

# WWAN Antenna Information

## ThinkPad X13 Gen 3 Series

### [Amphenol Taiwan Corporation antenna]

<b>Platform</b>	
Platform owner	Lenovo(Japan) Limited
Platform name	ThinkPad X13 Gen 3
Regulatory Model name (Compliance ID)	TP00131C *, TP00131D* (* = 0 -9, A-Z, a-z, or blank)
ODM	LCFC
Target Launch Date	2022 / 03/ 31
<b>Tx Antenna</b>	
Brand name	Amphenol Taiwan Corporation
Parts Number	Main Antenna: DC33001YH00
	Auxiliary Antenna: DC33001YH00 (Rx only)
	MIMO1 Antenna DC33001QG20 (Rx only)
	MIMO2 Antenna DC33001QG30
<b>Transmitter Module</b>	
WWAN Module	Model: Fibocom FM350-GL      FCC ID: ZMOFM350GL IC: :21374-FM350GL
	Model: Fibocom L860-GL-16      FCC ID: ZMOL860GL16 IC: :21374-L860GL16
	Model: Quectel EM05-G      FCC ID: XMR2021EM05G IC: 10224A-2021EM05G

#### Revision history

Revision number	Date	Description
1	2020/ xx/ xx	Initial release

## Section 1. Antenna Assembly Specifications

Green = EM05G & L860-GL-16 & FM350GL  
 Yellow = EM05G  
 Blue = FM350GL  
 Gray = No Support Plan

### Main Antenna

Antenna Part Number	Manufacturer	Antenna Type	Cable Assembly Part Number and Information	Frequency (MHz)	Cable Loss (dB)	Peak Gain (including cable loss)		
						Horizontal (dBi)	Vertical (dBi)	
DC33001YH 00	Amphenol Taiwan Corporation	PIFA	1. Cable P/N: C-5878-16-051-78 2. Diameter:1.13mm 50 ohm coaxial cable 3. Cable length: 126 mm 4. Connector P/N: C-3971-15-000-95	EU/ANZ/CN/Japan UMTS/HSPA (UMTS 2100, Band 1) (UE-UTRA, Band 1, n1)	1920.00	-0.4	1.1	-5.5
					1950.00	-0.4	1.3	-6.7
					1980.00	-0.4	1.3	-6.7
				FCC Part 24 GSM/GPRS/EDGE (GSM 1900) UMTS/HSPA/EVDO (UMTS1900, Band 2) (UE-UTRA, Band 2, n2)	1850.00	-0.4	-1.4	-6.6
					1880.00	-0.4	-1	-5.5
					1910.00	-0.4	-0.7	-5.5
				EU/ANZ/CN/Japan GSM/GPRS/EDGE (GSM 1800, Band 3) (UE-UTRA, Band 3, n3)	1710.00	-0.3	-0.7	-5.4
					1747.50	-0.3	-0.1	-6.0
					1785.00	-0.3	1.5	-6.8
				FCC Part 27 UMTS(AWS) / HSPA (UMTS, Band 4) (UE-UTRA, Band 4)	1710.00	-0.3	-0.7	-5.4
					1732.50	-0.3	-0.8	-6
					1755.00	-0.3	-0.7	-6.2
				FCC Part 22 GSM/GPRS/EDGE (GSM 850) ANZ (UMTS850, Band 5) (UE-UTRA, Band 5, n5)	824.00	-0.3	-1.4	-8.6
					836.50	-0.3	-0.6	-8.5
					849.00	-0.3	-0.7	-9
				Japan (UMTS, Band 6)	830.00	-0.3	-0.5	-8.5
					835.00	-0.3	0.1	-8.4
					840.00	-0.3	0.2	-8.5
				FCC Part 27 CA/EU/ANZ (UE-UTRA, Band 7, n7)	2500.00	-0.4	0.6	-8.4
					2535.00	-0.4	0.5	-8.4
					2570.00	-0.4	0.6	-7
				EU/ANZ/Japan UMTS/HSPA (UMTS 900, Band 8) (UE-UTRA, Band 8, n8)	880.00	-0.3	-2.4	-9.1
					897.50	-0.3	-2.3	-8.9
					915.00	-0.3	-1.5	-8.5
				Japan (WCDMA, Band 9)	1844.9	-0.4	1.7	-6.4
					1862.5	-0.4	1.0	-6.3
					1879.9	-0.4	0.7	-5.3
				FCC Part 27 (UE-UTRA, Band 12, n12)	699.00	-0.2	-3.4	-5.6
					707.50	-0.2	-3.0	-5.7
					716.00	-0.2	-3.3	-5.1
				FCC Part 27 (UE-UTRA, Band 13)	777.00	-0.2	-1.1	-7.0
					782.00	-0.2	-0.5	-6.5
					787.00	-0.3	-0.7	-7.0
FCC Part 90 (UE-UTRA, Band 14)	788.00	-0.3	-0.7	-7.1				
	793.00	-0.3	-0.4	-7.1				
	798.00	-0.3	-0.3	-7.0				
FCC Part 27 (UE-UTRA, Band 17)	704.00	-0.2	-3.2	-5.8				
	710.00	-0.2	-3.1	-5.4				
	716.00	-0.2	-3.3	-5.1				
Japan (UE-UTRA, Band 18)	815.00	-0.3	-1.0	-7.4				
	822.50	-0.3	-1.4	-8.5				
	830.00	-0.3	-0.5	-8.5				
Japan (UMTS, Band 19) (UE-UTRA, Band 19)	830.00	-0.3	-0.5	-8.5				
	837.50	-0.3	0.1	-8.6				
	845.00	-0.3	0.2	-8.5				

EU (UE-UTRA, Band 20, n20)	832.00	-0.3	-0.1	-8.4
	847.00	-0.3	-0.1	-8.9
	862.00	-0.3	-0.2	-9.0
FCC Part 24 (UE-UTRA, Band 25)	1850.00	-0.4	-1.4	-6.6
	1882.50	-0.4	-0.7	-5.3
	1915.00	-0.4	-0.4	-5
FCC Part 90, 22H (UE-UTRA, Band 26)	814.00	-0.3	-1.1	-7.5
	831.50	-0.3	-0.6	-8.4
	849.00	-0.3	-0.7	-9
EU/ANZ/Japan (UE-UTRA, Band 28, n28)	703.00	-0.2	-3.3	-5.7
	725.50	-0.2	-2.6	-5.0
	748.00	-0.2	-1.7	-5.4
FCC Part 27 CA (UE-UTRA, Band 29) * Down link only	717.00	-0.2	-3.2	-5.1
	722.50	-0.2	-2.7	-5.0
	728.00	-0.2	-2.8	-5.1
FCC Part 27 (UE-UTRA, Band 30)	2305.00	-0.4	0.7	-7.1
	2310.00	-0.4	0.8	-7.2
	2315.00	-0.4	0.7	-7.5
EU (LTE, Band 32) * Down link only	1452.00	-0.3	-0.3	-6.6
	1474.00	-0.3	0.5	-6.6
	1496.00	-0.3	0.9	-6.8
EU (LTE Band 34)	2010.00	-0.4	1.9	-6.4
	2017.50	-0.4	1.9	-6.5
	2025.00	-0.4	1.6	-7.1
EU/CN (UE-UTRA, Band 38, n38)	2570.00	-0.4	0.6	-7
	2595.00	-0.4	0.9	-5.6
	2620.00	-0.4	0.8	-5.9
CN (TD-SCDMA, Band 39)	1880.00	-0.4	-1	-5.5
	1900.00	-0.4	1.2	-4.7
	1920.00	-0.4	1.1	-5.5
EU/ANZ/CN (UE-UTRA, Band 40)	2300.00	-0.4	1.6	-6.9
	2350.00	-0.4	1.5	-8.9
	2400.00	-0.4	1.9	-7.9
FCC Part 27 US/CN/Japan (UE-UTRA, Band 41, n41)	2496.00	-0.4	0.8	-8.4
	2593.00	-0.4	0.8	-5.6
	2690.00	-0.4	0.7	-4.8
FCC Part 96 CA/EU/Japan (LTE Band 42)	3400.00	-0.5	-0.7	-7.1
	3500.00	-0.5	0.8	-8.9
	3600.00	-0.5	0.3	-6.2
LTE Band 43	3600.00	-0.5	0.3	-6.2
	3700.00	-0.5	0.5	-4.3
	3800.00	-0.5	0.2	-5.3
FCC Part 15, 90, 95 (LTE Band 46) TD Unlicensed, LAA RCV only	5150.00	-0.6	-3.0	-3.8
	5537.00	-0.6	0.3	-3.7
	5925.00	-0.7	-0.9	-3.1
FCC Part 96 (LTE Band 48)	3550.00	-0.5	0.2	-7.4
	3625.00	-0.5	0.5	-5.5
	3700.00	-0.5	0.5	-4.3
FCC Part 27 (LTE, Band 66, n66)	1710.00	-0.3	-0.7	-5.4
	1745.00	-0.3	-0.8	-6
	1780.00	-0.3	-0.7	-7.3
FCC Part 24, 27 (LTE Band 71, n71)	663.00	-0.2	-2.7	-5.4
	680.50	-0.2	-3.3	-7.0
	698.00	-0.2	-3.5	-5.6
FCC/EU/CN/JP (5G NR Band 77)	3300.00	-0.5	-0.3	-7.3
	3750.00	-0.5	0.9	-4.8
	4200.00	-0.6	0.2	-5.2
EU/CN/JP	3300.00	-0.5	-0.3	-7.3

				<b>(5G NR Band 78)</b>	3550.00	-0.5	0.2	-7.4
					3800.00	-0.5	0.2	-5.3
				<b>CN/JP (5G NR Band 79)</b>	4400.00	-0.6	-3.6	-6.1
					4700.00	-0.6	-1.2	-6.3
					5000.00	-0.6	-1.6	-3.0
				<b>Japan (UE-UTRA, Band 21) Japan J-CDMA</b>	1447.90	-0.3	-0.4	-6.3
					1455.40	-0.3	-0.1	-6.8
					1462.90	-0.3	-0.1	-7.2
					815.00	-0.3	-1.0	-7.4
					824.70	-0.3	-1.4	-8.7
					836.52	-0.3	0.1	-8.5
					848.31	-0.3	-0.2	-9.0
					870.00	-0.3	-0.9	-9.4
					880.20	-0.3	-2.4	-9.1
					897.60	-0.3	-2.2	-8.9
					914.80	-0.3	-1.5	-8.5
					925.00	-0.3	-2.0	-9.3
				940.00	-0.3	-1.7	-9.2	
				<b>Japan J-CDMA</b>	1922.40	-0.4	1.1	-5.9
					1950.00	-0.4	1.3	-6.7
1977.60	-0.4	1.3	-6.5					

MIMO Antenna

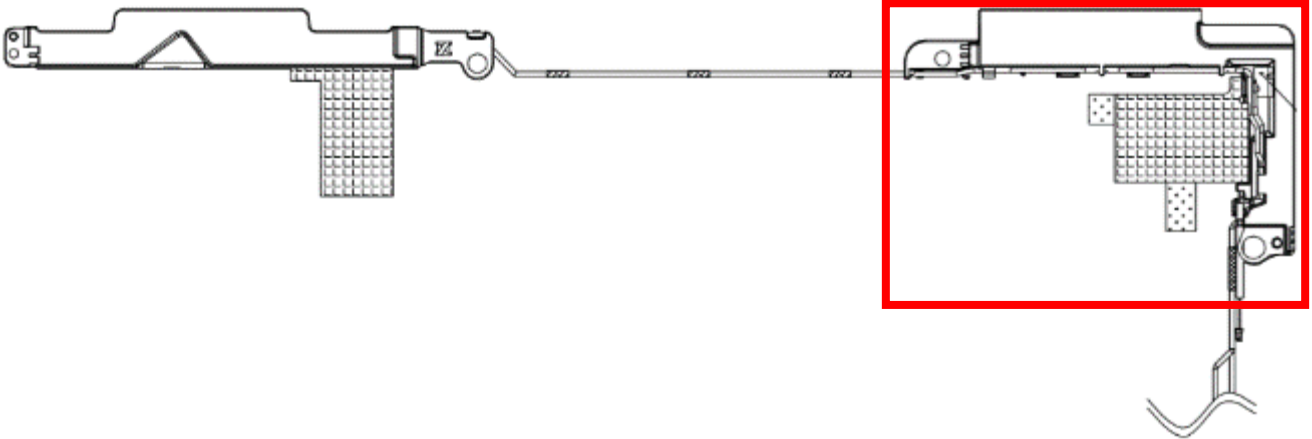
Antenna Part Number	Manufacturer	Antenna Type	Cable Assembly Part Number and Information	Frequency (MHz)		Cable Loss (dB)	Peak Gain (including cable loss)	
							Horizontal (dBi)	Vertical (dBi)
DC33001Q G30	Amphenol Taiwan Corporation	PIFA	1. Cable P/N: <b>C-5878-16-004-78</b> 2. Diameter:x.xxmm 50 ohm coaxial cable 3.Cable length: <b>458</b> mm 4. Connector P/N: <b>C-3971-15-000-95</b>	EU/ANZ/CN/Japan UMTS/HSPA (UMTS 2100, Band 1) (UE-UTRA, Band 1, n1)	1920.00	-1.1	-2.1	-2.2
					1950.00	-1.1	-2.4	-2.2
					1980.00	-1.2	-2.6	-1.7
				FCC Part 24 GSM/GPRS/EDGE (GSM 1900) UMTS/HSPA/EVDO (UMTS1900, Band 2) (UE-UTRA, Band 2, n2)	1850.00	-1.1	-1.8	-0.9
					1880.00	-1.1	-0.2	-1.0
					1910.00	-1.1	-0.9	-1.1
				EU/ANZ/CN/Japan GSM/GPRS/EDGE (GSM 1800, Band 3) (UE-UTRA, Band 3, n3)	1710.00	-1.1	-1.0	-2.4
					1747.50	-1.1	-0.4	-1.2
					1785.00	-1.1	1.7	1.1
				FCC Part 27 UMTS(AWS) / HSPA (UMTS, Band 4) (UE-UTRA, Band 4)	1710.00	-1.1	-1.0	-2.4
					1732.50	-1.1	-0.8	-1.8
					1755.00	-1.1	0.7	-0.7
				FCC Part 22 GSM/GPRS/EDGE (GSM 850) ANZ (UMTS850, Band 5) (UE-UTRA, Band 5, n5)	824.00			
					836.50			
					849.00			
					830.00			
				Japan (UMTS, Band 6)	835.00			
					840.00			
					2500.00	-1.3	0.4	-3.8
				FCC Part 27 CA/EU/ANZ (UE-UTRA, Band 7, n7)	2535.00	-1.3	0.3	-3.7
					2570.00	-1.3	0.5	-2.7
					880.00			
				EU/ANZ/Japan UMTS/HSPA (UMTS 900, Band 8) (UE-UTRA, Band 8, n8)	897.50			
					915.00			
					1844.9			
				Japan (WCDMA, Band 9)	1862.5			
					1879.9			
					699.00			
				FCC Part 27 (UE-UTRA, Band 12, n12)	707.50			
					716.00			
					777.00			
				FCC Part 27 (UE-UTRA, Band 13)	782.00			
					787.00			
					788.00			
				FCC Part 90 (UE-UTRA, Band 14)	793.00			
					798.00			
					704.00			
				FCC Part 27 (UE-UTRA, Band 17)	710.00			
					716.00			
					815.00			
Japan (UE-UTRA, Band 18)	822.50							
	830.00							
	830.00							
Japan (UMTS, Band 19) (UE-UTRA, Band 19)	837.50							
	845.00							
	832.00							
EU (UE-UTRA, Band 20,	847.00							

				n20)	862.00				
				FCC Part 24	1850.00	-1.1	0.7	-1.0	
				(UE-UTRA, Band 25)	1882.50	-1.1	1.9	-0.6	
					1915.00	-1.1	1.5	0.2	
				FCC Part 90, 22H	814.00				
				(UE-UTRA, Band 26)	831.50				
					849.00				
				EU/ANZ/Japan	703.00				
				(UE-UTRA, Band 28, n28)	725.50				
					748.00				
				FCC Part 27 CA	717.00				
				(UE-UTRA, Band 29)	722.50				
				* Down link only	728.00				
				FCC Part 27	2305.00	-1.2	-0.7	-5.4	
				(UE-UTRA, Band 30)	2310.00	-1.3	-0.6	-5.0	
					2315.00	-1.3	-1.0	-4.9	
				EU	1452.00				
				(LTE, Band 32)	1474.00				
				* Down link only	1496.00				
				EU	2010.00				
				(LTE Band 34)	2017.50				
					2025.00				
				EU/CN	2570.00	-1.3	0.5	-2.7	
				(UE-UTRA, Band 38, n38)	2595.00	-1.3	0.2	-2.6	
					2620.00	-1.3	0.3	-3.0	
				CN	1880.00				
				(TD-SCDMA, Band 39)	1900.00				
					1920.00				
				EU/ANZ/CN	2300.00	-1.2	-0.5	-5.0	
				(UE-UTRA, Band 40)	2350.00	-1.3	0.4	-4.1	
					2400.00	-1.3	0.0	-4.4	
				FCC Part 27 US/CN/Japan	2496.00	-1.3	0.1	-4.1	
				(UE-UTRA, Band 41, n41)	2593.00	-1.3	0.3	-2.5	
					2690.00	-1.4	0.3	-3.0	
				FCC Part 96 CA/EU/Japan	3400.00	-1.6	0.7	-1.0	
				(LTE Band 42)	3500.00	-1.6	0.6	-1.7	
					3600.00	-1.6	0.4	-2.0	
				LTE Band 43	3600.00	-1.6	0.4	-2.0	
					3700.00	-1.6	0.8	-2.6	
					3800.00	-1.7	0.3	-1.2	
				FCC Part 15, 90, 95 (LTE Band 46)	5150.00				
				TD Unlicensed, LAA RCV only	5537.00				
					5925.00				
				FCC Part 96 (LTE Band 48)	3550.00	-1.6	0.6	-2.0	
					3625.00	-1.6	0.8	-2.3	
					3700.00	-1.6	0.8	-2.6	
				FCC Part 27 (LTE, Band 66, n66)	1710.00	-1.1	-1.0	-2.4	
					1745.00	-1.1	-0.4	-1.2	
					1780.00	-1.1	1.6	0.7	
				FCC Part 24, 27 (LTE Band 71, n71)	663.00				
					680.50				
					698.00				
				FCC/EU/CN/JP (5G NR Band 77)	3300.00	-1.5	0.6	-0.1	
					3750.00	-1.7	0.5	-1.5	
					4200.00	-1.8	0.7	-1.3	
				EU/CN/JP (5G NR Band 78)	3300.00	-1.5	0.6	-0.1	
					3550.00	-1.6	0.6	-2.0	
					3800.00	-1.7	0.3	-1.2	

				<b>CN/JP (5G NR Band 79)</b>	4400.00	-1.8	0.8	0.0
					4700.00	-1.9	0.5	0.2
					5000.00	-1.9	-0.5	0.4
				<b>Japan (UE-UTRA, Band 21) Japan J-CDMA</b>	1477.90			
					1455.40			
					1462.90			
					815.00			
					824.70			
					836.52			
					848.31			
					870.00			
					880.20			
					897.60			
					914.80			
					925.00			
					940.00			
				<b>Japan J-CDMA</b>	1922.40			
					1950.00			
					1977.60			

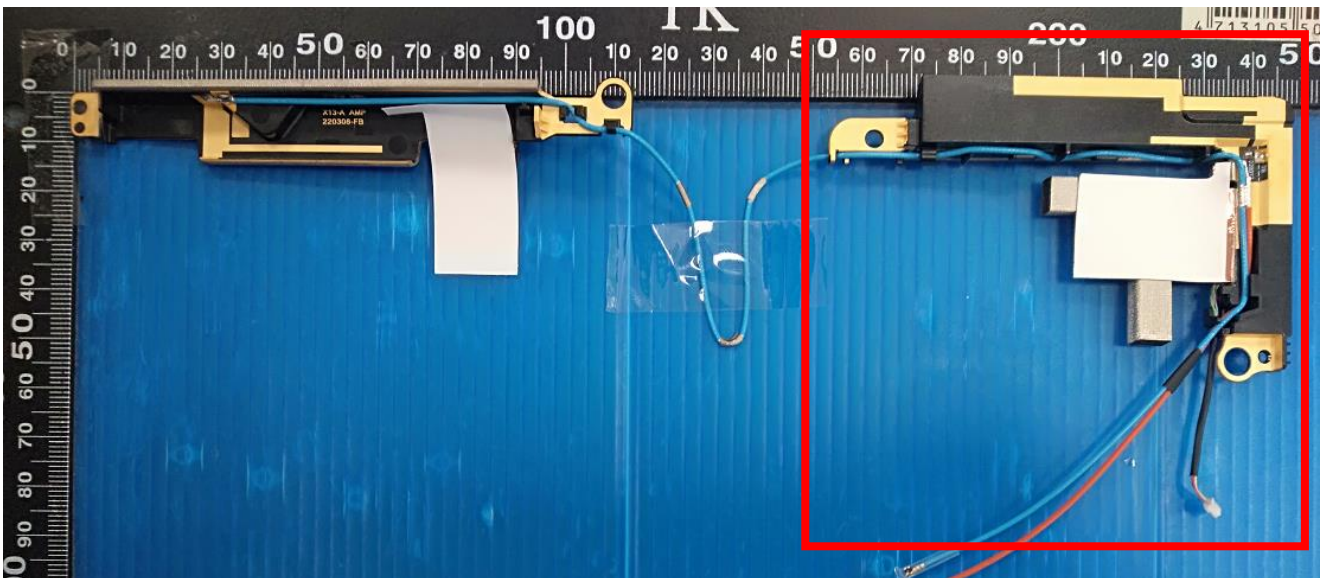
## Section 2. Dimensioned Photos or Drawings of Antennas

