Toshiba Corporation
FCC ID: CJ6UPA3489WL
802.11 a/b/g Mini-PCI Express Module

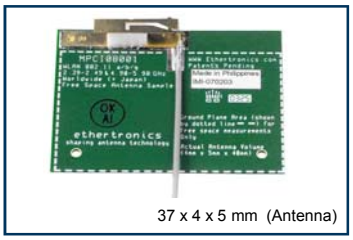
Antenna List

Manufacturer	Model	Type	2.4 GHz Max. Gain (dBi)	5.15-5.35GHz Max Gain (dBi)	5.4-5.8 GHz Max. Gain (dBi)	Cable Length	Remark
Ethertronics	MPCI-8	GS Isolated Magnetic Dipole	3	5	5	470mm	As documented in the FCC ID: PD9WM3945ABG Original application (10/12/05)
Wistron	81.EBQ15.010	PIFA	6.09	6.1	5.27	350/300 mm	As documented in the FCC ID: PD9WM3945ABG Class II application (10/19/05)
Hitachi	HTL017	PIFA	-1.27	1	2.92	306mm	As documented in the FCC ID: PD9WM3945ABG Class II application (10/20/05)
Tyco	TBN001	PIFA	1.1	0.8	1.3	306mm	As documented in the FCC ID: PD9WM3945ABG

							Class II application (10/20/05)
NISSEI	IRX-3400	Inverted-F	2.13	1.8	1.39	590/650mm	As documented in the FCC ID: PD9WM3945ABG Class II application (10/26/05)

ethertronics
shaping antenna technology™

IMD WLAN Internal Antenna Module
MPCI-8 2.4/4.9/5.2/5.8 GHz



MPCI-8 (mini-PCI) Internal Antenna Module

The MPCI-8 model, part of the IMD Family of WLAN Internal Antennas, is a single element internal (embedded) antenna module for Worldwide WLAN applications. MPCI-8 supports 802.11a/b/g protocols throughout the world including the newly licensed 4.9 MHz Japanese spectrum. The MPCI-8 module is a complete solution consisting of one GS Isolated Magnetic Dipole™ (IMD) antenna with a high performance cable and connector. The IMD antenna's small size and high isolation properties make the MPCI-8 easy to integrate into notebooks and other mobile devices, while offering the ability to be used in a diversity configuration.

Ethertronics' proprietary and patented IMD antenna technology offers three distinct advantages over traditional internal antennas:

High Performance
- High efficiency
- Up to 50% higher signal strength than other internal antennas

High Isolation/Selectivity
- Minimal coupling between antennas (isolation of 20-40 dB)
- Ideal for diversity applications
- Reduced EMI with surrounding components
- Makes integration easy

Shaping Technology
- Controls and redirects the near-field electromagnetic distribution of the antenna's wave
- Optimizes antenna performance by improving signal strength and data quality inside buildings, in noisy environments and in fringe network coverage areas
- Less interaction with surrounding objects

The MPCI-8 module is ideally suited for manufacturers where performance, size and costs are critical. The design's low profile, small form factor and industry standard cabling/connectors are suited for high volume applications. Standard assemblies are available or the antenna can be configured to suit individual OEM requirements.

Advantages:

Worldwide WLAN Coverage
- Single internal antenna module covers worldwide WLAN frequency bands saving cost and valuable space
- Supports WLAN bands for today's standards allowing one configuration to support all markets

Spatial Diversity
- Individual MPCI-8 modules can be placed in close proximity to other IMD antennas with reduced risk of coupling from one to another

Better Performance
- Increased range/data throughput
- Improved sensitivity in low signal environments

Flexible Integration
- MPCI-8 module's high isolation offers consistent performance across multiple platforms and requires minimal space making placement easier
- Standard cables and connectors make for easy connection to MPCI cards

Worldwide Support
- Regional technical support and FAEs are available to help speed the integration process
- Manufacturing by Far East suppliers means quick turnaround and lower import costs

WLAN

WLAN Technologies:
WiFi (802.11a/b/g)

Applications:
Notebooks • Tablet PCs
Portable Computers • Printers

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San Diego, CA 92121 • U.S.A.
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info@ethertronics.com

2.390-2.490/4.900-5.100 GHz/5.150-5.350/5.470-5.900 GHz Internal (Embedded) Antenna Specifications

Electrical Specifications:

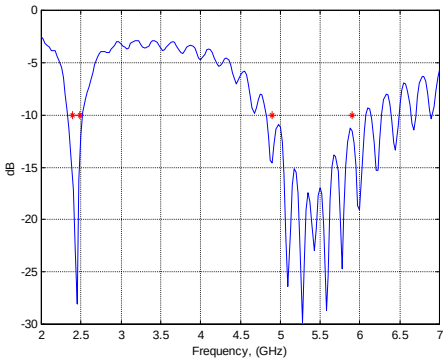
Typical Characteristics
(Free Space)

Model: MPCI-8 Module	2.390-2.490 GHz Band	4.900-5.100 GHz Band	5.150-5.350 GHz Band	5.470-5.900 GHz Band
Peak Gain	**3 dBi**	**3 dBi**	**5 dBi**	**5 dBi**
Efficiency	**75 %**	**65 %**	**65 %**	**65 %**
VSWR Match	2.1 : 1	2.1 : 1	2.1 : 1	2.1 : 1
Front to Back Ratio	-2 dB	-10 dB	-10 dB	-10 dB
Feed Point Impedance	50 ohms unbalanced (other if required)			
Power Handling	2 Watt cw			
Polarization	Linear			
Shielding Ratio	6 to 1 (near field)			

Mechanical Specifications:

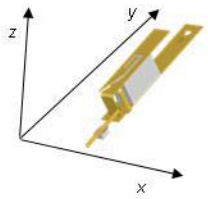
Size	40 x 52 x 6 mm (Antenna, 37 x 4 x 5 mm)
Module Weight	5 g
Packaging	Individually packaged
Cable/Connector	Hirose Electric Co., U.FL-LP-088 or equivalent
Cable Length	450 mm standard (50-500 mm available when specified)

Typical Return Loss:



Antenna Radiation Patterns:

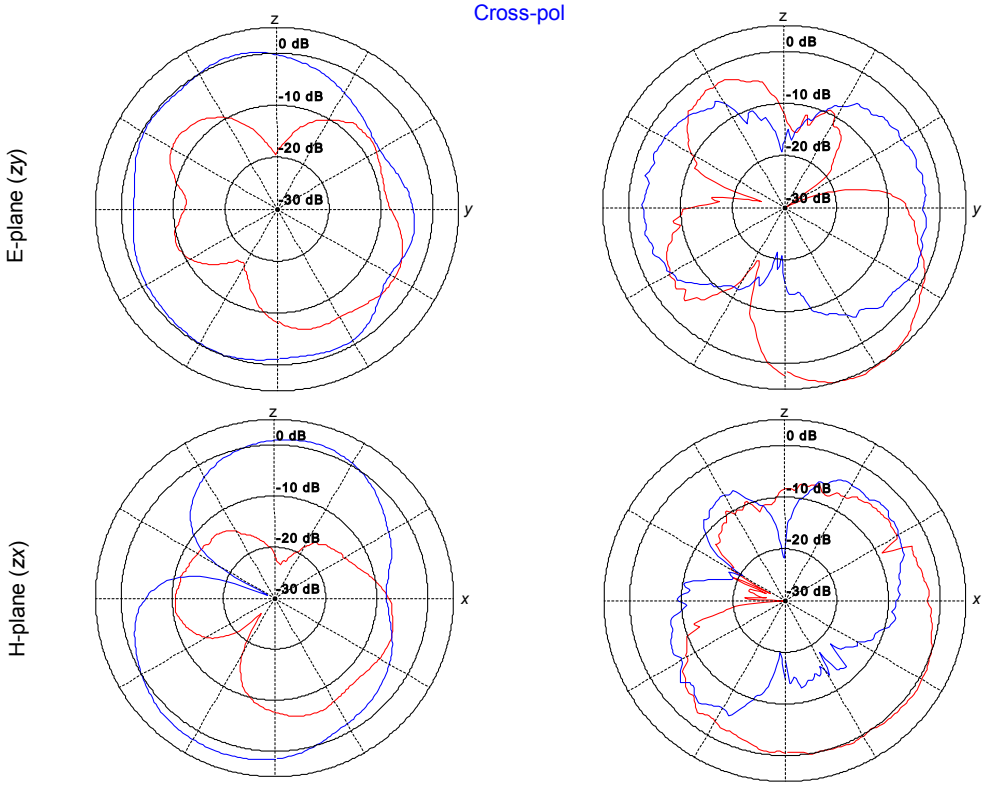
Typical



2.390-2.490 GHz Band

Main-pol
Cross-pol

4.900-5.900 GHz Band



Specifications subject to change without notice.

Regulatory WLAN Antenna Information

	Company Name	Project Code
ODM	Quanta Computer.Inc	ZB1
Antenna	Wistron Neweb Corporation	EBQ-Q1
P/N	Wistron Neweb Corporation	81.EBQ15.010

Antenna Sample / Antenna Data
Requirements for worldwide regulatory approval

Section	Description of Required OEM / ODM Antenna Information	US / IC	EU	Japan	Taiwan	S.Korea
1A	Part Number for Antenna only	Required	Required	Required	Required	Required
1B	Antenna Manufacturer Name	Required	Required	Required	Required	Required
1C	Description of Antenna Type	Required	N/A	N/A	N/A	N/A
1D	Part number of Antenna Assembly / cable impedance, length & diameter.	Required	Desired	Desired	Desired	Desired
1E	Main & Aux antenna (Peak Gain W/ cable loss)	Required	Required	Required	Required	Required
	1E OR 1F, 1G, 1H					
1F	Main & Aux antenna (Peak Gain only)	Required	Required	Required	Required	Required
1G	VSWR of cable including connector	Required	Required	Required	Required	Required
1H	Main & Aux antenna (Cable loss W/ connector)	Required	Required	Required	Required	Required
2	Dimensioned Photographs and Drawings of main & auxiliary antennas	Required	Required	Required	Required	Required
3	Radiation patterns of antennas loaded in the host platform.	Required	Desired	Required	N/A	Required
4	Platform model name / number - correlated to antenna manufacturer and antenna part number	Required	Required	Desired	Required	Desired
5	Photograph(s) or Drawings showing location of antennas in platform. (S. Korea requires photographs of antennas for approval submission). Taiwan requires pictures of each antenna type shown in the system.	Required	Required	Desired	Required (Photos)	Required (Photos)
6	Mech. drawings / photos with dimensions of antenna locations and distance from end-user (For evaluation of SAR testing requirement).	Required	N/A	N/A	N/A	N/A
7	Photograph(s) or Drawings showing the location of all antennas (WLAN, BT, other) and distance between those transmitting antennas. Information will be used to evaluate whether co-location testing is required.	Required	N/A	N/A	N/A	N/A

Antenna Information

Section 1. Antenna Assembly Specifications

Antenna Assembly Summary:

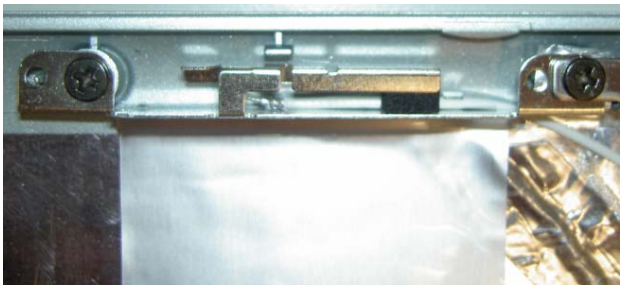
1A Antenna Part Number	1B Manufacture	1C Antenna Type	1D Cable Assembly Part Number and Information	1E Peak Gain W/ Cable loss (dBi)	1F Peak Gain w/o Cable Loss (dBi)	1G VSWR	1H Cable Loss (dBi)
Main Antenna (WNC P/N: 81.EBQ15.010) (customer P/N:)	Wistron Neweb Corporation	PIFA	P/N:1371300B(221)&1371350W(221) 50 ohm Coaxial. length: 350 mm diameter: 1.37 mm Connector: IPEX	2400-2500MHz **6.09** dBi (peak)	2400-2500MHz **7.04** dBi (peak)	2400-2500MHz **2.0** max	2400-2500MHz **0.95** dBi (peak)
				5150-5350MHz **4.11** dBi (peak)	5150-5350MHz **5.57** dBi (peak)	5150-5350MHz **2.5** max	5150-5350MHz **1.46** dBi (peak)
				5470-5725MHz **4.51** dBi (peak)	5470-5725MHz **6.06** dBi (peak)	5470-5725MHz **2.5** max	5470-5725MHz **1.55** dBi (peak)
				5725-5825MHz **2.58** dBi (peak)	5725-5825MHz **4.14** dBi (peak)	5725-5825MHz **2.5** max	5725-5825MHz **1.57** dBi (peak)
AUX Antenna (WNC P/N: 81.EBQ15.010) (customer P/N:)	Wistron Neweb Corporation	PIFA	P/N:1371300B(221)&1371350W(221) 50 ohm Coaxial. length: 300 mm diameter: 1.37 mm Connector: IPEX	2400-2500MHz **4.45** dBi (peak)	2400-2500MHz **5.29** dBi (peak)	2400-2500MHz **2.0** max	2400-2500MHz **0.84** dBi (peak)
				5150-5350MHz **6.10** dBi (peak)	5150-5350MHz **7.39** dBi (peak)	5150-5350MHz **2.5** max	5150-5350MHz **1.29** dBi (peak)
				5470-5725MHz **5.27** dBi (peak)	5470-5725MHz **6.63** dBi (peak)	5470-5725MHz **2.5** max	5470-5725MHz **1.36** dBi (peak)
				5725-5825MHz **4.00** dBi (peak)	5725-5825MHz **5.38** dBi (peak)	5725-5825MHz **2.5** max	5725-5825MHz **1.38** dBi (peak)

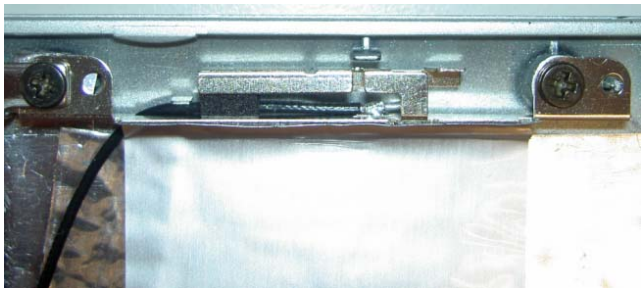
Section 2. Dimensioned Photos or Drawings of Antennas

Include a dimensioned photo and dimensioned drawing of main antenna here.

Main and Aux Antenna Dimensioned Drawing:

Main and Aux Antenna Photo:

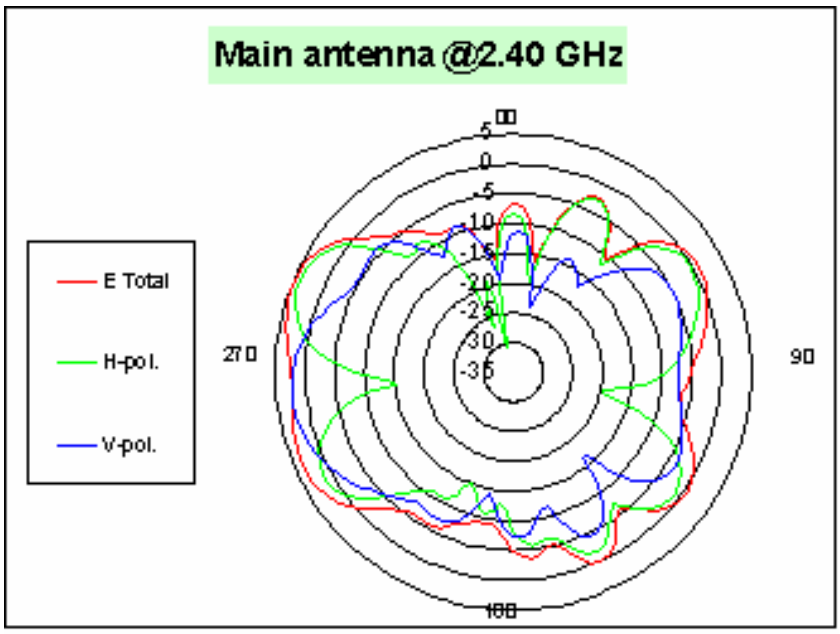




Section 3. Radiation characteristics of antennae Loaded in Host Platform

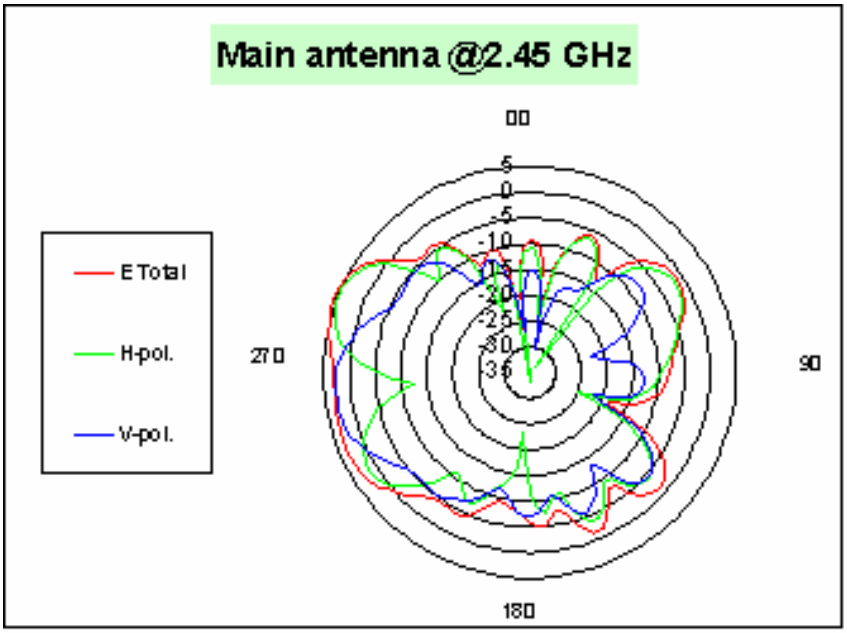
2400-2500MHz radiation characteristic

Main antenna: 2400 MHz



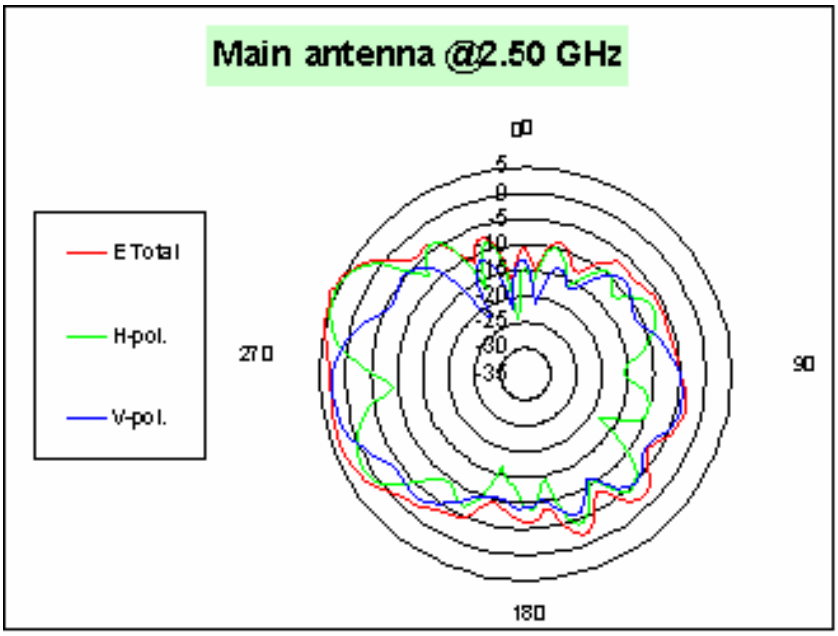
	Total	H-pol	V pol
Peak Gain	4.86	4.10	2.27
Average Gain	-1.91	-4.77	-5.86

Main antenna: 2450 MHz



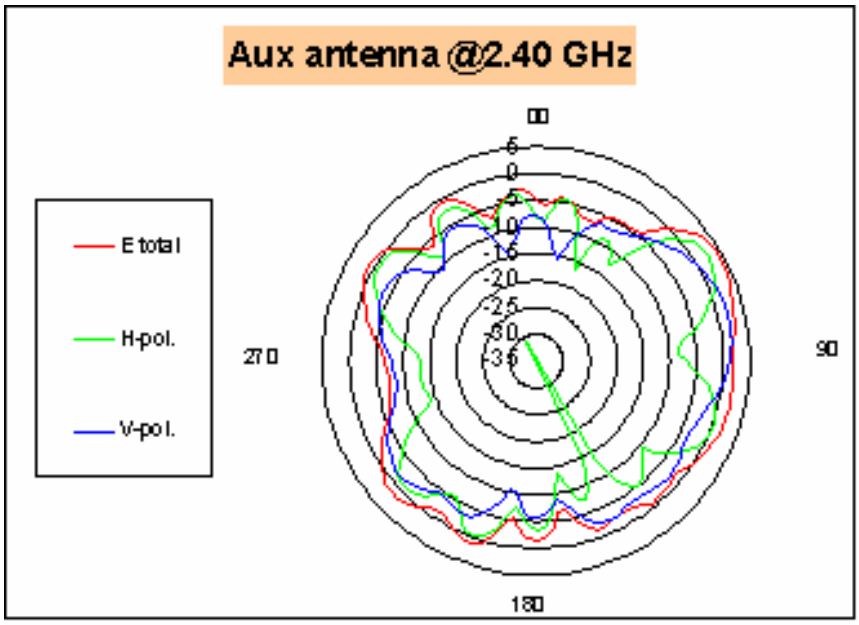
	Total	H-pol	V pol
Peak Gain	5.48	4.99	2.79
Average Gain	-2.84	-5.55	-7.08

Main antenna: 2500 MHz



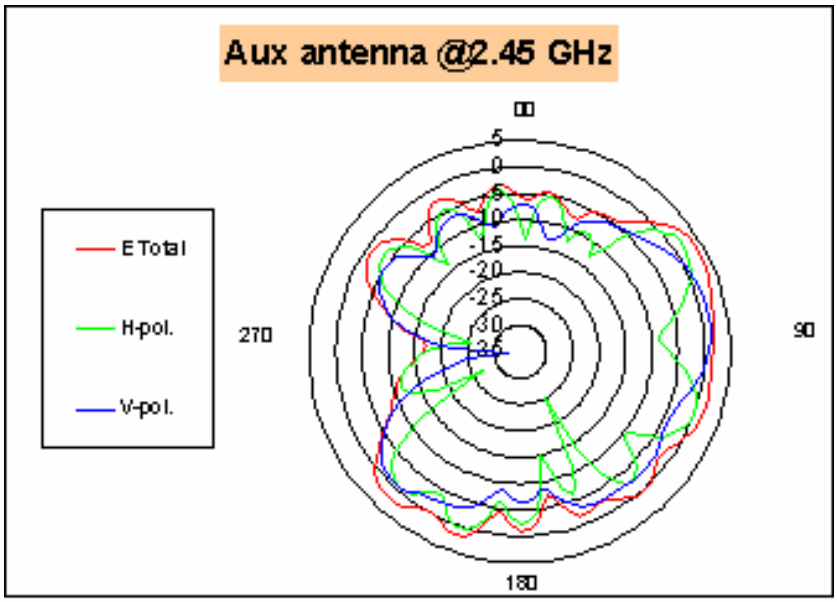
	Total	H-pol	V pol
Peak Gain	6.09	5.36	2.63
Average Gain	-2.68	-6.01	-6.12

Auxiliary antenna: 2400 MHz



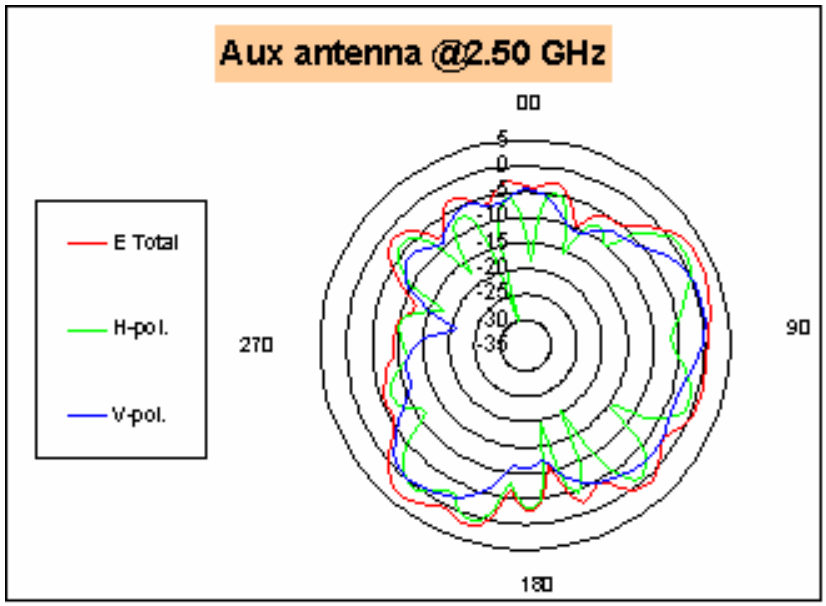
	Total	H-pol	V pol
Peak Gain	4.45	2.56	1.85
Average Gain	-1.16	-4.69	-4.17

Auxiliary antenna: 2450 MHz



	Total	H-pol	V pol
Peak Gain	3.88	1.97	1.62
Average Gain	-1.86	-5.52	-4.74

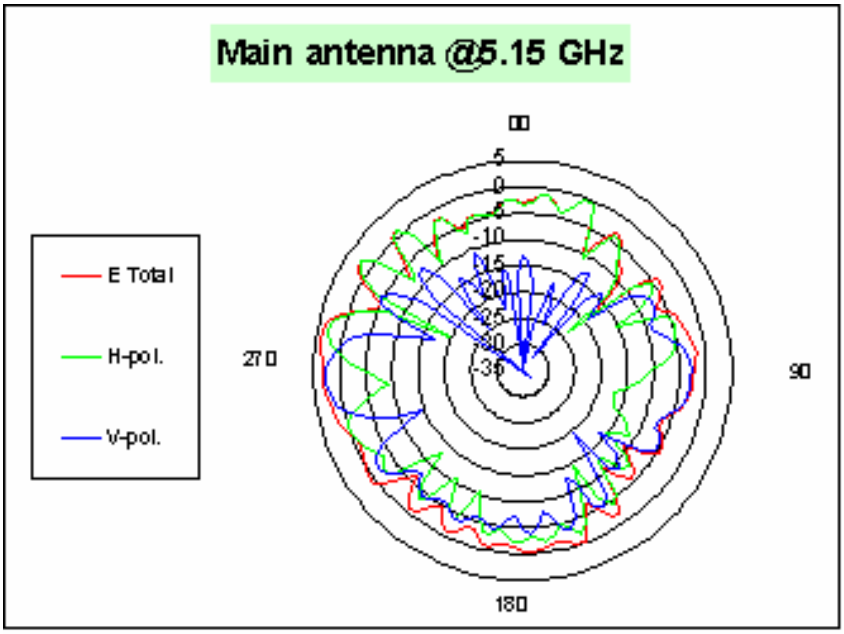
Auxiliary antenna: 2500 MHz



	Total	H-pol	V pol
Peak Gain	3.12	0.93	0.47
Average Gain	-2.21	-5.54	-5.33

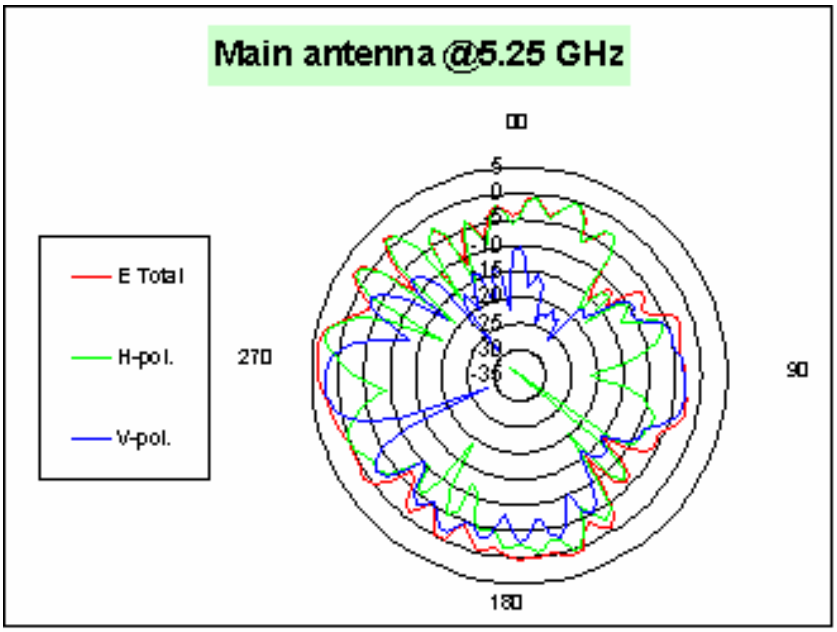
5150-5350 MHz radiation characteristic

Main antenna: 5150 MHz



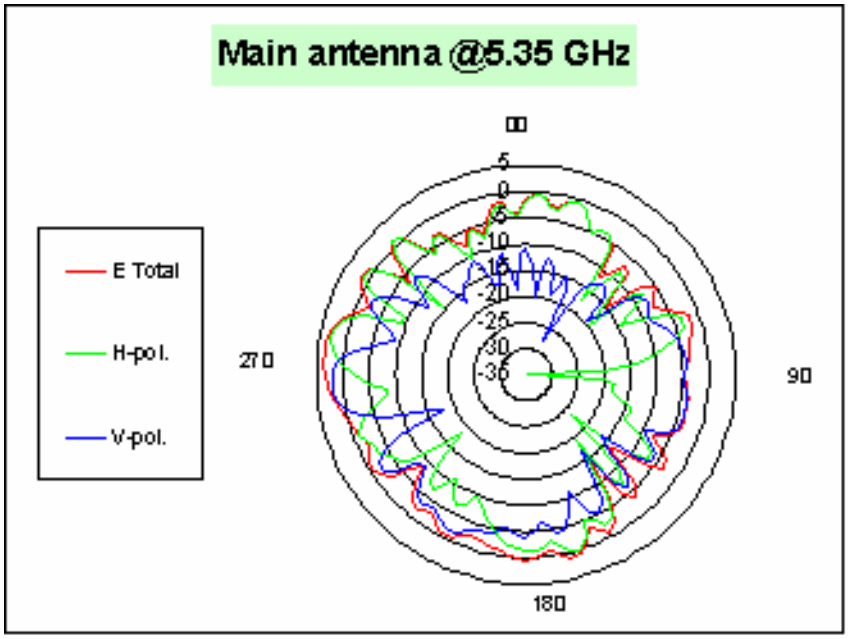
	Total	H-pol	V pol
Peak Gain	4.07	2.89	2.62
Average Gain	-2.23	-4.80	-7.20

Main antenna: 5250 MHz



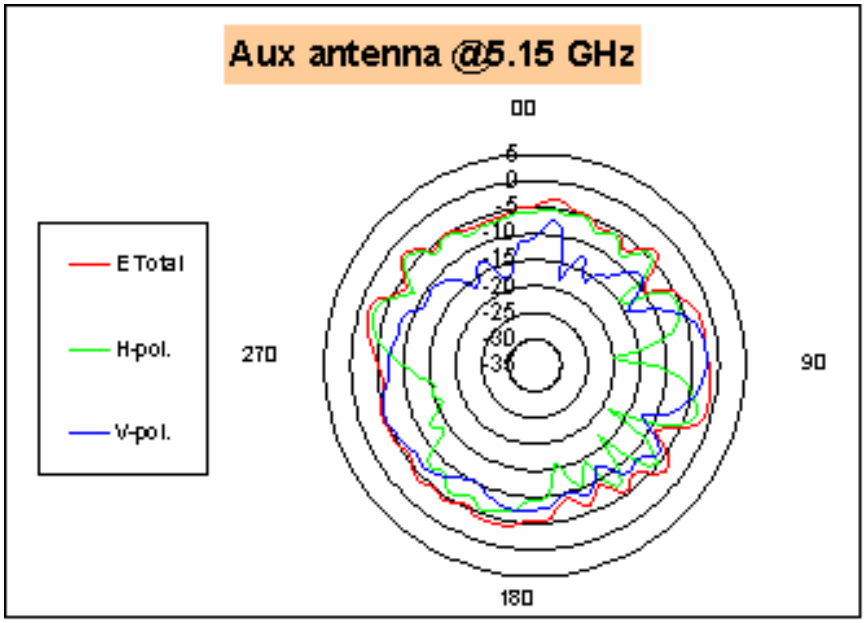
	Total	H-pol	V pol
Peak Gain	4.11	2.93	2.64
Average Gain	-2.24	-4.91	-7.09

