



CFR 47 FCC PART 15 SUBPART C ISED RSS-247 ISSUE 3

CERTIFICATION TEST REPORT

For
CC1312PSIP SimpleLink™ Sub-1-GHz Wireless System-in-Package

MODEL NUMBER: CC1312PSIP

FCC ID: ZAT-1312PSIP-1

IC: 451H-1312PSIP1

REPORT NUMBER: 4791354466-1

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Prepared for

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Revision History

Rev.	Issue Date	Revisions	Revised By
V0	8/16/2024	Initial Issue	

Note: This report is based on FR341305 which is issued by Sporton International Inc. Wensan Laboratory. The EUT had already applied for the FCC ID & IC ID, the customer updates the antenna designed. The RF technical construction including circuit diagram, PCB Layout, components, component layout and performance does not change except for the antenna designed. All the dates have been tested in this report.

Summary of Test Results			
Clause	Test Items	FCC/ISED Rules	Test Results
1	20dB Bandwidth and 99% Occupied Bandwidth	FCC 15.247 (a)(1) (i) RSS-247 Clause 5.1 (c) RSS-Gen Clause 6.7	Pass
2	Conducted Output Power	FCC 15.247 (b) (2) RSS-247 Clause 5.4 (a)	Pass
3	Carrier Hopping Channel Separation	FCC 15.247 (a) (1) RSS-247 Clause 5.1 (c)	Pass
4	Number of Hopping Frequency	15.247 (a) (i) RSS-247 Clause 5.1 (c)	Pass
5	Time of Occupancy (Dwell Time)	15.247 (a) (i) RSS-247 Clause 5.1 (c)	Pass
6	Conducted Bandedge	FCC 15.247 (d) RSS-247 Clause 5.5	Pass
7	Radiated Bandedge and Spurious	FCC 15.247 (d) FCC 15.209 FCC 15.205 RSS-247 Clause 5.5 RSS-GEN Clause 8.9 RSS-GEN Clause 8.10	Pass
8	Conducted Emission Test for AC Power Port	FCC Part 15.207 RSS-GEN Clause 8.8	Pass
9	Antenna Requirement	FCC 15.203 RSS-GEN Clause 6.8	Pass

Note:

1. This test report is only published to and used by the applicant, and it is not for evidence purpose in China.
2. The measurement result for the sample received is <Pass> according to < CFR 47 FCC PART 15 SUBPART C >< ISED RSS-247 > when <Simple Acceptance> decision rule is applied.

TABLE OF CONTENTS

1. ATTESTATION OF TEST RESULTS.....	8
2. TEST METHODOLOGY	9
3. FACILITIES AND ACCREDITATION.....	9
4. CALIBRATION AND UNCERTAINTY	10
4.1. <i>MEASURING INSTRUMENT CALIBRATION.....</i>	10
4.2. <i>MEASUREMENT UNCERTAINTY.....</i>	10
5. EQUIPMENT UNDER TEST	11
5.1. <i>DESCRIPTION OF EUT.....</i>	11
5.2. <i>MAXIMUM PEAK OUTPUT POWER</i>	11
5.3. <i>CHANNEL LIST.....</i>	12
5.4. <i>TEST CHANNEL CONFIGURATION.....</i>	12
5.5. <i>THE WORSE CASE POWER SETTING PARAMETER</i>	12
5.6. <i>DESCRIPTION OF AVAILABLE ANTENNAS</i>	13
5.7. <i>DESCRIPTION OF TEST SETUP.....</i>	14
6. MEASURING INSTRUMENT AND SOFTWARE USED	15
7. ANTENNA PORT TEST RESULTS	17
7.1. <i>ON TIME AND DUTY CYCLE</i>	17
7.2. <i>20 dB BANDWIDTH AND 99 % OCCUPIED BANDWIDTH.....</i>	18
7.3. <i>CONDUCTED OUTPUT POWER</i>	20
7.4. <i>CARRIER FREQUENCY SEPARATION</i>	21
7.5. <i>NUMBER OF HOPPING FREQUENCIES</i>	23
7.6. <i>TIME OF OCCUPANCY (DWELL TIME)</i>	25
7.7. <i>CONDUCTED BANDEdge AND SPURIOUS EMISSION</i>	27
8. RADIATED TEST RESULTS	29
8.1. <i>SPURIOUS EMISSIONS (1 GHz ~ 10 GHz).....</i>	36
8.2. <i>SPURIOUS EMISSIONS (30 MHz ~ 1 GHz).....</i>	66
8.3. <i>SPURIOUS EMISSIONS BELOW 30 MHz</i>	68
9. AC POWER LINE CONDUCTED EMISSIONS	71
10. ANTENNA REQUIREMENTS.....	74
TEST DATA.....	75
11. GFSK.50 kbps Condition 1	75

11.1.	<i>Appendix A1: DUTY CYCLE</i>	75
11.1.1.	Test Result.....	75
11.1.2.	Test Graphs	76
11.2.	<i>Appendix B1: 20DB BANDWIDTH & OCCUPIED CHANNEL BANDWIDTH</i>	77
11.2.1.	Test Result.....	77
11.2.2.	Test Graphs	78
11.3.	<i>Appendix C1: CONDUCTED OUTPUT POWER</i>	79
11.3.1.	Test Result.....	79
11.4.	<i>Appendix D1: CARRIER FREQUENCY SEPARATION</i>	80
11.4.1.	Test Result.....	80
11.4.2.	Test Graphs	80
11.5.	<i>Appendix E1: NUMBER OF HOPPING FREQUENCIES</i>	81
11.5.1.	Test Result.....	81
11.5.2.	Test Graphs	81
11.6.	<i>Appendix F1: TIME OF OCCUPANCY (DWELL TIME)</i>	82
11.6.1.	Test Result.....	82
11.6.2.	Test Graphs	83
11.7.	<i>Appendix G1: CONDUCTED BAND EDGE AND SPURIOUS EMISSION</i>	84
11.7.1.	Test Result.....	84
11.7.2.	Test Graphs	85
12.	GFSK.50 kbps Condition 2	89
12.1.	<i>Appendix A2: DUTY CYCLE</i>	89
12.1.1.	Test Result.....	89
12.1.2.	Test Graphs	90
12.2.	<i>Appendix B2: 20DB BANDWIDTH & OCCUPIED CHANNEL BANDWIDTH</i>	91
12.2.1.	Test Result.....	91
12.2.2.	Test Graphs	92
12.3.	<i>Appendix C2: CONDUCTED OUTPUT POWER</i>	93
12.3.1.	Test Result.....	93
12.4.	<i>Appendix D2: CARRIER FREQUENCY SEPARATION</i>	94
12.4.1.	Test Result.....	94
12.4.2.	Test Graphs	94
12.5.	<i>Appendix E2: NUMBER OF HOPPING FREQUENCIES</i>	95
12.5.1.	Test Result.....	95
12.5.2.	Test Graphs	95
12.6.	<i>Appendix F2: TIME OF OCCUPANCY (DWELL TIME)</i>	96
12.6.1.	Test Result.....	96
12.6.2.	Test Graphs	97
12.7.	<i>Appendix G2: CONDUCTED BAND EDGE AND SPURIOUS EMISSION</i>	98
12.7.1.	Test Result.....	98
12.7.2.	Test Graphs	99
13.	GFSK.50 kbps Condition 3	103
13.1.	<i>Appendix A3: DUTY CYCLE</i>	103
13.1.1.	Test Result.....	103

13.1.2.	Test Graphs	104
13.2.	<i>Appendix B3: 20DB BANDWIDTH & OCCUPIED CHANNEL BANDWIDTH</i>	105
13.2.1.	Test Result.....	105
13.2.2.	Test Graphs	106
13.3.	<i>Appendix C3: CONDUCTED OUTPUT POWER</i>	107
13.3.1.	Test Result.....	107
13.4.	<i>Appendix D3: CARRIER FREQUENCY SEPARATION</i>	108
13.4.1.	Test Result.....	108
13.4.2.	Test Graphs	108
13.5.	<i>Appendix E3: NUMBER OF HOPPING FREQUENCIES</i>	109
13.5.1.	Test Result.....	109
13.5.2.	Test Graphs	109
13.6.	<i>Appendix F3: TIME OF OCCUPANCY (DWELL TIME)</i>	110
13.6.1.	Test Result.....	110
13.6.2.	Test Graphs	111
13.7.	<i>Appendix G3: CONDUCTED BAND EDGE AND SPURIOUS EMISSION</i>	112
13.7.1.	Test Result.....	112
13.7.2.	Test Graphs	113
14.	GFSK.50 kbps Condition 4	117
14.1.	<i>Appendix A4: DUTY CYCLE</i>	117
14.1.1.	Test Result.....	117
14.1.2.	Test Graphs	118
14.2.	<i>Appendix B4: 20DB BANDWIDTH & OCCUPIED CHANNEL BANDWIDTH</i>	119
14.2.1.	Test Result.....	119
14.2.2.	Test Graphs	120
14.3.	<i>Appendix C4: CONDUCTED OUTPUT POWER</i>	121
14.3.1.	Test Result.....	121
14.4.	<i>Appendix D4: CARRIER FREQUENCY SEPARATION</i>	122
14.4.1.	Test Result.....	122
14.4.2.	Test Graphs	122
14.5.	<i>Appendix E4: NUMBER OF HOPPING FREQUENCIES</i>	123
14.5.1.	Test Result.....	123
14.5.2.	Test Graphs	123
14.6.	<i>Appendix F4: TIME OF OCCUPANCY (DWELL TIME)</i>	124
14.6.1.	Test Result.....	124
14.6.2.	Test Graphs	125
14.7.	<i>Appendix G4: CONDUCTED BAND EDGE AND SPURIOUS EMISSION</i>	126
14.7.1.	Test Result.....	126
14.7.2.	Test Graphs	127
15.	GFSK.50 kbps Condition 5	131
15.1.	<i>Appendix A5: DUTY CYCLE</i>	131
15.1.1.	Test Result.....	131
15.1.2.	Test Graphs	132

15.2.	<i>Appendix B5: 20DB BANDWIDTH & OCCUPIED CHANNEL BANDWIDTH</i>	133
15.2.1.	Test Result.....	133
15.2.2.	Test Graphs	134
15.3.	<i>Appendix C5: CONDUCTED OUTPUT POWER</i>	135
15.3.1.	Test Result.....	135
15.4.	<i>Appendix D5: CARRIER FREQUENCY SEPARATION</i>	136
15.4.1.	Test Result.....	136
15.4.2.	Test Graphs	136
15.5.	<i>Appendix E5: NUMBER OF HOPPING FREQUENCIES</i>	137
15.5.1.	Test Result.....	137
15.5.2.	Test Graphs	137
15.6.	<i>Appendix F5: TIME OF OCCUPANCY (DWELL TIME)</i>	138
15.6.1.	Test Result.....	138
15.6.2.	Test Graphs	139
15.7.	<i>Appendix G5: CONDUCTED BAND EDGE AND SPURIOUS EMISSION</i>	140
15.7.1.	Test Result.....	140
15.7.2.	Test Graphs	141

1. ATTESTATION OF TEST RESULTS

Applicant Information

Company Name: Texas Instruments Incorporated
Address: 12500 TI BLVD., Dallas Texas 75243

Manufacturer Information

Company Name: Texas Instruments Incorporated
Address: 12500 TI BLVD., Dallas Texas 75243

EUT Information

EUT Name: CC1312PSIP SimpleLink™ Sub-1-GHz Wireless System-in-Package
Model: CC1312PSIP
Brand: Texas Instruments
Sample Received Date: June 26, 2024
Sample Status: Normal
Sample ID: 7345774
Date of Tested: July 23, 2024~ August 16, 2024

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
CFR 47 FCC PART 15 SUBPART C	PASS
ISED RSS-247 Issue 3	PASS
ISED RSS-GEN Issue 5	PASS

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2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with KDB 558074 D01 15.247 Meas Guidance v05r02, 414788 D01 Radiated Test Site v01r01, CFR 47 FCC Part 2, CFR 47 FCC Part 15, ANSI C63.10-2013, ISED RSS-247 Issue 3 and ISED RSS-GEN Issue 5.

3. FACILITIES AND ACCREDITATION

Accreditation Certificate	<p>A2LA (Certificate No.: 4102.01) UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. has been assessed and proved to be in compliance with A2LA.</p> <p>FCC (FCC Designation No.: CN1187) UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. Has been recognized to perform compliance testing on equipment subject to the Commission's Declaration of Conformity (DoC) and Certification rules</p> <p>ISED (Company No.: 21320) UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. has been registered and fully described in a report filed with ISED. The Company Number is 21320 and the test lab Conformity Assessment Body Identifier (CABID) is CN0046.</p> <p>VCCI (Registration No.: G-20192, C-20153, T-20155 and R-20202) UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. has been assessed and proved to be in compliance with VCCI, the Membership No. is 3793.</p> <p>Facility Name: Chamber D, the VCCI registration No. is G-20192 and R-20202 Shielding Room B, the VCCI registration No. is C-20153 and T-20155</p>
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Note 1: All tests measurement facilities use to collect the measurement data are located at Building 10, Innovation Technology Park, Song Shan Lake Hi tech Development Zone, Dongguan, 523808, China

Note 2: The test anechoic chamber in UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch had been calibrated and compared to the open field sites and the test anechoic chamber is shown to be equivalent to or worst case from the open field site.

Note 3: For below 30 MHz, lab had performed measurements at test anechoic chamber and comparing to measurements obtained on an open field site. And these measurements below 30 MHz had been correlated to measurements performed on an OFS.

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations and is traceable to recognized national standards.

4.2. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

Test Item	Uncertainty
Conduction emission	3.62 dB
Radiated Emission (Included Fundamental Emission) (9 kHz ~ 30 MHz)	2.2 dB
Radiated Emission (Included Fundamental Emission) (30 MHz ~ 1 GHz)	4.00 dB
Radiated Emission (Included Fundamental Emission) (1 GHz ~ 18 GHz)	5.78 dB (1 GHz ~ 18 GHz)
	5.23 dB (18 GHz ~ 26 GHz)
Duty Cycle	±0.028%
20dB Emission Bandwidth and 99% Occupied Bandwidth	±0.0196%
Carrier Frequency Separation	±1.9%
Maximum Conducted Output Power	±0.743 dB
Number of Hopping Channel	±1.9%
Time of Occupancy	±0.028%
Conducted Band-edge Compliance	±1.328 dB
Conducted Unwanted Emissions In Non-restricted Frequency Bands	±0.746 dB (9 kHz ~ 1 GHz) ±1.328dB (1 GHz ~ 26 GHz)
Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.	

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

EUT Name	CC1312PSIP SimpleLink™ Sub-1-GHz Wireless System-in-Package
Model	CC1312PSIP
Frequency Range:	912.75 MHz to 919.12 MHz
Modulation Technique:	Frequency Hopping Spread Spectrum(FHSS)
Type of Modulation:	GFSK
Data Rates:	50 kbps
Normal Test Voltage:	DC 3.3 V

Condition	HVIN
1	D-SWC-A28-06B-A
2	D-SP-A46-01-A
3	D-SP-A39-02-A
4	D-SP-A47-01-A
5	D-SWC-A37-01-A

5.2. MAXIMUM PEAK OUTPUT POWER

Test Mode	Bit Rate	Operation Frequency	Condition	Maximum Conducted PEAK Output Power (dBm)
			1	13.21
GFSK	50 kbps	912.75 MHz to 919.72 MHz	2	13.37
			3	13.35
			4	13.32
			5	13.27

5.3. CHANNEL LIST

Channel List									
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	912.75	11	914.05	21	915.35	31	916.65	41	917.95
2	912.88	12	914.18	22	915.48	32	916.78	42	918.08
3	913.01	13	914.31	23	915.61	33	916.91	43	918.21
4	913.14	14	914.44	24	915.74	34	917.04	44	918.34
5	913.27	15	914.57	25	915.87	35	917.17	45	918.47
6	913.4	16	914.7	26	916	36	917.3	46	918.6
7	913.53	17	914.83	27	916.13	37	917.43	47	918.73
8	913.66	18	914.96	28	916.26	38	917.56	48	918.86
9	913.79	19	915.09	29	916.39	39	917.69	49	918.99
10	913.92	20	915.22	30	916.52	40	917.82	50	919.12

5.4. TEST CHANNEL CONFIGURATION

Test Mode	Test Channel	Frequency
GFSK	CH 1(Low Channel), CH 25(MID Channel), CH50(High Channel)	912.75 MHz, 915.87 MHz, 919.12 MHz

5.5. THE WORSE CASE POWER SETTING PARAMETER

The Worse Case Power Setting Parameter under 902 ~ 928MHz Band					
Test Software		SmartRF Studio 7			
Modulation Mode	Transmit Antenna Number	Test Channel			
		LCH	MCH	HCH	
GFSK Condition 1	1	14	14	14	
GFSK Condition 2	1	14	14	14	
GFSK Condition 3	1	14	14	14	
GFSK Condition 4	1	14	14	14	
GFSK Condition 5	1	14	14	14	

5.6. DESCRIPTION OF AVAILABLE ANTENNAS

Condition 1

Antenna	Frequency Band (MHz)	Model Name	Antenna Type	MAX Antenna Gain (dBi)
1	912-920	Dimmer Antenna	PCB IFA antenna	-0.50

Condition 2

Antenna	Frequency Band (MHz)	Model Name	Antenna Type	MAX Antenna Gain (dBi)
1	912-920	Indoor Plug Antenna	Metal IFA antenna	-3.95

Condition 3

Antenna	Frequency Band (MHz)	Model Name	Antenna Type	MAX Antenna Gain (dBi)
1	912-920	Outdoor Plug Antenna	PCB IFA antenna	-3.62

Condition 4

Antenna	Frequency Band (MHz)	Model Name	Antenna Type	MAX Antenna Gain (dBi)
1	912-920	Socket Antenna	Mental Monopole antenna	-3.17

Condition 5

Antenna	Frequency Band (MHz)	Model Name	Antenna Type	MAX Antenna Gain (dBi)
1	912-920	Switch Antenna	PCB IFA antenna	-0.04

Modulation	Transmit and Receive Mode	Description
GFSK Condition 1	<input checked="" type="checkbox"/> 1TX, 1RX	Antenna 1 can be used as transmitting/receiving antenna.
GFSK Condition 2	<input checked="" type="checkbox"/> 1TX, 1RX	Antenna 1 can be used as transmitting/receiving antenna.
GFSK Condition 3	<input checked="" type="checkbox"/> 1TX, 1RX	Antenna 1 can be used as transmitting/receiving antenna.
GFSK Condition 4	<input checked="" type="checkbox"/> 1TX, 1RX	Antenna 1 can be used as transmitting/receiving antenna.
GFSK Condition 5	<input checked="" type="checkbox"/> 1TX, 1RX	Antenna 1 can be used as transmitting/receiving antenna.

Note: The value of the antenna gain was declared by customer.

5.7. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Item	Equipment	Brand Name	Model Name	Remark
1	PC	Lenovo	E42-80	/
2	AC Adaptor	Lenovo	ADLX65YCC3D	Input: AC 100-240V, 1.8A, 50-60Hz Output: DC 20V, 3.25A, 65.0W Max

I/O CABLES

Cable No	Port	Connector Type	Cable Type	Cable Length(m)	Remarks
1	USB	/	/	1.0	/

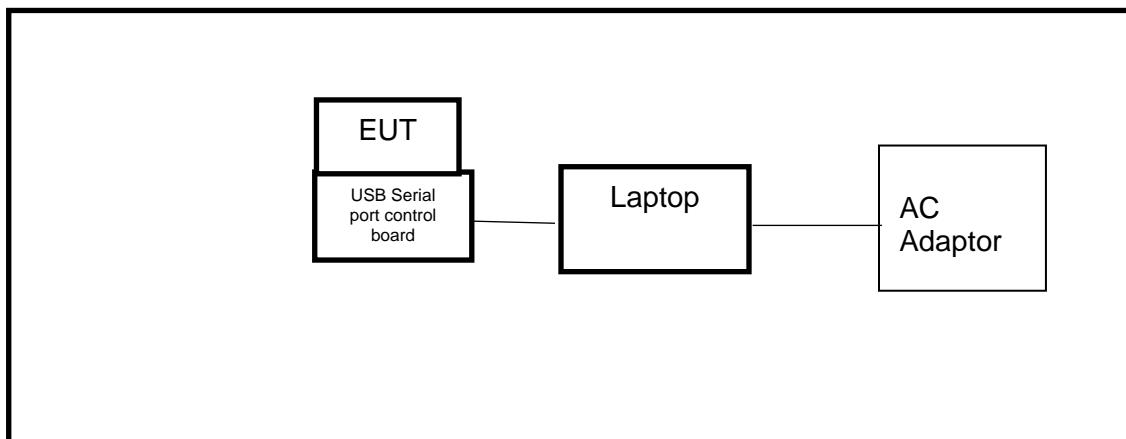
ACCESSORIES

Item	Accessory	Brand Name	Model Name	Description
/	/	/	/	/

TEST SETUP

The EUT can work in engineering mode with a software through a Laptop.

SETUP DIAGRAM FOR TESTS



Note: AC Adaptor only use for AC POWER LINE CONDUCTED EMISSION test.

6. MEASURING INSTRUMENT AND SOFTWARE USED

R&S TS 8997 Test System					
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Due. Date
Power sensor, Power Meter	R&S	OSP120	100921	Mar.25,2024	Mar.24,2025
Vector Signal Generator	R&S	SMBV100A	261637	Oct.12, 2023	Oct.11, 2024
Signal Generator	R&S	SMB100A	178553	Oct.12, 2023	Oct.11, 2024
Signal Analyzer	R&S	FSV40	101118	Oct.12, 2023	Oct.11, 2024
Software					
Description	Manufacturer	Name		Version	
For R&S TS 8997 Test System	Rohde & Schwarz	EMC 32		10.60.10	
Tonsend RF Test System					
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Due. Date
PXA Signal Analyzer	Keysight	N9030A	MY55410512	Oct.12, 2023	Oct.11, 2024
MXG Vector Signal Generator	Keysight	N5182B	MY56200284	Oct.12, 2023	Oct.11, 2024
MXG Vector Signal Generator	Keysight	N5172B	MY56200301	Oct.12, 2023	Oct.11, 2024
Attenuator	Aglient	8495B	2814a12853	Oct.12, 2023	Oct.11, 2024
RF Control Unit	Tonsend	JS0806-2	23B80620666	Mar.25,2024	Mar.24,2025
Software					
Description	Manufacturer	Name		Version	
Tonsend SRD Test System	Tonsend	JS1120-3 RF Test System		V3.2.22	

Conducted Emissions					
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Due Date
EMI Test Receiver	R&S	ESR3	101961	Oct.13, 2023	Oct.12, 2024
Two-Line V-Network	R&S	ENV216	101983	Oct.13, 2023	Oct.12, 2024
Artificial Mains Networks	Schwarzbeck	NSLK 8126	8126465	Oct.13, 2023	Oct.12, 2024
Software					
Description			Manufacturer	Name	Version
Test Software for Conducted Emissions			Farad	EZ-EMC	Ver. UL-3A1

Radiated Emissions						
Equipment	Manufacturer	Model No.	Serial No.	Upper Last Cal.	Last Cal.	Due Date
MXE EMI Receiver	KESIGHT	N9038A	MY56400036	/	Oct.12, 2023	Oct.11, 2024
Hybrid Log Periodic Antenna	TDK	HLP-3003C	130959	Aug.02, 2021	June 28, 2024	June 27, 2027
Preamplifier	HP	8447D	2944A09099	/	Oct.12, 2023	Oct.11, 2024
EMI Measurement Receiver	R&S	ESR26	101377	/	Oct.12, 2023	Oct.11, 2024
Horn Antenna	TDK	HRN-0118	130939	/	Apr.29, 2022	Apr.28, 2025
Preamplifier	TDK	PA-02-0118	TRS-305-00067	/	Oct.12, 2023	Oct.11, 2024
Horn Antenna	Schwarzbeck	BBHA9170	697	July 20, 2021	June 30, 2024	June 29, 2027
Preamplifier	TDK	PA-02-2	TRS-307-00003	/	Oct.12, 2023	Oct.11, 2024
Preamplifier	TDK	PA-02-3	TRS-308-00002	/	Oct.12, 2023	Oct.11, 2024
Loop antenna	Schwarzbeck	1519B	00008	/	Dec.14, 2021	Dec.13, 2024
Preamplifier	TDK	PA-02-001-3000	TRS-302-00050	/	Oct.12, 2023	Oct.11, 2024
Notch Filter	Wainwright	WHJ10-882-980-7000-40SS	23	/	Oct.12, 2023	Oct.11, 2024
Software						
Description			Manufacturer	Name	Version	
Test Software for Radiated Emissions			Farad	EZ-EMC	Ver. UL-3A1	

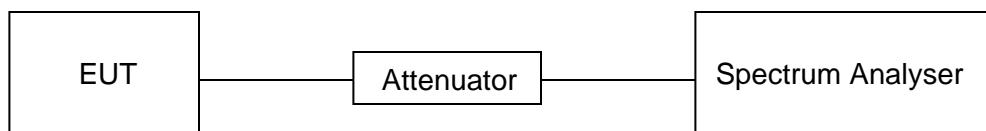
7. ANTENNA PORT TEST RESULTS

7.1. ON TIME AND DUTY CYCLE

LIMITS

None; for reporting purposes only.