### Main Antenna Dimensioned Drawing:

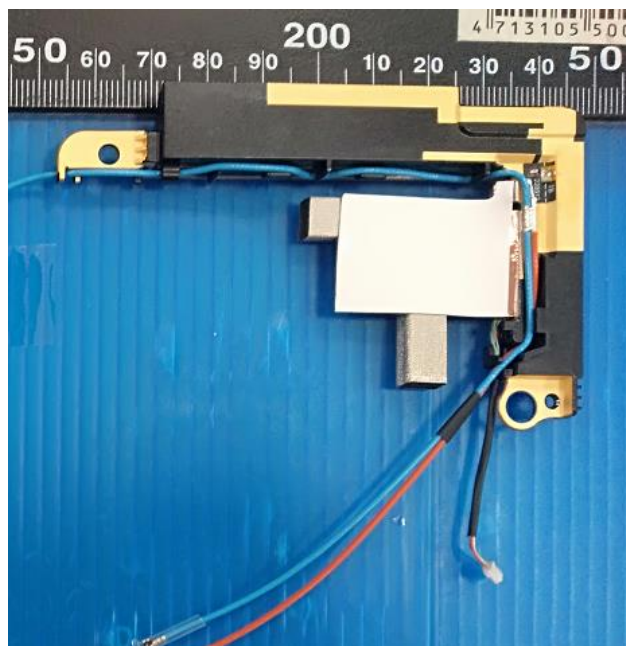


### Main Antenna Photo:

Overall view

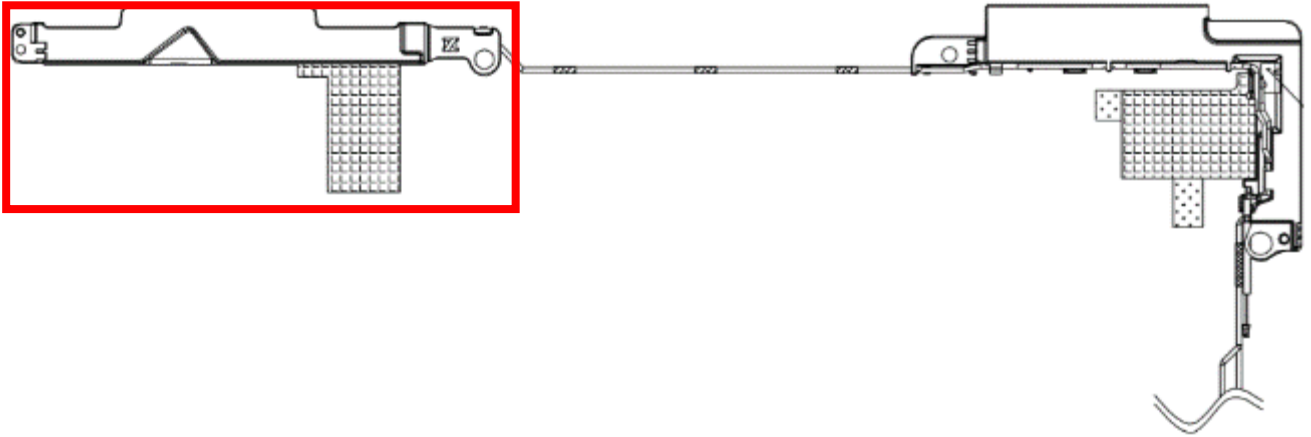


Close-up view



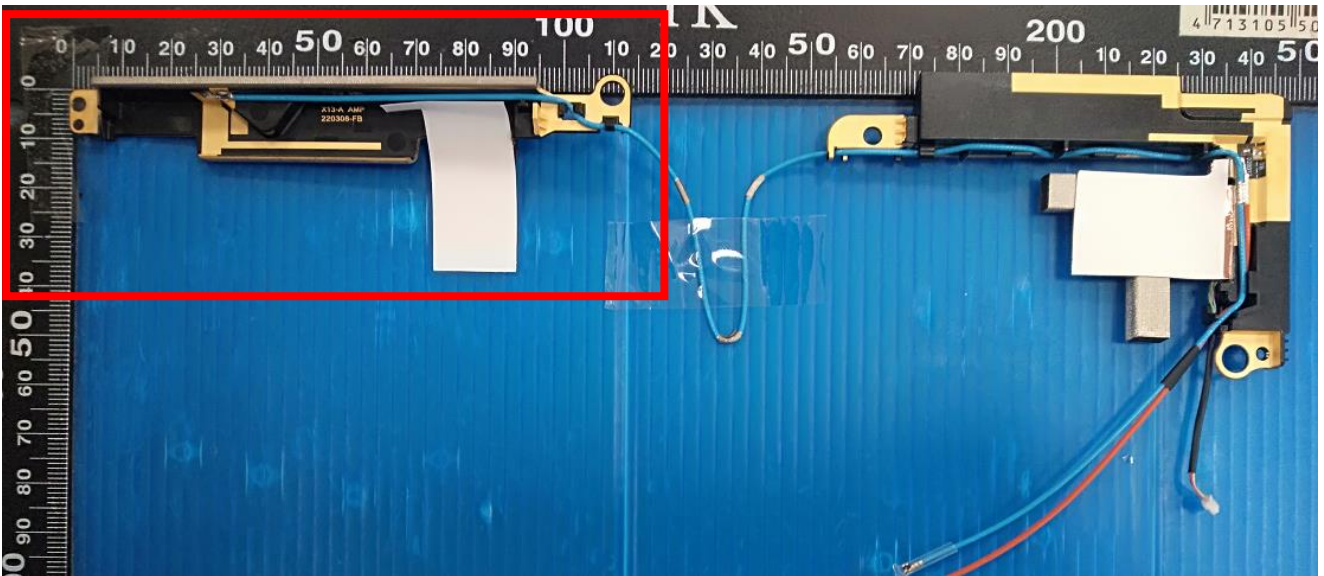


**Aux Antenna Dimensioned Drawing:**

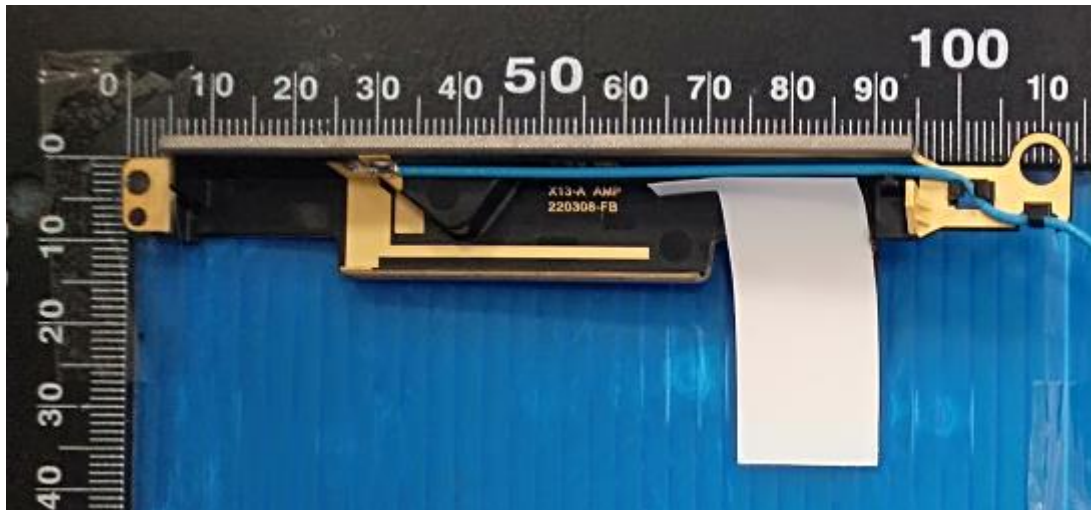


**Aux Antenna Photo:**

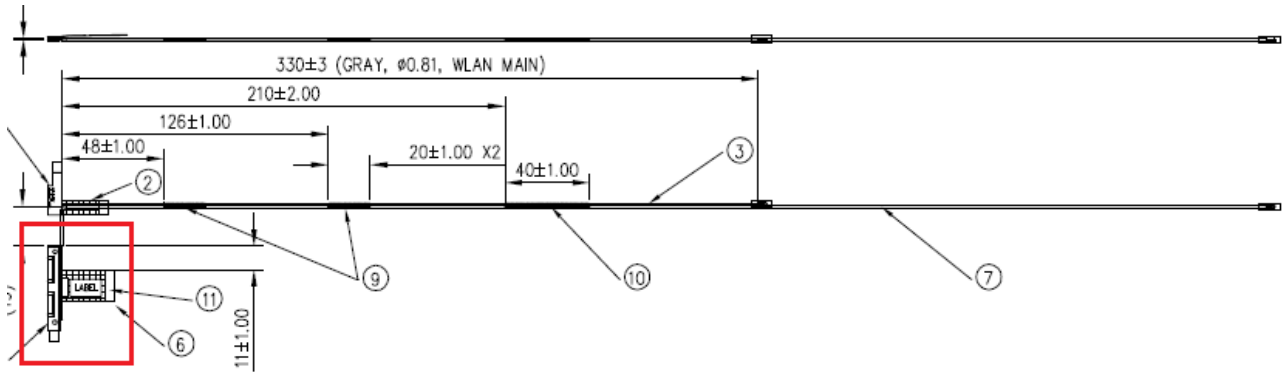
Overall view



Close-up view

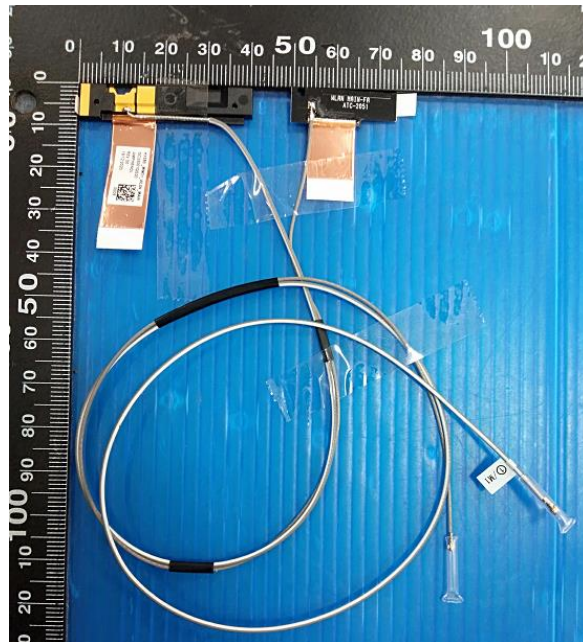


**MIMO1 Antenna Dimensioned Drawing:**

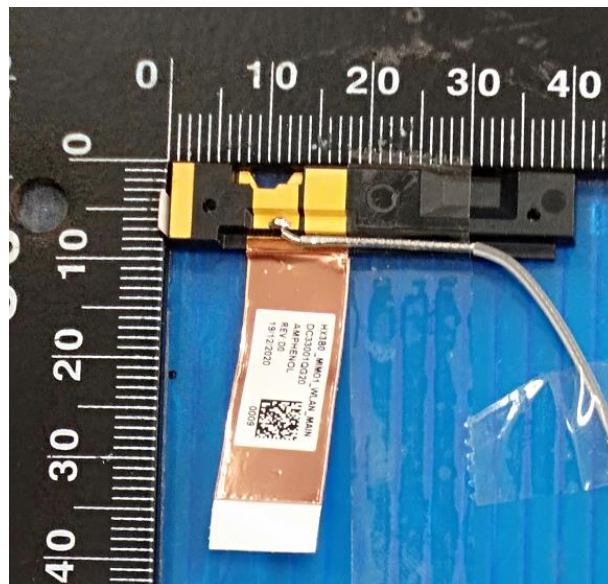


**MIMO1 Antenna Photo:**

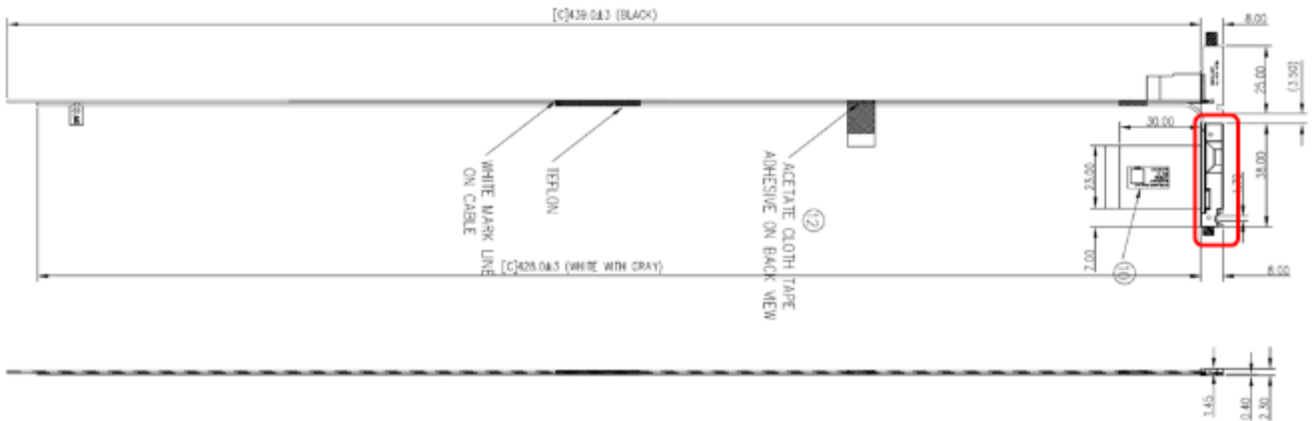
**Overall view**



**Close-up view**



**MIMO2 Antenna Dimensioned Drawing:**



**MIMO2 Antenna Photo:**

**Overall view**



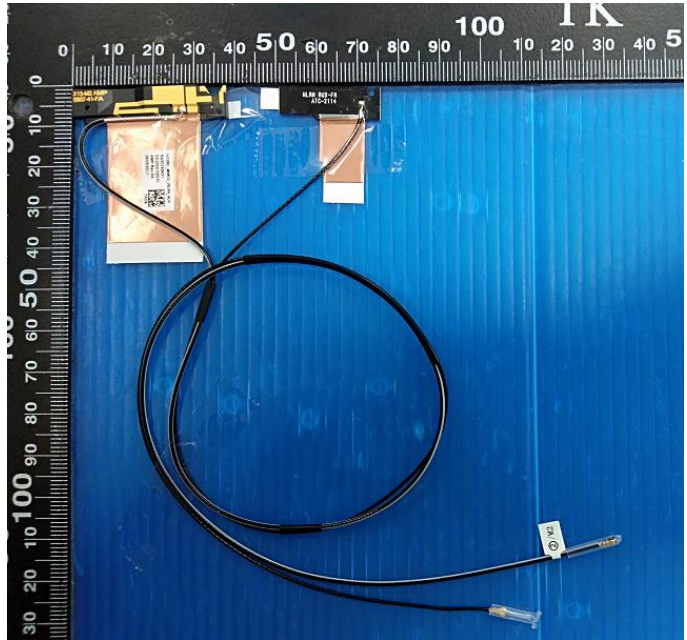
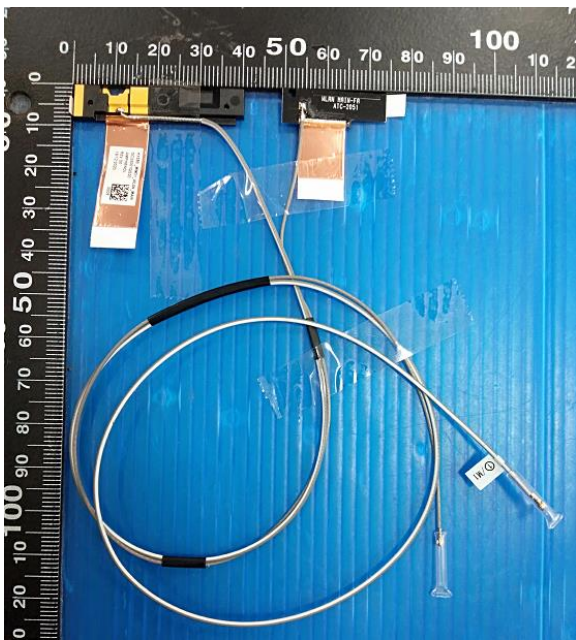
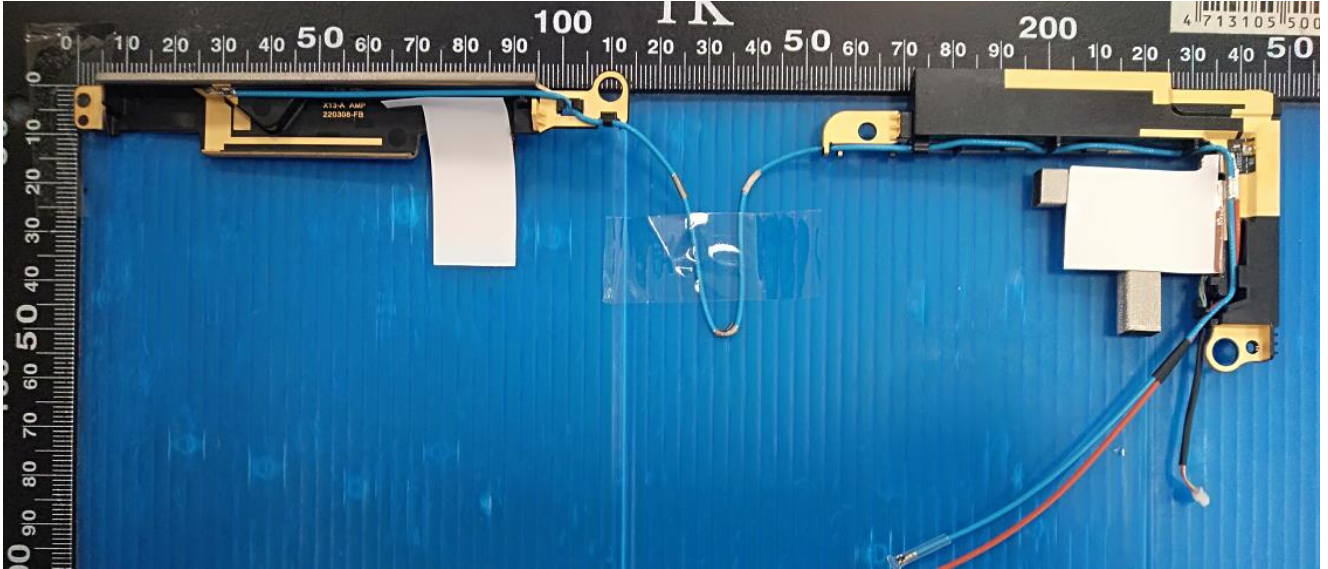
**Close-up view**





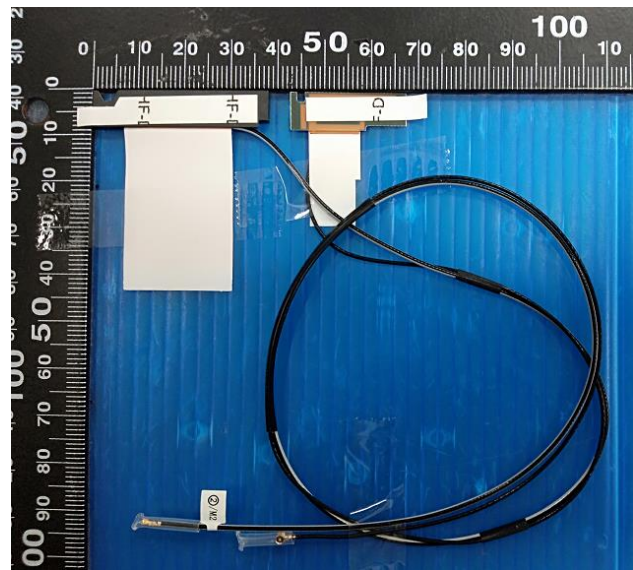
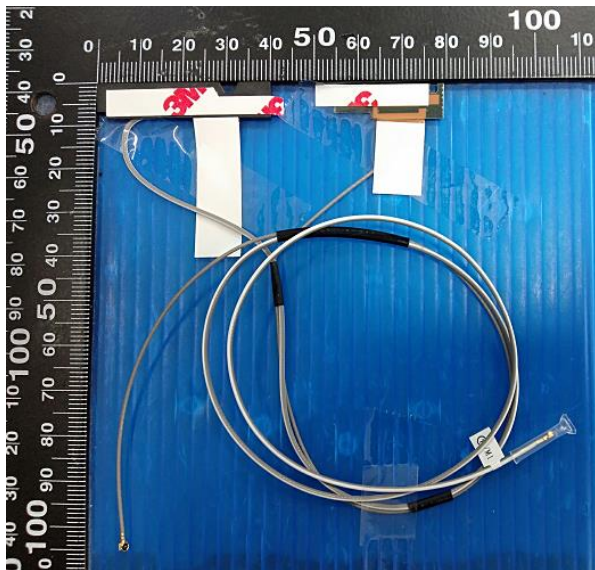
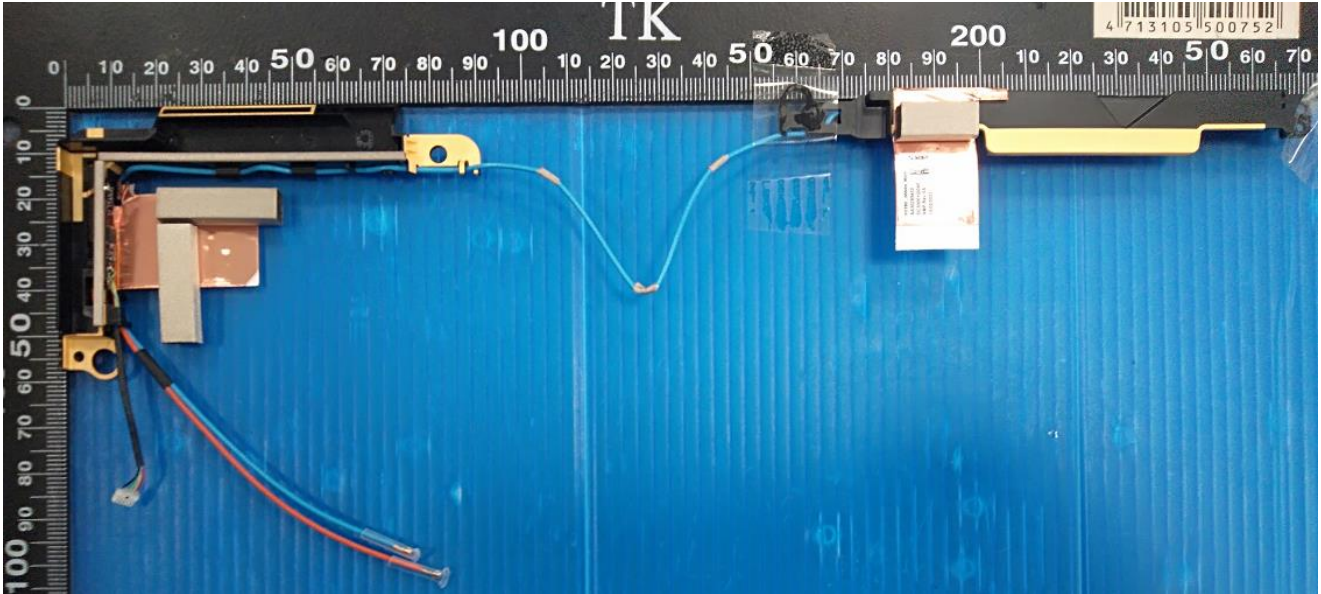
Trade Name: Amphenol Taiwan Corporation  
Model No.: DC33001YH00 (Main)  
DC33001YH00 (Aux)  
DC33001QG20 (MIMO1)  
DC33001QG30 (MIMO2)

