

# FCC Test Report

## (PART 27)

**Report No.:** RF160112E05

**FCC ID:** 2AD8UFW2IADPM01

**Test Model:** FW2IADPM01

**Received Date:** Jan. 12, 2016

**Test Date:** Feb. 01 to 02, 2016

**Issued Date:** Feb. 25, 2016

**Applicant:** Nokia Solutions and Networks

**Address:** 1455 West Shure Drive, Arlington Heights, IL 60004, USA

**Issued By:** Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch  
Hsin Chu Laboratory

**Lab Address:** E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300,  
Taiwan R.O.C.

**Test Location (1):** E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300,  
Taiwan R.O.C.

**Test Location (2):** No. 49, Ln. 206, Wende Rd., Shangshan Tsuen, Chiung Lin Hsiang, Hsin  
Chu Hsien 307, Taiwan R.O.C.



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### Release Control Record

Issue No.	Description	Date Issued
RF160112E05	Original release.	Feb. 25, 2016



## 2 Summary of Test Results

Applied Standard: FCC Part 27 & Part 2			
FCC Clause	Test Item	Result	Remarks
2.1046 27.50(d)(2)	Equivalent Isotropically radiated power	PASS	Meet the requirement of limit.
2.1055 27.54	Frequency Stability Stay with the authorized bands of operation	PASS	Meet the requirement of limit.
2.1049 27.53(h)	Occupied Bandwidth	PASS	Meet the requirement of limit.
27.53(h)	Band Edge Measurements	PASS	Meet the requirement of limit.
---	Peak To Average Ratio	PASS	Meet the requirement of limit.
2.1051 27.53(h)	Conducted Spurious Emissions	PASS	Meet the requirement of limit.
2.1053 27.53(h)	Radiated Spurious Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -13.02dB at 4290MHz.

### 2.1 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

Measurement	Frequency	Expanded Uncertainty (k=2) ( $\pm$ )
Radiated Emissions up to 1 GHz	30MHz ~ 1GHz	5.19 dB
Radiated Emissions above 1 GHz	1GHz ~ 6GHz	3.43 dB
	6GHz ~ 18GHz	3.49 dB
	18GHz ~ 40GHz	4.11 dB

## 2.2 Test Site and Instruments

### For radiated spurious emissions test:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Agilent	N9038A	MY54450088	July 24, 2015	July 23, 2016
Pre-Amplifier Mini-Circuits	ZFL-1000VH2 B	AMP-ZFL-01	Nov. 11, 2015	Nov. 10, 2016
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-406	Jan. 04, 2016	Jan. 03, 2017
RF Cable	8D	966-4-1 966-4-2 966-4-3	Apr. 03, 2015	Apr. 02, 2016
Horn_Antenna SCHWARZBECK	BBHA 9120D	9120D-783	Jan. 19, 2016	Jan. 18, 2017
Pre-Amplifier Agilent	8449B	3008A01922	Sep. 19, 2015	Sep. 18, 2016
RF Cable	EMC104-SM- SM-2000 EMC104-SM- SM-5000 EMC104-SM- SM-5000	150318 150323 150324	Mar. 31, 2015	Mar. 30, 2016
Pre-Amplifier EMCI	EMC184045	980143	Jan. 15, 2016	Jan. 14, 2017
Horn_Antenna SCHWARZBECK	BBHA 9170	BBHA9170608	Jan. 08, 2016	Jan. 07, 2017
RF Cable	SUCOFLEX 102	36432/2 36441/2	Jan. 16, 2016	Jan. 15, 2017
Software	ADT_Radiated _V8.7.07	NA	NA	NA
Antenna Tower & Turn Table CT	NA	NA	NA	NA

#### Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in 966 Chamber No. 4.
3. The FCC Site Registration No. is 292998
4. The CANADA Site Registration No. is 20331-2
5. Tested Date: Feb. 01 to 02, 2016

**For other test items:**

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
SPECTRUM ANALYZER R&S	FSP40	100060	May 08, 2015	May 07, 2016
Spectrum Analyzer Agilent	E4446A	MY48250253	Dec. 22, 2015	Dec. 21, 2016
Power meter Anritsu	ML2495A	1014008	Apr. 28, 2015	Apr. 27, 2016
Power sensor Anritsu	MA2411B	0917122	Apr. 28, 2015	Apr. 27, 2016
AC Power Source EXTECH Electronics	6205	1440452	NA	NA
Temperature & Humidity Chamber GIANTFORCE	GTH-150-40-SP-AR	MAA0812-008	Jan. 15, 2016	Jan. 14, 2017
DC Power Supply Topward	6603D	795558	NA	NA
ESG Vector signal generator Agilent	E4438C	MY45094468/0 05 506 602 UK6 UNJ	Dec. 01, 2015	Nov. 30, 2016
Software	ADT_RF Test Software V6.6.5.3	NA	NA	NA

- NOTE:**
1. The test was performed in Oven room A.
  2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
  3. Tested Date: Feb. 02, 2016

### 3 General Information

#### 3.1 General Description of EUT

Product	Nokia FW2IA LTE Module	
Brand	Nokia	
Test Model	FW2IADPM01	
Test Sample S/N	EB155110008, EB154810036	
Hardware Version	X23	
Status of EUT	MASS-PRODUCTION	
Power Supply Rating	12Vdc	
Modulation Type	QPSK, 16QAM, 64QAM	
Modulation Technology	FDD	
Transfer Rate	Uplink : 75Mbps , Downlink : 300Mbps	
Operating Frequency	Channel Bandwidth: 5MHz	2112.5MHz ~2177.5MHz
	Channel Bandwidth: 10MHz	2115MHz ~2175MHz
	Channel Bandwidth: 15MHz	2117.5MHz ~2172.5MHz
	Channel Bandwidth: 20MHz	2120MHz ~2170MHz
Number of Channel	Channel Bandwidth: 5MHz	651
	Channel Bandwidth: 10MHz	601
	Channel Bandwidth: 15MHz	551
	Channel Bandwidth: 20MHz	501
Max. EIRP Power	Channel Bandwidth: 5MHz	826.0mW (QPSK)
	Channel Bandwidth: 10MHz	912.0mW (QPSK)
	Channel Bandwidth: 15MHz	867.0mW (QPSK)
	Channel Bandwidth: 20MHz	867.0mW (QPSK)
Emission Designator	Channel Bandwidth: 5MHz	QPSK: 4M50G7D
		16QAM: 4M51W7D
		64QAM: 4M51W7D
	Channel Bandwidth: 10MHz	QPSK: 8M96G7D
		16QAM: 9M00W7D
		64QAM: 8M98W7D
	Channel Bandwidth: 15MHz	QPSK: 13M5G7D
		16QAM: 13M5W7D
		64QAM: 13M5W7D
	Channel Bandwidth: 20MHz	QPSK: 17M9G7D
		16QAM: 17M9W7D
		64QAM: 17M9W7D
Antenna Type	Refer to note as below	
Antenna Connector	Refer to user's manual	
Accessory Device	NA	
Data Cable Supplied	NA	



**Note:**

1. There is LTE technology used for the EUT, which supports 2110~2180MHz frequency band.
2. The EUT incorporates a MIMO function for LTE mode

Channel Bandwidth	Modulation	TX & RX configuration	
5MHz	QPSK, 16QAM, 64QAM	2TX	2RX
10MHz	QPSK, 16QAM, 64QAM	2TX	2RX
15MHz	QPSK, 16QAM, 64QAM	2TX	2RX
20MHz	QPSK, 16QAM, 64QAM	2TX	2RX

3. The EUT's spec. as below table:

Model name	LTE				
	Freq.(MHz)		Freq.(MHz)		Band
FW2IADPM01	UL	BW 5MHz : 1712.5~1777.5	DL	BW 5MHz : 2112.5~2177.5	AWS
		BW 10MHz : 1715~1775		BW 10MHz : 2115~2175	
		BW 15MHz : 1717.5~1772.5		BW 15MHz : 2117.5~2172.5	
		BW 20MHz : 1720~1770		BW 20MHz : 2120~2170	

4. The antennas provided to the EUT, please refer to the following table:

**Antenna Spec.**

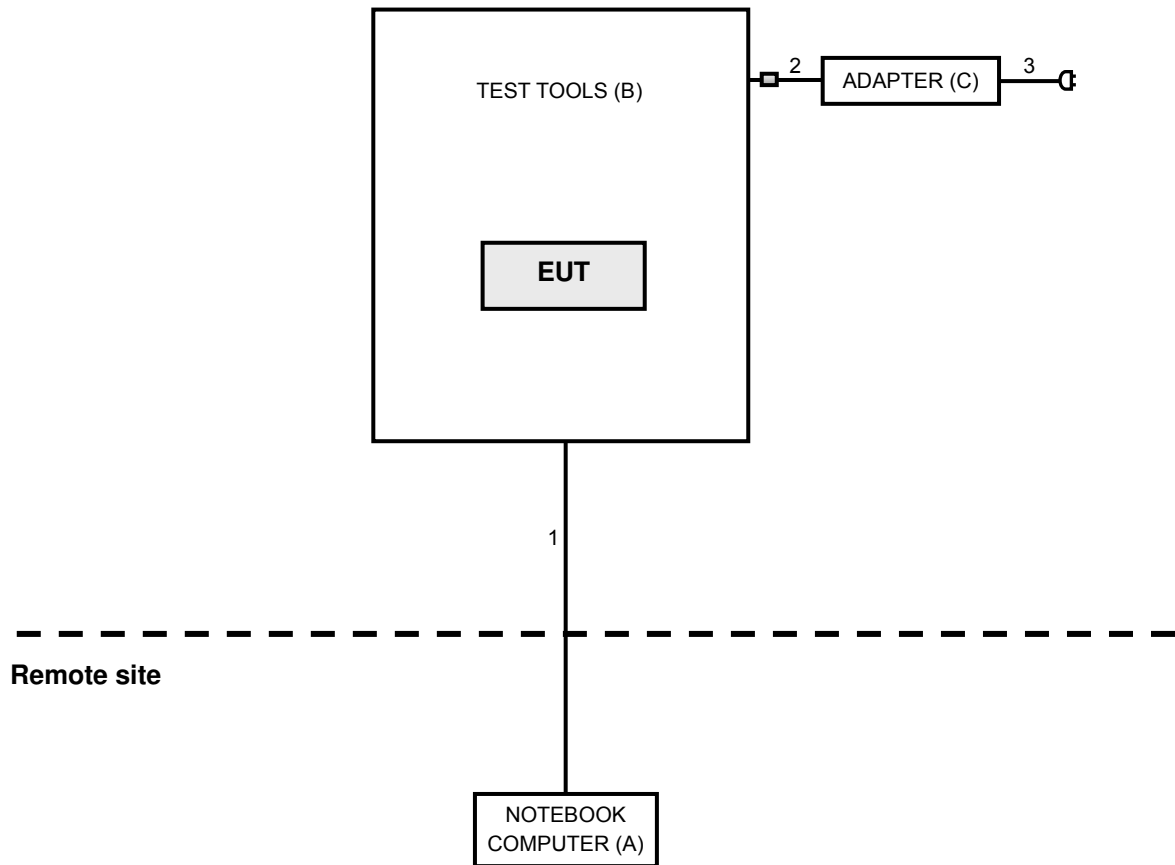
Antenna No	Brand	Model	Antenna Type	Gain(dBi)	Frequency (GHz)
LTE Ant1(Main)	Nokia	FW2IADPM01	Slot Antenna	6.03	1.7~2.7
Antenna No	Brand	Model	Antenna Type	Gain(dBi)	Frequency (GHz)
LTE Ant2(Aux)	Nokia	FW2IADPM01	Slot Antenna	4.64	1.7~2.7

**Cable Spec.**

Brand	Model	Connector Type	Cable Loss(dB)	Cable Length (mm)
NA	NA	Right angle MMCX Plug	peak gain included	287

5. The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.

### 3.2 Configuration of System under Test



### 3.2.1 Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

No.	Product	Brand	Model No.	Serial No.	FCC ID	Remark
A	NOTEBOOK COMPUTER	DELL	D531	CN-0XM006-48643-86L -4472	QDS-BRCM1019	Provided by Lab
B	TEST TOOLS	NA	NA	NA	NA	Supplied by Client
C	ADAPTER	DVE	DSA-60PFE-12	NA	NA	Supplied by Client

**NOTE:**

1. All power cords of the above support units are non-shielded (1.8 m).

No.	Cable	Qty.	Length (m)	Shielded (Yes/ No)	Cores (Number)	Remark
1	RJ-45	1	10	No	0	Provided by Lab
2	DC	1	1.2	No	1	Supplied by Client
3	AC	1	1.8	No	0	Supplied by Client

**NOTE:**

1. The core(s) is(are) originally attached to the cable(s).

### 3.3 Test Mode Applicability and Tested Channel Detail

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis and antenna ports

The worst case was found when positioned on X-plane. Following channel(s) was (were) selected for the final test as listed below:

Test Item	Available Frequency (MHz)	Tested Frequency (MHz)	Channel Bandwidth	Modulation
Output Power	2110 to 2180	2112.5, 2145, 2177.5	5MHz	QPSK
		2115, 2145, 2175	10MHz	QPSK
		2117.5, 2145, 2172.5	15MHz	QPSK
		2120, 2145, 2170	20MHz	QPSK
Frequency Stability	2110 to 2180	2145	5MHz	QPSK
		2145	10MHz	QPSK
		2145	15MHz	QPSK
		2145	20MHz	QPSK
Emission Bandwidth	2110 to 2180	2112.5, 2145, 2177.5	5MHz	QPSK, 16QAM, 64QAM
		2115, 2145, 2175	10MHz	QPSK, 16QAM, 64QAM
		2117.5, 2145, 2172.5	15MHz	QPSK, 16QAM, 64QAM
		2120, 2145, 2170	20MHz	QPSK, 16QAM, 64QAM
Channel Edge	2110 to 2180	2112.5, 2177.5	5MHz	QPSK
		2115, 2175	10MHz	QPSK
		2117.5, 2172.5	15MHz	QPSK
		2120, 2170	20MHz	QPSK
Peak To Average Ratio	2110 to 2180	2112.5, 2145, 2177.5	5MHz	QPSK, 16QAM, 64QAM
		2115, 2145, 2175	10MHz	QPSK, 16QAM, 64QAM
		2117.5, 2145, 2172.5	15MHz	QPSK, 16QAM, 64QAM
		2120, 2145, 2170	20MHz	QPSK, 16QAM, 64QAM
Conducted Emission	2110 to 2180	2112.5, 2145, 2177.5	5MHz	QPSK
		2115, 2145, 2175	10MHz	QPSK
		2117.5, 2145, 2172.5	15MHz	QPSK
		2120, 2145, 2170	20MHz	QPSK
Radiated Emission Below 1GHz	2110 to 2180	2112.5, 2145, 2177.5	5MHz	QPSK
		2115, 2145, 2175	10MHz	QPSK
		2117.5, 2145, 2172.5	15MHz	QPSK
		2120, 2145, 2170	20MHz	QPSK
Radiated Emission Above 1GHz	2110 to 2180	2112.5, 2145, 2177.5	5MHz	QPSK
		2115, 2145, 2175	10MHz	QPSK
		2117.5, 2145, 2172.5	15MHz	QPSK
		2120, 2145, 2170	20MHz	QPSK

\*This module is based on FW2XXXX host assembly provide base band data during testing.

**NOTE:**

- For Radiated Emission, EUT has been pre-tested under following test samples, and sample A was the worst case for final test. For other test items, the Sample S/N: EB154810036 was chosen for the test mode.

Sample	Model
A	Sample S/N: EB155110008
B	Sample S/N: EB154810036

- All supported modulation types were evaluated. The Worst case emission of QPSK was selected. Therefore, the EIRP power, Frequency Stability, Channel Edge, Conducted Emission and Radiated Emission were presented under QPSK mode only.



**Test Condition:**

Test Item	Environmental Conditions	Input Power (System)	Tested By	Test Location
Output Power	18deg. C, 62%RH	120Vac, 60Hz	Robert Cheng	(1)
Frequency Stability	18deg. C, 62%RH	120Vac, 60Hz	Robert Cheng	
Emission Bandwidth	18deg. C, 62%RH	120Vac, 60Hz	Robert Cheng	
Band Edge	18deg. C, 62%RH	120Vac, 60Hz	Robert Cheng	
Peak To Average Ratio	18deg. C, 62%RH	120Vac, 60Hz	Robert Cheng	
Conducted Emission	18deg. C, 62%RH	120Vac, 60Hz	Robert Cheng	
Radiated Emission	20deg. C, 62%RH	120Vac, 60Hz	Rex Huang	

Note: Above input power with the AC/DC PSU used during testing.

### 3.4 EUT Operating Conditions

The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency

### 3.5 General Description of Applied Standards

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

**FCC 47 CFR Part 2**

**FCC 47 CFR Part 27**

**KDB 971168 D01 Power Meas License Digital Systems v02r02**

**ANSI/TIA/EIA-603-C 2004**

**NOTE:** All test items have been performed and recorded as per the above standards.

## 4 Test Types and Results

### 4.1 Output Power Measurement

#### 4.1.1 Limits of Output Power Measurement

The radiated peak output power shall be according to the specific rule Part 27.50(d)(2) that are limited to EIRP of 1640 watts/MHz when transmitting with an emission bandwidth greater than 1 MHz.

#### 4.1.2 Test Procedures

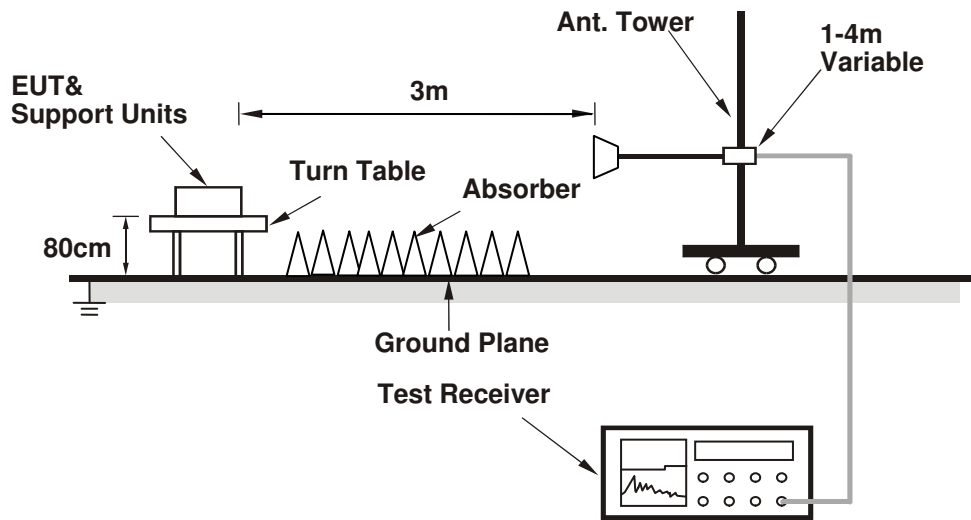
EIRP / ERP Measurement:

- a. All measurements were done at low, middle and high operational frequency range. RBW and VBW is 10MHz for LTE mode.
- b. Substitution method is used for EIRP measurement. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. The "Read Value" is the spectrum reading the maximum power value.
- c. The substitution horn antenna is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a tx cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to "Read Value" of step b. Record the power level of S.G
- d.  $EIRP = \text{Output power level of S.G} - \text{TX cable loss} + \text{Antenna gain of substitution horn}.$

Conducted Power Measurement:

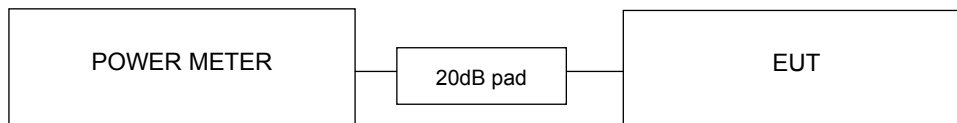
A power sensor was used on the output port of the EUT. A power meter was used to read the response of the power sensor. Record the power level.

4.1.3 Test Setup  
EIRP / ERP MEASUREMENT:



For the actual test configuration, please refer to the attached file (Test Setup Photo).

CONDUCTED POWER MEASUREMENT:





#### 4.1.4 Test Results

##### EIRP Power (dBm)

Channel Bandwidth: 5MHz / QPSK				
Frequency (MHz)	LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)
2112.5	22.6	6.4	29.0	796.2
2145	22.8	6.4	29.2	826.0
2177.5	22.7	6.4	29.1	811.0

Channel Bandwidth: 10MHz / QPSK				
Frequency (MHz)	LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)
2115	22.5	6.4	28.9	776.2
2145	22.7	6.4	29.1	807.2
2175	23.2	6.4	29.6	912.0

Channel Bandwidth: 15MHz / QPSK				
Frequency (MHz)	LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)
2117.5	22.4	6.4	28.8	762.1
2145	23.0	6.4	29.4	867.0
2172.5	22.3	6.4	28.8	749.9

Channel Bandwidth: 20MHz / QPSK				
Frequency (MHz)	LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)
2120	23.0	6.4	29.4	867.0
2145	22.5	6.4	28.9	778.0
2170	22.2	6.4	28.6	724.4

**Conducted Output Power (dBm)**

Freq. (MHz)	5MHz / QPSK			
	Conducted Average Power (dBm)			Limit(dBm)
	Chain0	Chain1	Total	Maximum
2112.5	23.39	23.43	26.42	33.0
2145	23.41	23.45	26.44	33.0
2177.5	23.41	23.38	26.41	33.0

Freq. (MHz)	10MHz / QPSK			
	Conducted Average Power (dBm)			Limit(dBm)
	Chain0	Chain1	Total	Maximum
2115	23.41	23.47	26.45	33.0
2145	23.39	23.48	26.45	33.0
2175	23.42	23.52	26.48	33.0

Freq. (MHz)	15MHz / QPSK			
	Conducted Average Power (dBm)			Limit(dBm)
	Chain0	Chain1	Total	Maximum
2117.5	23.39	23.42	26.42	33.0
2145	23.41	23.45	26.44	33.0
2172.5	23.35	23.37	26.37	33.0

Freq. (MHz)	20MHz / QPSK			
	Conducted Average Power (dBm)			Limit(dBm)
	Chain0	Chain1	Total	Maximum
2120	23.42	23.52	26.48	33.0
2145	23.39	23.42	26.42	33.0
2170	23.27	23.28	26.29	33.0

## 4.2 Frequency Stability Measurement

### 4.2.1 Limits of Frequency Stability Measurement

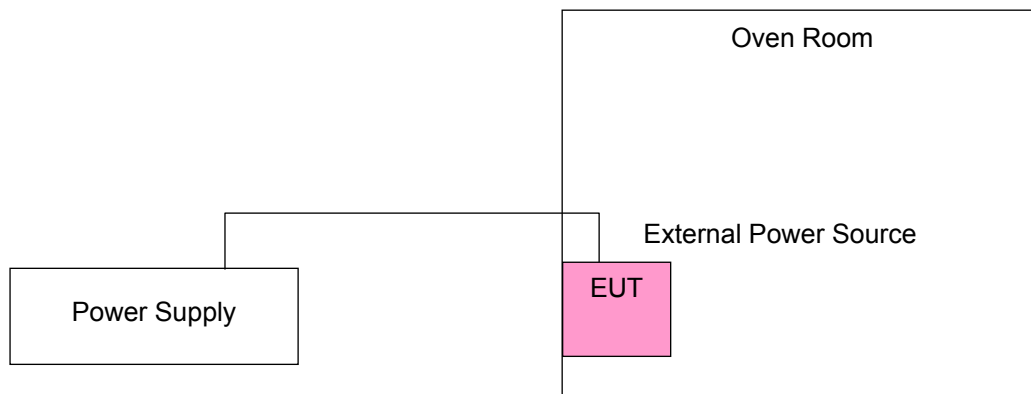
According to the FCC part 2.1055 shall be tested the frequency stability. The rule is defined that "The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block." The test extreme voltage is according to the 2.1055(d)(1) Vary primary supply voltage from 85 to 115 percent of the nominal value for other than hand carried battery equipment and the extreme temperature rule is comply with specification of EUT  $-30^{\circ}\text{C} \sim 50^{\circ}\text{C}$ .