TEST SETUP



TEST ENVIRONMENT

Temperature	24.9 °C	Relative Humidity	61.7 %
Atmosphere Pressure	101 kPa	Test Voltage	DC 3.3 V

PROCEDURE

Refer to ANSI C63.10-2013 Zero – Span Spectrum Analyzer method.

RESULTS

Please refer to appendix A1-A5.

7.2. 20 dB BANDWIDTH AND 99 % OCCUPIED BANDWIDTH

LIMITS

CFR 47FCC Part15 (15.247) Subpart C ISED RSS-247 ISSUE 3			
Section	Test Item	Limit	Frequency Range (MHz)
CFR 47 FCC 15.247 (a)(1) (i) RSS-247 Clause 5.1 (a)	20 dB Bandwidth	500 kHz	902 - 928
ISED RSS-Gen Clause 6.7	99 % Occupied Bandwidth	None; for reporting purposes only.	902 - 928

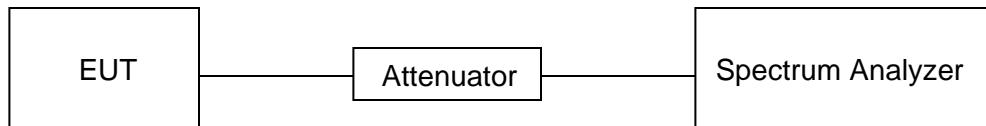
TEST PROCEDURE

Connect the EUT to the spectrum analyser and use the following settings:

Center Frequency	The center frequency of the channel under test
Detector	Peak
RBW	For 20 dB Bandwidth: 1 % to 5 % of the 20 dB bandwidth For 99 % Occupied Bandwidth: 1 % to 5 % of the occupied bandwidth
VBW	For 20 dB Bandwidth: approximately 3xRBW For 99 % Occupied Bandwidth: $\geq 3 \times \text{RBW}$
Span	Approximately 2 to 3 times the 20dB bandwidth
Trace	Max hold
Sweep	Auto couple

a) Use the occupied bandwidth function of the instrument, allow the trace to stabilize and report the measured 99 % occupied bandwidth and 20 dB Bandwidth.

TEST SETUP



TEST ENVIRONMENT

Temperature	24.9 °C	Relative Humidity	61.7 %
Atmosphere Pressure	101 kPa	Test Voltage	DC 3.3 V

RESULTS

Please refer to appendix B1-B5.

7.3. CONDUCTED OUTPUT POWER

LIMITS

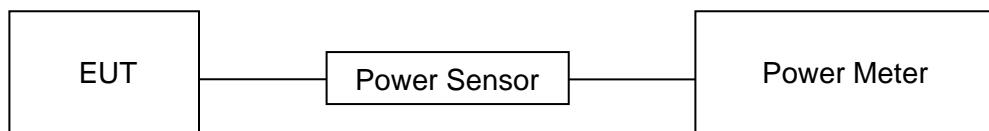
CFR 47 FCC Part15 (15.247), Subpart C ISED RSS-247 ISSUE 3			
Section	Test Item	Limit	Frequency Range (MHz)
CFR 47 FCC 15.247 (b) (2) ISED RSS-247 Clause 5.4 (a)	Peak Conducted Output Power	1 watt for systems employing at least 50 hopping channels	902 - 928

TEST PROCEDURE

Connect the EUT to a low loss RF cable from the antenna port to the power sensor (video bandwidth is greater than the occupied bandwidth).

Measure peak emission level, the indicated level is the peak output power, after any corrections for external attenuators and cables.

TEST SETUP



TEST ENVIRONMENT

Temperature	24.9 °C	Relative Humidity	61.7 %
Atmosphere Pressure	101 kPa	Test Voltage	DC 3.3 V

RESULTS

Please refer to appendix C1-C5.

7.4. CARRIER FREQUENCY SEPARATION

LIMITS

CFR 47 FCC Part15 (15.247), Subpart C ISED RSS-247 ISSUE 3			
Section	Test Item	Limit	Frequency Range (MHz)
CFR 47 FCC 15.247 (a) (1) ISED RSS-247 Clause 5.1 (b)	Carrier Frequency Separation	Minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.	902 - 928

TEST PROCEDURE

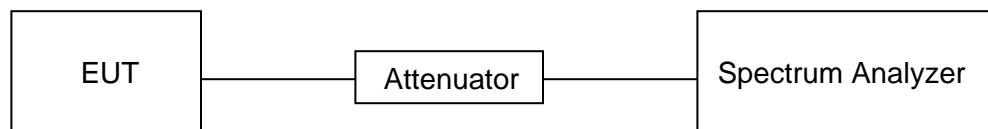
Connect the EUT to the spectrum analyzer and use the following settings:

Center Frequency	The center frequency of the channel under test
Span	wide enough to capture the peaks of two adjacent channels
Detector	Peak
RBW	Start with the RBW set to approximately 30 % of the channel spacing; adjust as necessary to best identify the center of each individual channel.
VBW	\geq RBW
Trace	Max hold
Sweep time	Auto couple

Allow the trace to stabilize and use the marker-delta function to determine the separation between the peaks of the adjacent channels.

Compliance of an EUT with the appropriate regulatory limit shall be determined.

TEST SETUP



TEST ENVIRONMENT

Temperature	24.9 °C	Relative Humidity	61.7 %
Atmosphere Pressure	101 kPa	Test Voltage	DC 3.3 V

RESULTS

Please refer to Appendix D1-D5.

7.5. NUMBER OF HOPPING FREQUENCIES

LIMITS

CFR 47 FCC Part15 (15.247), Subpart C ISED RSS-247 ISSUE 3		
Section	Test Item	Limit
CFR 47 15.247 (a) (i) ISED RSS-247 Clause 5.1 (c)	Number of Hopping Frequency	1. if the 20 dB bandwidth of the hopping channel is less than 250 kHz, at least 50 hopping channels 2. if the 20 dB bandwidth of the hopping channel is 250 kHz or greater, at least 25 hopping channels

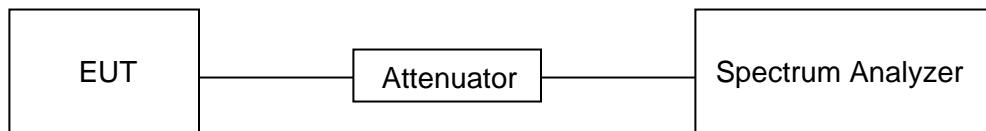
TEST PROCEDURE

Connect the EUT to the spectrum Analyzer and use the following settings:

Detector	Peak
RBW	To identify clearly the individual channels, set the RBW to less than 30% of the channel spacing or the 20 dB bandwidth, whichever is smaller.
VBW	\geq RBW
Span	The frequency band of operation. Depending on the number of channels the device supports, it may be necessary to divide the frequency range of operation across multiple spans, to allow the individual channels to be clearly seen.
Trace	Max hold
Sweep time	Auto couple

Set EUT to transmit maximum output power and switch on frequency hopping function. then set enough count time (larger than 5000 times) to get all the hopping frequency channel displayed on the screen of spectrum analyzer, count the quantity of peaks to get the number of hopping channels.

TEST SETUP



TEST ENVIRONMENT

Temperature	24.9 °C	Relative Humidity	61.7 %
Atmosphere Pressure	101 kPa	Test Voltage	DC 3.3 V

RESULTS

Please refer to appendix E1-E5.

7.6. TIME OF OCCUPANCY (DWELL TIME)

LIMITS

CFR 47 FCC Part15 (15.247), Subpart C ISED RSS-247 ISSUE 3		
Section	Test Item	Limit
CFR 47 15.247 (a) (i) ISED RSS-247 Clause 5.1 (c)	Time of Occupancy (Dwell Time)	<p>1. If the 20 dB bandwidth of the hopping channel is less than 250 kHz, the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period.</p> <p>2. if the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period.</p>

TEST PROCEDURE

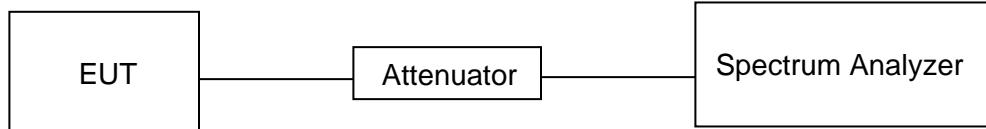
Connect the EUT to the spectrum Analyzer and use the following settings:

Center Frequency	The center frequency of the channel under test
Detector	Peak
RBW	\leq channel spacing and where possible RBW should be set $\gg 1 / T$, where T is the expected dwell time per channel.
VBW	\geq RBW
Span	Zero span, centered on a hopping channel
Trace	Max hold
Sweep time	As necessary to capture the entire dwell time per hopping channel; where possible use a video trigger and trigger delay so that the transmitted signal starts a little to the right of the start of the plot. The trigger level might need slight adjustment to prevent triggering when the system hops on an adjacent channel

- The transmitter output (antenna port) was connected to the spectrum analyzer
- Set RBW of spectrum analyzer to 1MHz and VBW to 1MHz.
- Use a video trigger with the trigger level set to enable triggering only on full pulses.
- Sweep Time is more than once pulse time.
- Set the center frequency on any frequency would be measure and set the frequency span to zero span.
- Measure the maximum time duration of one single pulse.
- Measure the maximum time duration of one single pulse.

$$\text{A Period Time} = (\text{channel number}) * 0.4$$

TEST SETUP



TEST ENVIRONMENT

Temperature	24.9 °C	Relative Humidity	61.7 %
Atmosphere Pressure	101 kPa	Test Voltage	DC 3.3 V

RESULTS

Please refer to appendix F1-F5.

7.7. CONDUCTED BANDEDGE AND SPURIOUS EMISSION

LIMITS

CFR 47 FCC Part15 (15.247), Subpart C ISED RSS-247 ISSUE 3		
Section	Test Item	Limit
CFR 47 FCC §15.247 (d) ISED RSS-247 5.5	Conducted Spurious Emission	at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power

TEST PROCEDURE

Connect the EUT to the spectrum analyser and use the following settings for reference level measurement:

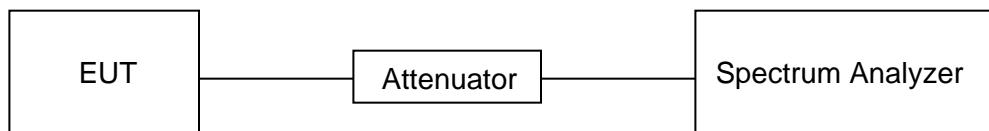
Center Frequency	The center frequency of the channel under test
Detector	Peak
RBW	100 kHz
VBW	$\geq 3 \times$ RBW
Span	1.5 x DTS bandwidth
Trace	Max hold
Sweep time	Auto couple.

Allow trace to fully stabilize and use the peak marker function to determine the maximum PSD level.

Change the settings for emission level measurement:

Span	Set the center frequency and span to encompass frequency range to be measured
Detector	Peak
RBW	100 kHz
VBW	$\geq 3 \times$ RBW
measurement points	\geq span/RBW
Trace	Max hold
Sweep time	Auto couple.

Allow trace to fully stabilize and use the peak marker function to determine the maximum PSD level. Ensure that the amplitude of all unwanted emissions outside of the authorized frequency band (excluding restricted frequency bands) is attenuated by at least the minimum requirements.

TEST SETUP**TEST ENVIRONMENT**

Temperature	24.9 °C	Relative Humidity	61.7 %
Atmosphere Pressure	101 kPa	Test Voltage	DC 3.3 V

RESULTS

Please refer to appendix G1-G5.

8. RADIATED TEST RESULTS

LIMITS

Please refer to CFR 47 FCC §15.205 and §15.209.

Please refer to ISED RSS-GEN Clause 8.9 and Clause 8.10.

Radiation Disturbance Test Limit for FCC (Class B) (9 kHz-1 GHz)

Emissions radiated outside of the specified frequency bands above 30 MHz			
Frequency Range (MHz)	Field Strength Limit (uV/m) at 3 m	Field Strength Limit (dBuV/m) at 3 m	
		Quasi-Peak	
30 - 88	100	40	
88 - 216	150	43.5	
216 - 960	200	46	
Above 960	500	54	
Above 1000	500	Peak	Average
		74	54

FCC Emissions radiated outside of the specified frequency bands below 30 MHz		
Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30

ISED General field strength limits at frequencies below 30 MHz

Table 6 – General field strength limits at frequencies below 30 MHz		
Frequency	Magnetic field strength (H-Field) (μ A/m)	Measurement distance (m)
9 - 490 kHz ^{Note 1}	6.37/F (F in kHz)	300
490 - 1705 kHz	63.7/F (F in kHz)	30
1.705 - 30 MHz	0.08	30

Note 1: The emission limits for the ranges 9-90 kHz and 110-490 kHz are based on measurements employing a linear average detector.

ISED Restricted bands please refer to ISED RSS-GEN Clause 8.10

Table 7 – Restricted frequency bands ^{Note 1}		
MHz	MHz	GHz
0.090 - 0.110	149.9 - 150.05	9.0 - 9.2
0.495 - 0.505	156.52475 - 156.52525	9.3 - 9.5
2.1735 - 2.1905	156.7 - 156.9	10.6 - 12.7
3.020 - 3.026	162.0125 - 167.17	13.25 - 13.4
4.125 - 4.128	167.72 - 173.2	14.47 - 14.5
4.17725 - 4.17775	240 - 285	15.35 - 16.2
4.20725 - 4.20775	322 - 335.4	17.7 - 21.4
5.677 - 5.683	399.9 - 410	22.01 - 23.12
6.215 - 6.218	608 - 614	23.6 - 24.0
6.26775 - 6.26825	960 - 1427	31.2 - 31.8
6.31175 - 6.31225	1435 - 1626.5	36.43 - 36.5
8.291 - 8.294	1645.5 - 1646.5	Above 38.6
8.362 - 8.366	1660 - 1710	
8.37625 - 8.38675	1718.8 - 1722.2	
8.41425 - 8.41475	2200 - 2300	
12.29 - 12.293	2310 - 2390	
12.51975 - 12.52025	2483.5 - 2500	
12.57675 - 12.57725	2655 - 2900	
13.36 - 13.41	3260 - 3287	
16.42 - 16.423	3332 - 3339	
16.69475 - 16.69525	3345.8 - 3358	
16.80425 - 16.80475	3500 - 4400	
25.5 - 25.67	4500 - 5150	
37.5 - 38.25	5350 - 5460	
73 - 74.6	7250 - 7750	
74.8 - 75.2	8025 - 8500	
108 - 138		

Note 1: Certain frequency bands listed in table 7 and in bands above 38.6 GHz are designated for licence-exempt applications. These frequency bands and the requirements that apply to related devices are set out in the 200 and 300 series of RSSs.

FCC Restricted bands of operation refer to FCC §15.205 (a):

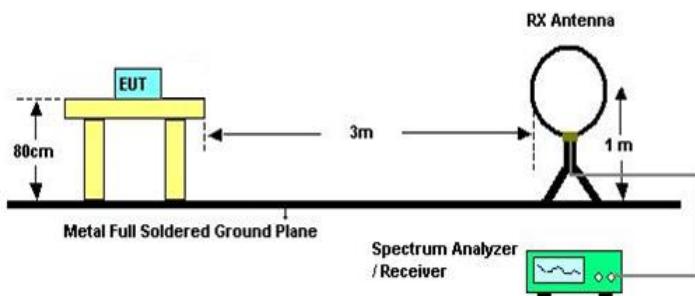
MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
¹ 0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3287	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	(²)
13.36-13.41			

 Note: ¹Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

²Above 38.6c

TEST SETUP AND PROCEDURE

Below 30 MHz

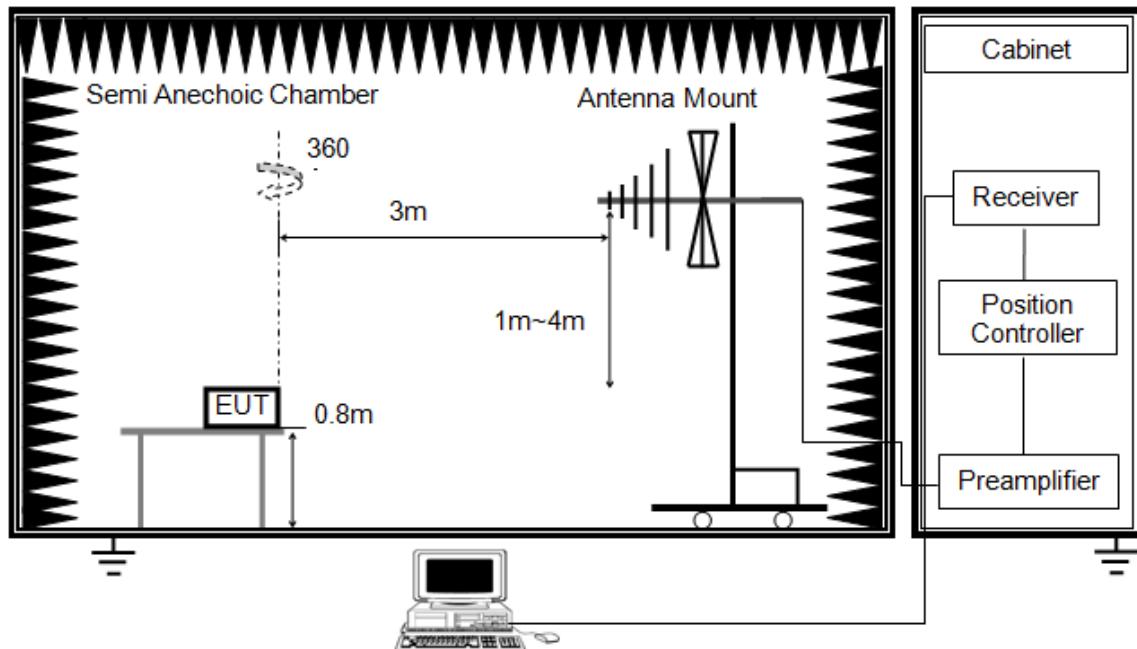


The setting of the spectrum analyser

RBW	200 Hz (From 9 kHz to 0.15 MHz)/ 9 kHz (From 0.15 MHz to 30 MHz)
VBW	200 Hz (From 9 kHz to 0.15 MHz)/ 9 kHz (From 0.15 MHz to 30 MHz)
Sweep	Auto
Trace	Max hold

1. The testing follows the guidelines in ANSI C63.10-2013 clause 6.4.
2. The EUT was arranged to its worst case and then turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level. Both Horizontal, Face-on and Face-off polarizations of the antenna are set to make the measurement.
3. The EUT was placed on a turntable with 80 cm above ground.
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a 1 m height antenna tower.
5. The radiated emission limits are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.
6. For measurement below 1 GHz, the initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak and average detector mode re-measured. If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak and average detector and reported.
7. Although these tests were performed other than open field site, adequate comparison measurements were confirmed against 30m open field 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 site based on KDB 414788.
8. The limits in CFR 47, Part 15, Subpart C, paragraph 15.209 (a), are identical to those in RSS-GEN Section 8.9, Table 6, since the measurements are performed in terms of magnetic field strength and converted to electric field strength levels (as reported in the table) using the free space impedance of 377Ω . For example, the measurement frequency X KHz resulted in a level of Y dB_{UV}/m, which is equivalent to $Y-51.5 = Z$ dB_{UA}/m, which has the same margin, W dB, to the corresponding RSS-GEN Table 6 limit as it has to be 15.209(a) limit.

Below 1 GHz and above 30 MHz

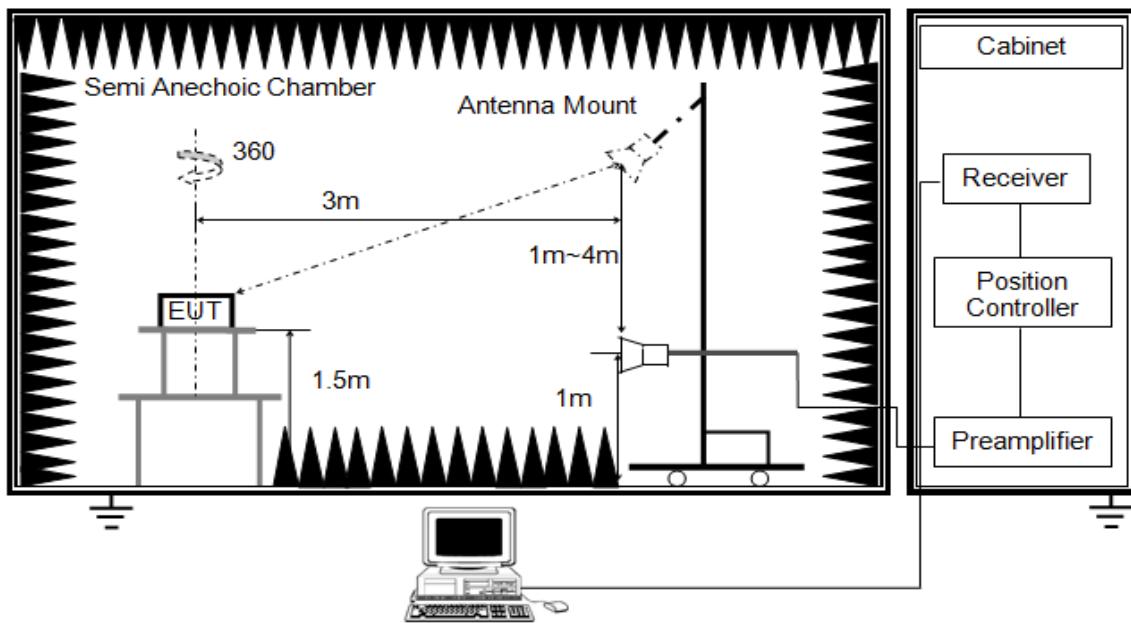


The setting of the spectrum analyser

RBW	120 kHz
VBW	300 kHz
Sweep	Auto
Detector	Peak/QP
Trace	Max hold

1. The testing follows the guidelines in ANSI C63.10-2013 clause 6.5.
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
3. The EUT was placed on a turntable with 80 cm above ground.
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
5. For measurement below 1 GHz, the initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured. If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.

Above 1 GHz

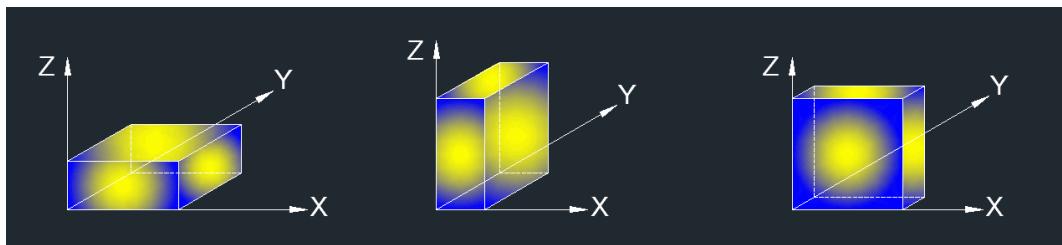


The setting of the spectrum analyser

RBW	1 MHz
VBW	PEAK: 3 MHz AVG: see note 6
Sweep	Auto
Detector	Peak
Trace	Max hold

1. The testing follows the guidelines in ANSI C63.10-2013 clause 6.6.
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
3. The EUT was placed on a turntable with 1.5 m above ground.
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
5. For measurement above 1 GHz, the emission measurement will be measured by the peak detector. This peak level, once corrected, must comply with the limit specified in Section 15.209.
6. For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 3 MHz for peak measurements and 1 MHz resolution bandwidth with 1/T video bandwidth with peak detector for average measurements. For the Duty Cycle please refer to clause 7.1.ON TIME AND DUTY CYCLE.

X axis, Y axis, Z axis positions:



Note 1: For all radiated test, EUT in each of three orthogonal axis emissions had been tested, but only the worst case (X axis) data recorded in the report.

Note 2: The EUT was fully exercised with external accessories during the test. In the case of multiple accessory external ports, an external accessory shall be connected to one of each type of port.

For Radiate Spurious emission (9 kHz ~ 30 MHz):

Note:

1. Measurement = Reading Level + Correct Factor.
2. If the peak values are less than the QP limit, the QP result is deemed to comply with QP limit.
3. All 3 polarizations (Horizontal, Face-on and Face-off) of the loop antenna had been tested, but only the worst data recorded in the report.
4. All modes and conditions have been tested, but only the worst data was recorded in the report.
5. $\text{dBuA/m} = \text{dBuV/m} - 20\log_{10}[120\pi] = \text{dBuV/m} - 51.5$

For Radiate Spurious Emission (30 MHz ~ 1 GHz):

Note:

1. Result Level = Read Level + Correct Factor.
2. If the peak values are less than the QP limit, the QP result is deemed to comply with QP limit.
3. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
4. All modes and conditions have been tested, but only the worst data was recorded in the report.