Front view



Trade Name: Amphenol Taiwan Corporation  
Model No.: DC33001YH00 (Main)  
DC33001YH00 (Aux)  
DC33001QG20 (MIMO1)  
DC33001QG30 (MIMO2)

Back view

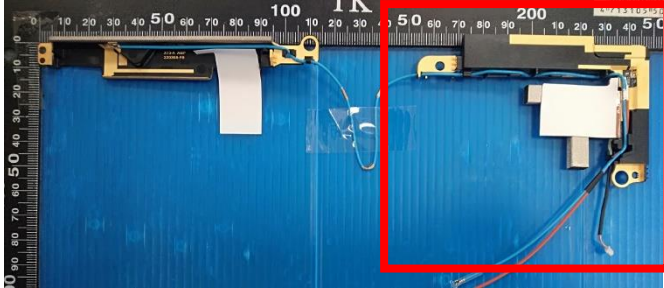




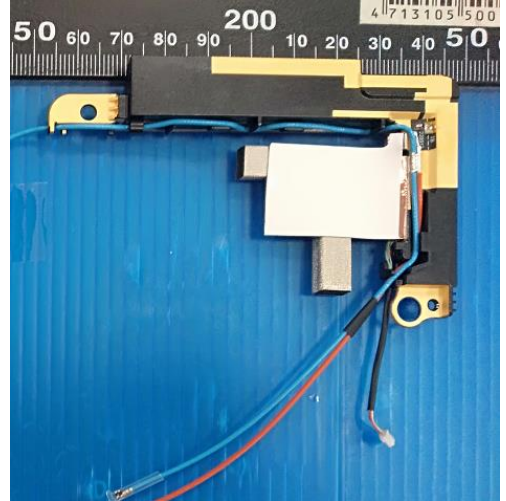
<Front View>

Trade Name: Amphenol Taiwan Corporation  
Model No.: DC33001YH00 (WWAN Main)

Front view – Far



Front view – Near



Model No.: DC33001YH00 (WWAN Aux)

Front view – Far



Front view – Near

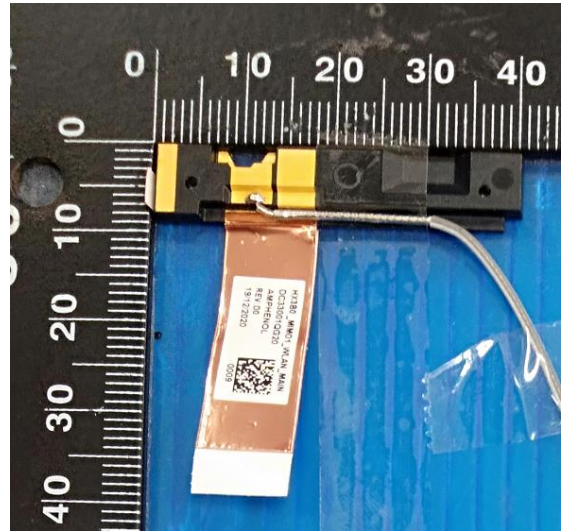


Trade Name: Amphenol Taiwan Corporation  
Model No.: DC33001QG20 (WWAN MIMO1)

Front view – Far



Front view – Near

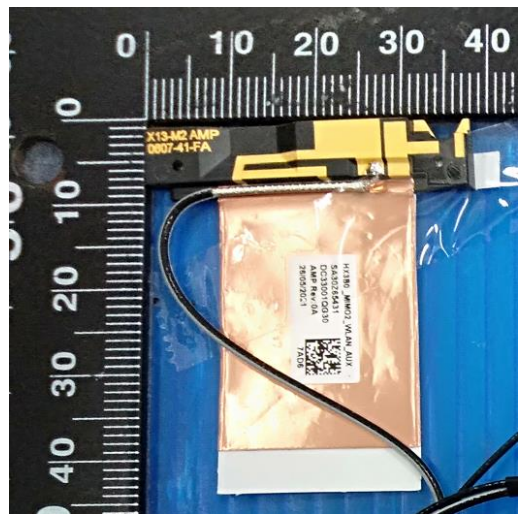


Model No.: DC33001QG30 (WWAN MIMO2)

Front view – Far



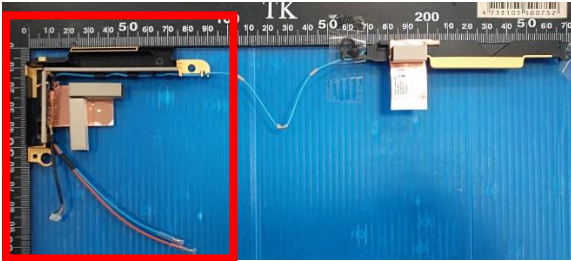
Front view – Near



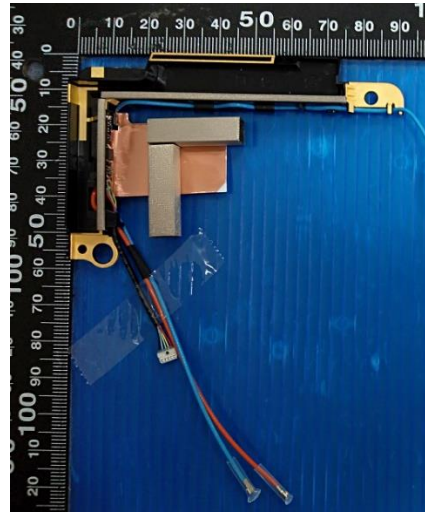
<Back View>

Trade Name: Amphenol Taiwan Corporation  
Model No.: DC33001YH00 (WWAN Main)

Back view – Far

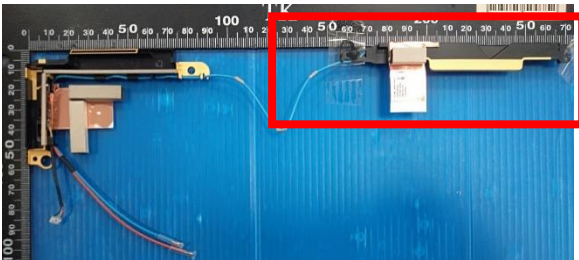


Back view – Near



Model No.: DC33001YH00 (WWAN Aux)

Back view – Far



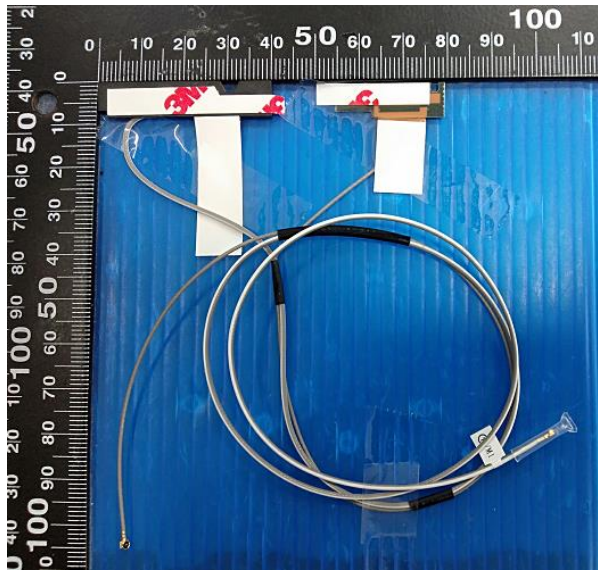
Back view – Near



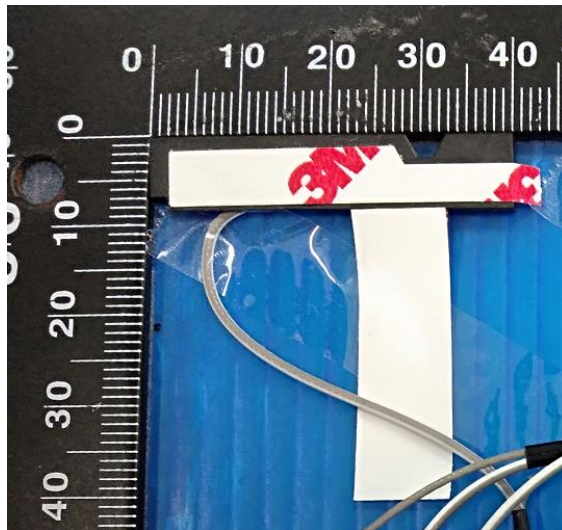


Trade Name: Amphenol Taiwan Corporation  
Model No.: DC33001GQ20 (WWAN MIMO1)

Back view – Far



Back view – Near

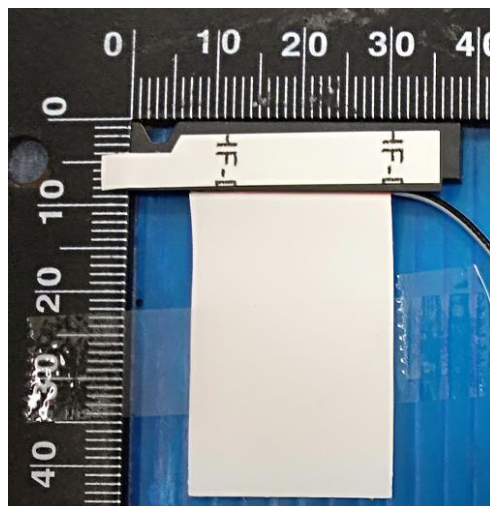


Model No.: DC33001GQ30 (WWAN MIMO2)

Back view – Far

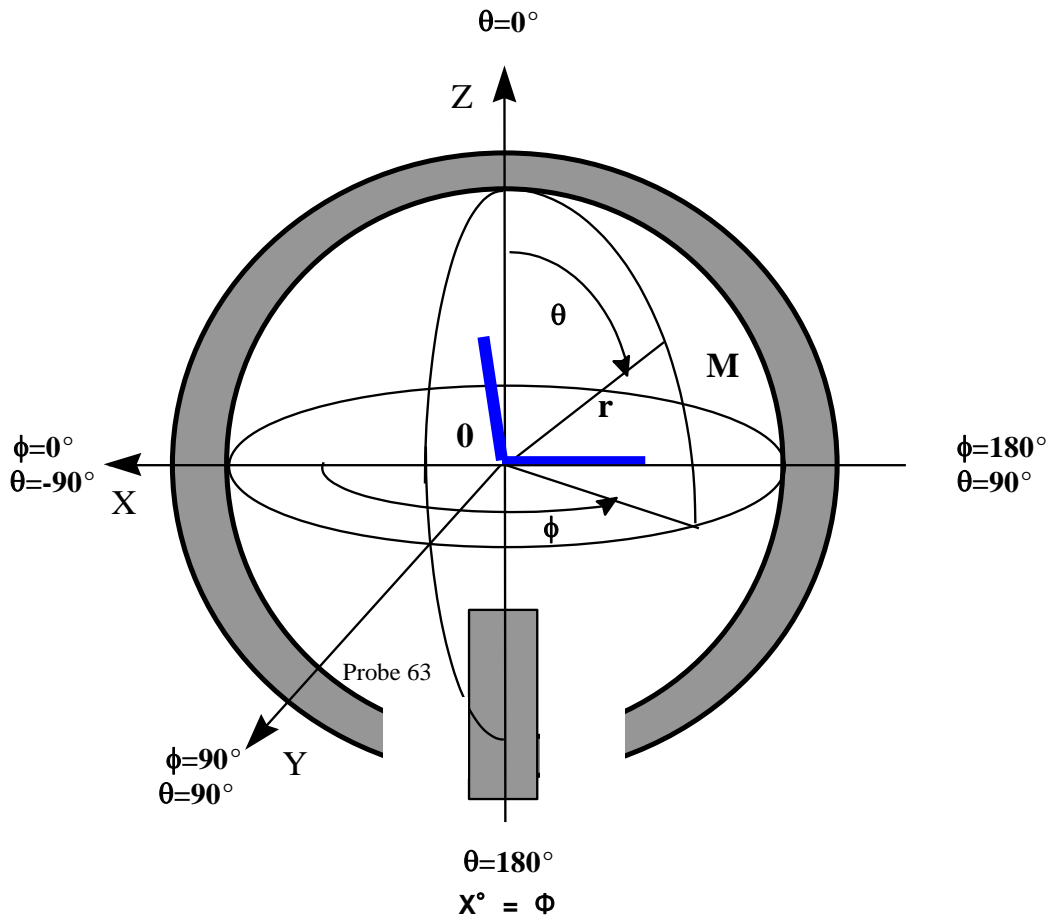


Back view – Near



### Section 3. Radiation characteristics of antenna

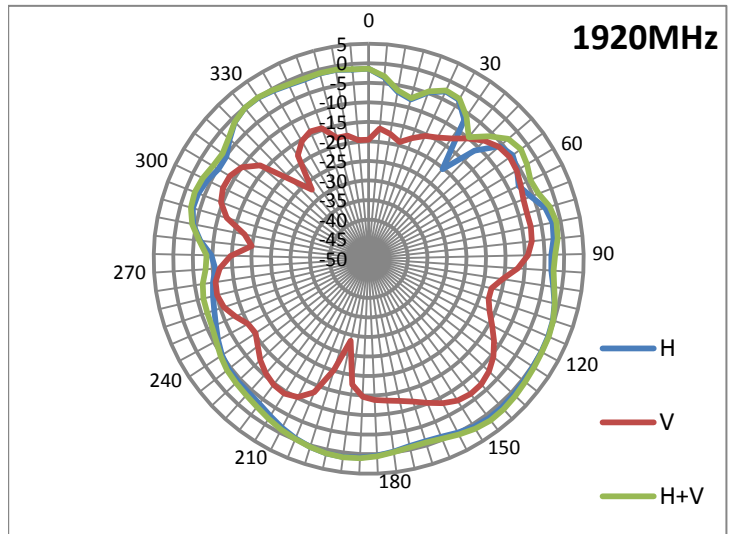
Antenna Gain and Radiation Pattern Measuring Structure Diagram



**Radiation characteristic in 1920MHz ~ 1980MHz (EU/ANZ/CN/JP: UMTS/HSDPA, Band 1, n1)**

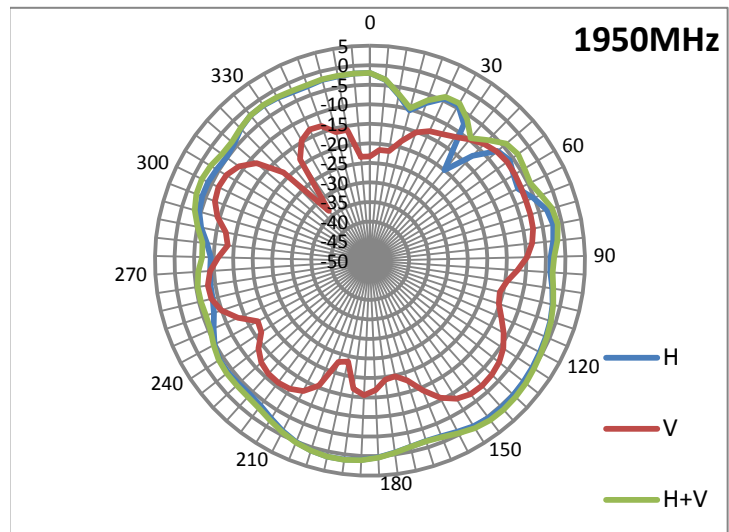
**Main antenna: 1920.00 MHz**

1920.00 MHz		
Horizontal Peak (dBi)	1.1	300deg
Vertical Peak(dBi)	-5.5	135deg



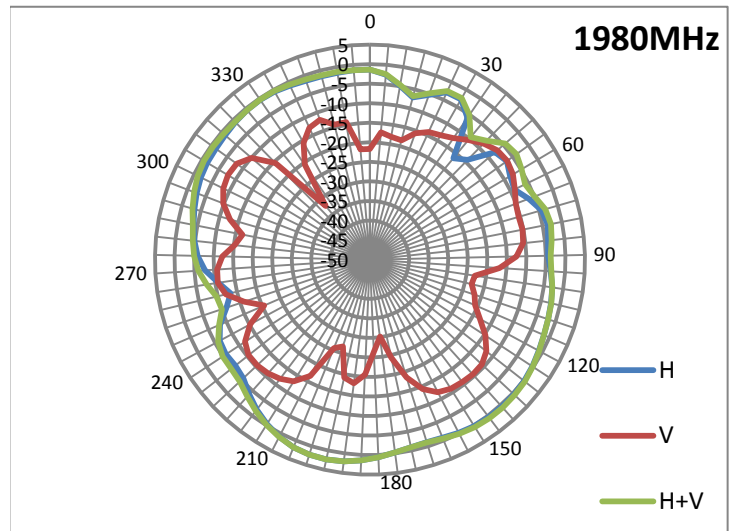
**Main antenna: 1950.00 MHz**

1950.00 MHz		
Horizontal Peak (dBi)	1.3	300deg
Vertical Peak(dBi)	-6.7	135deg



**Main antenna: 1980.00 MHz**

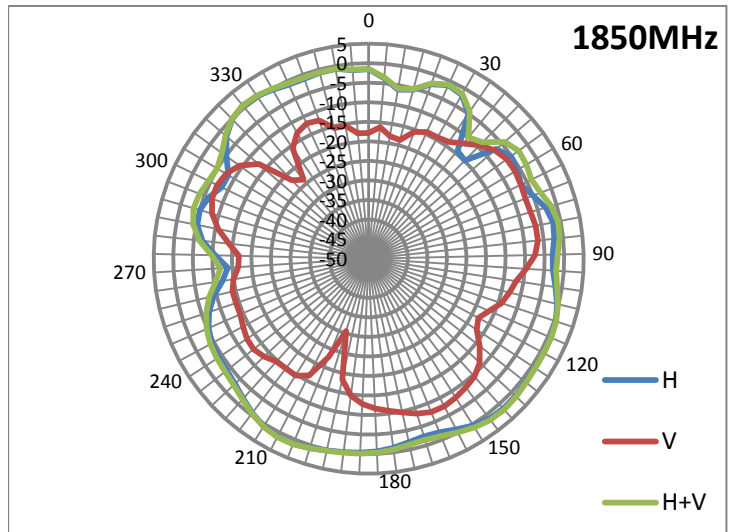
1980.00 MHz		
Horizontal Peak (dBi)	1.3	300deg
Vertical Peak(dBi)	-6.7	130deg



**Radiation characteristic in 1850MHz ~ 1910MHz (FCC Part 24 PCS, Band 2, n2)**

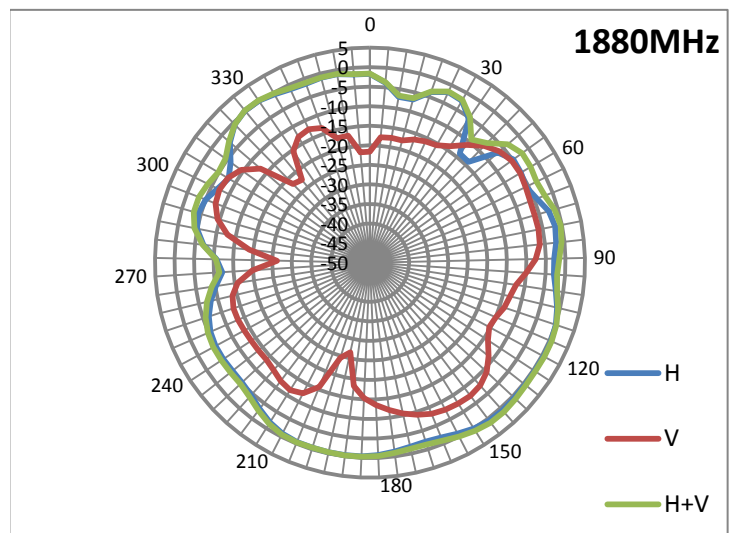
**Main antenna: 1850.00 MHz**

1850.00 MHz		
Horizontal Peak (dBi)	-1.4	295deg
Vertical Peak(dBi)	-6.6	140deg



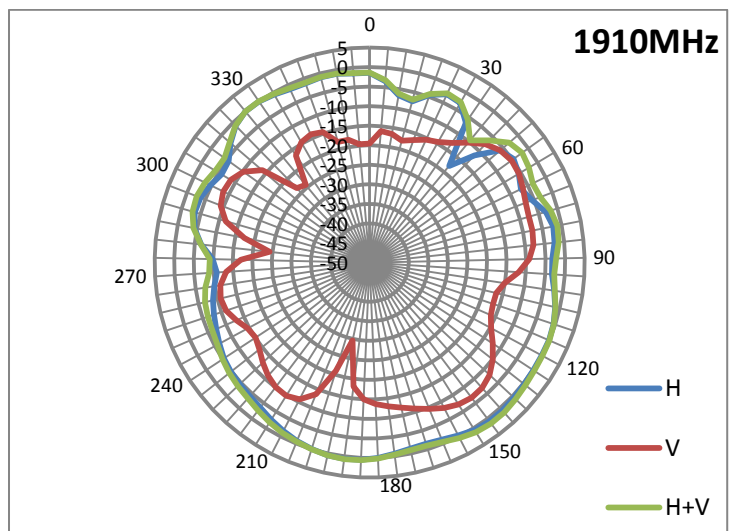
**Main antenna: 1880.00 MHz**

1880.00 MHz		
Horizontal Peak (dBi)	-1	300deg
Vertical Peak(dBi)	-5.5	140deg



**Main antenna: 1910.00 MHz**

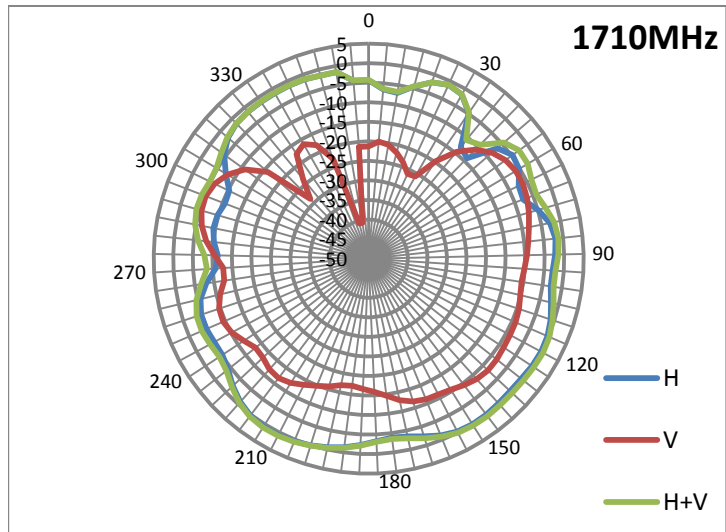
1910.00 MHz		
Horizontal Peak (dBi)	-0.7	300deg
Vertical Peak(dBi)	-5.5	135deg



