Report No.: ET-ID14063431

FCC Test Report

(FCC ID: 2AB6X52691)

Applicant	:	ELECTRONICA INTEGRAL DE SONIDO S.A.
Address	:	Pol. Malpica, C/F-Oeste, Grupo Quejido, 87-88, Zaragoza, Spain

Equipment Under Test (EUT)

Product Name	:	IN-WALL BLUETOOTH AUDIO RECEIVER
Model No.	:	52691
Trademark	:	EISSOUND

Applicable standards	:	FCC CFR Title 47 Part 15 Subpart C Section 15.247
Date of sample receipt	:	2014-06-05
Date of test	:	2014-06-05 to 2014-06-17
Date of report issued	:	2014-06-18
Test result	:	**PASS***

*In the configuration tested, the EUT complied with the standards specified above.

Test/Witness Engineer : Jim chen

Approved & Authorized : Laiddai

This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in the report.

Contents

1. General Information

1.1. Client Information

Applicant	:	ELECTRONICA INTEGRAL DE SONIDO S.A.
Address	:	Pol. Malpica, C/F-Oeste, Grupo Quejido, 87-88, Zaragoza, Spain
Manufacturer	:	Shenzhen AOK Science And Technology Co., Ltd
Address	:	No.3 Bldg., Guihutang Street, Guhua Village, Guanlan Town, Bao'an, Shenzhen, China

1.2. General Description of EUT (Equipment Under Test)

Product Name	:	IN-WALL BLUETOOTH AUDIO RECEIVER	
Models No.	:	52691	
Trademark	:	EISSOUND	
Product Description	:	Operation Frequency:	2402MHz~2480MHz
		Transfer Rate:	1/2/3 Mbits/s
		Number of Channel:	79 Channels
		Modulation Type:	GFSK, π/4-DQPSK, 8-DPSK
		Modulation Technology:	FHSS
		Antenna Type:	Integral PCB Antenna
		Antenna Gain:	0 dBi
Power Supply	:	DC 15V from external power supply	

Note:

(1) For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

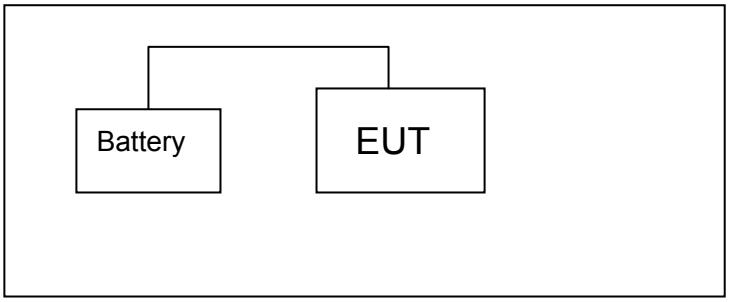
(2) Channel List:

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
00	2402	27	2429	54	2456
01	2403	28	2430	55	2457
02	2404	29	2431	56	2458
03	2405	30	2432	57	2459
04	2406	31	2433	58	2460
05	2407	32	2434	59	2461
06	2408	33	2435	60	2462
07	2409	34	2436	61	2463
08	2410	35	2437	62	2464
09	2411	36	2438	63	2465
10	2412	37	2439	64	2466

11	2413	38	2440	65	2467
12	2414	39	2441	66	2468
13	2415	40	2442	67	2469
14	2416	41	2443	68	2470
15	2417	42	2444	69	2471
16	2418	43	2445	70	2472
17	2419	44	2446	71	2473
18	2420	45	2447	72	2474
19	2421	46	2448	73	2475
20	2422	47	2449	74	2476
21	2423	48	2450	75	2477
22	2424	49	2451	76	2478
23	2425	50	2452	77	2479
24	2426	51	2453	78	2480
25	2427	52	2454		
26	2428	53	2455		
Remark: Channel 0, 39 &78 selected for GFSK, π/4-DQPSK and 8DPSK.					

1.3. Block Diagram Showing The Configuration of System Tested

TX Mode:



1.4. Description of Support Units

Name	Model	FCC ID/DOC	Manufacturer	Used "√"
PC	OPTIPLEX380	DOC	DELL	
LCD Monitor	E170Sc	DOC	DELL	
Keyboard	L100	DOC	DELL	
Mouse	M-UARDEL7	DOC	DELL	

1.5. External I/O Cable

N/A

1.6. Description of Test Software Setting

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

Test Software Version	Test Program: CSR MP Tool.apk		
Frequency	2402 MHz	2441MHz	2480 MHz
GFSK	DEF	DEF	DEF
π/4-DQPSK	DEF	DEF	DEF
8-DPSK	DEF	DEF	DEF

1.7. Description of Test Mode

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned follow was evaluated respectively.

Test Mode	Description
Transmitting mode	Keep the EUT in Transmitting mode with worst case data rate
Remark	GFSK(1Mbps) is the worst case mode

Remark: The sample was placed 0.8m above the ground plane of 3m chamber. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating the turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages.

1.8. Laboratory Location

The testing was performed by the Shenzhen Toby Technology Co., Ltd., in their facilities located at:
1A/F., Bldg.6, Yusheng Industrial Zone, The National Road No.107 Xixiang Section 467, Xixiang, Bao'an, Shenzhen, Guangdong, China.

At the time of testing, the following bodies accredited the Laboratory:

The Laboratory has been accredited by CNAS to ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories for the competence in the field of testing. And the Registration No.: CNAS L5813.

The Laboratory is listed in the United States of American Federal Communications Commission (FCC), and the registration number is 811562.

Tel:86-755-26509301 Fax: 86-755-26509195

1.9. Test Instruments List

Item	Test Equipment	Manufacturer	Model No.	Series No.	Cal. Date	Cal. Due date
1	EMI Test Receiver	ROHDE& SCHWARZ	ESCI	100321	Aug. 10, 2013	Aug.09, 2014
2	50ΩCoaxial Switch	Anritsu	MP59B	X10321	Aug. 10, 2013	Aug.09, 2014
3	RF Switching Unit	Compliance Direction	RSU-A4	34403	Aug. 10, 2013	Aug.09, 2014
4	L.I.S.N	Rohde & Schwarz	ENV216	101131	Aug. 10, 2013	Aug.09, 2014
5	L.I.S.N	SCHWARZBECK	NNBL 8226-2	8226-2/164	Aug. 10, 2013	Aug.09, 2014
6	Spectrum Analyzer	Agilent	E4407B	MY45106456	Mar. 20, 2014	Mar. 19, 2015
7	Spectrum Analyzer	Rohde & Schwarz	FSP7	DE25181	Aug. 10, 2013	Aug.09, 2014
8	Spectrum Analyzer	Rohde & Schwarz	FSP30	DE43625	Aug. 10, 2013	Aug.09, 2014
9	EMI Test Receiver	Rohde & Schwarz	ESCI	101165	Aug. 10, 2013	Aug.09, 2014
10	Bilog Antenna	ETS-LINDGREN	3142E	00117537	Mar. 07, 2014	Mar.06, 2015
11	Horn Antenna	ETS-LINDGREN	3117	00143207	Mar. 07, 2014	Mar.06, 2015
12	Pre-amplifier	HP	11909A	185903	Mar. 07, 2014	Mar.06, 2015
13	Pre-amplifier	HP	8447B	3008A00849	Mar. 07, 2014	Mar.06, 2015
14	Cable	HUBER+SUHNER	100	SUCOFLEX	Mar. 07, 2014	Mar.06, 2015
15	Cable	HUBER+SUHNER	RG 223/U	CBL2-NN-2.0	Aug. 10, 2013	Aug.09, 2014
16	Signal Generator	Rohde & Schwarz	SML03	IKW682-054	Feb. 11, 2014	Feb.10, 2015
17	Positioning Controller	ETS-LINDGREN	2090	N/A	N/A	N/A
18	Antenna Mast	ETS-LINDGREN	2175	N/A	N/A	N/A

2. Test Summary

Standard Section	Test Item	Result
15.203/15.247(c)	Antenna Requirement	PASS
15.207	Conducted Emission	N/A
15.247(b)(1)	Conducted Peak Output Power	PASS
15.247(a)(1)	20dB Occupied Bandwidth	PASS
15.247(a)(1)	Carrier Frequencies Separation	PASS
15.247(a)(1)	Hopping Channel Number	PASS
15.247(a)(1)	Dwell Time	PASS
15.247(b)(4)&TCB Exclusion List (7 July 2002)	Pseudorandom Frequency Hopping Sequence	PASS
15.205/15.209	Spurious Emission	PASS
15.247(d)	Band Edge	PASS
Remark: "N/A" is an abbreviation for Not Applicable.		

3. Test Results and Measurement Data

3.1. Antenna Requirement

Standard requirement:	FCC Part15 C Section 15.203 /247(c)

15.203 requirement:

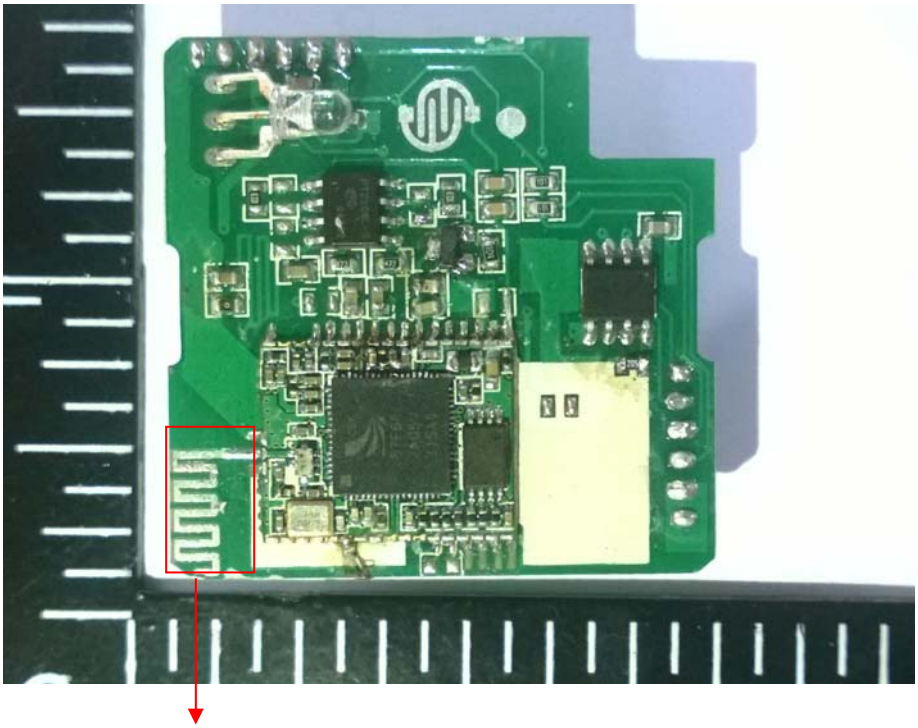
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

15.247(c) (1)(i) requirement:

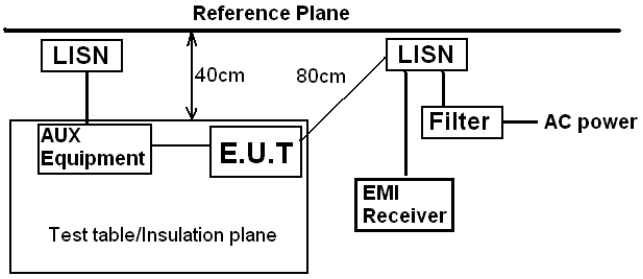
(i) Systems operating in the 2400-2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6dBi.

E.U.T Antenna:	

The Bluetooth antenna is an integral antenna which permanently attached, and the best case gain of the antenna is 0dBi.

