FCC RADIO TEST REPORT
FCC 47 CFR PART 15 SUBPART C

Test Standard	**FCC Part 15.247**
FCC ID	**2ALXP-CV-DW**
Product name	**DISPLAY AUDIO**
Brand name	**Panasonic**
Model name	**CV-DW**
Test Result	**Pass**

The test Result was tested by Compliance Certification Services Inc. The test data, data evaluation, test procedures, and equipment configurations shown in this report were given in ANSI C63.10: 2013 and compliance standards.

The test results of this report relate only to the tested sample (EUT) identified in this report.
The test Report of full or partial shall not copy. Without written approval of CCS. Inc.

The sample selected for test was production product and was provided by manufacturer.

Testing Laboratory
1309

Approved by:

Sam Chuang
Manager

Tested by:

Ed Chiang
Engineer

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Revision History

Rev.	Issue Date	Revisions	Revised By
00	March 14, 2017	Initial Issue	Doris Chu
01	April 20, 2017	1. Revise EDR-3Mbps Duty Cycle in page 12. 2. Revise remark in page 45-56. 3. Added 26.5GHz ~ 40GHz setup photo in page 58.	Angel Cheng
02	April 27, 2017	1. Revise Duty Factor in page 12.	Angel Cheng
03	April 28, 2017	1. Revise Duty Factor in page 12.	Angel Cheng

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APPENDIX 1 - PHOTOGRAPHS OF EUT

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1. GENERAL INFORMATION

1.1 EUT INFORMATION

Applicant	Panasonic Taiwan Co., Ltd.
Applicant Address	No.579, Yuan Shan Road, Chung-Ho Dist., New Taipei City, Taiwan
Equipment	DISPLAY AUDIO
Model Name	CV-DW
Model Discrepancy	N/A
EUT Functions	BT2.1+EDR
Received Date	February 18, 2017
Date of Test	March 1 ~ 8, 2017
Output Power(W)	GFSK : 0.0022 W 8DPSK : 0.0008W
Power Operation	Power from Car Charger (DC 12V)

Remark:
Due to similarity of RF product constructions of given model series, only dedicated model as described in test report with the most complexity constructions was selected for testing and record.

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1.2 EUT CHANNEL INFORMATION

Frequency Range	2402MHz-2480MHz
Modulation Type	1. GFSK for BR-1Mbps 2. π/4-DQPSK for EDR-2Mbps 3. 8DPSK for EDR-3Mbps
Number of channel	79 Channels

Remark:
Refer as ANSI 63.10:2013 clause 5.6.1 Table 4 for test channels

Number of frequencies to be tested		
Frequency range in which device operates	**Number of frequencies**	**Location in frequency range of operation**
☐ 1 MHz or less	1	Middle
☐ 1 MHz to 10 MHz	2	1 near top and 1 near bottom
☒ More than 10 MHz	3	1 near top, 1 near middle, and 1 near bottom

1.3 ANTENNA INFORMATION

Antenna Category	☒ Integral: antenna permanently attached ☐ External dedicated antennas ☐ External Unique antenna connector
Antenna Type	☐ PIFA(Printed) ☒ PCB ☐ Dipole ☐ Chip ☐ Coils
Antenna Gain	2.66 dBi

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1.4 MEASUREMENT UNCERTAINTY

PARAMETER	UNCERTAINTY
AC Powerline Conducted Emission	+/- 1.2575
Emission bandwidth, 20dB bandwidth	+/- 1.4003
RF output power, conducted	+/- 1.1372
Power density, conducted	+/- 1.4003
3M Semi Anechoic Chamber / 30M~200M	+/- 4.0138
3M Semi Anechoic Chamber / 200M~1000M	+/- 3.9483
3M Semi Anechoic Chamber / 1G~8G	+/- 2.5975
3M Semi Anechoic Chamber / 8G~18G	+/- 2.6112
3M Semi Anechoic Chamber / 18G~26G	+/- 2.7389
3M Semi Anechoic Chamber / 26G~40G	+/- 2.9683
3M Semi Anechoic Chamber / 40G~60G	+/- 1.8509
3M Semi Anechoic Chamber / 60G~75G	+/- 1.9869
3M Semi Anechoic Chamber / 75G~110G	+/- 2.9651
3M Semi Anechoic Chamber / 110G~170G	+/- 2.7807
3M Semi Anechoic Chamber / 170G~220G	+/- 3.6437
3M Semi Anechoic Chamber / 220G~325G	+/- 4.2982

***Remark**:*
1.This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2
2. ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report.

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1.5 FACILITIES AND TEST LOCATION

All measurement facilities used to collect the measurement data are located at

No.989-1, Wenshan Rd., Shangshan Village, Qionglin Township, Hsinchu County 30741, Taiwan (R.O.C.)

Test site	Test Engineer	Remark
AC Conduction Room	ED Chiang	
Radiation	ED Chiang	
RF Conducted	ED Chiang	

Remark: *The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22.*

1.6 INSTRUMENT CALIBRATION

RF Conducted Test Site					
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Date**	**Calibration Due**
Power Meter	Anritsu	ML2495A	1012009	07/04/2016	07/03/2017
Power Meter	Anritsu	MA2411B	917072	07/04/2016	07/03/2017
Spectrum Analyzer	R&S	FSV 40	101073	08/01/2016	07/31/2017

Wugu 966 Chamber A					
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Date**	**Calibration Due**
Bilog Antenna	Sunol Sciences	JB3	A030105	07/03/2016	07/02/2017
Horn Antenna	EMCO	3117	00055165	02/20/2017	02/19/2018
Horn Antenna	ETS LINDGREN	3116	00026370	01/12/2017	01/11/2018
Pre-Amplifier	EMCI	EMC 012635	980151	06/23/2016	06/22/2017
Pre-Amplifier	EMEC	EM330	060609	06/08/2016	06/07/2017
Spectrum Analyzer	Agilent	E4446A	US42510252	12/05/2016	12/04/2017
Antenna Tower	CCS	CC-A-1F	N/A	N.C.R	N.C.R
Controller	CCS	CC-C-1F	N/A	N.C.R	N.C.R
Turn Table	CCS	CC-T-1F	N/A	N.C.R	N.C.R
Software	EZ-EMC (CCS-3A1RE)				

Conducted Emission Room # B					
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Date**	**Calibration Due**
N/A					

Remark:

1. Each piece of equipment is scheduled for calibration once a year and Precision Dipole is scheduled for calibration once three years.

2. N.C.R. = No Calibration Request.

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1.7 SUPPORT AND EUT ACCESSORIES EQUIPMENT

EUT Accessories Equipment					
No.	**Equipment**	**Brand**	**Model**	**Series No.**	**FCC ID**
	N/A				

Support Equipment					
No.	**Equipment**	**Brand**	**Model**	**Series No.**	**FCC ID**
1	DC Power Source	GWINSTEK	SPS-3610	N/A	N/A
2	Notebook PC	Acer	Aspire 4320 series	N/A	QDS-BRCM1018

1.8 TEST METHODOLOGY AND APPLIED STANDARDS

The test methodology, setups and results comply with all requirements in accordance with ANSI C63.10:2013, FCC Part 2, FCC Part 15.247.

1.9 TABLE OF ACCREDITATIONS AND LISTINGS

Country	Agency	Scope of Accreditation	Logo
USA	FCC	3M Semi Anechoic Chamber (FCC MRA: TW1039) to perform FCC Part 15 measurements	FCC MRA: TW0240

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2. TEST SUMMERY

FCC Standard Sec.	Report Sec.	Test Item	Result
15.203	1.2	Antenna Requirement	Pass
15.207	4.1	AC Conducted Emission	Pass
15.247(a)(1)	4.2	20 dB Bandwidth	Pass
-	4.2	Occupied Bandwidth (99%)	-
15.247(b)(1)	4.3	Output Power Measurement	Pass
15.247(a)(1)	4.4	Frequency Separation	Pass
15.247(b)(1)	4.5	Number of Hopping	Pass
15.247(d)	4.6	Conducted Band Edge	Pass
15.247(d)	4.6	Conducted Emission	Pass
15.247(d)	4.8	Radiation Band Edge	Pass
15.247(d)	4.8	Radiation Spurious Emission	Pass

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3. DESCRIPTION OF TEST MODES

3.1 THE WORST MODE OF OPERATING CONDITION

Operation mode	GFSK for BR-1Mbps (DH5) π/4-DQPSK for EDR-2Mbps (DH5) 8DPSK for EDR-3Mbps (DH5)
Test Channel Frequencies	**GFSK for BR-1Mbps:** 1.Lowest Channel : 2402MHz 2.Middle Channel : 2441MHz 3.Highest Channel : 2480MHz **π/4-DQPSK for EDR-2Mbps:** 1.Lowest Channel : 2402MHz 2.Middle Channel : 2441MHz 3.Highest Channel : 2480MHz **8DPSK for EDR-3Mbps:** 1.Lowest Channel : 2402MHz 2.Middle Channel : 2441MHz 3.Highest Channel : 2480MHz

Remark:
1. EUT pre-scanned data rate of output power for each mode, the worst data rate were recorded in this report.

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3.2 THE WORST MODE OF MEASUREMENT

Radiated Emission Measurement Above 1G	
Test Condition	Band edge, Emission for Unwanted and Fundamental
DC Voltage	12V DC
Test Mode	Mode 1: EUT power by DC power source.
Worst Mode	☒ Mode 1 ☐ Mode 2 ☐ Mode 3 ☐ Mode 4
Worst Position	☐ Placed in fixed position. ☒ Placed in fixed position at X-Plane (E2-Plane) ☐ Placed in fixed position at Y-Plane (E1-Plane) ☐ Placed in fixed position at Z-Plane (H-Plane)
Worst Polarity	☐ Horizontal ☒ Vertical

Radiated Emission Measurement Below 1G	
Test Condition	Radiated Emission Below 1G
DC Voltage	12V DC
Test Mode	Mode 1: EUT power by DC power source.
Worst Mode	☒ Mode 1 ☐ Mode 2 ☐ Mode 3 ☐ Mode 4

Remark:
1. The worst mode was record in this test report.
2. EUT pre-scanned in three axis ,X,Y, Z and two polarity, Horizontal and Vertical for radiated measurement. The worst case(X-Plane and Vertical) were recorded in this report

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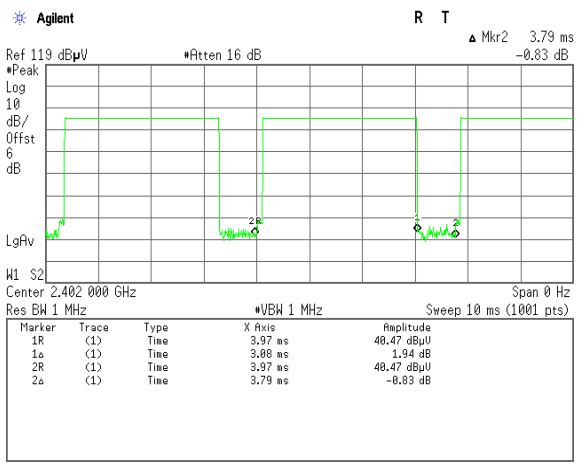
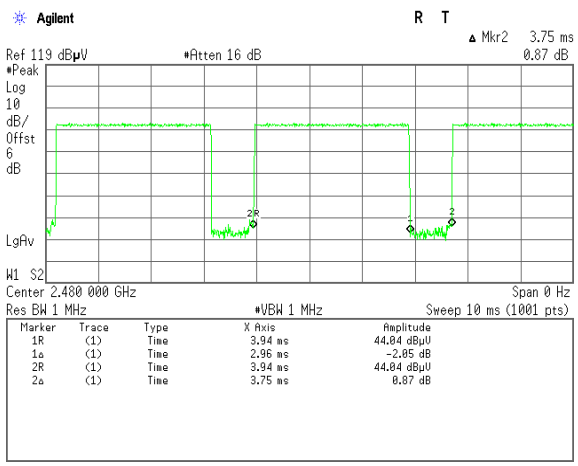
3.3 EUT DUTY CYCLE

Duty Cycle				
Configuration	TX ON (ms)	TX ALL (ms)	Duty Cycle (%)	Duty Factor(dB)
BR-1Mbps	3.0800	3.7900	81.27	-1.80
EDR-3Mbps	2.9600	3.7500	78.93	-2.06

BR-1Mbps



EDR-3Mbps



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4. TEST RESULT

4.1 AC POWER LINE CONDUCTED EMISSION

4.1.1 Test Limit

According to §15.207(a),

Frequency Range (MHz)	Limits(dBμV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56*	56 to 46*
0.50 to 5	56	46
5 to 30	60	50

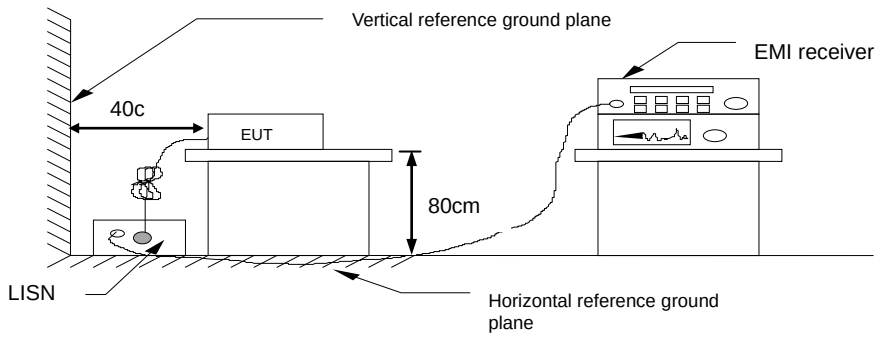
* Decreases with the logarithm of the frequency.

4.1.2 Test Procedure

Test method Refer as ANSI 63.10:2013 clause 6.2,

1. The EUT was placed on a non-conducted table, which is 0.8m above horizontal ground plane and 0.4m above vertical ground plane.
2. EUT connected to the line impedance stabilization network (LISN)
3. Receiver set RBW of 9kHz and Detector Peak, and note as quasi-peak and average.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. Recorded Line for Neutral and Line.

4.1.3 Test Setup



4.1.4 Test Result

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Test Data

Not applicable, because EUT not connect to AC Main Source direct.

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4.2 20DB BANDWIDTH AND OCCUPIED BANDWIDTH (99%)

4.2.1 Test Limit

According to §15.247(a)(1)

20 dB Bandwidth ：For reporting purposes only.

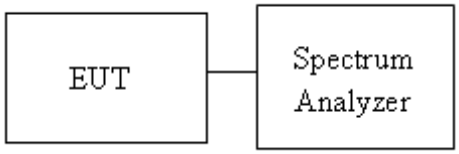
Occupied Bandwidth(99%) ：For reporting purposes only.

4.2.2 Test Procedure

Test method Refer as ANSI 63.10:2013 clause 6.9.2,

1. The EUT RF output connected to the spectrum analyzer by RF cable.
2. Setting maximum power transmit of EUT
3. SA set RBW = 30kHz, VBW = 100kHz and Detector = Peak, to measurement 20 dB Bandwidth and 99% Bandwidth.
4. Measure and record the result of 20 dB Bandwidth and 99% Bandwidth. in the test report.

