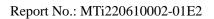


Test Report

Report No.:	MTi220610002-01E2
Date of issue:	2022-07-28
Applicant:	ShenZhen Cannice Technology Co., Ltd.
Product:	WIRELESS EARPHONES
Model(s):	AAABLK100024300, AALAV100074914
FCC ID:	2ADTV-74914

Shenzhen Microtest Co., Ltd. http://www.mtitest.com





Instructions

1. This test report shall not be partially reproduced without the written consent of the laboratory.

2. The test results in this test report are only responsible for the samples submitted

3. This test report is invalid without the seal and signature of the laboratory.

4. This test report is invalid if transferred, altered, or tampered with in any form without authorization.

Any objection to this test report shall be submitted to the laboratory within
15 days from the date of receipt of the report.



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Test Result Certification						
Applicant:	Applicant: ShenZhen Cannice Technology Co., Ltd.					
Address:	20/F, Tower A, Building 7, Baoneng Science and Technology Park, Qingxiang Road #1, Longhua New District, Shenzhen, China					
Manufacturer:	Dongguan Cannice Precision Manufacturing Co., Ltd.					
Address:	Buiding 2, No.21, Nange West Road Daojiao Town Dongguan Guangdong 523750 China					
Product description						
Product name:	WIRELESS EARPHONES					
Trademark:	onn					
Model name:	AAABLK100024300					
Serial Model:	AALAV100074914					
Standards:	FCC 47 CFR Part 15 Subpart C					
Test method:	ANSI C63.10-2013					
Date of Test	Date of Test					
Date of test:	2022-07-11 ~ 2022-07-20					
Test result:	Pass					

Test Engineer :

Dowid. Cee

(David Lee)

Reviewed By: :

loor chen

(Leon Chen)

Approved By: :

Tom Kue

(Tom Xue)



1 General Description

1.1 Description of EUT

Product name:	WIRELESS EARPHONES
Model name:	AAABLK100024300
Series Model:	AALAV100074914
Model difference:	All the models are the same circuit and module, except the model name and color.
Electrical rating:	Input: DC 5V/500mA Output: DC 5V/40mA Battery: Charging box: DC 3.7V 300mAh 1.11Wh Earbuds: DC 3.7V 43mAh 0.16Wh
Hardware version:	VOE
Software version:	V0B
Accessories:	N/A
EUT serial number:	MTi220610002-01-S0001
RF specification:	·
Bluetooth version:	V5.1
Operation frequency:	2402 MHz ~ 2480 MHz
Modulation type:	GFSK
Antenna designation:	FPC antenna, antenna Gain: -0.19 dBi
Max. peak conducted output power:	4.15 dBm

1.2 Description of test modes

1.2.1 Operation channel list

Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)
0	2402	10	2422	20	2442	30	2462
1	2404	11	2424	21	2444	31	2464
2	2406	12	2426	22	2446	32	2466
3	2408	13	2428	23	2448	33	2468
4	2410	14	2430	24	2450	34	2470
5	2412	15	2432	25	2452	35	2472
6	2414	16	2434	26	2454	36	2474
7	2416	17	2436	27	2456	37	2476
8	2418	18	2438	28	2458	38	2478
9	2420	19	2440	29	2460	39	2480



1.2.2 Test channels

Chanel	Frequency
Lowest (CH0)	2402MHz
Middle (CH19)	2440MHz
Highest (CH39)	2480MHz

Note: The test software has been used to control EUT for working in engineering mode, that enables selectable channel, and capable of continuous transmitting mode.

1.2.3 Description of support units

Support equipment list						
Description	Model	Serial No.	Manufacturer			
Adapter	HW-090200CH0	/	Huizhou BYD Electronics Co., Ltd.			
Mobile phone	Mate 30	/	HUAWEI			

1.3 Measurement uncertainty

Parameter	Measurement uncertainty
AC power line conducted emission (9 kHz~30 MHz)	±2.5 dB
Occupied Bandwidth	±3 %
Conducted RF output power	±0.16 dB
Conducted spurious emissions	±0.21 dB
Radiated emission (9 kHz ~ 30 MHz)	±4.0 dB
Radiated emission (30 MHz~1 GHz)	±4.2 dB
Radiated emission (above 1 GHz)	±4.3 dB

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



2 Summary of Test Result

No.	FCC reference	Description of test	Result
1	§ 15.203	Antenna requirement	Pass
2	§ 15.207	AC power line conducted emissions	Pass
3	15.247(a)(2)	6dB occupied bandwidth	Pass
4	15.247(b)(3)	Conducted peak output power	Pass
5	15.247(e)	Power Spectral Density	Pass
6	15.247(d)	Conducted emission at the band edge	Pass
7	15.247(d)	Conducted spurious emissions	Pass
8	/	Duty Cycle	Pass
9	15.247(d)	Radiated spurious emissions	Pass

Note: N/A means not applicable.



3 Test Facilities and Accreditations

3.1 Test laboratory

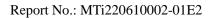
Test laboratory:	Shenzhen Microtest Co., Ltd.
Test site location:	101, No. 7, Zone 2, Xinxing Industrial Park, Fuhai Avenue, Xinhe Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China
Telephone:	(86-755)88850135
Fax:	(86-755)88850136
CNAS Registration No.:	CNAS L5868
FCC Registration No.:	448573



4 Equipment List

No.	Equipment	Manufacturer	Model	Serial No.	Cal. date	Cal. Due
MTi-E002	EMI Test Receiver	R&S	ESCI3	101368	2022/05/05	2023/05/04
MTi-E023	Artificial power network	Schwarzbeck	NSLK8127	NSLK8127# 841	2022/05/05	2023/05/04
MTi-E025	Artificial power network	Schwarzbeck	NSLK8127	8127183	2022/05/05	2023/05/04
MTI-E043	EMI test receiver	R&S	ESCI7	101166	2022/05/05	2023/05/04
MTI-E046	Active Loop Antenna	Schwarzbeck	FMZB 1519 B	00044	2021/05/30	2023/05/29
MTI-E044	Broadband antenna	Schwarzbeck	VULB9163	9163-1338	2021/05/30	2023/05/29
MTI-E045	Horn antenna	Schwarzbeck	BBHA9120D	9120D-2278	2021/05/30	2023/05/29
MTI-E047	Pre-amplifier	Hewlett-Packard	8447F	3113A06184	2022/05/05	2023/05/04
MTI-E048	Pre-amplifier	Agilent	8449B	3008A01120	2022/05/05	2023/05/04
MTi-E120	Broadband antenna	Schwarzbeck	VULB9163	9163-1419	2021/05/30	2023/05/29
MTi-E121	Pre-amplifier	Hewlett-Packard	8447D	2944A09365	2022/04/15	2023/04/14
MTi-E123	Pre-amplifier	Agilent	8449B	3008A04723	2022/05/05	2023/05/04
MTi-E135	Horn antenna	Schwarzbeck	BBHA 9170	00987	2021/05/30	2023/05/29
MTi-E136	Pre-amplifier	Space-Dtronics	EWLAN1840G -G45	210405001	2022/05/05	2023/05/04
MTi-E062	PXA Signal Analyzer	Agilent	N9030A	MY51350296	2022/05/05	2023/05/04
MTi-E067	RF Control Unit	Tonscend	JS0806-1	19D8060152	2022/05/05	2023/05/04
MTi-E068	RF Control Unit	Tonscend	JS0806-2	19D8060153	2022/05/05	2023/05/04
MTi-E069	Band Reject Filter Group	Tonscend	JS0806-F	19D8060160	2022/05/05	2023/05/04
MTI-E010S	EMI Measurement Software	Farad	EZ-EMC Ver. EMEC-3A1	/	/	/
MTI-E014S		Tonscend	TS®JS1120 V2.6.88.0330	/	/	/







