FCC Test Report (PART 27)

Report No.:	RF170123E07
FCC ID:	2AD8UFW2PADPM01
Test Model:	FW2PADPM01
Received Date:	Jan. 23, 2017
Test Date:	Feb. 07 to Mar. 30, 2017
Issued Date:	Apr. 20, 2017
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.

Table of Contents

Release Control Record

Issue No.	Description	Date Issued
RF170123E07	Original release.	Apr. 20, 2017

1 Certificate of Conformity

Product:	Nokia FW2P LTE module
Brand:	Nokia
Test Model:	FW2PADPM01
Sample Status:	MASS-PRODUCTION
Applicant:	Nokia Solutions and Networks
Test Date:	Feb. 07 to Mar. 30, 2017
Standards:	FCC Part 27 FCC Part 2

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

Prepared by : _____ , **Date:** Apr. 20, 2017

Claire Kuan / Specialist

Approved by : _____ , **Date:** Apr. 20, 2017

May Chen / Manager

2 Summary of Test Results

Applied Standard: FCC Part 27 & Part 2			
FCC Clause	Test Item	Result	Remarks
2.1046 27.50(b)(9)	Equivalent Isotropically radiated power	PASS	Meet the requirement of limit.
2.1047	Modulation characteristics	PASS	Meet the requirement
2.1055 27.54	Frequency Stability Stay with the authorized bands of operation	PASS	Meet the requirement of limit.
2.1049	Occupied Bandwidth	PASS	Meet the requirement of limit.
27.53(c)(1)	Channel Measurements	PASS	Meet the requirement of limit.
27.50(B)	Peak To Average Ratio	PASS	Meet the requirement of limit.
2.1051 27.53(c)(1)	Conducted Spurious Emissions	PASS	Meet the requirement of limit.
2.1053 27.53(c)(1)	Radiated Spurious Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -34.88dB at 5257MHz.

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) (±)
Radiated Emissions up to 1 GHz	30MHz ~ 1GHz	5.34 dB
Radiated Emissions above 1 GHz	1GHz ~ 6GHz	3.41 dB
	6GHz ~ 18GHz	3.49 dB
	18GHz ~ 40GHz	3.30 dB

2.2 Test Site and Instruments

For radiated spurious emissions test:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Keysight	N9038A	MY54450088	July 20, 2016	July 19, 2017
Pre-Amplifier Mini-Circuits	ZFL-1000VH2B	AMP-ZFL-01	Nov. 10, 2016	Nov. 09, 2017
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-406	Dec. 13, 2016	Dec. 12, 2017
RF Cable	8D	966-4-1 966-4-2 966-4-3	Apr. 02, 2016	Apr. 01, 2017
Fixed attenuator Mini-Circuits	UNAT-5+	PAD-3m-4-01	Oct. 05, 2016	Oct. 04, 2017
Horn_Antenna SCHWARZBECK	BBHA 9120D	9120D-783	Dec. 27, 2016	Dec. 26, 2017
Pre-Amplifier EMCI	EMC12630SE	980385	Feb. 02, 2017	Feb. 01, 2018
RF Cable	EMC104-SM-SM-2000 EMC104-SM-SM-5000 EMC104-SM-SM-5000	160923 150318 150323	Feb. 02, 2017 Mar. 30, 2016 Mar. 30, 2016	Feb. 01, 2018 Mar. 29, 2017 Mar. 29, 2017
Pre-Amplifier EMCI	EMC184045SE	980387	Feb. 02, 2017	Feb. 01, 2018
Horn_Antenna SCHWARZBECK	BBHA 9170	BBHA9170608	Dec. 15, 2016	Dec. 14, 2017
RF Cable	SUCOFLEX 102	36432/2 36433/2	Jan. 15, 2017	Jan. 14, 2018
Software	ADT_Radiated_V8.7.08	NA	NA	NA
Antenna Tower & Turn Table Max-Full	MF-7802	MF780208410	NA	NA
Boresight Antenna Fixture	FBA-01	FBA-SIP02	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. 17, 2017

For Modulation Characteristics:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Spectrum Analyzer R&S	FSV40	100964	June 28, 2016	June 27, 2017
Spectrum Analyzer Agilent	E4446A	MY48250253	Dec. 21, 2016	Dec. 20, 2017
Power meter Anritsu	ML2495A	1014008	May 05, 2016	May 04, 2017
Power sensor Anritsu	MA2411B	0917122	May 05, 2016	May 04, 2017
AC Power Source Extech Electronics	6205	1440452	NA	NA
Temperature & Humidity Chamber Giant Force	GTH-150-40-SP-AR	MAA0812-008	Jan. 11, 2017	Jan. 10, 2018
DC Power Supply Topward	6603D	795558	NA	NA
Digital Multimeter FLUKE	87III	73680266	Nov. 10, 2016	Nov. 09, 2017
ESG Vector signal generator Agilent	E4438C	MY45094468/005 506 602 UK6 UNJ	Nov. 25, 2016	Nov. 24, 2017
Mech Switch Absorptive Mini-Circuits	MSP4TA-18+	0140	Mar. 18, 2017	Mar. 17, 2018
FXD ATTEN Mini-Circuits	BW-S3W2+	MN71981	Mar. 18, 2017	Mar. 17, 2018
Software	ADT_RF Test Software V6.6.5.4	NA	NA	NA

NOTE:
1. The test was performed in Oven room 2.
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: Mar. 30, 2017

For other test items:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Spectrum Analyzer R&S	FSV40	100964	June 28, 2016	June 27, 2017
Spectrum Analyzer Agilent	E4446A	MY48250253	Dec. 21, 2016	Dec. 20, 2017
Power meter Anritsu	ML2495A	1014008	May 05, 2016	May 04, 2017
Power sensor Anritsu	MA2411B	0917122	May 05, 2016	May 04, 2017
AC Power Source Extech Electronics	6205	1440452	NA	NA
Temperature & Humidity Chamber Giant Force	GTH-150-40-SP-AR	MAA0812-008	Jan. 11, 2017	Jan. 10, 2018
DC Power Supply Topward	6603D	795558	NA	NA
Digital Multimeter FLUKE	87III	73680266	Nov. 10, 2016	Nov. 09, 2017
ESG Vector signal generator Agilent	E4438C	MY45094468/005 506 602 UK6 UNJ	Nov. 25, 2016	Nov. 24, 2017
Mech Switch Absorptive Mini-Circuits	MSP4TA-18+	0140	Mar. 19, 2016	Mar. 18, 2017
FXD ATTEN Mini-Circuits	BW-S3W2+	MN71981	Mar. 19, 2016	Mar. 18, 2017
Software	ADT_RF Test Software V6.6.5.4	NA	NA	NA

NOTE: 1. The test was performed in Oven room 2.
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. 07, 2017

3 General Information

3.1 General Description of EUT

Product	Nokia FW2P LTE module	
Brand	Nokia	
Test Model	FW2PADPM01	
Test Sample S/N	EB160810030	
Hardware Version	A101	
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	748.5MHz ~753.5MHz
	Channel Bandwidth: 10MHz	751MHz
Number of Channel	Channel Bandwidth: 5MHz	51
	Channel Bandwidth: 10MHz	1
Max. ERP Power	Channel Bandwidth: 5MHz	QPSK: 2084.5mW
		16QAM: 2089.3mW
		64QAM: 2051.2mW
	Channel Bandwidth: 10MHz	QPSK: 1977.0mW
		16QAM: 1981.5mW
		64QAM: 1954.3mW
Emission Designator	Channel Bandwidth: 5MHz	QPSK: 4M51G7D
		16QAM: 4M50D7W
		64QAM: 4M50D7W
	Channel Bandwidth: 10MHz	QPSK: 9M02G7D
		16QAM: 9M02D7W
		64QAM: 9M02D7W
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 746~757MHz 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

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

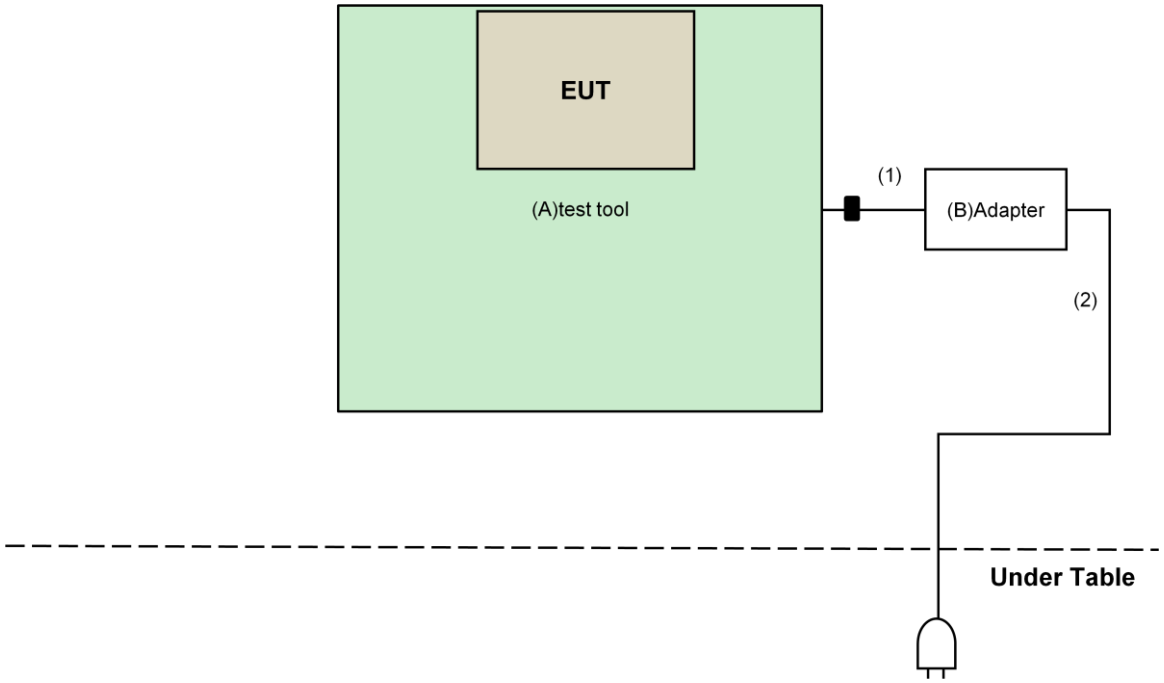
Model name	LTE				
	Freq.(MHz)		Freq.(MHz)		Band
FW2PADPM01	TX	BW 5MHz : 748.5 ~ 753.5	RX	BW 5MHz : 779.5~ 784.5	LTE Band 13
		BW 10MHz : 751		BW 10MHz : 782	

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

Antenna Spec.	
Gain(dBi)	Frequency (MHz)
6	746~787

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	TEST TOOLS	Foxconn	NA	NA	NA	Supplied by Client
B	ADAPTER	DVE	DSA-60PFE-12	120500	NA	Provided by Lab

No.	Cable	Qty.	Length (m)	Shielded (Yes/ No)	Cores (Number)	Remark
1	DC	1	1.1	No	1	Supplied by Client
2	AC	1	1.8	No	0	Provided by Lab

NOTE:

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

3.3 Test Mode Applicability and Tested Channel Detail

Test Item	Available Frequency (MHz)	Tested Frequency (MHz)	Channel Bandwidth	Modulation
Output Power	748.5 to 753.5	748.5, 751, 753.5	5MHz	QPSK, 16QAM, 64QAM
		751	10MHz	QPSK, 16QAM, 64QAM
Modulation Characteristics	748.5 to 753.5	751	5MHz	QPSK, 16QAM, 64QAM
Frequency Stability	748.5 to 753.5	751	5MHz	QPSK
		751	10MHz	QPSK
Emission Bandwidth	748.5 to 753.5	748.5, 751, 753.5	5MHz	QPSK, 16QAM, 64QAM
		751	10MHz	QPSK, 16QAM, 64QAM
Channel Edge	748.5 to 753.5	748.5, 751, 753.5	5MHz	QPSK
		751	10MHz	QPSK
Peak To Average Ratio	748.5 to 753.5	748.5, 751, 753.5	5MHz	QPSK, 16QAM, 64QAM
		751	10MHz	QPSK, 16QAM, 64QAM
Conducted Emission	748.5 to 753.5	748.5, 751, 753.5	5MHz	QPSK
		751	10MHz	QPSK
Radiated Emission Below 1GHz	748.5 to 753.5	748.5, 751, 753.5	5MHz	QPSK
		751	10MHz	QPSK
Radiated Emission Above 1GHz	748.5 to 753.5	748.5, 751, 753.5	5MHz	QPSK
		751	10MHz	QPSK