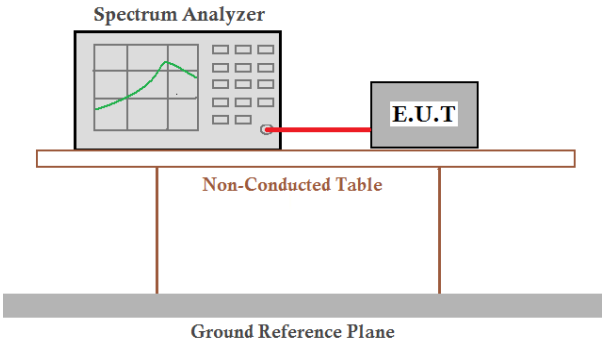


3.2. Conducted Emission Test

<table>
<tr><td>Test Requirement:</td><td>FCC Part15 C Section 15.207</td></tr>
<tr><td>Test Method:</td><td>ANSI C63.4:2003</td></tr>
<tr><td>Test Frequency Range:</td><td>150 kHz to 30 MHz</td></tr>
<tr><td>Class / Severity:</td><td>Class B</td></tr>
<tr><td>Receiver setup:</td><td>RBW=9 kHz, VBW=30 kHz, Sweep time=auto</td></tr>
<tr><td>Limit:</td><td>
<table>
<tr><td rowspan="2">Frequency range (MHz)</td><td colspan="2">Limit (dBuV)</td></tr>
<tr><td>Quasi-peak</td><td>Average</td></tr>
<tr><td>0.15-0.5</td><td>66 to 56*</td><td>56 to 46*</td></tr>
<tr><td>0.5-5</td><td>56</td><td>46</td></tr>
<tr><td>5-30</td><td>60</td><td>50</td></tr>
</table>
* Decreases with the logarithm of the frequency.
</td></tr>
<tr><td>Test setup:</td><td>


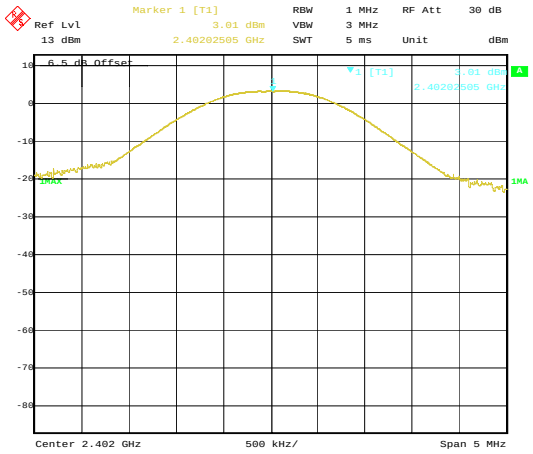
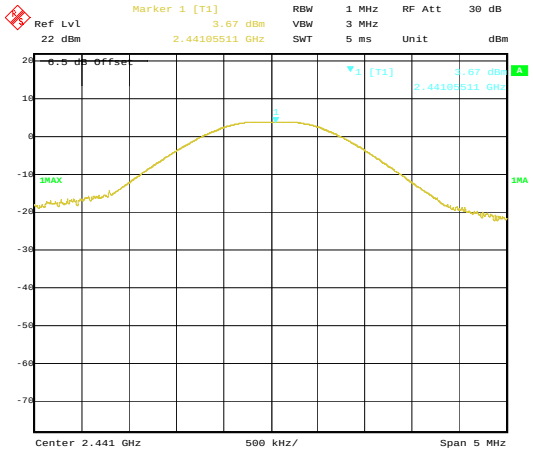
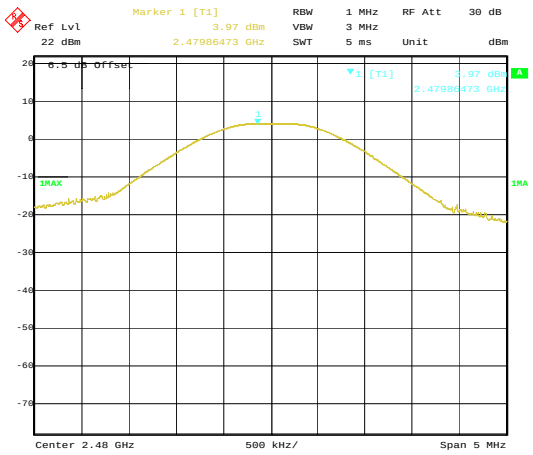
Remark:
E.U.T: Equipment Under Test
LISN: Line Impedence Stabilization Network
Test table height=0.8m
</td></tr>
<tr><td>Test procedure:</td><td>The E.U.T and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm/50uH coupling impedance for the measuring equipment.
The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs).
Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4: 2003 on conducted measurement.</td></tr>
<tr><td>Test Instruments:</td><td>Refer to section 1.9 for details</td></tr>
<tr><td>Test mode:</td><td>Bluetooth (Continuous transmitting) mode</td></tr>
<tr><td>Test results:</td><td>N/A.
The EUT’s power supply is DC 15V, from an external battery.</td></tr>
</table>

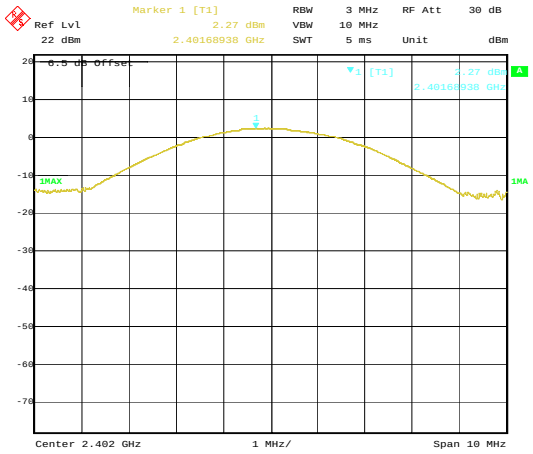
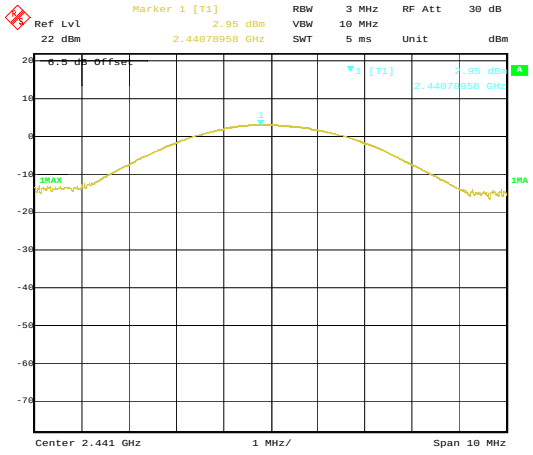
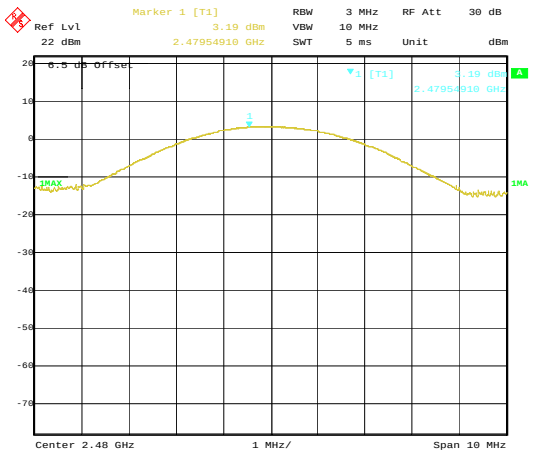
3.3. Conducted Peak Output Power Test

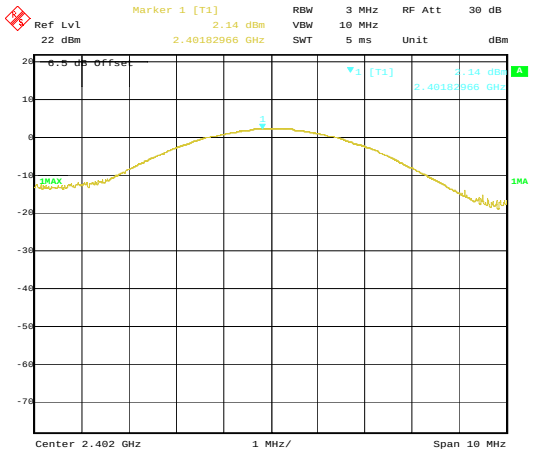
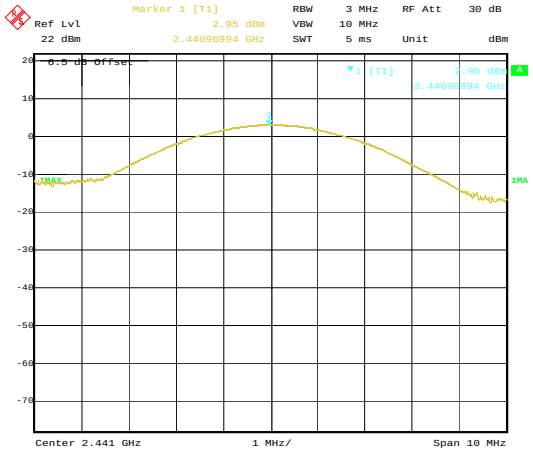
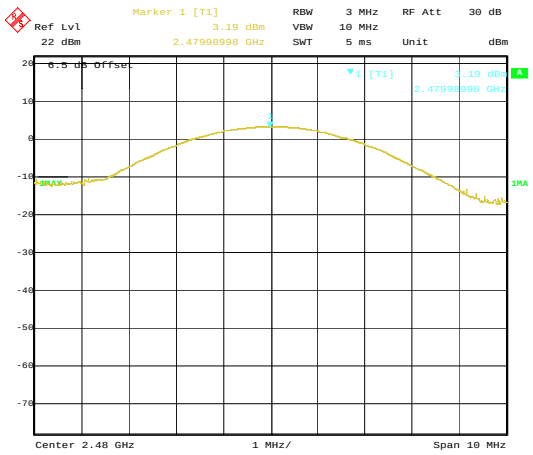
Test Requirement:	FCC Part15 C Section 15.247 (b)(3)
Test Method:	ANSI C63.4:2003 and DA00-705
Receiver setup:	RBW=1MHz, VBW=3MHz, Detector=Peak (If 20dB BW ≤1 MHz) RBW=3MHz, VBW=10MHz, Detector=Peak (If 20dB BW > 1 MHz and < 3MHz)
Limit:	125 mW(21 dBm)
Test setup:	
Test Instruments:	Refer to section 1.9 for details
Test mode:	Non-hopping mode
Test results:	Pass

Measurement Data

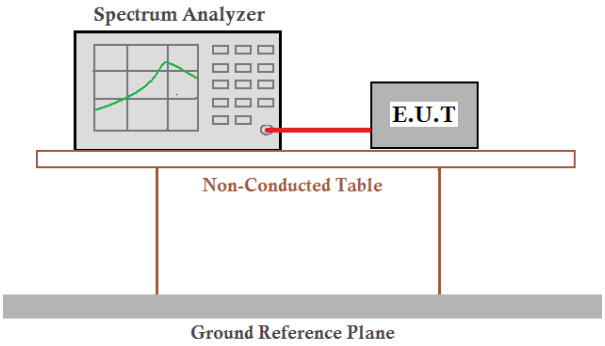
GFSK mode				
Channel Number	**Channel Frequency (MHz)**	**Test Result (dBm)**	**Limit (30dBm)**	**Result**
CH 00	2402	3.01	21	PASSED
CH 39	2441	3.67	21	PASSED
CH 78	2480	3.97	21	PASSED
π/4-DQPSK mode				
Channel Number	**Channel Frequency (MHz)**	**Test Result (dBm)**	**Limit (30dBm)**	**Result**
CH 00	2402	2.27	21	PASSED
CH 39	2441	2.95	21	PASSED
CH 78	2480	3.19	21	PASSED
8DPSK mode				
Channel Number	**Channel Frequency (MHz)**	**Test Result (dBm)**	**Limit (30dBm)**	**Result**
CH 00	2402	2.14	21	PASSED
CH 39	2441	2.95	21	PASSED
CH 78	2480	3.19	21	PASSED

Modulation mode	GFSK mode
2402MHz	
2441MHz	
2480MHz	

Modulation mode	π/4-DQPSK
2402MHz	
2441MHz	
2480MHz	

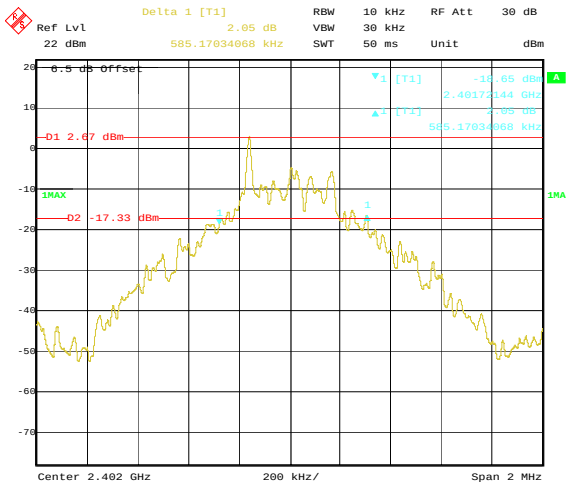
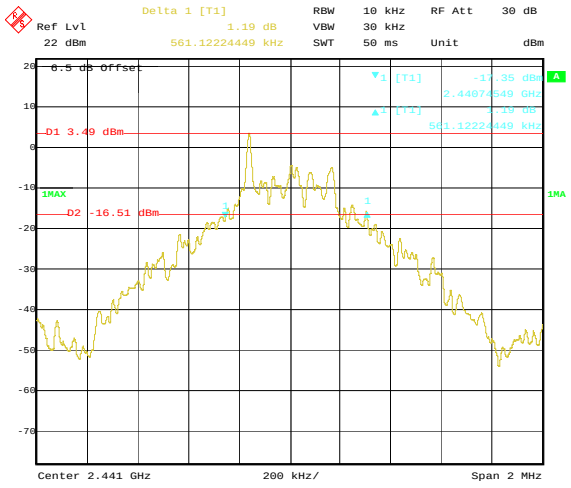
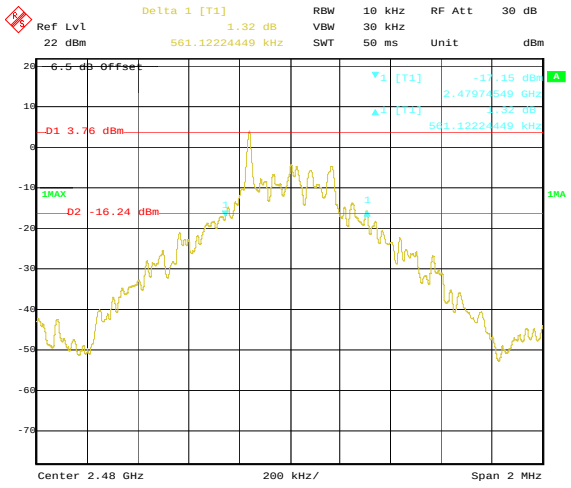
Modulation mode	8DPSK
2402MHz	
2441MHz	
2480MHz	

