

ZTT Antenna Products Catalogue 2025



Connecting Wonderful Life with Optic-Electric Network

Passive Single-Band Antennas

Product Name	Model	Frequency MHz	HPBW °	Gain dBi	Tilt°
2-Port,X-Pol,Panel Antenna, 1×698-960MHz,65deg,15dBi,Integrated RET	HBZ2B6515	1×698-960	65	15.0	2-12
2-Port,X-Pol,Panel Antenna, 1×698-960MHz,65deg,16dBi,Integrated RET	HBZ2B6516	1×698-960	65	16.0	2-12
2-Port,X-Pol,Panel Antenna, 1×698-960MHz,65deg,18dBi,Integrated RET	HBZ2B6518	1×698-960	65	17.5	2-12
2-Port,X-Pol,Narrow Beam Panel Antenna, 1×698-960MHz,33deg,20dBi,Integrated RET	HBZ2B3320	1×698-960	33	20.0	2-12
2-Port,X-Pol,Panel Antenna, 1×1710-2690MHz,65deg,18dBi,Integrated RET	HBZ2D6518	1×1710-2690	65	18.0	2-12
2-Port,X-Pol,Panel Antenna, 1×1710-2690MHz,65deg,20dBi,Integrated RET	HBZ2D6520	1×1710-2690	65	20.0	2-12
4-Port,X-Pol,Narrow Beam Panel Antenna, 2×1710-2690MHz,33deg,20dBi,Integrated RET	HBZ4D3320	2×1710-2690	33	20.0	2-12
4-Port,X-Pol,Panel Antenna, 2×698-960MHz,65deg,15dBi,Integrated RET	HBZ4B6515	2×698-960	65	15.0	2-15
4-Port,X-Pol,Panel Antenna, 2×698-960MHz,65deg,16dBi,Integrated RET	HBZ4B6516	2×698-960	65	16.0	2-12
4-Port,X-Pol,Panel Antenna, 2×698-960MHz,65deg,17dBi,Integrated RET	HBZ4B6517	2×698-960	65	17.0	2-12
4-Port,X-Pol,Panel Antenna, 2×617-896MHz,65deg,17dBi,Integrated RET	HBZ4A6517	2×617-896	65	17.0	2-12
4-Port,X-Pol,Panel Antenna, 2×1710-2690MHz,65deg,18dBi,Integrated RET	HBZ4D6518	2×1710-2690	65	18.0	2-12
4-Port,X-Pol,Panel Antenna, 2×1710-2690MHz,65deg,20dBi,Integrated RET	HBZ4D6520	2×1710-2690	65	20.0	2-12
4-Port,X-Pol,Narrow Beam Panel Antenna, 2×1710-2690MHz,33deg,21dBi,Integrated RET	HBZ4D3321	2×1710-2690	33	21.0	2-12
4-Port,X-Pol,Panel Antenna, 2×3300-3800MHz,65deg,18dBi,Integrated RET	HBZ4E6518	2×3300-3800	65	18.0	2-12
4-Port,X-Pol,Panel Antenna, 2×4720-4920MHz,65deg,18dBi,Integrated RET	HBZ4G6518	2×4720-4920	65	18.0	2-12
6-Port,X-Pol, Panel Antenna, 3×1710-2690,65deg,18dBi,Integrated RET	HBZ6D6518	3×1710-2690	65	18.0	2-12
8-Port,X-Pol,Panel Antenna, 4×1710-2690MHz,65deg,18dBi,Integrated RET	HBZ8D6518	4×1710-2690	65	18.0	2-12

Passive Multi-Band Antennas

Product Name	Model	Frequency MHz	HPBW °	Gain dBi	Tilt°
4-Port,X-Pol,Panel Antenna, 1×698-960&1×1710-2690MHz,65deg,15&17dBi,Integrated RET	HBZ22P651517	1×698-960 1×1710-2690	65	15.0 17.5	2-15 2-12
4-Port,X-Pol,Panel Antenna, 1×698-960&1×1710-2690MHz,65deg,16&17dBi,Integrated RET	HBZ22P651617	1×698-960 1×1710-2690	65	15.5 17.5	2-12
4-Port,X-Pol,Panel Antenna, 1×698-960&1×1710-2690MHz,65deg,17&17dBi,Integrated RET	HBZ22P6517	1×698-960 1×1710-2690	65	17.0 17.5	2-12
6-Port,X-Pol,Panel Antenna, 1×698-960&2×1710-2690MHz,65deg,15&17dBi,Integrated RET	HBZ24P651517	1×698-960 2×1710-2690	65	14.5 17.5	2-15 2-12
6-Port,X-Pol,Panel Antenna, 1×698-960&2×1710-2690MHz,65deg,16&17dBi,Integrated RET	HBZ24P651617	1×698-960 2×1710-2690	65	15.5 17.5	2-12
6-Port,X-Pol,Panel Antenna, 1×698-960&2×1710-2690MHz,65deg,17&17dBi,Integrated RET	HBZ24P6517	1×698-960 2×1710-2690	65	16.5 17.5	2-12
8-Port,X-Pol,Panel Antenna, 2×698-960&2×1710-2690MHz,65deg,15&18dBi,Integrated RET	HBZ44P651518	2×698-960 2×1710-2690	65	14.5 17.5	2-12
8-Port,X-Pol,Panel Antenna, 2×698-960&2×1710-2690MHz,65deg,16&18dBi,Integrated RET	HBZ44P651618	2×698-960 2×1710-2690	65	15.5 17.5	2-12
8-Port,X-Pol,Panel Antenna, 2×698-960&2×1710-2690MHz,65deg,17&18dBi,Integrated RET	HBZ44P651718	2×698-960 2×1710-2690	65	16.5 17.5	2-12
8-Port,X-Pol,Narrow Beam Panel Antenna, 2×690-960&2×1710-2690MHz,33deg,17&20dBi,Integrated RET	HBZ44P331720	2×698-960 2×1710-2690	33	16.5 20.0	2-10
10-Port,X-Pol,Panel Antenna, 1×690-960&4×1695-2690MHz,65deg,15&16dBi,Integrated RET	HBZ28P651516	1×698-960 4×1710-2690	65	15.0 15.5	2-12
10-Port,X-Pol,Panel Antenna, 1×690-960&4×1695-2690MHz,65deg,16&17dBi,Integrated RET	HBZ28P651617	1×698-960 4×1710-2690	65	16.0 17.0	2-12
10-Port,X-Pol,Panel Antenna, 1×690-960&4×1695-2690MHz,65deg,16&18dBi,Integrated RET	HBZ28P651618	1×698-960 4×1710-2690	65	16.5 17.5	2-12

12-Port,X-Pol,Panel Antenna, 2×694-960&4×1695-2690MHz,65deg,15&17dBi,Integrated RET	HBZ48P651517	2×694-960 4×1695-2690	65	14.5 17.0	2-12
12-Port,X-Pol,Sector Antenna, 2×690-960&4×1695-2690MHz,65deg,16&17dBi,Integrated RET	HBZ48P651617	2×690-960 4×1695-2690	65	15.5 17.0	2-12
12-Port,X-Pol,Panel Antenna, 2×690-960&4×1695-2690MHz,65deg,17&17dBi,Integrated RET	HBZ48P651717	2×694-960 4×1695-2690	65	16.5 17.0	2-12
12-Port,X-Pol,Panel Antenna, 2×698-960&4×1710-2690MHz,65deg,15&16dBi,Integrated RET	HBZ48P651516	2×698-960 4×1710-2690	65	15.0 16.0	2-12
12-Port,X-Pol,Panel Antenna, 2×690-960&4×1710-2690MHz,65deg,17&17dBi,Integrated RET	HBZ48P6517	2×698-960 4×1710-2690	65	16.5 17.0	2-12
12-Port,X-Pol,Panel Antenna, 2×690-960&4×1710-2690MHz(Twin Beam),65deg,17&18dBi,Integrated RET	HBD48P651718	2×698-960 4×1710-2690	65	17.0 17.5	2-12

5G TDD Antennas

9-Port,X-Pol,TDD Antenna, 3300-3800MHz,Integrated RET	HBZ81E9716	1×3300-3800	90	16.0	2-12
9-Port,X-Pol,TDD Antenna, 3300-4200MHz,Integrated RET	HBZ81T9716	1×3300-4200	90	16.5	2-12
2-Port,X-Pol,TDD Antenna, 2300-2690MHz,Integrated RET	HBZ2D9217	1×2300-2690	65	17.0	2-12

5G FDD&TDD Antennas

13-Port,X-Pol,FDD&TDD Antenna, FDD2×1695-2690MHz,TDD1×3300-3800MHz,Integrated RET	HBZ481M731718	2×1695-2690 1×3300-3800	65 90	17.5 16.0	2-12
8-Port,X-Pol,FDD&TDD Antenna, FDD1×690-960&2×1695-2690MHz,TDD1×2300-2690MHz,Integrated RET	HBZ242S7017	1×690-960 2×1695-2690 1×2300-2690	65 65 90	16.5 17.0 15.5	2-12
10-Port,X-Pol,FDD&TDD Antenna, FDD1×698-960&3×1710-2690MHz,TDD1×2300-2690MHz,Integrated RET	HBZ262S6817	1×690-960 3×1695-2690 1×2300-2690	65 65 90	16.5 17.0 15.0	2-12
12-Port,X-Pol,FDD&TDD Antenna, FDD1×698-960&4×1710-2690MHz,TDD1×3300-3800MHz,Integrated RET	HBZ282J651617	1×690-960 4×1695-2690 1×3300-3800	65 65 90	16.5 17.0 15.0	0-10 2-12 2-12
14-Port,X-Pol,FDD&TDD Antenna, FDD2×698-960&4×1710-2690MHz,TDD1×2300-2690MHz,Integrated RET	HBZ482J6617	2×690-960 4×1695-2690 1×2300-2690	65 65 90	16.5 17.0 15.5	2-12

Product Name:1#2-Port,X-Pol,Panel Antenna,
1×698-960MHz,65deg,15dBi,Integrated RET

Antenna Model:**HBZ2B6515**

Electrical Specifications				
Frequency Range	MHz	1×698-960(R1)		
Frequency Band	MHz	698-790	790-896	870-960
Gain Over All Tilts	dBi	14.1±0.6	14.6±0.5	15.0±0.3
Gain by Tilt Average Min	dBi	14.7	15.1	15.3
Gain by Tilt Average Mid		14.2	14.6	15.2
Gain by Tilt Average Max		13.8	14.2	14.8
Horizontal 3dB Beam Width	Deg	69±2.0	66±3.0	63±3.0
Vertical 3dB Beam Width	Deg	15.1±1.4	13.7±1	12.8±0.6
1 st Upper Side Lobe Suppression Above Main Beam	dB	≥15		
Front to Back Ratio at 180Deg ±30Deg	dB	≥25		
Cross-Polar Ratio 0Deg	dB	≥17		
Cross-Polar Ratio ±60Deg	dB	≥8		
Electrical Downtilt	Deg	2-12,Continuously adjustable		
VSWR	/	≤1.5		
Cross Polar Isolation	dB	≥26		
Interband Isolation	dB	≥26		
Intermodulation IM3	dBc	≤-153(2×43 dBm carrier)		
Max. Power Per Port	Watt	350(at 50°C ambient temperature)		
Mechanical Specifications				
Antenna Dimensions	mm	1500×320×140		
Antenna Net Weight	kg	15.5		
Packing Dimensions	mm	1766×415×235		

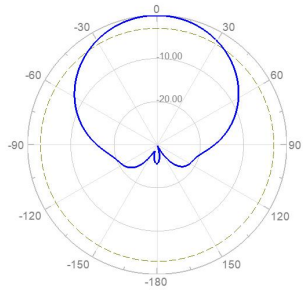
Antenna Gross Weight	kg	25.3
Connector Type	/	2×4.3-10 Female
Connector Position	/	Bottom
Radiator Material	/	Low loss circuit board
Radome Material / Color	/	Fiberglass / Light Grey RAL7035
Reflector Material	/	Aluminum
Storage Temperature	°C	-40 to +60
Operating Temperature	°C	-40 to +60
Humidity	/	5% to 95%
Max. operational Wind Speed	km/h	200
Wind Load @Rated Wind Front	N	600
Wind Load @Rated Wind Side	N	109
Wind Load @Rated Wind Rear	N	673
Lightning Protection	/	DC ground
Accessories		
Downtilt Kit (mechanical)	Deg	0-12
Mounting Accessories (clamp)	/	Included with antenna
Mounting Pipe Diameter	mm	50-115
Internal RET Specifications		
RCU (remote control unit)	/	Replaceable RET (can be exchangeable without exchanging antenna)
		AISG2.0 /3GPP
Input Voltage Range	V	10-30 DC
Power Consumption	W	< 10 (motor activated , single RET)
		< 2 (stand by, single RET)
Adjustment Time (full range)	s	< 120 (typically, depending on antenna type)
RET Connector	/	1 pair of AISG 5 pin male & female
Pin Assignment According AISG	/	5-pin circular connector conforming to IEC 60130-9 - Ed. 3.0

Lightning Protection	kA	5 (8/20 μ s differential mode), 8 (8/20 μ s common mode)
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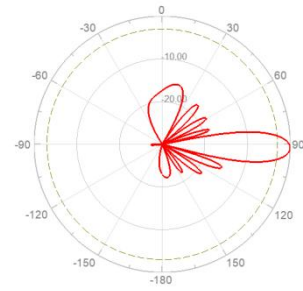
Reference Pattern

698-960MHz

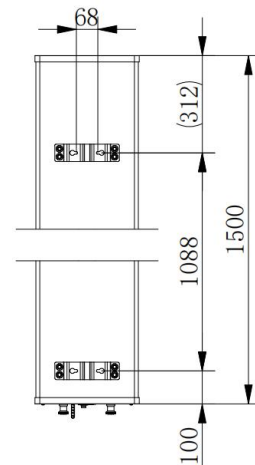
Horizontal Pattern



Vertical Pattern



Layout of Interface



Layout of Array

Array	Connector	Frequency(MHz)	RET Serial	
R1	1-2	698-960	ZTR1...01	R1

All data are based on NGMN recommendations on Base Station Antenna Standards (BASTA V13.0).

Product Name:2#2-Port,X-Pol,Panel Antenna,
 1×698-960MHz,65deg,16dBi,Integrated RET
 Antenna Model:**HBZ2B6516**

Electrical Specifications				
Description	2-Port,X-Pol,Panel Antenna, 1×698-960MHz,65deg,16dBi,Integrated RET			
Frequency Range	MHz	1×698-960(R1)		
Frequency Band	MHz	698-790	790-896	870-960
Gain Over All Tilts	dBi	15.7±0.6	16.2±0.5	16.4±0.4
Gain by Tilt Average Min	dBi	15.9	16.4	16.7
Gain by Tilt Average Mid		15.7	16.0	16.4
Gain by Tilt Average Max		15.5	15.7	16.0
Horizontal 3dB Beam Width	Deg	70±5	67±4	66±3
Vertical 3dB Beam Width	Deg	11.4±0.7	10.0±0.8	9.2±0.8
1 st Upper Side Lobe Suppression Above Main Beam	dB	≥16	≥16	≥15
Front to Back Ratio at 180Deg ±30Deg	dB	≥26		
Cross-Polar Ratio 0Deg	dB	≥19		
Electrical Downtilt	Deg	2-12,Continuously adjustable		
VSWR	/	≤1.5		
Cross Polar Isolation	dB	≥28		
Interband Isolation	dB	≥28		
Intermodulation IM3	dBc	≤-150(2×43 dBm carrier)		
Max. Power Per Port	Watt	350(at 50°C ambient temperature)		
Mechanical Specifications				
Antenna Dimensions	mm	2000×320×140		
Antenna Net Weight	kg	19.3		

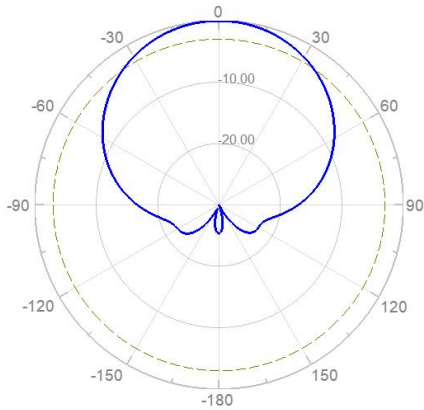
Packing Dimensions	mm	2200×450×300
Antenna Gross Weight	kg	19.0
Connector Type	/	2×4.3-10 Female
Connector Position	/	Bottom
Radiator Material	/	Low loss circuit board
Radome Material / Color	/	Fiberglass / Light Grey RAL7035
Reflector Material	/	Aluminum
Storage Temperature	°C	-40 to +60
Operating Temperature	°C	-40 to +60
Humidity	/	5% to 95%
Max. operational Wind Speed	km/h	200
Wind Load @Rated Wind Front	N	806
Wind Load @Rated Wind Side	N	146
Wind Load @Rated Wind Rear	N	903
Lightning Protection	/	DC ground
Accessories		
Downtilt Kit (mechanical)	Deg	0-12
Mounting Accessories (clamp)	/	Included with antenna
Mounting Pipe Diameter	mm	50-115
Internal RET Specifications		
RCU (remote control unit)	/	Replaceable RET (can be exchanged without exchanging antenna)
		AISG2.0 /3GPP
Input Voltage Range	V	10-30 DC
Power Consumption	W	< 10 (motor activated , single RET)
		< 2 (stand by, single RET)
Adjustment Time (full range)	s	< 120 (typically, depending on antenna type)
RET Connector	/	1 pair of AISG 5 pin male & female
Pin Assignment According AISG	/	5-pin circular connector conforming to IEC 60130-9 - Ed.

		3.0
Lightning Protection	kA	5 (8/20 μ s differential mode), 8 (8/20 μ s common mode)

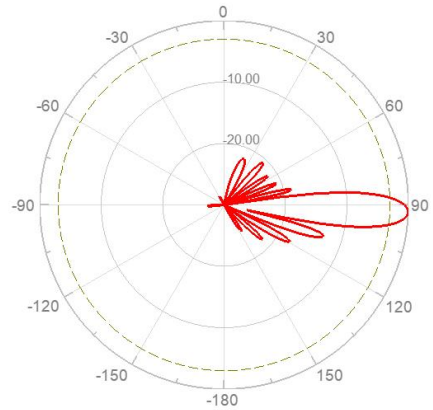
Reference Pattern

698-960MHz

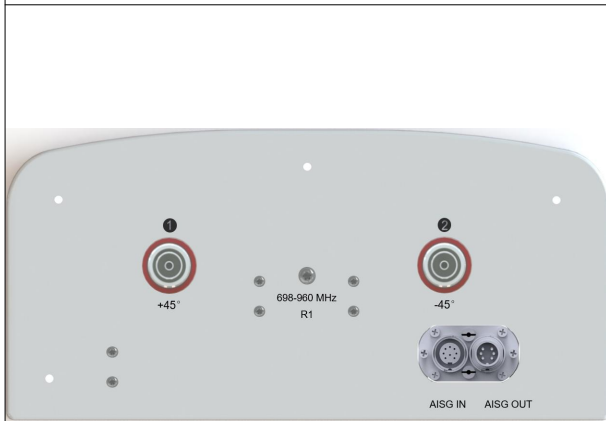
Horizontal Pattern



Vertical Pattern



Layout of Interface



Layout of Array

Array	Connector	Frequency(MHz)	RET Serial	
R1	1-2	698-960	ZTR1...01	R1

All data are based on NGMN recommendations on Base Station Antenna Standards (BASTA V13.0).

Product Name:3#2-Port,X-Pol,Panel Antenna,
 1×698-960MHz,65deg,18dBi,Integrated RET
 Antenna Model:**HBZ2B6518**

Electrical Specifications				
Description	2-Port,X-Pol,Panel Antenna, 1×698-960MHz,65deg,18dBi,Integrated RET			
Frequency Range	MHz	1×698-960(R1)		
Frequency Band	MHz	698-790	790-896	870-960
Gain Over All Tilts	dBi	17.2±0.6	17.5±0.5	17.7±0.4
Gain by Tilt Average Min	dBi	17.6	17.7	18.1
Gain by Tilt Average Mid		16.9	17.5	17.6
Gain by Tilt Average Max		16.6	17.2	17.3
Horizontal 3dB Beam Width	Deg	69±5	67±4	65±3
Vertical 3dB Beam Width	Deg	8.4±0.7	7.5±0.8	6.9±0.8
1 st Upper Side Lobe Suppression Above Main Beam	dB	≥16		
Front to Back Ratio at 180Deg ±30Deg	dB	≥25		
Cross-Polar Ratio 0Deg	dB	≥17		
Cross-Polar Ratio ±60Deg	dB	≥10		
Electrical Downtilt	Deg	2-12,Continuously adjustable		
VSWR	/	≤1.5		
Cross Polar Isolation	dB	≥28		
Interband Isolation	dB	≥28		
Intermodulation IM3	dBc	≤-150(2×43 dBm carrier)		
Max. Power Per Port	Watt	350(at 50°C ambient temperature)		
Mechanical Specifications				
Antenna Dimensions	mm	2500×320×140		

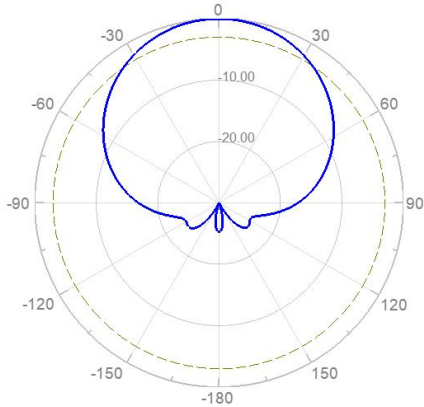
Antenna Net Weight	kg	22.3
Packing Dimensions	mm	2700×450×240
Antenna Gross Weight	kg	33.4
Connector Type	/	2×4.3-10 Female
Connector Position	/	Bottom
Radiator Material	/	Low loss circuit board
Radome Material / Color	/	Fiberglass / Light Grey RAL7035
Reflector Material	/	Aluminum
Storage Temperature	°C	-40 to +60
Operating Temperature	°C	-40 to +60
Humidity	/	5% to 95%
Max. operational Wind Speed	km/h	200
Wind Load @Rated Wind Front	N	1005
Wind Load @Rated Wind Side	N	182
Wind Load @Rated Wind Rear	N	1126
Lightning Protection	/	DC ground
Accessories		
Downtilt Kit (mechanical)	Deg	0-12
Mounting Accessories (clamp)	/	Included with antenna
Mounting Pipe Diameter	mm	50-115
Internal RET Specifications		
RCU (remote control unit)	/	Replaceable RET (can be exchangeable without exchanging antenna)
		AISG2.0 /3GPP
Input Voltage Range	V	10-30 DC
Power Consumption	W	< 10 (motor activated , single RET) < 2 (stand by, single RET)
Adjustment Time (full range)	s	< 120 (typically, depending on antenna type)
RET Connector	/	1 pair of AISG 5 pin male & female

Pin Assignment According AISG	/	5-pin circular connector conforming to IEC 60130-9 - Ed. 3.0
Lightning Protection	kA	5 (8/20 μ s differential mode), 8 (8/20 μ s common mode)

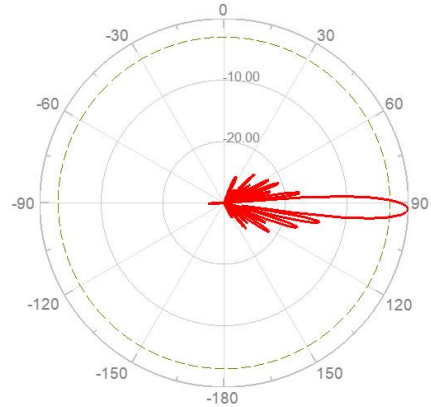
Reference Pattern

698-960MHz

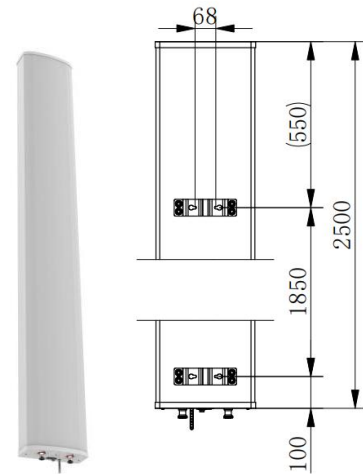
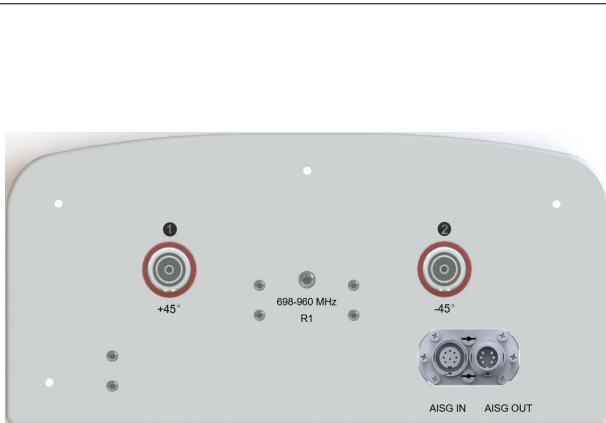
Horizontal Pattern



Vertical Pattern



Layout of Interface



Layout of Array

Array	Connector	Frequency(MHz)	RET Serial	
R1	1-2	698-960	ZTR1...01	R1

All data are based on NGMN recommendations on Base Station Antenna Standards (BASTA V13.0).

Product Name:4#2-Port,X-Pol,Panel Antenna,
 1×694-960MHz,33deg,20dBi,Integrated RET
 Antenna Model:**HBZ2B3320**

Electrical Specifications				
Description	2-Port,X-Pol,Panel Antenna, 1×694-960MHz,33deg,20dBi,Integrated RET			
Frequency Range	MHz	1×694-960(R1)		
Frequency Band	MHz	694-790	824-890	890-960
Gain Over All Tilts	dBi	19.2±0.6	19.7±0.5	20.3±0.4
Gain by Tilt Average Min	dBi	19.6	20.2	20.5
Gain by Tilt Average Mid		18.9	19.7	20.1
Gain by Tilt Average Max		18.6	19.5	19.9
Horizontal 3dB Beam Width	Deg	35±3	33±2	29±3
Vertical 3dB Beam Width	Deg	9.1±0.7	7.9±0.5	7.3±0.4
1 st Upper Side Lobe Suppression Above Main Beam	dB	≥16		
Front to Back Ratio at 180Deg ±30Deg	dB	≥25		
Cross-Polar Ratio 0Deg	dB	≥19		
Cross-Polar Ratio ±60Deg	dB	≥8		
Electrical Downtilt	Deg	2-12,Continuously adjustable		
VSWR	/	≤1.5		
Cross Polar Isolation	dB	≥28		
Interband Isolation	dB	≥28		
Intermodulation IM3	dBc	≤-150(2×43 dBm carrier)		
Max. Power Per Port	Watt	250(at 50°C ambient temperature)		
Mechanical Specifications				
Antenna Dimensions	mm	2500×585×155		

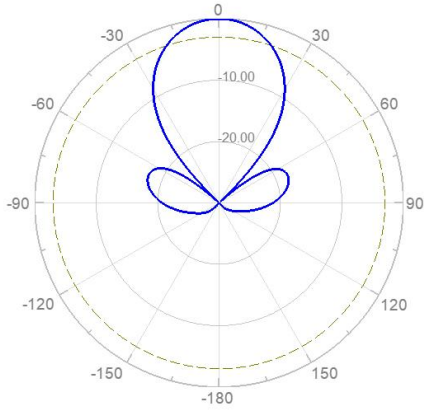
Antenna Net Weight	kg	39.0
Packing Dimensions	mm	2700×700×250
Antenna Gross Weight	kg	50.0
Connector Type	/	2×4.3-10 Female
Connector Position	/	Bottom
Radiator Material	/	Low loss circuit broad
Radome Material / Color	/	Fiberglass / Light Grey RAL7035
Reflector Material	/	Aluminum
Storage Temperature	°C	-40 to +60
Operating Temperature	°C	-40 to +60
Humidity	/	5% to 95%
Max. operational Wind Speed	km/h	200
Wind Load @Rated Wind Front	N	1867
Wind Load @Rated Wind Side	N	205
Wind Load @Rated Wind Rear	N	2092
Lightning Protection	/	DC ground
Accessories		
Downtilt Kit (mechanical)	Deg	0-12
Mounting Accessories (clamp)	/	Included with antenna
Mounting Pipe Diameter	mm	50-115
Internal RET Specifications		
RCU (remote control unit)	/	Replaceable RET (can be exchangeable without exchanging antenna)
		AISG2.0 /3GPP
Input Voltage Range	V	10-30 DC
Power Consumption	W	< 10 (motor activated , single RET) < 2 (stand by, single RET)
Adjustment Time (full range)	s	< 120 (typically, depending on antenna type)
RET Connector	/	1 pair of AISG 5 pin male & female

Pin Assignment According AISG	/	5-pin circular connector conforming to IEC 60130-9 - Ed. 3.0
Lightning Protection	kA	5 (8/20 μ s differential mode), 8 (8/20 μ s common mode)

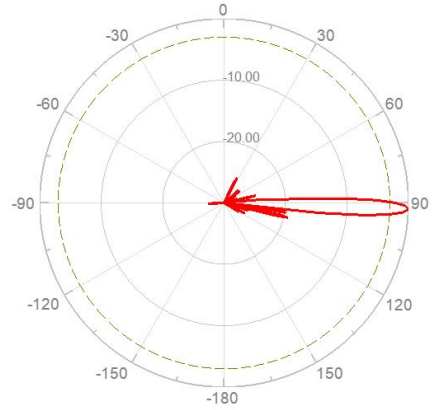
Reference Pattern

694-960MHz

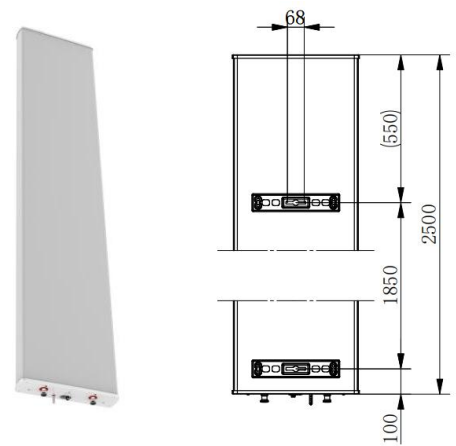
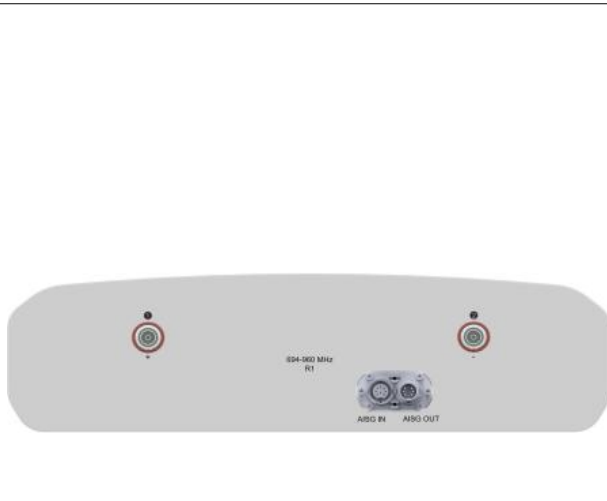
Horizontal Pattern



Vertical Pattern



Layout of Interface



Layout of Array

Array	Connector	Frequency(MHz)	RET Serial	
R1	1-2	694-960	ZTR1...01	R1

All data are based on NGMN recommendations on Base Station Antenna Standards (BASTA V13.0).

Product Name:5#2-Port,X-Pol,Panel Antenna,
 1×1710-2690MHz,65deg,18dBi,Integrated RET
 Antenna Model:**HB2D6518**

Electrical Specifications						
Description	2-Port,X-Pol,Panel Antenna, 1×1710-2690MHz,65deg,18dBi,Integrated RET					
Frequency Range	MHz	1×1710-2690(Y1)				
Frequency Band	MHz	1710-1880	1850-1990	1920-2170	2300-2490	2500-2690
Gain Over All Tilts	dBi	17.5±0.5	17.6±0.5	18.0±0.6	18.4±0.5	18.5±0.7
Gain by Tilt Average Min	dBi	18.0	18.1	18.6	18.7	18.9
Gain by Tilt Average Mid		17.7	17.5	18.0	18.3	18.4
Gain by Tilt Average Max		17.4	17.1	17.5	17.9	17.9
Horizontal 3dB Beam Width	Deg	68±4	64±7	63±6	62±6	60±6
Vertical 3dB Beam Width	Deg	6.9±0.5	6.3±0.4	5.9±0.8	5.2±0.5	5.0±0.5
1 st Upper Side Lobe Suppression Above Main Beam	dB	≥16				
Front to Back Ratio at 180Deg ±30Deg	dB	≥25				
Cross-Polar Ratio 0Deg	dB	≥16				
Cross-Polar Ratio ±60Deg	dB	≥7				
Electrical Downtilt	Deg	2-12,Continuously adjustable				
VSWR	/	≤1.5				
Cross Polar Isolation	dB	≥28				
Interband Isolation	dB	≥28				
Intermodulation IM3	dBc	≤-153(2×43 dBm carrier)				
Max. Power Per Port	Watt	250(at 50°C ambient temperature)				
Impedance	Ohm	50				
Polarization	Deg	±45				

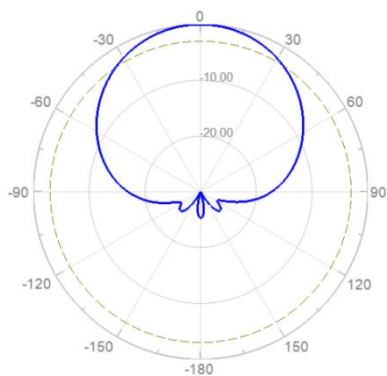
Mechanical Specifications		
Antenna Dimensions	mm	1500×160×115
Antenna Net Weight	kg	8.5
Packing Dimensions	mm	1700×300×250
Antenna Gross Weight	kg	13.6
Connector Type	/	2×4.3-10 Female
Connector Position	/	Bottom
Radiator Material	/	Low loss circuit broad
Radome Material / Color	/	Fiberglass / Light Grey RAL7035
Reflector Material	/	Aluminum
Storage Temperature	°C	-40 to +60
Operating Temperature	°C	-40 to +60
Humidity	/	5% to 95%
Max. operational Wind Speed	km/h	200
Wind Load @Rated Wind Front	N	300
Wind Load @Rated Wind Side	N	89
Wind Load @Rated Wind Rear	N	336
Lightning Protection	/	DC ground
Accessories		
Downtilt Kit (mechanical)	Deg	0-12
Mounting Accessories (clamp)	/	Included with antenna
Mounting Pipe Diameter	mm	50-115
Internal RET Specifications		
RCU (remote control unit)	/	Replaceable RET (can be exchangeable without exchanging antenna)
		AISG2.0 /3GPP
Input Voltage Range	V	10-30 DC
Power Consumption	W	< 10 (motor activated , single RET) < 2 (stand by, single RET)

Adjustment Time (full range)	s	< 120 (typically, depending on antenna type)
RET Connector	/	1 pair of AISG 5 pin male & female
Pin Assignment According AISG	/	5-pin circular connector conforming to IEC 60130-9 - Ed. 3.0
Lightning Protection	kA	5 (8/20 μ s differential mode), 8 (8/20 μ s common mode)

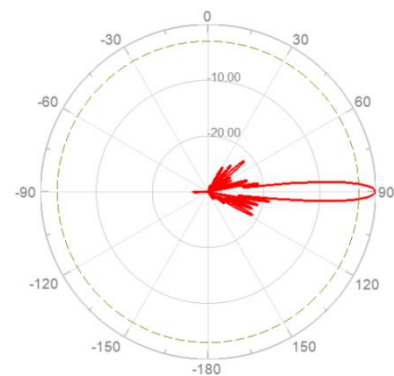
Reference Pattern

1710-2690MHz

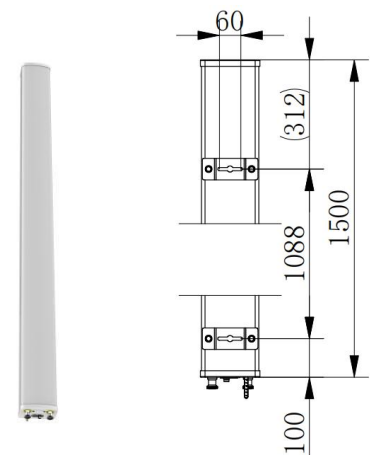
Horizontal Pattern



Vertical Pattern



Layout of Interface



Layout of Array

Array	Connector	Frequency(MHz)	RET Serial	
Y1	1-2	1710-2690	ZTY1...01	Y1

All data are based on NGMN recommendations on Base Station Antenna Standards (BASTA V13.0).

Product Name:6#2-Port,X-Pol,Panel Antenna,
 1×1710-2690MHz,65deg,20dBi,Integrated RET
 Antenna Model:**HBZ2D6520**

Electrical Specifications						
Description	2-Port,X-Pol,Panel Antenna, 1×1710-2690MHz,65deg,20dBi,Integrated RET					
Frequency Range	MHz	1×1710-2690(Y1)				
Frequency Band	MHz	1710-1880	1850-1990	1920-2170	2300-2490	2500-2690
Gain Over All Tilts	dBi	19.5±0.5	19.6±0.5	20.0±0.6	20.2±0.5	20.4±0.7
Gain by Tilt Average Min	dBi	20.0	20.1	20.6	20.7	20.9
Gain by Tilt Average Mid		19.7	19.5	20.0	20.3	20.4
Gain by Tilt Average Max		19.4	19.1	19.5	19.9	19.9
Horizontal 3dB Beam Width	Deg	70±4	66±7	63±6	61±6	59±6
Vertical 3dB Beam Width	Deg	4.9±0.5	4.8±0.4	4.0±0.8	3.5±0.5	3.3±0.5
1 st Upper Side Lobe Suppression Above Main Beam	dB	≥16				
Front to Back Ratio at 180Deg ±30Deg	dB	≥25				
Cross-Polar Ratio 0Deg	dB	≥15				
Cross-Polar Ratio ±60Deg	dB	≥10				
Electrical Downtilt	Deg	2-12,Continuously adjustable				
VSWR	/	≤1.5				
Cross Polar Isolation	dB	≥28				
Interband Isolation	dB	≥28				
Intermodulation IM3	dBc	≤-150(2×43 dBm carrier)				
Max. Power Per Port	Watt	250(at 50°C ambient temperature)				
Impedance	Ohm	50				
Polarization	Deg	±45				

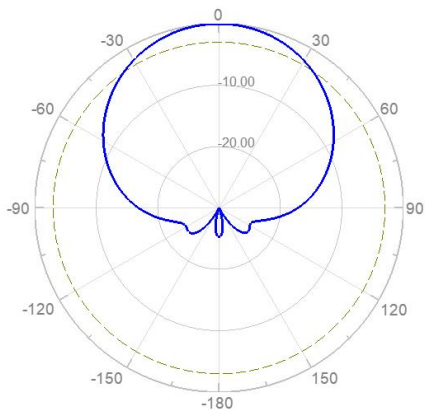
Mechanical Specifications		
Antenna Dimensions	mm	2100×160×115
Antenna Net Weight	kg	11.5
Packing Dimensions	mm	2400×300×250
Antenna Gross Weight	kg	19.5
Connector Type	/	2×4.3-10 Female
Connector Position	/	Bottom
Radiator Material	/	Low loss circuit broad
Radome Material / Color	/	Fiberglass / Light Grey RAL7035
Reflector Material	/	Aluminum
Storage Temperature	°C	-40 to +60
Operating Temperature	°C	-40 to +60
Humidity	/	5% to 95%
Max. operational Wind Speed	km/h	200
Wind Load @Rated Wind Front	N	1532
Wind Load @Rated Wind Side	N	168
Wind Load @Rated Wind Rear	N	1717
Lightning Protection	/	DC ground
Accessories		
Downtilt Kit (mechanical)	Deg	0-12
Mounting Accessories (clamp)	/	Included with antenna
Mounting Pipe Diameter	mm	50-115
Internal RET Specifications		
RCU (remote control unit)	/	Replaceable RET (can be exchangeable without exchanging antenna)
		AISG2.0 /3GPP
Input Voltage Range	V	10-30 DC
Power Consumption	W	< 10 (motor activated , single RET) < 2 (stand by, single RET)

Adjustment Time (full range)	s	< 120 (typically, depending on antenna type)
RET Connector	/	1 pair of AISG 5 pin male & female
Pin Assignment According AISG	/	5-pin circular connector conforming to IEC 60130-9 - Ed. 3.0
Lightning Protection	kA	5 (8/20 μ s differential mode), 8 (8/20 μ s common mode)

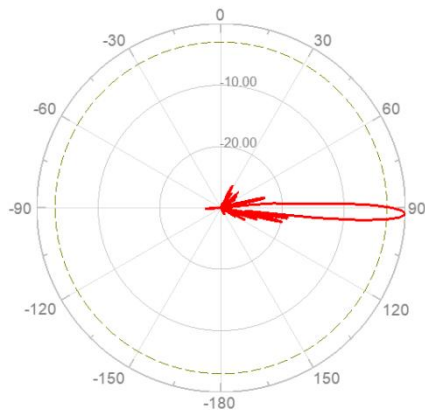
Reference Pattern

1710-2690MHz

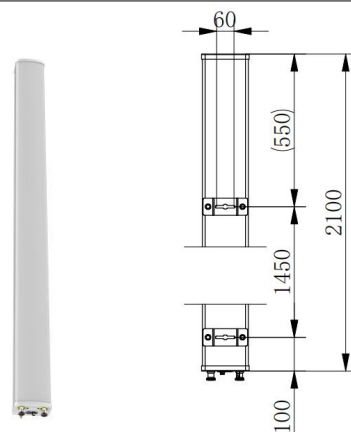
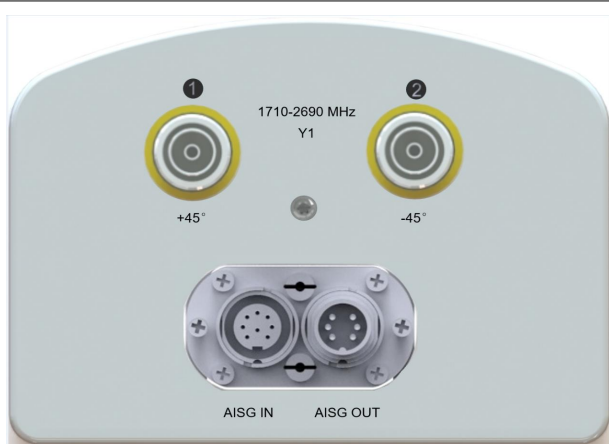
Horizontal Pattern



Vertical Pattern



Layout of Interface



Layout of Array

Array	Connector	Frequency(MHz)	RET Serial	
Y1	1-2	1710-2690	ZTY1...01	Y1

All data are based on NGMN recommendations on Base Station Antenna Standards (BASTA V13.0).

Product Name:7#4-Port,X-Pol,Panel Antenna,
 2×1710-2690MHz,33deg,20dBi,Integrated RET
 Antenna Model:**HBZ4D3320**

Electrical Specifications						
Description	4-Port,X-Pol,Panel Antenna, 2×1710-2690MHz,33deg,20dBi,Integrated RET					
Frequency Range	MHz	2×1710-2690(Y1/Y2)				
Frequency Band	MHz	1710-1880	1850-1990	1920-2170	2300-2400	2500-2690
Gain Over All Tilts	dBi	19.5±0.5	19.6±0.5	20.0±0.6	20.2±0.5	20.4±0.7
Gain by Tilt Average Min	dBi	20.0	20.1	20.6	20.7	20.9
Gain by Tilt Average Mid		19.7	19.5	20.0	20.3	20.4
Gain by Tilt Average Max		19.4	19.1	19.5	19.9	19.9
Horizontal 3dB Beam Width	Deg	36±4	34±6	33±6	31±5	30±4
Vertical 3dB Beam Width	Deg	7.0±0.5	6.8±0.4	6.4±0.5	5.9±0.5	5.3±0.5
1 st Upper Side Lobe Suppression Above Main Beam	dB	≥16				
Front to Back Ratio at 180Deg ±30Deg	dB	≥25				
Cross-Polar Ratio 0Deg	dB	≥17				
Cross-Polar Ratio ±60Deg	dB	≥8				
Electrical Downtilt	Deg	2-12,Continuously adjustable				
VSWR	/	≤1.5				
Cross Polar Isolation	dB	≥26				
Interband Isolation	dB	≥26				
Intermodulation IM3	dBc	≤-150(2×43 dBm carrier)				
Max. Power Per Port	Watt	250(at 50°C ambient temperature)				
Impedance	Ohm	50				
Polarization	Deg	±45				

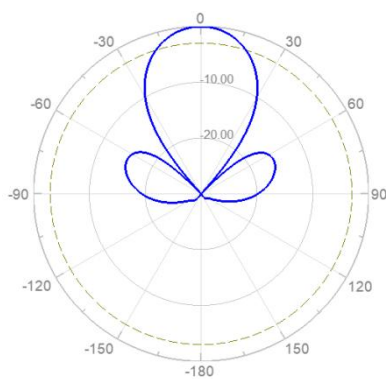
Mechanical Specifications		
Antenna Dimensions	mm	1500×499×199
Antenna Net Weight	kg	14.0
Packing Dimensions	mm	1800×650×300
Antenna Gross Weight	kg	25.1
Connector Type	/	4×4.3-10 Female
Connector Position	/	Bottom
Radiator Material	/	Aluminum
Radome Material / Color	/	Fiberglass / Light Grey RAL7035
Reflector Material	/	Aluminum
Storage Temperature	°C	-40 to +60
Operating Temperature	°C	-40 to +60
Humidity	/	5% to 95%
Max. operational Wind Speed	km/h	200
Wind Load @Rated Wind Front	N	936
Wind Load @Rated Wind Side	N	154
Wind Load @Rated Wind Rear	N	1049
Lightning Protection	/	DC ground
Accessories		
Downtilt Kit (mechanical)	Deg	0-12
Mounting Accessories (clamp)	/	Included with antenna
Mounting Pipe Diameter	mm	50-115
Internal RET Specifications		
RCU (remote control unit)	/	Replaceable RET (can be exchangeable without exchanging antenna)
		AISG2.0 /3GPP
Input Voltage Range	V	10-30 DC
Power Consumption	W	< 10 (motor activated , single RET) < 2 (stand by, single RET)

Adjustment Time (full range)	s	< 120 (typically, depending on antenna type)
RET Connector	/	1 pair of AISG 5 pin male & female
Pin Assignment According AISG	/	5-pin circular connector conforming to IEC 60130-9 - Ed. 3.0
Lightning Protection	kA	5 (8/20 μ s differential mode), 8 (8/20 μ s common mode)

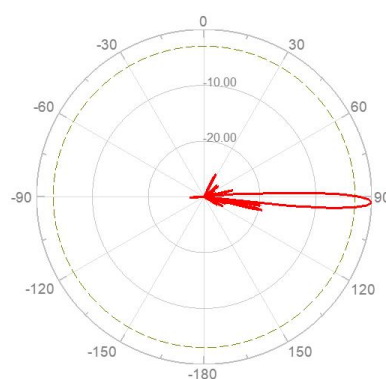
Reference Pattern

1710-2690MHz

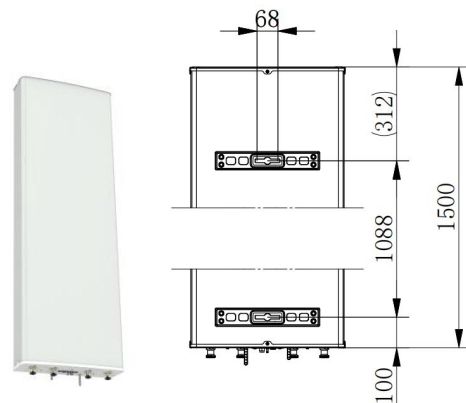
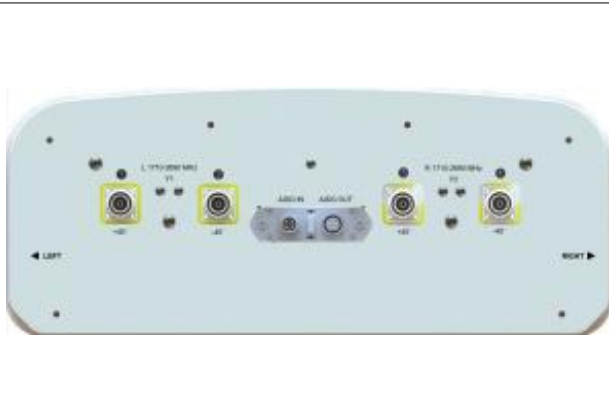
Horizontal Pattern



Vertical Pattern



Layout of Interface



Layout of Array

Array	Connector	Frequency(MHz)	RET Serial	
Y1	1-2	1710-2690	ZTY1...01	
Y2	3-4	1710-2690	ZTY1...02	

All data are based on NGMN recommendations on Base Station Antenna Standards (BASTA V13.0).

