TEST REPORT

Product Name:	Adjustable bed
FCC ID:	2AXVZ-S4M
Trademark:	N/A
Model Number:	S4M
Prepared For:	Zhejiang Tri mix Technology Co., Ltd
Address:	Room 201, 2nd Floor, Building 2, No. 332 Xinfei Road, Fengqiao Town, Nanhu District, Jiaxing City, Zhejiang Province, China
Manufacturer:	Zhejiang Tri mix Technology Co., Ltd
Address:	Room 201, 2nd Floor, Building 2, No. 332 Xinfei Road, Fengqiao Town, Nanhu District, Jiaxing City, Zhejiang Province, China
Prepared By:	Shenzhen CTB Testing Technology Co., Ltd.
Address:	1&2/F., Building A, No.26, Xinhe Road, Xinqiao, Xinqiao Street, Bao'an District, Shenzhen, Guangdong, China
Sample Received Date:	Jan. 30, 2024
Sample tested Date:	Jan. 30, 2024 to Feb. 24, 2024
Issue Date:	Feb. 24, 2024
Report No.:	CTB240224027RFX
Test Standards	FCC Part15.247 ANSI C63.10:2013
Test Results	PASS
Remark:	This is Bluetooth radio test report.

Compiled by:	Reviewed by:	Approved by:
Zhou Kui	Arron Liu	Bin Mei
Zhou Kui	Arron Liu	Bin Mei / Director

Note: If there is any objection to the inspection results in this report, please submit a written report to the company within 15 days from the date of receiving the report. The test report is effective only with both signature and specialized stamp. This result(s) shown in this report refer only to the sample(s) tested. Without written approval of Shenzhen CTB Testing Technology Co., Ltd. this report can't be reproduced except in full. The tested sample(s) and the sample information are provided by the client. "*" indicates the testing items were fulfilled by subcontracted lab. "#" indicates the items are not in CNAS accreditation scope.

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(Note: N/A means not applicable)

1. VERSION

Report No.	Issue Date	Description	Approved
CTB240224027RFX	Feb. 24, 2024	Original	Valid

2. TEST SUMMARY

The Product has been tested according to the following specifications:

Test Item	Test Requirement	Test method	Result
AC Power Line Conducted Emission	47 CFR Part 15 Subpart C Section 15.207	ANSI C63.10-2013	PASS
Radiated Spurious emissions	47 CFR Part 15 Subpart C Section 15.205/15.209	ANSI C63.10-2013	PASS
Band edge and RF Conducted Spurious Emissions	47 CFR Part 15 Subpart C Section 15.247(d)/15.205(a)	ANSI C63.10-2013	PASS
Conducted Peak Output Power	47 CFR Part 15 Subpart C Section 15.247 (b)(3)	ANSI C63.10-2013	PASS
Bandwidth	47 CFR Part 15 Subpart C Section 15.247 (a)(2)	ANSI C63.10-2013	PASS
Power Spectral Density	47 CFR Part 15Subpart C Section 15.247 (e)	ANSI C63.10-2013/ KDB 558074 D01v05r02	PASS
Antenna Requirement	47 CFR Part 15 Subpart C Section 15.203/15.247 (b)	/	PASS

Remark:
Test according to ANSI C63.10-2013.

3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the Product as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

Item	Uncertainty
Occupancy bandwidth	54.3kHz
Conducted output power Above 1G	0.9dB
Conducted output power below 1G	0.9dB
Power Spectral Density , Conduction	0.9dB
Conduction spurious emissions	2.0dB
Out of band emission	2.0dB
3m camber Radiated spurious emission(9K-30MHz)	4.8dB
3m camber Radiated spurious emission(30MHz-1GHz)	4.6dB
3m chamber Radiated spurious emission(1GHz-18GHz)	5.1dB
3m chamber Radiated spurious emission(18GHz-40GHz)	3.4dB
humidity uncertainty	5.5%
Temperature uncertainty	0.63℃
frequency	1×10-7
Conducted Emission (150KHz-30MHz)	3.2 dB
Radiated Emission(30MHz ~ 1000MHz)	4.8 dB
Radiated Emission(1GHz ~6GHz)	4.9 dB

4. PRODUCT INFORMATION AND TEST SETUP

4.1 Product Information

Model(s):	S4M
Model Description:	N/A
Bluetooth Version:	Bluetooth 4.2
Hardware Version:	V1.0
Software Version:	V1.0
Operation Frequency:	Bluetooth: 2402-2480MHz
Max. RF output power:	Bluetooth: 2.056dBm
Type of Modulation:	Bluetooth: GFSK
Antenna installation:	Bluetooth: PCB Antenna
Antenna Gain:	Bluetooth: 1.77dBi
Ratings:	W87RA07-290030: Input: AC 100-240V, 4A Output: DC 29V, 3A W52RA199-290018: Input: AC 100-240V, 1.5A Output: DC 29V, 1.8A W52RA198-290018: Input: AC 100-240V, 1.5A Output: DC 29V, 1.8A

4.2 Test Setup Configuration

See test photographs attached in EUT TEST SETUP PHOTOGRAPHS for the actual connections between Product and support equipment.

4.3 Support Equipment

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Note

Notes:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

4.4 Channel List

CH No.	Frequency (MHz)	CH No.	Frequency (MHz)	CH No.	Frequency (MHz)	CH No.	Frequency (MHz)
0	2402	1	2404	2	2406	3	2408
4	2410	5	2412	6	2414	7	2416
8	2418	9	2420	10	2422	11	2424
12	2426	13	2428	14	2430	15	2432
16	2434	17	2436	18	2438	19	2440
20	2442	21	2444	22	2446	23	2448
24	2450	25	2452	26	2454	27	2456
28	2458	29	2460	30	2462	31	2464
32	2466	33	2468	34	2470	35	2472
36	2474	37	2476	38	2478	39	2480

4.5 Test Mode

All test mode(s) and condition(s) mentioned were considered and evaluated respectively by performing full tests, the worst data were recorded and reported.

Test mode	Low channel	Middle channel	High channel
Transmitting (GFSK)	2402MHz	2440MHz	2480MHz

4.6 Test Environment

Humidity(%):	54
Atmospheric Pressure(kPa):	101
Normal Voltage(DC):	29V
Normal Temperature(℃)	23
Low Temperature(℃)	0
High Temperature(℃)	40

5. TEST FACILITY AND TEST INSTRUMENT USED

5.1 Test Facility

All measurement facilities used to collect the measurement data are located at 1&2F., Building A, No. 26, Xinhe Road, Xinqiao, Xinqiao Street, Bao'an District, Shenzhen, Guangdong, China. The site and apparatus are constructed in conformance with the requirements of ANSI C63.4 and CISPR 16-1-1 other equivalent standards.

5.2 Test Instrument Used

Item	Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	Agilent	N9020A	MY52090073	2024.07.05
2	Power Sensor	Agilent	U2021XA	MY56120032	2024.07.05
3	Power Sensor	Agilent	U2021XA	MY56120034	2024.07.05
4	Communication test set	R&S	CMW500	108058	2024.07.05
5	Spectrum Analyzer	KEYSIGHT	N9020A	MY51289897	2024.07.05
6	Signal Generator	Agilent	N5181A	MY50140365	2024.07.05
7	Vector signal generator	Agilent	N5182A	MY47420195	2024.07.05
8	Communication test set	Agilent	E5515C	MY50102567	2024.07.06
9	2.4 GHz Filter	Shenxiang	MSF2400-2483.5MS-1154	20181015001	2024.07.05
10	5 GHz Filter	Shenxiang	MSF5150-5850 MS-1155	20181015001	2024.07.06
11	Filter	Xingbo	XBLBQ-DZA120	190821-1-1	2024.07.06
12	BT&WI-FI Automatic test software	Micowave	MTS8000	Ver. 2.0.0.0	/
13	Rohde & Schwarz SFU Broadcast Test System	R&S	SFU	101017	2024.10.30
14	Temperature humidity chamber	Hongjing	TH-80CH	DG-15174	2024.07.05
15	234G Automatic test software	Micowave	MTS8200	Ver. 2.0.0.0	/
16	966 chamber	C.R.T.	966	/	2024.08.11
17	Receiver	R&S	ESPI	100362	2024.07.05
18	Amplifier	HP	8447E	2945A02747	2024.07.05
19	Amplifier	Agilent	8449B	3008A01838	2024.07.05
20	TRILOG Broadband Antenna	Schwarzbeck	VULB 9168	00869	2024.07.08

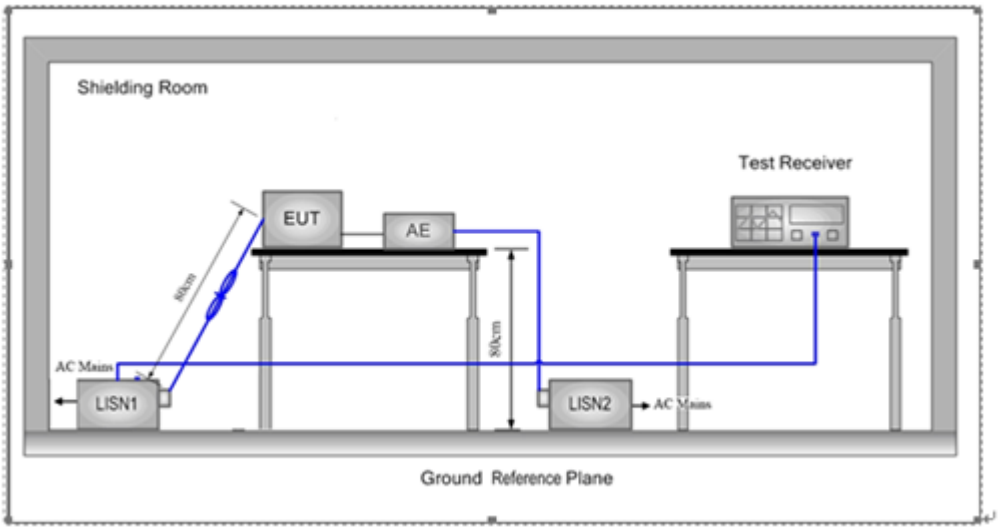
21	Double Ridged Broadband Horn Antenna	Schwarzbeck	BBHA9120D	01911	2024.07.08
22	EMI test software	Fala	EZ-EMC	FA-03A2 RE	/
23	Loop Antenna	Schwarzbeck	FMZB 1519B	1519B-224	2024.07.08
24	loop antenna	ZHINAN	ZN30900A	GTS534	/
25	40G Horn antenna	A/H/System	SAS-574	588	2024.10.30
26	Amplifier	AEROFLEX	Aeroflex	097	2024.07.05

Continuous disturbance					
No.	Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	LISN	ROHDE&SCHWARZ	ESH3-Z5	100318	2024.07.05
2	Pulse limiter	ROHDE&SCHWARZ	ESH3Z2	357881052	2024.07.05
3	EMI TEST RECEIVER	ROHDE&SCHWARZ	ESCI	100428/003	2024.07.05
4	Coaxial cable	ZDECL	Z302S-NJ-SMA J-12M	18091905	2024.07.05
5	ISN	Schwarzbeck	NTFM8158	183	2024.07.05
6	Communication test set	Agilent	E5515C	MY50102567	2024.07.05
7	Communication test set	R&S	CMW500	108058	2024.07.05
8	EZ-EMC	Frad	EMC-con3A1.1	/	/

Radiated emission					
No.	Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	Double Ridged Broadband Horn Antenna	Schwarzbeck	BBHA 9120 D	01911	2024.07.08
2	TRILOG Broadband Antenna	Schwarzbeck	VULB 9168	00869	2024.07.08
3	Amplifier	Agilent	8449B	3008A01838	2024.07.05
4	Amplifier	HP	8447E	2945A02747	2024.07.05
5	EMI TEST RECEIVER	ROHDE&SCHWARZ	ESCI	100428/003	2024.07.05
6	Coaxial cable	ETS	RFC-SNS-100-NMS-80 NI	/	2024.07.05
7	Coaxial cable	ETS	RFC-SNS-100-NMS-20 NI	/	2024.07.05
8	Coaxial cable	ETS	RFC-SNS-100-SMS-20 NI	/	2024.07.05
9	Coaxial cable	ETS	RFC-NNS-100 -NMS-300 NI	/	2024.07.05
10	Communication test set	Agilent	E5515C	MY50102567	2024.07.05
11	Communication test set	R&S	CMW500	108058	2024.07.05
12	EZ-EMC	Frad	EMC-con3A1.1	/	/

6. AC POWER LINE CONDUCTED EMISSION

6.1 Block Diagram Of Test Setup



6.2 Limit

Table 4 – AC power-line conducted emissions limits

Frequency (MHz)	Conducted limit (dBμV)	
	Quasi-peak	Average
0.15 - 0.5	66 to 56[Note 1]	56 to 46[Note 1]
0.5 – 5	56	46
5 – 30	60	50

Note 1: The level decreases linearly with the logarithm of the frequency.

* Decreasing linearly with the logarithm of the frequency

6.3 Test procedure

1) The mains terminal disturbance voltage test was conducted in a shielded room.

2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50Ω/50μH + 5Ω linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.

3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane,

4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under

test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2.

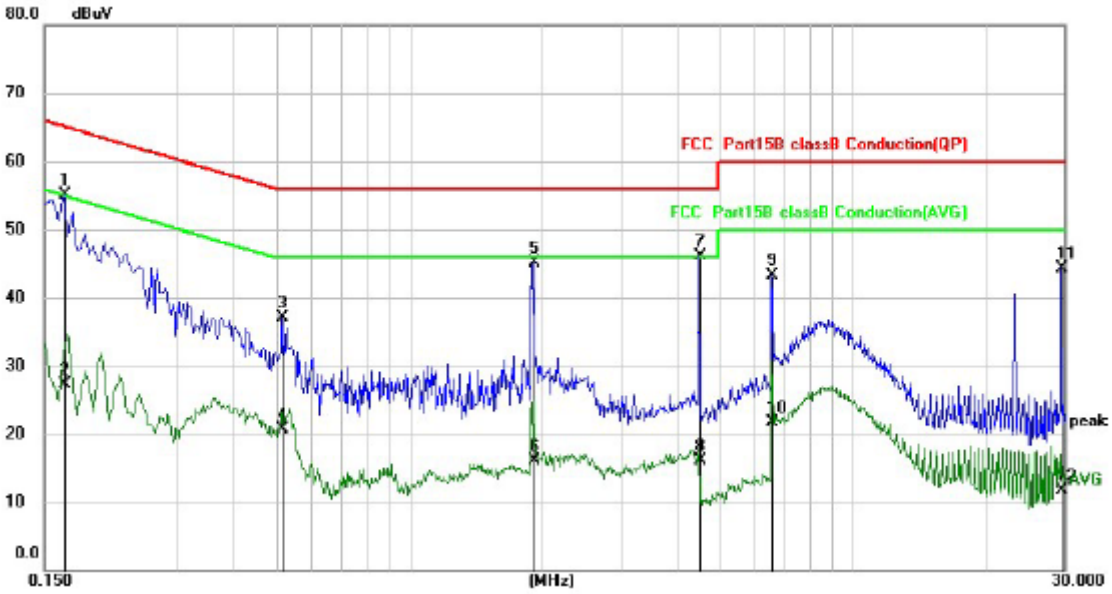
5) In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10:2013 on conducted measurement**.**

6) All modes were tested at AC 120V and 240V, only the worst result of AC 120V 60Hz was reported.

7) If a EUT received DC power from the USB Port of Notebook PC, the PC's adapter received AC120V/60Hz power through a Line Impedance Stabilization Network (LISN) which supplied power source and was grounded to the ground plane.

