

# Shenzhen Toby Technology Co., Ltd.

Report No.: TB-FCC151315

Page: 1 of 45

# **FCC Radio Test Report** FCC ID: 2AG2ATON9668

## **Original Grant**

Report No. TB-FCC151315

Shenzhen Fast Precision Technologies Co. Ltd. **Applicant** 

**Equipment Under Test (EUT)** 

**EUT Name BLE Anti-lost Card** 

Model No. TON9668

Serial No. Please see the page of 4

**Brand Name** iQard

**Receipt Date** 2017-01-10

2017-01-11 to 2017-02-09 **Test Date** 

**Issue Date** 2017-02-10

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

**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** 

the report.

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

TB-RF-074-1.0

Tel: +86 75526509301



Page: 2 of 45

# Contents

CON	NTENTS	2
1.	GENERAL INFORMATION ABOUT EUT	4
	1.1 Client Information	4
	1.2 General Description of EUT (Equipment Under Test)	4
	1.3 Block Diagram Showing the Configuration of System Tested	5
	1.4 Description of Support Units	
	1.5 Description of Test Mode	6
	1.6 Description of Test Software Setting	
	1.7 Measurement Uncertainty	
	1.8 Test Facility	
2.	TEST SUMMARY	
3.	TEST EQUIPMENT	10
4.	CONDUCTED EMISSION TEST	11
	4.1 Test Standard and Limit	11
	4.2 Test Setup	
	4.3 Test Procedure	11
	4.4 EUT Operating Mode	12
	4.5 Test Data	12
5.	RADIATED EMISSION TEST	17
	5.1 Test Standard and Limit	17
	5.2 Test Setup	18
	5.3 Test Procedure	19
	5.4 EUT Operating Condition	20
	5.5 Test Data	20
6.	RESTRICTED BANDS REQUIREMENT	29
	6.1 Test Standard and Limit	29
	6.2 Test Setup	29
	6.3 Test Procedure	29
	6.4 EUT Operating Condition	30
	6.5 Test Data	30
7.	BANDWIDTH TEST	36
	7.1 Test Standard and Limit	36
	7.2 Test Setup	
	7.3 Test Procedure	
	7.4 EUT Operating Condition	36
	7.5 Test Data	37
8.	PEAK OUTPUT POWER TEST	39
	8.1 Test Standard and Limit	
	8.2 Test Setup	



Page: 3 of 45

	8.3 Test Procedure	39
	8.4 EUT Operating Condition	
	8.5 Test Data	
9.	POWER SPECTRAL DENSITY TEST	42
	9.1 Test Standard and Limit	42
	9.2 Test Setup	42
	9.3 Test Procedure	42
	9.4 EUT Operating Condition	42
	9.5 Test Data	
10.	ANTENNA REQUIREMENT	45
	10.1 Standard Requirement	45
	10.2 Antenna Connected Construction	
	10.3 Result	45



Page: 4 of 45

# 1. General Information about EUT

#### 1.1 Client Information

**Applicant**: Shenzhen Fast Precision Technologies Co. Ltd.

Address 4th Floor, Yangtian Building, Chuangye 2nd Road, Baoan 72 District,

Shenzhen, China.

Manufacturer : Shenzhen Fast Precision Technologies Co. Ltd.

Address: 4th Floor, Yangtian Building, Chuangye 2nd Road, Baoan 72 District,

Shenzhen, China.

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

<b>EUT Name</b>	1	BLE Anti-lost Card	
Models No.	TON9668 TON9668* (* represents 2-digit characters, and each character of anything ranging from 0 to 9, A to Z, symbols like "-" or "space" a different product models. And * is targeted at different sales territisales regions, sales methods, varied client groups, different mark positioning and different product colors, and won't affect the product safety and electromagnetic compatibility)		to 9, A to Z, symbols like "-" or "space" and s. And * is targeted at different sales territories, thods, varied client groups, different market product colors, and won't affect the product
Model Difference			entical in the same PCB layout and electrical ce is model name for commercial.
Product Description	(52) ···	Operation Frequency: Number of Channel: RF Output Power: Antenna Gain: Modulation Type: Bit Rate of Transmitter:	Bluetooth 4.0(BLE): 2402MHz~2480MHz  Bluetooth 4.0(BLE): 40 channels see note(3)  0.567 dBm Conducted Power  2 dBi FPC Antenna  GFSK  1Mbps(GFSK)
Power Source	:	DC Supply from the Hos DC Supply by the Batter	
Power Rating			
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 Means 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.



