



WWAN RSE Assessment

HP Bayfield 1.0 HSN-Q20C

RSE Report from similar a platform “HP Miramar (HSN-C04C)” is used to show compliance.

You will find below the rationalizations:

1. Same WWLAN module: **Fibocom L850-GL**
2. Same Power Levels are used:
WCDMA = 23.5dBm
LTE = 23dBm
3. Same antenna type with lower gain is used: **Pifa** (details below)
4. Host platform is almost identical: **2 in 1 Convertible PC**
5. No Radiated Spurious Emissions signals were detected at less than 10 dBm to the limit on HP Miramar Platform

Platforms Information:

Platform Name	Peak Gain (dBi)	Antenna Type	Reference document	Attachments
HP Bayfield 1.0 (HSN-Q20C)	-3.68	PIFA	<i>Bayfield 1.0_HSN-Q20C_WWAN_Antenna Agency Report_INPAQ.pdf</i>	See Attachment 1
HP Miramar (HSN-C04C)	0.33	PIFA	<i>Miramar(HSN-C04C)_WWAN(TB)_INPAQ_antenna agency report_2019036.pdf</i>	See Attachment 2

RSE Report:

Platform Name	Report ID	Attachments
HP Miramar (HSN-C04C)	<i>61815RRF001s.pdf</i>	See Attachment 3

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Attachment 1

Regulatory WWAN Antenna Information

Platform information				
Brand	ODM	Platform model name	Platform type (ex: regular NB, convertible PC, AIO...etc)	SAR minimum separation (mm)
HP Inc.	Quanta Corporation	Bayfield 1.0 (HSN-Q20C)	Convertible PC	4mm
Antenna information				Peak gain w/ cable loss (dBi)
Vendor	Type	Antenna Part number (Main)	Antenna Part number (Aux)	xx.x GHz (Choice high peak gain)
INPAQ	Couple	DQ6LBLB0205 (WA-P-LTE15LTE15LBLB-02-002)	DQ6LBLB0205 (WA-P-LTE15LTE15LBLB-02-002)	-3.68
Module information				
Model	Form factor and suffixes (NGW/ HMW AND AN/ NB/ BN....)			
Pandora	Fibocom lt4210 LTE/HSPA+ w/GPS Intel® XMM™ 7360 LTE-Advanced (M.2)			
Phuket	Fibocom LTE/HSPA+ w/GPS Intel® XMM™ 7560 LTE-Advanced Pro (M.2)			

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	Tx1, Tx2 & Tx3 antenna (Peak Gain W / cable loss) *	Required	Required	Required	Required	Required
	1E OR 1F, 1G, 1H					
1F	Tx1, Tx2 & Tx3 antenna (Peak Gain only) *	Required	Required	Required	Required	Required
1G	VSW R of cable including connector	Required	Required	Required	Required	Required
1H	Tx1, Tx2 & Tx3 antenna (Cable loss W / connector) *	Required	Required	Required	Required	Required
2	Dimensioned Photographs and Drawings of Tx1, Tx2, and Tx3 (or Rx3) 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 (W LAN, 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
8	Local representative contact information for LMA/ PARS process.	Required	N/A	N/A	N/A	N/A

Antenna Information

Section 1. Antenna Assembly Specifications

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)
DQ6LBLB0205 (WA-P-LTE15LTE15 LBLB-02-002) Main	INPAQ	Couple	50 ohm Coaxial. length: 319mm diameter: 1.13mm Connector: 20565-001R-13	824-849MHz <u>-5.86</u> dBi (peak)	824-849MHz <u>-5.37</u> dBi (peak)	824-849MHz <u>7.00</u> max	824-849MHz <u>0.49</u> dBi (peak)
				880-915MHz <u>-6.87</u> dBi (peak)	880-915MHz <u>-6.30</u> dBi (peak)	880-915MHz <u>7.00</u> max	880-915MHz <u>0.57</u> dBi (peak)
				1710-1785MHz <u>-5.79</u> dBi (peak)	1710-1785MHz <u>-4.98</u> dBi (peak)	1710-1785MHz <u>5.00</u> max	1710-1785MHz <u>0.81</u> dBi (peak)
				1850-1910MHz <u>-6.19</u> dBi (peak)	1850-1910MHz <u>-5.36</u> dBi (peak)	1850-1910MHz <u>5.00</u> max	1850-1910MHz <u>0.83</u> dBi (peak)
				1920-1980MHz <u>-5.97</u> dBi (peak)	1920-1980MHz <u>-5.10</u> dBi (peak)	1920-1980MHz <u>5.00</u> max	1920-1980MHz <u>0.87</u> dBi (peak)
				704-716MHz <u>-5.21</u> dBi (peak)	704-716MHz <u>-4.69</u> dBi (peak)	704-716MHz <u>7.00</u> max	704-716MHz <u>0.52</u> dBi (peak)
				777-787MHz <u>-4.32</u> dBi (peak)	777-787MHz <u>-3.83</u> dBi (peak)	777-787MHz <u>7.00</u> max	777-787MHz <u>0.49</u> dBi (peak)
				832-862MHz <u>-6.05</u> dBi (peak)	832-862MHz <u>-5.55</u> dBi (peak)	832-862MHz <u>7.00</u> max	832-862MHz <u>0.50</u> dBi (peak)
				1710-1755MHz <u>-5.43</u> dBi (peak)	1710-1755MHz <u>-4.61</u> dBi (peak)	1710-1755MHz <u>5.00</u> max	1710-1755MHz <u>0.82</u> dBi (peak)
				2500-2570MHz <u>-4.9</u> dBi (peak)	2500-2570MHz <u>-3.90</u> dBi (peak)	2500-2570MHz <u>4.00</u> max	2500-2570MHz <u>1.00</u> dBi (peak)
				2305-2315MHz <u>-3.68</u> dBi (peak)	2305-2315MHz <u>-2.73</u> dBi (peak)	2305-2315MHz <u>4.00</u> max	2305-2315MHz <u>0.95</u> dBi (peak)
				2595 MHz <u>-6.78</u> dBi (peak)	2595 MHz <u>-5.77</u> dBi (peak)	2595 MHz z <u>4.00</u> max	2595 MHz <u>1.01</u> dBi (peak)
				2496-2593MHz <u>-5.15</u> dBi (peak)	2496-2593MHz <u>-4.15</u> dBi (peak)	2496-2593MHz <u>4.00</u> max	2496-2593MHz <u>1.00</u> dBi (peak)
				DQ6LBLB0205 (WA-P-LTE15LTE15 LBLB-02-002) Aux	INPAQ	Couple	50 ohm Coaxial. length: 617mm diameter: 1.13mm Connector: 20565-001R-13
925-960MHz <u>-8.80</u> dBi (peak)	925-960MHz <u>-7.60</u> dBi (peak)	925-960MHz <u>6.00</u> max	925-960MHz <u>1.20</u> dBi (peak)				
1805-1880MHz <u>-6.89</u> dBi (peak)	1805-1880MHz <u>-5.29</u> dBi (peak)	1805-1880MHz <u>5.00</u> max	1805-1880MHz <u>1.60</u> dBi (peak)				
1930-1990MHz <u>-6.61</u> dBi (peak)	1930-1990MHz <u>-4.93</u> dBi (peak)	1930-1990MHz <u>5.00</u> max	1930-1990MHz <u>1.68</u> dBi (peak)				
2110-2170MHz <u>-8.58</u> dBi (peak)	2110-2170MHz <u>-6.83</u> dBi (peak)	2110-2170MHz <u>5.00</u> max	2110-2170MHz <u>1.75</u> dBi (peak)				
734-746MHz <u>-9.09</u> dBi (peak)	734-746MHz <u>-8.08</u> dBi (peak)	734-746MHz <u>6.00</u> max	734-746MHz <u>1.01</u> dBi (peak)				
746-756MHz <u>-9.09</u> dBi (peak)	746-756MHz <u>-8.08</u> dBi (peak)	746-756MHz <u>6.00</u> max	746-756MHz <u>1.01</u> dBi (peak)				
791-821MHz <u>-7.97</u> dBi (peak)	791-821MHz <u>-6.81</u> dBi (peak)	791-821MHz <u>6.00</u> max	791-821MHz <u>0.98</u> dBi (peak)				
2110-2155MHz <u>-8.51</u> dBi (peak)	2110-2155MHz <u>-6.75</u> dBi (peak)	2110-2155MHz <u>5.00</u> max	2110-2155MHz <u>1.76</u> dBi (peak)				
2620-2690MHz <u>-6.00</u> dBi (peak)	2620-2690MHz <u>-4.04</u> dBi (peak)	2620-2690MHz <u>4.00</u> max	2620-2690MHz <u>1.96</u> dBi (peak)				
2350-2360MHz <u>-7.95</u> dBi (peak)	2350-2360MHz <u>-6.07</u> dBi (peak)	2350-2360MHz <u>4.00</u> max	2350-2360MHz <u>1.88</u> dBi (peak)				
2595 MHz <u>-5.76</u> dBi (peak)	2595 MHz <u>-4.75</u> dBi (peak)	2595 MHz z <u>4.00</u> max	2595 MHz <u>1.01</u> dBi (peak)				
2496-2593MHz <u>-5.76</u> dBi (peak)	2496-2593MHz <u>-4.76</u> dBi (peak)	2496-2593MHz <u>4.00</u> max	2496-2593MHz <u>1.88</u> dBi (peak)				

- Antenna Peak Gain required being test in system basis.
- 1E frame contend absolutely peak antenna gain include H/V

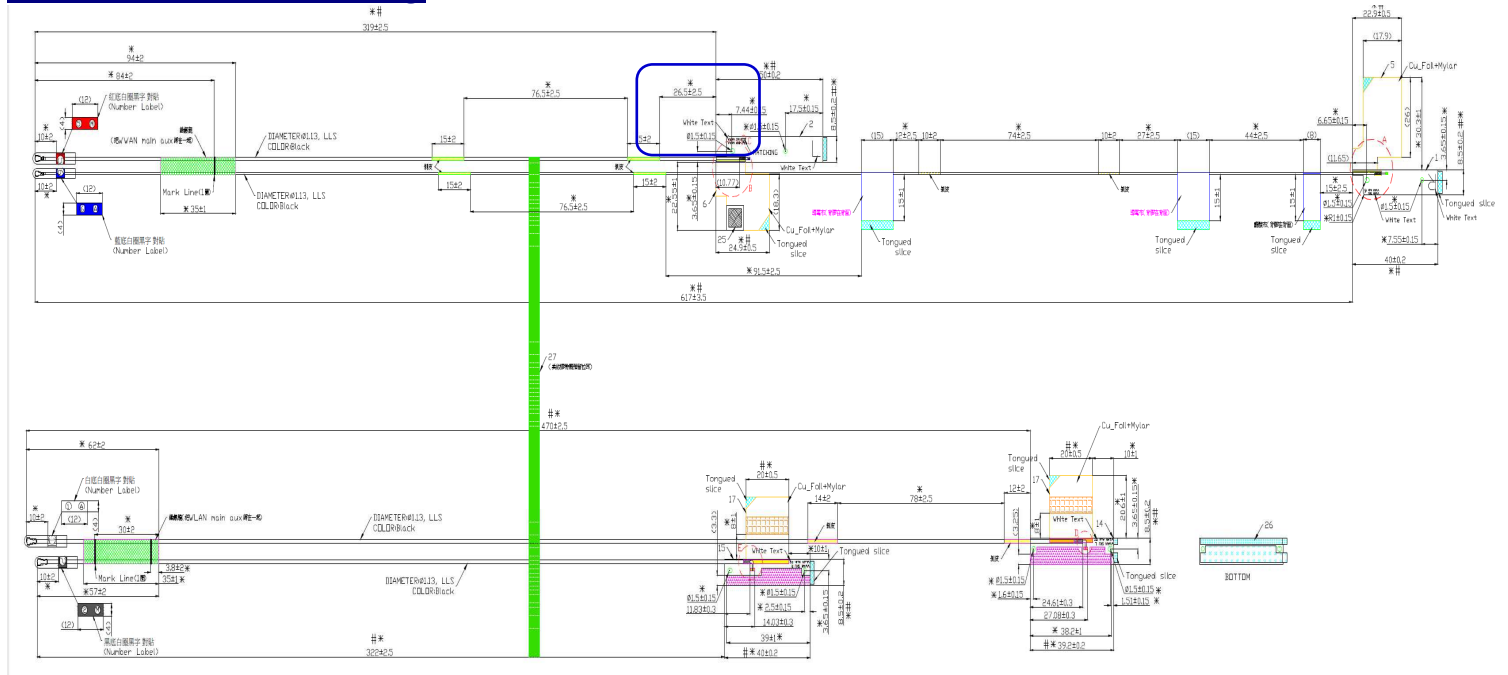
Antenna Peak Gain Table:

Main antenna			Aux antenna		
Frequency (MHz)	Horizontal	Vertical	Frequency (MHz)	Horizontal	Vertical
	(dBi)	(dBi)		(dBi)	(dBi)
824.2	-5.86	-9.95	869	-9.92	-10.92
836.6	-6.21	-10.45	880	-9.36	-10.94
848.8	-6.66	-10.7	894	-8.53	-10.69
880.2	-6.87	-10.25	925	-8.8	-10.94
897.6	-7.06	-10.42	940	-9.55	-11.24
914.8	-7.46	-10.79	960	-10.21	-11.67
1710.2	-5.79	-9.98	1805	-8.01	-10.12
1747.6	-5.96	-9.97	1840	-8.18	-10.8
1784.8	-7.35	-10.36	1880	-6.89	-9.68
1850.2	-6.19	-9.21	1930	-6.61	-12.27
1880	-6.45	-8.5	1960	-6.89	-11.13
1909.8	-6.85	-10.52	1990	-8.11	-12.35
1922.6	-6.93	-10.74	2110	-9.03	-12.03
1950	-6.28	-11.46	2140	-8.58	-12.67
1977.4	-5.97	-12.52	2170	-8.78	-13.13
704	-5.21	-8.89	734	-9.09	-11.42
710	-5.32	-9.11	740	-9.21	-11.28
716	-5.31	-9.11	746	-9.16	-11.04
777	-4.39	-8.53	751	-9.2	-10.85
782	-4.32	-8.65	756	-9.09	-10.64
787	-4.41	-8.86	791	-7.97	-10.48
832	-6.05	-10.33	806	-9.14	-10.74
847	-6.61	-10.68	821	-9.36	-10.72
862	-6.92	-10.64	2110	-9.03	-12.03
1710	-5.79	-9.98	2132	-8.71	-12.4
1732	-5.43	-10.17	2155	-8.51	-13.03
1755	-6.22	-9.86	2620	-6.14	-11.87
2500	-5.15	-10.52	2655	-6	-12.1
2535	-4.9	-10.72	2690	-6.77	-13.28
2570	-5.68	-11.22	2350	-8.38	-8.88
2305	-3.75	-6.99	2355	-8.39	-8.78
2310	-3.68	-7.05	2360	-7.95	-8.77
2315	-3.78	-7.02	2595	-5.76	-11.27
2595	-6.78	-12.71	2496	-6.45	-9.36
2496	-5.15	-10.52	2593	-5.76	-11.27
2593	-6.78	-12.71			

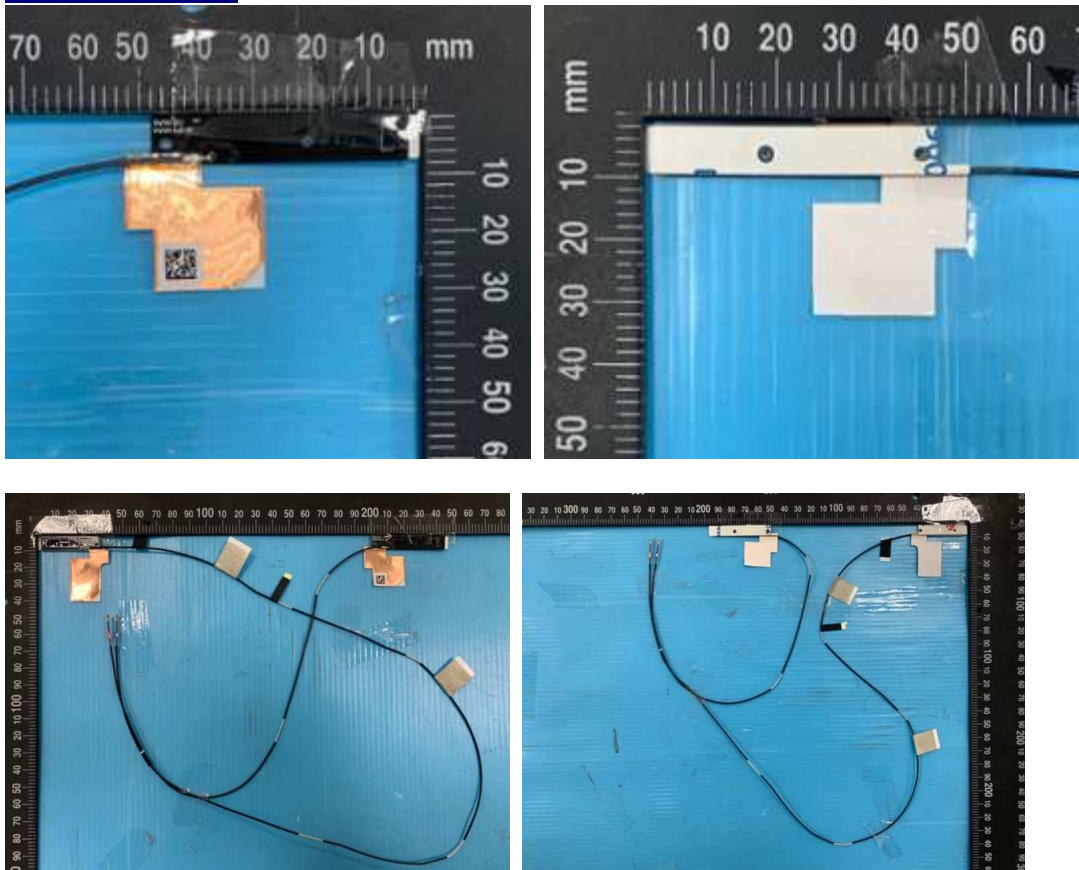
Section 2. Dimensioned Photos or Drawings of Antennas

Include a dimensioned photo and dimensioned drawing of Tx 1 antenna here.

Tx 1 Antenna Dimensioned Drawing:

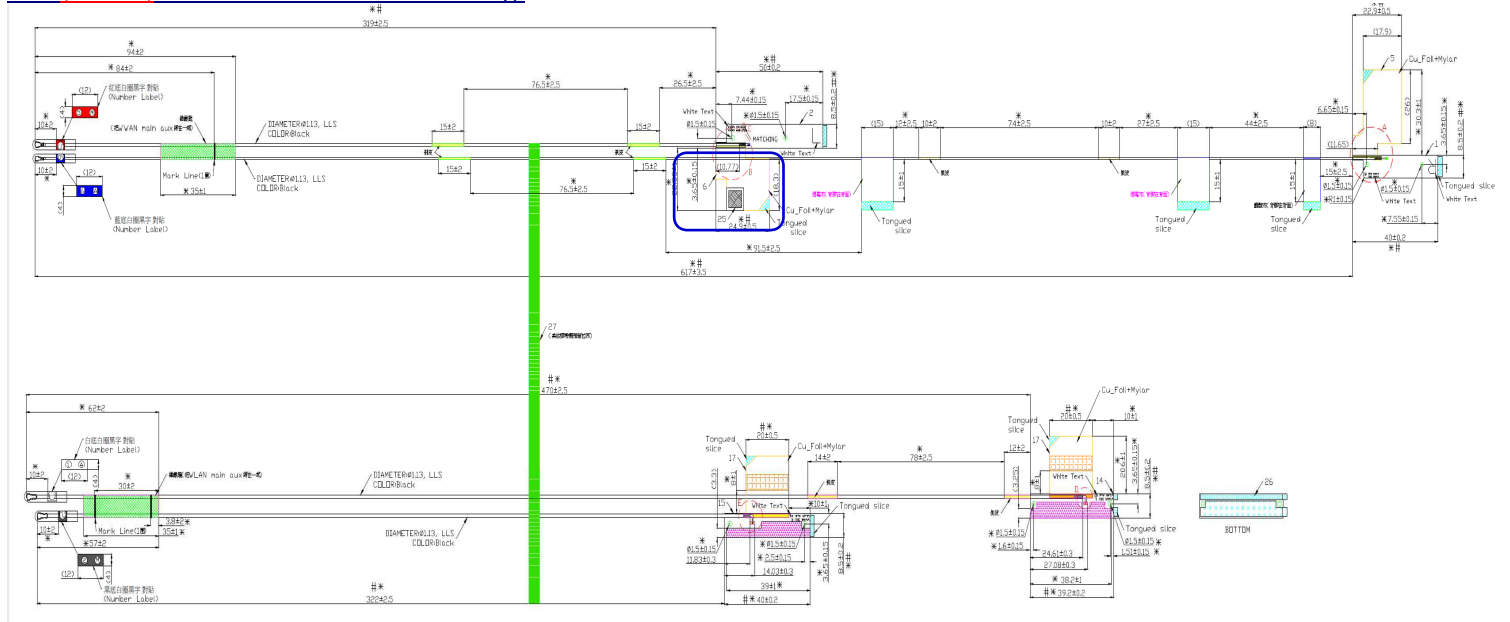


Tx 1 Antenna Photo:

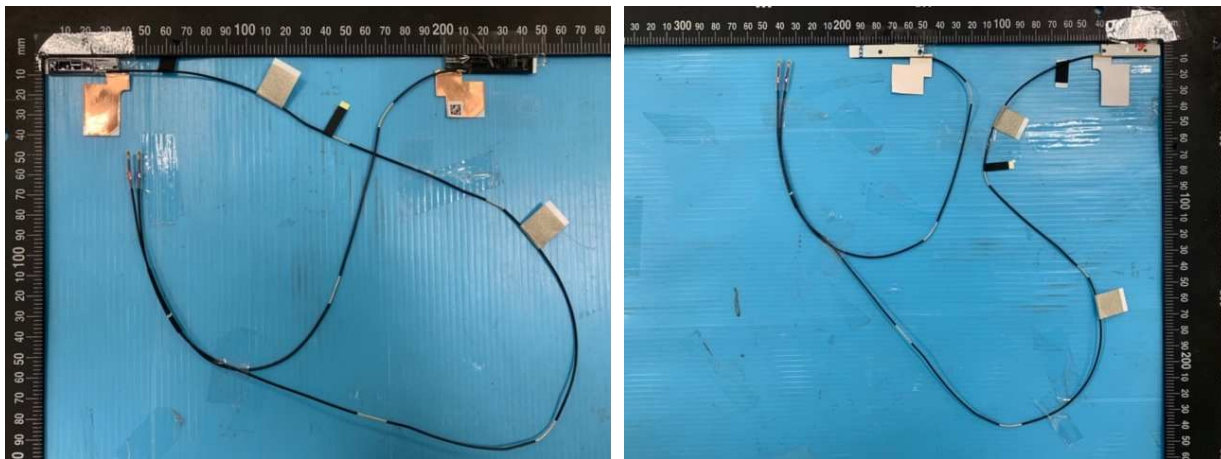
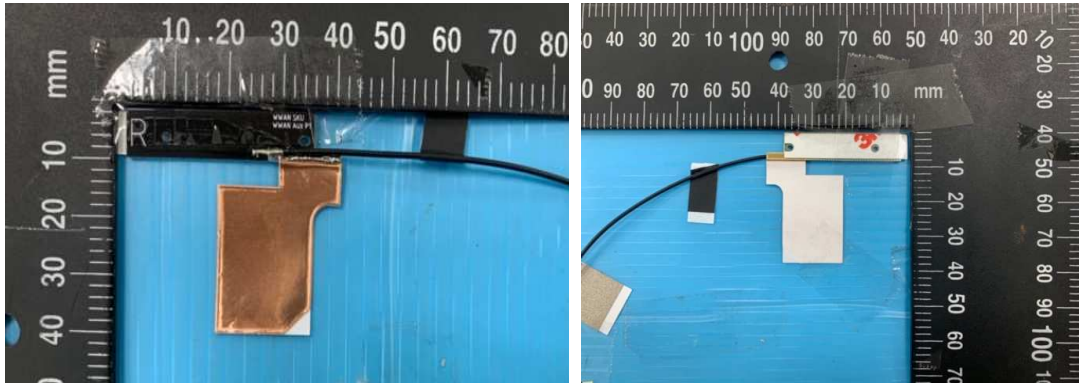


Include a dimensioned photo and dimensioned drawing of Tx2 (or Rx2) antenna here.

Tx2 (or Rx2) Antenna Dimensioned Drawing:

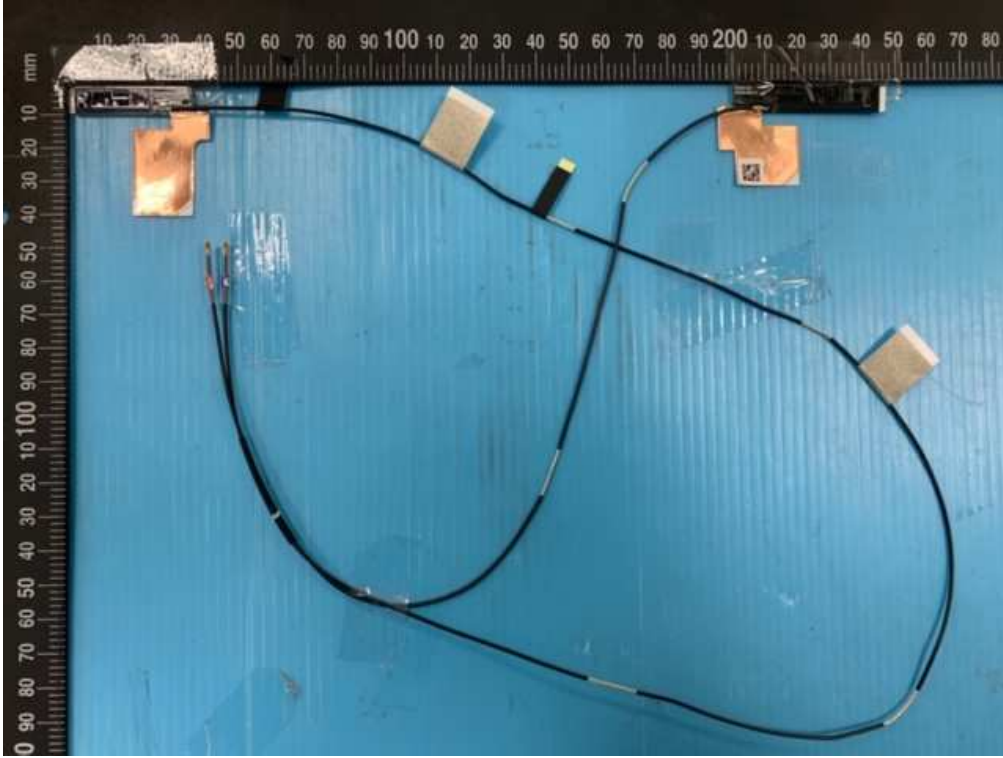


Tx2 (or Rx2) Antenna Photo:



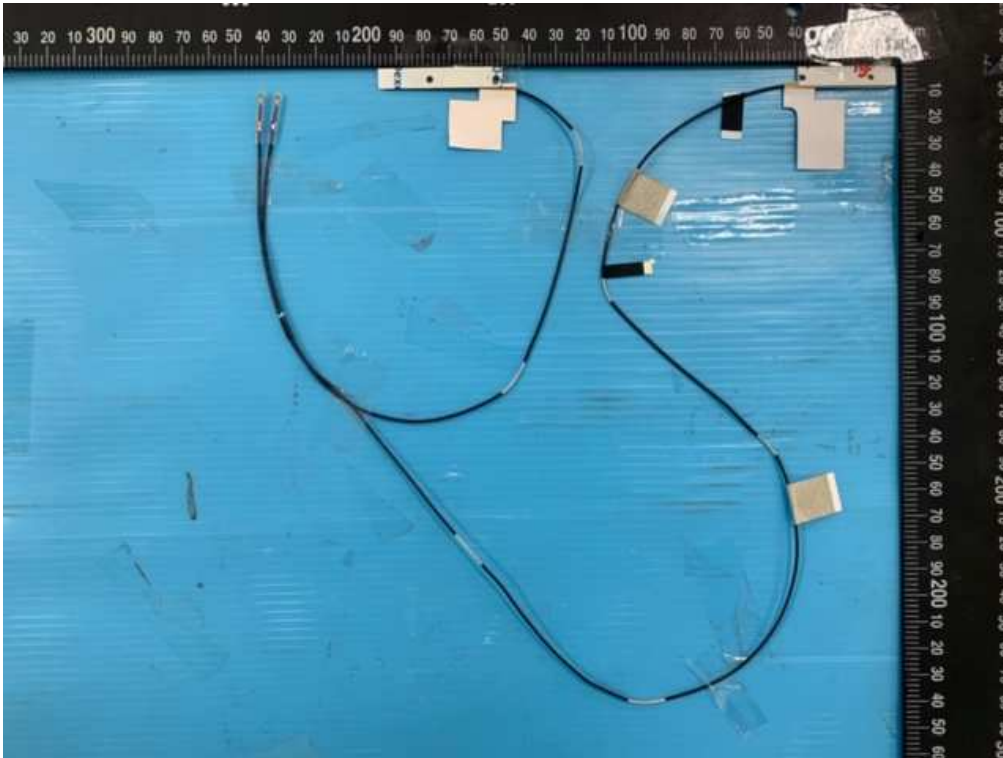
Include front view photo of all antennas here.

Antenna Manufacturer: INPAQ Technology Corporation
Antenna Part Number: DQ6LBLB0205(WA-P-LTE15LTE15LBLB-02-002) (Tx1) ,
DQ6LBLB0205(WA-P-LTE15LTE15LBLB-02-002) (Tx2 or Rx2)



Include back view photo of all antennas here.

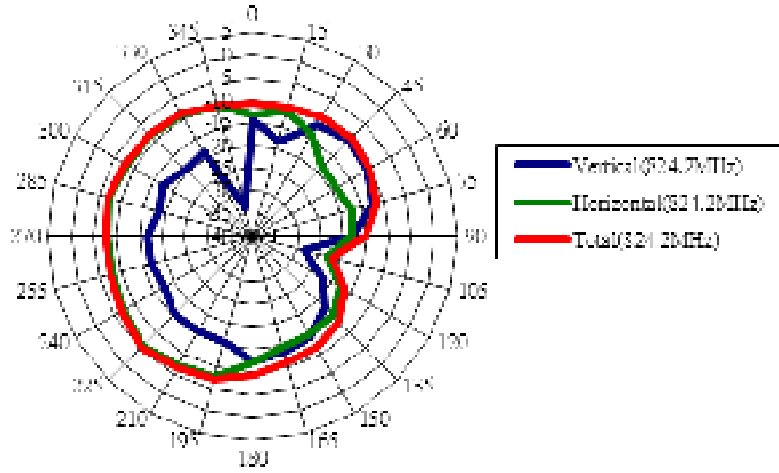
Antenna Manufacturer: INPAQ Technology Corporation
Antenna Part Number: DQ6LBLB0205(WA-P-LTE15LTE15LBLB-02-002) (Tx1) ,
DQ6LBLB0205(WA-P-LTE15LTE15LBLB-02-002) (Tx2 or Rx2)



Section 3. Radiation characteristics of antennae Loaded in Host Platform

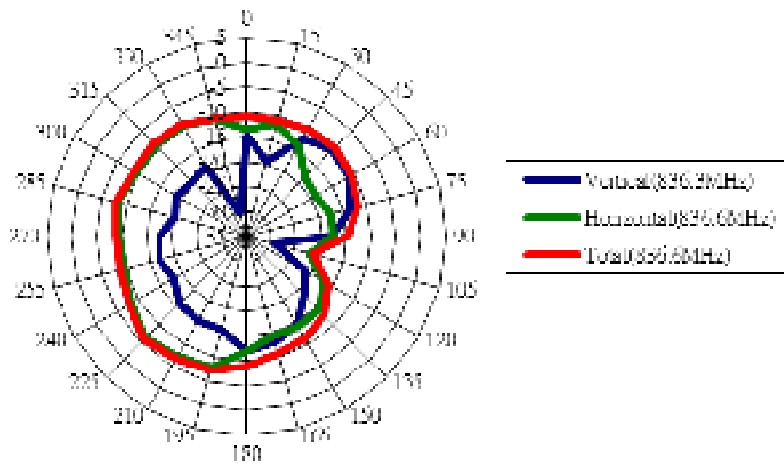
850MHz radiation characteristic

Tx1 antenna: 824.2MHz



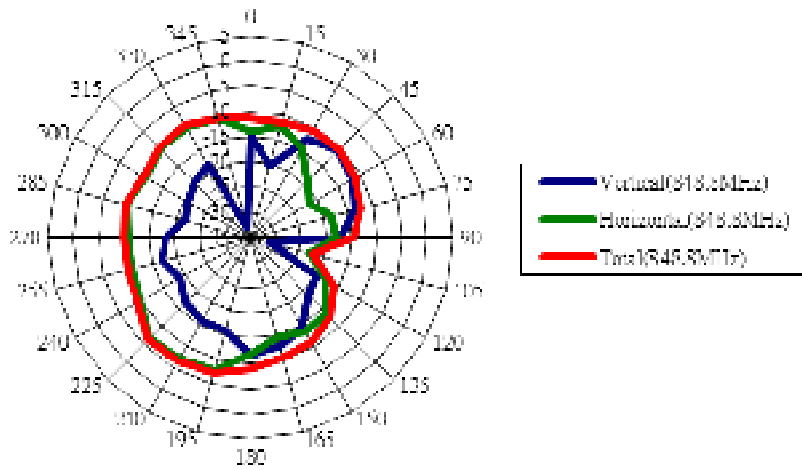
Center Frequency	824.2 MHz
Horizontal (dBi) peak	-5.86
Vertical (dBi) peak	-9.95

Tx1 antenna: 836.6 MHz



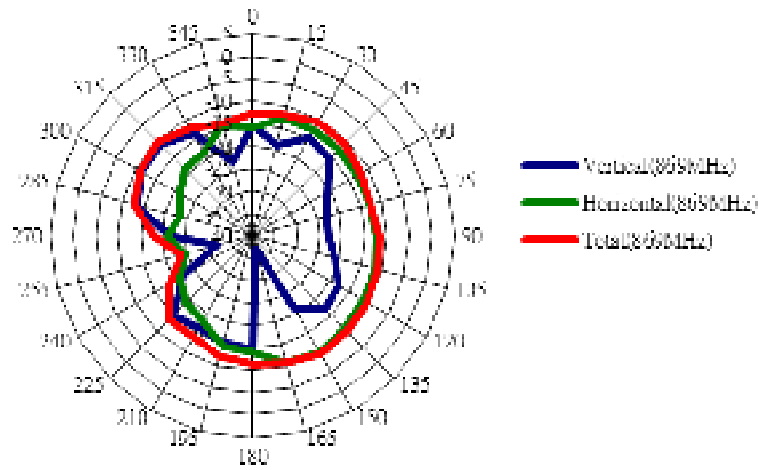
Center Frequency	836.6 MHz
Horizontal (dBi) peak	-6.21
Vertical (dBi) peak	-10.45

Tx 1 antenna: 848.8 MHz



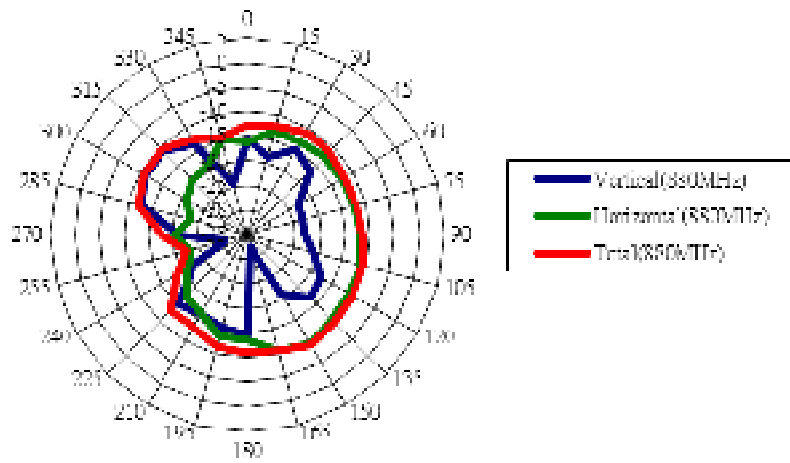
Center Frequency	848.8MHz
Horizontal (dBi) peak	-6.66
Vertical (dBi) peak	-10.7

Tx2 antenna: 869 MHz



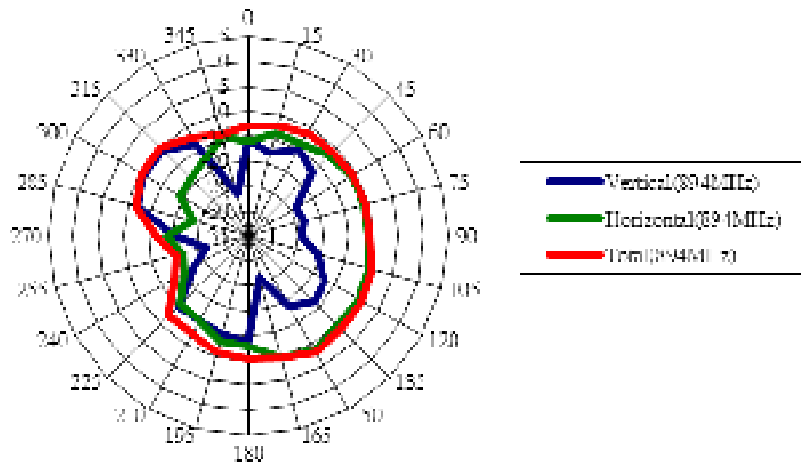
Center Frequency	869 MHz
Horizontal (dBi) peak	-9.92
Vertical (dBi) peak	-10.92

Tx2 antenna: 880 MHz



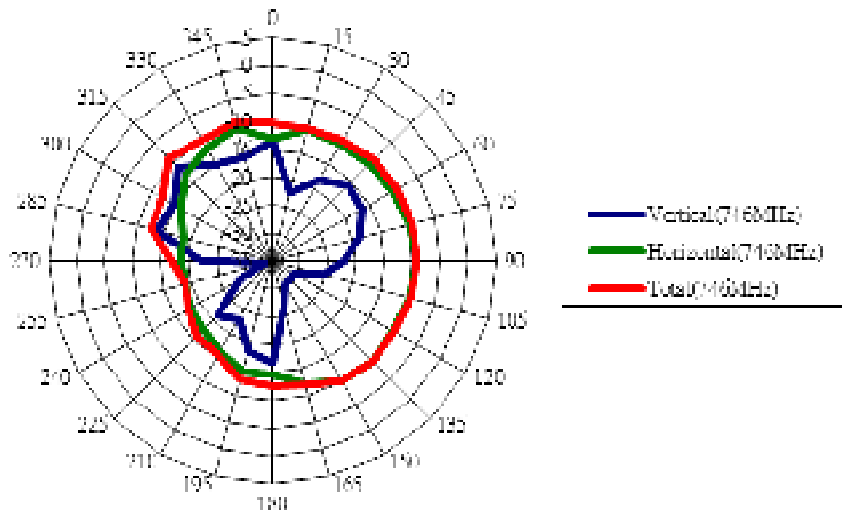
Center Frequency	880 MHz
Horizontal (dBi) peak	-9.36
Vertical (dBi) peak	-10.94