5 Test Result

5.1 Antenna requirement

15.203 requirement

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of §§15.211, 15.213, 15.217, 15.219, 15.221, or §15.236. 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 §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.

Description of the antenna of EUT

The antenna of EUT is FPC antenna (Antenna Gain: -0.19 dBi). which is no consideration of replacement.



5.2 AC power line conducted emissions

5.2.1 Limits

Frequency (MHz)	Detector type / Bandwidth	Limit-Quasi-peak dBµV	Limit-Average dBµV
0.15 -0.5	Average / 9 kHz	66 to 56	56 to 46
0.5 -5		56	46
5 -30		60	50

Note 1: the limit decreases with the logarithm of the frequency in the range of 0.15 MHz to 0.5 MHz.

5.2.2 Test Procedures

a) The test setup is refer to the standard ANSI C63.10-2013.

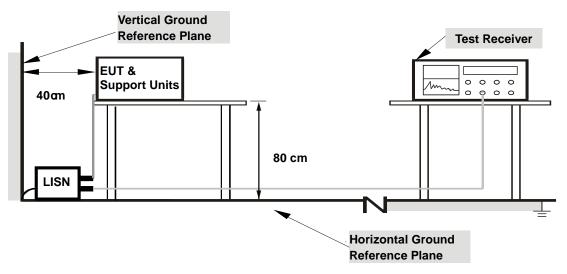
b) The EUT is connected to the main power through a line impedance stabilization network (LISN). All support equipment is powered from additional LISN(s).

c) Emissions were measured on each current carrying line of the EUT using an EMI test receiver connected to the LISN powering the EUT.

d) The test receiver scanned from 150 kHz to 30 MHz for emissions in each of the test modes described in Item 1.2.

e) The test data of the worst-case condition(s) was recorded.

5.2.3 Test setup



For the actual test configuration, please refer to the related item – Photographs of the test setup.

5.2.4 Test Result

Notes:

All modes of operation of the EUT were investigated, and only the worst-case results are reported.

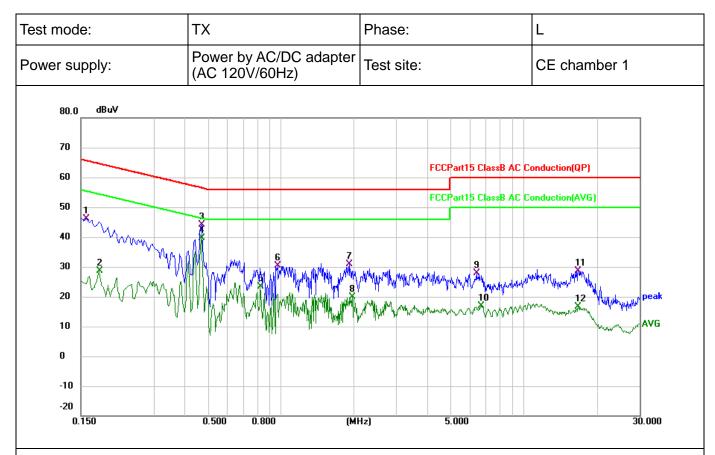
Calculation formula:

Measurement (dB μ V) = Reading Level (dB μ V) + Correct Factor (dB) Over (dB) = Measurement (dB μ V) – Limit (dB μ V)



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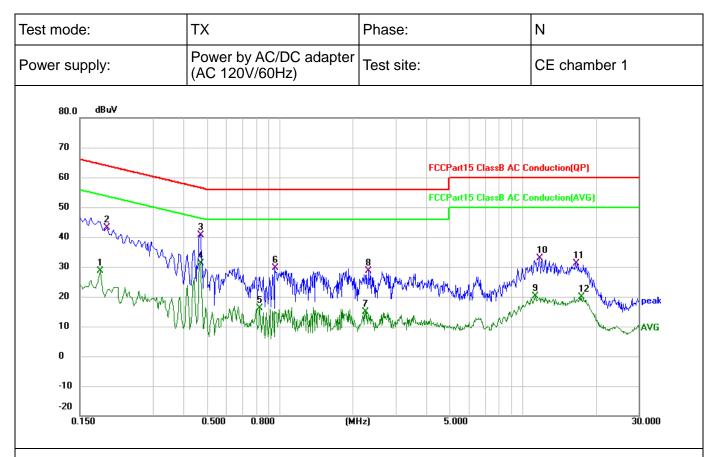


No. Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
	MHz	dBuV	dB	dBuV	dBuV	dB	Detecto
1	0.1580	35.92	10.28	46.20	65.57	-19.37	QP
2	0.1780	18.35	10.28	28.63	54.58	-25.95	AVG
3	0.4700	32.75	11.26	44.01	56.51	-12.50	QP
4 *	0.4700	28.33	11.26	39.59	46.51	-6.92	AVG
5	0.8260	11.40	12.05	23.45	46.00	-22.55	AVG
6	0.9700	18.07	12.35	30.42	56.00	-25.58	QP
7	1.9100	20.97	10.03	31.00	56.00	-25.00	QP
8	1.9700	9.97	10.01	19.98	46.00	-26.02	AVG
9	6.4020	17.57	10.28	27.85	60.00	-32.15	QP
10	6.6860	6.56	10.28	16.84	50.00	-33.16	AVG
11	16.7700	18.04	10.56	28.60	60.00	-31.40	QP
12	16.7700	6.04	10.56	16.60	50.00	-33.40	AVG