Product Name:8#4-Port,X-Pol, Panel Antenna,
 2×698-960MHz,65deg,15dBi,Integrated RET
 Antenna Model:**HBZ4B6515**

Electrical Specifications				
Description	4-Port,X-Pol, Panel Antenna, 2×698-960MHz,65deg,15dBi,Integrated RET			
Frequency Range	MHz	2×698-960(R1/R2)		
Frequency Band	MHz	698-790	790-896	896-960
Gain Over All Tilts	dBi	14±1.0	14.7±0.5	15.2±0.5
Gain by Tilt Average Min	dBi	15.0	15.2	15.4
Gain by Tilt Average Mid		14.5	14.6	15.0
Gain by Tilt Average Max		14.2	14.4	14.8
Horizontal 3dB Beam Width	Deg	60±4	59±5	64±4
Vertical 3dB Beam Width	Deg	16.7±0.8	15.5±0.7	14.3±0.5
1 st Upper Side Lobe Suppression Above Main Beam	dB	≥15	≥15	≥15
Front to Back Ratio at 180Deg ±30Deg	dB	≥23	≥25	≥25
Cross-Polar Ratio 0Deg	dB	≥15		
Electrical Downtilt	Deg	2-15,Continuously adjustable		
VSWR	/	≤1.5		
Cross Polar Isolation	dB	≥26		
Interband Isolation	dB	≥26		
Intermodulation IM3	dBc	≤-153(2×43 dBm carrier)		
Max. Power Per Port	Watt	350(at 50°C ambient temperature)		
Impedance	Ohm	50		
Polarization	Deg	±45		
Mechanical Specifications				

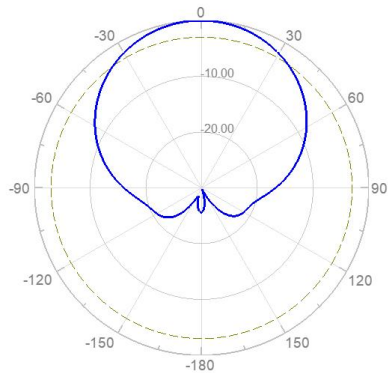
Antenna Dimensions	mm	1500×499×199
Antenna Net Weight	kg	24.5
Packing Dimensions	mm	1700×600×300
Antenna Gross Weight	kg	35.0
Connector Type	/	4×4.3-10 Female
Connector Position	/	Bottom
Radiator Material	/	Aluminum&Low loss circuit board
Radome Material / Color	/	Fiberglass / Light Grey RAL7035
Reflector Material	/	Aluminum
Storage Temperature	°C	-40 to +60
Operating Temperature	°C	-40 to +60
Humidity	/	5% to 95%
Max. operational Wind Speed	km/h	200
Wind Load @Rated Wind Front	N	905
Wind Load @Rated Wind Side	N	149
Wind Load @Rated Wind Rear	N	1014
Lightning Protection	/	DC ground
Accessories		
Downtilt Kit (mechanical)	Deg	0-12
Mounting Accessories (clamp)	/	Included with antenna
Mounting Pipe Diameter	mm	50-115
Internal RET Specifications		
RCU (remote control unit)	/	Replaceable RET (can be exchangeable without exchanging antenna)
		AISG2.0 /3GPP
Input Voltage Range	V	10-30 DC
Power Consumption	W	< 10 (motor activated , single RET) < 2 (stand by, single RET)
Adjustment Time (full range)	s	< 120 (typically, depending on antenna type)

RET Connector	/	1 pair of AISG 5 pin male & female
Pin Assignment According AISG	/	5-pin circular connector conforming to IEC 60130-9 - Ed. 3.0
Lightning Protection	kA	5 (8/20 μ s differential mode), 8 (8/20 μ s common mode)

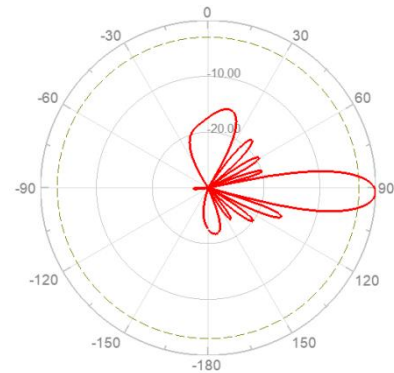
Reference Pattern

698-960MHz

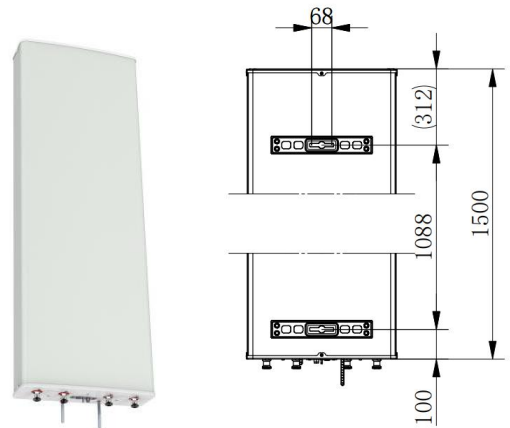
Horizontal Pattern



Vertical Pattern



Layout of Interface



Layout of Array

Array	Connector	Frequency(MHz)	RET Serial	
R1	1-2	698-960	ZTR1...01	
R2	3-4	698-960	ZTR2...02	

All data are based on NGMN recommendations on Base Station Antenna Standards (BASTA V13.0).

Product Name:9#4-Port,X-Pol, Panel Antenna,
 2×698-960MHz,65deg,16dBi,Integrated RET
 Antenna Model:**HBZ4B6516**

Electrical Specifications				
Description	4-Port,X-Pol, Panel Antenna, 2×698-960MHz,65deg,16dBi,Integrated RET			
Frequency Range	MHz	2×698-960(R1/R2)		
Frequency Band	MHz	698-790	790-896	896-960
Gain Over All Tilts	dBi	15.2±0.5	15.7±0.5	15.9±0.9
Gain by Tilt Average Min	dBi	15.7	16.2	16.8
Gain by Tilt Average Mid		15.3	15.7	16.0
Gain by Tilt Average Max		14.9	15.3	15.3
Horizontal 3dB Beam Width	Deg	62±6	59±5	58±4
Vertical 3dB Beam Width	Deg	11.3±0.6	10.3±0.5	9.2±0.5
1 st Upper Side Lobe Suppression Above Main Beam	dB	≥16	≥16	≥16
Front to Back Ratio at 180Deg ±30Deg	dB	≥23	≥25	≥25
Cross-Polar Ratio 0Deg	dB	≥15		
Electrical Downtilt	Deg	2-12,Continuously adjustable		
VSWR	/	≤1.5		
Cross Polar Isolation	dB	≥26		
Interband Isolation	dB	≥26		
Intermodulation IM3	dBc	≤-153(2×43 dBm carrier)		
Max. Power Per Port	Watt	350(at 50°C ambient temperature)		
Impedance	Ohm	50		
Polarization	Deg	±45		
Mechanical Specifications				

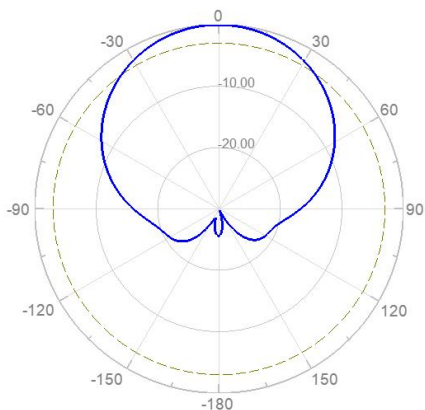
Antenna Dimensions	mm	2000×499×199
Antenna Net Weight	kg	27.9
Packing Dimensions	mm	2250×600×300
Antenna Gross Weight	kg	38.5
Connector Type	/	4×4.3-10 Female
Connector Position	/	Bottom
Radiator Material	/	Aluminum&Low loss circuit board
Radome Material / Color	/	Fiberglass / Light Grey RAL7035
Reflector Material	/	Aluminum
Storage Temperature	°C	-40 to +60
Operating Temperature	°C	-40 to +60
Humidity	/	5% to 95%
Max. operational Wind Speed	km/h	200
Wind Load @Rated Wind Front	N	1250
Wind Load @Rated Wind Side	N	206
Wind Load @Rated Wind Rear	N	1401
Lightning Protection	/	DC ground
Accessories		
Downtilt Kit (mechanical)	Deg	0-12
Mounting Accessories (clamp)	/	Included with antenna
Mounting Pipe Diameter	mm	50-115
Internal RET Specifications		
RCU (remote control unit)	/	Replaceable RET (can be exchangeable without exchanging antenna)
		AISG2.0 /3GPP
Input Voltage Range	V	10-30 DC
Power Consumption	W	< 10 (motor activated , single RET) < 2 (stand by, single RET)
Adjustment Time (full range)	s	< 120 (typically, depending on antenna type)

RET Connector	/	1 pair of AISG 5 pin male & female
Pin Assignment According AISG	/	5-pin circular connector conforming to IEC 60130-9 - Ed. 3.0
Lightning Protection	kA	5 (8/20 μ s differential mode), 8 (8/20 μ s common mode)

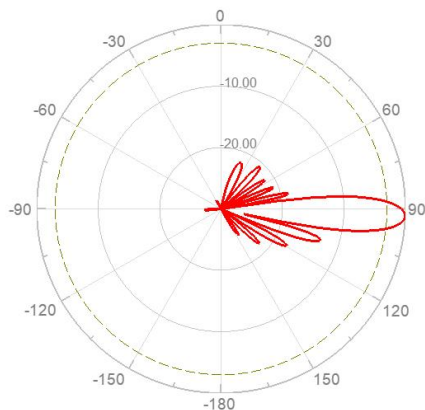
Reference Pattern

698-960MHz

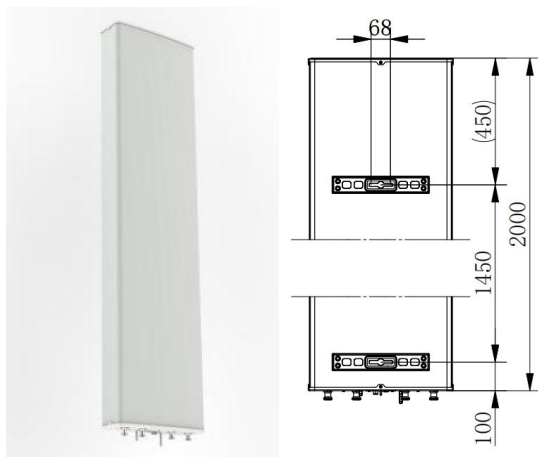
Horizontal Pattern



Vertical Pattern



Layout of Interface



Layout of Array

Array	Connector	Frequency(MHz)	RET Serial	
R1	1-2	698-960	ZTR1...01	
R2	3-4	698-960	ZTR2...02	

All data are based on NGMN recommendations on Base Station Antenna Standards (BASTA V13.0).

Product Name:10#4-Port,X-Pol, Panel Antenna,
 2×698-960MHz,65deg,17dBi,Integrated RET
 Antenna Model:**HBZ4B6517**

Electrical Specifications				
Description	4-Port,X-Pol, Panel Antenna, 2×698-960MHz,65deg,17dBi,Integrated RET			
Frequency Range	MHz	2×698-960(R1/R2)		
Frequency Band	MHz	698-790	790-896	896-960
Gain Over All Tilts	dBi	15.7±0.5	16.8±0.5	16.9±0.5
Gain by Tilt Average Min	dBi	16.3	17.1	17.3
Gain by Tilt Average Mid		15.7	16.6	17.0
Gain by Tilt Average Max		14.9	16.3	16.5
Horizontal 3dB Beam Width	Deg	65±5	59±5	58±4
Vertical 3dB Beam Width	Deg	8.8±0.9	7.8±1.0	7.3±0.5
1 st Upper Side Lobe Suppression Above Main Beam	dB	≥16	≥16	≥16
Front to Back Ratio at 180Deg ±30Deg	dB	≥23	≥25	≥25
Cross-Polar Ratio 0Deg	dB	≥17		
Cross-Polar Ratio ±60Deg	dB	≥8		
Electrical Downtilt	Deg	2-12,Continuously adjustable		
VSWR	/	≤1.5		
Cross Polar Isolation	dB	≥27		
Interband Isolation	dB	≥27		
Intermodulation IM3	dBc	≤-150(2×43 dBm carrier)		
Max. Power Per Port	Watt	350(at 50°C ambient temperature)		
Impedance	Ohm	50		
Polarization	Deg	±45		

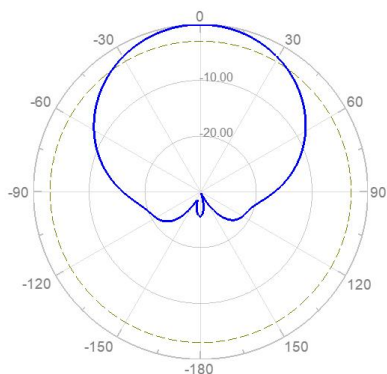
Mechanical Specifications		
Antenna Dimensions	mm	2600×499×199
Antenna Net Weight	kg	37.9
Packing Dimensions	mm	2850×600×300
Antenna Gross Weight	kg	48.5
Connector Type	/	4×4.3-10 Female
Connector Position	/	Bottom
Radiator Material	/	Aluminum&Low loss circuit board
Radome Material / Color	/	Fiberglass / Light Grey RAL7035
Reflector Material	/	Aluminum
Storage Temperature	°C	-40 to +60
Operating Temperature	°C	-40 to +60
Humidity	/	5% to 95%
Max. operational Wind Speed	km/h	200
Wind Load @Rated Wind Front	N	1633
Wind Load @Rated Wind Side	N	270
Wind Load @Rated Wind Rear	N	1830
Lightning Protection	/	DC ground
Accessories		
Downtilt Kit (mechanical)	Deg	0-12
Mounting Accessories (clamp)	/	Included with antenna
Mounting Pipe Diameter	mm	50-115
Internal RET Specifications		
RCU (remote control unit)	/	Replaceable RET (can be exchangeable without exchanging antenna)
		AISG2.0 /3GPP
Input Voltage Range	V	10-30 DC
Power Consumption	W	< 10 (motor activated , single RET) < 2 (stand by, single RET)

Adjustment Time (full range)	s	< 120 (typically, depending on antenna type)
RET Connector	/	1 pair of AISG 5 pin male & female
Pin Assignment According AISG	/	5-pin circular connector conforming to IEC 60130-9 - Ed. 3.0
Lightning Protection	kA	5 (8/20 μ s differential mode), 8 (8/20 μ s common mode)

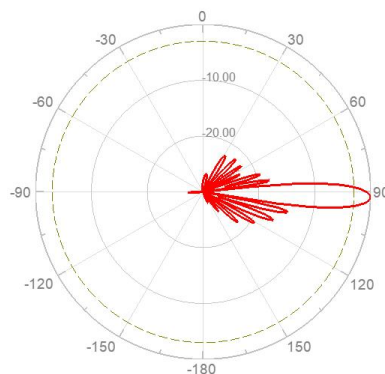
Reference Pattern

698-960MHz

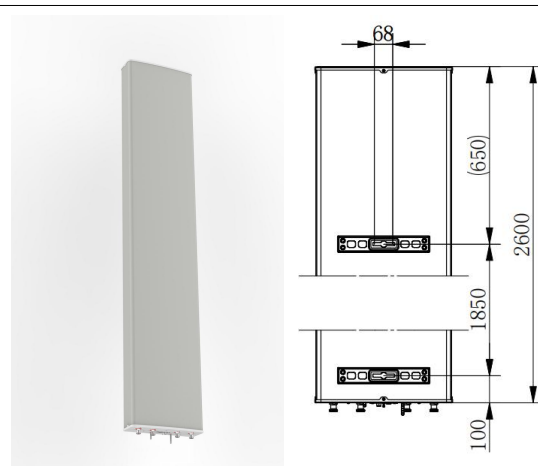
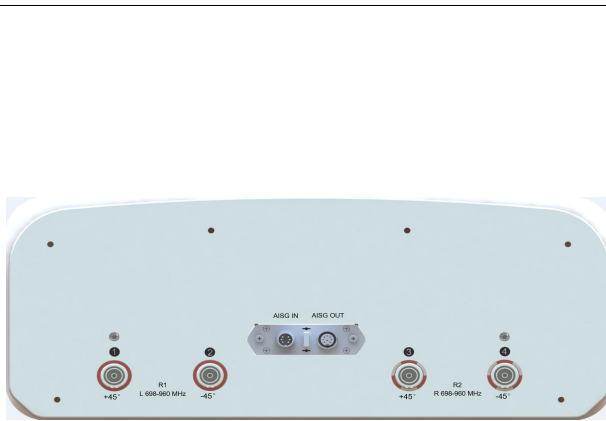
Horizontal Pattern



Vertical Pattern



Layout of Interface



Layout of Array

Array	Connector	Frequency(MHz)	RET Serial	
R1	1-2	698-960	ZTR1...01	
R2	3-4	698-960	ZTR2...02	

All data are based on NGMN recommendations on Base Station Antenna Standards (BASTA V13.0).

Product Name:11#4-Port,X-Pol, Panel Antenna,
2×617-896MHz,65deg,17dBi,Integrated RET
Antenna Model:**HBZ4A6517**

Electrical Specifications				
Description	4-Port,X-Pol, Panel Antenna, 2×617-896MHz,65deg,17dBi,Integrated RET			
Frequency Range	MHz	2×617-896(R1/R2)		
Frequency Band	MHz	617-698	698-790	790-896
Gain Over All Tilts	dBi	15.7±0.5	16.8±0.5	16.9±0.5
Gain by Tilt Average Min	dBi	16.3	17.1	17.3
Gain by Tilt Average Mid		15.7	16.6	17.0
Gain by Tilt Average Max		14.9	16.3	16.5
Horizontal 3dB Beam Width	Deg	68±6	67±6	68±8
Vertical 3dB Beam Width	Deg	10.4±0.8	9.9±0.7	9.0±0.5
1 st Upper Side Lobe Suppression Above Main Beam	dB	≥15	≥15	≥15
Front to Back Ratio at 180Deg ±30Deg	dB	≥25	≥26	≥26
Cross-Polar Ratio 0Deg	dB	≥17		
Cross-Polar Ratio ±60Deg	dB	≥7		
Electrical Downtilt	Deg	2-12,Continuously adjustable		
VSWR	/	≤1.5		
Cross Polar Isolation	dB	≥26		
Interband Isolation	dB	≥26		
Intermodulation IM3	dBc	≤-150(2×43 dBm carrier)		
Max. Power Per Port	Watt	350(at 50°C ambient temperature)		
Impedance	Ohm	50		
Polarization	Deg	±45		

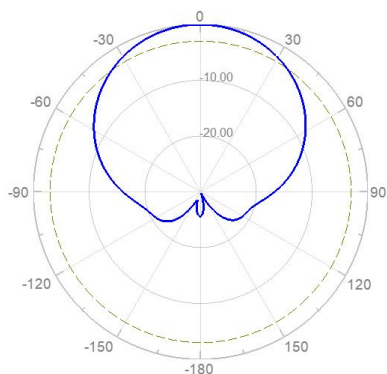
Mechanical Specifications		
Antenna Dimensions	mm	2600×499×199
Antenna Net Weight	kg	34.0
Packing Dimensions	mm	2880×600×300
Antenna Gross Weight	kg	47.8
Connector Type	/	4×4.3-10 Female
Connector Position	/	Bottom
Radiator Material	/	Aluminum&Low loss circuit board
Radome Material / Color	/	Fiberglass / Light Grey RAL7035
Reflector Material	/	Aluminum
Storage Temperature	°C	-40 to +60
Operating Temperature	°C	-40 to +60
Humidity	/	5% to 95%
Max. operational Wind Speed	km/h	200
Wind Load @Rated Wind Front	N	1508
Wind Load @Rated Wind Side	N	249
Wind Load @Rated Wind Rear	N	1690
Lightning Protection	/	DC ground
Accessories		
Downtilt Kit (mechanical)	Deg	0-12
Mounting Accessories (clamp)	/	Included with antenna
Mounting Pipe Diameter	mm	50-115
Internal RET Specifications		
RCU (remote control unit)	/	Replaceable RET (can be exchangeable without exchanging antenna)
		AISG2.0 /3GPP
Input Voltage Range	V	10-30 DC
Power Consumption	W	< 10 (motor activated , single RET) < 2 (stand by, single RET)

Adjustment Time (full range)	s	< 120 (typically, depending on antenna type)
RET Connector	/	1 pair of AISG 5 pin male & female
Pin Assignment According AISG	/	5-pin circular connector conforming to IEC 60130-9 - Ed. 3.0
Lightning Protection	kA	5 (8/20 μ s differential mode), 8 (8/20 μ s common mode)

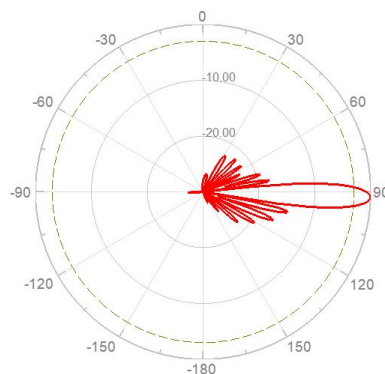
Reference Pattern

617-896MHz

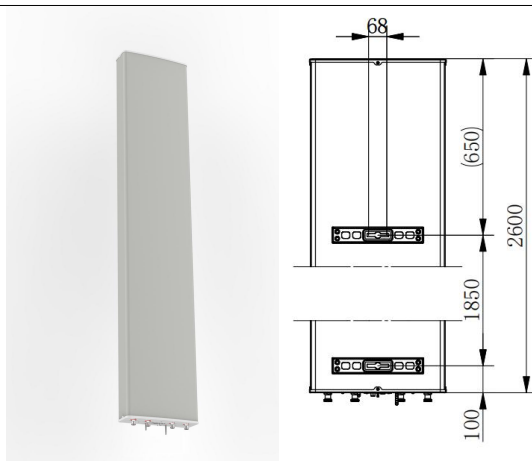
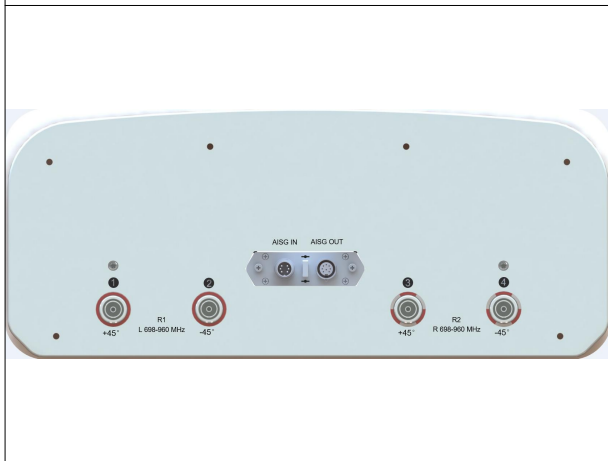
Horizontal Pattern



Vertical Pattern



Layout of Interface



Layout of Array

Array	Connector	Frequency(MHz)	RET Serial	
R1	1-2	617-896	ZTR1...01	
R2	3-4	617-896	ZTR2...02	

All data are based on NGMN recommendations on Base Station Antenna Standards (BASTA V13.0).

Product Name:12#4-Port,X-Pol, Panel Antenna,
2×1710-2690,65deg,18dBi,Integrated RET
Antenna Model:**HBZ4D6518**

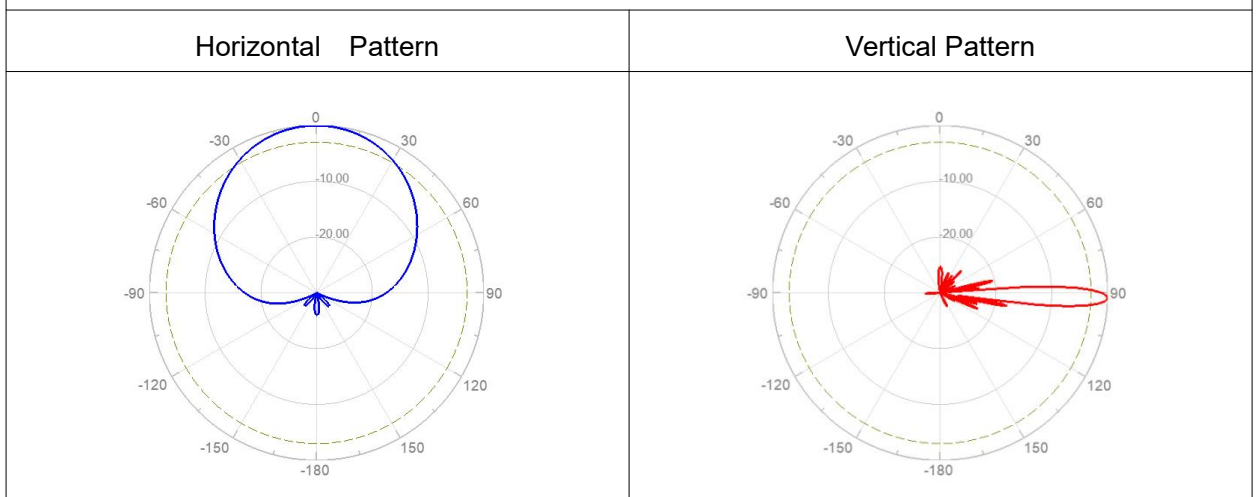
Electrical Specifications						
Description	4-Port,X-Pol, Panel Antenna, 2×1710-2690,65deg,18dBi,Integrated RET					
Frequency Range	MHz	2×1710-2690(Y1/Y2)				
Frequency Band	MHz	1710-1880	1850-1990	1920-2170	2300-2490	2500-2690
Gain Over All Tilts	dBi	17.1±0.4	17.3±0.3	17.5±0.3	17.7±0.4	18.0±0.5
Gain by Tilt Average Min	dBi	17.3	17.6	17.8	18.1	18.5
Gain by Tilt Average Mid		17.0	17.3	17.5	17.7	18.1
Gain by Tilt Average Max		16.8	16.8	17.2	17.4	17.6
Horizontal 3dB Beam Width	Deg	71±4	69±4	68±4	65±4	62±4
Vertical 3dB Beam Width	Deg	6.9±0.5	6.4±0.4	5.8±0.5	5.2±0.4	4.9±0.4
1 st Upper Side Lobe Suppression Above Main Beam	dB	≥16				
Front to Back Ratio at 180Deg ±30Deg	dB	≥25				
Cross-Polar Ratio 0Deg	dB	≥17				
Cross-Polar Ratio ±60Deg	dB	≥10				
Electrical Downtilt	Deg	2-12,Continuously adjustable				
VSWR	/	≤1.5				
Cross Polar Isolation	dB	≥28				
Interband Isolation	dB	≥28				
Intermodulation IM3	dBc	≤-153(2×43 dBm carrier)				
Max. Power Per Port	Watt	250(at 50°C ambient temperature)				
Impedance	Ohm	50				
Polarization	Deg	±45				

Mechanical Specifications		
Antenna Dimensions	mm	1500×320×123
Antenna Net Weight	kg	15.3
Packing Dimensions	mm	1700×450×200
Antenna Gross Weight	kg	22.7
Connector Type	/	4×4.3-10 Female
Connector Position	/	Bottom
Radiator Material	/	Aluminum&Low loss circuit board
Radome Material / Color	/	Fiberglass / Light Grey RAL7035
Reflector Material	/	Aluminum
Storage Temperature	°C	-40 to +60
Operating Temperature	°C	-40 to +60
Humidity	/	5% to 95%
Max. operational Wind Speed	km/h	200
Wind Load @Rated Wind Front	N	661
Wind Load @Rated Wind Side	N	156
Wind Load @Rated Wind Rear	N	741
Lightning Protection	/	DC ground
Accessories		
Downtilt Kit (mechanical)	Deg	0-12
Mounting Accessories (clamp)	/	Included with antenna
Mounting Pipe Diameter	mm	50-115
Internal RET Specifications		
RCU (remote control unit)	/	Replaceable RET (can be exchangeable without exchanging antenna)
		AISG2.0 /3GPP
Input Voltage Range	V	10-30 DC
Power Consumption	W	< 10 (motor activated , single RET) < 2 (stand by, single RET)

Adjustment Time (full range)	s	< 120 (typically, depending on antenna type)
RET Connector	/	1 pair of AISG 5 pin male & female
Pin Assignment According AISG	/	5-pin circular connector conforming to IEC 60130-9 - Ed. 3.0
Lightning Protection	kA	5 (8/20 μ s differential mode), 8 (8/20 μ s common mode)

Reference Pattern

1710-2690MHz



Layout of Interface



Layout of Array

Array	Connector	Frequency(MHz)	RET Serial	
Y1	1-2	1710-2690	ZTY1...01	
Y2	3-4	1710-2690	ZTY2...02	

All data are based on NGMN recommendations on Base Station Antenna Standards (BASTA V13.0).

Product Name:13#4-Port,X-Pol, Panel Antenna,
 2×1710-2690,65deg,20dBi,Integrated RET
 Antenna Model:**HBZ4D6520**

Electrical Specifications						
Description	4-Port,X-Pol, Panel Antenna, 2×1710-2690,65deg,20dBi,Integrated RET					
Frequency Range	MHz	2×1710-2690(Y1/Y2)				
Frequency Band	MHz	1710-1880	1850-1990	1920-2170	2300-2490	2500-2690
Gain Over All Tilts	dBi	20.0±0.5	20.1±0.5	20.3±0.5	20.7±0.5	21.0±0.5
Gain by Tilt Average Min	dBi	20.3	20.6	20.8	21.1	21.5
Gain by Tilt Average Mid		20.0	20.3	20.5	20.7	21.1
Gain by Tilt Average Max		19.8	19.8	20.2	20.4	20.6
Horizontal 3dB Beam Width	Deg	65±4	64±3	62±4	61±3	58±5
Vertical 3dB Beam Width	Deg	4.5±0.5	4.2±0.4	4.0±0.2	3.7±0.5	3.3±0.4
1 st Upper Side Lobe Suppression Above Main Beam	dB	≥16				
Front to Back Ratio at 180Deg ±30Deg	dB	≥25				
Cross-Polar Ratio 0Deg	dB	≥17				
Cross-Polar Ratio ±60Deg	dB	≥10				
Electrical Downtilt	Deg	2-12,Continuously adjustable				
VSWR	/	≤1.5				
Cross Polar Isolation	dB	≥28				
Interband Isolation	dB	≥28				
Intermodulation IM3	dBc	≤-150(2×43 dBm carrier)				
Max. Power Per Port	Watt	250(at 50°C ambient temperature)				
Impedance	Ohm	50				
Polarization	Deg	±45				

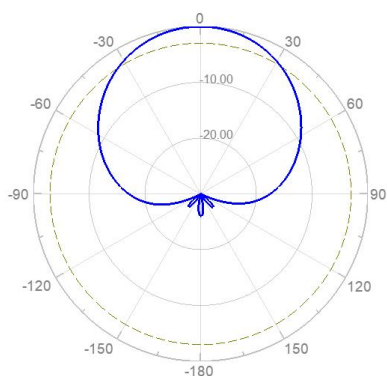
Mechanical Specifications		
Antenna Dimensions	mm	1900×320×123
Antenna Net Weight	kg	22.3
Packing Dimensions	mm	2180×445×245
Antenna Gross Weight	kg	32.1
Connector Type	/	4×4.3-10 Female
Connector Position	/	Bottom
Radiator Material	/	Aluminum&Low loss circuit board
Radome Material / Color	/	Fiberglass / Light Grey RAL7035
Reflector Material	/	Aluminum
Storage Temperature	°C	-40 to +60
Operating Temperature	°C	-40 to +60
Humidity	/	5% to 95%
Max. operational Wind Speed	km/h	200
Wind Load @Rated Wind Front	N	765
Wind Load @Rated Wind Side	N	122
Wind Load @Rated Wind Rear	N	858
Lightning Protection	/	DC ground
Accessories		
Downtilt Kit (mechanical)	Deg	0-12
Mounting Accessories (clamp)	/	Included with antenna
Mounting Pipe Diameter	mm	50-115
Internal RET Specifications		
RCU (remote control unit)	/	Replaceable RET (can be exchangeable without exchanging antenna)
		AISG2.0 /3GPP
Input Voltage Range	V	10-30 DC
Power Consumption	W	< 10 (motor activated , single RET) < 2 (stand by, single RET)

Adjustment Time (full range)	s	< 120 (typically, depending on antenna type)
RET Connector	/	1 pair of AISG 5 pin male & female
Pin Assignment According AISG	/	5-pin circular connector conforming to IEC 60130-9 - Ed. 3.0
Lightning Protection	kA	5 (8/20 μ s differential mode), 8 (8/20 μ s common mode)

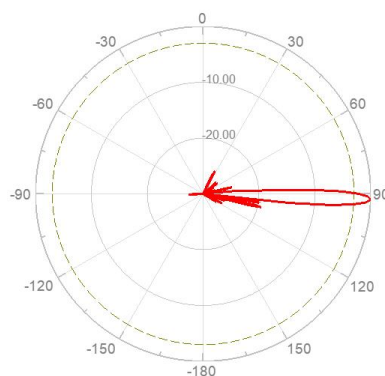
Reference Pattern

1710-2690MHz

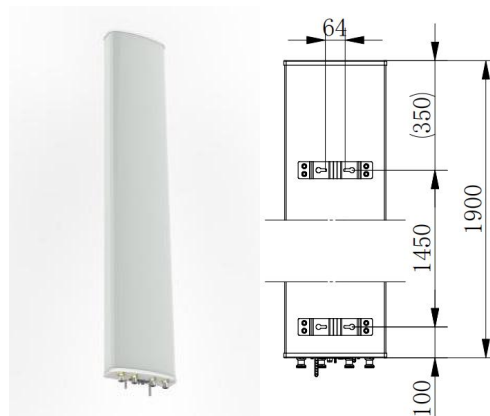
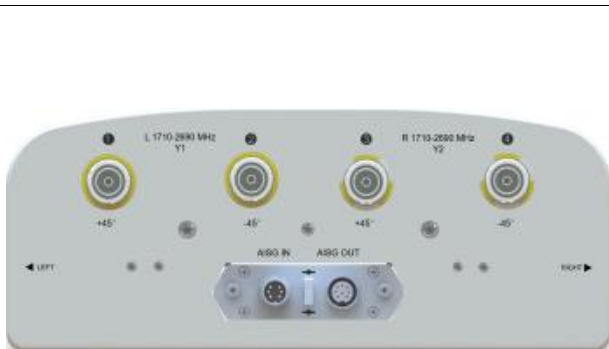
Horizontal Pattern



Vertical Pattern



Layout of Interface



Layout of Array

Array	Connector	Frequency(MHz)	RET Serial	
Y1	1-2	1710-2690	ZTY1...01	
Y2	3-4	1710-2690	ZTY2...02	

All data are based on NGMN recommendations on Base Station Antenna Standards (BASTA V13.0).

Product Name:14#4-Port,X-Pol,Panel Antenna,
 2×1710-2690MHz,33deg,21dBi,Integrated RET
 Antenna Model:**HBZ4D3321**

Electrical Specifications						
Description	4-Port,X-Pol,Panel Antenna, 2×1710-2690MHz,33deg,21dBi,Integrated RET					
Frequency Range	MHz	2×1710-2690(Y1/Y2)				
Frequency Band	MHz	1710-1880	1850-1990	1920-2170	2300-2400	2500-2690
Gain Over All Tilts	dBi	20.0±0.5	20.8±0.5	21.0±0.5	21.0±0.5	21.6±0.6
Gain by Tilt Average Min	dBi	20.3	21.3	21.4	21.5	22.2
Gain by Tilt Average Mid		20.0	20.7	21.0	21.1	21.5
Gain by Tilt Average Max		19.8	20.4	20.8	20.7	21.1
Horizontal 3dB Beam Width	Deg	37.8±2.5	32.9±2	29.8±3.5	25.7±0.8	25.9±2
Vertical 3dB Beam Width	Deg	6.6±0.5	6±0.5	5.8±0.5	5.0±0.5	4.7±0.5
1 st Upper Side Lobe Suppression Above Main Beam	dB	≥16				
Front to Back Ratio at 180Deg ±30Deg	dB	≥25				
Cross-Polar Ratio 0Deg	dB	≥16				
Cross-Polar Ratio 0Deg	dB	≥18				
Electrical Downtilt	Deg	2-12,Continuously adjustable				
VSWR	/	≤1.5				
Cross Polar Isolation	dB	≥26				
Interband Isolation	dB	≥26				
Intermodulation IM3	dBc	≤-150(2×43 dBm carrier)				
Max. Power Per Port	Watt	250(at 50°C ambient temperature)				
Impedance	Ohm	50				
Polarization	Deg	±45				

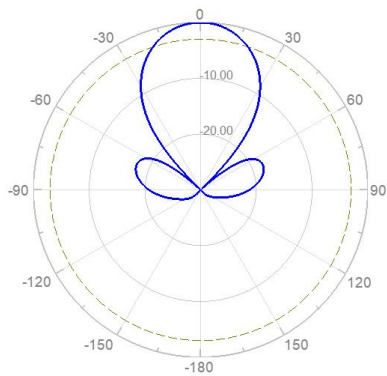
Mechanical Specifications		
Antenna Dimensions	mm	1500×499×199
Antenna Net Weight	kg	21.7
Packing Dimensions	mm	1745×595×295
Antenna Gross Weight	kg	31.5
Connector Type	/	4×4.3-10 Female
Connector Position	/	Bottom
Radiator Material	/	Aluminum&Low loss circuit board
Radome Material / Color	/	Fiberglass / Light Grey RAL7035
Reflector Material	/	Aluminum
Storage Temperature	°C	-40 to +60
Operating Temperature	°C	-40 to +60
Humidity	/	5% to 95%
Max. operational Wind Speed	km/h	200
Wind Load @Rated Wind Front	N	939
Wind Load @Rated Wind Side	N	155
Wind Load @Rated Wind Rear	N	1052
Lightning Protection	/	DC ground
Accessories		
Downtilt Kit (mechanical)	Deg	0-12
Mounting Accessories (clamp)	/	Included with antenna
Mounting Pipe Diameter	mm	50-115
Internal RET Specifications		
RCU (remote control unit)	/	Replaceable RET (can be exchangeable without exchanging antenna)
		AISG2.0 /3GPP
Input Voltage Range	V	10-30 DC
Power Consumption	W	< 10 (motor activated , single RET) < 2 (stand by, single RET)

Adjustment Time (full range)	s	< 120 (typically, depending on antenna type)
RET Connector	/	1 pair of AISG 5 pin male & female
Pin Assignment According AISG	/	5-pin circular connector conforming to IEC 60130-9 - Ed. 3.0
Lightning Protection	kA	5 (8/20 μ s differential mode), 8 (8/20 μ s common mode)

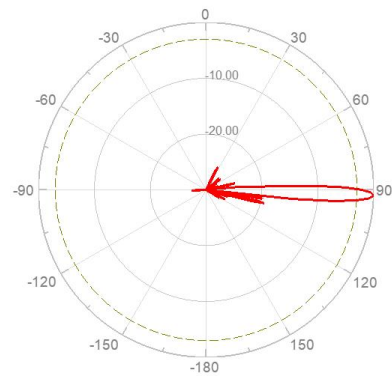
Reference Pattern

1710-2690MHz

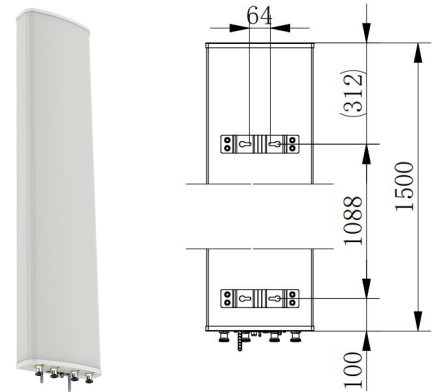
Horizontal Pattern



Vertical Pattern



Layout of Interface



Layout of Array

Array	Connector	Frequency(MHz)	RET Serial	
Y1	1-2	1710-2690	ZTY1...01	
Y2	3-4	1710-2690	ZTY2...02	

All data are based on NGMN recommendations on Base Station Antenna Standards (BASTA V13.0).

Product Name:15#4-Port,X-Pol, Panel Antenna,
 2×3300-3800MHz,65deg,18dBi,Integrated RET
 Antenna Model:**HBZ4E6518**

Electrical Specifications			
Description	4-Port,X-Pol, Panel Antenna, 2×3300-3800,65deg,18dBi,Integrated RET		
Frequency Range	MHz	2×3300-3800(P1/P2)	
Frequency Band	MHz	3300-3600	3600-3800
Gain Over All Tilts	dBi	16.9±1.0	17.1±0.5
Gain by Tilt Average Min	dBi	17.9	17.6
Gain by Tilt Average Mid		17.5	17.1
Gain by Tilt Average Max		16.9	16.7
Horizontal 3dB Beam Width	Deg	69±4	64±5
Vertical 3dB Beam Width	Deg	6.1±0.4	6.0±0.2
1 st Upper Side Lobe Suppression Above Main Beam	dB	≥15	≥15
Front to Back Ratio at 180Deg ±30Deg	dB	≥22	≥23
Cross-Polar Ratio 0Deg	dB	≥17	
Cross-Polar Ratio ±60Deg	dB	≥10	
Electrical Downtilt	Deg	2-12,Continuously adjustable	
VSWR	/	≤1.5	
Cross Polar Isolation	dB	≥25	
Interband Isolation	dB	≥25	
Intermodulation IM3	dBc	≤-150(2×43 dBm carrier)	
Max. Power Per Port	Watt	200(at 50°C ambient temperature)	
Impedance	Ohm	50	
Polarization	Deg	±45	

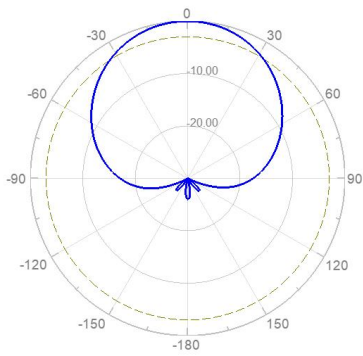
Mechanical Specifications		
Antenna Dimensions	mm	1000×180×155
Antenna Net Weight	kg	8.1
Packing Dimensions	mm	1230×300×230
Antenna Gross Weight	kg	13.1
Connector Type	/	4×4.3-10 Female
Connector Position	/	Bottom
Radiator Material	/	Low loss circuit board
Radome Material / Color	/	Fiberglass / Light Grey RAL7035
Reflector Material	/	Aluminum
Storage Temperature	°C	-40 to +60
Operating Temperature	°C	-40 to +60
Humidity	/	5% to 95%
Max. operational Wind Speed	km/h	200
Wind Load @Rated Wind Front	N	227
Wind Load @Rated Wind Side	N	60
Wind Load @Rated Wind Rear	N	254
Lightning Protection	/	DC ground
Accessories		
Downtilt Kit (mechanical)	Deg	0-12
Mounting Accessories (clamp)	/	Included with antenna
Mounting Pipe Diameter	mm	50-115
Internal RET Specifications		
RCU (remote control unit)	/	Replaceable RET (can be exchangeable without exchanging antenna)
		AISG2.0 /3GPP
Input Voltage Range	V	10-30 DC
Power Consumption	W	< 10 (motor activated , single RET) < 2 (stand by, single RET)

Adjustment Time (full range)	s	< 120 (typically, depending on antenna type)
RET Connector	/	1 pair of AISG 5 pin male & female
Pin Assignment According AISG	/	5-pin circular connector conforming to IEC 60130-9 - Ed. 3.0
Lightning Protection	kA	5 (8/20 μ s differential mode), 8 (8/20 μ s common mode)

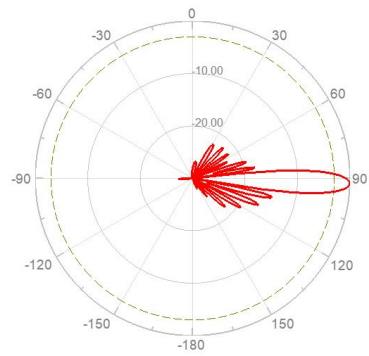
Reference Pattern

3300-3800MHz

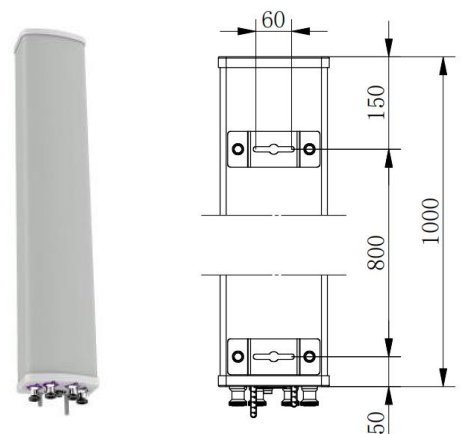
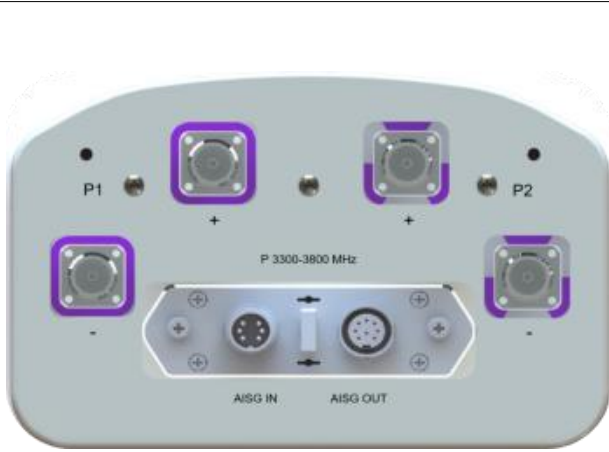
Horizontal Pattern



Vertical Pattern



Layout of Interface



Layout of Array

Array	Connector	Frequency(MHz)	RET Serial	
P1	1-2	3300-3800	ZTP1...01	
P2	3-4	3300-3800	ZTP2...02	

All data are based on NGMN recommendations on Base Station Antenna Standards (BASTA V13.0).

