FCC TEST REPORT

FCC ID: 2BM7C-Z422

On Behalf of

Xiamen DeYin Technology Co.,Ltd

Thermal Label Printer

Model No.: Z422, LT-Y41, GD42, GD43, GD45, GD46, GD49, Z422A, Z422B, Z422C, Z422D, Z422E

Prepared for	:	Xiamen DeYin Technology Co.,Ltd
Address	:	4-5, No. 28, Huli Industrial Park, Meixi Road, Tong'an District, Xiamen, China

Prepared By	:	Shenzhen Alpha Product Testing Co., Ltd.
Address	:	Building i, No.2, Lixin Road, Fuyong Street, Bao'an District, 518103, Shenzhen, Guangdong, China

Report Number	:	A2607080-C01 -R01
Date of Receipt	:	July 14, 2026
Date of Test	:	July 28, 2026 – September 29, 2026
Date of Report	:	September 29, 2026
Version Number	:	V0
Result		**Pass**

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TABLE OF CONTENTS

Description	Page
1. Summary of Standards And Results	**6**
1.1. Description of Standards and Results	6
2. General Information	**7**
2.1. Description of Device (EUT)	7
2.2. Accessories of Device (EUT)	8
2.3. Tested Supporting System Details	8
2.4. Block Diagram of Test	8
2.5. Test Mode Description	9
2.6. Test Conditions	9
2.7. Test Facility	9
2.8. Measurement Uncertainty	10
2.9. Test Equipment List	11
3. Spurious Emission	**14**
3.1. Test Limits	14
3.2. Test Procedure	15
3.3. Test Setup	15
3.4. Test Results	17
4. RF CONDUCTED SPURIOUS EMISSIONS	**26**
4.1. Block diagram of test setup	26
4.2. Limits	26
4.3. Test procedure	26
4.4. Test result	26
5. Power line Conducted Emission	**27**
5.1. Test Limits	27
5.2. Test Procedure	27
5.3. Test Setup	27
5.4. Test Results	27
6. Duty Cycle	**31**
6.1. Block diagram of test setup	31
6.2. Test Procedure	31
6.3. Test Results	31
7. Conducted Maximum Output Power	**32**
7.1. Test limits	32
7.2. Test Procedure	32
7.3. Test Setup	32
7.4. Test Results	32
Please refer to Appendix of BLE data.	**32**
8. Peak Power Spectral Density	**33**
8.1. Test limits	33
8.2. Test Procedure	33
8.3. Test Setup	33
8.4. Test Results	33
9. Bandwidth	**34**
9.1. Test limits	34
9.2. Test Procedure	34
9.3. Test Setup	34

9.4. Test Results---------- 34
10. Band Edge (Conducted) ---------- 35
10.1. Test limits---------- 35
10.2. Block diagram of test setup ---------- 35
10.3. Test Procedure---------- 35
10.4. Test Results---------- 35
11. Band Edge(Radiated) ---------- 36
11.1. Test limits---------- 36
11.2. Block diagram of test setup ---------- 36
11.3. Test Procedure---------- 37
11.4. Test Results---------- 37
12. Antenna Requirement ---------- 39
12.1. Standard Requirement---------- 39
12.2. Antenna Connected Construction ---------- 39
12.3. Results---------- 39
13. Test Setup Photo ---------- 40
14. EUT photo---------- 40

TEST REPORT DECLARATION

Applicant	:	Xiamen DeYin Technology Co.,Ltd
Address	:	4-5, No. 28, Huli Industrial Park, Meixi Road, Tong'an District, Xiamen, China
Manufacturer	:	Xiamen DeYin Technology Co.,Ltd
Address	:	4-5, No. 28, Huli Industrial Park, Meixi Road, Tong'an District, Xiamen, China
EUT Description	:	Thermal Label Printer
		(A) Model No. : Z422, LT-Y41, GD42, GD43, GD45, GD46, GD49, Z422A, Z422B, Z422C, Z422D, Z422E
		(B) Trademark : N/A

Measurement Standard Used:

FCC Rules and Regulations Part 15 Subpart C Section 15.247,

ANSI C63.10-2020

The device described above is tested by Shenzhen Alpha Product Testing Co., Ltd. to determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the FCC Part 15 Subpart C limits both conducted and radiated emissions. The test results are contained in this test report and Shenzhen Alpha Product Testing Co., Ltd. is assumed of full responsibility for the accuracy and completeness of these tests.

After the test, our opinion is that EUT compliance with the requirement of the above standards.

This report applies to above tested sample only. This report shall not be reproduced in parts without written approval of Shenzhen Alpha Product Testing Co., Ltd.

Tested by (name + signature).....…..:	Tom Chen Project Engineer	Tom Chen
Approved by (name + signature)…....:	Alan Fan Project Manager	Alan Fan
Date of issue……..:	September 29, 2026	

Revision History

Revision	Issue Date	Revisions	Revised By
V0	September 29, 2026	Initial released Issue	Tom Chen

1. SUMMARY OF STANDARDS AND RESULTS

1.1. Description of Standards and Results

The EUT have been tested according to the applicable standards as referenced below:

Test Item	Standards Paragraph	Result
Conducted Emission	FCC Part 15: 15.207	P
6dB Bandwidth	FCC PART 15:15.247(a)(2)	P
Output Power	FCC Part 15: 15.247(b)(3)	P
Radiated Spurious Emission	FCC Part 15: 15.209, FCC Part 15: 15.247(d)	P
Conducted Spurious & Band Edge Emission	FCC Part 15: 15.247(d)	P
Power Spectral Density	FCC PART 15:15.247(e)	P
Radiated Band Edge Emission	FCC Part 15: 15.247(d)	P
Antenna Requirement	FCC Part 15: 15.203	P
Note:	1. P is an abbreviation for Pass. 2. F is an abbreviation for Fail. 3. N/A is an abbreviation for Not Applicable.	

1. Pass: The EUT complies with the essential requirements in the standard.
2. Frequency Stability: The manufacturer stated in the user's manual.
3. The conclusion of this test report is judged by actual test data without considering measurement uncertainty.

2. GENERAL INFORMATION

2.1. Description of Device (EUT)

Description/PMN	:	Thermal Label Printer
Model	:	Z422, LT-Y41, GD42, GD43, GD45, GD46, GD49, Z422A, Z422B, Z422C, Z422D, Z422E
Diff.	:	The only difference product models is colors of appearance. Z422, Z422C, GD42, LT-Y41 is black, GD42, Z422D, Z422, LT-Y41 is white, Z422A, GD46, GD43 is purple, Z422B, Z422E, GD49, GD45 is pink. Other power supply methods, appearance, internal structures, circuits and key components are the same, and do not affect safety and electromagnetic compatibility performance. According to the above information, all tests were performed on Z422.
Test Voltage	:	DC 24V from adapter

Radio Technology	:	Bluetooth BLE
Operation frequency	:	2402-2480MHz
Channel No.	:	40 channels
Data rate	:	1Mbps
Channel Separation	:	2MHz
Modulation	:	GFSK
Antenna Type	:	Internal antenna, max gain -0.93dBi (Antenna information is provided by applicant.)
Software Version	:	V1.0
Hardware version	:	V1.0
Intend use environment	:	Residential, commercial and light industrial environment

2.2. Accessories of Device (EUT)

Accessories	:	/
Manufacturer	:	/
Model	:	/
Ratings	:	/

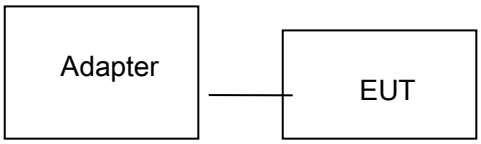
2.3. Tested Supporting System Details

No.	Description	Manufacturer	Model	Serial Number	Certification or SDOC
1.	Notebook	ACER	ZQT	N/A	N/A

2.4. Block Diagram of Test

Radiated Emission

Conducted Emission



RF conduction method

2.5. Test Mode Description

Tested mode, channel, and data rate information		
Mode	**Channel**	**Frequency (MHz)**
GFSK(1Mbps)	Low : CH0	2402
	Middle: CH19	2440
	High: CH39	2480

Use the engineering interface to control EUT work in Continuous TX mode, and select test channel, wireless mode, the power level of the test is set to default.

Channel list							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
CH0	2402	CH10	2422	CH20	2442	CH30	2462
CH1	2404	CH11	2424	CH21	2444	CH31	2464
CH2	2406	CH12	2426	CH22	2446	CH32	2466
CH3	2408	CH13	2428	CH23	2448	CH33	2468
CH4	2410	CH14	2430	CH24	2450	CH34	2470
CH5	2412	CH15	2432	CH25	2452	CH35	2472
CH6	2414	CH16	2434	CH26	2454	CH36	2474
CH7	2416	CH17	2436	CH27	2456	CH37	2476
CH8	2418	CH18	2438	CH28	2458	CH38	2478
CH9	2420	CH19	2440	CH29	2460	CH39	2480

Remark: During the test, the test voltage was tuned from 85% to 115% of the nominal rated supply voltage, and found that the worst case was under the nominal rated supply condition. So the report just shows that condition's data.