### 4.2.2 Test Procedure

- a. Device is placed at the oven room. The oven room could control the temperatures and humidity. Power warm up is at least 15 min and power applied should perform before recording frequency error.
- b. The test voltage range is from minimum to maximum working voltage. Each step shall be record the frequency error rate.
- c. The temperature range step is 10 degrees in this test items. All temperature levels shall be hold the  $\pm 0.5^{\circ}\text{C}$  during the measurement testing. The each temperature step shall be at least 0.5 hours, consider the EUT could be test under the stability condition.

**NOTE:** The frequency error was recorded frequency error from the communication simulator.

### 4.2.3 Test Setup



#### 4.2.4 Test Results

##### Frequency Error vs. Voltage

Voltage (Volts)	Frequency Error (ppm)				Limit (ppm)
	5MHz	10MHz	15MHz	20MHz	
102	0.019	0.021	0.021	0.019	2.5
138	0.017	0.012	0.017	0.018	2.5

TEMP. (°C)	Frequency Error (ppm)				Limit (ppm)
	5MHz	10MHz	15MHz	20MHz	
50	0.016	0.020	0.015	0.019	2.5
40	0.013	0.013	0.016	0.020	2.5
30	0.015	0.012	0.014	0.021	2.5
20	0.013	0.021	0.019	0.020	2.5
10	0.018	0.018	0.017	0.014	2.5
0	0.012	0.014	0.019	0.021	2.5
-10	0.013	0.021	0.017	0.012	2.5
-20	0.015	0.013	0.013	0.018	2.5
-30	0.019	0.021	0.014	0.018	2.5

### 4.3 Emission Bandwidth Measurement

#### 4.3.1 Limits of Emission Bandwidth Measurement

##### -26dBc Bandwidth

According to FCC 27.53(m)(6) specified that emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26dB below the transmitter power.

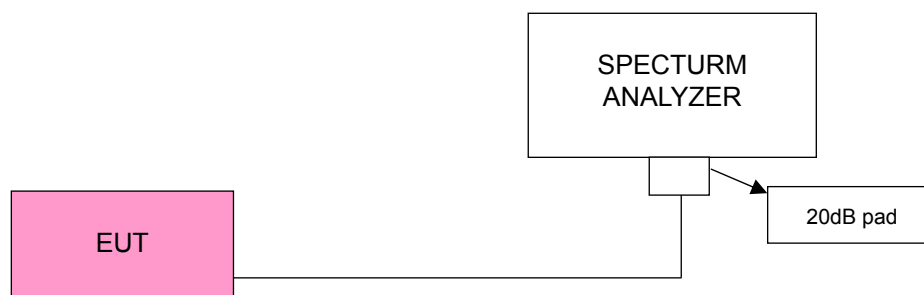
##### Occupied Bandwidth

The EUT makes a call to the communication simulator. All measurements were done at low, middle and high operational frequency range. The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency. Use OBW measurement function of Spectrum analyzer to measure 99 % occupied bandwidth.

#### 4.3.2 Test Procedure

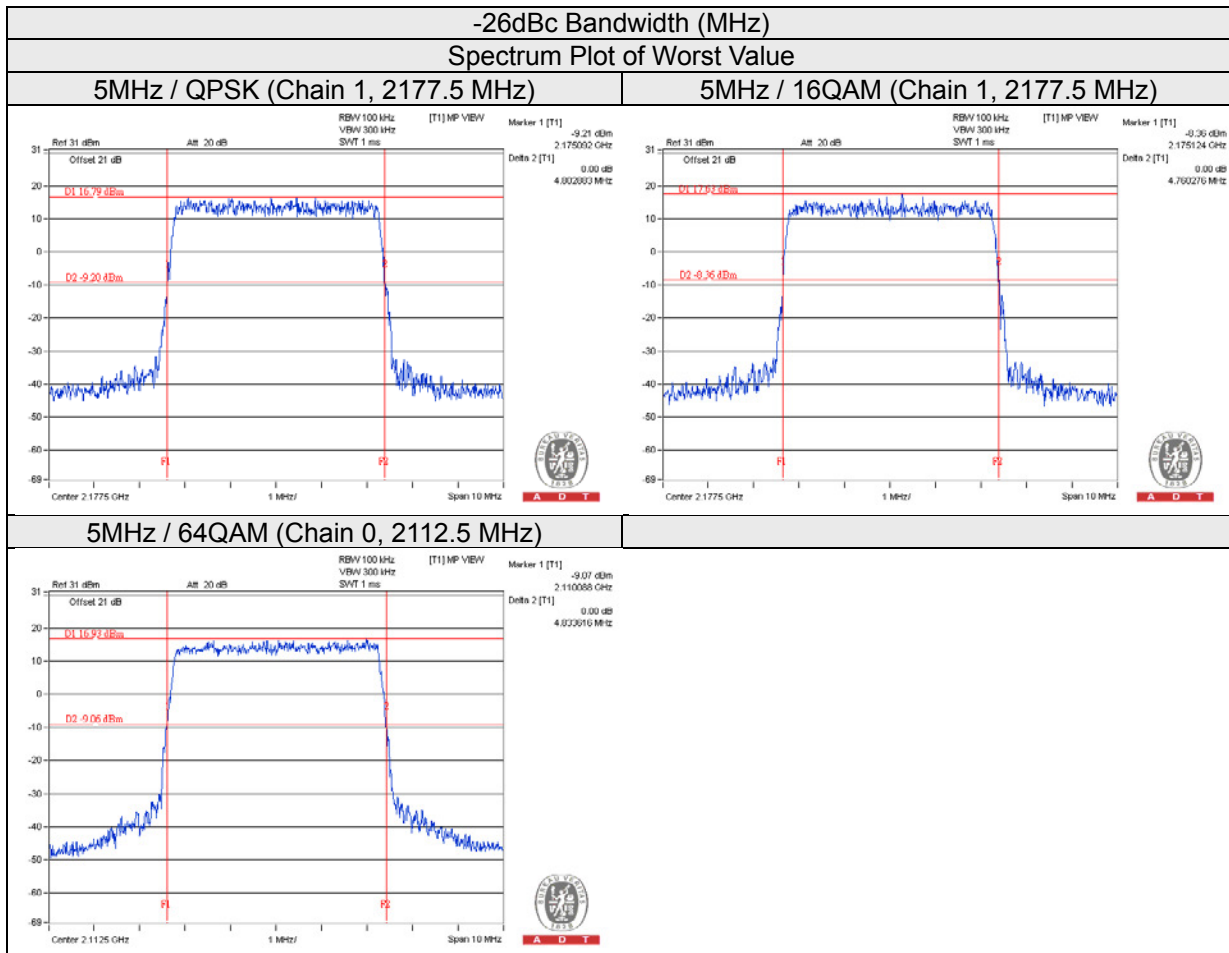
The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with RBW = 100kHz and VBW = 300kHz (Channel Bandwidth: 5MHz), RBW = 200kHz and VBW = 620kHz (Channel Bandwidth: 10MHz) , RBW = 300kHz and VBW = 1MHz (Channel Bandwidth: 15MHz), RBW = 510kHz and VBW = 1.8MHz (Channel Bandwidth: 20MHz).

#### 4.3.3 Test Setup



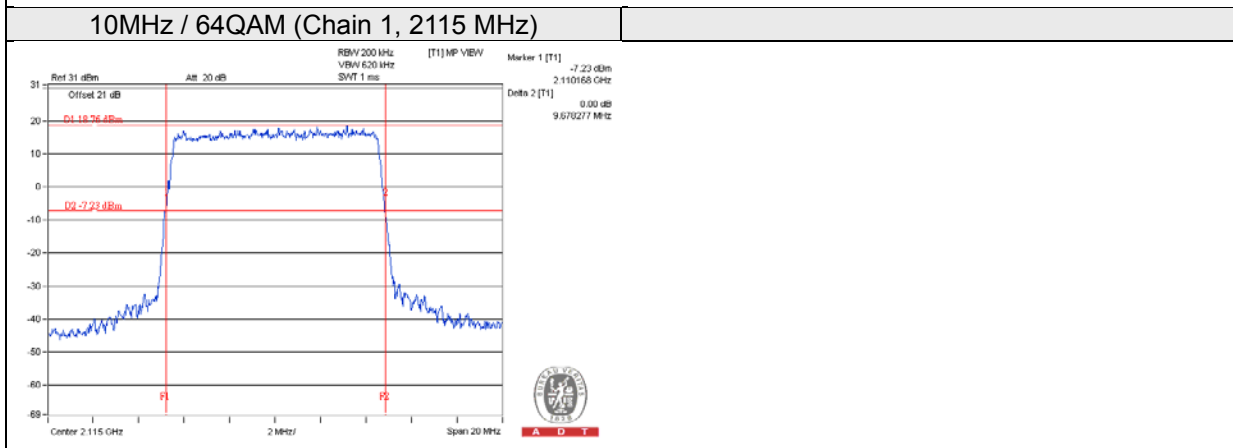
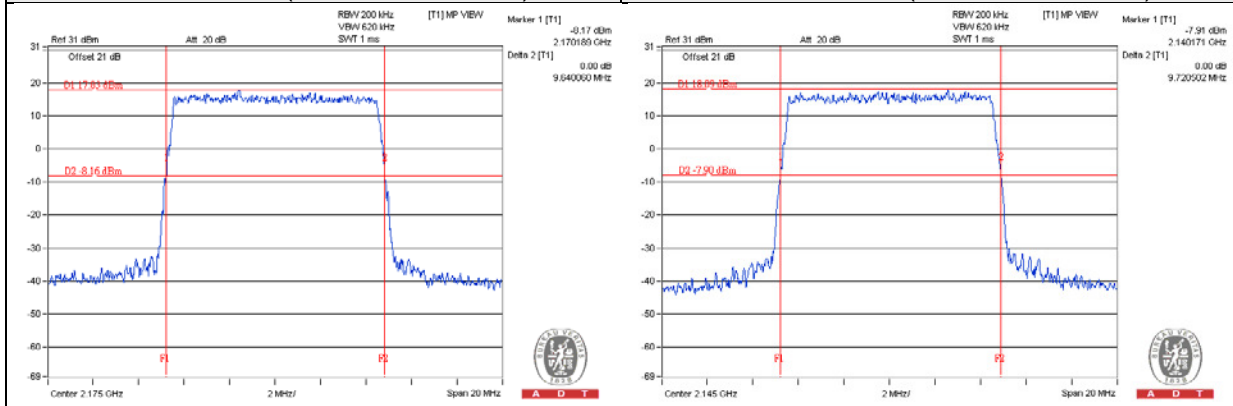
### 4.3.4 Test Results (-26dBc Bandwidth)

Channel Bandwidth: 5MHz						
Frequency (MHz)	-26dBc Bandwidth (MHz)					
	Chain0			Chain1		
	QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
2112.5	4.87	4.85	4.83	4.86	4.84	4.87
2145	4.84	4.88	4.91	4.85	4.84	4.84
2177.5	4.90	4.90	4.87	4.80	4.76	4.88



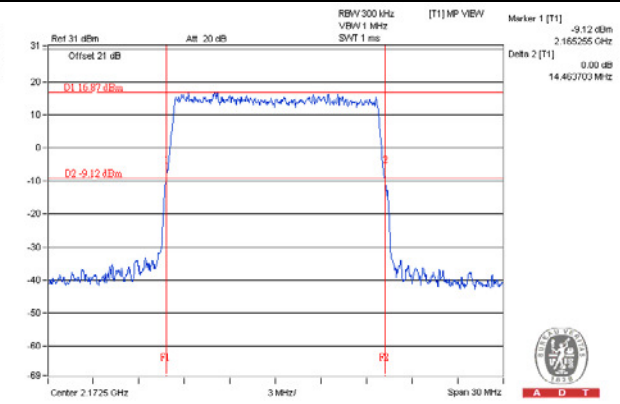
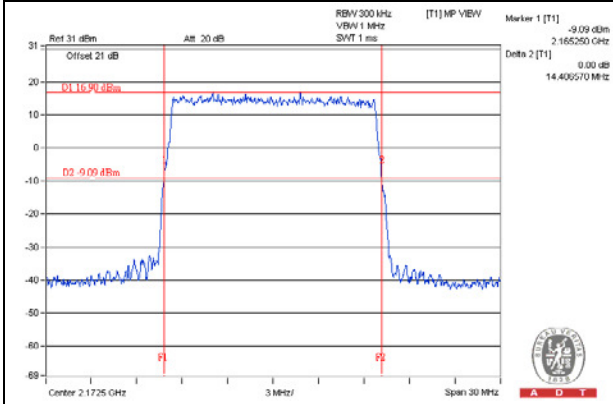
Channel Bandwidth: 10MHz						
Frequency (MHz)	-26dBc Bandwidth (MHz)					
	Chain0			Chain1		
	QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
2115	9.69	9.72	9.80	9.71	9.75	9.68
2145	9.81	9.78	9.76	9.78	9.72	9.79
2175	9.74	9.72	9.69	9.64	9.83	9.75

-26dBc Bandwidth (MHz)  
Spectrum Plot of Worst Value

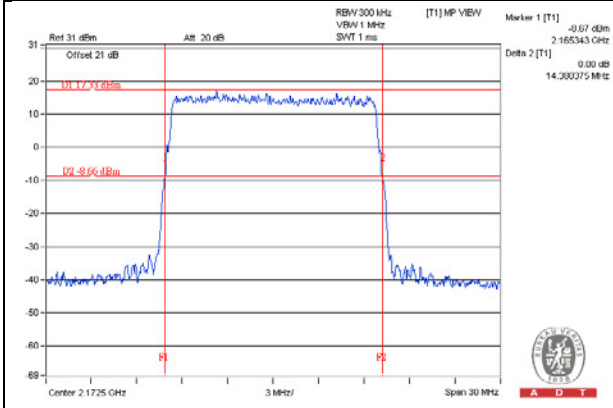


Channel Bandwidth: 15MHz						
Frequency (MHz)	-26dBc Bandwidth (MHz)					
	Chain0			Chain1		
	QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
2117.5	14.60	14.68	14.60	14.55	14.64	14.63
2145	14.70	14.55	14.67	14.65	14.62	14.63
2172.5	14.49	14.53	14.55	14.41	14.46	14.38

-26dBc Bandwidth (MHz)	
Spectrum Plot of Worst Value	
15MHz / QPSK (Chain 1, 2172.5 MHz)	15MHz / 16QAM (Chain 1, 2172.5 MHz)



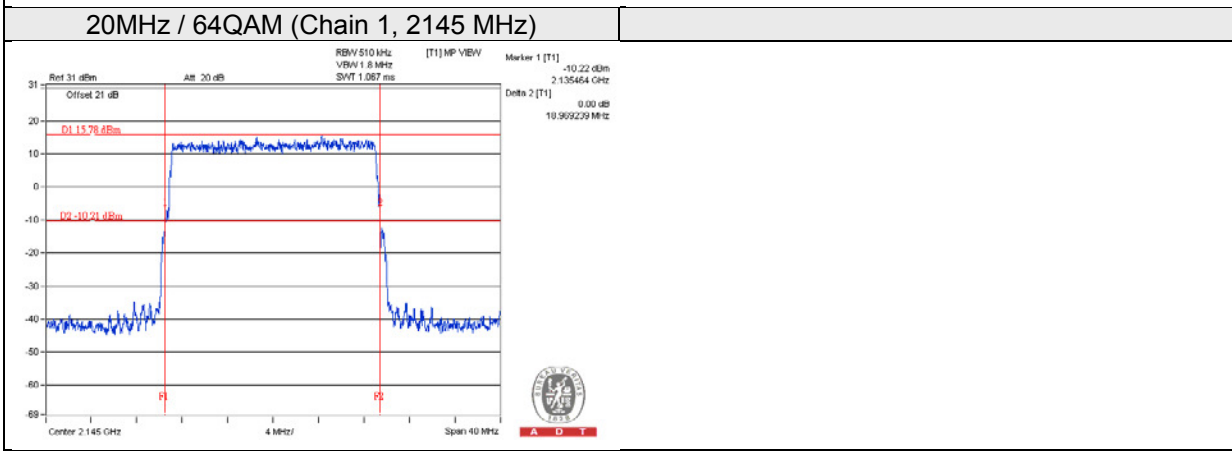
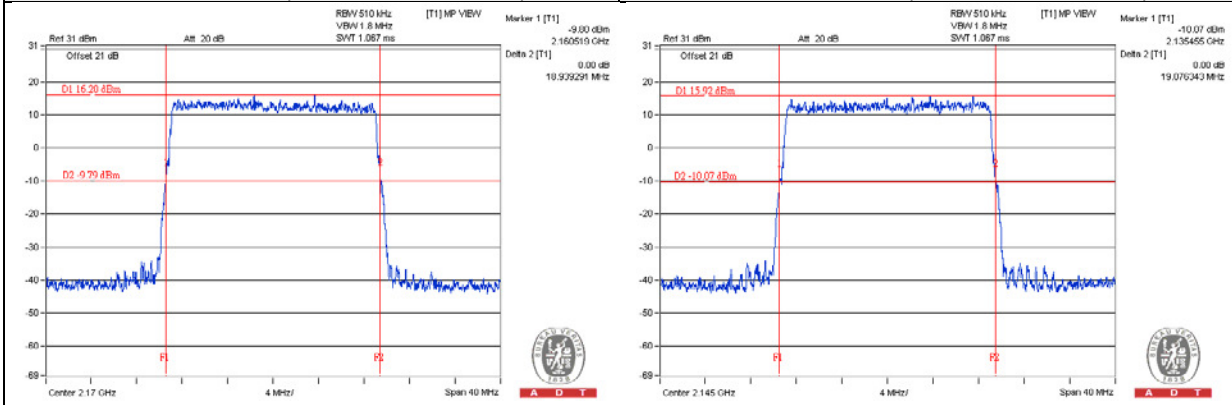
15MHz / 64QAM (Chain 1, 2172.5 MHz)	
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Channel Bandwidth: 20MHz						
Frequency (MHz)	-26dBc Bandwidth (MHz)					
	Chain0			Chain1		
	QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
2120	19.51	19.64	19.54	19.59	19.57	19.62
2145	19.66	19.60	19.67	19.00	19.08	18.97
2170	18.94	19.11	19.12	19.11	19.20	19.13

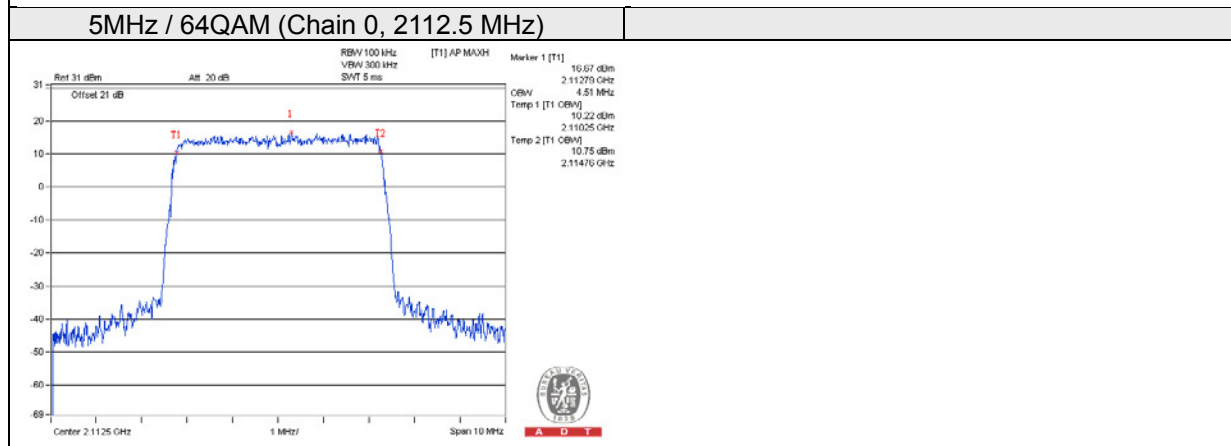
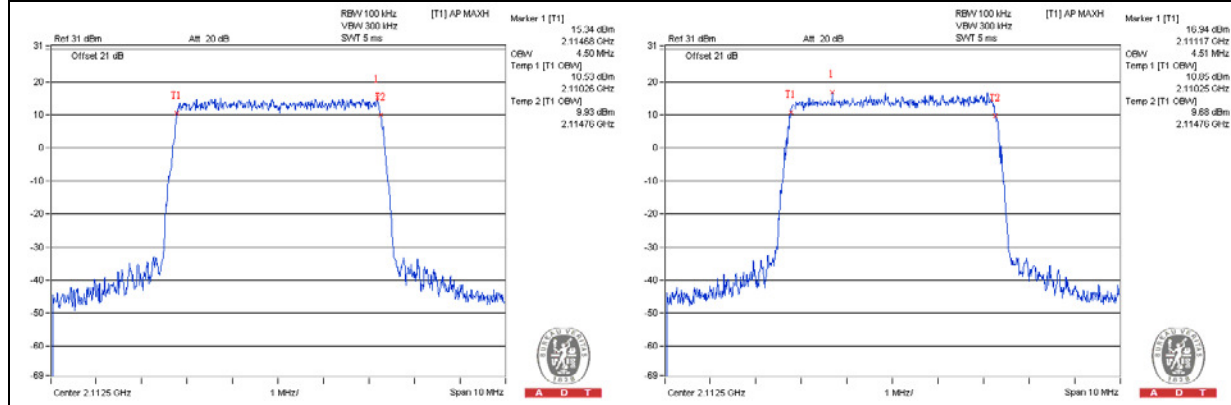
-26dBc Bandwidth (MHz)  
Spectrum Plot of Worst Value