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

NOTE:

1. All supported modulation types were evaluated.The Worst case emaission of QPSK was selected. Therefore, the 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
Output Power	25deg. C, 63%RH	120Vac, 60Hz	Allen Chuang
Modulation Characteristics	26deg. C, 68%RH	120Vac, 60Hz	Allen Chuang
Frequency Stability	25deg. C, 63%RH	120Vac, 60Hz	Allen Chuang
Emission Bandwidth	25deg. C, 63%RH	120Vac, 60Hz	Allen Chuang
Channel Edge	25deg. C, 63%RH	120Vac, 60Hz	Allen Chuang
Peak To Average Ratio	25deg. C, 63%RH	120Vac, 60Hz	Allen Chuang
Conducted Emission	25deg. C, 63%RH	120Vac, 60Hz	Allen Chuang
Radiated Emission	24deg. C, 64%RH	120Vac, 60Hz	JyunChun Lin

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

KDB 662911 D01 Multiple Transmitter Output v02r01

ANSI/TIA/ -603-D 2010

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

Control stations and mobile stations transmitting in the 746-757 MHz, 776-788 MHz, and 805-806 MHz bands and fixed stations transmitting in the 787-788 MHz and 805-806 MHz bands are limited to 30 watts ERP.

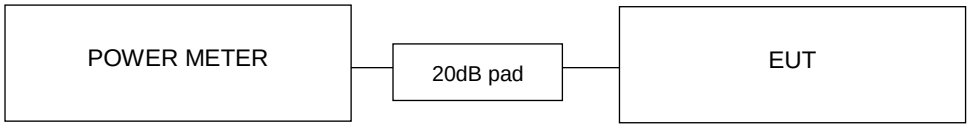
4.1.2 Test Procedures

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

CONDUCTED POWER MEASUREMENT:



4.1.4 Test Results

ERP POWER Channel Bandwidth: 5MHz / QPSK							
Channel No.	Frequency (MHz)	Conducted Power (dBm)		Conducted Total Power (dBm)	Direacional Gain(dBi)	ERP Total power	
		Chain0	Chain1			dBm	mW
5205	748.5	23.33	23.31	26.33	9.01	33.19	2084.5
5230	751	23.24	23.21	26.24	9.01	33.10	2041.7
5255	753.5	23.07	23.02	26.06	9.01	32.92	1958.8

ERP POWER Channel Bandwidth: 5MHz / 16QAM							
Channel No.	Frequency (MHz)	Conducted Power (dBm)		Conducted Total Power (dBm)	Direacional Gain(dBi)	ERP Total power	
		Chain0	Chain1			dBm	mW
5205	748.5	23.45	23.21	26.34	9.01	33.20	2089.3
5230	751	23.24	23.08	26.17	9.01	33.03	2009.1
5255	753.5	23.07	22.91	26.00	9.01	32.86	1932.0

ERP POWER Channel Bandwidth: 5MHz / 64QAM							
Channel No.	Frequency (MHz)	Conducted Power (dBm)		Conducted Total Power (dBm)	Direacional Gain(dBi)	ERP Total power	
		Chain0	Chain1			dBm	mW
5205	748.5	23.36	23.14	26.26	9.01	33.12	2051.2
5230	751	23.24	23.02	26.14	9.01	33.00	1995.3
5255	753.5	23.04	22.85	25.96	9.01	32.82	1914.3

REMARKS: 1. EIPR Output Power (dBm) = Conducted Power (dBm) + Antenna Gain (dB)

2. ERP power = EIPR power - 2.15dBi

ERP POWER Channel Bandwidth: 10MHz / QPSK							
Channel No.	Frequency (MHz)	Conducted Power (dBm)		Conducted Total Power (dBm)	Direacional Gain(dBi)	ERP Total power	
		Chain0	Chain1			dBm	mW
5230	751	23.12	23.06	26.10	9.01	32.96	1977.0

ERP POWER Channel Bandwidth: 10MHz / 16QAM							
Channel No.	Frequency (MHz)	Conducted Power (dBm)		Conducted Total Power (dBm)	Direacional Gain(dBi)	ERP Total power	
		Chain0	Chain1			dBm	mW
5230	751	23.13	23.06	26.11	9.01	32.97	1981.5

ERP POWER Channel Bandwidth: 10MHz / 64QAM							
Channel No.	Frequency (MHz)	Conducted Power (dBm)		Conducted Total Power (dBm)	Direacional Gain(dBi)	ERP Total power	
		Chain0	Chain1			dBm	mW
5230	751	23.07	23.01	26.05	9.01	32.91	1954.3

REMARKS: 1. EIPR Output Power (dBm) = Conducted Power (dBm) + Antenna Gain (dB)

2. ERP power = EIPR power - 2.15dBi

4.2 Modulation characteristics Measurement

4.2.1 Limits of Modulation characteristics

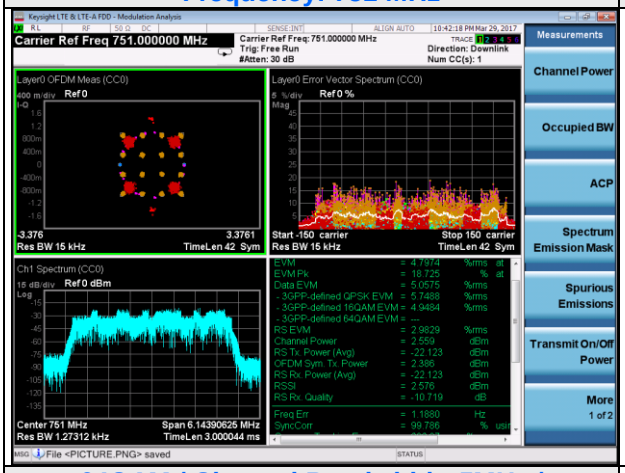
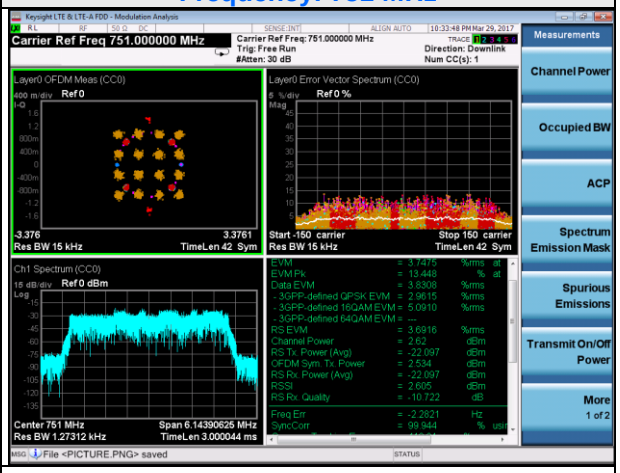
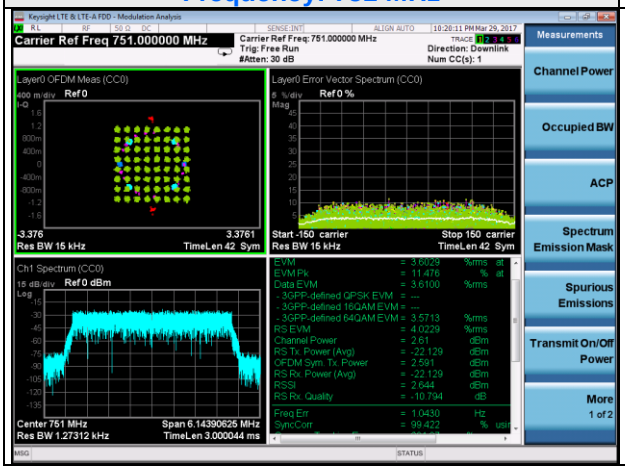
N/A

4.2.2 Test Procedure

Connect the EUT to Communication Simulator via the antenna connector, The frequency band is set as EUT supported Modulation and Channels, the EUT output is matched with 50 ohm load, the waveform quality and constellation of the EUT was tested.

4.2.3 Test Setup

4.2.4 Test Results

Spectrum Plot of Measurement Value	
QPSK / Channel Bandwidth: 5MHz / Frequency: 751 MHz	**16QAM / Channel Bandwidth: 5MHz / Frequency: 751 MHz**
	
64QAM / Channel Bandwidth: 5MHz / Frequency: 751 MHz	
	

4.3 Frequency Stability Measurement

4.3.1 Limits of Frequency Stabiliity 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℃ ~ 50℃.

4.3.2 Test Procedure

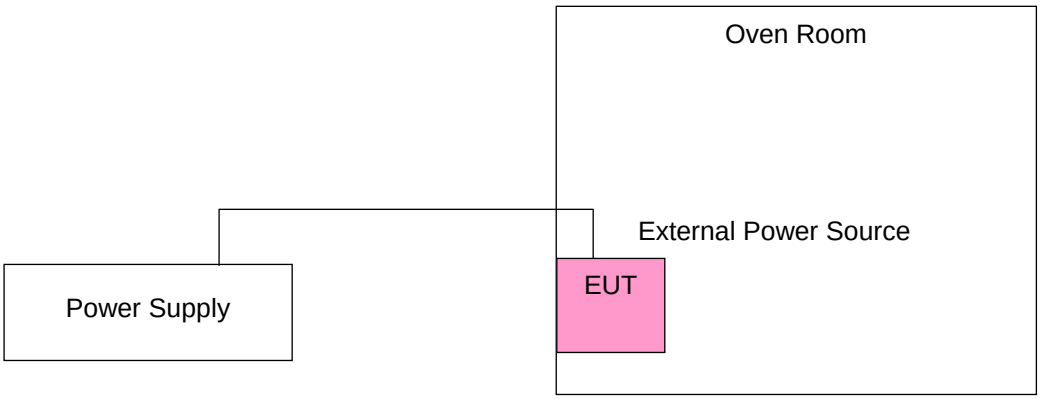
a. Device is placed at the oven room. The oven room could control the temperatures and humidity. Power warm up is at least 15 min and power applied should perform before recording frequency error.

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 ±0.5 ℃ 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.

4.3.3 Test Setup



4.3.4 Test Results

Frequency Error vs. Voltage

Voltage (Volts)	Frequency Error (MHz)				Result
	5MHz		10MHz		
	Frequency error (MHz)	Frequency error (ppm)	Frequency error (MHz)	Frequency error (ppm)	
102	751.000024	0.032	751.00004	0.053	Pass
120	751.000026	0.035	751.000039	0.052	Pass
138	751.000025	0.033	751.000042	0.056	Pass

TEMP. (℃)	Frequency Error (MHz)				Result
	5MHz		10MHz		
	Frequency error (MHz)	Frequency error (ppm)	Frequency error (MHz)	Frequency error (ppm)	
50	751.000037	0.049	751.000036	0.048	Pass
40	751.000024	0.032	751.000038	0.051	Pass
30	751.000035	0.047	751.000035	0.047	Pass
20	751.000026	0.035	751.000046	0.061	Pass
10	751.000045	0.06	751.000035	0.047	Pass
0	751.000029	0.039	751.000023	0.031	Pass
-10	751.000046	0.061	751.000025	0.033	Pass
-20	751.000033	0.044	751.000041	0.055	Pass
-30	751.000044	0.059	751.000042	0.056	Pass

4.4 Emission Bandwidth Measurement

4.4.1 Limits of Emission Bandwidth Measurement

-26dBc Bandwidth
According to FCC Paet 2.1049 & KDB 971168 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.

