

CTC Laboratories, Inc.

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Т	EST REPORT			
Report No. ·····:	CTC20200469E07			
FCC ID:	PADWF113-A			
IC:	10563A-WF113A			
Applicant:	Wahoo Fitness L.L.C.			
Address:	90 W. Wieuca Road #110, Atlanta, G/	A 30342, United States		
Manufacturer	Wahoo Fitness L.L.C.			
Address:	90 W. Wieuca Road #110, Atlanta, G	A 30342, United States		
Product Name:	KICKR 2020			
Trade Mark······	Wahoo Fitness			
Model/Type reference······:	WF113			
Listed Model(s) ·····:	N/A			
Standard:	FCC CFR Title 47 Part 15 Subpart C Section 15.247 RSS 247 Issue 2			
Date of receipt of test sample:	Apr. 28, 2020			
Date of testing:	Apr. 29, 2020 to May. 07, 2020			
Date of issue:	May. 08, 2020			
Result:	PASS			
Compiled by: (Printed name+signature)	Terry Su	Terry Su		
Supervised by: (Printed name+signature)	Miller Ma	Tenny Su Miller Ma		
Approved by:				
(Printed name+signature)	Walter Chen Walter Ches			
Testing Laboratory Name:	CTC Laboratories, Inc.			
Address	1-2/F., Building 2, Jiaquan Building, Guanlan High-Tech Park, Shenzhen, Guangdong, China			
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Table of Contents

Page

1. T	TEST SUMMARY	3
1.1.	. Test Standards	3
1.2.	. Report version	
1.3.	. Test Description	4
1.4.	. Test Facility	5
1.5.	. Measurement Uncertainty	5
1.6.	. Environmental conditions	6
2. G	GENERAL INFORMATION	7
2.1.		
2.2.		
2.3.		
2.4.	. Measurement Instruments List	9
3. Т	TEST ITEM AND RESULTS	
3.1.	. Conducted Emission	
3.2.		
3.3.	. Band Edge Emissions	24
3.4.	DTS BANDWIDTH	
3.5.	. PEAK OUTPUT POWER	
3.6.	. Power Spectral Density	
3.7.		
3.8.	. ANTENNA REQUIREMENT	



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.

<u>RSS 247 Issue 2</u>: Standard Specifications for Frequency Hopping Systems (FHSs) and Digital Transmission Systems (DTSs) Operating in the Bands 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.	Date of issue	Description
01	May. 08, 2020	Original



1.3. Test Description

FCC Part 15 Subpart C (15.247) / RSS 247 Issue 2						
Test Item	Standard	Section	Result	Test		
Test item	FCC	IC		Engineer		
Antenna Requirement	15.203	/	Pass	Rod Lou		
Conducted Emission	15.207	RSS-Gen 8.8	Pass	Terry Su		
Band Edge Emissions	15.247(d)	RSS 247 5.5	Pass	Rod Lou		
6dB Bandwidth	15.247(a)(2)	RSS 247 5.2 (a)	Pass	Rod Lou		
Conducted Max Output Power	15.247(b)(3)	RSS 247 5.4 (d)	Pass	Rod Lou		
Power Spectral Density	15.247(e)	RSS 247 5.2 (b)	Pass	Rod Lou		
Transmitter Radiated Spurious	15.209&15.247(d)	RSS 247 5.5& RSS-Gen 8.9	Pass	Terry Su		

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



1.4. Test Facility

CTC Laboratories, Inc.

Add: 1-2/F., Building 2, Jiaquan Building, Guanlan High-Tech Park, Shenzhen, Guangdong, China

Laboratory accreditation

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

CNAS-Lab Code: L5365

CTC Laboratories, Inc. has been assessed and proved to be in compliance with CNAS-CL01 Accreditation. Criteria for Testing and Calibration Laboratories (identical to ISO/IEC17025:2017 General Requirements) f or the Competence of Testing and Calibration Laboratories.

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 the Competence of Testing and Calibration Laboratories and any additional program requirements in th e 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 Indus try 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 (F CC) 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 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
Transmitter power conducted	0.42 dB	(1)
Transmitter power Radiated	2.14 dB	(1)
Conducted spurious emissions 9kHz~40GHz	1.60 dB	(1)
Radiated spurious emissions 9kHz~40GHz	2.20 dB	(1)
Conducted Emissions 9kHz~30MHz	3.20 dB	(1)
Radiated Emissions 30~1000MHz	4.70 dB	(1)
Radiated Emissions 1~18GHz	5.00 dB	(1)
Radiated Emissions 18~40GHz	5.54 dB	(1)
Occupied Bandwidth		(1)

Note (1): This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=1.96.

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



ΕN

2. GENERAL INFORMATION

2.1. Client Information

Applicant:	Wahoo Fitness L.L.C.
Address:	90 W. Wieuca Road #110, Atlanta, GA 30342, United States
Manufacturer:	Wahoo Fitness L.L.C.
Address:	90 W. Wieuca Road #110, Atlanta, GA 30342, United States
Factory	East West Industries Vietnam LLC
Address:	NO.27, Street 2, VSIP 2, Hoa Phu Ward, Thu Dau Mot City, Binh Duong Province, Vietnam

2.2. General Description of EUT

Note: (1) RevD is the PCBA version				
-				



2.3. 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
:	:
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.