Main antenna: 5350 MHz



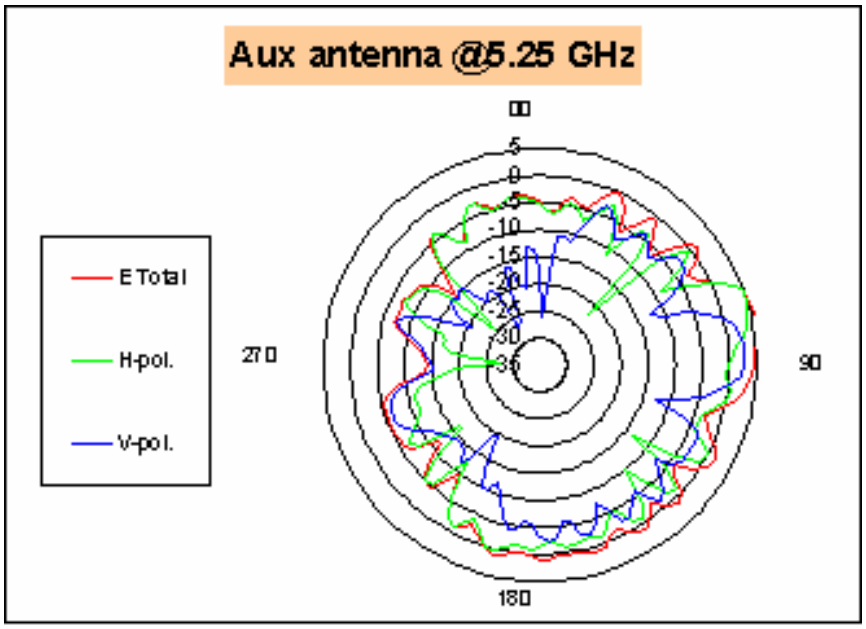
	Total	H-pol	V pol
Peak Gain	3.84	2.90	2.10
Average Gain	-2.30	-5.18	-6.76

Auxiliary antenna: 5150 MHz



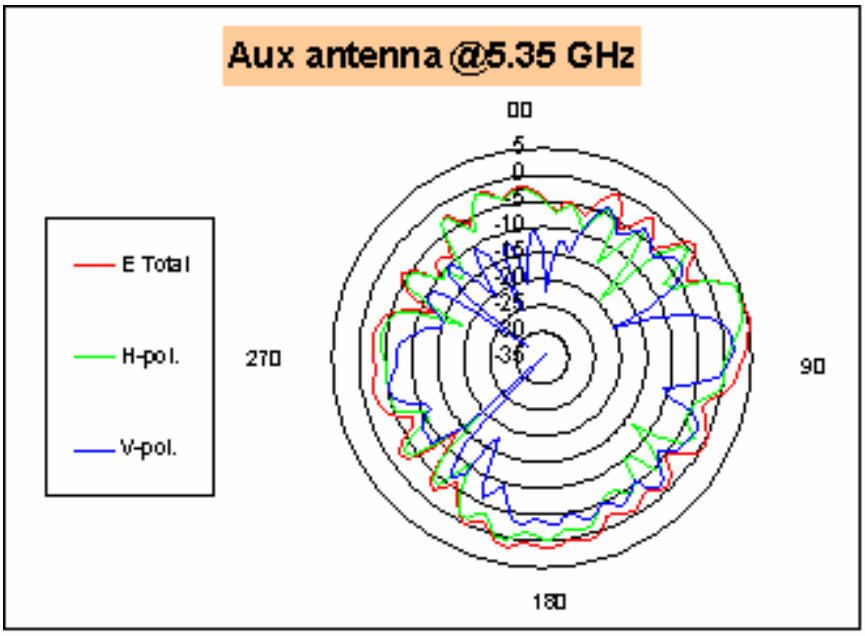
	Total	H-pol	V pol
Peak Gain	-1.18	-2.77	-2.45
Average Gain	-4.69	-7.66	-8.58

Auxiliary antenna: 5250 MHz



	Total	H-pol	V pol
Peak Gain	6.10	4.96	2.79
Average Gain	-2.02	-4.16	-7.00

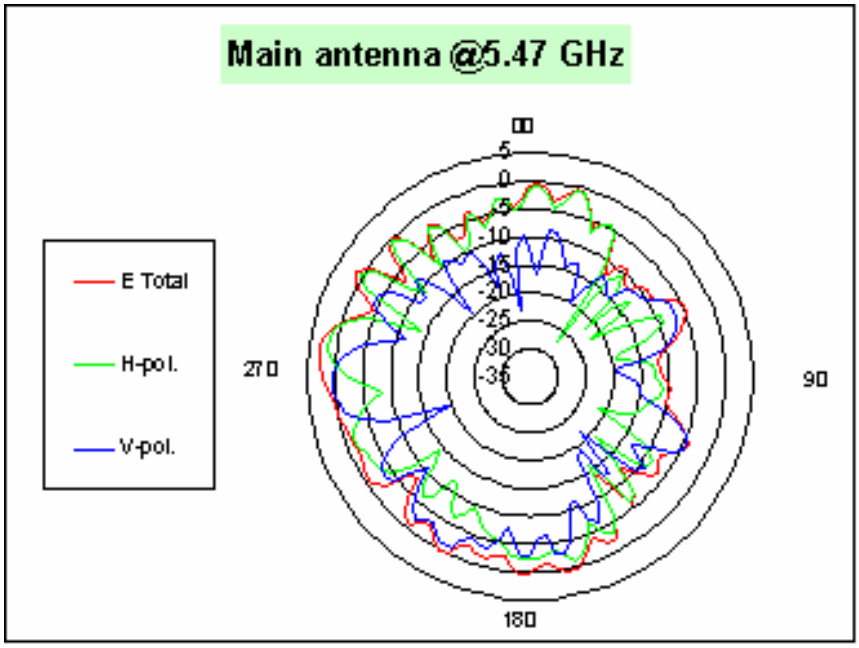
Auxiliary antenna: 5350 MHz



	Total	H-pol	V pol
Peak Gain	5.34	4.45	1.52
Average Gain	-1.72	-3.75	-6.79

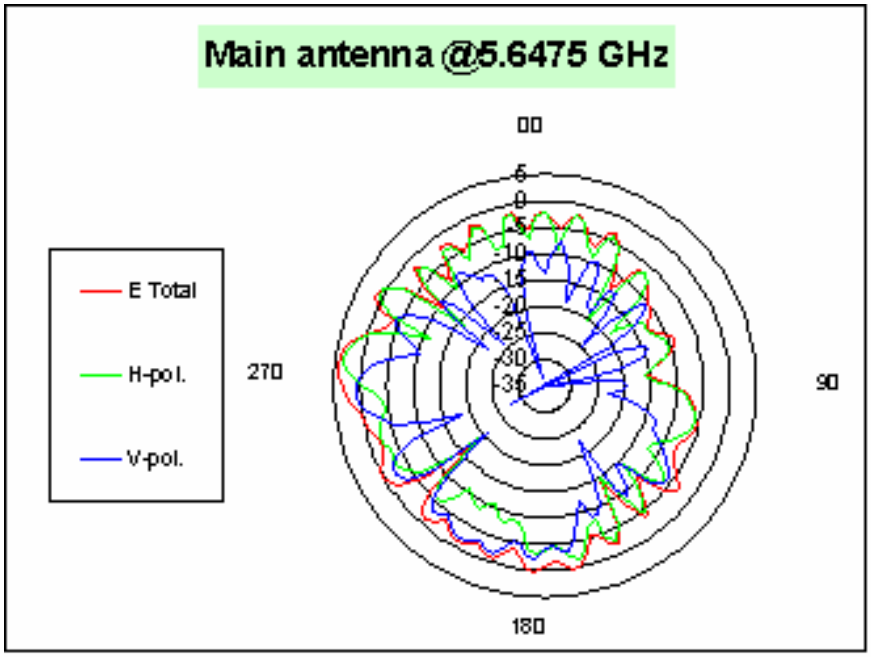
5470-5725MHz radiation characteristic

Main antenna: 5470 MHz



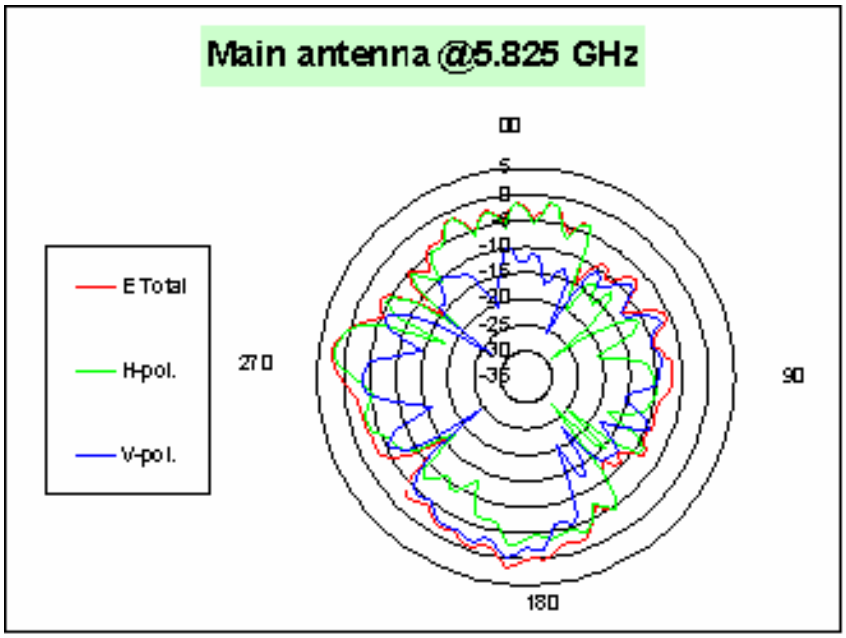
	Total	H-pol	V pol
Peak Gain	3.04	1.65	0.57
Average Gain	-3.30	-5.99	-7.78

Main antenna: 5647.5 MHz



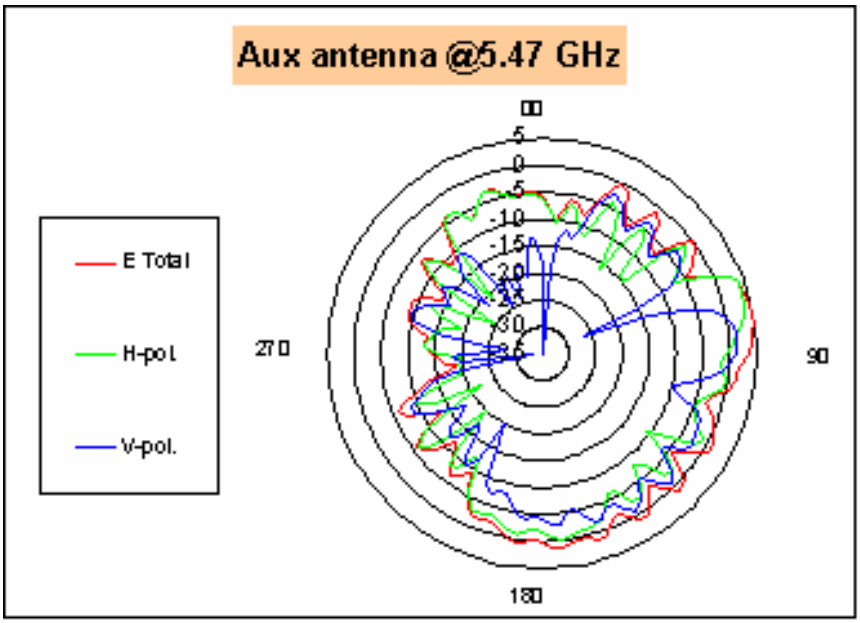
	Total	H-pol	V pol
Peak Gain	4.51	3.48	0.96
Average Gain	-3.49	-5.73	-8.52

Main antenna: 5825 MHz



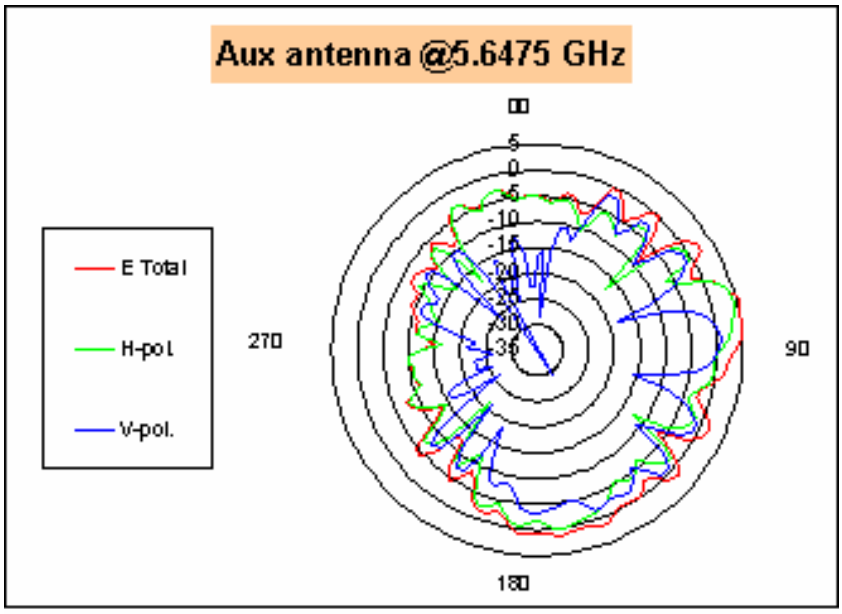
	Total	H-pol	V pol
Peak Gain	2.58	2.00	-0.34
Average Gain	-4.27	-6.88	-8.94

Auxiliary antenna: 5470 MHz



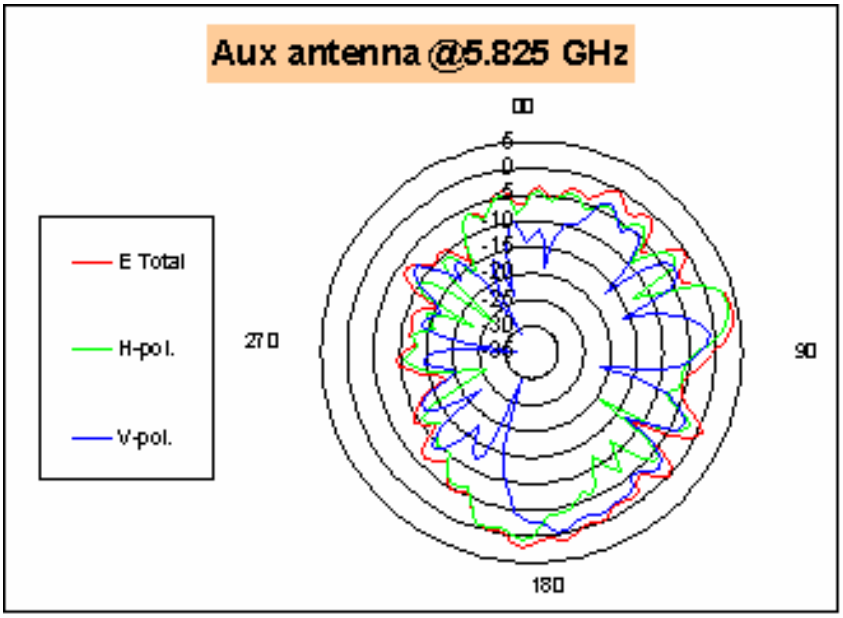
	Total	H-pol	V pol
Peak Gain	5.07	3.90	1.45
Average Gain	-2.97	-5.27	-7.70

Auxiliary antenna: 5647.5 MHz



	Total	H-pol	V pol
Peak Gain	5.27	4.72	0.71
Average Gain	-2.54	-4.57	-7.66

Auxiliary antenna: 5825 MHz



	Total	H-pol	V pol
Peak Gain	4.00	3.58	-0.49
Average Gain	-3.77	-6.21	-8.38

Section 4. Host Platform Information

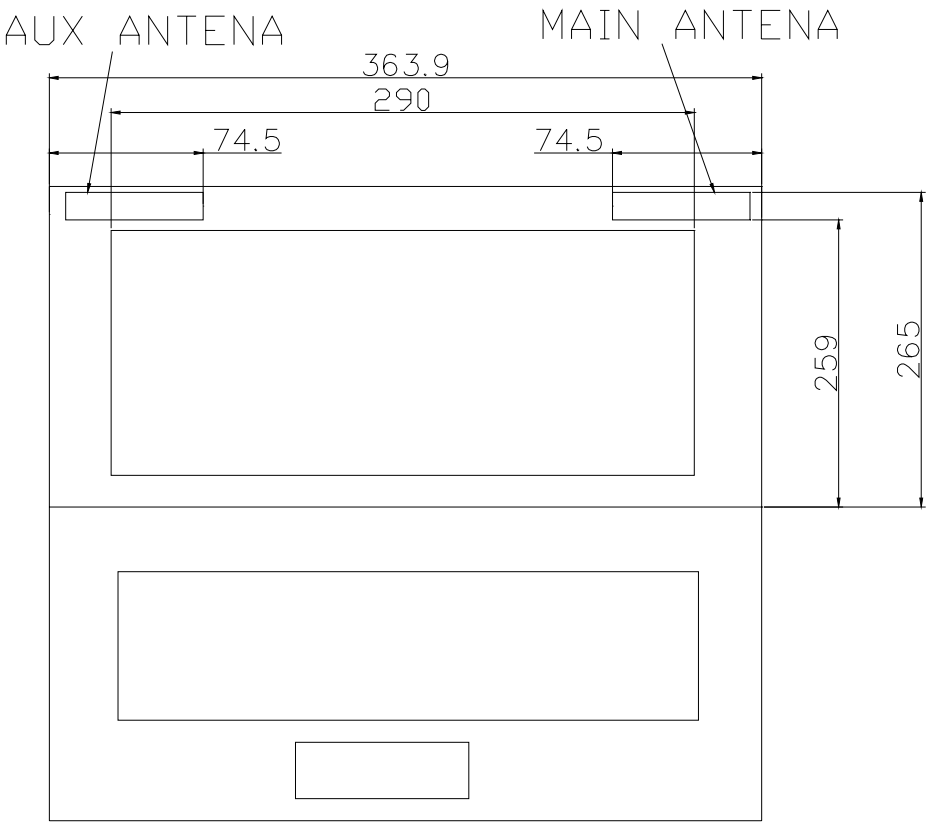
OEM / ODM Host platform: (XXXXXXX) platform correlated to antenna data

Rating Label Photo:

Module Location Photo: (if Singapore required)

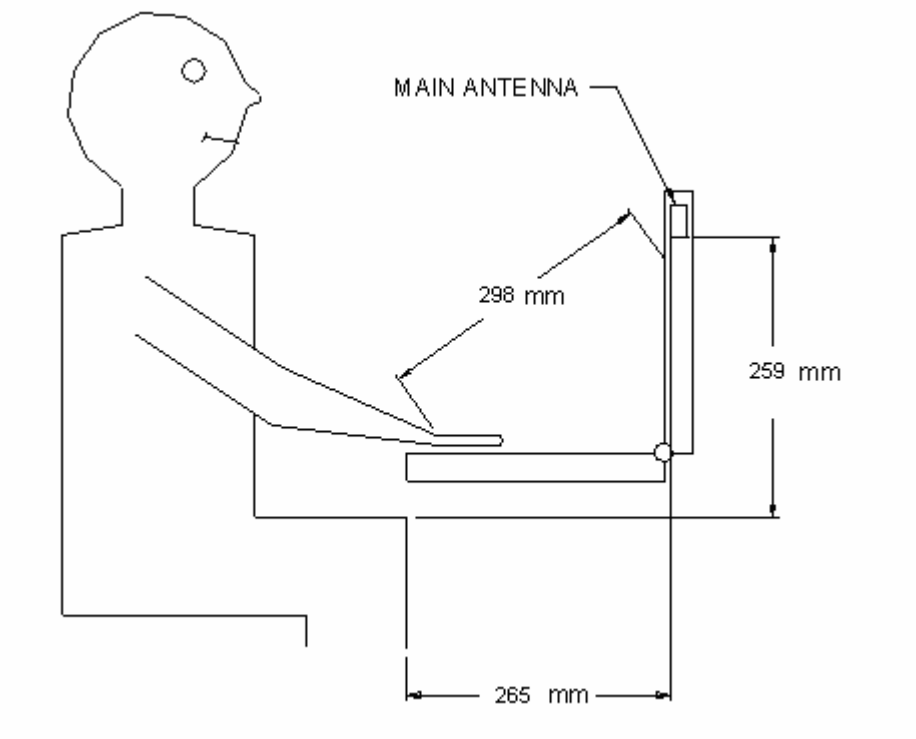
Section 5. Antenna Host Platform Location Information

Include a dimensioned photos or dimensioned drawings of main and auxiliary antenna placements.



Section 6. Antenna dimensional information for SAR evaluation

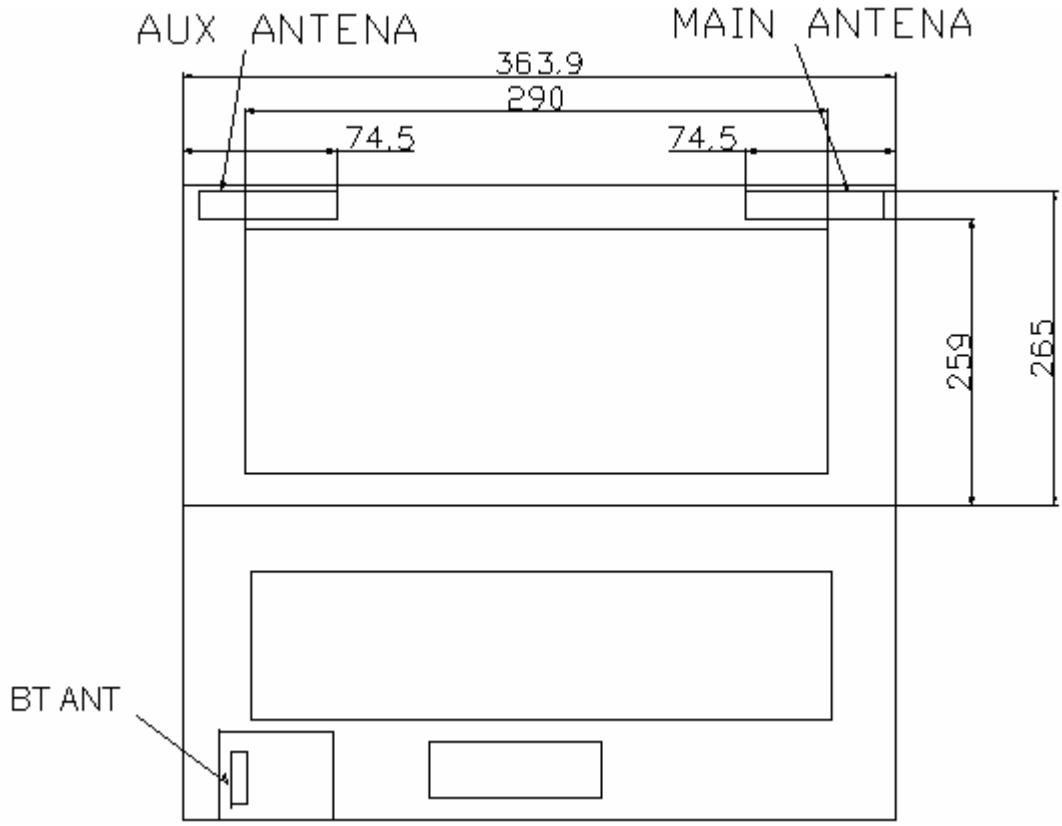
Include a dimensioned photos or dimensioned drawings showing the distance (mm) between the transmit (main) antenna and the user (excluding hands, wrist, feet, and ankle)



Section 7. Diagram Example of Co-Location Antenna Separation

Indicate distance between WLAN module antennas and Bluetooth/other radio antenna element.

(Note: Due to the evolving rules regarding co-location, each platform will need to be reviewed on a case by case basis)



Regulatory WLAN Antenna Information
HTL017

Intel Corporation

Antenna Sample / Antenna Data
Requirements for worldwide regulatory approval

Section	Description of Required OEM / ODM Antenna Information	US / IC	EU	Japan	Taiwan	Korea
1A	Part Number for Antenna only	Required	Required	Required	Required	Required
1B	Antenna Manufacturer Name	Required	Required	Required	Required	Required
1C	Description of Antenna Type	Required	N/A	N/A	N/A	N/A
1D	Part number of Antenna Assembly / cable impedance, length & diameter.	Required	Desired	Desired	Desired	Desired
1E	Main & Aux antenna (Peak Gain W/ cable loss)	Required	Required	Required	Required	Required
	1E OR 1F, 1G, 1H					
1F	Main & Aux antenna (Peak Gain only)	Required	Required	Required	Required	Required
1G	VSWR of cable including connector	Required	Required	Required	Required	Required
1H	Main & Aux antenna (Cable loss W/ connector)	Required	Required	Required	Required	Required
2	Dimensioned Photographs or Drawings of main & auxiliary antennas	Required	Required	Required	Required	Required
3	Radiation patterns of antennas loaded in the host platform.	Required	Desired	Required	N/A	Required
4	Platform model name / number - correlated to antenna manufacturer and antenna part number	Required	Required	Desired	Required	Desired
5	Photograph(s) or Drawings showing location of antennas in platform.	Required	Required	Desired	Required	Desired
6	Mech. drawings / photos with dimensions of antenna locations and distance from end-user (For evaluation of SAR testing requirement).	Required	N/A	N/A	N/A	N/A
7	Photograph(s) or Drawings showing the location of all antennas (WLAN, BT, other) and distance between those transmitting antennas. Information will be used to evaluate whether co-location testing is required.	Required	N/A	N/A	N/A	N/A

Antenna Information

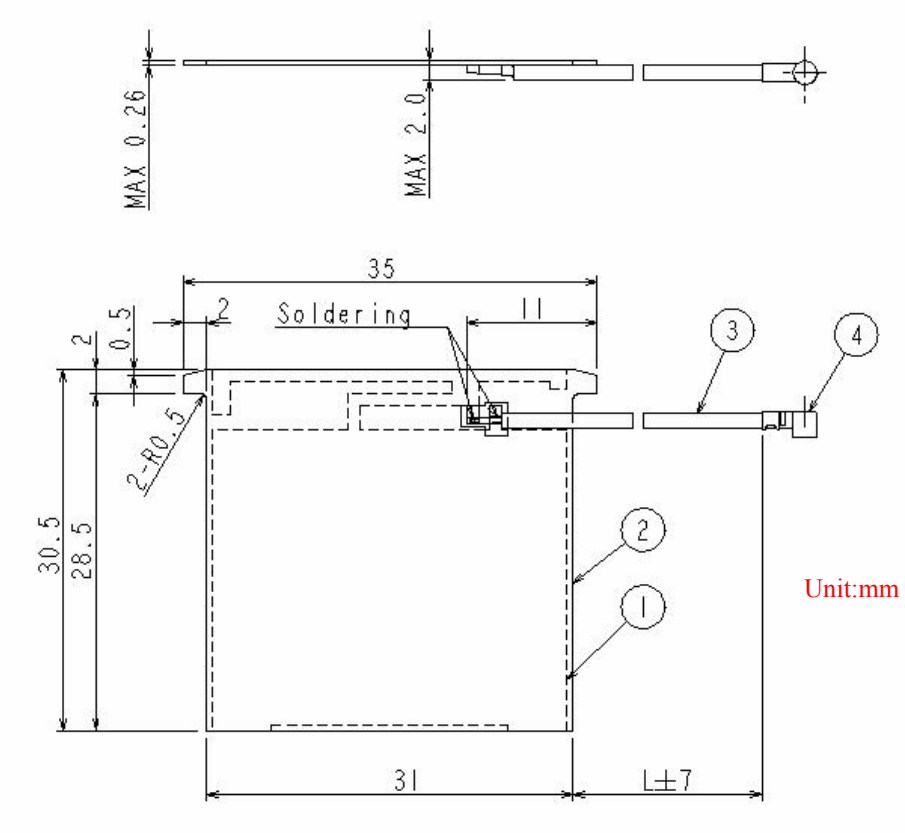
Section 1. Antenna Assembly Specifications

Antenna Assembly Summary:

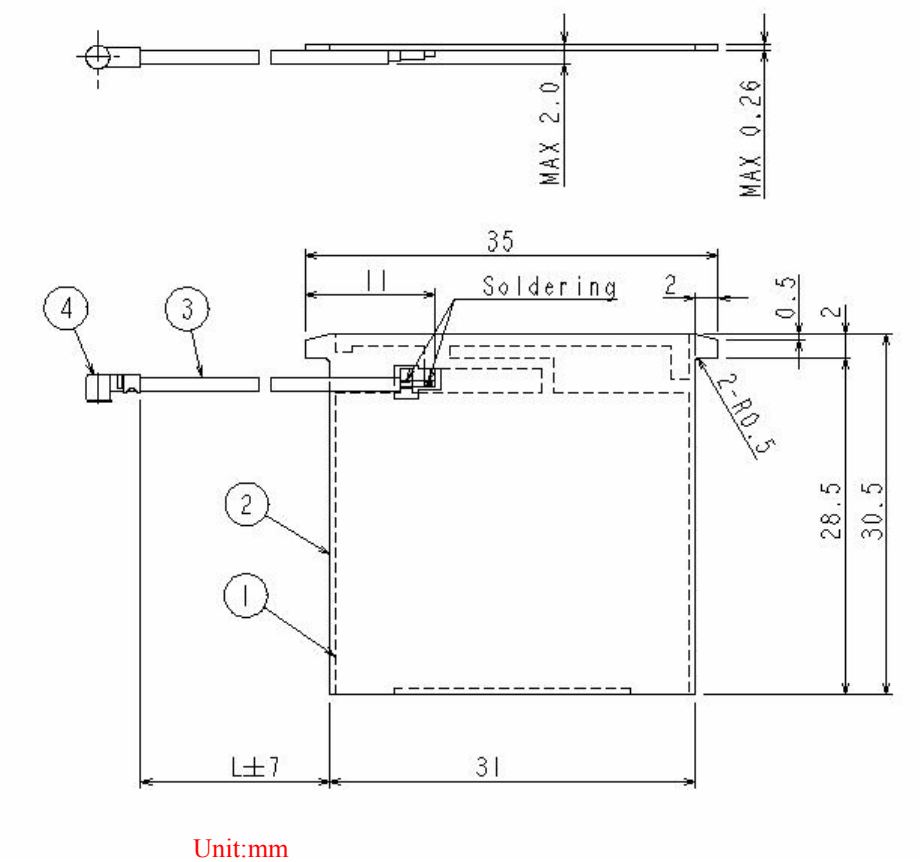
1A Antenna Part Number	1B Manufacture	1C Antenna Type	1D Cable Assembly Part Number and Information	1E Peak Gain W/ Cable loss (dBi)	1F Peak Gain w/o Cable Loss (dBi)	1G VSWR	1H Cable Loss (dBi)
HTL017	Hitachi Cable, Ltd.	2.4GHzPIFA 5GHz:PIFA	P/N: HTL017 50 ohm Coaxial. length: 306mm diameter: 1.0mm Connector: IPEX	2400-2500MHz -1.36 dBi (peak)	2400-2500MHz -0.50 dBi (peak)	2400-2500MHz 1.30 max	2400-2500MHz 0.86 dBi (peak)
				5150-5350MHz 1.00 dBi (peak)	5150-5350MHz 2.26 dBi (peak)	5150-5350MHz 1.30 max	5150-5350MHz 1.26 dBi (peak)
				5470-5725MHz 2.92 dBi (peak)	5470-5725MHz 4.18 dBi (peak)	5470-5725MHz 1.30 max	5470-5725MHz 1.26 dBi (peak)
				5725-5850MHz 1.97 dBi (peak)	5725-5850MHz 3.23 dBi (peak)	5725-5850MHz 1.30 max	5725-5850MHz 1.26 dBi (peak)
HTL017	Hitachi Cable, Ltd.	2.4GHz:PIFA 5GHzPIFA	P/N: HTL017 50 ohm Coaxial. length: 306mm diameter: 1.0mm Connector: IPEX	2400-2500MHz -1.27 dBi (peak)	2400-2500MHz -0.41 dBi (peak)	2400-2500MHz 1.30 max	2400-2500MHz 0.86 dBi (peak)
				5150-5350MHz -0.74 dBi (peak)	5150-5350MHz 0.52 dBi (peak)	5150-5350MHz 1.30 max	5150-5350MHz 1.26 dBi (peak)
				5470-5725MHz -0.36 dBi (peak)	5470-5725MHz 0.90 dBi (peak)	5470-5725MHz 1.30 max	5470-5725MHz 1.26 dBi (peak)
				5725-5850MHz -0.21 dBi (peak)	5725-5850MHz 1.05 dBi (peak)	5725-5850MHz 1.30 max	5725-5850MHz 1.26 dBi (peak)

Section 2. Dimensioned Photos or Drawings of Antennas

Include a dimensioned photo or dimensioned drawing of main antenna here.



Include a dimensioned photo or dimensioned drawing of aux antenna here.



