FCC TEST REPORT

(Part 15, Subpart C)

Applicant:	Ingenious Technology LLC
Address:	111 Deerwood Road, Suite 200, San Ramon, Ca, 94583

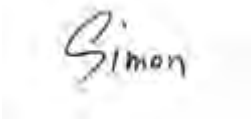
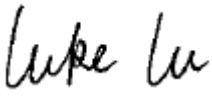
Manufacturer or Supplier:	Shenzhen Hoverstar Innovations Technology Co.,Ltd.
Address:	5F ,block B,Aerospace Micro-motor Building,No. 25 North 2nd Road of Science and technology,Nanshan
Product:	Osprey Electronics Hotspot G1
Brand Name:	Osprey Electronics
Model Name:	Hotspot G1
FCC ID:	2A3TX-HG1V1
Date of tests:	Dec. 01, 2021 ~ Mar. 01, 2022

The tests have been carried out according to the requirements of the following standard:

☒ **FCC Part 15, Subpart C, Section 15.247**

☒ **ANSI C63.10-2013**

CONCLUSION: The submitted sample was found to COMPLY with the test requirement

Prepared by Simon Wang	Approved by Luke Lu
Engineer / Mobile Department	Manager / Mobile Department
	
Date: Mar. 01, 2022	Date: Mar. 01, 2022

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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
W7L-P21120015RF03	Original release	Mar. 01, 2022

1 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC PART 15, SUBPART C (SECTION 15.247)		
STANDARD SECTION	**TEST TYPE AND LIMIT**	**RESULT**
15.207	AC Power Conducted Emission	Compliance
15.205 15.209	Radiated Emissions	Compliance
15.247(d)	Out of band Emission Measurement	Compliance
15.247(a)(2)	6dB bandwidth	Compliance
15.247(b)	Conducted Output power	Compliance
15.247(e)	Power Spectral Density	Compliance
15.203	Antenna Requirement	Compliance

Note：Except RSE，other data please refer to Appendix .

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:

MEASUREMENT	UNCERTAINTY
AC Power Conducted emissions	±2.70dB
Radiated emissions (30MHz~1GMHz)	±4.98dB
Radiated emissions (1GMHz ~6GMHz)	±4.70dB
Radiated emissions (6GMHz ~18GMHz)	±4.60dB
Radiated emissions (18GMHz ~40GMHz)	±4.12dB
Conducted emissions	±4.01dB
Occupied Channel Bandwidth	±43.58KHz
Conducted Output power	±2.06dB
Power Spectral Density	±0.85 dB

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

2 GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

PRODUCT	Osprey Electronics Hotspot G1
BRAND NAME	Osprey Electronics
MODEL NAME	Hotspot G1
NOMINAL VOLTAGE	5.0Vdc(adapter or host equipment)
MODULATION	DSSS, OFDM, GFSK
TRANSMISSION RATE	802.11b: 11/ 5.5/ 2.0 / 1.0 Mbps 802.11g: 54/ 48/ 36 / 24 / 18 / 9/ 6 Mbps BT_LE: 1 Mbps
OPERATING FREQUENCY	2412-2462MHz for 11b/g 2402-2480MHz for BT-LE(GFSK)
MAX. OUTPUT POWER	WLAN: 263.63mW (Maximum) BT-LE: 1.61mW (Maximum)
ANTENNA TYPE	PCB Antenna with -3.5dBi gain for WIFI/BT-LE
HW VERSION	G1
SW VERSION	G1
I/O PORTS	Refer to user's manual
CABLE SUPPLIED	USB cable : unshielded without ferrite, 0.3 meter

NOTE:

1. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.

2. The EUT incorporates a SISO function. Physically, the EUT provides one transmitter and one receiver.

MODULATION MODE	TX/RX FUNCTION
802.11b	1TX /1RX
802.11g	1TX /1RX
BT_LE(1MHz)	1TX /1RX

3. For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report.
4. CMD command was used for the testing.

List of Accessory:

ACCESSORIES	BRAND	MODEL	SPECIFICATION
AC Adapter	Sunshiny	XSD-0503000NUSD	I/P: 100-240Vac, 0.5A, O/P: 5.0Vdc, 3.0A
USB Cable	HCTL	AM TO TYPE-C-0.3M	Signal Line, 0.3meter

2.2 DESCRIPTION OF TEST MODES

11 channels are provided for 802.11b, 802.11g:

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
1	2412 MHz	7	2442 MHz
2	2417 MHz	8	2447 MHz
3	2422 MHz	9	2452 MHz
4	2427 MHz	10	2457 MHz
5	2432 MHz	11	2462 MHz
6	2437 MHz		

40 channels are provided for BT-LE (GFSK):

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

2.2.1 CONFIGURATION OF SYSTEM UNDER TEST

Please see section 5 photographs of the test configuration for reference.

2.2.2 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis and antenna ports.
The worst case was found when positioned on Y axis for radiated emission. Following test modes were selected for the final test, and the final worst case is marked in boldface and recorded in the report:

EUT CONFIGURE MODE	APPLICABLE TO				MODE
	RE<1G	RE≥1G	PLC	APCM	
-	√	√	√	√	-

Where **RE<1G:** Radiated Emission below 1GHz **RE≥1G:** Radiated Emission above 1GHz
PLC: Power Line Conducted Emission **APCM:** Antenna Port Conducted Measurement

NOTE: No need to concern of Conducted Emission due to the EUT is powered by battery.

RADIATED EMISSION TEST (BELOW 1GHz):

☒ 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).

☒ Following channel(s) was (were) selected for the final test as listed below.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)
802.11g	1 to 11	1	OFDM	6.0
BT-LE	0 to 39	0	GFSK	1.0

RADIATED EMISSION TEST (ABOVE 1GHz):

☒ 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).

☒Following channel(s) was (were) selected for the final test as listed below.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)
802.11b	1 to 11	1, 6, 11	DSSS	1.0
802.11g	1 to 11	1, 6, 11	OFDM	6.0
BT-LE	0 to 39	0,19, 39	GFSK	1.0

POWER LINE CONDUCTED EMISSION TEST

☒ 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).

☒ Following channel(s) was (were) selected for the final test as listed below.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)
802.11g	1 to 11	1	OFDM	6.0

BANDEDGE MEASUREMENT:

☒ 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).

☒ Following channel(s) was (were) selected for the final test as listed below.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)
802.11b	1 to 11	1, 11	DSSS	1.0
802.11g	1 to 11	1, 11	OFDM	6.0
BT-LE	0 to 39	0, 39	GFSK	1.0

ANTENNA PORT CONDUCTED MEASUREMENT:

☒ This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.
☒ 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).
☒ Following channel(s) was (were) selected for the final test as listed below.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)
802.11b	1 to 11	1, 6, 11	DSSS	1.0
802.11g	1 to 11	1, 6, 11	OFDM	6.0
BT-LE	0 to 39	0,19, 39	GFSK	1.0

TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	TEST VOLTAGE	TESTED BY
RE<1G	23deg. C, 70%RH	DC 5V By Adapter	Star Le
RE≥1G	23deg. C, 70%RH	DC5V By Adapter	Star Le
PLC	25deg. C, 52%RH	DC5V By Adapter	Carl xie
APCM	25deg. C, 60%RH	DC5V By Adapter	Carl xie

2.3 Duty Cycle of Test Signal

Please Refer to Appendix A/B Of this test report.

WORST-CASE DATA:

Measured Duty Cycle		
Mode		Duty Cycle [%]
		ANT1
WIFI 2.4GHz	11B	100.00
	11G	98.85
BT LE	BT4.0	62.36

Note:
Duty cycle of test signal is < 98%, duty factor shall be considered.

2.4 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC Part 15, Subpart C, Section 15.247

KDB 558074 D01 DTS Meas Guidance v05r02

ANSI C63.10-2013

Note：

1. All test items have been performed and recorded as per the above standards.
2. The EUT is also considered as a kind of computer peripheral, because the connection to computer is necessary for typical use. It has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B (Certification). The test report has been issued separately.

2.5 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	Desktop	Lenovo	M73 SFF	PC04GRQV	N/A
2	Desktop	Lenovo	M73 SFF	PC06CS27	N/A
3	Laptop	Lenovo	Thnikpad T450	PC-049PT1	N/A

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	AC Line: Unshielded, Detachable 1.5m
2	AC Line: Unshielded, Detachable 1.5m
3	AC Line: Unshielded, Detachable 1.5m

3 TEST TYPES AND RESULTS

3.1 CONDUCTED EMISSION MEASUREMENT

3.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY OF EMISSION (MHz)	CONDUCTED LIMIT (dBμV)	
	Quasi-peak	Average
0.15 ~ 0.5	66 to 56	56 to 46
0.5 ~ 5	56	46
5 ~ 30	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. All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

3.1.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde&Schwarz	ESR3	101900	Mar. 03,21	Mar. 02,22
EMC32 test software	Rohde&Schwarz	EMC32	NA	NA	NA
LISN network	Rohde&Schwarz	ENV216	101922	Feb. 25,21	Feb. 24, 22
LISN network	Rohde&Schwarz	ENV216	101922	Feb. 24,22	Feb. 25,23

NOTE:

1. The test was performed in CE shielded room.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.

3.1.3 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.

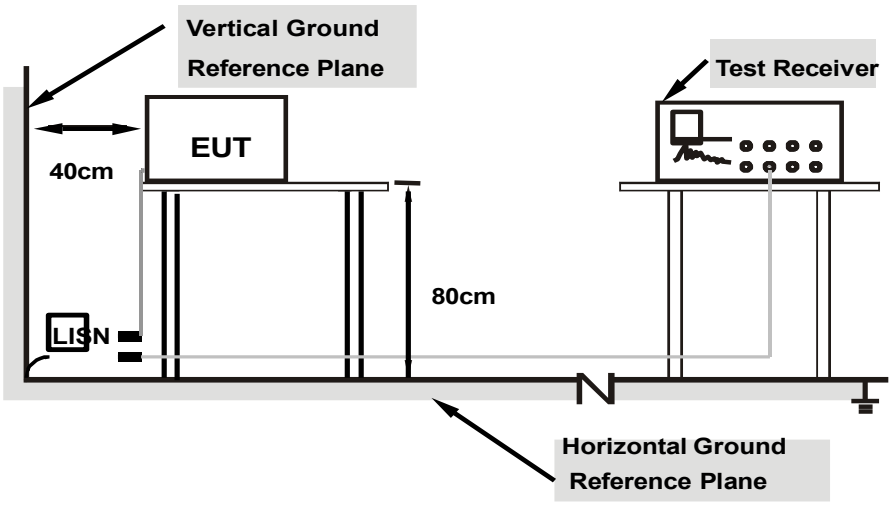
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

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

3.1.4 DEVIATION FROM TEST STANDARD

No deviation.

3.1.5 TEST SETUP



Note: 1.Support units were connected to second LISN.
2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

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

3.1.6 EUT OPERATING CONDITIONS

a. Turned on the power and connected of all equipment.
b. EUT was operated according to the type used was description in manufacturer's specifications or the User's Manual.

3.1.7 TEST RESULTS

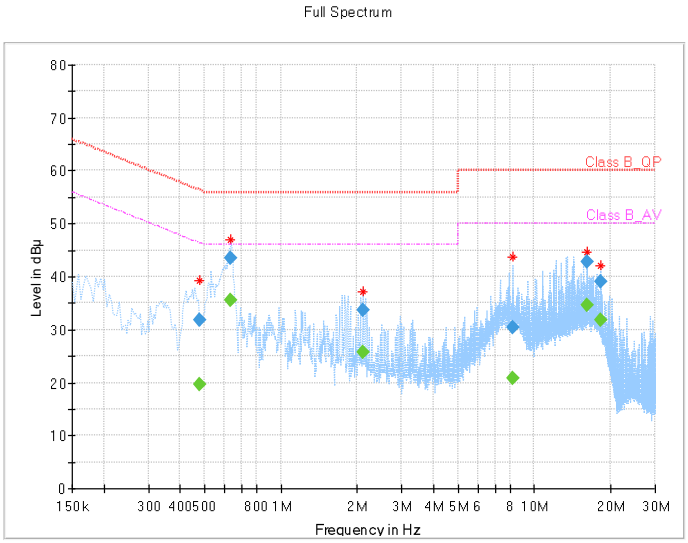
CONDUCTED WORST-CASE DATA:

2.4G WIFI

Frequency Range	150KHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9 kHz
Input Power	120Vac, 60Hz	Environmental Conditions	26deg. C, 51%RH
Tested By	Carl xie		

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.480000	---	19.63	46.34	26.71	L1	ON	9.7
0.480000	31.91	---	56.34	24.43	L1	ON	9.7
0.636000	---	35.54	46.00	10.46	L1	ON	9.7
0.636000	43.53	---	56.00	12.47	L1	ON	9.7
2.100000	---	25.68	46.00	20.32	L1	ON	9.7
2.100000	33.69	---	56.00	22.31	L1	ON	9.7
8.184000	---	20.76	50.00	29.24	L1	ON	9.7
8.184000	30.30	---	60.00	29.70	L1	ON	9.7
16.228000	---	34.57	50.00	15.43	L1	ON	9.8
16.228000	42.75	---	60.00	17.25	L1	ON	9.8
18.244000	---	31.79	50.00	18.21	L1	ON	9.8
18.244000	39.15	---	60.00	20.85	L1	ON	9.8

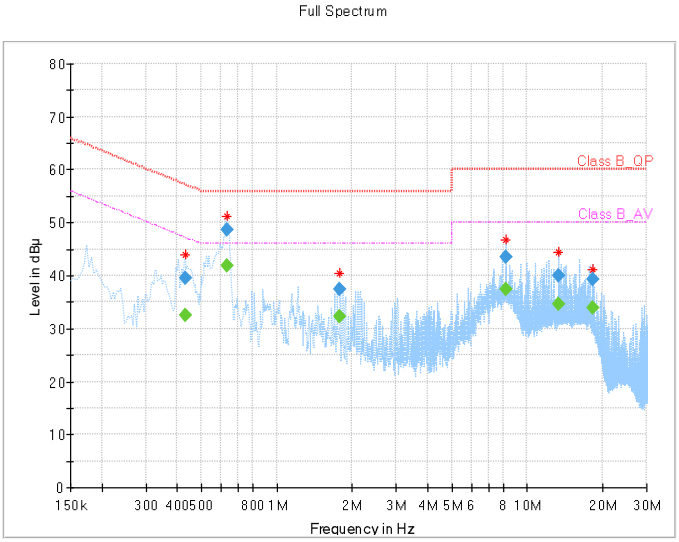
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Limit value - Emission level
5. Correction factor = Insertion loss + Cable loss
6. Emission Level = Correction Factor + Reading Value.



Frequency Range	150KHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9 kHz
Input Power	120Vac, 60Hz	Environmental Conditions	26deg. C, 51%RH
Tested By	Carl xie		

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.432000	---	32.51	47.21	14.70	N	ON	9.7
0.432000	39.51	---	57.21	17.70	N	ON	9.7
0.632000	---	41.92	46.00	4.08	N	ON	9.7
0.632000	48.74	---	56.00	7.26	N	ON	9.7
1.788000	---	32.36	46.00	13.64	N	ON	9.8
1.788000	37.38	---	56.00	18.62	N	ON	9.8
8.196000	---	37.43	50.00	12.57	N	ON	9.8
8.196000	43.55	---	60.00	16.45	N	ON	9.8
13.360000	---	34.71	50.00	15.29	N	ON	9.8
13.360000	40.06	---	60.00	19.94	N	ON	9.8
18.244000	---	33.87	50.00	16.13	N	ON	9.9
18.244000	39.30	---	60.00	20.70	N	ON	9.9

REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Limit value - Emission level
5. Correction factor = Insertion loss + Cable loss
6. Emission Level = Correction Factor + Reading Value.