4.2.3 Test Setup



4.2.4 Test Result

Test mode: GFSK_BR-1Mbps mode / 2402-2480 MHz			
Channel	**Frequency (MHz)**	**OBW (99%) (MHz)**	**20dB BW (MHz)**
Low	2402	0.8379	0.8292
Mid	2440	0.8335	0.8640
High	2480	0.8335	0.8292

Test mode: 8DPSK_EDR-3Mbps mode / 2402-2480 MHz			
Channel	**Frequency (MHz)**	**OBW (99%) (MHz)**	**20dB BW (MHz)**
Low	2402	1.1765	1.2547
Mid	2440	1.1635	1.2547
High	2480	1.1591	1.2547

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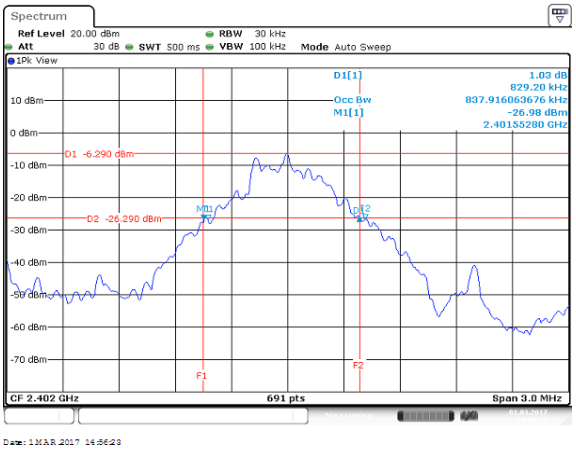
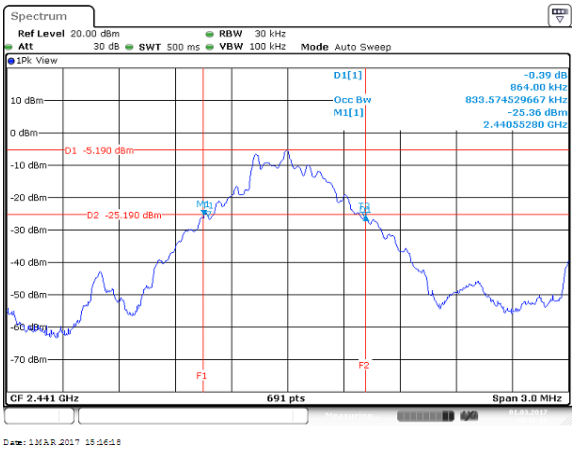
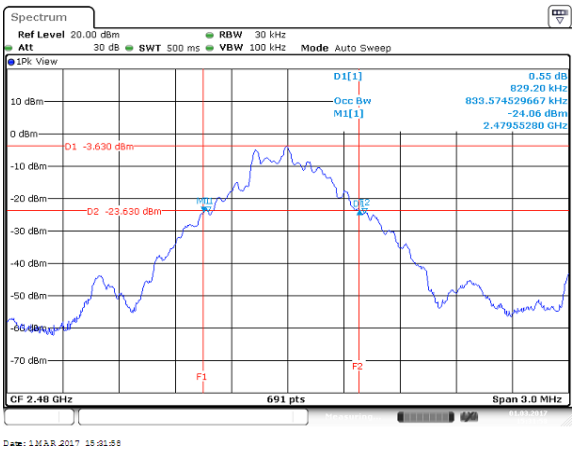
Test Data

GFSK_BR-1Mbps mode	
Low CH	**Mid CH**
	
High CH	
	

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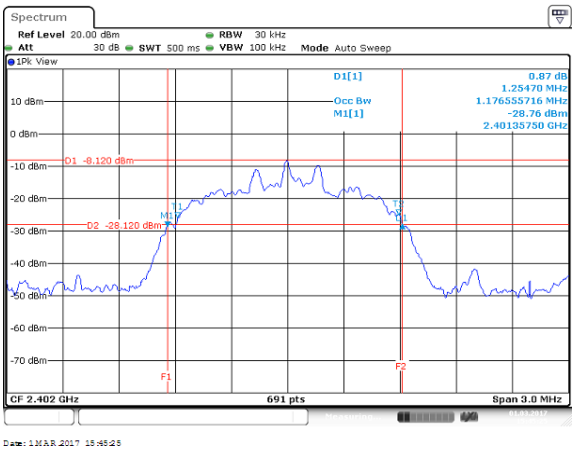
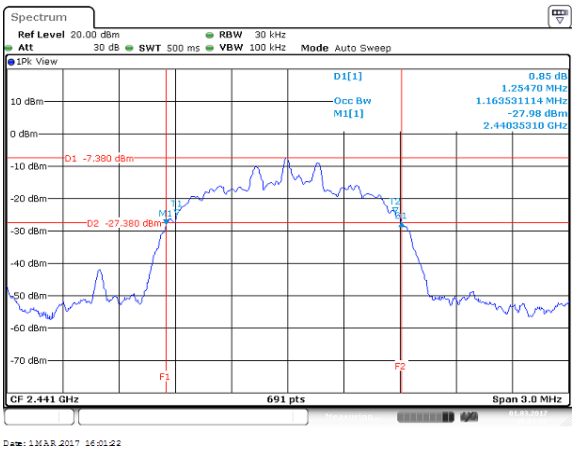
8DPSK _EDR-3Mbps mode

Low CH



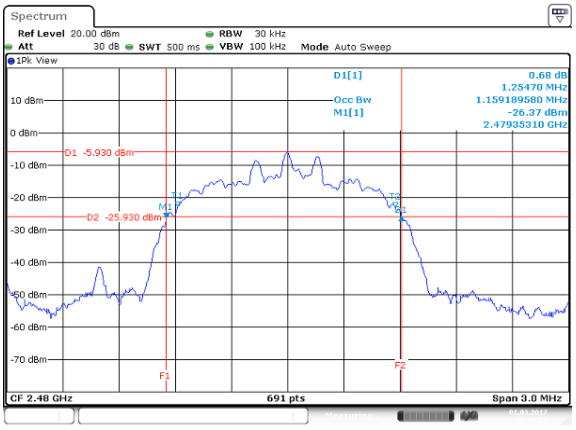
Date: 1MAR.2017 15:45:25

Mid CH



Date: 1MAR.2017 16:01:22

High CH



Date: 1MAR.2017 16:06:25

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4.3 OUTPUT POWER MEASUREMENT

4.3.1 Test Limit

According to §15.247(b)(1),

Peak output power：

For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.

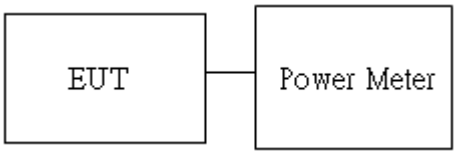
Limit	☒ Antenna not exceed 6 dBi：21dBm ☐ Antenna with DG greater than 6 dBi： [Limit = 30 – (DG – 6)]

Average output power：For reporting purposes only.

4.3.2 Test Procedure

1. The EUT RF output connected to the power meter by RF cable.
2. Setting maximum power transmit of EUT.
3. The path loss was compensated to the results for each measurement.
4. Measure and record the result of Peak output power and Average output power. in the test report.

4.3.3 Test Setup



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4.3.4 Test Result

Peak output power：

For GFSK / DH5

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	2402	***3.52**	0.0022	0.125	PASS
Mid	2441	0.85	0.0012		PASS
High	2480	0.25	0.0011		PASS

For 8DPSK / DH5

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	2402	-1.61	0.0007	0.125	PASS
Mid	2441	-1.52	0.0007		PASS
High	2480	-1.12	0.0008		PASS

Average output power：

For GFSK / DH5

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)
Low	2402	-0.84	0.0008
Mid	2441	-3.91	0.0004
High	2480	-1.57	0.0007

For 8DPSK / DH5

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)
Low	2402	-6.79	0.0002
Mid	2441	-5.54	0.0003
High	2480	-4.24	0.0004

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4.4 FREQUENCY SEPARATION

4.4.1 Test Limit

According to §15.247(a)(1)

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

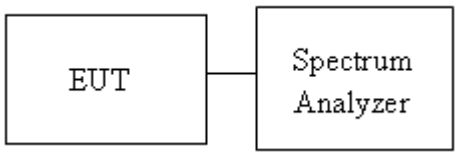
Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

Limit	> two-thirds of the 20 dB bandwidth

4.4.2 Test Procedure

1. Place the EUT on the table and set it in transmitting mode.
2. EUT RF output port connected to the SA by RF cable.
3. Set the spectrum analyzer as RBW = 100kHz, VBW = 300kHz, Sweep = auto. Max hold, mark 3 peaks of hopping channel and record the 3 peaks frequency

4.4.3 Test Setup



4.4.4 Test Result

Test mode: GFSK_BR-1Mbps mode / 2402-2480 MHz				
Channel	**Frequency (MHz)**	**Channel Separation (MHz)**	**Channel Separation Limits (MHz)**	**Result**
Low	2402	1.0029	0.5528	PASS
Mid	2441	1.0029	0.5760	PASS
High	2480	1.0029	0.5528	PASS

Test mode: 8DPSK_EDR-3Mbps mode / 2402-2480 MHz				
Channel	**Frequency (MHz)**	**Channel Separation (MHz)**	**Channel Separation Limits (MHz)**	**Result**
Low	2402	0.9986	0.8365	PASS
Mid	2441	0.9986	0.8365	PASS
High	2480	0.9986	0.8365	PASS

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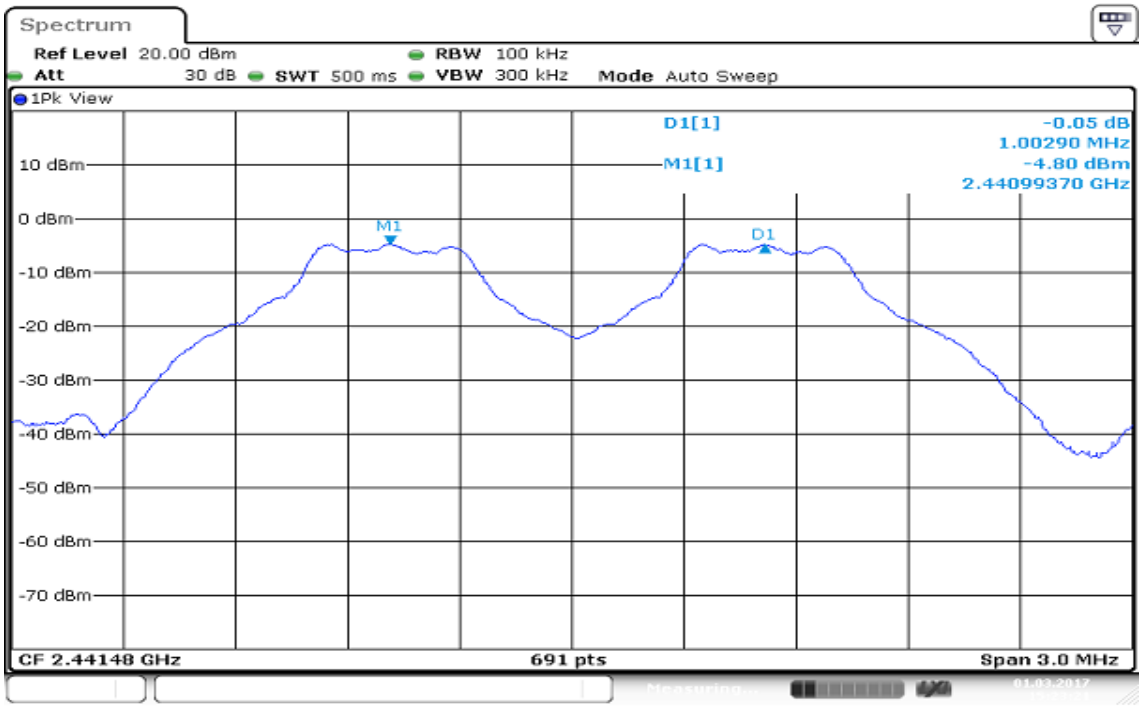
Test Data

GFSK_BR-1Mbps mode



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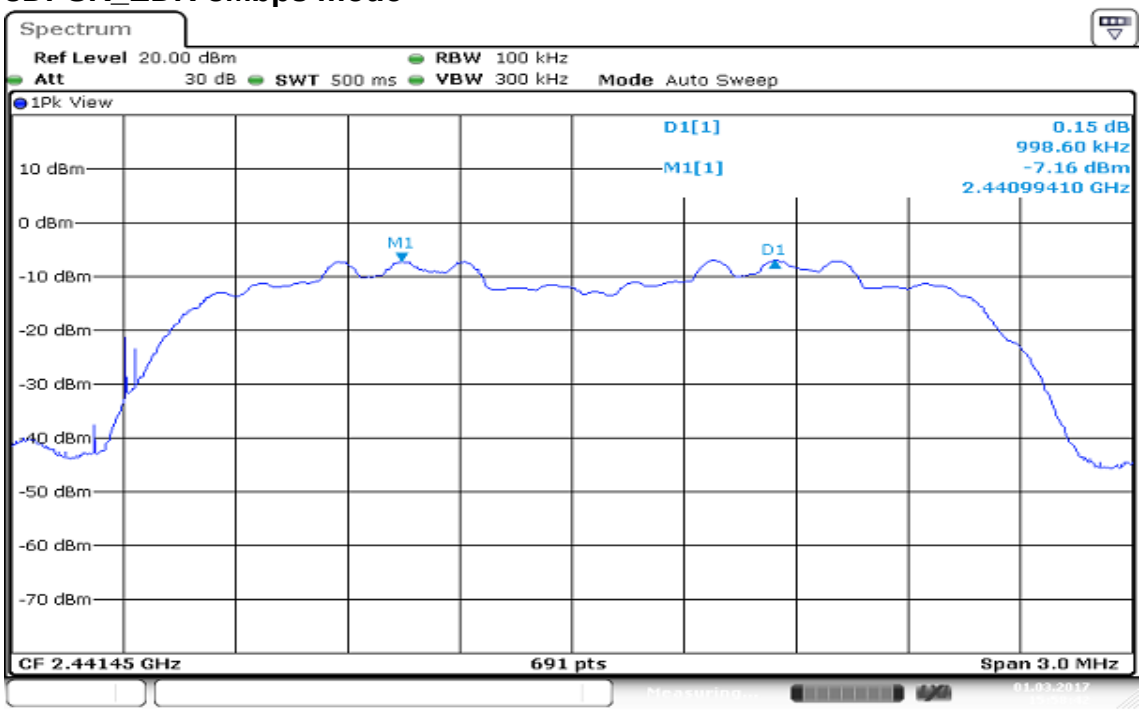
8DPSK_EDR-3Mbps mode



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4.5 NUMBER OF HOPPING

4.5.1 Test Limit

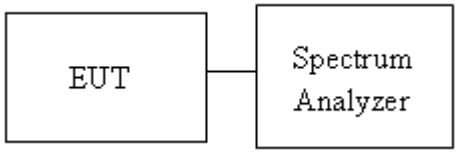
According to §15.247(a)(1)(iii),

For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels

4.5.2 Test Procedure

Test method Refer as ANSI 63.10:2013 clause 7.8.3,
1. Place the EUT on the table and set it in transmitting mode.
2. EUT RF output port connected to the SA by RF cable.
3. Set spectrum analyzer Start Freq. = 2400 MHz, Stop Freq. = 2483.5 MHz, RBW=100KHz, VBW = 300KHz.Sweep Time = 1s
4. Max hold, view and count how many channel in the band.

4.5.3 Test Setup



4.5.4 Test Result

Number of Hopping				
Mode	**Frequency (MHz)**	**Hopping Channel Number**	**Hopping Channel Number Limits**	**Result**
BR-1Mbps	2402-2480	79	15	Pass
EDR-3Mbps	2402-2480	79	15	

REMARK:
The frequency spectrum was broken up in to two sub-range to clearly show all of the hopping frequencies. In the AFH mode, this device operation was using 20 channels, so the requirement for minimum number of hopping channels is satisfied

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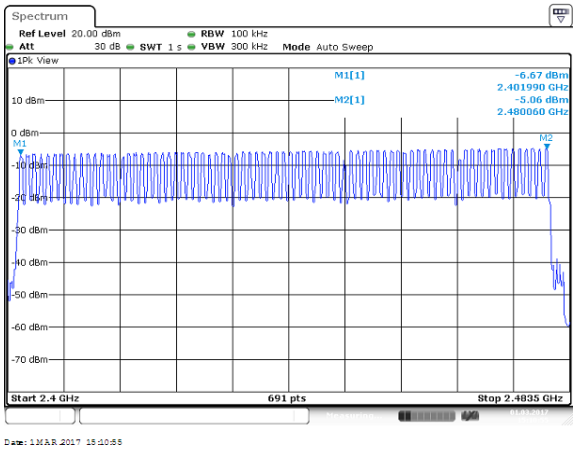
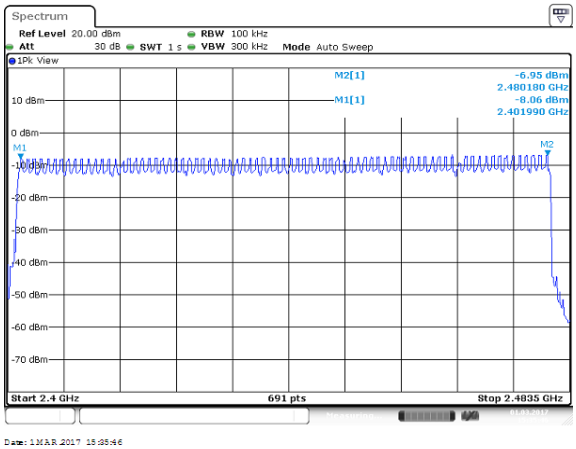
Test Data

Number of Hopping	
GFSK_BR-1Mbps mode	8DPSK_EDR-3Mbps mode
	

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4.6 CONDUCTED BANDEDGE AND SPURIOUS EMISSION

4.6.1 Test Limit

According to §15.247(d),

Limit	-20 dBc

.