2.6. Test Conditions

Items	Required	Actual
Temperature range:	15-35℃	26.1℃
Humidity range:	25-75%	55.2%
Pressure range:	86-106kPa	101kPa

2.7. Test Facility

Shenzhen Alpha Product Testing Co., Ltd
Building i, No.2, Lixin Road, Fuyong Street, Bao'an District, 518103,
Shenzhen, Guangdong, China

June 21, 2018 File on Federal Communication Commission
Registration Number: 293961
Designation Number: CN1236

July 15, 2019 Certificated by IC
Registration Number: 12135A
CAB identified: CN0085

2.8. Measurement Uncertainty

(95% confidence levels, k=2)

Item	Uncertainty
Uncertainty for Power point Conducted Emissions Test	1.63dB
Uncertainty for Radiation Emission test in 3m chamber (below 30MHz)	3.5dB
Uncertainty for Radiation Emission test in 3m chamber (30MHz to 1GHz)	3.74dB(Polarize: V)
	3.76dB(Polarize: H)
Uncertainty for Radiation Emission test in 3m chamber (1GHz to 25GHz)	3.77dB(Polarize: V)
	3.80dB(Polarize: H)
Uncertainty for Radiation Emission test in 3m chamber (18GHz to 40GHz)	4.31 dB(Polarize: V)
	4.30 dB(Polarize: H)
Uncertainty for radio frequency	5.06×10^{-8}GHz
Uncertainty for conducted RF Power	0.40dB
Uncertainty for temperature	0.2℃
Uncertainty for humidity	1%
Uncertainty for DC and low frequency voltages	0.06%
Uncertainty for Power Spectral Density	0.39dB
Uncertainty for Occupied-Bandwidth	968Hz

2.9. Test Equipment List

Equipment	Manufacturer	Model No.	Firmware version	Serial No.	Last Cal.	Cal. Due day
9*6*6 anechoic chamber	CHENYU	9*6*6	/	N/A	2025/03/09	2029/03/08
4*4*3 Shielded room	CHENYU	4*4*3	/	N/A	2025/03/09	2029/03/08
Spectrum analyzer	ROHDE&SCHWARZ	FSV40-N	2.3	102137	2026/7/28	2027/7/27
Spectrum analyzer	Agilent	N9020A	A.14.16	MY499100060	2026/7/27	2027/7/26
Spectrum analyzer	Keysight	N9020A	A.19.05	MY54500254	2026/7/27	2027/7/26
Spectrum analyzer	ROHDE&SCHWARZ	FSU	4.71.SP5	200002	2026/7/28	2027/7/27
CMW500	ROHDE&SCHWARZ	CMW500	V 3.7.22	1201.0002K50-117239-sM	2026/7/27	2027/7/26
UXM 5G Base Wireless Test Platform	Keysight	E5175E	1.8.1.2908 2(NR)(LTE)	MY62226130	2026/03/03	2027/03/02
Test Receiver	ROHDE&SCHWARZ	ESR	2.28 SP1	1316.3003K03-102082-Wa	2026/7/27	2027/7/26
Test Receiver	ROHDE&SCHWARZ	ESCI	4.42 SP1	101165	2026/7/28	2027/7/27
Bilog Antenna	SCHWARZBECK	VULB 9168	/	VULB 9168#627	2025/08/11	2027/08/10
Horn Antenna	SCHWARZBECK	BBHA 9120 D	/	2106	2025/08/11	2027/08/10
Loop Antenna	SCHWARZBECK	FMZB 1519B	/	00128	2025/08/11	2027/08/10
RF Cable	Resenberger	Cable 1	/	RE1	2026/7/27	2027/7/26
RF Cable	Resenberger	Cable 2	/	RE2	2026/7/27	2027/7/26
RF Cable	Resenberger	Cable 3	/	CE1	2026/7/27	2027/7/26
Amplifier	HP	HP8347A	/	2834A00455	2026/7/28	2027/7/27
Amplifier	Agilent	8449B	/	3008A02664	2026/7/27	2027/7/26
Amplifier	SKET	LNPA_0118G-45	/	SK2020010801	2026/7/27	2027/7/26
Filter/Amplifier bank unit	SKET	RSESU-HPH-LNPP18G	/	SK20190712	2026/7/27	2027/7/26
L.I.S.N.#1	SCHWARZBECK	NSLK8126	/	8126-466	2026/7/28	2027/7/27
L.I.S.N.#2	ROHDE&SCHWARZ	ENV216	/	101043	2026/7/28	2027/7/27
Pulse Limiter	SCHWARZBECK	9516F	/	9618	2026/7/27	2027/7/26
Horn Antenna	SCHWARZBECK	BBHA 9170	/	00946	2025/8/11	2027/8/10
Preamplifier	SKET	LNPA_1840-50	/	SK2018101801	2026/7/27	2027/7/26
Vector Signal Generator	Agilent	N5182A	/	MY49060042	2026/7/28	2027/7/27
Vector Signal Generator	Agilent	N5172B	2.02	MY51350397	2026/7/27	2027/7/26
Analog Signal Generator	HP	83712B	10.02	US34490219	2026/7/27	2027/7/26
Power Meter	Agilent	E4419B	/	GB40202122	2026/7/27	2027/7/26
Power Sensor	Agilent	E9300A	/	MY41496628	2026/7/27	2027/7/26
Power Sensor	Agilent	E9304A	/	MY41496815	2026/7/27	2027/7/26
Power Sensor	DARE	RPR3006W	/	15100041SNO91	2026/7/28	2027/7/27
Power Sensor	DARE	RPR3006W	/	15100041SNO92	2026/7/28	2027/7/27
Temp. & Humid. Chamber	Teelong	TL-HW408S	/	TL-20191205-01	2026/07/07	2027/07/06

Electronic Thermo-Hygrometer	S.H.Qixiang	HTC-1	/	N/A	2026/7/31	2027/7/30
Switching Mode Power Supply	JUNKE	JK12010S	/	20140927-6	2026/7/27	2027/7/26
Adjustable attenuator	MWRFtest	N/A	/	N/A	N/A	N/A
10dB Attenuator	Mini-Circuits	DC-6G	/	N/A	N/A	N/A
6dB Fixed Attenuator	SKET	AP_DC01G-2W-N-6dB	/	N/A	2026/7/28	2027/7/27

Software Information			
Test Item	Software Name	Manufacturer	Version
RE	EZ-EMC	EZ	Alpha-3A1
CE	EZ-EMC	EZ	Alpha-3A1
RF-CE	MTS 8310	MW	V2.0.0.0

3. SPURIOUS EMISSION

3.1. Test Limits

All the emissions appearing within 15.205 restricted frequency bands shall not exceed the limits shown in 15.209, all the other emissions shall be at least 20dB below the fundamental emissions, or comply with 15.209 limits.

15.205 Restricted frequency band

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])

15.209 Limit

FREQUENCY MHz	DISTANCE Meters	FIELD STRENGTHS LIMIT	
		μV/m	dB(μV)/m
0.009-0.490	300	2400/F(KHz)	/
0.490-1.705	30	24000/F(KHz)	/
1.705-30	30	30	29.5
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
960 ~ 1000	3	500	54.0
Above 1000	3	74.0 dB(μV)/m (Peak) 54.0 dB(μV)/m (Average)	
Note 1: The peak limit is 20 dB higher than the average limit			

Harmonic emissions limits comply with below 54 dBuV/m at 3m. Other emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or comply with the radiated emissions limits specified in section 15.209(a) limit in the table below has to be followed.

3.2. Test Procedure

The measuring distance of 3m shall be used for measurements at frequency up to 1GH and above 1GHz.

The EUT was placed on a rotating 0.8 m high above ground for below 1GHz and 1.5m high for above1GHz testing, The table was rotated 360 degrees to determine the position of the highest radiation.

