RADIO TEST REPORT
FCC 47 CFR PART 15 SUBPART C

Test Standard	**FCC Part 15.247**
FCC ID	**M82-TREK734LTE**
Product name	**Computer**
Brand Name	**ADVANTECH**
Model Name	**TREK-734**
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 Compliance Certification Services Inc.(Wugu Laboratory)

Testing Laboratory
1309

Approved by:

Sam Chuang
Manager

Tested by:

Jerry Chuang
Engineer

Revision History

Rev.	Issue Date	Revisions	Revised By
00	November 16, 2017	Initial Issue	Allison Chen

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1. GENERAL INFORMATION

1.1 EUT INFORMATION

Applicant	Advantech Co.Ltd. No.1, Alley 20, Lane 26, Rueiguang Road, Neihu District, Taipei 114, Taiwan, R.O.C.
Manufacturer	Advantech Co.Ltd. No.1, Alley 20, Lane 26, Rueiguang Road, Neihu District, Taipei 114, Taiwan, R.O.C.
Equipment	Computer
Model No.	TREK-734
Model Discrepancy	N/A
Received Date	October 23, 2017
Date of Test	November 10 ~ November 13, 2017
Output Power(W)	GFSK : 0.0059 8DPSK :0.0036
Power Supply	Power tested: DC 12V I/P: 9~32Vdc, 10A Max

1.2 EUT CHANNEL INFORMATION

Frequency Range	2402MHz-2480MHz
Modulation Type	1. GFSK for BR-1Mbps 2. 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 Type	☐ PIFA ☐ PCB ☒ Dipole ☐ Coils
Antenna Gain	Gain: -0.61dBi

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.

1.5 FACILITIES AND TEST LOCATION

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

No.11, Wugong 6th Rd., Wugu Dist., New Taipei City 24891, Taiwan. (R.O.C.)

Test site	Test Engineer	Remark
AC Conduction Room	--	*Not applicable, because EUT not connect to AC Main Source direct.*
Radiation	Jerry Chuang	
RF Conducted	Eric Lee	

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					
Equipment	**Manufacturer**	**Model**	**S/N**	**Cal Date**	**Cal Due**
Power Meter	Anritsu	ML2495A	1012009	07/03/2017	07/02/2018
Power Sensor	Anritsu	MA2411B	917072	07/03/2017	07/02/2018
Spectrum Analyzer	R&S	FSV 40	101073	10/02/2017	10/01/2018

3M 966 Chamber Test Site					
Equipment	**Manufacturer**	**Model**	**S/N**	**Cal Date**	**Cal Due**
Bilog Antenna	Sunol Sciences	JB3	A030105	06/20/2017	06/19/2018
Horn Antenna	EMCO	3117	00055165	02/20/2017	02/19/2018
Pre-Amplifier	EMCI	EMC 012635	980151	08/01/2017	07/31/2018
Pre-Amplifier	EMEC	EM330	060609	06/07/2017	06/06/2018
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

Remark: *Each piece of equipment is scheduled for calibration once a year.*

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 supply	Motech	N/A	N/A	N/A

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, Part 15.205, Part 15.207, Part 15.209.

2. TEST SUMMERY

FCC Standard Section	Report Section	Test Item	Result
15.203	1.2	Antenna Requirement	Pass
15.207(a)	4.1	AC Conducted Emission	-
15.247(a)(1)	4.2	20 dB Bandwidth	Pass
-	4.2	Occupied Bandwidth (99%)	Pass
15.247(b)(1)	4.3	Output Power Measurement	Pass
15.247(a)(1)	4.4	Frequency Separation	Pass
15.247(a)(1)(iii)	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(a)(1)(iii)	4.7	Time of Occupancy	Pass
15.247(d)	4.8	Radiation Band Edge	Pass
15.247(d)	4.8	Radiation Spurious Emission	Pass

3. DESCRIPTION OF TEST MODES

3.1 THE WORST MODE OF OPERATING CONDITION

Operation mode	GFSK for BR-1Mbps (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 **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.

3.2 THE WORST MODE OF MEASUREMENT

Radiated Emission Measurement Above 1G	
Test Condition	**Band edge, Emission for Unwanted and Fundamental**
Voltage/Hz	**DC 12V**
Test Mode	**Mode 1:EUT power by Battery.**
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

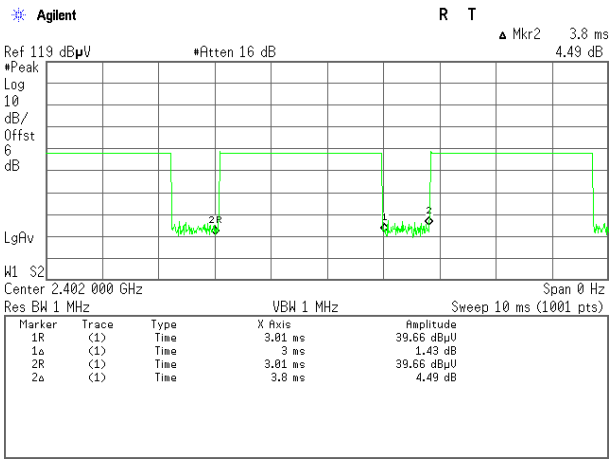
Radiated Emission Measurement Below 1G	
Test Condition	**Radiated Emission Below 1G**
Voltage/Hz	**DC 12V**
Test Mode	**Mode 1:EUT power by Battery.**
Worst Mode	☒ Mode 1 ☐ Mode 2 ☐ Mode 3 ☐ Mode 4

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(Y-Plane and Vertical) were recorded in this report
3. For below 1G, AC power line conducted emission and radiation emission were performed the EUT transmit at the highest output power channel as worse case.

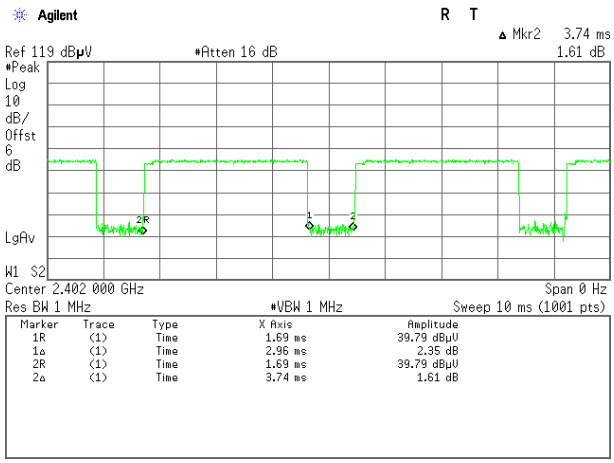
3.3 EUT DUTY CYCLE

Duty Cycle				
Configuration	TX ON (ms)	TX ALL (ms)	Duty Cycle (%)	Duty Factor(dB)
BR-1Mbps	2.9500	3.7600	78.46%	1.05
EDR-3Mbps	2.9600	3.4700	85.30%	0.69

BR-1Mbps



EDR-3Mbps



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

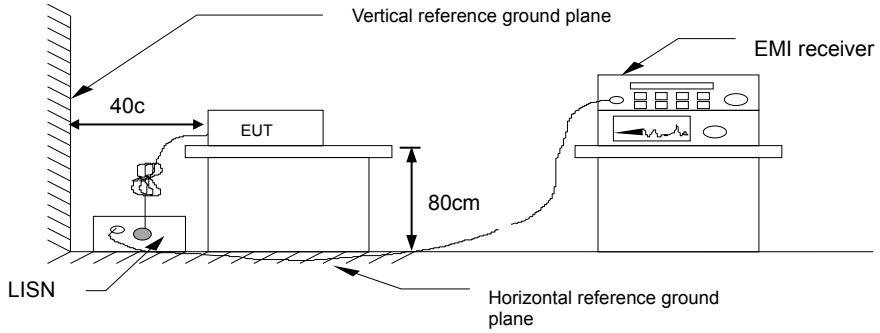
* Decreases with the logarithm of the frequency.

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

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

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.

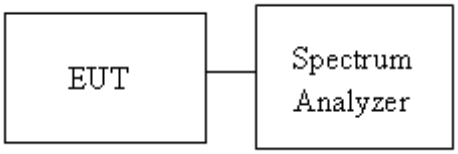
Occupied Bandwidth(99%) ：For reporting purposes only.

4.2.2 Test Procedure

Test method Refer as ANSI 63.10:2013 clause 6.9.2 & 6.9.3.

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

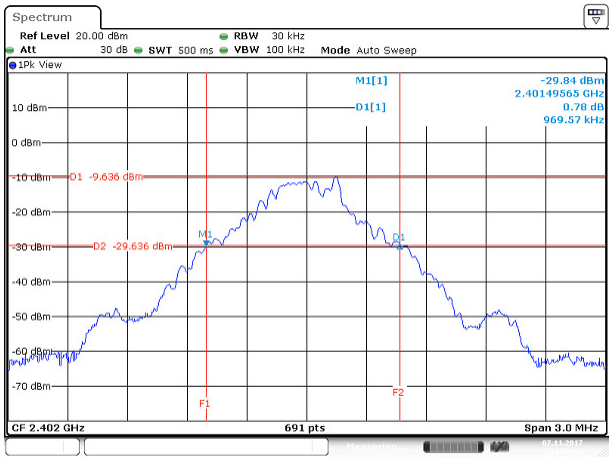
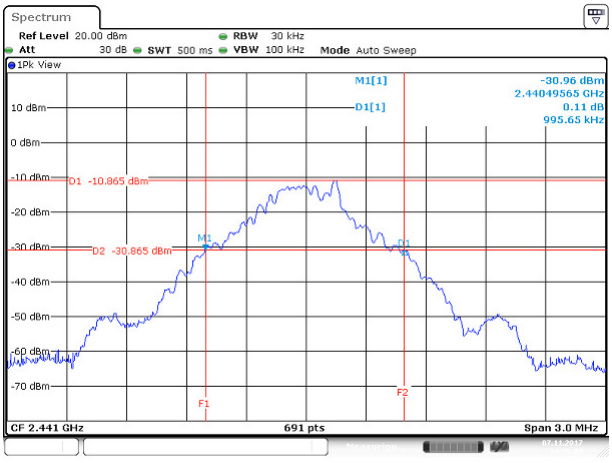
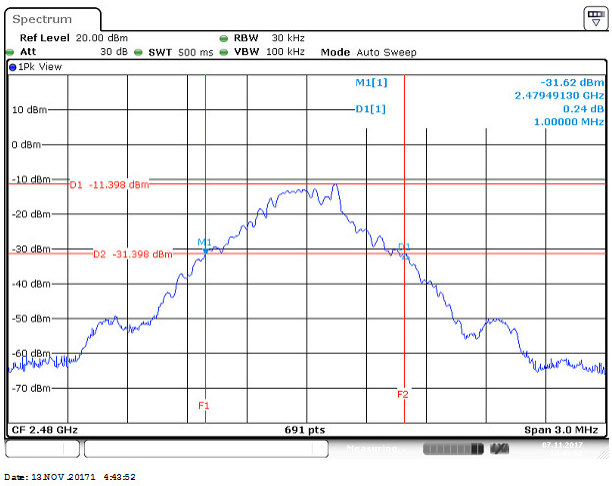


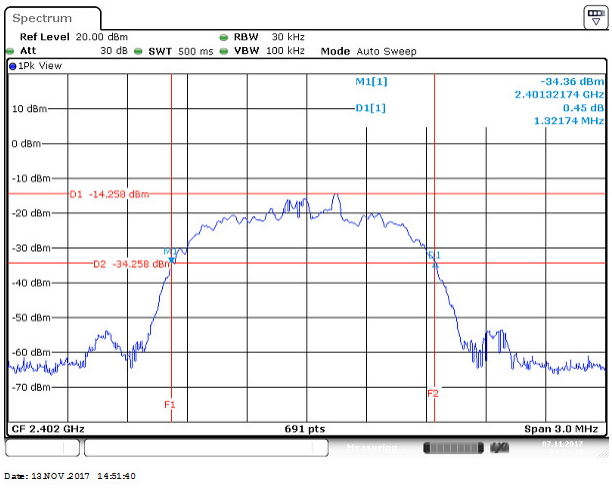
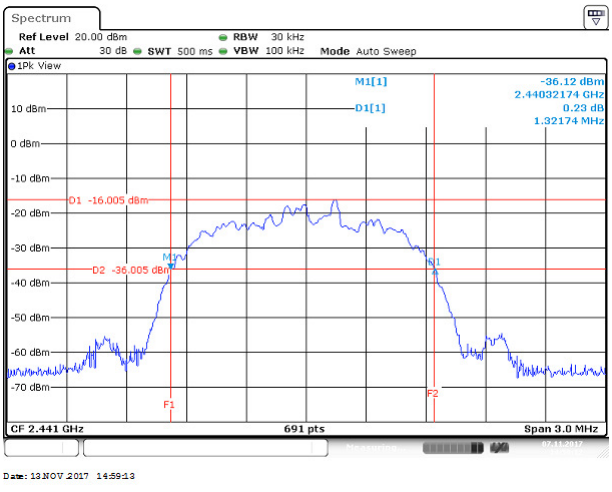
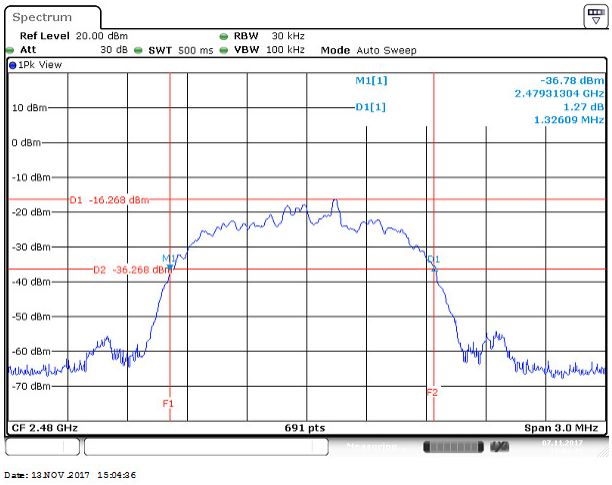
4.2.4 Test Result

Test mode: GFSK_BR-1Mbps mode / 2402-2480 MHz			
Channel	**Frequency (MHz)**	**OBW(99%) (MHz)**	**20dB BW (MHz)**
Low	2402	0.8989	0.9690
Mid	2441	0.9030	0.9950
High	2480	0.8986	1.0000

Test mode: 8DPSK_EDR-3Mbps mode / 2402-2480 MHz			
Channel	**Frequency (MHz)**	**OBW(99%) (MHz)**	**20dB BW (MHz)**
Low	2402	1.2026	1.3210
Mid	2441	1.2069	1.3210
High	2480	1.2112	1.3260

Test Data

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

8DPSK_EDR-3Mbps mode	
Low CH	**Mid CH**
	
High CH	
	

4.3 OUTPUT POWER MEASUREMENT

4.3.1 Test Limit

According to §15.247(b)(1)

Peak output power：

FCC

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.

