FCC RF TEST REPORT

ISSUED BY
Shenzhen BALUN Technology Co., Ltd.

FOR

Tethys

ISSUED TO
Shanghai Bwave Technology Co., Ltd.

6F, Building 12, 399 Keyuan Road,Zhangjiang Hi-Tech Park, Shanghai, China

Tested by: Cao Shaodong (Engineer)
Date: Mar. 23, 2017

Approved by: Wei Yanquan (Chief Engineer)
Date: Mar. 23, 2017

Report No.:	BL-SZ16C0097-601
EUT Name:	Tethys
Model Name:	RTK00V2XRC7746SFS
Brand Name:	N/A
Test Standard:	47 CFR Part 90 Subpart I and M
FCC ID:	2AHMN-TETHYS
Test conclusion:	Pass
Test Date:	Dec. 19, 2016 ~ Feb. 28, 2017
Date of Issue:	Mar. 23, 2017

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Revision History

Version	Issue Date	Revisions
Rev. 01	Jan. 18, 2017	Initial Issue
Rev. 02	Jan. 25, 2017	Update the power and correct mask limit.
Rev. 03	Mar. 23, 2017	The way of work of two modules was changed, so we have re-evaluated it and update the item of Power, PSD and Mask, Change the Software Version

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1 ADMINISTRATIVE DATA (GENERAL INFORMATION)

1.1 Identification of the Testing Laboratory

Company Name	Shenzhen BALUN Technology Co., Ltd.
Address	Block B, 1st FL, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China
Phone Number	+86 755 6685 0100
Fax Number	+86 755 6182 4271

1.2 Identification of the Responsible Testing Location

Test Location	Shenzhen BALUN Technology Co., Ltd.
Address	Block B, 1st FL, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China
Accreditation Certificate	The laboratory has been listed by Industry Canada to perform electromagnetic emission measurements. The recognition numbers of test site are 11524A-1. The laboratory has been listed by US Federal Communications Commission to perform electromagnetic emission measurements. The recognition numbers of test site are 832625. The laboratory is a testing organization accredited by China National Accreditation Service for Conformity Assessment (CNAS) according to ISO/IEC 17025. The accreditation certificate number is L6791.
Description	All measurement facilities used to collect the measurement data are located at Block B, FL 1, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China 518055

1.3 Laboratory Condition

Ambient Temperature	20 to 25℃
Ambient Relative Humidity	45% - 55%
Ambient Pressure	100 kPa - 102 kPa

1.4 Announce

(1) The test report reference to the report template version v1.0.

(2) The test report is invalid if not marked with the signatures of the persons responsible for preparing and approving the test report.

(3) The test report is invalid if there is any evidence and/or falsification.

(4) The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein.

(5) This document may not be altered or revised in any way unless done so by BALUN and all revisions are duly noted in the revisions section.

(6) Content of the test report, in part or in full, cannot be used for publicity and/or promotional purposes without prior written approval from the laboratory.

2 PRODUCT INFORMATION

2.1 Applicant Information

Applicant	Shanghai Bwave Technology Co., Ltd.
Address	6F, Building 12, 399 Keyuan Road, Zhangjiang Hi-Tech Park, Shanghai, China

2.2 Manufacturer Information

Manufacturer	Shanghai Bwave Technology Co., Ltd.
Address	6F, Building 12, 399 Keyuan Road, Zhangjiang Hi-Tech Park, Shanghai, China

2.3 Factory Information

Factory	N/A
Address	N/A

2.4 General Description for Equipment under Test (EUT)

EUT Name	Tethys
Model Name Under Test	RTK00V2XRC7746SFS
Series Model Name	N/A
Description of Model name differentiation	N/A
Hardware Version	V3.0
Software Version	beta2(main board)+C2X_FW_U_01.01.02(RF board)
Dimensions (Approx.)	N/A
Weight (Approx.)	N/A
Network and Wireless connectivity	Dedicated Short-Range Communications Service Roadside Units (DSRCS-RSUs), GPS

2.5 Ancillary Equipment

Ancillary Equipment 1	3dB Antenna	
	Length	2.0 m
Ancillary Equipment 2	5dB Antenna	
	Length	0.2 m
Ancillary Equipment 3	GPS Antenna	
	Length	5.0 m
Ancillary Equipment 4	USB Cable	
	Length	1.5 m

2.6 Technical Information

The requirement for the following technical information of the EUT was tested in this report:

Modulation Technology			802.11p
Modulation Type			BPSK, QPSK, 16-QAM, 64-QAM
Transfer Rate			BPSK: 3 Mbps, 4.5 Mbps ; QPSK: 6 Mbps, 9 Mbps 16-QAM: 12 Mbps, 18 Mbps ; 64-QAM: 24 Mbps, 27 Mbps
Frequency Range			The frequency range used is 5850 MHz to 5925 MHz. f_c = 5000 MHz + N*5 MHz, where - f_c = "Operating Frequency" in MHz, - N = "Channel Number" with the range from 172 to 184.
Number of channel			7
Tested Channel			172 (5860 MHz), 178 (5890 MHz), 184 (5920 MHz)
Antenna Type(Primary)			Cable Antenna
Antenna Type(Second)			Rod Antenna
Antenna Gain[Note1]	Module 1	CH0	5 dBi
		CH1	5 dBi
	Module 2	CH0	5 dBi
		CH1	5 dBi
Total directional gain	For power spectral density(PSD) measurements		8.01 dBi Formulas: Directional gain = G_{ANT} + Array Gain, *Array Gain = 10 log(N_{ANT}/N_{SS}) dB*. N_{SS} =1, G_{ANT} set equal to the gain of the antenna having the highest gain.
	For power measurements		5 dBi Formulas: Directional gain = G_{ANT} + Array Gain, *Array Gain* = 0, G_{ANT} set equal to the gain of the antenna having the highest gain.
	For Conducted Out-of-Band and Spurious Measurements		8.01 dBi Formulas: Directional gain = G_{ANT} + Array Gain, *Array Gain = 10 log(N_{ANT}/N_{SS}) dB*. N_{SS} =1, G_{ANT} set equal to the gain of the antenna having the highest gain.
Antenna System(MIMO Smart Antenna)			Cyclic Delay Diversity (CDD)
Categorization as Correlated or Completely Uncorrelated			Categorization as Correlated
About the Product			The EUT is Dedicated Short-Range Communications Service Roadside Units (DSRCS-RSUs), and only the DSRCS was tested in this report.

Note1: The EUT has two sets of different antennas, we define it as the Primary and Second antenna. They have been tested in this report. The primary antenna is 5 dBi, the second antenna is 3 dBi. Only the primary antenna mainly shown in this report.

Note2: The EUT have two same modules, which independent of each other, the module 1 have two antennas (CH0 and CH1), and CH1 is the main antenna for transmitting data; also, the module 2 have two antennas（CH2 and CH3）and CH3 is the main antenna for transmitting data.

Module	Antenna		
	Antenna 0	Antenna 1	Antenna 0 + Antenna1
Module 1	√	√	√
Module 2	√	√	√

All channel was listed on the following table:

Channel number	Freq. (MHz)	Channel number	Freq. (MHz)
172	**5860**	180	5900
174	5870	182	5910
176	5880	**184**	**5920**
178	**5890**		

The Lowest frequency, the middle frequency and the highest frequency of channel were selected to perform the test, and the selected channel see below:

Channel	Channel Number	Frequency (MHz）
Low	172	5860
Mid	178	5890
High	184	5920

2.7 Additional Instructions

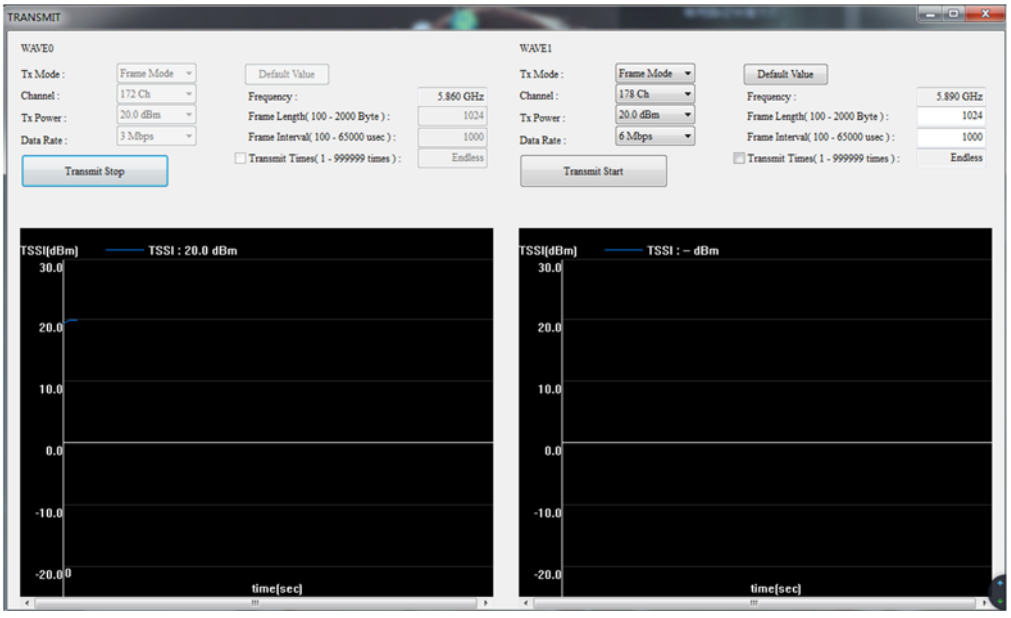
EUT Software Settings:

Mode	☒ Special software is used. The software provided by client to enable the EUT under transmission condition continuously at specific channel frequencies individually.

During testing. Channel and Power Controlling Software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product.

Power level setup in software		
Test Software Version	TOOL_TEST	
Mode	Channel	Soft Set
BPSK	**172**	20
	174	20
	176	20
	178	20
	180	9
	182	9
	184	20
64-QAM	**172**	20
	174	20
	176	20
	178	20
	180	9
	182	9
	184	20

Run Software



3 SUMMARY OF TEST RESULTS

3.1 Test Standards

No.	Identity	Document Title
1	47 CFR Part 90, Subpart I (10-1-15 Edition)	General Technical Standards
2	47 CFR Part 90, Subpart M (10-1-15 Edition)	Intelligent Transportation Systems Radio Service
3	KDB Publication 662911 D01 v02r01	Emissions Testing of Transmitters with Multiple Outputs in the Same Band (e.g., MIMO, Smart Antenna, etc)
4	KDB 412172 D01 v01r01	Guidelines for determing the effective radiated power(DRP) and equivalent isotropically radiated power(EIRP) of an transmitting system
5	KDB 971168 D01 v02r02	Measurement guidance for certification of licensed digital transmitters.
6	ANSI C63.2-2009	American National Standard for Electromagnetic Noise and Field Strength Instrumentation, 10 Hz to 40 GHz Specifications
7	ANSI C63.4-2014	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz
8	ANSI/TIA-603-D-2010	Land Mobile FM or PM Communications Equipment Measurement and Performance Standards
9	ANSI/TIA-603-C-2004	Land Mobile FM or PM Communications Equipment Measurement and Performance Standards

3.2 Verdict

No.	Description	FCC Part No.	Test Result	Verdict
1	RF Power Output	2.1046 90.377	ANNEX A.1	Pass
2	Occupied Bandwidth	2.1049 90.209	ANNEX A.2	Pass
3	Emission masks	90.210 90.375	ANNEX A.3	Pass
4	Conducted Spurious Emissions	2.1051 90.379	ANNEX A.4	Pass
5	Radiated Spurious Emission	2.1053 90.379	ANNEX A.5	Pass
6	Frequency Stability	2.1055 90.213	ANNEX A.6	Pass

Note 1: Preliminary tests were performed in different data rate in above table to find the worst radiated emission. The data rate shown in the table below is the worst-case rate with respect to the specific test item. Investigation has been done on all the possible configurations for searching the worst cases. The following table is a list of the test modes shown in this test report.

Note 2: Because of the two modules of the hardware, antenna and software settings is same, so only the item of RF output power, PSD and MASK was shown data of all modules, others was shown the worst case.

Test Items	Data Rate (Mbps)	Modulation Type	Channel
RF Output Power	3	BPSK	L/M/H/180/182
	27	64-QAM	L/M/H/180/182
Occupied Bandwidth	27	64-QAM	L/M/H
Emission masks	27	64-QAM	L/M/H
Conducted Spurious Emissions	27	64-QAM	L/M/H
Radiated Spurious Emission	27	64-QAM	L/M/H
Frequency Stability	N/A	modulated	M

4 GENERAL TEST CONFIGURATIONS

4.1 Test Environments

During the measurement, the normal environmental conditions were within the listed ranges:

Relative Humidity	45% - 55%	
Atmospheric Pressure	100 kPa - 102 kPa	
Temperature	NT (Normal Temperature)	+22℃ to +25℃
Working Voltage of the EUT	NV (Normal Voltage)	12 V

4.2 Test Equipment List

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
Spectrum Analyzer	ROHDE&SCHWARZ	FSV-30	103118	2016.07.13	2017.07.12
Vector Signal Generator	ROHDE&SCHWARZ	SMBV100A	177746	2016.07.13	2017.07.12
Signal Generator	ROHDE&SCHWARZ	SMB100A	260592	2016.07.13	2017.07.12
Switch Unit with OSP-B157	ROHDE&SCHWARZ	OSP120	101270	2016.07.13	2017.07.12
Spectrum Analyzer	AGILENT	E4440A	MY45304434	2016.11.08	2017.11.07
EMI Receiver	ROHDE&SCHWARZ	ESRP	101036	2016.07.05	2017.07.04
LISN	SCHWARZBECK	NSLK 8127	8127-687	2016.07.05	2017.07.04
Bluetooth Tester	ROHDE&SCHWARZ	CBT	101005	2016.07.13	2017.07.12
Power Splitter	KMW	DCPD-LDC	1305003215	--	--
Power Sensor	ROHDE&SCHWARZ	NRP-Z21	103971	2016.07.13	2017.07.12
Attenuator (20 dB)	KMW	ZA-S1-201	110617091	--	--
Attenuator (6 dB)	KMW	ZA-S1-61	1305003189	--	--
DC Power Supply	ROHDE&SCHWARZ	HMP2020	018141664	2016.07.13	2017.07.12
Temperature Chamber	ANGELANTIONI SCIENCE	NTH64-40A	1310	2016.07.13	2017.07.12
Test Antenna-Rod(9 kHz-30 MHz)	SCHWARZBECK	VAMP 9243	9243-556	2015.07.22	2017.07.21
Test Antenna-Bi-Log(30 MHz-3 GHz)	SCHWARZBECK	VULB 9163	9163-624	2015.07.22	2017.07.21
Test Antenna-Horn(1-18 GHz)	SCHWARZBECK	BBHA 9120D	9120D-1148	2015.07.22	2017.07.21
Test Antenna-Horn(15-26.5 GHz)	SCHWARZBECK	BBHA 9170	9170-305	2015.07.22	2017.07.21
Anechoic Chamber	RAINFORD	9m*6m*6m	N/A	2015.02.28	2017.02.27
Anechoic Chamber	EMC TECHNOLOGY LTD	21.1m*11.6m*7.35m	N/A	2016.08.09	2018.08.08
Shielded Enclosure	ChangNing	CN-130701	130703	--	--

4.3 Measurement Uncertainty

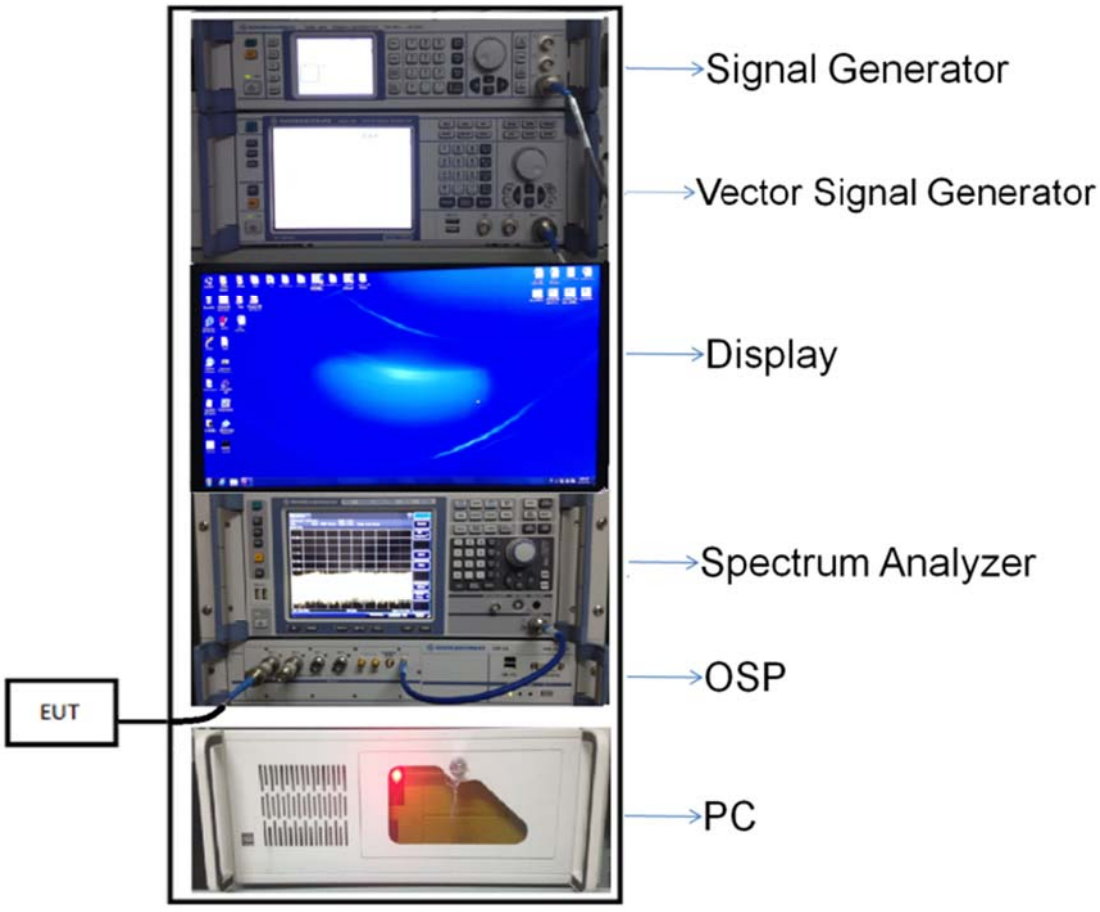
The following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2.

