

CTC Laboratories, Inc.

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TEST REPORT				
Report No. ······	CTC2024205801			
FCC ID:	2AQ5R-UB01			
Applicant:	Shenzhen KTC Commercial Display	y Technology Co.,LTD.		
Address	No.4023,Northern Wuhe Road,Bantian Street, Longgang District,Shenzhen City,Guangdong Province,P.R.			
Manufacturer	Shenzhen Bluesource Electronics Teo	chnology Co., Ltd		
Address:	Building 5A1103, Huaqiang IdeaPark, Shenzhen, China	Guangming District,		
Product Name······:	Dongle			
Trade Mark······:	Horion			
Model/Type reference······:	UB01			
Listed Model(s) ······	/			
Standard	FCC CFR Title 47 Part 15 Subpart C Section 15.247			
Date of receipt of test sample:	Aug. 23, 2024			
Date of testing:	Aug. 23, 2024 ~ Sept. 14, 2024			
Date of issue	Sept. 14, 2024			
Result:	PASS			
Compiled by:		T. Jima		
(Printed name+signature)	Jim Jiang)in my		
Supervised by:		Jim Jiang Zric zhang		
(Printed name+signature)	Eric Zhang	GACZON		
Approved by:		Johnas		
(Printed name+signature)	Totti Zhao	/		
Testing Laboratory Name:	CTC Laboratories, Inc.			
Address	Room 101 Building B, No. 7, Lanqing Guanhu Subdistrict, Longhua District, China			
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Accreditation Administration of the People's Republic of China : yz.cnca.cn



1.1. Test Standards

The tests were performed according to following standards:

FCC Rules Part 15.247: Operation within the bands of 902-928MHz, 2400-2483.5MHz, and 5725-5850MHz. ANSI C63.10-2013: American National Standard for Testing Unlicensed Wireless Devices.

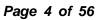
1.2. Report Version

Revised No.	Report No.	Date of issue	Description
01	CTC2024205801	Sept. 14, 2024	Original

1.3. Test Description

FCC Part 15 Subpart C (15.247)					
Test Here	Standard Section	Decult	Test Engineer		
Test Item	FCC	- Result			
Antenna Requirement	15.203	Pass	Jim Jiang		
Conducted Emission	15.207	Pass	Jim Jiang		
Conducted Band Edge and Spurious Emissions	15.247(d)	Pass	Jim Jiang		
Radiated Band Edge and Spurious Emissions	15.205&15.209& 15.247(d)	Pass	Jim Jiang		
6dB Bandwidth	15.247(a)(2)	Pass	Jim Jiang		
Conducted Max Output Power	15.247(b)(3)	Pass	Jim Jiang		
Power Spectral Density	15.247(e)	Pass	Jim Jiang		
Transmitter Radiated Spurious	15.209&15.247(d)	Pass	Jim Jiang		

Note: The measurement uncertainty is not included in the test result.





CTC Laboratories, Inc.

Add: Room 101 of Building B, Room 107, 108, 207, 208 of Building A, No. 7, Lanqing 1st Road, Luhu Community, Guanhu Subdistrict, Longhua District, Shenzhen, Guangdong, China

Laboratory accreditation

The test facility is recognized, certified, or accredited by the following organizations:

A2LA-Lab Cert. No.: 4340.01

CTC Laboratories, Inc. EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025:2017 General Requirements for r the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

Industry Canada (Registration No.: 9783A, CAB Identifier: CN0029)

CTC Laboratories, Inc. EMC Laboratory has been registered by Certification and Engineer Bureau of Industry Canada for the performance of with Registration NO.: 9783A on Jan, 2016.

FCC (Registration No.: 951311, Designation Number CN1208)

CTC Laboratories, Inc. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained inour files. Registration 951311, Aug 26, 2017.

1.5. Measurement Uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to TR-100028-01" Electromagnetic compatibility and Radio spectrum Matters (ERM);Uncertainties in the measurement of mobile radio equipment characteristics; Part 1" and TR-100028-02 "Electromagnetic compatibility and Radio spectrum Matters (ERM);Uncertainties in the measurement characteristics; Part 2" and TR-100028-02 "Electromagnetic compatibility and Radio spectrum Matters (ERM);Uncertainties in the measurement of mobile radio equipment characteristics; Part 2 " and is documented in the CTC Laboratories, Inc. quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Below is the best measurement capability for CTC Laboratories, Inc.



Test Items	Measurement Uncertainty	Notes
RF output power	± 1.24 dB	(1)
Power Spectral Density	±1.88 dB	(1)
Duty Cycle	±0.566 dB	(1)
Tx-sequence	±0.566 dB	(1)
Тх-дар	±0.566 dB	(1)
Medium Utilization (MU) factor	±0.566 dB	(1)
Dwell time	±0.028%	(1)
Minimum Frequency Occupation	±0.028%	(1)
Hopping Sequence	±1.9%	(1)
Hopping Frequency Separation	±1.9%	(1)
Occupied Channel Bandwidth	±0.0196%	(1)
Transmitter unwanted emissions in the out-of-band domain	±1.328dB	(1)
Transmitter unwanted emissions in the spurious domain	30MHz~1GHz: ±0.746dB 1GHz~12.75GHz: ±1.328dB	(1)
Receiver spurious emissions	30MHz~1GHz: ±0.746dB 1GHz~12.75GHz: ±1.328dB	(1)

Note (1): This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

1.6. Environmental Conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature:	21°C ~ 27°C
Relative Humidity:	40% ~ 60%
Air Pressure:	101kPa



2. GENERAL INFORMATION

2.1. Client Information

Applicant:	Shenzhen KTC Commercial Display Technology Co.,LTD.
Address:	No.4023,Northern Wuhe Road,Bantian Street, Longgang District,Shenzhen City,Guangdong Province,P.R.
Manufacturer:	Shenzhen Bluesource Electronics Technology Co., Ltd
Address:	Building 5A1103, Huaqiang IdeaPark, Guangming District, Shenzhen, China

2.2. General Description of EUT

Product Name:	Dongle		
Trade Mark:	Horion		
Model/Type reference:	UB01		
Listed Model(s):	/		
Model Difference:	/		
Power supply:	DC 5V		
Hardware version:	/		
Software version:	/		
BT 5.0/ BLE			
Modulation:	GFSK		
Operation frequency:	2402MHz~2480MHz		
Channel number:	40		
Channel separation:	2MHz		
Data rate:	1Mbps, 2Mbps		
Antenna type:	PCB Antenna		
Antenna gain:	-1.73dBi		



EN

2.3. Accessory Equipment Information

Equipment Information						
Name	Model	S/N	Manufacturer			
Notebook ThinkBook 14 G3 ACL		/	Lenovo			
USB TO TTL	/	/	/			
Cable Information	Cable Information					
Name Shielded Type Ferrite Core Length						
USB Cable	Unshielded	Without	100cm			
Test Software Information						
Name / / /						
FCC assist	1.0.2.2	/	/			



2.4. Operation State

Operation Frequency List: The EUT has been tested under typical operating condition. The Applicant provides communication tools software to control the EUT for staying in continuous transmitting and receiving mode for testing. BT BLE, 40 channels are provided to the EUT. Channels 00/19/39 were selected for testing. Operation Frequency List:

Channel	Frequency (MHz)
00	2402
01	2404
i	÷
18	2438
19	2440
20	2442
:	:
38	2478
39	2480

Note: The display in grey were the channel selected for testing.

Test mode

For RF test items:

The engineering test program was provided and enabled to make EUT continuous transmit.

For AC power line conducted emissions:

The EUT was set to connect with the Bluetooth instrument under large package sizes transmission.

For Radiated spurious emissions test item:

The engineering test program was provided and enabled to make EUT continuous transmit. The EUT in each of three orthogonal axis emissions had been tested, but only the worst case (X axis) data recorded in the report.



2.5. Measurement Instruments List

	RF Test System - SRD					
Item	tem Test Equipment Manufacturer Model No. Serial No. Calibrated					
1 Spectrum Analyzer Keysight		Keysight	N9020A	MY52091402	Aug. 21, 2025	
2	USB Wideband Power Sensor	Keysight	U2021XA	MY55130004	Mar. 21 2025	
3 USB Wideband Power Sensor k		Keysight	U2021XA	MY55130006	Mar. 21 2025	
4	Test Software	Tonscend	JS1120-3	V3.3.38	/	

	Radiated emission					
Item Test Equipment Manufacturer		Model No.	Serial No.	Calibrated Until		
1	Trilog-Broadband Antenna	Schwarzbeck	VULB 9163	01026	Dec. 18, 2024	
2	Horn Antenna	Schwarzbeck	BBHA 9120D	9120D-647	Sep. 25, 2025	
3	Test Receiver	Keysight	N9038A	MY56400071	Dec. 12, 2024	
4	Broadband Amplifier	SCHWARZBECK	BBV9743B	259	Dec. 12, 2024	
5	Mirowave Broadband Amplifier	SCHWARZBECK	BBV9718C	111	Dec. 12, 2024	
6	3m chamber 3	YIHENG	EE106	/	Aug. 28, 2026	
7	Test Software	FARA	EZ-EMC	FA-03A2	/	

		Conc	lucted emission		
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	LISN	R&S	ENV216	101112	Dec. 12, 2024
2	LISN	R&S	ENV216	101113	Dec. 12, 2024
3	EMI Test Receiver	R&S	ESCS30	100353	Dec. 12, 2024
4	ISN CAT6	Schwarzbeck	NTFM 8158	CAT6-8158-0046	Dec. 12, 2024
5	ISN CAT5	Schwarzbeck	NTFM 8158	CAT5-8158-0046	Dec. 12, 2024
6	Test Software	R&S	EMC32	6.10.10	/

Note:1. The Cal. Interval was one year.

2. The cable loss has calculated in test result which connection between each test instruments.



3. TEST ITEM AND RESULTS

3.1. Conducted Emission

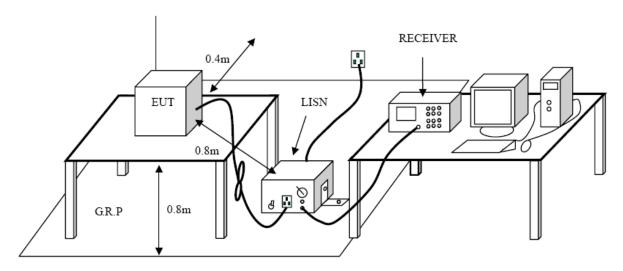
<u>Limit</u>

FCC CFR Title 47 Part 15 Subpart C Section 15.207

	Limit (d	BuV)
Frequency range (MHz)	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.

