

VARIANT FCC TEST REPORT

(Part 15, Subpart C)

Applicant:	Honeywell International Inc
Address:	9680 Old Bailes Road, Fort Mill, SC 29707 United States

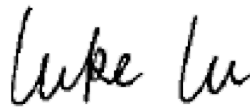
Manufacturer or Supplier:	Honeywell International Inc
Address:	9680 Old Bailes Road, Fort Mill, SC 29707 United States
Product:	Mobile Computer
Brand Name:	Honeywell
Model Name:	CT45-L0N
FCC ID:	HD5-CT45L0N
Date of tests:	Oct, 09, 2025 ~ Dec. 12, 2025

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

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

☒ **ANSI C63.10-2020**

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

Prepared by Hanwen Xu Engineer / Mobile Department	Approved by Luke Lu Manager / Mobile Department
	
Date: Dec. 12, 2025	Date: Dec. 12, 2025

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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RFBGDJ-W7L-P21060011-4	Original release	Jul. 02, 2021
PSU-QBJ2512030314RF01	Based on the original report, the new product add alternate parts, the electrical specs of the alternate part is equivalent to the current part. This report verify power, CE and RSE worst case. The verify results of conducted power are similar or lower. So this report update the SW version, updates CE and the low frequency data and the high frequency data (8DPSK_CH0) of RSE, other data please refer to original report.	Dec. 12, 2025



1 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC Part 15, Subpart C		
STANDARD	TEST TYPE AND LIMIT	RESULT
15.207	AC Power Conducted Emission	Compliance
15.247(a)(1)(iii)	Number of Hopping Frequency Used	See note
15.247(a)(1)(iii)	Dwell Time on Each Channel	See note
15.247(a)(1)	1. Hopping Channel Separation 2. Spectrum Bandwidth of a Frequency Hopping Sequence Spread Spectrum System	See note
15.247(b)	Maximum Peak Output Power	See note
15.247(d)&15.209	Transmitter Radiated Emissions	Compliance
15.247(d)	Out of band Measurement	See note
15.203	Antenna Requirement	See note

NOTE:

1. If the Frequency Hopping System operating in 2400-2483.5MHz band and the output power less than 125mW. The hopping channel carrier frequencies separated by a minimum of 25kHz or two-thirds of the 20dB bandwidth of hopping channel whichever is greater.
2. The system shall hop to channel frequencies that are selected at the system hopping rate from a pseudo randomly ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.
3. Please refer to report RFBGDJ-W7L-P21060011-4 (FCC ID: HD5-CT45L0N).

*Test Lab Information Reference

Lab A:

Huarui 7Layers High Technology (Suzhou) Co., Ltd.

Lab Address:

Tower N, Innovation Center, 88 Zuyi Road, High-tech District, Suzhou City, Anhui Province, China

Accredited Test Lab Cert 6613.01

The FCC Site Registration No. is 434559; The Designation No. is CN1325.

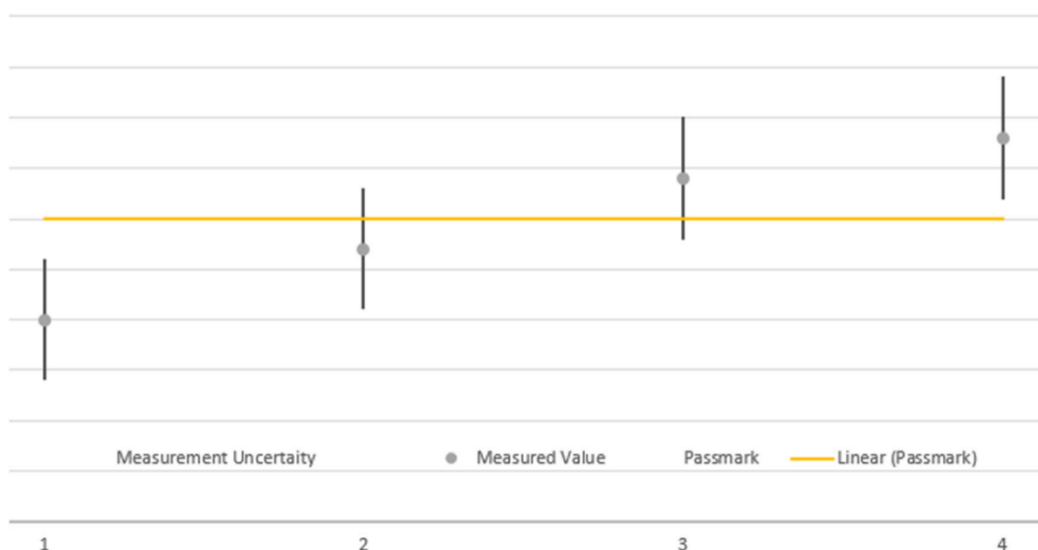


1.1 MEASUREMENT UNCERTAINTY

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	$\pm 2.70\text{dB}$
Radiated emissions (9KHz~30MHz)	$\pm 2.68\text{dB}$
Radiated emissions (30MHz~1GHz)	$\pm 4.98\text{dB}$
Radiated emissions (1GHz ~6GHz)	$\pm 4.70\text{dB}$
Radiated emissions (6GHz ~18GHz)	$\pm 4.60\text{dB}$
Radiated emissions (18GHz ~40GHz)	$\pm 4.12\text{dB}$
Conducted emissions	$\pm 4.01\text{dB}$
Occupied Channel Bandwidth	$\pm 43.58\text{KHz}$
Conducted Output power	$\pm 2.06\text{dB}$
Power Spectral Density	$\pm 0.85\text{ dB}$

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



The verdicts in this test report are given according the above diagram:

Case	Measured Value	Uncertainty Range	Verdict
1	below pass mark	below pass mark	Passed
2	below pass mark	within pass mark	Passed
3	above pass mark	within pass mark	Failed
4	above pass mark	above pass mark	Failed

That means, the laboratory applies, as decision rule (see ISO/IEC 17025:2017), the so-called shared risk principle.



2 GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

PRODUCT*	Mobile Computer
BRAND NAME*	Honeywell
MODEL NAME*	CT45-L0N
NOMINAL VOLTAGE*	5Vdc (adapter) 3.85Vdc (Lithium-ion cell, battery)
MODULATION TECHNOLOGY	FHSS
MODULATION TYPE	GFSK, $\pi/4$ -DQPSK, 8DPSK
OPERATING FREQUENCY	2402MHz~2480MHz
NUMBER OF CHANNEL	79
MAX. OUTPUT POWER	4.59mW (Max. Measured)
ANTENNA GAIN*	☒ Provided by client 1.4dBi
ANTENNA TYPE*	LDS type Antenna
HW VERSION*	V1.0
SW VERSION*	311.C0.00.0343-N
I/O PORTS*	Refer to user's manual
CABLE SUPPLIED*	USB cable: shielded without ferrite, 1.25 meter Earphone cable: unshielded without ferrite, 1.27 meter

NOTE:

1. *Since the above data and/or information is provided by the client relevant results or conclusions of this report are only made for these data and/or information, Test Lab is not responsible for the authenticity, integrity and results of the data and information and/or the validity of the conclusion.
2. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.
3. For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report.
4. Antenna gain and EUT conducted cable loss are provided by the customer, and the laboratory will record the results based on these items that involve these two parameters.



5. This product includes the following four SKU which hardware is exactly same, the difference is described as following, Sample 1 was full test, sample 2 verify the worst case, check worst case Radiated emission;

SAMPLE	EUT CONFIGURATION INFORMATION
1	SKU ID:CT45-L0N-27D100G ,Assembled Scanner Imager: 7-S0703
2	SKU ID:CT45-L0N-28D100G ,Assembled Scanner Imager: 8 - N6308/S0803
3	SKU ID: CT45-L0N-28D200G, The device is same #2, only software is none GMS package
4	SKU ID: CT45-L0N-27D200G, The device is same #1, only software is none GMS package

6. List of Accessory:

ACCESSORIES	BRAND	MODEL	SPECIFICATION
Battery	Honeywell	CT50-BTSC	Capacity : 3.85vdc 4020mAh
AC Adapter	HONOR	ADS-12B-06 05010E	I/P:100-240Vac, 0.3A O/P: 5Vdc, 2A
USB Cable	Honeywell	CT40-SN	Shielded, 1.25meter
Earphone	Honeywell	PTE-300N 3.5L	Shielded, 1.27meter



2.2 DESCRIPTION OF TEST MODES

79 channels are provided to this EUT:

CHANNEL	FREQ. (MHz)	CHANNEL	FREQ. (MHz)	CHANNEL	FREQ. (MHz)	CHANNEL	FREQ. (MHz)
0	2402	20	2422	40	2442	60	2462
1	2403	21	2423	41	2443	61	2463
2	2404	22	2424	42	2444	62	2464
3	2405	23	2425	43	2445	63	2465
4	2406	24	2426	44	2446	64	2466
5	2407	25	2427	45	2447	65	2467
6	2408	26	2428	46	2448	66	2468
7	2409	27	2429	47	2449	67	2469
8	2410	28	2430	48	2450	68	2470
9	2411	29	2431	49	2451	69	2471
10	2412	30	2432	50	2452	70	2472
11	2413	31	2433	51	2453	71	2473
12	2414	32	2434	52	2454	72	2474
13	2415	33	2435	53	2455	73	2475
14	2416	34	2436	54	2456	74	2476
15	2417	35	2437	55	2457	75	2477
16	2418	36	2438	56	2458	76	2478
17	2419	37	2439	57	2459	77	2479
18	2420	38	2440	58	2460	78	2480
19	2421	39	2441	59	2461		



2.2.1 CONFIGURATION OF SYSTEM UNDER TEST

Please see section 4 photograph 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 X axis for radiated emission.

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

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

Where **RE<1G**: Radiated Emission below 1GHz

PLC: Power Line Conducted Emission

RE≥1G: Radiated Emission above 1GHz

APCM: Antenna Port Conducted Measurement

RADIATED EMISSION TEST (BELOW 1 GHz):

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, XYZ axis, antenna ports (if EUT with antenna diversity architecture) and packet type.
- ☒ The following channel(s) was (were) selected for the final test as listed below.

EUT CONFIGURE MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	PACKET TYPE
-	0 to 78	0	FHSS	8DPSK	3DH5

RADIATED EMISSION TEST (ABOVE 1 GHz):

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, XYZ axis, antenna ports (if EUT with antenna diversity architecture) and packet type.
- ☒ The following channel(s) was (were) selected for the final test as listed below.

EUT CONFIGURE MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	PACKET TYPE
-	0 to 78	0	FHSS	8DPSK	3DH5

**POWER LINE CONDUCTED EMISSION TEST:**

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, antenna ports (if EUT with antenna diversity architecture) and packet type.
- ☒ Following channel(s) was (were) selected for the final test as listed below.

EUT CONFIGURE MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	PACKET TYPE
-	0 to 78	0	FHSS	8DPSK	3DH5

<u>TEST CONDITION</u>			
APPLICABLE TO	ENVIRONMENTAL CONDITIONS	TEST VOLTAGE (SYSTEM)	TESTED BY
PLC	23deg. C, 70%RH	DC 5.0V By Adapter	Hanwen Xu
RE<1G	23deg. C, 70%RH	DC 5.0V By Adapter	Hanwen Xu
RE≥1G	23deg. C, 70%RH	DC 5.0V By Adapter	Hanwen Xu



2.3 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

ANSI C63.10-2020

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.

2.4 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	Laptop	Lenovo	Thinkpad E14	SL10W47313	N/A
2	PC Adapter	Lenovo	ADLX65YCC3D	N/A	N/A

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	USB Line: Shielded, Detachable 1.25m;
2	PC USB Line: Unshielded, Detachable, 1.0m;



3 TEST TYPES AND RESULTS

3.1 CONDUCTED EMISSION MEASUREMENT

3.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY OF EMISSION (MHz)	CONDUCTED LIMIT (dB μ V)	
0.15 ~ 0.5	Quasi-peak	Average
0.5 ~ 5	66 to 56	56 to 46
5 ~ 30	56	46
	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	102749	Mar.28,24	Mar.27,26
ELEKTRA test software	Rohde&Schwarz	ELEKTRA	NA	N/A	N/A
LISN network	Rohde&Schwarz	ENV216	102640	Mar.28,24	Mar.27,26
CABLE	Rohde&Schwarz	W61.01	N/A	Apr.26,25	Apr.25,26
CABLE	Rohde&Schwarz	W601	N/A	Apr.26,25	Apr.25,26

NOTE:

1. The test was performed in CE shielded room.
2. The calibration interval of the above test instruments is 12 /24 months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.

3.1.3 TEST PROCEDURES

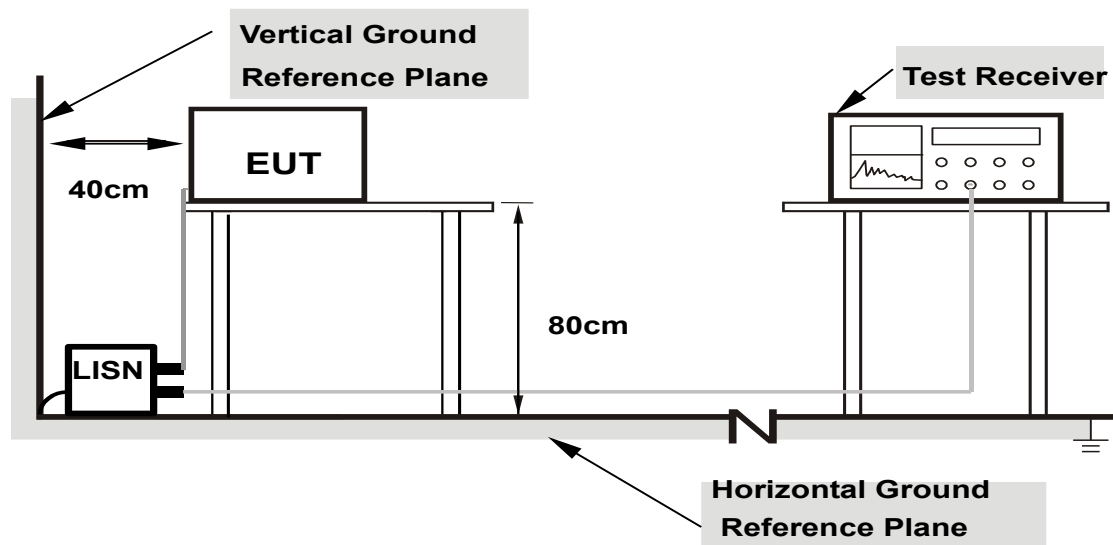
- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling 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.



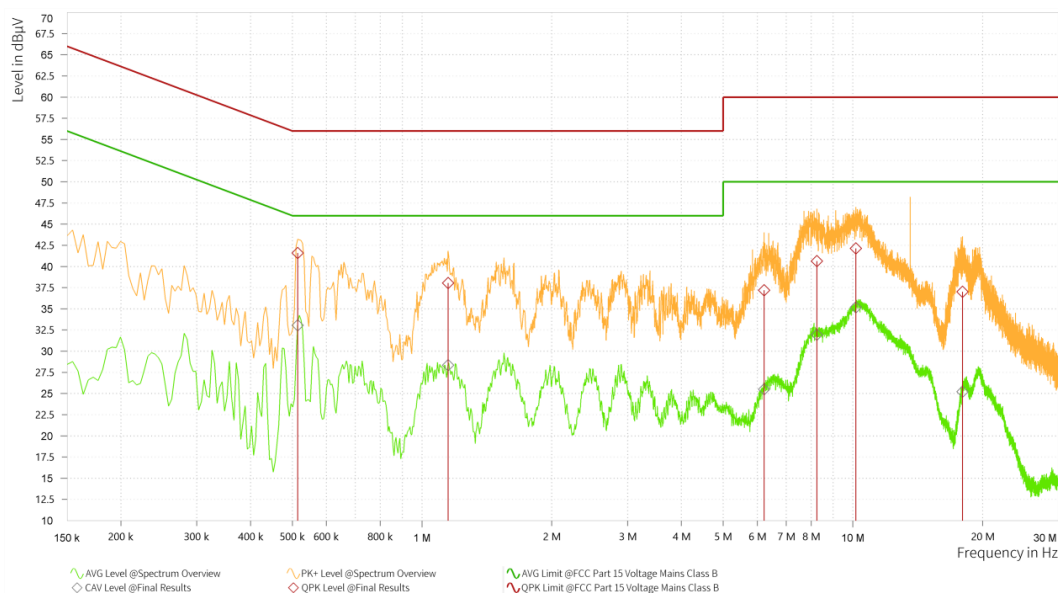
3.1.7 TEST RESULTS

CONDUCTED WORST-CASE DATA			
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	Hanwen Xu		

Rg	Frequency [MHz]	QPK Level [dBμV]	QPK Limit [dBμV]	QPK Margin [dB]	CAV Level [dBμV]	CAV: AVG Limit [dBμV]	CAV Margin [dB]	Correction [dB]	Line	Meas. BW [kHz]
1	0.515	41.59	56.00	14.41	33.04	46.00	12.96	9.75	L1	9.000
1	1.149	38.06	56.00	17.94	28.35	46.00	17.65	9.77	L1	9.000
1	6.225	37.19	60.00	22.81	25.51	50.00	24.49	10.32	L1	9.000
1	8.250	40.63	60.00	19.37	31.95	50.00	18.05	10.67	L1	9.000
1	10.158	42.13	60.00	17.87	35.17	50.00	14.83	11.02	L1	9.000
1	17.975	37.02	60.00	22.98	25.22	50.00	24.78	13.02	L1	9.000

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.