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

Measurement	Value
Occupied Channel Bandwidth	±4%
RF output power, conducted	±1.4 dB
Power Spectral Density, conducted	±2.5 dB
Unwanted Emissions, conducted	±2.8 dB
All emissions, radiated	±5.4 dB
Temperature	±1°C
Humidity	±4%

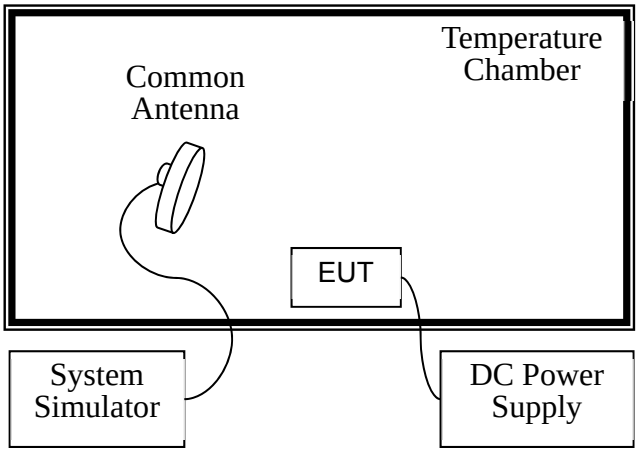
4.4 Description of Test Setup

4.4.1 For Antenna Port Test



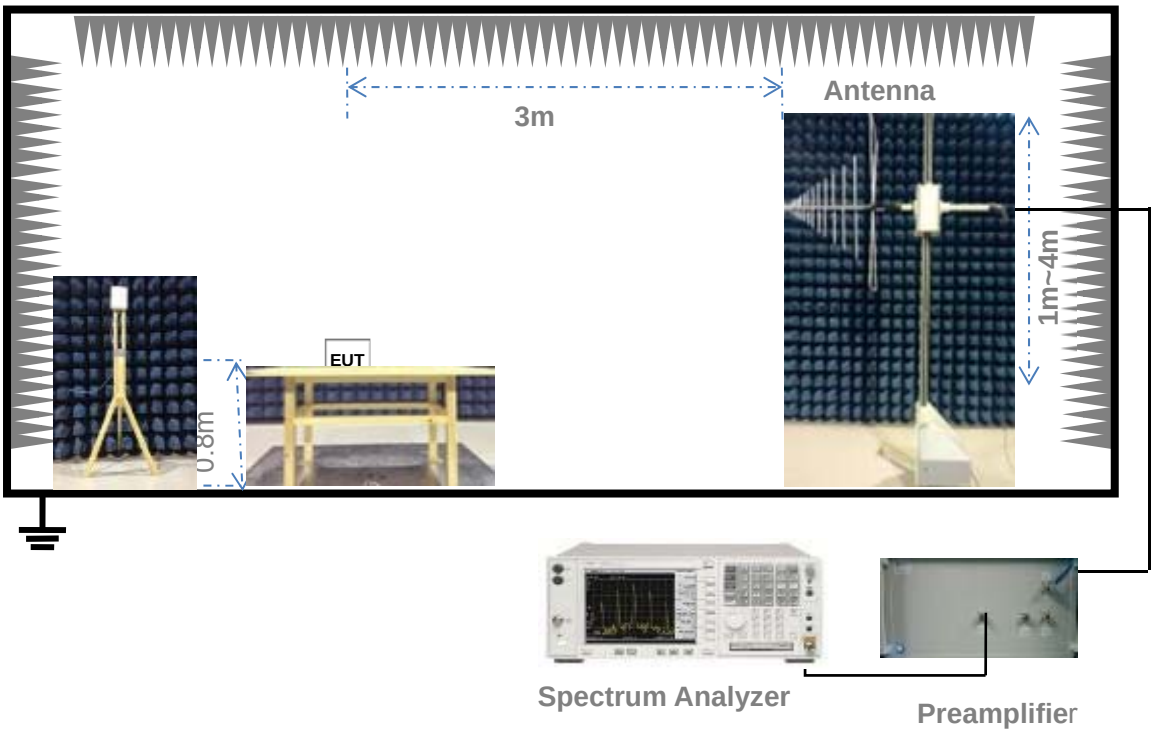
(Diagram 1)

4.4.2 For Frequency Stability Test



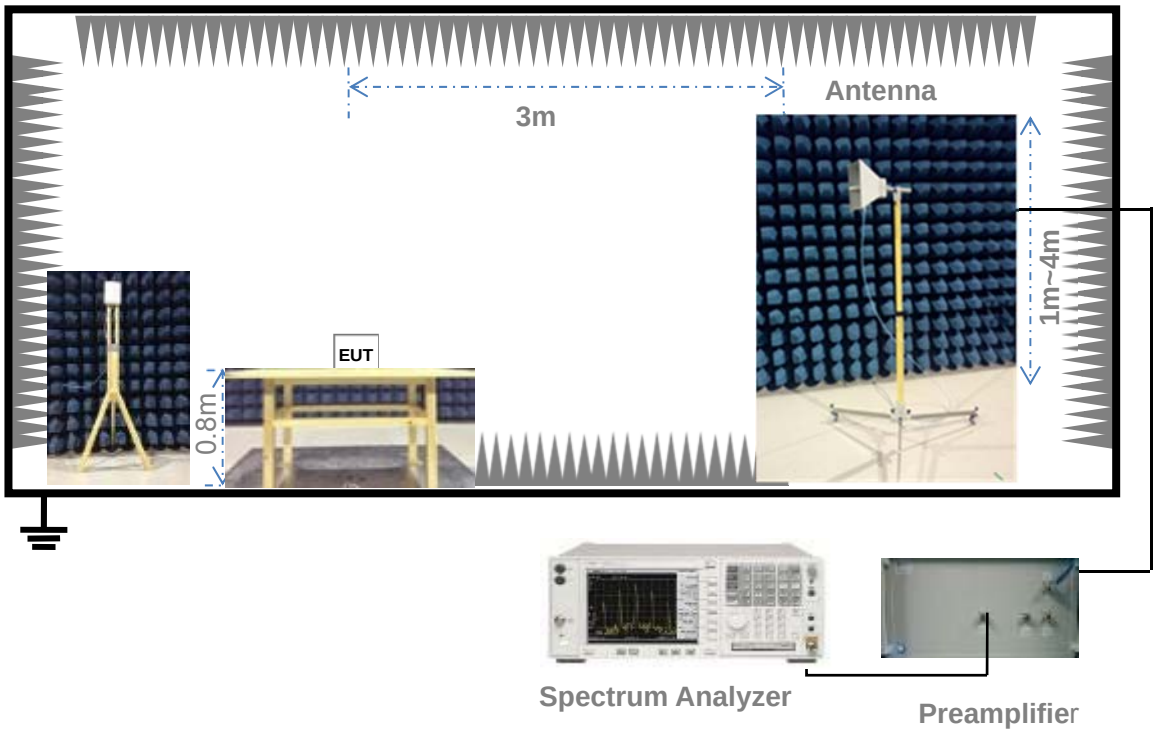
(Diagram 2)

4.4.3 For Radiated Test (30 MHz-1 GHz)



(Diagram 3)

4.4.4 For Radiated Test (Above 1 GHz)



(Diagram 4)

5 TEST ITEMS

5.1 RF Power Output

5.1.1 Test Limit

FCC § 2.1046 & 90.377

Channel No.	Center Frequency (MHz)	Bandwidth (MHz)	Max. EIRP (dBm)
170	5852.5	5	Reserved
172	5860	10	33
174	5870	10	33
175	5875	20	23
176	5880	10	33
178	5890	10	33
180	5900	10	23
181	5905	20	23
182	5910	10	23
184	5920	10	33

Note: An RSU may employ an antenna with a height exceeding 8 meters but not exceeding 15 meters provided the EIRP specified in the table above is reduced by a factor of 20 log(Ht/8) in dB where Ht is the height of the radiation center of the antenna in meters above the roadway bed surface. The EIRP is measured as the maximum EIRP toward the horizon or horizontal, whichever is greater, of the gain associated with the main or center of the transmission beam. The RSU antenna height shall not exceed 15 meters above the roadway bed surface.

5.1.2 Test Setup

The section 4.4.1 (Diagram 1) test setup description was used for this test. The photo of test setup please refer to ANNEX B.

5.1.3 Test Procedure

Description of the Conducted Output Power Measurement

The RF load attached to EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading. A system simulator was used to establish communication with the EUT, Its parameters were set to force the EUT transmitting at maximum output power. The measured power in the radio frequency on the transmitter output terminals shall be reported.

Note: Reference test setup 4.4.1 (Diagram 1)

Description of the Transmitter Radiated Power Measurement

In many cases, the RF output power limits for licensed digital transmission devices is specified in terms of effective radiated power (ERP) or equivalent isotropic radiated power (EIRP). Typically, ERP is specified when the operating frequency is less than or equal to 1 GHz and EIRP is specified when the operating frequency is greater than 1 GHz. Both are determined by adding the transmit antenna gain to the conducted RF output power with the primary difference between the two being that when determining the ERP, the transmit antenna gain is referenced to a

dipole antenna (i.e., dBd) whereas when determining the EIRP, the transmit antenna gain is referenced to an isotropic antenna (dBi).

The relevant equation for determining the ERP or EIRP from the conducted RF output power measured using the guidance provided above is:

ERP/EIRP = P_{Meas} + GT − LC

where:

ERP/EIRP = effective or equivalent radiated power, respectively (expressed in the same units as P_{Meas}, typically dBW or dBm);

PMeas = measured transmitter output power or PSD, in dBm or dBW;

GT = gain of the transmitting antenna, in dBd (ERP) or dBi (EIRP);

dBd (ERP)=dBi (EIRP) -2.15 dB

LC = signal attenuation in the connecting cable between the transmitter and antenna, in dB.

For devices utilizing multiple antennas, KDB 662911 provides guidance for determining the effective array transmit antenna gain term to be used in the above equation.

Note: Reference test setup 4.4.3 and 4.4.4 (Diagram 3, 4)

5.1.4 Test Result

Please refer to ANNEX A.1.

5.2 Occupied Bandwidth

5.2.1 Limit

FCC §2.1049 & 90.209

The occupied bandwidth is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission.

5.2.2 Test Setup

See section 4.4.1 for test setup description for the antenna port. The photo of test setup please refer to ANNEX B.

5.2.3 Test Procedure

The following procedure shall be used for measuring (99%) power bandwidth.

a) The spectrum analyzer center frequency is set to the nominal EUT channel center frequency. The frequency span for the spectrum analyzer shall be set wide enough to capture all modulation products including the emission skirts (i.e., two to five times the anticipated OBW).

b) The nominal IF filter bandwidth (3 dB RBW) shall be in the range of 1 to 5 % of the anticipated OBW, and the VBW shall be at least 3 times the RBW.

c) Set the reference level of the instrument as required to keep the signal from exceeding the maximum input mixer level for linear operation. In general, the peak of the spectral envelope must be at least 10log (OBW / RBW) below the reference level.

d) NOTE—Steps a) through c) may require iteration to adjust within the specified tolerances.

e) Set the detection mode to peak, and the trace mode to max hold.

f) For 99% OBW, use the 99 % power bandwidth function of the spectrum analyzer (if available) and report the measured bandwidth.

5.2.4 Test Result

Please refer to ANNEX A.2.

5.3 Emission Mask

5.3.1 Limit

FCC §90.210 & 90.375

The transmitted spectral density of the transmitted signal for all devices shall FIG. 11 OFDM PHY Frequency Channel Plan for North America E2213 − 03 (2010) fall within the spectral mask, as detailed in next table of DSRC Spectrum Mask:

Class	±4.5 MHz Offset	±5.0 MHz Offset	±5.5 MHz Offset	±10 MHz Offset	±15 MHz Offset
A	0	-10	-20	-28	-40
B	0	-16	-20	-28	-40
C	**0**	**-26**	**-32**	**-40**	**-50**
D	0	-35	-45	-55	-65

Note: Reduction in Power Spectral Density, dBr.

Emissions limitations are specified in §90M and refer to The American Society for Testing and Materials (ASTM) E2213–03, “Standard Specification for Telecommunications and Information Exchange Between Roadside and Vehicle Systems—5 GHz Band Dedicated Short Range Communications (DSRC) Medium Access Control (MAC) and Physical Layer (PHY) Specifications.”

There are several Road Side Units (RSU) classes which are described in §90.375 RSU license areas, communication zones and registrations with the appropriate limits listed in §90.375(c) (reproduced below).

RSU class	Max. output power (dBm)	Communications zone (meters)
A	0	15
B	10	100
C	**20**	**400**
D	28.8	1000

Table 9 of ASTM E2213-03 refers to the DSRC Device Classes A through D (reproduced below).

TABLE 9 DSRC Device Classes and Transmit Power Levels[A]

Device Class	Maximum Device Output Power, dBm
A	0
B	10
C	20
D	28.8 or more

[A] From IEEE 802.11a. Copyright 1999 IEEE. All rights reserved.