For Radiate Spurious Emission (1 GHz ~ 10 GHz):

Note:

1. Peak Result = Reading Level + Correct Factor.
2. If the peak values are less than the average limit of 54 dBuV/m, the average result is deemed to comply with average limit.
3. Peak: Peak detector.
4. AVG = Peak test result + Duty Cycle Correction Factor.
5. For Duty Cycle Correction Factor, please refer to clause 7.1.
6. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
7. Proper operation of the transmitter prior to adding the filter to the measurement chain.
8. All modes have been tested, but only the worst data was recorded in the report.

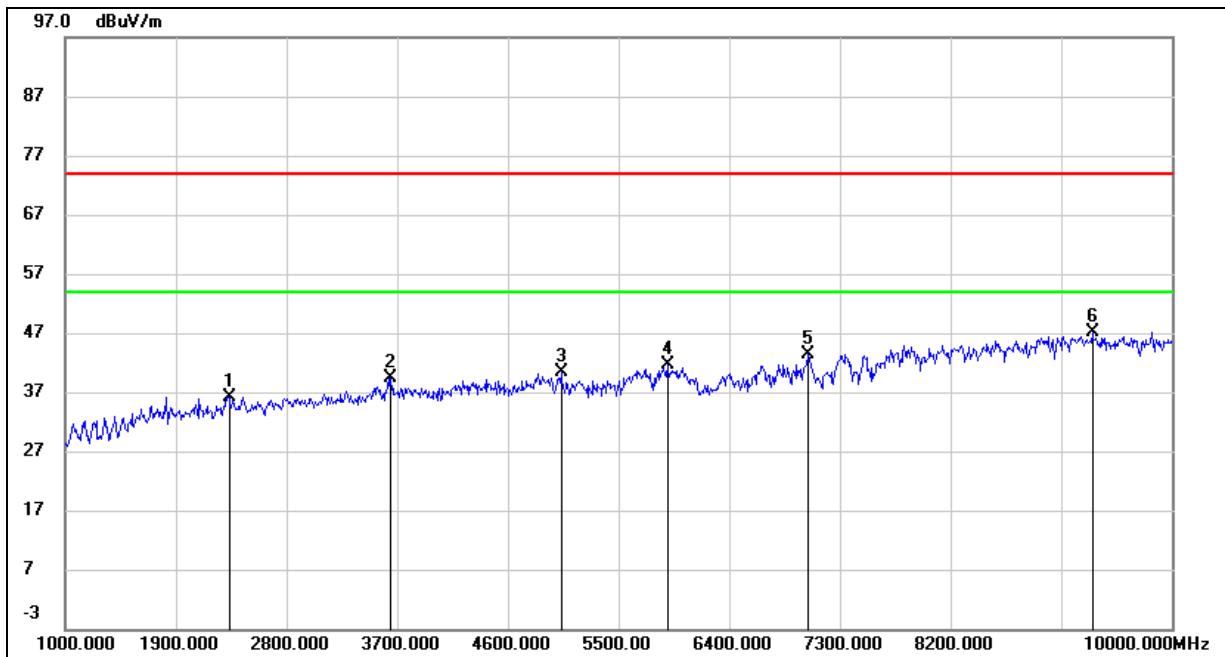
TEST ENVIRONMENT

Temperature	22.5 °C	Relative Humidity	64 %
Atmosphere Pressure	101 kPa	Test Voltage	DC 3.3 V

RESULTS

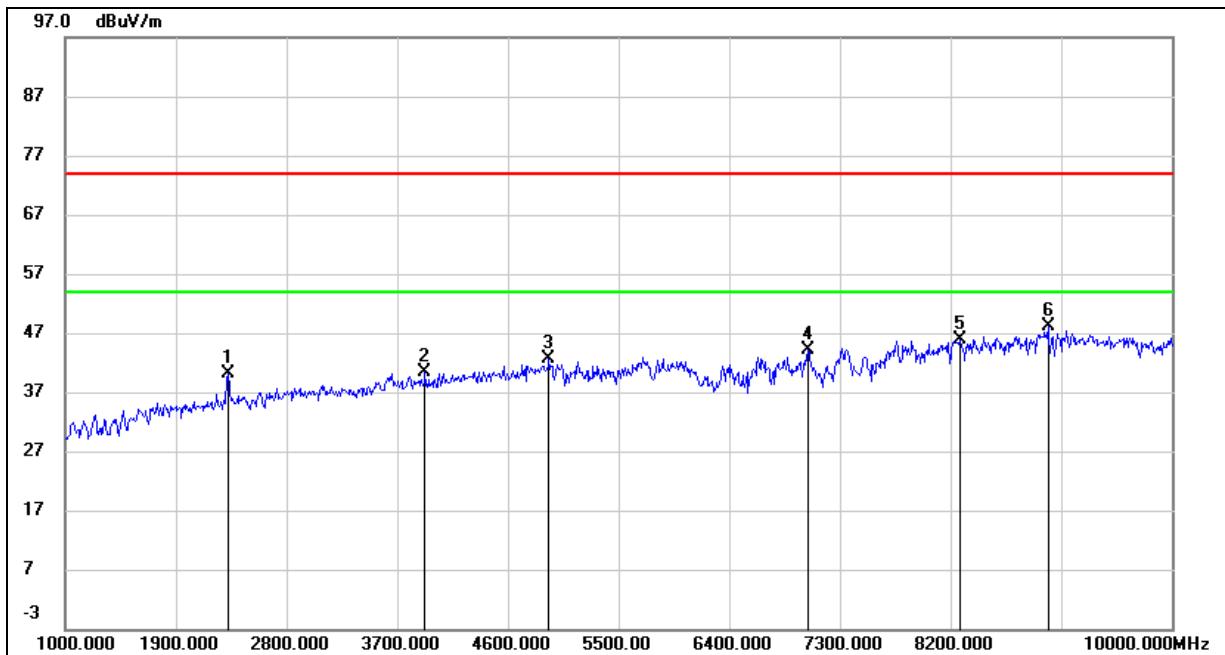
8.1. SPURIOUS EMISSIONS (1 GHz ~ 10 GHz)

Test Mode:	GFSK Condition 1	Frequency(MHz):	912.75
Polarity:	Horizontal	Test Voltage:	DC 3.3 V



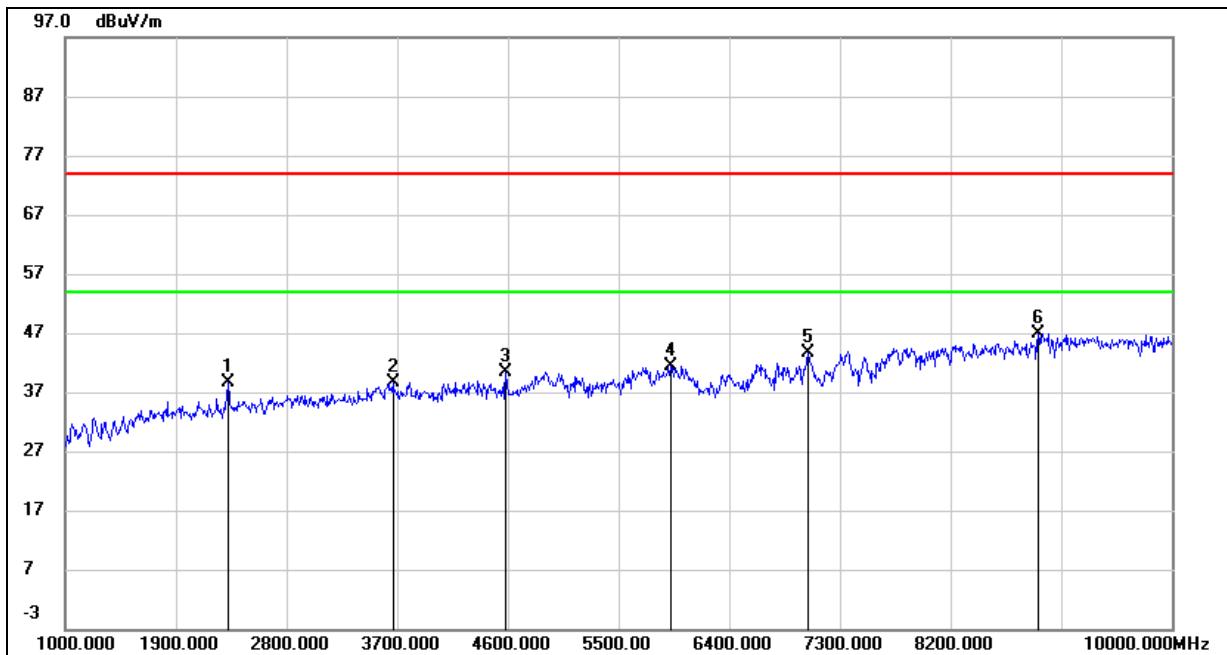
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2332.000	44.63	-8.41	36.22	74.00	-37.78	peak
2	3646.000	43.29	-3.94	39.35	74.00	-34.65	peak
3	5032.000	39.69	0.69	40.38	74.00	-33.62	peak
4	5896.000	39.35	2.40	41.75	74.00	-32.25	peak
5	7039.000	36.61	6.72	43.33	74.00	-30.67	peak
6	9352.000	37.23	9.95	47.18	74.00	-26.82	peak

Test Mode:	GFSK Condition 1	Frequency(MHz):	912.75
Polarity:	Vertical	Test Voltage:	DC 3.3 V



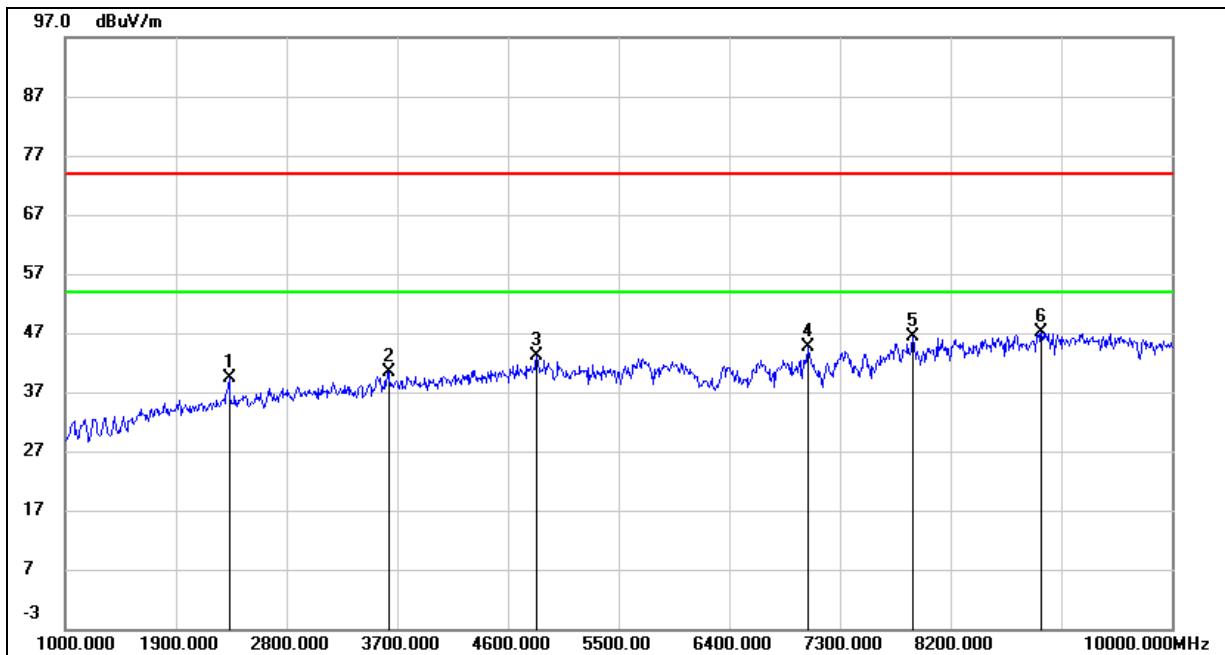
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2323.000	47.75	-7.62	40.13	74.00	-33.87	peak
2	3925.000	42.77	-2.38	40.39	74.00	-33.61	peak
3	4933.000	41.07	1.57	42.64	74.00	-31.36	peak
4	7039.000	36.54	7.59	44.13	74.00	-29.87	peak
5	8272.000	37.16	8.69	45.85	74.00	-28.15	peak
6	8992.000	37.46	10.78	48.24	74.00	-25.76	peak

Test Mode:	GFSK Condition 1	Frequency(MHz):	915.87
Polarity:	Horizontal	Test Voltage:	DC 3.3 V



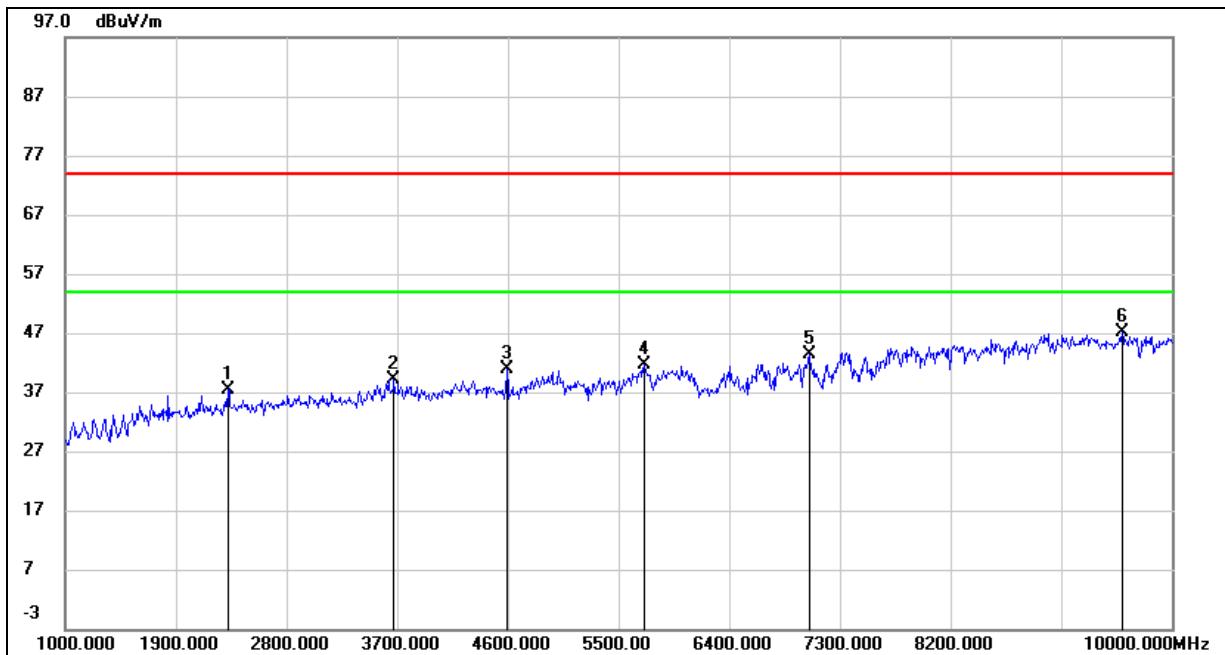
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2323.000	47.12	-8.45	38.67	74.00	-35.33	peak
2	3664.000	42.55	-3.89	38.66	74.00	-35.34	peak
3	4582.000	41.73	-1.27	40.46	74.00	-33.54	peak
4	5923.000	38.87	2.54	41.41	74.00	-32.59	peak
5	7039.000	36.80	6.72	43.52	74.00	-30.48	peak
6	8911.000	37.59	9.40	46.99	74.00	-27.01	peak

Test Mode:	GFSK Condition 1	Frequency(MHz):	915.87
Polarity:	Vertical	Test Voltage:	DC 3.3 V



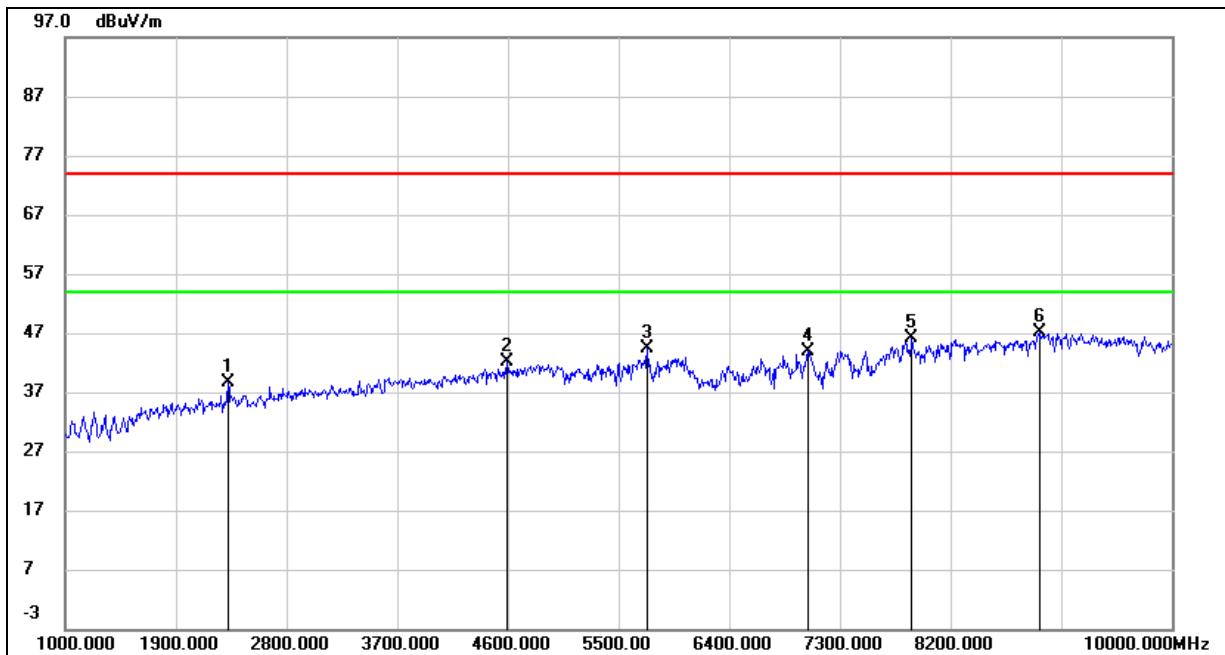
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2332.000	46.99	-7.57	39.42	74.00	-34.58	peak
2	3628.000	43.36	-2.96	40.40	74.00	-33.60	peak
3	4834.000	41.88	1.18	43.06	74.00	-30.94	peak
4	7039.000	37.02	7.59	44.61	74.00	-29.39	peak
5	7894.000	39.17	7.33	46.50	74.00	-27.50	peak
6	8938.000	37.03	10.16	47.19	74.00	-26.81	peak

Test Mode:	GFSK Condition 1	Frequency(MHz):	919.12
Polarity:	Horizontal	Test Voltage:	DC 3.3 V



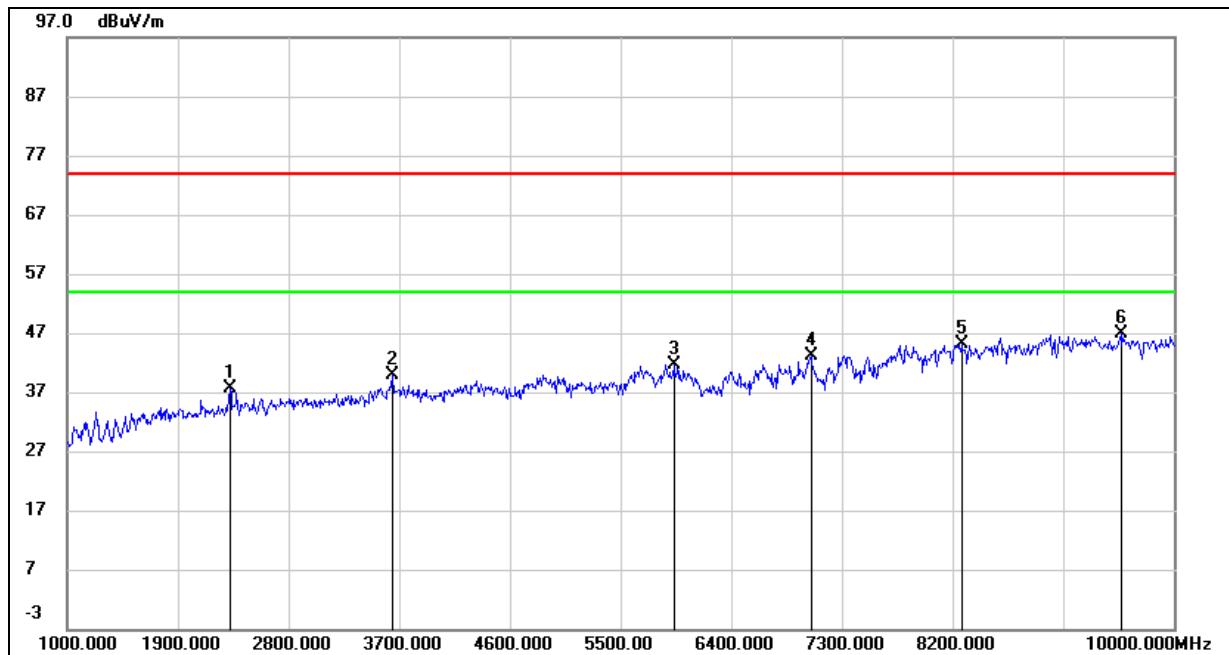
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2323.000	45.87	-8.45	37.42	74.00	-36.58	peak
2	3673.000	42.96	-3.87	39.09	74.00	-34.91	peak
3	4591.000	42.10	-1.23	40.87	74.00	-33.13	peak
4	5707.000	39.72	1.97	41.69	74.00	-32.31	peak
5	7048.000	36.62	6.69	43.31	74.00	-30.69	peak
6	9595.000	36.39	10.70	47.09	74.00	-26.91	peak

Test Mode:	GFSK Condition 1	Frequency(MHz):	919.12
Polarity:	Vertical	Test Voltage:	DC 3.3 V



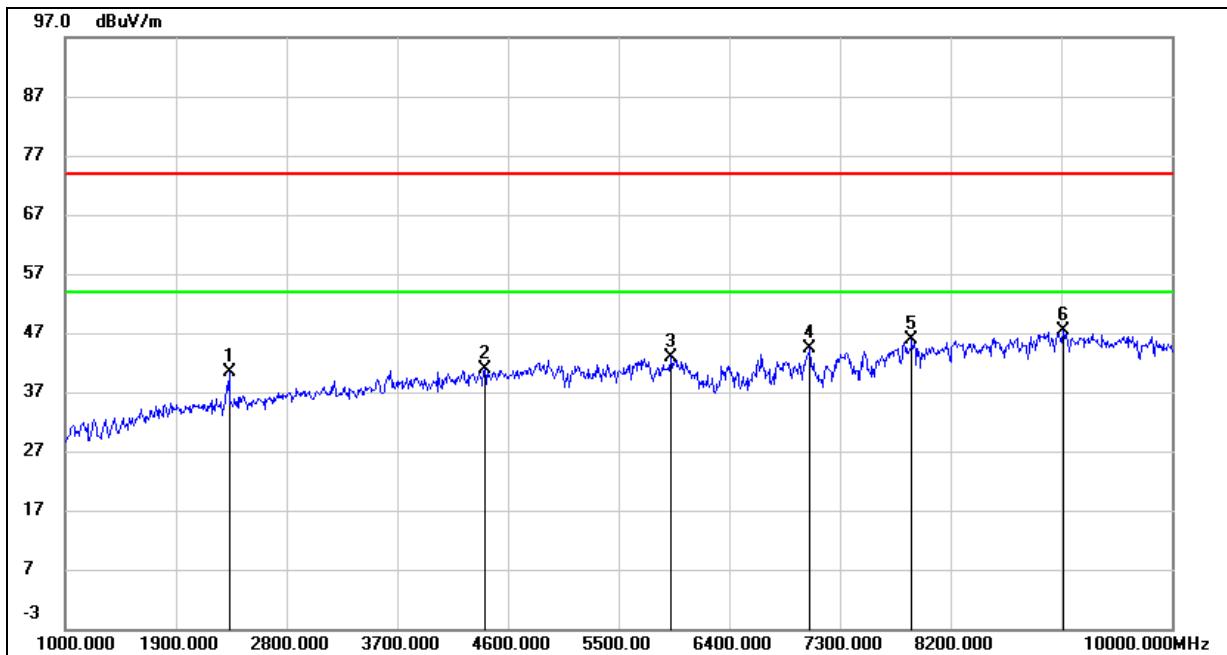
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2323.000	46.29	-7.62	38.67	74.00	-35.33	peak
2	4591.000	42.31	-0.28	42.03	74.00	-31.97	peak
3	5734.000	41.23	3.06	44.29	74.00	-29.71	peak
4	7039.000	36.33	7.59	43.92	74.00	-30.08	peak
5	7885.000	38.88	7.34	46.22	74.00	-27.78	peak
6	8920.000	37.10	9.95	47.05	74.00	-26.95	peak

Test Mode:	GFSK Condition 2	Frequency(MHz):	912.75
Polarity:	Horizontal	Test Voltage:	DC 3.3 V