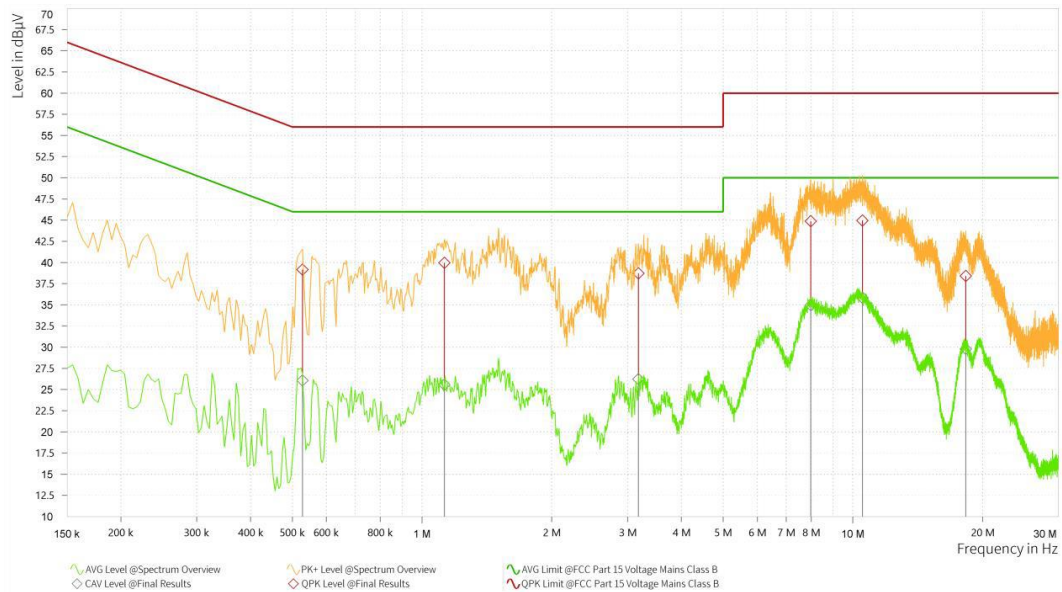


FREQUENCY RANGE	150KHz ~ 30MHz	DETECTOR FUNCTION & RESOLUTION BANDWIDTH	Quasi-Peak (QP) / Average (AV), 9 kHz
INPUT POWER	120Vac, 60Hz	ENVIRONMENTAL CONDITIONS	26deg. C, 51%RH
TESTED BY	Hanwen Xu		

Rg	Frequency [MHz]	QPK Level [dBμV]	QPK Limit [dBμV]	QPK Margin [dB]	CAV Level [dBμV]	CAV: AVG Limit [dBμV]	CAV Margin [dB]	Correction [dB]	Line	Meas. BW [kHz]
1	0.528	39.16	56.00	16.84	26.07	46.00	19.93	9.75	N	9.000
1	1.127	39.97	56.00	16.03	25.59	46.00	20.41	9.77	N	9.000
1	3.179	38.73	56.00	17.27	26.22	46.00	19.78	9.97	N	9.000
1	7.980	44.87	60.00	15.13	34.97	50.00	15.03	10.62	N	9.000
1	10.523	44.94	60.00	15.06	35.84	50.00	14.16	11.12	N	9.000
1	18.285	38.41	60.00	21.59	29.79	50.00	20.21	13.10	N	9.000

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 AND BANDEDGE MEASUREMENT

3.2.1 LIMITS OF RADIATED EMISSION AND BANDEDGE 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). 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. 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.
Pre-Amplifier	R&S	SCU18F1	100815	Aug.29,25	Aug.28,27
Pre-Amplifier	R&S	SCU08F1	101028	Jan.22,24	Jan.21,26
Signal Generator	R&S	SMB100A	182185	Mar.29,24	Mar.28,26
3m Fully-anechoic Chamber	TDK	9m*6m*6m	HRSW-SZ-EMC-01Chamber	Nov.24,22	Nov.23,25
3m Fully-anechoic Chamber	TDK	9m*6m*6m	HRSW-SZ-EMC-01Chamber	Nov.23,25	Nov.22,28
3m Semi-anechoic Chamber	TDK	9m*6m*6m	HRSW-SZ-EMC-02Chamber	Aug.20,25	Aug.19,28
EMI TEST Receiver	R&S	ESW44	101973	Mar.28,24	Mar.27,26
Bilog Antenna	SCHWARZBECK	VULB 9163	1264	Jul.04,25	Jul.03,27
Horn Antenna	ETS-LINDGREN	3117	227836	Aug.20,25	Aug.19,27
Horn Antenna (18GHz-40GHz)	Steatite Q-par Antennas	QMS 00880	23486	Jul.15,24	Jul.14,26
Horn Antenna	Steatite Q-par Antennas	QMS 00208	23485	Mar.22,25	Mar.21,27
Loop Antenna	SCHWARZ	HFH2-Z2/Z2E	100976	Jul.08,25	Jul.07,27
WIDEBANDRADIO COMMUNICATION TESTER	R&S	CMW500	169399	Jun.19,24	Jun.18,26
Test Software	ELEKTRA	ELEKTRA4.32	N/A	N/A	N/A
Open Switch and Control Unit	R&S	OSP220	101964	N/A	N/A
DC Source	HYELEC	HY3010B	551016	Jul.31,25	Jul.30,27
Hygrothermograph	DELI	20210528	SZ014	Mar.18,25	Mar.17,27
6DB attenuator	Tonscend Technology Co., Ltd	N/A	23062787	N/A	N/A
PC	LENOVO	E14	HRSW0024	N/A	N/A
TMC-AMI18843A(CABLE)	R&S	HF290-NMNM-7.00M	N/A	N/A	N/A
TMC-AMI18843A(CABLE)	R&S	HF290-NMNM-4.00M	N/A	N/A	N/A
CABLE	R&S	W13.02	N/A	Apr.26,25	Apr.25,26
CABLE	R&S	W12.14	N/A	Apr.26,25	Apr.25,26

NOTE:

1. The calibration interval of the above test instruments is 12/ 24/ 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 434559; The Designation No. is CN1325.



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 at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz for Average detection (AV) at frequency above 1GHz.
4. If the dwell time per channel of the hopping signal is less than 100 ms, then the reading obtained with the 10 Hz VBW may be further adjusted by a “duty cycle correction factor”, derived from $20\log(\text{dwell time}/100 \text{ ms})$, in an effort to demonstrate compliance with the 15.209 limit.
5. All modes of operation were investigated and the worst-case emissions are reported.

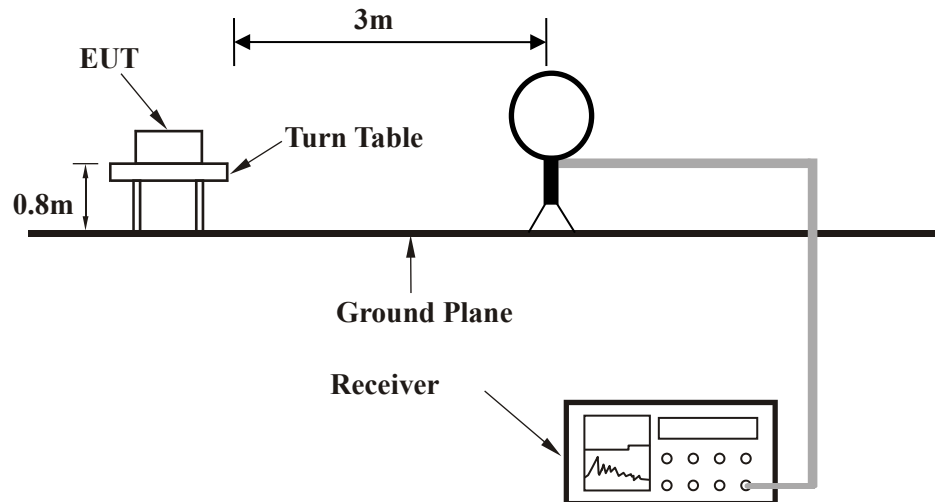
3.2.4 DEVIATION FROM TEST STANDARD

No deviation.

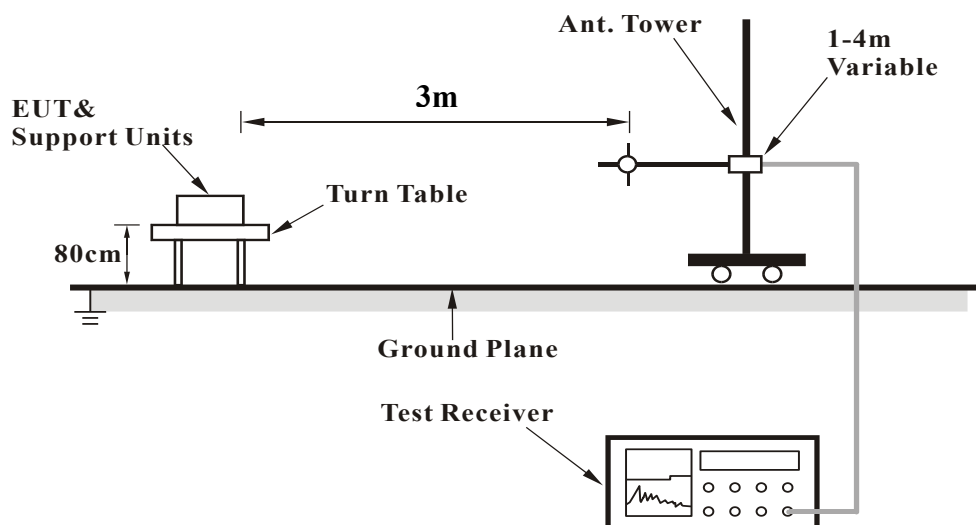


3.2.5 TEST SETUP

<Frequency Range 9KHz~30MHz >

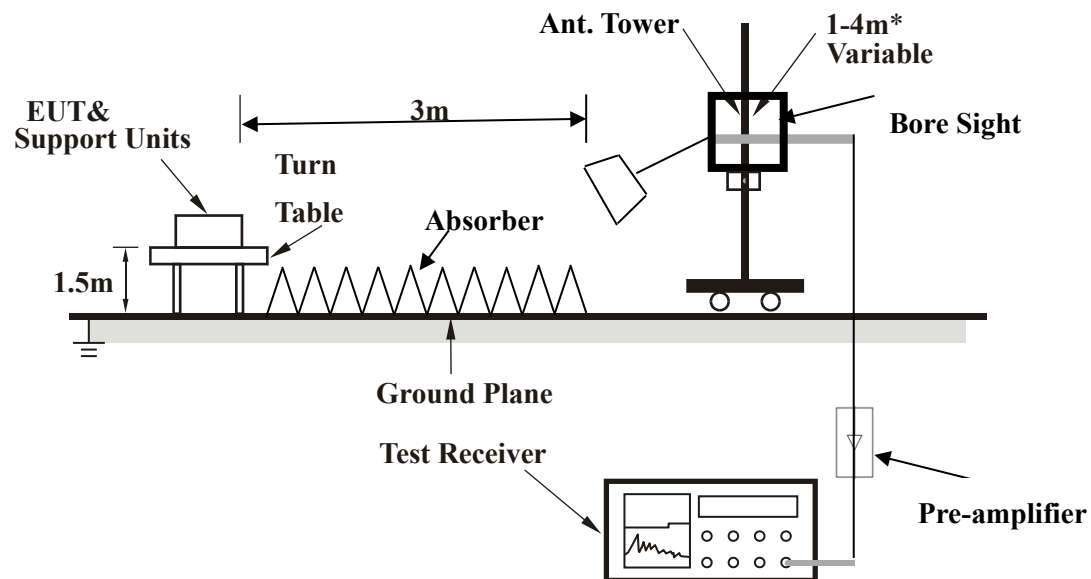


< Frequency Range 30MHz~1GHz >





<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

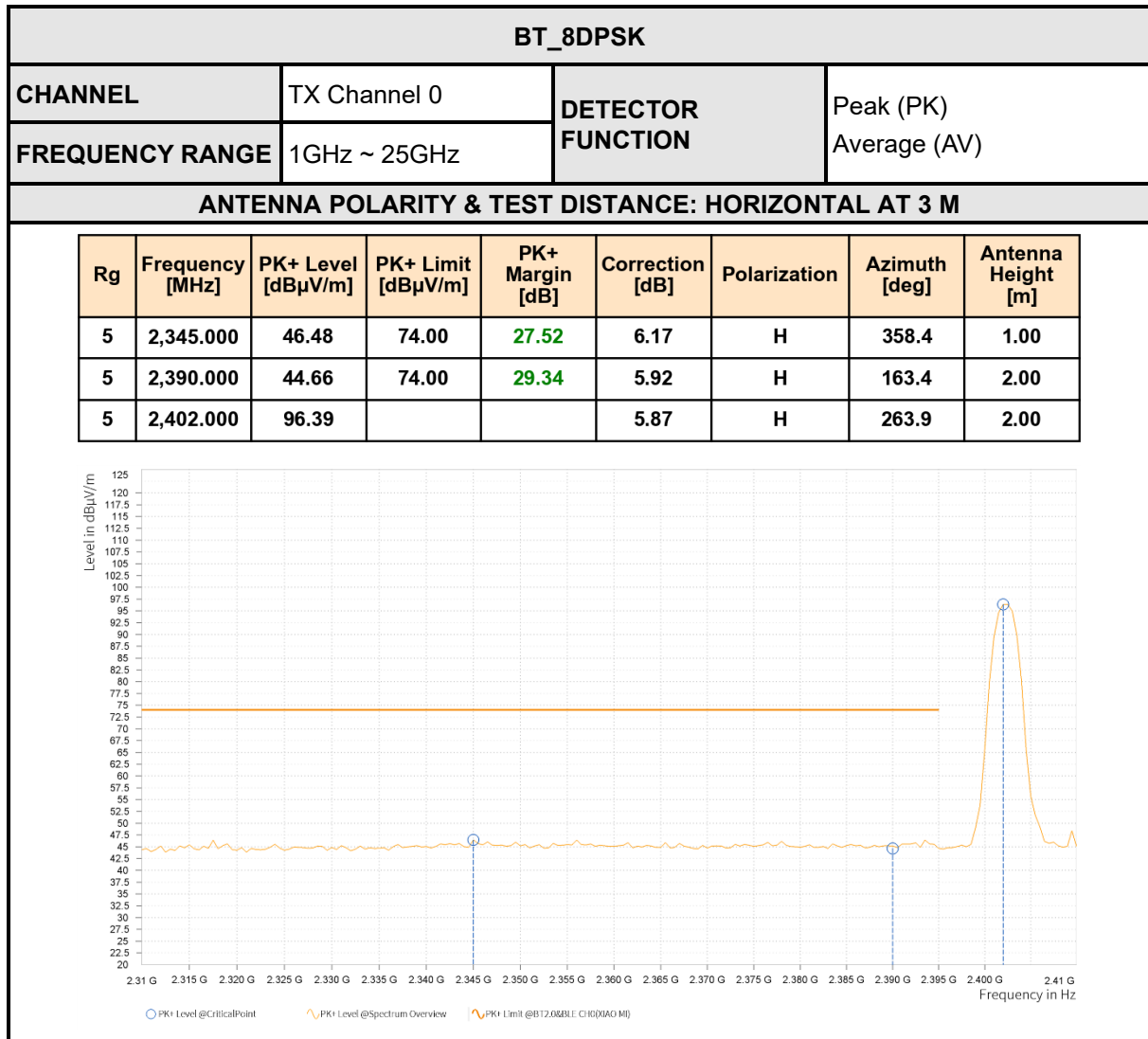
- Set the EUT under full load condition and placed them on a testing table.
- Set the transmitter part of EUT under transmission condition continuously at specific channel frequency.
- The necessary accessories enable the EUT in full functions.