### 4.3.5 Test Results (Occupied Bandwidth)

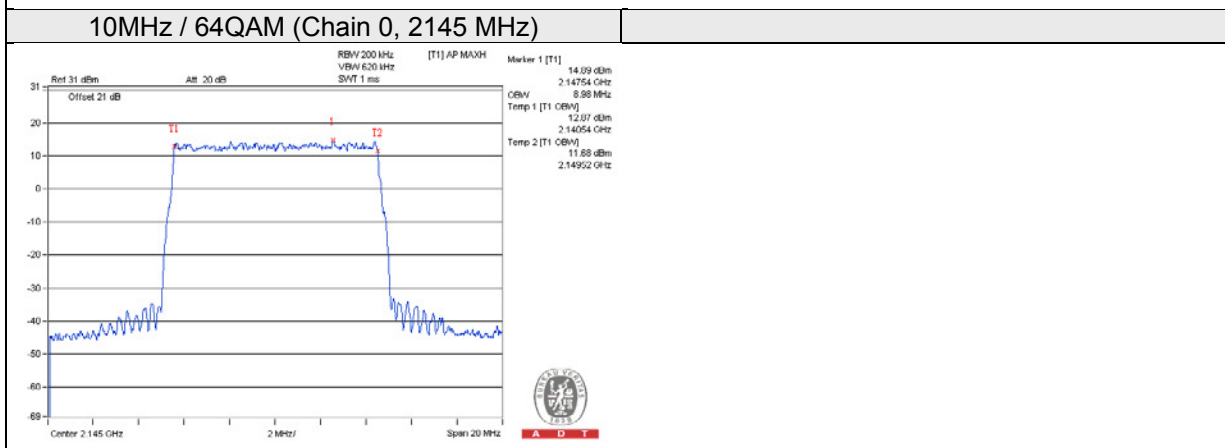
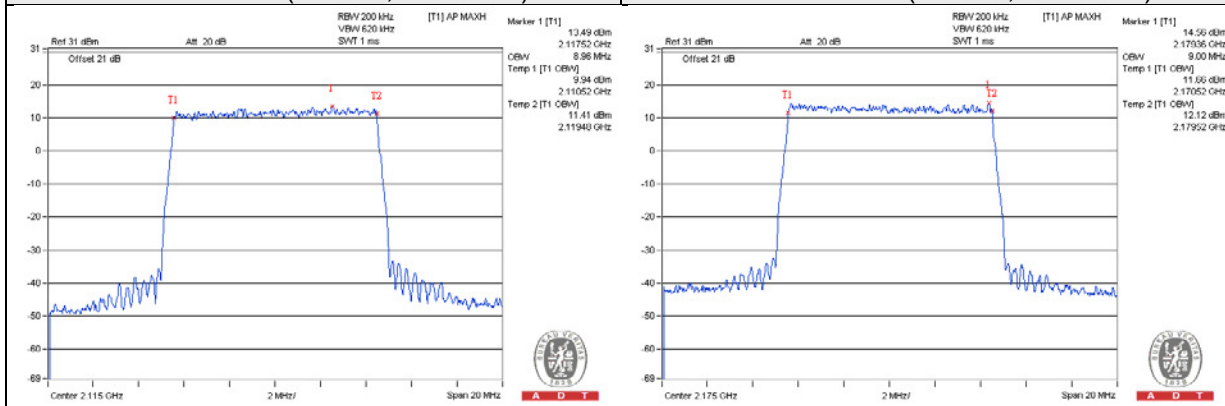
Channel Bandwidth: 5MHz						
Frequency (MHz)	Occupied Bandwidth (MHz)					
	Chain0			Chain1		
	QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
2112.5	4.50	4.51	4.51	4.49	4.51	4.50
2145	4.50	4.51	4.51	4.49	4.51	4.51
2177.5	4.49	4.51	4.49	4.49	4.49	4.50

### Occupied Bandwidth Spectrum Plot of Worst Value



Channel Bandwidth: 10MHz						
Frequency (MHz)	Occupied Bandwidth (MHz)					
	Chain0			Chain1		
	QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
2115	8.96	8.96	8.94	8.96	8.96	8.94
2145	8.96	8.96	8.98	8.94	8.96	8.98
2175	8.96	8.96	8.96	8.96	9.00	8.96

**Occupied Bandwidth**  
**Spectrum Plot of Worst Value**



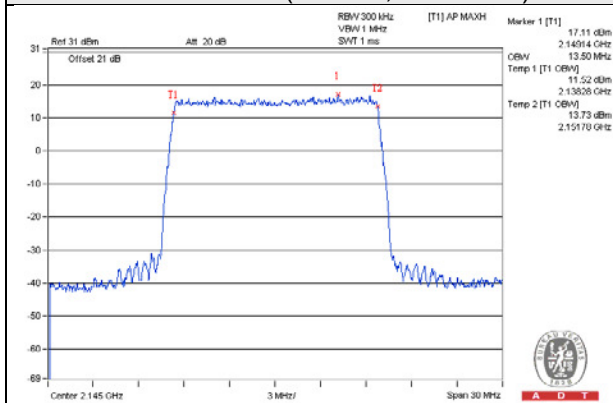
Channel Bandwidth: 15MHz

Frequency (MHz)	Occupied Bandwidth (MHz)					
	Chain0			Chain1		
	QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
2117.5	13.41	13.41	13.44	13.44	13.44	13.44
2145	13.47	13.44	13.44	13.50	13.47	13.47
2172.5	13.47	13.44	13.50	13.47	13.47	13.47

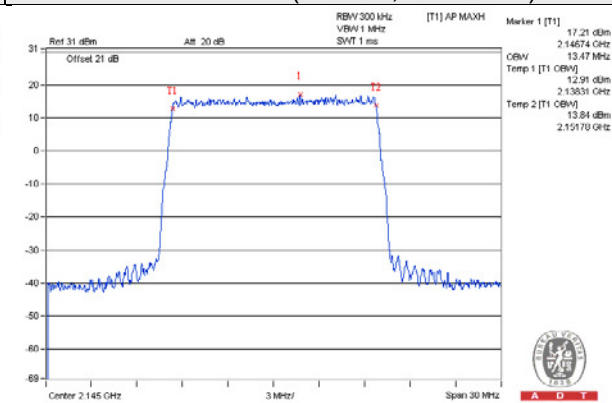
Occupied Bandwidth

Spectrum Plot of Worst Value

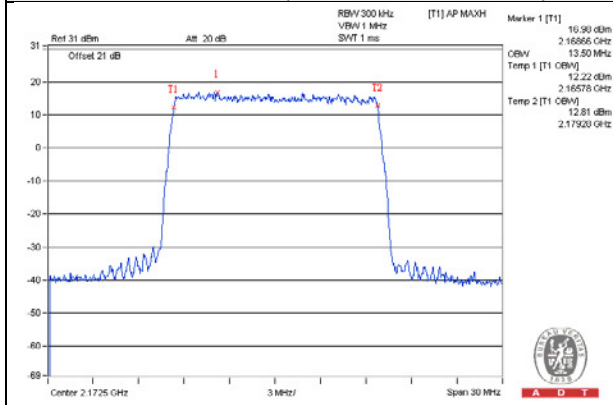
15MHz / QPSK (Chain 1, 2145 MHz)



15MHz / 16QAM (Chain 1, 2145 MHz)

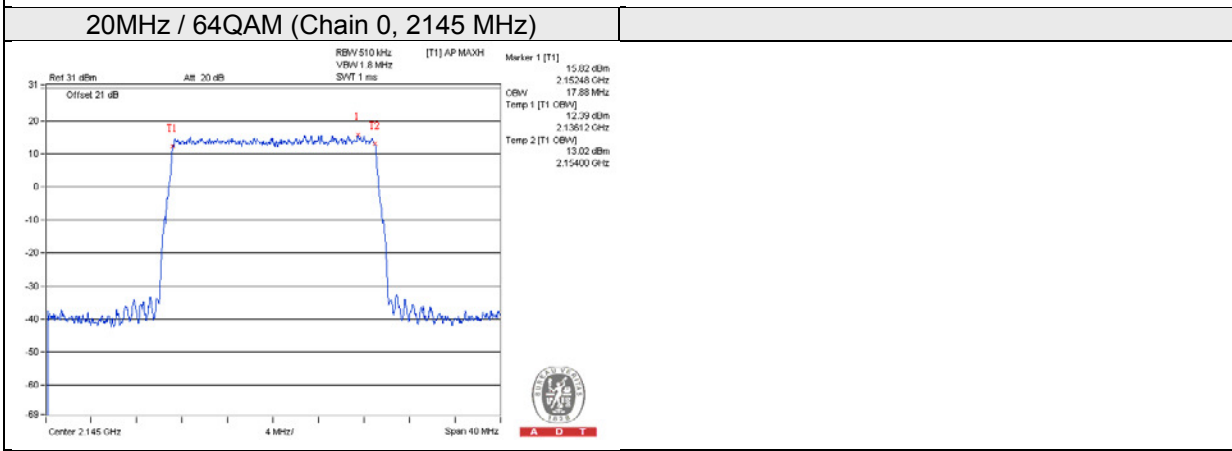
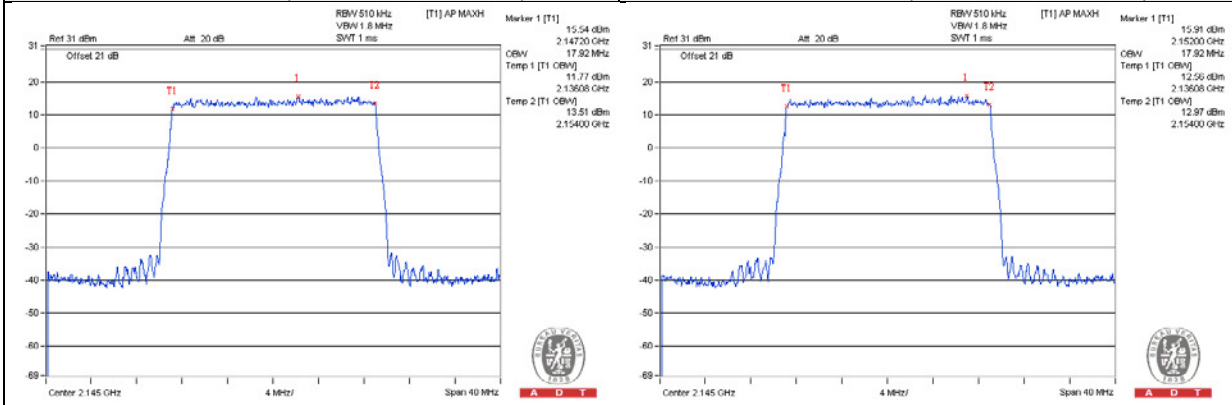


15MHz / 64QAM (Chain 0, 2172.5 MHz)



Channel Bandwidth: 20MHz						
Frequency (MHz)	Occupied Bandwidth (MHz)					
	Chain0			Chain1		
	QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
2120	17.88	17.88	17.88	17.84	17.88	17.84
2145	17.92	17.92	17.88	17.87	17.92	17.88
2170	17.86	17.88	17.88	17.88	17.92	17.88

**Occupied Bandwidth**  
**Spectrum Plot of Worst Value**



## 4.4 Channel Edge Measurement

### 4.4.1 Limits of Channel Edge Measurement

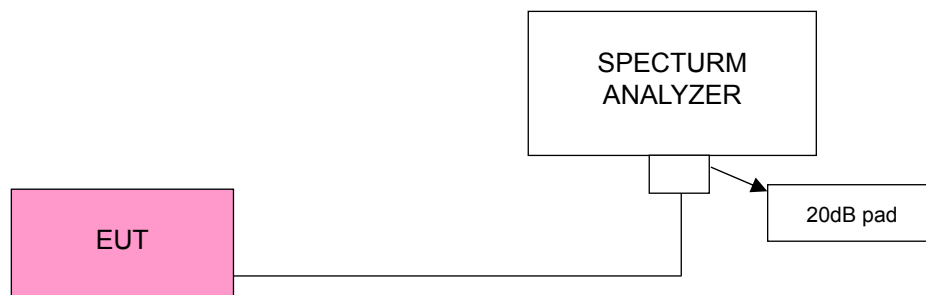
According to FCC 27.53(h) specified the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least  $43 + 10 \log_{10}(P)$  dB. In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

Note:

This device can be implement MIMO function, so the limit of spurious emissions needs to be reduced by  $10\log(\text{Numbers}_{\text{Ant}})$  according to FCC KDB 662911 D01 guidance.

{The limit is adjusted to  $-13\text{dBm} - 10*\log(2) = -16.01\text{dBm}$ .}

### 4.4.2 Test Setup



### 4.4.3 Test Procedures

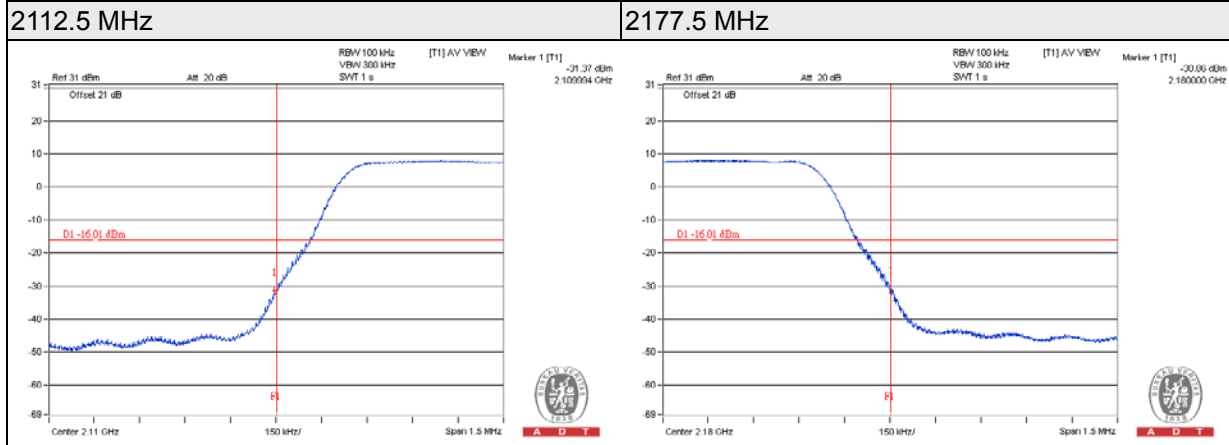
- a. The EUT was set up for the rated peak power. The power was measured with Spectrum Analyzer. All measurements were done at 3 channels: low, middle and high operational frequency range.
- b. The center frequency of spectrum is the band edge frequency and span is 15MHz. RBW of the spectrum is 100kHz (Channel Bandwidth: 5MHz) / 200kHz (Channel Bandwidth: 10MHz) / 300kHz (Channel Bandwidth: 15MHz) / 510kHz (Channel Bandwidth: 20MHz).
- c. Record the max trace plot into the test report.

#### 4.4.4 Test Results

##### Chain 0

QPSK / Channel Bandwidth: 5MHz

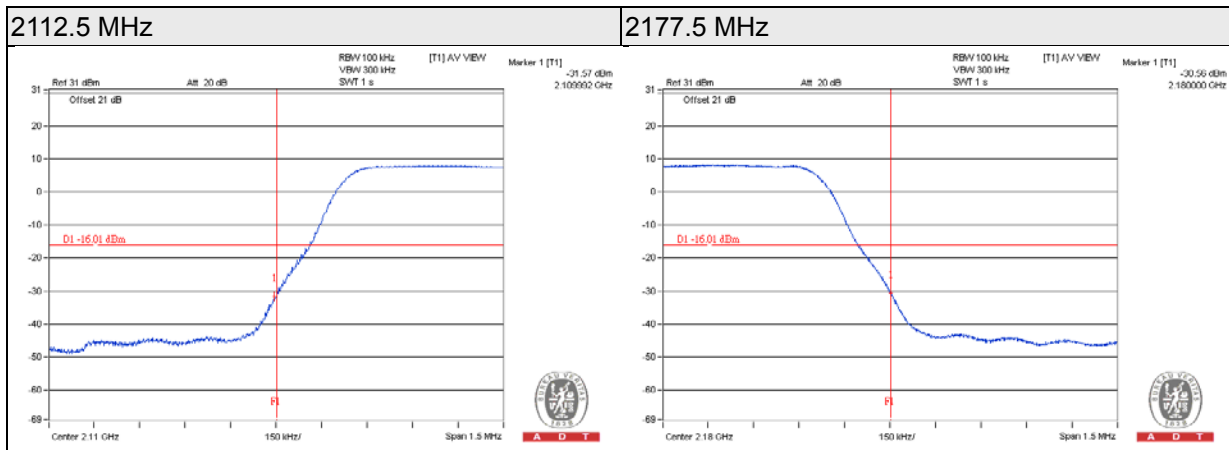
Frequency(MHz)	Measurement Value	Limit	Margin	Result
2112.5	-31.37	-16.01	-15.36	Pass
2177.5	-30.86	-16.01	-14.85	Pass



##### Chain 1

QPSK / Channel Bandwidth: 5MHz

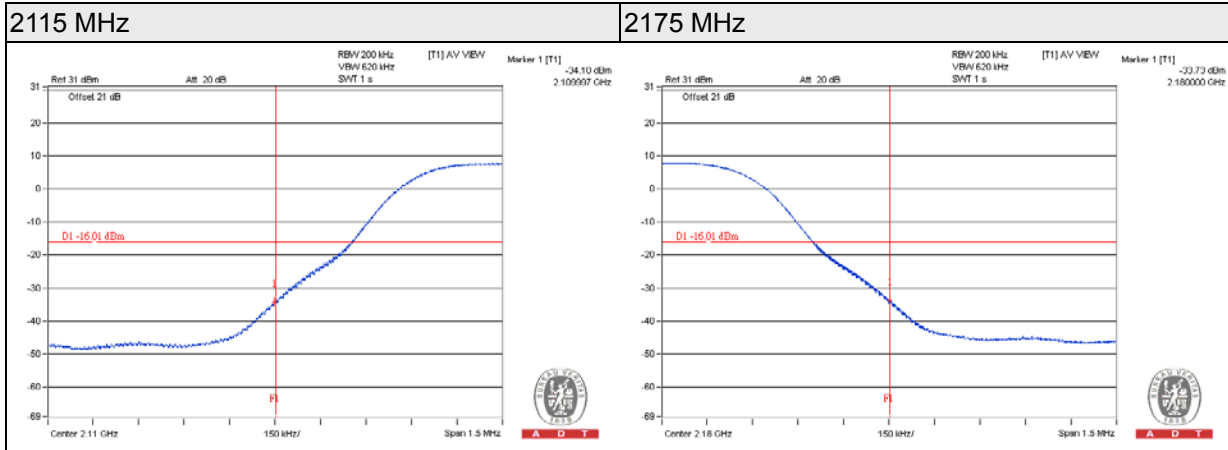
Frequency(MHz)	Measurement Value	Limit	Margin	Result
2112.5	-31.57	-16.01	-15.56	Pass
2177.5	-30.56	-16.01	-14.55	Pass



**Chain 0**

QPSK / Channel Bandwidth: 10MHz

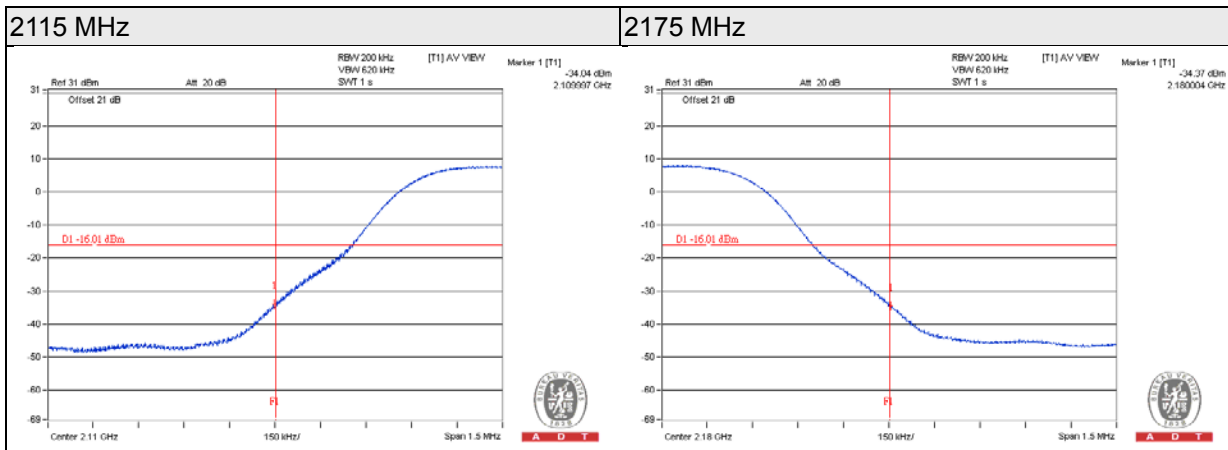
Frequency(MHz)	Measurement Value	Limit	Margin	Result
2115	-34.1	-16.01	-18.09	Pass
2175	-33.73	-16.01	-17.72	Pass



**Chain 1**

QPSK / Channel Bandwidth: 10MHz

Frequency(MHz)	Measurement Value	Limit	Margin	Result
2115	-34.04	-16.01	-18.03	Pass
2175	-34.37	-16.01	-18.36	Pass

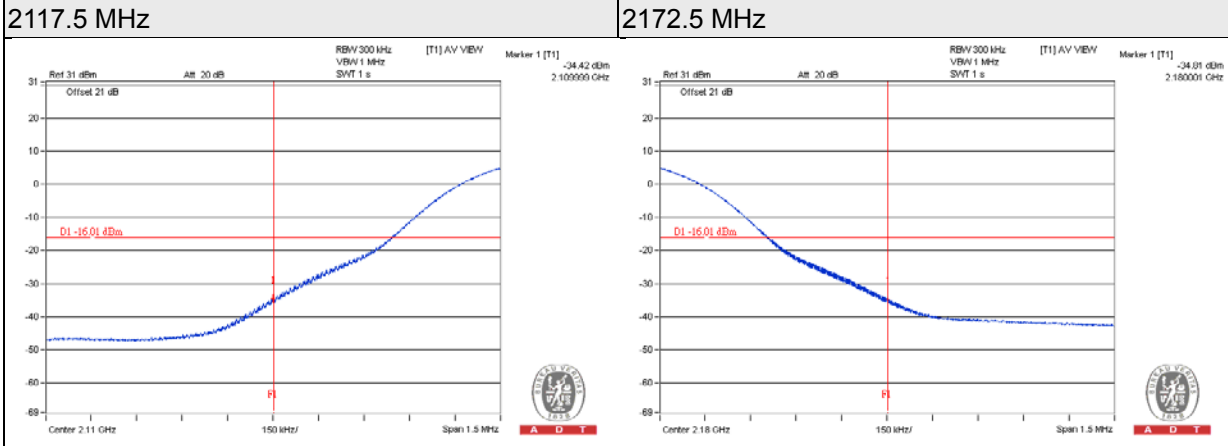




**Chain 0**

QPSK / Channel Bandwidth: 15MHz

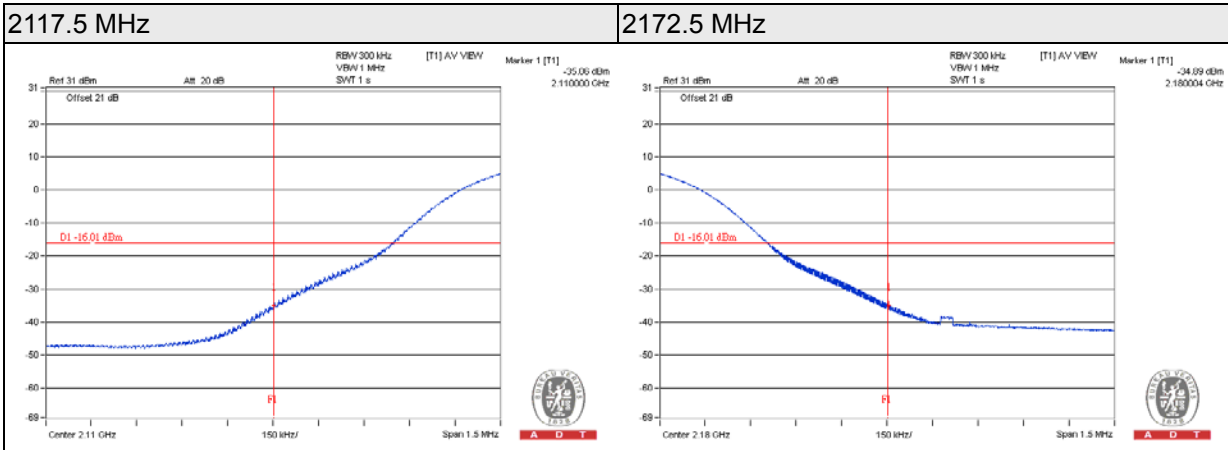
Frequency(MHz)	Measurement Value	Limit	Margin	Result
2117.5	-34.42	-16.01	-18.41	Pass
2172.5	-34.81	-16.01	-18.80	Pass