6.4 Test Result

Adapter model: W87RA07-290030+ white nose:
L: Worst case-GFSK(low channel)

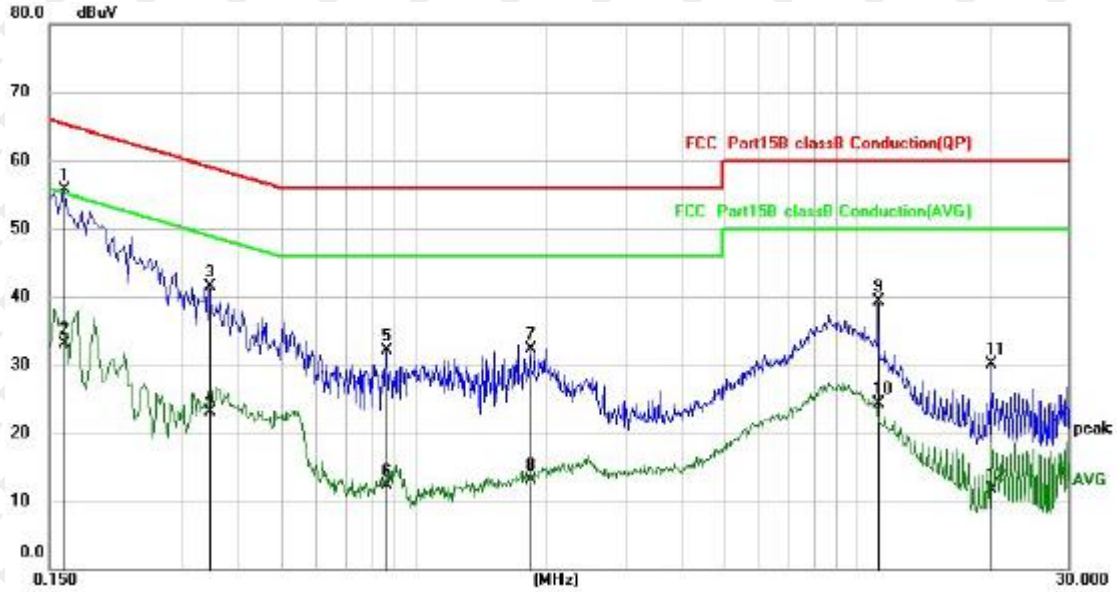


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1		0.1660	44.38	10.65	55.03	65.16	-10.13	QP
2		0.1660	16.61	10.65	27.26	55.16	-27.90	AVG
3		0.5180	26.48	10.68	37.16	56.00	-18.84	QP
4		0.5180	9.94	10.68	20.62	46.00	-25.38	AVG
5		1.9100	34.36	10.78	45.14	56.00	-10.86	QP
6		1.9100	5.41	10.78	16.19	46.00	-29.81	AVG
7	*	4.5020	35.28	10.79	46.07	56.00	-9.93	QP
8		4.5020	5.28	10.79	16.07	46.00	-29.93	AVG
9		6.5660	32.41	10.87	43.28	60.00	-16.72	QP
10		6.5660	10.86	10.87	21.73	50.00	-28.27	AVG
11		29.6500	32.67	11.59	44.26	60.00	-15.74	QP
12		29.6500	0.06	11.59	11.65	50.00	-38.35	AVG

Remark:

Factor = Cable loss + LISN factor, Margin = Measurement – Limit

N:

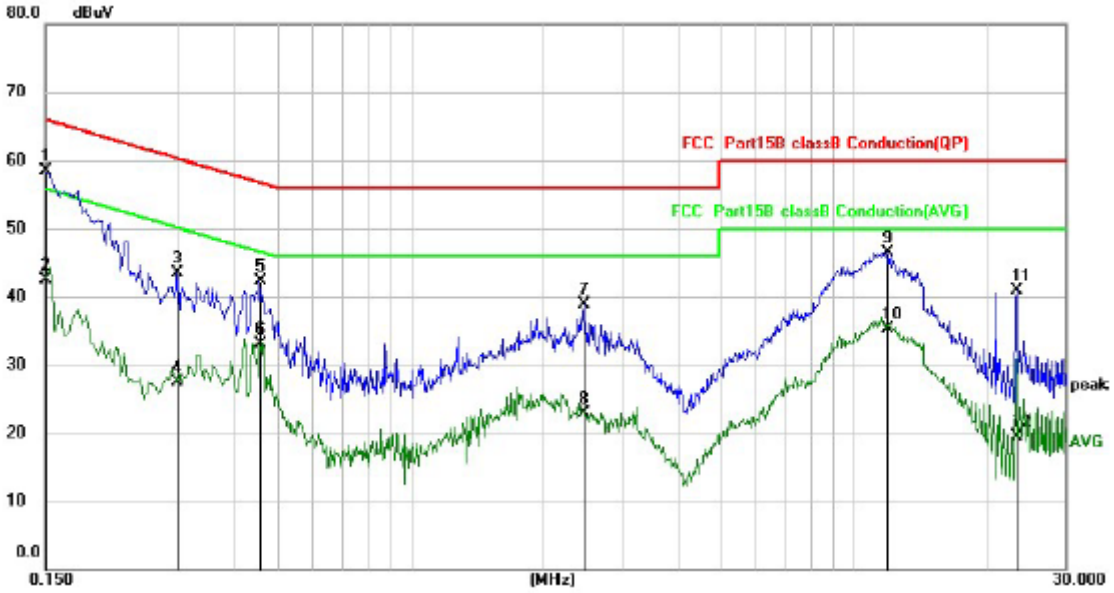


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1	*	0.1620	45.06	10.65	55.71	65.36	-9.65	QP
2		0.1620	22.36	10.65	33.01	55.36	-22.35	AVG
3		0.3460	30.94	10.64	41.58	59.06	-17.48	QP
4		0.3460	12.55	10.64	23.19	49.06	-25.87	AVG
5		0.8620	21.44	10.71	32.15	56.00	-23.85	QP
6		0.8620	1.58	10.71	12.29	46.00	-33.71	AVG
7		1.8340	21.51	10.78	32.29	56.00	-23.71	QP
8		1.8340	2.27	10.78	13.05	46.00	-32.95	AVG
9		11.1500	28.26	11.01	39.27	60.00	-20.73	QP
10		11.1500	13.27	11.01	24.28	50.00	-25.72	AVG
11		20.0860	18.74	11.27	30.01	60.00	-29.99	QP
12		20.0860	0.41	11.27	11.68	50.00	-38.32	AVG

Remark:

Factor = Cable loss + LISN factor, Margin = Measurement – Limit

Adapter model: W52RA199-290018+ white nose:
L: Worst case-GFSK(low channel)

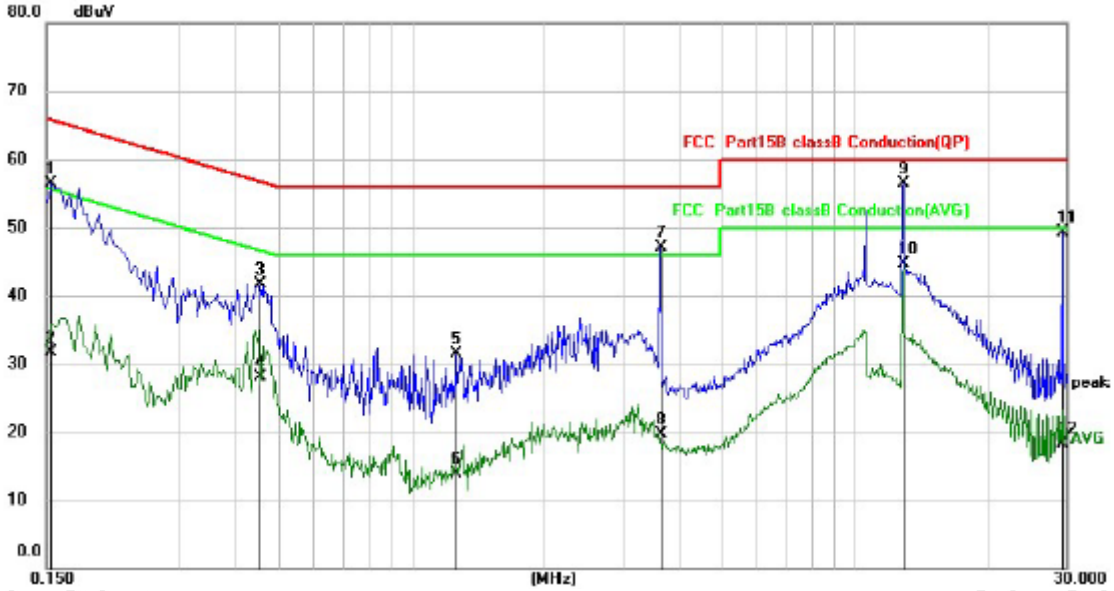


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1	*	0.1500	47.88	10.67	58.55	66.00	-7.45	QP
2		0.1500	31.88	10.67	42.55	56.00	-13.45	AVG
3		0.2980	32.78	10.63	43.41	60.30	-16.89	QP
4		0.2980	16.94	10.63	27.57	50.30	-22.73	AVG
5		0.4580	31.58	10.67	42.25	56.73	-14.48	QP
6		0.4580	22.39	10.67	33.06	46.73	-13.67	AVG
7		2.4660	28.10	10.79	38.89	56.00	-17.11	QP
8		2.4660	12.13	10.79	22.92	46.00	-23.08	AVG
9		11.8820	35.57	11.03	46.60	60.00	-13.40	QP
10		11.8820	24.28	11.03	35.31	50.00	-14.69	AVG
11		23.2740	29.51	11.33	40.84	60.00	-19.16	QP
12		23.2740	8.19	11.33	19.52	50.00	-30.48	AVG

Remark:

Factor = Cable loss + LISN factor, Margin = Measurement – Limit

N:

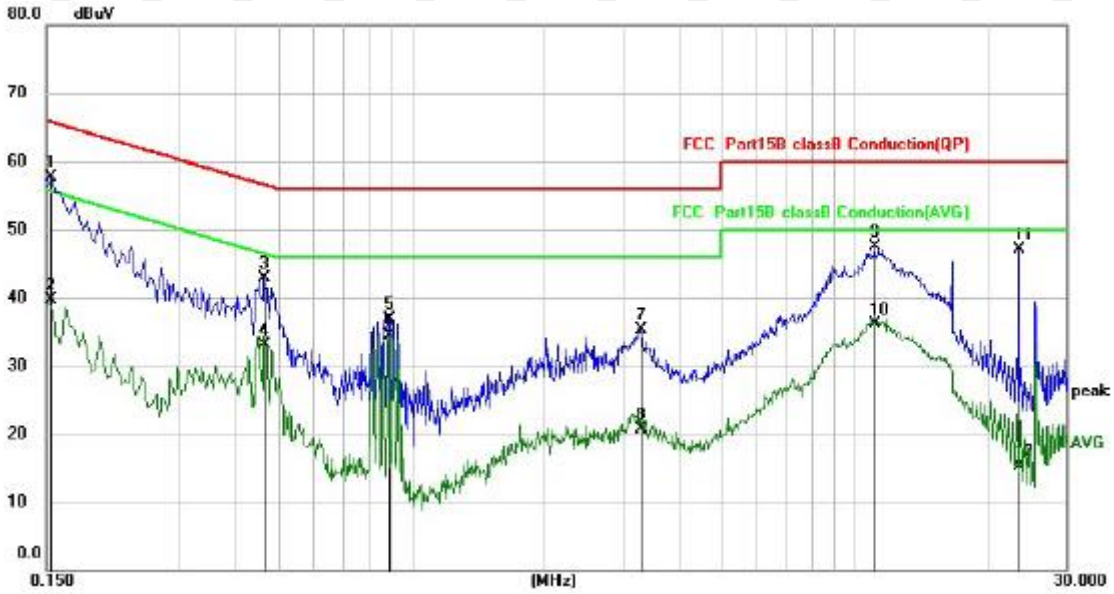


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1		0.1539	45.80	10.66	56.46	65.79	-9.33	QP
2		0.1539	21.08	10.66	31.74	55.79	-24.05	AVG
3		0.4540	31.11	10.67	41.78	56.80	-15.02	QP
4		0.4540	17.51	10.67	28.18	46.80	-18.62	AVG
5		1.2579	20.77	10.73	31.50	56.00	-24.50	QP
6		1.2579	3.16	10.73	13.89	46.00	-32.11	AVG
7		3.6540	36.24	10.79	47.03	56.00	-8.97	QP
8		3.6540	8.92	10.79	19.71	46.00	-26.29	AVG
9	*	12.8620	45.42	11.05	56.47	60.00	-3.53	QP
10		12.8620	33.58	11.05	44.63	50.00	-5.37	AVG
11		29.4900	37.82	11.58	49.40	60.00	-10.60	QP
12		29.4900	6.71	11.58	18.29	50.00	-31.71	AVG

Remark:

Factor = Cable loss + LISN factor, Margin = Measurement – Limit

Adapter model: W52RA198-290018+ white nose:
L: Worst case-GFSK(low channel)

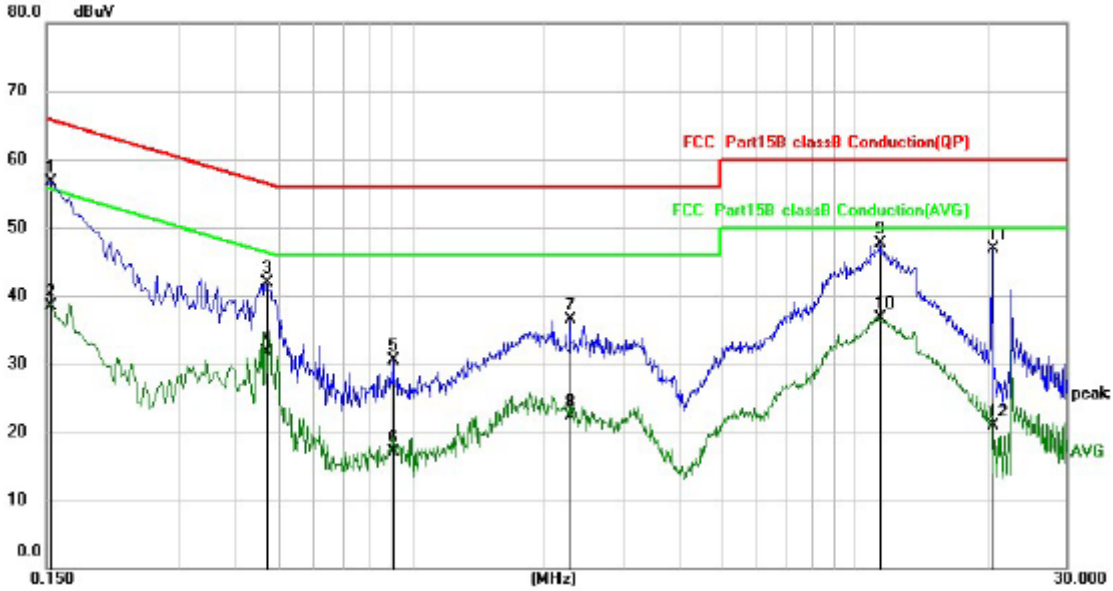


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1	*	0.1539	47.00	10.66	57.66	65.79	-8.13	QP
2		0.1539	28.96	10.66	39.62	55.79	-16.17	AVG
3		0.4660	32.15	10.67	42.82	56.58	-13.76	QP
4		0.4660	22.44	10.67	33.11	46.58	-13.47	AVG
5		0.8900	26.25	10.71	36.96	56.00	-19.04	QP
6		0.8900	23.87	10.71	34.58	46.00	-11.42	AVG
7		3.2820	24.42	10.79	35.21	56.00	-20.79	QP
8		3.2820	9.85	10.79	20.64	46.00	-25.36	AVG
9		11.0940	36.49	11.01	47.50	60.00	-12.50	QP
10		11.0940	25.18	11.01	36.19	50.00	-13.81	AVG
11		23.3980	35.78	11.33	47.11	60.00	-12.89	QP
12		23.3980	3.93	11.33	15.26	50.00	-34.74	AVG

Remark:

Factor = Cable loss + LISN factor, Margin = Measurement – Limit

N:

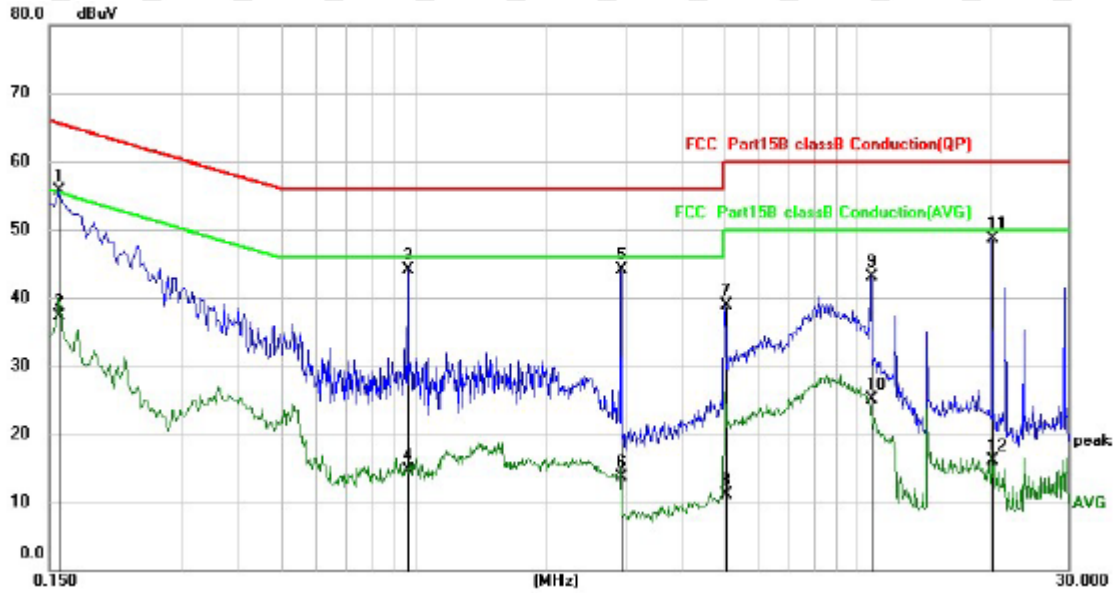


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1	*	0.1539	45.99	10.66	56.65	65.79	-9.14	QP
2		0.1539	27.94	10.66	38.60	55.79	-17.19	AVG
3		0.4700	31.14	10.67	41.81	56.51	-14.70	QP
4		0.4700	21.07	10.67	31.74	46.51	-14.77	AVG
5		0.9100	19.82	10.71	30.53	56.00	-25.47	QP
6		0.9100	6.33	10.71	17.04	46.00	-28.96	AVG
7		2.2740	25.64	10.79	36.43	56.00	-19.57	QP
8		2.2740	11.54	10.79	22.33	46.00	-23.67	AVG
9		11.4300	36.63	11.02	47.65	60.00	-12.35	QP
10		11.4300	25.63	11.02	36.65	50.00	-13.35	AVG
11		20.4660	35.67	11.28	46.95	60.00	-13.05	QP
12		20.4660	9.71	11.28	20.99	50.00	-29.01	AVG

Remark:

Factor = Cable loss + LISN factor, Margin = Measurement – Limit

Adapter model: W87RA07-290030+ Black nose:
L: Worst case-GFSK(low channel)