Tx2 antenna: 894 MHz



Center Frequency	894 MHz
Horizontal (dBi) peak	-8.53
Vertical (dBi) peak	-10.69

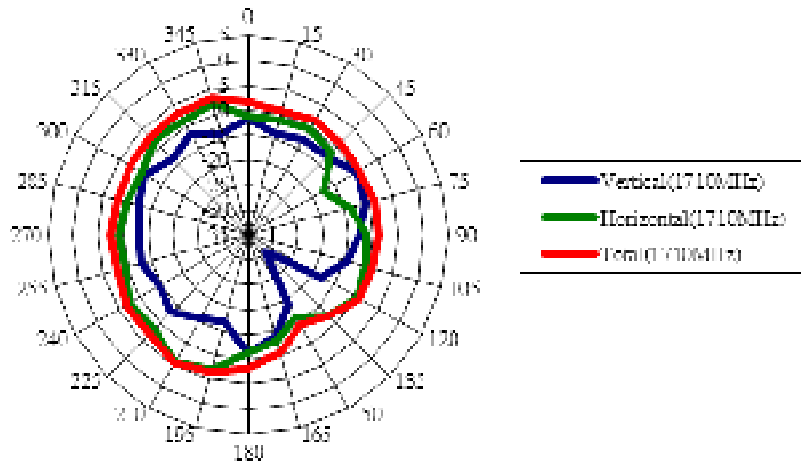
Tx2 antenna: 746 MHz



Center Frequency	746 MHz
Horizontal (dBi) peak	-9.16
Vertical (dBi) peak	-11.04

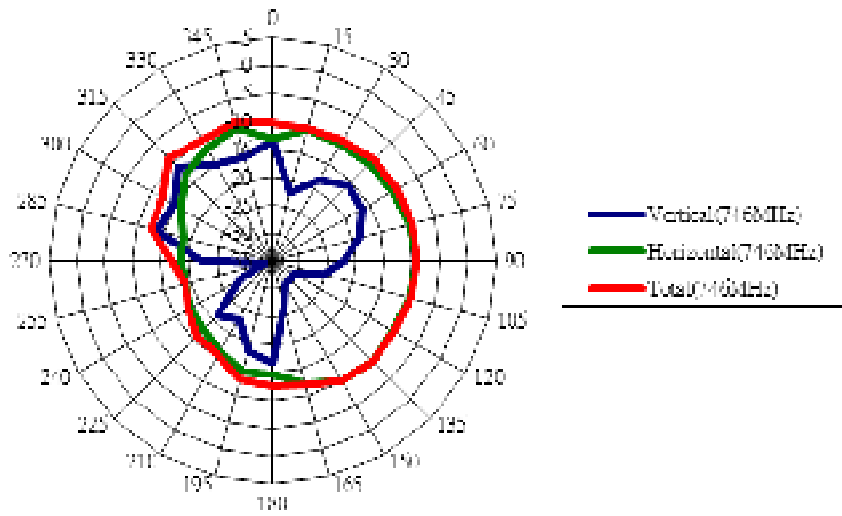
Band 4 radiation characteristic

Tx1 antenna: 1710 MHz



Center Frequency	1710 MHz
Horizontal (dBi) peak	-5.79
Vertical (dBi) peak	-9.98

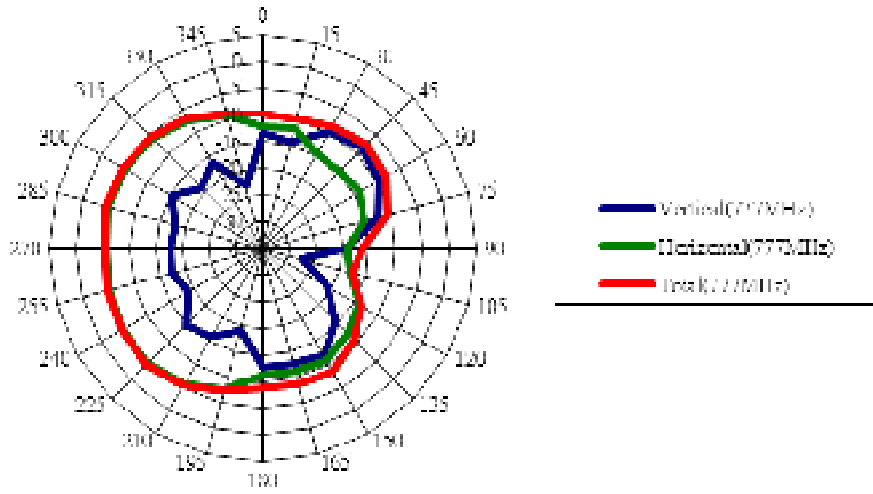
Tx2 antenna: 746 MHz



Center Frequency	746 MHz
Horizontal (dBi) peak	-9.16
Vertical (dBi) peak	-11.04

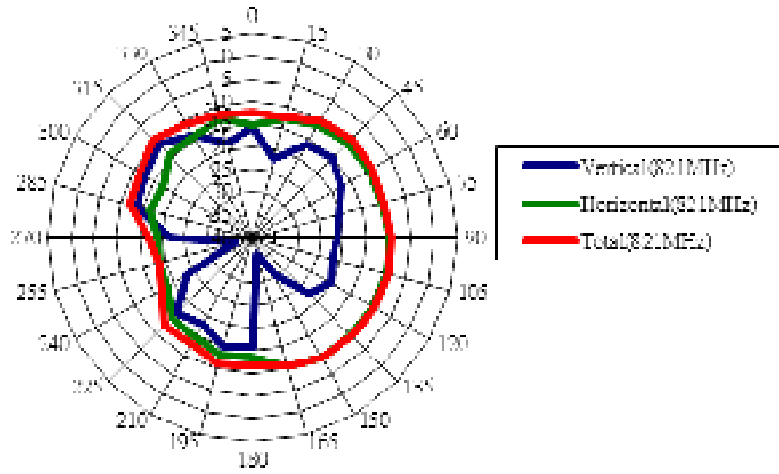
Band 13 radiation characteristic

Tx1 antenna: 777 MHz



Center Frequency	777 MHz
Horizontal (dBi) peak	-4.39
Vertical (dBi) peak	-8.53

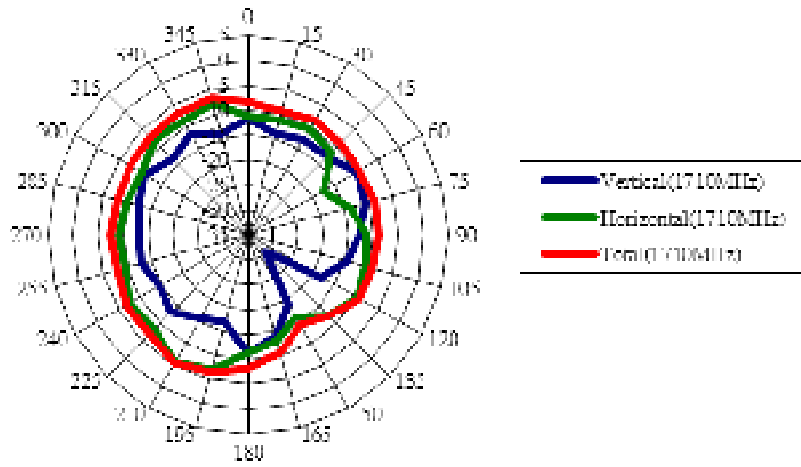
Tx2 antenna: 821 MHz



Center Frequency	821 MHz
Horizontal (dBi) peak	-9.36
Vertical (dBi) peak	-10.72

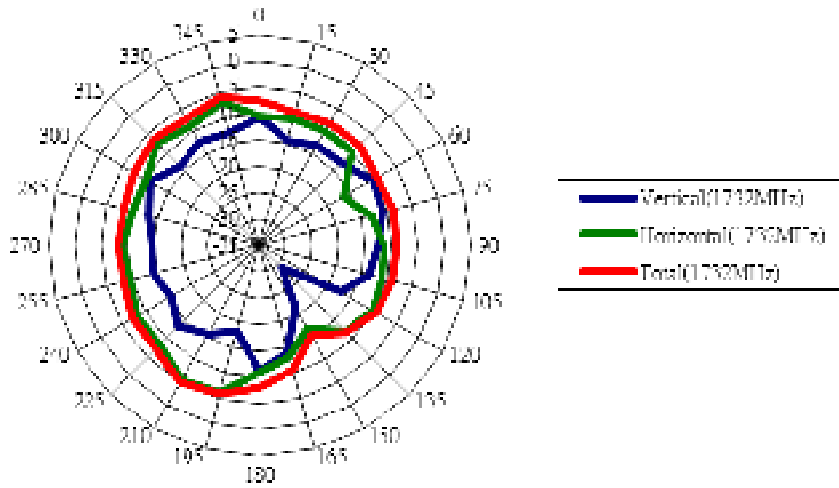
Band 4 radiation characteristic

Tx1 antenna: 1710 MHz



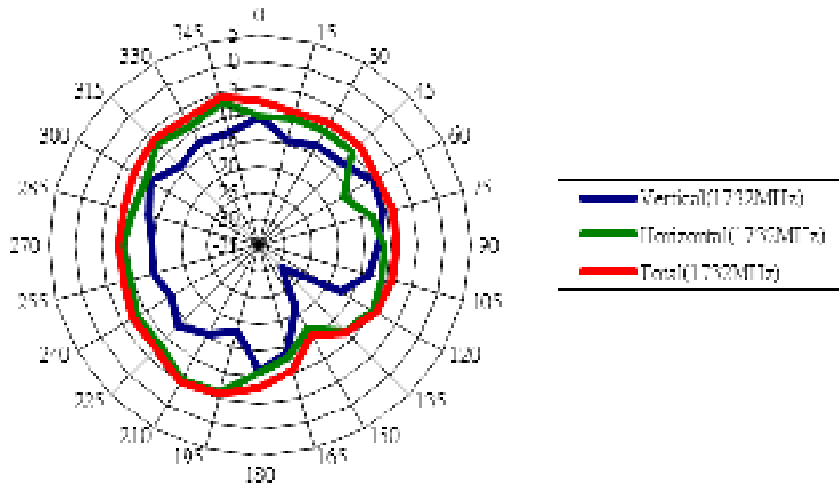
Center Frequency	1710 MHz
Horizontal (dBi) peak	-5.79
Vertical (dBi) peak	-9.98

Tx 1 antenna: 1732 MHz



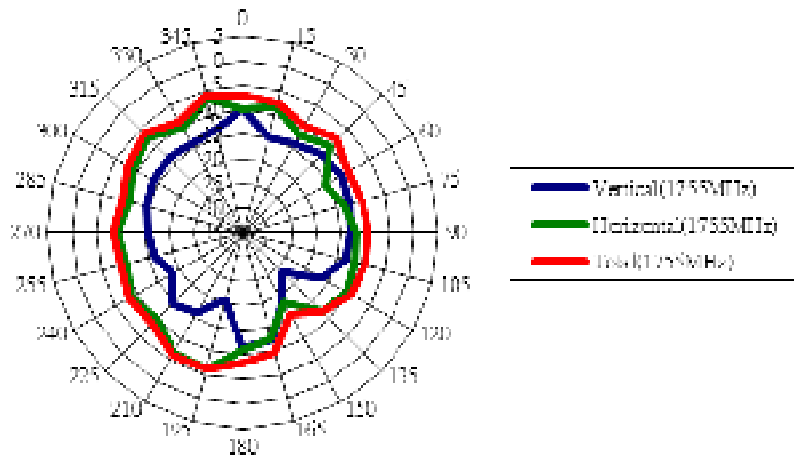
Center Frequency	1732 MHz
Horizontal (dBi) peak	-5.43
Vertical (dBi) peak	-10.17

Tx 1 antenna: 1732 MHz



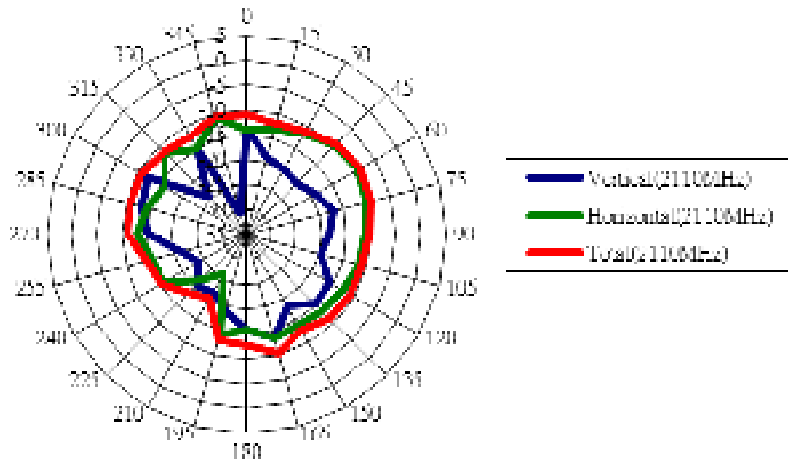
Center Frequency	1732 MHz
Horizontal (dBi) peak	-5.43
Vertical (dBi) peak	-10.17

Tx 1 antenna: 1755 MHz



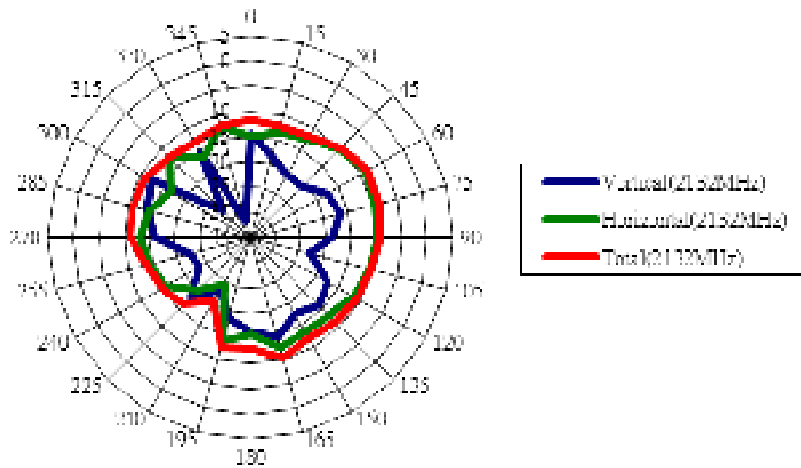
Center Frequency	1755 MHz
Horizontal (dBi) peak	-6.22
Vertical (dBi) peak	-9.86

Tx2 antenna: 2110 MHz



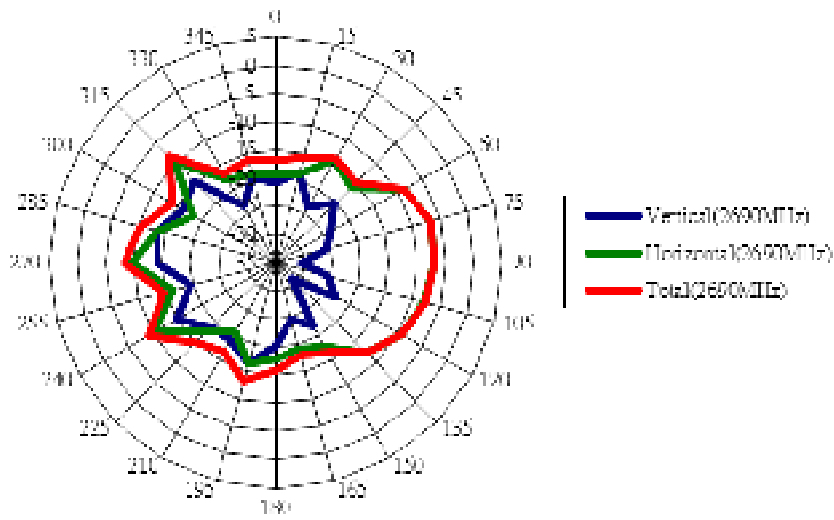
Center Frequency	2110 MHz
Horizontal (dBi) peak	-9.03
Vertical (dBi) peak	-12.03

Tx2 antenna: 2132 MHz



Center Frequency	2132 MHz
Horizontal (dBi) peak	-8.71
Vertical (dBi) peak	-12.4

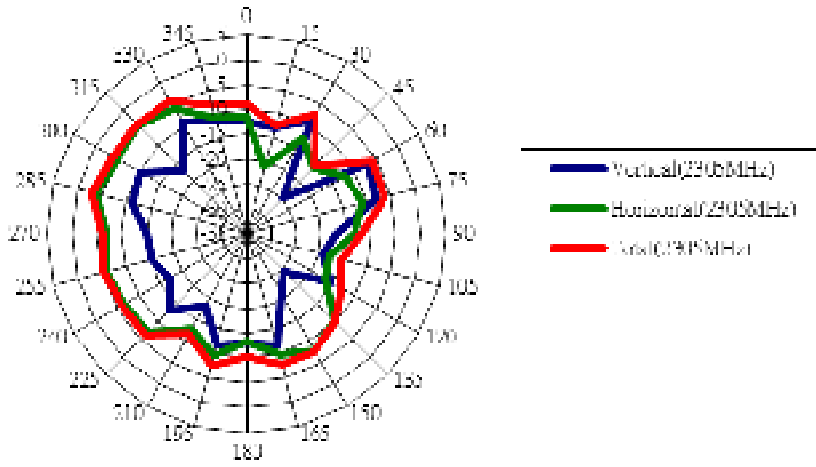
Tx2 antenna: 2690 MHz



Center Frequency	2690 MHz
Horizontal (dBi) peak	-6.77
Vertical (dBi) peak	-13.28

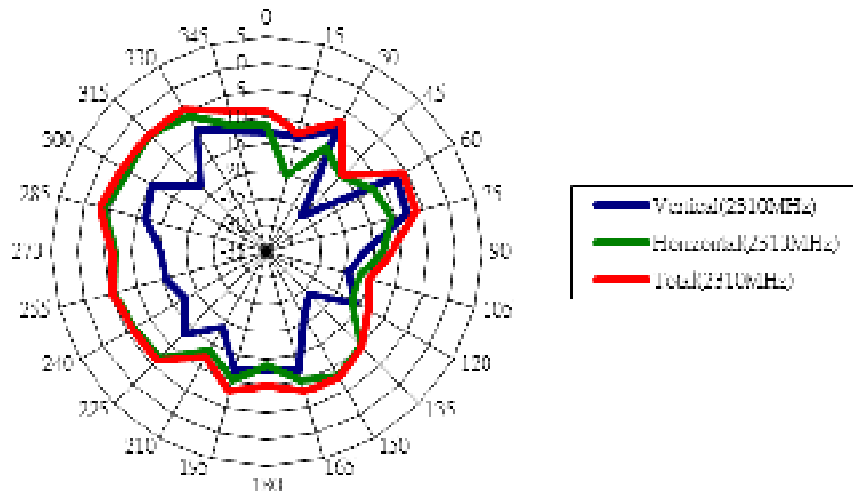
Band 30 radiation characteristic

Tx1 antenna: 2305 MHz



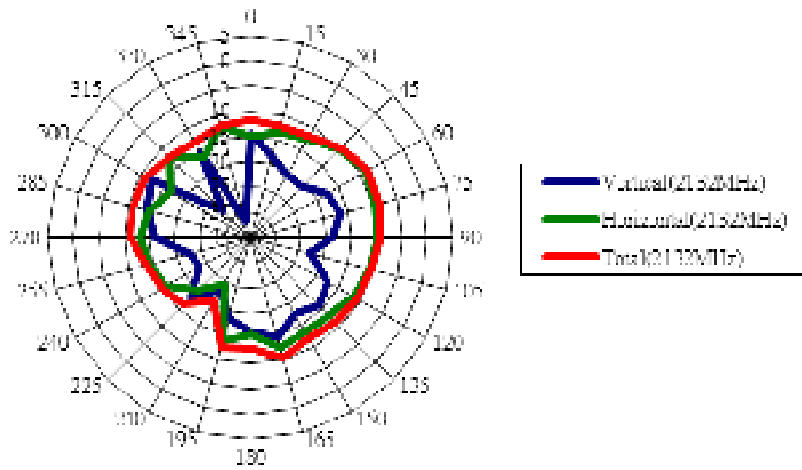
Center Frequency	2305 MHz
Horizontal (dBi) peak	-3.75
Vertical (dBi) peak	-6.99

Tx 1 antenna: 2310 MHz



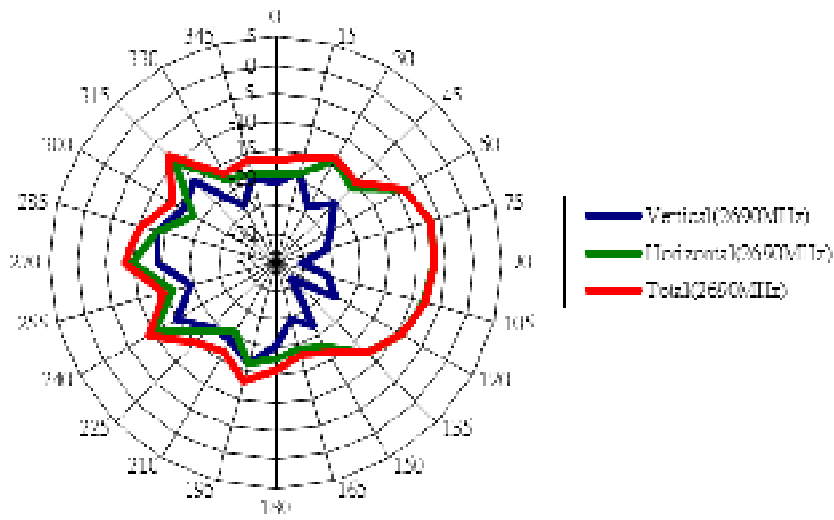
Center Frequency	2310 MHz
Horizontal (dBi) peak	-3.68
Vertical (dBi) peak	-7.05

Tx2 antenna: 2132 MHz



Center Frequency	2132 MHz
Horizontal (dBi) peak	-8.71
Vertical (dBi) peak	-12.4

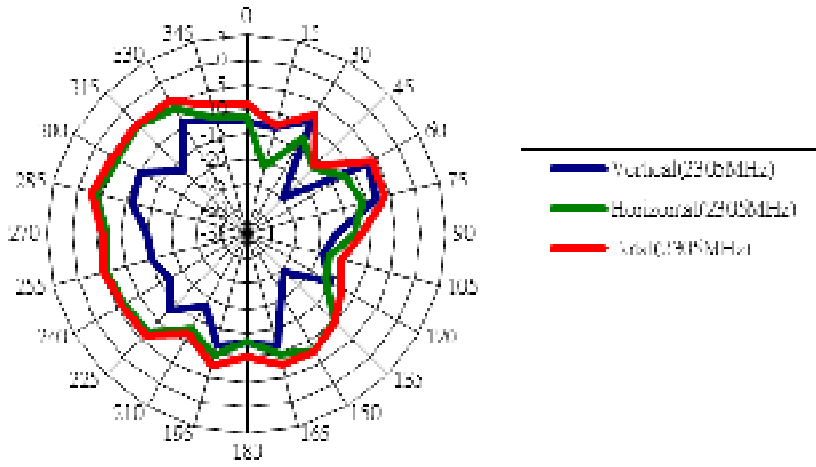
Tx2 antenna: 2690 MHz



Center Frequency	2690 MHz
Horizontal (dBi) peak	-6.77
Vertical (dBi) peak	-13.28

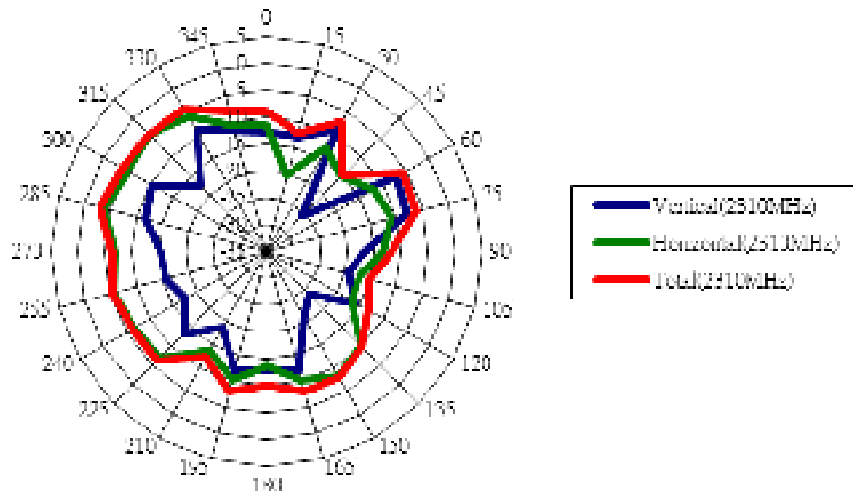
Band 30 radiation characteristic

Tx1 antenna: 2305 MHz



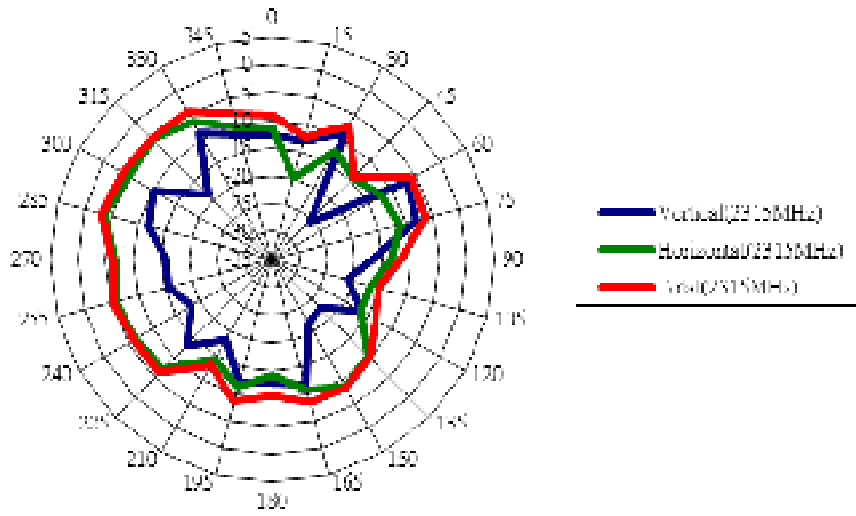
Center Frequency	2305 MHz
Horizontal (dBi) peak	-3.75
Vertical (dBi) peak	-6.99

Tx 1 antenna: 2310 MHz



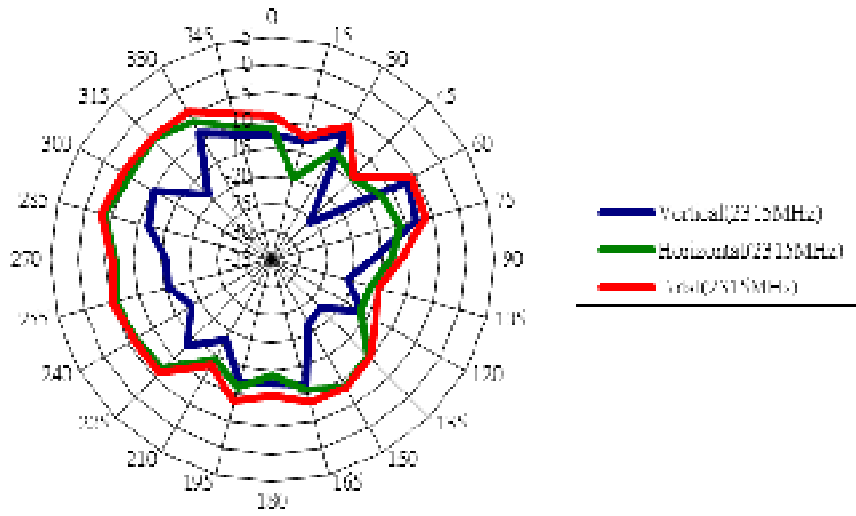
Center Frequency	2310 MHz
Horizontal (dBi) peak	-3.68
Vertical (dBi) peak	-7.05

Tx 1 antenna: 2315 MHz



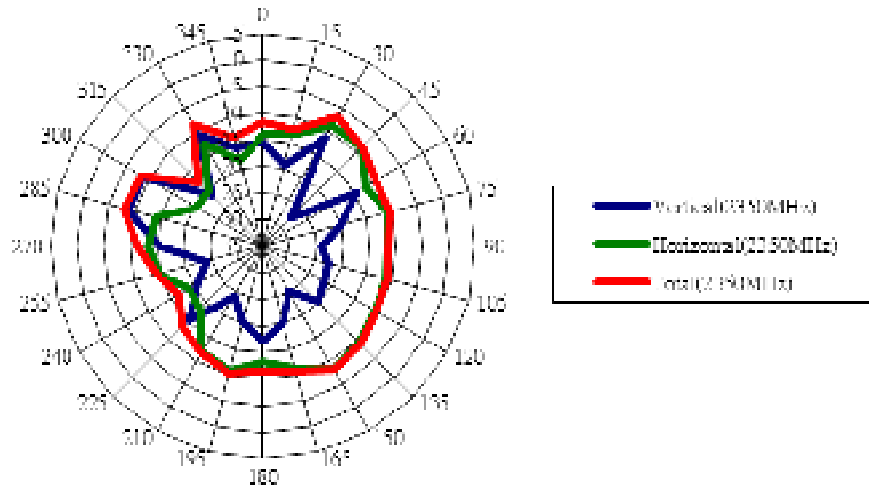
Center Frequency	2315 MHz
Horizontal (dBi) peak	-3.78
Vertical (dBi) peak	-7.02

Tx 1 antenna: 2315 MHz



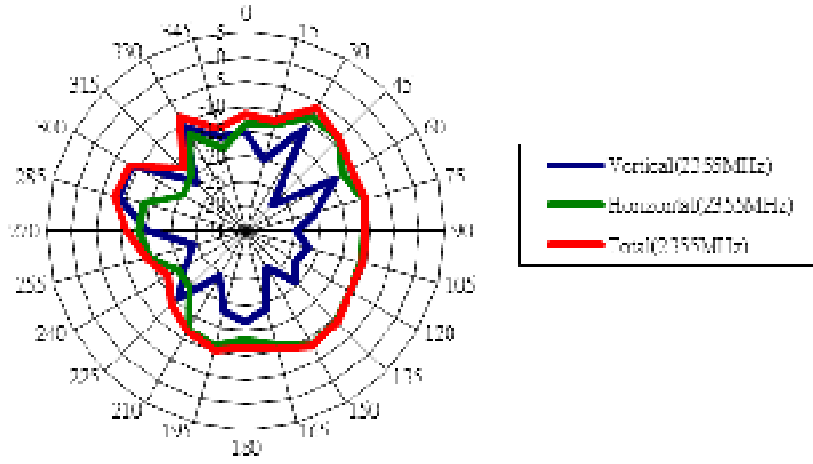
Center Frequency	2315 MHz
Horizontal (dBi) peak	-3.78
Vertical (dBi) peak	-7.02

Tx2 antenna: 2350 MHz



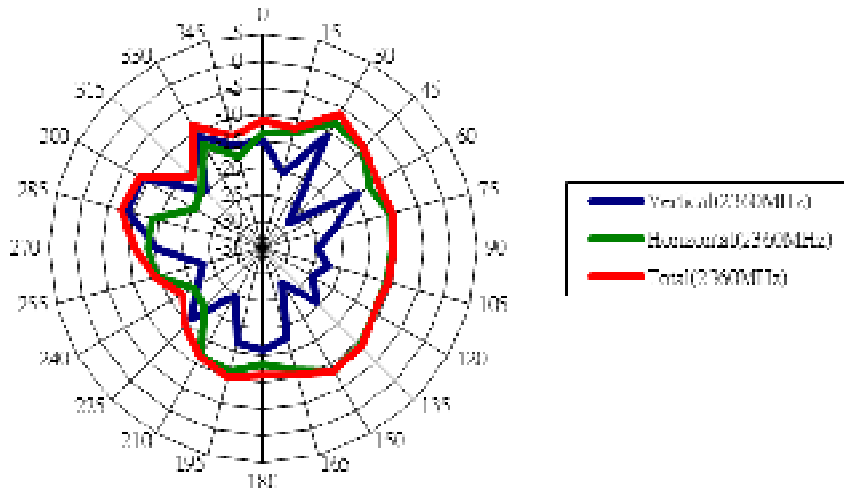
Center Frequency	2350 MHz
Horizontal (dBi) peak	-8.38
Vertical (dBi) peak	-8.88

Tx2 antenna: 2355 MHz



Center Frequency	2355 MHz
Horizontal (dBi) peak	-8.39
Vertical (dBi) peak	-8.78

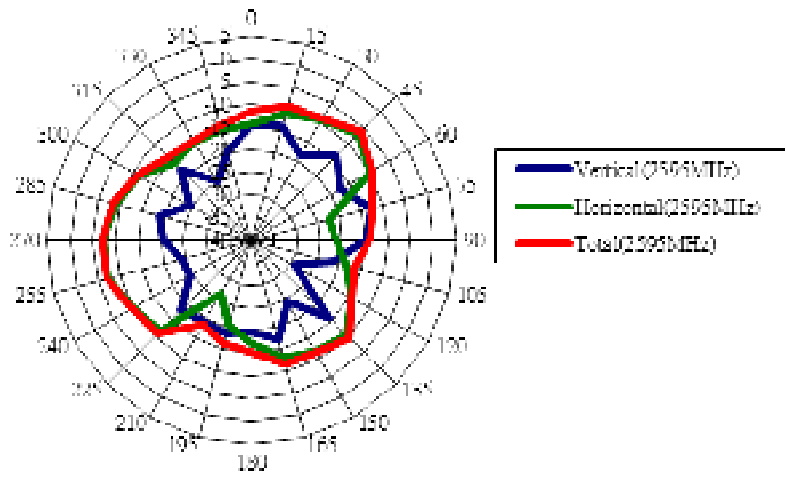
Tx2 antenna: 2360 MHz



Center Frequency	2360 MHz
Horizontal (dBi) peak	-7.95
Vertical (dBi) peak	-8.77

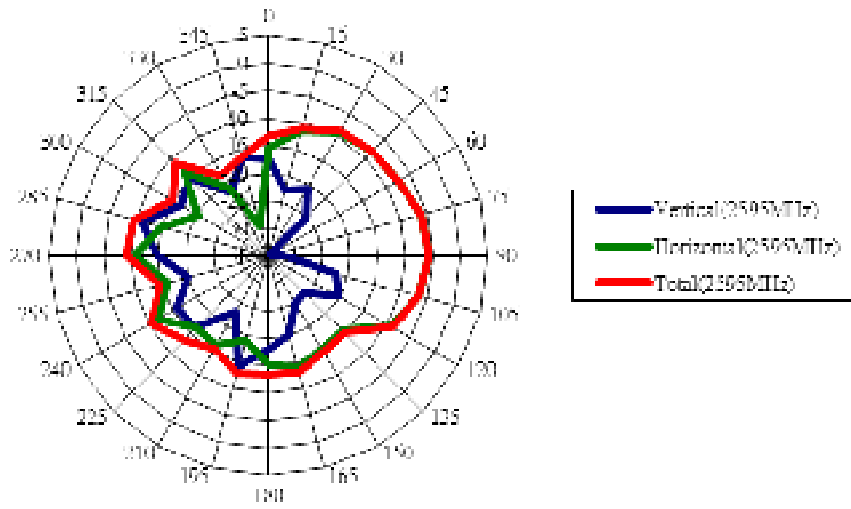
Band 38 radiation characteristic

Tx 1 antenna: 2595 MHz



Center Frequency	2595 MHz
Horizontal (dBi) peak	-6.78
Vertical (dBi) peak	-12.71

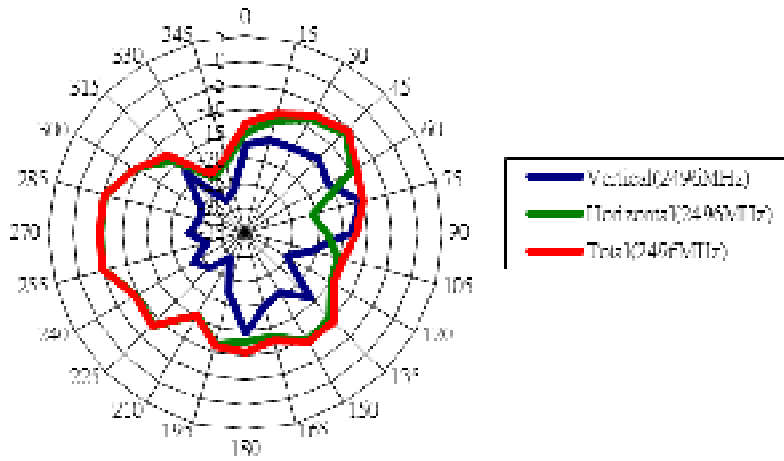
Tx2 antenna: 2595 MHz



Center Frequency	2595 MHz
Horizontal (dBi) peak	-5.76
Vertical (dBi) peak	-11.27

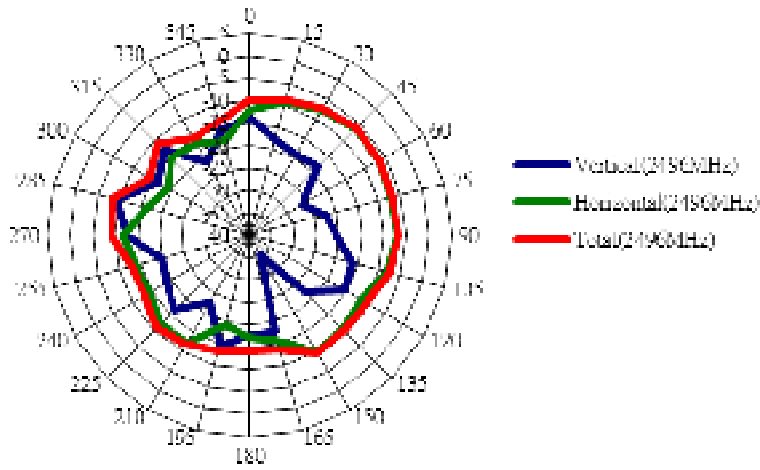
Band 41 radiation characteristic

Tx1 antenna: 2496MHz



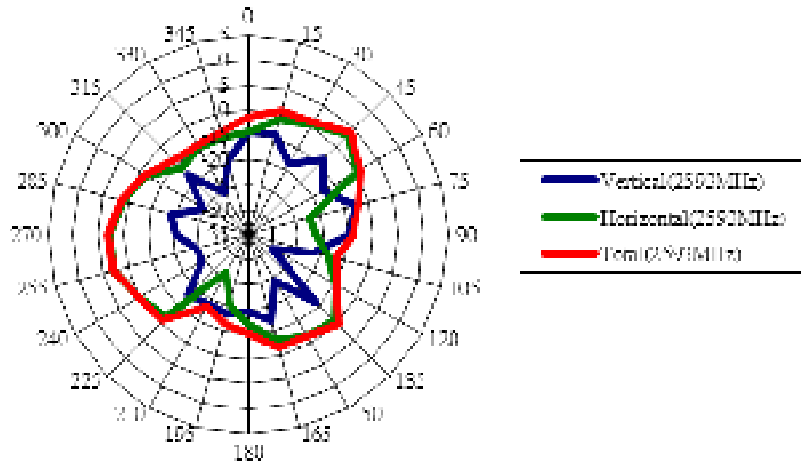
Center Frequency	2496 MHz
Horizontal (dBi) peak	-5.15
Vertical (dBi) peak	-10.52

Tx2 antenna: 2496MHz



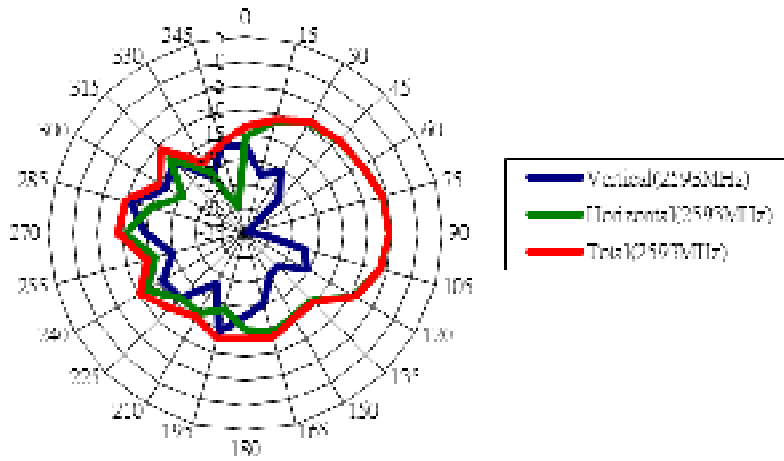
Center Frequency	2496 MHz
Horizontal (dBi) peak	-6.45
Vertical (dBi) peak	-9.36

