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

CERTIFICATION TEST REPORT

For

Milo

MODEL NUMBER: M01

FCC ID: 2A6M9-MV01

IC: 28476-MV01

REPORT NUMBER: 4790849656-3

ISSUE DATE: January 12, 2024

Prepared for

Loose Cannon Systems, Inc.
PO Box 1447, Ross, CA. 94957 USA

Prepared by

UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch

Building 10, Innovation Technology Park, No. 1, Li Bin Road, Song Shan Lake Hi-Tech Development Zone Dongguan, 523808, People's Republic of China

Tel: +86 769 22038881
Fax: +86 769 33244054
Website: www.ul.com

Revision History

Rev.	Issue Date	Revisions	Revised By
V0	1/12/2024	Initial Issue	

Note: This report is based on 4790371944-10 which is issued by UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch on July 18, 2022. The EUT had already applied for the FCC ID & IC ID, the customer added the new Bit Rates and updated the channel list. The RF technical construction including circuit diagram, PCB Layout, components, component layout and performance does not change. All the Bit Rates 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 <Accuracy Method> decision rule is applied.

TABLE OF CONTENTS

1. ATTESTATION OF TEST RESULTS

Applicant Information

Company Name: Loose Cannon Systems, Inc.
Address: PO Box 1447, Ross, CA. 94957 USA

Manufacturer Information

Company Name: Loose Cannon Systems, Inc.
Address: PO Box 1447, Ross, CA. 94957 USA

EUT Information

EUT Name: Milo
Model: M01
Brand: milo
Sample Received Date: May 6, 2023
Sample Status: Normal
Sample ID: 6728894
Date of Tested: May 6, 2023~ January 12, 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

Prepared By:

Fanny Huang

Engineer Project Associate

Checked By:

Denny Huang

Senior Project Engineer

Approved By:

Stephen Guo

Operations Manager

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	**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. **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 **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. **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. 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

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 to 26 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	Milo
Model	M01
Power Supply	DC 5 V

Note: The product has 3 power supply modes: battery(DC 3.7 V), USB(DC 5 V), AC adapter, we had pre-scan for all the 3 modes, and only the worst data for DC 5 V supply are recorded in the report.

Test Mode	Modulation	Bit Rate	Operation Frequency	Number of Channels
FCC.SubG.2GFSK.10kbps	2GFSK	10 kbps	902.2565 MHz-927.7365 MHz	51
FCC.SubG.2GFSK.25kbps		25 kbps	902.2565 MHz-927.7365 MHz	51
FCC.SubG.2GFSK.60kbps		60 kbps	902.2565 MHz-927.7365 MHz	51
FCC.SubG.2GFSK.96kbps		96 kbps	902.2565 MHz-927.7365 MHz	51
FCC.SubG.2GFSK.150kbps		150 kbps	902.2565 MHz-927.7365 MHz	51
FCC.SubG.2GFSK.250kbps		250 kbps	902.354 MHz-927.582 MHz	51
FCC.SubG.4GFSK.200kbps	4GFSK	200 kbps	902.354 MHz-927.582 MHz	51
FCC.SubG.4GFSK.250kbps		250 kbps	902.2565 MHz-927.7365 MHz	51
FCC.SubG.4GFSK.350kbps		350 kbps	902.3245 MHz-927.4345 MHz	51

5.2. MAXIMUM PEAK OUTPUT POWER

Test Mode	Modulation	Bit Rate	Operation Frequency	Maximum Conducted PEAK Output Power (dBm)
FCC.SubG.2GFSK.10kbps	2GFSK	10 kbps	902.2565 MHz-927.7365 MHz	25.89
FCC.SubG.2GFSK.25kbps		25 kbps	902.2565 MHz-927.7365 MHz	26.11
FCC.SubG.2GFSK.60kbps		60 kbps	902.2565 MHz-927.7365 MHz	26.13
FCC.SubG.2GFSK.96kbps		96 kbps	902.2565 MHz-927.7365 MHz	26.37
FCC.SubG.2GFSK.150kbps		150 kbps	902.2565 MHz-927.7365 MHz	25.54
FCC.SubG.2GFSK.250kbps		250 kbps	902.354 MHz-927.582 MHz	25.63
FCC.SubG.4GFSK.200kbps	4GFSK	200 kbps	902.354 MHz-927.582 MHz	26.23
FCC.SubG.4GFSK.250kbps		250 kbps	902.2565 MHz-927.7365 MHz	26.14
FCC.SubG.4GFSK.350kbps		350 kbps	902.3245 MHz-927.4345 MHz	26.13

5.3. CHANNEL LIST

Channel List for FCC.SubG.2GFSK.10kbps									
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
11	902.2565	103	908.6965	162	912.8265	239	918.2165	331	924.6565
21	902.9565	109	909.1165	169	913.3165	254	919.2665	336	925.0065
23	903.0965	113	909.3965	182	914.2265	274	920.6665	353	926.1965
39	904.2165	114	909.4665	193	914.9965	277	920.8765	356	926.4065
42	904.4265	128	910.4465	198	915.3465	289	921.7165	367	927.1765
49	904.9165	144	911.5665	207	915.9765	295	922.1365	374	927.6665
63	905.8965	146	911.7065	211	916.2565	296	922.2065	375	927.7365
64	905.9665	147	911.7765	214	916.4665	301	922.5565	/	/
74	906.6665	150	911.9865	229	917.5165	302	922.6265	/	/
81	907.1565	158	912.5465	231	917.6565	311	923.2565	/	/
95	908.1365	160	912.6865	238	918.1465	319	923.8165	/	/

Channel List for FCC.SubG.2GFSK.25kbps									
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
11	902.2565	95	908.1365	165	913.0365	237	918.0765	329	924.5165
18	902.7465	105	908.8365	175	913.7365	239	918.2165	338	925.1465
24	903.1665	117	909.6765	176	913.8065	248	918.8465	340	925.2865
34	903.8665	119	909.8165	193	914.9965	268	920.2465	345	925.6365
44	904.5665	120	909.8865	195	915.1365	274	920.6665	350	925.9865
52	905.1265	134	910.8665	204	915.7665	283	921.2965	372	927.5265
61	905.7565	135	910.9365	220	916.8865	297	922.2765	375	927.7365
70	906.3865	141	911.3565	226	917.3065	301	922.5565	/	/
72	906.5265	145	911.6365	228	917.4465	302	922.6265	/	/
81	907.1565	161	912.7565	232	917.7265	325	924.2365	/	/
91	907.8565	162	912.8265	236	918.0065	327	924.3765	/	/

Channel List for FCC.SubG.2GFSK.60kbps									
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
11	902.2565	50	907.7165	86	912.7565	124	918.0765	168	924.2365
16	902.9565	56	908.5565	88	913.0365	125	918.2165	171	924.6565
22	903.7965	62	909.3965	91	913.4565	129	918.7765	180	925.9165
24	904.0765	63	909.5365	96	914.1565	139	920.1765	182	926.1965
28	904.6365	66	909.9565	102	914.9965	143	920.7365	184	926.4765
31	905.0565	67	910.0965	105	915.4165	144	920.8765	190	927.3165
32	905.1965	72	910.7965	110	916.1165	147	921.2965	193	927.7365
35	905.6165	73	910.9365	114	916.6765	155	922.4165	/	/
40	906.3165	75	911.2165	119	917.3765	161	923.2565	/	/
46	907.1565	80	911.9165	121	917.6565	164	923.6765	/	/
48	907.4365	84	912.4765	122	917.7965	166	923.9565	/	/

Channel List for FCC.SubG.2GFSK.96kbps									
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
11	902.2565	52	907.9965	91	913.4565	130	918.9165	173	924.9365
12	902.3965	53	908.1365	95	914.0165	131	919.0565	174	925.0765
17	903.0965	55	908.4165	99	914.5765	140	920.3165	175	925.2165
18	903.2365	63	909.5365	102	914.9965	145	921.0165	178	925.6365
26	904.3565	65	909.8165	111	916.2565	146	921.1565	183	926.3365
34	905.4765	66	909.9565	114	916.6765	152	921.9965	190	927.3165
38	906.0365	76	911.3565	115	916.8165	155	922.4165	193	927.7365
42	906.5965	79	911.7765	117	917.0965	156	922.5565	/	/
43	906.7365	80	911.9165	120	917.5165	158	922.8365	/	/
46	907.1565	89	913.1765	122	917.7965	163	923.5365	/	/
48	907.4365	90	913.3165	129	918.7765	165	923.8165	/	/

Channel List for FCC.SubG.2GFSK.150kbps									
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
11	902.2565	30	907.5765	48	912.6165	70	918.7765	87	923.5365
13	902.8165	34	908.6965	50	913.1765	73	919.6165	89	924.0965
14	903.0965	36	909.2565	51	913.4565	74	919.8965	93	925.2165
15	903.3765	37	909.5365	55	914.5765	77	920.7365	94	925.4965
17	903.9365	38	909.8165	56	914.8565	78	921.0165	98	926.6165
20	904.7765	39	910.0965	57	915.1365	79	921.2965	99	926.8965
22	905.3365	42	910.9365	59	915.6965	81	921.8565	102	927.7365
26	906.4565	44	911.4965	63	916.8165	82	922.1365	/	/
27	906.7365	45	911.7765	65	917.3765	84	922.6965	/	/
28	907.0165	46	912.0565	66	917.6565	85	922.9765	/	/
29	907.2965	47	912.3365	67	917.9365	86	923.2565	/	/

Channel List for FCC.SubG.2GFSK.250kbps									
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
11	902.354	22	907.59	34	913.302	46	919.014	57	924.25
12	902.83	23	908.066	35	913.778	47	919.49	58	924.726
13	903.306	25	909.018	36	914.254	48	919.966	59	925.202
14	903.782	26	909.494	37	914.73	49	920.442	61	926.154
15	904.258	27	909.97	38	915.206	50	920.918	62	926.63
16	904.734	28	910.446	39	915.682	51	921.394	63	927.106
17	905.21	29	910.922	40	916.158	52	921.87	64	927.582
18	905.686	30	911.398	41	916.634	53	922.346	/	/
19	906.162	31	911.874	43	917.586	54	922.822	/	/
20	906.638	32	912.35	44	918.062	55	923.298	/	/
21	907.114	33	912.826	45	918.538	56	923.774	/	/

Channel List for FCC.SubG.4GFSK.200kbps									
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
11	902.354	34	907.828	57	913.302	83	919.49	100	923.536
12	902.592	35	908.066	61	914.254	84	919.728	101	923.774
15	903.306	36	908.304	62	914.492	85	919.966	109	925.678
17	903.782	40	909.256	64	914.968	86	920.204	112	926.392
18	904.02	46	910.684	65	915.206	89	920.918	113	926.63
21	904.734	49	911.398	67	915.682	92	921.632	116	927.344
22	904.972	50	911.636	68	915.92	95	922.346	117	927.582
25	905.686	51	911.874	71	916.634	96	922.584	/	/
29	906.638	52	912.112	78	918.3	97	922.822	/	/
31	907.114	55	912.826	79	918.538	98	923.06	/	/
32	907.352	56	913.064	80	918.776	99	923.298	/	/

Channel List for FCC.SubG.4GFSK.250kbps									
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
11	902.2565	30	907.5765	49	912.8965	70	918.7765	89	924.0965
16	903.6565	31	907.8565	51	913.4565	71	919.0565	90	924.3765
17	903.9365	32	908.1365	52	913.7365	73	919.6165	93	925.2165
18	904.2165	33	908.4165	53	914.0165	76	920.4565	94	925.4965
19	904.4965	34	908.6965	56	914.8565	77	920.7365	95	925.7765
20	904.7765	38	909.8165	58	915.4165	79	921.2965	96	926.0565
21	905.0565	42	910.9365	59	915.6965	80	921.5765	102	927.7365
22	905.3365	44	911.4965	62	916.5365	81	921.8565	/	/
23	905.6165	45	911.7765	63	916.8165	84	922.6965	/	/
27	906.7365	46	912.0565	67	917.9365	86	923.2565	/	/
28	907.0165	48	912.6165	68	918.2165	87	923.5365	/	/

Channel List for FCC.SubG.4GFSK.350kbps									
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
11	902.3245	24	907.5895	37	912.8545	52	918.9295	64	923.7895
12	902.7295	25	907.9945	39	913.6645	53	919.3345	65	924.1945
13	903.1345	26	908.3995	40	914.0695	54	919.7395	67	925.0045
14	903.5395	27	908.8045	41	914.4745	56	920.5495	69	925.8145
16	904.3495	29	909.6145	42	914.8795	57	920.9545	71	926.6245
17	904.7545	30	910.0195	43	915.2845	58	921.3595	72	927.0295
18	905.1595	31	910.4245	44	915.6895	59	921.7645	73	927.4345
20	905.9695	32	910.8295	46	916.4995	60	922.1695	/	/
21	906.3745	33	911.2345	47	916.9045	61	922.5745	/	/
22	906.7795	35	912.0445	50	918.1195	62	922.9795	/	/
23	907.1845	36	912.4495	51	918.5245	63	923.3845	/	/

5.4. TEST CHANNEL CONFIGURATION

Test Mode	Test Channel	Frequency
FCC.SubG.2GFSK.10kbps	CH 11(Low Channel), CH 193(MID Channel), CH375(High Channel)	902.2565 MHz, 914.9965 MHz, 927.7365 MHz
FCC.SubG.2GFSK.25kbps	CH 11(Low Channel), CH 193(MID Channel), CH375(High Channel)	902.2565 MHz, 914.9965 MHz, 927.7365 MHz
FCC.SubG.2GFSK.60kbps	CH 11(Low Channel), CH 102(MID Channel), CH 193(High Channel)	902.2565 MHz, 914.9965 MHz, 927.7365 MHz
FCC.SubG.2GFSK.96kbps	CH 11(Low Channel), CH 102(MID Channel), CH 193(High Channel)	902.2565 MHz, 914.9965 MHz, 927.7365 MHz
FCC.SubG.2GFSK.150kbps	CH 11(Low Channel), CH 56(MID Channel), CH 102(High Channel)	902.2565 MHz, 914.9965 MHz, 927.7365 MHz
FCC.SubG.2GFSK.250kbps	CH 11(Low Channel), CH 37(MID Channel), CH 64(High Channel)	902.354 MHz, 914.73 MHz, 927.582 MHz
FCC.SubG.4GFSK.200kbps	CH 11(Low Channel), CH 64(MID Channel), CH 117(High Channel)	902.354 MHz, 914.968 MHz, 927.582 MHz
FCC.SubG.4GFSK.250kbps	CH 11(Low Channel), CH 56(MID Channel), CH 102(High Channel)	902.2565 MHz, 914.8565 MHz, 927.7365 MHz
FCC.SubG.4GFSK.350kbps	CH 11(Low Channel), CH 42(MID Channel), CH 37(High Channel)	902.3245 MHz, 914.8795 MHz, 927.4345 MHz

5.5. THE WORSE CASE POWER SETTING PARAMETER

The Worse Case Power Setting Parameter under 902 ~ 928MHz Band				
Test Software		Yukon		
Modulation Mode	Transmit Antenna Number	Test Channel		
		LCH	MCH	HCH
FCC.SubG.2GFSK.10kbps	1	Default	Default	Default
FCC.SubG.2GFSK.25kbps	1	Default	Default	Default
FCC.SubG.2GFSK.60kbps	1	Default	Default	Default
FCC.SubG.2GFSK.96kbps	1	Default	Default	Default
FCC.SubG.2GFSK.150kbps	1	Default	Default	Default
FCC.SubG.2GFSK.250kbps	1	Default	Default	Default
FCC.SubG.4GFSK.200kbps	1	Default	Default	Default
FCC.SubG.4GFSK.250kbps	1	Default	Default	Default
FCC.SubG.4GFSK.350kbps	1	Default	Default	Default

5.6. DESCRIPTION OF AVAILABLE ANTENNAS

Antenna	Frequency Band (MHz)	Antenna Type	MAX Antenna Gain (dBi)
1	902-928	Inverted F	-1.15

Modulation	Transmit and Receive Mode	Description
FCC.SubG.2GFSK.10kbps	☒1TX, 1RX	Antenna 1 can be used as transmitting/receiving antenna.
FCC.SubG.2GFSK.25kbps	☒1TX, 1RX	Antenna 1 can be used as transmitting/receiving antenna.
FCC.SubG.2GFSK.60kbps	☒1TX, 1RX	Antenna 1 can be used as transmitting/receiving antenna.
FCC.SubG.2GFSK.96kbps	☒1TX, 1RX	Antenna 1 can be used as transmitting/receiving antenna.
FCC.SubG.2GFSK.150kbps	☒1TX, 1RX	Antenna 1 can be used as transmitting/receiving antenna.
FCC.SubG.2GFSK.250kbps	☒1TX, 1RX	Antenna 1 can be used as transmitting/receiving antenna.
FCC.SubG.4GFSK.200kbps	☒1TX, 1RX	Antenna 1 can be used as transmitting/receiving antenna.
FCC.SubG.4GFSK.250kbps	☒1TX, 1RX	Antenna 1 can be used as transmitting/receiving antenna.
FCC.SubG.4GFSK.350kbps	☒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	P/N	Remarks
1	PC	Dell	Vostro 3902	8KNDDB2	/
2	USB TO UART	/	/	/	/
3	AC Adapter	/	HW-100225C00	/	Input: AC 100-240V, 50/60Hz,0.75A Output: DC 5 V,2A

I/O PORT

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

ACCESSORY

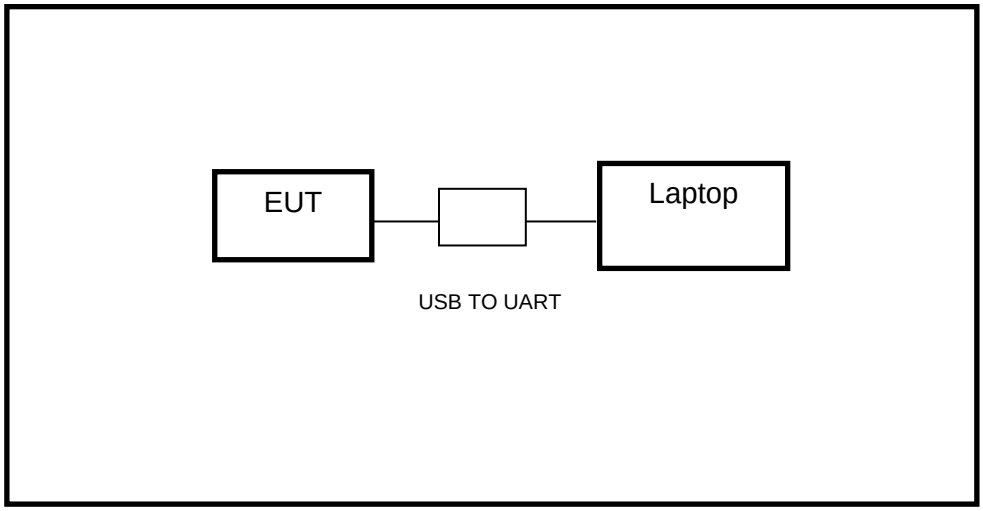
Item	Accessory	Brand Name	Model Name	Description
/	/	/	/	/

TEST SETUP

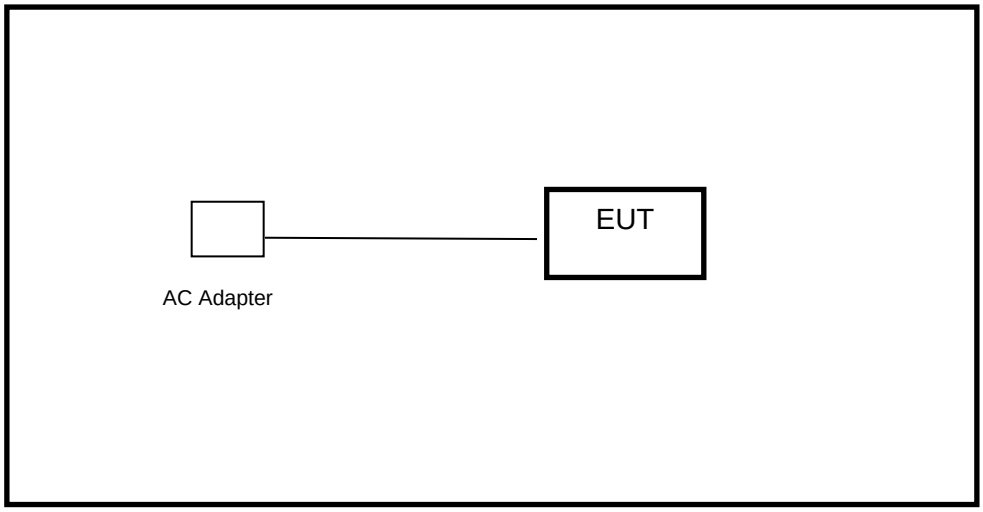
The EUT can work in engineering mode with a software through a Laptop.

SETUP DIAGRAM FOR TESTS

For others:



For AC POWER LINE CONDUCTED EMISSIONS only:



6. MEASURING INSTRUMENT AND SOFTWARE USED

R&S TS 8997 Test System						
Equipment	Manufacturer	Model No.	Serial No.	Upper Last Cal.	Last Cal.	Due. Date
Power sensor, Power Meter	R&S	OSP120	100921	/	Mar.31, 2023	Mar.30, 2024
Vector Signal Generator	R&S	SMBV100A	261637	Oct.17, 2022	Oct.12, 2023	Oct.11, 2024
Signal Generator	R&S	SMB100A	178553	Oct.17, 2022	Oct.12, 2023	Oct.11, 2024
Signal Analyzer	R&S	FSV40	101118	Oct.17, 2022	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.	Upper Last Cal.	Last Cal.	Due. Date
Wideband Radio Communication Tester	R&S	CMW500	155523	Oct.17, 2022	Oct.12, 2023	Oct.11, 2024
Wireless Connectivity Tester	R&S	CMW270	1201.0002N75-102	Sep.28, 2022	Sep.27, 2023	Sep.26, 2024
PXA Signal Analyzer	Keysight	N9030A	MY55410512	Oct.17, 2022	Oct.12, 2023	Oct.11, 2024
MXG Vector Signal Generator	Keysight	N5182B	MY56200284	Oct.17, 2022	Oct.12, 2023	Oct.11, 2024
MXG Vector Signal Generator	Keysight	N5172B	MY56200301	Oct.17, 2022	Oct.12, 2023	Oct.11, 2024
DC power supply	Keysight	E3642A	MY55159130	Oct.17, 2022	Oct.12, 2023	Oct.11, 2024
Temperature & Humidity Chamber	SANMOOD	SG-80-CC-2	2088	Oct.17, 2022	Oct.12, 2023	Oct.11, 2024
Attenuator	Aglient	8495B	2814a12853	Oct.18, 2022	Oct.12, 2023	Oct.11, 2024
RF Control Unit	Tonscend	JS0806-2	23B80620666	/	April 18,2023	April 17,2024
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.	Upper Last Cal.	Last Cal.	Due. Date
EMI Test Receiver	R&S	ESR3	101961	Oct.17, 2022	Oct.13, 2023	Oct.12, 2024
Two-Line V-Network	R&S	ENV216	101983	Oct.17, 2022	Oct.13, 2023	Oct.12, 2024
Artificial Mains Networks	Schwarzbeck	NSLK 8126	8126465	Oct.17, 2022	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.17, 2022	Oct.12, 2023	Oct.11, 2024
Hybrid Log Periodic Antenna	TDK	HLP-3003C	130959	/	Aug.02, 2021	Aug.01, 2024
Preamplifier	HP	8447D	2944A09099	Oct.17, 2022	Oct.12, 2023	Oct.11, 2024
EMI Measurement Receiver	R&S	ESR26	101377	Oct.17, 2022	Oct.12, 2023	Oct.11, 2024
Horn Antenna	TDK	HRN-0118	130940	/	July 20, 2021	July 19, 2024
Preamplifier	TDK	PA-02-0118	TRS-305-00067	Oct.17, 2022	Oct.12, 2023	Oct.11, 2024
Horn Antenna	Schwarzbeck	BBHA9170	697	/	July 20, 2021	July 19, 2024
Preamplifier	TDK	PA-02-2	TRS-307-00003	Oct.17, 2022	Oct.12, 2023	Oct.11, 2024
Preamplifier	TDK	PA-02-3	TRS-308-00002	Oct.17, 2022	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.17, 2022	Oct.12, 2023	Oct.11, 2024
Preamplifier	Mini-Circuits	ZX60-83LN-S+	SUP01202035	Oct.17, 2022	Oct.12, 2023	Oct.11, 2024
High Pass Filter	Wi	WHKX10-2700-3000-18000-40SS	23	Dec.01,2022	Oct.12, 2023	Oct.11, 2024
Highpass Filter	Wainwright	WHKX10-5850-6500-	4	Dec.01,2022	Oct.12, 2023	Oct.11, 2024

		1800-40SS				
Band Reject Filter	Wainwright	WRCJV12-5695-5725-5850-5880-40SS	4	Dec.01,2022	Oct.12, 2023	Oct.11, 2024
Band Reject Filter	Wainwright	WRCJV20-5120-5150-5350-5380-60SS	2	Dec.01,2022	Oct.12, 2023	Oct.11, 2024
Band Reject Filter	Wainwright	WRCJV20-5440-5470-5725-5755-60SS	1	Dec.01,2022	Oct.12, 2023	Oct.11, 2024
Band Reject Filter	Wainwright	WRCJV8-2350-2400-2483.5-2533.5-40SS	4	Dec.01,2022	Oct.12, 2023	Oct.11, 2024
Band Reject Filter	Wainwright	WRCD5-1879-1879.85-1880.15-1881-40SS	1	Dec.01,2022	Oct.12, 2023	Oct.11, 2024
Notch Filter	Wainwright	WHJ10-882-980-7000-40SS	1	Dec.01,2022	Oct.12, 2023	Oct.11, 2024
Software						
Description		Manufacturer	Name	Version		
Test Software for Radiated Emissions		Farad	EZ-EMC	Ver. UL-3A1		

Other Instrument						
Equipment	Manufacturer	Model No.	Serial No.	Upper Last Cal.	Last Cal.	Due. Date
Temperature humidity probe	OMEGA	ITHX-SD-5	18470007	Oct.22, 2022	Oct.19, 2023	Oct.18, 2024
Barometer	Yiyi	Baro	N/A	Oct.24, 2022	Oct.19, 2023	Oct.18, 2024
Attenuator	Agilent	8495B	2814a12853	Oct.18, 2022	Oct.12, 2023	Oct.11, 2024
Power Sensor	Keysight	USB Wideband Power Sensor	MY5100022	Oct.17, 2022	Oct.12, 2023	Oct.11, 2024

Other Instruments					
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
Dual Channel Power Meter	Keysight	N1912A	MY55416024	Oct.30, 2021	Oct.29, 2022
Power Sensor	Keysight	USB Wideband Power Sensor	MY5100022	Oct.30, 2021	Oct.29, 2022
Signal Analyzer	R&S	FSV40	101118	Oct.30, 2021	Oct.29, 2022

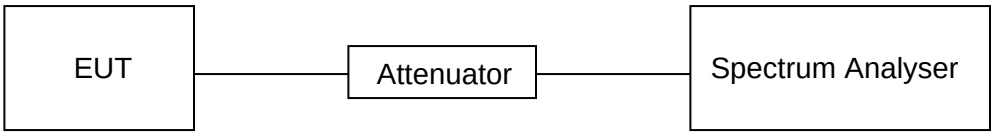
7. ANTENNA PORT TEST RESULTS

7.1. ON TIME AND DUTY CYCLE

LIMITS

None; for reporting purposes only.

TEST SETUP



TEST ENVIRONMENT

Temperature	23.8 °C	Relative Humidity	52 %
Atmosphere Pressure	101 kPa	Test Voltage	DC 5 V

PROCEDURE

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

RESULTS

Please refer to appendix A1-A9.

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

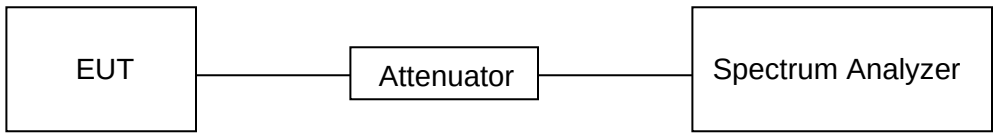
TEST PROCEDURE

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 3×RBW For 99 % Occupied Bandwidth: ≥ 3×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	23.8 °C	Relative Humidity	52 %
Atmosphere Pressure	101 kPa	Test Voltage	DC 5 V

RESULTS

Please refer to appendix B1-B9.

7.3. CONDUCTED OUTPUT POWER

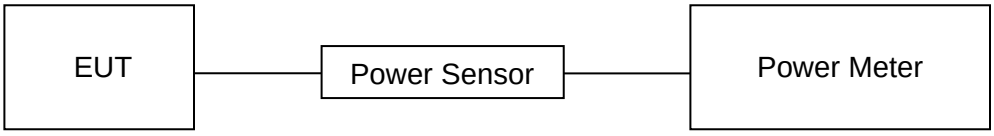
LIMITS

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	23.8 °C	Relative Humidity	52 %
Atmosphere Pressure	101 kPa	Test Voltage	DC 5 V

RESULTS

Please refer to appendix C1-C9.

Note: Reported average power is for information only.

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

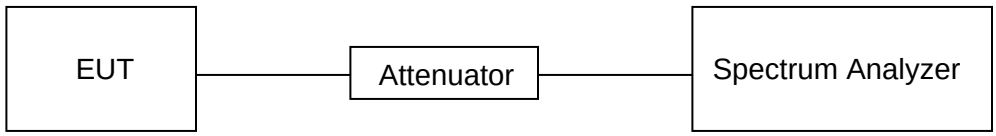
TEST PROCEDURE

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	≥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	23.8 °C	Relative Humidity	52 %
Atmosphere Pressure	101 kPa	Test Voltage	DC 5 V

RESULTS

Please refer to Appendix D1-D9.

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

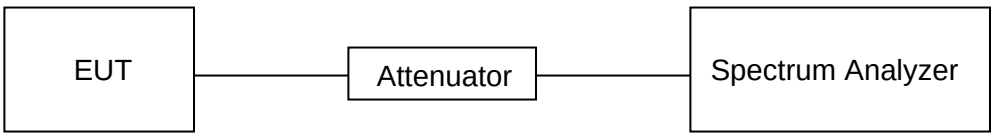
TEST PROCEDURE

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	≥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	23.8 °C	Relative Humidity	52 %
Atmosphere Pressure	101 kPa	Test Voltage	DC 5 V

RESULTS

Please refer to appendix E1-E9.

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)	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. 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.

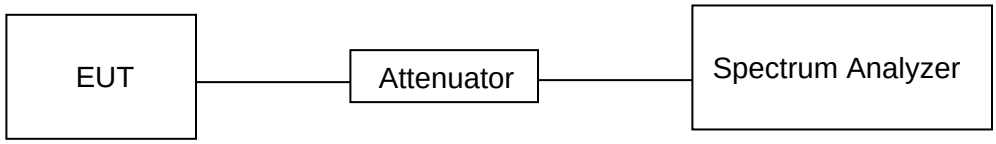
TEST PROCEDURE

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	≤ channel spacing and where possible RBW should be set >> 1 / T, where T is the expected dwell time per channel.
VBW	≥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

a. The transmitter output (antenna port) was connected to the spectrum analyzer
b. Set RBW of spectrum analyzer to 1MHz and VBW to 1MHz.
c. Use a video trigger with the trigger level set to enable triggering only on full pulses.
d. Sweep Time is more than once pulse time.
e. Set the center frequency on any frequency would be measure and set the frequency span to zero span.
f. Measure the maximum time duration of one single pulse.
g. Measure the maximum time duration of one single pulse.
A Period Time = (channel number)*0.4

TEST SETUP



TEST ENVIRONMENT

Temperature	23.8 °C	Relative Humidity	52 %
Atmosphere Pressure	101 kPa	Test Voltage	DC 5 V

RESULTS

Please refer to appendix F1-F9.

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	≥3 × RBW
Span	1.5 x DTS bandwidth
Trace	Max hold
Sweep time	Auto couple.

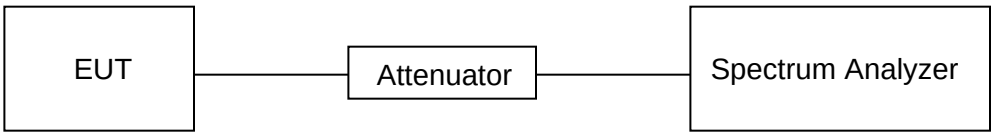
Allow trace to fully stabilize and use the peak marker function to determine the maximum PSD level.

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	≥3 × RBW
measurement points	≥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	23.8 °C	Relative Humidity	52 %
Atmosphere Pressure	101 kPa	Test Voltage	DC 5 V

RESULTS

Please refer to appendix G1-G9.

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) (µA/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 – 3267	
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.

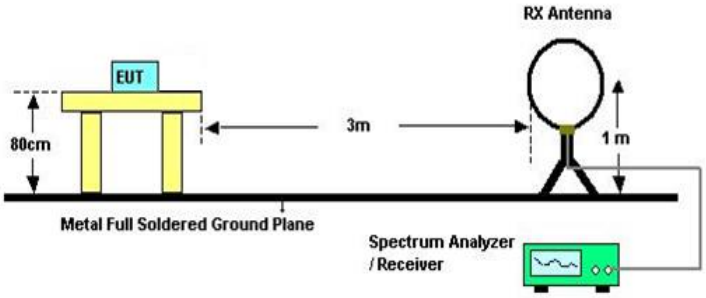
FCC Restricted bands of operation refer to FCC §15.205 (a):

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	3260-3267	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: [1]Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.
[2]Above 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.

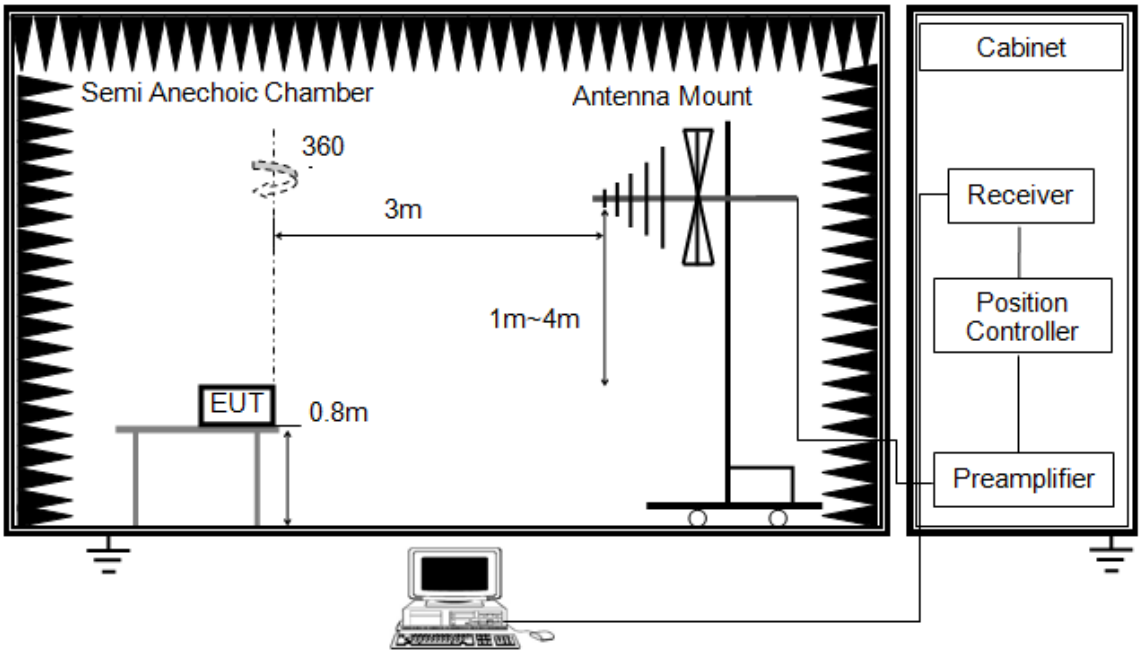
5. The radiated emission limits are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.