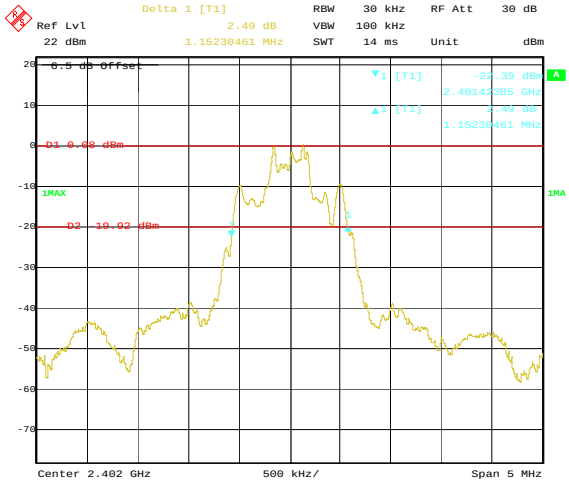
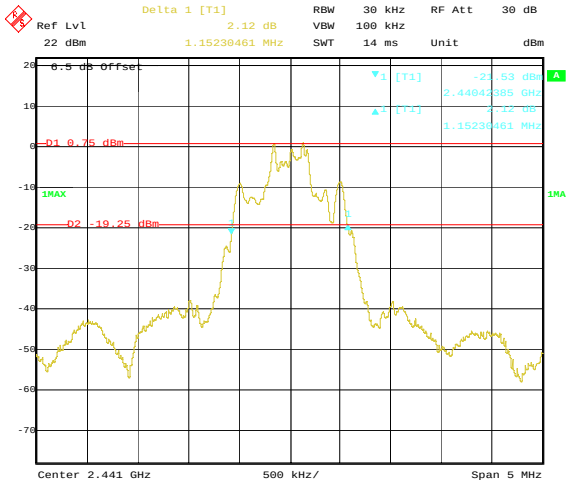
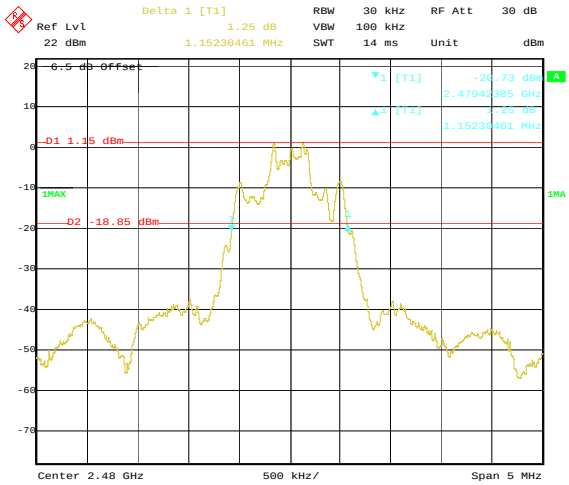
3.4. 20dB Occupy Bandwidth Test

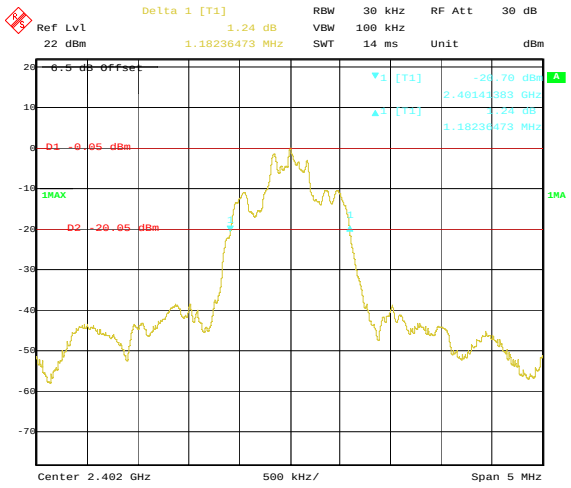
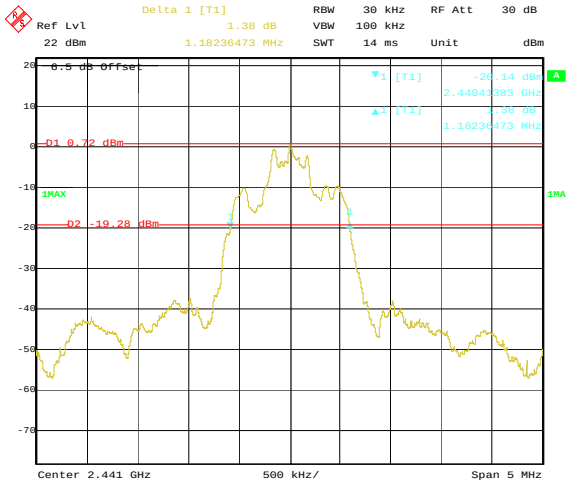
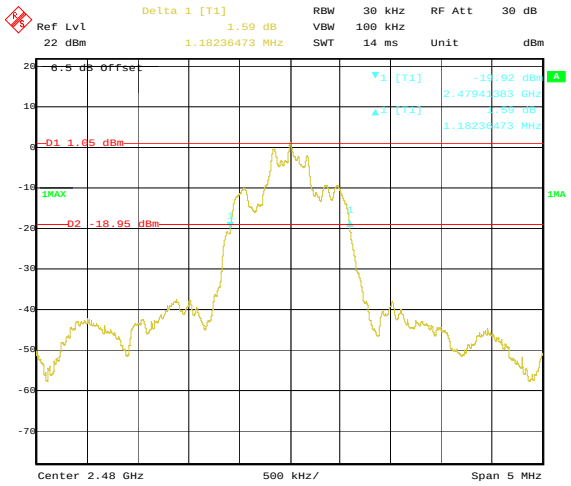
Test Requirement:	FCC Part15 C Section 15.247 (a)(1)
Test Method:	ANSI C63.4:2003 and DA00-705
Receiver setup:	RBW=30 kHz, VBW=100 kHz, detector=Peak
Limit:	NA
Test setup:	
Test Instruments:	Refer to section 1.9 for details
Test mode:	Non-hopping mode
Test results:	Pass

Measurement Data

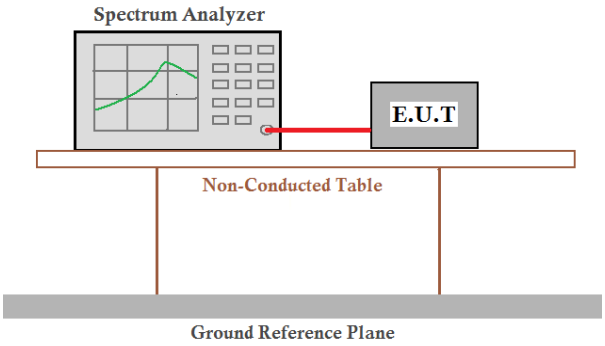
Channel Number	Channel Frequency	20dB Bandwidth (kHz)		
		GFSK	π/4-DQPSK	8DPSK
CH 00	2402(MHz)	585	1152	1182
CH 39	2441(MHz)	561	1152	1182
CH 78	2480(MHz)	561	1152	1182

Modulation mode	GFSK mode
2402MHz	
2441MHz	
2480MHz	

Modulation mode	π/4-DQPSK
2402MHz	
2441MHz	
2480MHz	

Modulation mode	8DPSK
2402MHz	
2441MHz	
2480MHz	

3.5. Carrier Frequency Separation Test

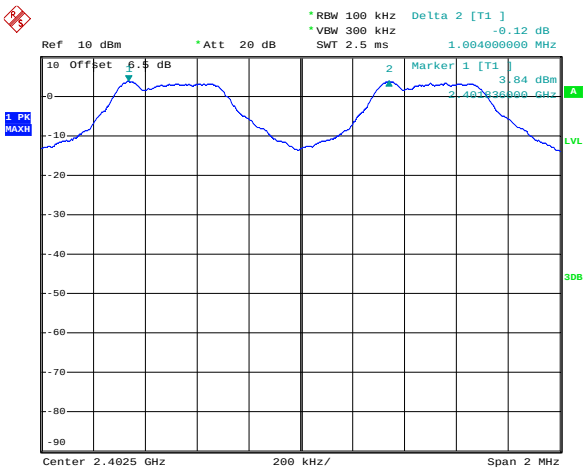
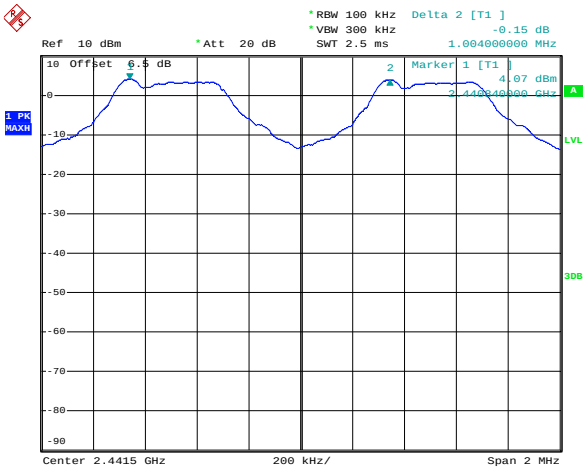
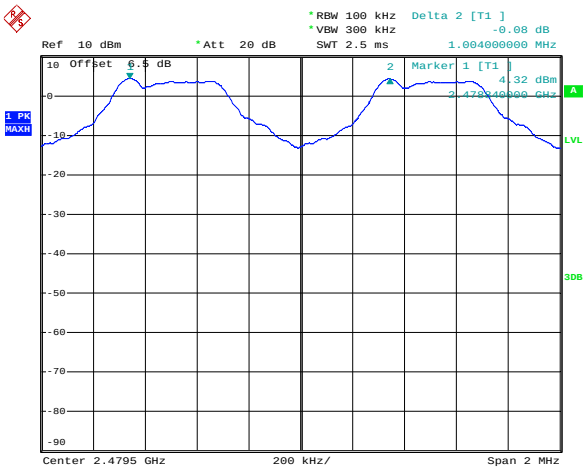
Test Requirement:	FCC Part15 C Section 15.247 (a)(1)
Test Method:	ANSI C63.4:2003 and DA00-705
Receiver setup:	RBW=100 kHz, VBW=300 kHz, detector=Peak
Limit:	0.025MHz or 2/3 of the 20dB bandwidth (whichever is greater)
Test setup:	
Test Instruments:	Refer to section 1.9 for details
Test mode:	Hopping mode
Test results:	Pass

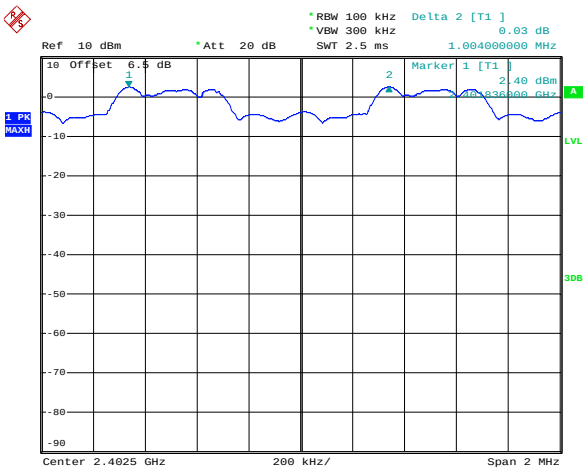
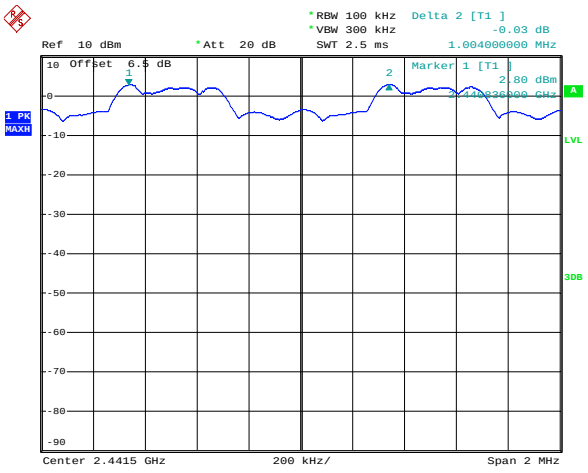
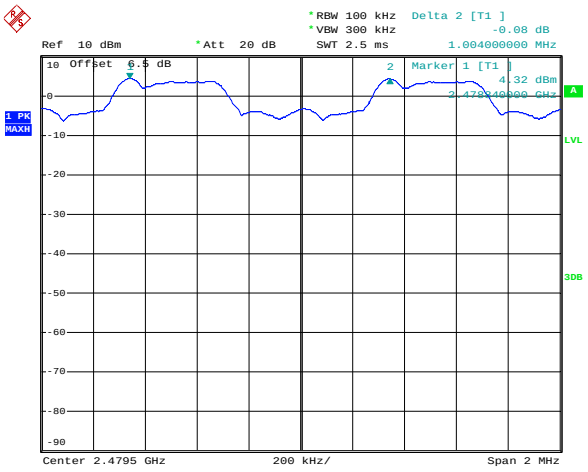
Measurement Data