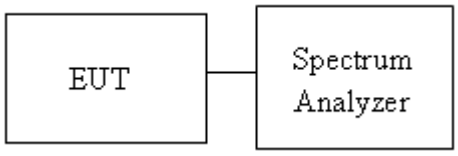
4.6.2 Test Procedure

1. EUT RF output port connected to the SA by RF cable, and the path loss was compensated to result.

2. SA setting, RBW=100kHz, VBW=300kHz, Detector=Peak, Trace mode = max hold, SWT = Auto.

3. The Band Edge at 2.4GHz and 2.4835GHz are investigated with normal hopping mode.

4.6.3 Test Setup



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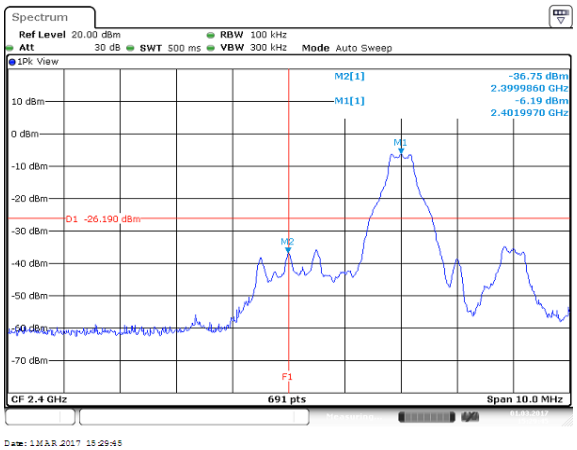
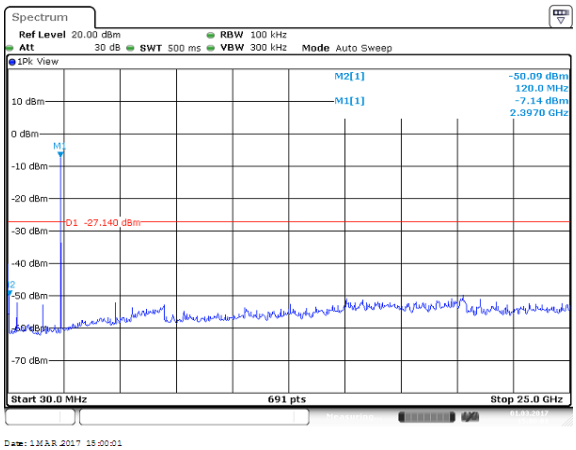
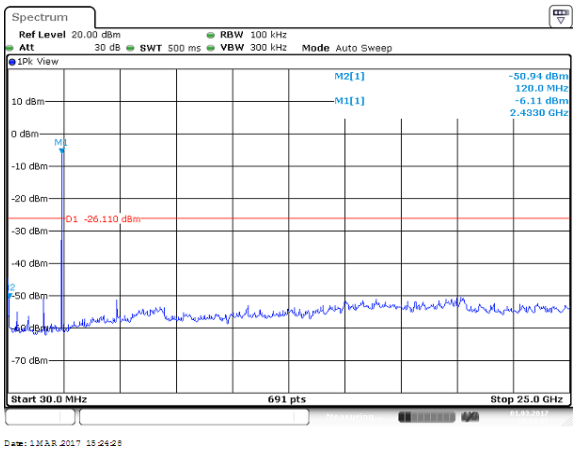
4.6.4 Test Result

Test Data

GFSK_BR-1Mbps mode Low CH	
Band Edge	**Spurious Emission 30MHz-25GHz**
	

GFSK_BR-1Mbps mode Mid CH	
Spurious Emission 30MHz-25GHz	
	

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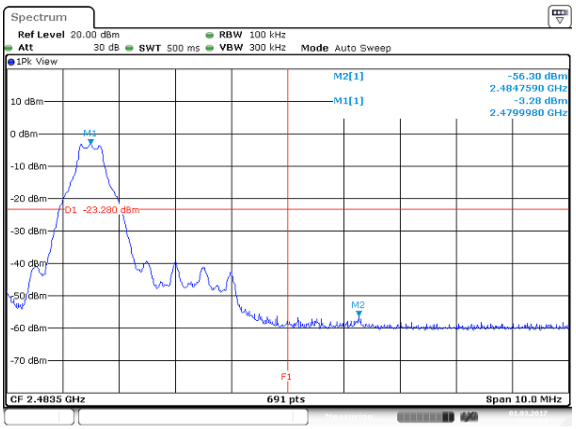
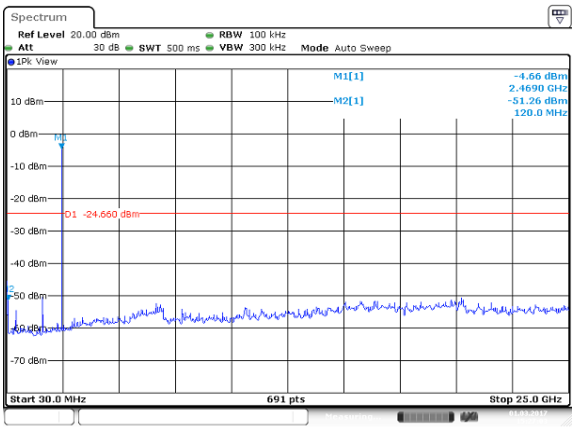
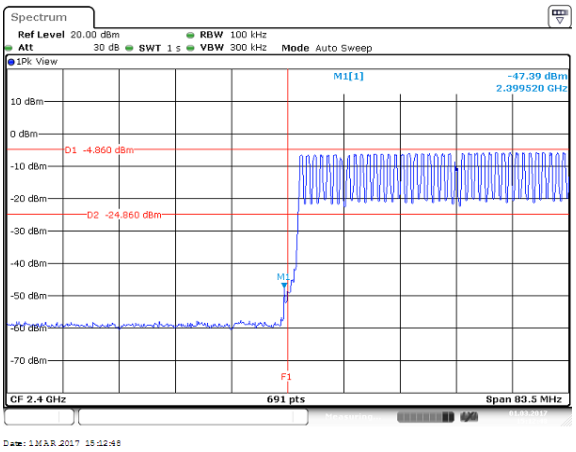
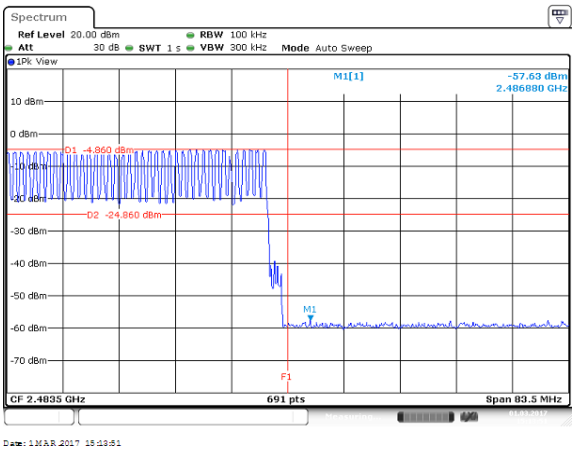
GFSK_BR-1Mbps mode High CH	
Band Edge	**Spurious Emission 30MHz-25GHz**
	

GFSK_BR-1Mbps Hopping mode	
Low Band Edge	**High Band Edge**
	

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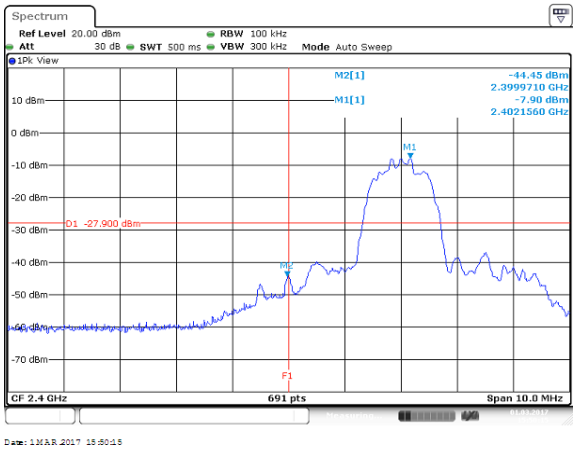
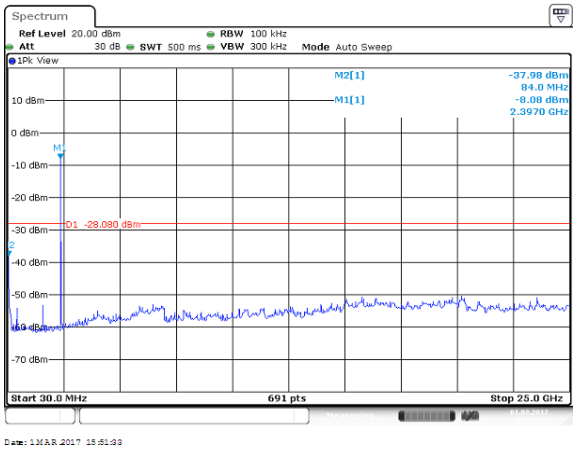
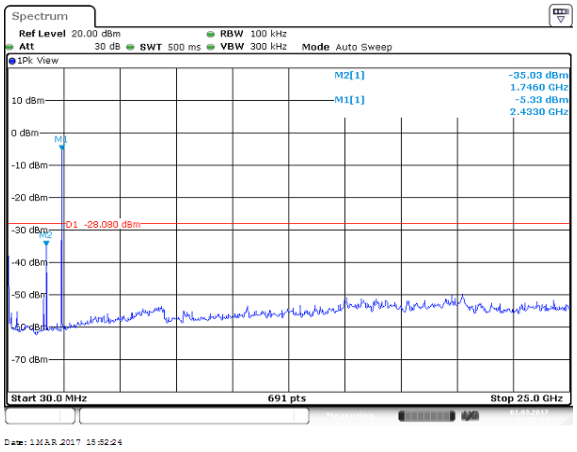
8DPSK_EDR-3Mbps mode Low CH	
Band Edge	**Spurious Emission 30MHz-25GHz**
	

8DPSK_EDR-3Mbps mode Mid CH	
Spurious Emission 30MHz-25GHz	
	

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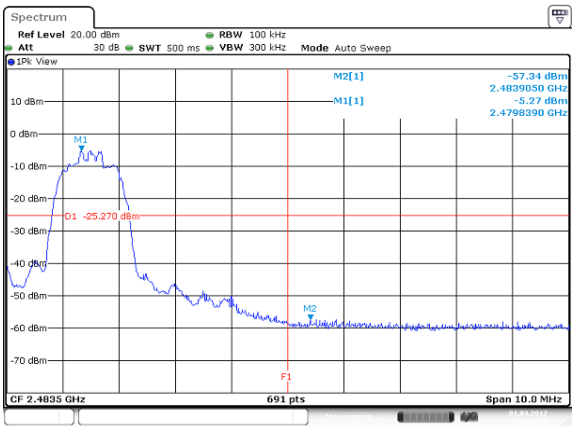
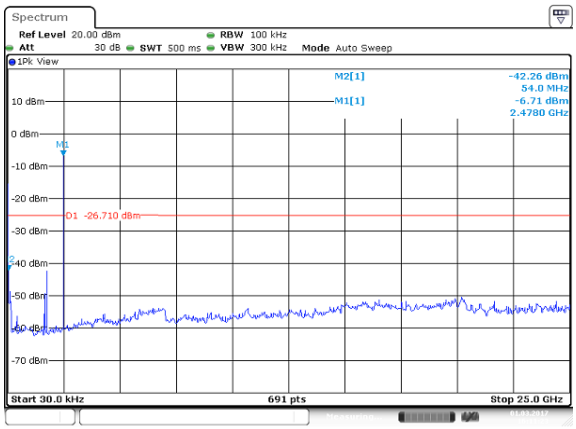
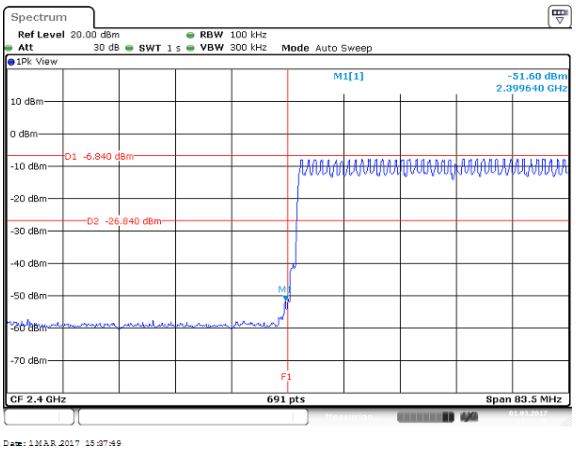
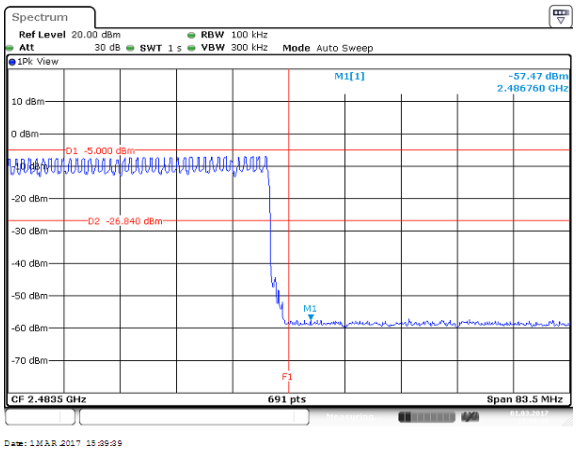
8DPSK_EDR-3Mbps mode High CH	
Band Edge	**Spurious Emission 30MHz-25GHz**
	

8DPSK_EDR-3Mbps Hopping mode	
Low Band Edge	**High Band Edge**
	

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4.7 TIME OF OCCUPANCY (DWELL TIME)

4.7.1 Test Limit

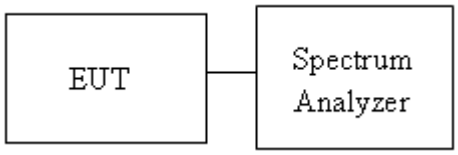
According to §15.247(a)(1)(iii),

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

4.7.2 Test Procedure

1. EUT RF output port connected to the SA by RF cable.
2. Set center frequency of spectrum analyzer = operating frequency.
3. Set the spectrum analyzer as RBW, VBW=1MHz, Sweep = 1 ms

4.7.3 Test Setup



4.7.4 Test Result

Time of Occupancy (Dwell Time)							
Mode	**Frequency (MHz)**	**Pulse Time Per Hopping (ms)**	**Minimum Number of Hopping Freq.**	**Number of pulse in (0.4 * N sec)**	**Dwell Time IN (0.4 * N sec)**	**Dwell Time Limits (s)**	**Result**
BR-1Mbps	2441	0.5652	79	106.67	0.0603	0.4	Pass
EDR-3Mbps	2441	2.971	79	106.67	0.3169	0.4	
Non-AFH: DH5 Packet permit maximum 1600/ 79 / 6 = 3.37 hops per second in each channel (5 time slots RX, 1 time slot TX). So, the dwell time is the time duration of the pulse times 3.37 * 0.4 *79 = 106.6							
AFH: DH5 Packet permit maximum 800/ 20 / 6 = 6.666 hops per second in each channel (5 time slots RX, 1 time slot TX). So, the dwell time is the time duration of the pulse times 6.666*0.4*20 = 53.33							

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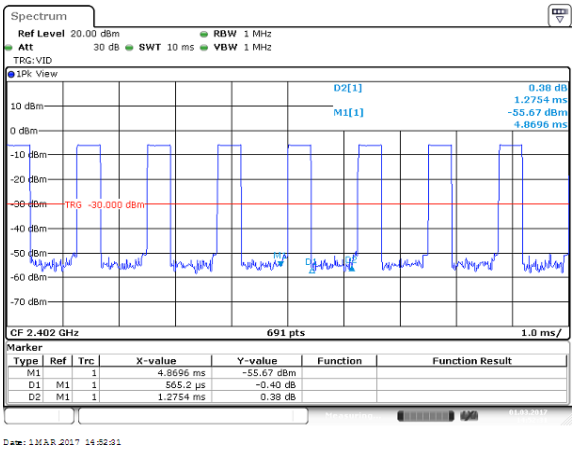
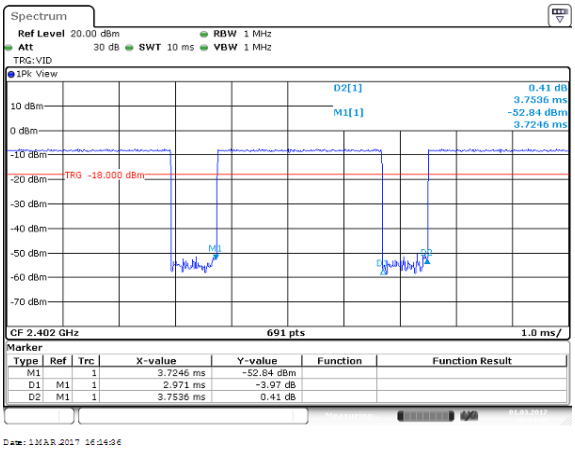
Test Data

Time of Occupancy (Dwell Time)	
GFSK_BR-1Mbps mode	**8DPSK_EDR-3Mbps mode**
	

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4.8 RADIATION BANDEDGE AND SPURIOUS EMISSION

4.8.1 Test Limit

According to §15.247(d), §15.209 and §15.205,

In any 100 kHz bandwidth outside the authorized frequency band, all harmonic and spurious must be least 20 dB below the highest emission level with the authorized frequency band. Radiation emission which fall in the restricted bands must also follow the FCC section 15.209 as below limit in table.

Below 30 MHz

Frequency	Field Strength (microvolts/m)	Magnetic H-Field (microamperes/m)	Measurement Distance (metres)
9-490 kHz	2,400/F (F in kHz)	2,400/F (F in kHz)	300
490-1,705 kHz	24,000/F (F in kHz)	24,000/F (F in kHz)	30
1.705-30 MHz	30	N/A	30

Above 30 MHz

Frequency (MHz)	Field Strength microvolts/m at 3 metres (watts, e.i.r.p.)	
	Transmitters	Receivers
30-88	100 (3 nW)	100 (3 nW)
88-216	150 (6.8 nW)	150 (6.8 nW)
216-960	200 (12 nW)	200 (12 nW)
Above 960	500 (75 nW)	500 (75 nW)

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4.8.2 Test Procedure

Test method Refer as ANSI C63.10:2013.