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 dBuV/m, which is equivalent to Y-51.5 = Z dBuA/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.

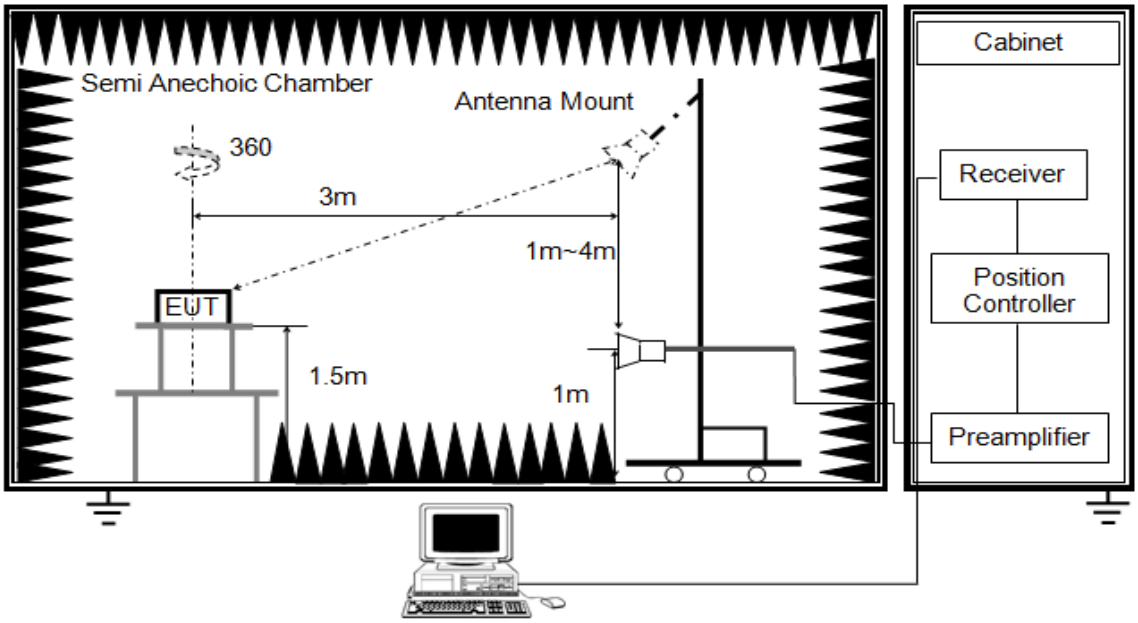
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level. Both horizontal and vertical polarizations 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.

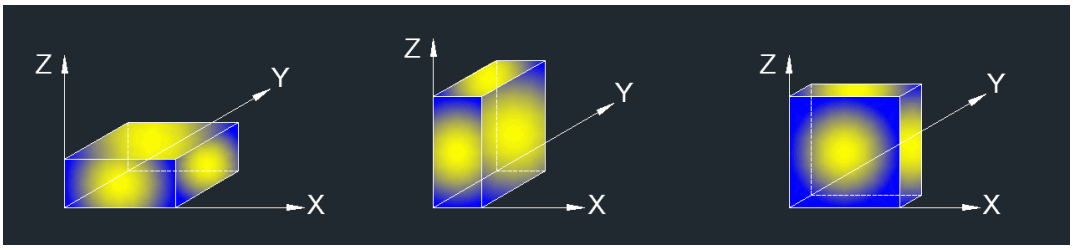
3. The EUT was placed on a turntable with 1.5 m above ground.

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 have been tested, but only the worst data was recorded in the report.
5. dBuA/m= dBuV/m- 20Log10[120π] = 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 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: VBW=1/Ton, where: Ton is the transmitting duration.
5. For the transmitting duration, please refer to clause 7.5.
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.

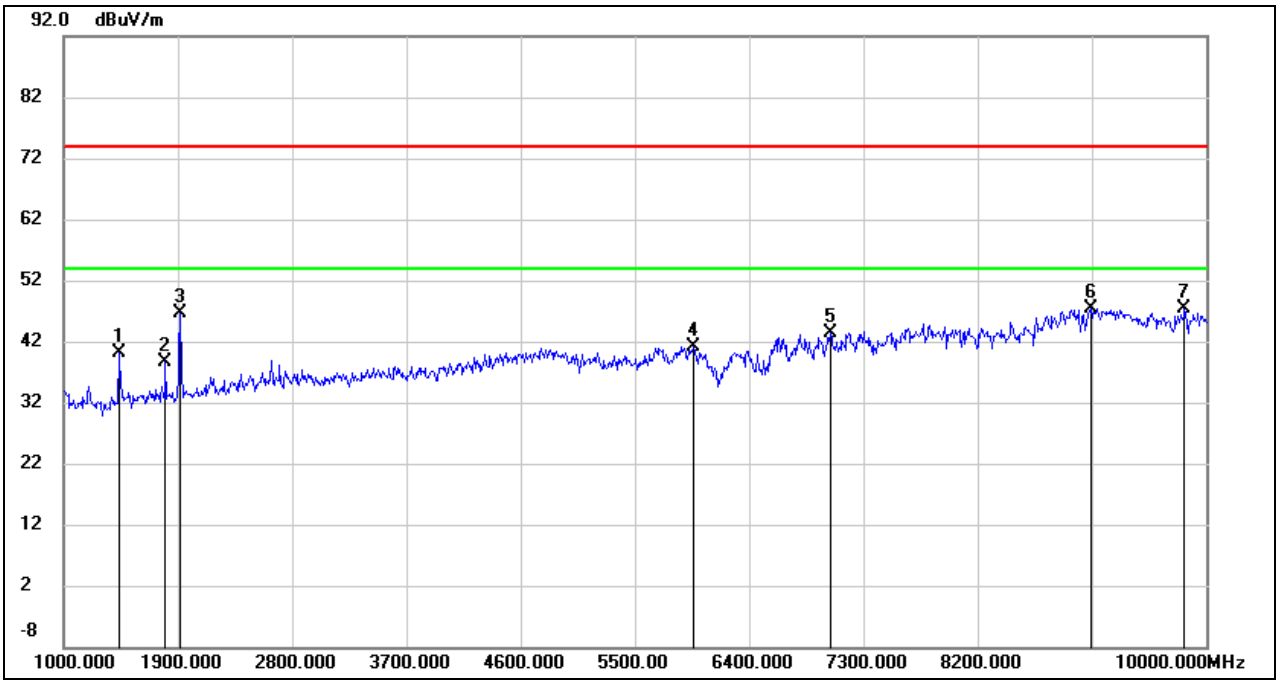
TEST ENVIRONMENT

Temperature	24.2 °C	Relative Humidity	55 %
Atmosphere Pressure	101 kPa	Test Voltage	DC 5 V

RESULTS

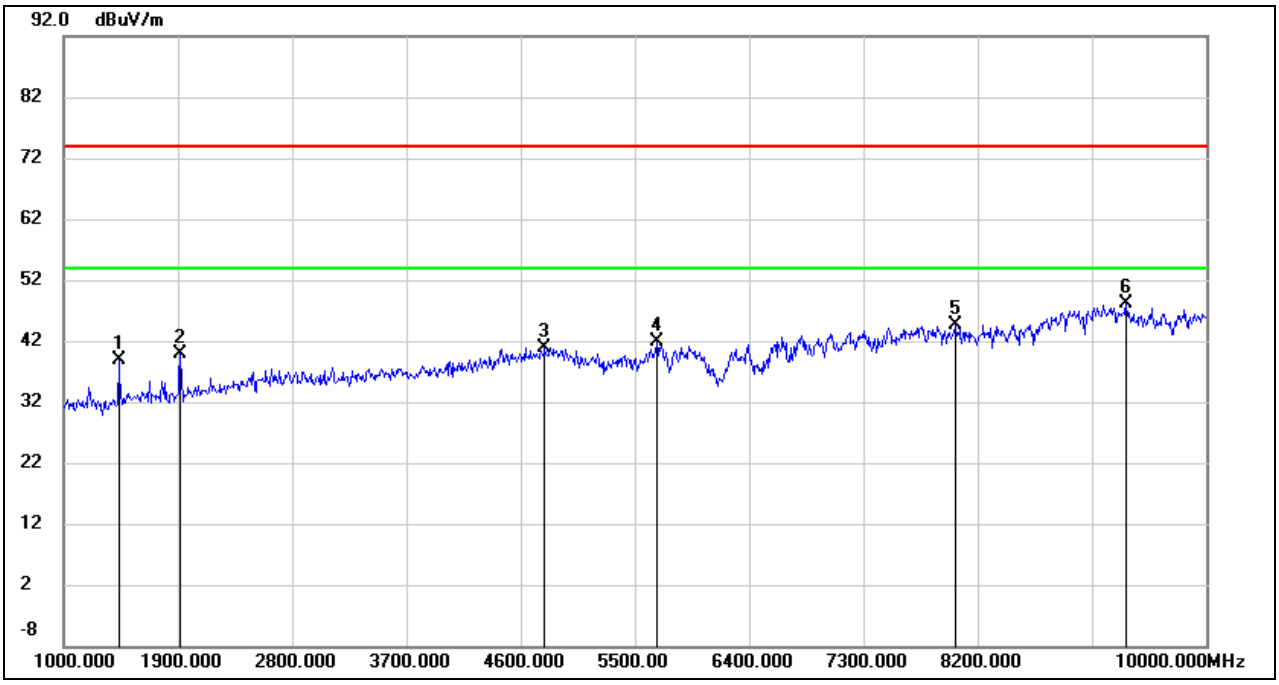
8.1. SPURIOUS EMISSIONS (1 GHz ~ 10 GHz)

Test Mode:	SubG.2GFSK.10kbps	Frequency(MHz):	902.2565
Polarity:	Horizontal	Test Voltage:	DC 5 V



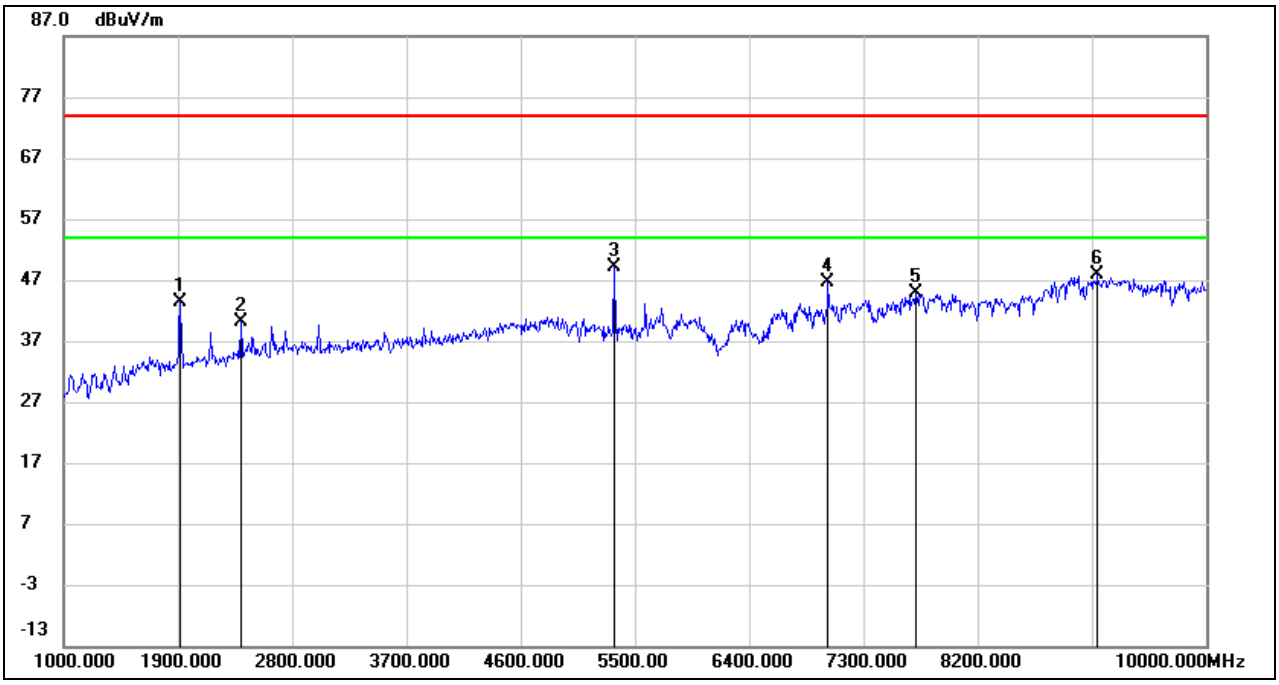
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1432.000	53.13	-13.02	40.11	74.00	-33.89	peak
2	1801.000	50.29	-11.72	38.57	74.00	-35.43	peak
3	1918.000	57.90	-11.33	46.57	74.00	-27.43	peak
4	5959.000	39.42	1.74	41.16	74.00	-32.84	peak
5	7039.000	37.10	6.17	43.27	74.00	-30.73	peak
6	9091.000	37.58	9.78	47.36	74.00	-26.64	peak
7	9829.000	36.67	10.74	47.41	74.00	-26.59	peak

Test Mode:	SubG.2GFSK.10kbps	Frequency(MHz):	902.2565
Polarity:	Vertical	Test Voltage:	DC 5 V



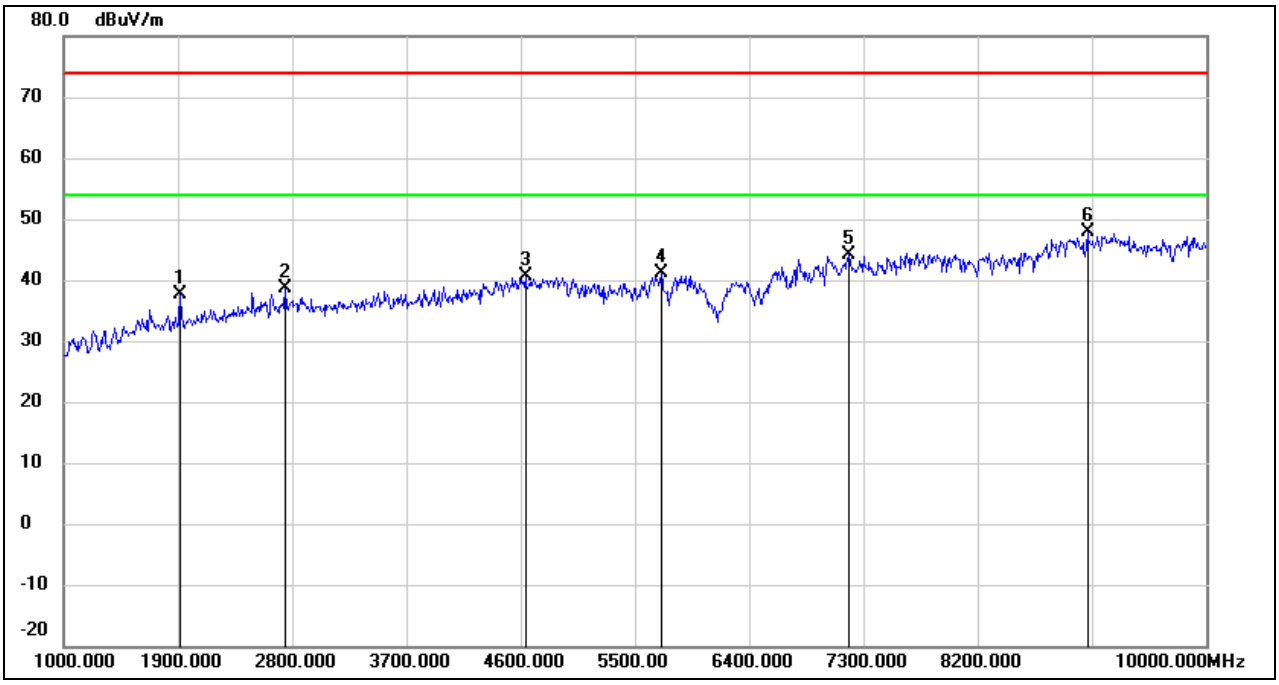
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1432.000	51.81	-13.02	38.79	74.00	-35.21	peak
2	1918.000	51.10	-11.33	39.77	74.00	-34.23	peak
3	4789.000	41.91	-1.00	40.91	74.00	-33.09	peak
4	5671.000	41.05	0.91	41.96	74.00	-32.04	peak
5	8020.000	38.91	5.67	44.58	74.00	-29.42	peak
6	9370.000	38.25	9.89	48.14	74.00	-25.86	peak

Test Mode:	SubG.2GFSK.10kbps	Frequency(MHz):	914.9965
Polarity:	Horizontal	Test Voltage:	DC 5 V



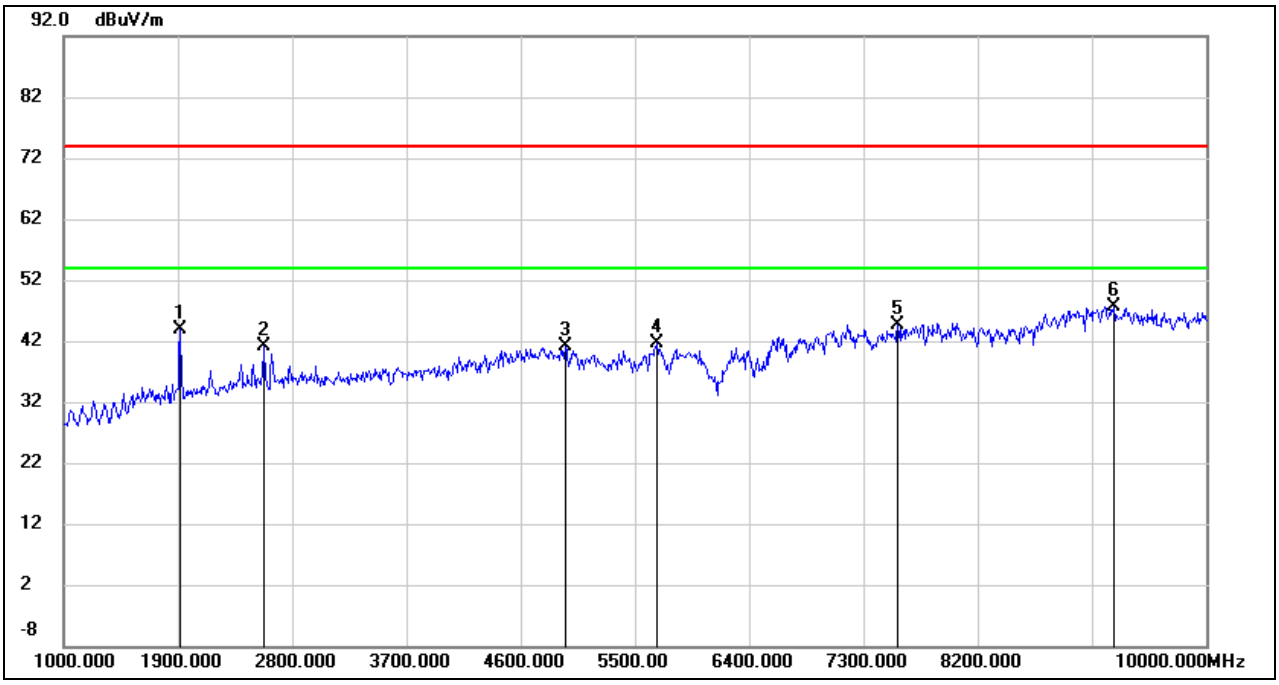
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1918.000	54.60	-11.33	43.27	74.00	-30.73	peak
2	2395.000	49.06	-9.02	40.04	74.00	-33.96	peak
3	5338.000	48.84	0.24	49.08	74.00	-24.92	peak
4	7021.000	40.54	6.19	46.73	74.00	-27.27	peak
5	7714.000	39.08	5.68	44.76	74.00	-29.24	peak
6	9145.000	38.12	9.80	47.92	74.00	-26.08	peak

Test Mode:	SubG.2GFSK.10kbps	Frequency(MHz):	914.9965
Polarity:	Vertical	Test Voltage:	DC 5 V



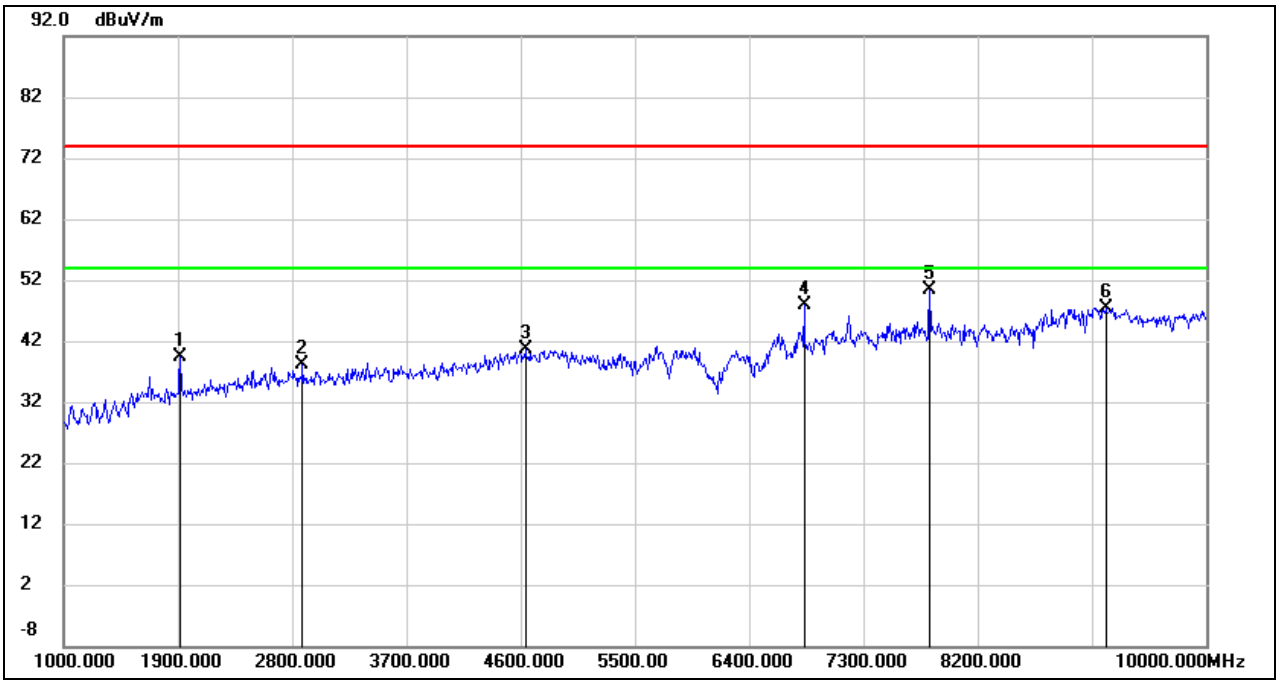
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1918.000	49.01	-11.33	37.68	74.00	-36.32	peak
2	2746.000	46.45	-7.75	38.70	74.00	-35.30	peak
3	4636.000	42.26	-1.59	40.67	74.00	-33.33	peak
4	5707.000	40.08	1.01	41.09	74.00	-32.91	peak
5	7183.000	38.22	6.01	44.23	74.00	-29.77	peak
6	9064.000	38.18	9.76	47.94	74.00	-26.06	peak

Test Mode:	SubG.2GFSK.10kbps	Frequency(MHz):	927.7365
Polarity:	Horizontal	Test Voltage:	DC 5 V



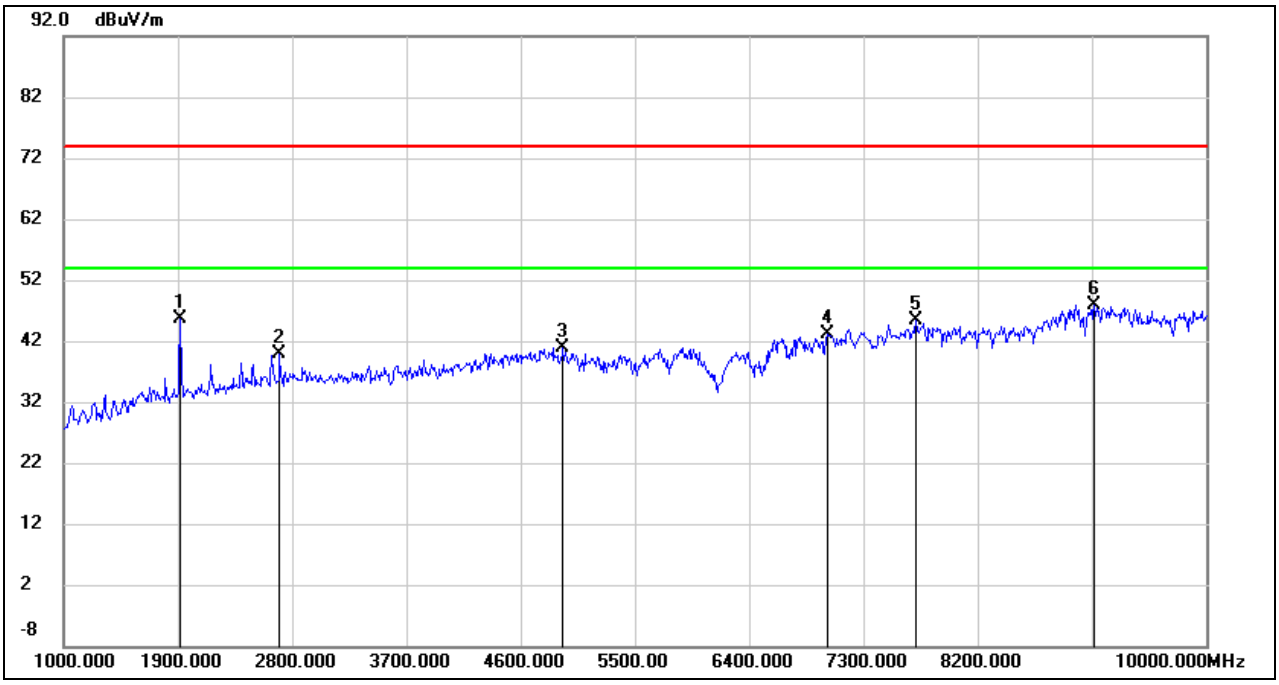
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1918.000	55.09	-11.33	43.76	74.00	-30.24	peak
2	2575.000	49.36	-8.27	41.09	74.00	-32.91	peak
3	4951.000	41.43	-0.34	41.09	74.00	-32.91	peak
4	5671.000	40.78	0.91	41.69	74.00	-32.31	peak
5	7570.000	38.89	5.68	44.57	74.00	-29.43	peak
6	9271.000	37.87	9.84	47.71	74.00	-26.29	peak

Test Mode:	SubG.2GFSK.10kbps	Frequency(MHz):	927.7365
Polarity:	Vertical	Test Voltage:	DC 5 V



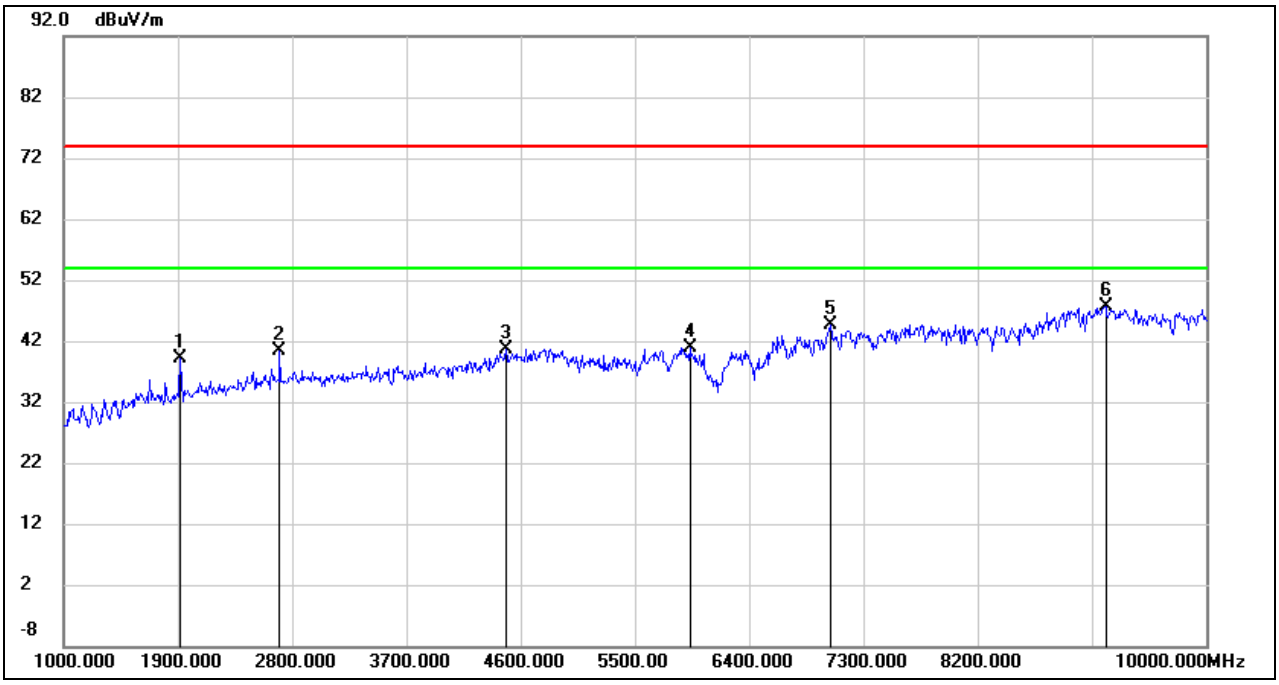
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1918.000	50.59	-11.33	39.26	74.00	-34.74	peak
2	2881.000	45.45	-7.33	38.12	74.00	-35.88	peak
3	4636.000	42.27	-1.59	40.68	74.00	-33.32	peak
4	6832.000	42.61	5.37	47.98	74.00	-26.02	peak
5	7822.000	44.80	5.66	50.46	74.00	-23.54	peak
6	9208.000	37.64	9.82	47.46	74.00	-26.54	peak

Test Mode:	SubG.2GFSK.25kbps	Frequency(MHz):	902.2565
Polarity:	Horizontal	Test Voltage:	DC 5 V



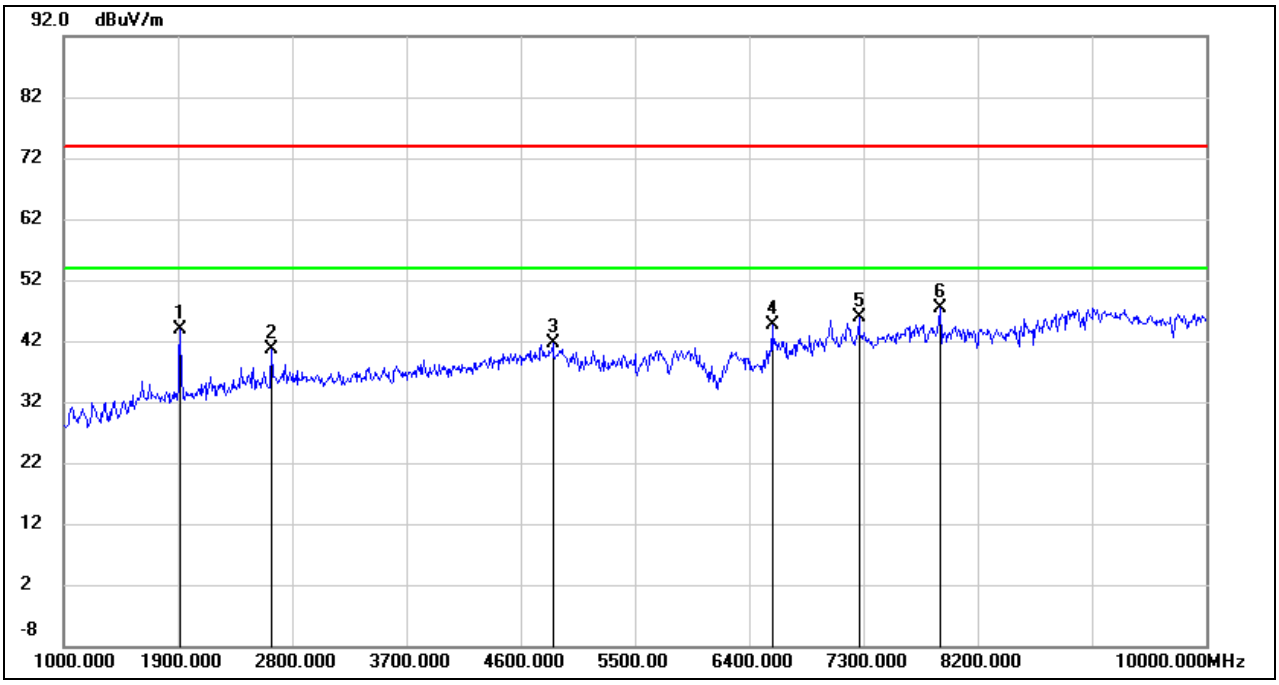
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1918.000	57.00	-11.33	45.67	74.00	-28.33	peak
2	2701.000	47.84	-7.89	39.95	74.00	-34.05	peak
3	4933.000	41.31	-0.42	40.89	74.00	-33.11	peak
4	7021.000	36.98	6.19	43.17	74.00	-30.83	peak
5	7714.000	39.63	5.68	45.31	74.00	-28.69	peak
6	9118.000	38.20	9.79	47.99	74.00	-26.01	peak

Test Mode:	SubG.2GFSK.25kbps	Frequency(MHz):	902.2565
Polarity:	Vertical	Test Voltage:	DC 5 V



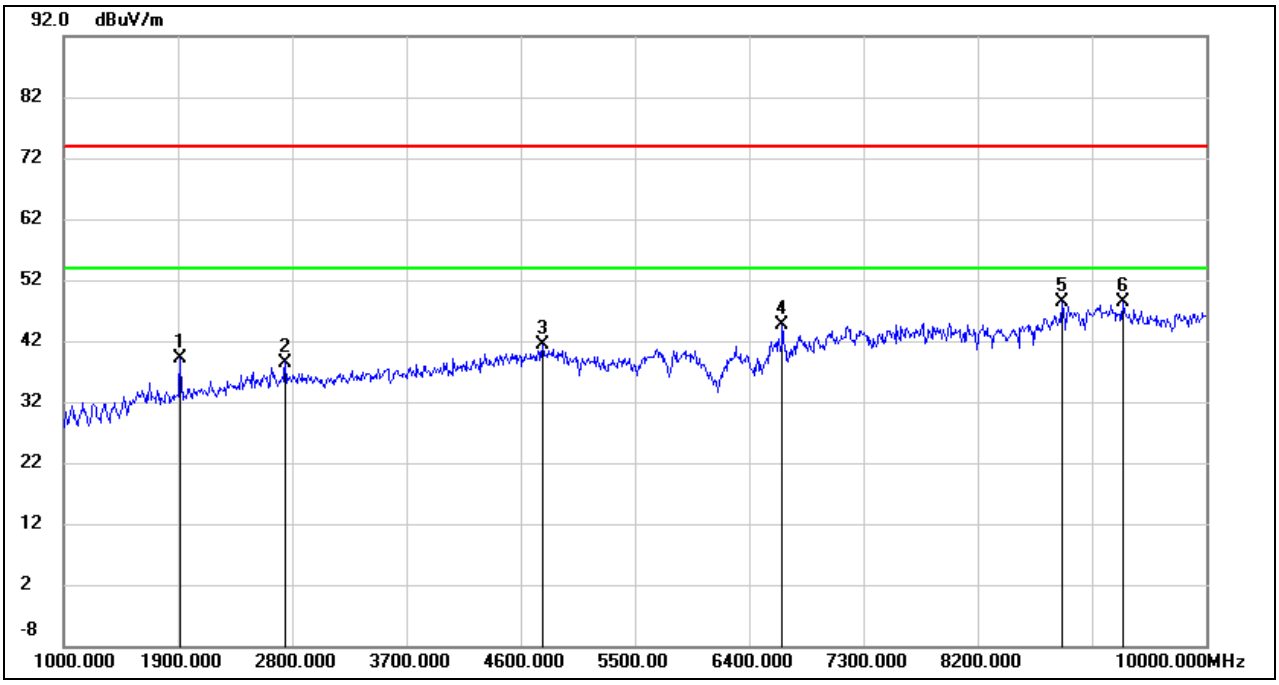
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1918.000	50.41	-11.33	39.08	74.00	-34.92	peak
2	2701.000	48.27	-7.89	40.38	74.00	-33.62	peak
3	4483.000	42.94	-2.21	40.73	74.00	-33.27	peak
4	5932.000	39.28	1.65	40.93	74.00	-33.07	peak
5	7039.000	38.46	6.17	44.63	74.00	-29.37	peak
6	9208.000	37.85	9.82	47.67	74.00	-26.33	peak