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No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detecto
1		0.1819	18.16	10.59	28.75	54.40	-25.65	AVG
2		0.1940	32.54	10.59	43.13	63.86	-20.73	QP
3		0.4700	29.34	11.24	40.58	56.51	-15.93	QP
4	*	0.4700	19.97	11.24	31.21	46.51	-15.30	AVC
5		0.8300	4.02	12.03	16.05	46.00	-29.95	AVC
6		0.9580	17.34	12.26	29.60	56.00	-26.40	QP
7		2.2540	4.53	10.43	14.96	46.00	-31.04	AVC
8		2.3220	18.12	10.41	28.53	56.00	-27.47	QP
9		11.2700	9.82	10.35	20.17	50.00	-29.83	AVC
10		11.6860	22.59	10.37	32.96	60.00	-27.04	QP
11		16.5540	20.46	10.55	31.01	60.00	-28.99	QP
12		17.4140	9.29	10.59	19.88	50.00	-30.12	AVG



5.3 6dB occupied bandwidth

5.3.1 Limits

Systems using digital modulation techniques may operate in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

5.3.2 Test setup



5.3.3 Test procedures

- a) Test method: ANSI C63.10-2013 Section 11.8.2.
- b) The transmitter output of EUT is connected to the spectrum analyzer.

c) Spectrum analyzer setting: RBW = 100 kHz, VBW = 300 kHz, detector = Peak

5.3.4 Test results

Mode	Test channel	Test channel Frequency (MHz)		Limit (MHz)
	СНО		0.6661	≥ 0.5
BLE 1Mbps	CH19	2440	0.6515	≥ 0.5
	CH39	2480	0.665	≥ 0.5
	CH0	2402	1.158	≥ 0.5
BLE 2Mbps	CH19	2440	1.115	≥ 0.5
	CH39	2480	1.216	≥ 0.5



6dB occupied bandwidth

BLE_1M CH0



BLE_1M CH19



BLE_1M CH39





BLE_2M CH0



BLE_2M CH19



BLE_2M CH39





5.4 Conducted peak output power

5.4.1 Limits

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

5.4.2 Test setup



5.4.3 Test procedure

- a) Test method: ANSI C63.10-2013 Section 11.9.1.1.
- b) The EUT was set to continuously transmitting in the max power during the test.
- c) The transmitter output of EUT is connected to the spectrum analyzer.
- d) Spectrum analyzer setting: RBW \geq 6dB occupied bandwidth, VBW \geq 3 × RBW, detector = Peak

5.4.4 Test results

Mode	Test channel	t channel Frequency (MHz) Conducted peak output pov (dBm)		Limit (dBm)
	CH0	2402	2.61	≤ 30
BLE 1Mbps	CH19	2440	2.61	≤ 30
	CH39	2480	3.88	≤ 30
	CH0	2402	2.89	≤ 30
BLE 2Mbps	CH19	2440	2.86	≤ 30
	CH39	2480	4.15	≤ 30



Peak conducted output power



BLE_1M CH19



BLE_1M CH39







BLE_2M CH0

BLE_2M CH19



BLE_2M CH39





5.5 Power spectral density test

5.5.1 Limit

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

5.5.2 Test setup

EUT	Spectrum	
EUT	Analyzer	

5.5.3 Test Procedure

a) Test method: ANSI C63.10-2013 Section 11.10.2.

b) The EUT was set to continuously transmitting in the max power during the test.

- c) The transmitter output of EUT is connected to the spectrum analyzer.
- d) Spectrum analyzer setting: RBW = 3 kHz, VBW = 10 kHz, detector = Peak

5.5.4 Test Results

Mode	de Test channel (MHz)		Power spectral density (dBm/3kHz)	Limit (dBm/3kHz)
	CH0	2402	-7.68	≤ 8
BLE 1Mbps	CH19	2440	-7.77	≤ 8
	CH39	2480	-6.53	≤ 8
	CH0	2402	-10.56	≤ 8
BLE 2Mbps	CH19	2440	-11	≤ 8
	CH39	2480	-8.89	≤ 8



Power spectral density



BLE_1M CH19



BLE_1M CH39







BLE_2M CH0





BLE_2M CH39





5.6 Conducted emissions at the band edge

5.6.1 Limits

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

5.6.2 Test setup

сит	Spectrum
EUI	Analyzer

5.6.3 Test procedure

a) Test method: ANSI C63.10-2013 Section 11.13

b) The EUT was set to continuously transmitting in the max power during the test.

c) The transmitter output of EUT is connected to the spectrum analyzer.

d) Spectrum analyzer setting: RBW = 100 kHz, VBW = 300 kHz, Detector = Peak.

5.6.4 Test results



BLE 1Mbps - conducted emissions at the band edge

						Low	bar	nd-e	edge			
^{lgilent Spe RL Center}		RF	50 g	DC 0000 G	SHZ PNO: Fast IFGain:Low				ALIGN OFF g Type: RMS Hold: 300/300	TRA	M 3.J 11, 2022 CE 2345 (FE M WWWWWW (FE P P P P P P	Frequency
10 dB/div			ffset 12. 20.00 d	71 dB	IFGain:Low	anden. o			Mkr		225 GHz 45 dBm	Auto Tur
10.0 0.00 -10.0											Å	Center Fre 2.352500000 GH
-20.0 -30.0 -40.0		A4									-1791 be	Start Fre 2.30000000 Gł
60.0 60.0 70.0	n rejean	~	attend <u>a</u>	1990 197 0 1997 1	Antelaniada		ليدودايس مالي	haa ng mana k		un aut Sam	and V	Stop Fro 2.405000000 Gi
tart 2. Res Bi					#VB	W 300 kHz			Sweep 3	Stop 2.4 3.867 ms	0500 GHz (1001 pts)	10.500000 MI
KR MODE	TRC 1	SCL		х		Y		NCTION	FUNCTION WIDTH	FUNCT	ON VALUE	Auto M
1 N	1	f			270 GHz	2.102 di -47.231 di	3m					
3 N	1	f		2,390 (000 GHz	-48,503 dl	3m					Freq Offs
4 N	1	f			000 GHz 225 GHz	-50.126 d						0
6 7 8 9 10				2.000		00.040 01						
	_	_							-		>	

High band-edge

RL RF 50.0 DC	SENSE:INT	ALIGN OFF	07:37:43 PM 3./ 11, 2022	
enter Freq 2.51000000	CHZ PNO: Fast → Trig: Free Run IFGain:Low #Atten: 30 dB	#Avg Type: RMS Avg Hold: 300/300	TRACE 123456 TYPE MUMUUMU DET PPPPP	Frequency
Ref Offset 13.29 dB 0 dB/div Ref 20.00 dBm	IF GAILE, UW IN REAL OF ALL	Mkr	4 2.483 68 GHz -42.279 dBm	Auto Tun
				Center Fre 2.510000000 GH
	\$ ³		-16.59 abn	Start Fre 2.470000000 Gł
	elandaran yang kanalaran yana yana ya	tti gelanimi singelan satis	aylayddydaesalysanwyyd	Stop Fre 2.55000000 Gł
tart 2.47000 GHz Res BW 100 kHz	#VBW 300 kHz		Stop 2.55000 GHz .000 ms (1001 pts)	CF Ste 8.000000 Mi Auto Mi
2 N 1 f 2.4 3 N 1 f 2.5	80 00 GHz 3.410 dBm 83 50 GHz 43.802 dBm 00 00 GHz 46.677 dBm 83 68 GHz 42.279 dBm	FUNCTION FUNCTION WDTH	FUNCTION VALUE	Freq Offs
9 9				
1			×	