**Chain 1**

QPSK / Channel Bandwidth: 15MHz

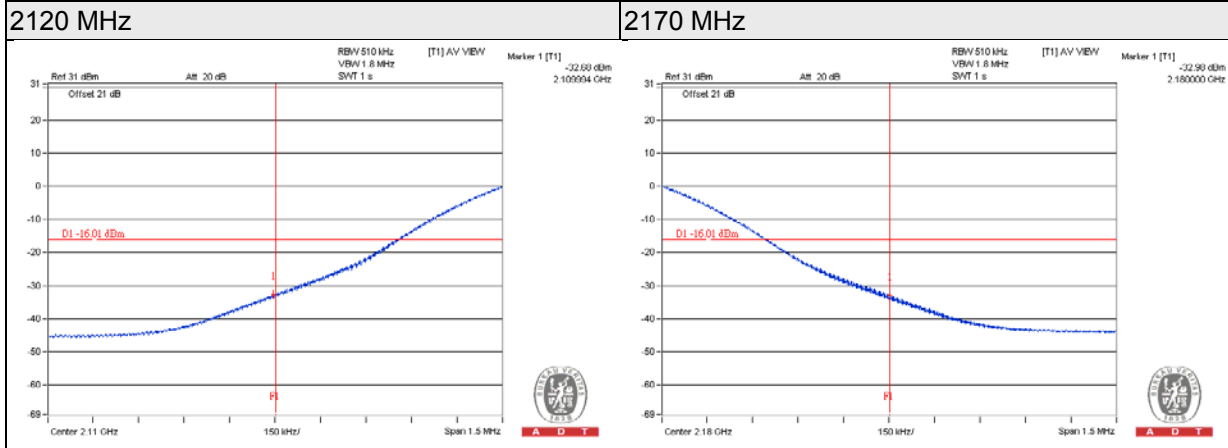
Frequency(MHz)	Measurement Value	Limit	Margin	Result
2117.5	-35.06	-16.01	-19.05	Pass
2172.5	-34.89	-16.01	-18.88	Pass



**Chain 0**

QPSK / Channel Bandwidth: 20MHz

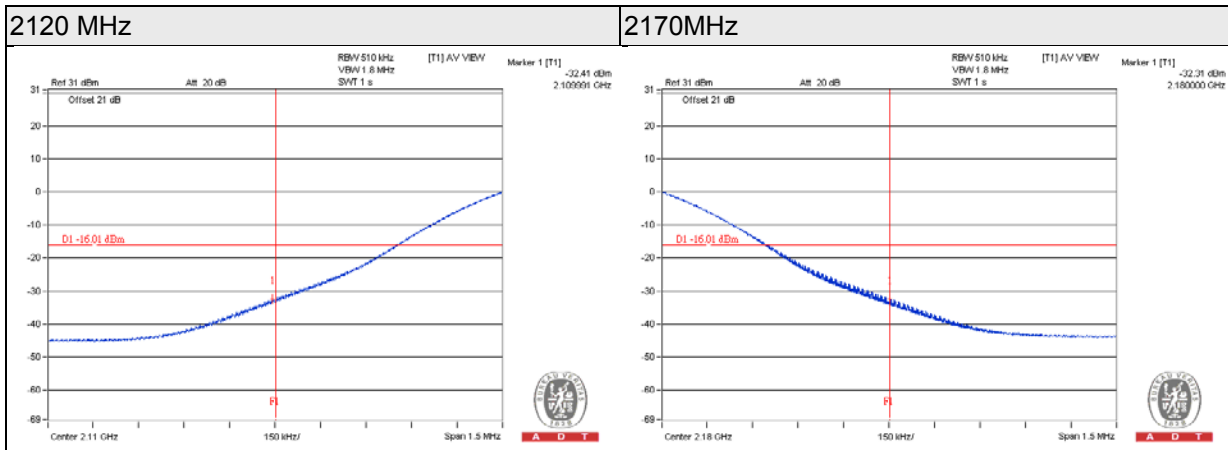
Frequency(MHz)	Measurement Value	Limit	Margin	Result
2120	-32.68	-16.01	-16.67	Pass
2170	-32.98	-16.01	-16.97	Pass



**Chain 1**

QPSK / Channel Bandwidth: 20MHz

Frequency(MHz)	Measurement Value	Limit	Margin	Result
2120	-32.41	-16.01	-16.40	Pass
2170	-32.31	-16.01	-27.52	Pass

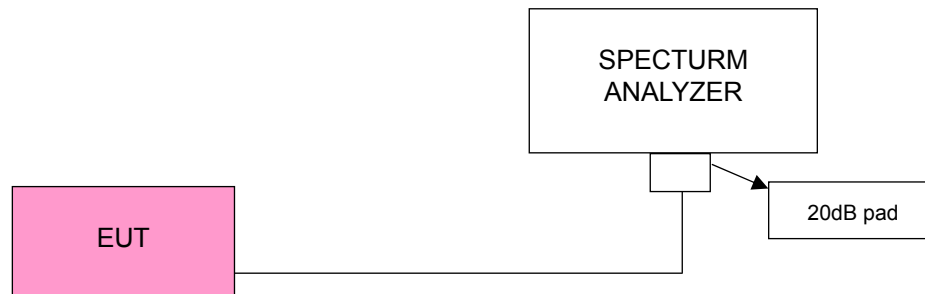


## 4.5 Peak to Average Ratio

### 4.5.1 Limits of Peak to Average Ratio Measurement

In measuring transmissions in this band using an average power technique, the peak to-average ratio (PAR) of the transmission may not exceed 13 dB

### 4.5.2 Test Setup



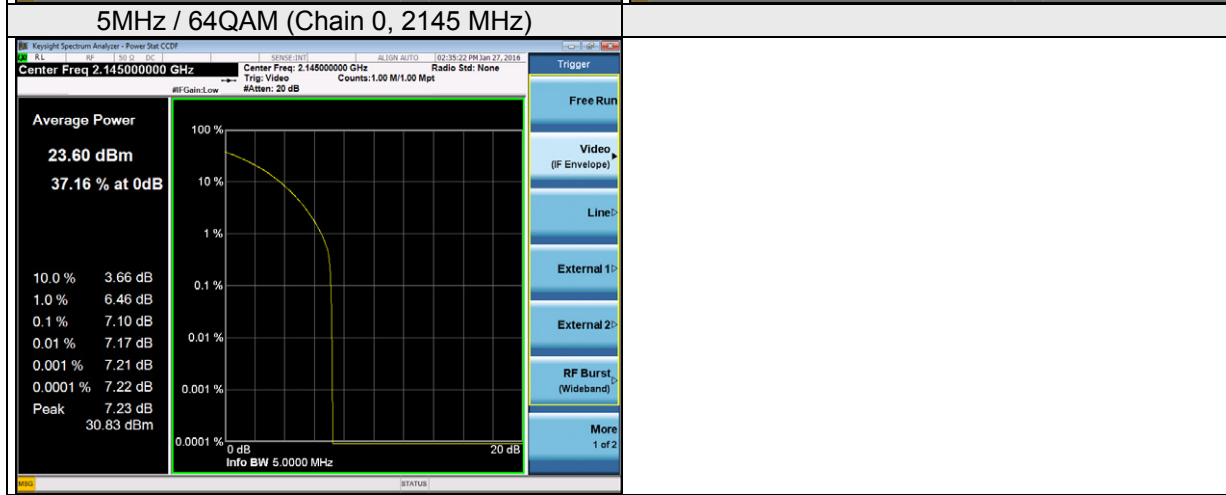
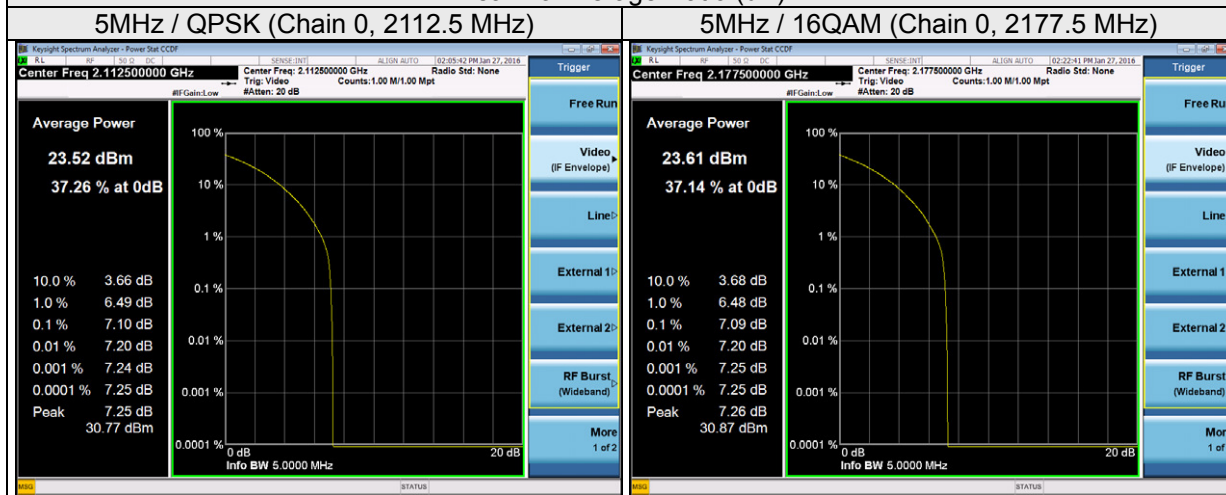
### 4.5.3 Test Procedures

1. Set resolution/measurement bandwidth  $\geq$  signal's occupied bandwidth;
2. Set the number of counts to a value that stabilizes the measured CCDF curve;
3. Record the maximum PAPR level associated with a probability of 0.1%.

4.5.4 Test Results

Channel Bandwidth: 5MHz						
Frequency (MHz)	Peak To Average Ratio (dB)					
	Chain0			Chain1		
	QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
2112.5	7.10	7.06	7.07	7.09	7.06	7.10
2145	7.08	7.08	7.10	7.07	7.08	7.10
2177.5	7.09	7.08	7.09	7.09	7.09	7.09

SPECTRUM PLOT OF WORST VALUE  
Peak To Average Ratio (dB)



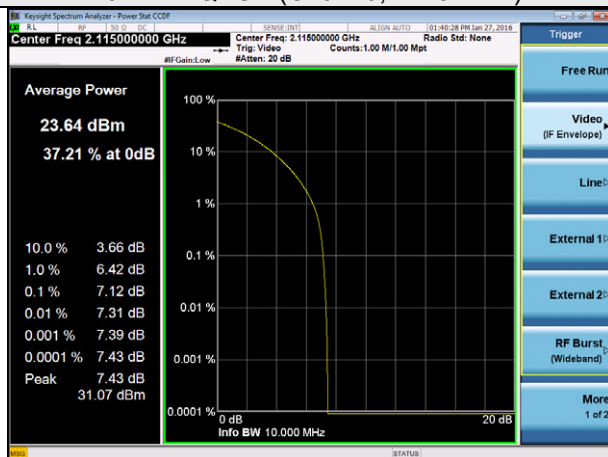
Channel Bandwidth: 10MHz

Frequency (MHz)	Peak To Average Ratio (dB)					
	Chain0			Chain1		
	QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
2115	7.12	7.14	7.11	7.11	7.11	7.14
2145	7.09	7.10	7.10	7.09	7.10	7.07
2175	7.10	7.09	7.10	7.09	7.09	7.11

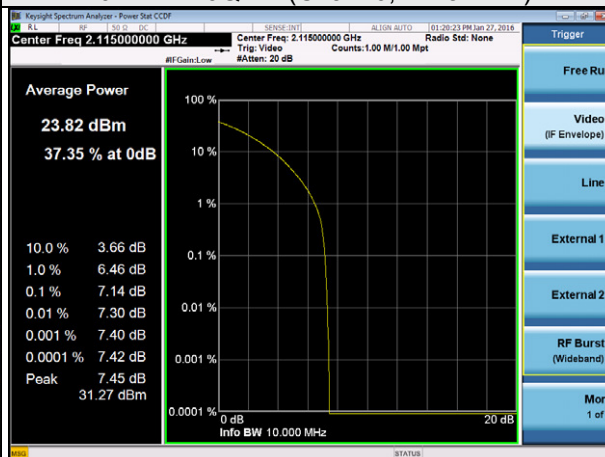
SPECTRUM PLOT OF WORST VALUE

Peak To Average Ratio (dB)

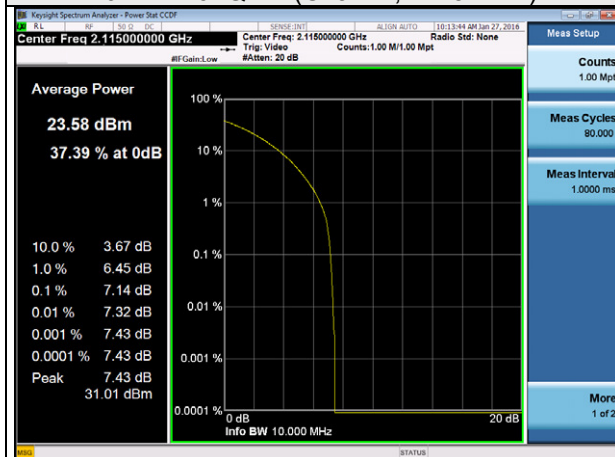
10MHz / QPSK (Chain 0, 2115 MHz)



10MHz / 16QAM (Chain 0, 2115 MHz)

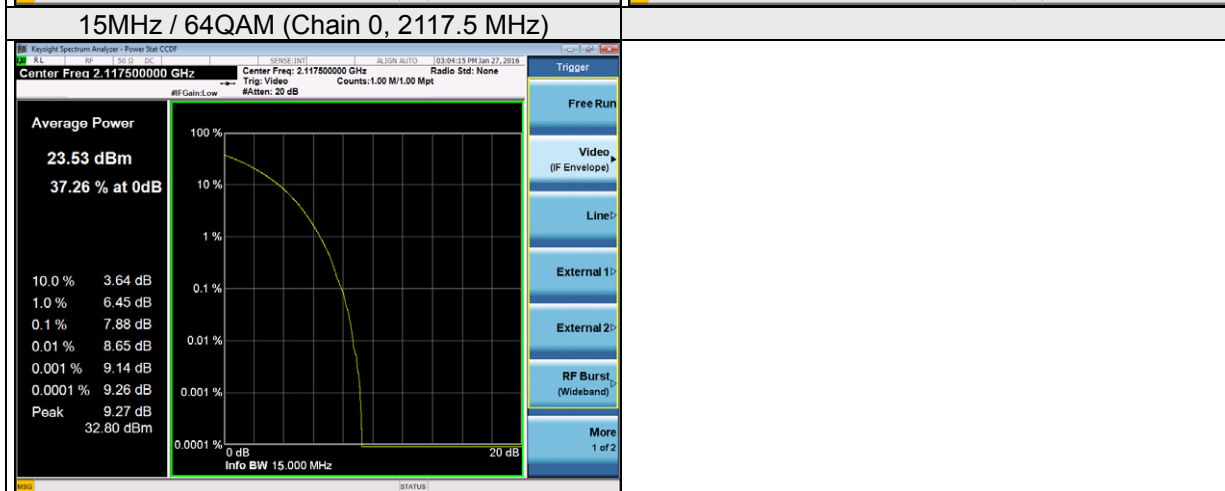
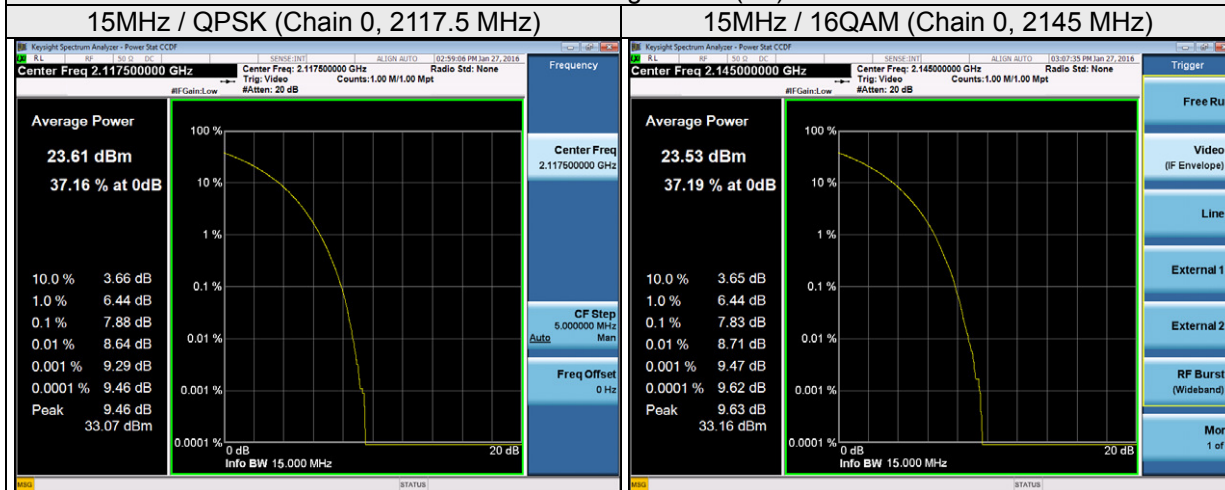


10MHz / 64QAM (Chain 1, 2115 MHz)



Channel Bandwidth: 15MHz						
Frequency (MHz)	Peak To Average Ratio (dB)					
	Chain0			Chain1		
	QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
2117.5	7.88	7.82	7.88	7.88	7.83	7.83
2145	7.83	7.83	7.82	7.85	7.80	7.81
2172.5	7.83	7.83	7.86	7.85	7.81	7.85

**SPECTRUM PLOT OF WORST VALUE**  
Peak To Average Ratio (dB)



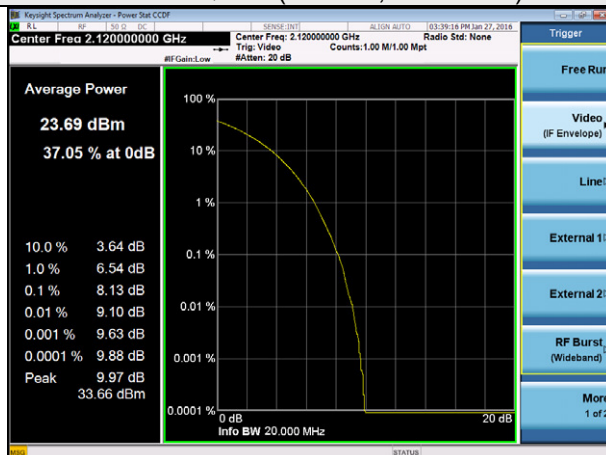
Channel Bandwidth: 20MHz

Frequency (MHz)	Peak To Average Ratio (dB)					
	Chain0			Chain1		
	QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
2120	8.11	8.09	8.14	8.13	8.10	8.14
2145	8.09	8.10	8.11	8.12	8.07	8.10
2170	8.10	8.14	8.14	8.10	8.10	8.15

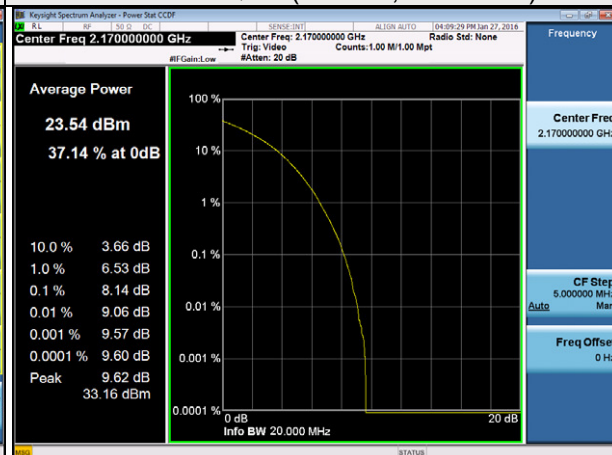
SPECTRUM PLOT OF WORST VALUE

Peak To Average Ratio (dB)

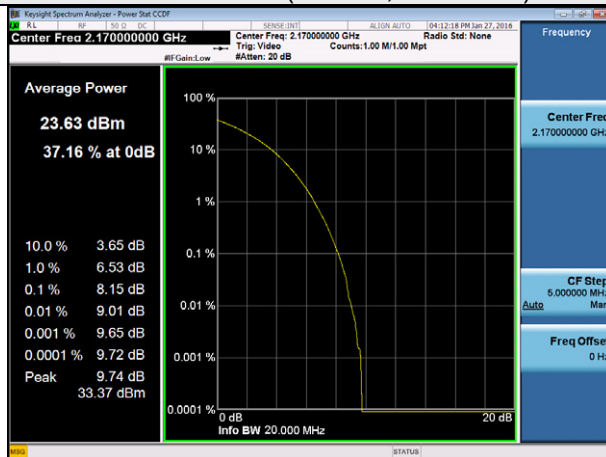
20MHz / QPSK (Chain 1, 2120 MHz)



20MHz / 16QAM (Chain 0, 2170 MHz)



20MHz / 64QAM (Chain 1, 2170 MHz)



## 4.6 Conducted Spurious Emissions

### 4.6.1 Limits of Conducted Spurious Emissions Measurement

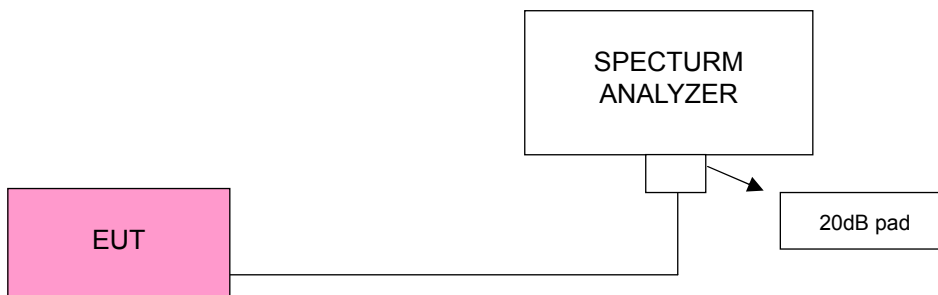
In the FCC 27.53(h), On any frequency outside a licensee’s frequency block, The power of any emission shall be attenuated below the transmitter power (P) by at least  $43 + 10 \log (P)$  dB, the emission limit equal to  $-13\text{dBm}$ .