Unit:mm

Section 3. Radiation characteristics of antennae Loaded in Host Platform

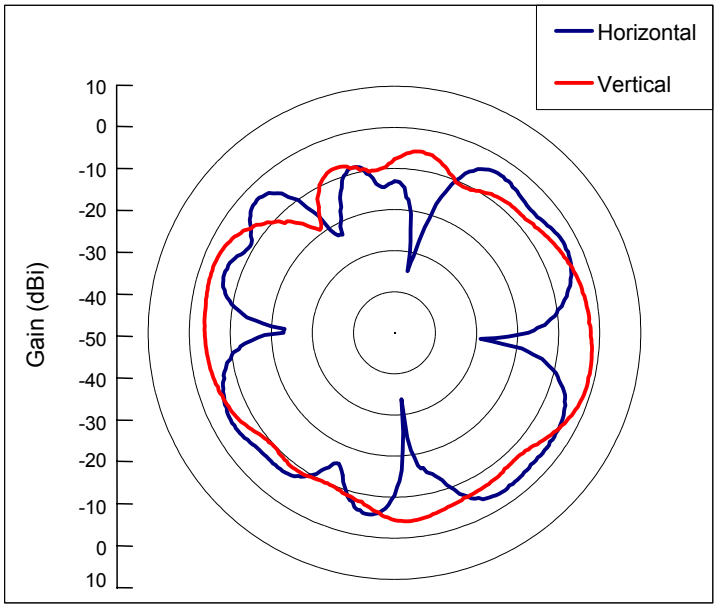
2400-2500MHz radiation characteristic

Main antenna: 2400 MHz

<Average Gain>

	Horizontal	Vertical
AVG	−9.50	−6.58
MAX	−3.19	−1.36

(dBi)



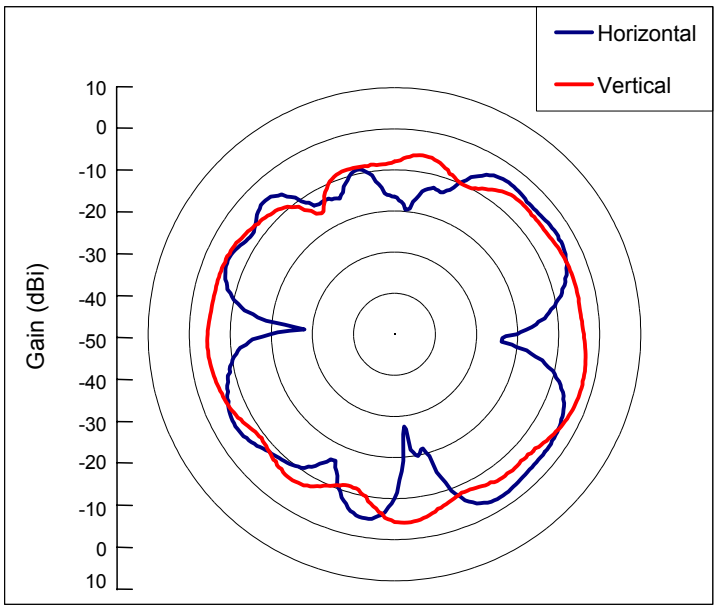
Center Frequency	2400 MHz
Horizontal (dBi) peak	-3.19
Vertical (dBi) peak	-1.36
Horz+Vert (dBi) peak	-1.36

Main antenna: 2450 MHz

<Average Gain>

	Horizontal	Vertical
AVG	−9.45	−6.59
MAX	−2.66	−2.56

(dBi)



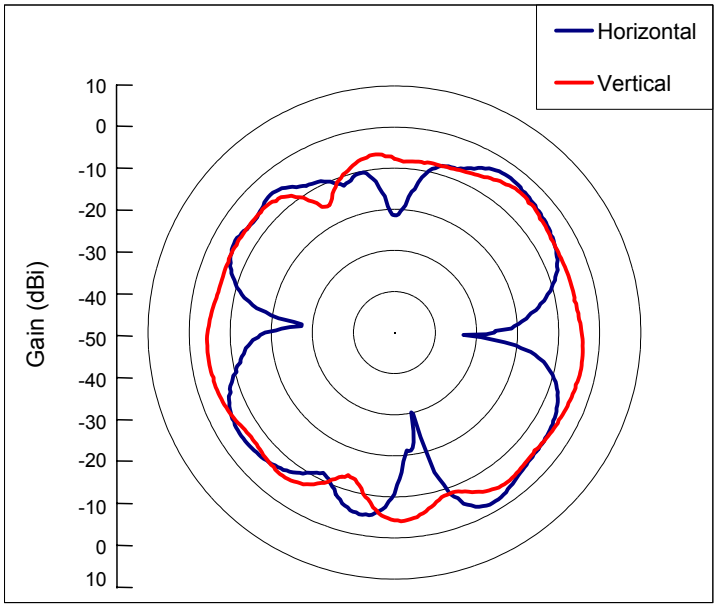
Center Frequency	2450 MHz
Horizontal (dBi) peak	-2.66
Vertical (dBi) peak	-2.56
Horz+Vert (dBi) peak	-2.56

Main antenna: 2500 MHz

<Average Gain>

	Horizontal	Vertical
AVG	−9.51	−6.38
MAX	−2.12	−3.72

(dBi)



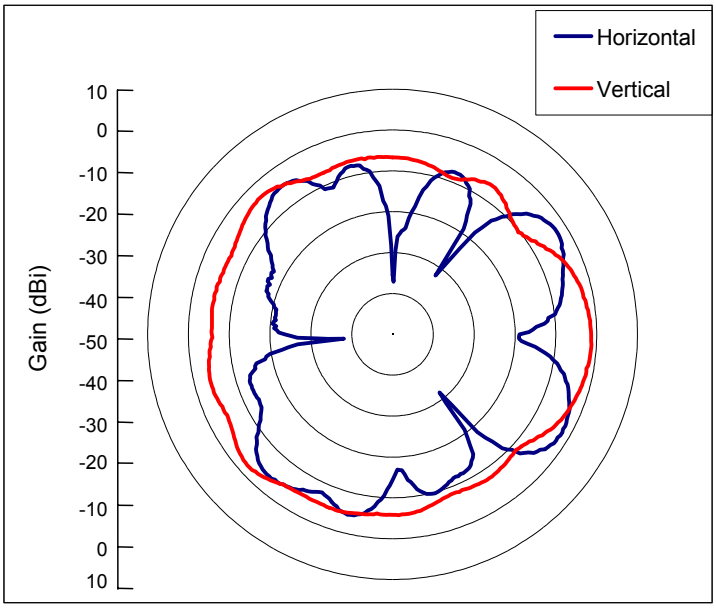
Center Frequency	**2500 MHz**
Horizontal (dBi) peak	**-2.12**
Vertical (dBi) peak	**-3.72**
Horz+Vert (dBi) peak	**-2.12**

Auxiliary antenna: 2400 MHz

<Average Gain>

	Horizontal	Vertical
AVG	-11.37	-5.53
MAX	-2.03	-1.27

(dBi)



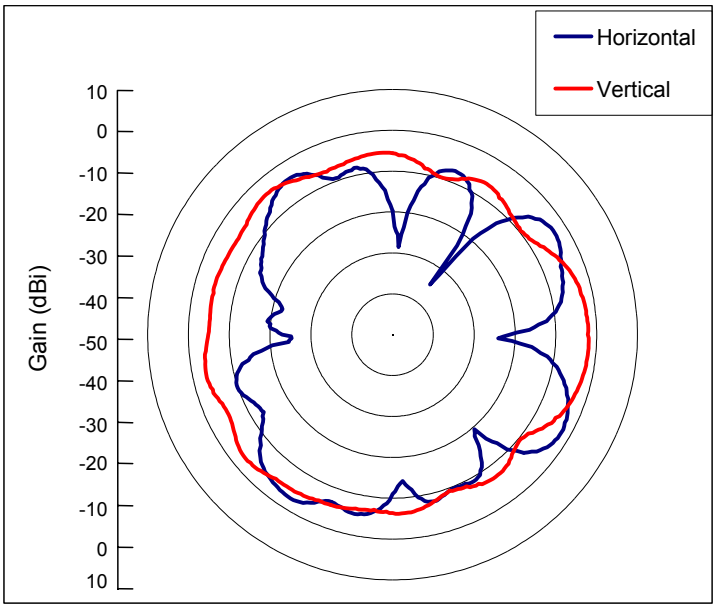
Center Frequency	2400 MHz
Horizontal (dBi) peak	-2.03
Vertical (dBi) peak	-1.27
Horz+Vert (dBi) peak	-1.27

Auxiliary antenna: 2450 MHz

<Average Gain>

	Horizontal	Vertical
AVG	−10.36	−5.73
MAX	−2.22	−1.93

(dBi)



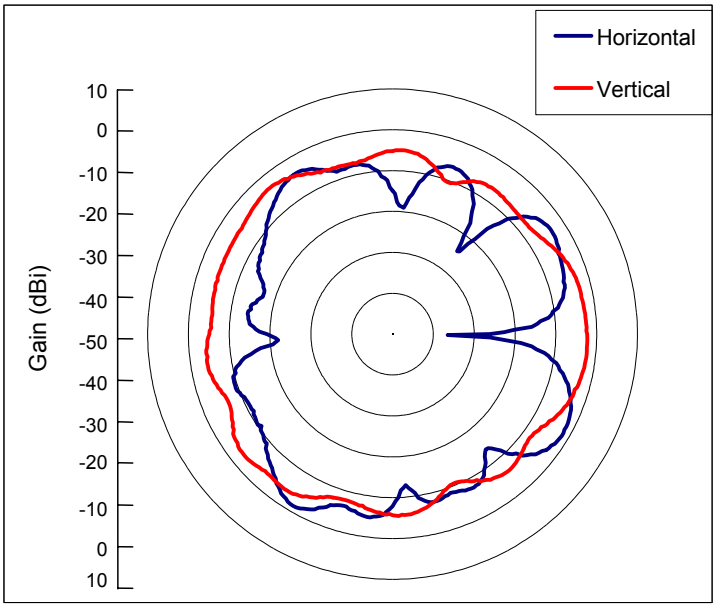
Center Frequency	2450 MHz
Horizontal (dBi) peak	-2.22
Vertical (dBi) peak	-1.93
Horz+Vert (dBi) peak	-1.93

Auxiliary antenna: 2500 MHz

<Average Gain>

	Horizontal	Vertical
AVG	−9.34	−5.66
MAX	−1.50	−2.26

(dBi)



Center Frequency	2500 MHz
Horizontal (dBi) peak	-1.50
Vertical (dBi) peak	-2.26
Horz+Vert (dBi) peak	-1.50

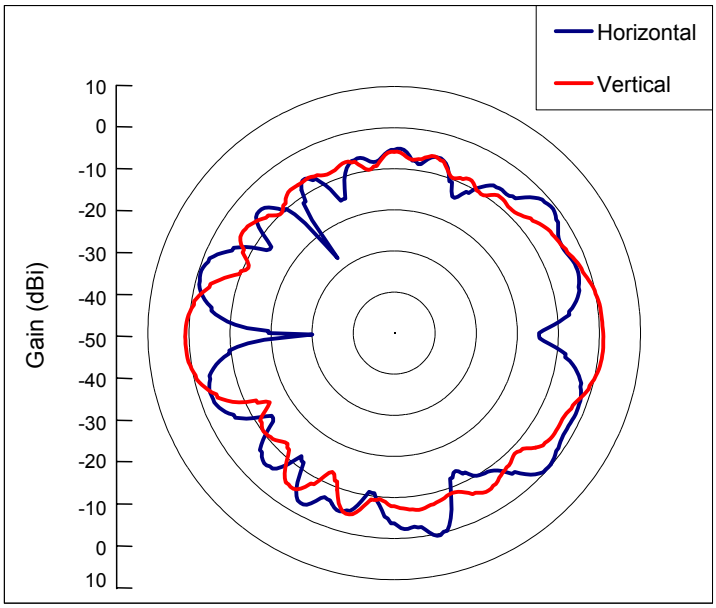
5150-5350 MHz radiation characteristic

Main antenna: 5150 MHz

<Average Gain>

	Horizontal	Vertical
AVG	-6.64	-6.01
MAX	0.43	1.00

(dBi)



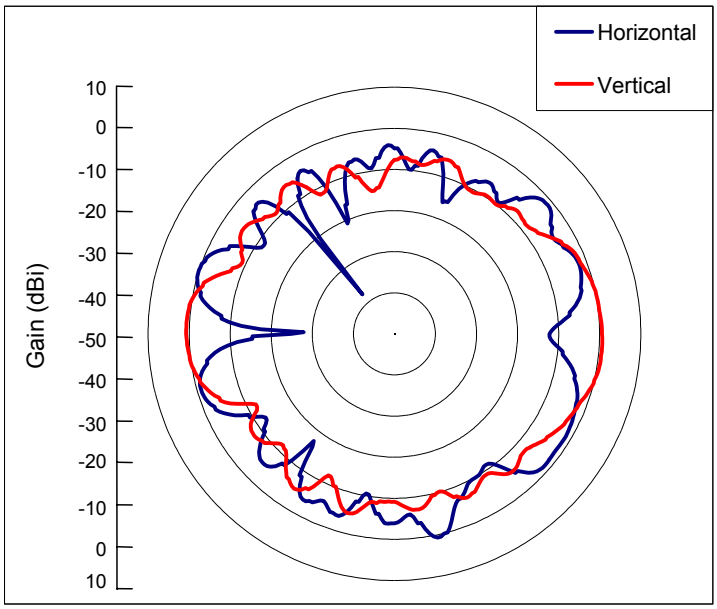
Center Frequency	5150 MHz
Horizontal (dBi) peak	0.43
Vertical (dBi) peak	1.00
Horz+Vert (dBi) peak	1.00

Main antenna: 5250 MHz

<Average Gain>

	Horizontal	Vertical
AVG	-6.42	-6.11
MAX	0.67	0.73

(dBi)

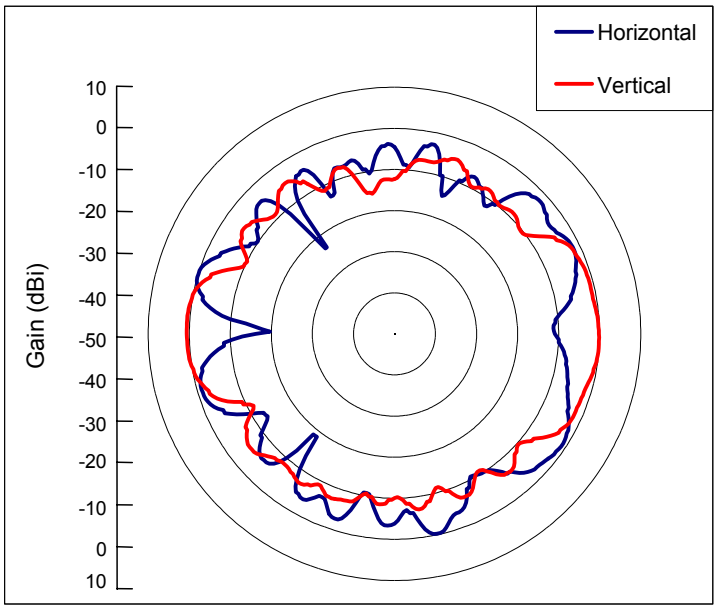


Center Frequency	5250 MHz
Horizontal (dBi) peak	0.67
Vertical (dBi) peak	0.73
Horz+Vert (dBi) peak	0.73

Main antenna: 5350 MHz

<Average Gain>

	Horizontal	Vertical
AVG	−6.31	−6.27
MAX	−0.02	0.62 (dBi)



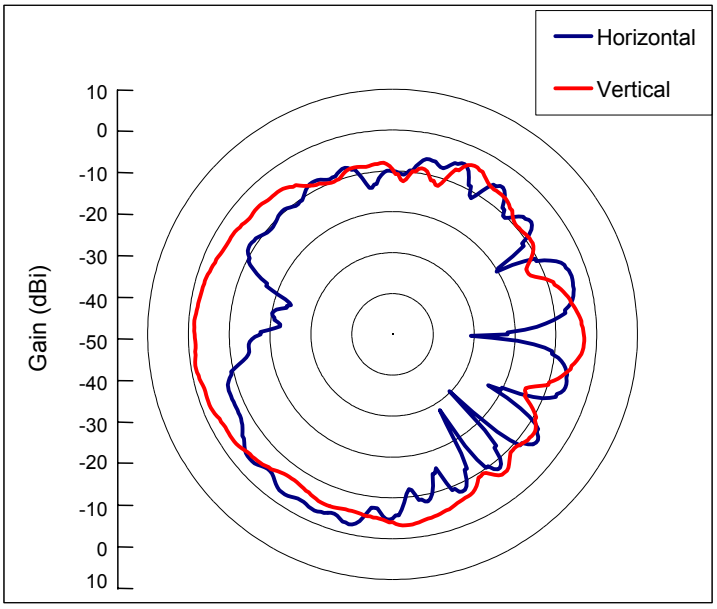
Center Frequency	5350 MHz
Horizontal (dBi) peak	-0.02
Vertical (dBi) peak	0.62
Horz+Vert (dBi) peak	0.62

Auxiliary antenna: 5150 MHz

<Average Gain>

	Horizontal	Vertical
AVG	-9.74	-6.26
MAX	-2.35	-1.12

(dBi)



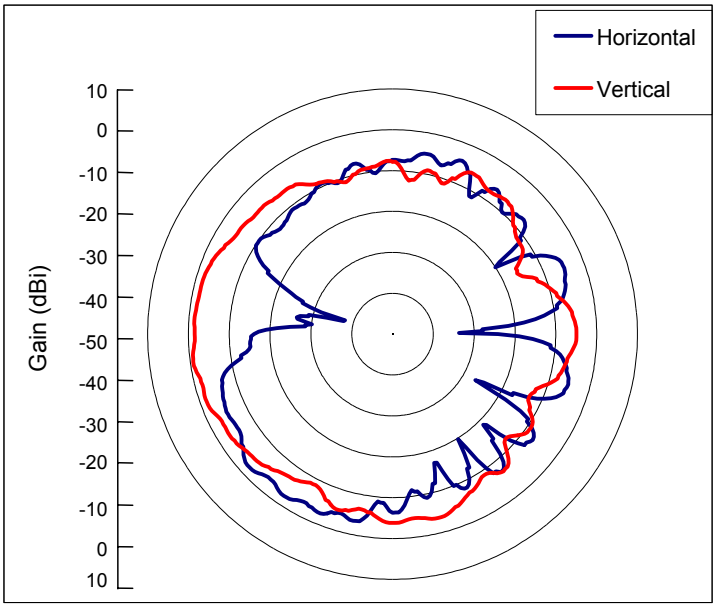
Center Frequency	5150 MHz
Horizontal (dBi) peak	-2.35
Vertical (dBi) peak	-1.12
Horz+Vert (dBi) peak	-1.12

Auxiliary antenna: 5250 MHz

<Average Gain>

	Horizontal	Vertical
AVG	−10.18	−6.81
MAX	−2.18	−0.74

(dBi)



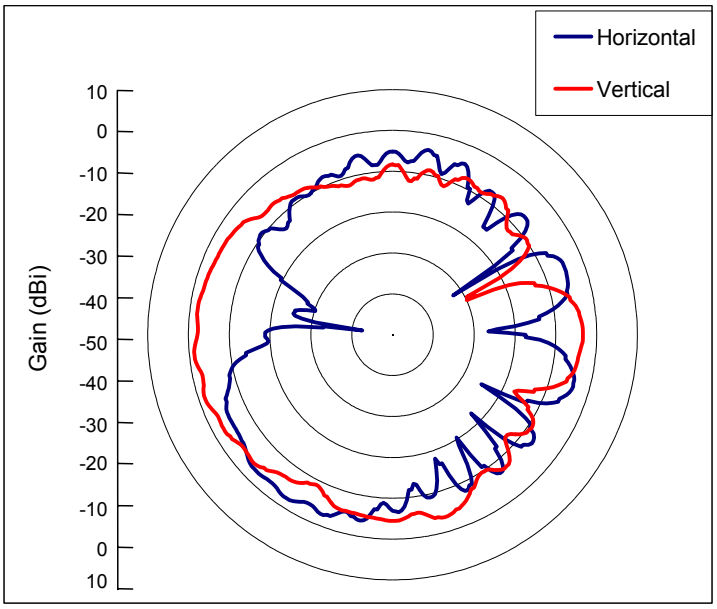
Center Frequency	5250 MHz
Horizontal (dBi) peak	-2.18
Vertical (dBi) peak	-0.74
Horz+Vert (dBi) peak	-0.74

Auxiliary antenna: 5350 MHz

<Average Gain>

	Horizontal	Vertical
AVG	−10.14	−7.18
MAX	−2.32	−1.23

(dBi)



Center Frequency	5350 MHz
Horizontal (dBi) peak	-2.32
Vertical (dBi) peak	-1.23
Horz+Vert (dBi) peak	-1.23

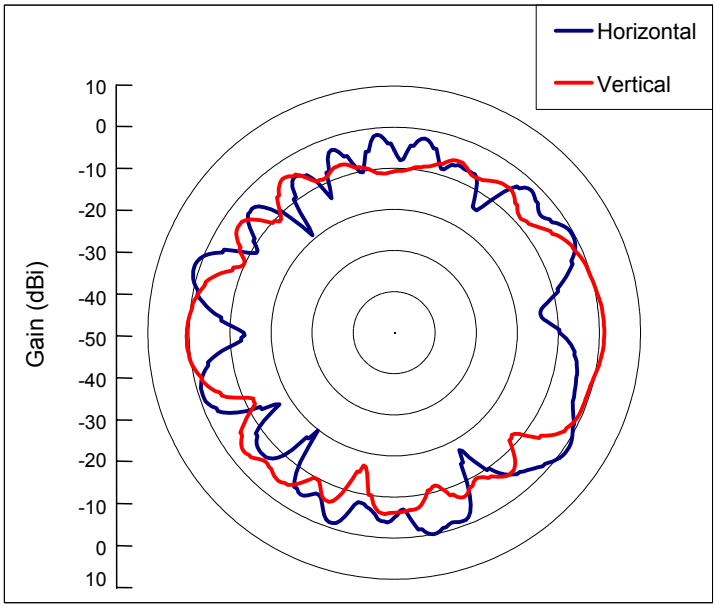
5470-5725MHz radiation characteristic

Main antenna: 5470 MHz

<Average Gain>

	Horizontal	Vertical
AVG	-5.82	-5.66
MAX	1.25	1.20

(dBi)



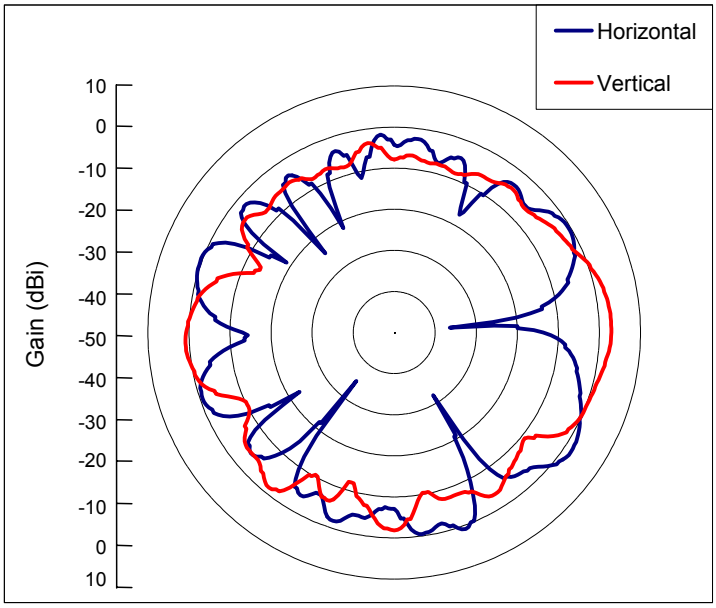
Center Frequency	5470 MHz
Horizontal (dBi) peak	1.25
Vertical (dBi) peak	1.20
Horz+Vert (dBi) peak	1.20

Main antenna: 5597.5 MHz

<Average Gain>

	Horizontal	Vertical
AVG	-5.97	-4.76
MAX	1.93	2.92

(dBi)



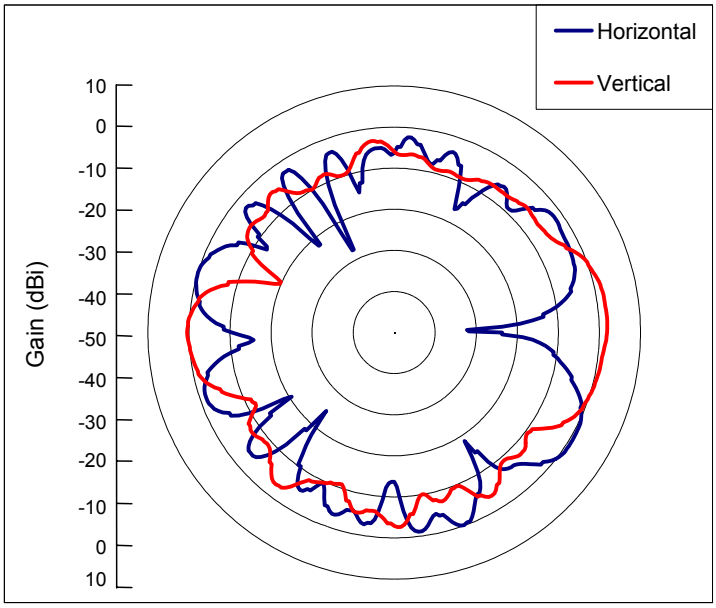
Center Frequency	5597.5 MHz
Horizontal (dBi) peak	1.93
Vertical (dBi) peak	2.92
Horz+Vert (dBi) peak	2.92

Main antenna: 5725 MHz

<Average Gain>

	Horizontal	Vertical
AVG	-6.79	-5.72
MAX	0.70	1.97

(dBi)



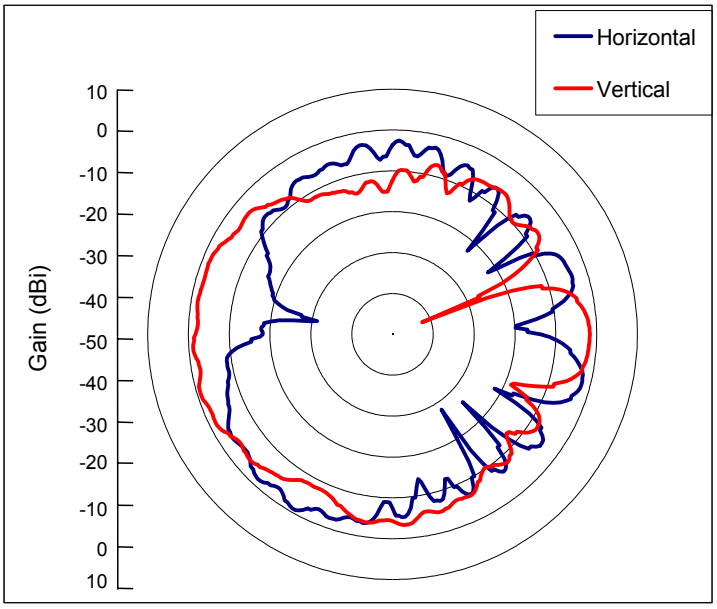
Center Frequency	5725 MHz
Horizontal (dBi) peak	0.70
Vertical (dBi) peak	1.97
Horz+Vert (dBi) peak	1.97

Auxiliary antenna: 5470 MHz

<Average Gain>

	Horizontal	Vertical
AVG	-8.52	-7.00
MAX	-0.86	-0.82

(dBi)



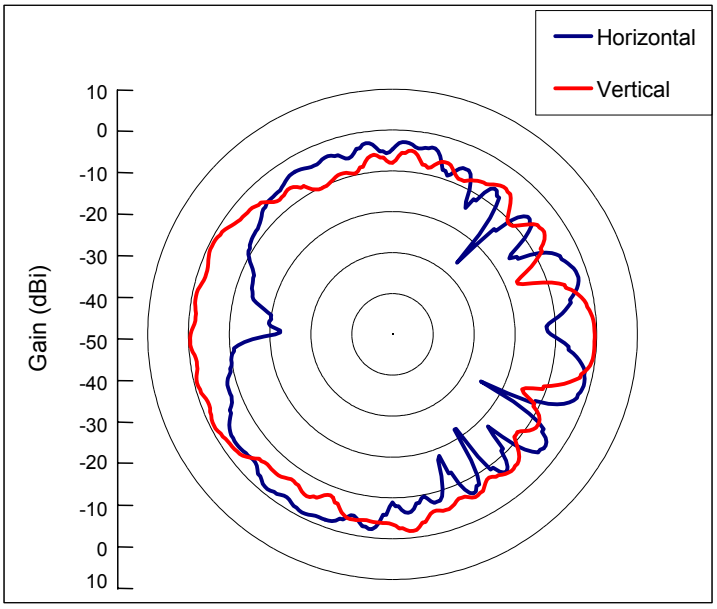
Center Frequency	5470 MHz
Horizontal (dBi) peak	-0.86
Vertical (dBi) peak	-0.82
Horz+Vert (dBi) peak	-0.82

Auxiliary antenna: 5597.5 MHz

<Average Gain>

	Horizontal	Vertical
AVG	-7.47	-5.40
MAX	-1.16	-0.42

(dBi)



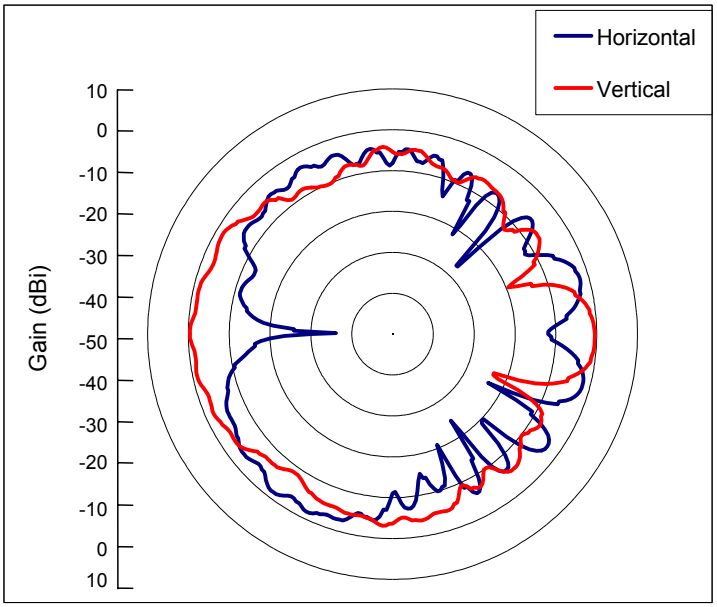
Center Frequency	5597.5 MHz
Horizontal (dBi) peak	-1.16
Vertical (dBi) peak	-0.42
Horz+Vert (dBi) peak	-0.42

Auxiliary antenna: 5725 MHz

<Average Gain>

	Horizontal	Vertical
AVG	−8.06	−6.01
MAX	−1.56	−0.36

(dBi)



Center Frequency	5725 MHz
Horizontal (dBi) peak	-1.56
Vertical (dBi) peak	-0.36
Horz+Vert (dBi) peak	-0.36

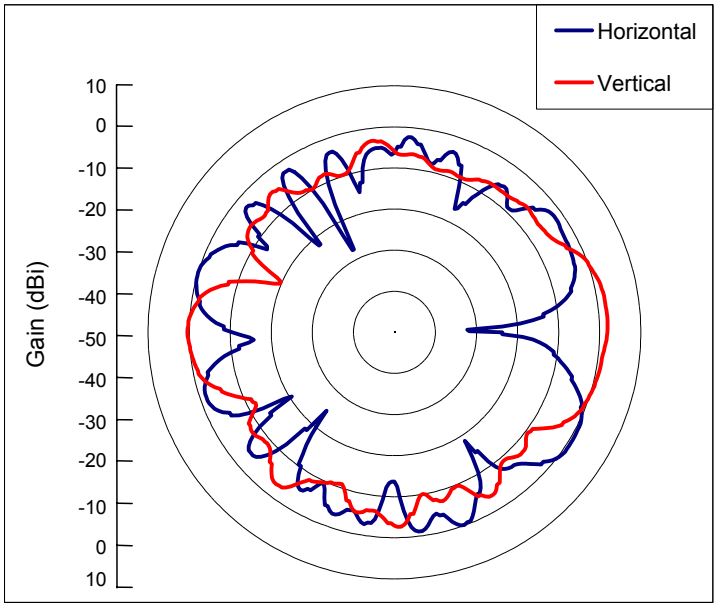
5725-5850 MHz radiation characteristic

Main antenna: 5725 MHz

<Average Gain>

	Horizontal	Vertical
AVG	-6.79	-5.72
MAX	0.70	1.97

(dBi)



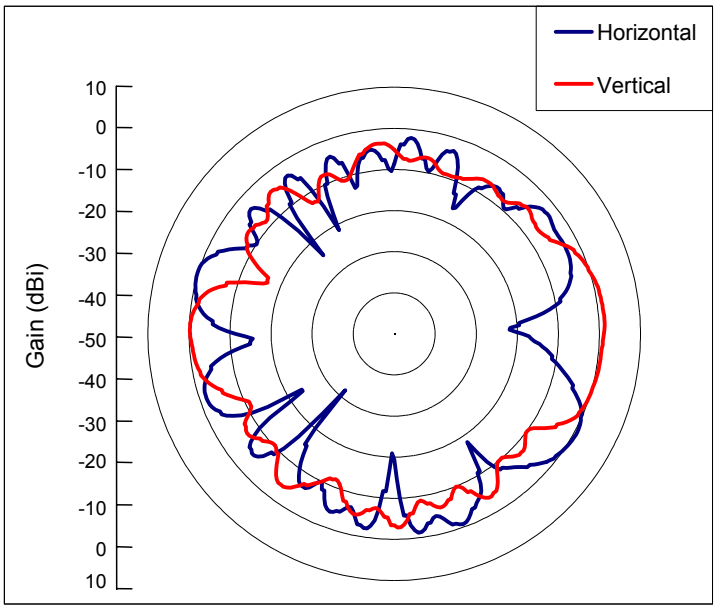
Center Frequency	5725 MHz
Horizontal (dBi) peak	0.70
Vertical (dBi) peak	1.97
Horz+Vert (dBi) peak	1.97

Main antenna: 5785 MHz

<Average Gain>

	Horizontal	Vertical
AVG	−6.95	−5.91
MAX	0.61	1.33

(dBi)