Address: 101, No. 7, Zone 2, Xinxing Industrial Park, Fuhai Avenue, Xinhe Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, ChinaTel: (86-755)88850135Fax: (86-755) 88850136Web: www.mtitest.comE-mail: mti@51mti.com



BLE 2Mbps - conducted emissions at the band edge

		Low ba	nd-edge		
Agilent Spectrum Analyzer - S RL RF 50 Center Freq 2.3525	© DC 500000 GHz PN0: Fast -		ALIGN OFF #Avg Type: RMS Avg[Hold: 300/300	07:40:13 PM Jul 11, 2022 TRACE 2 3 4 5 0 TYPE M	Frequency
Ref Offset 1 10 dB/div Ref 20.00		#Atten: 30 dB	Mkr5	2.399 960 GHz -32.095 dBm	Auto Tun
10.0 .000 .10.0					Center Fre 2.352500000 GH
-20.0 -30.0 -40.0					Start Fre 2.300000000 GH
-50.0	1999, (*1999) (*1999) (*1997) 1999 - Carlon Carlon, (*1997)	an a	and a start of the second s	meterstillingeter (http://www.	Stop Fre 2.405000000 Gi
Start 2.30000 GHz #Res BW 100 kHz	#VB	W 300 kHz	Sweep 3	Stop 2.40500 GHz .867 ms (1001 pts)	CF Ste 10.500000 Mi
MYSH MODE: THC: SQ. 1 N 1 F 3 N 1 F 4 N 1 F 6 N 1 F 6 N 1 F 8 S 9 9 10 S 1 S 1 S 1 S 1 S 1 S 1 S 1 S 1	× 2.402 060 GHz 2.400 000 GHz 2.390 000 GHz 2.310 000 GHz 2.399 960 GHz	Y 1.922 dBm 32,095 dBm 49,124 dBm -50,510 dBm -32,095 dBm	PUNCTION PUNCTION WIDTH	PUNCTION VALUE	Auto Mi Freq Offs 0 I
a			STATU	>	

High band-edge

		SENSE:INT	ALIGN OFF	07:44:42 PM Jul 11, 2022	Frequency
enter Freq 2.51000000	PNO: Fast	Trig: Free Run #Atten: 30 dB	#Avg Type: RMS Avg Hold: 300/300	TRACE 2 3 4 5 6 TYPE MULLIUM DET P P P P P P	Frequency
Ref Offset 13.29 dB	IFGain:Low	Mitell, 30 dB	Mk	r4 2.512 80 GHz -45.716 dBm	Auto Tun
					Center Fre 2.510000000 GH
	¢ ³	∳ ⁴ .			Start Fre 2.470000000 GH
0.0 m. 1 	wenter and	Merita and a start	ana an	Albert 199-Jakilan maraka	Stop Fre 2.55000000 GH
tart 2.47000 GHz Res BW 100 kHz	#VBW 3			Stop 2.55000 GHz 3.000 ms (1001 pts)	8.000000 MH
Res BW 100 kHz RR MODE TRC SCL X 1 N 1 f 2.4 2 N 1 f 2.4 3 N 1 f 2.5 6 5 5 5	80 00 GHz 83 50 GHz 4 00 00 GHz 4		Sweep :	3.000 ms (1001 pts)	CF Ste 8.000000 Mi <u>Auto</u> Ma Freq Offs 0 i
Res BW 100 kHz KR MODE TRC SCL X 1 N 1 f 2.4 2 N 1 f 2.4 3 N 1 f 2.5 4 N 1 f 2.5	80 00 GHz 83 50 GHz 4 00 00 GHz 4	2.627 dBm 18.361 dBm 17.411 dBm		3.000 ms (1001 pts)	8.000000 Mi <u>Auto</u> Mi Freq Offs



5.7 Conducted spurious emissions

5.7.1 Limits

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

5.7.2 Test setup



5.7.3 Test procedure

a) Test method: ANSI C63.10-2013 Section 11.11 & 11.12.

b) The EUT was set to continuously transmitting in the max power during the test.

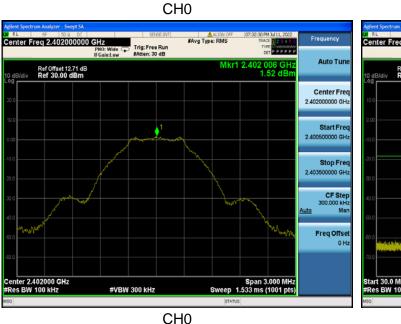
c) The transmitter output of EUT is connected to the spectrum analyzer.

d) Spectrum analyzer setting: RBW = 100 kHz, VBW = 300 kHz, Detector = Peak.

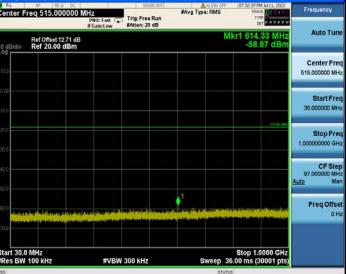
5.7.4 Test results

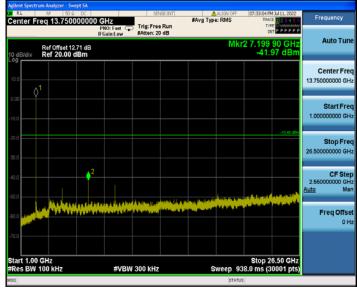


BLE 1Mbps - conducted spurious emissions

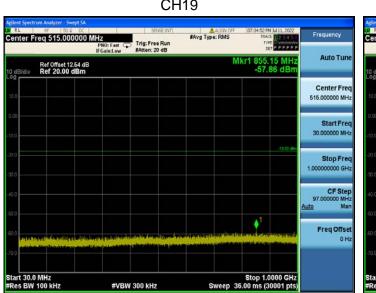


CH0





CH19





CH19



Address: 101, No. 7, Zone 2, Xinxing Industrial Park, Fuhai Avenue, Xinhe Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China Tel: (86-755)88850135 Fax: (86-755) 88850136 Web: www.mtitest.com E-mail: mti@51mti.com