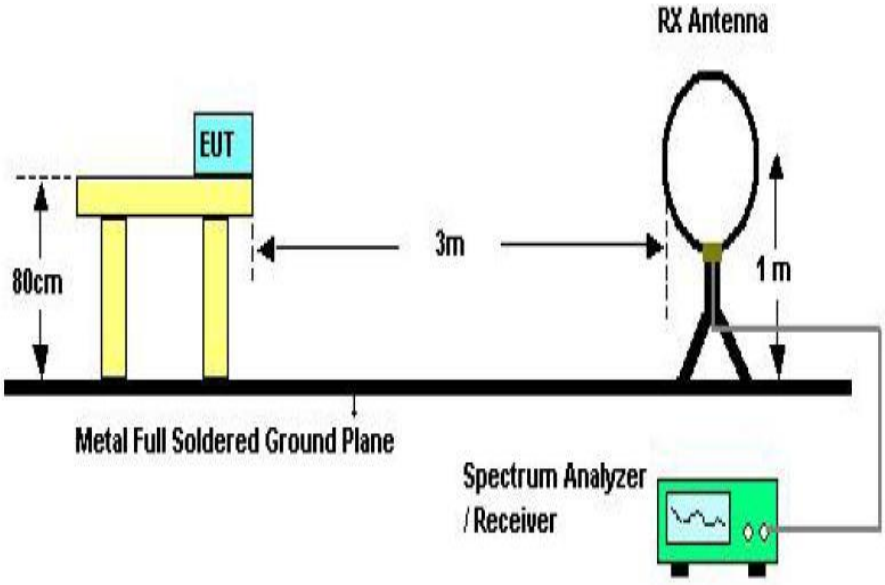
The Test antenna shall vary between 1m and 4m, Both Horizontal and Vertical antenna are set of make measurement.

The initial step in collecting radiated 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 premeasured.

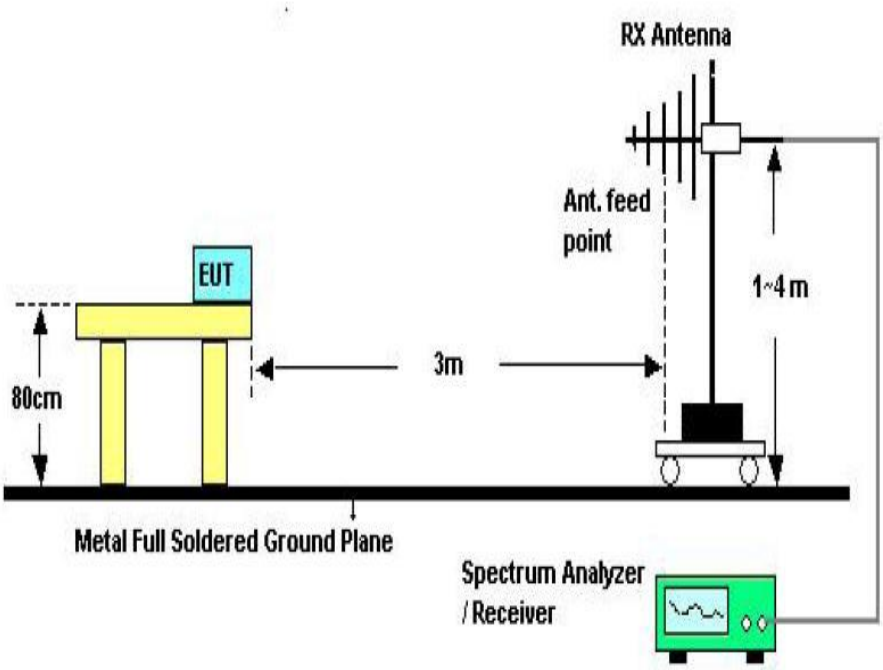
If Peak value comply with QP limit Below 1GHz, the EUT deemed to comply with QP limit. But the Peak value and average value both need to comply with applicable limit above 1GHz.

For the actual test configuration, please see the test setup photo.

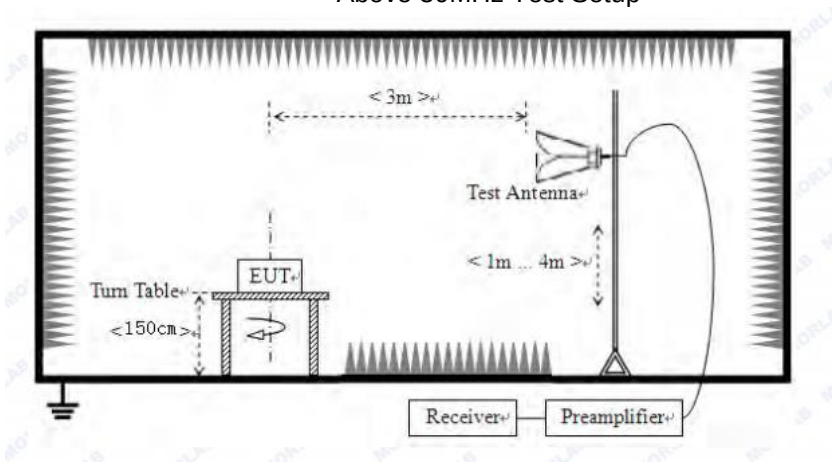
3.3. Test Setup



Below 30MHz Test Setup



Above 30MHz Test Setup



Above 1GHz Test Setup

3.4. Test Results

Test Condition

Continual Transmitting in maximum power.

9KHz~150KHz	RBW200Hz	VBW1KHz
150KHz~30MHz	RBW9KHz	VBW 30KHz
30MHZ~1GHz	RBW120KHz	VBW 300KHz
Above1GHz	RBW1MHz	VBW 3MHz

We have scanned the EUT from 9kHz up to the 10th harmonic of the fundamental.

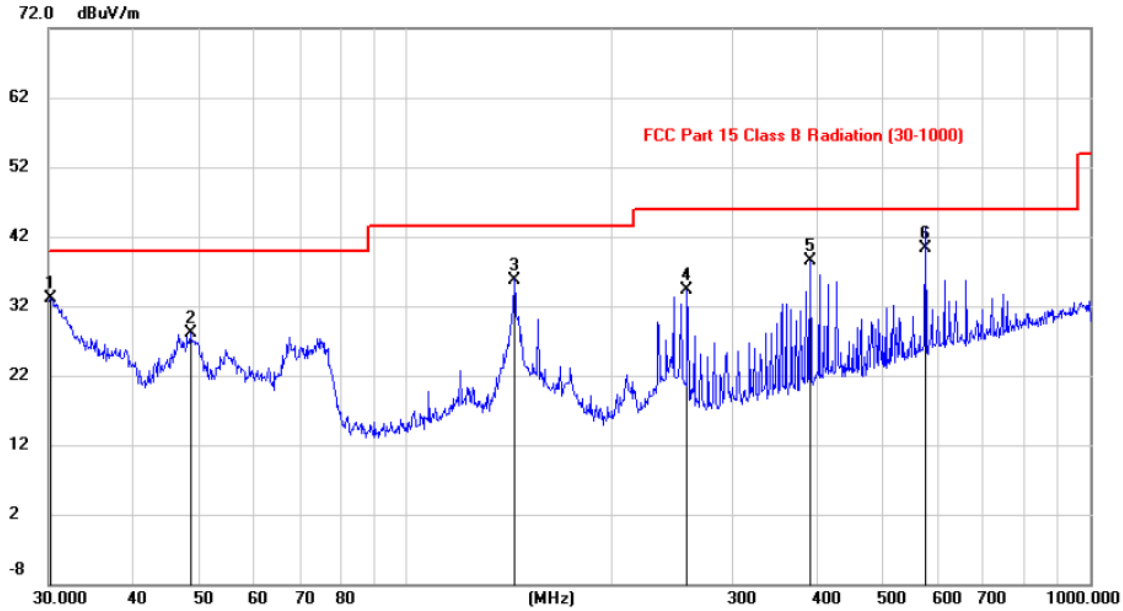
Detailed information please see the following page.