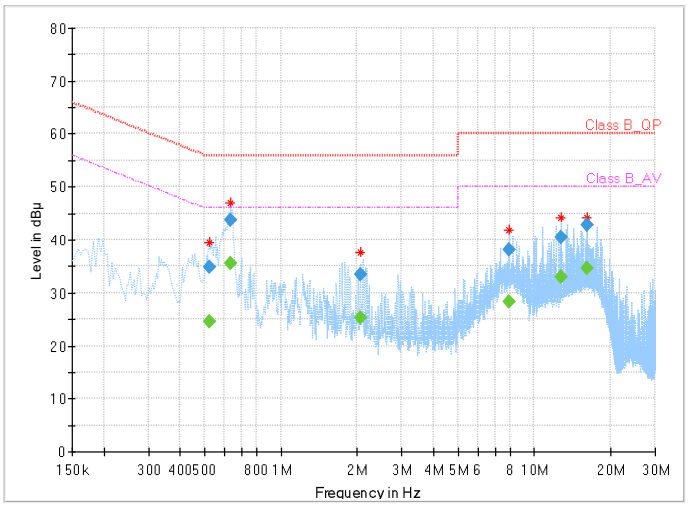
B-LE:

Frequency Range	150KHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9 kHz
Input Power	120Vac, 60Hz	Environmental Conditions	26deg. C, 51%RH
Tested By	Carl xie		

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.520000	---	24.57	46.00	21.43	L1	ON	9.7
0.520000	34.77	---	56.00	21.23	L1	ON	9.7
0.636000	---	35.56	46.00	10.44	L1	ON	9.7
0.636000	43.68	---	56.00	12.32	L1	ON	9.7
2.056000	---	25.37	46.00	20.63	L1	ON	9.7
2.056000	33.40	---	56.00	22.60	L1	ON	9.7
7.924000	---	28.36	50.00	21.64	L1	ON	9.7
7.924000	38.08	---	60.00	21.92	L1	ON	9.7
12.748000	---	32.93	50.00	17.07	L1	ON	9.8
12.748000	40.58	---	60.00	19.42	L1	ON	9.8
16.228000	---	34.74	50.00	15.26	L1	ON	9.8
16.228000	42.79	---	60.00	17.21	L1	ON	9.8

REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Limit value - Emission level
5. Correction factor = Insertion loss + Cable loss
6. Emission Level = Correction Factor + Reading Value.

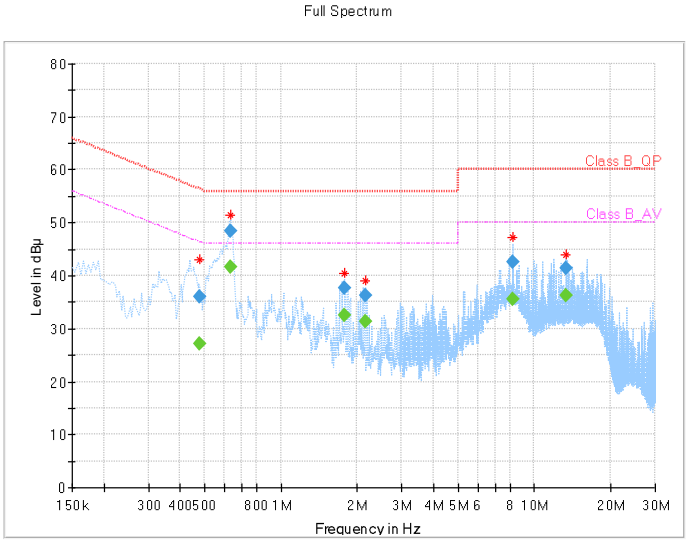
Full Spectrum



Frequency Range	150KHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9 kHz
Input Power	120Vac, 60Hz	Environmental Conditions	26deg. C, 51%RH
Tested By	Carl xie		

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.480000	---	27.20	46.34	19.14	N	ON	9.7
0.480000	36.12	---	56.34	20.22	N	ON	9.7
0.636000	---	41.63	46.00	4.37	N	ON	9.7
0.636000	48.36	---	56.00	7.64	N	ON	9.7
1.788000	---	32.50	46.00	13.50	N	ON	9.8
1.788000	37.63	---	56.00	18.37	N	ON	9.8
2.146000	---	31.41	46.00	14.59	N	ON	9.8
2.146000	36.15	---	56.00	19.85	N	ON	9.8
8.196000	---	35.65	50.00	14.35	N	ON	9.8
8.196000	42.51	---	60.00	17.49	N	ON	9.8
13.420000	---	36.22	50.00	13.78	N	ON	9.8
13.420000	41.30	---	60.00	18.70	N	ON	9.8

REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Limit value - Emission level
5. Correction factor = Insertion loss + Cable loss
6. Emission Level = Correction Factor + Reading Value.



3.2 RADIATED EMISSION MEASUREMENT

3.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

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).

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. As shown in 15.35(b), 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.

3.2.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
3m Semi-anechoic Chamber	ETS-LINDGREN	9m*6m*6m	Euroshieldpn-CT0001143-1216	May. 19,20	May. 18,23
Bilog Antenna	ETS-LINDGREN	3143B	00161965	Mar. 05,21	Mar. 04,22
Horn Antenna	ETS-LINDGREN	3117	00168728	Apr. 02, 21	Apr. 01, 22
Horn Antenna (18GHz-40GHz)	N/A	QWH-SL-18-40-K-SG/QMS-00361	15433	Aug. 25, 21	Aug. 24, 22
Test Software	E3	V 9.160323	N/A	N/A	N/A
Test Software	ADT	ADT_Radiated_V7.6.15.9.2	N/A	N/A	N/A
10dB Attenuator	JFW/USA	50HF-010-SMA	1505	Jun. 03,21	Jun. 02,22
MXE EMI Receiver	KEYSIGHT	N9038A-544	MY54450026	Apr. 27,21	Apr. 26,22
Signal Pre-Amplifier	EMSI	EMC 9135	980249	Jun. 02,21	Jun. 01,22
Signal Pre-Amplifier	EMSI	EMC 012645B	980257	Jun. 02,21	Jun. 01,22
Signal Pre-Amplifier	EMSI	EMC 184045B	980259	Apr. 30,21	Apr. 29,22
DC Source	Kikusui/JP	PMX18-5A	0000001	Aug. 25,21	Aug. 24,22
Power Meter	Anritsu	ML2495A	1506002	Feb. 24,22	Feb. 25,23
Power Sensor	Anritsu	MA2411B	1339352	Feb. 24,22	Feb. 25,23
Loop Antenna	Schwarzbeck	FMZB 1519B	1519B-051	Feb 14,20	Feb. 13,23

NOTE: 1. The calibration interval of the above test instruments is 12 months or 36 months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.

2. The test was performed in 3m Chamber.

3. The FCC Site Registration No. is 525120; The Designation No. is CN1171.

3.2.3 TEST PROCEDURES

a. The EUT was placed on the top of a rotating table 0.8 meters (for below 1GHz) / 1.5 meters (for above 1GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.

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

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

d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

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

f. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, For battery operated equipment, the equipment tests shall be perform using fresh batteries. The turntable was rotated to maximize the emission level.

Note:

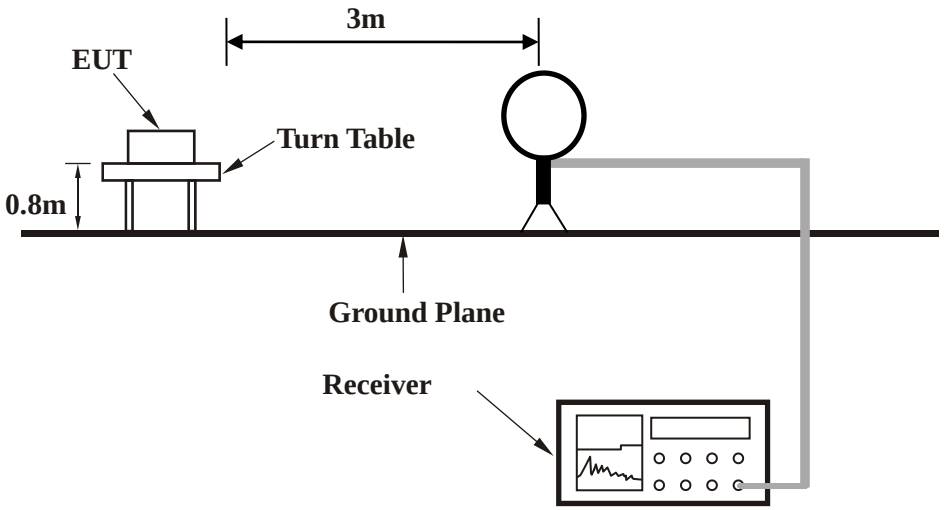
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 3MHz for RMS Average (Duty cycle < 98%) for Average detection (AV) at frequency above 1GHz, then the measurement results was added to a correction factor (10 log(1/duty cycle)).
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.

3.2.4 DEVIATION FROM TEST STANDARD

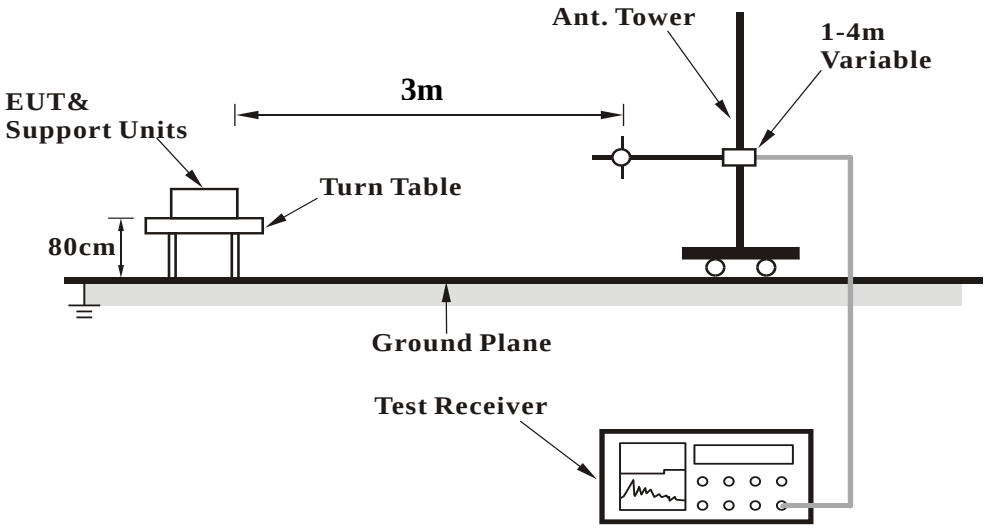
No deviation

3.2.5 TEST SETUP

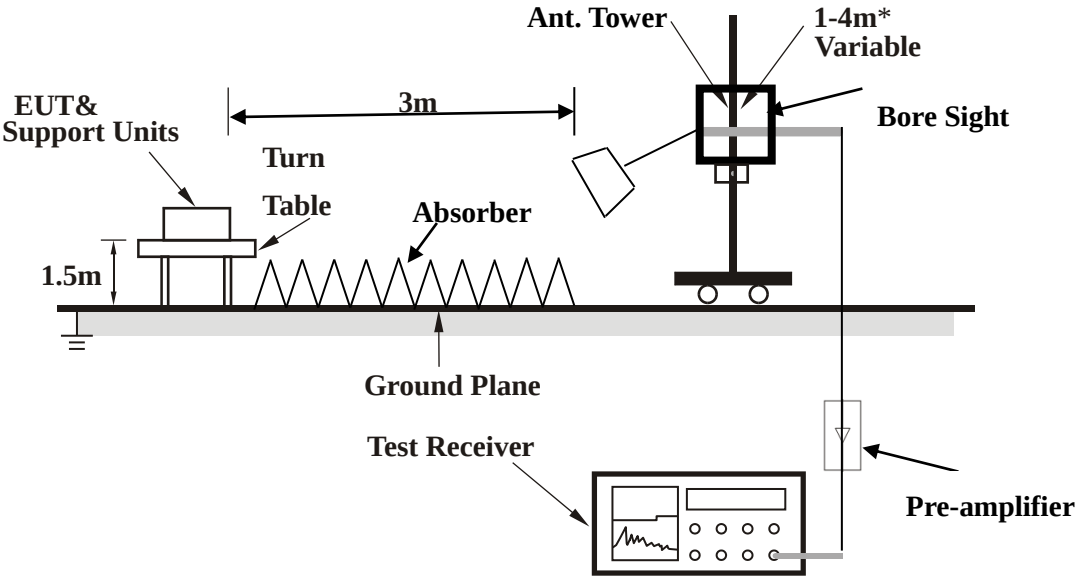
<Frequency Range 9KHz~30MHz >



< Frequency Range 30MHz~1GHz >



<Frequency Range above 1GHz>



Note: Above 1G is a directional antenna

Depends on the EUT height and the antenna 3dB beamwidth both, refer to section 7.3 of CISPR 16-2-3.

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

3.2.6 EUT OPERATING CONDITIONS

a. Set the EUT under full load condition and placed them on a testing table.

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

c. The necessary accessories enable the EUT in full functions.

3.2.7 TEST RESULTS

BELOW 1GHz WORST-CASE DATA :

30 MHz – 1GHz data:

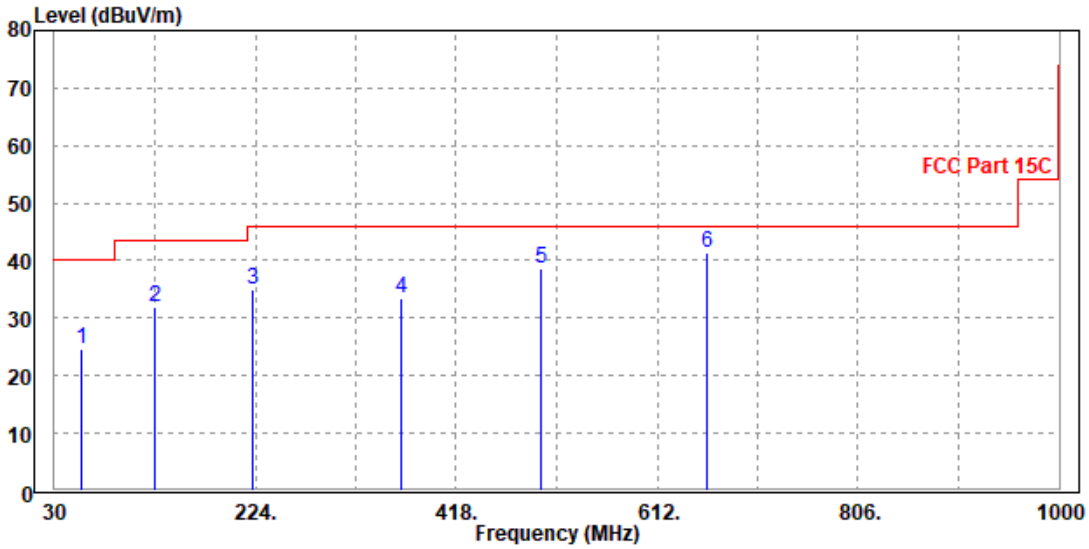
802.11g

CHANNEL	TX Channel 1	**DETECTOR FUNCTION**	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
56.19	24.6	53.52	40	-15.4	7.98	0.43	37.33	300	0	QP
127	31.93	60.8	43.5	-11.57	7.55	0.6	37.02	300	0	QP
221.09	34.92	58.8	46	-11.08	11.93	0.78	36.59	300	0	QP
364.65	33.34	53.25	46	-12.66	15.87	1.02	36.8	300	0	QP
500.45	38.72	55.79	46	-7.28	18.71	1.22	37	300	0	QP
659.53	41.46	55.61	46	-4.54	21.89	1.43	37.47	300	0	QP

REMARKS:

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

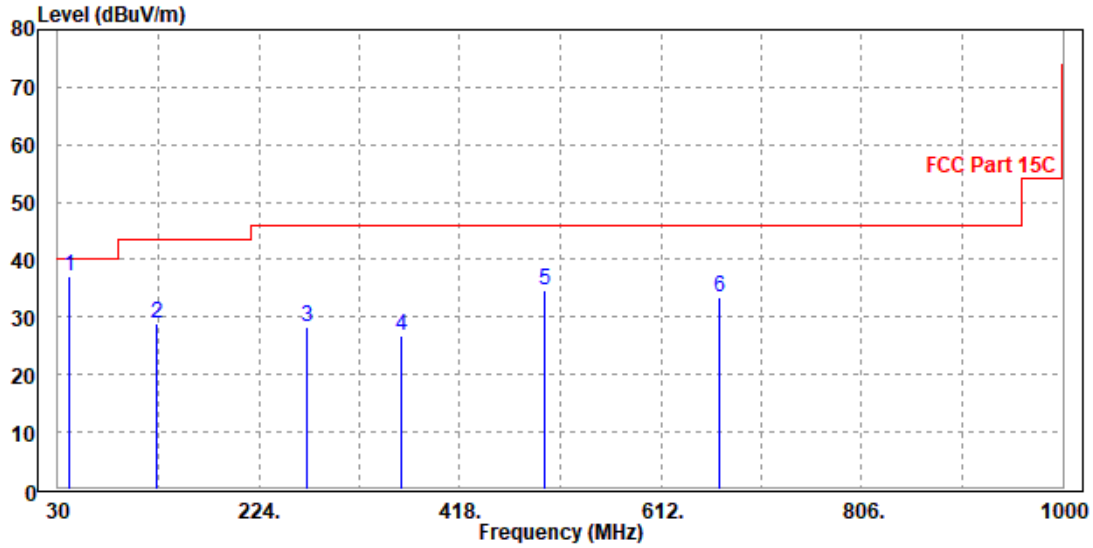


CHANNEL	TX Channel 1	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
40.67	36.97	62.11	40	-3.03	11.99	0.37	37.5	200	0	QP
126.03	28.98	57.55	43.5	-14.52	7.86	0.6	37.03	200	0	QP
270.56	28.27	49.81	46	-17.73	14.29	0.86	36.69	200	0	QP
360.77	26.69	46.14	46	-19.31	16.34	1.01	36.8	200	0	QP
500.45	34.74	51.41	46	-11.26	19.11	1.22	37	200	0	QP
668.26	33.31	47.49	46	-12.69	21.86	1.44	37.48	200	0	QP

REMARKS:

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



ABOVE 1GHz WORST-CASE DATA:

Note: For higher frequency, the emission is too low to be detected.