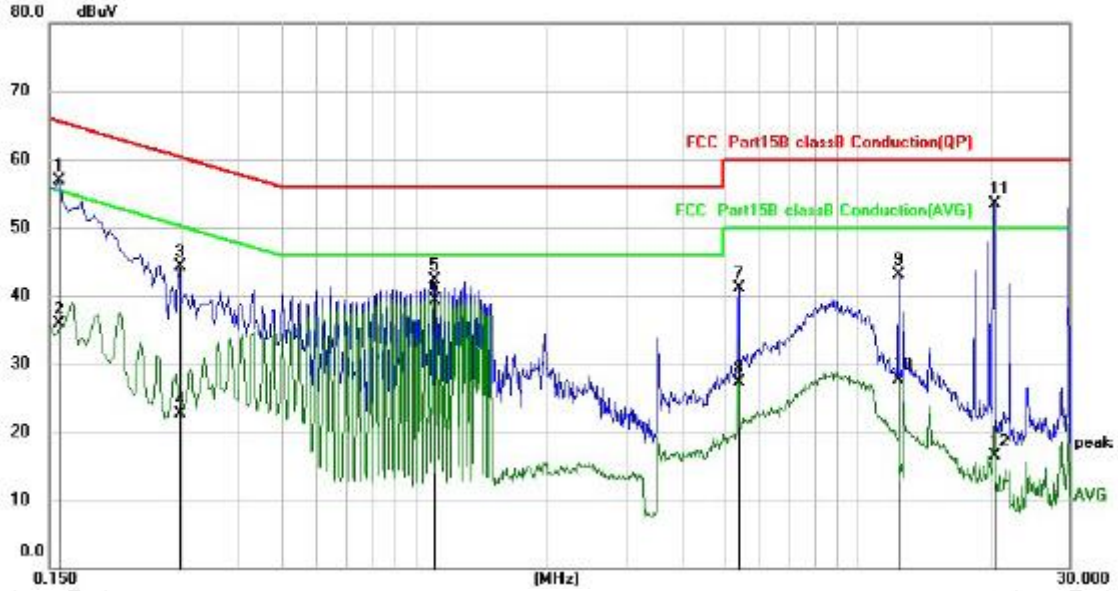


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1	*	0.1580	44.99	10.66	55.65	65.57	-9.92	QP
2		0.1580	26.67	10.66	37.33	55.57	-18.24	AVG
3		0.9700	33.46	10.71	44.17	56.00	-11.83	QP
4		0.9700	4.09	10.71	14.80	46.00	-31.20	AVG
5		2.9420	33.33	10.79	44.12	56.00	-11.88	QP
6		2.9420	2.89	10.79	13.68	46.00	-32.32	AVG
7		5.0540	28.11	10.79	38.90	60.00	-21.10	QP
8		5.0540	0.36	10.79	11.15	50.00	-38.85	AVG
9		10.7340	32.19	11.00	43.19	60.00	-16.81	QP
10		10.7340	14.19	11.00	25.19	50.00	-24.81	AVG
11		20.1900	37.43	11.27	48.70	60.00	-11.30	QP
12		20.1900	4.75	11.27	16.02	50.00	-33.98	AVG

Remark:

Factor = Cable loss + LISN factor, Margin = Measurement – Limit

N:

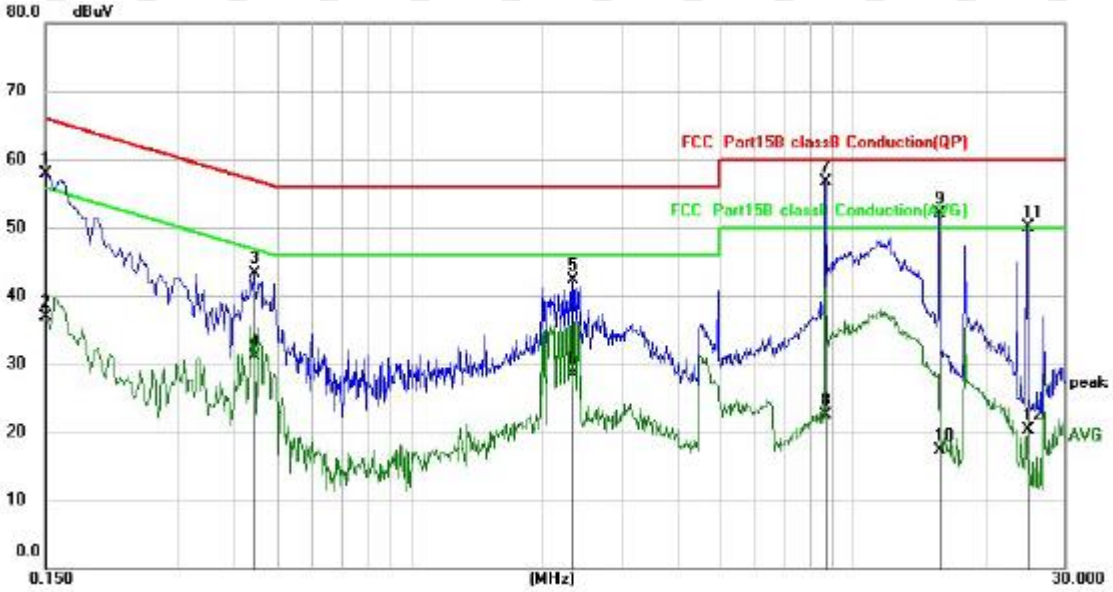


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1		0.1580	46.18	10.66	56.84	65.57	-8.73	QP
2		0.1580	25.15	10.66	35.81	55.57	-19.76	AVG
3		0.2940	33.70	10.62	44.32	60.41	-16.09	QP
4		0.2940	12.14	10.62	22.76	50.41	-27.65	AVG
5		1.1060	31.49	10.72	42.21	56.00	-13.79	QP
6		1.1060	28.56	10.72	39.28	46.00	-6.72	AVG
7		5.3940	30.29	10.81	41.10	60.00	-18.90	QP
8		5.3940	16.53	10.81	27.34	50.00	-22.66	AVG
9		12.3340	32.12	11.04	43.16	60.00	-16.84	QP
10		12.3340	16.75	11.04	27.79	50.00	-22.21	AVG
11	*	20.3740	42.30	11.28	53.58	60.00	-6.42	QP
12		20.3740	5.13	11.28	16.41	50.00	-33.59	AVG

Remark:

Factor = Cable loss + LISN factor, Margin = Measurement – Limit

Adapter model: W52RA199-290018+ Black nose:
L: Worst case-GFSK(low channel)

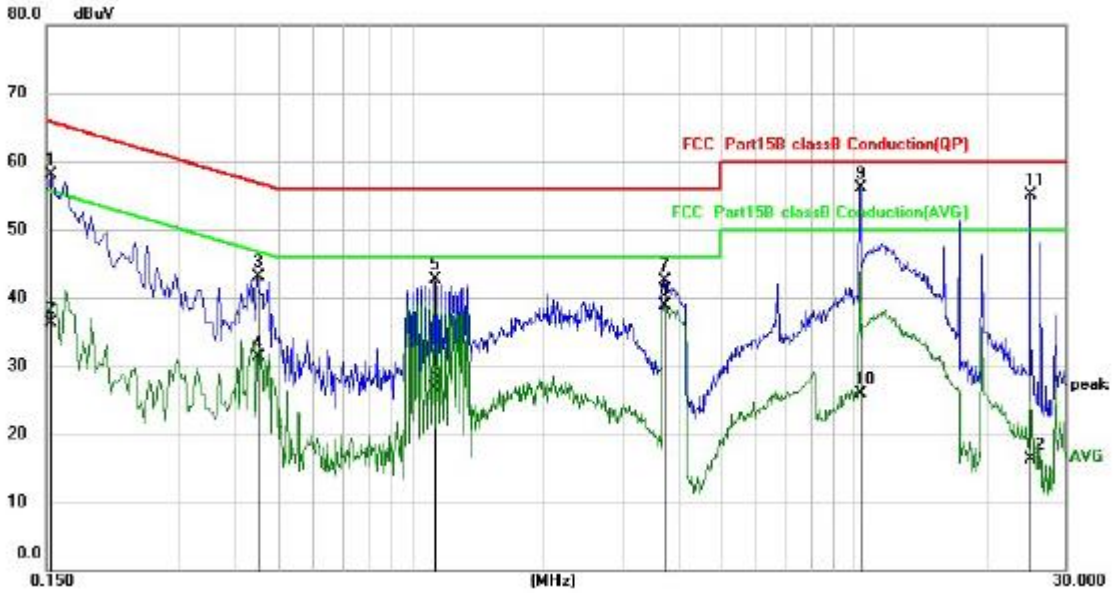


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1		0.1500	47.31	10.67	57.98	66.00	-8.02	QP
2		0.1500	26.30	10.67	36.97	56.00	-19.03	AVG
3		0.4460	32.69	10.67	43.36	56.95	-13.59	QP
4		0.4460	20.42	10.67	31.09	46.95	-15.86	AVG
5		2.3300	31.61	10.79	42.40	56.00	-13.60	QP
6		2.3300	17.75	10.79	28.54	46.00	-17.46	AVG
7	*	8.6780	45.70	10.94	56.64	60.00	-3.36	QP
8		8.6780	11.62	10.94	22.56	50.00	-27.44	AVG
9		15.7020	41.04	11.13	52.17	60.00	-7.83	QP
10		15.7020	6.19	11.13	17.32	50.00	-32.68	AVG
11		24.7139	38.73	11.35	50.08	60.00	-9.92	QP
12		24.7139	8.95	11.35	20.30	50.00	-29.70	AVG

Remark:

Factor = Cable loss + LISN factor, Margin = Measurement – Limit

N:

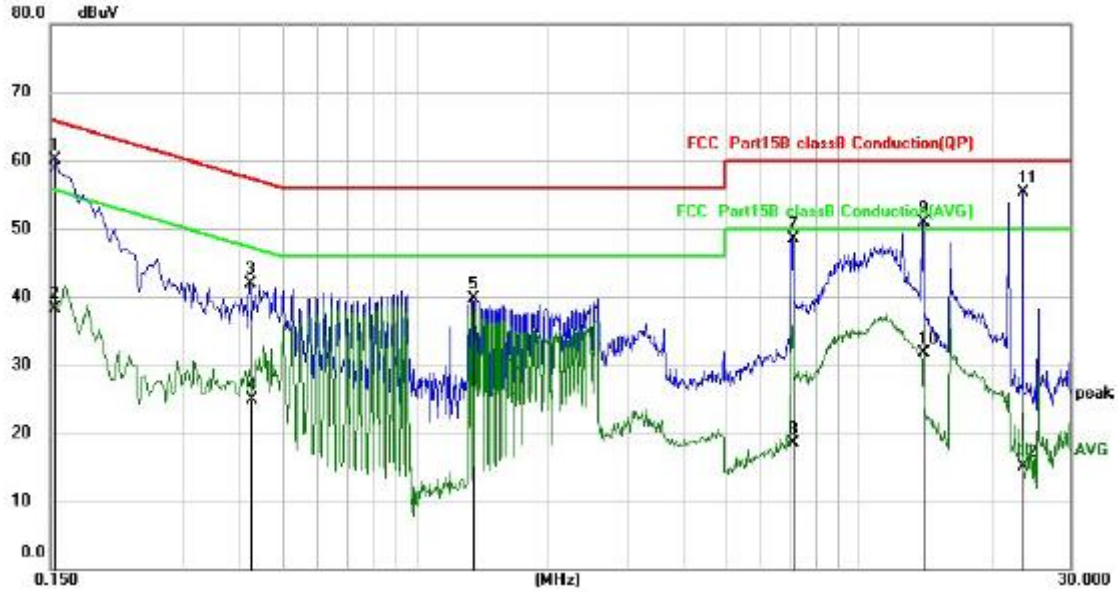


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1		0.1539	47.52	10.66	58.18	65.79	-7.61	QP
2		0.1539	25.61	10.66	36.27	55.79	-19.52	AVG
3		0.4500	32.43	10.67	43.10	56.88	-13.78	QP
4		0.4500	20.66	10.67	31.33	46.88	-15.55	AVG
5		1.1300	32.02	10.72	42.74	56.00	-13.26	QP
6		1.1300	15.91	10.72	26.63	46.00	-19.37	AVG
7		3.7220	31.78	10.79	42.57	56.00	-13.43	QP
8		3.7220	28.13	10.79	38.92	46.00	-7.08	AVG
9	*	10.3100	45.09	10.99	56.08	60.00	-3.92	QP
10		10.3100	14.92	10.99	25.91	50.00	-24.09	AVG
11		24.9900	43.68	11.36	55.04	60.00	-4.96	QP
12		24.9900	4.85	11.36	16.21	50.00	-33.79	AVG

Remark:

Factor = Cable loss + LISN factor, Margin = Measurement – Limit

Adapter model: W52RA198-290018+ Black nose:
L: Worst case-GFSK(low channel)

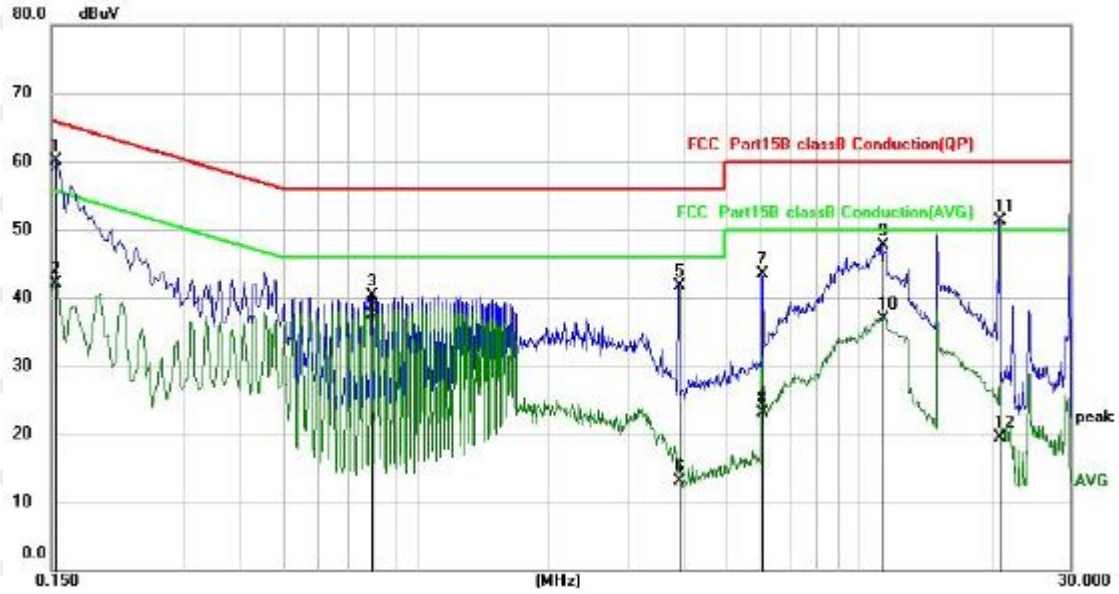


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1		0.1539	49.44	10.66	60.10	65.79	-5.69	QP
2		0.1539	27.69	10.66	38.35	55.79	-17.44	AVG
3		0.4220	31.33	10.66	41.99	57.41	-15.42	QP
4		0.4260	14.21	10.66	24.87	47.33	-22.46	AVG
5		1.3460	28.98	10.74	39.72	56.00	-16.28	QP
6		1.3460	17.72	10.74	28.46	46.00	-17.54	AVG
7		7.0860	37.59	10.89	48.48	60.00	-11.52	QP
8		7.0860	7.65	10.89	18.54	50.00	-31.46	AVG
9		13.9300	39.83	11.08	50.91	60.00	-9.09	QP
10		13.9300	20.61	11.08	31.69	50.00	-18.31	AVG
11	*	23.3980	44.00	11.33	55.33	60.00	-4.67	QP
12		23.3980	3.81	11.33	15.14	50.00	-34.86	AVG

Remark:

Factor = Cable loss + LISN factor, Margin = Measurement – Limit

N:



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1	*	0.1539	49.44	10.66	60.10	65.79	-5.69	QP
2		0.1539	31.49	10.66	42.15	55.79	-13.64	AVG
3		0.7940	29.69	10.70	40.39	56.00	-15.61	QP
4		0.7940	26.76	10.70	37.46	46.00	-8.54	AVG
5		3.9020	31.00	10.79	41.79	56.00	-14.21	QP
6		3.9020	2.34	10.79	13.13	46.00	-32.87	AVG
7		6.0500	32.68	10.84	43.52	60.00	-16.48	QP
8		6.0500	12.32	10.84	23.16	50.00	-26.84	AVG
9		11.3700	36.72	11.02	47.74	60.00	-12.26	QP
10		11.3700	25.87	11.02	36.89	50.00	-13.11	AVG
11		20.7300	40.00	11.28	51.28	60.00	-8.72	QP
12		20.7300	8.22	11.28	19.50	50.00	-30.50	AVG

Remark:

Factor = Cable loss + LISN factor, Margin = Measurement – Limit

7. RADIATED SPURIOUS EMISSION

7.1 Block Diagram Of Test Setup

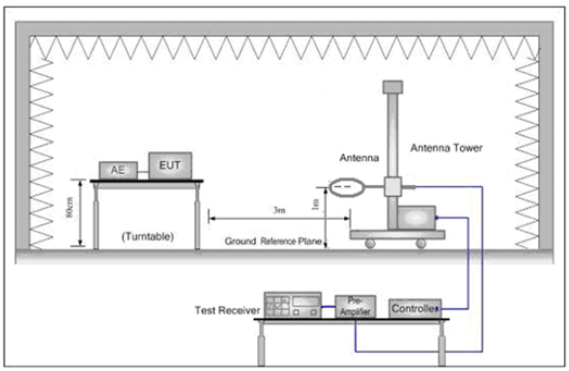


Figure 1. Below 30MHz

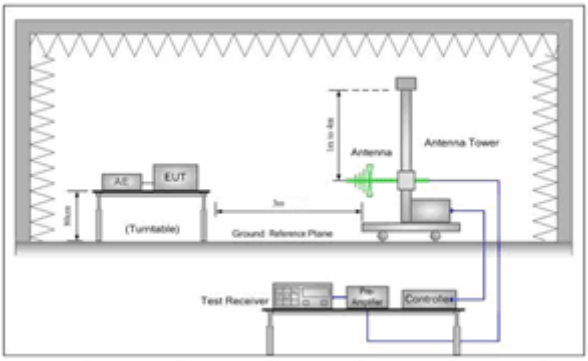
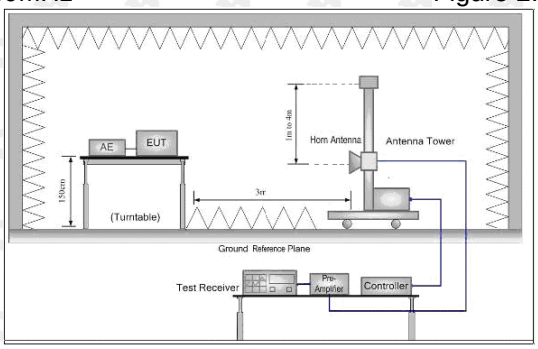


Figure 2. 30MHz to 1GHz



7.2 Limit

Spurious Emissions:

Frequency	Field strength (microvolt/meter)	Limit (dBμV/m)	Remark	Measurement distance (m)
0.009MHz-0.490MHz	2400/F(kHz)	-	-	300
0.490MHz-1.705MHz	24000/F(kHz)	-	-	30
1.705MHz-30MHz	30	-	-	30
30MHz-88MHz	100	40.0	Quasi-peak	3
88MHz-216MHz	150	43.5	Quasi-peak	3
216MHz-960MHz	200	46.0	Quasi-peak	3
960MHz-1GHz	500	54.0	Quasi-peak	3
Above 1GHz	500	54.0	Average	3

Note: 15.35(b), Unless otherwise specified, the limit on peak radio frequency emissions is 20dB above the maximum permitted average emission limit applicable to the equipment under test. This peak limit applies to the total peak emission level radiated by the device.