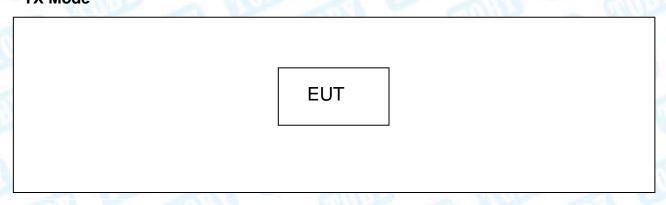
Page: 5 of 45

# (4) Channel List:

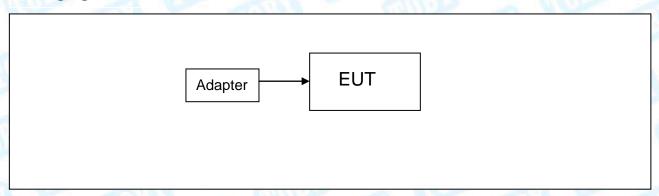
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
00	2402	14	2430	28	2458
01	2404	15	2432	29	2460
02	2406	16	2434	30	2462
03	2408	17	2436	31	2464
04	2410	18	2438	32	2466
05	2412	19	2440	33	2468
06	2414	20	2442	34	2470
07	2416	21	2444	35	2472
08	2418	22	2446	36	2474
09	2420	23	2448	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

# **TX Mode**



# **Charging Mode**





Page: 6 of 45

## 1.4 Description of Support Units

	Equip	ment Information		
Name	Model	S/N	Manufacturer	Used "√"
AC Adapter	TEKA012-0502000UK		N/A	1

## 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	TX Mode
Mode2	Charging Mode

	For Radiated Test
Final Test Mode	Description
Mode 3	TX Mode
Mode 4	TX Mode
Wode 4	(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.



Page: 7 of 45

## 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	prodtest		
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
Radiated Emission	Level Accuracy:	. 4 60 dB
Radiated Emission	9kHz to 30 MHz	±4.60 dB
Redicted Emission	Level Accuracy:	±4.40 dB
Radiated Emission	30MHz to 1000 MHz	±4.40 dB
Redicted Emission	Level Accuracy:	.4.20 dB
Radiated Emission	Above 1000MHz	±4.20 dB



Page: 8 of 45

## 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.



Page: 9 of 45

# 2. Test Summary

Standard S	Section	Tool Ham	ludana ant	Damark
FCC	IC	Test Item	Judgment	Remark
15.203		Antenna Requirement	PASS	N/A
15.207(a)	RSS-GEN 7.2.4	Conducted Emission	PASS	N/A
15.205&15.247(d)	RSS-GEN 7.2.2	Band-Edge & Unwanted Emissions into Restricted Frequency	PASS	N/A
15.247(a)(2)	RSS 247 5.2 (1)	6dB Bandwidth	PASS	N/A
15.247(b)(3)	RSS 247 5.4 (4)	Conducted Max Output Power	PASS	N/A
15.247(e)	RSS 247 5.2 (2)	Power Spectral Density	PASS	N/A
15.205, 15.209&15.247(d)	RSS 247 5.5	Transmitter Radiated Spurious &Unwanted Emissions into Restricted Frequency	PASS	N/A

