

## Shenzhen Toby Technology Co., Ltd.

Report No.: TB-FCC149028

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# FCC Radio Test Report FCC ID: 2AI8E-FATL03I

### **Original Grant**

Report No. : TB-FCC149028

**Applicant**: FUAI Photoelectric Technology (Shenzhen) Co., Ltd.

**Equipment Under Test (EUT)** 

**EUT Name**: Intelligent outdoor lamp

Model No. : FA-TL03-I

Serial No. : N/A

Brand Name : FUAI

**Receipt Date** : 2016-07-15

**Test Date** : 2016-07-16 to 2016-07-25

**Issue Date** : 2016-07-26

**Standards** : FCC Part 15: 2015, Subpart C(15.247)

**Test Method** : ANSI C63.10: 2013

Conclusions : PASS

In the configuration tested, the EUT complied with the standards specified above,

**Test/Witness** 

Engineer

:

Approved&

Authorized

fogta

This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in the report.

TB-RF-074-1.0



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## 1. General Information about EUT

#### 1.1 Client Information

**Applicant**: FUAI Photoelectric Technology (Shenzhen) Co., Ltd.

Address : Jingkai Building 303 Room, The Silicon Valley Power Qinghu Park

C2 Building, Longhua New District, Shenzhen, China

Manufacturer : FUAI Photoelectric Technology (Shenzhen) Co., Ltd.

Address : Jingkai Building 303 Room, The Silicon Valley Power Qinghu Park

C2 Building, Longhua New District, Shenzhen, China

#### 1.2 General Description of EUT (Equipment Under Test)

EUT Name	1	Intelligent outdoor lamp			
Models No.	1	FA-TL03-I			
Model Difference	•	N/A			
M MOOR		Operation Frequency: BLE: 2402MHz~2480MHz			
		Number of Channel:	BLE: 40 channels see note(3)		
Product		RF Output Power:	-2.553 dBm Conducted Power		
Description		Antenna Gain:	0.5 dBi PCB Antenna		
		Modulation Type:	GFSK		
Maria		Bit Rate of Transmitter:	1Mbps(GFSK)		
Power Supply		DC Voltage supplied from DC power by Li-ion Batto	m Host System by USB cable. ery.		
Power Rating	:	DC 5.0V by USB cable.			
		DC 3.7V by 4000mAh Li-ion Battery.			
Connecting I/O Port(S)		Please refer to the User	's Manual		

#### Note:

- (1) This Test Report is FCC Part 15.247 for Bluetooth BLE, the test procedure follows the FCC KDB 558074 D01 DTS Meas Guidance v03r05.
- (2) For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.
- (3) Antenna information provided by the applicant.
- (4) Channel List:

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
00	2402	14	2430	28	2458

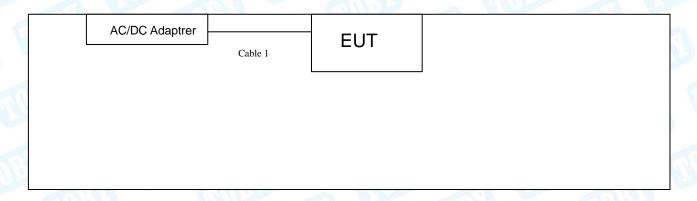


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01	2404	15	2432	29	2460
02	2406	16	2434	30	2462
03	2408	17	2436	31	2464
04	2410	18	2438	32	2466
05	2412	19	2440	33	2468
06	2414	20	2442	34	2470
07	2416	21	2444	35	2472
08	2418	22	2446	36	2474
09	2420	23	2448	37	2476
10	2422	24	2450	38	2478
11	2424	25	2452	39	2480
12	2426	26	2454		
13	2428	27	2456		

1.3 Block Diagram Showing the Configuration of System Tested

## **Charging with TX Mode**



## TX Mode





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#### 1.4 Description of Support Units

Equipment Information							
Name Model FCC ID/DOC Manufacturer Used '							
AC/DC Adapter TEKA012			TEKA	<b>√</b>			
	Cable Information						
Number Shielded Type Ferrite Core Length Note							
Cable 1	NO	NO	0.5M	Accessorise			

#### 1.5 Description of Test Mode

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned follow was evaluated respectively.

For Conducted Test				
Final Test Mode Description				
Mode 1	Charging with TX Mode			

For Radiated Test					
Final Test Mode Description					
Mode 2	TX Mode				
Mode 3	TX Mode				
Mode 3	(Channel 00/20/39)				

#### Note:

(1) For all test, we have verified the construction and function in typical operation. And all the test modes were carried out with the EUT in transmitting operation in maximum power with all kinds of data rate.

According to ANSI C63.10 standards, the measurements are performed at the highest, middle, lowest available channels, and the worst case data rate as follows:

BLE Mode: GFSK Modulation Transmitting mode.

- (2) During the testing procedure, the continuously transmitting with the maximum power mode was programmed by the customer.
- (3) The EUT is considered a mobile unit; in normal use it was positioned on X-plane. The worst case was found positioned on X-plane. Therefore only the test data of this X-plane was used for radiated emission measurement test.



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#### 1.6 Description of Test Software Setting

During testing channel& Power controlling software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product power parameters of RF setting.

Test Software Version	SmartRF Studio 7		
Frequency	2402 MHz	2442MHz	2480 MHz
BLE GFSK	DEF	DEF	DEF

#### 1.7 Measurement Uncertainty

The reported uncertainty of measurement  $y \pm U$ , where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95 %.

Test Item	Parameters	Expanded Uncertainty (U <sub>Lab</sub> )
	Level Accuracy:	
Conducted Emission	9kHz~150kHz	±3.42 dB
	150kHz to 30MHz	±3.42 dB
Redicted Emission	Level Accuracy:	.4.60 dB
Radiated Emission	9kHz to 30 MHz	±4.60 dB
Dedicted Emission	Level Accuracy:	.4.40 dD
Radiated Emission	30MHz to 1000 MHz	±4.40 dB
Redicted Emission	Level Accuracy:	.4.20 dB
Radiated Emission	Above 1000MHz	±4.20 dB



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#### 1.8 Test Facility

The testing was performed by the Shenzhen Toby Technology Co., Ltd., in their facilities located at:1A/F., Bldg.6, Yusheng Industrial Zone, The National Road No.107 Xixiang Section 467, Xixiang, Bao'an, Shenzhen, Guangdong, China.

At the time of testing, the following bodies accredited the Laboratory:

#### **CNAS (L5813)**

The Laboratory has been accredited by CNAS to ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories for the competence in the field of testing. And the Registration No.: CNAS L5813.

#### FCC List No.: (811562)

The Laboratory is listed in the United States of American Federal Communications Commission (FCC), and the registration number is 811562.

#### IC Registration No.: (11950A-1)

The Laboratory has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing. The site registration: Site# 11950A-1.



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## 2. Test Summary

Standa	rd Section	Tool Home	ludana ant	Damada
FCC	IC	Test Item	Judgment	Remark
15.203		Antenna Requirement	PASS	N/A
15.207	RSS-GEN 7.2.4	Conducted Emission	PASS	N/A
15.205	RSS-GEN 7.2.2	Restricted Bands	PASS	N/A
15.247(a)(2)	RSS 247 5.2 (1)	6dB Bandwidth	PASS	N/A
15.247(b)	RSS 247 5.4 (4)	Peak Output Power	PASS	N/A
15.247(e)	RSS 247 5.2 (2)	Power Spectral Density	PASS	N/A
15.247(d)	RSS 247 5.5	Transmitter Radiated Spurious Emission	PASS	N/A