The CelPlan FR-100 radio complies with Device Class A to D with the attendant emissions mask reproduced from E2213-03 shown below:

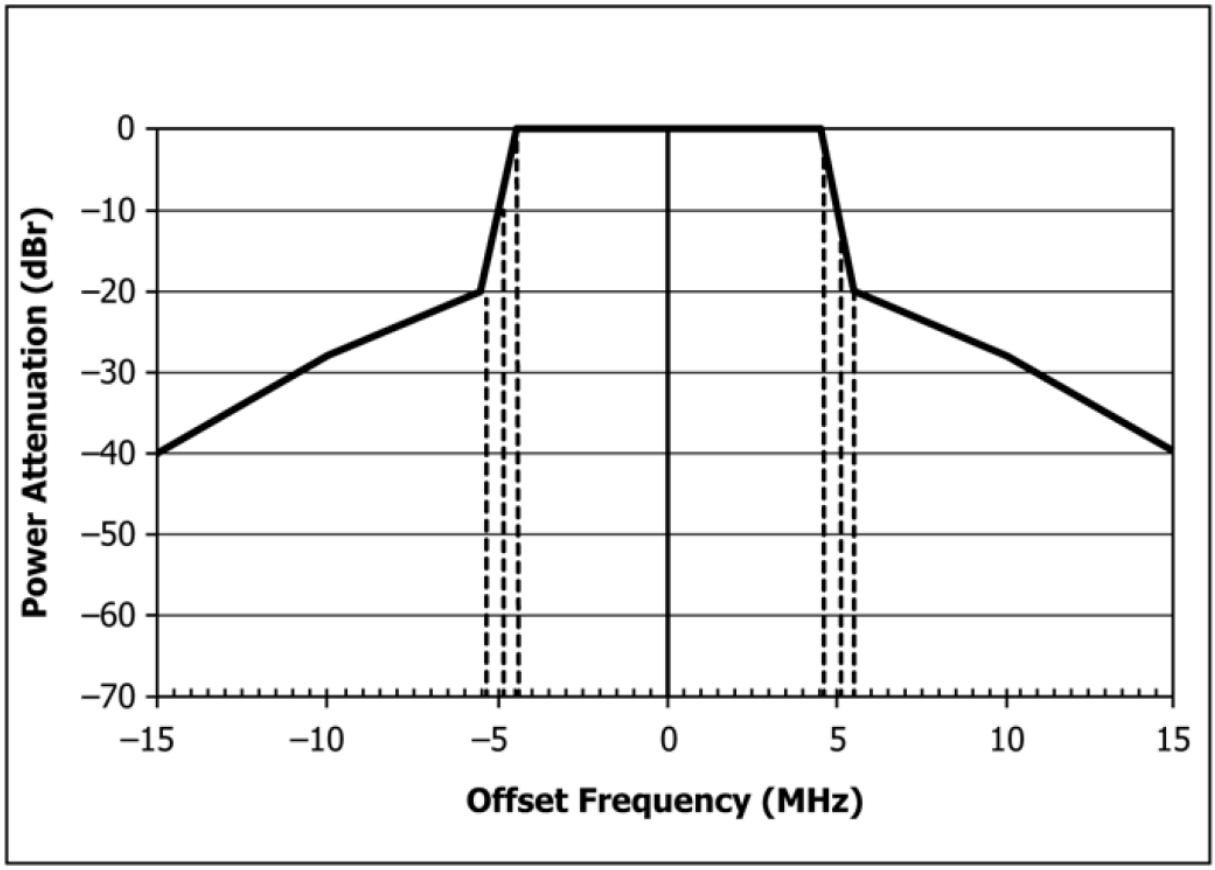


FIG: Class A Transmit Spectrum Mask

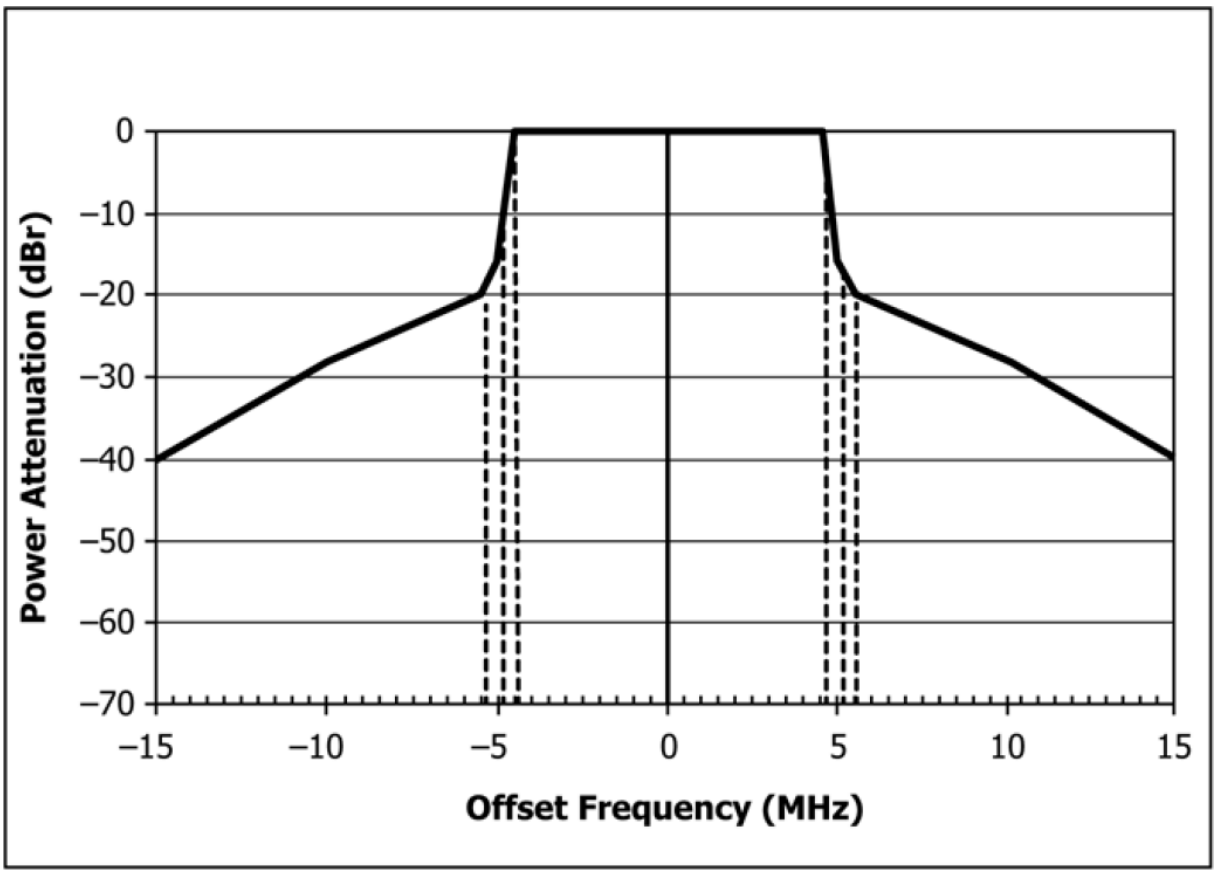


FIG: Class B Transmit Spectrum Mask

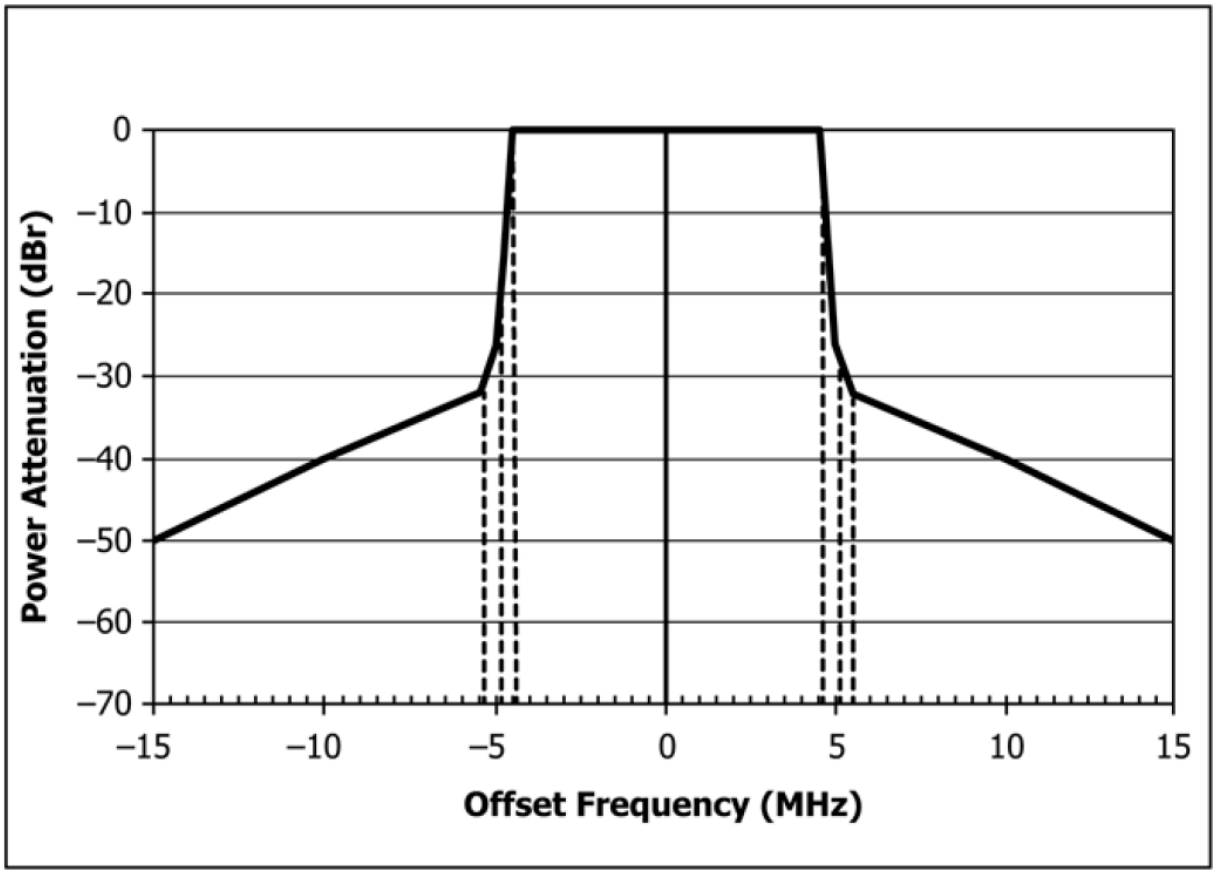


FIG: Class C Transmit Spectrum Mask

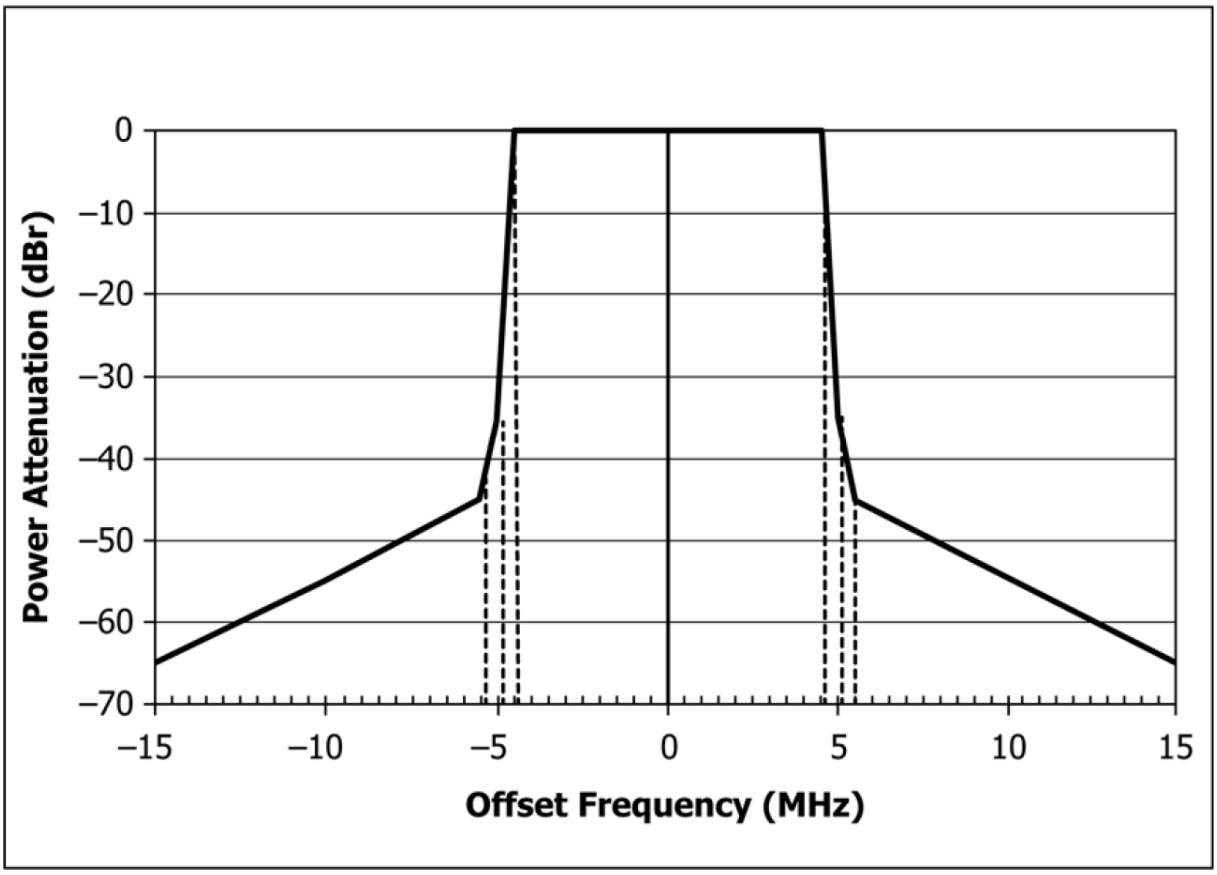


FIG: Class D Transmit Spectrum Mask

5.3.2 Test Setup

See section 4.4.1 for test setup description for the antenna port. The photo of test setup please refer to ANNEX B.

5.3.3 Test Procedure

Use the following spectrum analyzer settings:

Span = wide enough to capture all modulation products including the emission skirts (i.e., two to five times the anticipated OBW).

Set the RBW = 100 kHz.

Set the VBW = 30 kHz.

Detector = peak.

Sweep time = auto couple.

Trace mode = max hold.

Allow trace to fully stabilize.

5.3.4 Test Result

Please refer to ANNEX A.3.

5.4 Conducted Spurious Emission

5.4.1 Limit

FCC §2.1051 & 90.379

The DSRC transmitted spectrum mask is relative to the device class of operation. The power in the transmitted spectrum for all DSRC devices shall be −25 dBm or less within 100 kHz outside all channel and band edges. This will be accomplished by attenuating the transmitted signal 100 kHz outside the channel and band edges by 55 + 10log(P) dB, where P is the total transmitted power in watts.

5.4.2 Test Setup

See section 4.4.1 for test setup description for the antenna port. The photo of test setup please refer to ANNEX B.

5.4.3 Test Procedure

1. The RF output of the transmitter was connected to the input of the spectrum analyzer through sufficient attenuation.
2. Use the following spectrum analyzer settings:

   Set the RBW = 100 kHz.

   Set the VBW ≥ 3 x RBW.

   Detector = peak.

   Sweep time = auto couple.

   Sweep point number = Span/RBW.

   Trace mode = max hold.

   Allow trace to fully stabilize.
3. Record the frequencies and levels of spurious emissions.

5.4.4 Test Result

Please refer to ANNEX A.4.

5.5 Radiated Spurious Emission

5.5.1 Limit

FCC §2.1053 & 90.379
The DSRC transmitted spectrum mask is relative to the device class of operation. The power in the transmitted spectrum for all DSRC devices shall be −25 dBm or less within 100 kHz outside all channel and band edges. This will be accomplished by attenuating the transmitted signal 100 kHz outside the channel and band edges by 55 + 10log(P) dB, where P is the total transmitted power in watts.

5.5.2 Test Setup

See section 4.4.3 to 4.4.4 for test setup description. The photo of test setup please refer to ANNEX B.

5.5.3 Test Procedure

The measurement frequency range is from 30 MHz to the 10th harmonic of the fundamental frequency. The Turn Table is actuated to turn from 0° to 360°, and both horizontal and vertical polarizations of the Test Antenna are used to find the maximum radiated power. Mid channels on all channel bandwidth verified. Only the worst RB size/offset presented.

The power of the EUT transmitting frequency should be ignored.

All Spurious Emission tests were performed in X, Y, Z axis direction. And only the worst axis test condition was recorded in this test report.

Use the following spectrum analyzer settings:

Span = wide enough to fully capture the emission being measured
RBW = 1 MHz for f ≥ 1 GHz, 100 kHz for f < 1 GHz
VBW ≥ RBW
Sweep = auto
Detector function = peak
Trace = max hold
For measurement below 1GHz, If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported, Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.

5.5.4 Test Result

Please refer to ANNEX A.5.

5.6 Frequency Stability

5.6.1 Limit

FCC §2.1055 & 90.213

FCC § 2.1055

The frequency stability shall be measured with variation of ambient temperature as follows:

(1) The temperature is varied from -30°C to +50°C.

(2) Frequency measurements shall be made at the extremes of the specified temperature range and at intervals of not more than 10°C through the range.

The frequency stability shall be measured with variation of primary supply voltage as follows:

(1) Vary primary supply voltage from 85 to 115 percent of the nominal value for other than carried battery equipment.

(2) For hand carried, battery powered equipment, reduce primary supply voltage to the battery operating and point which shall be specified by the manufacture.

(3) The supply voltage shall be measured at the input to the cable normally provided with the equipment, or at the power supply terminals if cables are not normally provided.