7.3 Test procedure

Below 1GHz test procedure as below:

a.The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation.

b.The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c.The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

d.For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rota table table was turned from 0 degrees to 360 degrees to find the maximum reading.

e.The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

f.If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

Above 1GHz test procedure as below:

g.Different between above is the test site, change from Semi- Anechoic Chamber to fully Anechoic Chamber and change form table 0.8 meter to 1.5 meter(Above 18GHz the distance is 1 meter and table is 1.5 meter).

h.Test the EUT in the lowest channel ,the middle channel ,the Highest channel

i.Repeat above procedures until all frequencies measured was complete.

j. Full battery is usedduring test

Receiver set:

Frequency	Detector	RBW	VBW	Remark
0.009MHz-0.090MHz	Peak	10kHz	30KHz	Peak
0.009MHz-0.090MHz	Average	10kHz	30KHz	Average
0.090MHz-0.110MHz	Quasi-peak	10kHz	30KHz	Quasi-peak
0.110MHz-0.490MHz	Peak	10kHz	30KHz	Peak
0.110MHz-0.490MHz	Average	10kHz	30KHz	Average
0.490MHz -30MHz	Quasi-peak	10kHz	30kHz	Quasi-peak
30MHz-1GHz	Quasi-peak	120 kHz	300KHz	Quasi-peak
Above 1GHz	Peak	1MHz	3MHz	Peak
	Peak	1MHz	10Hz	Average

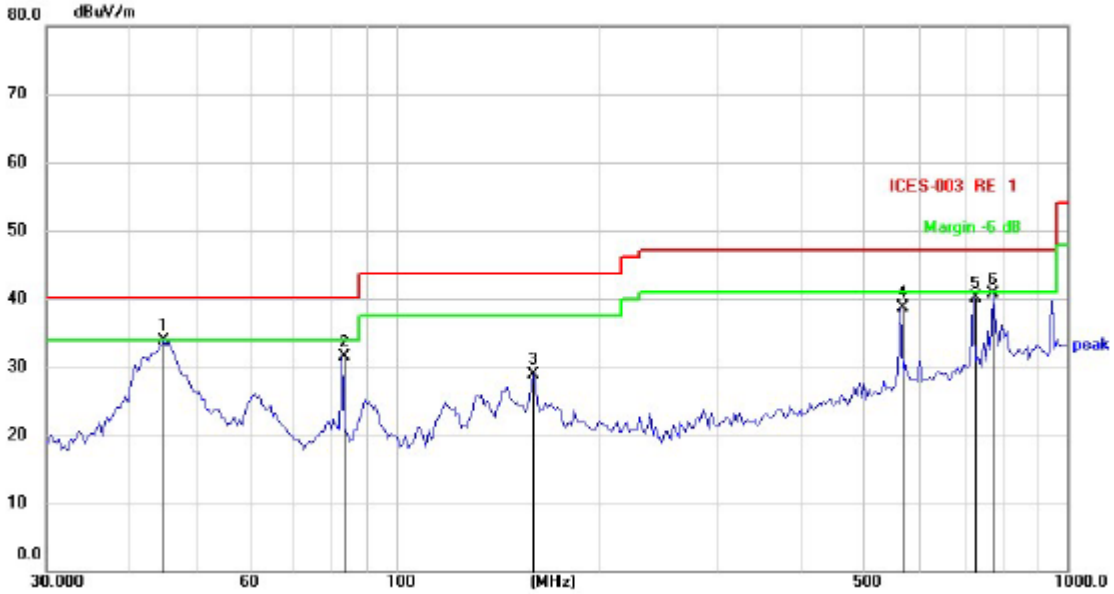
7.4 Test Result

Adapter model: W87RA07-290030+ white nose:
Below 1GHz Test Results:
Antenna polarity: H
Worst case-GFSK(low channel)

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1		41.4942	29.89	-5.05	24.84	40.00	-15.16	QP
2		61.0245	33.53	-6.87	26.66	40.00	-13.34	QP
3		173.2051	32.41	-4.74	27.67	43.50	-15.83	QP
4		273.2341	35.54	-5.90	29.64	47.00	-17.36	QP
5		580.7026	36.76	2.13	38.89	47.00	-8.11	QP
6	*	722.9924	35.49	4.98	40.47	47.00	-6.53	QP

Remark: Factor = Cable lose + Antenna factor - Pre-amplifier; Margin = Measurement – Limit

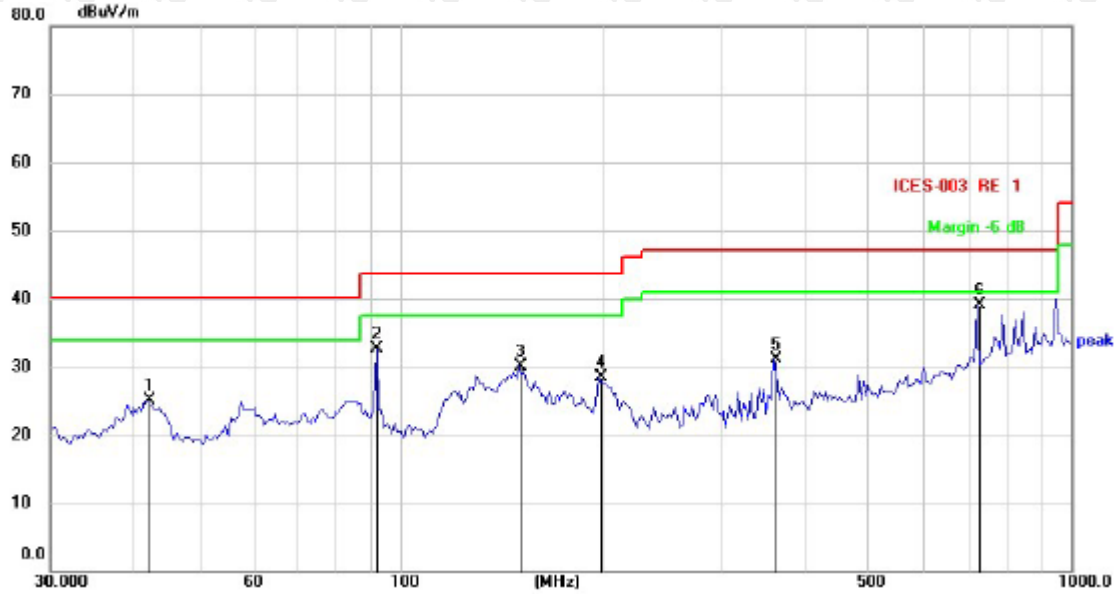
Antenna polarity: V
Worst case-GFSK(low channel)



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1	*	44.9006	39.59	-5.69	33.90	40.00	-6.10	QP
2		82.9385	40.88	-9.35	31.53	40.00	-8.47	QP
3		160.0648	32.52	-3.54	28.98	43.50	-14.52	QP
4		565.6297	37.05	1.74	38.79	47.00	-8.21	QP
5		722.9924	35.09	4.98	40.07	47.00	-6.93	QP
6		775.5169	34.82	5.96	40.78	47.00	-6.22	QP

Remark: Factor = Cable lose + Antenna factor - Pre-amplifier; Margin = Measurement – Limit

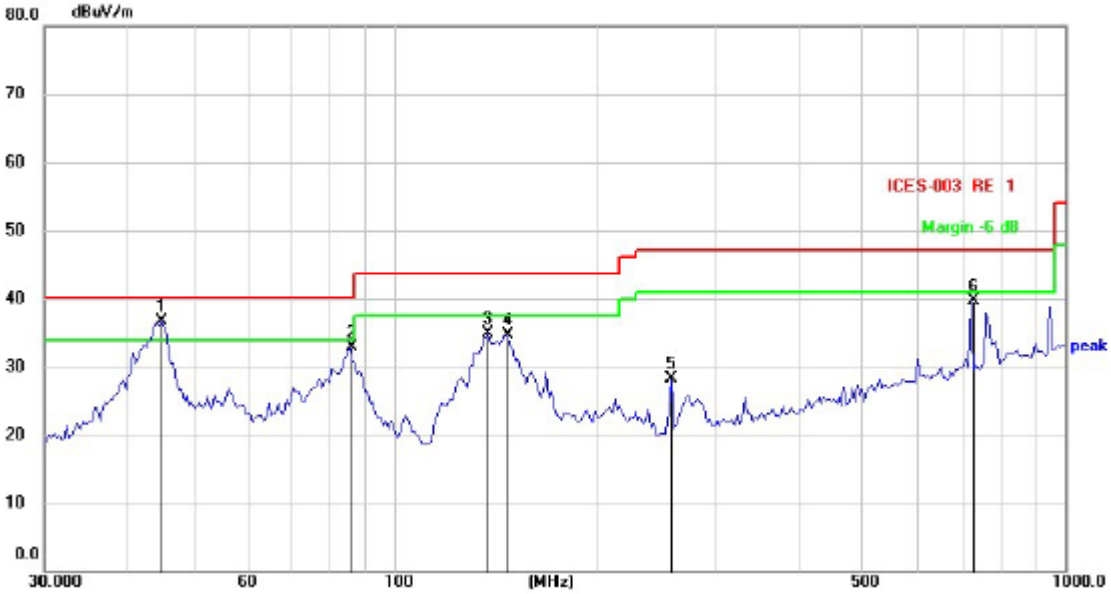
Adapter model: W52RA199-290018+ white nose:
Below 1GHz Test Results:
Antenna polarity: H
Worst case-GFSK(low channel)



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1		41.8596	30.31	-5.12	25.19	40.00	-14.81	QP
2		92.1386	42.49	-9.76	32.73	43.50	-10.77	QP
3		150.5378	33.39	-3.19	30.20	43.50	-13.30	QP
4		197.5462	35.96	-7.49	28.47	43.50	-15.03	QP
5		361.7139	34.30	-3.14	31.16	47.00	-15.84	QP
6	*	722.9924	34.07	4.98	39.05	47.00	-7.95	QP

Remark: Factor = Cable lose + Antenna factor - Pre-amplifier; Margin = Measurement – Limit

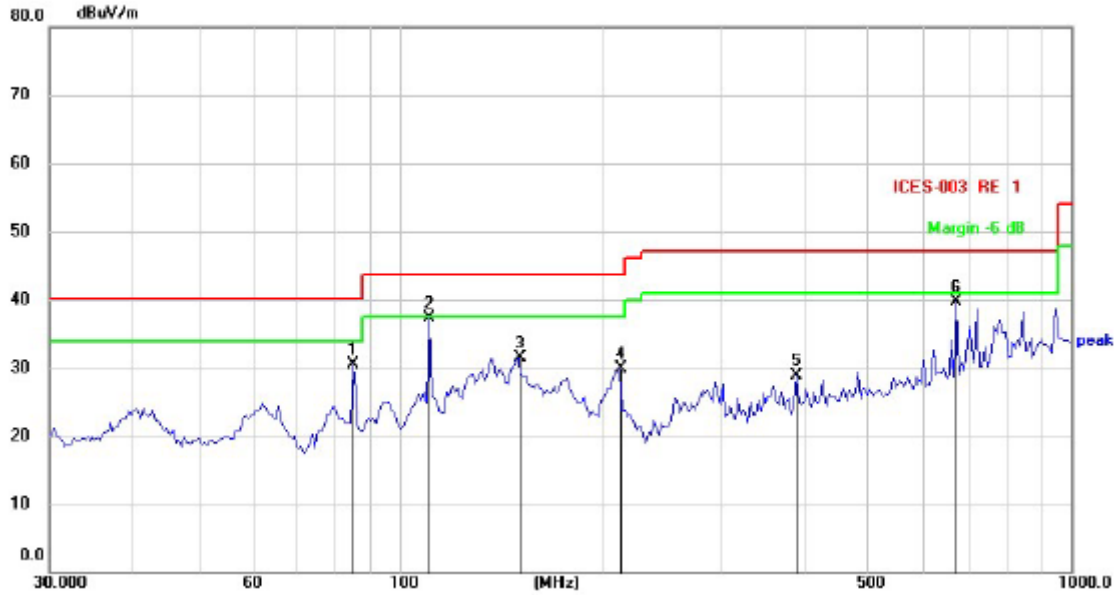
Antenna polarity: V
Worst case-GFSK(low channel)



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1	*	44.9006	42.41	-5.69	36.72	40.00	-3.28	QP
2		85.8984	42.56	-9.62	32.94	40.00	-7.06	QP
3		137.9028	39.39	-4.48	34.91	43.50	-8.59	QP
4		146.6304	38.27	-3.58	34.69	43.50	-8.81	QP
5		259.2338	34.89	-6.50	28.39	47.00	-18.61	QP
6		722.9924	34.70	4.98	39.68	47.00	-7.32	QP

Remark: Factor = Cable lose + Antenna factor - Pre-amplifier; Margin = Measurement – Limit

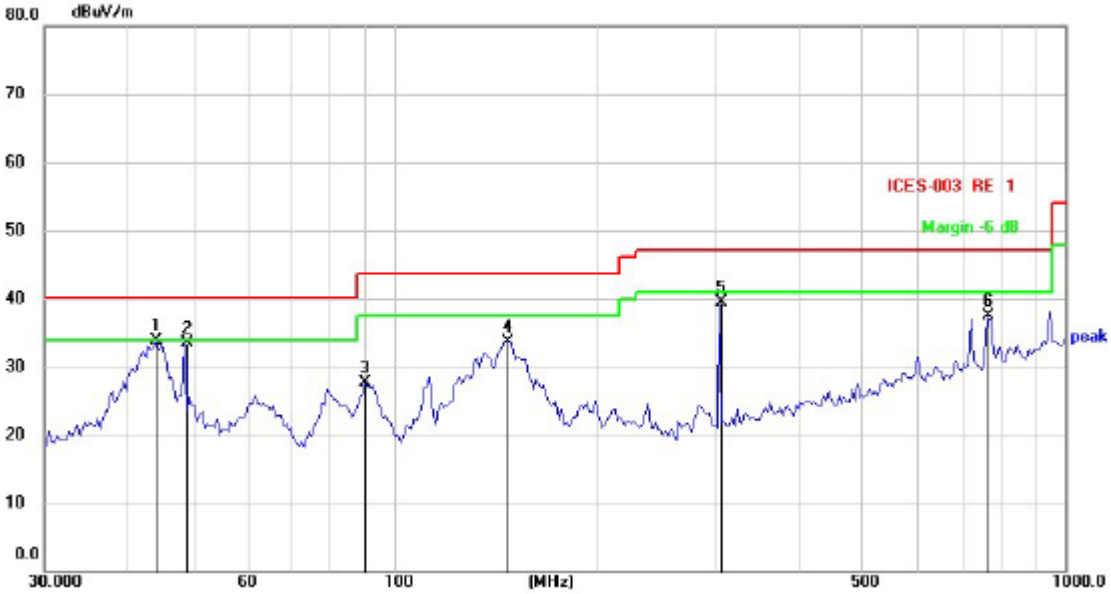
Adapter model: W52RA198-290018+ white nose:
Below 1GHz Test Results:
Antenna polarity: H
Worst case-GFSK(low channel)



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1		85.1486	39.98	-9.55	30.43	40.00	-9.57	QP
2	*	110.7627	44.21	-6.90	37.31	43.50	-6.19	QP
3		150.5378	34.72	-3.19	31.53	43.50	-11.97	QP
4		211.8977	37.31	-7.33	29.98	43.50	-13.52	QP
5		391.4082	31.26	-2.37	28.89	47.00	-18.11	QP
6		674.0252	35.62	4.05	39.67	47.00	-7.33	QP

Remark: Factor = Cable lose + Antenna factor - Pre-amplifier; Margin = Measurement – Limit

Antenna polarity: V
Worst case-GFSK(low channel)



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1	*	44.1202	39.45	-5.54	33.91	40.00	-6.09	QP
2		48.5867	39.96	-6.38	33.58	40.00	-6.42	QP
3		90.5374	37.65	-9.94	27.71	43.50	-15.79	QP
4		146.6304	37.34	-3.58	33.76	43.50	-9.74	QP
5		306.2164	43.99	-4.58	39.41	47.00	-7.59	QP
6		768.7481	31.72	5.84	37.56	47.00	-9.44	QP

