FCC Part 15, Subpart C
Test Report

FCC ID:	2BBQK-MERTON
Applicant:	Marshall Group AB
Address:	Centralplan 15 111 20 Stockholm Sweden
Manufacturer:	Marshall Group AB
Address:	Centralplan 15 111 20 Stockholm Sweden
Product:	True Wireless Headphones
Brand(s):	Marshall, Marshall
Test Model(s):	MERTON
Series Model(s):	N/A
Test Date:	Jun. 22, 2026 ~ Jul. 16, 2026
Issued Date:	Jul. 17, 2026
Issued By:	Hwa-Hsing (Dongguan) Testing Co., Ltd.
Address:	No.101, Building N1, Yuyuan 2 Road, Yuyuan Industrial Park, HuangJiang Town, Dongguan City, People's Republic of China
Test Firm Registration No.:	915896
Designation No.:	CN1255
Standards:	FCC CFR 47 Part 2, Subpart J FCC CFR 47 Part 15, Subpart C

The above equipment has been tested by **Hwa-Hsing (Dongguan) Testing Co., Ltd.**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

Prepared by : Nature Lee
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Reviewed by : Sye Yang
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Approved by : Scott He
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Table of Contents

Release Control Record **4**

1. Summary of Test Results **5**

1.1 Measurement Uncertainty 5
1.2 Modification Record 5

2. General Information **6**

2.1 General Description of EUT 6
2.2 Description of Test Channels 7
2.3 Test Mode Applicability and Tested Channel Detail 8
2.4 Description of Support Units 10
2.5 Configuration of System under Test 10

3. Test Types and Results **11**

3.1 Radiated Emission and Band-edge Measurement 11
3.1.1 Limits of radiated emission and band-edge measurement 11
3.1.2 Test Instruments 12
3.1.3 Test Procedures 13
3.1.4 Deviation from Test Standard 14
3.1.5 Test Setup 15
3.1.6 EUT Operating Conditions 16
3.1.7 Test Results 17
3.2 Conducted Emission Measurement 31
3.2.1 Limits of Conducted Emission Measurement 31
3.2.2 Test Instruments 31
3.2.3 Test Procedures 32
3.2.4 Test Setup 32
3.2.5 EUT Operating Condition 32
3.2.6 Deviation from Test Standard 32
3.2.7 Test Results 33
3.3 6dB Bandwidth Measurement 35
3.3.1 Limits of 6dB Bandwidth Measurement 35
3.3.2 Test Setup 35
3.3.3 Test Instruments 35
3.3.4 Test Procedure 36
3.3.5 Deviation from Test Standard 36
3.3.6 EUT Operating Conditions 36
3.3.7 Test Result 37
3.4 Occupied Bandwidth Measurement 40
3.4.1 Test Setup 40
3.4.2 Test Instruments 40
3.4.3 Test Procedure 40
3.4.4 Deviation from Test Standard 40
3.4.5 EUT Operating Conditions 40
3.4.6 Test Results 41
3.5 Conducted Output Power Measurement 44
3.5.1 Limits of Conducted Output Power Measurement 44
3.5.2 Test Setup 44
3.5.3 Test Instruments 44
3.5.4 Test Procedures 44
3.5.5 Deviation from Test Standard 46
3.5.6 EUT Operating Conditions 46
3.5.7 Test Results 47
3.6 Power Spectral Density Measurement 54

3.6.1 Limits of Power Spectral Density Measurement 54
3.6.2 Test Setup 54
3.6.3 Test Instruments 54
3.6.4 Test Procedure 55
3.6.5 Deviation from Test Standard 55
3.6.6 EUT Operating Condition 55
3.6.7 Test Results 56
3.7 Conducted Out of Band Emission Measurement 59
3.7.1 Limits of Conducted Out of Band Emission Measurement 59
3.7.2 Test Setup 59
3.7.3 Test Instruments 59
3.7.4 Test Procedure 60
3.7.5 Deviation from Test Standard 60
3.7.6 EUT Operating Condition 60
3.7.7 Test results 61
3.8 Antenna Application 72
3.8.1 Antenna Requirement 72
3.8.2 Test Results 72

4. Pictures of Test Arrangements 73

5. Test Instruments 74

Appendix – Information on The Testing Laboratories 75

Release Control Record

Issue No.	Description	Date Issued
26062606-RF-US-02	Original Release	Jul. 17, 2026

1. Summary of Test Results

FCC CFR 47 Part 15, Subpart C			
FCC Clause	Test Item	Result	Remarks
15.207	AC Power Conducted Emission	Pass	Meet the requirement
15.247(a)	Emission Bandwidth Measurement	Pass	Meet the requirement
15.247(d)	Conducted Spurious Emissions	Pass	Meet the requirement
15.205 15.209 15.247(d)	Radiated Spurious Emission	Pass	Meet the requirement
15.247(e)	Power Spectral Density Measurement	Pass	Meet the requirement
15.247(b)	Maximum Output Power	Pass	Meet the requirement
15.203	Antenna Requirement	Pass	Meet the requirement
NOTE1: The above test items were tested in accordance with the C63.10 2020 standard for all the requirements. NOTE2: According to FCC OET KDB 558074, the report use radiated measurements in the restricted frequency bands. In addition, the radiated test is also performed to ensure the emissions emanating from the device cabinet also comply with the applicable limits.			

1.1 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

The listed uncertainties are the worst cases uncertainty for the entire range of measurement. Please note that the uncertainty values are provided for informational purposes only and are not used in determining the PASS/FAIL results.

Measurement	Frequency	Expended Uncertainty (k=2) (±)
Conducted Emissions at mains ports	150kHz ~ 30MHz	2.66 dB
Radiated Emissions up to 1 GHz	9KHz ~ 30MHz	2.16 dB
	30MHz ~ 1000MHz	3.56 dB
Radiated Emissions above 1 GHz	1GHz ~ 6GHz	4.71 dB
	6GHz~18GHz	4.84 dB
	18GHz ~ 40GHz	5.73 dB

Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k = 2.

1.2 Modification Record

There were no modifications required for compliance.

2. General Information

2.1 General Description of EUT

Product(s)	True Wireless Headphones
Test Model(s)	MERTON
Sample No.	HS26062606001, HS26062606002
Series Model(s)	N/A
Status of EUT	Engineering Prototype
Power Supply Rating	Charge case: DC 5V from USB or DC 3.8V from battery Each Earbud: DC 5V from Charge case or DC 3.85V from battery
Modulation Type	GFSK for DTS
Transfer Rate	1 Mbps, 2Mbps
Operating Frequency	1M: 2402 ~ 2480MHz 2M: 2404 ~ 2478MHz
Number of Channel	40 for 1Mbps 37 for 2Mbps
Maximum Output Power	4.39dBm (Peak)
Antenna Type and Antenna Gain	FPC Antenna; Left: -0.34dBi Gain Right: -0.29dBi Gain
Antenna Connector	N/A
Accessory Device	N/A

Note:

1. Please refer to the EUT photo document (Reference No.: 26062606-01&02) for detailed product photo.
2. The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or User's Manual.
3. Hwa-Hsing (Dongguan) Testing Co., Ltd. is not responsible for the accuracy of the information provided by the manufacturer.
4. This product has two Bluetooth Chips (distribute left earphone and right earphone), they are identical in RF circuitry and antenna except the layout of partial components; both of the earphones are tested on all items, and the report only shows the worst data-Right earphone (the right earphone power is greater). And only the worst case was shown in the test report.
5. The charge case battery and the earphone battery both come with two types of batteries as options.

2.2 Description of Test Channels

40 channels are provided to BT-LE (1Mbps):

CHANNEL	FREQ. (MHZ)	CHANNEL	FREQ. (MHZ)	CHANNEL	FREQ. (MHZ)	CHANNEL	FREQ. (MHZ)
0	2402	10	2422	20	2442	30	2462
1	2404	11	2424	21	2444	31	2464
2	2406	12	2426	22	2446	32	2466
3	2408	13	2428	23	2448	33	2468
4	2410	14	2430	24	2450	34	2470
5	2412	15	2432	25	2452	35	2472
6	2414	16	2434	26	2454	36	2474
7	2416	17	2436	27	2456	37	2476
8	2418	18	2438	28	2458	38	2478
9	2420	19	2440	29	2460	39	2480

37 channels are provided to BT-LE (2Mbps):

CHANNEL	FREQ. (MHZ)	CHANNEL	FREQ. (MHZ)	CHANNEL	FREQ. (MHZ)	CHANNEL	FREQ. (MHZ)
-	-	10	2422	20	2442	30	2462
1	2404	11	2424	21	2444	31	2464
2	2406	-	-	22	2446	32	2466
3	2408	13	2428	23	2448	33	2468
4	2410	14	2430	24	2450	34	2470
5	2412	15	2432	25	2452	35	2472
6	2414	16	2434	26	2454	36	2474
7	2416	17	2436	27	2456	37	2476
8	2418	18	2438	28	2458	38	2478
9	2420	19	2440	29	2460	-	-

2.3 Test Mode Applicability and Tested Channel Detail

EUT Configure Mode	Applicable test items	X-Axis	Y-Axis	Z-Axis	Voltage Supply
Conducted	AC Power Conducted Emission	N/A	N/A	N/A	DC 5V from USB via AC120V input
Radiated	Radiated Emissions	√	√	√	DC 3.85V from battery
Antenna Port Conducted Measurement	Band Edge Measurement	N/A	N/A	N/A	
	Antenna Port Emission	N/A	N/A	N/A	
	6dB Bandwidth	N/A	N/A	N/A	
	Occupied Bandwidth Measurement	N/A	N/A	N/A	
	Conducted power	N/A	N/A	N/A	
	Power Spectral Density	N/A	N/A	N/A	

1. *: The EUT had been pre-tested on the positioned of each 3 Axis. The worst case was found when positioned on **Z-plane**.
2. "N/A" means Not Applicable.

Test Condition:

Applicable test items	Environmental Conditions	Test Date	Tested by
Radiated Emissions	24.0deg. C, 55%RH	Jul. 07, 2026	Carl
Antenna Port Conducted Measurement	25.5deg. C, 58%RH	Jul. 10, 2026	Yonah Wu

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- Pre-defined engineering program for regulatory testing used to control the EUT for staying in continuous transmitting and receiving mode is programmed.
- Following channel(s) was (were) selected for the final test as listed below.

Radiated Emission Test (Above 1GHz):

EUT Configure Mode	Available Channel	Tested Channel	Modulation Type	Data Rate (Mbps)
-	0 to 39	0,19, 39	GFSK	1
-	1 to 38	1,19, 38	GFSK	2

Radiated Emission Test (Below 1GHz):

EUT Configure Mode	Available Channel	Tested Channel	Modulation Type	Data Rate (Mbps)
-	0 to 39	0,19, 39	GFSK	1
-	1 to 38	1,19, 38	GFSK	2

Power Line Conducted Emission Test:

EUT Configure Mode	Available Channel	Tested Channel	Modulation Type	Data Rate (Mbps)
-	0 to 39	0	GFSK	1

Antenna Port Conducted Measurement:

*This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.

EUT Configure Mode	Available Channel	Tested Channel	Modulation Type	Data Rate (Mbps)
-	0 to 39	0,19, 39	GFSK	1
-	1 to 38	1,19, 38	GFSK	2

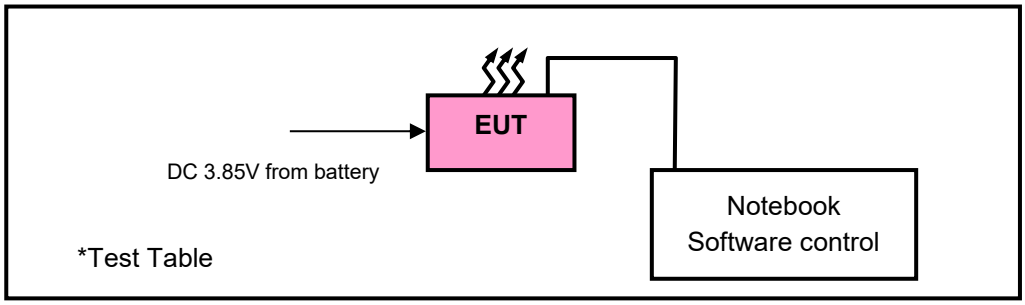
2.4 Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

No.	Product	Brand	Model No.	Serial No.	FCC ID
1	Notebook	DELL	Latitude E6420	00426-OEM-8992662-00006	N/A
2	Notebook	HUAWEI	NbD-WFH9	EUEPM21725002655	N/A

No.	Signal Cable Description of The Above Support Units
1.	USB extension cord: Unshielded, Detachable 1.8m;

2.5 Configuration of System under Test



3. Test Types and Results

3.1 Radiated Emission and Band-edge Measurement

3.1.1 Limits of radiated emission and band-edge measurement

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table. Other emissions shall be at least 20dB below the highest level of the desired power:

Frequencies (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 ~ 0.490	2400/F(kHz)	300
0.490 ~ 1.705	24000/F(kHz)	30
1.705 ~ 30.0	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

Note:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. For frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

3.1.2 Test Instruments

Radiated emission below 30MHz:

Equipment	Manufacturer	Model No.	Serial No.	Next Cal.
EMI Test Receiver	Rohde&Schwarz	ESR7	100962	2026-07-23
3m Semi-anechoic Chamber	MAORUI	9m*6m*6m	HS-2018037	2029-03-21**
Test software	FARAD	FARAD	EZ_EMCV1.1.4.2	N/A
Loop Antenna	TESEQ	HLA 6121	56735	2028-05-22*
Antenna Tower	MF	MFA-440H	NA	NA
Turn Table	MF	MFT-201SS	NA	NA
Antenna Tower&Turn Table Controller	MF	MF-7802	NA	NA

Frequency Range below 1GHz:

Equipment	Manufacturer	Model No.	Serial No.	Next Cal.
EMI Test Receiver (9kHz~3GHz)	Rohde&Schwarz	ESPI 7	101978	2026-07-23
Broadband antenna (25MHz~2500MHz)	Schwarzbeck	VULB 9168	00937	2026-07-25
3m Semi-anechoic Chamber	MAORUI	9m*6m*6m	HS-2018037	2029-03-21**
Signal Amplifier (30MHz~1000MHz)	Com-power	PAM-103	18020051	2026-07-23
Attenuator	R&S	TS2GA-6dB	18101101	N/A
Test software	FARAD	EZ_EMC V1.1.4.2	N/A	N/A
Broadcast test system	R&S	SFU	100410	2026-07-23
Coaxial cable	N/A	N/A	HS-EMC-100	2026-07-23
Coaxial cable	N/A	N/A	HS-EMC-101/102	2026-07-23

Frequency Range above 1GHz:

Equipment	Manufacturer	Model No.	Serial No.	Next Cal.
EMI Test Receiver	Rohde&Schwarz	ESPI 7	101978	2026-07-23
3m Semi-anechoic Chamber	MAORUI	9m*6m*6m	HS-2018037	2029-03-21**
Test software	FARAD	EZ_EMCV1.1.4.2	N/A	N/A
Digital Multimeter	FLUKE	15B+	43512617WS	2026-07-28
Horn Antenna	Schwarzbeck	BBHA 9120 D	1959	2026-08-02
Horn Antenna	Schwarzbeck	BBHA 9170	975	2028-05-23*
Spectrum Analyzer	Rohde&Schwarz	FSV-40N	101783	2026-07-23
Broadband Coaxial Preamplifier	Schwarzbeck	BBV 9718	00025	2026-07-23
Pre-Amplifier	EMCI	EMC 184045SE	9870709	2026-07-30
Spectrum	Keysight	N9020A	MY51240612	2026-07-23
Broadcast test system	R&S	SFU	100410	2026-07-23
Antenna Tower	MF	MFA-440H	NA	NA
Turn Table	MF	MFT-201SS	NA	NA
Antenna Tower&Turn Table Controller	MF	MF-7802	NA	NA
Coaxial cable	N/A	N/A	HS-EMC-103	2026-07-23
Coaxial cable	N/A	N/A	HS-EMC-104/105	2026-07-23

Note:
1. The calibration interval of the above test instruments is 12/24*/36** months.
2. The test was performed in 966.

3.1.3 Test Procedures

a. Peak emission levels are measured by setting the instrument as follow:

1) RBW & VBW setting as a function of frequency:

Frequency	RBW	VBW
9kHz~150kHz	200Hz	600Hz
0.15MHz~30MHz	9kHz	30kHz
30MHz~1000MHz	120kHz	300kHz
>1000MHz	1MHz	3MHz

2) Detector = peak.
3) Sweep time = auto.
4) Trace mode = max hold.
5) Allow sweeps to continue until the trace stabilizes. (Note that the required measurement time may be lengthened for low-duty-cycle applications.)

Note: If the peak-detected amplitude can be shown to comply with the average limit, then it is not necessary to perform a separate average measurement.

b. Average emission levels are measured by setting the instrument as follow:

- **Trace averaging with continuous EUT transmission at full power**

If the EUT can be configured or modified to transmit continuously (D ≥ 98%). then the average emission levels shall be measured using the following method (with EUT transmitting continuously):

1) RBW=1 MHz (unless otherwise specified).
2) VBW ≥ 3 *RBW.
3) Detector =RMS
4) Sweep time = auto.
5) Perform a trace average of at least 100 traces.

- **Trace averaging across ON and OFF times of the EUT transmissions followed by duty cycle correction**

If continuous transmission of the EUT (D ≥ 98%) cannot be achieved and the duty cycle is constant (duty cycle variations are less than ±2%). then the following procedure shall be used

1) The EUT shall be configured to operate at the maximum achievable duty cycle.
2) Measure the duty cycle D of the transmitter output signal as described in ANSI C63.10.
3) RBW=1 MHz (unless otherwise specified).
4) VBW ≥ 3 *RBW.
5) Detector =RMS
6) Sweep time = auto.
7) Perform a trace average of at least 100 traces.

A correction factor shall be added to the measurement results prior to comparing with the emission limit to compute the emission level that would have been measured had the test been performed at 100% duty cycle. The correction factor is computed as follows:

*If power averaging (rms) mode was used in step 5). then the applicable correction factor is [10 10g (1/ D)], where D is the duty cycle.

**If linear voltage averaging mode was used in step f). then the applicable correction factor is [20 10g (1/D)], where D is the duty cycle.

***If a specific emission is demonstrated to be continuous (D > 98%) rather than turning ON and OFF with the transmit cycle, then no duty cycle correction is required for that.