Tx 1 antenna: 2593MHz



Center Frequency	2593 MHz
Horizontal (dBi) peak	-6.78
Vertical (dBi) peak	-12.71

Tx2 antenna: 2593MHz

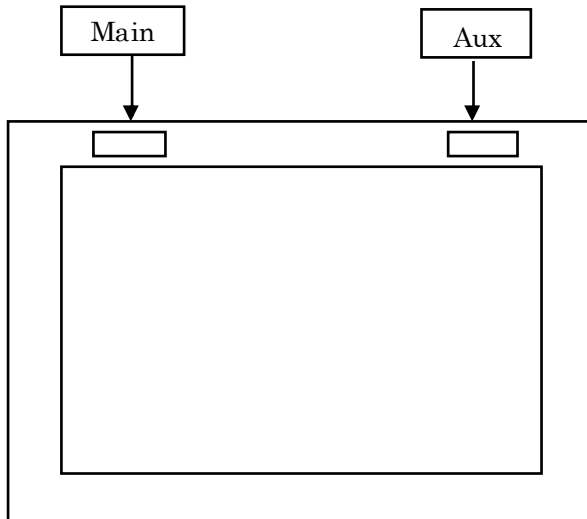
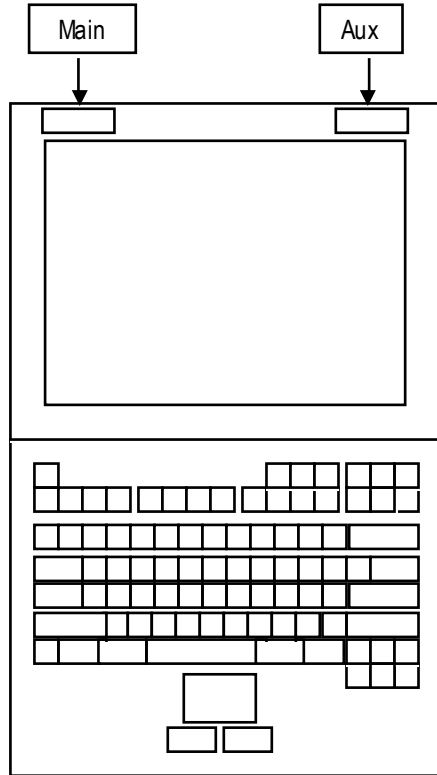


Center Frequency	2593 MHz
Horizontal (dBi) peak	-5.76
Vertical (dBi) peak	-11.27

Section 4. Host Platform Information

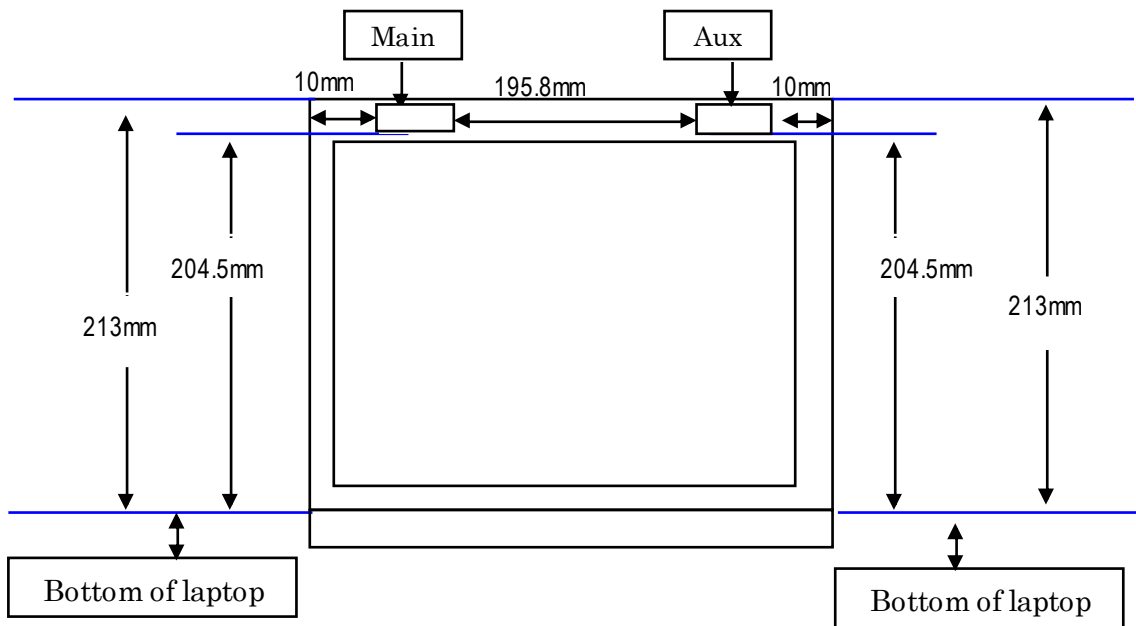
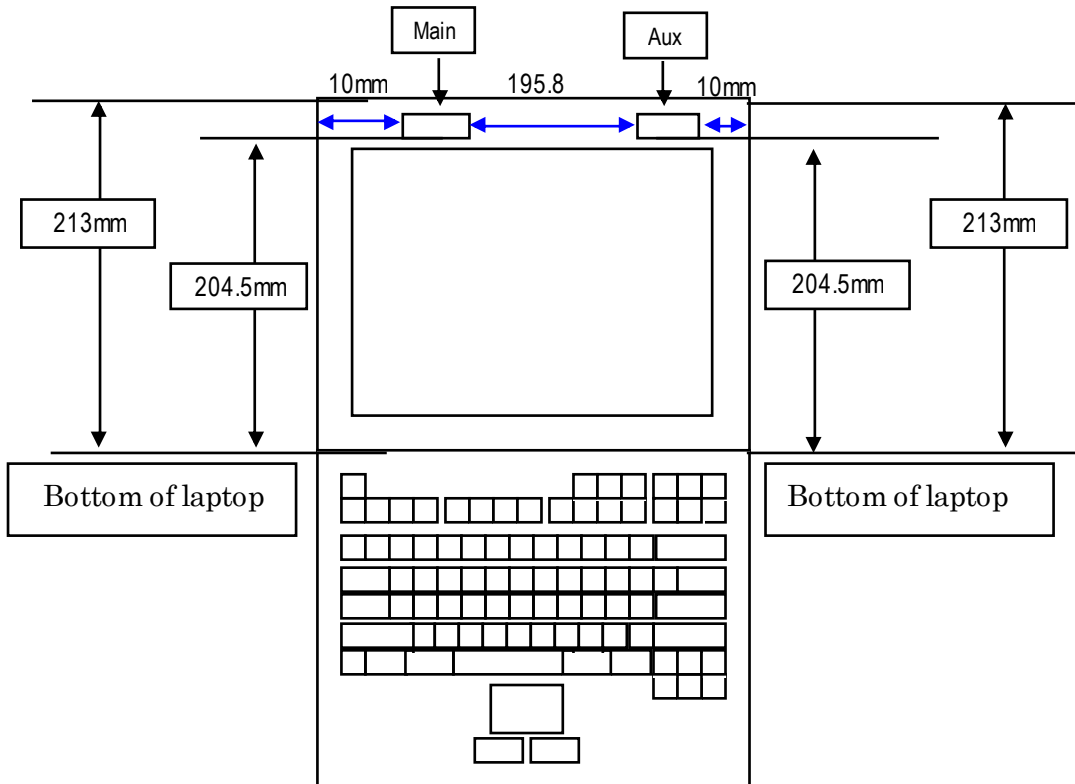
OEM / ODM Host platform: (Quanta/Bayfield 1.0) platform correlated to antenna data

Rating Label Photo:



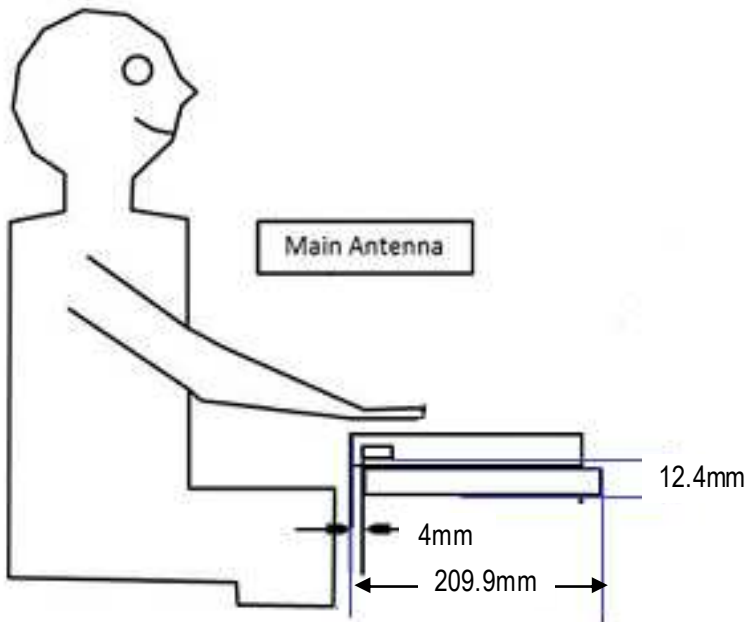
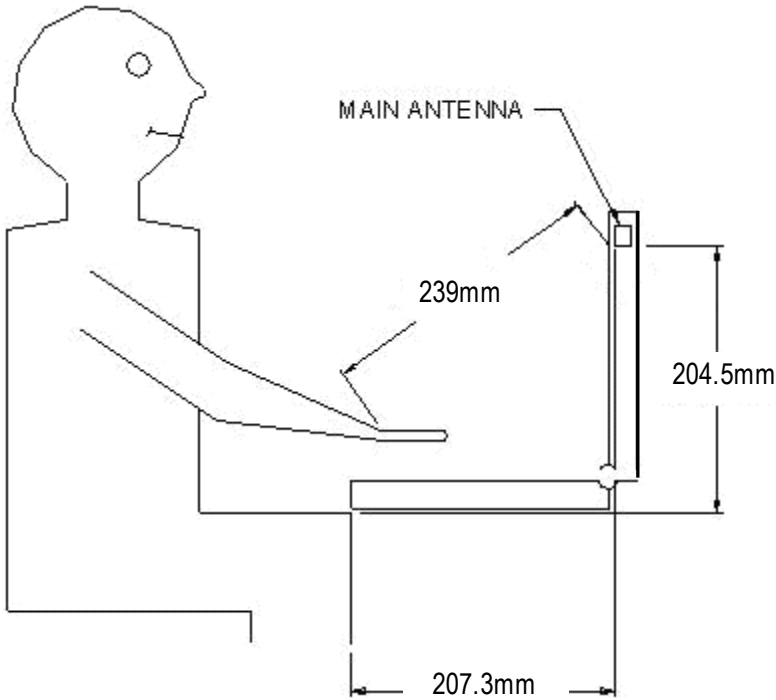
Section 5. Antenna Host Platform Location Information

Include a **dimensioned photo(s) or dimensioned drawing(s)** of Tx1, Tx2 and Tx3 antenna placements (measurements are not required for receive-only antenna). Any antenna that transmits must show dimensions to bottom of laptop. Provide a description of the materials that are used for supporting or surrounding transmit antennas; for example, non-conductive plastics vs. conductive coated plastic or metallic materials.



Section 6. Antenna dimensional information for SAR evaluation

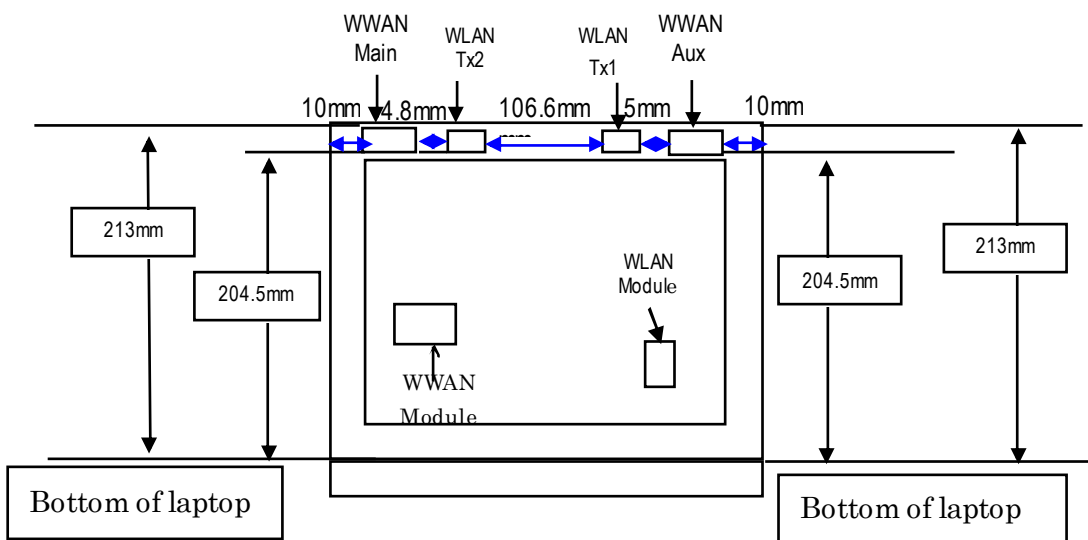
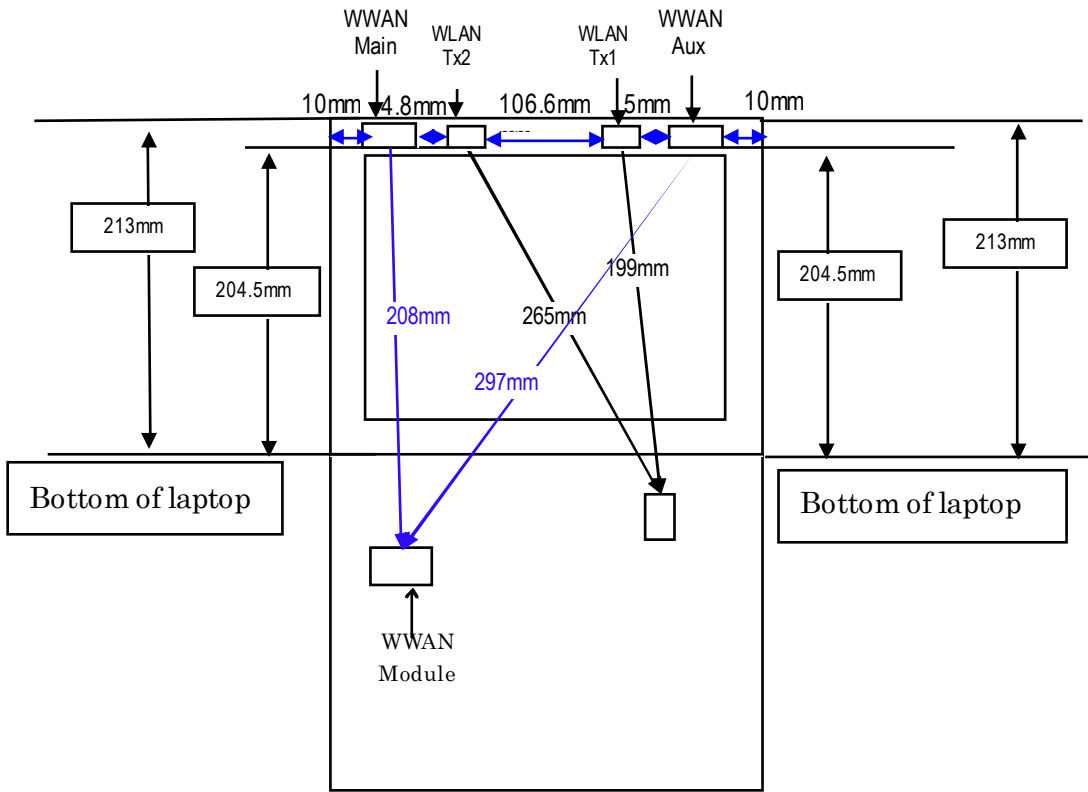
Include a **dimensioned photo(s) or dimensioned drawing(s)** showing the distance (mm) between the transmit antennas and the user (excluding hands, wrist, feet, and ankle). For notebook/laptop hosts show lapheld position (example below). For tablet hosts show all orientations including lapheld, primary & secondary portrait, primary & secondary landscape positions. Include a description of any proximity sensors or power throttling implementations that limit or exclude use of any host orientation.



Section 7. Diagram Example of Co-Location Antenna Separation

Include a **dimensioned photo or dimensioned drawing** showing the distance (mm) between all WLAN transmit antennas and other co-located radiator transmit antenna such as Bluetooth, WWAN,..

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



Section 8. Local representative contact information

Local representative contact information is required for regulatory support for target countries below.

	Local company name	Contact name	Phone number	FAX Number	e-Mail Address	Notes
Argentina						
Azerbaijan						
Cambodia						
Indonesia						
Israel						
Malaysia						
Philippines						
Singapore						Telecommunication Equipment Dealer License Required
South Africa						
USA, Canada						
Vietnam						

Attachment 2

Regulatory WLAN Antenna Information

(English Language Required for Module Vendor Regulatory Review / Approval)

(OEM/ODM or antenna vendor is required to complete this document with platform antenna information.

Remove Intel references and make this your own document)

Platform information							
Brand	ODM	Platform model name	Platform type (ex: regular NB, convertible PC, AIO...etc)	SAR minimum separation (mm)			
HP Inc.	Compal	Miramar (HSN-C04C)	Tablet	3.45mm			
Antenna information				Peak gain w/ cable loss (dBi)			
Vendor	Type	Antenna Part number (Main/TX1)	Antenna Part number (Aux/TX2)	2.4GHz	5.2GHz	5.5GHz	5.8GHz
INPAQ	PIFA	WA-P-LB-02-610 (DC330029D00)	WA-P-LB-02-611 (DC330029D10)	-0.91	0.34	0.61	0.58
Module information							
Model	Form factor and suffixes (NGW/ HMW AND AN/ NB/ BN....)						
Jefferson Peak 2	Intel Wireless-AC 9560 802.11ac 2x2 WiFi + BT5 (vPro, supporting Gigabit Wi-Fi) (Jefferson Peak 2) (SD)						
Cyclone Peak 2	Intel Wireless-AC 22260 802.11ax 2x2 WiFi + BT5 (vPro, supporting Gigabit Wi-Fi) (Cyclone Peak 2) (SD)						

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	Tx1, Tx2 & Tx3 antenna (Peak Gain W/ cable loss) *	Required	Required	Required	Required	Required
	1E OR 1F, 1G, 1H					
1F	Tx1, Tx2 & Tx3 antenna (Peak Gain only) *	Required	Required	Required	Required	Required
1G	VSWR of cable including connector	Required	Required	Required	Required	Required
1H	Tx1, Tx2 & Tx3 antenna (Cable loss W/ connector) *	Required	Required	Required	Required	Required
2	Dimensioned Photographs and Drawings of Tx1, Tx2, and Tx3 (or Rx3) 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, 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
8	Local representative contact information for LMA/ PARS process.	Required	N/A	N/A	N/A	N/A

Antenna Information

Section 1. Antenna Assembly Specifications

1A	1B	1C	1D	1E	1F	1G	1H
Antenna Part Number	Manufacture	Antenna Type	Cable Assembly Part Number and Information	*Peak Gain W/ Cable loss (dBi)	Peak Gain w/o Cable Loss (dBi)	VSWR	Cable Loss (dBi)
DC330029D00 (WA-P-LB-02-610) Tx1/ Rx1 Antenna	INPAQ Corporation	PIFA	50 ohm Coaxial length: 191mm diameter: 1.13mm	2400-2500MHz -0.95dBi (peak)	2400-2500MHz -0.36dBi (peak)	2400-2500MHz 2.0 max	2400-2500MHz 0.59 dBi (peak)
				5150-5350MHz 0.34dBi (peak)	5150-5350MHz 1.24 dBi (peak)	5150-5350MHz 2.0 max	5150-5350MHz 0.90 dBi (peak)
				5470-5725MHz -1.36dBi (peak)	5470-5725MHz -0.41 dBi (peak)	5470-5725MHz 2.0 max	5470-5725MHz 0.95 dBi (peak)
				5725-5850MHz -1.79dBi (peak)	5725-5850MHz -0.78dBi (peak)	5725-5850MHz 2.0 max	5725-5850MHz 1.01 dBi (peak)
DC330029D10 (WA-P-LB-02-611) Tx2/ Rx2 Antenna	INPAQ Corporation	PIFA	50 ohm Coaxial length: 105mm diameter: 1.13mm	2400-2500MHz -0.91 dBi (peak)	2400-2500MHz -0.59 dBi (peak)	2400-2500MHz 2.0 max	2400-2500MHz 0.32dBi (peak)
				5150-5350MHz -0.39dBi (peak)	5150-5350MHz 0.11 dBi (peak)	5150-5350MHz 2.0 max	5150-5350MHz 0.50 dBi (peak)
				5470-5725MHz 0.61dBi (peak)	5470-5725MHz 1.14 dBi (peak)	5470-5725MHz 2.0 max	5470-5725MHz 0.53 dBi (peak)
				5725-5850MHz 0.58dBi (peak)	5725-5850MHz 1.14 dBi (peak)	5725-5850MHz 2.0 max	5725-5850MHz 0.56 dBi (peak)

- Antenna Peak Gain required being test in system basis.
- 1E frame contend absolutely peak antenna gain include H/V

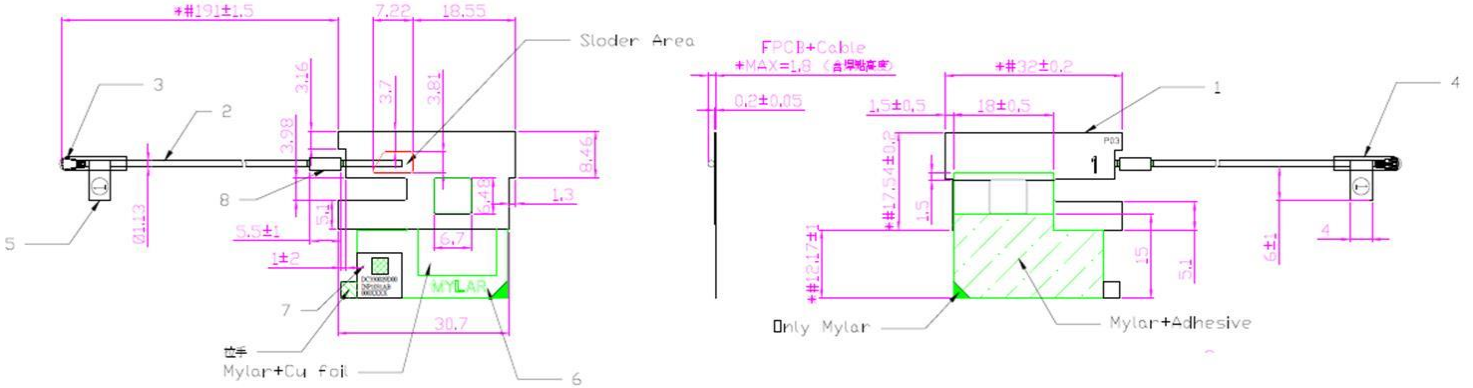
Antenna Peak Gain Table:

Frequency (MHz)	Tx1 antenna		Tx2 (or Rx2) Antenna	
	Horizontal (dBi)	Vertical (dBi)	Horizontal (dBi)	Vertical (dBi)
2400	-2.71	-3.52	-0.92	-2.57
2450	-2.04	-2.53	-1.81	-1.71
2500	-0.95	-2.09	-0.91	-2.52
5150	0.34	-4.54	-0.39	-8.94
5250	-0.91	-4.09	-1.12	-5.14
5350	-2.68	-3.52	-1.91	-1.75
5470	-2.03	-4.28	0.61	-2.69
5600	-1.36	-5.55	-0.79	-2.73
5725	-1.79	-4.71	-0.30	-1.10
5785	-2.77	-4.68	0.58	-0.94
5850	-3.75	-5.13	0.00	-3.06

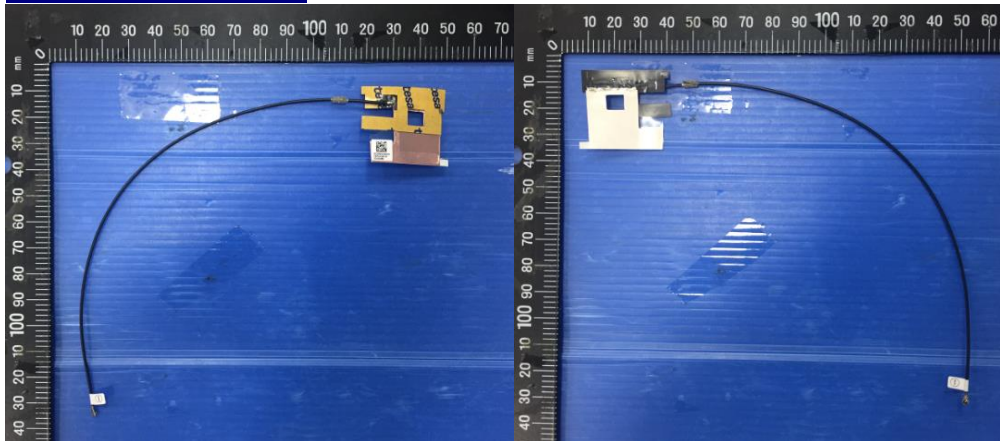
Section 2. Dimensioned Photos or Drawings of Antennas

Include a dimensioned photo and dimensioned drawing of Tx1 antenna here.

Tx1 Antenna Dimensioned Drawing:

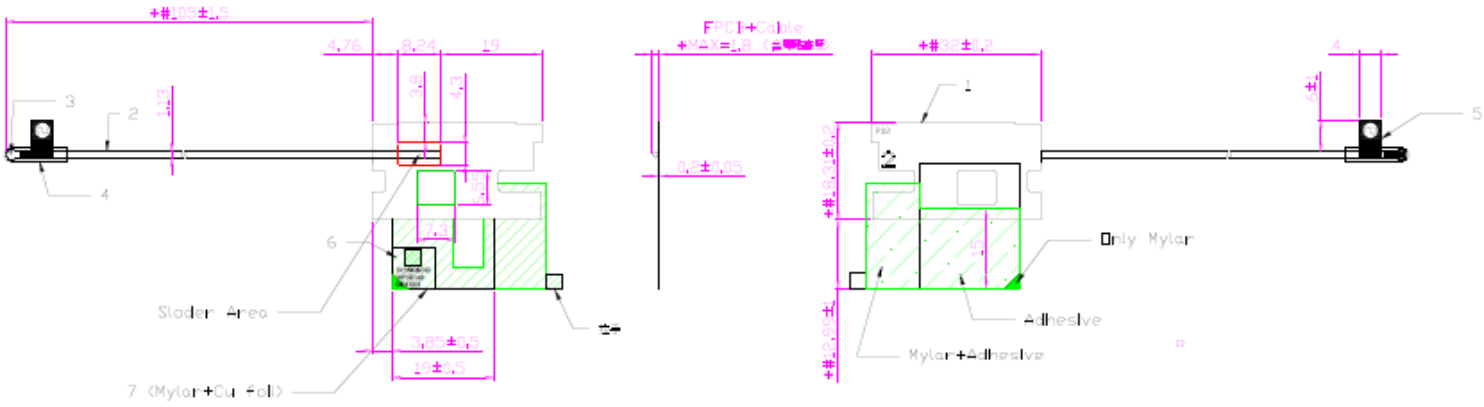


Tx1 Antenna Photo:

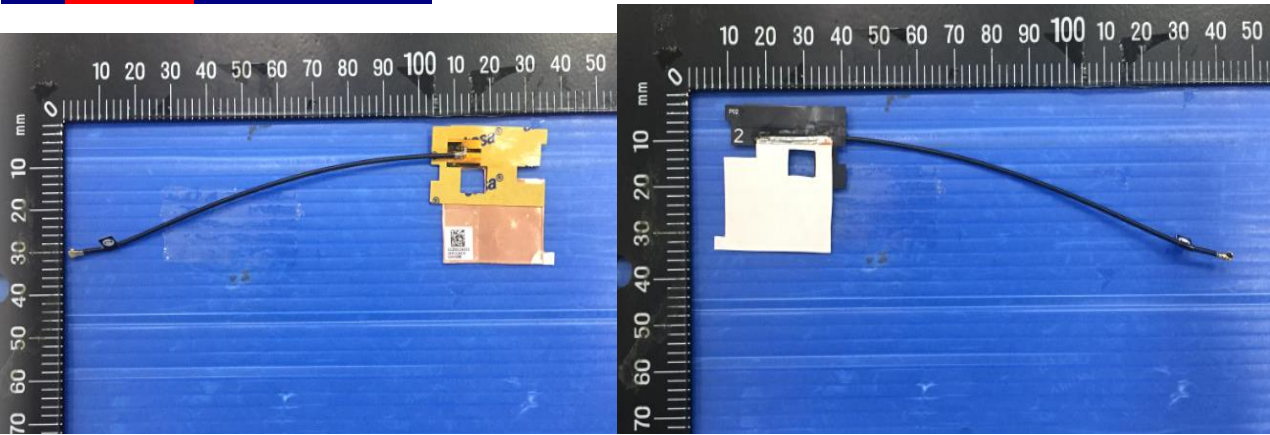


Include a dimensioned photo and dimensioned drawing of Tx2 (or Rx2) antenna here.

Tx2 (or Rx2) Antenna Dimensioned Drawing:

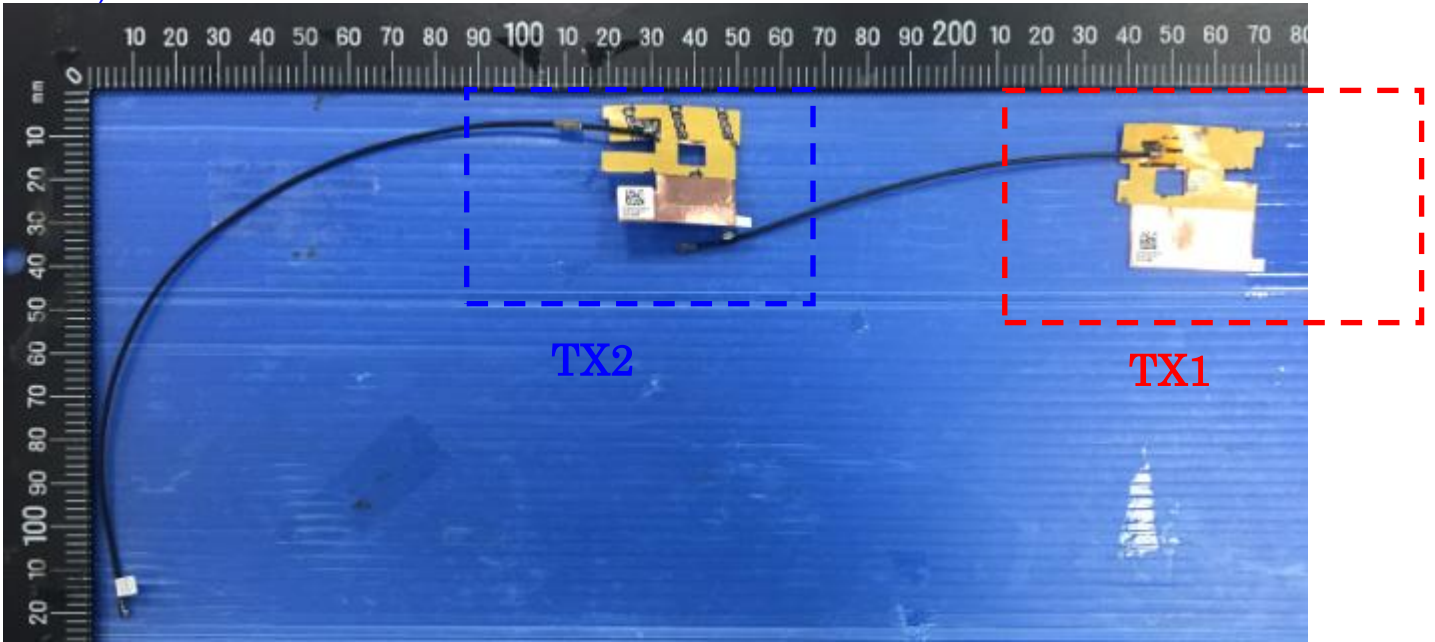


Tx2 (or Rx2) Antenna Photo:



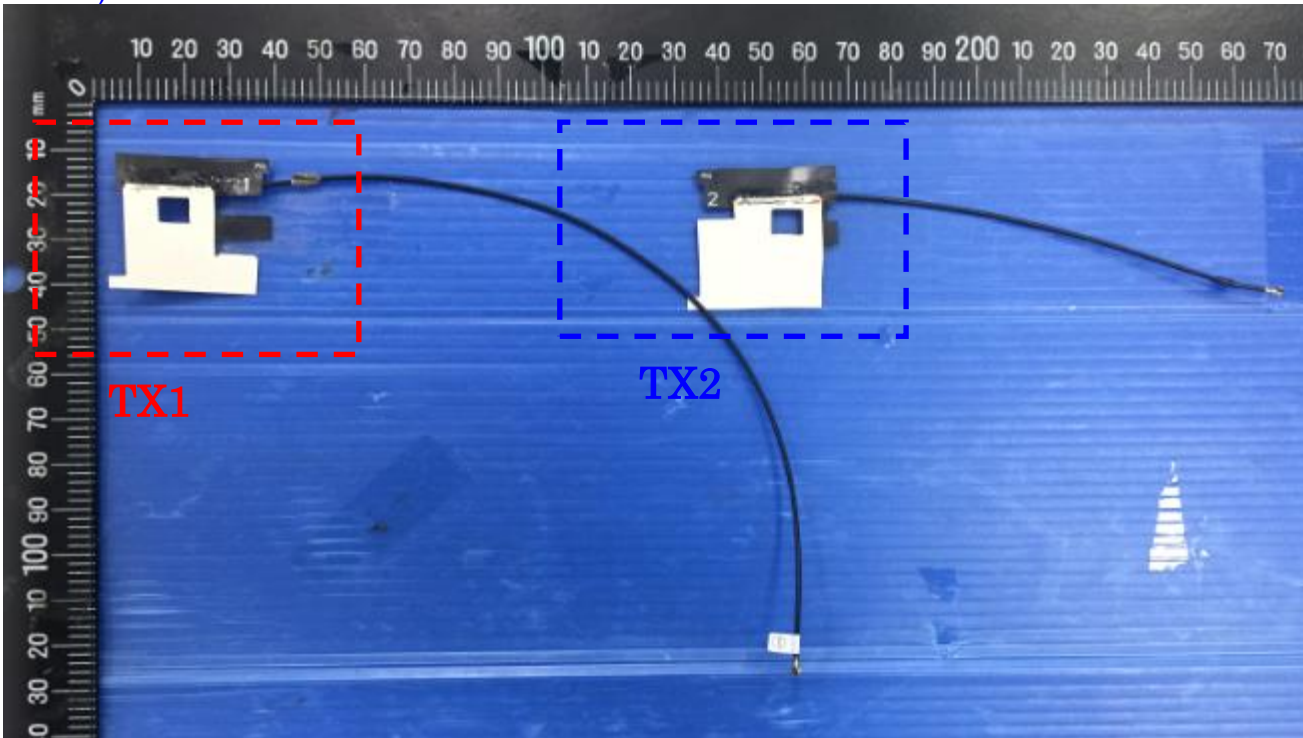
Include front view photo of all 2 antennas here.

Antenna Manufacturer: INPAQ Technology Corporation
Antenna Part Number: 0 WA-P-LB-02-610 (DC330029D0) (Tx1), WA-P-LB-02-611 (DC330029D10) (Tx2 or Rx2)



Include back view photo of all 2 antennas here.