Test Mode:	SubG.2GFSK.25kbps	Frequency(MHz):	914.9965
Polarity:	Horizontal	Test Voltage:	DC 5 V



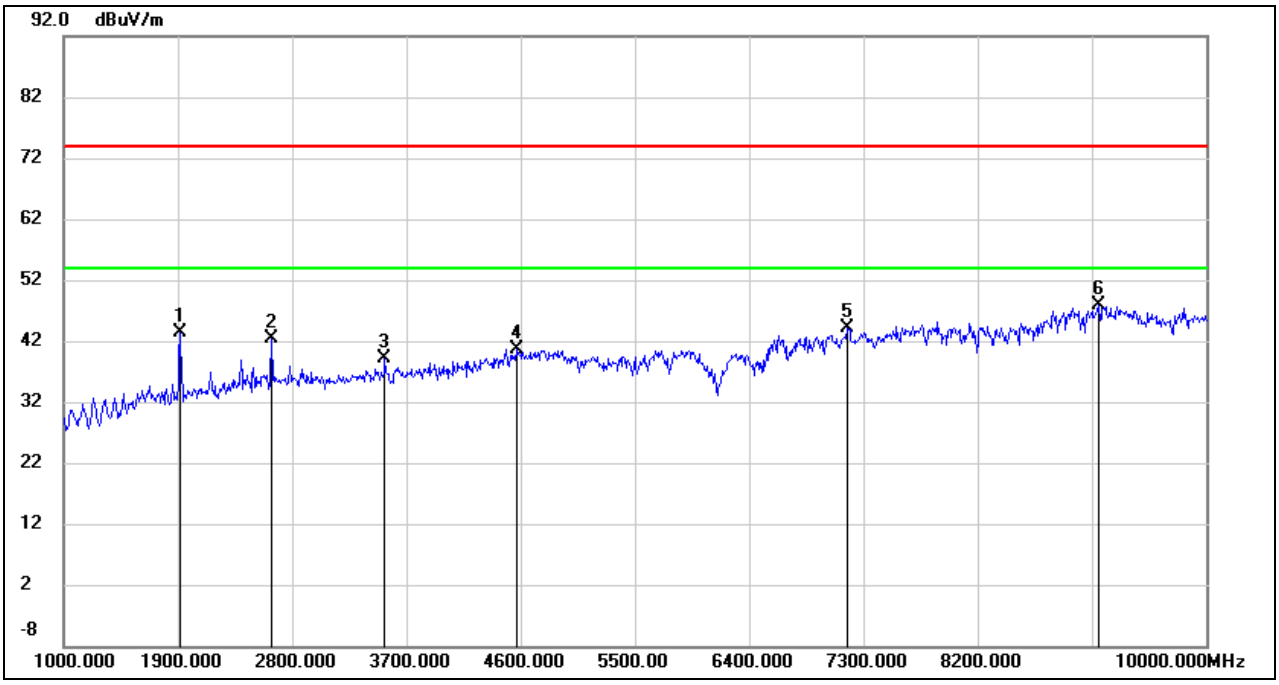
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1918.000	55.21	-11.33	43.88	74.00	-30.12	peak
2	2638.000	48.62	-8.07	40.55	74.00	-33.45	peak
3	4852.000	42.36	-0.74	41.62	74.00	-32.38	peak
4	6580.000	40.53	4.11	44.64	74.00	-29.36	peak
5	7264.000	39.86	5.93	45.79	74.00	-28.21	peak
6	7903.000	41.84	5.66	47.50	74.00	-26.50	peak

Test Mode:	SubG.2GFSK.25kbps	Frequency(MHz):	914.9965
Polarity:	Vertical	Test Voltage:	DC 5 V



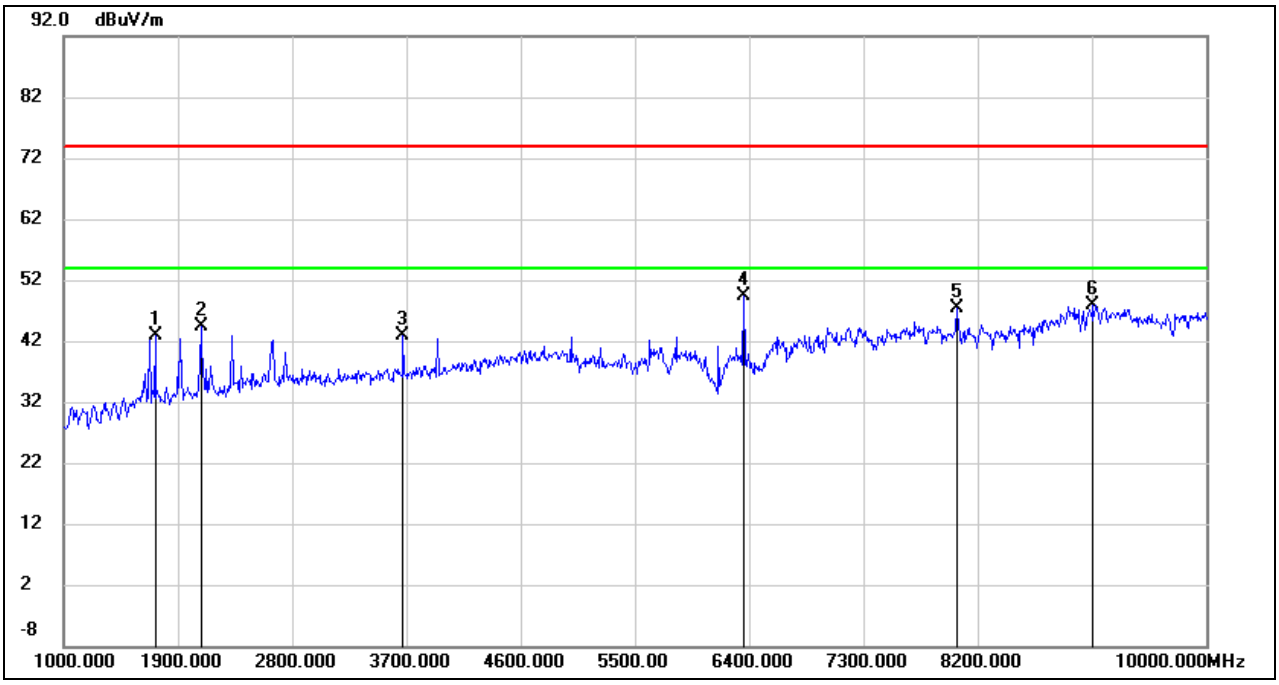
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1918.000	50.36	-11.33	39.03	74.00	-34.97	peak
2	2746.000	46.25	-7.75	38.50	74.00	-35.50	peak
3	4771.000	42.47	-1.06	41.41	74.00	-32.59	peak
4	6661.000	40.04	4.52	44.56	74.00	-29.44	peak
5	8866.000	39.67	8.80	48.47	74.00	-25.53	peak
6	9343.000	38.44	9.88	48.32	74.00	-25.68	peak

Test Mode:	SubG.2GFSK.25kbps	Frequency(MHz):	927.7365
Polarity:	Horizontal	Test Voltage:	DC 5 V



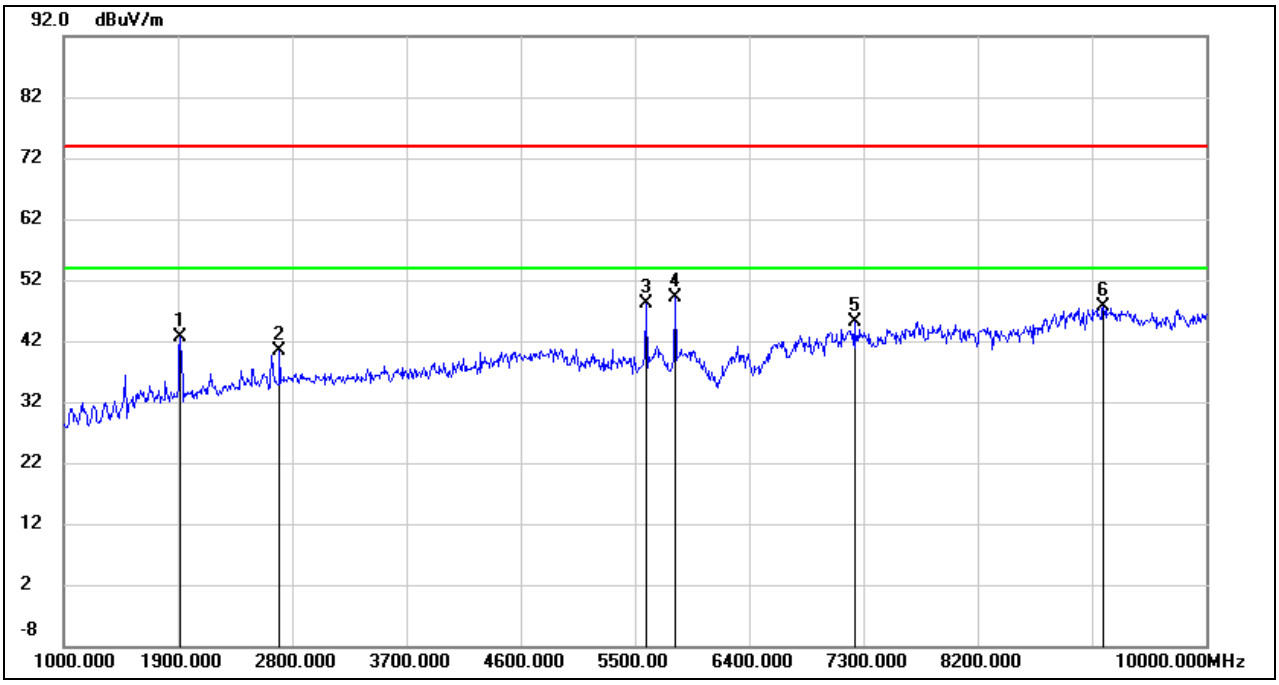
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1918.000	54.61	-11.33	43.28	74.00	-30.72	peak
2	2638.000	50.48	-8.07	42.41	74.00	-31.59	peak
3	3529.000	44.82	-5.77	39.05	74.00	-34.95	peak
4	4564.000	42.51	-1.89	40.62	74.00	-33.38	peak
5	7174.000	38.19	6.02	44.21	74.00	-29.79	peak
6	9154.000	37.98	9.80	47.78	74.00	-26.22	peak

Test Mode:	SubG.2GFSK.25kbps	Frequency(MHz):	927.7365
Polarity:	Vertical	Test Voltage:	DC 5 V



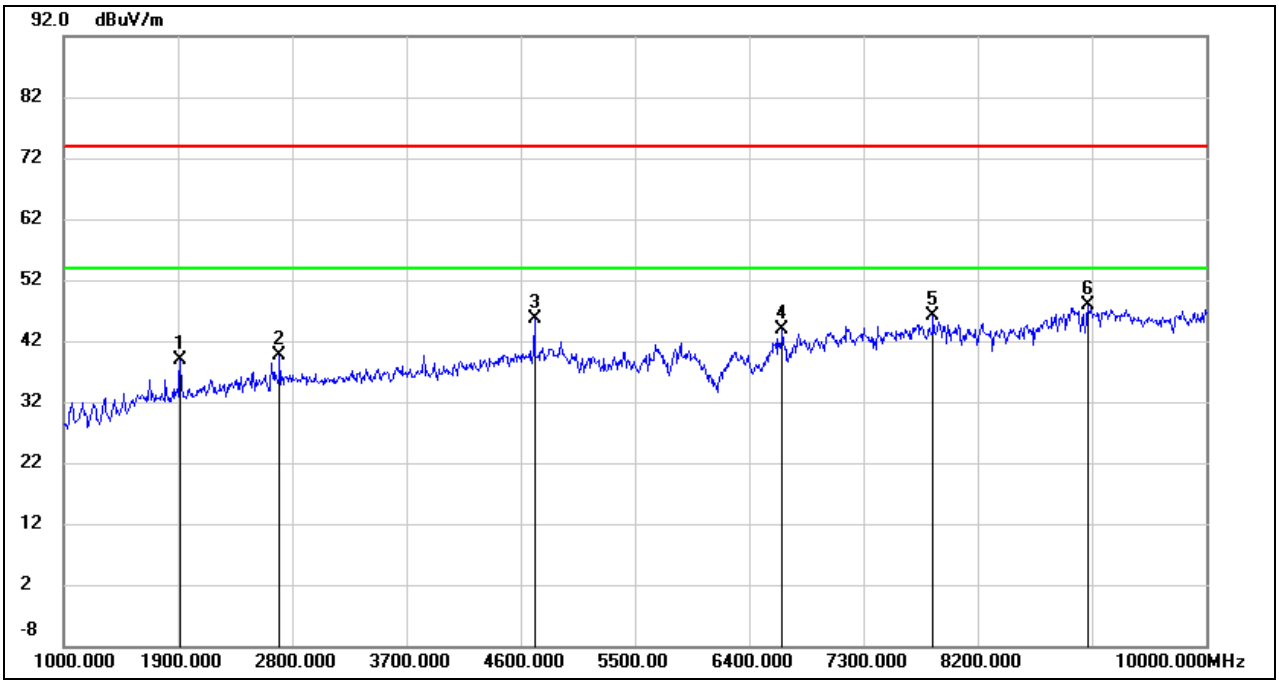
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1720.000	54.85	-11.98	42.87	74.00	-31.13	peak
2	2080.000	54.94	-10.64	44.30	74.00	-29.70	peak
3	3673.000	48.17	-5.37	42.80	74.00	-31.20	peak
4	6355.000	46.15	3.18	49.33	74.00	-24.67	peak
5	8038.000	41.62	5.69	47.31	74.00	-26.69	peak
6	9109.000	38.13	9.78	47.91	74.00	-26.09	peak

Test Mode:	SubG.2GFSK.60kbps	Frequency(MHz):	902.2565
Polarity:	Horizontal	Test Voltage:	DC 5 V



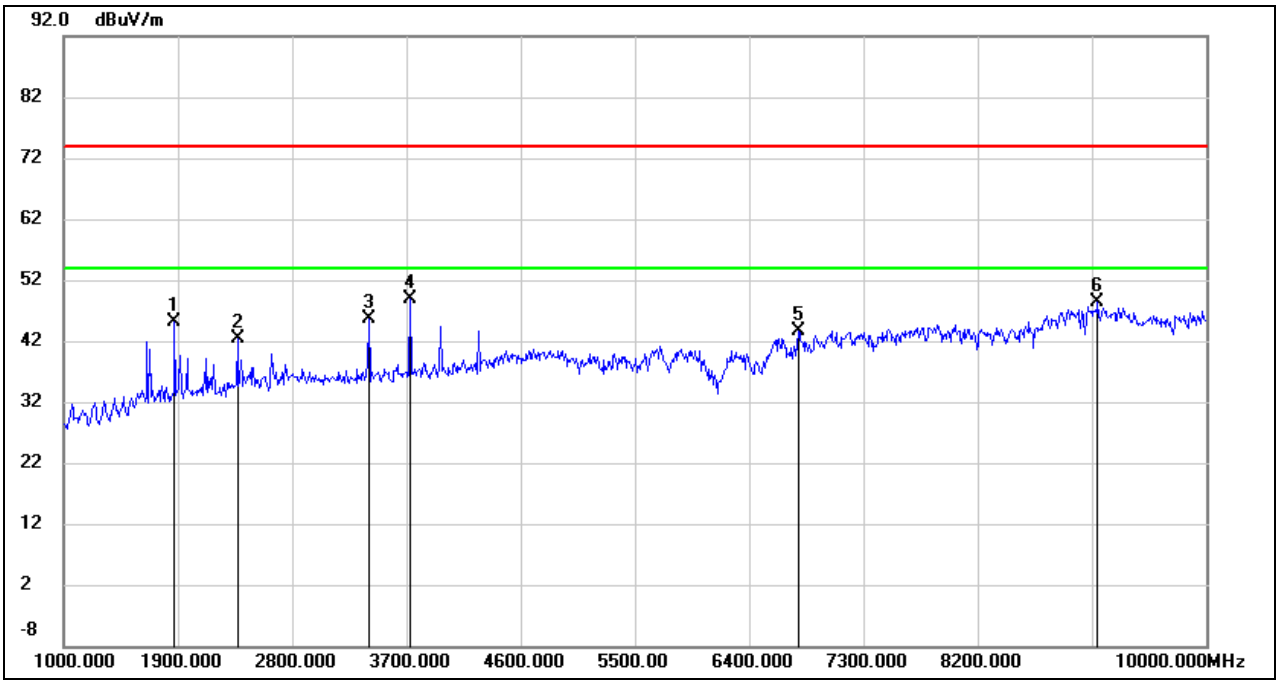
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1918.000	54.07	-11.33	42.74	74.00	-31.26	peak
2	2701.000	48.30	-7.89	40.41	74.00	-33.59	peak
3	5590.000	47.50	0.68	48.18	74.00	-25.82	peak
4	5815.000	47.91	1.32	49.23	74.00	-24.77	peak
5	7228.000	39.19	5.97	45.16	74.00	-28.84	peak
6	9190.000	37.76	9.81	47.57	74.00	-26.43	peak

Test Mode:	SubG.2GFSK.60kbps	Frequency(MHz):	902.2565
Polarity:	Vertical	Test Voltage:	DC 5 V



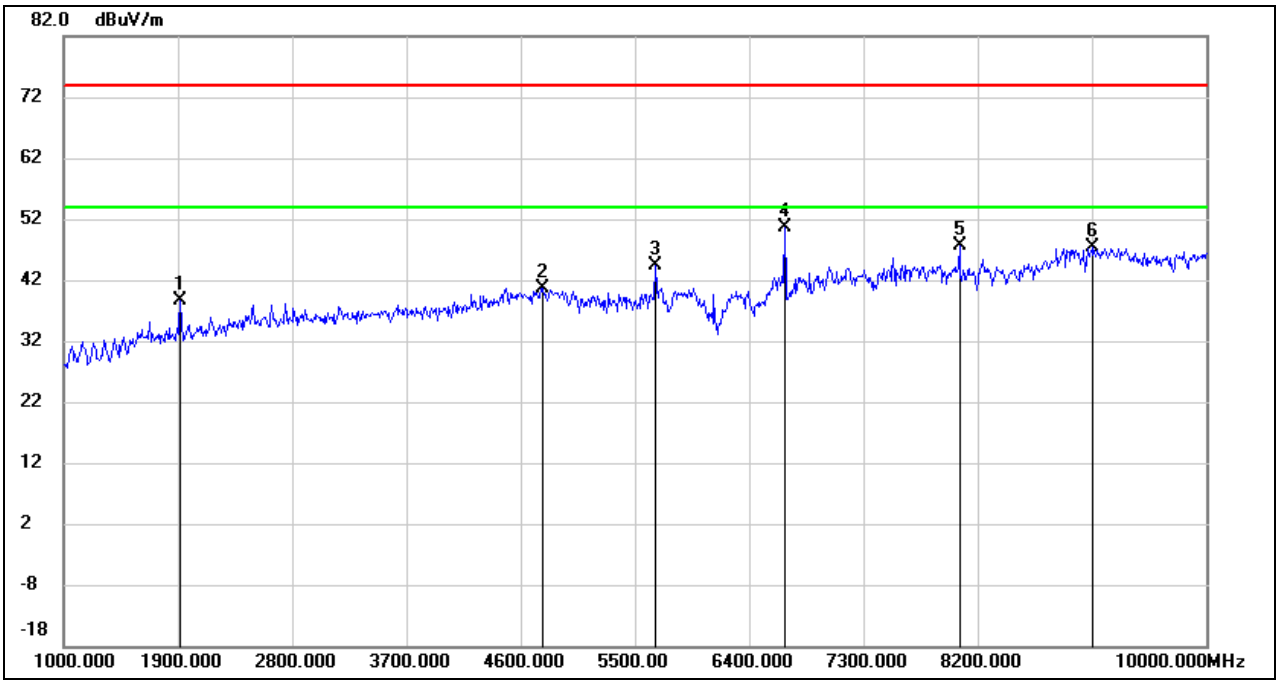
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1918.000	50.09	-11.33	38.76	74.00	-35.24	peak
2	2701.000	47.57	-7.89	39.68	74.00	-34.32	peak
3	4708.000	47.00	-1.31	45.69	74.00	-28.31	peak
4	6661.000	39.29	4.52	43.81	74.00	-30.19	peak
5	7849.000	40.34	5.67	46.01	74.00	-27.99	peak
6	9064.000	38.19	9.76	47.95	74.00	-26.05	peak

Test Mode:	SubG.2GFSK.60kbps	Frequency(MHz):	914.9965
Polarity:	Horizontal	Test Voltage:	DC 5 V



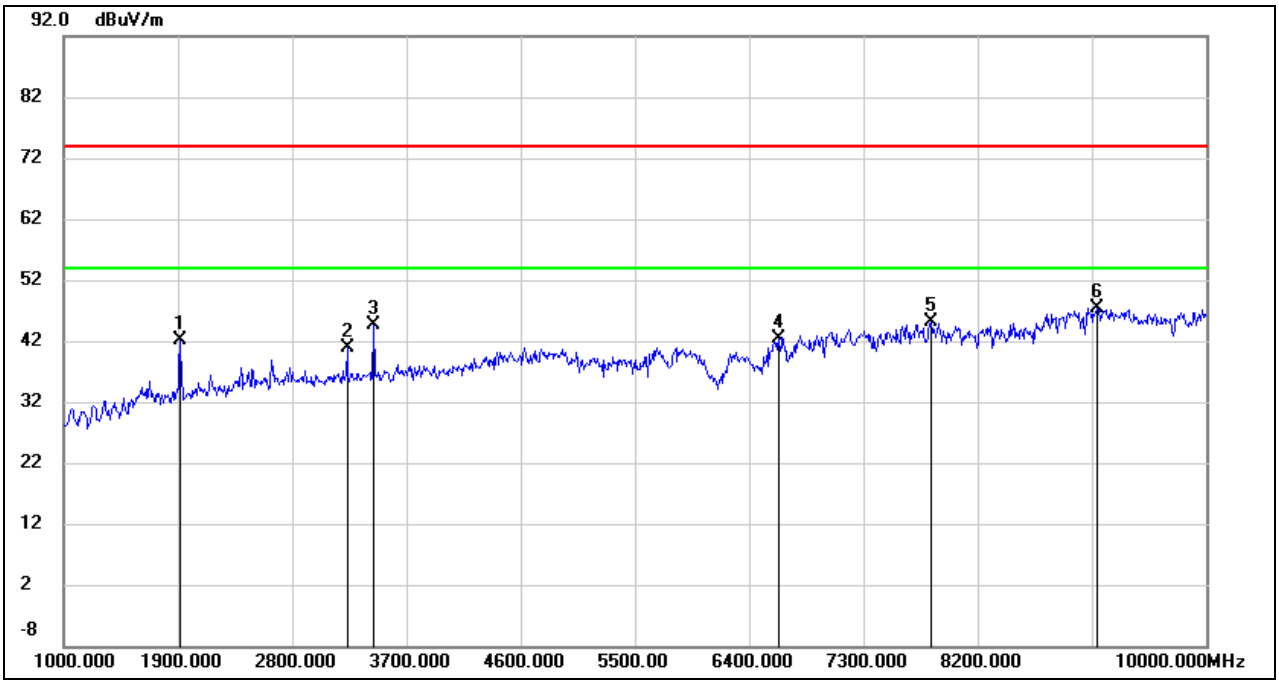
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1873.000	56.59	-11.47	45.12	74.00	-28.88	peak
2	2368.000	51.63	-9.16	42.47	74.00	-31.53	peak
3	3403.000	51.79	-6.07	45.72	74.00	-28.28	peak
4	3727.000	54.15	-5.23	48.92	74.00	-25.08	peak
5	6787.000	38.50	5.14	43.64	74.00	-30.36	peak
6	9145.000	38.48	9.80	48.28	74.00	-25.72	peak

Test Mode:	SubG.2GFSK.60kbps	Frequency(MHz):	914.9965
Polarity:	Vertical	Test Voltage:	DC 5 V



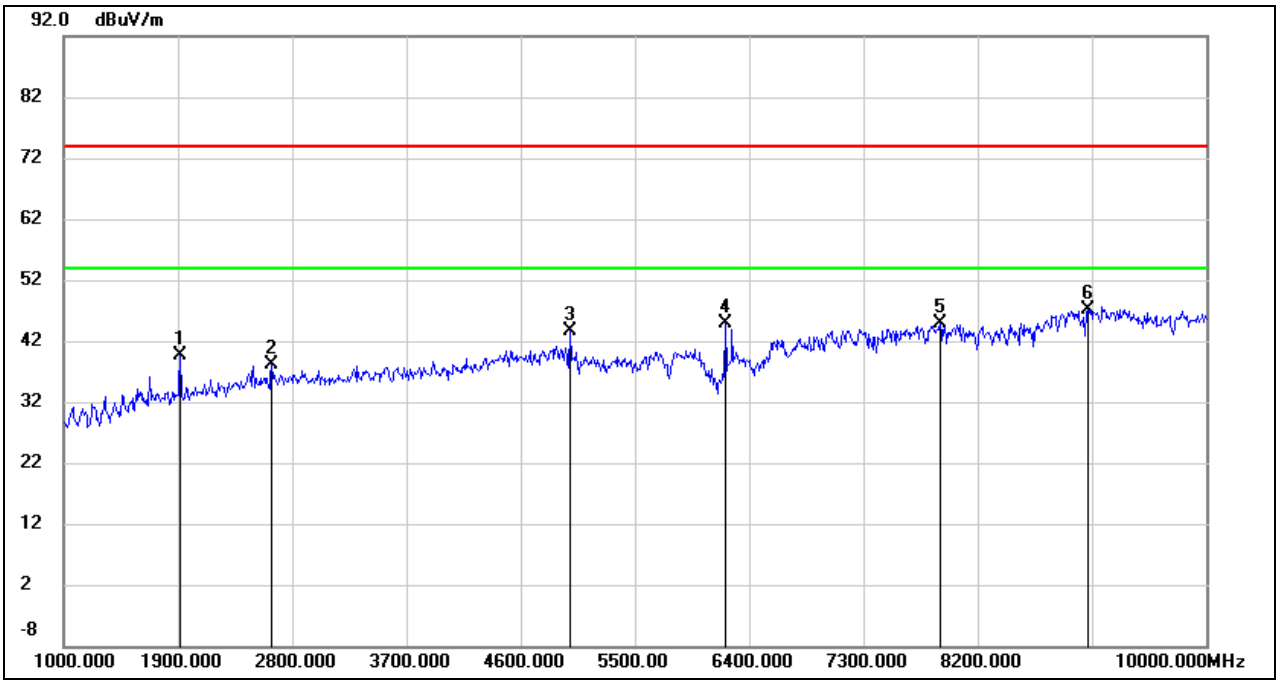
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1918.000	50.07	-11.33	38.74	74.00	-35.26	peak
2	4771.000	41.66	-1.06	40.60	74.00	-33.40	peak
3	5662.000	43.42	0.89	44.31	74.00	-29.69	peak
4	6679.000	46.11	4.61	50.72	74.00	-23.28	peak
5	8056.000	41.83	5.72	47.55	74.00	-26.45	peak
6	9109.000	37.54	9.78	47.32	74.00	-26.68	peak

Test Mode:	SubG.2GFSK.60kbps	Frequency(MHz):	927.7365
Polarity:	Horizontal	Test Voltage:	DC 5 V



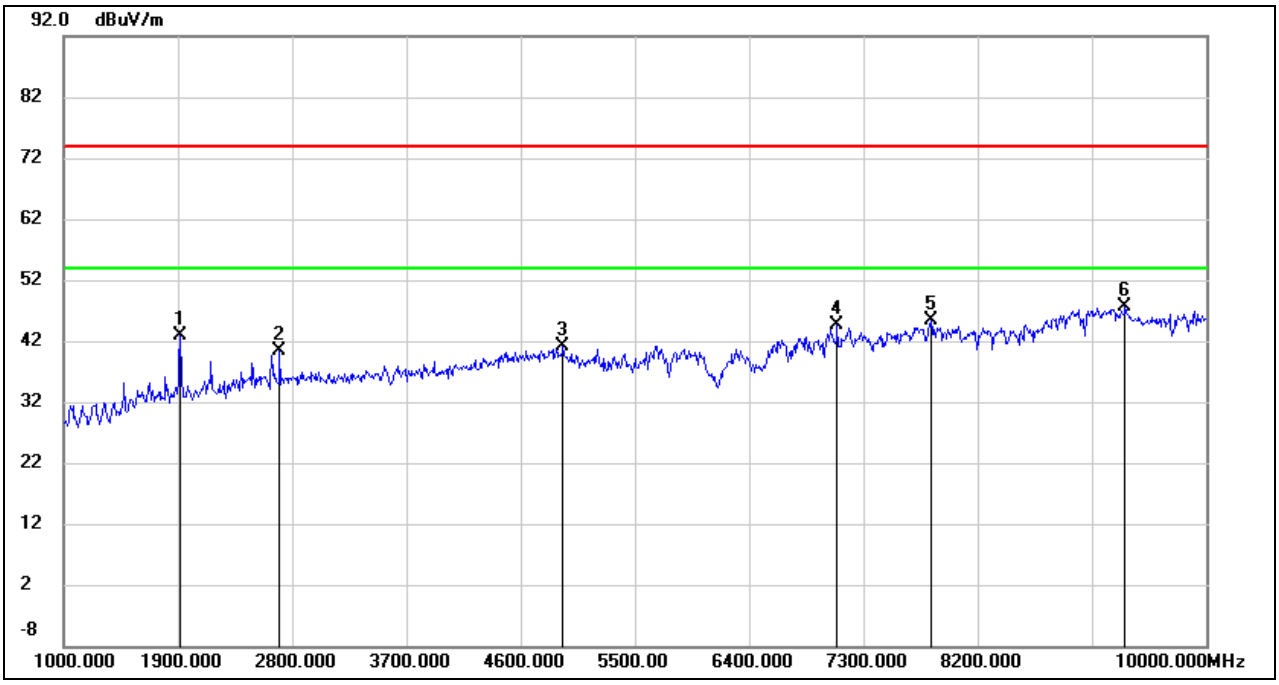
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1918.000	53.42	-11.33	42.09	74.00	-31.91	peak
2	3232.000	47.26	-6.46	40.80	74.00	-33.20	peak
3	3439.000	50.53	-5.99	44.54	74.00	-29.46	peak
4	6634.000	38.09	4.38	42.47	74.00	-31.53	peak
5	7831.000	39.47	5.67	45.14	74.00	-28.86	peak
6	9145.000	37.67	9.80	47.47	74.00	-26.53	peak

Test Mode:	SubG.2GFSK.60kbps	Frequency(MHz):	927.7365
Polarity:	Vertical	Test Voltage:	DC 5 V



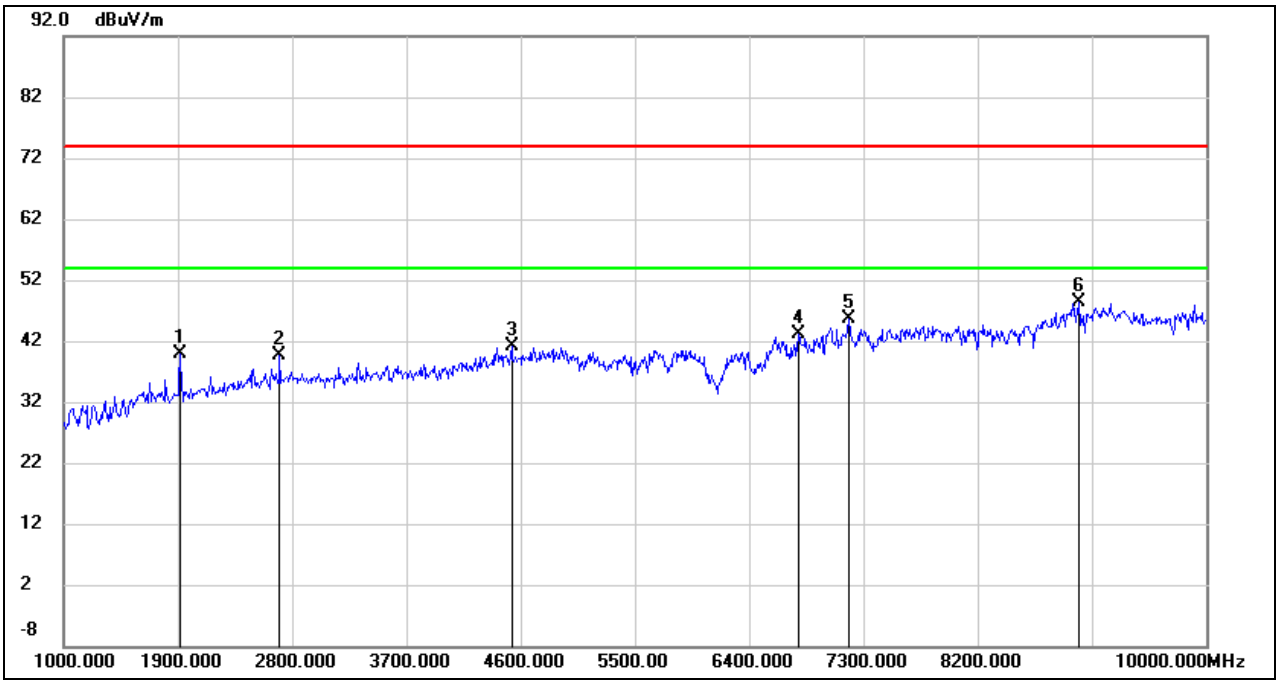
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1918.000	50.93	-11.33	39.60	74.00	-34.40	peak
2	2638.000	46.14	-8.07	38.07	74.00	-35.93	peak
3	4987.000	43.93	-0.20	43.73	74.00	-30.27	peak
4	6211.000	42.32	2.64	44.96	74.00	-29.04	peak
5	7903.000	39.11	5.66	44.77	74.00	-29.23	peak
6	9064.000	37.35	9.76	47.11	74.00	-26.89	peak

Test Mode:	SubG.2GFSK.96kbps	Frequency(MHz):	902.2565
Polarity:	Horizontal	Test Voltage:	DC 5 V