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



Page: 10 of 45

# 3. Test Equipment

Conducte	d Emission Te	est			
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Due Date
EMI Test Receiver	Rohde & Schwarz	ESCI	100321	Jul. 22, 2016	Jul. 21, 2017
RF Switching Unit	Compliance Direction Systems Inc	RSU-A4	34403	Jul. 22, 2016	Jul. 21, 2017
AMN	SCHWARZBECK	NNBL 8226-2	8226-2/164	Jul. 22, 2016	Jul. 21, 2017
LISN	Rohde & Schwarz	ENV216	101131	Jul. 22, 2016	Jul. 21, 2017
Radiation	Emission Tes	t			
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Due Date
Spectrum Analyzer	Agilent	E4407B	MY45106456	Jul. 22, 2016	Jul. 21, 2017
EMI Test Receiver	Rohde & Schwarz	ESPI	100010/007	Jul. 22, 2016	Jul. 21, 2017
Bilog Antenna	ETS-LINDGREN	3142E	00117537	Mar. 20, 2016	Mar. 19, 201
Bilog Antenna	ETS-LINDGREN	3142E	00117542	Mar. 20, 2016	Mar. 19, 201
Horn Antenna	ETS-LINDGREN	3117	00143207	Mar. 19, 2016	Mar. 18, 201
Horn Antenna	ETS-LINDGREN	3117	00143209	Mar. 19, 2016	Mar. 18, 201
Pre-amplifier	Sonoma	310N	185903	Mar. 20, 2016	Mar. 19, 201
Pre-amplifier	HP	8449B	3008A00849	Mar. 26, 2016	Mar. 25, 201
Cable	HUBER+SUHNER	100	SUCOFLEX	Mar. 26, 2016	Mar. 25, 201
Positioning Controller	ETS-LINDGREN	2090	N/A	N/A	N/A
Antenna C	Conducted Em	ission			
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Due Date
Spectrum Analyzer	Agilent	E4407B	MY45106456	Jul. 22, 2016	Jul. 21, 2017
Spectrum Analyzer	Rohde & Schwarz	ESCI	100010/007	Jul. 22, 2016	Jul. 21, 2017
Power Meter	Anritsu	ML2495A	25406005	Jul. 22, 2016	Jul. 21, 2017
Power Sensor	Anritsu	ML2411B	25406005	Jul. 22, 2016	Jul. 21, 2017



Page: 11 of 45

# 4. Conducted Emission Test

#### 4.1 Test Standard and Limit

4.1.1Test Standard FCC Part 15.207

#### 4.1.2 Test Limit

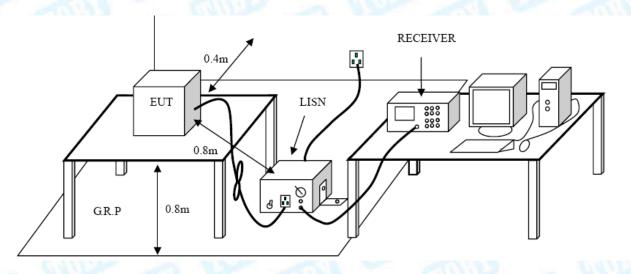
#### **Conducted Emission Test Limit**

Eroguanov	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.



Page: 12 of 45

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 9 kHz, and the test frequency band is from 0.15MHz to 30MHz.

## 4.4 EUT Operating Mode

Please refer to the description of test mode.

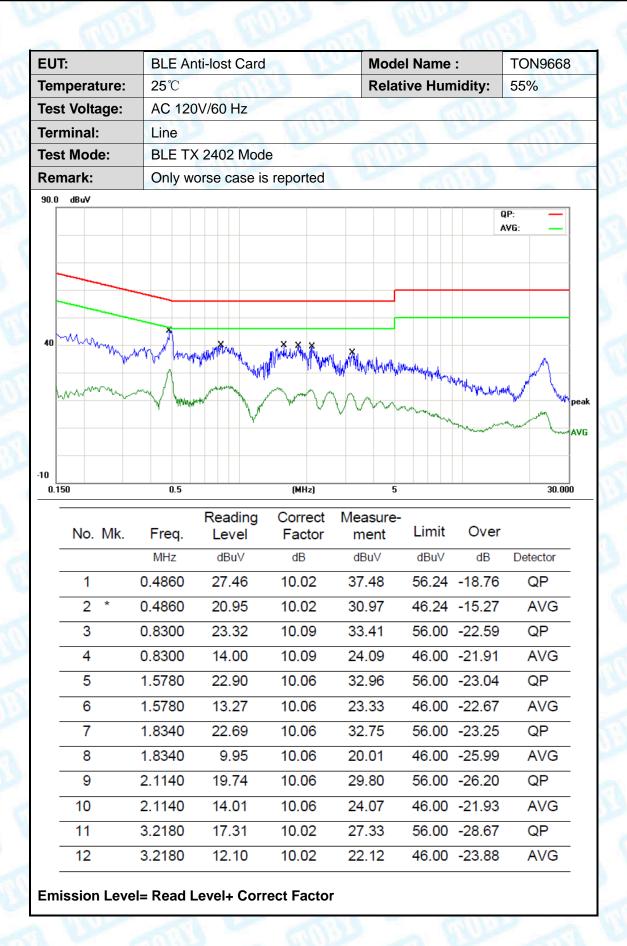
## 4.5 Test Data

Test data please refer the following pages.