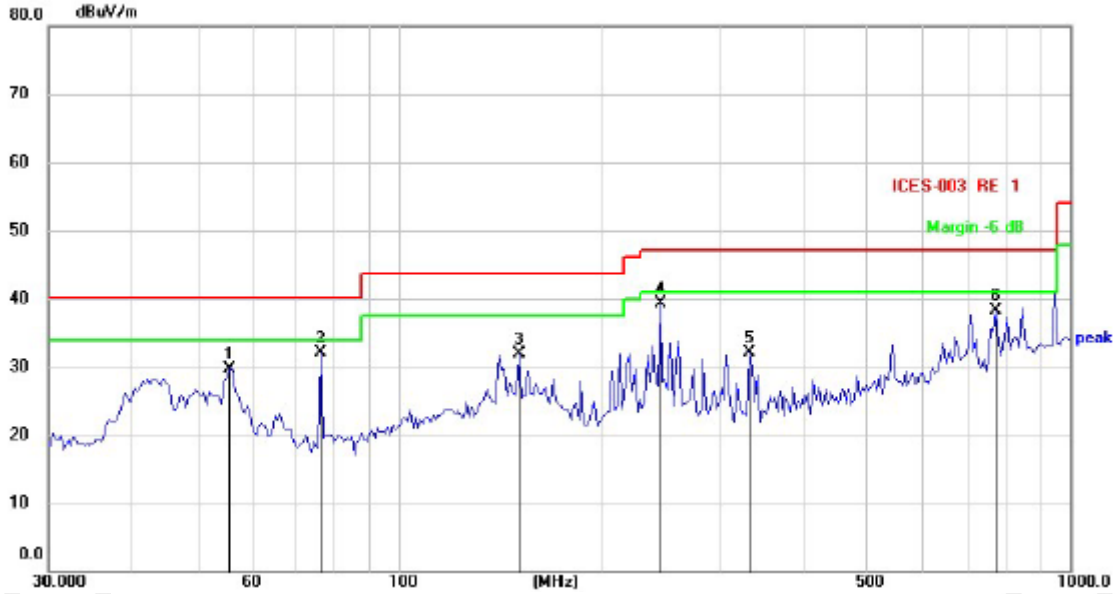
Remark: Factor = Cable lose + Antenna factor - Pre-amplifier; Margin = Measurement – Limit

Adapter model: W87RA07-290030+ Black nose:

Below 1GHz Test Results:

Antenna polarity: H

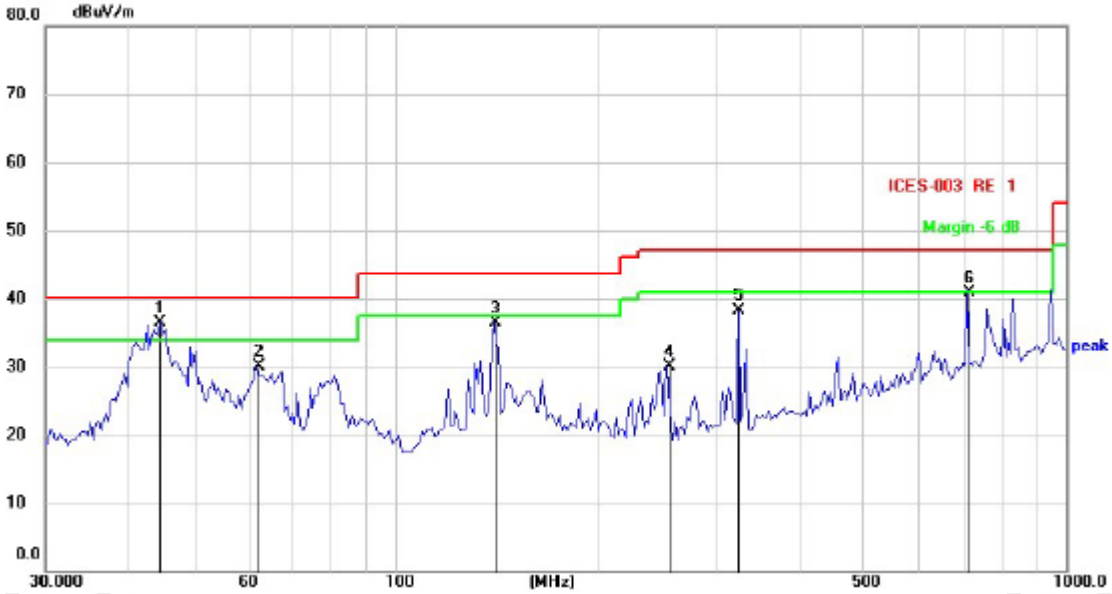
Worst case-GFSK(low channel)



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1		55.9025	36.48	-6.69	29.79	40.00	-10.21	QP
2		76.6461	40.87	-8.73	32.14	40.00	-7.86	QP
3		151.8632	35.17	-3.24	31.93	43.50	-11.57	QP
4	*	245.9507	46.20	-6.95	39.25	47.00	-7.75	QP
5		334.2721	35.94	-3.85	32.09	47.00	-14.91	QP
6		775.5167	32.42	5.96	38.38	47.00	-8.62	QP

Remark: Factor = Cable lose + Antenna factor - Pre-amplifier; Margin = Measurement – Limit

Antenna polarity: V
Worst case-GFSK(low channel)



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1	*	44.5087	42.16	-5.61	36.55	40.00	-3.45	QP
2		62.1039	37.02	-7.01	30.01	40.00	-9.99	QP
3		140.3421	40.79	-4.35	36.44	43.50	-7.06	QP
4		254.7284	36.81	-6.70	30.11	47.00	-16.89	QP
5		325.5958	42.47	-4.08	38.39	47.00	-8.61	QP
6		710.4268	36.21	4.74	40.95	47.00	-6.05	QP

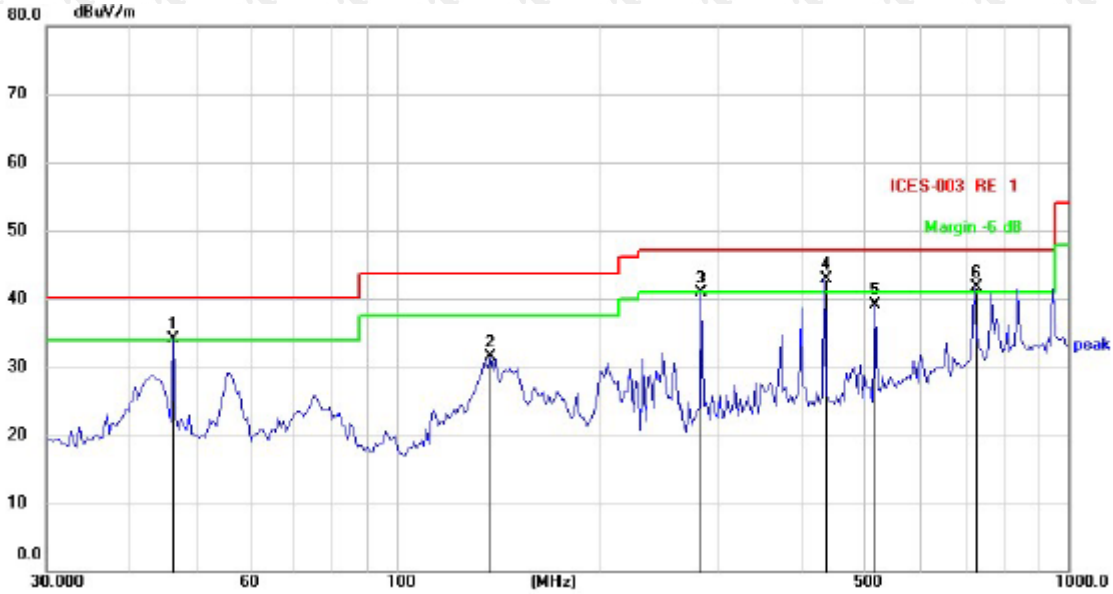
Remark: Factor = Cable lose + Antenna factor - Pre-amplifier; Margin = Measurement – Limit

Adapter model: W52RA199-290018+ Black nose:

Below 1GHz Test Results:

Antenna polarity: H

Worst case-GFSK(low channel)



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1	!	46.5030	40.16	-5.99	34.17	40.00	-5.83	QP
2		137.9028	36.03	-4.48	31.55	43.50	-11.95	QP
3		285.4768	46.33	-5.37	40.96	47.00	-6.04	QP
4	*	434.8268	44.37	-1.39	42.98	47.00	-4.02	QP
5		518.1556	38.59	0.51	39.10	47.00	-7.90	QP
6	!	722.9924	36.80	4.98	41.78	47.00	-5.22	QP

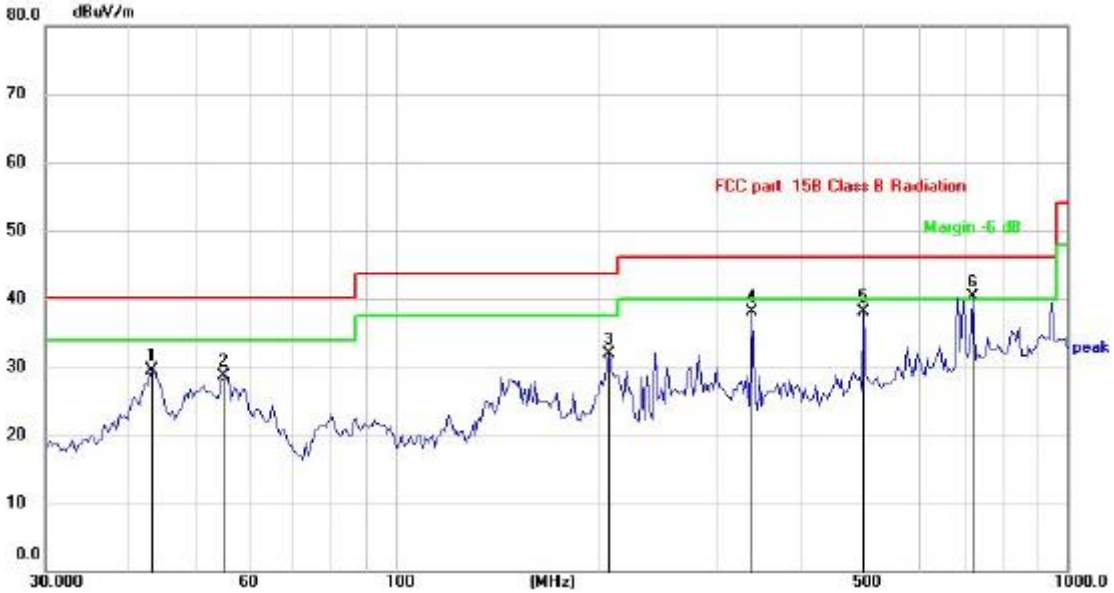
Remark: Factor = Cable lose + Antenna factor - Pre-amplifier; Margin = Measurement – Limit

Antenna polarity: V
Worst case-GFSK(low channel)

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1	*	44.5087	42.51	-5.61	36.90	40.00	-3.10	QP
2	!	55.4147	41.81	-6.69	35.12	40.00	-4.88	QP
3	!	147.9214	43.55	-3.42	40.13	43.50	-3.37	QP
4	!	167.2368	43.09	-4.15	38.94	43.50	-4.56	QP
5		229.2931	36.79	-7.14	29.65	46.00	-16.35	QP
6	!	645.1195	37.68	3.50	41.18	47.00	-5.82	QP

Remark: Factor = Cable lose + Antenna factor - Pre-amplifier; Margin = Measurement – Limit

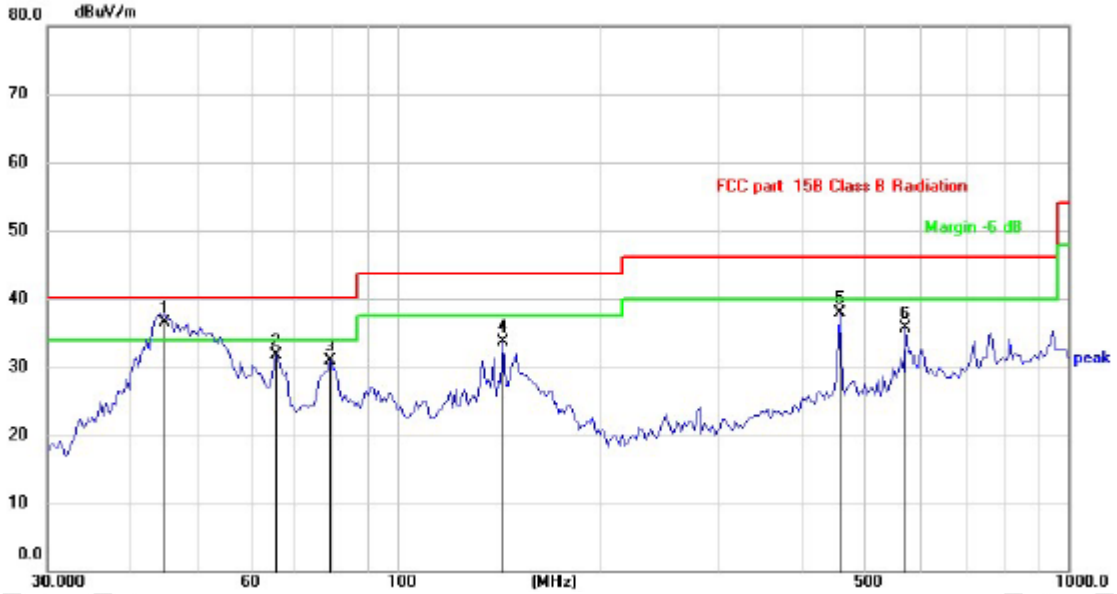
Adapter model: W52RA198-290018+ Black nose:
Below 1GHz Test Results:
Antenna polarity: H
Worst case-GFSK(low channel)



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1		43.3534	34.94	-5.40	29.54	40.00	-10.46	QP
2		55.4147	35.34	-6.69	28.65	40.00	-11.35	QP
3		208.2147	39.36	-7.38	31.98	43.50	-11.52	QP
4		340.1847	41.80	-3.70	38.10	46.00	-7.90	QP
5		500.3009	38.00	0.05	38.05	46.00	-7.95	QP
6	*	722.9923	35.38	4.98	40.36	46.00	-5.64	QP

Remark: Factor = Cable lose + Antenna factor - Pre-amplifier; Margin = Measurement – Limit

Antenna polarity: V
Worst case-GFSK(low channel)



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1	*	44.9004	42.25	-5.69	36.56	40.00	-3.44	QP
2		66.0341	39.21	-7.53	31.68	40.00	-8.32	QP
3		79.3816	39.85	-9.02	30.83	40.00	-9.17	QP
4		144.0818	37.59	-3.89	33.70	43.50	-9.80	QP
5		458.3100	38.84	-0.87	37.97	46.00	-8.03	QP
6		575.6341	33.67	2.00	35.67	46.00	-10.33	QP

Remark: Factor = Cable lose + Antenna factor - Pre-amplifier; Margin = Measurement – Limit

Adapter model: W87RA07-290030+ white nose:

Above 1 GHz Test Results:

CH Low (2402MHz)
Horizontal:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2402	110.67	-5.84	104.83	N/A	N/A	peak
2402	93.57	-5.84	87.73	N/A	N/A	AVG
4804	57.63	-3.64	53.99	74	-20.01	peak
4804	48.83	-3.64	45.19	54	-8.81	AVG
7206	60.38	-0.95	59.43	74	-14.57	peak
7206	48.12	-0.95	47.17	54	-6.83	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits						

Vertical:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2402	109.34	-5.84	103.50	N/A	N/A	peak
2402	94.91	-5.84	89.07	N/A	N/A	AVG
4804	57.65	-3.64	54.01	74	-19.99	peak
4804	47.38	-3.64	43.74	54	-10.26	AVG
7206	58.65	-0.95	57.70	74	-16.30	peak
7206	50.88	-0.95	49.93	54	-4.07	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits						

CH Middle (2440MHz)
Horizontal:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2440	106.73	-5.71	101.02	N/A	N/A	peak
2440	92.07	-5.71	86.36	N/A	N/A	AVG
4880	55.89	-3.51	52.38	74	-21.62	peak
4880	47.00	-3.51	43.49	54	-10.51	AVG
7320	57.45	-0.82	56.63	74	-17.37	peak
7320	46.58	-0.82	45.76	54	-8.24	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits

Vertical:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2440	106.45	-5.71	100.74	N/A	N/A	peak
2440	93.02	-5.71	87.31	N/A	N/A	AVG
4880	55.76	-3.51	52.25	74	-21.75	peak
4880	46.20	-3.51	42.69	54	-11.31	AVG
7320	57.81	-0.82	56.99	74	-17.01	peak
7320	47.28	-0.82	46.46	54	-7.54	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits

CH High (2480MHz)
Horizontal:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2480	107.45	-5.65	101.80	N/A	N/A	peak
2480	91.44	-5.65	85.79	N/A	N/A	AVG
4960	55.46	-3.43	52.03	74	-21.97	peak
4960	46.37	-3.43	42.94	54	-11.06	AVG
7440	56.66	-0.75	55.91	74	-18.09	peak
7440	47.62	-0.75	46.87	54	-7.13	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits

Vertical:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2480	106.18	-5.65	100.53	N/A	N/A	peak
2480	91.47	-5.65	85.82	N/A	N/A	AVG
4960	54.35	-3.43	50.92	74	-23.08	peak
4960	46.95	-3.43	43.52	54	-10.48	AVG
7440	56.61	-0.75	55.86	74	-18.14	peak
7440	47.27	-0.75	46.52	54	-7.48	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits

Remark:
(1) Measuring frequencies from 9KHz to the 25 GHz, The test range is 9K ~10 times the main wave, and other spurious below the limit of 20dB will not be reflected in the report.
(2). All modes of GFSK were test at Low, Middle, and High channel, only the worst result of GFSK Low Channel was reported for below 1GHz test.
(3). For BT above 1GHz test all modes of GFSK were test at Low, Middle, and High channel, only the worst result of GFSK Low Channel was reported.
(4). By preliminary testing and verifying three axis (X, Y and Z) position of EUT transmitted status, it was found that “Z axis” position was the worst, and test data recorded in this report.
(5). Radiated emission test from 9kHz to 10th harmonic of fundamental was verified, and no emission found except system noise floor in 9kHz to 30MHz and not recorded in this report.