Test Configuration



Test Procedure

1. The EUT was setup according to ANSI C63.10:2013 requirements.

2. The EUT was placed on a platform of nominal size, 1 m by 1.5 m, raised 80 cm above the conducting ground plane. The vertical conducting plane was located 40 cm to the rear of the EUT. All other surfaces of EUT were at least 80 cm from any other grounded conducting surface.

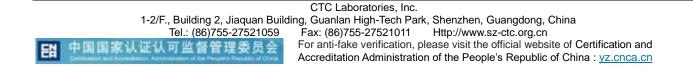
3. The EUT and simulators are connected to the main power through a line impedances stabilization network (LISN). The LISN provides a 50ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN. (Please refer to the block diagram of the test setup and photographs)

4. Each current-carrying conductor of the EUT power cord, except the ground (safety) conductor, was individually connected through a LISN to the input power source.

5. The excess length of the power cord between the EUT and the LISN receptacle were folded back and forth at the center of the lead to form a bundle not exceeding 40 cm in length.

6. Conducted Emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9 kHz.

7. During the above scans, the emissions were maximized by cable manipulation.

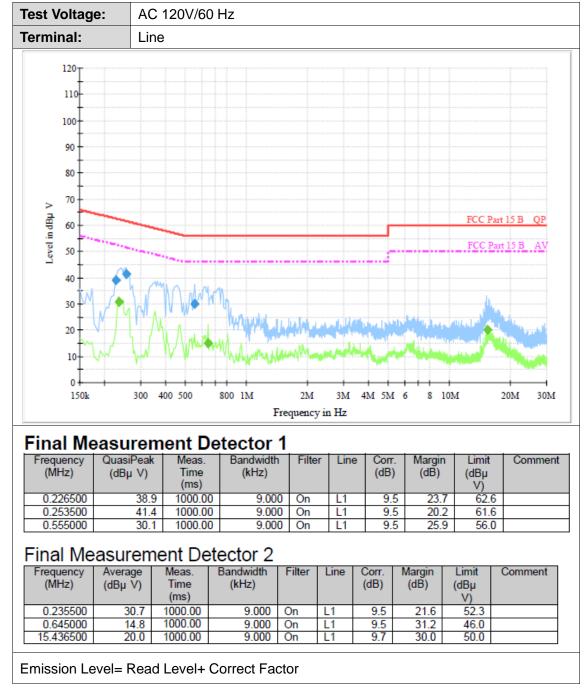




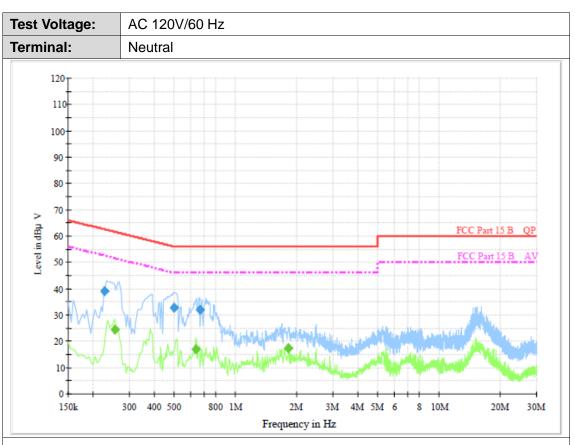
Test Mode:

Please refer to the clause 2.4.

Test Results







Final Measurement Detector 1

Frequency (MHz)	QuasiPeak (dBµ V)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµ V)	Comment
0.226500	39.1	1000.00	9.000	On	N	9.4	23.5	62.6	
0.496500	32.6	1000.00	9.000	On	Ν	9.4	23.5	56.1	
0.663000	32.0	1000.00	9.000	On	N	9.4	24.0	56.0	

Final Measurement Detector 2

	Frequency (MHz)	Average (dBµ V)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµ V)	Comment
Ī	0.253500	24.3	1000.00	9.000	On	N	9.4	27.3	51.6	
Ī	0.636000	16.9	1000.00	9.000	On	N	9.4	29.1	46.0	
ĺ	1.819500	17.5	1000.00	9.000	On	N	9.4	28.5	46.0	

Emission Level= Read Level+ Correct Factor



3.2. Radiated Emission

<u>Limit</u>

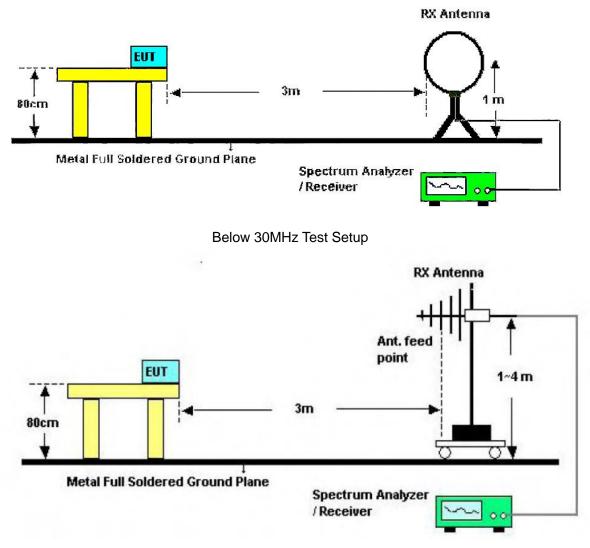
FCC CFR Title 47 Part 15 Subpart C Section 15.209/ RSS - Gen 8.9

Frequency	Limit (dBuV/m @3m)	Value
30 MHz ~ 88 MHz	40.00	Quasi-peak
88 MHz ~ 216 MHz	43.50	Quasi-peak
216 MHz ~ 960 MHz	46.00	Quasi-peak
960 MHz ~ 1 GHz	54.00	Quasi-peak
	54.00	Average
Above 1 GHz	74.00	Peak

Note:

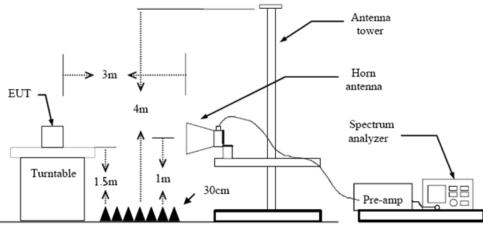
- (1) The tighter limit applies at the band edges.
- (2) Emission Level (dBuV/m)=20log Emission Level (uV/m).

Test Configuration



Below 1000MHz Test Setup





Above 1GHz Test Setup

Test Procedure

1. The EUT was setup and tested according to ANSI C63.10:2013

2. The EUT is placed on a turn table which is 0.8 meter above ground for below 1 GHz, and 1.5 m for

above 1 GHz. The turn table is rotated 360 degrees to determine the position of the maximum emission level. The EUT was set 3 meters from the receiving antenna, which was mounted on the top of a variable 3. height antenna tower.

4. For each suspected emission, the EUT was arranged to its worst case and then tune the Antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level to comply with the guidelines.

5. Set to the maximum power setting and enable the EUT transmit continuously.

Use the following spectrum analyzer settings 6.

Span shall wide enough to fully capture the emission being measured;

(2) 9k – 150kHz:

RBW=300 Hz, VBW=1 kHz, Sweep=auto, Detector function=peak, Trace=max hold (3) 0.15M - 30MHz:

RBW=10 kHz, VBW=30 kHz, Sweep=auto, Detector function=peak, Trace=max hold (4) 30M - 1 GHz:

RBW=120 kHz, VBW=300 kHz, Sweep=auto, Detector function=peak, Trace=max hold If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.

(5) From 1 GHz to 10th harmonic:

RBW=1MHz, VBW=3MHz Peak detector for Peak value.

RBW=1MHz, VBW see note 1 with Peak Detector for Average Value.

Note 1: For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 3 MHz for peak measurements and 1 MHz resolution bandwidth with 1/T video bandwidth with peak detector for average measurements. For the Duty Cycle please refer to clause 3.8 Duty Cycle.

Test Mode

Please refer to the clause 2.4.

Test Result

9 KHz~30 MHz

From 9 KHz to 30 MHz: Conclusion: PASS

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

CTC Laboratories, Inc.



۱nt	. Pol	•	Hor	izontal								
Fes	t Mo	de:	ТΧ	BLE 1M	lbps	Mode 2402	MHz					
Ren	nark	:	Onl	y worse	cas	e is reported	ł					
90.0	dBu	W/m										_
80												_
70												_
60								FCC Part	15 RE-Class	B 30-1000M		-
50								Margin - (dB			f
40										5	hund	Ц
30							Mar Burgh		hall and	41. SVY	Muno	<u>kw</u>
20	M	a share by	Aut Lu		W	A MANY WANNAMAN			Munitur	under 1		-
10			Annanan	"Thursday the	No.	1						-
0 -10												-
	0.000		60.OD			(MHz)	30	0.00			10	000.000
N	0.	Frequ (MH	-	Read (dBu	-	Factor (dB/m)	Level (dBuV/m		imit uV/m)	Margin (dB)	Det	tector
1	*	224.0	000	56.8	34	-18.52	38.32	4	6.00	-7.68	C	ΩP
2		319.7	066	45.8	37	-15.15	30.72	4	6.00	-15.28	C	٩¢
3		366.5		43.6		-13.87	29.82	4	6.00	-16.18	0	ΩP
4	-	396.9		43.4		-13.01	30.43		6.00	-15.57		ΩP
5	-	767.8		37.3		-4.41	32.98		6.00	-13.02		ΩP
6	6	796.9	466	38.3	39	-3.85	34.54	4	6.00	-11.46	0	ΩP

1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor 2.Margin value = Level -Limit value

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Ant. I	Pol	-		Vert	tica												
lest l	Мо	de:		ТХΙ	X BLE 1Mbps Mode 2402MHz Only worse case is reported												
Rema	ark:	1		Only													
90.0	dBu	i∀/m		1													_
80																_	_
70 -											_					_	_
60 -							$\left \right $				F	CC Part	15 RE-Clas	s B 30-100	ом	+	-
50 -							$\left \right $					argin-6	dB				f
40										ç			4 5			6	
30 -									1	1 million	Whent	tran/hM	WIJMIN	WHAT	WHAT W	, A	<u>~</u>
20 -	w	mm	har	vluhand	ady sh	٨٨	Ar	m hall	<u>t na fharryddinaeth a s</u>		helpe t		· · ·•				
10 -					Y	₩ *											
-10																	
30.0	000		ŧ	50.00					(MHz)	1	300.0	00	II			1	1000.000
No).	Frequ (Mł		су			adir 3u∖	<u> </u>	Factor (dB/m)	Lev (dBu\			imit uV/m)	Marg (dB		De	tector
1		120.2	210	0	4	43	.28	3	-18.04	25.2	24	43	3.50	-18.2	26	(QP
2	*	215.5	593	3		51	.32	2	-18.81	32.5	51	4	3.50	-10.9	99	(QP
3		399.2	246	6	4	45	.10)	-12.95	32.1	5	4	6. 00	-13.8	35	(QP
4		431.9	903	3	4	44	.34	1	-11.95	32.3	39	4	6.00	-13.6	61	(QP
5		469.4	110	0	4	41	.46	6	-11.09	30.3	37	4	6. 00	-15.6	63	(QP
6		892.9	976	6		35	.45	5	-2.79	32.6	66	4	6.00	-13.3	34	(QP