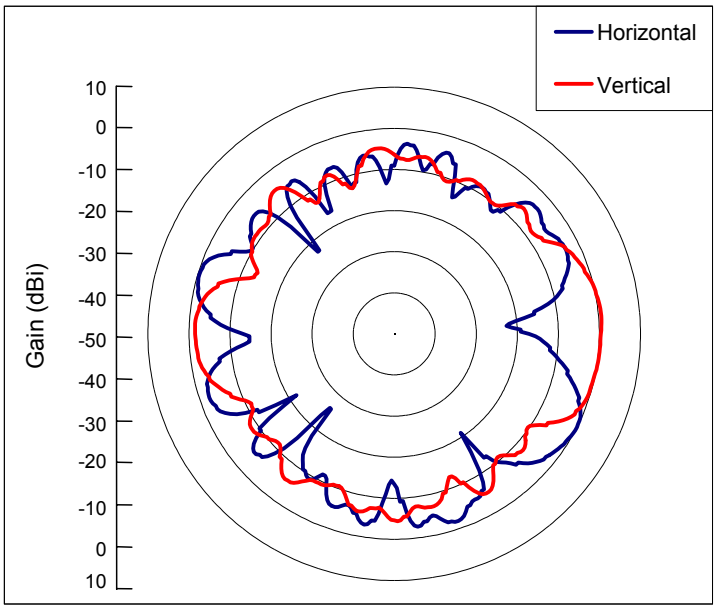
Center Frequency	5785 MHz
Horizontal (dBi) peak	0.61
Vertical (dBi) peak	1.33
Horz+Vert (dBi) peak	1.33

Main antenna: 5850 MHz

<Average Gain>

	Horizontal	Vertical
AVG	−7.58	−6.67
MAX	−0.05	0.60

(dBi)



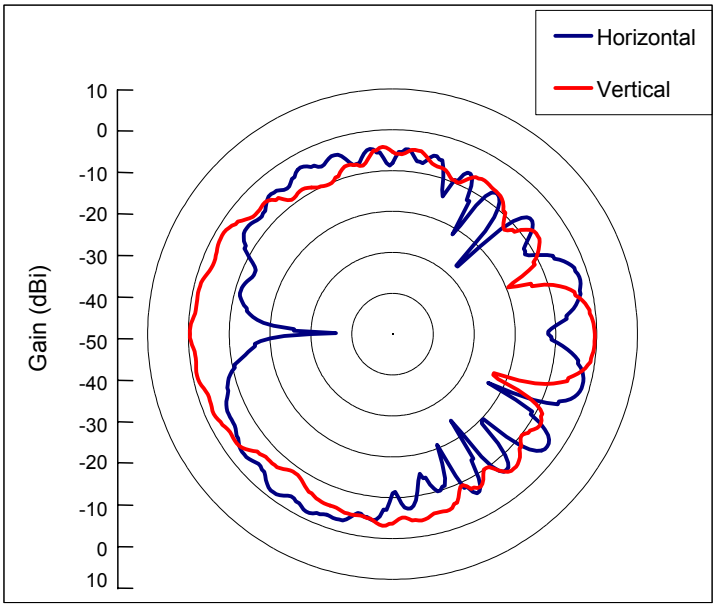
Center Frequency	5850 MHz
Horizontal (dBi) peak	-0.05
Vertical (dBi) peak	0.60
Horz+Vert (dBi) peak	0.60

Auxiliary antenna: 5725 MHz

<Average Gain>

	Horizontal	Vertical
AVG	−8.06	−6.01
MAX	−1.56	−0.36

(dBi)



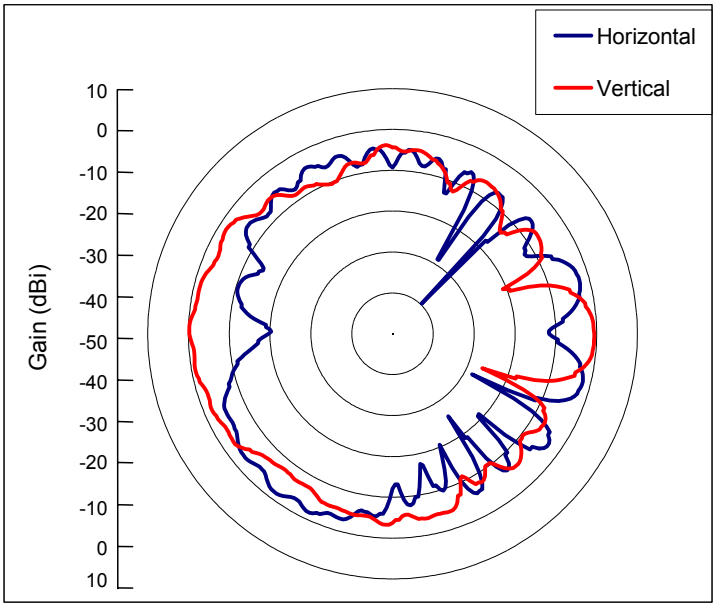
Center Frequency	5725 MHz
Horizontal (dBi) peak	-1.56
Vertical (dBi) peak	-0.36
Horz+Vert (dBi) peak	-0.36

Auxiliary antenna: 5785 MHz

<Average Gain>

	Horizontal	Vertical
AVG	−8.18	−6.05
MAX	−1.64	−0.21

(dBi)



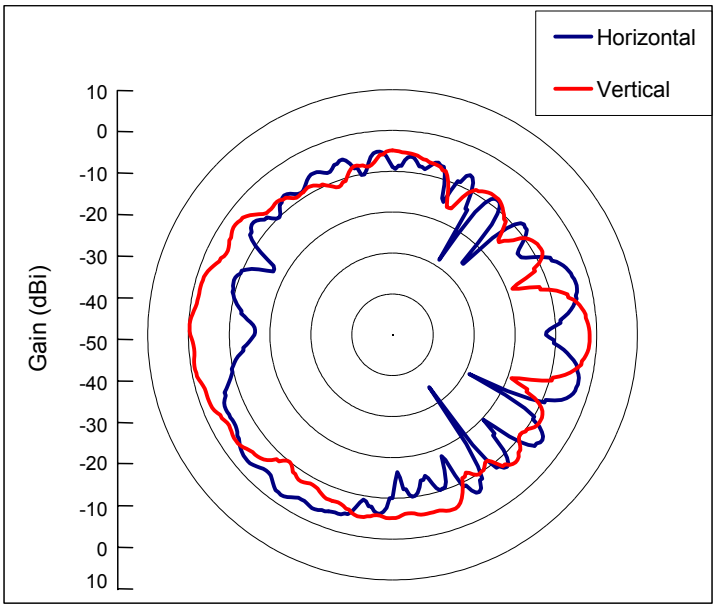
Center Frequency	5785 MHz
Horizontal (dBi) peak	-1.64
Vertical (dBi) peak	-0.21
Horz+Vert (dBi) peak	-0.21

Auxiliary antenna: 5850 MHz

<Average Gain>

	Horizontal	Vertical
AVG	−8.77	−6.85
MAX	−2.27	−0.25

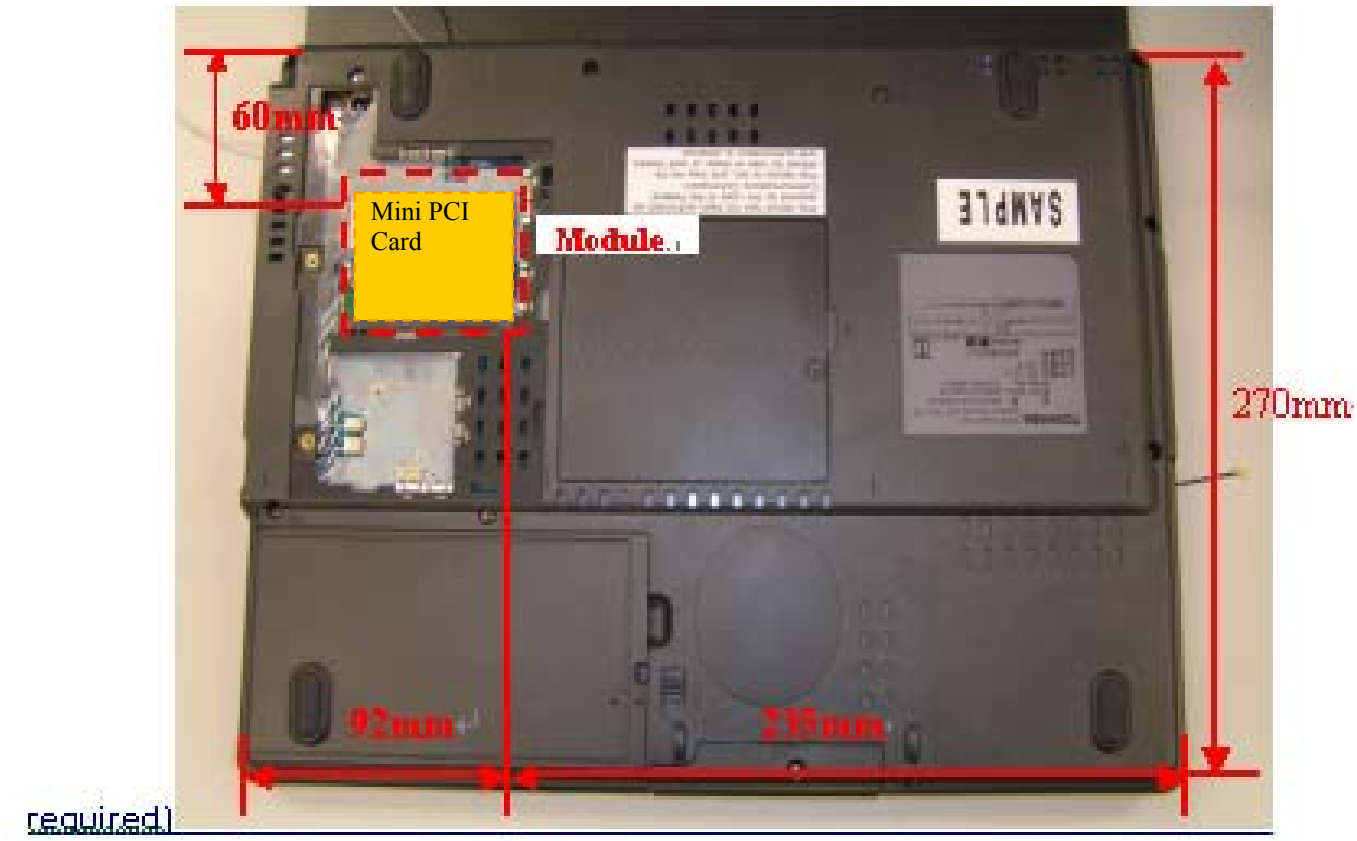
(dBi)



Center Frequency	5850 MHz
Horizontal (dBi) peak	-2.27
Vertical (dBi) peak	-0.25
Horz+Vert (dBi) peak	-0.25

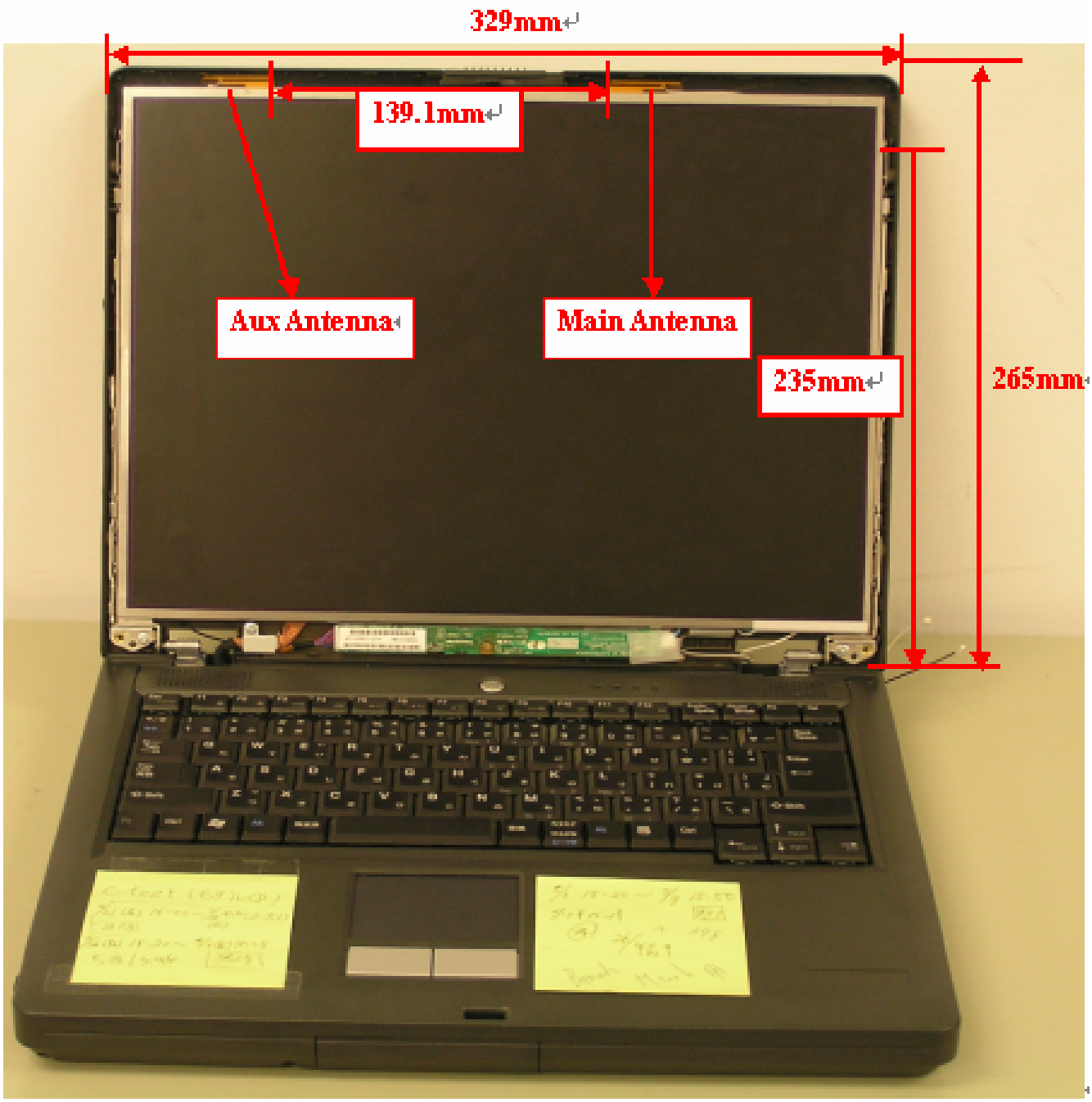
Section 4. Host Platform Information

Module Location Photo:



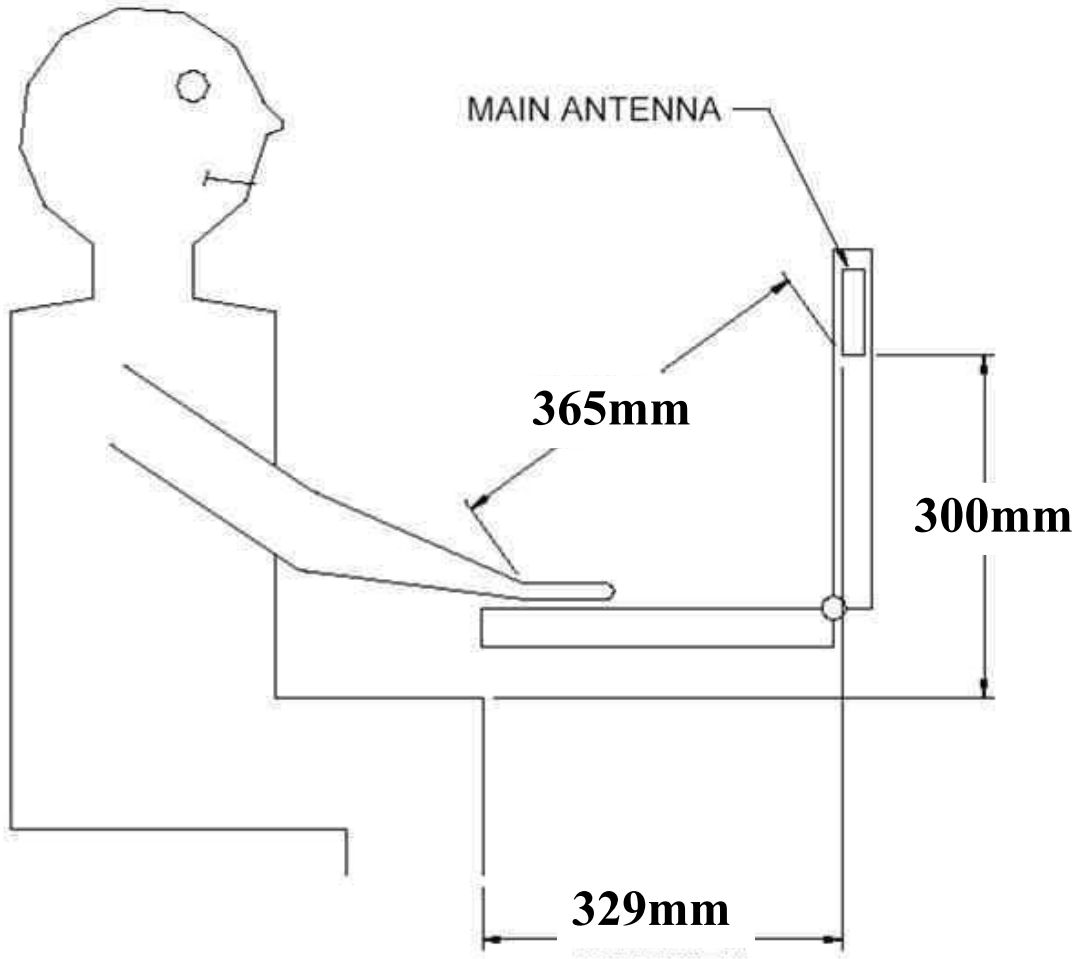
Section 5. Antenna Host Platform Location Information

Include a **dimensioned photo or dimensioned drawing** of main and auxiliary antenna placements.



Section 6. Antenna dimensional information for SAR evaluation

Include a **dimensioned photo or dimensioned drawing** showing the distance (mm) between the transmit (main) antenna and the user (excluding hands, wrist, feet, and ankle)



Regulatory WLAN Antenna Information
TBN001

Intel Corporation

Antenna Sample / Antenna Data
Requirements for worldwide regulatory approval

Section	Description of Required OEM / ODM Antenna Information	US / IC	EU	Japan	Taiwan	Korea
1A	Part Number for Antenna only	Required	Required	Required	Required	Required
1B	Antenna Manufacturer Name	Required	Required	Required	Required	Required
1C	Description of Antenna Type	Required	N/A	N/A	N/A	N/A
1D	Part number of Antenna Assembly / cable impedance, length & diameter.	Required	Desired	Desired	Desired	Desired
1E	Main & Aux antenna (Peak Gain W/ cable loss)	Required	Required	Required	Required	Required
	1E OR 1F, 1G, 1H					
1F	Main & Aux antenna (Peak Gain only)	Required	Required	Required	Required	Required
1G	VSWR of cable including connector	Required	Required	Required	Required	Required
1H	Main & Aux antenna (Cable loss W/ connector)	Required	Required	Required	Required	Required
2	Dimensioned Photographs or Drawings of main & auxiliary antennas	Required	Required	Required	Required	Required
3	Radiation patterns of antennas loaded in the host platform.	Required	Desired	Required	N/A	Required
4	Platform model name / number - correlated to antenna manufacturer and antenna part number	Required	Required	Desired	Required	Desired
5	Photograph(s) or Drawings showing location of antennas in platform.	Required	Required	Desired	Required	Desired
6	Mech. drawings / photos with dimensions of antenna locations and distance from end-user (For evaluation of SAR testing requirement).	Required	N/A	N/A	N/A	N/A
7	Photograph(s) or Drawings showing the location of all antennas (WLAN, BT, other) and distance between those transmitting antennas. Information will be used to evaluate whether co-location testing is required.	Required	N/A	N/A	N/A	N/A

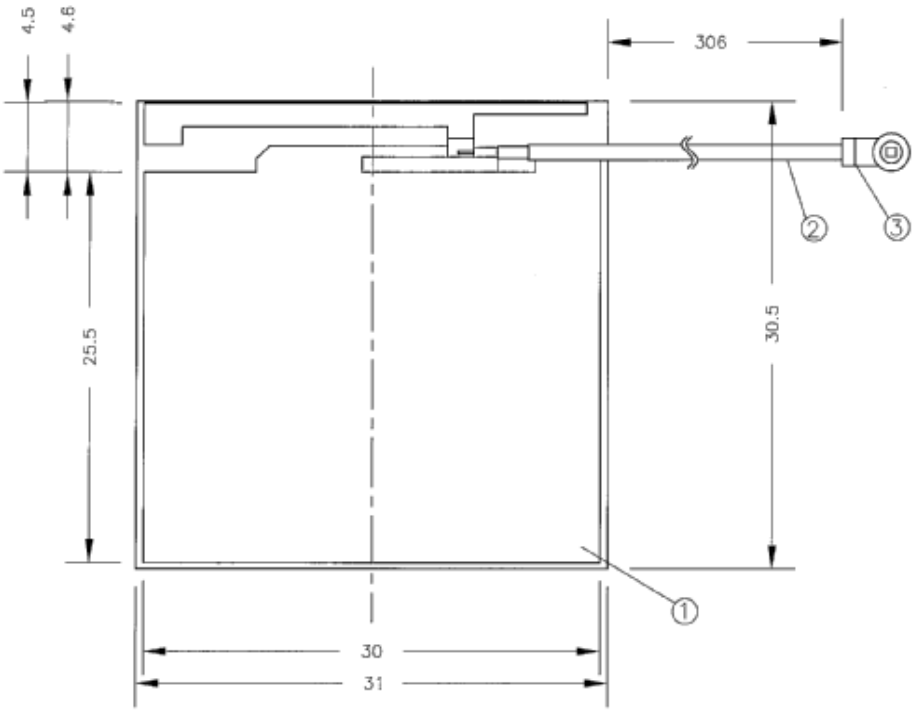
Section 1. Antenna Assembly Specifications

Antenna Assembly Summary:

1A Antenna Part Number	1B Manufacture	1C Antenna Type	1D Cable Assembly Part Number and Information	1E Peak Gain W/ Cable loss (dBi)	1F Peak Gain w/o Cable Loss (dBi)	1G VSWR	1H Cable Loss (dBi)
TBN001	Tyco Electronics AMP K.K.	2.4GHz:PIFA 5GHz:PIFA	P/N:TBN001-001 50 ohm Coaxial. length: 306mm diameter: 0.95mm Connector: U.FL or equivalent	2400-2500MHz 1.1 dBi (peak)	2400-2500MHz 2.0 dBi (peak)	2400-2500MHz 1.66 max	2400-2500MHz 0.91 dBi (peak)
				5150-5350MHz 0.8 dBi (peak)	5150-5350MHz 1.9 dBi (peak)	5150-5350MHz 1.76 max	5150-5350MHz 1.16 dBi (peak)
				5470-5725MHz 1.1 dBi (peak)	5470-5725MHz 2.3 dBi (peak)	5470-5725MHz 1.97 max	5470-5725MHz 1.18 dBi (peak)
				5725-5850MHz 0.5 dBi (peak)	5725-5850MHz 1.7 dBi (peak)	5725-5850MHz 1.86 max	5725-5850MHz 1.19 dBi (peak)
TBN001	Tyco Electronics AMP K.K.	2.4GHz:PIFA 5GHz:PIFA	P/N:TBN001-001 50 ohm Coaxial. length: 306mm diameter: 0.95mm Connector: U.FL or equivalent	2400-2500MHz 1.1 dBi (peak)	2400-2500MHz 2.0 dBi (peak)	2400-2500MHz 1.74 max	2400-2500MHz 0.91 dBi (peak)
				5150-5350MHz 0.0 dBi (peak)	5150-5350MHz 1.1 dBi (peak)	5150-5350MHz 1.56 max	5150-5350MHz 1.16 dBi (peak)
				5470-5725MHz 1.3 dBi (peak)	5470-5725MHz 2.4 dBi (peak)	5470-5725MHz 1.96 max	5470-5725MHz 1.18 dBi (peak)
				5725-5850MHz 1.3 dBi (peak)	5725-5850MHz 2.4 dBi (peak)	5725-5850MHz 2.18 max	5725-5850MHz 1.19 dBi (peak)

Section 2. Dimensioned Photos or Drawings of Antennas

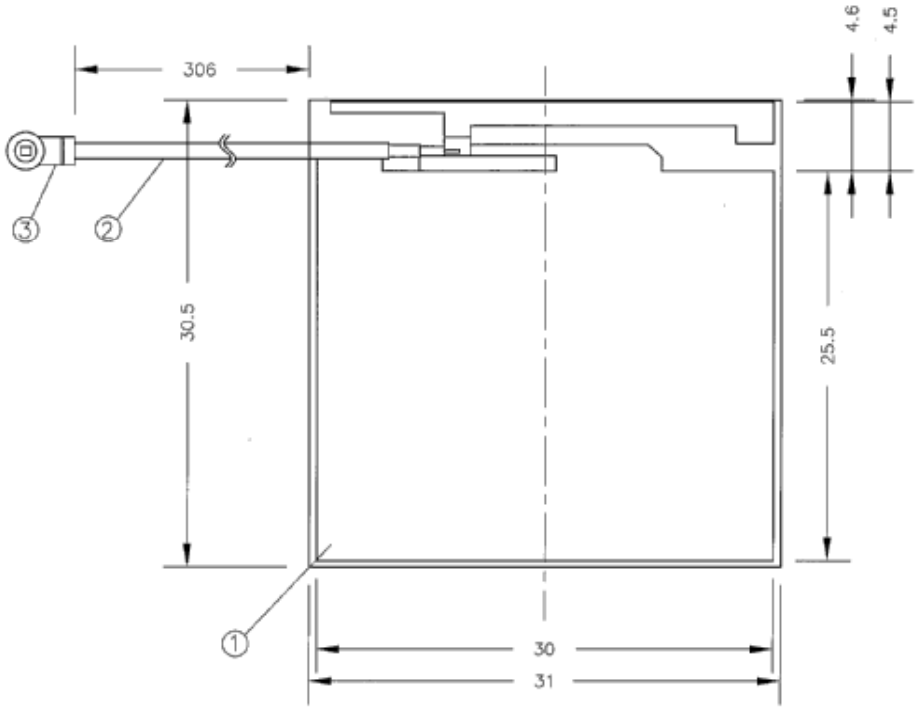
Include a dimensioned photo or dimensioned drawing of main antenna here.



Item	Description
①	Antenna element (TBN001)
②	Coaxial cable, ϕ 0.95, color white
③	Coaxial connector, U.FL or its compatible

The drawing of a main sub-assembly.
Unit: mm

Include a dimensioned photo or dimensioned drawing of aux antenna here.



Item	Description
①	Antenna element (TBN001)
②	Coaxial cable, ϕ 0.95, color black
③	Coaxial connector, U.FL or its compatible

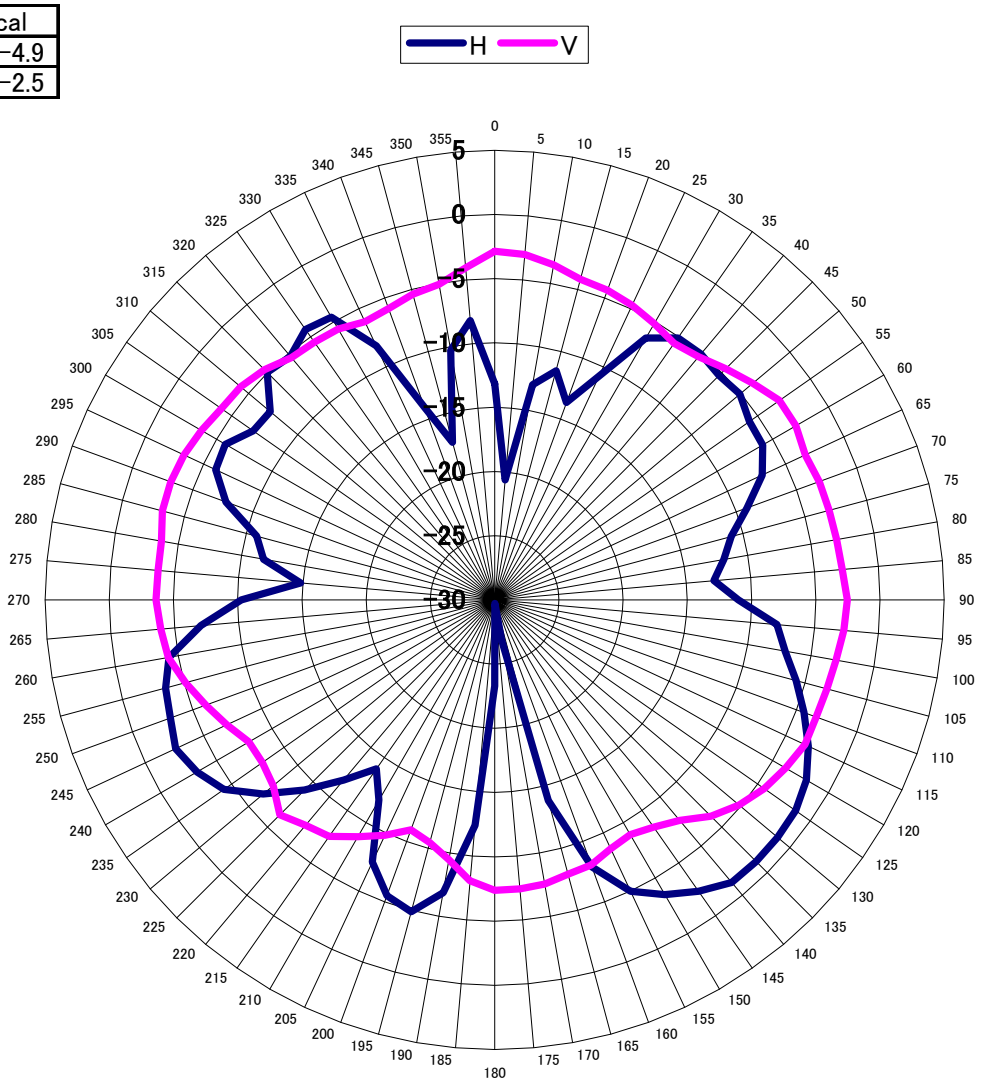
The drawing of an aux sub-assembly.
Unit: mm

Section 3. Radiation characteristics of antennae Loaded in Host Platform

2400-2500MHz radiation characteristic

Main antenna: 2400 MHz

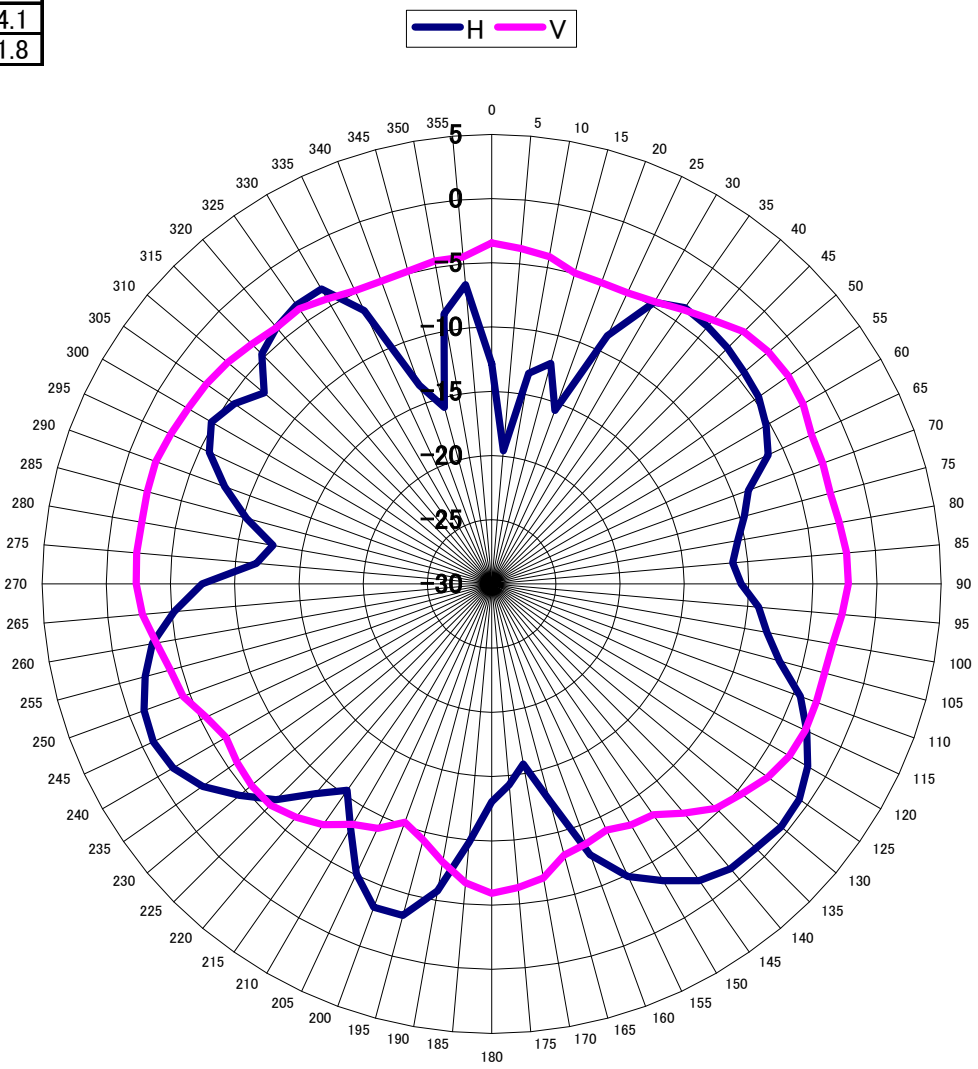
	Horizontal	Vertical
AVG	−6.2	−4.9
MAX	−1.2	−2.5