Restricted bands around fundamental frequency (Radiated)

Operation Mode: TX CH Low (2402MHz)
Horizontal (Worst case)

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2310	54.48	-5.81	48.67	74	-25.33	peak
2310	/	-5.81	/	54	/	AVG
2390	55.95	-5.84	50.11	74	-23.89	peak
2390	/	-5.84	/	54	/	AVG
2400	54.70	-5.84	48.86	74	-25.14	peak
2400	/	-5.84	/	54	/	AVG

Vertical:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2310	56.80	-5.81	50.99	74	-23.01	peak
2310	/	-5.81	/	54	/	AVG
2390	53.33	-5.84	47.49	74	-26.51	peak
2390	/	-5.84	/	54	/	AVG
2400	57.36	-5.84	51.52	74	-22.48	peak
2400	/	-5.84	/	54	/	AVG

When the peak value is smaller than the AVG limit, AVG is not reflected.

Operation Mode: TX CH High (2480MHz)
Horizontal (Worst case)

Frequency (MHz)	Reading Result (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2483.50	55.52	-5.65	49.87	74	-24.13	peak
2483.50	/	-5.65	/	54	/	AVG
2500.00	53.25	-5.65	47.60	74	-26.40	peak
2500.00	/	-5.65	/	54	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits						

Vertical:

Frequency (MHz)	Reading Result (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2483.50	55.67	-5.65	50.02	74	-23.98	peak
2483.50	/	-5.65	/	54	/	AVG
2500.00	55.55	-5.65	49.90	74	-24.10	peak
2500.00	/	-5.65	/	54	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits						
Remark: All the other emissions not reported were too low to read and deemed to comply with FCC limit.						

When the peak value is smaller than the AVG limit, AVG is not reflected.

Adapter model: W52RA199-290018+ white nose:

Above 1 GHz Test Results:

CH Low (2402MHz)
Horizontal:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2402	108.62	-5.84	102.78	N/A	N/A	peak
2402	94.11	-5.84	88.27	N/A	N/A	AVG
4804	57.76	-3.64	54.12	74	-19.88	peak
4804	49.20	-3.64	45.56	54	-8.44	AVG
7206	59.03	-0.95	58.08	74	-15.92	peak
7206	48.84	-0.95	47.89	54	-6.11	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits						

Vertical:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2402	108.37	-5.84	102.53	N/A	N/A	peak
2402	94.69	-5.84	88.85	N/A	N/A	AVG
4804	57.42	-3.64	53.78	74	-20.22	peak
4804	49.51	-3.64	45.87	54	-8.13	AVG
7206	60.16	-0.95	59.21	74	-14.79	peak
7206	49.89	-0.95	48.94	54	-5.06	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits						

CH Middle (2440MHz)
Horizontal:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2440	107.69	-5.71	101.98	N/A	N/A	peak
2440	92.78	-5.71	87.07	N/A	N/A	AVG
4880	54.96	-3.51	51.45	74	-22.55	peak
4880	45.04	-3.51	41.53	54	-12.47	AVG
7320	57.45	-0.82	56.63	74	-17.37	peak
7320	46.94	-0.82	46.12	54	-7.88	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits

Vertical:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2440	106.76	-5.71	101.05	N/A	N/A	peak
2440	91.86	-5.71	86.15	N/A	N/A	AVG
4880	54.57	-3.51	51.06	74	-22.94	peak
4880	45.54	-3.51	42.03	54	-11.97	AVG
7320	57.68	-0.82	56.86	74	-17.14	peak
7320	45.96	-0.82	45.14	54	-8.86	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits

CH High (2480MHz)
Horizontal:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2480	106.50	-5.65	100.85	N/A	N/A	peak
2480	92.31	-5.65	86.66	N/A	N/A	AVG
4960	56.15	-3.43	52.72	74	-21.28	peak
4960	47.24	-3.43	43.81	54	-10.19	AVG
7440	55.98	-0.75	55.23	74	-18.77	peak
7440	45.89	-0.75	45.14	54	-8.86	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits

Vertical:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2480	105.95	-5.65	100.30	N/A	N/A	peak
2480	91.10	-5.65	85.45	N/A	N/A	AVG
4960	54.43	-3.43	51.00	74	-23.00	peak
4960	45.62	-3.43	42.19	54	-11.81	AVG
7440	56.14	-0.75	55.39	74	-18.61	peak
7440	47.11	-0.75	46.36	54	-7.64	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits

Remark:
(1) Measuring frequencies from 9KHz to the 25 GHz, The test range is 9K ~10 times the main wave, and other spurious below the limit of 20dB will not be reflected in the report.
(2). All modes of GFSK were test at Low, Middle, and High channel, only the worst result of GFSK Low Channel was reported for below 1GHz test.
(3). For BT above 1GHz test all modes of GFSK were test at Low, Middle, and High channel, only the worst result of GFSK Low Channel was reported.
(4). By preliminary testing and verifying three axis (X, Y and Z) position of EUT transmitted status, it was found that “Z axis” position was the worst, and test data recorded in this report.
(5). Radiated emission test from 9kHz to 10th harmonic of fundamental was verified, and no emission found except system noise floor in 9kHz to 30MHz and not recorded in this report.

Restricted bands around fundamental frequency (Radiated)

Operation Mode: TX CH Low (2402MHz)
Horizontal (Worst case)

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2310	53.42	-5.81	47.61	74	-26.39	peak
2310	/	-5.81	/	54	/	AVG
2390	53.28	-5.84	47.44	74	-26.56	peak
2390	/	-5.84	/	54	/	AVG
2400	54.55	-5.84	48.71	74	-25.29	peak
2400	/	-5.84	/	54	/	AVG

Vertical:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2310	56.13	-5.81	50.32	74	-23.68	peak
2310	/	-5.81	/	54	/	AVG
2390	54.88	-5.84	49.04	74	-24.96	peak
2390	/	-5.84	/	54	/	AVG
2400	56.33	-5.84	50.49	74	-23.51	peak
2400	/	-5.84	/	54	/	AVG

When the peak value is smaller than the AVG limit, AVG is not reflected.

Operation Mode: TX CH High (2480MHz)
Horizontal (Worst case)

Frequency (MHz)	Reading Result (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2483.50	54.61	-5.65	48.96	74	-25.04	peak
2483.50	/	-5.65	/	54	/	AVG
2500.00	54.20	-5.65	48.55	74	-25.45	peak
2500.00	/	-5.65	/	54	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits						

Vertical:

Frequency (MHz)	Reading Result (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2483.50	54.33	-5.65	48.68	74	-25.32	peak
2483.50	/	-5.65	/	54	/	AVG
2500.00	55.44	-5.65	49.79	74	-24.21	peak
2500.00	/	-5.65	/	54	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits						
Remark: All the other emissions not reported were too low to read and deemed to comply with FCC limit.						

When the peak value is smaller than the AVG limit, AVG is not reflected.

Adapter model: W52RA198-290018+ white nose:

Above 1 GHz Test Results:

CH Low (2402MHz)
Horizontal:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2402	110.32	-5.84	104.48	N/A	N/A	peak
2402	92.37	-5.84	86.53	N/A	N/A	AVG
4804	58.27	-3.64	54.63	74	-19.37	peak
4804	48.02	-3.64	44.38	54	-9.62	AVG
7206	60.62	-0.95	59.67	74	-14.33	peak
7206	50.74	-0.95	49.79	54	-4.21	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits						

Vertical:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2402	109.84	-5.84	104.00	N/A	N/A	peak
2402	93.80	-5.84	87.96	N/A	N/A	AVG
4804	56.91	-3.64	53.27	74	-20.73	peak
4804	47.98	-3.64	44.34	54	-9.66	AVG
7206	59.74	-0.95	58.79	74	-15.21	peak
7206	48.91	-0.95	47.96	54	-6.04	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits						

CH Middle (2440MHz)
Horizontal:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2440	107.36	-5.71	101.65	N/A	N/A	peak
2440	92.95	-5.71	87.24	N/A	N/A	AVG
4880	54.58	-3.51	51.07	74	-22.93	peak
4880	46.37	-3.51	42.86	54	-11.14	AVG
7320	57.94	-0.82	57.12	74	-16.88	peak
7320	47.58	-0.82	46.76	54	-7.24	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits

Vertical:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2440	106.28	-5.71	100.57	N/A	N/A	peak
2440	91.59	-5.71	85.88	N/A	N/A	AVG
4880	54.77	-3.51	51.26	74	-22.74	peak
4880	45.02	-3.51	41.51	54	-12.49	AVG
7320	56.78	-0.82	55.96	74	-18.04	peak
7320	46.92	-0.82	46.10	54	-7.90	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits

CH High (2480MHz)
Horizontal:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2480	107.65	-5.65	102.00	N/A	N/A	peak
2480	92.81	-5.65	87.16	N/A	N/A	AVG
4960	55.34	-3.43	51.91	74	-22.09	peak
4960	46.86	-3.43	43.43	54	-10.57	AVG
7440	56.61	-0.75	55.86	74	-18.14	peak
7440	47.29	-0.75	46.54	54	-7.46	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits						

Vertical:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2480	106.58	-5.65	100.93	N/A	N/A	peak
2480	91.67	-5.65	86.02	N/A	N/A	AVG
4960	55.48	-3.43	52.05	74	-21.95	peak
4960	47.47	-3.43	44.04	54	-9.96	AVG
7440	55.86	-0.75	55.11	74	-18.89	peak
7440	47.34	-0.75	46.59	54	-7.41	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits						

Remark:
(1) Measuring frequencies from 9KHz to the 25 GHz, The test range is 9K ~10 times the main wave, and other spurious below the limit of 20dB will not be reflected in the report.
(2). All modes of GFSK were test at Low, Middle, and High channel, only the worst result of GFSK Low Channel was reported for below 1GHz test.
(3). For BT above 1GHz test all modes of GFSK were test at Low, Middle, and High channel, only the worst result of GFSK Low Channel was reported.
(4). By preliminary testing and verifying three axis (X, Y and Z) position of EUT transmitted status, it was found that “Z axis” position was the worst, and test data recorded in this report.
(5). Radiated emission test from 9kHz to 10th harmonic of fundamental was verified, and no emission found except system noise floor in 9kHz to 30MHz and not recorded in this report.

Restricted bands around fundamental frequency (Radiated)

Operation Mode: TX CH Low (2402MHz)
Horizontal (Worst case)

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2310	53.91	-5.81	48.10	74	-25.90	peak
2310	/	-5.81	/	54	/	AVG
2390	55.96	-5.84	50.12	74	-23.88	peak
2390	/	-5.84	/	54	/	AVG
2400	54.62	-5.84	48.78	74	-25.22	peak
2400	/	-5.84	/	54	/	AVG

Vertical:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2310	56.17	-5.81	50.36	74	-23.64	peak
2310	/	-5.81	/	54	/	AVG
2390	53.89	-5.84	48.05	74	-25.95	peak
2390	/	-5.84	/	54	/	AVG
2400	55.93	-5.84	50.09	74	-23.91	peak
2400	/	-5.84	/	54	/	AVG

When the peak value is smaller than the AVG limit, AVG is not reflected.

Operation Mode: TX CH High (2480MHz)
Horizontal (Worst case)

Frequency (MHz)	Reading Result (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2483.50	55.79	-5.65	50.14	74	-23.86	peak
2483.50	/	-5.65	/	54	/	AVG
2500.00	54.35	-5.65	48.70	74	-25.30	peak
2500.00	/	-5.65	/	54	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits						

Vertical:

Frequency (MHz)	Reading Result (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2483.50	54.48	-5.65	48.83	74	-25.17	peak
2483.50	/	-5.65	/	54	/	AVG
2500.00	54.13	-5.65	48.48	74	-25.52	peak
2500.00	/	-5.65	/	54	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits						
Remark: All the other emissions not reported were too low to read and deemed to comply with FCC limit.						

When the peak value is smaller than the AVG limit, AVG is not reflected.

Adapter model: W87RA07-290030+ Black nose:

Above 1 GHz Test Results:

CH Low (2402MHz)
Horizontal:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2402	110.54	-5.84	104.70	N/A	N/A	peak
2402	92.92	-5.84	87.08	N/A	N/A	AVG
4804	58.00	-3.64	54.36	74	-19.64	peak
4804	49.35	-3.64	45.71	54	-8.29	AVG
7206	59.62	-0.95	58.67	74	-15.33	peak
7206	48.45	-0.95	47.50	54	-6.50	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits						

Vertical:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2402	109.53	-5.84	103.69	N/A	N/A	peak
2402	92.01	-5.84	86.17	N/A	N/A	AVG
4804	58.43	-3.64	54.79	74	-19.21	peak
4804	48.56	-3.64	44.92	54	-9.08	AVG
7206	58.16	-0.95	57.21	74	-16.79	peak
7206	49.87	-0.95	48.92	54	-5.08	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits						

CH Middle (2440MHz)
Horizontal:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2440	106.65	-5.71	100.94	N/A	N/A	peak
2440	92.93	-5.71	87.22	N/A	N/A	AVG
4880	55.50	-3.51	51.99	74	-22.01	peak
4880	46.56	-3.51	43.05	54	-10.95	AVG
7320	57.57	-0.82	56.75	74	-17.25	peak
7320	45.93	-0.82	45.11	54	-8.89	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits

Vertical:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2440	106.22	-5.71	100.51	N/A	N/A	peak
2440	92.91	-5.71	87.20	N/A	N/A	AVG
4880	54.46	-3.51	50.95	74	-23.05	peak
4880	46.07	-3.51	42.56	54	-11.44	AVG
7320	56.04	-0.82	55.22	74	-18.78	peak
7320	46.38	-0.82	45.56	54	-8.44	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits

CH High (2480MHz)
Horizontal:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2480	107.85	-5.65	102.20	N/A	N/A	peak
2480	91.51	-5.65	85.86	N/A	N/A	AVG
4960	55.43	-3.43	52.00	74	-22.00	peak
4960	46.40	-3.43	42.97	54	-11.03	AVG
7440	57.22	-0.75	56.47	74	-17.53	peak
7440	46.05	-0.75	45.30	54	-8.70	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits

Vertical:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2480	105.39	-5.65	99.74	N/A	N/A	peak
2480	90.80	-5.65	85.15	N/A	N/A	AVG
4960	56.10	-3.43	52.67	74	-21.33	peak
4960	47.05	-3.43	43.62	54	-10.38	AVG
7440	55.85	-0.75	55.10	74	-18.90	peak
7440	46.84	-0.75	46.09	54	-7.91	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits

Remark:
(1) Measuring frequencies from 9KHz to the 25 GHz, The test range is 9K ~10 times the main wave, and other spurious below the limit of 20dB will not be reflected in the report.
(2). All modes of GFSK were test at Low, Middle, and High channel, only the worst result of GFSK Low Channel was reported for below 1GHz test.
(3). For BT above 1GHz test all modes of GFSK were test at Low, Middle, and High channel, only the worst result of GFSK Low Channel was reported.
(4). By preliminary testing and verifying three axis (X, Y and Z) position of EUT transmitted status, it was found that “Z axis” position was the worst, and test data recorded in this report.
(5). Radiated emission test from 9kHz to 10th harmonic of fundamental was verified, and no emission found except system noise floor in 9kHz to 30MHz and not recorded in this report.

Restricted bands around fundamental frequency (Radiated)

Operation Mode: TX CH Low (2402MHz)
Horizontal (Worst case)

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2310	55.32	-5.81	49.51	74	-24.49	peak
2310	/	-5.81	/	54	/	AVG
2390	54.54	-5.84	48.70	74	-25.30	peak
2390	/	-5.84	/	54	/	AVG
2400	52.72	-5.84	46.88	74	-27.12	peak
2400	/	-5.84	/	54	/	AVG

Vertical:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2310	55.49	-5.81	49.68	74	-24.32	peak
2310	/	-5.81	/	54	/	AVG
2390	55.08	-5.84	49.24	74	-24.76	peak
2390	/	-5.84	/	54	/	AVG
2400	57.20	-5.84	51.36	74	-22.64	peak
2400	/	-5.84	/	54	/	AVG

When the peak value is smaller than the AVG limit, AVG is not reflected.

Operation Mode: TX CH High (2480MHz)
Horizontal (Worst case)

Frequency (MHz)	Reading Result (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2483.50	55.42	-5.65	49.77	74	-24.23	peak
2483.50	/	-5.65	/	54	/	AVG
2500.00	54.68	-5.65	49.03	74	-24.97	peak
2500.00	/	-5.65	/	54	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits						

Vertical:

Frequency (MHz)	Reading Result (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2483.50	53.91	-5.65	48.26	74	-25.74	peak
2483.50	/	-5.65	/	54	/	AVG
2500.00	55.01	-5.65	49.36	74	-24.64	peak
2500.00	/	-5.65	/	54	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits						
Remark: All the other emissions not reported were too low to read and deemed to comply with FCC limit.						

When the peak value is smaller than the AVG limit, AVG is not reflected.