- **Reduced VBW Averaqing across ON and OFF times of the EUT transmissions with max hold**

If continuous transmission of the EUT (D > 98%) cannot be achieved and the duty cycle is not constant (duty cycle variations exceed ±2%), then the following procedure shall be used:

1) RBW = 1 MHz
2) VBW ≥ 1/T.
3) Detector =peak
4) Sweep time = auto.
5) Trace mode = max hold.
6) Allow max hold to run for at least [50 x (1/ D)] traces

c. The EUT was placed on the top of a rotating table 0.8 meters (below 1GHz) / 1.5 meters (Above 1GHz) above the reference ground. The table was rotated 360 degrees to determine the position of the highest radiation.
d. The EUT was set 3 meters away from the interference-receiving antenna (Below 1GHz) & (Above 1GHz), which was mounted on the top of a variable-height antenna tower.
e. The height of antenna 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.
f. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
g. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
h. The test-receiver system was set to peak and average detected function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Note:

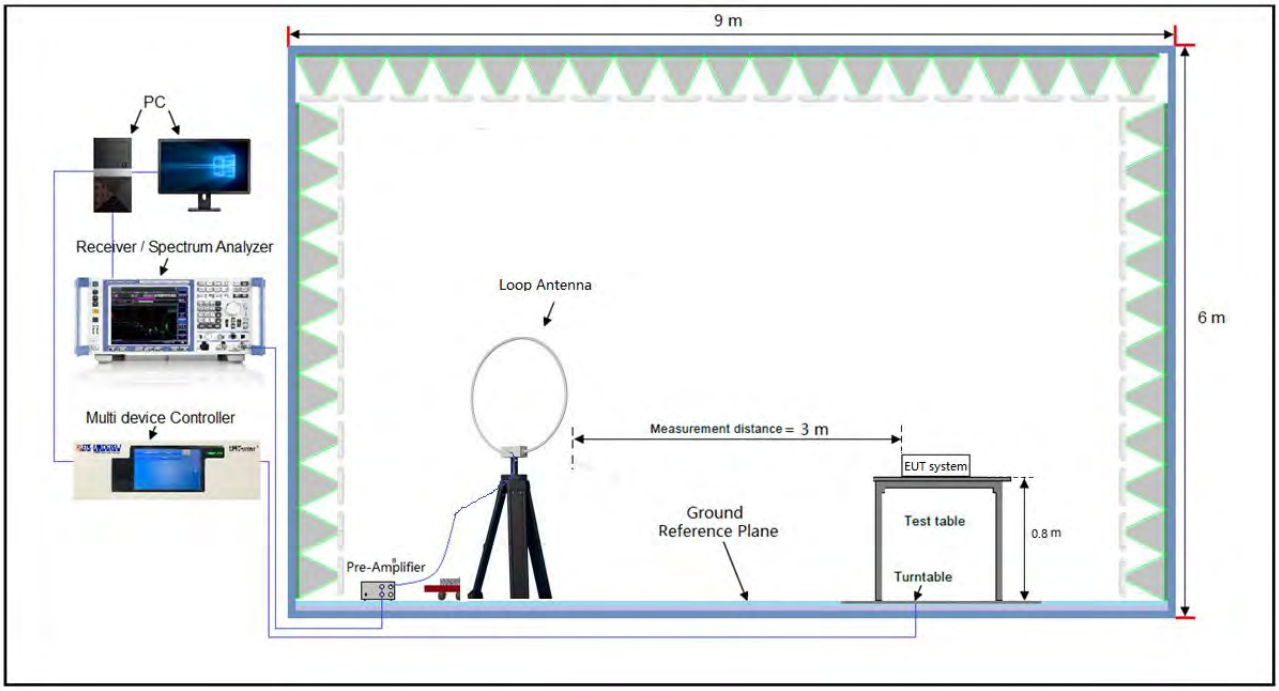
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz & 360kHz for Quasi-peak detection (QP) at frequency below 1 GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth =3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth =1/T for Average (Duty cycle < 98 %) detection at frequency above 1 GHz.
4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is =10Hz (Duty cycle ≥ 98%) for Average detection (AV) at frequency above 1GHz.
5. All modes of operation were investigated and the worst-case emissions are reported.

3.1.4 Deviation from Test Standard

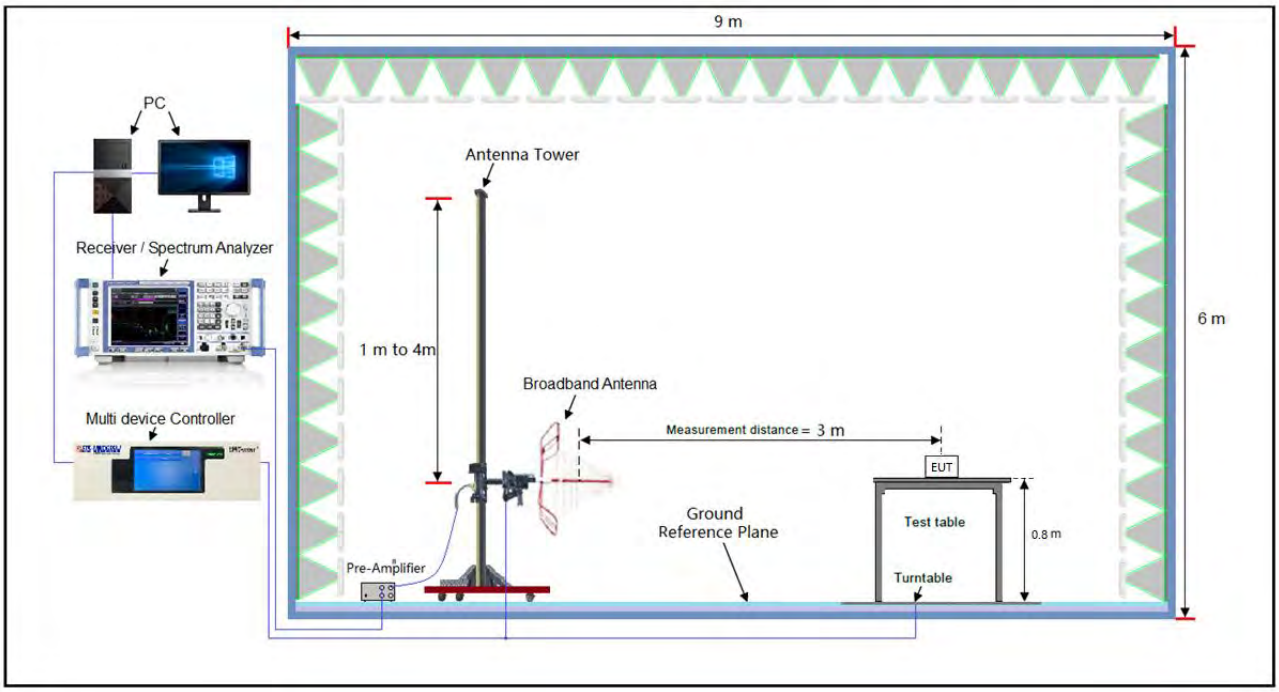
No deviation.

3.1.5 Test Setup

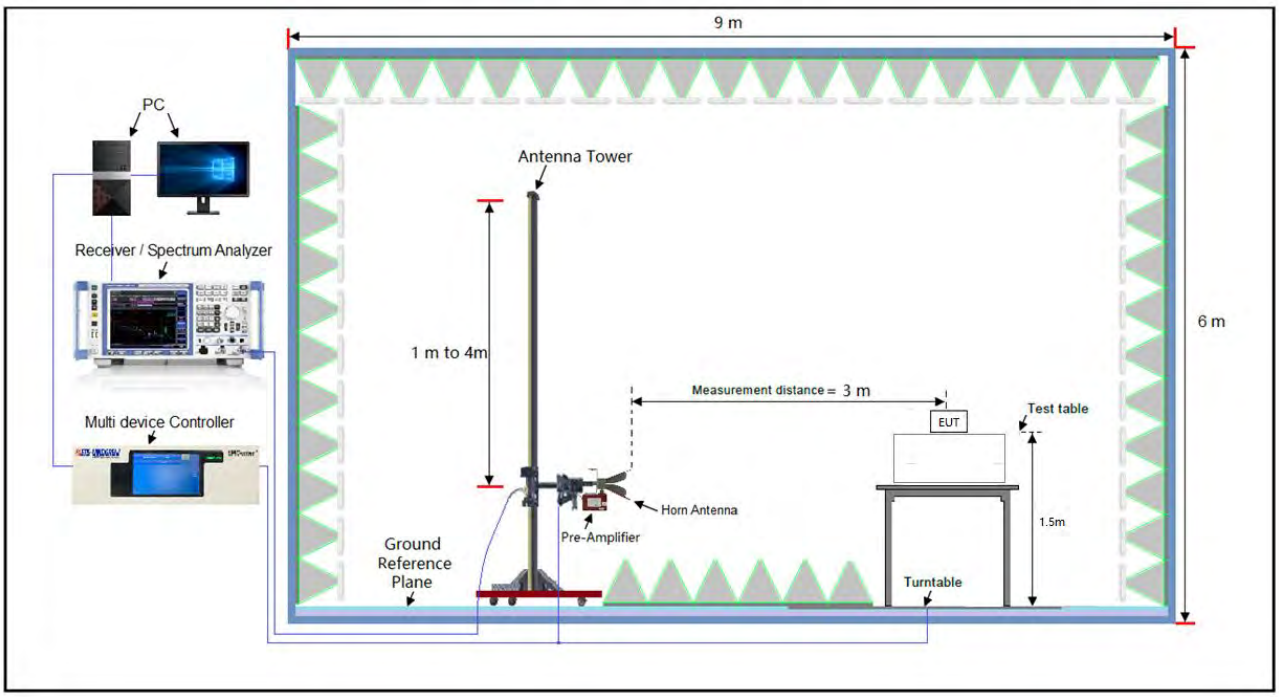
Radiated emission below 30MHz:



Frequency Range below 1GHz:



Frequency Range above 1GHz:



For the actual test configuration, please refer to the attached file (Test Setup Photo).

3.1.6 EUT Operating Conditions

a. Placed the EUT on the testing table.

b. Set the EUT under transmission condition continuously at specific channel frequency.

3.1.7 Test Results

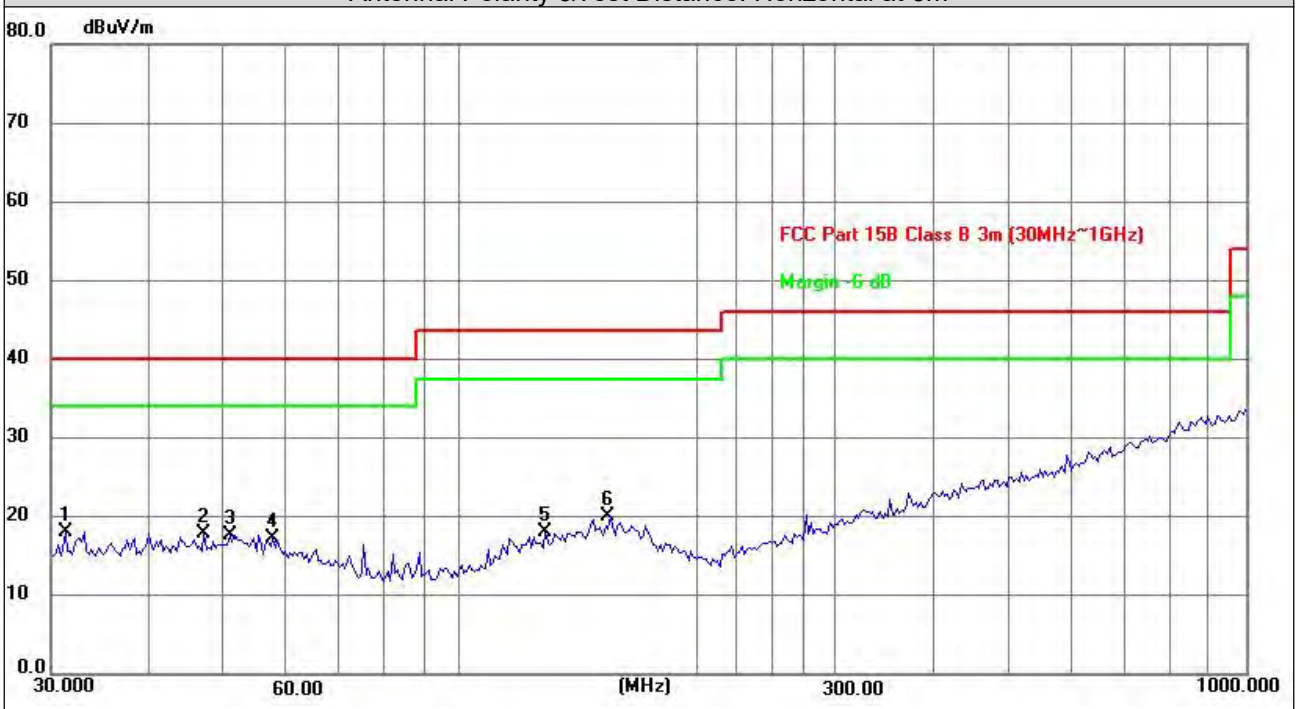
9kHz ~ 30MHz Data:

The amplitude of spurious emissions attenuated more than 20dB below the permissible value is not required to be report.

30 MHz ~ 1GHz Worst-Case Data: GFSK 1Mbps

Frequency Range	30MHz ~ 1GHz	Detector Function	Peak (PK) Quasi-peak (QP)
Test Mode	GFSK 1Mbps	Test Channel	Channel 0

Antennal Polarity &Test Distance: Horizontal at 3m



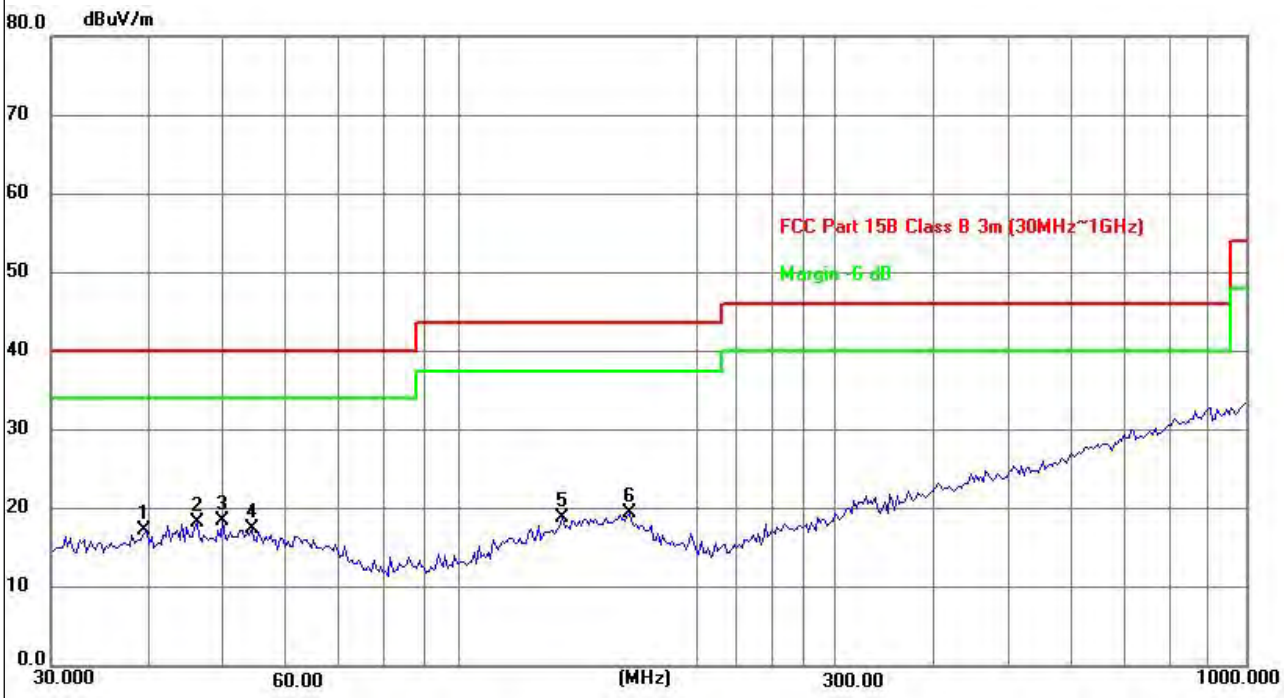
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Height (cm)	Table Angle (Degree)
1	31.2892	34.76	-16.62	18.14	40.00	-21.86	peak	100	0
2	46.9948	33.08	-15.30	17.78	40.00	-22.22	peak	100	0
3	50.7637	32.77	-15.08	17.69	40.00	-22.31	peak	100	0
4	57.5940	33.49	-16.21	17.28	40.00	-22.72	peak	100	0
5	128.1130	33.10	-15.03	18.07	43.50	-25.43	peak	100	0
6	154.8204	33.41	-13.40	20.01	43.50	-23.49	peak	100	0

Remarks:

1. Emission Level = Read Level + Factor (Antenna Factor + Cable Loss - Preamp Factor)
2. Margin value = Emission level – Limit value

Frequency Range	30MHz ~ 1GHz	Detector Function	Peak (PK) Quasi-peak (QP)
Test Mode	GFSK 1Mbps	Test Channel	Channel 0

Antennal Polarity& Test Distance: Vertical at 3m



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Height (cm)	Table Angle (Degree)
1	39.7146	32.77	-15.55	17.22	40.00	-22.78	peak	100	0
2	46.0164	33.46	-15.30	18.16	40.00	-21.84	peak	100	0
3	49.7068	33.67	-15.12	18.55	40.00	-21.45	peak	100	0
4	54.0710	32.64	-15.26	17.38	40.00	-22.62	peak	100	0
5	134.5591	33.02	-14.23	18.79	43.50	-24.71	peak	100	0
6	163.7550	33.02	-13.56	19.46	43.50	-24.04	peak	100	0

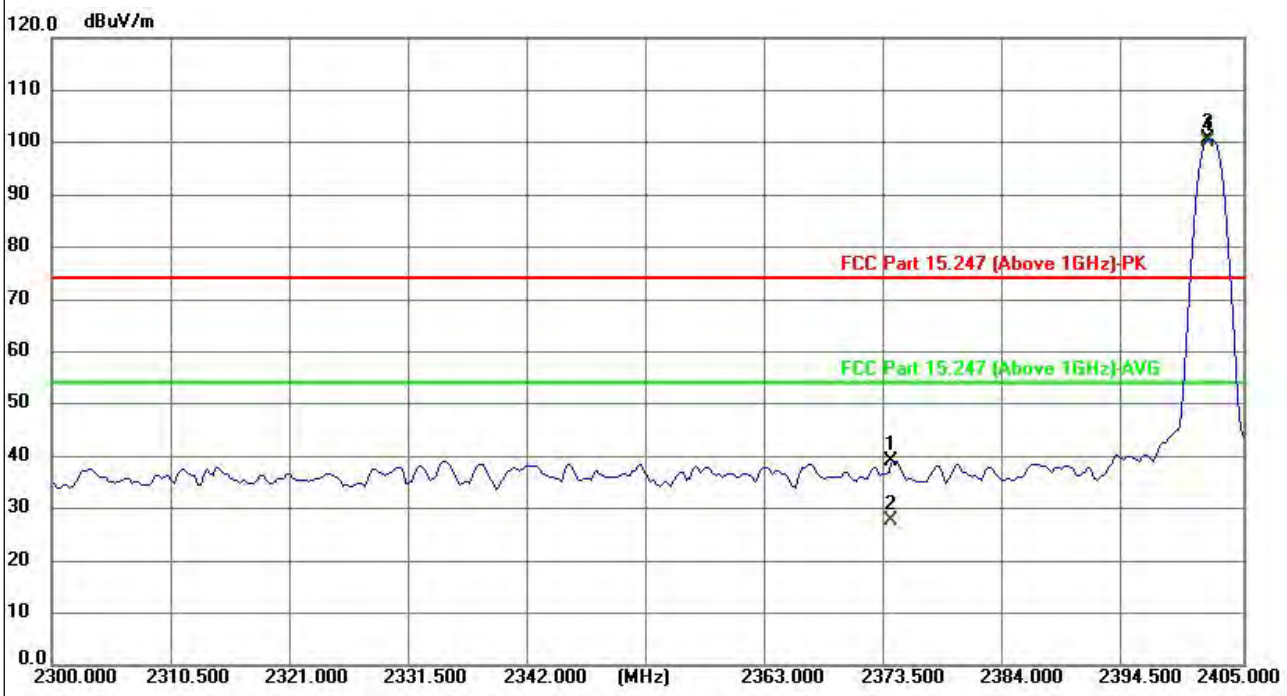
Remarks:

1. Emission Level = Read Level + Factor (Antenna Factor + Cable Loss - Preamp Factor)
2. Margin value = Emission level – Limit value