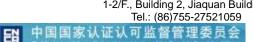


2.4. Measurement Instruments List

Tonsce	Tonscend JS0806-2 Test system					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated until	
1	Spectrum Analyzer	Rohde & Schwarz	FSU26	100105	Dec. 27, 2020	
2	Spectrum Analyzer	Rohde & Schwarz	FUV40-N	101331	Mar. 15, 2021	
3	MXG Vector Signal Generator	Agilent	N5182A	MY47420864	Dec. 27, 2020	
4	Signal Generator	Agilent	E8257D	MY46521908	Dec. 27, 2020	
5	Power Sensor	Agilent	U2021XA	MY5365004	Dec. 27, 2020	
6	Power Sensor	Agilent	U2021XA	MY5365006	Dec. 27, 2020	
7	Simultaneous Sampling DAQ	Agilent	U2531A	TW54493510	Dec. 27, 2020	
8	Climate Chamber	TABAI	PR-4G	A8708055	Dec. 27, 2020	
9	Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	116410	Dec. 27, 2020	
10	Climate Chamber	ESPEC	MT3065	/	Dec. 27, 2020	
11	300328 v2.2.2 test system	TONSCEND	v2.6	/	/	

Radiate	Radiated Emission and Transmitter spurious emissions					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated until	
1	EMI Test Receiver	Rohde & Schwarz	ESCI	100658	Dec. 27, 2020	
2	High pass filter	micro-tranics	HPM50111	142	Dec. 27, 2020	
3	Log-Bicon Antenna	Schwarzbeck	CBL6141A	4180	Dec. 27, 2020	
4	Ultra-Broadband Antenna	ShwarzBeck	BBHA9170	25841	Dec. 27, 2020	
5	Loop Antenna	LAPLAC	RF300	9138	Dec. 27, 2020	
6	Spectrum Analyzer	Rohde & Schwarz	FSU26	100105	Dec. 27, 2020	
7	Horn Antenna	Schwarzbeck	BBHA 9120D	647	Dec. 27, 2020	
8	Pre-Amplifier	HP	8447D	1937A03050	Dec. 27, 2020	
9	Pre-Amplifier	EMCI	EMC051835	980075	Dec. 27, 2020	
10	Antenna Mast	UC	UC3000	N/A	N/A	
11	Turn Table	UC	UC3000	N/A	N/A	
12	Cable Below 1GHz	Schwarzbeck	AK9515E	33155	Dec. 27, 2020	
13	Cable Above 1GHz	Hubersuhner	SUCOFLEX 102	DA1580	Dec. 27, 2020	
14	Splitter	Mini-Circuit	ZAPD-4	400059	Dec. 27, 2020	
15	RF Connection Cable	HUBER+SUHNER	RE-7-FL	N/A	Dec. 27, 2020	
16	RF Connection Cable	Chengdu E-Microwave			Dec. 27, 2020	

CTC Laboratories, Inc.





17	High pass filter	Compliance Direction systems	BSU-6	34202	Dec. 27, 2020
18	Attenuator	Chengdu E-Microwave	EMCAXX-10 RNZ-3		Dec. 27, 2020
19	High and low temperature box	ESPEC	MT3065	12114019	Dec. 27, 2020

Conduc	ted Emission				
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	LISN	R&S	ENV216	101112	Dec. 27, 2020
2	LISN	R&S	ENV216	101113	Dec. 27, 2020
3	EMI Test Receiver	R&S	ESCI	100658	Dec. 27, 2020

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

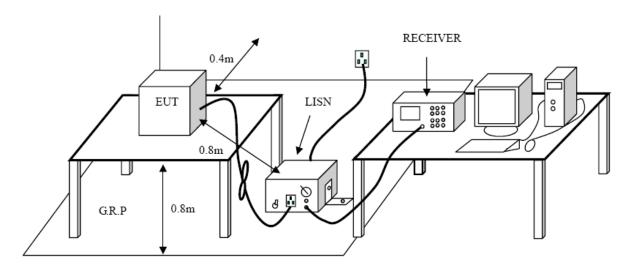
<u>Limit</u>

FCC CFR Title 47 Part 15 Subpart C Section 15.207/ RSS - Gen 8.8

	Limit (dBuV)						
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.

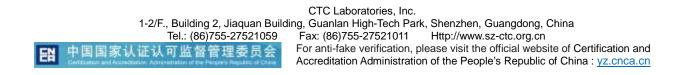
3. The EUT and simulators are connected to the main power through a line impedances stabilization network (LISN). The LISN provides a 50ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN. (Please refer to the block diagram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

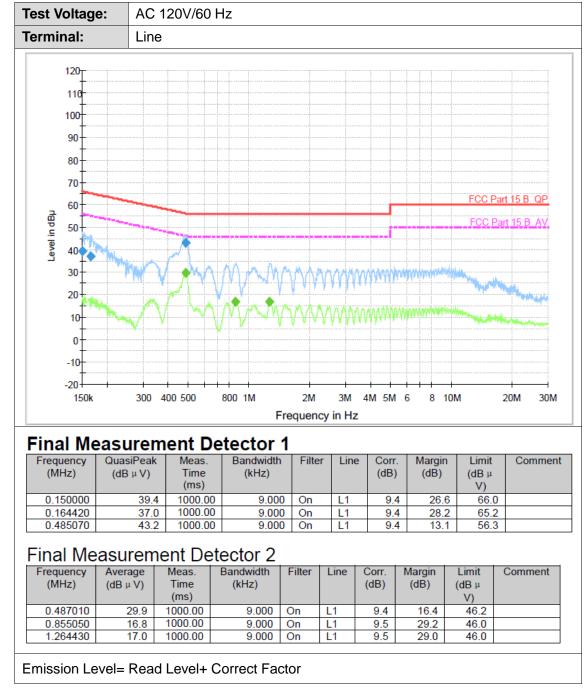




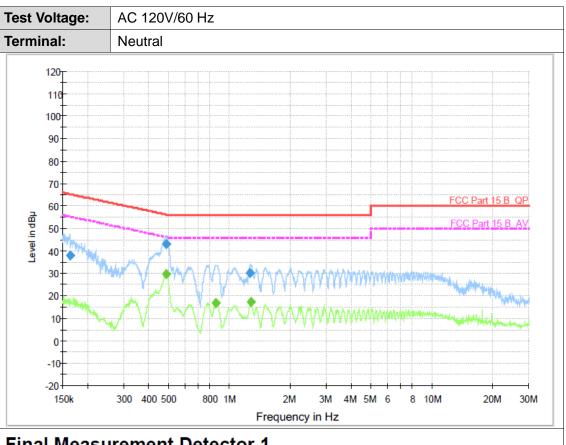
Test Mode:

Please refer to the clause 2.3.