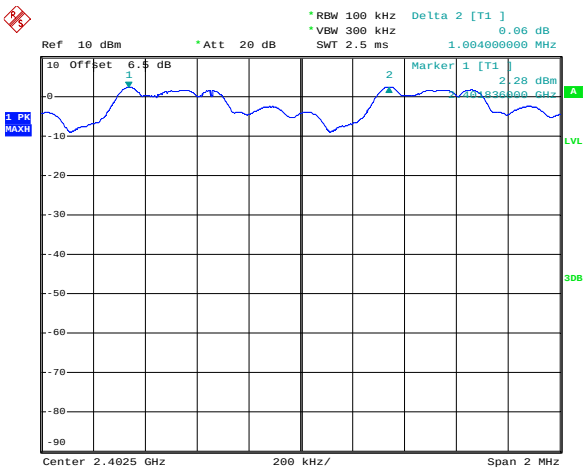
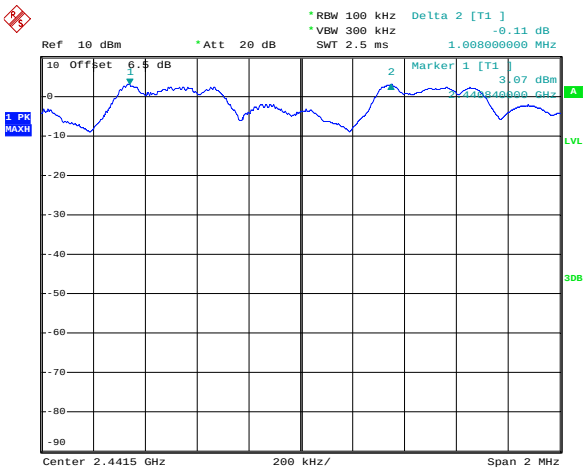
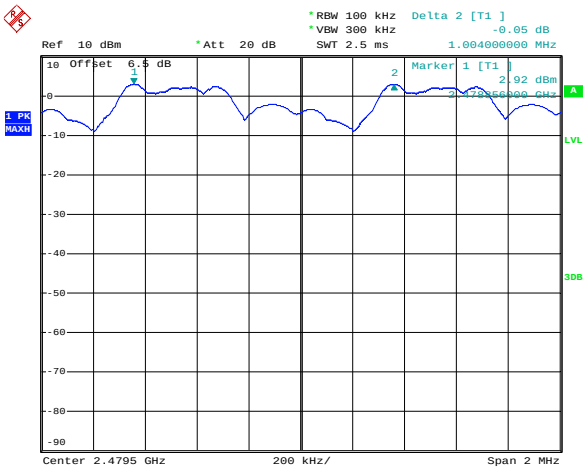
GFSK mode				
Channel Number	**Channel Frequency (MHz)**	**Test Result (dBm)**	**Limit (30dBm)**	**Result**
CH 00	2402	1004	374.000	PASS
CH 39	2441	1004	374.000	PASS
CH 78	2480	1004	374.000	PASS
π/4-DQPSK mode				
Channel Number	**Channel Frequency (MHz)**	**Test Result (dBm)**	**Limit (30dBm)**	**Result**
CH 00	2402	1004	768.000	PASS
CH 39	2441	1004	768.000	PASS
CH 78	2480	1004	768.000	PASS
8DPSK mode				
Channel Number	**Channel Frequency (MHz)**	**Test Result (dBm)**	**Limit (30dBm)**	**Result**
CH 00	2402	1004	788.000	PASS
CH 39	2441	1008	788.000	PASS
CH 78	2480	1004	788.000	PASS

According to section 3.4

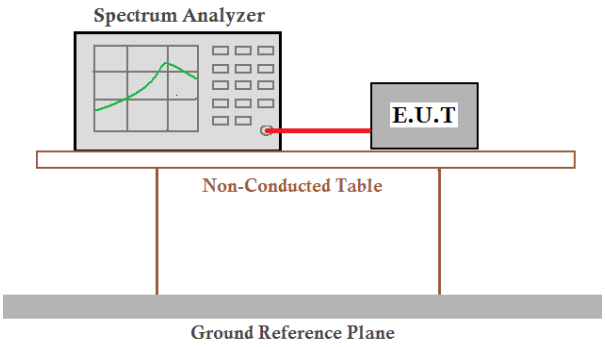
Test Mode	20dB bandwidth (kHz) (worse case)	Limit (kHz) (Carrier Frequency Separation)
GFSK	561.00	374.000
π/4-DQPSK	1152.00	768.000
8DPSK	1182.00	788.000

Modulation mode	GFSK mode
2402MHz	
2441MHz	
2480MHz	

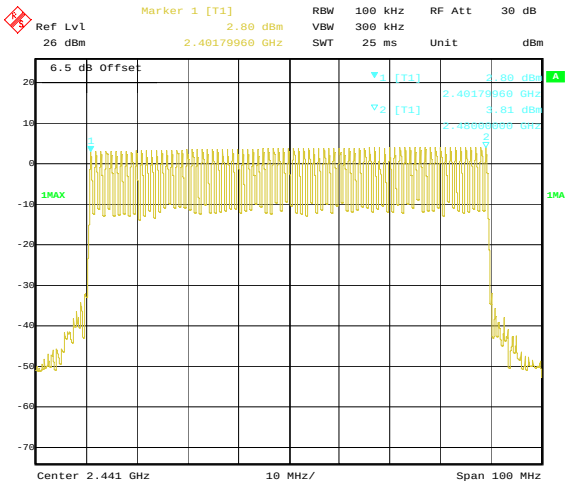
Modulation mode	π/4-DQPSK
2402MHz	
2441MHz	
2480MHz	

Modulation mode	8DPSK
2402MHz	
2441MHz	
2480MHz	

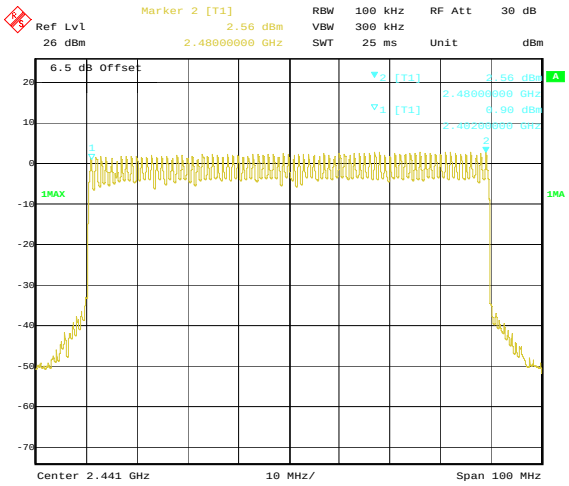
3.6. Number of Hopping Channel

Test Requirement:	FCC Part15 C Section 15.247 (a)(1)
Test Method:	ANSI C63.4:2003 and DA00-705
Receiver setup:	RBW=100 kHz, VBW=300 kHz, Frequency range=2400MHz-2483.5MHz, Detector=Peak
Limit:	15 channels
Test setup:	
Test Instruments:	Refer to section 1.9 for details
Test mode:	Hopping mode
Test results:	Pass

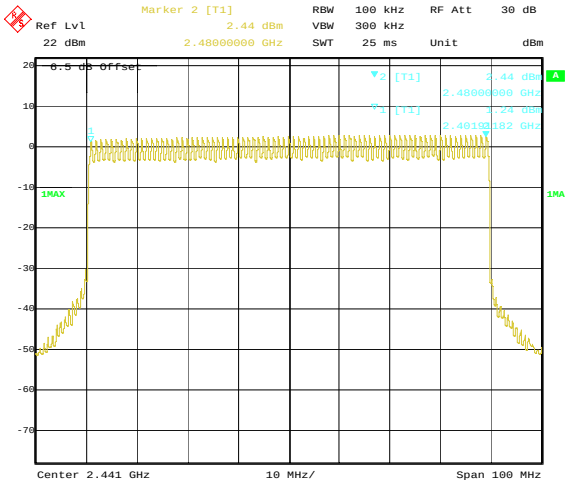
Modulation mode	GFSK mode



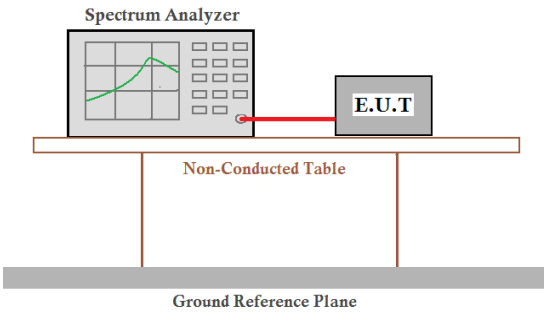
Modulation mode	π/4-DQPSK



Modulation mode	8DPSK



3.7. Dwell Time Test

Test Requirement:	FCC Part15 C Section 15.247 (a)(1)
Test Method:	ANSI C63.4:2003 and KDB DA00-705
Receiver setup:	RBW=1 MHz, VBW=1 MHz, Span=0 Hz, Detector=Peak
Limit:	0.4 Second
Test setup:	
Test Instruments:	Refer to section 1.9 for details
Test mode:	Hopping mode
Test results:	Pass

Measurement Data

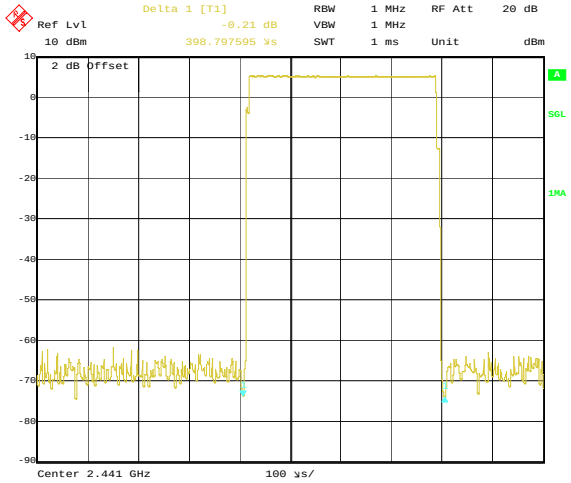
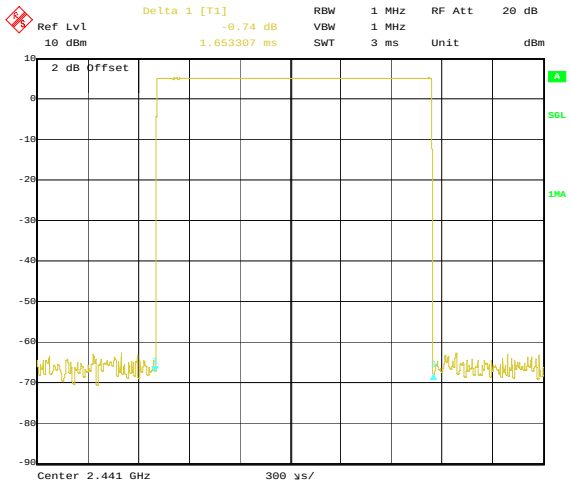
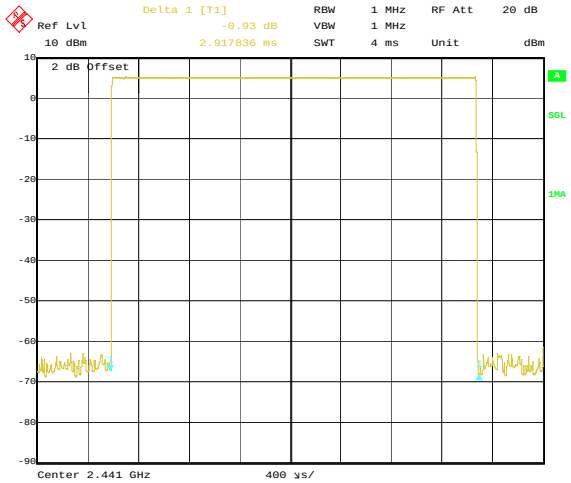
Mode	Packet	Total of Dwell (ms)	Period Time (s)	Limit (s)	Result
GFSK	DH1	0.12768	31.60	0.4	PASS
	DH3	0.26448	31.60		PASS
	DH5	0.31125	31.60		PASS
π/4-DQPSK	2-DH1	0.12768	31.60		PASS
	2-DH3	0.27024	31.60		PASS
	2-DH5	0.31125	31.60		PASS
8DPSK	3-DH1	0.12896	31.60		PASS
	3-DH3	0.26640	31.60		PASS
	3-DH5	0.31381	31.60		PASS