Above 1GHz, all modes have been tested, and only the worst mode is shown below: GFSK 1Mbps

Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Quasi-peak (QP)
Test Mode	GFSK 1Mbps	Test Channel	Channel 0

Antennal Polarity& Test distance: Horizontal at 3 M



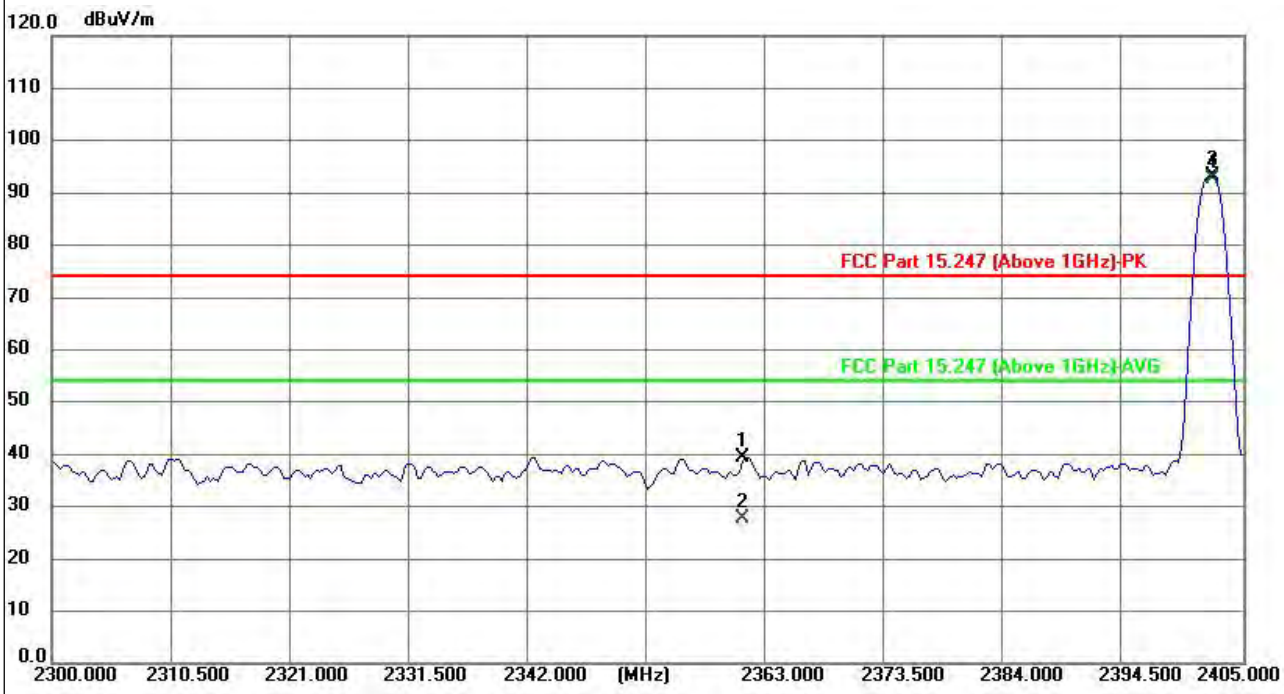
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Height (cm)	Table Angle (Degree)
1	2374.287	40.56	-1.40	39.16	74.00	-34.84	peak	100	152
2	2374.287	28.97	-1.40	27.57	54.00	-26.43	AVG	100	152
3 #	2401.850	101.84	-1.22	100.62			peak	100	152
4 #	2401.850	101.35	-1.22	100.13			AVG	100	152

Remarks:

1. Emission Level = Read Level + Factor (Antenna Factor + Cable Loss - Preamp Factor)
2. Margin value = Emission level – Limit value
3. #: Fundamental frequency
4. The amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required to be report
5. The harmonic values recorded in the table are from the test results of the low SPAN spectrum.

Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Quasi-peak (QP)
Test Mode	GFSK 1Mbps	Test Channel	Channel 0

Antennal Polarity& Test Distance: Vertical at 3m



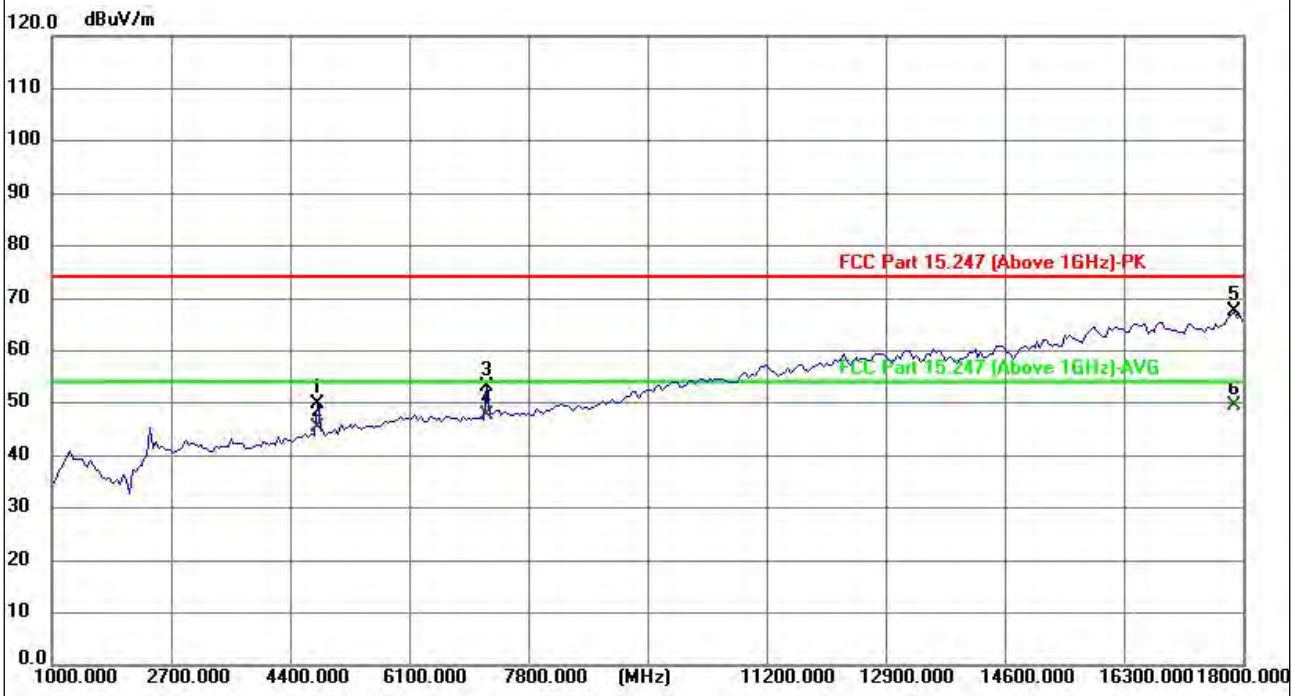
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Height (cm)	Table Angle (Degree)
1	2361.162	40.89	-1.48	39.41	74.00	-34.59	peak	100	78
2	2361.162	29.10	-1.48	27.62	54.00	-26.38	AVG	100	78
3 #	2402.375	94.56	-1.22	93.34			peak	100	78
4 #	2402.375	93.97	-1.22	92.75			AVG	100	78

Remarks:

1. Emission Level = Read Level + Factor (Antenna Factor + Cable Loss - Preamp Factor)
2. Margin value = Emission level – Limit value
3. #: Fundamental frequency
4. The amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required to be report
5. The harmonic values recorded in the table are from the test results of the low SPAN spectrum.

Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Quasi-peak (QP)
Test Mode	GFSK 1Mbps	Test Channel	Channel 0

Antennal Polarity& Test distance: Horizontal at 3 M



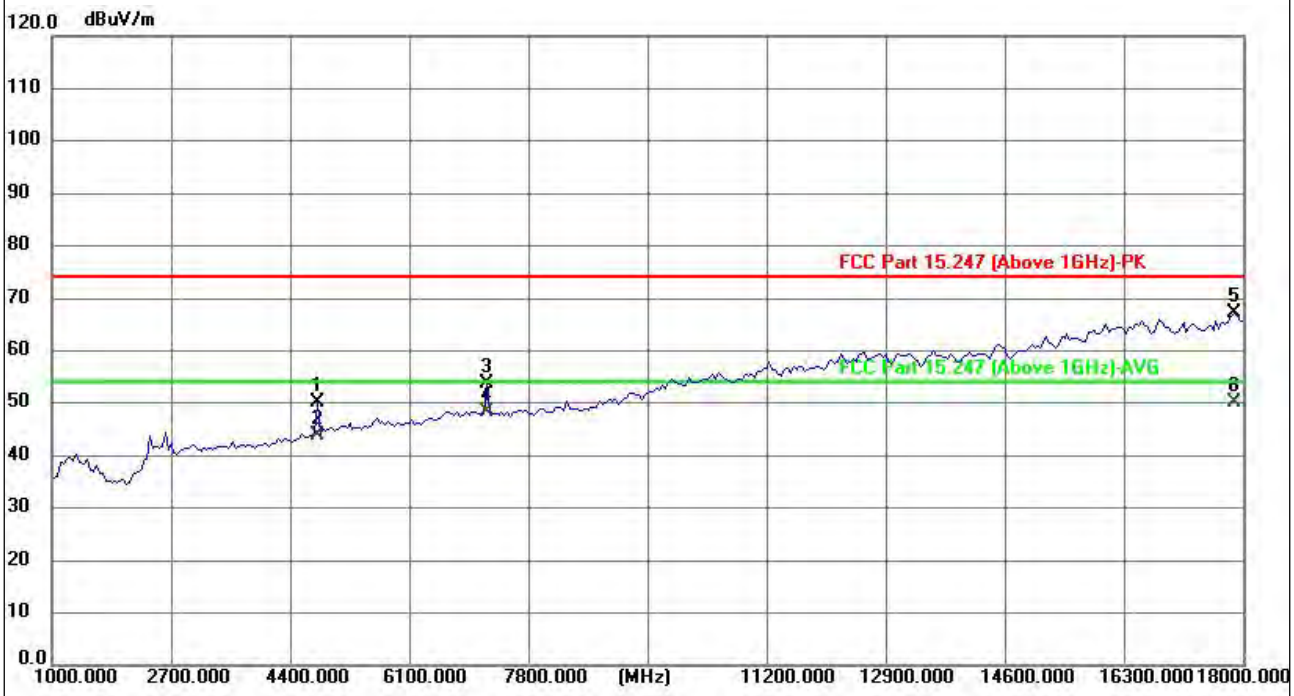
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Height (cm)	Table Angle (Degree)
1	4804.000	45.70	2.45	48.15	74.00	-25.85	peak	231	147
2	4804.000	39.40	2.45	41.85	54.00	-12.15	AVG	231	147
3	7206.000	38.31	9.90	48.21	74.00	-25.79	peak	100	115
4	7206.000	28.25	9.90	38.15	54.00	-15.85	AVG	100	115
5	17872.500	39.92	27.53	67.45	74.00	-6.55	peak	150	0
6	17872.500	21.92	27.53	49.45	54.00	-4.55	AVG	150	0

Remarks:

1. Emission Level = Read Level + Factor (Antenna Factor + Cable Loss - Preamp Factor)
2. Margin value = Emission level – Limit value
3. #: Fundamental frequency
4. The amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required to be report
5. The harmonic values recorded in the table are from the test results of the low SPAN spectrum.

Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Quasi-peak (QP)
Test Mode	GFSK 1Mbps	Test Channel	Channel 0

Antennal Polarity& Test Distance: Vertical at 3m



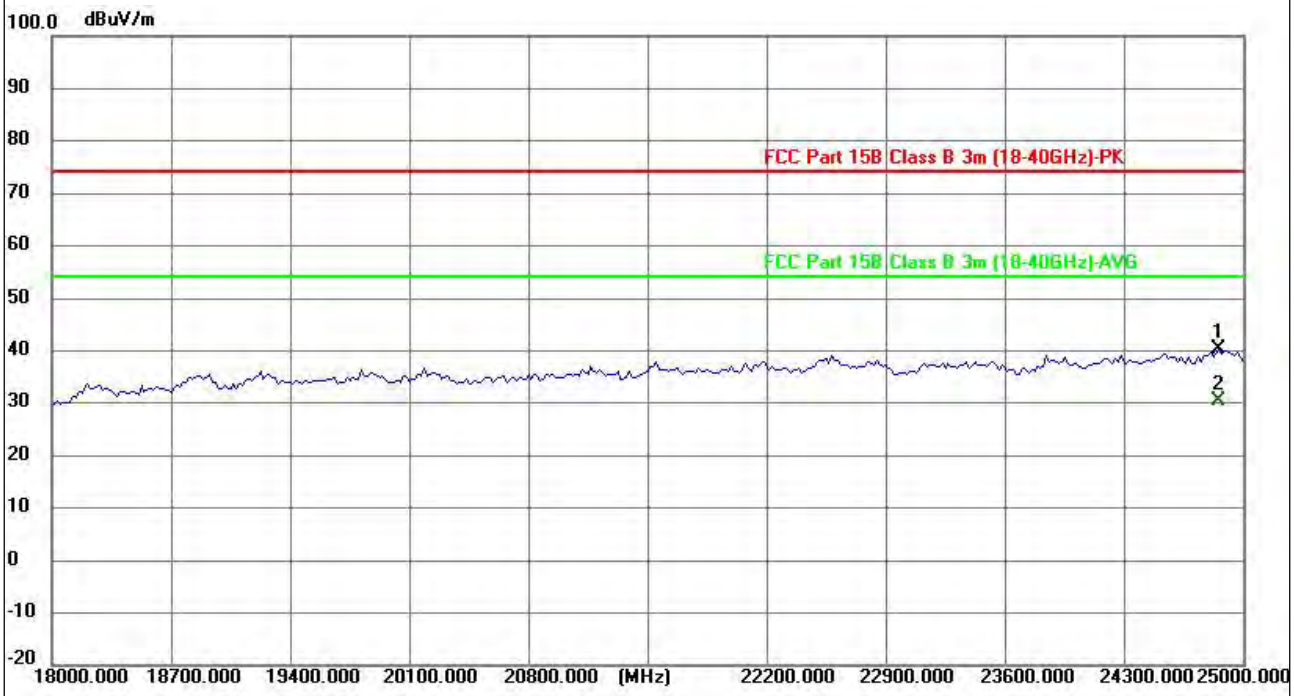
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Height (cm)	Table Angle (Degree)
1	4804.000	44.40	2.45	46.85	74.00	-27.15	peak	148	300
2	4804.000	31.90	2.45	34.35	54.00	-19.65	AVG	148	300
3	7206.000	29.25	9.90	39.15	74.00	-34.85	peak	100	134
4	7206.000	27.65	9.90	37.55	54.00	-16.45	AVG	100	134
5	17872.500	39.54	27.53	67.07	74.00	-6.93	peak	150	0
6	17872.500	22.54	27.53	50.07	54.00	-3.93	AVG	150	0

Remarks:

1. Emission Level = Read Level + Factor (Antenna Factor + Cable Loss - Preamp Factor)
2. Margin value = Emission level – Limit value
3. #: Fundamental frequency
4. The amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required to be report
5. The harmonic values recorded in the table are from the test results of the low SPAN spectrum.

Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Quasi-peak (QP)
Test Mode	GFSK 1Mbps	Test Channel	Channel 0

Antennal Polarity& Test distance: Horizontal at 3 M



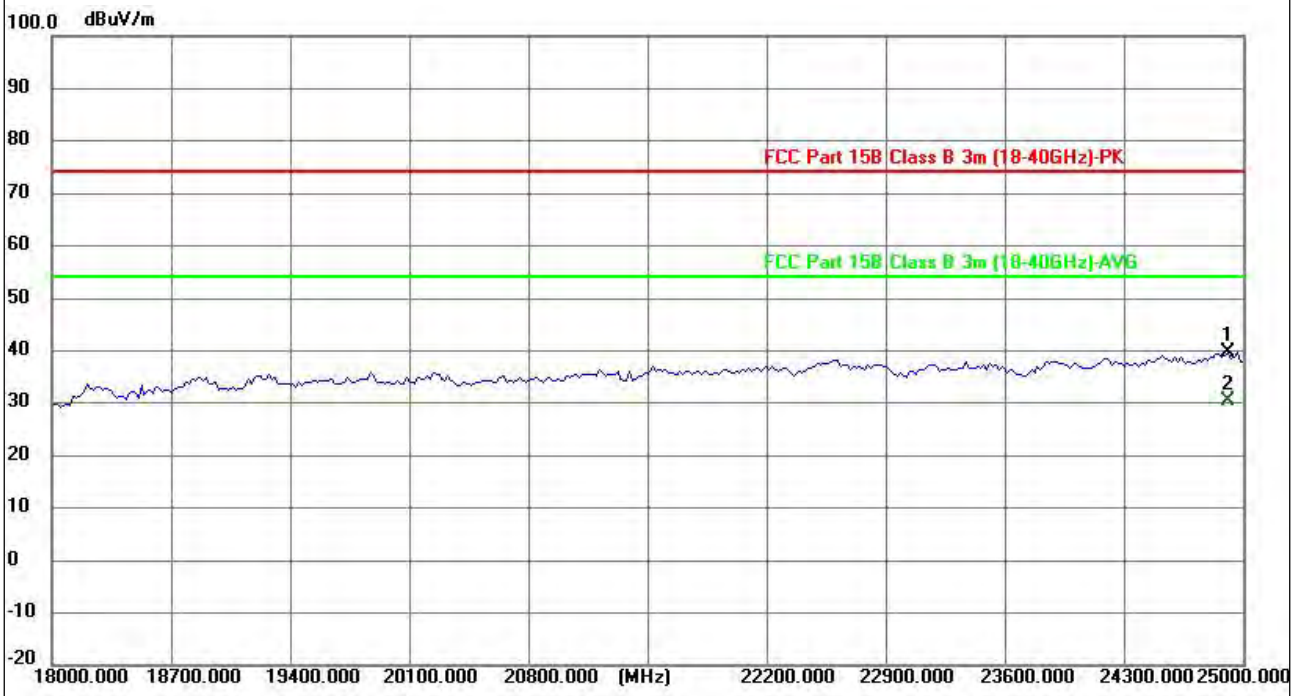
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Height (cm)	Table Angle (Degree)
1	24860.000	41.05	-0.74	40.31	74.00	-33.69	peak	150	0
2	24860.000	31.05	-0.74	30.31	54.00	-23.69	AVG	150	0

Remarks:

1. Emission Level = Read Level + Factor (Antenna Factor + Cable Loss - Preamp Factor)
2. Margin value = Emission level – Limit value
3. #: Fundamental frequency
4. The amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required to be report
5. The harmonic values recorded in the table are from the test results of the low SPAN spectrum.

Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Quasi-peak (QP)
Test Mode	GFSK 1Mbps	Test Channel	Channel 0

Antennal Polarity& Test Distance: Vertical at 3m



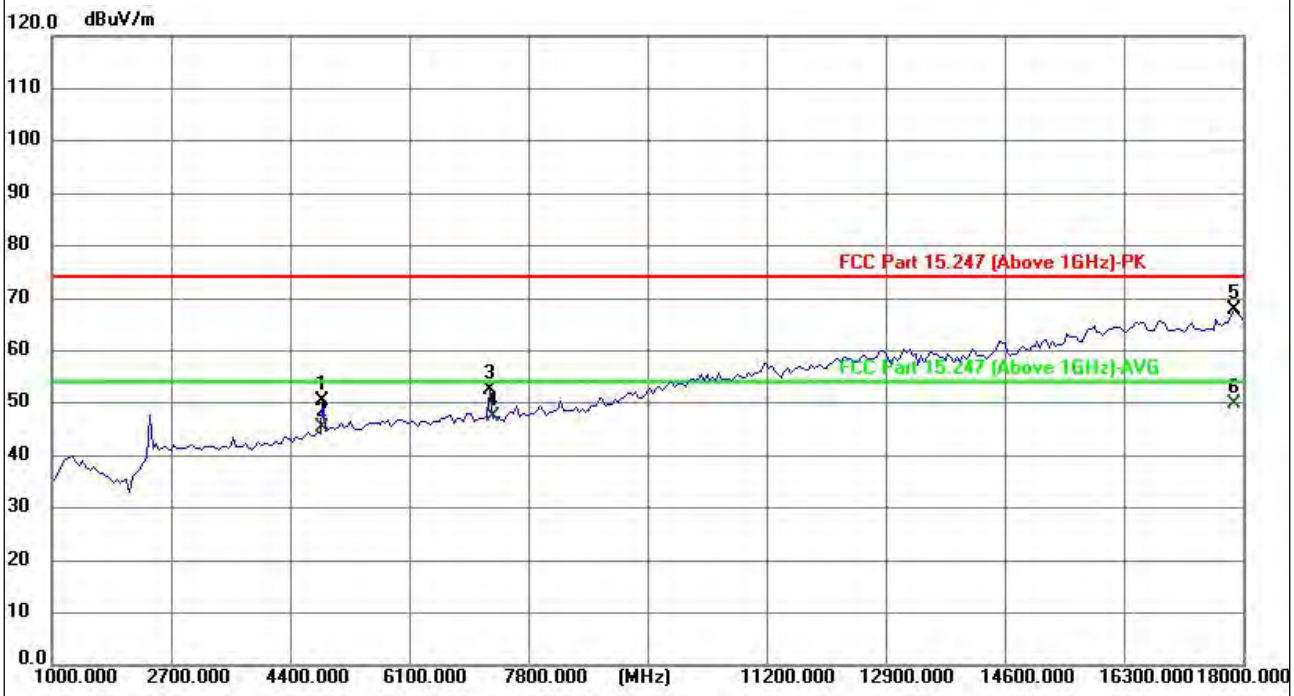
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Height (cm)	Table Angle (Degree)
1	24912.500	40.47	-0.73	39.74	74.00	-34.26	peak	150	0
2	24912.500	31.18	-0.73	30.45	54.00	-23.55	AVG	150	0

Remarks:

1. Emission Level = Read Level + Factor (Antenna Factor + Cable Loss - Preamp Factor)
2. Margin value = Emission level – Limit value
3. #: Fundamental frequency
4. The amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required to be report
5. The harmonic values recorded in the table are from the test results of the low SPAN spectrum.

Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Quasi-peak (QP)
Test Mode	GFSK 1Mbps	Test Channel	Channel 19

Antennal Polarity& Test Distance: Horizontal at 3m



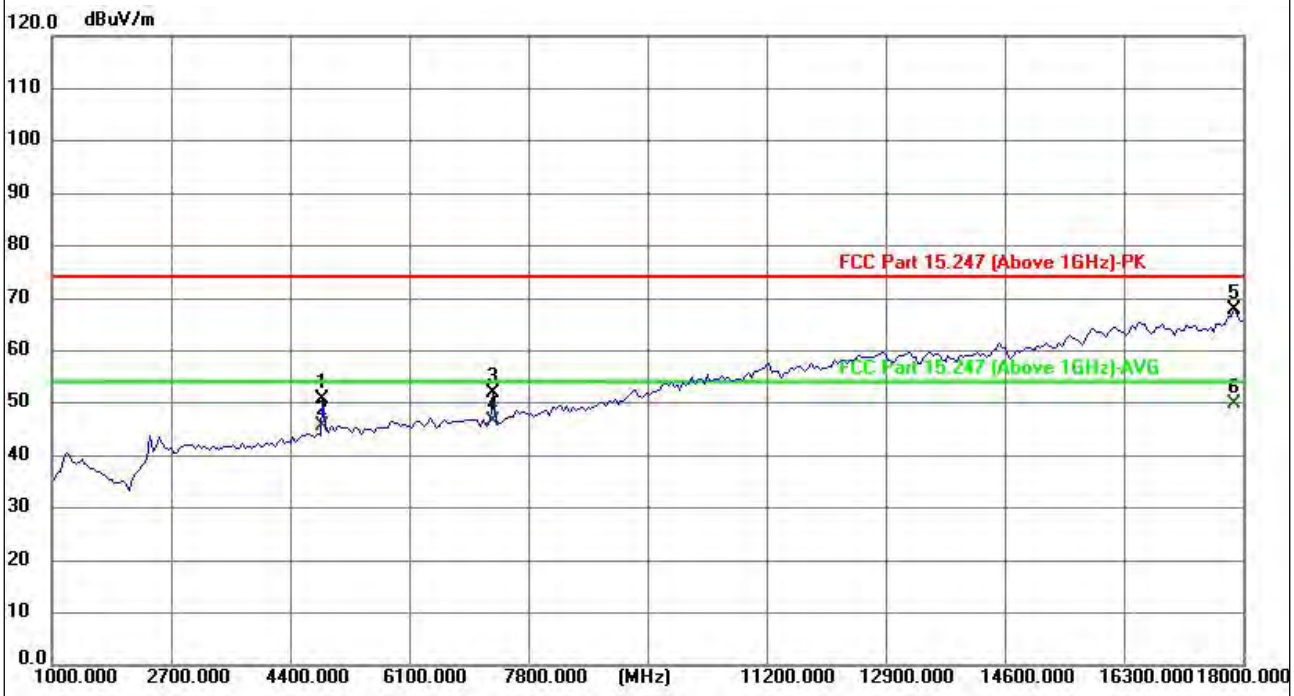
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Height (cm)	Table Angle (Degree)
1	4880.000	45.88	2.63	48.51	74.00	-25.49	peak	215	154
2	4880.000	38.21	2.63	40.84	54.00	-13.16	AVG	215	154
3	7320.000	38.83	10.20	49.03	74.00	-24.97	peak	100	144
4	7320.000	28.27	10.20	38.47	54.00	-15.53	AVG	100	114
5	17872.500	40.37	27.53	67.90	74.00	-6.10	peak	150	0
6	17872.500	22.37	27.53	49.90	54.00	-4.10	AVG	150	0

Remarks:

1. Emission Level = Read Level + Factor (Antenna Factor + Cable Loss - Preamp Factor)
2. Margin value = Emission level – Limit value
3. #: Fundamental frequency
4. The amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required to be report
5. The harmonic values recorded in the table are from the test results of the low SPAN spectrum.

Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Quasi-peak (QP)
Test Mode	GFSK 1Mbps	Test Channel	Channel 19

Antennal Polarity& Test Distance: Vertical at 3m



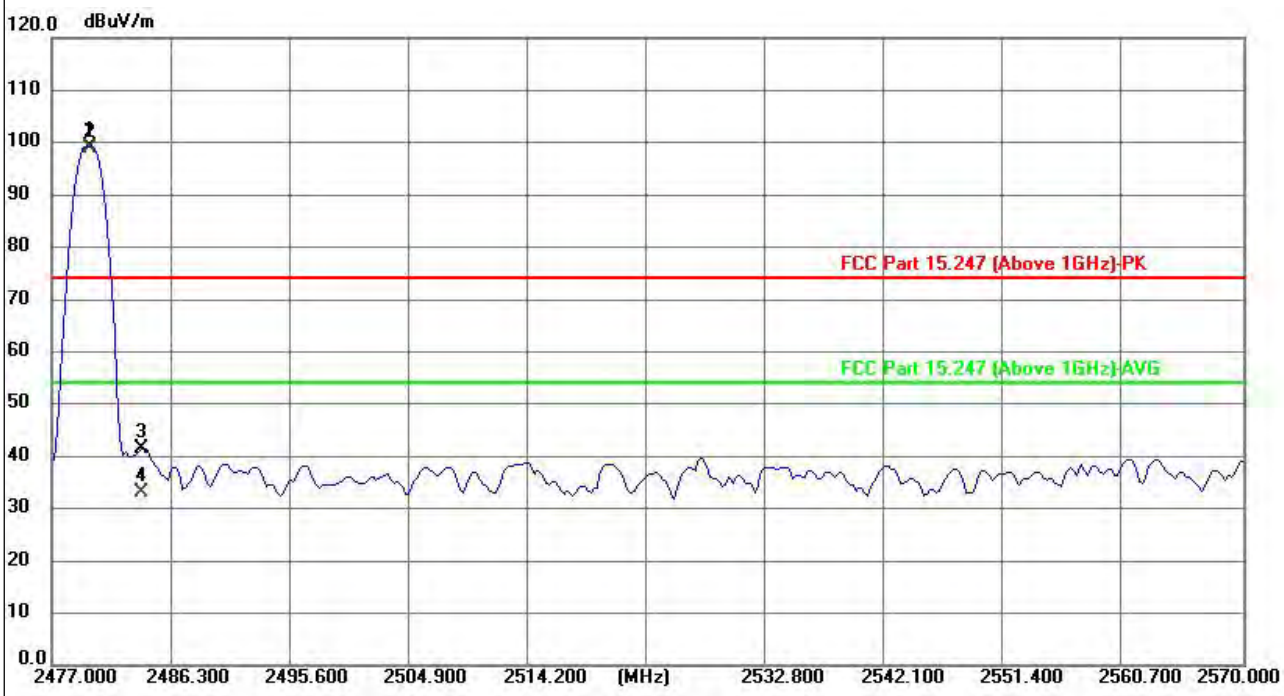
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Height (cm)	Table Angle (Degree)
1	4880.000	43.39	2.63	46.02	74.00	-27.98	peak	360	155
2	4880.000	34.92	2.63	37.55	54.00	-16.45	AVG	360	155
3	7320.000	40.04	10.20	50.24	74.00	-23.76	peak	100	131
4	7320.000	28.49	10.20	38.69	54.00	-15.31	AVG	100	131
5	17872.500	40.24	27.53	67.77	74.00	-6.23	peak	150	0
6	17872.500	22.24	27.53	49.77	54.00	-4.23	AVG	150	0

Remarks:

1. Emission Level = Read Level + Factor (Antenna Factor + Cable Loss - Preamp Factor)
2. Margin value = Emission level – Limit value
3. #: Fundamental frequency
4. The amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required to be report
5. The harmonic values recorded in the table are from the test results of the low SPAN spectrum.

Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Quasi-peak (QP)
Test Mode	GFSK 1Mbps	Test Channel	Channel 39

Antennal Polarity& Test Distance: Horizontal at 3 M



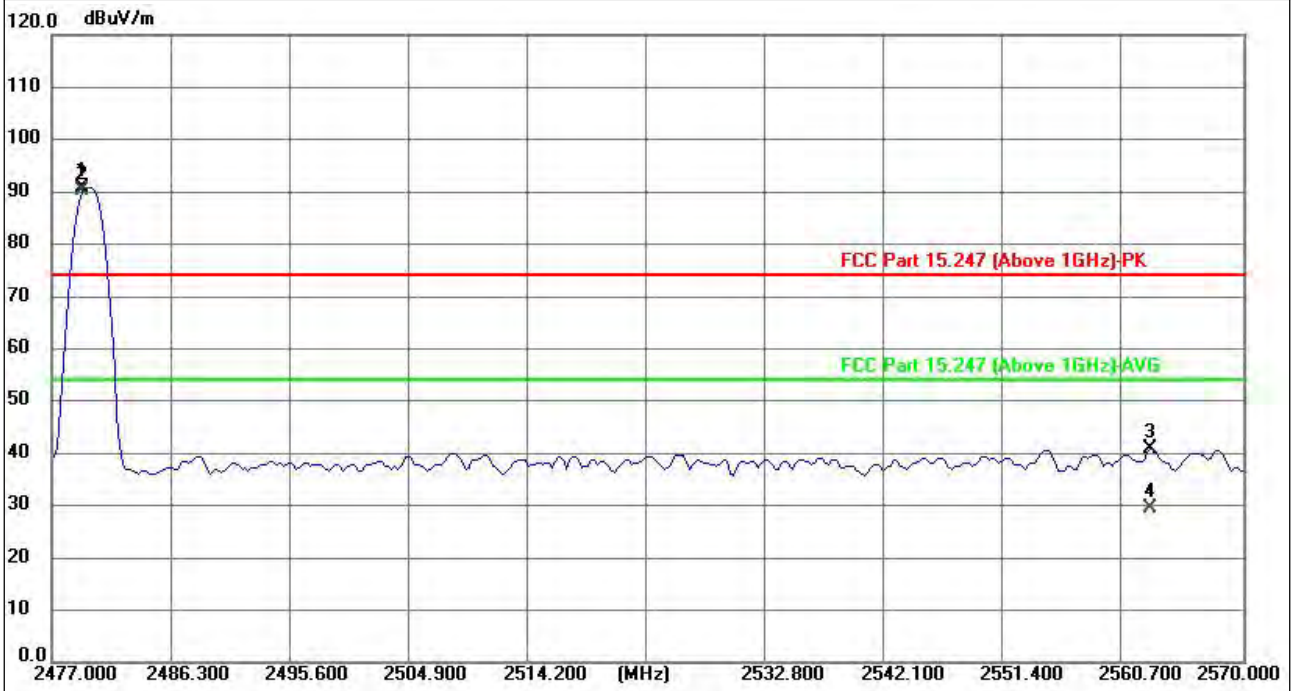
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Height (cm)	Table Angle (Degree)
1#	2480.023	100.05	-0.72	99.33			peak	380	159
2#	2480.023	99.61	-0.72	98.89			AVG	380	159
3	2484.207	42.10	-0.69	41.41	74.00	-32.59	peak	380	159
4	2484.207	33.82	-0.69	33.13	54.00	-20.87	AVG	380	159

Remarks:

1. Emission Level = Read Level + Factor (Antenna Factor + Cable Loss - Preamp Factor)
2. Margin value = Emission level – Limit value
3. #: Fundamental frequency
4. The amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required to be report
5. The harmonic values recorded in the table are from the test results of the low SPAN spectrum.

Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Quasi-peak (QP)
Test Mode	GFSK 1Mbps	Test Channel	Channel 39

Antennal Polarity& Test Distance: Vertical at 3 M



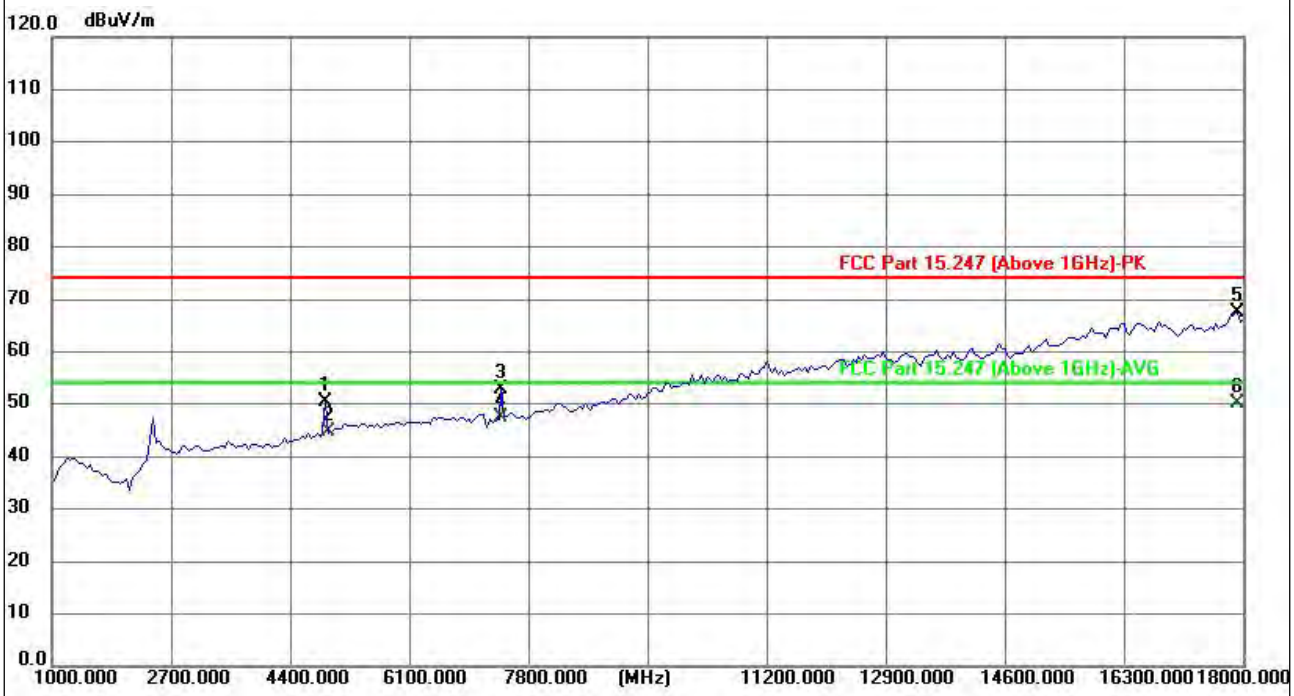
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Height (cm)	Table Angle (Degree)
1#	2479.557	91.52	-0.72	90.80			peak	100	275
2#	2479.557	91.05	-0.72	90.33			AVG	100	275
3	2562.793	41.18	-0.42	40.76	74.00	-33.24	peak	100	275
4	2562.793	29.98	-0.42	29.56	54.00	-24.44	AVG	100	275

Remarks:

1. Emission Level = Read Level + Factor (Antenna Factor + Cable Loss - Preamp Factor)
2. Margin value = Emission level – Limit value
3. #: Fundamental frequency
4. The amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required to be report
5. The harmonic values recorded in the table are from the test results of the low SPAN spectrum.

Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Quasi-peak (QP)
Test Mode	GFSK 1Mbps	Test Channel	Channel 39

Antennal Polarity& Test Distance: Horizontal at 3 M



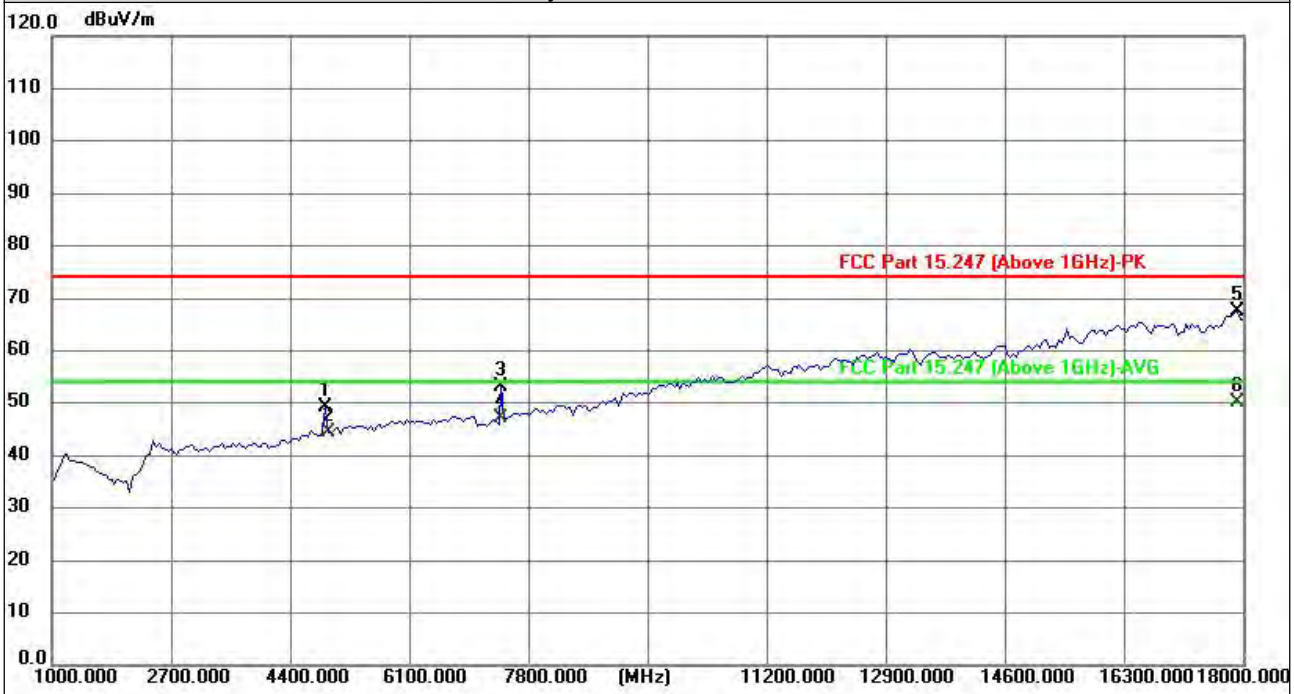
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Height (cm)	Table Angle (Degree)
1	4960.000	45.09	2.82	47.91	74.00	-26.09	peak	101	112
2	4960.000	37.33	2.82	40.15	54.00	-13.85	AVG	101	112
3	7440.000	38.80	10.51	49.31	74.00	-24.69	peak	100	0
4	7440.000	27.59	10.51	38.10	54.00	-15.90	AVG	100	0
5	17915.000	39.74	27.65	67.39	74.00	-6.61	peak	150	0
6	17915.000	22.49	27.65	50.14	54.00	-3.86	AVG	150	0

Remarks:

1. Emission Level = Read Level + Factor (Antenna Factor + Cable Loss - Preamp Factor)
2. Margin value = Emission level – Limit value
3. #: Fundamental frequency
4. The amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required to be report
5. The harmonic values recorded in the table are from the test results of the low SPAN spectrum.

Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Quasi-peak (QP)
Test Mode	GFSK 1Mbps	Test Channel	Channel 39

Antennal Polarity& Test Distance: Vertical at 3 M



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Height (cm)	Table Angle (Degree)
1	4960.000	43.69	2.82	46.51	74.00	-27.49	peak	100	300
2	4960.000	36.36	2.82	39.18	54.00	-14.82	AVG	100	300
3	7440.000	39.51	10.51	50.02	74.00	-23.98	peak	100	127
4	7440.000	28.64	10.51	39.15	54.00	-14.85	AVG	100	127
5	17915.000	39.73	27.65	67.38	74.00	-6.62	peak	150	0
6	17915.000	22.34	27.65	49.99	54.00	-4.01	AVG	150	0

Remarks:

1. Emission Level = Read Level + Factor (Antenna Factor + Cable Loss - Preamp Factor)
2. Margin value = Emission level – Limit value
3. #: Fundamental frequency
4. The amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required to be report
5. The harmonic values recorded in the table are from the test results of the low SPAN spectrum.

3.2 Conducted Emission Measurement

3.2.1 Limits of Conducted Emission Measurement

Frequency (MHz)	Conducted Limit (dBuV)	
	Quasi-Peak	Average
0.15 - 0.5	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30.0	60	50

Note:
1. The lower limit shall apply at the transition frequencies.
2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

3.2.2 Test Instruments

Equipment	Manufacturer	Model No.	Serial No.	Next Cal. Date
EMI Test Receiver (10kHz~7GHz)	Rohde&Schwarz	ESR7	101961	2026-07-23
2 Line V-Network LISN	Rohde&Schwarz	ENV216	3560.6550.15	2026-07-23
Test software	FARAD	EZ_EMC V1.1.4.2	N/A	N/A
Broadcast test system	R&S	SFU	100410	2026-07-23

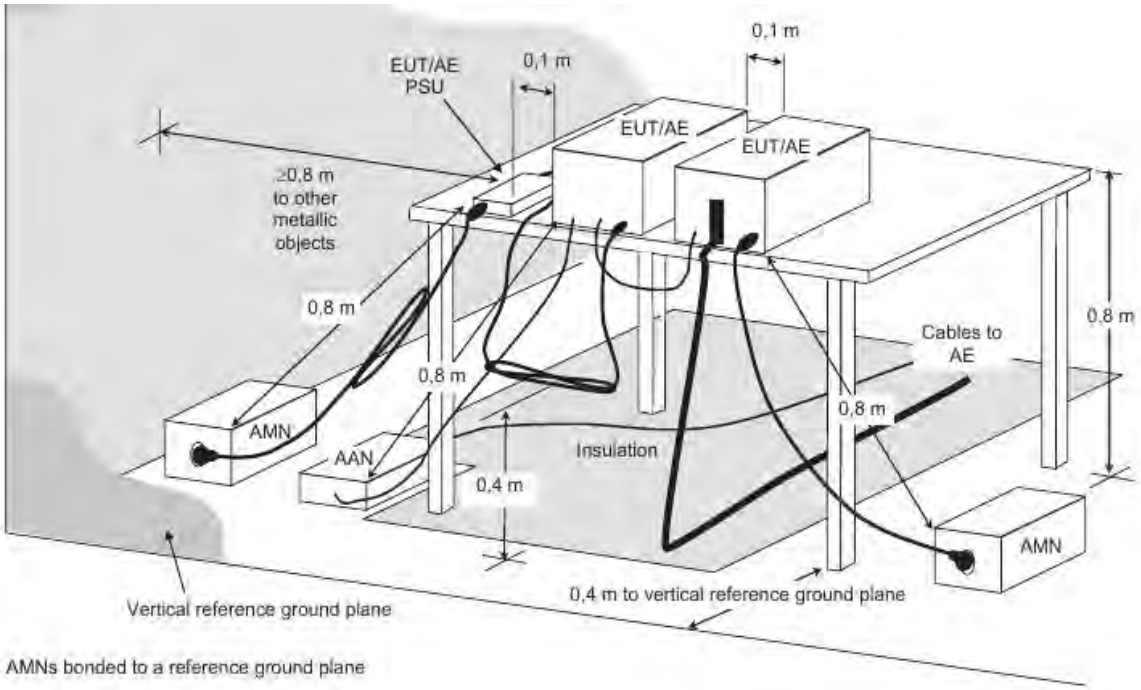
Note:
1. The calibration interval of the above test instruments is 12 months and calibrated by LISAI/CHINA.
2. The test was performed in Shielded Room 743.

3.2.3 Test Procedures

a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.
b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit – 20dB)was not recorded.

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

3.2.4 Test Setup



For the actual test configuration, please refer to the attached file (Test Setup Photo).

3.2.5 EUT Operating Condition

Set the EUT under transmission condition continuously at specific channel frequency.

3.2.6 Deviation from Test Standard

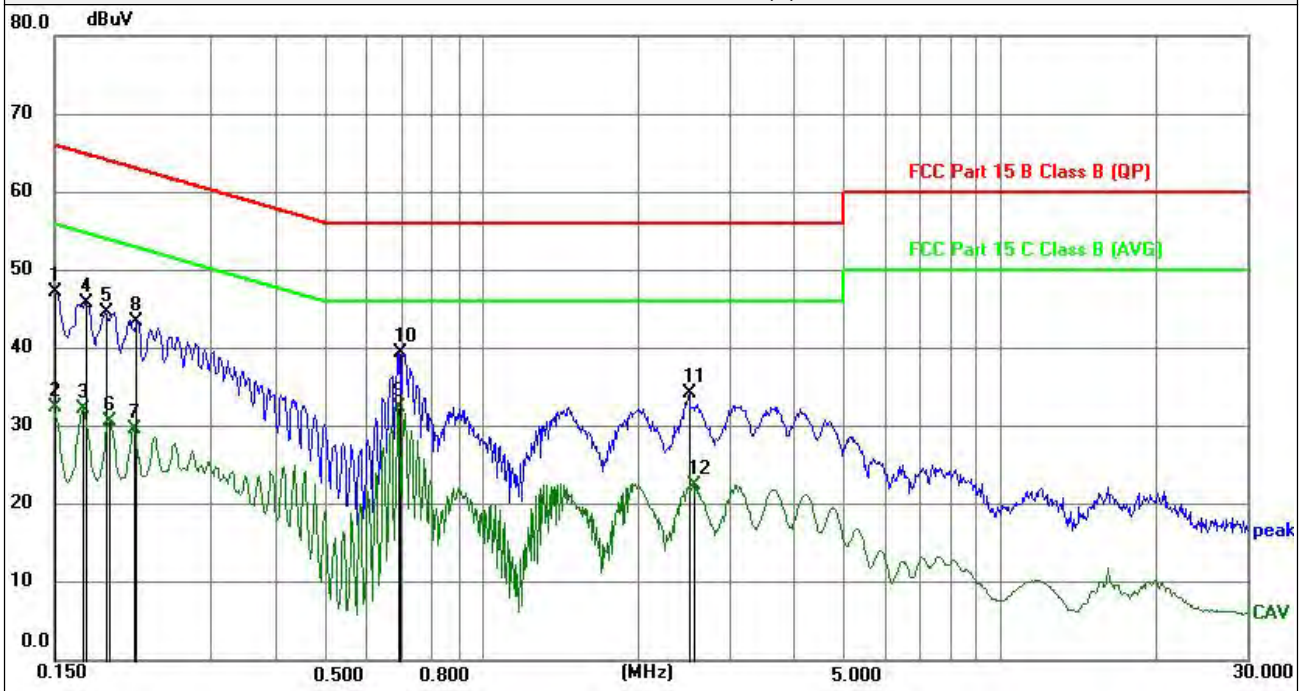
No deviation.

3.2.7 Test Results

Worst-Case Data:

Frequency Range	150kHz ~ 30MHz	Detector Function	Quasi-Peak (QP) / Average (AV), 9kHz
Test Mode	GFSK 1Mbps	Test Channel	Channel 0

Phase of Power: Line (L)



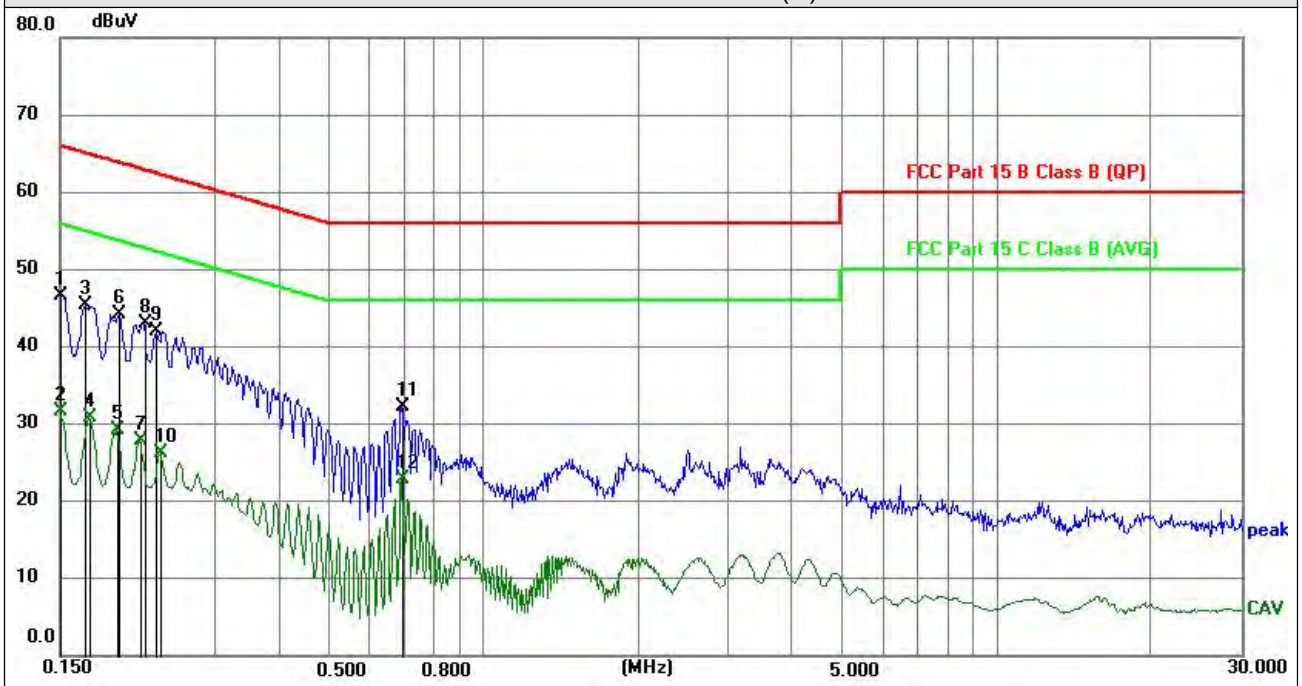
No.	Frequency	Reading	Correct Factor	Emission Level	Limit	Margin	Remark
	(MHz)	(dBuV)	dB	(dBuV)	(dBuV)	(dB)	Det.
1	0.1500	37.04	10.11	47.15	66.00	-18.85	peak
2	0.1500	22.31	10.11	32.42	56.00	-23.58	AVG
3	0.1703	22.21	10.07	32.28	54.95	-22.67	AVG
4	0.1725	35.76	10.07	45.83	64.84	-19.01	peak
5	0.1883	34.57	10.05	44.62	64.11	-19.49	peak
6	0.1905	20.53	10.04	30.57	54.01	-23.44	AVG
7	0.2130	19.64	10.03	29.67	53.09	-23.42	AVG
8	0.2153	33.32	10.03	43.35	63.00	-19.65	peak
9	0.6922	22.40	9.98	32.38	46.00	-13.62	AVG
10	0.6945	29.51	9.98	39.49	56.00	-16.51	peak
11	2.5148	24.43	9.82	34.25	56.00	-21.75	peak
12	2.5553	12.72	9.82	22.54	46.00	-23.46	AVG

Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level - Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value.

Frequency Range	150kHz ~ 30MHz	Detector Function	Quasi-Peak (QP) / Average (AV), 9kHz
Test Mode	GFSK 1Mbps	Test Channel	Channel 0

Phase of Power: Neutral (N)



No.	Frequency	Reading	Correct Factor	Emission Level	Limit	Margin	Remark
	(MHz)	(dBuV)	dB	(dBuV)	(dBuV)	(dB)	Det.
1	0.1500	36.51	10.11	46.62	66.00	-19.38	peak
2	0.1500	21.54	10.11	31.65	56.00	-24.35	AVG
3	0.1680	35.35	10.07	45.42	65.06	-19.64	peak
4	0.1703	20.82	10.07	30.89	54.95	-24.06	AVG
5	0.1928	19.14	10.04	29.18	53.92	-24.74	AVG
6	0.1949	34.11	10.04	44.15	63.83	-19.68	peak
7	0.2130	17.71	10.03	27.74	53.09	-25.35	AVG
8	0.2175	32.91	10.03	42.94	62.91	-19.97	peak
9	0.2310	31.94	10.03	41.97	62.41	-20.44	peak
10	0.2355	16.26	10.03	26.29	52.25	-25.96	AVG
11	0.6945	22.28	9.98	32.26	56.00	-23.74	peak
12	0.6945	12.90	9.98	22.88	46.00	-23.12	AVG

Remarks:

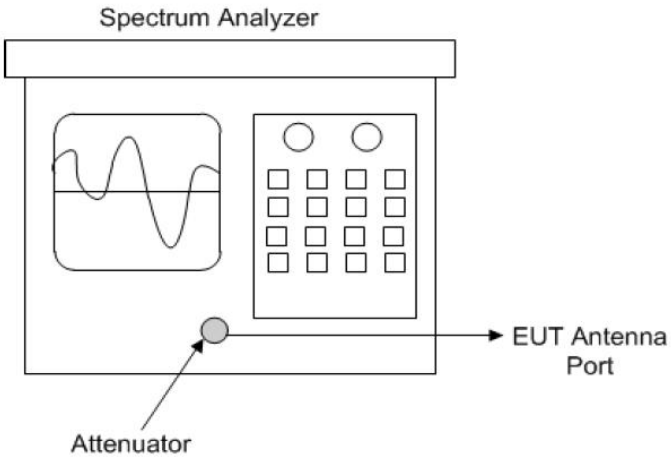
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level - Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value.

3.3 6dB Bandwidth Measurement

3.3.1 Limits of 6dB Bandwidth Measurement

The minimum of 6dB Bandwidth Measurement is 500 kHz(0.5 MHz).

3.3.2 Test Setup



Spectrum analyzer test configuration

3.3.3 Test Instruments

Refer to section 5 to get information of above instrument.

3.3.4 Test Procedure

Option 1:

a. Set resolution bandwidth (RBW) = 100kHz
b. Set the video bandwidth (VBW) ≥ 3 x RBW
c. Detector = Peak.
d. Trace mode = max hold.
e. Sweep = auto couple.
f. Allow the trace to stabilize.
g. Measure the maximum width of the emission that is constrained by the frequencies associated with the two amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission

Option 2:

The automatic bandwidth measurement capability of an instrument may be employed using the dB bandwidth mode with *X* set to 6 dB. if the functionality described in 11.8.1 (i.e. RBW= 100 kHz. VBW ≥ 3*RBW. and peak detector with maximum hold) is implemented by the instrumentation function. When using this capability. care shall be taken so that the bandwidth measurement is not influenced by any intermediate power nulls in the fundamental emission that might be ≥6 dB

3.3.5 Deviation from Test Standard

No deviation.

3.3.6 EUT Operating Conditions

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

3.3.7 Test Result

Test Mode	Antenna	Channel	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
BLE_1M	Ant1	2402	0.700	2401.648	2402.348	0.5	PASS
		2440	0.696	2439.652	2440.348	0.5	PASS
		2480	0.704	2479.636	2480.340	0.5	PASS
BLE_2M	Ant1	2404	1.248	2403.344	2404.592	0.5	PASS
		2440	1.224	2439.344	2440.568	0.5	PASS
		2478	1.256	2477.336	2478.592	0.5	PASS

BLE_1M_Ant1_2402

BLE_1M_Ant1_2440

BLE_1M_Ant1_2480

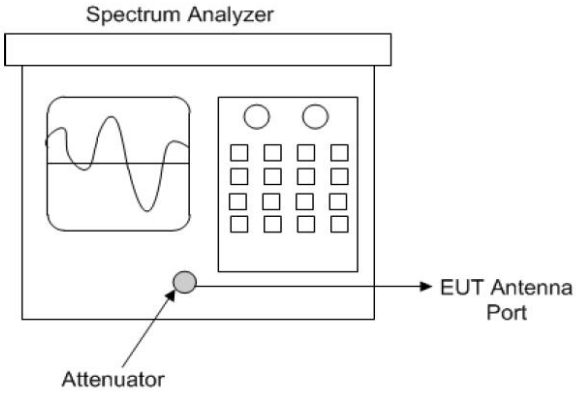
BLE_2M_Ant1_2404

BLE_2M_Ant1_2440

BLE_2M_Ant1_2478

3.4 Occupied Bandwidth Measurement

3.4.1 Test Setup



3.4.2 Test Instruments

Refer to section 5 to get information of above instrument.

3.4.3 Test Procedure

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with resolution bandwidth in the range of 1% to 5% of the anticipated emission bandwidth, and a video bandwidth at least 3x the resolution bandwidth and set the detector to peak. The width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5 %of the total mean power of a given emission.

3.4.4 Deviation from Test Standard

No deviation.