Product Name:16#4-Port,X-Pol, Panel Antenna,
2×4720-4920MHz,65deg,18dBi,Integrated RET
Antenna Model:**HBZ4G6518**

Electrical Specifications			
Description	4-Port,X-Pol, Panel Antenna, 2×4720-4920,65deg,18dBi,Integrated RET		
Frequency Range	MHz	2×4720-4920(P1/P2)	
Frequency Band	MHz	4720-4820	4820-4920
Gain Over All Tilts	dBi	16.9±0.6	17.1±0.5
Gain by Tilt Average Min	dBi	17.3	17.6
Gain by Tilt Average Mid		17.0	17.1
Gain by Tilt Average Max		16.8	16.7
Horizontal 3dB Beam Width	Deg	66±5	67±6
Vertical 3dB Beam Width	Deg	5.6±0.4	5.4±0.5
1 st Upper Side Lobe Suppression Above Main Beam	dB	≥15	
Front to Back Ratio at 180Deg ±30Deg	dB	≥18	
Cross-Polar Ratio 0Deg	dB	≥10	
Cross-Polar Ratio ±60Deg	dB	≥6	
Electrical Downtilt	Deg	2-12,Continuously adjustable	
VSWR	/	≤1.5	
Cross Polar Isolation	dB	≥26	
Interband Isolation	dB	≥26	
Intermodulation IM3	dBc	≤-150(2×43 dBm carrier)	
Max. Power Per Port	Watt	150(at 50°C ambient temperature)	
Impedance	Ohm	50	
Polarization	Deg	±45	

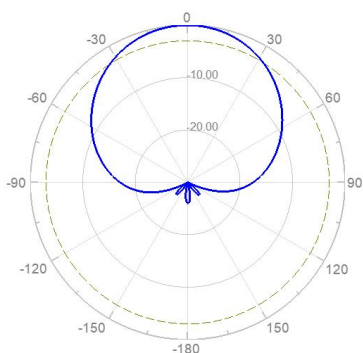
Mechanical Specifications		
Antenna Dimensions	mm	800×260×130
Antenna Net Weight	kg	7.1
Packing Dimensions	mm	1015×360×215
Antenna Gross Weight	kg	11.5
Connector Type	/	4×4.3-10 Female
Connector Position	/	Bottom
Radiator Material	/	Low loss circuit board
Radome Material / Color	/	UPVC / Light Grey RAL7035
Reflector Material	/	Aluminum
Storage Temperature	°C	-40 to +60
Operating Temperature	°C	-40 to +60
Humidity	/	5% to 95%
Max. operational Wind Speed	km/h	200
Wind Load @Rated Wind Front	N	261
Wind Load @Rated Wind Side	N	54
Wind Load @Rated Wind Rear	N	293
Lightning Protection	/	DC ground
Accessories		
Downtilt Kit (mechanical)	Deg	0-12
Mounting Accessories (clamp)	/	Included with antenna
Mounting Pipe Diameter	mm	50-115
Internal RET Specifications		
RCU (remote control unit)	/	Replaceable RET (can be exchangeable without exchanging antenna)
		AISG2.0 /3GPP
Input Voltage Range	V	10-30 DC
Power Consumption	W	< 10 (motor activated , single RET) < 2 (stand by, single RET)

Adjustment Time (full range)	s	< 120 (typically, depending on antenna type)
RET Connector	/	1 pair of AISG 5 pin male & female
Pin Assignment According AISG	/	5-pin circular connector conforming to IEC 60130-9 - Ed. 3.0
Lightning Protection	kA	5 (8/20 μ s differential mode), 8 (8/20 μ s common mode)

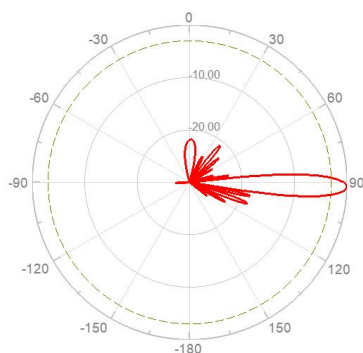
Reference Pattern

4720-4920MHz

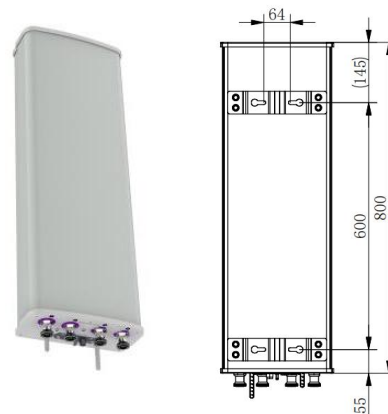
Horizontal Pattern



Vertical Pattern



Layout of Interface



Layout of Array

Array	Connector	Frequency(MHz)	RET Serial	
P1	1-2	4720-4920	ZTP1...01	
P2	3-4	4720-4920	ZTP2...02	

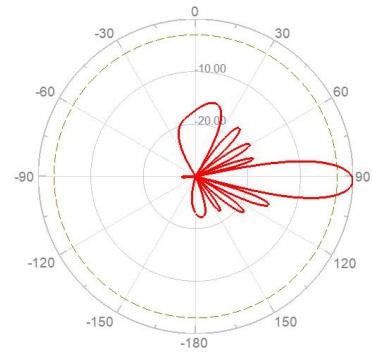
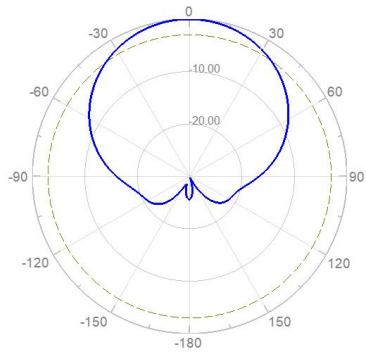
All data are based on NGMN recommendations on Base Station Antenna Standards (BASTA V13.0).

Product Name:17#4-Port,X-Pol, Panel Antenna,
 1×698-960&1×1710-2690MHz,65deg,15&17dBi,Integrated RET
 Antenna Model:**HBZ22P651517**

Electrical Specifications						
Description	4-Port,X-Pol,Panel Antenna, 1×698-960&1×1710-2690MHz,65deg,15&17dBi,Integrated RET					
Frequency Range	MHz	1×698-960(R1)				
Frequency Band	MHz	698-806	790-896	890-960		
Gain Bottom Over All Tilts	dBi	13.8±0.5	14.4±0.5	14.8±0.5		
Gain Bottom by Tilt Average Min	dBi	14.3	14.9	15.3		
Gain Bottom by Tilt Average Mid		14.0	14.4	14.8		
Gain Bottom by Tilt Average Max		13.7	14.0	14.4		
Horizontal 3dB Beam Width	Deg	67.8±2.0	65.4±1.5	64.9±1.0		
Vertical 3dB Beam Width Bottom	Deg	17.8±1.9	15.7±1.0	14.6±0.5		
1 st Upper Side Lobe Suppression Above Main Beam	dB	≥15				
Front to Back Ratio at 180Deg ±30Deg	dB	≥25				
Cross-Polar Ratio 0Deg	dB	≥17				
Cross-Polar Ratio ±60Deg	dB	≥8				
Electrical Downtilt	Deg	2-15,Continuously adjustable				
VSWR	/	≤1.5				
Cross Polar Isolation	dB	≥25				
Interband Isolation	dB	≥25				
Intermodulation IM3	dBc	≤-153(2×43 dBm carrier)				
Max. Power Per Port	Watt	350(at 50°C ambient temperature)				
Frequency Range	MHz	1×1710-2690(Y1)				
Frequency Point	MHz	1710-1880	1850-1990	1920-2200	2300-2490	2500-2690

Gain Over All Tilts	dBi	16.5±0.7	17.0±0.6	17.4±0.6	17.1±0.6	17.3±0.6
Gain by Tilt Average Min	dBi	17.1	17.4	17.9	17.7	17.9
Gain by Tilt Average Mid		16.6	17.0	17.4	17.3	17.3
Gain by Tilt Average Max		16.0	16.5	16.8	16.9	18.9
Horizontal 3dB Beam Width	Deg	64±6	60±6	60±6	62±3	58±6
Vertical 3dB Beam Width	Deg	6.9±0.5	6.5±0.4	6.2±0.5	5.4±0.4	5.0±0.4
1 st Upper Side Lobe Suppression Above Main Beam	dB	≥15				
Front to Back Ratio at 180Deg ±30Deg	dB	≥25				
Cross-Polar Ratio 0Deg	dB	≥15				
Electrical Downtilt	Deg	2-12, Continuously adjustable				
VSWR	/	≤1.5				
Cross Polar Isolation	dB	≥25				
Interband Isolation	dB	≥25				
Intermodulation IM3	dBc	≤-153(2×43 dBm carrier)				
Max. Power Per Port	Watt	250(at 50°C ambient temperature)				
Impedance	Ohm	50				
Polarization	Deg	±45				
Mechanical Specifications						
Antenna Dimensions	mm	1500×301×181				
Antenna Net Weight	kg	16.2				
Packing Dimensions	mm	1750×375×270				
Antenna Gross Weight	kg	28.5				
Connector Type	/	4× 4.3-10 Female				
Connector Position	/	Bottom				
Radiator Material	/	Low loss circuit broad				

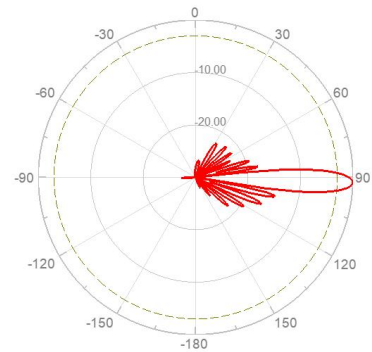
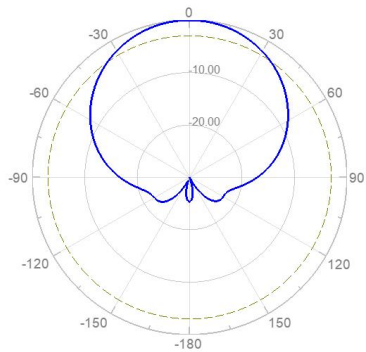
Radome Material / Color	/	Fiberglass / Light Grey RAL7035
Reflector Material	/	Aluminum
Storage Temperature	°C	-40 to +60
Operating Temperature	°C	-40 to +60
Humidity	/	5% to 95%
Max. operational Wind Speed	km/h	200
Wind Load @Rated Wind Front	N	532
Wind Load @Rated Wind Side	N	255
Wind Load @Rated Wind Rear	N	588
Lightning Protection	/	DC ground
Accessories		
Downtilt Kit (mechanical)	Deg	0-12
Mounting Accessories (clamp)	/	Included with antenna
Mounting Pipe Diameter	mm	50-115
Internal RET Specifications		
RCU (remote control unit)	/	Replaceable RET (can be exchangeable without exchanging antenna)
		AISG2.0 /3GPP
Input Voltage Range	V	10-30 DC
Power Consumption	W	< 10 (motor activated , single RET) < 2 (stand by, single RET)
Adjustment Time (full range)	s	< 120 (typically, depending on antenna type)
RET Connector	/	1 pair of AISG 5 pin male & female
Pin Assignment According AISG	/	5-pin circular connector conforming to IEC 60130-9 - Ed. 3.0
Lightning Protection	kA	5 (8/20 μs differential mode), 8 (8/20 μs common mode)
Reference Pattern		
698-960MHz		
Horizontal Pattern		Vertical Pattern



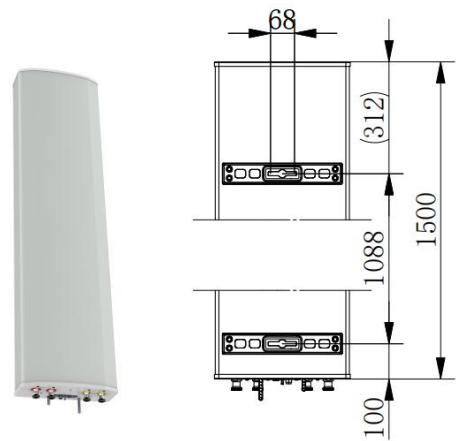
1710-2690MHz

Horizontal Pattern

Vertical Pattern

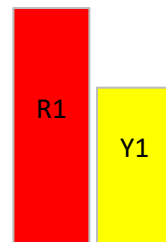


Layout of Interface



Layout of Array

Array	Connector	Frequency(MHz)	RET Serial
R1	1-2	698-960	ZTR1...01
Y1	3-4	1710-2690	ZTY1...02



All data are based on NGMN recommendations on Base Station Antenna Standards (BASTA V13.0).

Product Name:18#4-Port,X-Pol,Panel Antenna,
 1×698-960&1×1710-2690MHz,65deg,16&17dBi,Integrated RET
 Antenna Model:**HBZ22P651617**

Electrical Specifications						
Description	4-Port,X-Pol,Panel Antenna, 1×698-960&1×1710-2690MHz,65deg,16&17dBi,Integrated RET					
Frequency Range	MHz	1×698-960(R1)				
Frequency Band	MHz	698-806	790-896	890-960		
Gain Bottom Over All Tilts	dBi	14.6±0.5	15.3±0.4	15.5±0.4		
Gain Bottom by Tilt Average Min	dBi	15.1	15.7	15.8		
Gain Bottom by Tilt Average Mid		14.6	15.3	15.4		
Gain Bottom by Tilt Average Max		14.2	14.9	15.1		
Horizontal 3dB Beam Width	Deg	77±5	74±5	71±5		
Vertical 3dB Beam Width Bottom	Deg	11.0±0.9	9.9±0.7	9.3±0.8		
1st Upper Side Lobe Suppression Above Main Beam	dB	≥15				
Front to Back Ratio at 180Deg ±30Deg	dB	≥25				
Cross-Polar Ratio 0Deg	dB	≥15				
Cross-Polar Ratio ±60Deg	dB	≥8				
Electrical Downtilt	Deg	2-12,Continuously adjustable				
VSWR	/	≤1.5				
Cross Polar Isolation	dB	≥25				
Interband Isolation	dB	≥25				
Intermodulation IM3	dBc	≤-153(2×43 dBm carrier)				
Max. Power Per Port	Watt	350(at 50°C ambient temperature)				
Frequency Range	MHz	1×1710-2690(Y1)				
Frequency Point	MHz	1710-1880	1850-1990	1920-2200	2300-2490	2500-2690
Gain Over All Tilts	dBi	16.5±0.7	17.0±0.6	17.4±0.6	17.1±0.6	17.3±0.6

Gain by Tilt Average Min	dBi	17.2	17.6	17.8	17.7	17.8
Gain by Tilt Average Mid		16.6	16.9	17.4	17.2	17.4
Gain by Tilt Average Max		16.1	16.4	17.0	16.7	16.8
Horizontal 3dB Beam Width	Deg	65±3	61±5	60±5	62±4	58±5
Vertical 3dB Beam Width	Deg	6.9±0.5	6.5±0.4	6.2±0.5	5.4±0.4	5.0±0.4
1 st Upper Side Lobe Suppression Above Main Beam	dB	≥15				
Front to Back Ratio at 180Deg ±30Deg	dB	≥24				
dddCross-Polar Ratio 0Deg	dB	≥15				
Electrical Downtilt	Deg	2-12, Continuously adjustable				
VSWR	/	≤1.5				
Cross Polar Isolation	dB	≥25				
Interband Isolation	dB	≥25				
Intermodulation IM3	dBc	≤-153(2×43 dBm carrier)				
Max. Power Per Port	Watt	250(at 50°C ambient temperature)				
Impedance	Ohm	50				
Polarization	Deg	±45				
Mechanical Specifications						
Antenna Dimensions	mm	2000×350×200				
Antenna Net Weight	kg	21.5				
Packing Dimensions	mm	2260×420×295				
Antenna Gross Weight	kg	34.8				
Connector Type	/	4× 4.3-10 Female				
Connector Position	/	Bottom				
Radiator Material	/	Aluminum				
Radome Material / Color	/	Fiberglass / Light Grey RAL7035				
Reflector Material	/	Aluminum				

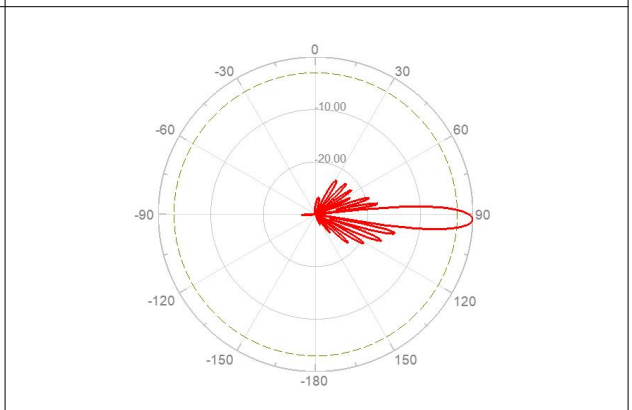
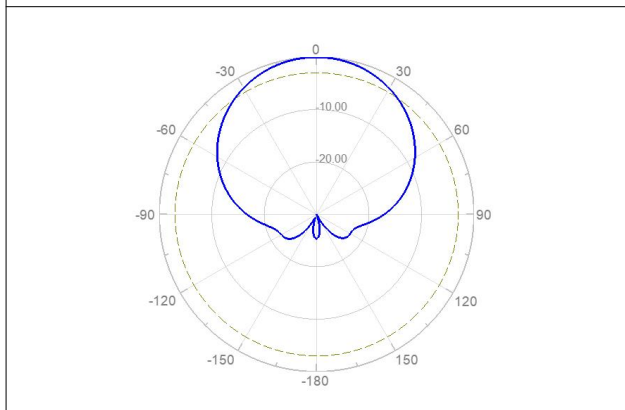
Storage Temperature	°C	-40 to +60
Operating Temperature	°C	-40 to +60
Humidity	/	5% to 95%
Max. operational Wind Speed	km/h	200
Wind Load @Rated Wind Front	N	706
Wind Load @Rated Wind Side	N	339
Wind Load @Rated Wind Rear	N	780
Lightning Protection	/	DC ground
Accessories		
Downtilt Kit (mechanical)	Deg	0-12
Mounting Accessories (clamp)	/	Included with antenna
Mounting Pipe Diameter	mm	50-115
Internal RET Specifications		
RCU (remote control unit)	/	Replaceable RET (can be exchangeable without exchanging antenna)
		AISG2.0 /3GPP
Input Voltage Range	V	10-30 DC
Power Consumption	W	< 10 (motor activated , single RET) < 2 (stand by, single RET)
Adjustment Time (full range)	s	< 120 (typically, depending on antenna type)
RET Connector	/	1 pair of AISG 5 pin male & female
Pin Assignment According AISG	/	5-pin circular connector conforming to IEC 60130-9 - Ed. 3.0
Lightning Protection	kA	5 (8/20 μs differential mode), 8 (8/20 μs common mode)
Reference Pattern		
698-960MHz		
Horizontal Pattern		Vertical Pattern



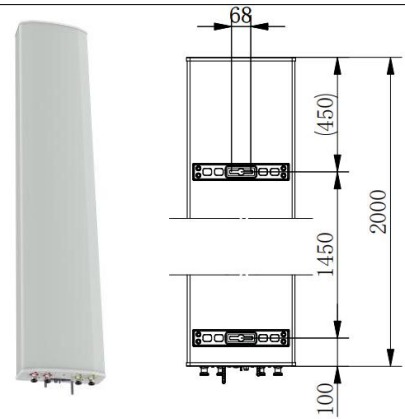
1710-2690MHz

Horizontal Pattern

Vertical Pattern



Layout of Interface



Layout of Array

Array	Connector	Frequency(MHz)	RET Serial	
R1	1-2	698-960	ZTR1...01	
Y1	3-4	1710-2690	ZTY1...02	

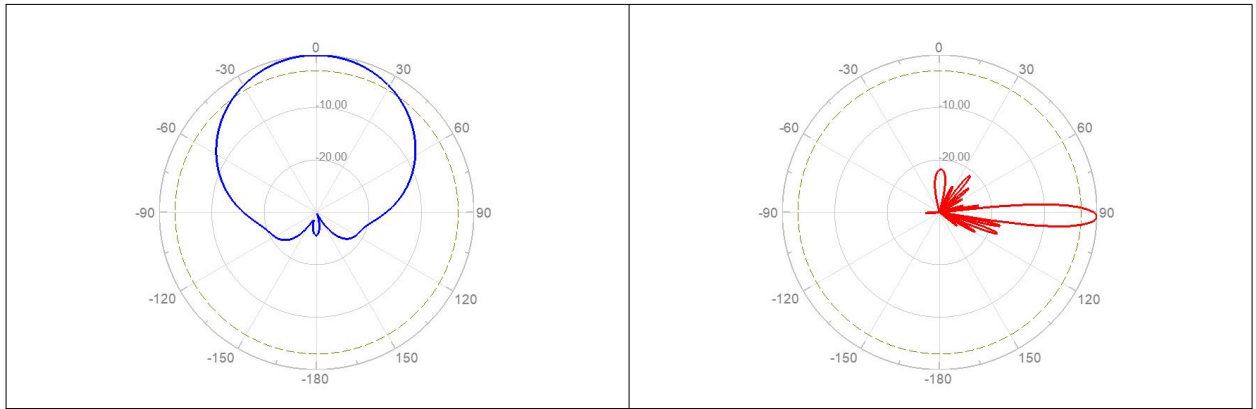
All data are based on NGMN recommendations on Base Station Antenna Standards (BASTA V13.0).

Product Name:19#4-Port,X-Pol,Panel Antenna,
 1×698-960&1×1710-2690MHz,65deg,17&17dBi,Integrated RET
 Antenna Model:**HBZ22P6517**

Electrical Specifications						
Description	4-Port,X-Pol,Panel Antenna, 1×698-960&1×1710-2690MHz,65deg,17&17dBi,Integrated RET					
Frequency Range	MHz	1×698-960(R1)				
Frequency Band	MHz	698-806	790-896	890-960		
Gain Bottom Over All Tilts	dBi	16.7±0.5	16.9±0.2	17.0±0.2		
Gain Bottom by Tilt Average Min	dBi	17.2	17.1	17.1		
Gain Bottom by Tilt Average Mid		16.8	16.8	17.0		
Gain Bottom by Tilt Average Max		16.4	16.7	16.8		
Horizontal 3dB Beam Width	Deg	68±3	67±3	69±2		
Vertical 3dB Beam Width Bottom	Deg	8.9±0.7	8.1±0.7	7.2±0.4		
1 st Upper Side Lobe Suppression Above Main Beam	dB	≥16				
Front to Back Ratio at 180Deg ±30Deg	dB	≥25				
Cross-Polar Ratio 0Deg	dB	≥15				
Cross-Polar Ratio ±60Deg	dB	≥8				
Electrical Downtilt	Deg	2-12,Continuously adjustable				
VSWR	/	≤1.5				
Cross Polar Isolation	dB	≥26				
Interband Isolation	dB	≥26				
Intermodulation IM3	dBc	≤-107(2×43 dBm carrier)				
Max. Power Per Port	Watt	350(at 50°C ambient temperature)				
Frequency Range	MHz	1×1710-2690(Y1)				
Frequency Point	MHz	1710-1880	1850-1990	1920-2200	2300-2490	2500-2690
Gain Over All Tilts	dBi	16.6±0.8	17.1±0.6	17.5±0.6	17.2±0.6	17.3±0.6

Gain by Tilt Average Min	dBi	17.3	17.7	17.9	17.6	17.9
Gain by Tilt Average Mid		16.6	17.0	17.5	17.2	17.3
Gain by Tilt Average Max		16.0	16.5	16.9	16.8	16.9
Horizontal 3dB Beam Width	Deg	66±5	63±4	62±3	61±5	58±6
Vertical 3dB Beam Width	Deg	7.0±0.4	6.4±0.5	6.3±0.3	5.5±0.5	5.1±0.5
1 st Upper Side Lobe Suppression Above Main Beam	dB	≥15				
Front to Back Ratio at 180Deg ±30Deg	dB	≥25	≥25	≥25	≥25	≥24
Cross-Polar Ratio 0Deg	dB	≥17				
Cross-Polar Ratio ±60Deg	dB	≥5				
Electrical Downtilt	Deg	2-12, Continuously adjustable				
VSWR	/	≤1.5				
Cross Polar Isolation	dB	≥25				
Interband Isolation	dB	≥25				
Intermodulation IM3	dBc	≤-107(2×43 dBm carrier)				
Max. Power Per Port	Watt	250(at 50°C ambient temperature)				
Impedance	Ohm	50				
Polarization	Deg	±45				
Mechanical Specifications						
Antenna Dimensions	mm	2600×350×200				
Antenna Net Weight	kg	28.4				
Packing Dimensions	mm	2940×445×295				
Antenna Gross Weight	kg	38.9				
Connector Type	/	4× 4.3-10 Female				
Connector Position	/	Bottom				
Radiator Material	/	Low loss circuit board				
Radome Material / Color	/	Fiberglass / Light Grey RAL7035				

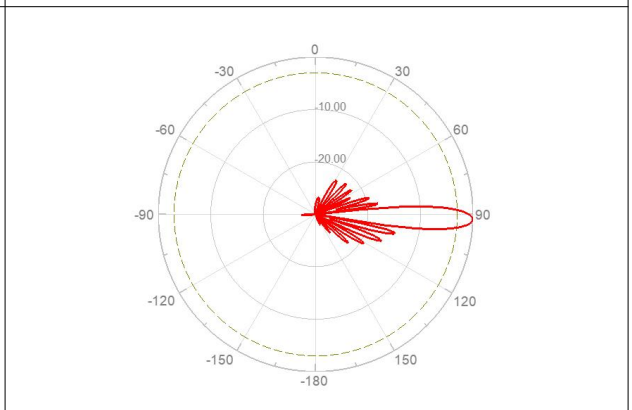
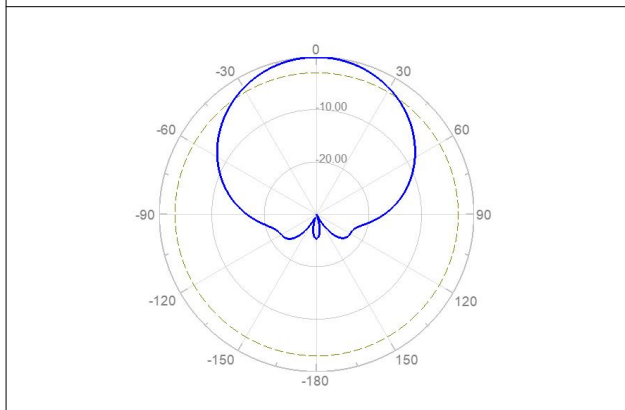
Reflector Material	/	Aluminum
Storage Temperature	°C	-40 to +60
Operating Temperature	°C	-40 to +60
Humidity	/	5% to 95%
Max. operational Wind Speed	km/h	200
Wind Load @Rated Wind Front	N	1185
Wind Load @Rated Wind Side	N	280
Wind Load @Rated Wind Rear	N	1328
Lightning Protection	/	DC ground
Accessories		
Downtilt Kit (mechanical)	Deg	0-12
Mounting Accessories (clamp)	/	Included with antenna
Mounting Pipe Diameter	mm	50-115
Internal RET Specifications		
RCU (remote control unit)	/	Replaceable RET (can be exchangeable without exchanging antenna)
		AISG2.0 /3GPP
Input Voltage Range	V	10-30 DC
Power Consumption	W	< 10 (motor activated , single RET) < 2 (stand by, single RET)
Adjustment Time (full range)	s	< 120 (typically, depending on antenna type)
RET Connector	/	1 pair of AISG 5 pin male & female
Pin Assignment According AISG	/	5-pin circular connector conforming to IEC 60130-9 - Ed. 3.0
Lightning Protection	kA	5 (8/20 μs differential mode), 8 (8/20 μs common mode)
Reference Pattern		
698-960MHz		
Horizontal Pattern		Vertical Pattern



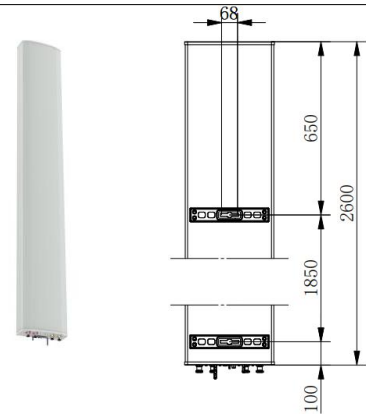
1710-2690MHz

Horizontal Pattern

Vertical Pattern



Layout of Interface



Layout of Array

Array	Connector	Frequency(MHz)	RET Serial	
R1	1-2	698-960	ZTR1...01	
Y1	3-4	1710-2690	ZTY1...02	

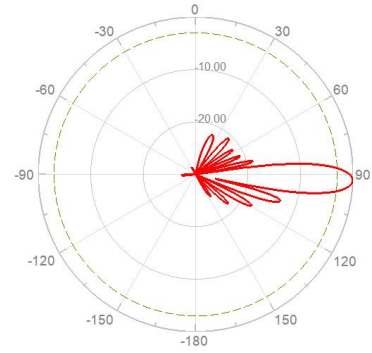
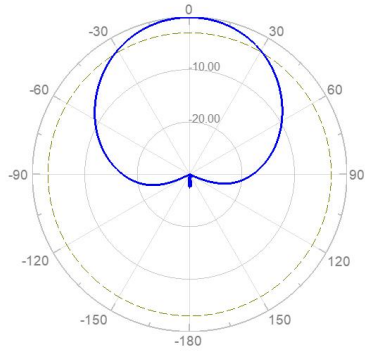
All data are based on NGMN recommendations on Base Station Antenna Standards (BASTA V13.0).

Product Name:20#6-Port,X-Pol,Panel Antenna,
 1×698-960&2×1710-2690MHz,65deg,15&17dBi,Integrated RET
 Antenna Model:**HBZ24P651517**

Electrical Specifications						
Description	6-Port,X-Pol,Panel Antenna, 1×698-960&2×1710-2690MHz,65deg,15&17dBi,Integrated RET					
Frequency Range	MHz	1×698-960(R1)				
Frequency Band	MHz	698-806	790-896	890-960		
Gain Bottom Over All Tilts	dBi	13.5±0.5	13.8±0.5	14.1±0.4		
Gain Bottom by Tilt Average Min	dBi	14.0	14.3	14.5		
Gain Bottom by Tilt Average Mid		13.6	13.8	14.1		
Gain Bottom by Tilt Average Max		13.0	13.5	13.8		
Horizontal 3dB Beam Width	Deg	66±2	64±3	64±2		
Vertical 3dB Beam Width Bottom	Deg	17.8±1.2	16.0±1.3	14.9±0.7		
1 st Upper Side Lobe Suppression Above Main Beam	dB	≥16				
Front to Back Ratio at 180Deg ±30Deg	dB	≥25				
Cross-Polar Ratio 0Deg	dB	≥17				
Cross-Polar Ratio ±60Deg	dB	≥8				
Electrical Downtilt	Deg	2-15,Continuously adjustable				
VSWR	/	≤1.5				
Cross Polar Isolation	dB	≥26				
Interband Isolation	dB	≥26				
Intermodulation IM3	dBc	≤-107(2×43 dBm carrier)				
Max. Power Per Port	Watt	350(at 50°C ambient temperature)				
Frequency Range	MHz	2×1710-2690(Y1/Y2)				
Frequency Point	MHz	1710-1880	1850-1990	1920-2200	2300-2400	2500-2690
Gain Over All Tilts	dBi	16.5±0.7	17.0±0.6	17.4±0.6	17.1±0.6	17.3±0.6

Gain by Tilt Average Min	dBi	17.1	17.4	18.0	17.6	17.9
Gain by Tilt Average Mid		16.5	16.9	17.5	17.1	17.3
Gain by Tilt Average Max		16.0	16.5	16.9	16.7	16.8
Horizontal 3dB Beam Width	Deg	64±6	60±6	60±6	62±3	58±6
Vertical 3dB Beam Width	Deg	6.9±0.5	6.5±0.4	6.2±0.5	5.4±0.4	5.0±0.4
1 st Upper Side Lobe Suppression Above Main Beam	dB	≥16			≥15	
Front to Back Ratio at 180Deg ±30Deg	dB	≥25				
Cross-Polar Ratio 0Deg	dB	≥15				
Cross-Polar Ratio ±60Deg	dB	≥8				
Electrical Downtilt	Deg	2-12, Continuously adjustable				
VSWR	/	≤1.5				
Cross Polar Isolation	dB	≥26				
Interband Isolation	dB	≥26				
Intermodulation IM3	dBc	≤-107(2×43 dBm carrier)				
Max. Power Per Port	Watt	250(at 50°C ambient temperature)				
Impedance	Ohm	50				
Polarization	Deg	±45				
Mechanical Specifications						
Antenna Dimensions	mm	1500×350×200				
Antenna Net Weight	kg	18.5				
Packing Dimensions	mm	1770×425×275				
Antenna Gross Weight	kg	29.0				
Connector Type	/	6× 4.3-10 Female				
Connector Position	/	Bottom				
Radiator Material	/	Low loss circuit board				
Radome Material / Color	/	Fiberglass / Light Grey RAL7035				

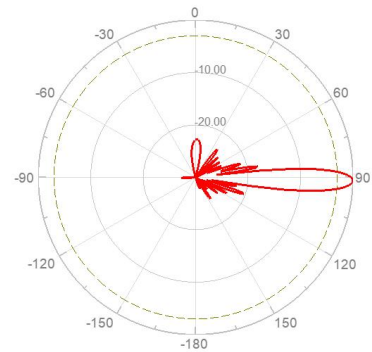
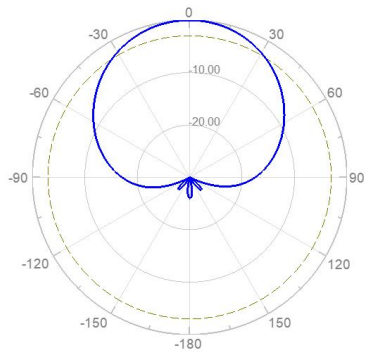
Reflector Material	/	Aluminum
Storage Temperature	°C	-40 to +60
Operating Temperature	°C	-40 to +60
Humidity	/	5% to 95%
Max. operational Wind Speed	km/h	200
Wind Load @Rated Wind Front	N	659
Wind Load @Rated Wind Side	N	156
Wind Load @Rated Wind Rear	N	738
Lightning Protection	/	DC ground
Accessories		
Downtilt Kit (mechanical)	Deg	0-12
Mounting Accessories (clamp)	/	Included with antenna
Mounting Pipe Diameter	mm	50-115
Internal RET Specifications		
RCU (remote control unit)	/	Replaceable RET (can be exchangeable without exchanging antenna)
		AISG2.0 /3GPP
Input Voltage Range	V	10-30 DC
Power Consumption	W	< 10 (motor activated , single RET) < 2 (stand by, single RET)
Adjustment Time (full range)	s	< 120 (typically, depending on antenna type)
RET Connector	/	1 pair of AISG 5 pin male & female
Pin Assignment According AISG	/	5-pin circular connector conforming to IEC 60130-9 - Ed. 3.0
Lightning Protection	kA	5 (8/20 μs differential mode), 8 (8/20 μs common mode)
Reference Pattern		
698-960MHz		
Horizontal Pattern		Vertical Pattern



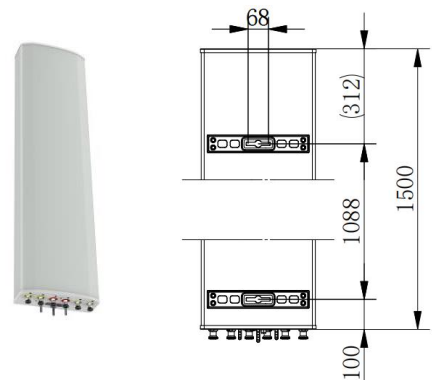
1710-2690MHz

Horizontal Pattern

Vertical Pattern

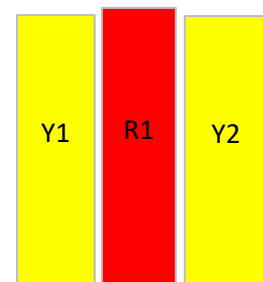


Layout of Interface



Layout of Array

Array	Connector	Frequency(MHz)	RET Serial
R1	1-2	698-960	ZTR1...01
Y1	3-4	1710-2690	ZTY1...02
Y2	5-6	1710-2690	ZTY2...03



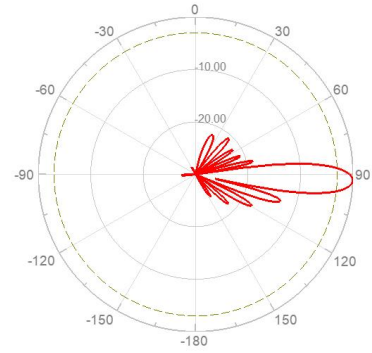
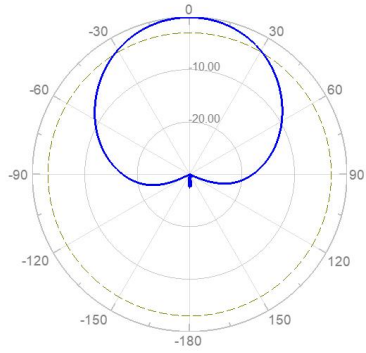
All data are based on NGMN recommendations on Base Station Antenna Standards (BASTA V13.0).

Product Name:21#6-Port,X-Pol,Panel Antenna,
 1×698-960&2×1710-2690MHz,65deg,16&17dBi,Integrated RET
 Antenna Model:**HB224P651617**

Electrical Specifications						
Description	6-Port,X-Pol,Panel Antenna, 1×698-960&2×1710-2690MHz,65deg,16&17dBi,Integrated RET					
Frequency Range	MHz	1×698-960(R1)				
Frequency Band	MHz	698-806	790-896	870-960		
Gain Bottom Over All Tilts	dBi	14.6±0.6	15.3±0.7	15.9±0.4		
Gain Bottom by Tilt Average Min	dBi	15.2	15.8	16.3		
Gain Bottom by Tilt Average Mid		14.6	15.2	16.0		
Gain Bottom by Tilt Average Max		14.1	14.7	15.8		
Horizontal 3dB Beam Width	Deg	68±7	67±6	61±3		
Vertical 3dB Beam Width Bottom	Deg	12.6±1.8	10.6±0.7	9.4±0.6		
1st Upper Side Lobe Suppression Above Main Beam	dB	≥15				
Front to Back Ratio at 180Deg ±30Deg	dB	≥25				
Cross-Polar Ratio 0Deg	dB	≥15				
Cross-Polar Ratio ±60Deg	dB	≥8				
Electrical Downtilt	Deg	2-12,Continuously adjustable				
VSWR	/	≤1.5				
Cross Polar Isolation	dB	≥26				
Interband Isolation	dB	≥26				
Intermodulation IM3	dBc	≤-107(2×43 dBm carrier)				
Max. Power Per Port	Watt	350(at 50°C ambient temperature)				
Frequency Range	MHz	2×1710-2690(Y1)				
Frequency Point	MHz	1710-1880	1850-1990	1920-2200	2300-2400	2500-2690
Gain Over All Tilts	dBi	16.5±0.7	17.0±0.6	17.4±0.6	17.1±0.6	17.3±0.6

Gain by Tilt Average Min	dBi	17.1	17.4	18.0	17.6	17.9
Gain by Tilt Average Mid		16.5	16.9	17.5	17.1	17.3
Gain by Tilt Average Max		16.0	16.5	16.9	16.7	16.8
Horizontal 3dB Beam Width	Deg	65±5	61±4	61±5	62±4	59±5
Vertical 3dB Beam Width	Deg	6.8±0.6	6.4±0.5	6.2±0.4	5.5±0.4	5.1±0.5
1 st Upper Side Lobe Suppression Above Main Beam	dB	≥16			≥15	
Front to Back Ratio at 180Deg ±30Deg	dB	≥25				
Cross-Polar Ratio 0Deg	dB	≥15				
Cross-Polar Ratio ±60Deg	dB	≥8				
Electrical Downtilt	Deg	2-12, Continuously adjustable				
VSWR	/	≤1.5				
Cross Polar Isolation	dB	≥26				
Interband Isolation	dB	≥26				
Intermodulation IM3	dBc	≤-107(2×43 dBm carrier)				
Max. Power Per Port	Watt	250(at 50°C ambient temperature)				
Impedance	Ohm	50				
Polarization	Deg	±45				
Mechanical Specifications						
Antenna Dimensions	mm	2000×350×200				
Antenna Net Weight	kg	23.0				
Packing Dimensions	mm	2240×425×275				
Antenna Gross Weight	kg	35.8				
Connector Type	/	6×4.3-10 Female				
Connector Position	/	Bottom				
Radiator Material	/	Low loss circuit board				
Radome Material / Color	/	Fiberglass / Light Grey RAL7035				

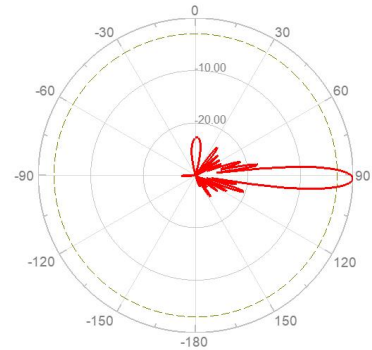
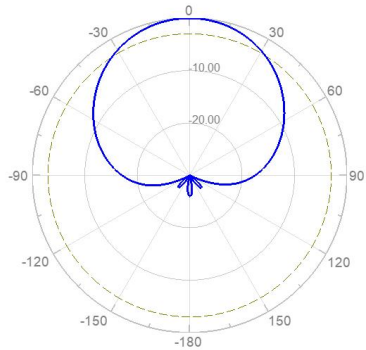
Reflector Material	/	Aluminum
Storage Temperature	°C	-40 to +60
Operating Temperature	°C	-40 to +60
Humidity	/	5% to 95%
Max. operational Wind Speed	km/h	200
Wind Load @Rated Wind Front	N	864
Wind Load @Rated Wind Side	N	204
Wind Load @Rated Wind Rear	N	968
Lightning Protection	/	DC ground
Accessories		
Downtilt Kit (mechanical)	Deg	0-12
Mounting Accessories (clamp)	/	Included with antenna
Mounting Pipe Diameter	mm	50-115
Internal RET Specifications		
RCU (remote control unit)	/	Replaceable RET (can be exchangeable without exchanging antenna)
		AISG2.0 /3GPP
Input Voltage Range	V	10-30 DC
Power Consumption	W	< 10 (motor activated , single RET) < 2 (stand by, single RET)
Adjustment Time (full range)	s	< 120 (typically, depending on antenna type)
RET Connector	/	1 pair of AISG 5 pin male & female
Pin Assignment According AISG	/	5-pin circular connector conforming to IEC 60130-9 - Ed. 3.0
Lightning Protection	kA	5 (8/20 μs differential mode), 8 (8/20 μs common mode)
Reference Pattern		
698-960MHz		
Horizontal Pattern		Vertical Pattern



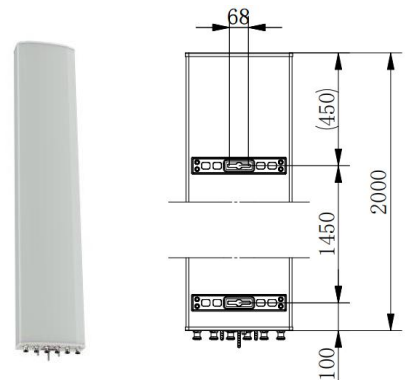
1710-2690MHz

Horizontal Pattern

Vertical Pattern

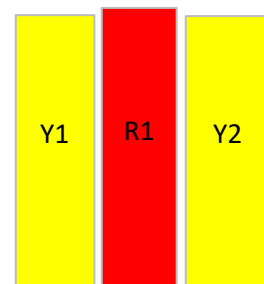


Layout of Interface



Layout of Array

Array	Connector	Frequency(MHz)	RET Serial
R1	1-2	698-960	ZTR1...01
Y1	3-4	1710-2690	ZTY1...02
Y2	5-6	1710-2690	ZTY2...03



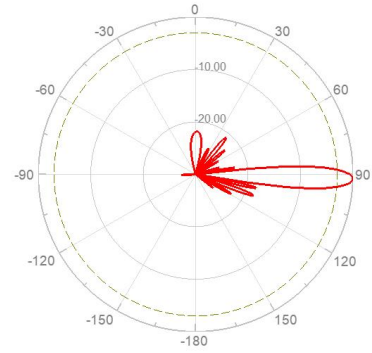
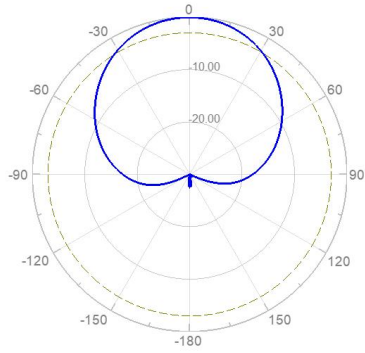
All data are based on NGMN recommendations on Base Station Antenna Standards (BASTA V13.0).

Product Name:22#6-Port,X-Pol,Panel Antenna,
 1×698-960&2×1710-2690MHz,65deg,17&17dBi,Integrated RET
 Antenna Model:**HBZ24P6517**

Electrical Specifications						
Description	6-Port,X-Pol,Panel Antenna, 1×698-960&2×1710-2690MHz,65deg,17&17dBi,Integrated RET					
Frequency Range	MHz	1×698-960(R1)				
Frequency Band	MHz	698-806	790-896	870-960		
Gain Bottom Over All Tilts	dBi	15.8±0.4	16.3±0.6	16.7±0.4		
Gain Bottom by Tilt Average Min	dBi	16.2	16.8	17.1		
Gain Bottom by Tilt Average Mid		15.8	16.4	16.8		
Gain Bottom by Tilt Average Max		15.5	15.7	16.3		
Horizontal 3dB Beam Width	Deg	66±3	64±3	62±2		
Vertical 3dB Beam Width Bottom	Deg	8.7±0.4	7.8±0.8	7.2±0.4		
1 st Upper Side Lobe Suppression Above Main Beam	dB	≥16				
Front to Back Ratio at 180Deg ±30Deg	dB	≥25				
Cross-Polar Ratio 0Deg	dB	≥15				
Cross-Polar Ratio ±60Deg	dB	≥8				
Electrical Downtilt	Deg	2-12,Continuously adjustable				
VSWR	/	≤1.5				
Cross Polar Isolation	dB	≥26				
Interband Isolation	dB	≥26				
Intermodulation IM3	dBc	≤-153(2×43 dBm carrier)				
Max. Power Per Port	Watt	350(at 50°C ambient temperature)				
Frequency Range	MHz	2×1710-2690(Y1/Y2)				
Frequency Point	MHz	1710-1880	1850-1990	1920-2180	2300-2490	2500-2690
Gain Over All Tilts	dBi	16.6±0.6	16.9±0.5	17.3±0.7	17.1±0.6	17.5±0.6

Gain by Tilt Average Min	dBi	17.2	17.4	17.9	17.6	18.0
Gain by Tilt Average Mid		16.6	17.0	17.3	17.2	17.4
Gain by Tilt Average Max		16.1	16.5	16.7	16.6	16.9
Horizontal 3dB Beam Width	Deg	66±6	63±5	62±5	62±3	59±6
Vertical 3dB Beam Width	Deg	6.9±0.4	6.5±0.5	6.3±0.5	5.4±0.4	5.2±0.6
1 st Upper Side Lobe Suppression Above Main Beam	dB	≥16			≥15	
Front to Back Ratio at 180Deg ±30Deg	dB	≥25				
Cross-Polar Ratio 0Deg	dB	≥15				
Cross-Polar Ratio ±60Deg	dB	≥8				
Electrical Downtilt	Deg	2-12, Continuously adjustable				
VSWR	/	≤1.5				
Cross Polar Isolation	dB	≥26				
Interband Isolation	dB	≥26				
Intermodulation IM3	dBc	≤-153(2×43 dBm carrier)				
Max. Power Per Port	Watt	250(at 50°C ambient temperature)				
Impedance	Ohm	50				
Polarization	Deg	±45				
Mechanical Specifications						
Antenna Dimensions	mm	2690×350×200				
Antenna Net Weight	kg	31.5				
Packing Dimensions	mm	2940×445×295				
Antenna Gross Weight	kg	50.5				
Connector Type	/	6× 4.3-10 Female				
Connector Position	/	Bottom				
Radiator Material	/	Low loss circuit board				
Radome Material / Color	/	Fiberglass / Light Grey RAL7035				

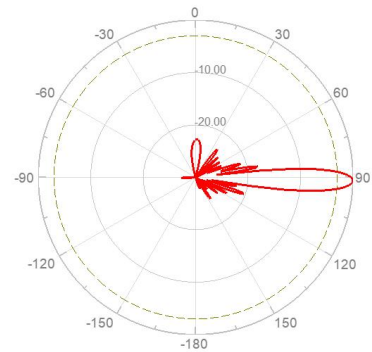
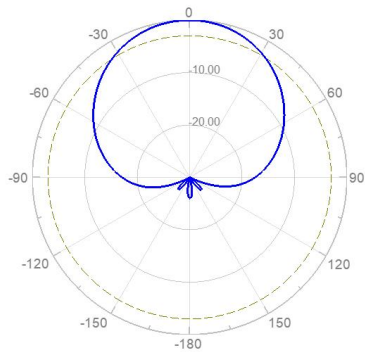
Reflector Material	/	Aluminum
Storage Temperature	°C	-40 to +60
Operating Temperature	°C	-40 to +60
Humidity	/	5% to 95%
Max. operational Wind Speed	km/h	200
Wind Load @Rated Wind Front	N	1185
Wind Load @Rated Wind Side	N	280
Wind Load @Rated Wind Rear	N	1328
Lightning Protection	/	DC ground
Accessories		
Downtilt Kit (mechanical)	Deg	0-12
Mounting Accessories (clamp)	/	Included with antenna
Mounting Pipe Diameter	mm	50-115
Internal RET Specifications		
RCU (remote control unit)	/	Replaceable RET (can be exchangeable without exchanging antenna)
		AISG2.0 /3GPP
Input Voltage Range	V	10-30 DC
Power Consumption	W	< 10 (motor activated , single RET) < 2 (stand by, single RET)
Adjustment Time (full range)	s	< 120 (typically, depending on antenna type)
RET Connector	/	1 pair of AISG 5 pin male & female
Pin Assignment According AISG	/	5-pin circular connector conforming to IEC 60130-9 - Ed. 3.0
Lightning Protection	kA	5 (8/20 μs differential mode), 8 (8/20 μs common mode)
Reference Pattern		
698-960MHz		
Horizontal Pattern		Vertical Pattern



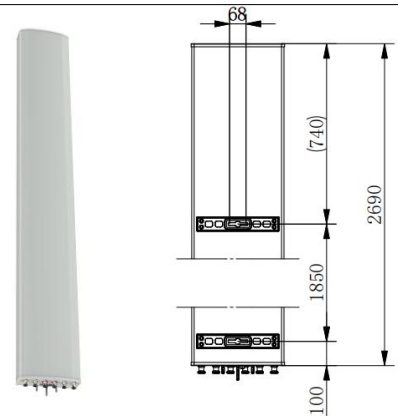
1710-2690MHz

Horizontal Pattern

Vertical Pattern

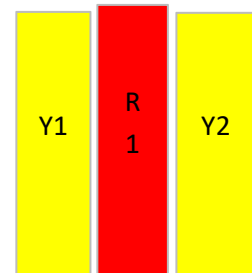


Layout of Interface



Layout of Array

Array	Connector	Frequency(MHz)	RET Serial
R1	1-2	698-960	ZTR1...01
Y1	3-4	1710-2690	ZTY1...02
Y2	5-6	1710-2690	ZTY2...03



All data are based on NGMN recommendations on Base Station Antenna Standards (BASTA V13.0).