Test Results







Final Measurement Detector 1

Frequency (MHz)	QuasiPeak (dB µ V)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dB µ V)	Comment
0.162470	37.9	1000.00	9.000	On	Ν	9.4	27.4	65.3	
0.483140	43.1	1000.00	9.000	On	N	9.4	13.2	56.3	
1.264430	30.4	1000.00	9.000	On	Ν	9.5	25.6	56.0	

Final Measurement Detector 2

Frequency (MHz)	Average (dB µ V)	Meas. Time	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dB µ	Comment
0.487010	30.0	(ms) 1000.00	9.000	On	N	9.4	16.2	V) 46.2	
0.855050	17.0	1000.00	9.000	On	N	9.5	29.0	46.0	
1.274560	17.1	1000.00	9.000	On	Ν	9.5	28.9	46.0	

Emission Level= Read Level+ Correct Factor

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3.2. Radiated Emission

<u>Limit</u>

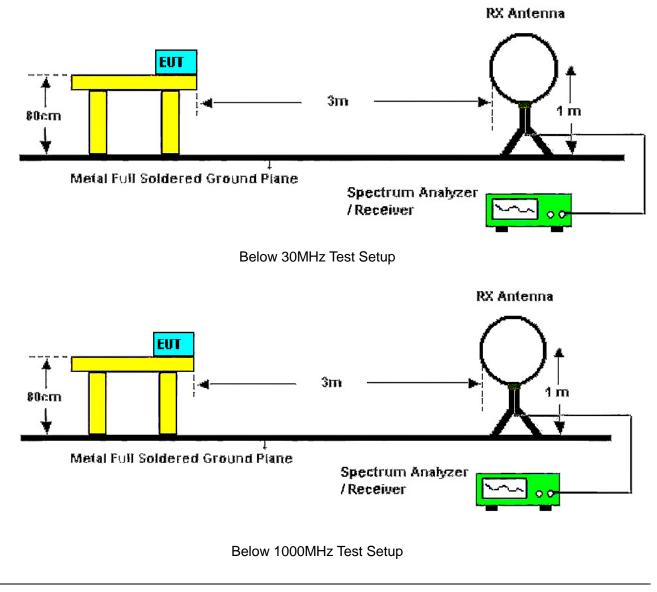
FCC CFR Title 47 Part 15 Subpart C Section 15.209/ RSS - Gen 8.9

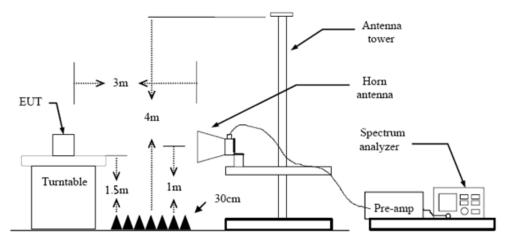
Frequency	Limit (dBuV/m @3m)	Value
30 MHz ~ 88 MHz	40.00	Quasi-peak
88 MHz ~ 216 MHz	43.50	Quasi-peak
216 MHz ~ 960 MHz	46.00	Quasi-peak
960 MHz ~ 1 GHz	54.00	Quasi-peak
	54.00	Average
Above 1 GHz	74.00	Peak

Note:

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

Test Configuration





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.

3. The EUT was set 3 meters from the receiving antenna, which was mounted on the top of a variable 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.

- 6. Use the following spectrum analyzer settings
- (1) Span shall wide enough to fully capture the emission being measured;
- (2) Below 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.

(3) From 1 GHz to 10th harmonic:

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

RBW=1MHz, VBW=10Hz with Peak Detector for Average Value.

Test Mode

Please refer to the clause 2.3.

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.

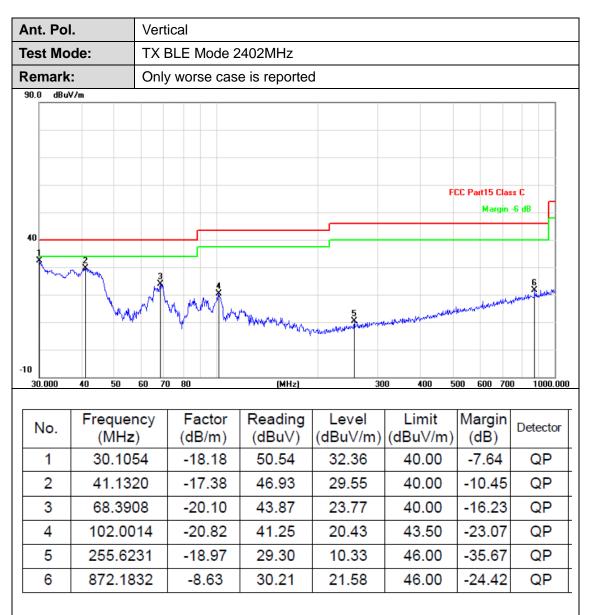


EN

Ant. Pol	-	Horiz	zontal					
Test Mo	de:	TX E	BLE Mode 2	2402MHz				
Remark	:	Only	worse cas	se is reported	ł			
90.0 dBu	//m							
40	40 50	2 2 50 70		(MHz)		Mun Jam	CC Part15 Clas Margin	6 dB
No.	Frequer (MHz	-	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	44.58	68	-17.64	32.61	14.97	40.00	-25.03	QP
2	69.114	41	-20.24	37.86	17.62	40.00	-22.38	QP
3	101.28	85	-20.88	40.05	19.17	43.50	-24.33	QP
4	121.12	31	-19.21	35.92	16.71	43.50	-26.79	QP
4			-18.24	34.78	16.54	46.00	-29.46	QP
4 5	283.97	91	-10.24	01.10				

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





Remarks:

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



EN

No report for the emission which more than 10 dB below the prescribed limit.									
26000.00 M									
Detector									
AVG									
peak									