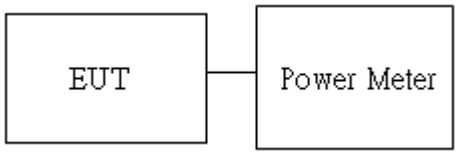
Limit	☒ Antenna not exceed 6 dBi：21dBm ☐ Antenna with DG greater than 6 dBi：21dBm [Limit = 30 – (DG – 6)]

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



4.3.4 Test Result

Peak output power：

BT					
Config.	CH	Freq. (MHz)	PK Power (dBm)	PK Power (W)	Limit (dBm)
GFSK BR-1Mbps (DH5)	0	2402	7.68	0.0059	21
	39	2441	7.66	0.0058	
	78	2480	7.7	0.0059	
8DPSK EDR-3Mbps (DH5)	0	2402	5.61	0.0036	
	39	2441	5.14	0.0033	
	78	2480	4.78	0.0030	

Average output power：

BT			
Config.	CH	Freq. (MHz)	AV Power (dBm)
GFSK BR-1Mbps (DH5)	0	2402	7.61
	39	2441	7.56
	78	2480	7.61
8DPSK EDR-3Mbps (DH5)	0	2402	4.57
	39	2441	3.93
	78	2480	3.74

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.

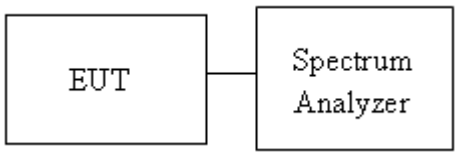
Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than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



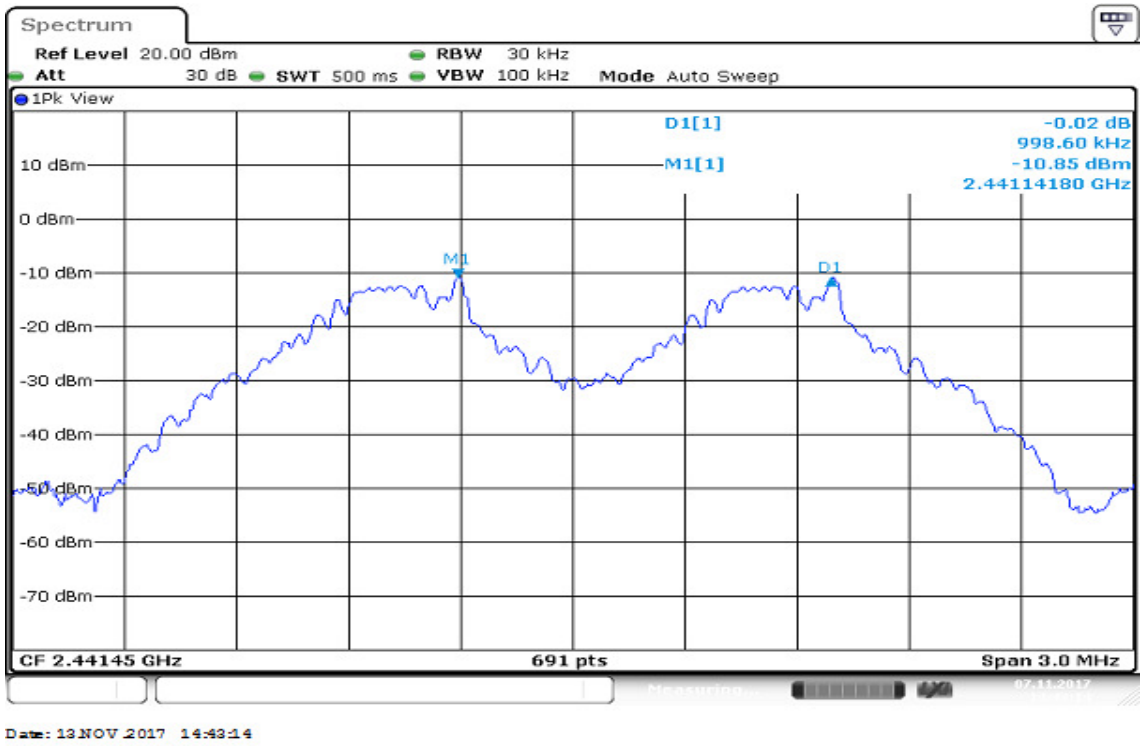
4.4.4 Test Result

Test mode: GFSK_BR-1Mbps mode / 2402-2480 MHz				
Channel	**Frequency (MHz)**	**Channel Separation (MHz)**	**Channel Separation Limits (MHz)**	**Result**
Low	2402	0.9986	0.646	PASS
Mid	2441	0.9986	0.663	PASS
High	2480	0.9986	0.667	PASS

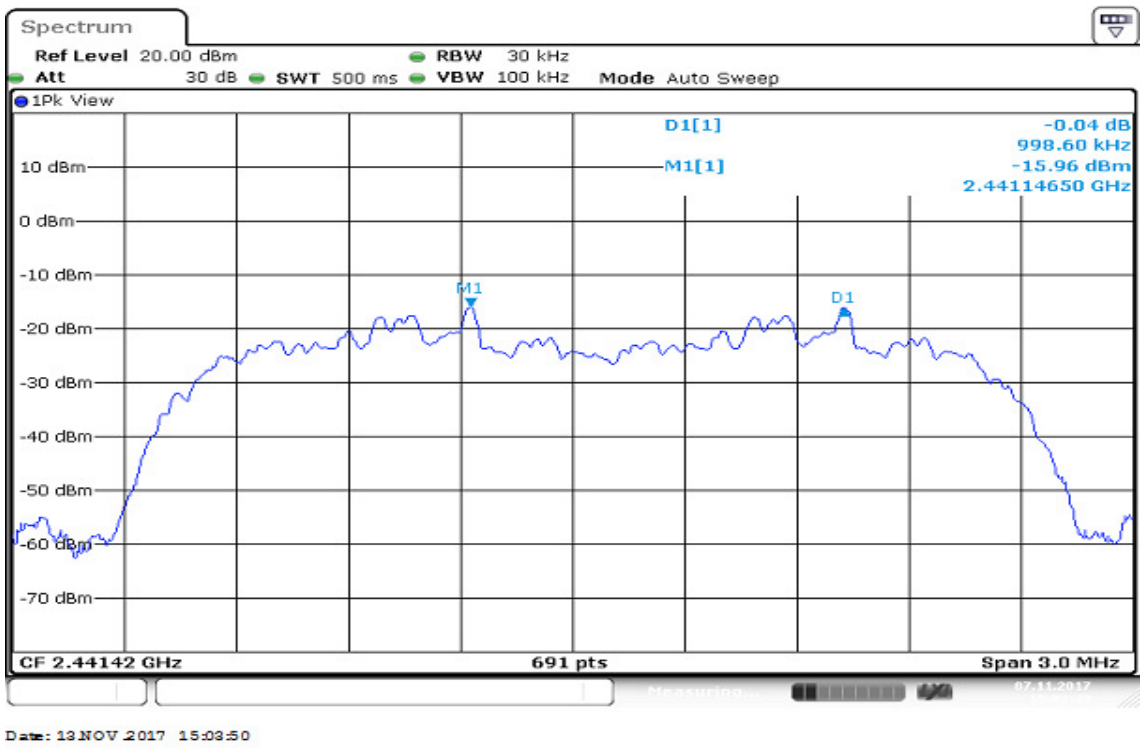
Test mode: 8DPSK_EDR-3Mbps mode / 2402-2480 MHz				
Channel	**Frequency (MHz)**	**Channel Separation (MHz)**	**Channel Separation Limits (MHz)**	**Result**
Low	2402	0.9986	0.881	PASS
Mid	2441	0.9986	0.881	PASS
High	2480	0.9986	0.884	PASS

Test Data

GFSK_BR-1Mbps mode



8DPSK_EDR-3Mbps mode



4.5 NUMBER OF HOPPING

4.5.1 Test Limit

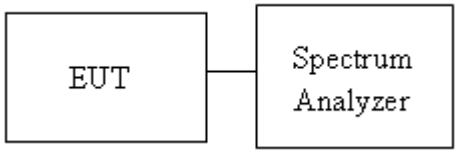
According to §15.247(a)(1)(iii),

Frequency hopping system in the 2400-2483.5MHz band shall use at least 15 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.
4. Max hold, view and count how many channel in the band.

4.5.3 Test Setup



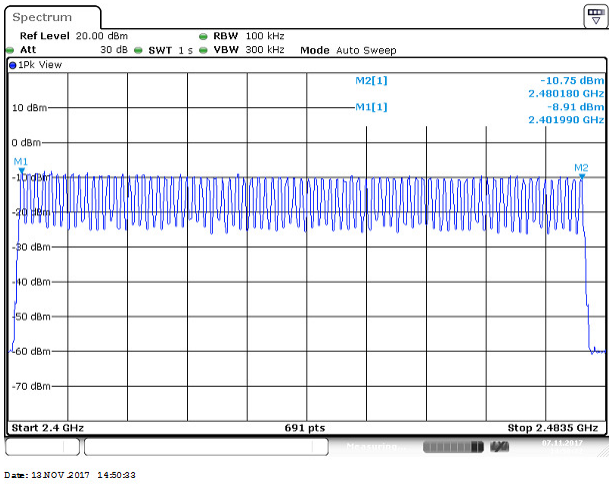
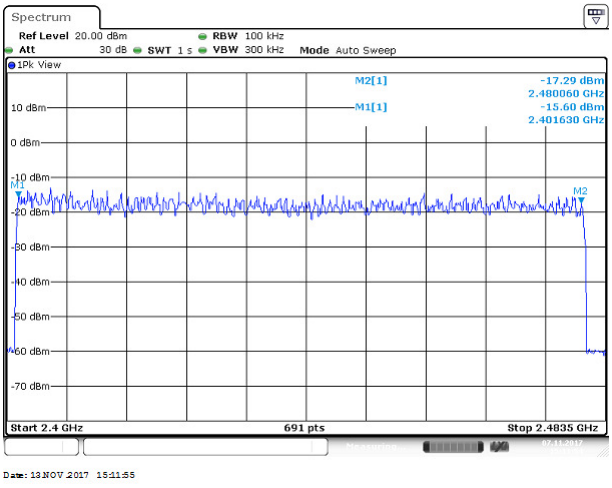
4.5.4 Test Result

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

Test Data

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

4.6 CONDUCTED BANDEDGE AND SPURIOUS EMISSION

4.6.1 Test Limit

According to §15.247(d) and RSS-247 section 5.5

Limit	-20 dBc

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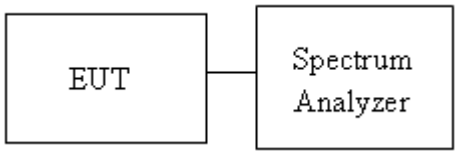
4.6.2 Test Procedure

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.

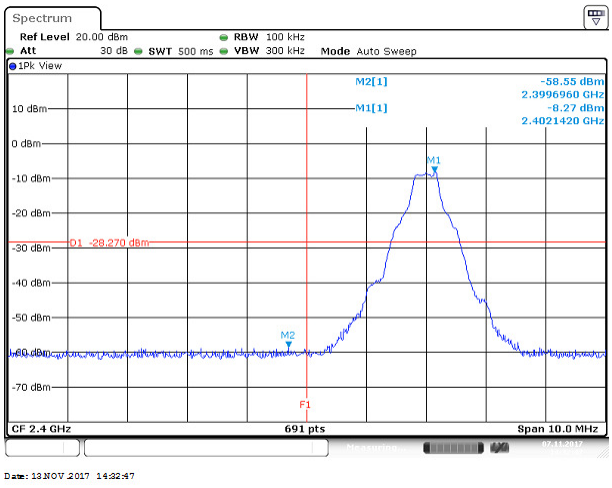
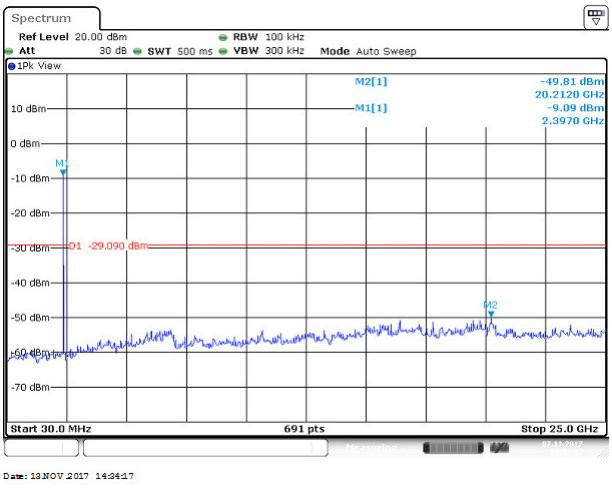
3. The Band Edge at 2.4GHz and 2.4835GHz are investigated with normal hopping mode.

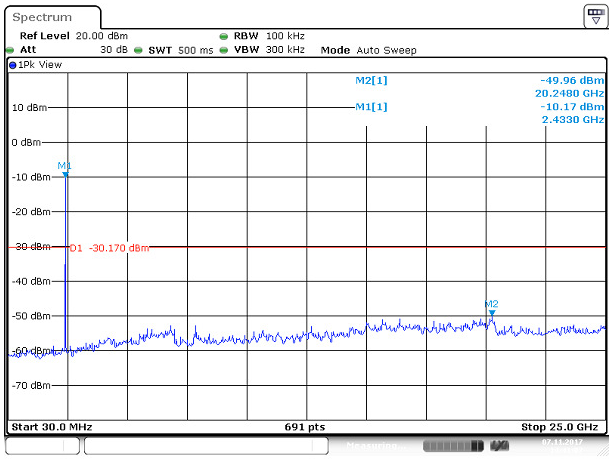
4.6.3 Test Setup

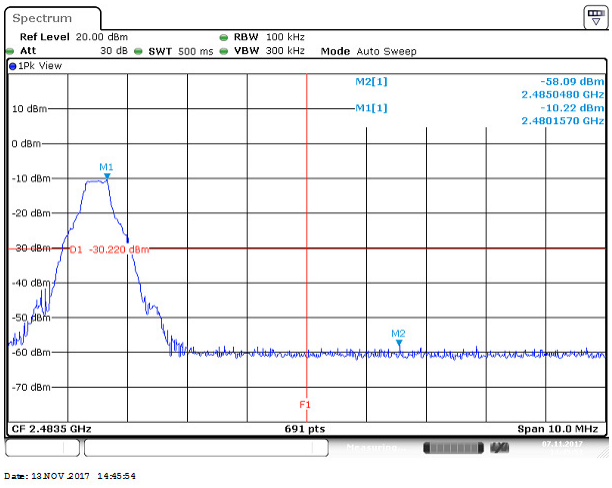
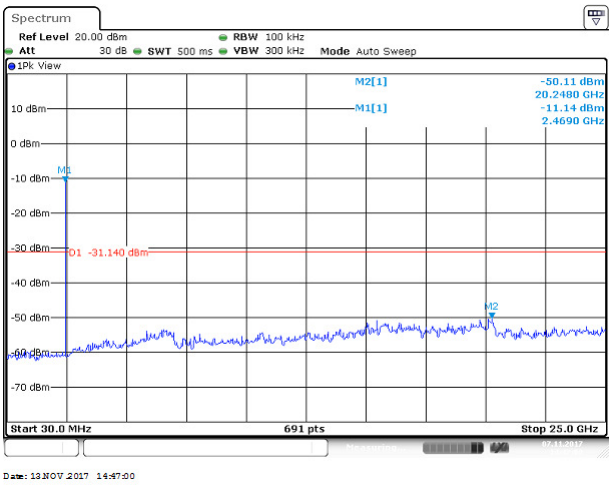