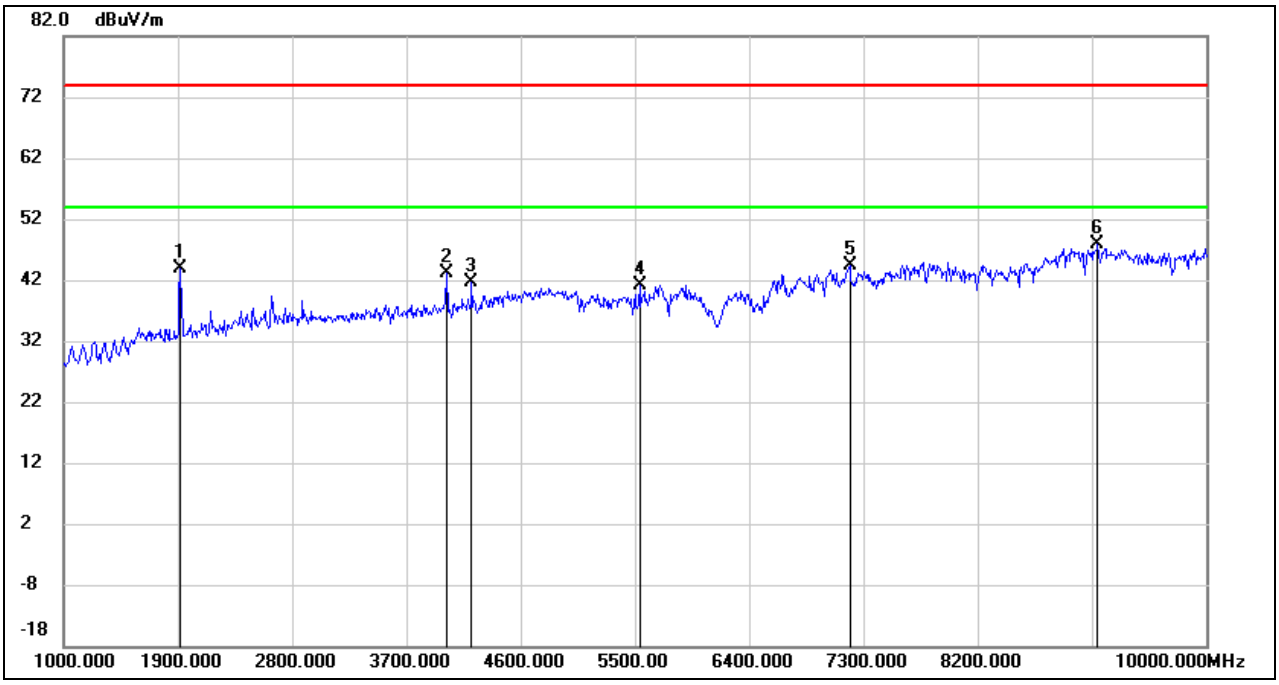
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1918.000	54.14	-11.33	42.81	74.00	-31.19	peak
2	2701.000	48.31	-7.89	40.42	74.00	-33.58	peak
3	4933.000	41.43	-0.42	41.01	74.00	-32.99	peak
4	7093.000	38.50	6.10	44.60	74.00	-29.40	peak
5	7831.000	39.78	5.67	45.45	74.00	-28.55	peak
6	9361.000	37.67	9.89	47.56	74.00	-26.44	peak

Test Mode:	SubG.2GFSK.96kbps	Frequency(MHz):	902.2565
Polarity:	Vertical	Test Voltage:	DC 5 V



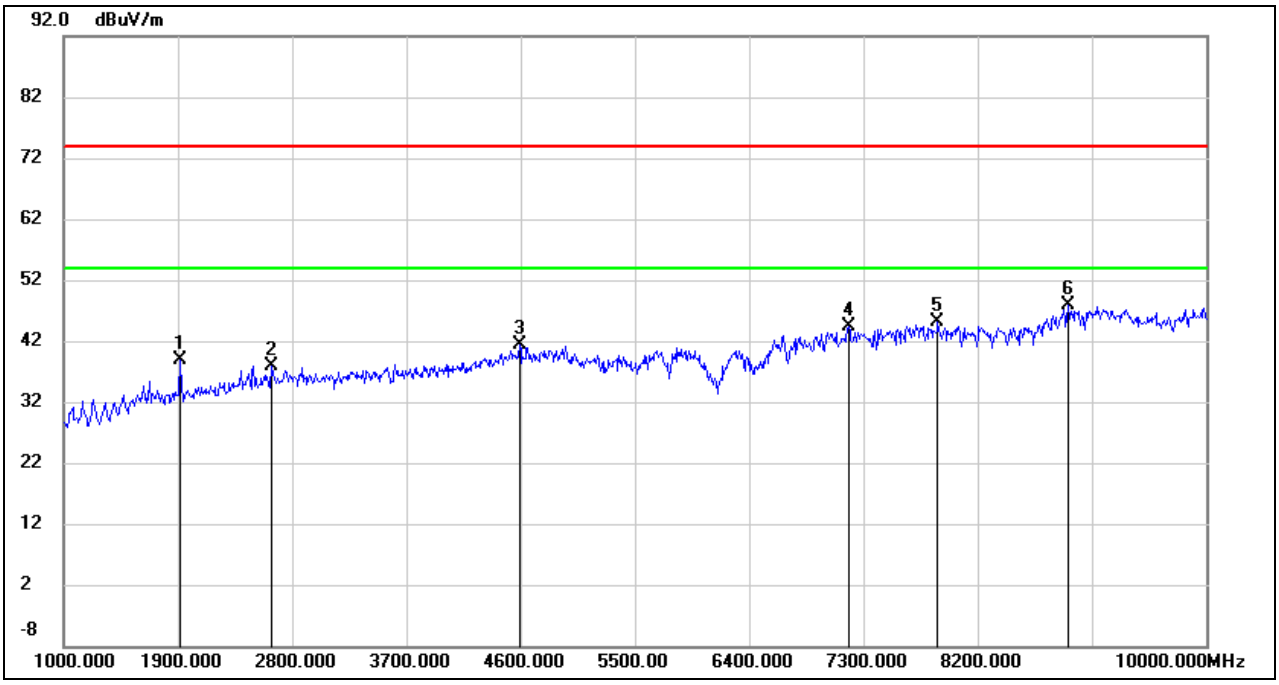
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1918.000	51.14	-11.33	39.81	74.00	-34.19	peak
2	2701.000	47.41	-7.89	39.52	74.00	-34.48	peak
3	4528.000	43.05	-2.03	41.02	74.00	-32.98	peak
4	6787.000	38.09	5.14	43.23	74.00	-30.77	peak
5	7183.000	39.59	6.01	45.60	74.00	-28.40	peak
6	9001.000	38.73	9.74	48.47	74.00	-25.53	peak

Test Mode:	SubG.2GFSK.96kbps	Frequency(MHz):	914.9965
Polarity:	Horizontal	Test Voltage:	DC 5 V



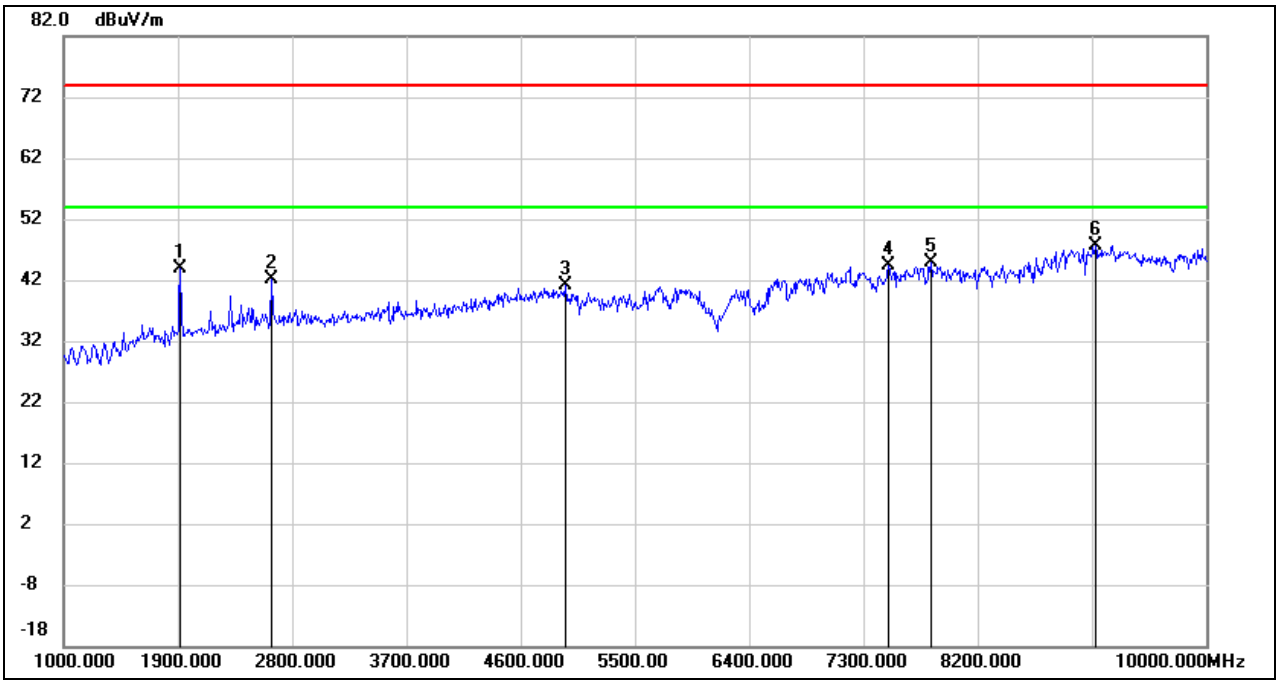
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1918.000	55.15	-11.33	43.82	74.00	-30.18	peak
2	4015.000	47.54	-4.41	43.13	74.00	-30.87	peak
3	4213.000	45.18	-3.48	41.70	74.00	-32.30	peak
4	5536.000	40.62	0.52	41.14	74.00	-32.86	peak
5	7192.000	38.30	6.00	44.30	74.00	-29.70	peak
6	9145.000	38.18	9.80	47.98	74.00	-26.02	peak

Test Mode:	SubG.2GFSK.96kbps	Frequency(MHz):	914.9965
Polarity:	Vertical	Test Voltage:	DC 5 V



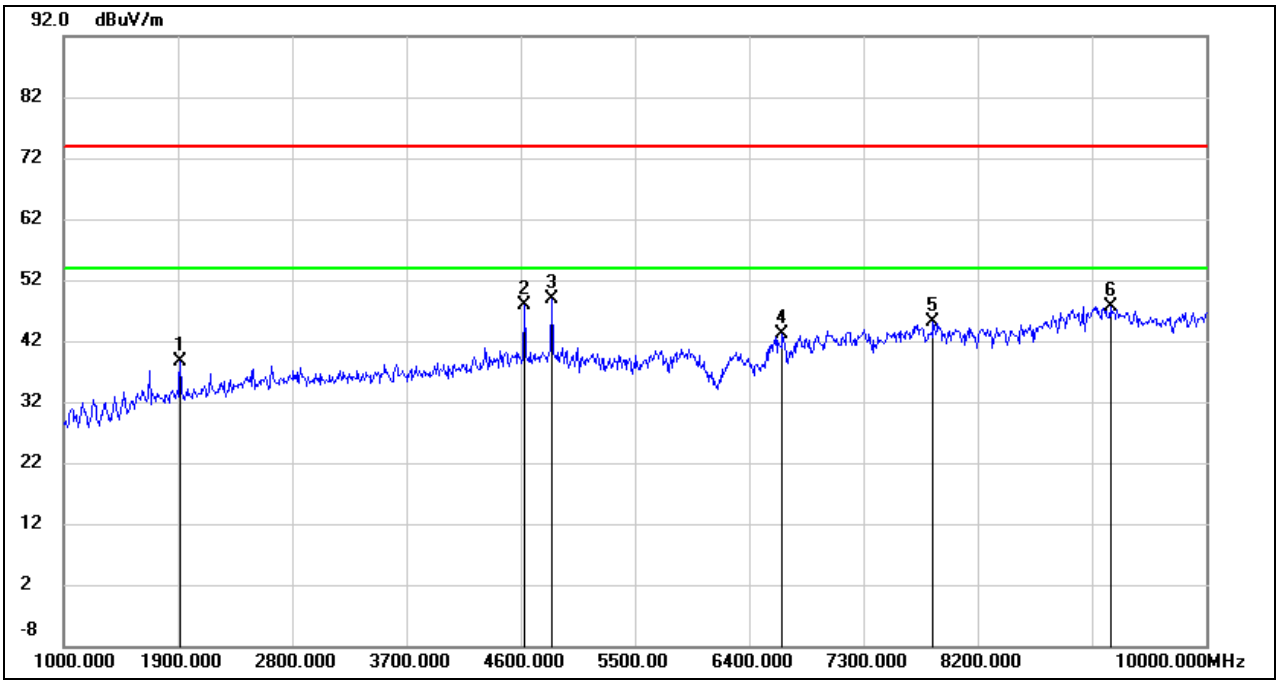
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1918.000	50.28	-11.33	38.95	74.00	-35.05	peak
2	2638.000	46.07	-8.07	38.00	74.00	-36.00	peak
3	4591.000	43.06	-1.78	41.28	74.00	-32.72	peak
4	7183.000	38.35	6.01	44.36	74.00	-29.64	peak
5	7885.000	39.45	5.66	45.11	74.00	-28.89	peak
6	8911.000	38.79	9.11	47.90	74.00	-26.10	peak

Test Mode:	SubG.2GFSK.96kbps	Frequency(MHz):	927.7365
Polarity:	Horizontal	Test Voltage:	DC 5 V



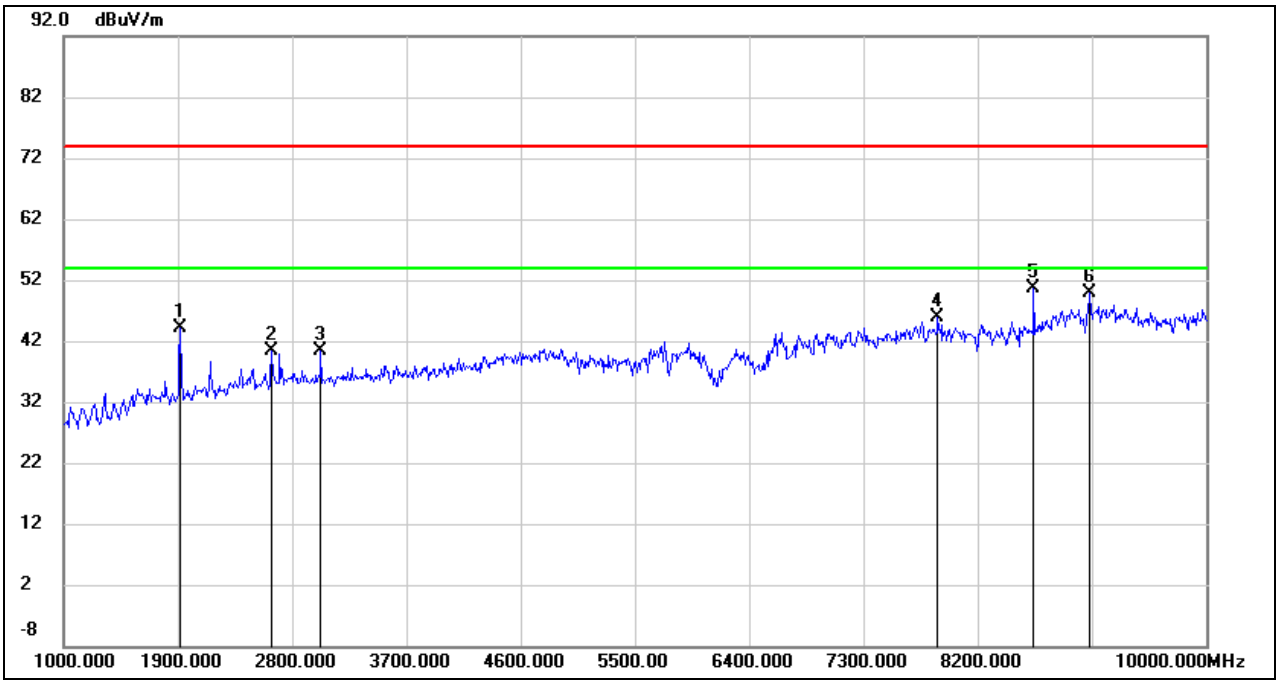
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1918.000	55.16	-11.33	43.83	74.00	-30.17	peak
2	2638.000	50.08	-8.07	42.01	74.00	-31.99	peak
3	4951.000	41.45	-0.34	41.11	74.00	-32.89	peak
4	7498.000	38.62	5.69	44.31	74.00	-29.69	peak
5	7831.000	39.14	5.67	44.81	74.00	-29.19	peak
6	9127.000	37.94	9.79	47.73	74.00	-26.27	peak

Test Mode:	SubG.2GFSK.96kbps	Frequency(MHz):	927.7365
Polarity:	Vertical	Test Voltage:	DC 5 V



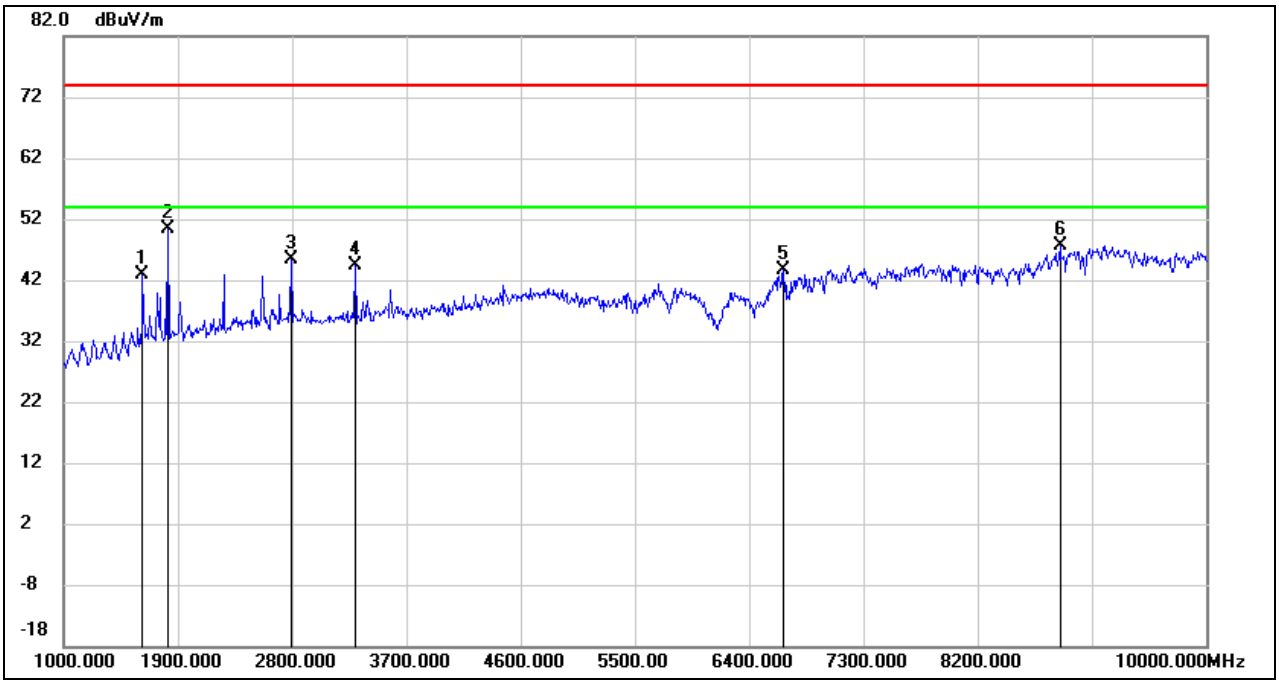
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1918.000	49.96	-11.33	38.63	74.00	-35.37	peak
2	4627.000	49.47	-1.63	47.84	74.00	-26.16	peak
3	4843.000	49.56	-0.78	48.78	74.00	-25.22	peak
4	6661.000	38.54	4.52	43.06	74.00	-30.94	peak
5	7849.000	39.51	5.67	45.18	74.00	-28.82	peak
6	9244.000	37.78	9.83	47.61	74.00	-26.39	peak

Test Mode:	SubG.2GFSK.150kbps	Frequency(MHz):	902.2565
Polarity:	Horizontal	Test Voltage:	DC 5 V



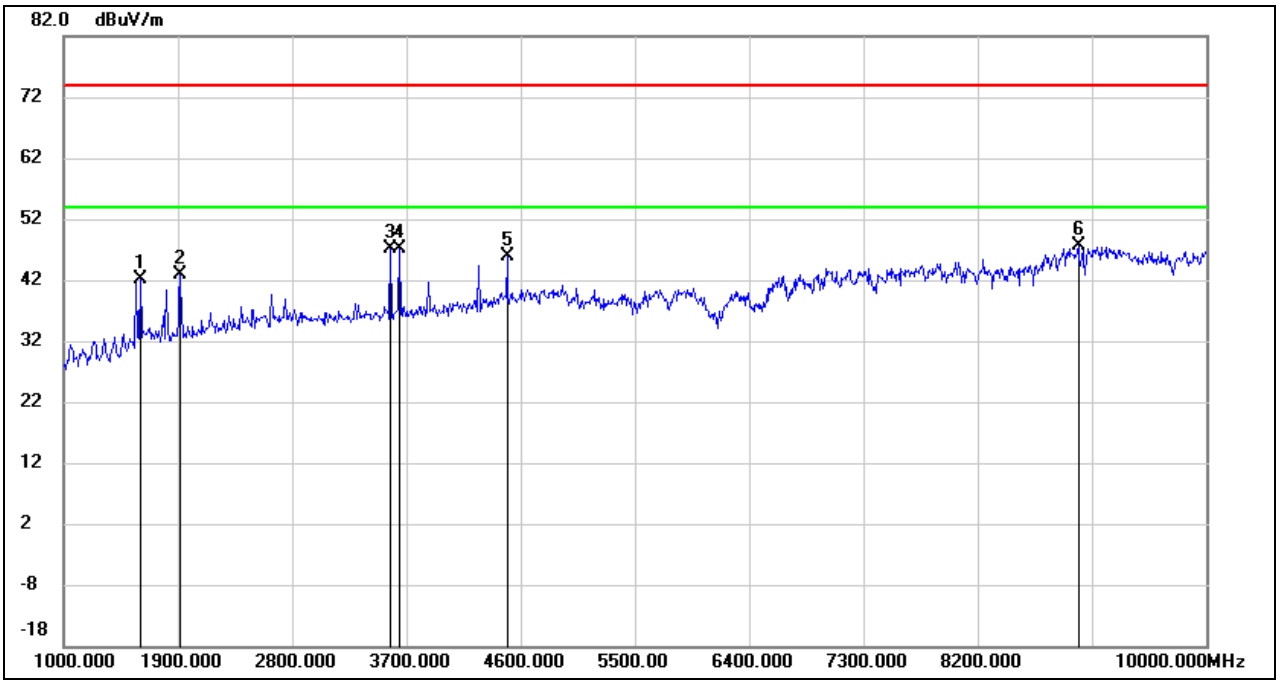
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1918.000	55.41	-11.33	44.08	74.00	-29.92	peak
2	2638.000	48.53	-8.07	40.46	74.00	-33.54	peak
3	3025.000	47.40	-6.92	40.48	74.00	-33.52	peak
4	7885.000	40.27	5.66	45.93	74.00	-28.07	peak
5	8641.000	43.39	7.23	50.62	74.00	-23.38	peak
6	9082.000	40.10	9.77	49.87	74.00	-24.13	peak

Test Mode:	SubG.2GFSK.150kbps	Frequency(MHz):	902.2565
Polarity:	Vertical	Test Voltage:	DC 5 V



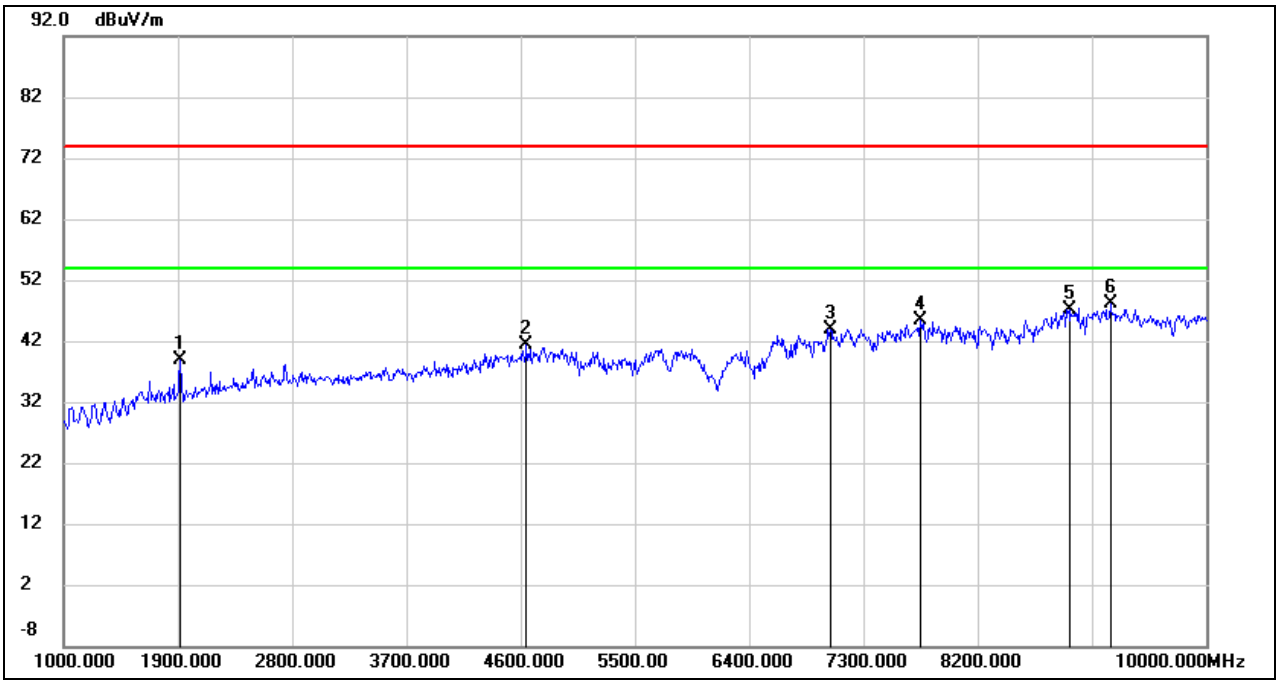
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1621.000	55.07	-12.31	42.76	74.00	-31.24	peak
2	1819.000	61.93	-11.65	50.28	74.00	-23.72	peak
3	2791.000	52.99	-7.62	45.37	74.00	-28.63	peak
4	3295.000	50.80	-6.32	44.48	74.00	-29.52	peak
5	6670.000	39.11	4.57	43.68	74.00	-30.32	peak
6	8848.000	38.98	8.67	47.65	74.00	-26.35	peak

Test Mode:	SubG.2GFSK.150kbps	Frequency(MHz):	914.9965
Polarity:	Horizontal	Test Voltage:	DC 5 V



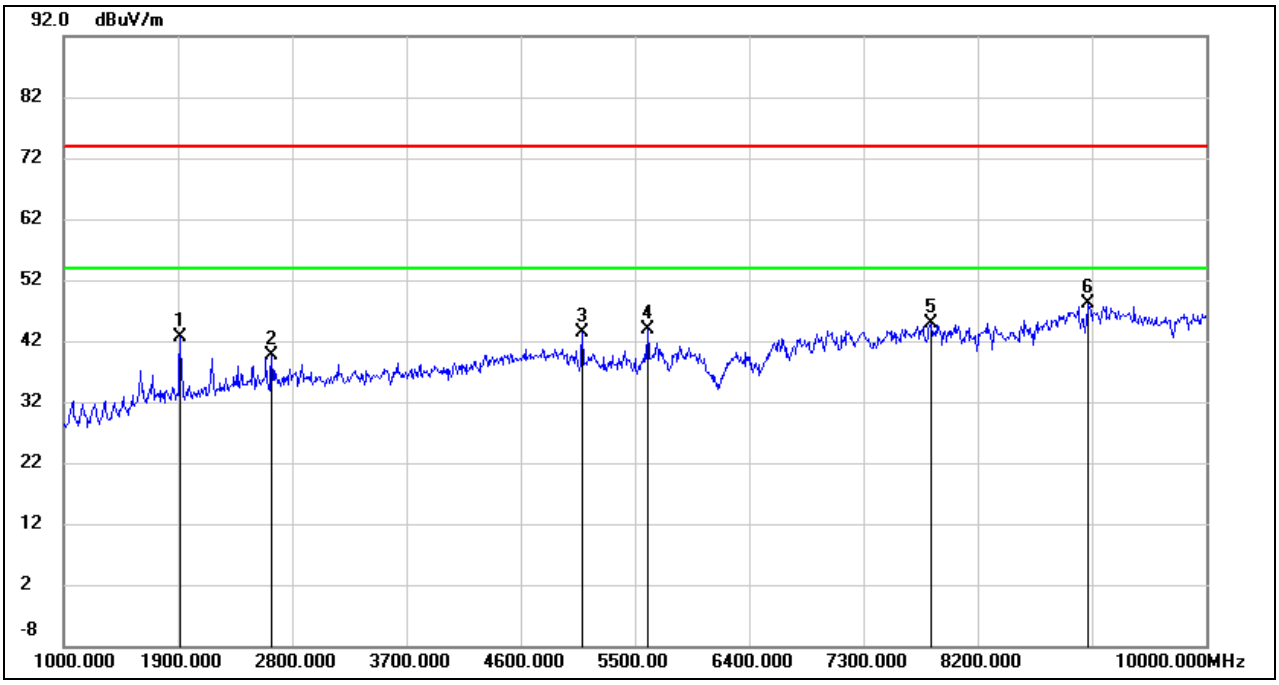
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1603.000	54.57	-12.37	42.20	74.00	-31.80	peak
2	1918.000	54.17	-11.33	42.84	74.00	-31.16	peak
3	3574.000	52.74	-5.65	47.09	74.00	-26.91	peak
4	3646.000	52.59	-5.45	47.14	74.00	-26.86	peak
5	4492.000	48.19	-2.19	46.00	74.00	-28.00	peak
6	8992.000	37.87	9.68	47.55	74.00	-26.45	peak

Test Mode:	SubG.2GFSK.150kbps	Frequency(MHz):	914.9965
Polarity:	Vertical	Test Voltage:	DC 5 V



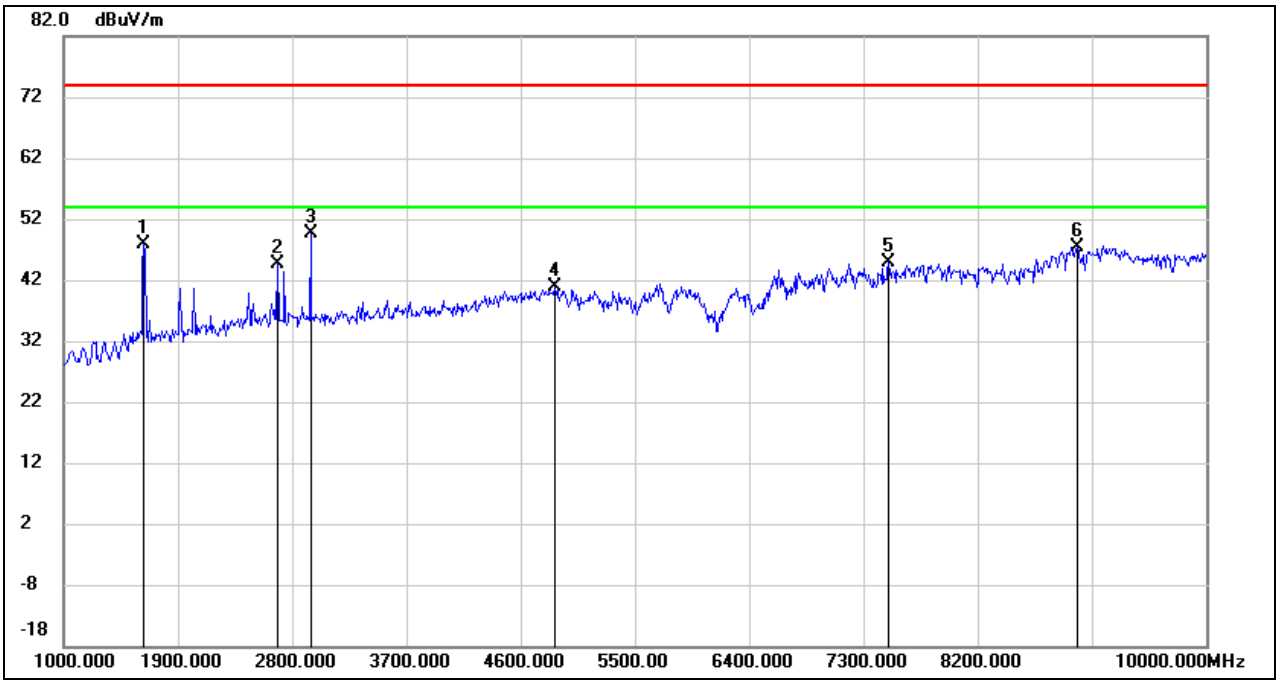
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1918.000	50.16	-11.33	38.83	74.00	-35.17	peak
2	4645.000	43.03	-1.57	41.46	74.00	-32.54	peak
3	7039.000	37.76	6.17	43.93	74.00	-30.07	peak
4	7750.000	39.69	5.67	45.36	74.00	-28.64	peak
5	8920.000	37.98	9.17	47.15	74.00	-26.85	peak
6	9244.000	38.20	9.83	48.03	74.00	-25.97	peak

Test Mode:	SubG.2GFSK.150kbps	Frequency(MHz):	927.7365
Polarity:	Horizontal	Test Voltage:	DC 5 V



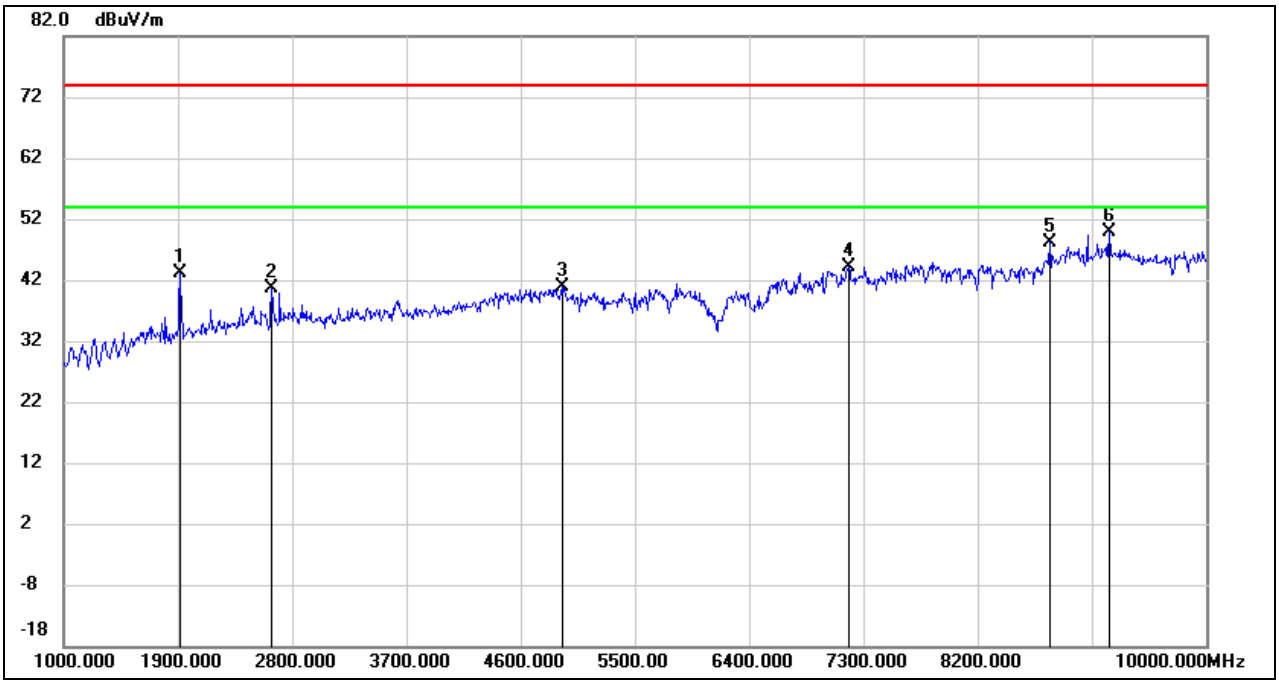
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1918.000	54.01	-11.33	42.68	74.00	-31.32	peak
2	2638.000	47.66	-8.07	39.59	74.00	-34.41	peak
3	5086.000	43.31	-0.05	43.26	74.00	-30.74	peak
4	5599.000	43.14	0.70	43.84	74.00	-30.16	peak
5	7831.000	39.17	5.67	44.84	74.00	-29.16	peak
6	9073.000	38.46	9.77	48.23	74.00	-25.77	peak