Page: 13 of 45







14 of 45 Page:

TOBY		
1000		

EUT:	BLE A	nti-lost Car	d	Мо	del Name :	TON9668
emperature:	25℃		A 183	Rel	ative Humidity:	55%
Test Voltage:	AC 12	20V/60 Hz	33	- E4	1111	
Terminal:	Neutra	al		13	0.1111	
Test Mode:	BLE T	X 2402 Mo	de			Million .
Remark:	Only v	worse case	is reported	14/11	1 miles	All Indian
90.0 dBuV						
					QI	P: — VG: —
40 ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	X		, X . ×			
\ \frac{1}{2}	My Mary Mary	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	mar Jankon Maranda	Mary State Control of the Control of	11000 A	X
morm	ىلى. \ / / السم	moremen	$\Delta \Lambda_{\Delta}$		Wyrynhum manna	a merent
	1 //	$\bigvee$	A. A	$A \wedge A \wedge A$	Mr.	pe
					Manyany	Appropries June Al
	0.5		(MU-)	5		30,000
0.150	0.5		(MHz)	5		30.000
0.150		Reading	Correct	Measure-		30.000
	Freq.	Level	Correct Factor	Measure- ment	Limit Over	
No. Mk.	Freq.	Level dBuV	Correct Factor	Measure- ment	Limit Over	Detector
No. Mk.	Freq. MHz 0.2220	dBuV 28.35	Correct Factor	Measure- ment dBuV 38.46	Limit         Over           dBuV         dB           62.74         -24.28	Detector QP
No. Mk.  1 2	Freq. MHz 0.2220 0.2220	Level dBuV 28.35 16.28	Correct Factor dB 10.11	Measurement dBuV 38.46 26.39	Limit         Over           dBuV         dB           62.74         -24.28           52.74         -26.35	Detector QP AVG
No. Mk.  1 2 3	Freq. MHz 0.2220 0.2220 0.4940	Level dBuV 28.35 16.28 26.63	Correct Factor  dB  10.11  10.11  10.02	Measure- ment dBuV 38.46 26.39 36.65	Limit     Over       dBuV     dB       62.74     -24.28       52.74     -26.35       56.10     -19.45	Detector QP AVG QP
No. Mk.	Freq. MHz 0.2220 0.2220	Level dBuV 28.35 16.28	Correct Factor dB 10.11	Measurement dBuV 38.46 26.39	Limit         Over           dBuV         dB           62.74         -24.28           52.74         -26.35	Detector QP AVG
No. Mk.  1 2 3	Freq. MHz 0.2220 0.2220 0.4940	Level dBuV 28.35 16.28 26.63	Correct Factor  dB  10.11  10.11  10.02	Measure- ment dBuV 38.46 26.39 36.65	Limit     Over       dBuV     dB       62.74     -24.28       52.74     -26.35       56.10     -19.45	Detector QP AVG QP
No. Mk.  1 2 3 4 *	Freq. MHz 0.2220 0.2220 0.4940 0.4940	Level  dBuV  28.35  16.28  26.63  22.34	Correct Factor  dB  10.11  10.11  10.02  10.02	Measure- ment dBuV 38.46 26.39 36.65 32.36	Limit     Over       dBuV     dB       62.74     -24.28       52.74     -26.35       56.10     -19.45       46.10     -13.74	Detector  QP  AVG  QP  AVG
No. Mk.  1 2 3 4 * 5	Freq. MHz 0.2220 0.2220 0.4940 0.4940 1.5740	Level  dBuV  28.35  16.28  26.63  22.34  18.81	Correct Factor  dB  10.11  10.11  10.02  10.02  10.10	Measurement  dBuV  38.46  26.39  36.65  32.36  28.91	Limit     Over       dBuV     dB       62.74     -24.28       52.74     -26.35       56.10     -19.45       46.10     -13.74       56.00     -27.09	Detector QP AVG QP AVG QP
No. Mk.  1 2 3 4 * 5 6	Freq. MHz 0.2220 0.2220 0.4940 0.4940 1.5740 1.5740	Level  dBuV  28.35  16.28  26.63  22.34  18.81  14.40	Correct Factor  dB  10.11  10.11  10.02  10.02  10.10  10.10	Measurement  dBuV  38.46  26.39  36.65  32.36  28.91  24.50	Limit     Over       dBuV     dB       62.74     -24.28       52.74     -26.35       56.10     -19.45       46.10     -13.74       56.00     -27.09       46.00     -21.50	Detector QP AVG QP AVG QP AVG
No. Mk.  1 2 3 4 * 5 6 7	Freq. MHz 0.2220 0.2220 0.4940 0.4940 1.5740 1.5740 2.0860	Level  dBuV  28.35  16.28  26.63  22.34  18.81  14.40  21.64	Correct Factor  dB  10.11  10.11  10.02  10.02  10.10  10.10  10.06	Measurement  dBuV  38.46  26.39  36.65  32.36  28.91  24.50  31.70	Limit         Over           dBuV         dB           62.74         -24.28           52.74         -26.35           56.10         -19.45           46.10         -13.74           56.00         -27.09           46.00         -21.50           56.00         -24.30	Detector QP AVG QP AVG QP AVG QP AVG
No. Mk.  1 2 3 4 * 5 6 7 8 9	Freq. MHz 0.2220 0.2220 0.4940 0.4940 1.5740 1.5740 2.0860 2.0860 3.1780	Level  dBuV  28.35  16.28  26.63  22.34  18.81  14.40  21.64  16.07  17.42	Correct Factor  dB  10.11  10.02  10.02  10.10  10.10  10.06  10.06	Measure-ment dBuV 38.46 26.39 36.65 32.36 28.91 24.50 31.70 26.13 27.48	Limit         Over           dBuV         dB           62.74         -24.28           52.74         -26.35           56.10         -19.45           46.10         -13.74           56.00         -27.09           46.00         -21.50           56.00         -24.30           46.00         -19.87           56.00         -28.52	Detector QP AVG QP AVG QP AVG QP AVG QP AVG
No. Mk.  1 2 3 4 * 5 6 7 8 9 10	Freq. MHz 0.2220 0.2220 0.4940 0.4940 1.5740 1.5740 2.0860 2.0860	Level  dBuV  28.35  16.28  26.63  22.34  18.81  14.40  21.64  16.07	Correct Factor  dB  10.11  10.11  10.02  10.02  10.10  10.10  10.06  10.06	Measure-ment  dBuV  38.46  26.39  36.65  32.36  28.91  24.50  31.70  26.13	Limit         Over           dBuV         dB           62.74         -24.28           52.74         -26.35           56.10         -19.45           46.10         -13.74           56.00         -27.09           46.00         -21.50           56.00         -24.30           46.00         -19.87	Detector QP AVG QP AVG QP AVG AVG QP AVG