Product Name:23#6-Port,X-Pol, Panel Antenna,
 3x1710-2690,65deg,18dBi,Integrated RET
 Antenna Model:**HBZ6D6518**

Electrical Specifications						
Description	6-Port,X-Pol, Panel Antenna, 3×1710-2690,65deg,18dBi,Integrated RET					
Frequency Range	MHz	3×1710-2690(Y1/Y2/Y3)				
Frequency Band	MHz	1710-1880	1850-1990	1920-2170	2300-2400	2500-2690
Gain Over All Tilts	dBi	17.9±0.7	18.2±0.5	18.5±0.6	18.2±0.6	18.0±0.8
Gain by Tilt Average Min	dBi	18.5	18.6	18.8	18.6	18.7
Gain by Tilt Average Mid		18.1	18.4	18.5	18.2	18.4
Gain by Tilt Average Max		17.8	18.2	18.4	17.9	18.3
Horizontal 3dB Beam Width	Deg	65±5	62±7	62±7	63±6	60±7
Vertical 3dB Beam Width	Deg	6.5±0.5	6.3±0.4	5.9±0.5	5.4±0.4	4.9±0.4
1 st Upper Side Lobe Suppression Above Main Beam	dB	≥15				
Front to Back Ratio at 180Deg ±30Deg	dB	≥25				
Cross-Polar Ratio 0Deg	dB	≥17				
Cross-Polar Ratio ±60Deg	dB	≥10				
Electrical Downtilt	Deg	2-12,Continuously adjustable				
VSWR	/	≤1.5				
Cross Polar Isolation	dB	≥28				
Interband Isolation	dB	≥28				
Intermodulation IM3	dBc	≤-150(2×43 dBm carrier)				
Max. Power Per Port	Watt	250(at 50°C ambient temperature)				
Impedance	Ohm	50				
Polarization	Deg	±45				

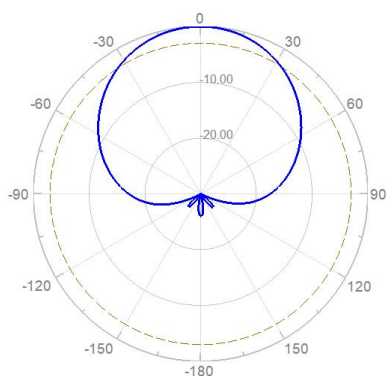
Mechanical Specifications		
Antenna Dimensions	mm	1500×428×145
Antenna Net Weight	kg	21.0
Packing Dimensions	mm	1800×500×240
Antenna Gross Weight	kg	30.2
Connector Type	/	6×4.3-10 Female
Connector Position	/	Bottom
Radiator Material	/	Low loss circuit board
Radome Material / Color	/	Fiberglass / Light Grey RAL7035
Reflector Material	/	Aluminum
Storage Temperature	°C	-40 to +60
Operating Temperature	°C	-40 to +60
Humidity	/	5% to 95%
Max. operational Wind Speed	km/h	200
Wind Load @Rated Wind Front	N	803
Wind Load @Rated Wind Side	N	113
Wind Load @Rated Wind Rear	N	900
Lightning Protection	/	DC ground
Accessories		
Downtilt Kit (mechanical)	Deg	0-12
Mounting Accessories (clamp)	/	Included with antenna
Mounting Pipe Diameter	mm	50-115
Internal RET Specifications		
RCU (remote control unit)	/	Replaceable RET (can be exchangeable without exchanging antenna)
		AISG2.0 /3GPP
Input Voltage Range	V	10-30 DC
Power Consumption	W	< 10 (motor activated , single RET) < 2 (stand by, single RET)

Adjustment Time (full range)	s	< 120 (typically, depending on antenna type)
RET Connector	/	1 pair of AISG 5 pin male & female
Pin Assignment According AISG	/	5-pin circular connector conforming to IEC 60130-9 - Ed. 3.0
Lightning Protection	kA	5 (8/20 μ s differential mode), 8 (8/20 μ s common mode)

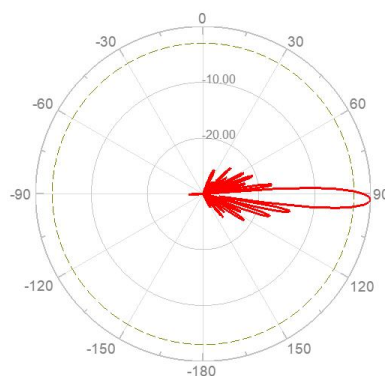
Reference Pattern

1710-2690MHz

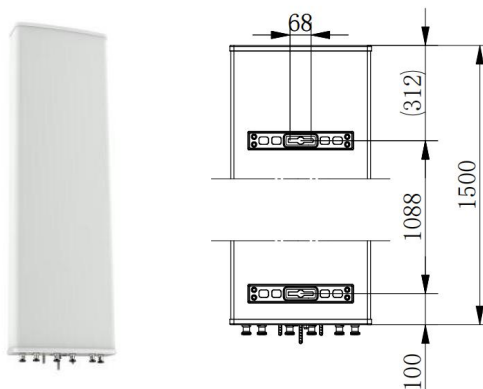
Horizontal Pattern



Vertical Pattern



Layout of Interface



Layout of Array

Array	Connector	Frequency(MHz)	RET Serial	
Y1	1-2	1710-2690	ZTY1...01	
Y2	3-4	1710-2690	ZTY2...02	
Y3	5-6	1710-2690	ZTY3...03	

All data are based on NGMN recommendations on Base Station Antenna Standards (BASTA V13.0).

Product Name:24#8-Port,X-Pol,Panel Antenna,
 4×1710-2690MHz,65deg,18dBi,Integrated RET
 Antenna Model:**HBZ8D6518**

Electrical Specifications						
Description	8-Port,X-Pol,Panel Antenna, 4×1710-2690MHz,65deg,18dBi,Integrated RET					
Frequency Range	MHz	4×1710-2690(Y1/Y2/Y3/Y4)				
Frequency Band	MHz	1710-1880	1850-1990	1920-2170	2300-2490	2500-2690
Gain Over All Tilts	dBi	17.0±0.5	17.7±0.4	17.9±0.5	18.0±0.5	18.1±0.6
Gain by Tilt Average Min		17.4	18.1	18.3	18.4	18.7
Gain by Tilt Average Mid		17.3	17.7	17.8	18.0	18.3
Gain by Tilt Average Max		16.8	17.5	17.4	17.6	17.9
Horizontal 3dB Beam Width	Deg	68±5	65±6	64±4	64±6	61±7
Vertical 3dB Beam Width	Deg	6.8±0.5	6.1±0.5	5.6±0.8	5.4±0.5	4.9±0.3
1 st Upper Side Lobe Suppression Above Main Beam	dB	≥18				
Front to Back Ratio at 180Deg ±30Deg	dB	≥25				
Cross-Polar Ratio 0Deg	dB	≥18				
Cross-Polar Ratio 60Deg	dB	≥9				
Electrical Downtilt	Deg	2-12,Continuously adjustable				
VSWR	/	≤1.5				
Interband Isolation	dB	≥28				
Isolation between Ports	dB	≥28				
Intermodulation IM3	dBc	≤-153(2×43 dBm carrier)				
Max. Power Per Port	Watt	250(at 50°C ambient temperature)				
Impedance	Ohm	50				
Polarization	Deg	±45				

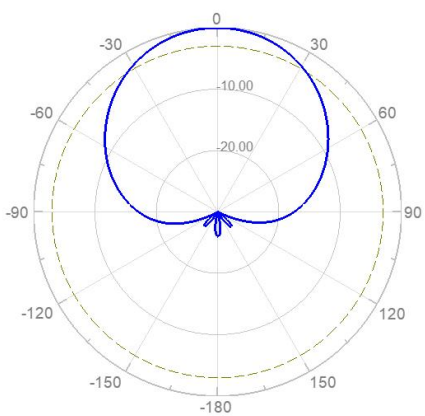
Mechanical Specifications		
Antenna Dimensions	mm	1500×499×199
Antenna Net Weight	kg	24.1
Packing Dimensions	mm	1800×600×300
Antenna Gross Weight	kg	34.6
Connector Type	/	8 x 4.3-10 Female
Connector Position	/	Bottom
Radiator Material	/	Low loss circuit board
Radome Material / Color	/	Fiberglass / light Grey RAL7035
Reflector Material	/	Aluminum
Storage Temperature	°C	-55 to +65
Operating Temperature	°C	-40 to +60
Humidity	/	5% to 95%
Max. operational Wind Speed	km/h	200
Wind Load @Rated Wind Front	N	933
Wind Load @Rated Wind Side	N	154
Wind Load @Rated Wind Rear	N	1045
Lightning Protection	/	DC ground
Accessories		
Downtilt Kit (mechanical)	Deg	0-16
Mounting Accessories (clamp)	/	Included with antenna
Mounting Pipe Diameter	mm	50-115
Internal RET Specifications		
RCU (remote control unit)	/	Replaceable RET (can be exchangeable without exchanging antenna)
		AISG2.0 /3GPP
Input Voltage Range	V	10-30 DC
Power Consumption	W	< 10 (motor activated , single RET) < 2 (stand by, single RET)

Adjustment Time (full range)	s	< 120 (typically, depending on antenna type)
RET Connector	/	1 pair of AISG 5 pin male & female
Pin Assignment According AISG	/	5-pin circular connector conforming to IEC 60130-9 - Ed. 3.0
Lightning Protection	kA	5 (8/20 μ s differential mode), 8 (8/20 μ s common mode)

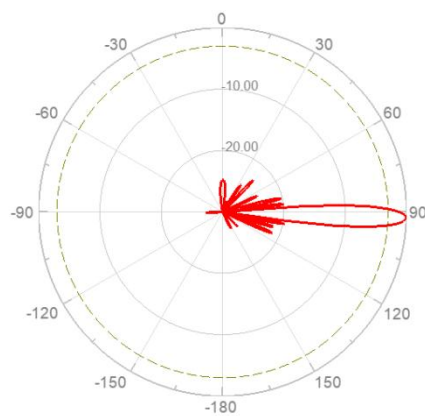
Reference Pattern

1710-2690MHz

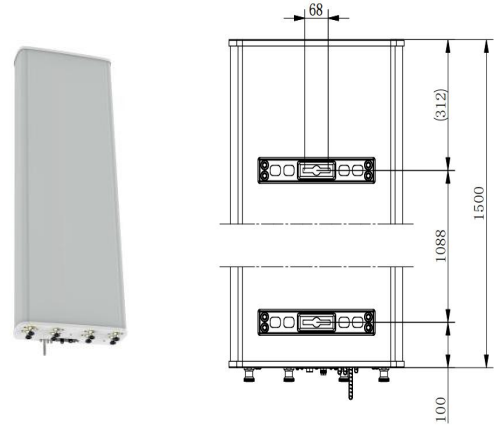
Horizontal pattern



Vertical pattern

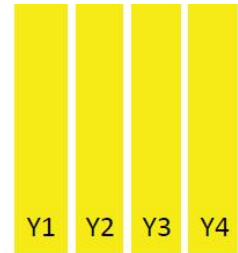


Layout of Interface



Layout of Array

Array	Connector	Frequency(MHz)	RET Serial
Y1	1-2	1710-2690	ZTY1...01
Y2	3-4	1710-2690	ZTY2...02
Y3	5-6	1710-2690	ZTY3...03
Y4	7-8	1710-2690	ZTY4...04



All data are based on NGMN recommendations on Base Station Antenna Standards (BASTA V13.0).

Product Name:25#8-Port,X-Pol,Panel Antenna,
 2×698-960&2×1710-2690MHz,65deg,15&18dBi,Integrated RET
 Antenna Model:**HBZ44P651518**

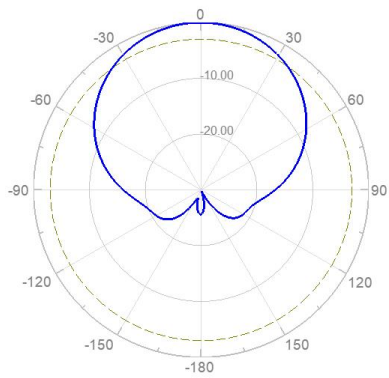
Electrical Specifications				
Description	8-Port,X-Pol,Panel Antenna, 2×698-960&2×1710-2690MHz,65deg,15&18dBi,Integrated RET			
Frequency Range	MHz	2×698-960(R1/R2)		
Frequency Band	MHz	698-806	790-890	890-960
Gain Over All Tilts	dBi	13.7±0.5	14.3±0.5	14.4±0.5
Gain by Tilt Average Min		14.2	14.7	14.9
Gain by Tilt Average Mid		13.6	14.3	14.4
Gain by Tilt Average Max		13.3	13.9	14.1
Horizontal 3dB Beam Width	Deg	65±4	64±6	64±7
Vertical 3dB Beam Width	Deg	15.9±0.9	14.1±0.8	13.1±0.7
1 st Upper Side Lobe Suppression Above Main Beam	dB	≥15		
Front to Back Ratio at 180Deg ±30Deg	dB	≥25		
Cross-Polar Ratio 0Deg	dB	≥15		
Cross-Polar Ratio 60Deg	dB	≥8		
Electrical Downtilt	Deg	2-12,Continuously adjustable		
VSWR	/	≤1.5		
Interband Isolation	dB	≥26		
Isolation between Ports	dB	≥26		
Intermodulation IM3	dBc	≤-150(2×43 dBm carrier)		
Max. Power Per Port	Watt	250(at 50℃ ambient temperature)		
Impedance	Ohm	50		
Polarization	Deg	±45		

Frequency Range	MHz	2×1710-2690(Y1/Y2)				
Frequency Band	MHz	1710-1880	1850-1990	1920-2200	2300-2490	2500-2690
Gain Over All Tilts	dBi	17.0±0.5	17.1±0.5	17.7±0.6	17.6±0.5	17.5±0.7
Gain by Tilt Average Min		17.4	17.6	17.9	18.1	17.8
Gain by Tilt Average Mid		17.3	17.4	17.6	17.8	17.3
Gain by Tilt Average Max		17.0	17.2	17.4	17.6	17.0
Horizontal 3dB Beam Width	Deg	65±4	64±7	63±6	62±6	59±6
Vertical 3dB Beam Width	Deg	6.7±0.5	6.4±0.4	6.0±0.5	5.4±0.4	4.8±0.4
1 st Upper Side Lobe Suppression Above Main Beam	dB	≥15				
Front to Back Ratio at 180Deg ±30Deg	dB	≥25				
Cross-Polar Ratio 0Deg	dB	≥16				
Electrical Downtilt	Deg	2-12, Continuously adjustable				
VSWR	/	≤1.5				
Interband Isolation	dB	≥26				
Isolation between Ports	dB	≥26				
Intermodulation IM3	dBc	≤-150(2×43 dBm carrier)				
Max. Power Per Port	Watt	250(at 50°C ambient temperature)				
Impedance	Ohm	50				
Polarization	Deg	±45				
Mechanical Specifications						
Antenna Dimensions	mm	1500×469×198				
Antenna Net Weight	kg	24.2				
Packing Dimensions	mm	1750×550×280				
Antenna Gross Weight	kg	33.9				
Connector Type	/	8 × 4.3-10 Female				

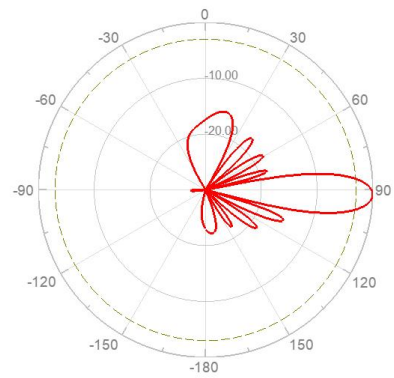
Connector Position	/	Bottom
Radiator Material	/	Aluminum&Low loss circuit board
Radome Material / Color	/	Fiberglass / light Grey RAL7035
Reflector Material	/	Aluminum
Storage Temperature	°C	-55 to +65
Operating Temperature	°C	-40 to +60
Humidity	/	5% to 95%
Max. operational Wind Speed	km/h	200
Wind Load @Rated Wind Front	N	886
Wind Load @Rated Wind Side	N	155
Wind Load @Rated Wind Rear	N	993
Lightning Protection	/	DC ground
Accessories		
Downtilt Kit (mechanical)	Deg	0-16
Mounting Accessories (clamp)	/	Included with antenna
Mounting Pipe Diameter	mm	50-115
Internal RET Specifications		
RCU (remote control unit)	/	Replaceable RET (can be exchangeable without exchanging antenna)
		AISG2.0 /3GPP
Input Voltage Range	V	10-30 DC
Power Consumption	W	< 10 (motor activated , single RET) < 2 (stand by, single RET)
Adjustment Time (full range)	s	< 120 (typically, depending on antenna type)
RET Connector	/	1 pair of AISG 5 pin male & female
Pin Assignment According AISG	/	5-pin circular connector conforming to IEC 60130-9 - Ed. 3.0
Lightning Protection	kA	5 (8/20 μs differential mode), 8 (8/20 μs common mode)
Reference Pattern		

698-960MHz

Horizontal pattern

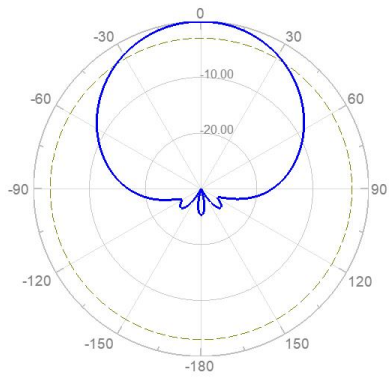


Vertical pattern

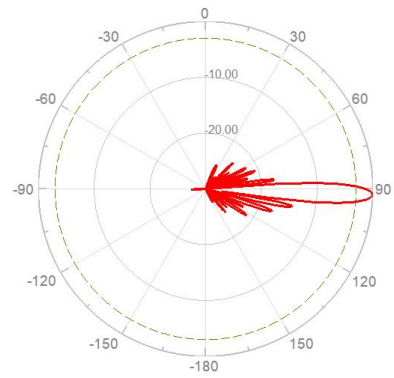


1710-2690MHz

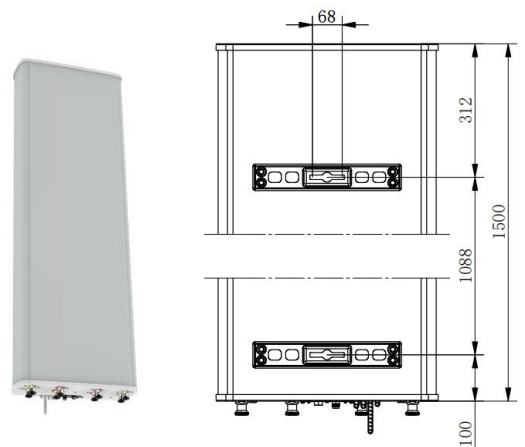
Horizontal pattern

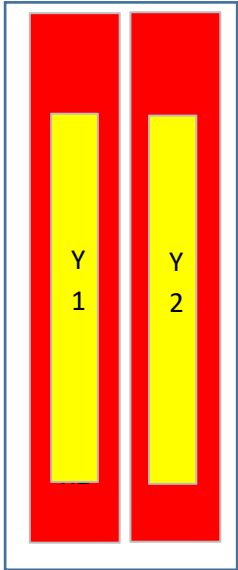


Vertical pattern



Layout of Interface



Layout of Array				
Array	Connector	Frequency(MHz)	RET Serial	
R1	1-2	698-960	ZTR1...01	
R2	3-4	698-960	ZTR2...02	
Y1	5-6	1710-2690	ZTY1...03	
Y2	7-8	1710-2690	ZTY2...04	

All data are based on NGMN recommendations on Base Station Antenna Standards (BASTA V13.0).

Product Name:26#8-Port,X-Pol,Panel Antenna,
 2×698-960&2×1710-2690MHz,65deg,16&18dBi,Integrated RET
 Antenna Model:**HBZ44P651618**

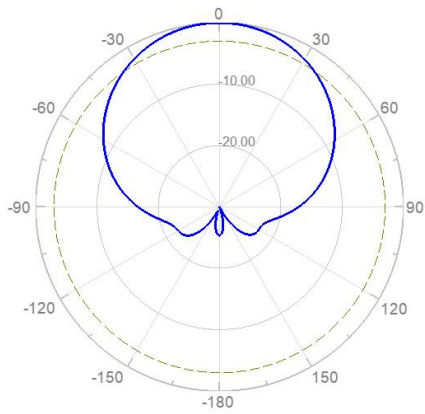
Electrical Specifications				
Description	8-Port,X-Pol,Panel Antenna, 2×698-960&2×1710-2690MHz,65deg,16&18dBi,Integrated RET			
Frequency Range	MHz	2×698-960(R1/R2)		
Frequency Band	MHz	698-806	790-896	870-960
Gain Over All Tilts	dBi	14.7±0.7	15.3±0.7	15.4±0.7
Gain by Tilt Average Min		15.4	16.0	16.1
Gain by Tilt Average Mid		14.8	15.5	15.6
Gain by Tilt Average Max		14.3	15.2	15.4
Horizontal 3dB Beam Width	Deg	66±4	64±3	63±4
Vertical 3dB Beam Width	Deg	12.4±0.7	11.4±0.5	10.8±0.6
1 st Upper Side Lobe Suppression Above Main Beam	dB	≥16		
Front to Back Ratio at 180Deg ±30Deg	dB	≥25		
Cross-Polar Ratio 0Deg	dB	≥17		
Cross-Polar Ratio 60Deg	dB	≥8		
Electrical Downtilt	Deg	2-12,Continuously adjustable		
VSWR	/	≤1.5		
Interband Isolation	dB	≥26		
Isolation between Ports	dB	≥26		
Intermodulation IM3	dBc	≤-150(2×43 dBm carrier)		
Max. Power Per Port	Watt	250(at 50℃ ambient temperature)		
Impedance	Ohm	50		
Polarization	Deg	±45		

Frequency Range	MHz	2×1710-2690(Y1/Y2)				
Frequency Band	MHz	1710-1880	1850-1990	1920-2200	2300-2490	2500-2690
Gain Over All Tilts	dBi	17.2±0.4	17.1±0.5	17.2±0.4	17.0±0.3	16.9±0.7
Gain by Tilt Average Min		17.4	17.6	17.6	17.3	17.6
Gain by Tilt Average Mid		17.3	17.4	17.2	17.1	17.3
Gain by Tilt Average Max		17.0	17.2	16.9	16.8	16.5
Horizontal 3dB Beam Width	Deg	63±4	64±7	62±6	67±6	66±5
Vertical 3dB Beam Width	Deg	6.4±0.3	6.2±0.3	5.9±0.4	5.3±0.3	5.1±0.2
1 st Upper Side Lobe Suppression Above Main Beam	dB	≥16				
Front to Back Ratio at 180Deg ±30Deg	dB	≥25				≥23
Cross-Polar Ratio 0Deg	dB	≥17				
Electrical Downtilt	Deg	2-12, Continuously adjustable				
VSWR	/	≤1.5				
Interband Isolation	dB	≥26				
Isolation between Ports	dB	≥26				
Intermodulation IM3	dBc	≤-150(2×43 dBm carrier)				
Max. Power Per Port	Watt	250(at 50°C ambient temperature)				
Impedance	Ohm	50				
Polarization	Deg	±45				
Mechanical Specifications						
Antenna Dimensions	mm	2000×469×198				
Antenna Net Weight	kg	31.5				
Packing Dimensions	mm	2200×550×280				
Antenna Gross Weight	kg	42.5				
Connector Type	/	8 x 4.3-10 Female				

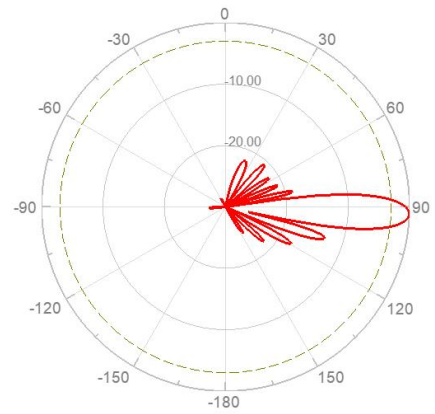
Connector Position	/	Bottom
Radiator Material	/	Aluminum
Radome Material / Color	/	Fiberglass / light Grey RAL7035
Reflector Material	/	Aluminum
Storage Temperature	°C	-55 to +65
Operating Temperature	°C	-40 to +60
Humidity	/	5% to 95%
Max. operational Wind Speed	km/h	200
Wind Load @Rated Wind Front	N	1181
Wind Load @Rated Wind Side	N	206
Wind Load @Rated Wind Rear	N	1323
Lightning Protection	/	DC ground
Accessories		
Downtilt Kit (mechanical)	Deg	0-16
Mounting Accessories (clamp)	/	Included with antenna
Mounting Pipe Diameter	mm	50-115
Internal RET Specifications		
RCU (remote control unit)	/	Replaceable RET (can be exchangeable without exchanging antenna)
		AISG2.0 /3GPP
Input Voltage Range	V	10-30 DC
Power Consumption	W	< 10 (motor activated , single RET) < 2 (stand by, single RET)
Adjustment Time (full range)	s	< 120 (typically, depending on antenna type)
RET Connector	/	1 pair of AISG 5 pin male & female
Pin Assignment According AISG	/	5-pin circular connector conforming to IEC 60130-9 - Ed. 3.0
Lightning Protection	kA	5 (8/20 μ s differential mode), 8 (8/20 μ s common mode)
Reference Pattern		

698-960MHz

Horizontal pattern

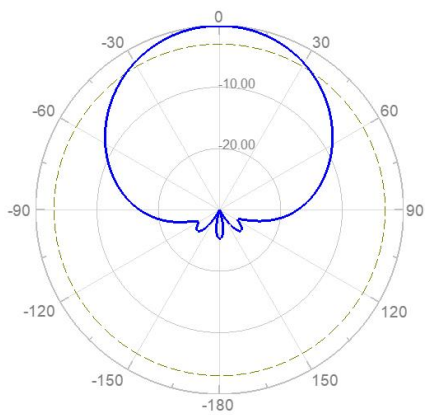


Vertical pattern

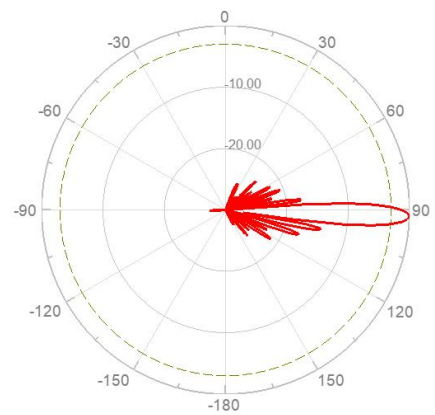


1710-2690MHz

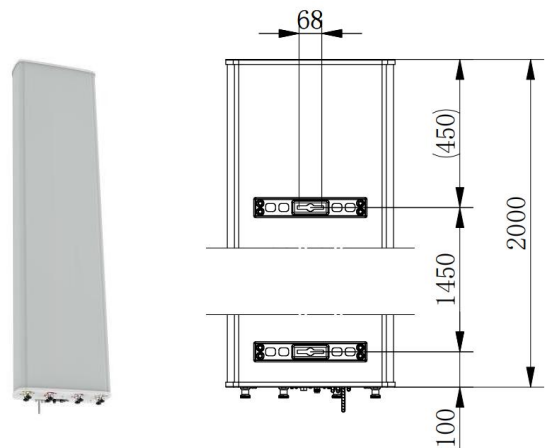
Horizontal pattern



Vertical pattern



Layout of Interface



Layout of Array				
Array	Connector	Frequency(MHz)	RET Serial	
R1	1-2	698-960	ZTR1...01	
R2	3-4	698-960	ZTR2...02	
Y1	5-6	1710-2690	ZTY1...03	
Y2	7-8	1710-2690	ZTY2...04	
<p>All data are based on NGMN recommendations on Base Station Antenna Standards (BASTA V13.0).</p>				

Product Name:27#8-Port,X-Pol,Panel Antenna,
 2×698-960&2×1710-2690MHz,65deg,17&18dBi,Integrated RET
 Antenna Model:**HBZ44P651718**

Electrical Specifications				
Description	8-Port,X-Pol,Panel Antenna, 2×698-960&2×1710-2690MHz,65deg,17&18dBi,Integrated RET			
ZTT Product Code	H			
Frequency Range	MHz	2×698-960(R1/R2)		
Frequency Band	MHz	698-806	790-890	890-960
Gain Over All Tilts	dBi	15.9±0.5	16.5±0.5	16.6±0.5
Gain by Tilt Average Min		16.4	16.9	17.1
Gain by Tilt Average Mid		16.0	16.5	16.6
Gain by Tilt Average Max		15.4	16.0	16.3
Horizontal 3dB Beam Width	Deg	62±5	60±6	60±5
Vertical 3dB Beam Width	Deg	8.5±0.6	7.9±0.5	7.2±0.5
1 st Upper Side Lobe Suppression Above Main Beam	dB	≥15		
Front to Back Ratio at 180Deg ±30Deg	dB	≥25		
Cross-Polar Ratio 0Deg	dB	≥17		
Cross-Polar Ratio 60Deg	dB	≥8		
Electrical Downtilt	Deg	2-12,Continuously adjustable		
VSWR	/	≤1.5		
Interband Isolation	dB	≥26		
Isolation between Ports	dB	≥26		
Intermodulation IM3	dBc	≤-150(2×43 dBm carrier)		
Max. Power Per Port	Watt	250(at 50°C ambient temperature)		
Impedance	Ohm	50		

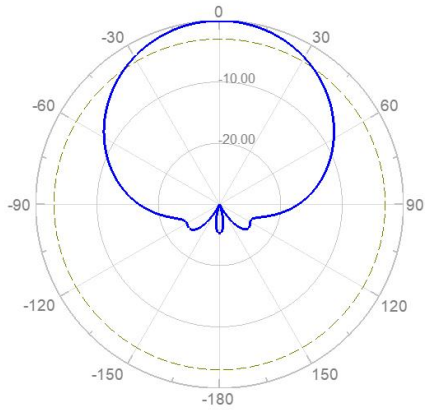
Polarization	Deg	±45				
Frequency Range	MHz	2×1710-2690(Y1/Y2)				
Frequency Band	MHz	1710-1880	1850-1990	1920-2200	2300-2490	2500-2690
Gain Over All Tilts	dBi	17.0±0.5	17.1±0.5	17.5±0.6	17.6±0.5	17.7±0.7
Gain by Tilt Average Min		17.4	17.6	17.9	18.1	17.8
Gain by Tilt Average Mid		17.3	17.4	17.6	17.8	17.3
Gain by Tilt Average Max		17.0	17.2	17.4	17.6	17.0
Horizontal 3dB Beam Width	Deg	66±5	65±6	63±5	62±6	60±5
Vertical 3dB Beam Width	Deg	6.6±0.5	6.4±0.5	5.8±0.8	5.4±0.5	5.0±0.6
1st Upper Side Lobe Suppression Above Main Beam	dB	≥15				
Front to Back Ratio at 180Deg ±30Deg	dB	≥25				
Cross-Polar Ratio 0Deg	dB	≥17				
Electrical Downtilt	Deg	2-12, Continuously adjustable				
VSWR	/	≤1.5				
Interband Isolation	dB	≥26				
Isolation between Ports	dB	≥26				
Intermodulation IM3	dBc	≤-150(2×43 dBm carrier)				
Max. Power Per Port	Watt	250(at 50°C ambient temperature)				
Impedance	Ohm	50				
Polarization	Deg	±45				
Mechanical Specifications						
Antenna Dimensions	mm	2600×469×198				
Antenna Net Weight	kg	36.3				
Packing Dimensions	mm	2850×550×280				
Antenna Gross Weight	kg	51.5				

Connector Type	/	8 × 4.3-10 Female
Connector Position	/	Bottom
Radiator Material	/	Aluminum
Radome Material / Color	/	Fiberglass / light Grey RAL7035
Reflector Material	/	Aluminum
Storage Temperature	°C	-55 to +65
Operating Temperature	°C	-40 to +60
Humidity	/	5% to 95%
Max. operational Wind Speed	km/h	200
Wind Load @Rated Wind Front	N	1523
Wind Load @Rated Wind Side	N	266
Wind Load @Rated Wind Rear	N	1707
Lightning Protection	/	DC ground
Accessories		
Downtilt Kit (mechanical)	Deg	0-16
Mounting Accessories (clamp)	/	Included with antenna
Mounting Pipe Diameter	mm	50-115
Internal RET Specifications		
RCU (remote control unit)	/	Replaceable RET (can be exchangeable without exchanging antenna)
		AISG2.0 /3GPP
Input Voltage Range	V	10-30 DC
Power Consumption	W	< 10 (motor activated , single RET) < 2 (stand by, single RET)
Adjustment Time (full range)	s	< 120 (typically, depending on antenna type)
RET Connector	/	1 pair of AISG 5 pin male & female
Pin Assignment According AISG	/	5-pin circular connector conforming to IEC 60130-9 - Ed. 3.0
Lightning Protection	kA	5 (8/20 μs differential mode), 8 (8/20 μs common mode)

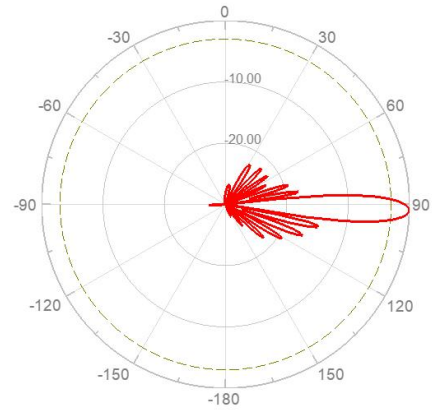
Reference Pattern

698-960MHz

Horizontal pattern

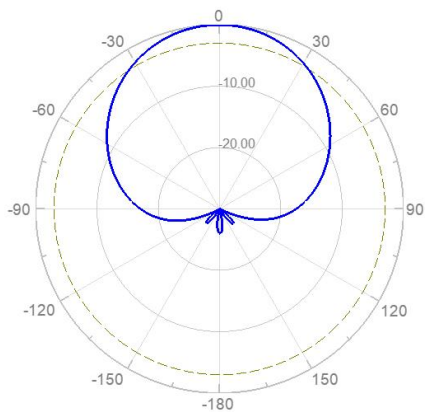


Vertical pattern

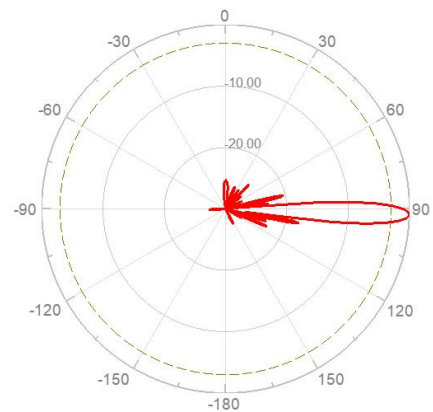


1710-2690MHz

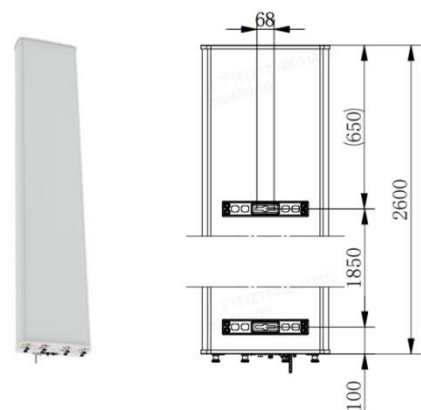
Horizontal pattern



Vertical pattern



Layout of Interface



Layout of Array				
Array	Connector	Frequency(MHz)	RET Serial	
R1	1-2	698-960	ZTR1...01	
R2	3-4	698-960	ZTR2...02	
Y1	5-6	1710-2690	ZTY1...03	
Y2	7-8	1710-2690	ZTY2...04	
<p>All data are based on NGMN recommendations on Base Station Antenna Standards (BASTA V13.0).</p>				

Product Name:28#8-Port,X-Pol,Narrow Beam Panel Antenna,
 2×690-960&2×1710-2690MHz,33deg,17&20dBi,Integrated RET
 Antenna Model:**HBZ44P331720**

Electrical Specifications				
Description	8-Port,X-Pol,Narrow Beam Panel Antenna, 2×690-960&2×1710-2690MHz,33deg,17&20dBi,Integrated RET			
Frequency Range	MHz	2×690-960(Bottom:R1;Top:R2)		
Frequency Band	MHz	690-806	790-890	890-960
Gain Top Over All Tilts	dBi	16.5±0.8	16.8±0.7	17±0.6
Gain Top by Tilt Average Min	dBi	17.3	17.4	17.6
Gain Top by Tilt Average Mid		17.0	17.1	17.3
Gain Top by Tilt Average Max		16.2	16.6	16.8
Gain Bottom Over All Tilts	dBi	16.5±0.8	16.8±0.7	17±0.6
Gain Bottom by Tilt Average Min	dBi	17.3	17.4	17.6
Gain Bottom by Tilt Average Mid		17.0	17.1	17.3
Gain Bottom by Tilt Average Max		16.2	16.6	16.8
Horizontal 3dB Beam Width	Deg	37±3	32±3	30±2
Vertical 3dB Beam Width Top	Deg	17.1±1.3	15.4±1.1	13.8±0.5
Vertical 3dB Beam Width Bottom	Deg	18.1±1.4	16.3±1.2	14.5±0.6
1 st Upper Side Lobe Suppression Above Main Beam	dB	≥15		
Front to Back Ratio at 180Deg ±30Deg	dB	≥25		
Cross-Polar Ratio 0Deg	dB	≥15		
Electrical Downtilt	Deg	2-10,Continuously adjustable		
VSWR	/	≤1.5		
Cross Polar Isolation	dB	≥26		
Interband Isolation	dB	≥26		

Intermodulation IM3	dBc	≤-153(2×43 dBm carrier)				
Max. Power Per Port	Watt	350(at 50°C ambient temperature)				
Frequency Range	MHz	2×1710-2690(Bottom:Y1;Top:Y2)				
Frequency Point	MHz	1710-1880	1850-1990	1920-2200	2300-2490	2500-2690
Gain Top Over All Tilts	dBi	19.8±0.6	19.7±0.5	19.6±0.4	19.0±0.5	19.2±0.7
Gain Top by Tilt Average Min	dBi	20.1	20.2	19.9	16.5	17.0
Gain Top by Tilt Average Mid		19.5	19.8	19.0	18.4	18.6
Gain Top by Tilt Average Max		19.3	19.4	16.1	16.1	16.5
Gain Bottom Over All Tilts	dBi	19.9±0.5	19.9±0.4	19.9±0.5	19.2±0.5	18.9±0.8
Gain Bottom by Tilt Average Min	dBi	20.4	20.3	20.4	19.7	19.7
Gain Bottom by Tilt Average Mid		19.9	19.8	19.8	19.3	19.0
Gain Bottom by Tilt Average Max		19.6	19.5	19.4	18.8	18.7
Horizontal 3dB Beam Width	Deg	31±2	32±2	34±3	35±2	29±5
Vertical 3dB Beam Width Top	Deg	7.1±0.5	6.4±0.3	6.1±0.5	5.5±0.3	5.0±0.3
Vertical 3dB Beam Width Bottom	Deg	7.1±0.4	6.7±0.4	6.3±0.4	5.5±0.3	5.0±0.3
1st Upper Side Lobe Suppression Above Main Beam	dB	≥15				
Front to Back Ratio at 180Deg ±30Deg	dB	≥25				
Cross-Polar Ratio 0Deg	dB	≥15				
Electrical Downtilt	Deg	2-10,Continuously adjustable				
VSWR	/	≤1.5				
Cross Polar Isolation	dB	≥26				
Interband Isolation	dB	≥26				
Intermodulation IM3	dBc	≤-153(2×43 dBm carrier)				
Max. Power Per Port	Watt	250(at 50°C ambient temperature)				

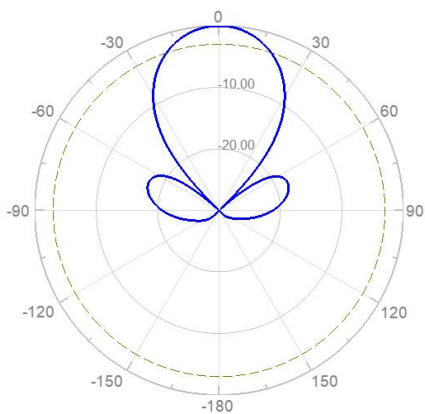
Impedance	Ohm	50
Polarization	Deg	±45
Mechanical Specifications		
Antenna Dimensions	mm	2600×585×155
Antenna Net Weight	kg	44.2
Packing Dimensions	mm	2940×680×250
Antenna Gross Weight	kg	58.4
Connector Type	/	8×4.3-10 Female
Connector Position	/	Bottom
Radiator Material	/	Aluminum&Low loss circuit broad
Radome Material / Color	/	Fiberglass / Light Grey RAL7035
Reflector Material	/	Aluminum
Storage Temperature	°C	-40 to +60
Operating Temperature	°C	-40 to +60
Humidity	/	5% to 95%
Max. operational Wind Speed	km/h	200
Wind Load @Rated Wind Front	N	1981
Wind Load @Rated Wind Side	N	217
Wind Load @Rated Wind Rear	N	2220
Lightning Protection	/	DC ground
Accessories		
Downtilt Kit (mechanical)	Deg	0-12
Mounting Accessories (clamp)	/	Included with antenna
Mounting Pipe Diameter	mm	50-115
Internal RET Specifications		
RCU (remote control unit)	/	Replaceable RET (can be exchangeable without exchanging antenna)
		AISG2.0 /3GPP
Input Voltage Range	V	10-30 DC

Power Consumption	W	< 10 (motor activated , single RET) < 2 (stand by, single RET)
Adjustment Time (full range)	s	< 120 (typically, depending on antenna type)
RET Connector	/	1 pair of AISG 5 pin male & female
Pin Assignment According AISG	/	5-pin circular connector conforming to IEC 60130-9 - Ed. 3.0
Lightning Protection	kA	5 (8/20 μ s differential mode), 8 (8/20 μ s common mode)

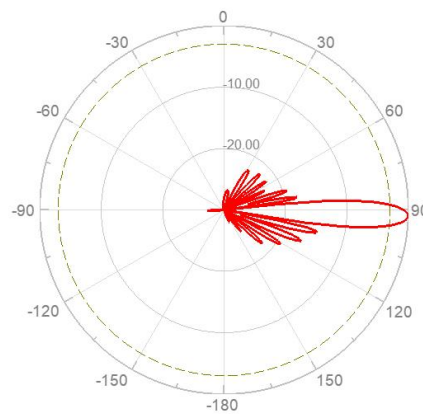
Reference Pattern

690-960MHz

Horizontal Pattern

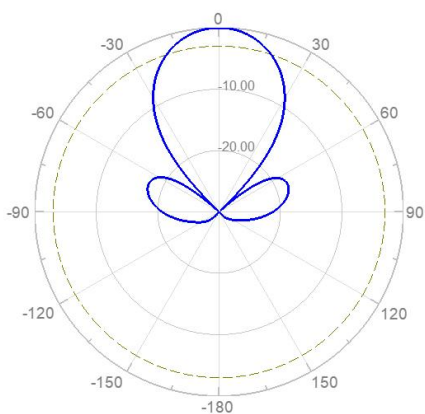


Vertical Pattern

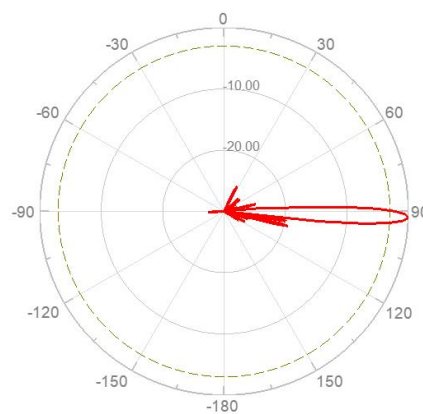


1710-2690MHz

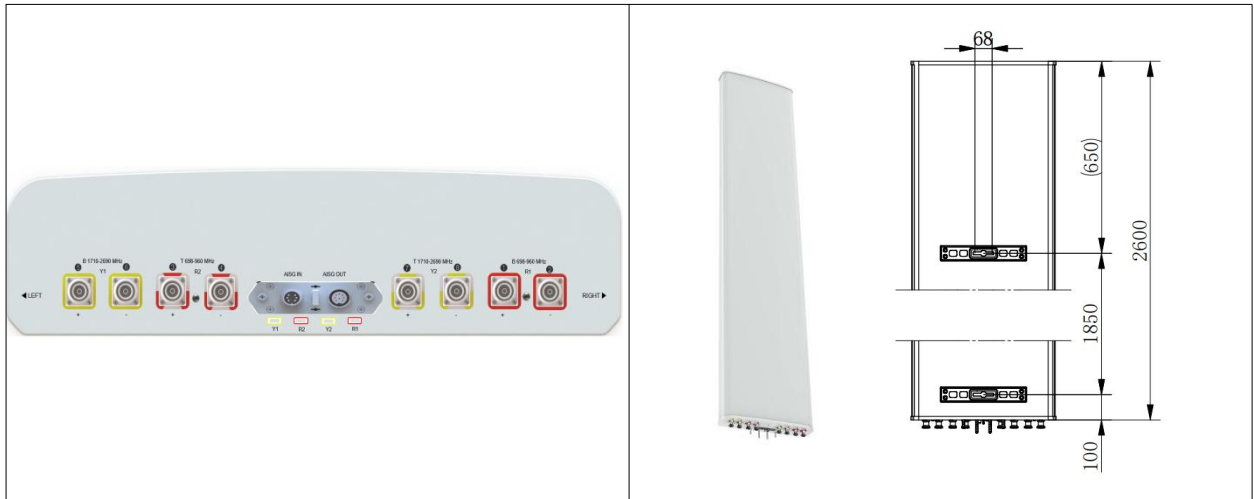
Horizontal Pattern



Vertical Pattern



Layout of Interface



Layout of Array

Array	Connector	Frequency(MHz)	RET Serial	
R1	1-2	690-960	ZTR1...01	
R2	3-4	690-960	ZTR2...02	
Y1	5-6	1710-2690	ZTY1...03	
Y2	7-8	1710-2690	ZTY2...04	

All data are based on NGMN recommendations on Base Station Antenna Standards (BASTA V13.0).