Note:

This device can be implelement MIMO function, so the limit of spurious emissions needs to be reduced by  $10\log(\text{Numbers}_{\text{Ant}})$  according to FCC KDB 662911 D01 guidance.

{The limit is adjusted to  $-13\text{dBm} - 10*\log(2) = -16.01\text{dBm}$ .}

### 4.6.2 Test Setup



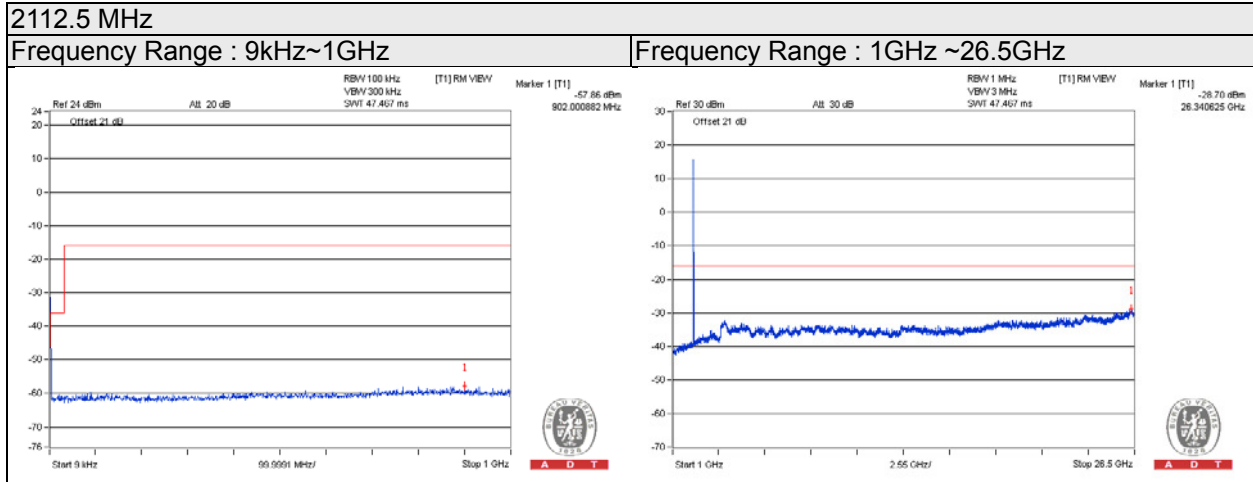
### 4.6.3 Test Procedure

- a. All measurements were done at 3 channels: low, middle and high operational frequency range.
- b. When the spectrum scanned from 9kHz to 26.5GHz, it shall be connected to the 20dB pad attenuated the carried frequency.

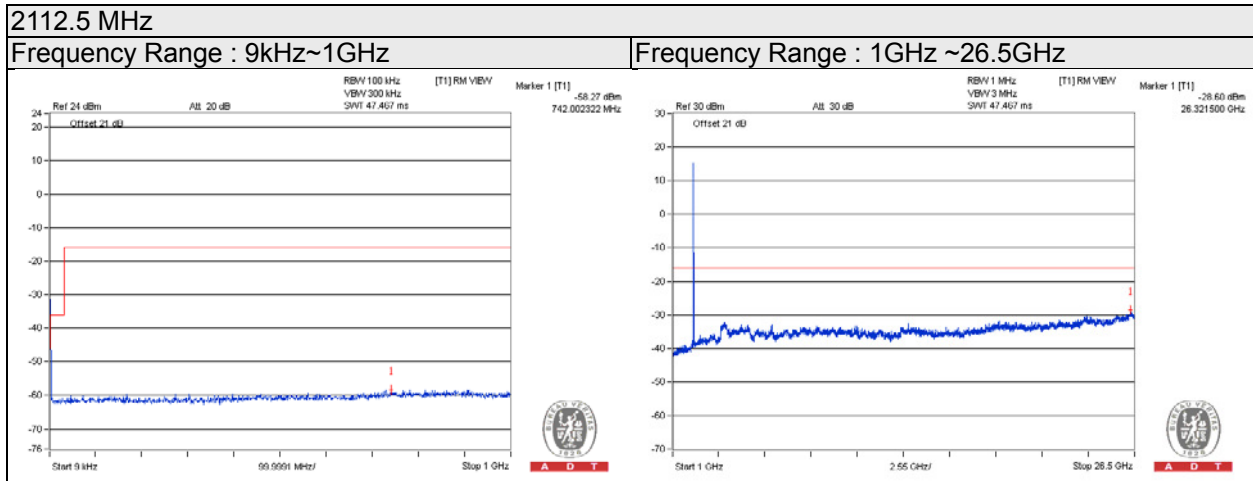


### 4.6.5 Test Results

Chain 0				
QPSK / Channel Bandwidth: 5MHz				
Frequency(MHz)	Measurement Value	Limit	Margin	Result
902.00	-57.86	-16.01	-41.85	Pass
24640.63	-28.70	-16.01	-12.69	Pass



Chain 1				
QPSK / Channel Bandwidth: 5MHz				
Frequency(MHz)	Measurement Value	Limit	Margin	Result
742.00	-58.27	-16.01	-42.26	Pass
26321.50	-28.60	-16.01	-12.59	Pass



**Chain 0**

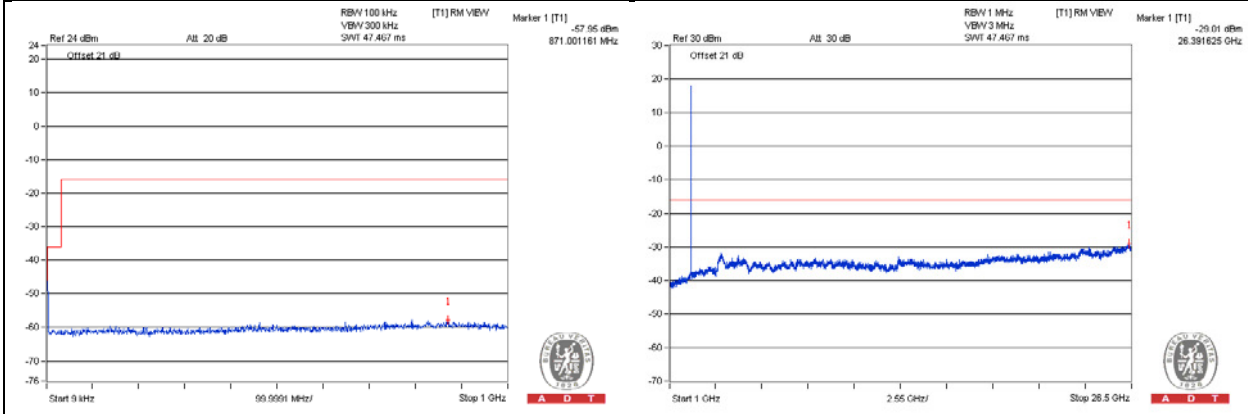
QPSK / Channel Bandwidth: 5MHz

Frequency(MHz)	Measurement Value	Limit	Margin	Result
871.00	-57.95	-16.01	-41.94	Pass
26391.63	-29.01	-16.01	-13.00	Pass

2145 MHz

Frequency Range : 9kHz~1GHz

Frequency Range : 1GHz ~26.5GHz



**Chain 1**

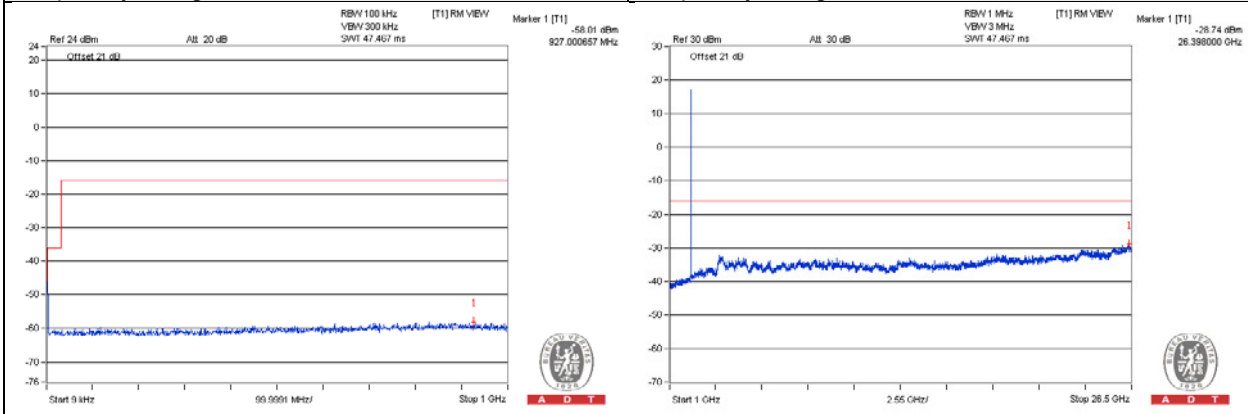
QPSK / Channel Bandwidth: 5MHz

Frequency(MHz)	Measurement Value	Limit	Margin	Result
927.00	-58.01	-16.01	-42.00	Pass
26398.00	-28.74	-16.01	-12.73	Pass

2145 MHz

Frequency Range : 9kHz~1GHz

Frequency Range : 1GHz ~26.5GHz



**Chain 0**

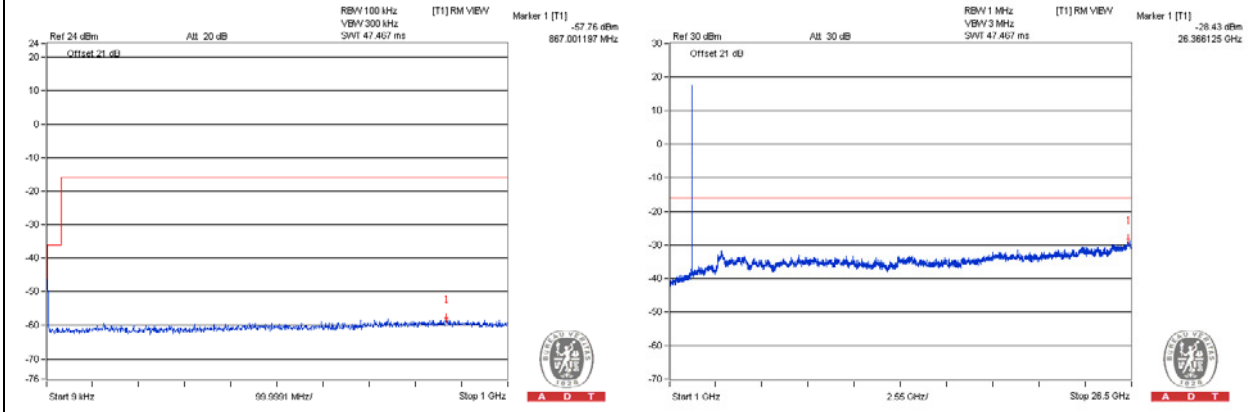
QPSK / Channel Bandwidth: 5MHz

Frequency(MHz)	Measurement Value	Limit	Margin	Result
867.00	-57.76	-16.01	-41.75	Pass
26366.13	-28.43	-16.01	-12.42	Pass

2177.5 MHz

Frequency Range : 9kHz~1GHz

Frequency Range : 1GHz ~26.5GHz



**Chain 1**

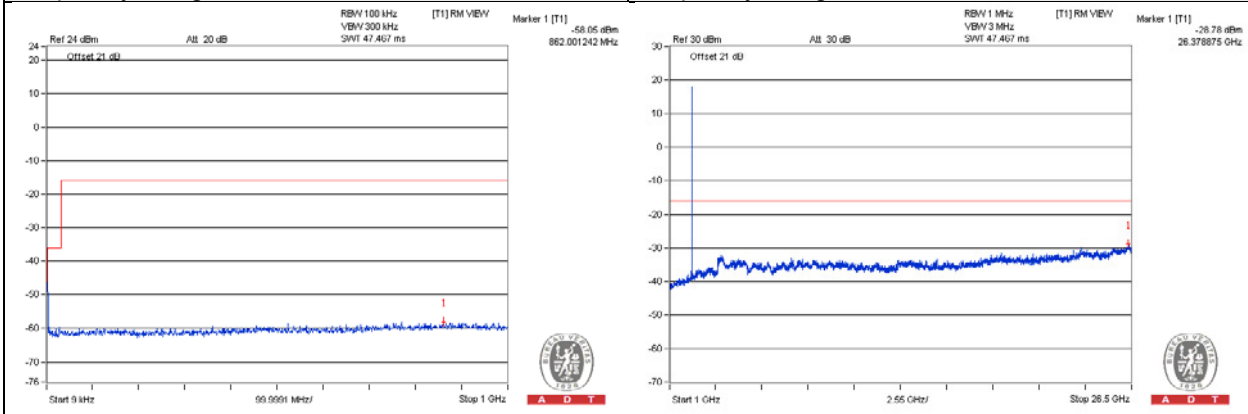
QPSK / Channel Bandwidth: 5MHz

Frequency(MHz)	Measurement Value	Limit	Margin	Result
862.00	-58.05	-16.01	-42.04	Pass
26378.88	-28.78	-16.01	-12.77	Pass

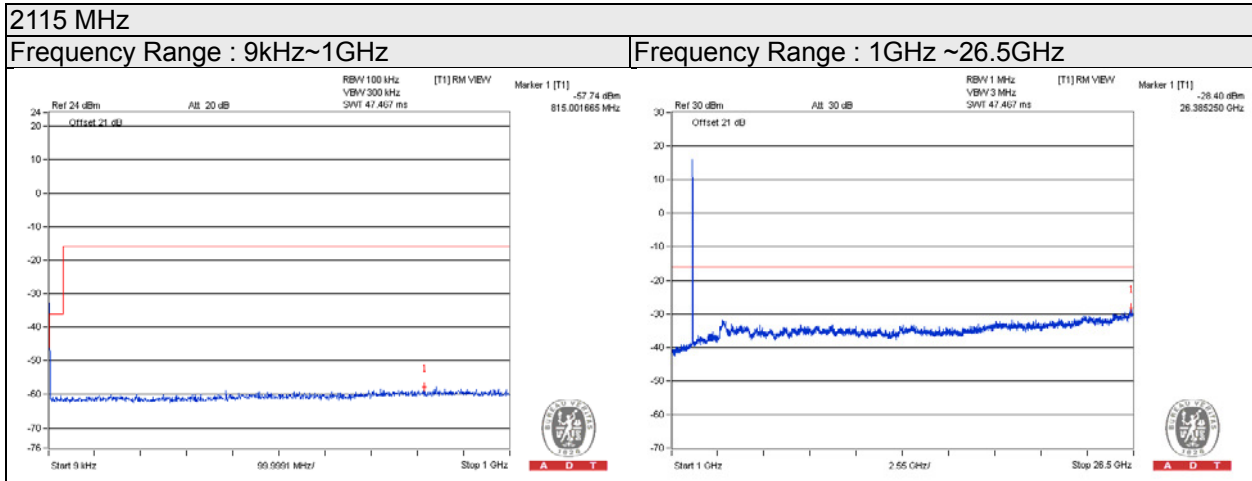
2177.5 MHz

Frequency Range : 9kHz~1GHz

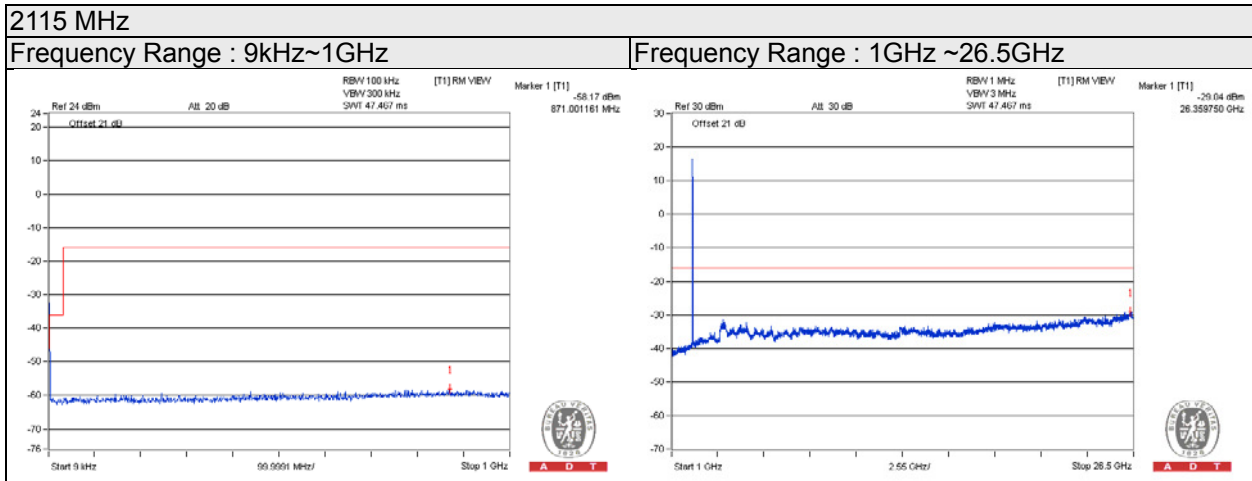
Frequency Range : 1GHz ~26.5GHz



Chain 0				
QPSK / Channel Bandwidth: 10MHz				
Frequency(MHz)	Measurement Value	Limit	Margin	Result
815.00	-57.74	-16.01	-41.73	Pass
26385.25	-28.40	-16.01	-12.39	Pass



Chain 1				
QPSK / Channel Bandwidth: 10MHz				
Frequency(MHz)	Measurement Value	Limit	Margin	Result
871.00	-58.17	-16.01	-42.16	Pass
26359.75	-29.04	-16.01	-13.03	Pass



**Chain 0**

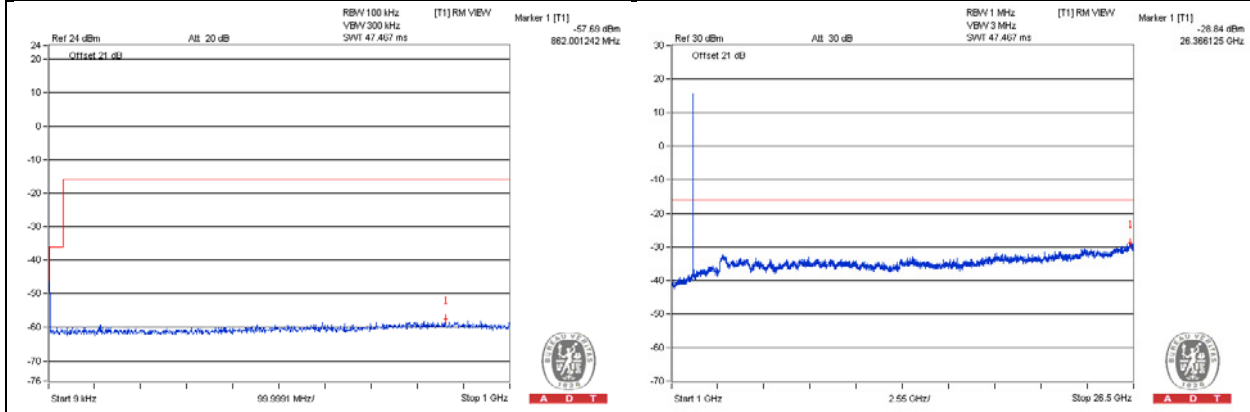
QPSK / Channel Bandwidth: 10MHz

Frequency(MHz)	Measurement Value	Limit	Margin	Result
862.00	-57.69	-16.01	-41.68	Pass
26366.13	-28.84	-16.01	-12.83	Pass

2145 MHz

Frequency Range : 9kHz~1GHz

Frequency Range : 1GHz ~26.5GHz



**Chain 1**

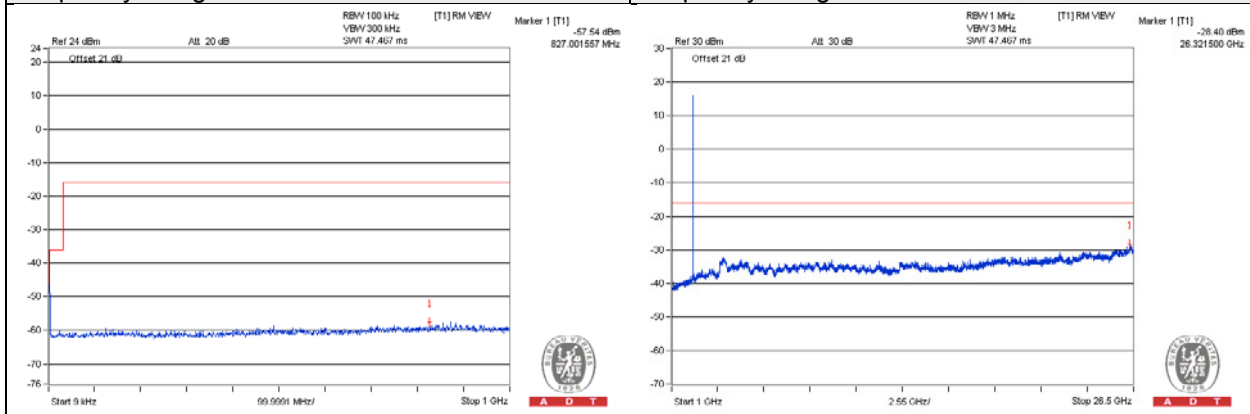
QPSK / Channel Bandwidth: 10MHz

Frequency(MHz)	Measurement Value	Limit	Margin	Result
827.00	-57.54	-16.01	-41.53	Pass
26321.50	-28.40	-16.01	-12.39	Pass