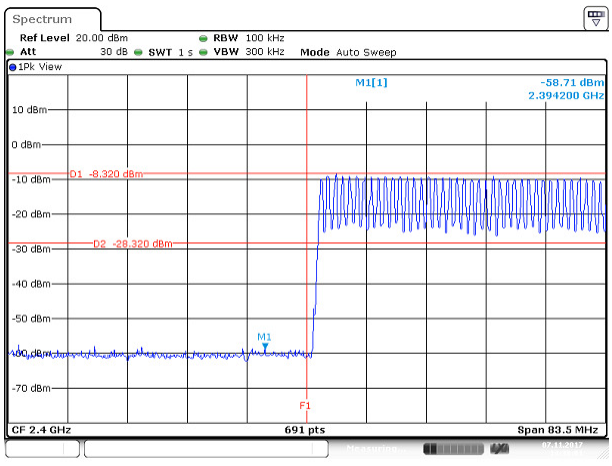
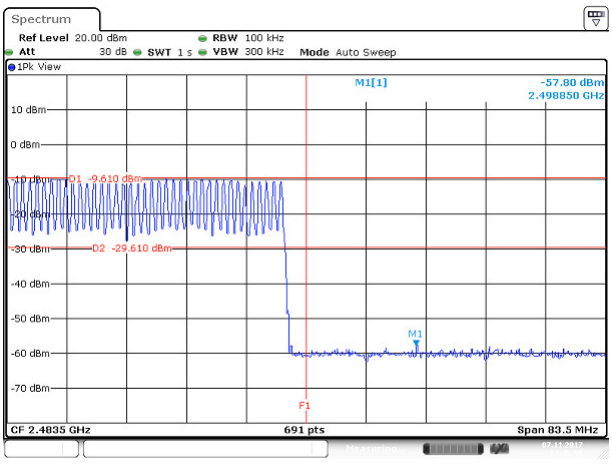
4.6.4 Test Result

Test Data

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

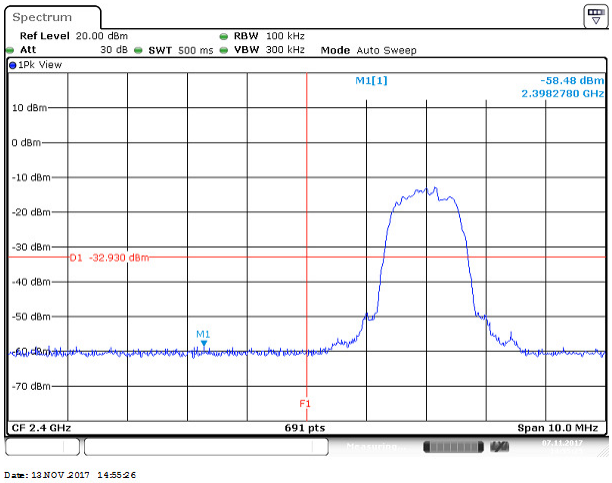
GFSK_BR-1Mbps mode Mid CH
Spurious Emission 30MHz-25GHz


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

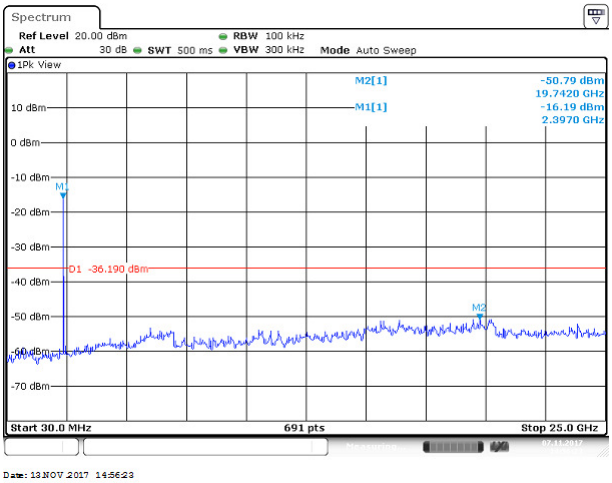
GFSK_BR-1Mbps Hopping mode	
Low Band Edge	**High Band Edge**
	

8DPSK_EDR-3Mbps mode Low CH

Band Edge

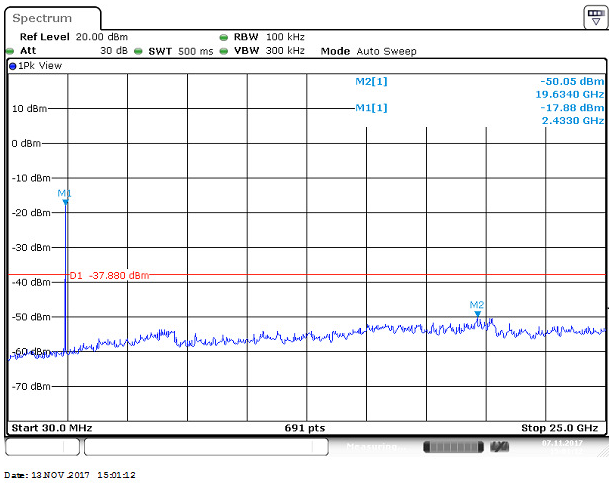


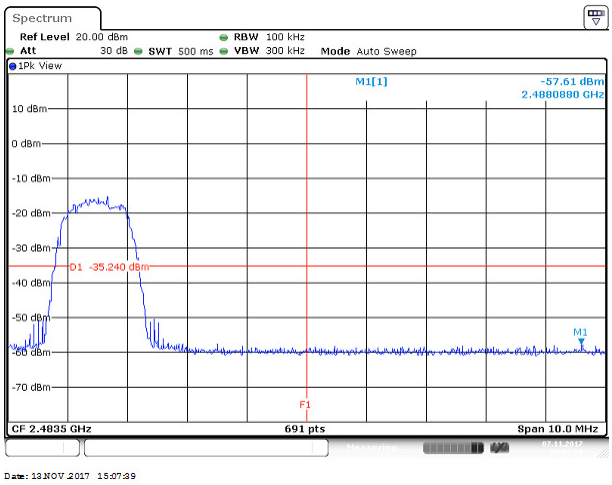
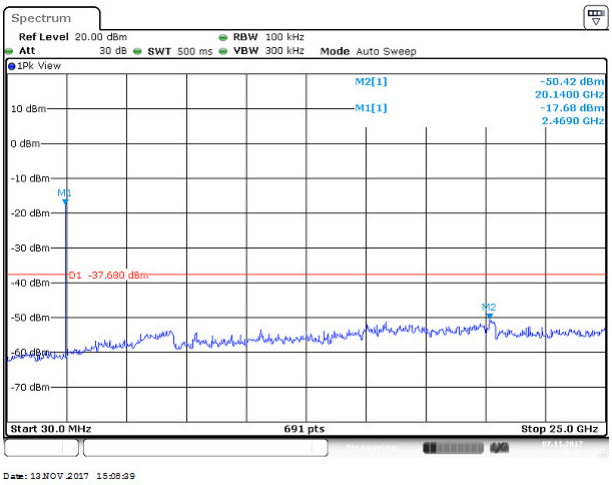
Spurious Emission 30MHz-25GHz

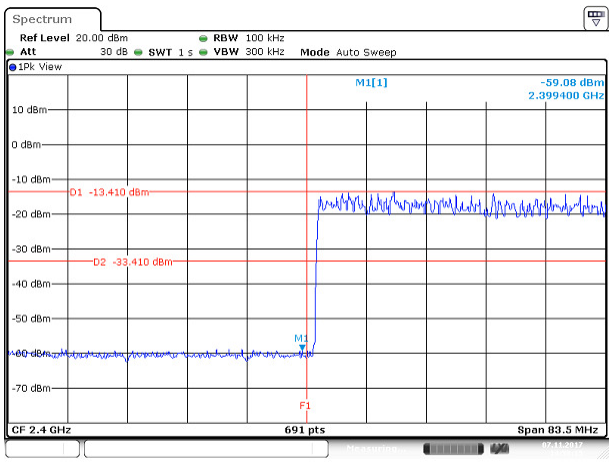
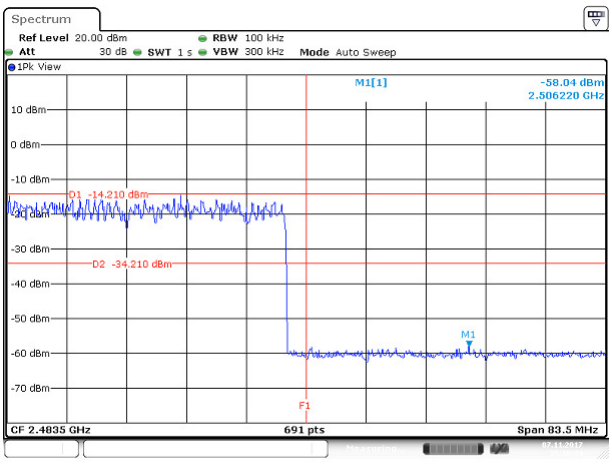


8DPSK_EDR-3Mbps mode Mid CH

Spurious Emission 30MHz-25GHz



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

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

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.

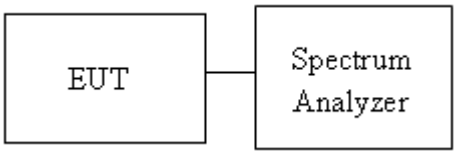
4.7.2 Test Procedure

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

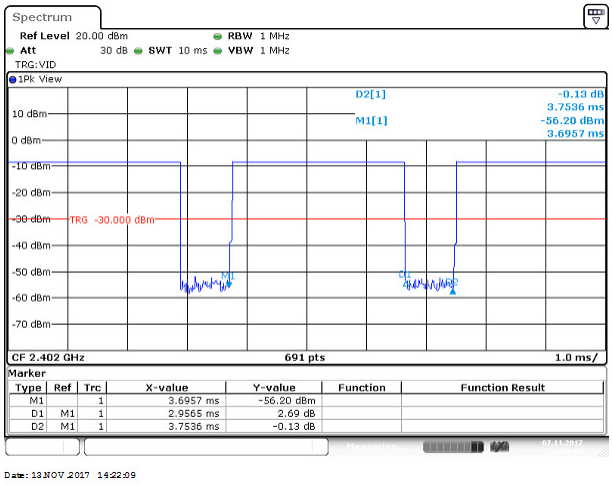
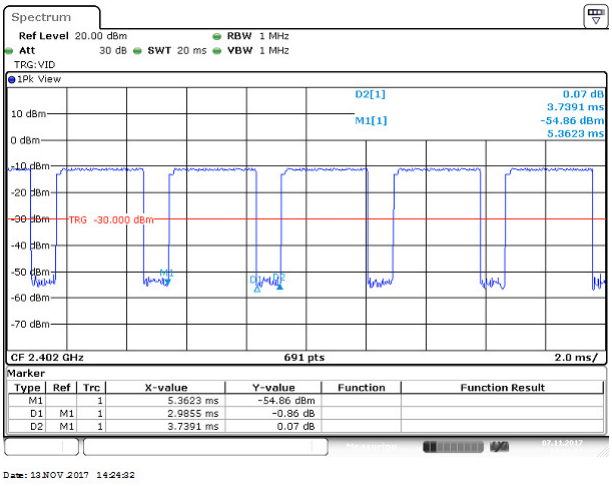
4.7.3 Test Setup



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	2.9565	79	106.67	0.3215	0.4	Pass
EDR-3Mbps	2441	2.9855	79	106.67	0.3185	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							

Test Data

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

4.8 RADIATION BANDEDGE AND SPURIOUS EMISSION

4.8.1 Test Limit

FCC 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)

Remark:
Although these tests were performed other than open area test site, adequate comparison measurements were confirmed against 30 m open are test site. Therefore sufficient tests were made to demonstrate that the alternative site produces results that correlate with the ones of tests made in an open field based on KDB 937606.

4.8.2 Test Procedure

Test method Refer as KDB 558074 D01 v03r05, Section 12.1.

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 26.5GHz set to the low, Mid and High channels with the EUT transmit.

Remark:

Although these tests were performed other than open area test site, adequate comparison measurements were confirmed against 30 m open are test site. Therefore sufficient tests were made to demonstrate that the alternative site produces results that correlate with the ones of tests made in an open field based on KDB 937606.

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.

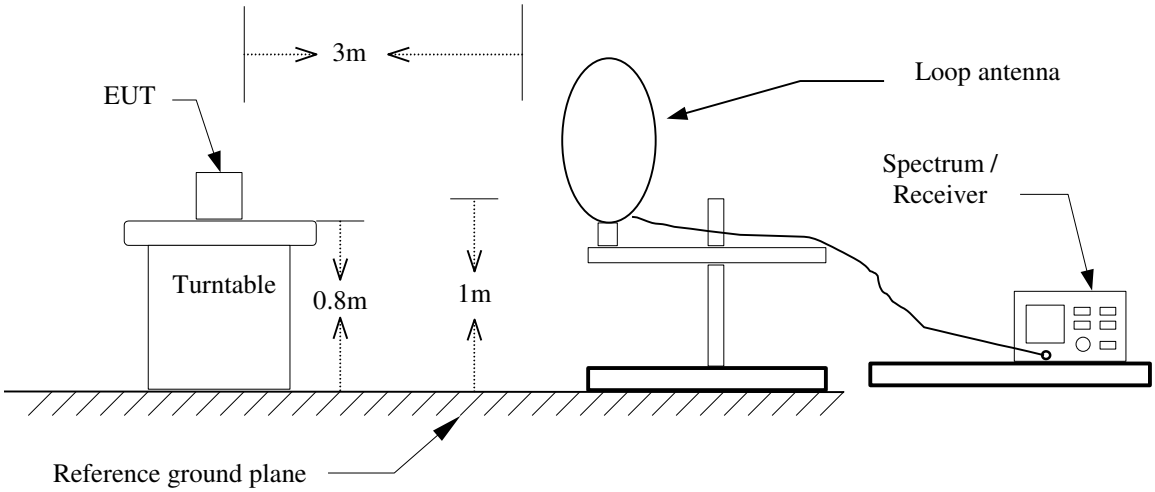
(2.2) For Average measurement：RBW = 1MHz, VBW

- If Duty Cycle ≥ 98%, VBW=10Hz.
- If Duty Cycle < 98%, VBW=1/T.