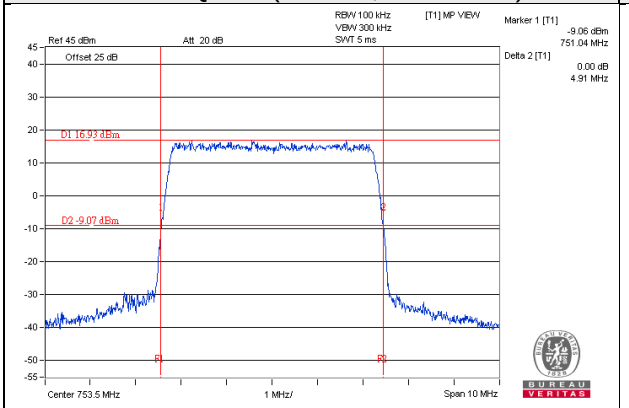
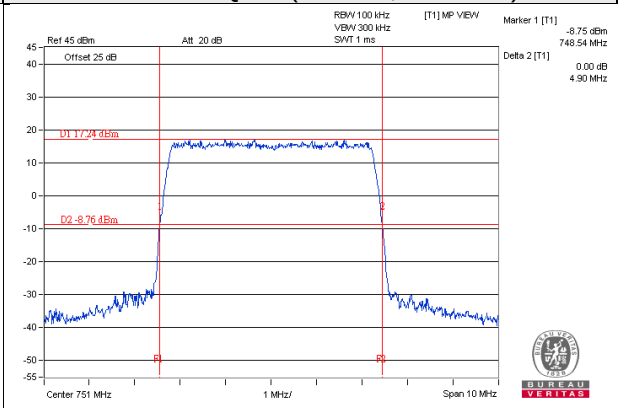
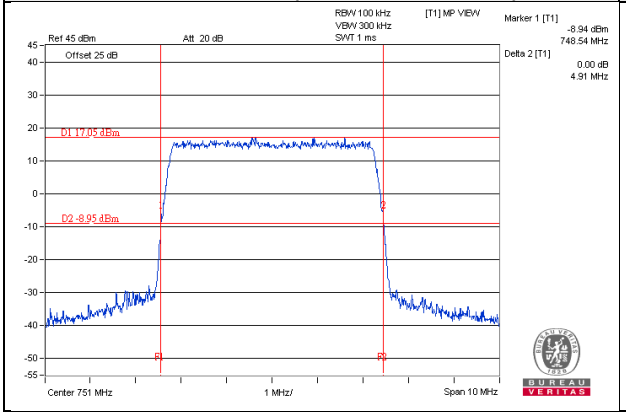
4.4.2 Test Procedure

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)

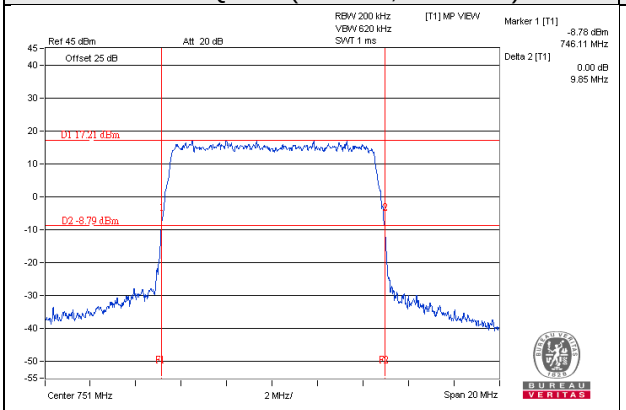
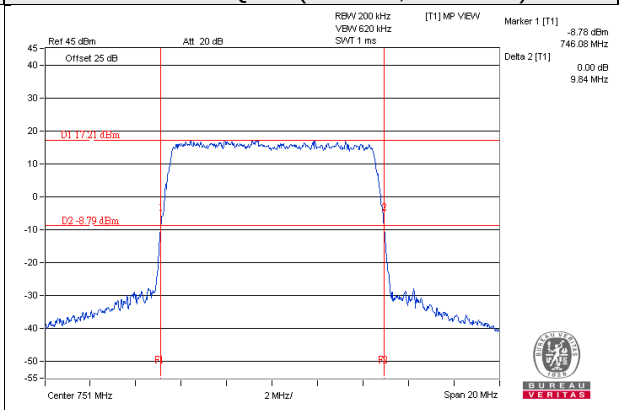
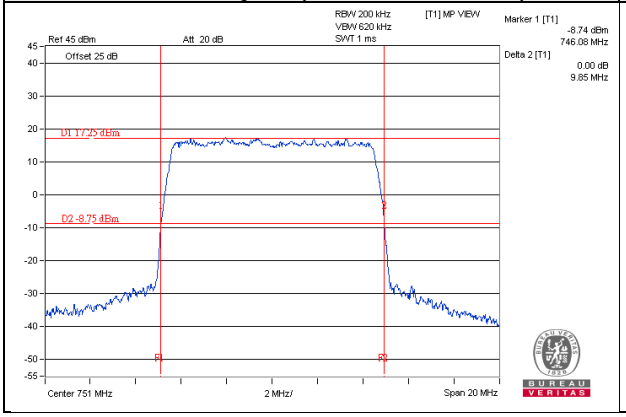
4.4.3 Test Setup

4.4.4 Test Results (-26dBc Bandwidth)

Channel Bandwidth: 5MHz						
Frequency (MHz)	-26dBc Bandwidth (MHz)					
	Chain0			Chain1		
	QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
748.5	4.90	4.88	4.87	4.91	4.88	4.89
751	4.89	4.90	4.91	4.91	4.90	4.88
753.5	4.91	4.88	4.91	4.91	4.87	4.90

-26dBc Bandwidth (MHz)	
Spectrum Plot of Worst Value	
5MHz / QPSK (Chain 0, 753.5 MHz)	5MHz / 16QAM (Chain 0, 751 MHz)
	
5MHz / 64QAM (Chain 0, 751 MHz)	
	

Channel Bandwidth: 10MHz						
Frequency (MHz)	-26dBc Bandwidth (MHz)					
	Chain0			Chain1		
	QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
751	9.83	9.84	9.82	9.85	9.83	9.85

-26dBc Bandwidth (MHz)	
Spectrum Plot of Worst Value	
10MHz / QPSK (Chain 1, 751 MHz)	10MHz / 16QAM (Chain 0, 751 MHz)
	
10MHz / 64QAM (Chain 1, 751 MHz)	
	

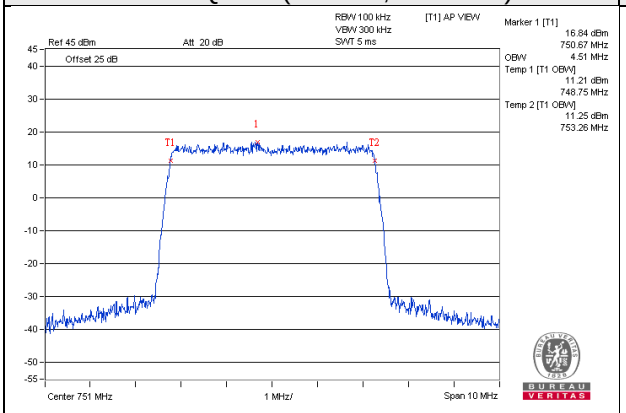
4.4.5 Test Results (Occupied Bandwidth)

Channel Bandwidth: 5MHz						
Frequency (MHz)	Occupied Bandwidth (MHz)					
	Chain0			Chain1		
	QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
748.5	4.49	4.50	4.49	4.50	4.49	4.49
751	4.50	4.50	4.50	4.51	4.50	4.50
753.5	4.50	4.50	4.50	4.50	4.49	4.50

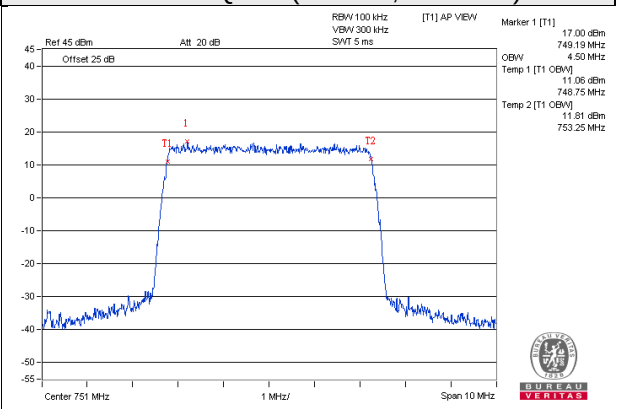
Occupied Bandwidth

Spectrum Plot of Worst Value

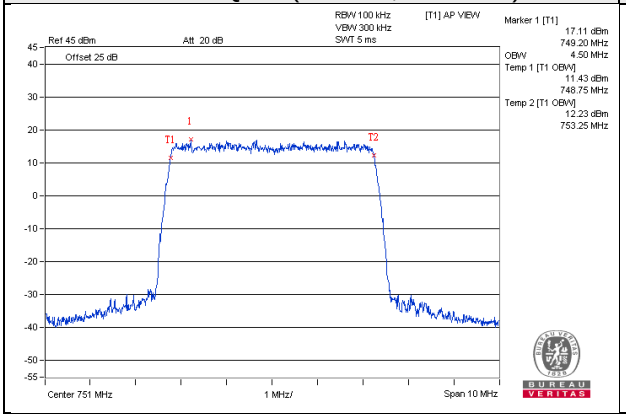
5MHz / QPSK (Chain 1, 751 MHz)



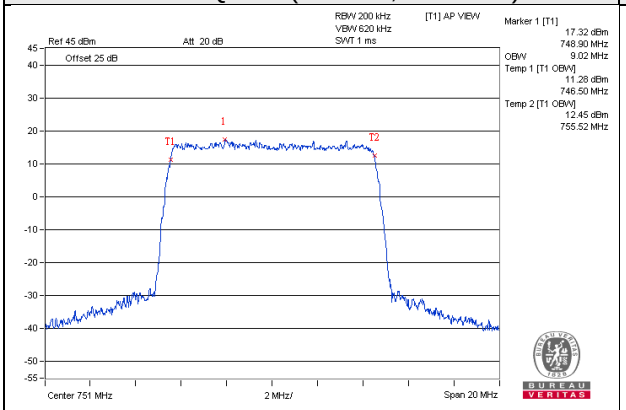
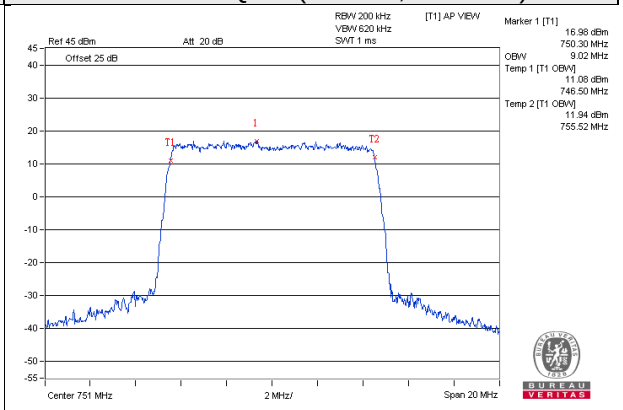
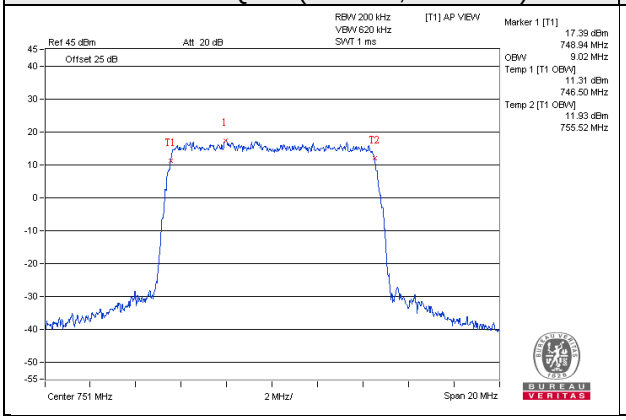
5MHz / 16QAM /(Chain 1, 751 MHz)



5MHz / 64QAM (Chain 1, 751 MHz)



Channel Bandwidth: 10MHz						
Frequency (MHz)	Occupied Bandwidth (MHz)					
	Chain0			Chain1		
	QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
751	9.02	9.02	9.02	9.00	9.02	9.02

Occupied Bandwidth	
Spectrum Plot of Worst Value	
10MHz / QPSK (Chain 0, 751 MHz)	10MHz / 16QAM (Chain 0, 751 MHz)
	
10MHz / 64QAM (Chain 0, 751 MHz)	
	

4.5 Out-of Band Emissions Measurement

4.5.1 Limits of Out-of Band Emissions Measurement

According to FCC 27.53(c) 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 log10 (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 has 2x2 MIMO function, so the limit of spurious emissions needs to be reduced by 10log($Numbers_{Ant}$) according to FCC KDB 662911 D01 guidance.