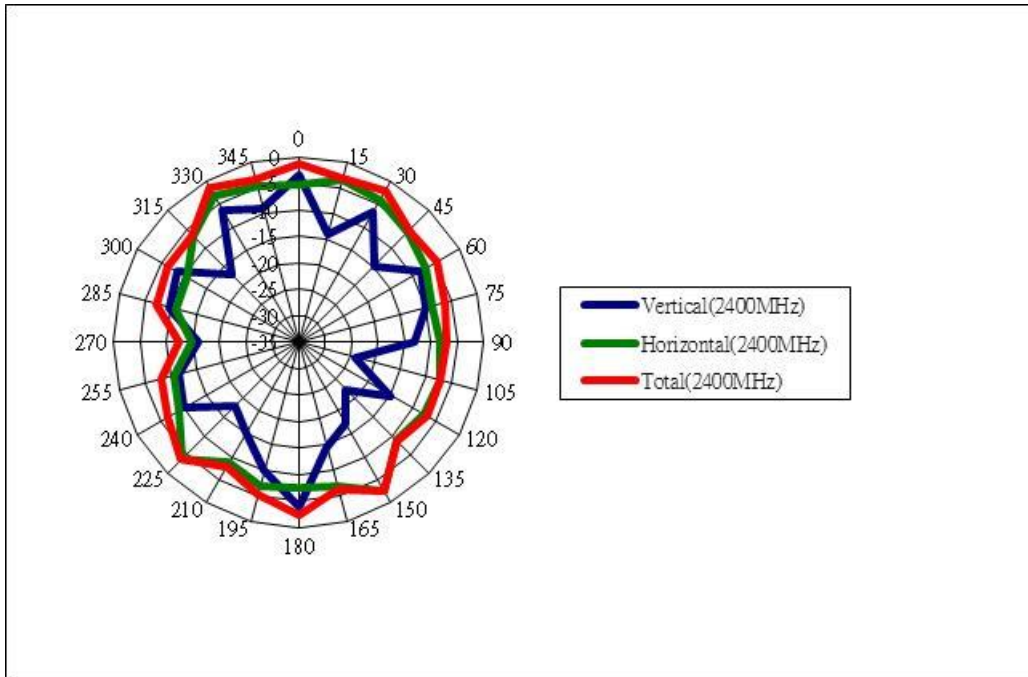
Antenna Manufacturer: INPAQ Technology Corporation
Antenna Part Number: WA-P-LB-02-610 (DC330029D00) (Tx1), WA-P-LB-02-611 (DC330029D10) (Tx2 or Rx2)



Section 3. Radiation characteristics of antennae Loaded in Host Platform

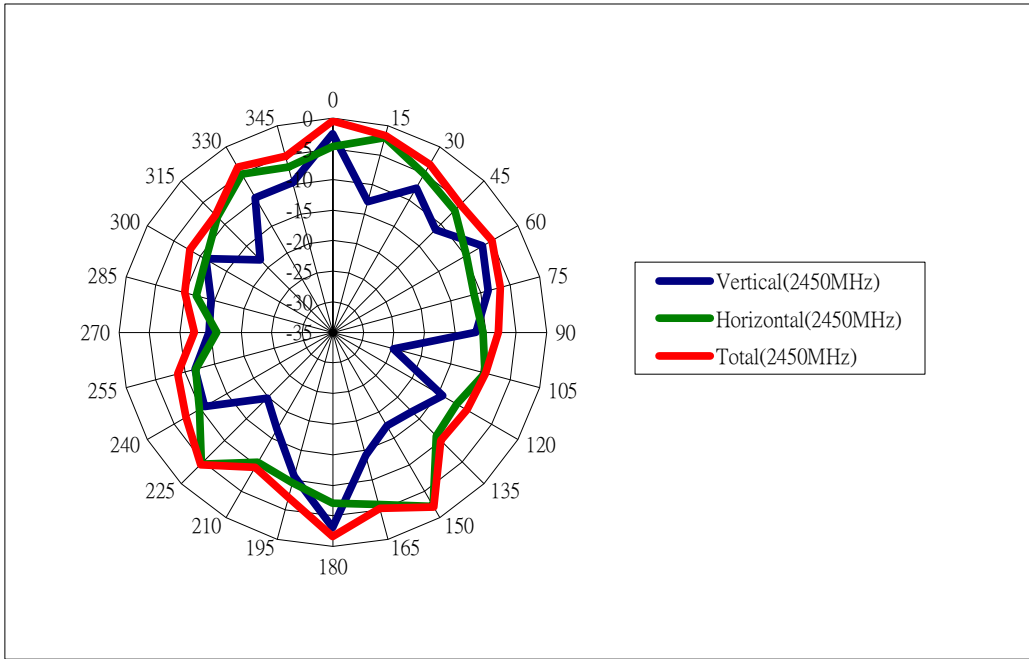
2400-2500MHz radiation characteristic

Tx1 antenna: 2400 MHz



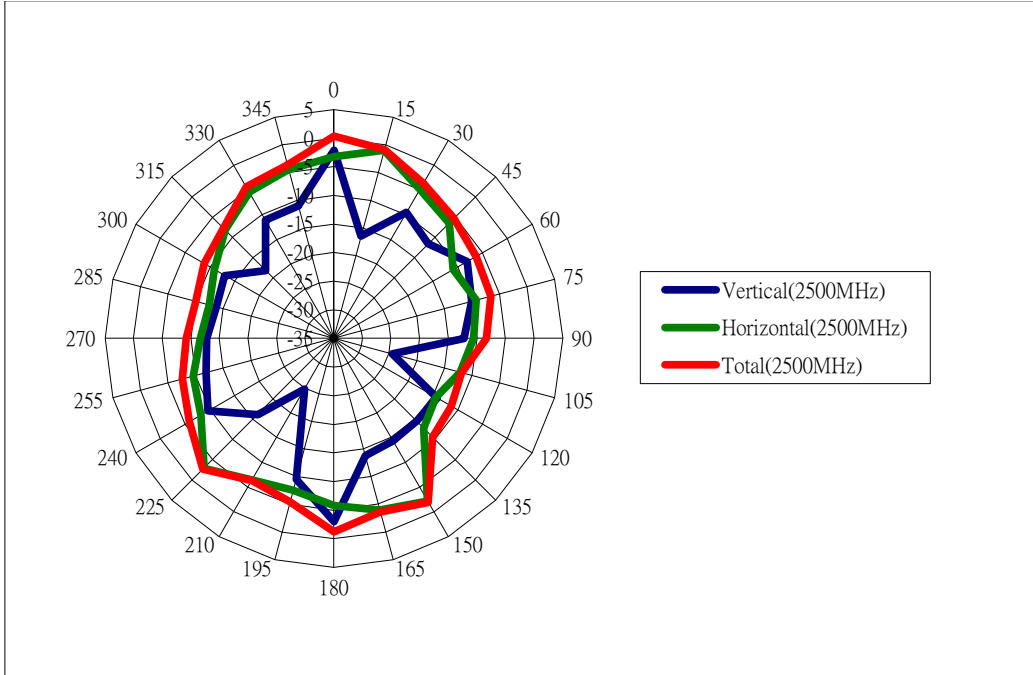
Center Frequency	2400 MHz
Horizontal (dBi) peak	-2.71
Vertical (dBi) peak	-3.52

Tx1 antenna: 2450 MHz



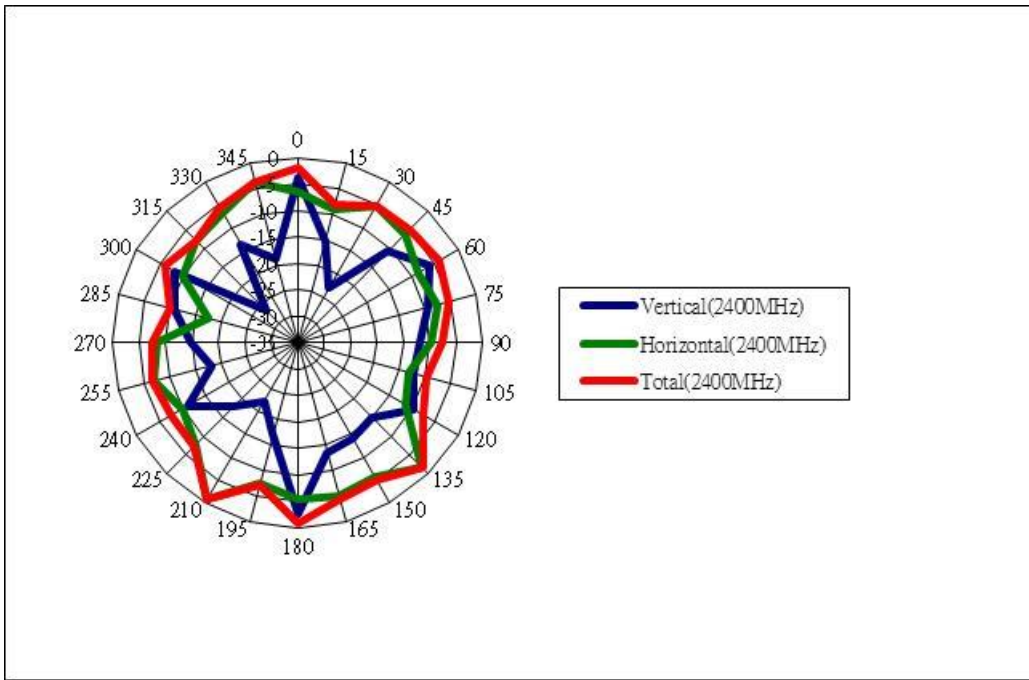
Center Frequency	2450 MHz
Horizontal (dBi) peak	-2.04
Vertical (dBi) peak	-2.53

Tx1 antenna: 2500 MHz



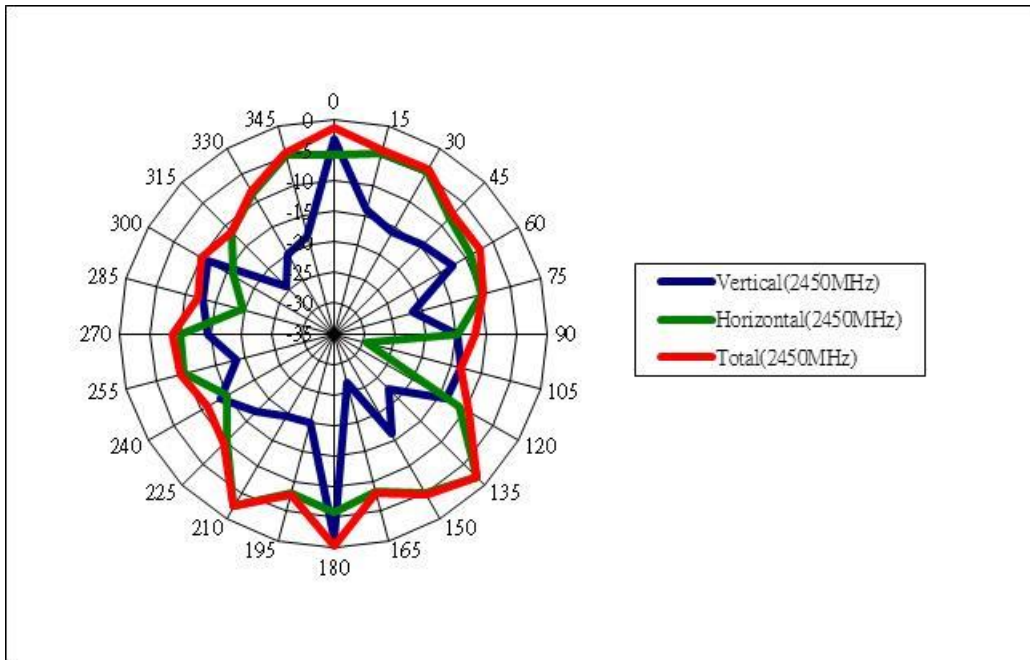
Center Frequency	2500 MHz
Horizontal (dBi) peak	-0.95
Vertical (dBi) peak	-2.09

Tx2 (or Rx2) antenna: 2400 MHz



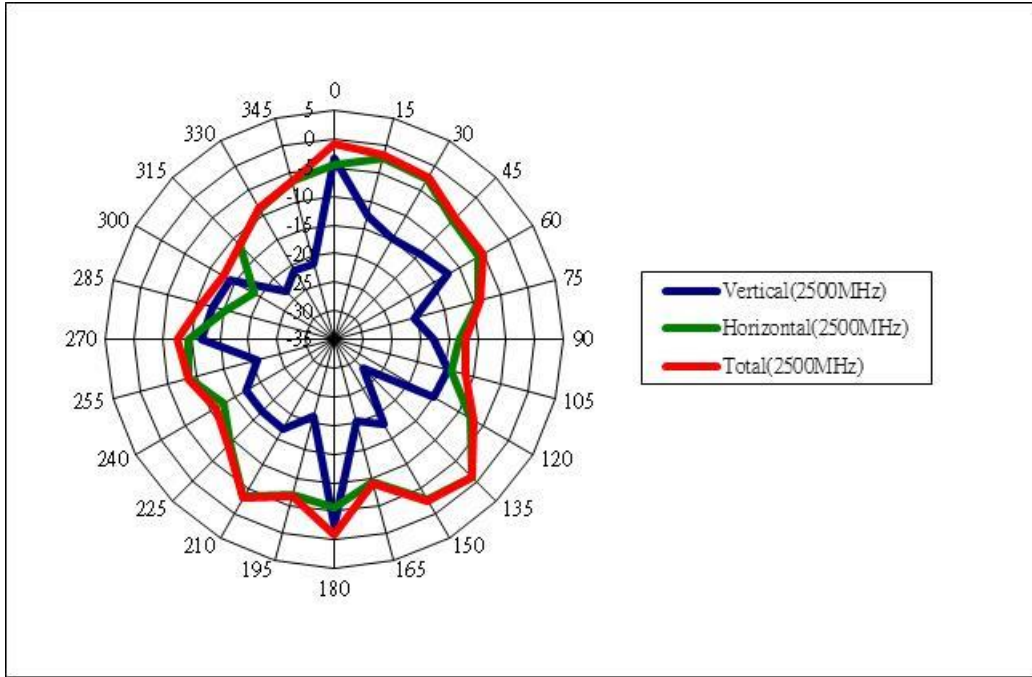
Center Frequency	2400 MHz
Horizontal (dBi) peak	-0.92
Vertical (dBi) peak	-2.57

Tx2 (or Rx2) antenna: 2450 MHz



Center Frequency	2450 MHz
Horizontal (dBi) peak	-1.81
Vertical (dBi) peak	-1.71

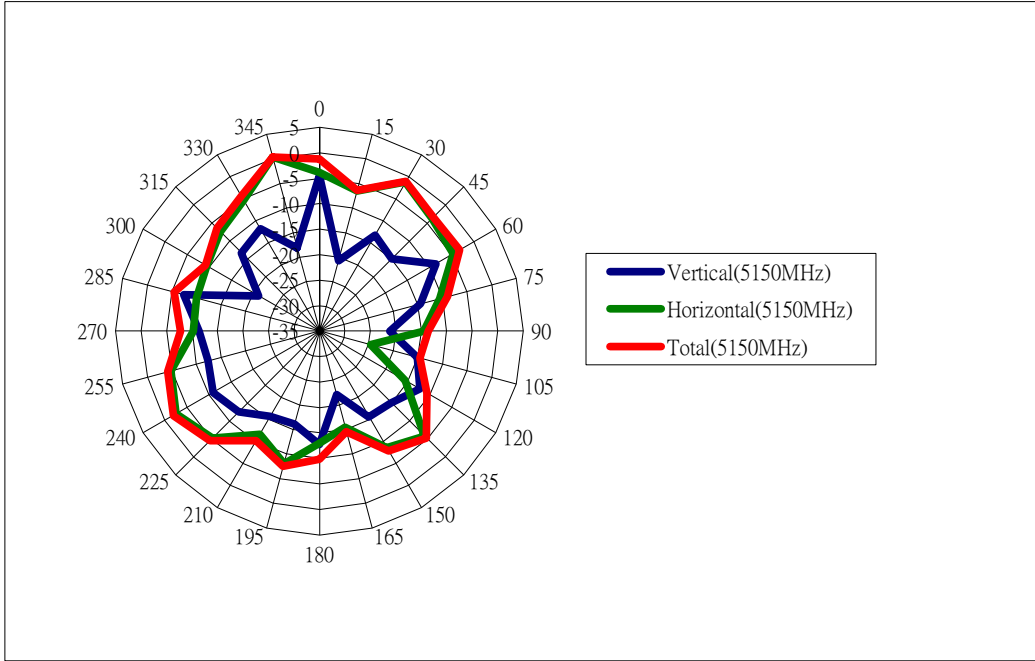
Tx2 (or Rx2) antenna: 2500 MHz



Center Frequency	2500 MHz
Horizontal (dBi) peak	-0.91
Vertical (dBi) peak	-2.52

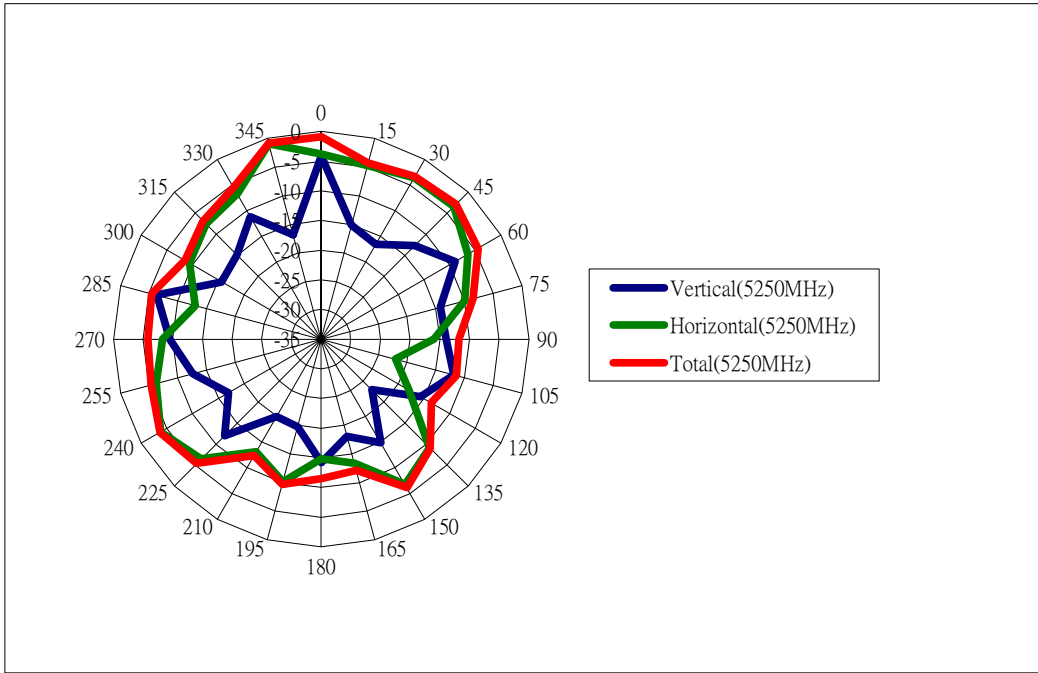
5150-5350 MHz radiation characteristic

Tx1 antenna: 5150 MHz



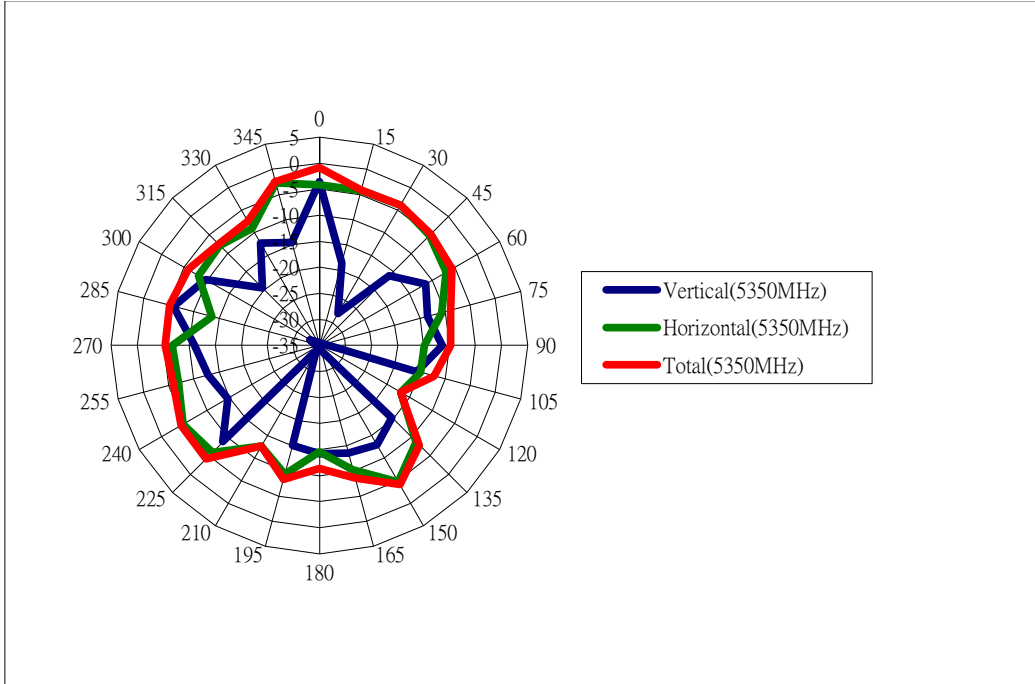
Center Frequency	5150 MHz
Horizontal (dBi) peak	0.34
Vertical (dBi) peak	-4.54

Tx1 antenna: 5250 MHz



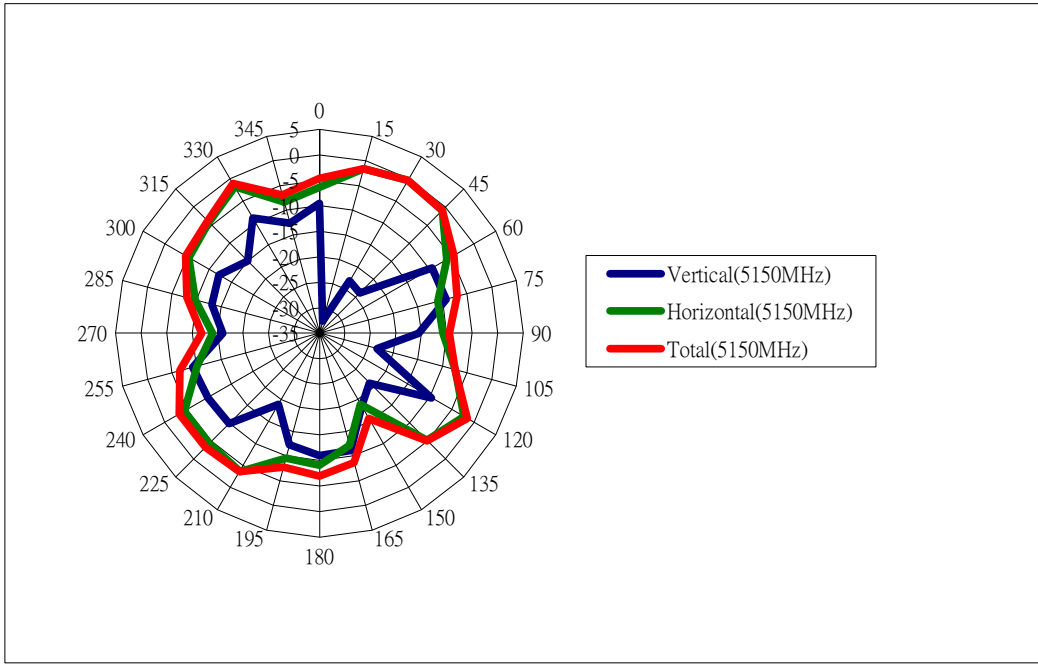
Center Frequency	5250 MHz
Horizontal (dBi) peak	-0.91
Vertical (dBi) peak	-4.09

Tx1 antenna: 5350 MHz



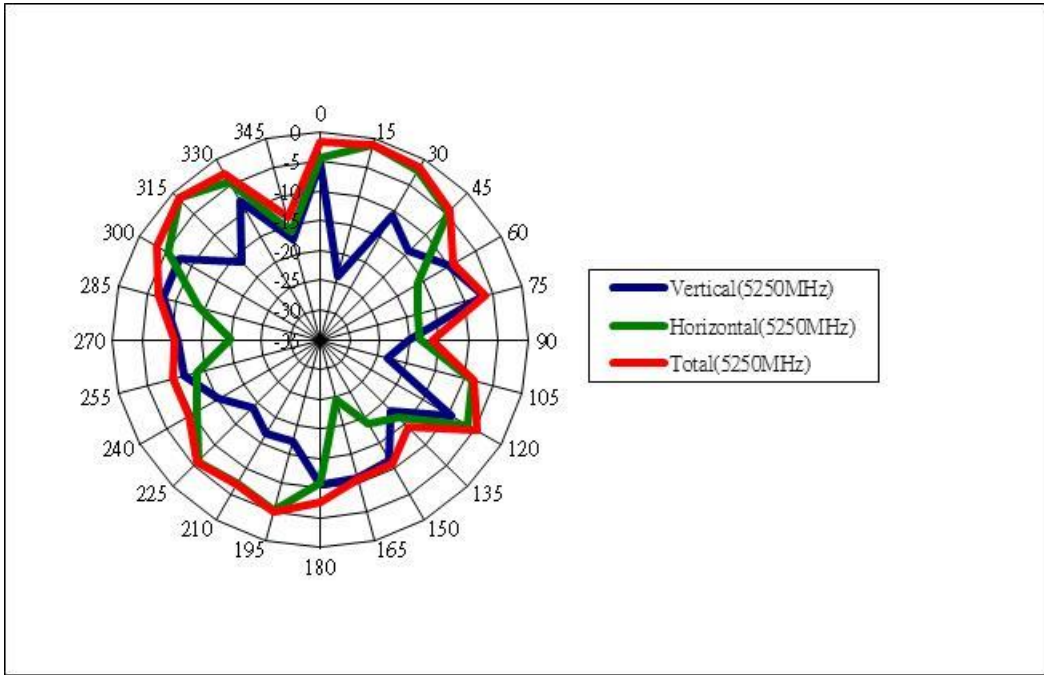
Center Frequency	5350 MHz
Horizontal (dBi) peak	-2.68
Vertical (dBi) peak	-3.52

Tx2 (or Rx2) antenna: 5150 MHz



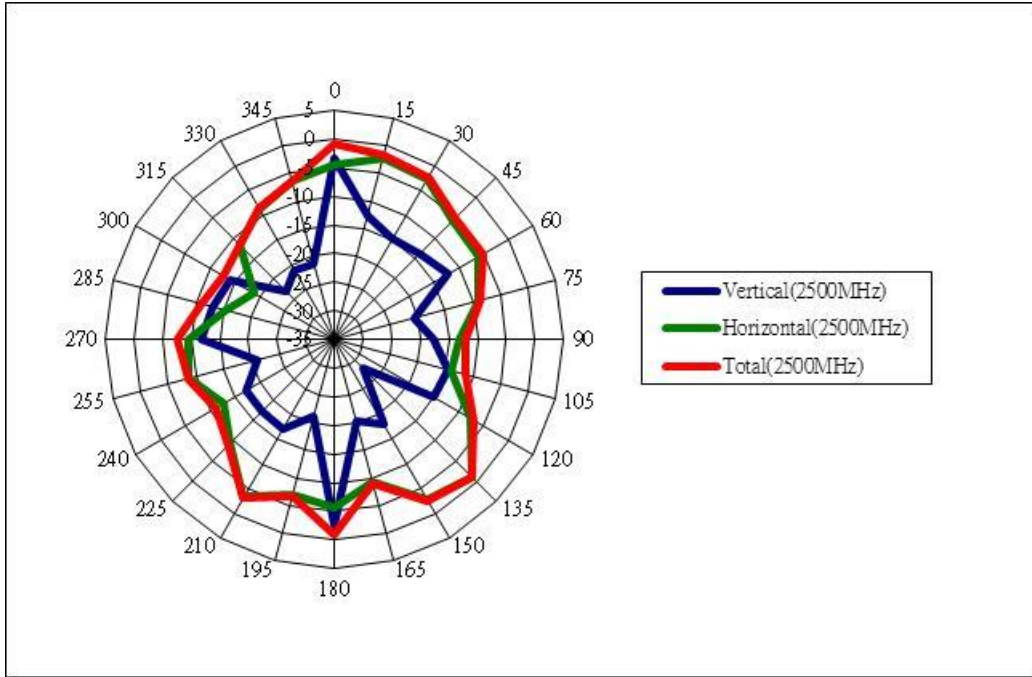
Center Frequency	5150 MHz
Horizontal (dBi) peak	-0.39
Vertical (dBi) peak	-8.94

Tx2 (or Rx2) antenna: 5250 MHz



Center Frequency	5250 MHz
Horizontal (dBi) peak	-1.12
Vertical (dBi) peak	-5.14

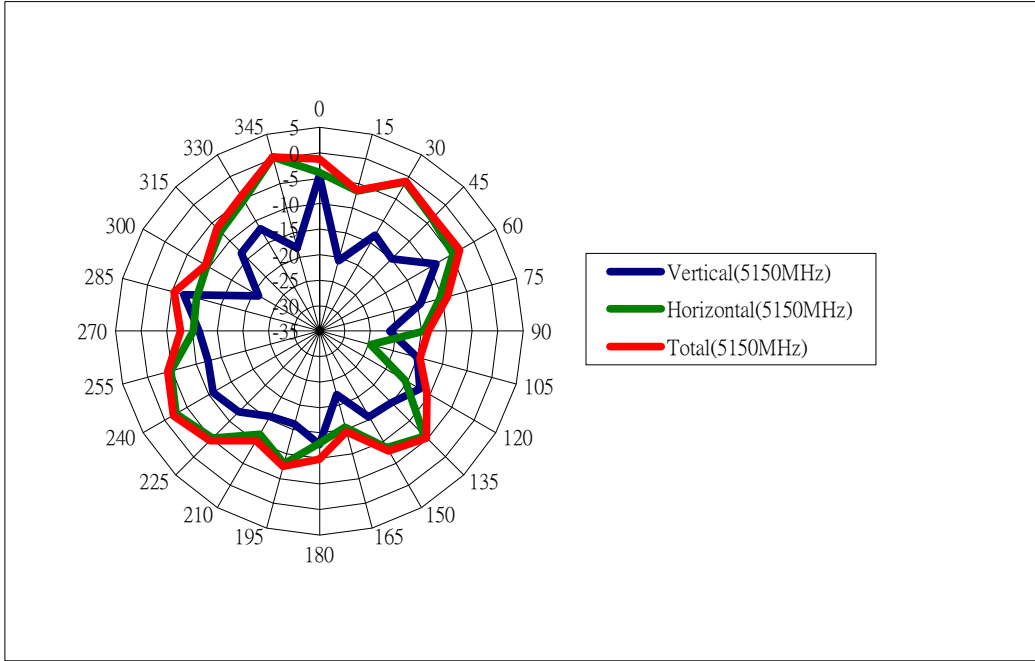
Tx2 (or Rx2) antenna: 2500 MHz



Center Frequency	2500 MHz
Horizontal (dBi) peak	-0.91
Vertical (dBi) peak	-2.52

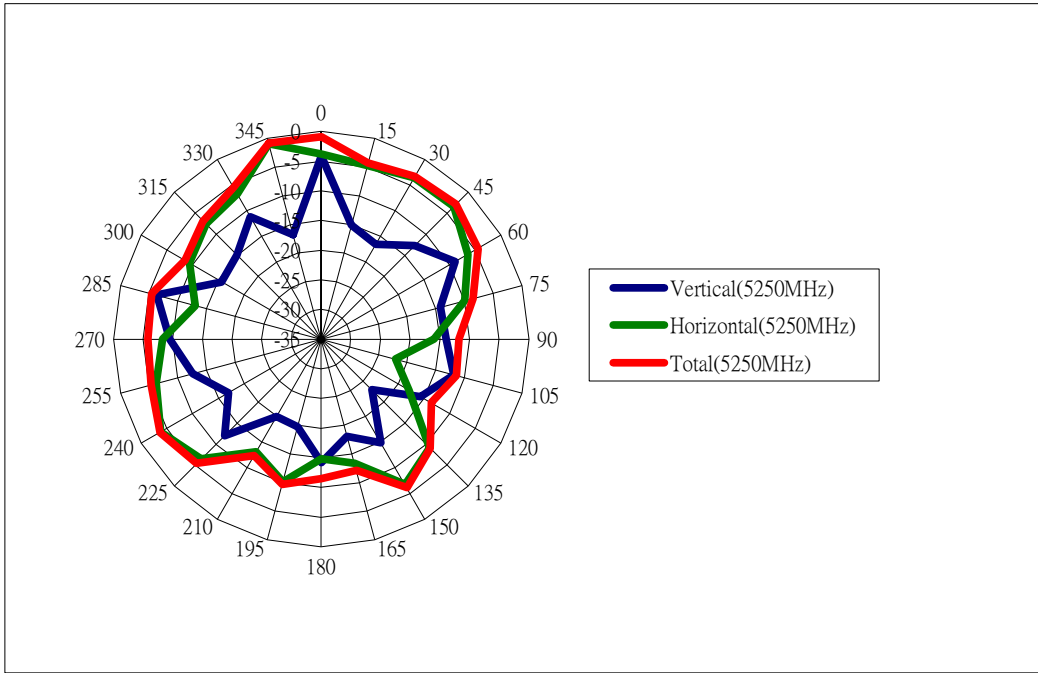
5150-5350 MHz radiation characteristic

Tx1 antenna: 5150 MHz



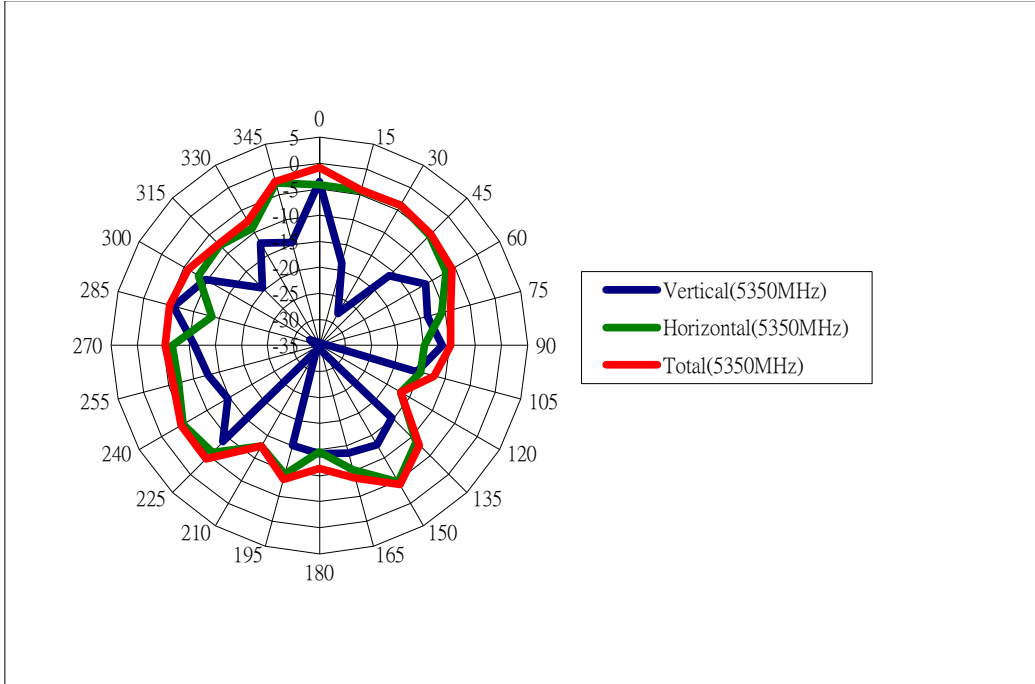
Center Frequency	5150 MHz
Horizontal (dBi) peak	0.34
Vertical (dBi) peak	-4.54

Tx1 antenna: 5250 MHz



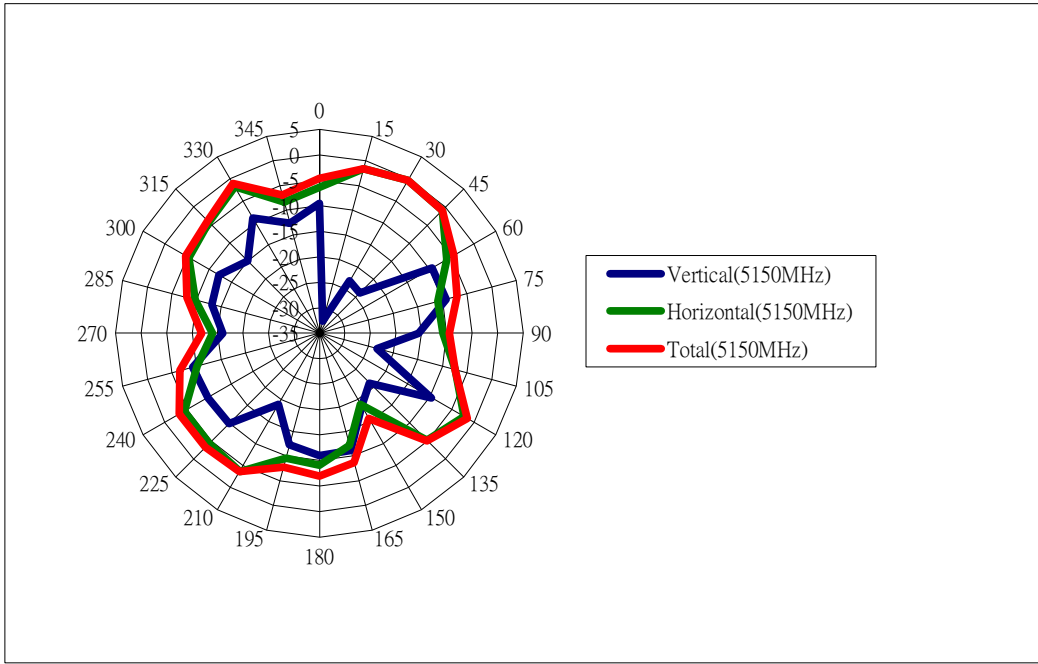
Center Frequency	5250 MHz
Horizontal (dBi) peak	-0.91
Vertical (dBi) peak	-4.09

Tx1 antenna: 5350 MHz



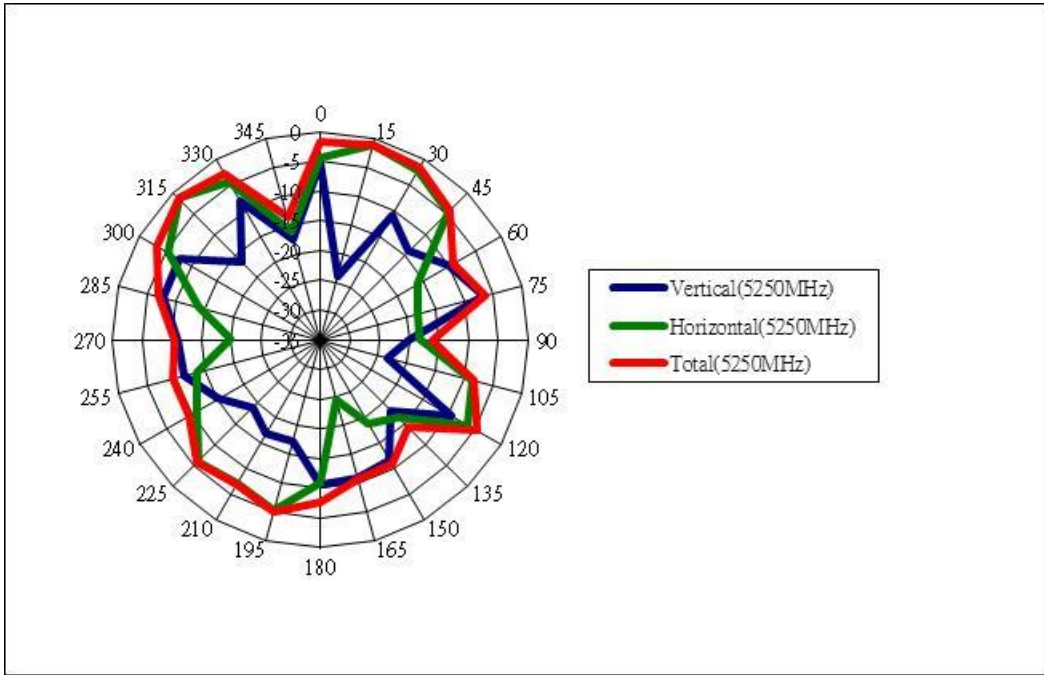
Center Frequency	5350 MHz
Horizontal (dBi) peak	-2.68
Vertical (dBi) peak	-3.52

Tx2 (or Rx2) antenna: 5150 MHz



Center Frequency	5150 MHz
Horizontal (dBi) peak	-0.39
Vertical (dBi) peak	-8.94

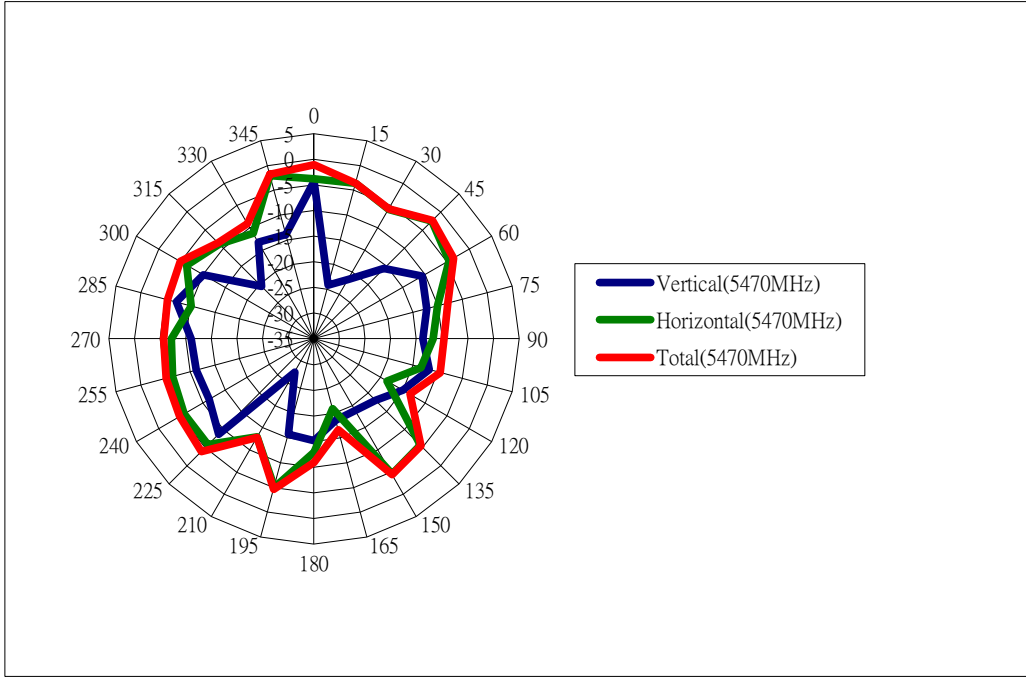
Tx2 (or Rx2) antenna: 5250 MHz



Center Frequency	5250 MHz
Horizontal (dBi) peak	-1.12
Vertical (dBi) peak	-5.14

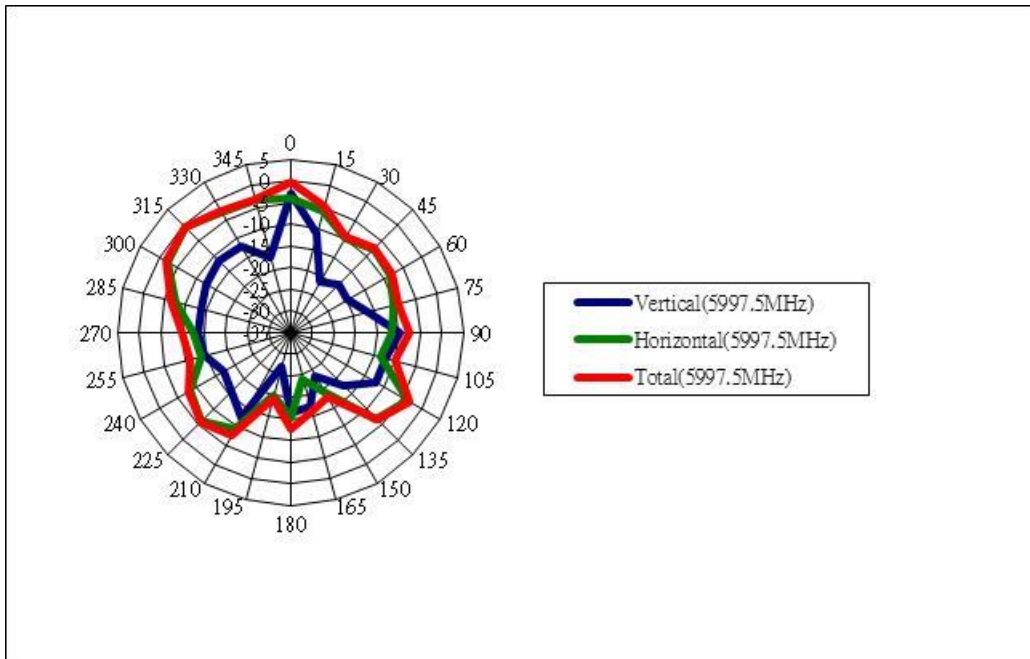
5470-5725MHz radiation characteristic

Tx1 antenna: 5470 MHz



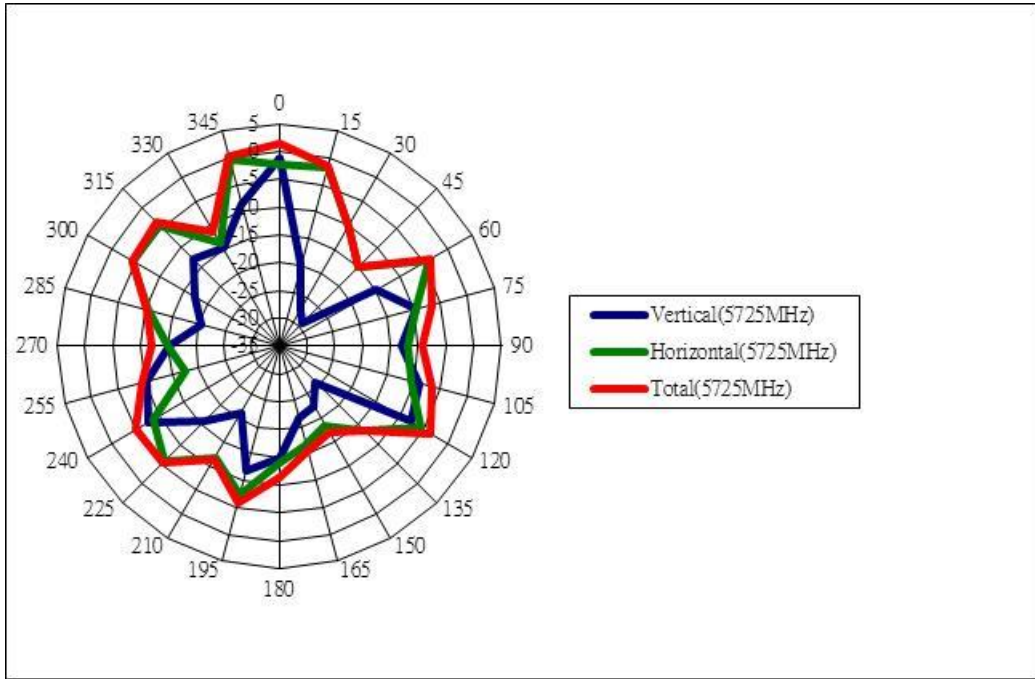
Center Frequency	5470 MHz
Horizontal (dBi) peak	-2.03
Vertical (dBi) peak	-4.28