802.11b:

CHANNEL	TX Channel 1	**DETECTOR FUNCTION**	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	51.29	60.05	74	-22.71	31.75	5.86	46.37	115	78	Peak
2390	44.35	53.11	54	-9.65	31.75	5.86	46.37	115	78	Average
2412	88.47	97.13	/	/	31.82	5.89	46.37	115	78	Peak
2412	87.27	95.93	/	/	31.82	5.89	46.37	115	78	Average
2483.5	51.91	60.24	74	-22.09	32.05	5.99	46.37	115	78	Peak
2483.5	44.65	52.98	54	-9.35	32.05	5.99	46.37	115	78	Average
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	53.12	61.49	74	-20.88	32.14	5.86	46.37	102	175	Peak
2390	45.62	53.99	54	-8.38	32.14	5.86	46.37	102	175	Average
2412	91.49	99.78	/	/	32.19	5.89	46.37	102	175	Peak
2412	90.45	98.74	/	/	32.19	5.89	46.37	102	175	Average
2483.5	52	60.02	74	-22	32.36	5.99	46.37	102	175	Peak
2483.5	45.31	53.33	54	-8.69	32.36	5.99	46.37	102	175	Average

REMARKS:

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
   Margin value = Emission level – Limit value.
2. 2412MHz: Fundamental frequency.

CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	51.53	60.29	74	-22.47	31.75	5.86	46.37	130	78	Peak
2390	44.65	53.41	54	-9.35	31.75	5.86	46.37	130	78	Average
2437	88.68	97.22	/	/	31.9	5.93	46.37	130	78	Peak
2437	87.48	96.02	/	/	31.9	5.93	46.37	130	78	Average
2483.5	51.78	60.11	74	-22.22	32.05	5.99	46.37	130	78	Peak
2483.5	44.42	52.75	54	-9.58	32.05	5.99	46.37	130	78	Average
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	53.66	62.03	74	-20.34	32.14	5.86	46.37	102	175	Peak
2390	45.17	53.54	54	-8.83	32.14	5.86	46.37	102	175	Average
2437	91.92	100.11	/	/	32.25	5.93	46.37	102	175	Peak
2437	90.67	98.86	/	/	32.25	5.93	46.37	102	175	Average
2483.5	52.35	60.37	74	-21.65	32.36	5.99	46.37	102	175	Peak
2483.5	45.09	53.11	54	-8.91	32.36	5.99	46.37	102	175	Average

REMARKS:

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
   Margin value = Emission level – Limit value.
   2. 2437MHz: Fundamental frequency.

CHANNEL	TX Channel 11	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	51.4	60.16	74	-22.6	31.75	5.86	46.37	112	78	Peak
2390	44.6	53.36	54	-9.4	31.75	5.86	46.37	112	78	Average
2462	90.25	98.68	/	/	31.98	5.96	46.37	112	78	Peak
2462	88.82	97.25	/	/	31.98	5.96	46.37	112	78	Average
2483.5	52.33	60.66	74	-21.67	32.05	5.99	46.37	112	78	Peak
2483.5	45.48	53.81	54	-8.52	32.05	5.99	46.37	112	78	Average
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	53.51	61.88	74	-20.49	32.14	5.86	46.37	102	175	Peak
2390	45.52	53.89	54	-8.48	32.14	5.86	46.37	102	175	Average
2462	91.51	99.61	/	/	32.31	5.96	46.37	102	175	Peak
2462	90.57	98.67	/	/	32.31	5.96	46.37	102	175	Average
2483.5	52.19	60.21	74	-21.81	32.36	5.99	46.37	102	175	Peak
2483.5	45.34	53.36	54	-8.66	32.36	5.99	46.37	102	175	Average

REMARKS:

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
   Margin value = Emission level – Limit value.
2. 2462MHz: Fundamental frequency.

802.11g

CHANNEL	TX Channel 1	**DETECTOR FUNCTION**	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	**EMISSION LEVEL (dBuV/m)**	**READ LEVEL (dBuV)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA FACTOR (dB /m)**	**CABLE LOSS (dB)**	**PREAMP FACTOR (dB)**	**ANTENNA HEIGHT (cm)**	**TABLE ANGLE (Degree)**	**REMARK**
2390	52.56	61.32	74	-21.44	31.75	5.86	46.37	114	78	Peak
2390	45.16	53.92	54	-8.84	31.75	5.86	46.37	114	78	Average
2412	92.41	101.07	/	/	31.82	5.89	46.37	114	78	Peak
2412	85.72	94.38	/	/	31.82	5.89	46.37	114	78	Average
2483.5	52.49	60.82	74	-21.51	32.05	5.99	46.37	114	78	Peak
2483.5	44.7	53.03	54	-9.3	32.05	5.99	46.37	114	78	Average
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	**EMISSION LEVEL (dBuV/m)**	**READ LEVEL (dBuV)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA FACTOR (dB /m)**	**CABLE LOSS (dB)**	**PREAMP FACTOR (dB)**	**ANTENNA HEIGHT (cm)**	**TABLE ANGLE (Degree)**	**REMARK**
2390	52.88	61.25	74	-21.12	32.14	5.86	46.37	102	175	Peak
2390	**45.75**	**54.12**	**54**	**-8.25**	**32.14**	**5.86**	**46.37**	**102**	**175**	**Average**
2412	95.5	103.79	/	/	32.19	5.89	46.37	102	175	Peak
2412	88.84	97.13	/	/	32.19	5.89	46.37	102	175	Average
2483.5	53.43	61.45	74	-20.57	32.36	5.99	46.37	102	175	Peak
2483.5	44.72	52.74	54	-9.28	32.36	5.99	46.37	102	175	Average

REMARKS:

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
   Margin value = Emission level – Limit value.
2. 2412MHz: Fundamental frequency.

CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	51.56	60.32	74	-22.44	31.75	5.86	46.37	112	78	Peak
2390	45.12	53.88	54	-8.88	31.75	5.86	46.37	112	78	Average
2437	91.83	100.37	/	/	31.9	5.93	46.37	112	78	Peak
2437	85.21	93.75	/	/	31.9	5.93	46.37	112	78	Average
2483.5	52.87	61.2	74	-21.13	32.05	5.99	46.37	112	78	Peak
2483.5	44.8	53.13	54	-9.2	32.05	5.99	46.37	112	78	Average
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	52.94	61.31	74	-21.06	32.14	5.86	46.37	102	175	Peak
2390	45.08	53.45	54	-8.92	32.14	5.86	46.37	102	175	Average
2437	95.39	103.58	/	/	32.25	5.93	46.37	102	175	Peak
2437	88.77	96.96	/	/	32.25	5.93	46.37	102	175	Average
2483.5	52.83	60.85	74	-21.17	32.36	5.99	46.37	102	175	Peak
2483.5	44.86	52.88	54	-9.14	32.36	5.99	46.37	102	175	Average

REMARKS:

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
   Margin value = Emission level – Limit value.
   2. 2437MHz: Fundamental frequency.

CHANNEL	TX Channel 11	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	52.04	60.8	74	-21.96	31.75	5.86	46.37	212	78	Peak
2390	45.14	53.9	54	-8.86	31.75	5.86	46.37	212	78	Average
2462	94.38	102.81	/	/	31.98	5.96	46.37	212	78	Peak
2462	87.97	96.4	/	/	31.98	5.96	46.37	212	78	Average
2483.5	52.29	60.62	74	-21.71	32.05	5.99	46.37	212	78	Peak
2483.5	45.18	53.51	54	-8.82	32.05	5.99	46.37	212	78	Average
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	52.75	61.12	74	-21.25	32.14	5.86	46.37	102	175	Peak
2390	44.79	53.16	54	-9.21	32.14	5.86	46.37	102	175	Average
2462	96.44	104.54	/	/	32.31	5.96	46.37	102	175	Peak
2462	89.92	98.02	/	/	32.31	5.96	46.37	102	175	Average
2483.5	52.85	60.87	74	-21.15	32.36	5.99	46.37	102	175	Peak
2483.5	45.72	53.74	54	-8.28	32.36	5.99	46.37	102	175	Average

REMARKS:

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
   Margin value = Emission level – Limit value.
2. 2462MHz: Fundamental frequency.

BELOW 1GHz WORST-CASE DATA:

30 MHz – 1GHz data:

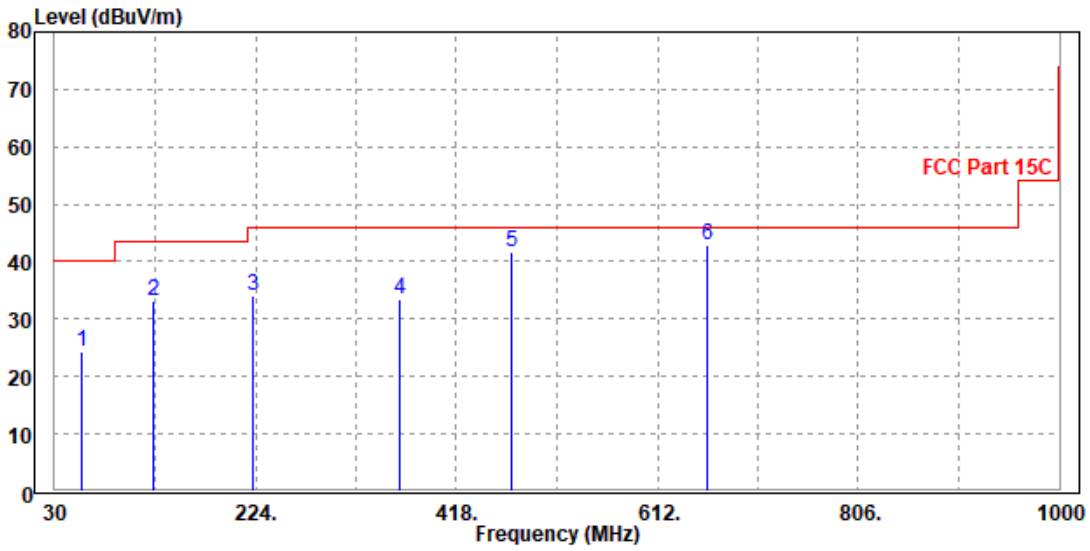
BT-LE _1M

CHANNEL	TX Channel 0	**DETECTOR FUNCTION**	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
56.19	24.3	53.22	40	-15.7	7.98	0.43	37.33	200	0	QP
126.03	33.18	62.01	43.5	-10.32	7.6	0.6	37.03	200	0	QP
222.06	34.14	57.98	46	-11.86	11.97	0.78	36.59	200	0	QP
362.71	33.48	53.45	46	-12.52	15.82	1.01	36.8	200	0	QP
471.35	41.58	59.17	46	-4.42	18.18	1.18	36.95	200	0	QP
660.5	42.88	57.01	46	-3.12	21.91	1.43	37.47	200	0	QP

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

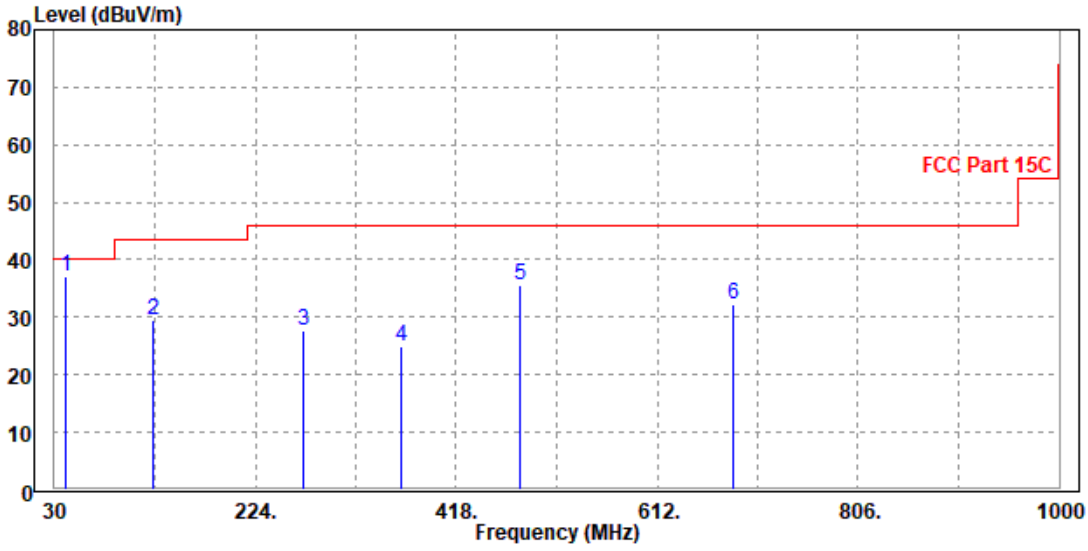


CHANNEL	TX Channel 0	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
40.67	36.97	62.11	40	-3.03	11.99	0.37	37.5	300	0	QP
126.03	29.38	57.95	43.5	-14.12	7.86	0.6	37.03	300	0	QP
270.56	27.81	49.35	46	-18.19	14.29	0.86	36.69	300	0	QP
364.65	24.94	44.3	46	-21.06	16.42	1.02	36.8	300	0	QP
480.08	35.67	52.73	46	-10.33	18.72	1.19	36.97	300	0	QP
684.75	32.17	46.13	46	-13.83	22.09	1.46	37.51	300	0	QP

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value



ABOVE 1GHz TEST DATA

Note: For higher frequency, the emission is too low to be detected.

BT-LE _1M

CHANNEL	TX Channel 0	**DETECTOR FUNCTION**	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	**EMISSION LEVEL (dBuV/m)**	**READ LEVEL (dBuV)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA FACTOR (dB /m)**	**CABLE LOSS (dB)**	**PREAMP FACTOR (dB)**	**ANTENNA HEIGHT (cm)**	**TABLE ANGLE (Degree)**	**REMARK**
2390	51.84	60.6	74	-22.16	31.75	5.86	46.37	100	60	Peak
2390	44.36	53.12	54	-9.64	31.75	5.86	46.37	100	60	Average
2402	103.24	111.94	/	/	31.79	5.88	46.37	100	60	Peak
2402	102.72	111.42	/	/	31.79	5.88	46.37	100	60	Average
2483.5	52.39	60.72	74	-21.61	32.05	5.99	46.37	100	60	Peak
2483.5	44.65	52.98	54	-9.35	32.05	5.99	46.37	100	60	Average
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	**EMISSION LEVEL (dBuV/m)**	**READ LEVEL (dBuV)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA FACTOR (dB /m)**	**CABLE LOSS (dB)**	**PREAMP FACTOR (dB)**	**ANTENNA HEIGHT (cm)**	**TABLE ANGLE (Degree)**	**REMARK**
2390	52.29	60.66	74	-21.71	32.14	5.86	46.37	160	190	Peak
2390	**45.24**	**53.61**	**54**	**-8.76**	**32.14**	**5.86**	**46.37**	**160**	**190**	**Average**
2402	99.44	107.77	/	/	32.16	5.88	46.37	160	190	Peak
2402	97.84	106.17	/	/	32.16	5.88	46.37	160	190	Average
2483.5	52	60.02	74	-22	32.36	5.99	46.37	160	190	Peak
2483.5	45.13	53.15	54	-8.87	32.36	5.99	46.37	160	190	Average

REMARKS:

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
   Margin value = Emission level – Limit value.
2. 2402MHz: Fundamental frequency.

CHANNEL	TX Channel 19	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	51.87	60.63	74	-22.13	31.75	5.86	46.37	118	10	Peak
2390	44.02	52.78	54	-9.98	31.75	5.86	46.37	118	10	Average
2440	102.02	110.55	/	/	31.91	5.93	46.37	118	10	Peak
2440	100.39	108.92	/	/	31.91	5.93	46.37	118	10	Average
2483.5	51.79	60.12	74	-22.21	32.05	5.99	46.37	118	10	Peak
2483.5	44.91	53.24	54	-9.09	32.05	5.99	46.37	118	10	Average
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	52.73	61.1	74	-21.27	32.14	5.86	46.37	100	175	Peak
2390	45.1	53.47	54	-8.9	32.14	5.86	46.37	100	175	Average
2440	99	107.18	/	/	32.26	5.93	46.37	100	175	Peak
2440	97.29	105.47	/	/	32.26	5.93	46.37	100	175	Average
2483.5	52.54	60.56	74	-21.46	32.36	5.99	46.37	100	175	Peak
2483.5	44.99	53.01	54	-9.01	32.36	5.99	46.37	100	175	Average

REMARKS:

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
   Margin value = Emission level – Limit value.
2. 2440MHz: Fundamental frequency.