Test Mode:	SubG.2GFSK.150kbps	Frequency(MHz):	927.7365
Polarity:	Vertical	Test Voltage:	DC 5 V



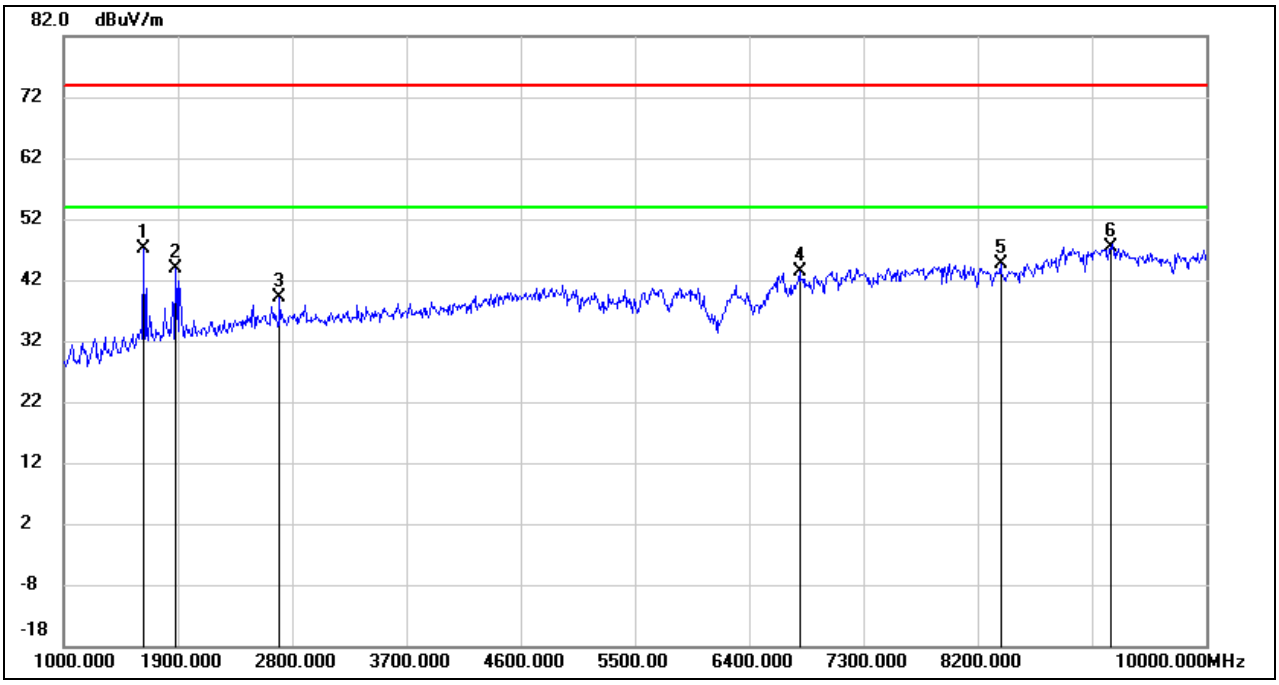
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1630.000	60.20	-12.28	47.92	74.00	-26.08	peak
2	2683.000	52.58	-7.93	44.65	74.00	-29.35	peak
3	2944.000	56.81	-7.15	49.66	74.00	-24.34	peak
4	4870.000	41.66	-0.66	41.00	74.00	-33.00	peak
5	7498.000	39.22	5.69	44.91	74.00	-29.09	peak
6	8983.000	37.71	9.62	47.33	74.00	-26.67	peak

Test Mode:	SubG.4GFSK.200kbps	Frequency(MHz):	902.354
Polarity:	Horizontal	Test Voltage:	DC 5 V



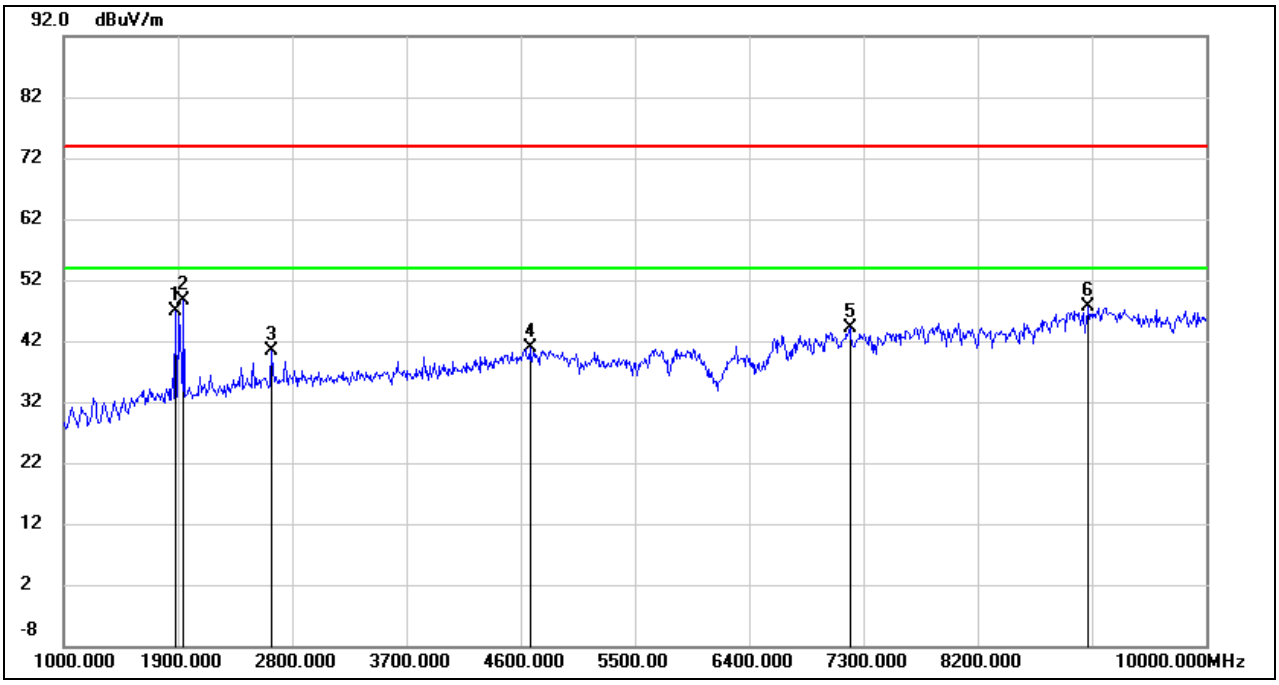
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1918.000	54.55	-11.33	43.22	74.00	-30.78	peak
2	2638.000	48.58	-8.07	40.51	74.00	-33.49	peak
3	4924.000	41.24	-0.45	40.79	74.00	-33.21	peak
4	7183.000	38.14	6.01	44.15	74.00	-29.85	peak
5	8767.000	40.15	8.10	48.25	74.00	-25.75	peak
6	9235.000	40.08	9.84	49.92	74.00	-24.08	peak

Test Mode:	SubG.4GFSK.200kbps	Frequency(MHz):	902.354
Polarity:	Vertical	Test Voltage:	DC 5 V



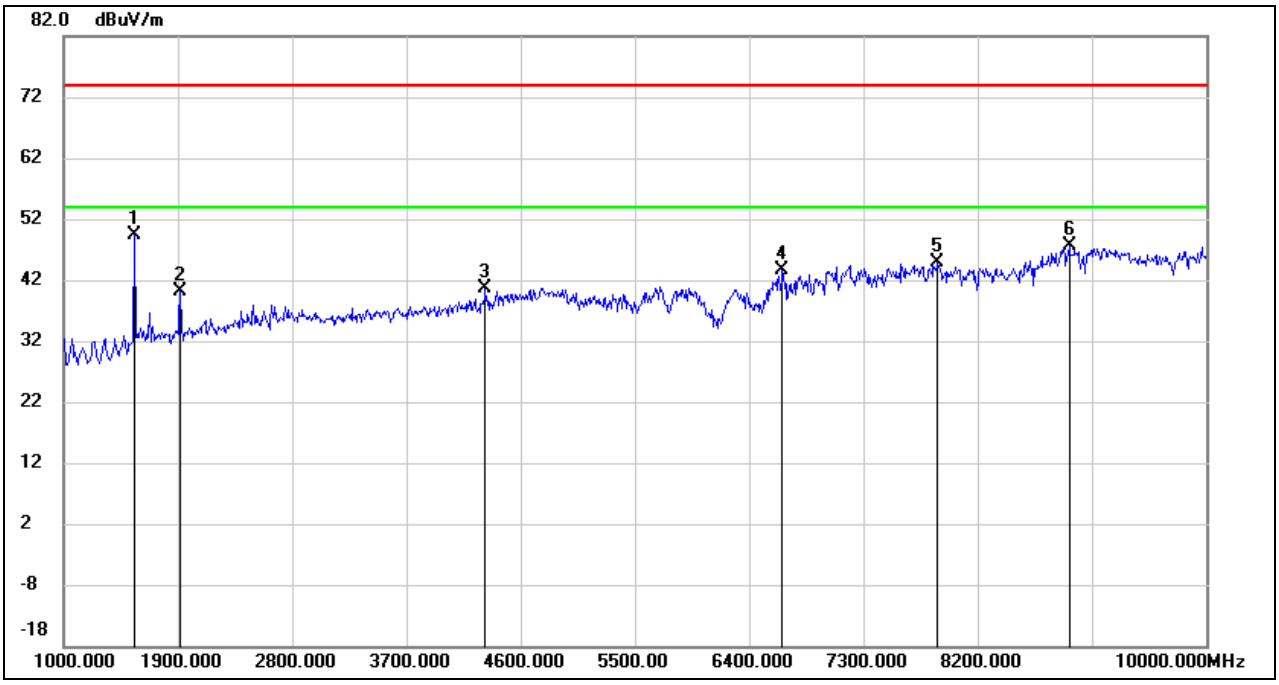
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1630.000	59.46	-12.28	47.18	74.00	-26.82	peak
2	1882.000	55.36	-11.45	43.91	74.00	-30.09	peak
3	2701.000	46.98	-7.89	39.09	74.00	-34.91	peak
4	6796.000	38.08	5.19	43.27	74.00	-30.73	peak
5	8380.000	38.43	6.09	44.52	74.00	-29.48	peak
6	9244.000	37.58	9.83	47.41	74.00	-26.59	peak

Test Mode:	SubG.4GFSK.200kbps	Frequency(MHz):	914.968
Polarity:	Horizontal	Test Voltage:	DC 5 V



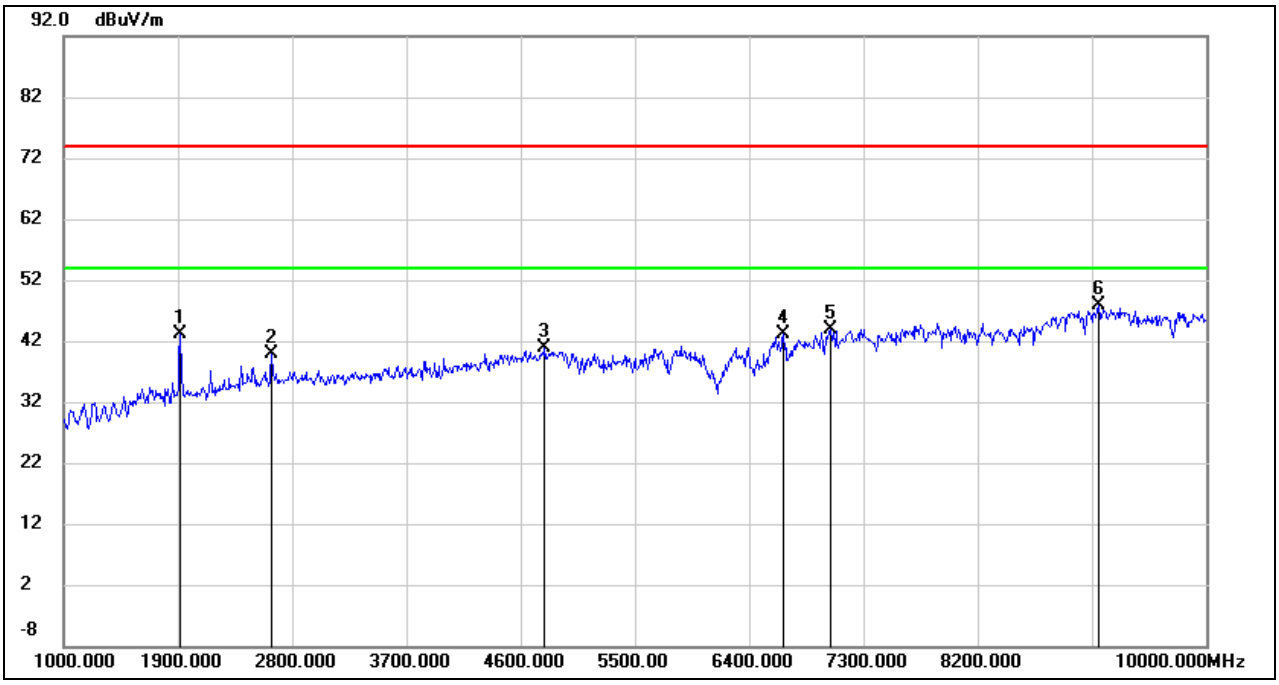
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1882.000	58.23	-11.45	46.78	74.00	-27.22	peak
2	1945.000	59.93	-11.24	48.69	74.00	-25.31	peak
3	2638.000	48.47	-8.07	40.40	74.00	-33.60	peak
4	4672.000	42.27	-1.46	40.81	74.00	-33.19	peak
5	7192.000	38.25	6.00	44.25	74.00	-29.75	peak
6	9073.000	37.84	9.77	47.61	74.00	-26.39	peak

Test Mode:	SubG.4GFSK.200kbps	Frequency(MHz):	914.968
Polarity:	Vertical	Test Voltage:	DC 5 V



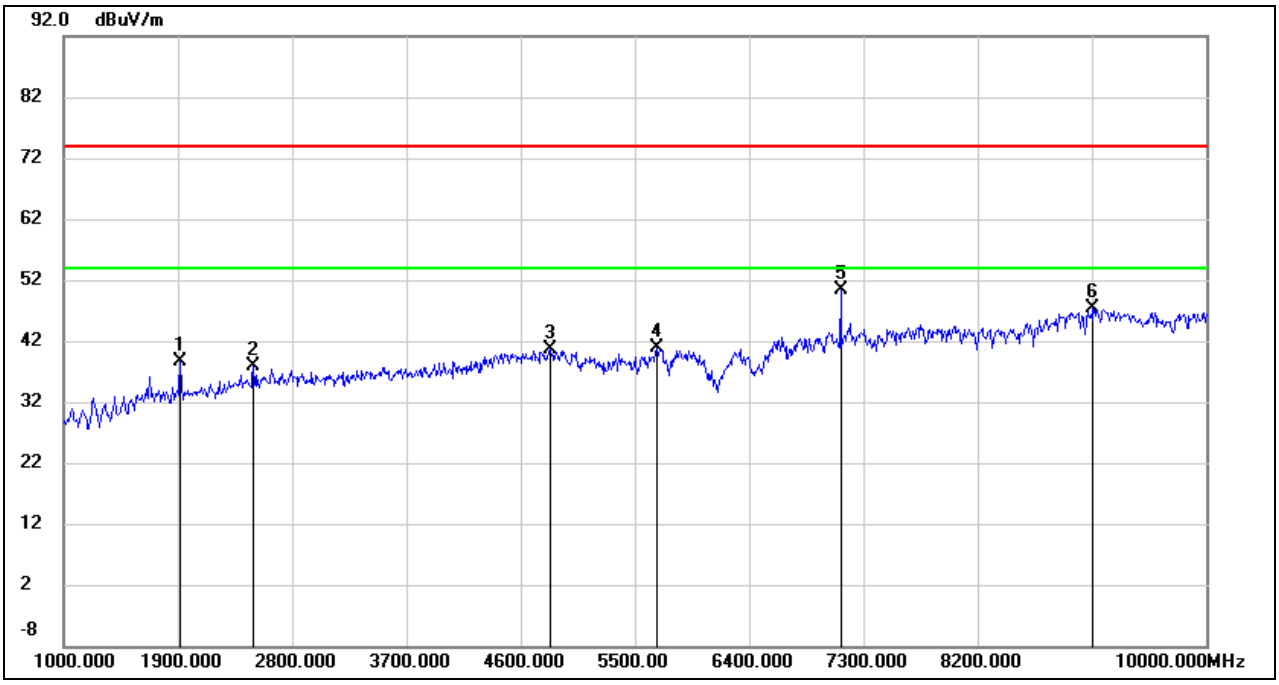
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1558.000	62.01	-12.52	49.49	74.00	-24.51	peak
2	1918.000	51.54	-11.33	40.21	74.00	-33.79	peak
3	4321.000	43.73	-2.98	40.75	74.00	-33.25	peak
4	6661.000	39.02	4.52	43.54	74.00	-30.46	peak
5	7885.000	39.30	5.66	44.96	74.00	-29.04	peak
6	8920.000	38.34	9.17	47.51	74.00	-26.49	peak

Test Mode:	SubG.4GFSK.200kbps	Frequency(MHz):	927.582
Polarity:	Horizontal	Test Voltage:	DC 5 V



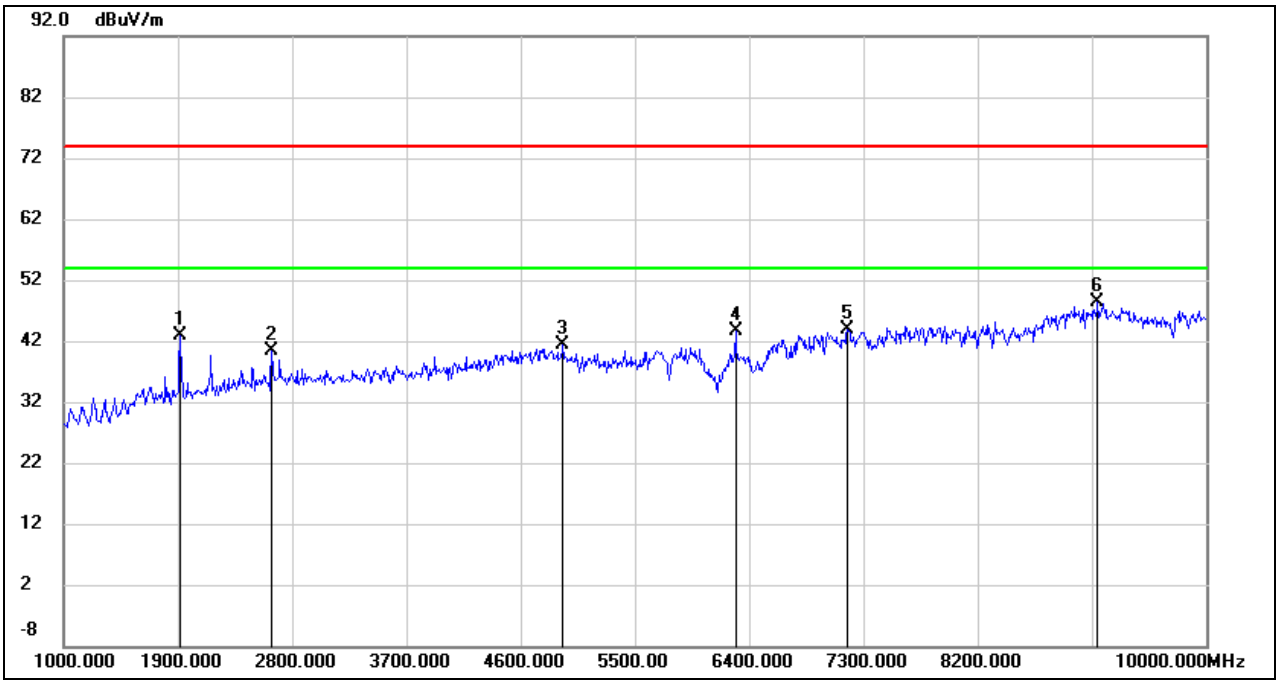
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1918.000	54.37	-11.33	43.04	74.00	-30.96	peak
2	2638.000	47.98	-8.07	39.91	74.00	-34.09	peak
3	4789.000	41.88	-1.00	40.88	74.00	-33.12	peak
4	6670.000	38.67	4.57	43.24	74.00	-30.76	peak
5	7039.000	37.70	6.17	43.87	74.00	-30.13	peak
6	9154.000	37.97	9.80	47.77	74.00	-26.23	peak

Test Mode:	SubG.4GFSK.200kbps	Frequency(MHz):	927.582
Polarity:	Vertical	Test Voltage:	DC 5 V



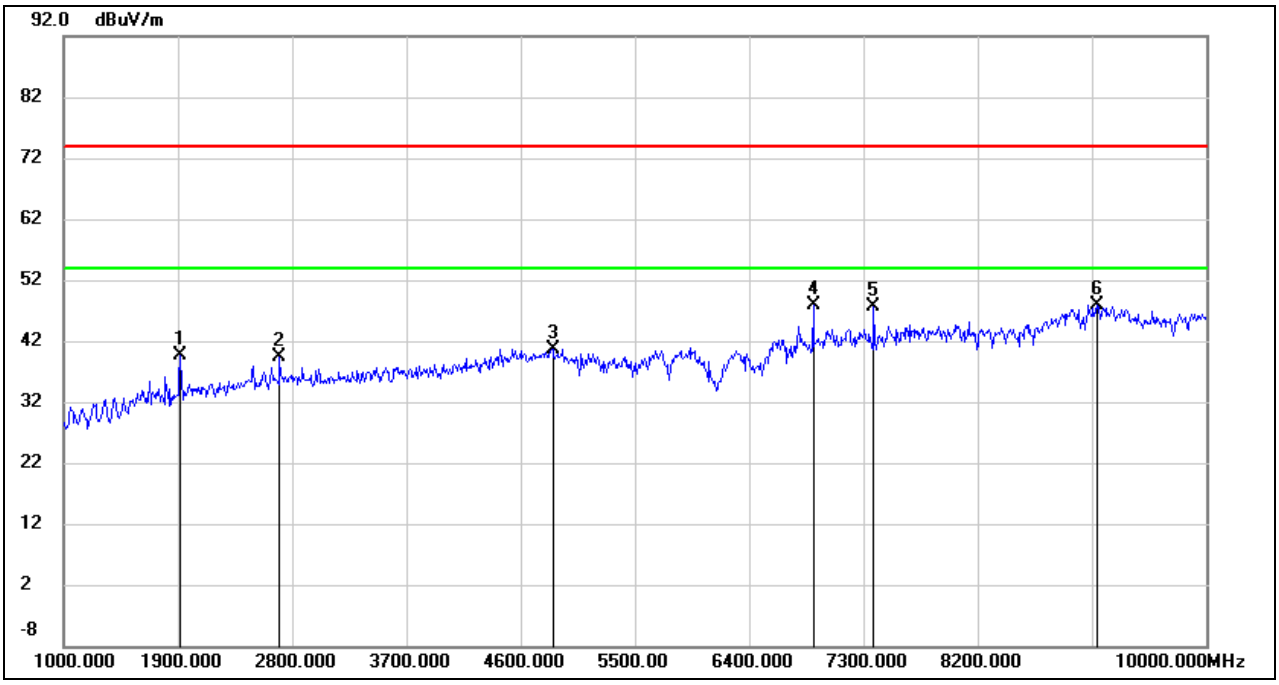
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1918.000	50.02	-11.33	38.69	74.00	-35.31	peak
2	2494.000	46.46	-8.52	37.94	74.00	-36.06	peak
3	4834.000	41.54	-0.81	40.73	74.00	-33.27	peak
4	5671.000	40.05	0.91	40.96	74.00	-33.04	peak
5	7120.000	44.23	6.08	50.31	74.00	-23.69	peak
6	9109.000	37.66	9.78	47.44	74.00	-26.56	peak

Test Mode:	SubG.2GFSK.250kbps	Frequency(MHz):	902.354
Polarity:	Horizontal	Test Voltage:	DC 5 V



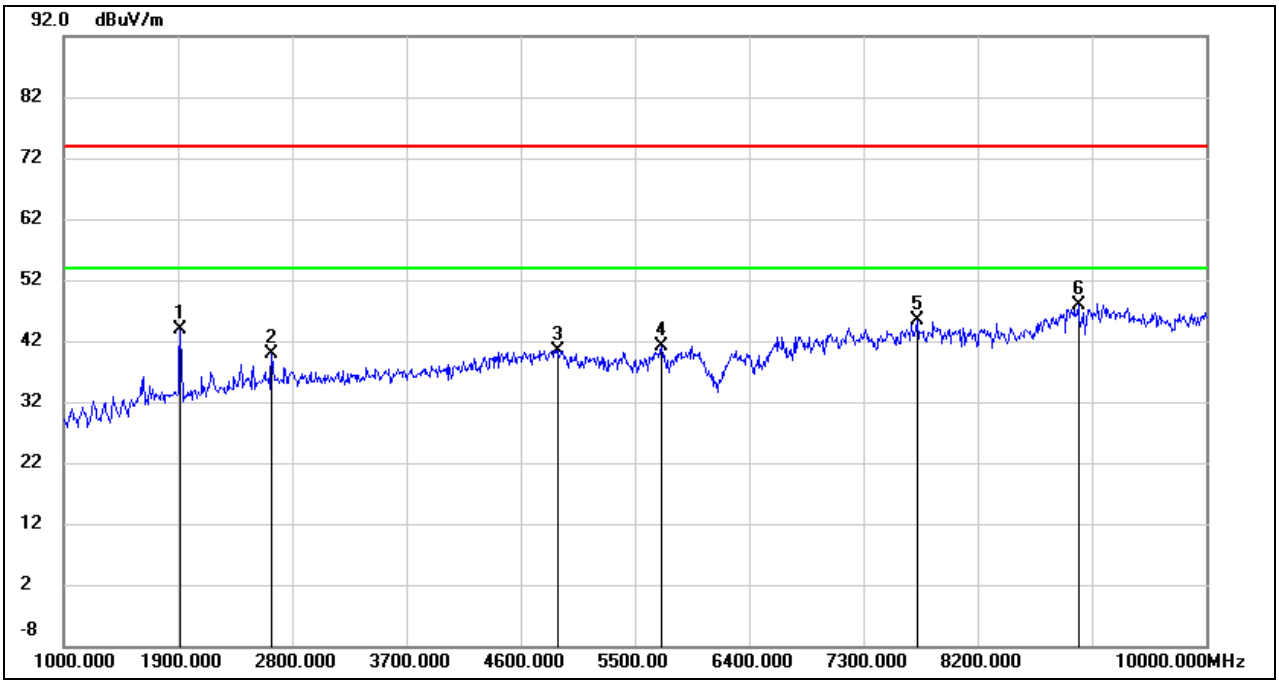
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1918.000	54.24	-11.33	42.91	74.00	-31.09	peak
2	2638.000	48.49	-8.07	40.42	74.00	-33.58	peak
3	4933.000	41.85	-0.42	41.43	74.00	-32.57	peak
4	6292.000	40.75	2.95	43.70	74.00	-30.30	peak
5	7174.000	37.97	6.02	43.99	74.00	-30.01	peak
6	9145.000	38.51	9.80	48.31	74.00	-25.69	peak

Test Mode:	SubG.2GFSK.250kbps	Frequency(MHz):	902.354
Polarity:	Vertical	Test Voltage:	DC 5 V



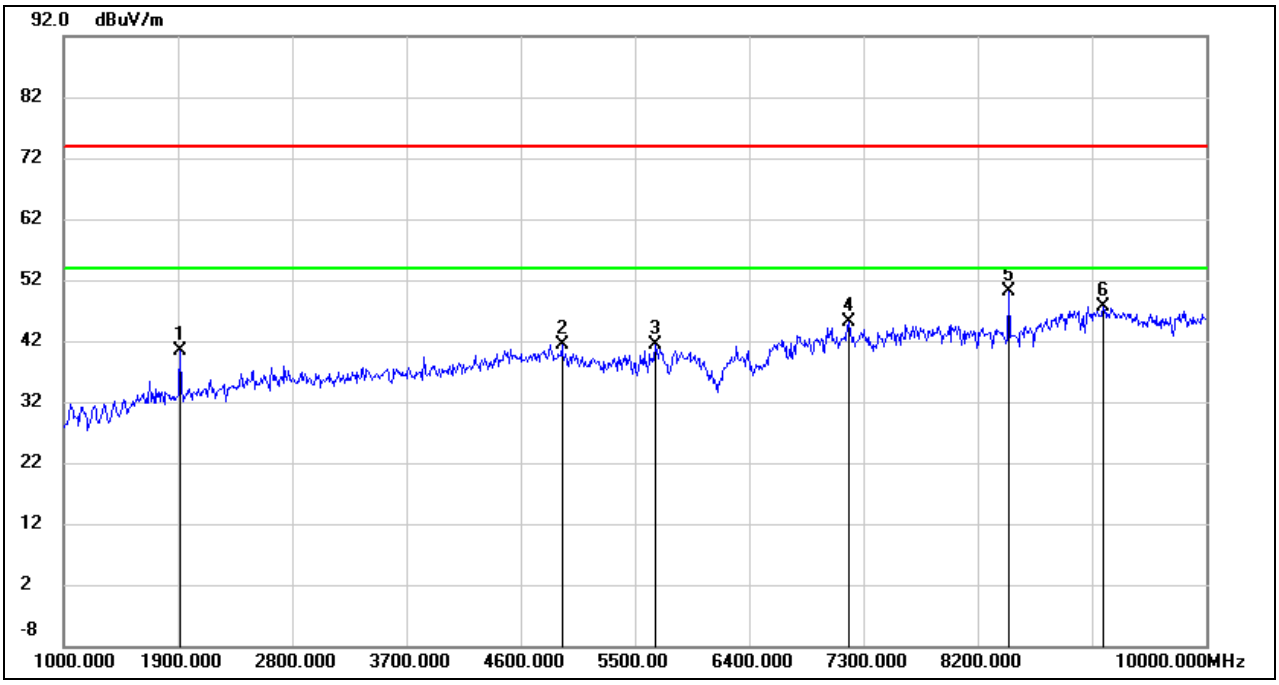
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1918.000	51.06	-11.33	39.73	74.00	-34.27	peak
2	2701.000	47.34	-7.89	39.45	74.00	-34.55	peak
3	4852.000	41.41	-0.74	40.67	74.00	-33.33	peak
4	6904.000	42.20	5.72	47.92	74.00	-26.08	peak
5	7381.000	41.72	5.81	47.53	74.00	-26.47	peak
6	9136.000	38.08	9.80	47.88	74.00	-26.12	peak

Test Mode:	SubG.2GFSK.250kbps	Frequency(MHz):	914.73
Polarity:	Horizontal	Test Voltage:	DC 5 V



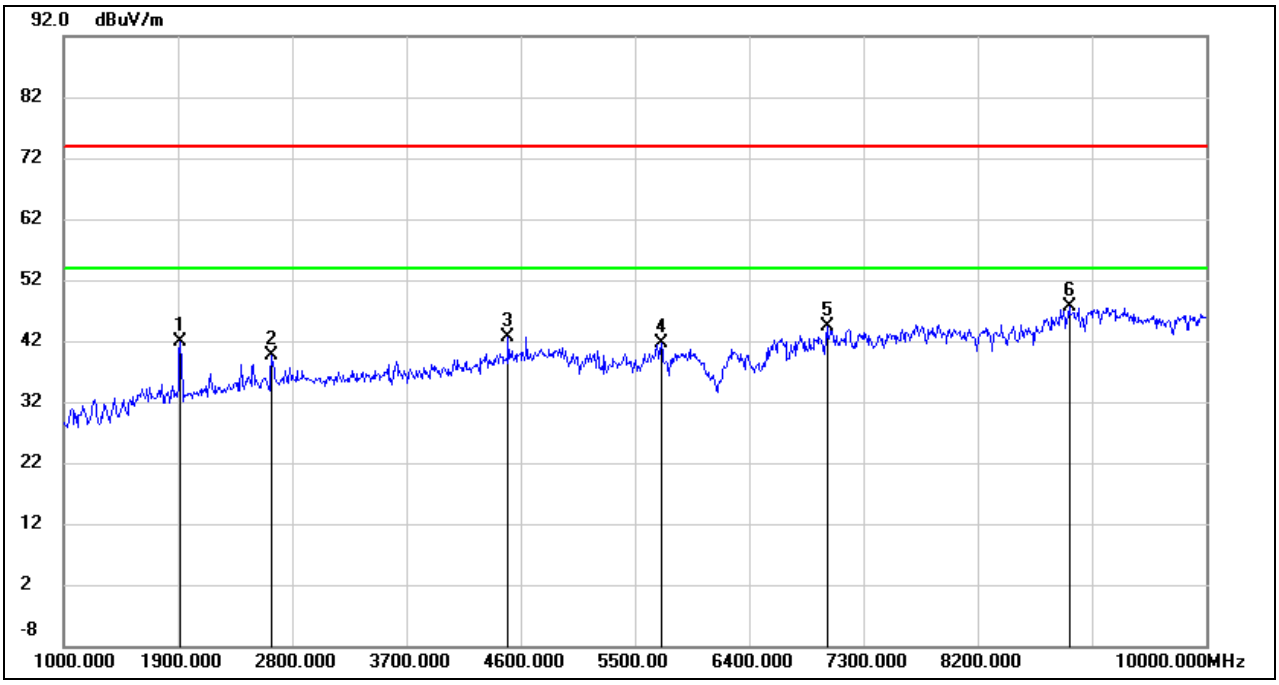
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1918.000	55.14	-11.33	43.81	74.00	-30.19	peak
2	2638.000	47.97	-8.07	39.90	74.00	-34.10	peak
3	4897.000	41.04	-0.55	40.49	74.00	-33.51	peak
4	5707.000	40.22	1.01	41.23	74.00	-32.77	peak
5	7723.000	39.62	5.67	45.29	74.00	-28.71	peak
6	8992.000	38.13	9.68	47.81	74.00	-26.19	peak

Test Mode:	SubG.2GFSK.250kbps	Frequency(MHz):	914.73
Polarity:	Vertical	Test Voltage:	DC 5 V