From 9KHz to 30MHz: Conclusion: PASS

Note: 1.The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

From 30MHz to 1000MHz: Conclusion: Pass

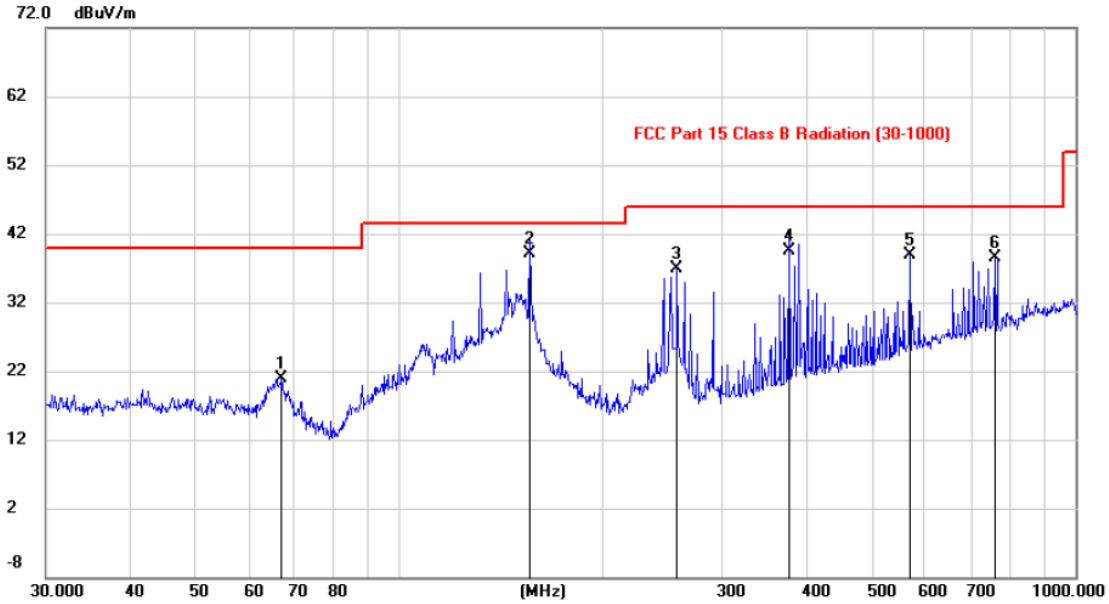
BLE_1M / Polarization: Vertical / CH: L



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		30.3031	20.16	13.03	33.19	40.00	-6.81	peak			
2		48.4902	14.48	13.58	28.06	40.00	-11.94	peak			
3		144.1156	21.65	14.15	35.80	43.50	-7.70	peak			
4		258.2057	21.29	12.93	34.22	46.00	-11.78	peak			
5		390.3574	22.09	16.51	38.60	46.00	-7.40	peak			
6	*	575.8361	19.87	20.38	40.25	46.00	-5.75	QP			

Note:1. *:Maximum data; x:Over limit; !:over margin.
2.Measurement=Reading Level+Correct Factor; Correct Factor=Antenna Factor+Cable Loss.

BLE_1M / Polarization: Horizontal / CH: L



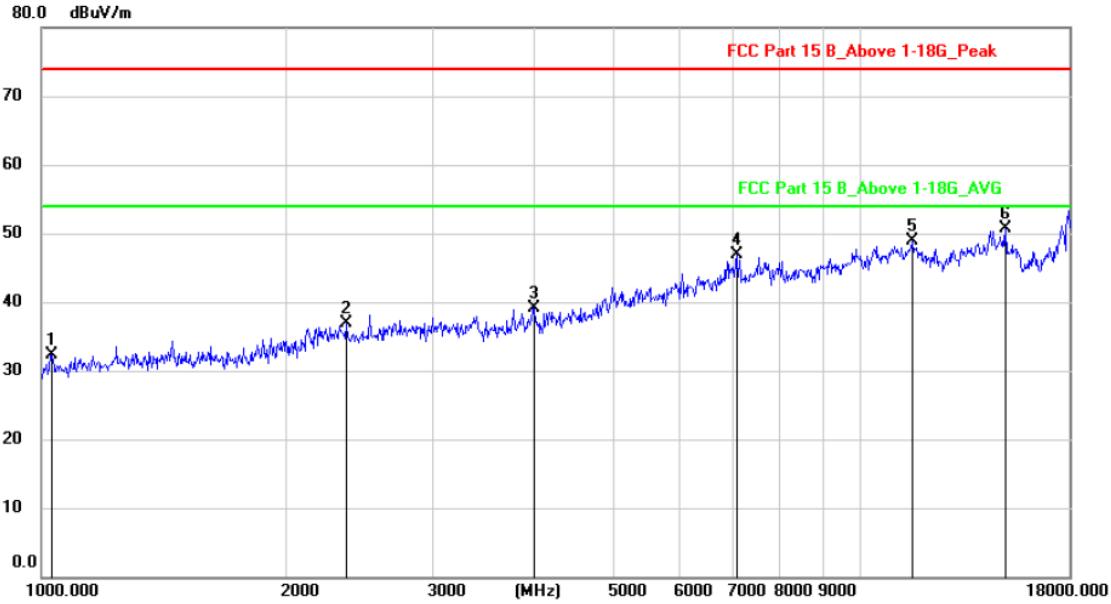
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		67.0296	9.43	11.46	20.89	40.00	-19.11	peak			
2	*	156.0559	24.44	14.70	39.14	43.50	-4.36	QP			
3		257.9945	23.89	12.92	36.81	46.00	-9.19	peak			
4		378.0537	23.38	16.20	39.58	46.00	-6.42	QP			
5		570.0767	18.76	20.10	38.86	46.00	-7.14	peak			
6		761.1483	15.15	23.32	38.47	46.00	-7.53	peak			

Note:1. *:Maximum data; x:Over limit; !:over margin.
2.Measurement=Reading Level+Correct Factor; Correct Factor=Antenna Factor+Cable Loss.

Notes: Pre-scan all mode, and found the BLE_1M modulation which it is 2402MHz channel which it is worse case for below 1GHz, so only show the test data for worse case.

From 1G-25GHz(1Mbps):

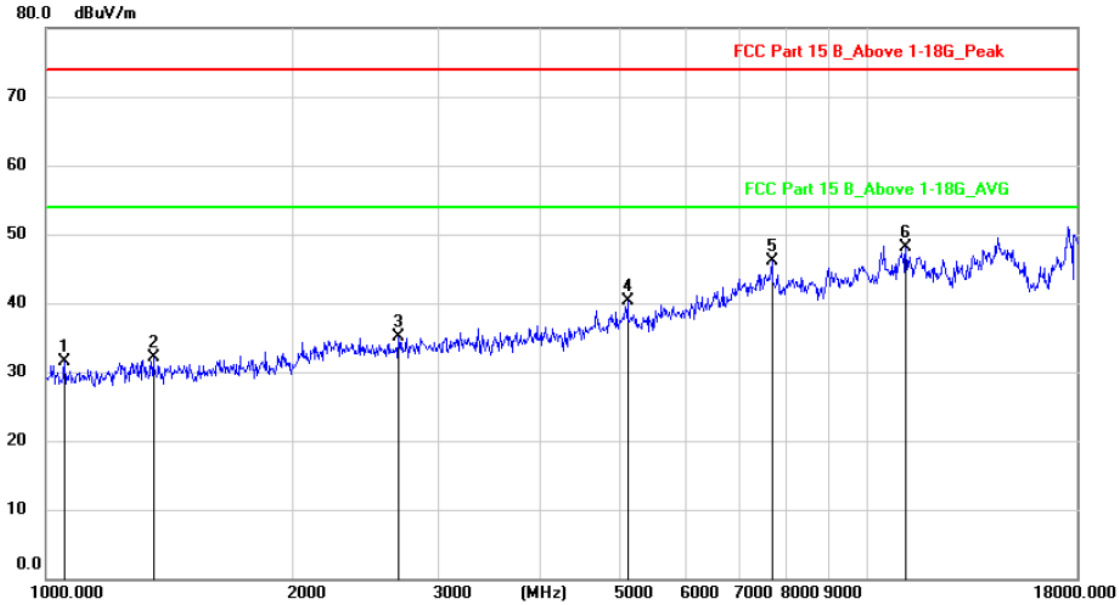
GFSK_1M mode / Polarization: Horizontal / CH: L



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		1031.013	54.70	-22.32	32.38	74.00	-41.62	peak			
2		2355.390	55.62	-18.73	36.89	74.00	-37.11	peak			
3		3999.326	55.47	-16.30	39.17	74.00	-34.83	peak			
4		7059.492	56.54	-9.60	46.94	74.00	-27.06	peak			
5		11572.44	54.51	-5.70	48.81	74.00	-25.19	peak			
6	*	15080.23	54.85	-4.11	50.74	74.00	-23.26	peak			

Note:1. *:Maximum data; x:Over limit; !:over margin.
2.Measurement=Reading Level+Correct Factor; Correct Factor=Antenna Factor+Cable Loss.