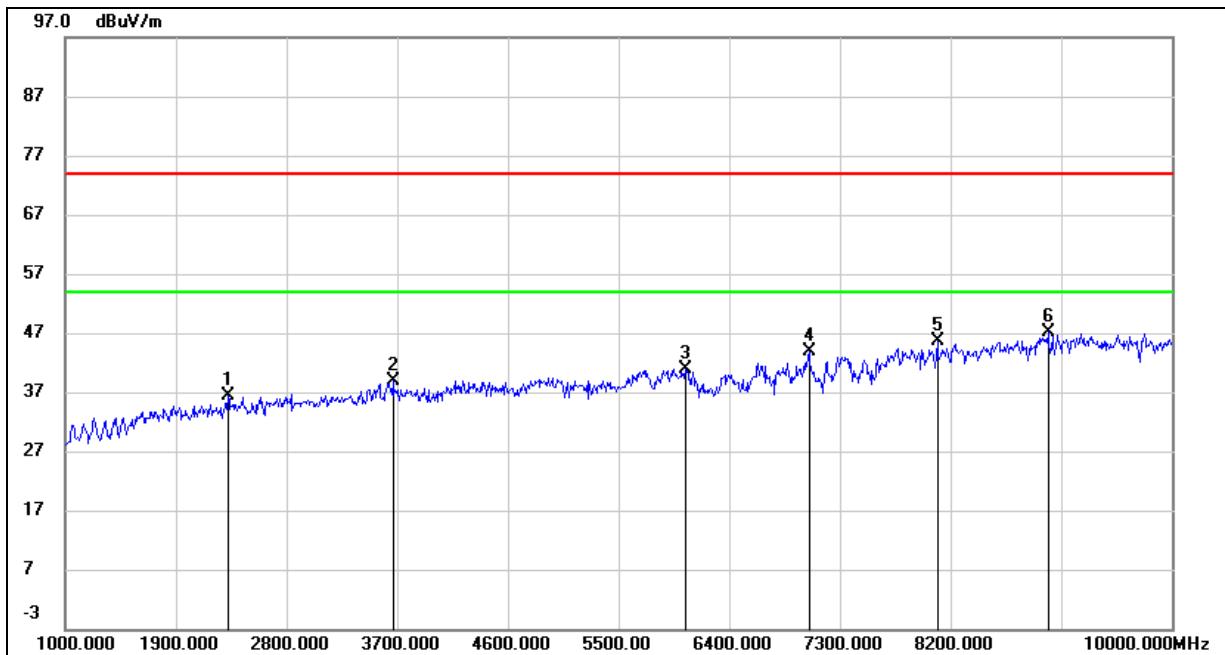
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2323.000	46.19	-8.45	37.74	74.00	-36.26	peak
2	3646.000	43.84	-3.94	39.90	74.00	-34.10	peak
3	5932.000	39.08	2.58	41.66	74.00	-32.34	peak
4	7048.000	36.47	6.69	43.16	74.00	-30.84	peak
5	8272.000	37.06	8.13	45.19	74.00	-28.81	peak
6	9568.000	36.29	10.62	46.91	74.00	-27.09	peak

Test Mode:	GFSK Condition 2	Frequency(MHz):	912.75
Polarity:	Vertical	Test Voltage:	DC 3.3 V



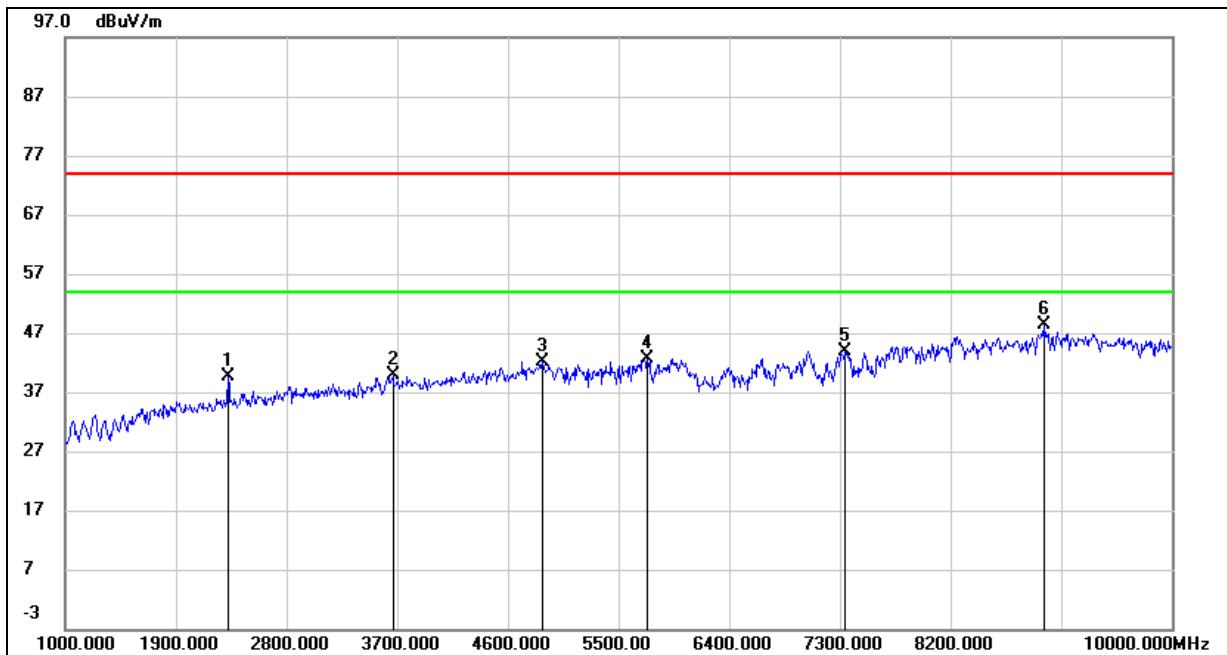
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2332.000	47.90	-7.57	40.33	74.00	-33.67	peak
2	4411.000	41.81	-0.82	40.99	74.00	-33.01	peak
3	5923.000	39.29	3.57	42.86	74.00	-31.14	peak
4	7057.000	36.81	7.49	44.30	74.00	-29.70	peak
5	7885.000	38.46	7.34	45.80	74.00	-28.20	peak
6	9118.000	37.16	10.26	47.42	74.00	-26.58	peak

Test Mode:	GFSK Condition 2	Frequency(MHz):	915.87
Polarity:	Horizontal	Test Voltage:	DC 3.3 V



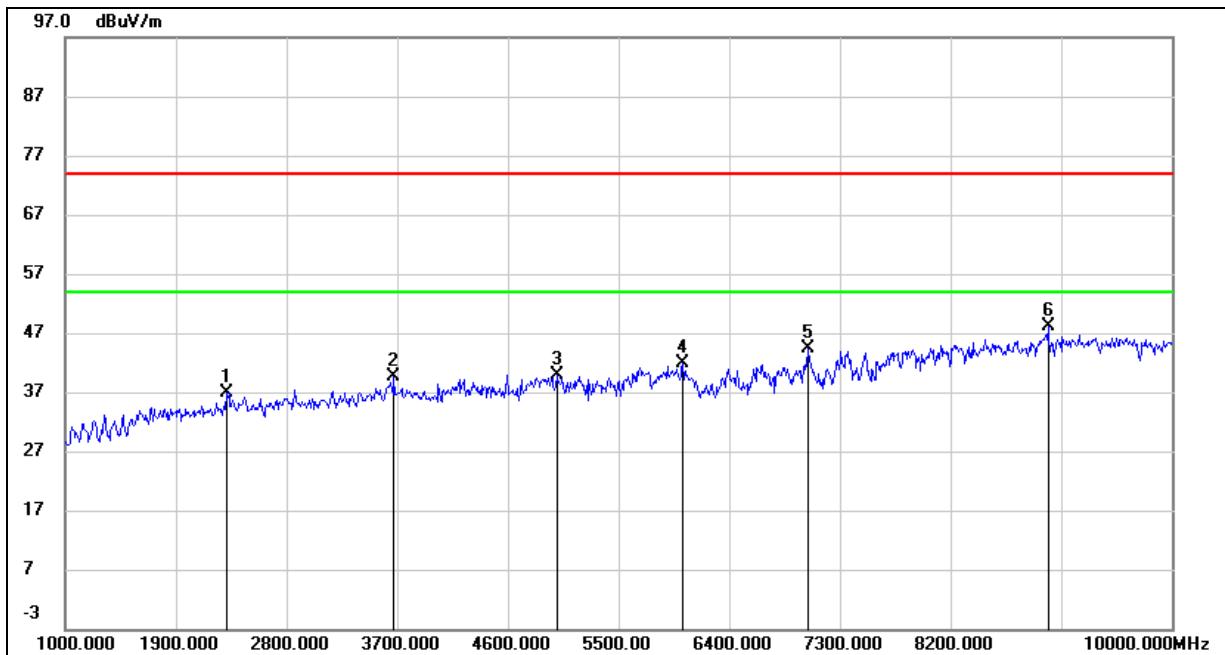
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2323.000	44.78	-8.45	36.33	74.00	-37.67	peak
2	3664.000	42.83	-3.89	38.94	74.00	-35.06	peak
3	6040.000	38.13	2.82	40.95	74.00	-33.05	peak
4	7048.000	37.30	6.69	43.99	74.00	-30.01	peak
5	8092.000	38.17	7.41	45.58	74.00	-28.42	peak
6	8992.000	36.71	10.38	47.09	74.00	-26.91	peak

Test Mode:	GFSK Condition 2	Frequency(MHz):	915.87
Polarity:	Vertical	Test Voltage:	DC 3.3 V



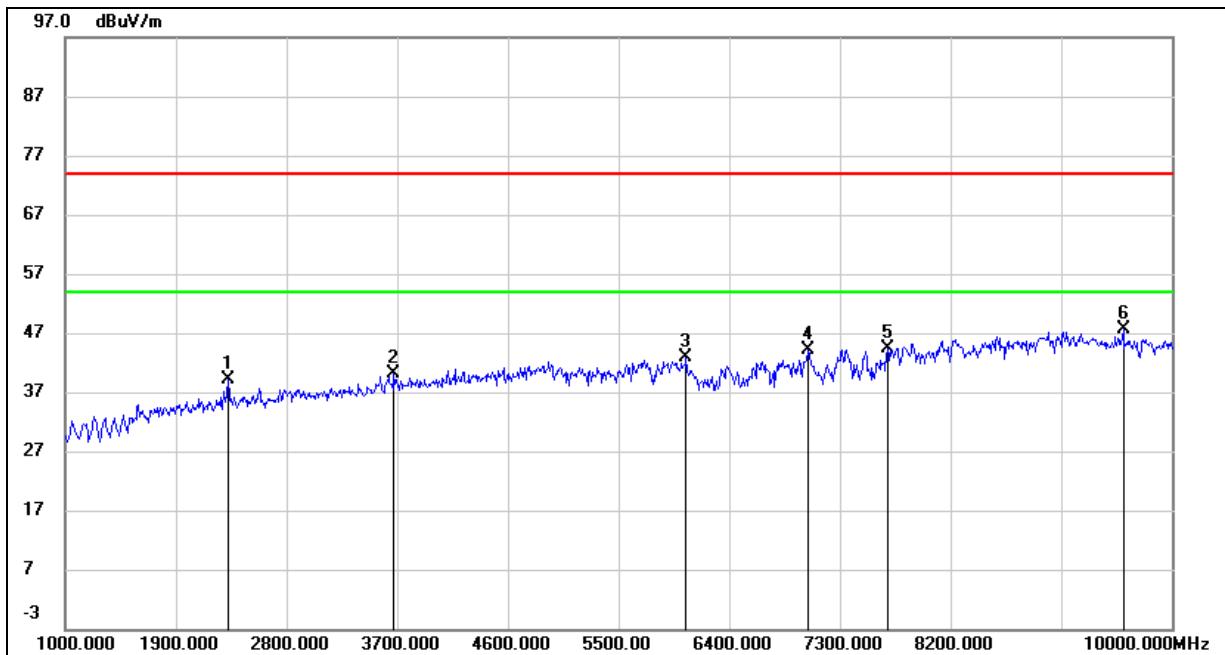
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2323.000	47.29	-7.62	39.67	74.00	-34.33	peak
2	3664.000	42.84	-2.86	39.98	74.00	-34.02	peak
3	4879.000	40.85	1.36	42.21	74.00	-31.79	peak
4	5734.000	39.67	3.06	42.73	74.00	-31.27	peak
5	7345.000	36.37	7.54	43.91	74.00	-30.09	peak
6	8965.000	37.87	10.47	48.34	74.00	-25.66	peak

Test Mode:	GFSK Condition 2	Frequency(MHz):	919.12
Polarity:	Horizontal	Test Voltage:	DC 3.3 V



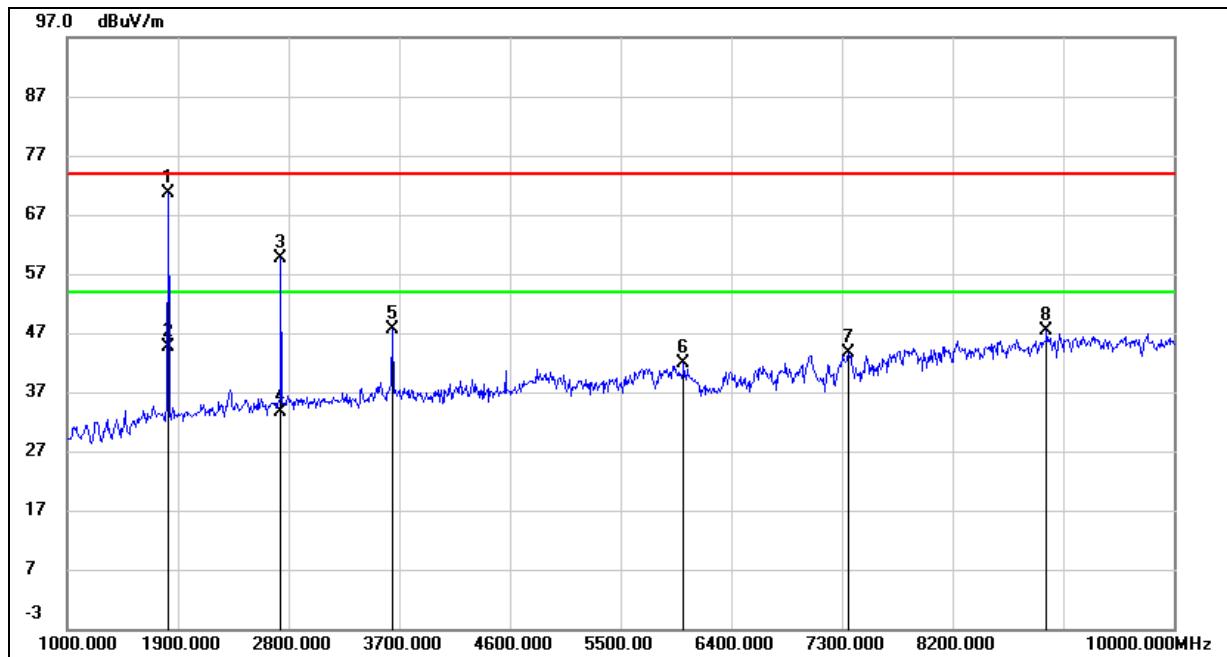
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2314.000	45.40	-8.50	36.90	74.00	-37.10	peak
2	3673.000	43.47	-3.87	39.60	74.00	-34.40	peak
3	4996.000	39.25	0.62	39.87	74.00	-34.13	peak
4	6022.000	39.02	2.87	41.89	74.00	-32.11	peak
5	7039.000	37.58	6.72	44.30	74.00	-29.70	peak
6	8992.000	37.82	10.38	48.20	74.00	-25.80	peak

Test Mode:	GFSK Condition 2	Frequency(MHz):	919.12
Polarity:	Vertical	Test Voltage:	DC 3.3 V



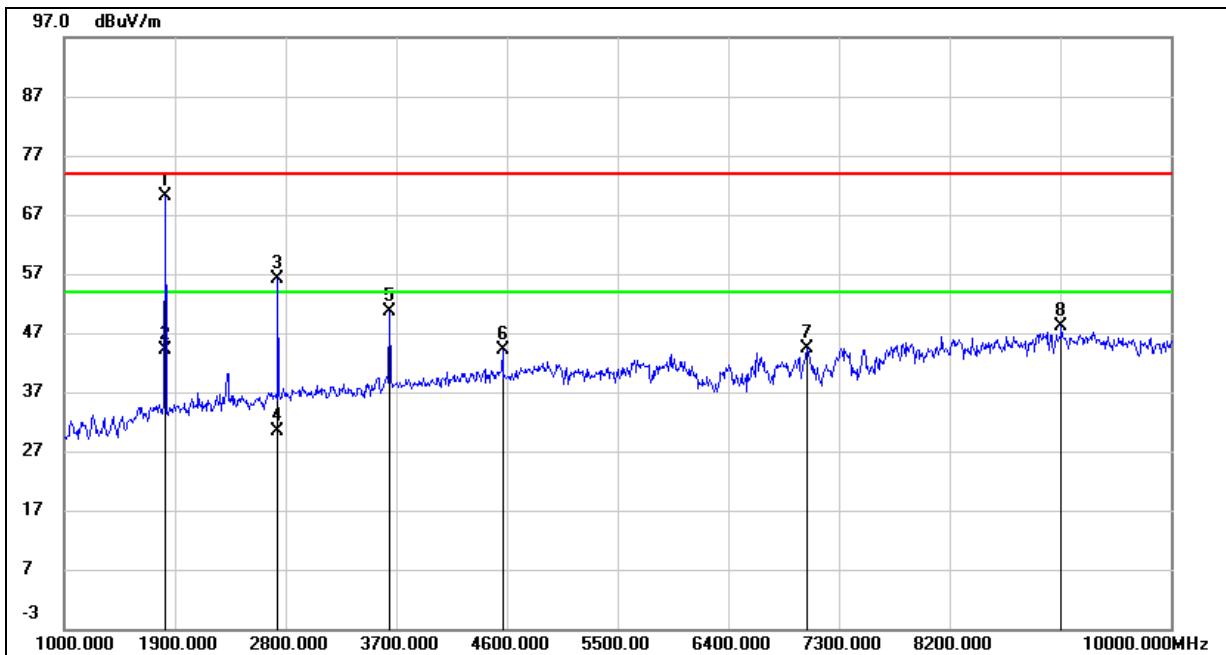
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2323.000	46.87	-7.62	39.25	74.00	-34.75	peak
2	3673.000	43.07	-2.83	40.24	74.00	-33.76	peak
3	6049.000	39.19	3.79	42.98	74.00	-31.02	peak
4	7039.000	36.47	7.59	44.06	74.00	-29.94	peak
5	7687.000	37.08	7.28	44.36	74.00	-29.64	peak
6	9604.000	37.16	10.58	47.74	74.00	-26.26	peak

Test Mode:	GFSK Condition 3	Frequency(MHz):	912.75
Polarity:	Horizontal	Test Voltage:	DC 3.3 V



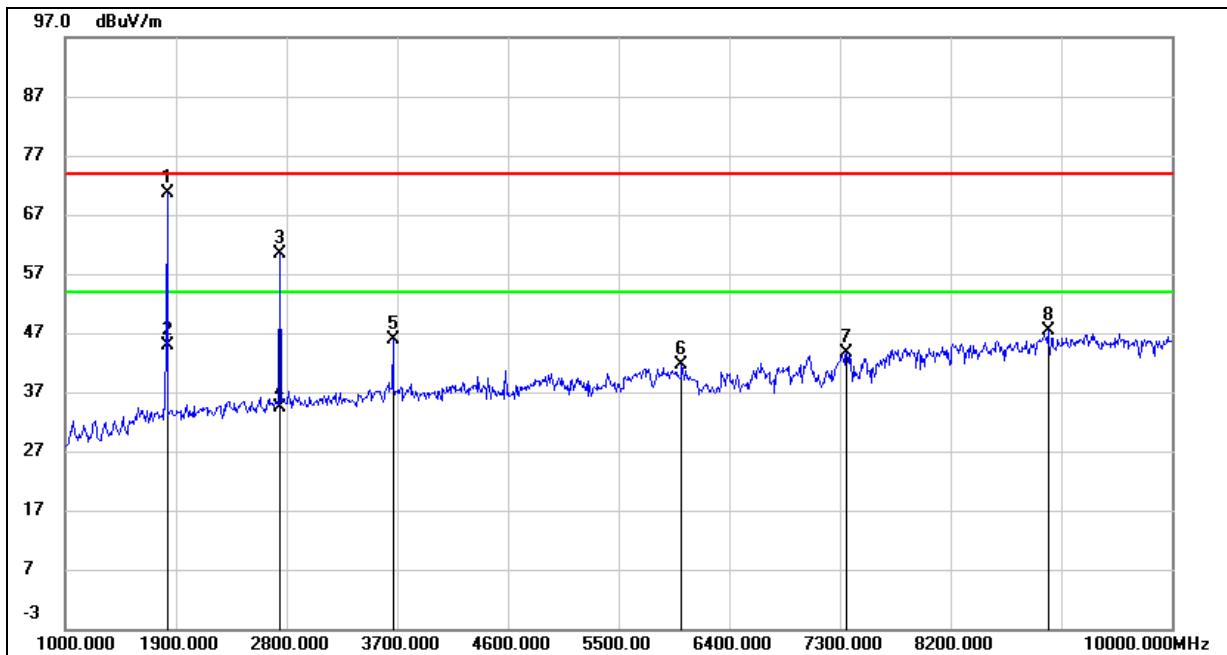
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1819.000	81.02	-10.35	70.67	74.00	-3.33	peak
2	1819.000	/	/	44.72	54.00	-9.28	AVG
3	2737.000	66.94	-7.24	59.70	74.00	-14.30	peak
4	2737.000	/	/	33.75	54.00	-20.25	AVG
5	3646.000	51.66	-3.94	47.72	74.00	-26.28	peak
6	6013.000	39.00	2.90	41.90	74.00	-32.10	peak
7	7354.000	36.62	6.97	43.59	74.00	-30.41	peak
8	8965.000	37.22	10.06	47.28	74.00	-26.72	peak

Test Mode:	GFSK Condition 3	Frequency(MHz):	912.75
Polarity:	Vertical	Test Voltage:	DC 3.3 V



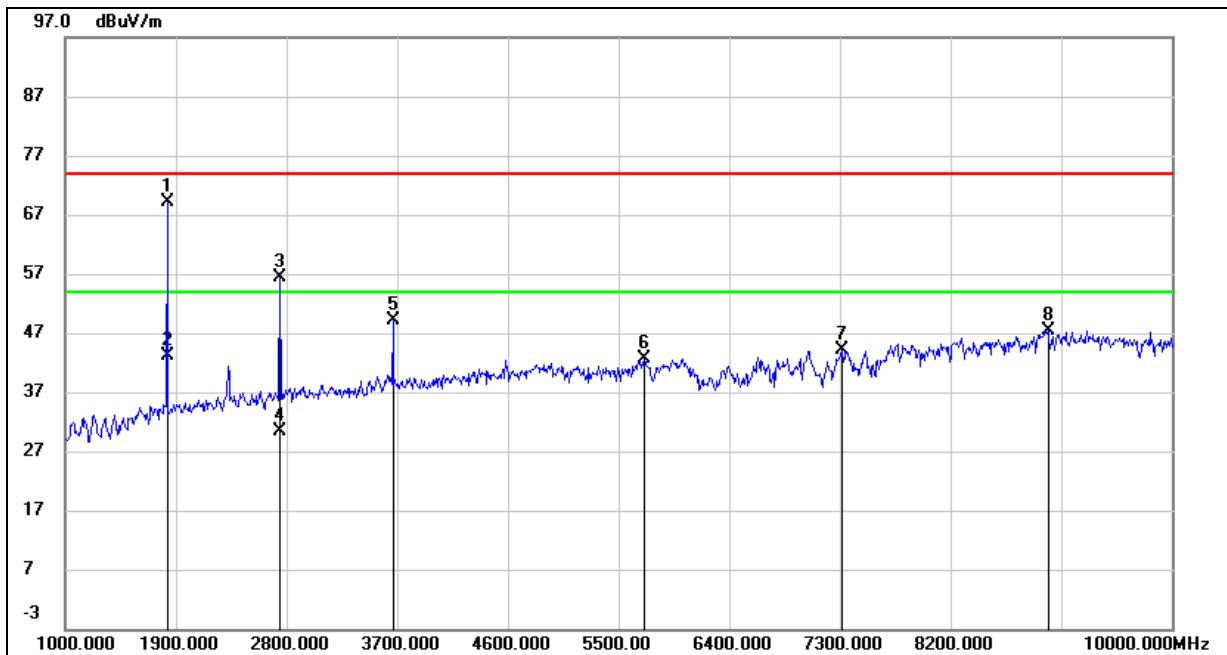
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1819.000	79.78	-9.74	70.04	74.00	-3.96	peak
2	1819.000	/	/	44.09	54.00	-9.91	AVG
3	2737.000	62.45	-6.21	56.24	74.00	-17.76	peak
4	2737.000	/	/	30.29	54.00	-23.71	AVG
5	3646.000	53.51	-2.91	50.60	74.00	-23.40	peak
6	4564.000	44.38	-0.37	44.01	74.00	-29.99	peak
7	7039.000	36.78	7.59	44.37	74.00	-29.63	peak
8	9109.000	37.80	10.30	48.10	74.00	-25.90	peak