Frequency

BLE 1Mbps - conducted spurious emissions





PNO: Fast Trig: Free Run IFGain:Low #Atten: 20 dB Auto Tun Ref Offset 13.29 dB Ref 20.00 dBm -57.86 dB Center Freq 515.000000 MH Start Free 30.000000 MH Stop Free 1.00000000 GH: CF Step 97.00 ٠ Freq Offse 0 H Stop 1.0000 GHz Sweep 36.00 ms (30001 pts) t 30.0 MHz s BW 100 kHz #VBW 300 kHz

CH39

#Avg Type: RMS

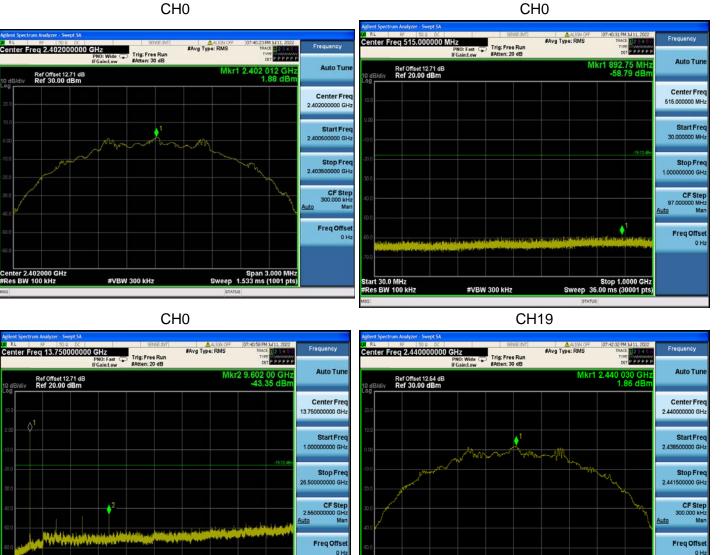
CH39

Frequency	07:38:24 PM 3d 11, 2022 TRACE 8284 57 TYPE	ALIGN OFF	ig: Free Run		50 0 DC		RL Center Fi
Auto Tur	DET PPPPP		itten: 20 dB	PNO: Fast 🗭 IFGain:Low		155	
Auto Tu	7.433 65 GHz -41.71 dBm	Mkr			t 13.29 dB 00 dBm	Ref Offset Ref 20.0	0 dB/div
Center Fre 13.750000000 GH) ¹	10.0
Start Fre 1.000000000 GH	11.50 die.						10.0
Stop Fre 26.50000000 GF	. A C SI dei						20.0
CF St 2.550000000 Gi <u>Auto</u> M		Market of the other			¢ ²		40.0
Freq Offs 01				and adding to the	Weight	WWW W	60.0
	Stop 26.50 GHz 0 ms (30001 pts)	Sweep 93	0 kHz	#VBW			Start 1.00
		STATUS	104 - 104 C	10000000			50



BLE 2Mbps - conducted spurious emissions

CH0



er 2.440000 GHz BW 100 kHz

#VBW 300 kHz

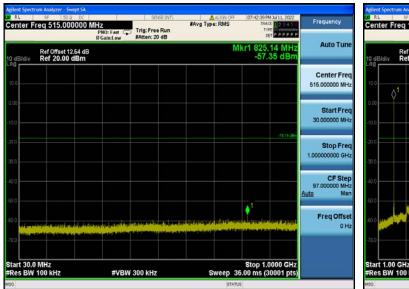
#VBW 300 kHz

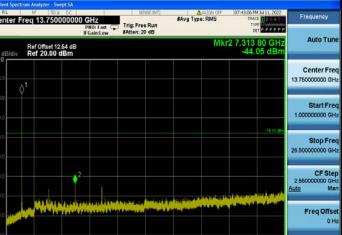
CH19

#VBW 300 kHz

1.00 GHz BW 100 kHz

Stop 26.50 GHz Sweep 938.0 ms (30001 pts





CH19

Span 3.000 MH Sweep 1.533 ms (1001 pt

Stop 26.50 GHz

een 938.0

Address: 101, No. 7, Zone 2, Xinxing Industrial Park, Fuhai Avenue, Xinhe Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China Tel: (86-755)88850135 Fax: (86-755) 88850136 Web: www.mtitest.com E-mail: mti@51mti.com



Start 30.0 MHz #Res BW 100 kHz

Stop 1.0000 GHz Sweep 36.00 ms (30001 pts)

Auto Tun

Start Free

CF Step

Freq Offse

0 H

BLE 2Mbps - conducted spurious emissions



CH39 #Avg Type: RMS Frequency ter Freq 515.000000 MHz PNO: Fast Trig: Free Run IFGain:Low #Atten: 20 dB Ref Offset 13.29 dB Ref 20.00 dBm 58.30 dE Center Freq 515.000000 MH 30.000000 MH Stop Free 1.00000000 GH: 97.00

#VBW 300 kHz



CH39

Agilent Spect	rum Analyzer - Swept S		SENSE 201		07:46:19 PM 3/11, 2022	
	req 13.750000		Trig: Free Run	#Avg Type: RMS	TRACE	Frequency
10 dB/div	Ref Offset 13.29 Ref 20.00 dBr	IFGain:Low	#Atten: 20 dB	Mkr	2 7.434 50 GHz -43.70 dBm	Auto Tune
10.0	\1					Center Free 13.750000000 GH
10.0					.15.78 dBn	Start Fre 1.000000000 GH
30.0						Stop Fre 26.50000000 GH
40.0		¢ ²			, house a loss of the	CF Ste 2.55000000 GH Auto Ma
60.0	AN ANALY					Freq Offse 0 H
Start 1.00		#VBW	300 kHz	Sweep 93	Stop 26.50 GHz 8.0 ms (30001 pts)	
150			on collectory -	STATU		



5.8 Duty Cycle

5.8.1 Conformance Limit

None, for reporting purposes only.

5.8.2 Test setup

сит	Spectrum
EUT	Analyzer

5.8.3 Test procedure

- a) Test method: KDB 558074 Zero-span spectrum analyzer method.
- b) The EUT was set to continuously transmitting in the max power during the test.
- c) The transmitter output of EUT is connected to the spectrum analyzer.

d) Spectrum analyzer setting: RBW = 100 kHz, VBW = 300 kHz, Detector = Peak.