1. The EUT is placed on a turntable, Above 1 GHz is 1.5m and below 1 GHz is 0.8m above ground plane. The EUT Configured un accordance with ANSI C63.10, and the EUT set in a continuous mode.

2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level. And EUT is set 3m away from the receiving antenna, which is scanned from 1m to 4m above the ground plane to find out the highest emissions. Measurement are made polarized in both the vertical and the horizontal positions with antenna.

3. Span shall wide enough to full capture the emission measured. The SA from 30MHz to 40GHz set to the low, Mid and High channels with the EUT transmit.

4. For harmonic, the worst case of output power was BR-1Mbps. Therefore only BR-1Mbps record in the report.

5. The SA setting following：

(1) Below 1G：RBW = 100kHz, VBW ≥ 3 RBW, Sweep = Auto, Detector = Peak, Trace = Max hold.

(2) Above 1G：

(2.1) For Peak measurement：RBW = 1MHz, VBW ≥ 3 RBW, Sweep = Auto, Detector = Peak, Trace = Max hold.

(2.2) For Average measurement：RBW = 1MHz, VBW

˙If Duty Cycle ≥ 98%, VBW=10Hz.

˙If Duty Cycle < 98%, VBW=1/T.

Configuration	Duty Cycle (%)	VBW
GFSK_BR-1Mbps	81%	330Hz
8DPSK_EDR-3Mbps	79%	360 Hz

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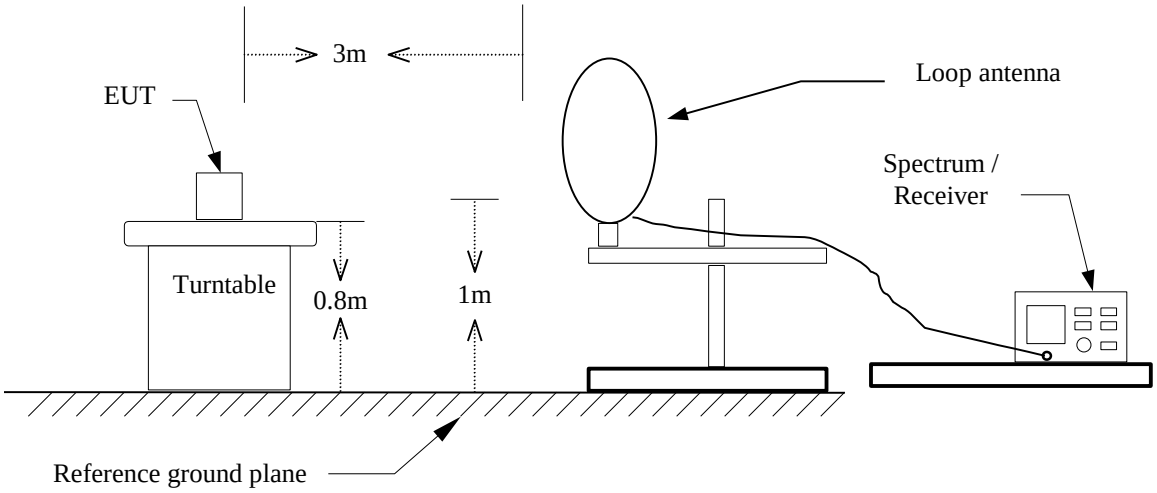
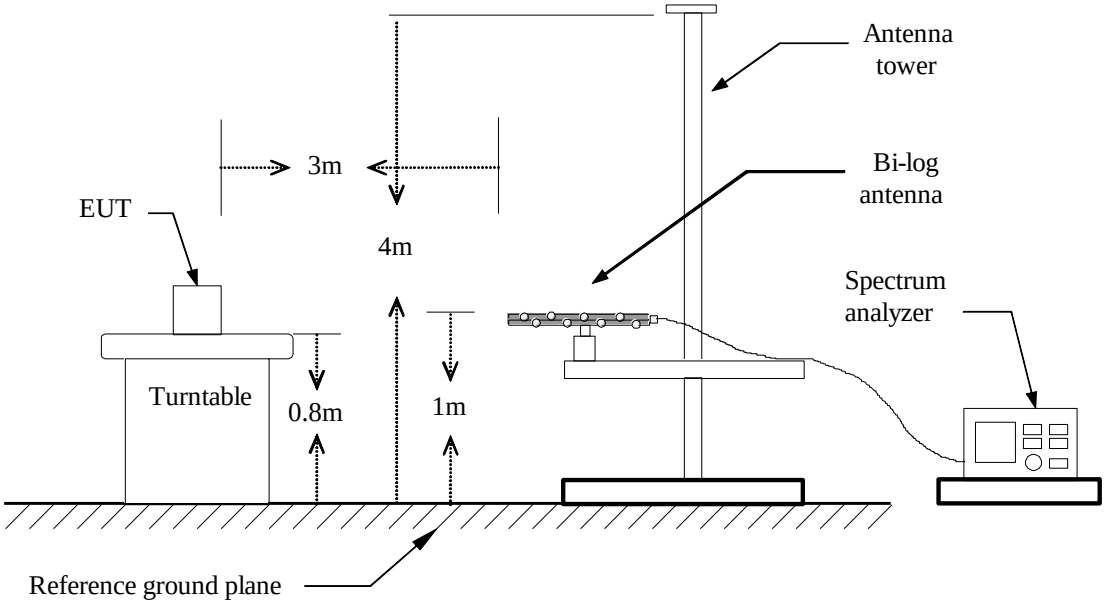
4.8.3 Test Setup

9kHz ~ 30MHz



30MHz ~ 1GHz



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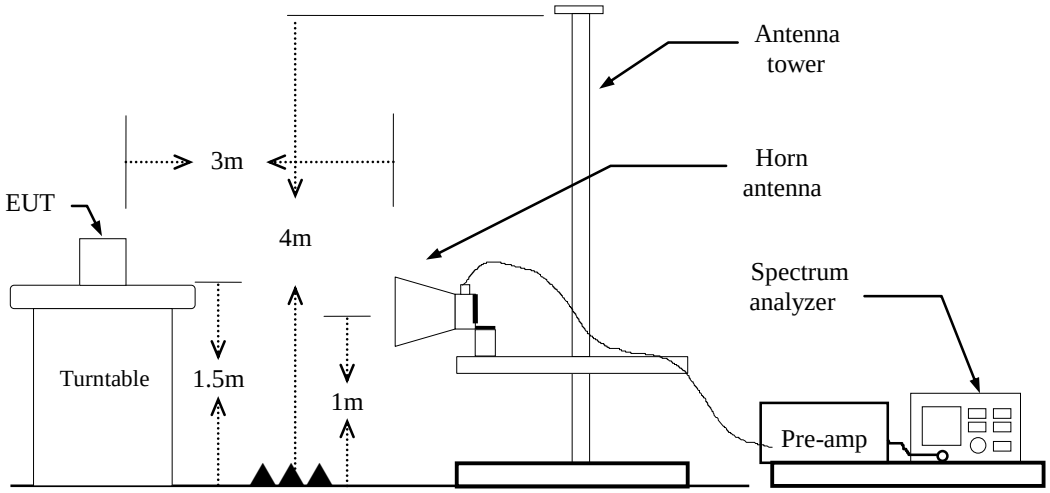
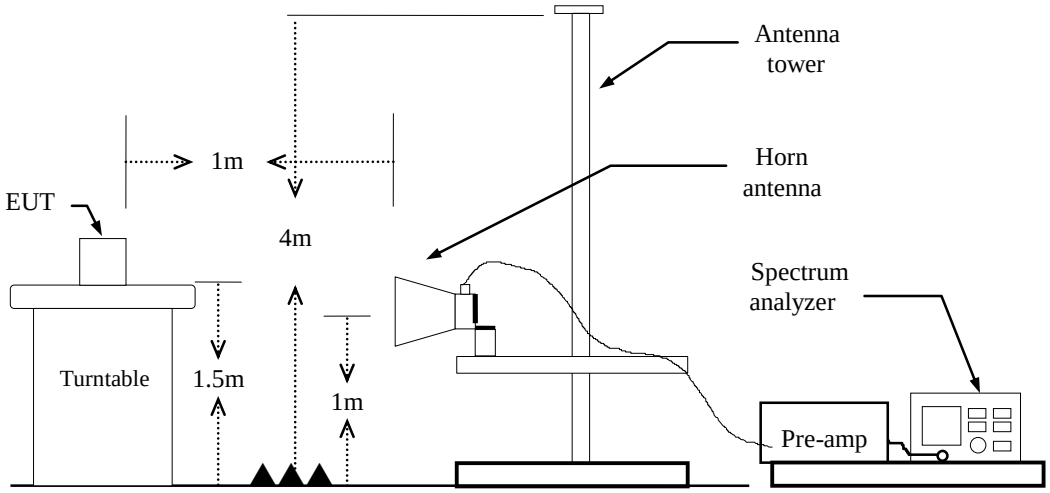
1 GHz ~ 26.5GHz



26.5 GHz ~ 40GHz



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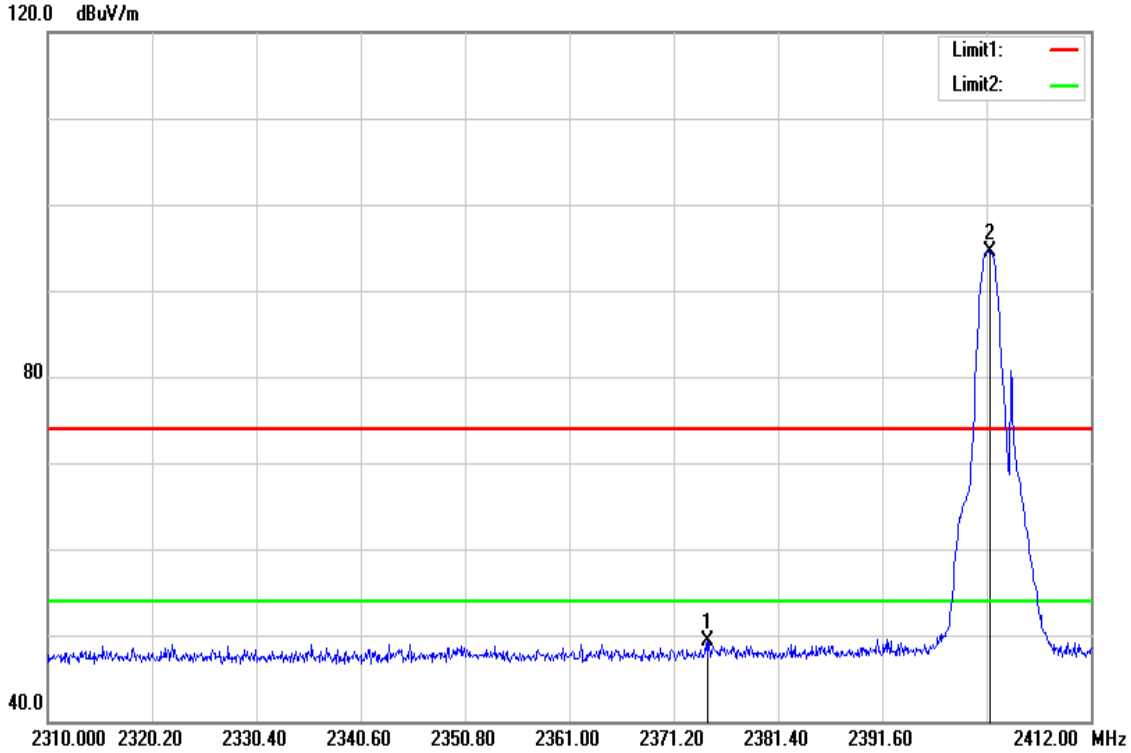
4.8.4 Test Result

Band Edge Test Data

Test Mode	GFSK_BR-1Mbps Low CH	Temp/Hum	27(℃)/ 53%RH
Test Item	Band Edge	Test Date	March 7, 2017
Polarize	Horizontal	Test Engineer	ED Chiang
Detector	Peak	Test Voltage	120Vac / 60Hz



Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
2374.566	52.00	-2.62	49.38	74.00	-24.62	peak
2402.106	97.00	-2.41	94.59	-	-	peak

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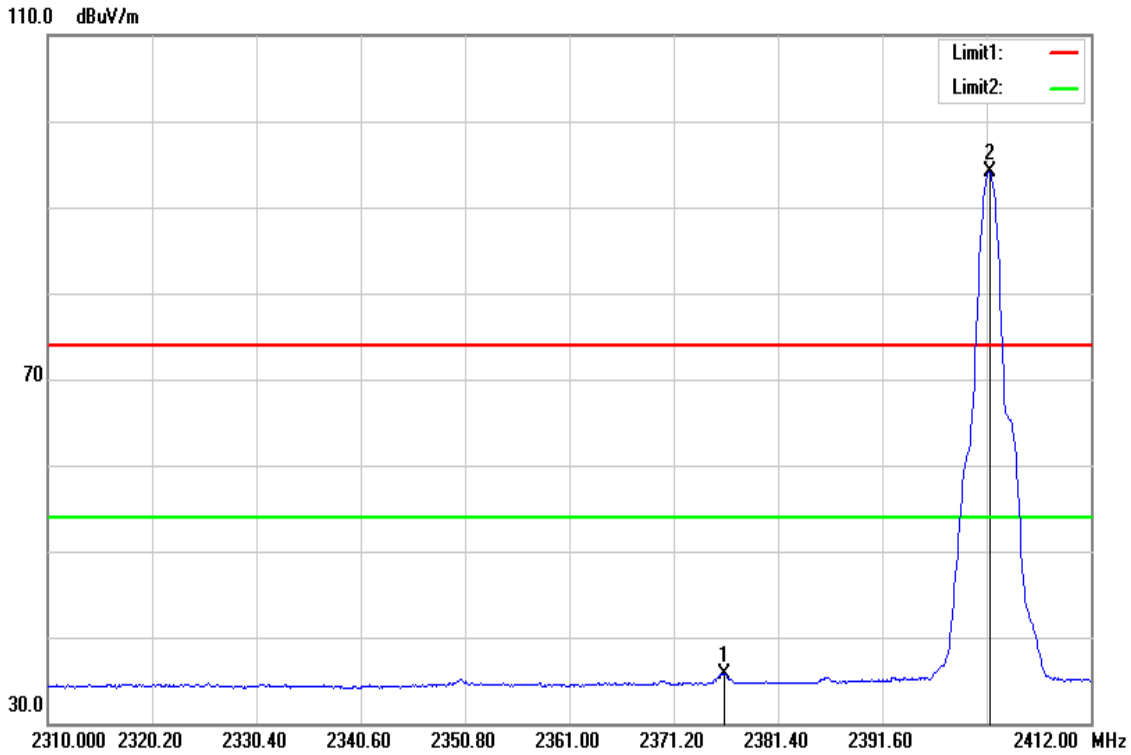
Test Mode	GFSK_BR-1Mbps Low CH	Temp/Hum	27(℃)/ 53%RH
Test Item	Band Edge	Test Date	March 7, 2017
Polarize	Horizontal	Test Engineer	ED Chiang
Detector	Average	Test Voltage	120Vac / 60Hz



Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
376.096	38.37	-2.61	35.76	54.00	-18.24	AVG
2402.106	96.43	-2.41	94.02	-	-	AVG