Page: 15 of 45



EUT:	BLE Ar	nti-lost Card	15	Mode	el Name :	TON9668
emperature:	25℃	M. Commercial Commerci		Relat	tive Humidity:	55%
Test Voltage:	AC 240	)V/60 Hz	LA LEGIS		OF THE	1000
Terminal:	Line	THE STATE OF		(MA)	<b>)</b>	TOTAL STREET
Test Mode:	BLE TX	< 2402 Mod	е	N. S.	ATI I	
Remark:	Only we	orse case is	reported		1777	100
90.0 dBuV						
						QP: — AVG: —
40	man Man	d <b>X</b> oo	* * ×			
	Wk., Nw	dayana Taraya Markada ka	Profession Control of the Profession of the Prof	chapinah japah jajawa ka	despringly have been still be showing a hour bedown	, X
man	<i></i>	I JANA	A 45 M		- arrange Hill of Jan Jan of Jan of Jan of	alter July
W.	No.	mary property		~~~~~	harman and a second	ре
					- Caranga Marana	AI
-10						
0.150	0.5		(MHz)	5		30.000
		Reading	Correct	Measure-		
No. Mk.	Freq.	Level	Factor	ment	Limit Over	
	MHz	dBu∨	dB	dBu∀	dBuV dB	Detector
1	0.5020	24.74	10.02	34.76	56.00 -21.24	QP
2 *	0.5020	17.34	10.02	27.36	46.00 -18.64	AVG
3	0.7780	20.70	10.10	30.80	56.00 -25.20	QP
4	0.7780	9.05	10.10	19.15	46.00 -26.85	AVG
5	1.5540	20.05	10.06	30.11	56.00 -25.89	QP
	4.5540	8.84	10.06	18.90	46.00 -27.10	AVG
6	1.5540	0.01				
			10.06	30.80	56.00 -25.20	QP
7	1.7620	20.74	10.06	30.80 18.73	56.00 -25.20 46.00 -27.27	
7	1.7620 1.7620	20.74 8.67	10.06	18.73	46.00 -27.27	AVG
7 8 9	1.7620 1.7620 2.0860	20.74 8.67 17.86	10.06 10.06	18.73 27.92	46.00 -27.27 56.00 -28.08	AVG QP
7 8 9 10	1.7620 1.7620 2.0860 2.0860	20.74 8.67 17.86 8.65	10.06 10.06 10.06	18.73 27.92 18.71	46.00 -27.27 56.00 -28.08 46.00 -27.29	AVG QP AVG
7 8 9 10	1.7620 1.7620 2.0860	20.74 8.67 17.86	10.06 10.06	18.73 27.92	46.00 -27.27 56.00 -28.08	AVG QP AVG QP