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

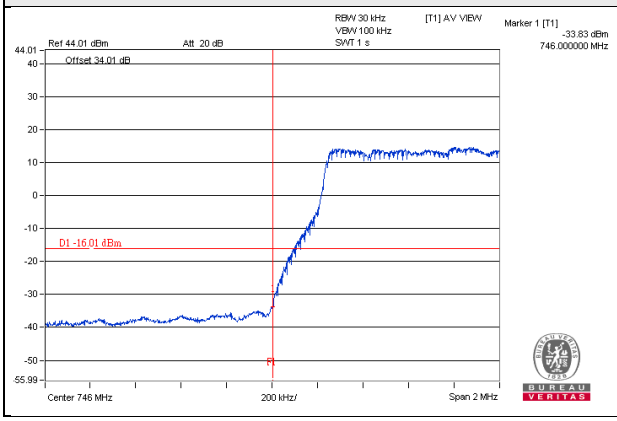
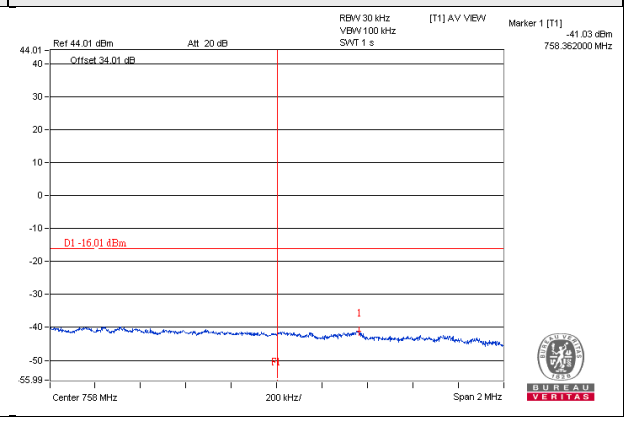
4.5.2 Test Setup

4.5.3 Test Procedures

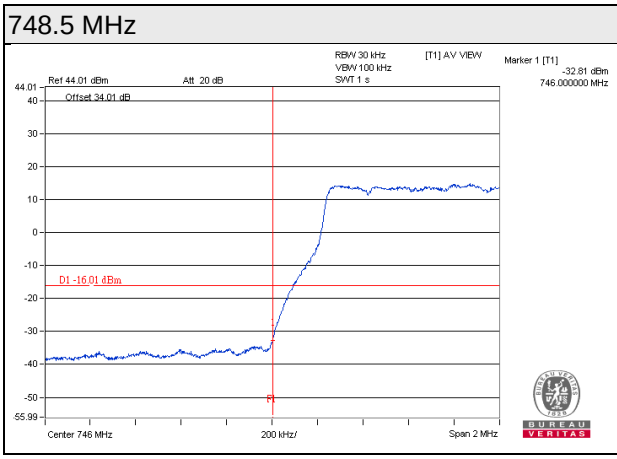
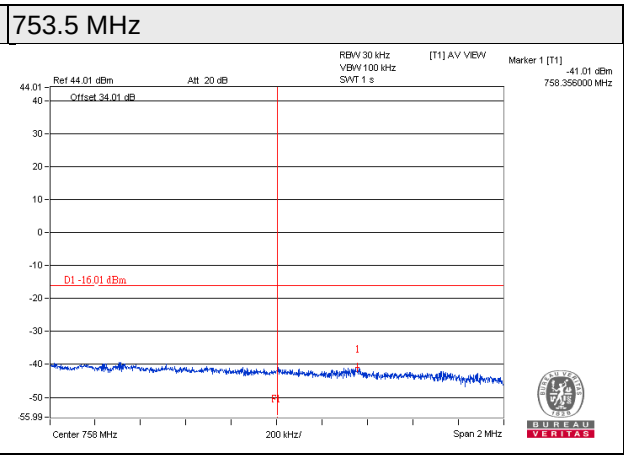
a. All measurements were done at low and high operational frequency range.
b. The center frequency of spectrum is the band edge frequency and RB of the spectrum is 30kHz EMISSION BANDWIDTH and VB of the spectrum is 100kHz.
c. Record the max trace plot into the test report.

4.5.4 Test Results

Chain 0				
QPSK / Channel Bandwidth: 5MHz				
Frequency(MHz)	Measurement Value	Limit	Margin	Result
748.5	-33.83	-16.01	-17.82	Pass
753.5	-41.03	-16.01	-25.02	Pass

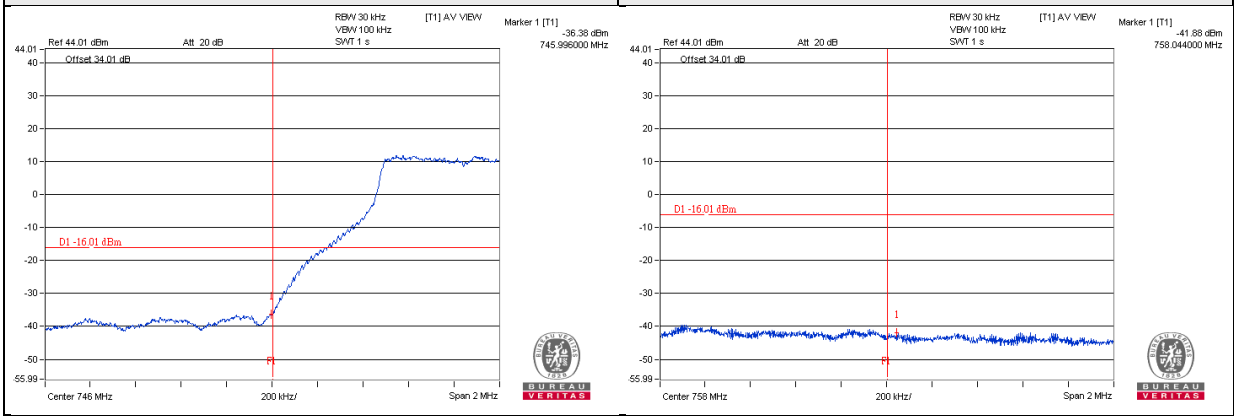
748.5 MHz	753.5 MHz
	

Chain 1				
QPSK / Channel Bandwidth: 5MHz				
Frequency(MHz)	Measurement Value	Limit	Margin	Result
748.5	-32.81	-16.01	-16.8	Pass
753.5	-41.01	-16.01	-25	Pass

748.5 MHz	753.5 MHz
	

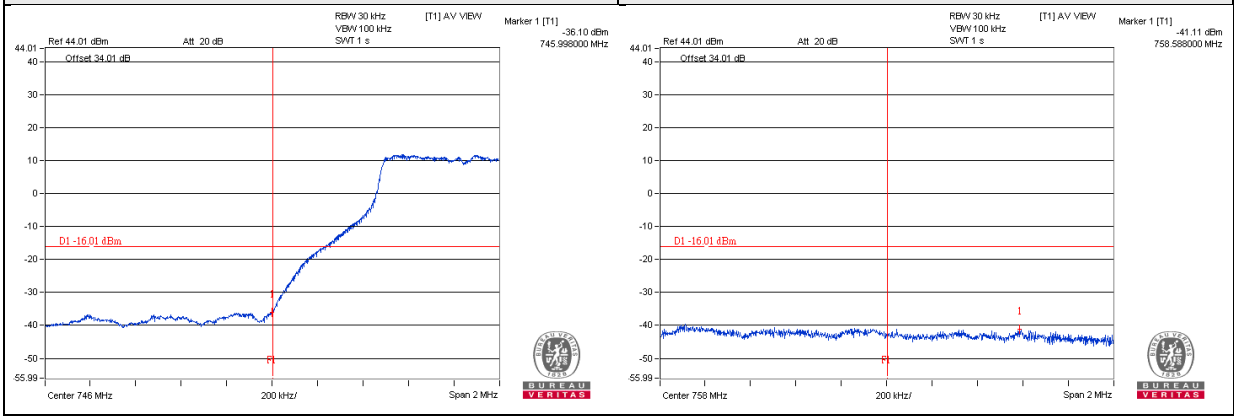
Chain 0				
QPSK / Channel Bandwidth: 10MHz				
Frequency(MHz)	Measurement Value	Limit	Margin	Result
751	-36.38	-16.01	-20.37	Pass
751	-41.88	-16.01	-25.87	Pass

751 MHz	



Chain 1				
QPSK / Channel Bandwidth: 10MHz				
Frequency(MHz)	Measurement Value	Limit	Margin	Result
751	-36.1	-16.01	-20.09	Pass
751	-41.11	-16.01	-25.1	Pass

751 MHz	751 MHz



4.6 Peak to Average Ratio

4.6.1 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

4.6.2 Test Setup

4.6.3 Test Procedures

1. Set resolution/measurement bandwidth ≥ 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%.

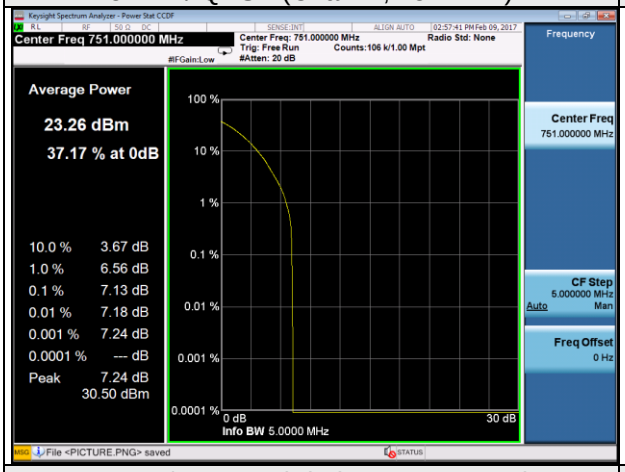
4.6.4 Test Results

Channel Bandwidth: 5MHz						
Frequency (MHz)	Peak To Average Ratio (dB)					
	Chain0			Chain1		
	QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
748.5	7.10	7.10	7.14	7.11	7.10	7.13
751	7.11	7.09	7.12	7.13	7.10	7.12
753.5	7.13	7.13	7.13	7.12	7.10	7.13

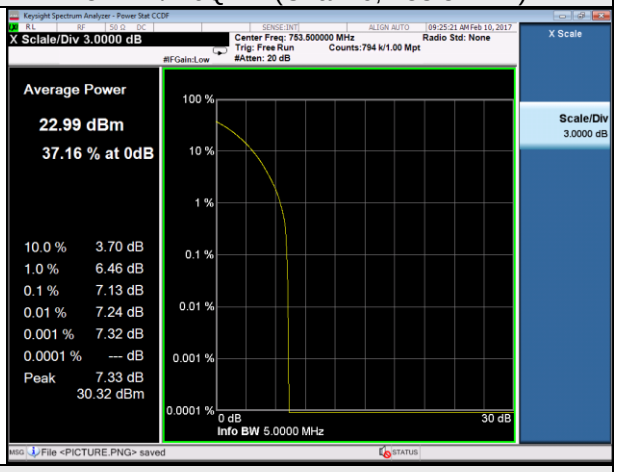
SPECTRUM PLOT OF WORST VALUE

Peak To Average Ratio (dB)