Test Mode:	GFSK Condition 3	Frequency(MHz):	915.87
Polarity:	Horizontal	Test Voltage:	DC 3.3 V



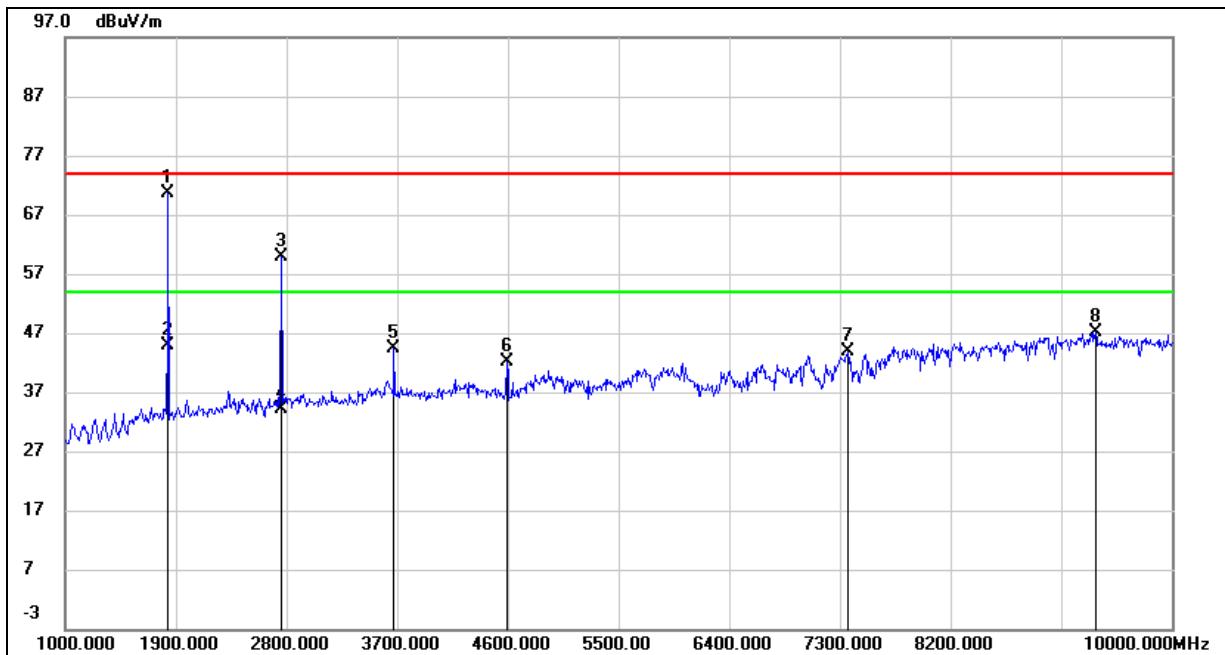
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1828.000	81.08	-10.34	70.74	74.00	-3.26	peak
2	1828.000	/	/	44.79	54.00	-9.21	AVG
3	2746.000	67.48	-7.20	60.28	74.00	-13.72	peak
4	2746.000	/	/	34.33	54.00	-19.67	AVG
5	3664.000	49.67	-3.89	45.78	74.00	-28.22	peak
6	6013.000	38.66	2.90	41.56	74.00	-32.44	peak
7	7354.000	36.60	6.97	43.57	74.00	-30.43	peak
8	8992.000	37.09	10.38	47.47	74.00	-26.53	peak

Test Mode:	GFSK Condition 3	Frequency(MHz):	915.87
Polarity:	Vertical	Test Voltage:	DC 3.3 V



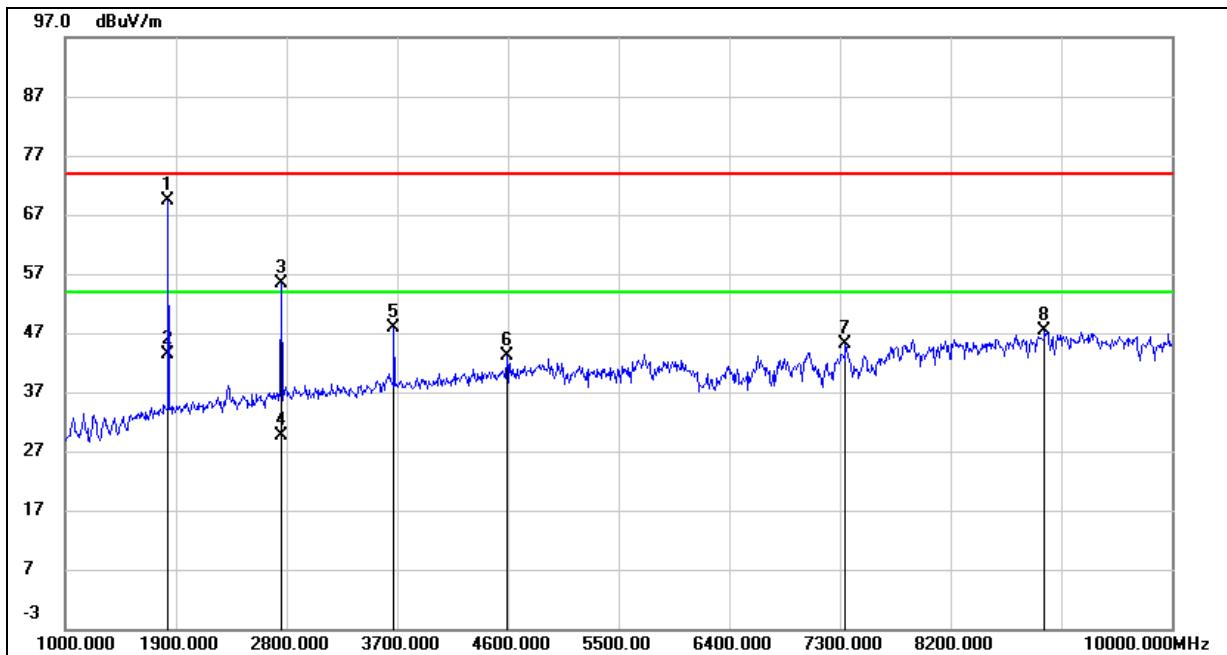
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1828.000	78.90	-9.71	69.19	74.00	-4.81	peak
2	1828.000	/	/	43.24	54.00	-10.76	AVG
3	2746.000	62.57	-6.15	56.42	74.00	-17.58	peak
4	2746.000	/	/	30.47	54.00	-23.53	AVG
5	3664.000	52.10	-2.86	49.24	74.00	-24.76	peak
6	5707.000	39.59	3.09	42.68	74.00	-31.32	peak
7	7318.000	36.70	7.38	44.08	74.00	-29.92	peak
8	8992.000	36.65	10.78	47.43	74.00	-26.57	peak

Test Mode:	GFSK Condition 3	Frequency(MHz):	919.12
Polarity:	Horizontal	Test Voltage:	DC 3.3 V



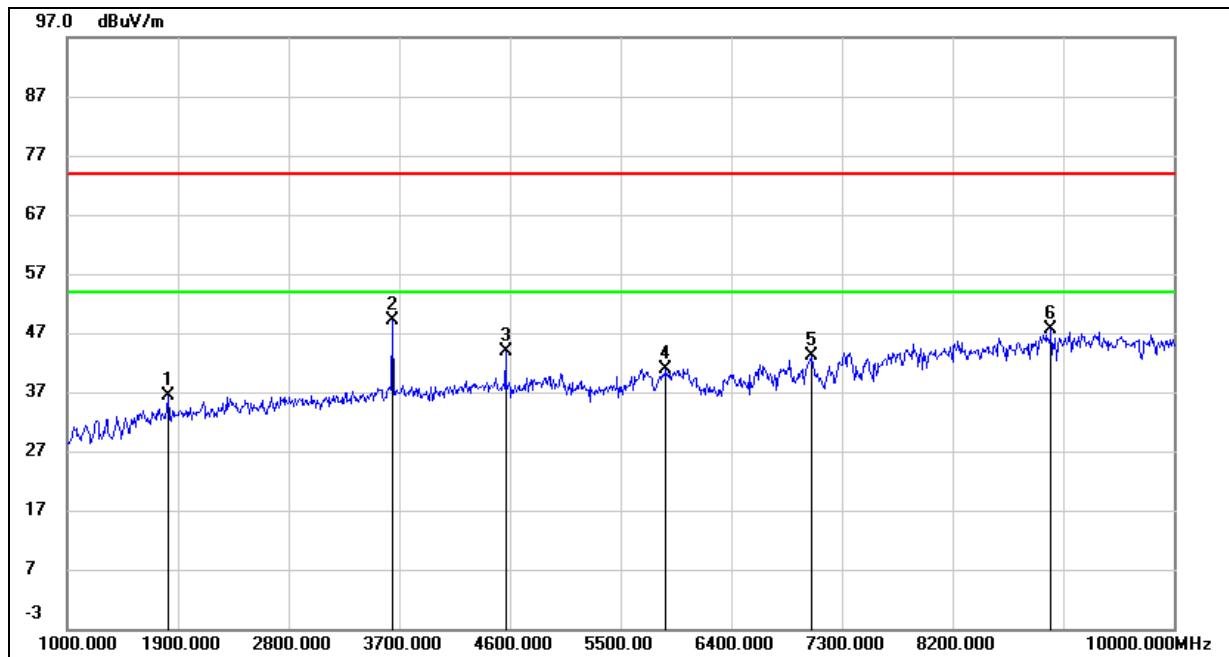
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1837.000	81.06	-10.34	70.72	74.00	-3.28	peak
2	1837.000	/	/	44.77	54.00	-9.23	AVG
3	2755.000	67.13	-7.15	59.98	74.00	-14.02	peak
4	2755.000	/	/	34.03	54.00	-19.97	AVG
5	3673.000	48.22	-3.87	44.35	74.00	-29.65	peak
6	4591.000	43.28	-1.23	42.05	74.00	-31.95	peak
7	7363.000	36.84	7.03	43.87	74.00	-30.13	peak
8	9379.000	37.00	10.02	47.02	74.00	-26.98	peak

Test Mode:	GFSK Condition 3	Frequency(MHz):	919.12
Polarity:	Vertical	Test Voltage:	DC 3.3 V



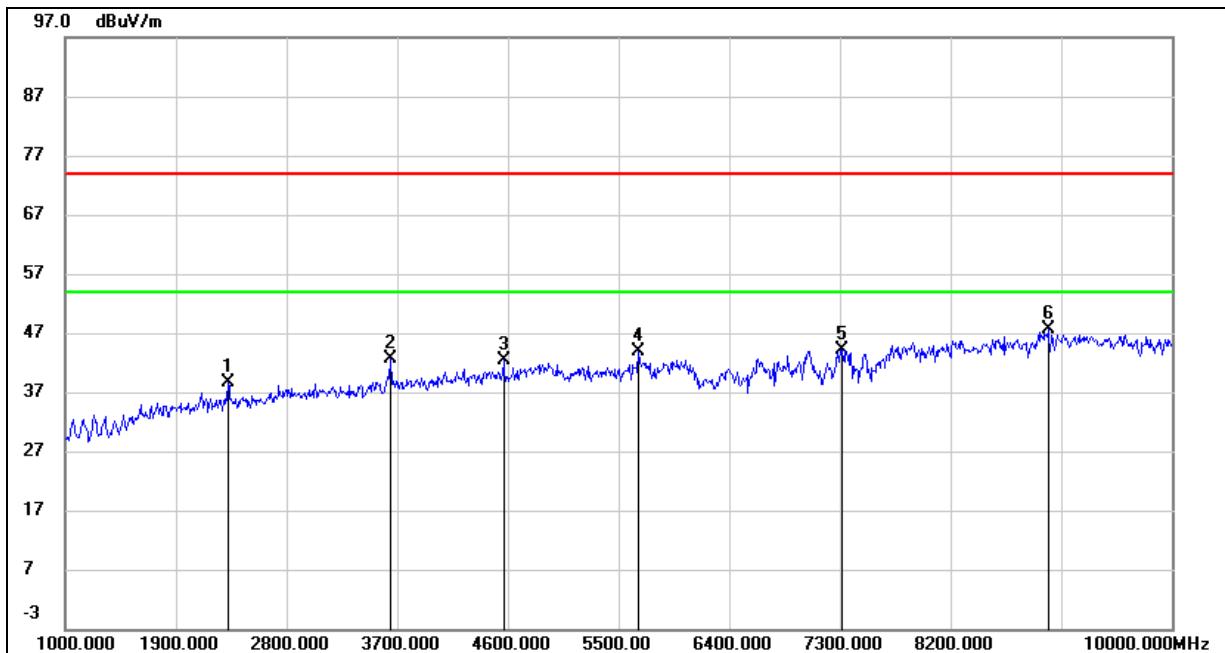
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1837.000	79.12	-9.70	69.42	74.00	-4.58	peak
2	1837.000	/	/	43.47	54.00	-10.53	AVG
3	2755.000	61.56	-6.09	55.47	74.00	-18.53	peak
4	2755.000	/	/	29.52	54.00	-24.48	AVG
5	3673.000	50.80	-2.83	47.97	74.00	-26.03	peak
6	4591.000	43.40	-0.28	43.12	74.00	-30.88	peak
7	7345.000	37.63	7.54	45.17	74.00	-28.83	peak
8	8965.000	36.94	10.47	47.41	74.00	-26.59	peak

Test Mode:	GFSK Condition 4	Frequency(MHz):	912.75
Polarity:	Horizontal	Test Voltage:	DC 3.3 V



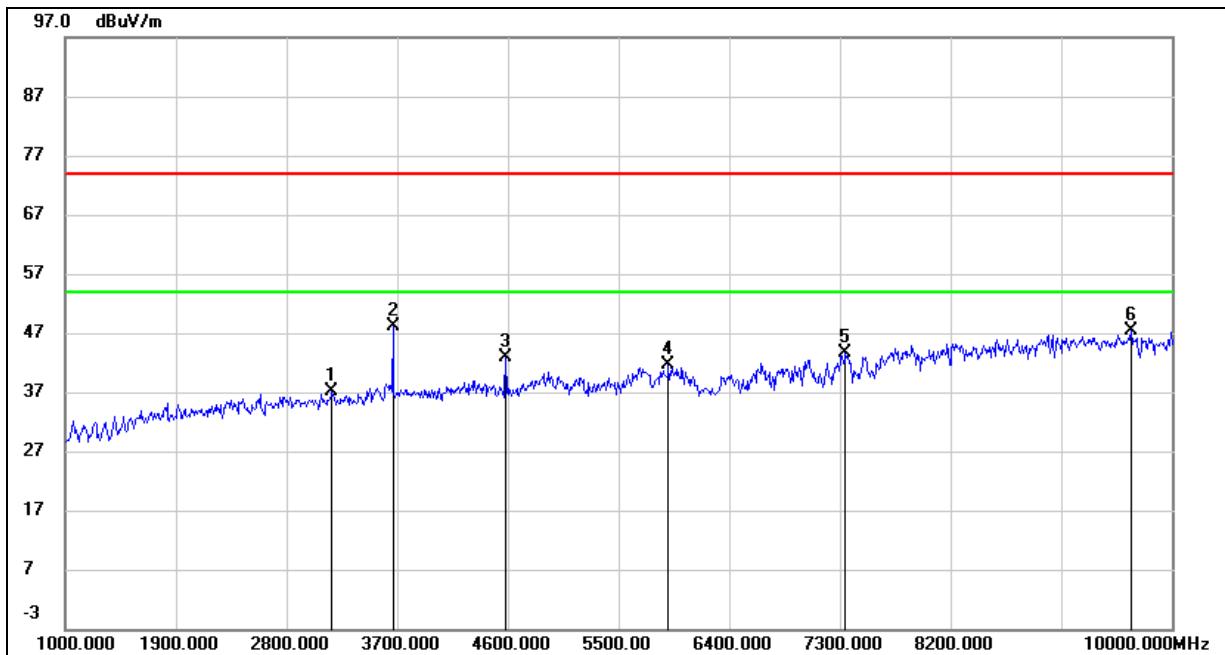
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1819.000	46.65	-10.35	36.30	74.00	-37.70	peak
2	3646.000	52.98	-3.94	49.04	74.00	-24.96	peak
3	4564.000	45.11	-1.31	43.80	74.00	-30.20	peak
4	5869.000	38.72	2.26	40.98	74.00	-33.02	peak
5	7048.000	36.37	6.69	43.06	74.00	-30.94	peak
6	9001.000	37.13	10.47	47.60	74.00	-26.40	peak

Test Mode:	GFSK Condition 4	Frequency(MHz):	912.75
Polarity:	Vertical	Test Voltage:	DC 3.3 V



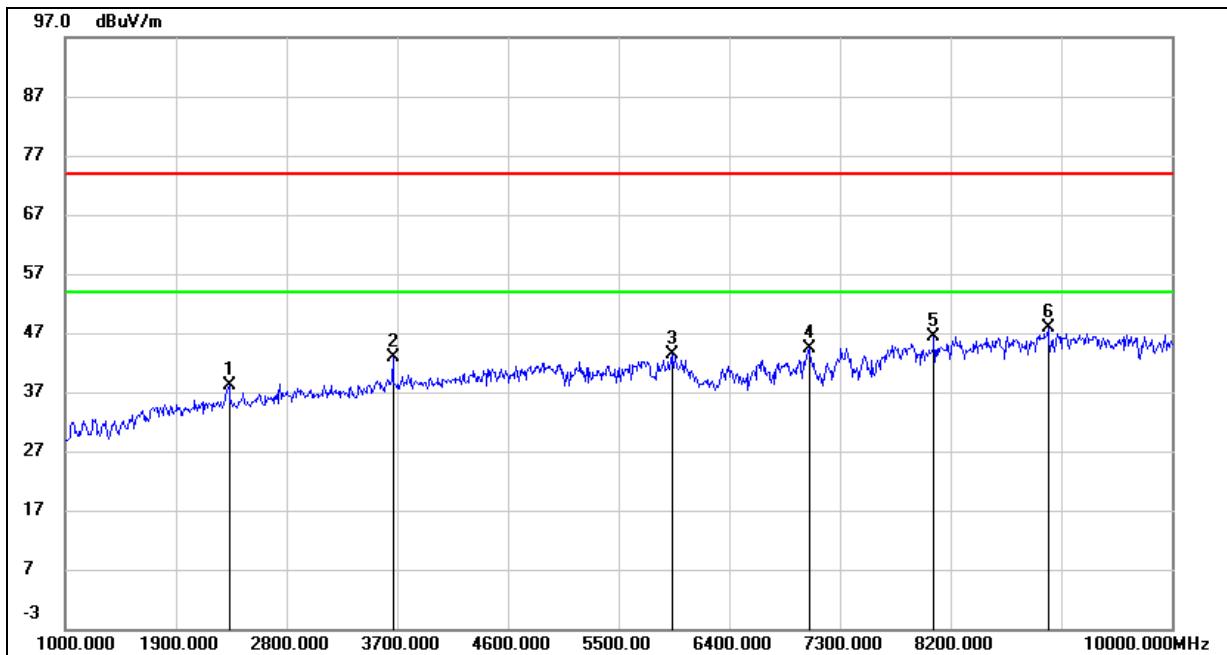
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2323.000	46.22	-7.62	38.60	74.00	-35.40	peak
2	3646.000	45.47	-2.91	42.56	74.00	-31.44	peak
3	4564.000	42.74	-0.37	42.37	74.00	-31.63	peak
4	5662.000	40.64	3.13	43.77	74.00	-30.23	peak
5	7318.000	36.84	7.38	44.22	74.00	-29.78	peak
6	8992.000	36.91	10.78	47.69	74.00	-26.31	peak

Test Mode:	GFSK Condition 4	Frequency(MHz):	915.87
Polarity:	Horizontal	Test Voltage:	DC 3.3 V



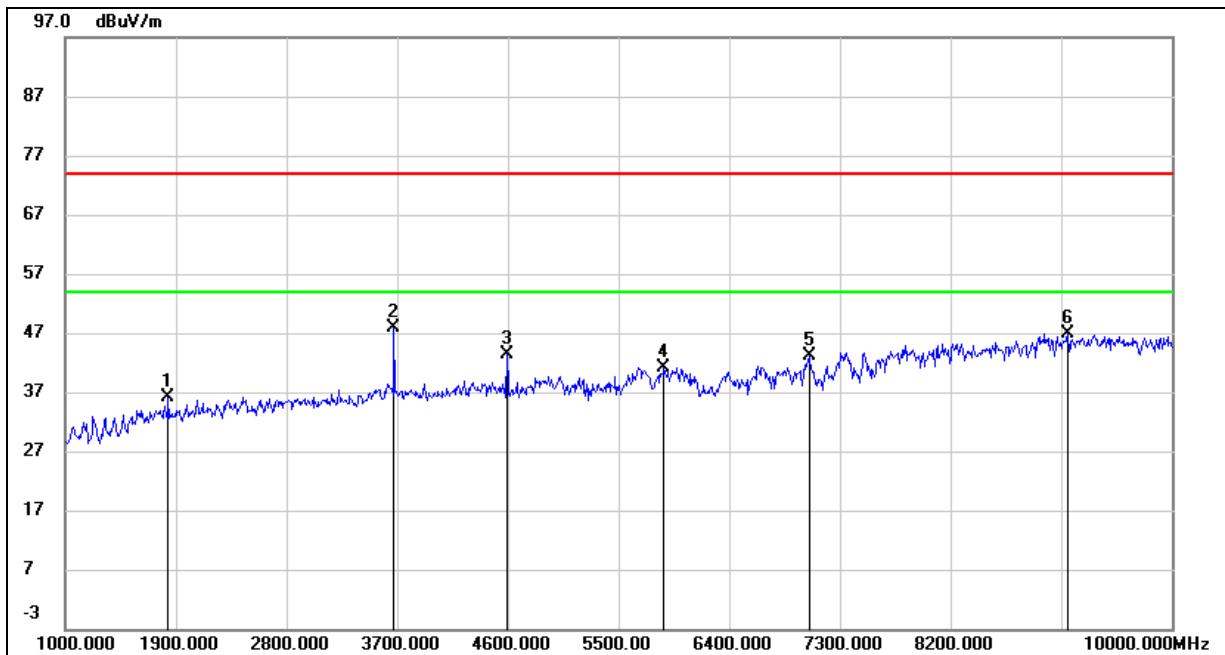
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	3169.000	42.84	-5.72	37.12	74.00	-36.88	peak
2	3664.000	52.09	-3.89	48.20	74.00	-25.80	peak
3	4582.000	44.07	-1.27	42.80	74.00	-31.20	peak
4	5905.000	39.29	2.45	41.74	74.00	-32.26	peak
5	7345.000	36.62	6.91	43.53	74.00	-30.47	peak
6	9667.000	36.49	10.86	47.35	74.00	-26.65	peak

Test Mode:	GFSK Condition 4	Frequency(MHz):	915.87
Polarity:	Vertical	Test Voltage:	DC 3.3 V



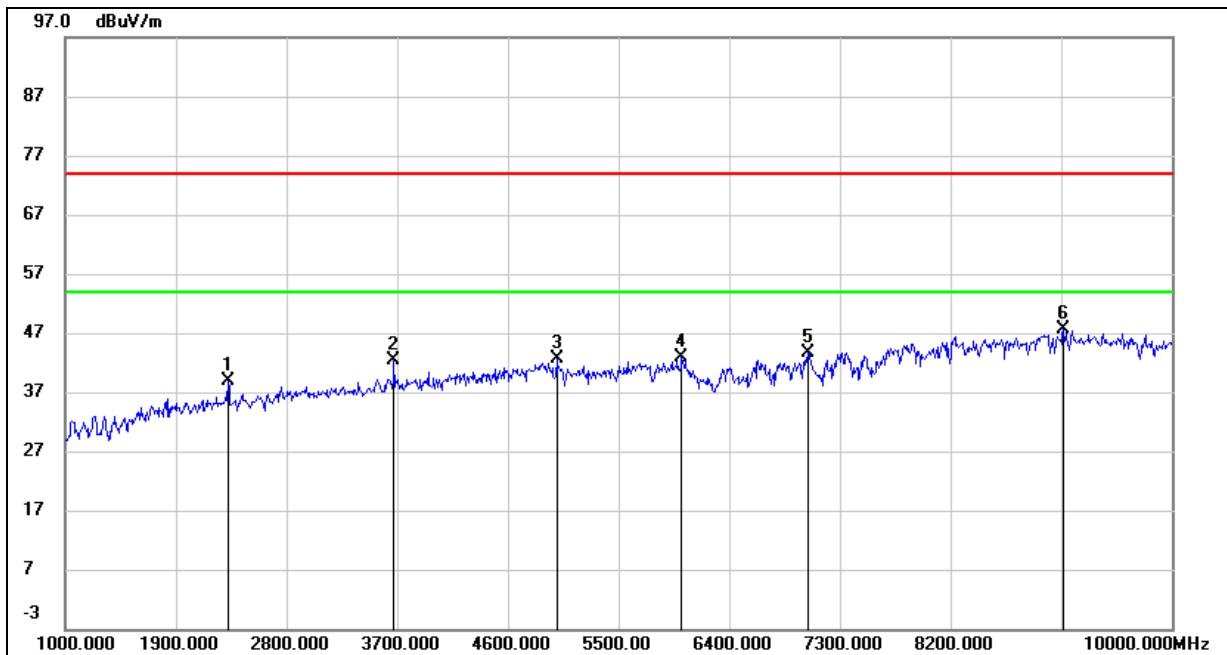
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2332.000	45.61	-7.57	38.04	74.00	-35.96	peak
2	3664.000	45.79	-2.86	42.93	74.00	-31.07	peak
3	5932.000	39.74	3.61	43.35	74.00	-30.65	peak
4	7048.000	36.79	7.55	44.34	74.00	-29.66	peak
5	8065.000	38.74	7.69	46.43	74.00	-27.57	peak
6	8992.000	37.14	10.78	47.92	74.00	-26.08	peak