Page: 16 of 45



EUT:	BLE A	nti-lost Car	b	Mode	I Name :		TON9668	
Temperature:	25℃	No.		Relati	ive Humidi	ity:	55%	
Test Voltage:	AC 24	0V/60 Hz	LUK (III)					
Terminal:	Neutra	al		16/10			THILL SE	
Test Mode:	BLE T	X 2402 Mo	de	The same	200			
Remark:	Only v	vorse case	is reported		A Park		1000	
90.0 dBuV								
						QP AV		
						,		
40 X	XXV							
- when you with	Z. JAN	m-tradegrate controlo	MAN TO THE PROPERTY OF THE PARTY OF THE PART	Males 4			X	
m	/~\	White the	1May 17	A STANSON AND STANSON OF THE STANSON	they was the help of they	Market of	January V.	
Mry M	7	W. J.	A SUMMER AND	- was	man.		pe	
					- Andrew Constraint	and the same	AV	
-10 0.150	0.5		(MHz)	5			30.000	
		Dooding						
		Reading	Correct	Measure-	Limit (	Over		
No. Mk.	Freq.	Level	ractor	ment				
No. MK.	Freq.	Level dBuV	Factor dB	ment dBuV	dBuV	dB	Detector	
	MHz	dBuV	dB	dBuV				
1 0	MHz 0.1660	dBuV 28.80	dB 10.12	dBu√ 38.92	65.15 -2	6.23	QP	
1 0 2 0	MHz 0.1660 0.1660	dBuV 28.80 12.95	dB 10.12 10.12	dBuV 38.92 23.07	65.15 -2 55.15 -3	6.23 2.08	QP AVG	
1 0 2 0 3 * 0	MHz 0.1660 0.1660 0.4620	dBuV 28.80 12.95 25.98	dB 10.12 10.12 10.03	dBuV 38.92 23.07 36.01	65.15 -2 55.15 -3 56.66 -2	6.23 2.08 0.65	QP AVG QP	
1 0 2 0 3 * 0 4 0	MHz 0.1660 0.1660 0.4620 0.4620	dBuV 28.80 12.95 25.98 15.96	dB 10.12 10.12 10.03 10.03	dBuV 38.92 23.07 36.01 25.99	65.15 -2 55.15 -3 56.66 -2 46.66 -2	6.23 2.08 0.65 0.67	QP AVG QP AVG	
1 0 2 0 3 * 0 4 0 5 0	MHz 0.1660 0.1660 0.4620 0.4620 0.9740	dBuV 28.80 12.95 25.98 15.96 15.82	dB 10.12 10.12 10.03 10.03 10.15	dBuV 38.92 23.07 36.01 25.99 25.97	65.15 -2 55.15 -3 56.66 -2 46.66 -2 56.00 -3	6.23 2.08 0.65 0.67 0.03	QP AVG QP AVG QP	
1 0 2 0 3 * 0 4 0 5 0 6 0	MHz 0.1660 0.1660 0.4620 0.4620 0.9740	dBuV 28.80 12.95 25.98 15.96 15.82 7.29	dB 10.12 10.12 10.03 10.03 10.15	dBuV 38.92 23.07 36.01 25.99 25.97 17.44	65.15 -2 55.15 -3 56.66 -2 46.66 -2 56.00 -3 46.00 -2	6.23 2.08 0.65 0.67 0.03 8.56	QP AVG QP AVG QP AVG	