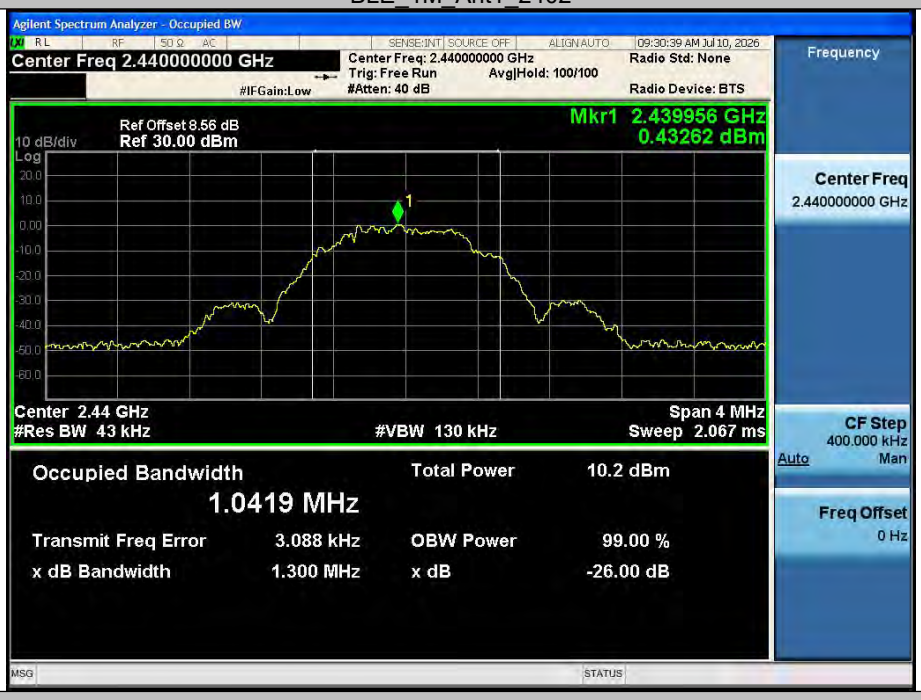
3.4.5 EUT Operating Conditions

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

3.4.6 Test Results

Test Mode	Antenna	Channel	OCB [MHz]	FL[MHz]	FH[MHz]
BLE_1M	Ant1	2402	1.0429	2401.483	2402.526
		2440	1.0419	2439.482	2440.524
		2480	1.0395	2479.485	2480.525
BLE_2M	Ant1	2404	2.0742	2402.975	2405.049
		2440	2.0837	2438.968	2441.051
		2478	2.0825	2476.972	2479.055

BLE_1M_Ant1_2402

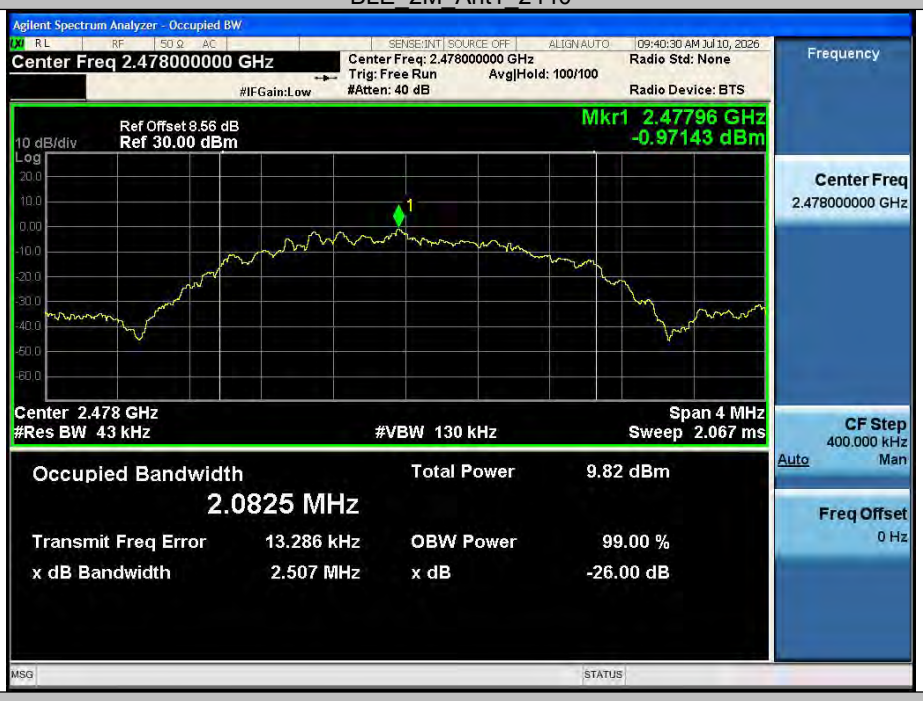


BLE_1M_Ant1_2440

BLE_1M_Ant1_2480

BLE_2M_Ant1_2404

BLE_2M_Ant1_2440



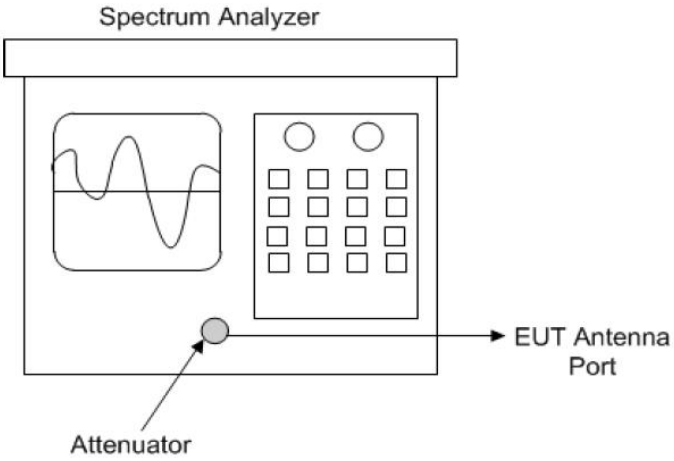
BLE_2M_Ant1_2478

3.5 Conducted Output Power Measurement

3.5.1 Limits of Conducted Output Power Measurement

For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt(30dBm).

3.5.2 Test Setup



Spectrum analyzer output power test configuration

3.5.3 Test Instruments

Refer to section 5 to get information of above instrument.

3.5.4 Test Procedures

Measurement using a spectrum analyzer (SA)，Selection of test method：

The proper test method is selected based on the following criteria:

a) **Method AVGSA-1 or method AVGSA-1A (alternative)** shall be applied if either of the following conditions can be satisfied:
   1) The EUT transmits continuously (or with a D> 98%).
   2) Sweep triggering can be implemented in such a way that the device transmits at the maximum power control level throughout the duration of each of the instrument sweeps to be averaged. This condition can generally be achieved by triggering the instrument's sweep if the duration of the sweep (with the instrument configured as in method AVGSA-1) is equal to or shorter than the duration T of each transmission from the EUT, and if those transmissions exhibit full power throughout their durations.
b) **Method AVGSA-2 or method AVGSA-2A (alternative)** shall be applied if the conditions of the preceding item a) cannot be achieved and the transmissions exhibit a constant duty cycle during the measurement duration. Duty cycle will be considered to be constant if variations are less than +2%.
c) **Method AVGSA-3 or method AVGSA-3A** (alternative) shall be applied if the conditions of the preceding item a) and item b) cannot be achieved.

☒ Measurement using a spectrum analyzer (SA)，Selection of test method：

☒ Maximum peak conducted output power

The following procedure shall be used when an instrument with a resolution bandwidth that is greater than the DTS bandwidth is available to perform the measurement:

a) Set the RBW > DTS bandwidth.

b) Set VBW> [3 x RBW]

c) Set span > [3 x RBW]

d) Sweep time = auto couple.

e) Detector = peak

f) Trace mode = max hold.

g) Allow trace to fully stabilize.

h) Use peak marker function to determine the peak amplitude level.

☒ Maximum conducted (average) output power (Method AVGSA-2):

a) Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
b) Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
c) SA Setting:
1* Set span to at least 1.5 times the OBW
2* Set sweep trigger to "free run."
3* Set RBW= 1% to 5% of the OBW. not to exceed 1MHz.
4* Set VBW ≥ 3 x RBW
5* Number of points in sweep≥ 2 x span /RBW. (This gives bin-to-bin spacing ≤ RBW / 2. so that narrowband signals are not lost between frequency bins).
6* Sweep time ≤ (number of points in sweep) x T. where T is defined in 11.6. If this gives a sweep time less than the auto sweep time of the instrument. then method AVGSA-3 shall not be used (use AVGSA-3A). The purpose of this step is so that the averaging time in each bin is less than or equal to the minimum time of a transmission.
7* Detector =RMS (power averaging).
8* Trace mode =max hold.
9* Allow max hold to run for at least 60 s or longer as needed to allow the trace to stabilize.
10* Compute power by integrating the spectrum across the OBW of the signal using the instrument's band power measurement function with band limits set equal to the OBW band edges. If the instrument does not have a band power function. then sum the spectrum levels (in power units) at intervals equal to the RBW extending across the entire OBW
d. Measure the captured power within the band and recording the plot.
e. Repeat above procedures until all frequencies required were complete.

3.5.5 Deviation from Test Standard

No deviation.

3.5.6 EUT Operating Conditions

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

3.5.7 Test Results

Right headphone:

Test Mode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	2402	4.35	≤30	PASS
		2440	4.07	≤30	PASS
		2480	4.39	≤30	PASS
BLE_2M	Ant1	2404	4.25	≤30	PASS
		2440	4.00	≤30	PASS
		2478	4.26	≤30	PASS

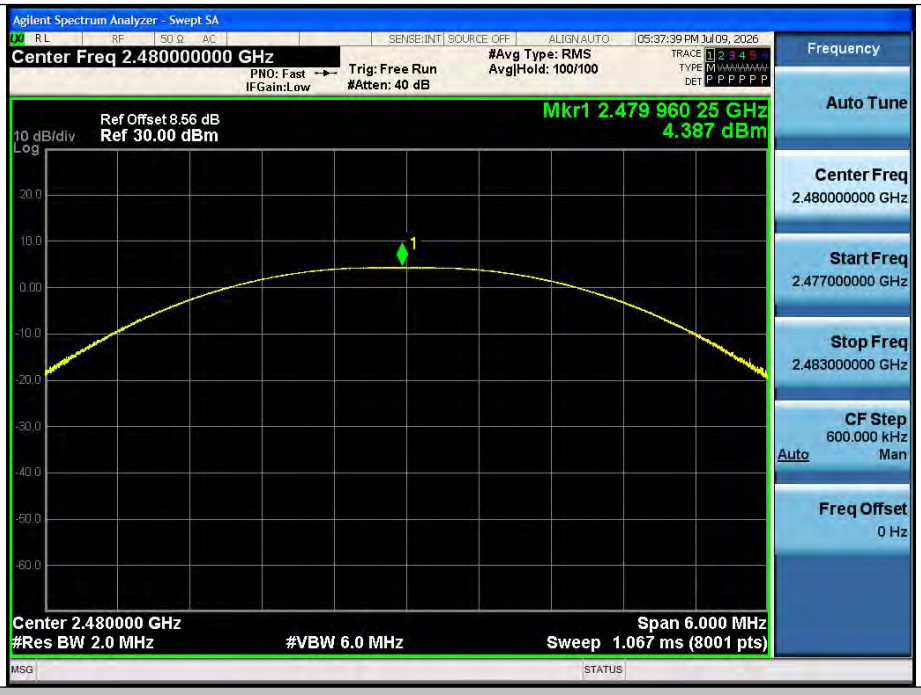
Left headphone:

Test Mode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	2402	4.19	≤30	PASS
		2440	3.92	≤30	PASS
		2480	4.38	≤30	PASS
BLE_2M	Ant1	2404	4.08	≤30	PASS
		2440	3.90	≤30	PASS
		2478	4.28	≤30	PASS

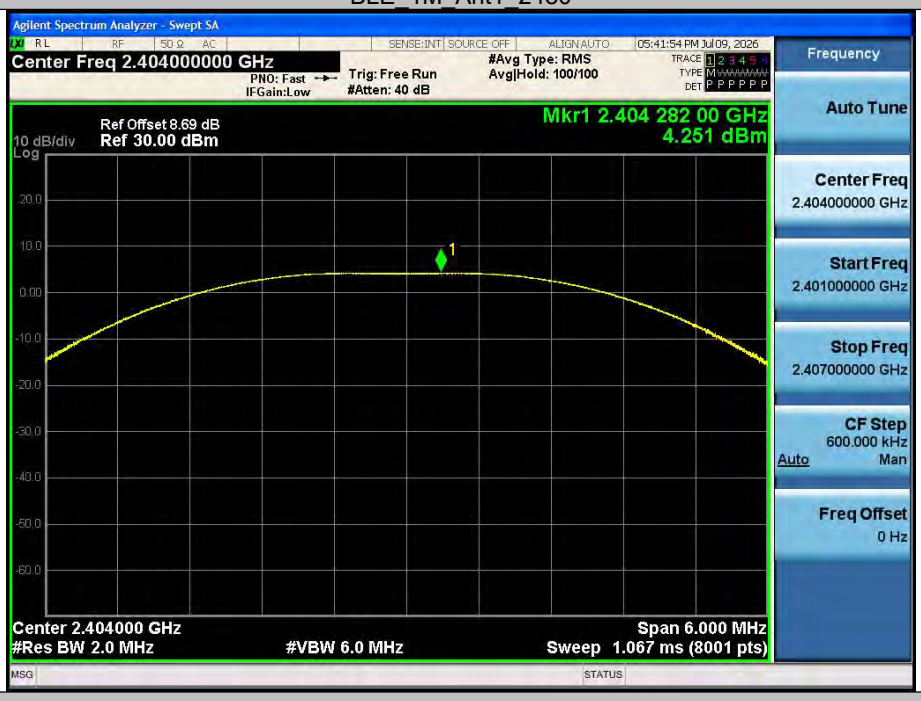
Right headphone:

BLE_1M_Ant1_2402

BLE_1M_Ant1_2440



BLE_1M_Ant1_2480



BLE_2M_Ant1_2404

BLE_2M_Ant1_2440

BLE_2M_Ant1_2478

Left headphone:

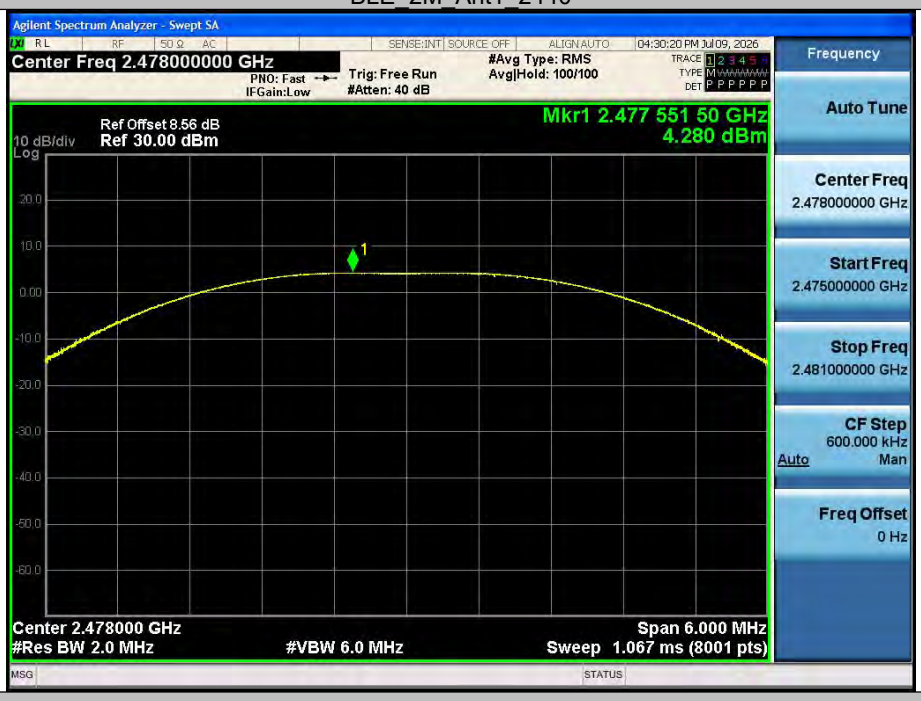
BLE_1M_Ant1_2402

BLE_1M_Ant1_2440

BLE_1M_Ant1_2480

BLE_2M_Ant1_2404

BLE_2M_Ant1_2440



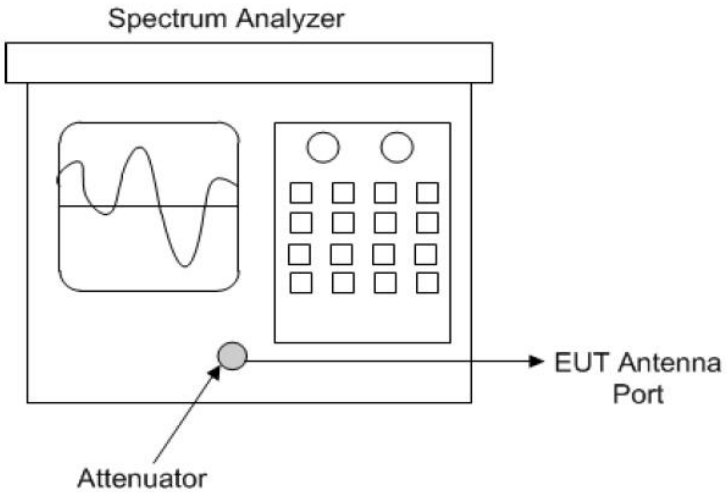
BLE_2M_Ant1_2478

3.6 Power Spectral Density Measurement

3.6.1 Limits of Power Spectral Density Measurement

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

3.6.2 Test Setup



Spectrum analyzer test configuration

3.6.3 Test Instruments

Refer to section 5 to get information of above instrument.

3.6.4 Test Procedure

a. **Method AVGPSD-1 or method AVGPSD-1A (alternative)** shall be applied if either of the following conditions can be satisfied:
   1) The EUT transmits continuously (or with a D ≥98%).
   2) Sweep triggering can be implemented in such a way that the device transmits at the maximum power control level throughout the duration of each of the instrument sweeps to be averaged. This condition can generally be achieved by triggering the instrument's sweep if the duration of the sweep is equal to or shorter than the duration I of each transmission from the EUT, and if those transmissions exhibit full power throughout these durations.

b. **Method AVGPSD-2 or method AVGPSD-2A (alternative)** shall be applied if the conditions of the preceding item a) cannot be achieved. and the transmissions exhibit a constant duty cycle during the measurement duration. Duty cycle will be considered to be constant if variations are less than ±2%.

c. **Method AVGPSD-3 or method AVGPSD-3A (alternative)** shall be applied if the conditions of the preceding paragraphs a) and b) cannot be achieved.

Method AVGPSD-3:

Method AVGPSD-3 uses mms detection across ON and OFE times of the EUT with max hold. The following procedure is applicable when the EUT cannot be configured to transmit continuously (i.e. D<98%), when sweep triggering/signal gating cannot be used to measure only when the EUT is transmitting at its maximum power control level. and when the transmission duty cycle is not constant (i.e., duty cycle variations exceed ±2%).

SA Setting:

a. Set the instrument span to a minimum of 1.5 times the OBW.
b. Set sweep trigger to "free run."
c. Set the RBW = 3 kHz, VBW =10 kHz,
d. Detector = RMS (power averaging).
e. Sweep time = Auto couple,
f. Allow max hold to run for at least 60 s or longer as needed to allow the trace to stabilize.
g. Use the peak marker function to determine the maximum PSD level

- If the measured value exceeds requirement, then reduce RBW (but no less than 3 kHz) and repeat (note that this may require zooming in on the emission of interest and reducing the span to meet the minimum measurement point requirement as the RBW is reduced).

3.6.5 Deviation from Test Standard

No deviation.