EN

Ant. Po	ol.	Verti	cal									
Fest Mo	ode:	TX E	BLE Mode 2	402MHz								
Remarl	k:		To report for the emission which more than 10 dB below the prescribed limit.									
100.0 dB	uV/m											
					FCC Par	rt15 Class C 3M Ab	ove-16 Peak					
					FCC	Part15 Class C 3M	Above-1G AV					
50	ž											
	×											
0.0	0 3500.00 6(00.00	8500.00 11	000.00 13500.0	0 16000.00 1	18500.00 21000		26000.00 MH				
No.	Frequer (MHz	псу	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit	Margin (dB)	Detector				
1	4803.0	60	-2.82	35.04	32.22	54.00	-21.78	AVG				
2	4804.2	30	-2.82	49.83	47.01	74.00	-26.99	peak				
Remark		Anten	na Factor (dB/m)+Cabl	e Factor (dF	3)-Pre-ampli	fier Facto	or				



Ant	. Pol			Hori	zonta											
	t Mo						24	40MHz								
	nark							-	0.14	hich i	more t	han		below the	2	
Nen		•		pres	cribe	ed limi	t.	51113310		mon	nore i	nan			5	
100.0) dBu	W/m														
											FCC Pa	rt15 Cla	ss C 3M Ab	ove-16 Peak		
											FCC	Dav115 (Class C 2M	Above-1G AV		
50			2								TCC	raitio	Lidss C JM	Above-Tu At		
			2													
			1 X													
0.0																
10	00.000	3500.00	600	0.00	850). 00 1	100	0.00 135	00.0	0 160	0.00 1	8500.0	0 21000	.00	26000.001	Hz
		F ire er			-		_	Deedin	~		u a l			Manain		
N	lo.	Frequ (M	uen Hz)	су		actor B/m)	'	Readin (dBuV			vel V/m)		imit uV/m)	Margin (dB)	Detecto	or
	1	4879		00		2.60	+	35.14	<i>,</i>	•	.54		4.00	-21.46	AVG	
	2	4879				2.60	+	49.58			.98		4.00	-27.02		
	-	-107	2.72		-			40.00						21.02	peur	`
D																

Page 20 of 39

Remarks:

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



Ant.	Pol.		Vert	Vertical									
Fest	Mod	e:	TX E	BLE Mode	e 2440	MHz							
Rem	nark:			eport for		nission v	vhich ı	more t	han 10 dB l	pelow the	9		
100.0	dBu¥a	'm											
								FCC Pa	rt15 Class C 3M At	ove-16 Peak			
								FCC	Part15 Class C 3M	Above-1G AV			
50		2 X											
		*											
0.0	0.000		6000.00	8500.00	11000.00) 13500.0	0 100	0.00	18500.00 21000		26000.00 MI		
N	lo.	Freque (MH		Facto (dB/m		eading dBuV)	1	vel V/m)	Limit (dBuV/m)	Margin (dB)	Detector		
	1	4879	122	-2.60	3	35.26	32	.66	54.00	-21.34	AVG		
	2	4879	.944	-2.60	4	9.42	46	.82	74.00	-27.18	peak		
	narks:	dB/m) =											

2.Margin value = Level -Limit value

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Ant.	Pol	•		Н	oriz	ontal												
Fest	Mo	de:		T	X Bl	E N	lode	e 24	180N	1Hz								
Rem	ark					port ribec			emis	ssior	W	hich ı	more	than	10 d	Βt	pelow the)
100.0	dBu\	//m		1.173					_									
													FCC Pa	rt15 Cl	ass C 3	M Ab	ove-16 Peak	
													FCC	Part15	Class (: 3M	Above-16 AV	
50			2 X															
			×															
0.0	0.000	3500	00	6000.0	10	8500.0	10	110	DO.OO	1350	n nn	160)0.00	18500.	00 2	1000	00	26000.00 MI
No	D.		eque (MH:	-	/	Fac (dB	ctor /m)		Rea (dB	iding 8uV)		Le ^v (dBu	vel V/m)		.imit uV/r	n)	Margin (dB)	Detector
1	1	4	959.	424		-2	.38		35	.02		32.	.64	5	64.00)	-21.36	AVG
2	2	4	959.	580		-2	.38		48	.98		46.	.60	7	4.00)	-27.40	peak
	ctor	(dB	/m) = ue =						B/m)	+Ca	ble	e Fact	or (dE	3)-Pr	e-an	npli	fier Facto	or



Ant. Pol.	•	Vertical						
Test Mod	de:	TX BLE	Mode 2	480MHz				
Remark:	:	No repo prescrib		emission v	vhich more t	han 10 dB t	pelow the	1
100.0 dBux	W/m					rt15 Class C 3M Ab Part15 Class C 3M		
0.0	0500.00	200.00	0.00 11	000.00 10500.0	10000 00 1	10500.00 01000		
No.	Frequer (MHz	ncy F	actor IB/m)	Reading (dBuV)	Level	Limit (dBuV/m)	Margin	Detector
1	4959.9	· ·	2.38	49.47	47.09	74.00	-26.91	peak
2	4960.6	56 .	-2.38	35.06	32.68	54.00	-21.32	AVG
No.	Frequer (MHz 4959.9	ncy F) (c 26 ·	actor IB/m) -2.38	(dBuV) 49.47	Level (dBuV/m) 47.09	(dBuV/m) 74.00	Margin (dB) -26.91	pea

Page 23 of 39

Remarks:

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



3.3. Band Edge Emissions

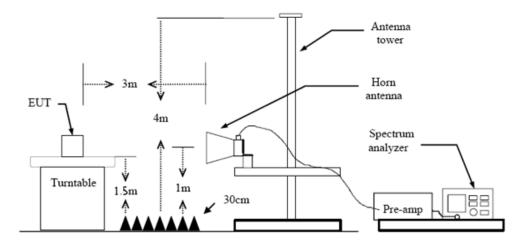
<u>Limit</u>

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (d)/ RSS 247 5.5:

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

Conducted band edge limit: The highest point of the operating frequency waveform down 20dB

Test Configuration



Test Procedure

- 1. The EUT was setup and tested according to ANSI C63.10:2013 requirements.
- 2. The EUT is placed on a turn table which is 1.5 meter above ground. The turn table is rotated 360 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.
- 4. The antenna is scanned from 1 meter to 4 meters to find out the maximum emission level. This is 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 3.7 Duty Cycle.

Test Mode

Please refer to the clause 2.3.