FCC §90.213

Transmit Center Frequency Tolerance—The transmitted center frequency tolerance shall be ±10 ppm maximum for RSUs and ±10 ppm maximum for OBUs. The transmit center frequency and the symbol clock frequency shall be derived from the same reference oscillator.

5.6.2 Test Setup

The section 4.4.2 (Diagram 2) test setup description was used for this test. The photo of test setup please refer to ANNEX B.

5.6.3 Test Procedure

1. The test is performed in a Temperature Chamber.
2. The EUT is configured as MS + DC Power Supply.

5.6.4 Test Result

Please refer to ANNEX A.6.

ANNEX A TEST RESULT

A.1 RF Power Output

A.1.1 Peak Transmit Power

Test Data

Module 1

Test Mode:		BPSK						
Channel	Frequency (MHz)	Conducted output power CH0 (dBm)	Conducted output power CH1 (dBm)	Total conducted output power (dBm)	Antenna gain (dBi)	Conducted output power Limit (dBm)	E.I.R.P (dBm)	E.I.R.P Limit (dBm)
172	5860	26.98	-13.63	26.98	5	28.8	31.98	33
178	5890	26.97	-13.26	26.97	5	28.8	31.97	33
180	5900	17.24	-3.20	17.28	5	20	22.24	23
182	5910	17.27	-3.33	17.31	5	20	22.27	23
184	5920	27.06	-13.02	27.06	5	28.8	32.06	33

Test Mode:		64QAM						
Channel	Frequency (MHz)	Conducted output power CH0 (dBm)	Conducted output powerCH1 (dBm)	Total conducted output power (dBm)	Antenna gain (dBi)	Conducted output power Limit (dBm)	E.I.R.P (dBm)	E.I.R.P Limit (dBm)
172	5860	27.03	-13.85	27.03	5	28.8	32.03	33
178	5890	27.10	-13.36	27.10	5	28.8	32.10	33
180	5900	17.14	-3.29	17.18	5	20	22.18	23
182	5910	17.01	-3.26	17.05	5	20	22.05	23
184	5920	26.73	-13.12	26.73	5	28.8	31.73	33

Module 2

Test Mode:		BPSK						
Channel	Frequency (MHz)	Conducted output power CH2 (dBm)	Conducted output power CH3 (dBm)	Total conducted output power (dBm)	Antenna gain (dBi)	Conducted output power Limit (dBm)	E.I.R.P (dBm)	E.I.R.P Limit (dBm)
172	5860	27.16	-13.26	27.16	5	28.8	32.16	33
178	5890	27.00	-13.22	27.00	5	28.8	32.00	33
180	5900	17.06	-3.56	17.10	5	20	22.06	23
182	5910	17.58	-3.69	17.61	5	20	22.58	23
184	5920	26.91	-14.25	26.91	5	28.8	31.91	33

Test Mode:		64QAM						
Channel	Frequency (MHz)	Conducted output power CH2 (dBm)	Conducted output power CH3 (dBm)	Total conducted output power (dBm)	Antenna gain (dBi)	Conducted output power Limit (dBm)	E.I.R.P (dBm)	E.I.R.P Limit (dBm)
172	5860	27.07	-13.85	27.07	5	28.8	32.07	33
178	5890	27.00	-13.36	27.00	5	28.8	32.00	33
180	5900	17.04	-3.29	17.08	5	20	22.04	23
182	5910	17.06	-3.26	17.10	5	20	22.06	23
184	5920	27.72	-13.12	27.72	5	28.8	32.72	33

A.2 Power Spectral Density

Test Data

Module 1

Test Mode:		64QAM					
Channel	Center Frequency (MHz)	Bandwidth (MHz)	Power Spectral Density CH0 (dBm/MHz)	Power Spectral Density CH1 (dBm/MHz)	Total Power Spectral Density (dBm/MHz)	Limit (dBm/MHz)	Verdict
172	5860	10	-13.890	19.100	19.102	N/A	Only reported
178	5890	10	-15.570	19.280	19.281	N/A	
184	5920	10	-15.040	18.490	18.492	N/A	

Module 2

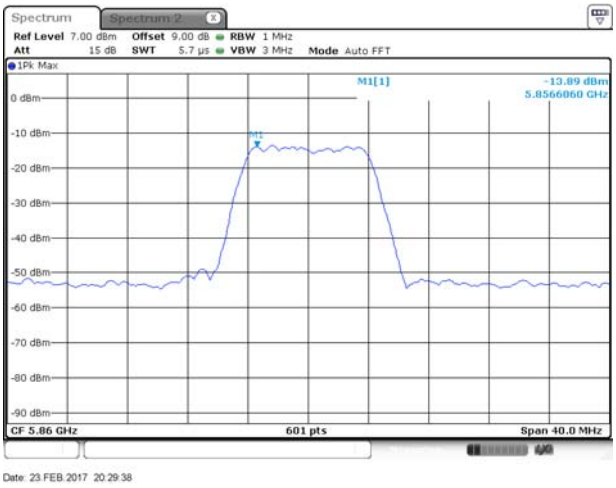
Test Mode:		64QAM					
Channel	Center Frequency (MHz)	Bandwidth (MHz)	Power Spectral Density CH2 (dBm/MHz)	Power Spectral Density CH3 (dBm/MHz)	Total Power Spectral Density (dBm/MHz)	Limit (dBm/MHz)	Verdict
172	5860	10	-12.080	18.740	18.744	N/A	Only reported
178	5890	10	-12.790	18.370	18.373	N/A	
184	5920	10	-13.110	19.170	19.173	N/A	

Test plots

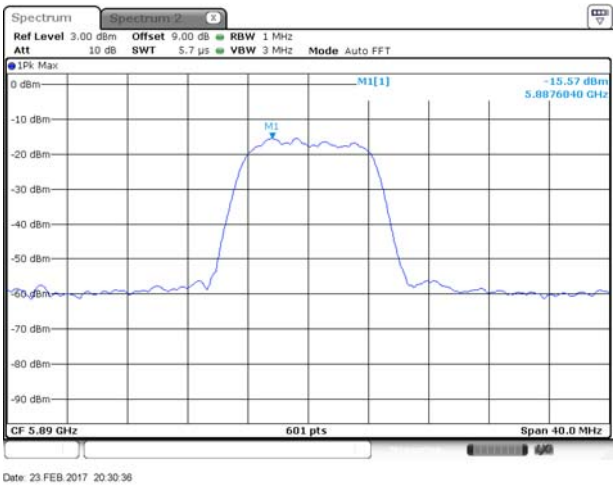
Module 1

CH0

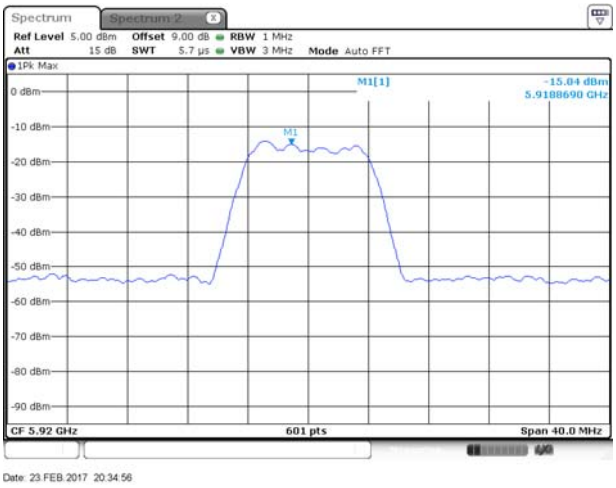
64-QAM: LOW CHANNEL



64-QAM: MIDDLE CHANNEL



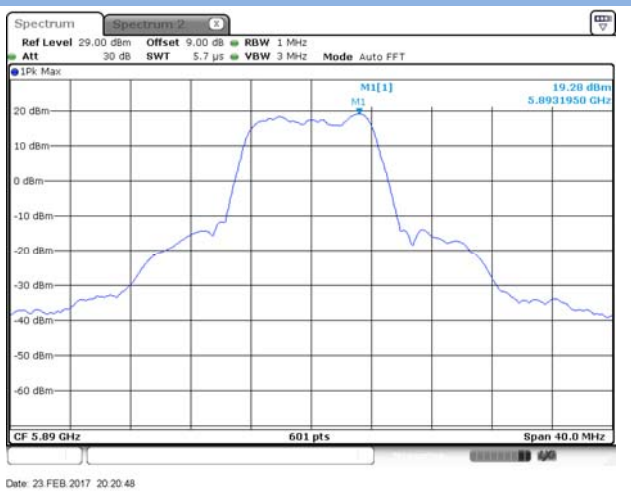
64-QAM: HIGH CHANNEL



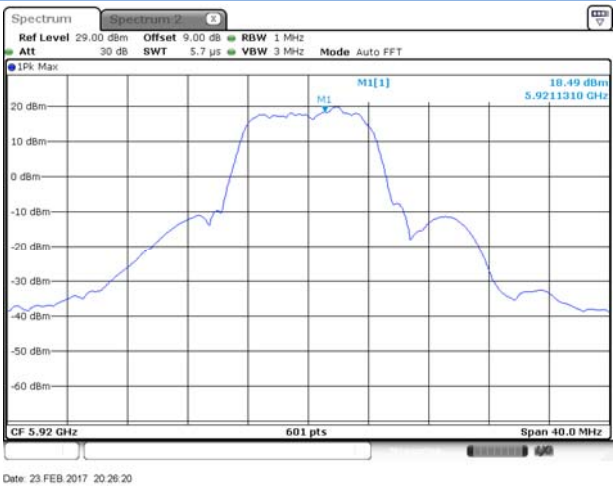
CH1

64-QAM: LOW CHANNEL

64-QAM: MIDDLE CHANNEL



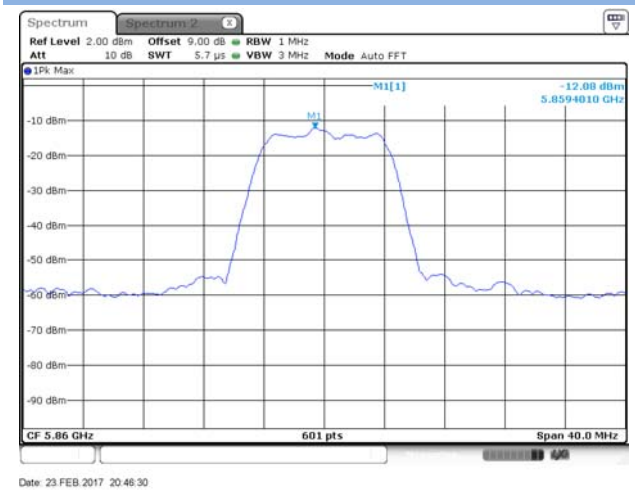
64-QAM: HIGH CHANNEL



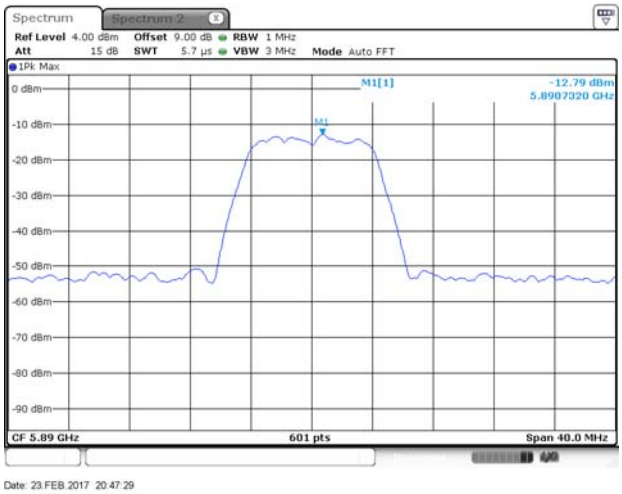
Module 2

CH2

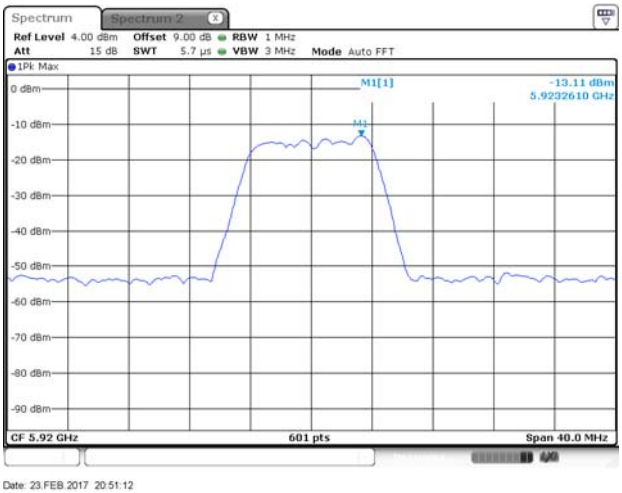
64-QAM: LOW CHANNEL



64-QAM: MIDDLE CHANNEL

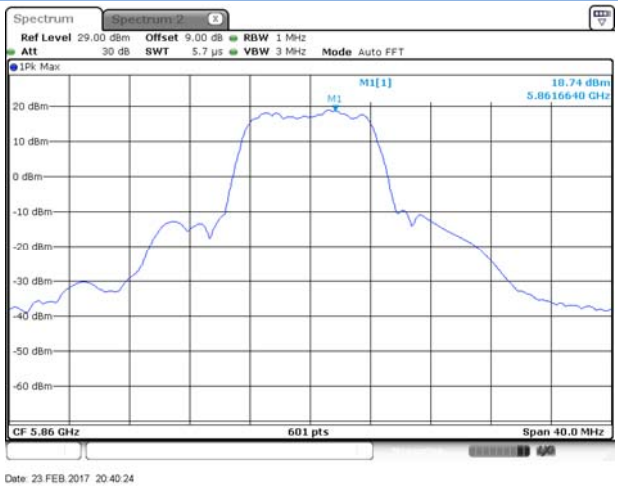


64-QAM: HIGH CHANNEL

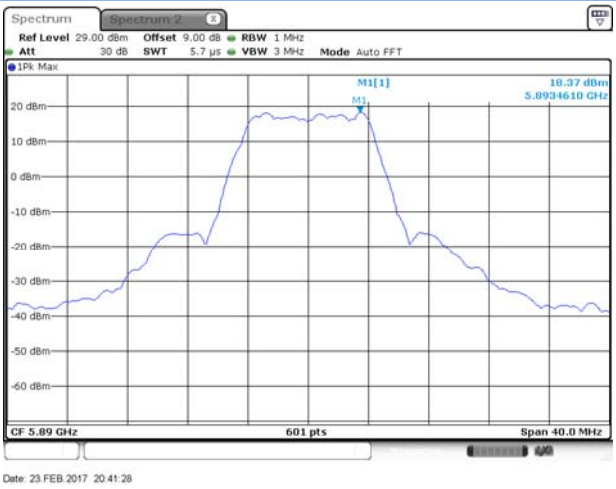


CH3

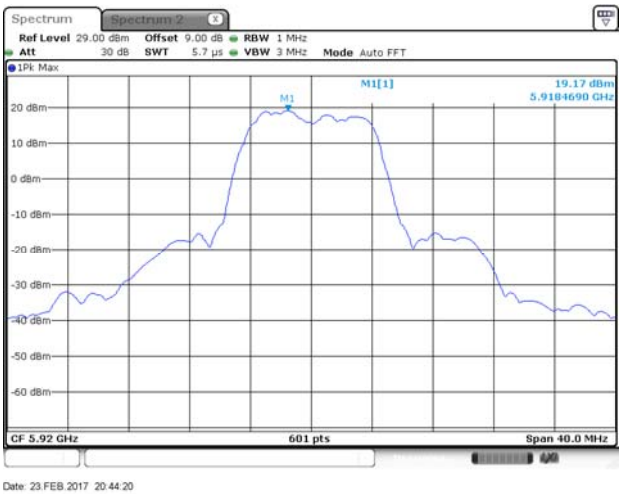
64-QAM: LOW CHANNEL



64-QAM: MIDDLE CHANNEL



64-QAM: HIGH CHANNEL



A.3 Occupied Bandwidth

Test Data

Module 1

CH0

Test Mode:	64-QAM		
Channel	99% Bandwidth (MHz)	Bandwidth Limits (MHz)	Verdict
Low Channel	8.3936	N/A	Only reported
Middle Channel	8.3936	N/A	Only reported
High Channel	8.3936	N/A	Only reported

CH1

Test Mode:	64-QAM		
Channel	99% Bandwidth (MHz)	Bandwidth Limits (MHz)	Verdict
Low Channel	8.5022	N/A	Only reported
Middle Channel	8.4298	N/A	Only reported
High Channel	8.3575	N/A	Only reported