**Radiation characteristic in 1710MHz ~ 1785MHz (EU/ANZ/CN/JP: UE-UTRA, Band 3, n3)**

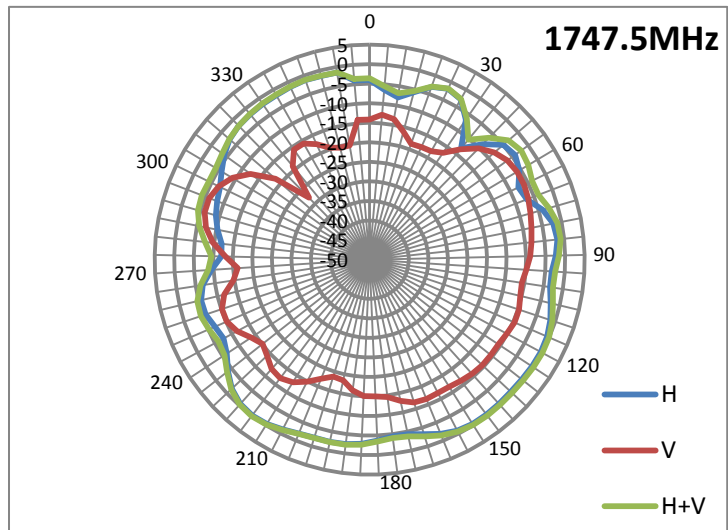
**Main antenna: 1710.00 MHz**

1710.00 MHz		
Horizontal Peak (dBi)	-0.7	300deg
Vertical Peak(dBi)	-5.4	130deg



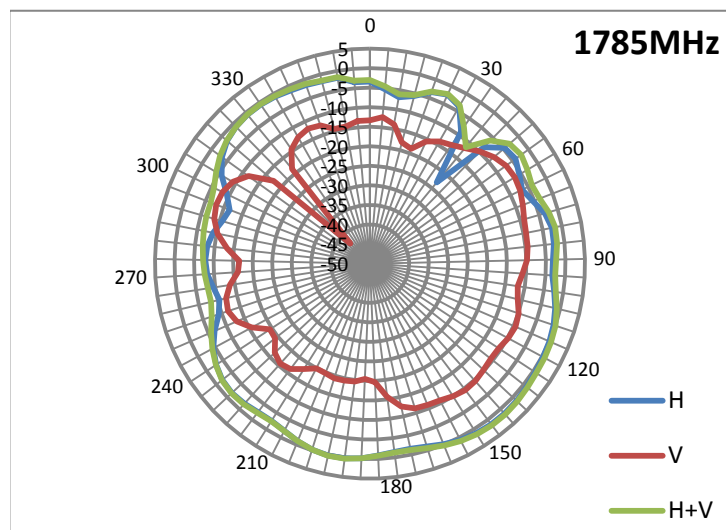
**Main antenna: 1747.50 MHz**

1747.50 MHz		
Horizontal Peak (dBi)	-0.1	300deg
Vertical Peak(dBi)	-6.0	150deg



**Main antenna: 1785.00 MHz**

1785.00 MHz		
Horizontal Peak (dBi)	1.5	300deg
Vertical Peak(dBi)	-6.8	145deg

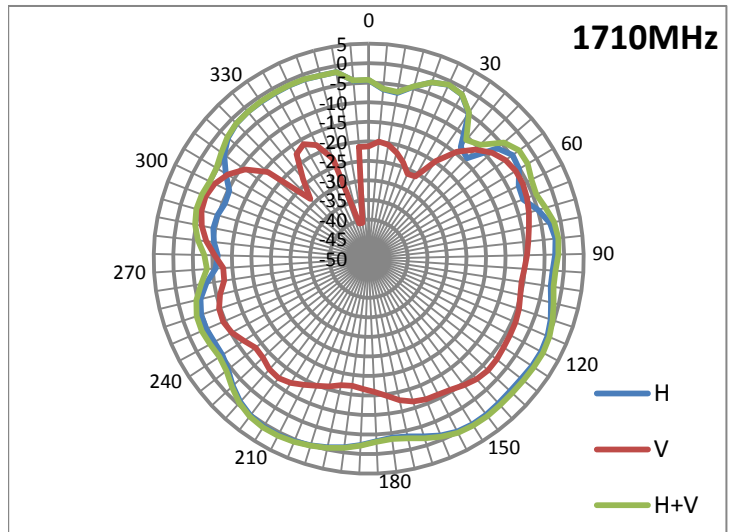




**Radiation characteristic in 1710MHz ~ 1755MHz (FCC Part 27 UMTS(AWS), Band 4)**

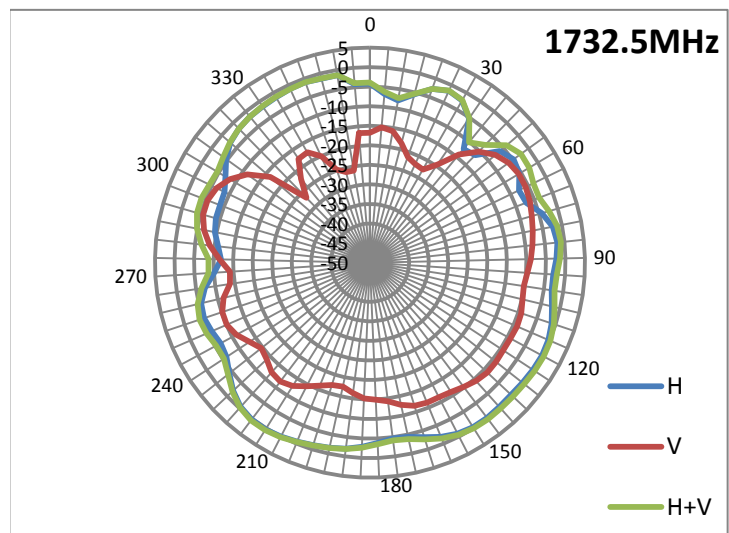
**Main antenna: 1710.00 MHz**

1710.00 MHz		
Horizontal Peak (dBi)	-0.7	300deg
Vertical Peak(dBi)	-5.4	130deg



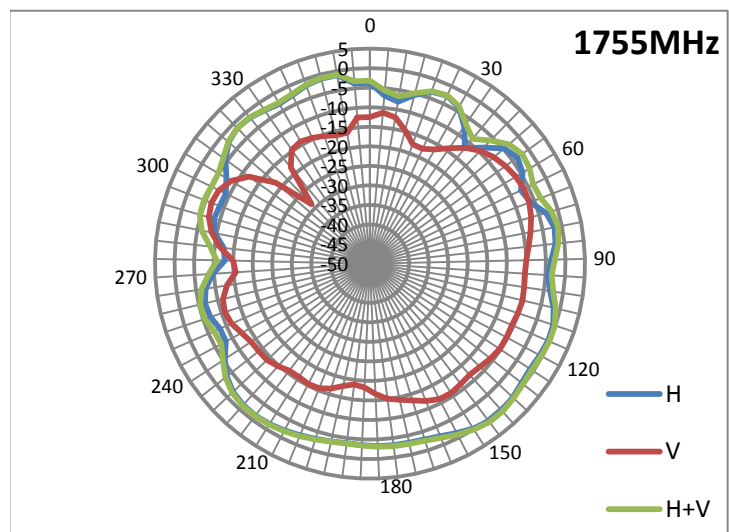
**Main antenna: 1732.50 MHz**

1732.50 MHz		
Horizontal Peak (dBi)	-0.8	300deg
Vertical Peak(dBi)	-6	150deg



**Main antenna: 1755.00 MHz**

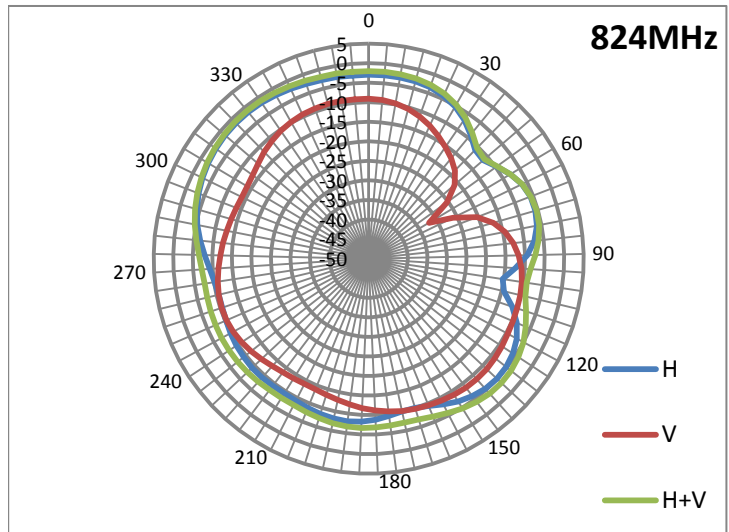
1755.00 MHz		
Horizontal Peak (dBi)	-0.7	300deg
Vertical Peak(dBi)	-6.2	145deg



**Radiation characteristic in 824MHz ~ 849MHz (FCC Part 22 Cellular, Band 5, n5)**

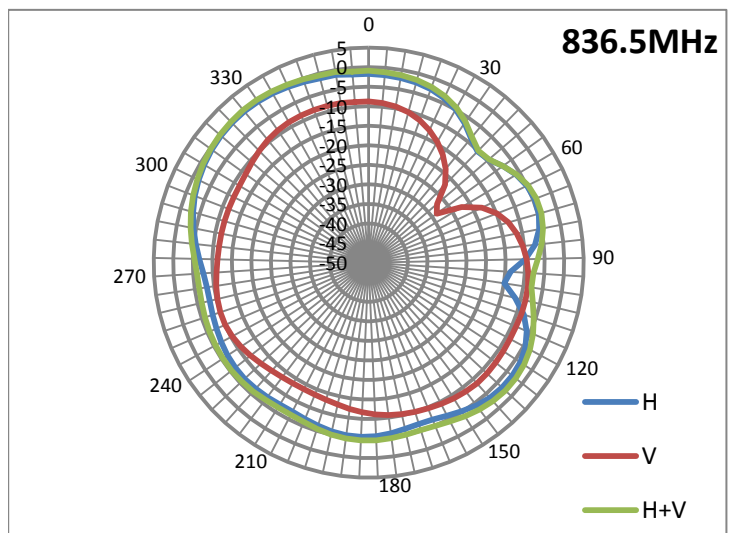
**Main antenna: 824.00 MHz**

824.00 MHz		
Horizontal Peak (dBi)	-1.4	275deg
Vertical Peak(dBi)	-8.6	345deg



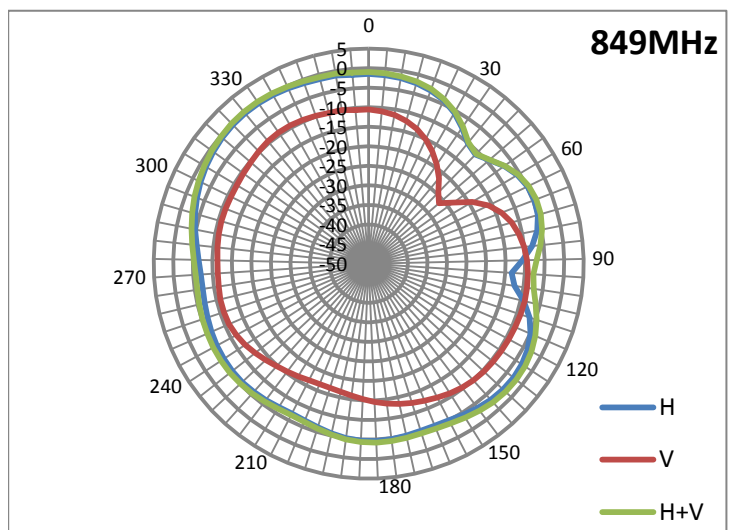
**Main antenna: 836.50 MHz**

836.50 MHz		
Horizontal Peak (dBi)	-0.6	280deg
Vertical Peak(dBi)	-8.5	185deg



**Main antenna: 849.0 MHz**

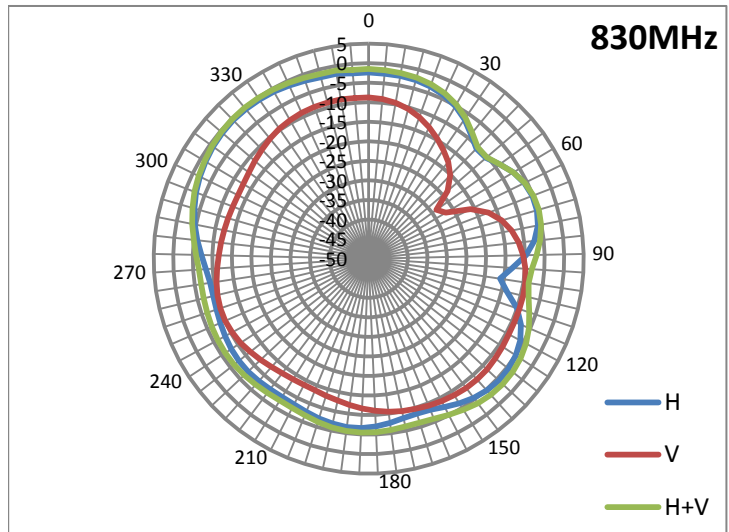
849.0 MHz		
Horizontal Peak (dBi)	-0.7	285deg
Vertical Peak(dBi)	-9	240deg



**Radiation characteristic in 830MHz ~ 840MHz (Japan, Band 6)**

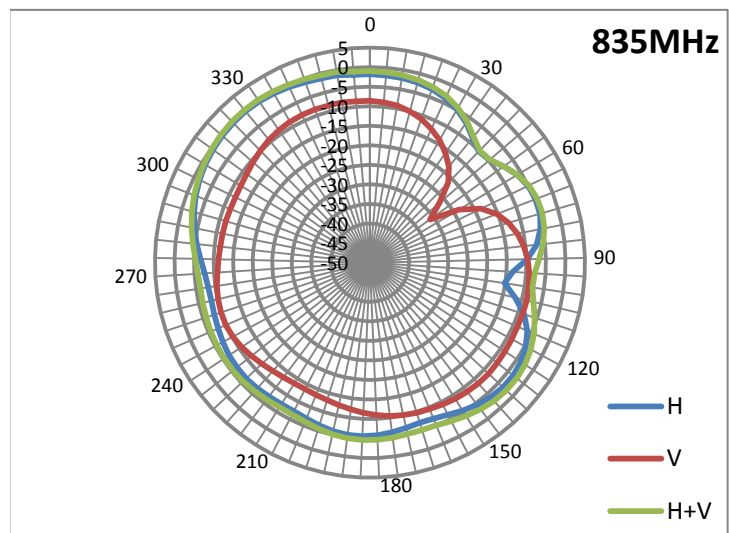
**Main antenna: 830.00 MHz**

830.00 MHz		
Horizontal Peak (dBi)	-0.5	275deg
Vertical Peak(dBi)	-8.5	345deg



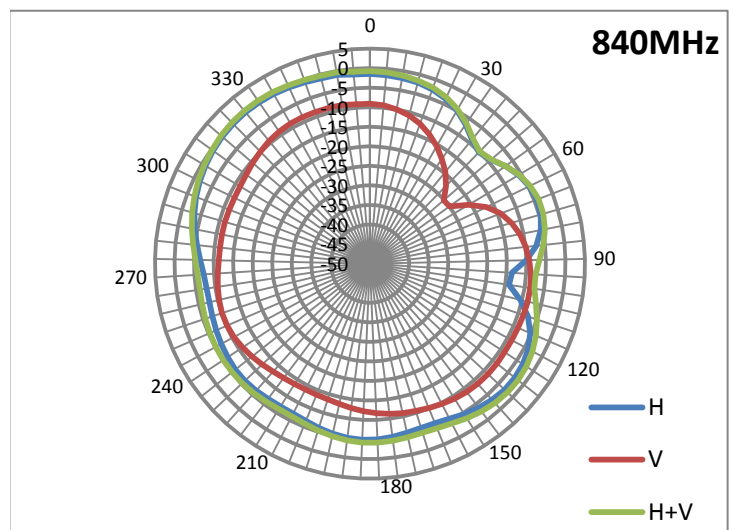
**Main antenna: 835.00 MHz**

835.00 MHz		
Horizontal Peak (dBi)	0.1	280deg
Vertical Peak(dBi)	-8.4	185deg



**Main antenna: 840.00 MHz**

840.00 MHz		
Horizontal Peak (dBi)	0.2	280deg
Vertical Peak(dBi)	-8.5	215deg

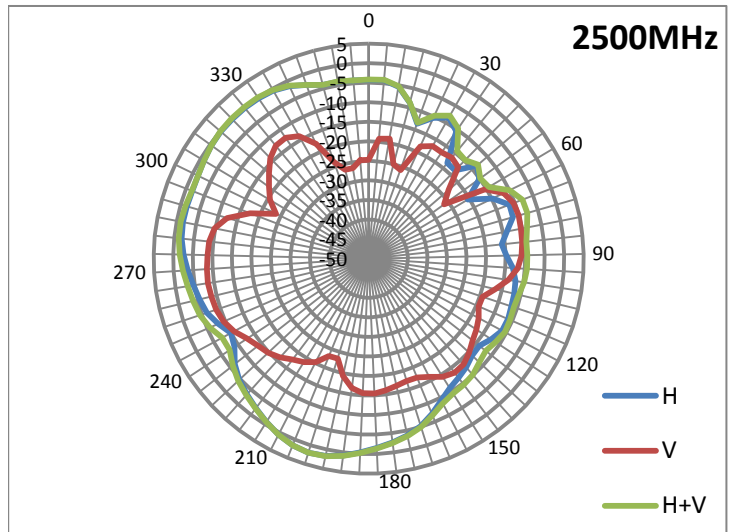




**Radiation characteristic in 2500MHz ~ 2570MHz (CA/EU/ANZ UE-UTRA, Band 7, n7)**

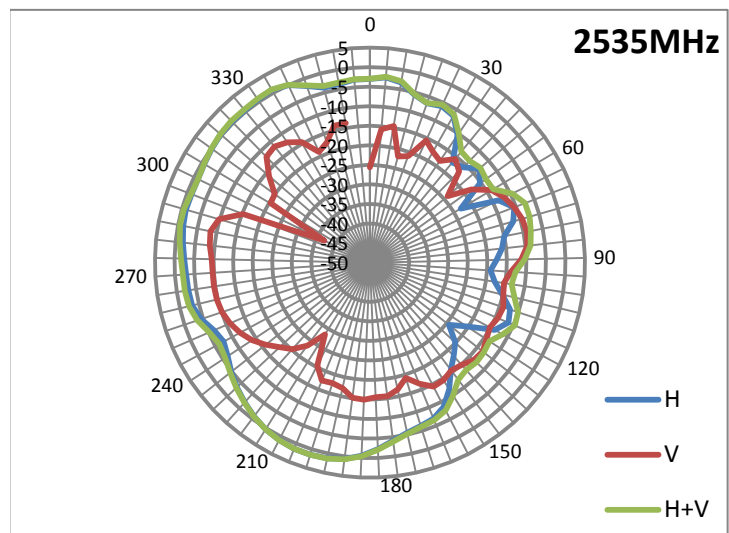
**Main antenna: 2500.00 MHz**

2500.00 MHz		
Horizontal Peak (dBi)	0.6	280deg
Vertical Peak(dBi)	-8.4	250deg



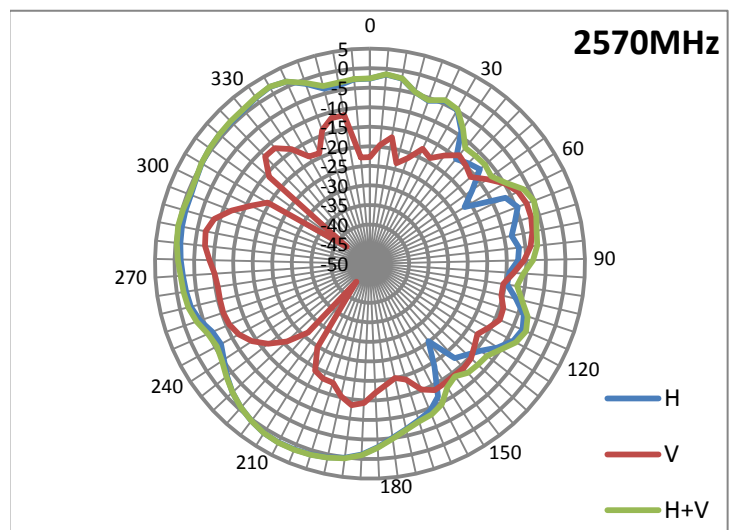
**Main antenna: 2535.00 MHz**

2535.00 MHz		
Horizontal Peak (dBi)	0.5	280deg
Vertical Peak(dBi)	-8.4	250deg



**Main antenna: 2570.00 MHz**

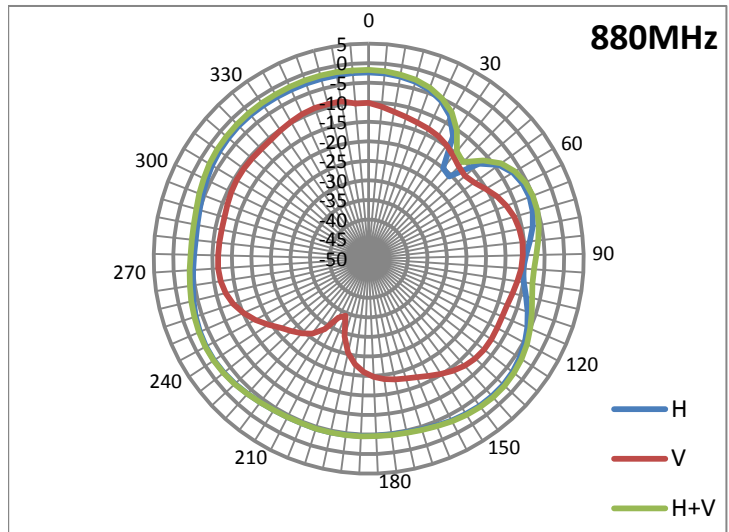
2570.00 MHz		
Horizontal Peak (dBi)	0.6	285deg
Vertical Peak(dBi)	-7	255deg