Tx2 (or Rx2) antenna: 5597.5 MHz



Center Frequency	5597.5 MHz
Horizontal (dBi) peak	-0.79
Vertical (dBi) peak	-2.73

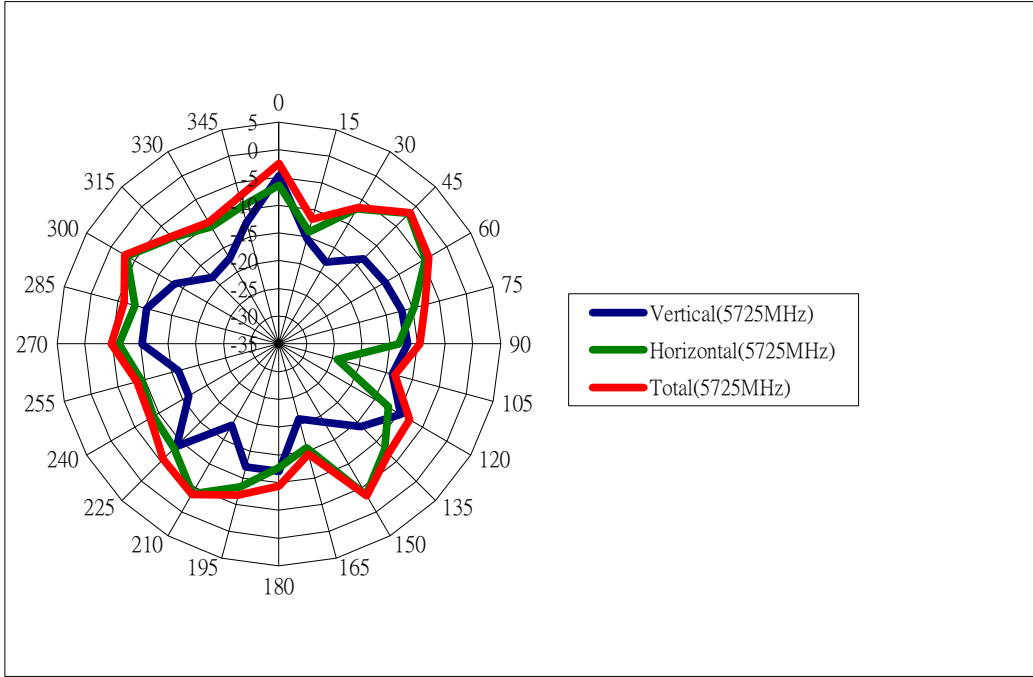
Tx2 (or Rx2) antenna: 5725 MHz



Center Frequency	5725 MHz
Horizontal (dBi) peak	-0.30
Vertical (dBi) peak	-1.10

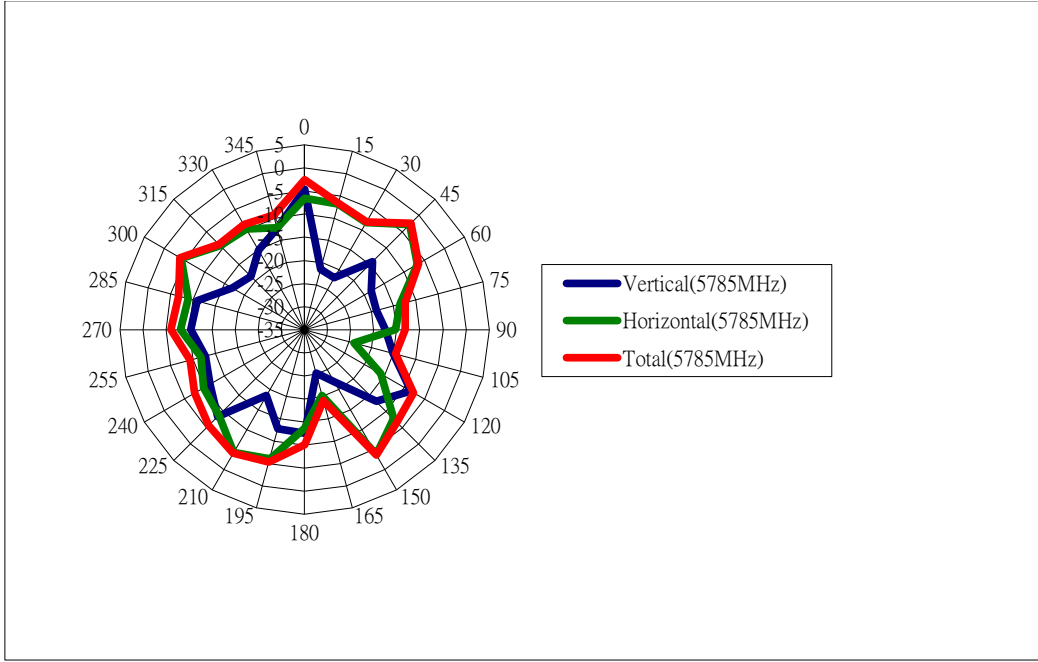
5725-5850 MHz radiation characteristic

Tx1 antenna: 5725 MHz



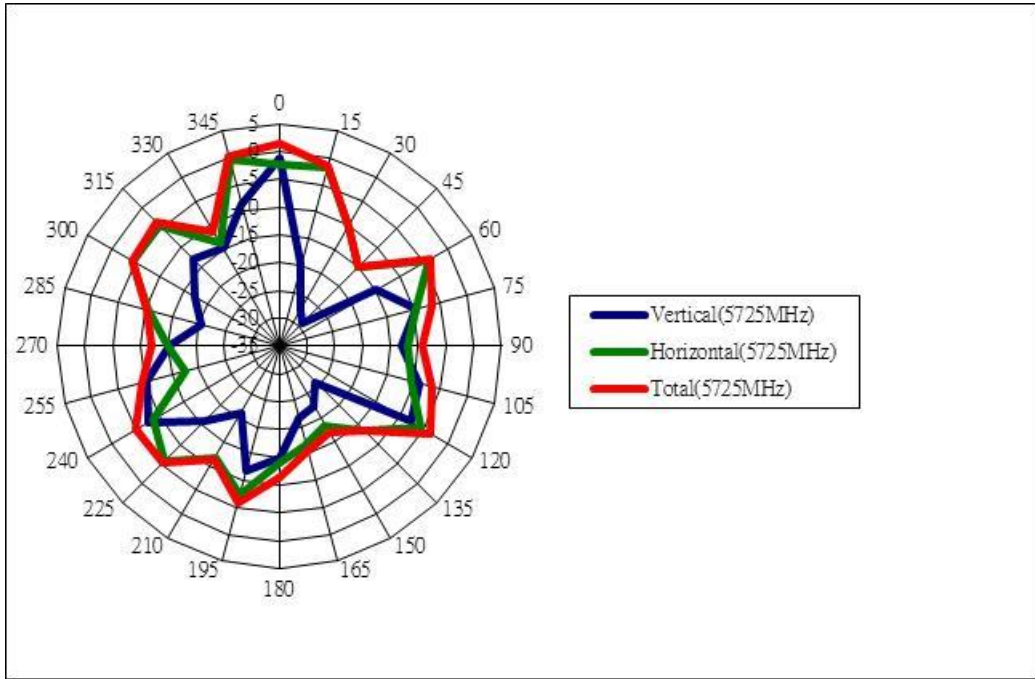
Center Frequency	5725 MHz
Horizontal (dBi) peak	-1.79
Vertical (dBi) peak	-4.71

Tx1 antenna: 5785 MHz



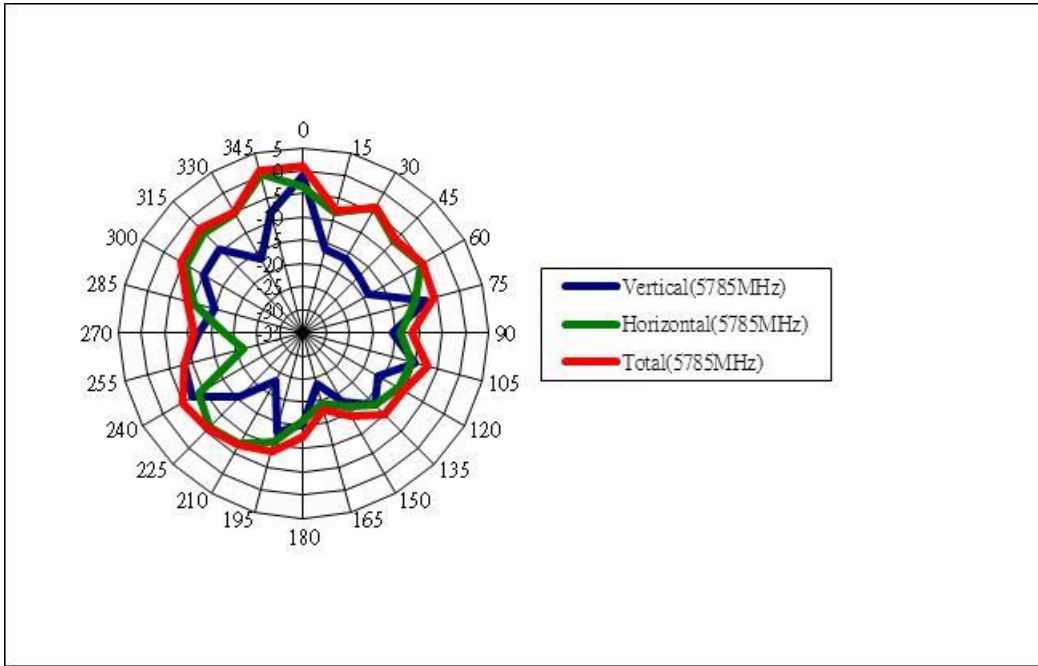
Center Frequency	5785 MHz
Horizontal (dBi) peak	-2.77
Vertical (dBi) peak	-4.68

Tx2 (or Rx2) antenna: 5725 MHz



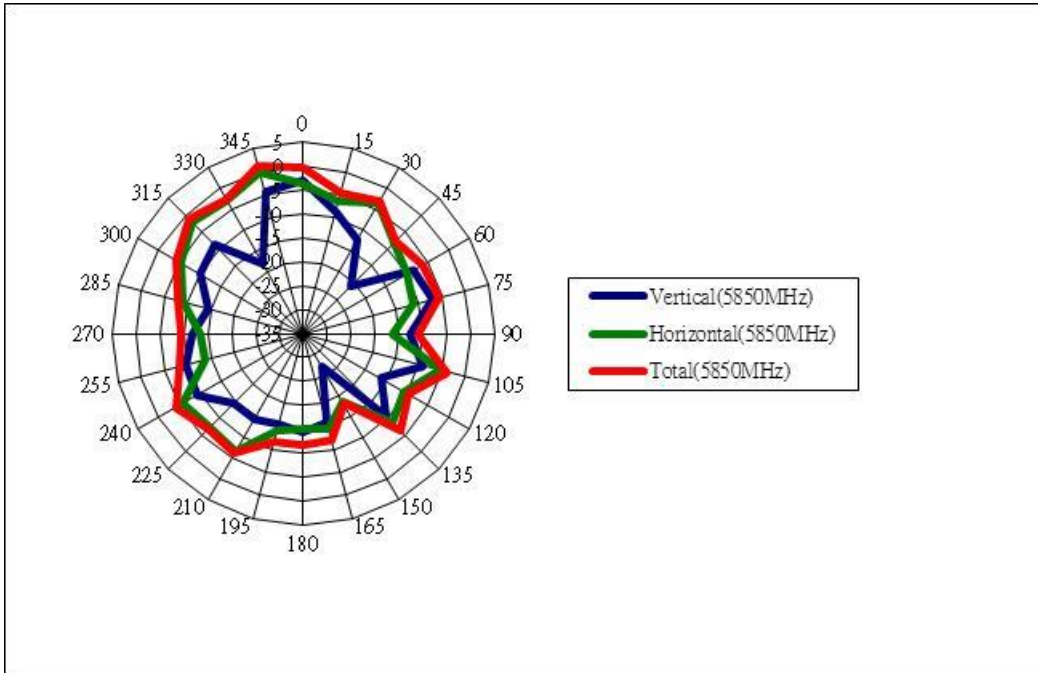
Center Frequency	5725 MHz
Horizontal (dBi) peak	-0.30
Vertical (dBi) peak	-1.10

Tx2 (or Rx2) antenna: 5785 MHz



Center Frequency	5785 MHz
Horizontal (dBi) peak	0.58
Vertical (dBi) peak	-0.94

Tx2 (or Rx2) antenna: 5850 MHz

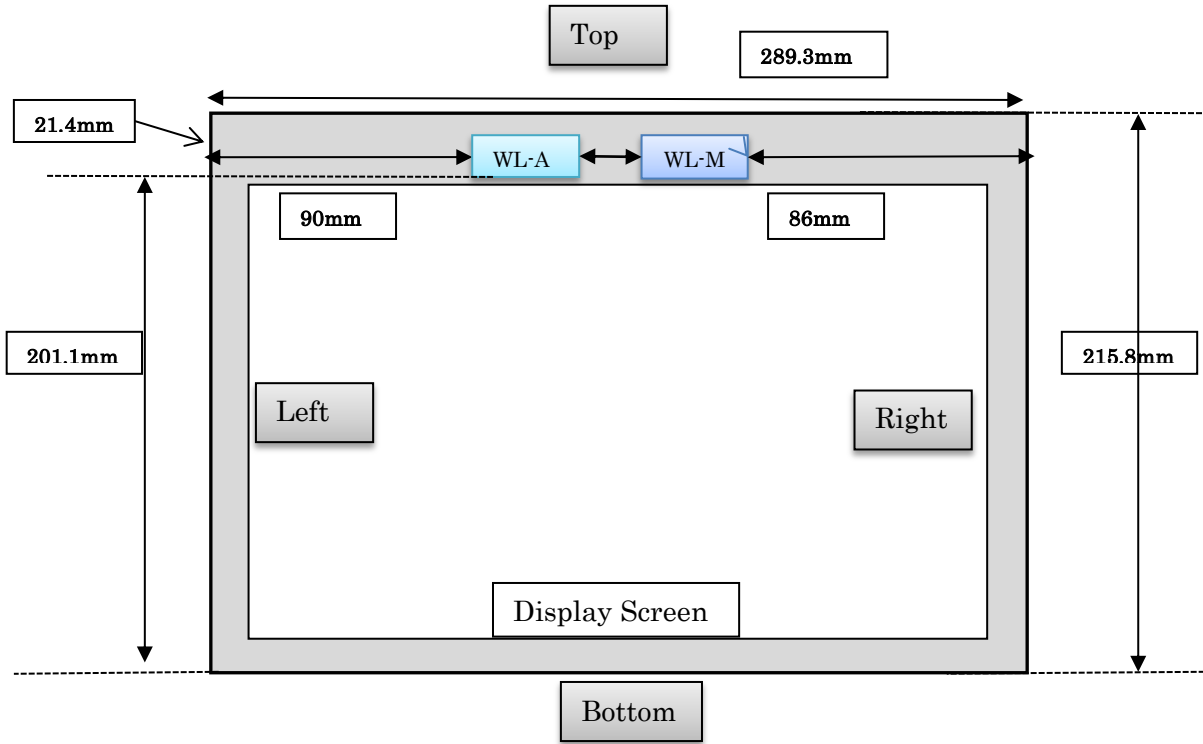


Center Frequency	5850 MHz
Horizontal (dBi) peak	0.00
Vertical (dBi) peak	-3.06

Section 4. Host Platform Information

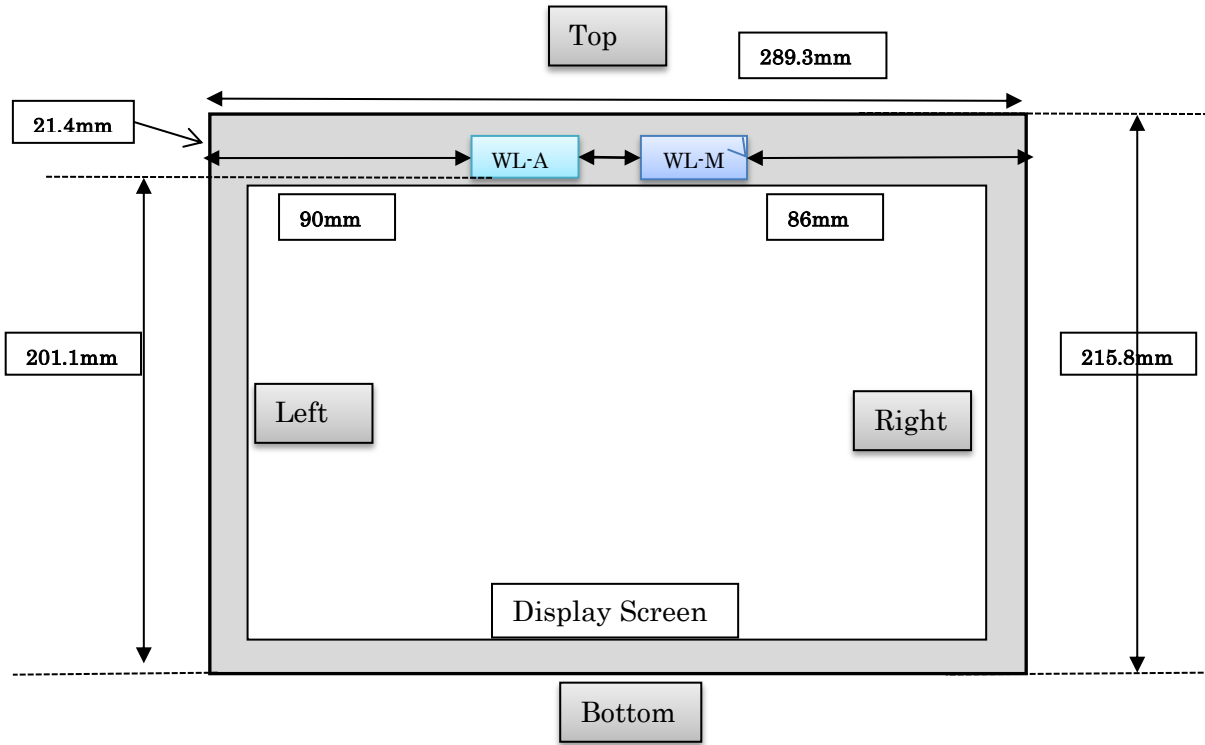
OEM / ODM Host platform: (Miramar 1.0) platform correlated to antenna data

Rating Label Photo:



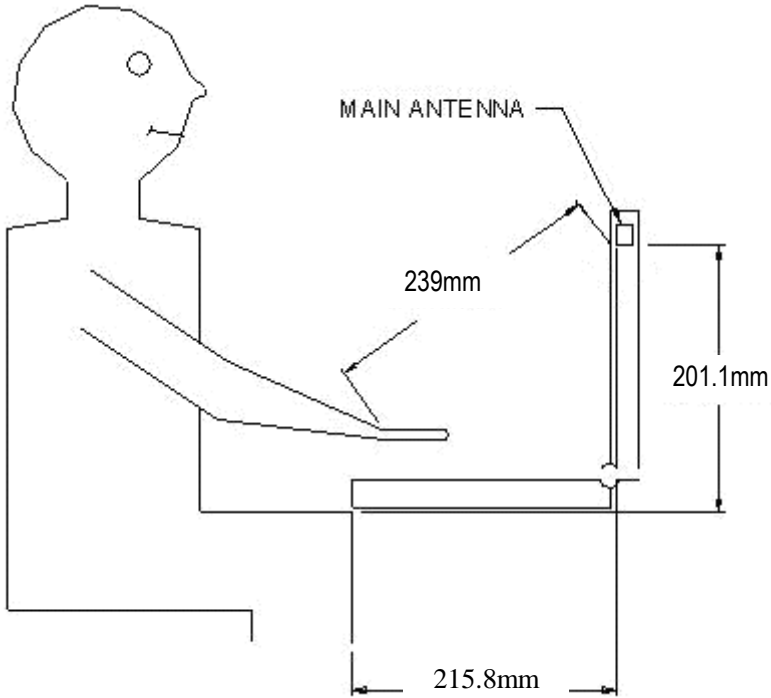
Section 5. Antenna Host Platform Location Information

Include a **dimensioned photo(s) or dimensioned drawing(s)** of Tx1, Tx2 placements (measurements are not required for receive-only antenna). Any antenna that transmits must show dimensions to bottom of laptop. Provide a description of the materials that are used for supporting or surrounding transmit antennas; for example, non-conductive plastics vs. conductive coated plastic or metallic materials.



Section 6. Antenna dimensional information for SAR evaluation

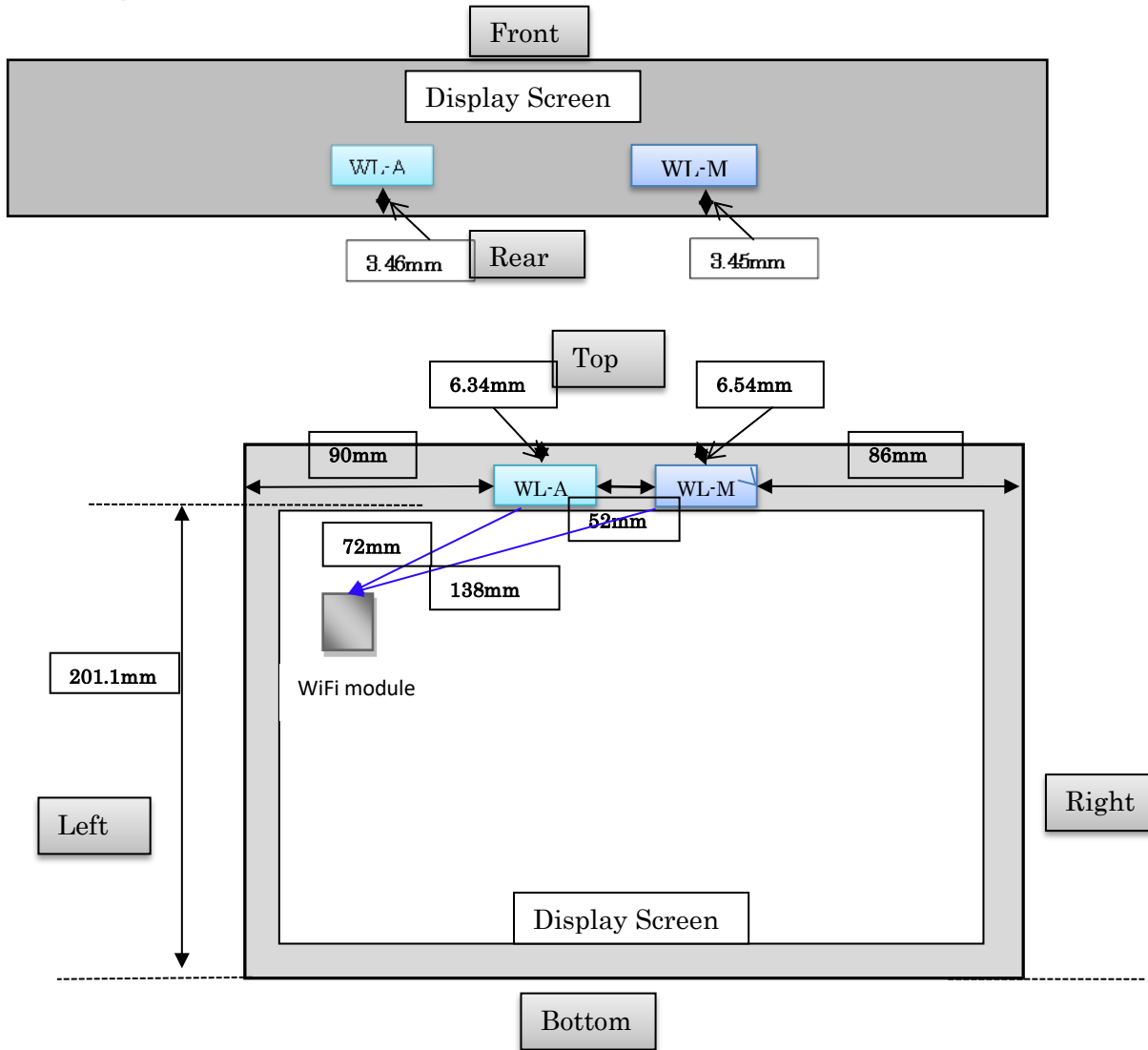
Include a **dimensioned photo(s) or dimensioned drawing(s)** showing the distance (mm) between the transmit antennas and the user (excluding hands, wrist, feet, and ankle). For notebook/laptop hosts show lapheld position (example below). For tablet hosts show all orientations including lapheld, primary & secondary portrait, primary & secondary landscape positions. Include a description of any proximity sensors or power throttling implementations that limit or exclude use of any host orientation.



Section 7. Diagram Example of Co-Location Antenna Separation

Include a **dimensioned photo or dimensioned drawing** showing the distance (mm) between all WLAN transmit antennas and other co-located radiator transmit antenna such as Bluetooth, WWAN,..

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



Section 8. Local representative contact information

Local representative contact information is required for regulatory support for target countries below.

	Local company name	Contact name	Phone number	FAX Number	e-Mail Address	Notes
Argentina						
Azerbaijan						
Cambodia						
Indonesia						
Israel						
Malaysia						
Philippines						
Singapore						Telecommunication Equipment Dealer License Required
South Africa						
USA, Canada						
Vietnam						



Test report No:
 NIE: 61815RRF.001

Partial Test report
REFERENCE STANDARD:
USA FCC Part 22 & Part 24 & Part 27
CANADA RSS-130, RSS-132, RSS-133, RSS-139 &
RSS-199

(*) Identification of item tested	Tablet with WiFi/BT and Cellular connectivity
(*) Trademark	HP
(*) Model and /or type reference tested	HSN-C04C
Other identification of the product	FCC ID: B94HNC04PKCP2 IC: 466X-HNC04PK
(*) Features	Data not provided
Manufacturer	HP Inc. 1501 Page Mill Road Palo Alto, CA 94304, USA.
Test method requested, standard	USA FCC Part 22 10-1-18 Edition. USA FCC Part 24 10-1-18 Edition. USA FCC Part 27 10-1-18 Edition. CANADA RSS-130 Issue 1, Oct. 2013. CANADA RSS-132 Issue 3, Jan. 2013. CANADA RSS-133 Issue 6, Jan. 2013. CANADA RSS-139 Issue 3, Jul. 2015. CANADA RSS-199 Issue 3, Dec. 2016. ANSI C63.26-2015. ANSI/TIA-603-E: 2016. KDB 971168 D01 Power Meas License Digital Systems v03r01, April. 2018.
Approved by (name / position & signature)	A. Llamas RF Lab. Manager
Date of issue	2019-07-18

Report template No

FDT08_22

(*) "Data provided by the client"

Index

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Competences and guarantees

DEKRA Testing and Certification is a testing laboratory accredited by the National Accreditation Body (ENAC - Entidad Nacional de Acreditación), to perform the tests indicated in the Certificate No. 51/LE 147.

DEKRA Testing and Certification is a FCC-recognized accredited testing laboratory with appropriate scope of accreditation that include testing performed in this test report.

DEKRA Testing and Certification is an ISED-recognized accredited testing laboratory with appropriate scope of accreditation that include testing performed in this test report.

In order to assure the traceability to other national and international laboratories, DEKRA Testing and Certification has a calibration and maintenance program for its measurement equipment.

DEKRA Testing and Certification guarantees the reliability of the data presented in this report, which is the result of the measurements and the tests performed to the item under test on the date and under the conditions stated on the report and, it is based on the knowledge and technical facilities available at DEKRA Testing and Certification at the time of performance of the test.

DEKRA Testing and Certification is liable to the client for the maintenance of the confidentiality of all information related to the item under test and the results of the test.

The results presented in this Test Report apply only to the particular item under test established in this document.

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General conditions

1. This report is only referred to the item that has undergone the test.
2. This report does not constitute or imply on its own an approval of the product by the Certification Bodies or competent Authorities.
3. This document is only valid if complete; no partial reproduction can be made without previous written permission of DEKRA Testing and Certification.
4. This test report cannot be used partially or in full for publicity and/or promotional purposes without previous written permission of DEKRA Testing and Certification and the Accreditation Bodies.

Uncertainty

Uncertainty (factor k=2) was calculated according to the DEKRA Testing and Certification internal document PODT000.

Data provided by the client

The sample consists of a tablet with WiFi/BT and Cellular connectivity.

The following data has been provided by the client:

1. Information relating to the description of the sample ("Identification of the item tested", "Trademark", "Model and/or type reference tested").

DEKRA Testing and Certification S.A.U. declines any responsibility with respect to the information provided by the client and that may affect the validity of results.

Usage of samples

Samples undergoing test have been selected by: the client.

Sample S/01 is composed of the following elements:

Control Nº	Description	Model	Serial Nº	Date of reception
61815C/001	Tablet with WiFi/BT and Cellular connectivity	HSN-C04C	E5400348200052	2019-06-17
61815C/002	Keyboard tablet	---	---	2019-06-17
61815C/003	AC/DC power supply	---	---	2019-06-17
61815C/004	Power supply cable	---	---	2019-06-17

1. Sample S/01 has undergone the following test(s):

All radiated tests on WCDMA bands indicated in Appendixes A, B and C.

Sample S/02 is composed of the following elements:

Control Nº	Description	Model	Serial Nº	Date of reception
61815C/005	Tablet with WiFi/BT and Cellular connectivity	HSN-C04C	EPM200010016	2019-07-03
61815C/006	Keyboard tablet	---	---	2019-07-03
61815C/007	AC/DC power supply	---	---	2019-07-03
61815C/008	Power supply cable	---	---	2019-07-03

1. Sample S/02 has undergone the following test(s):

All radiated tests on LTE bands indicated in Appendixes A, B and C.

Test sample description

Ports..... :	Port name and description	Cable		
		Specified length [m]	Attached during test	Shielded
			<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>

Supplementary information to the ports.....:	N/A						
Rated power supply	Voltage and Frequency		Reference poles				
			L1	L2	L3	N	PE
	<input type="checkbox"/>	AC:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	DC:						
Rated Power							
Clock frequencies.....:							
Other parameters							
Software version							
Hardware version							
Dimensions in cm (L x W x D).....:							
Mounting position	<input type="checkbox"/>	Table top equipment					
	<input type="checkbox"/>	Wall/Ceiling mounted equipment					
	<input type="checkbox"/>	Floor standing equipment					
	<input checked="" type="checkbox"/>	Hand-held equipment					
	<input type="checkbox"/>	Other:					
Modules/parts.....:	Module/parts of test item			Type	Manufacturer		
	N/A						
Accessories (not part of the test item)	Description		Type		Manufacturer		
Documents as provided by the applicant	Description		File name		Issue date		

Identification of the client

HP Inc.
 1501 Page Mill Road Palo Alto, CA 94304, USA.

Testing period and place

Test Location	DEKRA Testing and Certification S.A.U.
Date (start)	2019-06-23
Date (finish)	2019-07-09

Document history

Report number	Date	Description
61815RRF.001	2019-07-18	First release

Environmental conditions

In the control chamber, the following limits were not exceeded during the test:

Temperature	Min. = 15 °C Max. = 35 °C
Relative humidity	Min. = 20 % Max. = 75 %

In the semianechoic chamber, the following limits were not exceeded during the test.

Temperature	Min. = 15 °C Max. = 35 °C
Relative humidity	Min. = 20 % Max. = 75 %
Air pressure	Min. = 860 mbar Max. = 1060 mbar

Remarks and comments

The Tablet supports only UMTS and LTE, without UL carrier aggregation. The applicable frequency bands and operating modes are identified in the following table, where North America bands are shown in bold.

Mode	Bands	Supportes TX Mode			
		WCDMA	HSDPA	HSUPA	DC-HSDPA
WCDMA / HSPA +	FDD II (1850 to 1910 MHz)	X	X	X	X
	FDD IV (1710 to 1755 MHz)	X	X	X	X
	FDD V (824 to 849 MHz)	X	X	X	X
	FDD VIII (888 to 915 MHz)	X	X	X	X

Mode	Bands	Supportes Channel Bandwidth (MHz)					
		1.4	3	5	10	15	20
LTE FDD	Band 2 (1850 to 1910 MHz)	X	X	X	X	X	X
	Band 4 (1710 to 1755 MHz)	X	X	X	X	X	X
	Band 5 (824 to 849 MHz)	X	X	X	X		
	Band 7 (2500 to 2570 MHz)			X	X	X	X
	Band 12 (699 to 716 MHz)	X	X	X	X		
	Band 13 (777 to 787 MHz)			X	X		
	Band 14 (788 to 798 MHz)			X	X		
	Band 17 (704 to 716 MHz)			X	X		
	Band 18 (815 to 830 MHz)			X	X	X	
	Band 19 (830 to 845 MHz)			X	X	X	
	Band 25 (1850 to 1915 MHz)	X	X	X	X	X	X
	Band 26 (814 to 849 MHz)	X	X	X	X	X	
	Band 28 (703 to 748 MHz)		X	X	X	X	X
	Band 30 (2305 to 2315 MHz)			X	X		
Band 66 (1710 to 1780 MHz)	X	X	X	X	X	X	
LTE TDD	Band 38 (2570 to 2620 MHz)			X	X	X	X
	Band 40 (2300 to 2400 MHz)			X	X	X	X
	Band 41 (2496 to 2690 MHz)			X	X	X	X

The manufacturer declared that the worst cases were WCDMA II, IV, V and LTE 4, 12, 13, 25, 26, 41.

The tests have been performed by the technical personnel: Nicolas Salguero, Francisco J. Alcaide, Ignacio Cabra and Jose Carlos Luque.

Used instrumentation:

Radiated Measurements

		Last Cal. date	Cal. due date
1.	Semianechoic Absorber Lined Chamber ETS FACT3 200STP	N.A.	N.A.
2.	Multi Device Controller EMCO 2090	N.A.	N.A.
3.	AC Power Supply California Instruments 5001iM-400	2018/11	2020/11
4.	EMI Test Receiver ROHDE AND SCHWARZ ESR7	2017/08	2019/08
5.	RF Pre-amplifier, 38 dB, 30 MHz-6 GHz BONN ELEKTRONIK BLNA 0360-01N	2018/07	2019/07
6.	Biconical/Log Antenna 30 MHz-6 GHz ETS LINDGREN 3142E	2018/07	2021/07
7.	Signal and Spectrum Analyzer ROHDE AND SCHWARZ FSW50	2018/02	2020/02
8.	Pre-amplifier G>30dB, 1-18GHz BONN ELEKTRONIK BLMA 0118-1M	2019/04	2020/04
9.	Broadband Horn antenna 1-18GHz SCHWARZBECK MESS-ELEKTRONIK BBHA 9120 D	2016/11	2019/11
10.	Broadband Horn antenna 18-40GHz SCHWARZBECK MESS-ELEKTRONIK BBHA 9170	2018/07	2021/07
11.	RF Pre-amplifier G>30dB, 18-40GHz BONN ELEKTRONIK BLMA 1840-1M	2018/02	2020/02
12.	Wideband Radio Communication Tester R&S CMW500	2019/02	2020/02
13.	Universal Communication Tester R&S CMU200	2018/07	2019/07

Testing verdicts

Not applicable :	N/A
Pass :	P
Fail :	F
Not measured :	N/M

Summary

FCC PART 22/CANADA RSS-132 PARAGRAPH		
Requirement – Test case	Verdict	Remark
Clause 22.913/RSS-132 Clause 5.4: RF output power	N/M	(2)
Clause 2.1047/RSS-132 Clause 5.2: Modulation characteristics	N/M	(2)
Clause 22.355/RSS-132 Clause 5.3: Frequency stability	N/M	(2)
Clause 2.1049: Occupied Bandwidth	N/M	(2)
Clause 22.917/RSS-132 Clause 5.5: Spurious emissions at antenna terminals	N/M	(2)
Clause 22.917/RSS-132 Clause 5.5: Radiated emissions	P	(1)
<p><u>Supplementary information and remarks:</u></p> <p>(1) HSDPA modulation mode has not been tested to prove USA FCC Part 22 and Part 24 compliance because it is an improved mode of operation only for Downlink (UE reception), but using the normal WCDMA mode for UL (Up Link, UE transmission). Therefore HSDPA has no associated a Power class or modulation scheme different than WCDMA mode for the UL transmission. Taking into account the above comments, testing in HSDPA modulation mode is redundant for FCC Part 22 and Part 24 as it is the same as WCDMA mode as long as UE transmission is concerned. WCDMA modulation mode has been tested as indicated on the present test report.</p> <p>(2) Test not requested.</p>		

FCC PART 24/CANADA RSS-133 PARAGRAPH		
Requirement – Test case	Verdict	Remark
Clause 24.232/RSS-133 Clause 6.4: RF output power	N/M	(2)
Clause 2.1047/RSS-133 Clause 6.2: Modulation characteristics	N/M	(2)
Clause 24.235/RSS-133 Clause 6.3: Frequency stability	N/M	(2)
Clause 2.1049: Occupied Bandwidth	N/M	(2)
Clause 24.238/RSS-133 Clause 6.5: Spurious emissions at antenna terminals	N/M	(2)
Clause 24.238/RSS-133 Clause 6.5: Radiated emissions	P	(1)
<p><u>Supplementary information and remarks:</u></p> <p>(1) HSDPA modulation mode has not been tested to prove USA FCC Part 22 and Part 24 compliance because it is an improved mode of operation only for Downlink (UE reception), but using the normal WCDMA mode for UL (Up Link, UE transmission). Therefore HSDPA has no associated a Power class or modulation scheme different than WCDMA mode for the UL transmission. Taking into account the above comments, testing in HSDPA modulation mode is redundant for FCC Part 22 and Part 24 as it is the same as WCDMA mode as long as UE transmission is concerned. WCDMA modulation mode has been tested as indicated on the present test report.</p> <p>(2) Test not requested.</p>		

FCC PART 27/CANADA RSS-130 /CANADA RSS-139/CANADA RSS-199 PARAGRAPH		
Requirement – Test case	Verdict	Remark
Clause 27.50 / RSS-139 Clause 6.5. / RSS-130 Clause 4.4. / RSS-199 Clause 4.4: RF output power	N/M	(1)
Clause 2.1047 / RSS-139 Clause 6.2. / RSS-130 Clause 4.1./ RSS-199 Clause 4.1: Modulation characteristics	N/M	(1)
Clause 27.54 / RSS-139 Clause 6.4. / RSS-130 Clause 4.3. / RSS-199 Clause 4.3: Frequency stability	N/M	(1)
Clause 2.1049: Occupied Bandwidth	N/M	(1)
Clause 27.53 / RSS-139 Clause 6.6. / RSS-130 Clause 4.6. / RSS-199 Clause 4.5: Spurious emissions at antenna terminals	N/M	(1)
Clause 27.53 / RSS-139 Clause 6.6. / RSS-130 Clause 4.6. / RSS-199 Clause 4.5: Radiated emissions	P	
<u>Supplementary information and remarks:</u>		
(1) Test not requested.		