Module 2

CH2

Test Mode:	64-QAM		
Channel	99% Bandwidth (MHz)	Bandwidth Limits (MHz)	Verdict
Low Channel	8.4232	N/A	Only reported
Middle Channel	8.3755	N/A	Only reported
High Channel	8.3201	N/A	Only reported

CH3

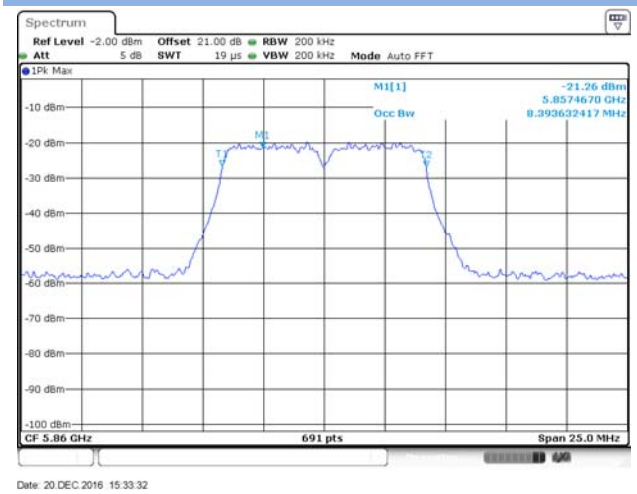
Test Mode:	64-QAM		
Channel	99% Bandwidth (MHz)	Bandwidth Limits (MHz)	Verdict
Low Channel	8.3936	N/A	Only reported
Middle Channel	8.4298	N/A	Only reported
High Channel	8.3936	N/A	Only reported

Test plots

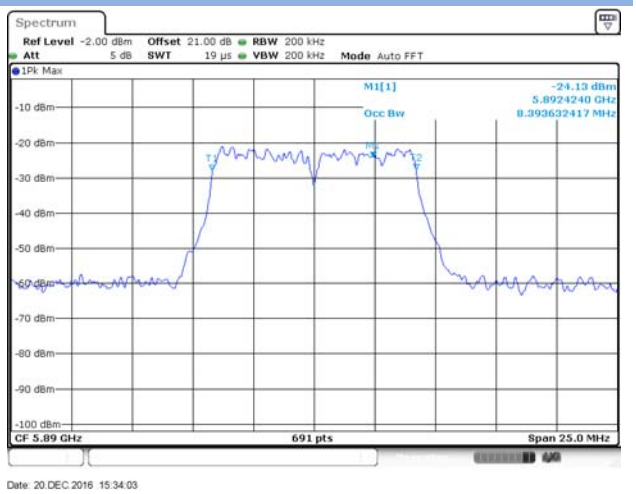
Module 1

CH0

64-QAM: LOW CHANNEL



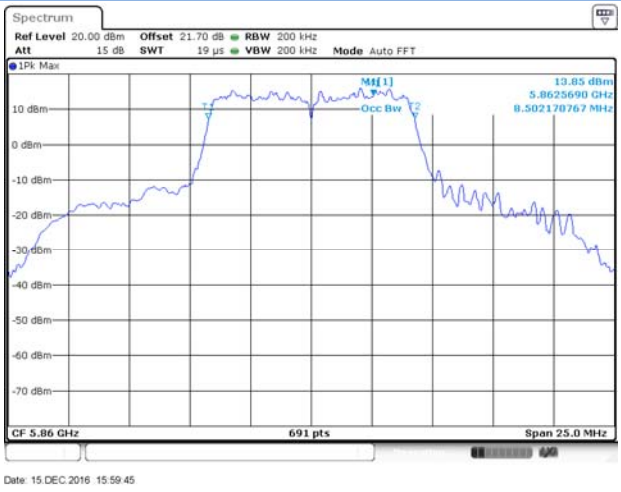
64-QAM: MIDDLE CHANNEL



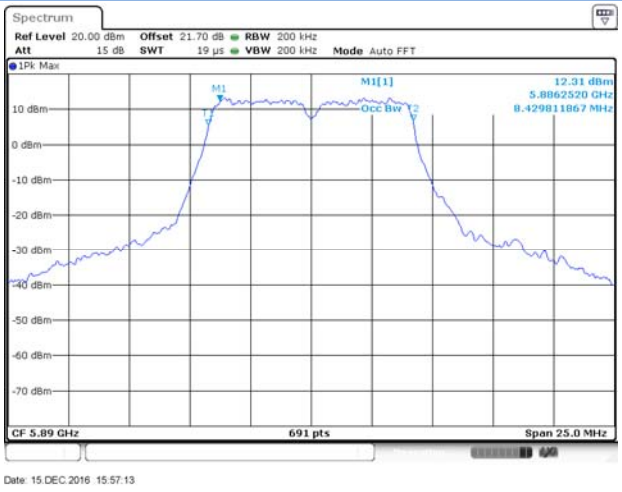
64-QAM: HIGH CHANNEL

CH1

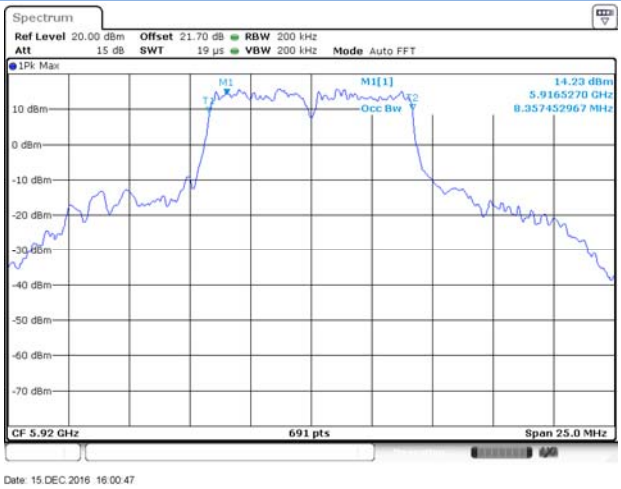
64-QAM: LOW CHANNEL



64-QAM: MIDDLE CHANNEL



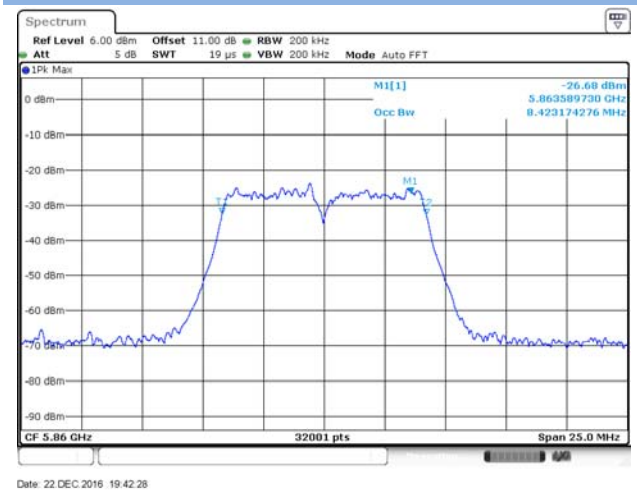
64-QAM: HIGH CHANNEL



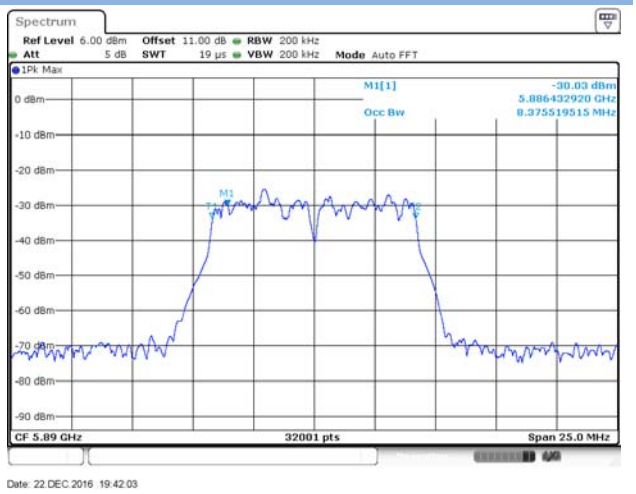
Module 2

CH2

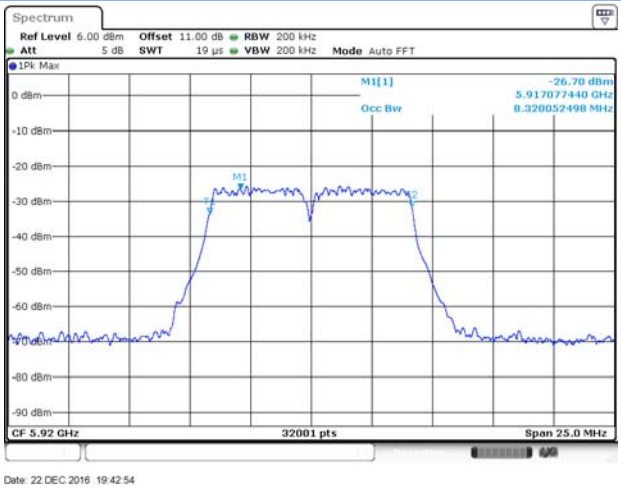
64-QAM: LOW CHANNEL



64-QAM: MIDDLE CHANNEL

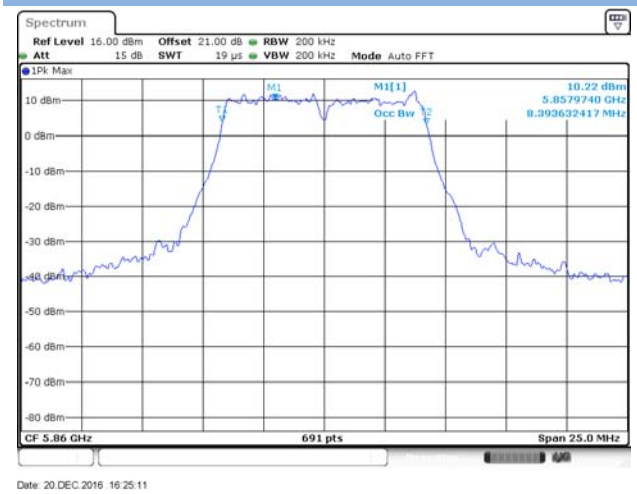


64-QAM: HIGH CHANNEL



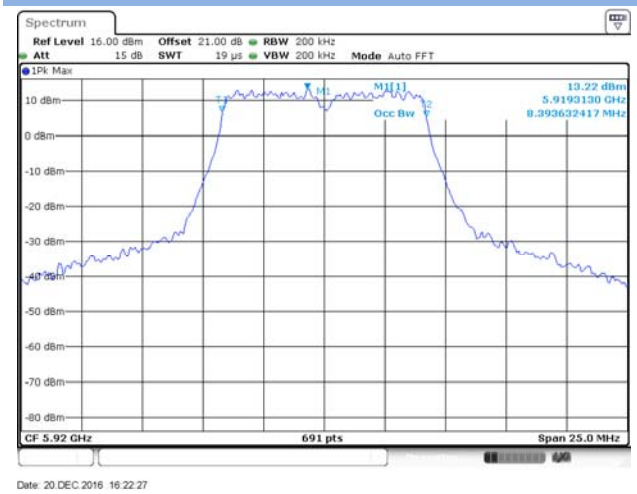
CH3

64-QAM: LOW CHANNEL



64-QAM: MIDDLE CHANNEL

64-QAM: HIGH CHANNEL



A.3 Emission Mask

Test Data

Module 1

CH0

Test Mode:	64-QAM		
Channel	RSU Class	Result	Verdict
Low Channel	C	Refer to the test plots	Pass
Middle Channel			Pass
High Channel			Pass

CH1

Test Mode:	64-QAM		
Channel	RSU Class	Result	Verdict
Low Channel	C	Refer to the test plots	Pass
Middle Channel			Pass
High Channel			Pass

Module 2

CH2

Test Mode:	64-QAM		
Channel	RSU Class	Result	Verdict
Low Channel	C	Refer to the test plots	Pass
Middle Channel			Pass
High Channel			Pass

CH3

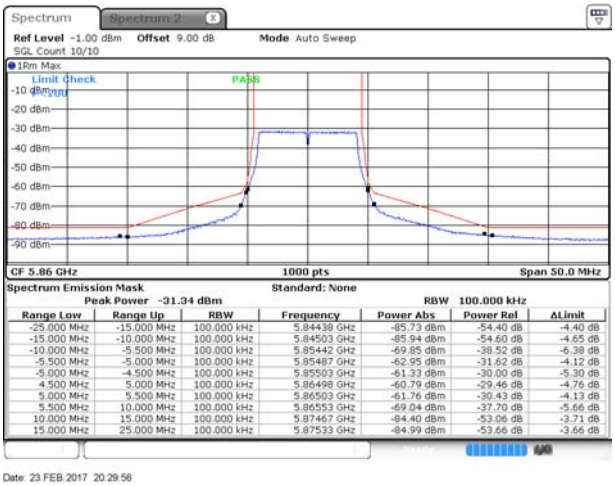
Test Mode:	64-QAM		
Channel	RSU Class	Result	Verdict
Low Channel	C	Refer to the test plots	Pass
Middle Channel			Pass
High Channel			Pass