3.6.6 EUT Operating Condition

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

3.6.7 Test Results

Test Mode	Antenna	Channel	Result[dBm/3kHz]	Limit[dBm/3kHz]	Verdict
BLE_1M	Ant1	2402	-11.1	≤8.00	PASS
		2440	-11.39	≤8.00	PASS
		2480	-10.93	≤8.00	PASS
BLE_2M	Ant1	2404	-13.35	≤8.00	PASS
		2440	-13.55	≤8.00	PASS
		2478	-13.23	≤8.00	PASS

BLE_1M_Ant1_2402

BLE_1M_Ant1_2440

BLE_1M_Ant1_2480

BLE_2M_Ant1_2404

BLE_2M_Ant1_2440

BLE_2M_Ant1_2478

3.7 Conducted Out of Band Emission Measurement

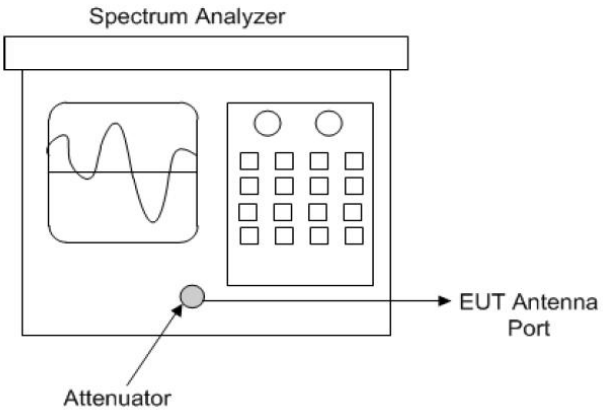
3.7.1 Limits of Conducted Out of Band Emission Measurement

a. **If the maximum peak conducted output power procedure was used to determine compliance as described in 11.9.1**, then the peak output power measured in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz (i.e., 20 dBc).

b. **If maximum conducted (average) output power was used to determine compliance as described in 11.9.2**. then the peak power in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 30 dB relative to the maximum in-band peak PSD level in 100 kHz (i.e., 30 dBc).

3.7.2 Test Setup

- DTS emissions in non-restricted frequency bands of ANSI C63.10 is applicable.
- DTS emissions in restricted frequency bands of ANSI C63.10 is applicable.



Spectrum analyzer test configuration

3.7.3 Test Instruments

Refer to section 5 to get information of above instrument.

3.7.4 Test Procedure

a. Establish a reference level by using the following procedure:

1) Set instrument center frequency to DTS channel center frequency.
2) Set the span to 21.5 times the DTS bandwidth)
3) Set the RBW= 100 kHz)
4) Set the VBW ≥3 x RBW
5) Detector = peak
6) Sweep time = auto coupling
7) Trace mode =max hold
8) Allow trace to fully stabilize
9) Use the peak marker function to determine the maximum PSD level.

Note that the channel found to contain the maximum PSD level can be used to establish the reference level.

b. Establish an emission level by using the following procedure:

1) Set the center frequency and span to encompass frequency range to be measured.
2) Set the RBW = 100 kHz
3) Set the VBW ≥ 300 kHz.
4) Detector = peak.
5) Sweep time = auto couple.
6) Trace mode = max hold.
7) Allow trace to fully stabilize.
8) Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.

3.7.5 Deviation from Test Standard

No deviation.

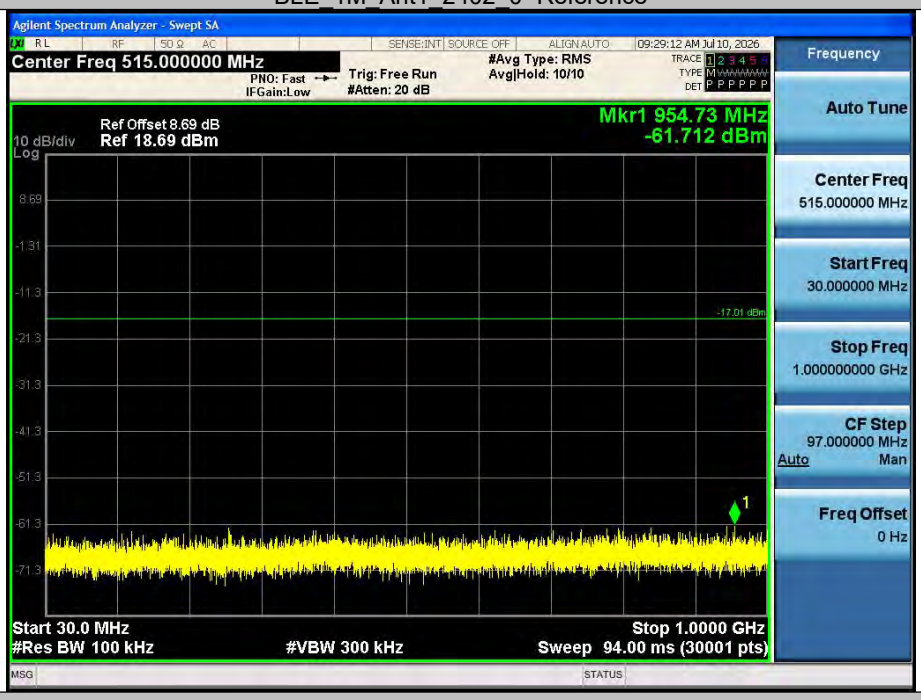
3.7.6 EUT Operating Condition

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

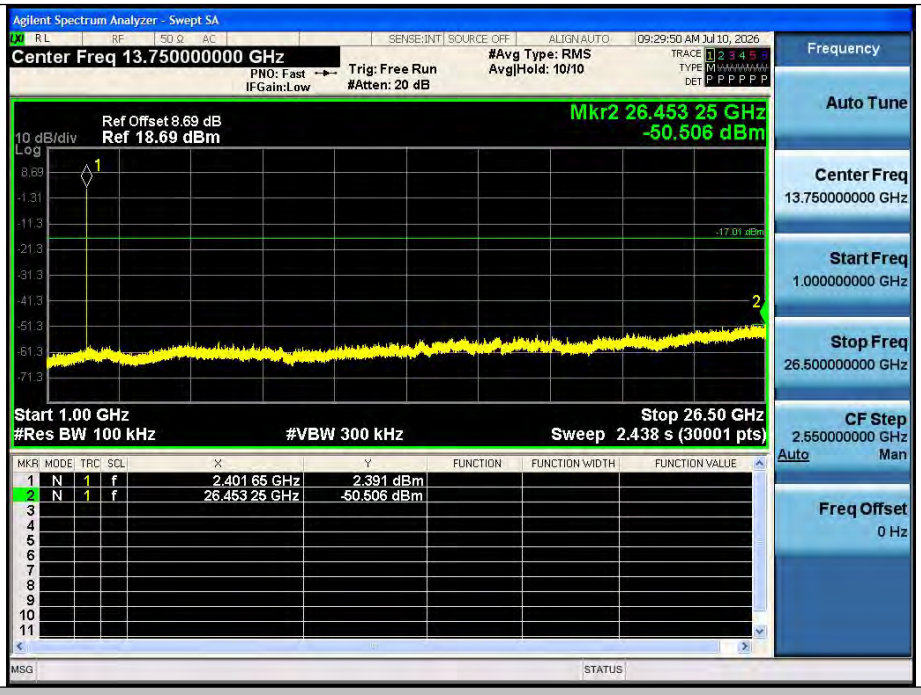
3.7.7 Test results

The spectrum plots are attached on the following images. Mkr1 of 0~Reference indicates the highest level, Mkr1 of 30~1000 and 1000~26500 indicates the 20dB offset below highest level. It shows compliance with the requirement.