3.2.7 TEST RESULTS

NOTE : The 9K~30MHz amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required in the report.

BANDEDGE MEASUREMENT





ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

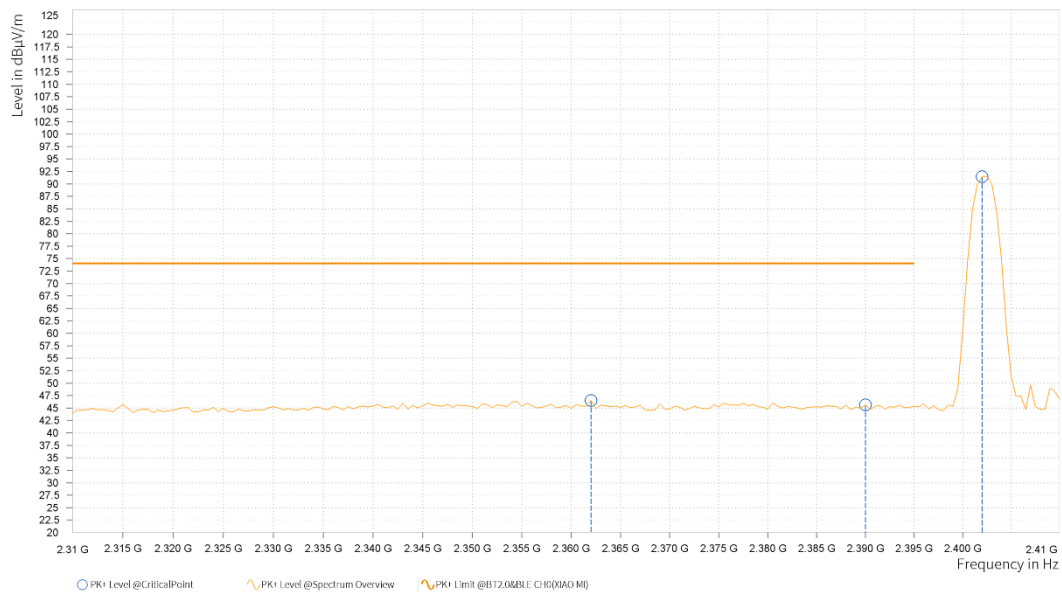
Rg	Frequency [MHz]	AVG Level [dBμV/m]	AVG Limit [dBμV/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
5	2,358.000	31.27	54.00	22.73	6.19	H	261.5	2.00
5	2,390.000	31.10	54.00	22.90	5.97	H	158.6	2.00
5	2,402.500	87.62			5.87	H	261.5	2.00





ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

Rg	Frequency [MHz]	PK+ Level [dBμV/m]	PK+ Limit [dBμV/m]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
5	2,362.000	46.53	74.00	27.47	6.17	V	5.5	1.00
5	2,390.000	45.62	74.00	28.38	5.97	V	358.6	1.00
5	2,402.000	91.47			5.87	V	59.5	2.00





ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

Rg	Frequency [MHz]	AVG Level [dBμV/m]	AVG Limit [dBμV/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
5	2,342.500	31.43	54.00	22.57	6.13	V	157.5	2.00
5	2,390.000	31.45	54.00	22.55	5.97	V	100.9	1.00
5	2,402.000	82.47			5.87	V	54.8	2.00



REMARKS:

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
2. Margin value = Limit value – Emission level.
3. 2402MHz: Fundamental frequency.



RADIATED EMISSION

BELOW 1GHz WORST-CASE DATA

BT_8DPSK

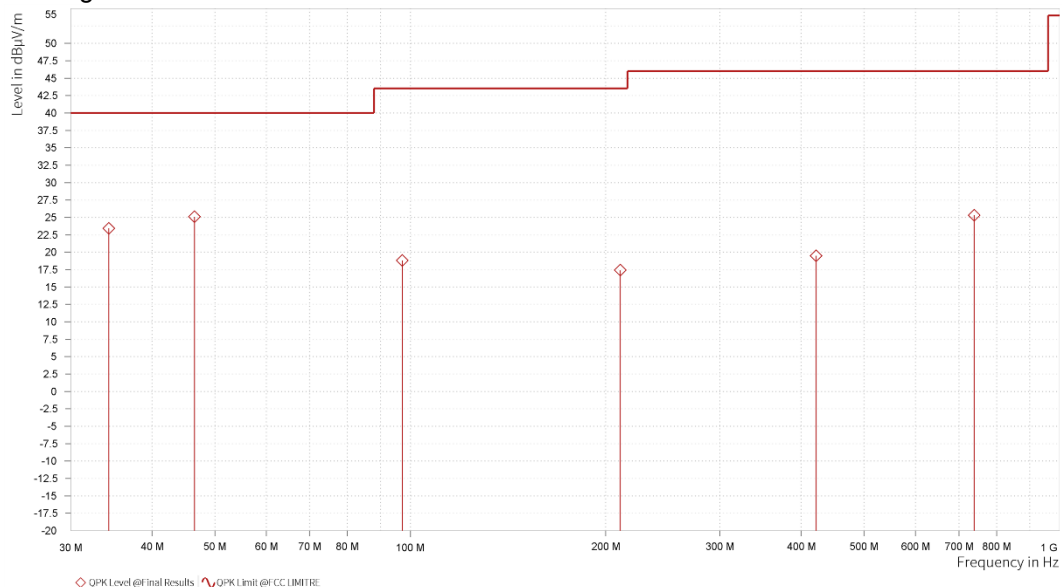
CHANNEL	Channel 0	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

Rg	Frequency [MHz]	QPK Level [dBμV/m]	QPK Limit [dBμV/m]	QPK Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]	Meas. BW [kHz]
1	34.317	23.42	40.00	16.58	-12.84	H	333.3	2.00	120.000
1	46.490	25.08	40.00	14.92	-10.21	H	23.7	2.00	120.000
1	97.221	18.82	43.50	24.68	-12.53	H	0.9	2.00	120.000
1	210.517	17.40	43.50	26.10	-11.47	H	4.8	1.00	120.000
1	421.541	19.47	46.00	26.53	-3.91	H	306.4	1.00	120.000
1	738.925	25.29	46.00	20.71	-0.49	H	1	1.00	120.000

REMARKS:

1. Emission Level(dBuV/m) = Read Level(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 = Limit value – Emission level.





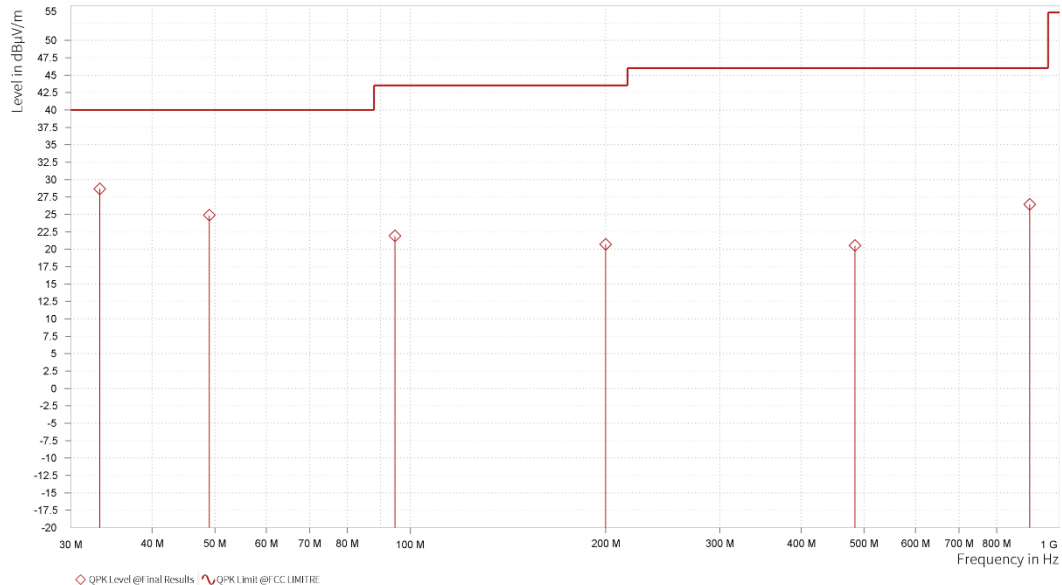
CHANNEL	Channel 0	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

Rg	Frequency [MHz]	QPK Level [dBμV/m]	QPK Limit [dBμV/m]	QPK Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]	Meas. BW [kHz]
1	33.250	28.66	40.00	11.34	-13.02	V	155.8	1.00	120.000
1	49.012	24.87	40.00	15.13	-10.01	V	1	1.00	120.000
1	94.699	21.89	43.50	21.61	-13.11	V	359.1	1.00	120.000
1	199.993	20.70	43.50	22.80	-11.12	V	326.7	1.00	120.000
1	484.251	20.51	46.00	25.49	-3.96	V	1	1.00	120.000
1	899.799	26.44	46.00	19.56	1.90	V	4.8	1.00	120.000

REMARKS:

1. Emission Level(dBuV/m) = Read Level(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 = Limit value – Emission level.





ABOVE 1GHz WORST-CASE DATA

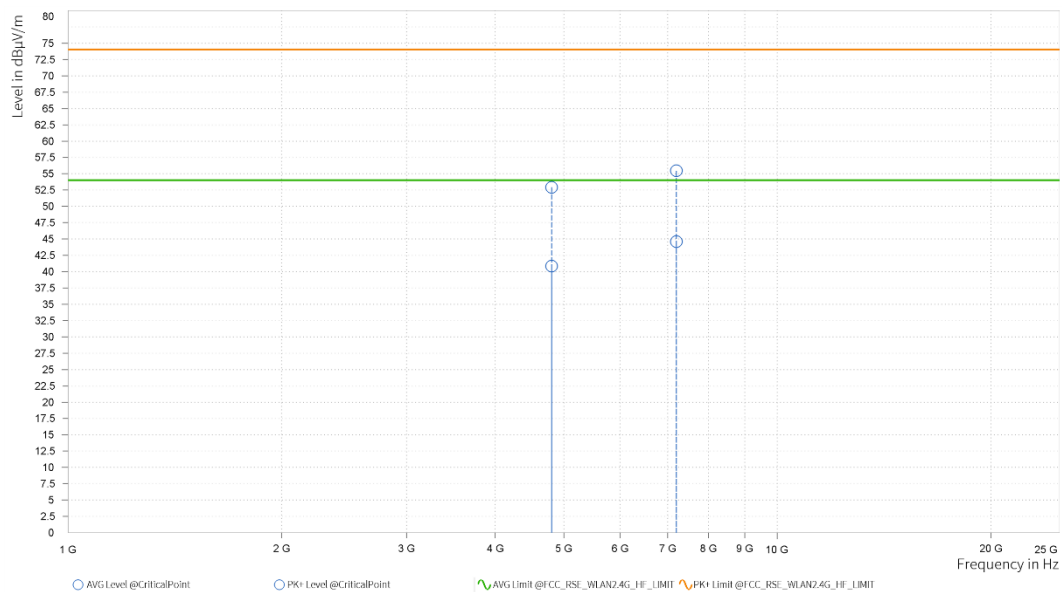
Note: All other emissions that greater than 20dB below the limit were not recorded.

BT_8DPSK

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

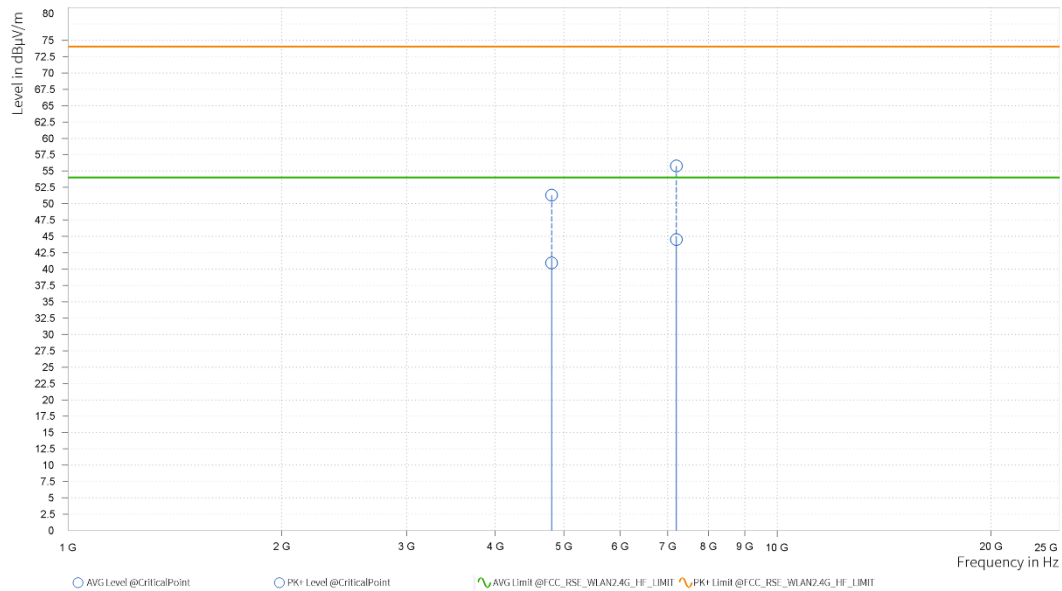
Rg	Frequency [MHz]	PK+ Level [dBμV/m]	PK+ Limit [dBμV/m]	PK+ Margin [dB]	AVG Level [dBμV/m]	AVG Limit [dBμV/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
2	4,804.000	52.93	74.00	21.07	40.86	54.00	13.14	15.70	H	271.1	2.00
2	7,206.000	55.45	74.00	18.55	44.61	54.00	9.39	21.05	H	271.1	2.00





ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

Rg	Frequency [MHz]	PK+ Level [dBμV/m]	PK+ Limit [dBμV/m]	PK+ Margin [dB]	AVG Level [dBμV/m]	AVG Limit [dBμV/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
2	4,804.000	51.30	74.00	22.70	40.94	54.00	13.06	15.70	V	15.5	2.00
2	7,206.000	55.77	74.00	18.23	44.53	54.00	9.47	21.05	V	0.9	2.00



REMARKS:

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
2. Margin value = Limit value – Emission level.
3. 2402MHz: Fundamental frequency.



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.



Test Report No.: PSU-QBJ2512030314RF01

6 APPENDIX: THE ORIGINAL REPORT

RADIO TEST REPORT

(FCC Part 15 Subpart C / IC RSS-247)

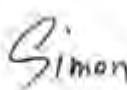
Applicant:	Honeywell International Inc Honeywell Safety and Productivity Solutions
Address:	9680 Old Bailes Road, Fort Mill, SC 29707 United States

Manufacturer:	Honeywell International Inc Honeywell Safety and Productivity Solutions
Address:	9680 Old Bailes Road, Fort Mill, SC 29707 United States
Product:	Mobile Computer
Brand Name:	Honeywell
Model Name:	CT45-L0N
FCC ID:	HD5-CT45L0N
Date of tests:	2021-06-11 to 2021-07-01

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

☒ **Part 15 Subpart C §15. 247 / IC RSS-247 issue 2**

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

Prepared by Simon Wang Engineer / Mobile Department	Approved by Luke Lu Manager / Mobile Department
 Date: Jul. 02, 2021	 Date: Jul. 02, 2021

This report is governed by, and incorporates by reference, CPS Conditions of Service as posted at the date of issuance of this report at <http://www.bureauveritas.com/home/about-us/our-business/cps/about-us/terms-conditions> and is intended for your exclusive use. Any copying or replication of this report to or for any other person or entity, or use of our name or trademark, is permitted only with our prior written permission. This report sets forth our findings solely with respect to the test samples identified herein. The results set forth in this report are not indicative or representative of the quality or characteristics of the lot from which a test sample was taken or any similar or identical product unless specifically and expressly noted. Our report includes all of the tests requested by you and the results thereof based upon the information that you provided to us. Measurement uncertainty is only provided upon request for accredited tests. You have 60 days from date of issuance of this report to notify us of any material error or omission caused by our negligence or if you require measurement uncertainty; provided, however, that such notice shall be in writing and shall specifically address the issue you wish to raise. A failure to raise such issue within the prescribed time shall constitute you unqualified acceptance of the completeness of this report, the tests conducted and the correctness of the report contents.