Test Plots

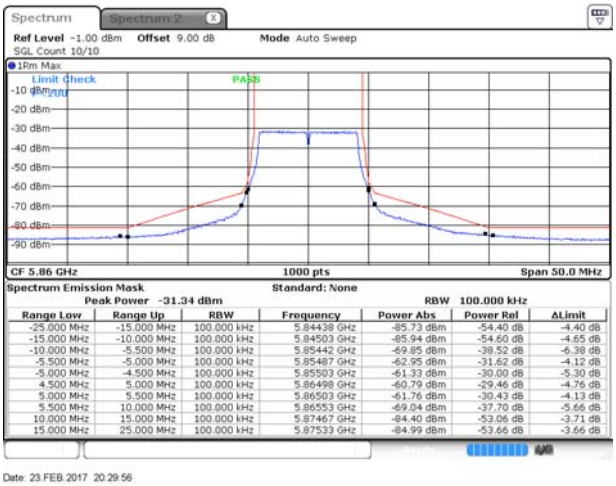
Module 1

CH0

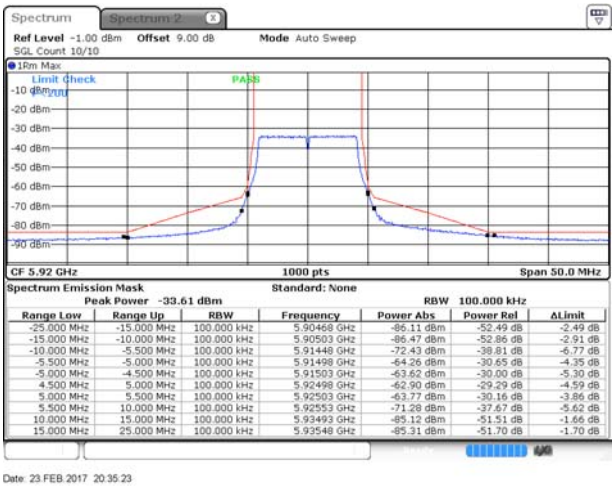
64-QAM: LOW CHANNEL



64-QAM: MIDDLE CHANNEL

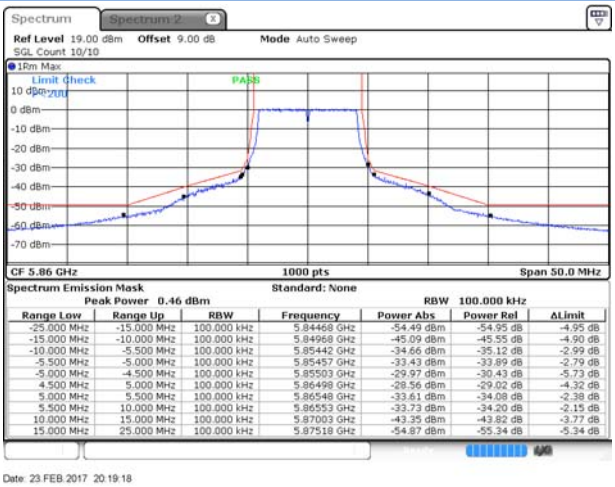


64-QAM: HIGH CHANNEL

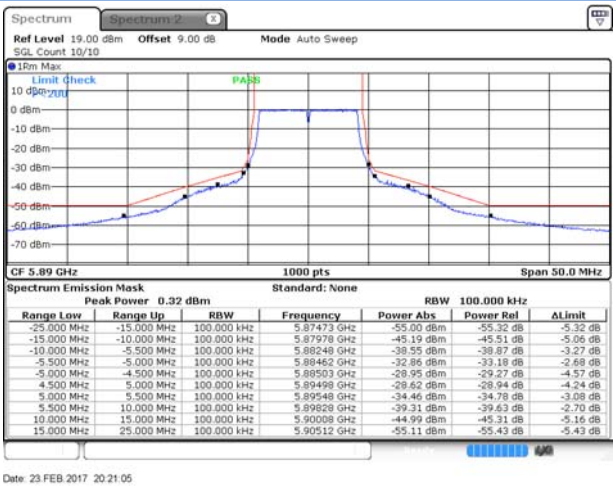


CH1

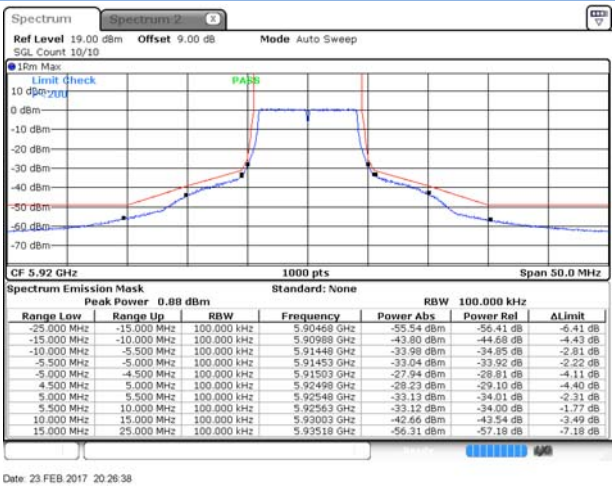
64-QAM: LOW CHANNEL



64-QAM: MIDDLE CHANNEL



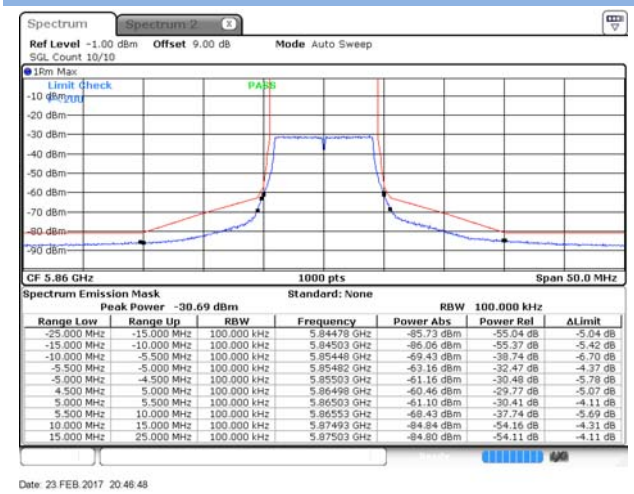
64-QAM: HIGH CHANNEL



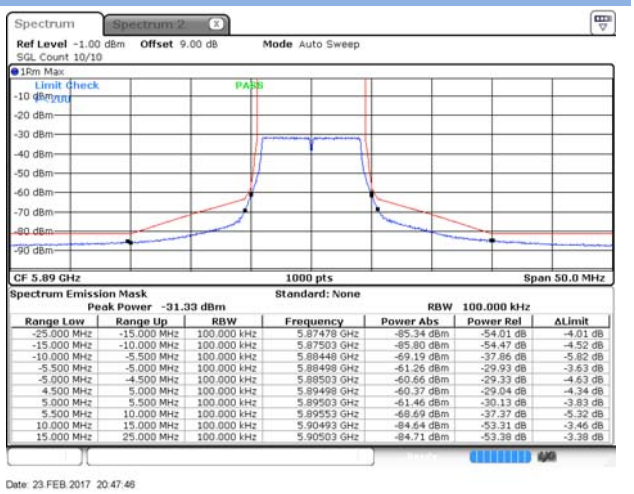
Module 2

CH2

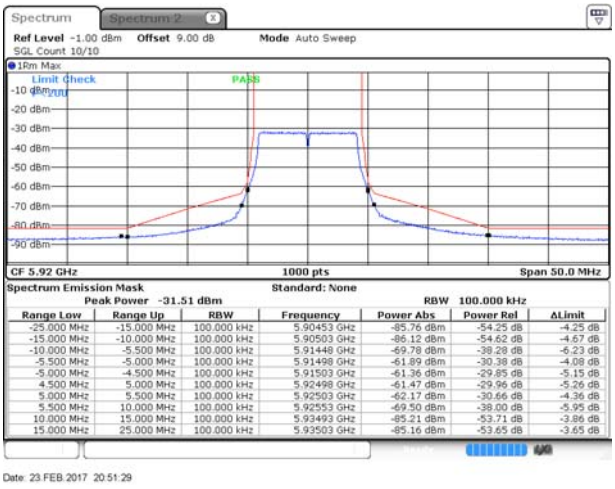
64-QAM: LOW CHANNEL



64-QAM: MIDDLE CHANNEL

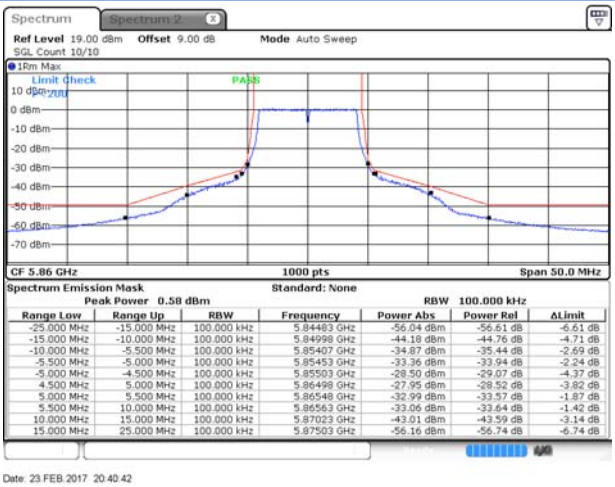


64-QAM: HIGH CHANNEL

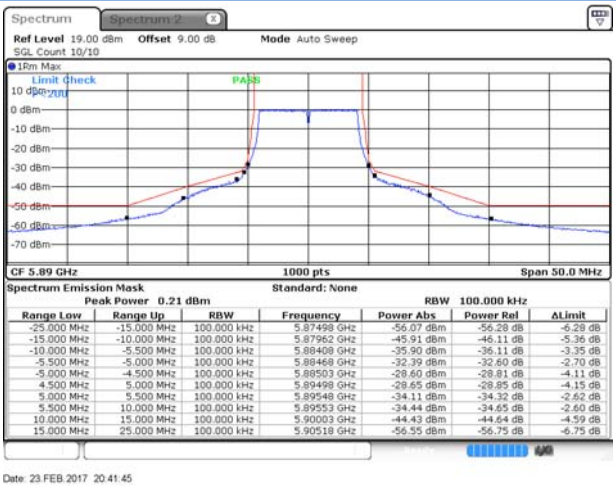


CH3

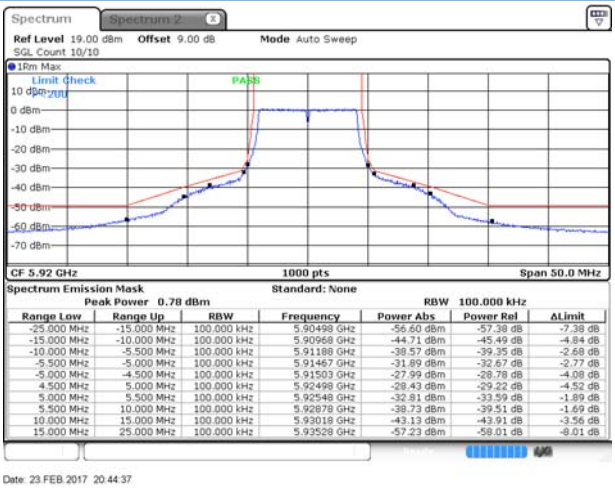
64-QAM: LOW CHANNEL



64-QAM: MIDDLE CHANNEL



64-QAM: HIGH CHANNEL



A.4 Conducted Spurious Emissions

Test Data

Module 1

CH0

Test Mode:	64-QAM		
Channel	Measured Max. Out of Band Emission (dBm)	Limit (dBm)	Verdict
Low	-52.06	-25	Pass
Middle	-50.24	-25	Pass
High	-53.02	-25	Pass

CH1

Test Mode:	64-QAM		
Channel	Measured Max. Out of Band Emission (dBm)	Limit (dBm)	Verdict
Low	-50.78	-25	Pass
Middle	-51.56	-25	Pass
High	-51.96	-25	Pass

Module 2

CH2

Test Mode:	64-QAM		
Channel	Measured Max. Out of Band Emission (dBm)	Limit (dBm)	Verdict
Low	-55.24	-25	Pass
Middle	-47.62	-25	Pass
High	-58.38	-25	Pass

CH3

Test Mode:	64-QAM		
Channel	Measured Max. Out of Band Emission (dBm)	Limit (dBm)	Verdict
Low	-58.56	-25	Pass
Middle	-57.67	-25	Pass
High	-58.94	-25	Pass

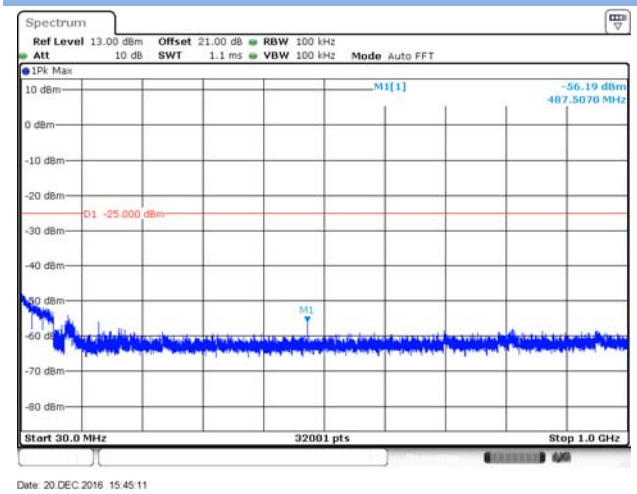
Note: The frequency, which started from 30 GHz to 40 GHz, was pre-scanned and the result which was 20 dB lower than the limit line per FCC part 2.1051 was not reported.

Test Plots(64-QAM)

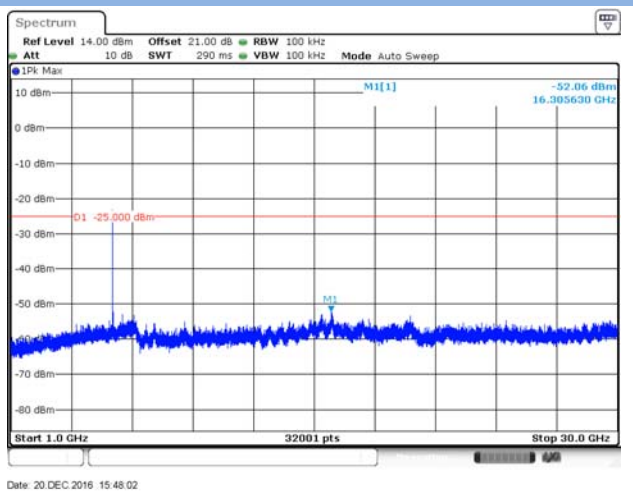
Module 1

CH0

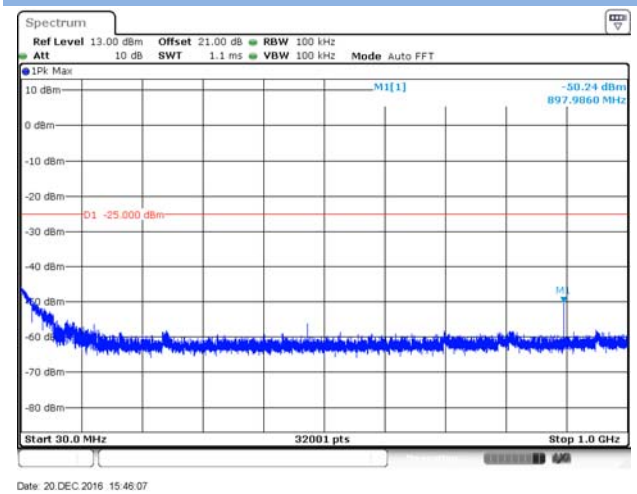
LOW CHANNEL , SPURIOUS 30 MHz ~ 1 GHz



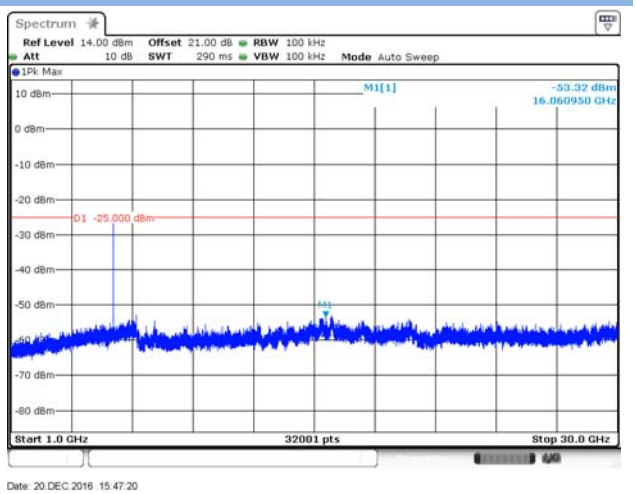
LOW CHANNEL , SPURIOUS 1 GHz ~ 30 GHz



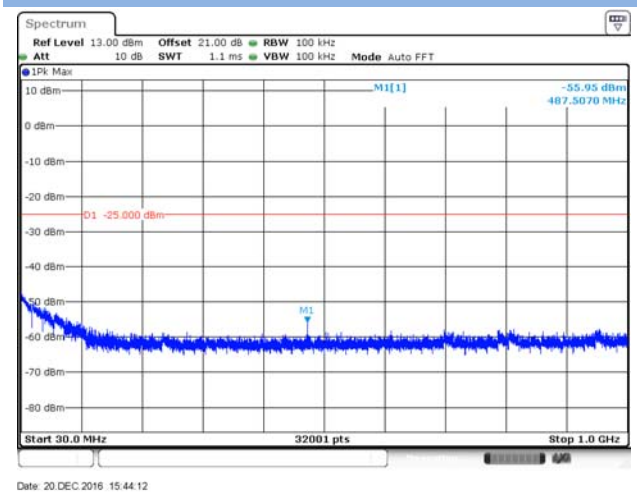
MIDDLE CHANNEL , SPURIOUS 30 MHz ~ 1 GHz



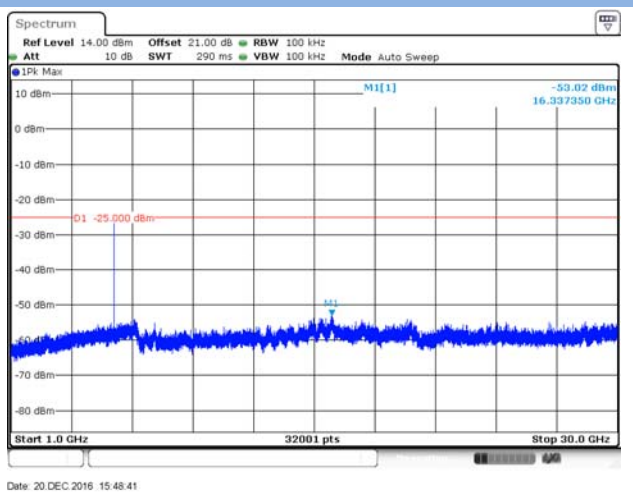
MIDDLE CHANNEL , SPURIOUS 1 GHz ~ 30 GHz