1 0 2 0 3 * 0 4 0 5 0 6 0	MHz 0.1660 0.1660 0.4620 0.4620 0.9740	dBuV 28.80 12.95 25.98 15.96 15.82	dB 10.12 10.12 10.03 10.03 10.15	dBuV 38.92 23.07 36.01 25.99 25.97	65.15 -2 55.15 -3 56.66 -2 46.66 -2 56.00 -3	6.23 2.08 0.65 0.67 0.03 8.56	QP AVG QP AVG QP	
1 0 2 0 3 * 0 4 0 5 0 6 0 7 1	MHz 0.1660 0.1660 0.4620 0.4620 0.9740	dBuV 28.80 12.95 25.98 15.96 15.82 7.29	dB 10.12 10.12 10.03 10.03 10.15	dBuV 38.92 23.07 36.01 25.99 25.97 17.44	65.15 -2 55.15 -3 56.66 -2 46.66 -2 56.00 -3 46.00 -2	6.23 2.08 0.65 0.67 0.03 8.56 9.23	QP AVG QP AVG QP AVG	
1 0 2 0 3 * 0 4 0 5 0 6 0 7 1 8 1	MHz 0.1660 0.1660 0.4620 0.4620 0.9740 0.9740 0.6140	dBuV 28.80 12.95 25.98 15.96 15.82 7.29 16.67	dB 10.12 10.12 10.03 10.03 10.15 10.15	dBuV 38.92 23.07 36.01 25.99 25.97 17.44 26.77	65.15 -2 55.15 -3 56.66 -2 46.66 -2 56.00 -3 46.00 -2 56.00 -2	6.23 2.08 0.65 0.67 0.03 8.56 9.23 7.64	QP AVG QP AVG QP AVG QP	
1 0 2 0 3 * 0 4 0 5 0 6 0 7 1 8 1 9 2	MHz 0.1660 0.1660 0.4620 0.4620 0.9740 0.9740 0.6140	dBuV 28.80 12.95 25.98 15.96 15.82 7.29 16.67 8.26	dB 10.12 10.12 10.03 10.03 10.15 10.15 10.10	dBuV 38.92 23.07 36.01 25.99 25.97 17.44 26.77 18.36	65.15 -2 55.15 -3 56.66 -2 46.66 -2 56.00 -3 46.00 -2 56.00 -2 46.00 -2	6.23 2.08 0.65 0.67 0.03 8.56 9.23 7.64 8.63	QP AVG QP AVG QP AVG QP AVG	
1 0 2 0 3 * 0 4 0 5 0 6 0 7 1 8 1 9 2 10 2	MHz 0.1660 0.1660 0.4620 0.4620 0.9740 0.9740 0.6140 0.1500	dBuV 28.80 12.95 25.98 15.96 15.82 7.29 16.67 8.26 17.31	dB 10.12 10.12 10.03 10.03 10.15 10.15 10.10 10.10	dBuV 38.92 23.07 36.01 25.99 25.97 17.44 26.77 18.36 27.37	65.15 -2 55.15 -3 56.66 -2 46.66 -2 56.00 -3 46.00 -2 56.00 -2 46.00 -2	6.23 2.08 0.65 0.67 0.03 8.56 9.23 7.64 8.63 5.37	QP AVG QP AVG QP AVG QP AVG QP	



Page: 17 of 45

# 5. Radiated Emission Test

## 5.1 Test Standard and Limit

5.1.1 Test Standard FCC Part 15.247(d)

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	Distance Meters (at 3m)				
(MHz)	Peak (dBuV/m)	Average (dBuV/m)			
Above 1000	74	54			