5.8.4 Test Results

TestMode	Transmission Duration	Transmission Period	Duty Cycle	
	(ms]	(ms]	(%)	
BLE 1Mbps	2.134	2.501	85.33	

BLE 1Mbps

Center Fr	req 2.4020000		SENSE:INT Trig Delay-2.000 Trig: Video #Atten: 40 dB		ALIGN OFF g Type: RMS	07:29:31 PM Jul 11, 2023 TRACE 2 3 4 5 TYPE W	Frequency
10 dB/div	Ref Offset 12.71 Ref 30.00 dBr				Δ	Mkr3 2.501 m 4.50 dl	
20.0			y 1				Center Fre 2.402000000 GH
-10.0		(least)					Start Fre 2.402000000 GH
40.0							Stop Fre 2.402000000 GH
Center 2.4 Res BW 8			8.0 MHz	FUNCTION	Sweep 5	Span 0 H .000 ms (8000 pts	2 CF Ste 8.000000 MH Auto Ma
1 N 1 2 Δ1 1 3 Δ1 1 4 5	t t (Δ) t (Δ)	1.998 ms 2.134 ms (Δ) 2.501 ms (Δ)	-4.05 dBm 3.43 dB 4.50 dB	PONCTION	FORCHORWOTH	PORCTON VALUE	Freq Offs 0 F
6 7 8 9 10							
10 11						Þ	•



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Report No.: MTi220610002-01E2

TestMode	TestMode Transmission Duration (ms]		Duty Cycle (%)	
BLE 2Mbps	1.083	2.501	43.30	

BLE 2Mbps

RL Center F	req 2.440000000	GHz PNO: Fast	SENSE:INT Trig Delay-2.000 Trig: Video #Atten: 40 dB	▲ ALIGN OFF ms #Avg Type: RMS	07:41:54 PM 3411, 2022 TRACE 2 3 4 5 6 TYPE WWWWWWWW DET P P P P P	Frequency
10 dB/div	Ref Offset 12.54 dB Ref 30.00 dBm				ΔMkr3 2.501 ms 3.94 dB	Auto Tun
20.0 10.0 0.00			y <mark>1</mark>	² 2∆1	43∆1	Center Free 2.440000000 GH
-10.0	n eler iki popisiona Lisati train dalap			ter tige sea segrender Stationen, die segrender		Start Free 2.440000000 GH
-40.0 -50.0 -60.0						Stop Fre 2.44000000 GH
Res BW 8		#VBW	8.0 MHz		Span 0 Hz 5.000 ms (8000 pts)	CF Ste 8.000000 MH <u>Auto</u> Ma
2 Δ1 4 3 Δ1 4 5	t t (Δ)	1.998 ms 1.083 ms (Δ) 2.501 ms (Δ)	-5.00 dBm 1.41 dB 3.94 dB	FUNCTION FUNCTION WIDT	R FUNCTION VALUE	Freq Offse 0 H
6 7 8 9 10						



5.9 Radiated spurious emission

5.9.1 Limits

§ 15.247 (d) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in § 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a) (see § 15.205(c)).

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

§ 15.209 Radiated emission limits at restricted bands:

Note 1: the tighter limit applies at the band edges.

Note 2: the emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector

§ 15.35 (b) requirements:

When average radiated emission measurements are specified in this part, including average emission measurements below 1000 MHz, there also is a limit on the peak level of the radio frequency emissions. Unless otherwise specified, e.g., see §§ 15.250, 15.252, 15.253(d), 15.255, 15.256, and 15.509 through 15.519, the limit on peak radio frequency emissions is 20 dB above the maximum permitted average emission limit applicable to the equipment under test.



According to ANSI C63.10-2013, the tests shall be performed in the frequency range shown in the following table:

Frequency range of measurements for unlicensed wireless device

Lowest frequency generated in the device	Upper frequency range of measurement
9 kHz to below 10 GHz	10th harmonic of highest fundamental frequency or to 40 GHz, whichever is lower
At or above 10 GHz to below 30 GHz	5th harmonic of highest fundamental frequency or to 100 GHz, whichever is lower
At or above 30 GHz	5th harmonic of highest fundamental frequency or to 200 GHz, whichever is lower, unless otherwise specified

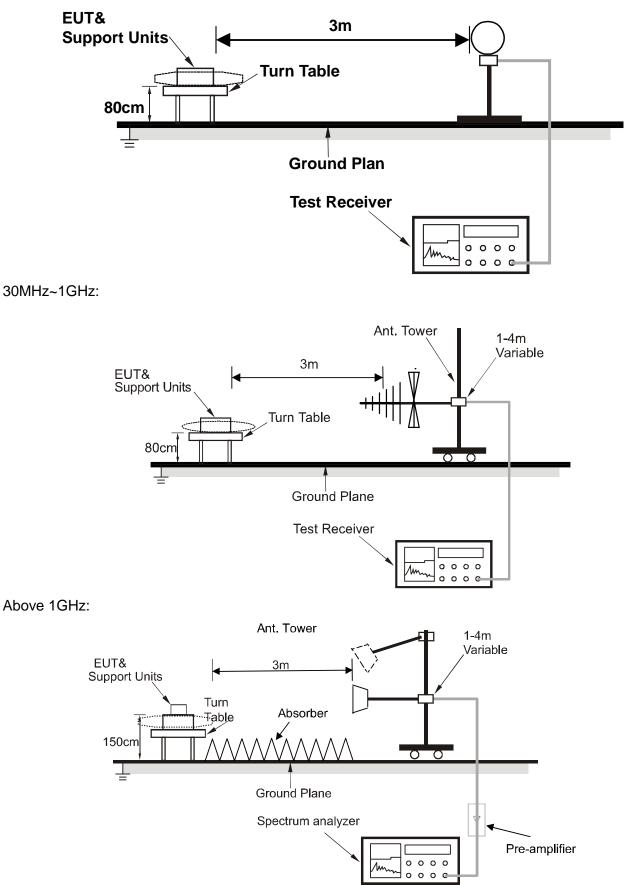
Frequency range of measurements for unlicensed wireless device with digital device

Highest frequency generated or used in the device or on which the device operates or tunes	Upper frequency range of measurement
Below 1.705 MHz	30 MHz
1.705 MHz to 108 MHz	1000 MHz
108 MHz to 500 MHz	2000 MHz
500 MHz to 1000 MHz	5000 MHz
	5th harmonic of the highest frequency or 40 GHz, whichever is lower



5.9.2 Test setup

Below 30MHz:



For the actual test configuration, please refer to the related item - Photographs of the test setup.



5.9.3 Test procedure

a) Test method: ANSI C63.10-2013 Section 6.3, 6.4, 6.5, 6.6, 11.11, 11.12, 11.13.

b) The EUT is placed on an on-conducting table 0.8 meters above the ground plane for measurement below 1GHz, 1.5 meters above the ground plane for measurement above 1GHz.

c) Emission blew 18 GHz were measured at a 3 meters test distance, above 18 GHz were measured at 1-meter test distance with the application of a distance correction factor

d) The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized in both the vertical and the horizontal positions.