Appendix A: Test results for FCC PART 22 / CANADA RSS-132

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Radiated emissions.....	15

TEST CONDITIONS

Power supply (V):

Vnom = 120 Vac

Vmax = N/A

Vmin = N/A

The subscripts nom, min and max indicate voltage test conditions (nominal, minimum and maximum respectively, as declared by the applicant).

Type of power supply = AC Voltage from AC/DC adapter.

Type of antenna = Internal antenna

WCDMA AND HSUPA MODULATION (Band V)

Lowest channel (4132): 826.4 MHz

Middle channel (4182): 836.4 MHz

Highest channel (4233): 846.6 MHz

824-849 MHz Band:

LTE. QPSK AND 16QAM MODULATION (BAND 26)

	Channel (Frequency, MHz)				
	BW = 1.4 MHz	BW = 3 MHz	BW = 5 MHz	BW = 10 MHz	BW = 15 MHz
Lowest	26797 (824.70)	26805 (825.50)	26815 (826.50)	26840 (829.00)	26865 (831.50)
Middle	26865 (831.50)	26865 (831.50)	26865 (831.50)	26865 (831.50)	26865 (831.50)
Highest	27033 (848.30)	27025 (847.50)	27015 (846.50)	26990 (844.00)	26965 (841.50)

Radiated emissions

SPECIFICATION

FCC § 22.917

RSS-132. Clause 5.5.

METHOD

The measurement was performed with the EUT inside an anechoic chamber. The spectrum was scanned from 30 MHz to at least the 10th harmonic of the highest frequency generated within the equipment.

The EUT was placed on a 1 meter high non-conductive stand at a 3 meter distance from the measuring antenna for measurements below 1 GHz and at 1 m distance for measurements above 1 GHz.

Detected emissions were maximized at each frequency by rotating the EUT and adjusting the measuring antenna height and polarization. The maximum meter reading was recorded. The radiated emissions were measured with peak detector and 1 MHz bandwidth.

Each detected emission is substituted by the Substitution method, in accordance with the ANSI/TIA-603-E.

Measurement Limit:

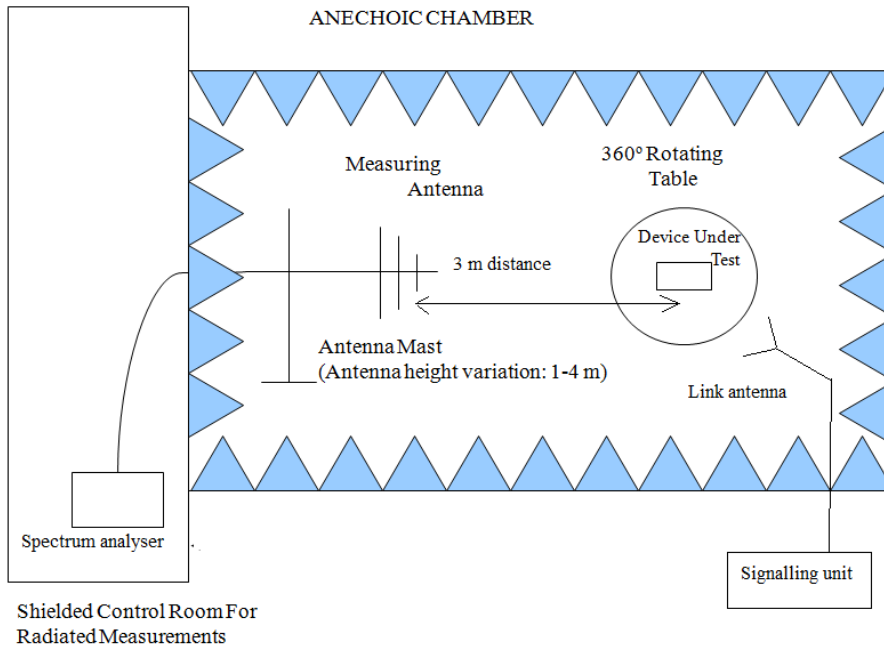
According to specification, the power of emissions shall be attenuated below the transmitter power (P) by a factor of at least $43 + 10 \log (P)$ dB. P in watts.

At P_o transmitting power, the specified minimum attenuation becomes $43+10\log (P_o)$, and the level in dBm relative P_o becomes:

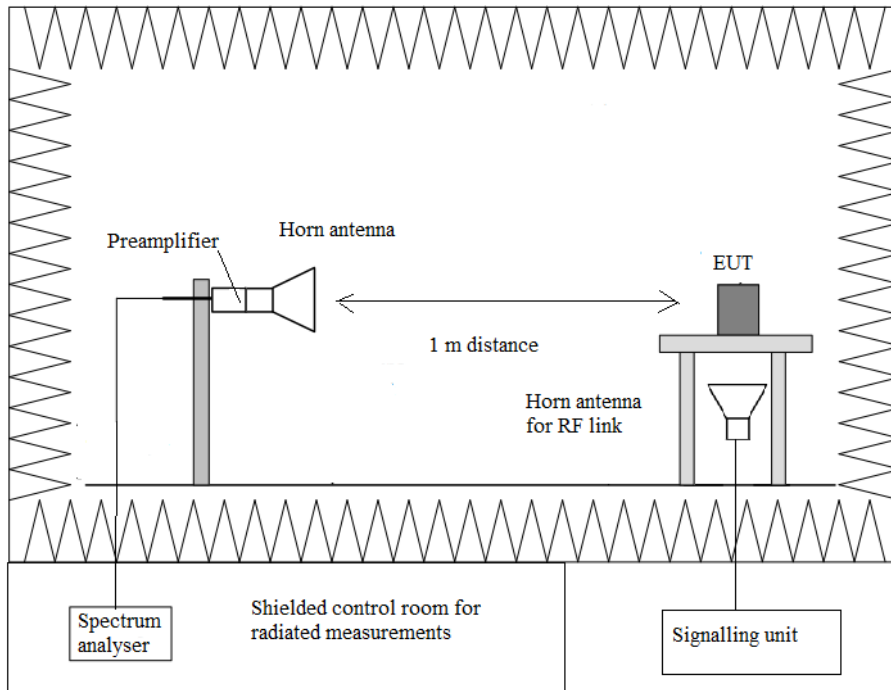
$$P_o \text{ (dBm)} - [43 + 10 \log (P_o \text{ in mwatts}) - 30] = - 13 \text{ dBm}$$

TEST SETUP

Radiated measurements below 1 GHz.



Radiated measurements above 1 GHz.



WCDMA Band:

A preliminary scan determined the WCDMA BAND V - Middle channel - 836.6 MHz - BW 5 MHz QPSK modulation as the worst case. The following tables and plots show the results for QPSK modulation.

The following tables and plots show the results for this configuration.

1. CHANNEL: MIDDLE

Frequency range 30 MHz-1000 MHz.

No radiated spurious signals were detected at less than 20 dB respect to the limit.

Frequency range 1 GHz-18 GHz.

Substitution method data

Frequency (MHz)	Instrument reading (dBm)	Polarization	(1) Generator output (dBm)	(2) Cable loss (dB)	(3) Substitution antenna gain Gi (respect to isotropic radiator) (dB)	E.I.R.P. (dBm) = (1) – (2) + (3)
1674.567	-37.56	Horizontal	-56.80	0.84	8.69	-65.11
2512.833	-44.07	Horizontal	-62.73	1.08	10.60	-60.32

Measurement uncertainty (dB)	<±4.87 for f ≥ 1 GHz up to 18 GHz
------------------------------	-----------------------------------

Verdict: PASS

LTE Band:

LTE Band 26 QPSK AND 16QAM MODULATION. BW = 1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15MHz.

A preliminary scan determined that the middle channel with QPSK modulation and 1.4 MHz bandwidth as the worst case. The configuration of Resource Blocks was used RB=1 half offset.

The following tables and plots show the results for this configuration.

1. CHANNEL: MIDDLE

Frequency range 30 MHz-1000 MHz.

No radiated spurious signals were detected at less than 20 dB respect to the limit.

Frequency range 1 GHz-18 GHz.

Substitution method data

Frequency (MHz)	Instrument reading (dBm)	Polarization	(1) Generator output (dBm)	(2) Cable loss (dB)	(3) Substitution antenna gain Gi (respect to isotropic radiator) (dB)	E.I.R.P. (dBm) = (1) – (2) + (3)
1662.160	-49.21	Horizontal	-68.44	0.84	8.68	-60.60
2493.233	-44.36	Horizontal	-63.03	1.08	10.59	-53.51

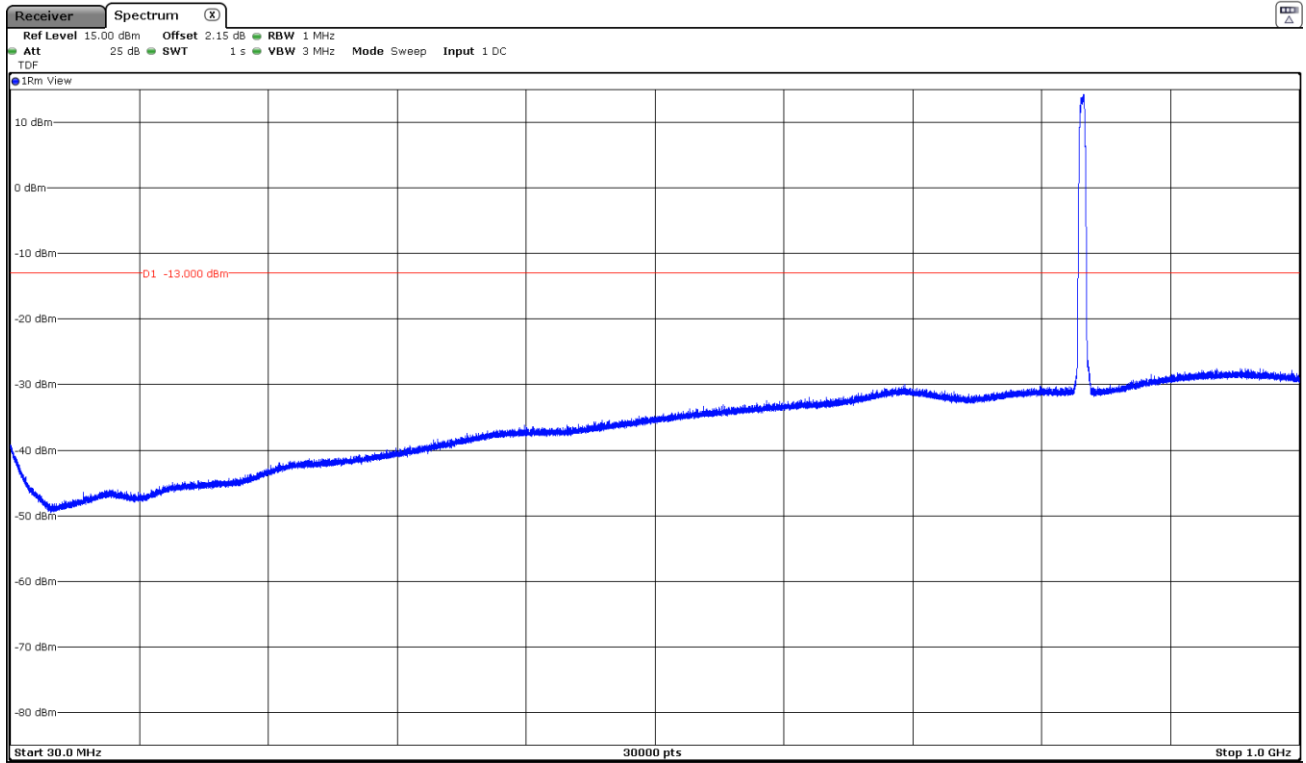
Measurement uncertainty (dB)	<±4.87 for f ≥ 1 GHz up to 18 GHz
------------------------------	-----------------------------------

Verdict: PASS

FREQUENCY RANGE 30 MHz-1000 MHz.

WCDMA MODULATION (Band V)

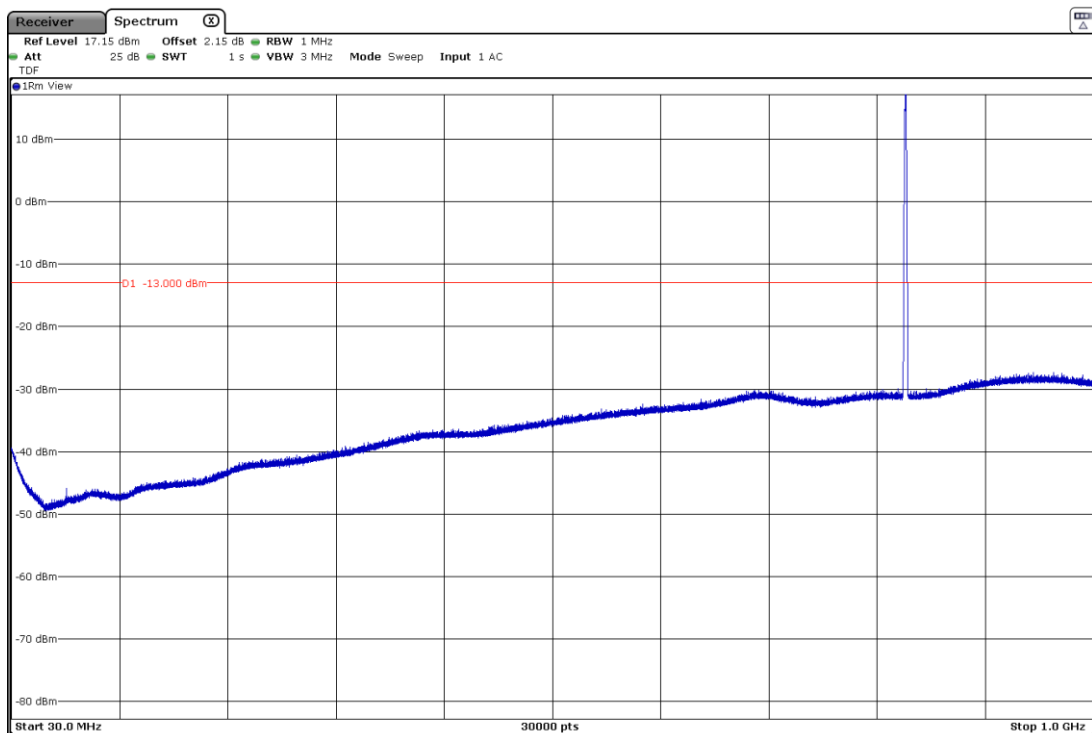
CHANNEL: MIDDLE



Note: The peak above the limit is the carrier frequency.

LTE Band 26 - QPSK MODULATION. BW=1.4 MHz

CHANNEL: MIDDLE

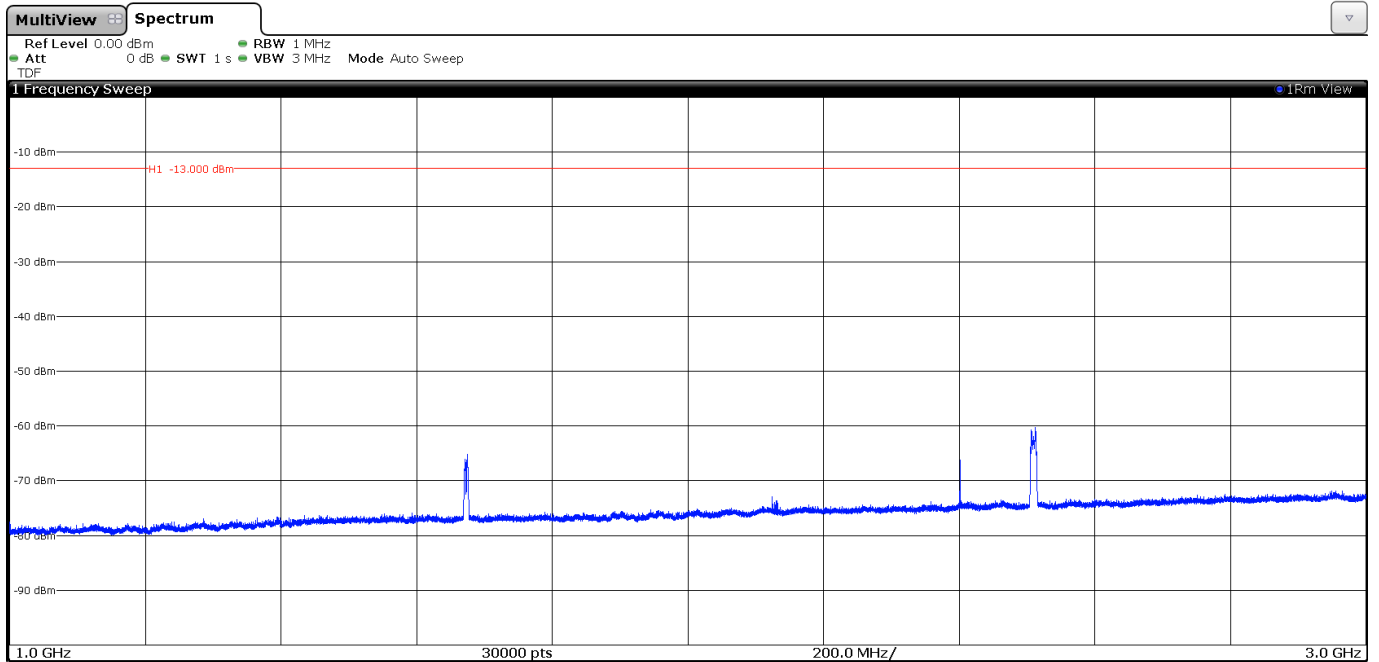


Note: The peak above the limit is the carrier frequency. The peak at 876.5MHz corresponds to the downlink signal

FREQUENCY RANGE 1 GHz to 3 GHz.

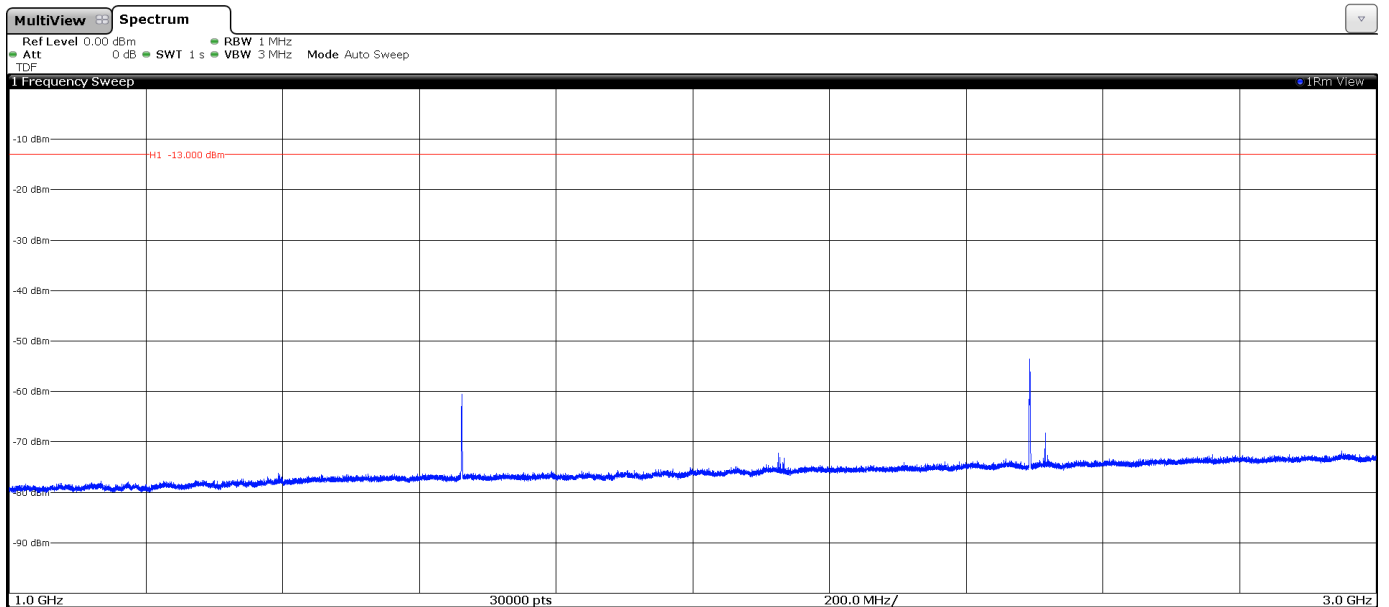
WCDMA MODULATION (Band V)

CHANNEL: MIDDLE



LTE Band 26 QPSK MODULATION. BW=1.4 MHz

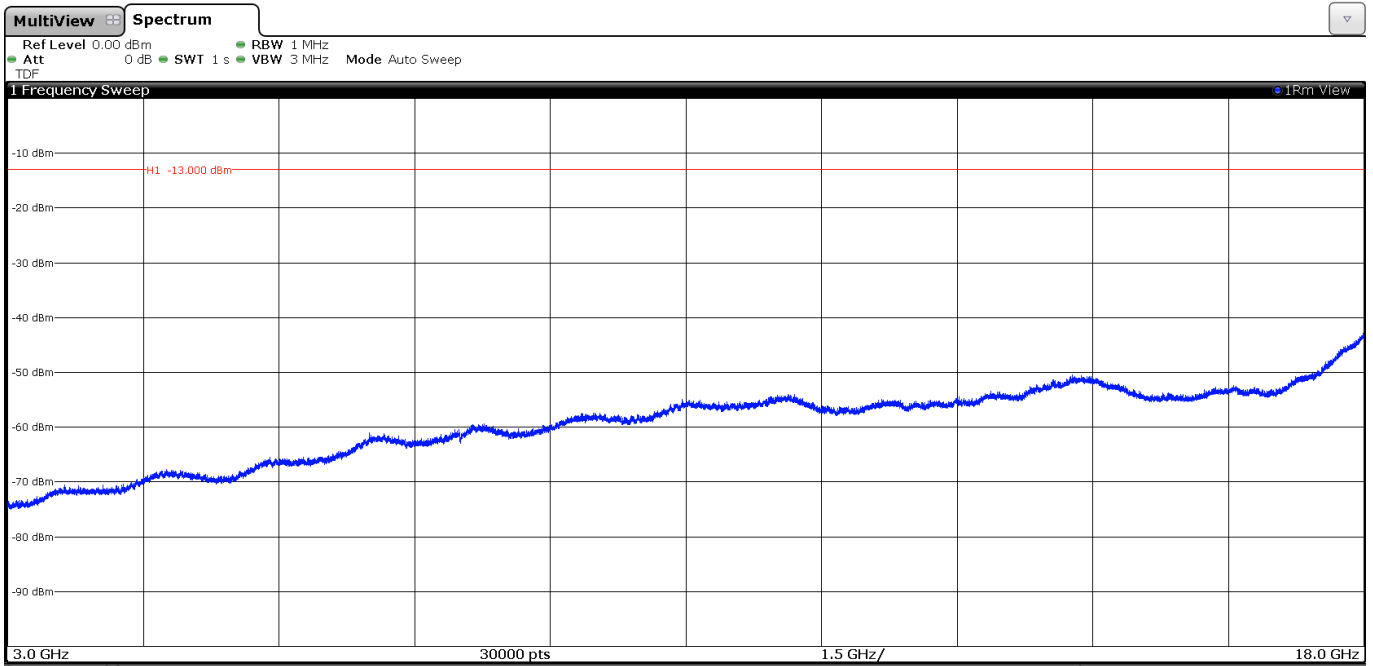
CHANNEL: MIDDLE



FREQUENCY RANGE 3 GHz to 18 GHz.

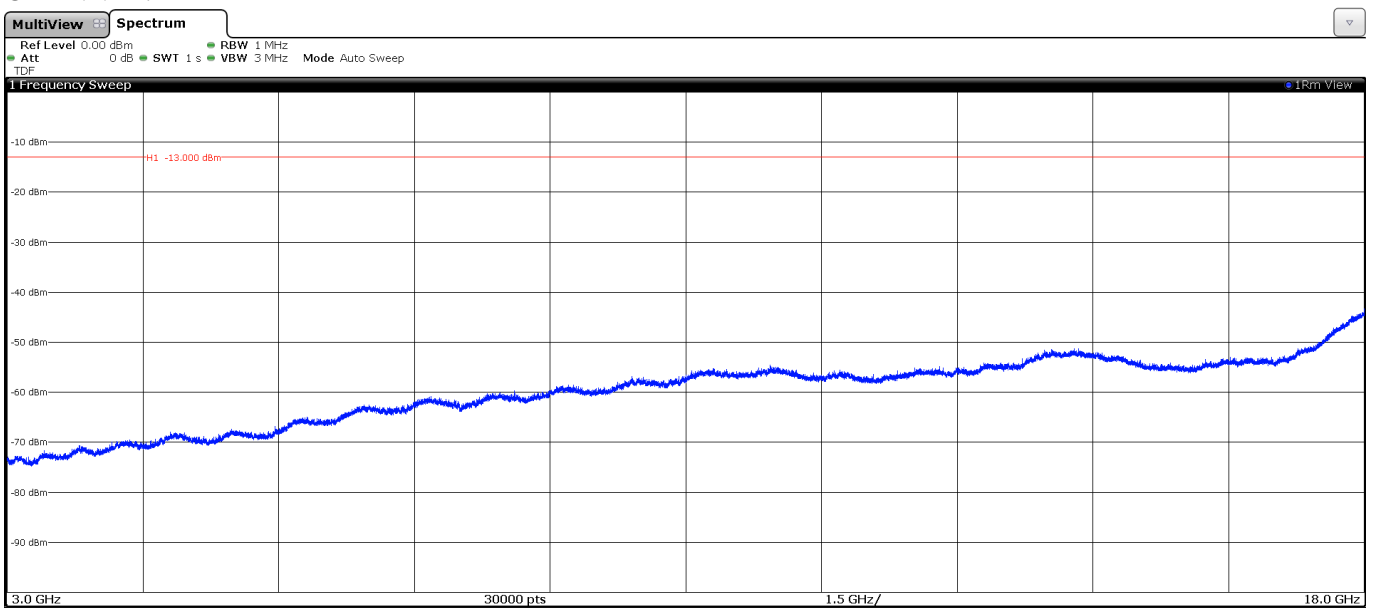
WCDMA MODULATION (Band V)

CHANNEL: MIDDLE



LTE Band 26 QPSK MODULATION. BW=1.4 MHz

CHANNEL: MIDDLE



Appendix B: Test results for FCC PART 24/ CANADA RSS-133

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TEST CONDITIONS.....	23
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TEST CONDITIONS

Power supply (V):

$$V_{nom} = 120 \text{ Vac}$$

$$V_{max} = \text{N/A}$$

$$V_{min} = \text{N/A}$$

The subscripts nom, min and max indicate voltage test conditions (nominal, minimum and maximum respectively, as declared by the applicant).

Type of power supply = AC Voltage from AC/DC adapter.

Type of antenna = Internal antenna

TEST FREQUENCIES:

WCDMA AND HSUPA MODULATION (Band II)

Lowest channel (9262): 1852.4 MHz

Middle channel (9400): 1880.0 MHz

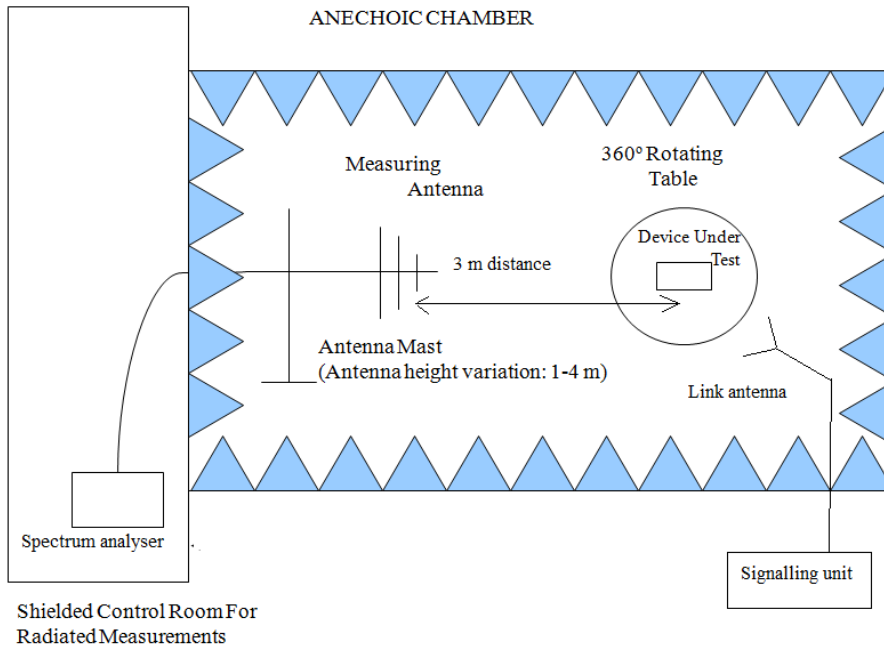
Highest channel (9538): 1907.6 MHz

LTE. QPSK AND 16QAM MODULATION (BAND 25)

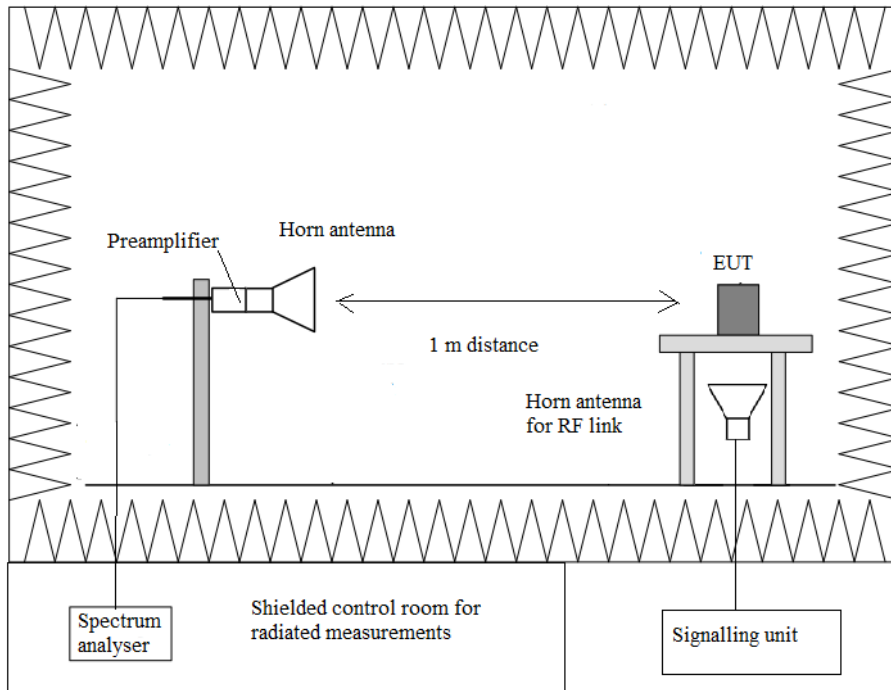
	Channel (Frequency. MHz)					
	BW = 1.4 MHz	BW = 3 MHz	BW = 5 MHz	BW = 10 MHz	BW = 15 MHz	BW = 20 MHz
Lowest	26047 (1850.7)	26055 (1851.5)	26065 (1852.5)	26090 (1855)	26115 (1857.5)	26140 (1860)
Middle	26365 (1882.5)	26365 (1882.5)	26365 (1882.5)	26365 (1882.5)	26365 (1882.5)	26365 (1882.5)
Highest	26683 (1914.3)	26675 (1913.5)	26665 (1912.5)	26640 (1910)	26615 (1907.5)	26590 (1905)

TEST SETUP

Radiated measurements below 1 GHz.



Radiated measurements above 1 GHz.



Radiated emissions

SPECIFICATION

FCC § 24.238

RSS-132. Clause 5.5.

METHOD

The measurement was performed with the EUT inside an anechoic chamber. The spectrum was scanned from 30 MHz to at least the 10th harmonic of the highest frequency generated within the equipment.

The EUT was placed on a 1 meter high non-conductive stand at a 3 meter distance from the measuring antenna for measurements below 1 GHz and at 1 m distance for measurements above 1 GHz.

Detected emissions were maximized at each frequency by rotating the EUT and adjusting the measuring antenna height and polarization. The maximum meter reading was recorded. The radiated emissions were measured with peak detector and 1 MHz bandwidth.

Each detected emission is substituted by the Substitution method, in accordance with the ANSI/TIA-603-E.

Measurement Limit:

According to specification, the power of emissions shall be attenuated below the transmitter power (P) by a factor of at least $43 + 10 \log (P)$ dB. P in watts.

At P_o transmitting power, the specified minimum attenuation becomes $43 + 10 \log (P_o)$, and the level in dBm relative P_o becomes:

$$P_o \text{ (dBm)} - [43 + 10 \log (P_o \text{ in mwatts}) - 30] = - 13 \text{ dBm}$$

WCDMA Band:

A preliminary scan determined the WCDMA BAND II –middle channel – 1880 MHz - BW 5 MHz QPSK modulation as the worst case. The following tables and plots show the results for QPSK modulation.

1. CHANNEL: MIDDLE

Frequency range 30 MHz-1000 MHz.

No radiated spurious signals were detected at less than 20 dB respect to the limit.

Frequency range 1 GHz-18 GHz.

No radiated spurious signals were detected at less than 20 dB respect to the limit.

Frequency range 18 GHz-26.5 GHz.

No radiated spurious signals were detected at less than 20 dB respect to the limit.

Verdict: PASS

LTE Band:

LTE Band 25 QPSK AND 16QAM MODULATION. BW = 1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15MHz and 20MHz.

A preliminary scan determined that the highest channel with QPSK modulation and 1.4 MHz bandwidth as the worst case. The configuration of Resource Blocks was used RB=1 full offset.

The following tables and plots show the results for this configuration.

1. CHANNEL: HIGHEST

Frequency range 30 MHz-1000 MHz.

No radiated spurious signals were detected at less than 20 dB respect to the limit.

Frequency range 1 GHz-18 GHz.

Substitution method data

Frequency (MHz)	Instrument reading (dBm)	Polarization	(1) Generator output (dBm)	(2) Cable loss (dB)	(3) Substitution antenna gain Gi (respect to isotropic radiator) (dB)	E.I.R.P. (dBm) = (1) – (2) + (3)
3827.790	-60.14	Vertical	-76.45	1.69	11.93	-66.21
5741.750	-56.79	Horizontal	-68.83	1.70	12.46	-58.07
10531.350	-61.92	Horizontal	-61.23	2.36	10.12	-53.47

Measurement uncertainty (dB)	<±4.87 for f ≥ 1 GHz up to 18 GHz
------------------------------	-----------------------------------

Frequency range 18 GHz-26.5 GHz.

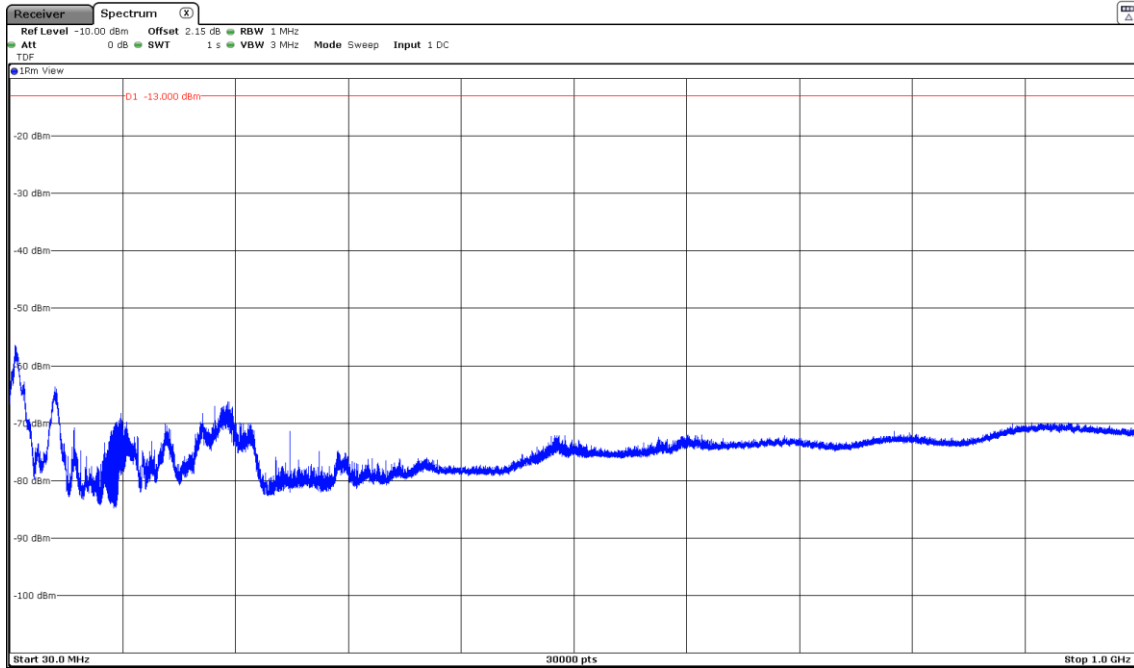
No radiated spurious signals were detected at less than 20 dB respect to the limit.

Verdict: PASS

FREQUENCY RANGE 30 MHz-1000 MHz.