Center Frequency	2400 MHz
Horizontal (dBi) peak	−1.2
Vertical (dBi) peak	−2.5
Horiz+Vert (dBi) peak	−1.2

Main antenna: 2450 MHz

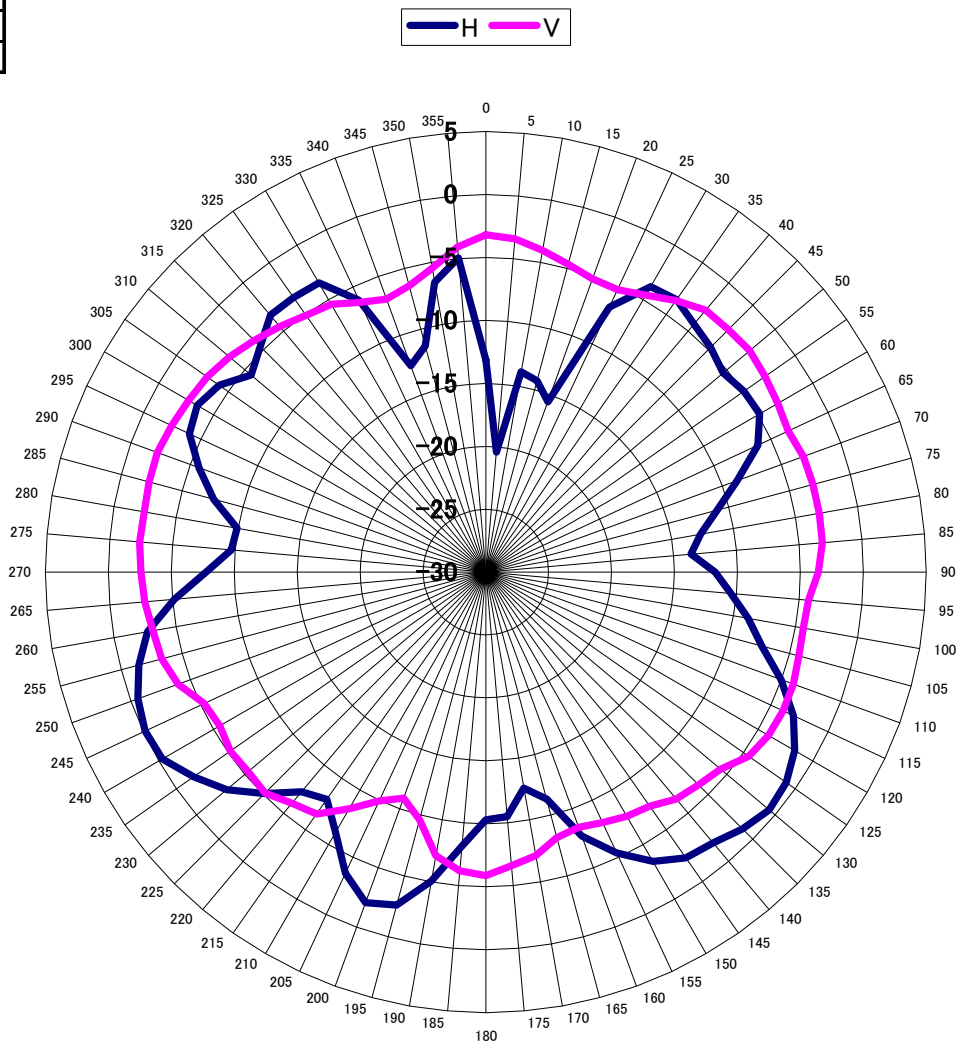
	Horizontal	Vertical
AVG	−5.2	−4.1
MAX	−0.6	−1.8



Center Frequency	2450 MHz
Horizontal (dBi) peak	−0.6
Vertical (dBi) peak	−1.8
Horiz+Vert (dBi) peak	−0.6

Main antenna: 2500 MHz

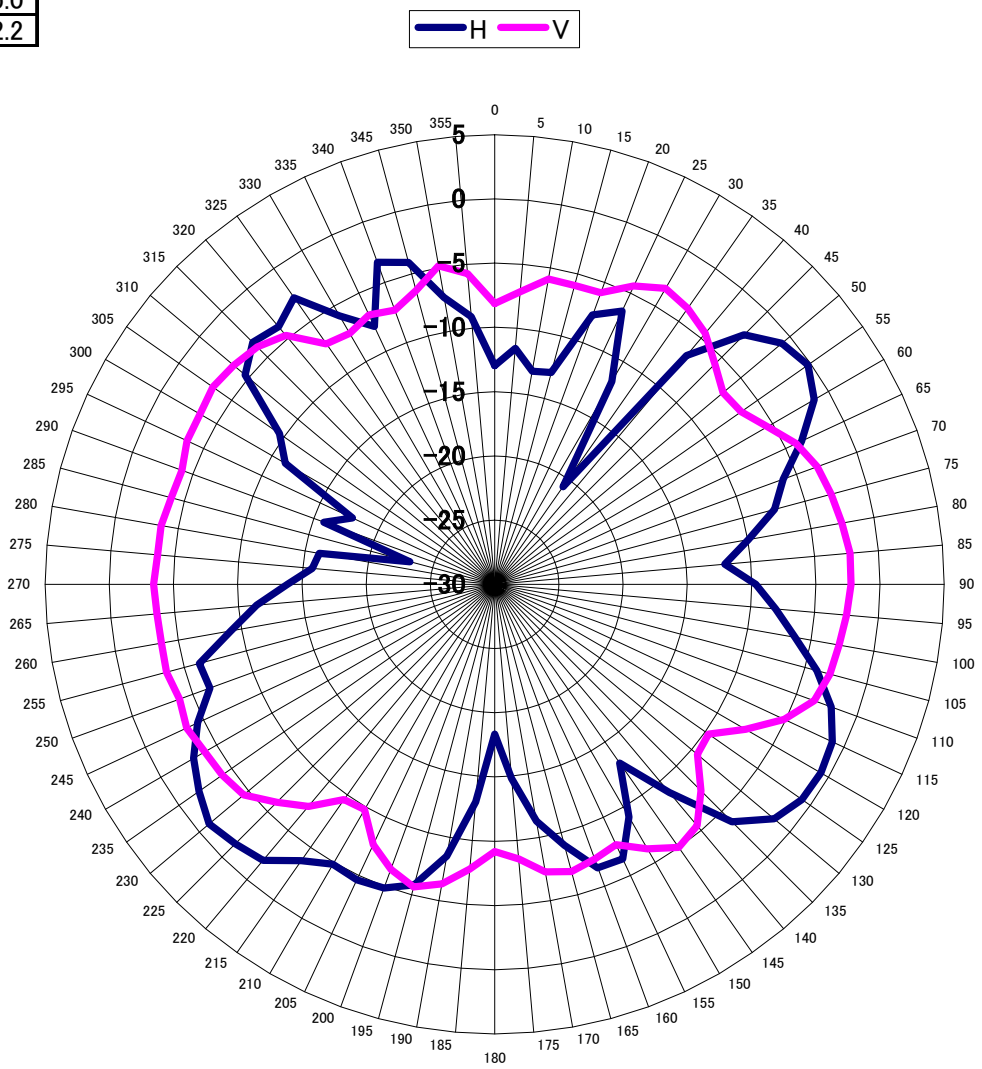
	Horizontal	Vertical
AVG	−4.8	−4.5
MAX	−0.1	−2.2



Center Frequency	2500 MHz
Horizontal (dBi) peak	−0.1
Vertical (dBi) peak	−2.2
Horiz+Vert (dBi) peak	−0.1

Auxiliary antenna: 2400 MHz

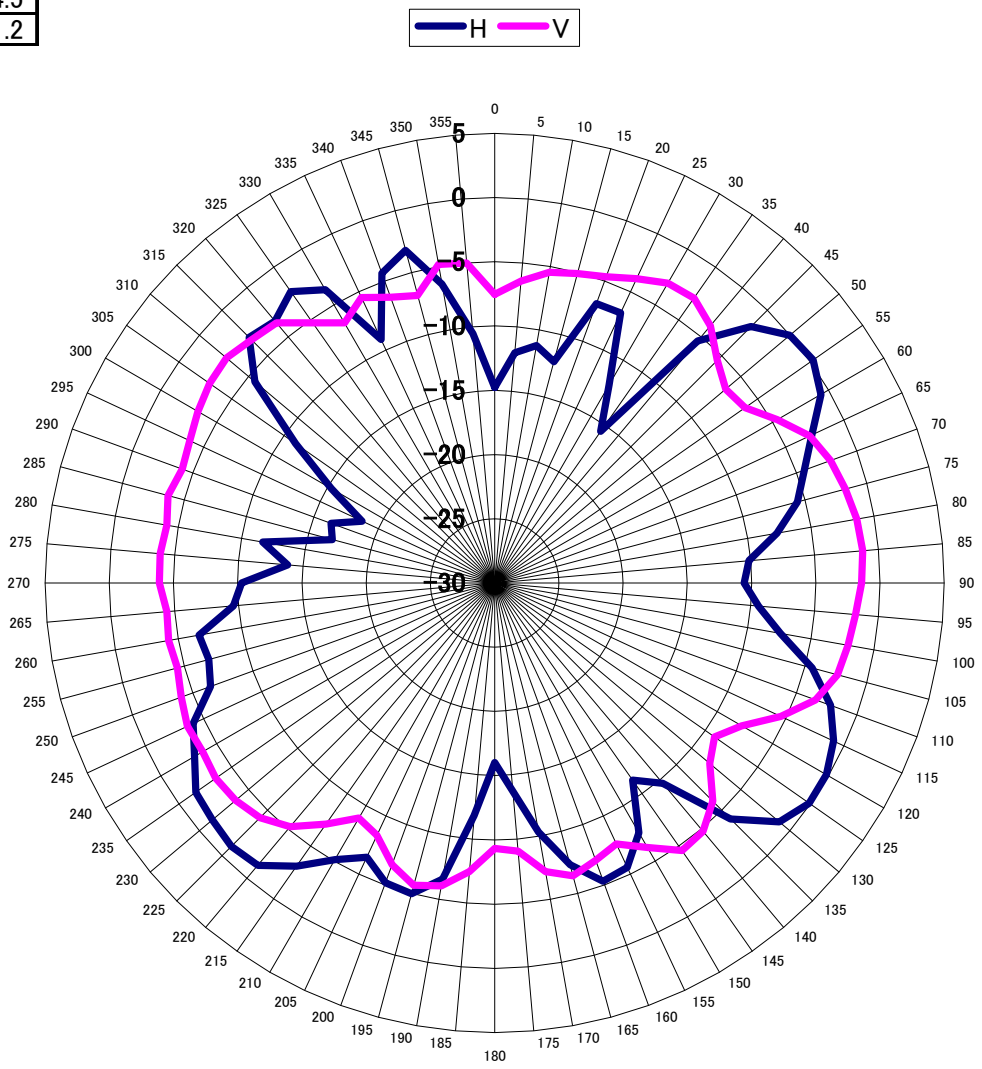
	Horizontal	Vertical
AVG	−5.4	−5.0
MAX	−0.2	−2.2



Center Frequency	2400 MHz
Horizontal (dBi) peak	−0.2
Vertical (dBi) peak	−2.2
Horiz+Vert (dBi) peak	−0.2

Auxiliary antenna: 2450 MHz

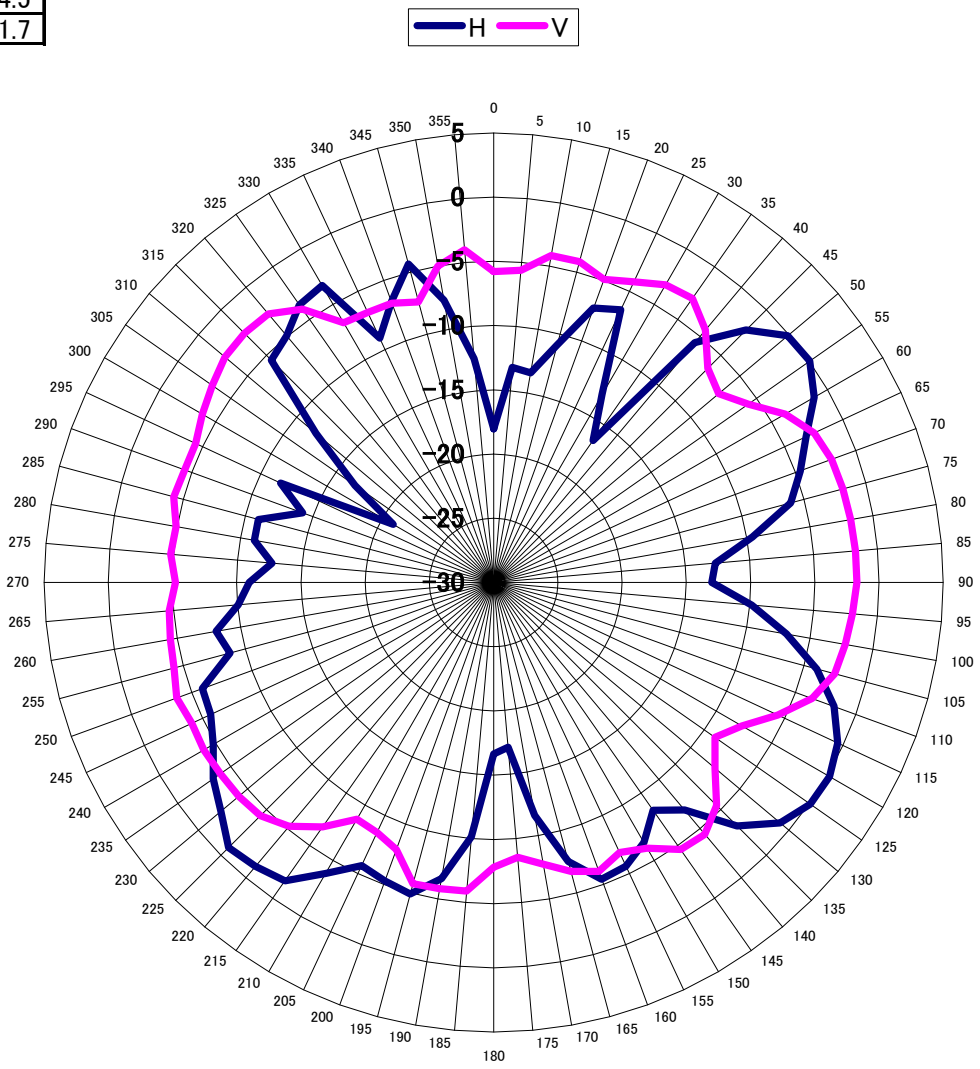
	Horizontal	Vertical
AVG	−5.0	−4.5
MAX	0.3	−1.2



Center Frequency	2450 MHz
Horizontal (dBi) peak	0.3
Vertical (dBi) peak	−1.2
Horiz+Vert (dBi) peak	0.3

Auxiliary antenna: 2500 MHz

	Horizontal	Vertical
AVG	−5.2	−4.5
MAX	0.2	−1.7

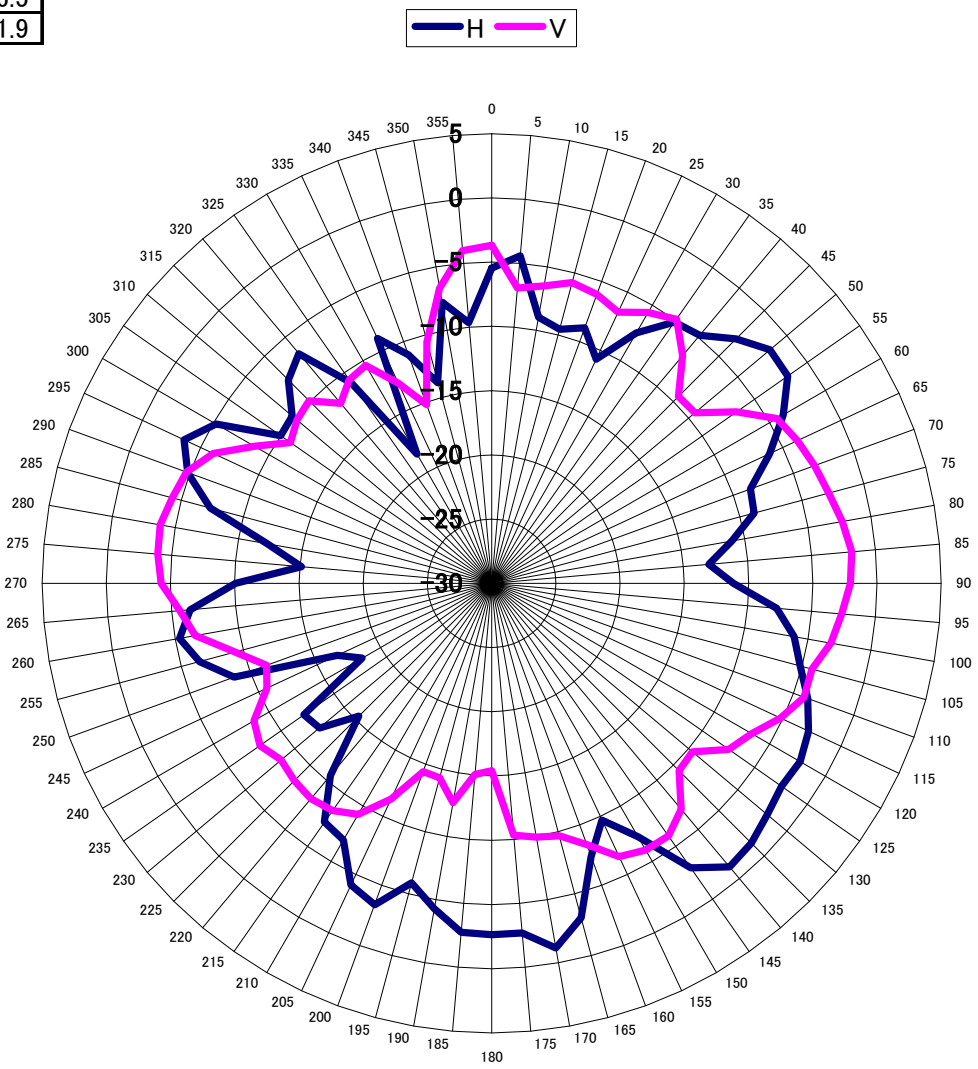


Center Frequency	2500 MHz
Horizontal (dBi) peak	0.2
Vertical (dBi) peak	−1.7
Horiz+Vert (dBi) peak	0.2

5150-5350 MHz radiation characteristic

Main antenna: 5150 MHz

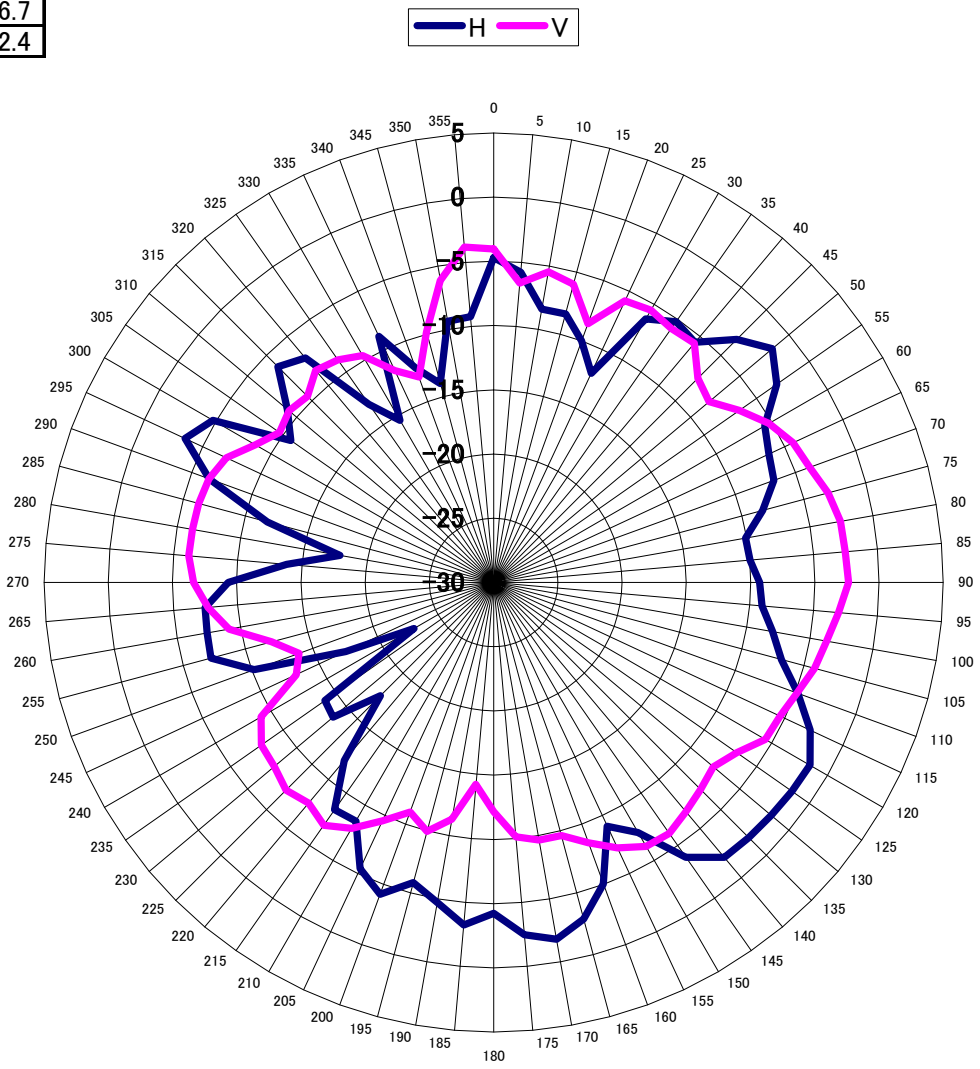
	Horizontal	Vertical
AVG	−5.7	−6.5
MAX	−1.2	−1.9



Center Frequency	5150 MHz
Horizontal (dBi) peak	−1.2
Vertical (dBi) peak	−1.9
Horiz+Vert (dBi) peak	−1.2

Main antenna: 5250 MHz

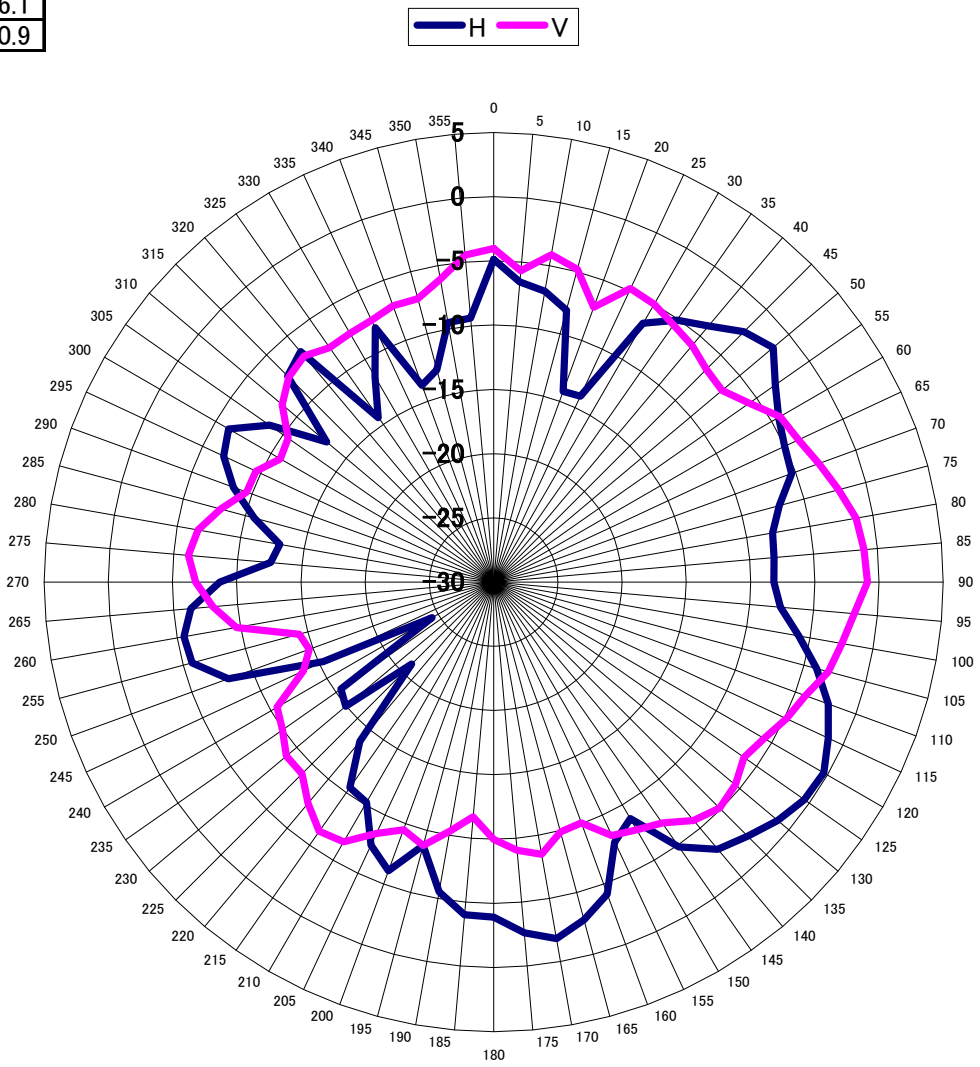
	Horizontal	Vertical
AVG	−6.1	−6.7
MAX	−1.6	−2.4



Center Frequency	5250 MHz
Horizontal (dBi) peak	−1.6
Vertical (dBi) peak	−2.4
Horiz+Vert (dBi) peak	−1.6

Main antenna: 5350 MHz

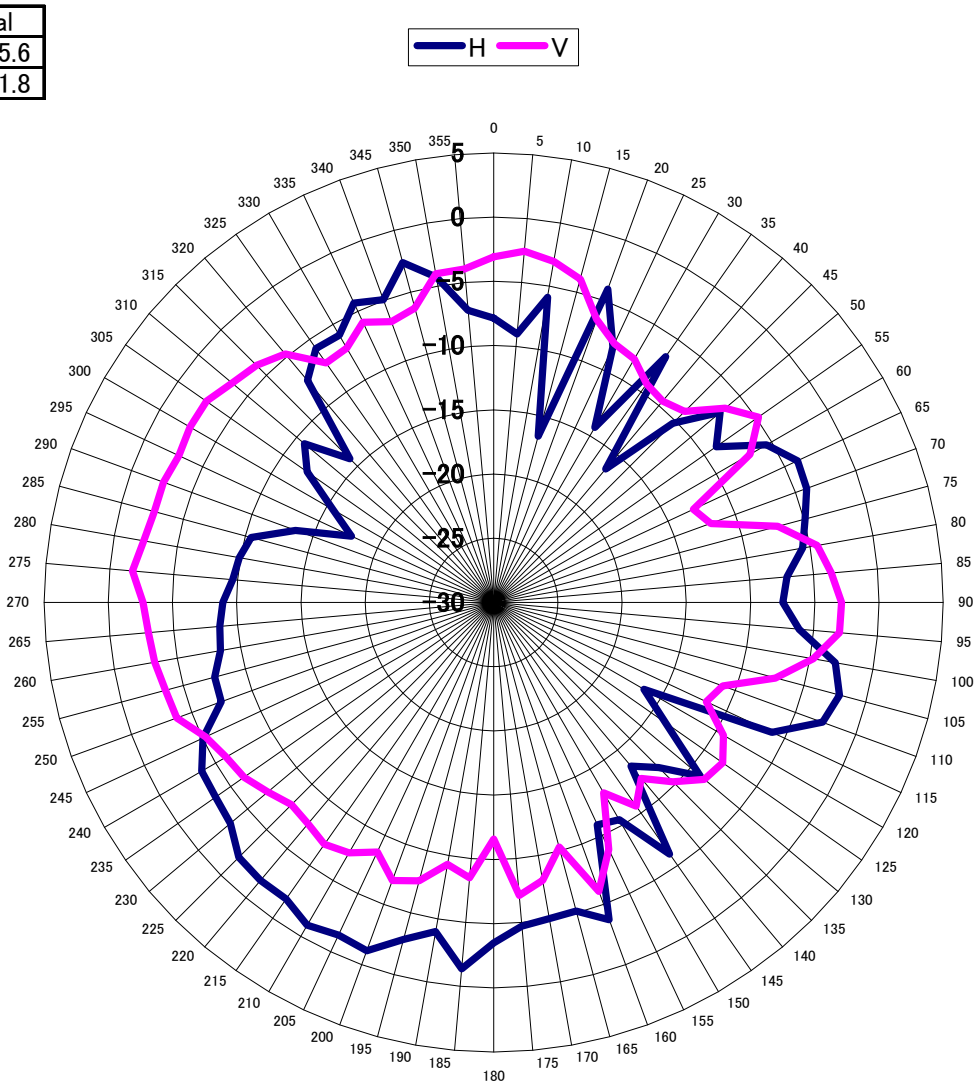
	Horizontal	Vertical
AVG	−5.8	−6.1
MAX	−0.4	−0.9



Center Frequency	5350 MHz
Horizontal (dBi) peak	−0.4
Vertical (dBi) peak	−0.9
Horiz+Vert (dBi) peak	−0.4

Auxiliary antenna: 5150 MHz

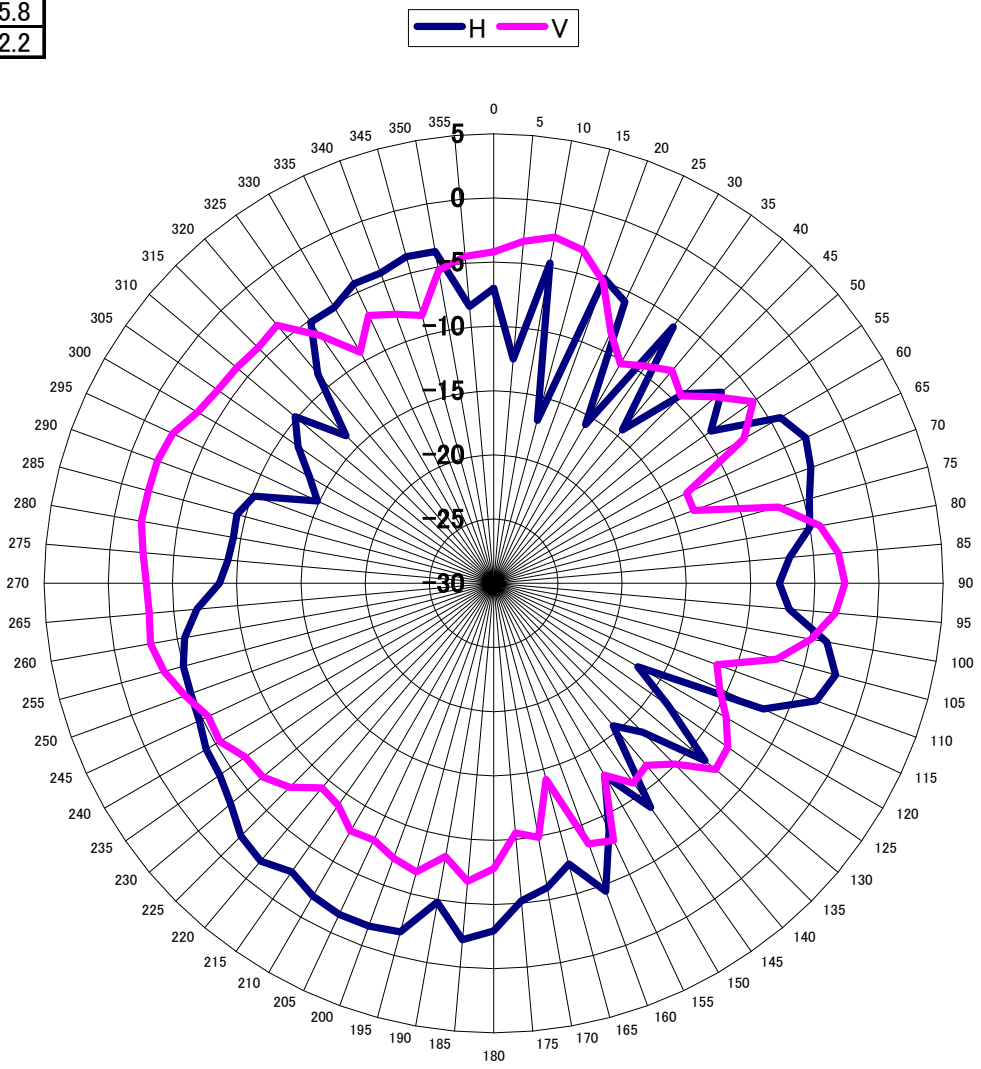
	Horizontal	Vertical
AVG	−5.6	−5.6
MAX	−1.0	−1.8



Center Frequency	5150 MHz
Horizontal (dBi) peak	−1.0
Vertical (dBi) peak	−1.8
Horiz+Vert (dBi) peak	−1.0