**Note:** N/A is an abbreviation for Not Applicable.



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## 3. Test Equipment

Conducted	d Emission Te	st			
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Due Date
EMI Test Receiver	Rohde & Schwarz	ESCI	100321	Aug. 07, 2015	Aug. 06, 2016
RF Switching Unit	Compliance Direction Systems Inc	RSU-A4	34403	Aug. 07, 2015	Aug. 06, 2016
AMN	SCHWARZBECK	NNBL 8226-2	8226-2/164	Aug. 07, 2015	Aug. 06, 2016
LISN	Rohde & Schwarz	ENV216	101131	Aug. 08, 2015	Aug. 07, 2016
Radiation	Emission Tes	t			
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Due Date
Spectrum Analyzer	Agilent	E4407B	MY45106456	Aug. 07, 2015	Aug. 06, 2016
EMI Test Receiver	Rohde & Schwarz	ESPI	100010/007	Aug. 07, 2015	Aug. 06, 2016
Bilog Antenna	ETS-LINDGREN	3142E	00117537	Mar. 26, 2016	Mar. 25, 2017
Bilog Antenna	ETS-LINDGREN	3142E	00117542	Mar. 26, 2016	Mar. 25, 2017
Horn Antenna	ETS-LINDGREN	3117	00143207	Mar. 26, 2016	Mar. 25, 2017
Horn Antenna	ETS-LINDGREN	3117	00143209	Mar. 26, 2016	Mar. 25, 2017
Pre-amplifier	Sonoma	310N	185903	Mar. 26, 2016	Mar. 25, 2017
Pre-amplifier	HP	8447B	3008A00849	Mar. 26, 2016	Mar. 25, 2017
Cable	HUBER+SUHNER	100	SUCOFLEX	Mar. 26, 2016	Mar. 25, 2017
Positioning Controller	ETS-LINDGREN	2090	N/A	N/A	N/A
Antenna C	onducted Em	ission			
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Due Date
Spectrum Analyzer	Agilent	E4407B	MY45106456	Aug. 07, 2015	Aug. 06, 2016
EMI Test Receiver	Rohde & Schwarz	ESCI	100010/007	Aug. 07, 2015	Aug. 06, 2016
Power Meter	Anritsu	ML2495A	25406005	Aug.07, 2015	Aug.06, 2016
Power Sensor	Anritsu	ML2411B	25406005	Aug.07, 2015	Aug.06, 2016



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## 4. Conducted Emission Test

#### 4.1 Test Standard and Limit

4.1.1Test Standard FCC Part 15.207

#### 4.1.2 Test Limit

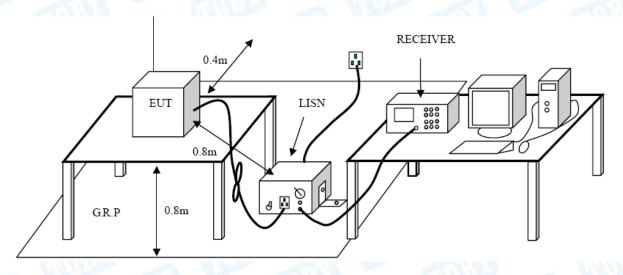
#### **Conducted Emission Test Limit**

THE PROPERTY OF THE PARTY OF TH	Maximum RF Line Voltage (dBμV)			
Frequency	Quasi-peak Level	Average Level		
150kHz~500kHz	66 ~ 56 *	56 ~ 46 *		
500kHz~5MHz	56	46		
5MHz~30MHz	60	50		

#### Notes:

- (1) \*Decreasing linearly with logarithm of the frequency.
- (2) The lower limit shall apply at the transition frequencies.
- (3) The limit decrease in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

#### 4.2 Test Setup



#### 4.3 Test Procedure

The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/50uH of coupling impedance for the measuring instrument.

Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.



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I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.

LISN at least 80 cm from nearest part of EUT chassis.

The bandwidth of EMI test receiver is set at 9kHz, and the test frequency band is from 0.15MHz to 30MHz.

#### 4.4 EUT Operating Mode

Please refer to the description of test mode.

#### 4.5 Test Data

Test data please refer the following pages.





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EUT:	Intellige	ent outdoor l	amp	Model:		FA	-TL03-I
Temperature:	25 ℃	A British	-	Relative	Humidity	y: 55	%
Test Voltage:	AC 120	)V/60 Hz	CHO.		1 62		
Terminal:	Line		-	CALL DE	3	2 M	
Test Mode:	Chargii	ng with TX G	FSK Mode	2402 MHz		13	
Remark:	Only w	orse case is	reported		A STATE OF		100
40 X X		Mamm	May May Markay July	Mary Mark Mark Mark	May way was	QP: AVG:	white pea
-10							
0.150	0.5		(MHz)	5			30.000
	Freq.	Reading Level	(MHz)  Correct Factor	Measure- ment	Limit	Over	30.000
0.150		_	Correct	Measure-	Limit dBu∀	Over	30.000 Detecto
0.150	Freq.	Level	Correct Factor	Measure- ment	Limit		
0.150 No. Mk.	Freq.	<b>Level</b> dBu∀	Correct Factor	Measure- ment	Limit dBu∀	dB	Detecto
0.150 No. Mk.	Freq. MHz	dBuV 35.01	Correct Factor dB	Measure- ment dBuV 45.13	dBuV 64.21 54.21	dB -19.08	Detecto
0.150  No. Mk.	Freq. MHz 0.1860 0.1860	dBuV 35.01 24.29	Correct Factor dB 10.12 10.12	Measure- ment dBuV 45.13 34.41	dBuV 64.21 54.21 61.75	dB -19.08 -19.80	Detecto QP AVC
0.150  No. Mk.  1 2 3	Freq. MHz 0.1860 0.1860 0.2500	Level dBuV 35.01 24.29 32.50	Correct Factor dB 10.12 10.12	Measure- ment dBuV 45.13 34.41 42.60	dBuV 64.21 54.21 61.75	dB -19.08 -19.80 -19.15	Detecto QP AVC
0.150  No. Mk.  1 2 3 4	Freq. MHz 0.1860 0.1860 0.2500 0.2500	Level  dBuV  35.01  24.29  32.50  22.33	Correct Factor dB 10.12 10.12 10.10	Measure- ment dBuV 45.13 34.41 42.60 32.43	64.21 54.21 61.75 51.75 56.00	dB -19.08 -19.80 -19.15 -19.32	Detecto QP AVC
0.150  No. Mk.  1 2 3 4 5 *	Freq. MHz 0.1860 0.1860 0.2500 0.2500 0.5020	Level  dBuV  35.01  24.29  32.50  22.33  37.68	Correct Factor dB 10.12 10.12 10.10 10.10	Measure- ment dBuV 45.13 34.41 42.60 32.43 47.70	64.21 54.21 61.75 51.75 56.00 46.00	dB -19.08 -19.80 -19.15 -19.32 -8.30	QP AVC QP
No. Mk.  1 2 3 4 5 *	Freq. MHz 0.1860 0.1860 0.2500 0.2500 0.5020	Level  dBuV  35.01  24.29  32.50  22.33  37.68  25.79	Correct Factor  dB  10.12  10.12  10.10  10.10  10.02	Measure- ment  dBuV  45.13  34.41  42.60  32.43  47.70  35.81	64.21 54.21 61.75 51.75 56.00 46.00	dB -19.08 -19.80 -19.15 -19.32 -8.30 -10.19	Detecto QP AVC QP AVC
0.150  No. Mk.  1 2 3 4 5 * 6 7	Freq. MHz 0.1860 0.1860 0.2500 0.2500 0.5020 0.5020 1.1019	Level  dBuV  35.01  24.29  32.50  22.33  37.68  25.79  30.39	Correct Factor dB 10.12 10.12 10.10 10.10 10.02 10.02	Measure- ment dBuV 45.13 34.41 42.60 32.43 47.70 35.81 40.54	64.21 54.21 61.75 51.75 56.00 46.00 46.00	dB -19.08 -19.80 -19.15 -19.32 -8.30 -10.19 -15.46	QP AVC QP AVC QP AVC
0.150  No. Mk.  1 2 3 4 5 * 6 7 8	Freq. MHz 0.1860 0.1860 0.2500 0.2500 0.5020 0.5020 1.1019 1.1019	Level  dBuV  35.01  24.29  32.50  22.33  37.68  25.79  30.39  16.17	Correct Factor dB 10.12 10.12 10.10 10.10 10.02 10.02 10.05 10.15	Measure- ment dBuV 45.13 34.41 42.60 32.43 47.70 35.81 40.54 26.32	64.21 54.21 61.75 51.75 56.00 46.00 56.00	dB -19.08 -19.80 -19.15 -19.32 -8.30 -10.19 -15.46 -19.68	Detecto QP AVC QP AVC QP AVC
0.150  No. Mk.  1 2 3 4 5 * 6 7 8 9	Freq. MHz 0.1860 0.1860 0.2500 0.2500 0.5020 0.5020 1.1019 1.1019 2.0820	Level  dBuV  35.01  24.29  32.50  22.33  37.68  25.79  30.39  16.17  26.92	Correct Factor  dB  10.12  10.12  10.10  10.02  10.02  10.05  10.15  10.06	Measure- ment  dBuV  45.13  34.41  42.60  32.43  47.70  35.81  40.54  26.32  36.98	64.21 54.21 61.75 51.75 56.00 46.00 56.00 46.00	dB -19.08 -19.80 -19.15 -19.32 -8.30 -10.19 -15.46 -19.68 -19.02	QP AVC QP AVC QP AVC QP