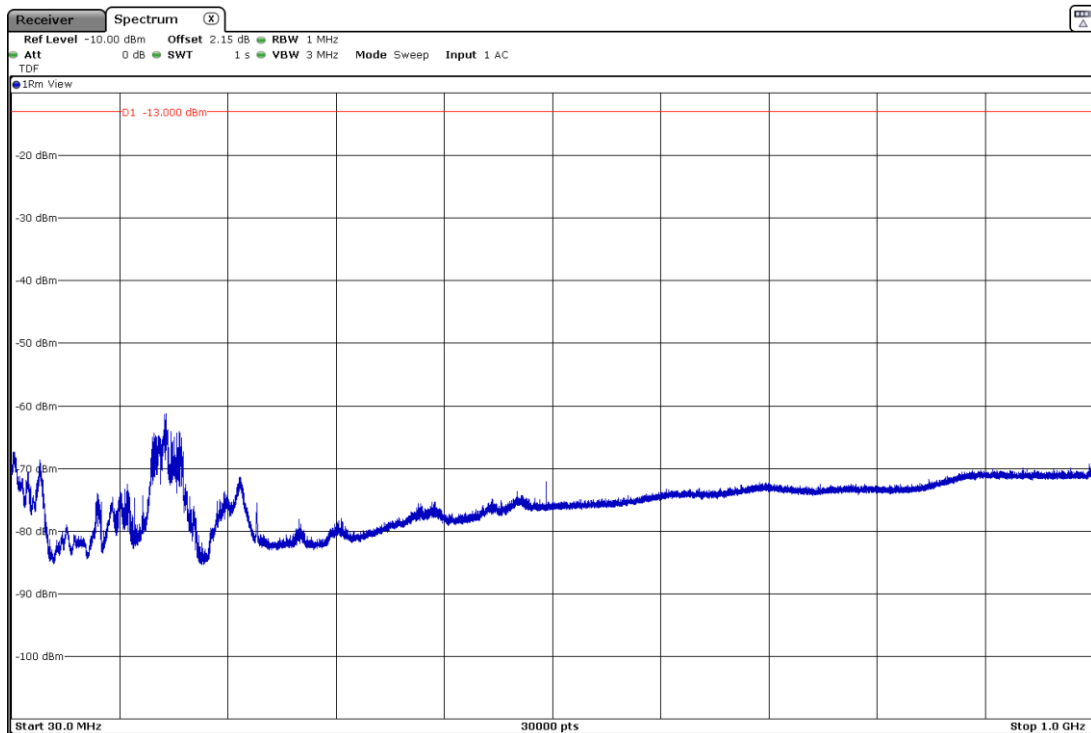
WCDMA MODULATION (Band II)

CHANNEL: MIDDLE



LTE Band 25 - QPSK MODULATION. BW=1.4 MHz

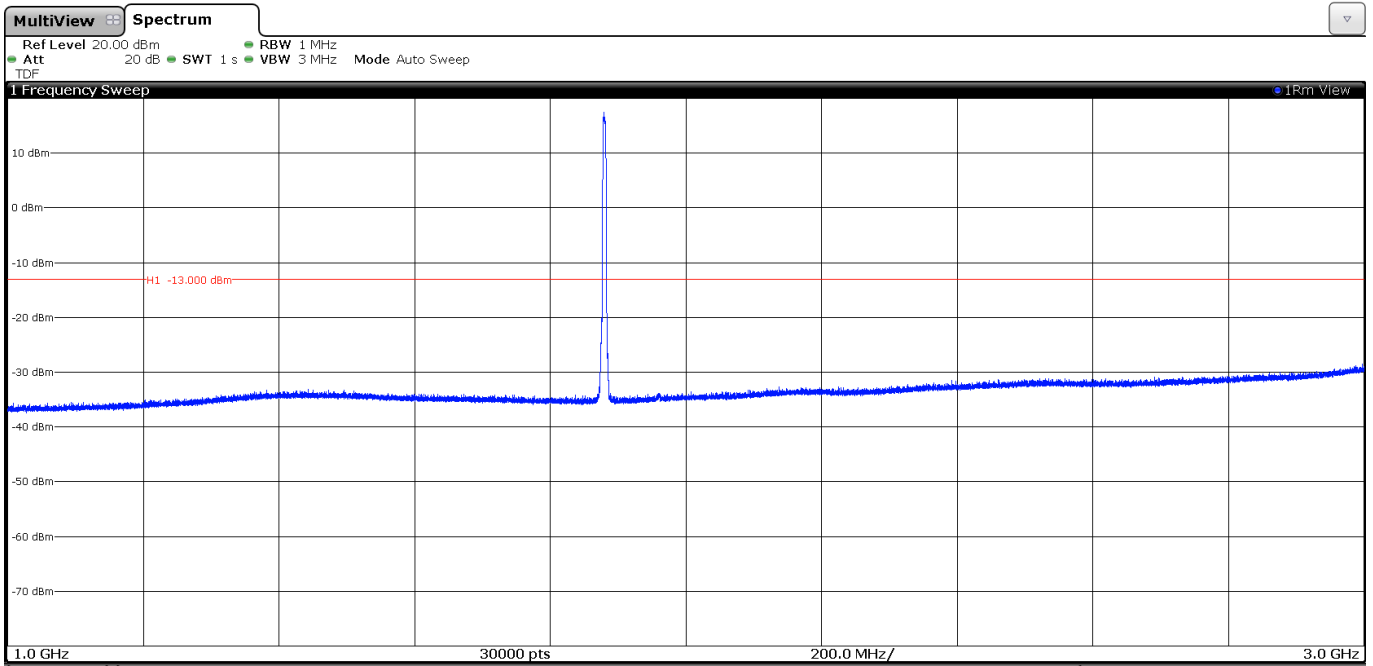
CHANNEL: HIGHEST



FREQUENCY RANGE 1 GHz to 3 GHz.

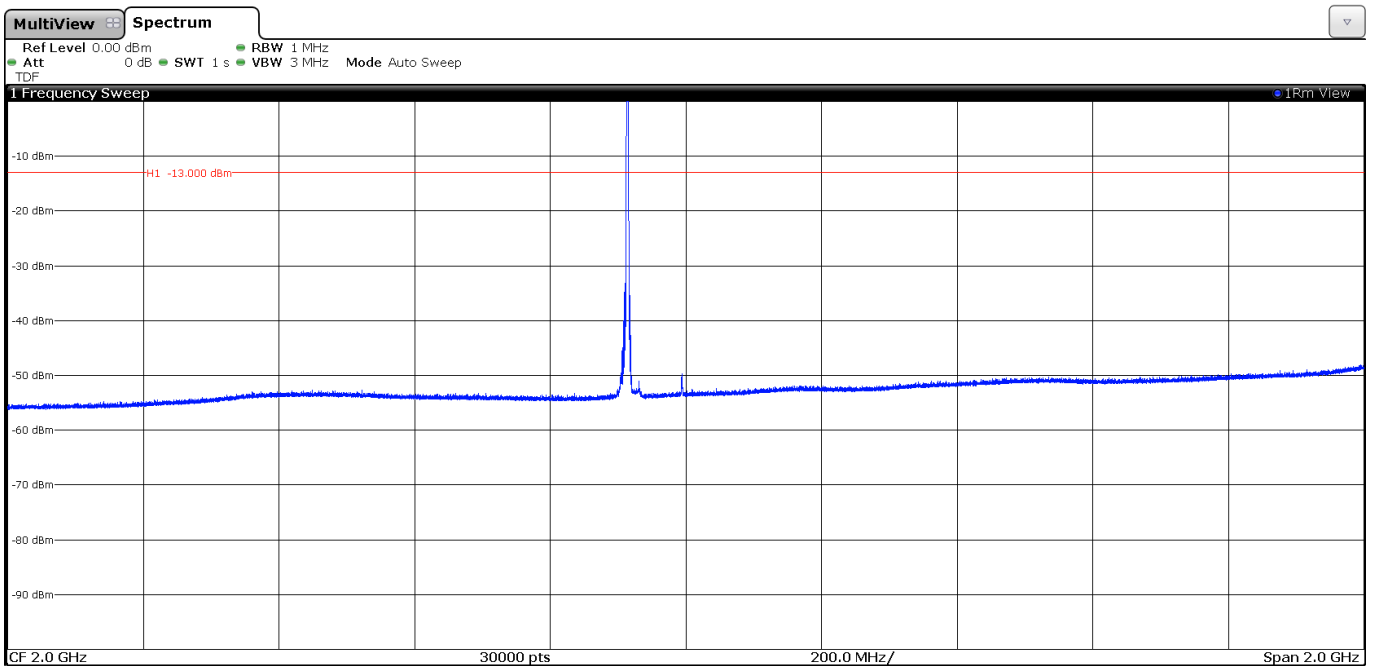
WCDMA MODULATION (Band II)

CHANNEL: MIDDLE



LTE Band 25 QPSK MODULATION. BW=1.4 MHz

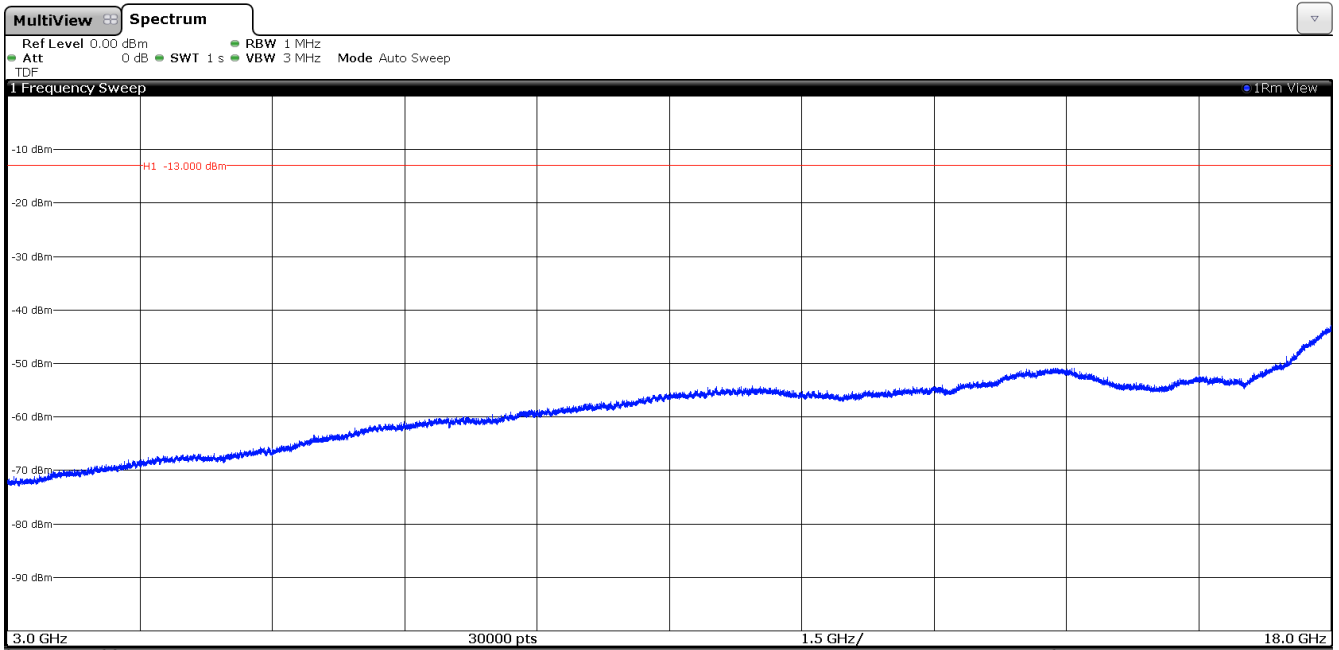
CHANNEL: HIGHEST



FREQUENCY RANGE 3 GHz to 18 GHz.

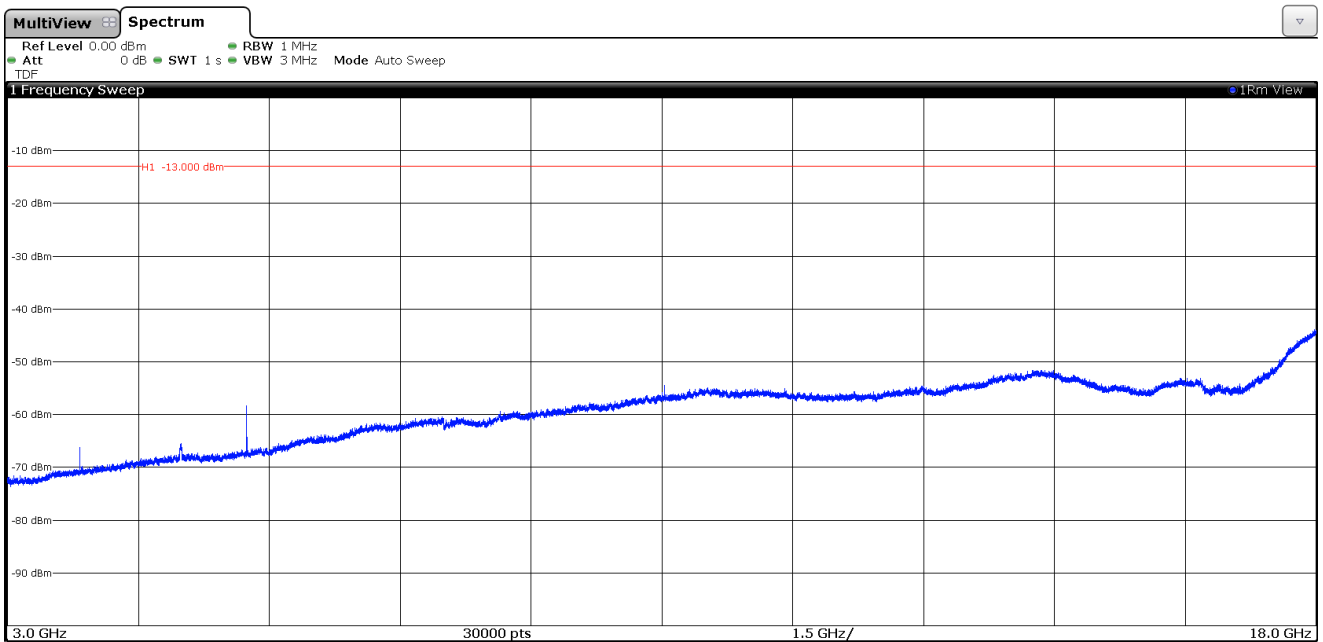
WCDMA MODULATION (Band II)

CHANNEL: MIDDLE



LTE Band 25 QPSK MODULATION. BW=1.4 MHz

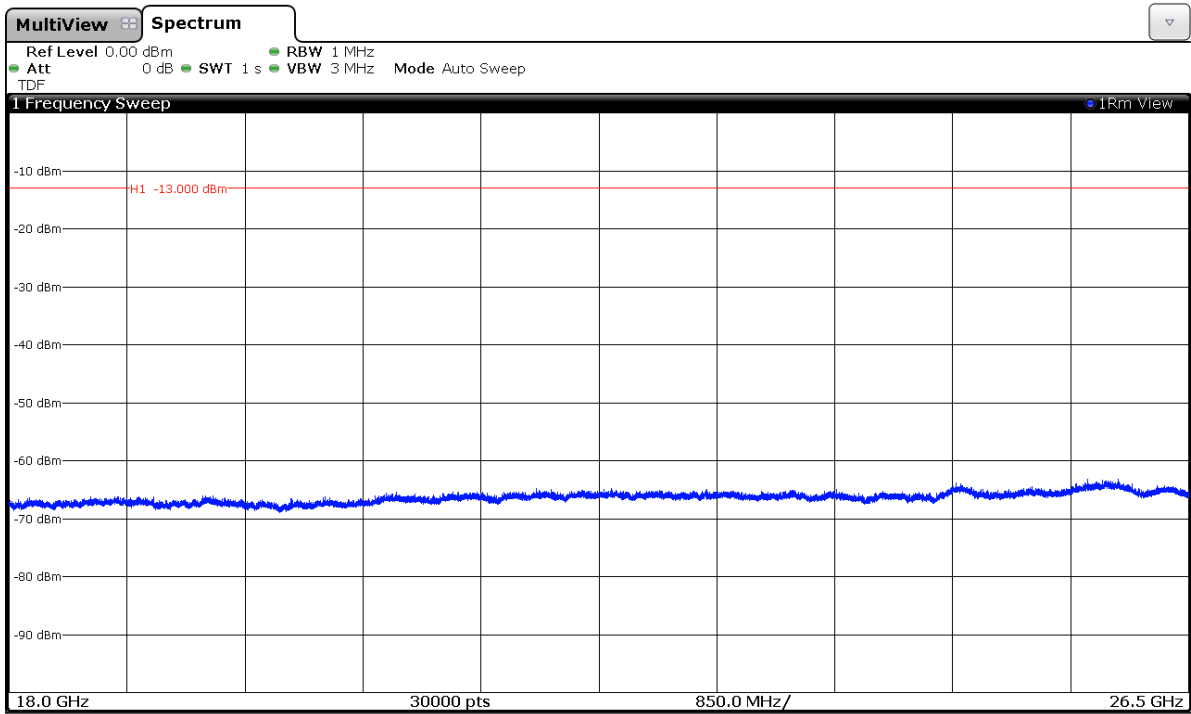
CHANNEL: HIGHEST



FREQUENCY RANGE 18 GHz to 26.5 GHz.

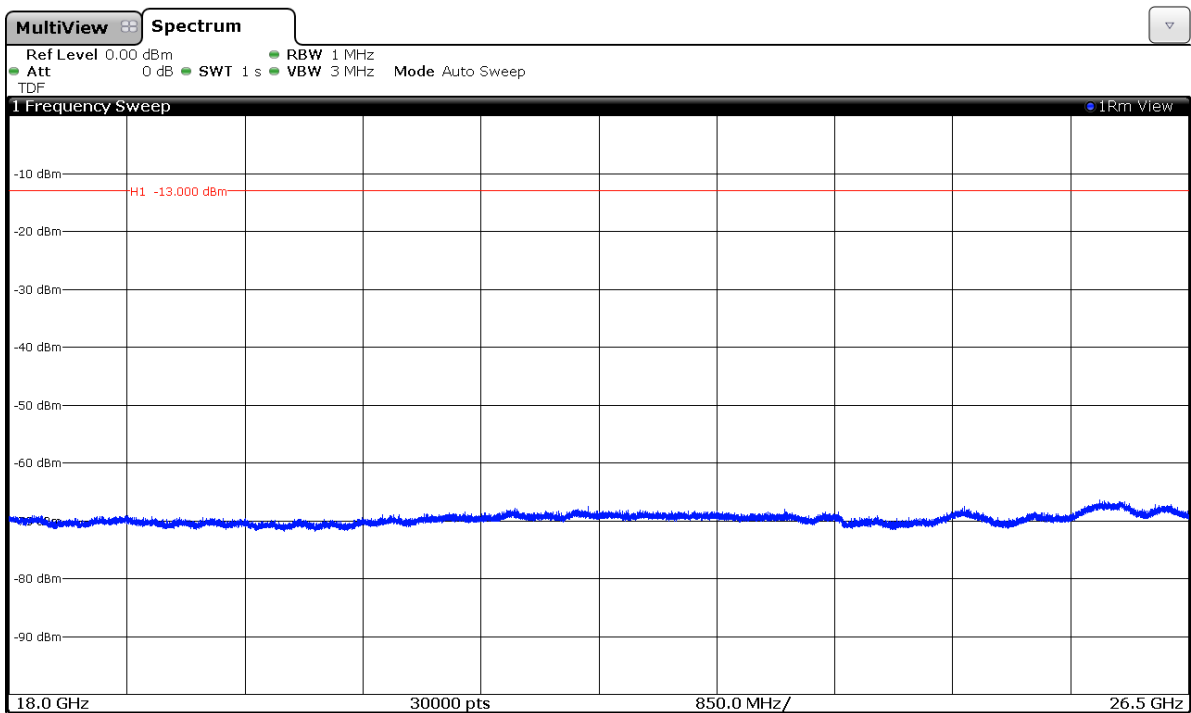
WCDMA MODULATION (Band II)

CHANNEL: MIDDLE



LTE Band 25 QPSK MODULATION. BW=1.4 MHz

CHANNEL: HIGHEST



Appendix C: Test results for FCC PART 27/CANADA RSS-130 & RSS-139 & RSS-199

INDEX

TEST CONDITIONS.....	33
Radiated emissions.....	35

TEST CONDITIONS

Power supply (V):

$$V_{nom} = 120 \text{ Vac}$$

$$V_{max} = \text{N/A}$$

$$V_{min} = \text{N/A}$$

The subscripts nom, min and max indicate voltage test conditions (nominal, minimum and maximum respectively, as declared by the applicant).

Type of power supply = AC Voltage from AC/DC adapter.

Type of antenna = Internal antenna

TEST FREQUENCIES:

WCDMA AND HSUPA MODULATION (Band IV)

Lowest channel (1312): 1712.4 MHz

Middle channel (1413): 1732.6 MHz

Highest channel (1513): 1752.6 MHz

LTE. QPSK AND 16QAM MODULATION (BAND 4)

	Channel (Frequency. MHz)					
	BW = 1.4 MHz	BW = 3 MHz	BW = 5 MHz	BW = 10 MHz	BW = 15 MHz	BW = 20 MHz
Lowest	19957 (1710.7)	19965 (1711.5)	19975 (1712.5)	20000 (1715.0)	20025 (1717.5)	20050 (1720.0)
Middle	20175 (1732.5)	20175 (1732.5)	20175 (1732.5)	20175 (1732.5)	20175 (1732.5)	20175 (1732.5)
Highest	20393 (1754.3)	20385 (1753.5)	20375 (1752.5)	20350 (1750.0)	20325 (1747.5)	20300 (1745.0)

LTE. QPSK AND 16QAM MODULATION (BAND 12)

	Channel (Frequency. MHz)			
	BW = 1.4 MHz	BW = 3 MHz	BW = 5 MHz	BW = 10 MHz
Lowest	23017 (699.7)	23025 (700.5)	23035 (701.5)	23060 (704.0)
Middle	23095 (707.5)	23095 (707.5)	23095 (707.5)	23095 (707.5)
Highest	23173 (715.3)	23165 (714.5)	23155 (713.5)	23130 (711.0)

LTE. QPSK AND 16QAM MODULATION (BAND 13)

	Channel (Frequency, MHz)	
	BW = 5 MHz	BW = 10 MHz
Lowest	23205 (779.5)	N/A
Middle	23230 (782.0)	23230 (782.0)
Highest	23255 (784.5)	N/A

LTE. QPSK AND 16QAM MODULATION (BAND 41)

	Channel (Frequency. MHz)			
	BW = 5 MHz	BW = 10 MHz	BW = 15 MHz	BW = 20 MHz
Lowest	39675 (2498.5)	39700 (2501.0)	39725 (2503.5)	39750 (2506.0)
Middle	40620 (2593.0)	40620 (2593.0)	40620 (2593.0)	40620 (2593.0)
Highest	41565 (2687.5)	41540 (2685.0)	41515 (2682.5)	41490 (2680.0)

Radiated emissions

SPECIFICATION

WCDMA BAND IV and LTE BAND 4.

FCC §27.53 (h). RSS-139 Clause 6.6.

According to specification, the power of emissions shall be attenuated below the transmitter power (P) by a factor of at least $43 + 10 \log (P)$ dB. P in watts.

LTE BAND 12.

FCC §27.53 (g).

For operations in the 600 MHz band and the 698-746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least $43 + 10 \log (P)$ dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater.

RSS-130 Clause 4.6.

The power of any unwanted emissions in any 100 kHz bandwidth on any frequency outside the frequency range(s) within which the equipment is designed to operate shall be attenuated below the transmitter power, P (dBW), by at least $43 + 10 \log_{10} p$ (watts), dB.

LTE BAND 13.

FCC §27.53 (g) & (f).

On any frequency outside the 776-788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least $43 + 10 \log (P)$ dB.

On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than $65 + 10 \log (P)$ dB in a 6.25 kHz band segment, for mobile and portable stations.

For operations in the 746-758 MHz, 775-788 MHz, and 805-806 MHz bands, emissions in the band 1559-1610 MHz shall be limited to -70 dBW (-40 dBm)/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and -80 dBW (-50 dBm) EIRP for discrete emissions of less than 700 Hz bandwidth.

RSS-130 Clause 4.6.

The power of any unwanted emissions in any 100 kHz bandwidth on any frequency outside the frequency range(s) within which the equipment is designed to operate shall be attenuated below the transmitter power, P (dBW), by at least $43 + 10 \log_{10} p$ (watts), dB.

The power of any unwanted emissions in any 6.25 kHz bandwidth for all frequencies between 763-775 MHz and 793-806 MHz shall be attenuated below the transmitter power, P (dBW), by at least $65 + 10 \log_{10} p$ (watts), dB, for mobile and portable equipment.

The e.i.r.p. in the band 1559-1610 MHz shall not exceed -70 dBW (-40 dBm) /MHz for wideband signal and -80 dBW (-50 dBm) for discrete emission with bandwidth less than 700 Hz.

LTE BAND 41.

FCC §27.53 (m). RSS-199 Clause 4.5.

For mobile digital stations, the attenuation factor shall be not less than $40 + 10 \log (P)$ dB on all frequencies between the channel edge and 5 megahertz from the channel edge, $43 + 10 \log (P)$ dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and $55 + 10 \log (P)$ dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less than $43 + 10 \log (P)$ dB on all frequencies between 2490.5 MHz and 2496 MHz and $55 + 10 \log (P)$ dB at or below 2490.5 MHz.

At P_o transmitting power, the specified minimum attenuation becomes $40+10 \log (P_o)$, and the level in dBm relative P_o becomes:

$$P_o \text{ (dBm)} - [40 + 10 \log (P_o \text{ in mwatts}) - 30] = -10 \text{ dBm.}$$

At P_o transmitting power, the specified minimum attenuation becomes $43+10 \log (P_o)$, and the level in dBm relative P_o becomes:

$$P_o \text{ (dBm)} - [43 + 10 \log (P_o \text{ in mwatts}) - 30] = -13 \text{ dBm.}$$

At P_o transmitting power, the specified minimum attenuation becomes $55+10 \log (P_o)$, and the level in dBm relative P_o becomes:

$$P_o \text{ (dBm)} - [55 + 10 \log (P_o \text{ in mwatts}) - 30] = -25 \text{ dBm.}$$

METHOD

The measurement was performed with the EUT inside an anechoic chamber. The spectrum was scanned from 30 MHz to at least the 10th harmonic of the highest frequency generated within the equipment.

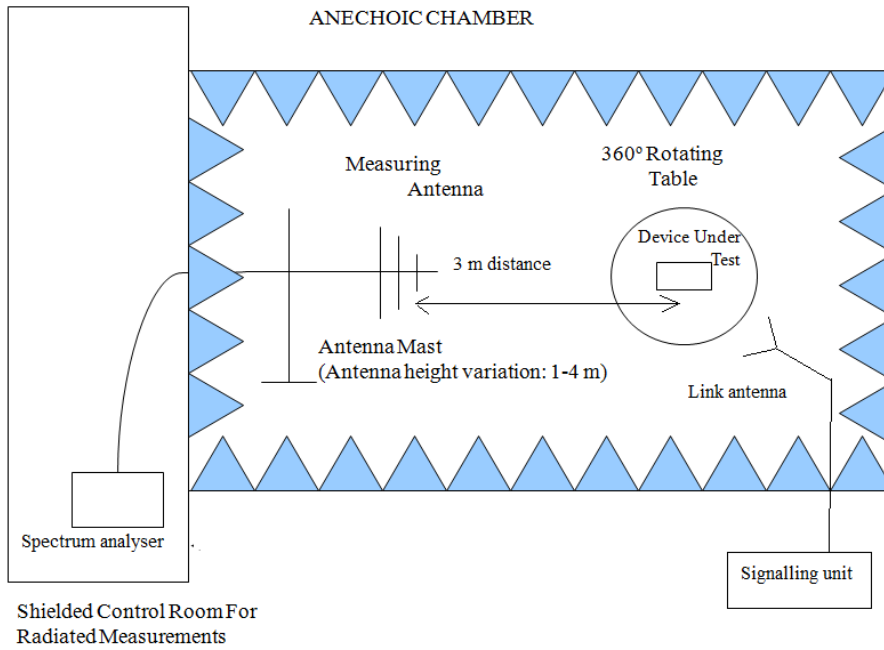
The EUT was placed on a non-conductive stand at a 3 meter distance from the measuring antenna for measurements below 1 GHz and at 1 m distance for measurements above 1 GHz.

Detected emissions were maximized at each frequency by rotating the EUT and adjusting the measuring antenna height and polarization. The maximum meter reading was recorded.

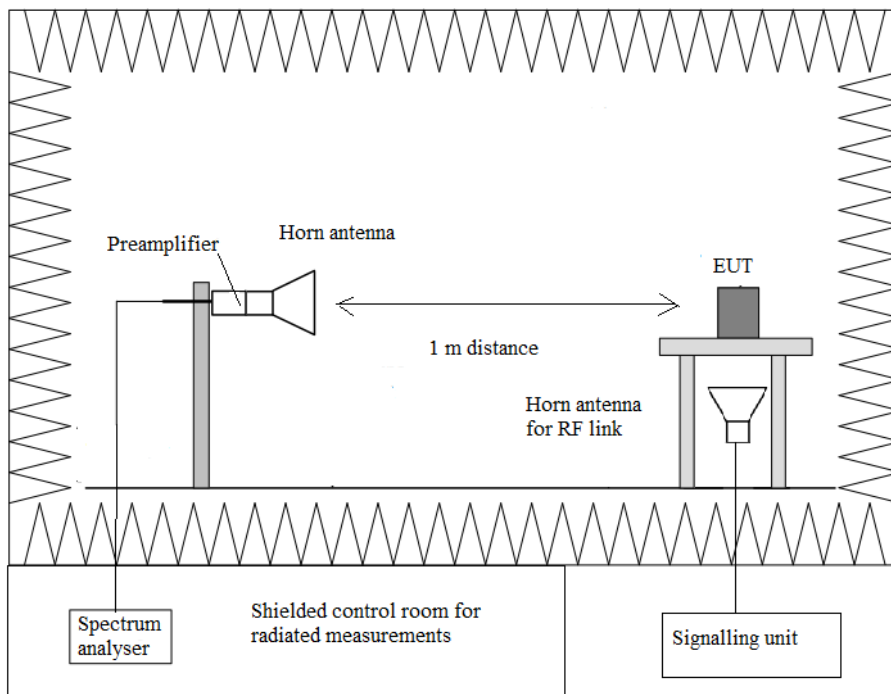
Each detected emission at less than 20 dB respect to the limit is substituted by the Substitution method in accordance with the ANSI/TIA-603-E.

TEST SETUP

Radiated measurements below 1 GHz.



Radiated measurements above 1 GHz.



RESULTS

WCDMA Band:

A preliminary scan determined the WCDMA BAND IV – middle channel – 1732.6 MHz - BW 5 MHz QPSK modulation as the worst case. The following tables and plots show the results for QPSK modulation.

1. CHANNEL: MIDDLE

Frequency range 30 MHz-1000 MHz.

No radiated spurious signals were detected at less than 20 dB respect to the limit.

Frequency range 1 GHz-18 GHz.

Substitution method data

Frequency (MHz)	Instrument reading (dBm)	Polarization	(1) Generator output (dBm)	(2) Cable loss (dB)	(3) Substitution antenna gain G_i (respect to isotropic radiator) (dB)	E.I.R.P. (dBm) = (1) – (2) + (3)
5194.21	-61.41	Vertical	-73.79	2.78	12.07	-64.50

Measurement uncertainty (dB)	<±4.87 for $f \geq 1$ GHz up to 18 GHz
------------------------------	--

LTE Bands:

LTE QPSK AND 16QAM MODULATION. Band 4. BW = 1.4 MHz, 3MHz, 5MHz, 10MHz, 15MHz and 20 MHz.

A preliminary scan determined that the lowest channel with QPSK modulation and 1.4 MHz bandwidth as the worst case. The configuration of Resource Blocks was used RB=1 no offset.

The following tables and plots show the results for this configuration.

1. CHANNEL: LOWEST

Frequency range 30 MHz-1000 MHz.

No radiated spurious signals were detected at less than 20 dB respect to the limit.

Frequency range 1 GHz-18 GHz.

Substitution method data

Frequency (MHz)	Instrument reading (dBm)	Polarization	(1) Generator output (dBm)	(2) Cable loss (dB)	(3) Substitution antenna gain G_i (respect to isotropic radiator) (dB)	E.I.R.P. (dBm) = (1) – (2) + (3)
5130.75	-54.18	Vertical	-66.56	2.72	11.91	-57.36

Measurement uncertainty (dB)	<±4.87 for $f \geq 1$ GHz up to 18 GHz
------------------------------	--

LTE QPSK AND 16QAM MODULATION. Band 12. BW = 1.4 MHz, 3 MHz, 5 MHz. and 10 MHz.

A preliminary scan determined that the highest channel with QPSK modulation and 5 MHz bandwidth as the worst case. The configuration of Resource Blocks was used RB=1 full offset.

The following tables and plots show the results for this configuration.

1. CHANNEL: HIGHEST

Frequency range 30 MHz-1000 MHz.

No radiated spurious signals were detected at less than 20 dB respect to the limit.

Frequency range 1 GHz-18 GHz.

Substitution method data

Frequency (MHz)	Instrument reading (dBm)	Polarization	(1) Generator output (dBm)	(2) Cable loss (dB)	(3) Substitution antenna gain Gi (respect to isotropic radiator) (dB)	E.I.R.P. (dBm) = (1) – (2) + (3)
1431.3	-46.27	Vertical	-65.27	0.72	7.66	-58.34
2147.1	-38.31	Horizontal	-57.62	1.00	10.25	-48.37

Measurement uncertainty (dB)	<±4.87 for f ≥ 1 GHz up to 18 GHz
------------------------------	-----------------------------------

LTE QPSK AND 16QAM MODULATION. Band 13. BW = 5 MHz. and 10 MHz.

A preliminary scan determined that the lowest channel with QPSK modulation and 5 MHz bandwidth as the worst case. The configuration of Resource Blocks was used RB=1 no offset.

The following tables and plots show the results for this configuration.

1. CHANNEL: LOWEST

Frequency range 30 MHz-1000 MHz.

No radiated spurious signals were detected at less than 20 dB respect to the limit.

Frequency range 1 GHz-18 GHz.

Substitution method data

Frequency (MHz)	Instrument reading (dBm)	Polarization	(1) Generator output (dBm)	(2) Cable loss (dB)	(3) Substitution antenna gain Gi (respect to isotropic radiator) (dB)	E.I.R.P. (dBm) = (1) – (2) + (3)
1164.167	-56.24	Vertical	-74.76	0.59	6.32	-69.03
1256.300	-51.12	Vertical	-69.80	0.63	6.78	-63.65
2339.033	-51.55	Horizontal	-70.50	1.04	10.44	-61.10

Measurement uncertainty (dB)	<±4.87 for f ≥ 1 GHz up to 18 GHz
------------------------------	-----------------------------------

Frequency range 1559 MHz-1610 MHz.

Substitution method data

Frequency (MHz)	Instrument reading (dBm)	Polarization	(1) Generator output (dBm)	(2) Cable loss (dB)	(3) Substitution antenna gain Gi (respect to isotropic radiator) (dB)	E.I.R.P. (dBm) = (1) – (2) + (3)
1559.620	-52.55	Horizontal	-71.69	0.79	8.25	-64.23
1566.783	-56.66	Horizontal	-75.81	0.79	8.28	-68.32
1570.537	-47.08	Horizontal	-66.23	0.79	8.30	-58.73
1587.642	-45.64	Vertical	-64.81	0.80	8.37	-57.24
1600.328	-56.53	Vertical	-75.71	0.81	8.42	-68.10

Measurement uncertainty (dB)	<±4.87 for $f \geq 1$ GHz up to 18 GHz
------------------------------	--

LTE QPSK AND 16QAM MODULATION. Band 41. BW = 5 MHz, 10MHz, 15MHz and 20 MHz.

A preliminary scan determined that the highest channel with QPSK modulation and 5 MHz bandwidth as the worst case. The configuration of Resource Blocks was used RB=1 full offset.

The following tables and plots show the results for this configuration.

1. CHANNEL: HIGHEST

Frequency range 30 MHz-1000 MHz.

No radiated spurious signals were detected at less than 20 dB respect to the limit.

Frequency range 1 GHz-3 GHz.

No radiated spurious signals were detected at less than 20 dB respect to the limit.

Frequency range 3 GHz-18 GHz.

Frequency (MHz)	Instrument reading (dBm)	Polarization	(1) Generator output (dBm)	(2) Cable loss (dB)	(3) Substitution antenna gain Gi (respect to isotropic radiator) (dB)	E.I.R.P. (dBm) = (1) – (2) + (3)
2517.645	-28.39	Horizontal	-46.93	1.08	10.62	-37.39
5342.270	-60.56	Vertical	-74.24	1.64	12.42	-63.46
16026.380	-64.40	Vertical	-64.88	2.97	16.55	-51.30

Measurement uncertainty (dB)	<±4.87 for $f \geq 1$ GHz up to 18 GHz
------------------------------	--

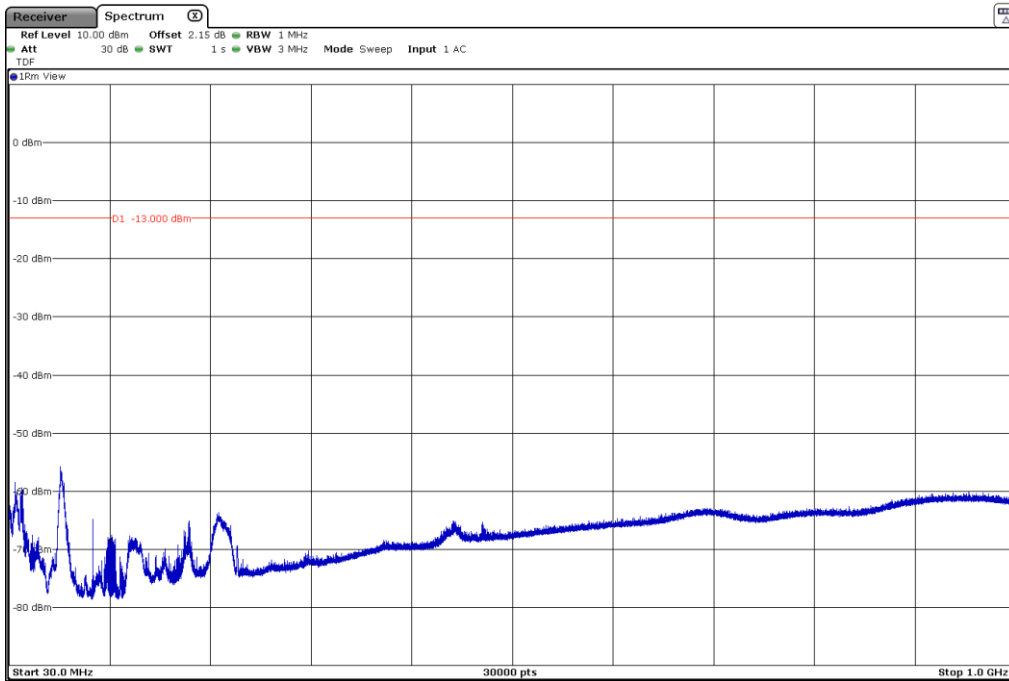
Frequency range 18 GHz-26.5 GHz.

No radiated spurious signals were detected at less than 20 dB respect to the limit.

FREQUENCY RANGE 30 MHz-1000 MHz.