Test Mode:	GFSK Condition 4	Frequency(MHz):	919.12
Polarity:	Horizontal	Test Voltage:	DC 3.3 V



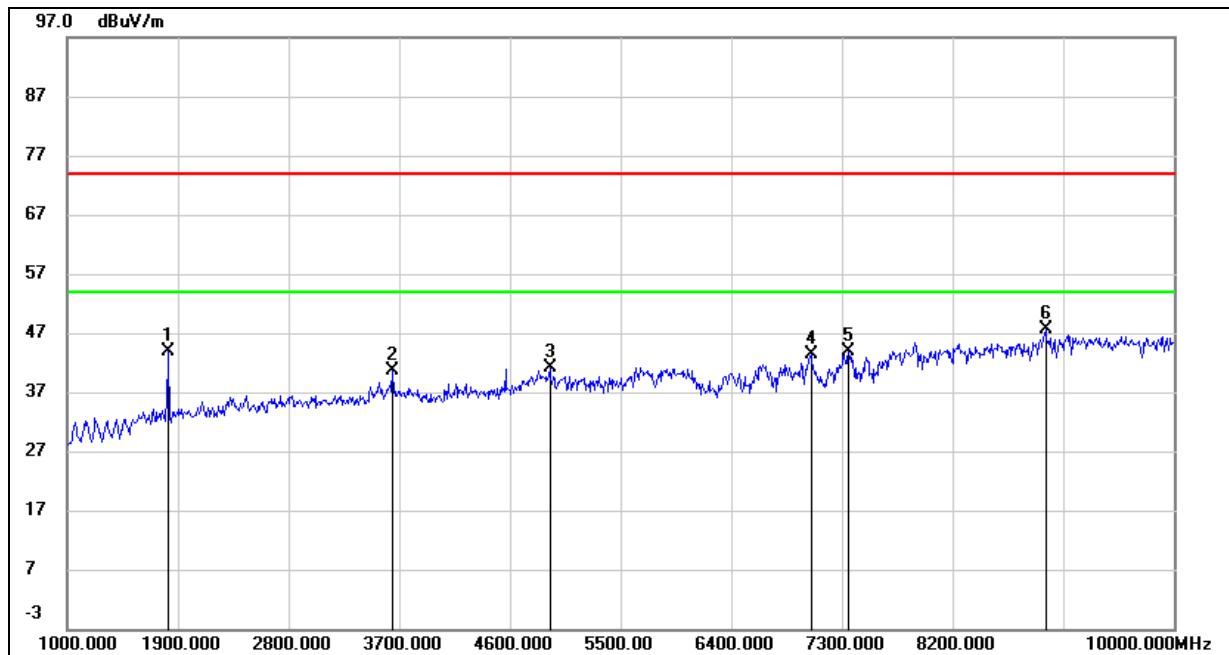
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1837.000	46.42	-10.34	36.08	74.00	-37.92	peak
2	3673.000	51.78	-3.87	47.91	74.00	-26.09	peak
3	4591.000	44.53	-1.23	43.30	74.00	-30.70	peak
4	5869.000	38.95	2.26	41.21	74.00	-32.79	peak
5	7048.000	36.47	6.69	43.16	74.00	-30.84	peak
6	9154.000	37.09	9.80	46.89	74.00	-27.11	peak

Test Mode:	GFSK Condition 4	Frequency(MHz):	919.12
Polarity:	Vertical	Test Voltage:	DC 3.3 V



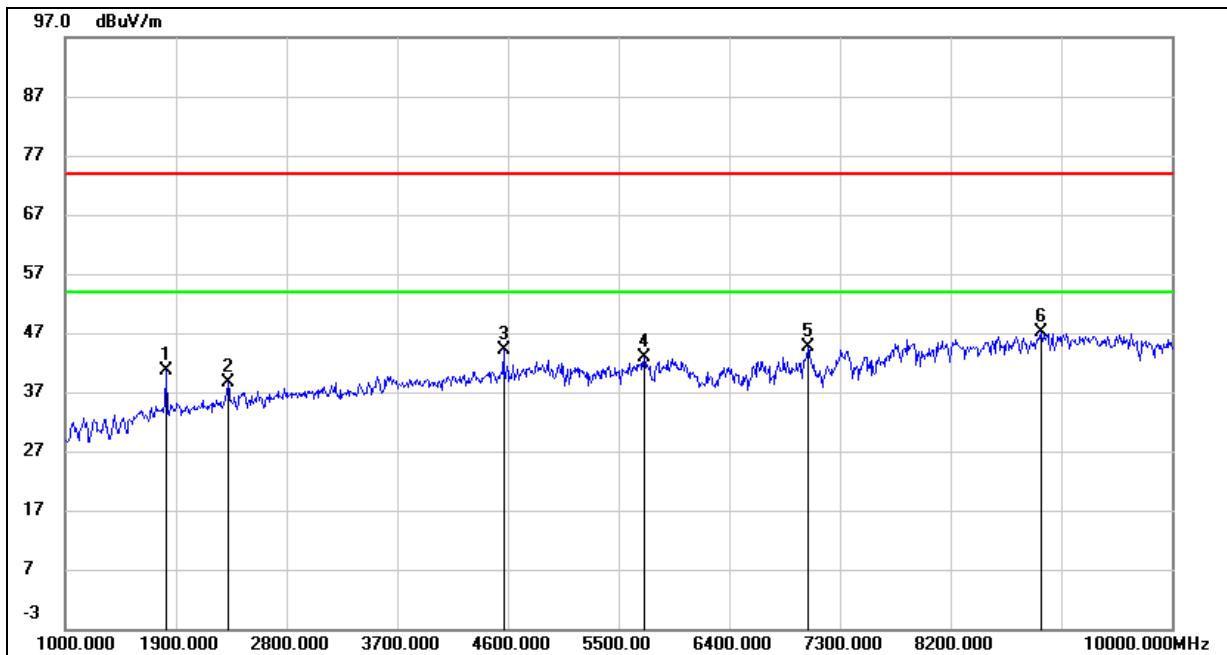
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2323.000	46.50	-7.62	38.88	74.00	-35.12	peak
2	3673.000	45.24	-2.83	42.41	74.00	-31.59	peak
3	4996.000	40.74	1.82	42.56	74.00	-31.44	peak
4	6013.000	38.91	3.89	42.80	74.00	-31.20	peak
5	7039.000	36.14	7.59	43.73	74.00	-30.27	peak
6	9118.000	37.33	10.26	47.59	74.00	-26.41	peak

Test Mode:	GFSK Condition 5	Frequency(MHz):	912.75
Polarity:	Horizontal	Test Voltage:	DC 3.3 V



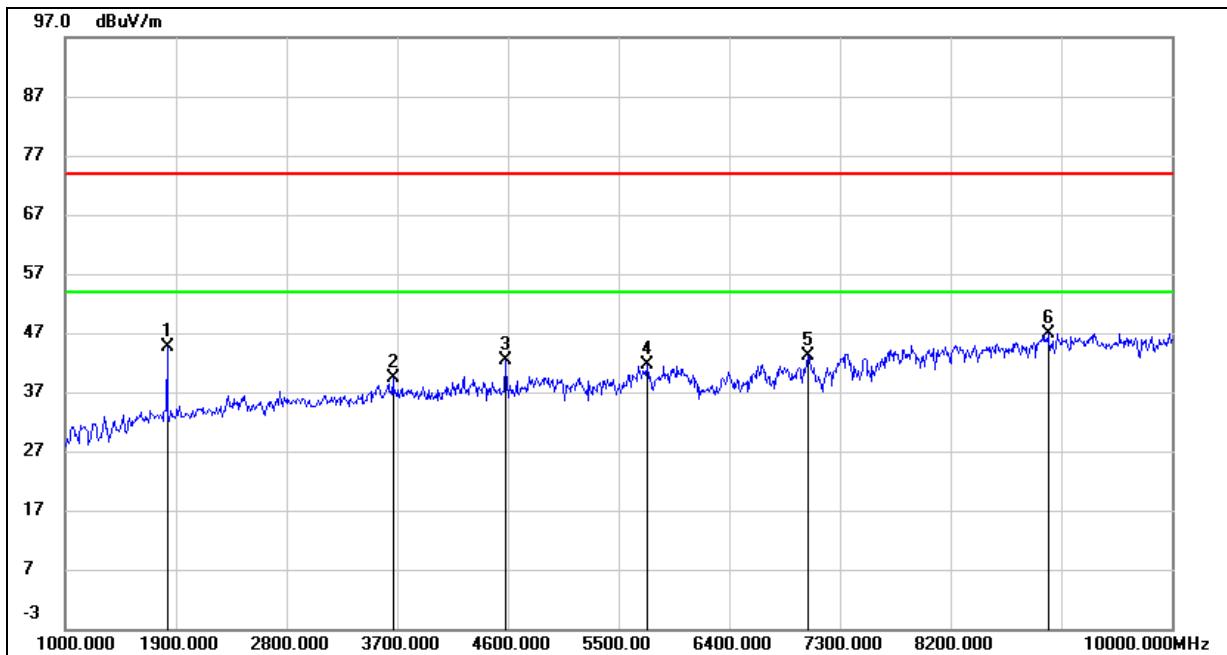
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1819.000	54.30	-10.35	43.95	74.00	-30.05	peak
2	3646.000	44.51	-3.94	40.57	74.00	-33.43	peak
3	4924.000	40.81	0.39	41.20	74.00	-32.80	peak
4	7048.000	36.66	6.69	43.35	74.00	-30.65	peak
5	7354.000	36.79	6.97	43.76	74.00	-30.24	peak
6	8956.000	37.60	9.95	47.55	74.00	-26.45	peak

Test Mode:	GFSK Condition 5	Frequency(MHz):	912.75
Polarity:	Vertical	Test Voltage:	DC 3.3 V



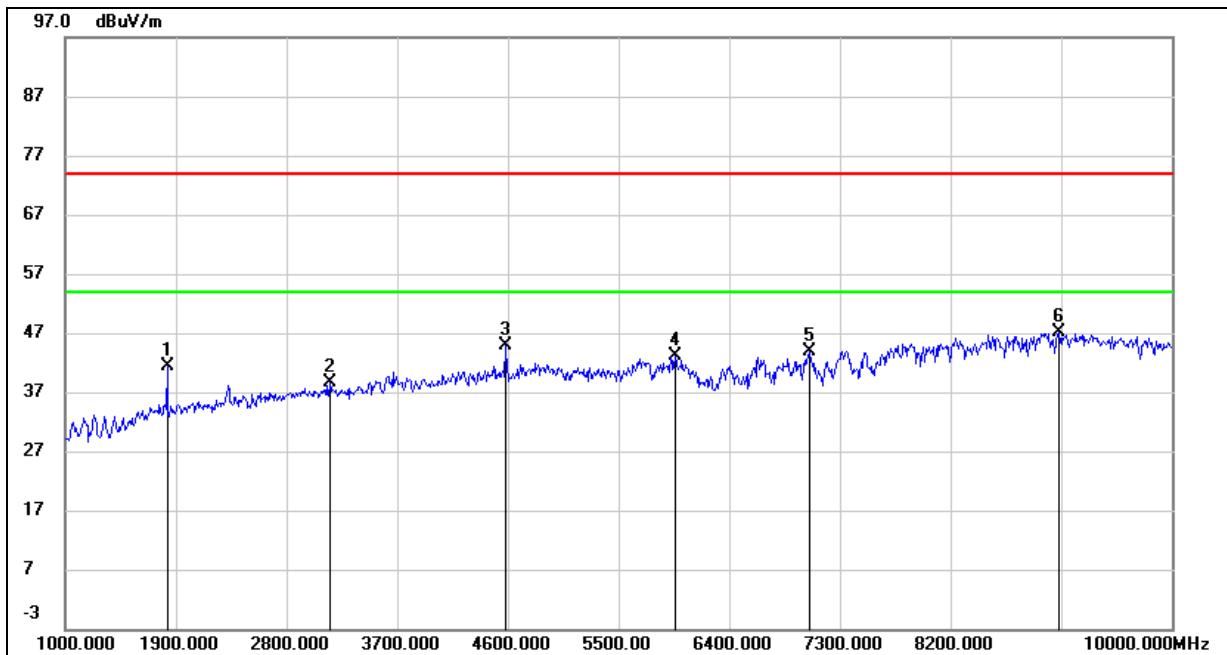
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1819.000	50.28	-9.74	40.54	74.00	-33.46	peak
2	2323.000	46.33	-7.62	38.71	74.00	-35.29	peak
3	4564.000	44.61	-0.37	44.24	74.00	-29.76	peak
4	5707.000	39.70	3.09	42.79	74.00	-31.21	peak
5	7039.000	37.09	7.59	44.68	74.00	-29.32	peak
6	8938.000	36.98	10.16	47.14	74.00	-26.86	peak

Test Mode:	GFSK Condition 5	Frequency(MHz):	915.87
Polarity:	Horizontal	Test Voltage:	DC 3.3 V



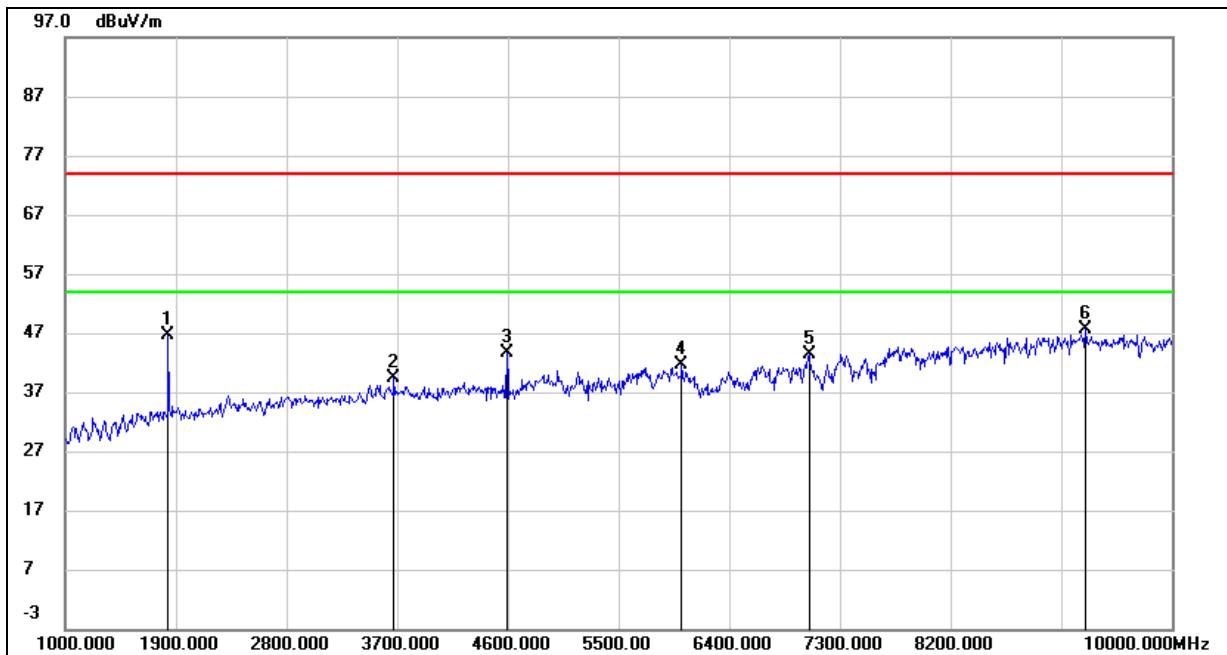
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1828.000	54.96	-10.34	44.62	74.00	-29.38	peak
2	3664.000	43.36	-3.89	39.47	74.00	-34.53	peak
3	4582.000	43.70	-1.27	42.43	74.00	-31.57	peak
4	5734.000	39.72	1.95	41.67	74.00	-32.33	peak
5	7039.000	36.37	6.72	43.09	74.00	-30.91	peak
6	8992.000	36.59	10.38	46.97	74.00	-27.03	peak

Test Mode:	GFSK Condition 5	Frequency(MHz):	915.87
Polarity:	Vertical	Test Voltage:	DC 3.3 V



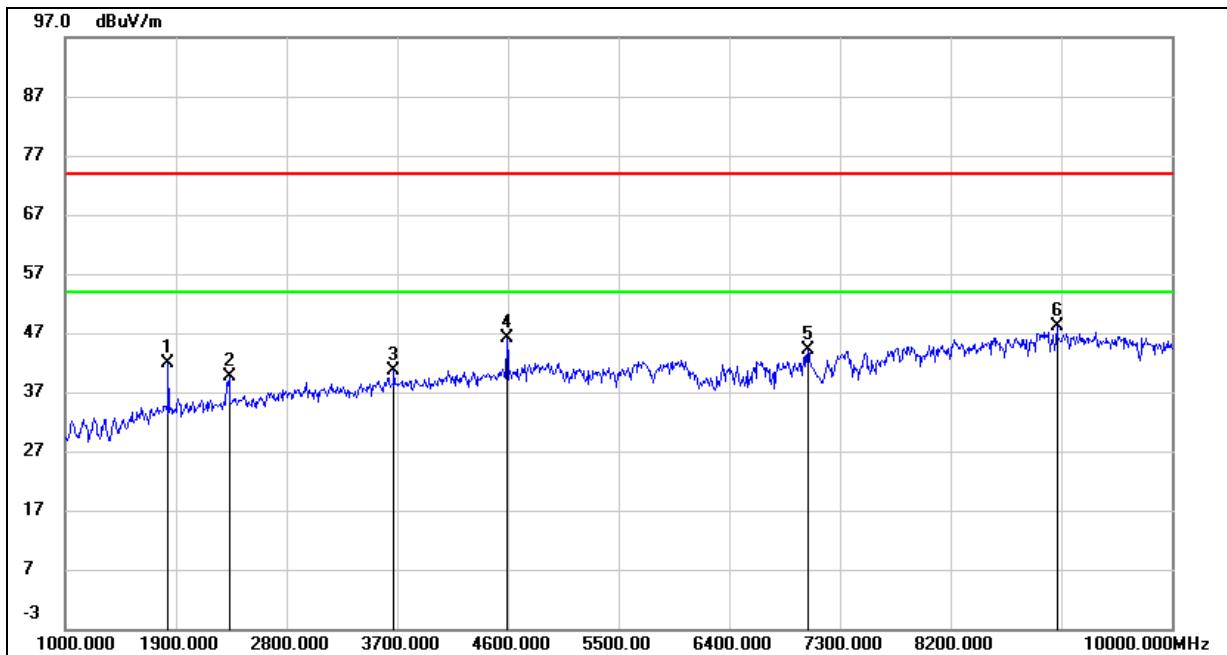
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1828.000	51.01	-9.71	41.30	74.00	-32.70	peak
2	3151.000	43.21	-4.56	38.65	74.00	-35.35	peak
3	4582.000	45.08	-0.32	44.76	74.00	-29.24	peak
4	5959.000	39.30	3.74	43.04	74.00	-30.96	peak
5	7057.000	36.43	7.49	43.92	74.00	-30.08	peak
6	9082.000	36.56	10.45	47.01	74.00	-26.99	peak

Test Mode:	GFSK Condition 5	Frequency(MHz):	919.12
Polarity:	Horizontal	Test Voltage:	DC 3.3 V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1837.000	56.94	-10.34	46.60	74.00	-27.40	peak
2	3673.000	43.19	-3.87	39.32	74.00	-34.68	peak
3	4591.000	44.88	-1.23	43.65	74.00	-30.35	peak
4	6013.000	38.67	2.90	41.57	74.00	-32.43	peak
5	7048.000	36.81	6.69	43.50	74.00	-30.50	peak
6	9298.000	37.87	9.83	47.70	74.00	-26.30	peak

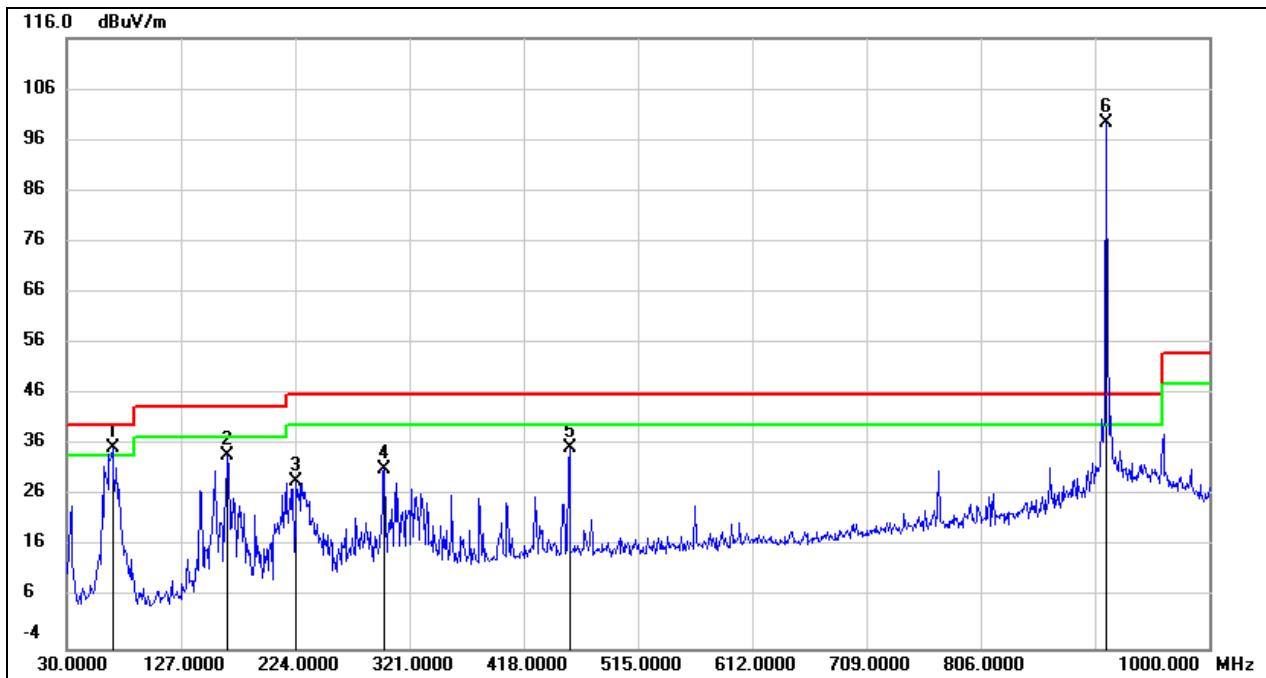
Test Mode:	GFSK Condition 5	Frequency(MHz):	919.12
Polarity:	Vertical	Test Voltage:	DC 3.3 V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1837.000	51.64	-9.70	41.94	74.00	-32.06	peak
2	2332.000	47.08	-7.57	39.51	74.00	-34.49	peak
3	3673.000	43.48	-2.83	40.65	74.00	-33.35	peak
4	4591.000	46.35	-0.28	46.07	74.00	-27.93	peak
5	7039.000	36.61	7.59	44.20	74.00	-29.80	peak
6	9064.000	37.52	10.54	48.06	74.00	-25.94	peak