CHANNEL	TX Channel 39	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	51.57	60.33	74	-22.43	31.75	5.86	46.37	190	40	Peak
2390	44.57	53.33	54	-9.43	31.75	5.86	46.37	190	40	Average
2480	101.8	110.15	/	/	32.04	5.98	46.37	190	40	Peak
2480	100.16	108.51	/	/	32.04	5.98	46.37	190	40	Average
2483.5	52.5	60.83	74	-21.5	32.05	5.99	46.37	190	40	Peak
2483.5	45.04	53.37	54	-8.96	32.05	5.99	46.37	190	40	Average
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	52.74	61.11	74	-21.26	32.14	5.86	46.37	100	175	Peak
2390	44.72	53.09	54	-9.28	32.14	5.86	46.37	100	175	Average
2480	99.17	107.21	/	/	32.35	5.98	46.37	100	175	Peak
2480	97.62	105.66	/	/	32.35	5.98	46.37	100	175	Average
2483.5	52.37	60.39	74	-21.63	32.36	5.99	46.37	100	175	Peak
2483.5	44.67	52.69	54	-9.33	32.36	5.99	46.37	100	175	Average

REMARKS:

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
   Margin value = Emission level – Limit value.
2. 2480MHz: Fundamental frequency.

3.3 6 dB BANDWIDTH MEASUREMENT

3.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

3.3.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
Power Meter	ANRITSU	ML2495A	1506002	Feb. 24,22	Feb. 24,23
EXA Signal Analyzer	KEYSIGHT	N9010A-526	MY54510322	Feb. 24,22	Feb. 24,23
EXA Signal Analyzer	KEYSIGHT	N9010A-544	MY54510355	Apr. 26,21	Apr. 25,22
Power Sensor	ANRITSU	MA2411B	1339352	Feb. 24,22	Feb. 24,23

NOTE:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.
2. The test was performed in RF Oven room.

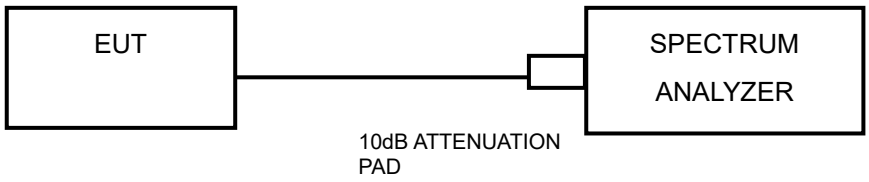
3.3.3 TEST PROCEDURE

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

3.3.4 DEVIATION FROM TEST STANDARD

No deviation.

3.3.5 TEST SETUP



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 RESULTS

Please Refer to Appendix A/B Of this test report.

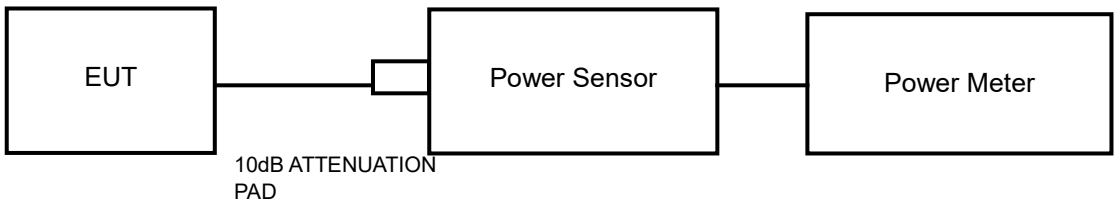
3.4 CONDUCTED OUTPUT POWER

3.4.1 LIMITS OF CONDUCTED OUTPUT POWER MEASUREMENT

For systems using digital modulation in the 2400–2483.5 MHz band: 1 Watt (30dBm)

3.4.2 TEST SETUP

BT:



3.4.3 TEST INSTRUMENTS

Refer to section 3.2.2 to get information of above instrument.

3.4.4 TEST PROCEDURES

A peak power sensor was used on the output port of the EUT. A power meter was used to read the response of the peak power sensor. Record the power level.

3.4.5 DEVIATION FROM TEST STANDARD

No deviation.

3.4.6 EUT OPERATING CONDITIONS

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

3.4.7 TEST RESULTS

3.4.7.1 MAXIMUM PEAK OUTPUT POWER

Please Refer to Appendix A/B Of this test report.

3.4.7.2 AVERAGE OUTPUT POWER (FOR REFERENCE)

The average power sensor was used on the output port of the EUT. A power meter was used to read the response of the power sensor. Record the power level.

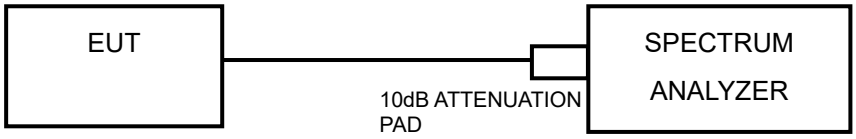
Please Refer to Appendix A/B Of this test report.

3.5 POWER SPECTRAL DENSITY MEASUREMENT

3.5.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Maximum of Power Spectral Density Measurement is 8dBm/3KHz.

3.5.2 TEST SETUP



3.5.3 TEST INSTRUMENTS

Refer to section 3.3.2 to get information of above instrument.

3.5.4 TEST PROCEDURE

1. Set the span to 1.5 times the DTS bandwidth
2. Set the RBW = 3 kHz, VBW ≥ 3 x RBW, Detector = peak.
3. Sweep time = auto couple, Trace mode = max hold, allow trace to fully stabilize.
4. Use the peak marker function to determine the maximum amplitude level.

3.5.5 DEVIATION FROM TEST STANDARD

No deviation.

3.5.6 EUT OPERATING CONDITION

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

3.5.7 TEST RESULTS

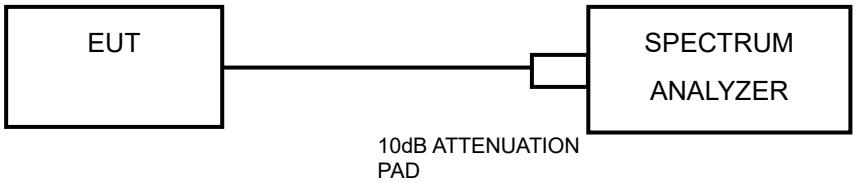
Please Refer to Appendix A/B Of this test report.

3.6 OUT OF BAND EMISSION MEASUREMENT

3.6.1 LIMITS OF OUT OF BAND EMISSION MEASUREMENT

Below –20dB of the highest emission level of operating band (in 100kHz Resolution Bandwidth).

3.6.2 TEST SETUP



3.6.3 TEST INSTRUMENTS

Refer to section 3.3.2 to get information of above instrument.

3.6.4 TEST PROCEDURE

MEASUREMENT PROCEDURE REF

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

MEASUREMENT PROCEDURE OOBE

1. Set RBW = 100 kHz.
2. Set VBW ≥ 300 kHz.
3. Set span to encompass the spectrum to be examined
4. Detector = peak.
5. Trace Mode = max hold.
6. Sweep = auto couple.

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

The spectrum plots are attached on the following images. D1 line indicates the highest level. D2 line indicates the 20dB offset below D1. It shows compliance to the requirement.

Please Refer to Appendix A/B Of this test report.

4 PHOTOGRAPHS OF THE TEST CONFIGURATION

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

5 MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB

No any modifications are made to the EUT by the lab during the test.

6 Appendix

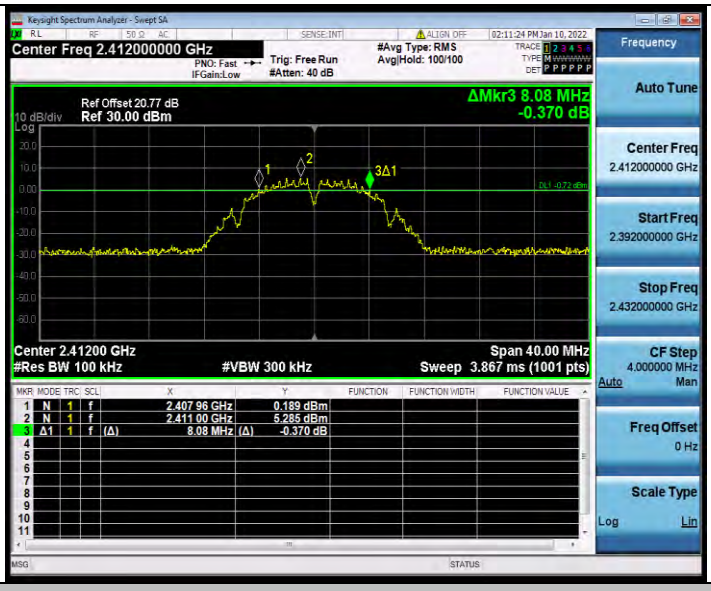
Appendix A: 2.4G WLAN

DTS BANDWIDTH

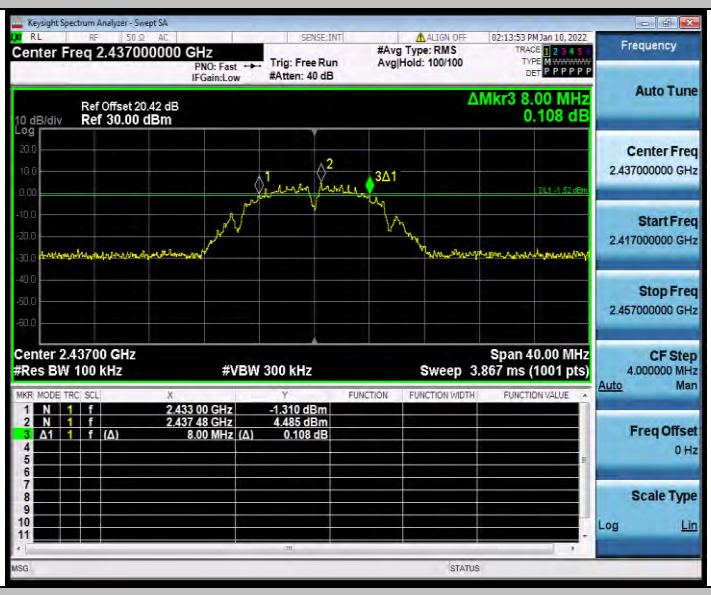
TEST RESULT

TestMode	Antenna	Channel	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11B	Ant1	2412	8.080	2407.960	2416.040	0.5	PASS
		2437	8.000	2433.000	2441.000	0.5	PASS
		2462	8.560	2457.480	2466.040	0.5	PASS
11G	Ant1	2412	16.320	2403.840	2420.160	0.5	PASS
		2437	16.280	2428.840	2445.120	0.5	PASS
		2462	13.880	2454.440	2468.320	0.5	PASS