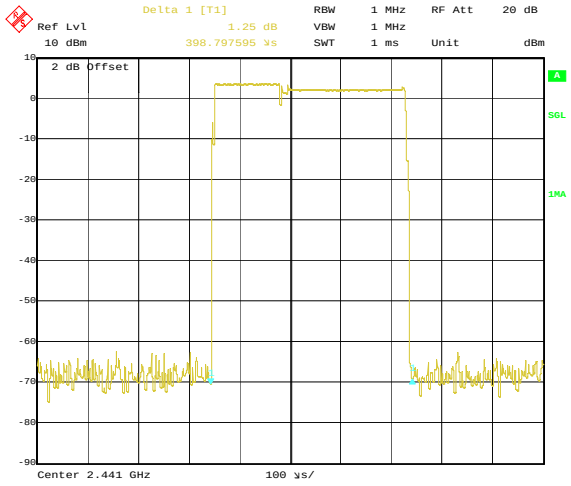
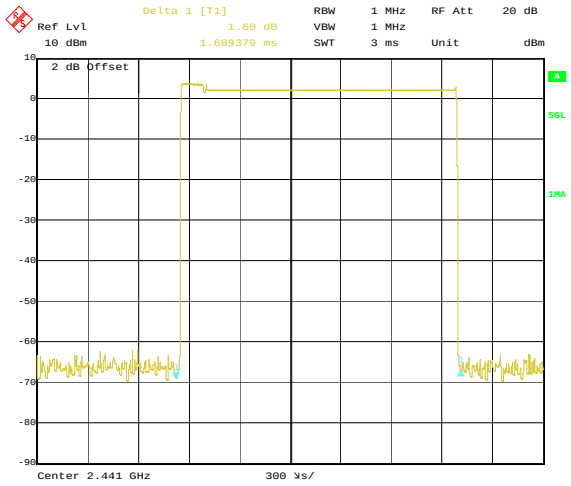
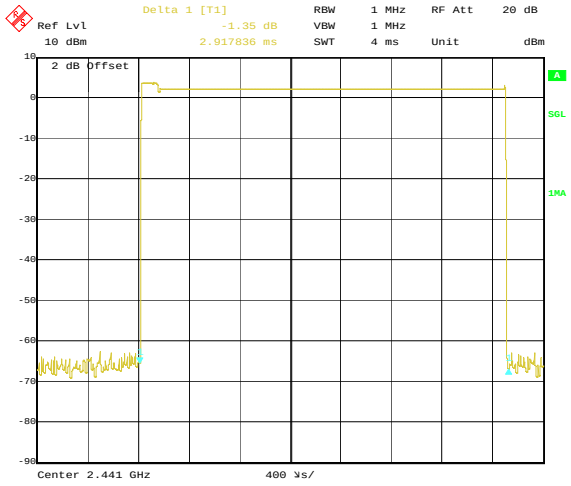
For GFSK, π/4-DQPSK and 8DPSK:
The test period: T= 0.4 Second/Channel x 79 Channel = 31.6 s
The lowest channel (2402MHz), middle channel (2441MHz), highest channel (2480MHz) as below

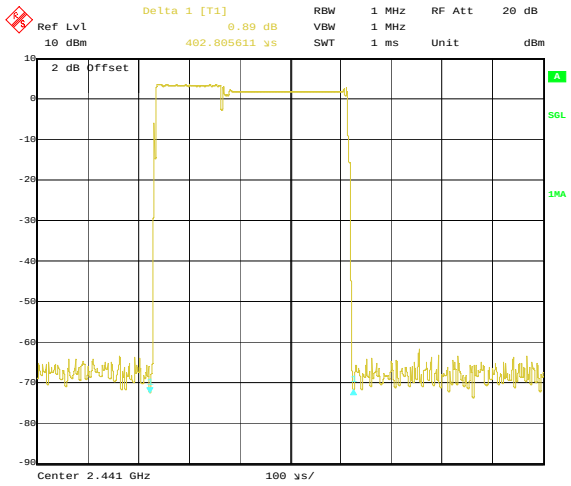
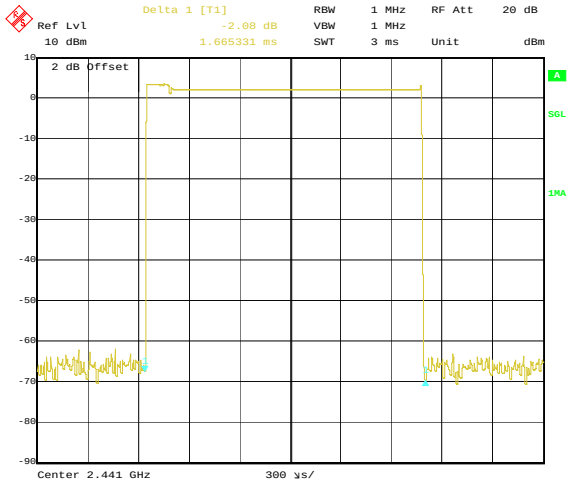
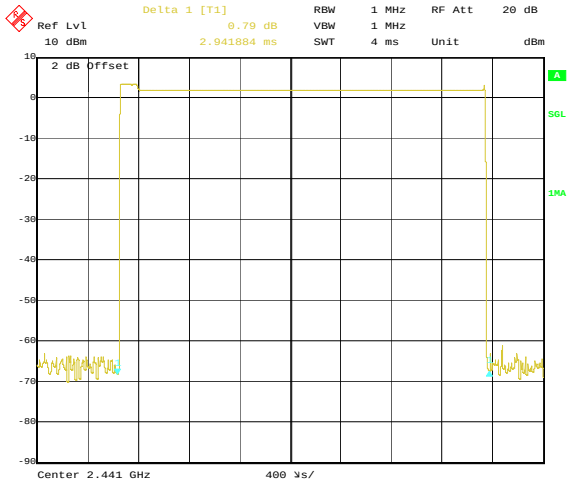
DH1 time slot=0.399*(1600/ (2*79))*31.6=127.68ms
DH3 time slot=1.653*(1600/ (4*79))*31.6=264.48ms
DH5 time slot=2.918*(1600/ (6*79))*31.6=311.25ms

2-DH1 time slot=0.399*(1600/ (2*79))*31.6=127.68ms
2-DH3 time slot=1.689*(1600/ (4*79))*31.6=270.24ms
2-DH5 time slot=2.918*(1600/ (6*79))*31.6=311.25ms

3-DH1 time slot=0.403*(1600/ (2*79))*31.6=128.96ms
3-DH3 time slot=1.665*(1600/ (4*79))*31.6=266.40ms
3-DH5 time slot=2.942*(1600/ (6*79))*31.6=313.81ms

Modulation mode	GFSK mode
DH1	
DH3	
DH5	

Modulation mode	π/4-DQPSK
2-DH1	
2-DH3	
2-DH5	

Modulation mode	8DPSK
3-DH1	
3-DH3	
3-DH5	

3.8. Pseudorandom Frequency Hopping Sequence

Test Requirement:	FCC Part15 C Section 15.247 (a)(1) requirement:

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. The system shall hop to channel frequencies that are selected at the system hopping rate from a Pseudorandom ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding

transmitters and shall shift frequencies in synchronization with the transmitted signals.

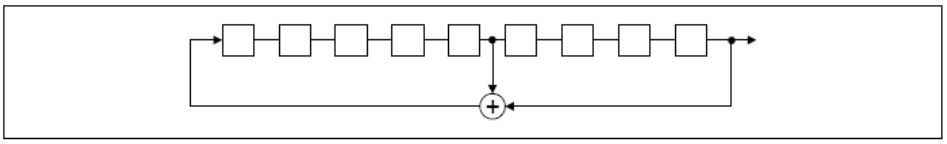
EUT Pseudorandom Frequency Hopping Sequence

The pseudorandom sequence may be generated in a nine-stage shift register whose 5th and 9th stage outputs are added in a modulo-two addition stage. And the result is fed back to the input of the first stage. The sequence begins with the first ONE of 9 consecutive ONEs; i.e. the shift register is initialized with nine ones.

• Number of shift register stages: 9

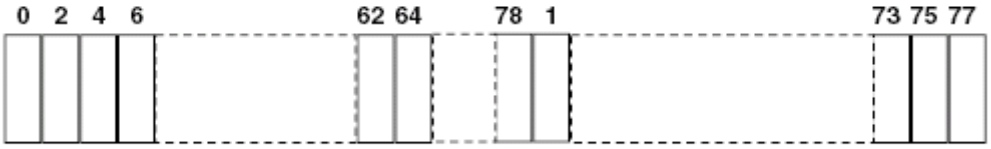
• Length of pseudo-random sequence: 2^9 -1 = 511 bits

• Longest sequence of zeros: 8 (non-inverted signal)



Linear Feedback Shift Register for Generation of the PRBS sequence

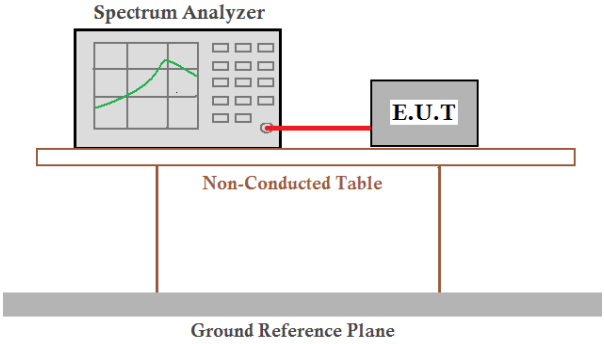
An example of Pseudorandom Frequency Hopping Sequence as follow:



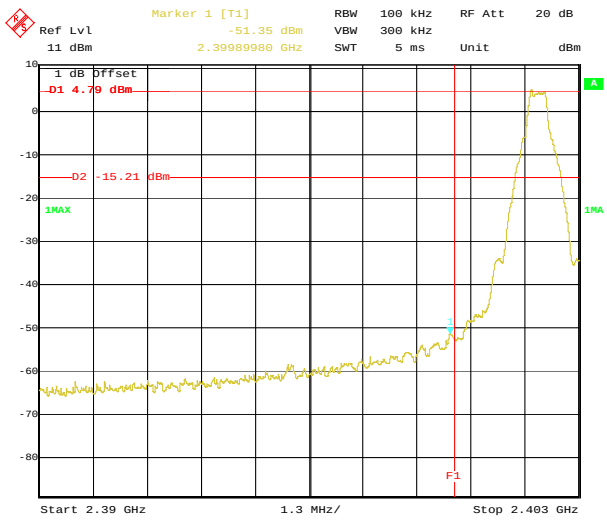
Each frequency used equally on the average by each transmitter.

The system receivers have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shift frequencies in synchronization with the transmitted signals.

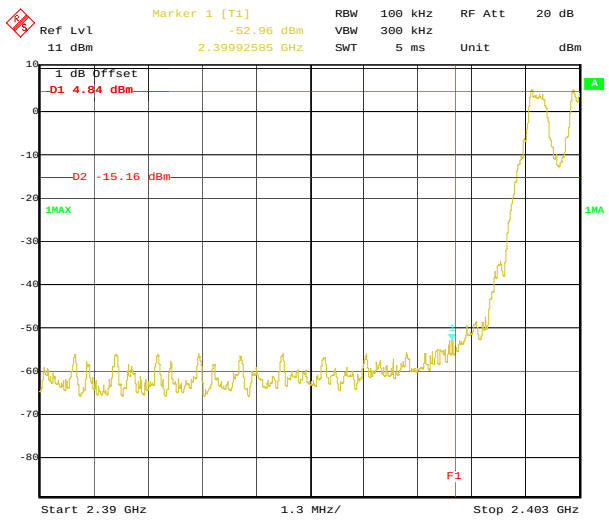
3.9. Band Edge Requirement (Conducted Emission Method)

Test Requirement:	FCC Part15 C Section 15.247 (d)
Test Method:	ANSI C63.4:2003 and DA00-705
Receiver setup:	RBW=100 kHz, VBW=300 kHz, Detector=Peak
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.
Test setup:	
Test Instruments:	Refer to section 1.9 for details
Test mode:	Non-hopping mode and hopping mode
Test results:	Pass