Test Results



(1) Radiation Test

Ant. Po	l.	Hori	zontal								
est Mo	de:	BLE	Mode 24	402M⊦	łz						
100.0 dB	uV/m										
											\wedge
							FCC Pa	t15 Class C	ЗМ АЬ	ove-16 Peak	H-
							FCC	Part15 Class	с зм	Above-1G AV	
50										1 *	
				a fait an air ann an						3	\
0.0											
	2318.00	2328.00	2338.00	2348.00	2358.00) 2368	3.00 2	2378.00	2388.0	00	2408.00 MI
	Freque		Facto (dB/m		eading dBuV)	1	vel V/m)	Lim (dBuV		· · ·	Detector
No.	(MH	Z)	(-						
No. 1	(MH) 2390.	·	-8.10)	48.27	40	.17	74.0	00	-33.83	peak

2.Margin value = Level -Limit value



	. Pol	-	V	ertical								
est	t Mo	de:	В	LE Mo	de 24	02MH:	Z			_		_
ЮО.О Г) dBu\	//m			1					1	1	
50											Above-16 Peak	
0.0	08.000	2318.00	2328.0	00 233	38.00	2348.00	2358.00) 2368	3.00 2	2378.00 23	88.00	2408.00 M
N	lo.	Freq (M	uency Hz)	-	actor B/m)		ading BuV)		vel V/m)	Limit (dBuV/n	Margin n) (dB)	Detector
	lo. 1	(M		(c		(d		(dBu			n) (dB)	Detector peak

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



nt. F	Mode:	_	zontal Mode 2480					
	dBuV/m	DLE	Wode 2480					
	Λ							
					FCC Par	t15 Class C 3M Ab	ove-16 Peak	
	-1							
50					FCC	Part15 Class C 3M	Above-16 AV	
50								
						~~~,		
0.0	.000 2481.00	2491.00	2501.00 25	11.00 2521.00	0501.00	541.00 2551.0		2571.00.14
2471.	000 2401.00	2431.00	2001.00 20	11.00 2321.00	2531.00 2	541.00 2551.0	0	2571.00 MH
N.	Frequ	ency	Factor	Reading	Level	Limit	Margin	
No	. (₩F	lz)	(dB/m)	(dBuV)	(dBuV/m)	(dBuV/m)		Detector
1	2483	.500	-7.68	59.60	51.92	74.00	-22.08	peak
2	2483	.500	-7.68	56.49	48.81	54.00	-5.19	AVG

2.Margin value = Level -Limit value



Ant.	Pol.	Verti	cal					
Test	Mode:	BLE	Mode 248	) MHz				
100.0	dBuV/m	1						
	Δ							
	$-\Lambda$				FCC Par	t15 Class C 3M Ab	ove-16 Peak	
E0					FCC	Part15 Class C 3M	Above-1G AV	
50								
-		·			~	- 1		
0.0 2471	1.000 2481.00	2491.00	2501.00 25	511.00 2521.00	2531.00 2	541.00 2551.0	10	2571.00 MH
No		uency Hz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1		3.500	-7.68	56.86	49.18	74.00	-24.82	peak
2	2 248	3.500	-7.68	53.12	45.44	54.00	-8.56	AVG
-	arks: ctor (dB/m)	Anton						



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#### (2) Conducted Test

(z) Conducted lest			
	Spectrum Ref Level 20.00 dBm Offset 0.50 dB • Ri	BW 100 kHz	
	👄 Att 30 dB SWT 113.8 μs 👄 V	BW 300 kHz Mode Auto FFT	
	Count 244/300 Pk View		
			73 dBm 730 GHz
	10 dBm	M2[1] -51.	.79 dBm 000t€Hz
	0 dBm		T T
	-10 dBm		
	-20 dBm 01 -23.730 dBm		
	-30 dBm		
CH00	-40 d8m		
CHOO	-50 dBm-		Ma 1
	HBOAR RATE LAND A LAND AND A LAND AND A LAND AND AND AND AND AND AND AND AND AND	Man March	<u></u>
	-70 dBm		
	Start 2.3 GHz Marker	691 pts Stop 2.4	05 GHz
		Y-value Function Function Result     -3.73 dBm	
	M2 1 2.4 GHz	-51.79 dBm	
	M3         1         2.39 GHz           M4         1         2.399978 GHz	-61.66 dBm -53.97 dBm	
		Measuring 1111111 (49) 20.05	L2026
	Date: 29.APR.2020 17:51:13	1	
Mark frequency(MHz)	Value (dBm)	Limit (dBm)	Result
2400.000	-51.79	-	
2390.000	-61.66	-23.73	Pass
0000 070	50.07		
2399.978	-53.97		₩
СН39	Spectrum           Ref Level 20.00 dBm         Offset 0.50 dB @ RB           Att         30 dB         SWT         94.8 µs         VB           Count 286/300         91Pk View         910 dBm         910 dBm <t< td=""><td>W 300 kHz         Mode Auto FFT           M1[1]         -S.           M2[1]         -61.           2.483         -           2.483         -           2.483         -           4.40         -           61.2483         -           61.2483         -           691 pts         Stop 2.           Y-value         Function           -51.12 dBm         -           -58.04 dBm         -</td><td>II2 dBm         J12 dBm         J10 GHz         32 dBm         500 GHz         S55 GHz</td></t<>	W 300 kHz         Mode Auto FFT           M1[1]         -S.           M2[1]         -61.           2.483         -           2.483         -           2.483         -           4.40         -           61.2483         -           61.2483         -           691 pts         Stop 2.           Y-value         Function           -51.12 dBm         -           -58.04 dBm         -	II2 dBm         J12 dBm         J10 GHz         32 dBm         500 GHz         S55 GHz
CH39	Spectrum           Ref Level 20.00 dBm         Offset 0.50 dB = RB           Att         30 dB         SWT         94.8 µs = VB           Count 286/300         ● IPk View         ●         ●         ●           10 dBm         ●         ●         ●         ●         ●         ●         ●         ●         ●         ●         ●         ●         ●         ●         ●         ●         ●         ●         ●         ●         ●         ●         ●         ●         ●         ●         ●         ●         ●         ●         ●         ●         ●         ●         ●         ●         ●         ●         ●         ●         ●         ●         ●         ●         ●         ●         ●         ●         ●         ●         ●         ●         ●         ●         ●         ●         ●         ●         ●         ●         ●         ●         ●         ●         ●         ●         ●         ●         ●         ●         ●         ●         ●         ●         ●         ●         ●         ●         ●         ●         ●         ●         ●         ●         ●         <	W 300 kHz         Mode Auto FFT           M1[1]         -5.           M2[1]         -61.           2.480           -61.           M4           M4	12 dBm 010 GHz 32 dBm 500 GHz 40.40,000 55 GHz
CH39 Mark frequency(MHz)	Spectrum           Ref Level 20.00 dBm         Offset 0.50 dB = RB           Att         30 dB         SWT         94.8 µs         • VB           Count 286/300         1Pk View         10 dBm	W 300 kHz         Mode Auto FFT           M1[1]         -S.           M2[1]         -61.           2.483         -           2.483         -           2.483         -           4.40         -           61.2483         -           61.2483         -           691 pts         Stop 2.           Y-value         Function           -51.12 dBm         -           -58.04 dBm         -	12 dBm 310 GHz 32 dBm 500 GHz
CH39 Mark frequency(MHz) 2483.500	Spectrum           Ref Level 20.00 dBm         Offset 0.50 dB = RB           Att         30 dB         SWT         94.8 µs         VB           Count 286/300         ● IPk View         0         0         ID         0         ID         0         ID         ID         0         ID         0         ID         0         ID         ID </td <td>W 300 kHz         Mode Auto FFT           M1[1]         -5.           M2[1]         -61.           2.480           -61.           2.483           M2[1]         -61.           2.483           M4           M4</td> <td>12 dBm 010 GHz 32 dBm 500 GHz 555 GHz S55 GHz Result</td>	W 300 kHz         Mode Auto FFT           M1[1]         -5.           M2[1]         -61.           2.480           -61.           2.483           M2[1]         -61.           2.483           M4           M4	12 dBm 010 GHz 32 dBm 500 GHz 555 GHz S55 GHz Result
CH39 Mark frequency(MHz)	Spectrum           Ref Level 20.00 dBm         Offset 0.50 dB = RB           Att         30 dB         SWT         94.8 µs         • VB           Count 286/300         1Pk View         10 dBm	W 300 kHz         Mode Auto FFT           M1[1]         -5.           M2[1]         -61.           2.480           -61.           M4           M4	12 dBm 010 GHz 32 dBm 500 GHz 40.40,000 55 GHz