Adapter model: W52RA199-290018+ Black nose:

Above 1 GHz Test Results:

CH Low (2402MHz)
Horizontal:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2402	108.50	-5.84	102.66	N/A	N/A	peak
2402	93.40	-5.84	87.56	N/A	N/A	AVG
4804	56.33	-3.64	52.69	74	-21.31	peak
4804	49.33	-3.64	45.69	54	-8.31	AVG
7206	58.13	-0.95	57.18	74	-16.82	peak
7206	48.10	-0.95	47.15	54	-6.85	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits						

Vertical:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2402	108.61	-5.84	102.77	N/A	N/A	peak
2402	92.49	-5.84	86.65	N/A	N/A	AVG
4804	58.14	-3.64	54.50	74	-19.50	peak
4804	49.78	-3.64	46.14	54	-7.86	AVG
7206	58.24	-0.95	57.29	74	-16.71	peak
7206	48.54	-0.95	47.59	54	-6.41	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits						

CH Middle (2440MHz)
Horizontal:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2440	108.00	-5.71	102.29	N/A	N/A	peak
2440	92.77	-5.71	87.06	N/A	N/A	AVG
4880	55.58	-3.51	52.07	74	-21.93	peak
4880	46.06	-3.51	42.55	54	-11.45	AVG
7320	57.48	-0.82	56.66	74	-17.34	peak
7320	46.79	-0.82	45.97	54	-8.03	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits

Vertical:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2440	107.43	-5.71	101.72	N/A	N/A	peak
2440	91.37	-5.71	85.66	N/A	N/A	AVG
4880	55.79	-3.51	52.28	74	-21.72	peak
4880	45.15	-3.51	41.64	54	-12.36	AVG
7320	56.68	-0.82	55.86	74	-18.14	peak
7320	47.87	-0.82	47.05	54	-6.95	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits

CH High (2480MHz)
Horizontal:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2480	108.01	-5.65	102.36	N/A	N/A	peak
2480	91.44	-5.65	85.79	N/A	N/A	AVG
4960	56.09	-3.43	52.66	74	-21.34	peak
4960	47.15	-3.43	43.72	54	-10.28	AVG
7440	57.07	-0.75	56.32	74	-17.68	peak
7440	46.13	-0.75	45.38	54	-8.62	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits

Vertical:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2480	106.75	-5.65	101.10	N/A	N/A	peak
2480	91.09	-5.65	85.44	N/A	N/A	AVG
4960	54.20	-3.43	50.77	74	-23.23	peak
4960	46.22	-3.43	42.79	54	-11.21	AVG
7440	55.11	-0.75	54.36	74	-19.64	peak
7440	46.34	-0.75	45.59	54	-8.41	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits

Remark:
(1) Measuring frequencies from 9KHz to the 25 GHz, The test range is 9K ~10 times the main wave, and other spurious below the limit of 20dB will not be reflected in the report.
(2). All modes of GFSK were test at Low, Middle, and High channel, only the worst result of GFSK Low Channel was reported for below 1GHz test.
(3). For BT above 1GHz test all modes of GFSK were test at Low, Middle, and High channel, only the worst result of GFSK Low Channel was reported.
(4). By preliminary testing and verifying three axis (X, Y and Z) position of EUT transmitted status, it was found that “Z axis” position was the worst, and test data recorded in this report.
(5). Radiated emission test from 9kHz to 10th harmonic of fundamental was verified, and no emission found except system noise floor in 9kHz to 30MHz and not recorded in this report.

Restricted bands around fundamental frequency (Radiated)

Operation Mode: TX CH Low (2402MHz)
Horizontal (Worst case)

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2310	55.41	-5.81	49.60	74	-24.40	peak
2310	/	-5.81	/	54	/	AVG
2390	55.15	-5.84	49.31	74	-24.69	peak
2390	/	-5.84	/	54	/	AVG
2400	54.80	-5.84	48.96	74	-25.04	peak
2400	/	-5.84	/	54	/	AVG

Vertical:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2310	55.93	-5.81	50.12	74	-23.88	peak
2310	/	-5.81	/	54	/	AVG
2390	53.36	-5.84	47.52	74	-26.48	peak
2390	/	-5.84	/	54	/	AVG
2400	55.83	-5.84	49.99	74	-24.01	peak
2400	/	-5.84	/	54	/	AVG

When the peak value is smaller than the AVG limit, AVG is not reflected.

Operation Mode: TX CH High (2480MHz)
Horizontal (Worst case)

Frequency (MHz)	Reading Result (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2483.50	55.39	-5.65	49.74	74	-24.26	peak
2483.50	/	-5.65	/	54	/	AVG
2500.00	55.54	-5.65	49.89	74	-24.11	peak
2500.00	/	-5.65	/	54	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits						

Vertical:

Frequency (MHz)	Reading Result (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2483.50	55.88	-5.65	50.23	74	-23.77	peak
2483.50	/	-5.65	/	54	/	AVG
2500.00	56.66	-5.65	51.01	74	-22.99	peak
2500.00	/	-5.65	/	54	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits						
Remark: All the other emissions not reported were too low to read and deemed to comply with FCC limit.						

When the peak value is smaller than the AVG limit, AVG is not reflected.

Adapter model: W52RA198-290018+ Black nose

Above 1 GHz Test Results:

CH Low (2402MHz)
Horizontal:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2402	110.54	-5.84	104.70	N/A	N/A	peak
2402	92.74	-5.84	86.90	N/A	N/A	AVG
4804	56.96	-3.64	53.32	74	-20.68	peak
4804	48.82	-3.64	45.18	54	-8.82	AVG
7206	60.11	-0.95	59.16	74	-14.84	peak
7206	49.35	-0.95	48.40	54	-5.60	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits						

Vertical:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2402	110.03	-5.84	104.19	N/A	N/A	peak
2402	92.08	-5.84	86.24	N/A	N/A	AVG
4804	57.01	-3.64	53.37	74	-20.63	peak
4804	48.99	-3.64	45.35	54	-8.65	AVG
7206	58.10	-0.95	57.15	74	-16.85	peak
7206	49.18	-0.95	48.23	54	-5.77	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits						

CH Middle (2440MHz)
Horizontal:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2440	106.27	-5.71	100.56	N/A	N/A	peak
2440	92.33	-5.71	86.62	N/A	N/A	AVG
4880	55.14	-3.51	51.63	74	-22.37	peak
4880	45.27	-3.51	41.76	54	-12.24	AVG
7320	57.54	-0.82	56.72	74	-17.28	peak
7320	47.18	-0.82	46.36	54	-7.64	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits

Vertical:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2440	106.68	-5.71	100.97	N/A	N/A	peak
2440	91.92	-5.71	86.21	N/A	N/A	AVG
4880	56.13	-3.51	52.62	74	-21.38	peak
4880	46.20	-3.51	42.69	54	-11.31	AVG
7320	57.93	-0.82	57.11	74	-16.89	peak
7320	46.90	-0.82	46.08	54	-7.92	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits

CH High (2480MHz)
Horizontal:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2480	107.60	-5.65	101.95	N/A	N/A	peak
2480	92.02	-5.65	86.37	N/A	N/A	AVG
4960	55.60	-3.43	52.17	74	-21.83	peak
4960	47.26	-3.43	43.83	54	-10.17	AVG
7440	56.54	-0.75	55.79	74	-18.21	peak
7440	45.79	-0.75	45.04	54	-8.96	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits

Vertical:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2480	106.69	-5.65	101.04	N/A	N/A	peak
2480	91.25	-5.65	85.60	N/A	N/A	AVG
4960	54.42	-3.43	50.99	74	-23.01	peak
4960	47.02	-3.43	43.59	54	-10.41	AVG
7440	55.45	-0.75	54.70	74	-19.30	peak
7440	46.25	-0.75	45.50	54	-8.50	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits

Remark:
(1) Measuring frequencies from 9KHz to the 25 GHz, The test range is 9K ~10 times the main wave, and other spurious below the limit of 20dB will not be reflected in the report.
(2). All modes of GFSK were test at Low, Middle, and High channel, only the worst result of GFSK Low Channel was reported for below 1GHz test.
(3). For BT above 1GHz test all modes of GFSK were test at Low, Middle, and High channel, only the worst result of GFSK Low Channel was reported.
(4). By preliminary testing and verifying three axis (X, Y and Z) position of EUT transmitted status, it was found that “Z axis” position was the worst, and test data recorded in this report.
(5). Radiated emission test from 9kHz to 10th harmonic of fundamental was verified, and no emission found except system noise floor in 9kHz to 30MHz and not recorded in this report.

Restricted bands around fundamental frequency (Radiated)

Operation Mode: TX CH Low (2402MHz)
Horizontal (Worst case)

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2310	54.99	-5.81	49.18	74	-24.82	peak
2310	/	-5.81	/	54	/	AVG
2390	54.41	-5.84	48.57	74	-25.43	peak
2390	/	-5.84	/	54	/	AVG
2400	54.36	-5.84	48.52	74	-25.48	peak
2400	/	-5.84	/	54	/	AVG

Vertical:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2310	56.56	-5.81	50.75	74	-23.25	peak
2310	/	-5.81	/	54	/	AVG
2390	55.58	-5.84	49.74	74	-24.26	peak
2390	/	-5.84	/	54	/	AVG
2400	56.58	-5.84	50.74	74	-23.26	peak
2400	/	-5.84	/	54	/	AVG

When the peak value is smaller than the AVG limit, AVG is not reflected.

Operation Mode: TX CH High (2480MHz)
Horizontal (Worst case)

Frequency (MHz)	Reading Result (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2483.50	56.80	-5.65	51.15	74	-22.85	peak
2483.50	/	-5.65	/	54	/	AVG
2500.00	55.27	-5.65	49.62	74	-24.38	peak
2500.00	/	-5.65	/	54	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits						

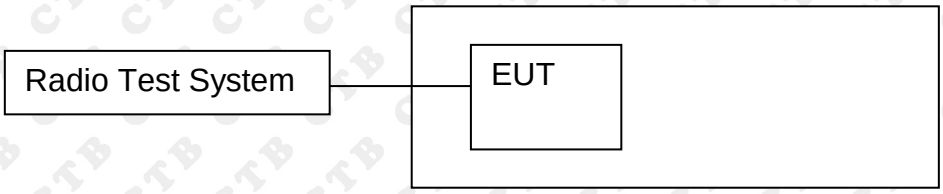
Vertical:

Frequency (MHz)	Reading Result (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2483.50	56.25	-5.65	50.60	74	-23.40	peak
2483.50	/	-5.65	/	54	/	AVG
2500.00	54.09	-5.65	48.44	74	-25.56	peak
2500.00	/	-5.65	/	54	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits						
Remark: All the other emissions not reported were too low to read and deemed to comply with FCC limit.						

When the peak value is smaller than the AVG limit, AVG is not reflected.

8. BAND EDGE AND RF COUNDUCTED SPURIOUS EMISSIONS

8.1 Block Diagram Of Test Setup



8.2 Limit

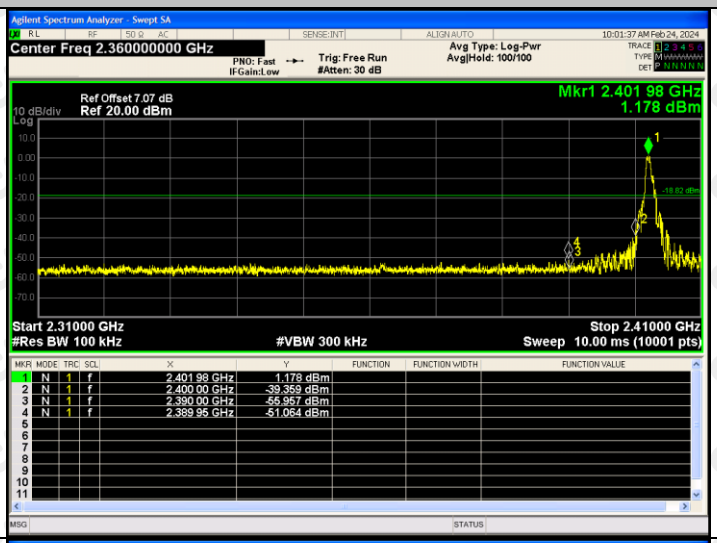
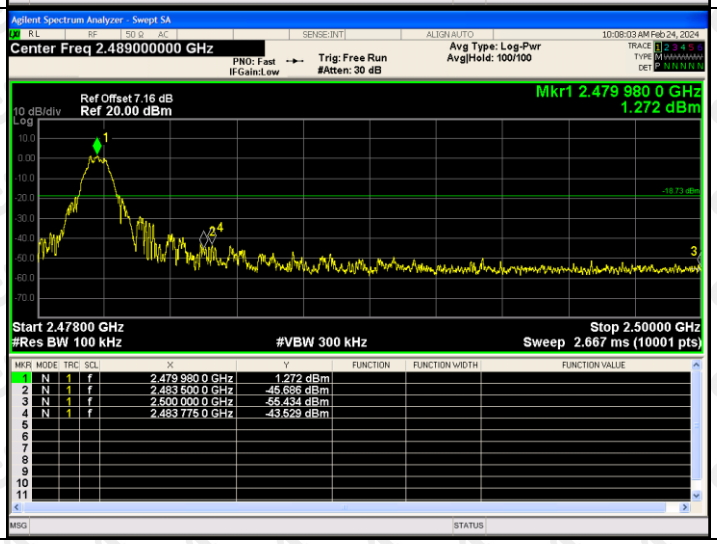
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

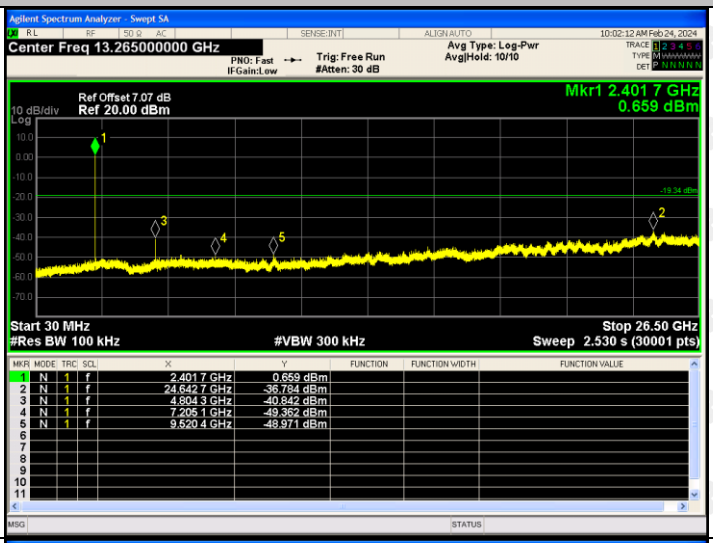
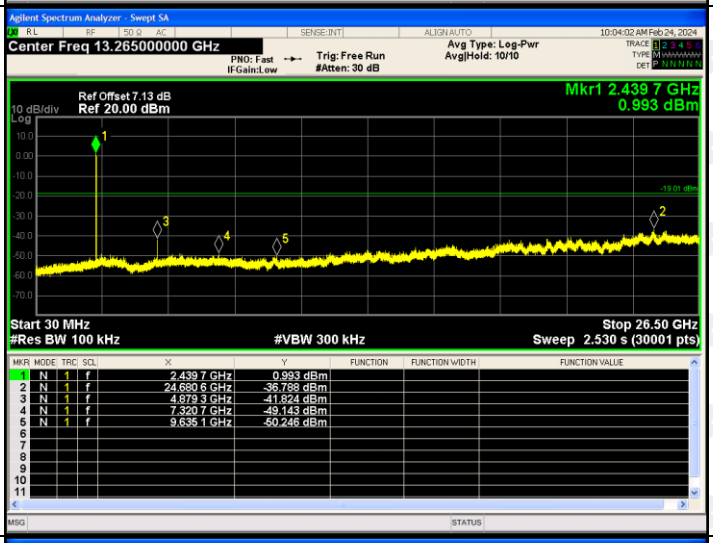
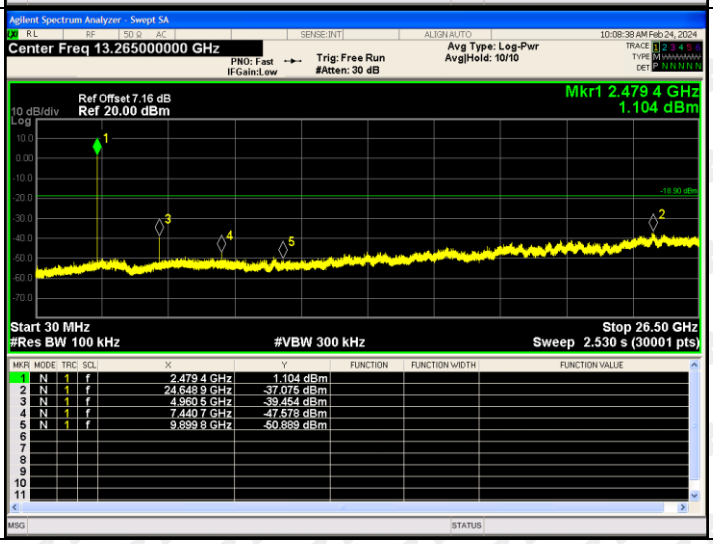
8.3 Test procedure

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;
2. Set the spectrum analyzer:

Blow 30MHz:
RBW = 100kHz, VBW = 300kHz, Sweep = auto
Detector function = peak, Trace = max hold
Above 30MHz:
RBW = 100KHz, VBW = 300KHz, Sweep = auto
Detector function = peak, Trace = max hold

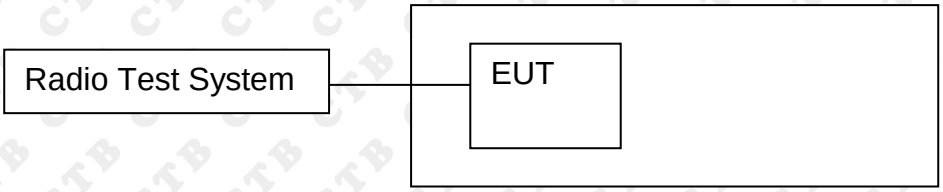
8.4 Test Result

BAND EDGE Graphs			
GFSK/LCH			
GFSK/HCH			

RF Conducted Spurious Emissions Graphs		
GFSK/LCH		
GFSK/MCH		
GFSK/HCH		

9. COUDUCTED OUTPUT POWER

9.1 Block Diagram Of Test Setup



9.2 Limit

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(b)(3)	Output Power	1 watt or 30dBm	2400-2483.5	PASS

9.3 Test procedure

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set the spectrum analyzer: RBW = 2MHz. VBW = 6MHz. Channel power measurement.
Sweep = auto; Detector Function = peak.
3. Keep the EUT in transmitting at lowest, middle and highest channel individually. Record the max value.