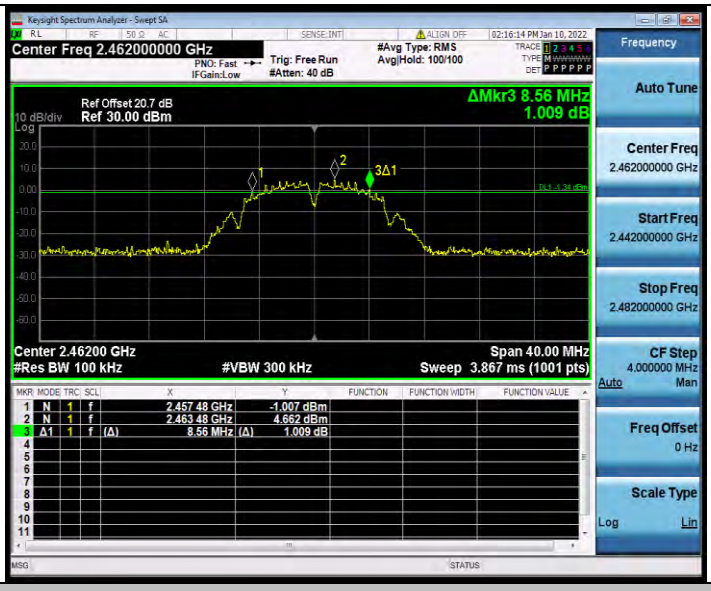
TEST GRAPHS



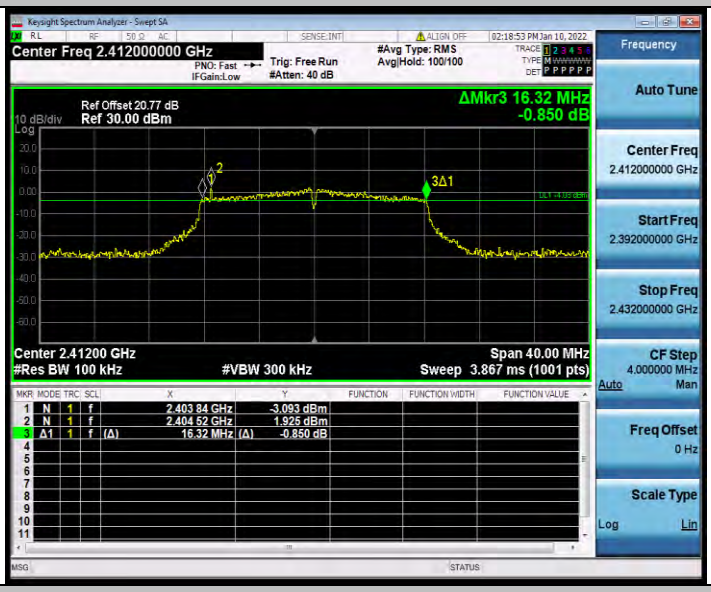
11B_Ant1_2412



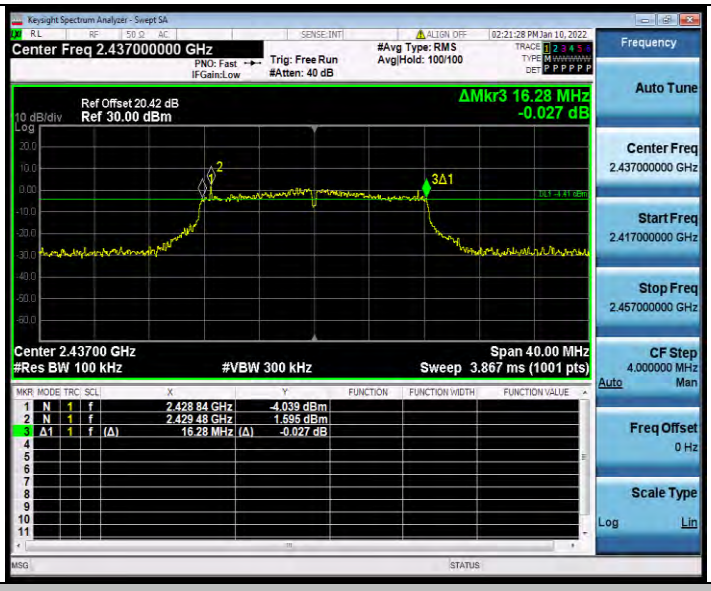
11B_Ant1_2437



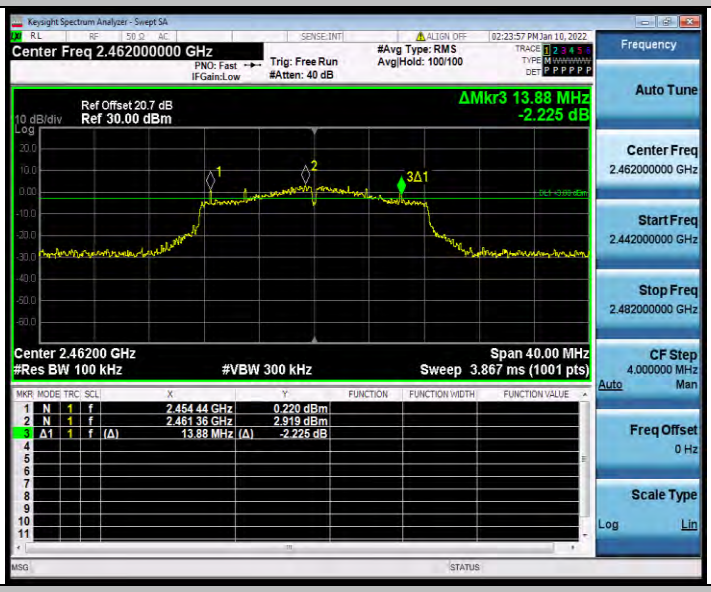
11B_Ant1_2462



11G_Ant1_2412



11G_Ant1_2437



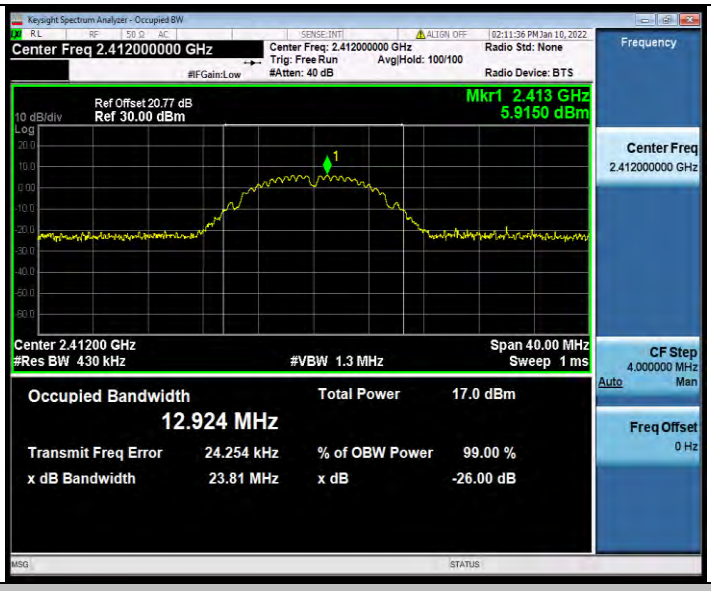
11G_Ant1_2462

OCCUPIED CHANNEL BANDWIDTH

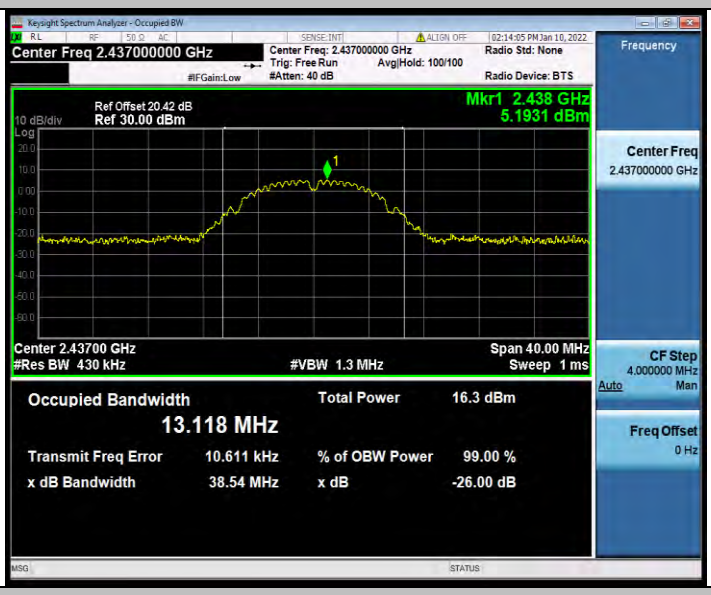
TEST RESULT

TestMode	Antenna	Channel	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11B	Ant1	2412	12.924	2405.562	2418.486	---	PASS
		2437	13.118	2430.452	2443.570	---	PASS
		2462	13.137	2455.443	2468.580	---	PASS
11G	Ant1	2412	17.325	2403.327	2420.652	---	PASS
		2437	17.386	2428.309	2445.695	---	PASS
		2462	16.878	2453.548	2470.426	---	PASS

TEST GRAPHS



11B_Ant1_2412



11B_Ant1_2437

11B_Ant1_2462

11G_Ant1_2412

11G_Ant1_2437

11G_Ant1_2462

MAXIMUM CONDUCTED OUTPUT POWER

TEST RESULT PEAK POWER

TestMode	Antenna	Channel	Peak power [dBm]	Peak power [mw]	Limit [dBm]	Verdict	Power Setting
11B	Ant1	2412	16.31	42.76	≤30	PASS	44
		2437	16.21	41.78	≤30	PASS	44
		2462	16.01	39.90	≤30	PASS	43
11G	Ant1	2412	23.86	243.22	≤30	PASS	44
		2437	24.16	260.62	≤30	PASS	44
		2462	24.21	263.63	≤30	PASS	44

Test Result Average Power

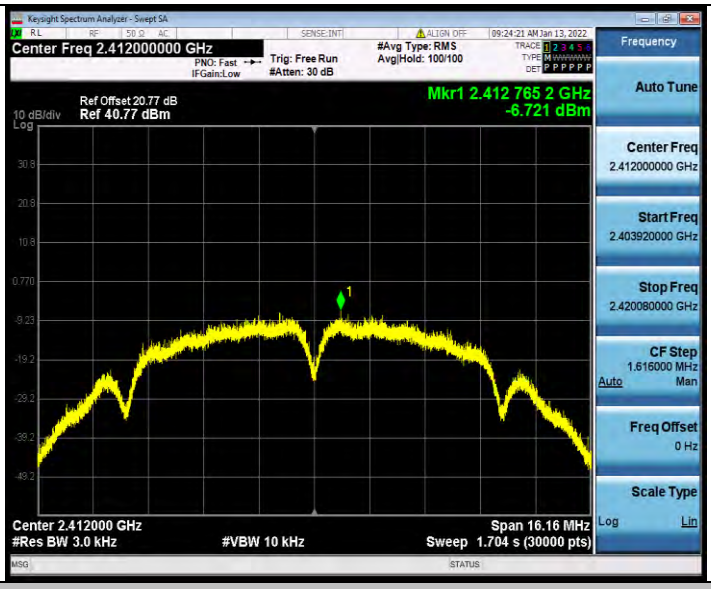
TestMode	Antenna	Channel	Average power [dBm]	Limit [dBm]	Verdict	Power Setting
11B	Ant1	2412	13.20	/	PASS	44
		2437	13.10	/	PASS	44
		2462	13.02	/	PASS	43
11G	Ant1	2412	13.33	/	PASS	44
		2437	13.45	/	PASS	44
		2462	13.64	/	PASS	44

MAXIMUM POWER SPECTRAL DENSITY

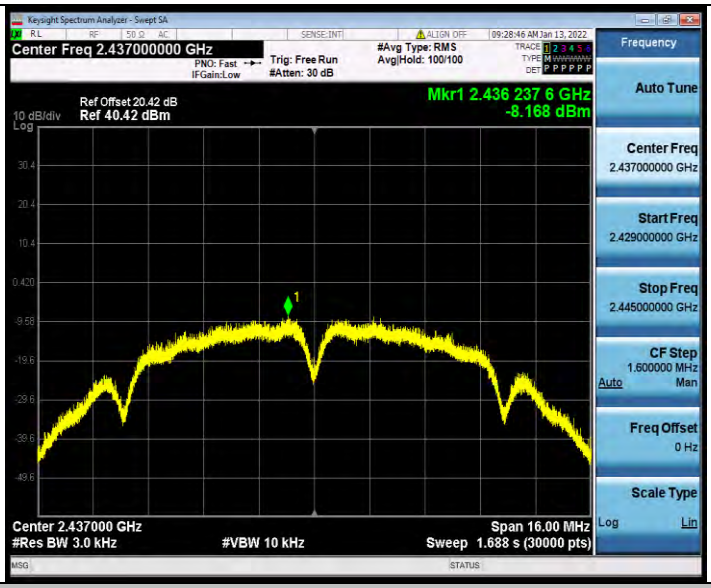
TEST RESULT

TestMode	Antenna	Channel	Result[dBm/3kHz]	Limit[dBm/3kHz]	Verdict
11B	Ant1	2412	-6.72	≤8	PASS
		2437	-8.17	≤8	PASS
		2462	-6.82	≤8	PASS
11G	Ant1	2412	-8.73	≤8	PASS
		2437	-9.51	≤8	PASS
		2462	-7.96	≤8	PASS

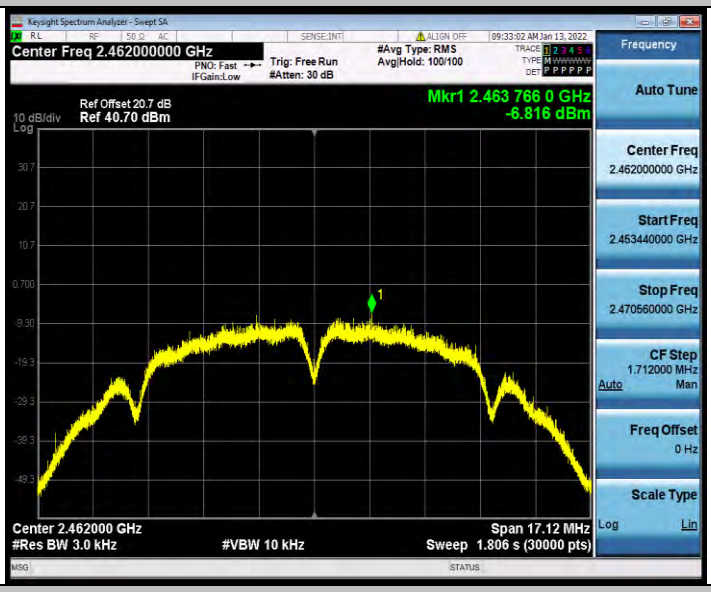
TEST GRAPHS



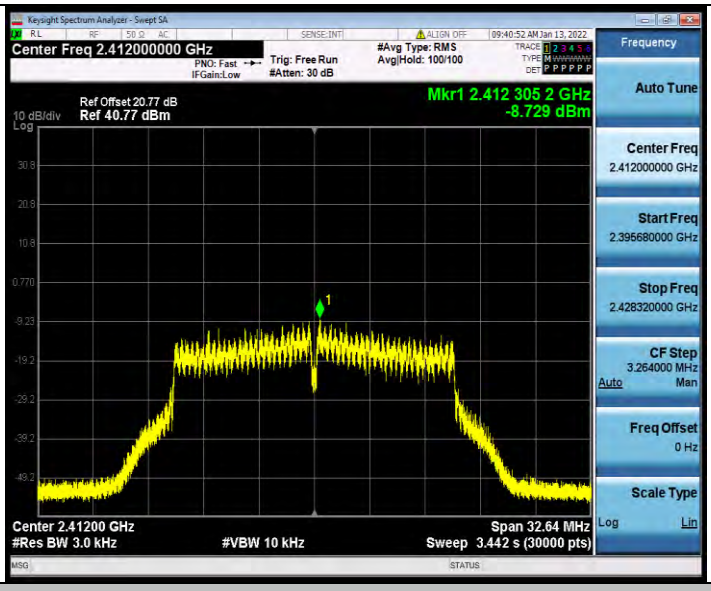
11B_Ant1_2412



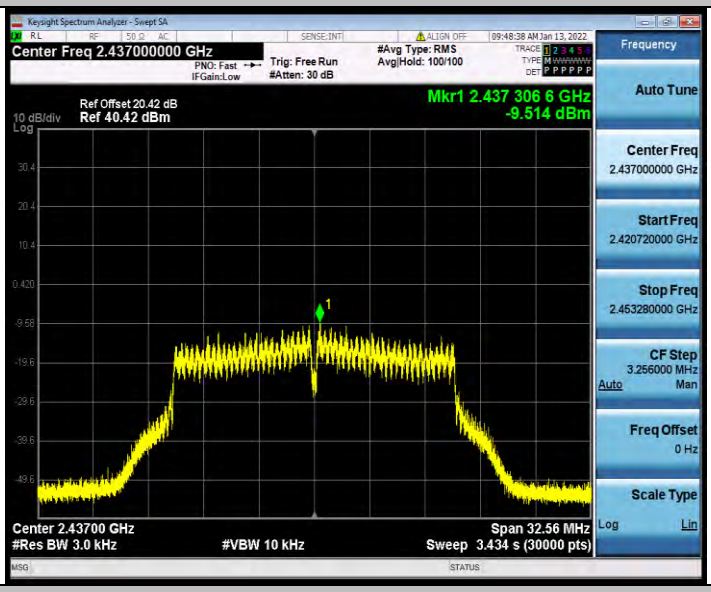
11B_Ant1_2437



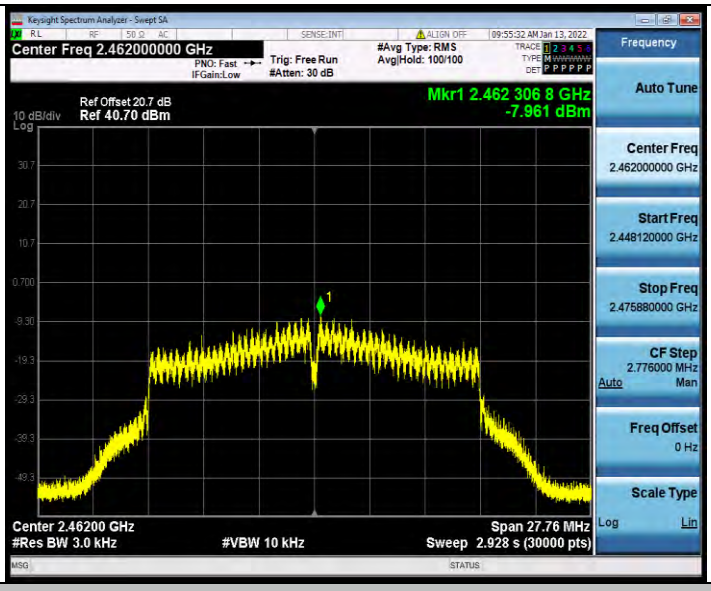
11B_Ant1_2462



11G_Ant1_2412



11G_Ant1_2437



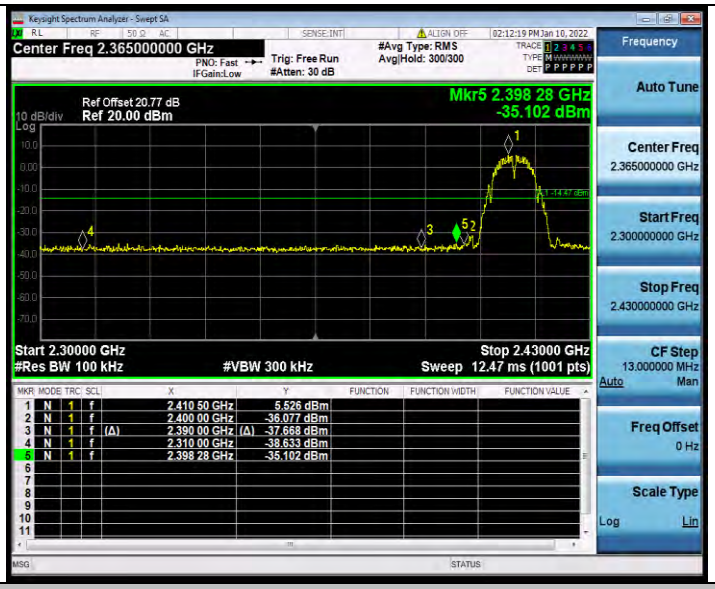
11G_Ant1_2462

BAND EDGE MEASUREMENTS

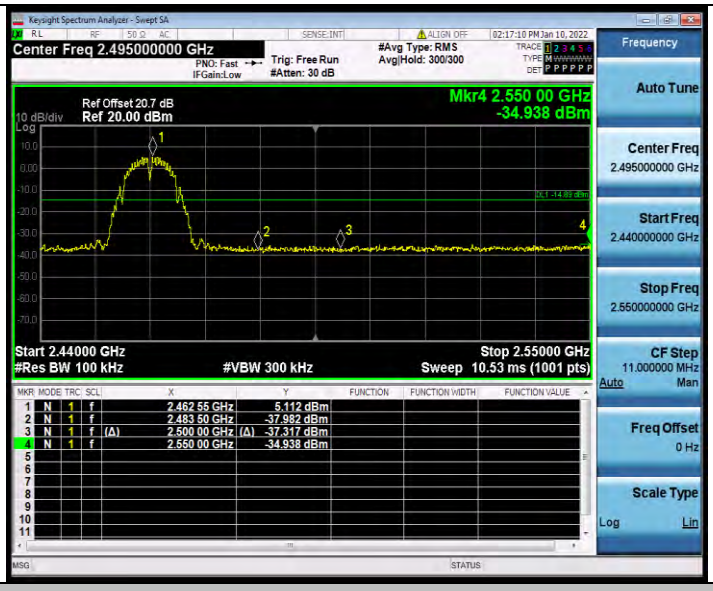
TEST RESULT

TestMode	Antenna	ChName	Channel	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
11B	Ant1	Low	2412	5.53	-35.1	≤-14.47	PASS
		High	2462	5.11	-34.94	≤-14.89	PASS
11G	Ant1	Low	2412	2.31	-33.94	≤-17.69	PASS
		High	2462	3.15	-33.03	≤-16.85	PASS