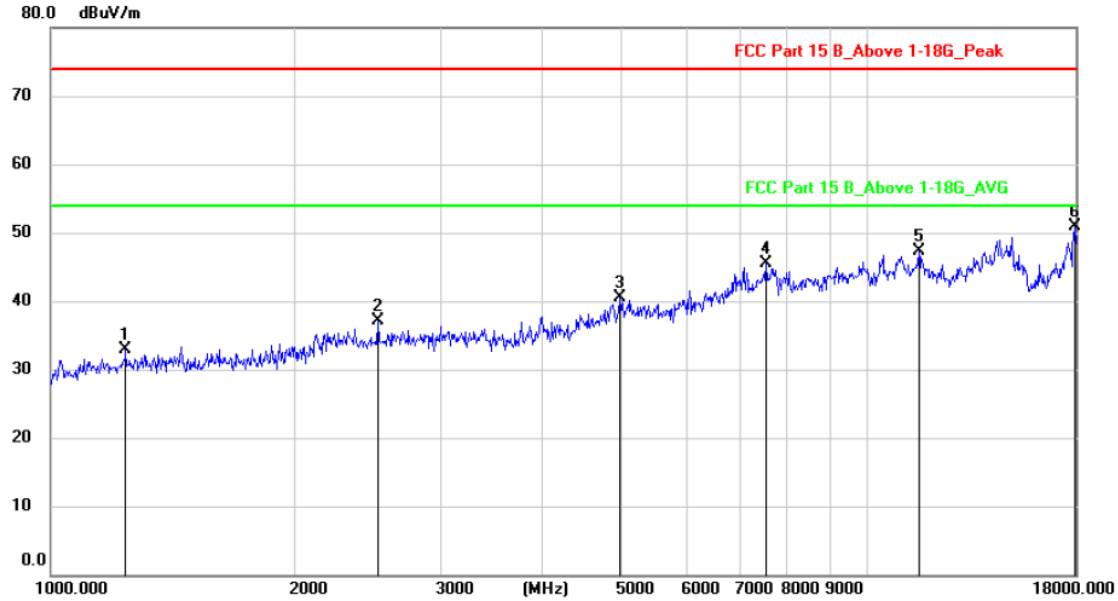
GFSK_1M / Polarization: Vertical / CH: L



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		1054.521	53.87	-22.38	31.49	74.00	-42.51	peak			
2		1352.751	53.40	-21.33	32.07	74.00	-41.93	peak			
3		2693.181	53.43	-18.27	35.16	74.00	-38.84	peak			
4		5111.138	54.08	-13.79	40.29	74.00	-33.71	peak			
5		7661.953	55.31	-9.28	46.03	74.00	-27.97	peak			
6	*	11145.67	53.71	-5.56	48.15	74.00	-25.85	peak			

Note:1. *:Maximum data; x:Over limit; !:over margin.
2.Measurement=Reading Level+Correct Factor; Correct Factor=Antenna Factor+Cable Loss.

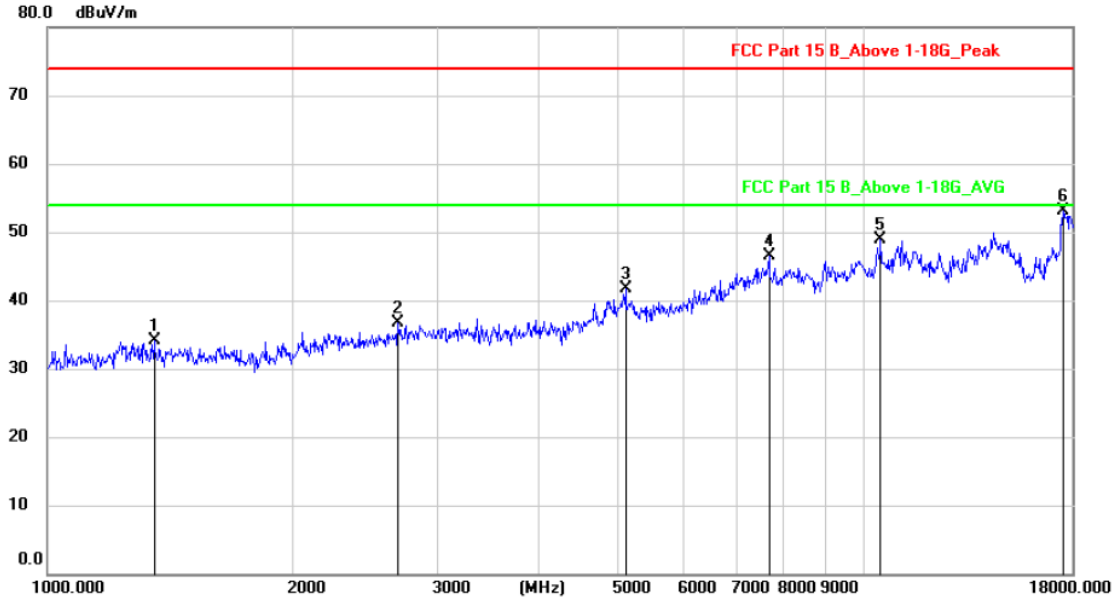
GFSK_1M / Polarization: Horizontal / CH: M



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		1235.623	54.57	-21.62	32.95	74.00	-41.05	peak			
2		2518.508	55.99	-18.80	37.19	74.00	-36.81	peak			
3		4987.578	54.47	-13.96	40.51	74.00	-33.49	peak			
4		7531.674	54.60	-9.12	45.48	74.00	-28.52	peak			
5		11572.44	53.01	-5.70	47.31	74.00	-26.69	peak			
6	*	17993.06	48.19	2.65	50.84	74.00	-23.16	peak			

Note:1. *:Maximum data; x:Over limit; !:over margin.
2.Measurement=Reading Level+Correct Factor; Correct Factor=Antenna Factor+Cable Loss.

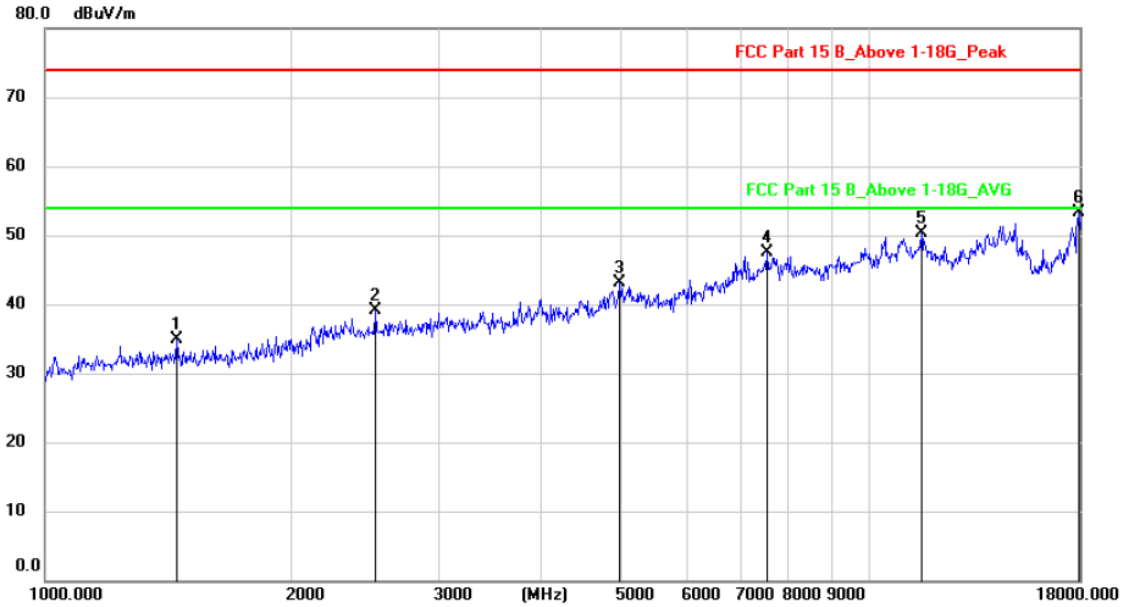
GFSK_1M / Polarization: Vertical / CH: M



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		1352.751	55.40	-21.33	34.07	74.00	-39.93	peak			
2		2693.181	54.93	-18.27	36.66	74.00	-37.34	peak			
3		5111.138	55.58	-13.79	41.79	74.00	-32.21	peak			
4		7661.953	55.81	-9.28	46.53	74.00	-27.47	peak			
5		10493.32	54.89	-6.06	48.83	74.00	-25.17	peak			
6	*	17556.39	54.46	-1.38	53.08	74.00	-20.92	peak			

Note:1. *:Maximum data; x:Over limit; !:over margin.
2.Measurement=Reading Level+Correct Factor; Correct Factor=Antenna Factor+Cable Loss.