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EUT:	Intelli	gent outdoo	r lamp	Model:		FA	A-TL03-I
Temperature:	25 ℃		-511	Relative	Humidit	<b>y</b> : 55	5%
Test Voltage:	AC 12	20V/60 Hz	MILL		a W		TITLE OF
Terminal:	Neutr	al		dillo	9	~ N	HULL
Test Mode:	Char	ging with TX	GFSK Mod	le 2402 MH	z	19	
Remark:	Only	worse case	is reported		630		1975
90.0 dBuV							
						QP: AVG:	_
XX							
40	Y A A		Market Andrewsky	pery second water care	M		
Vallal	MINN	Jaha Mahasa	India, A.	NO.	```\_		
/\W}\\	1 ~ 1 / 1		. 4460	Ma and	Moderation	strandle Anapage	pea
PUV	MANA	AND	March of the property of	War har street of the	Magazin de mariament de maria	one and a second and	AVI
-10							
0.150	0.5		(MHz)	5			30.000
NI- MI-	Freq.	Reading	Correct	Measure-	Limit	Over	
No. Mk.	Fred	Level	Factor	ment	LIIIII	Ovei	
		dD\/	4D	dD\/	dD.A/	4D	Detector
1	MHz	dBu√	dB	dBuV	dBu∀	dB	Detector
	MHz 0.1819	35.97	10.12	46.09	64.39	-18.30	QP
2	MHz 0.1819 0.1819	35.97 20.70	10.12	46.09 30.82	64.39 54.39	-18.30 -23.57	QP AVG
2 3	MHz 0.1819 0.1819 0.2540	35.97 20.70 34.50	10.12 10.12 10.10	46.09 30.82 44.60	64.39 54.39 61.62	-18.30 -23.57 -17.02	QP AVG QP
2 3 4	MHz 0.1819 0.1819 0.2540	35.97 20.70 34.50 16.95	10.12 10.12 10.10 10.10	46.09 30.82 44.60 27.05	64.39 54.39 61.62 51.62	-18.30 -23.57 -17.02 -24.57	QP AVG QP AVG
2 3 4 5	MHz 0.1819 0.1819 0.2540 0.2540 0.4220	35.97 20.70 34.50 16.95 31.14	10.12 10.12 10.10 10.10 10.05	46.09 30.82 44.60 27.05 41.19	64.39 54.39 61.62 51.62 57.41	-18.30 -23.57 -17.02 -24.57 -16.22	QP AVG QP AVG QP
2 3 4 5 6	MHz 0.1819 0.1819 0.2540 0.2540 0.4220 0.4220	35.97 20.70 34.50 16.95 31.14 15.00	10.12 10.12 10.10 10.10 10.05 10.05	46.09 30.82 44.60 27.05 41.19 25.05	64.39 54.39 61.62 51.62 57.41 47.41	-18.30 -23.57 -17.02 -24.57 -16.22 -22.36	QP AVG QP AVG QP AVG
2 3 4 5 6 7 *	MHz 0.1819 0.1819 0.2540 0.2540 0.4220 0.4220 0.5100	35.97 20.70 34.50 16.95 31.14 15.00 34.01	10.12 10.12 10.10 10.10 10.05 10.05	46.09 30.82 44.60 27.05 41.19 25.05 44.03	64.39 54.39 61.62 51.62 57.41 47.41 56.00	-18.30 -23.57 -17.02 -24.57 -16.22 -22.36 -11.97	QP AVG QP AVG QP AVG QP
2 3 4 5 6 7 *	MHz 0.1819 0.1819 0.2540 0.2540 0.4220 0.4220	35.97 20.70 34.50 16.95 31.14 15.00	10.12 10.12 10.10 10.10 10.05 10.05 10.02	46.09 30.82 44.60 27.05 41.19 25.05 44.03 23.62	64.39 54.39 61.62 51.62 57.41 47.41 56.00 46.00	-18.30 -23.57 -17.02 -24.57 -16.22 -22.36 -11.97 -22.38	QP AVG QP AVG QP AVG
2 3 4 5 6 7 *	MHz 0.1819 0.1819 0.2540 0.2540 0.4220 0.4220 0.5100	35.97 20.70 34.50 16.95 31.14 15.00 34.01	10.12 10.12 10.10 10.10 10.05 10.05	46.09 30.82 44.60 27.05 41.19 25.05 44.03	64.39 54.39 61.62 51.62 57.41 47.41 56.00 46.00	-18.30 -23.57 -17.02 -24.57 -16.22 -22.36 -11.97	QP AVG QP AVG QP AVG QP
2 3 4 5 6 7 * 8	MHz 0.1819 0.1819 0.2540 0.2540 0.4220 0.4220 0.5100	35.97 20.70 34.50 16.95 31.14 15.00 34.01 13.60	10.12 10.12 10.10 10.10 10.05 10.05 10.02	46.09 30.82 44.60 27.05 41.19 25.05 44.03 23.62	64.39 54.39 61.62 51.62 57.41 47.41 56.00 46.00	-18.30 -23.57 -17.02 -24.57 -16.22 -22.36 -11.97 -22.38	QP AVG QP AVG QP AVG QP AVG
2 3 4 5 6 7 * 8 9	MHz 0.1819 0.1819 0.2540 0.2540 0.4220 0.4220 0.5100 0.5100 1.0620	35.97 20.70 34.50 16.95 31.14 15.00 34.01 13.60 27.63	10.12 10.12 10.10 10.10 10.05 10.05 10.02 10.02	46.09 30.82 44.60 27.05 41.19 25.05 44.03 23.62 37.78	64.39 54.39 61.62 51.62 57.41 47.41 56.00 46.00 46.00	-18.30 -23.57 -17.02 -24.57 -16.22 -22.36 -11.97 -22.38 -18.22	QP AVG QP AVG QP AVG QP AVG