Report Revise Record

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	2021.07.02	Valid	Original Report

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Summary of Test Result

FCC Rule	IC Rule	Description	Limit	Result	Remark
15.247(a)(1)	RSS-247 5.1(a)	20dB Bandwidth	NA	Pass	-
-	RSS-Gen 6.7	99% Bandwidth	-	Pass	-
15.247(a)(1)	RSS-247 5.1(b)	Hopping Channel Separation	$\geq 2/3$ of 20dB BW	Pass	-
15.247(a)(1)	RSS-247 5.1(d)	Number of Channels	≥ 15 Chs	Pass	-
15.247(a)(1)	RSS-247 5.1(d)	Average Time of Occupancy	≤ 0.4 sec in 31.6sec period	Pass	-
15.247(b)(1)	RSS-247 5.4(b)	Peak Output Power	≤ 125 mW	Pass	-
15.247(d)	RSS-247 5.5	Conducted Band Edges	≤ 20 dBc	Pass	-
15.247(d)	RSS-247 5.5	Conducted Spurious Emission	≤ 20 dBc	Pass	-
15.247(d)	RSS-247 5.5	Radiated Band Edges and Radiated Spurious Emission	15.209(a) & 15.247(d)	Pass	Under limit 9.08 dB at 9764 MHz
15.207	RSS-Gen 8.8	AC Conducted Emission	15.207(a)	Pass	Under limit 17.16 dB at 0.497 MHz
15.203 & 15.247(b)	RSS-Gen 6.8	Antenna Requirement	15.203 & 15.247(b) RSS-GEN 6.8	Pass	-

1 Test Laboratory

1.1 Test facility

Please refer to chapter 5(P50/51)

2 General Description

2.1 Applicant

Honeywell International Inc
Honeywell Safety and Productivity Solutions
9680 Old Bailes Road, Fort Mill, SC 29707 United States

2.2 Manufacturer

Honeywell International Inc
Honeywell Safety and Productivity Solutions
9680 Old Bailes Road, Fort Mill, SC 29707 United States

2.3 General Description Of EUT

Product	Mobile Computer
Model No.	CT45-L0N
Additional NO.	N/A
Difference Description	N/A
Power Supply	3.85Vdc for EUT
Modulation Technology	FHSS
Modulation Type	GFSK, 8DPSK, $\pi/4$ DQPSK
Operating Frequency	2402MHz~2480MHz
Number Of Channel	79
Max. Output Power	Bluetooth BR(1Mbps) : 6.62 dBm (0.0046W) Bluetooth BR(2Mbps) : 5.70 dBm (0.0037W) Bluetooth BR(3Mbps) : 6.08 dBm (0.0041W)
Max. e.i.r.p.	8.02 dBm (0.0063W)
Antenna Type	LDS type Antenna with 1.4dBi gain
HW Version	V1.0
SW Version	OS.11.001
I/O Ports	Refer to user's manual
Cable Supplied	N/A

NOTE:

1. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.
2. For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report.

2.4 Modification of EUT

No modifications are made to the EUT during all test items.

2.5 Applicable Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- ♦ FCC Part 15 Subpart C §15.247
- ♦ ANSI C63.10-2013
- ♦ IC RSS-247 Issue 2
- ♦ IC RSS-Gen Issue 5
- ♦ KDB 558074 D01 15.247 Meas Guidance v05r02

Remark:

1. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B&ICES-003, recorded in a separate test report.

3 Test Configuration of Equipment Under Test

3.1 Descriptions of Test Mode

The transmitter has a maximum peak conducted output power as follows:

Mode	Channel	Frequency	Bluetooth RF Output Power
GFSK	Ch00	2402MHz	4.75
	Ch39	2441MHz	5.4
	Ch78	2480MHz	6.62
4 π -DQPSK	Ch00	2402MHz	3.78
	Ch39	2441MHz	4.43
	Ch78	2480MHz	5.7
8DPSK	Ch00	2402MHz	4.15
	Ch39	2441MHz	4.87
	Ch78	2480MHz	6.08

Remark:

1. All the test data for each data rate were verified, but only the worst case was reported.
2. The data rate was set in 1Mbps for all the test items due to the highest RF output power.

3.2 Test Mode

3.2.1 Antenna Port Conducted Measurement

Summary table of Test Cases			
Test Item	Data Rate / Modulation		
	Bluetooth BR 1Mbps GFSK	Bluetooth EDR 2Mbps $\pi/4$ -DQPSK	Bluetooth EDR 3Mbps 8-DPSK
Conducted Test Cases	Mode 1: CH00_2402 MHz	Mode 4: CH00_2402 MHz	Mode 7: CH00_2402 MHz
	Mode 2: CH39_2441 MHz	Mode 5: CH39_2441 MHz	Mode 8: CH39_2441 MHz
	Mode 3: CH78_2480 MHz	Mode 6: CH78_2480 MHz	Mode 9: CH78_2480 MHz

3.2.2 Radiated Emission Test (Below 1GHz)

Radiated	Bluetooth BR 1Mbps GFSK
Test Cases	Mode 1: CH00_2402MHz

Note : 1. Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, XYZ axis, antenna ports (if EUT with antenna diversity architecture) and packet type. Y orientation was worst-case orientation; therefore, all final radiated testing was performed with the EUT in Y orientation.

2. Following channel(s) was (were) selected for the final test as listed above

3.2.3 Radiated Emission Test (Above 1GHz)

Radiated	Bluetooth BR 1Mbps GFSK
Test Cases	Mode 1: CH00_2402 MHz Mode 2: CH39_2441 MHz Mode 3: CH78_2480 MHz

Note : 1. The fundamental of the EUT was investigated in three orthogonal orientations X, Y and Z it was determined that Y orientation was worst-case orientation; therefore, all final radiated testing was performed with the EUT in Y orientation.

2. Following channel(s) was (were) selected for the final test as listed above

3. For frequency above 18GHz, the measured value is much lower than the limit, therefore, it is not reflected in the report.

3.2.4 Power Line Conducted Emission Test:

AC Conducted Emission	Mode 1 : BT Linking + Earphone + Adapter
-----------------------------	--



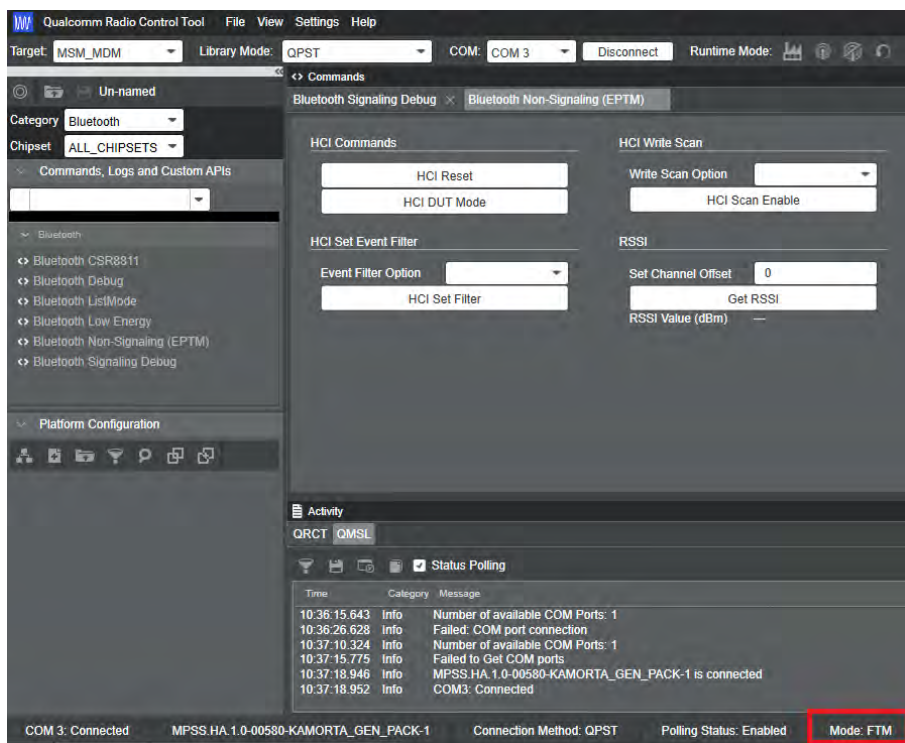
3.3 Support Equipment

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	WLAN AP	NETGEAR	R7800	PY315100319	N/A	shielded, 1.8 m
2.	Notebook	Lenovo	E470C	FCC sDoC	N/A	shielded cable DC O/P 1.8 m unshielded AC I/P cable 1.2 m
3.	Earphone	Honeywell	PTE-300N	FCC sDoC	N/A	N/A
4.	Adapter	Honeywell	ADS-12B-06 05010E	FCC sDoC	N/A	N/A

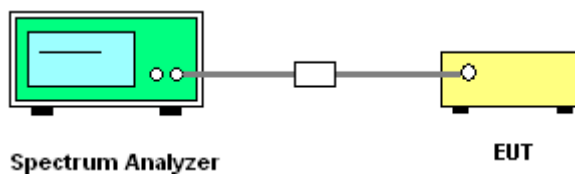
3.4 Test Setup

The EUT is continuously communicating to the Bluetooth tester during the tests.

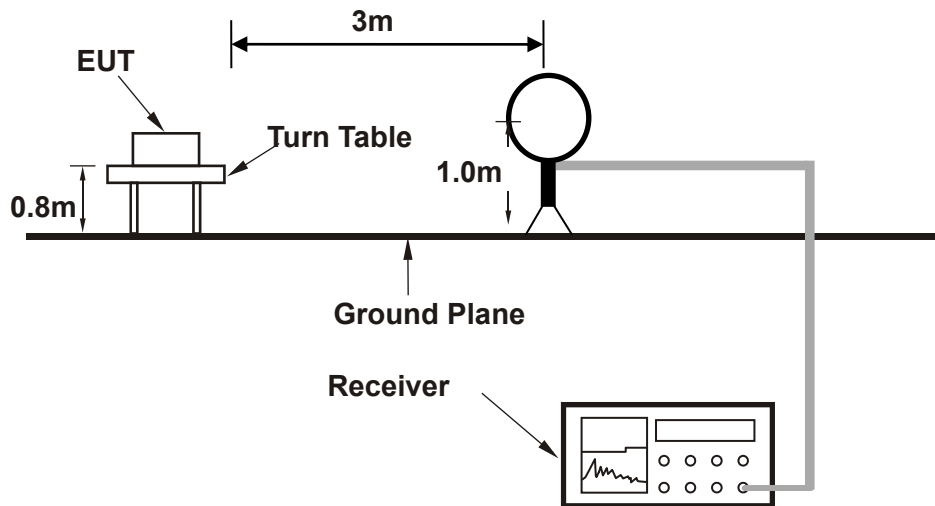
EUT was set in the Hidden menu mode to enable BT communications.



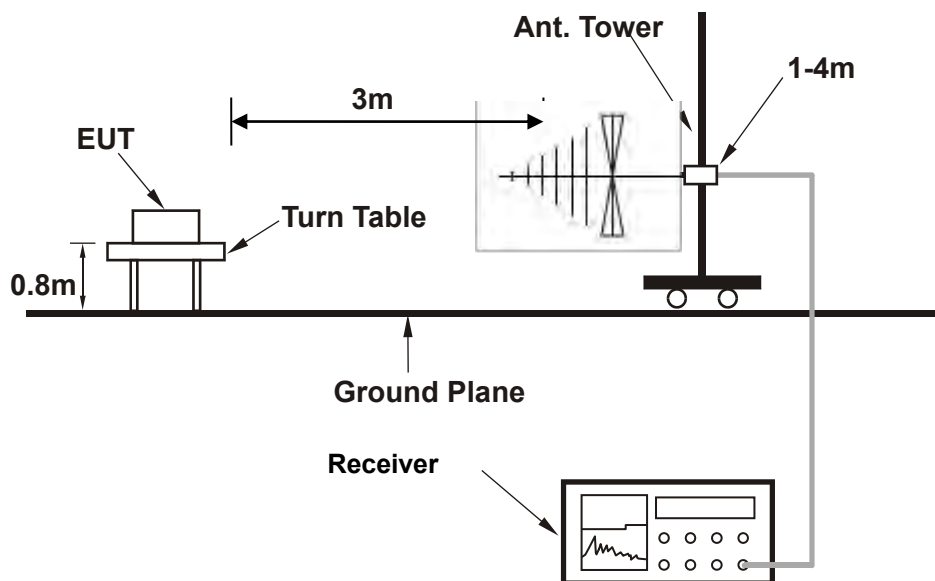
Setup diagram for Conducted Test



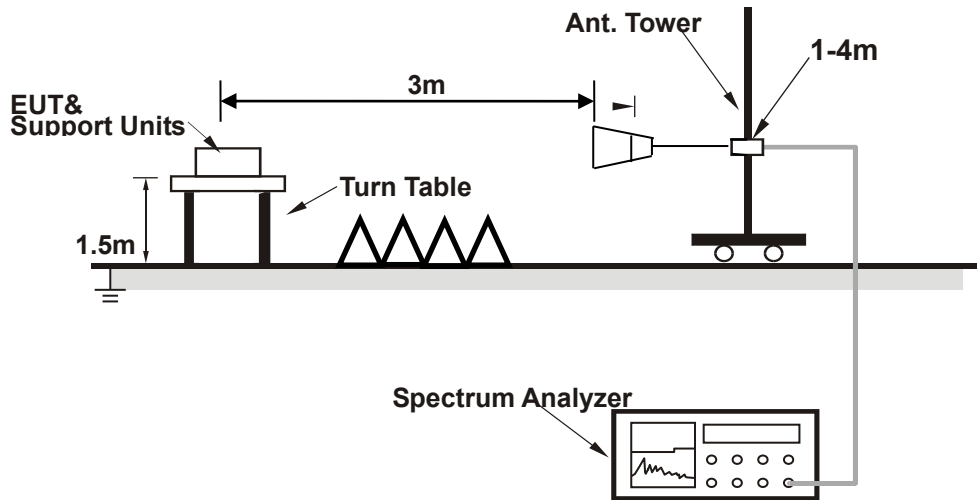
Setup diagram for Raidation(9KHz~30MHz) Test



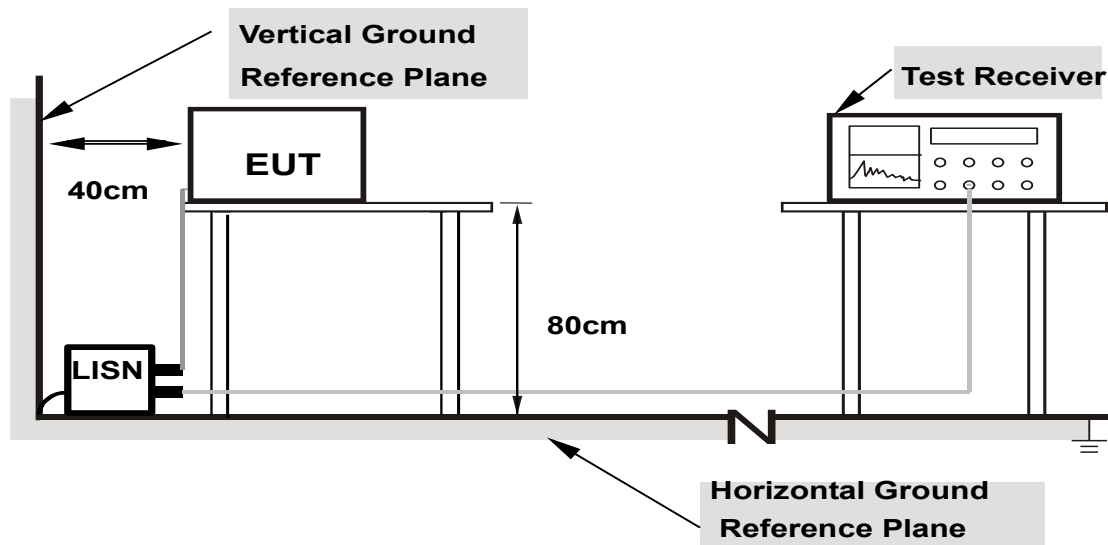
Setup diagram for Raidation(Below 1G) Test



Setup diagram for Raidation(Above1G) Test



Setup diagram for AC Conducted Emission Test



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

3.5 Measurement Results Explanation Example

For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuator factor between EUT conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly the EUT RF output level.

Example:

The spectrum analyzer offset is derived from RF cable loss and attenuator factor.

Offset = RF cable loss + attenuator factor.