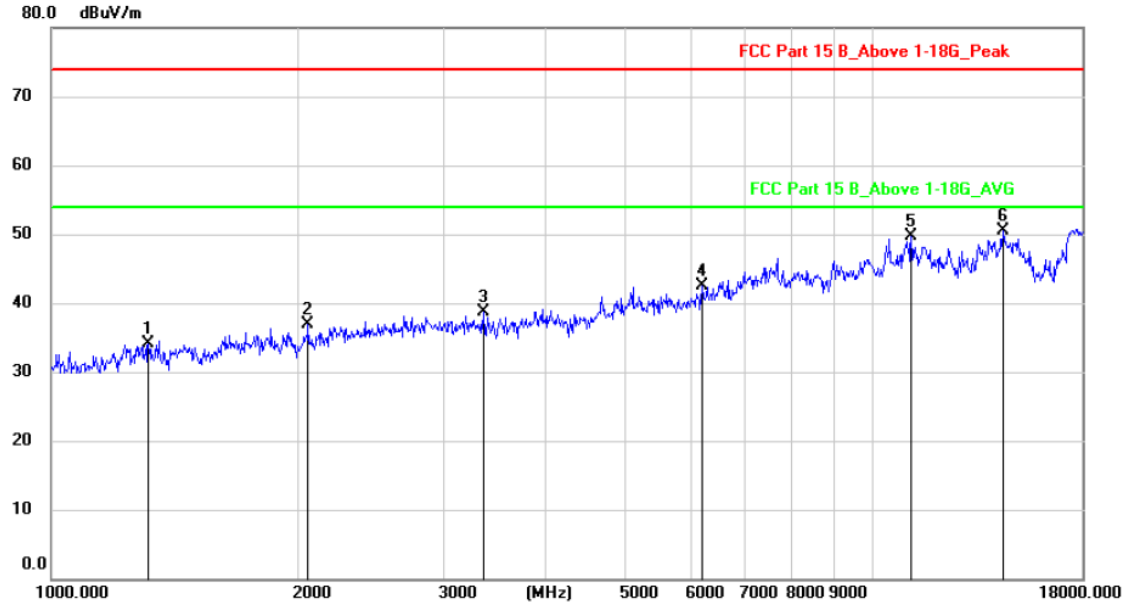
GFSK_1M / Polarization: Horizontal / CH: H



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		1446.572	56.26	-21.40	34.86	74.00	-39.14	peak			
2		2518.508	57.99	-18.80	39.19	74.00	-34.81	peak			
3		4987.578	56.97	-13.96	43.01	74.00	-30.99	peak			
4		7531.674	56.60	-9.12	47.48	74.00	-26.52	peak			
5		11572.44	56.01	-5.70	50.31	74.00	-23.69	peak			
6	*	17993.06	50.69	2.65	53.34	74.00	-20.66	peak			

Note:1. *:Maximum data; x:Over limit; !:over margin.
2.Measurement=Reading Level+Correct Factor; Correct Factor=Antenna Factor+Cable Loss.

GFSK_1M / Polarization: Vertical / CH: H



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		1313.705	55.51	-21.33	34.18	74.00	-39.82	peak			
2		2059.172	56.83	-20.00	36.83	74.00	-37.17	peak			
3		3363.860	56.44	-17.67	38.77	74.00	-35.23	peak			
4		6211.047	54.99	-12.41	42.58	74.00	-31.42	peak			
5		11145.67	55.21	-5.56	49.65	74.00	-24.35	peak			
6	*	14444.56	53.28	-2.87	50.41	74.00	-23.59	peak			

Note:1. *:Maximum data; x:Over limit; !:over margin.
2.Measurement=Reading Level+Correct Factor; Correct Factor=Antenna Factor+Cable Loss.

Remark:

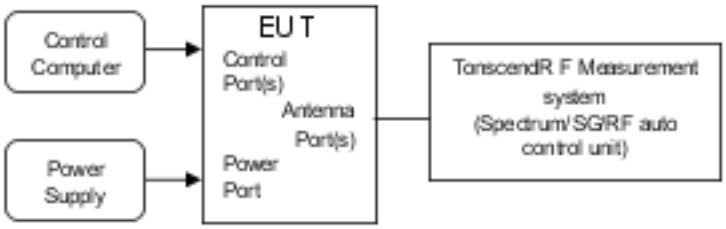
1.Pre-scan all mode, and found the GFSK_1M mode which it is worse case, so only show the test data for worse case.

2.Since the peak value is less than the limit of the AVG value, there is no AVG data.

3.From 18GHz to 25GHz,the amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

4. RF CONDUCTED SPURIOUS EMISSIONS

4.1. Block diagram of test setup



4.2. Limits

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 20dB.
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)).

4.3. Test procedure

ANSI C63.10-2020, Section 11.11.1, Section 11.11.2, Section 11.11.3.

4.4. Test result

Please refer to Appendix of BLE data.

5. POWER LINE CONDUCTED EMISSION

5.1. Test Limits

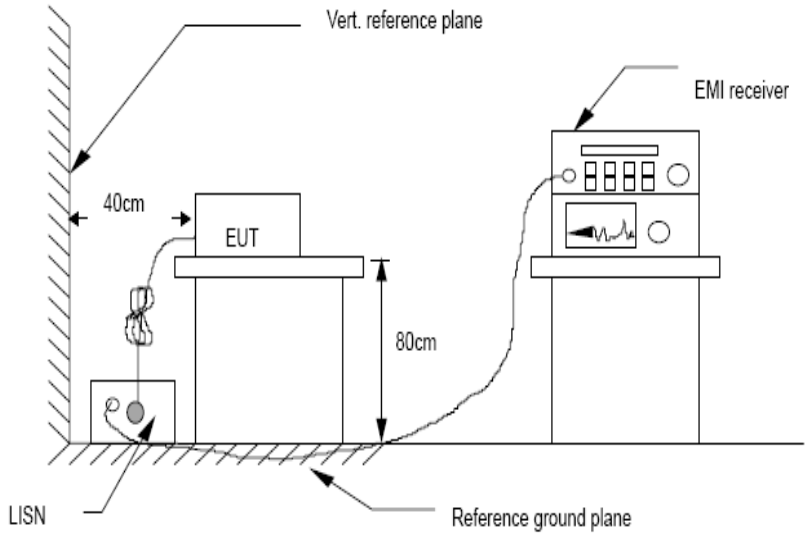
Frequency	Limits dB(μV)	
MHz	Quasi-peak Level	Average Level
0.15 -0.50	66 -56*	56 - 46*
0.50 -5.00	56	46
5.00 -30.00	60	50

Notes: 1. *Decreasing linearly with logarithm of frequency.
2. The lower limit shall apply at the transition frequencies.
3. The limit decreases in line with the logarithm of the frequency in the rang of 0.15 to 0.50 MHz.

5.2. Test Procedure

The EUT is put on the plane 0.8m high above the ground by insulating support and is connected to the power mains through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm coupling impedance for the EUT system. Please refer the block diagram of the test setup and photographs. Both sides of AC lines are checked to find out the maximum conducted emission. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to ANSI C63.10-2020 on Conducted Emission Measurement.
The bandwidth of test receiver is set at 9 kHz.

5.3. Test Setup

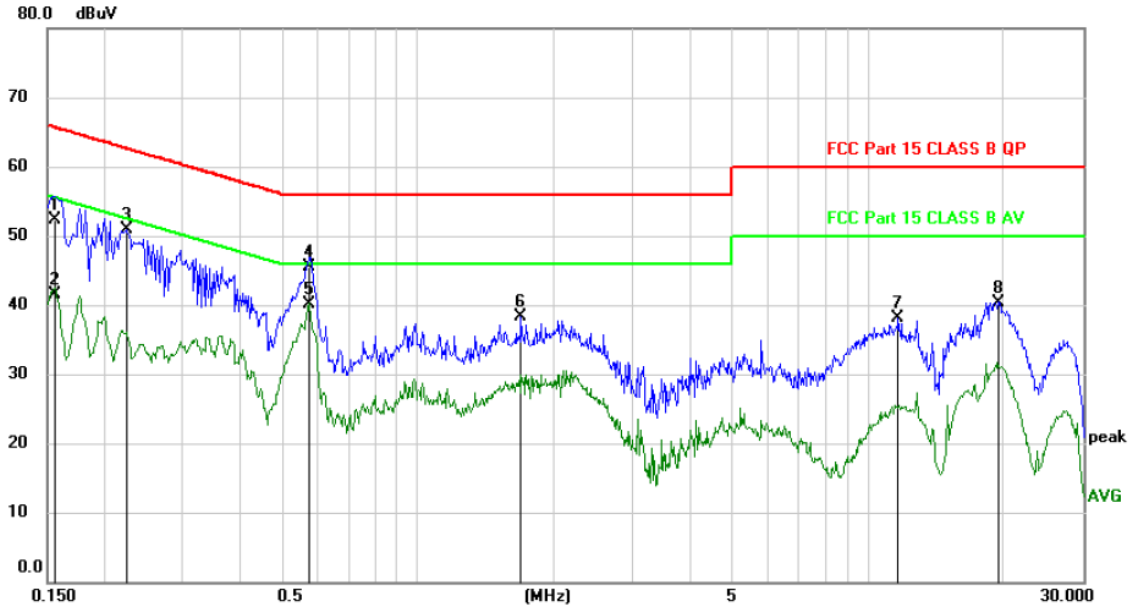


5.4. Test Results

PASS. (See below detailed test data)

Note: If peak Result comply with AV limit, QP and AV Result is deemed to comply with AV limit

Line:

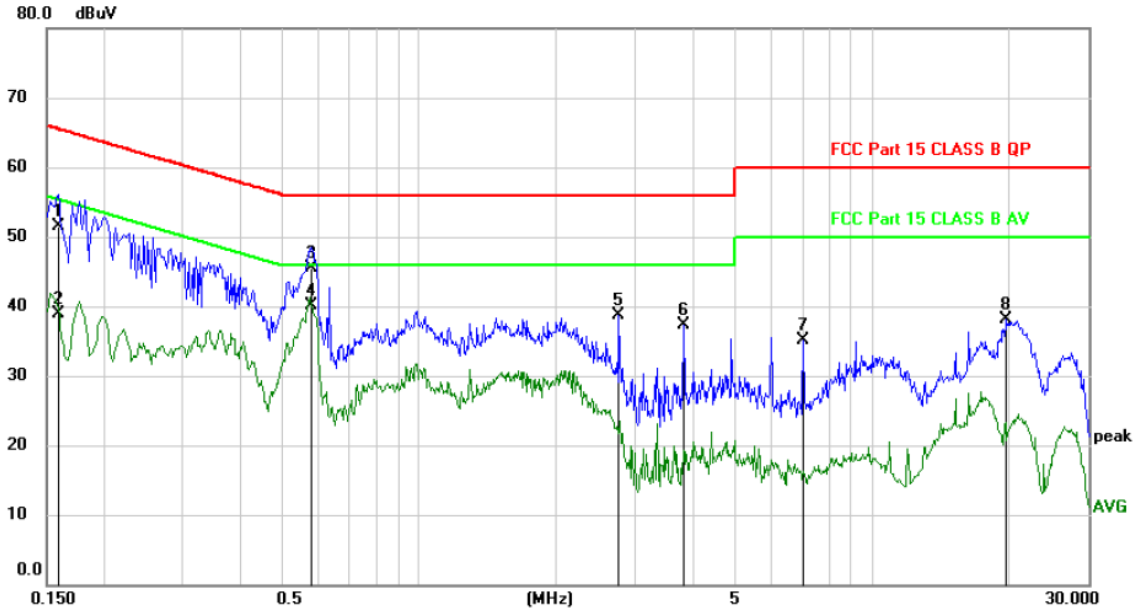


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1560	41.38	10.91	52.29	65.67	-13.38	QP	
2		0.1560	30.62	10.91	41.53	55.67	-14.14	AVG	
3		0.2250	40.11	10.70	50.81	62.63	-11.82	peak	
4		0.5730	34.45	10.96	45.41	56.00	-10.59	QP	
5	*	0.5730	29.19	10.96	40.15	46.00	-5.85	AVG	
6		1.6980	27.40	10.83	38.23	56.00	-17.77	peak	
7		11.6700	26.87	11.27	38.14	60.00	-21.86	peak	
8		19.4730	29.24	11.16	40.40	60.00	-19.60	peak	

*:Maximum data x:Over limit !:over margin 〈Reference Only

Note: Measurement=Reading Level+Correc Factor. Factor=(LISN or ISN or PLC or Current Probe)Factor+Cable

Neutral:



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1590	40.68	10.90	51.58	65.52	-13.94	QP	
2		0.1590	27.92	10.90	38.82	55.52	-16.70	AVG	
3		0.5790	34.61	10.96	45.57	56.00	-10.43	QP	
4	*	0.5790	29.15	10.96	40.11	46.00	-5.89	AVG	
5		2.7630	28.01	10.78	38.79	56.00	-17.21	peak	
6		3.8370	26.42	10.96	37.38	56.00	-18.62	peak	
7		7.0500	23.97	11.11	35.08	60.00	-24.92	peak	
8		19.7820	26.99	11.16	38.15	60.00	-21.85	peak	

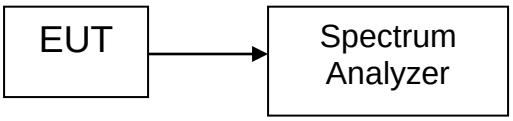
*:Maximum data x:Over limit !:over margin 〈Reference Only

Note: Measurement=Reading Level+Correc Factor. Factor=(LISN or ISN or PLC or Current Probe)Factor+Cable

Note: All modes and channels have been tested and only the GFSK 2440MHz (1Mbps) mode with the worst data is listed.

6. DUTY CYCLE

6.1. Block diagram of test setup



6.2. Test Procedure

Details see the ANSI C63.10-2020

6.2.1 A diode detector and an oscilloscope that together have a sufficiently short response time to permit accurate measurements of the ON and OFF times of the transmitted signal.

6.2.2 The zero-span mode on a spectrum analyzer or EMI receiver if the response time and spacing between bins on the sweep are sufficient to permit accurate measurements of the ON and OFF times of the transmitted signal:

a) Set the center frequency of the instrument to the center frequency of the transmission.

b) Set RBW ≥ OBW if possible; otherwise, set RBW to the largest available value.

c) Set VBW ≥ RBW. Set detector = peak or average.

d) The zero-span measurement method shall not be used unless both RBW and VBW are > 50/T and the number of sweep points across duration T exceeds 100. (For example, if VBW and/or RBW are limited to 3 MHz, then the zero-span method of measuring the duty cycle shall not be used if T ≤ 16.7 us.)

6.3. Test Results

Please refer to Appendix of BLE data.

7. CONDUCTED MAXIMUM OUTPUT POWER

7.1. Test limits

Please refer section15.247.
Regulation 15.247(b) The limit of Maximum Peak conducted output power Measurement is 1W(30dBm). The e.i.r.p. shall not exceed 4 W(36dBm).

7.2. Test Procedure

Details see the ANSI C63.10-2020

7.2.1 Place the EUT on the table and set it in transmitting mode.

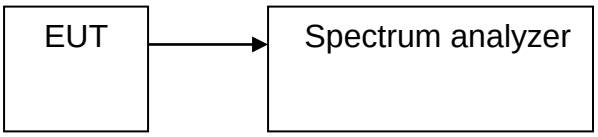
7.2.2 Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.

7.2.3 This procedure shall be used when the measurement instrument has available a resolution bandwidth that is greater than the DTS bandwidth.

Set the spectrum analyzer as RBW ⩾ DTS bandwidth, VBW ⩾ 3 x RBW, span ⩾ 3 x RBW, sweep time = auto couple, detector = peak, trace mode = max hold, allow trace to fully stabilize, use peak marker function to determine the peak amplitude level

7.2.4 Measure out each mode and each bands peak output power of EUT.

7.3. Test Setup



7.4. Test Results

Please refer to Appendix of BLE data.

8. PEAK POWER SPECTRAL DENSITY

8.1. Test limits

8.1.1 Please refer section 15.247.

8.1.2 For direct sequence systems, the peak power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3kHz band during any time interval of continuous transmission.

8.1.3 The direct sequence operating of the hybrid system, with the frequency hopping operation turned off, shall comply with the power density requirements of paragraph (d) of this section.

8.2. Test Procedure

Details see the ANSI C63.10-2020

8.2.1 Place the EUT on the table and set it in transmitting mode.

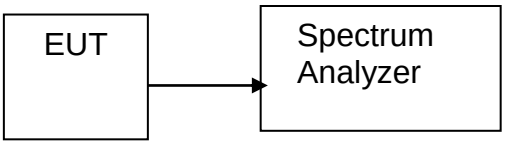
8.2.2 Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.

8.2.3 Set the spectrum analyzer as RBW = 3kHz(Set the RBW to: 3 kHz≤RBW≤100 kHz.), VBW = 10kHz(Set the VBW≥3×RBW), span≥1.5×DTS bandwidth, detector = peak, trace mode = max hold. Allow trace to fully stabilize, use the peak marker function to determine the maximum power level, if measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat, the resulting peak PSD level shall not be greater than 8 dBm in any 3 kHz band, detail see the test plot.

8.2.4 Record the max reading.

8.2.5 Repeat the above procedure until the measurements for all frequencies are completed.

8.3. Test Setup



8.4. Test Results

Please refer to Appendix of BLE data.

9. BANDWIDTH

9.1. Test limits

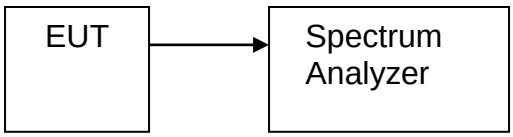
Please refer section 15.247

For direct sequence systems, the minimum 6dB bandwidth shall be at least 500 kHz.