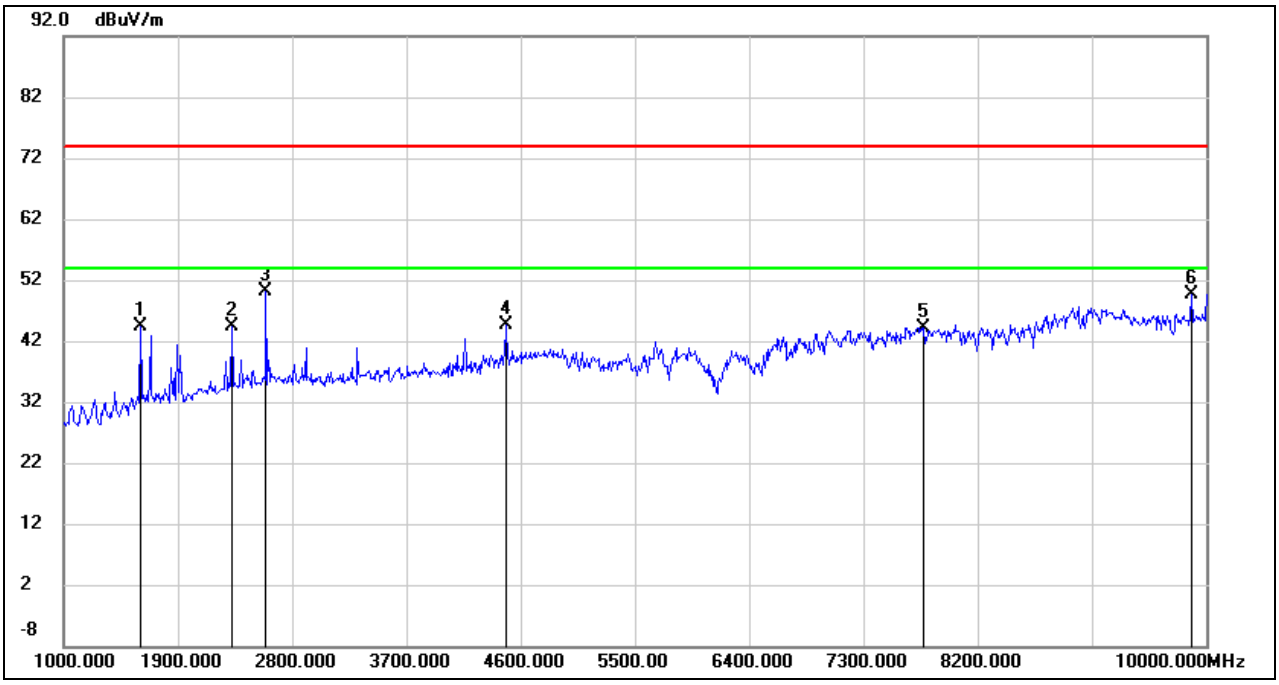
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1918.000	51.63	-11.33	40.30	74.00	-33.70	peak
2	4924.000	41.83	-0.45	41.38	74.00	-32.62	peak
3	5662.000	40.59	0.89	41.48	74.00	-32.52	peak
4	7183.000	39.05	6.01	45.06	74.00	-28.94	peak
5	8443.000	44.08	6.16	50.24	74.00	-23.76	peak
6	9190.000	37.78	9.81	47.59	74.00	-26.41	peak

Test Mode:	SubG.2GFSK.250kbps	Frequency(MHz):	927.582
Polarity:	Horizontal	Test Voltage:	DC 5 V



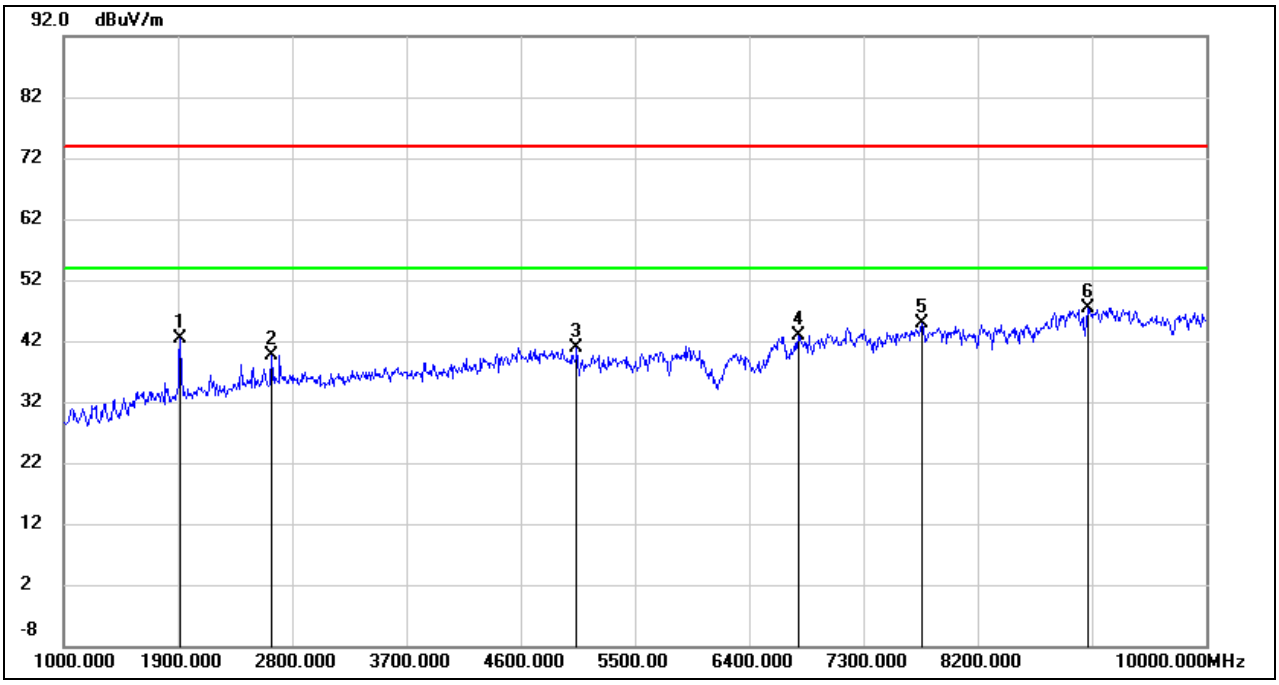
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1918.000	53.16	-11.33	41.83	74.00	-32.17	peak
2	2638.000	47.72	-8.07	39.65	74.00	-34.35	peak
3	4501.000	44.86	-2.14	42.72	74.00	-31.28	peak
4	5707.000	40.50	1.01	41.51	74.00	-32.49	peak
5	7012.000	38.15	6.18	44.33	74.00	-29.67	peak
6	8920.000	38.37	9.17	47.54	74.00	-26.46	peak

Test Mode:	SubG.2GFSK.250kbps	Frequency(MHz):	927.582
Polarity:	Vertical	Test Voltage:	DC 5 V



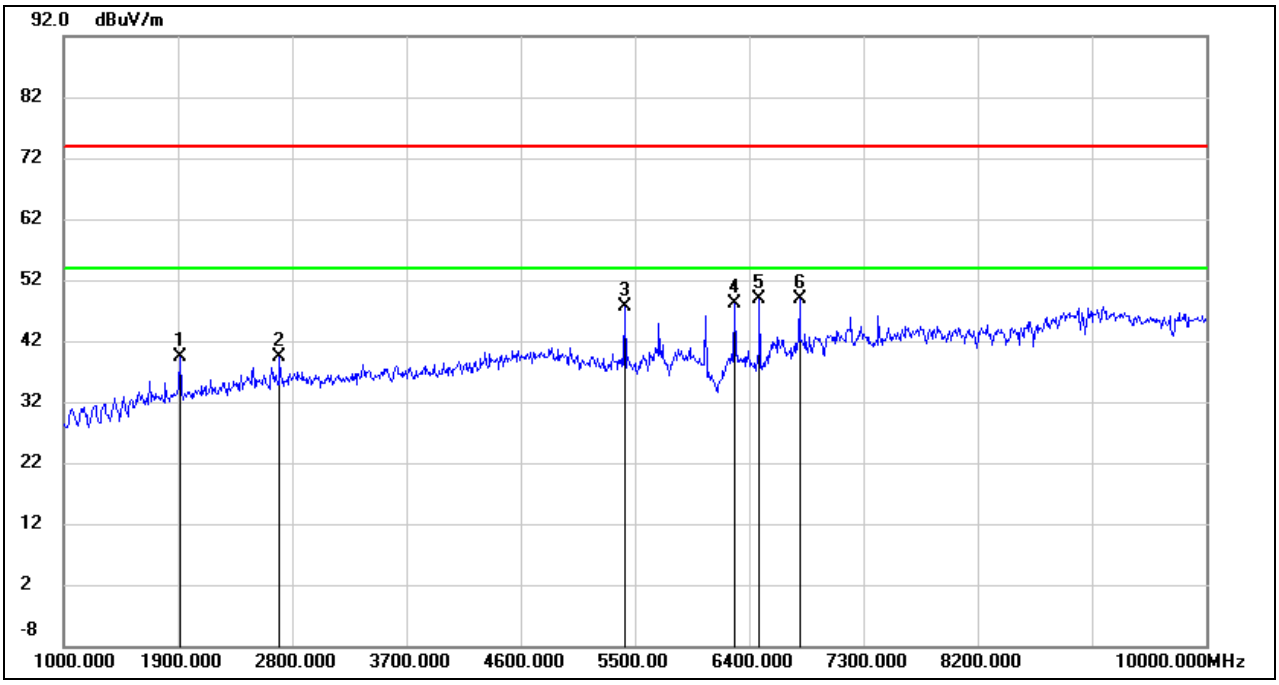
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1603.000	56.84	-12.37	44.47	74.00	-29.53	peak
2	2323.000	53.76	-9.40	44.36	74.00	-29.64	peak
3	2593.000	58.28	-8.20	50.08	74.00	-23.92	peak
4	4483.000	46.77	-2.21	44.56	74.00	-29.44	peak
5	7777.000	38.54	5.67	44.21	74.00	-29.79	peak
6	9883.000	38.72	10.87	49.59	74.00	-24.41	peak

Test Mode:	SubG.4GFSK.250kbps	Frequency(MHz):	902.2565
Polarity:	Horizontal	Test Voltage:	DC 5 V



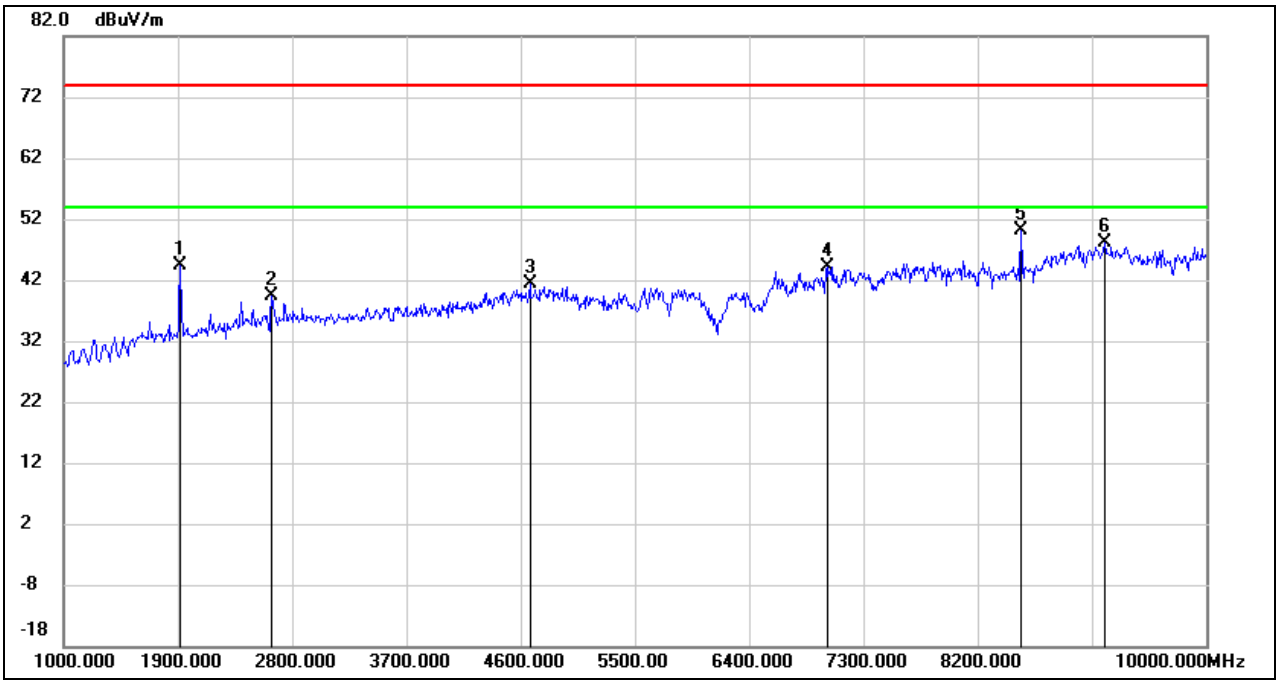
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1918.000	53.78	-11.33	42.45	74.00	-31.55	peak
2	2638.000	47.72	-8.07	39.65	74.00	-34.35	peak
3	5041.000	41.08	-0.11	40.97	74.00	-33.03	peak
4	6787.000	37.72	5.14	42.86	74.00	-31.14	peak
5	7759.000	39.19	5.67	44.86	74.00	-29.14	peak
6	9073.000	37.56	9.77	47.33	74.00	-26.67	peak

Test Mode:	SubG.4GFSK.250kbps	Frequency(MHz):	902.2565
Polarity:	Vertical	Test Voltage:	DC 5 V



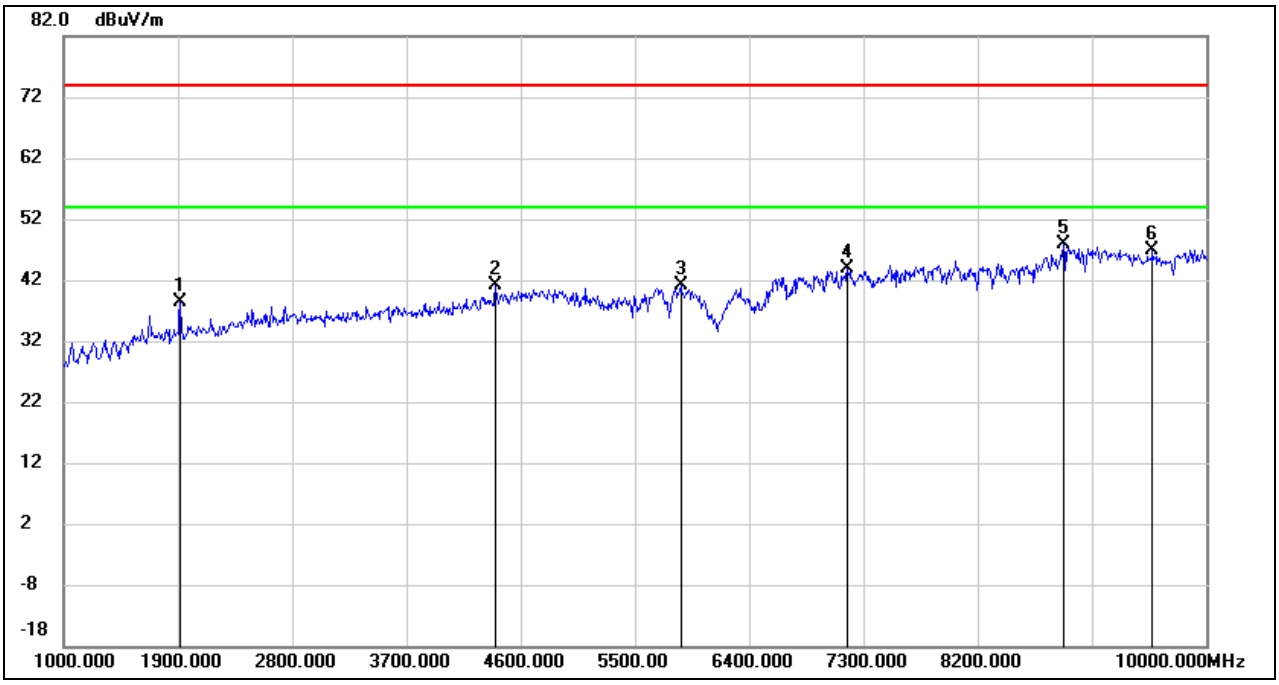
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1918.000	50.66	-11.33	39.33	74.00	-34.67	peak
2	2701.000	47.30	-7.89	39.41	74.00	-34.59	peak
3	5419.000	47.42	0.33	47.75	74.00	-26.25	peak
4	6283.000	45.29	2.91	48.20	74.00	-25.80	peak
5	6481.000	45.19	3.65	48.84	74.00	-25.16	peak
6	6796.000	43.63	5.19	48.82	74.00	-25.18	peak

Test Mode:	SubG.4GFSK.250kbps	Frequency(MHz):	914.8565
Polarity:	Horizontal	Test Voltage:	DC 5 V



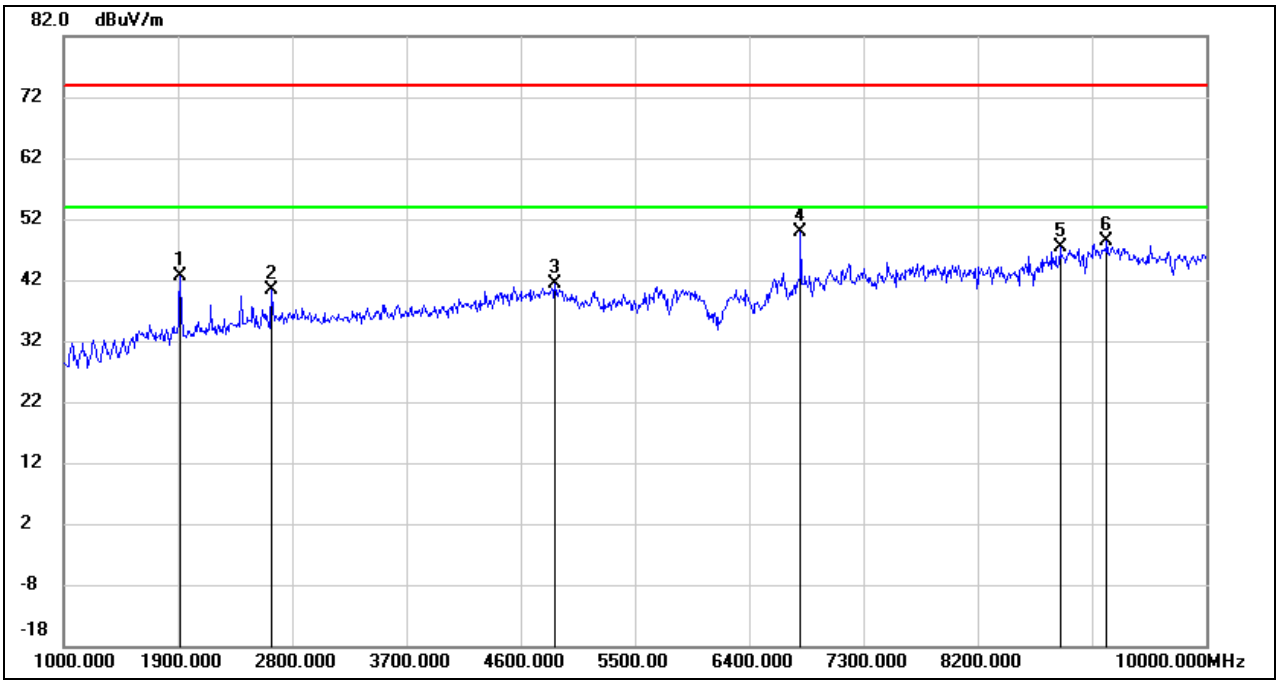
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1918.000	55.63	-11.33	44.30	74.00	-29.70	peak
2	2638.000	47.41	-8.07	39.34	74.00	-34.66	peak
3	4672.000	42.93	-1.46	41.47	74.00	-32.53	peak
4	7012.000	37.93	6.18	44.11	74.00	-29.89	peak
5	8542.000	43.63	6.53	50.16	74.00	-23.84	peak
6	9199.000	38.42	9.82	48.24	74.00	-25.76	peak

Test Mode:	SubG.4GFSK.250kbps	Frequency(MHz):	914.8565
Polarity:	Vertical	Test Voltage:	DC 5 V



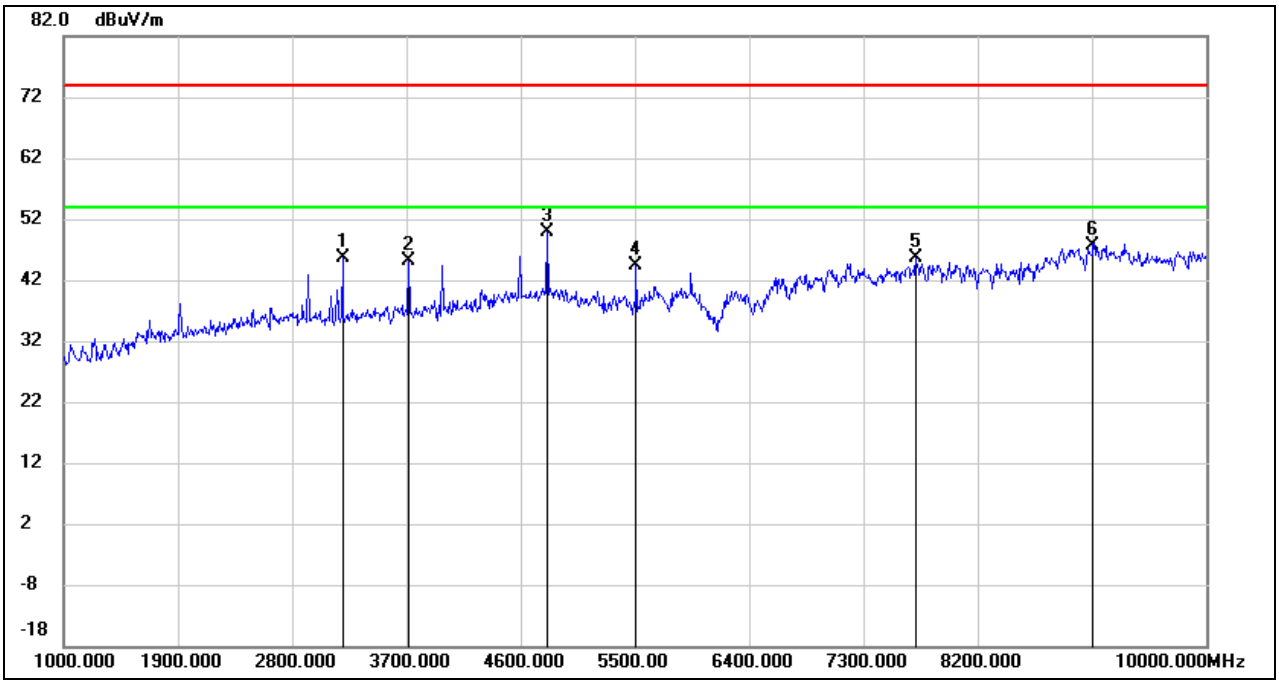
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1918.000	49.77	-11.33	38.44	74.00	-35.56	peak
2	4402.000	43.71	-2.60	41.11	74.00	-32.89	peak
3	5860.000	39.76	1.45	41.21	74.00	-32.79	peak
4	7174.000	37.75	6.02	43.77	74.00	-30.23	peak
5	8875.000	38.97	8.86	47.83	74.00	-26.17	peak
6	9577.000	36.77	10.13	46.90	74.00	-27.10	peak

Test Mode:	SubG.4GFSK.250kbps	Frequency(MHz):	927.7365
Polarity:	Horizontal	Test Voltage:	DC 5 V



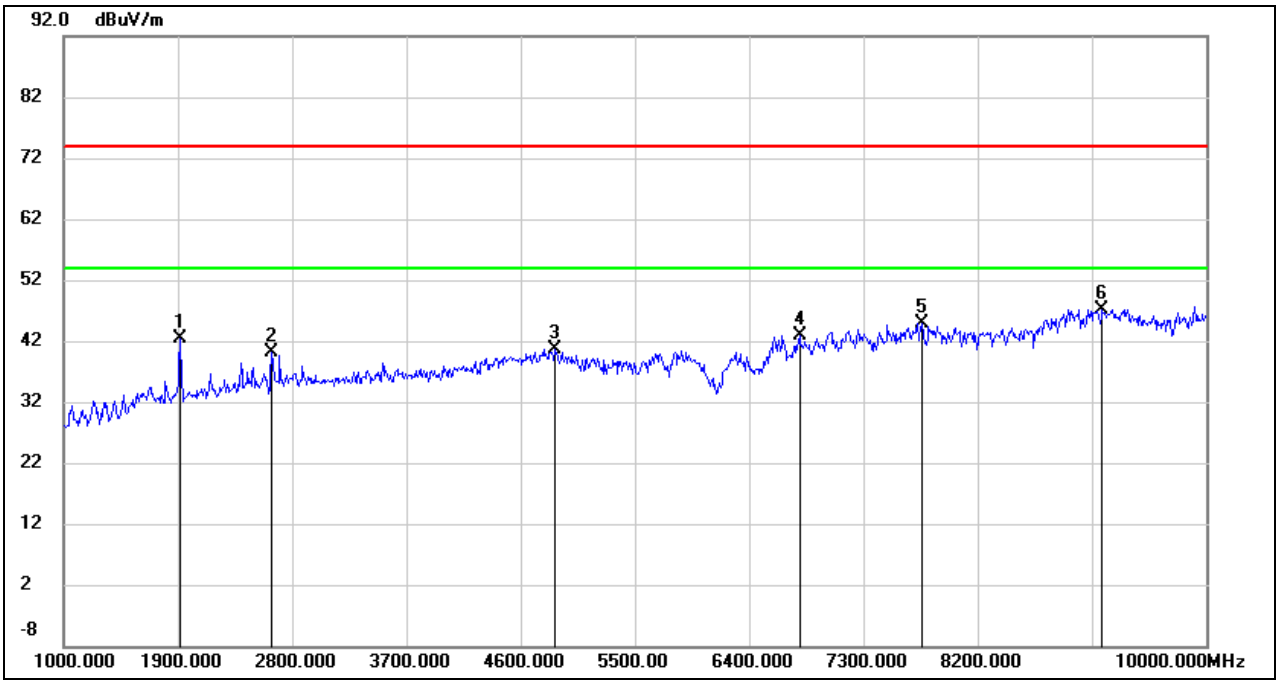
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1918.000	54.07	-11.33	42.74	74.00	-31.26	peak
2	2638.000	48.54	-8.07	40.47	74.00	-33.53	peak
3	4870.000	42.09	-0.66	41.43	74.00	-32.57	peak
4	6805.000	44.70	5.23	49.93	74.00	-24.07	peak
5	8848.000	38.81	8.67	47.48	74.00	-26.52	peak
6	9217.000	38.50	9.83	48.33	74.00	-25.67	peak

Test Mode:	SubG.4GFSK.250kbps	Frequency(MHz):	927.7365
Polarity:	Vertical	Test Voltage:	DC 5 V



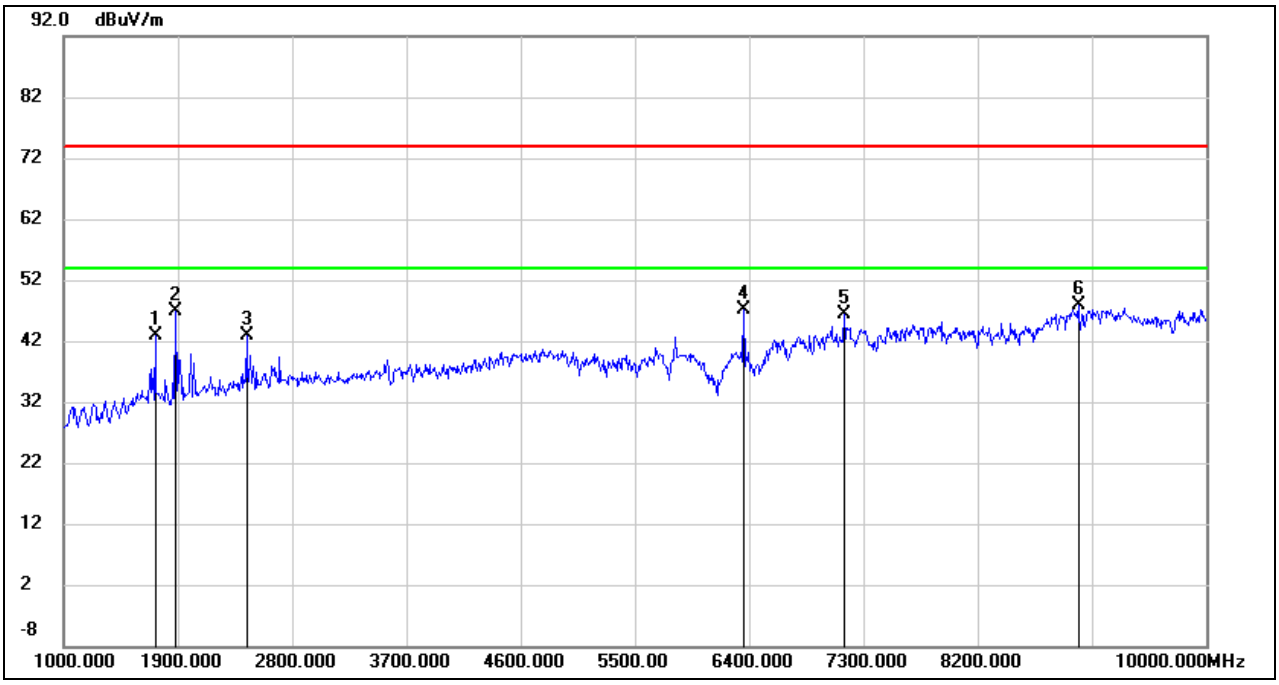
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	3196.000	52.14	-6.54	45.60	74.00	-28.40	peak
2	3718.000	50.27	-5.25	45.02	74.00	-28.98	peak
3	4807.000	50.83	-0.92	49.91	74.00	-24.09	peak
4	5509.000	43.85	0.45	44.30	74.00	-29.70	peak
5	7714.000	40.00	5.68	45.68	74.00	-28.32	peak
6	9109.000	37.84	9.78	47.62	74.00	-26.38	peak

Test Mode:	SubG.4GFSK.350kbps	Frequency(MHz):	902.3245
Polarity:	Horizontal	Test Voltage:	DC 5 V



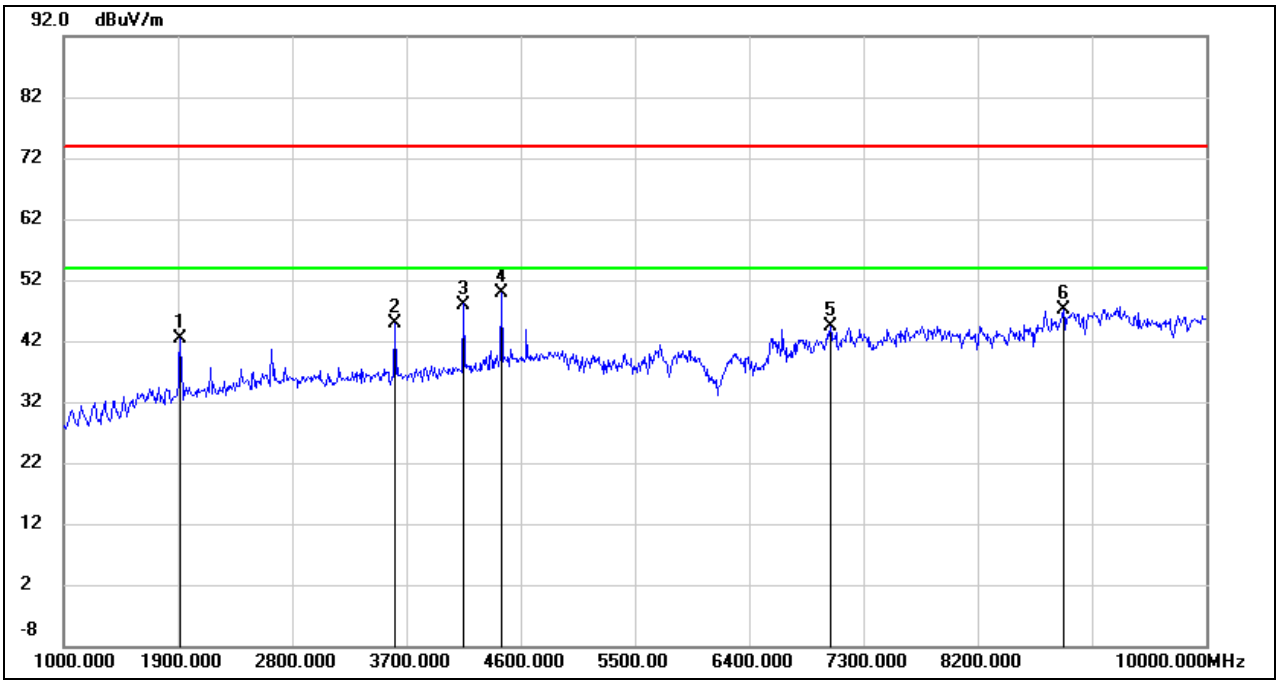
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1918.000	53.60	-11.33	42.27	74.00	-31.73	peak
2	2638.000	48.27	-8.07	40.20	74.00	-33.80	peak
3	4870.000	41.34	-0.66	40.68	74.00	-33.32	peak
4	6796.000	37.63	5.19	42.82	74.00	-31.18	peak
5	7759.000	39.26	5.67	44.93	74.00	-29.07	peak
6	9181.000	37.40	9.81	47.21	74.00	-26.79	peak

Test Mode:	SubG.4GFSK.350kbps	Frequency(MHz):	902.3245
Polarity:	Vertical	Test Voltage:	DC 5 V



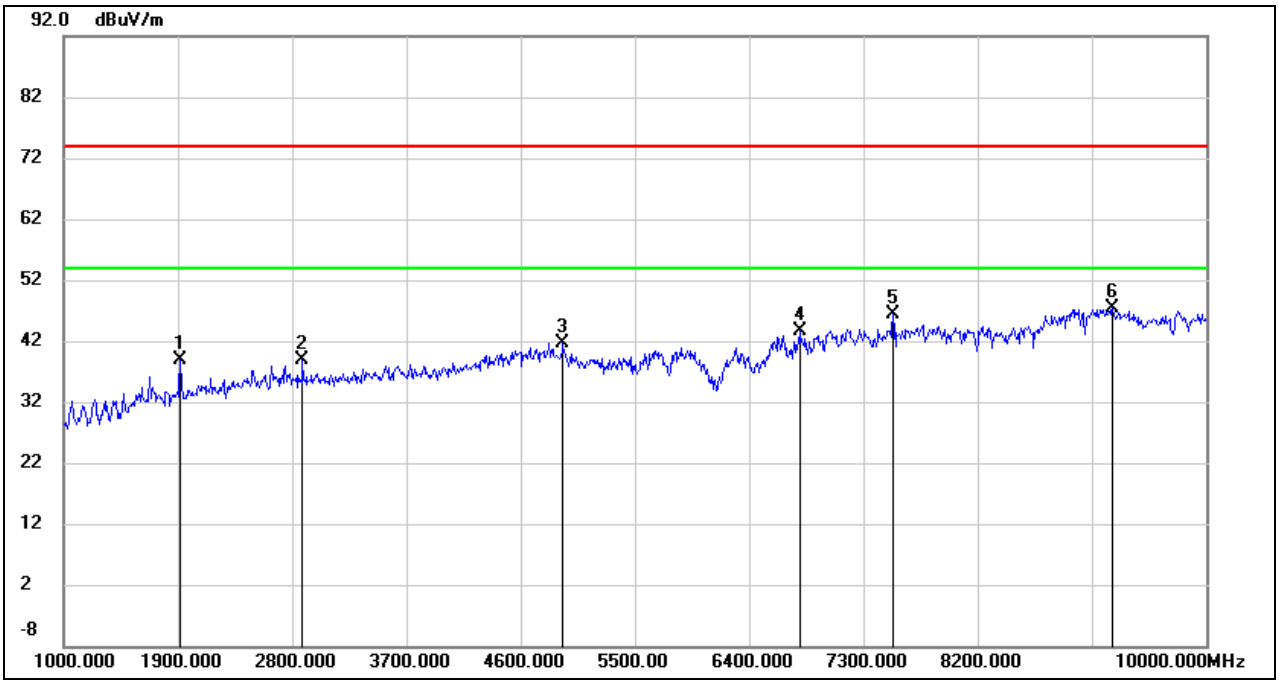
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1720.000	54.85	-11.98	42.87	74.00	-31.13	peak
2	1882.000	58.34	-11.45	46.89	74.00	-27.11	peak
3	2440.000	51.73	-8.80	42.93	74.00	-31.07	peak
4	6355.000	43.98	3.18	47.16	74.00	-26.84	peak
5	7147.000	40.43	6.06	46.49	74.00	-27.51	peak
6	8992.000	38.25	9.68	47.93	74.00	-26.07	peak