Auxiliary antenna: 5250 MHz

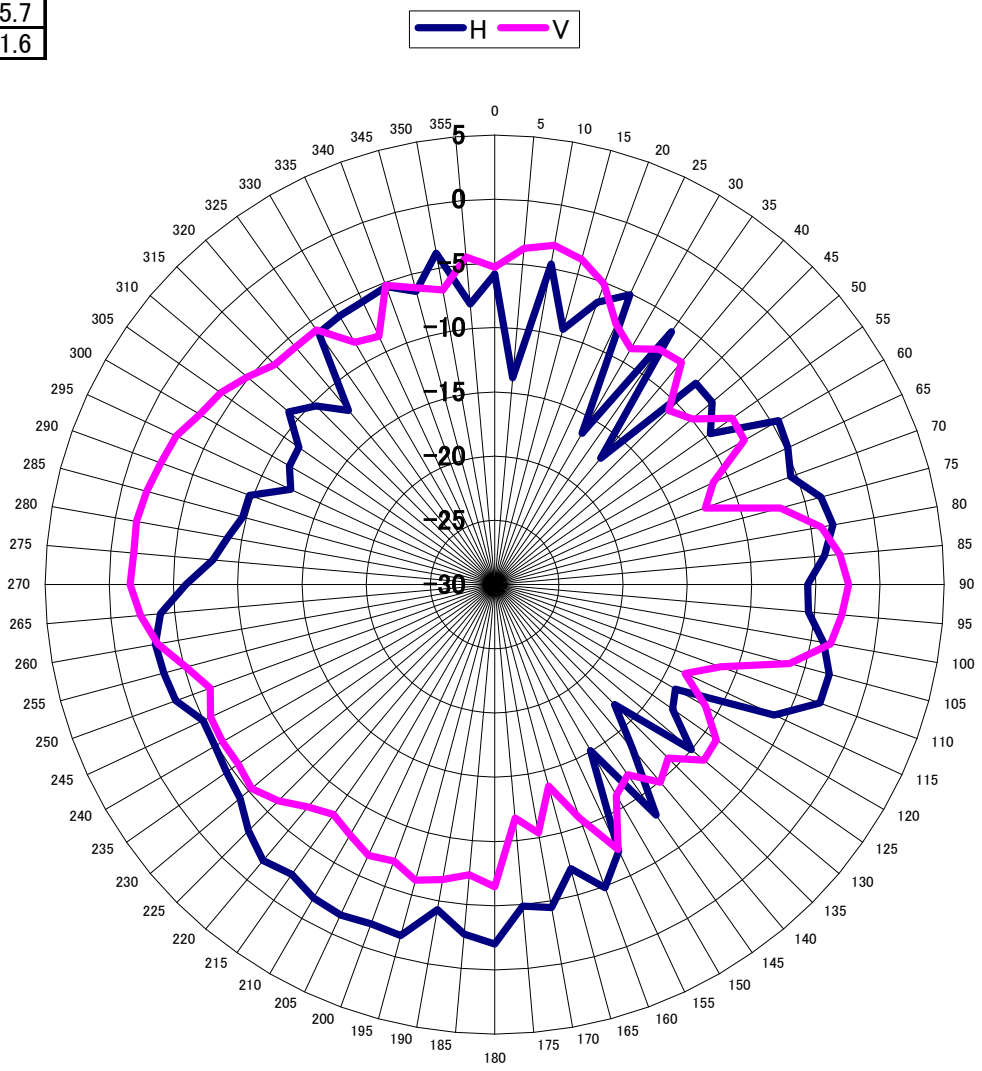
	Horizontal	Vertical
AVG	−5.6	−5.8
MAX	−1.6	−2.2



Center Frequency	5250 MHz
Horizontal (dBi) peak	−1.6
Vertical (dBi) peak	−2.2
Horiz+Vert (dBi) peak	−1.6

Auxiliary antenna: 5350 MHz

	Horizontal	Vertical
AVG	−5.5	−5.7
MAX	−1.6	−1.6

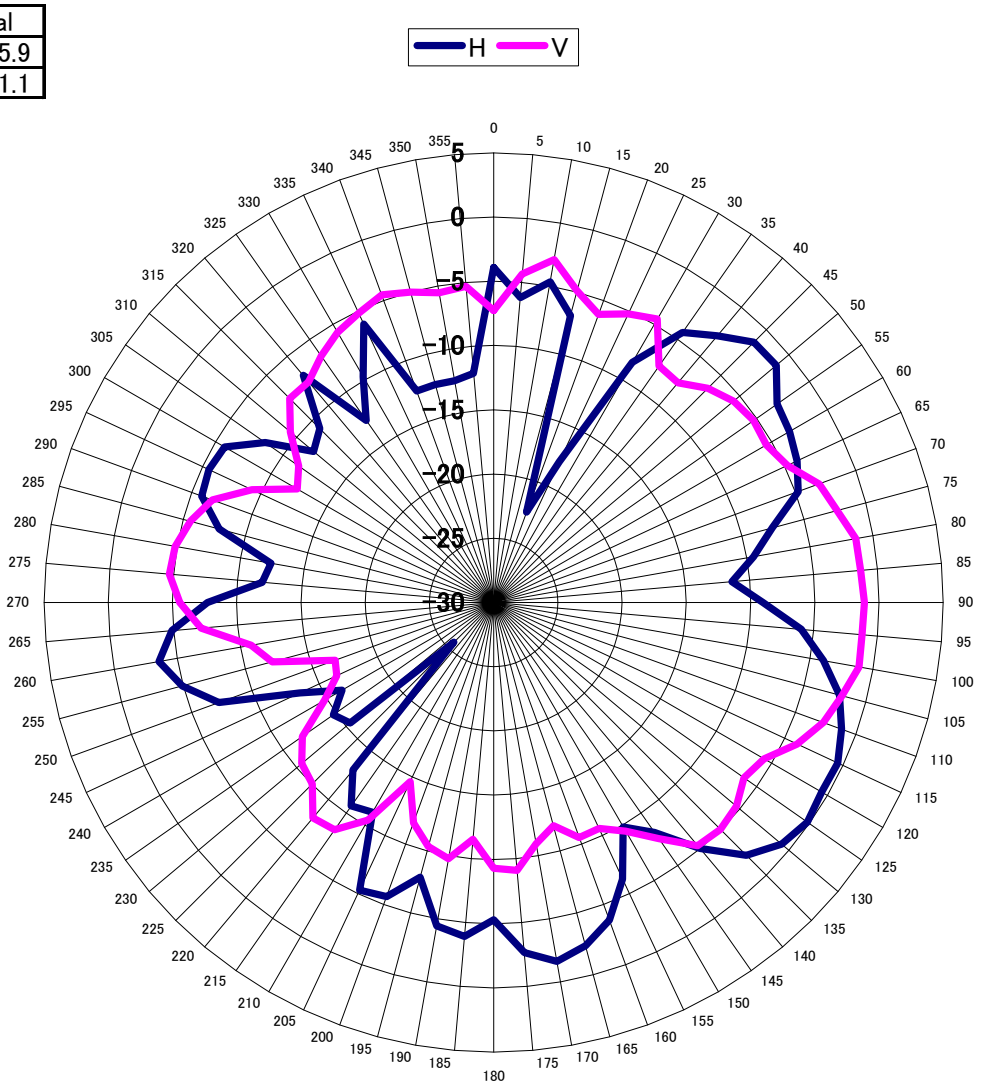


Center Frequency	5350 MHz
Horizontal (dBi) peak	−1.6
Vertical (dBi) peak	−1.6
Horiz+Vert (dBi) peak	−1.6

5470-5725MHz radiation characteristic

Main antenna: 5470 MHz

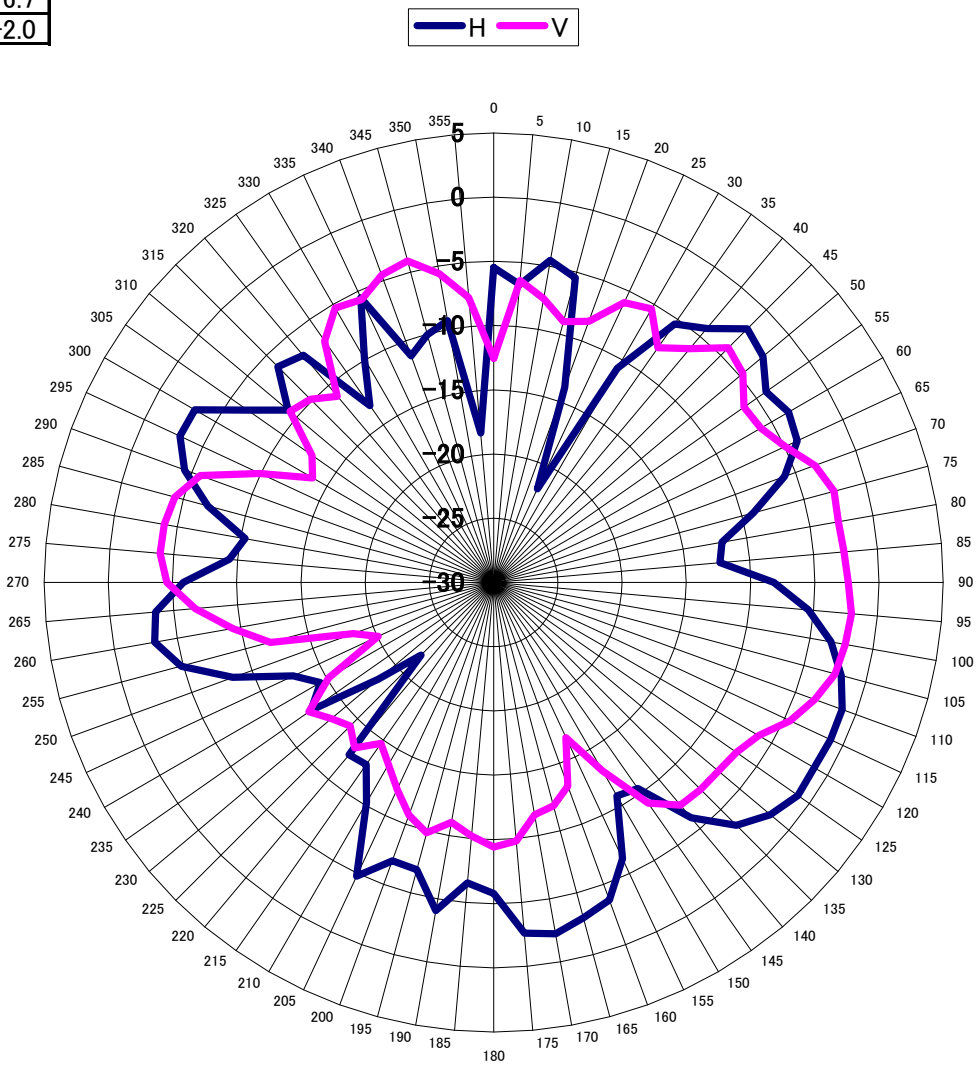
	Horizontal	Vertical
AVG	−5.4	−5.9
MAX	−0.2	−1.1



Center Frequency	5470 MHz
Horizontal (dBi) peak	−0.2
Vertical (dBi) peak	−1.1
Horiz+Vert (dBi) peak	−0.2

Main antenna: 5597.5 MHz

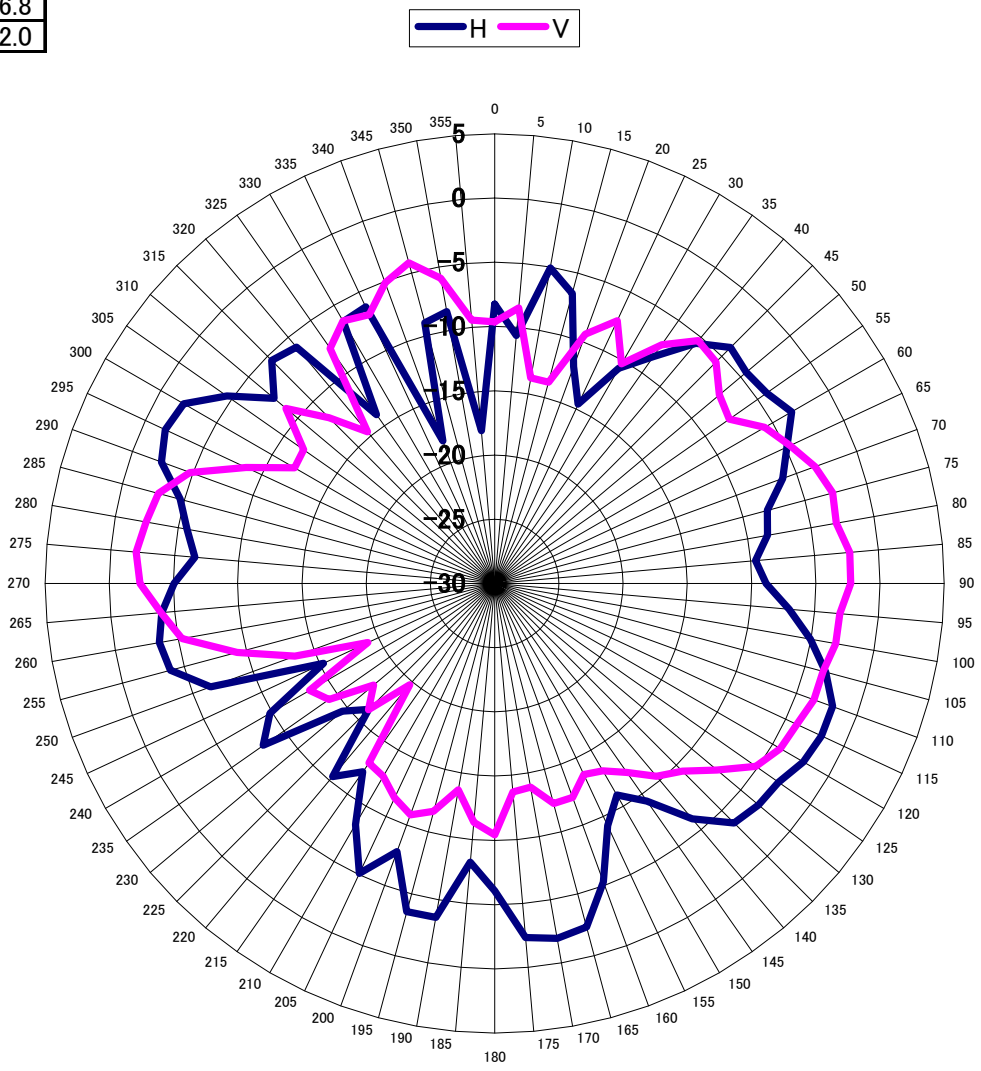
	Horizontal	Vertical
AVG	-5.5	-6.7
MAX	-1.1	-2.0



Center Frequency	5597.5 MHz
Horizontal (dBi) peak	-1.1
Vertical (dBi) peak	-2.0
Horiz+Vert (dBi) peak	-1.1

Main antenna: 5725 MHz

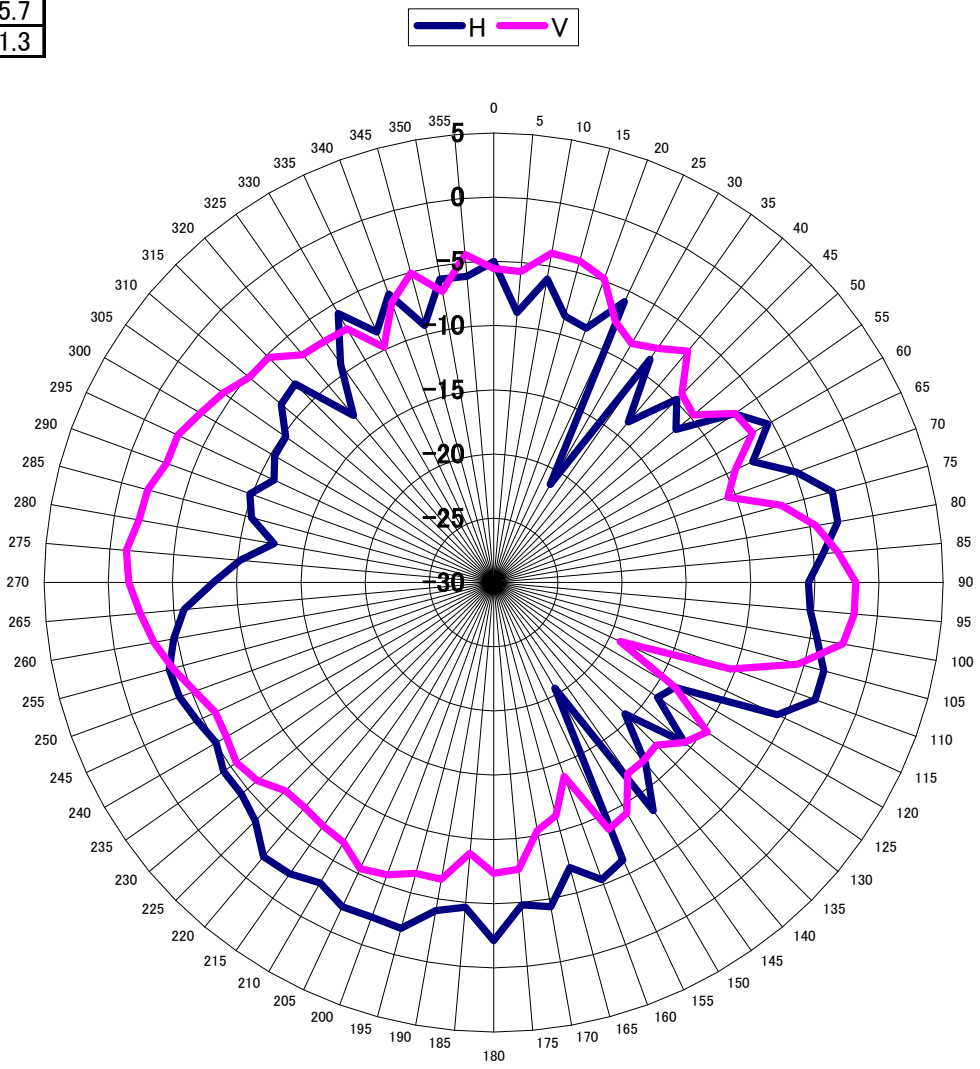
	Horizontal	Vertical
AVG	−5.6	−6.8
MAX	−1.7	−2.0



Center Frequency	5725 MHz
Horizontal (dBi) peak	−1.7
Vertical (dBi) peak	−2.0
Horiz+Vert (dBi) peak	−1.7

Auxiliary antenna: 5470 MHz

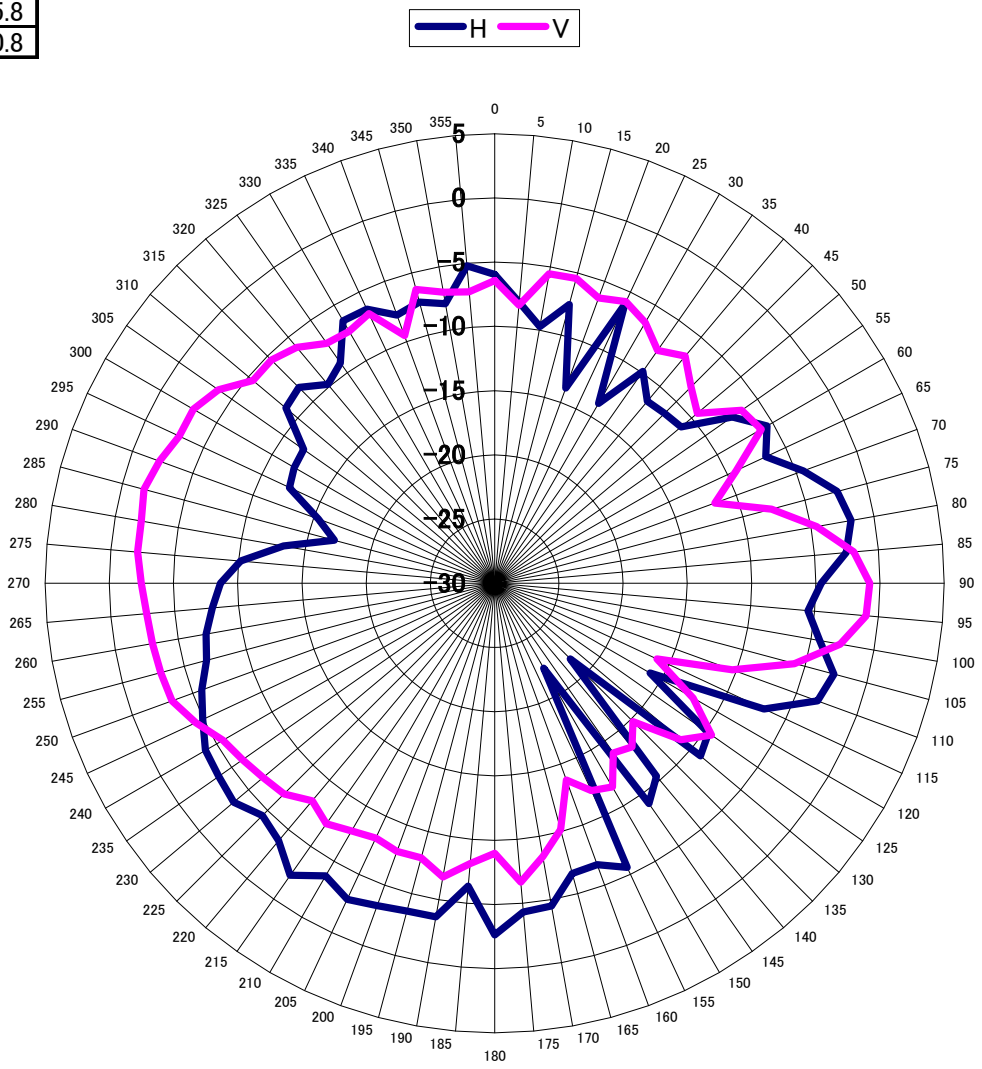
	Horizontal	Vertical
AVG	−5.9	−5.7
MAX	−2.1	−1.3



Center Frequency	5470 MHz
Horizontal (dBi) peak	−2.1
Vertical (dBi) peak	−1.3
Horiz+Vert (dBi) peak	−1.3

Auxiliary antenna: 5597.5 MHz

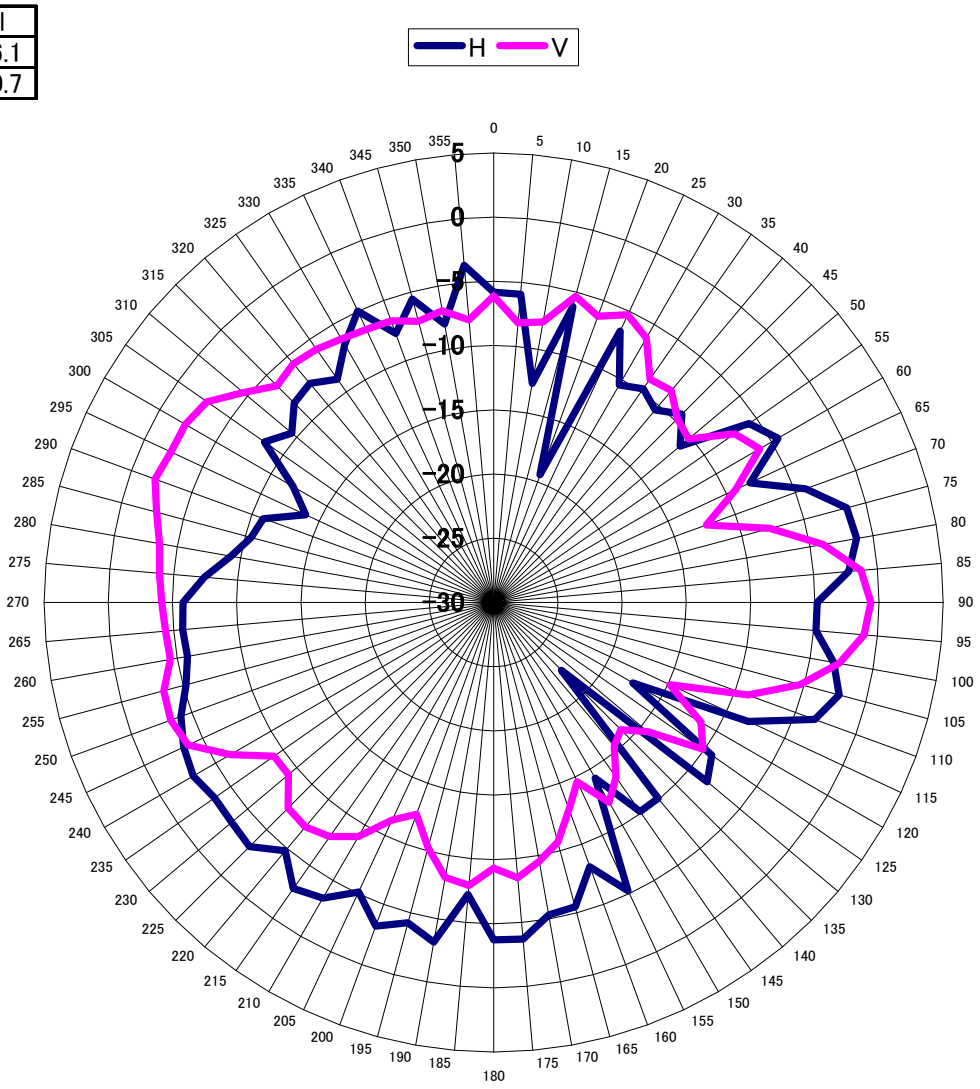
	Horizontal	Vertical
AVG	−6.2	−5.8
MAX	−1.8	−0.8



Center Frequency	5597.5 MHz
Horizontal (dBi) peak	−1.8
Vertical (dBi) peak	−0.8
Horiz+Vert (dBi) peak	−0.8

Auxiliary antenna: 5725 MHz

	Horizontal	Vertical
AVG	−5.7	−6.1
MAX	−1.3	−0.7

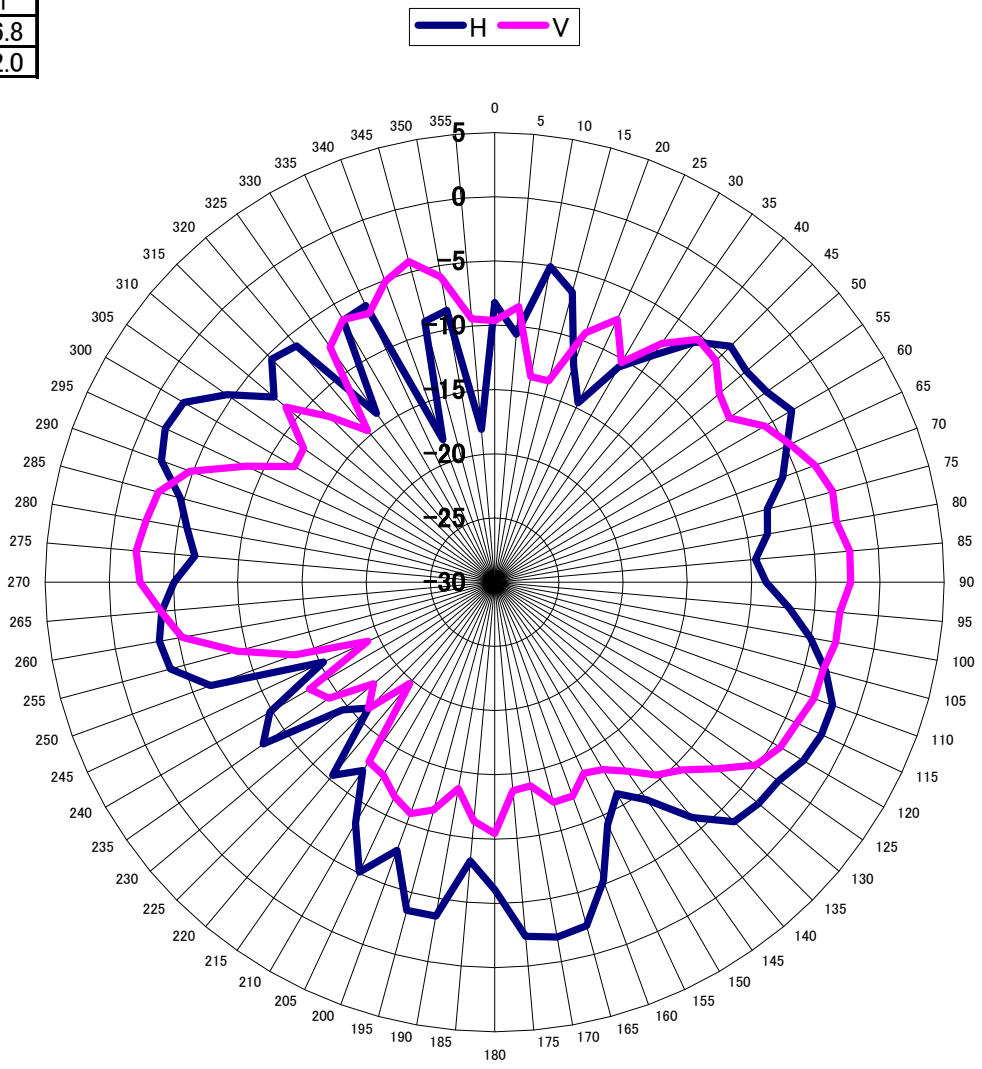


Center Frequency	5725 MHz
Horizontal (dBi) peak	−1.3
Vertical (dBi) peak	−0.7
Horiz+Vert (dBi) peak	−0.7

5725-5850 MHz radiation characteristic

Main antenna: 5725 MHz

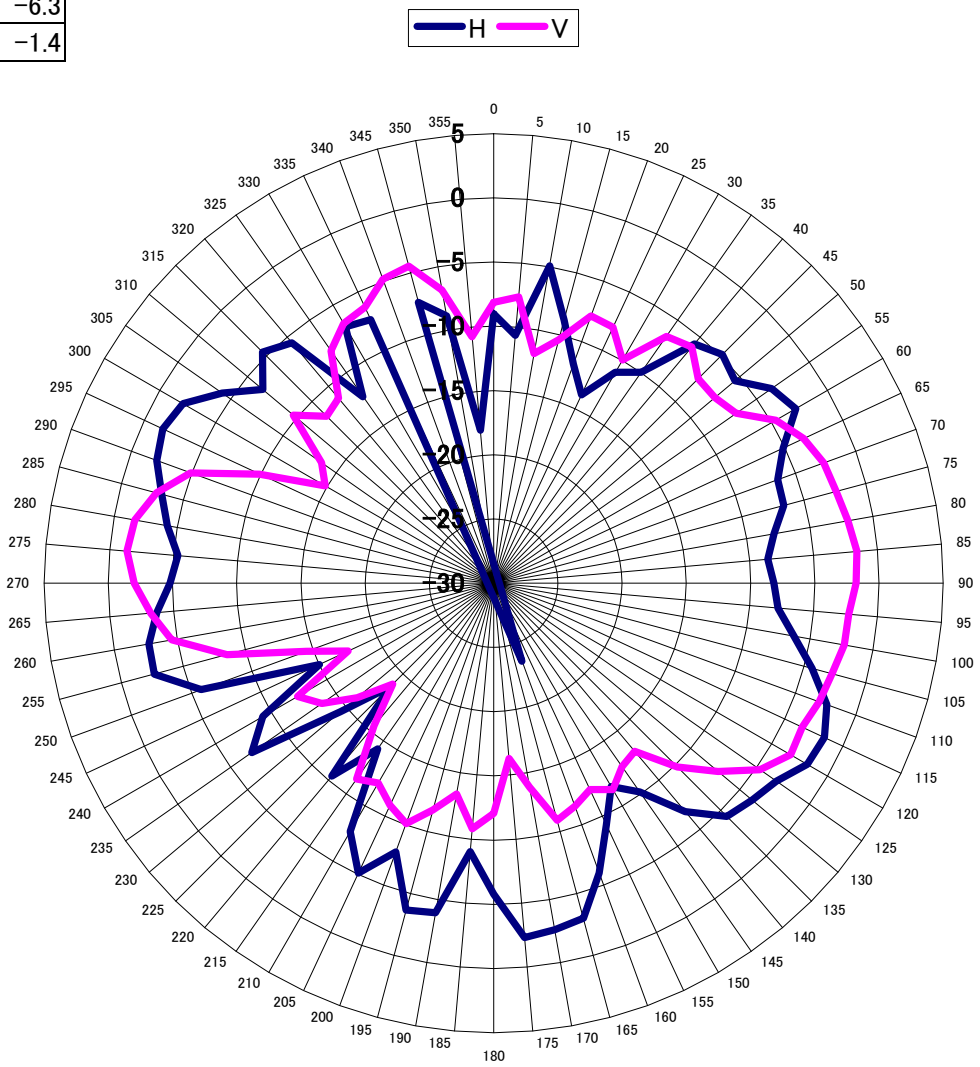
	Horizontal	Vertical
AVG	−5.6	−6.8
MAX	−1.7	−2.0



Center Frequency	5725 MHz
Horizontal (dBi) peak	−1.7
Vertical (dBi) peak	−2.0
Horiz+Vert (dBi) peak	−1.7