**Radiation characteristic in 880MHz ~ 915MHz (EU/ANZ/JP: Band 8, n8)**

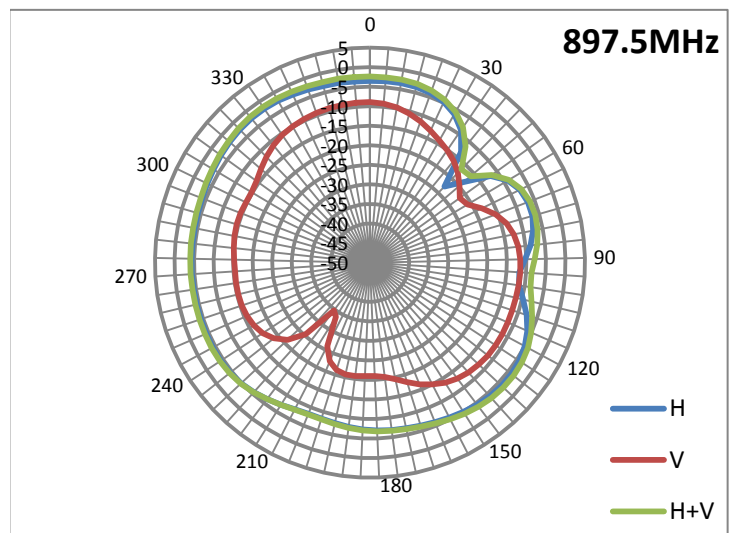
**Main antenna: 880.00 MHz**

880.00 MHz		
Horizontal Peak (dBi)	-2.4	345deg
Vertical Peak(dBi)	-9.1	290deg



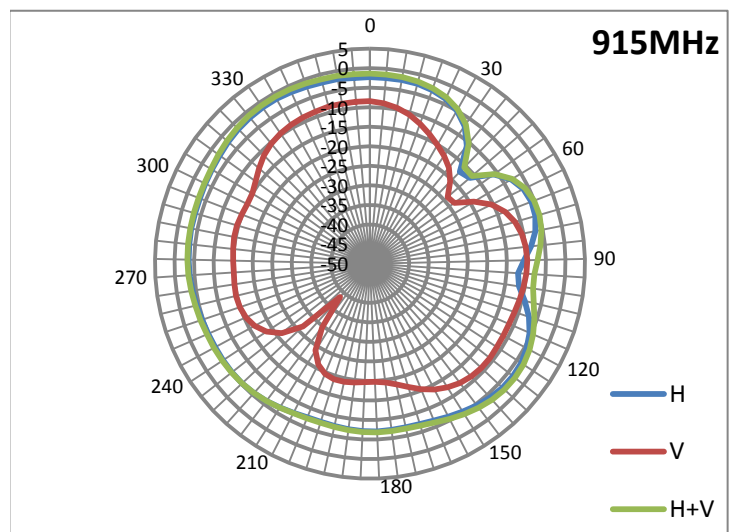
**Main antenna: 897.50 MHz**

897.50 MHz		
Horizontal Peak (dBi)	-2.3	320deg
Vertical Peak(dBi)	-8.9	295deg



**Main antenna: 915.00 MHz**

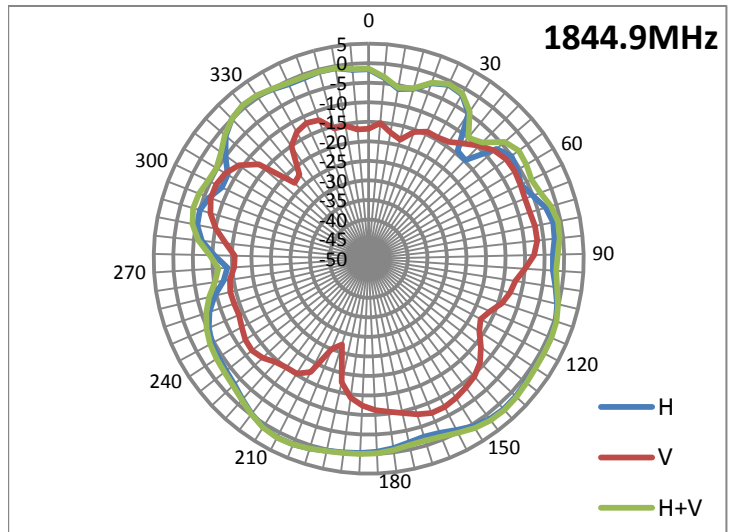
915.00 MHz		
Horizontal Peak (dBi)	-1.5	320deg
Vertical Peak(dBi)	-8.5	290deg



**Radiation characteristic in 1844.9MHz ~ 1879.9MHz (Japan, Band 9)**

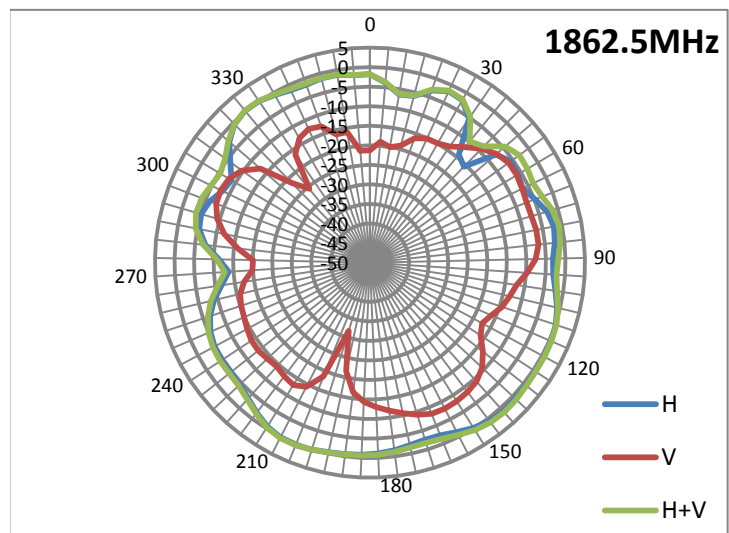
**Main antenna: 1844.90 MHz**

1844.90 MHz		
Horizontal Peak (dBi)	1.7	295deg
Vertical Peak(dBi)	-6.4	145deg



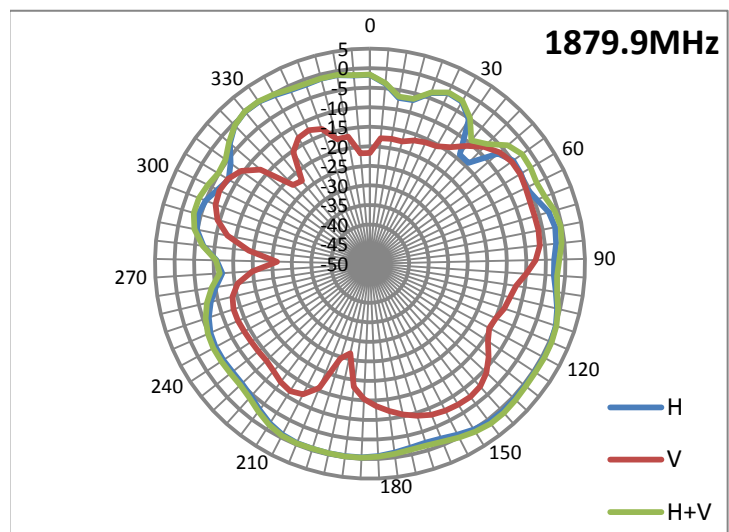
**Main antenna: 1862.50 MHz**

1862.50 MHz		
Horizontal Peak (dBi)	1.0	295deg
Vertical Peak(dBi)	-6.3	140deg



**Main antenna: 1879.90 MHz**

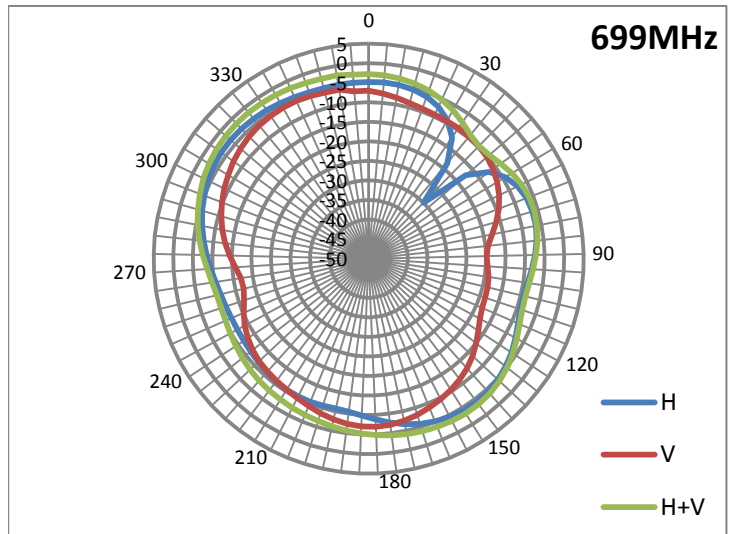
1879.90 MHz		
Horizontal Peak (dBi)	0.7	295deg
Vertical Peak(dBi)	-5.3	140deg



**Radiation characteristic in 699MHz ~ 716MHz (FCC Part 27 UE-UTRA, Band 12, n12)**

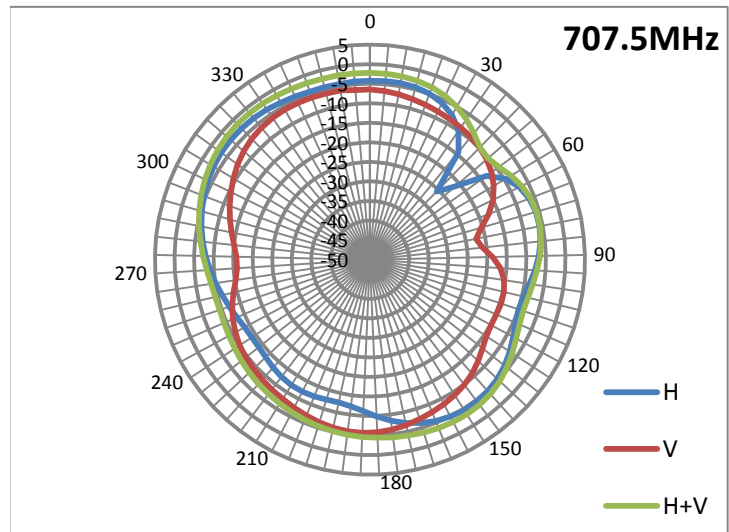
**Main antenna: 699.00 MHz**

699.00 MHz		
Horizontal Peak (dBi)	-3.4	270deg
Vertical Peak(dBi)	-5.6	315deg



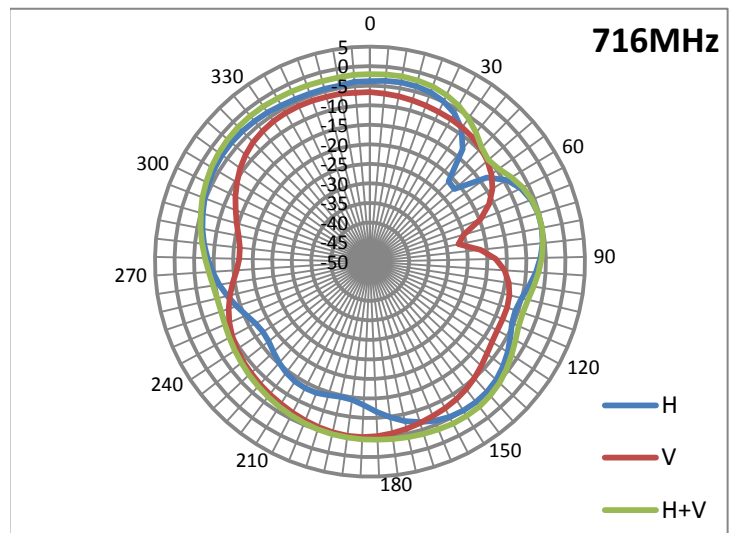
**Main antenna: 707.50 MHz**

707.50 MHz		
Horizontal Peak (dBi)	-3.0	265deg
Vertical Peak(dBi)	-5.7	345deg



**Main antenna: 716.00 MHz**

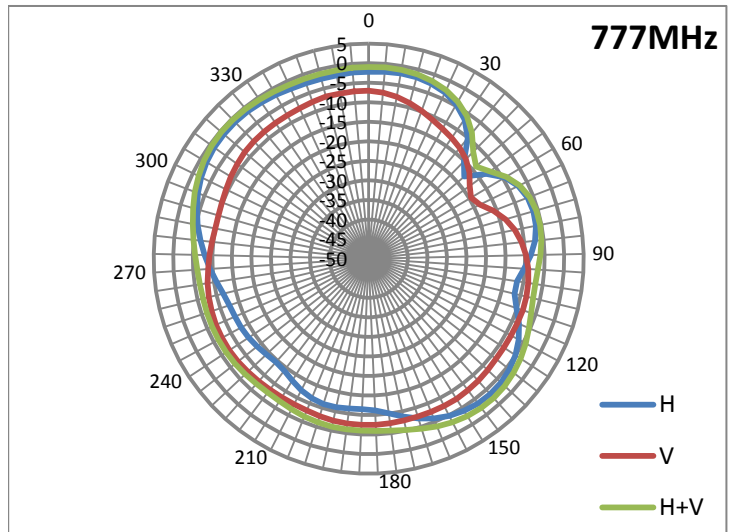
716.00 MHz		
Horizontal Peak (dBi)	-3.3	260deg
Vertical Peak(dBi)	-5.1	345deg



**Radiation characteristic in 776MHz ~ 787MHz (FCC Part 27 UE-UTRA, Band 13)**

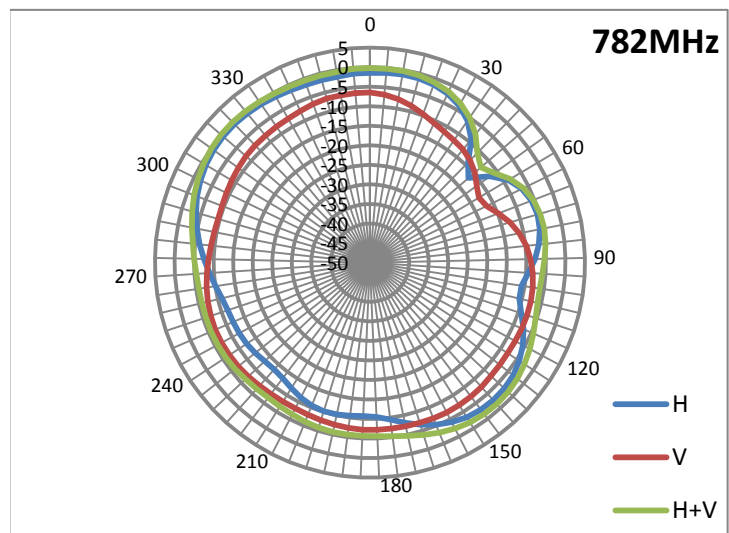
**Main antenna: 777.00 MHz**

777.00 MHz		
Horizontal Peak (dBi)	-1.1	265deg
Vertical Peak(dBi)	-7.0	350deg



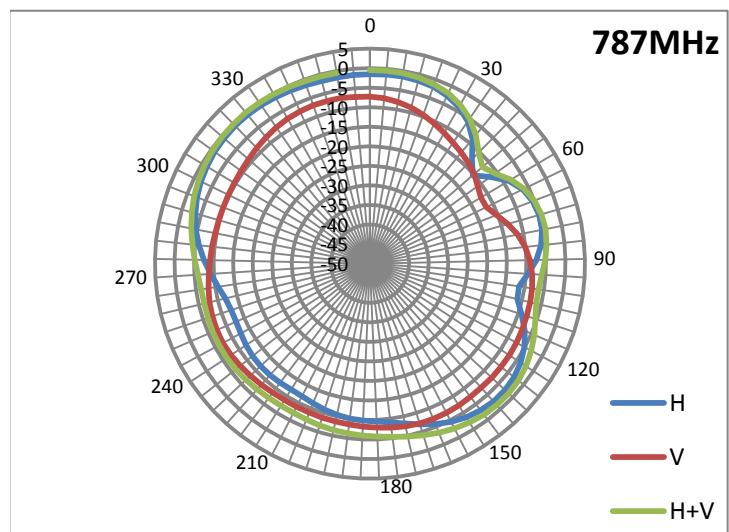
**Main antenna: 782.00 MHz**

782.00 MHz		
Horizontal Peak (dBi)	-0.5	265deg
Vertical Peak(dBi)	-6.5	350deg



**Main antenna: 787.00 MHz**

787.00 MHz		
Horizontal Peak (dBi)	-0.7	270deg
Vertical Peak(dBi)	-7.0	350deg

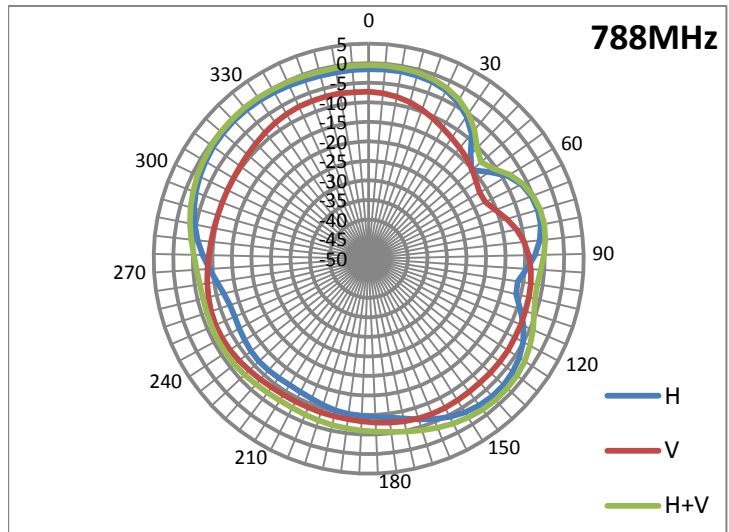




**Radiation characteristic in 788MHz ~ 798MHz (FCC Part 90 UE-UTRA, Band 14)**

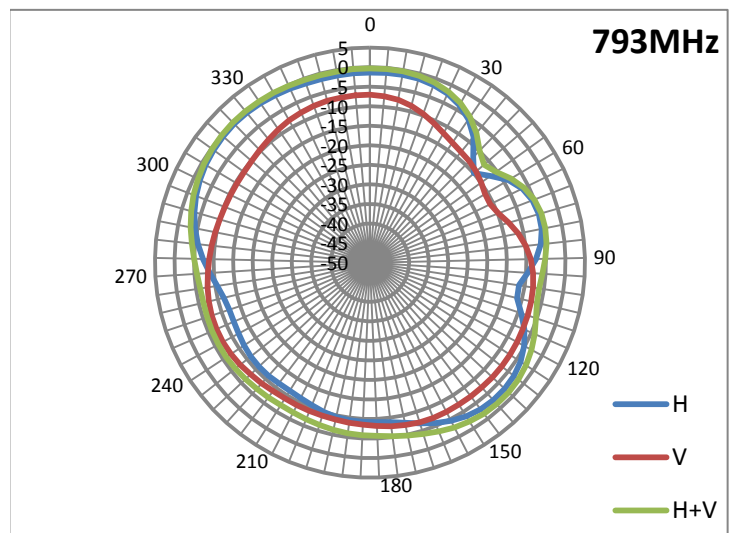
**Main antenna: 788.00 MHz**

788.00 MHz		
Horizontal Peak (dBi)	-0.7	270deg
Vertical Peak(dBi)	-7.1	350deg



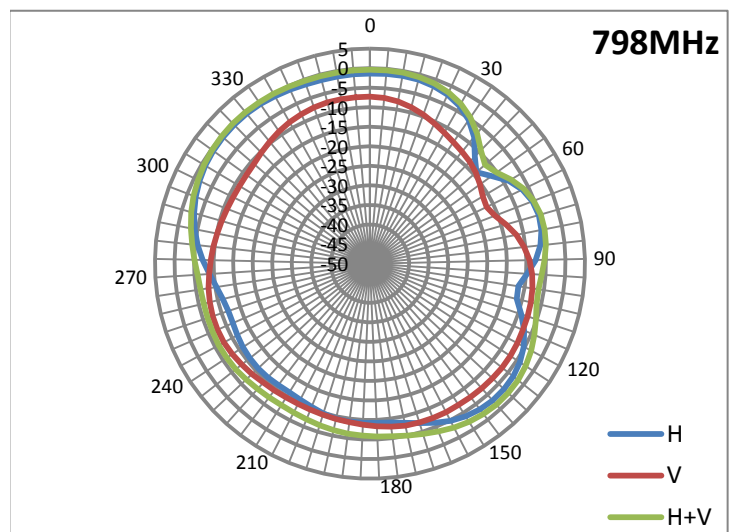
**Main antenna: 793.00 MHz**

793.00 MHz		
Horizontal Peak (dBi)	-0.4	270deg
Vertical Peak(dBi)	-7.1	350deg



**Main antenna: 798.00 MHz**

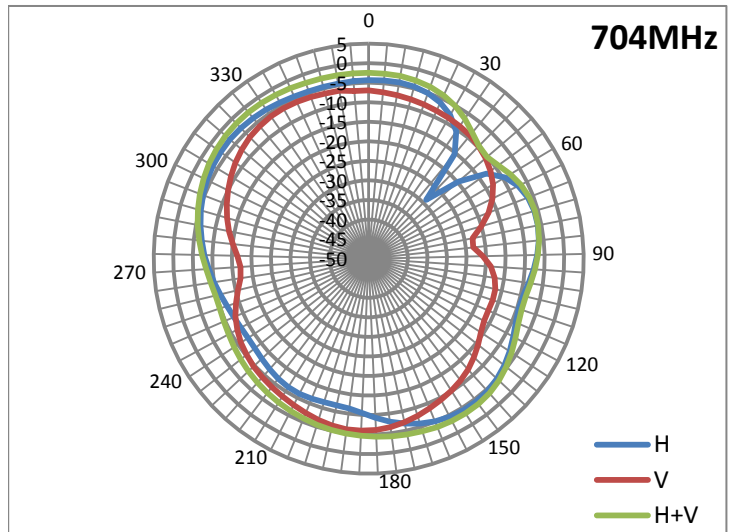
798.00 MHz		
Horizontal Peak (dBi)	-0.3	270deg
Vertical Peak(dBi)	-7.0	350deg