Product Name:29#10-Port,X-Pol,Panel Antenna,
 1×690-960&4×1710-2690MHz,65deg,15&16dBi,Integrated RET
 Antenna Model:**HBZ28P651516**

Electrical Specifications						
Description	10-Port,X-Pol,Panel Antenna, 1×690-960&4×1710-2690MHz,65deg,15&16dBi,Integrated RET					
Frequency Range	MHz	1×690-960(R1)				
Frequency Band	MHz	690-806	790-890	890-960		
Gain Bottom Over All Tilts	dBi	14.6±0.5	15.1±0.4	15.2±0.4		
Gain Bottom by Tilt Average Min	dBi	15.0	15.3	15.5		
Gain Bottom by Tilt Average Mid		14.5	15.0	15.1		
Gain Bottom by Tilt Average Max		14.1	14.7	14..8		
Horizontal 3dB Beam Width	Deg	69±5	69±5	68±5		
Vertical 3dB Beam Width Bottom	Deg	11.8±0.6	10.4±0.7	9.6±0.4		
1 st Upper Side Lobe Suppression Above Main Beam	dB	≥15				
Front to Back Ratio at 180Deg ±30Deg	dB	≥24				
Cross-Polar Ratio 0Deg	dB	≥15				
Electrical Downtilt	Deg	2-12,Continuously adjustable				
VSWR	/	≤1.5				
Cross Polar Isolation	dB	≥25				
Interband Isolation	dB	≥25				
Intermodulation IM3	dBc	≤-150(2×43 dBm carrier)				
Max. Power Per Port	Watt	350(at 50°C ambient temperature)				
Frequency Range	MHz	2×1710-2690(Bottom:Y1/Y3;Top:Y2/Y4)				
Frequency Point	MHz	1710-1880	1850-1990	1920-2170	2300-2400	2500-2690
Gain Top Over All Tilts	dBi	14.6±0.5	15.0±0.5	15.1±0.7	15.2±0.7	15.6±0.5

Gain Top by Tilt Average Min	dBi	15.1	15.5	15.7	15.9	16.2
Gain Top by Tilt Average Mid		14.5	14.9	15.0	15.1	15.6
Gain Top by Tilt Average Max		14.1	14.5	14.5	14.7	15.2
Gain Bottom Over All Tilts	dBi	15.0±0.5	15.4±0.5	15.5±0.7	15.6±0.7	16.0±0.5
Gain Bottom by Tilt Average Min	dBi	15.5	15.8	16.0	16.3	16.5
Gain Bottom by Tilt Average Mid		14.9	15.3	15.4	15.5	15.9
Gain Bottom by Tilt Average Max		14.5	15.0	15.1	15.1	15.5
Horizontal 3dB Beam Width	Deg	64±9	63±6	60±5	66±6	60±9
Vertical 3dB Beam Width Top	Deg	7.1±0.5	6.4±0.3	6.1±0.5	5.5±0.3	5.0±0.3
Vertical 3dB Beam Width Bottom	Deg	6.8±0.4	6.3±0.3	5.8±0.4	5.2±0.4	4.8±0.5
1 st Upper Side Lobe Suppression Above Main Beam	dB	≥15				
Front to Back Ratio at 180Deg ±30Deg	dB	≥24				
Cross-Polar Ratio 0Deg	dB	≥15				
Electrical Downtilt	Deg	2-12, Continuously adjustable				
VSWR	/	≤1.5				
Cross Polar Isolation	dB	≥25				
Interband Isolation	dB	≥25				
Intermodulation IM3	dBc	≤-153(2×43 dBm carrier)				
Max. Power Per Port	Watt	250(at 50°C ambient temperature)				
Impedance	Ohm	50				
Polarization	Deg	±45				
Mechanical Specifications						
Antenna Dimensions	mm	2000×350×200				
Antenna Net Weight	kg	26				
Packing Dimensions	mm	2260×420×295				

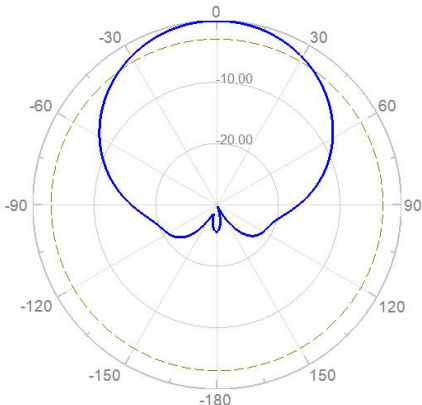
Antenna Gross Weight	kg	37.5
Connector Type	/	10×4.3-10 Female
Connector Position	/	Bottom
Radiator Material	/	Aluminum
Radome Material / Color	/	Fiberglass / Light Grey RAL7035
Reflector Material	/	Aluminum
Storage Temperature	°C	-40 to +60
Operating Temperature	°C	-40 to +60
Humidity	/	5% to 95%
Max. operational Wind Speed	km/h	200
Wind Load @Rated Wind Front	N	877
Wind Load @Rated Wind Side	N	207
Wind Load @Rated Wind Rear	N	983
Lightning Protection	/	DC ground
Accessories		
Downtilt Kit (mechanical)	Deg	0-12
Mounting Accessories (clamp)	/	Included with antenna
Mounting Pipe Diameter	mm	50-115
Internal RET Specifications		
RCU (remote control unit)	/	Replaceable RET (can be exchangeable without exchanging antenna)
		AISG2.0 /3GPP
Input Voltage Range	V	10-30 DC
Power Consumption	W	< 10 (motor activated , single RET)
		< 2 (stand by, single RET)
Adjustment Time (full range)	s	< 120 (typically, depending on antenna type)
RET Connector	/	1 pair of AISG 5 pin male & female
Pin Assignment According AISG	/	5-pin circular connector conforming to IEC 60130-9 - Ed. 3.0

Lightning Protection	kA	5 (8/20 μ s differential mode), 8 (8/20 μ s common mode)
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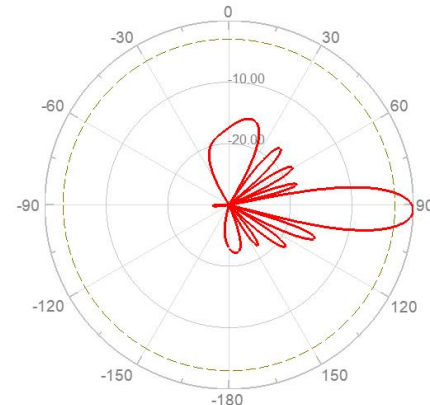
Reference Pattern

690-960MHz

Horizontal Pattern

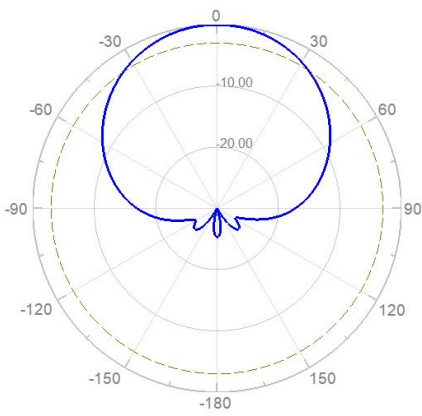


Vertical Pattern

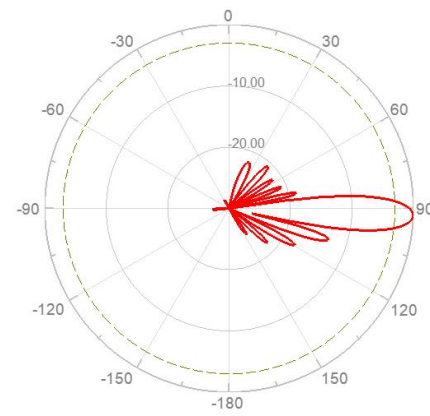


1710-2690MHz

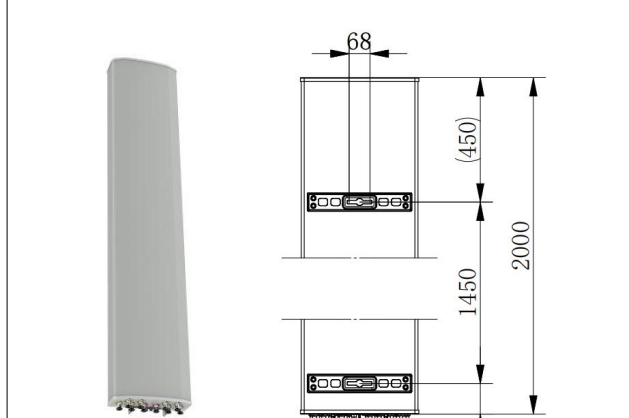
Horizontal Pattern



Vertical Pattern



Layout of Interface



Layout of Array			
Array	Connector	Frequency(MHz)	RET Serial
R1	1-2	690-960	ZTR1...01
Y1	3-4	1710-2690	ZTY1...02
Y2	5-6	1710-2690	ZTY2...03
Y3	7-8	1710-2690	ZTY3...04
Y4	9-10	1710-2690	ZTY4...05

The diagram illustrates the physical layout of the antenna array. It consists of four yellow vertical bars arranged in a row, labeled Y1, Y2, Y3, and Y4 from left to right. A central red vertical bar is positioned between Y2 and Y3, labeled R1. The bars are of equal height and are separated by small gaps.

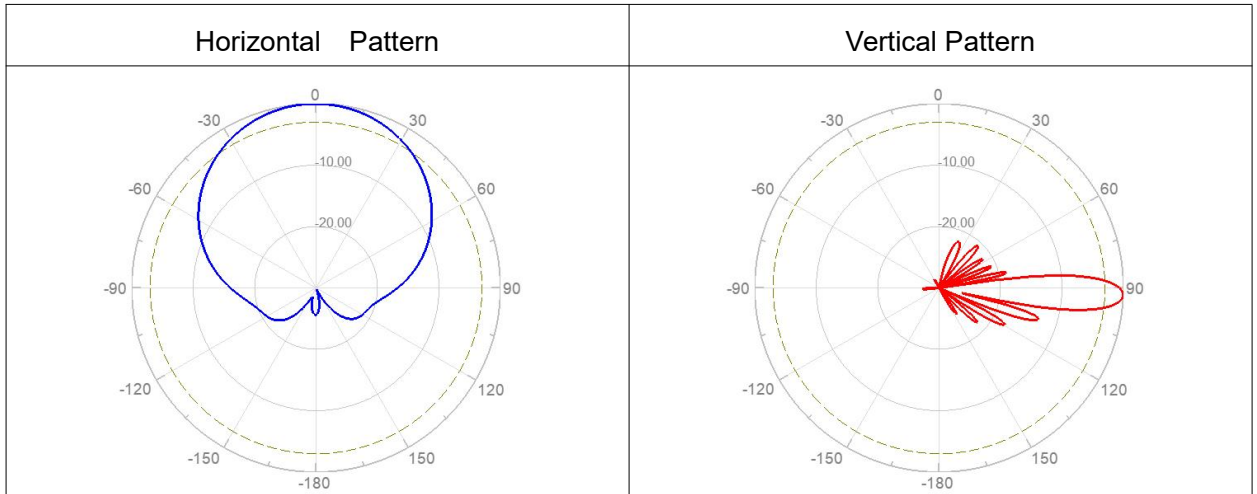
All data are based on NGMN recommendations on Base Station Antenna Standards (BASTA V13.0).

Product Name:30#10-Port,X-Pol,Panel Antenna,
 1×690-960&4×1710-2690MHz,65deg,16&17dBi,Integrated RET
 Antenna Model:**HBZ28P651617**

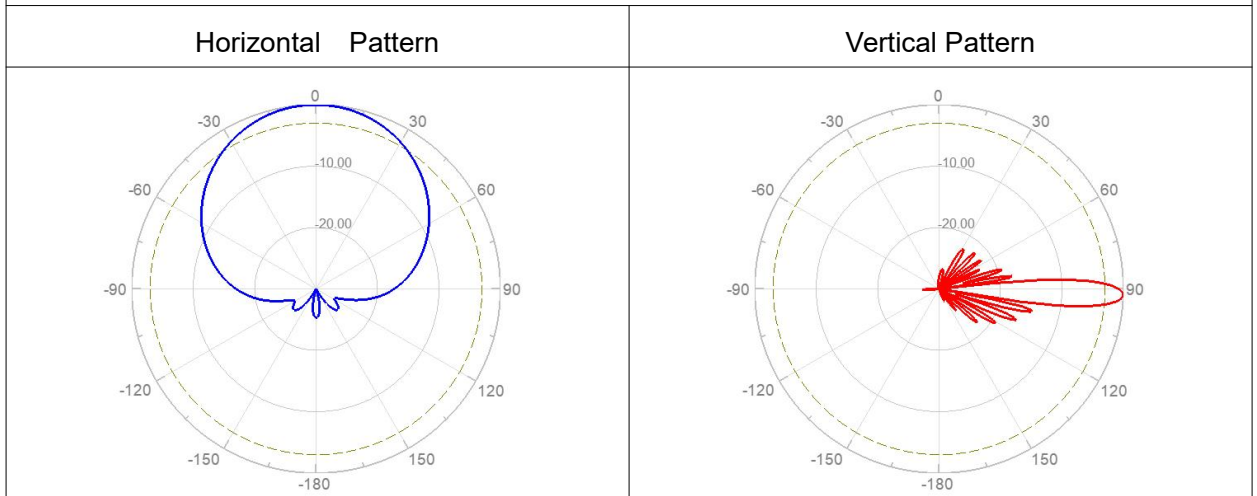
Electrical Specifications						
Description	10-Port,X-Pol,Panel Antenna, 1×690-960&4×1710-2690MHz,65deg,16&17dBi,Integrated RET					
Frequency Range	MHz	1×690-960(R1)				
Frequency Band	MHz	690-806	790-890	890-960		
Gain Over All Tilts	dBi	15.4±0.6	15.9±0.4	16.1±0.5		
Gain by Tilt Average Min	dBi	16.0	16.3	16.6		
Gain by Tilt Average Mid		15.4	15.8	16.2		
Gain by Tilt Average Max		15.0	15.5	15.8		
Horizontal 3dB Beam Width	Deg	72±5	69±4	66±3		
Vertical 3dB Beam Width	Deg	9.1±0.7	8.3±0.8	7.8±0.8		
1 st Upper Side Lobe Suppression Above Main Beam	dB	≥16				
Front to Back Ratio at 180Deg ±30Deg	dB	≥25				
Cross-Polar Ratio 0Deg	dB	≥17				
Cross-Polar Ratio ±60Deg	dB	≥8				
Electrical Downtilt	Deg	2-12,Continuously adjustable				
VSWR	/	≤1.5				
Cross Polar Isolation	dB	≥26				
Interband Isolation	dB	≥26				
Intermodulation IM3	dBc	≤-150(2×43 dBm carrier)				
Max. Power Per Port	Watt	350(at 50°C ambient temperature)				
Frequency Range	MHz	4×1710-2690(:Y1/Y2/Y3/Y4)				
Frequency Point	MHz	1710-1880	1850-1990	1920-2200	2300-2400	2500-2690

Gain Over All Tilts	dBi	15.5±0.5	16.0±0.5	16.4±0.6	16.6±0.5	16.9±0.7
Gain by Tilt Average Min	dBi	16.0	16.5	17.0	17.1	17.6
Gain by Tilt Average Mid		15.4	16.0	16.5	16.6	17.0
Gain by Tilt Average Max		15.2	15.6	16.0	16.1	16.5
Horizontal 3dB Beam Width	Deg	64±4	64±7	63±6	68±6	66±6
Vertical 3dB Beam Width	Deg	8.0±0.5	7.3±0.5	7.1±0.9	6.0±0.5	5.5±0.5
1 st Upper Side Lobe Suppression Above Main Beam	dB	≥16				
Front to Back Ratio at 180Deg ±30Deg	dB	≥25				
Cross-Polar Ratio 0Deg	dB	≥17				
Cross-Polar Ratio ±60Deg	dB	≥8				
Electrical Downtilt	Deg	2-12, Continuously adjustable				
VSWR	/	≤1.5				
Cross Polar Isolation	dB	≥26				
Interband Isolation	dB	≥26				
Intermodulation IM3	dBc	≤-150(2×43 dBm carrier)				
Max. Power Per Port	Watt	250(at 50°C ambient temperature)				
Impedance	Ohm	50				
Polarization	Deg	±45				
Mechanical Specifications						
Antenna Dimensions	mm	2450×350×200				
Antenna Net Weight	kg	34.1				
Packing Dimensions	mm	2780×425×275				
Antenna Gross Weight	kg	51.1				
Connector Type	/	10×4.3-10 Female				
Connector Position	/	Bottom				

Radiator Material	/	Aluminum
Radome Material / Color	/	Fiberglass / Light Grey RAL7035
Reflector Material	/	Aluminum
Storage Temperature	°C	-40 to +60
Operating Temperature	°C	-40 to +60
Humidity	/	5% to 95%
Max. operational Wind Speed	km/h	200
Wind Load @Rated Wind Front	N	1146
Wind Load @Rated Wind Side	N	271
Wind Load @Rated Wind Rear	N	1284
Lightning Protection	/	DC ground
Accessories		
Downtilt Kit (mechanical)	Deg	0-12
Mounting Accessories (clamp)	/	Included with antenna
Mounting Pipe Diameter	mm	50-115
Internal RET Specifications		
RCU (remote control unit)	/	Replaceable RET (can be exchangeable without exchanging antenna)
		AISG2.0 /3GPP
Input Voltage Range	V	10-30 DC
Power Consumption	W	< 10 (motor activated , single RET) < 2 (stand by, single RET)
Adjustment Time (full range)	s	< 120 (typically, depending on antenna type)
RET Connector	/	1 pair of AISG 5 pin male & female
Pin Assignment According AISG	/	5-pin circular connector conforming to IEC 60130-9 - Ed. 3.0
Lightning Protection	kA	5 (8/20 μs differential mode), 8 (8/20 μs common mode)
Reference Pattern		
690-960MHz		



1710-2690MHz



Layout of Interface



Layout of Array			
Array	Connector	Frequency(MHz)	RET Serial
R1	1-2	690-960	ZTR1...01
Y1	3-4	1710-2690	ZTY1...02
Y2	5-6	1710-2690	ZTY2...03
Y3	7-8	1710-2690	ZTY3...04
Y4	9-10	1710-2690	ZTY4...05

The diagram illustrates the physical layout of the antenna array. It consists of five vertical bars. A central red bar is labeled 'R 1'. On either side of this central bar are two yellow bars. The yellow bars on the left are labeled 'Y2' (top) and 'Y1' (bottom). The yellow bars on the right are labeled 'Y4' (top) and 'Y3' (bottom). The bars are arranged in a staggered pattern, with the top of the left bars aligned with the bottom of the right bars.

All data are based on NGMN recommendations on Base Station Antenna Standards (BASTA V13.0).

Product Name:10-Port,X-Pol,Panel Antenna,
 1×690-960&4×1695-2690MHz,65deg,16&18dBi,Integrated RET
 Antenna Model:**HBZ28P651618**

Electrical Specifications					
Description	10-Port,X-Pol,Panel Antenna, 1×698-960MHz&4×1695-2690MHz,65deg,16&18dBi,Integrated RET				
Frequency Range	MHz	1×698-960(R1)			
Frequency Band	MHz	698-896	880-960		
Gain Over All Tilts	dBi	16.4±0.5	16.5±0.5		
Gain by Tilt Average Mid		16.5	16.6		
Horizontal 3dB Beam Width	Deg	69±8	64±8		
Vertical 3dB Beam Width	Deg	11.8±0.8	10.2±0.5		
1st Upper Side Lobe Suppression Above Main Beam	dB	≥17	≥17		
Front to Back Ratio at 180Deg ±30Deg	dB	≥25	≥25		
Cross-Polar Ratio 0Deg	dB	≥19	≥20		
Electrical Downtilt	Deg	2-10,Continuously adjustable			
VSWR	/	≤1.4			
Isolation between Ports	dB	≥28			
Intermodulation IM3	dBc	≤-153(2×43 dBm carrier)			
Max. Power Per Port	Watt	250(at 50°C ambient temperature)			
Frequency Range	MHz	2×1695-2690(Y1/Y2)			
Frequency Band	MHz	1695-1880	1900-2200	2300-2400	2500-2690
Gain Over All Tilts	dBi	17.6±0.4	17.7±0.5	17.8±0.5	17.9±0.5
Gain by Tilt Average Mid		17.6	17.7	17.8	17.9
Horizontal 3dB Beam Width	Deg	65±8	64±8	62±8	58±8

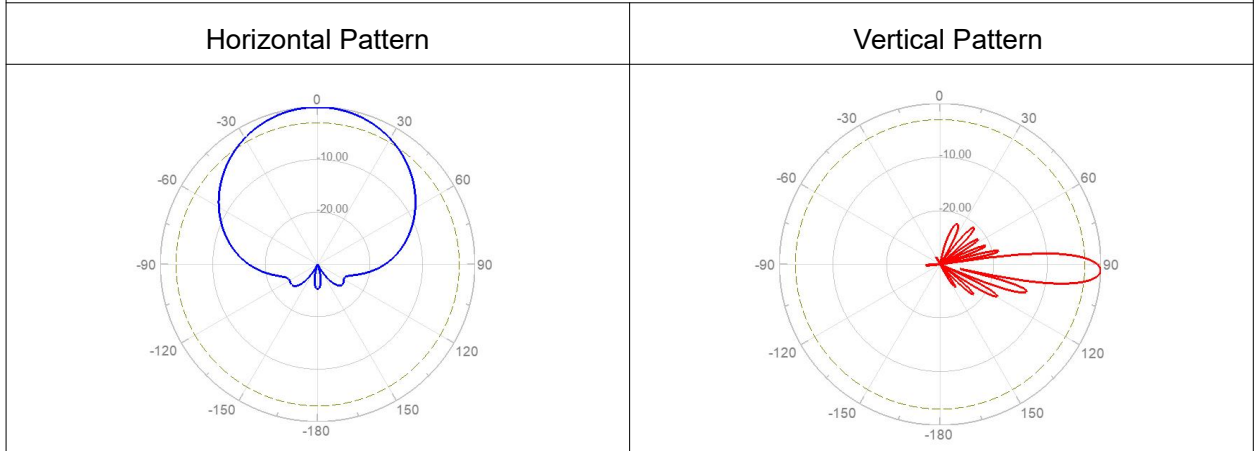
Vertical 3dB Beam Width	Deg	10.5±0.5	9.1±0.5	8.0±0.4	7.2±0.4
1 st Upper Side Lobe Suppression Above Main Beam	dB	≥17	≥17	≥17	≥17
Front to Back Ratio at 180Deg ±30Deg	dB	≥25	≥25	≥25	≥25
Cross-Polar Ratio 0Deg	dB	≥20	≥20	≥18	≥18
Electrical Downtilt	Deg	2-10,Continuously adjustable			
VSWR	/	≤1.4			
Isolation between Ports	dB	≥28			
Intermodulation IM3	dBc	≤-153(2×43 dBm carrier)			
Max. Power Per Port	Watt	200(at 50°C ambient temperature)			
Frequency Range	MHz	2×1695-2690(Y3/Y4)			
Frequency Band	MHz	1695-1880	1900-2200	2300-2400	2500-2690
Gain Over All Tilts	dBi	17.6±0.4	17.7±0.5	17.8±0.5	17.9±0.5
Gain by Tilt Average Mid		17.6	17.7	17.8	17.9
Horizontal 3dB Beam Width	Deg	65±8	64±8	62±8	58±8
Vertical 3dB Beam Width	Deg	10.5±0.5	9.1±0.5	8.0±0.4	7.2±0.4
1 st Upper Side Lobe Suppression Above Main Beam	dB	≥17	≥17	≥17	≥17
Front to Back Ratio at 180Deg ±30Deg	dB	≥25	≥25	≥25	≥25
Cross-Polar Ratio 0Deg	dB	≥20	≥20	≥18	≥18
Electrical Downtilt	Deg	2-10,Continuously adjustable			
VSWR	/	≤1.4			
Isolation between Ports	dB	≥28			

Intermodulation IM3	dBc	≤-153(2×43 dBm carrier)
Max. Power Per Port	Watt	200(at 50°C ambient temperature)
Impedance	Ohm	50
Polarization	Deg	±45
Mechanical Specifications		
Antenna Dimensions	mm	2000×380×177
Antenna Net Weight	kg	30.0
Packing Dimensions	mm	2260×485×275
Antenna Gross Weight	kg	40.0
Connector Type	/	10×4.3-10 Female
Connector Position	/	Bottom
Radome Material / Color	/	Fiberglass / Light Grey RAL7035
Reflector Material	/	Aluminum
Storage Temperature	°C	-50 to +65
Operating Temperature	°C	-50 to +65
Humidity	/	5% to 95%
Max. operational Wind Speed	km/h	200
Wind Load @Rated Wind Front	N	957
Wind Load @Rated Wind Side	N	184
Wind Load @Rated Wind Rear	N	1072
Lightning Protection	/	DC ground
Accessories		
Downtilt Kit (mechanical)	Deg	0-10
Mounting Accessories (clamp)	/	Included with antenna
Mounting Pipe Diameter	mm	50-115
Internal RET Specifications		
RCU (remote control unit)	/	Replaceable RET (can be exchangeable without exchanging antenna)

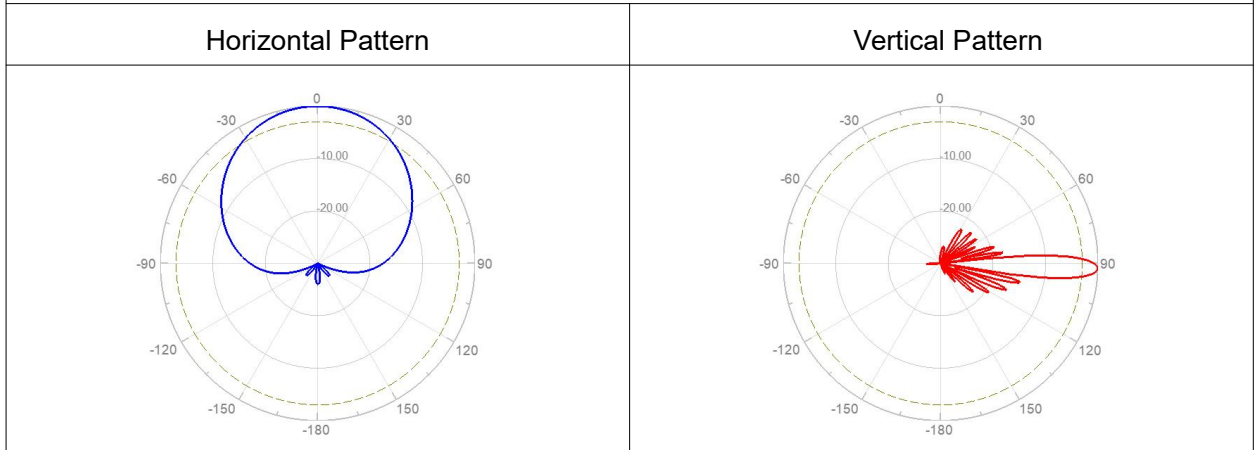
		AISG2.0 /3GPP
Input Voltage Range	V	10-30 DC
Power Consumption	W	< 10 (motor activated , single RET) < 2 (stand by, single RET)
Adjustment Time (full range)	s	< 120 (typically, depending on antenna type)
RET Connector	/	1 pair of AISG 5 pin male & female
Pin Assignment According AISG	/	5-pin circular connector conforming to IEC 60130-9 - Ed. 3.0
Lightning Protection	kA	5 (8/20 μ s differential mode), 8 (8/20 μ s common mode)

Reference Pattern

698-960MHz



1695-2690MHz



Layout of Array

Array	Connector	Frequency(MHz)	RET Serial	
R1	1-2	698-960	XXR1...01	
Y1	3-4	1695-2690	XXY1...02	
Y2	5-6	1695-2690	XXY2...03	
Y3	7-8	1695-2690	XXY3...04	
Y4	9-10	1695-2690	XXY4...05	

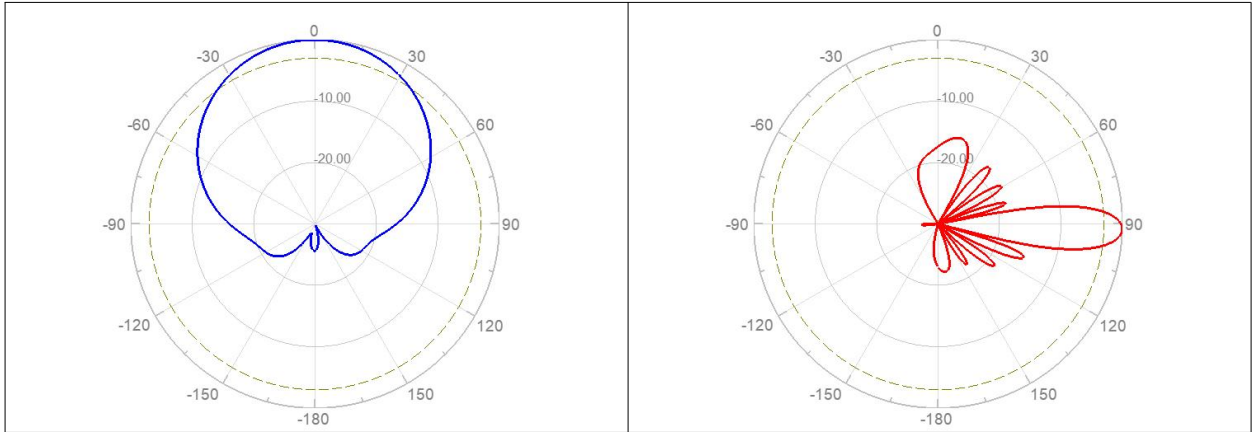
All data are based on NGMN recommendations on Base Station Antenna Standards (BASTA V12.0).

Product Name:31#12-Port,X-Pol,Panel Antenna,
 2×690-960&4×1695-2690MHz,65deg,15&17dBi,Integrated RET
 Antenna Model:**HBZ48P651517**

Electrical Specifications						
Description	12-Port,X-Pol,Panel Antenna, 2×690-960&4×1695-2690MHz,65deg,15&17dBi,Integrated RET					
Frequency Range	MHz	2×690-960(R1/R2)				
Frequency Band	MHz	690-806	790-890	890-960		
Gain Over All Tilts	dBi	13.8±0.8	14.2±0.5	14.4±0.5		
Gain by Tilt Average Min	dBi	14.6	14.7	14.9		
Gain by Tilt Average Mid		14.1	14.5	14.7		
Gain by Tilt Average Max		13.7	14.1	14.2		
Horizontal 3dB Beam Width	Deg	67±6	70±4	69±5		
Vertical 3dB Beam Width	Deg	16.1±1.1	14.4±0.8	13.3±0.7		
1 st Upper Side Lobe Suppression Above Main Beam	dB	≥15				
Front to Back Ratio at 180Deg ±30Deg	dB	≥25				
Cross-Polar Ratio 0Deg	dB	≥17				
Cross-Polar Ratio ±60Deg	dB	≥8				
Electrical Downtilt	Deg	2-12,Continuously adjustable				
VSWR	/	≤1.5				
Cross Polar Isolation	dB	≥25				
Interband Isolation	dB	≥25				
Intermodulation IM3	dBc	≤-150(2×43 dBm carrier)				
Max. Power Per Port	Watt	350(at 50°C ambient temperature)				
Frequency Range	MHz	4×1695-2690(Y1/Y2/Y3/Y4)				
Frequency Point	MHz	1695-1880	1850-1990	1920-2200	2300-2490	2500-2690

Gain Over All Tilts	dBi	16.5±0.6	16.8±0.5	16.9±0.6	17.2±0.7	17.4±0.7
Gain by Tilt Average Min	dBi	17.0	17.2	17.3	17.6	18.0
Gain by Tilt Average Mid		16.6	16.7	16.9	17.3	17.4
Gain by Tilt Average Max		16.0	16.3	16.4	16.7	17.0
Horizontal 3dB Beam Width	Deg	70±9	67±9	67±6	62±7	58±6
Vertical 3dB Beam Width	Deg	6.6±0.5	6.2±0.4	5.9±0.5	5.2±0.4	4.8±0.3
1 st Upper Side Lobe Suppression Above Main Beam	dB	≥15				
Front to Back Ratio at 180Deg ±30Deg	dB	≥25				
Cross-Polar Ratio 0Deg	dB	≥17				
Electrical Downtilt	Deg	2-12, Continuously adjustable				
VSWR	/	≤1.5				
Cross Polar Isolation	dB	≥25				
Interband Isolation	dB	≥25				
Intermodulation IM3	dBc	≤-150(2×43 dBm carrier)				
Max. Power Per Port	Watt	250(at 50°C ambient temperature)				
Impedance	Ohm	50				
Polarization	Deg	±45				
Mechanical Specifications						
Antenna Dimensions	mm	1500×499×199				
Antenna Net Weight	kg	28.8				
Packing Dimensions	mm	1770×570×275				
Antenna Gross Weight	kg	39.7				
Connector Type	/	12×4.3-10 Female				
Connector Position	/	Bottom				
Radiator Material	/	Aluminum				

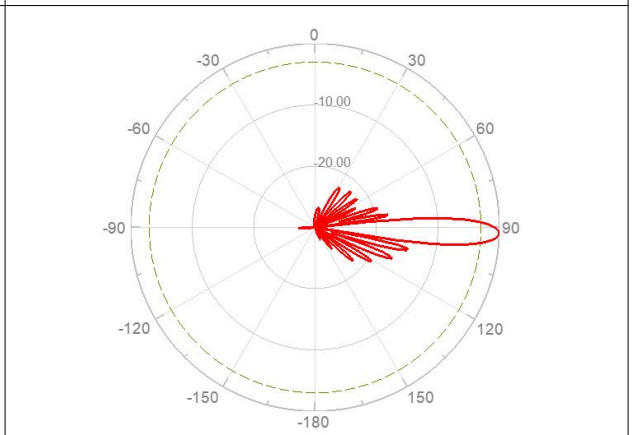
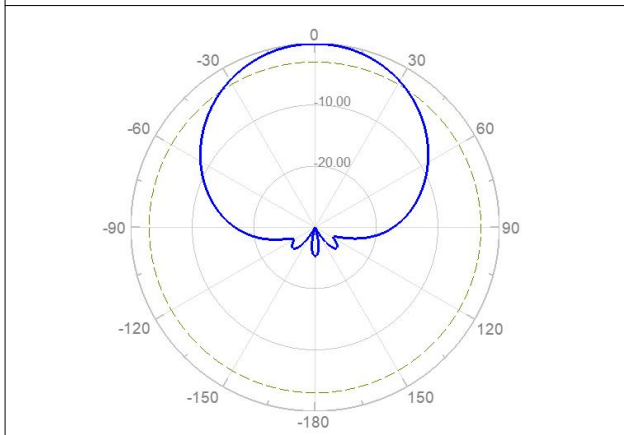
Radome Material / Color	/	Fiberglass / Light Grey RAL7035
Reflector Material	/	Aluminum
Storage Temperature	°C	-40 to +60
Operating Temperature	°C	-40 to +60
Humidity	/	5% to 95%
Max. operational Wind Speed	km/h	200
Wind Load @Rated Wind Front	N	936
Wind Load @Rated Wind Side	N	154
Wind Load @Rated Wind Rear	N	1049
Lightning Protection	/	DC ground
Accessories		
Downtilt Kit (mechanical)	Deg	0-12
Mounting Accessories (clamp)	/	Included with antenna
Mounting Pipe Diameter	mm	50-115
Internal RET Specifications		
RCU (remote control unit)	/	Replaceable RET (can be exchangeable without exchanging antenna)
		AISG2.0 /3GPP
Input Voltage Range	V	10-30 DC
Power Consumption	W	< 10 (motor activated , single RET) < 2 (stand by, single RET)
Adjustment Time (full range)	s	< 120 (typically, depending on antenna type)
RET Connector	/	1 pair of AISG 5 pin male & female
Pin Assignment According AISG	/	5-pin circular connector conforming to IEC 60130-9 - Ed. 3.0
Lightning Protection	kA	5 (8/20 μ s differential mode), 8 (8/20 μ s common mode)
Reference Pattern		
690-960MHz		
Horizontal Pattern		Vertical Pattern



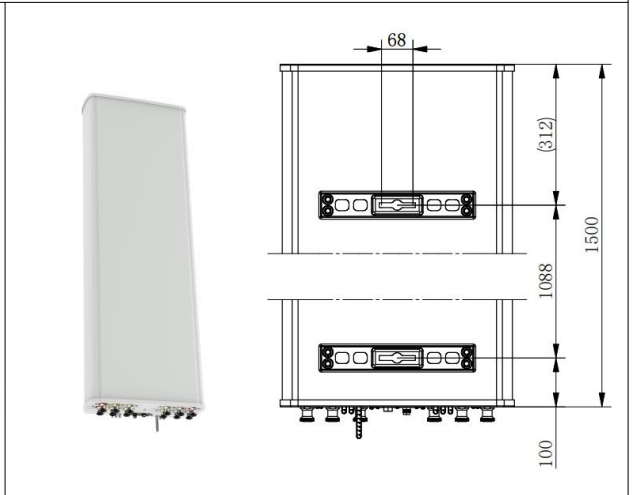
1695-2690MHz

Horizontal Pattern

Vertical Pattern



Layout of Interface



Layout of Array				
Array	Connector	Frequency(MHz)	RET Serial	
R1	1-2	690-960	ZTR1...01	
Y1	3-4	1695-2690	ZTY1...02	
Y2	5-6	1695-2690	ZTY2...03	
Y3	7-8	1695-2690	ZTY3...04	
Y4	9-10	1695-2690	ZTY4...05	

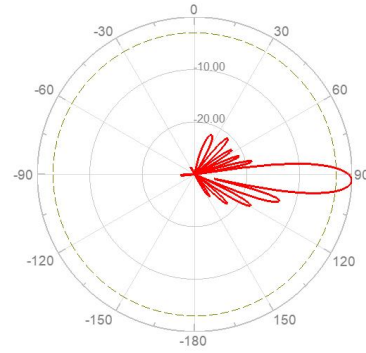
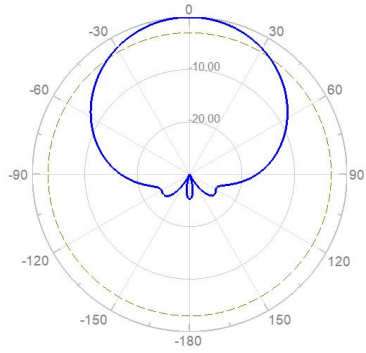
All data are based on NGMN recommendations on Base Station Antenna Standards (BASTA V13.0).

Product Name:32#12-port Sector Antenna,
 2×690-960&4×1695-2690MHz,65Deg,16&17dBi,Integrated RET
 Antenna Model:**HBZ48P651617**

Electrical Specifications				
Description	12-port Sector Antenna, 2×690-960&4×1695-2690MHz,65Deg,16&17dBi,Integrated RET			
Frequency Range	MHz	FDD:2×690-960(R1/R2)		
Gain Over All Tilts	dBi	15.9±0.4	16.3±0.4	16.5±0.3
Gain by Tilt Average Mid	dBi	15.9	16.3	16.5
Horizontal 3dB Beam Width	Deg	60±5	58±4	60±8
Vertical 3dB Beam Width	Deg	12.8±1.6	11.2±1.1	9.8±0.9
1st Upper Side Lobe Suppression Above Main Beam	dB	≥16		
Front to Back Ratio at 180Deg ±30Deg	dB	≥24		
Cross Polar Ratio 0Deg	dB	≥15		
Electrical Downtilt	Deg	2-12,Continuously adjustable		
VSWR	/	≤1.5		
Intraband Isolation	dB	≥25		
Interband Isolation	dB	≥25		
Intermodulation IM3	dBc	≤-153(2×43 dBm carrier)		
Max. Power Per Port	Watt	300(at 50°C ambient temperature)		
Frequency Range	MHz	FDD:4×1695-2690(Y1/Y2/Y3/Y4)		
Frequency Band	MHz	1695-1990	1920-2200	2300-2500 2490-2690
Gain Over All Tilts	dBi	17.0±0.5	17.4±0.6	17.5±0.4 17.4±0.4
Gain by Tilt Average Mid	dBi	17.0	17.4	17.5 17.4
Horizontal 3dB Beam Width	Deg	68±8	67±5	63±7 63±8

Vertical 3dB Beam Width	Deg	9.5±0.7	8.6±0.6	7.3±0.5	6.8±0.5
1 st Upper Side Lobe Suppression Above Main Beam	dB	≥16			
Front to Back Ratio at 180Deg ±30Deg	dB	≥25			
Cross Polar Ratio 0Deg	dB	≥15			
Electrical Downtilt	Deg	2-12, Continuously adjustable			
VSWR	/	≤1.5			
Intraband Isolation	dB	≥25			
Interband Isolation	dB	≥25			
Intermodulation IM3	dBc	≤-153(2×43 dBm carrier)			
Max. Power Per Port	Watt	250(at 50°C ambient temperature)			
Impedance	Ohm	50			
Polarization	Deg	±45			
Mechanical Specifications					
Antenna Dimensions	mm	1820×498×186			
Antenna Net Weight	kg	31.5			
Packing Dimensions	mm	2100×550×265			
Antenna Gross Weight	kg	42			
Connector Type	/	12×4.3-10 Female			
Connector Position	/	Bottom			
Radiator Material	/	Low loss circuit board & Aluminum			
Radome Material / Color	/	Fiberglass / Light Grey RAL7035			
Reflector Material	/	Aluminum			
Storage Temperature	°C	-50 to +65			
Operating Temperature	°C	-50 to +65			
Humidity	/	5% to 95%			
Max. operational Wind Speed	km/h	200			

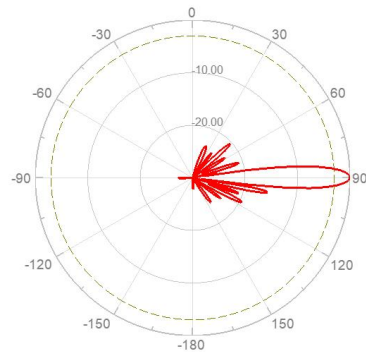
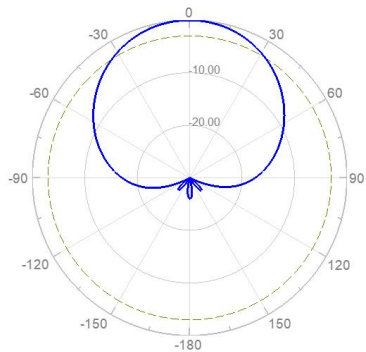
Wind Load @Rated Wind Front, 150km/h	N	644
Wind Load @Rated Wind Side, 150km/h	N	176
Wind Load @Rated Wind Rear, 150km/h	N	678
Lightning Protection	/	DC ground
Accessories		
Downtilt Kit (mechanical)	Deg	0-12
Mounting Accessories (clamp)	/	Included with antenna
Mounting Pipe Diameter	mm	50-115
Max Clamp Weight for 2 Clamps	kg	5
Internal RET Specifications		
RCU (remote control unit)	/	Replaceable RET (can be exchangeable without exchanging antenna)
		AISG2.0 /3GPP
Input Voltage Range	V	10-30 DC
Power Consumption	W	< 10 (motor activated , single RET) < 2 (stand by, single RET)
Adjustment Time (full range)	s	< 120 (typically, depending on antenna type)
RET Connector	/	1 pair of AISG 5 pin male & female
Pin Assignment According AISG	/	8-pin circular connector conforming to IEC 60130-9 - Ed. 3.0
Lightning Protection	kA	5 (8/20 μ s differential mode), 8 (8/20 μ s common mode)
Reference Pattern		
FDD:690-960MHz		
Horizontal Pattern		Vertical Pattern



FDD:1695-2690MHz

Horizontal Pattern

Vertical Pattern

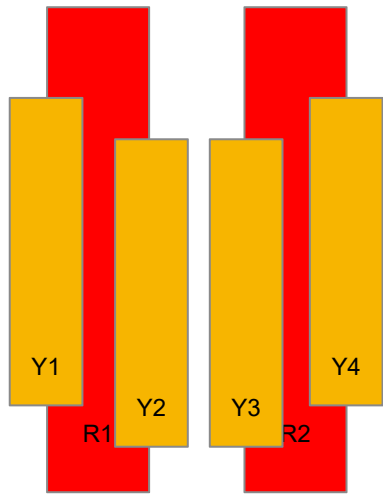


Layout of Interface



Layout of Array

Array	Connector	Frequency(MHz)	RET Serial
R1	1-2	690-960	ZTR1...05
R2	3-4	690-960	ZTR2...04
Y1	5-6	1695-2690	ZTY1...08
Y2	7-8	1695-2690	ZTY2...01
Y3	9-10	1695-2690	ZTY3...06
Y4	11-12	1695-2690	ZTY4...03



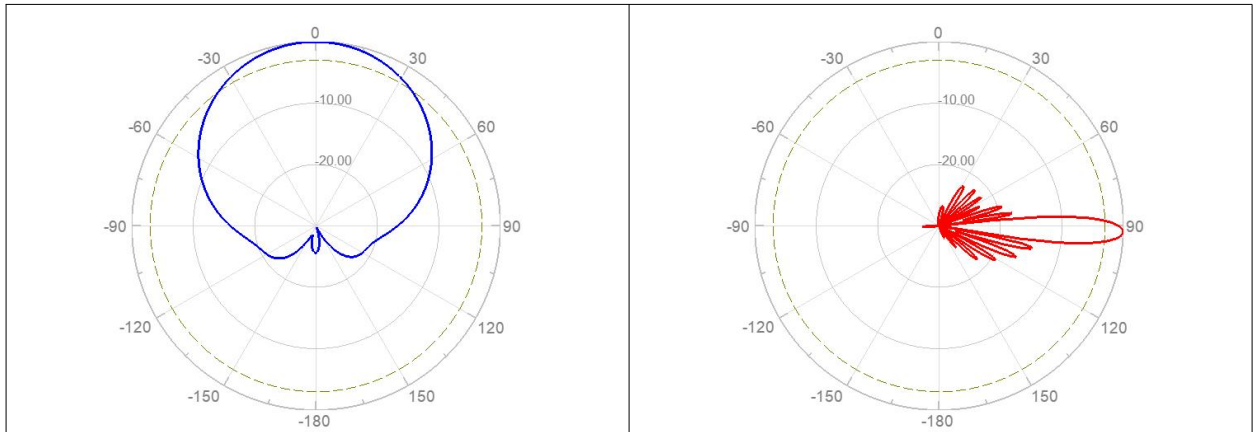
All data are based on NGMN recommendations on Base Station Antenna Standards (BASTA V13.0).