HIGH CHANNEL , SPURIOUS 30 MHz ~ 1 GHz

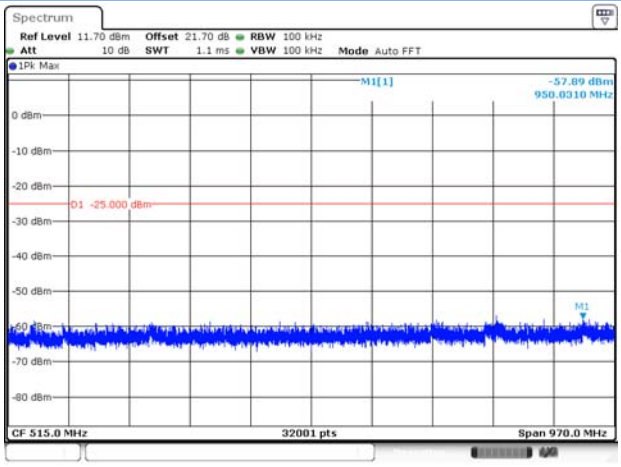


HIGH CHANNEL , SPURIOUS 1 GHz ~ 30 GHz

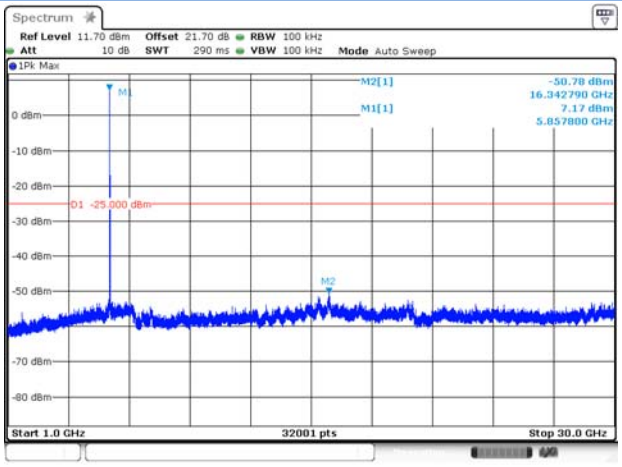


CH1

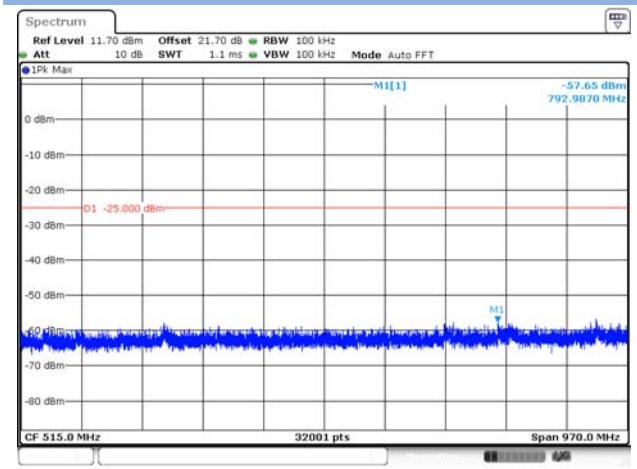
LOW CHANNEL , SPURIOUS 30 MHz ~ 1 GHz



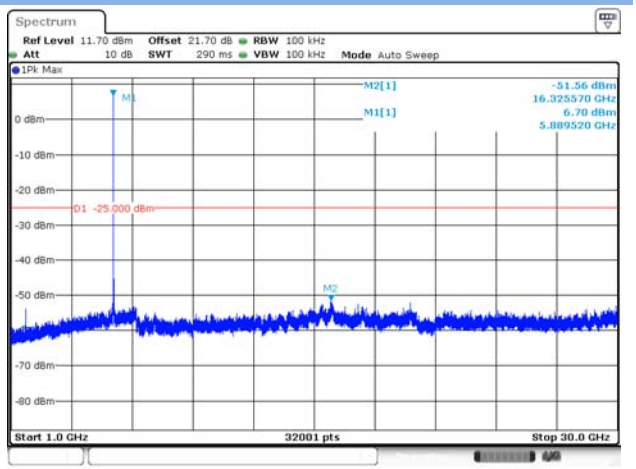
LOW CHANNEL , SPURIOUS 1 GHz ~ 30 GHz



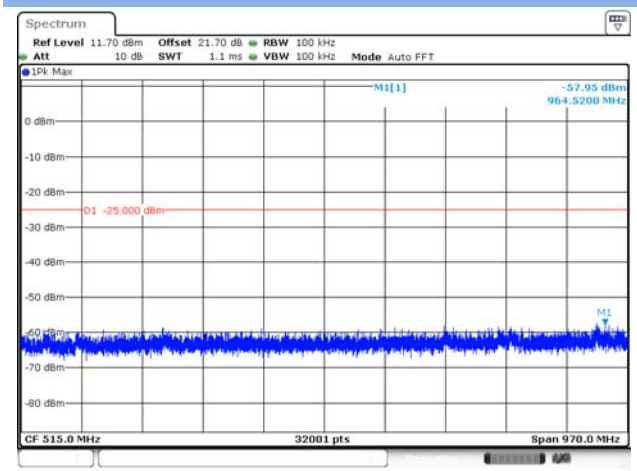
MIDDLE CHANNEL , SPURIOUS 30 MHz ~ 1 GHz



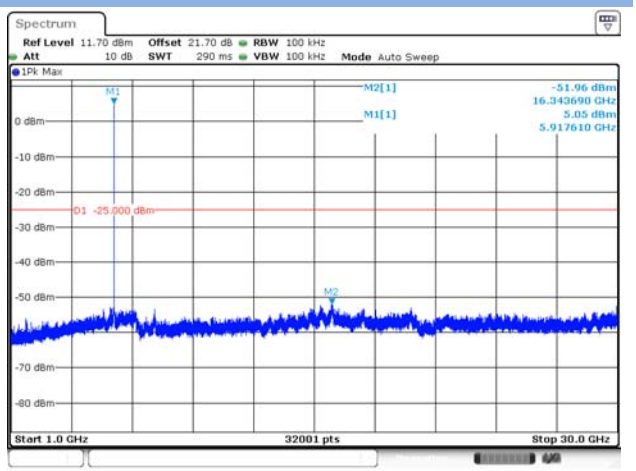
MIDDLE CHANNEL , SPURIOUS 1 GHz ~ 30 GHz



HIGH CHANNEL , SPURIOUS 30 MHz ~ 1 GHz



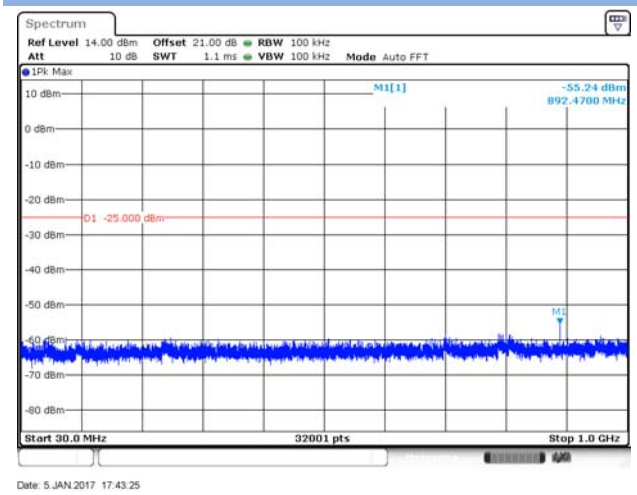
HIGH CHANNEL , SPURIOUS 1 GHz ~ 30 GHz



Module 2

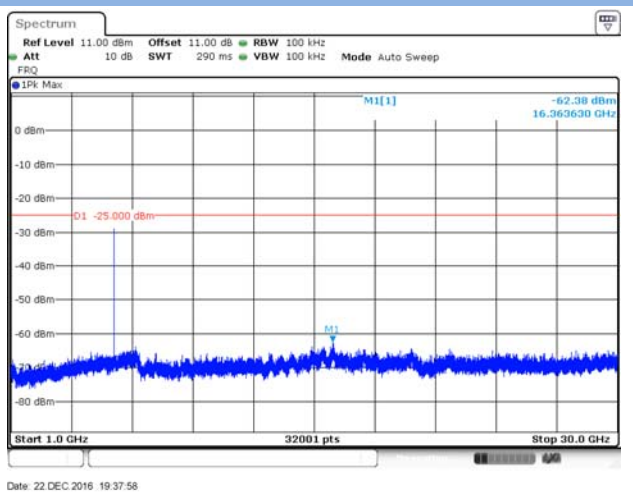
CH2

LOW CHANNEL , SPURIOUS 30 MHz ~ 1 GHz



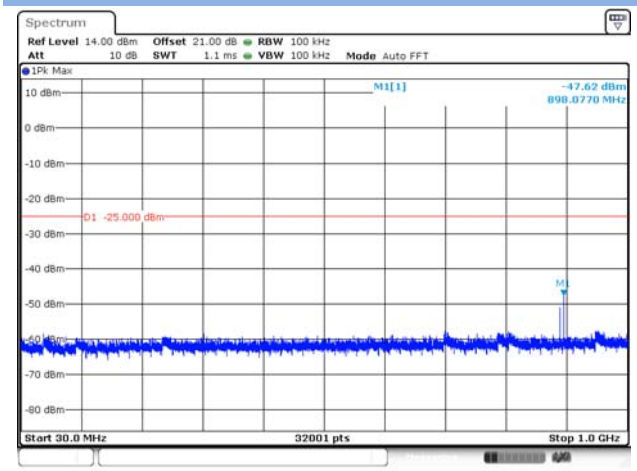
Date: 5.JAN.2017 17:43:25

LOW CHANNEL , SPURIOUS 1 GHz ~ 30 GHz



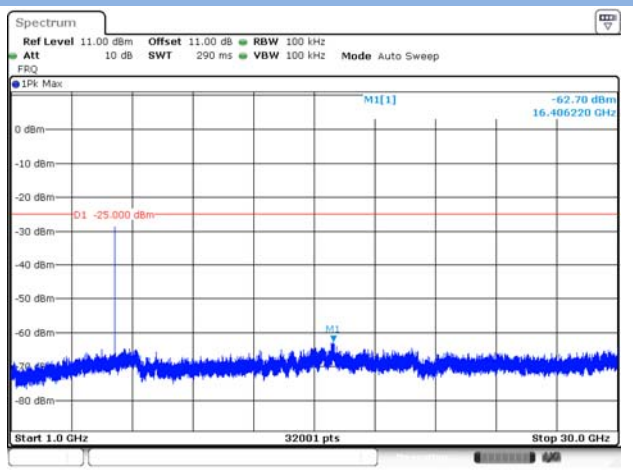
Date: 22.DEC.2016 19:37:58

MIDDLE CHANNEL , SPURIOUS 30 MHz ~ 1 GHz



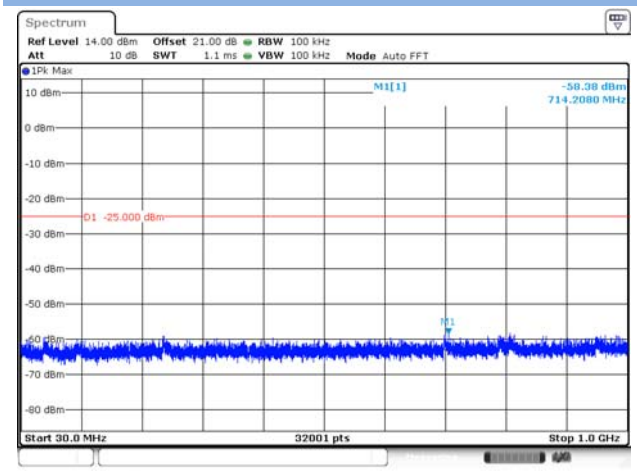
Date: 5.JAN.2017 17:44:42

MIDDLE CHANNEL , SPURIOUS 1 GHz ~ 30 GHz



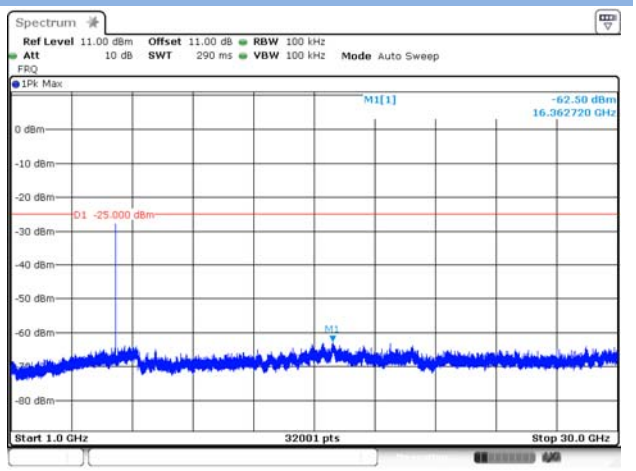
Date: 22.DEC.2016 19:37:29

HIGH CHANNEL , SPURIOUS 30 MHz ~ 1 GHz



Date: 5.JAN.2017 17:45:05

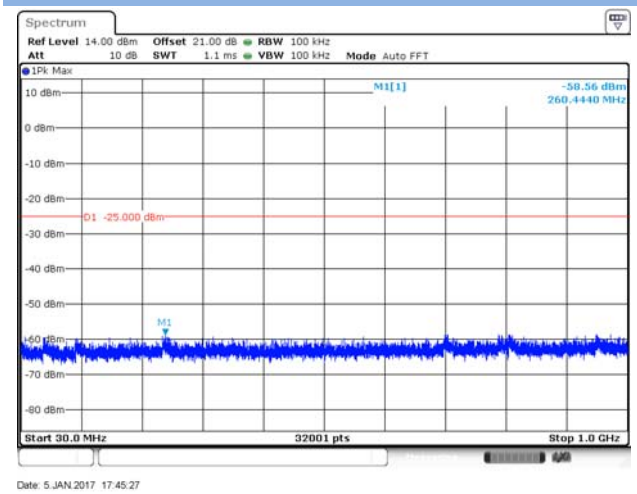
HIGH CHANNEL , SPURIOUS 1 GHz ~ 30 GHz



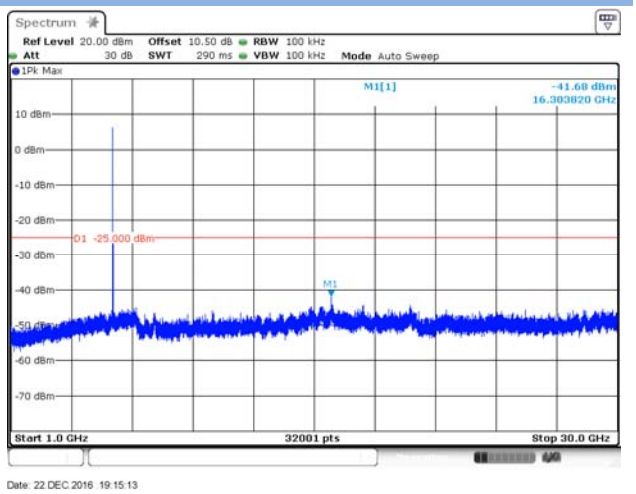
Date: 22.DEC.2016 19:37:00

CH3

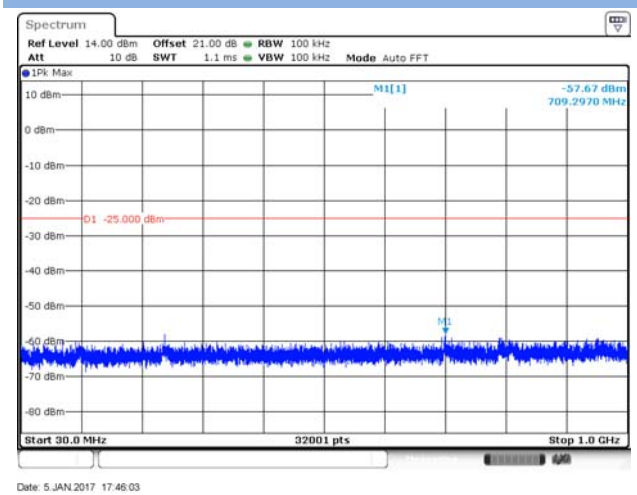
LOW CHANNEL , SPURIOUS 30 MHz ~ 1 GHz



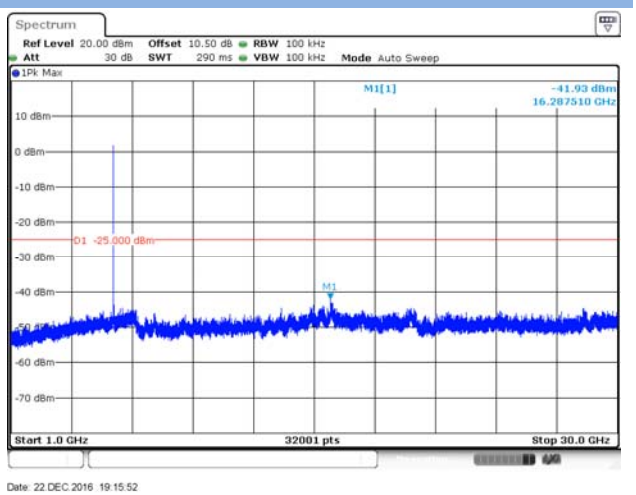
LOW CHANNEL , SPURIOUS 1 GHz ~ 30 GHz



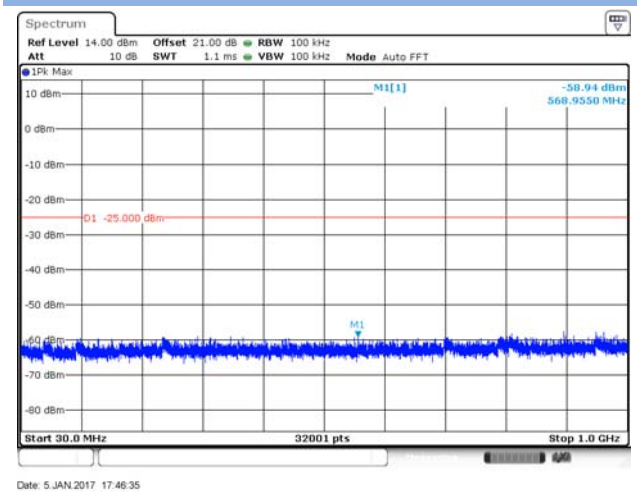
MIDDLE CHANNEL , SPURIOUS 30 MHz ~ 1 GHz