2145 MHz

Frequency Range : 9kHz~1GHz

Frequency Range : 1GHz ~26.5GHz



**Chain 0**

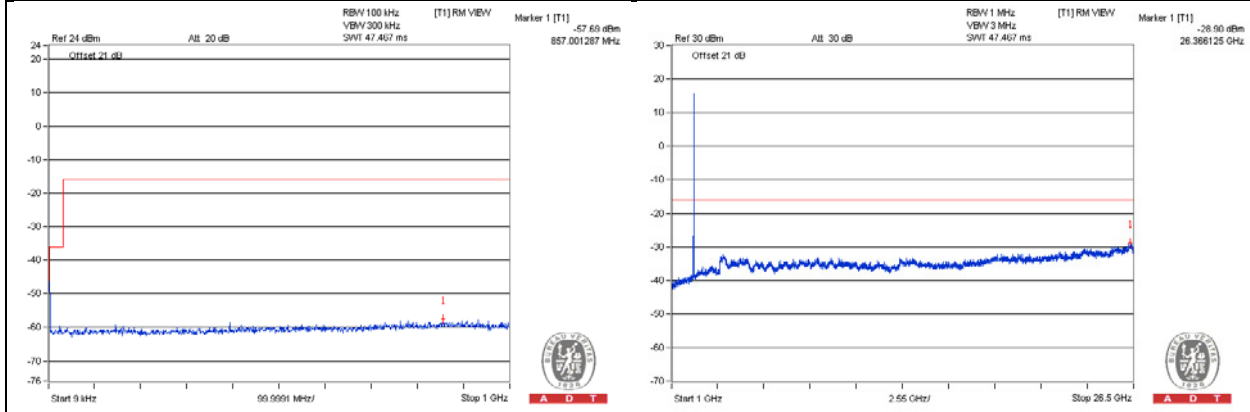
QPSK / Channel Bandwidth: 10MHz

Frequency(MHz)	Measurement Value	Limit	Margin	Result
857.00	-57.69	-16.01	-41.68	Pass
26366.13	-28.90	-16.01	-12.89	Pass

2175 MHz

Frequency Range : 9kHz~1GHz

Frequency Range : 1GHz ~26.5GHz



**Chain 1**

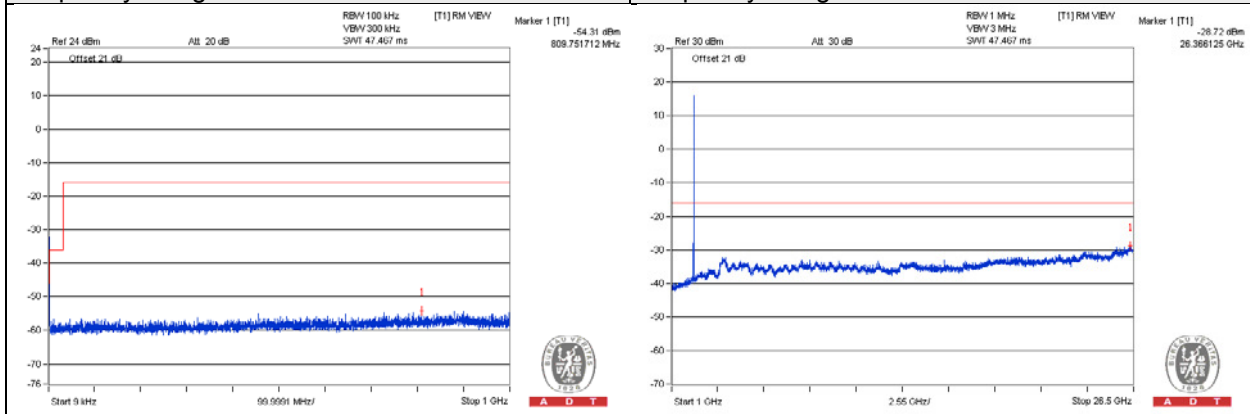
QPSK / Channel Bandwidth: 10MHz

Frequency(MHz)	Measurement Value	Limit	Margin	Result
809.75	-54.31	-16.01	-38.30	Pass
26366.13	-28.72	-16.01	-12.71	Pass

2175 MHz

Frequency Range : 9kHz~1GHz

Frequency Range : 1GHz ~26.5GHz



**Chain 0**

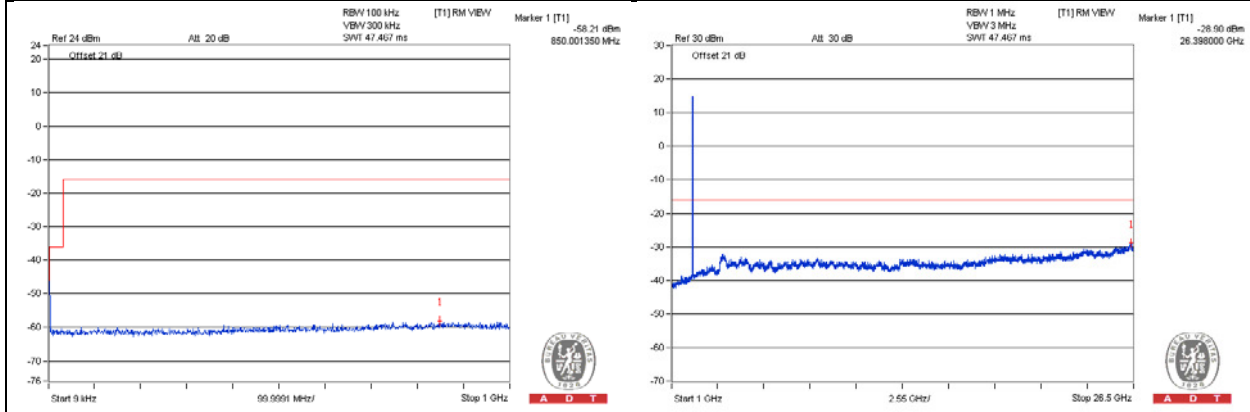
QPSK / Channel Bandwidth: 15MHz

Frequency(MHz)	Measurement Value	Limit	Margin	Result
850.00	-58.21	-16.01	-42.20	Pass
26398.00	-28.90	-16.01	-12.89	Pass

**217.5 MHz**

Frequency Range : 9kHz~1GHz

Frequency Range : 1GHz ~26.5GHz



**Chain 1**

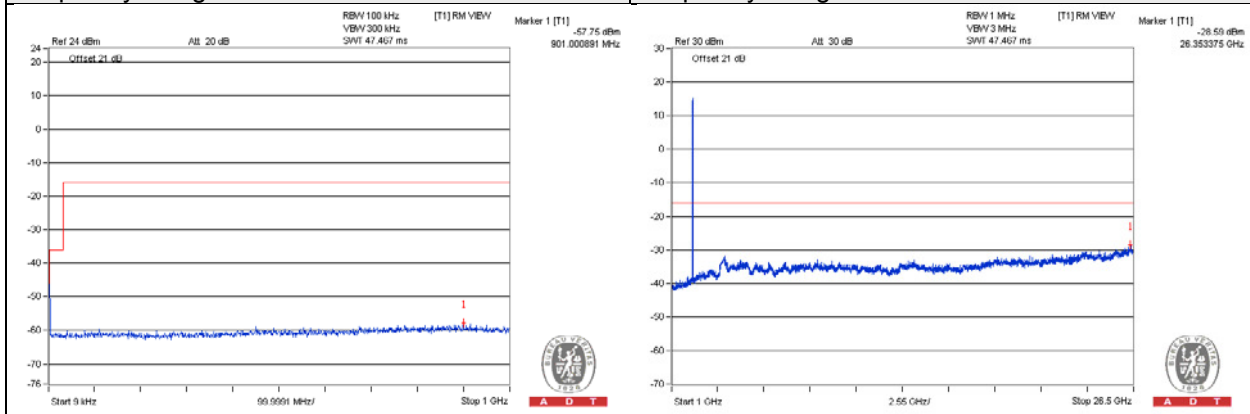
QPSK / Channel Bandwidth: 15MHz

Frequency(MHz)	Measurement Value	Limit	Margin	Result
901.00	-57.75	-16.01	-41.74	Pass
26353.38	-28.59	-16.01	-12.58	Pass

**217.5 MHz**

Frequency Range : 9kHz~1GHz

Frequency Range : 1GHz ~26.5GHz



**Chain 0**

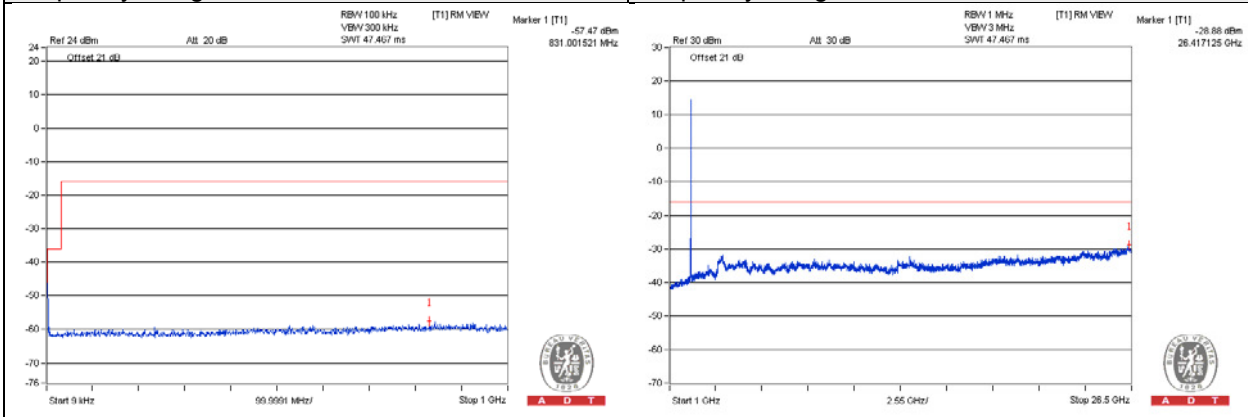
QPSK / Channel Bandwidth: 15MHz

Frequency(MHz)	Measurement Value	Limit	Margin	Result
831.00	-57.47	-16.01	-41.46	Pass
26417.13	-28.88	-16.01	-12.87	Pass

2145 MHz

Frequency Range : 9kHz~1GHz

Frequency Range : 1GHz ~26.5GHz



**Chain 1**

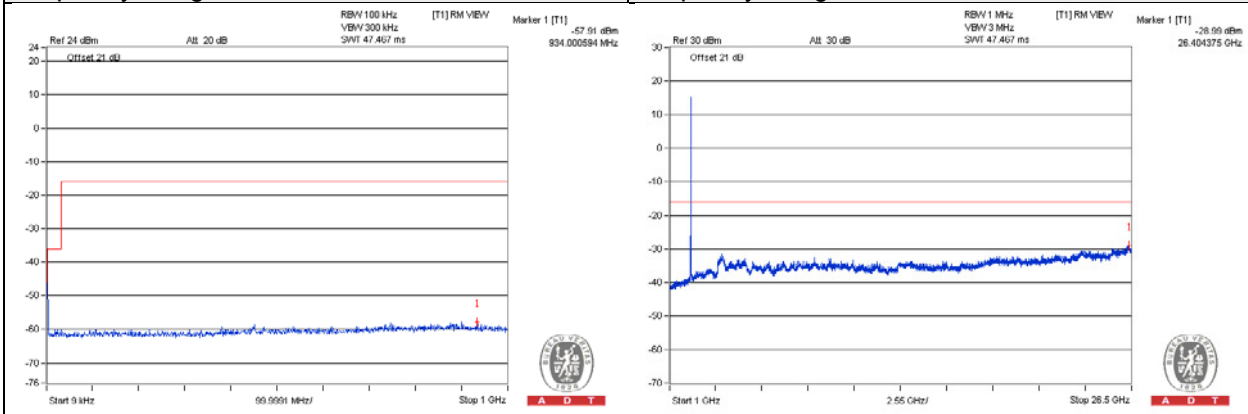
QPSK / Channel Bandwidth: 15MHz

Frequency(MHz)	Measurement Value	Limit	Margin	Result
934	-57.91	-16.01	-41.9	Pass
26404.38	-28.99	-16.01	-12.89	Pass

2145 MHz

Frequency Range : 9kHz~1GHz

Frequency Range : 1GHz ~26.5GHz





**Chain 0**

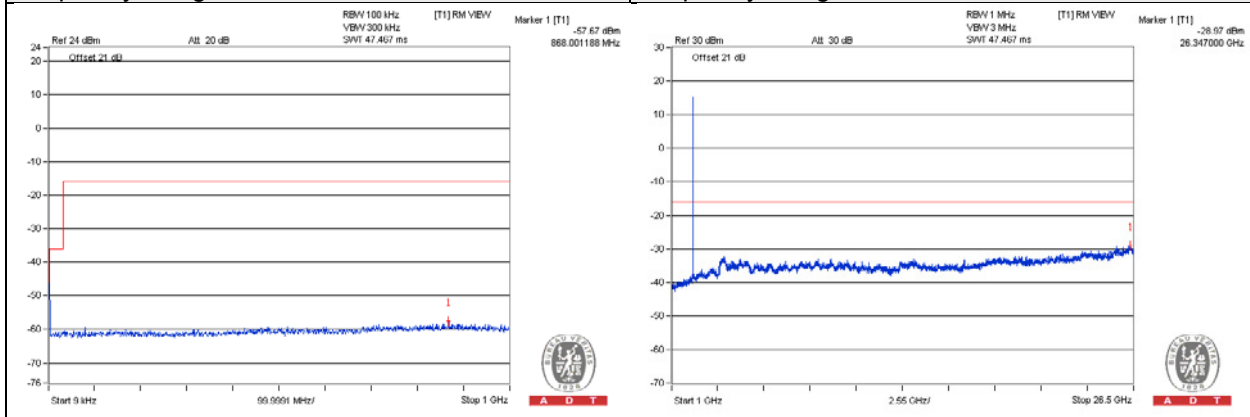
QPSK / Channel Bandwidth: 15MHz

Frequency(MHz)	Measurement Value	Limit	Margin	Result
868.00	-57.67	-16.01	-41.66	Pass
26347.00	-28.97	-16.01	-12.96	Pass

2172.5 MHz

Frequency Range : 9kHz~1GHz

Frequency Range : 1GHz ~26.5GHz



**Chain 1**

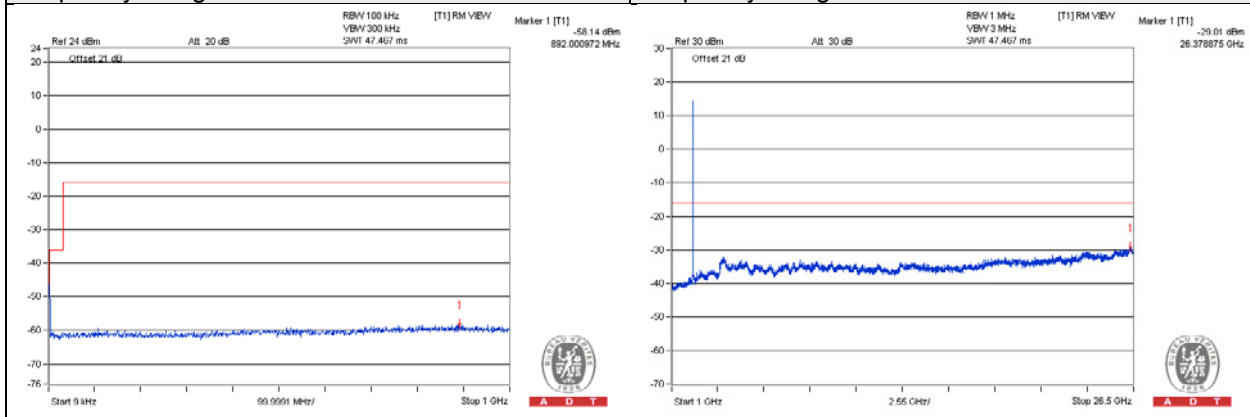
QPSK / Channel Bandwidth: 15MHz

Frequency(MHz)	Measurement Value	Limit	Margin	Result
892.00	-58.14	-16.01	-42.13	Pass
26378.88	-29.01	-16.01	-13.01	Pass

2172.5 MHz

Frequency Range : 9kHz~1GHz

Frequency Range : 1GHz ~26.5GHz



**Chain 0**

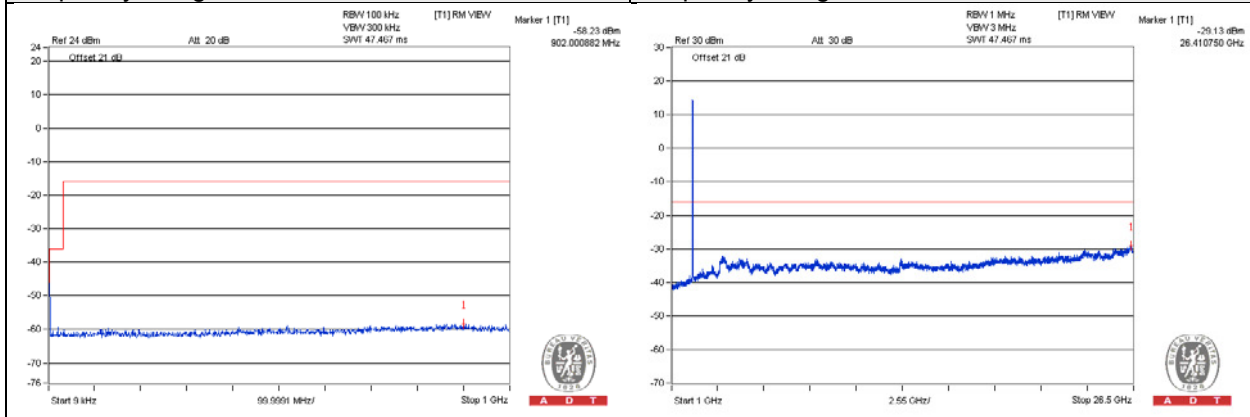
QPSK / Channel Bandwidth: 20MHz

Frequency(MHz)	Measurement Value	Limit	Margin	Result
902.00	-58.23	-16.01	-42.22	Pass
26410.75	-29.13	-16.01	-13.12	Pass

2120 MHz

Frequency Range : 9kHz~1GHz

Frequency Range : 1GHz ~26.5GHz



**Chain 1**

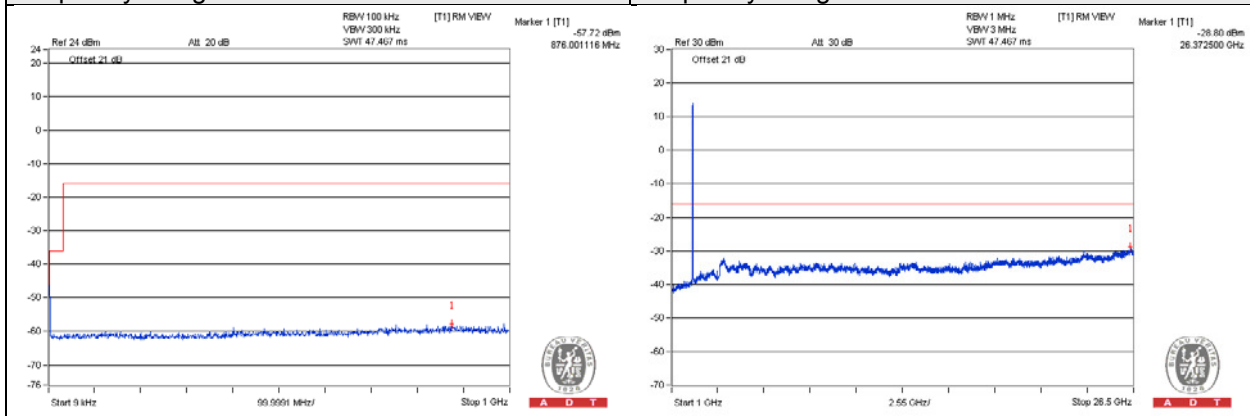
QPSK / Channel Bandwidth: 20MHz

Frequency(MHz)	Measurement Value	Limit	Margin	Result
876.00	-57.72	-16.01	-41.71	Pass
26372.50	-28.80	-16.01	-12.79	Pass

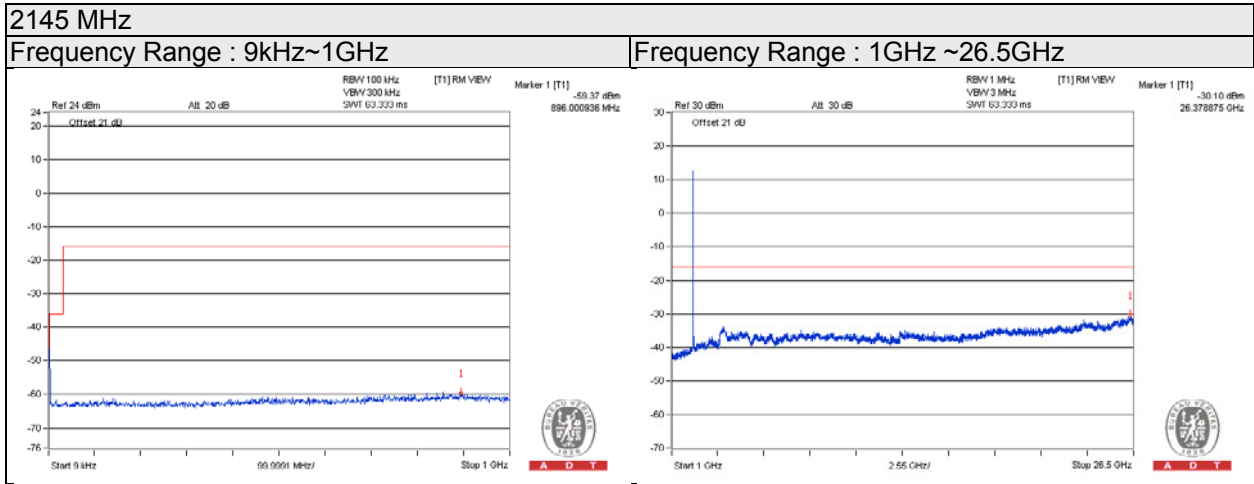
2120 MHz

Frequency Range : 9kHz~1GHz

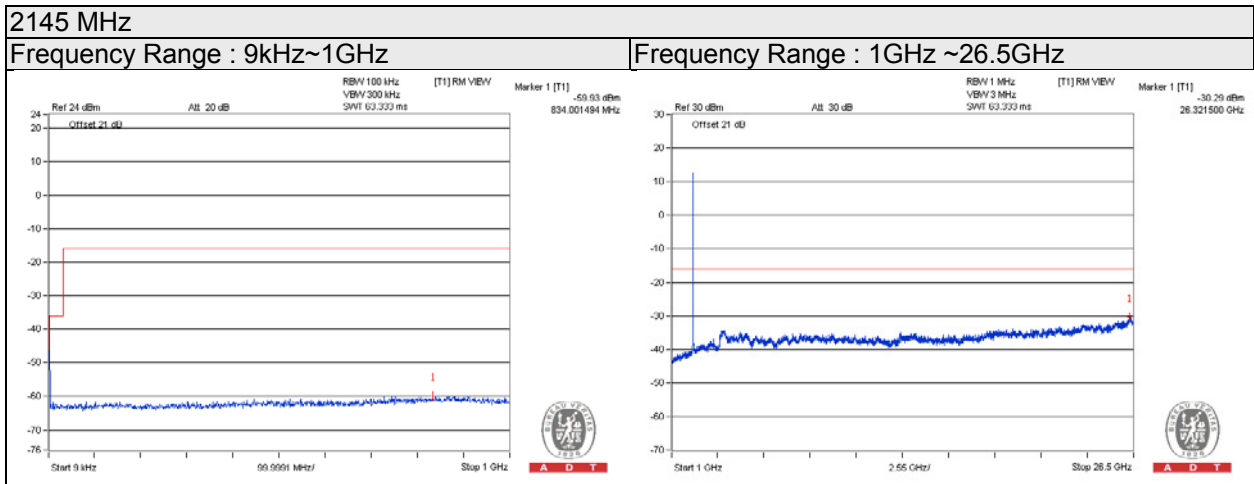
Frequency Range : 1GHz ~26.5GHz



Chain 0				
QPSK / Channel Bandwidth: 20MHz				
Frequency(MHz)	Measurement Value	Limit	Margin	Result
896.00	-59.37	-16.01	-43.36	Pass
26378.88	-30.10	-16.01	-14.09	Pass