9.2. Test Procedure

Details see the ANSI C63.10-2020
a) Set RBW = 1% to 5% of the OBW.
b) Set the VBW >= [3 × RBW].
c) Detector = peak.
d) Trace mode = max hold.
e) Sweep = auto couple.
f) Allow the trace to stabilize.
g) Use the 99% power bandwidth function of the instrument (if available) and report the measured bandwidth

9.3. Test Setup



9.4. Test Results

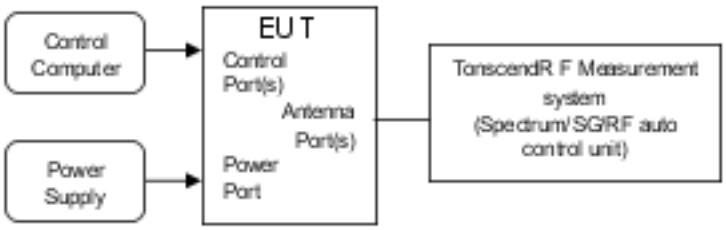
Please refer to Appendix of BLE data.

10. BAND EDGE (CONDUCTED)

10.1.Test limits

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)).

10.2.Block diagram of test setup



10.3.Test Procedure

Details see the ANSI C63.10-2020
10.3.1. Place the EUT on the table and set it in transmitting mode.
10.3.2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
10.3.3. Set center frequency of spectrum analyzer = operating frequency.
10.3.4. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz. The detector is set to Peak. The trace mode is max hold.
10.3.5. Repeat above procedures until all frequency measured were complete.

10.4.Test Results

Please refer to Appendix of BLE data.

11. BAND EDGE(RADIATED)

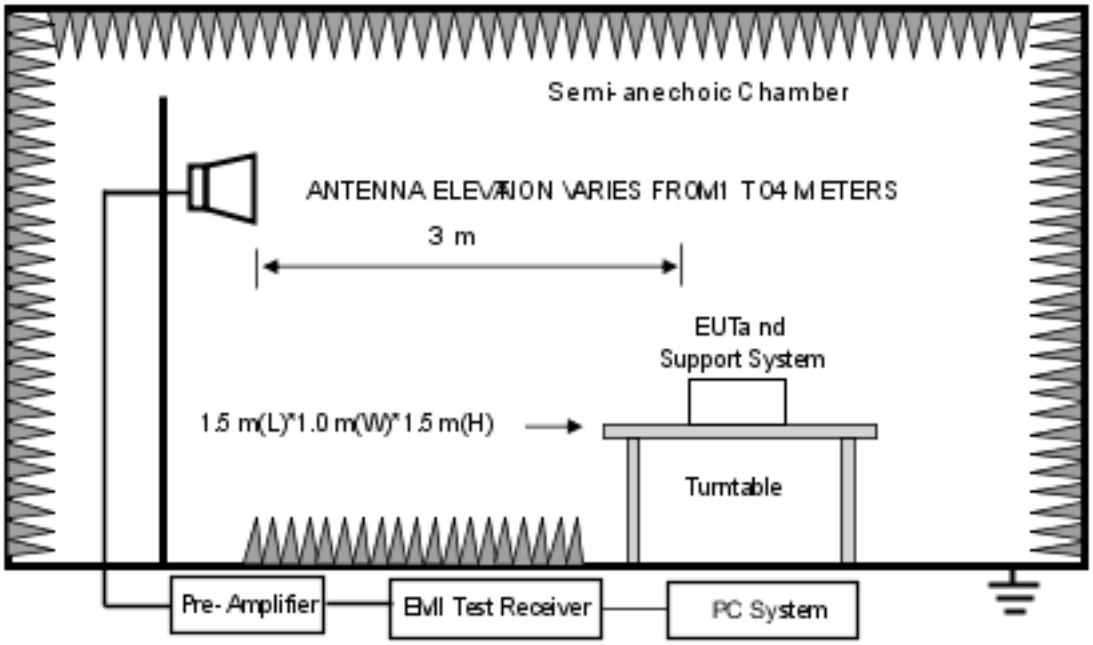
11.1.Test limits

Please refer RSS-GEN & FCC PART 15: 15.247

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced 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 that the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of root-mean-square averaging over a time interval, as permitted under section 5.4(d), the attenuation required shall be30 dB instead of 20 dB. Attenuation below the general field strength limits specified in RSS-Gen is not required.

In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

11.2.Block diagram of test setup



11.3.Test Procedure

Details see the ANSI C63.10-2020

10.3.1 Put the EUT on a 1.5m high table, power on the EUT. Emissions were scanned and measured rotating the EUT to 360 degrees, Find the maximum Emission

10.3.2 Check the spurious emissions out of band.

10.3.3 RBW 1MHz , VBW 3MHz , peak detector for peak value , RBW 1MHz , VBW 3MHz , RMS detector for AV value.

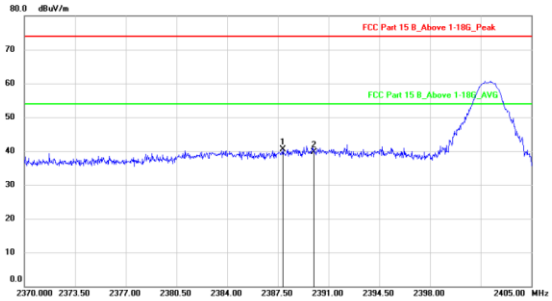
All restriction band and non- restriction band have been tested, only worse case is reported.

11.4.Test Results

PASS.
Detailed information please see the following page.

Radiated Method: GFSK(1M)

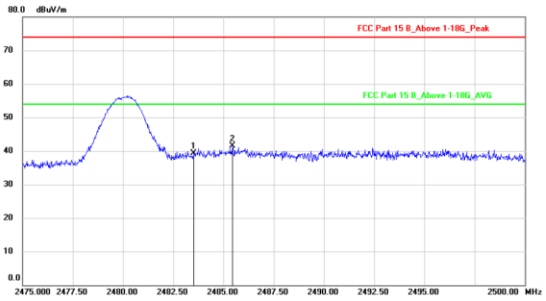
Test Mode: CH-L
Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	*	2387.863	59.11	-18.66	40.45	74.00	-33.55	peak			
2		2390.000	58.33	-18.66	39.67	74.00	-34.33	peak			

Note:1. *:Maximum data; x:Over limit; !:over margin.
2.Measurement=Reading Level+Correct Factor; Correct Factor=Antenna Factor+Cable Loss.

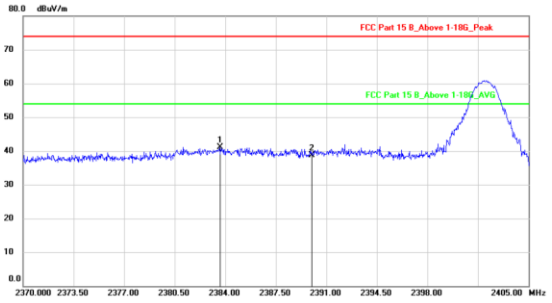
Test Mode: CH-H
Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		2483.500	58.02	-18.76	39.26	74.00	-34.74	peak			
2	*	2485.463	60.23	-18.76	41.47	74.00	-32.53	peak			

Note:1. *:Maximum data; x:Over limit; !:over margin.
2.Measurement=Reading Level+Correct Factor; Correct Factor=Antenna Factor+Cable Loss.

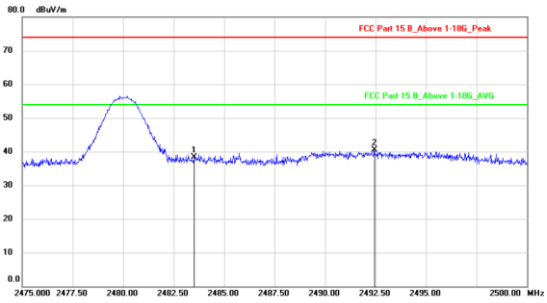
Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	*	2383.628	59.82	-18.65	41.17	74.00	-32.83	peak			
2		2390.000	57.33	-18.66	38.67	74.00	-35.33	peak			

Note:1. *:Maximum data; x:Over limit; !:over margin.
2.Measurement=Reading Level+Correct Factor; Correct Factor=Antenna Factor+Cable Loss.

Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		2483.500	57.02	-18.76	38.26	74.00	-35.74	peak			
2	*	2492.435	59.22	-18.75	40.47	74.00	-33.53	peak			

Note:1. *:Maximum data; x:Over limit; !:over margin.
2.Measurement=Reading Level+Correct Factor; Correct Factor=Antenna Factor+Cable Loss.

Note:

1.Pre-scan all mode, and found the GFSK_1M mode which it is worse case, so only show the test data for worse case.

2.Since the peak value is less than the limit of the AVG value, there is no AVG data

12. ANTENNA REQUIREMENT

12.1.Standard 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 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.

12.2.Antenna Connected Construction

The antenna is internal antenna and no consideration of replacement. Please see EUT photo for details.

12.3.Results

The EUT antenna is Internal Antenna. It comply with the standard requirement.

13. Test Setup Photo

Please refer to Appendix for Test photo.

14. EUT PHOTO

Please refer to Appendix for EUT photo.

---------END OF REPORT-------