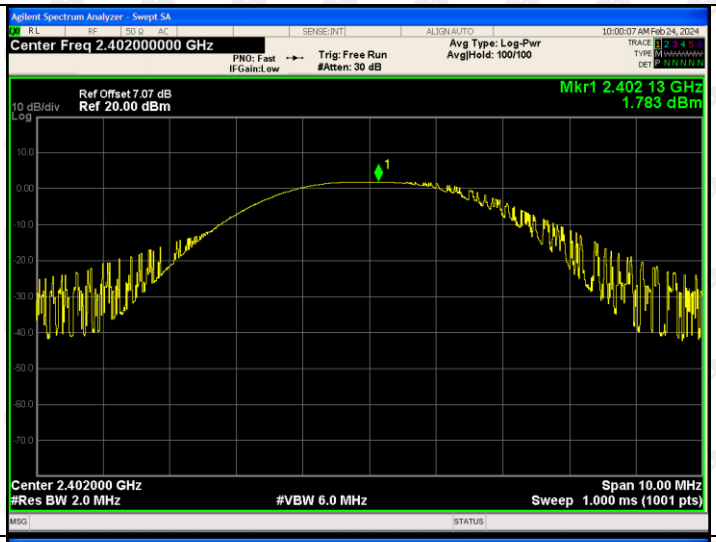
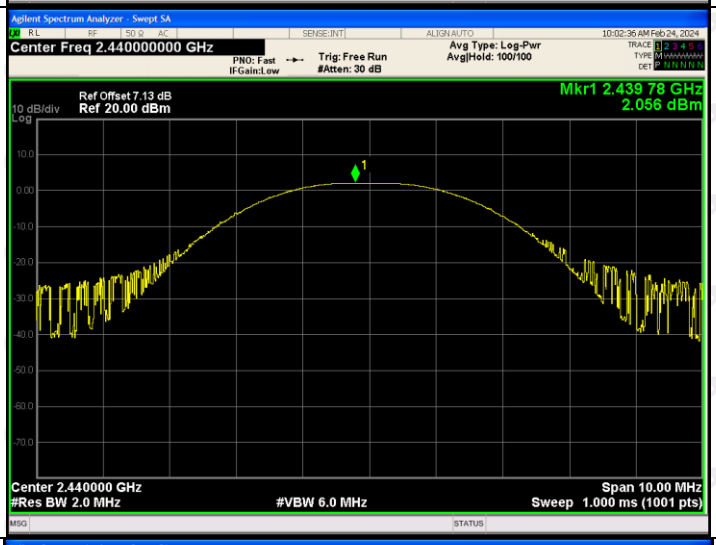
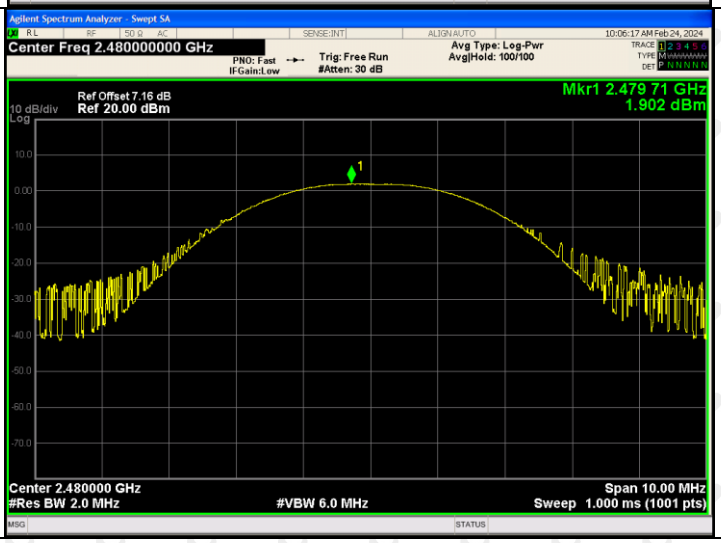
9.4 Test Result

Mode	Channel.	Maximum Output Power [dBm]	Limit[dBm]	Verdict
GFSK	LCH	1.783	30	PASS
	MCH	2.056	30	PASS
	HCH	1.902	30	PASS

Duty Cycle

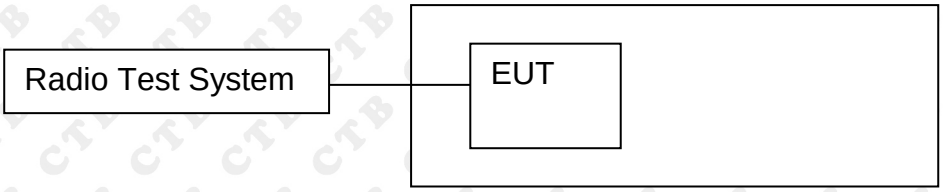
Mode	Channel.	Duty Cycle(%)	Correction Factor (dB)
GFSK	LCH	100	0
	MCH	100	0
	HCH	100	0

Test Graph:

GFSK Low channel			
GFSK Mid channel			
GFSK High channel			

10. 6DB OCCUPIED BANDWIDTH

10.1 Block Diagram Of Test Setup



10.2 Limit

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(a)(2)	Bandwidth	>= 500KHz (6dB bandwidth)	2400-2483.5	PASS

10.3 Test procedure

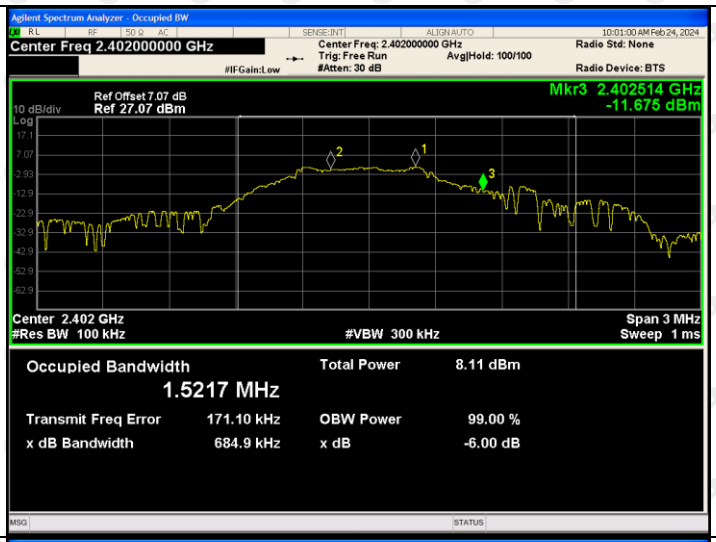
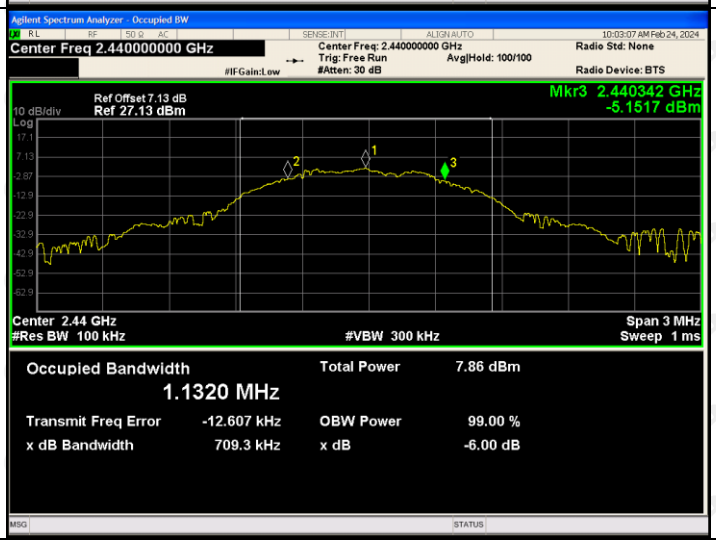
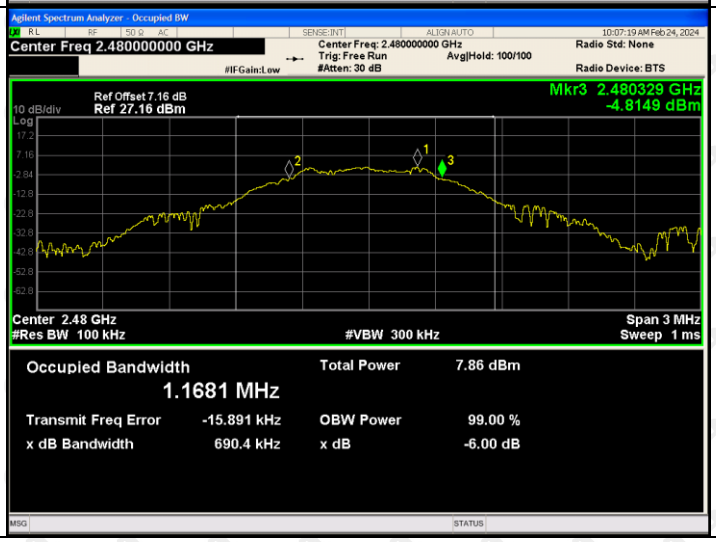
1. Rem1. Set RBW = 100 kHz.
2. Set the video bandwidth (VBW) ≥ 3 x RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

10.4 Test Result

Test Mode	Frequency	6dB Bandwidth (MHz)	Limit (KHz)	Result
GFSK	Low channel	0.685	>= 500	PASS
	Mid channel	0.709	>= 500	PASS
	High channel	0.69	>= 500	PASS

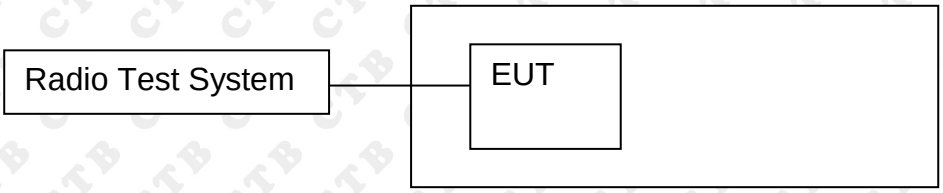
Note: All modes of operation were Pre-scan and the worst-case emissions are reported.

Test Graph:

GFSK Low channel			
GFSK Mid channel			
GFSK High channel			

11. POWER SPECTRAL DENSITY

11.1 Block Diagram Of Test Setup



11.2 Limit

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247	Power Spectral Density	8 dBm (in any 3KHz)	2400-2483.5	PASS

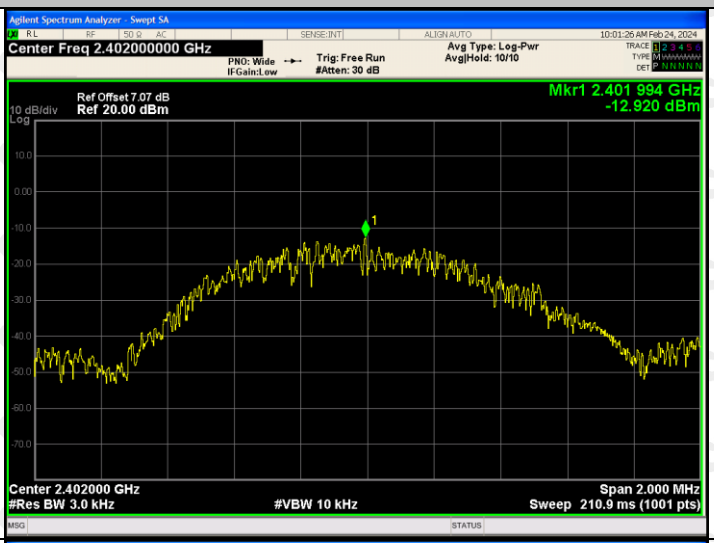
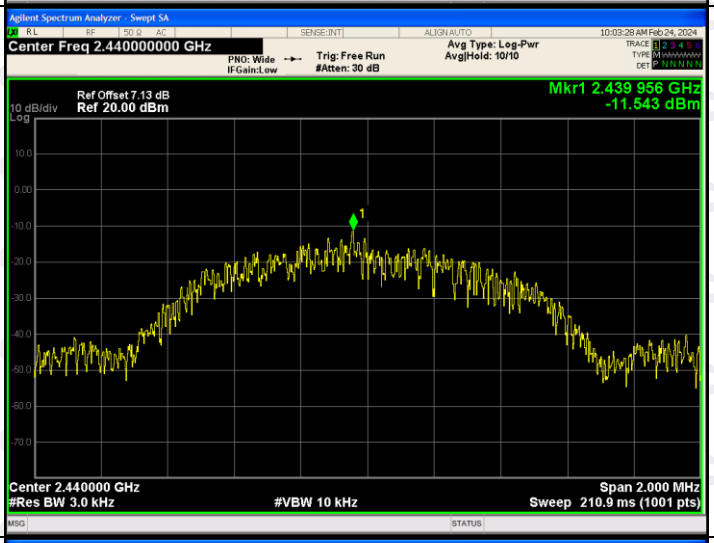
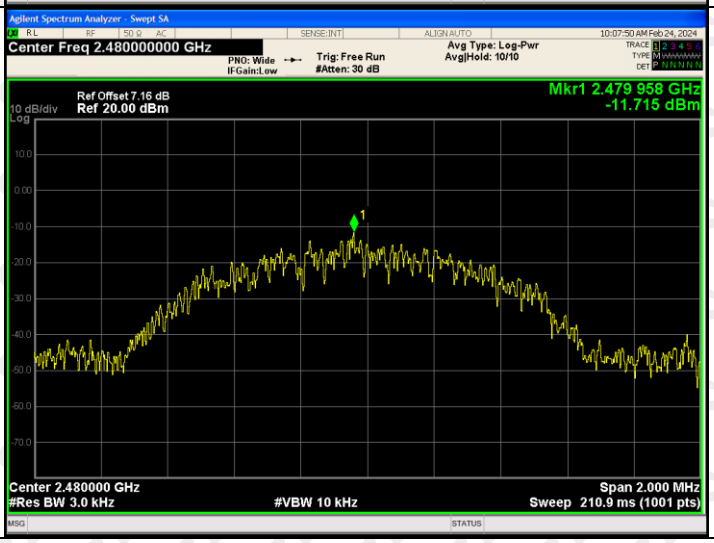
11.3 Test procedure

1. Set analyzer center frequency to DTS channel center frequency.
2. Set the span to 1.5 times the DTS bandwidth.
3. Set the RBW to: 3 kHz ≤ RBW ≤ 100 kHz.
4. Set the VBW ≥ 3 x RBW.
5. Detector = peak.
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.
9. Use the peak marker function to determine the maximum amplitude level within the RBW.
10. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

11.4 Test Result

Mode	Channel.	Power Spectral Density (dBm/3KHz)	Limit(dBm/3KHz)	Verdict
GFSK	LCH	-12.92	8	PASS
GFSK	MCH	-11.543	8	PASS
GFSK	HCH	-11.715	8	PASS

Test Graph

Graphs			
GFSK/LCH			
GFSK/MCH			
GFSK/HCH			

12. ANTENNA REQUIREMENT

15.203 requirement:
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.
15.247(b) (4) requirement:
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.

EUT Antenna:

The EUT antenna is PCB antenna. The best case gain of the antenna is 1.77dBi.

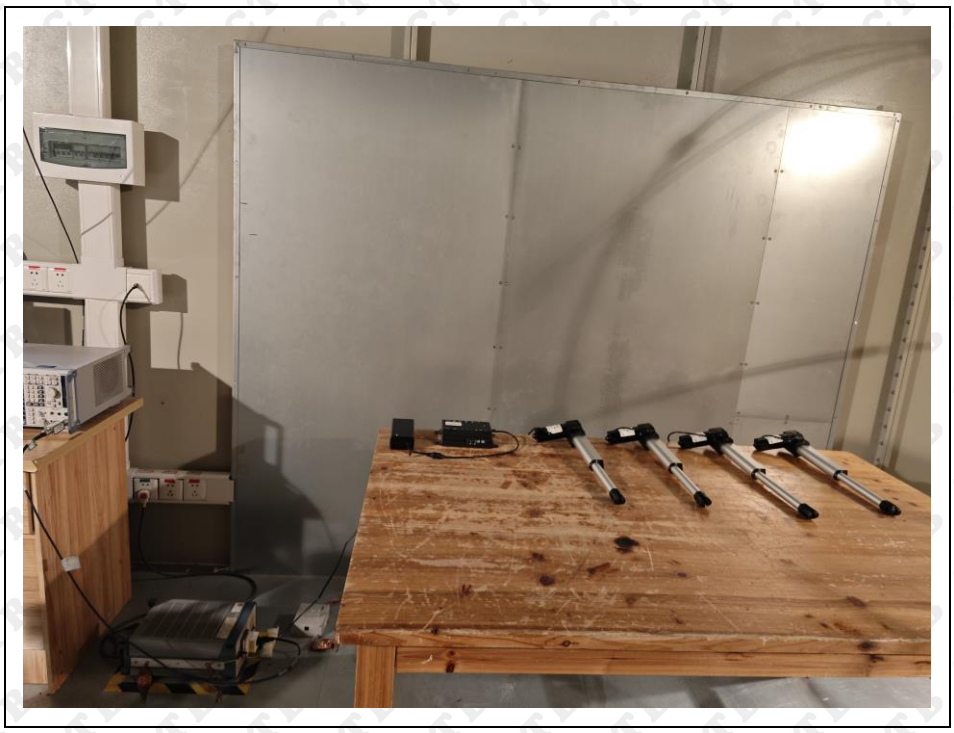
13. EUT TEST SETUP PHOTOGRAPHS

Radiated Emissions

Below 1G

Above 1G

Conducted emission



※※※※※ **END OF REPORT** ※※※※※