Main antenna: 5785 MHz

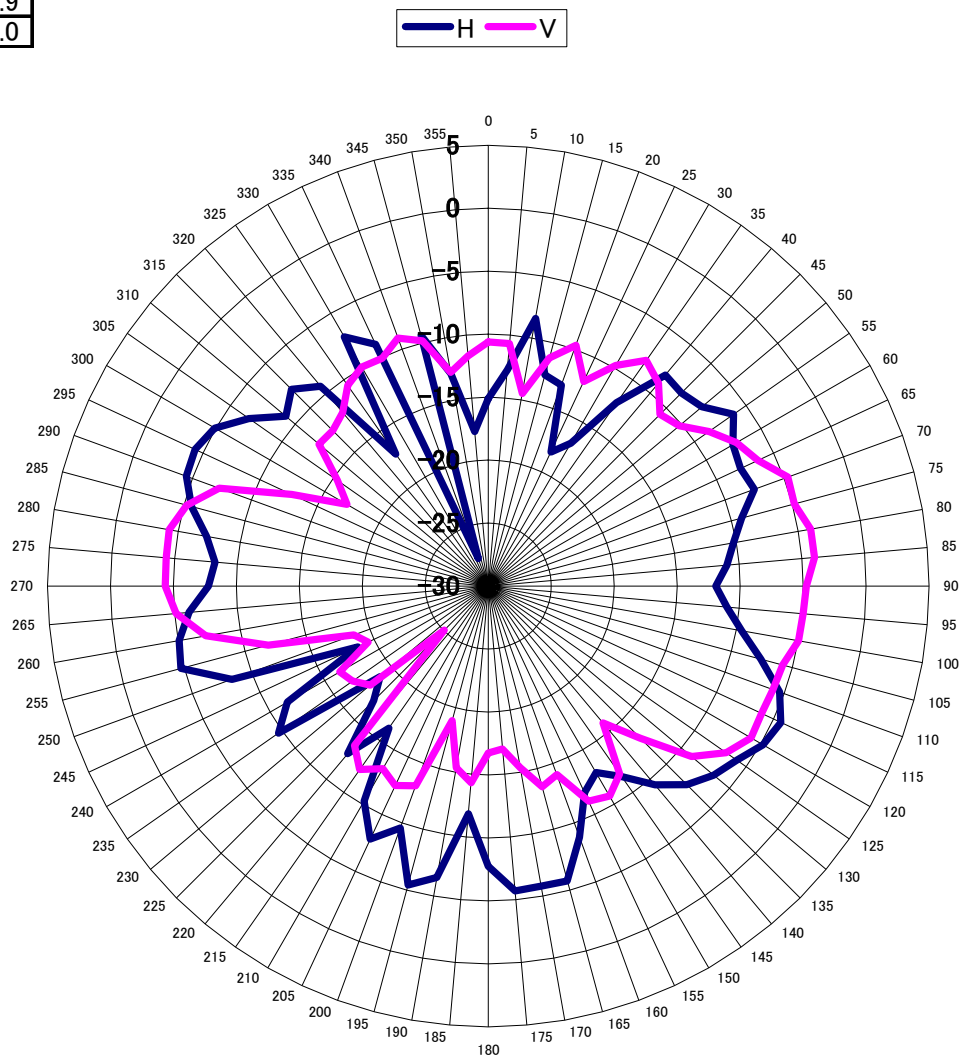
	Horizontal	Vertical
AVG	−5.6	−6.3
MAX	−1.6	−1.4



Center Frequency	5785 MHz
Horizontal (dBi) peak	−1.6
Vertical (dBi) peak	−1.4
Horiz+Vert (dBi) peak	−1.4

Main antenna: 5850 MHz

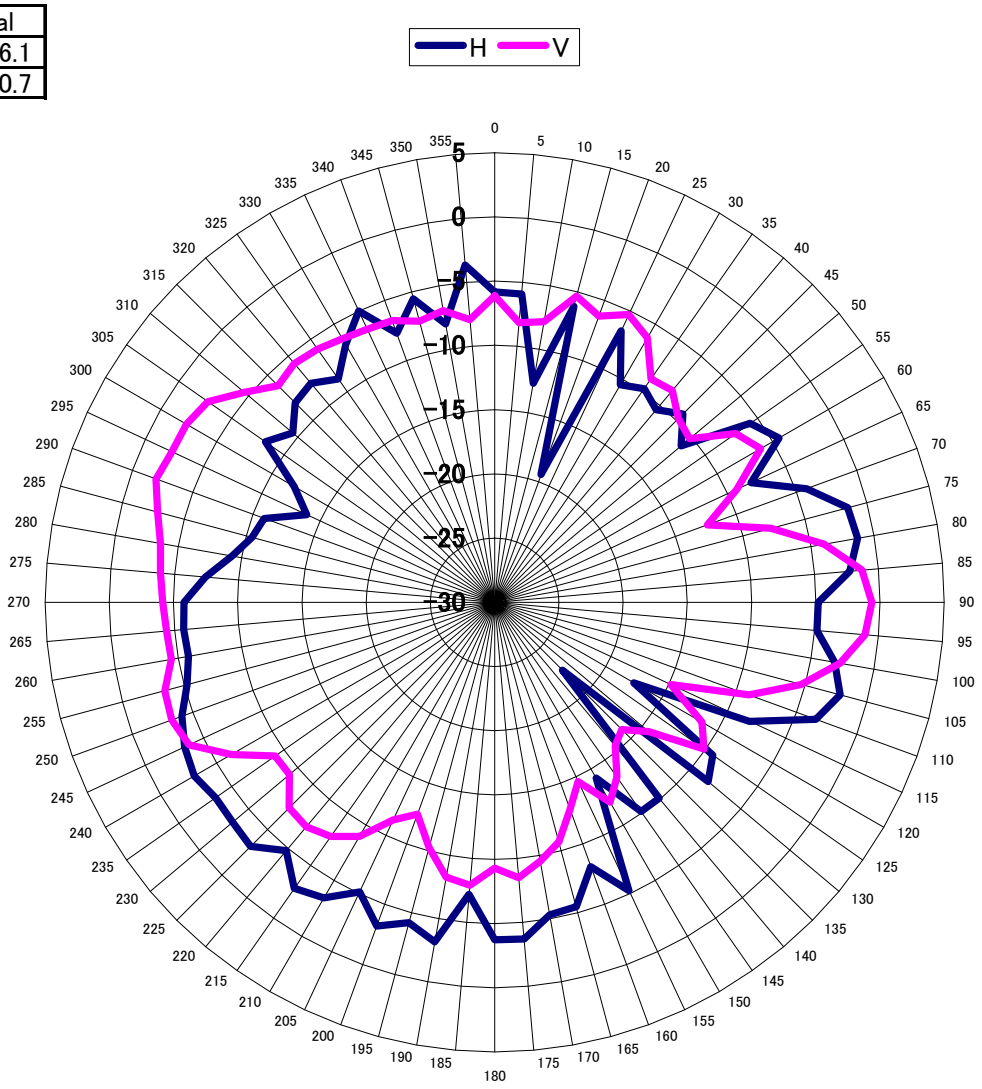
	Horizontal	Vertical
AVG	−8.3	−8.9
MAX	−4.3	−4.0



Center Frequency	5850 MHz
Horizontal (dBi) peak	−4.3
Vertical (dBi) peak	−4.0
Horiz+Vert (dBi) peak	−4.0

Auxiliary antenna: 5725 MHz

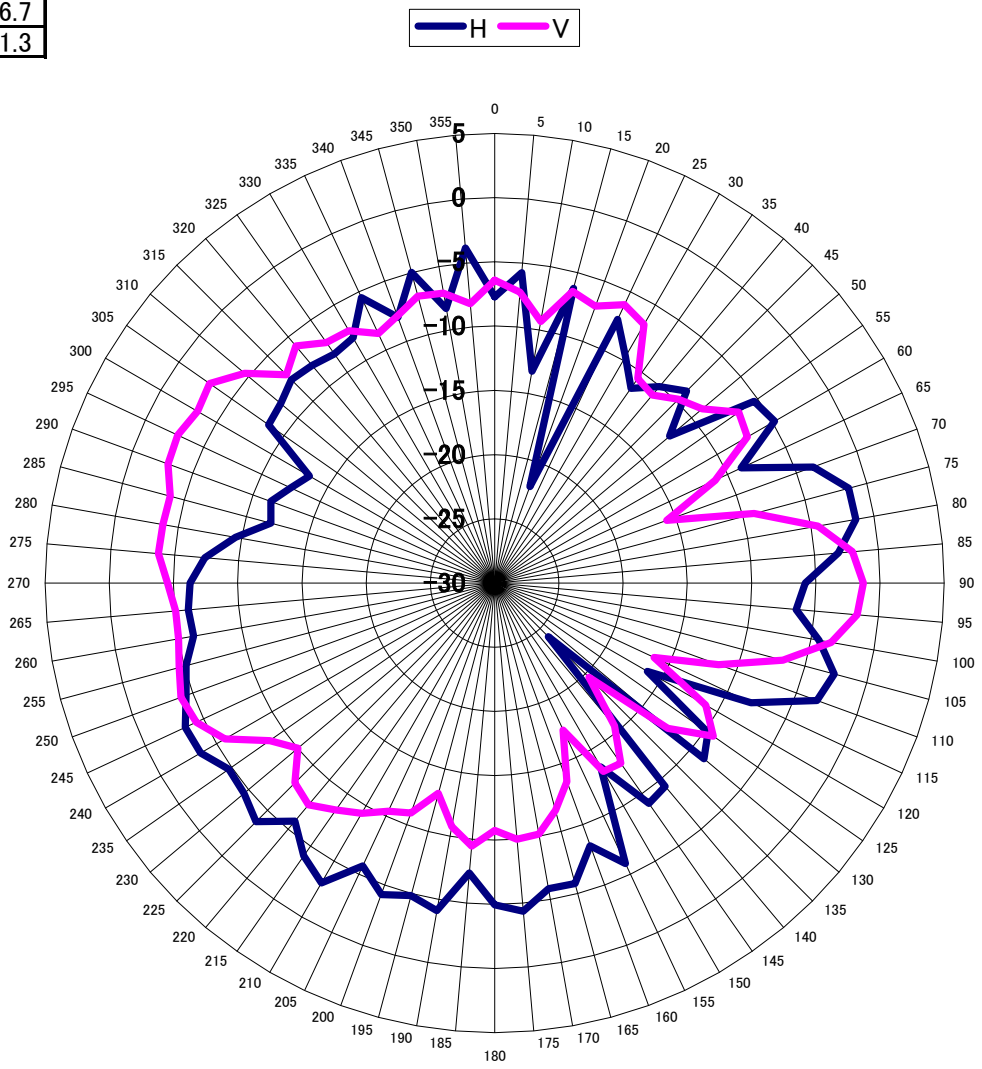
	Horizontal	Vertical
AVG	−5.7	−6.1
MAX	−1.3	−0.7



Center Frequency	5725 MHz
Horizontal (dBi) peak	−1.3
Vertical (dBi) peak	−0.7
Horiz+Vert (dBi) peak	−0.7

Auxiliary antenna: 5785 MHz

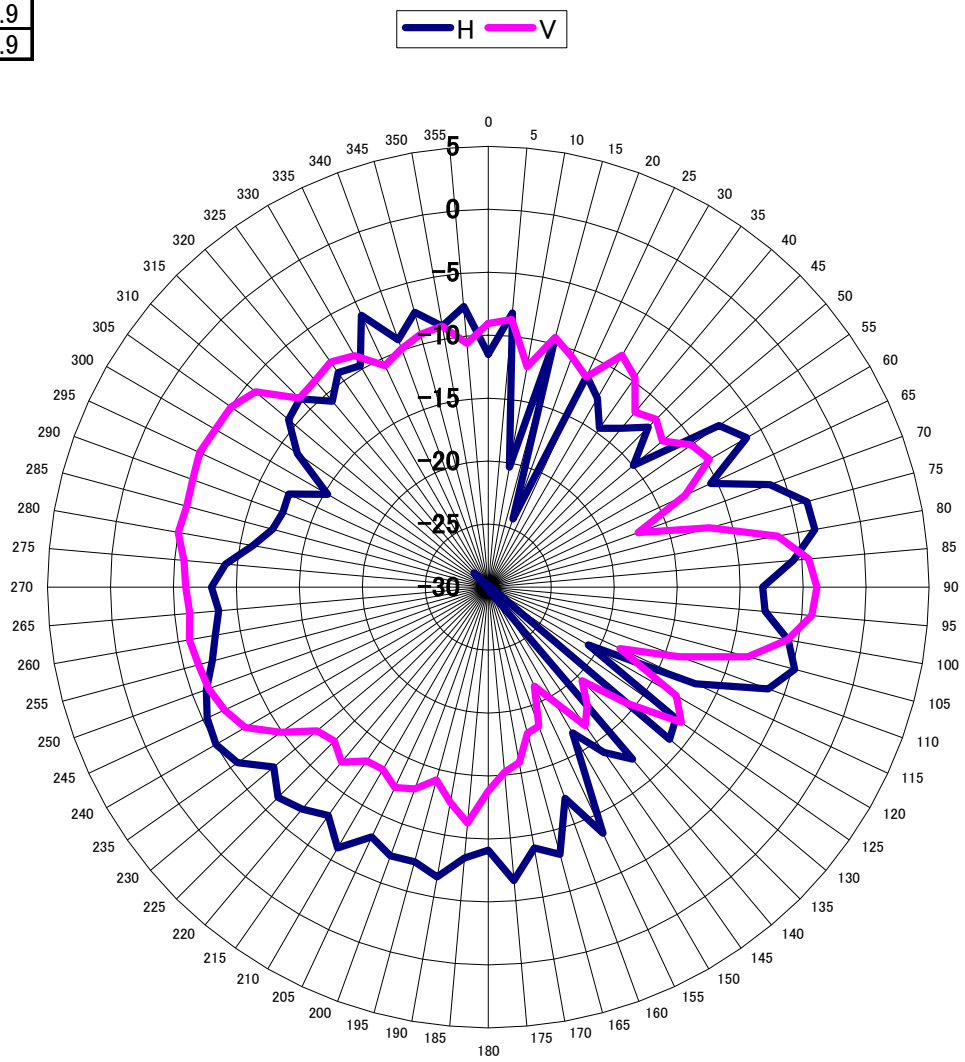
	Horizontal	Vertical
AVG	−6.1	−6.7
MAX	−1.5	−1.3



Center Frequency	5785 MHz
Horizontal (dBi) peak	−1.5
Vertical (dBi) peak	−1.3
Horiz+Vert (dBi) peak	−1.3

Auxiliary antenna: 5850 MHz

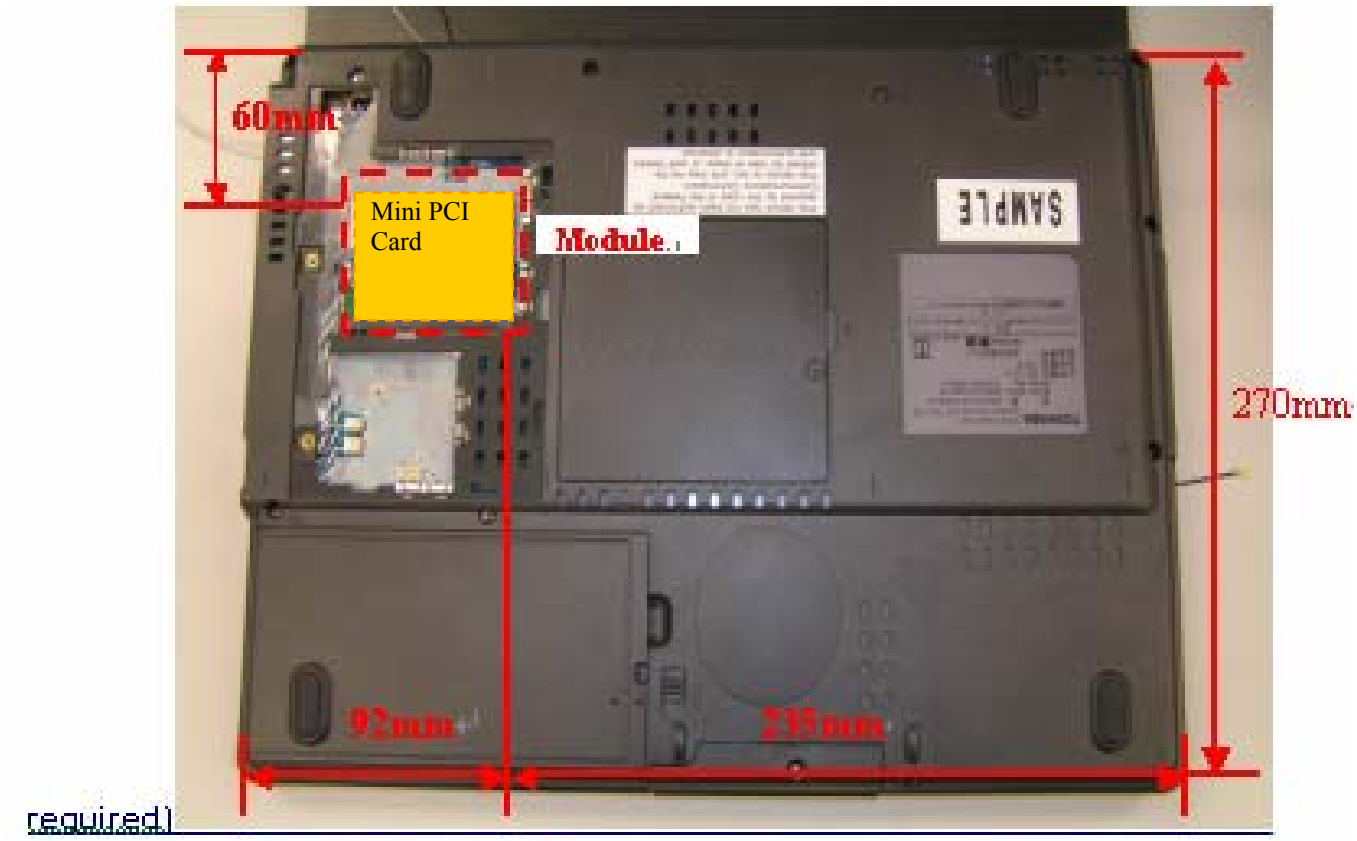
	Horizontal	Vertical
AVG	−8.4	−8.9
MAX	−3.7	−3.9



Center Frequency	5850 MHz
Horizontal (dBi) peak	−3.7
Vertical (dBi) peak	−3.9
Horiz+Vert (dBi) peak	−3.7

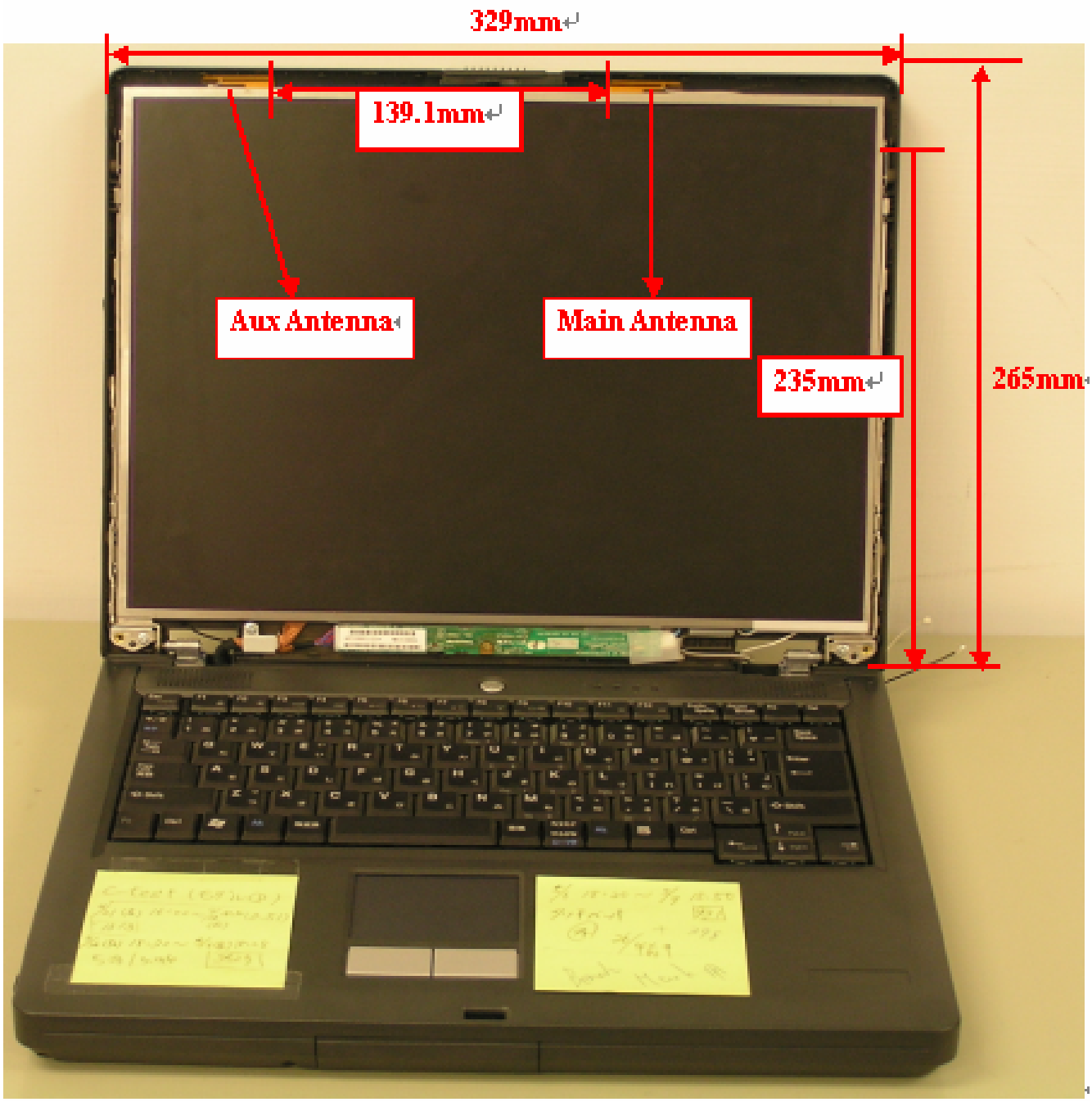
Section 4. Host Platform Information

Module Location Photo:



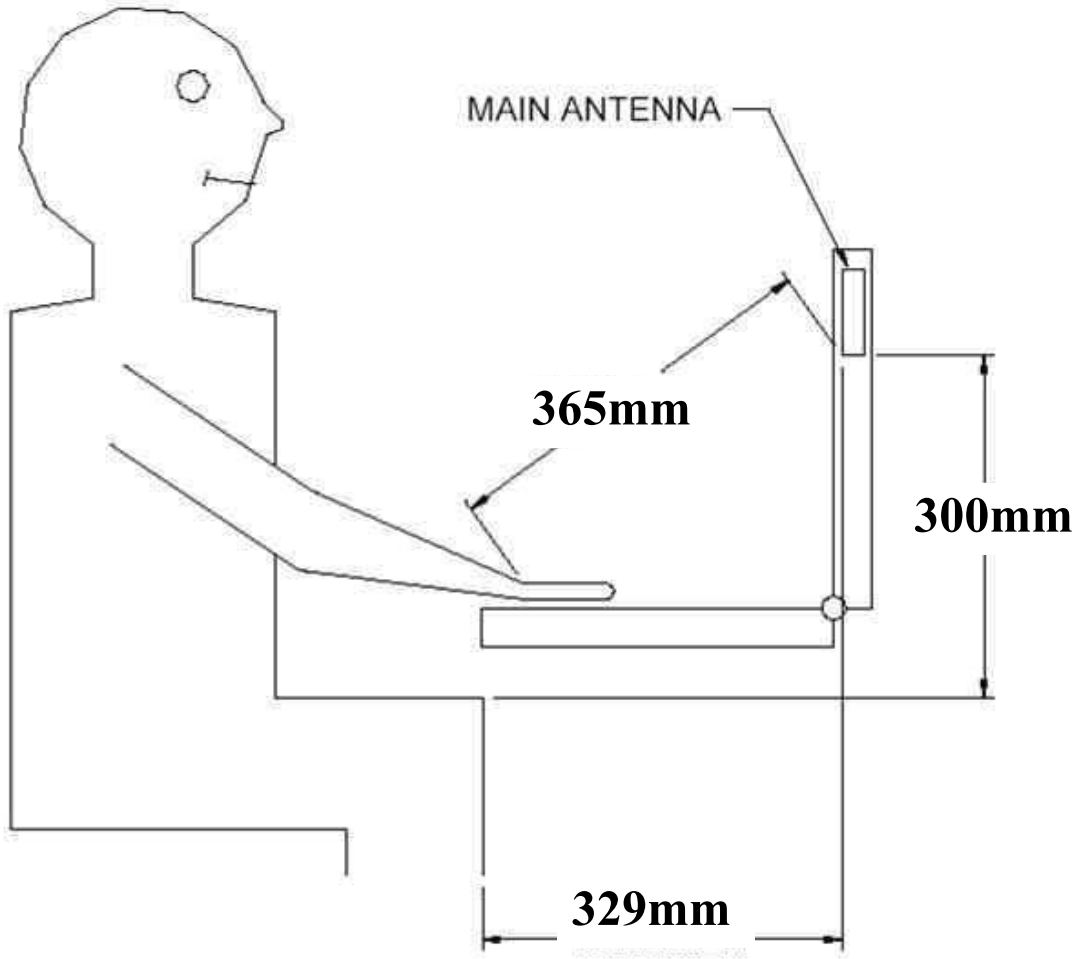
Section 5. Antenna Host Platform Location Information

Include a **dimensioned photo or dimensioned drawing** of main and auxiliary antenna placements.



Section 6. Antenna dimensional information for SAR evaluation

Include a **dimensioned photo or dimensioned drawing** showing the distance (mm) between the transmit (main) antenna and the user (excluding hands, wrist, feet, and ankle)



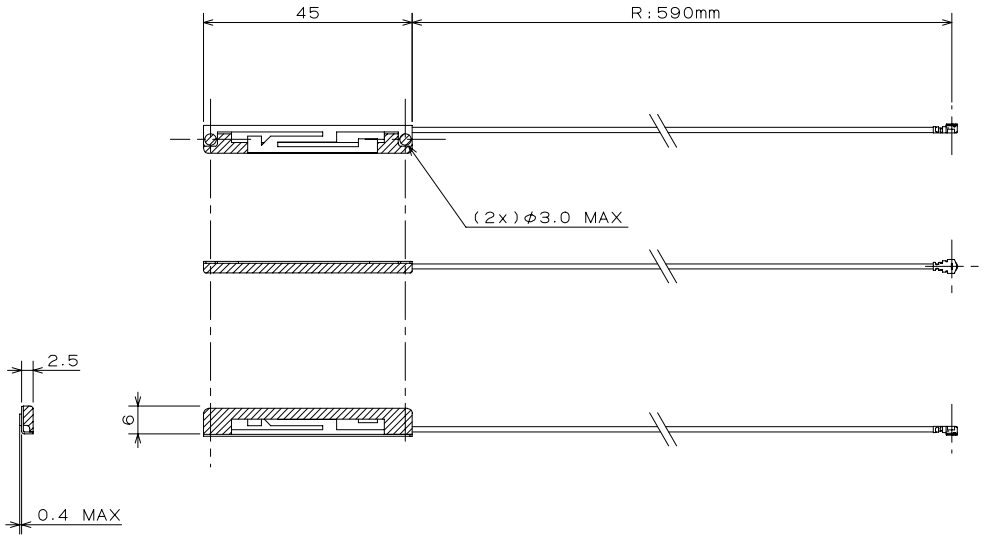
Section 1. Antenna Assembly Specifications

Antenna Assembly Summary:

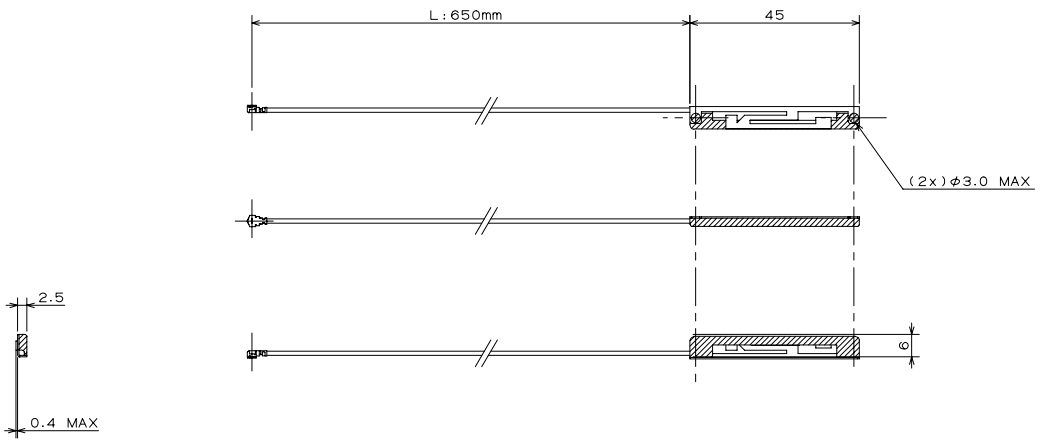
1A Antenna Part Number	1B Manufacture	1C Antenna Type	1D Cable Assembly Part Number and Information	1E Peak Gain W/ Cable loss (dBi)	1F Peak Gain w/o Cable Loss (dBi)	1G VSWR	1H Cable Loss (dBi)
P/N:1-754-420-11 Main antenna (R side)	NISSEI ELECTRIC CO., LTD.	Inverted-F	P/N: RF-MF50161 50 ohm Coaxial. length: 590mm diameter: 1.13mm Connector: U.FL	2400-2500MHz 2.13 dBi (peak)	2400-2500MHz 4.10 dBi (peak)	2400-2500MHz 2.00 max	2400-2500MHz 1.97 dBi (peak)
				5150-5350MHz 1.80 dBi (peak)	5150-5350MHz 4.83 dBi (peak)	5150-5350MHz 2.00 max	5150-5350MHz 3.03 dBi (peak)
				5470-5725MHz -0.31 dBi (peak)	5470-5725MHz 2.84 dBi (peak)	5470-5725MHz 2.00 max	5470-5725MHz 3.15 dBi (peak)
				5725-5850MHz -1.31 dBi (peak)	5725-5850MHz 1.99 dBi (peak)	5725-5850MHz 2.00 max	5725-5850MHz 3.30 dBi (peak)
P/N:1-754-420-21 Auxiliary antenna (L side)	NISSEI ELECTRIC CO., LTD.	Inverted-F	P/N: RF-MF50161 50 ohm Coaxial. length: 650mm diameter: 1.13mm Connector: U.FL	2400-2500MHz -0.41 dBi (peak)	2400-2500MHz 1.76 dBi (peak)	2400-2500MHz 2.00 max	2400-2500MHz 2.17 dBi (peak)
				5150-5350MHz 1.21 dBi (peak)	5150-5350MHz 4.55 dBi (peak)	5150-5350MHz 2.00 max	5150-5350MHz 3.34 dBi (peak)
				5470-5725MHz 1.39 dBi (peak)	5470-5725MHz 4.86 dBi (peak)	5470-5725MHz 2.00 max	5470-5725MHz 3.47 dBi (peak)
				5725-5850MHz 1.12 dBi (peak)	5725-5850MHz 4.75 dBi (peak)	5725-5850MHz 2.00 max	5725-5850MHz 3.63 dBi (peak)

Section 2. Dimensioned Photos or Drawings of Antennas

Include a dimensioned photo or dimensioned drawing of main antenna here.



Include a dimensioned photo or dimensioned drawing of aux antenna here.