Modulation mode	GFSK	Test channel	Lowest

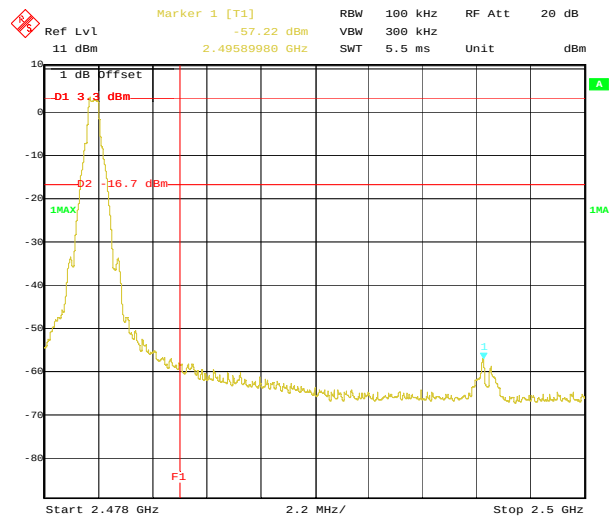


No-hopping mode

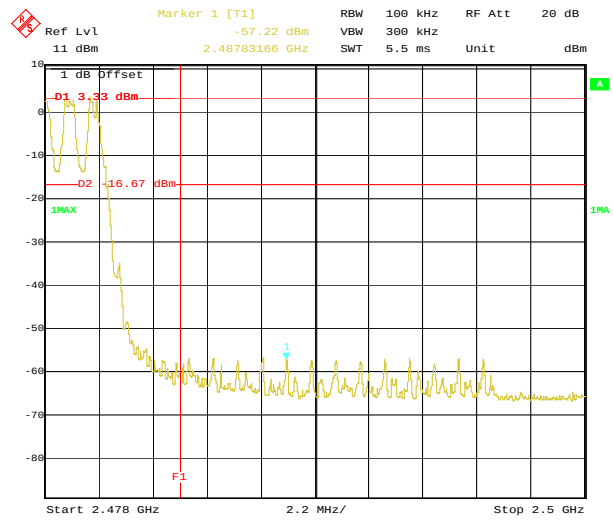


Hopping mode

Modulation mode	GFSK	Test channel	Highest

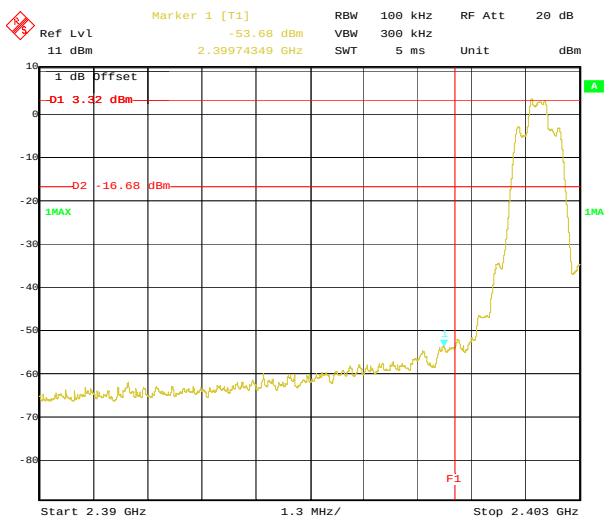


No-hopping mode

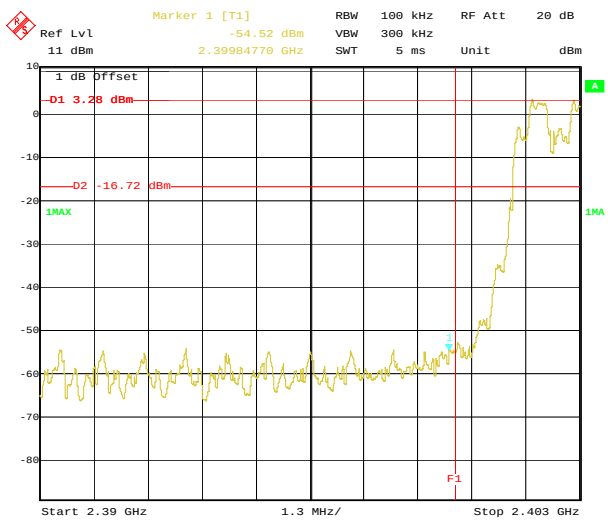


Hopping mode

Modulation mode	π/4-DQPSK	Test channel	Lowest

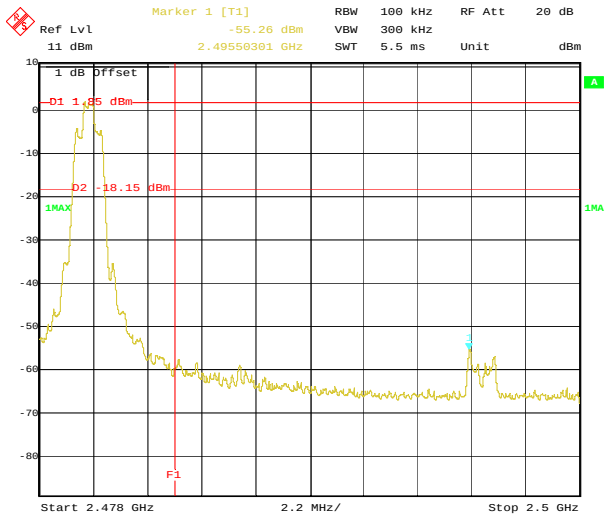


No-hopping mode

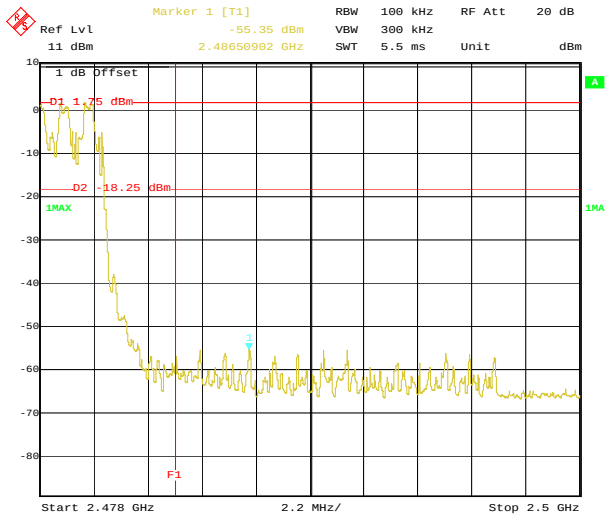


Hopping mode

Modulation mode	π/4-DQPSK	Test channel	Highest

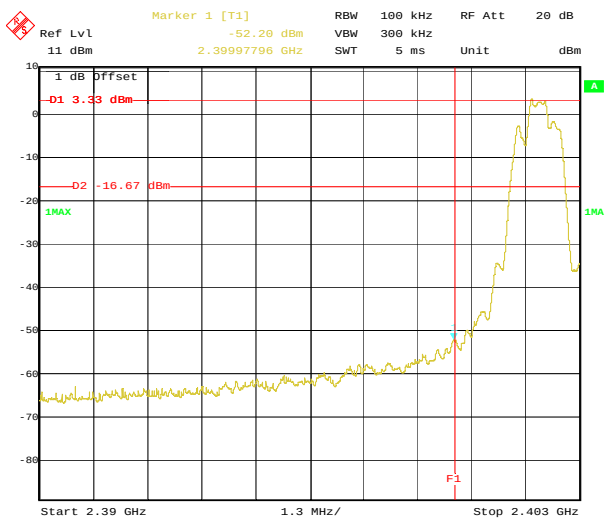


No-hopping mode

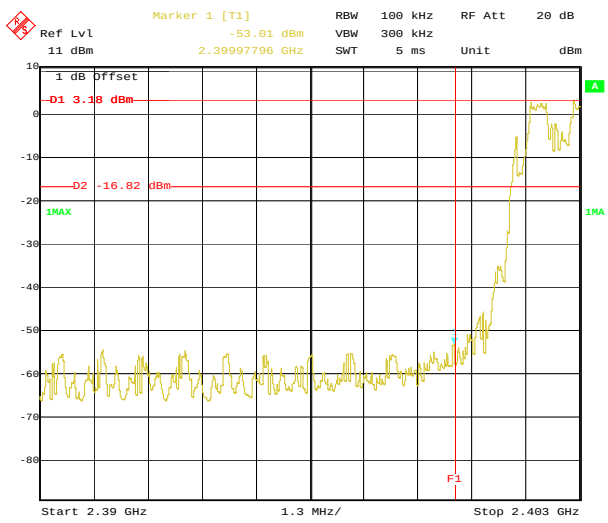


Hopping mode

Modulation mode	8DPSK	Test channel	Lowest

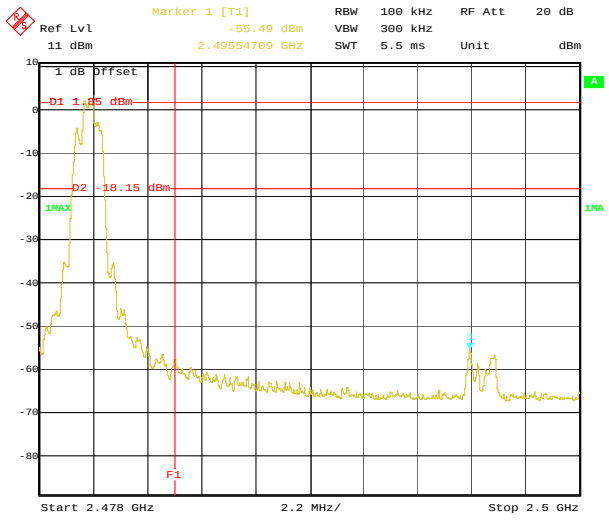


No-hopping mode

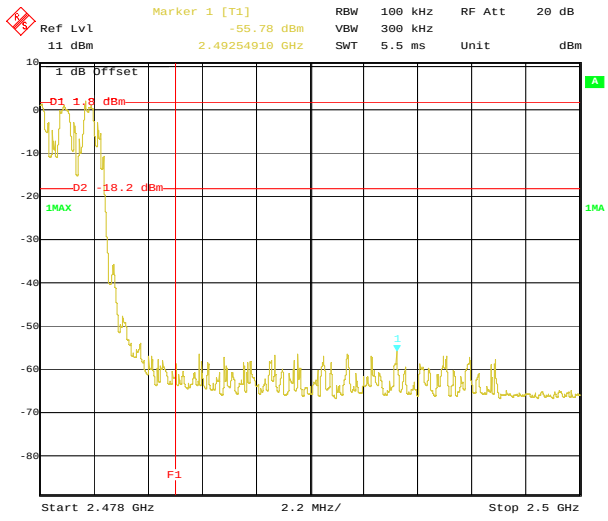


Hopping mode

Modulation mode	8DPSK	Test channel	Highest

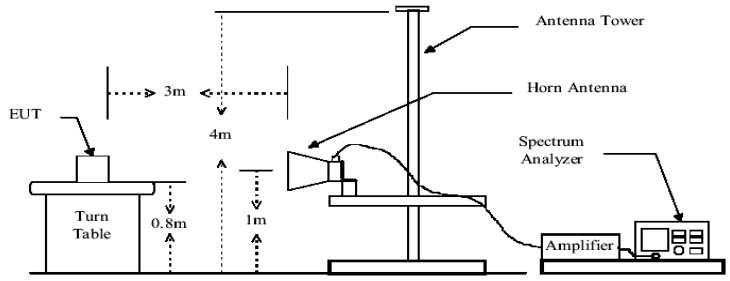


No-hopping mode



Hopping mode

3.10. Band Edge Requirement (Radiated Emission Method)

<table>
<tr><td>Test Requirement:</td><td>FCC Part15 C Section 15.209 and 15.205</td></tr>
<tr><td>Test Method:</td><td>ANSI C63.4: 2003</td></tr>
<tr><td>Test Frequency Range:</td><td>2.3GHz to 2.5GHz</td></tr>
<tr><td>Test site:</td><td>Measurement Distance: 3m</td></tr>
<tr><td>Receiver setup:</td><td>
<table>
<tr><td>Frequency</td><td>Detector</td><td>RBW</td><td>VBW</td><td>Remark</td></tr>
<tr><td rowspan="2">Above 1GHz</td><td>Peak</td><td>1MHz</td><td>3MHz</td><td>Peak Value</td></tr>
<tr><td>Peak</td><td>1MHz</td><td>10Hz</td><td>Average Value</td></tr>
</table>
</td></tr>
<tr><td>Limit:</td><td>
<table>
<tr><td>Frequency</td><td>Limit (dBuV/m @3m)</td><td>Remark</td></tr>
<tr><td rowspan="2">Above 1GHz</td><td>54.00</td><td>Average Value</td></tr>
<tr><td>74.00</td><td>Peak Value</td></tr>
</table>
</td></tr>
<tr><td>Test setup:</td><td> 
</td></tr>
<tr><td>Test Procedure:</td><td>1. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation.
2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
3. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rota table was turned from 0 degrees to 360 degrees to find the maximum reading.
5. The test-receiver system was set to Peak Detect Function and Specified</td></tr>
<tr><td>Test Instruments:</td><td>Refer to section 1.9 for details</td></tr>
<tr><td>Test mode:</td><td>Non-hopping mode</td></tr>
<tr><td>Test results:</td><td>Pass</td></tr>
</table>

Test Data

Remark:

1. During the test, pre-scan the GFSK, π/4-DQPSK, 8DPSK, and all data were shown in the report.
2. Pre-scan all kind of the place mode (X-axis, Y-axis, Z-axis), and found the Y-axis is the worst case.

Test mode: GFSK				Test channel: Lowest			
Frequency (MHz)	Read Level (dBuV)	Correct Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Pol.	Detector
2390.00	52.87	0.77	53.64	74.00	-20.36	H	PEAK
2390.00	53.22	0.77	53.99	74.00	-20.01	V	PEAK
2390.00	40.21	0.77	40.98	54.00	-13.02	H	AVG.
2390.00	41.63	0.77	42.40	54.00	-11.60	V	AVG.
Test mode: GFSK				Test channel: Highest			
Frequency (MHz)	Read Level (dBuV)	Correct Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Pol.	Detector
2483.50	53.62	1.17	54.79	74.00	-19.21	H	PEAK
2483.50	54.78	1.17	55.95	74.00	-18.05	V	PEAK
2483.50	48.50	1.17	49.67	54.00	-4.33	H	AVG.
2483.50	47.13	1.17	48.30	54.00	-5.70	V	AVG.