## 3.4. DTS Bandwidth

<u>Limit</u>

#### FCC CFR Title 47 Part 15 Subpart C Section 15.247 (a)(2)/ RSS-247 5.2 a:

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.

NOTE: The EUT was set to continuously transmitting in each mode and low, Middle and high channel for the test.

#### Test Mode

Please refer to the clause 2.3.

#### Test Results

Туре	Channel	99% Bandwidth (MHz)	6dB Bandwidth (MHz)	Limit (kHz)	Result
	00	1.047	0.716		
BT-BLE	19	1.051	0.716	≧500	Pass
	39	1.051	0.720		



#### 99% Bandwidth **T** Spectrum Ref Level 30.00 dBm Offset 0.50 dB ● RBW 50 kHz Att 40 dB SWT 37.9 µs ● VBW 200 kHz Att Mode Auto FFT Count 100/100 M1[1] 4.32 di 2.40202000 GH 1.046953047 MH 20 dBm 10 dBm 0 dBm -10 dBm 12 CH00 -20 dBm -30 dBm 40 dBr -50 dBm m -60 dBm Span 4.0 MHz CF 2.402 GHz 1001 pt ..... Date: 29.APR.2020 17:50:32 ₽ Spectrum Ref Level 30.00 dBm Offset 0.50 dB RBW 50 kHz Att 40 dB SWT 37.9 µs WBW 200 kHz Mode Auto FFT Count 100/100 1Pk View M1[1] 4.72 dB 2.44002000 GH 1.050949051 MH 20 dBm c By 10 dBm 0 dBm -10 dBm .T2 **CH19** -20 dBm -30 dBm $\sim$ 40 dBr -50 dBm -60 dBm CF 2.44 G 1001 4.0 MH; Date: 29.APR.2020 17:55:17 ∎ Spectrum RefLevel 30.00 dBm Att 40 dB Offset 0.50 dB ● RBW 50 kHz SWT 37.9 μs • VBW 200 kHz Att Mode Auto FFT Count 100/100 M1[1] 5.46 dB 2.48001600 GH 20 dBn 051 1.050949 10 dBm 0 dBm -10 dBm **CH39** -20 dBm -30 dBm 40 dBr -50 dBm--60 dBm 1001 pt CF 2.48 G 4.0 MH Date: 29.APR.2020 17:58:01