A	nt. Pol	I .	Hori	zontal					
Т	est Mo	de:	TX E	BLE 1Mbps I	Mode 2402I	MHz			
R	Remark	:		eport for the cribed limit.	emission v	vhich more t	han 10 dB b	elow the)
	No.	Freque (MHz		Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
ŀ	1	4760.0	00	42.19	1.91	44.10	74.00	-29.90	peak
	2	5993.7	50	40.27	5.63	45.90	74.00	-28.10	peak
	3	8108.7	50	40.22	10.59	50.81	74.00	-23.19	peak
	4	9518.7	50	39.29	12.58	51.87	74.00	-22.13	peak
ŀ	5 *	10776.0	000	38.50	14.41	52.91	74.00	-21.09	peak
	6	11998.0	000	37.41	15.45	52.86	74.00	-21.14	peak

1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor

2.Margin value = Level -Limit value

Ant. Po	l.	Vert	ical					
Test Mo	ode:	TX I	BLE 1Mbps	Mode 2402	MHz			
Remark	K :		eport for the scribed limit.	emission v	vhich more t	han 10 dB t	elow the	•
No.	Frequer (MHz		Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	3972.7	50	40.83	0.44	41.27	74.00	-32.73	peak
2	5629.5	00	40.70	4.23	44.93	74.00	-29.07	peak
3	7638.7	50	40.16	10.13	50.29	74.00	-23.71	peak
4	9612.7	50	39.14	12.62	51.76	74.00	-22.24	peak
5	10764.2	250	37.77	14.39	52.16	74.00	-21.84	peak
6 *	11727.7	750	38.11	15.10	53.21	74.00	-20.79	peak

Remarks:



A	Ant. Po	Ι.	Hori	zontal									
T	lest Mo	de:	TX E	K BLE 1Mbps Mode 2440MHz									
F	Remark	:		eport for the cribed limit.	emission v	vhich more t	han 10 dB b	elow the	•				
	No.	Frequer (MHz	-	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector				
ľ	1	4000.1	67	40.58	0.54	41.12	74.00	-32.88	peak				
	2	5065.5	00	41.94	2.46	44.40	74.00	-29.60	peak				
ľ	3	6499.0	00	39.29	7.32	46.61	74.00	-27.39	peak				
ľ	4	8426.0	00	40.86	10.59	51.45	74.00	-22.55	peak				
ľ	5	10364.7	750	38.61	13.83	52.44	74.00	-21.56	peak				
ľ	6 *	12045.0	000	37.43	15.51	52.94	74.00	-21.06	peak				

1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor

2.Margin value = Level -Limit value

Ant. Po	I.	Vert	tical					
Fest Mo	ode:	ТΧ	BLE 1Mbps	Mode 2440	MHz			
Remark	(:		report for the scribed limit.		which more t	han 10 dB t	pelow the)
No.	Frequer (MHz		Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	3820.0	00	40.53	-0.16	40.37	74.00	-33.63	peak
2	5335.7	50	41.16	3.23	3.23 44.39 74.00	-29.61	peak	
3	7098.2	50	39.19	9.47	48.66	74.00	-25.34	peak
4	9213.2	50	39.35	12.38	51.73	74.00	-22.27	peak
5	11081.5	500	38.20	14.71	52.91	74.00	-21.09	peak
6 *	12573.7	′50	37.28	16.00	53.28	74.00	-20.72	peak

2.Margin value = Level -Limit value



Interm (MHz) (dBuV) (dB/m) (dBuV/m) (dBuV/m) (dB) 1 3902.250 41.27 0.16 41.43 74.00 -32.57 p	Detector
No. Frequency (MHz) Reading (dBuV) Factor (dB/m) Level (dBuV/m) Limit (dBuV/m) Margin (dB) Description 1 3902.250 41.27 0.16 41.43 74.00 -32.57 prescription	Detector
NO. (MHz) (dBuV) (dB/m) (dBuV/m) (dBuV/m) (dB) D 1 3902.250 41.27 0.16 41.43 74.00 -32.57 g	Detector
	20100101
	peak
2 5770.500 40.19 4.81 45.00 74.00 -29.00 p	peak
3 7309.750 39.08 10.07 49.15 74.00 -24.85 p	peak
4 8825.500 39.76 11.44 51.20 74.00 -22.80 p	peak
5 11163.750 38.05 14.75 52.80 74.00 -21.20 p	peak
6 * 12374.000 37.44 15.52 52.96 74.00 -21.04 p	peak

1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor

2.Margin value = Level -Limit value

Ant. Po	I.	Vert	ical					
Test Mo	de:	ТΧ	BLE 1Mbps	Mode 2480	MHz			
Remark			report for the scribed limit.		which more t	han 10 dB t	below the	•
No.	Frequer (MHz		Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	4337.0	00	42.26	0.99	43.25	74.00	-30.75	peak
2	6369.7	50	39.56	6.94	46.50	74.00	-27.50	peak
3	7991.2	50	39.88	10.85	50.73	74.00	-23.27	peak
4	9236.7	50	39.33	12.40	51.73	74.00	-22.27	peak
5	11140.2	250	37.75	14.73	52.48	74.00	-21.52	peak
6 *	12303.5	500	37.72	15.60	53.32	74.00	-20.68	peak



A	nt. Pol	I.	Hori	zontal					
Т	est Mo	de:	TX E	BLE 2Mbps	Mode 2402	MHz			
R	emark	:		eport for the cribed limit.	emission v	vhich more t	han 10 dB t	elow the)
	No.	Frequer (MHz		Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
	1	4948.0	00	41.44	2.19	43.63	74.00	-30.37	peak
	2	6980.7	50	39.50	8.84	48.34	74.00	-25.66	peak
ľ	3	8437.7	50	40.06	10.62	50.68	74.00	-23.32	peak
ľ	4	9706.7	50	39.24	12.78	52.02	74.00	-21.98	peak
ľ	5	11058.0	000	37.72	14.70	52.42	74.00	-21.58	peak
	6 *	11974.5	500	37.68	15.41	53.09	74.00	-20.91	peak
R	emarks	s:					1		
			Anten	na Factor (c	dB/m)+Cabl	e Factor (dB)-Pre-ampli	fier Facto	or

2.Margin value = Level -Limit value

	Ant. Pol		Vert	ical					
٦	Fest Mo	de:	TX E	BLE 2Mbps	Mode 2402	MHz			
F	Remark	:		eport for the cribed limit.	emission v	vhich more t	han 10 dB b	elow the	
	No.	Freque (MHz		Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
	1	5359.2	50	41.49	3.28	44.77	74.00	-29.23	peak
	2	7709.2	50	39.87	10.26	50.13	74.00	-23.87	peak
	3	8731.5	00	39.84	11.28	51.12	74.00	-22.88	peak
	4	10106.2	250	38.32	13.39	51.71	74.00	-22.29	peak
	5	11175.5	500	38.12	14.75	52.87	74.00	-21.13	peak
	6 *	12197.7	750	37.29	15.72	53.01	74.00	-20.99	peak
									. <u> </u>

Remarks:



Ant. Pol.		Hori	zontal					
Test Mod	e:	TX E	BLE 2Mbps	Mode 2440	MHz			
Remark:			eport for the cribed limit.	emission v	vhich more t	han 10 dB t	elow the	;
No.	Frequer (MHz		Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	4572.0	00	41.24	1.54	42.78	74.00	-31.22	peak
2	7145.2	5 0	38.15	9.73	47.88	74.00	-26.12	peak
3	8954.7	50	39.73	11.63	51.36	74.00	-22.64	peak
4	10188.5	500	38.58	13.57	52.15	74.00	-21.85	peak
5	11175.5	500	37.91	14.75	52.66	74.00	-21.34	peak
6 *	12632.5	500	36.97	16.15	53.12	74.00	-20.88	peak

2.Margin value = Level -Limit value

Ant. Po	l.	Vert	ical					
Test Mo	de:	TX I	BLE 2Mbps	Mode 2440	MHz			
Remark	:		report for the scribed limit.	emission v	vhich more t	han 10 dB b	elow the	!
No.	Frequer (MHz		Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	4807.0	00	41.97	2.00	43.97	74.00	-30.03	peak
2	7168.7	50	38.68	9.85	48.53	74.00	-25.47	peak
3	8755.0	00	40.03	11.31	51.34	74.00	-22.66	peak
4	10259.0	000	38.66	13.67	52.33	74.00	-21.67	peak
5	11516.2	250	37.81	14.98	52.79	74.00	-21.21	peak
6 *	12644.2	250	37.00	16.18	53.18	74.00	-20.82	peak

Remarks:



Ant. Po	Ι.	Hori	zontal					
Test Mo	de:	TX I	BLE 2Mbps	Mode 2480	MHz			
Remark			report for the scribed limit.	emission v	which more t	han 10 dB k	pelow the	•
No.	Frequer (MHz		Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	5171.2	50	41.11	2.78	43.89	74.00	-30.11	peak
2	7251.0	00	38.46	10.04	48.50	74.00	-25.50	peak
3	8285.0	00	40.42	10.43	50.85	74.00	-23.15	peak
4	9683.2	50	39.08	12.74	51.82	74.00	-22.18	peak
5	11018.8	333	38.40	14.68	53.08	74.00	-20.92	peak
6 *	12409.2	250	37.79	15.52	53.31	74.00	-20.69	peak

2.Margin value = Level -Limit value

Α	nt. Pol		Vert	ical					
Т	est Mo	de:	TX E	BLE 1Mbps	Mode 2480I	MHz			
R	emark	:		eport for the cribed limit.	emission v	vhich more t	han 10 dB b	elow the	
	No.	Frequer (MHz		Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
	1	4160.7	50	40.93	0.70	41.63	74.00	-32.37	peak
	2	5982.0	00	40.05	5.58	45.63	74.00	-28.37	peak
	3	7509.5	00	39.15	10.09	49.24	74.00	-24.76	peak
	4	8990.0	00	39.87	11.67	51.54	74.00	-22.46	peak
	5	11034.5	500	37.98	14.69	52.67	74.00	-21.33	peak
	6 *	12515.0	000	37.15	15.82	52.97	74.00	-21.03	peak
									I

Remarks:



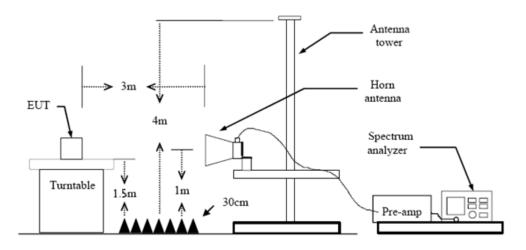
3.3. Band Edge Emissions (Radiated)

Limit

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (d):

Restricted Frequency Band	(dBuV/m	n)(at 3m)
(MHz)	Peak	Average
2310 ~ 2390	74	54
2483.5 ~ 2500	74	54

Test Configuration



Test Procedure

- 1. The EUT was setup and tested according to ANSI C63.10:2013 requirements.
- The EUT is placed on a turn table which is 1.5 meter above ground. The turn table is rotated 360 2. degrees to determine the position of the maximum emission level.
- 3. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.
- The antenna is scanned from 1 meter to 4 meters to find out the maximum emission level. This is 4. repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10:2013 on radiated measurement.
- 5. The receiver set as follow:

RBW=1MHz, VBW=3MHz Peak detector for Peak value.