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EUT:	Intellig	gent outdoor	lamp	Model:		F.A	A-TL03-I
emperature:	25 ℃		a W	Relative	Humidity	<b>y</b> : 55	5%
est Voltage:	AC 24	10V/60 Hz		J. CHI	- Design	1	A Property of
erminal:	Line	1		3	641	100	
est Mode:	Charg	ing with TX	GFSK Mode	e 2402 MHz		6	
Remark:	Only v	worse case i	s reported	Million.		a V	N. Isa
90.0 dBuV						QP:	_
40			Paragh Wood of the Control of the Co	Value of Marian Control of the Contr	Maryan	Morrison	peak
10 0.150	0.5		(MHz)	5			30.000
10 0.150 No. Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	30.000
0.150 No. Mk.	Freq.	<b>Level</b> dBu∨	Correct Factor	Measure- ment	dBuV	dB	30.000 Detector
0.150 No. Mk.	Freq. MHz	dBuV 38.94	Correct Factor dB	Measure- ment dBuV 48.96	dBu∨ 62.02	dB -13.06	30.000 Detector
0.150  No. Mk.  1 00 2 0	Freq. MHz 0.2420 0.2420	dBuV 38.94 21.86	Correct Factor dB 10.02 10.02	Measure- ment dBuV 48.96 31.88	dBuV 62.02 52.02	dB -13.06 -20.14	Detector QP
0.150  No. Mk.  1 0 2 0 3 0	Freq. MHz 0.2420 0.2420 0.3700	dBuV 38.94 21.86 38.18	Correct Factor dB 10.02 10.02	Measure- ment dBuV 48.96 31.88 48.20	dBuV 62.02 52.02 58.50	dB -13.06 -20.14 -10.30	Detector QP AVG
0.150  No. Mk.  1 0 2 0 3 0	Freq. MHz 0.2420 0.2420	dBuV 38.94 21.86 38.18 20.88	Correct Factor  dB  10.02  10.02  10.02  10.02	Measure- ment  dBuV  48.96  31.88  48.20  30.90	dBuV 62.02 52.02	dB -13.06 -20.14 -10.30 -17.60	Detector QP AVG
0.150  No. Mk.  1	Freq. MHz 0.2420 0.2420 0.3700	dBuV 38.94 21.86 38.18	Correct Factor dB 10.02 10.02	Measure- ment dBuV 48.96 31.88 48.20	dBuV 62.02 52.02 58.50	dB -13.06 -20.14 -10.30	Detector QP
0.150  No. Mk.  1	Freq. MHz 0.2420 0.2420 0.3700 0.3700	dBuV 38.94 21.86 38.18 20.88	Correct Factor  dB  10.02  10.02  10.02  10.02	Measure- ment  dBuV  48.96  31.88  48.20  30.90	dBuV 62.02 52.02 58.50 48.50	dB -13.06 -20.14 -10.30 -17.60 -8.47	Detector  QP  AVG
0.150  No. Mk.  1	Freq. MHz 0.2420 0.2420 0.3700 0.3700 0.4980	dBuV 38.94 21.86 38.18 20.88 37.54	Correct Factor  dB  10.02  10.02  10.02  10.02  10.02	Measure- ment  dBuV  48.96  31.88  48.20  30.90  47.56	dBuV 62.02 52.02 58.50 48.50 56.03	dB -13.06 -20.14 -10.30 -17.60 -8.47 -18.64	Detector QP AVG QP AVG
0.150  No. Mk.  1	Freq. MHz 0.2420 0.2420 0.3700 0.3700 0.4980 0.4980	dBuV 38.94 21.86 38.18 20.88 37.54 17.37	Correct Factor dB 10.02 10.02 10.02 10.02 10.02	Measure- ment dBuV 48.96 31.88 48.20 30.90 47.56 27.39	dBuV 62.02 52.02 58.50 48.50 56.03 46.03	dB -13.06 -20.14 -10.30 -17.60 -8.47 -18.64 -12.61	Journal Detector  QP  AVG  QP  AVG
0.150  No. Mk.  1	Freq. MHz 0.2420 0.2420 0.3700 0.3700 0.4980 0.4980 0.9580	Level  dBuV  38.94  21.86  38.18  20.88  37.54  17.37  33.32	Correct Factor  dB  10.02  10.02  10.02  10.02  10.02  10.02  10.02	Measure- ment dBuV 48.96 31.88 48.20 30.90 47.56 27.39 43.39	dBuV 62.02 52.02 58.50 48.50 56.03 46.03	dB -13.06 -20.14 -10.30 -17.60 -8.47 -18.64 -12.61 -23.70	Journal Detector  QP  AVG  QP  AVG  QP  AVG  QP
0.150  No. Mk.  1	Freq. MHz 0.2420 0.2420 0.3700 0.3700 0.4980 0.4980 0.9580	dBuV 38.94 21.86 38.18 20.88 37.54 17.37 33.32 12.23	Correct Factor  dB  10.02  10.02  10.02  10.02  10.02  10.02  10.07	Measure- ment  dBuV  48.96  31.88  48.20  30.90  47.56  27.39  43.39  22.30	dBuV 62.02 52.02 58.50 48.50 56.03 46.03 56.00 46.00	dB -13.06 -20.14 -10.30 -17.60 -8.47 -18.64 -12.61 -23.70 -13.73	Detector QP AVG QP AVG QP AVG
0.150  No. Mk.  1	Freq. MHz 0.2420 0.2420 0.3700 0.3700 0.4980 0.4980 0.9580 0.9580 0.9580	Level  dBuV  38.94  21.86  38.18  20.88  37.54  17.37  33.32  12.23  32.22	Correct Factor  dB  10.02  10.02  10.02  10.02  10.02  10.07  10.07  10.05	Measure- ment  dBuV  48.96  31.88  48.20  30.90  47.56  27.39  43.39  22.30  42.27	dBuV 62.02 52.02 58.50 48.50 56.03 46.03 56.00 46.00	dB -13.06 -20.14 -10.30 -17.60 -8.47 -18.64 -12.61 -23.70 -13.73	Joetector QP AVG QP AVG QP AVG QP AVG





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EUT:	Intellige	ent outdoo	r lamp	Model:		FA-TL0	3-I
emperature:	25 ℃	BREE	-	Relative	Humidity:	55%	
est Voltage:	AC 240	)V/60 Hz	DHI.		I W		
Terminal:	Neutra	TOTAL .		dillim		RAT	
est Mode:	Chargii	ng with TX	GFSK Mod	le 2402 MH:	z		
Remark:	Only w	orse case	is reported	-	W.B.		
40 40 -10 0.150	0.5		(MHz)	5	Way Markey	Morrow	AV 0.000
No. Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit C	)ver	
140. 1711.	MHz	dBuV	dB	dBuV			ector
1 * 0	0.5060	37.86	10.02	47.88	56.00 -8.	.12	QP
	0.5060	23.84	10.02	33.86			VG
3 0	0.9300	33.28	10.13	43.41	56.00 -12	2.59	QΡ
4 0	0.9300	15.77	10.13	25.90	46.00 -20	).10 A	VG
5 1	1.7020	30.31	10.09	40.40	56.00 -15	5.60	QΡ
6 1	1.7020	14.82	10.09	24.91	46.00 -21	1.09 A	VG
7 2	2.3620	31.82	10.06	41.88	56.00 -14	1.12	QP
8 2	2.3620	18.02	10.06	28.08	46.00 -17	7.92 A	VG
9 4	1.4380	29.83	10.06	39.89	56.00 -16	6.11 C	QΡ
10 4	1.4380	16.29	10.06	26.35	46.00 -19	9.65 A	VG
10 4		00.40	10.06	36.55	60.00 -23	3.45 C	QΡ
	5.8580	26.49	10.00	00.00			



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## 5. Radiated Emission Test

#### 5.1 Test Standard and Limit

5.1.1 Test Standard FCC Part 15.209

5.1.2 Test Limit

#### Radiated Emission Limits (9kHz~1000MHz)

Frequency (MHz	Field Strength (microvolt/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

#### Radiated Emission Limit (Above 1000MHz)

Frequency	Class A (dBuV	/m)(at 3 M)	Class B (dBuV/m)(at 3 M)		
(MHz)	Peak	Average	Peak	Average	
Above 1000	80	60	74	54	

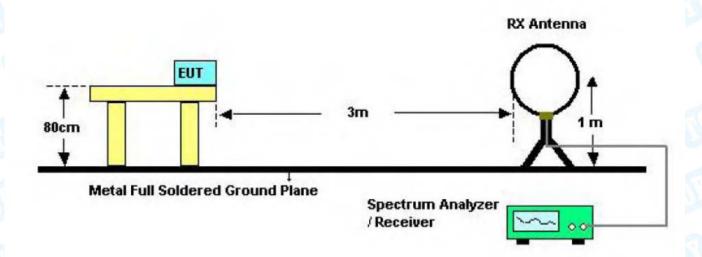
#### Note:

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

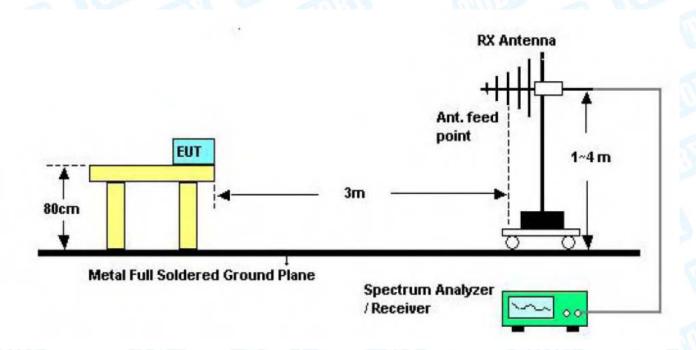


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## 5.2 Test Setup



Below 30MHz Test Setup

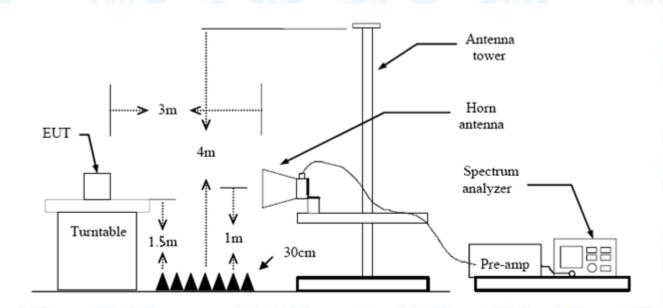


Below 1000MHz Test Setup





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Above 1GHz Test Setup

#### 5.3 Test Procedure

- (1) The measuring distance of 3m shall be used for measurements at frequency up to 1GHz and above 1 GHz. The EUT was placed on a rotating 0.8m high above ground, the table was rotated 360 degrees to determine the position of the highest radiation.
- (2) Measurements at frequency above 1GHz. The EUT was placed on a rotating 1.5m high above the ground. RF absorbers covered the ground plane with a minimum area of 3.0m by 3.0m between the EUT and measurement receiver antenna. The RF absorber shall not exceed 30cm in high above the conducting floor. The table was rotated 360 degrees to determine the position of the highest radiation.
- (3) The Test antenna shall vary between 1m and 4m, Both Horizontal and Vertical antenna are set to make measurement.
- (4) The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- (5) If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit Bellow 1 GHz, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed. But the Peak Value and average value both need to comply with applicable limit above 1 GHz.
- (6) Testing frequency range below 1GHz the measuring instrument use VBW=120 kHz with Quasi-peak detection.
- (7) Testing frequency range above 1GHz the measuring instrument use RBW=1 MHz and VBW=3 MHz with Peak Detector for Peak Values, and use RBW=1 MHz and VBW=10 Hz with Peak Detector for Average Values.
- (8) For the actual test configuration, please see the test setup photo.