Following shows an offset computation example with cable loss 5 dB and 10dB attenuator.

$$\begin{aligned}\text{Offset(dB)} &= \text{RF cable loss(dB)} + \text{attenuator factor(dB)} \\ &= 5 + 10 = 15 \text{ (dB)}\end{aligned}$$

For all radiated test items:

Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level

Over Limit (dB μ V/m) = Level(dB μ V/m) - Limit Level (dB μ V/m)

4 Test Result

4.1 20dB and 99% Bandwidth Measurement

4.1.1 Limit of 20dB and 99% Bandwidth

None; for reporting purposes only.

4.1.2 Test Procedures

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Turn on the EUT and connect it to measurement instrument.
3. Use the following spectrum analyzer settings for 20dB Bandwidth measurement.
Span = approximately 2 to 5 times the 20 dB bandwidth, centered on a hopping channel;
RBW $\geq$ 1% of the 20 dB bandwidth; VBW $\geq$ RBW; Sweep = auto; Detector function = peak;
Trace = max hold.
4. Use the following spectrum analyzer settings for 99 % Bandwidth measurement.
Span = approximately 1.5 to 5 times the 99% bandwidth, centered on a hopping channel;
RBW $\geq$ 1% of the 99% bandwidth; VBW $\geq$ RBW; Sweep = auto; Detector function = sample;
Trace = max hold.

4.1.3 Test Result of 20dB Bandwidth

Refer to Appendix A of this test report.

4.1.4 Test Result of 99% Bandwidth

Refer to Appendix B of this test report.

4.2 Peak Output Power Measurement

4.2.1 Limit of Peak Output Power

Section 15.247 (b)

The maximum peak conducted output power of the intentional radiator shall not exceed the following:

(1) For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band 0.125 watts.

RSS-247 5.4(b)

For FHSs operating in the band 2400-2483.5 MHz, the maximum peak conducted output power shall not exceed 1.0 W if the hopset uses 75 or more hopping channels; the maximum peak conducted output power shall not exceed 0.125 W if the hopset uses less than 75 hopping channels. The e.i.r.p. shall not exceed 4 W

4.2.2 Test Procedures

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Turn on the EUT and connect it to measurement instrument.
3. The transmitter output is connected to a spectrum analyzer the analyzer bandwidth is set to a value greater than the 20 dB bandwidth of the EUT.

4.2.3 Test Result of Peak Output Power

Refer to Appendix C of this test report.

4.3 Carrier Frequency Separation Measurement

4.3.1 Limit of Hopping Channel Separation

FCC §15.247 (a) (1)

RSS-247 5.1(b)

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

4.3.2 Test Procedures

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Turn on the EUT and connect it to measurement instrument.
3. The transmitter output is connected to a spectrum analyzer. The RBW is set to 300 kHz and the VBW is set to 300 kHz. The sweep time is coupled.

4.3.3 Test Result of Hopping Channel Separation

Refer to Appendix D of this test report.

4.4 Time of Occupancy Measurement

4.4.1 Limit of Average Time of Occupancy

FCC §15.247 (a) (1) (iii)

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

RSS-247 5.1(d)

FHSs operating in the band 2400-2483.5 MHz shall use at least 15 hopping channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds, multiplied by the number of hopping channels employed. Transmissions on particular hopping frequencies may be avoided or suppressed provided that at least 15 hopping channels are used.

4.4.2 Test Procedures

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Turn on the EUT and connect it to measurement instrument.
3. The transmitter output is connected to a spectrum analyzer. The span is set to 0 Hz, centered on a single, selected hopping channel. The width of a single pulse is measured in a fast scan. The number of pulses is measured in a 3.16 second scan, to enable resolution of each occurrence.
4. The average time of occupancy is calculated from the transmit time per hop multiplied by the number of hops in the period specified in the requirements.

The test period: $T = 0.4 \text{ Second/Channel} \times 79 \text{ Channel} = 31.6 \text{ s}$

Test channel: 2441MHz as below:

DH1 time slot = Burst Width (ms) * (1600 / (2 * 79)) * 31.6

DH3 time slot = Burst Width (ms) * (1600 / (4 * 79)) * 31.6

DH5 time slot = Burst Width (ms) * (1600 / (6 * 79)) * 31.6

4.4.3 Test Result of Dwell Time

Refer to Appendix E of this test report.

4.5 Number of Hopping Channels Measurement

4.5.1 Limits of Number of Hopping Channels

FCC § 15.247(a)(1)(iii)

Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels.

RSS-247 5.1(d)

FHSs operating in the band 2400-2483.5 MHz shall use at least 15 hopping channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds, multiplied by the number of hopping channels employed. Transmissions on particular hopping frequencies may be avoided or suppressed provided that at least 15 hopping channels are used.

4.5.2 Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Turn on the EUT and connect it to measurement instrument.
3. The transmitter output is connected to a spectrum analyzer. The span is set to cover the entire authorized band, in either a single sweep or in multiple contiguous sweeps. The RBW is set to 100KHz. The analyzer is set to Max Hold.

4.5.3 Test Result of Number of Hopping Channels

Refer to Appendix F of this test report.

4.6 Conducted Band Edges Measurement

4.6.1 Limit of Band Edges

FCC §15.247(d)

IC RSS-247 5.5

In any 100 kHz bandwidth outside the intentional radiation frequency band, the radio frequency power shall be at least 20 dB below the highest level of the radiated power. In addition, radiated emissions which fall in the restricted bands must also comply with the radiated emission limits.

4.6.2 Test Procedures

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Turn on the EUT and connect it to measurement instrument.
3. Set RBW = 100kHz, VBW = 300kHz. Band edge emissions must be at least 20 dB down from the highest emission level within the authorized band as measured with a 100kHz RBW. The attenuation shall be 30 dB instead of 20 dB when RMS conducted output power procedure is used.
4. Enable hopping function of the EUT and then repeat step 1~3.

4.6.3 Test Result of Conducted Band Edges

Refer to Appendix G of this test report.

4.7 Conducted Spurious Emission Measurement

4.7.1 Limit of Spurious Emission Measurement

FCC §15.247(d)

IC RSS-247 5.5

In any 100 kHz bandwidth outside the intentional radiation frequency band, the radio frequency power shall be at least 20 dB below the highest level of the radiated power. In addition, radiated emissions which fall in the restricted bands must also comply with the radiated emission limits.

4.7.2 Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Turn on the EUT and connect it to measurement instrument.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Set RBW = 100 kHz, VBW = 300kHz, scan up through 10th harmonic. All harmonics / spurs must be at least 20 dB down from the highest emission level within the authorized band as measured with a 100 kHz RBW.
5. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

4.7.3 Test Result of Conducted Spurious Emission

Refer to Appendix H of this test report.

4.8 Radiated Band Edges and Spurious Emission Measurement

4.8.1 Limit of Radiated Band Edges and Spurious Emission

FCC §15.247 (d)

IC RSS-247 5.5

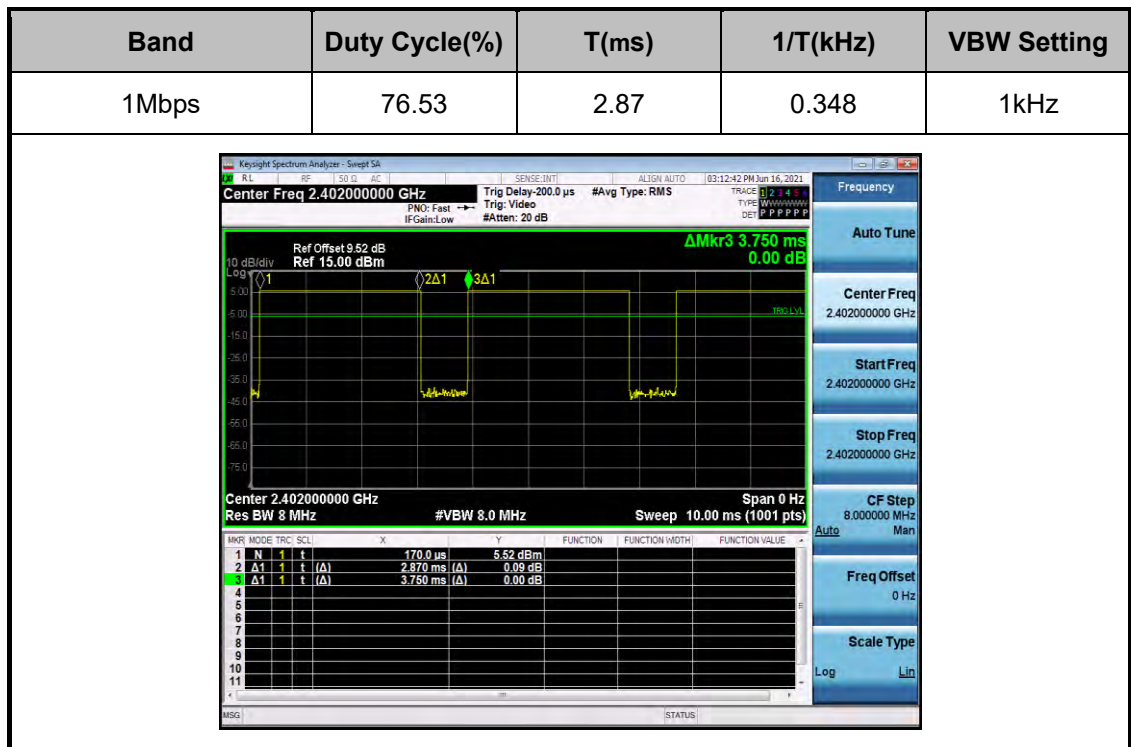
In any 100 kHz bandwidth outside the intentional radiator frequency band, all harmonics/spurious must be at least 20 dB below the highest emission level within the authorized band. In addition, radiated emissions which fall in the restricted bands must also comply with the FCC section 15.209 limits as below.

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

Note: The frequency range from 9KHz to 10th harmonic (25GHz) are checked, and no any emissions were found from 18GHz to 25GHz, So the radiated emissions from 18GHz to 25GHz were not record.

4.8.2 Test Procedures

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Turn on the EUT and connect it to measurement instrument.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Use the following spectrum analyzer settings:
 - (1) Span shall wide enough to fully capture the emission being measured;
 - (2) Set RBW=100 kHz for $f < 1$ GHz, RBW=1MHz for $f > 1$ GHz ; VBW=3RBW; Sweep = auto; Detector function = peak; Trace = max hold for peak
 - (3) For average measurement:
VBW = 10 Hz, when duty cycle is no less than 98 percent.
VBW $\geq 1/T$, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.
5. Add the maximum transmit antenna gain (in dBi) to the measured output power level to determine the EIRP.
6. Convert the resultant EIRP to an equivalent electric field strength using the following relationship:
$$E = \text{EIRP} - 20 \log d + 104.8$$
Where:
E is the electric field strength in dB μ V/m
EIRP is the equivalent isotropically radiated power in dBm
d is the specified measurement distance in m
$$E[\text{dB}\mu\text{V/m}] = \text{EIRP}[\text{dBm}] + 95.2, \text{ for } d = 3 \text{ m}.$$
7. Compare the resultant electric field strength level with the applicable regulatory limit.



4.8.3 Test Results of Radiated Spurious Emissions (9 kHz ~ 30 MHz)

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not reported.



**BUREAU
VERITAS**

Test Report No.: RFBGDJ-W7L-P21060011-4

4.8.4 Test Result of Radiated Spurious at Band Edges

Test Mode :	Bluetooth (3Mbps) CH00 (2402MHz)	Temperature :	23~25℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	2.3GHz~2.405GHz	Polarization :	Horizontal

Test Site : 3m Chamber

Temp/Humi : 25℃/64%

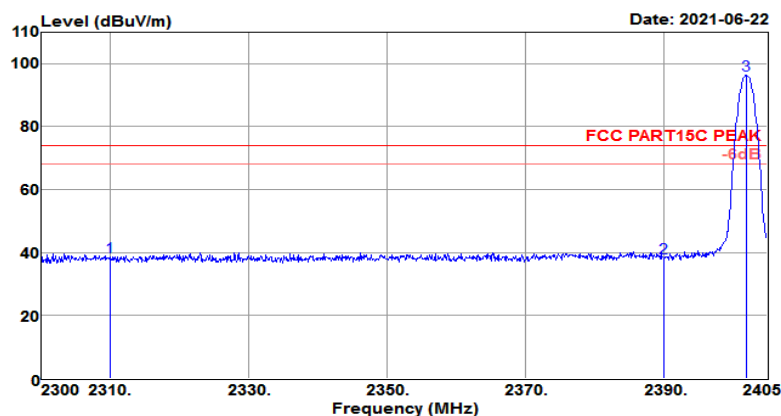
Tested by : Jack

Pol/Phase : HORIZONTAL

Test Mode : BT CH00(2402MHz)

Power rating: DC 3.85W

Data: 41

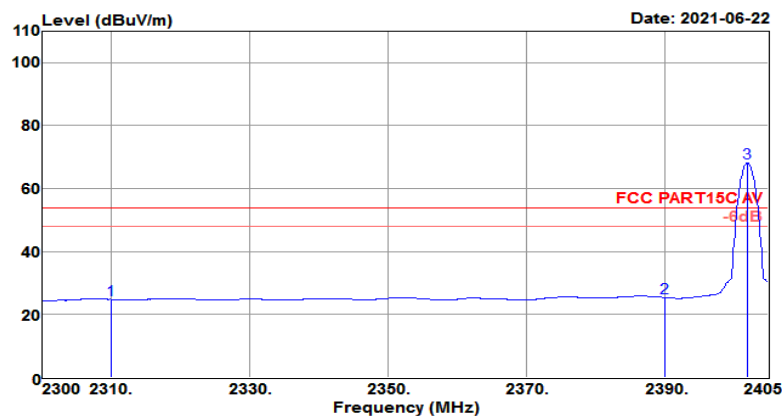


Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamplifier factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2310.000	42.90	27.38	4.11	35.61	38.78	74.00	-35.22	Peak
2390.000	42.40	27.56	4.18	35.79	38.35	74.00	-35.65	Peak
2402.060	100.48	27.58	4.19	35.82	96.43	74.00	22.43	Peak

Test Mode :	Bluetooth (3Mbps) CH00 (2402MHz)	Temperature :	23~25°C
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	2.3GHz~2.405GHz	Polarization :	Horizontal

Test Site	: 3m Chamber	Temp/Humi	: 25°C / 64%
Tested by	: Jack	Pol/Phase	: HORIZONTAL
Test Mode	: BT CH00(2402MHz)	Power rating:	DC 3.85V

Data: 42

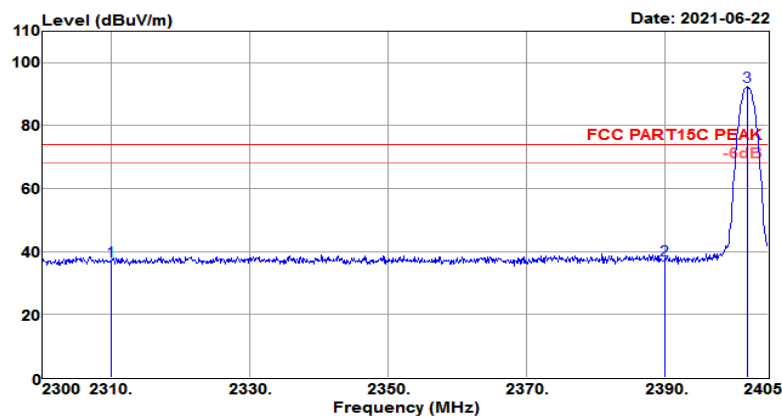


Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2310.000	28.95	27.38	4.11	35.61	24.83	54.00	-29.17	Average
2390.000	29.47	27.56	4.18	35.79	25.42	54.00	-28.58	Average
2401.955	72.20	27.58	4.19	35.82	68.15	54.00	14.15	Average

Test Mode :	Bluetooth (3Mbps) CH00 (2402MHz)	Temperature :	23~25°C
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	2.3GHz~2.405GHz	Polarization :	Vertical

Test Site	: 3m Chamber	Temp/Humi	: 25°C / 64%
Tested by	: Jack	Pol/Phase	: VERTICAL
Test Mode	: BT CH00(2402MHz)	Power rating:	DC 3.85V