**Radiation characteristic in 704MHz ~ 716MHz (FCC Part 27H UE-UTRA, Band 17)**

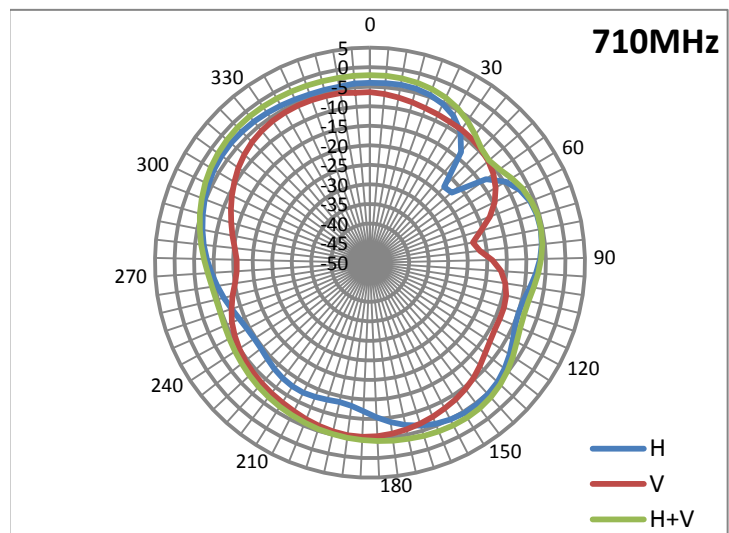
**Main antenna: 704.00 MHz**

704.00 MHz		
Horizontal Peak (dBi)	-3.2	270deg
Vertical Peak(dBi)	-5.8	315deg



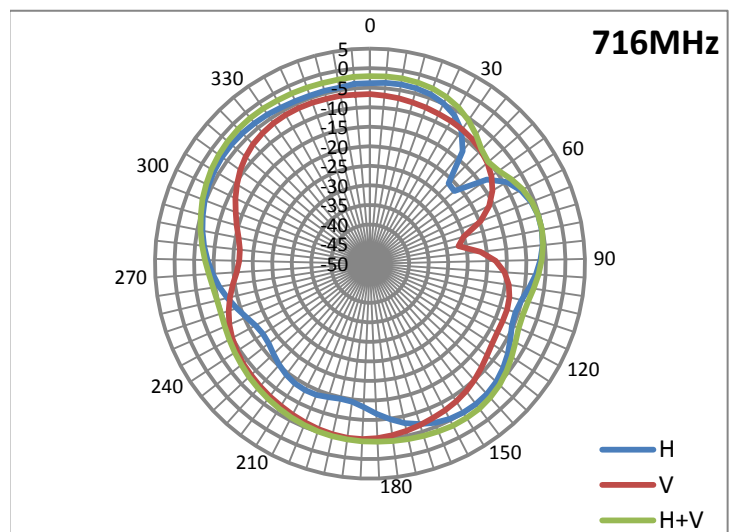
**Main antenna: 710.00 MHz**

710.00 MHz		
Horizontal Peak (dBi)	-3.1	260deg
Vertical Peak(dBi)	-5.4	345deg



**Main antenna: 716.00 MHz**

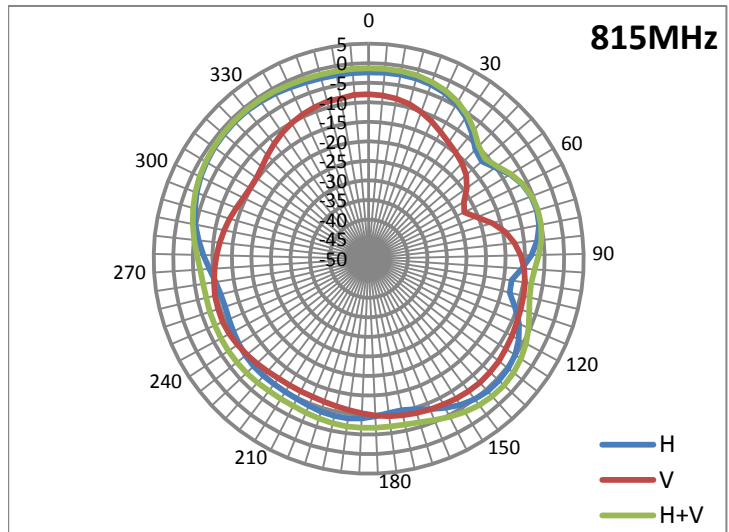
716.00 MHz		
Horizontal Peak (dBi)	-3.3	260deg
Vertical Peak(dBi)	-5.1	345deg



**Radiation characteristic in 815MHz ~ 830MHz (Japan, Band 18)**

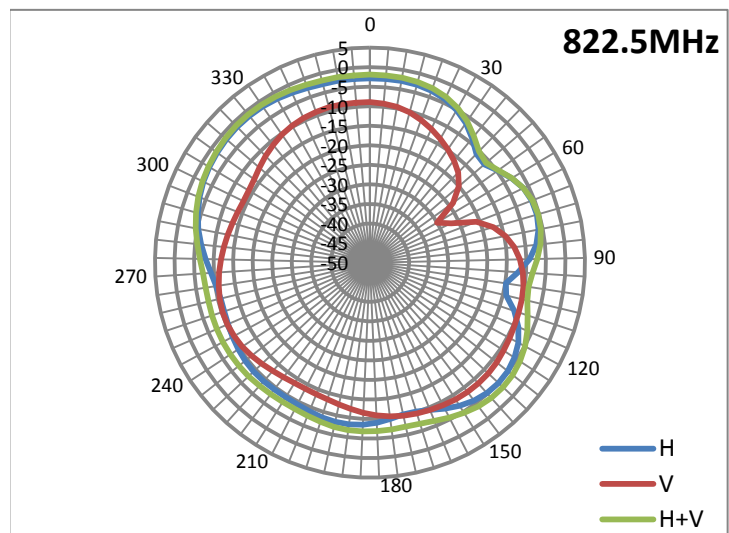
**Main antenna: 815.00 MHz**

815.00 MHz		
Horizontal Peak (dBi)	-1.0	270deg
Vertical Peak(dBi)	-7.4	345deg



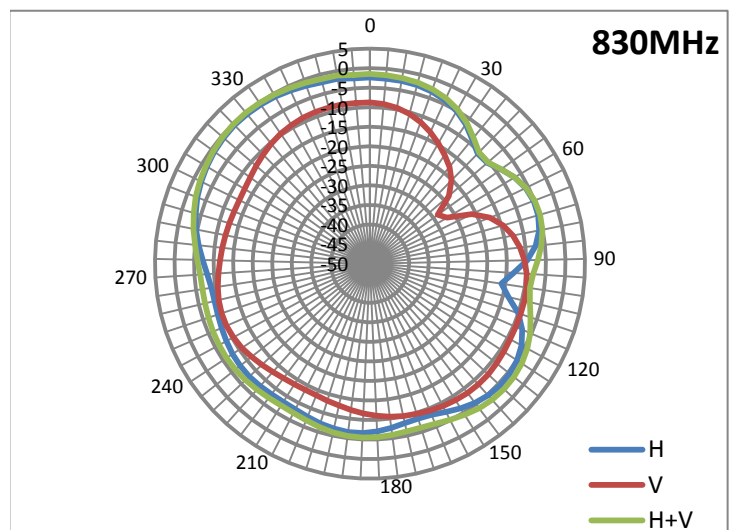
**Main antenna: 822.50 MHz**

822.50 MHz		
Horizontal Peak (dBi)	-1.4	275deg
Vertical Peak(dBi)	-8.5	345deg



**Main antenna: 830.00 MHz**

830.00 MHz		
Horizontal Peak (dBi)	-0.5	275deg
Vertical Peak(dBi)	-8.5	345deg

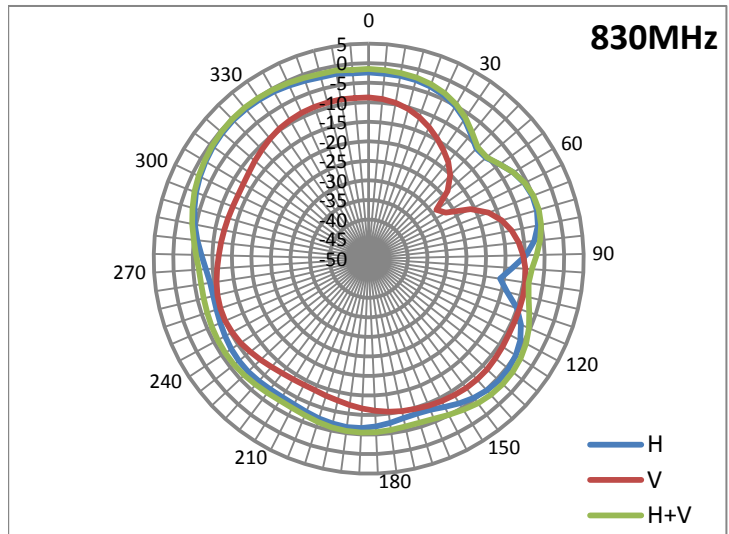




**Radiation characteristic in 830MHz ~ 845MHz (Japan, Band 19)**

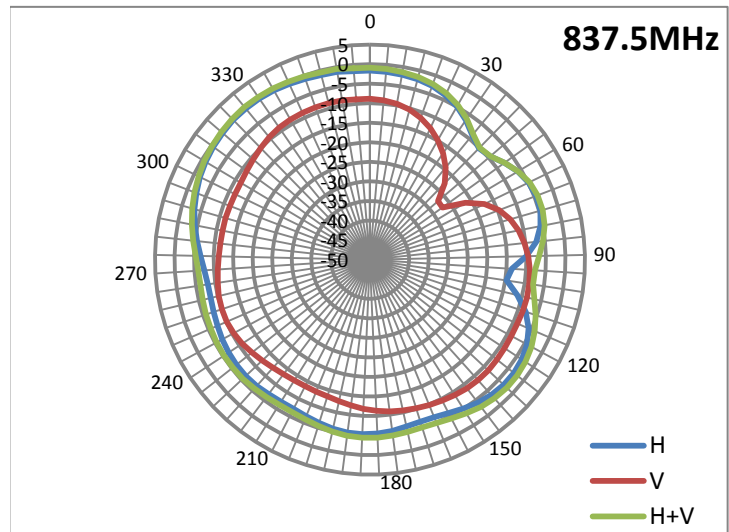
**Main antenna: 830.00 MHz**

830.00 MHz		
Horizontal Peak (dBi)	-0.5	275deg
Vertical Peak(dBi)	-8.5	345deg



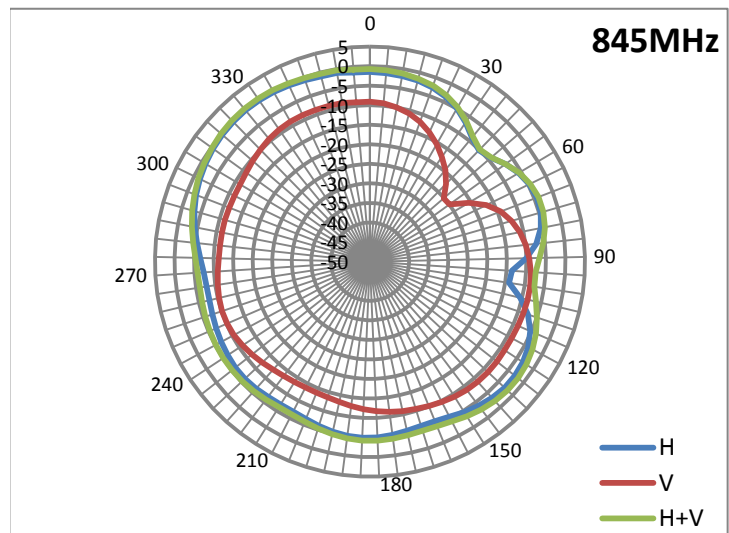
**Main antenna: 837.50 MHz**

837.50 MHz		
Horizontal Peak (dBi)	0.1	280deg
Vertical Peak(dBi)	-8.6	185deg



**Main antenna: 845.00 MHz**

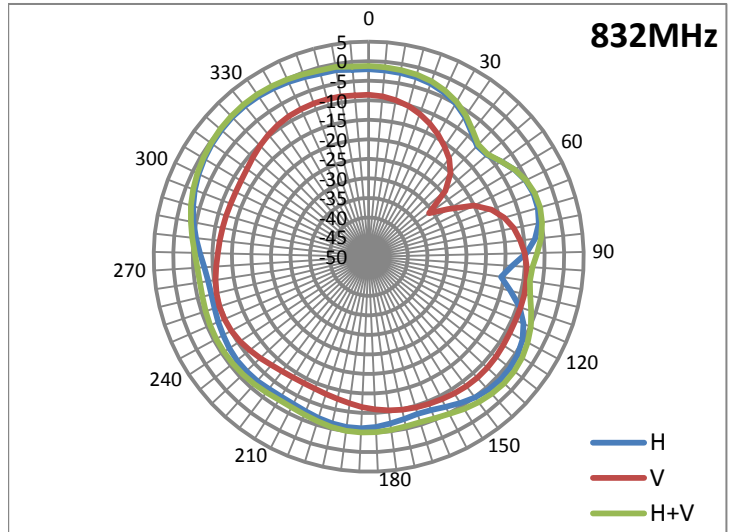
845.00 MHz		
Horizontal Peak (dBi)	0.2	280deg
Vertical Peak(dBi)	-8.5	235deg



**Radiation characteristic in 832MHz ~ 862MHz (EU UE-UTRA, Band 20, n20)**

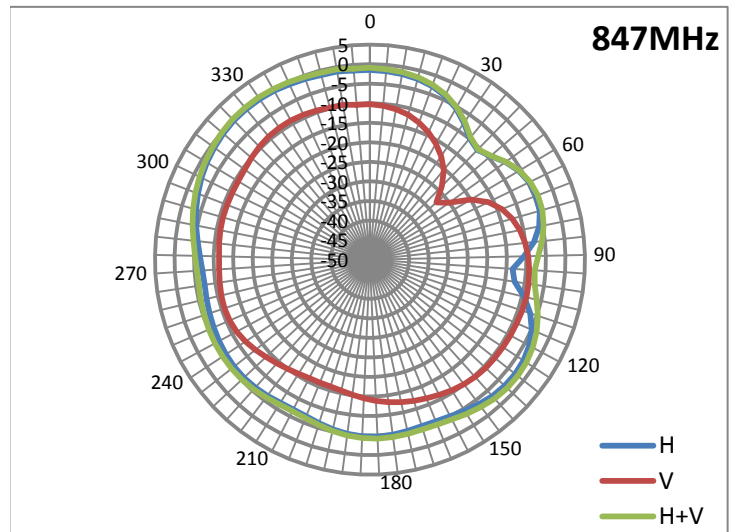
**Main antenna: 832.00 MHz**

832.00 MHz		
Horizontal Peak (dBi)	-0.1	280deg
Vertical Peak(dBi)	-8.4	345deg



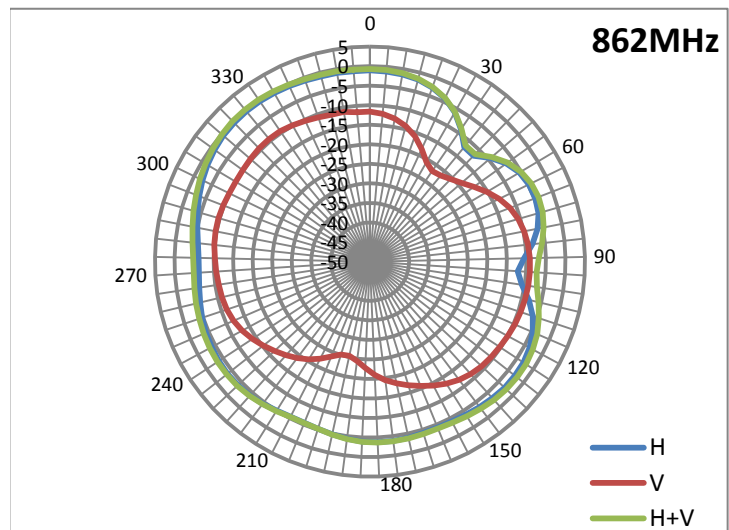
**Main antenna: 847.00 MHz**

847.00 MHz		
Horizontal Peak (dBi)	-0.1	285deg
Vertical Peak(dBi)	-8.9	240deg



**Main antenna: 862.00 MHz**

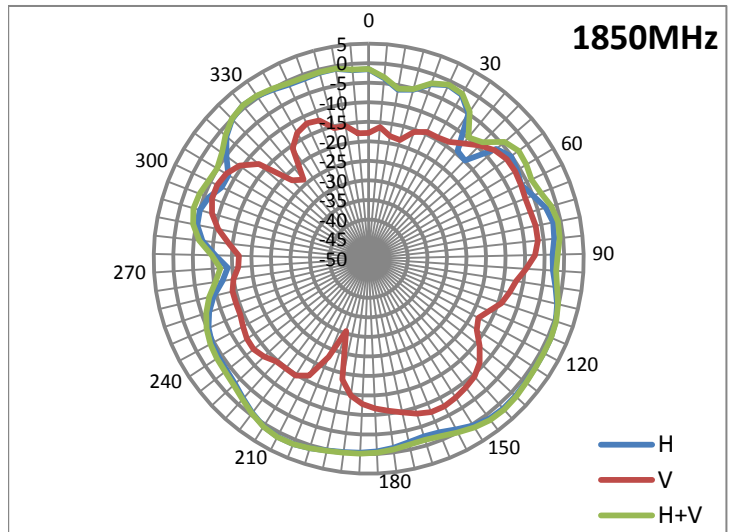
862.00 MHz		
Horizontal Peak (dBi)	-0.2	280deg
Vertical Peak(dBi)	-9.0	240deg