RBW=1MHz, VBW see note 1 with Peak Detector for Average Value.

Note 1: For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 3 MHz for peak measurements and 1 MHz resolution bandwidth with 1/T video bandwidth with peak detector for average measurements. For the Duty Cycle please refer to clause 3.8 Duty Cycle.

Test Mode

Please refer to the clause 2.4.

CTC Laboratories, Inc.



Test Results

Ant. F	Pol.		H	Hori	zont	al														
Test M	Mod	e:	E	BLE	1M	ops N	Лос	le 24	02N	1Hz	Z									
120.0	dBuV∕	'm				1				1										
110 _																	_			
100													_							
90 -													_		_				\wedge	
80												TCC I	0	RE-Clas	- D 4					
70												TLU I		nc-Lia	CX D A	DOVE				
60												FCC	Part15	RE-Clas	R R A	bove	16 44	,	+	
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40 -																2		\rightarrow	+	
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20															_		-		_	
10															-					
0.0 2286	6. 200	2298.20	231	0.20	232	2.20	23	34.20	(MI	1z)	235	8.20	2370.2	20 2	382.2	:0	2394.	.20	240	6.20
No.		Frequ	uenc Hz)	у		adin BuV			acto 3/m			evel JV/m)		Limit			argii 1B)	n c)etec	tor
4	_			_						·	-		· ·					+		
1		2390		_		5.40			1.31			5.71		74.00		<u> </u>	7.29	+	pea	
2 '		2390	J.00(J	6	6.00		31	1.31		37	.31		54.00	J	-16	6.69	9	AV	ق
Rema																				
1.Fact 2.Mar								IB/m))+Ca	able	e Fac	tor (dE	3)-P	re-ar	npli	tier	Fac	tor		

CTC Laboratories, Inc. 1-2/F., Building 2, Jiaquan Building, Guanlan High-Tech Park, Shenzhen, Guangdong, China Tel.: (86)755-27521059 Fax: (86)755-27521011 Http://www.sz-ctc.org.cn For anti-fake verification, please visit the official website of Certification and Accreditation Administration of the People's Republic of China : <u>vz.cnca.cn</u>



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Ant.	. Po		Ver	tical					
Test	t Mo	de:	BLE	E 1Mbps M	lode 2402MF	lz			
120.0) dBu	iV/m							
110									
100									
90									
80								1. 10.04	
70						FLL I	Part15 RE-Class B .	ADOVE 15 PK	
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10									
0.0 22	87.400	2299.40	2311.40	2323.40	2335.40 (MHz)	2359.40	2371.40 2383.	40 2395.4	0 2407.40
				I		1	1	1	1
N	0.	Frequ (MF	-	Reading (dBuV)	e	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1		2390.	000	15.83	31.31	47.14	74.00	-26.86	peak
2	*	2390.	000	4.64	31.31	35.95	54.00	-18.05	AVG
Rem	nark	5:							
1.Fa	actor	(dB/m) :		nna Factor -Limit valu	(dB/m)+Cab e	le Factor (dE	3)-Pre-ampli	ifier Facto	or



nt. Po	I.	Hori	zontal					
est Mo	ode:	BLE	1Mbps Mod	de 2480 M⊦	Ηz			
20.0 dB	u¥/m							
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2475.80	0 2487.80	2499.80	2511.80 25	623.80 (MHz)	2547.80 2	2559.80 2571.8	30 2583.80) 2595.
	_		Destine	Frates	11	1		
No.	Freque (MH	-	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detecto
1	2483.	500	16.09	31.48	47.57	74.00	-26.43	peak
2 *	2483.	500	4.26	31.48	35.74	54.00	-18.26	AVG



Ant. Po	Ι.	Vert	ical					
lest Mo	de:	BLE	1Mbps Moo	de 2480 M⊦	lz			
120.0 dB	uV/m							
110								
100								
90	Λ							
80	<u> </u>							
70		_			FCC P	ar[15 RE-Class B A	Above 1G PK	
60								
50	<u>}</u>				FCC P	ar 15 RE-Class B A	Above 1G AV	
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2472.80	0 2484.80	2496.80	2508.80 25	520.80 (MHz)	2544.80 2	556.80 2568.8	80 2580.80	2592.80
	Freque	encv	Reading	Factor	Level	Limit	Margin	
No.	(MH		(dBuV)	(dB/m)	(dBuV/m)		-	Detector
1	2483.5	500	17.11	31.48	48.59	74.00	-25.41	peak
2 *	2483.5	500	4.00	31.48	35.48	54.00	-18.52	AVG
Remark	s:							
1.Factor	(dB/m) =			dB/m)+Cabl	e Factor (dB	8)-Pre-ampli	ifier Facto	or
2.Margir	n value =	Level ·	Limit value					



nt. Po	l	Hor	zontal						
est Mo	de:	BLE	2Mbps Mo	de 2402 M⊦	lz				
120.0 dB	uV/m								
110									
100									
90								A	
80					FCC	Par(15 RE-Class B /	Above 16 PK	\square	
70		_					ADDTE TO I K		
60					FCC	Par(15 RE-Class B /	Above 15 AV		
50							1 ×		
40							2	-	
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20									
10									
0.0 2288.60	0 2300.60	2312.60	2324.60 2	336.60 (MHz)	2360.60	2372.60 2384.	60 2396.6	0 2408.6	
No.	Freque (MH;	-	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	
1	2390.0	000	17.70	31.31	49.01	74.00	-24.99	peak	
2 *	2390.0	000	5.01	31.31	36.32	54.00	-17.68	AVG	



Ant. F	V	Vertical																			
Test I	Mod	e:		E	BLE	2Mb	ops N	Лod	e 24	102 N	ЛH	Z									
120.0	dBuV	//m																			_
110 _														_							_
100														_							
90														_						<i>h</i>	
80																				Д_	_
70													FCC I	Parl1	i RE-CI	ass B	Above	• 1G P	ν K		
60 _																					
50 -													FCC	art1	i RE-C	ass B	Above	: 1G A	~	\rightarrow	_
40																					
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20																					
10																					
0.0	8.000	2300			2.00		4.00		36.00	(MI			0.00	2372.		2384			6.00		408.00
No			eque		y		adin			acto			vel		Lim			argi		Det	ector
		(MH	Z)		(dł	BuV)	(dł	B/m))	(dBu	V/m)	(dl	(dBuV/m)		((dB)		200000	
1		23	9 0 .	000)	15	5.62		31	1.31		46	.93		74.0	0	-2	7.0	7	pe	eak
2	*	23	9 0 .	90.000		3	.71		31	1.31		35	.02	54.00		-1	-18.98		AVG		
												1									
Rema 1.Fac 2.Mar	tor (dB/							B/m)+Ca	abl	e Fac	tor (dE	8)-P	re-a	mpl	ifier	Fac	cto	r	



EN

Ant. F	Pol.		Hori	zonta	al								
est I	Mode:		BLE	2Mb	ops Moo	de 24	80 MH	łz					
120.0	dBuV/m												
110													
100 -													
90 -	- <u>A</u>		_			_							
80 -									ECC.	Part15 RE-Class J	Abarra 10 DK		
70 -									FLL	Partio RE-Class	ADOVE 15 PK		
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20 -													
10 -			_										
0.0 2474	4.000 248	6.00	2498.00	251	0.00 2	522.00	(MHz)	254	6.00	2558.00 257).00 2582.1	00 2594.00	
No	Fr	equei	псу	Rea	ading	Fa	actor	Le	vel	Limit	Margin	Detector	
INO.	-	(MHz)	(df	BuV)	(dB/m)		(dBu	iV/m)	(dBuV/m) (dB)	Detector	
1	2	483.5	00	- 16	6.97	31	.48	48	.45	74.00	-25.55	peak	
2	* 24	483.5	00	5.09		31.48		36	.57	54.00	-17.43	AVG	
2010-	, ,												
						dB/m)	+Cab	e Fac	tor (dE	8)-Pre-amp	lifier Facto	or	



nt. Po		Vert	ical						
est Mo	de:	BLE	2Mbps Mod	de 2480 M⊦	lz				
120.0 dBu	V/m								
110									
100									
					FCC P	arl15 RE-Class B A	bove 1G PK		
	1				FCC P	ar 15 RE-Class B A	bove 1G AV		
	×								
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30									
20									
10 0.0									
2474.600	2486.60	2498.60	2510.60 25	22.60 (MHz)	2546.60 2	558.60 2570.6	0 2582.60	0 2594.60	
No.	Freque		Reading	Factor	Level	Limit	Margin	Detector	
110.	(MH:	z)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	Delector	
1	2483.5	500	17.16	31.48	48.64	74.00	-25.36	peak	
2 *	2483.5	500	4.18	31.48	35.66	54.00	-18.34	AVG	
			1	1		1			
Remarks .Factor	(dB/m) =	Anten		dB/m)+Cabl	e Factor (dB	b)-Pre-ampli	fier Facto	or	
			Limit value						

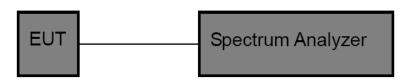


3.4. Band edge and Spurious Emissions (Conducted)

<u>Limit</u>

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (d):In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

Test Configuration



Test Procedure

- 1. The transmitter output was connected to the spectrum analyzer through an attenuator, the path loss was compensated to the results for each measurement.
- 2. Set to the maximum power setting and enable the EUT transmit continuously
- 3. Use the following spectrum analyzer settings:
 - RBW = 100 kHz, VBW \geq RBW, scan up through 10th harmonic.
- Sweep = auto, Detector function = peak, Trace = max hold
- 4. Measure and record the results in the test report.