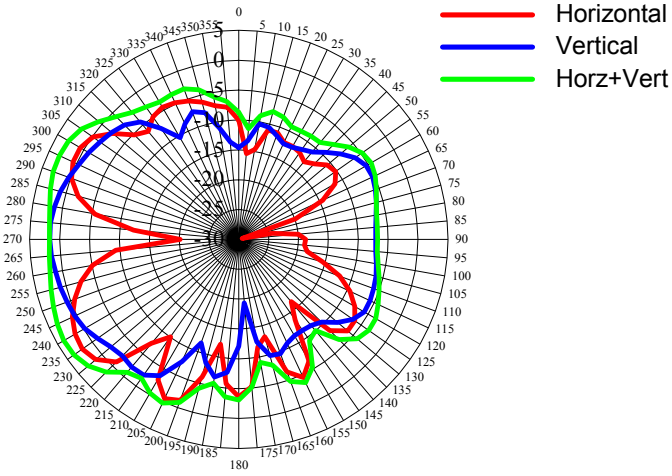


Section 3. Radiation characteristics of antennae Loaded in Host Platform

2400-2500MHz radiation characteristic

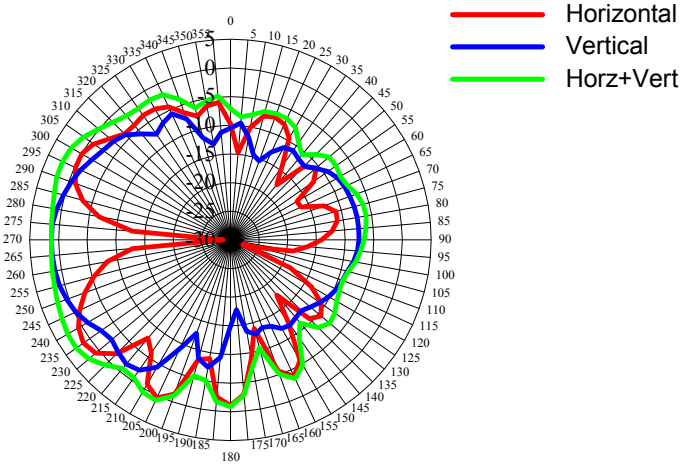
Main antenna: 2400 MHz

Main Antenna	2400 MHz
Horizontal Average	-4.97 dBi
Vertical Average	-4.07 dBi
Horz+Vert Average	-1.49 dBi
Horizontal Peak	1.97 dBi
Vertical Peak	1.63 dBi
Horz+Vert Peak	3.82 dBi



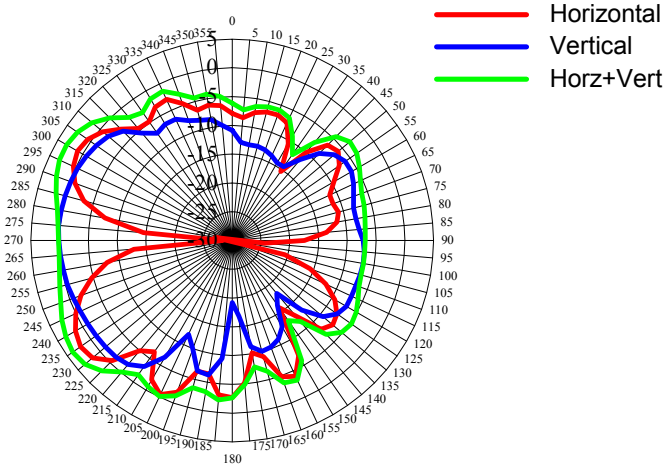
Main antenna: 2450 MHz

Main Antenna	2450 MHz
Horizontal Average	-5.12 dBi
Vertical Average	-4.82 dBi
Horz+Vert Average	-1.96 dBi
Horizontal Peak	1.33 dBi
Vertical Peak	1.23 dBi
Horz+Vert Peak	2.85 dBi



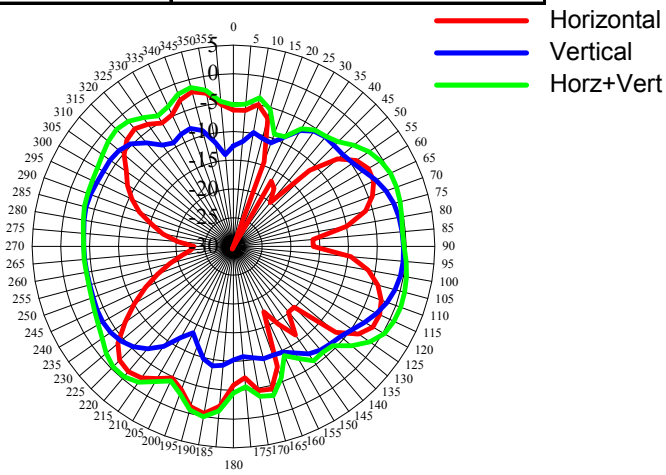
Main antenna: 2500 MHz

Main Antenna	2500 MHz
Horizontal Average	-4.52 dBi
Vertical Average	-4.76 dBi
Horz+Vert Average	-1.63 dBi
Horizontal Peak	2.13 dBi
Vertical Peak	0.23 dBi
Horz+Vert Peak	3.80 dBi



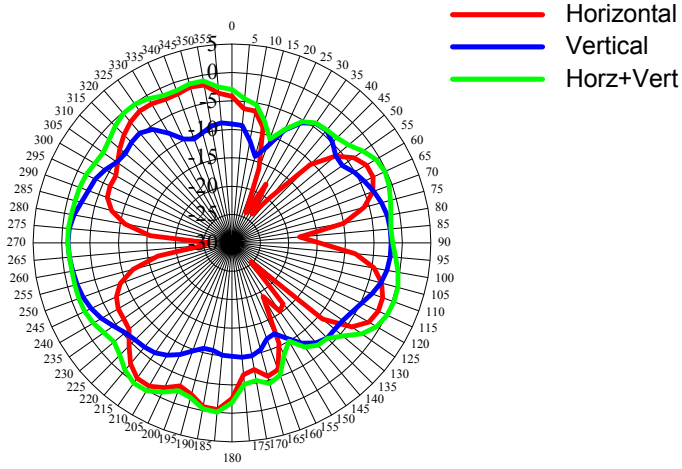
Auxiliary antenna: 2400 MHz

Auxiliary Antenna	2400 MHz
Horizontal Average	-5.77 dBi
Vertical Average	-5.00 dBi
Horz+Vert Average	-2.36 dBi
Horizontal Peak	-0.56 dBi
Vertical Peak	-0.41 dBi
Horz+Vert Peak	0.90 dBi



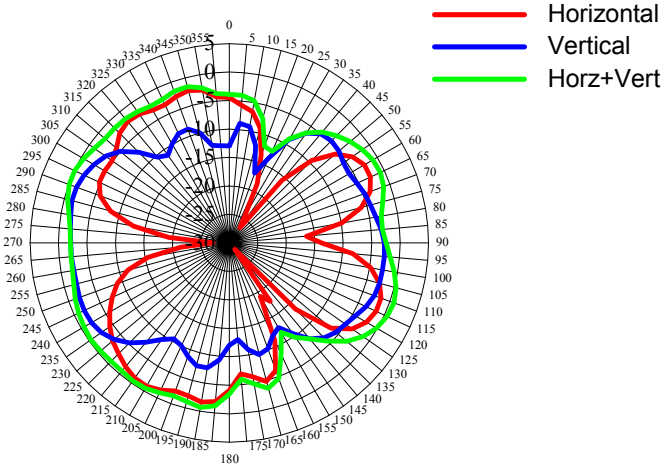
Auxiliary antenna: 2450 MHz

Auxiliary Antenna	2450 MHz
Horizontal Average	-4.98 dBi
Vertical Average	-5.08 dBi
Horz+Vert Average	-2.02 dBi
Horizontal Peak	-0.57 dBi
Vertical Peak	-1.13 dBi
Horz+Vert Peak	0.34 dBi



Auxiliary antenna: 2500 MHz

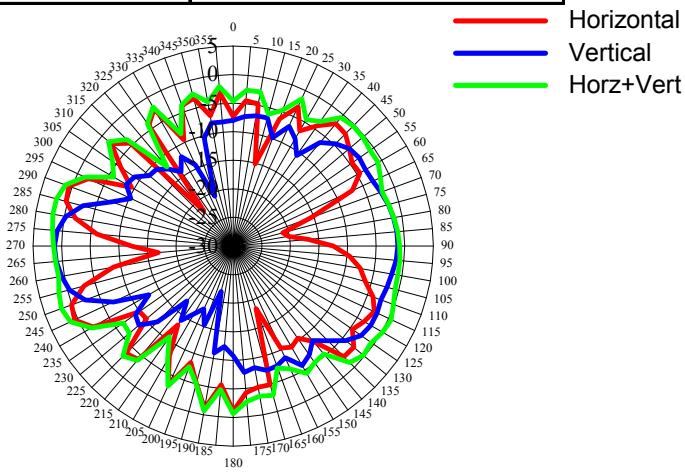
Auxiliary Antenna	2500 MHz
Horizontal Average	-4.96 dBi
Vertical Average	-5.26 dBi
Horz+Vert Average	-2.10 dBi
Horizontal Peak	-0.97 dBi
Vertical Peak	-1.45 dBi
Horz+Vert Peak	0.73 dBi



5150-5350 MHz radiation characteristic

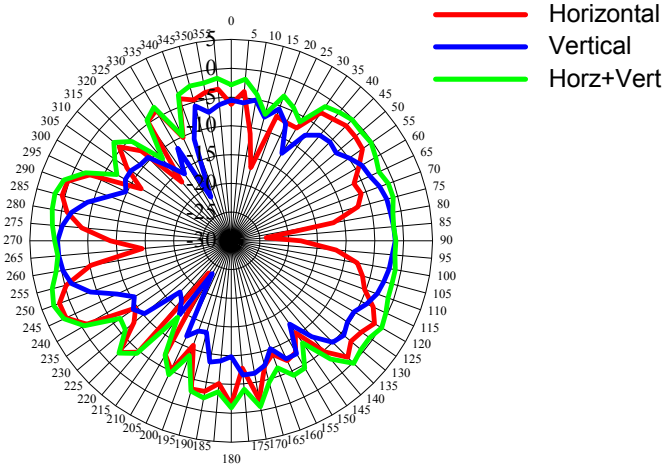
Main antenna: 5150 MHz

Main Antenna	5150 MHz
Horizontal Average	-4.63 dBi
Vertical Average	-4.87 dBi
Horz+Vert Average	-1.74 dBi
Horizontal Peak	0.59 dBi
Vertical Peak	1.20 dBi
Horz+Vert Peak	1.96 dBi



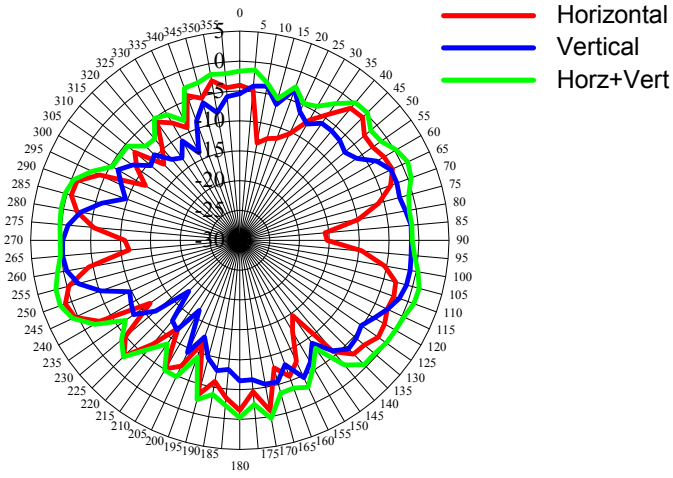
Main antenna: 5250 MHz

Main Antenna	5250 MHz
Horizontal Average	-4.23 dBi
Vertical Average	-5.35 dBi
Horz+Vert Average	-1.74 dBi
Horizontal Peak	1.80 dBi
Vertical Peak	0.21 dBi
Horz+Vert Peak	2.83 dBi



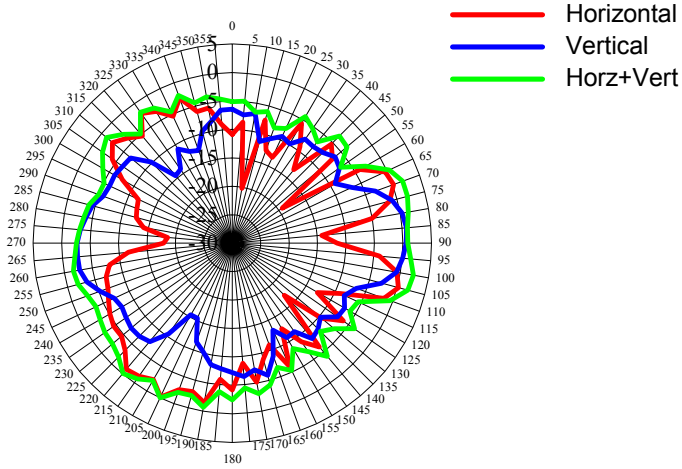
Main antenna: 5350 MHz

Main Antenna	5350 MHz
Horizontal Average	-4.37 dBi
Vertical Average	-4.93 dBi
Horz+Vert Average	-1.63 dBi
Horizontal Peak	1.08 dBi
Vertical Peak	-0.22 dBi
Horz+Vert Peak	1.99 dBi



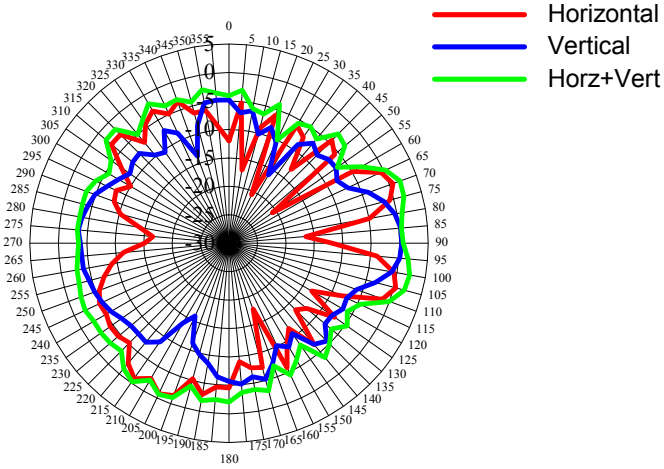
Auxiliary antenna: 5150 MHz

Auxiliary Antenna	5150 MHz
Horizontal Average	-5.13 dBi
Vertical Average	-5.79 dBi
Horz+Vert Average	-2.44 dBi
Horizontal Peak	0.20 dBi
Vertical Peak	0.73 dBi
Horz+Vert Peak	2.31 dBi



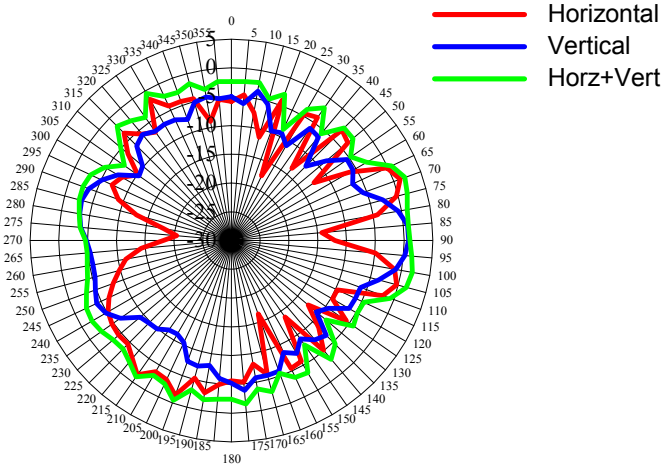
Auxiliary antenna: 5250 MHz

Auxiliary Antenna	5250 MHz
Horizontal Average	-5.23 dBi
Vertical Average	-5.68 dBi
Horz+Vert Average	-2.44 dBi
Horizontal Peak	0.65 dBi
Vertical Peak	0.37 dBi
Horz+Vert Peak	2.22 dBi



Auxiliary antenna: 5350 MHz

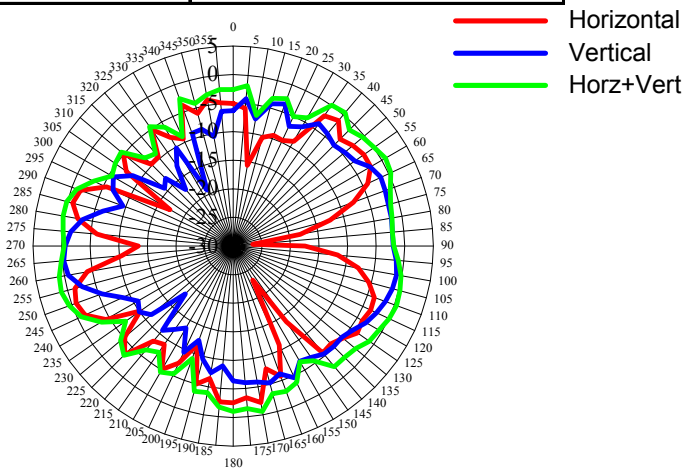
Auxiliary Antenna	5350 MHz
Horizontal Average	-5.16 dBi
Vertical Average	-5.35 dBi
Horz+Vert Average	-2.24 dBi
Horizontal Peak	1.21 dBi
Vertical Peak	0.77 dBi
Horz+Vert Peak	2.02 dBi



5470-5725MHz radiation characteristic

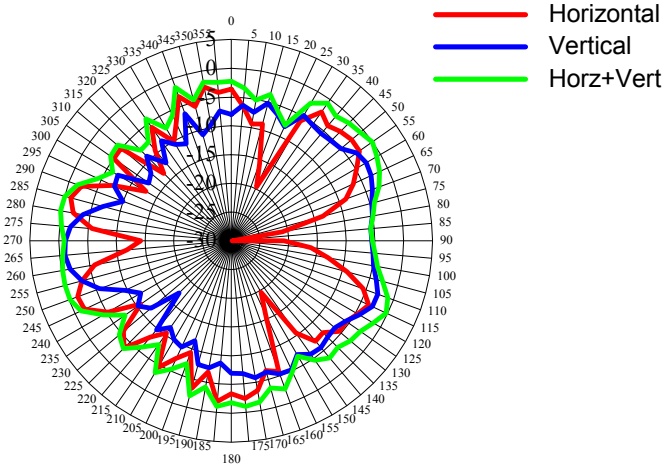
Main antenna: 5470 MHz

Main Antenna	5470 MHz
Horizontal Average	-5.22 dBi
Vertical Average	-4.92 dBi
Horz+Vert Average	-2.06 dBi
Horizontal Peak	-0.76 dBi
Vertical Peak	-0.31 dBi
Horz+Vert Peak	1.04 dBi



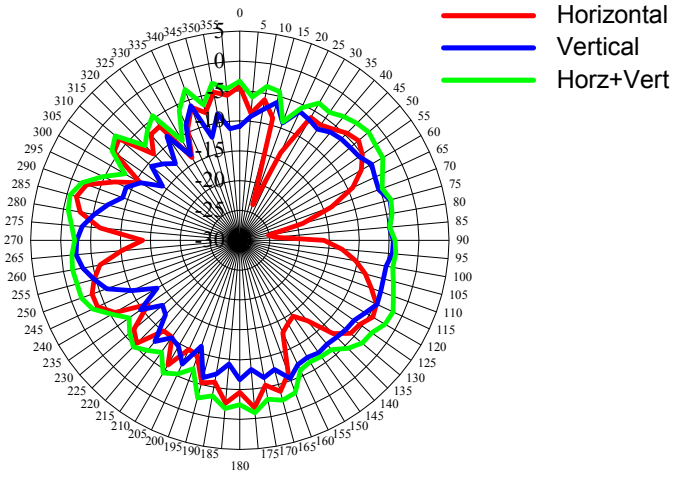
Main antenna: 5597.5 MHz

Main Antenna	5597.5 MHz
Horizontal Average	-5.65 dBi
Vertical Average	-5.93 dBi
Horz+Vert Average	-2.78 dBi
Horizontal Peak	-1.11 dBi
Vertical Peak	-0.94 dBi
Horz+Vert Peak	0.12 dBi



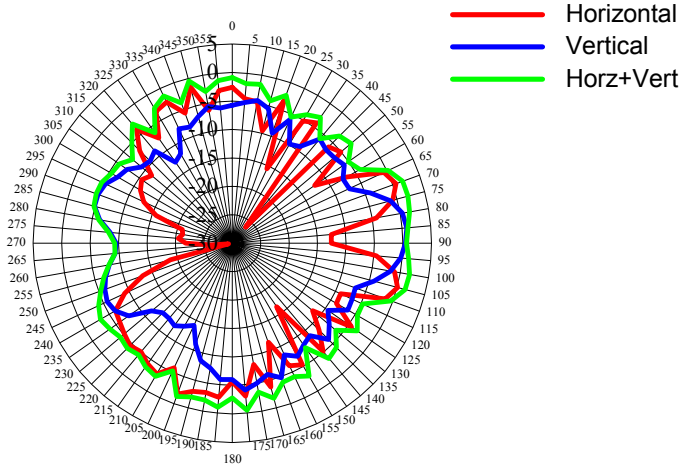
Main antenna: 5725 MHz

Main Antenna	5725 MHz
Horizontal Average	-6.52 dBi
Vertical Average	-6.76 dBi
Horz+Vert Average	-3.63 dBi
Horizontal Peak	-1.70 dBi
Vertical Peak	-2.51 dBi
Horz+Vert Peak	-0.61 dBi



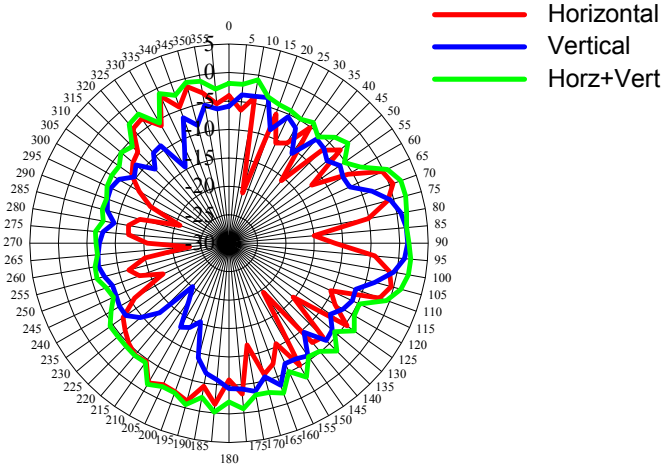
Auxiliary antenna: 5470 MHz

Auxiliary Antenna	5470 MHz
Horizontal Average	-5.28 dBi
Vertical Average	-5.89 dBi
Horz+Vert Average	-2.57 dBi
Horizontal Peak	0.59 dBi
Vertical Peak	0.79 dBi
Horz+Vert Peak	2.01 dBi



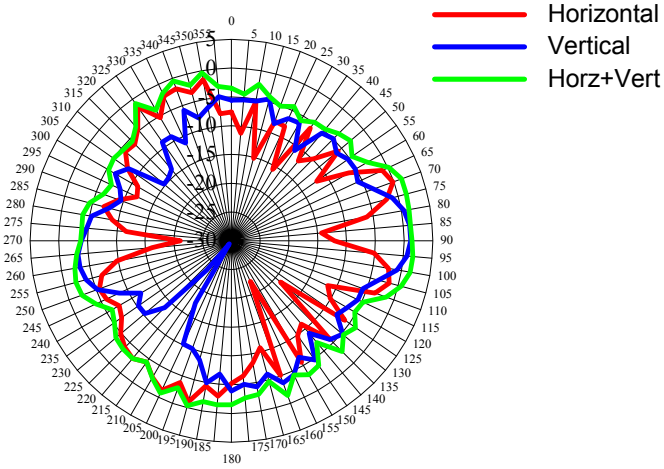
Auxiliary antenna: 5597.5 MHz

Auxiliary Antenna	5597.5 MHz
Horizontal Average	-5.36 dBi
Vertical Average	-5.52 dBi
Horz+Vert Average	-2.43 dBi
Horizontal Peak	0.64 dBi
Vertical Peak	1.39 dBi
Horz+Vert Peak	2.14 dBi



Auxiliary antenna: 5725 MHz

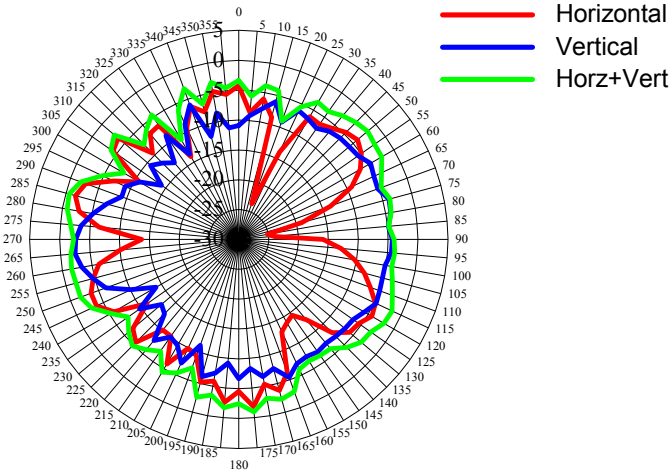
Auxiliary Antenna	5725 MHz
Horizontal Average	-5.53 dBi
Vertical Average	-5.29 dBi
Horz+Vert Average	-2.40 dBi
Horizontal Peak	-0.18 dBi
Vertical Peak	1.12 dBi
Horz+Vert Peak	1.58 dBi



5725-5850 MHz radiation characteristic

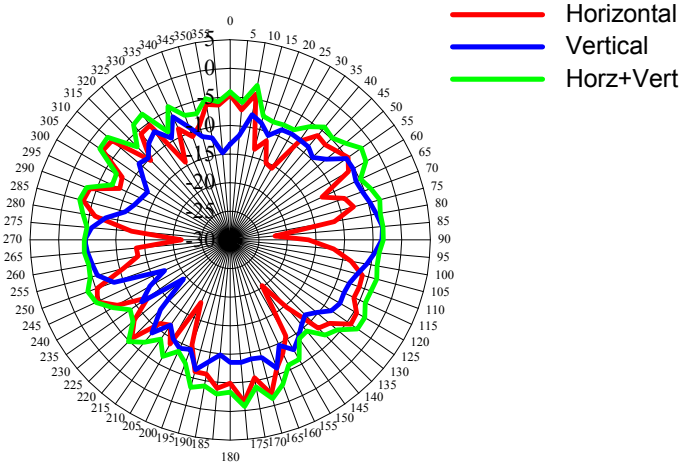
Main antenna: 5725 MHz

Main Antenna	5725 MHz
Horizontal Average	-6.52 dBi
Vertical Average	-6.76 dBi
Horz+Vert Average	-3.63 dBi
Horizontal Peak	-1.70 dBi
Vertical Peak	-2.51 dBi
Horz+Vert Peak	-0.61 dBi



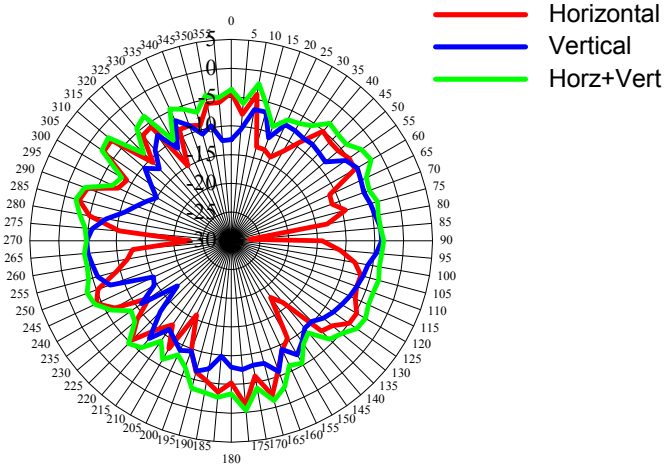
Main antenna: 5785 MHz

Main Antenna	5785 MHz
Horizontal Average	-7.08 dBi
Vertical Average	-7.98 dBi
Horz+Vert Average	-4.50 dBi
Horizontal Peak	-1.63 dBi
Vertical Peak	-3.28 dBi
Horz+Vert Peak	-0.82 dBi



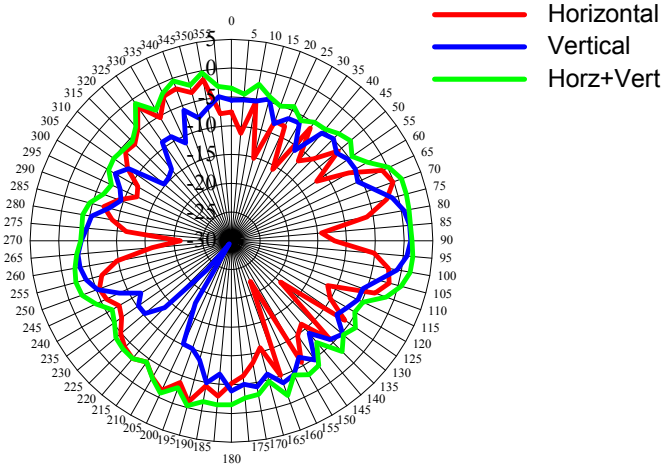
Main antenna: 5850 MHz

Main Antenna	5850 MHz
Horizontal Average	-6.93 dBi
Vertical Average	-7.82 dBi
Horz+Vert Average	-4.34 dBi
Horizontal Peak	-1.31 dBi
Vertical Peak	-3.85 dBi
Horz+Vert Peak	-0.37 dBi



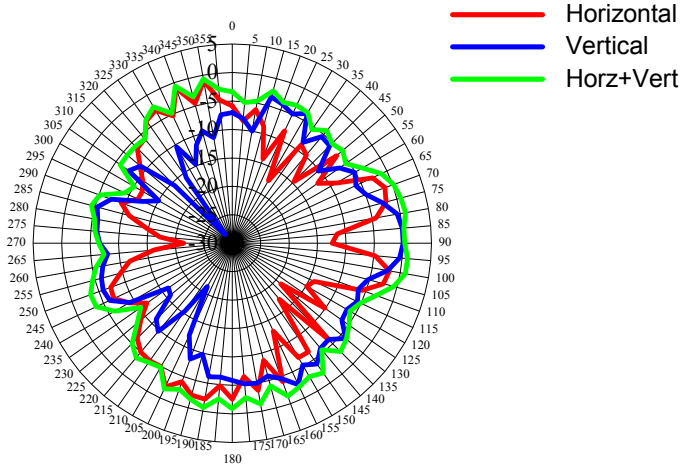
Auxiliary antenna: 5725 MHz

Auxiliary Antenna	5725 MHz
Horizontal Average	-5.53 dBi
Vertical Average	-5.29 dBi
Horz+Vert Average	-2.40 dBi
Horizontal Peak	-0.18 dBi
Vertical Peak	1.12 dBi
Horz+Vert Peak	1.58 dBi



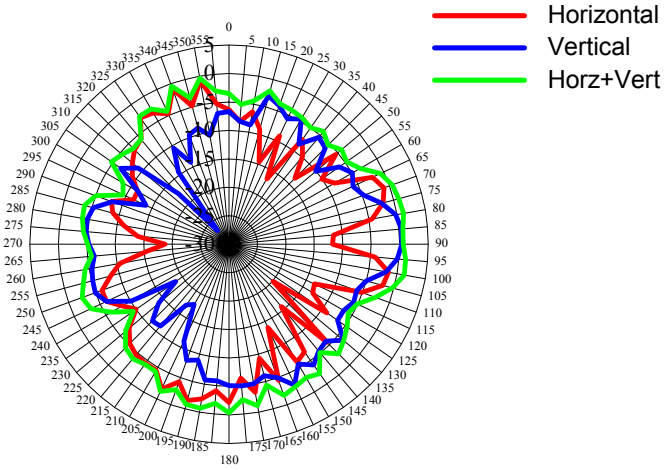
Auxiliary antenna: 5785 MHz

Auxiliary Antenna	5785 MHz
Horizontal Average	-6.11 dBi
Vertical Average	-5.99 dBi
Horz+Vert Average	-3.04 dBi
Horizontal Peak	-1.03 dBi
Vertical Peak	0.06 dBi
Horz+Vert Peak	0.94 dBi



Auxiliary antenna: 5850 MHz

Auxiliary Antenna	5850 MHz
Horizontal Average	-5.76 dBi
Vertical Average	-5.74 dBi
Horz+Vert Average	-2.74 dBi
Horizontal Peak	-0.88 dBi
Vertical Peak	0.39 dBi
Horz+Vert Peak	1.23 dBi

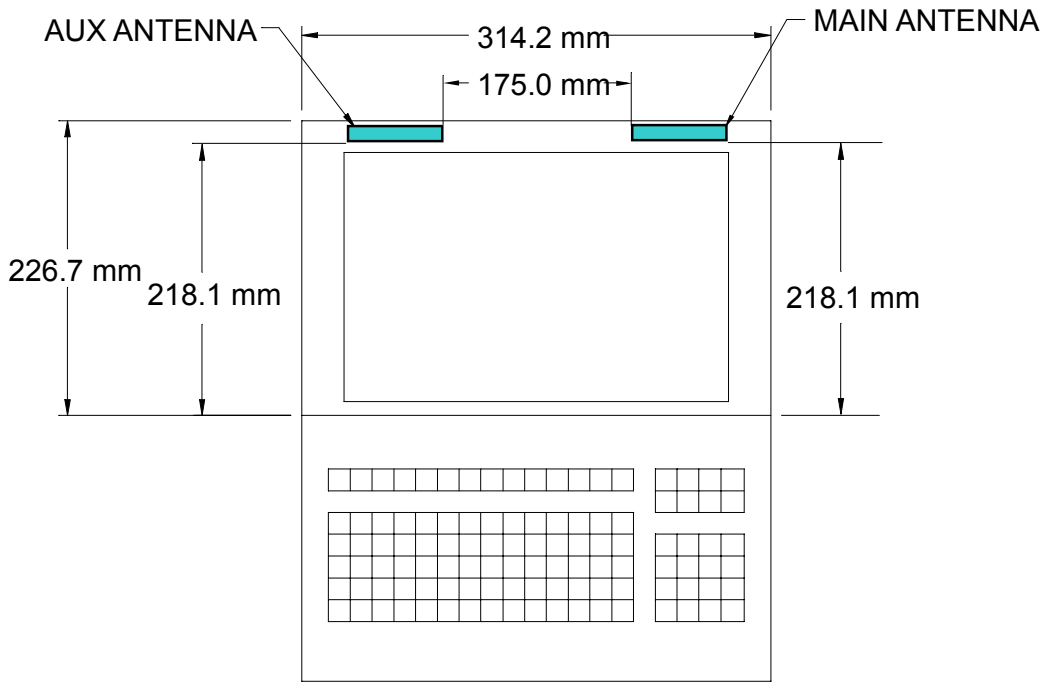


Section 4. Host Platform Information

OEM / ODM Host platform: IRX-3400 platform correlated to antenna data

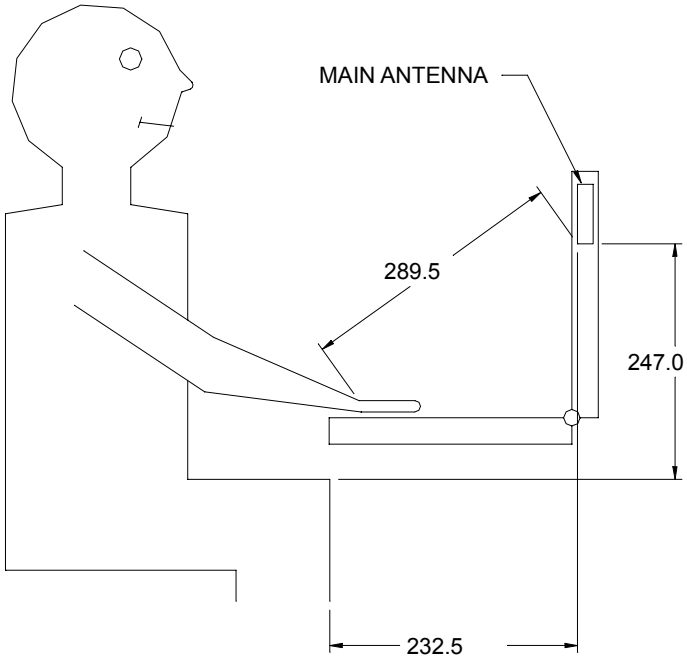
Section 5. Antenna Host Platform Location Information

Include a dimensioned photos or dimensioned drawings of main and auxiliary antenna placements.



Section 6. Antenna dimensional information for SAR evaluation

Include a dimensioned photos or dimensioned drawings showing the distance (mm) between the transmit (main) antenna and the user (excluding hands, wrist, feet, and ankle)



Section 7. Diagram Example of Co-Location Antenna Separation

Indicate distance between WLAN module antennas and Bluetooth/other radio antenna element.

(Note: Due to the evolving rules regarding co-location, each platform will need to be reviewed on a case by case basis)