Data: 44

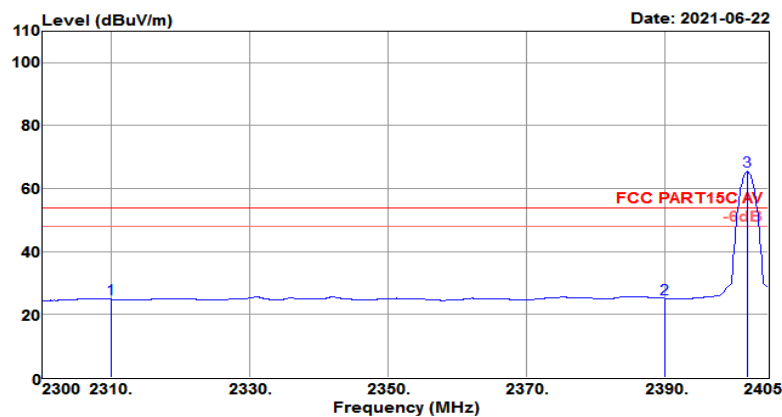


Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2310.000	41.27	27.38	4.11	35.61	37.15	74.00	-36.85	Peak
2390.000	41.42	27.56	4.18	35.79	37.37	74.00	-36.63	Peak
2401.955	96.51	27.58	4.19	35.82	92.46	74.00	18.46	Peak

Test Mode :	Bluetooth (3Mbps) CH00 (2402MHz)	Temperature :	23~25°C
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	2.3GHz~2.405GHz	Polarization :	Vertical

Test Site : 3m Chamber	Temp/Humi : 25°C/64%
Tested by : Jack	Pol/Phase : VERTICAL
Test Mode : BT CH00(2402MHz)	Power rating: DC 3.85V

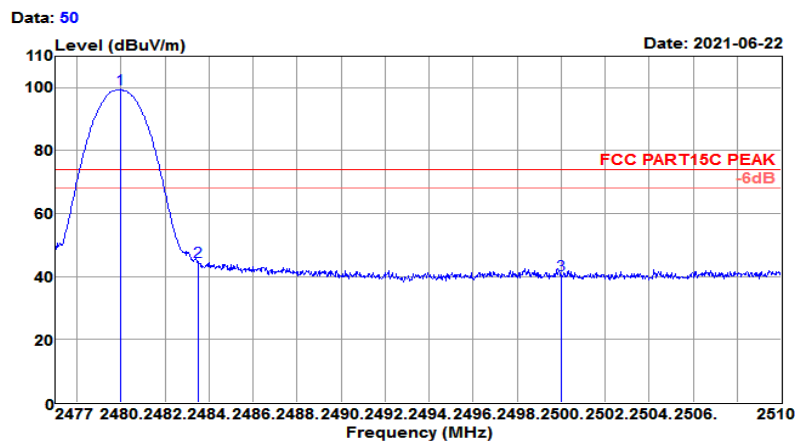
Data: 45



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2310.000	28.98	27.38	4.11	35.61	24.86	54.00	-29.14	Average
2390.000	29.19	27.56	4.18	35.79	25.14	54.00	-28.86	Average
2401.955	69.47	27.58	4.19	35.82	65.42	54.00	11.42	Average

Test Mode :	Bluetooth (3Mbps) CH78 (2480MHz)	Temperature :	23~25°C
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	2.477GHz~2.51GHz	Polarization :	Horizontal

Test Site	: 3m Chamber	Temp/Humi	: 25°C / 64%
Tested by	: Jack	Pol/Phase	: HORIZONTAL
Test Mode	: BT CH78(2480MHz)	Power rating:	DC 3.85V

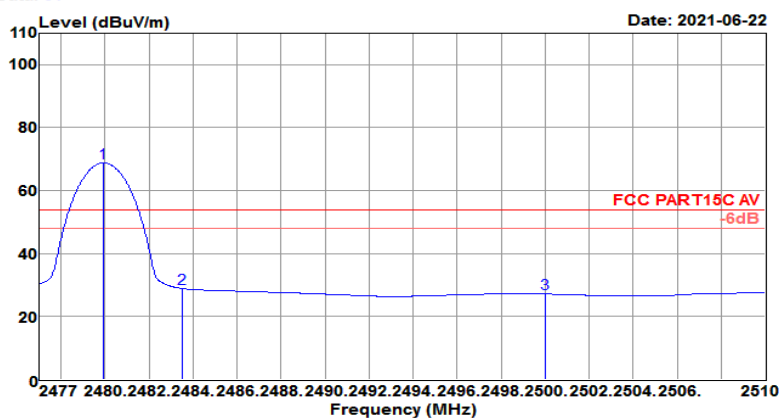


Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2479.970	103.46	27.76	4.26	35.99	99.49	74.00	25.49	Peak
2483.500	48.87	27.76	4.26	36.00	44.89	74.00	-29.11	Peak
2500.000	44.48	27.80	4.28	36.04	40.52	74.00	-33.48	Peak

Test Mode :	Bluetooth (3Mbps) CH78 (2480MHz)	Temperature :	23~25℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	2.477GHz~2.51GHz	Polarization :	Horizontal

Test Site	: 3m Chamber	Temp/Humi	: 25℃/64%
Tested by	: Jack	Pol/Phase	: HORIZONTAL
Test Mode	: BT CH78(2480MHz)	Power rating	: DC 3.85V

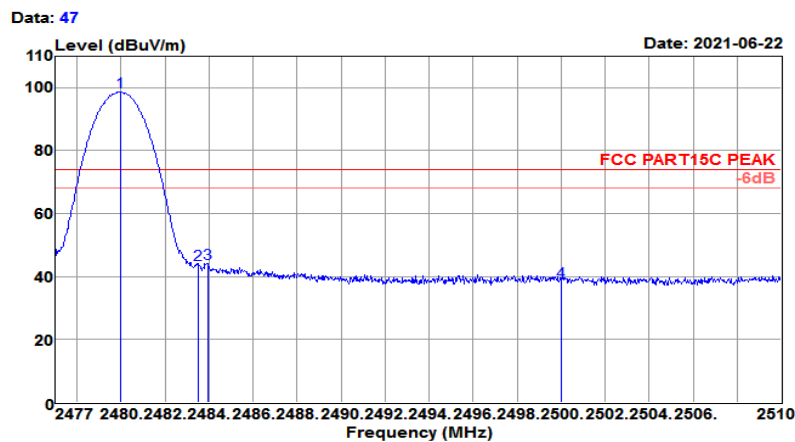
Data: 51



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2479.904	72.78	27.76	4.26	35.99	68.81	54.00	14.81	Average
2483.500	32.89	27.76	4.26	36.00	28.91	54.00	-25.09	Average
2500.000	31.12	27.80	4.28	36.04	27.16	54.00	-26.84	Average

Test Mode :	Bluetooth (3Mbps) CH78 (2480MHz)	Temperature :	23~25℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	2.477GHz~2.51GHz	Polarization :	Vertical

Test Site : 3m Chamber	Temp/Humi : 25℃/64%
Tested by : Jack	Pol/Phase : VERTICAL
Test Mode : BT CH78(2480MHz)	Power rating: DC 3.85V

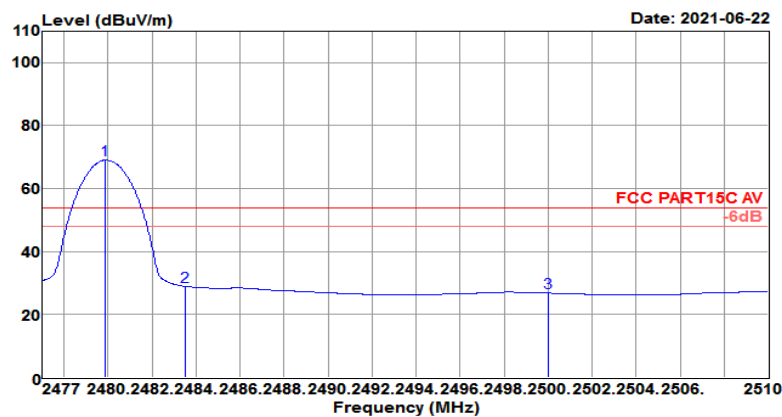


Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2480.003	102.61	27.76	4.26	35.99	98.64	74.00	24.64	Peak
2483.501	47.96	27.76	4.26	36.00	43.98	74.00	-30.02	Peak
2483.930	48.25	27.76	4.26	36.00	44.27	74.00	-29.73	Peak
2500.000	42.27	27.80	4.28	36.04	38.31	74.00	-35.69	Peak

Test Mode :	Bluetooth (3Mbps) CH78 (2480MHz)	Temperature :	23~25℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	2.477GHz~2.51GHz	Polarization :	Vertical

Test Site	: 3m Chamber	Temp/Humi	: 25℃/64%
Tested by	: Jack	Pol/Phase	: VERTICAL
Test Mode	: BT CH78(2480MHz)	Power rating:	DC 3.85V

Data: 48

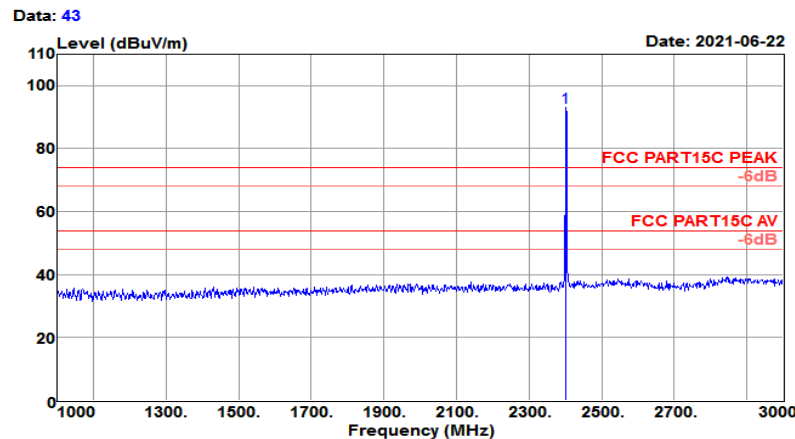


Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2479.871	73.01	27.76	4.26	35.99	69.04	54.00	15.04	Average
2483.500	32.93	27.76	4.26	36.00	28.95	54.00	-25.05	Average
2500.000	30.77	27.80	4.28	36.04	26.81	54.00	-27.19	Average

4.8.1 Test Result of Radiated Spurious Emission (1GHz ~ 10th Harmonic)

Test Mode :	Bluetooth (3Mbps) CH00 (2402MHz)	Temperature :	23~25℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	1GHz~3GHz	Polarization :	Horizontal

Test Site : 3m Chamber	Temp/Humi : 25℃/64%
Tested by : Jack	Pol/Phase : HORIZONTAL
Test Mode : BT CH00(2402MHz)	Power rating: DC 3.85V

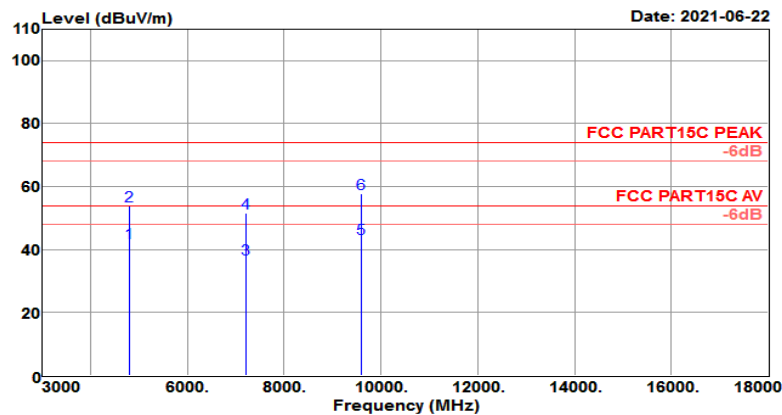


Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamplifier factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2402.000	97.06	27.58	4.19	35.82	93.01	74.00	19.01	Peak

Test Mode :	Bluetooth (3Mbps)CH00 (2402MHz)	Temperature :	23~25℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	3GHz~18GHz	Polarization :	Horizontal

Test Site : 3m Chamber	Temp/Humi : 25℃/64%
Tested by : Jack	Pol/Phase : HORIZONTAL
Test Mode : BT CH00(2402MHz)	Power rating: DC 3.85V

Data: 28

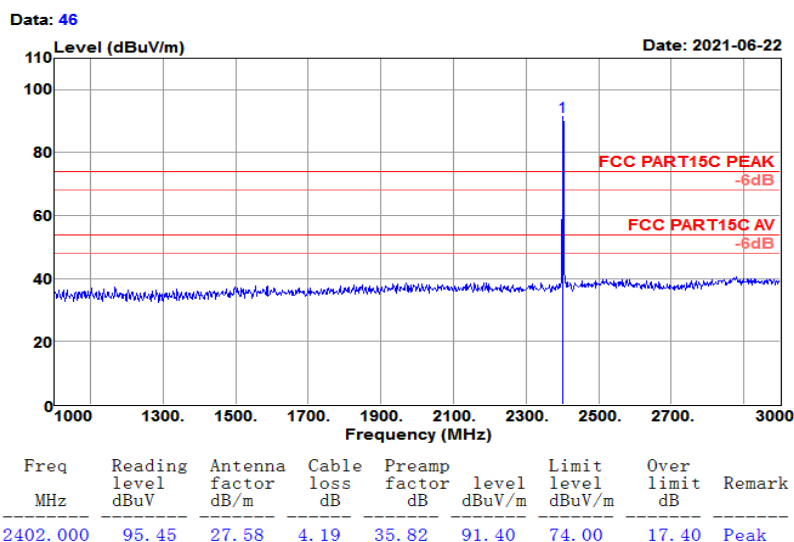


Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
4804.000	41.28	30.93	6.09	36.03	42.27	54.00	-11.73	Average
4804.000	52.85	30.93	6.09	36.03	53.84	74.00	-20.16	Peak
7206.000	26.58	35.39	9.22	34.25	36.94	54.00	-17.06	Average
7206.000	41.28	35.39	9.22	34.25	51.64	74.00	-22.36	Peak
9608.000	25.15	38.39	12.26	32.19	43.61	54.00	-10.39	Average
9608.000	39.29	38.39	12.26	32.19	57.75	74.00	-16.25	Peak

Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

Test Mode :	Bluetooth (3Mbps) CH00 (2402MHz)	Temperature :	23~25℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	1GHz~3GHz	Polarization :	Vertical

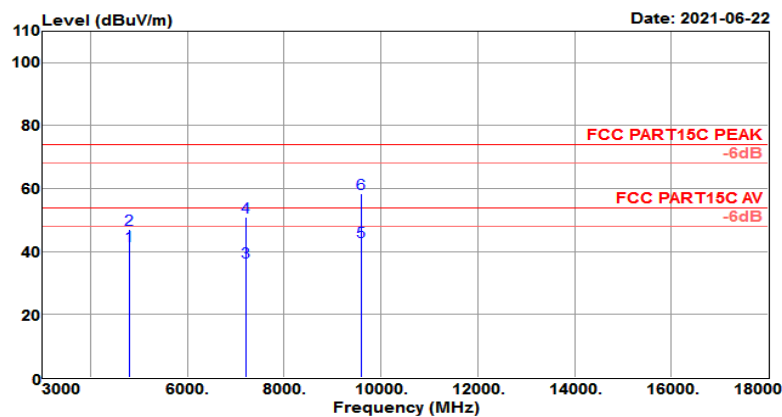
Test Site	: 3m Chamber	Temp/Humi	: 25℃/64%
Tested by	: Jack	Pol/Phase	: VERTICAL
Test Mode	: BT CH00(2402MHz)	Power rating:	DC 3.85V



Test Mode :	Bluetooth (3Mbps) CH00 (2402MHz)	Temperature :	23~25°C
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	3GHz~18GHz	Polarization :	Vertical

Test Site	: 3m Chamber	Temp/Humi	: 25°C / 64%
Tested by	: Jack	Pol/Phase	: VERTICAL
Test Mode	: BT CH00(2402MHz)	Power rating:	DC 3.85V

Data: 30

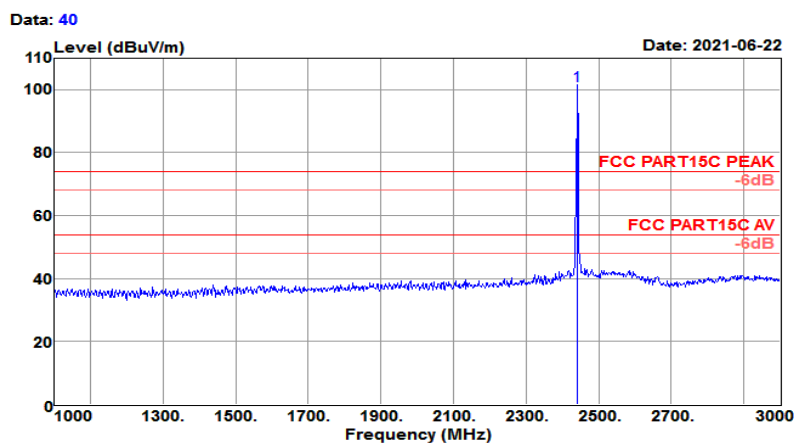


Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
4804.000	40.82	30.93	6.09	36.03	41.81	54.00	-12.19	Average
4804.000	46.18	30.93	6.09	36.03	47.17	74.00	-26.83	Peak
7206.000	26.48	35.39	9.22	34.25	36.84	54.00	-17.16	Average
7206.000	40.58	35.39	9.22	34.25	50.94	74.00	-23.06	Peak
9608.000	24.84	38.39	12.26	32.19	43.30	54.00	-10.70	Average
9608.000	40.00	38.39	12.26	32.19	58.46	74.00	-15.54	Peak

Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

Test Mode :	Bluetooth (3Mbps) CH39 (2441MHz)	Temperature :	23~25°C
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	1GHz~3GHz	Polarization :	Horizontal

Test Site	: 3m Chamber	Temp/Humi	: 25°C / 64%
Tested by	: Jack	Pol/Phase	: HORIZONTAL
Test Mode	: BT CH39(2441MHz)	Power rating:	DC 3.85V

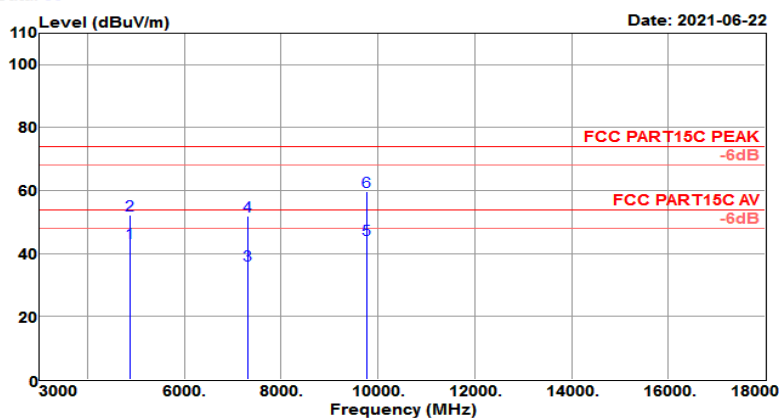


Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2441.000	105.26	27.67	4.22	35.91	101.24	74.00	27.24	Peak

Test Mode :	Bluetooth (3Mbps) CH39 (2441MHz)	Temperature :	23~25°C
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	3GHz~18GHz	Polarization :	Horizontal

Test Site	: 3m Chamber	Temp/Humi	: 25°C / 64%
Tested by	: Jack	Pol/Phase	: HORIZONTAL
Test Mode	: BT CH39(2441MHz)	Power rating:	DC 3.85V

Data: 36

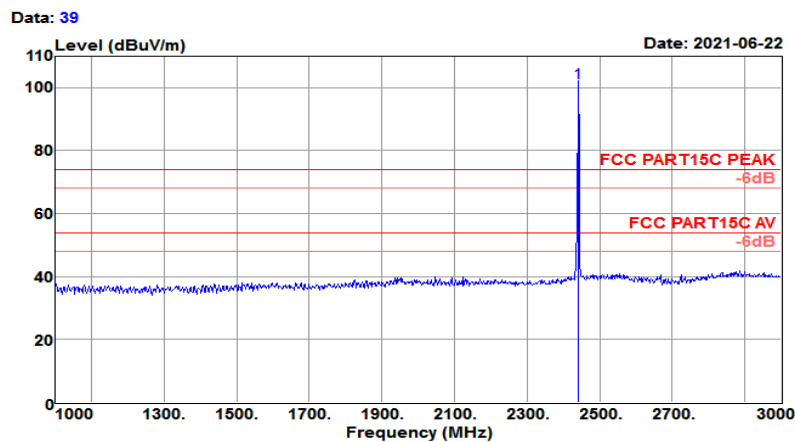


Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
4882.000	42.28	31.03	6.08	35.98	43.41	54.00	-10.59	Average
4882.000	51.18	31.03	6.08	35.98	52.31	74.00	-21.69	Peak
7323.000	25.80	35.68	9.20	34.29	36.39	54.00	-17.61	Average
7323.000	41.37	35.68	9.20	34.29	51.96	74.00	-22.04	Peak
9764.000	25.49	38.51	12.50	32.03	44.47	54.00	-9.53	Average
9764.000	40.82	38.51	12.50	32.03	59.80	74.00	-14.20	Peak

Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

Test Mode :	Bluetooth (3Mbps) CH39 (2441MHz)	Temperature :	23~25°C
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	1GHz~3GHz	Polarization :	Vertical

Test Site	: 3m Chamber	Temp/Humi	: 25°C / 64%
Tested by	: Jack	Pol/Phase	: VERTICAL
Test Mode	: BT CH39(2441MHz)	Power rating:	DC 3.85V

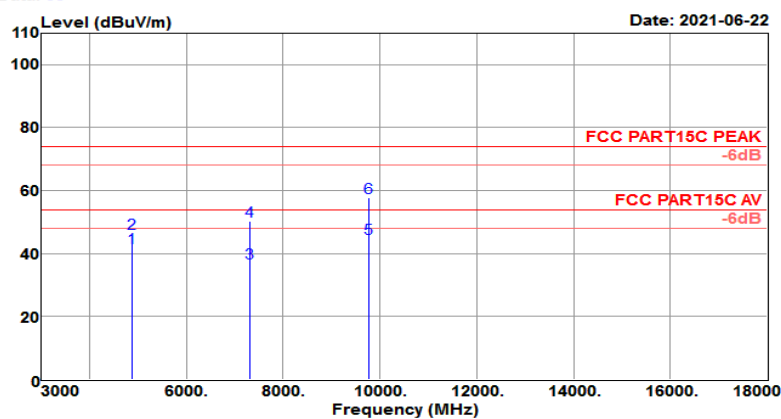


Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2441.000	105.60	27.67	4.22	35.91	101.58	74.00	27.58	Peak

Test Mode :	Bluetooth (3Mbps) CH39 (2441MHz)	Temperature :	23~25°C
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	3GHz~18GHz	Polarization :	Vertical

Test Site : 3m Chamber	Temp/Humi : 25°C / 64%
Tested by : Jack	Pol/Phase : VERTICAL
Test Mode : BT CH39(2441MHz)	Power rating: DC 3.85V

Data: 38

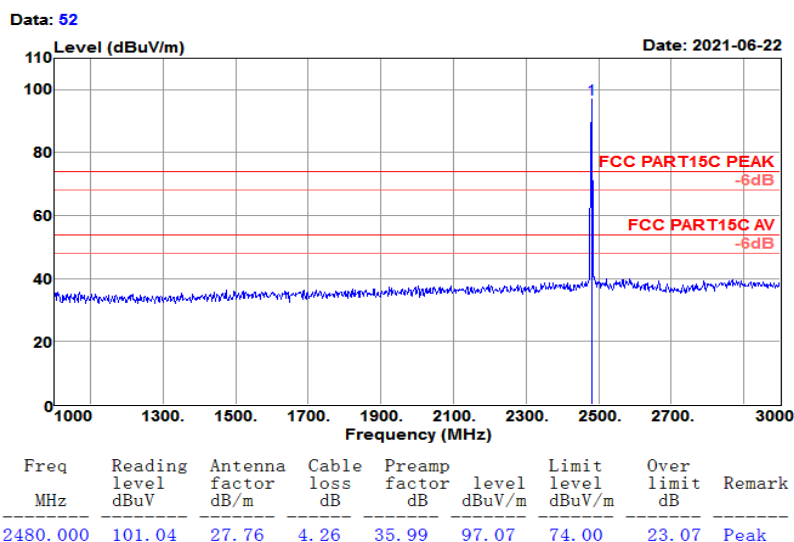


Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
4882.000	40.71	31.03	6.08	35.98	41.84	54.00	-12.16	Average
4882.000	45.18	31.03	6.08	35.98	46.31	74.00	-27.69	Peak
7323.000	26.27	35.68	9.20	34.29	36.86	54.00	-17.14	Average
7323.000	39.82	35.68	9.20	34.29	50.41	74.00	-23.59	Peak
9764.000	25.94	38.51	12.50	32.03	44.92	54.00	-9.08	Average
9764.000	38.92	38.51	12.50	32.03	57.90	74.00	-16.10	Peak

Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

Test Mode :	Bluetooth (3Mbps) CH78 (2480MHz)	Temperature :	23~25°C
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	1GHz~3GHz	Polarization :	Horizontal

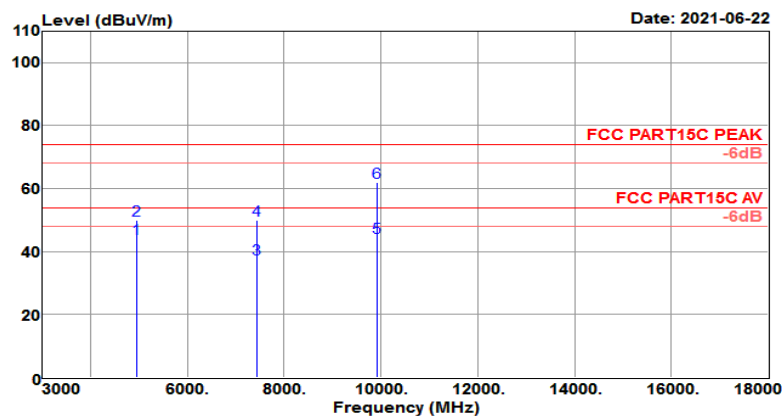
Test Site	: 3m Chamber	Temp/Humi	: 25°C / 64%
Tested by	: Jack	Pol/Phase	: HORIZONTAL
Test Mode	: BT CH78(2480MHz)	Power rating:	DC 3.85V



Test Mode :	Bluetooth (3Mbps) CH78 (2480MHz)	Temperature :	23~25°C
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	3GHz~18GHz	Polarization :	Horizontal

Test Site : 3m Chamber	Temp/Humi : 25°C / 64%
Tested by : Jack	Pol/Phase : HORIZONTAL
Test Mode : BT CH78(2480MHz)	Power rating: DC 3.85V

Data: 34



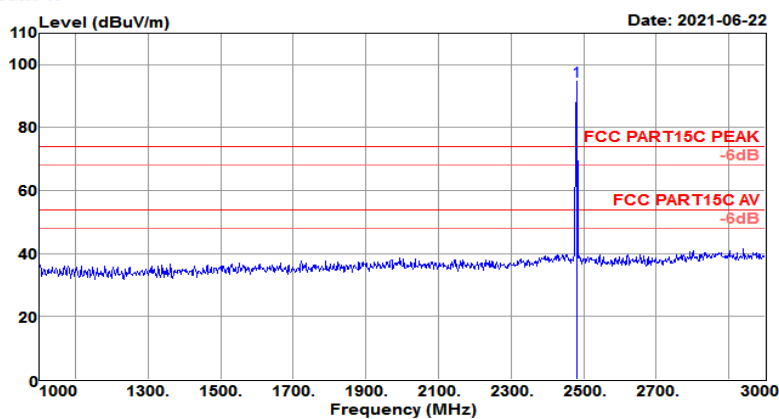
Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
4960.000	42.84	31.14	6.07	35.93	44.12	54.00	-9.88	Average
4960.000	48.75	31.14	6.07	35.93	50.03	74.00	-23.97	Peak
7440.000	26.84	35.96	9.04	34.32	37.52	54.00	-16.48	Average
7440.000	39.41	35.96	9.04	34.32	50.09	74.00	-23.91	Peak
9920.000	24.58	38.64	13.24	31.87	44.59	54.00	-9.41	Average
9920.000	41.83	38.64	13.24	31.87	61.84	74.00	-12.16	Peak

Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

Test Mode :	Bluetooth (3Mbps) CH78 (2480MHz)	Temperature :	23~25°C
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	1GHz~3GHz	Polarization :	Vertical

Test Site	: 3m Chamber	Temp/Humi	: 25°C / 64%
Tested by	: Jack	Pol/Phase	: VERTICAL
Test Mode	: BT CH78(2480MHz)	Power rating:	DC 3.85V

Data: 49

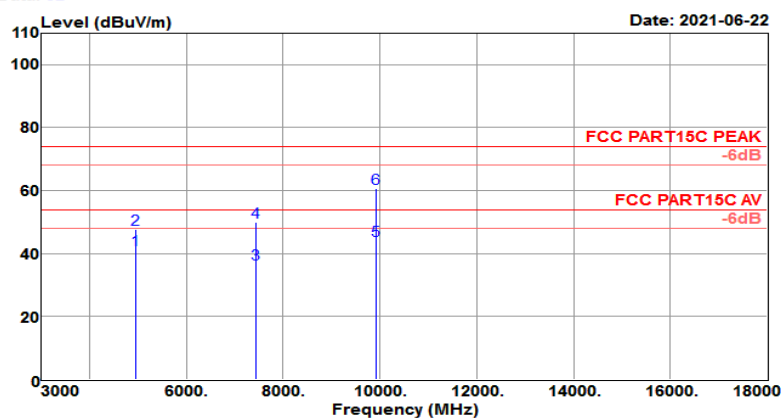


Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2480.000	98.66	27.76	4.26	35.99	94.69	74.00	20.69	Peak

Test Mode :	Bluetooth (3Mbps) CH78 (2480MHz)	Temperature :	23~25°C
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	3GHz~18GHz	Polarization :	Vertical

Test Site : 3m Chamber	Temp/Humi : 25°C / 64%
Tested by : Jack	Pol/Phase : VERTICAL
Test Mode : BT CH78(2480MHz)	Power rating: DC 3.85V

Data: 32



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
4960.000	39.82	31.14	6.07	35.93	41.10	54.00	-12.90	Average
4960.000	46.59	31.14	6.07	35.93	47.87	74.00	-26.13	Peak
7440.000	25.84	35.96	9.04	34.32	36.52	54.00	-17.48	Average
7440.000	39.17	35.96	9.04	34.32	49.85	74.00	-24.15	Peak
9920.000	24.28	38.64	13.24	31.87	44.29	54.00	-9.71	Average
9920.000	40.82	38.64	13.24	31.87	60.83	74.00	-13.17	Peak

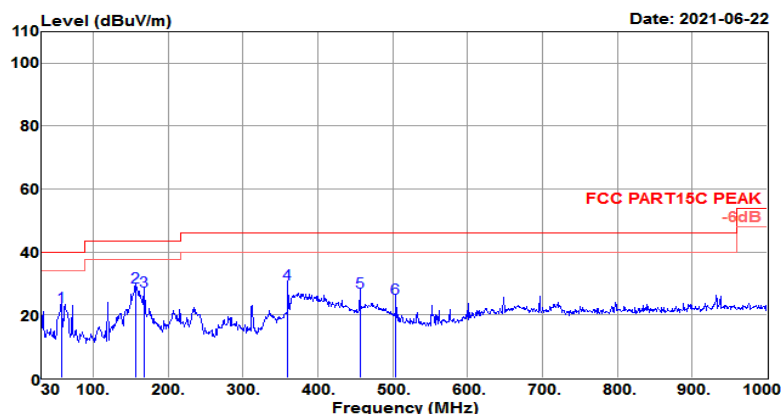
Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

4.8.2 Test Result of Radiated Spurious Emission (30MHz ~ 1GHz)

Test Mode :	Bluetooth (3Mbps) CH00 (2402MHz)	Temperature :	23~25℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	30MHz~1GHz	Polarization :	Horizontal

Test Site	: 3m Chamber	Temp/Humi	: 25℃/64%
Tested by	: Jack	Pol/Phase	: HORIZONTAL
Test Mode	: BT CH00(2402MHz)	Power rating	: DC 3.85V
EUT	: Mobile Computer		
Model No.	: CT45-L0N		

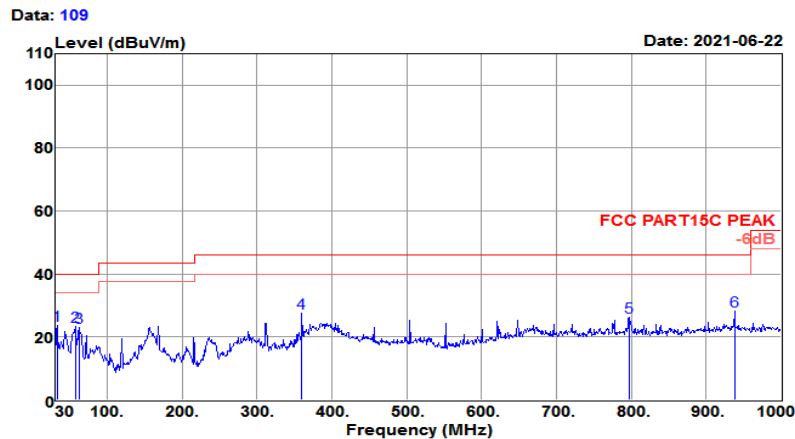
Data: 110



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
57.160	38.97	14.89	1.26	32.51	22.61	40.00	-17.39	QP
156.100	45.02	14.11	2.14	32.48	28.79	43.50	-14.71	QP
167.740	44.45	13.45	2.22	32.48	27.64	43.50	-15.86	QP
359.800	44.89	14.24	3.34	32.53	29.94	46.00	-16.06	QP
455.830	39.82	16.25	3.75	32.59	27.23	46.00	-18.77	QP
504.330	36.90	16.92	4.02	32.63	25.21	46.00	-20.79	QP

Test Mode :	Bluetooth (3Mbps) CH00 (2402MHz)	Temperature :	23~25℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	30MHz~1GHz	Polarization :	Vertical

Test Site : 3m Chamber	Temp/Humi : 25℃/64%
Tested by : Jack	Pol/Phase : VERTICAL
Test Mode : BT CH00(2402MHz)	Power rating: DC 3.85V
EUT : Mobile Computer	
Model No. : CT45-L0N	



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
32.910	41.11	13.94	0.95	32.45	23.55	40.00	-16.45	QP
57.160	39.60	14.89	1.26	32.51	23.24	40.00	-16.76	QP
62.010	40.06	14.31	1.31	32.51	23.17	40.00	-16.83	QP
359.800	42.60	14.24	3.34	32.53	27.65	46.00	-18.35	QP
797.270	32.48	20.99	5.16	32.32	26.31	46.00	-19.69	QP
937.920	32.20	22.41	5.76	32.15	28.22	46.00	-17.78	QP

4.9 AC Conducted Emission Measurement

4.9.1 Limit of AC Conducted Emission

FCC §15.207

IC RSS-GEN 8.8

For equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table.