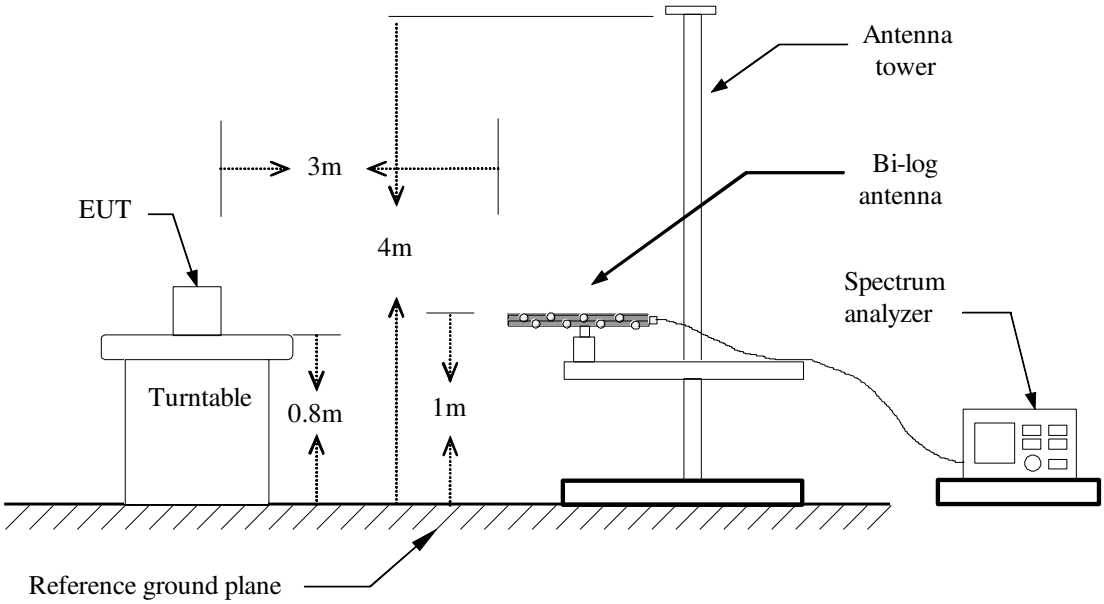
Configuration	Duty Cycle (%)	T(ms)	1/T (kHz)	VBW setting
GFSK_BR-1Mbps	79%	3.0000	0.333	360Hz
8DPSK_EDR-3Mbps	85%	2.9600	0.338	360Hz

4.8.3 Test Setup

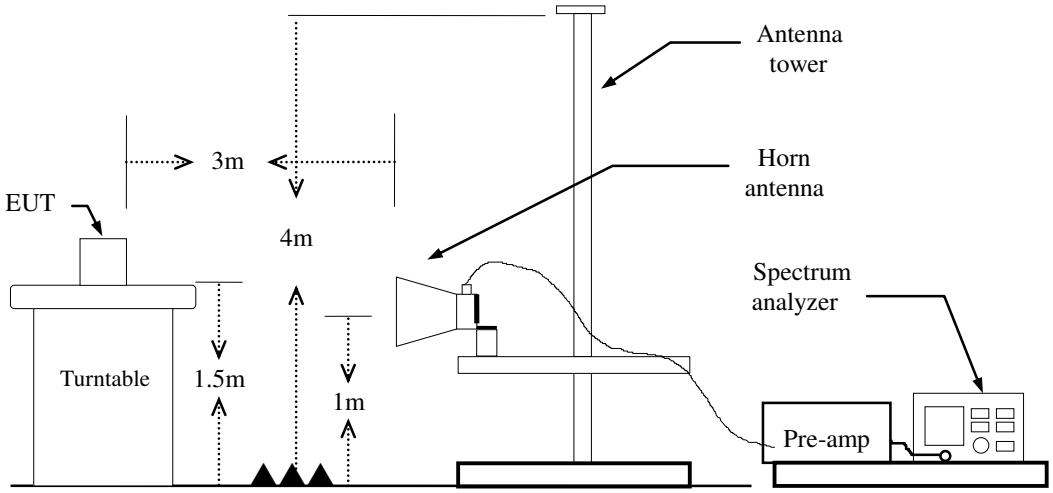
9kHz ~ 30MHz



30MHz ~ 1GHz



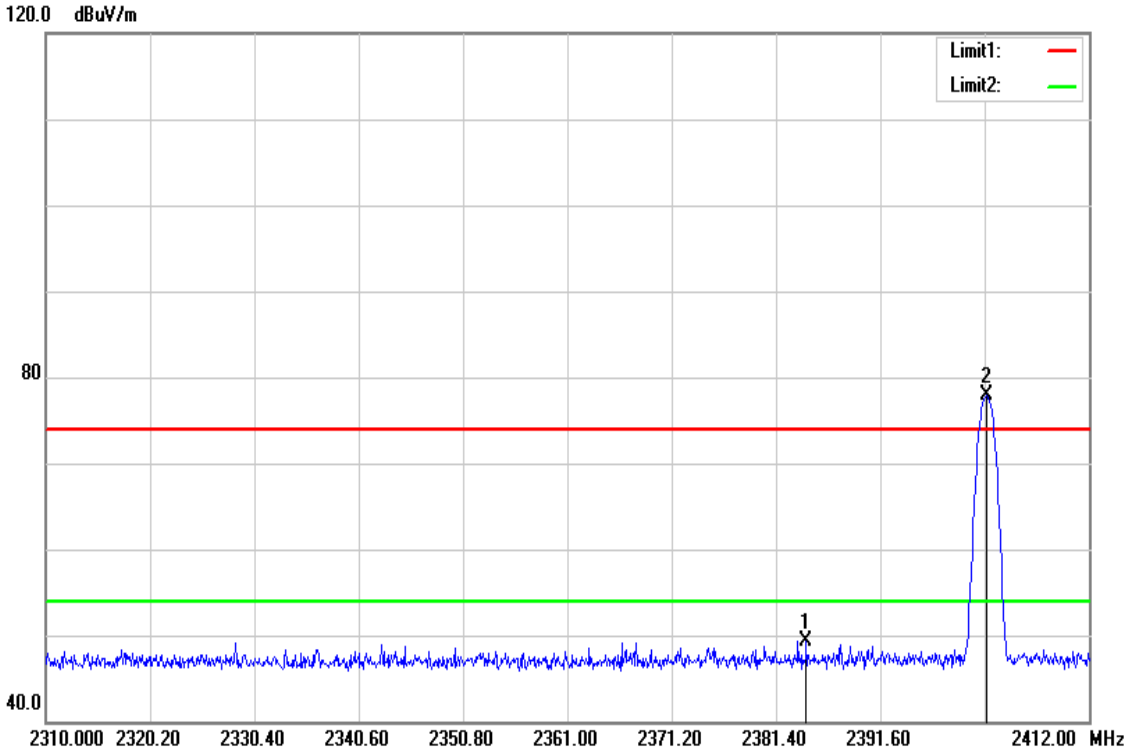
Above 1 GHz



4.8.4 Test Result

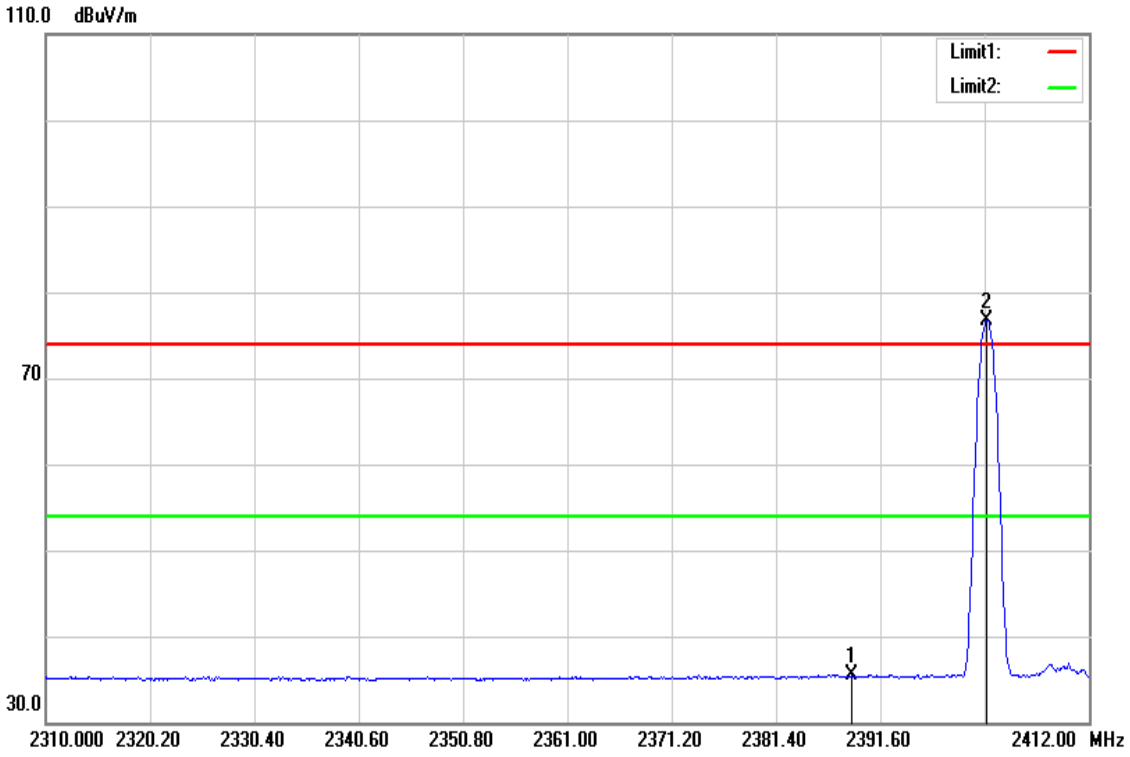
Band Edge Test Data

Test Mode:	GFSK_BR-1Mbps Low CH	Temp/Hum	24(℃)/ 33%RH
Test Item	Band Edge	Test Date	November 10, 2017
Polarize	Vertical	Test Engineer	Jerry Chuang
Detector	Peak	Test Voltage:	DC 12V



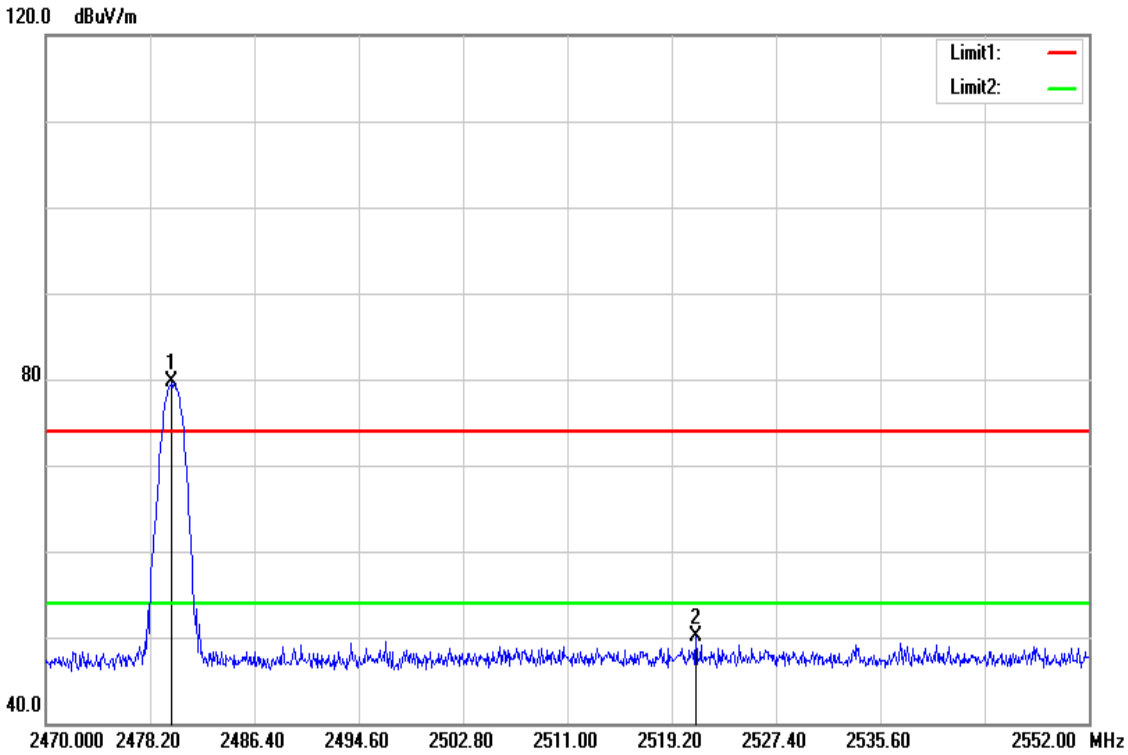
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2384.358	49.90	-0.61	49.29	74.00	-24.71	peak
2	2402.004	78.53	-0.57	77.96	-	-	peak

Test Mode:	GFSK_BR-1Mbps Low CH	Temp/Hum	24(℃)/ 33%RH
Test Item	Band Edge	Test Date	November 10, 2017
Polarize	Vertical	Test Engineer	Jerry Chuang
Detector	Average	Test Voltage:	DC 12V



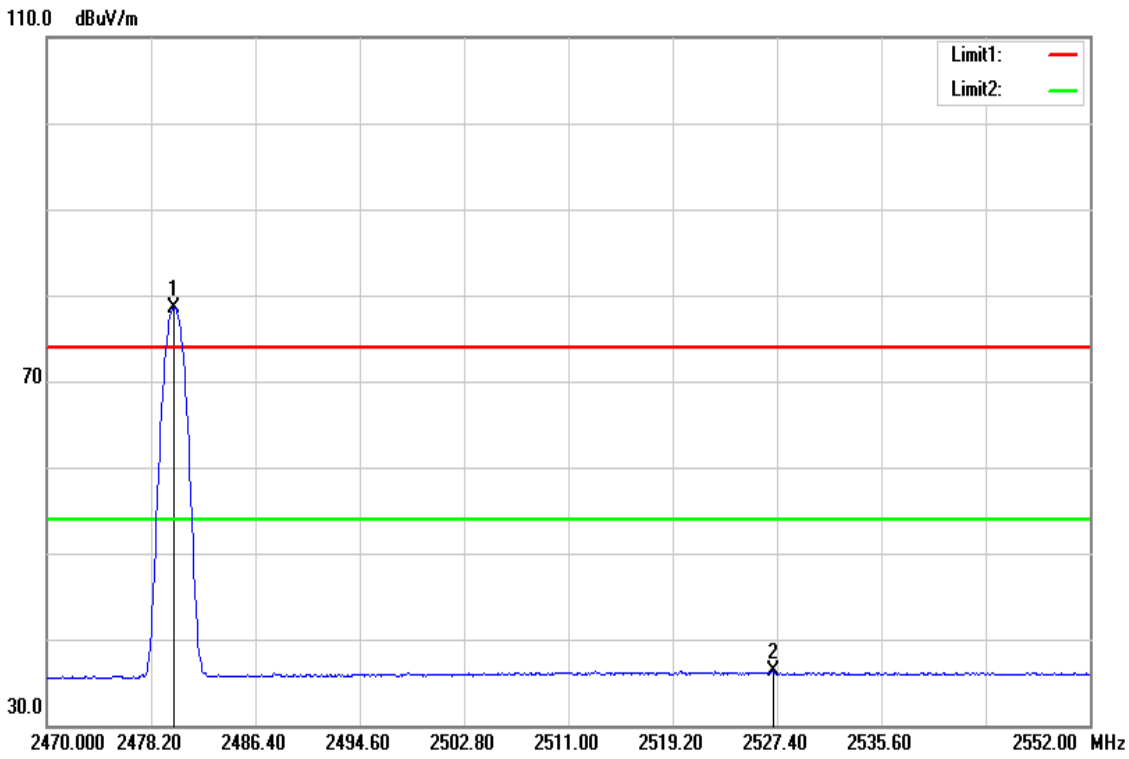
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2388.744	36.06	-0.60	35.46	54.00	-18.54	AVG
2	2402.004	77.27	-0.57	76.70	-	-	AVG