Test instrument setup

Frequency	Test receiver / Spectrum analyzer setting
9 kHz ~ 150 kHz	Quasi Peak / RBW: 200 Hz
150 kHz ~ 30 MHz	Quasi Peak / RBW: 9 kHz
30 MHz ~ 1 GHz	Quasi Peak / RBW: 120 kHz
Above 1 GHz	Peak / RBW: 1 MHz, VBW: 3MHz, Peak detector AVG / RBW: 1 MHz, VBW: 3MHz, Average detector

5.9.4 Test results

Notes:

The amplitude of spurious emissions which are attenuated more than 20 dB below the limits are not reported.

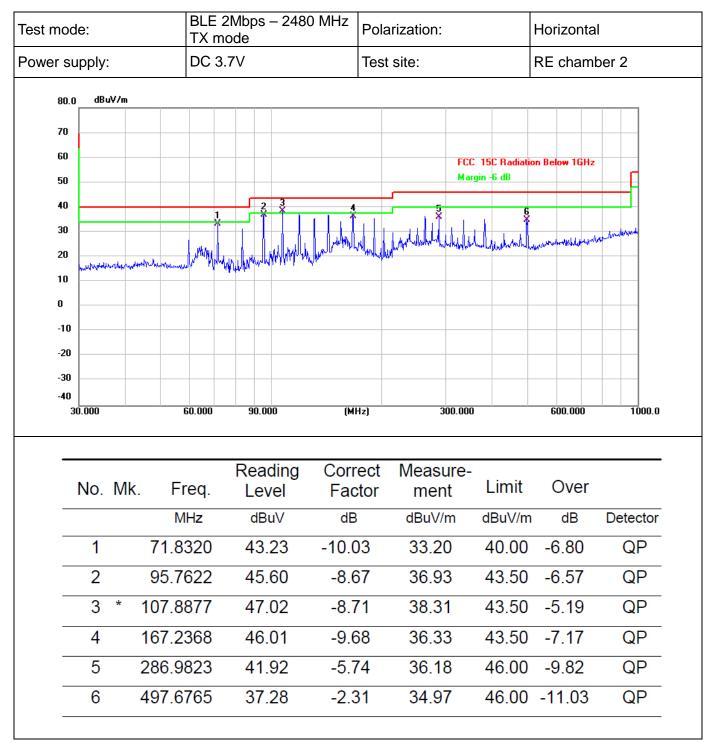
All modes of operation of the EUT were investigated, and only the worst-case results are reported. There were no emissions found below 30MHz within 20dB of the limit.

Calculation formula:

Measurement ($dB\mu V/m$) = Reading Level ($dB\mu V$) + Correct Factor (dB/m) Over (dB) = Measurement ($dB\mu V/m$) – Limit ($dB\mu V/m$)