**Radiation characteristic in 1850MHz ~ 1915MHz (FCC Part 24 UE-UTRA, Band 25)**

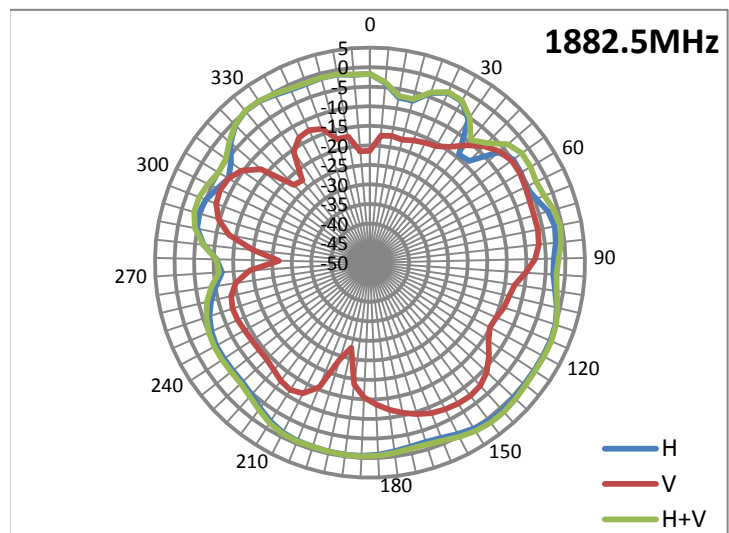
**Main antenna: 1850.00 MHz**

1850.00 MHz		
Horizontal Peak (dBi)	-1.4	295deg
Vertical Peak(dBi)	-6.6	140deg



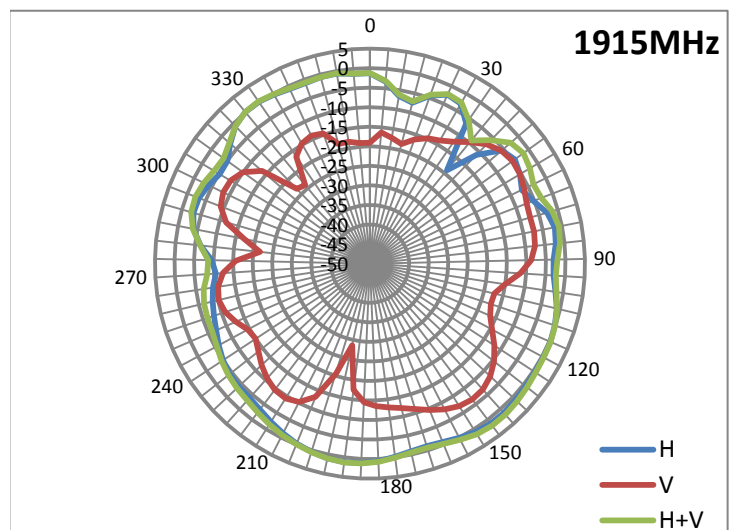
**Main antenna: 1882.50 MHz**

1882.50 MHz		
Horizontal Peak (dBi)	-0.7	300deg
Vertical Peak(dBi)	-5.3	140deg



**Main antenna: 1915.00 MHz**

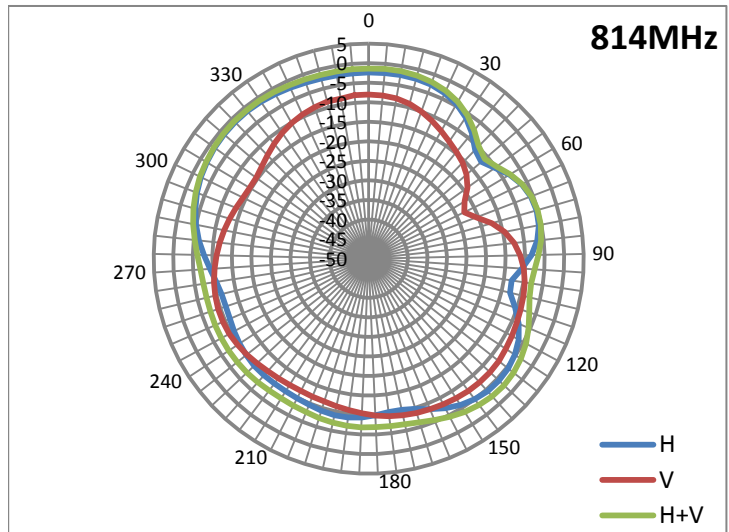
1915.00 MHz		
Horizontal Peak (dBi)	-0.4	300deg
Vertical Peak(dBi)	-5	135deg



**Radiation characteristic in 814MHz ~ 849MHz (FCC Part 90, 22H UE-UTRA, Band 26)**

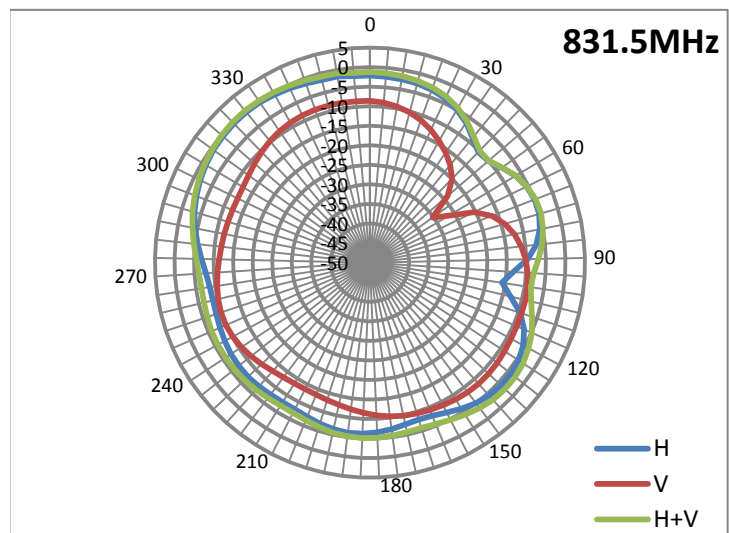
**Main antenna: 814.00 MHz**

814.00 MHz		
Horizontal Peak (dBi)	-1.1	270deg
Vertical Peak(dBi)	-7.5	345deg



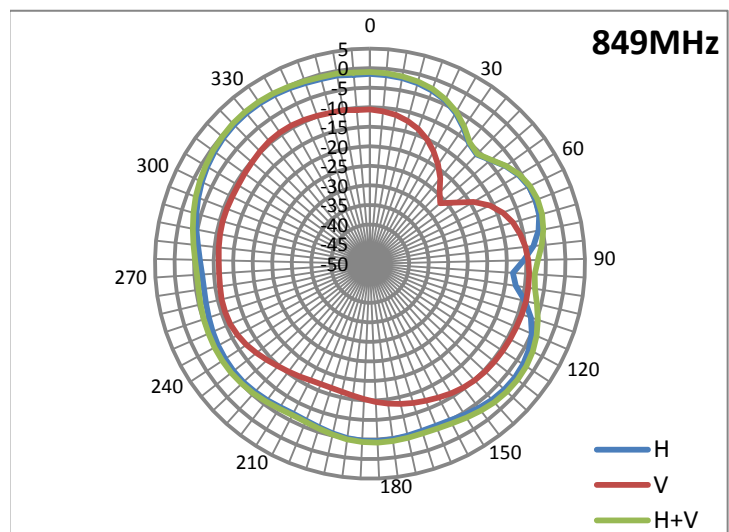
**Main antenna: 831.50 MHz**

831.50 MHz		
Horizontal Peak (dBi)	-0.6	280deg
Vertical Peak(dBi)	-8.4	345deg



**Main antenna: 849.00 MHz**

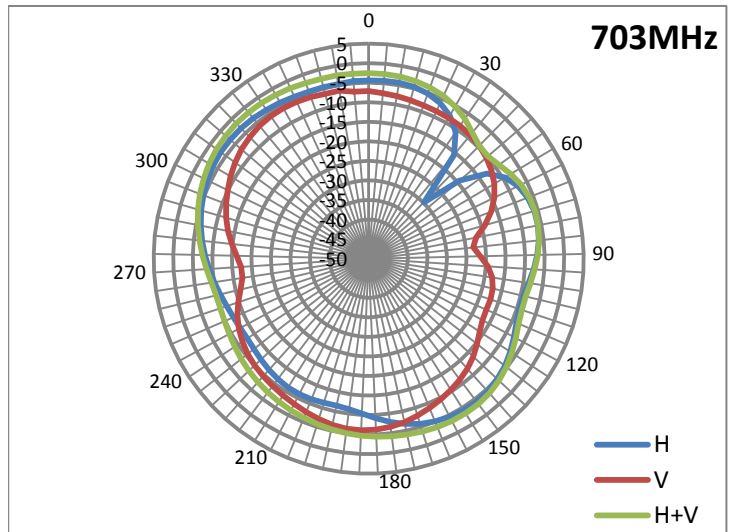
849.00 MHz		
Horizontal Peak (dBi)	-0.7	285deg
Vertical Peak(dBi)	-9	240deg



**Radiation characteristic in 703MHz ~ 748MHz (EU/ANZ/Japan UE-UTRA, Band 28, 28)**

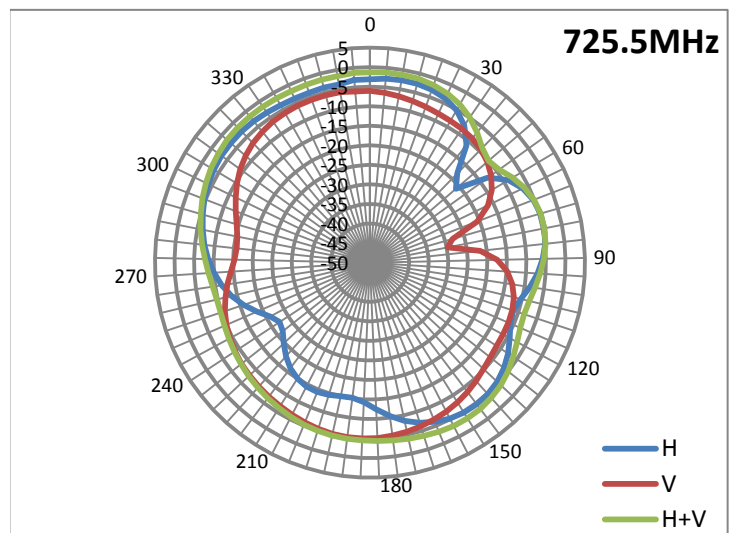
**Main antenna: 703.00 MHz**

703.00 MHz		
Horizontal Peak (dBi)	-3.3	270deg
Vertical Peak(dBi)	-5.7	315deg



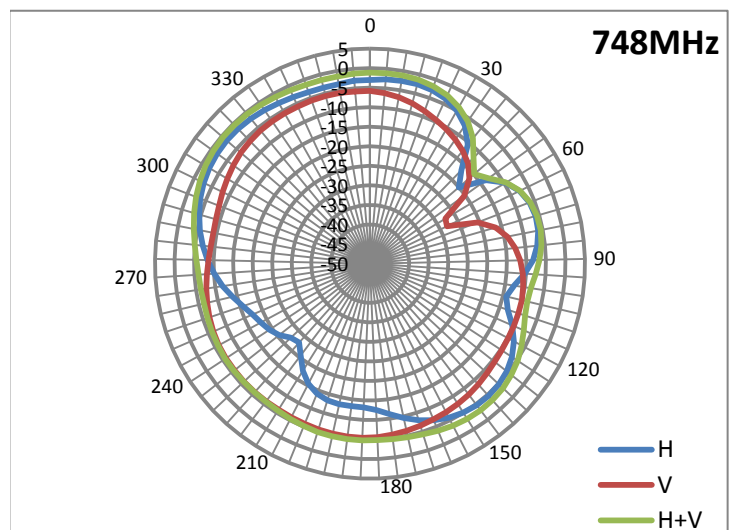
**Main antenna: 725.50 MHz**

725.50 MHz		
Horizontal Peak (dBi)	-2.6	260deg
Vertical Peak(dBi)	-5.0	345deg



**Main antenna: 748.00 MHz**

748.00 MHz		
Horizontal Peak (dBi)	-1.7	265deg
Vertical Peak(dBi)	-5.4	345deg



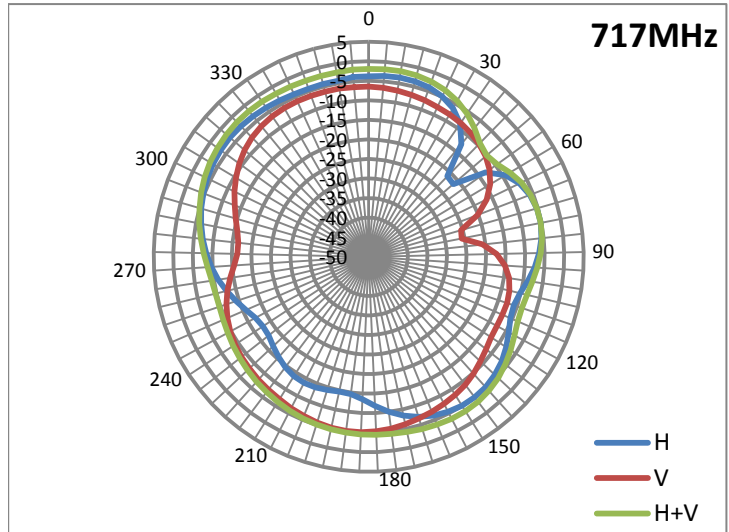


**Radiation characteristic in 717MHz ~ 728MHz (FCC Part 27 UE-UTRA, Band 29)**

\* Down link only

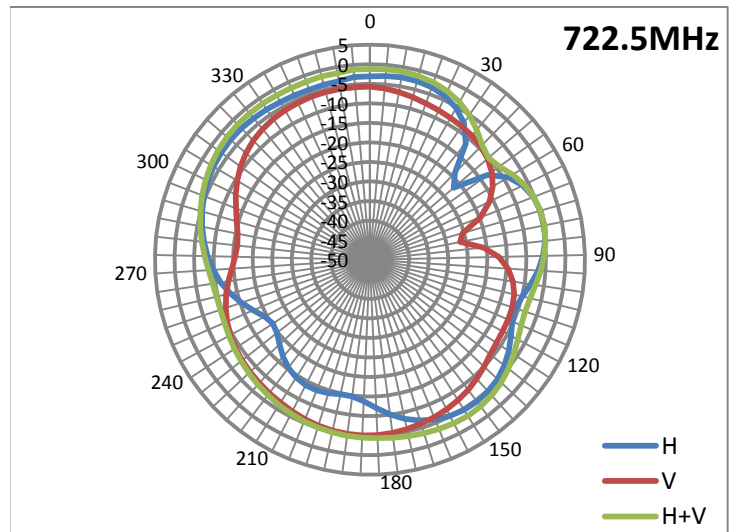
**Main antenna: 717.00 MHz**

717.00 MHz		
Horizontal Peak (dBi)	-3.2	260deg
Vertical Peak(dBi)	-5.1	345deg



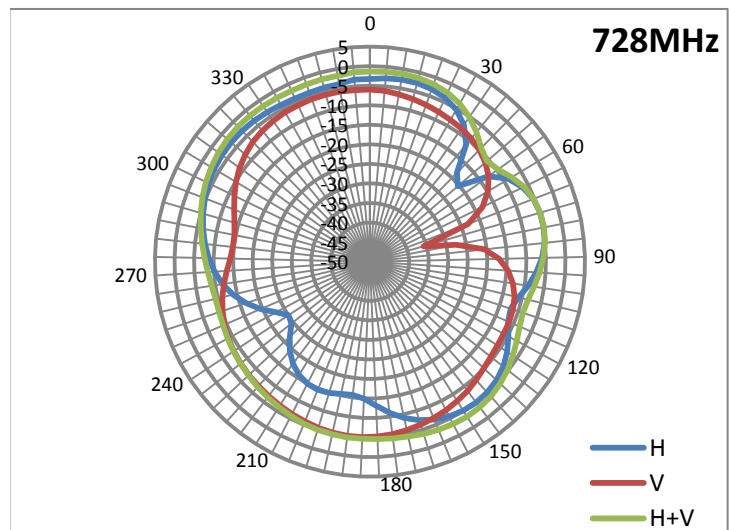
**Main antenna: 722.50 MHz**

722.50 MHz		
Horizontal Peak (dBi)	-2.7	260deg
Vertical Peak(dBi)	-5.0	345deg



**Main antenna: 728.00 MHz**

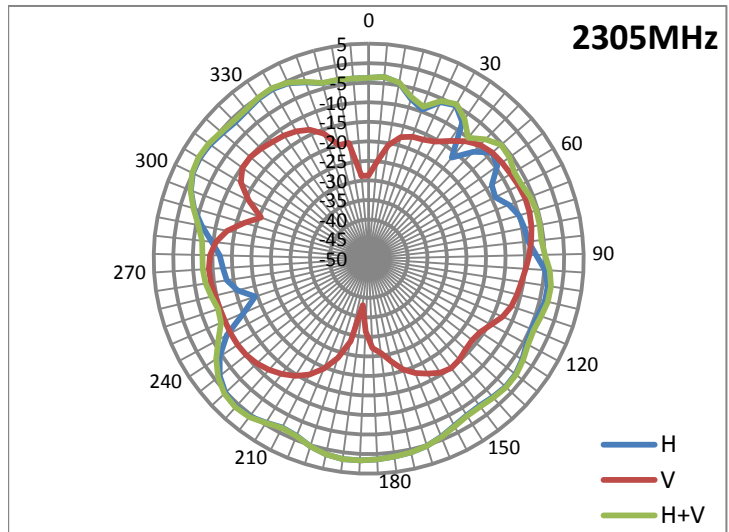
728.00 MHz		
Horizontal Peak (dBi)	-2.8	260deg
Vertical Peak(dBi)	-5.1	345deg