Remark:

1. Final Level = Read Level + Correct Factor
2. The emission levels of other frequencies are very lower than the limit and not show in test report.

Test mode: π/4-DQPSK				Test channel: Lowest			
Frequency (MHz)	Read Level (dBuV)	Correct Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Pol.	Detector
2400.00	52.31	0.77	53.08	74.00	-20.92	H	PEAK
2400.00	52.89	0.77	53.66	74.00	-20.34	V	PEAK
2400.00	39.56	0.77	40.33	54.00	-13.67	H	AVG.
2400.00	41.78	0.77	42.55	54.00	-11.45	V	AVG.
Test mode: π/4-DQPSK				Test channel: Highest			
Frequency (MHz)	Read Level (dBuV)	Correct Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Pol.	Detector
2483.50	51.17	1.17	52.34	74.00	-21.66	H	PEAK
2483.50	53.46	1.17	54.63	74.00	-19.37	V	PEAK
2483.50	47.30	1.17	48.47	54.00	-5.53	H	AVG.
2483.50	46.18	1.17	47.35	54.00	-6.65	V	AVG.

Remark:

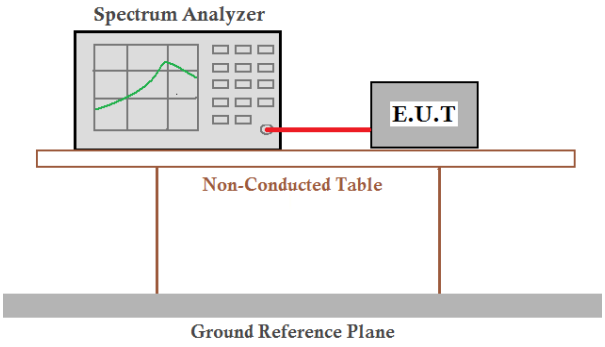
1. Final Level = Read Level + Correct Factor
2. The emission levels of other frequencies are very lower than the limit and not show in test report.

Test mode: 8DPSK				Test channel: Lowest			
Frequency (MHz)	Read Level (dBuV)	Correct Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Pol.	Detector
2400.00	51.49	0.77	52.26	74.00	-21.74	H	PEAK
2400.00	52.61	0.77	53.38	74.00	-20.62	V	PEAK
2400.00	39.11	0.77	39.88	54.00	-14.12	H	AVG.
2400.00	39.42	0.77	40.19	54.00	-13.81	V	AVG.
Test mode: 8DPSK				Test channel: Highest			
Frequency (MHz)	Read Level (dBuV)	Correct Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Pol.	Detector
2483.50	52.11	1.17	53.28	74.00	-20.72	H	PEAK
2483.50	52.43	1.17	53.60	74.00	-20.40	V	PEAK
2483.50	47.61	1.17	48.78	54.00	-5.22	H	AVG.
2483.50	46.25	1.17	47.42	54.00	-6.58	V	AVG.

Remark:

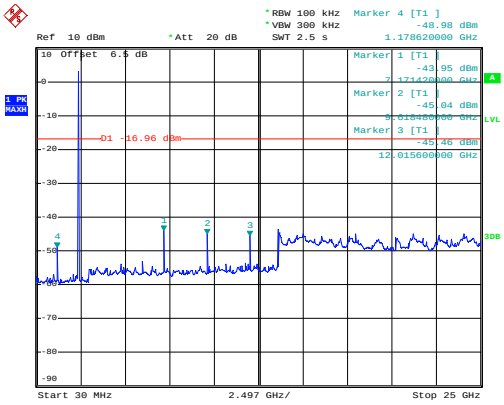
1. Final Level = Read Level + Correct Factor
2. The emission levels of other frequencies are very lower than the limit and not show in test report.

3.11. Spurious Emission (Conducted Emission Method)

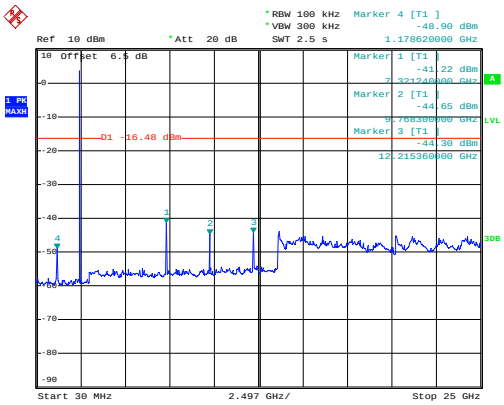
Test Requirement:	FCC Part15 C Section 15.247 (d)
Test Method:	ANSI C63.4:2003 and DA00-705
Receiver setup:	RBW=100 kHz, VBW=300 kHz, detector=Peak
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.
Test setup:	
Test Instruments:	Refer to section 1.9 for details
Test mode:	Non-hopping mode
Test results:	Pass

Modulation mode	GFSK	Frequency range	30MHz~25GHz

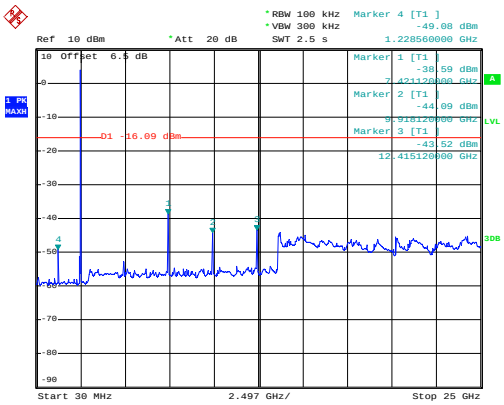
Lowest

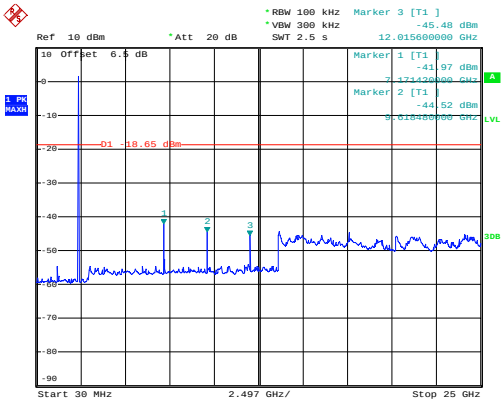
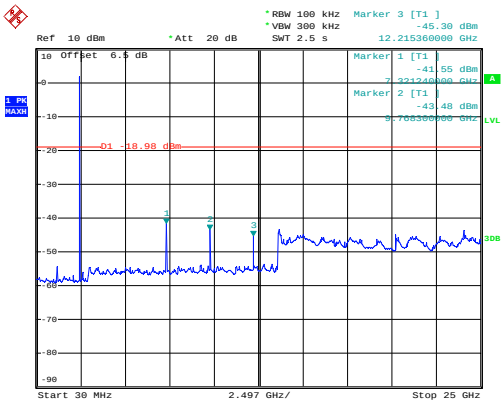
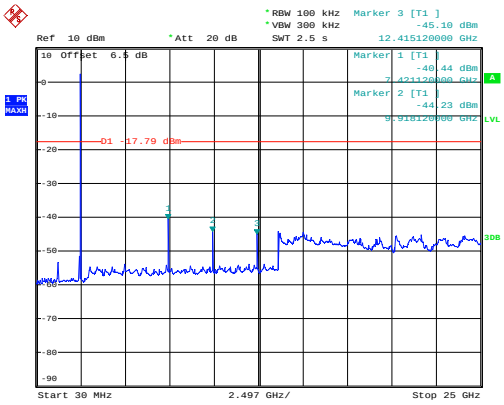


Middle



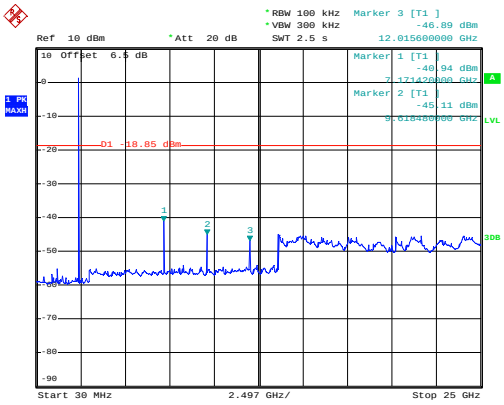
Highest



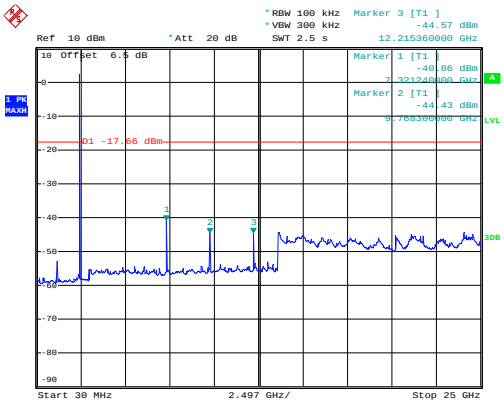
Modulation mode	π/4-DQPSK	Frequency range	30MHz~25GHz
Lowest			
Middle			
Highest			

Modulation mode	8DPSK	Frequency range	30MHz~25GHz

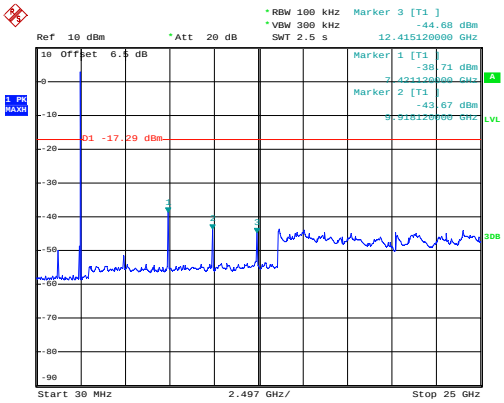
Lowest



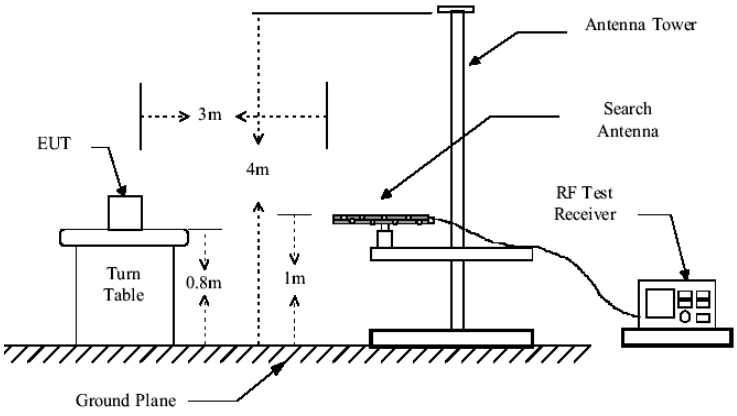
Middle

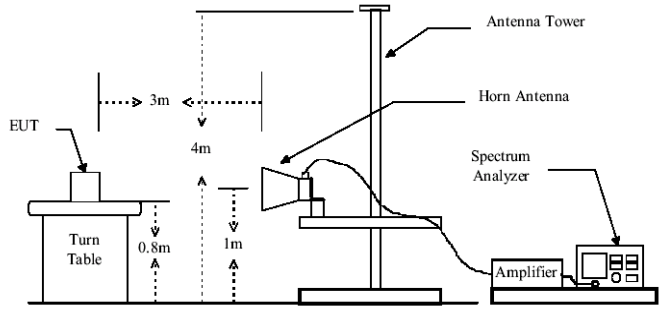


Highest



3.12. Spurious Emission (Radiated Emission Method)

<table>
<tr><td>Test Requirement:</td><td>FCC Part15 C Section 15.209</td></tr>
<tr><td>Test Method:</td><td>ANSI C63.4: 2003</td></tr>
<tr><td>Test Frequency Range:</td><td>9 kHz to 25 GHz</td></tr>
<tr><td>Test site:</td><td>Measurement Distance: 3m</td></tr>
<tr><td>Receiver setup:</td><td>
<table>
<tr><td>Frequency</td><td>Detector</td><td>RBW</td><td>VBW</td><td>Remark</td></tr>
<tr><td>30MHz-1GHz</td><td>Quasi-peak</td><td>120kHz</td><td>300kHz</td><td>Quasi-peak Value</td></tr>
<tr><td rowspan="2">Above 1GHz</td><td>Peak</td><td>1MHz</td><td>3MHz</td><td>Peak Value</td></tr>
<tr><td>Peak</td><td>1MHz</td><td>10Hz</td><td>Average Value</td></tr>
</table>
</td></tr>
<tr><td>Limit:</td><td>
<table>
<tr><td>Frequency</td><td>Limit (dBuV/m @3m)</td><td>Remark</td></tr>
<tr><td>30MHz-88MHz</td><td>40.0</td><td>Quasi-peak Value</td></tr>
<tr><td>88MHz-216MHz</td><td>43.5</td><td>Quasi-peak Value</td></tr>
<tr><td>216MHz-960MHz</td><td>46.0</td><td>Quasi-peak Value</td></tr>
<tr><td>960MHz-1GHz</td><td>54.0</td><td>Quasi-peak Value</td></tr>
<tr><td rowspan="2">Above 1GHz</td><td>54.0</td><td>Average Value</td></tr>
<tr><td>74.0</td><td>Peak Value</td></tr>
</table>
</td></tr>
<tr><td>Test setup:</td><td>Below 1GHz
 