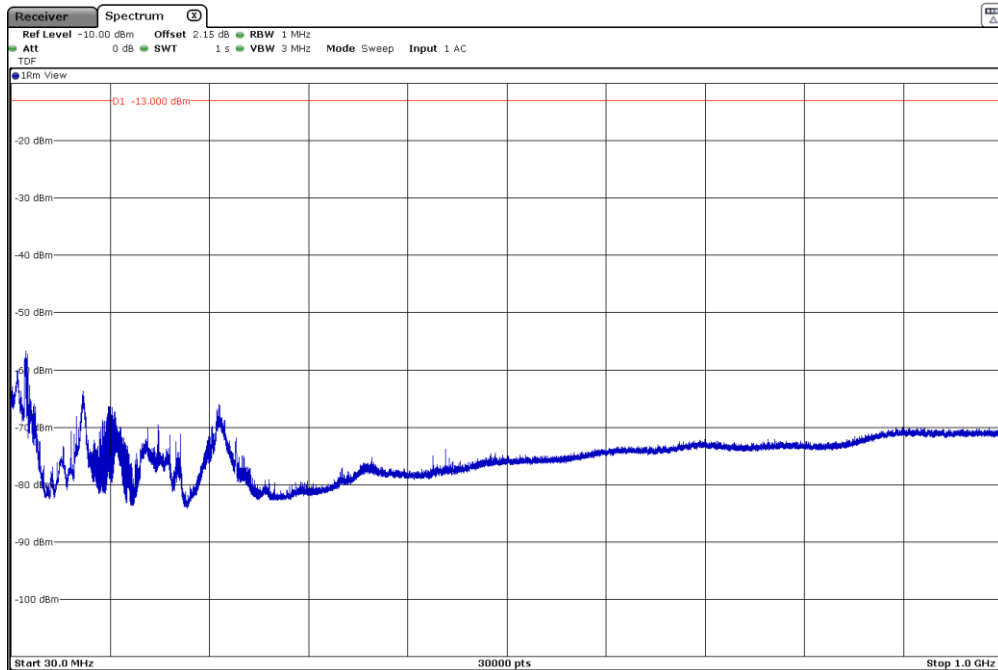
WCDMA MODULATION (Band IV)

CHANNEL: MIDDLE



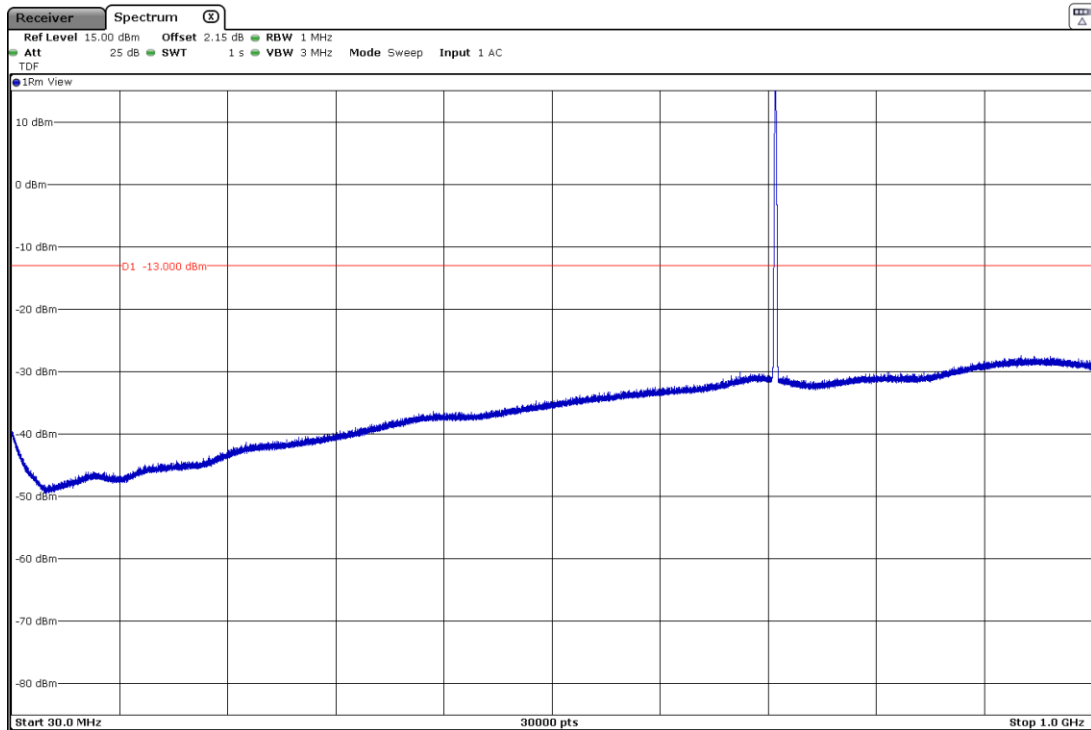
LTE Band 4 QPSK MODULATION. BW=1.4 MHz

CHANNEL: LOWEST



LTE Band 12 QPSK MODULATION. BW=5 MHz

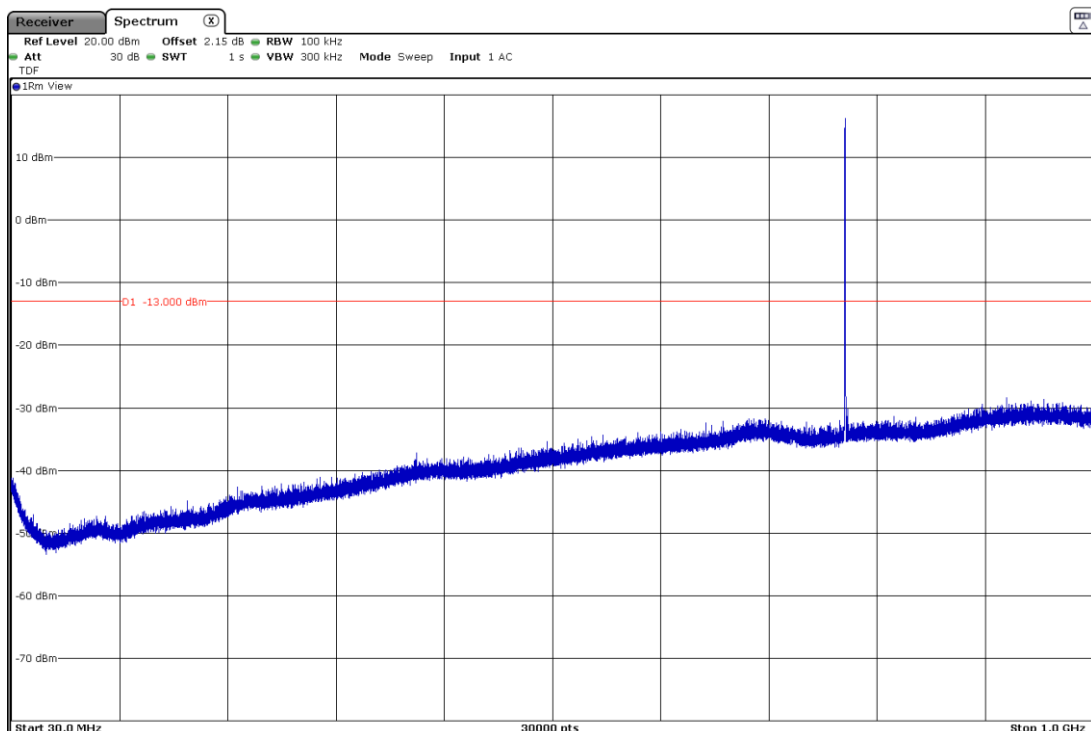
CHANNEL: HIGHEST



Note: The peak above the limit is the carrier frequency.

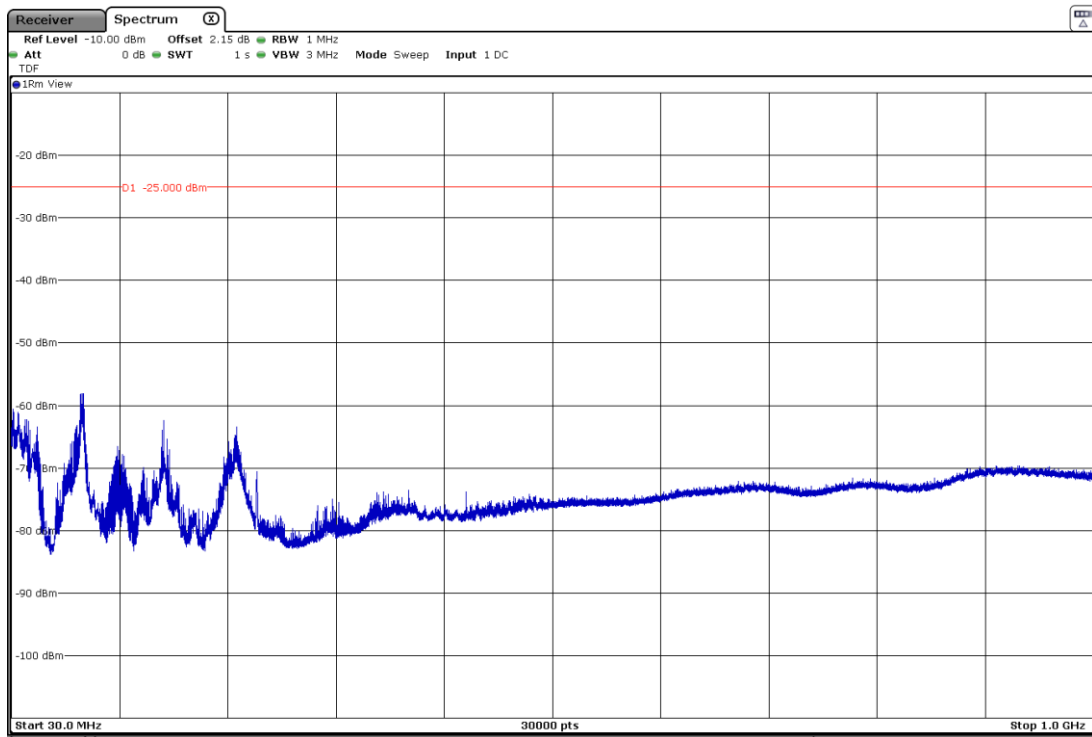
LTE Band 13 QPSK MODULATION. BW=5 MHz

CHANNEL: LOWEST



Note: The peak above the limit is the carrier frequency.

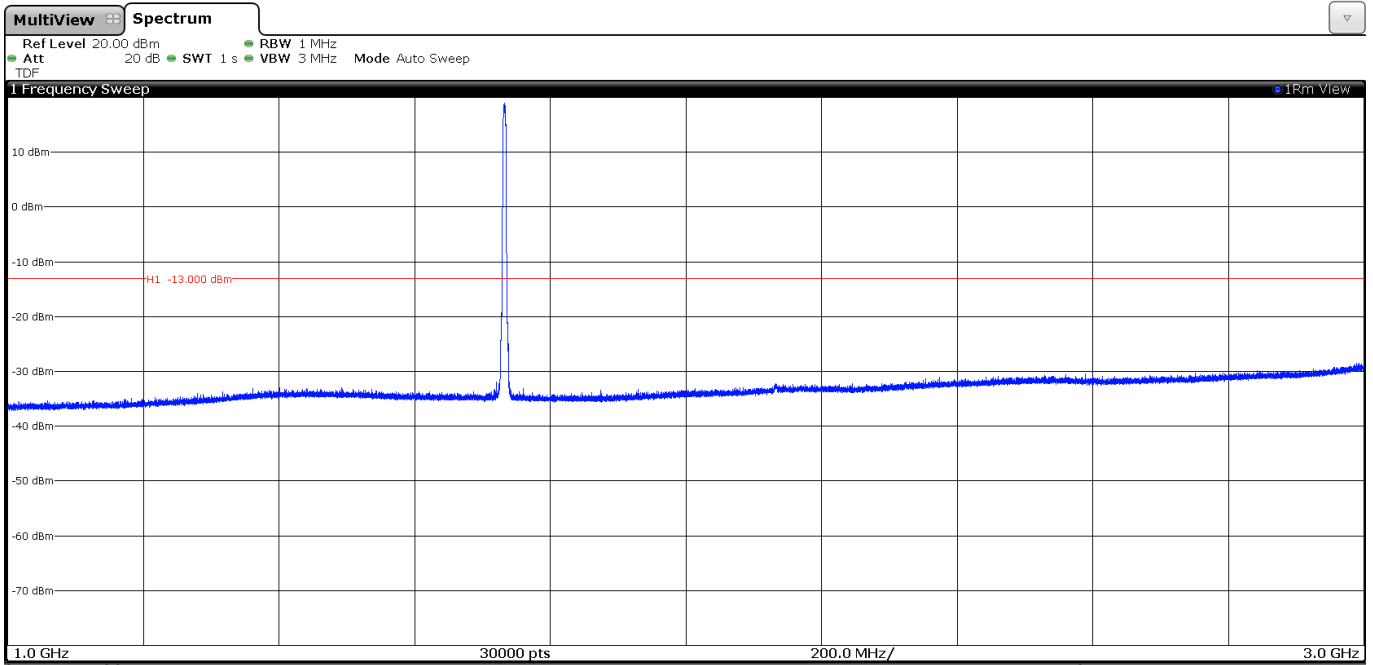
LTE Band 41. QPSK MODULATION. BW=5 MHz CHANNEL: HIGHEST



Frequency range 1 GHz to 3 GHz.

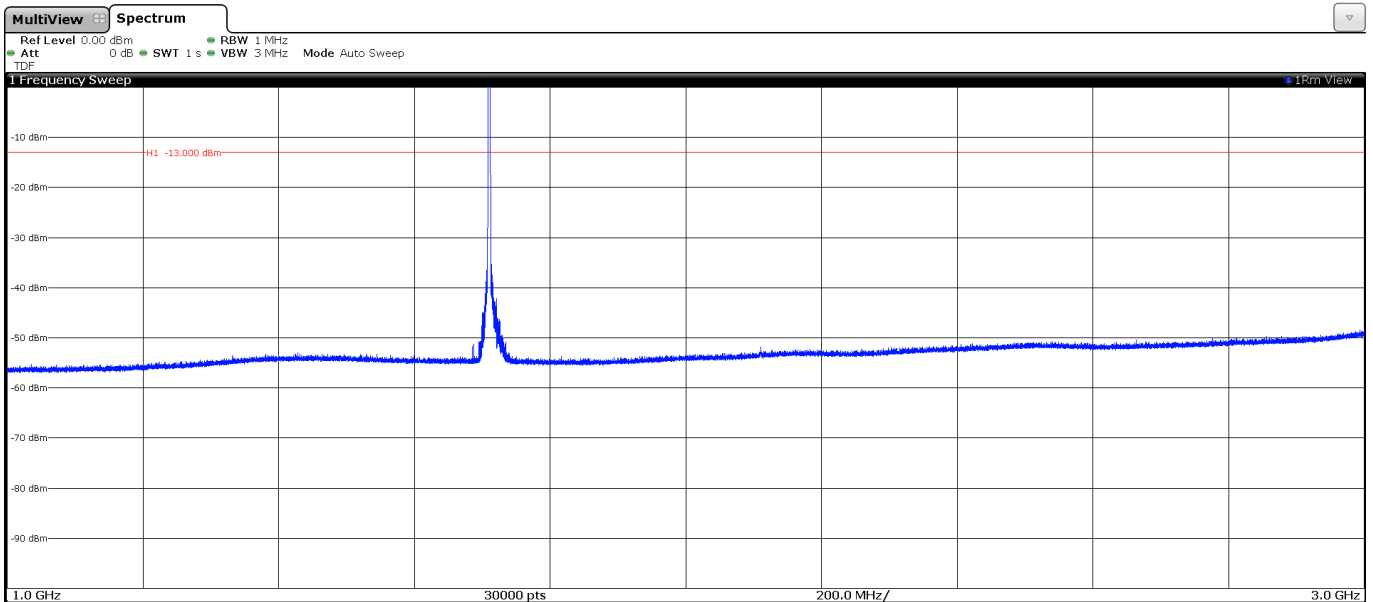
WCDMA MODULATION (Band IV)

CHANNEL: MIDDLE



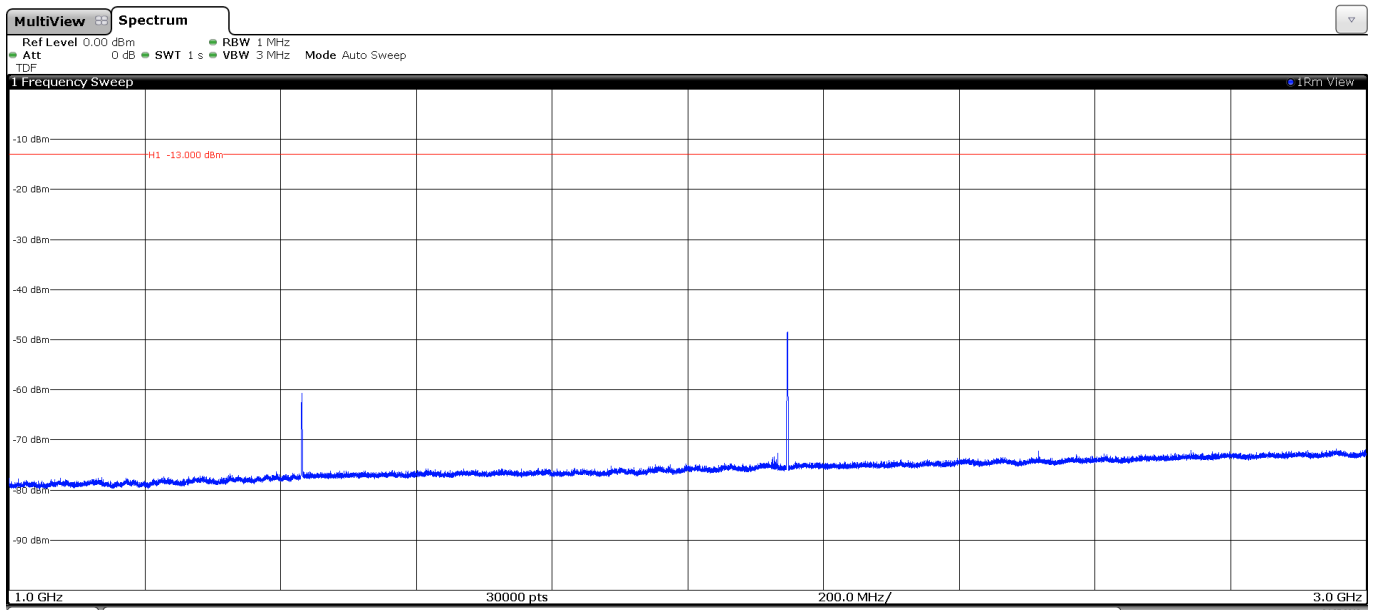
LTE Band 4 QPSK MODULATION. BW=1.4 MHz.

CHANNEL: LOWEST



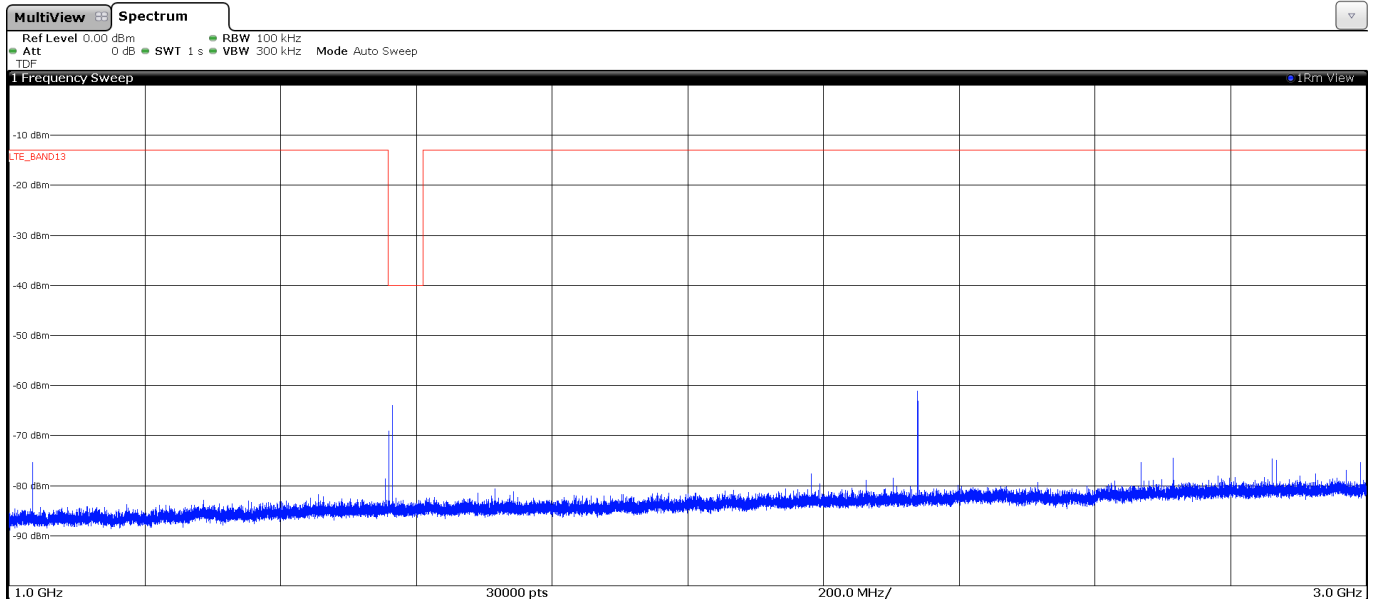
LTE Band 12 QPSK MODULATION. BW=5 MHz.

CHANNEL: HIGHEST



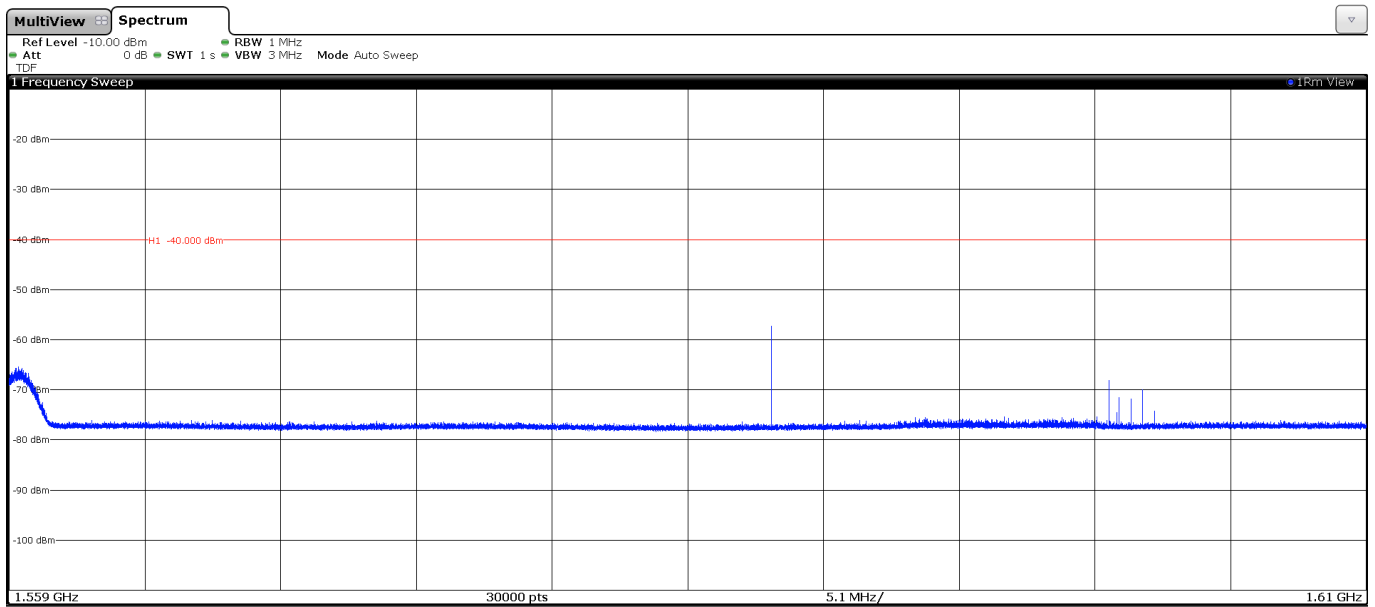
LTE Band 13 QPSK MODULATION. BW=5 MHz.

CHANNEL: LOWEST



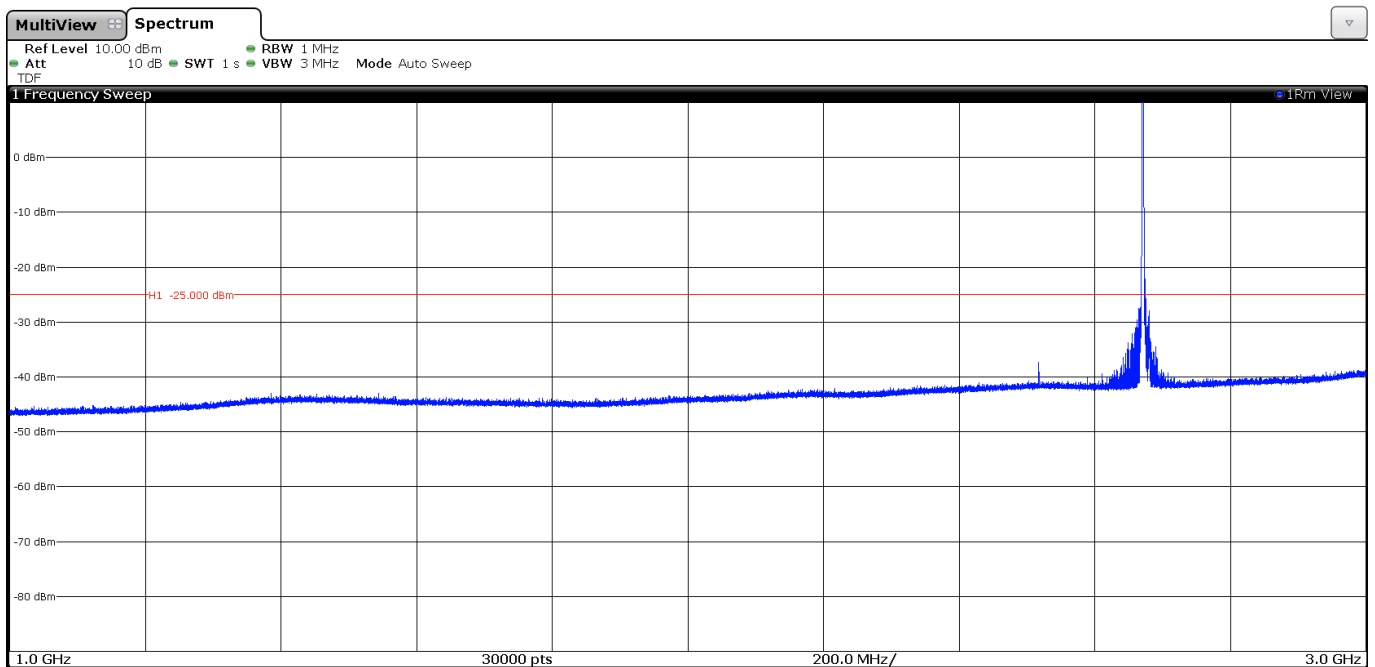
LTE Band 13. Frequency range 1559 MHz to 1610 MHz.

CHANNEL: LOWEST

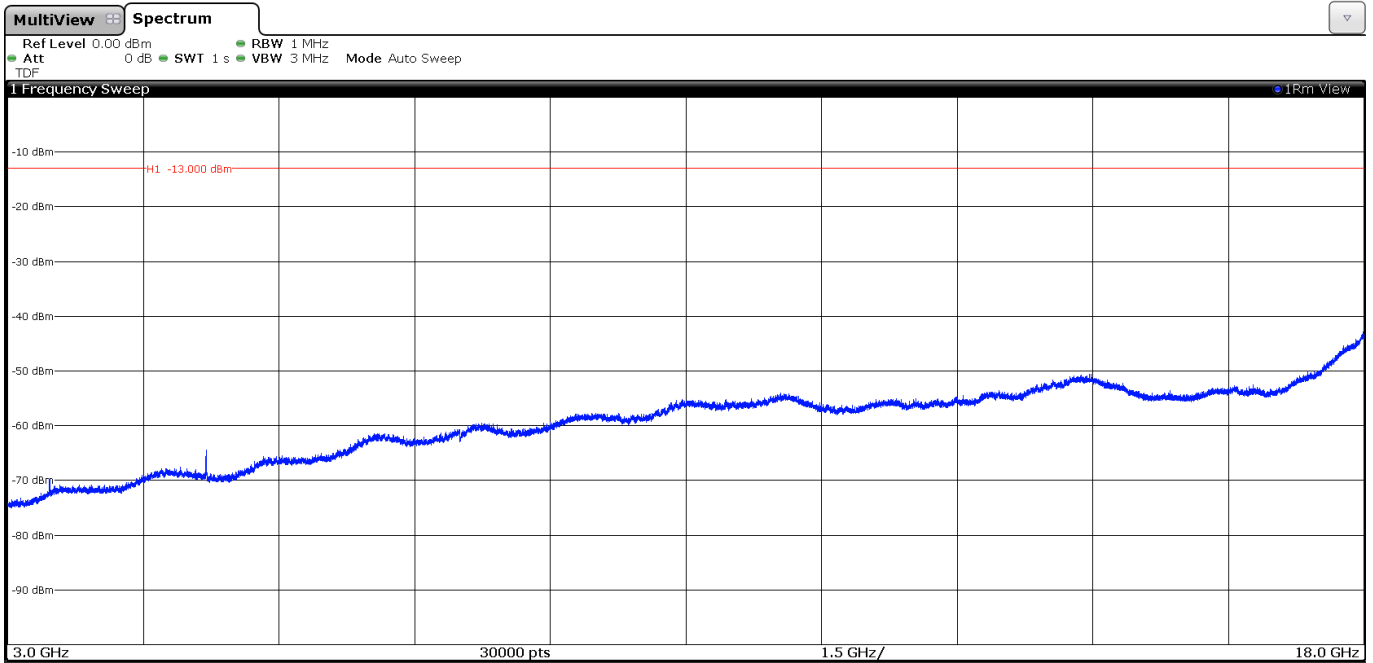


LTE Band 41 QPSK MODULATION. BW=5 MHz.

CHANNEL: HIGHEST

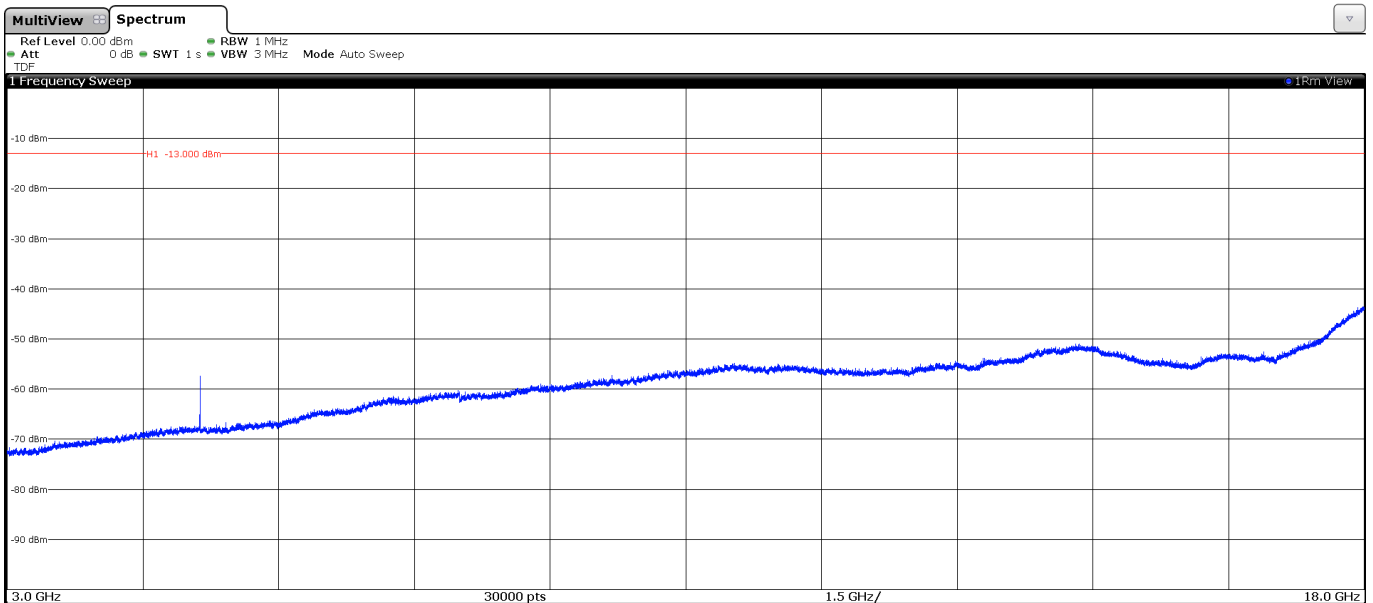


Frequency range 3 GHz to 18 GHz.
WCDMA MODULATION (Band IV)
CHANNEL: MIDDLE



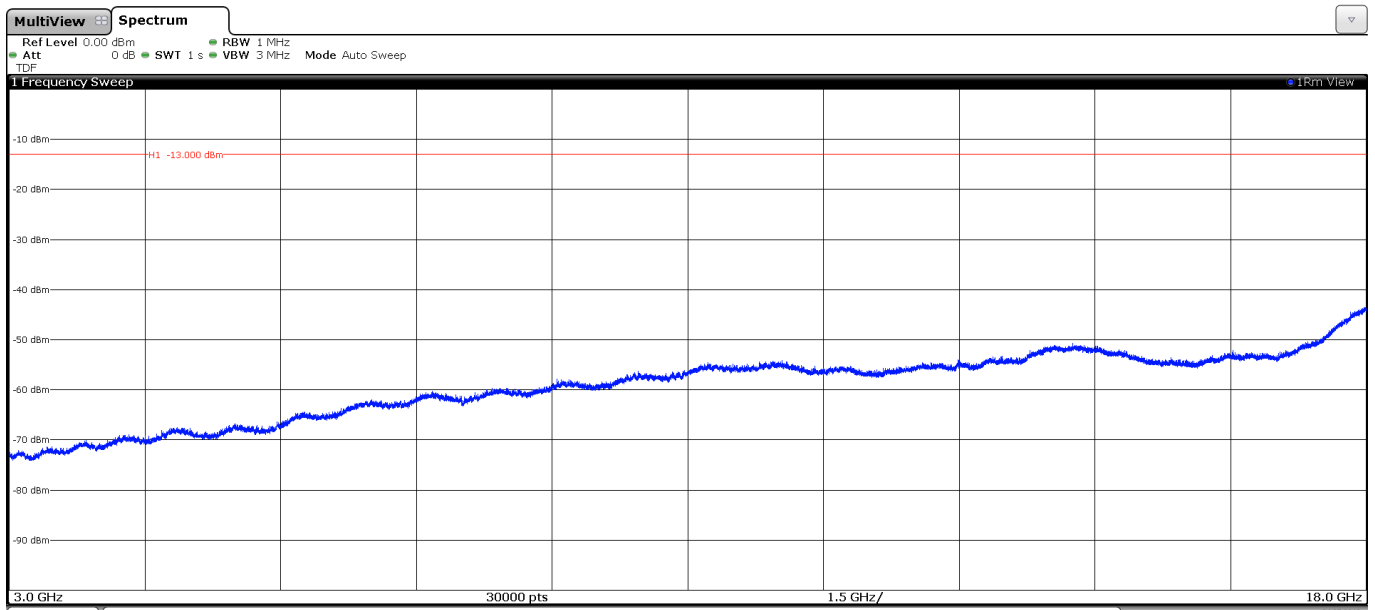
LTE Band 4 QPSK MODULATION. BW=1.4 MHz.

CHANNEL: LOWEST



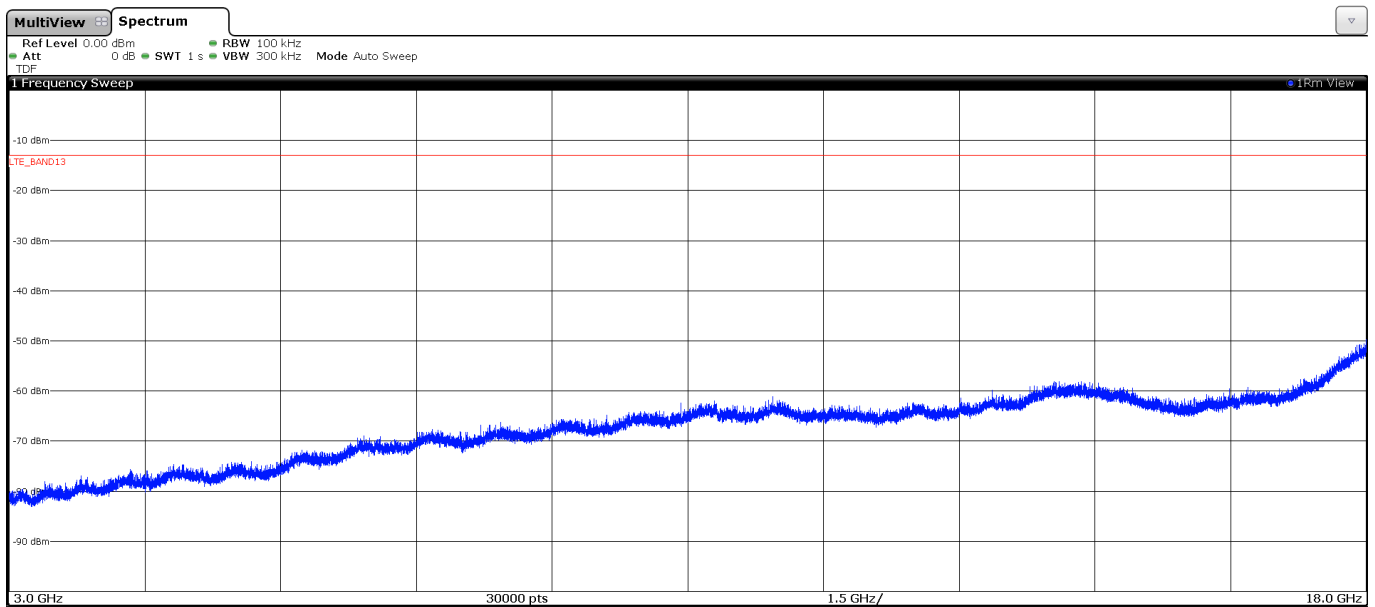
LTE Band 12 QPSK MODULATION. BW=5 MHz.

CHANNEL: HIGHEST

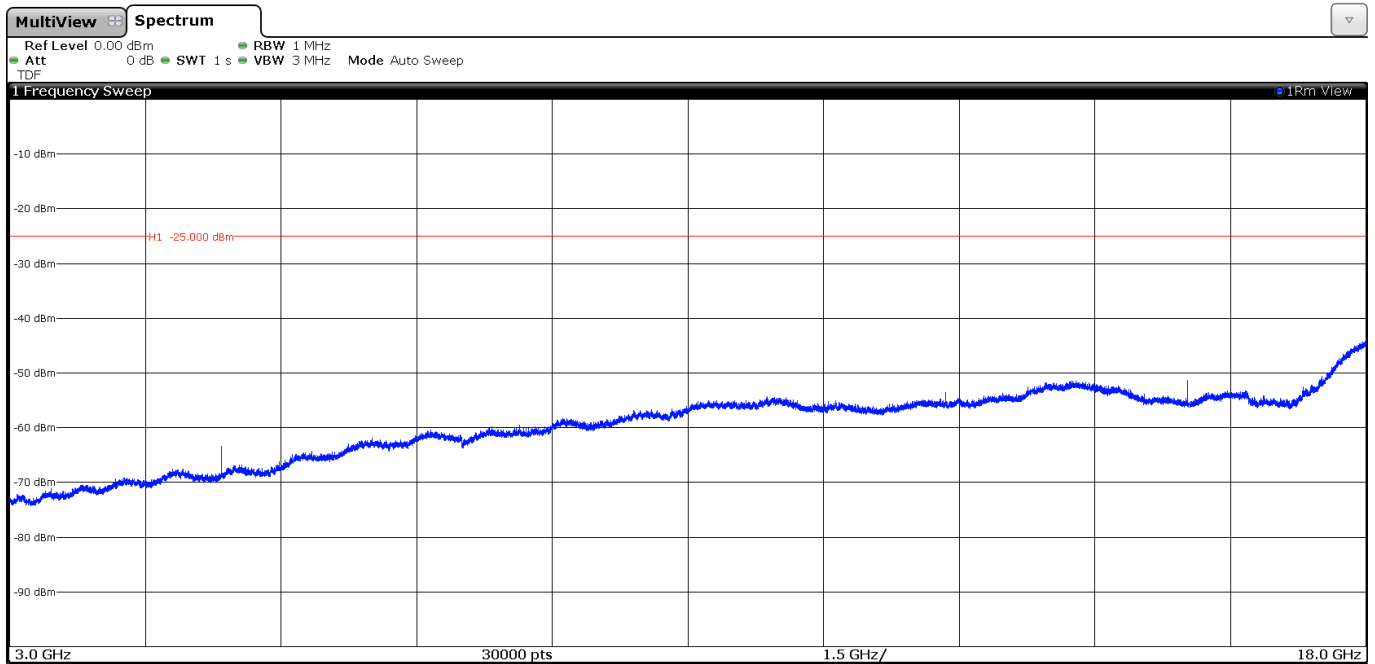


LTE Band 13 QPSK MODULATION. BW=5 MHz.

CHANNEL: LOWEST



LTE Band 41 QPSK MODULATION. BW=5 MHz.
CHANNEL: HIGHEST



Frequency range 18 GHz to 26.5 GHz.
LTE Band 41 QPSK MODULATION. BW=5 MHz.
CHANNEL: HIGHEST