Test Mode:	GFSK_BR-1Mbps High CH	Temp/Hum	24(℃)/ 33%RH
Test Item	Band Edge	Test Date	November 10, 2017
Polarize	Vertical	Test Engineer	Jerry Chuang
Detector	Peak	Test Voltage:	DC 12V



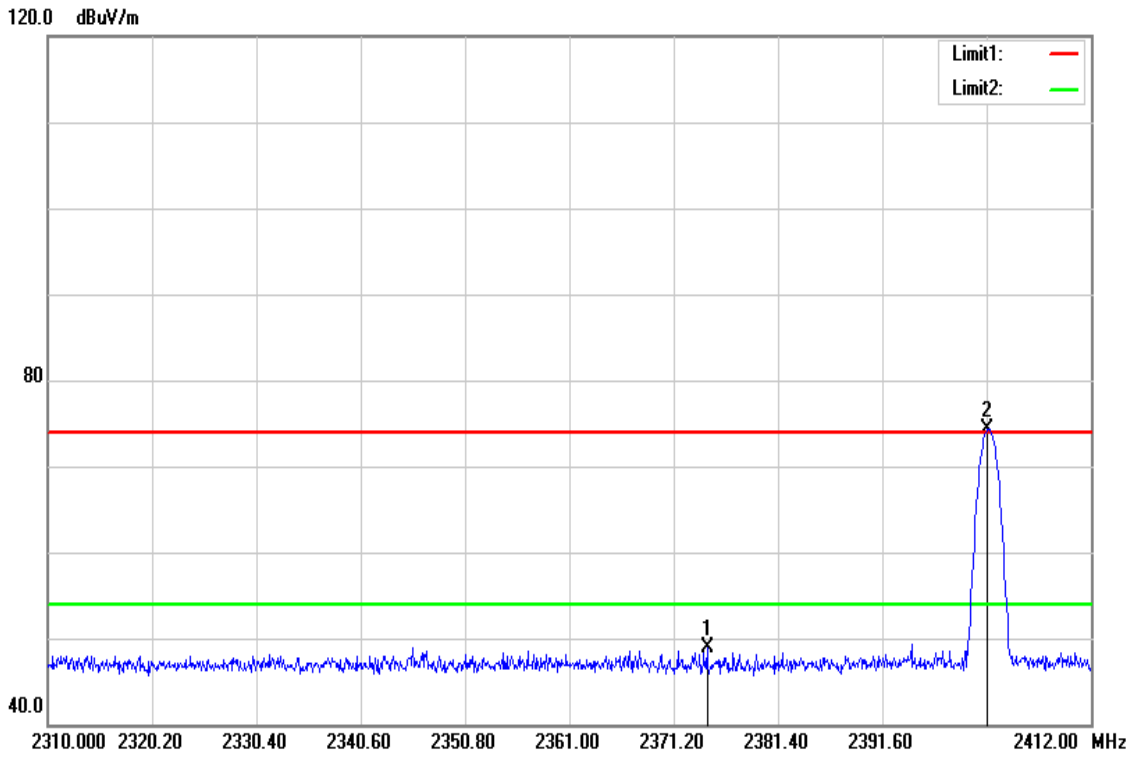
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2479.922	79.92	-0.31	79.61	-	-	peak
2	2521.086	50.30	-0.20	50.10	74.00	-23.90	peak

Test Mode:	GFSK_BR-1Mbps High CH	Temp/Hum	24(℃)/ 33%RH
Test Item	Band Edge	Test Date	November 10, 2017
Polarize	Vertical	Test Engineer	Jerry Chuang
Detector	Average	Test Voltage:	DC 12V



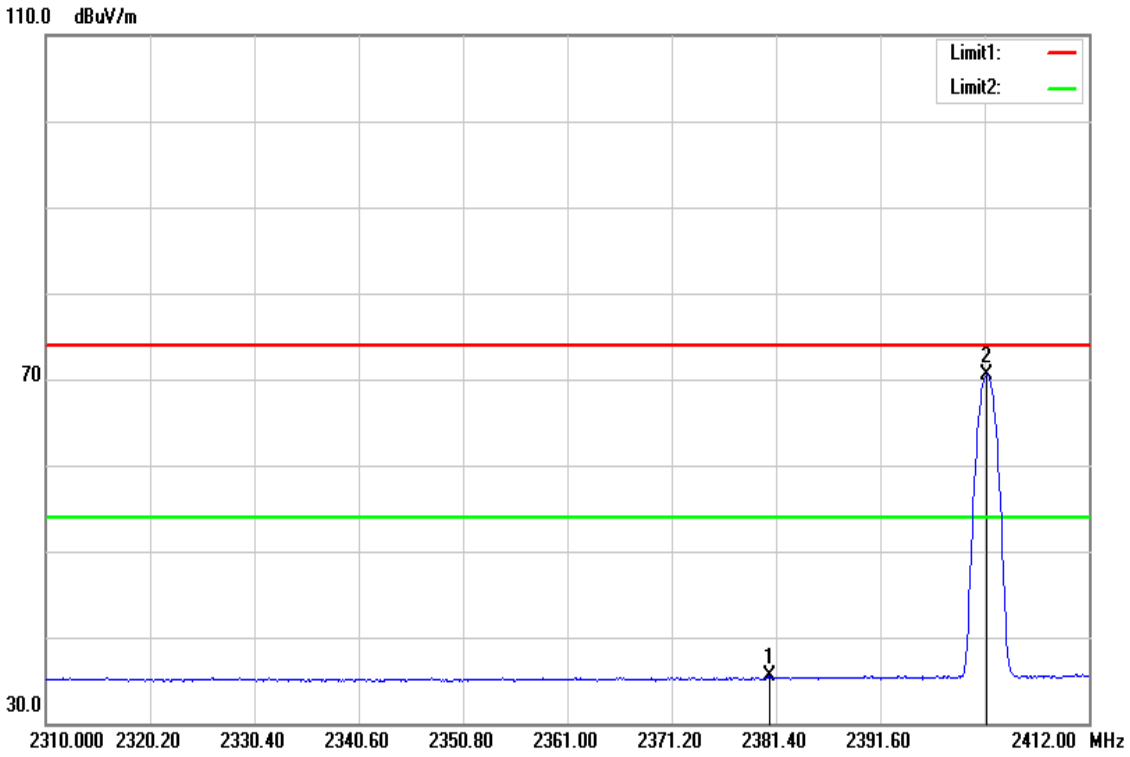
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2480.004	78.85	-0.31	78.54	-	-	AVG
2	2527.072	36.45	-0.19	36.26	54.00	-17.74	AVG

Test Mode:	8DPSK_EDR-3Mbps Low CH	Temp/Hum	24(℃)/ 33%RH
Test Item	Band Edge	Test Date	November 10, 2017
Polarize	Vertical	Test Engineer	Jerry Chuang
Detector	Peak	Test Voltage:	DC 12V



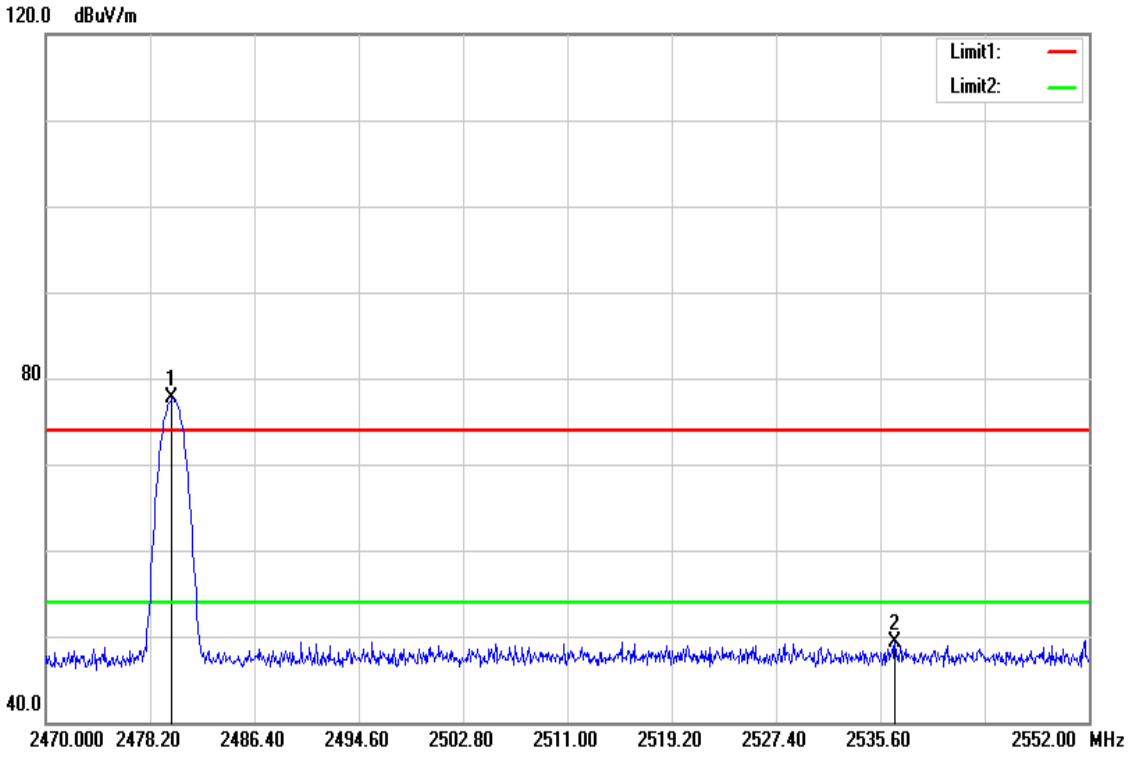
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2374.464	49.64	-0.65	48.99	74.00	-25.01	peak
2	2401.902	74.92	-0.57	74.35	-	-	peak

Test Mode:	8DPSK_EDR-3Mbps Low CH	Temp/Hum	24(℃)/ 33%RH
Test Item	Band Edge	Test Date	November 10, 2017
Polarize	Vertical	Test Engineer	Jerry Chuang
Detector	Average	Test Voltage:	DC 12V



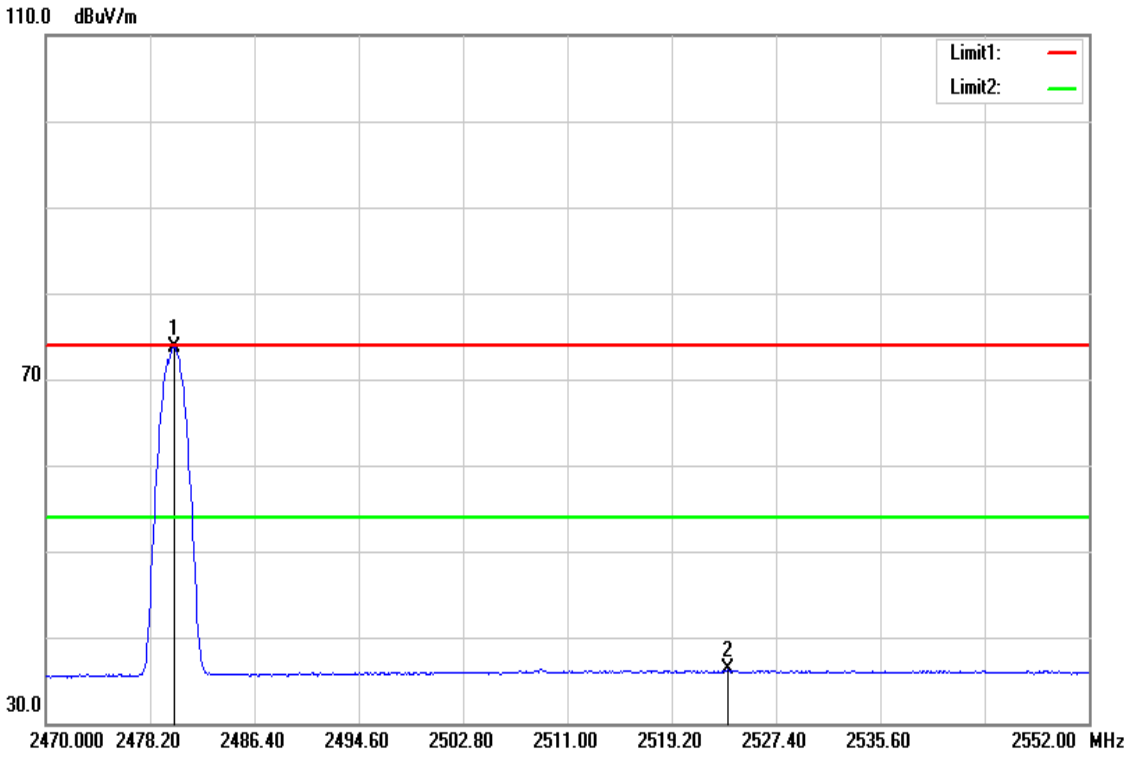
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2380.788	36.09	-0.63	35.46	54.00	-18.54	AVG
2	2402.004	71.04	-0.57	70.47	-	-	AVG

Test Mode:	8DPSK_EDR-3Mbps High CH	Temp/Hum	24(℃)/ 33%RH
Test Item	Band Edge	Test Date	November 10, 2017
Polarize	Vertical	Test Engineer	Jerry Chuang
Detector	Peak	Test Voltage:	DC 12V



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2479.922	77.94	-0.31	77.63	-	-	peak
2	2536.748	49.56	-0.16	49.40	74.00	-24.60	peak