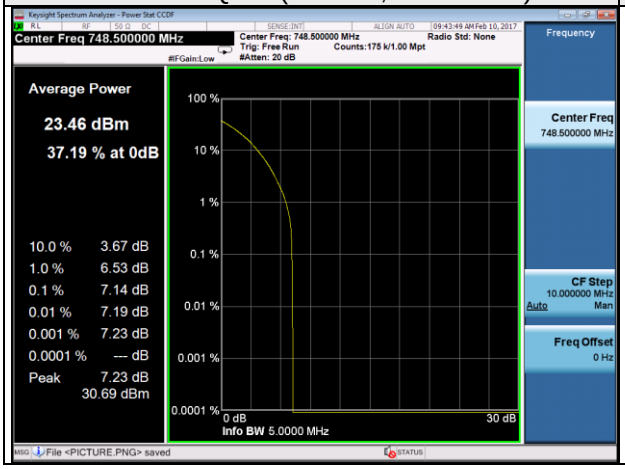
5MHz / QPSK (Chain 1, 751 MHz)



5MHz / 16QAM (Chain 0, 753.5 MHz)



5MHz / 64QAM (Chain 0, 748.5 MHz)

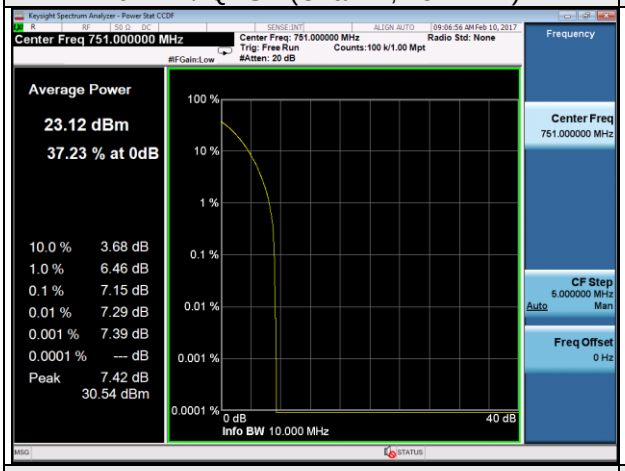


Channel Bandwidth: 10MHz						
Frequency (MHz)	Peak To Average Ratio (dB)					
	Chain0			Chain1		
	QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
751	7.12	7.12	7.13	7.15	7.14	7.16

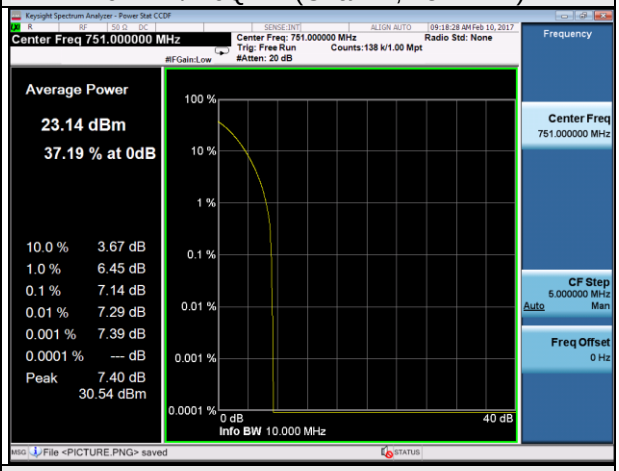
SPECTRUM PLOT OF WORST VALUE

Peak To Average Ratio (dB)

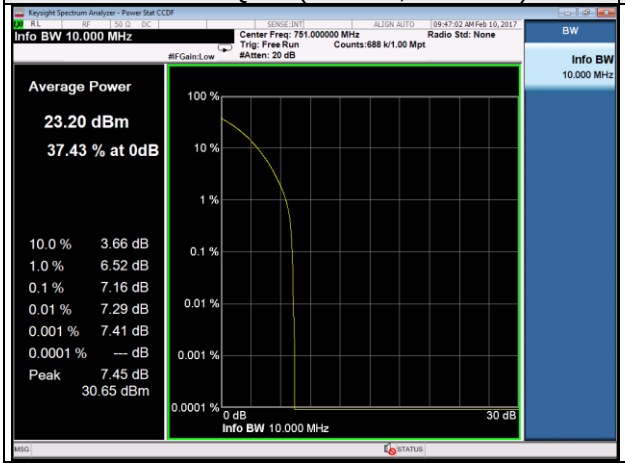
10MHz / QPSK (Chain 1, 751 MHz)



10MHz / 16QAM (Chain 1, 751 MHz)



10MHz / 64QAM (Chain 1, 751 MHz)



4.7 Conducted Spurious Emissions

4.7.1 Limits of Conducted Spurious Emissions Measurement

In the FCC 27.53(c), 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 –13dBm.

Note:

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

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

Note:
Part 27.53 (f) For operations in the 746–763 MHz, 775–793 MHz, and 805–806 MHz bands, emissions in the band 1559–1610 MHz shall be limited to -70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and -80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth.
{The limit is adjusted to -40dBm(-70dBW) – 10*log(2) = -43.01dBm.}

4.7.2 Test Setup

4.7.3 Test Procedure

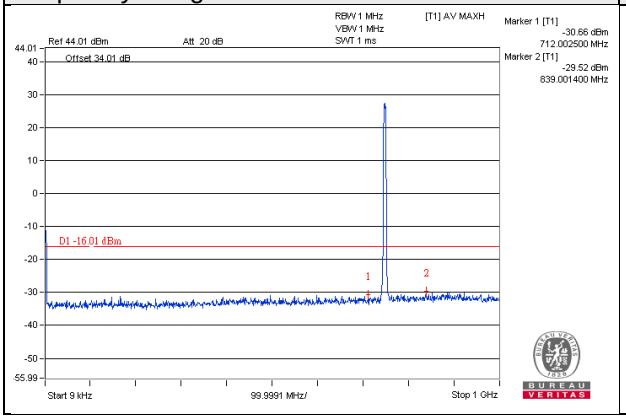
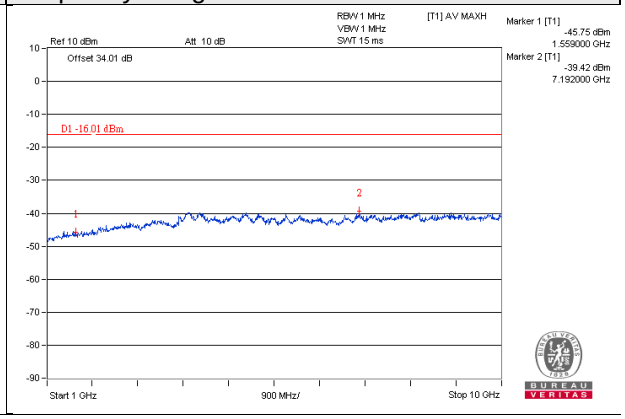
a. All measurements were done at 3 channels: low, middle and high operational frequency range.

b. When the spectrum scanned from 9kHz to 10GHz, it shall be connected to the 20dB pad attenuated the carried frequency.

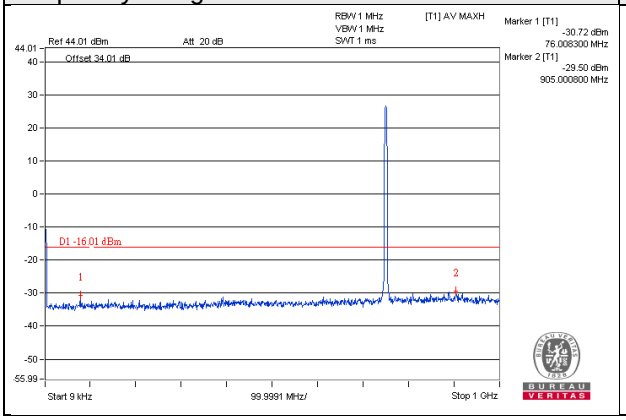
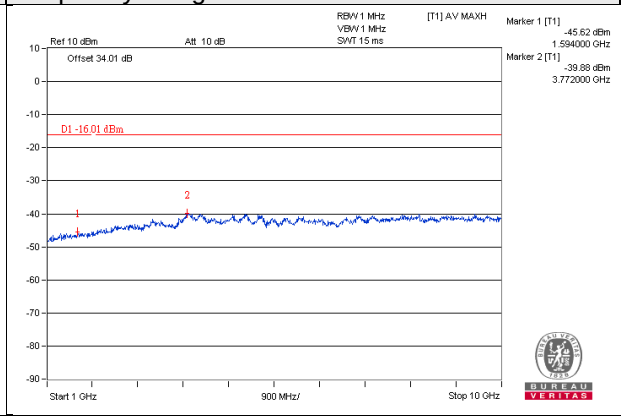
c. S.A. setting: RBW=1MHz, VBW=3MHz, Detector=RMS (Power average)

4.7.4 Test Results

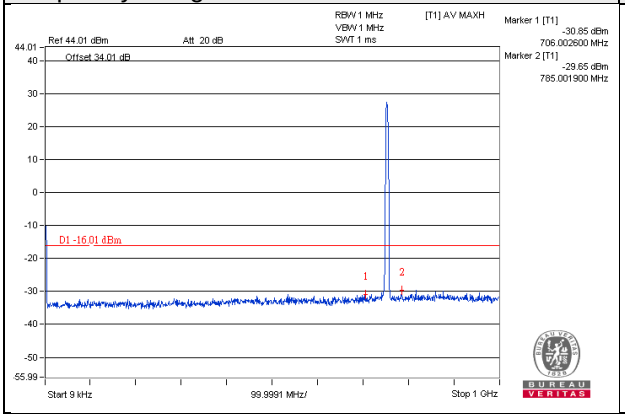
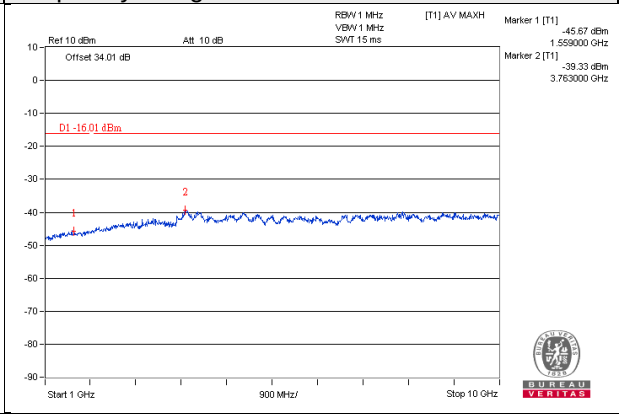
QPSK / Chain 0 / Channel Bandwidth: 5MHz / Frequency: 748.5				
Frequency(MHz)	Measurement Value	Limit	Margin	Result
839	-29.52	-16.01	-13.51	PASS
7192	-39.42	-16.01	-23.41	PASS
1559	-45.75	-43.01	-2.74	PASS