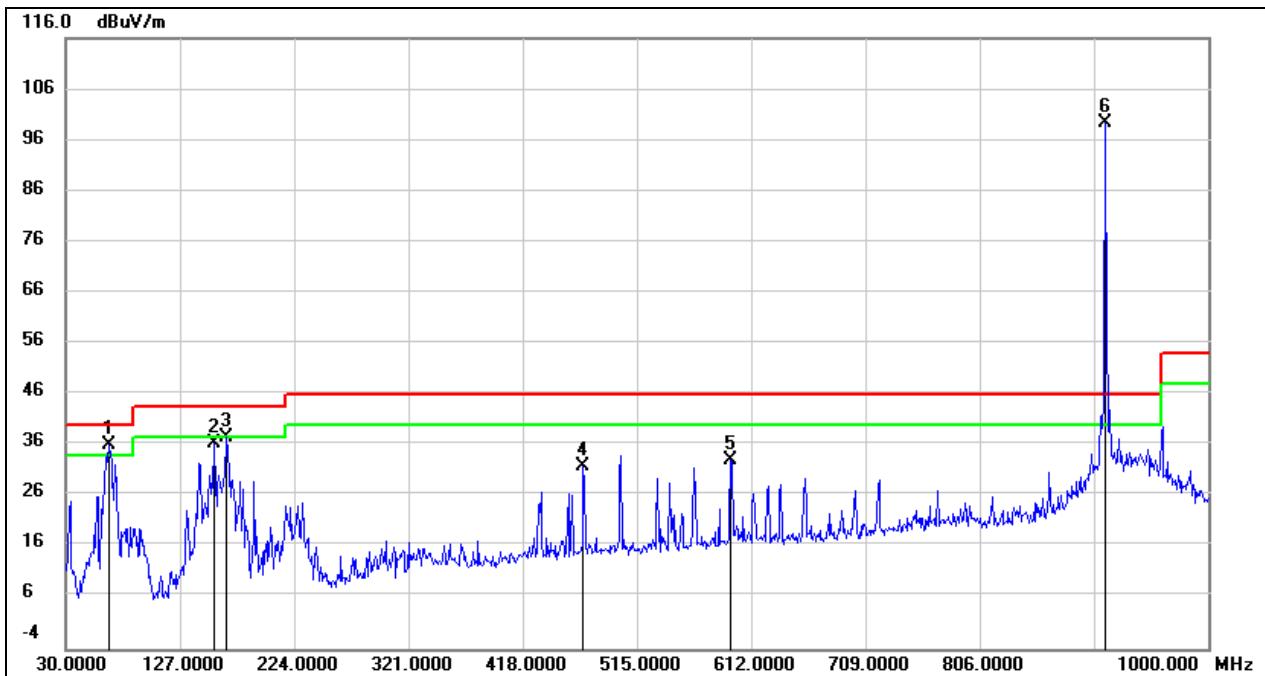
8.2. SPURIOUS EMISSIONS (30 MHz ~ 1 GHz)

Test Mode:	GFSK Condition 3	Frequency(MHz):	915.87
Polarity:	Horizontal	Test Voltage:	DC 3.3 V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	68.8000	50.92	-15.38	35.54	40.00	-4.46	QP
2	166.7700	46.44	-12.36	34.08	43.50	-9.42	QP
3	224.9700	42.20	-13.25	28.95	46.00	-17.05	QP
4	299.6600	42.72	-11.53	31.19	46.00	-14.81	QP
5	456.8000	43.79	-8.47	35.32	46.00	-10.68	QP
6	915.8700	100.86	-1.37	99.49	/	/	fundamental

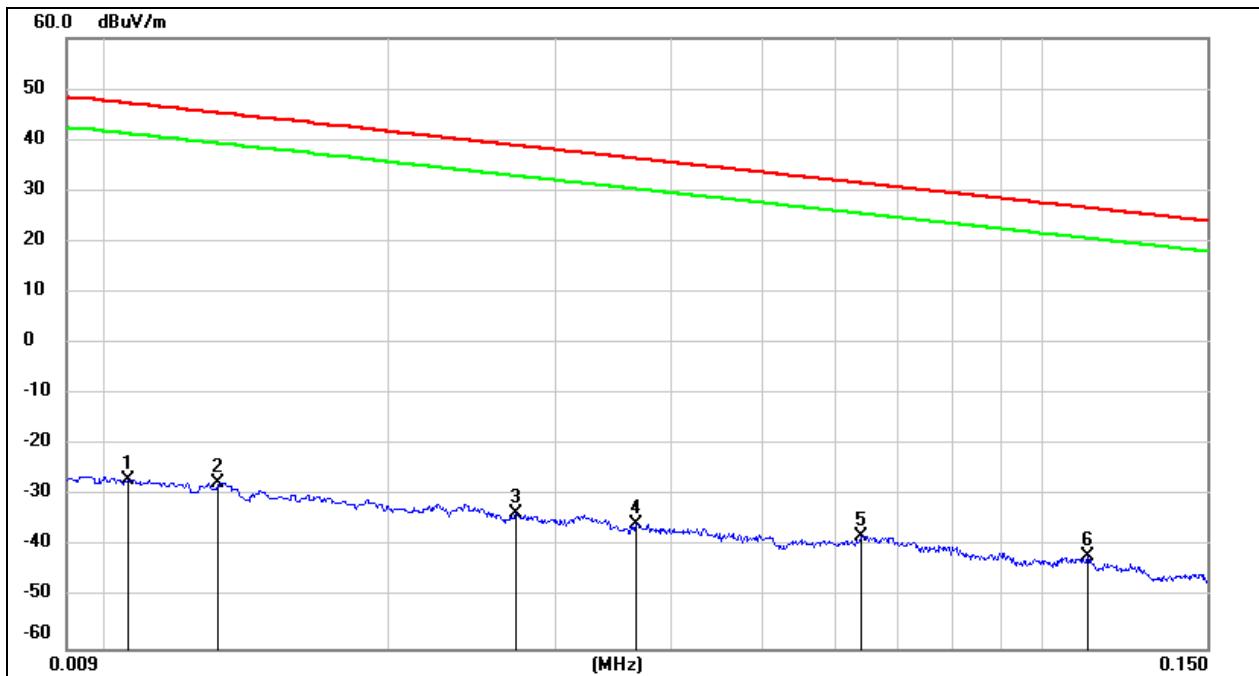
Test Mode:	GFSK Condition 3	Frequency(MHz):	915.87
Polarity:	Vertical	Test Voltage:	DC 3.3 V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	66.8600	51.44	-15.33	36.11	40.00	-3.89	QP
2	156.1000	49.33	-13.05	36.28	43.50	-7.22	QP
3	165.8000	49.96	-12.41	37.55	43.50	-5.95	QP
4	469.4100	40.07	-8.36	31.71	46.00	-14.29	QP
5	594.5400	39.41	-6.34	33.07	46.00	-12.93	QP
6	915.8700	100.70	-1.37	99.33	/	/	fundamental

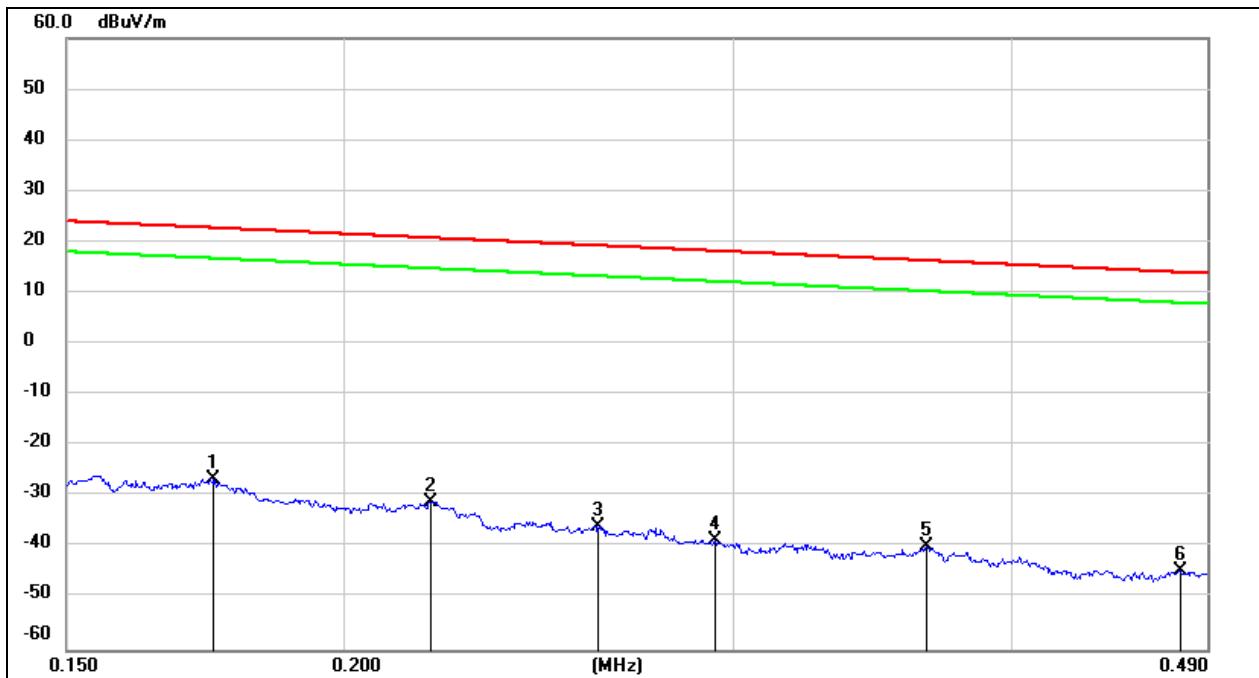
8.3. SPURIOUS EMISSIONS BELOW 30 MHz

Test Mode:	GFSK Condition 3	Frequency(MHz):	915.87
Polarity:	Horizontal	Test Voltage:	DC 3.3 V



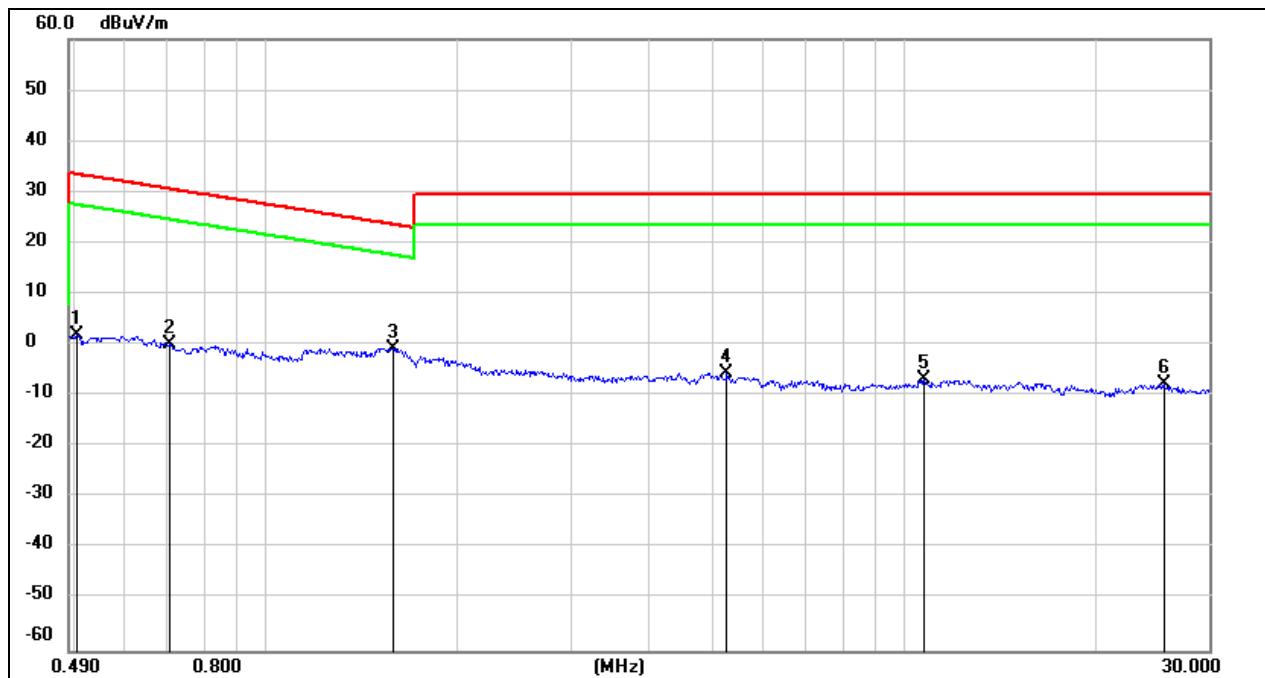
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	FCC Result (dBuV/m)	FCC Limit (dBuV/m)	ISED Result (dBuA/m)	ISED Limit (dBuA/m)	Margin (dB)	Remark
1	0.0105	74.60	- 101.40	-26.80	47.18	-78.30	-4.32	-73.98	peak
2	0.0131	73.97	- 101.38	-27.41	45.25	-78.91	-6.25	-72.66	peak
3	0.0273	67.99	- 101.38	-33.39	38.88	-84.89	-12.62	-72.27	peak
4	0.0366	65.87	- 101.42	-35.55	36.33	-87.05	-15.17	-71.88	peak
5	0.0637	63.61	- 101.54	-37.93	31.52	-89.43	-19.98	-69.45	peak
6	0.1116	59.89	- 101.76	-41.87	26.65	-93.37	-24.85	-68.52	peak

Test Mode:	GFSK Condition 3	Frequency(MHz):	915.87
Polarity:	Horizontal	Test Voltage:	DC 3.3 V



No.	Frequency	Reading	Correct	FCC Result	FCC Limit	ISED Result	ISED Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dBuA/m)	(dBuA/m)	(dB)	
1	0.1748	75.17	- 101.68	-26.51	22.76	-78.01	-28.74	-49.27	peak
2	0.2190	70.77	- 101.75	-30.98	20.79	-82.48	-30.71	-51.77	peak
3	0.2605	66.10	- 101.81	-35.71	19.28	-87.21	-32.22	-54.99	peak
4	0.2942	63.32	- 101.85	-38.53	18.23	-90.03	-33.27	-56.76	peak
5	0.3662	62.08	- 101.93	-39.85	16.33	-91.35	-35.17	-56.18	peak
6	0.4767	57.48	- 102.04	-44.56	14.04	-96.06	-37.46	-58.60	peak

Test Mode:	GFSK Condition 3	Frequency(MHz):	915.87
Polarity:	Horizontal	Test Voltage:	DC 3.3 V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	FCC Result (dBuV/m)	FCC Limit (dBuV/m)	ISED Result (dBuA/m)	ISED Limit (dBuA/m)	Margin (dB)	Remark
1	0.5039	63.93	-62.07	1.86	33.56	-49.64	-17.94	-31.70	peak
2	0.7066	62.40	-62.11	0.29	30.62	-51.21	-20.88	-30.33	peak
3	1.5826	61.38	-62.01	-0.63	23.61	-52.13	-27.89	-24.24	peak
4	5.2705	56.04	-61.45	-5.41	29.54	-56.91	-21.96	-34.95	peak
5	10.7299	53.98	-60.83	-6.85	29.54	-58.35	-21.96	-36.39	peak
6	25.4847	52.72	-60.40	-7.68	29.54	-59.18	-21.96	-37.22	peak

9. AC POWER LINE CONDUCTED EMISSIONS

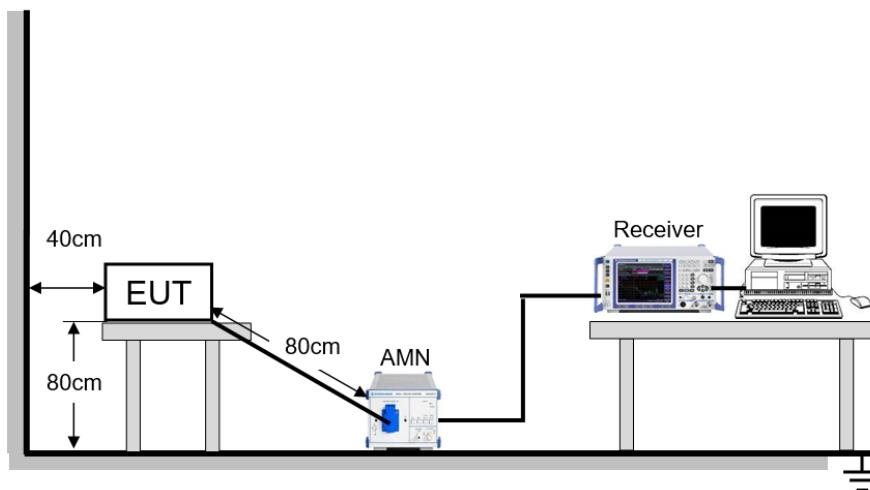
LIMITS

Please refer to CFR 47 FCC §15.207 (a).

FREQUENCY (MHz)	Quasi-peak	Average
0.15 -0.5	66 - 56 *	56 - 46 *
0.50 -5.0	56.00	46.00
5.0 -30.0	60.00	50.00

TEST SETUP AND PROCEDURE

Refer to ANSI C63.10-2013 clause 6.2.



The EUT is put on a table of non-conducting material that is 80 cm high. The vertical conducting wall of shielding is located 40 cm to the rear of the EUT. The power line of the EUT is connected to the AC mains through a Artificial Mains Network (A.M.N.). A EMI Measurement Receiver (R&S Test Receiver ESR3) is used to test the emissions from both sides of AC line. According to the requirements in Section 6.2 of ANSI C63.10-2013. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30 MHz using CISPR Quasi-Peak and average detector mode. The bandwidth of EMI test receiver is set at 9 kHz.

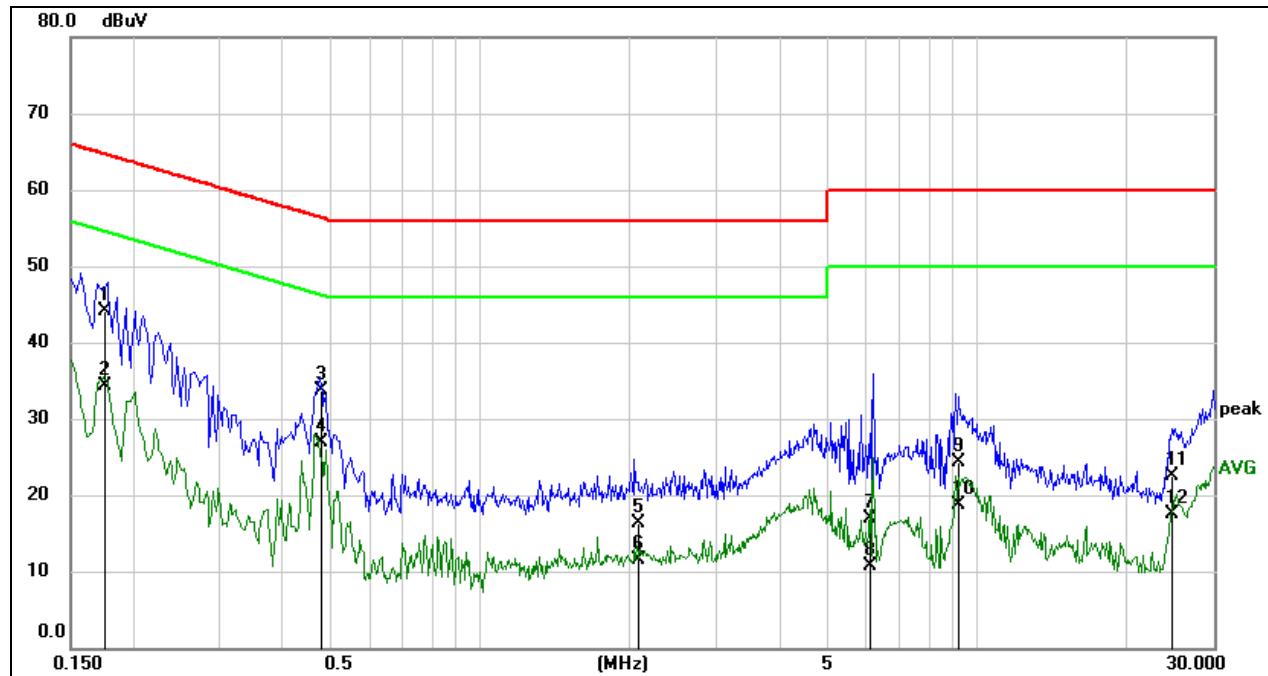
The arrangement of the equipment is installed to meet the standards and operating in a manner, which tends to maximize its emission characteristics in a normal application.

TEST ENVIRONMENT

Temperature	21.7 °C	Relative Humidity	53.8 %
Atmosphere Pressure	101 kPa	Test Voltage	AC 120 V/60 Hz

RESULTS

Test Mode:	GFSK Condition 3	Frequency(MHz):	915.87
Line:	Line		



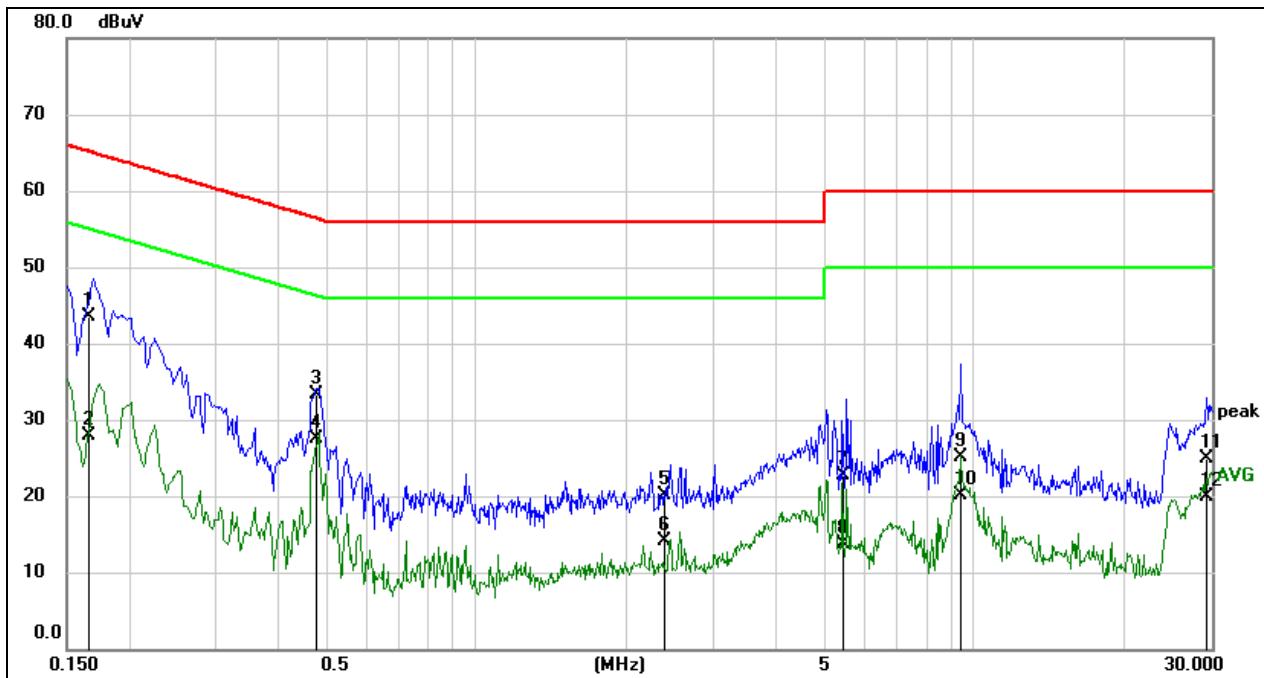
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.1757	33.84	10.29	44.13	64.69	-20.56	QP
2	0.1757	23.99	10.29	34.28	54.69	-20.41	AVG
3	0.4802	23.56	10.24	33.80	56.34	-22.54	QP
4	0.4802	16.75	10.24	26.99	46.34	-19.35	AVG
5	2.1040	6.37	9.96	16.33	56.00	-39.67	QP
6	2.1040	1.45	9.96	11.41	46.00	-34.59	AVG
7	6.1242	6.58	10.30	16.88	60.00	-43.12	QP
8	6.1242	0.42	10.30	10.72	50.00	-39.28	AVG
9	9.1648	14.07	10.33	24.40	60.00	-35.60	QP
10	9.1648	8.42	10.33	18.75	50.00	-31.25	AVG
11	24.8675	11.68	10.85	22.53	60.00	-37.47	QP
12	24.8675	6.69	10.85	17.54	50.00	-32.46	AVG

Note:

1. Result = Reading + Correct Factor.
2. If QP Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Test setup: RBW: 200 Hz (9 kHz ~ 150 kHz), 9 kHz (150 kHz ~ 30 MHz).
4. Step size: 80 Hz (0.009 MHz ~ 0.15 MHz), 4 kHz (0.15 MHz ~ 30 MHz), Scan time: auto.

Note: All the modes have been tested, only the worst data was recorded in the report.

Test Mode:	GFSK Condition 3	Frequency(MHz):	915.87
Line:	Neutral		



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.1658	33.31	10.21	43.52	65.17	-21.65	QP
2	0.1658	17.73	10.21	27.94	55.17	-27.23	AVG
3	0.4775	23.29	10.05	33.34	56.38	-23.04	QP
4	0.4775	17.42	10.05	27.47	46.38	-18.91	AVG
5	2.3844	10.04	10.10	20.14	56.00	-35.86	QP
6	2.3844	4.04	10.10	14.14	46.00	-31.86	AVG
7	5.4742	12.23	10.38	22.61	60.00	-37.39	QP
8	5.4742	3.36	10.38	13.74	50.00	-36.26	AVG
9	9.3827	14.58	10.43	25.01	60.00	-34.99	QP
10	9.3827	9.74	10.43	20.17	50.00	-29.83	AVG
11	29.3104	13.75	11.13	24.88	60.00	-35.12	QP
12	29.3104	8.84	11.13	19.97	50.00	-30.03	AVG

Note:

1. Result = Reading + Correct Factor.
2. If QP Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Test setup: RBW: 200 Hz (9 kHz ~ 150 kHz), 9 kHz (150 kHz ~ 30 MHz).
4. Step size: 80 Hz (0.009 MHz ~ 0.15 MHz), 4 kHz (0.15 MHz ~ 30 MHz), Scan time: auto.

Note: All the modes have been tested, only the worst data was recorded in the report.

10. ANTENNA REQUIREMENTS

APPLICABLE REQUIREMENTS

Please refer to FCC §15.203

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 shall be considered sufficient to comply with the provisions of this section. 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.