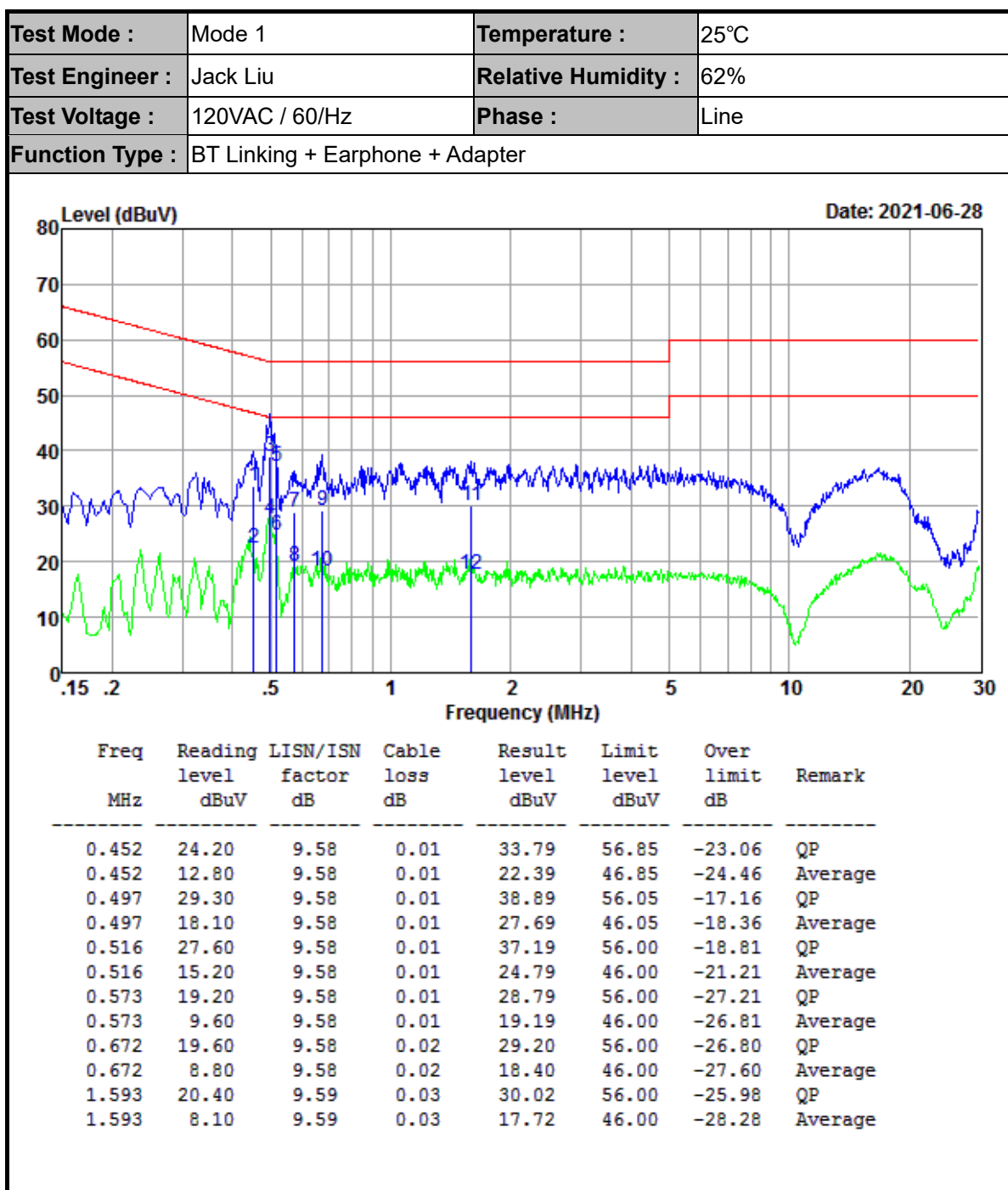
Frequency of emission (MHz)	Conducted limit (dB μ V)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

4.9.2 Test Procedures

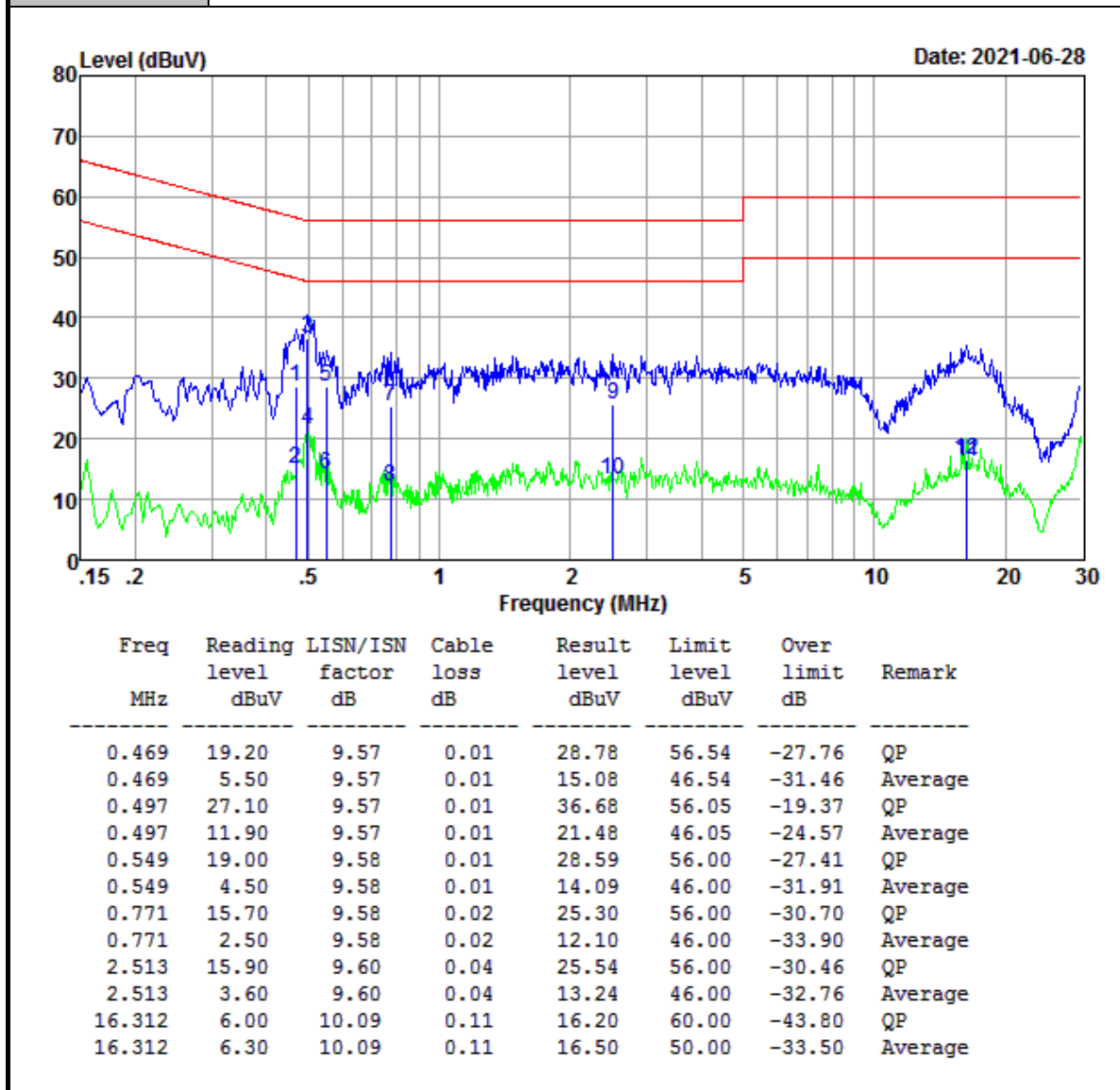
1. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.
4. The LISN provides 50 ohm coupling impedance for the measuring instrument.
5. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
6. Both sides of AC line were checked for maximum conducted interference.
7. The frequency range from 150 kHz to 30 MHz was searched.
8. Set the test-receiver system to Peak Detect Function and specified bandwidth (IF Bandwidth = 9kHz) with Maximum Hold Mode. Then measurement is also conducted by Average Detector and Quasi-Peak Detector Function respectively.

4.9.3 Test Result of AC Conducted Emission



Result Level= Reading Level + LISN Factor + Cable Loss

Test Mode :	Mode 1	Temperature :	25°C
Test Engineer :	Jack Liu	Relative Humidity :	62%
Test Voltage :	120VAC / 60/Hz	Phase :	Neutral
Function Type :	BT Linking + Earphone + Adapter		



Result Level= Reading Level + LISN Factor + Cable Loss

4.10 Antenna Requirements

4.10.1 Standard Applicable

According to antenna requirement of §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 re-placed by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of Sections 15.211, 15.213, 15.217, 15.219, or 15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with Section 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this Part are not exceeded..

And according to §15.247(4)(1), system operating in the 2400-2483.5MHz bands that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum peak output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6dBi.

4.10.2 Antenna Connected Construction

An LDS type Antenna design is used

4.10.3 Antenna Gain

The antenna peak gain of EUT is less than 6 dBi. Therefore, it is not necessary to reduce maximum peak output power limit.

5 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Due Date	Remark
Spectrum Analyzer	Keysight	N9010A	MY56070788	2021-01-05	2022-01-04	Conducted
Power Sensor	Keysight	U2021XA	MY56510025	2021-01-05	2022-01-04	Conducted
Power Sensor	Keysight	U2021XA	MY57030005	2021-01-05	2022-01-04	Conducted
Power Sensor	Keysight	U2021XA	MY56510018	2021-01-05	2022-01-04	Conducted
Power Sensor	Keysight	U2021XA	MY56480002	2021-01-05	2022-01-04	Conducted
Thermal Chamber	Howkin	UHL-34	19111801	2021-04-21	2022-04-20	Conducted
Base Station	R&S	CMW 270	101231	2021-01-05	2022-01-04	Conducted
Signal Generator (Interferer)	Keysight	N5182B	MY56200384	2021-01-05	2022-01-04	Conducted
Signal Generator (Blocker)	Keysight	N5171B	MY56200661	2021-01-05	2022-01-04	Conducted

Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Due Date	Remark
Spectrum Analyzer	R&S	FSV 40	101433	2021-01-05	2022-01-04	Radiation
Amplifier	Sonoma	310	363917	2021-01-06	2022-01-05	Radiation
Amplifier	Schwarzbeck	BBV 9718	327	2021-01-06	2022-01-05	Radiation
Amplifier	Narda	TTA1840-35-HG	2034380	2020-11-28	2021-11-27	Radiation
Loop Antenna	Schwarzbeck	FMZB 1519B	1519B-051	2020-02-14	2023-02-13	Radiation
Broadband Antenna	Schwarzbeck	VULB 9168	9168-757	2020-09-27	2023-09-26	Radiation
Horn Antenna	Schwarzbeck	BBHA 9120 D	1677	2020-02-14	2023-02-13	Radiation
Horn Antenna	COM-POWER	AH-1840	101117	2018-06-19	2021-06-18	Radiation
Horn Antenna	COM-POWER	AH-1840	101117	2021-06-18	2024-06-17	Radiation
Test Software	Audix	E3	6.111221a	N/A	N/A	Radiation
Filter	Micro-Tronics	BRM 50702	G266	N/A	N/A	Radiation

Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Due Date	Remark
LISN	R&S	ENV216	102125	2021-01-05	2022-01-04	Conducted
LISN	R&S	ENV432	101327	2021-01-06	2022-01-05	Conducted
EMI Test Receiver	R&S	ESR3	102143	2021-01-06	2022-01-05	Conducted
EMI Test Software	Audix	E3	N/A	N/A	N/A	Conducted

N/A: No Calibration Required

- NOTE:.**
1. The test was performed in 3m Semi-anechoic Chamber and RF Oven Room.
 2. The horn antenna is used only for the measurement of emission frequency above 1GHz if tested.
 3. The FCC Site Registration No. is 525120; The Designation No. is CN1171.

6 Uncertainty of Evaluation

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

MEASUREMENT	FREQUENCY	UNCERTAINTY
Conducted emissions	9kHz~30MHz	2.42dB
Radiated emission	30MHz ~ 1GMHz	2.50dB
	1GHz ~ 18GHz	3.51dB
	18GHz ~ 40GHz	3.96dB

MEASUREMENT	UNCERTAINTY
Occupied Channel Bandwidth	±196.4Hz
RF output power, conducted	±2.31dB
Power density, conducted	±2.31dB

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

Appendix A: 20dB Emission Bandwidth

Test Result

TestMode	Antenna	Channel	20db EBW[MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
DH5	Ant1	2402	0.948	2401.532	2402.480	---	PASS
		2441	0.951	2440.523	2441.474	---	PASS
		2480	0.939	2479.532	2480.471	---	PASS
2DH5	Ant1	2402	1.293	2401.352	2402.645	---	PASS
		2441	1.281	2440.358	2441.639	---	PASS
		2480	1.284	2479.358	2480.642	---	PASS
3DH5	Ant1	2402	1.302	2401.340	2402.642	---	PASS
		2441	1.308	2440.337	2441.645	---	PASS
		2480	1.284	2479.349	2480.633	---	PASS

Test Graphs



DH5_Ant1_2402



DH5_Ant1_2441



BUREAU
VERITAS

Test Report No.: RFBGDJ-W7L-P21060011-4



DH5_Ant1_2480



2DH5_Ant1_2402



BUREAU
VERITAS

Test Report No.: RFBGDJ-W7L-P21060011-4



2Dh5_Ant1_2441



2Dh5_Ant1_2480



BUREAU
VERITAS

Test Report No.: RFBGDJ-W7L-P21060011-4



3DH5_Ant1_2402



3DH5_Ant1_2441



Test Report No.: RFBGDJ-W7L-P21060011-4



3DH5 Ant1 2480

Appendix B: Occupied Channel Bandwidth

Test Result

TestMode	Antenna	Channel	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
DH5	Ant1	2402	0.83526	2401.572	2402.408	---	PASS
		2441	0.81841	2440.578	2441.397	---	PASS
		2480	0.84095	2479.567	2480.408	---	PASS
2DH5	Ant1	2402	1.1754	2401.403	2402.578	---	PASS
		2441	1.1785	2440.400	2441.579	---	PASS
		2480	1.1744	2479.400	2480.574	---	PASS
3DH5	Ant1	2402	1.1795	2401.397	2402.576	---	PASS
		2441	1.1885	2440.390	2441.579	---	PASS
		2480	1.1809	2479.395	2480.576	---	PASS

Test Graphs



DH5_Ant1_2402



DH5_Ant1_2441