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	Spectrum 🕎
	Ref Level         30.00 dBm         Offset         0.50 dB         RBW         100 kHz           ➡ Att         40 dB         SWT         18.9 μs         ¥BW 300 kHz         Mode Auto FFT
	Count 100/100
	M1[1] -9.92 d8m
	20 dBm M2[1] -3.86 dBm 2 40175200 GHz
	-10 d8m 01 -9.863 d8m
	-20 dem
CH00	-30 dem
	-40 d8m
	-50 dem
	-60 d8m
	CF 2.402 GHz 1001 pts Span 4.0 MHz
	Marker Type Ref Trc X-value Y-value Function Function Result
	Mi         1         2.401652 GHz         -9.92 dBm         Participant         Participant           M2         1         2.401752 GHz         -3.86 dBm
	D3 M1 1 716.0 kHz -0.02 dB
	Mexercine.
	Date: 29.AFR.2020 17:50:15
	Spectrum 🕎
	Ref Level         30.00 dBm         Offset         0.50 dB         RBW         100 kHz           ■ Att         40 dB         SWT         18.9 µs         VBW 300 kHz         Mode         Auto FFT
	Count 100/100
	M1[1] -10.29 dBm
	20 d8m 2.43965200 GHz M2[1] -4.26 dBm
	10 dBm 2.43975200 GHz
	-10-d8m 01 -10.258 d8m
	-20 dem
CH19	-30 dem
	-40 dBm
	-50 dBm
	-60 d8m
	CF 2.44 GHz 1001 pts Span 4.0 MHz Marker
	Type         Ref         Trc         X-value         Y-value         Function         Function Result           M1         1         2.439652 GHz         -10.29 dBm         -10.29 dBm <t< td=""></t<>
	M2 1 2.439752 GHz -4.26 dBm D3 M1 1 716.0 kHz -0.01 dB
	Date: 29.APR.2020 17:54:59
	Spectrum 🕎
	Ref Level 30.00 dBm Offset 0.50 dB 👄 RBW 100 kHz
	Att 40 dB SWT 18.9 µs      WBW 300 kHz Mode Auto FFT     Count 100/100
	1Pk View     M1[1] -11.07 dBm
	2 47065200 CH3
	20 d8m M2[1]44 d8m 10 d8m M2[1]4490 GHz
	20 dem M2[1]4.94 dBm 10 dBm2.47974800 GHz
	20 dem         M2[1]         -4.94 dBm           10 dBm         2.47974800 GHz           0 dBm         M2         0
	20 dem         M2[1]         -4.94 dBm           10 dBm         2.47974800 GHz           0 dBm         M2         0           -10 dBm         01 -10.936 dBm         M1
	20 dem     M2[1]     -4.94 dBm       10 dBm     2.47974800 GHz       0 dBm     M2       -10.dBm     01 -10.936 dBm       -20 dBm     400 mm
CH39	20 dem         M2[1]         -4.94 dBm           10 dBm         2.47974800 GHz           0 dBm         M2         0           -10 dBm         01 -10.936 dBm         M1
СН39	20 dem     M2[1]     -4.94 dBm       10 dBm     2.47974800 GHz       0 dBm     M2       -10.dBm     01 -10.936 dBm       -20 dBm     400 mm
СН39	20 dem     M2[1]     -4.94 dBm       10 dBm     2.47974800 CHz       0 dBm     M2       -10.dBm     01       -10.dBm     01       -20 dBm     2       -30 dBm
СН39	20 dem         M2[1]         -4.94 dBm           10 dBm         2.47974800 CHz           0 dBm         M2         0           -10.42m         01 -10.936 dBm         01           -20 dBm         -10.936 dBm         -10.936 dBm           -30 dBm         -10.936 dBm         -10.936 dBm
СН39	20 dem     M2[1]     -4.94 dBm       10 dBm     2.47974800 CHz       0 dBm     M2       -10.dBm     M1       -10.dBm     01       -10.dBm     M1       -20 dBm
СН39	20 dem     M2[1]     -4.94 dBm       10 dem     2.47974800 CHz       0 d8m     M2       -10.48m     01 -10.936 dBm       -20 dem
CH39	20 dem     M2[1]     -4.94 dBm       10 dBm     2.47974800 CHz       0 dBm     M2       -10.dBm     M1       -20 dBm     M1       -30 dBm     -10.926 dBm       -4.94 dBm     -10.926 dBm       -10.dBm     01 -10.926 dBm       -20 dBm     -10.926 dBm       -30 dBm     -10.926 dBm       -4.94 dBm     -10.926 dBm       -20 dBm     -10.926 dBm       -30 dBm     -10.926 dBm       -30 dBm     -10.926 dBm       -40 dBm     -10.926 dBm       -60 dBm     -10.926 dBm       -60 dBm     -10.926 dBm       -70 gBm     Function Result
CH39	20 dem     M2[1]     -4.94 dBm       10 dBm     2.47974800 CHz       0 dBm     M2       -10 dBm     M1       -10 dBm     M1       -20 dBm     M1       -30 dBm     M1       -4.94 dBm       -10 dBm     M1       -10 dBm     M1       -20 dBm     M1       -30 dBm     M1       -60 dBm     M1       -60 dBm     M1       -70 dBm     M1
СН39	20 dem     M2[1]     -4.94 dem       10 dem     2.47974800 CHz       0 dem     M2       -10 dem     M1       -10 dem     M1       -20 dem     M1       -30 dem     M1       -40 dem     M1       -50 dem     M1       -20 dem     M1       -20 dem     M1       -30 dem     -4.94 dem       -30 dem     -4.94 dem       -40 dem     -4.94 dem       -60 dem     -11.07 dem       M2     1       2.47974602 cHz     -11.07 dem

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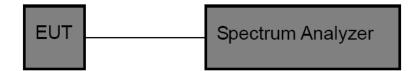
## 3.5. Peak Output Power

<u>Limit</u>

#### FCC CFR Title 47 Part 15 Subpart C Section 15.247 (b)(3)/ RSS-247 5.4 d:

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
ISED RSS-247 5.4 d	EIRP	4 Watt or 36dBm	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 2.3

### Test Result

Туре	Channel	Output power (dBm)	Limit (dBm)	Result
	00	-3.90		
BT-BLE	19	-4.20	≤30.00	Pass
	39	-4.85		