Frequency Range : 9kHz~1GHz	Frequency Range : 1GHz ~10GHz
	

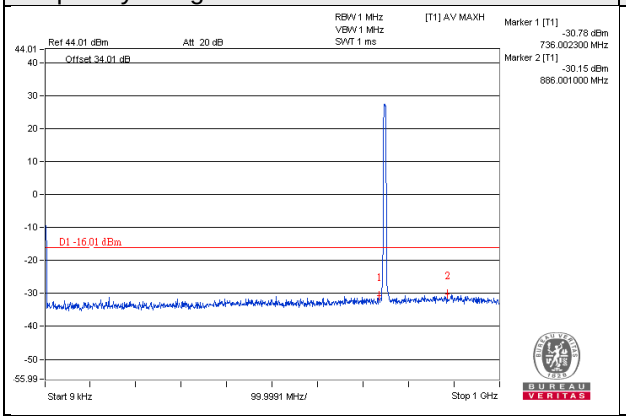
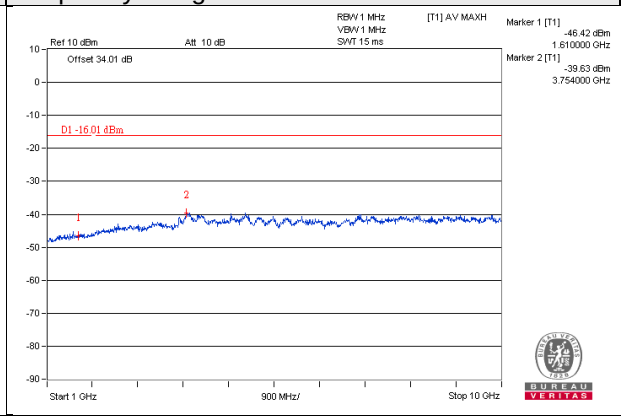
QPSK / Chain 0 / Channel Bandwidth: 5MHz / Frequency: 751				
Frequency(MHz)	Measurement Value	Limit	Margin	Result
905	-29.5	-16.01	-13.49	PASS
3772	-39.88	-16.01	-23.87	PASS
1594	-45.62	-43.01	-2.61	PASS

Frequency Range : 9kHz~1GHz	Frequency Range : 1GHz ~10GHz
	

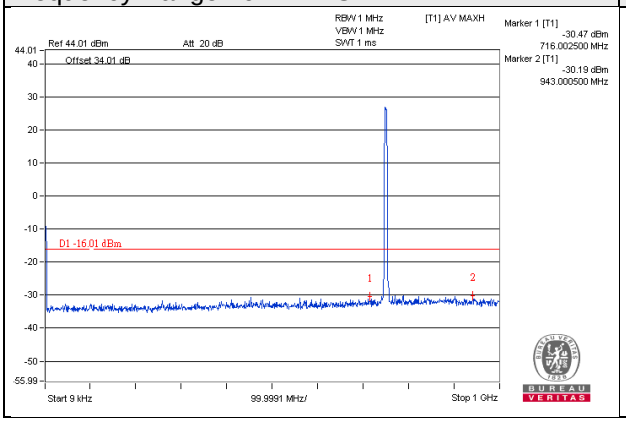
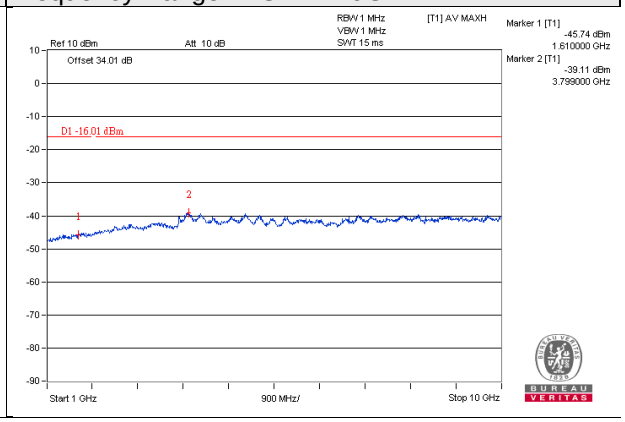
QPSK / Chain 0 / Channel Bandwidth: 5MHz / Frequency: 753.5				
Frequency(MHz)	Measurement Value	Limit	Margin	Result
785	-29.65	-16.01	-13.64	PASS
3763	-39.33	-16.01	-23.32	PASS
1559	-45.67	-43.01	-2.66	PASS

Frequency Range : 9kHz~1GHz	Frequency Range : 1GHz ~10GHz
	

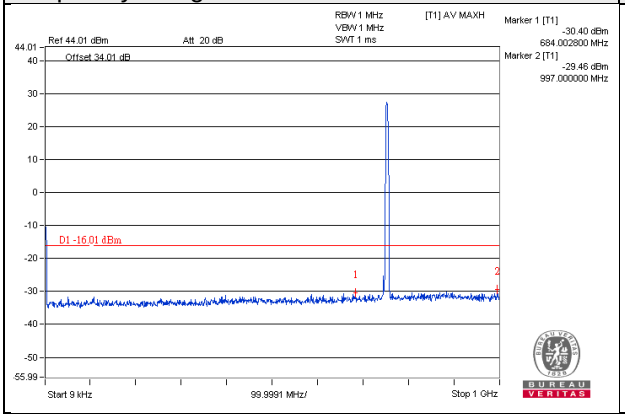
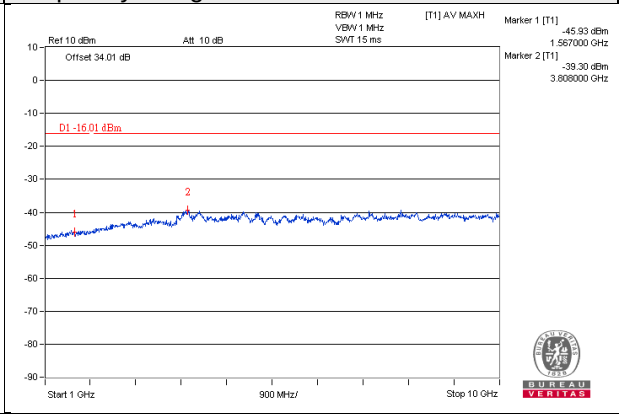
QPSK / Chain 1 / Channel Bandwidth: 5MHz / Frequency: 748.5				
Frequency(MHz)	Measurement Value	Limit	Margin	Result
886	-30.15	-16.01	-14.14	PASS
3754	-39.63	-16.01	-23.62	PASS
1610	-46.42	-43.01	-3.41	PASS

Frequency Range : 9kHz~1GHz	Frequency Range : 1GHz ~10GHz
	

QPSK / Chain 1 / Channel Bandwidth: 5MHz / Frequency: 751				
Frequency(MHz)	Measurement Value	Limit	Margin	Result
943	-30.19	-16.01	-14.18	PASS
3799	-39.11	-16.01	-23.1	PASS
1610	-45.74	-43.01	-2.73	PASS

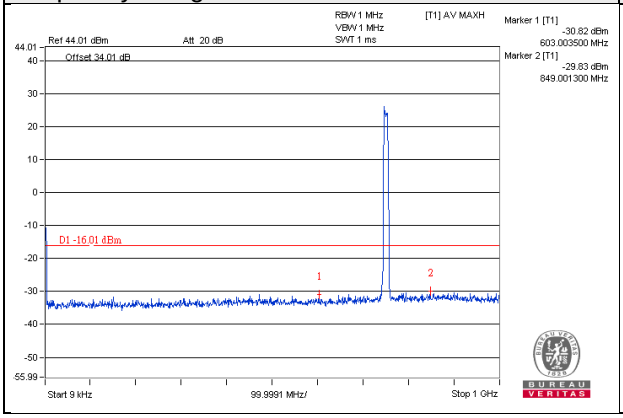
Frequency Range : 9kHz~1GHz	Frequency Range : 1GHz ~10GHz
	

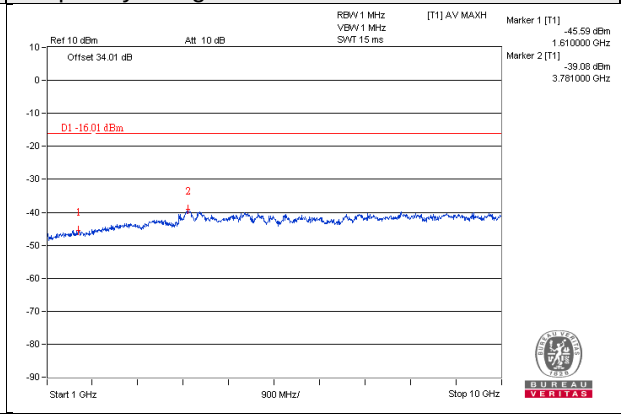
QPSK / Chain 1 / Channel Bandwidth: 5MHz / Frequency: 753.5				
Frequency(MHz)	Measurement Value	Limit	Margin	Result
997	-29.46	-16.01	-13.45	PASS
3808	-39.3	-16.01	-23.29	PASS
1567	-45.93	-43.01	-2.92	PASS

Frequency Range : 9kHz~1GHz	Frequency Range : 1GHz ~10GHz
	

QPSK / Chain 0 / Channel Bandwidth: 10 MHz / Frequency: 751				
Frequency(MHz)	Measurement Value	Limit	Margin	Result
849	-29.83	-16.01	-13.82	PASS
3781	-39.8	-16.01	-23.79	PASS
1610	-45.59	-43.01	-2.58	PASS

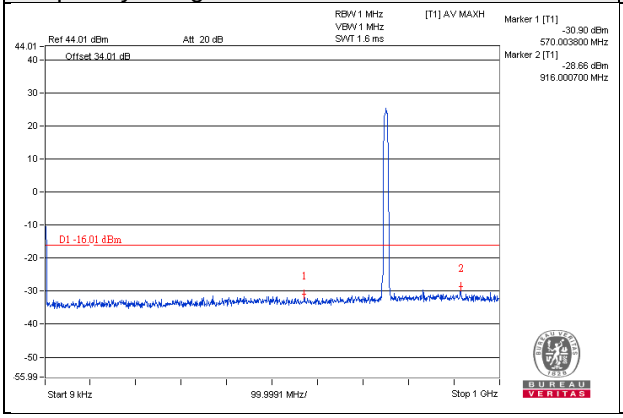
Frequency: 748.5	
Frequency Range : 9kHz~1GHz	Frequency Range : 1GHz ~10GHz

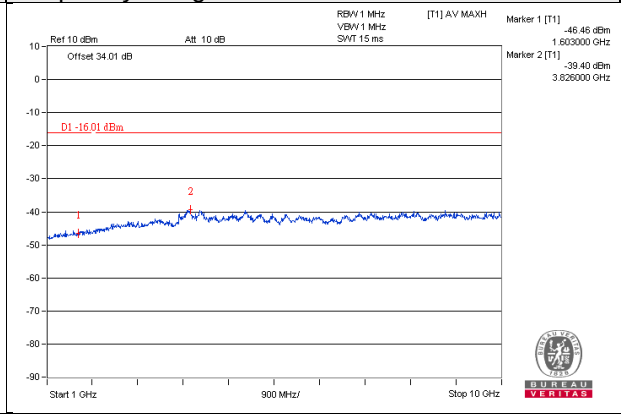




QPSK / Chain 1 / Channel Bandwidth: 10MHz / Frequency: 751				
Frequency(MHz)	Measurement Value	Limit	Margin	Result
916.01	-28.66	-16.01	-12.65	PASS
3826	-39.4	-16.01	-23.39	PASS
1603	-46.46	-43.01	-3.45	PASS

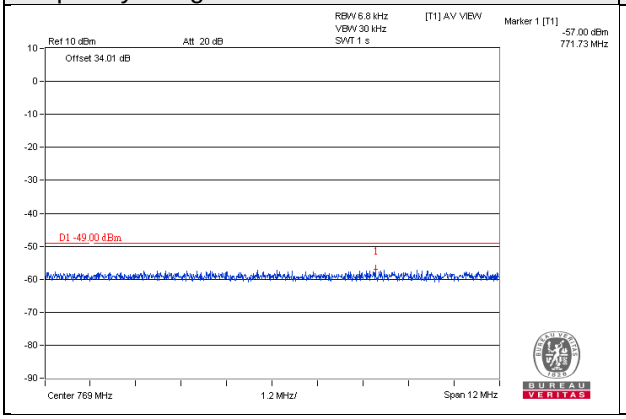
Frequency: 748.5	
Frequency Range : 9kHz~1GHz	Frequency Range : 1GHz ~10GHz