Above 1GHz
 

</td></tr>
</table>

Test Procedure:	1. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation. 2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. 3. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement. 4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rota table was turned from 0 degrees to 360 degrees to find the maximum reading. 5. The test-receiver system was set to Peak Detect Function and Specified
Test Instruments:	Refer to section 1.9 for details
Test mode:	Non-hopping mode
Test results:	Pass

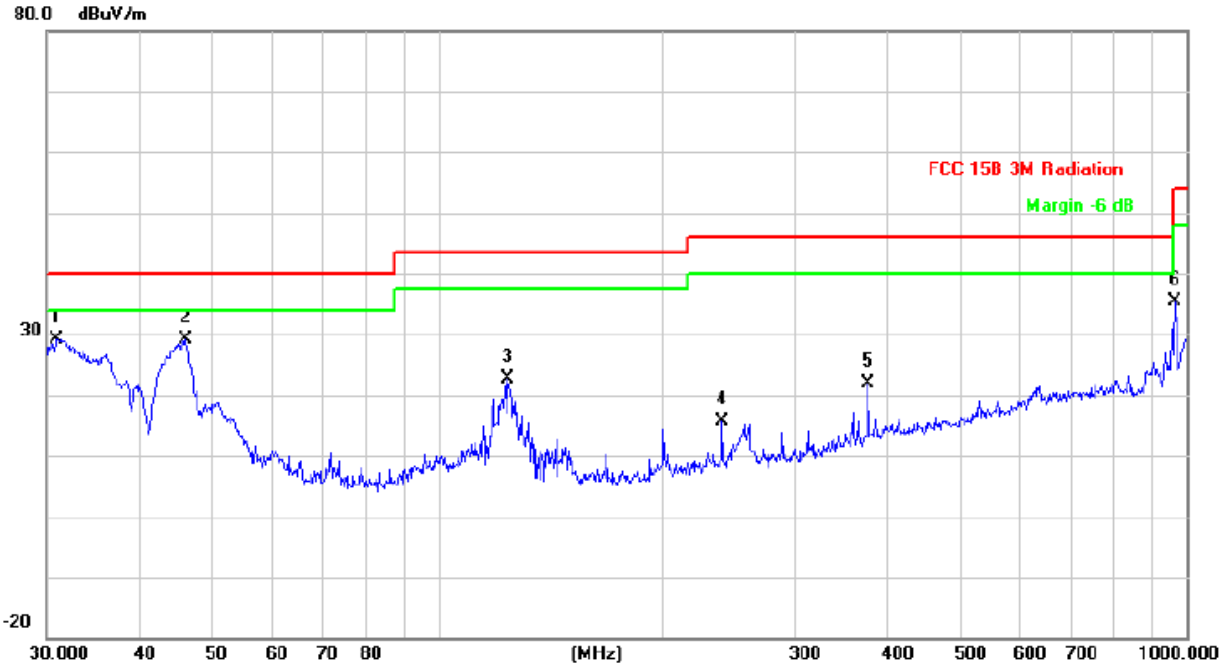
Test Data

Remark:

1. During the test, pre-scan the GFSK, π/4-DQPSK, 8-DPSK modulation, and found the GFSK modulation is the worst case.
2. Pre-scan all kind of the place mode (X-axis, Y-axis, Z-axis), and found the Y-axis is the worst case.
3. 9 kHz to 30 MHz is noise floor, so only shows the data of above 30MHz in this report.

Radiated Emission Test Data (Below 1GHz)

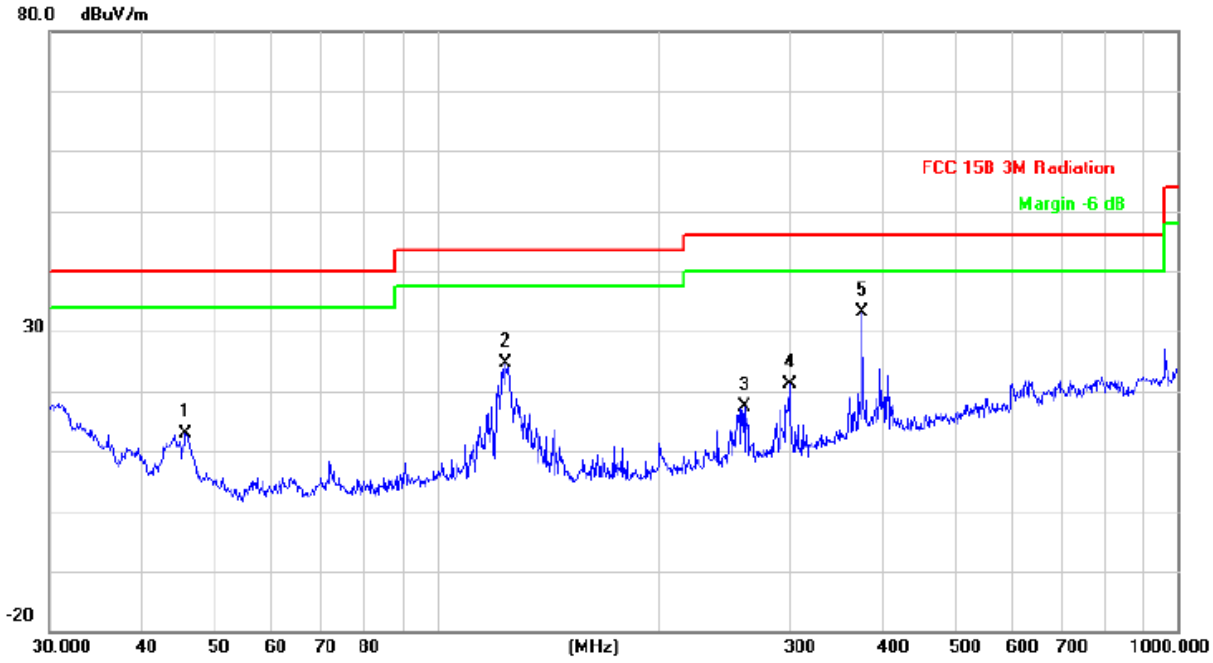
EUT:	IN-WALL BLUETOOTH AUDIO RECEIVER	**Model Name :**	52691
Temperature:	25℃	**Relative Humidity:**	55%
Test Voltage:	DC 15V		
Ant. Pol.	Horizontal		
Test Mode:	TX GFSK Mode 2402MHz		
Remark:	Only worse case is reported		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	30.9619	43.80	-14.56	29.24	40.00	-10.76	peak
2		46.0164	51.78	-22.71	29.07	40.00	-10.93	peak
3		124.1330	45.08	-22.37	22.71	43.50	-20.79	peak
4		239.9874	34.18	-18.59	15.59	46.00	-30.41	peak
5		375.9385	36.24	-14.40	21.84	46.00	-24.16	peak
6		965.5421	40.12	-4.84	35.28	54.00	-18.72	peak

Emission Level= Read Level+ Correct Factor

EUT:	IN-WALL BLUETOOTH AUDIO RECEIVER	Model Name :	52691
Temperature:	25℃	Relative Humidity:	55%
Test Voltage:	DC 15V		
Ant. Pol.	Vertical		
Test Mode:	TX GFSK Mode 2402MHz		
Remark:	Only worse case is reported		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	30.9619	43.80	-14.56	29.24	40.00	-10.76	peak
2		46.0164	51.78	-22.71	29.07	40.00	-10.93	peak
3		124.1330	45.08	-22.37	22.71	43.50	-20.79	peak
4		239.9874	34.18	-18.59	15.59	46.00	-30.41	peak
5		375.9385	36.24	-14.40	21.84	46.00	-24.16	peak
6		965.5421	40.12	-4.84	35.28	54.00	-18.72	peak

Emission Level= Read Level+ Correct Factor

Radiated Emission Test Data (Above 1GHz)

Test mode: GFSK				Test channel: Lowest			
Frequency (MHz)	Read Level (dBuV)	Correct Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Pol.	Detector
4804.00	56.86	8.18	65.04	74.00	-8.96	V	PEAK
7206.00	48.61	11.50	60.11	74.00	-13.89	V	PEAK
9608.00	*			74.00		V	PEAK
12010.00	*			74.00		V	PEAK
14412.00	*			74.00		V	PEAK
16814.00	*			74.00		V	PEAK
4804.00	54.21	8.18	62.39	74.00	-11.61	H	PEAK
7206.00	47.33	11.50	58.83	74.00	-15.17	H	PEAK
9608.00	*			74.00		H	PEAK
12010.00	*			74.00		H	PEAK
14412.00	*			74.00		H	PEAK
16814.00	*			74.00		H	PEAK
Frequency (MHz)	Read Level (dBuV)	Correct Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Pol.	Detector
4804.00	39.21	8.18	47.39	54.00	-6.61	V	AVG.
7206.00	34.78	11.50	46.28	54.00	-7.72	V	AVG.
9608.00				54.00		V	AVG.
12010.00				54.00		V	AVG.
14412.00				54.00		V	AVG.
16814.00				54.00		V	AVG.
4804.00	38.65	8.18	46.83	54.00	-7.17	H	AVG.
7206.00	33.46	11.50	44.96	54.00	-9.04	H	AVG.
9608.00				54.00		H	AVG.
12010.00	*			54.00		H	AVG.
14412.00	*			54.00		H	AVG.
16814.00	*			54.00		H	AVG.

Remark:

1. Final Level = Read Level + Correct Factor
2. "*", means this data is the too weak instrument of signal is unable to test.
3. The emission levels of other frequencies are very lower than the limit and not show in test report.

Radiated Emission Test Data (Above 1GHz)

Test mode: GFSK				Test channel: Middle			
Frequency (MHz)	Read Level (dBuV)	Correct Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Pol.	Detector
4882.00	55.96	8.18	64.14	74.00	-9.86	V	PEAK
7323.00	48.22	11.50	59.72	74.00	-14.28	V	PEAK
9764.00	*			74.00		V	PEAK
12205.00	*			74.00		V	PEAK
14646.00	*			74.00		V	PEAK
17087.00	*			74.00		V	PEAK
4882.00	53.16	8.18	61.34	74.00	-12.66	H	PEAK
7323.00	46.51	11.50	58.01	74.00	-15.99	H	PEAK
9764.00	*			74.00		H	PEAK
12205.00	*			74.00		H	PEAK
14646.00	*			74.00		H	PEAK
17087.00	*			74.00		H	PEAK
Frequency (MHz)	Read Level (dBuV)	Correct Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Pol.	Detector
4882.00	38.61	8.18	46.79	54.00	-7.21	V	AVG.
7323.00	34.22	11.50	45.72	54.00	-8.28	V	AVG.
9764.00				54.00		V	AVG.
12205.00				54.00		V	AVG.
14646.00				54.00		V	AVG.
17087.00				54.00		V	AVG.
4882.00	37.53	8.18	45.71	54.00	-8.29	H	AVG.
7323.00	34.56	11.50	46.06	54.00	-7.94	H	AVG.
9764.00				54.00		H	AVG.
12205.00	*			54.00		H	AVG.
14646.00	*			54.00		H	AVG.
17087.00	*			54.00		H	AVG.

Remark:

1. Final Level = Read Level + Correct Factor
2. “*”, means this data is the too weak instrument of signal is unable to test.
3. The emission levels of other frequencies are very lower than the limit and not show in test report.

Radiated Emission Test Data (Above 1GHz)

Test mode: GFSK			Test channel: Highest				
Frequency (MHz)	Read Level (dBuV)	Correct Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Pol.	Detector
4960.00	54.75	8.18	62.93	74.00	-11.07	V	PEAK
7440.00	47.22	11.50	58.72	74.00	-15.28	V	PEAK
9920.00	*			74.00		V	PEAK
12400.00	*			74.00		V	PEAK
14880.00	*			74.00		V	PEAK
17360.00	*			74.00		V	PEAK
4960.00	53.67	8.18	61.85	74.00	-12.15	H	PEAK
7440.00	46.58	11.50	58.08	74.00	-15.92	H	PEAK
9920.00	*			74.00		H	PEAK
12400.00	*			74.00		H	PEAK
14880.00	*			74.00		H	PEAK
17360.00	*			74.00		H	PEAK
Frequency (MHz)	Read Level (dBuV)	Correct Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Pol.	Detector
4960.00	38.64	8.18	46.82	54.00	-7.18	V	AVG.
7440.00	33.73	11.50	45.23	54.00	-8.77	V	AVG.
9920.00				54.00		V	AVG.
12400.00				54.00		V	AVG.
14880.00				54.00		V	AVG.
17360.00				54.00		V	AVG.
4960.00	37.69	8.18	45.87	54.00	-8.13	H	AVG.
7440.00	33.95	11.50	45.45	54.00	-8.55	H	AVG.
9920.00				54.00		H	AVG.
12400.00	*			54.00		H	AVG.
14880.00	*			54.00		H	AVG.
17360.00	*			54.00		H	AVG.

Remark:

1. Final Level = Read Level + Correct Factor
2. “*”, means this data is the too weak instrument of signal is unable to test.
3. The emission levels of other frequencies are very lower than the limit and not show in test report.