Test Mode

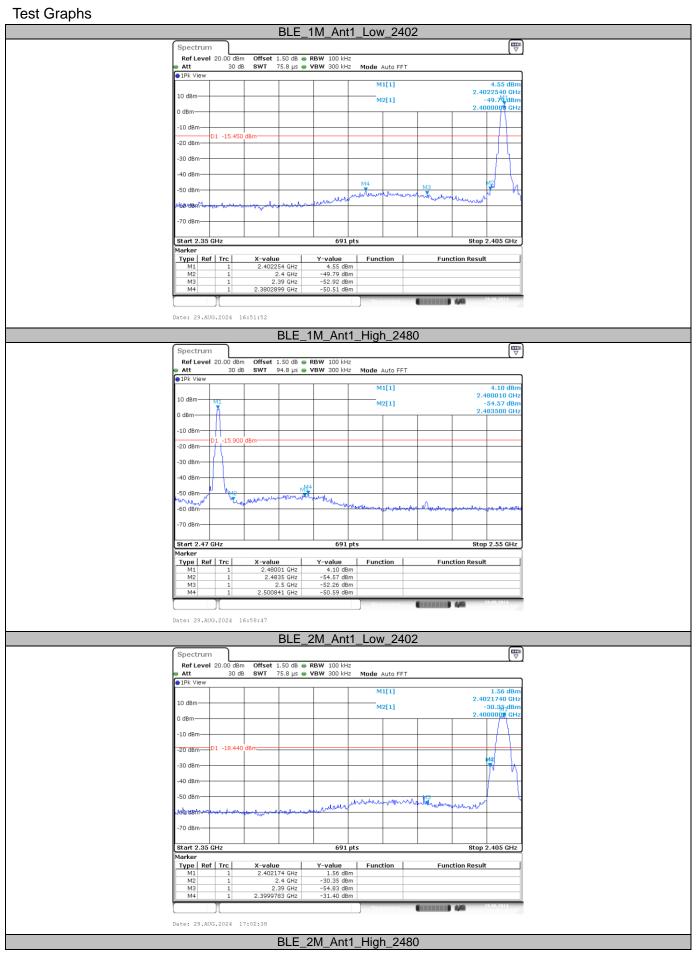
Please refer to the clause 2.4.

Test Results

(1) Band edge Conducted Test

Test Mode	Antenna	ChName	Freq(MHz)	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE 1M	Ant1	Low	2402	4.55	-50.51	≤-15.45	PASS
DLC_1W	Anti	High	2480	4.10	-50.59	≤-15.90	PASS
	Ant1	Low	2402	1.56	-31.40	≤-18.44	PASS
BLE_2M	Anti	High	2480	3.94	-48.93	≤-16.06	PASS





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EN

									E
Spectr	um								
Ref Le	vel 20.00 dB			RBW 100 kHz					
Att	30 c	IB SWT	94.8 µs 👄	VBW 300 kHa	2 Mode	Auto FFT			
1Pk Vie	w								
					M	1[1]			3.94 dBm
10 dBm-	M1								80010 GH;
	Ť				M	2[1]			53.04 dBm 83500 GHz
0 dBm	11			+ +				2.4	
-10 dBm-									
-20 dBm-	D1 -16.06	0 dBm							
-20 0011									
-30 dBm-	<u> </u>								
-40 dBm-				+ +					
	1 10	14							
-50 dBm-	1	Anna	munine	ubra.					
-60 dBm-		o have week		a burgery	Man Law Ma	tel march	m.	. have seened	BALL MARK & CA
-00 0511								1	
-70 dBm-									
Start 2.	47 GHz			691	nts			Ston	2.55 GHz
Marker	iii anii			0.71				0100	LIGO GIL
	Ref Trc	X-valu	e	Y-value	Func	tion	Fur	nction Result	
M1	1		01 GHz	3.94 dBr					
M2	1		35 GHz	-53.04 dBr					
M3	1		2.5 GHz	-53.72 dBr					
M4	1	2.4856	52 GHz	-48.93 dBr	m				
	1 X				Mea	suring		1444	9.08.2024
Date: 29	.AUG.2024	17:11:43							



EN

(2) Conducted Spurious Emissions Test

Test Mode	Antenna	Freq(MHz)	FreqRange [MHz]	RefLevel [dBm]	Result[dBm]	Limit[dBm]	Verdict
			Reference	4.54	4.54		PASS
		2402	30~1000	4.54	-57.54	≤-15.46	PASS
			1000~26500	4.54	-38.23	≤-15.46	PASS
			Reference	5.00	5.00		PASS
BLE_1M	Ant1	2440	30~1000	5.00	-57.24	≤-15.00	PASS
			1000~26500	5.00	-35.75	≤-15.00	PASS
			Reference	5.10	5.10		PASS
		2480	30~1000	5.10	-57.58	≤-14.90	PASS
			1000~26500	5.10	-37.17	≤-14.90	PASS
		2402	Reference	3.84	3.84		PASS
			30~1000	3.84	-58.33	≤-16.16	PASS
			1000~26500	3.84	-39.97	≤-16.16	PASS
			Reference	4.12	4.12		PASS
BLE_2M	Ant1	2440	30~1000	4.12	-57.49	≤-15.88	PASS
			1000~26500	4.12	-38.49	≤-15.88	PASS
			Reference	4.45	4.45		PASS
		2480	30~1000	4.45	-58.56	≤-15.55	PASS
			1000~26500	4.45	-38.32	≤-15.55	PASS

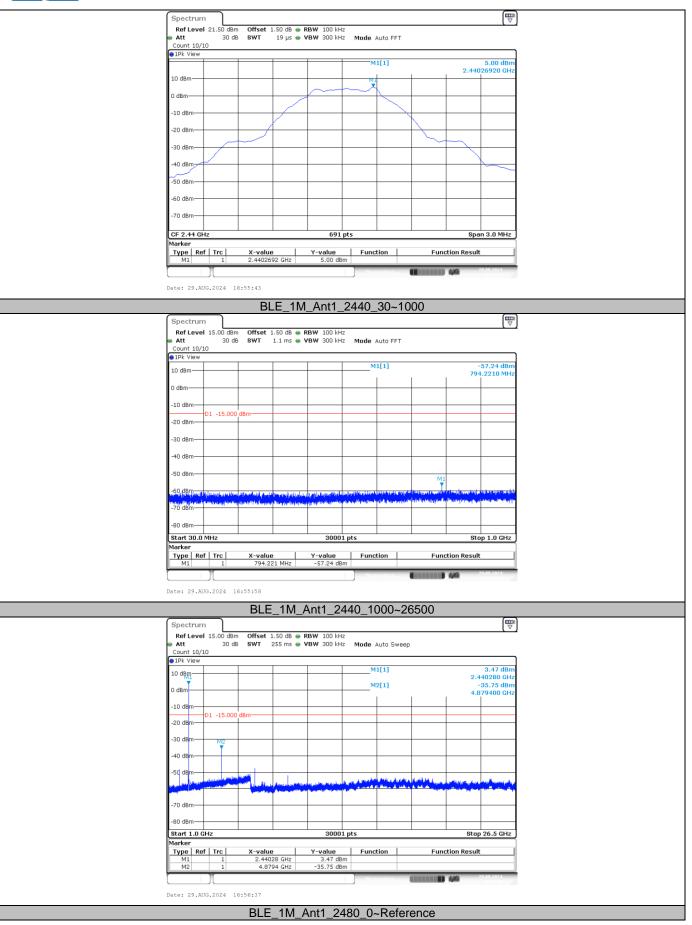


Test Graphs BLE_1M_Ant1_2402_0~Reference ▽ Spectrum RefLevel 21.50 dBm Att 30 dB Offset SWT Att Count 10/10 Mode Auto FFT ⊖1Pk Viev 4.54 dBn 2.40226920 GH 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm 40 dBr -50 dBm -60 dBr -70 dBr CF 2.402 GHz 691 pt n 3.0 MHz Sp larke 2 4∩22692 GHz Type Ref Trc Function 1 Y-value 4.54 dBm Function Result 100 446 Date: 29.AUG.2024 16:52:02 BLE_1M_Ant1_2402_30~1000 Spectrum RefLevel 15.00 Att 3 Offset 1.50 dB • RBW 100 kHz 1.1 ms • VBW 300 kHz dBr 30 dB SWT Mode Auto FFT Count 10/10 ●1Pk View -57.54 dBr 1.4600 MH M1[1] 10 dBm 954 0 dBn -10 dBm 01 -15.46 -20 dBm -30 dBr 40 dBr -50 dBm M1 ▼ 60 dBm -70 dB -80 dBm Start 30.0 MHz 30001 pt Stop 1.0 GHz larkei Type Ref Trc X-value 954.46 MHz -57.54 dBm Function Function Result III 440 Date: 29.AUG.2024 16:52:17 BLE_1M_Ant1_2402_1000~26500 ₽ Spectrum RefLevel 15.00 dBm Att 30 dB Offset SWT 1.50 dB 👄 RBW 100 kHz 255 ms 👄 VBW 300 kHz Mode Auto Sweep Count 10/10 ●1Pk View 3.20 dBm 2.402030 GHz -38.23 dBm 4.802900 GHz M1[1] 10 dBm M2[1] 0 dBm -10 d6 01 -15.46 -20 dB -30 dB 40 dE -50 d6r A State 70 dBr -80 dBm Start 1.0 GHz 30001 pts Stop 26.5 GHz larkei Type Ref Trc X-value 2.40203 GHz 4.8029 GHz Y-value 3.20 dBm -38.23 dBm | Function T Function Result M2 Date: 29.AUG.2024 16:52:57 BLE_1M_Ant1_2440_0~Reference

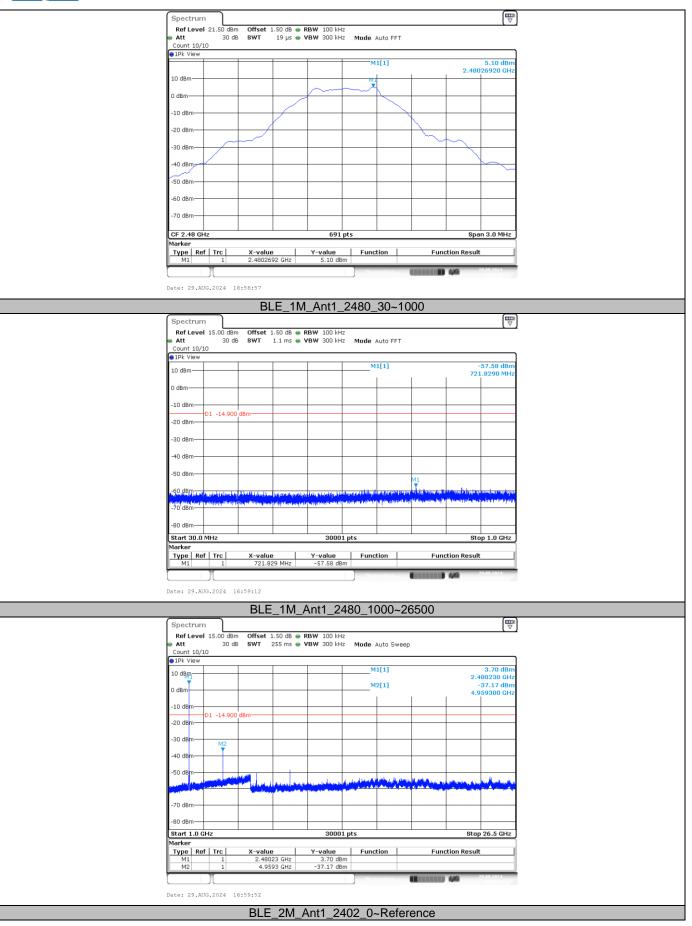
CTC Laboratories, Inc.