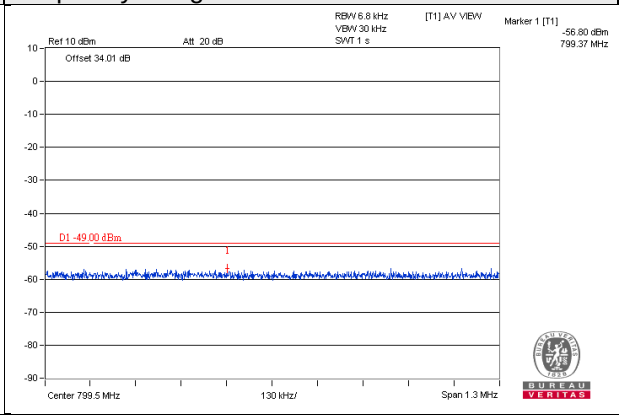




QPSK / Chain 0 / Channel Bandwidth: 5 MHz				
Frequency(MHz)	Measurement Value	Limit	Margin	Result
763-775	-57	-49	-8	PASS
793-806	-56.8	-49	-7.8	PASS

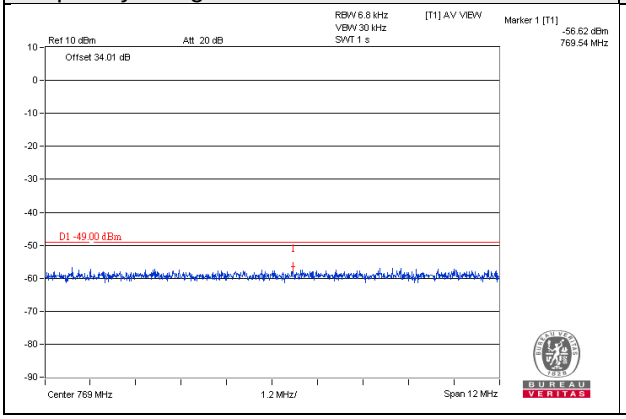
Frequency: 763-775	Frequency: 793-806
Frequency Range : 9kHz~1GHz	Frequency Range : 1GHz ~10GHz

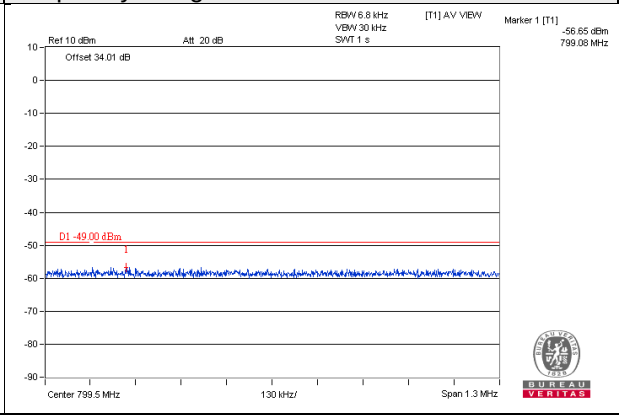




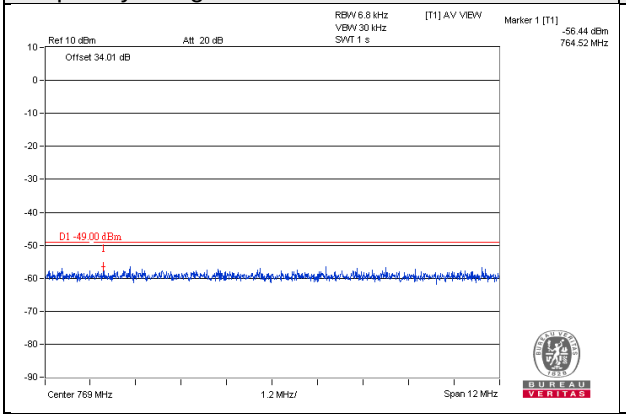
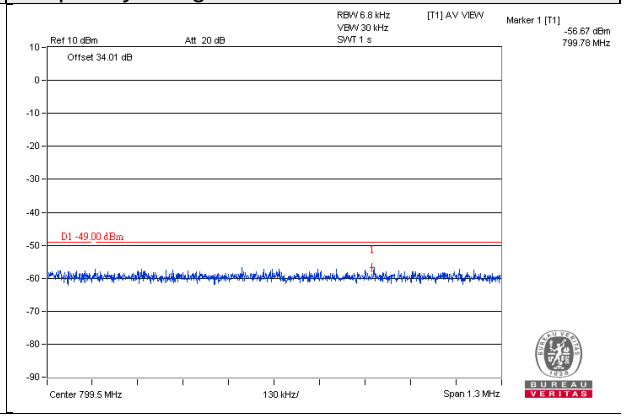
QPSK / Chain 1 / Channel Bandwidth: 5MHz				
Frequency(MHz)	Measurement Value	Limit	Margin	Result
763-775	-56.62	-49	-7.62	PASS
793-806	-56.65	-49	-7.65	PASS

Frequency: 748.5	
Frequency Range : 9kHz~1GHz	Frequency Range : 1GHz ~10GHz

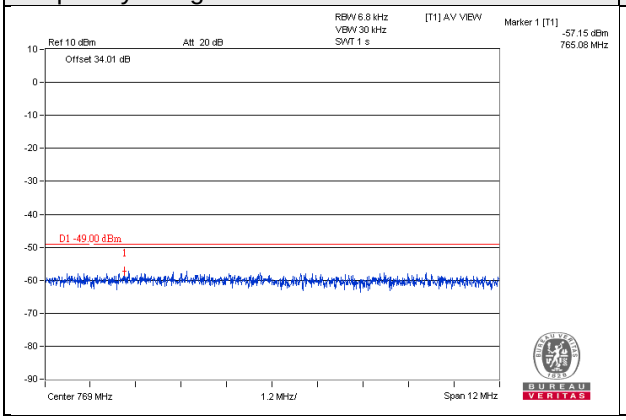
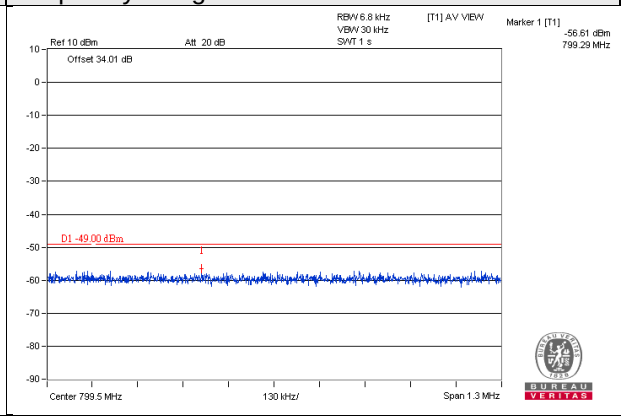




QPSK / Chain 0 / Channel Bandwidth: 10 MHz				
Frequency(MHz)	Measurement Value	Limit	Margin	Result
763-775	-56.44	-49	-7.44	PASS
793-806	-56.67	-49	-7.67	PASS

Frequency: 763-775	Frequency: 793-806
Frequency Range : 9kHz~1GHz	Frequency Range : 1GHz ~10GHz
	

QPSK / Chain 1 / Channel Bandwidth: 10MHz				
Frequency(MHz)	Measurement Value	Limit	Margin	Result
763-775	-57.15	-49	-8.15	PASS
793-806	-56.61	-49	-7.61	PASS

Frequency: 748.5	
Frequency Range : 9kHz~1GHz	Frequency Range : 1GHz ~10GHz
	

4.8 Radiated Emission Measurement

4.8.1 Limits of Radiated Emission Measurement

In the FCC 27.53(c), 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 –13dBm.

4.8.2 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. EIRP = Output power level of S.G – TX cable loss + Antenna gain of substitution antenna.

e. ERP power can be calculated form EIRP power by subtracting the gain of dipole, ERP power = EIRP power - 2.15dBi

f. S.A. setting: RBW=1MHz, VBW=3MHz, Detector=RMS (Power average)

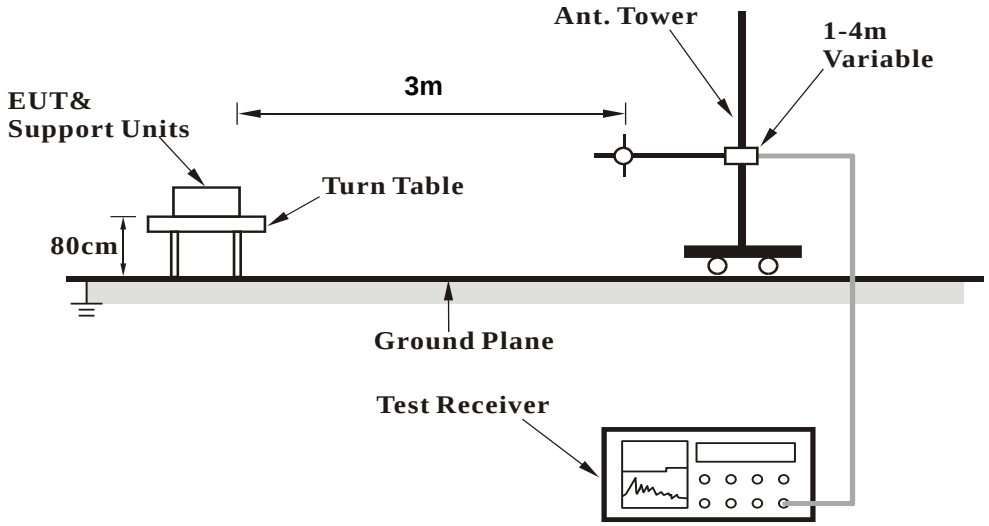
NOTE: The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1MHz/3MHz.

4.8.3 Deviation from Test Standard

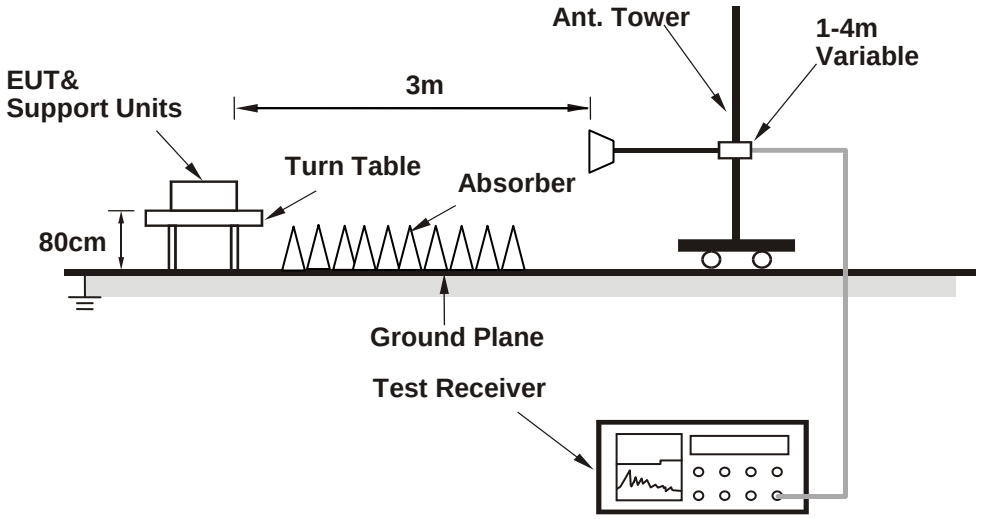
No deviation.