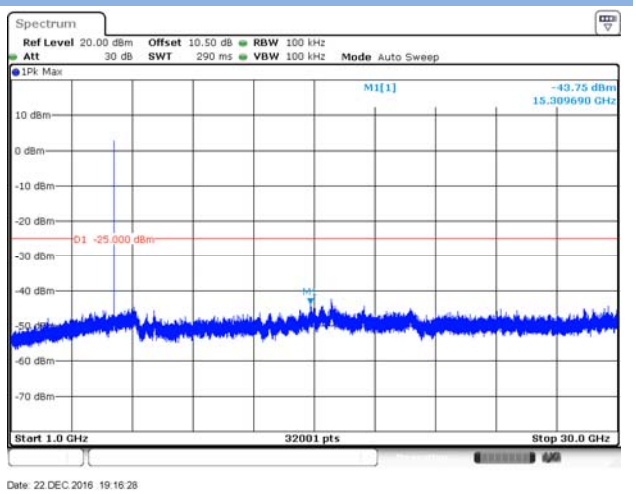
MIDDLE CHANNEL , SPURIOUS 1 GHz ~ 30 GHz



HIGH CHANNEL , SPURIOUS 30 MHz ~ 1 GHz



HIGH CHANNEL , SPURIOUS 1 GHz ~ 30 GHz



A.5 Radiated Spurious Emission

Note 1: The marked spikes near 5850 to 5925 MHz with circle should be ignored because they are Fundamental signal.
Note 2: Only the worst module was reported, the worst case is Module 1 in this report.
Note 3: Test frequency in 25 GHz ~ 40 GHz only noise floor was seen.

Test Data and Plots (Module 1) (CH0 + CH1) (64-QAM) (Antenna Type (Primary))

30 MHz to 25 GHz, Low channel ANT V

Frequency (MHz)	Result (dBm)	Factor (dB)	PK Limit (dBm)	Margin (dB)	Table (o)	ANT	EUT	Verdict
108.812	-51.53	-5.31	-25.0	26.53	121.90	Vertical	Horizontal	Pass
448.555	-46.98	3.82	-25.0	21.98	248.70	Vertical	Horizontal	Pass
1395.000	-50.50	11.17	-25.0	25.50	0.00	Vertical	Horizontal	Pass
5856.750	11.64	22.38	-25.0	-36.64	130.90	Vertical	Horizontal	N/A
11721.375	-29.80	35.51	-25.0	4.80	130.90	Vertical	Horizontal	Pass
20903.000	-31.37	33.97	-25.0	6.37	249.40	Vertical	Horizontal	Pass

30 MHz to 25 GHz, Low channel ANT H

Frequency (MHz)	Result (dBm)	Factor (dB)	PK Limit (dBm)	Margin (dB)	Table (o)	ANT	EUT	Verdict
331.427	-41.17	-1.57	-25.0	16.17	125.80	Horizontal	Horizontal	Pass
838.495	-49.75	10.09	-25.0	24.75	274.20	Horizontal	Horizontal	Pass
1744.000	-49.65	14.98	-25.0	24.65	71.90	Horizontal	Horizontal	Pass
5859.188	13.83	22.67	-25.0	-38.83	119.80	Horizontal	Horizontal	N/A
11718.938	-25.83	35.49	-25.0	0.83	111.30	Horizontal	Horizontal	Pass
14375.812	-30.35	41.84	-25.0	5.35	88.60	Horizontal	Horizontal	Pass

30 MHz to 25 GHz, Middle channel ANT V

Frequency (MHz)	Result (dBm)	Factor (dB)	PK Limit (dBm)	Margin (dB)	Table (o)	ANT	EUT	Verdict
108.812	-50.85	-5.31	-25.0	25.85	110.00	Vertical	Horizontal	Pass
448.555	-48.05	3.82	-25.0	23.05	255.60	Vertical	Horizontal	Pass
5220.562	-18.49	22.35	-25.0	-6.51	78.60	Vertical	Horizontal	N/A
5890.875	9.02	22.62	-25.0	-34.02	200.40	Vertical	Horizontal	N/A
11782.313	-33.24	36.21	-25.0	8.24	191.50	Vertical	Horizontal	Pass
24146.000	-29.44	33.66	-25.0	4.44	82.30	Vertical	Horizontal	Pass

30 MHz to 25 GHz, Middle channel ANT H

Frequency (MHz)	Result (dBm)	Factor (dB)	PK Limit (dBm)	Margin (dB)	Table (o)	ANT	EUT	Verdict
331.427	-40.71	-1.57	-25.0	15.71	131.10	Horizontal	Horizontal	Pass
448.555	-44.32	3.82	-25.0	19.32	119.40	Horizontal	Horizontal	Pass
838.495	-51.12	10.09	-25.0	26.12	278.80	Horizontal	Horizontal	Pass
5886.000	13.75	22.77	-25.0	-38.75	131.10	Horizontal	Horizontal	N/A
11777.438	-33.46	36.15	-25.0	8.46	126.80	Horizontal	Horizontal	Pass
25106.000	-29.07	33.57	-25.0	4.07	32.30	Horizontal	Horizontal	Pass

30 MHz to 25 GHz, High channel ANT V

Frequency (MHz)	Result (dBm)	Factor (dB)	PK Limit (dBm)	Margin (dB)	Table (o)	ANT	EUT	Verdict
108.812	-51.80	-5.31	-25.0	26.80	65.30	Vertical	Horizontal	Pass
448.555	-48.75	3.82	-25.0	23.75	256.10	Vertical	Horizontal	Pass
1752.000	-51.33	15.03	-25.0	26.33	39.30	Vertical	Horizontal	Pass
5917.687	10.70	22.89	-25.0	-35.70	190.80	Vertical	Horizontal	N/A
11840.812	-27.04	36.37	-25.0	2.04	190.80	Vertical	Horizontal	Pass
24479.001	-29.28	33.63	-25.0	4.28	341.00	Vertical	Horizontal	Pass

30 MHz to 25 GHz, High channel ANT H

Frequency (MHz)	Result (dBm)	Factor (dB)	PK Limit (dBm)	Margin (dB)	Table (o)	ANT	EUT	Verdict
108.812	-50.87	-5.31	-25.0	25.87	211.60	Horizontal	Horizontal	Pass
331.427	-41.75	-1.57	-25.0	16.75	119.20	Horizontal	Horizontal	Pass
448.555	-46.28	3.82	-25.0	21.28	113.10	Horizontal	Horizontal	Pass
5920.125	12.49	22.89	-25.0	-37.49	120.80	Horizontal	Horizontal	N/A
11845.687	-33.00	36.39	-25.0	8.00	125.10	Horizontal	Horizontal	Pass
20916.500	-31.62	33.96	-25.0	6.62	9.40	Horizontal	Horizontal	Pass

Test Data and Plots (Module 1) (CH0 + CH1) (64-QAM) (Antenna Type(Second))

30 MHz to 25 GHz, Low channel ANT V

Frequency (MHz)	Result (dBm)	Factor (dB)	PK Limit (dBm)	Margin (dB)	Table (o)	ANT	EUT	Verdict
249.947	-47.85	0.84	-25.0	22.85	114.40	Vertical	Horizontal	Pass
448.555	-48.63	3.82	-25.0	23.63	0.00	Vertical	Horizontal	Pass
1994.500	-43.14	10.22	-25.0	18.14	167.70	Vertical	Horizontal	Pass
5861.625	11.31	22.72	-25.0	-36.31	359.90	Vertical	Horizontal	N/A
11718.938	-26.84	35.49	-25.0	1.84	316.20	Vertical	Horizontal	Pass
24363.500	-29.23	33.64	-25.0	4.23	30.60	Vertical	Horizontal	Pass

30 MHz to 25 GHz, Low channel ANT H

Frequency (MHz)	Result (dBm)	Factor (dB)	PK Limit (dBm)	Margin (dB)	Table (o)	ANT	EUT	Verdict
487.598	-43.65	-0.25	-25.0	18.65	300.90	Horizontal	Horizontal	Pass
604.482	-54.53	2.36	-25.0	29.53	102.60	Horizontal	Horizontal	Pass
1189.500	-52.90	8.50	-25.0	27.90	215.20	Horizontal	Horizontal	Pass
1738.000	-50.09	15.01	-25.0	25.09	150.20	Horizontal	Horizontal	Pass
5861.625	1.36	22.72	-25.0	-26.36	260.80	Horizontal	Horizontal	N/A
21223.999	-30.24	33.94	-25.0	5.24	55.40	Horizontal	Horizontal	Pass

30 MHz to 25 GHz, Middle channel ANT V

Frequency (MHz)	Result (dBm)	Factor (dB)	PK Limit (dBm)	Margin (dB)	Table (o)	ANT	EUT	Verdict
249.947	-47.49	0.84	-25.0	22.49	184.90	Vertical	Horizontal	Pass
487.598	-46.59	-0.25	-25.0	21.59	14.20	Vertical	Horizontal	Pass
1991.500	-46.68	10.21	-25.0	21.68	172.20	Vertical	Horizontal	Pass
5886.000	11.36	22.77	-25.0	-36.36	0.10	Vertical	Horizontal	N/A
11779.875	-27.06	36.18	-25.0	2.06	259.60	Vertical	Horizontal	Pass
18011.687	-24.65	45.62	-25.0	-0.35	254.10	Vertical	Horizontal	N/A

30 MHz to 25 GHz, Middle channel ANT H

Frequency (MHz)	Result (dBm)	Factor (dB)	PK Limit (dBm)	Margin (dB)	Table (o)	ANT	EUT	Verdict
487.598	-43.89	-0.25	-25.0	18.89	327.50	Horizontal	Horizontal	Pass
1746.500	-49.39	15.02	-25.0	24.39	360.00	Horizontal	Horizontal	Pass
2554.500	-49.24	13.88	-25.0	24.24	211.40	Horizontal	Horizontal	Pass
5888.437	1.44	22.84	-25.0	-26.44	263.90	Horizontal	Horizontal	N/A
10797.563	-36.45	37.57	-25.0	11.45	21.60	Horizontal	Horizontal	Pass
14370.375	-30.69	41.94	-25.0	5.69	36.00	Horizontal	Horizontal	Pass

30 MHz to 25 GHz, High channel ANT V

Frequency (MHz)	Result (dBm)	Factor (dB)	PK Limit (dBm)	Margin (dB)	Table (o)	ANT	EUT	Verdict
487.598	-47.09	-0.25	-25.0	22.09	2.90	Vertical	Horizontal	Pass
1991.000	-46.05	10.20	-25.0	21.05	176.00	Vertical	Horizontal	Pass
5917.687	11.05	22.89	-25.0	-36.05	0.30	Vertical	Horizontal	N/A
9113.250	-38.50	35.36	-25.0	13.50	306.70	Vertical	Horizontal	Pass
11840.812	-26.29	36.37	-25.0	1.29	358.20	Vertical	Horizontal	Pass
14401.188	-30.59	41.37	-25.0	5.59	5.80	Vertical	Horizontal	Pass

30 MHz to 25 GHz, High channel ANT H

Frequency (MHz)	Result (dBm)	Factor (dB)	PK Limit (dBm)	Margin (dB)	Table (o)	ANT	EUT	Verdict
487.598	-44.85	-0.25	-25.0	19.85	310.80	Horizontal	Horizontal	Pass
643.525	-54.94	6.02	-25.0	29.94	103.50	Horizontal	Horizontal	Pass
1762.500	-49.10	14.59	-25.0	24.10	0.00	Horizontal	Horizontal	Pass
2580.500	-50.02	13.81	-25.0	25.02	332.60	Horizontal	Horizontal	Pass
5922.563	1.26	23.42	-25.0	-26.26	271.20	Horizontal	Horizontal	N/A
9101.062	-38.99	35.23	-25.0	13.99	351.10	Horizontal	Horizontal	Pass

A.6 Frequency Stability

Module 1

CH0

Test Conditions		Frequency Deviation		Limit (ppm)	Verdict
Power (V)	Temperature (°C)	MCH (5890 MHz)			
		Measurement Frequency (MHz)	Max. Deviation (ppm)		
12.0	-25	5889.997730	-0.39	±10	Pass
	-10	5889.984171	-2.69	±10	
	0	5890.037023	6.29	±10	
	+10	5890.009947	1.69	±10	
	+25	5890.015935	2.71	±10	
	+30	5889.965460	-5.86	±10	
	+40	5890.020411	3.47	±10	
	+50	5890.011868	2.01	±10	
	+65	5890.038757	6.58	±10	
13.2	+25	5890.015119	2.57	±10	
10.8	+25	5890.015935	2.71	±10	

CH1

Test Conditions		Frequency Deviation		Limit (ppm)	Verdict
Power (V)	Temperature (°C)	MCH (5890 MHz)			
		Measurement Frequency (MHz)	Max. Deviation (ppm)		
12.0	-25	5890.046074	7.82	±10	Pass
	-10	5890.017624	2.99	±10	
	0	5890.039431	6.69	±10	
	+10	5889.984263	-2.67	±10	
	+25	5890.000000	0.00	±10	
	+30	5889.992661	-1.25	±10	
	+40	5889.953779	-7.85	±10	
	+50	5890.003744	0.64	±10	
	+65	5890.045150	7.67	±10	
13.2	+25	5890.017569	2.98	±10	
10.8	+25	5890.044246	7.51	±10	

Module 2

CH2

Test Conditions		Frequency Deviation		Limit (ppm)	Verdict
Power (V)	Temperature (°C)	MCH (5890 MHz)			
		Measurement Frequency (MHz)	Max. Deviation (ppm)		
12.0	-25	5890.036805	6.25	±10	Pass
	-10	5890.001030	0.17	±10	
	0	5889.980011	-3.39	±10	
	+10	5890.031707	5.38	±10	
	+25	5890.000000	0.00	±10	
	+30	5889.964679	-6.00	±10	
	+40	5889.974506	-4.33	±10	
	+50	5890.030502	5.18	±10	
	+65	5890.015287	2.60	±10	
13.2	+25	5890.011163	1.90	±10	
10.8	+25	5890.021461	3.64	±10	

CH3

Test Conditions		Frequency Deviation		Limit (ppm)	Verdict
Power (V)	Temperature (°C)	MCH (5890 MHz)			
		Measurement Frequency (MHz)	Max. Deviation (ppm)		
12.0	-25	5890.017824	3.03	±10	Pass
	-10	5890.027564	4.68	±10	
	0	5890.009294	1.58	±10	
	+10	5889.964807	-5.98	±10	
	+25	5890.000000	0.00	±10	
	+30	5889.997842	-0.37	±10	
	+40	5889.973291	-4.53	±10	
	+50	5890.045038	7.65	±10	
	+65	5890.036746	6.24	±10	
13.2	+25	5890.046416	7.88	±10	
10.8	+25	5890.023089	3.92	±10	

ANNEX B TEST SETUP PHOTOS

Please refer the document “BL-SZ16C0097-AR.PDF”.

ANNEX C EUT EXTERNAL PHOTOS

Please refer the document “BL- SZ16C0097-AW.PDF”.

ANNEX D EUT INTERNAL PHOTOS

Please refer the document “BL- SZ16C0097-AI.PDF”.

--END OF REPORT--