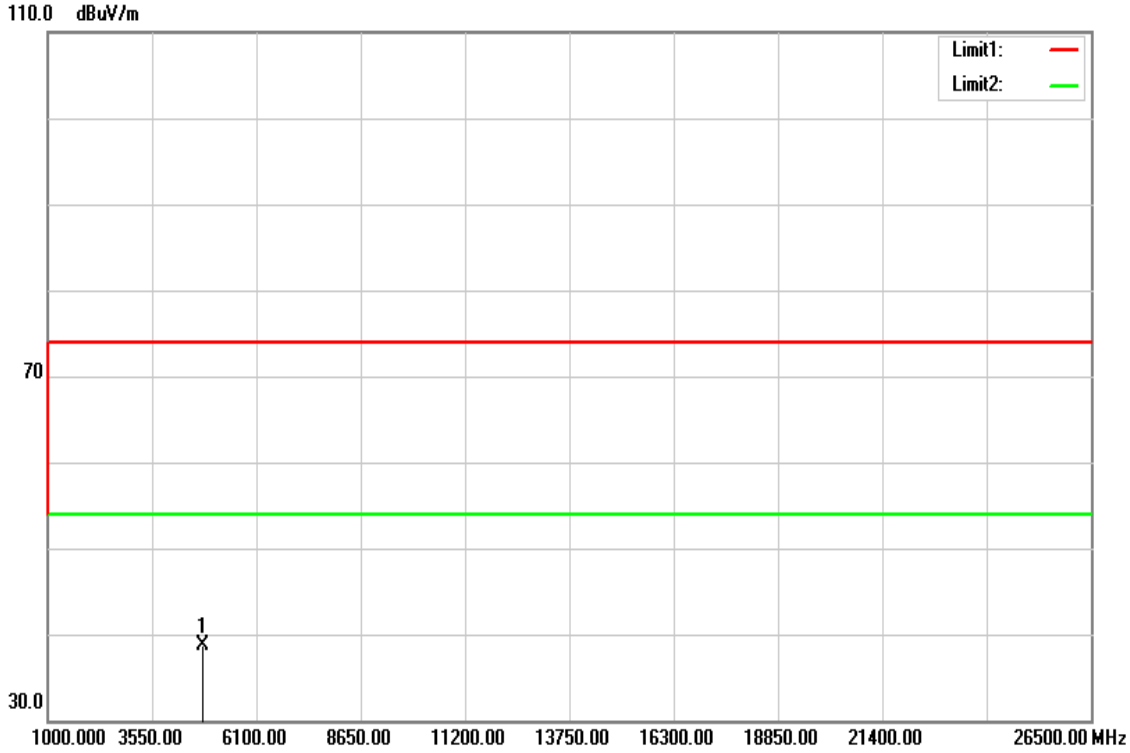
Test Mode:	8DPSK_EDR-3Mbps High CH	Temp/Hum	24(℃)/ 33%RH
Test Item	Band Edge	Test Date	November 10, 2017
Polarize	Vertical	Test Engineer	Jerry Chuang
Detector	Average	Test Voltage:	DC 12V



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2480.086	74.03	-0.31	73.72	-	-	AVG
2	2523.628	36.53	-0.20	36.33	54.00	-17.67	AVG

Above 1G Test Data

Test Mode:	GFSK_BR-1Mbps Low CH	Temp/Hum	24(℃)/ 33%RH
Test Item	Harmonic	Test Date	November 10, 2017
Polarize	Vertical	Test Engineer	Jerry Chuang
Detector	Peak and Average	Test Voltage:	DC 12V

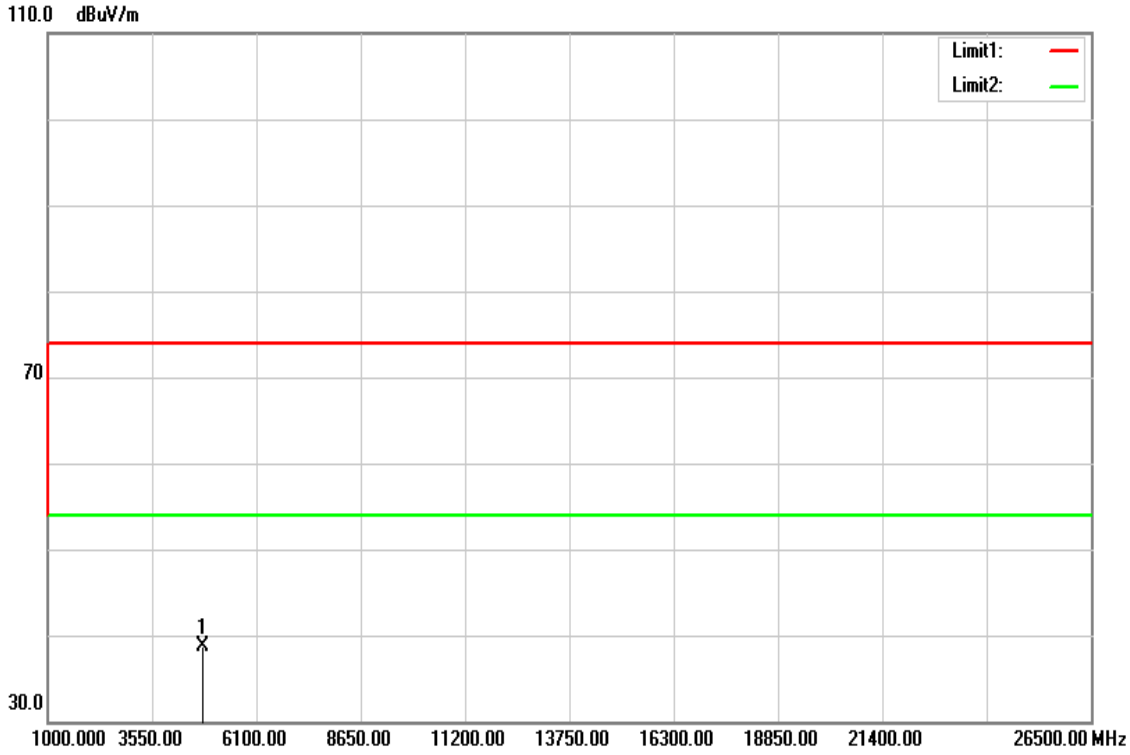


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4804.000	32.02	6.78	38.80	74.00	-35.20	peak
N/A						

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *For above 1GHz,the EUT peak value was under average limit, therefore the Average value compliance with the average limit*

Test Mode:	GFSK_BR-1Mbps Low CH	Temp/Hum	24(℃)/ 33%RH
Test Item	Harmonic	Test Date	November 10, 2017
Polarize	Horizontal	Test Engineer	Jerry Chuang
Detector	Peak and Average	Test Voltage:	DC 12V

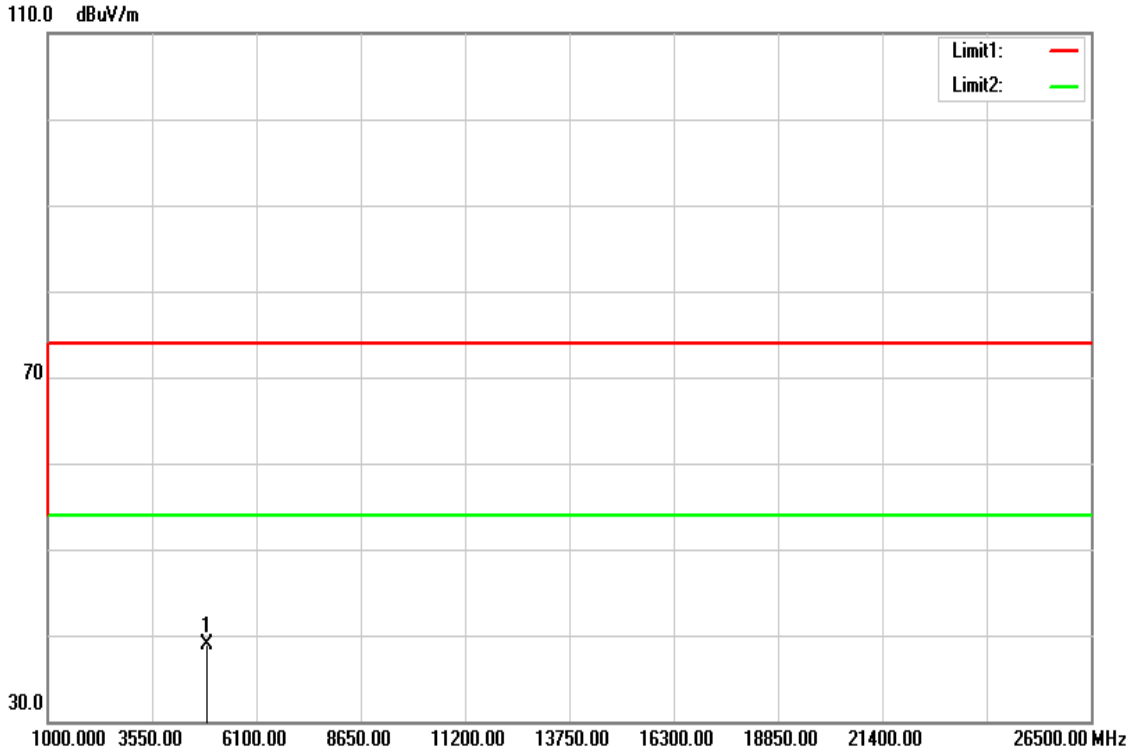


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4804.000	31.85	6.78	38.63	74.00	-35.37	peak
N/A						

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *For above 1GHz,the EUT peak value was under average limit, therefore the Average value compliance with the average limit*

Test Mode:	GFSK_BR-1Mbps Mid CH	Temp/Hum	24(℃)/ 33%RH
Test Item	Harmonic	Test Date	November 10, 2017
Polarize	Vertical	Test Engineer	Jerry Chuang
Detector	Peak and Average	Test Voltage:	DC 12V

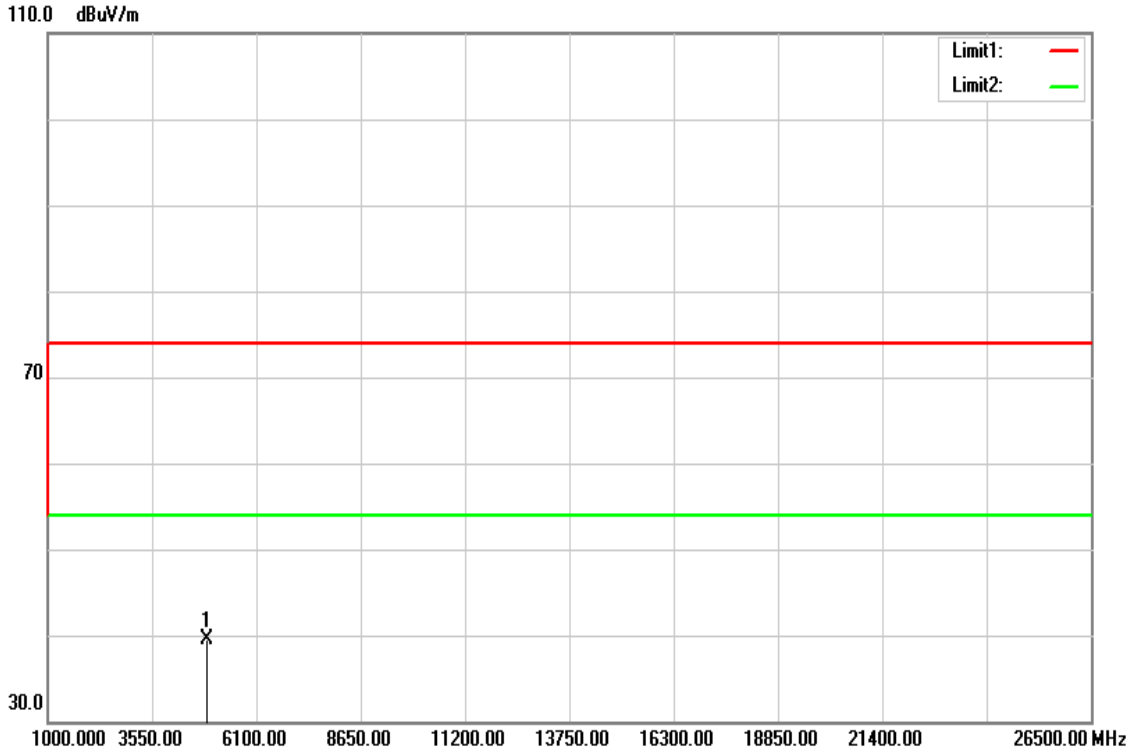


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4882.000	31.83	6.99	38.82	74.00	-35.18	peak
N/A						

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *For above 1GHz,the EUT peak value was under average limit, therefore the Average value compliance with the average limit*

Test Mode:	GFSK_BR-1Mbps Mid CH	Temp/Hum	24(℃)/ 33%RH
Test Item	Harmonic	Test Date	November 10, 2017
Polarize	Horizontal	Test Engineer	Jerry Chuang
Detector	Peak and Average	Test Voltage:	DC 12V

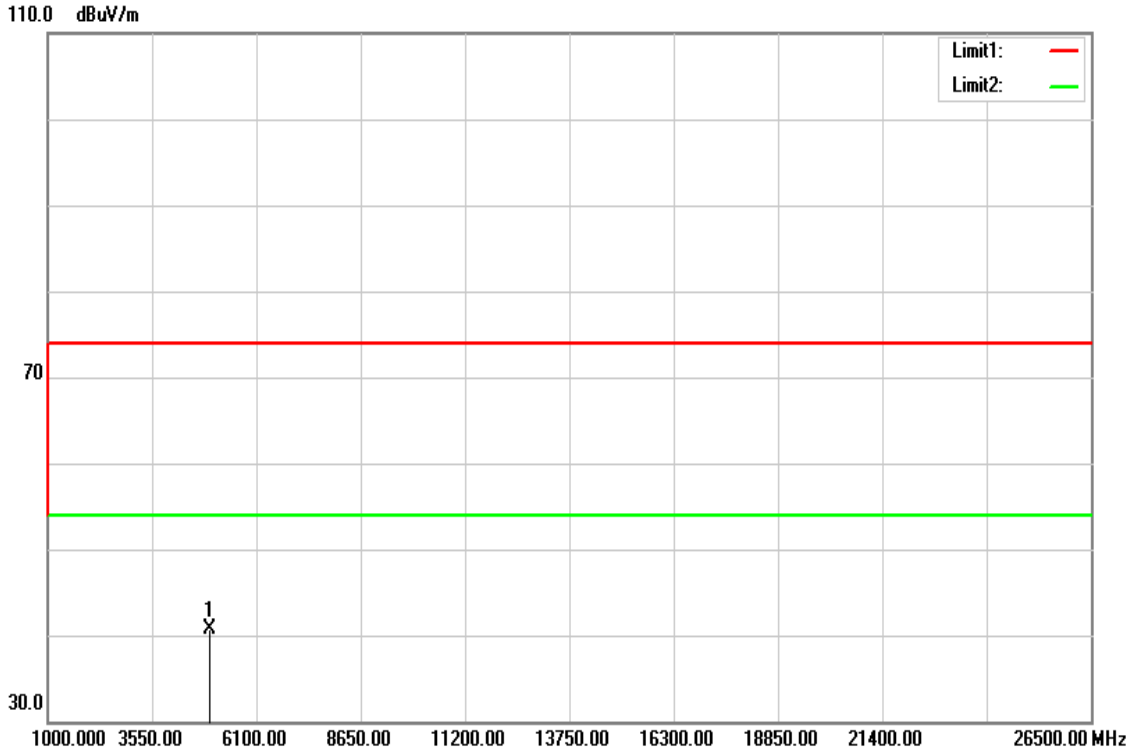


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4882.000	32.58	6.99	39.57	74.00	-34.43	peak
N/A						