Product Name:33#12-Port,X-Pol,Panel Antenna,
 2×690-960&4×1695-2690MHz,65deg,17&17dBi,Integrated RET
 Antenna Model:**HBZ48P651717**

Electrical Specifications					
Description	12-Port,X-Pol,Panel Antenna, 2×690-960&4×1695-2690MHz,65deg,17&17dBi,Integrated RET				
Frequency Range	MHz	2×690-960(R1/R2)			
Frequency Band	MHz	690-806	790-890	890-960	
Gain Over All Tilts	dBi	16.0±0.7	16.5±0.7	16.5±0.7	
Gain by Tilt Average Min	dBi	16.7	17.2	17.3	
Gain by Tilt Average Mid		16.3	16.3	16.8	
Gain by Tilt Average Max		15.8	16.0	16.3	
Horizontal 3dB Beam Width	Deg	60±4	63±7	64±7	
Vertical 3dB Beam Width	Deg	8.4±0.5	7.5±0.3	7.1±0.4	
1 st Upper Side Lobe Suppression Above Main Beam	dB	≥15			
Front to Back Ratio at 180Deg ±30Deg	dB	≥24			
Cross-Polar Ratio 0Deg	dB	≥17			
Cross-Polar Ratio ±60Deg	dB	≥8			
Electrical Downtilt	Deg	2-12,Continuously adjustable			
VSWR	/	≤1.5			
Cross Polar Isolation	dB	≥26			
Interband Isolation	dB	≥26			
Intermodulation IM3	dBc	≤-150(2×43 dBm carrier)			
Max. Power Per Port	Watt	300(at 50°C ambient temperature)			
Frequency Range	MHz	4×1695-2690(Y1/Y2/Y3/Y4)			
Frequency Point	MHz	1695-1880	1850-1990	1920-2200	2200-2490 2500-2690

Gain Over All Tilts	dBi	16.5±0.6	16.8±0.6	16.8±0.5	17.1±0.7	17.1±0.8
Gain by Tilt Average Min	dBi	16.8	17.3	17.3	17.6	17.9
Gain by Tilt Average Mid		16.5	16.8	16.9	17.0	17.1
Gain by Tilt Average Max		16.0	16.3	16.4	16.6	16.8
Horizontal 3dB Beam Width	Deg	70±9	68±8	67±7	62±8.7	56±6
Vertical 3dB Beam Width	Deg	6.5±0.5	6.2±0.5	6.0±0.5	5.2±0.4	4.6±0.5
1 st Upper Side Lobe Suppression Above Main Beam	dB	≥15				
Front to Back Ratio at 180Deg ±30Deg	dB	≥24				
Cross-Polar Ratio 0Deg	dB	≥15				
Electrical Downtilt	Deg	2-12, Continuously adjustable				
VSWR	/	≤1.5				
Cross Polar Isolation	dB	≥26				
Interband Isolation	dB	≥26				
Intermodulation IM3	dBc	≤-150(2×43 dBm carrier)				
Max. Power Per Port	Watt	200(at 50°C ambient temperature)				
Impedance	Ohm	50				
Polarization	Deg	±45				
Mechanical Specifications						
Antenna Dimensions	mm	2600×499×199				
Antenna Net Weight	kg	44.0				
Packing Dimensions	mm	2865×570×275				
Antenna Gross Weight	kg	58.6				
Connector Type	/	12×4.3-10 Female				
Connector Position	/	Bottom				
Radiator Material	/	Aluminum				

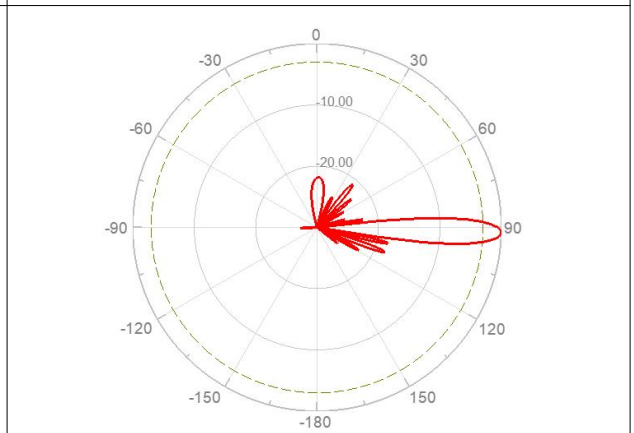
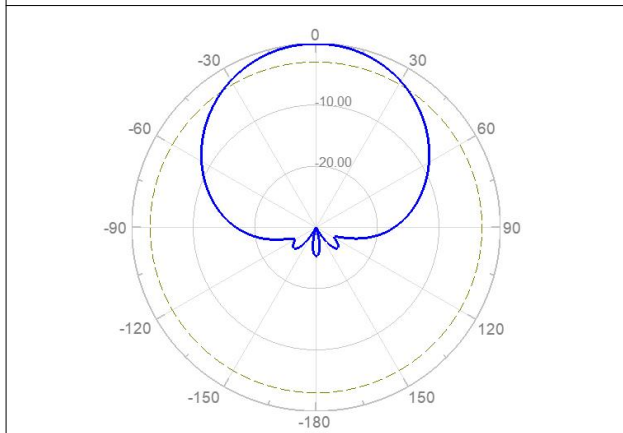
Radome Material / Color	/	Fiberglass / Light Grey RAL7035
Reflector Material	/	Aluminum
Storage Temperature	°C	-40 to +60
Operating Temperature	°C	-40 to +60
Humidity	/	5% to 95%
Max. operational Wind Speed	km/h	200
Wind Load @Rated Wind Front	N	1621
Wind Load @Rated Wind Side	N	267
Wind Load @Rated Wind Rear	N	1816
Lightning Protection	/	DC ground
Accessories		
Downtilt Kit (mechanical)	Deg	0-12
Mounting Accessories (clamp)	/	Included with antenna
Mounting Pipe Diameter	mm	50-115
Internal RET Specifications		
RCU (remote control unit)	/	Replaceable RET (can be exchangeable without exchanging antenna)
		AISG2.0 /3GPP
Input Voltage Range	V	10-30 DC
Power Consumption	W	< 10 (motor activated , single RET) < 2 (stand by, single RET)
Adjustment Time (full range)	s	< 120 (typically, depending on antenna type)
RET Connector	/	1 pair of AISG 5 pin male & female
Pin Assignment According AISG	/	5-pin circular connector conforming to IEC 60130-9 - Ed. 3.0
Lightning Protection	kA	5 (8/20 μs differential mode), 8 (8/20 μs common mode)
Reference Pattern		
690-960MHz		
Horizontal Pattern		Vertical Pattern



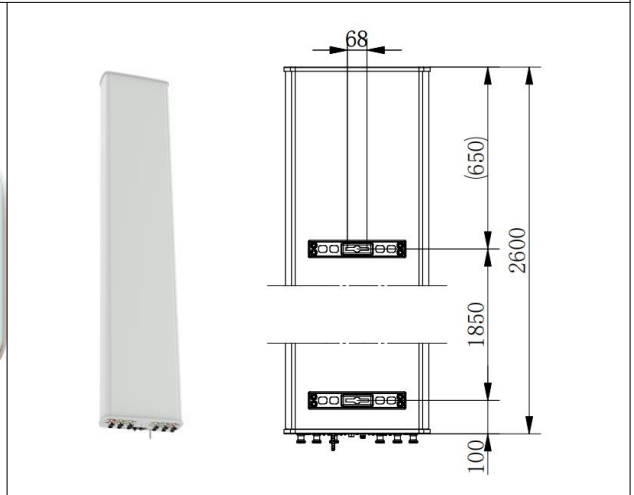
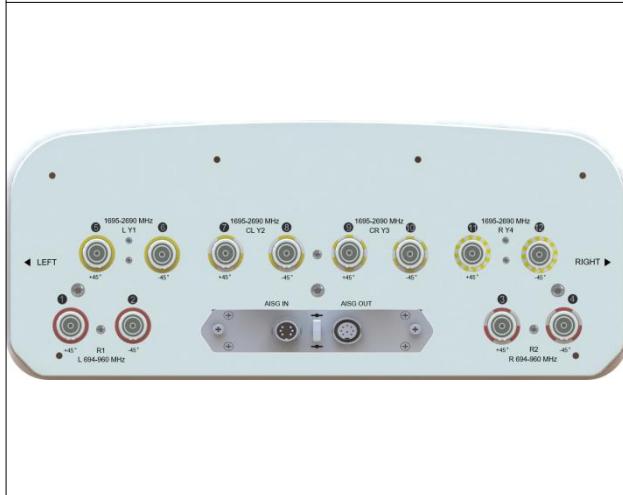
1695-2690MHz

Horizontal Pattern

Vertical Pattern



Layout of Interface



Layout of Array			
Array	Connector	Frequency(MHz)	RET Serial
R1	1-2	690-960	ZTR1...01
Y1	3-4	1695-2690	ZTY1...02
Y2	5-6	1695-2690	ZTY2...03
Y3	7-8	1695-2690	ZTY3...04
Y4	9-10	1695-2690	ZTY4...05

The diagram illustrates the physical layout of the antenna array. It consists of two vertical columns of elements. Each column has four yellow elements in the middle, labeled Y1, Y2, Y3, and Y4 from top to bottom. Red elements are located at the top and bottom of each column, labeled R1 and R2 respectively. The entire array is enclosed in a blue rectangular border.

All data are based on NGMN recommendations on Base Station Antenna Standards (BASTA V13.0).

Product Name:34#2-Port,X-Pol,Panel Antenna,
 2×698-960&4×1710-2690MHz,65deg,15&16dBi,Integrated RET
 Antenna Model:**HBZ48P651516**

Electrical Specifications						
Description	12-Port,X-Pol,Panel Antenna, 2×698-960&4×1710-2690MHz,65deg,15&16dBi,Integrated RET					
Frequency Range	MHz	2×698-960(R1/R2)				
Frequency Band	MHz	698-806	790-890	890-960		
Gain Bottom Over All Tilts	dBi	14.5±0.5	14.9±0.5	15.0±0.5		
Gain Bottom by Tilt Average Min	dBi	15.0	15.4	15.5		
Gain Bottom by Tilt Average Mid		14.5	14.9	15.0		
Gain Bottom by Tilt Average Max		14.0	14.5	14.6		
Horizontal 3dB Beam Width	Deg	63±7	65±6	67±6		
Vertical 3dB Beam Width Bottom	Deg	11.9±0.9	10.8±0.8	10.3±0.7		
1 st Upper Side Lobe Suppression Above Main Beam	dB	≥15				
Front to Back Ratio at 180Deg ±30Deg	dB	≥24				
Cross-Polar Ratio 0Deg	dB	≥17				
Electrical Downtilt	Deg	2-12,Continuously adjustable				
VSWR	/	≤1.5				
Cross Polar Isolation	dB	≥25				
Interband Isolation	dB	≥25				
Intermodulation IM3	dBc	≤-150(2×43 dBm carrier)				
Max. Power Per Port	Watt	350(at 50°C ambient temperature)				
Frequency Range	MHz	4×1710-2690(Bottom:Y1/Y3;Top:Y2/Y4)				
Frequency Point	MHz	1710-1880	1850-1990	1920-2200	200-2490	2500-2690
Gain Top Over All Tilts	dBi	15.2±0.7	15.6±0.7	15.7±0.8	15.5±0.6	15.4±0.7

Gain Top by Tilt Average Min	dBi	15.9	16.2	16.4	16.1	16.1
Gain Top by Tilt Average Mid		15.2	15.4	15.6	15.7	15.4
Gain Top by Tilt Average Max		14.6	14.9	15.1	15.3	15.0
Gain Bottom Over All Tilts	dBi	15.4±0.6	15.8±0.7	15.9±0.8	15.7±0.6	15.5±0.7
Gain Bottom by Tilt Average Min	dBi	16.0	16.5	16.6	16.1	16.2
Gain Bottom by Tilt Average Mid		15.5	15.9	15.9	15.6	15.4
Gain Bottom by Tilt Average Max		14.8	15.2	15.4	15.1	15.1
Horizontal 3dB Beam Width	Deg	69±4	68±5	66±5	60±7	58±6
Vertical 3dB Beam Width Top	Deg	11.6±0.8	10.9±0.5	10.2±0.8	8.9±0.7	8.7±0.6
Vertical 3dB Beam Width Bottom	Deg	11.6±0.8	10.9±0.5	10.2±0.8	8.9±0.7	8.7±0.6
1 st Upper Side Lobe Suppression Above Main Beam	dB	≥15				
Front to Back Ratio at 180Deg ±30Deg	dB	≥24				
Cross-Polar Ratio 0Deg	dB	≥15				
Electrical Downtilt	Deg	2-12, Continuously adjustable				
VSWR	/	≤1.5				
Cross Polar Isolation	dB	≥25				
Interband Isolation	dB	≥25				
Intermodulation IM3	dBc	≤-150(2×43 dBm carrier)				
Max. Power Per Port	Watt	250(at 50°C ambient temperature)				
Impedance	Ohm	50				
Polarization	Deg	±45				
Mechanical Specifications						
Antenna Dimensions	mm	2600×469×198				
Antenna Net Weight	kg	38.5				
Packing Dimensions	mm	2980×540×275				

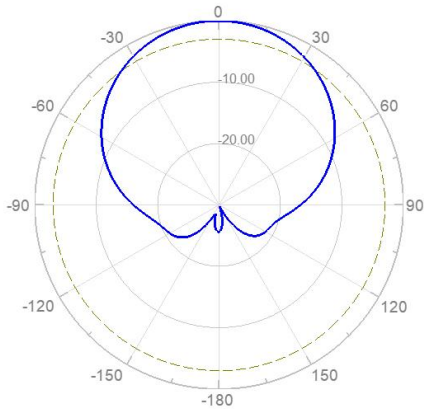
Antenna Gross Weight	kg	53.2
Connector Type	/	12×4.3-10 Female
Connector Position	/	Bottom
Radiator Material	/	Aluminum
Radome Material / Color	/	Fiberglass / Light Grey RAL7035
Reflector Material	/	Aluminum
Storage Temperature	°C	-40 to +60
Operating Temperature	°C	-40 to +60
Humidity	/	5% to 95%
Max. operational Wind Speed	km/h	200
Wind Load @Rated Wind Front	N	1180
Wind Load @Rated Wind Side	N	206
Wind Load @Rated Wind Rear	N	1322
Lightning Protection	/	DC ground
Accessories		
Downtilt Kit (mechanical)	Deg	0-12
Mounting Accessories (clamp)	/	Included with antenna
Mounting Pipe Diameter	mm	50-115
Internal RET Specifications		
RCU (remote control unit)	/	Replaceable RET (can be exchangable without exchanging antenna)
		AISG2.0 /3GPP
Input Voltage Range	V	10-30 DC
Power Consumption	W	< 10 (motor activated , single RET) < 2 (stand by, single RET)
Adjustment Time (full range)	s	< 120 (typically, depending on antenna type)
RET Connector	/	1 pair of AISG 5 pin male & female
Pin Assignment According AISG	/	5-pin circular connector conforming to IEC 60130-9 - Ed. 3.0

Lightning Protection	kA	5 (8/20 μ s differential mode), 8 (8/20 μ s common mode)
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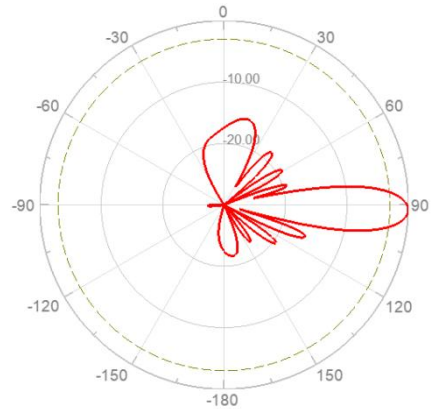
Reference Pattern

698-960MHz

Horizontal Pattern

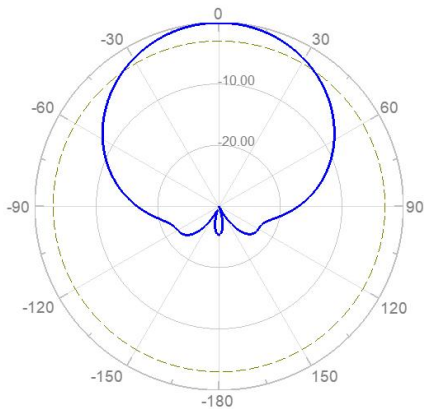


Vertical Pattern

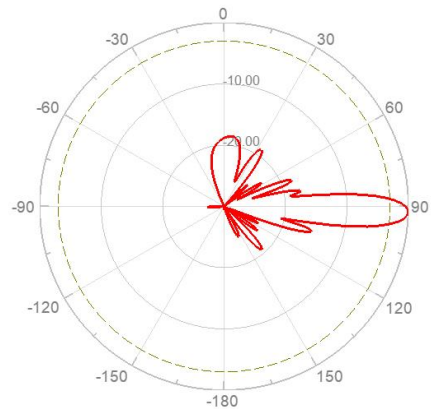


1710-2690MHz

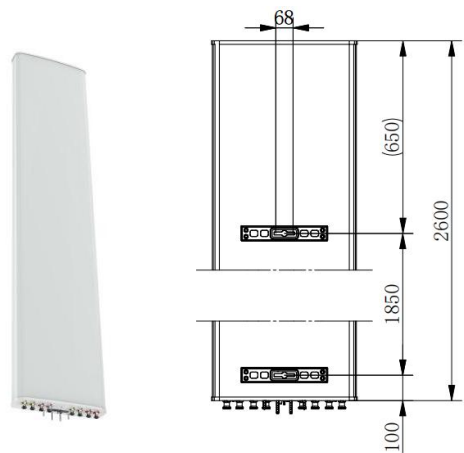
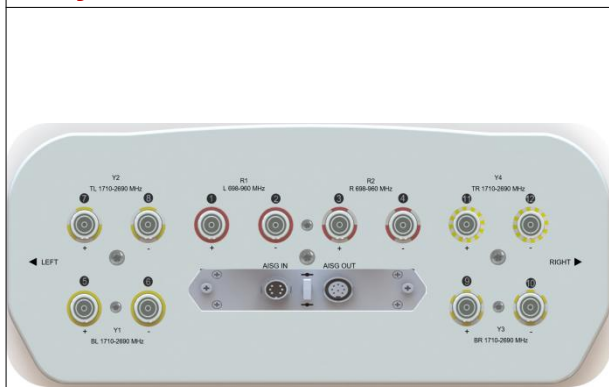
Horizontal Pattern



Vertical Pattern



Layout of Interface



Layout of Array

Array	Connector	Frequency(MHz)	RET Serial
R1	1-2	698-960	ZTR1...01
R2	3-4	698-960	ZTR2...02
Y1	5-6	1710-2690	ZTY1...03
Y2	7-8	1710-2690	ZTY2...04
Y3	9-10	1710-2690	ZTY3...05
Y4	11-12	1710-2690	ZTY4...06

All data are based on NGMN recommendations on Base Station Antenna Standards (BASTA V13.0).

Product Name:35#12-Port,X-Pol,Panel Antenna,
 2×698-960&4×1710-2690MHz,65deg,17&17dBi,Integrated RET
 Antenna Model:**HBZ48P6517**

Electrical Specifications						
Description	12-Port,X-Pol,Panel Antenna, 2×698-960&4×1710-2690MHz,65deg,17&17dBi,Integrated RET					
Frequency Range	MHz	2×698-960(R1/R2)				
Frequency Band	MHz	698-806	790-890	890-960		
Gain Bottom Over All Tilts	dBi	15.9±0.5	16.7±0.5	16.9±0.5		
Gain Bottom by Tilt Average Min	dBi	16.4	17.2	17.4		
Gain Bottom by Tilt Average Mid		16.2	17.0	17.1		
Gain Bottom by Tilt Average Max		15.8	16.5	16.7		
Horizontal 3dB Beam Width	Deg	64±4	63±4	62±5		
Vertical 3dB Beam Width Bottom	Deg	8.4±0.6	7.5±0.5	7.1±0.4		
1 st Upper Side Lobe Suppression Above Main Beam	dB	≥15				
Front to Back Ratio at 180Deg ±30Deg	dB	≥25				
Cross-Polar Ratio 0Deg	dB	≥15				
Electrical Downtilt	Deg	2-12,Continuously adjustable				
VSWR	/	≤1.5				
Cross Polar Isolation	dB	≥26				
Interband Isolation	dB	≥26				
Intermodulation IM3	dBc	≤-150(2×43 dBm carrier)				
Max. Power Per Port	Watt	350(at 50°C ambient temperature)				
Frequency Range	MHz	4×1710-2690(Bottom:Y1/Y3;Top:Y2/Y4)				
Frequency Point	MHz	1710-1880	1850-1990	1920-2200	2300-2490	2500-2690
Gain Top Over All Tilts	dBi	15.8±0.4	16.0±0.5	16.0±0.6	16.1±0.7	16.2±0.8

Gain Top by Tilt Average Min	dBi	16.2	16.3	16.4	16.4	16.8
Gain Top by Tilt Average Mid		15.8	16.0	16.0	16.1	16.3
Gain Top by Tilt Average Max		15.5	15.6	15.7	15.7	15.9
Gain Bottom Over All Tilts	dBi	16.5±0.4	16.8±0.6	17.0±0.6	16.9±0.7	17.0±0.7
Gain Bottom by Tilt Average Min	dBi	16.9	17.2	17.3	17.2	17.4
Gain Bottom by Tilt Average Mid		16.5	16.7	16.9	16.8	16.9
Gain Bottom by Tilt Average Max		16.1	16.2	16.4	16.3	16.5
Horizontal 3dB Beam Width	Deg	66±6	64±6	63±7	62±7	59±6
Vertical 3dB Beam Width Top	Deg	7.1±0.4	6.7±0.4	6.3±0.4	5.5±0.3	5.0±0.3
Vertical 3dB Beam Width Bottom	Deg	7.1±0.4	6.7±0.4	6.3±0.4	5.5±0.3	5.0±0.3
1 st Upper Side Lobe Suppression Above Main Beam	dB	≥15				
Front to Back Ratio at 180Deg ±30Deg	dB	≥25				
Cross-Polar Ratio 0Deg	dB	≥15				
Electrical Downtilt	Deg	2-12, Continuously adjustable				
VSWR	/	≤1.5				
Cross Polar Isolation	dB	≥26				
Interband Isolation	dB	≥26				
Intermodulation IM3	dBc	≤-150(2×43 dBm carrier)				
Max. Power Per Port	Watt	250(at 50°C ambient temperature)				
Impedance	Ohm	50				
Polarization	Deg	±45				
Mechanical Specifications						
Antenna Dimensions	mm	2600×469×198				
Antenna Net Weight	kg	43.7				
Packing Dimensions	mm	2850×540×275				

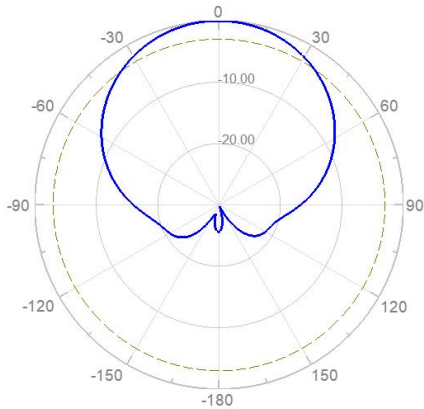
Antenna Gross Weight	kg	58.2
Connector Type	/	12×(7/16 or 4.3-10) Female
Connector Position	/	Bottom
Radiator Material	/	Aluminum
Radome Material / Color	/	Fiberglass / Light Grey RAL7035
Reflector Material	/	Aluminum
Storage Temperature	°C	-40 to +60
Operating Temperature	°C	-40 to +60
Humidity	/	5% to 95%
Max. operational Wind Speed	km/h	200
Wind Load @Rated Wind Front	N	1523
Wind Load @Rated Wind Side	N	266
Wind Load @Rated Wind Rear	N	1707
Lightning Protection	/	DC ground
Accessories		
Downtilt Kit (mechanical)	Deg	0-12
Mounting Accessories (clamp)	/	Included with antenna
Mounting Pipe Diameter	mm	50-115
Internal RET Specifications		
RCU (remote control unit)	/	Replaceable RET (can be exchangable without exchanging antenna)
		AISG2.0 /3GPP
Input Voltage Range	V	10-30 DC
Power Consumption	W	< 10 (motor activated , single RET) < 2 (stand by, single RET)
Adjustment Time (full range)	s	< 120 (typically, depending on antenna type)
RET Connector	/	1 pair of AISG 5 pin male & female
Pin Assignment According AISG	/	5-pin circular connector conforming to IEC 60130-9 - Ed. 3.0

Lightning Protection	kA	5 (8/20 μ s differential mode), 8 (8/20 μ s common mode)
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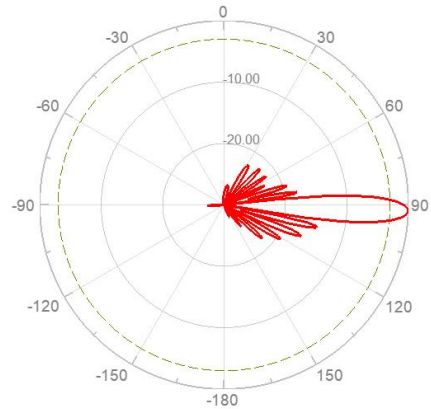
Reference Pattern

698-960MHz

Horizontal Pattern

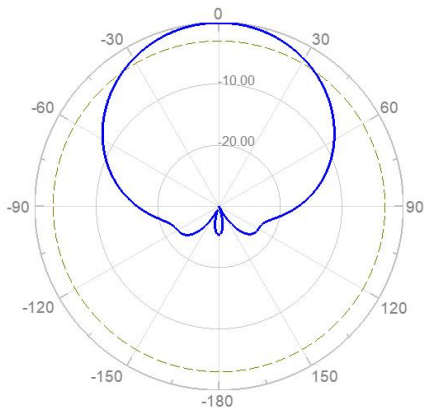


Vertical Pattern

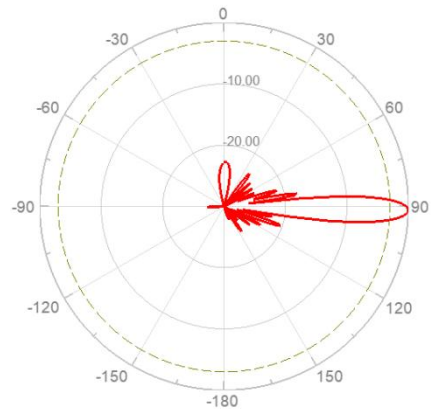


1710-2690MHz

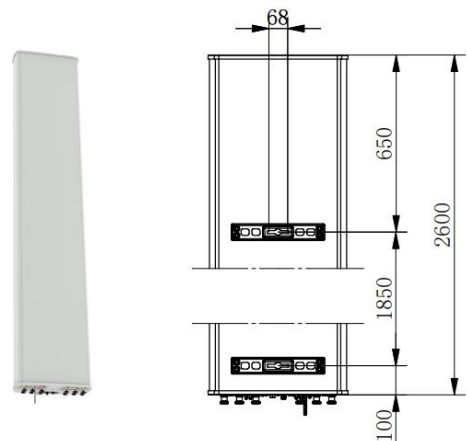
Horizontal Pattern



Vertical Pattern



Layout of Interface



Layout of Array			
Array	Connector	Frequency(MHz)	RET Serial
R1	1-2	698-960	ZTR1...01
R2	3-4	698-960	ZTR2...02
Y1	5-6	1710-2690	ZTY1...03
Y2	7-8	1710-2690	ZTY2...04
Y3	9-10	1710-2690	ZTY3...05
Y4	11-12	1710-2690	ZTY4...06

All data are based on NGMN recommendations on Base Station Antenna Standards (BASTA V13.0).

Product Name:36#12-Port,X-Pol,Panel Antenna,
 2×698-960&4×1710-2690MHz(Twin Beam),65deg,17&18dBi,Integrated RET
 Antenna Model:**HBD48P651718**

Electrical Specifications						
Description	12-Port,X-Pol,Panel Antenna, 2×698-960&4×1710-2690MHz(Twin Beam),65deg,17&18dBi,Integrated RET					
Frequency Range	MHz	2×698-960(R1/R2)				
Frequency Band	MHz	698-806	790-890	890-960		
Gain Bottom Over All Tilts	dBi	15.9±0.5	16.7±0.5	16.9±0.5		
Gain Bottom by Tilt Average Min	dBi	16.4	17.2	17.4		
Gain Bottom by Tilt Average Mid		16.2	17.0	17.1		
Gain Bottom by Tilt Average Max		15.8	16.5	16.7		
Horizontal 3dB Beam Width	Deg	70±6	64±6	60±7		
Vertical 3dB Beam Width Bottom	Deg	10.9±0.9	9.8±0.8	9.2±0.7		
1st Upper Side Lobe Suppression Above Main Beam	dB	≥15				
Front to Back Ratio at 180Deg ±30Deg	dB	≥25				
Cross-Polar Ratio 0Deg	dB	≥17				
Electrical Downtilt	Deg	2-12,Continuously adjustable				
VSWR	/	≤1.5				
Cross Polar Isolation	dB	≥25				
Interband Isolation	dB	≥25				
Intermodulation IM3	dBc	≤-150(2×43 dBm carrier)				
Max. Power Per Port	Watt	350(at 50°C ambient temperature)				
Frequency Range	MHz	4×1710-2690(Bottom:Y1/Y3;Top:Y2/Y4)				
Frequency Point	MHz	1710-1880	1850-1990	1920-2180	2300-2500	2500-2690

Gain Top Over All Tilts	dBi	16.7±0.9	17.4±0.9	18.1±0.8	17.8±0.8	17.5±0.8
Gain Top by Tilt Average Min	dBi	17.4	17.9	18.5	18.2	18.2
Gain Top by Tilt Average Mid		16.8	17.4	17.9	17.8	17.6
Gain Top by Tilt Average Max		16.4	16.9	17.4	17.4	17.3
Gain Bottom Over All Tilts	dBi	17.0±0.8	17.8±0.9	18.5±0.8	18.2±0.8	17.9±0.8
Gain Bottom by Tilt Average Min	dBi	17.7	18.5	19.0	18.6	18.4
Gain Bottom by Tilt Average Mid		17.2	18.0	18.5	18.1	17.8
Gain Bottom by Tilt Average Max		16.8	17.5	18.0	17.7	17.2
Horizontal 3dB Beam Width	Deg	31±3	29±3	27±3	26±3	24±3
Vertical 3dB Beam Width Top	Deg	9.9±0.5	9.4±0.5	9.0±0.4	7.9±0.4	7.4±0.6
Vertical 3dB Beam Width Bottom	Deg	9.9±0.5	9.4±0.5	9.0±0.4	7.9±0.4	7.4±0.6
1st Upper Side Lobe Suppression Above Main Beam	dB	≥15				
Front to Back Ratio at 180Deg ±30Deg	dB	≥25	≥25	≥25	≥24	≥23
Cross-Polar Ratio 0Deg	dB	≥15				
Electrical Downtilt	Deg	2-12, Continuously adjustable				
VSWR	/	≤1.5				
Cross Polar Isolation	dB	≥25				
Interband Isolation	dB	≥25				
Isolation Between Beams	dB	≥14	≥16	≥16	≥16	≥16
Intermodulation IM3	dBc	≤-150(2×43 dBm carrier)				
Max. Power Per Port	Watt	250(at 50°C ambient temperature)				
Impedance	Ohm	50				
Polarization	Deg	±45				
Mechanical Specifications						

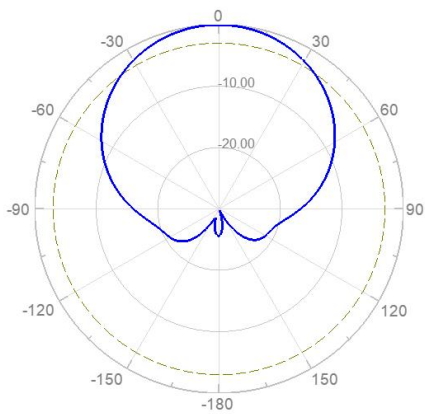
Antenna Dimensions	mm	2100×499×199
Antenna Net Weight	kg	37.2
Packing Dimensions	mm	2375×570×275
Antenna Gross Weight	kg	48.5
Connector Type	/	12×4.3-10 Female
Connector Position	/	Bottom
Radiator Material	/	Low loss circuit broad
Radome Material / Color	/	Fiberglass / Light Grey RAL7035
Reflector Material	/	Aluminum
Storage Temperature	°C	-40 to +60
Operating Temperature	°C	-40 to +60
Humidity	/	5% to 95%
Max. operational Wind Speed	km/h	200
Wind Load @Rated Wind Front	N	1313
Wind Load @Rated Wind Side	N	217
Wind Load @Rated Wind Rear	N	1471
Lightning Protection	/	DC ground
Accessories		
Downtilt Kit (mechanical)	Deg	0-12
Mounting Accessories (clamp)	/	Included with antenna
Mounting Pipe Diameter	mm	50-115
Internal RET Specifications		
RCU (remote control unit)	/	Replaceable RET (can be exchangable without exchanging antenna)
		AISG2.0 /3GPP
Input Voltage Range	V	10-30 DC
Power Consumption	W	< 10 (motor activated , single RET) < 2 (stand by, single RET)
Adjustment Time (full range)	s	< 120 (typically, depending on antenna type)

RET Connector	/	1 pair of AISG 5 pin male & female
Pin Assignment According AISG	/	5-pin circular connector conforming to IEC 60130-9 - Ed. 3.0
Lightning Protection	kA	5 (8/20 μ s differential mode), 8 (8/20 μ s common mode)

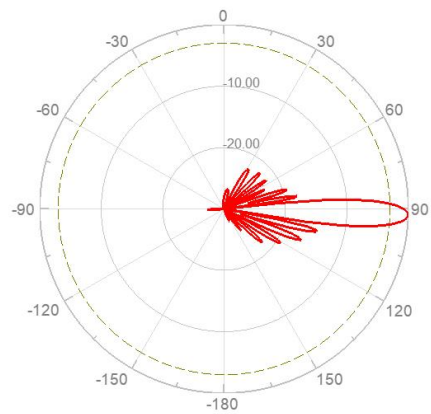
Reference Pattern

698-960MHz

Horizontal Pattern

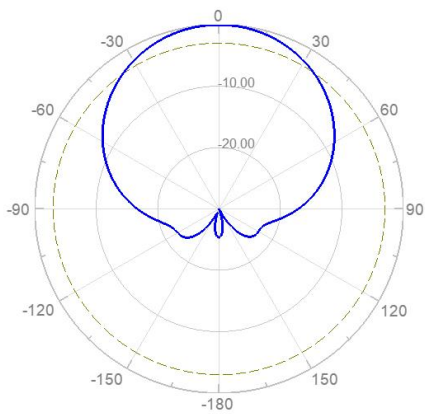


Vertical Pattern

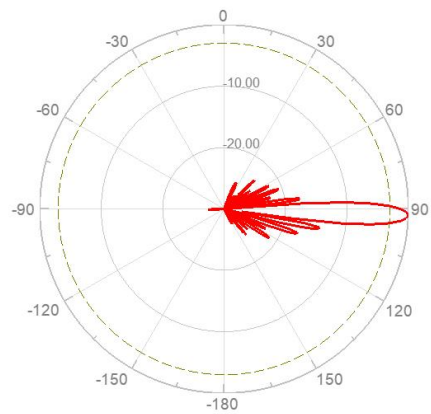


1710-2690MHz

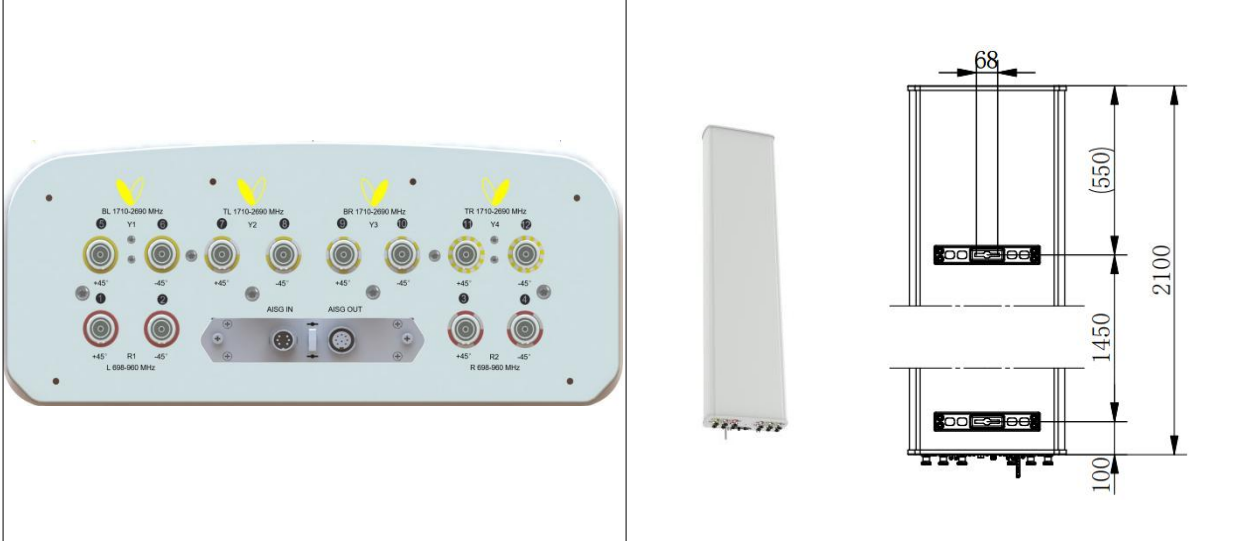
Horizontal Pattern



Vertical Pattern

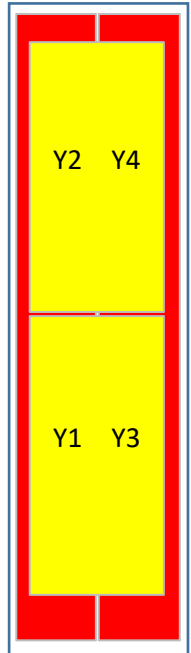


Layout of Interface



Layout of Array

Array	Connector	Frequency(MHz)	RET Serial
R1	1-2	698-960	ZTR1...01
R2	3-4	698-960	ZTR2...02
Y1	5-6	1710-2690	ZTY1...03
Y2	7-8	1710-2690	ZTY2...04
Y3	9-10	1710-2690	ZTY3...05
Y4	11-12	1710-2690	ZTY4...06



All data are based on NGMN recommendations on Base Station Antenna Standards (BASTA V13.0).

Product Name:37#9-Port,X-Pol,TDD Antenna,
 1×3300-3800MHz,Integrated RET
 Antenna Model:**HBZ81E9716**

Electrical Specifications				
Description		9-Port,X-Pol,TDD Antenna,1×3300-3800MHz,Integrated RET		
Frequency Range		MHz	TDD:3300-3800(P1)	
Frequency Band		MHz	3300-3600	3600-3800
Coupling Factor between Calibration Port and Each Antenna Port		dB	-26±2	
Max.Amplitude Tolerance from Calibration Port to Input Ports		dB	≤1.0	
Max.Phase Tolerance from Calibration Port to Input Ports		Deg	≤10	
VSWR		/	≤1.5	
Electrical Downtilt		Deg	2-12,Continuously adjustable	
Maximum Power		Watt	50(at 50°C ambient temperature)	
Co-polarization Isolation Between Ports		dB	≥20	
Cross-polarization Isolation Between Ports		dB	≥25	
Single Column Beam	Horizontal 3dB Beam Width	Deg	97±18	87±13
	Vertical 3dB Beam Width	Deg	5.6±0.6	5.2±0.5
	Gain Over All Tilts	dBi	15.7±0.8	16.0±0.8
	Gain by Tilt Average Min	dBi	16.4	16.5
	Gain by Tilt Average Mid	dBi	15.6	15.7
	Gain by Tilt Average Max	dBi	15.3	15.4
	Cross-Polar Ratio 0Deg	dB	≥17	
	1st Upper Side Lobe Suppression Above Main Beam	dB	≥16	
	Front to Back Ratio at 180Deg ±30Deg	dB	≥22	≥21
	Broadcast Beam	Horizontal 3dB Beam Width	Deg	66±6
Vertical 3dB Beam Width		Deg	5.6±0.7	5.2±0.6

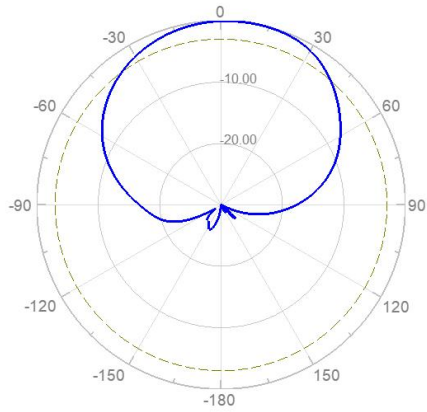
	Gain Over All Tilts	Deg	17.6±0.6	17.9±0.5
	Gain by Tilt Average Min	dBi	18.2	18.3
	Gain by Tilt Average Mid	dBi	17.7	17.8
	Gain by Tilt Average Max	dBi	17.2	17.5
	Cross-Polar Ratio at 0Deg	dB	≥17	
	1st Upper Side Lobe Suppression Above Main Beam	dB	≥16	
	Front to Back Ratio at 180Deg ±30Deg	dB	≥25	
Service Beam	0° Beam Gain Over All Tilts	dBi	21.4±0.5	21.5±0.5
	0° Beam Gain by Tilt Average Min	dBi	21.8	21.9
	0° Beam Gain by Tilt Average Mid	dBi	21.4	21.4
	0° Beam Gain by Tilt Average Max	dBi	20.9	21.0
	0° Beam Horizontal 3dB Beam Width	Deg	25±2	24±1
	0° Beam Front to Back Ratio	dB	≥28	
	0° Beam Cross-Polar Ratio at 0Deg	dB	≥18	
	±30° Beam Gain Over All Tilts	dBi	20.7±0.5	21.1±0.5
	±30° Beam Gain by Tilt Average Min	dBi	21.1	21.5
	±30° Beam Gain by Tilt Average Mid	dBi	20.8	21.0
	±30° Beam Gain by Tilt Average Max	dBi	20.2	20.8
	±30° Beam Horizontal 3dB Beam Width	Deg	28±2	26±1
	±30° Beam Horizontal Side Lobe	dB	≥8.3	≥8.8
Mechanical Specifications				
Antenna Dimensions	mm	1000×295×115		
Antenna Net Weight	kg	11.9		
Packing Dimensions	mm	1330×380×210		
Antenna Gross Weight	kg	19.3		
Connector Type	/	9×4.3-10 Female		

Connector Position	/	Bottom
Radiator Material	/	Low loss circuit board
Radome Material / Color	/	Fiberglass / Light Grey RAL7035
Reflector Material	/	Aluminum
Storage Temperature	°C	-40 to +60
Operating Temperature	°C	-40 to +60
Humidity	/	5% to 95%
Max. operational Wind Speed	km/h	200
Wind Load @Rated Wind Front	N	390
Wind Load @Rated Wind Side	N	63
Wind Load @Rated Wind Rear	N	437
Lightning Protection	/	DC ground
Accessories		
Downtilt Kit (mechanical)	Deg	0-12
Mounting Accessories (clamp)	/	Included with antenna
Mounting Pipe Diameter	mm	50-115
Internal RET Specifications		
RCU (remote control unit)	/	Replaceable RET (can be exchangeable without exchanging antenna)
		AISG2.0 /3GPP
Input Voltage Range	V	10-30 DC
Power Consumption	W	< 10 (motor activated , single RET) < 2 (stand by, single RET)
Adjustment Time (full range)	s	< 120 (typically, depending on antenna type)
RET Connector	/	1 pair of AISG 5 pin male & female
Pin Assignment According AISG	/	5-pin circular connector conforming to IEC 60130-9 - Ed. 3.0
Lightning Protection	kA	5 (8/20 μs differential mode), 8 (8/20 μs common mode)
Reference Pattern		

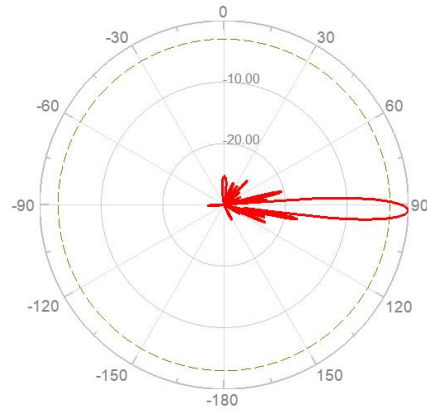
TDD:3300-3800

Single Column Beam

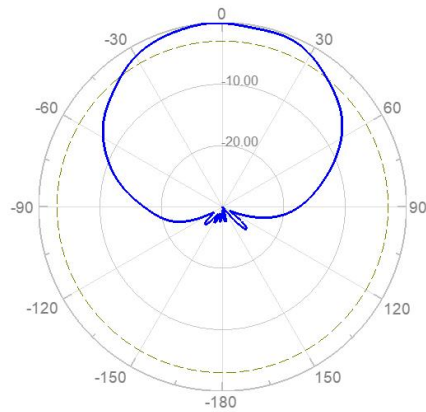
Horizontal Pattern



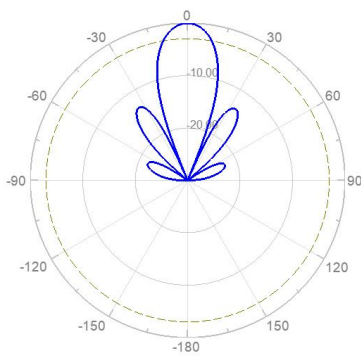
Vertical Pattern



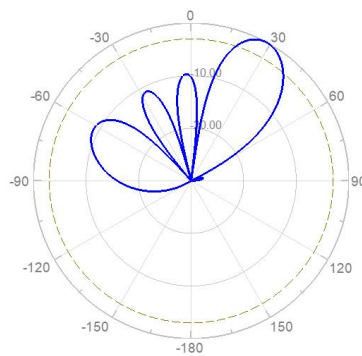
Broadcast Beam



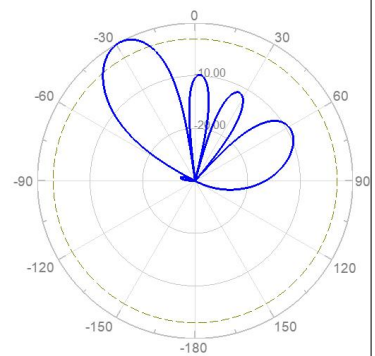
0° Service Beam



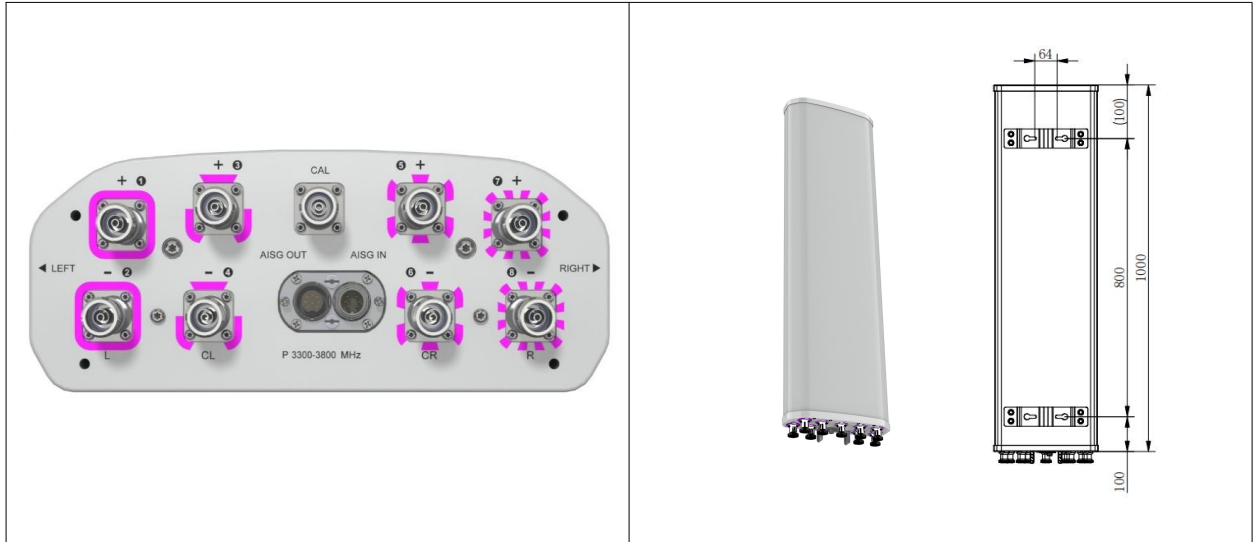
+30° Service Beam



-30° Service Beam



Layout of Interface



Layout of Array

Array	Connector	Frequency(MHz)	RET Serial	
P1	1-8	3300-3800	ZTP1...01	

All data are based on NGMN recommendations on Base Station Antenna Standards (BASTA V13.0).