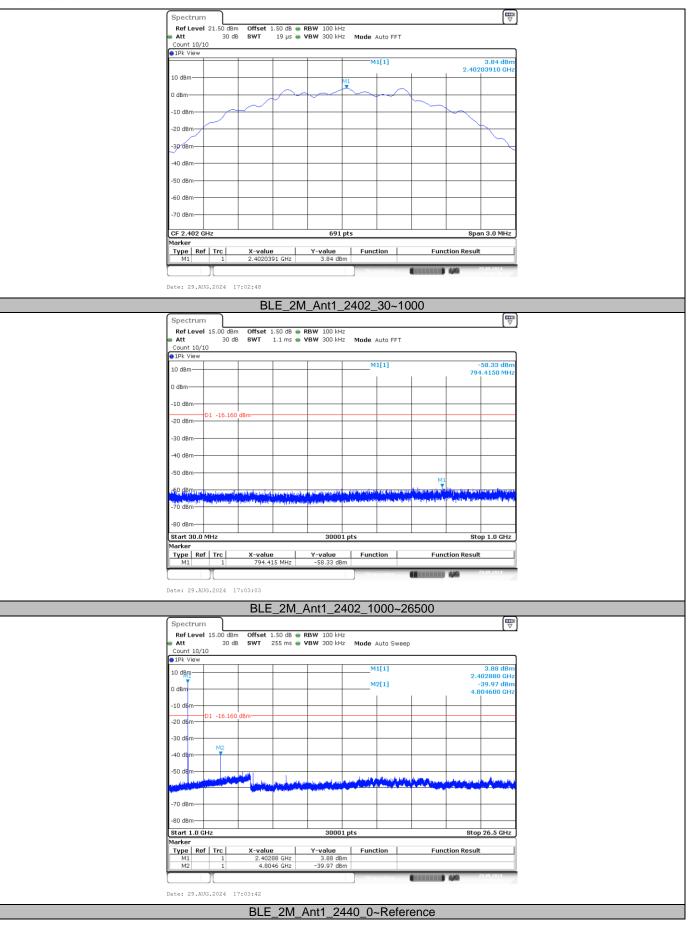




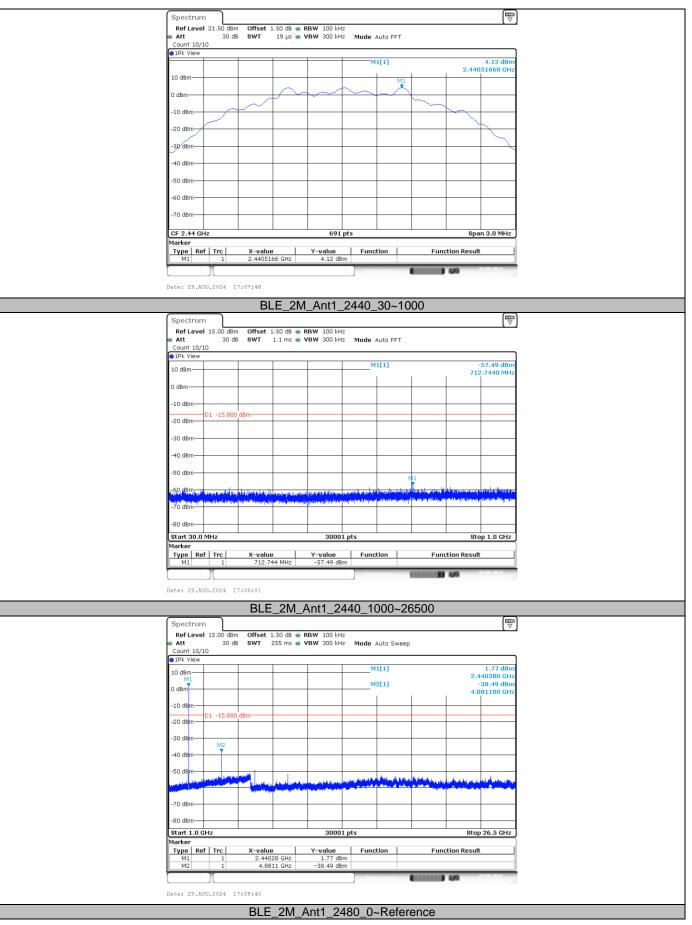






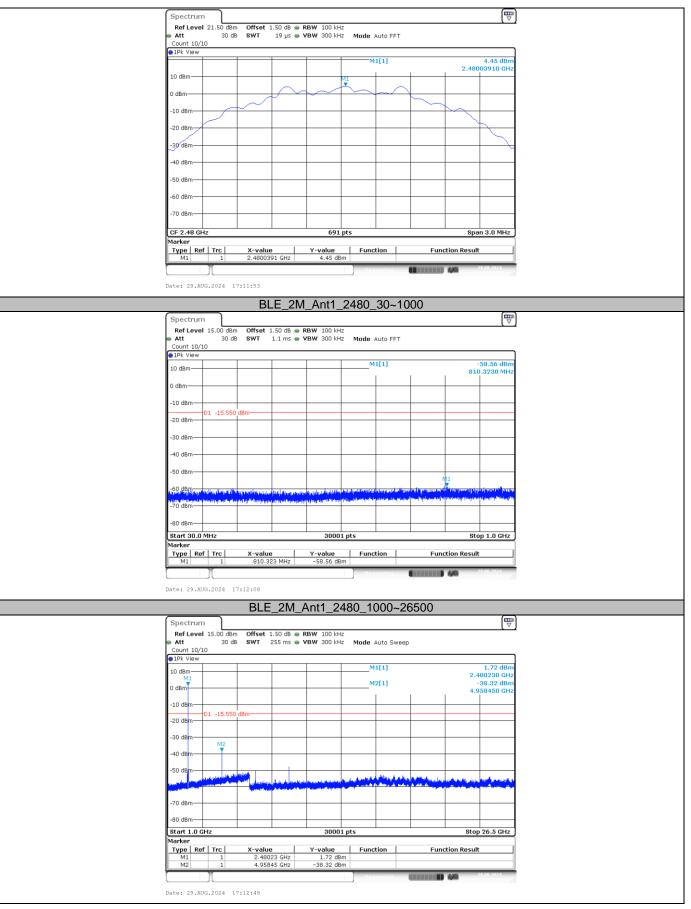














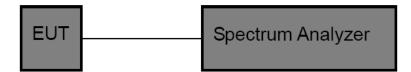
3.5. DTS Bandwidth

<u>Limit</u>

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (a)(2):

Test Item	Limit	Frequency Range(MHz)	
DTS Bandwidth	>=500 KHz (6dB bandwidth)	2400~2483.5	

Test Configuration



Test Procedure

1. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.

- 2. DTS Spectrum Setting:
 - (1) Set RBW = 100 kHz.
 - (2) Set the video bandwidth (VBW) \geq 3 RBW.
 - (3) Detector = Peak.
 - (4) Trace mode = Max hold.
 - (5) Sweep = Auto couple.
 - OCB Spectrum Setting:
 - (1) Set RBW = $1\% \sim 5\%$ occupied bandwidth.
 - (2) Set the video bandwidth (VBW) \geq 3 RBW.
 - (3) Detector = Peak.
 - (4) Trace mode = Max hold.
 - (5) Sweep = Auto couple.

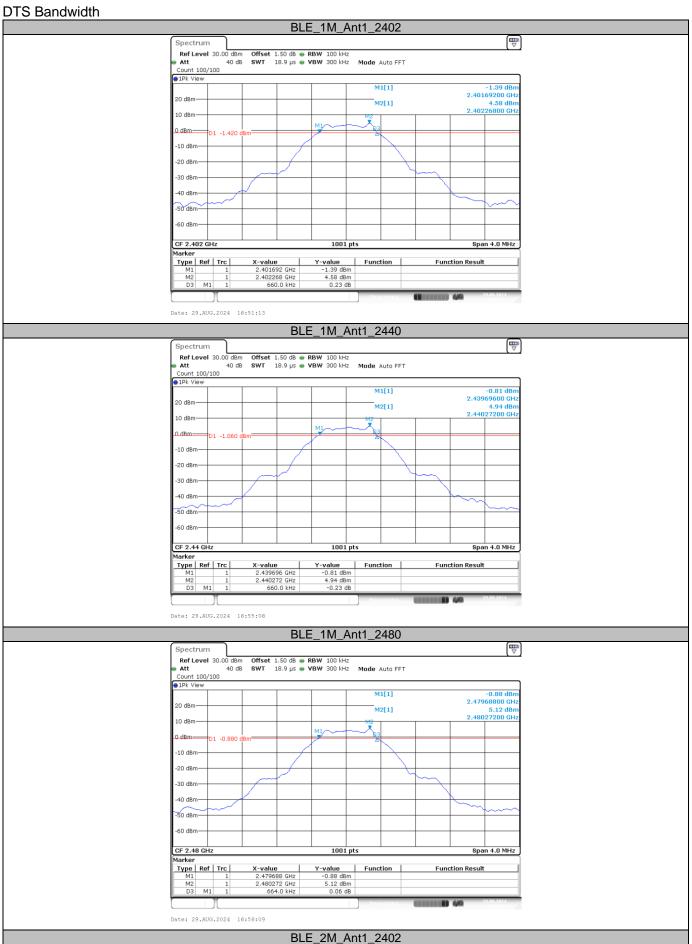
Test Mode

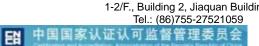
Please refer to the clause 2.4.