#### Test plot as follows:

	Re e estrura	m
	Spectrum Ref Level 30.00 dBm Offset 0.50 dB  RBW 1 MHz	
	Att 40 dB SWT 1.9 µs VBW 3 MHz Mode Auto FFT Count 100/100	
	IPk View	
	M1[1]	-3.90 dBm 2.40202170 GHz
	20 dBm-	
	10 dBm	
	0 dBm	
01100	-10 dBm	
CH00	-20-08m	
	-30 dBm	
	-40 dBm	
	-50 dBm	
	-60 d8m	
	CF 2.402 GHz 691 pts	Span 3.0 MHz
	Date: 30.AFR.2020 17:02:11	
	Spectrum	
	Ref Level 30.00 dBm Offset 0.50 dB  Ref NHz Att 40 dB SWT 1.9 µs VBW 3 MHz Mode Auto FFT	
	Count 100/100  1Pk View	
	M1[1]	-4.20 dBm 2.43975250 GHz
	20 dBm	
	10 dBm	
	0 dBm	
	× · · · ·	
	-10 dBm	
CH19	-20. dem	-
	-30 dem	
	-40 dBm	
	-50 dBm	
	-60 dBm	
	CF 2.44 GHz 691 pts	Span 3.0 MHz
	Neacuring	
	Date: 30.APR.2020 17:02:42	
	Spectrum	
	RefLevel 30.00 dBm Offset 0.50 dB  Att 40 dB SWT 1.9 µs  VBW 3 MHz Mode Auto FFT	
	Count 100/100	
	●1Pk View M1[1]	-4.85 dBm
	20 dBm	2.47976120 GHz
	10 dBm	
	10 dBm	
	0 d8m	
l l	-10 dBm	
СНЗ9		
CH39	-29.48m	
CH39	-20. d8m	
СН39	-30 dBm	
CH39		
CH39	-30 dBm	
CH39	-30 dem	
CH39	-30 dem	
CH39	-30 dem -40 dem -50 dem -60	Span 3.0 MHz

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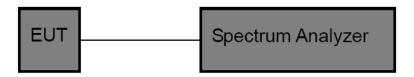
## 3.6. Power Spectral Density

#### <u>Limit</u>

#### FCC CFR Title 47 Part 15 Subpart C Section 15.247 (e)/ RSS-247 5.2 b:

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 2.3

#### Test Result

Туре	Channel	Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)	Result
	00	-19.19		
BT-BLE	19	-19.71	≤8.00	Pass
	39	-20.58		



#### Test plot as follows:

	Spectrum 🕎
	Ref Level         20.50 dBm         Offset         0.50 dB         RBW         3 kHz           ➡ Att         30 dB         SWT         632 μs         ➡ VBW         10 kHz         Mode         Auto FFT
	Count 100/100
	●19k View M1[1] -19.19 dBm
	2.4018839840 GHz
	10 dBm
	0 dBm
	-10 dem
	-20 dBm
CH00	-20 dem
CHUU	
	-50 psm
	-70 dem
	CF 2.402 GHz 30000 pts Span 1.432 MHz
	Measuring
	Date: 29.AFR.2020 17:50:58
	Spectrum 🕎
	Spectrum Ref Level 20.50 dBm Offset 0.50 dB ● RBW 3 kHz
	👄 Att 30 dB SWT 632 μs 👄 VBW 10 kHz Mode Auto FFT
	Count 100/100  PIPk View
	M1[1] -19.71 dBm
	10 dBm 2.4398832200 GHz
	0 dBm
	-10 dBm
	-20 dem
CH19	-30 dem
	-40 dam AAP II VI
	460 dem
	-70 dBm
	CF 2.44 GHz 30000 pts Span 1.432 MHz
	Moneurine
	Date: 29.AFR.2020 17:55:42
	Spectrum 🕎
	Ref Level 20.50 dBm Offset 0.50 dB ■ RBW 3 kHz Att 30 dB SWT 632 µs ■ VBW 10 kHz Mode Auto FFT
	Count 100/100
	●1Pk View M1[1] -20.58 dBm
	2.4798828560 GH2
	10 dBm
	0 dBm
	-10 dBm
	-20 dBm
CL 120	A AND A AND A MARKEN WALL AND A A
CH39	-20 dam
	-30 dem
	-50,000
	Alo dBm
	-70 dBm
	-70 d8m-
	-70 dBm CF 2.48 GHz 30000 pts Span 1.44 MHz

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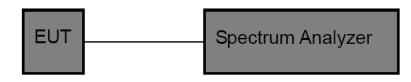


## 3.7. Duty Cycle

<u>Limit</u>

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 2.3

#### Test Result

Test Mode	Channel	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]	1/T Minimum VBW (KHz)	Final setting For VBW (KHz)
	2402	0.349	0.62	56.64	2.87	3
BT_BLE	2440	0.350	0.62	56.68	2.86	3
	2480	0.349	0.62	56.64	2.87	3



#### Test plot as follows: BT_BLE_Ant1_2402 Spectrum Offset 0.50 dB RBW 10 MHz SWT 5 ms VBW 10 MHz Ref Level 30.00 dBm 40 dB . SWT Att SGL TRG:VID 01Pk Clrw M1[1] 600 20 dBm D1[1] 8.42 9.419 µ 10 dBm -10 Br RG -12.400 -20 d£ -30 de 40 dBr -50 dBr -60 dB CF 2.402 GHz 8000 pts 500.0 µs/ X-value -600.1 ns 349.419 µs 616.952 µs Y-value -12.67 dBm 8.42 dB -8.93 dB Type Ref Trc Function Function Result D1 M1 Date: 29.APR.2020 17:49:48 BT BLE_Ant1_2440 Spectrum Ref Level 30.00 de Offset 0.50 dB ● RBW 10 MHz SWT 5 ms ● VBW 10 MHz Att 40 dB 😐 SWT SGL T TRG: VID M1[1] 20 dB D1[1] 10.51 50.044 p 10 dBn o de -10 d 20 and the ...... 50 de -60 dBn CF 2.44 GHz 8000 pts 500.0 µs/ arkeı Type Ref Trc M1 1 X-value -600.1 ns 350.044 μs Y-value -19.35 dBm 10.51 dB 5.11 dB Function Function Result M1 M1 D1 617.577 µs Date: 29.APR.2020 17:54:33 BT_BLE_Ant1_2480 ₽ Spectrum Offset 0.50 dB RBW 10 MHz SWT 5 ms VBW 10 MHz Ref Level 30.00 dBm Att SGL TRG:VID 40 dB 🖷 SWT 01Pk Cirv 00 20 dBr D1[1] 10.29 d 49.419 µ 10 dBr -10.dB -20 dB 40 de -50 dBr -60 dB CF 2.48 GHz 8000 pts 500.0 µs/ ark Type Ref Trc X-value -600.1 ns 349.419 µs 616.952 µs Y-value Function -15.41 dBm -10.29 dB -11.47 dB -11.47 dB Function Result D1 M1 Date: 29.APR.2020 17:57:17

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## 3.8. 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.

#### <u>Test Result</u>

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