Product Name:38#9-Port,X-Pol,TDD Antenna,
 1×3300-3800MHz,Integrated RET
 Antenna Model:**HBZ81T9716**

Electrical Specifications					
Description		9-Port,X-Pol,TDD Antenna,1×3300-3800MHz,Integrated RET			
Frequency Range		MHz	TDD:1×3300-3800(P1)		
Frequency Band		MHz	3300-3600	3600-3800	3800-4200
Coupling Factor between Calibration Port and Each Antenna Port		dB	-26±2		
Max.Amplitude Tolerance from Calibration Port to Input Ports		dB	≤0.9		
Max.Phase Tolerance from Calibration Port to Input Ports		Deg	≤9		
VSWR		/	≤1.5		
Electrical Downtilt		Deg	2-12,Continuously adjustable		
Maximum Power		Watt	50(at 50°C ambient temperature)		
Co-polarization Isolation Between Ports		dB	≥19		
Cross-polarization Isolation Between Ports		dB	≥24		
Single Column Beam	Horizontal 3dB Beam Width	Deg	97±15	87±13	80±10
	Vertical 3dB Beam Width	Deg	5.6±0.6	5.2±0.5	5.0±0.6
	Gain Over All Tilts	dBi	15.7±0.5	16.0±0.5	15.2±0.6
	Gain by Tilt Average Min	dBi	16.2	16.5	15.8
	Gain by Tilt Average Mid	dBi	15.6	15.9	15.2
	Gain by Tilt Average Max	dBi	15.3	15.6	14.7
	Cross-Polar Ratio 0Deg	dB	≥15		
	Cross-Polar Ratio ±60Deg	dB	≥8		
	Front to Back Ratio at 180Deg ±30Deg	dB	≥21	≥22	≥23
Broadcast Beam	Horizontal 3dB Beam Width	Deg	66±7	61±5	60±6
	Vertical 3dB Beam Width	Deg	5.6±0.7	5.2±0.6	5.0±0.5
	Gain Over All Tilts	Deg	17.6±0.5	17.9±0.5	18.0±0.5

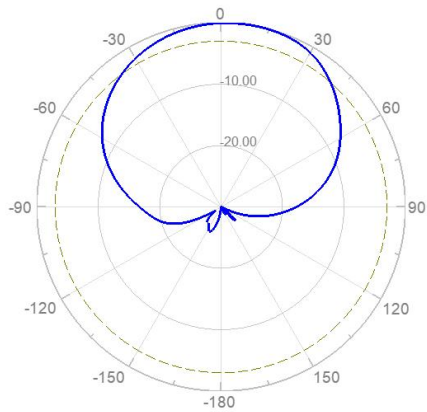
	Gain by Tilt Average Min	dBi	18.1	18.3	18.5
	Gain by Tilt Average Mid	dBi	17.7	17.8	18.0
	Gain by Tilt Average Max	dBi	17.2	17.5	17.6
	Cross-Polar Ratio at 0Deg	dB	≥15		
	Cross-Polar Ratio ±60Deg	dB	≥8		
	1st Upper Side Lobe Suppression Above Main Beam	dB	≥16		
	Front to Back Ratio at 180Deg ±30Deg	dB	≥25		
Service Beam	0° Beam Gain Over All Tilts	dBi	21.4±0.5	21.5±0.5	21.6±0.5
	0° Beam Gain by Tilt Average Min	dBi	21.8	21.9	22.0
	0° Beam Gain by Tilt Average Mid	dBi	21.4	21.4	21.6
	0° Beam Gain by Tilt Average Max	dBi	20.9	21.0	21.1
	0° Beam Horizontal 3dB Beam Width	Deg	25.3±1.1	23.5±0.7	21.4±0.6
	0° Beam Horizontal Side Lobe	dB	≥9	≥8	≥8
	0° Beam Front to Back Ratio	dB	≥28		
	0° Beam Cross-Polar Ratio at 0Deg	dB	≥18		
	±30° Beam Gain Over All Tilts	dBi	20.5±0.5	20.8±0.5	21.0±0.5
	±30° Beam Gain by Tilt Average Min	dBi	21.0	21.3	21.5
	±30° Beam Gain by Tilt Average Mid	dBi	20.7	20.8	20.9
	±30° Beam Gain by Tilt Average Max	dBi	20.2	20.4	20.6
	±30° Beam Horizontal 3dB Beam Width	Deg	28.2±1.6	25.6±1.5	22.9±1.4
Mechanical Specifications					
Antenna Dimensions	mm	1000×295×115			
Antenna Net Weight	kg	11.9			
Packing Dimensions	mm	1330×380×210			
Antenna Gross Weight	kg	19.3			
Connector Type	/	8×4.3-10 Female			

Connector Position	/	Bottom
Radiator Material	/	Low loss circuit board
Radome Material / Color	/	Fiberglass / Light Grey RAL7035
Reflector Material	/	Aluminum
Storage Temperature	°C	-40 to +60
Operating Temperature	°C	-40 to +60
Humidity	/	5% to 95%
Max. operational Wind Speed	km/h	200
Wind Load @Rated Wind Front	N	390
Wind Load @Rated Wind Side	N	63
Wind Load @Rated Wind Rear	N	437
Lightning Protection	/	DC ground
Accessories		
Downtilt Kit (mechanical)	Deg	0-12
Mounting Accessories (clamp)	/	Included with antenna
Mounting Pipe Diameter	mm	50-115
Internal RET Specifications		
RCU (remote control unit)	/	Replaceable RET (can be exchangeable without exchanging antenna)
		AISG2.0 /3GPP
Input Voltage Range	V	10-30 DC
Power Consumption	W	< 10 (motor activated , single RET) < 2 (stand by, single RET)
Adjustment Time (full range)	s	< 120 (typically, depending on antenna type)
RET Connector	/	1 pair of AISG 5 pin male & female
Pin Assignment According AISG	/	5-pin circular connector conforming to IEC 60130-9 - Ed. 3.0
Lightning Protection	kA	5 (8/20 μs differential mode), 8 (8/20 μs common mode)
Reference Pattern		

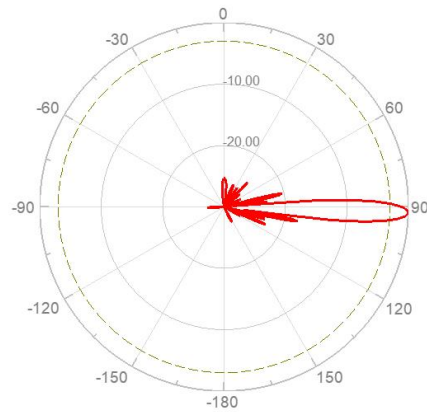
TDD:3300-3800

Single Column Beam

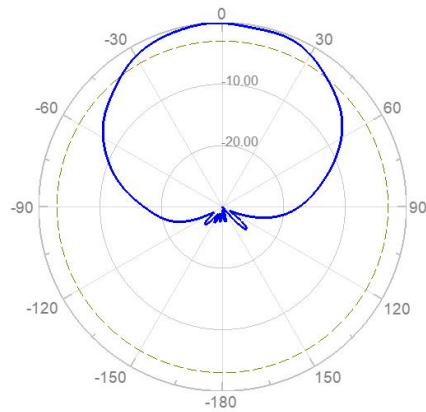
Horizontal Pattern



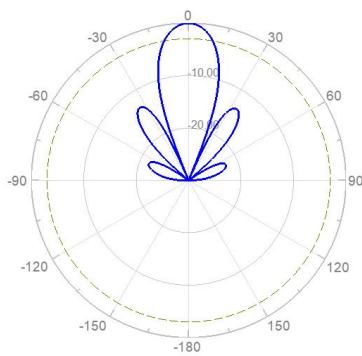
Vertical Pattern



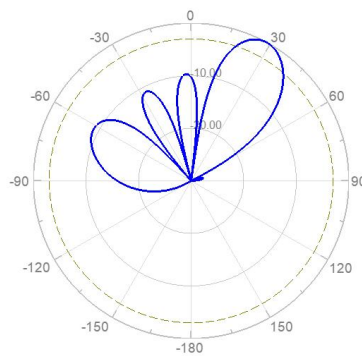
Broadcast Beam



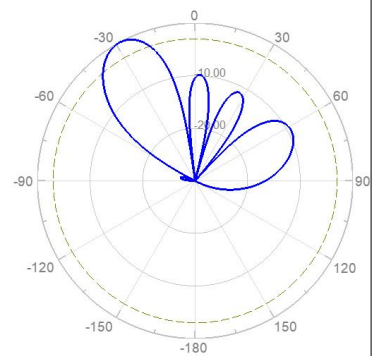
0° Service Beam



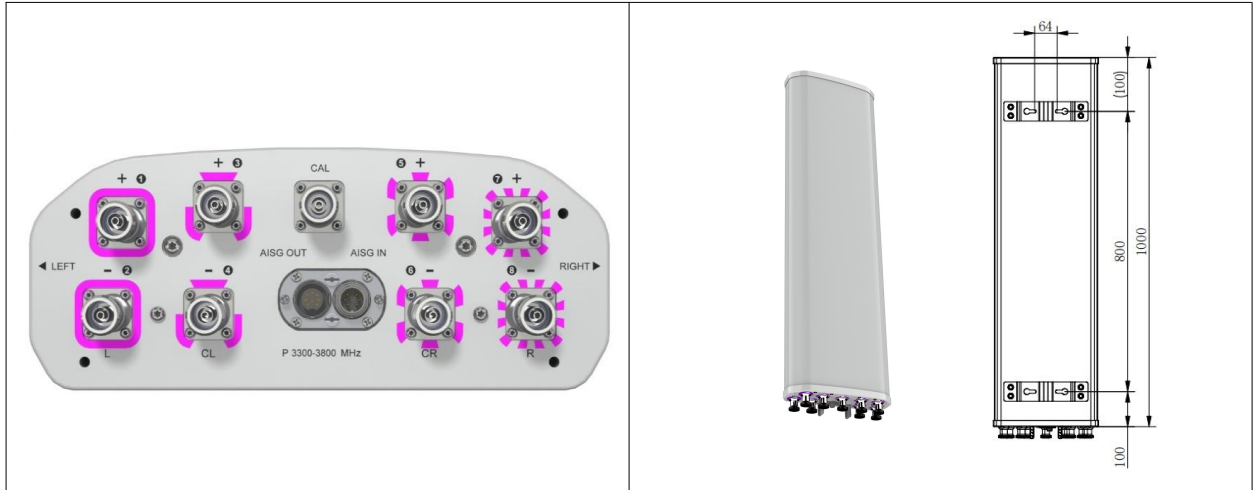
+30° Service Beam



-30° Service Beam



Layout of Interface



Layout of Array

Array	Connector	Frequency(MHz)	RET Serial	
P1	1-8	3300-3800	ZTP1...01	

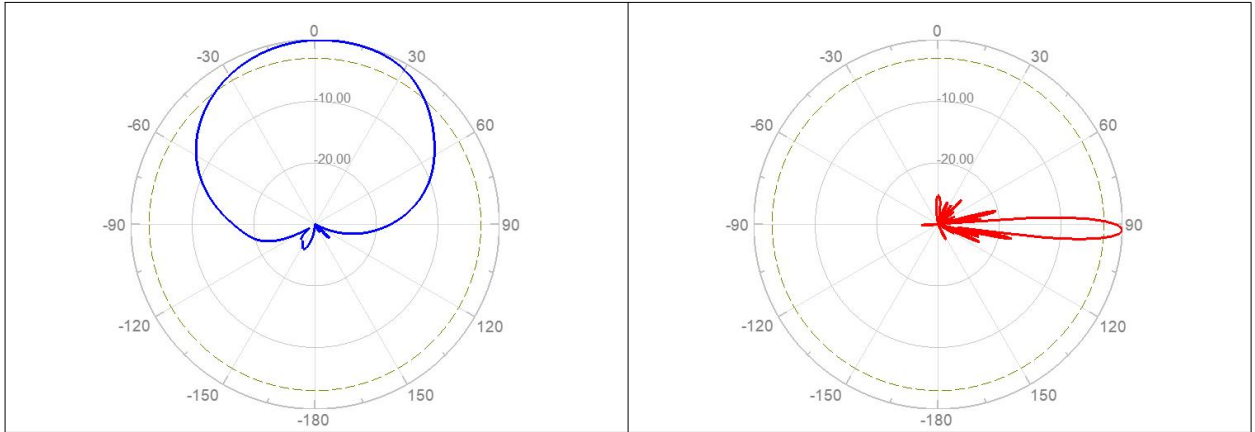
All data are based on NGMN recommendations on Base Station Antenna Standards (BASTA V13.0).

Product Name:39#2-Port,X-Pol,TDD Antenna,
 1×2300-2690MHz,Integrated RET
 Antenna Model:**HBZ2D9217**

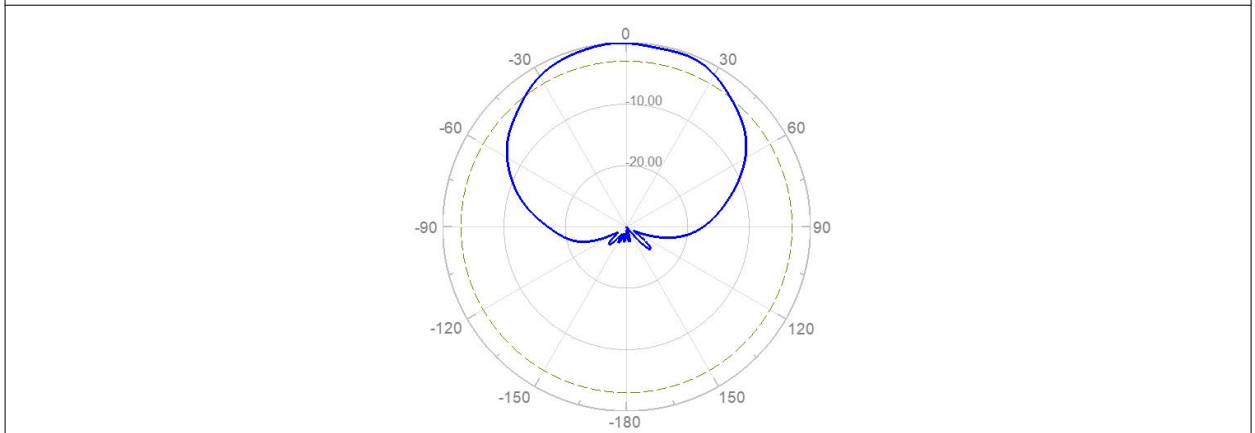
Electrical Specifications				
Description		2-Port,X-Pol,TDD Antenna,1×2300-2690MHz,Integrated RET		
Frequency Range		MHz	TDD:2300-2690(Y1)	
Frequency Band		MHz	2300-2490	2490-2690
Coupling Factor between Calibration Port and Each Antenna Port		dB	-26±2	
Max.Amplitude Tolerance from Calibration Port to Input Ports		dB	≤0.9	
Max.Phase Tolerance from Calibration Port to Input Ports		Deg	≤7	
VSWR		/	≤1.5	
Electrical Downtilt		Deg	2-12,Continuously adjustable	
Maximum Power		Watt	80(at 50°C ambient temperature)	
Co-polarization Isolation Between Ports		dB	≥19	
Cross-polarization Isolation Between Ports		dB	≥24	
Single Column Beam	Horizontal 3dB Beam Width	Deg	92±10	85±10
	Vertical 3dB Beam Width	Deg	4.7±0.2	4.3±0.3
	Gain Over All Tilts	dBi	16.6±0.5	16.8±0.5
	Gain by Tilt Average Min	dBi	17.0	17.3
	Gain by Tilt Average Mid	dBi	16.7	16.8
	Gain by Tilt Average Max	dBi	16.3	16.5
	Cross-Polar Ratio 0Deg	dB	≥15	
	Cross-Polar Ratio ±60Deg	dB	≥7	
	Vertical Upper Side Lobe Suppression Above Main Beam	dB	≥15	
	Front to Back Ratio at 180Deg ±30Deg	dB	≥25	

Broadcast Beam	Horizontal 3dB Beam Width	Deg	64±3	59±3
	Vertical 3dB Beam Width	Deg	4.6±0.4	4.3±0.4
	Gain Over All Tilts	Deg	18.5±0.5	18.9±0.6
	Gain by Tilt Average Min	dBi	19.0	19.2
	Gain by Tilt Average Mid	dBi	18.5	18.8
	Gain by Tilt Average Max	dBi	18.1	18.3
	Cross-Polar Ratio 0 Deg	dB	≥15	
	Cross-Polar Ratio ±60 Deg	dB	≥8	
	1st Upper Side Lobe Suppression Above Main Beam	dB	≥15	
	Front to Back Ratio at 180Deg ±30Deg	dB	≥28	
Service Beam	0° Beam Gain Over All Tilts	dBi	22.4±0.5	22.7±0.5
	0° Beam Gain by Tilt Average Min	dBi	22.7	23
	0° Beam Gain by Tilt Average Mid	dBi	22.4	22.6
	0° Beam Gain by Tilt Average Max	dBi	21.9	22.3
	0° Beam Horizontal 3dB Beam Width	Deg	23±1	21±1
	0° Beam Front to Back Ratio	dB	≥30	
	0° Beam Cross-Polar Ratio 0Deg	dB	≥15	
Mechanical Specifications				
Antenna Dimensions	mm	1500×350×200		
Antenna Net Weight	kg	18.0		
Packing Dimensions	mm	1755×445×295		
Antenna Gross Weight	kg	28.1		
Connector Type	/	2×Cluster MQ4+MQ5		
Connector Position	/	Bottom		
Radiator Material	/	Low loss circuit broad		
Radome Material / Color	/	Fiberglass / Light Grey RAL7035		
Reflector Material	/	Aluminum		

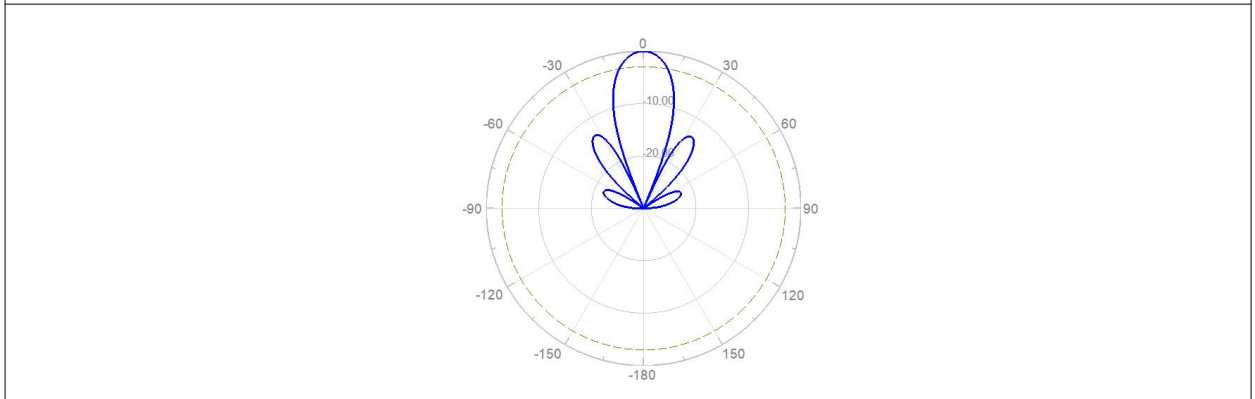
Storage Temperature	°C	-40 to +60
Operating Temperature	°C	-40 to +60
Humidity	/	5% to 95%
Max. operational Wind Speed	km/h	200
Wind Load @Rated Wind Front	N	661
Wind Load @Rated Wind Side	N	156
Wind Load @Rated Wind Rear	N	741
Lightning Protection	/	DC ground
Accessories		
Downtilt Kit (mechanical)	Deg	0-12
Mounting Accessories (clamp)	/	Included with antenna
Mounting Pipe Diameter	mm	50-115
Internal RET Specifications		
RCU (remote control unit)	/	Replaceable RET (can be exchangeable without exchanging antenna)
		AISG2.0 /3GPP
Input Voltage Range	V	10-30 DC
Power Consumption	W	< 10 (motor activated , single RET) < 2 (stand by, single RET)
Adjustment Time (full range)	s	< 120 (typically, depending on antenna type)
RET Connector	/	1 pair of AISG 5 pin male & female
Pin Assignment According AISG	/	5-pin circular connector conforming to IEC 60130-9 - Ed. 3.0
Lightning Protection	kA	5 (8/20 μs differential mode), 8 (8/20 μs common mode)
Reference Pattern		
TDD:2300-2690		
Single Column Beam		
Horizontal Pattern		Vertical Pattern



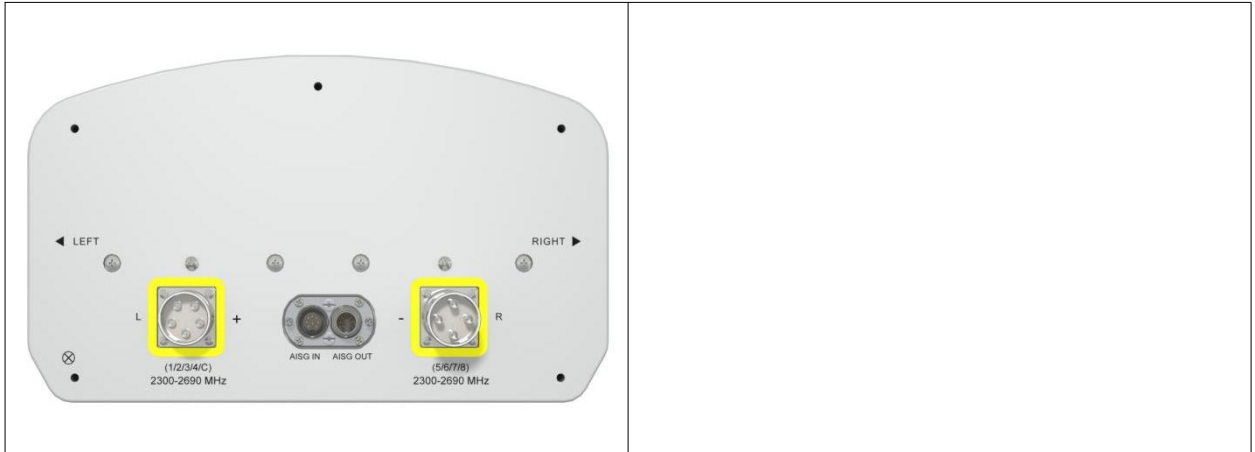
Broadcast Beam



0° Service Beam



Layout of Interface



Layout of Array

Array	Connector	Frequency(MHz)	RET Serial	
Y1	1-2	2300-2690	ZTY1...01	Y1

All data are based on NGMN recommendations on Base Station Antenna Standards (BASTA V13.0).

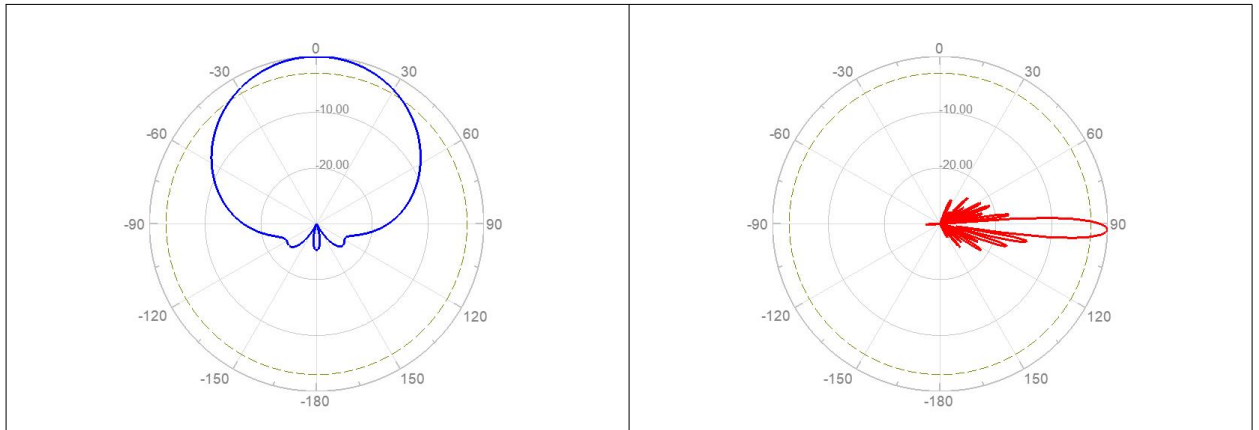
Product Name:40#13-Port,X-Pol,FDD&TDD Antenna,
 FDD:2×1695-2690MHz,TDD:1×3300-3800MHz,Integrated RET
 Antenna Model:**HBZ481M731718**

Electrical Specifications						
Description	13-Port,X-Pol,FDD&TDD Antenna,Integrated RET FDD:2×1695-2690MHz,TDD:1×3300-3800MHz					
Frequency Range	MHz	FDD:2×1695-2690(Y1/Y2)				
Frequency Band	MHz	1695-1880	1850-1990	1920-2180	2300-2500	2500-2690
Gain Over All Tilts	dBi	16.9±0.5	16.9±0.5	17.4±0.5	17.8±0.4	17.8±0.3
Gain by Tilt Average Min	dBi	17.2	17.3	17.6	18.0	18.1
Gain by Tilt Average Mid		16.9	17.1	17.3	17.7	17.9
Gain by Tilt Average Max		16.5	16.6	17.0	17.5	17.6
Horizontal 3dB Beam Width	Deg	73±6	73±4	71±5	67±3	63±5
Vertical 3dB Beam Width	Deg	6.8±0.5	6.2±0.3	5.8±0.5	5.2±0.4	4.8±0.5
1 st Upper Side Lobe Suppression Above Main Beam	dB	≥15				
Front to Back Ratio at 180Deg ±30Deg	dB	≥23				
Cross-Polar Ratio 0Deg	dB	≥15				
Cross-Polar Ratio ±60Deg	dB	≥8				
Electrical Downtilt	Deg	2-12,Continuously adjustable				
VSWR	/	≤1.5				
Isolation Between Ports	dB	≥26				
Intermodulation IM3	dBc	≤-107(2×43 dBm carrier)				
Max. Power Per Port	Watt	250(at 50°C ambient temperature)				
Impedance	Ohm	50				
Polarization	Deg	±45				
Electrical Specifications						
Frequency Range	MHz	TDD:1×3300-3800(P1)				

Frequency Band		MHz	3300-3500	3600-3800
Coupling Factor between Calibration Port and Each Antenna Port		dB	-26±2	
Max.Amplitude Tolerance from Calibration Port to Input Ports		dB	≤1	
Max.Phase Tolerance from Calibration Port to Input Ports		Deg	≤10	
VSWR		/	≤1.5	
Electrical Downtilt		Deg	2-12,Continuously adjustable	
Max. Power Per Port		Watt	50(at 50°C ambient temperature)	
Co-polarization Isolation Between Ports		dB	≥19	
Cross-polarization Isolation Between Ports		dB	≥24	
Single Column Beam	Horizontal 3dB Beam Width	Deg	85±8	80±8
	Vertical 3dB Beam Width	Deg	5.7±0.7	5.4±0.6
	Gain Over All Tilts	dBi	15.7±0.7	16.1±0.6
	Gain by Tilt Average Min	dBi	16.1	16.4
	Gain by Tilt Average Mid	dBi	15.6	15.9
	Gain by Tilt Average Max	dBi	15.3	15.6
	Cross-Polar Ratio 0Deg	dB	≥18	
	Cross-Polar Ratio ±60Deg	dB	≥8	≥7
	1st Upper Side Lobe Suppression Above Main Beam	dB	≥15	
	Front to Back Ratio at 180Deg ±30Deg	dB	≥20	
Broadcast Beam	Horizontal 3dB Beam Width	Deg	65±8	
	Vertical 3dB Beam Width	Deg	5.7±0.7	5.4±0.6
	Gain Over All Tilts	Deg	17.5±0.6	17.7±0.7
	Gain by Tilt Average Min	dBi	18.1	18.4
	Gain by Tilt Average Mid	dBi	17.7	18.0

	Gain by Tilt Average Max	dBi	17.2	17.5
	Cross-Polar Ratio at 0Deg	dB	≥15	
	Cross-Polar Ratio ±60Deg	dB	≥8	
	1st Upper Side Lobe Suppression Above Main Beam	dB	≥15	
	Front to Back Ratio at 180Deg ±30Deg	dB	≥25	
Service Beam	0° Beam Gain Over All Tilts	dBi	21.4±0.5	21.5±0.6
	0° Beam Gain by Tilt Average Min	dBi	21.8	22.1
	0° Beam Gain by Tilt Average Mid	dBi	21.5	21.8
	0° Beam Gain by Tilt Average Max	dBi	21.0	21.2
	0° Beam Horizontal 3dB Beam Width	Deg	25±1	23±2
	0° Beam Horizontal Sidelobe	dB	≥16	
	0° Beam Front to Back Ratio	dB	≥25	
	0° Beam Cross-Polar Ratio at 0Deg	dB	≥15	
	±30° Beam Gain Over All Tilts	dBi	20.5±0.5	21.0±0.6
	±30° Beam Gain by Tilt Average Min	dBi	21.0	21.4
	±30° Beam Gain by Tilt Average Mid	dBi	20.5	20.9
	±30° Beam Gain by Tilt Average Max	dBi	20.1	20.5
	±30° Beam Horizontal 3dB Beam Width	Deg	28±1	26±2
	±30° Beam Horizontal Sidelobe	dB	8.2	8.5
Mechanical Specifications				
Antenna Dimensions	mm	1500×498×197		
Antenna Net Weight	kg	26.5		
Packing Dimensions	mm	1760×560×275		
Antenna Gross Weight	kg	39.3		
Connector Type	/	13×4.3-10 Female		
Connector Position	/	Bottom		
Radiator Material	/	Low loss circuit broad		

Radome Material / Color	/	Fiberglass / Light Grey RAL7035
Reflector Material	/	Aluminum
Storage Temperature	°C	-40 to +60
Operating Temperature	°C	-40 to +60
Humidity	/	5% to 95%
Max. operational Wind Speed	km/h	200
Wind Load @Rated Wind Front	N	934
Wind Load @Rated Wind Side	N	153
Wind Load @Rated Wind Rear	N	1047
Lightning Protection	/	DC ground
Accessories		
Downtilt Kit (mechanical)	Deg	0-12
Mounting Accessories (clamp)	/	Included with antenna
Mounting Pipe Diameter	mm	50-115
Internal RET Specifications		
RCU (remote control unit)	/	Replaceable RET (can be exchangeable without exchanging antenna)
		AISG2.0 /3GPP
Input Voltage Range	V	10-30 DC
Power Consumption	W	< 10 (motor activated , single RET)
		< 2 (stand by, single RET)
Adjustment Time (full range)	s	< 120 (typically, depending on antenna type)
RET Connector	/	1 pair of AISG 5 pin male & female
Pin Assignment According AISG	/	5-pin circular connector conforming to IEC 60130-9 - Ed. 3.0
Lightning Protection	kA	5 (8/20 μs differential mode), 8 (8/20 μs common mode)
Reference Pattern		
1695-2690MHz		
Horizontal Pattern		Vertical Pattern

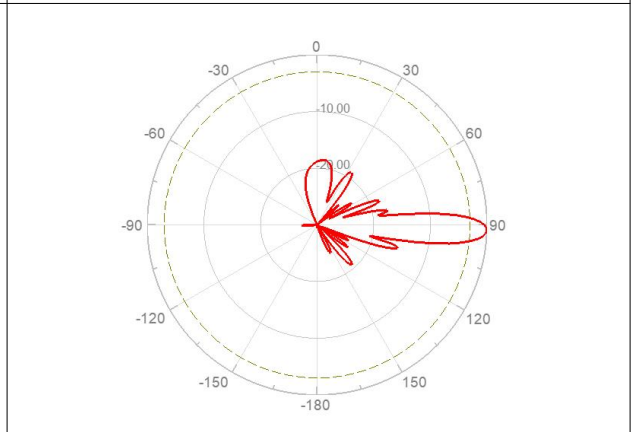
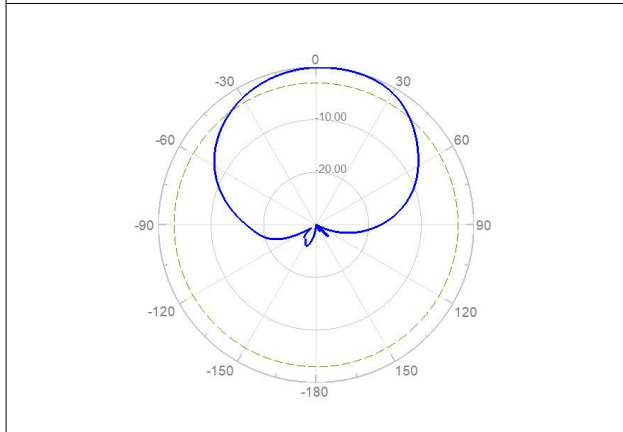


TDD:2300-2690

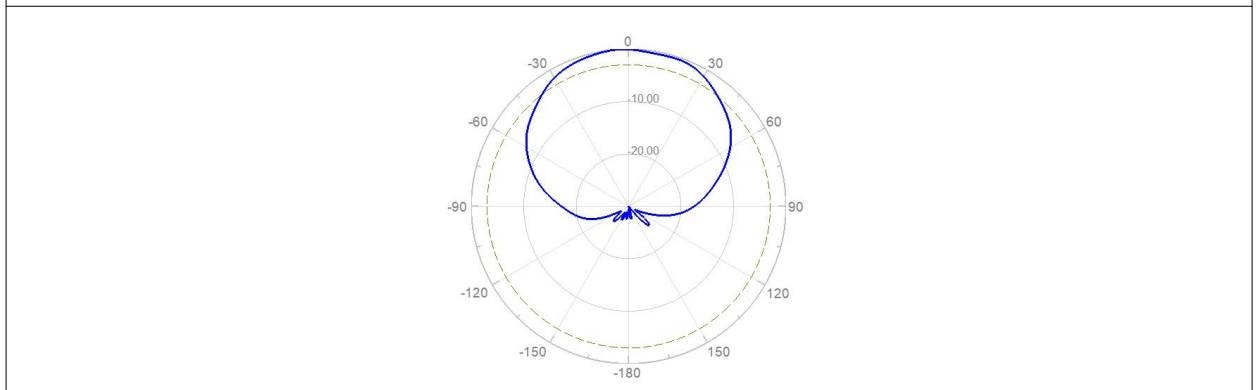
Single Column Beam

Horizontal Pattern

Vertical Pattern



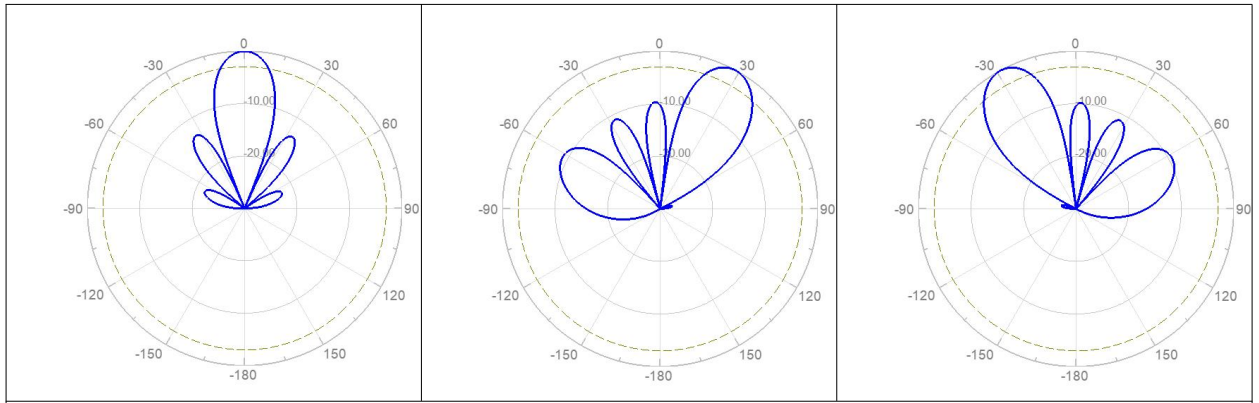
Broadcast Beam



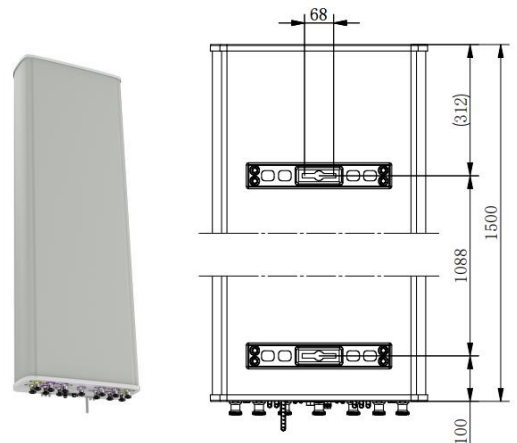
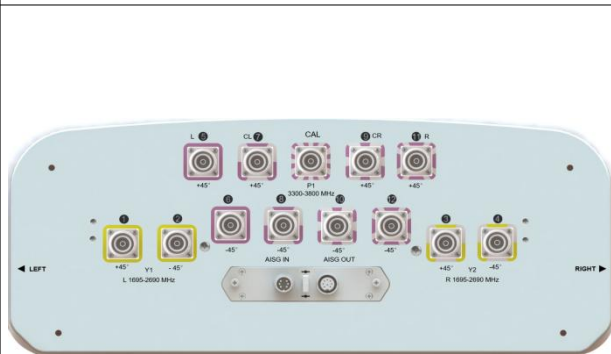
0° Service Beam

+30° Service Beam

-30° Service Beam

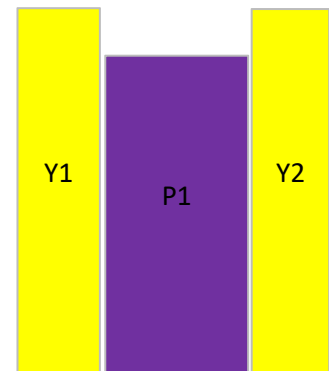


Layout of Interface



Layout of Array

Array	Connector	Frequency(MHz)	RET Serial
Y1	1-2	1695-2690	ZTY1...01
Y2	3-4	1695-2690	ZTY2...02
P1	5-12	3300-3800	ZTP1...03



All data are based on NGMN recommendations on Base Station Antenna Standards (BASTA V13.0).

Product Name:41#8-Port,X-Pol,TDD&FDD Antenna,Integrated RET

FDD:1×690-960&2×1695-2690MHz,TDD:1×2300-2690MHz

Antenna Model:**HBZ242S7017**

Electrical Specifications						
Description	8-Port,X-Pol,TDD&FDD Antenna,Integrated RET FDD:1×690-960&2×1695-2690MHz,TDD:1×2300-2690MHz					
Frequency Range	MHz	FDD:1×698-960(R1)				
Frequency Band	MHz	698-806	790-896	870-960		
Gain Over All Tilts	dBi	16.1±0.7	16.3±0.7	16.5±0.7		
Gain by Tilt Average Min		16.4	16.6	17.0		
Gain by Tilt Average Mid	dBi	16.0	16.2	16.5		
Gain by Tilt Average Max		15.5	15.7	16.1		
Horizontal 3dB Beam Width	Deg	70±7	65±7	60±6		
Vertical 3dB Beam Width	Deg	7.9±0.8	7.1±0.7	6.6±0.6		
1 st Upper Side Lobe Suppression Above Main Beam	dB	≥15				
Front to Back Ratio at 180Deg ±30Deg	dB	≥24				
Cross-Polar Ratio at 0Deg	dB	≥17				
Cross-Polar Ratio at ±60Deg	dB	≥8				
Electrical Downtilt	Deg	2-12,Continuously adjustable				
VSWR	/	≤1.5				
Cross Polar Isolation	dB	≥26				
Interband Isolation	dB	≥26				
Intermodulation IM3	dBc	≤-150(2×43 dBm carrier)				
Max. Power Per Port	Watt	350(at 50°C ambient temperature)				
Frequency Range	MHz	FDD:2×1695-2690(Y1/Y2)				
Frequency Band	MHz	1695-1880	1850-1990	1920-2200	2200-2490	2500-2690

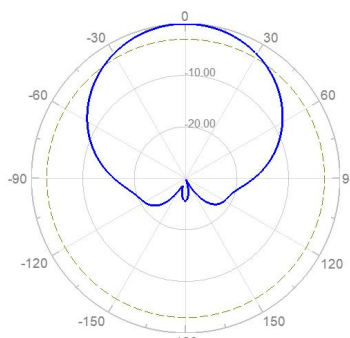
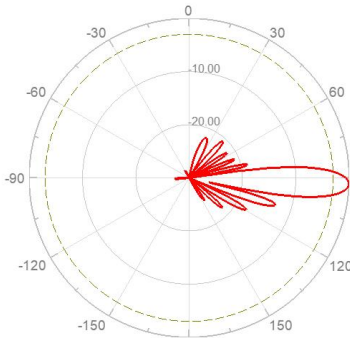
Gain Over All Tilts	dBi	16.4±0.7	16.9±0.5	17.0±0.7	16.8±0.7	17.2±0.7
Gain by Tilt Average Min	dBi	16.8	17.3	17.5	17.3	17.6
Gain by Tilt Average Mid		16.4	16.8	17.1	16.8	17.3
Gain by Tilt Average Max		16.0	16.5	16.6	16.4	16.9
Horizontal 3dB Beam Width	Deg	65±8	62±8	63±7	66±7	58±6
Vertical 3dB Beam Width	Deg	7±0.5	6.5±0.4	6.1±0.4	5.3±0.4	4.9±0.4
1 st Upper Side Lobe Suppression Above Main Beam	dB	≥15				
Front to Back Ratio at 180Deg ±30Deg	dB	≥24				
Cross-Polar Ratio 0Deg	dB	≥15				
Cross-Polar Ratio at ±60Deg	dB	≥8				
Electrical Downtilt	Deg	2-12, Continuously adjustable				
VSWR	/	≤1.5				
Cross Polar Isolation	dB	≥26				
Interband Isolation	dB	≥26				
Intermodulation IM3	dBc	≤-150(2×43 dBm carrier)				
Max. Power Per Port	Watt	250(at 50°C ambient temperature)				
Impedance	Ohm	50				
Polarization	Deg	±45				
Electrical Specifications						
Frequency Range	MHz	TDD:1×2300-2690(Y3)				
Frequency Band	MHz	2300-2490	2490-2690			
Coupling Factor between Calibration Port and Each Antenna Port	dB	-26±2				
Max.Amplitude Tolerance from Calibration Port to Input Ports	dB	≤0.9				
Max.Phase Tolerance from	Deg	≤9				

Calibration Port to Input Ports				
VSWR		/	≤1.5	
Electrical Downtilt		Deg	2-12, Continuously adjustable	
Maximum Power		Watt	80(at 50°C ambient temperature)	
Co-polarization Isolation Between Ports		dB	≥19	
Cross-polarization Isolation Between Ports		dB	≥24	
Single Column Beam	Horizontal 3dB Beam Width	Deg	93±10	88±12
	Vertical 3dB Beam Width	Deg	6.3±0.7	5.8±0.7
	Gain Over All Tilts	dBi	15.2±0.6	15.6±0.6
	Gain by Tilt Average Min	dBi	15.8	16.0
	Gain by Tilt Average Mid	dBi	15.3	15.7
	Gain by Tilt Average Max	dBi	15.0	15.4
	Cross-Polar Ratio 0Deg	dB	≥15	
	1st Upper Side Lobe Suppression Above Main Beam	dB	≥15	
	Front to Back Ratio at 180Deg ±30Deg	dB	≥23	
	Broadcast Beam	Horizontal 3dB Beam Width	Deg	65±10
Vertical 3dB Beam Width		Deg	6.3±0.7	5.8±0.7
Gain Over All Tilts		Deg	16.7±0.6	16.9±0.7
Gain by Tilt Average Min		dBi	17.2	17.4
Gain by Tilt Average Mid		dBi	16.7	16.8
Gain by Tilt Average Max		dBi	16.2	16.3
Cross-Polar Ratio at 0Deg		dB	≥15	
1st Upper Side Lobe Suppression Above Main Beam		dB	≥15	
Front to Back Ratio at 180Deg ±30Deg		dB	≥25	
Service Beam		0° Beam Gain Over All Tilts	dBi	20.8±0.5

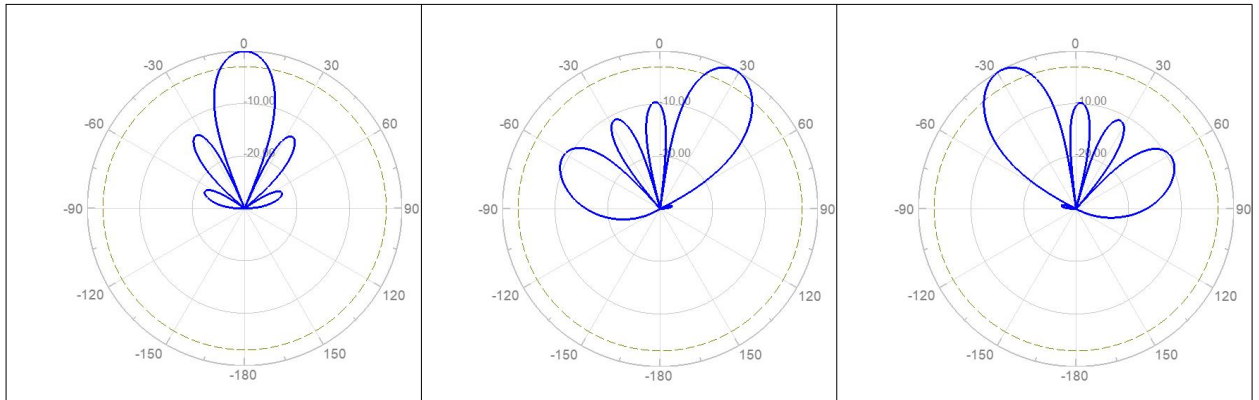
	0° Beam Gain by Tilt Average Min	dBi	21.2	21.4
	0° Beam Gain by Tilt Average Mid	dBi	20.9	21.0
	0° Beam Gain by Tilt Average Max	dBi	20.5	20.9
	0° Beam Horizontal 3dB Beam Width	Deg	23±1	21±2
	0° Beam Horizontal Sidelobe	dB	≥15	
	0° Beam Front to Back Ratio	dB	≥27	
	0° Beam Cross-Polar Ratio at 0Deg	dB	≥15	
	±30° Beam Gain Over All Tilts	dBi	19.8±0.5	20.1±0.6
	±30° Beam Gain by Tilt Average Min	dBi	20.3	20.6
	±30° Beam Gain by Tilt Average Mid	dBi	19.8	20.1
	±30° Beam Gain by Tilt Average Max	dBi	19.4	19.8
	±30° Beam Horizontal 3dB Beam Width	Deg	26±1	24±2
	±30° Beam Front to Back Ratio	dB	≥25	

Mechanical Specifications

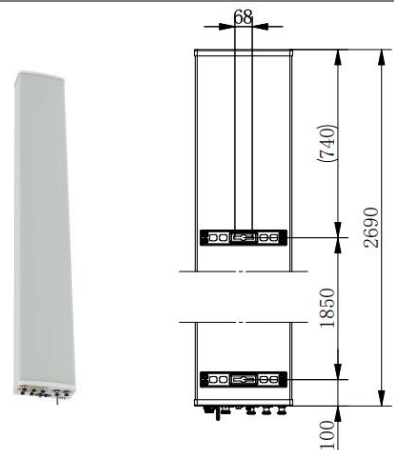
Antenna Dimensions	mm	2690×396×190
Antenna Net Weight	kg	33.8
Packing Dimensions	mm	2940×470×265
Antenna Gross Weight	kg	48.8
Connector Type	/	6×4.3-10 Female +2×Cluster MQ4+MQ5
Connector Position	/	Bottom
Radiator Material	/	Aluminum&Low loss circuit board
Radome Material / Color	/	Fiberglass / Light Grey RAL7035
Reflector Material	/	Aluminum
Storage Temperature	°C	-40 to +60
Operating Temperature	°C	-40 to +60
Humidity	/	5% to 95%
Max. operational Wind Speed	km/h	200
Wind Load @Rated Wind Front	N	1341

Wind Load @Rated Wind Side	N	266
Wind Load @Rated Wind Rear	N	1503
Lightning Protection	/	DC ground
Accessories		
Downtilt Kit (mechanical)	Deg	0-12
Mounting Accessories (clamp)	/	Included with antenna
Mounting Pipe Diameter	mm	50-115
Internal RET Specifications		
RCU (remote control unit)	/	Replaceable RET (can be exchangeable without exchanging antenna)
		AISG2.0 /3GPP
Input Voltage Range	V	10-30 DC
Power Consumption	W	< 10 (motor activated , single RET) < 2 (stand by, single RET)
Adjustment Time (full range)	s	< 120 (typically, depending on antenna type)
RET Connector	/	1 pair of AISG 5 pin male & female
Pin Assignment According AISG	/	5-pin circular connector conforming to IEC 60130-9 - Ed. 3.0
Lightning Protection	kA	5 (8/20 μ s differential mode), 8 (8/20 μ s common mode)
Reference Pattern		
FDD:690-960MHz		
Horizontal Pattern	Vertical Pattern	
		
FDD:1695-2690MHz		

Horizontal Pattern		Vertical Pattern	
TDD:2300-2690			
Single Column Beam			
Horizontal Pattern		Vertical Pattern	
Broadcast Beam			
0° Service Beam	+30° Service Beam	-30° Service Beam	

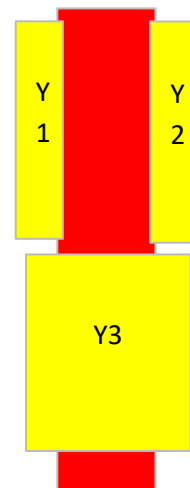


Layout of Interface



Layout of Array

Array	Connector	Frequency(MHz)	RET Serial
R1	1-2	698-960	ZTR1...01
Y1	3-4	1695-2690	ZTY1...02
Y2	5-6	1695-2690	ZTY2...03
Y3	7-8	2300-2690	ZTY3...04



All data are based on NGMN recommendations on Base Station Antenna Standards (BASTA V13.0).