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *For above 1GHz,the EUT peak value was under average limit, therefore the Average value compliance with the average limit*

Test Mode:	GFSK_BR-1Mbps High CH	Temp/Hum	24(℃)/ 33%RH
Test Item	Harmonic	Test Date	November 10, 2017
Polarize	Vertical	Test Engineer	Jerry Chuang
Detector	Peak and Average	Test Voltage:	DC 12V

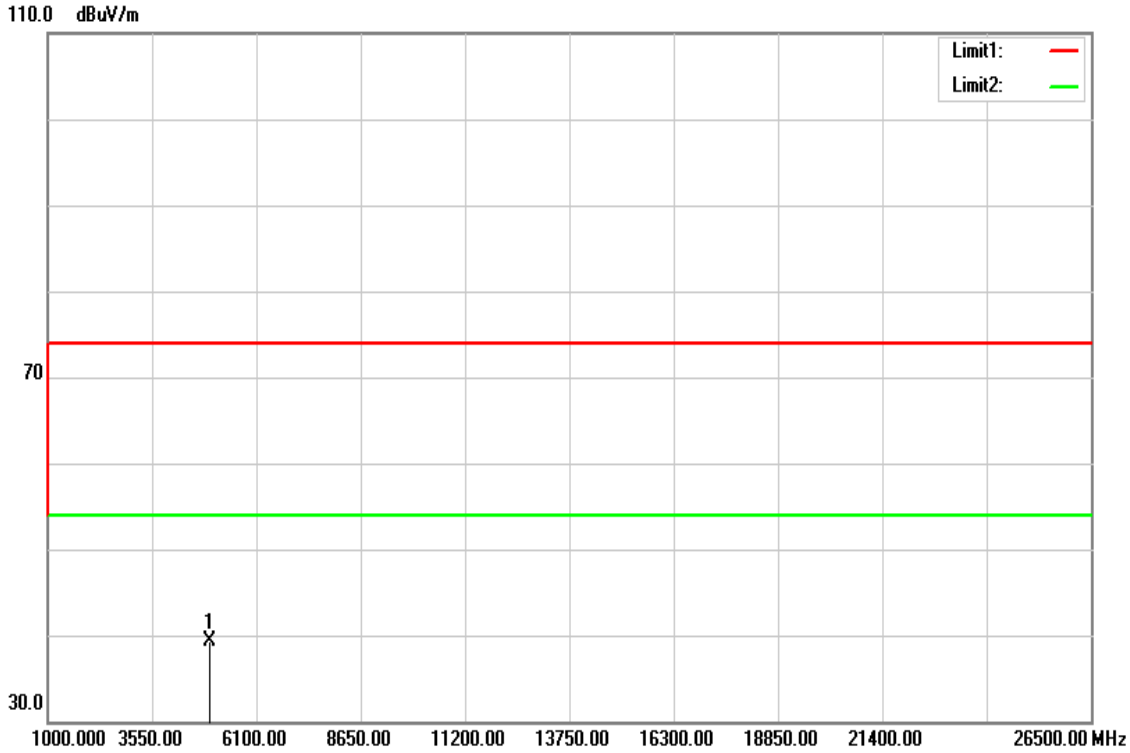


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4960.000	33.56	7.18	40.74	74.00	-33.26	peak
N/A						

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *For above 1GHz,the EUT peak value was under average limit, therefore the Average value compliance with the average limit*

Test Mode:	GFSK_BR-1Mbps High CH	Temp/Hum	24(℃)/ 33%RH
Test Item	Harmonic	Test Date	November 10, 2017
Polarize	Horizontal	Test Engineer	Jerry Chuang
Detector	Peak and Average	Test Voltage:	DC 12V

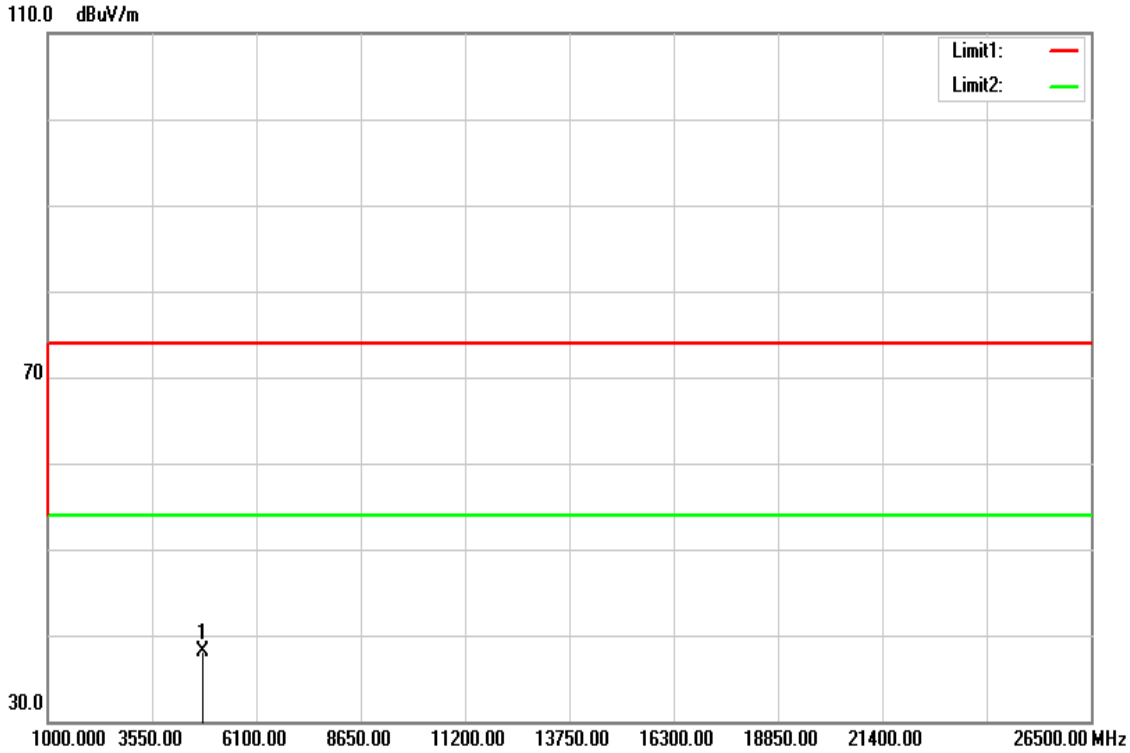


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4960.000	32.18	7.18	39.36	74.00	-34.64	peak
N/A						

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *For above 1GHz,the EUT peak value was under average limit, therefore the Average value compliance with the average limit*

Test Mode	8DPSK_EDR-3Mbps Low CH	Temp/Hum	24(℃)/ 33%RH
Test Item	Harmonic	Test Date	November 10, 2017
Polarize	Vertical	Test Engineer	Jerry Chuang
Detector	Peak and Average	Test Voltage:	DC 12V

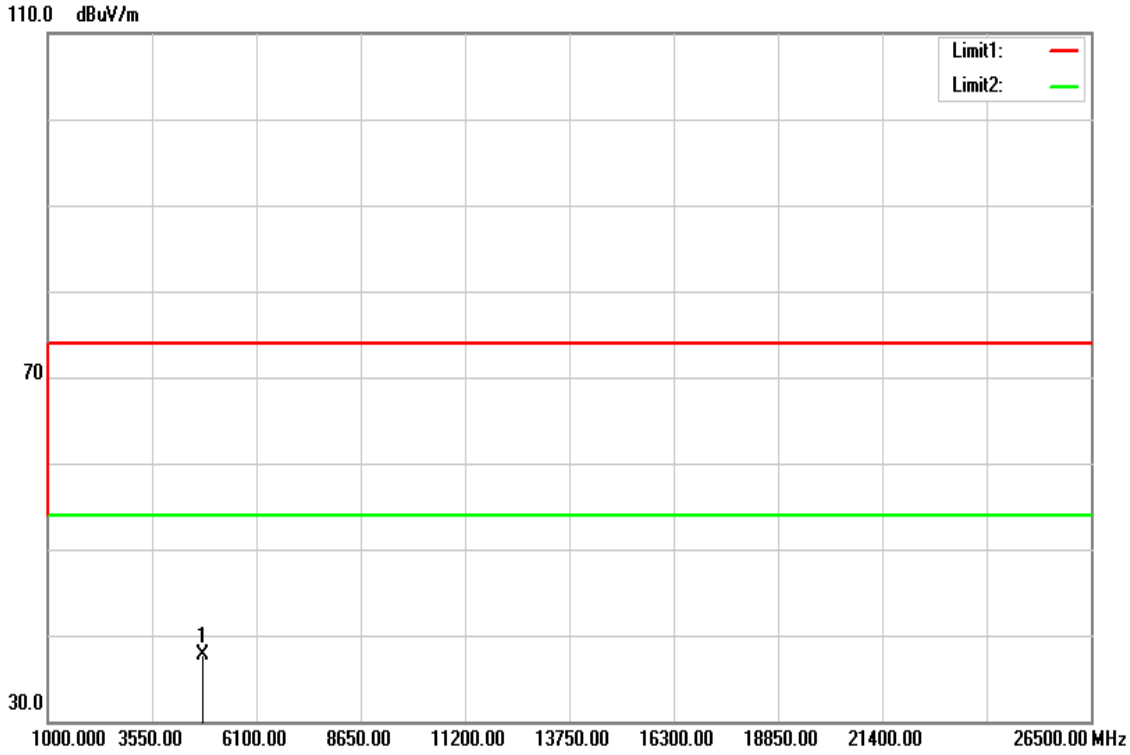


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4804.000	31.34	6.78	38.12	74.00	-35.88	peak
N/A						

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *For above 1GHz,the EUT peak value was under average limit, therefore the Average value compliance with the average limit*

Test Mode	8DPSK_EDR-3Mbps Low CH	Temp/Hum	24(℃)/ 33%RH
Test Item	Harmonic	Test Date	November 10, 2017
Polarize	Horizontal	Test Engineer	Jerry Chuang
Detector	Peak and Average	Test Voltage:	DC 12V

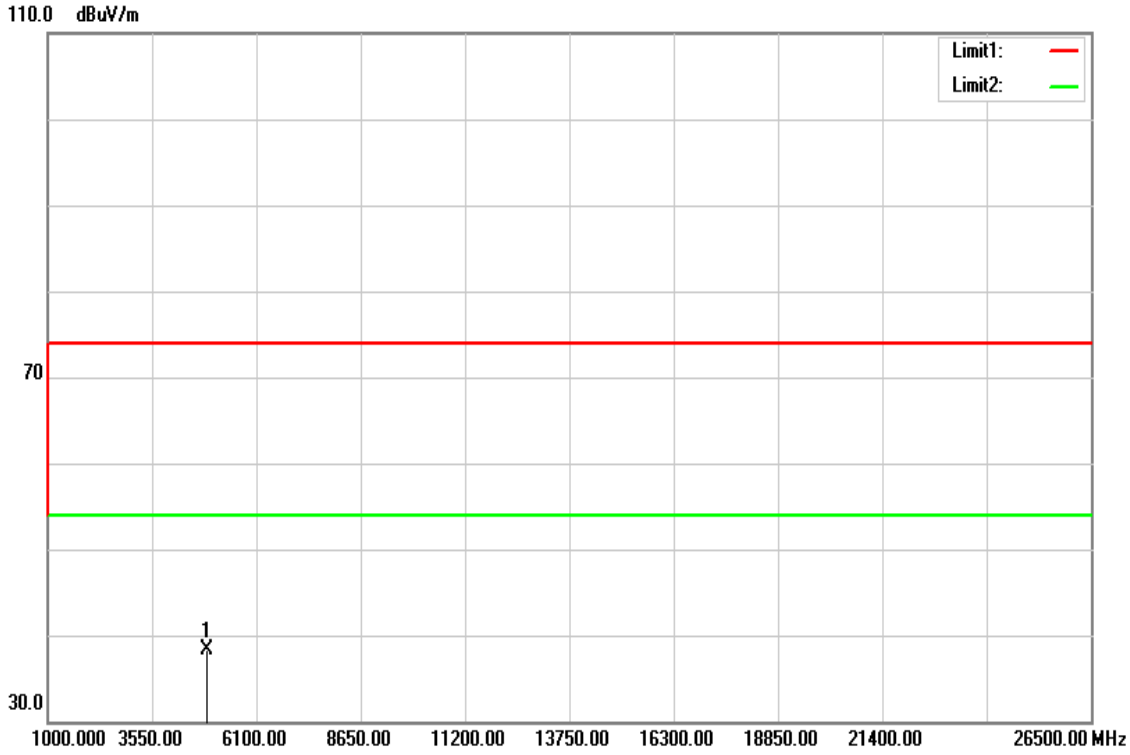


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4804.000	30.92	6.78	37.70	74.00	-36.30	peak
N/A						

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *For above 1GHz,the EUT peak value was under average limit, therefore the Average value compliance with the average limit*

Test Mode	8DPSK_EDR-3Mbps Mid CH	Temp/Hum	24(℃)/ 33%RH
Test Item	Harmonic	Test Date	November 10, 2017
Polarize	Vertical	Test Engineer	Jerry Chuang
Detector	Peak and Average	Test Voltage:	DC 12V

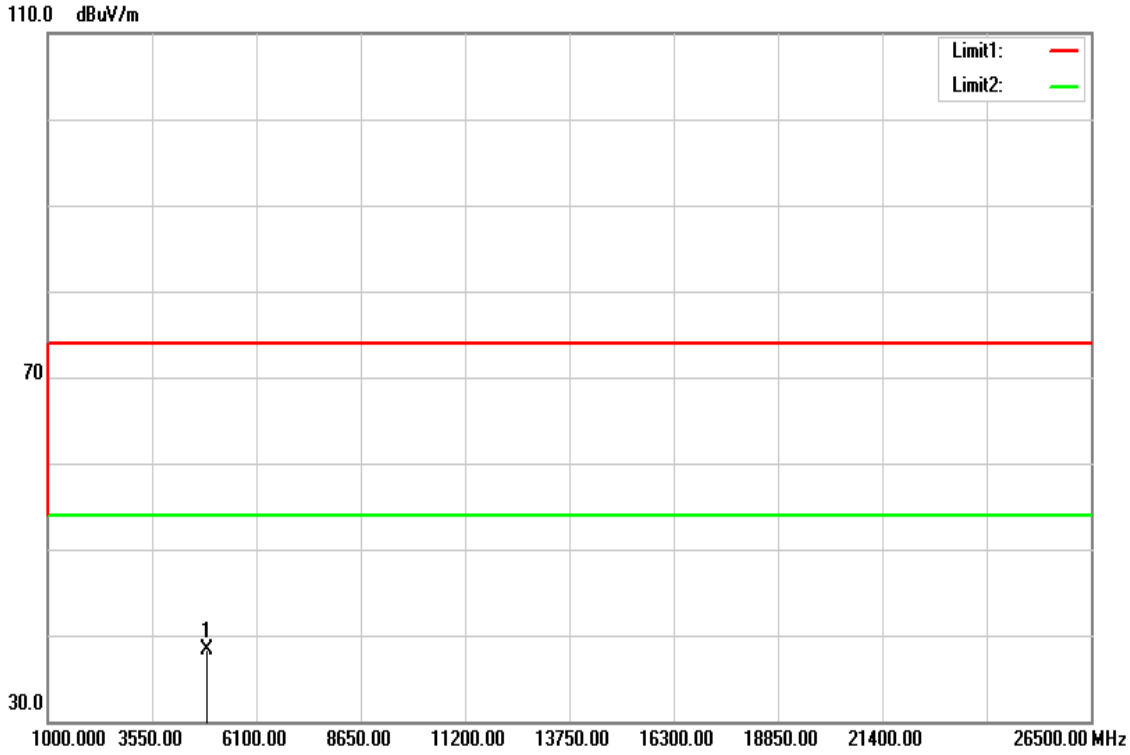


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4882.000	31.24	6.99	38.23	74.00	-35.77	peak
N/A						