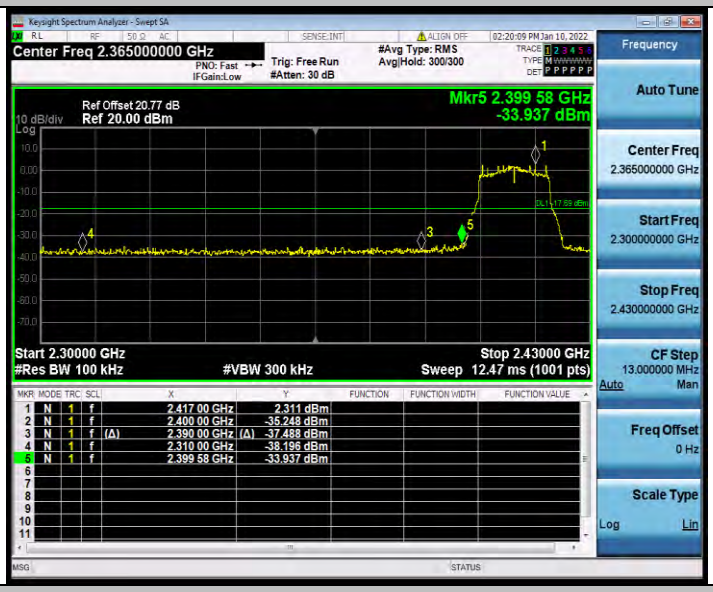
TEST GRAPHS



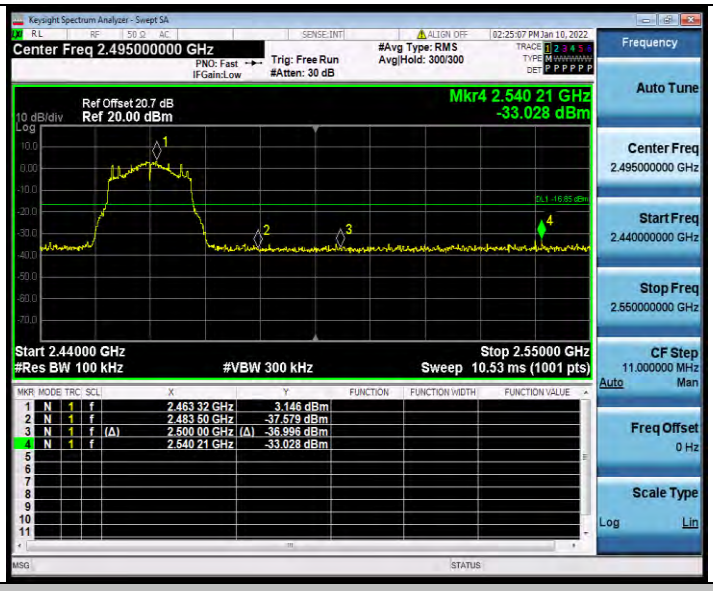
11B_Ant1_Low_2412



11B_Ant1_High_2462



11G_Ant1_Low_2412



11G_Ant1_High_2462

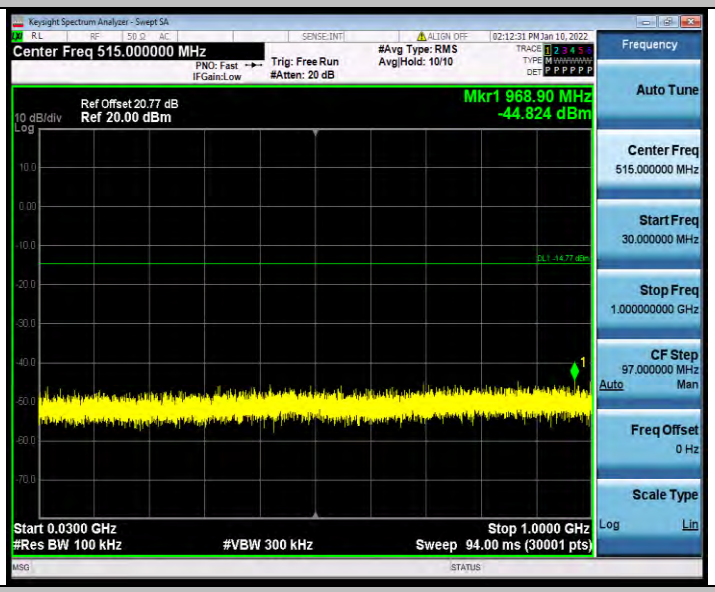
CONDUCTED SPURIOUS EMISSION

TEST RESULT

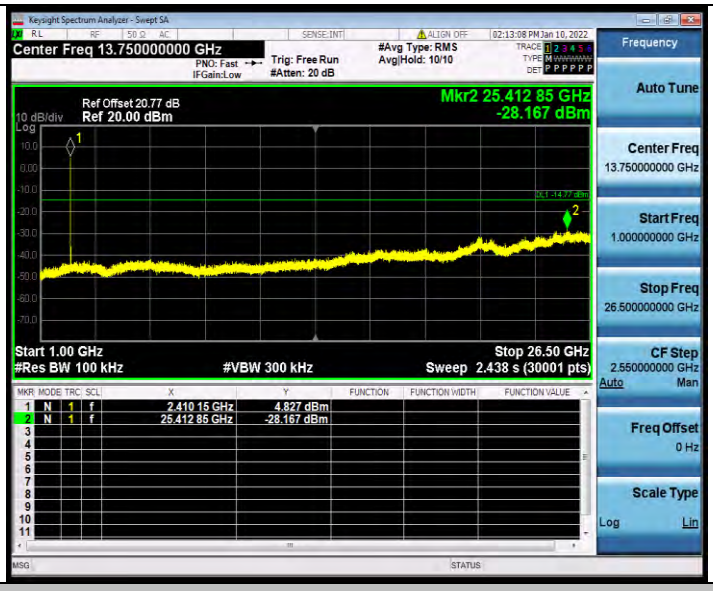
TestMode	Antenna	Channel	FreqRange [Mhz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
11B	Ant1	2412	Reference	5.23	5.23	---	PASS
			30~1000	5.23	-44.82	≤-14.77	PASS
			1000~26500	5.23	-28.17	≤-14.77	PASS
		2437	Reference	4.28	4.28	---	PASS
			30~1000	4.28	-44.68	≤-15.72	PASS
			1000~26500	4.28	-27.32	≤-15.72	PASS
		2462	Reference	3.51	3.51	---	PASS
			30~1000	3.51	-45.1	≤-16.49	PASS
			1000~26500	3.51	-28.54	≤-16.49	PASS
11G	Ant1	2412	Reference	1.56	1.56	---	PASS
			30~1000	1.56	-44.8	≤-18.44	PASS
			1000~26500	1.56	-28.78	≤-18.44	PASS
		2437	Reference	0.40	0.40	---	PASS
			30~1000	0.40	-44.93	≤-19.6	PASS
			1000~26500	0.40	-28.59	≤-19.6	PASS
		2462	Reference	2.71	2.71	---	PASS
			30~1000	2.71	-44.73	≤-17.29	PASS
			1000~26500	2.71	-28.25	≤-17.29	PASS