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## 5.4 EUT Operating Condition

The Equipment Under Test was set to Continual Transmitting in maximum power.

#### 5.5 Test Data

Remark: During testing above 1GHz the measuring instrument use RBW=1 MHz and VBW=3 MHz with Peak Detector for Peak Values, and use RBW=1 MHz and VBW=10 Hz with Peak Detector for Average Values.

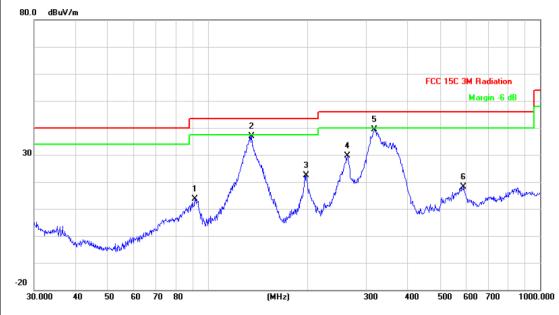
Test data please refer the following pages.





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EUT:	Intelligent outdoor lamp	Model:	FA-TL03-I
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V		13
Ant. Pol.	Horizontal		
Test Mode:	BLE TX 2402 Mode		HILL
Remark:	Only worse case is reported		
	<u>'</u>		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∨	dB/m	dBuV/m	dBuV/m	dB	Detector
1		91.4949	46.33	-32.60	13.73	43.50	-29.77	peak
2		135.5062	68.75	-31.95	36.80	43.50	-6.70	peak
3		197.8928	52.50	-30.10	22.40	43.50	-21.10	peak
4		262.8955	56.96	-27.42	29.54	46.00	-16.46	peak
5	*	316.5890	65.35	-26.01	39.34	46.00	-6.66	peak
6		588.9051	37.11	-19.05	18.06	46.00	-27.94	peak

<sup>\*:</sup>Maximum data x:Over limit !:over margin





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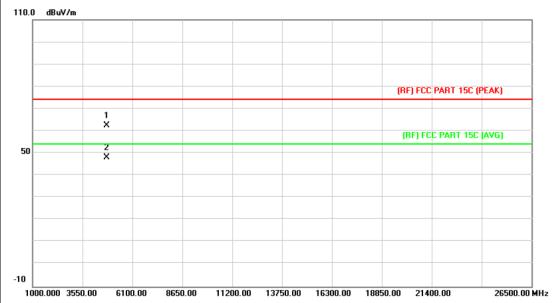
Tom			Intelligent outdoor lamp					Mo	Model:			A-TL03-I
remp	eratur	e:	25	$^{\circ}$ C			130	Rel	ative	Humid	ity: 5	5%
Test '	Voltage	<b>e</b> :	DC	3.7	'V	63		2.0 0		(all	1130	
Ant.	Pol.		Ver	tica	l		A MARIE			6		
Test	Mode:		BLE	E TX	X 24	02 Mc	ode	0.111		9	2	MARK
Rema	ark:		Onl	ly w	orse	case	is reported				13	
80.0	dBuV/m											
-20	wardy Wally			Harara Marie	1	2 X	3	5	6	benedic	and the second second	in -6 dB
30.0	00 40	50	60	70	80		(MHz)		300	400	500 600	700 1000.00
					_	ading	Correct	Measur	e-			
No	o. Mk.	F	req.			evel	Factor	ment		Limit	Over	ſ
No	o. Mk.		req. ⁄/Hz		Le					Limit dBuV/m	Over dB	Detecto
No 1	o. Mk.	N			Le dl	evel	Factor	ment	1			Detecto
	o. Mk.	75.	ИHz	2	Le di 43	evel BuV	Factor dB/m	ment dBuV/m	1	dBuV/m	dB	Detecto BO peak
1	o. Mk.	75.1 92.1	ИНZ 1822	2	43 42	BuV 3.71	Factor dB/m -33.51	ment dBuV/m 10.20	1	dBuV/m	dB -29.8	Detecto 80 peak 74 peak
1 2		75.1 92.1 133.	//Hz 1822 7871	2 I 8	43 42 53	BuV 3.71 2.25	Factor dB/m -33.51 -32.49	ment dBuV/m 10.20 9.76	1	dBuV/m 40.00 43.50	-29.8 -33.7	Detecto 80 peak 74 peak 19 peak
1 2 3		75. 92. 133. 195.	ИНZ 1822 7871 .618	2 I 8	43 42 53 41	BuV B.71 2.25 3.00	Factor  dB/m  -33.51  -32.49  -31.99	ment dBuV/m 10.20 9.76 21.01	1	dBuV/m 40.00 43.50 43.50	-29.8 -33.7 -22.4	Detecto peak peak peak peak peak





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EUT:	Intelligent outdoor lamp	Model:	FA-TL03-I
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V		33
Ant. Pol.	Horizontal		
Test Mode:	BLE Mode TX 2402 MHz		HILL
Remark:	No report for the emission wh prescribed limit.	ich more than 10 dB bel	ow the



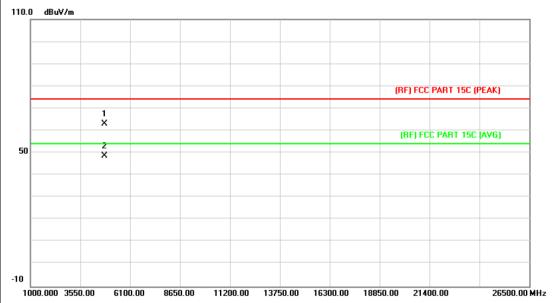
No	o. Mk	. Freq.	_	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∨	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4802.560	48.95	13.43	62.38	74.00	-11.62	peak
2	*	4802.560	34.53	13.43	47.96	54.00	-6.04	AVG





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EUT:	Intelligent outdoor lamp	Model:	FA-TL03-I				
Temperature:	25 ℃	<b>C</b> Relative Humidity: 55%					
Test Voltage:	DC 3.7V	DC 3.7V					
Ant. Pol.	Vertical						
Test Mode:	BLE Mode TX 2402 MHz		Hilling				
Remark:	No report for the emission which more than 10 dB below the						
	prescribed limit.						



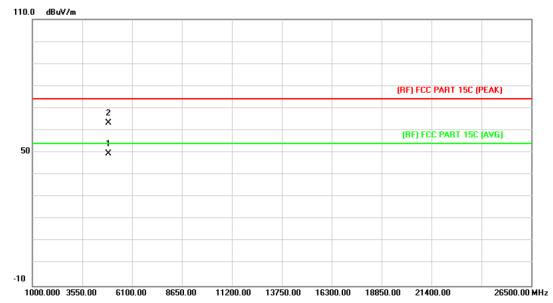
No	. Mk	Freq.	Reading Level		Measure- ment	Limit	Over	
		MHz	dBu∨	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4803.154	49.47	13.44	62.91	74.00	-11.09	peak
2	*	4803.892	35.14	13.44	48.58	54.00	-5.42	AVG





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EUT:	Intelligent outdoor lamp	Model:	FA-TL03-I				
Temperature:	25 ℃	25 °C Relative Humidity: 55%					
Test Voltage:	DC 3.7V	DC 3.7V					
Ant. Pol.	Horizontal						
Test Mode:	BLE Mode TX 2442 MHz		HILL				
Remark:	No report for the emission which more than 10 dB below the						
	prescribed limit.						