Test Mode:	SubG.4GFSK.350kbps	Frequency(MHz):	914.8795
Polarity:	Horizontal	Test Voltage:	DC 5 V



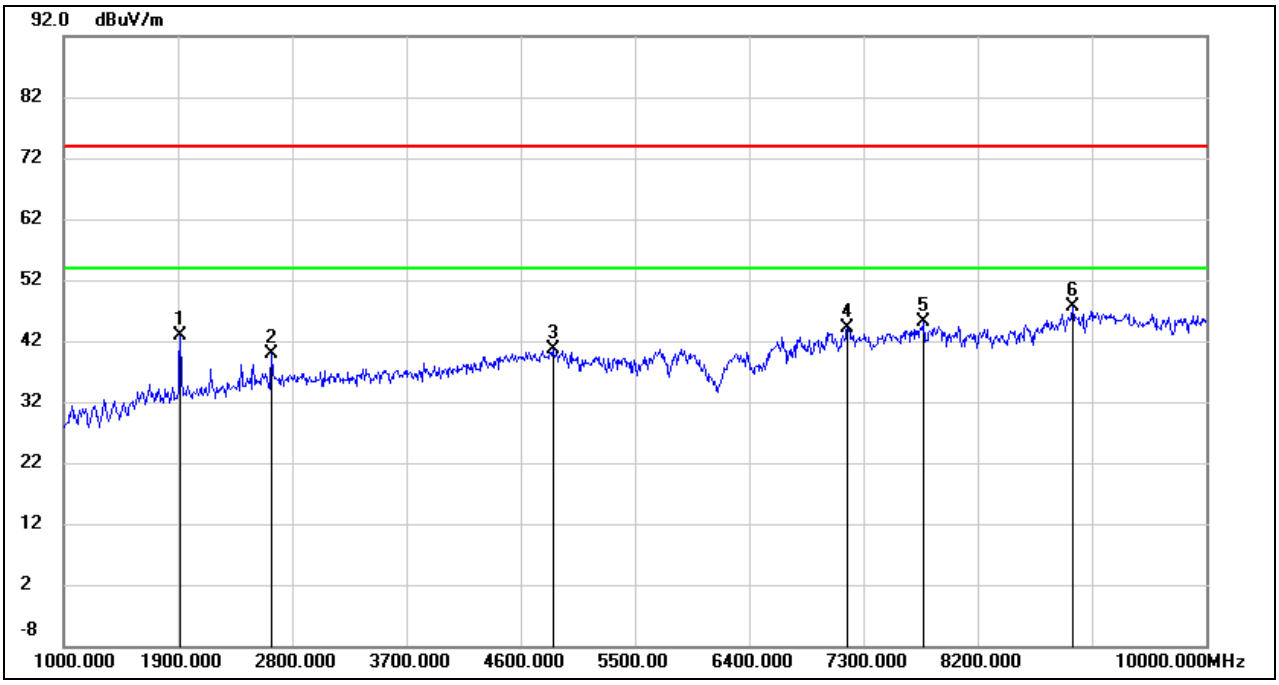
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1918.000	53.80	-11.33	42.47	74.00	-31.53	peak
2	3610.000	50.36	-5.55	44.81	74.00	-29.19	peak
3	4150.000	51.77	-3.77	48.00	74.00	-26.00	peak
4	4447.000	52.19	-2.40	49.79	74.00	-24.21	peak
5	7039.000	38.25	6.17	44.42	74.00	-29.58	peak
6	8875.000	38.37	8.86	47.23	74.00	-26.77	peak

Test Mode:	SubG.4GFSK.350kbps	Frequency(MHz):	914.8795
Polarity:	Vertical	Test Voltage:	DC 5 V



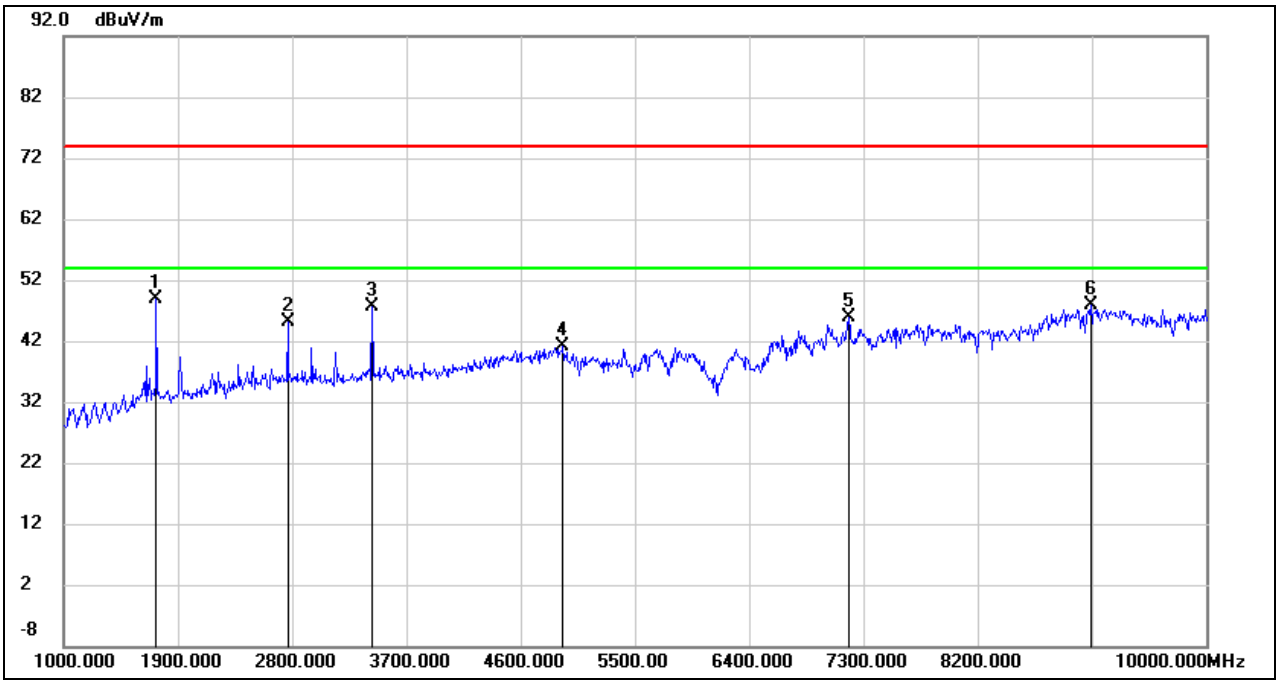
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1918.000	50.22	-11.33	38.89	74.00	-35.11	peak
2	2881.000	46.21	-7.33	38.88	74.00	-35.12	peak
3	4933.000	41.98	-0.42	41.56	74.00	-32.44	peak
4	6796.000	38.41	5.19	43.60	74.00	-30.40	peak
5	7534.000	40.78	5.69	46.47	74.00	-27.53	peak
6	9262.000	37.55	9.84	47.39	74.00	-26.61	peak

Test Mode:	SubG.4GFSK.350kbps	Frequency(MHz):	927.4345
Polarity:	Horizontal	Test Voltage:	DC 5 V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1918.000	54.24	-11.33	42.91	74.00	-31.09	peak
2	2638.000	48.01	-8.07	39.94	74.00	-34.06	peak
3	4852.000	41.29	-0.74	40.55	74.00	-33.45	peak
4	7174.000	38.05	6.02	44.07	74.00	-29.93	peak
5	7777.000	39.34	5.67	45.01	74.00	-28.99	peak
6	8947.000	38.25	9.37	47.62	74.00	-26.38	peak

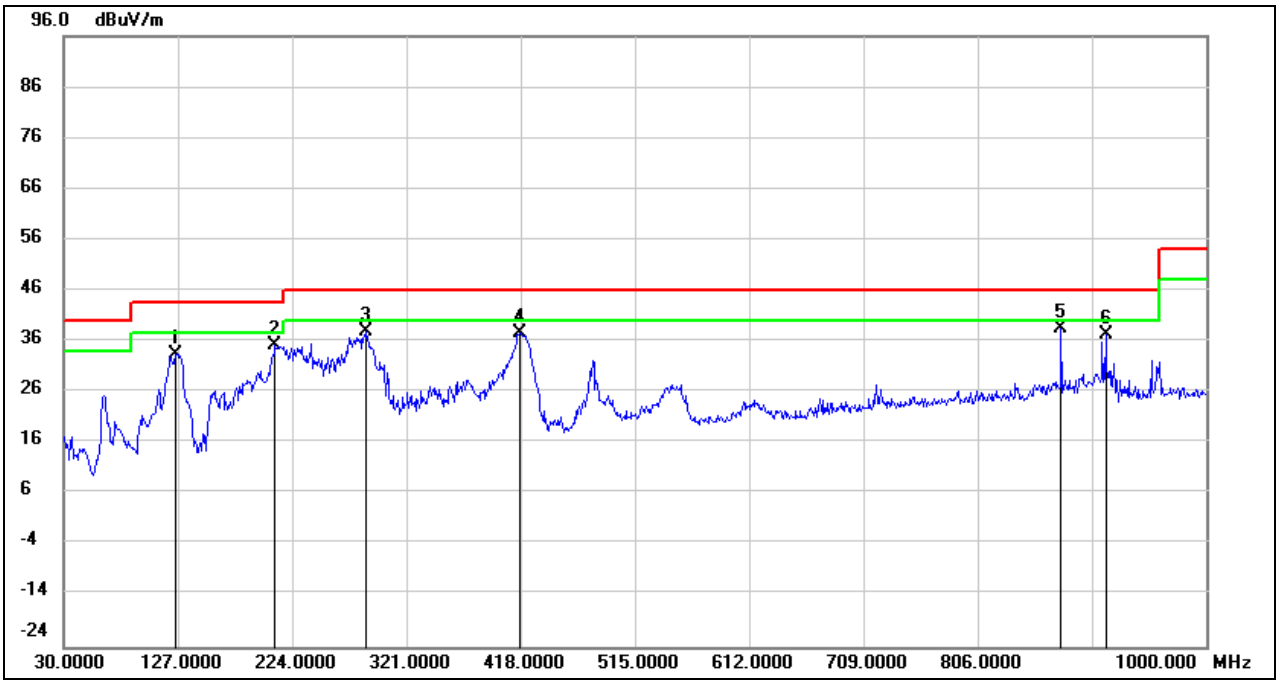
Test Mode:	SubG.4GFSK.350kbps	Frequency(MHz):	927.4345
Polarity:	Vertical	Test Voltage:	DC 5 V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1729.000	60.77	-11.95	48.82	74.00	-25.18	peak
2	2764.000	52.93	-7.69	45.24	74.00	-28.76	peak
3	3430.000	53.57	-6.01	47.56	74.00	-26.44	peak
4	4933.000	41.67	-0.42	41.25	74.00	-32.75	peak
5	7183.000	39.78	6.01	45.79	74.00	-28.21	peak
6	9091.000	38.16	9.78	47.94	74.00	-26.06	peak

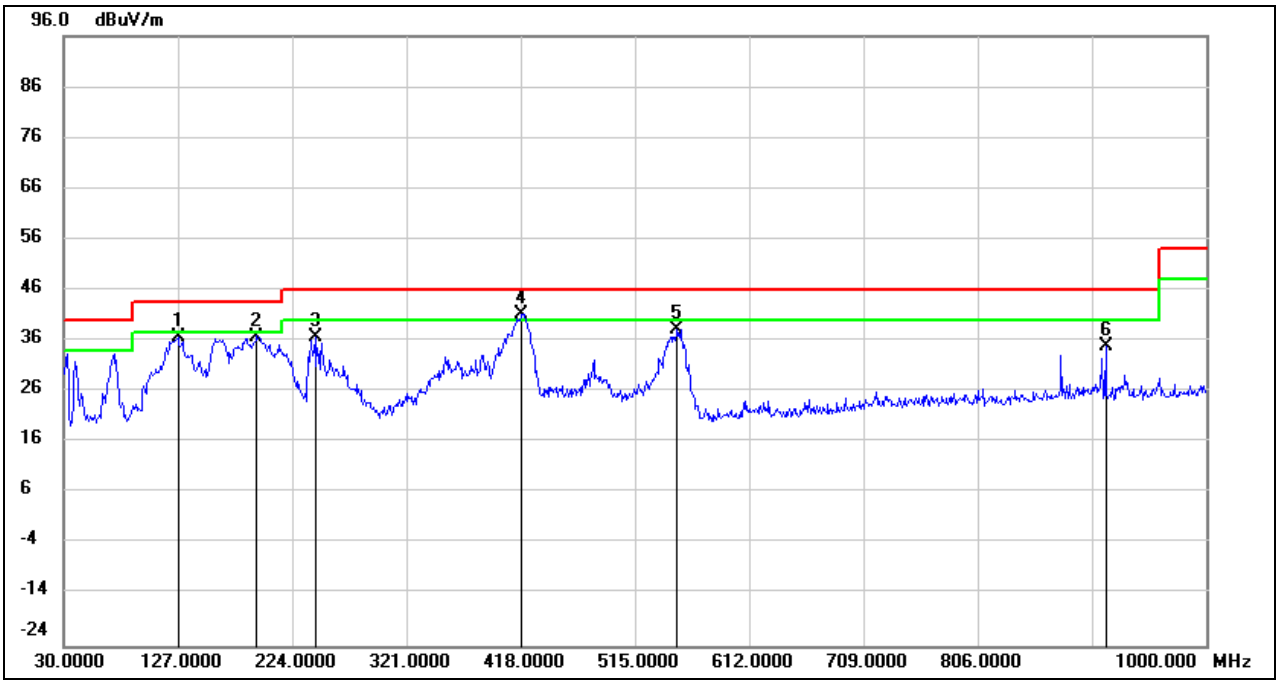
8.2. SPURIOUS EMISSIONS (30 MHz ~ 1 GHz)

Test Mode:	SubG.2GFSK.10kbps	Frequency(MHz):	902.2565
Polarity:	Horizontal	Test Voltage:	DC 5 V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	125.0600	52.72	-19.14	33.58	43.50	-9.92	QP
2	209.4500	51.55	-16.28	35.27	43.50	-8.23	QP
3	286.0799	53.63	-15.80	37.83	46.00	-8.17	QP
4	417.0300	49.91	-12.13	37.78	46.00	-8.22	QP
5	876.8100	43.75	-5.09	38.66	46.00	-7.34	QP
6	914.6400	41.68	-4.47	37.21	46.00	-8.79	QP

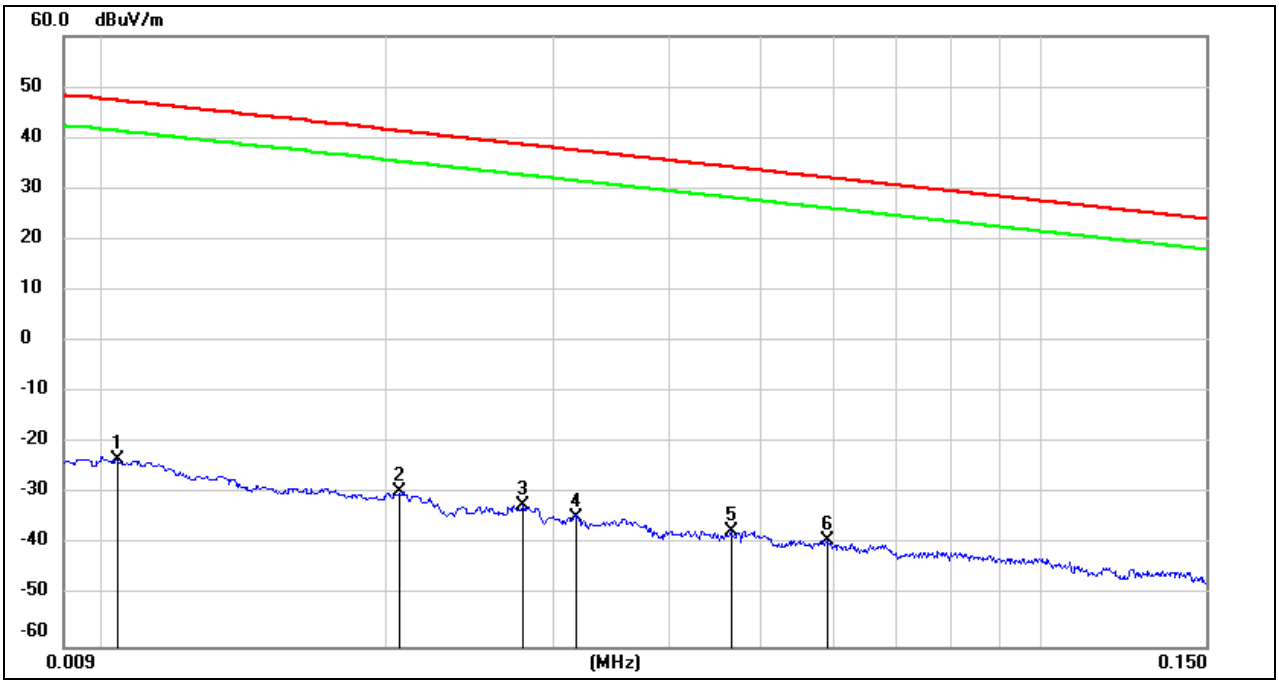
Test Mode:	SubG.2GFSK.10kbps	Frequency(MHz):	902.2565
Polarity:	Vertical	Test Voltage:	DC 5 V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	127.0000	55.91	-19.04	36.87	43.50	-6.63	QP
2	193.9299	52.84	-15.94	36.90	43.50	-6.60	QP
3	243.4000	54.85	-18.03	36.82	46.00	-9.18	QP
4	418.9700	53.35	-12.10	41.25	46.00	-4.75	QP
5	550.8900	48.55	-10.25	38.30	46.00	-7.70	QP
6	914.6400	39.40	-4.47	34.93	46.00	-11.07	QP

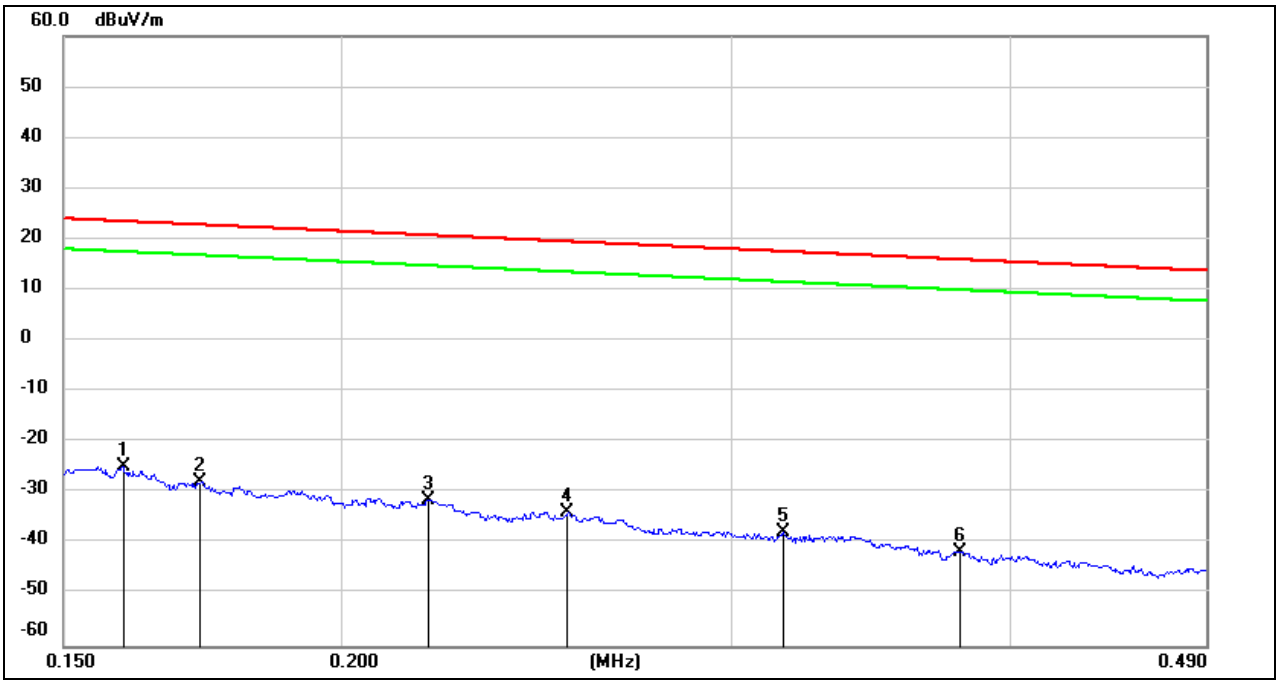
8.3. SPURIOUS EMISSIONS BELOW 30 MHz

Test Mode:	SubG.2GFSK.10kbps	Frequency(MHz):	902.2565
Polarity:	Horizontal	Test Voltage:	DC 5 V



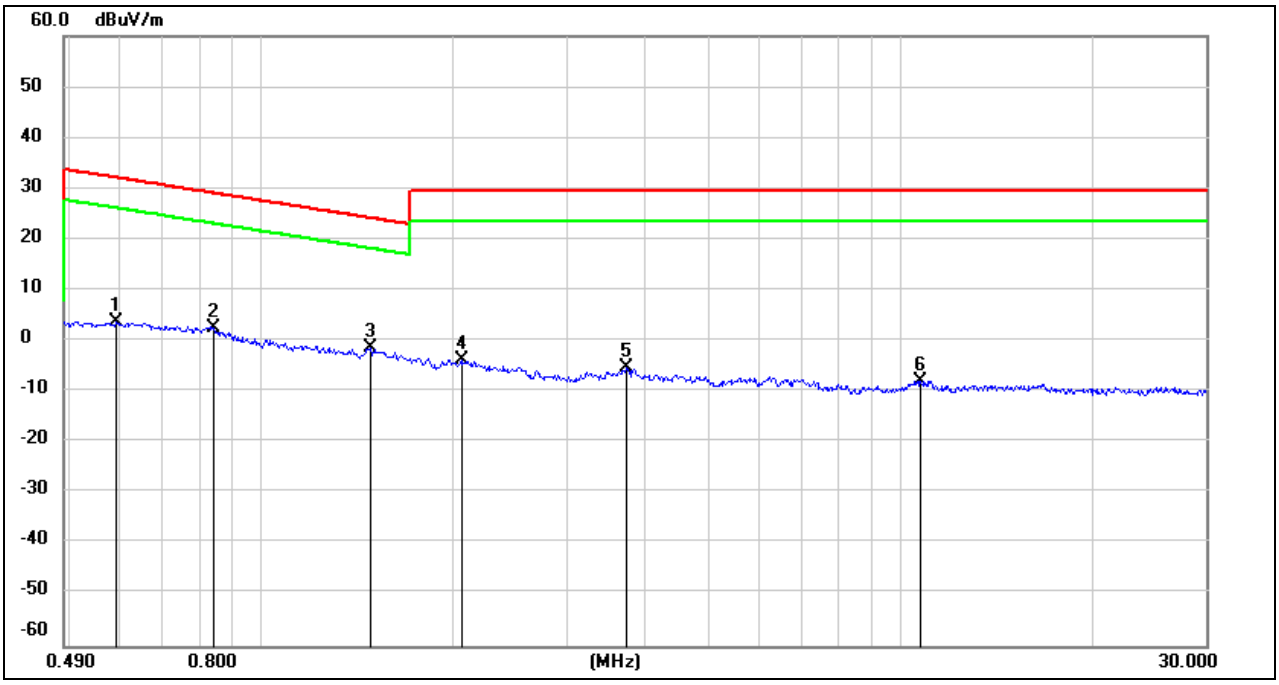
No.	Frequency	Reading	Correct	FCC Result	FCC Limit	ISED Result	ISED Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dBuA/m)	(dBuA/m)	(dB)	
1	0.0103	78.05	-101.40	-23.35	47.34	-74.85	-4.16	-70.69	peak
2	0.0206	71.92	-101.35	-29.43	41.32	-80.93	-10.18	-70.75	peak
3	0.0279	69.17	-101.38	-32.21	38.69	-83.71	-12.81	-70.90	peak
4	0.0318	66.84	-101.40	-34.56	37.55	-86.06	-13.95	-72.11	peak
5	0.0466	64.17	-101.46	-37.29	34.23	-88.79	-17.27	-71.52	peak
6	0.0589	62.31	-101.52	-39.21	32.20	-90.71	-19.30	-71.41	peak

Test Mode:	SubG.2GFSK.10kbps	Frequency(MHz):	902.2565
Polarity:	Horizontal	Test Voltage:	DC 5 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	0.1595	76.86	-101.65	-24.79	23.55	-76.29	-27.95	-48.34	peak
2	0.1728	73.99	-101.67	-27.68	22.86	-79.18	-28.64	-50.54	peak
3	0.2190	70.27	-101.75	-31.48	20.79	-82.98	-30.71	-52.27	peak
4	0.2530	68.14	-101.80	-33.66	19.54	-85.16	-31.96	-53.20	peak
5	0.3163	64.20	-101.87	-37.67	17.60	-89.17	-33.90	-55.27	peak
6	0.3800	60.52	-101.94	-41.42	16.01	-92.92	-35.49	-57.43	peak

Test Mode:	SubG.2GFSK.10kbps	Frequency(MHz):	902.2565
Polarity:	Horizontal	Test Voltage:	DC 5 V

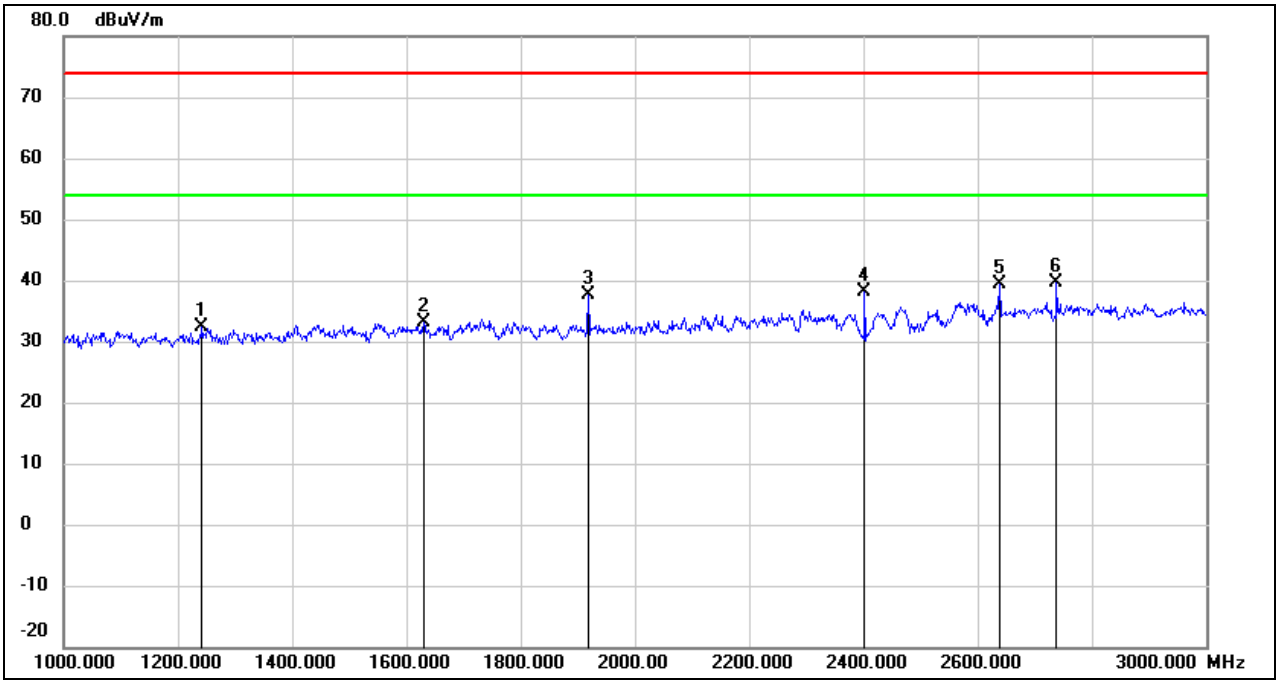


No.	Frequency	Reading	Correct	FCC Result	FCC Limit	ISED Result	ISED Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dBuA/m)	(dBuA/m)	(dB)	
1	0.5917	65.74	-62.08	3.66	32.16	-47.84	-19.34	-28.50	peak
2	0.8400	64.71	-62.17	2.54	29.12	-48.96	-22.38	-26.58	peak
3	1.4818	60.61	-62.05	-1.44	24.19	-52.94	-27.31	-25.63	peak
4	2.0539	58.20	-61.81	-3.61	29.54	-55.11	-21.96	-33.15	peak
5	3.7100	56.20	-61.41	-5.21	29.54	-56.71	-21.96	-34.75	peak
6	10.7299	52.98	-60.83	-7.85	29.54	-59.35	-21.96	-37.39	peak

8.4. WORST-CASE CO-LOCATION

8.4.1. GFSK AND 915M TRANSMISSION MODE

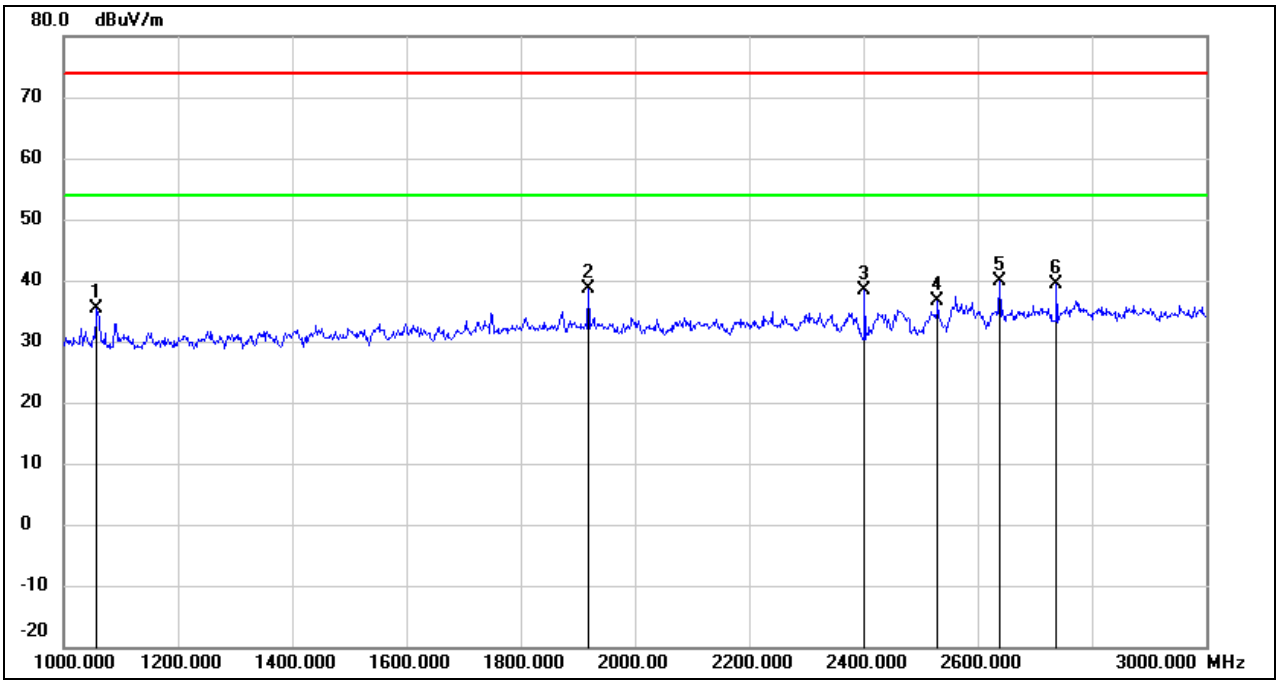
HARMONICS AND SPURIOUS EMISSIONS 1-3GHz (LOW CHANNEL, HORIZONTAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1242.000	46.22	-13.91	32.31	74.00	-41.69	peak
2	1630.000	45.30	-12.28	33.02	74.00	-40.98	peak
3	1918.000	49.05	-11.33	37.72	74.00	-36.28	peak
4	2402.000	47.23	-8.99	38.24	74.00	-35.76	peak
5	2638.000	47.57	-8.07	39.50	74.00	-34.50	peak
6	2737.000	47.40	-7.77	39.63	74.00	-34.37	peak

Note: 1. Peak Result = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. Filter losses were only considered in then spurious frequency bands and the authorized band was not corrected for Band reject filter losses.
5. Proper operation of the transmitter prior to adding the filter to the measurement chain.

HARMONICS AND SPURIOUS EMISSIONS 1-3GHz (LOW CHANNEL, VERTICAL)

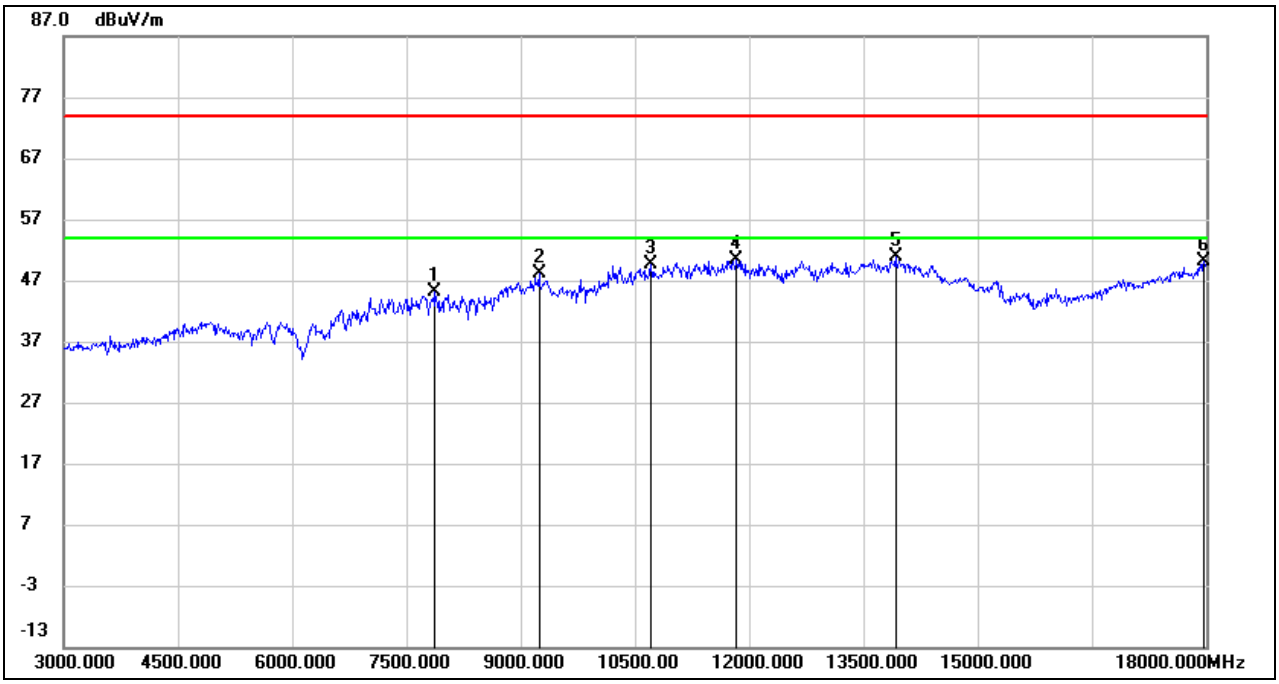


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1058.000	50.03	-14.76	35.27	74.00	-38.73	peak
2	1918.000	50.05	-11.33	38.72	74.00	-35.28	peak
3	2402.000	47.45	-8.99	38.46	74.00	-35.54	peak
4	2530.000	44.98	-8.40	36.58	74.00	-37.42	peak
5	2638.000	47.90	-8.07	39.83	74.00	-34.17	peak
6	2737.000	47.21	-7.77	39.44	74.00	-34.56	peak

Note: 1. Peak Result = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. Filter losses were only considered in then spurious frequency bands and the authorized band was not corrected for Band reject filter losses.
5. Proper operation of the transmitter prior to adding the filter to the measurement chain.