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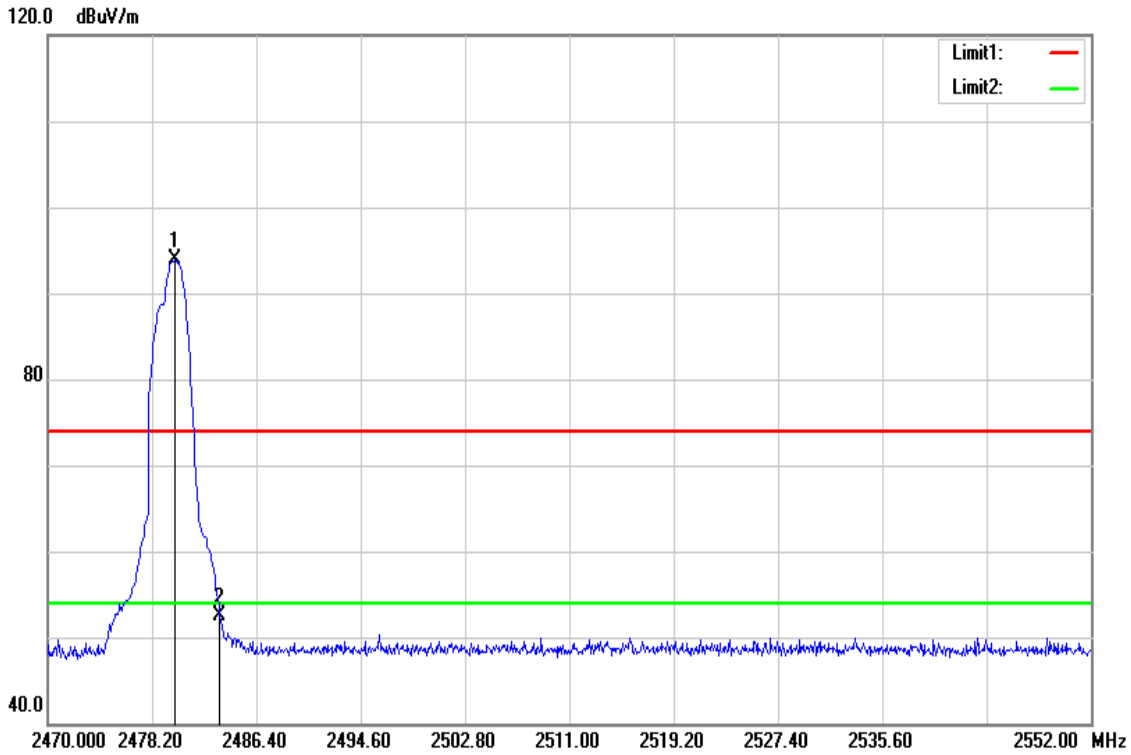
Test Mode	GFSK_BR-1Mbps High CH	Temp/Hum	27(℃)/ 53%RH
Test Item	Band Edge	Test Date	March 7, 2017
Polarize	Horizontal	Test Engineer	ED Chiang
Detector	Peak	Test Voltage	120Vac / 60Hz



Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
2480.004	95.84	-2.03	93.81	-	-	peak
2483.500	54.49	-1.99	52.50	74.00	-21.50	peak

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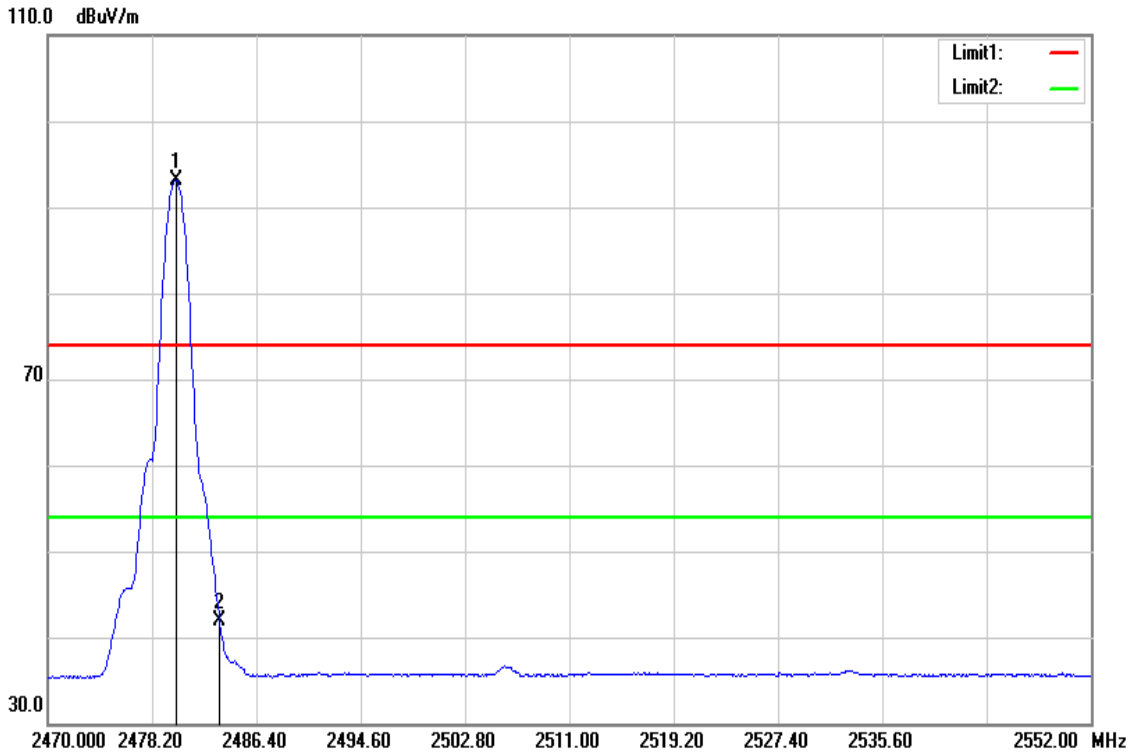
Test Mode	GFSK_BR-1Mbps High CH	Temp/Hum	27(℃)/ 53%RH
Test Item	Band Edge	Test Date	March 7, 2017
Polarize	Horizontal	Test Engineer	ED Chiang
Detector	Average	Test Voltage	120Vac / 60Hz



Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
480.086	95.10	-2.03	93.07	-	-	AVG
2483.500	43.80	-1.99	41.81	54.00	-12.19	AVG

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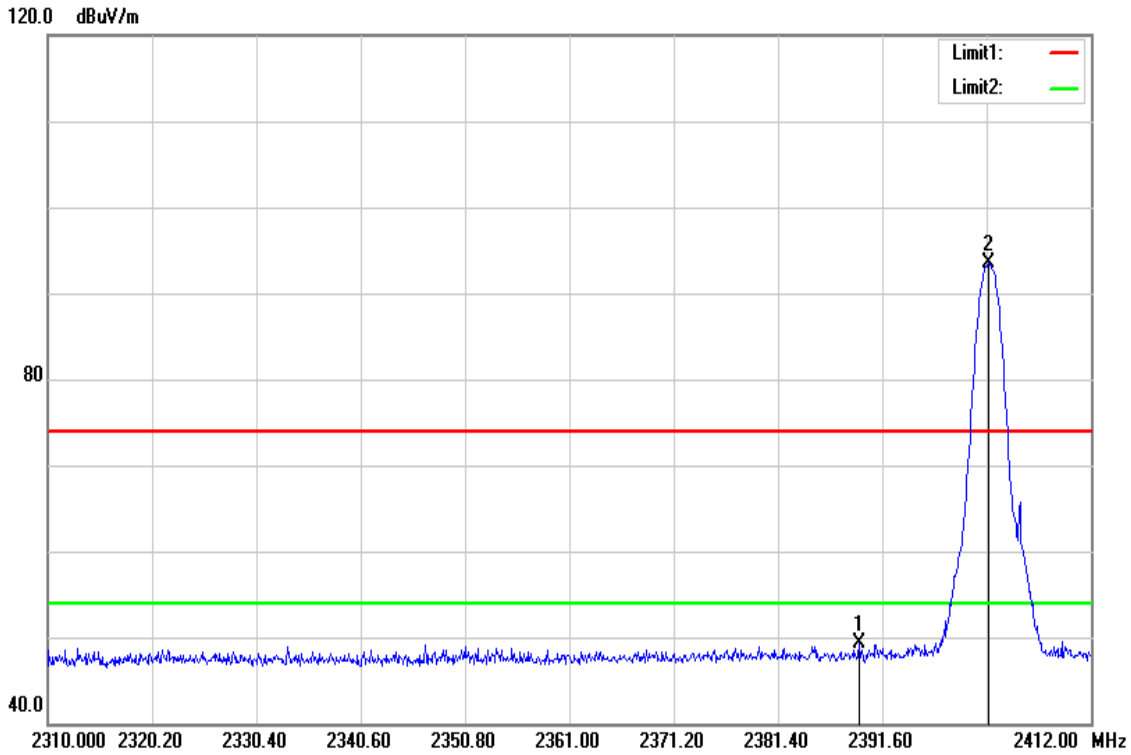
Test Mode	8DPSK_EDR-3Mbps Low CH	Temp/Hum	27(℃)/ 53%RH
Test Item	Band Edge	Test Date	March 7, 2017
Polarize	Horizontal	Test Engineer	ED Chiang
Detector	Peak	Test Voltage	120Vac / 60Hz



Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
2389.356	51.70	-2.50	49.20	74.00	-24.80	peak
2402.004	95.84	-2.41	93.43	-	-	peak

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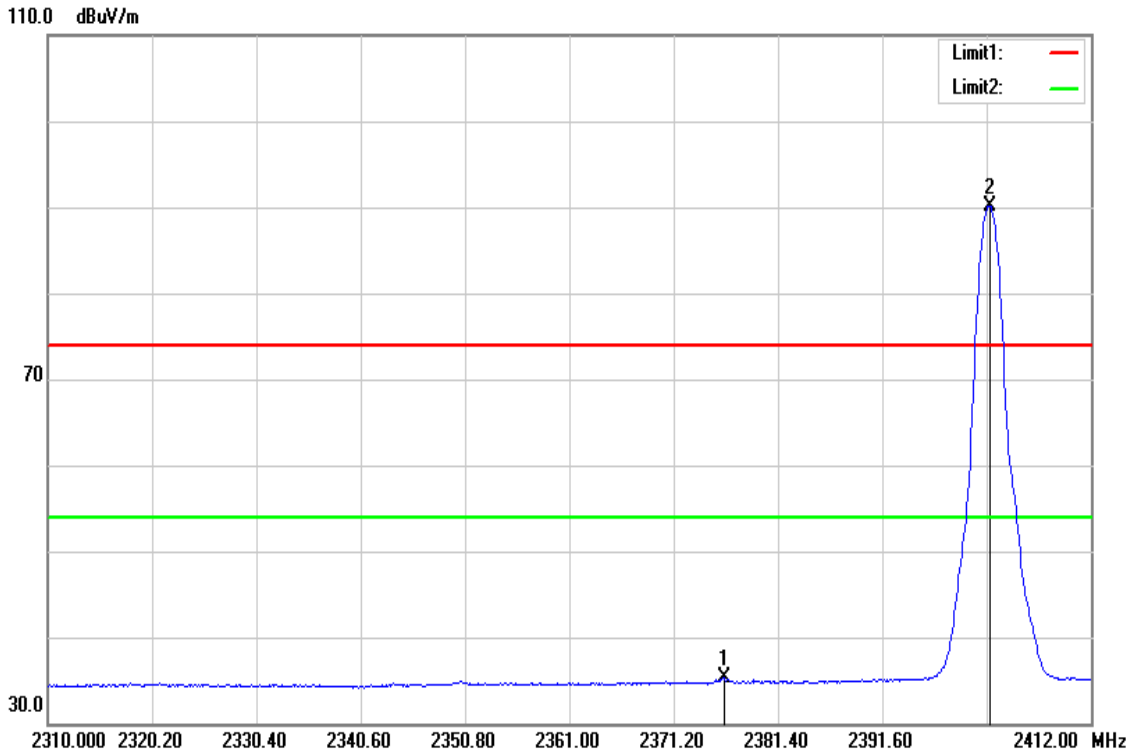
Test Mode	8DPSK_EDR-3Mbps Low CH	Temp/Hum	27(℃)/ 53%RH
Test Item	Band Edge	Test Date	March 7, 2017
Polarize	Horizontal	Test Engineer	ED Chiang
Detector	Average	Test Voltage	120Vac / 60Hz



Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
376.096	37.88	-2.61	35.27	54.00	-18.73	AVG
2402.106	92.58	-2.41	90.17	-	-	AVG

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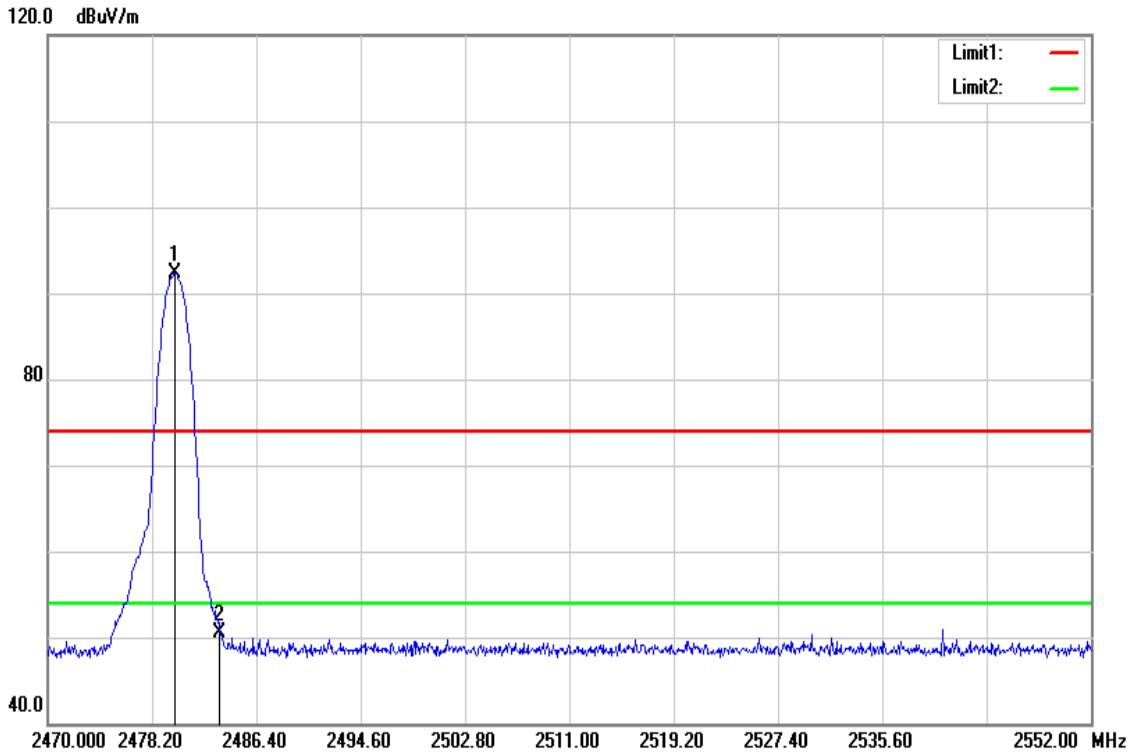
Test Mode	8DPSK_EDR-3Mbps High CH	Temp/Hum	27(℃)/ 53%RH
Test Item	Band Edge	Test Date	March 7, 2017
Polarize	Horizontal	Test Engineer	ED Chiang
Detector	Peak	Test Voltage	120Vac / 60Hz



Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
2480.004	94.34	-2.03	92.31	-	-	peak
2483.500	52.58	-1.99	50.59	74.00	-23.41	peak

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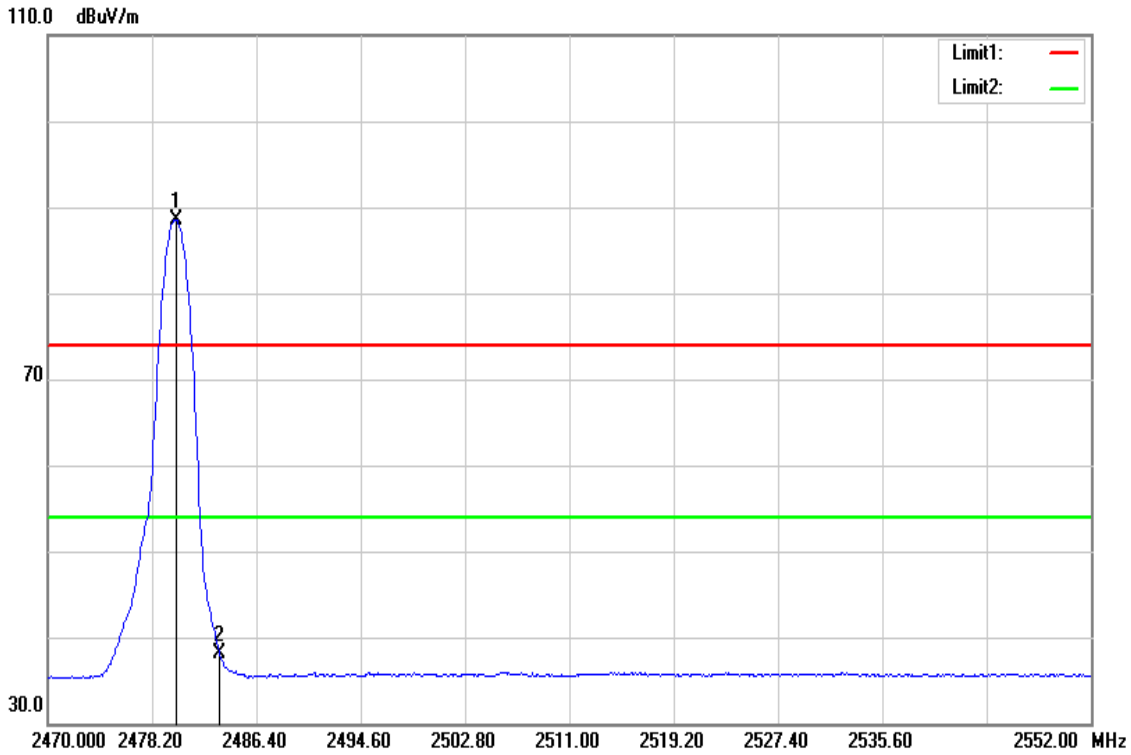
Test Mode	8DPSK_EDR-3Mbps High CH	Temp/Hum	27(℃)/ 53%RH
Test Item	Band Edge	Test Date	March 7, 2017
Polarize	Horizontal	Test Engineer	ED Chiang
Detector	Average	Test Voltage	120Vac / 60Hz



Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
480.086	90.54	-2.03	88.51	-	-	AVG
2483.500	40.07	-1.99	38.08	54.00	-15.92	AVG

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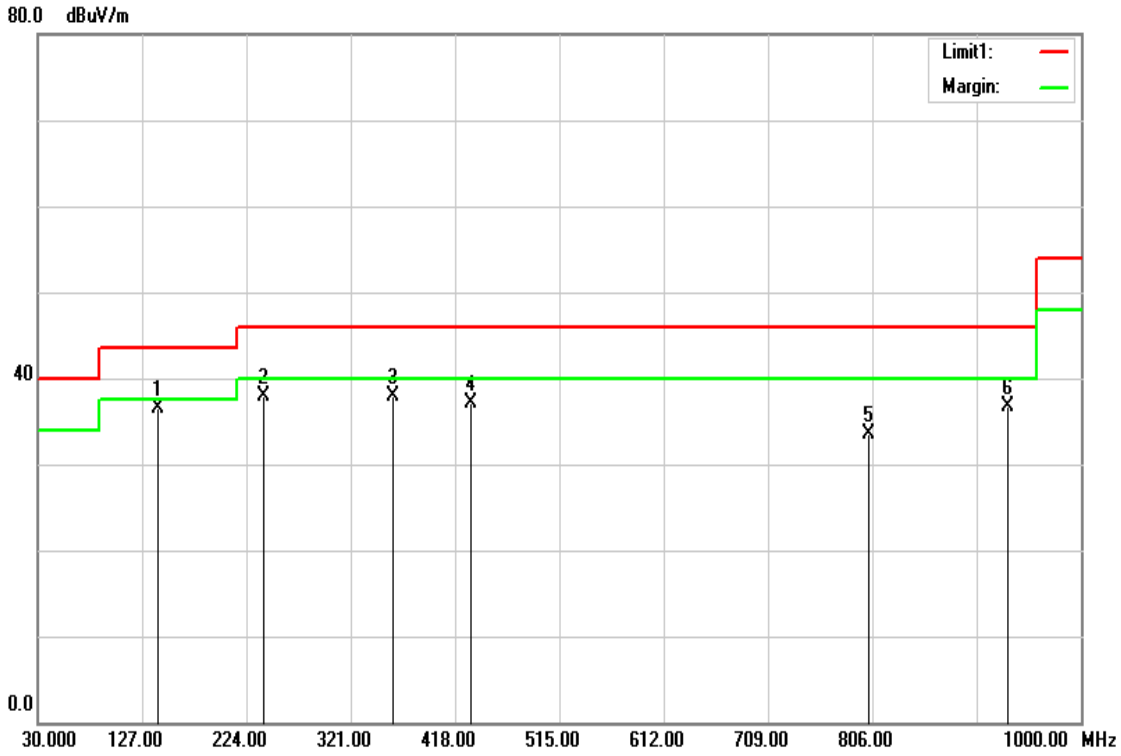
Below 1G Test Data

Test Mode	Mode 1	Temp/Hum	27(℃)/ 53%RH
Test Item	30MHz-1GHz	Test Date	March 8, 2017
Polarize	Vertical	Test Engineer	ED Chiang
Detector	Peak	Test Voltage	120Vac / 60Hz



Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
141.5500	52.31	-15.82	36.49	43.50	-7.01	peak
240.4900	54.42	-16.50	37.92	46.00	-8.08	peak
360.7700	50.57	-12.63	37.94	46.00	-8.06	peak
432.5500	47.84	-10.72	37.12	46.00	-8.88	peak
802.1200	37.95	-4.47	33.48	46.00	-12.52	peak
932.1000	39.33	-2.68	36.65	46.00	-9.35	peak

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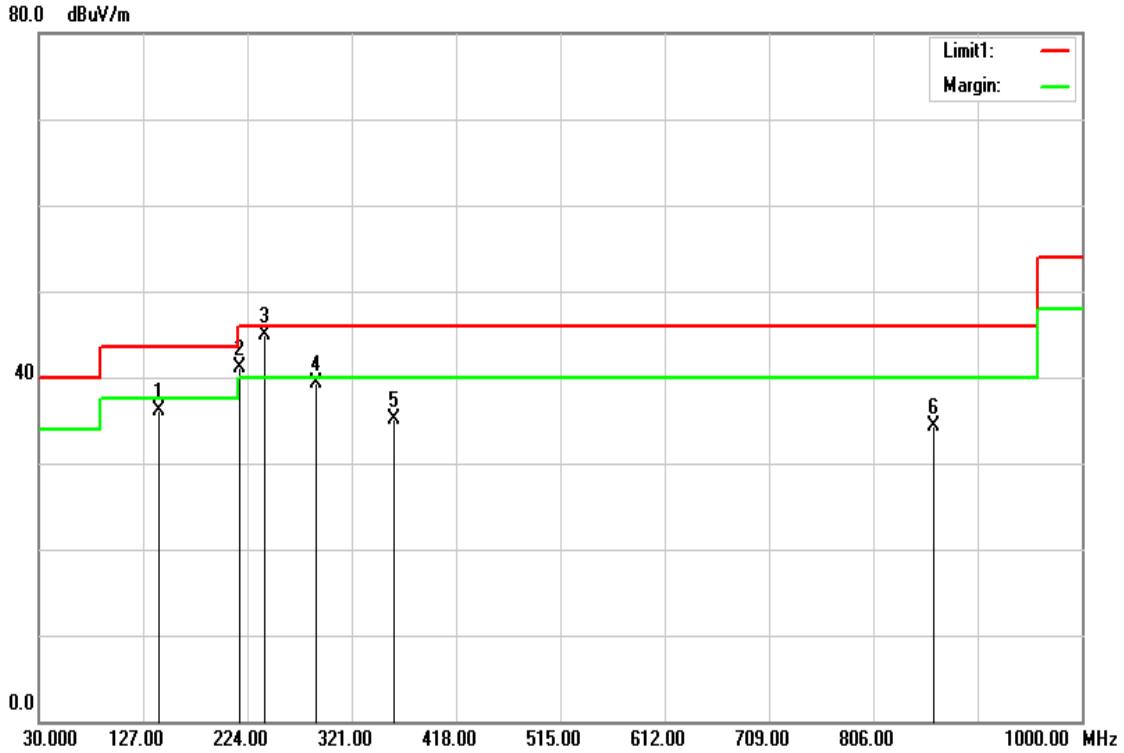
Test Mode	Mode 1	Temp/Hum	27(℃)/ 53%RH
Test Item	30MHz-1GHz	Test Date	March 8, 2017
Polarize	Horizontal	Test Engineer	ED Chiang
Detector	Peak	Test Voltage	120Vac / 60Hz



Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
141.5500	51.86	-15.82	36.04	43.50	-7.46	QP
216.2400	57.79	-16.69	41.10	46.00	-4.90	QP
240.4900	61.49	-16.50	44.99	46.00	-1.01	QP
288.0200	53.78	-14.46	39.32	46.00	-6.68	peak
359.8000	47.80	-12.66	35.14	46.00	-10.86	peak
862.2600	37.98	-3.64	34.34	46.00	-11.66	peak

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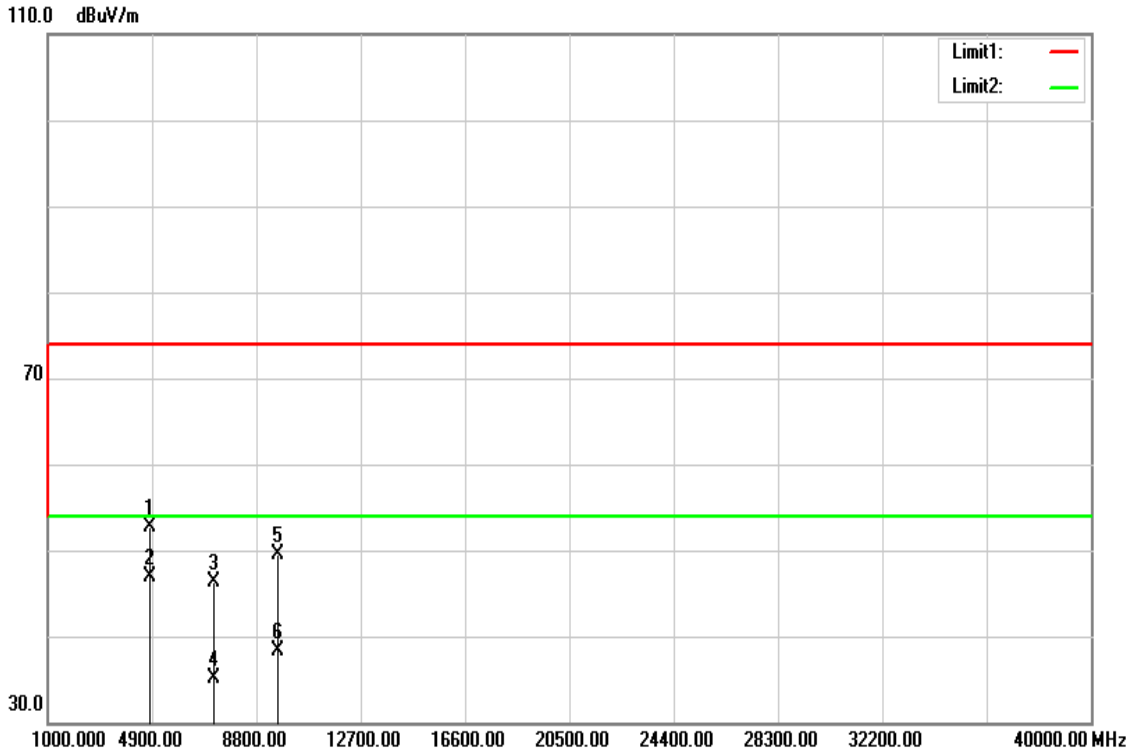
Above 1G Test Data

Test Mode	GFSK_BR-1Mbps Low CH	Temp/Hum	27(℃)/ 53%RH
Test Item	Harmonic	Test Date	March 8, 2017
Polarize	Vertical	Test Engineer	ED Chiang
Detector	Peak and Average	Test Voltage	120Vac / 60Hz



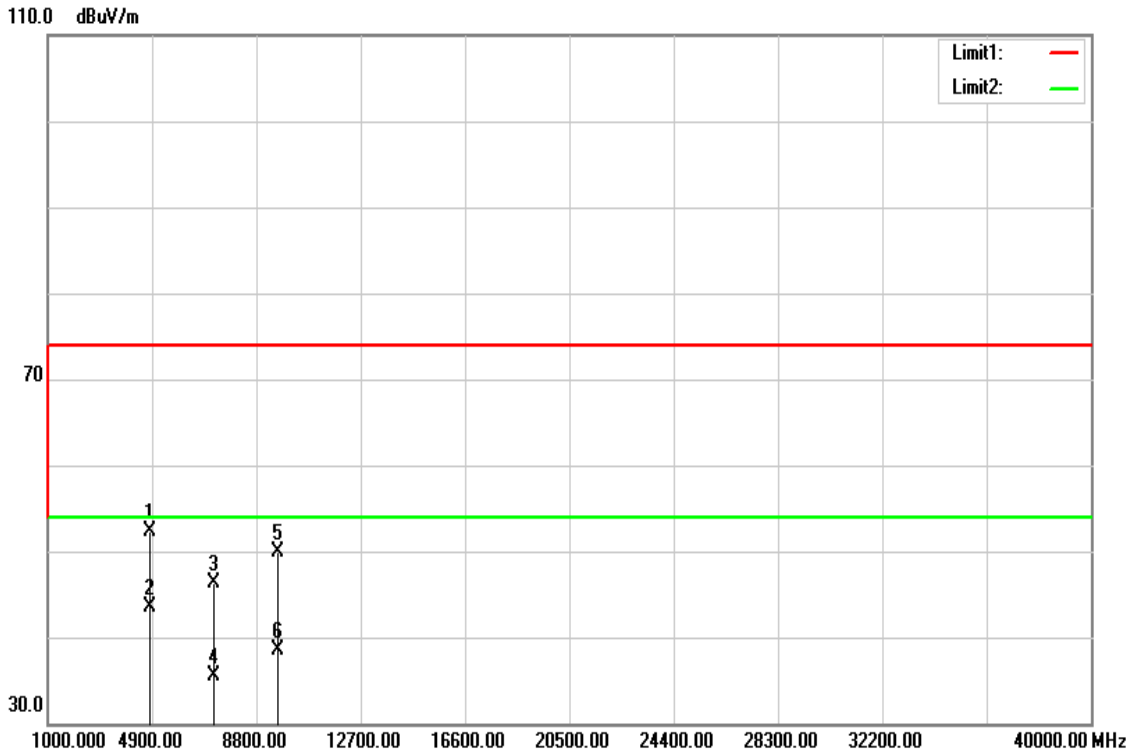
Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4806.000	47.72	5.05	52.77	74.00	-21.23	peak
4806.000	41.87	5.05	46.92	54.00	-7.08	AVG
7206.000	33.77	12.62	46.39	74.00	-27.61	peak
7206.000	22.56	12.62	35.18	54.00	-18.82	AVG
9608.000	31.90	17.60	49.50	74.00	-24.50	peak
9608.000	20.63	17.60	38.23	54.00	-15.77	AVG

Remark:

1. *Measuring frequencies from 1 GHz to 40GHz.*
2. *For above 1GHz,the EUT peak value was under average limit, therefore the Average value compliance with the average limit*

This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

Test Mode	GFSK_BR-1Mbps Low CH	Temp/Hum	27(℃)/ 53%RH
Test Item	Harmonic	Test Date	March 8, 2017
Polarize	Horizontal	Test Engineer	ED Chiang
Detector	Peak and Average	Test Voltage	120Vac / 60Hz



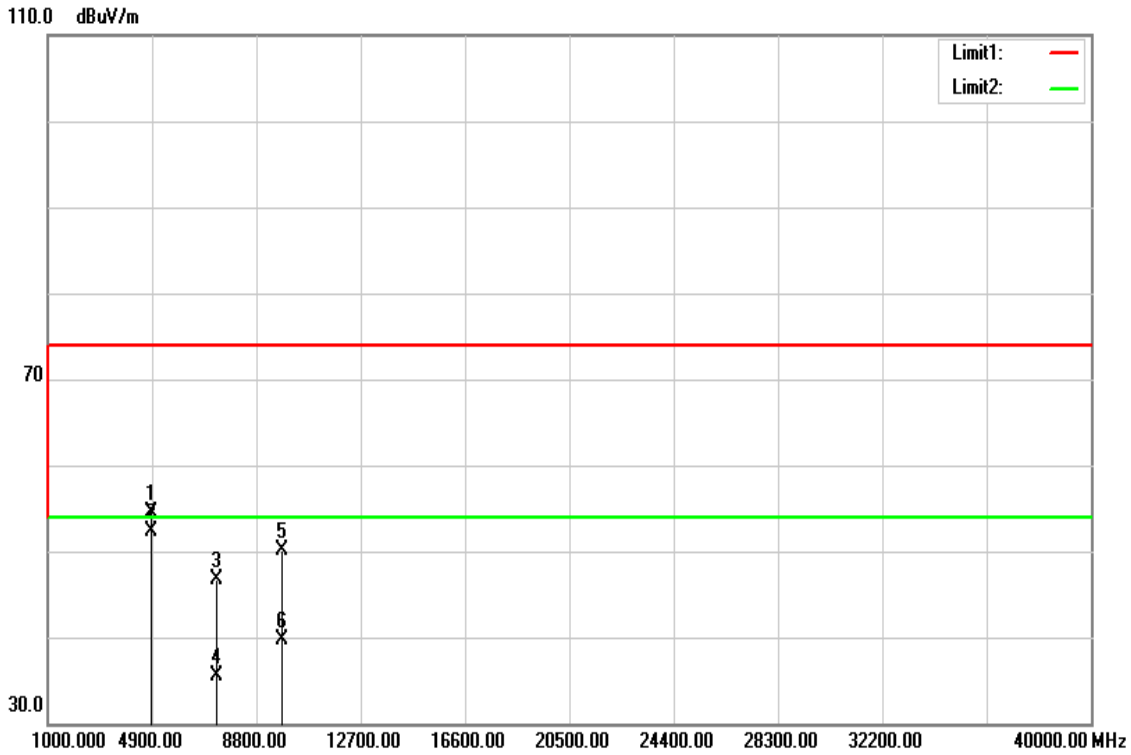
Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	emark
4806.000	47.28	5.05	52.33	74.00	-21.67	peak
4806.000	38.53	5.05	43.58	54.00	-10.42	AVG
7206.000	33.65	12.62	46.27	74.00	-27.73	peak
7206.000	22.85	12.62	35.47	54.00	-18.53	AVG
9608.000	32.23	17.60	49.83	74.00	-24.17	peak
9608.000	20.91	17.60	38.51	54.00	-15.49	AVG

Remark:

1. *Measuring frequencies from 1 GHz to 40GHz.*
2. *For above 1GHz,the EUT peak value was under average limit, therefore the Average value compliance with the average limit*

This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

Test Mode	GFSK_BR-1Mbps Mid CH	Temp/Hum	27(℃)/ 53%RH
Test Item	Harmonic	Test Date	March 8, 2017
Polarize	Vertical	Test Engineer	ED Chiang
Detector	Peak and Average	Test Voltage	120Vac / 60Hz



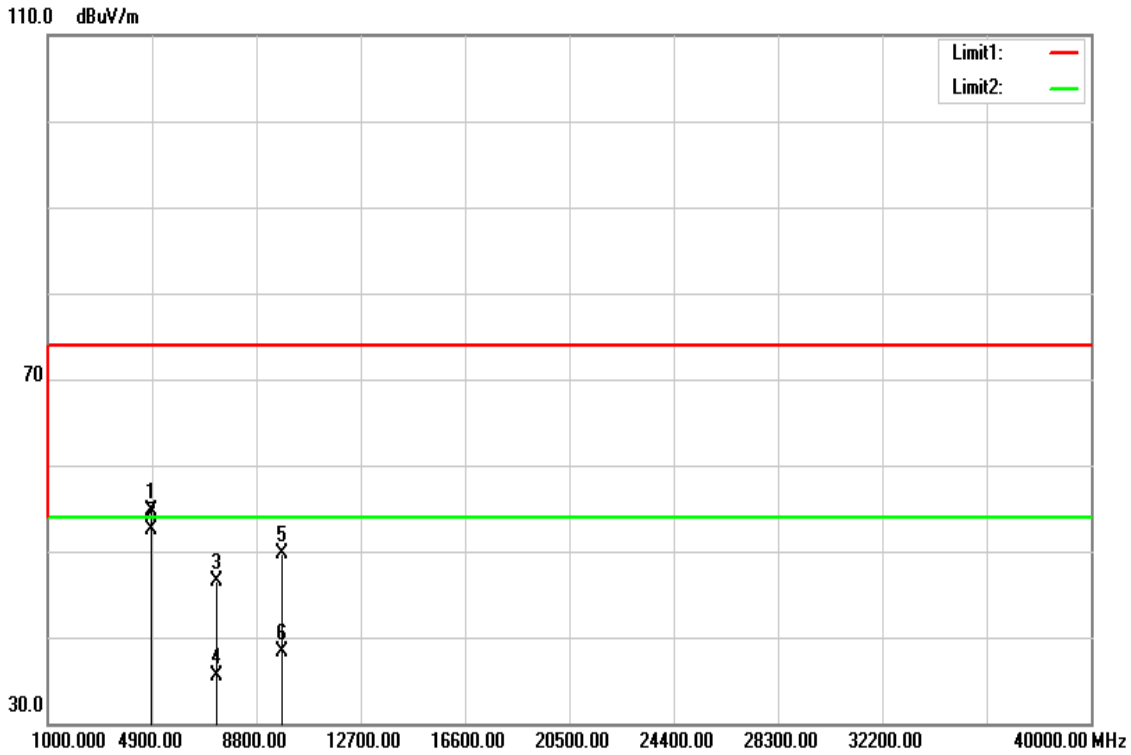
Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dB V/m)	Limit (dBuV/m)	Margin (dB)	Re ark
4883.000	49.16	5.26	54.42	74.00	-19.58	peak
4883.000	47.02	5.26	52.28	54.00	-1.72	AVG
7320.000	33.79	12.97	46.76	74.00	-27.24	peak
7320.000	22.49	12.97	35.46	54.00	-18.54	AVG
9760.000	32.42	17.60	50.02	74.00	-23.98	peak
9760.000	22.13	17.60	39.73	54.00	-14.27	AVG

Remark:

1. *Measuring frequencies from 1 GHz to 40GHz.*
2. *For above 1GHz,the EUT peak value was under average limit, therefore the Average value compliance with the average limit*

This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

Test Mode	GFSK_BR-1Mbps Mid CH	Temp/Hum	27(℃)/ 53%RH
Test Item	Harmonic	Test Date	March 8, 2017
Polarize	Horizontal	Test Engineer	ED Chiang
Detector	Peak and Average	Test Voltage	120Vac / 60Hz



Frequency (MHz)	Reading (dB V)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	emark
4883.000	49.53	5.26	54.79	74.00	-19.21	peak
4883.000	47.22	5.26	52.48	54.00	-1.52	AVG
7320.000	33.51	12.97	46.48	74.00	-27.52	peak
7320.000	22.45	12.97	35.42	54.00	-18.58	AVG
9760.000	32.07	17.60	49.67	74.00	-24.33	peak
9760.000	20.76	17.60	38.36	54.00	-15.64	AVG

Remark:

1. *Measuring frequencies from 1 GHz to 40GHz.*
2. *For above 1GHz,the EUT peak value was under average limit, therefore the Average value compliance with the average limit*

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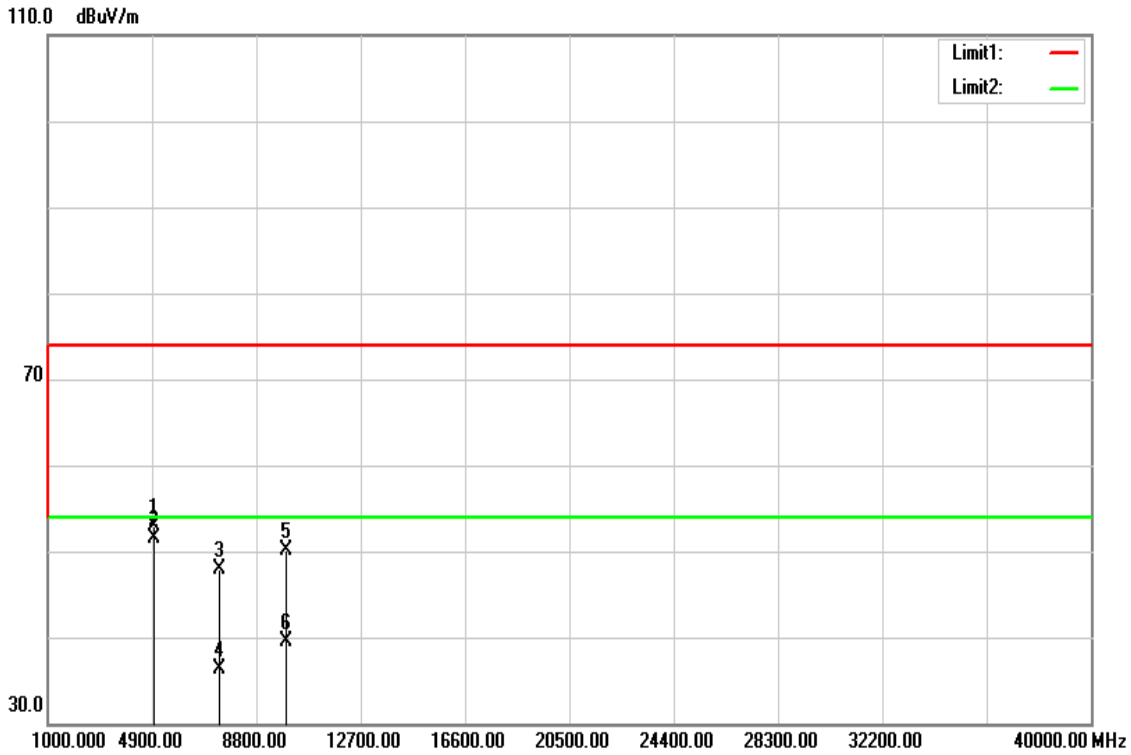
Test Mode	GFSK_BR-1Mbps High CH	Temp/Hum	27(℃)/ 53%RH
Test Item	Harmonic	Test Date	March 8, 2017
Polarize	Vertical	Test Engineer	ED Chiang
Detector	Peak and Average	Test Voltage	120Vac / 60Hz



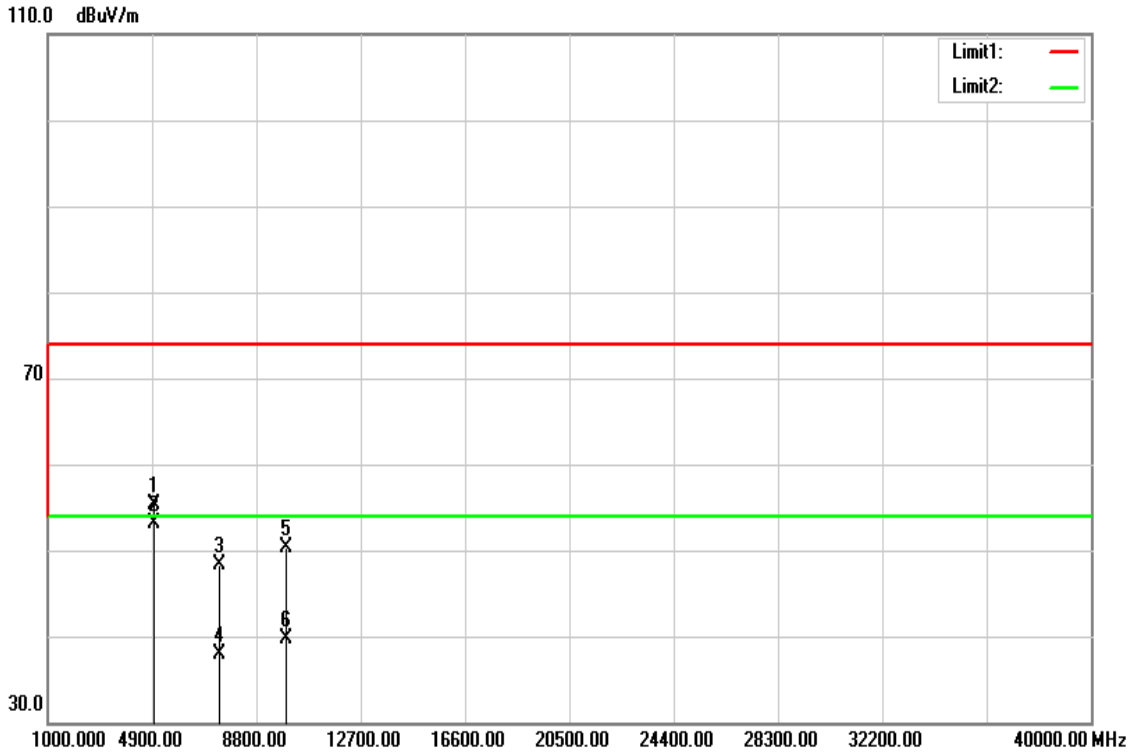
Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Re ark
4960.000	47.47	5.46	52.93	74.00	-21.07	peak
4960.000	45.95	5.46	51.41	54.00	-2.59	AVG
7440.000	34.48	13.33	47.81	74.00	-26.19	peak
7440.000	22.92	13.33	36.25	54.00	-17.75	AVG
9920.000	32.45	17.60	50.05	74.00	-23.95	peak
9920.000	21.88	17.60	39.48	54.00	-14.52	AVG

Remark:

1. *Measuring frequencies from 1 GHz to 40GHz.*
2. *For above 1GHz,the EUT peak value was under average limit, therefore the Average value compliance with the average limit*

This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

Test Mode	GFSK_BR-1Mbps High CH	Temp/Hum	27(℃)/ 53%RH
Test Item	Harmonic	Test Date	March 8, 2017
Polarize	Horizontal	Test Engineer	ED Chiang
Detector	Peak and Average	Test Voltage	120Vac / 60Hz



Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	emark
4960.000	49.84	5.46	55.30	74.00	-18.70	peak
4960.000	47.57	5.46	53.03	54.00	-0.97	AVG
7440.000	35.06	13.33	48.39	74.00	-25.61	peak
7440.000	24.55	13.33	37.88	54.00	-16.12	AVG
9920.000	32.63	17.60	50.23	74.00	-23.77	peak
9920.000	22.14	17.60	39.74	54.00	-14.26	AVG

Remark:

1. *Measuring frequencies from 1 GHz to 40GHz.*
2. *For above 1GHz,the EUT peak value was under average limit, therefore the Average value compliance with the average limit*

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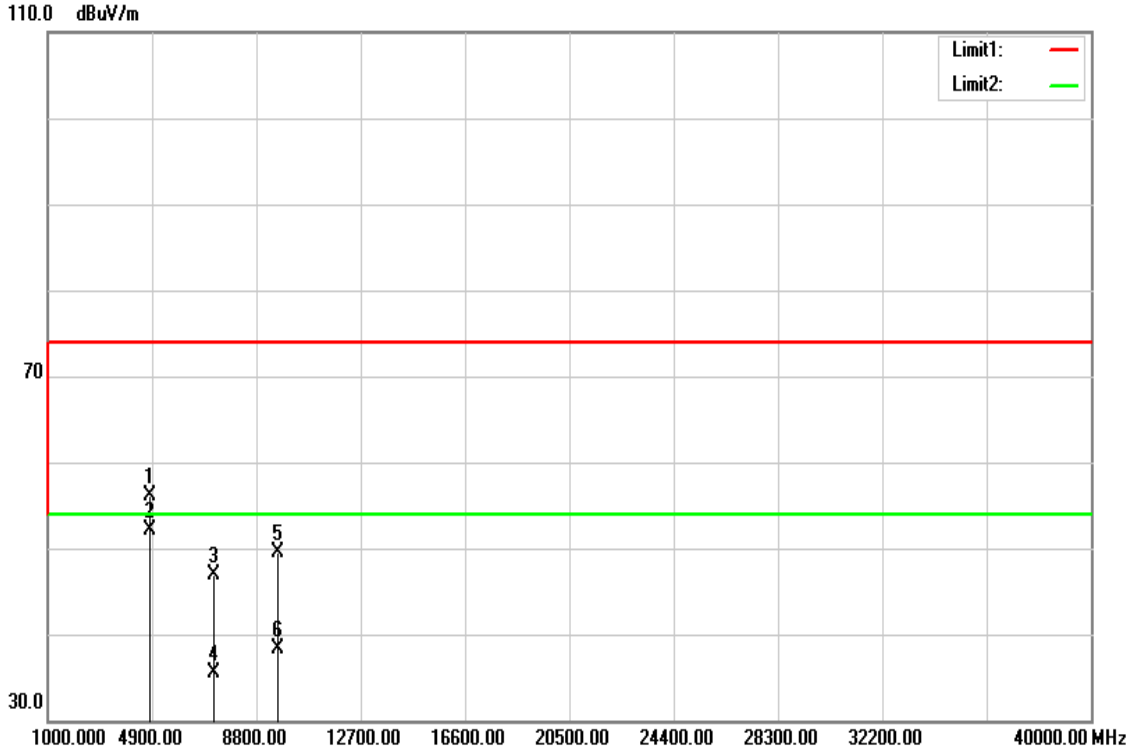
Test Mode	8DPSK_EDR-3Mbps Low CH	Temp/Hum	27(℃)/ 53%RH
Test Item	Harmonic	Test Date	March 8, 2017
Polarize	Vertical	Test Engineer	ED Chiang
Detector	Peak and Average	Test Voltage	120Vac / 60Hz



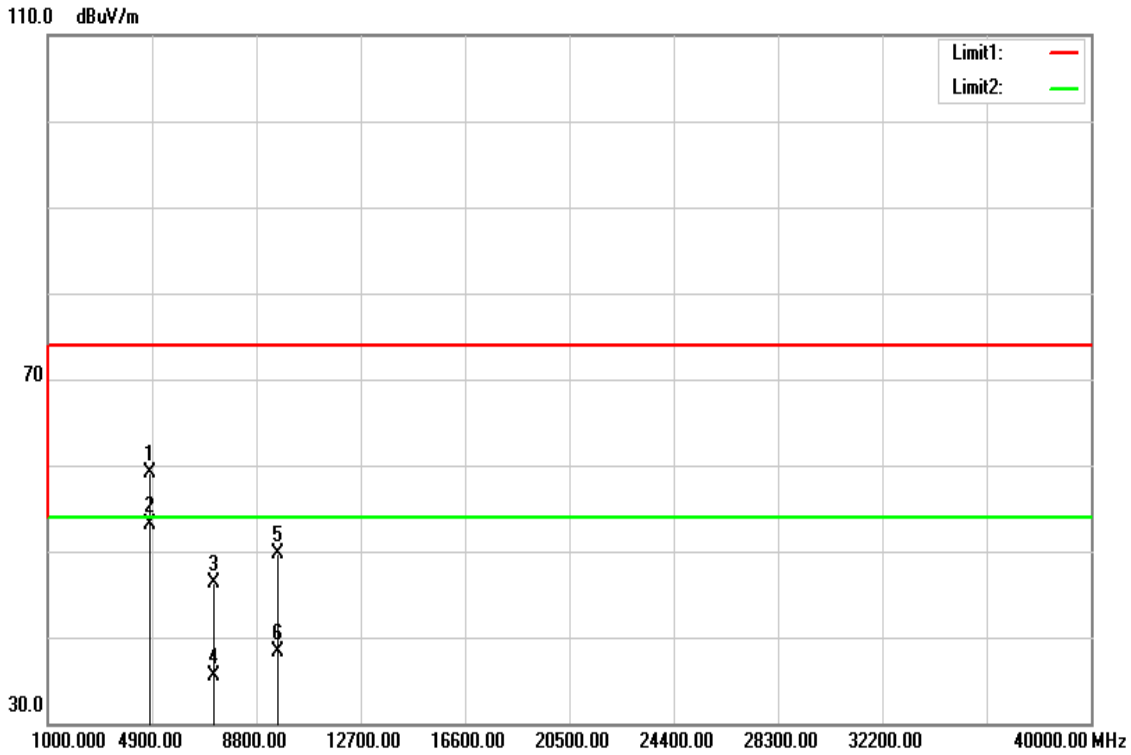
Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Re ark
4806.000	51.03	5.05	56.08	74.00	-17.92	peak
4806.000	47.03	5.05	52.08	54.00	-1.92	AVG
7206.000	34.23	12.62	46.85	74.00	-27.15	peak
7206.000	22.80	12.62	35.42	54.00	-18.58	AVG
9608.000	31.94	17.60	49.54	74.00	-24.46	peak
9608.000	20.61	17.60	38.21	54.00	-15.79	AVG