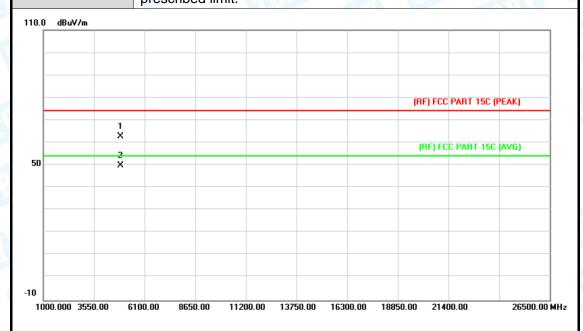


N	o. Mk	. Freq.	Reading Level		Measure- ment	Limit	Over	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4884.723	35.59	13.92	49.51	54.00	-4.49	AVG
2		4885.494	49.33	13.93	63.26	74.00	-10.74	peak



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		114.7				
EUT:	Intelligent outdoor lamp	t outdoor lamp Model:				
Temperature:	25 ℃	Relative Humidity: 55%				
Test Voltage:	DC 3.7V	illim .	3			
Ant. Pol.	Vertical					
Test Mode:	BLE Mode TX 2442 MHz		Hilling			
Remark:	No report for the emission which more than 10 dB below the					
	prescribed limit					



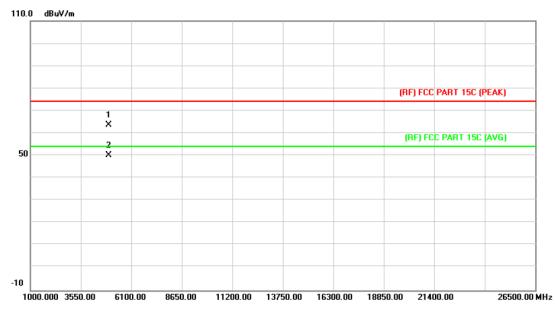
N	lo.	Mk.	Freq.	Reading Level		Measure- ment	Limit	Over	
			MHz	dBu∨	dB/m	dBuV/m	dBuV/m	dB	Detector
1			4884.078	48.71	13.92	62.63	74.00	-11.37	peak
2	,	*	4884.093	36.06	13.92	49.98	54.00	-4.02	AVG



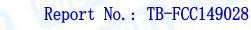
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EUT:	Intelligent outdoor lamp	Model:	FA-TL03-I				
Temperature:	25 ℃	25 °C Relative Humidity: 55%					
Test Voltage:	DC 3.7V	DC 3.7V					
Ant. Pol.	Horizontal						
Test Mode:	BLE Mode TX 2480 MHz		Allan				
Remark:	No report for the emission wh	No report for the emission which more than 10 dB below the					
	prescribed limit.						



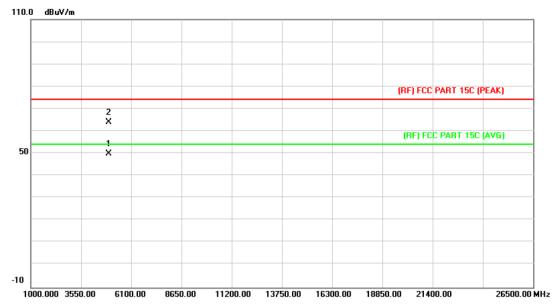
No	. Mk	. Freq.	Reading Level		Measure- ment	Limit	Over	
		MHz	dBu∨	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4960.033	49.37	14.36	63.73	74.00	-10.27	peak
2	*	4960.057	35.73	14.36	50.09	54.00	-3.91	AVG





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EUT:	Intelligent outdoor lamp	Model:	FA-TL03-I				
Temperature:	25 ℃	25 °C Relative Humidity: 55%					
Test Voltage:	DC 3.7V	DC 3.7V					
Ant. Pol.	Vertical						
Test Mode:	BLE Mode TX 2480 MHz		HALL				
Remark:	No report for the emission which more than 10 dB below the prescribed limit.						



N	No.	Mk.	Freq.	Reading Level		Measure- ment	Limit	Over	
			MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1		*	4959.832	35.55	14.36	49.91	54.00	-4.09	AVG
2			4960.309	49.58	14.36	63.94	74.00	-10.06	peak



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## 6. Restricted Bands Requirement

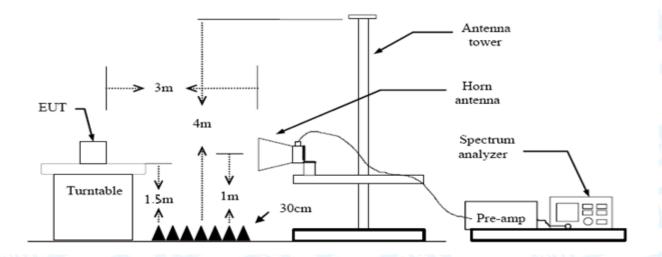
#### 6.1 Test Standard and Limit

6.1.1 Test Standard FCC Part 15.209 FCC Part 15.205

6.1.2 Test Limit

Restricted Frequency	Class B (dB	uV/m)(at 3 M)
Band (MHz)	Peak	Average
2310 ~2390	74	54
2483.5 ~2500	74	54

#### 6.2 Test Setup



#### 6.3 Test Procedure

- (1) The measuring distance of 3m shall be used for measurements at frequency up to 1GHz and above 1 GHz. The EUT was placed on a rotating 0.8m high above ground, the table was rotated 360 degrees to determine the position of the highest radiation.
- (2) Measurements at frequency above 1GHz. The EUT was placed on a rotating 1.5m high above the ground. RF absorbers covered the ground plane with a minimum area of 3.0m by 3.0m between the EUT and measurement receiver antenna. The RF absorber shall not exceed 30cm in high above the conducting floor. The table was rotated 360 degrees to determine the position of the highest radiation.
- (3) The Test antenna shall vary between 1m and 4m, Both Horizontal and Vertical antenna are set to make measurement.
- (4) The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked



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and then Quasi Peak detector mode re-measured.

- (5) If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit Bellow 1 GHz, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed. But the Peak Value and average value both need to comply with applicable limit above 1 GHz.
- (6) Testing frequency range below 1GHz the measuring instrument use VBW=120 kHz with Quasi-peak detection.
- (7) Testing frequency range above 1GHz the measuring instrument use RBW=1 MHz and VBW=3 MHz with Peak Detector for Peak Values, and use RBW=1 MHz and VBW=10 Hz with Peak Detector for Average Values.
- (8) For the actual test configuration, please see the test setup photo.

#### 6.4 EUT Operating Condition

The Equipment Under Test was set to Continual Transmitting in maximum power.

#### 6.5 Test Data

Remark: During testing above 1GHz the measuring instrument use RBW=1 MHz and VBW=3 MHz with Peak Detector for Peak Values, and use RBW=1 MHz and VBW=10 Hz with Peak Detector for Average Values.

Test data please refer the following pages.

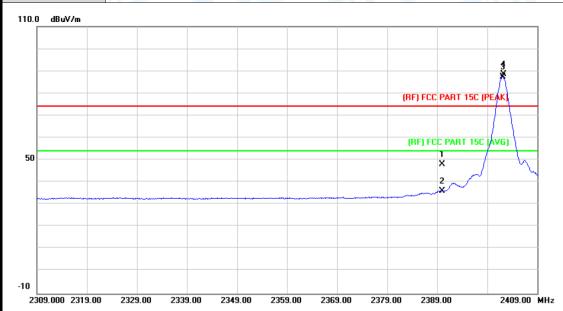




## (1) Radiation Test

TOBY

EUT:	Intelligent outdoor lamp	Model:	FA-TL03-I
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V	7	
Ant. Pol.	Horizontal		ALL DE
Test Mode:	BLE Mode TX 2402 MHz		
Remark:	N/A	132	



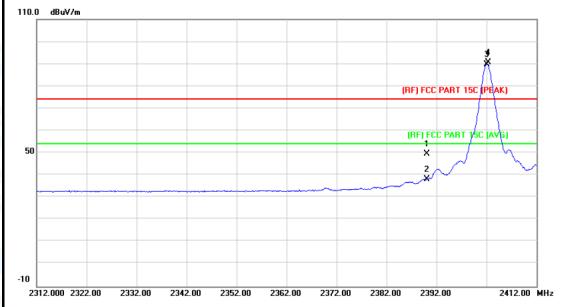
No	o. Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∨	dB/m	dBuV/m	dBuV/m	dB	Detector
1		2390.000	47.32	0.77	48.09	74.00	-25.91	peak
2		2390.000	35.33	0.77	36.10	54.00	-17.90	AVG
3	*	2402.100	86.62	0.82	87.44	Fundamental Frequency		AVG
4	Χ	2402.300	87.61	0.82	88.43	Fundamental F	requency	peak





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EUT:	Intelligent outdoor lamp	Model:	FA-TL03-I	
Temperature:	25 ℃	Relative Humidity:	55%	
Test Voltage:	DC 3.7V		33	
Ant. Pol.	Vertical			
Test Mode:	lode: BLE Mode TX 2480 MHz			
Remark:	N/A			