Test Results

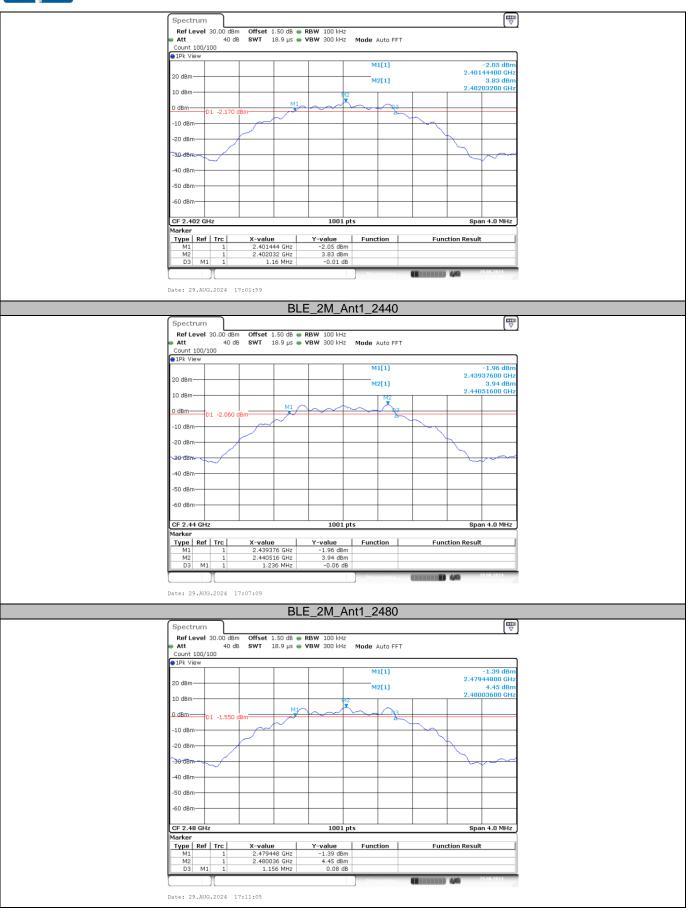
Test Mode	Antenna	Freq(MHz)	OCB [MHz]	DTS BW [MHz]	Limit[MHz]	Verdict
		2402	1.035	0.660	0.5	PASS
BLE_1M	Ant1	2440	1.031	0.660	0.5	PASS
		2480	1.031	0.664	0.5	PASS
		2402	2.03	1.160	0.5	PASS
BLE_2M	Ant1	2440	2.042	1.236	0.5	PASS
		2480	2.038	1.156	0.5	PASS



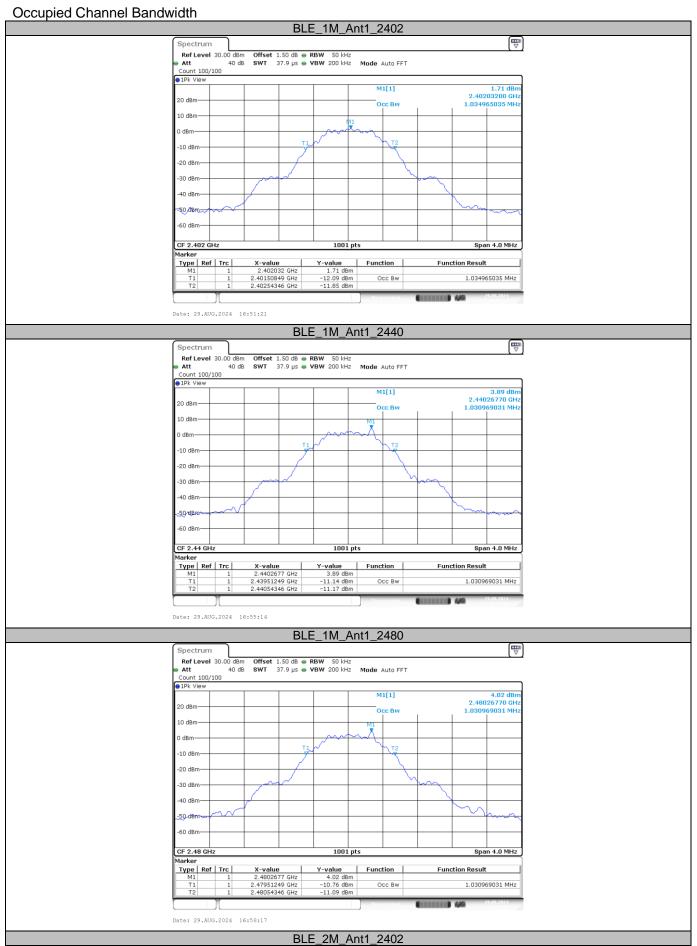






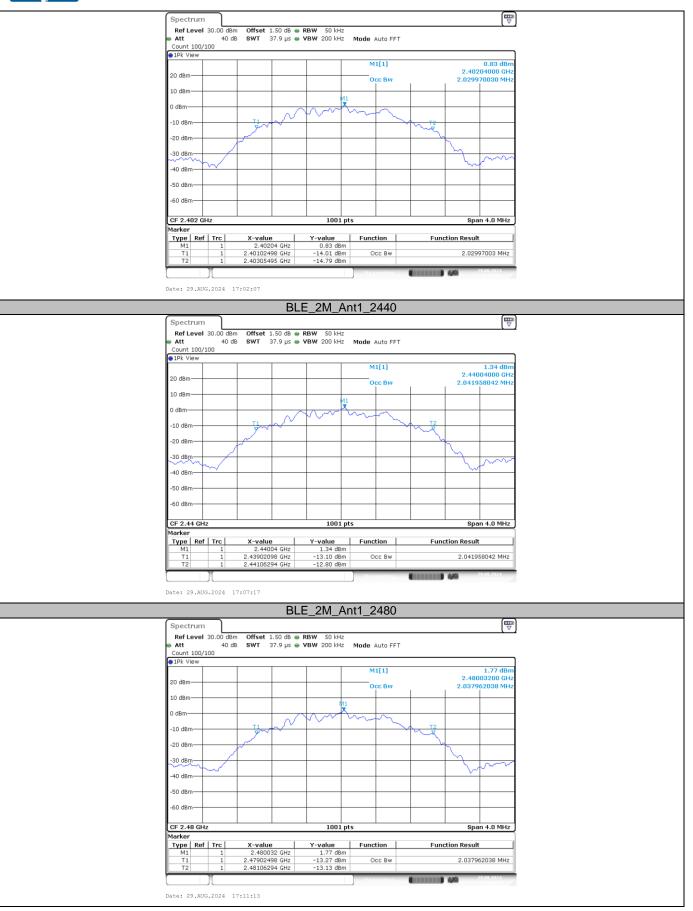














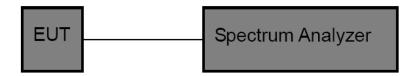
3.6. Peak Output Power

<u>Limit</u>

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (b)(3):

Section	Test Item	Limit	Frequency Range(MHz)
CFR 47 FCC 15.247(b)(3)	Maximum conducted output power	1 Watt or 30dBm	2400~2483.5

Test Configuration



Test Procedure

1. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.

2. Spectrum Setting:

Peak Detector: RBW≥DTS Bandwidth, VBW≥3*RBW.

Sweep time=Auto.

```
Detector= Peak.
```

```
Trace mode= Maxhold.
```

Allow trace to fully stabilize. Then use the peak marker function to determine the maximum amplitude level.

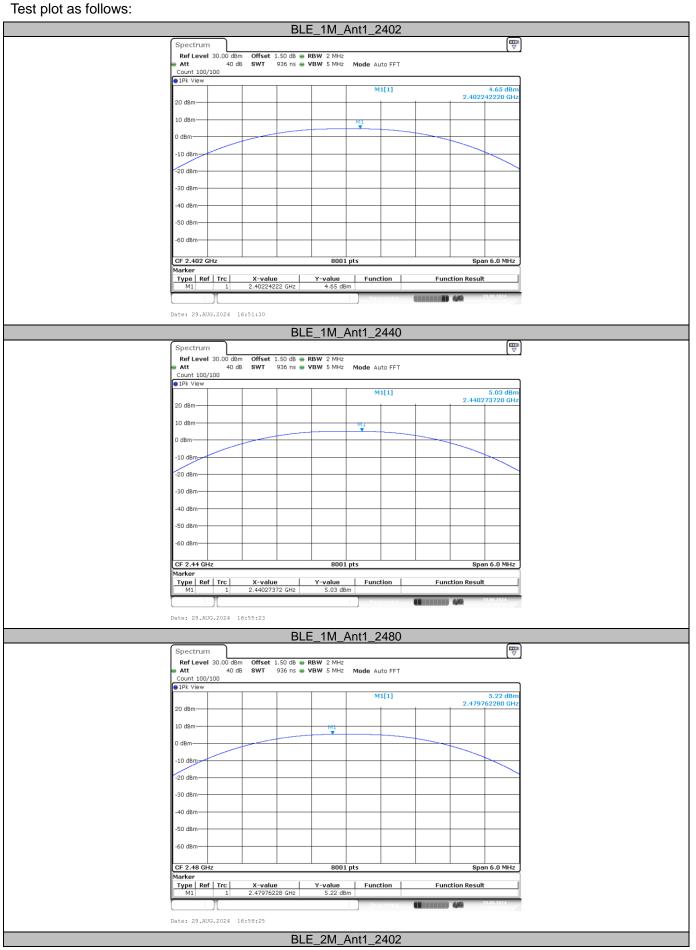
Test Mode

Please refer to the clause 2.4.