**Radiation characteristic in 2305MHz ~ 2315MHz (FCC Part 27 UE-UTRA, Band 30)**

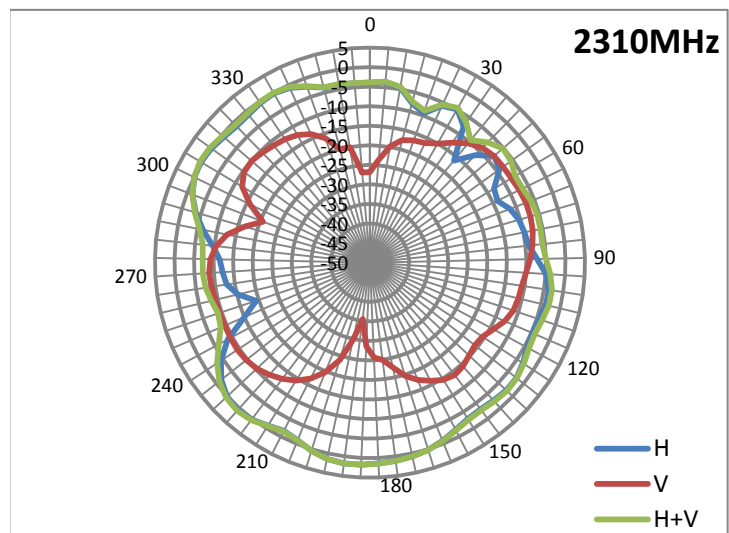
**Main antenna: 2305.00 MHz**

2305.00 MHz		
Horizontal Peak (dBi)	0.7	280deg
Vertical Peak(dBi)	-7.1	230deg



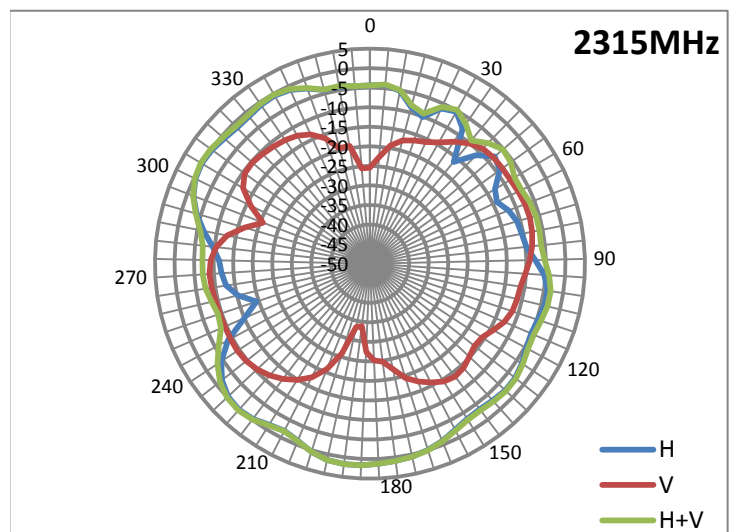
**Main antenna: 2310.00 MHz**

2310.00 MHz		
Horizontal Peak (dBi)	0.8	280deg
Vertical Peak(dBi)	-7.2	280deg



**Main antenna: 2315.00 MHz**

2315.00 MHz		
Horizontal Peak (dBi)	0.7	280deg
Vertical Peak(dBi)	-7.5	280deg

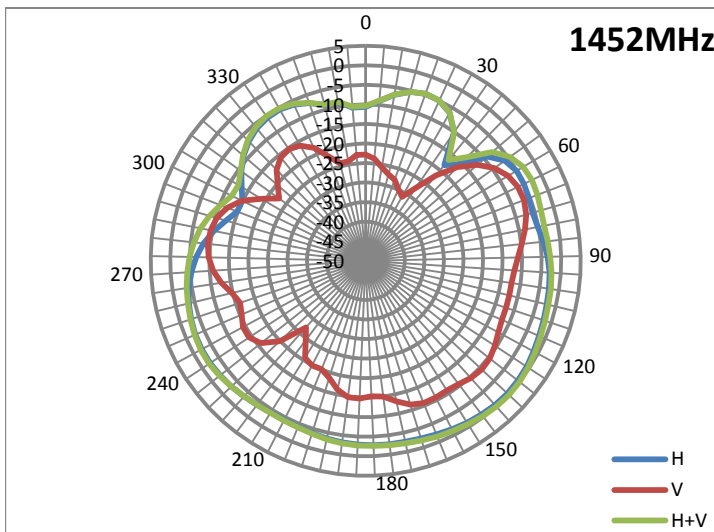


**Radiation characteristic in 1452MHz ~ 1496MHz (EU LTE, Band 32)**

\* Down link only

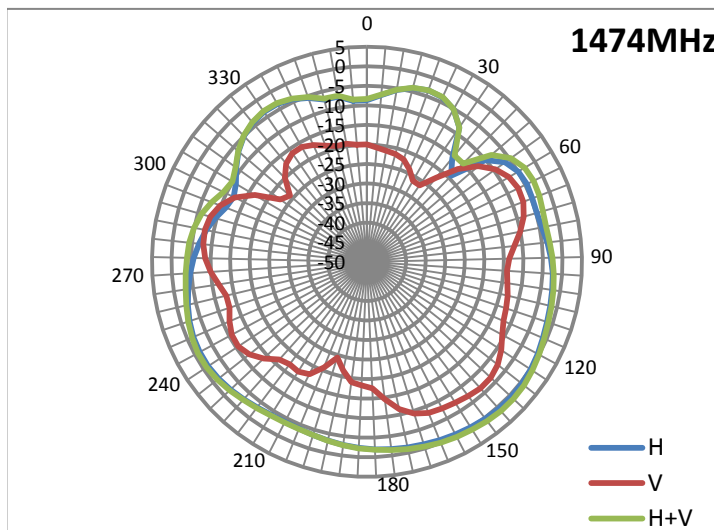
**Main antenna: 1452.00 MHz**

1452.00 MHz		
Horizontal Peak (dBi)	-0.3	295deg
Vertical Peak(dBi)	-6.6	270deg



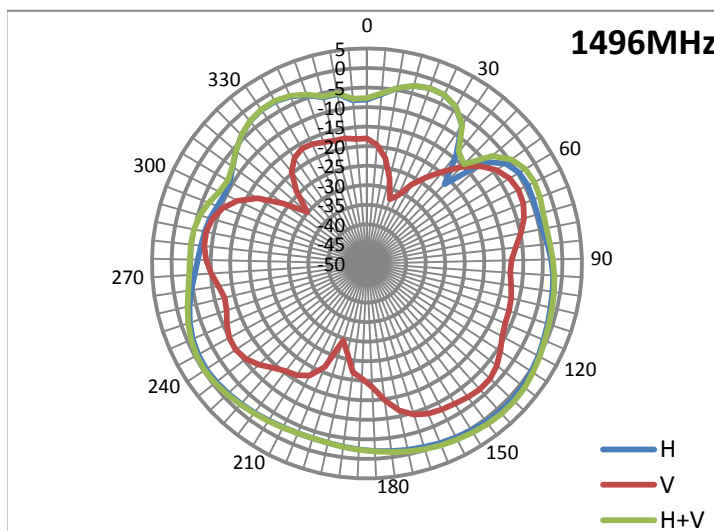
**Main antenna: 1474.00 MHz**

1474.00 MHz		
Horizontal Peak (dBi)	0.5	300deg
Vertical Peak(dBi)	-6.6	135deg



**Main antenna: 1496.00 MHz**

1496.00 MHz		
Horizontal Peak (dBi)	0.9	300deg
Vertical Peak(dBi)	-6.8	135deg

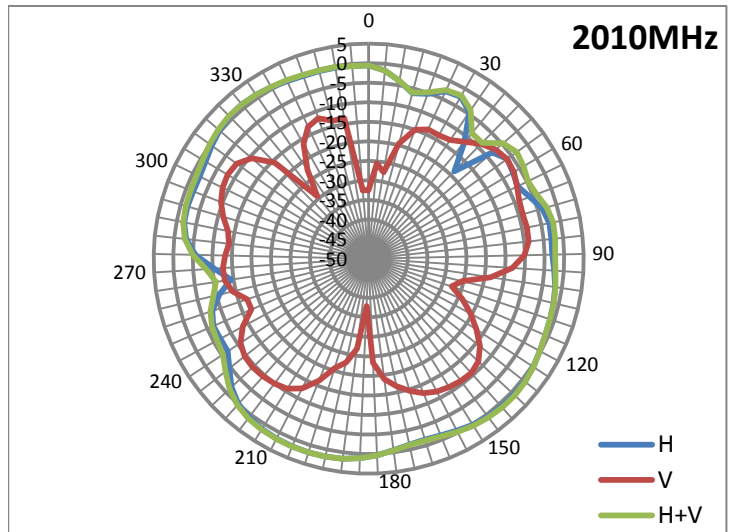




**Radiation characteristic in 2010MHz ~ 2025MHz (EU LTE, Band 34)**

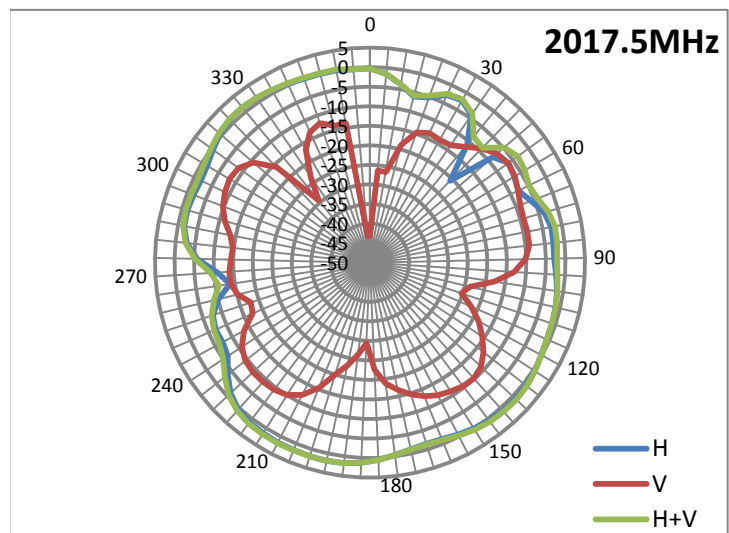
**Main antenna: 2010.00 MHz**

2010.00 MHz		
Horizontal Peak (dBi)	1.9	300deg
Vertical Peak(dBi)	-6.4	130deg



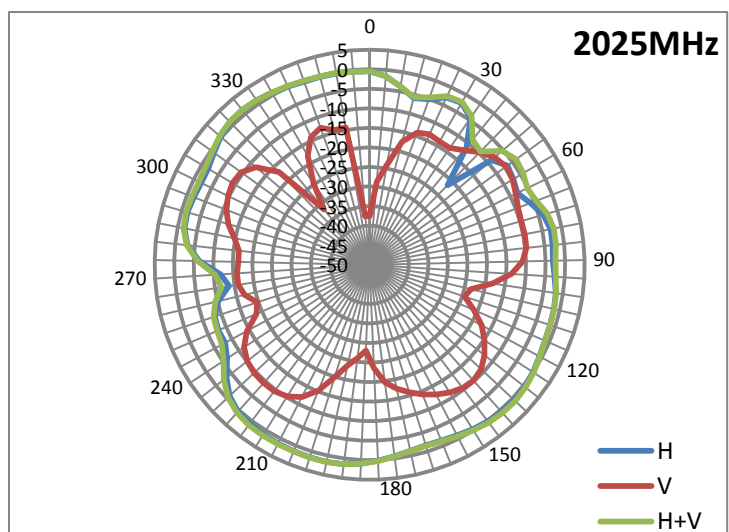
**Main antenna: 2017.50 MHz**

2017.50 MHz		
Horizontal Peak (dBi)	1.9	300deg
Vertical Peak(dBi)	-6.5	130deg



**Main antenna: 2025.00 MHz**

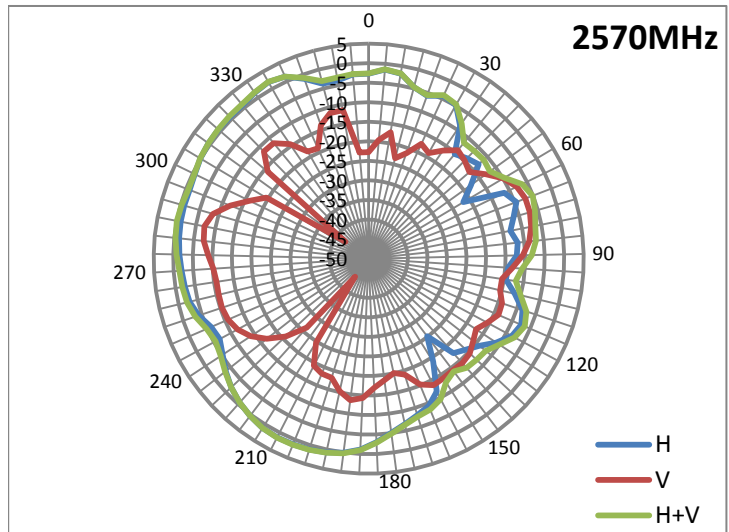
2025.00 MHz		
Horizontal Peak (dBi)	1.6	300deg
Vertical Peak(dBi)	-7.1	130deg



**Radiation characteristic in 2570MHz ~ 2620MHz (EU/CN UE-UTRA, Band 38, n38)**

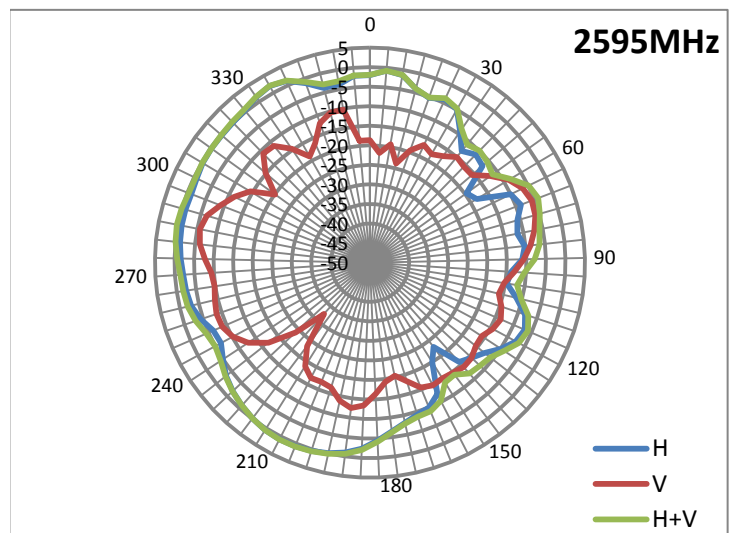
**Main antenna: 2570.00 MHz**

2570.00 MHz		
Horizontal Peak (dBi)	0.6	285deg
Vertical Peak(dBi)	-7	255deg



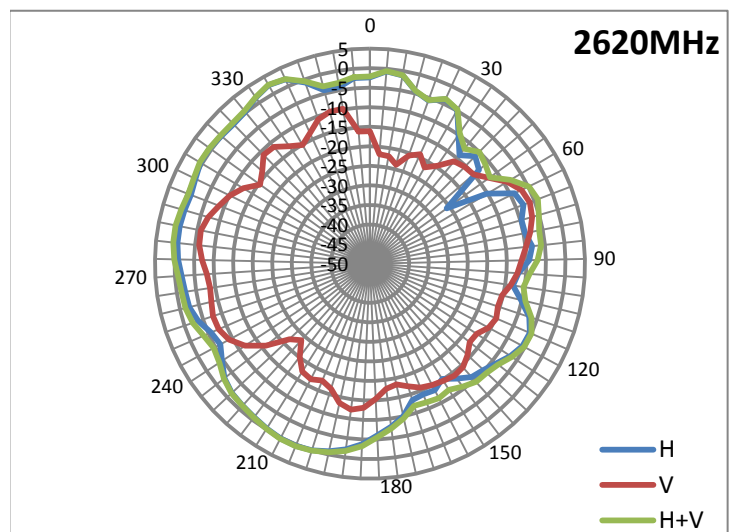
**Main antenna: 2595.00 MHz**

2595.00 MHz		
Horizontal Peak (dBi)	0.9	285deg
Vertical Peak(dBi)	-5.6	320deg



**Main antenna: 2620.00 MHz**

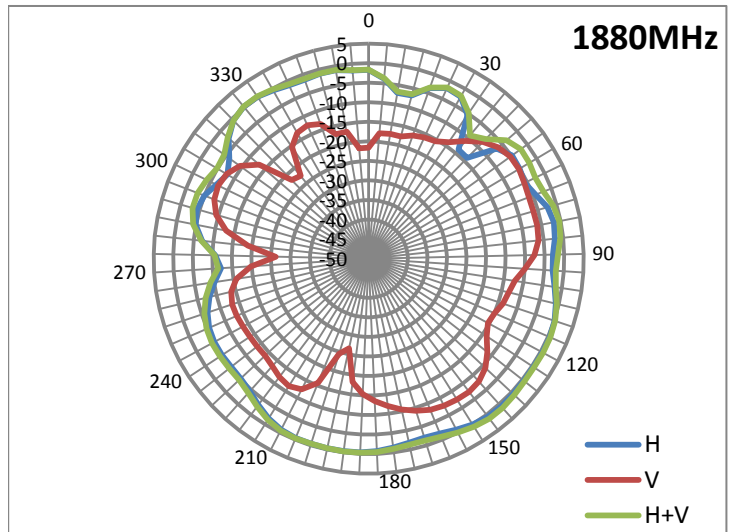
2620.00 MHz		
Horizontal Peak (dBi)	0.8	280deg
Vertical Peak(dBi)	-5.9	320deg



**Radiation characteristic in 1880MHz ~ 1920MHz (CN TD-SCDMA, Band 39)**

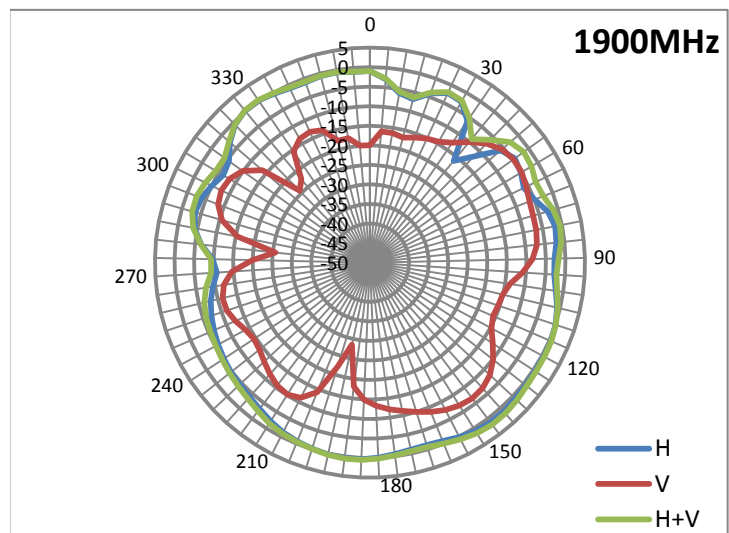
**Main antenna: 1880.00 MHz**

1880.00 MHz		
Horizontal Peak (dBi)	-1	300deg
Vertical Peak(dBi)	-5.5	140deg



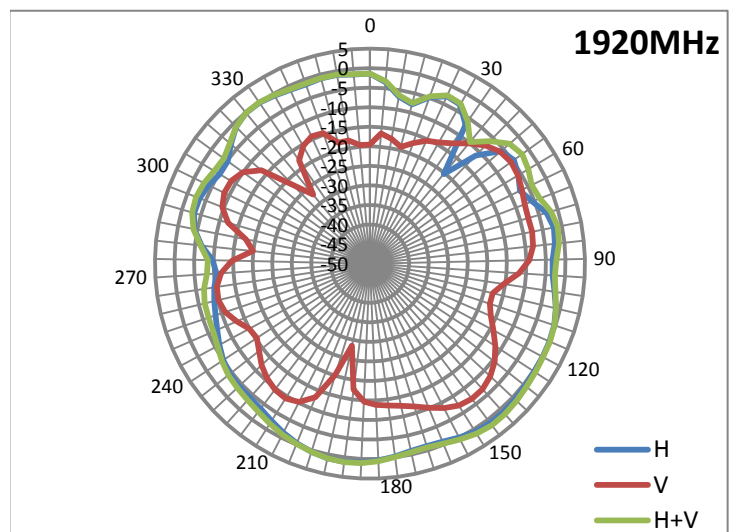
**Main antenna: 1900.00 MHz**

1900.00 MHz		
Horizontal Peak (dBi)	1.2	300deg
Vertical Peak(dBi)	-4.7	140deg



**Main antenna: 1920.00 MHz**

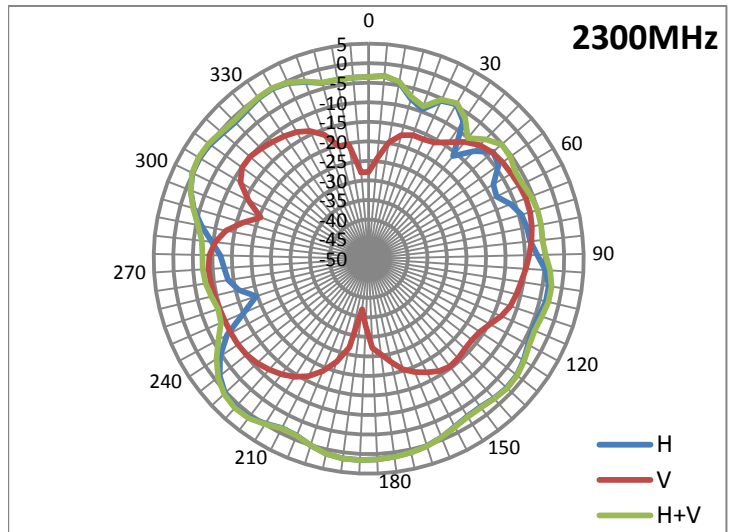
1920.00 MHz		
Horizontal Peak (dBi)	1.1	300deg
Vertical Peak(dBi)	-5.5	135deg



**Radiation characteristic in 2300MHz ~ 2400MHz (EU/ANZ/CN UE-UTRA, Band 40)**

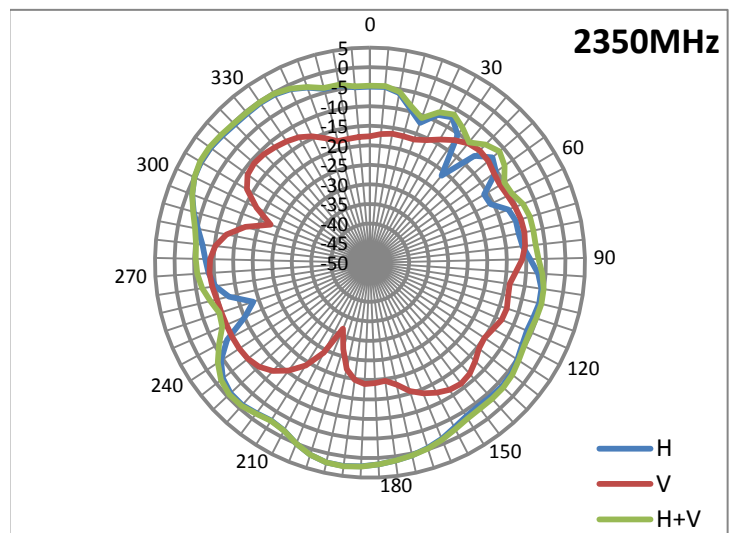
**Main antenna: 2300.00 MHz**

2300.00 MHz		
Horizontal Peak (dBi)	1.6	280deg
Vertical Peak(dBi)	-6.9	130deg



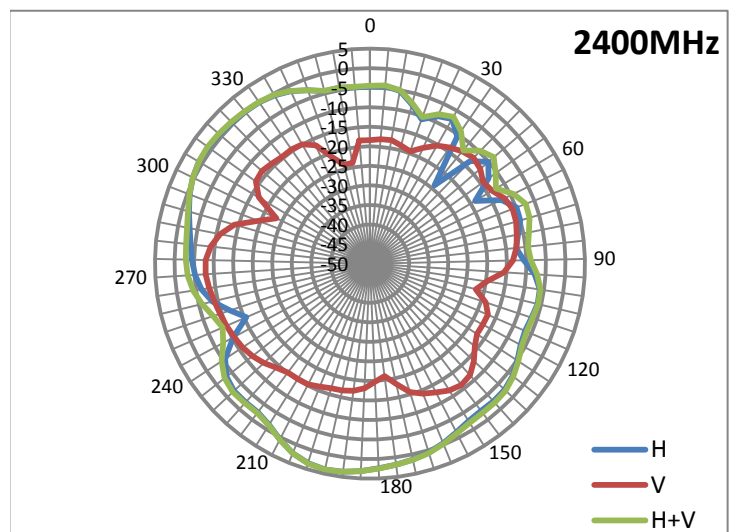
**Main antenna: 2350.00 MHz**

2350.00 MHz		
Horizontal Peak (dBi)	1.5	280deg
Vertical Peak(dBi)	-8.9	350deg



**Main antenna: 2400.00 MHz**

2400.00 MHz		
Horizontal Peak (dBi)	1.9	280deg
Vertical Peak(dBi)	-7.9	250deg

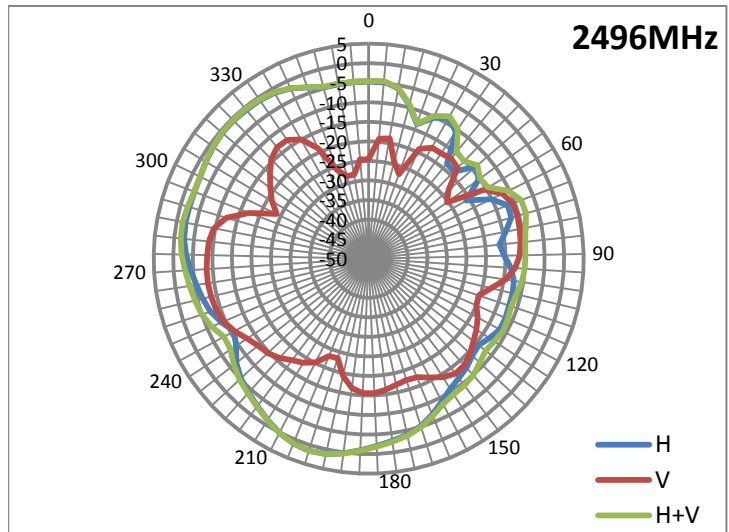




**Radiation characteristic in 2496MHz ~ 2690MHz (FCC Part 27 UE-UTRA, Band 41, n41)**

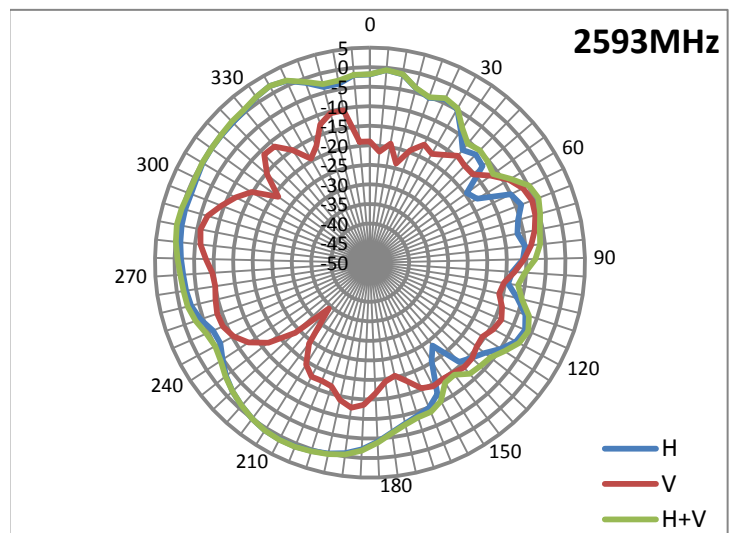
**Main antenna: 2496.00 MHz**

2496.00 MHz		
Horizontal Peak (dBi)	0.8	280deg
Vertical Peak(dBi)	-8.4	255deg



**Main antenna: 2593.00 MHz**

2593.00 MHz		
Horizontal Peak (dBi)	0.8	285deg
Vertical Peak(dBi)	-5.6	255deg



**Main antenna: 2690.00 MHz**

2690.00 MHz		
Horizontal Peak (dBi)	0.7	285deg
Vertical Peak(dBi)	-4.8	320deg