TEST GRAPHS

11B_Ant1_2412_0~Reference

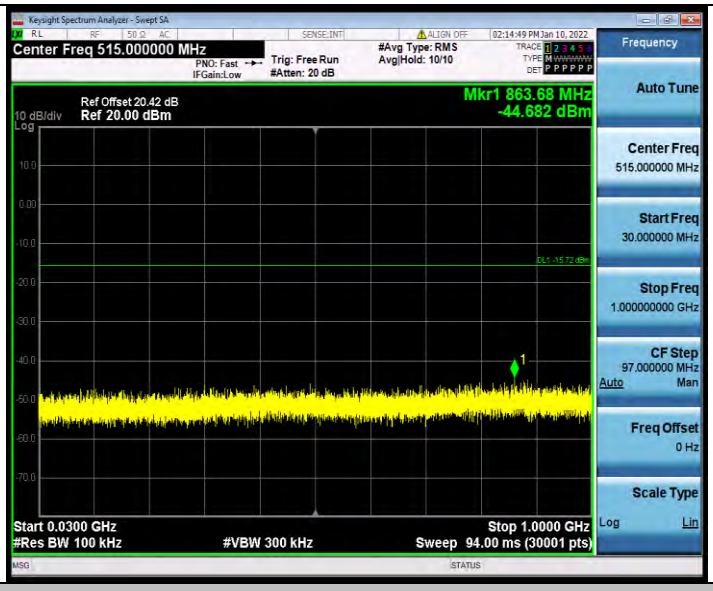


11B_Ant1_2412_30~1000

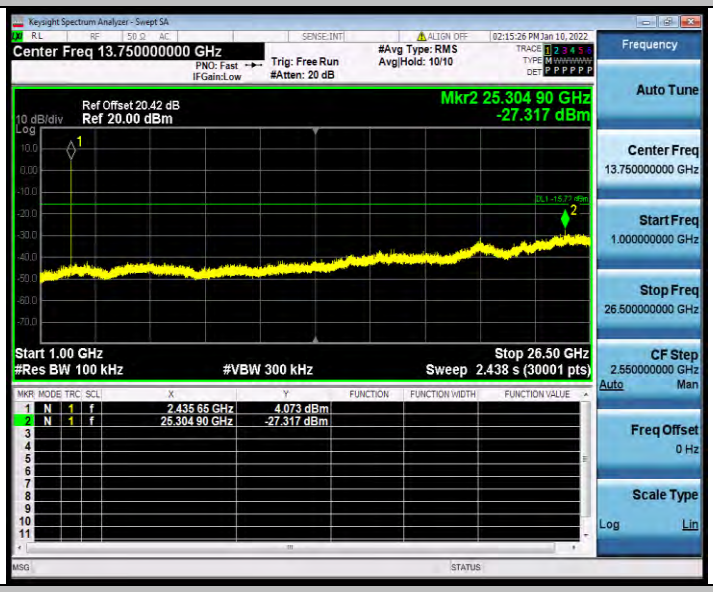


11B_Ant1_2412_1000~26500

11B_Ant1_2437_0~Reference

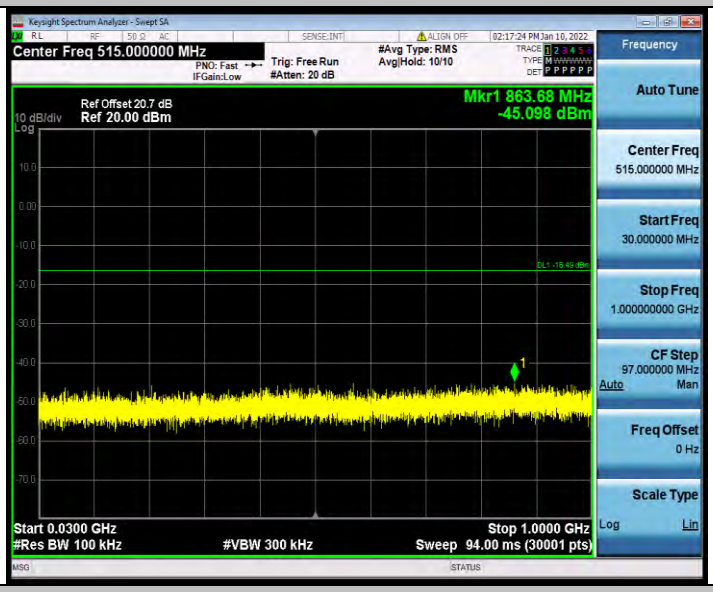


11B_Ant1_2437_30~1000

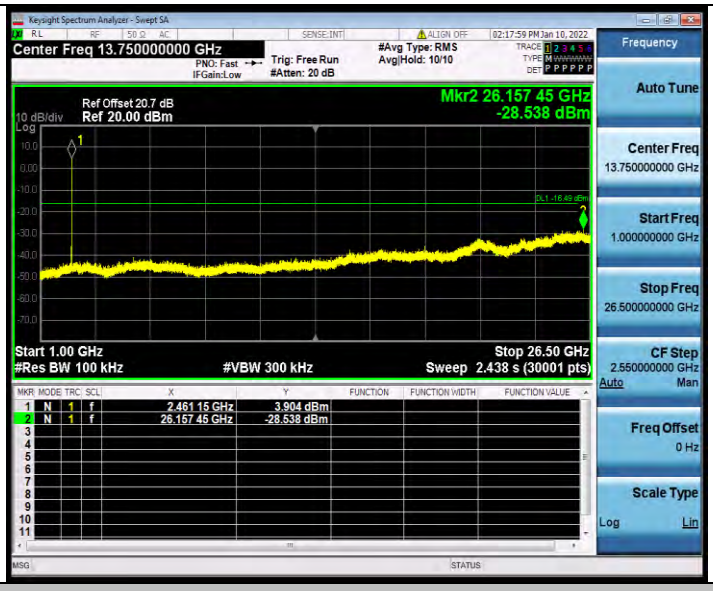


11B_Ant1_2437_1000~26500

11B_Ant1_2462_0~Reference

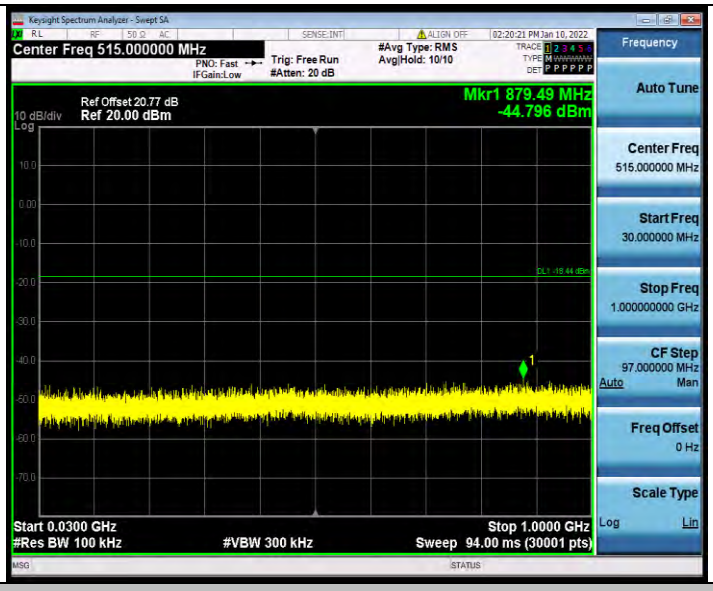


11B_Ant1_2462_30~1000

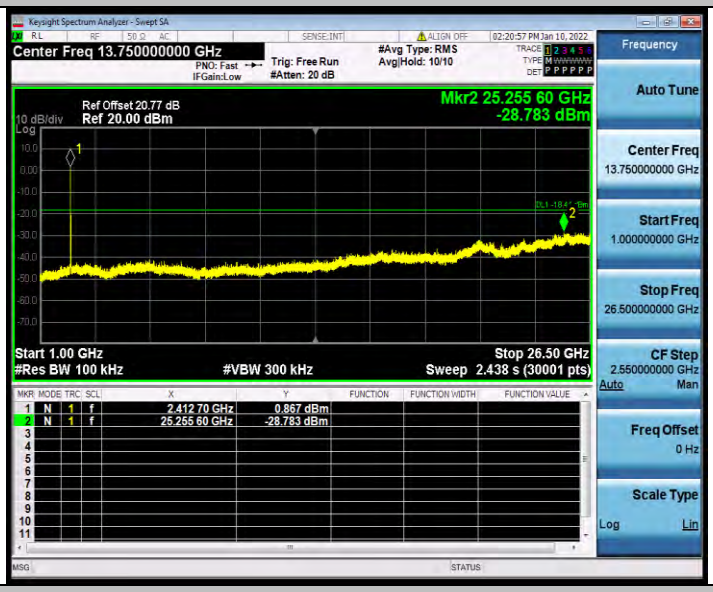


11B_Ant1_2462_1000~26500

11G_Ant1_2412_0~Reference

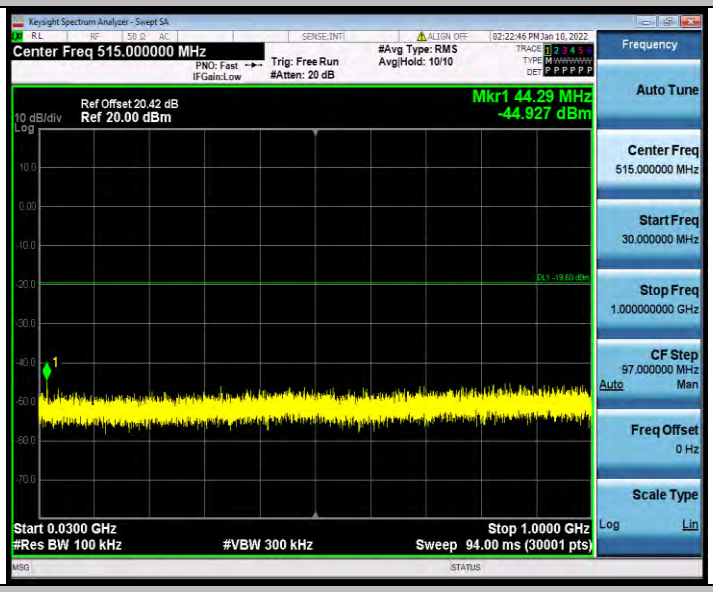


11G_Ant1_2412_30~1000

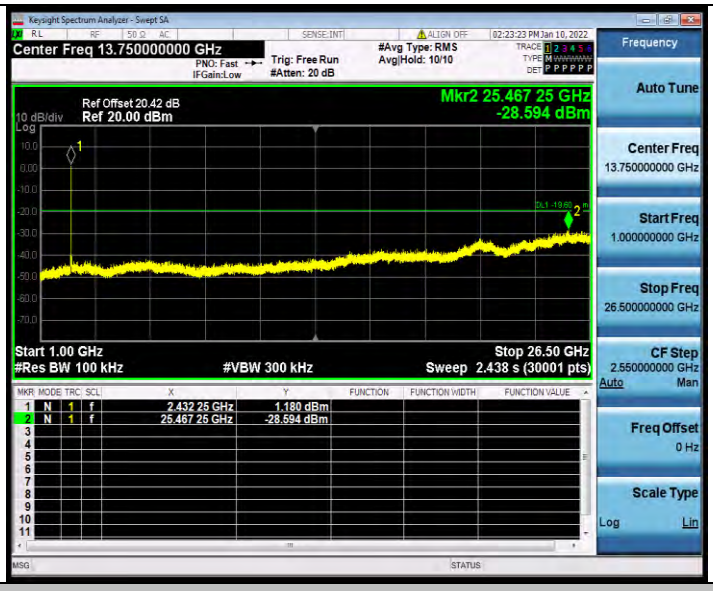


11G_Ant1_2412_1000~26500

11G_Ant1_2437_0~Reference

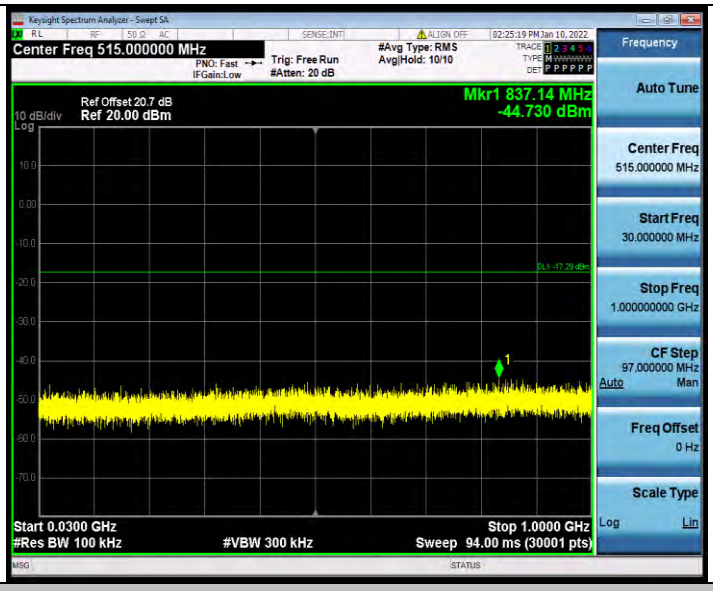


11G_Ant1_2437_30~1000

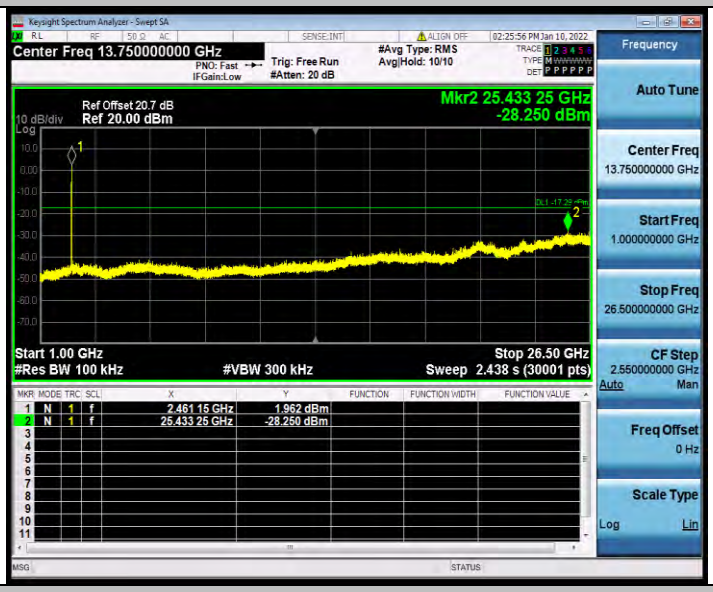


11G_Ant1_2437_1000~26500

11G_Ant1_2462_0~Reference



11G_Ant1_2462_30~1000



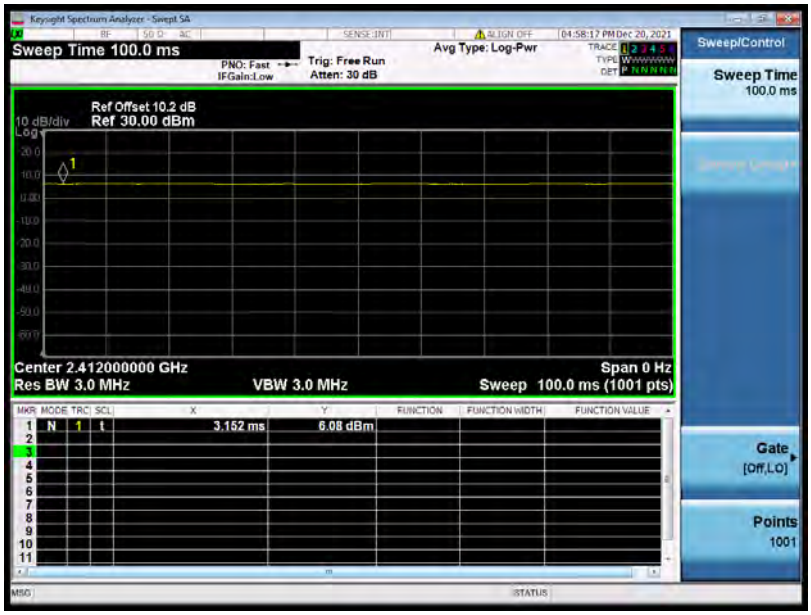
11G_Ant1_2462_1000~26500

DUTY CYCLE

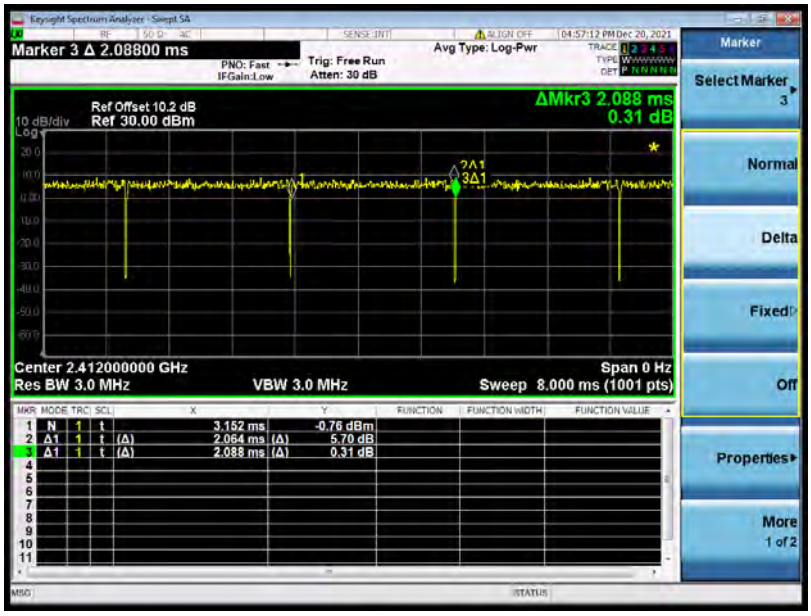
TEST RESULT

TestMode	Antenna	Channel	Duty Cycle
11B	Ant1	2412	100%
11G	Ant1	2412	98.85%

TEST GRAPHS



11B_Ant1_2412



11G_Ant1_2412

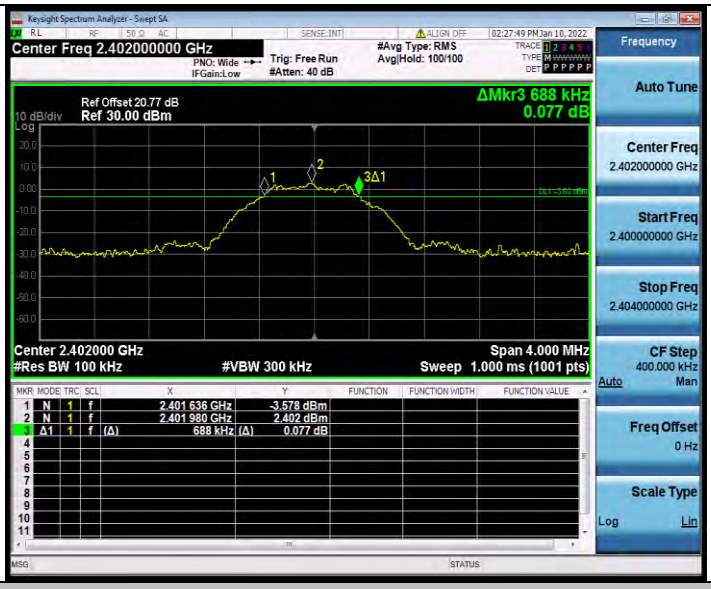
Appendix B: B-LE

DTS BANDWIDTH

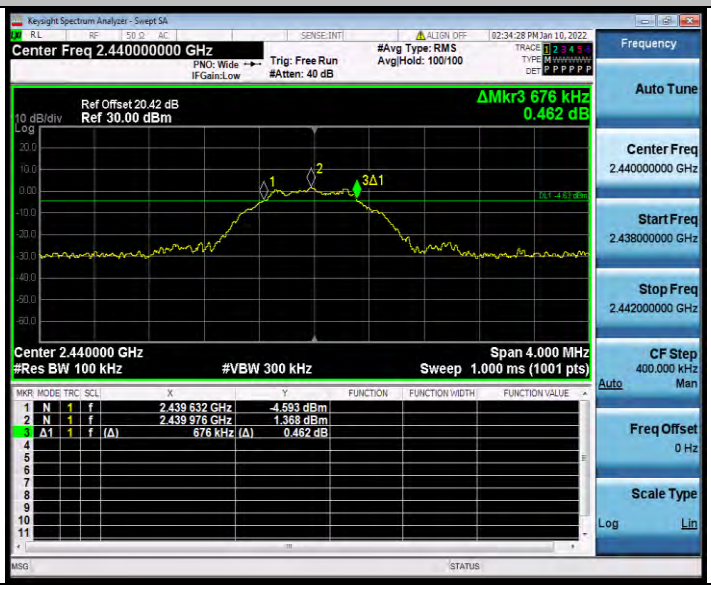
TEST RESULT

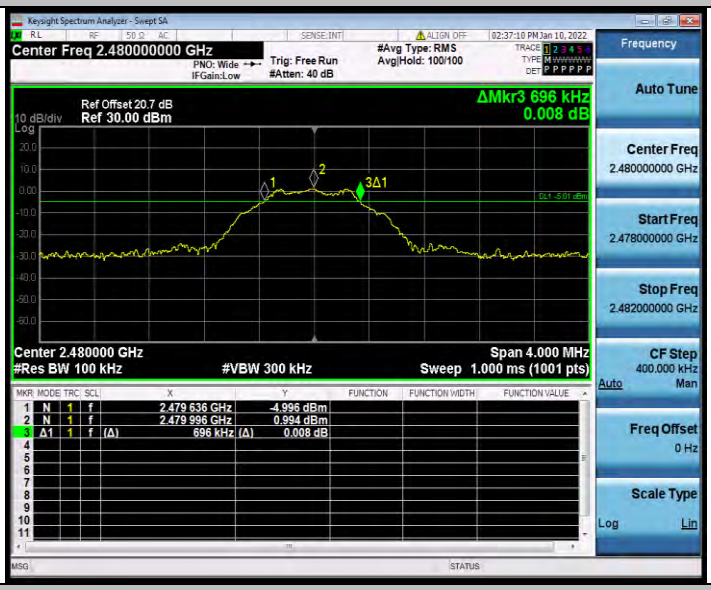
Test Mode	Antenna	Channel	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
BLE_1M	Ant1	2402	0.688	2401.636	2402.324	0.5	PASS
		2440	0.676	2439.632	2440.308	0.5	PASS
		2480	0.696	2479.636	2480.332	0.5	PASS

TEST GRAPHS



BLE_1M_Ant1_2402



BLE_1M_Ant1_2440

BLE_1M_Ant1_2480

OCCUPIED CHANNEL BANDWIDTH

TEST RESULT

Test Mode	Antenna	Channel	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
BLE_1M	Ant1	2402	1.1185	2401.424	2402.543	---	PASS
		2440	1.1114	2439.435	2440.547	---	PASS
		2480	1.1117	2479.440	2480.552	---	PASS

TEST GRAPHS

BLE_1M_Ant1_2402

BLE_1M_Ant1_2440

BLE_1M_Ant1_2480

MAXIMUM CONDUCTED OUTPUT POWER

TEST RESULT PEAK POWER

Test Mode	Antenna	Channel	Peak power [dBm]	Peak power [mw]	Limit [dBm]	Verdict	Power Setting
BLE_1M	Ant1	2402	2.06	1.61	≤30	PASS	/
		2440	2.01	1.59	≤30	PASS	/
		2480	2.05	1.60	≤30	PASS	/

Test Result Average Power

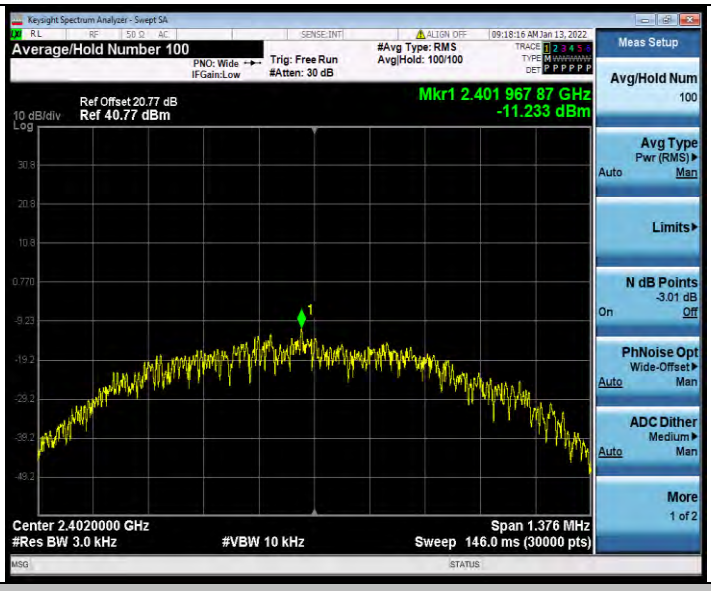
Test Mode	Antenna	Channel	Average power [dBm]	Limit [dBm]	Verdict	Power Setting
BLE_1M	Ant1	2402	-0.25	/	PASS	/
		2440	-0.16	/	PASS	/
		2480	-0.11	/	PASS	/

MAXIMUM POWER SPECTRAL DENSITY

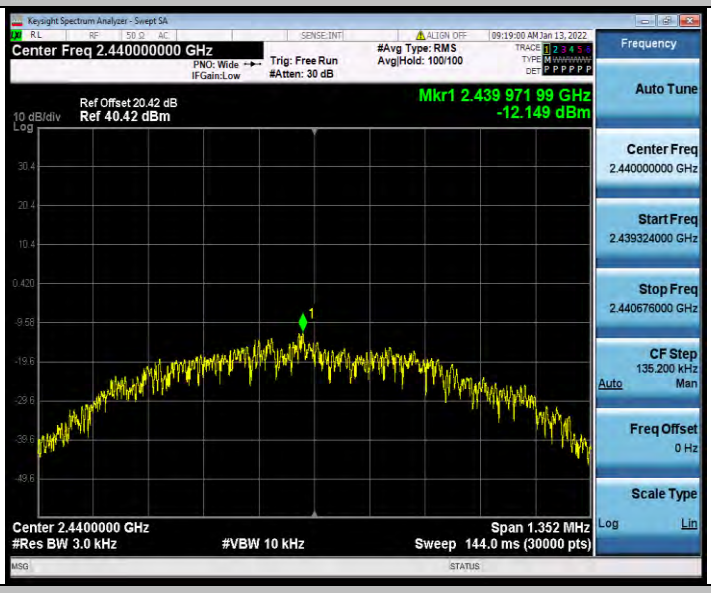
TEST RESULT

Test Mode	Antenna	Channel	Result[dBm/3kHz]	Limit[dBm/3kHz]	Verdict
BLE_1M	Ant1	2402	-11.23	≤8	PASS
		2440	-12.15	≤8	PASS
		2480	-12.57	≤8	PASS