Test Result

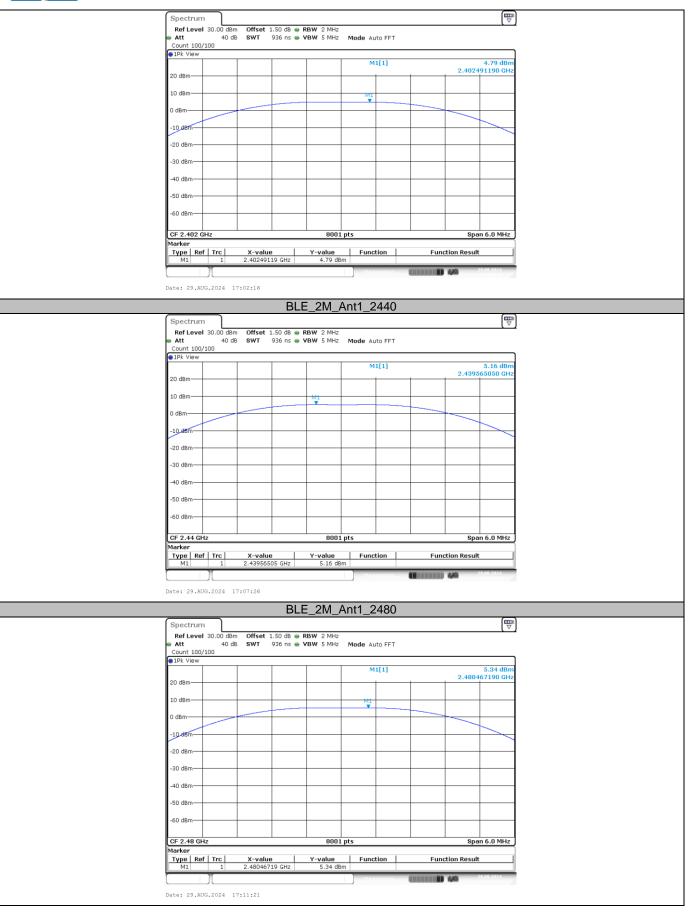
Test Mode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
		2402	4.65	≤30	PASS
BLE_1M	Ant1	2440	5.03	≤30	PASS
		2480	5.22	≤30	PASS
		2402	4.79	≤30	PASS
BLE_2M	Ant1	2440	5.16	≤30	PASS
		2480	5.34	≤30	PASS













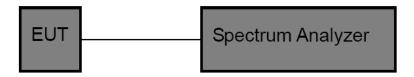
3.7. Power Spectral Density

<u>Limit</u>

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (e):

Test Item	Limit	Frequency Range(MHz)	
Power Spectral Density	8dBm(in any 3 kHz)	2400~2483.5	

Test Configuration



Test Procedure

- 1. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
- 2. The EUT was directly connected to the Spectrum Analyzer and antenna output port as show in the block diagram above. The measurement according to section 10.2 of KDB 558074 D01 DTS Meas Guidance v05r02.

3. Spectrum Setting:

Set analyzer center frequency to DTS channel center frequency.

Set the span to 1.5 times the DTS bandwidth.

Set the RBW to: 3 kHz

Set the VBW to: 10 kHz

Detector: peak

Sweep time: auto

Allow trace to fully stabilize. Then use the peak marker function to determine the maximum amplitude level.

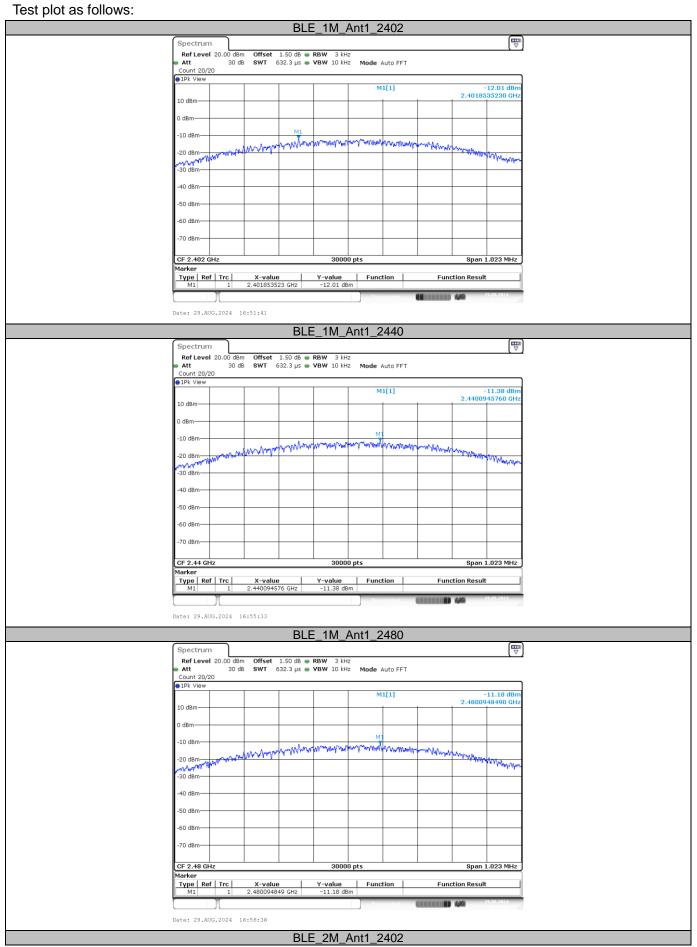
Test Mode

Please refer to the clause 2.4.

Test Result

Test Mode	Antenna	Channel Result[dBm/3kHz]		Limit[dBm/3kHz]	Verdict
		2402	-12.01	≤8	PASS
BLE_1M	Ant1	2440	-11.38	≤8	PASS
		2480	-11.18	≤8	PASS
		2402	-15.14	≤8	PASS
BLE_2M	Ant1	2440	-14.86	≤8	PASS
		2480	-14.62	≤8	PASS

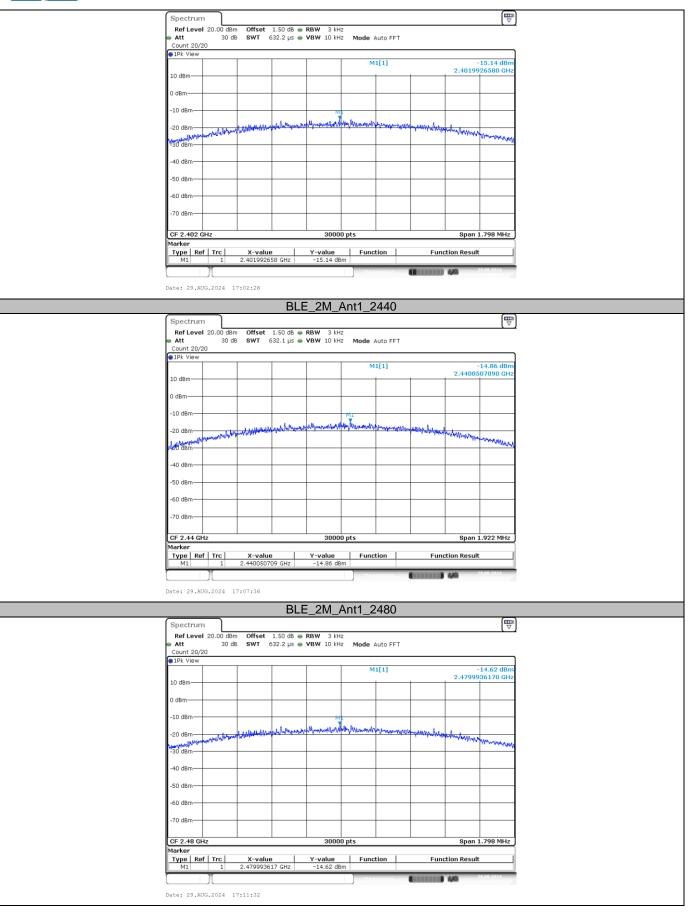






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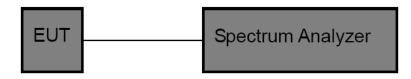


3.8. Duty Cycle

Limit

None, for report purposes only.

Test Configuration



Test Procedure

- 1. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
- 2. The EUT was directly connected to the Spectrum Analyzer and antenna output port as show in the block diagram above. The measurement according to section 10.2 of KDB 558074 D01 DTS Meas Guidance v05r02.
- 3. Spectrum Setting: Set analyzer center frequency to test channel center frequency. Set the span to 0Hz Set the RBW to 10MHz Set the VBW to 10MHz **Detector: Peak** Sweep time: Auto

Allow trace to fully stabilize. Then use the peak marker function to determine the maximum amplitude level.

Test Mode

Please refer to the clause 2.4.

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Test Result

Test Mode	Frequency [MHz]	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]	1/T Minimum VBW (kHz)	Final setting For VBW (kHz)
	2402	2.13	2.50	85.20	0.47	1
BLE 1M	2440	2.13	2.50	85.20	0.47	1
	2480	2.14	2.50	85.60	0.47	1
	2402	1.08	2.50	43.20	0.93	1
BLE 2M	2440	1.08	2.50	43.20	0.93	1
	2480	1.08	2.50	43.20	0.93	1

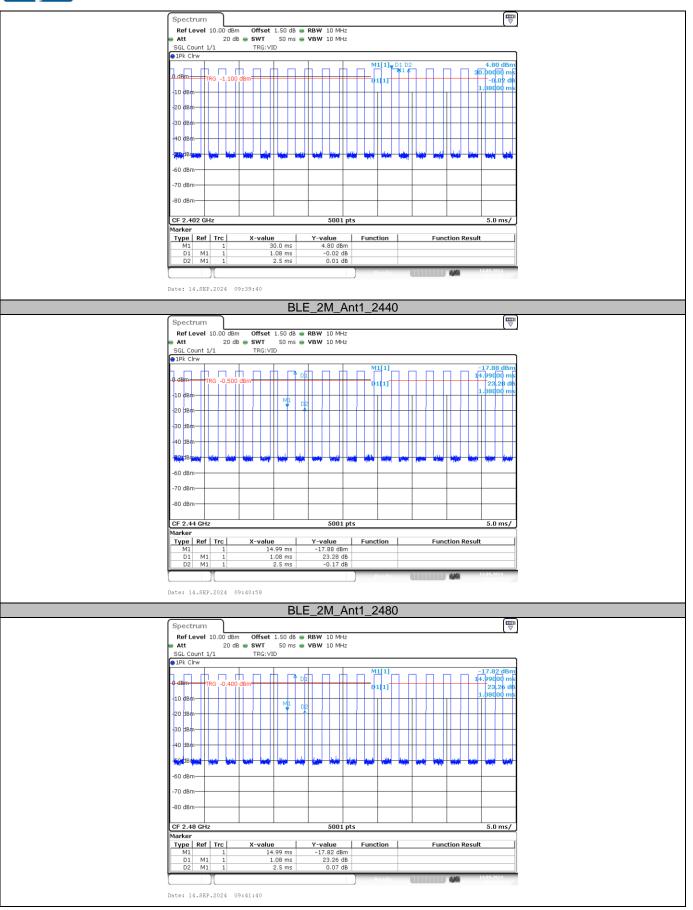






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3.9. Antenna Requirement

Requirement

FCC CFR Title 47 Part 15 Subpart C Section 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 antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

FCC CFR Title 47 Part 15 Subpart C Section 15.247(c) (1)(i):

(i) Systems operating in the 2400~2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6dBi.

Test Result

The directional gain of the antenna less than 6dBi, please refer to the EUT internal photographs antenna photo.