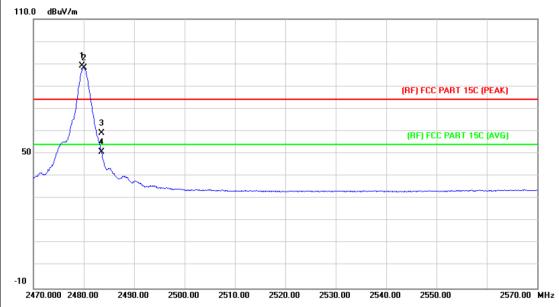


No	. Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1		2390.000	48.91	0.77	49.68	74.00	-24.32	peak
2		2390.000	37.36	0.77	38.13	54.00	-15.87	AVG
3	*	2402.100	88.98	0.82	89.80	Fundamental Frequency		AVG
4	Χ	2402.300	89.81	0.82	90.63	Fundamental Frequency		peak



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EUT:		Intelligent outdoor lamp	FA-TL03-I				
Temperatu	ıre:	25 ℃	Relative Humidity:	55%			
Test Voltag	ge:	DC 3.7V					
Ant. Pol.		Horizontal					
Test Mode	) <b>:</b>	BLE Mode TX 2480 MHz					
Remark:		N/A					



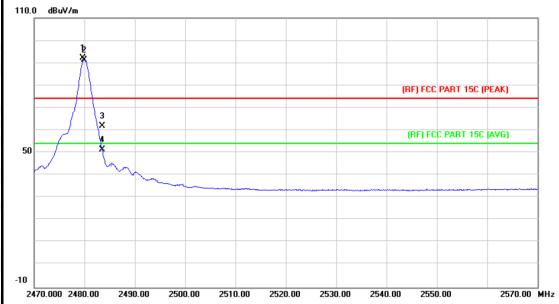
No	. Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∨	dB/m	dBuV/m	dBuV/m	dB	Detector
1	X	2479.700	88.04	1.15	89.19	Fundamental	Frequency	peak
2	*	2480.000	87.06	1.15	88.21	Fundamental	Frequency	AVG
3		2483.500	57.86	1.17	59.03	74.00	-14.97	peak
4		2483.500	49.65	1.17	50.82	54.00	-3.18	AVG







EUT:	Intelligent outdoor lamp	Model:	FA-TL03-I			
Temperature:	25 ℃	Relative Humidity:	55%			
Test Voltage:	DC 3.7V		70			
Ant. Pol.	Vertical					
Test Mode:	BLE Mode TX 2480 MHz					
Remark:	N/A	(III)				



No	. Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∨	dB/m	dBuV/m	dBuV/m	dB	Detector
1	X	2479.700	91.05	1.15	92.20	Fundamenta	l Frequency	peak
2	*	2479.900	90.21	1.15	91.36	Fundamental	Frequency	AVG
3		2483.500	60.66	1.17	61.83	74.00	-12.17	peak
4		2483.500	50.17	1.17	51.34	54.00	-2.66	AVG

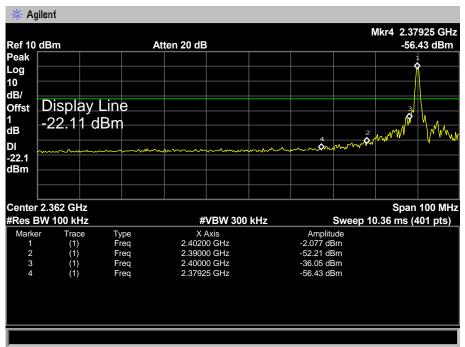


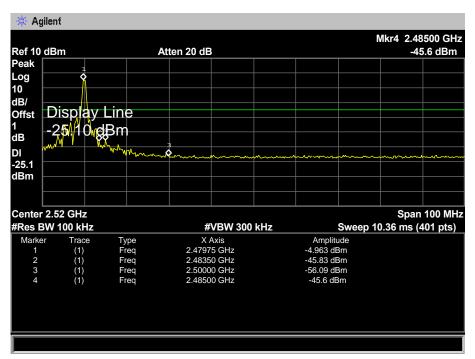


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#### (2) Conducted Test

EUT:	Intelligent outdoor lamp	Model:	FA-TL03-I					
Temperature:	25 ℃	Relative Humidity:	55%					
Test Voltage:	DC 3.7V	DC 3.7V						
Test Mode:	BLE Mode TX 2402MHz / BLE	BLE Mode TX 2402MHz / BLE Mode TX 2480MHz						
Remark:	The EUT is programed in continuously transmitting mode							







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## 7. Bandwidth Test

#### 7.1 Test Standard and Limit

7.1.1 Test Standard FCC Part 15.247 (a)(2)

7.1.2 Test Limit

FCC Part 15 Subpart C(15.247)/RSS-247						
Test Item	Limit	Frequency Range(MHz)				
Bandwidth	>=500 KHz (6dB bandwidth)	2400~2483.5				

#### 7.2 Test Setup



#### 7.3 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 bandwidth is measured at an amplitude level reduced 6dB from the reference level. The reference level is the level of the highest amplitude signal observed from the transmitter at the fundamental frequency. Once the reference level is established, the equipment is conditioned with typical modulating signal to produce the worst –case (i.e the widest) bandwidth.
- (3)Measure the channel separation the spectrum analyzer was set to Resolution Bandwidth:100 kHz, and Video Bandwidth:300 kHz, Detector: Peak, Sweep Time set auto.

### 7.4 EUT Operating Condition

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



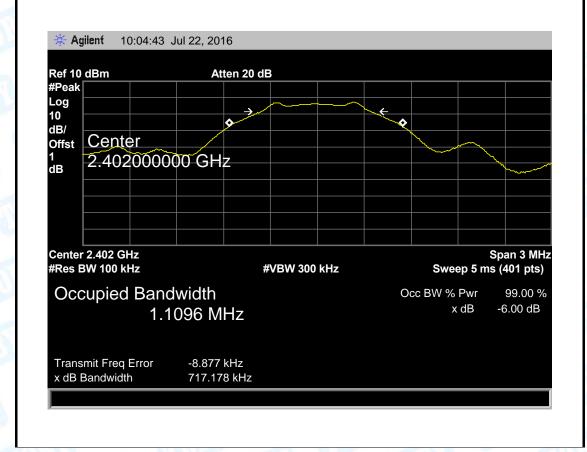
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#### 7.5 Test Data

EUT:	Intelligent outdoor lamp	Model:	FA-TL03-I				
Temperature:	25 ℃	Relative Humidity:	55%				
Test Voltage:	DC 3.7V	THUE	O December 1				
Test Mode:	BLE TX Mode		133				
Channel frequence	cy 6dB Bandwidth	99% Bandwidth	Limit				
(MHz)	(kHz)	(kHz)	(kHz)				
2402	717.178	1109.60					
2442	723.903	1120.20	>=500				
2480	722.114	1112.30					
RI E Modo							

#### **BLE Mode**

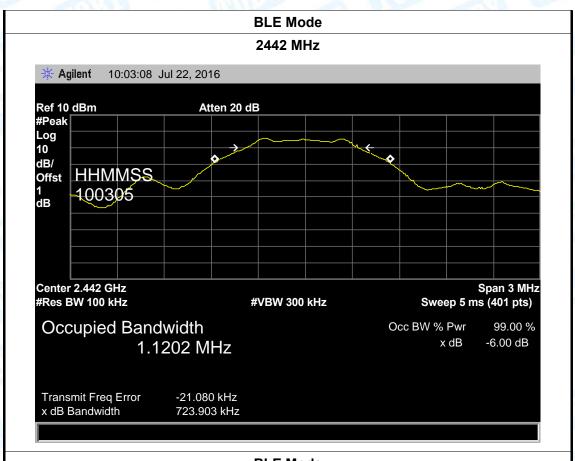
#### 2402 MHz





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#### **BLE Mode** 2480 MHz \* Agilent 10:05:51 Jul 22, 2016 Atten 20 dB Ref 10 dBm #Peak Log 10 dB/ Center Offst 1 dB 2.480000000 GHz Center 2.48 GHz Span 3 MHz #Res BW 100 kHz **#VBW 300 kHz** Sweep 5 ms (401 pts) Occupied Bandwidth Occ BW % Pwr 99.00 % -6.00 dB x dB 1.1123 MHz Transmit Freq Error -23.948 kHz 722.114 kHz x dB Bandwidth



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## 8. Peak Output Power Test

#### 8.1 Test Standard and Limit

8.1.1 Test Standard FCC Part 15.247 (b)

8.1.2 Test Limit

FCC Part 15 Subpart C(15.247)/RSS-247						
Test Item	Limit	Frequency Range(MHz)				
Peak Output Power	1 Watt or 30 dBm	2400~2483.5				

#### 8.2 Test Setup



#### 8.3 Test Procedure

The EUT was directly connected to the Spectrum Analyzer and antenna output port as show in the block diagram above. The measurement is according to section 9.1.1 of KDB 558074 D01 DTS Meas Guidance v03r05.