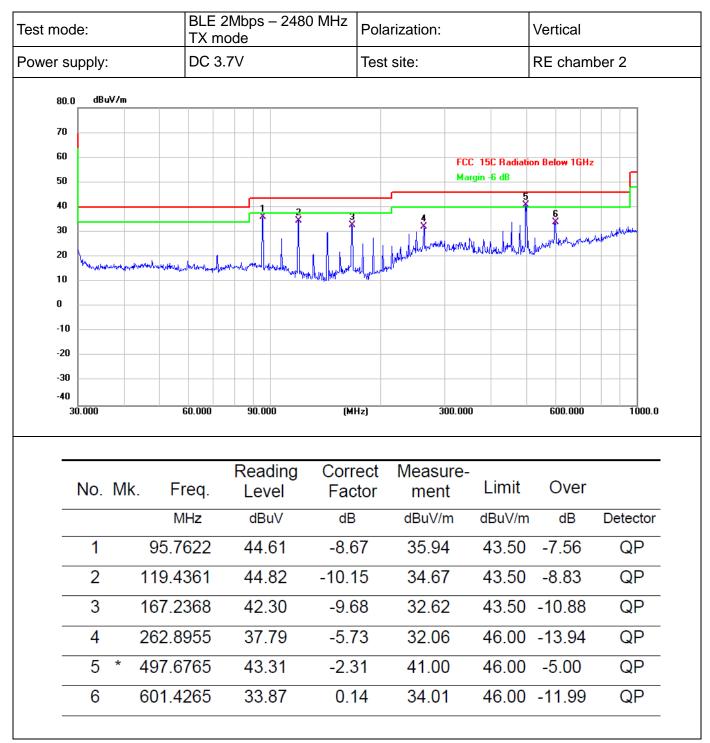


Left Earphone-Radiated emissions between 30MHz – 1GHz



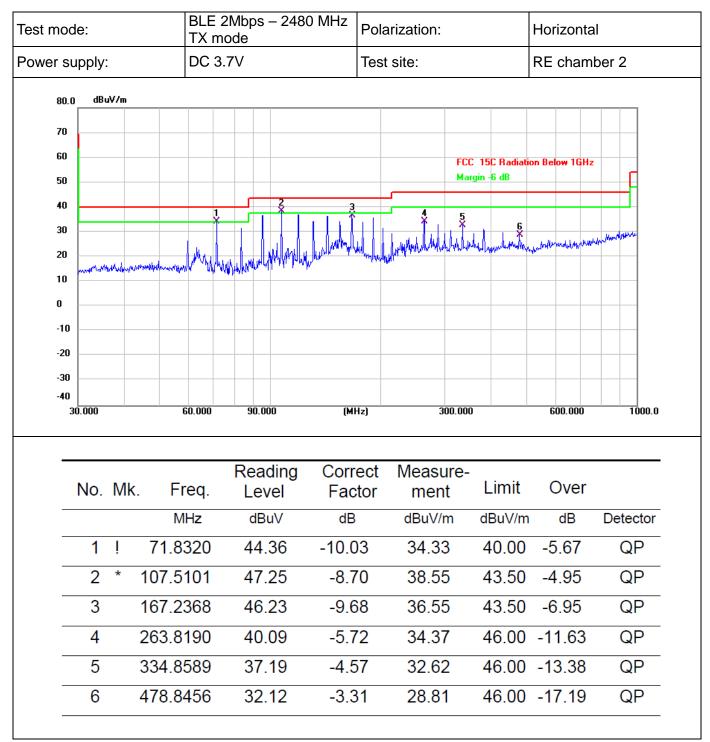


Left Earphone-Radiated emissions between 30MHz – 1GHz



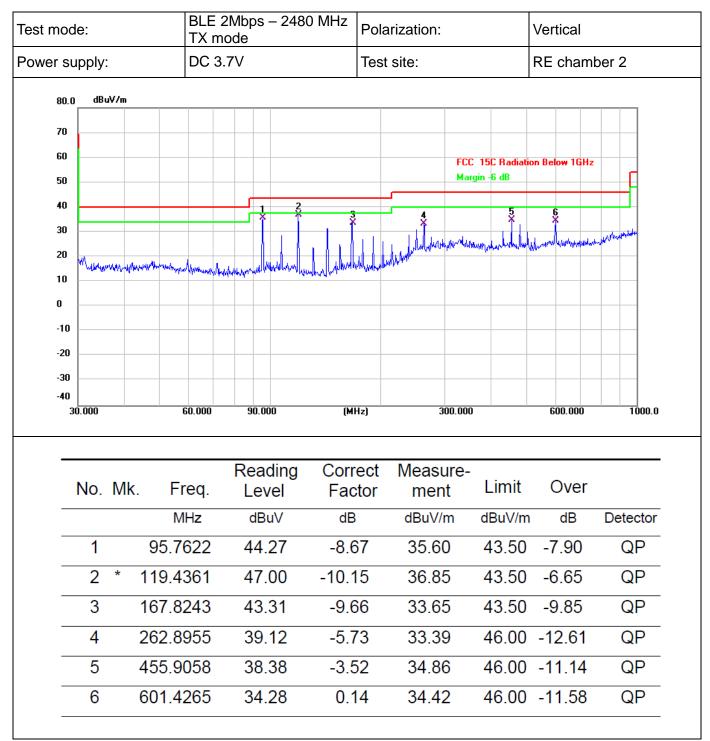


Right Earphone-Radiated emissions between 30MHz – 1GHz





Right Earphone-Radiated emissions between 30MHz – 1GHz





Radiated emissions 1 GHz ~ 25 GHz

Frequency	Reading Level	Correct Factor	Measurement	Limits	Over	Detector	Polarization
(MHz)	(dBµV)	(dB/m)	(dBµV/m)	(dBµV/m)	(dB)	Peak/AVG	H/V
		BLE	E 2Mbps - 240)2 MHz TX m	ode		·
4804	42.52	1.52	44.04	74.00	-29.96	Peak	V
4804	36.63	1.52	38.15	54.00	-15.85	AVG	V
7206	40.91	5.46	46.37	74.00	-27.63	Peak	V
7206	34.80	5.46	40.26	54.00	-13.74	AVG	V
9608	41.55	6.33	47.88	74.00	-26.12	Peak	V
9608	35.19	6.33	41.52	54.00	-12.48	AVG	V
4804	45.00	1.52	46.52	74.00	-27.48	Peak	Н
4804	38.69	1.52	40.21	54.00	-13.79	AVG	Н
7206	40.06	5.46	45.52	74.00	-28.48	Peak	Н
7206	33.77	5.46	39.23	54.00	-14.77	AVG	Н
9608	41.85	6.33	48.18	74.00	-25.82	Peak	Н
9608	35.78	6.33	42.11	54.00	-11.89	AVG	Н
		BLE	E 2Mbps - 244	10 MHz TX m	ode		·
4880	43.22	1.68	44.90	74.00	-29.10	Peak	V
4880	36.66	1.68	38.34	54.00	-15.66	AVG	V
7320	41.41	5.45	46.86	74.00	-27.14	Peak	V
7320	35.11	5.45	40.56	54.00	-13.44	AVG	V
9760	41.47	6.37	47.84	74.00	-26.16	Peak	V
9760	34.92	6.37	41.29	54.00	-12.71	AVG	V
4880	46.18	1.68	47.86	74.00	-26.14	Peak	Н
4880	39.68	1.68	41.36	54.00	-12.64	AVG	Н
7320	40.64	5.45	46.09	74.00	-27.91	Peak	Н
7320	34.67	5.45	40.12	54.00	-13.88	AVG	Н
9760	41.20	6.37	47.57	74.00	-26.43	Peak	Н
9760	34.88	6.37	41.25	54.00	-12.75	AVG	Н



Frequency	Reading Level	Correct Factor	Measurement	Limits	Over	Detector	Polarization
(MHz)	(dBµV)	(dB/m)	(dBµV/m)	(dBµV/m)	(dB)	Peak/AVG	H/V
		BLE	E 2Mbps - 248	80 MHz TX m	ode		
4960	42.00	1.83	43.83	74.00	-30.17	Peak	V
4960	35.69	1.83	37.52	54.00	-16.48	AVG	V
7440	40.83	5.43	46.26	74.00	-27.74	Peak	V
7440	34.72	5.43	40.15	54.00	-13.85	AVG	V
9920	41.01	6.41	47.42	74.00	-26.58	Peak	V
9920	34.80	6.41	41.21	54.00	-12.79	AVG	V
4960	44.06	1.83	45.89	74.00	-28.11	Peak	Н
4960	37.52	1.83	39.35	54.00	-14.65	AVG	Н
7440	41.02	5.43	46.45	74.00	-27.55	Peak	Н
7440	34.72	5.43	40.15	54.00	-13.85	AVG	Н
9920	41.22	6.41	47.63	74.00	-26.37	Peak	Н
9920	34.92	6.41	41.33	54.00	-12.67	AVG	Н



Radiated emissions at band edge

Frequency	Reading Level	Correct Factor	Measurement	Limits	Over	Detector	Polarization
(MHz)	(dBµV)	(dB/m)	(dBµV/m)	(dBµV/m)	(dB)	Peak/AVG	H/V
BLE 2Mbps – Low band-edge							
(MHz)	(dBµV)	(dB/m)	(dBµV/m)	(dBµV/m)	(dB)	Peak/AVG	H/V
2310	46.88	-6.60	40.28	74.00	-33.72	Peak	V
2310	37.41	-6.60	30.81	54.00	-23.19	AVG	V
2390	47.59	-6.23	41.36	74.00	-32.64	Peak	V
2390	37.68	-6.23	31.45	54.00	-22.55	AVG	V
2310	46.66	-6.60	40.06	74.00	-33.94	Peak	Н
2310	37.45	-6.60	30.85	54.00	-23.15	AVG	Н
2390	48.47	-6.23	42.24	74.00	-31.76	Peak	Н
2390	38.17	-6.23	31.94	54.00	-22.06	AVG	Н
BLE 2Mbps – High band-edge							
2483.5	47.59	-5.79	41.80	74.00	-32.20	Peak	V
2483.5	38.46	-5.79	32.67	54.00	-21.33	AVG	V
2500	47.46	-5.72	41.74	74.00	-32.26	Peak	V
2500	38.30	-5.72	32.58	54.00	-21.42	AVG	V
2483.5	50.62	-5.79	44.83	74.00	-29.17	Peak	Н
2483.5	40.99	-5.79	35.20	54.00	-18.80	AVG	Н
2500	50.45	-5.72	44.73	74.00	-29.27	Peak	Н
2500	40.31	-5.72	34.59	54.00	-19.41	AVG	Н



Photographs of the Test Setup

See the Appendix – Test Setup Photos.



Photographs of the EUT

See the Appendix - EUT Photos.

----End of Report----