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

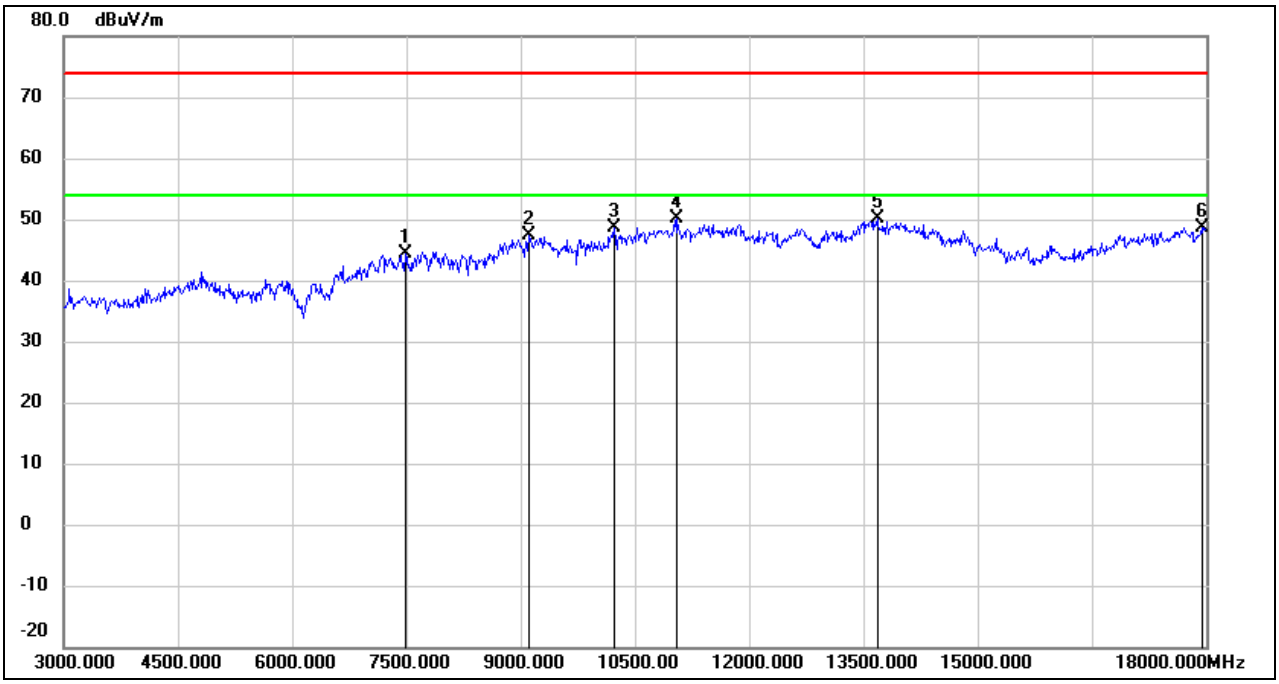
HARMONICS AND SPURIOUS EMISSIONS 3-18GHz (LOW CHANNEL, HORIZONTAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	7875.000	38.71	6.31	45.02	74.00	-28.98	peak
2	9240.000	37.46	10.58	48.04	74.00	-25.96	peak
3	10710.000	35.80	13.73	49.53	74.00	-24.47	peak
4	11835.000	32.76	17.51	50.27	74.00	-23.73	peak
5	13920.000	29.12	21.79	50.91	74.00	-23.09	peak
6	17970.000	24.64	25.51	50.15	74.00	-23.85	peak

Note: 1. Peak Result = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
5. Proper operation of the transmitter prior to adding the filter to the measurement chain.

HARMONICS AND SPURIOUS EMISSIONS 3-18GHz (LOW CHANNEL, VERTICAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	7485.000	37.96	6.34	44.30	74.00	-29.70	peak
2	9105.000	36.74	10.53	47.27	74.00	-26.73	peak
3	10230.000	36.22	12.46	48.68	74.00	-25.32	peak
4	11055.000	35.15	14.96	50.11	74.00	-23.89	peak
5	13680.000	28.96	21.29	50.25	74.00	-23.75	peak
6	17940.000	23.38	25.34	48.72	74.00	-25.28	peak

Note: 1. Peak Result = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
5. Proper operation of the transmitter prior to adding the filter to the measurement chain.

Note: BLE & 915M transmission mode and BT & 915M transmission mode have been tested, and all the channels have been tested, only the worst data for BT(GFSK) & 915M transmission mode was recorded in the report.

9. AC POWER LINE CONDUCTED EMISSIONS

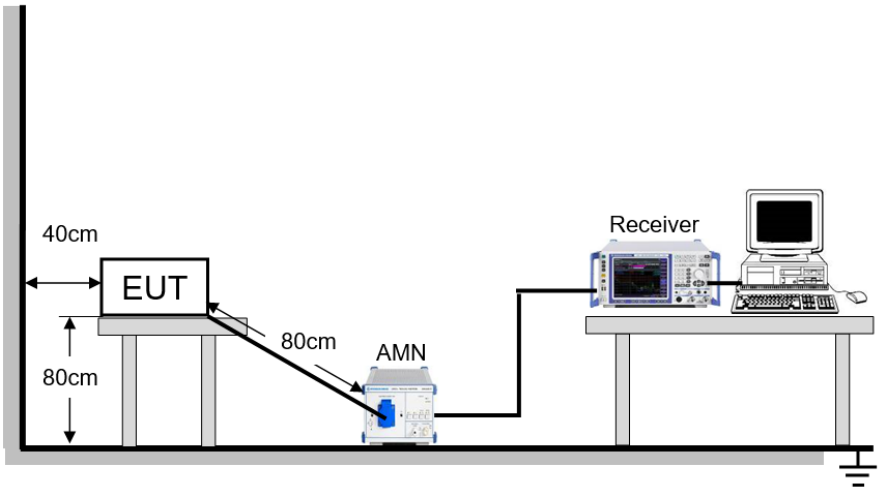
LIMITS

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.

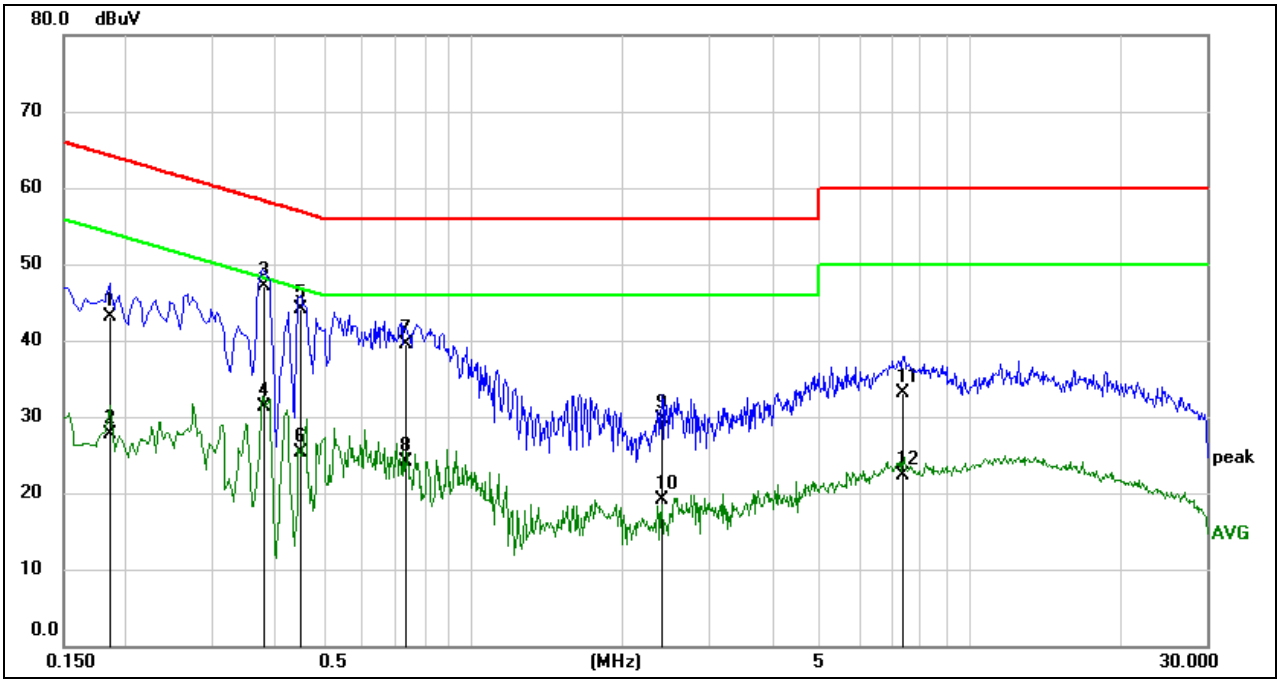
The arrangement of the equipment is installed to meet the standards and operating in a manner, which tends to maximize its emission characteristics in a normal application.

TEST ENVIRONMENT

Temperature	23.6 °C	Relative Humidity	57 %
Atmosphere Pressure	101 kPa	Test Voltage	AC 120 V/60 Hz

RESULTS

Test Mode:	SubG.2GFSK.10kbps	Frequency(MHz):	902.2565
Line:	Line		

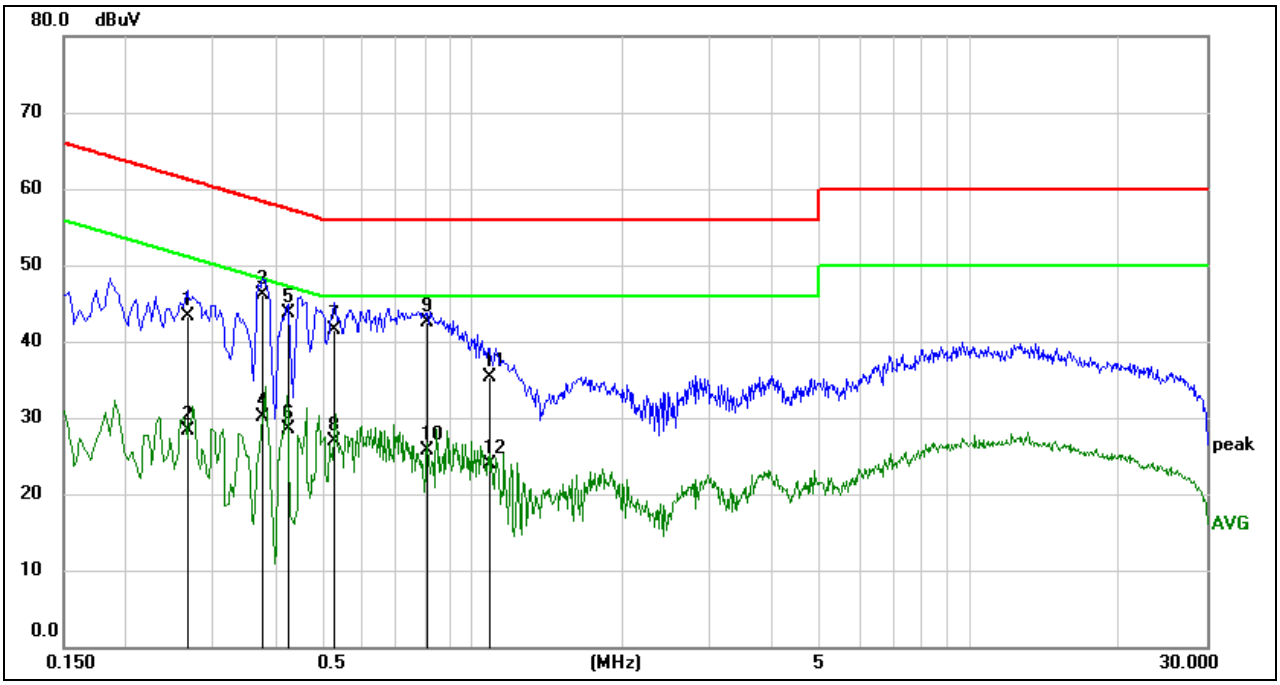


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.1867	33.48	9.59	43.07	64.18	-21.11	QP
2	0.1867	18.14	9.59	27.73	54.18	-26.45	AVG
3	0.3803	37.44	9.59	47.03	58.27	-11.24	QP
4	0.3803	21.67	9.59	31.26	48.27	-17.01	AVG
5	0.4483	34.46	9.60	44.06	56.91	-12.85	QP
6	0.4483	15.75	9.60	25.35	46.91	-21.56	AVG
7	0.7319	29.90	9.60	39.50	56.00	-16.50	QP
8	0.7319	14.54	9.60	24.14	46.00	-21.86	AVG
9	2.3986	20.15	9.65	29.80	56.00	-26.20	QP
10	2.3986	9.45	9.65	19.10	46.00	-26.90	AVG
11	7.3520	23.39	9.72	33.11	60.00	-26.89	QP
12	7.3520	12.64	9.72	22.36	50.00	-27.64	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:	SubG.2GFSK.10kbps	Frequency(MHz):	902.2565
Line:	Neutral		



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.2676	33.64	9.59	43.23	61.19	-17.96	QP
2	0.2676	18.69	9.59	28.28	51.19	-22.91	AVG
3	0.3782	36.49	9.59	46.08	58.32	-12.24	QP
4	0.3782	20.46	9.59	30.05	48.32	-18.27	AVG
5	0.4244	34.20	9.60	43.80	57.36	-13.56	QP
6	0.4244	18.82	9.60	28.42	47.36	-18.94	AVG
7	0.5247	31.81	9.60	41.41	56.00	-14.59	QP
8	0.5247	17.36	9.60	26.96	46.00	-19.04	AVG
9	0.8108	32.97	9.60	42.57	56.00	-13.43	QP
10	0.8108	16.12	9.60	25.72	46.00	-20.28	AVG
11	1.0843	25.75	9.61	35.36	56.00	-20.64	QP
12	1.0843	14.37	9.61	23.98	46.00	-22.02	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. FCC.SubG.2GFSK.10kbps

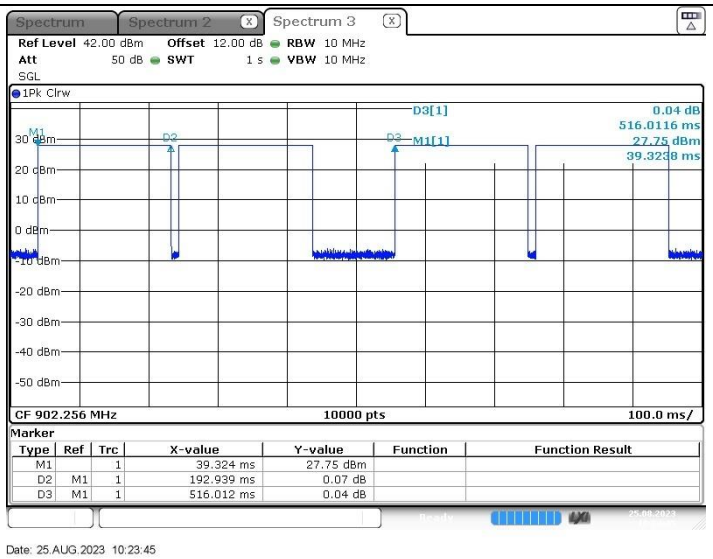
11.1. Appendix A1: DUTY CYCLE

11.1.1. Test Result

Test Mode	On Time (msec)	Period (msec)	Duty Cycle x (Linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	1/T Minimum VBW (kHz)	Final setting For VBW (kHz)
2GFSK-10 kbps	385.878	516.012	0.7478	74.78	1.26	0.0026	1

Note:
Duty Cycle Correction Factor=10log (1/x).
Where: x is Duty Cycle (Linear)
Where: T is On Time
On Time=D2*2=192.939*2=385.878 ms
If that calculated VBW is not available on the analyzer then the next higher value should be used.

Test Graphs



2GFSK-10 kbps_Ant1

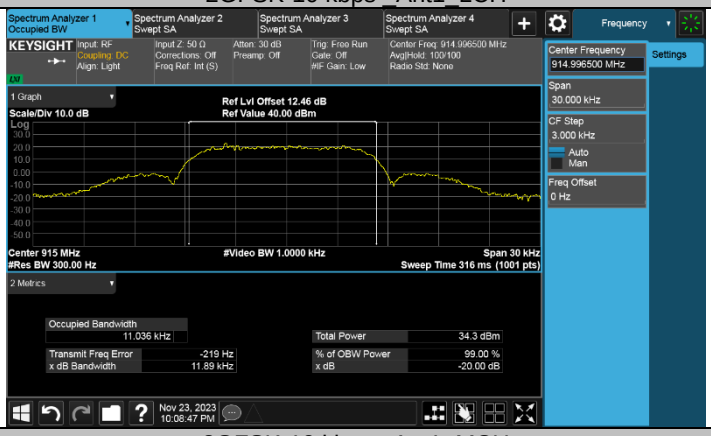
11.2. Appendix B1: 20DB BANDWIDTH & OCCUPIED CHANNEL BANDWIDTH

11.2.1. Test Result

Test Mode	Antenna	Channel	20db EBW[MHz]	OCB [MHz]	Verdict
2GFSK-10 kbps	Ant1	LCH	0.01199	0.010961	PASS
		MCH	0.01189	0.011036	PASS
		HCH	0.01207	0.011028	PASS

11.2.2. Test Graphs

2GFSK-10 kbps _Ant1_LCH



2GFSK-10 kbps _Ant1_MCH

2GFSK-10 kbps _Ant1_HCH

11.3. Appendix C1: CONDUCTED OUTPUT POWER

11.3.1. Test Result

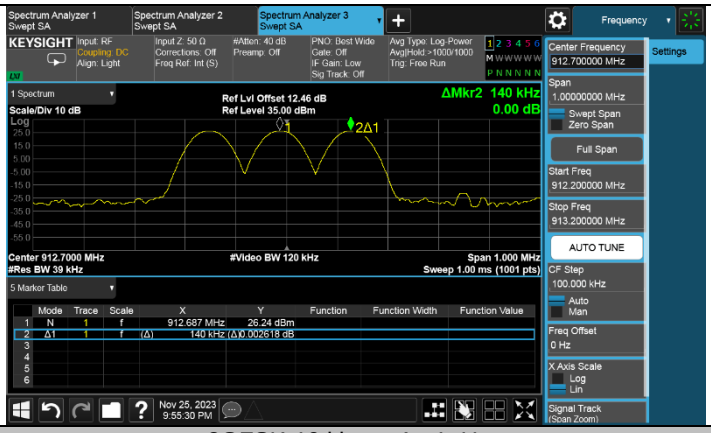
Test Mode	Antenna	Channel	PEAK Result[dBm]	AVG Result[dBm]	Limit[dBm]	Verdict
2GFSK-10 kbps	Ant1	LCH	25.79	25.72	≤30	PASS
		MCH	25.89	25.86	≤30	PASS
		HCH	25.83	25.79	≤30	PASS

11.4. Appendix D1: CARRIER FREQUENCY SEPARATION

11.4.1. Test Result

Test Mode	Antenna	Channel	Result [MHz]	Limit[MHz]	Verdict
2GFSK-10 kbps	Ant1	Hop	0.140	≥0.025	PASS

11.4.2. Test Graphs



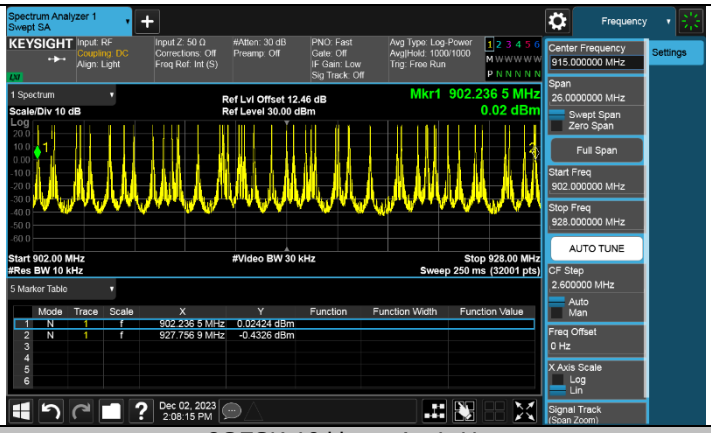
2GFSK-10 kbps _Ant1_Hop

11.5. Appendix E1: NUMBER OF HOPPING FREQUENCIES

11.5.1. Test Result

Test Mode	Antenna	Channel	Result[Num]	Limit[Num]	Verdict
2GFSK-10 kbps	Ant1	Hop	51	≥50	PASS

11.5.2. Test Graphs



2GFSK-10 kbps _Ant1_Hop

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

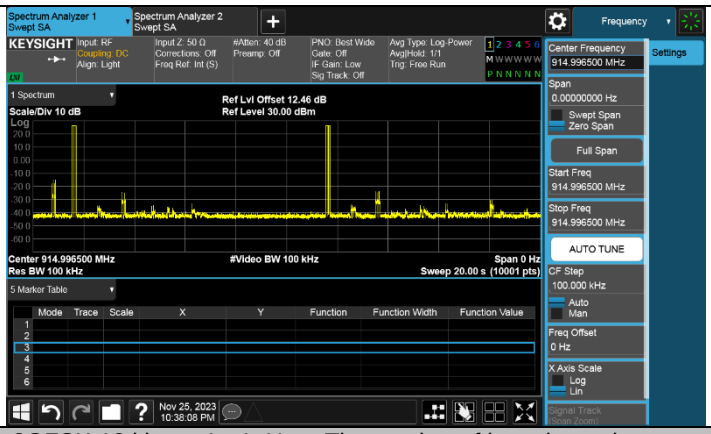
11.6.1. Test Result

Test Mode	Antenna	Channel	Time of single slot 1 [ms]	number of single slot 1	Burst Width 1 [ms/hop/ch]	The number of hop channel appear
2GFSK-10 kbps	Ant1	Hop	53.50	3	160.50	2

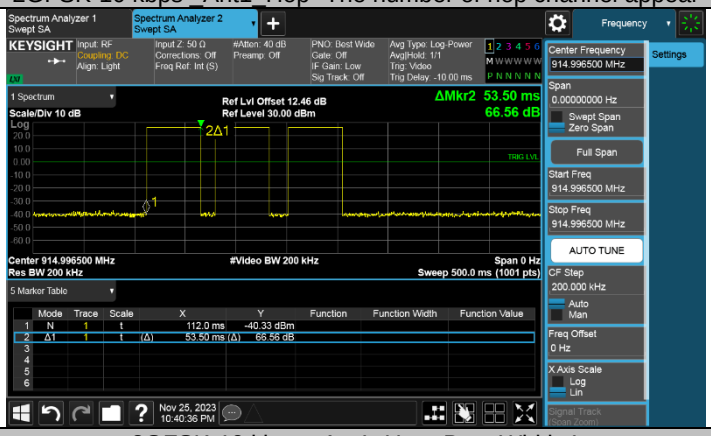
Test Mode	Antenna	Channel	Dwell Time [ms]	Limit [ms]	Results
2GFSK-10 kbps	Ant1	Hop	321.00	400	PASS

Note:
2GFSK-10 kbps: 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



2GFSK-10 kbps _Ant1_ Hop- The number of hop channel appear



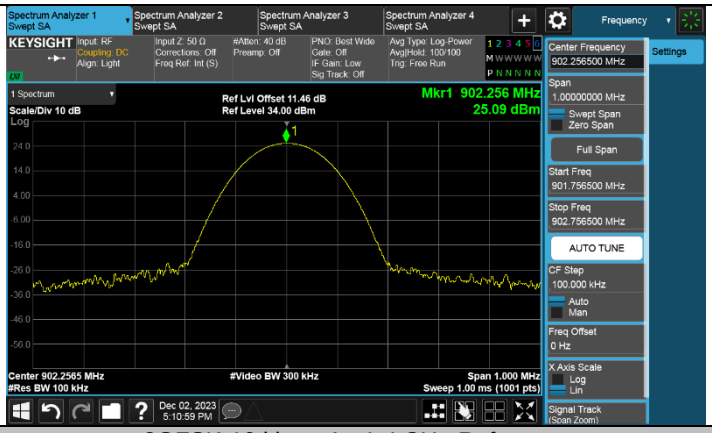
2GFSK-10 kbps _Ant1_ Hop- BurstWidth 1

11.7. Appendix G1:CONDUCTED BAND EDGE AND SPURIOUS EMISSION

11.7.1. Test Result

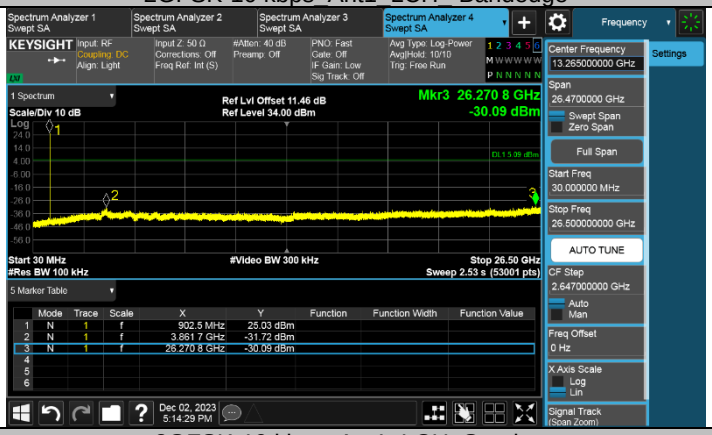
Test Mode	Antenna	ChName	Result [dBm]	Verdict
2GFSK-10 kbps	Ant1	LCH	See the below graphs	PASS
		MCH		PASS
		HCH		PASS
		Hop_ LCH		PASS
		Hop_ HCH		PASS

11.7.2. Test Graphs

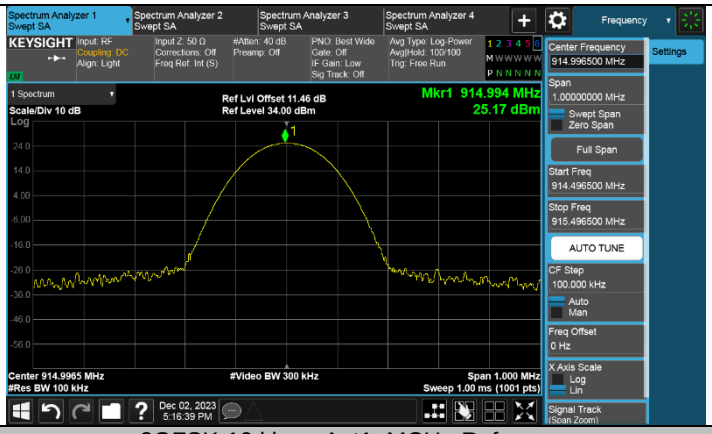


2GFSK-10 kbps_Ant1_LCH_Reference

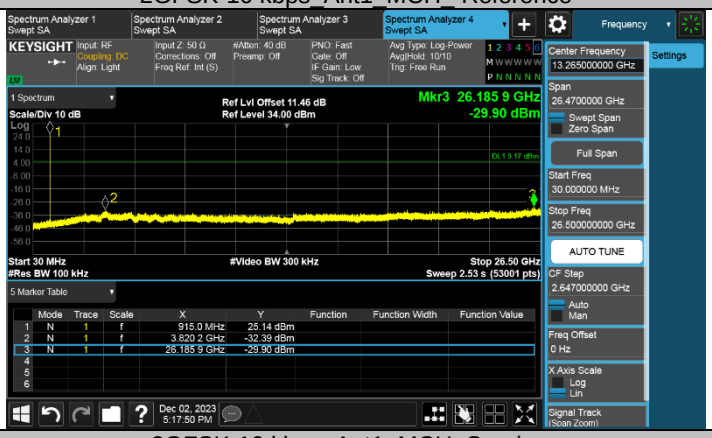
2GFSK-10 kbps_Ant1_LCH_Bandedge



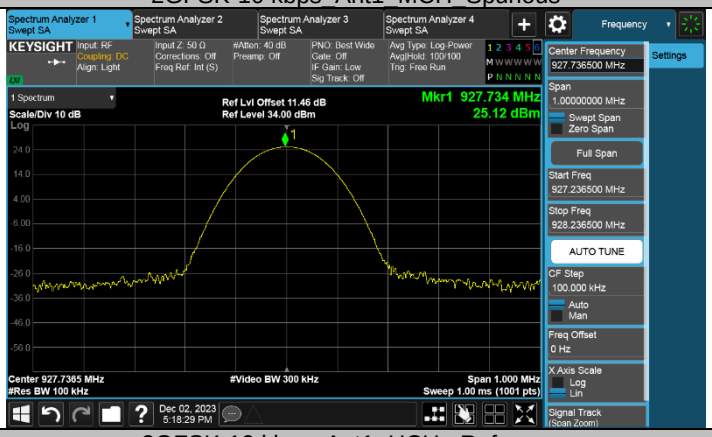
2GFSK-10 kbps_Ant1_LCH_Spurious



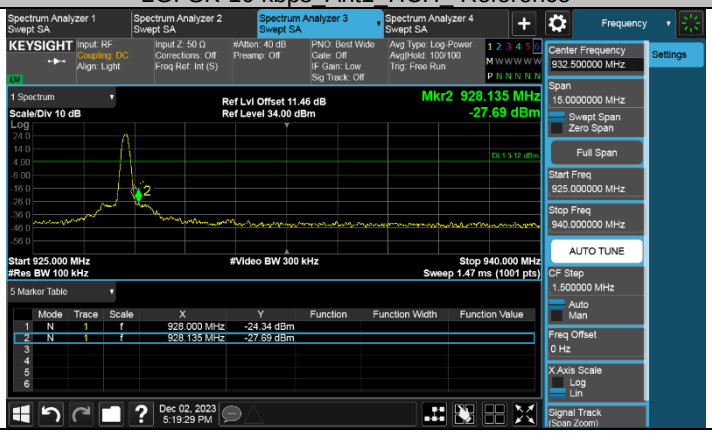
2GFSK-10 kbps_Ant1_MCH_ Reference

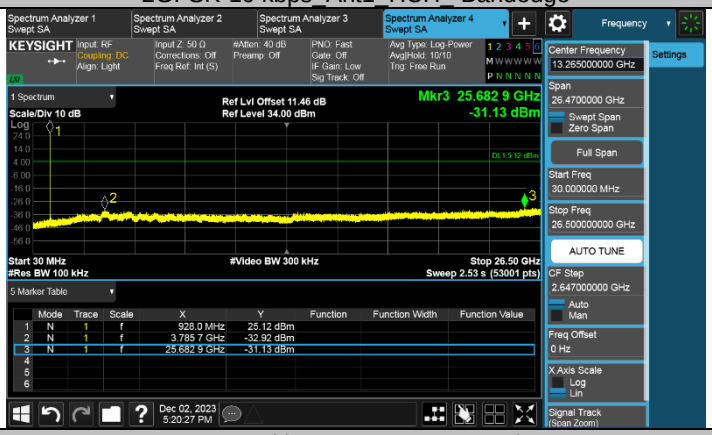


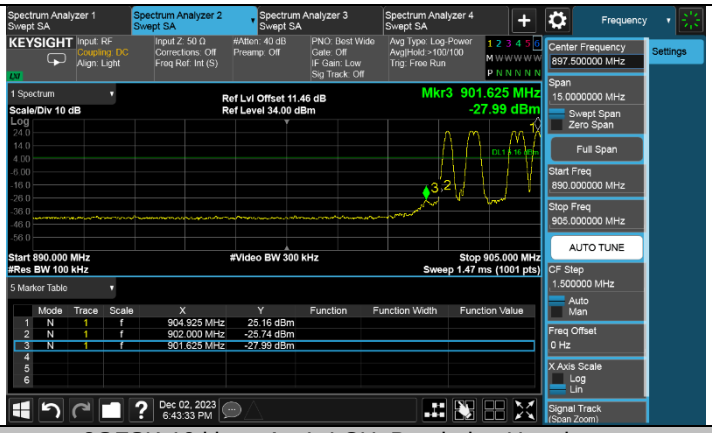
2GFSK-10 kbps_Ant1_MCH_ Spurious



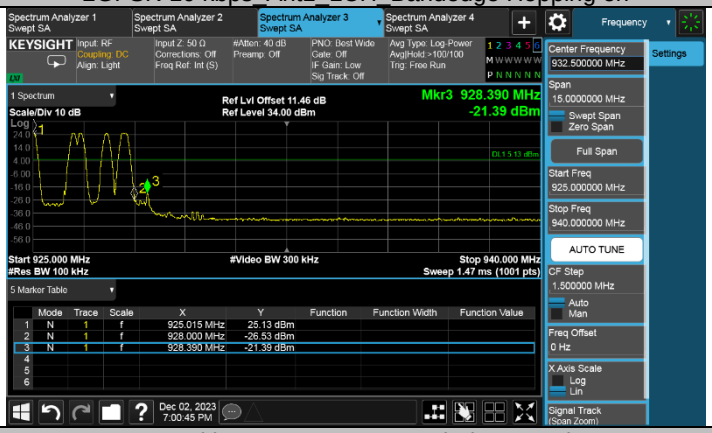
2GFSK-10 kbps_Ant1_HCH_ Reference



2GFSK-10 kbps_Ant1_HCH_ Bandedge

2GFSK-10 kbps_Ant1_HCH_Spurious



2GFSK-10 kbps_Ant1_LCH_Bandedge Hopping on



2GFSK-10 kbps_Ant1_HCH_Bandedge Hopping on

12. FCC.SubG.2GFSK.25kbps

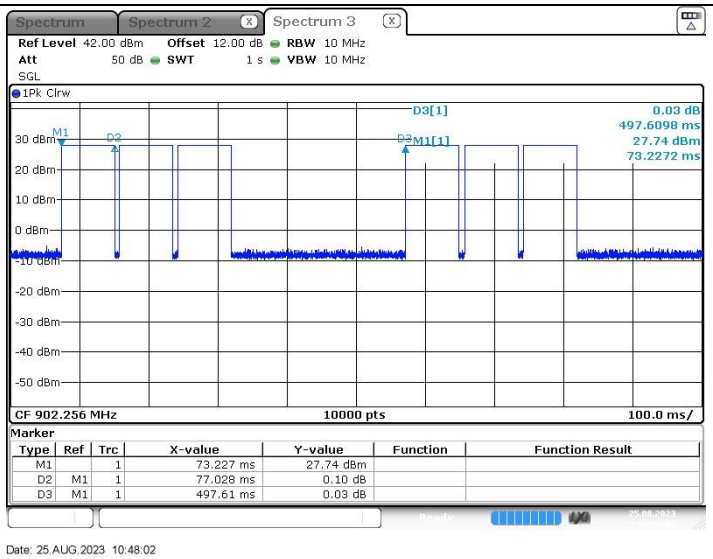
12.1. Appendix A2: DUTY CYCLE

12.1.1. Test Result

Test Mode	On Time (msec)	Period (msec)	Duty Cycle x (Linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	1/T Minimum VBW (kHz)	Final setting For VBW (kHz)
2GFSK-25 kbps	231.084	497.61	0.4644	46.44	3.33	0.0043	1

Note:
Duty Cycle Correction Factor=10log (1/x).
Where: x is Duty Cycle (Linear)
Where: T is On Time
If that calculated VBW is not available on the analyzer then the next higher value should be used.

Test Graphs



2GFSK-25 kbps_Ant1

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

12.2.1. Test Result

Test Mode	Antenna	Channel	20db EBW[MHz]	OCB [MHz]	Verdict
2GFSK-25 kbps	Ant1	LCH	0.02970	0.027920	PASS
		MCH	0.02964	0.027620	PASS
		HCH	0.02983	0.027676	PASS