4.8.4 Test Setup

<Frequency Range below 1GHz>



<Frequency Range above 1GHz>



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

4.8.5 Test Results

Below 1GHz

Channel Bandwidth: 5MHz

Test Frequency	748.5 MHz	Frequency Range	Below 1000 MHz

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBuV/m)	S.G Power Value (dBm)	Correction Factor (dB)	Emission Value (dBm)	Limit (dBm)	Margin (dB)
1	31.8	35.30	-36.61	-14.46	-51.07	-13	-38.07
2	158.58	29.37	-59.24	-0.74	-59.98	-13	-46.98
3	248.26	32.92	-62.11	3.88	-58.23	-13	-45.23
4	285.51	39.58	-55.77	3.81	-51.96	-13	-38.96
5	378.8	35.07	-62.78	3.44	-59.34	-13	-46.34
6	840.24	28.17	-67.28	1.13	-66.14	-13	-53.14
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBuV/m)	S.G Power Value (dBm)	Correction Factor (dB)	Emission Value (dBm)	Limit (dBm)	Margin (dB)
1	31.58	34.15	-37.68	-14.51	-52.20	-13	-39.20
2	128.73	29.03	-62.46	-1.24	-63.70	-13	-50.70
3	146.15	29.54	-62.64	-1.12	-63.76	-13	-50.76
4	289.1	31.65	-63.80	3.78	-60.02	-13	-47.02
5	377.73	28.52	-69.33	3.45	-65.88	-13	-52.88
6	983.46	31.38	-65.66	0.51	-65.15	-13	-52.15

Remarks:

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

Test Frequency	751 MHz	Frequency Range	Below 1000 MHz

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBuV/m)	S.G Power Value (dBm)	Correction Factor (dB)	Emission Value (dBm)	Limit (dBm)	Margin (dB)
1	31.68	35.26	-36.61	-14.49	-51.10	-13	-38.10
2	158.23	29.17	-59.54	-0.75	-60.29	-13	-47.29
3	248.38	31.70	-63.33	3.88	-59.45	-13	-46.45
4	286.18	39.03	-56.34	3.80	-52.53	-13	-39.53
5	379.71	33.85	-64.00	3.44	-60.56	-13	-47.56
6	840.56	27.09	-68.33	1.13	-67.20	-13	-54.20
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBuV/m)	S.G Power Value (dBm)	Correction Factor (dB)	Emission Value (dBm)	Limit (dBm)	Margin (dB)
1	31.12	32.70	-38.97	-14.63	-53.59	-13	-40.59
2	128.87	28.04	-63.48	-1.24	-64.72	-13	-51.72
3	146.13	28.38	-63.80	-1.12	-64.92	-13	-51.92
4	289.71	31.38	-64.09	3.78	-60.31	-13	-47.31
5	377.97	27.14	-70.71	3.45	-67.26	-13	-54.26
6	983.42	31.24	-65.80	0.51	-65.29	-13	-52.29

Remarks:

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

Test Frequency	753.5 MHz	Frequency Range	Below 1000 MHz

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBuV/m)	S.G Power Value (dBm)	Correction Factor (dB)	Emission Value (dBm)	Limit (dBm)	Margin (dB)
1	32.32	34.95	-37.15	-14.33	-51.48	-13	-38.48
2	158.1	28.90	-59.85	-0.76	-60.60	-13	-47.60
3	249.28	30.64	-64.35	3.89	-60.46	-13	-47.46
4	286	38.09	-57.27	3.80	-53.47	-13	-40.47
5	380.13	33.25	-64.60	3.44	-61.16	-13	-48.16
6	840.89	25.83	-69.56	1.13	-68.44	-13	-55.44
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBuV/m)	S.G Power Value (dBm)	Correction Factor (dB)	Emission Value (dBm)	Limit (dBm)	Margin (dB)
1	30.15	31.47	-39.84	-14.86	-54.71	-13	-41.71
2	127.88	27.98	-63.33	-1.23	-64.56	-13	-51.56
3	146.95	27.57	-64.38	-1.10	-65.47	-13	-52.47
4	289.94	30.71	-64.77	3.78	-60.99	-13	-47.99
5	378.28	26.12	-71.73	3.45	-68.29	-13	-55.29
6	982.51	30.49	-66.58	0.51	-66.07	-13	-53.07

Remarks:

1. Emission Value (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	748.5 MHz	Frequency Range	Above 1000MHz

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBuV/m)	S.G Power Value (dBm)	Correction Factor (dB)	Emission Value (dBm)	Limit (dBm)	Margin (dB)
1	1497	39.00	-65.80	7.43	-58.38	-13	-45.38
2	2245.5	37.50	-66.64	6.20	-60.44	-13	-47.44
3	2994	39.30	-63.32	4.20	-59.12	-13	-46.12
4	3742.5	38.1	-63.95	3.51	-60.44	-13	-47.44
5	4491	40.1	-61.23	4.38	-56.86	-13	-43.86
6	5239.5	45	-52.16	3.78	-48.38	-13	-35.38
7	5988	44	-55.03	3.00	-52.03	-13	-39.03
8	6736.5	44.8	-55.56	3.71	-51.85	-13	-38.85
9	7485	45.6	-65.97	4.12	-61.86	-13	-48.86
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBuV/m)	S.G Power Value (dBm)	Correction Factor (dB)	Emission Value (dBm)	Limit (dBm)	Margin (dB)
1	1497	43.7	-61.10	7.43	-53.68	-13	-40.68
2	2245.5	40.8	-63.34	6.20	-57.14	-13	-44.14
3	2994	42.1	-60.52	4.20	-56.32	-13	-43.32
4	3742.5	37.5	-64.55	3.51	-61.04	-13	-48.04
5	4491	38.4	-62.93	4.38	-58.56	-13	-45.56
6	5239.5	41.6	-56.08	3.39	-52.69	-13	-39.69
7	5988	45.3	-53.73	3.00	-50.73	-13	-37.73
8	6736.5	47.3	-53.06	3.71	-49.35	-13	-36.35
9	7485	46.2	-65.37	4.12	-61.26	-13	-48.26

Remarks:

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

Test Frequency	751 MHz	Frequency Range	Above 1000MHz

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBuV/m)	S.G Power Value (dBm)	Correction Factor (dB)	Emission Value (dBm)	Limit (dBm)	Margin (dB)
1	1502	39.30	-65.46	7.41	-58.05	-13	-45.05
2	2253	37.80	-66.34	6.10	-60.24	-13	-47.24
3	3004	39.40	-63.24	4.21	-59.02	-13	-46.02
4	3755	38.5	-63.43	3.41	-60.02	-13	-47.02
5	4506	40.3	-60.85	4.40	-56.44	-13	-43.44
6	5257	45.5	-51.66	3.78	-47.88	-13	-34.88
7	6008	44.3	-54.87	2.95	-51.93	-13	-38.93
8	6759	45.8	-54.67	3.77	-50.89	-13	-37.89
9	7510	46.1	-66.53	4.16	-62.37	-13	-49.37
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBuV/m)	S.G Power Value (dBm)	Correction Factor (dB)	Emission Value (dBm)	Limit (dBm)	Margin (dB)
1	1502	43.9	-60.86	7.41	-53.45	-13	-40.45
2	2253	41	-63.14	6.10	-57.04	-13	-44.04
3	3004	42.5	-60.14	4.21	-55.92	-13	-42.92
4	3755	37.4	-64.53	3.41	-61.12	-13	-48.12
5	4506	38.8	-62.35	4.40	-57.94	-13	-44.94
6	5257	41.9	-55.56	3.60	-51.96	-13	-38.96
7	6008	45.6	-53.57	2.95	-50.63	-13	-37.63
8	6759	47.1	-53.37	3.77	-49.59	-13	-36.59
9	7510	46.5	-66.13	4.16	-61.97	-13	-48.97

Remarks:
1. Emission Value (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

Test Frequency	753.5 MHz	Frequency Range	Above 1000MHz

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBuV/m)	S.G Power Value (dBm)	Correction Factor (dB)	Emission Value (dBm)	Limit (dBm)	Margin (dB)
1	1507	38.80	-65.92	7.39	-58.53	-13	-45.53
2	2260.5	37.90	-66.24	6.00	-60.24	-13	-47.24
3	3014	39.60	-63.08	4.22	-58.86	-13	-45.86
4	3767.5	38.7	-63.12	3.32	-59.80	-13	-46.80
5	4521	40.5	-60.46	4.43	-56.03	-13	-43.03
6	5274.5	45.3	-51.86	3.78	-48.08	-13	-35.08
7	6028	44.1	-55.21	2.89	-52.33	-13	-39.33
8	6781.5	45	-55.58	3.84	-51.74	-13	-38.74
9	7535	45.9	-67.79	4.20	-63.59	-13	-50.59
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBuV/m)	S.G Power Value (dBm)	Correction Factor (dB)	Emission Value (dBm)	Limit (dBm)	Margin (dB)
1	1507	44.3	-60.42	7.39	-53.03	-13	-40.03
2	2260.5	41.2	-62.94	6.00	-56.94	-13	-43.94
3	3014	42.4	-60.28	4.22	-56.06	-13	-43.06
4	3767.5	37.8	-64.02	3.32	-60.70	-13	-47.70
5	4521	38.3	-62.66	4.43	-58.23	-13	-45.23
6	5274.5	41.9	-55.35	3.80	-51.54	-13	-38.54
7	6028	45.2	-54.11	2.89	-51.23	-13	-38.23
8	6781.5	47.5	-53.08	3.84	-49.24	-13	-36.24
9	7535	46.4	-67.29	4.20	-63.09	-13	-50.09

Remarks:
1. Emission Value (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	751 MHz	Frequency Range	Below 1000 MHz

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBuV/m)	S.G Power Value (dBm)	Correction Factor (dB)	Emission Value (dBm)	Limit (dBm)	Margin (dB)
1	31.76	33.84	-38.06	-14.47	-52.53	-13	-39.53
2	158.02	28.10	-60.67	-0.76	-61.43	-13	-48.43
3	249.08	29.74	-65.26	3.89	-61.37	-13	-48.37
4	285.51	37.19	-58.16	3.81	-54.35	-13	-41.35
5	381.07	33.15	-64.70	3.43	-61.27	-13	-48.27
6	841.77	25.33	-69.99	1.12	-68.87	-13	-55.87
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBuV/m)	S.G Power Value (dBm)	Correction Factor (dB)	Emission Value (dBm)	Limit (dBm)	Margin (dB)
1	31.03	30.35	-41.28	-14.65	-55.93	-13	-42.93
2	128.26	26.51	-64.88	-1.24	-66.12	-13	-53.12
3	146.23	27.03	-65.12	-1.12	-66.24	-13	-53.24
4	289.28	30.03	-65.43	3.78	-61.65	-13	-48.65
5	377.42	25.60	-72.25	3.45	-68.80	-13	-55.80
6	982.45	29.17	-67.90	0.50	-67.39	-13	-54.39

Remarks:

1. Emission Value (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	751 MHz	Frequency Range	Above 1000MHz

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBuV/m)	S.G Power Value (dBm)	Correction Factor (dB)	Emission Value (dBm)	Limit (dBm)	Margin (dB)
1	1502	39.10	-65.70	7.42	-58.27	-13	-45.27
2	2253	38.10	-66.04	6.19	-59.85	-13	-46.85
3	3004	39.60	-63.02	4.20	-58.82	-13	-45.82
4	3755	38.3	-63.73	3.50	-60.24	-13	-47.24
5	4506	40.6	-60.71	4.38	-56.33	-13	-43.33
6	5257	45.3	-52.35	3.42	-48.93	-13	-35.93
7	6008	44.7	-54.35	3.00	-51.35	-13	-38.35
8	6759	46.2	-54.17	3.72	-50.46	-13	-37.46
9	7510	46.8	-64.91	4.12	-60.78	-13	-47.78
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBuV/m)	S.G Power Value (dBm)	Correction Factor (dB)	Emission Value (dBm)	Limit (dBm)	Margin (dB)
1	1502	44.3	-60.50	7.42	-53.07	-13	-40.07
2	2253	41.1	-63.04	6.19	-56.85	-13	-43.85
3	3004	42.7	-59.92	4.20	-55.72	-13	-42.72
4	3755	37.5	-64.53	3.50	-61.04	-13	-48.04
5	4506	38.6	-62.71	4.38	-58.33	-13	-45.33
6	5257	42.1	-55.55	3.42	-52.13	-13	-39.13
7	6008	45.4	-53.65	3.00	-50.65	-13	-37.65
8	6759	47.3	-53.07	3.72	-49.36	-13	-36.36
9	7510	46.3	-65.41	4.12	-61.28	-13	-48.28

Remarks:

1. Emission Value (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
Web Site: www.bureauveritas-adt.com

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

--- END ---