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *For above 1GHz,the EUT peak value was under average limit, therefore the Average value compliance with the average limit*

Test Mode	8DPSK_EDR-3Mbps Mid CH	Temp/Hum	24(℃)/ 33%RH
Test Item	Harmonic	Test Date	November 10, 2017
Polarize	Horizontal	Test Engineer	Jerry Chuang
Detector	Peak and Average	Test Voltage:	DC 12V

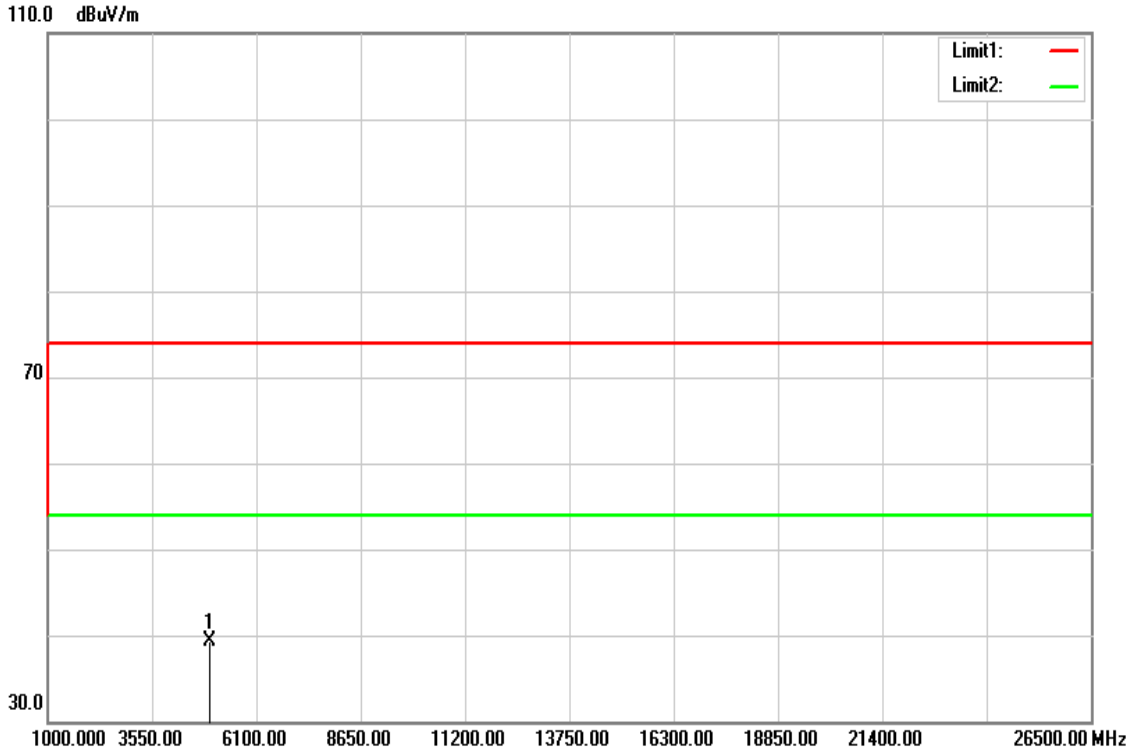


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4882.000	31.36	6.99	38.35	74.00	-35.65	peak
N/A						

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *For above 1GHz,the EUT peak value was under average limit, therefore the Average value compliance with the average limit*

Test Mode	8DPSK_EDR-3Mbps High CH	Temp/Hum	24(℃)/ 33%RH
Test Item	Harmonic	Test Date	November 10, 2017
Polarize	Vertical	Test Engineer	Jerry Chuang
Detector	Peak and Average	Test Voltage:	DC 12V

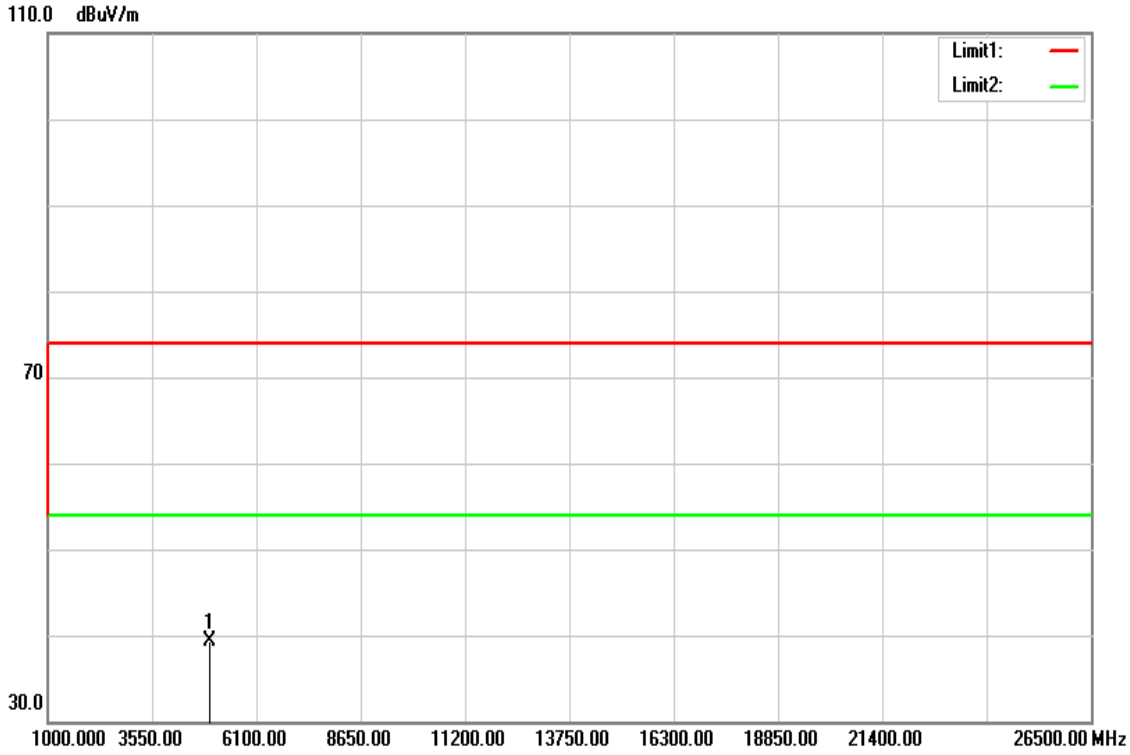


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4960.000	32.14	7.18	39.32	74.00	-34.68	peak
N/A						

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *For above 1GHz,the EUT peak value was under average limit, therefore the Average value compliance with the average limit*

Test Mode	8DPSK_EDR-3Mbps High CH	Temp/Hum	24(℃)/ 33%RH
Test Item	Harmonic	Test Date	November 10, 2017
Polarize	Horizontal	Test Engineer	Jerry Chuang
Detector	Peak and Average	Test Voltage:	DC 12V



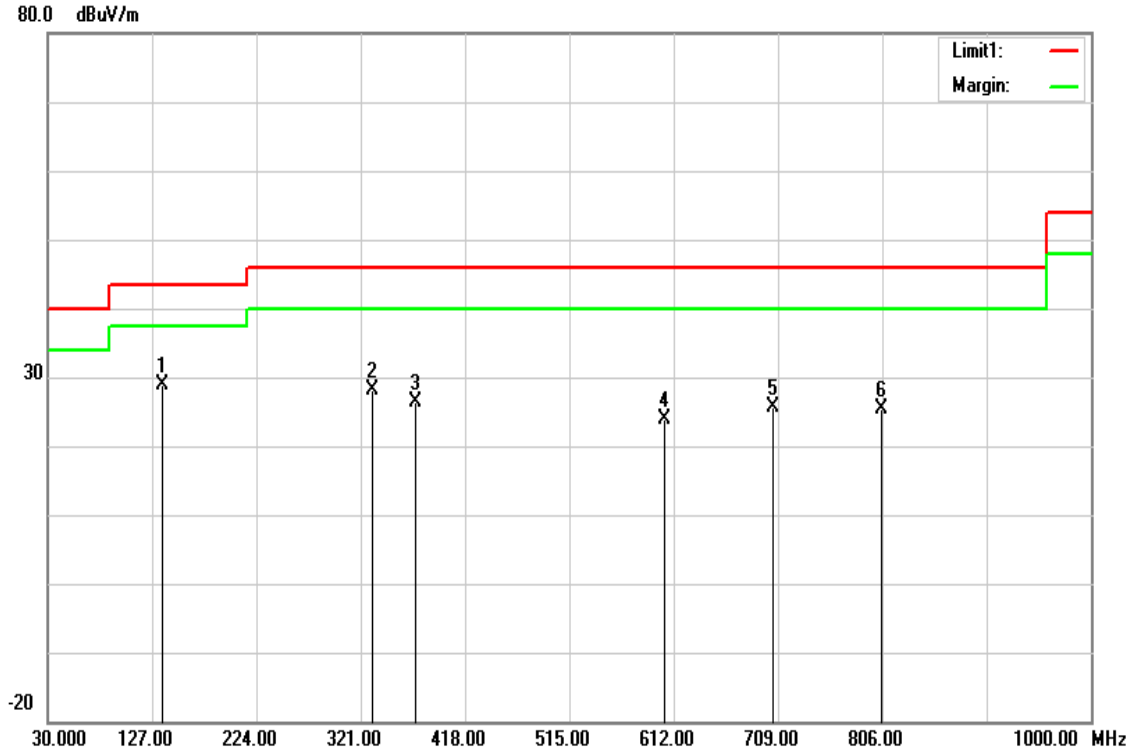
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4960.000	32.12	7.18	39.30	74.00	-34.70	peak
N/A						

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *For above 1GHz,the EUT peak value was under average limit, therefore the Average value compliance with the average limit*

Below 1G Test Data

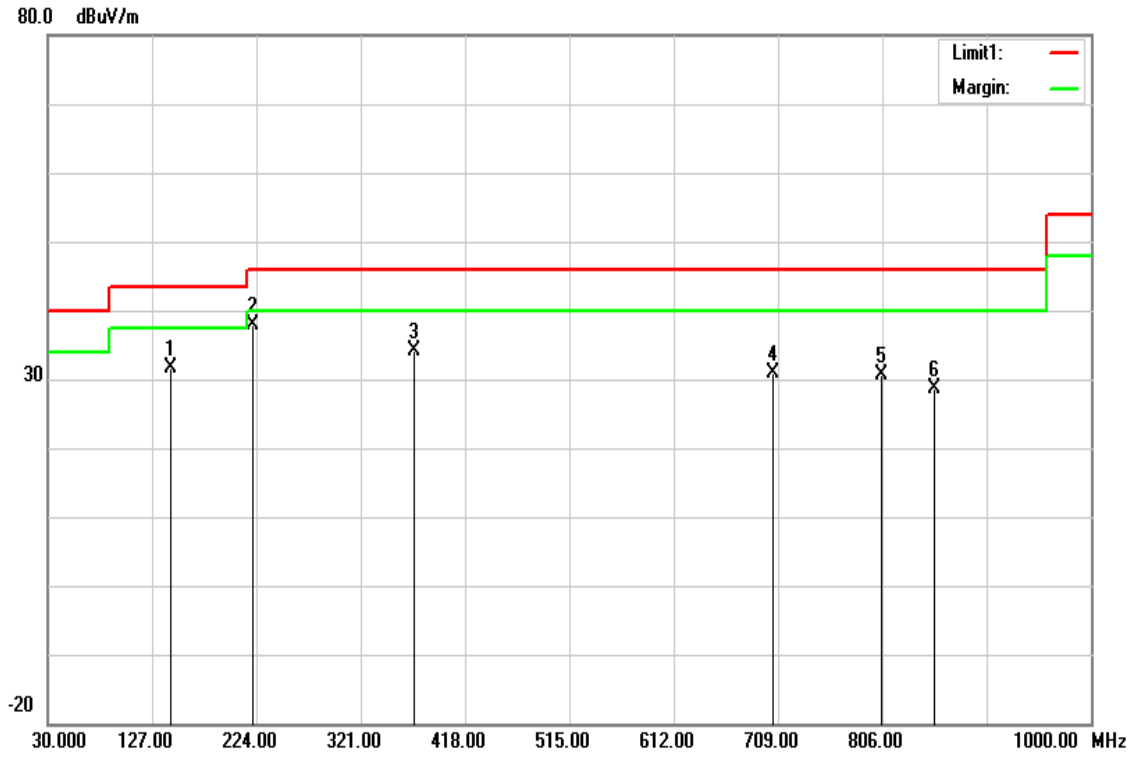
Test Mode:	Mode 1	Temp/Hum	24(℃)/ 33%RH
Test Item	30MHz-1GHz	Test Date	November 10, 2017
Polarize	Vertical	Test Engineer	Jerry Chuang
Detector	Peak and Quasi-peak	Test Voltage:	DC 12V



Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
136.7000	44.30	-15.44	28.86	43.50	-14.64	peak
331.6700	41.42	-13.37	28.05	46.00	-17.95	peak
371.4400	38.76	-12.30	26.46	46.00	-19.54	peak
603.2700	30.76	-6.84	23.92	46.00	-22.08	peak
704.1500	30.54	-4.85	25.69	46.00	-20.31	peak
805.0300	28.64	-3.32	25.32	46.00	-20.68	peak

Note: No emission found between lowest internal used/generated frequency to 30MHz(9KHz~30MHz)

Test Mode:	Mode 1	Temp/Hum	24(℃)/ 33%RH
Test Item	30MHz-1GHz	Test Date	November 10, 2017
Polarize	Horizontal	Test Engineer	Jerry Chuang
Detector	Peak and Quasi-peak	Test Voltage:	DC 12V



Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
144.4600	47.22	-15.63	31.59	43.50	-11.91	peak
220.1200	55.13	-17.33	37.80	46.00	-8.20	peak
370.4700	46.44	-12.33	34.11	46.00	-11.89	peak
704.1500	35.79	-4.85	30.94	46.00	-15.06	peak
805.0300	33.87	-3.32	30.55	46.00	-15.45	peak
854.5000	31.40	-2.79	28.61	46.00	-17.39	peak

Note: No emission found between lowest internal used/generated frequency to 30MHz(9KHz~30MHz)