Remark:

1. *Measuring frequencies from 1 GHz to 40GHz.*
2. *For above 1GHz,the EUT peak value was under average limit, therefore the Average value compliance with the average limit*

This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

Test Mode	8DPSK_EDR-3Mbps Low CH	Temp/Hum	27(℃)/ 53%RH
Test Item	Harmonic	Test Date	March 8, 2017
Polarize	Horizontal	Test Engineer	ED Chiang
Detector	Peak and Average	Test Voltage	120Vac / 60Hz



Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	emark
4806.000	53.97	5.05	59.02	74.00	-14.98	peak
4806.000	47.99	5.05	53.04	54.00	-0.96	AVG
7206.000	33.77	12.62	46.39	74.00	-27.61	peak
7206.000	22.85	12.62	35.47	54.00	-18.53	AVG
9608.000	32.07	17.60	49.67	74.00	-24.33	peak
9608.000	20.65	17.60	38.25	54.00	-15.75	AVG

Remark:

1. *Measuring frequencies from 1 GHz to 40GHz.*
2. *For above 1GHz,the EUT peak value was under average limit, therefore the Average value compliance with the average limit*

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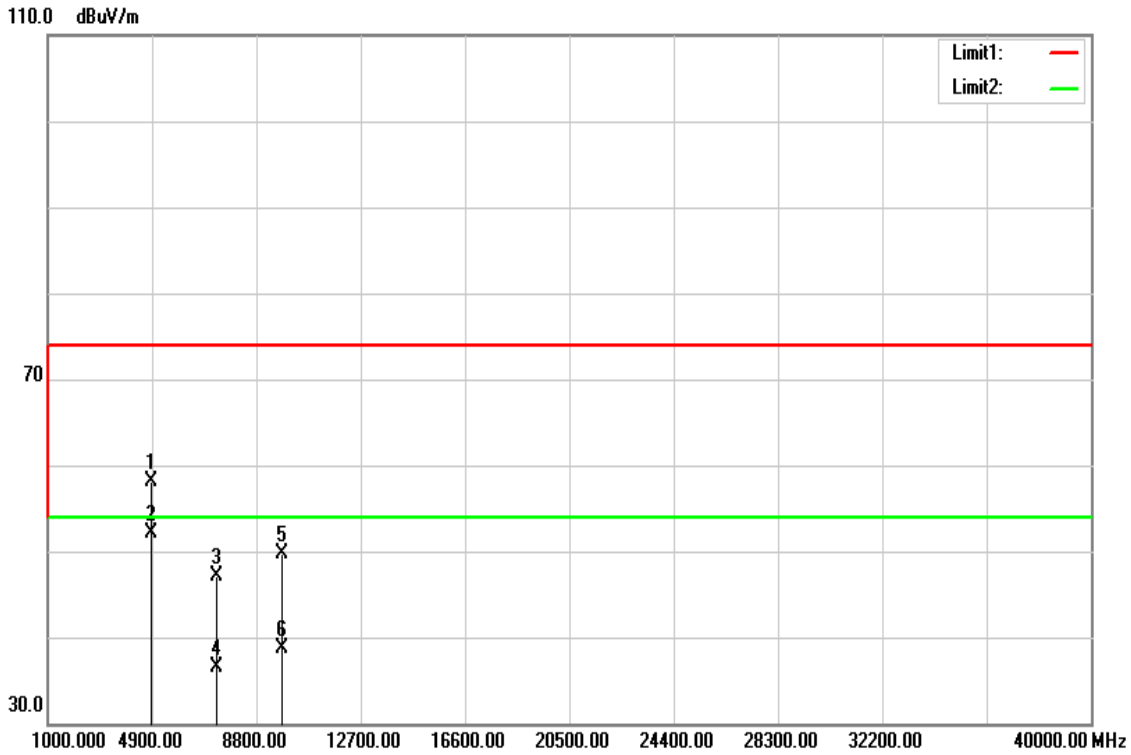
Test Mode	8DPSK_EDR-3Mbps Mid CH	Temp/Hum	27(℃)/ 53%RH
Test Item	Harmonic	Test Date	March 8, 2017
Polarize	Vertical	Test Engineer	ED Chiang
Detector	Peak and Average	Test Voltage	120Vac / 60Hz



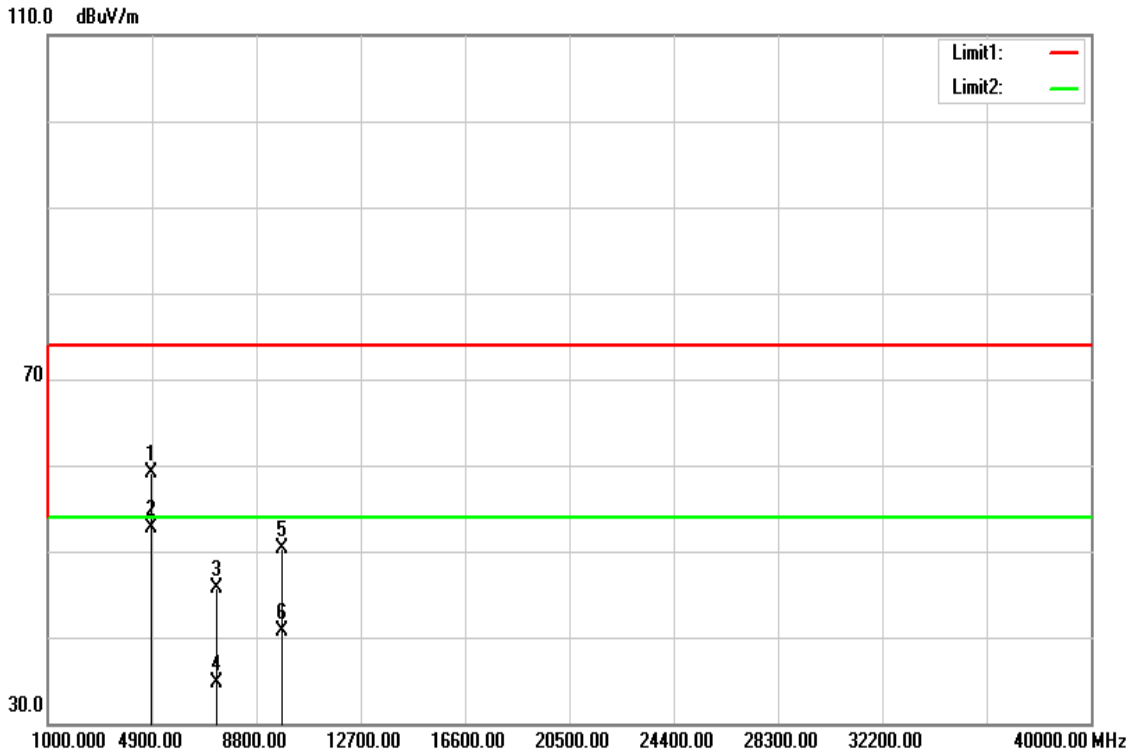
Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Re ark
4883.000	52.89	5.26	58.15	74.00	-15.85	peak
4883.000	46.93	5.26	52.19	54.00	-1.81	AVG
7320.000	34.18	12.97	47.15	74.00	-26.85	peak
7320.000	23.58	12.97	36.55	54.00	-17.45	AVG
9760.000	32.16	17.60	49.76	74.00	-24.24	peak
9760.000	21.13	17.60	38.73	54.00	-15.27	AVG

Remark:

1. *Measuring frequencies from 1 GHz to 40GHz.*
2. *For above 1GHz,the EUT peak value was under average limit, therefore the Average value compliance with the average limit*

This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

Test Mode	8DPSK_EDR-3Mbps Mid CH	Temp/Hum	27(℃)/ 53%RH
Test Item	Harmonic	Test Date	March 8, 2017
Polarize	Horizontal	Test Engineer	ED Chiang
Detector	Peak and Average	Test Voltage	120Vac / 60Hz



Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	emark
4883.000	53.84	5.26	59.10	74.00	-14.90	peak
4883.000	47.47	5.26	52.73	54.00	-1.27	AVG
7320.000	32.80	12.97	45.77	74.00	-28.23	peak
7320.000	21.71	12.97	34.68	54.00	-19.32	AVG
9760.000	32.66	17.60	50.26	74.00	-23.74	peak
9760.000	23.19	17.60	40.79	54.00	-13.21	AVG

Remark:

1. *Measuring frequencies from 1 GHz to 40GHz.*
2. *For above 1GHz,the EUT peak value was under average limit, therefore the Average value compliance with the average limit*

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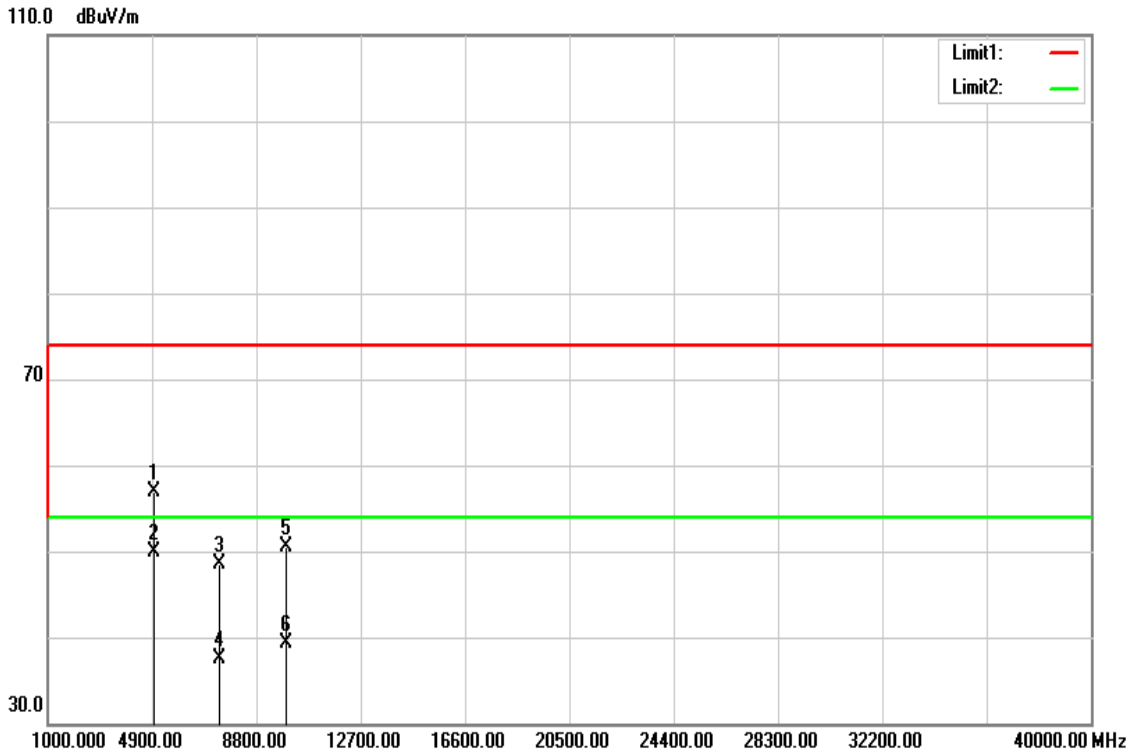
Test Mode	8DPSK_EDR-3Mbps High CH	Temp/Hum	27(℃)/ 53%RH
Test Item	Harmonic	Test Date	March 8, 2017
Polarize	Vertical	Test Engineer	ED Chiang
Detector	Peak and Average	Test Voltage	120Vac / 60Hz



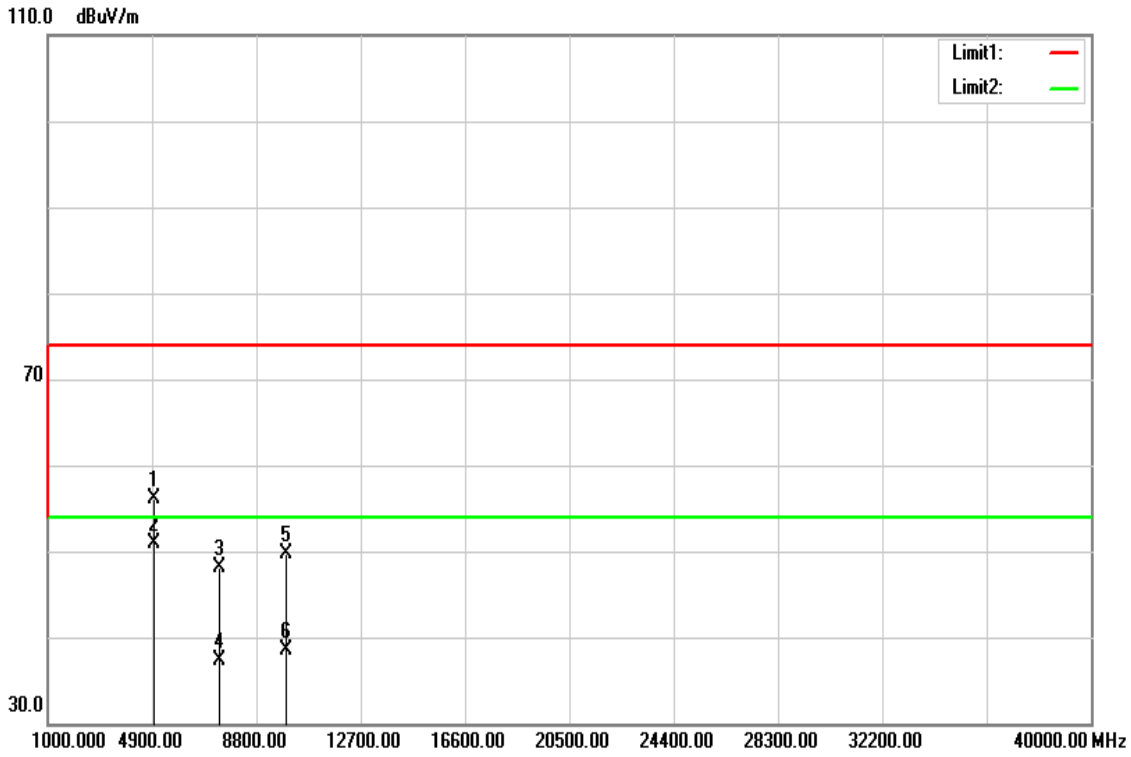
Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (BuV/m)	Limit (dBuV/m)	Margin (dB)	Re ark
4960.000	51.38	5.46	56.84	74.00	-17.16	peak
4960.000	44.35	5.46	49.81	54.00	-4.19	AVG
7440.000	35.16	13.33	48.49	74.00	-25.51	peak
7440.000	24.15	13.33	37.48	54.00	-16.52	AVG
9920.000	32.95	17.60	50.55	74.00	-23.45	peak
9920.000	21.79	17.60	39.39	54.00	-14.61	AVG

Remark:

1. *Measuring frequencies from 1 GHz to 40GHz.*
2. *For above 1GHz,the EUT peak value was under average limit, therefore the Average value compliance with the average limit*

This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

Test Mode	8DPSK_EDR-3Mbps High CH	Temp/Hum	27(℃)/ 53%RH
Test Item	Harmonic	Test Date	March 8, 2017
Polarize	Horizontal	Test Engineer	ED Chiang
Detector	Peak and Average	Test Voltage	120Vac / 60Hz



Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	emark
4960.000	50.55	5.46	56.01	74.00	-17.99	peak
4960.000	45.37	5.46	50.83	54.00	-3.17	AVG
7440.000	34.78	13.33	48.11	74.00	-25.89	peak
7440.000	24.06	13.33	37.39	54.00	-16.61	AVG
9920.000	32.03	17.60	49.63	74.00	-24.37	peak
9920.000	20.84	17.60	38.44	54.00	-15.56	AVG

Remark:

1. *Measuring frequencies from 1 GHz to 40GHz.*
2. *For above 1GHz,the EUT peak value was under average limit, therefore the Average value compliance with the average limit*

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