Chain 1				
QPSK / Channel Bandwidth: 20MHz				
Frequency(MHz)	Measurement Value	Limit	Margin	Result
834.00	-59.93	-16.01	-43.92	Pass
26321.50	-30.29	-16.01	-14.28	Pass



**Chain 0**

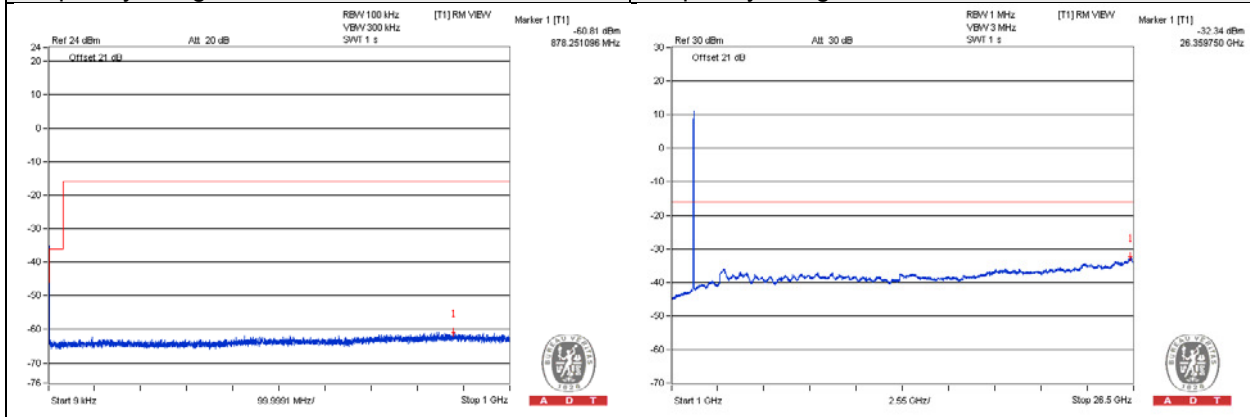
QPSK / Channel Bandwidth: 20MHz

Frequency(MHz)	Measurement Value	Limit	Margin	Result
878.25	-60.81	-16.01	-44.80	Pass
26359.75	-32.34	-16.01	-16.33	Pass

2170 MHz

Frequency Range : 9kHz~1GHz

Frequency Range : 1GHz ~26.5GHz



**Chain 1**

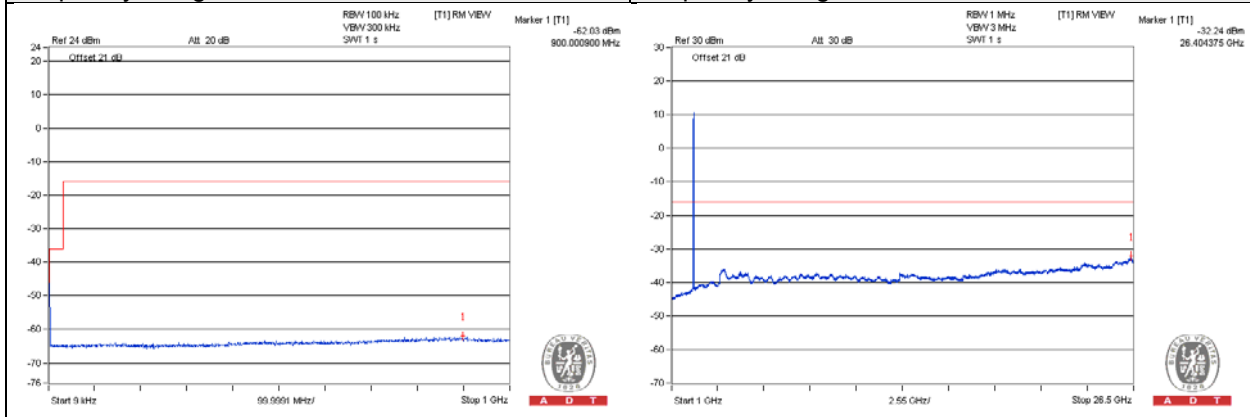
QPSK / Channel Bandwidth: 20MHz

Frequency(MHz)	Measurement Value	Limit	Margin	Result
900.00	-62.03	-16.01	-46.02	Pass
26404.38	-32.24	-16.01	-16.23	Pass

2170 MHz

Frequency Range : 9kHz~1GHz

Frequency Range : 1GHz ~26.5GHz



## 4.7 Radiated Emission Measurement

### 4.7.1 Limits of Radiated Emission Measurement

In the FCC 27.53(h), On any frequency outside a licensee's frequency block, The power of any emission shall be attenuated below the transmitter power (P) by at least  $43 + 10 \log (P)$  dB, the emission limit equal to  $-13\text{dBm}$ .

### 4.7.2 Test Procedure

- a. The power was measured with R&S Spectrum Analyzer. All measurements were done at 3 channels (low, middle and high channel of operational frequency range.)
- b. Substitution method is used for EIRP measurement. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. The "Read Value" is the spectrum reading the maximum power value.
- c. The substitution antenna is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a TX cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to "Read Value " of step b. Record the power level of S.G
- d.  $\text{EIRP} = \text{Output power level of S.G} - \text{TX cable loss} + \text{Antenna gain of substitution antenna}$ .

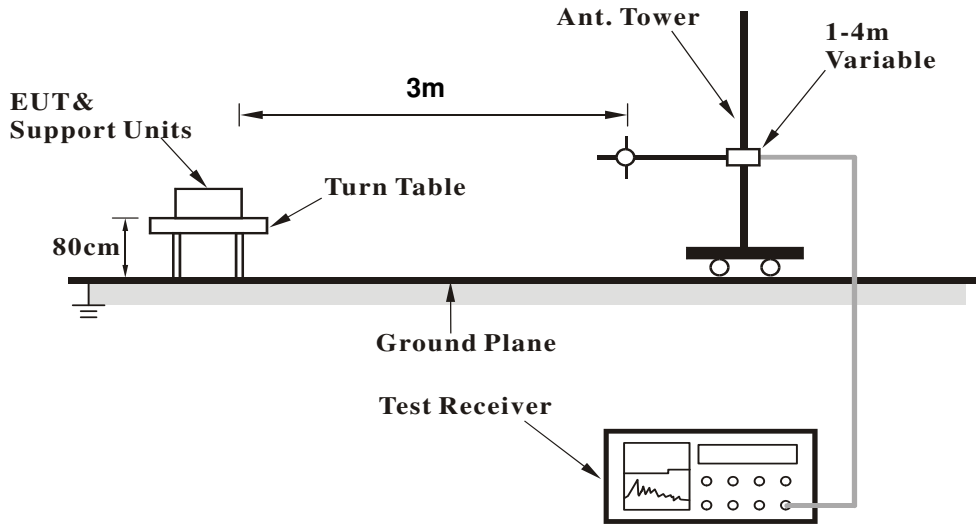
**NOTE:** The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1MHz/3MHz.

### 4.7.3 Deviation from Test Standard

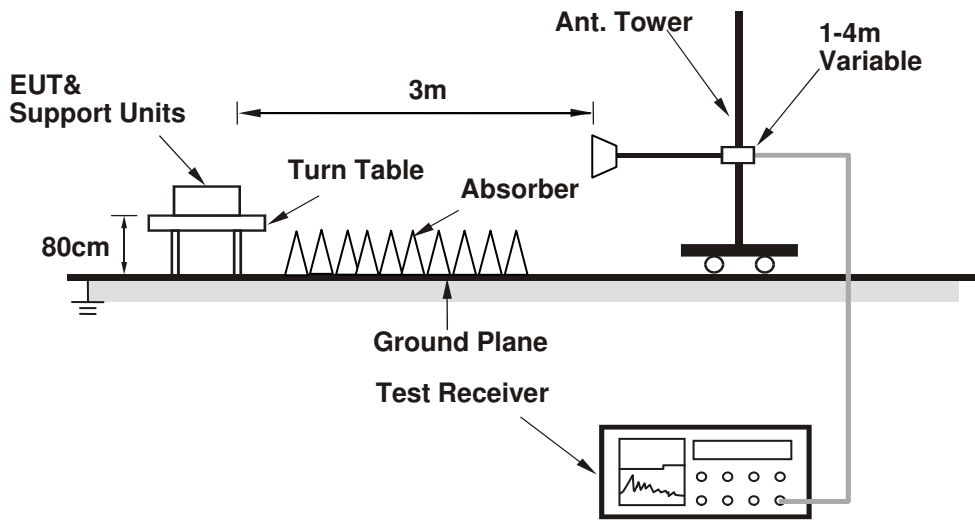
No deviation.

4.7.4 Test Setup

<Frequency Range below 1GHz>



<Frequency Range above 1GHz>



For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.7.5 Test Results

Below 1GHz

Channel Bandwidth: 5MHz

Test Frequency	2112.5 MHz	Frequency Range	Below 1000 MHz
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Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBuV/m)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	91.91	38.15	-40.82	-9.71	-50.52	-13	-37.52
2	237.29	37.61	-56.01	-1.30	-57.31	-13	-44.31
3	290.03	36.15	-59.49	3.74	-55.75	-13	-42.75
4	346.63	35.47	-59.52	1.74	-57.78	-13	-44.78
5	470.02	38.39	-60.10	0.43	-59.68	-13	-46.68
6	737.3	33.38	-64.46	0.39	-64.07	-13	-51.07
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBuV/m)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	69.5	32.77	-45.57	-10.13	-55.70	-13	-42.70
2	94.29	35.02	-55.63	-0.64	-56.27	-13	-43.27
3	128.79	30.41	-65.10	2.88	-62.22	-13	-49.22
4	239.03	34.05	-60.94	1.74	-59.19	-13	-46.19
5	510.03	35.36	-63.36	0.49	-62.87	-13	-49.87
6	610.01	36.04	-61.81	0.39	-61.42	-13	-48.42

Remarks:

1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

Test Frequency	2145 MHz	Frequency Range	Below 1000 MHz
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**Antenna Polarity & Test Distance: Horizontal at 3 M**

No.	Freq. (MHz)	Reading (dBuV/m)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	92.78	36.94	-54.97	-1.04	-56.02	-13	-43.02
2	237.81	37.15	-58.21	3.84	-54.37	-13	-41.37
3	289.5	35.97	-59.50	3.78	-55.71	-13	-42.71
4	345.7	35.46	-62.23	3.61	-58.62	-13	-45.62
5	469.6	37.98	-59.20	2.84	-56.36	-13	-43.36
6	737.03	32.20	-64.17	1.02	-63.14	-13	-50.14

**Antenna Polarity & Test Distance: Vertical at 3 M**

No.	Freq. (MHz)	Reading (dBuV/m)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	69.19	32.43	-55.20	-4.91	-60.11	-13	-47.11
2	93.44	34.69	-57.11	-1.00	-58.12	-13	-45.12
3	128.08	29.24	-62.11	-1.23	-63.35	-13	-50.35
4	239.82	32.79	-62.57	3.82	-58.75	-13	-45.75
5	510.8	34.84	-60.55	2.81	-57.74	-13	-44.74
6	609.06	35.40	-59.29	1.78	-57.51	-13	-44.51

**Remarks:**

1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).



Test Frequency	2177.5 MHz	Frequency Range	Below 1000 MHz
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**Antenna Polarity & Test Distance: Horizontal at 3 M**

No.	Freq. (MHz)	Reading (dBuV/m)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	92.79	32.61	-59.30	-1.04	-60.34	-13	-47.34
2	237.63	33.32	-62.04	3.85	-58.20	-13	-45.20
3	289.38	31.84	-63.62	3.78	-59.84	-13	-46.84
4	344.77	32.20	-65.45	3.61	-61.84	-13	-48.84
5	470.63	35.30	-61.83	2.84	-58.99	-13	-45.99
6	739.56	28.48	-67.89	0.98	-66.90	-13	-53.90

**Antenna Polarity & Test Distance: Vertical at 3 M**

No.	Freq. (MHz)	Reading (dBuV/m)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	68.83	28.33	-59.09	-5.02	-64.10	-13	-51.10
2	92.11	30.80	-61.23	-1.08	-62.31	-13	-49.31
3	130.24	26.53	-65.29	-1.25	-66.54	-13	-53.54
4	239.54	30.71	-64.65	3.82	-60.83	-13	-47.83
5	510.83	30.31	-65.08	2.81	-62.27	-13	-49.27
6	610.11	32.71	-61.99	1.78	-60.20	-13	-47.20

**Remarks:**

1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

ABOVE 1GHz

Channel Bandwidth: 5MHz

Test Frequency	2112.5 MHz	Frequency Range	Above 1000MHz
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**Antenna Polarity & Test Distance: Horizontal at 3 M**

No.	Freq. (MHz)	Reading (dBuV/m)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	4225	64.80	-40.00	7.43	-32.58	-13	-19.58
2	6337.5	49.80	-54.34	6.20	-48.14	-13	-35.14
3	8450	59.30	-43.32	4.20	-39.12	-13	-26.12
4	10562.5	53.8	-48.25	3.51	-44.74	-13	-31.74
5	12675	53.4	-47.93	4.38	-43.56	-13	-30.56
6	14787.5	56.6	-40.56	3.78	-36.78	-13	-23.78
7	16900	59.6	-39.43	3.00	-36.43	-13	-23.43
8	19012.5	62.1	-38.26	3.71	-34.55	-13	-21.55
9	21125	63.1	-48.47	4.12	-44.36	-13	-31.36

**Antenna Polarity & Test Distance: Vertical at 3 M**

No.	Freq. (MHz)	Reading (dBuV/m)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	4225	71.05	-33.75	7.43	-26.33	-13	-13.33
2	6337.5	52.09	-52.05	6.20	-45.85	-13	-32.85
3	8450	58.99	-43.63	4.20	-39.43	-13	-26.43
4	10562.5	57.44	-44.61	3.51	-41.10	-13	-28.10
5	12675	51.94	-49.39	4.38	-45.02	-13	-32.02
6	14787.5	59.05	-38.63	3.39	-35.24	-13	-22.24
7	16900	57.98	-41.05	3.00	-38.05	-13	-25.05
8	19012.5	60.88	-39.48	3.71	-35.77	-13	-22.77
9	21125	61.76	-49.81	4.12	-45.70	-13	-32.70

Remarks:

1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

Test Frequency	2145 MHz	Frequency Range	Above 1000MHz
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**Antenna Polarity & Test Distance: Horizontal at 3 M**

No.	Freq. (MHz)	Reading (dBuV/m)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	4290	64.38	-40.38	7.41	-32.97	-13	-19.97
2	6435	49.60	-54.54	6.10	-48.44	-13	-35.44
3	8580	59.00	-43.64	4.21	-39.42	-13	-26.42
4	10725	53.8	-48.13	3.41	-44.72	-13	-31.72
5	12870	53.4	-47.75	4.40	-43.34	-13	-30.34
6	15015	56.6	-40.56	3.78	-36.78	-13	-23.78
7	17160	59.6	-39.57	2.95	-36.63	-13	-23.63
8	19305	62.1	-38.37	3.77	-34.59	-13	-21.59
9	21450	63.8	-48.83	4.16	-44.67	-13	-31.67

**Antenna Polarity & Test Distance: Vertical at 3 M**

No.	Freq. (MHz)	Reading (dBuV/m)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
<b>1</b>	<b>4290</b>	<b>71.33</b>	<b>-33.43</b>	<b>7.41</b>	<b>-26.02</b>	<b>-13</b>	<b>-13.02</b>
2	6435	53.5	-50.64	6.10	-44.54	-13	-31.54
3	8580	60.3	-42.34	4.21	-38.12	-13	-25.12
4	10725	57.9	-44.03	3.41	-40.62	-13	-27.62
5	12870	53.4	-47.75	4.40	-43.34	-13	-30.34
6	15015	59.1	-38.36	3.60	-34.76	-13	-21.76
7	17160	59.2	-39.97	2.95	-37.03	-13	-24.03
8	19305	61.5	-38.97	3.77	-35.19	-13	-22.19
9	21450	63.8	-48.83	4.16	-44.67	-13	-31.67

**Remarks:**

1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

Test Frequency	2177.5 MHz	Frequency Range	Above 1000MHz
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**Antenna Polarity & Test Distance: Horizontal at 3 M**

No.	Freq. (MHz)	Reading (dBuV/m)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	4355	64.50	-40.22	7.39	-32.83	-13	-19.83
2	6532.5	49.80	-54.34	6.00	-48.34	-13	-35.34
3	8710	59.10	-43.58	4.22	-39.36	-13	-26.36
4	10887.5	53.9	-47.92	3.32	-44.60	-13	-31.60
5	13065	53.6	-47.36	4.43	-42.93	-13	-29.93
6	15242.5	56.8	-40.36	3.78	-36.58	-13	-23.58
7	17420	59.8	-39.51	2.89	-36.63	-13	-23.63
8	19597.5	62.3	-38.28	3.84	-34.44	-13	-21.44
9	21775	63.6	-50.09	4.20	-45.89	-13	-32.89

**Antenna Polarity & Test Distance: Vertical at 3 M**

No.	Freq. (MHz)	Reading (dBuV/m)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	4355	70.78	-33.94	7.39	-26.55	-13	-13.55
2	6532.5	51.76	-52.38	6.00	-46.38	-13	-33.38
3	8710	58.71	-43.97	4.22	-39.75	-13	-26.75
4	10887.5	57.06	-44.76	3.32	-41.44	-13	-28.44
5	13065	50.9	-50.06	4.43	-45.63	-13	-32.63
6	15242.5	58.33	-38.92	3.80	-35.11	-13	-22.11
7	17420	57.55	-41.76	2.89	-38.88	-13	-25.88
8	19597.5	60.61	-39.97	3.84	-36.13	-13	-23.13
9	21775	61.51	-52.18	4.20	-47.98	-13	-34.98

**Remarks:**

1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

Below 1GHz

Channel Bandwidth: 10MHz

Test Frequency	2115 MHz	Frequency Range	Below 1000 MHz
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**Antenna Polarity & Test Distance: Horizontal at 3 M**

No.	Freq. (MHz)	Reading (dBuV/m)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	89.5	34.52	-57.96	-1.23	-59.19	-13	-46.19
2	235.76	33.78	-61.59	3.87	-57.72	-13	-44.72
3	290.78	31.40	-64.10	3.77	-60.33	-13	-47.33
4	344.55	32.27	-65.37	3.61	-61.76	-13	-48.76
5	471.2	34.39	-62.71	2.84	-59.86	-13	-46.86
6	735.65	27.53	-68.83	1.05	-67.79	-13	-54.79

**Antenna Polarity & Test Distance: Vertical at 3 M**

No.	Freq. (MHz)	Reading (dBuV/m)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	69.23	27.94	-59.71	-4.90	-64.62	-13	-51.62
2	90.46	31.13	-61.18	-1.18	-62.36	-13	-49.36
3	128.1	25.88	-65.48	-1.23	-66.71	-13	-53.71
4	237.89	28.53	-66.83	3.84	-62.99	-13	-49.99
5	508.52	29.64	-65.78	2.83	-62.95	-13	-49.95
6	607.94	31.21	-63.47	1.78	-61.69	-13	-48.69

Remarks:

1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

Test Frequency	2145 MHz	Frequency Range	Below 1000 MHz
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**Antenna Polarity & Test Distance: Horizontal at 3 M**

No.	Freq. (MHz)	Reading (dBuV/m)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	93.54	31.35	-60.43	-1.00	-61.43	-13	-48.43
2	240.3	33.55	-61.80	3.81	-57.99	-13	-44.99
3	291.86	30.35	-65.19	3.77	-61.42	-13	-48.42
4	344.3	32.73	-64.90	3.61	-61.29	-13	-48.29
5	470.61	32.18	-64.95	2.84	-62.11	-13	-49.11
6	737.37	28.95	-67.42	1.02	-66.40	-13	-53.40

**Antenna Polarity & Test Distance: Vertical at 3 M**

No.	Freq. (MHz)	Reading (dBuV/m)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	71.6	28.03	-61.05	-4.21	-65.26	-13	-52.26
2	96.28	29.27	-62.04	-0.84	-62.88	-13	-49.88
3	128.27	26.17	-65.22	-1.24	-66.46	-13	-53.46
4	238.79	28.42	-66.94	3.83	-63.11	-13	-50.11
5	508.57	30.39	-65.03	2.83	-62.20	-13	-49.20
6	609.25	32.21	-62.48	1.78	-60.70	-13	-47.70

**Remarks:**

1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

Test Frequency	2175 MHz	Frequency Range	Below 1000 MHz
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**Antenna Polarity & Test Distance: Horizontal at 3 M**

No.	Freq. (MHz)	Reading (dBuV/m)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	93.07	34.54	-57.32	-1.03	-58.35	-13	-45.35
2	237.52	34.03	-61.33	3.85	-57.49	-13	-44.49
3	288.98	31.80	-63.65	3.78	-59.87	-13	-46.87
4	347.4	31.43	-66.33	3.60	-62.73	-13	-49.73
5	471.04	34.75	-62.35	2.84	-59.51	-13	-46.51
6	737.85	28.52	-67.85	1.01	-66.84	-13	-53.84

**Antenna Polarity & Test Distance: Vertical at 3 M**

No.	Freq. (MHz)	Reading (dBuV/m)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	69.91	29.41	-58.65	-4.70	-63.36	-13	-50.36
2	94.64	30.70	-60.89	-0.94	-61.83	-13	-48.83
3	130.57	25.21	-66.68	-1.25	-67.93	-13	-54.93
4	239.9	29.15	-66.21	3.82	-62.39	-13	-49.39
5	510.45	34.52	-60.88	2.81	-58.06	-13	-45.06
6	609.79	32.23	-62.46	1.78	-60.68	-13	-47.68

**Remarks:**

1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

ABOVE 1GHz

Channel Bandwidth: 10MHz

Test Frequency	2115 MHz	Frequency Range	Above 1000MHz
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Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBuV/m)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	4230	64.20	-40.60	7.42	-33.17	-13	-20.17
2	6345	49.62	-54.52	6.19	-48.33	-13	-35.33
3	8460	58.37	-44.25	4.20	-40.05	-13	-27.05
4	10575	53.68	-48.35	3.50	-44.86	-13	-31.86
5	12690	52.4	-48.91	4.38	-44.53	-13	-31.53
6	14805	55.81	-41.84	3.42	-38.42	-13	-25.42
7	16920	58.79	-40.26	3.00	-37.26	-13	-24.26
8	19035	62.29	-38.08	3.72	-34.37	-13	-21.37
9	21150	62.65	-49.06	4.12	-44.93	-13	-31.93
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBuV/m)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	4230	68.6	-36.20	7.42	-28.77	-13	-15.77
2	6345	50.56	-53.58	6.19	-47.39	-13	-34.39
3	8460	57.9	-44.72	4.20	-40.52	-13	-27.52
4	10575	55.89	-46.14	3.50	-42.65	-13	-29.65
5	12690	51.39	-49.92	4.38	-45.54	-13	-32.54
6	14805	57.77	-39.88	3.42	-36.46	-13	-23.46
7	16920	56.38	-42.67	3.00	-39.67	-13	-26.67
8	19035	58.83	-41.54	3.72	-37.83	-13	-24.83
9	21150	62.76	-48.95	4.12	-44.82	-13	-31.82

Remarks:

1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).