Please refer to FCC §15.247(b)(4)

The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

RESULTS

Complies

TEST DATA

11. GFSK.50 kbps Condition 1

11.1. Appendix A1: DUTY CYCLE

11.1.1. Test Result

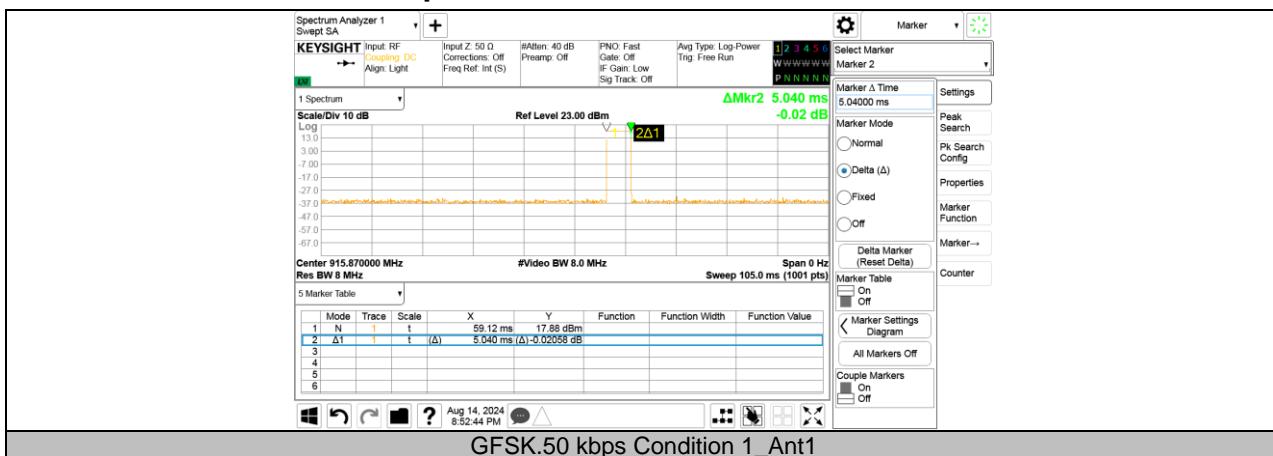
Test Mode	On Time (msec)	Period (msec)	Duty Cycle x (Linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)
GFSK.50 kbps Condition 1	5.04	100	0.0504	5.04	-25.95

Note:

Duty Cycle Correction Factor=20log (x).

Where: x is Duty Cycle (Linear)

11.1.2. Test Graphs

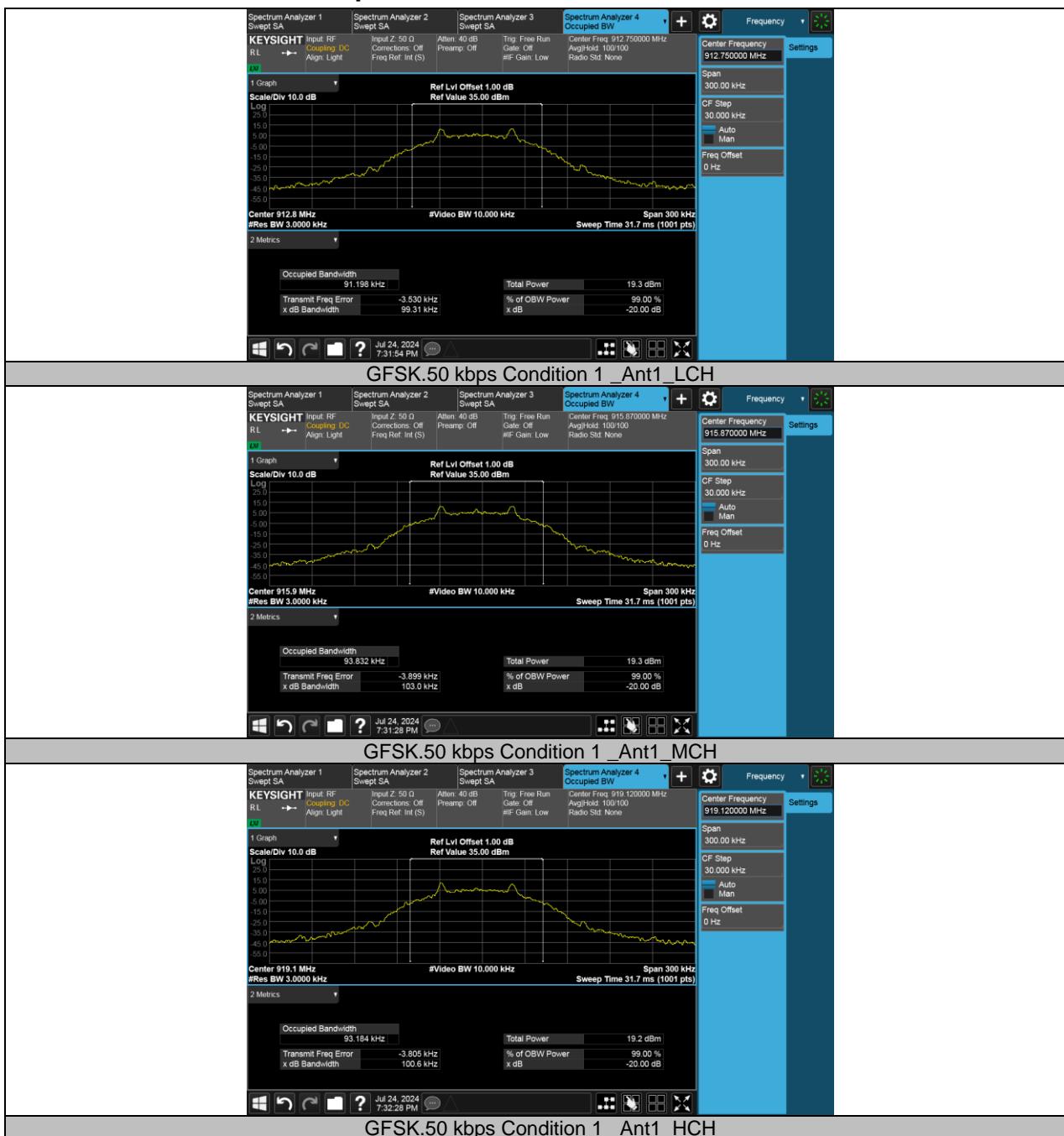


11.2. Appendix B1: 20DB BANDWIDTH & OCCUPIED CHANNEL BANDWIDTH

11.2.1. Test Result

Test Mode	Antenna	Channel	20db EBW[MHz]	OCB [MHz]	Verdict
GFSK.50 kbps Condition 1	Ant1	LCH	0.09931	0.093198	PASS
		MCH	0.10300	0.093832	PASS
		HCH	0.10060	0.093184	PASS

11.2.2. Test Graphs



11.3. Appendix C1: CONDUCTED OUTPUT POWER

11.3.1. Test Result

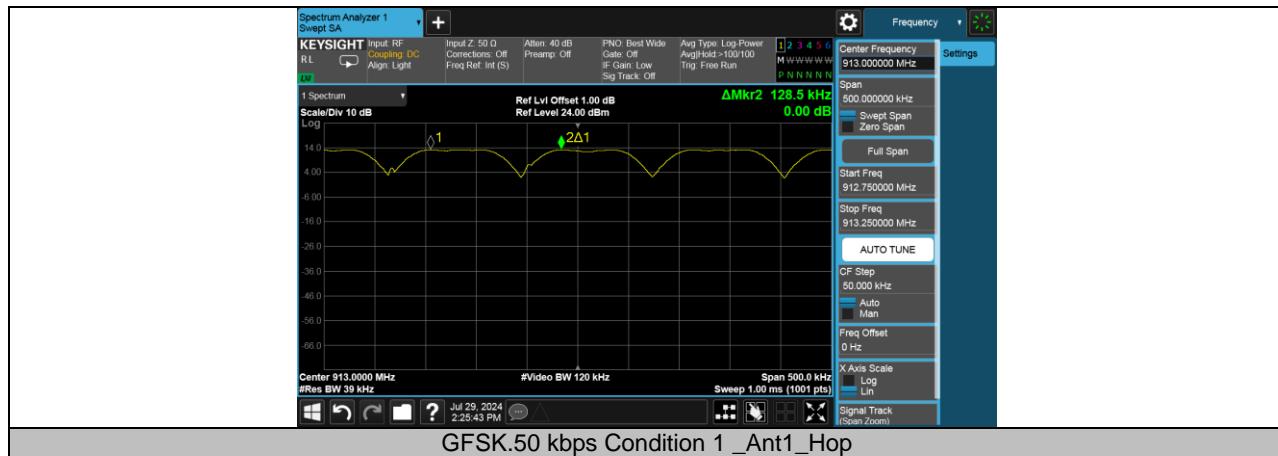
Test Mode	Antenna	Channel	PEAK Result[dBm]	Limit[dBm]	Verdict
GFSK.50 kbps Condition 1	Ant1	LCH	13.21	≤30	PASS
		MCH	13.18	≤30	PASS
		HCH	13.17	≤30	PASS

11.4. Appendix D1: CARRIER FREQUENCY SEPARATION

11.4.1. Test Result

Test Mode	Antenna	Channel	Result [MHz]	Limit[MHz]	Verdict
GFSK.50 kbps Condition 1	Ant1	Hop	0.1285	≥0.1060	PASS

11.4.2. Test Graphs

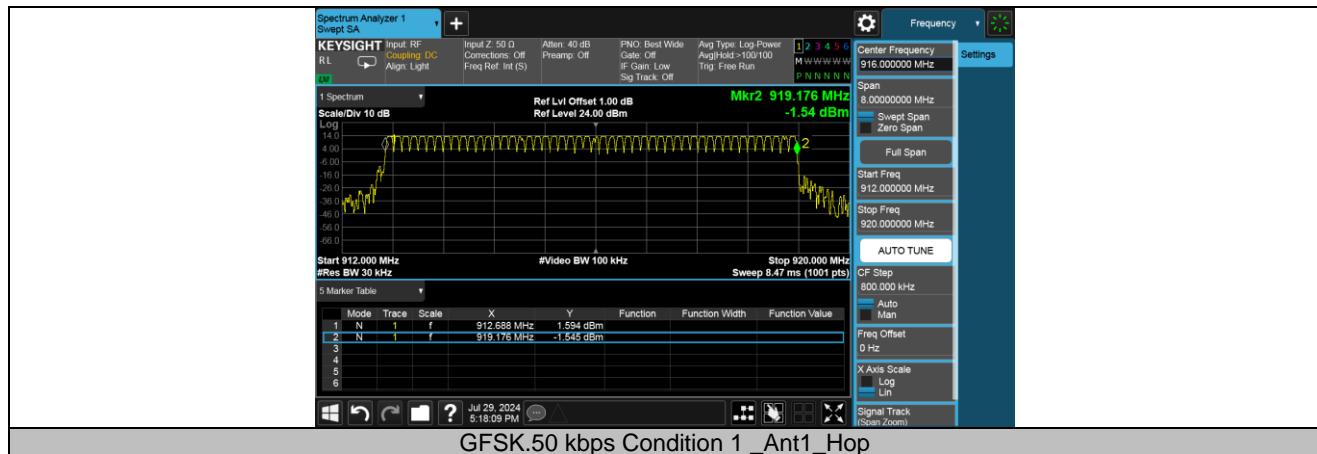


11.5. Appendix E1: NUMBER OF HOPPING FREQUENCIES

11.5.1. Test Result

Test Mode	Antenna	Channel	Result[Num]	Limit[Num]	Verdict
GFSK.50 kbps Condition 1	Ant1	Hop	50	≥50	PASS

11.5.2. Test Graphs



11.6. Appendix F1: TIME OF OCCUPANCY (DWELL TIME)

11.6.1. Test Result

Test Mode	Antenna	Channel	Time of single slot 1 [ms]	The number of hop channel appear	Burst Width 1 [ms/hop/ch]
GFSK.50 kbps Condition 1	Ant1	Hop	5.56	28	155.68

Test Mode	Antenna	Channel	Dwell Time [ms]	Limit [ms]	Results
GFSK.50 kbps Condition 1	Ant1	Hop	155.68	400	PASS

Note:

GFSK.50 kbps Condition 1: The dwell time = Time of single slot * The number of hop channel appear within 20s
 BurstWidth =Time of single slot*number of single slot

11.6.2. Test Graphs



11.7. Appendix G1: CONDUCTED BAND EDGE AND SPURIOUS EMISSION

11.7.1. Test Result

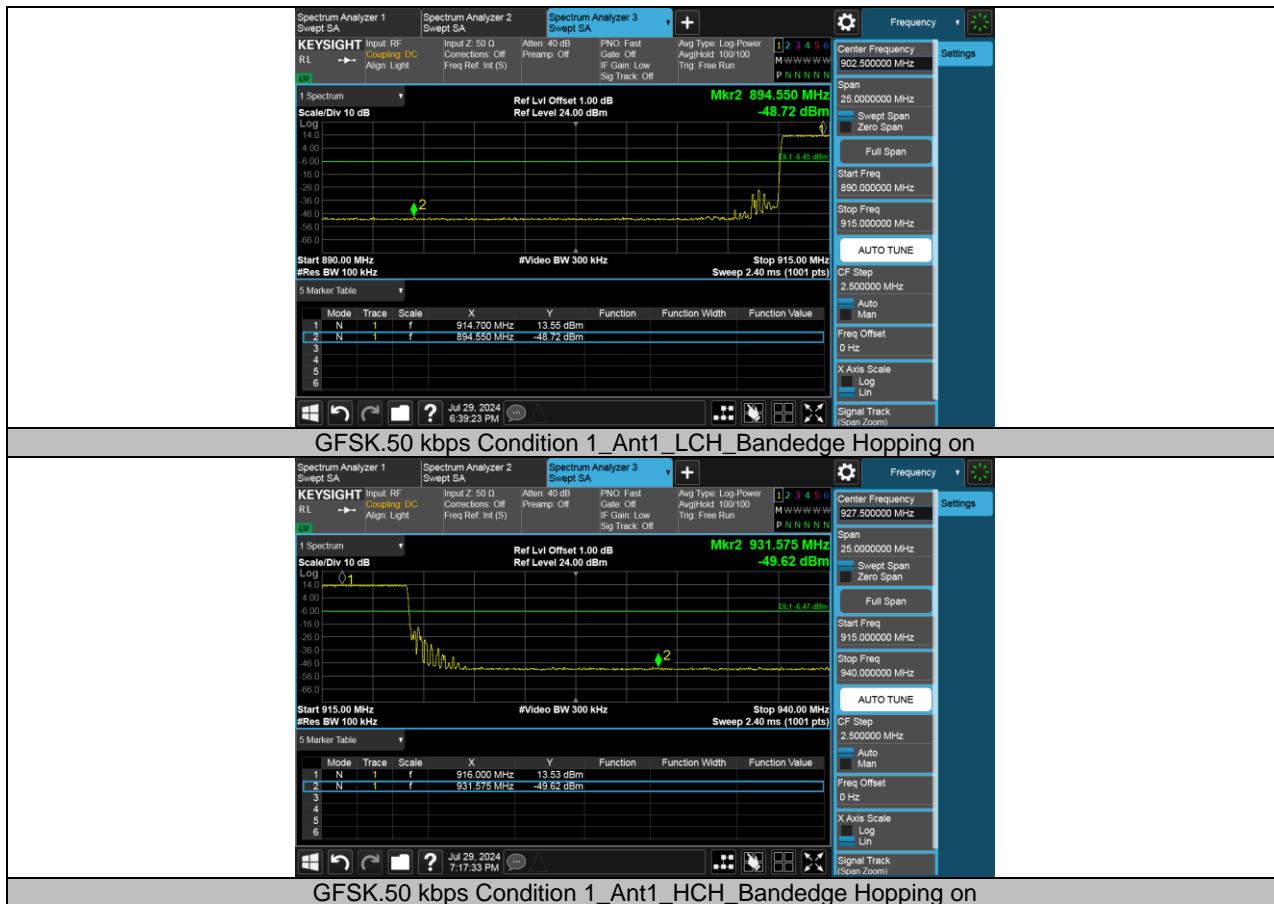
Test Mode	Antenna	ChName	Result [dBm]	Verdict
GFSK.50 kbps Condition 1	Ant1	LCH	See the below graphs	PASS
		MCH		PASS
		HCH		PASS
		Hop_LCH		PASS
		Hop_HCH		PASS

11.7.2. Test Graphs









12. GFSK.50 kbps Condition 2

12.1. Appendix A2: DUTY CYCLE

12.1.1. Test Result

Test Mode	On Time (msec)	Period (msec)	Duty Cycle x (Linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)
GFSK.50 kbps Condition 2	5.04	100	0.0504	5.04	-25.95

Note:

Duty Cycle Correction Factor=20log (x).

Where: x is Duty Cycle (Linear)

12.1.2. Test Graphs

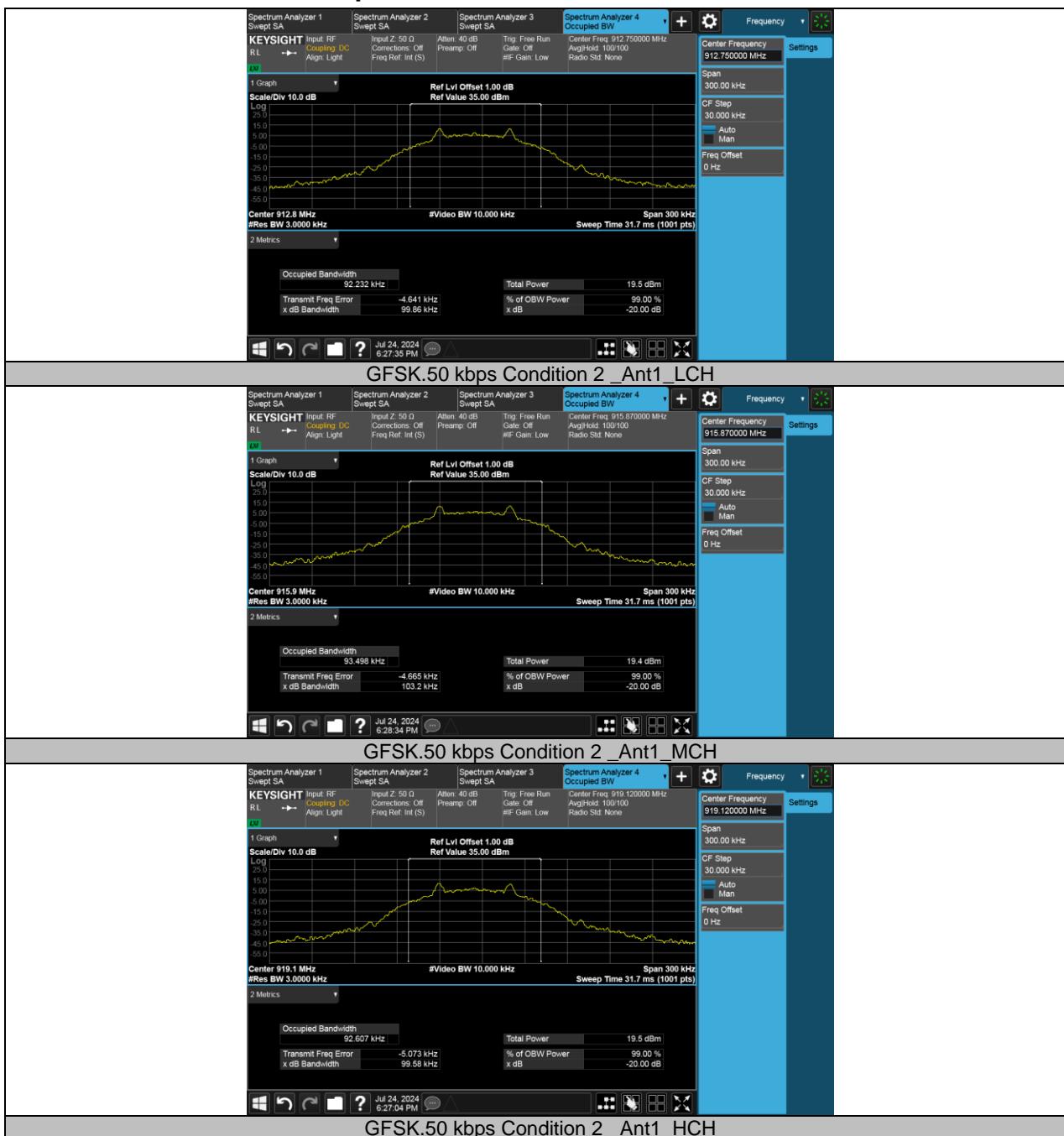


12.2. Appendix B2: 20DB BANDWIDTH & OCCUPIED CHANNEL BANDWIDTH

12.2.1. Test Result

Test Mode	Antenna	Channel	20db EBW[MHz]	OCB [MHz]	Verdict
GFSK.50 kbps Condition 2	Ant1	LCH	0.09986	0.092232	PASS
		MCH	0.10320	0.093498	PASS
		HCH	0.09958	0.092607	PASS

12.2.2. Test Graphs



12.3. Appendix C2: CONDUCTED OUTPUT POWER

12.3.1. Test Result

Test Mode	Antenna	Channel	PEAK Result[dBm]	Limit[dBm]	Verdict
GFSK.50 kbps Condition 2	Ant1	LCH	13.37	≤30	PASS
		MCH	13.34	≤30	PASS
		HCH	13.33	≤30	PASS

12.4. Appendix D2: CARRIER FREQUENCY SEPARATION

12.4.1. Test Result

Test Mode	Antenna	Channel	Result [MHz]	Limit[MHz]	Verdict
GFSK.50 kbps Condition 2	Ant1	Hop	0.1285	≥0.10320	PASS

12.4.2. Test Graphs

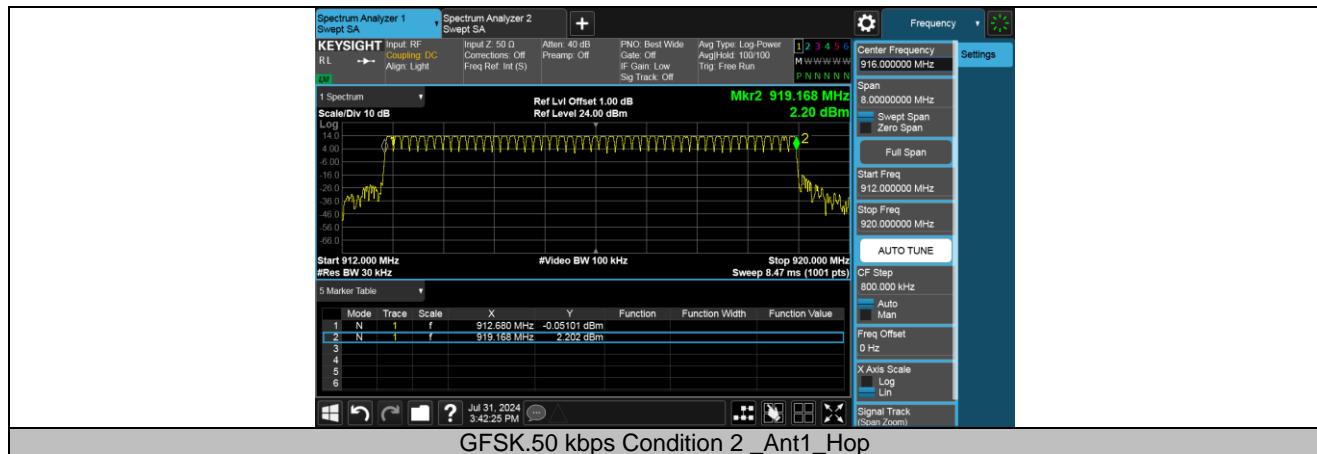


12.5. Appendix E2: NUMBER OF HOPPING FREQUENCIES

12.5.1. Test Result

Test Mode	Antenna	Channel	Result[Num]	Limit[Num]	Verdict
GFSK.50 kbps Condition 2	Ant1	Hop	50	≥50	PASS

12.5.2. Test Graphs



12.6. Appendix F2: TIME OF OCCUPANCY (DWELL TIME)

12.6.1. Test Result

Test Mode	Antenna	Channel	Time of single slot 1 [ms]	The number of hop channel appear	Burst Width 1 [ms/hop/ch]
GFSK.50 kbps Condition 2	Ant1	Hop	5.56	28	155.68

Test Mode	Antenna	Channel	Dwell Time [ms]	Limit [ms]	Results
GFSK.50 kbps Condition 2	Ant1	Hop	155.68	400	PASS

Note:

GFSK.50 kbps Condition 2: The dwell time = Time of single slot * The number of hop channel appear within 20s
 BurstWidth =Time of single slot*number of single slot

12.6.2. Test Graphs



12.7. Appendix G2: CONDUCTED BAND EDGE AND SPURIOUS EMISSION

12.7.1. Test Result

Test Mode	Antenna	ChName	Result [dBm]	Verdict
GFSK.50 kbps Condition 2	Ant1	LCH	See the below graphs	PASS
		MCH		PASS
		HCH		PASS
		Hop_LCH		PASS
		Hop_HCH		PASS

12.7.2. Test Graphs