BLE_1M_Ant1_2402_0~Reference

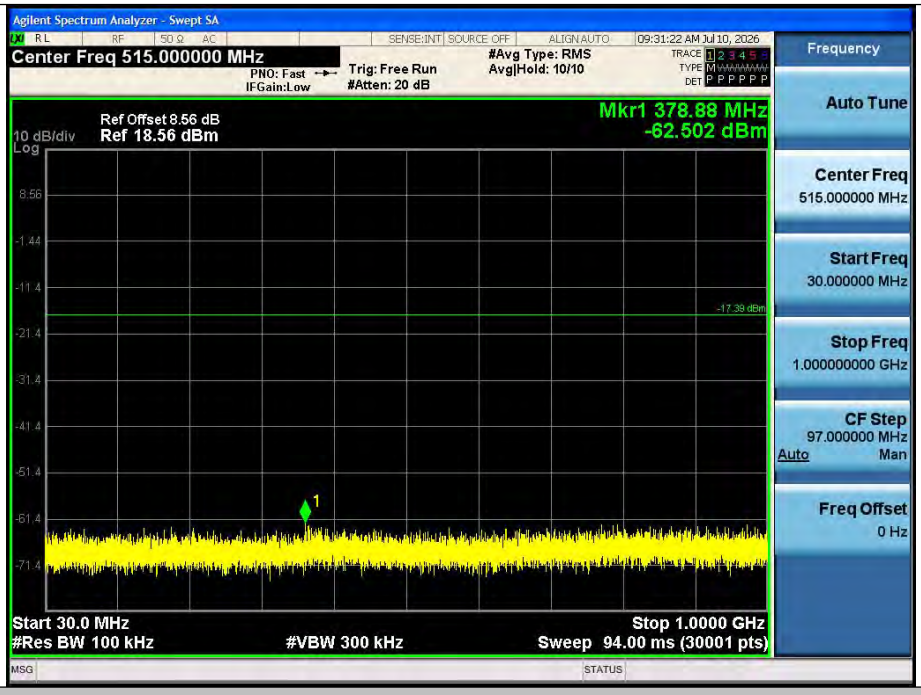


BLE_1M_Ant1_2402_30~1000

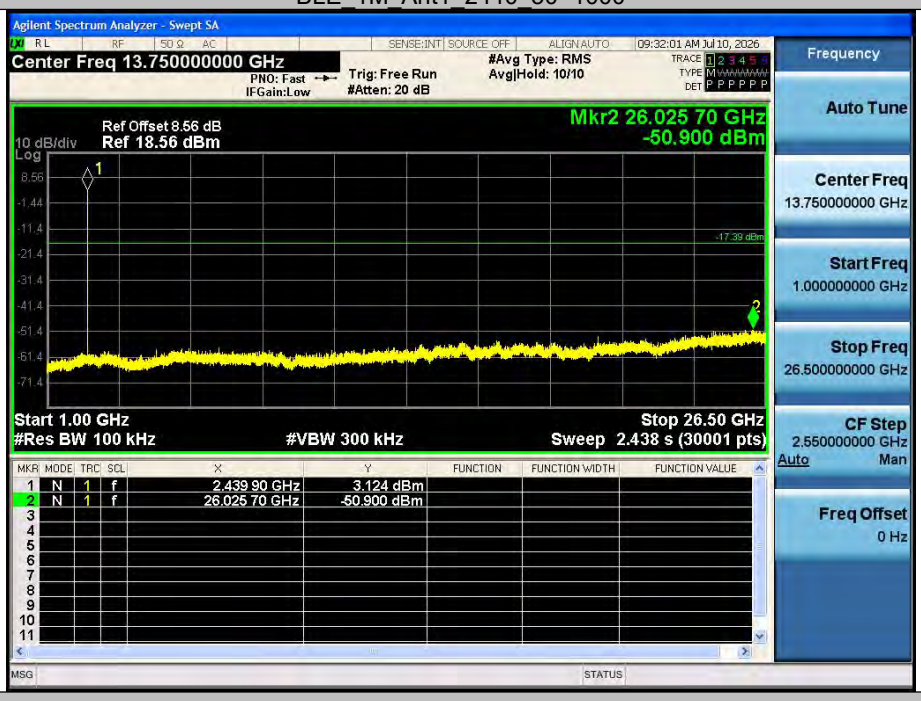


BLE_1M_Ant1_2402_1000~26500

BLE_1M_Ant1_2440_0~Reference

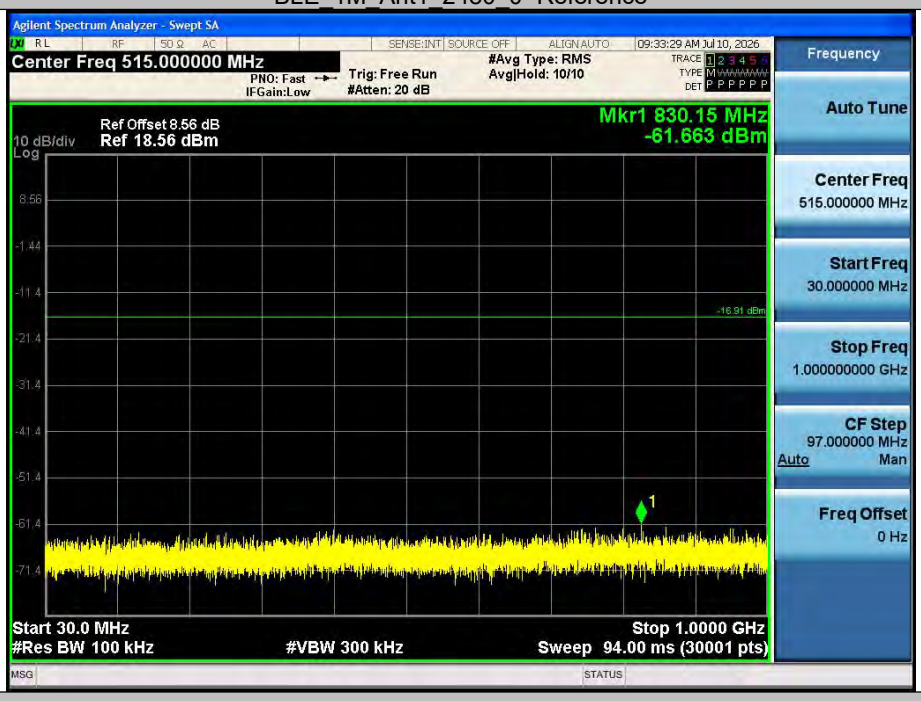


BLE_1M_Ant1_2440_30~1000

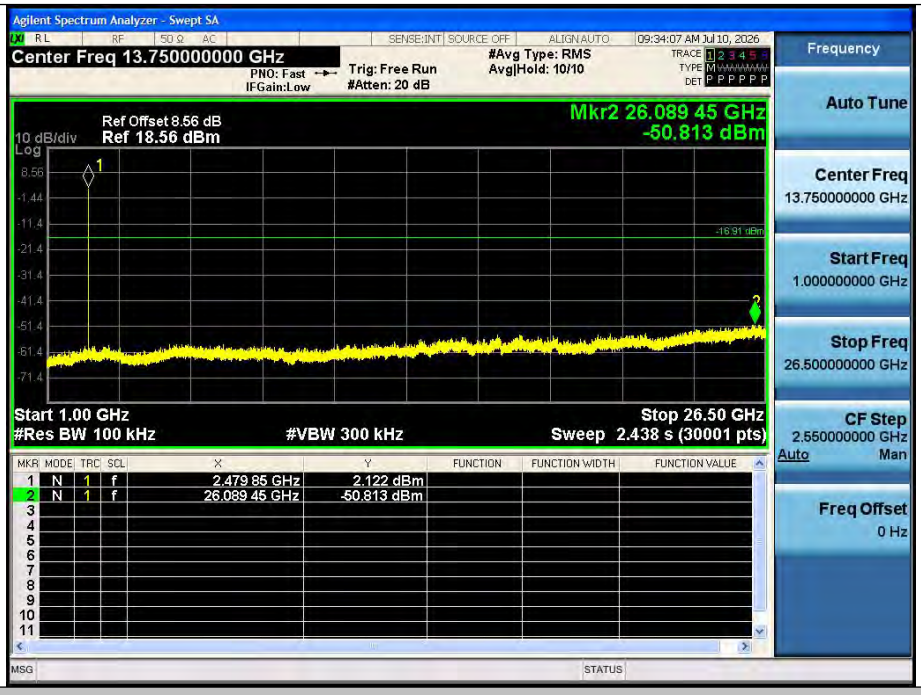


BLE_1M_Ant1_2440_1000~26500

BLE_1M_Ant1_2480_0~Reference

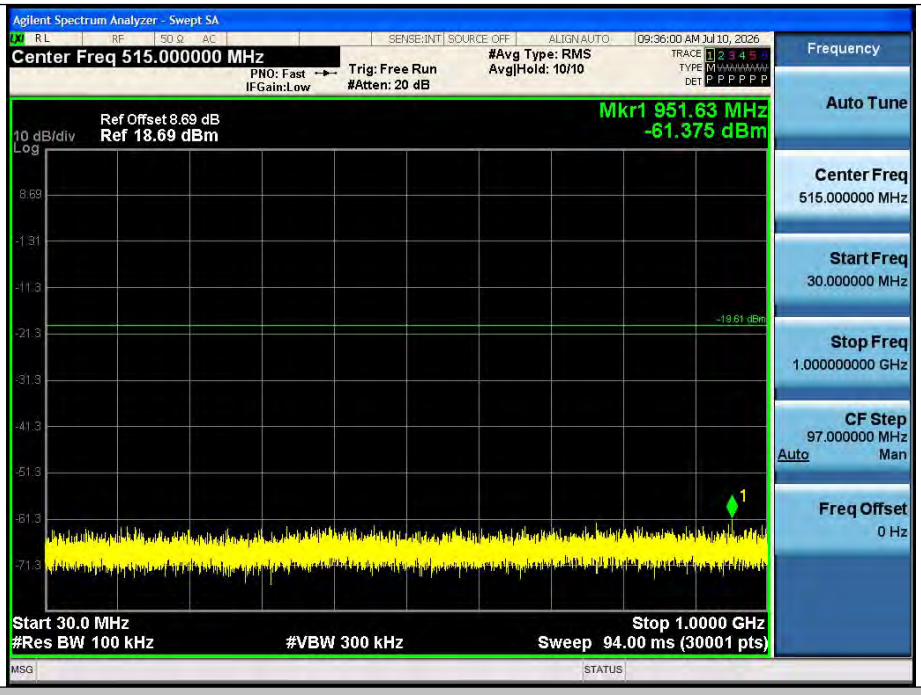


BLE_1M_Ant1_2480_30~1000

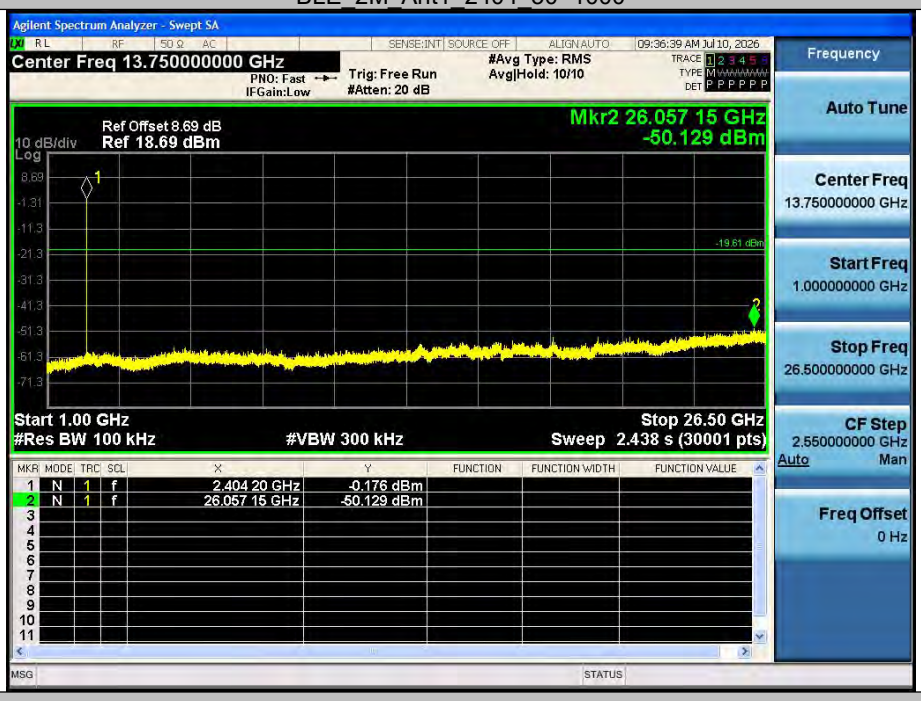


BLE_1M_Ant1_2480_1000~26500

BLE_2M_Ant1_2404_0~Reference

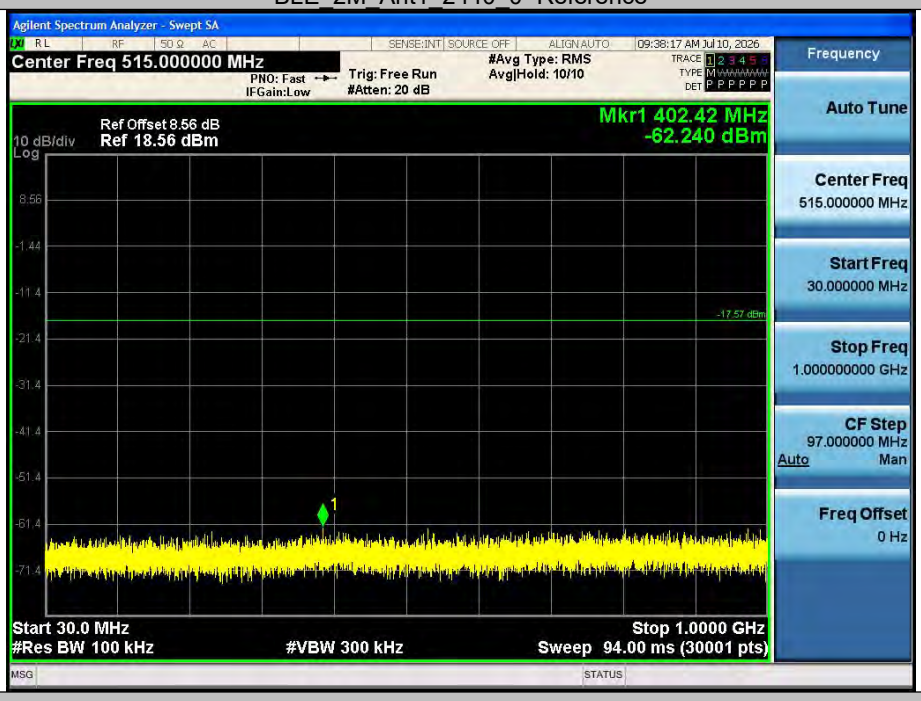


BLE_2M_Ant1_2404_30~1000

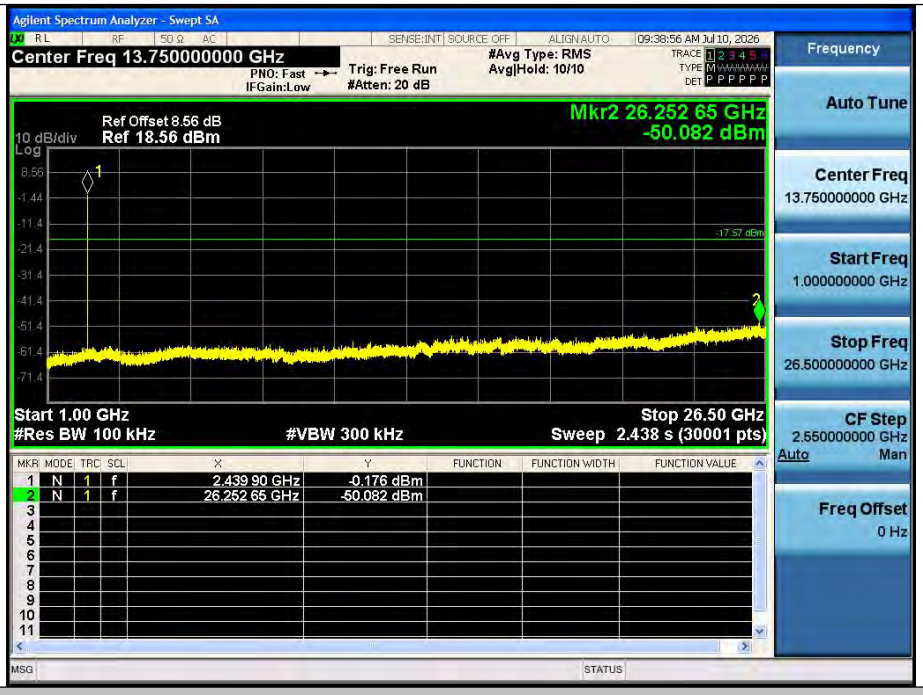


BLE_2M_Ant1_2404_1000~26500

BLE_2M_Ant1_2440_0~Reference

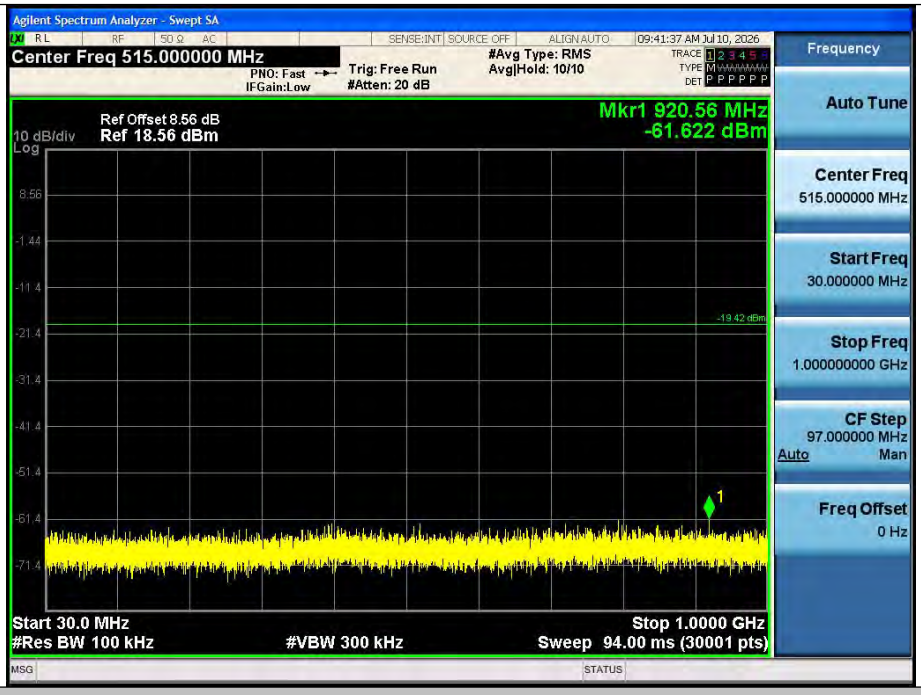


BLE_2M_Ant1_2440_30~1000

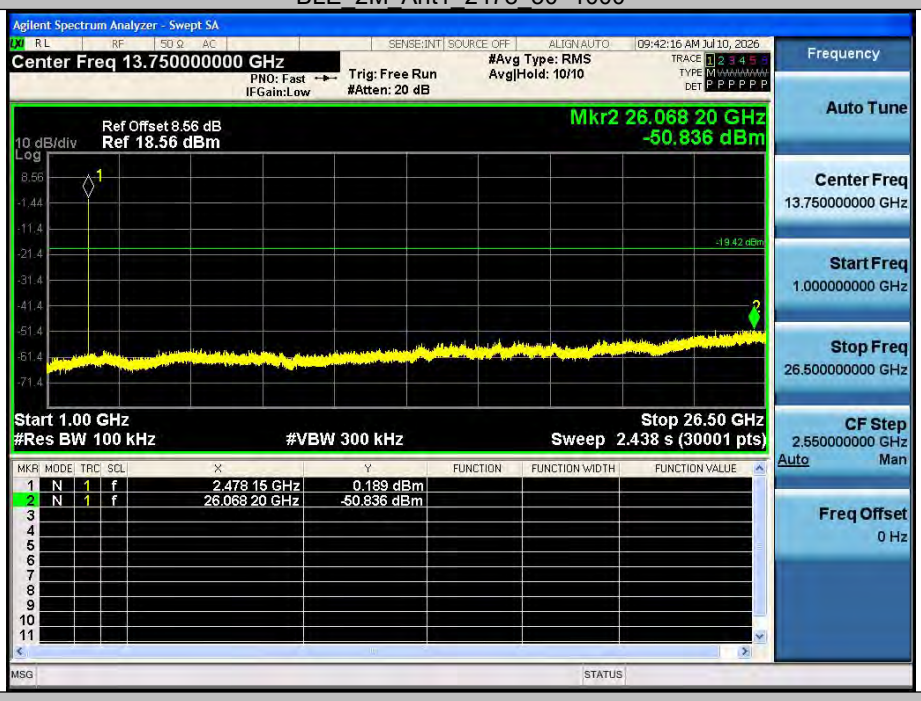


BLE_2M_Ant1_2440_1000~26500

BLE_2M_Ant1_2478_0~Reference

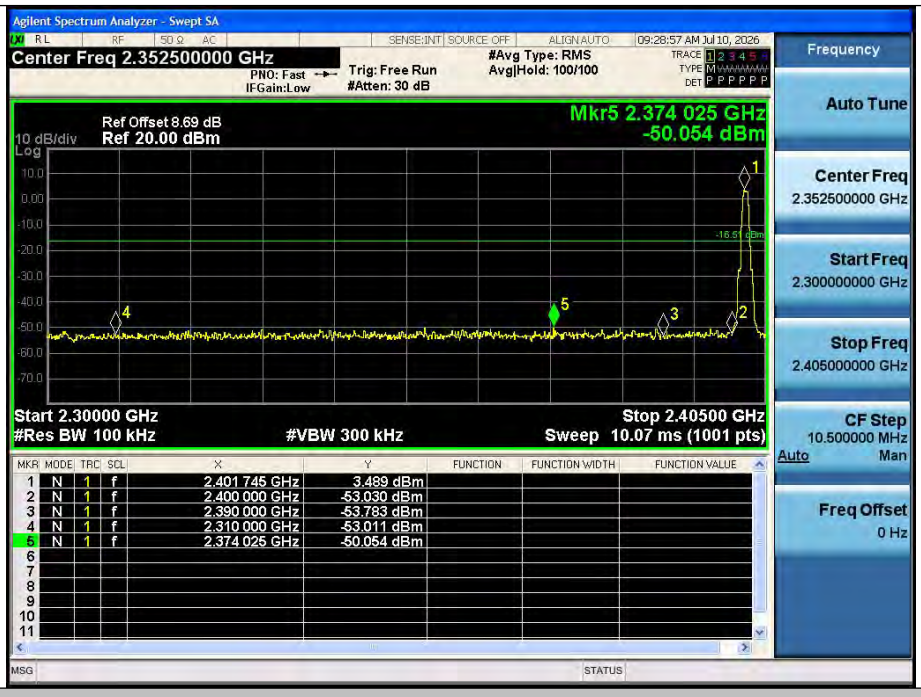


BLE_2M_Ant1_2478_30~1000

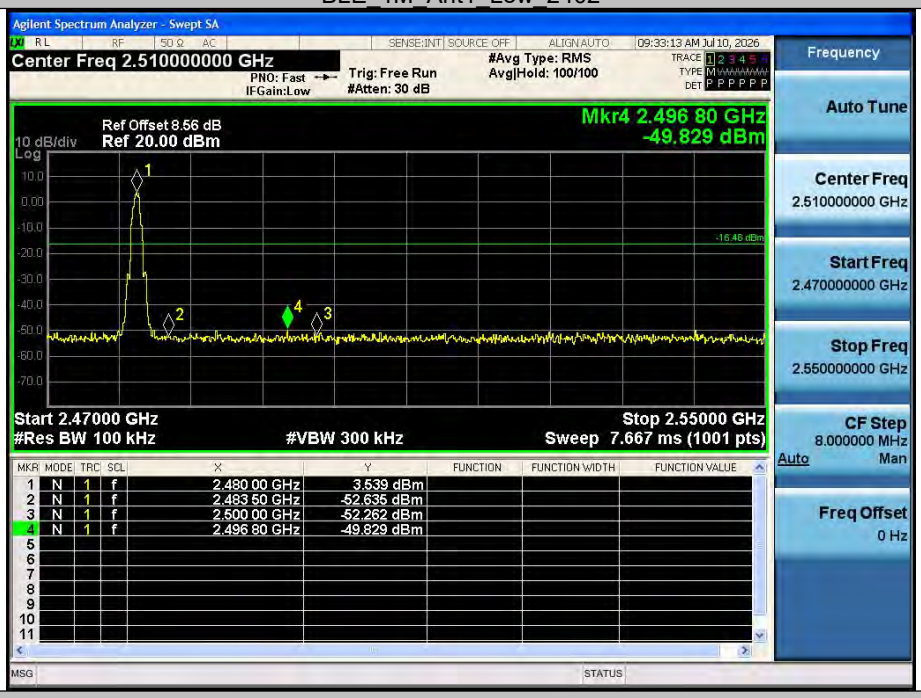


BLE_2M_Ant1_2478_1000~26500

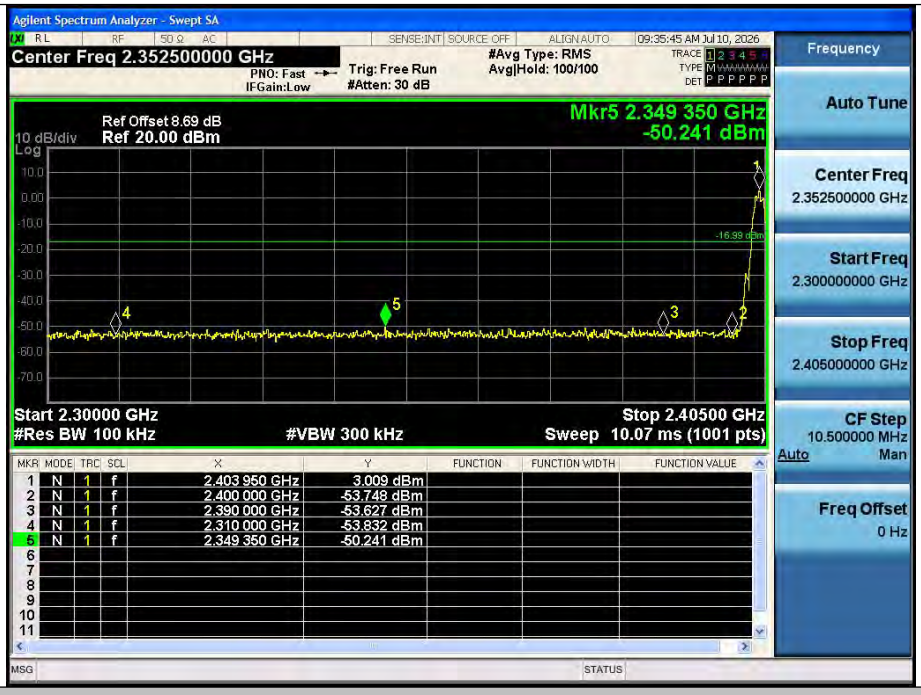
Mkr1 indicates the highest level, other indicates the 20dB offset below highest level. It shows compliance with the requirement.



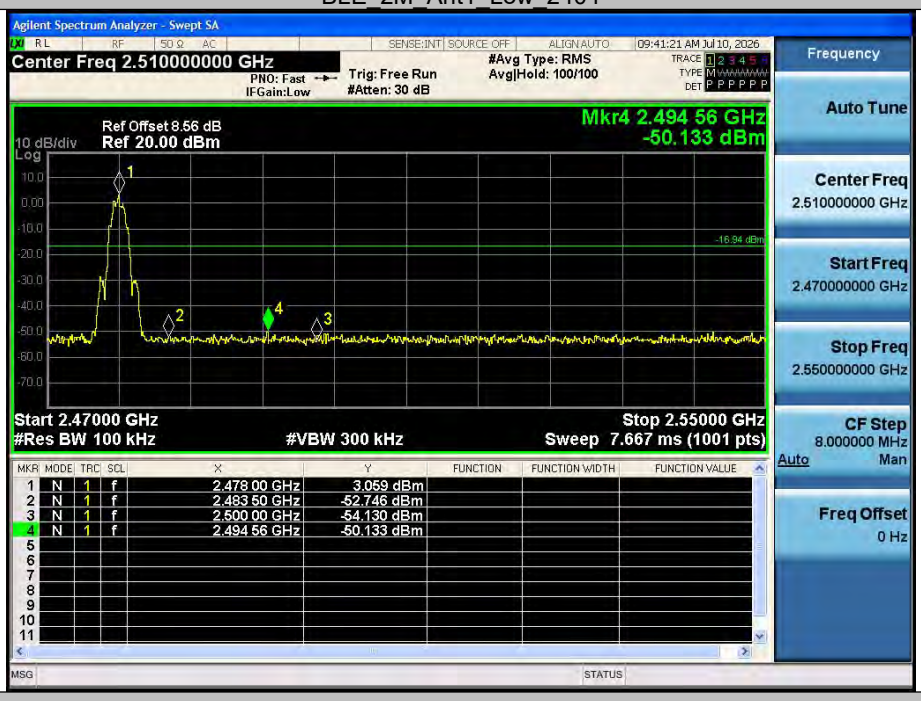
BLE_1M_Ant1_Low_2402



BLE_1M_Ant1_High_2480



BLE_2M_Ant1_Low_2404



BLE_2M_Ant1_High_2478

3.8 Antenna Application

3.8.1 Antenna Requirement

Standard	Requirement
FCC CFR Part 15.203	An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

3.8.2 Test Results

☑	Antenna use a permanently attached antenna which is not replaceable.
☐	Not using a standard antenna jack or electrical connector for antenna replacement
☐	The antenna has to be professionally installed (please provide method of installation)

Please refer to the attached document Internal Photos to show the antenna.

4. Pictures of Test Arrangements

Please refer to the attached file (Test Setup Photo).

5. Test Instruments

Equipment	Manufacturer	Model No.	Serial No.	Next Cal. Date
Spectrum	Keysight	N9020A	MY51240612	2026-07-23
Power Meter 10Hz~18GHz	Tonscend	JS0806-2	188060126	2026-07-23
Spectrum Analyzer	Rohde&Schwarz	FSV-40N	101783	2026-07-23
Signal generator	Agilent	E4421B	GB40051020	2027-05-22
Universal Switch Control Unit	Rohde&Schwarz	CMW500	12010002k50	2026-07-23
Humidity tester	Jingchuang	GSP-8A	CMA22B000592	2026-07-28
Test Software	Tonscend	JS0806-2	188060126	2026-07-23

Note:
1. The calibration interval of the above test instruments is 12 months.
2. The test was performed in RF Chamber.

Appendix – Information on The Testing Laboratories

We, Hwa-Hsing (Dongguan) Testing Co., Ltd., A global provider of TESTING and CERTIFICATION services for consumer products, electronic products and wireless information technology products. Adhering to the core values "HONEST and TRUSTWORTHY, OBJECTIVE and IMPARTIALITY, RIGOROUS and AFFICIENT", commitment to provide professional, perfect and efficient comprehensive ONE-STOP solution of TESTING and CERTIFICATION services for Manufacturers, Buyers, Traders, Brands, Retailers. Assist client to better manage risk, protect their brands, reduce costs and cut time to over 150 markets in global. Our laboratories are FCC recognized accredited test firms and accredited and approved according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

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