Product Name:42#10-Port,X-Pol,TDD&FDD Antenna,Integrated RET

FDD:1×698-960&3×1710-2690MHz,TDD:1×2300-2690MHz

Antenna Model:**HBZ262S6817**

Electrical Specifications				
Description	10-Port,X-Pol,TDD&FDD Antenna,Integrated RET FDD:1×698-960&3×1710-2690MHz,TDD:1×2300-2690MHz			
ZTT Product Code	H			
Frequency Range	MHz	FDD:1×698-960(R1)		
Frequency Band	MHz	698-790	790-896	870-960
Gain Over All Tilts	dBi	16.1±0.4	16.3±0.5	16.5±0.6
Gain by Tilt Average Min		16.5	16.7	17.0
Gain by Tilt Average Mid	dBi	16.2	16.5	16.8
Gain by Tilt Average Max		15.7	15.9	16.3
Horizontal 3dB Beam Width	Deg	68±5	66±6	65±6
Vertical 3dB Beam Width	Deg	8.7±0.7	7.6±0.6	7.1±0.6
1 st Upper Side Lobe Suppression Above Main Beam	dB	≥15		
Front to Back Ratio at 180Deg ±30Deg	dB	≥23	≥24	≥25
Cross-Polar Ratio at 0Deg	dB	≥15		
Cross-Polar Ratio at ±60Deg	dB	≥9		
Electrical Downtilt	Deg	2-12,Continuously adjustable		
VSWR	/	≤1.5		
Cross Polar Isolation	dB	≥25		
Interband Isolation	dB	≥25		
Intermodulation IM3	dBc	≤-150(2×43 dBm carrier)		
Max. Power Per Port	Watt	300(at 50°C ambient temperature)		
Frequency Range	MHz	FDD:3×1710-2690(Y1/Y2/Y3)		

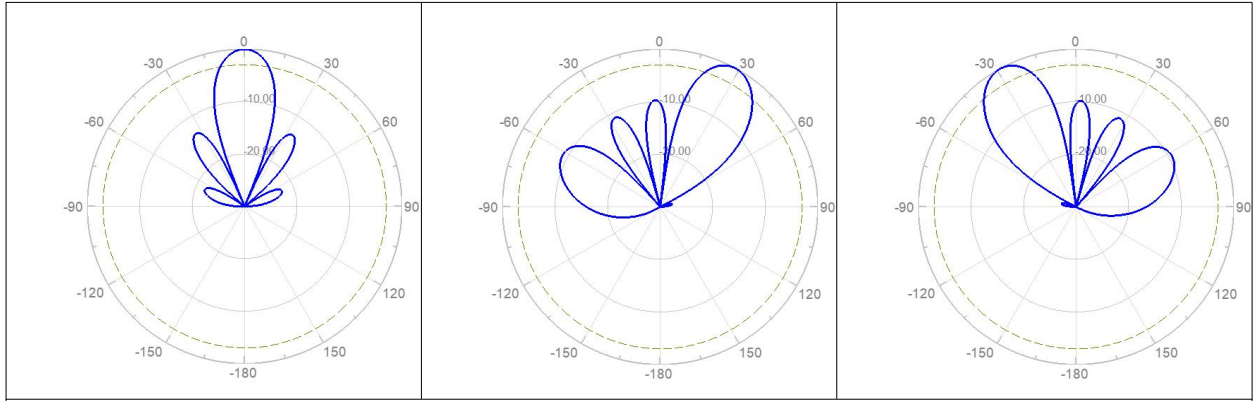
Frequency Band	MHz	1710-1880	1850-1990	1920-2180	2300-2500	2500-2690
Gain Over All Tilts	dBi	16.3±0.7	16.6±0.5	16.8±0.6	17.2±0.7	17.4±0.7
Gain by Tilt Average Min	dBi	16.7	16.8	17.1	17.4	17.8
Gain by Tilt Average Mid		16.5	16.6	16.9	17.2	17.4
Gain by Tilt Average Max		16.3	16.4	16.6	16.9	17.2
Horizontal 3dB Beam Width	Deg	71±8	68±8	67±7	62±7	58±6
Vertical 3dB Beam Width	Deg	7.1±0.5	6.7±0.5	6.3±0.5	5.7±0.4	4.9±0.5
1 st Upper Side Lobe Suppression Above Main Beam	dB	≥15				
Front to Back Ratio at 180Deg ±30Deg	dB	≥24				
Cross-Polar Ratio 0Deg	dB	≥15				
Electrical Downtilt	Deg	2-12,Continuously adjustable				
VSWR	/	≤1.5				
Cross Polar Isolation	dB	≥26				
Interband Isolation	dB	≥26				
Intermodulation IM3	dBc	≤-150(2×43 dBm carrier)				
Max. Power Per Port	Watt	200(at 50°C ambient temperature)				
Impedance	Ohm	50				
Polarization	Deg	±45				
Electrical Specifications						
Frequency Range	MHz	TDD:1×2300-2690(Y4)				
Frequency Band	MHz	2300-2490	2490-2690			
Coupling Factor between Calibration Port and Each Antenna Port	dB	-26±2				
Max.Amplitude Tolerance from Calibration Port to Input Ports	dB	≤0.9				
Max.Phase Tolerance from	Deg	≤7				

Calibration Port to Input Ports				
VSWR		/	≤1.5	
Electrical Downtilt		Deg	2-12,Continuously adjustable	
Maximum Power		Watt	80(at 50°C ambient temperature)	
Co-polarization Isolation Between Ports		dB	≥19	
Cross-polarization Isolation Between Ports		dB	≥24	
Single Column Beam	Horizontal 3dB Beam Width	Deg	88±12	81±10
	Vertical 3dB Beam Width	Deg	6.5±0.7	6.1±0.6
	Gain Over All Tilts	dBi	14.9±0.7	15.1±0.8
	Gain by Tilt Average Min	dBi	15.2	15.5
	Gain by Tilt Average Mid	dBi	14.9	15.1
	Gain by Tilt Average Max	dBi	14.7	14.9
	Cross-Polar Ratio 0Deg	dB	≥16	
	Cross-Polar Ratio ±60 Deg		≥8	
	1st Upper Side Lobe Suppression Above Main Beam	dB	≥15	
	Front to Back Ratio at 180Deg ±30Deg	dB	≥21	
	Broadcast Beam	Horizontal 3dB Beam Width	Deg	65±10
Vertical 3dB Beam Width		Deg	6.5±0.7	6.1±0.6
Gain Over All Tilts		Deg	16.5±0.6	16.8±0.7
Gain by Tilt Average Min		dBi	17.0	17.2
Gain by Tilt Average Mid		dBi	16.7	16.9
Gain by Tilt Average Max		dBi	16.2	16.5
Cross-Polar Ratio 0Deg		dB	≥15	
Cross-Polar Ratio ±60Deg			≥8	
1st Upper Side Lobe Suppression Above Main Beam		dB	≥15	
Front to Back Ratio		dB	≥25	

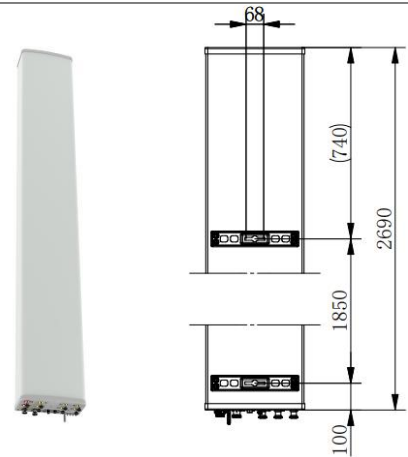
	at 180Deg ±30Deg			
Service Beam	0° Beam Gain Over All Tilts	dBi	20.6±0.5	20.9±0.6
	0° Beam Gain by Tilt Average Min	dBi	21.1	21.5
	0° Beam Gain by Tilt Average Mid	dBi	20.8	21.2
	0° Beam Gain by Tilt Average Max	dBi	20.5	20.9
	0° Beam Horizontal 3dB Beam Width	Deg	23±1	21±1
	0° Beam Front to Back Ratio	dB	≥25	
	0° Beam Cross-Polar Ratio 0Deg	dB	≥15	
	±30° Beam Gain Over All Tilts	dBi	19.7±0.5	19.9±0.6
	±30° Beam Gain by Tilt Average Min	dBi	20.2	20.5
	±30° Beam Gain by Tilt Average Mid	dBi	19.8	20.1
	±30° Beam Gain by Tilt Average Max	dBi	19.5	19.9
	±30° Beam Horizontal 3dB Beam Width	Deg	26±1	24±2
	±30° Beam Horizontal Sidelobe	dB	15.3	16.5
Mechanical Specifications				
Antenna Dimensions	mm	2690×396×190		
Antenna Net Weight	kg	41.1		
Packing Dimensions	mm	2940×490×285		
Antenna Gross Weight	kg	56.2		
Connector Type	/	8×4.3-10 Female +2×Cluster MQ4+MQ5		
Connector Position	/	Bottom		
Radiator Material	/	Aluminum&Low loss circuit board		
Radome Material / Color	/	Fiberglass / Light Grey RAL7035		
Reflector Material	/	Aluminum		
Storage Temperature	°C	-40 to +60		
Operating Temperature	°C	-40 to +60		
Humidity	/	5% to 95%		
Max. operational Wind Speed	km/h	200		

Wind Load @Rated Wind Front	N	1341
Wind Load @Rated Wind Side	N	266
Wind Load @Rated Wind Rear	N	1503
Lightning Protection	/	DC ground
Accessories		
Downtilt Kit (mechanical)	Deg	0-12
Mounting Accessories (clamp)	/	Included with antenna
Mounting Pipe Diameter	mm	50-115
Internal RET Specifications		
RCU (remote control unit)	/	Replaceable RET (can be exchangeable without exchanging antenna)
		AISG2.0 /3GPP
Input Voltage Range	V	10-30 DC
Power Consumption	W	< 10 (motor activated , single RET) < 2 (stand by, single RET)
Adjustment Time (full range)	s	< 120 (typically, depending on antenna type)
RET Connector	/	1 pair of AISG 5 pin male & female
Pin Assignment According AISG	/	5-pin circular connector conforming to IEC 60130-9 - Ed. 3.0
Lightning Protection	kA	5 (8/20 μ s differential mode), 8 (8/20 μ s common mode)
Reference Pattern		
FDD:698-960MHz		
Horizontal Pattern		Vertical Pattern

FDD:1710-2690MHz		
Horizontal Pattern	Vertical Pattern	
		
TDD:2300-2690		
Single Column Beam		
Horizontal Pattern	Vertical Pattern	
		
Broadcast Beam		
		
0° Service Beam	+30° Service Beam	-30° Service Beam

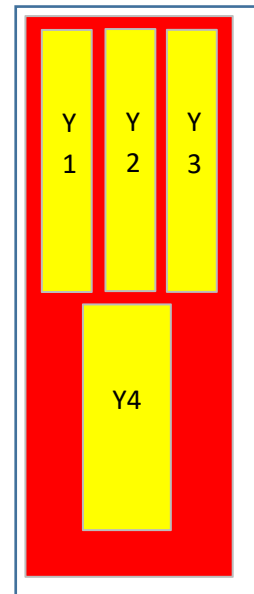


Layout of Interface



Layout of Array

Array	Connector	Frequency(MHz)	RET Serial
R1	1-2	698-960	ZTR1...01
Y1	3-4	1710-2690	ZTY1...02
Y2	5-6	1710-2690	ZTY2...03
Y3	7-8	1710-2690	ZTY3...04
Y4	7-8	2300-2690	ZTY4...05



All data are based on NGMN recommendations on Base Station Antenna Standards (BASTA V13.0).

Product Name:43#12-Port,X-Pol,TDD&FDD Antenna,Integrated RET

FDD:1×698-960&4×1695-2690MHz,TDD:1×3300-3800MHz

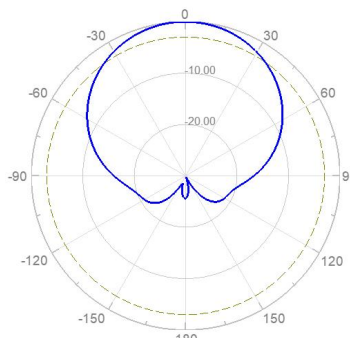
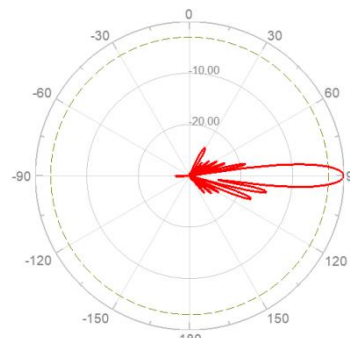
Antenna Model:**HBZ282J651617**

Electrical Specifications					
Description	12-Port,X-Pol,TDD&FDD Antenna,Integrated RET FDD:1×698-960&4×1695-2690MHz,TDD:1×3300-3800MHz				
Frequency Range	MHz	FDD:1×698-960(R1)			
Frequency Band	MHz	698-790	790-890	890-960	
Gain Over All Tilts	dBi	15.6±0.9	16.5±0.6	17.0±0.6	
Gain by Tilt Average Min	dBi	16.5	17.0	17.5	
Gain by Tilt Average Mid		15.5	16.6	17.1	
Gain by Tilt Average Max		15.0	16.2	16.7	
Horizontal 3dB Beam Width	Deg	65±5	66±6	66±7	
Vertical 3dB Beam Width	Deg	7.8±0.9	7.9±0.6	7.1±0.4	
1 st Upper Side Lobe Suppression Above Main Beam	dB	≥17			
Front to Back Ratio at 180Deg ±30Deg	dB	≥25			
Cross-Polar Ratio at 0Deg	dB	≥16	≥17	≥16	
Cross-Polar Ratio at ±60Deg	dB	≥8	≥8	≥8	
Electrical Downtilt	Deg	0-10,Continuously adjustable			
VSWR	/	≤1.5			
Cross Polar Isolation	dB	≥26			
Interband Isolation	dB	≥26			
Intermodulation IM3	dBc	≤-107(2×43 dBm carrier)			
Max. Power Per Port	Watt	350(at 50°C ambient temperature)			
Frequency Range	MHz	FDD:4×1695-2690(Bottom:Y1,TOP:Y2/Y3/Y4)			
Frequency Band	MHz	1695-1880	1850-1990	1920-2170	2300-2400 2400-2690

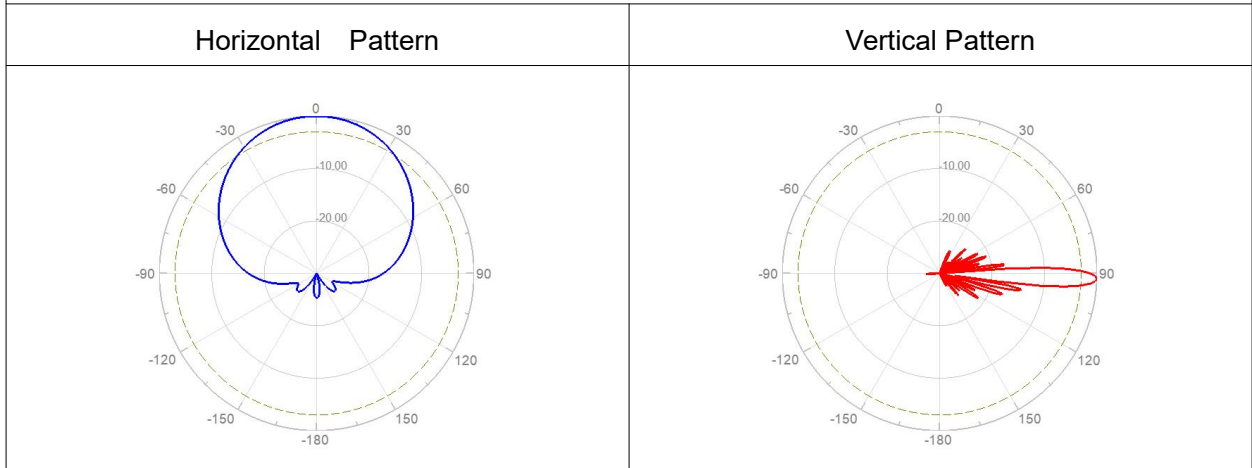
Gain Over All Tilts	dBi	16.5±0.4	16.8±0.6	17.0±0.6	17.0±0.7	17.0±0.7	
Gain by Tilt Average Min	dBi	16.8	17.4	17.5	17.7	17.6	
Gain by Tilt Average Mid		16.5	16.7	16.9	17.2	17.0	
Gain by Tilt Average Max		16.2	16.3	16.7	16.8	16.7	
Horizontal 3dB Beam Width	Deg	67±8	65±7	63±7	58±6	55±5	
Vertical 3dB Beam Width	Deg	6.4±0.9	6.0±0.7	5.7±0.5	4.9±0.4	4.7±0.5	
1 st Upper Side Lobe Suppression Above Main Beam	dB	≥16					
Front to Back Ratio at 180Deg ±30Deg	dB	≥25					
Cross-Polar Ratio 0Deg	dB	≥16					
Electrical Downtilt	Deg	2-12,Continuously adjustable					
VSWR	/	≤1.5					
Cross Polar Isolation	dB	≥26					
Interband Isolation	dB	≥26					
Intermodulation IM3	dBc	≤-150(2×43 dBc carrier)					
Max. Power Per Port	Watt	250(at 50°C ambient temperature)					
Impedance	Ohm	50					
Polarization	Deg	±45					
Electrical Specifications							
Frequency Range				MHz	TDD:1×3300-3800(Bottom:P1)		
Frequency Band				MHz	3300-3600	3600-3800	
Coupling Factor between Calibration Port and Each Antenna Port				dB	-26±2		
Max.Amplitude Tolerance from Calibration Port to Input Ports				dB	≤0.9		
Max.Phase Tolerance from Calibration Port to Input Ports				Deg	≤7		

VSWR		/	≤1.5	
Electrical Downtilt		Deg	2-12,Continuously adjustable	
Maximum Power		Watt	50(at 50°C ambient temperature)	
Co-polarization Isolation Between Ports	@2-6Deg	dB	≥20	≥20
	@7-12Deg		≥25	≥25
Cross-polarization Isolation Between Ports	@2-6Deg	dB	≥25	≥25
	@7-12Deg		≥25	≥25
Single Column Beam	Horizontal 3dB Beam Width	Deg	88±15	80±15
	Vertical 3dB Beam Width	Deg	5.7±0.5	5.3±0.4
	Gain Over All Tilts	dBi	14.8±0.8	15.2±0.6
	Gain by Tilt Average Min	dBi	15.5	15.6
	Gain by Tilt Average Mid	dBi	15.1	15.2
	Gain by Tilt Average Max	dBi	14.6	14.8
	Cross-Polar Ratio 0Deg	dB	≥15	
	Cross-Polar Ratio ±60 Deg		≥8	
	1st Upper Side Lobe Suppression Above Main Beam	dB	≥17	
	Front to Back Ratio at 180Deg ±30Deg	dB	≥22	≥23
Broadcast Beam	Horizontal 3dB Beam Width	Deg	66±7	60±4
	Vertical 3dB Beam Width	Deg	5.8±0.7	5.6±0.7
	Gain Over All Tilts	Deg	17.3±0.6	17.7±0.5
	Gain by Tilt Average Min	dBi	17.8	18.2
	Gain by Tilt Average Mid	dBi	17.2	17.7
	Gain by Tilt Average Max	dBi	16.9	17.4
	Cross-Polar Ratio 0Deg	dB	≥15	
	Cross-Polar Ratio ±60Deg		≥8	
	1st Upper Side Lobe Suppression Above Main Beam	dB	≥17	

	Front to Back Ratio at 180Deg ±30Deg	dB	≥25	
Service Beam	0° Beam Gain Over All Tilts	dBi	21.0±0.6	21.2±0.5
	0° Beam Gain by Tilt Average Min	dBi	21.6	21.6
	0° Beam Gain by Tilt Average Mid	dBi	21.1	21.2
	0° Beam Gain by Tilt Average Max	dBi	19.8	19.7
	0° Beam Horizontal 3dB Beam Width	Deg	26±2	25±2
	0° Beam Front to Back Ratio	dB	≥25	
	0° Beam Cross-Polar Ratio 0Deg	dB	≥18	
	±30° Beam Gain Over All Tilts	dBi	20.0±0.6	20.2±0.6
	±30° Beam Gain by Tilt Average Min	dBi	20.4	20.6
	±30° Beam Gain by Tilt Average Mid	dBi	20.0	20.1
	±30° Beam Gain by Tilt Average Max	dBi	19.7	19.7
	±30° Beam Horizontal 3dB Beam Width	Deg	28±2.5	27±2.5
±30° Beam Horizontal Sidelobe	dB	10	10	
Mechanical Specifications				
Antenna Dimensions	mm	2690×429×199		
Antenna Net Weight	kg	46.1		
Packing Dimensions	mm	2950×525×295		
Antenna Gross Weight	kg	58.2		
Connector Type	/	10×4.3-10 Female + MQ4&MQ5 Female		
Connector Position	/	Bottom		
Radiator Material	/	Aluminum&Low loss circuit board		
Radome Material / Color	/	Fiberglass / Light Grey RAL7035		
Reflector Material	/	Aluminum		
Storage Temperature	°C	-40 to +60		
Operating Temperature	°C	-40 to +60		
Humidity	/	5% to 95%		
Max. operational Wind Speed	km/h	200		

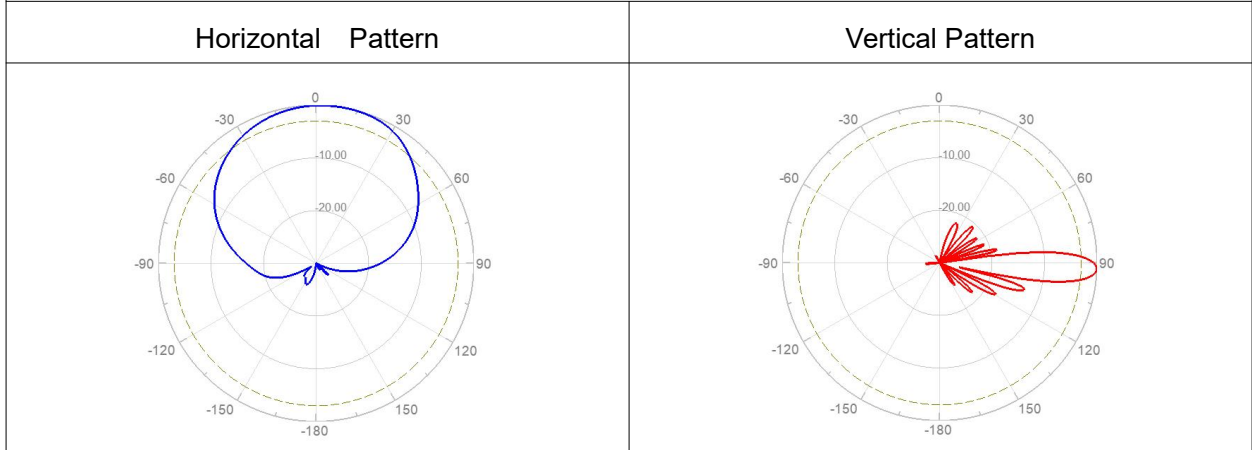
Wind Load @Rated Wind Front	N	1417
Wind Load @Rated Wind Side	N	563
Wind Load @Rated Wind Rear	N	1668
Lightning Protection	/	DC ground
Accessories		
Downtilt Kit (mechanical)	Deg	0-12
Mounting Accessories (clamp)	/	Included with antenna
Mounting Pipe Diameter	mm	50-115
Internal RET Specifications		
RCU (remote control unit)	/	Replaceable RET (can be exchangeable without exchanging antenna)
		AISG2.0 /3GPP
Input Voltage Range	V	10-30 DC
Power Consumption	W	< 10 (motor activated , single RET) < 2 (stand by, single RET)
Adjustment Time (full range)	s	< 120 (typically, depending on antenna type)
RET Connector	/	1 pair of AISG 5 pin male & female
Pin Assignment According AISG	/	5-pin circular connector conforming to IEC 60130-9 - Ed. 3.0
Lightning Protection	kA	5 (8/20 μ s differential mode), 8 (8/20 μ s common mode)
Reference Pattern		
FDD:698-960MHz		
Horizontal Pattern		Vertical Pattern
		

FDD:1695-2690MHz

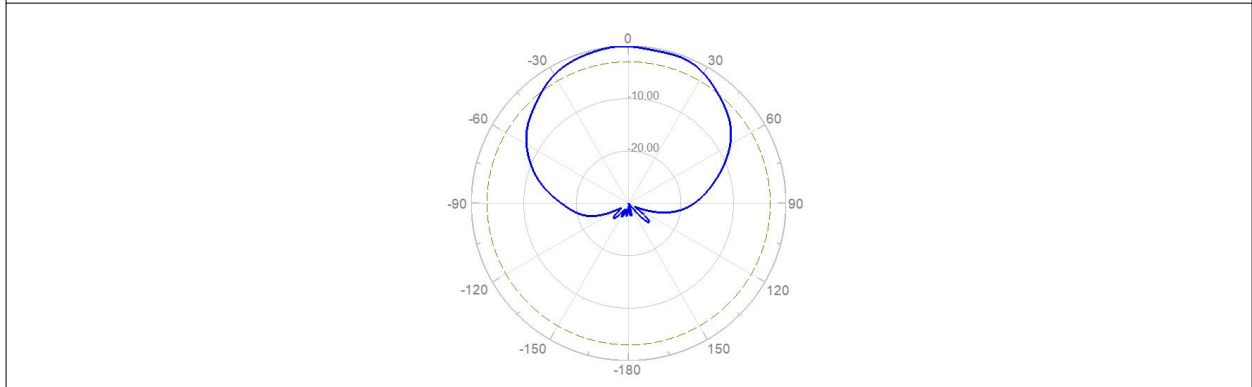


TDD:2300-2690

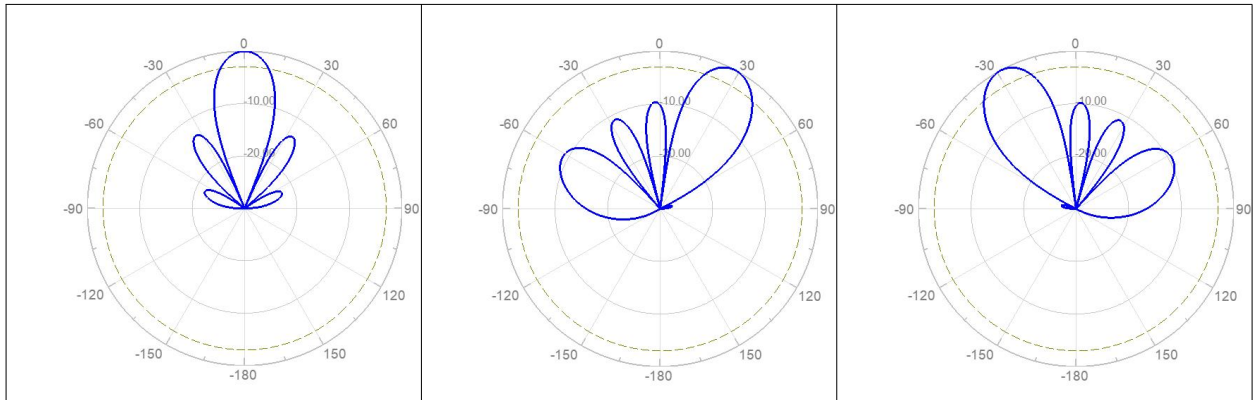
Single Column Beam



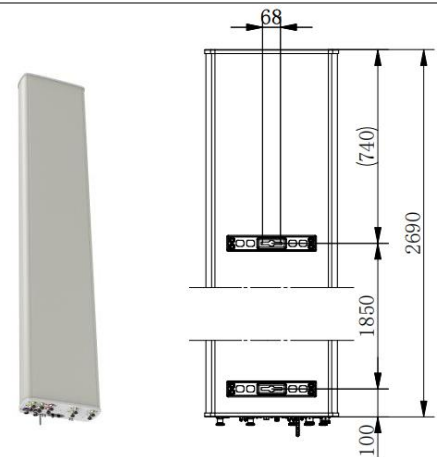
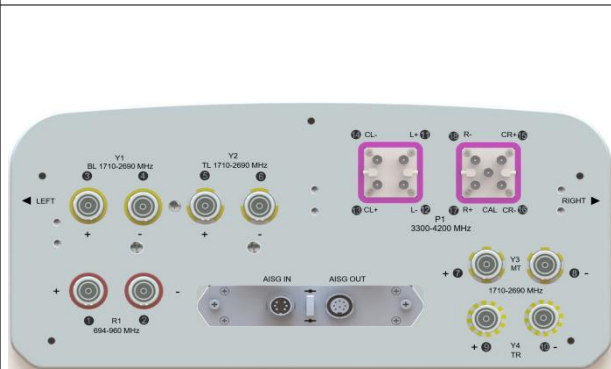
Broadcast Beam



0° Service Beam	+30° Service Beam	-30° Service Beam
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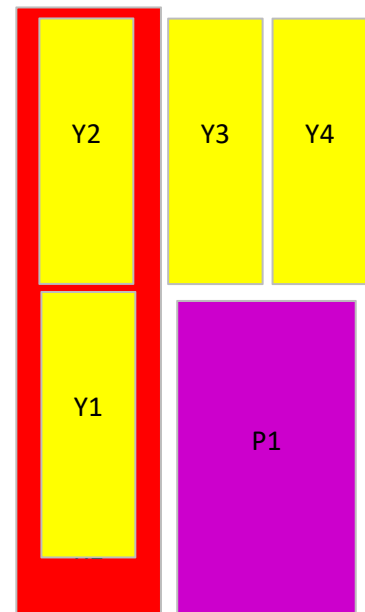


Layout of Interface



Layout of Array

Array	Connector	Frequency(MHz)	RET Serial
R1	1-2	698-960	ZTR1...01
Y1	3-4	1695-2690	ZTY1...02
Y2	5-6	1695-2690	ZTY2...03
Y3	7-8	1695-2690	ZTY3...04
Y4	9-10	1695-2690	ZTY4...05
P1	11-12	3300-3800	ZTP1...06



All data are based on NGMN recommendations on Base Station Antenna Standards (BASTA V13.0).

Product Name:44#14-Port,X-Pol,TDD&FDD Antenna,Integrated RET

FDD:2×698-960&4×1695-2690MHz,TDD:1×2300-2690MHz

Antenna Model:**HBZ482J6617**

Electrical Specifications					
Description	14-Port,X-Pol,TDD&FDD Antenna,Integrated RET FDD:2×698-960&4×1695-2690MHz,TDD:1×2300-2690MHz				
Frequency Range	MHz	FDD:2×698-960(R1/R2)			
Frequency Band	MHz	698-806	790-896	880-960	
Gain Over All Tilts	dBi	16.5±0.7	16.6±0.5	16.5±0.5	
Gain by Tilt Average Min	dBi	17.0	17.1	17.0	
Gain by Tilt Average Mid		16.5	16.7	16.4	
Gain by Tilt Average Max		16.2	16.3	16.2	
Horizontal 3dB Beam Width	Deg	66±8	72±5	74±5	
Vertical 3dB Beam Width	Deg	8.4±0.6	7.8±0.6	7.0±0.4	
1st Upper Side Lobe Suppression Above Main Beam	dB	≥16			
Front to Back Ratio at 180Deg ±30Deg	dB	≥25			
Cross-Polar Ratio at 0Deg	dB	≥17			
Electrical Downtilt	Deg	2-12,Continuously adjustable			
VSWR	/	≤1.5			
Cross Polar Isolation	dB	≥26			
Interband Isolation	dB	≥26			
Intermodulation IM3	dBc	≤-153(2×43 dBm carrier)			
Max. Power Per Port	Watt	350(at 50°C ambient temperature)			
Frequency Range	MHz	FDD:4×1695-2690(Y1/Y2/Y3/Y4)			
Frequency Band	MHz	1710-1880	1850-1990	1920-2180	2300-2500 2500-2690
Gain Over All Tilts	dBi	16.8±0.7	16.9±0.7	17.1±0.8	16.8±0.8 17.1±0.8

Gain by Tilt Average Min	dBi	17.4	17.5	17.7	17.6	17.7
Gain by Tilt Average Mid		16.9	17.0	17.0	17.1	17.2
Gain by Tilt Average Max		16.3	16.4	16.5	16.6	16.6
Horizontal 3dB Beam Width	Deg	69±9	66±6	67±5	61±6	58±5
Vertical 3dB Beam Width	Deg	6.7±0.5	6.2±0.4	5.8±0.4	5.3±0.4	4.9±0.4
1 st Upper Side Lobe Suppression Above Main Beam	dB	≥15				
Front to Back Ratio at 180Deg ±30Deg	dB	≥25				
Cross-Polar Ratio 0Deg	dB	≥16				
Electrical Downtilt	Deg	2-12,Continuously adjustable				
VSWR	/	≤1.5				
Cross Polar Isolation	dB	≥25				
Interband Isolation	dB	≥25				
Intermodulation IM3	dBc	≤-153(2×43 dBc carrier)				
Max. Power Per Port	Watt	250(at 50°C ambient temperature)				
Impedance	Ohm	50				
Polarization	Deg	±45				
Electrical Specifications						
Frequency Range		MHz	TDD:1×2300-2690(Y5)			
Frequency Band		MHz	2300-2490	2490-2690		
Coupling Factor between Calibration Port and Each Antenna Port		dB	-26±2			
Max.Amplitude Tolerance from Calibration Port to Input Ports		dB	≤0.9			
Max.Phase Tolerance from Calibration Port to Input Ports		Deg	≤9			
VSWR		/	≤1.5			

Electrical Downtilt		Deg	2-12,Continuously adjustable	
Maximum Power		Watt	80(at 50°C ambient temperature)	
Co-polarization Isolation Between Ports		dB	≥19	
Cross-polarization Isolation Between Ports		dB	≥24	
Single Column Beam	Horizontal 3dB Beam Width	Deg	95±15	89±15
	Vertical 3dB Beam Width	Deg	5.7±1.3	5.2±1.4
	Gain Over All Tilts	dBi	15.2±0.7	15.3±0.7
	Gain by Tilt Average Min	dBi	15.9	15.9
	Gain by Tilt Average Mid	dBi	15.3	15.4
	Gain by Tilt Average Max	dBi	14.7	15.0
	Cross-Polar Ratio 0Deg	dB	≥15	
	1st Upper Side Lobe Suppression Above Main Beam	dB	≥15	
	Front to Back Ratio at 180Deg ±30Deg	dB	≥23	
Broadcast Beam	Horizontal 3dB Beam Width	Deg	71±3.0	61±5.9
	Vertical 3dB Beam Width	Deg	6.2±0.7	5.4±0.7
	Gain Over All Tilts	Deg	16.0±0.6	16.5±0.7
	Gain by Tilt Average Min	dBi	16.5	17.0
	Gain by Tilt Average Mid	dBi	16.0	16.5
	Gain by Tilt Average Max	dBi	15.7	16.0
	Cross-Polar Ratio 0Deg	dB	≥16	
	1st Upper Side Lobe Suppression Above Main Beam	dB	≥16	
	Front to Back Ratio at 180Deg ±30Deg	dB	≥25	
Service Beam	0° Beam Gain Over All Tilts	dBi	19.9±0.4	20.8±0.6
	0° Beam Gain by Tilt Average Min	dBi	20.1	21.0
	0° Beam Gain by Tilt Average Mid	dBi	19.8	20.7

	0° Beam Gain by Tilt Average Max	dBi	19.6	20.4
	0° Beam Horizontal 3dB Beam Width	Deg	25±2	21±2
	0° Beam Horizontal Sidelobe	dB	12	
	0° Beam Front to Back Ratio	dB	≥28	
	0° Beam Cross-Polar Ratio 0Deg	dB	≥15	
	±30° Beam Gain Over All Tilts	dBi	19.2±0.5	19.7±0.6
	±30° Beam Gain by Tilt Average Min	dBi	19.7	20.2
	±30° Beam Gain by Tilt Average Mid	dBi	19.3	19.8
	±30° Beam Gain by Tilt Average Max	dBi	18.8	19.3
	±30° Beam Horizontal 3dB Beam Width	Deg	29±1	26±2
	0° Beam Front to Back Ratio	dB	≥25	
Mechanical Specifications				
Antenna Dimensions	mm	2690×499×199		
Antenna Net Weight	kg	47.5		
Packing Dimensions	mm	2940×570×275		
Antenna Gross Weight	kg	62.3		
Connector Type	/	12×4.3-10 Female +2×Cluster		
Connector Position	/	Bottom		
Radiator Material	/	Aluminum&Low loss circuit broad		
Radome Material / Color	/	Fiberglass / Light Grey RAL7035		
Reflector Material	/	Aluminum		
Storage Temperature	°C	-40 to +60		
Operating Temperature	°C	-40 to +60		
Humidity	/	5% to 95%		
Max. operational Wind Speed	km/h	200		
Wind Load @Rated Wind Front	N	1690		
Wind Load @Rated Wind Side	N	278		
Wind Load @Rated Wind Rear	N	1894		

Lightning Protection	/	DC ground
Accessories		
Downtilt Kit (mechanical)	Deg	0-12
Mounting Accessories (clamp)	/	Included with antenna
Mounting Pipe Diameter	mm	50-115
Internal RET Specifications		
RCU (remote control unit)	/	Replaceable RET (can be exchangeable without exchanging antenna)
		AISG2.0 /3GPP
Input Voltage Range	V	10-30 DC
Power Consumption	W	< 10 (motor activated , single RET) < 2 (stand by, single RET)
Adjustment Time (full range)	s	< 120 (typically, depending on antenna type)
RET Connector	/	1 pair of AISG 5 pin male & female
Pin Assignment According AISG	/	5-pin circular connector conforming to IEC 60130-9 - Ed. 3.0
Lightning Protection	kA	5 (8/20 μ s differential mode), 8 (8/20 μ s common mode)
Reference Pattern		
FDD:698-960MHz		
Horizontal Pattern		Vertical Pattern
FDD:1695-2690MHz		
Horizontal Pattern		Vertical Pattern

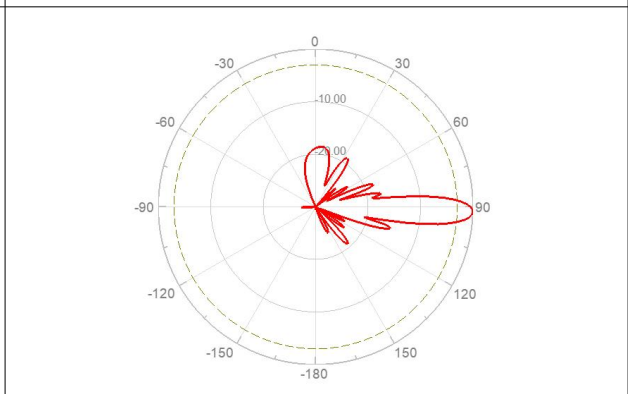
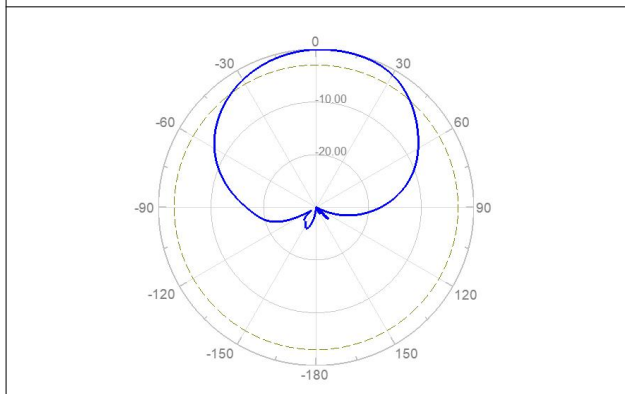


TDD:2300-2690

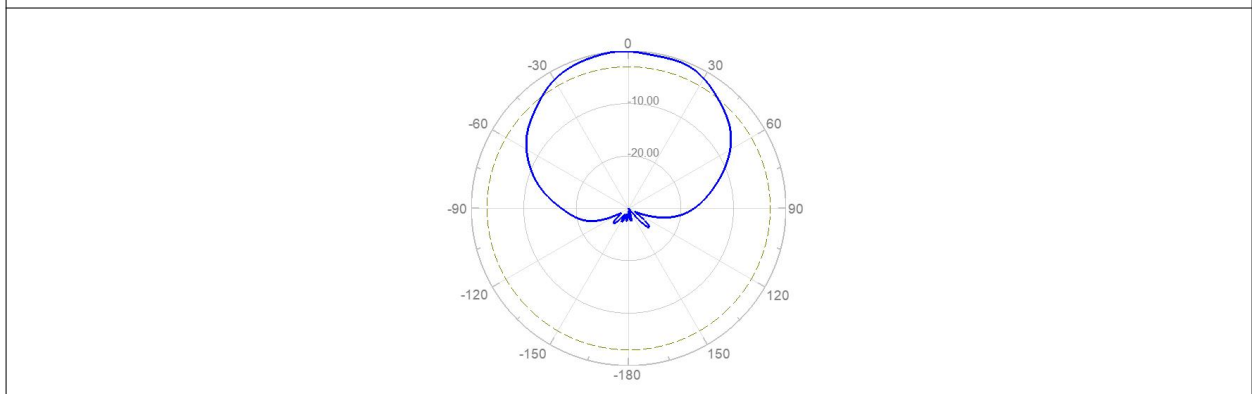
Single Column Beam

Horizontal Pattern

Vertical Pattern



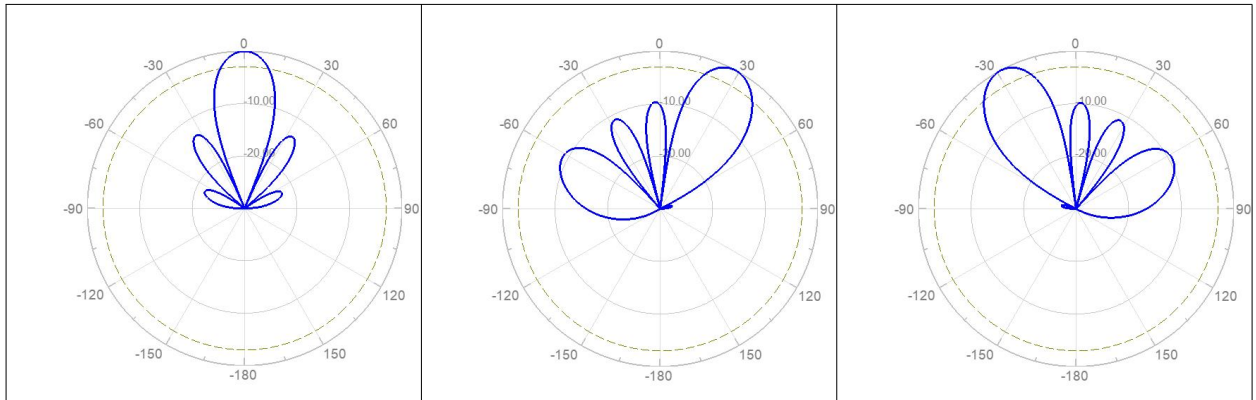
Broadcast Beam



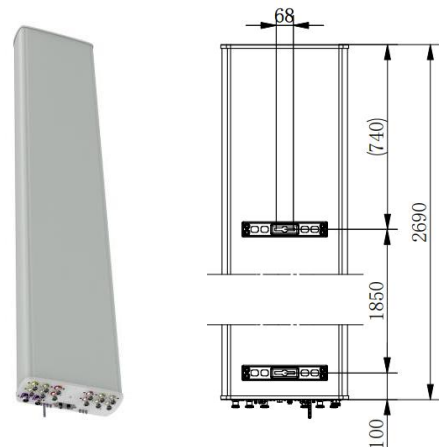
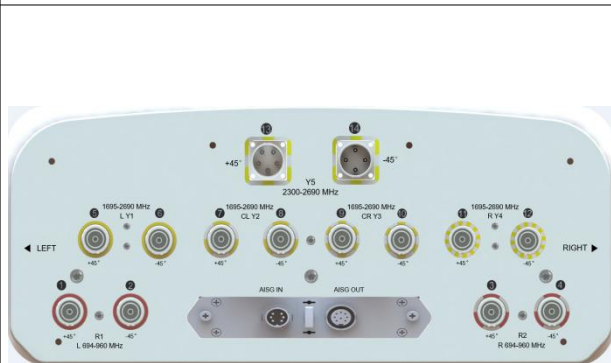
0° Service Beam

+30° Service Beam

-30° Service Beam

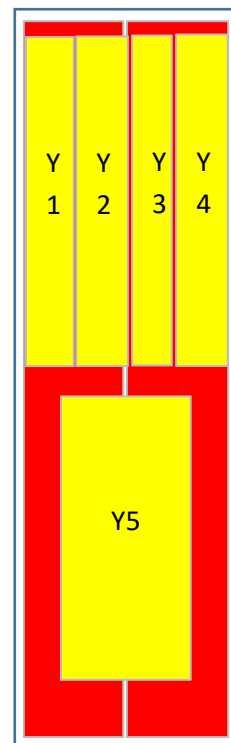


Layout of Interface



Layout of Array

Array	Connector	Frequency(MHz)	RET Serial
R1	1-2	698-960	ZTR1...01
Y1	3-4	1695-2690	ZTY1...02
Y2	5-6	1695-2690	ZTY2...03
Y3	7-8	1695-2690	ZTY3...04
Y4	9-10	1695-2690	ZTY4...05
Y5	11-14	2300-2690	ZTY5...06



All data are based on NGMN recommendations on Base Station Antenna Standards (BASTA V13.0).