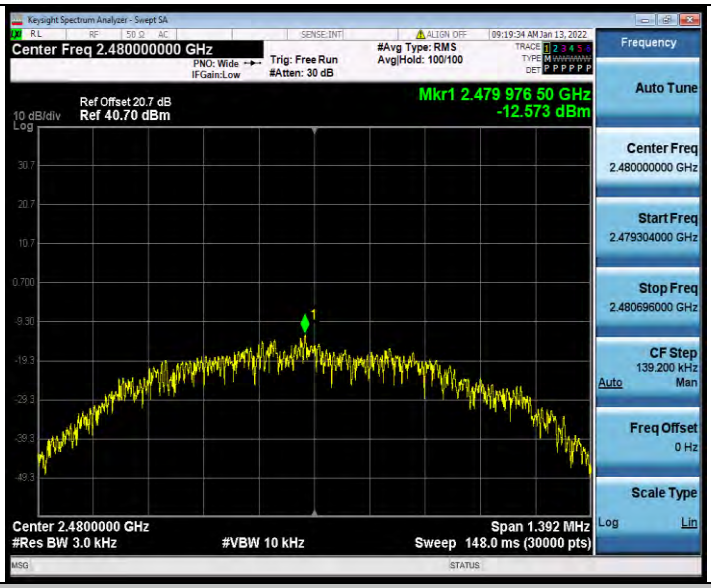
TEST GRAPHS



BLE_1M_Ant1_2402



BLE_1M_Ant1_2440



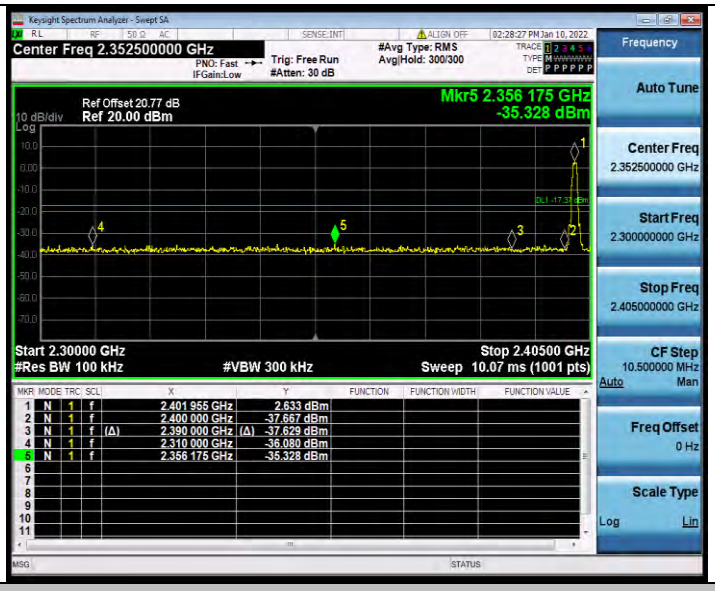
BLE_1M_Ant1_2480

BAND EDGE MEASUREMENTS

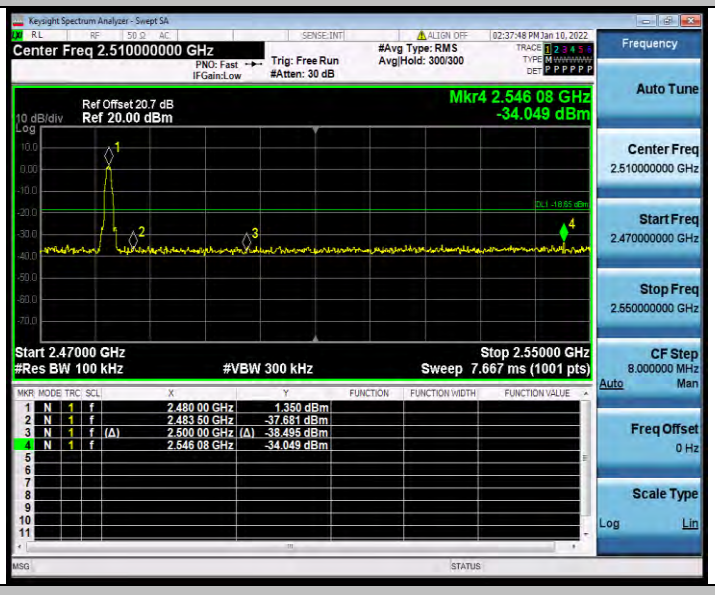
TEST RESULT

TestMode	Antenna	ChName	Channel	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	Low	2402	2.63	-35.33	≤-17.37	PASS
		High	2480	1.35	-34.05	≤-18.65	PASS

TEST GRAPHS



BLE_1M_Ant1_Low_2402



BLE_1M_Ant1_High_2480

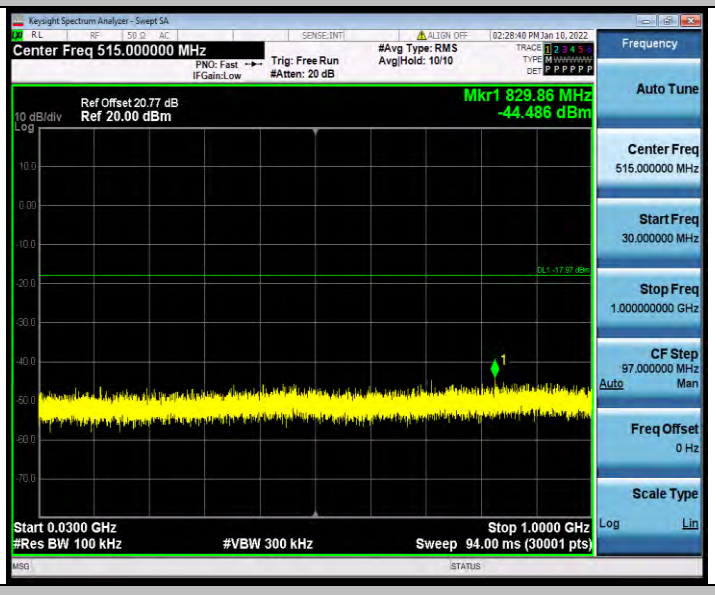
CONDUCTED SPURIOUS EMISSION

TEST RESULT

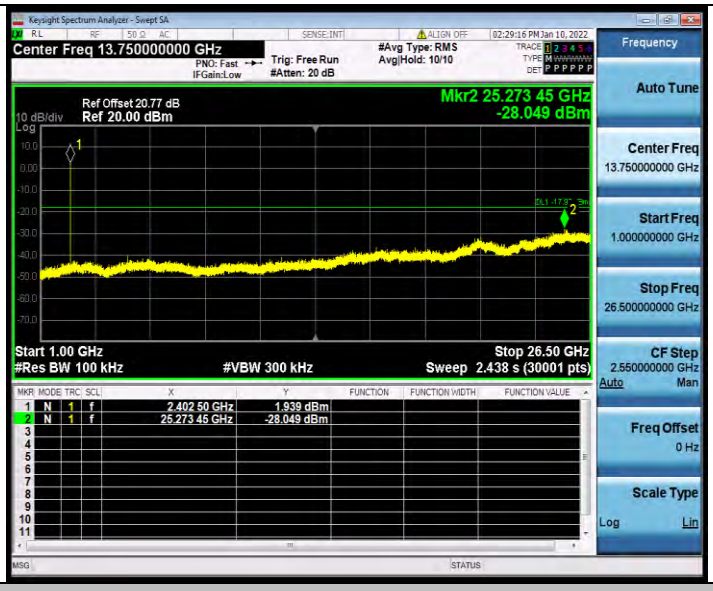
Test Mode	Antenna	Channel	FreqRange [MHz]	RefLevel [dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	2402	Reference	2.03	2.03	---	PASS
			30~1000	2.03	-44.49	≤-17.97	PASS
			1000~26500	2.03	-28.05	≤-17.97	PASS
		2440	Reference	0.00	0.00	---	PASS
			30~1000	0.00	-45.37	≤-20	PASS
			1000~26500	0.00	-28.19	≤-20	PASS
		2480	Reference	0.83	0.83	---	PASS
			30~1000	0.83	-44.19	≤-19.18	PASS
			1000~26500	0.83	-28.74	≤-19.18	PASS

TEST GRAPHS

BLE_1M_Ant1_2402_0~Reference

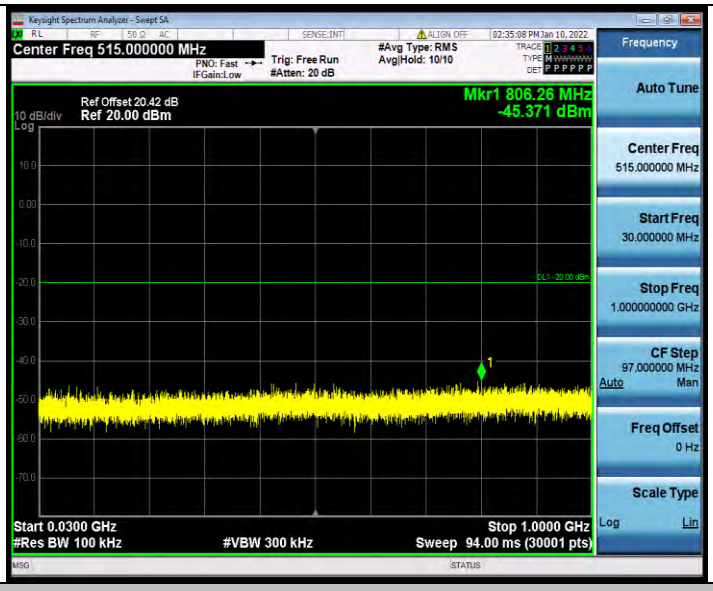


BLE_1M_Ant1_2402_30~1000

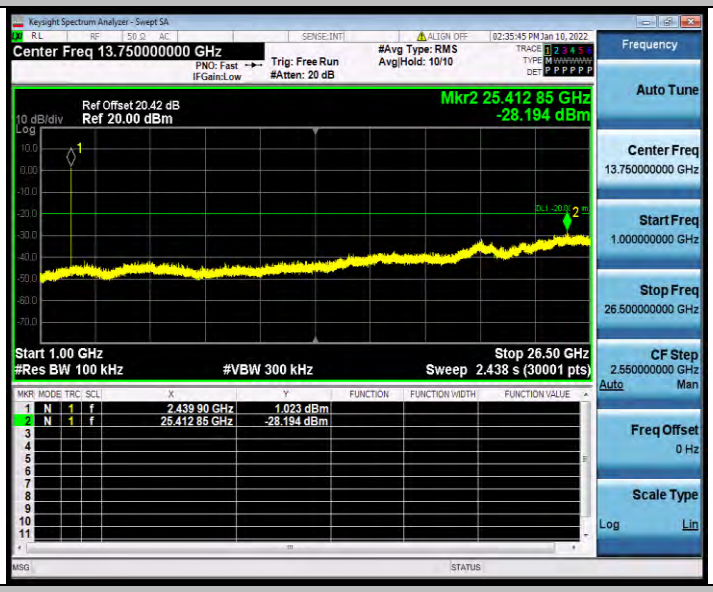


BLE_1M_Ant1_2402_1000~26500

BLE_1M_Ant1_2440_0~Reference

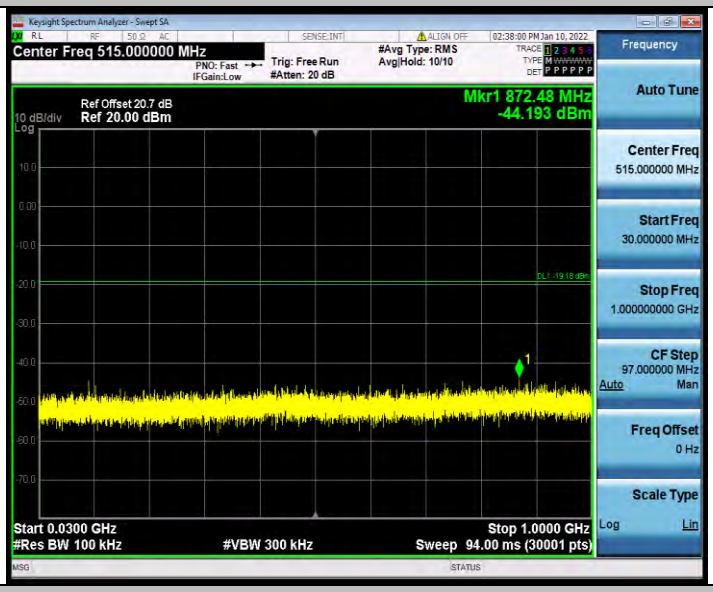


BLE_1M_Ant1_2440_30~1000



BLE_1M_Ant1_2440_1000~26500

BLE_1M_Ant1_2480_0~Reference



BLE_1M_Ant1_2480_30~1000

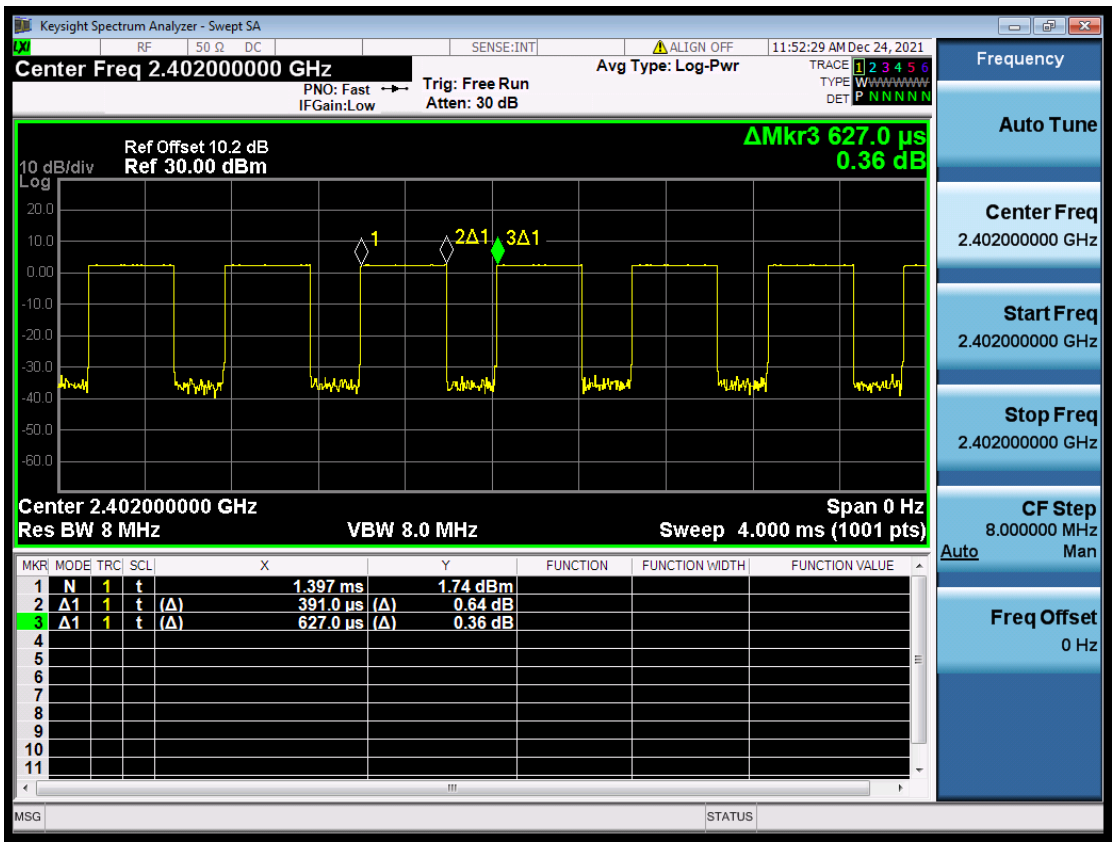
BLE_1M_Ant1_2480_1000~26500

DUTY CYCLE

TEST RESULT

TestMode	Antenna	Channel	Duty Cycle
BLE_1M	Ant1	2402	62.36%

TEST GRAPHS



BLE_1M_Ant1_2402