- (1) Set the RBW≥DTS Bandwidth
- (2) Set VBW≥3\*RBW
- (3) Set Span≥3\*RBW
- (4) Sweep time=auto
- (5) Detector= peak
- (6) Trace mode= maxhold.
- (7) Allow trace to fully stabilize, and then use peak marker function to determine the peak amplitude level.

### 8.4 EUT Operating Condition

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

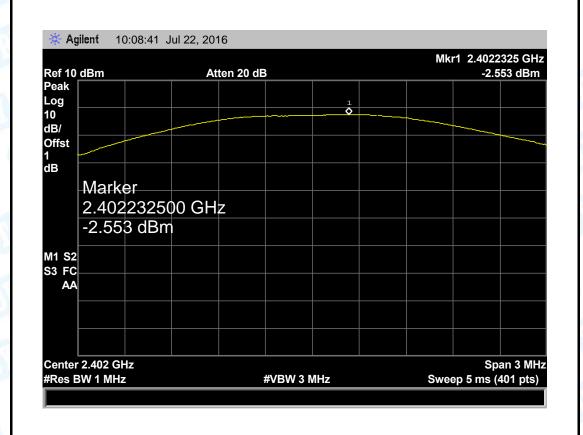


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#### 8.5 Test Data

EUT:	Intelligent	outdoor lamp	Model:		FA-TL03-I		
Temperature: 25 ℃		130	Relative Humidity:		55%		
Test Voltage:	DC 3.7V		MIL		A Branch		
Test Mode: BLE TX N		1ode		(M) 1929	- B		
Channel frequen	cy (MHz)	Test Result (dBm)		Limit (dBm)			
2402		-2.553					
2442		-3.961		3	80		
2480		-5.425					
BLE Mode							

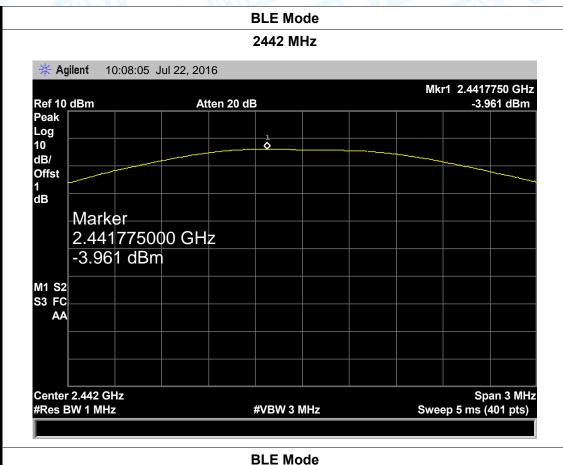
#### 2402 MHz

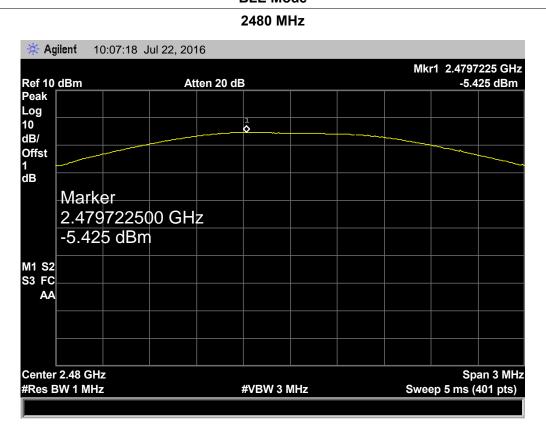






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## 9. Power Spectral Density Test

#### 9.1 Test Standard and Limit

9.1.1 Test Standard FCC Part 15.247 (e)

9.1.2 Test Limit

FCC Part 15 Subpart C(15.247)				
Test Item	Limit	Frequency Range(MHz)		
Power Spectral Density	8dBm(in any 3 kHz)	2400~2483.5		

#### 9.2 Test Setup



#### 9.3 Test Procedure

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 v03r05.

- (1) The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
- (2) Set analyser center frequency to DTS channel center frequenyc.
- (3) Set the span to 1.5 times the DTS bandwidth.
- (4) Set the RBW to: 3 kHz(5) Set the VBW to: 10 kHz
- (6) Detector: peak(7) Sweep time: auto
- (8) Allow trace to fully stabilize. Then use the peak marker function to determine the maximum amplitude level.

## 9.4 EUT Operating Condition

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

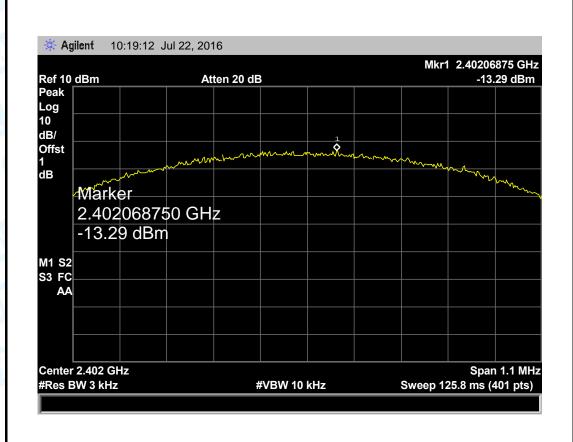


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#### 9.5 Test Data

EUT:	Intelligent outdoor lamp		Model:	FA-TL03-I	
Temperature:	25 ℃		Relative Humidity:	55%	
Test Voltage:	DC 3.7V				
Test Mode:	BLE TX Mode				
Channel Frequency Power		Power Densi	ty Limit (dBm)		
(MHz)		(3 kHz/dBm)			
2402		-13.29			
2442		-15.53		8	
2480		-16.41			
		BLE Mode	•		

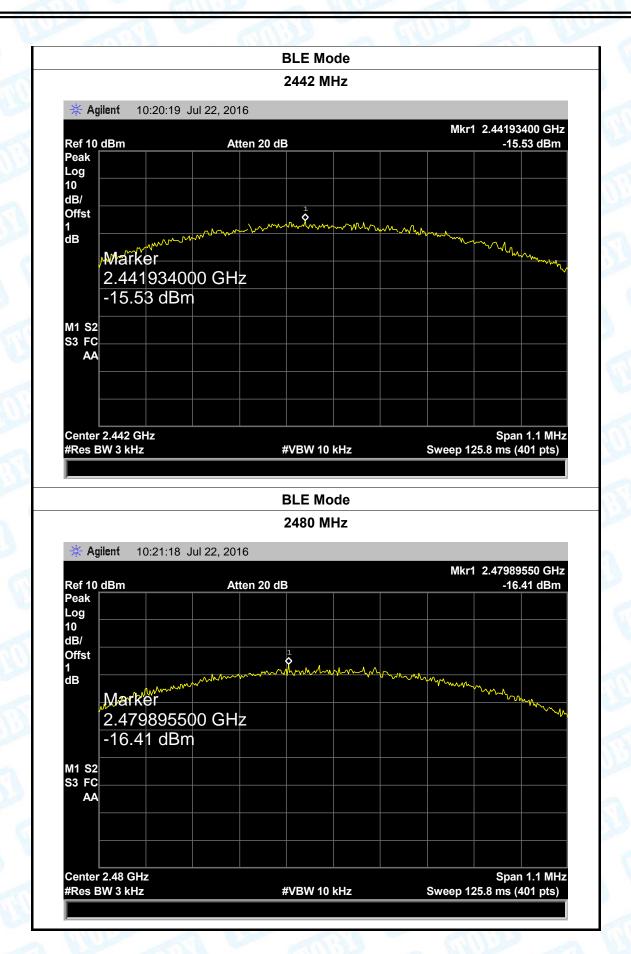
#### 2402 MHz







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## 10. Antenna Requirement

#### 10.1 Standard Requirement

10.1.1 Standard FCC Part 15.203

#### 10.1.2 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.

#### 10.2 Antenna Connected Construction

The directional gains of the antenna used for transmitting is 0.5 dBi, and the antenna de-signed with permanent attachment and no consideration of replacement. Please see the EUT photo for details.

#### 10.3 Result

The EUT antenna is a PCB Antenna. It complies with the standard requirement.

Antenna Type		
▶ Permanent attached antenna	T	
☐ Unique connector antenna		
☐ Professional installation antenna	1	