Test Frequency	2145 MHz	Frequency Range	Above 1000MHz
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**Antenna Polarity & Test Distance: Horizontal at 3 M**

No.	Freq. (MHz)	Reading (dBuV/m)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	4290	63.25	-41.51	7.41	-34.10	-13	-21.10
2	6435	48.94	-55.20	6.10	-49.10	-13	-36.10
3	8580	58.99	-43.65	4.21	-39.43	-13	-26.43
4	10725	53.94	-47.99	3.41	-44.58	-13	-31.58
5	12870	51.52	-49.63	4.40	-45.22	-13	-32.22
6	15015	56.09	-41.37	3.60	-37.77	-13	-24.77
7	17160	58.74	-40.43	2.95	-37.49	-13	-24.49
8	19305	62.77	-37.70	3.77	-33.92	-13	-20.92
9	21450	62.34	-50.29	4.16	-46.13	-13	-33.13

**Antenna Polarity & Test Distance: Vertical at 3 M**

No.	Freq. (MHz)	Reading (dBuV/m)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	4290	68.18	-36.58	7.41	-29.17	-13	-16.17
2	6435	51.39	-52.75	6.10	-46.65	-13	-33.65
3	8580	57.38	-45.26	4.21	-41.04	-13	-28.04
4	10725	55.5	-46.43	3.41	-43.02	-13	-30.02
5	12870	51.46	-49.69	4.40	-45.28	-13	-32.28
6	15015	56.91	-40.55	3.60	-36.95	-13	-23.95
7	17160	56.45	-42.72	2.95	-39.78	-13	-26.78
8	19305	58.6	-41.87	3.77	-38.09	-13	-25.09
9	21450	63.11	-49.52	4.16	-45.36	-13	-32.36

**Remarks:**

1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

Test Frequency	2175 MHz	Frequency Range	Above 1000MHz
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**Antenna Polarity & Test Distance: Horizontal at 3 M**

No.	Freq. (MHz)	Reading (dBuV/m)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	4350	63.91	-40.81	7.39	-33.42	-13	-20.42
2	6525	50.18	-53.96	6.01	-47.95	-13	-34.95
3	8700	57.48	-45.19	4.22	-40.97	-13	-27.97
4	10875	53.68	-48.72	3.34	-45.38	-13	-32.38
5	13050	51.99	-48.99	4.42	-44.57	-13	-31.57
6	15225	56.6	-40.67	3.78	-36.90	-13	-23.90
7	17400	58.41	-40.89	2.89	-37.99	-13	-24.99
8	19575	62.69	-37.88	3.83	-34.04	-13	-21.04
9	21750	63.06	-50.49	4.19	-46.30	-13	-33.30

**Antenna Polarity & Test Distance: Vertical at 3 M**

No.	Freq. (MHz)	Reading (dBuV/m)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	4350	68.7	-36.02	7.39	-28.63	-13	-15.63
2	6525	50.18	-53.96	6.01	-47.95	-13	-34.95
3	8700	57.75	-44.92	4.22	-40.70	-13	-27.70
4	10875	55.56	-46.84	3.34	-43.50	-13	-30.50
5	13050	51.73	-49.25	4.42	-44.83	-13	-31.83
6	15225	58.31	-38.96	3.78	-35.19	-13	-22.19
7	17400	55.58	-43.72	2.89	-40.82	-13	-27.82
8	19575	59.51	-41.06	3.83	-37.22	-13	-24.22
9	21750	62.2	-51.35	4.19	-47.16	-13	-34.16

**Remarks:**

1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

Below 1GHz

Channel Bandwidth: 15MHz

Test Frequency	2117.5 MHz	Frequency Range	Below 1000 MHz
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**Antenna Polarity & Test Distance: Horizontal at 3 M**

No.	Freq. (MHz)	Reading (dBuV/m)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	90.7	32.66	-59.61	-1.16	-60.77	-13	-47.77
2	236.34	34.40	-60.97	3.86	-57.10	-13	-44.10
3	289.42	32.04	-63.42	3.78	-59.64	-13	-46.64
4	345.78	30.31	-67.38	3.60	-63.77	-13	-50.77
5	470.63	34.47	-62.66	2.84	-59.82	-13	-46.82
6	736.78	26.93	-69.44	1.03	-68.41	-13	-55.41

**Antenna Polarity & Test Distance: Vertical at 3 M**

No.	Freq. (MHz)	Reading (dBuV/m)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	70.36	28.37	-59.96	-4.57	-64.54	-13	-51.54
2	95.62	28.28	-63.15	-0.88	-64.03	-13	-51.03
3	127.82	25.77	-65.53	-1.23	-66.76	-13	-53.76
4	238.24	28.50	-66.86	3.84	-63.02	-13	-50.02
5	511.75	28.95	-66.43	2.80	-63.63	-13	-50.63
6	607.21	32.06	-62.61	1.78	-60.83	-13	-47.83

Remarks:

1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

Test Frequency	2145 MHz	Frequency Range	Below 1000 MHz
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**Antenna Polarity & Test Distance: Horizontal at 3 M**

No.	Freq. (MHz)	Reading (dBuV/m)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	90.81	32.83	-59.42	-1.16	-60.58	-13	-47.58
2	238.49	32.51	-62.85	3.83	-59.02	-13	-46.02
3	288.18	31.23	-64.20	3.79	-60.41	-13	-47.41
4	347.44	31.27	-66.49	3.60	-62.89	-13	-49.89
5	468.87	33.18	-64.04	2.84	-61.21	-13	-48.21
6	739.3	29.51	-66.86	0.99	-65.87	-13	-52.87

**Antenna Polarity & Test Distance: Vertical at 3 M**

No.	Freq. (MHz)	Reading (dBuV/m)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	68.79	26.57	-60.82	-5.03	-65.85	-13	-52.85
2	92.66	30.70	-61.23	-1.05	-62.28	-13	-49.28
3	128.96	26.00	-65.54	-1.24	-66.78	-13	-53.78
4	240.17	29.27	-66.08	3.81	-62.27	-13	-49.27
5	508.42	29.02	-66.40	2.83	-63.57	-13	-50.57
6	610.65	31.07	-63.63	1.78	-61.85	-13	-48.85

**Remarks:**

1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

Test Frequency	2172.5 MHz	Frequency Range	Below 1000 MHz
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Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBuV/m)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	92.28	31.90	-60.10	-1.07	-61.17	-13	-48.17
2	238.84	32.64	-62.72	3.83	-58.89	-13	-45.89
3	290.64	31.33	-64.17	3.77	-60.40	-13	-47.40
4	348.83	30.66	-67.16	3.60	-63.56	-13	-50.56
5	474.12	34.93	-62.01	2.85	-59.16	-13	-46.16
6	735.7	28.30	-68.06	1.04	-67.02	-13	-54.02

Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBuV/m)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	65.31	26.47	-58.84	-6.04	-64.87	-13	-51.87
2	94.06	28.86	-62.83	-0.97	-63.80	-13	-50.80
3	127.87	26.98	-64.33	-1.23	-65.56	-13	-52.56
4	237.87	29.37	-65.99	3.84	-62.15	-13	-49.15
5	510.64	29.44	-65.95	2.81	-63.14	-13	-50.14
6	609.32	33.50	-61.19	1.78	-59.41	-13	-46.41

**Remarks:**

1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

ABOVE 1GHz

Channel Bandwidth: 15MHz

Test Frequency	2117.5 MHz	Frequency Range	Above 1000MHz
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**Antenna Polarity & Test Distance: Horizontal at 3 M**

No.	Freq. (MHz)	Reading (dBuV/m)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	4235	64.12	-40.67	7.42	-33.25	-13	-20.25
2	6352.5	50.78	-53.36	6.18	-47.18	-13	-34.18
3	8470	57.66	-44.96	4.20	-40.76	-13	-27.76
4	10587.5	52.79	-49.43	3.49	-45.94	-13	-32.94
5	12705	51.27	-50.01	4.38	-45.63	-13	-32.63
6	14822.5	55.64	-41.98	3.44	-38.54	-13	-25.54
7	16940	58.7	-40.37	2.99	-37.38	-13	-24.38
8	19057.5	62.51	-37.88	3.72	-34.15	-13	-21.15
9	21175	63.06	-48.78	4.13	-44.65	-13	-31.65

**Antenna Polarity & Test Distance: Vertical at 3 M**

No.	Freq. (MHz)	Reading (dBuV/m)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	4235	67.96	-36.83	7.42	-29.41	-13	-16.41
2	6352.5	50.84	-53.30	6.18	-47.12	-13	-34.12
3	8470	57.29	-45.33	4.20	-41.13	-13	-28.13
4	10587.5	56.34	-45.88	3.49	-42.39	-13	-29.39
5	12705	52.34	-48.94	4.38	-44.56	-13	-31.56
6	14822.5	57.72	-39.90	3.44	-36.46	-13	-23.46
7	16940	54.94	-44.13	2.99	-41.14	-13	-28.14
8	19057.5	60.41	-39.98	3.72	-36.25	-13	-23.25
9	21175	62.82	-49.02	4.13	-44.89	-13	-31.89

Remarks:

1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

Test Frequency	2145 MHz	Frequency Range	Above 1000MHz
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**Antenna Polarity & Test Distance: Horizontal at 3 M**

No.	Freq. (MHz)	Reading (dBuV/m)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	4290	64.76	-40.00	7.41	-32.59	-13	-19.59
2	6435	51.42	-52.72	6.10	-46.62	-13	-33.62
3	8580	57.56	-45.08	4.21	-40.86	-13	-27.86
4	10725	53.74	-48.19	3.41	-44.78	-13	-31.78
5	12870	52.03	-49.12	4.40	-44.71	-13	-31.71
6	15015	55.01	-42.45	3.60	-38.85	-13	-25.85
7	17160	59.05	-40.12	2.95	-37.18	-13	-24.18
8	19305	63.38	-37.09	3.77	-33.31	-13	-20.31
9	21450	63.71	-48.92	4.16	-44.76	-13	-31.76

**Antenna Polarity & Test Distance: Vertical at 3 M**

No.	Freq. (MHz)	Reading (dBuV/m)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	4290	67.13	-37.63	7.41	-30.22	-13	-17.22
2	6435	50.45	-53.69	6.10	-47.59	-13	-34.59
3	8580	56.64	-46.00	4.21	-41.78	-13	-28.78
4	10725	57.19	-44.74	3.41	-41.33	-13	-28.33
5	12870	52.58	-48.57	4.40	-44.16	-13	-31.16
6	15015	57.82	-39.64	3.60	-36.04	-13	-23.04
7	17160	54.51	-44.66	2.95	-41.72	-13	-28.72
8	19305	59.48	-40.99	3.77	-37.21	-13	-24.21
9	21450	63.22	-49.41	4.16	-45.25	-13	-32.25

**Remarks:**

1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

Test Frequency	2172.5 MHz	Frequency Range	Above 1000MHz
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**Antenna Polarity & Test Distance: Horizontal at 3 M**

No.	Freq. (MHz)	Reading (dBuV/m)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	4345	64.20	-40.53	7.40	-33.13	-13	-20.13
2	6517.5	50.41	-53.73	6.02	-47.71	-13	-34.71
3	8690	57.30	-45.37	4.22	-41.15	-13	-28.15
4	10862.5	53.71	-48.14	3.34	-44.80	-13	-31.80
5	13035	51.93	-49.08	4.42	-44.66	-13	-31.66
6	15207.5	54.85	-42.45	3.75	-38.70	-13	-25.70
7	17380	57.84	-41.44	2.90	-38.54	-13	-25.54
8	19552.5	63.14	-37.41	3.82	-33.59	-13	-20.59
9	21725	62.26	-51.16	4.19	-46.98	-13	-33.98

**Antenna Polarity & Test Distance: Vertical at 3 M**

No.	Freq. (MHz)	Reading (dBuV/m)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	4345	66.97	-37.76	7.40	-30.36	-13	-17.36
2	6517.5	49.56	-54.58	6.02	-48.56	-13	-35.56
3	8690	55.67	-47.00	4.22	-42.78	-13	-29.78
4	10862.5	55.94	-45.91	3.34	-42.57	-13	-29.57
5	13035	51.37	-49.64	4.42	-45.22	-13	-32.22
6	15207.5	57.61	-39.69	3.75	-35.94	-13	-22.94
7	17380	53.93	-45.35	2.90	-42.45	-13	-29.45
8	19552.5	58.84	-41.71	3.82	-37.89	-13	-24.89
9	21725	61.83	-51.59	4.19	-47.41	-13	-34.41

**Remarks:**

1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).



Below 1GHz

Channel Bandwidth: 20MHz

Test Frequency	2120 MHz	Frequency Range	Below 1000 MHz
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**Antenna Polarity & Test Distance: Horizontal at 3 M**

No.	Freq. (MHz)	Reading (dBuV/m)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	91.34	33.56	-58.60	-1.13	-59.73	-13	-46.73
2	238.11	33.45	-61.91	3.84	-58.07	-13	-45.07
3	289.94	30.79	-64.69	3.78	-60.91	-13	-47.91
4	345.83	30.37	-67.32	3.60	-63.72	-13	-50.72
5	471.4	33.57	-63.51	2.84	-60.67	-13	-47.67
6	734.93	28.27	-68.09	1.06	-67.04	-13	-54.04

**Antenna Polarity & Test Distance: Vertical at 3 M**

No.	Freq. (MHz)	Reading (dBuV/m)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	67.9	26.27	-60.59	-5.29	-65.88	-13	-52.88
2	91.85	30.25	-61.82	-1.10	-62.92	-13	-49.92
3	128.91	26.48	-65.05	-1.24	-66.29	-13	-53.29
4	239.69	28.35	-67.01	3.82	-63.19	-13	-50.19
5	509.35	30.69	-64.72	2.82	-61.90	-13	-48.90
6	609.24	33.19	-61.50	1.78	-59.72	-13	-46.72

Remarks:

1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

Test Frequency	2145 MHz	Frequency Range	Below 1000 MHz
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**Antenna Polarity & Test Distance: Horizontal at 3 M**

No.	Freq. (MHz)	Reading (dBuV/m)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	91.04	34.08	-58.13	-1.14	-59.28	-13	-46.28
2	234.88	32.10	-63.27	3.88	-59.39	-13	-46.39
3	287.98	32.20	-63.22	3.79	-59.43	-13	-46.43
4	349.15	29.99	-67.84	3.60	-64.24	-13	-51.24
5	467.9	34.56	-62.72	2.84	-59.88	-13	-46.88
6	736.32	29.18	-67.18	1.03	-66.15	-13	-53.15

**Antenna Polarity & Test Distance: Vertical at 3 M**

No.	Freq. (MHz)	Reading (dBuV/m)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	70.38	26.80	-61.54	-4.57	-66.11	-13	-53.11
2	93.62	28.20	-63.57	-0.99	-64.56	-13	-51.56
3	129.08	25.86	-65.71	-1.24	-66.95	-13	-53.95
4	240.14	28.34	-67.01	3.81	-63.20	-13	-50.20
5	510.23	31.03	-64.37	2.81	-61.55	-13	-48.55
6	612.31	30.85	-63.86	1.78	-62.08	-13	-49.08

**Remarks:**

1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

Test Frequency	2170 MHz	Frequency Range	Below 1000 MHz
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Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBuV/m)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	91.15	34.32	-57.87	-1.14	-59.01	-13	-46.01
2	235.23	32.04	-63.33	3.88	-59.45	-13	-46.45
3	292.59	33.56	-62.00	3.76	-58.24	-13	-45.24
4	346.1	31.70	-66.00	3.60	-62.40	-13	-49.40
5	471.26	33.97	-63.12	2.84	-60.28	-13	-47.28
6	737.73	29.62	-66.75	1.01	-65.73	-13	-52.73
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBuV/m)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	70.94	29.41	-59.27	-4.41	-63.68	-13	-50.68
2	95.71	28.85	-62.56	-0.87	-63.43	-13	-50.43
3	125.93	26.70	-64.18	-1.22	-65.41	-13	-52.41
4	239.38	28.62	-66.74	3.82	-62.91	-13	-49.91
5	510.64	32.89	-62.50	2.81	-59.69	-13	-46.69
6	608.96	33.88	-60.81	1.78	-59.03	-13	-46.03

**Remarks:**

1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

ABOVE 1GHz

Channel Bandwidth: 20MHz

Test Frequency	2120 MHz	Frequency Range	Above 1000MHz
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Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBuV/m)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	4240	64.60	-40.19	7.42	-32.77	-13	-19.77
2	6360	51.12	-53.02	6.16	-46.86	-13	-33.86
3	8480	56.56	-46.06	4.20	-41.86	-13	-28.86
4	10600	52.80	-49.43	3.48	-45.95	-13	-32.95
5	12720	51.52	-49.74	4.39	-45.36	-13	-32.36
6	14840	55.79	-41.81	3.47	-38.34	-13	-25.34
7	16960	57.41	-41.67	2.98	-38.69	-13	-25.69
8	19080	62.34	-38.06	3.73	-34.33	-13	-21.33
9	21200	61.32	-50.65	4.13	-46.52	-13	-33.52
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBuV/m)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	4240	66.56	-38.23	7.42	-30.81	-13	-17.81
2	6360	49.34	-54.80	6.16	-48.64	-13	-35.64
3	8480	55.22	-47.40	4.20	-43.20	-13	-30.20
4	10600	56.34	-45.89	3.48	-42.41	-13	-29.41
5	12720	51.61	-49.65	4.39	-45.27	-13	-32.27
6	14840	57.41	-40.19	3.47	-36.72	-13	-23.72
7	16960	53.30	-45.78	2.98	-42.80	-13	-29.80
8	19080	59.21	-41.19	3.73	-37.46	-13	-24.46
9	21200	62.29	-49.68	4.13	-45.55	-13	-32.55

Remarks:

1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

Test Frequency	2145 MHz	Frequency Range	Above 1000MHz
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**Antenna Polarity & Test Distance: Horizontal at 3 M**

No.	Freq. (MHz)	Reading (dBuV/m)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	4290	64.15	-40.61	7.41	-33.20	-13	-20.20
2	6435	50.21	-53.93	6.10	-47.83	-13	-34.83
3	8580	56.07	-46.57	4.21	-42.35	-13	-29.35
4	10725	52.39	-49.54	3.41	-46.13	-13	-33.13
5	12870	50.78	-50.37	4.40	-45.96	-13	-32.96
6	15015	54.75	-42.71	3.60	-39.11	-13	-26.11
7	17160	55.98	-43.19	2.95	-40.25	-13	-27.25
8	19305	60.96	-39.51	3.77	-35.73	-13	-22.73
9	21450	60.48	-52.15	4.16	-47.99	-13	-34.99

**Antenna Polarity & Test Distance: Vertical at 3 M**

No.	Freq. (MHz)	Reading (dBuV/m)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	4290	66.42	-38.34	7.41	-30.93	-13	-17.93
2	6435	47.89	-56.25	6.10	-50.15	-13	-37.15
3	8580	54.72	-47.92	4.21	-43.70	-13	-30.70
4	10725	55.12	-46.81	3.41	-43.40	-13	-30.40
5	12870	50.43	-50.72	4.40	-46.31	-13	-33.31
6	15015	56.60	-40.86	3.60	-37.26	-13	-24.26
7	17160	53.19	-45.98	2.95	-43.04	-13	-30.04
8	19305	58.16	-42.31	3.77	-38.53	-13	-25.53
9	21450	61.23	-51.40	4.16	-47.24	-13	-34.24

**Remarks:**

1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

Test Frequency	2170 MHz	Frequency Range	Above 1000MHz
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**Antenna Polarity & Test Distance: Horizontal at 3 M**

No.	Freq. (MHz)	Reading (dBuV/m)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	4340	63.37	-41.36	7.40	-33.97	-13	-20.97
2	6510	50.61	-53.53	6.04	-47.49	-13	-34.49
3	8680	56.63	-46.03	4.22	-41.81	-13	-28.81
4	10850	51.61	-50.25	3.35	-46.90	-13	-33.90
5	13020	50.40	-50.63	4.42	-46.21	-13	-33.21
6	15190	55.03	-42.30	3.73	-38.57	-13	-25.57
7	17360	55.23	-44.03	2.91	-41.12	-13	-28.12
8	19530	60.18	-40.36	3.82	-36.54	-13	-23.54
9	21700	60.78	-52.51	4.18	-48.33	-13	-35.33

**Antenna Polarity & Test Distance: Vertical at 3 M**

No.	Freq. (MHz)	Reading (dBuV/m)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	4340	65.93	-38.80	7.40	-31.41	-13	-18.41
2	6510	48.80	-55.34	6.04	-49.30	-13	-36.30
3	8680	54.90	-47.76	4.22	-43.54	-13	-30.54
4	10850	55.39	-46.47	3.35	-43.12	-13	-30.12
5	13020	50.39	-50.64	4.42	-46.22	-13	-33.22
6	15190	56.84	-40.49	3.73	-36.76	-13	-23.76
7	17360	52.10	-47.16	2.91	-44.25	-13	-31.25
8	19530	58.18	-42.36	3.82	-38.54	-13	-25.54
9	21700	61.14	-52.15	4.18	-47.97	-13	-34.97

**Remarks:**

1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

## 5 Pictures of Test Arrangements

Please refer to the attached file (Test Setup Photo).



## Appendix – Information on the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

**Linko EMC/RF Lab**

Tel: 886-2-26052180

Fax: 886-2-26051924

**Hsin Chu EMC/RF Lab/Telecom Lab**

Tel: 886-3-6668565

Fax: 886-3-6668323

**Hwa Ya EMC/RF/Safety**

Tel: 886-3-3183232

Fax: 886-3-3270892

**Email:** [service.adt@tw.bureauveritas.com](mailto:service.adt@tw.bureauveritas.com)

**Web Site:** [www.bureauveritas-adt.com](http://www.bureauveritas-adt.com)

The address and road map of all our labs can be found in our web site also.

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