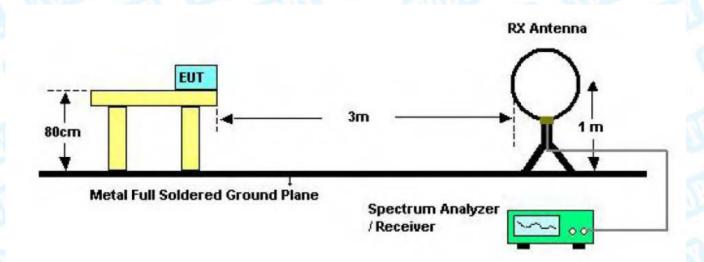
#### Note:

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

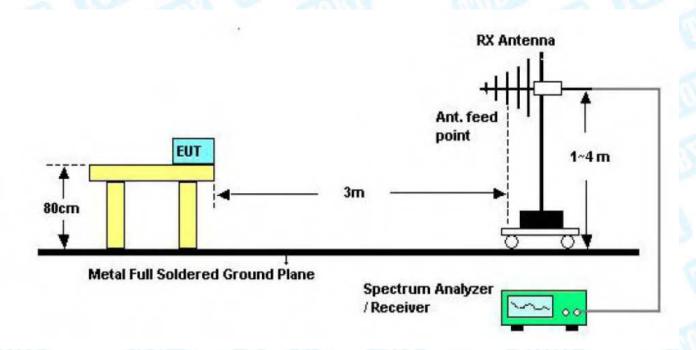


Page: 18 of 45

# 5.2 Test Setup



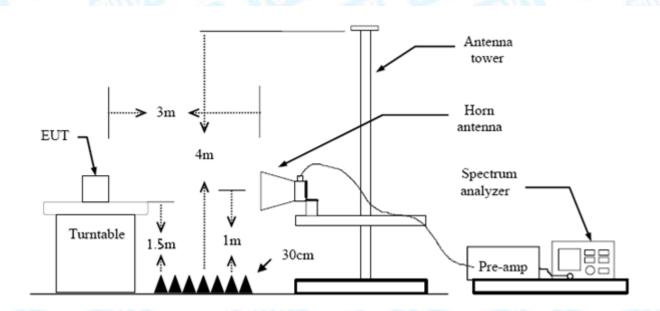
Below 30MHz Test Setup



Below 1000MHz Test Setup



Page: 19 of 45



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.



Page: 20 of 45

# 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.



Page: 21 of 45

## 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.

## 30MHz~1GHz

		BLI	E Ar	nti-lo	st Car	d	Model:			TON9668			
Temperatur	e:	25°	°C				Relative H	lumid	lity:	55%	ó		
Test Voltage	e:	DC	3.7	V		White			The second				il.
Ant. Pol.		Ho	rizo	ntal			MILE				M	N.	
Test Mode:		BLI	E T	X 24	02 Mo	de		1	Win				160
Remark:		On	ly w	orse	case	is reported						M	. 19
80.0 dBuV/m													
									(RF)FC	C 15C	3M Rad	diation	
											Mar	gin -6 ı	dB [
20				╨			3 4 _						
30						2	/*/w*\_*	Б Х.,					A. 65.4.1
, Marylan					JM(	Market L.	7 71	h h	hhlyhynes <sub>tok</sub>	MUNA-APON	water War	Haddhada	And Marks
Mr. J	ws M	$\sim$	<b>,</b>		www.	a . Mad	p S						
"	. A.A.		March	WW									
			_										
30.000 40	50	60	70	80		(MHz)		300	400	500	600	700	1000.00
	50	60	70		adina		Magazira		400	500	600	700	1000.00
				Re	eading		Measure ment	<del>-</del>	400 imit		600 Ver	700	1000.00
30.000 40	k. I	60 Fred	<b>q</b> .	Re	_	Correct Factor		- L		O			1000.00
30.000 40	k.	Frec MHz	<b>7</b> .	Re	evel dBuV	Correct Factor	ment dBuV/m	e- L	imit BuV/m	0	ver B	Det	ector
No. M	k.	Fred MHz	q. :	Re L	evel dBuV 86.79	Correct Factor dB/m	ment dBuV/m 20.45	e- L d	imit BuV/m	-19	ver B 9.55	Det	ector eak
No. M	k. 33	Fred MHz 3.562	24	Re L	evel dBu√ 86.79 44.70	Correct Factor dB/m -16.34 -22.03	ment dBuV/m 20.45 22.67	e- L	imit BuV/m 40.00 43.50	-1!	ver <sup>IB</sup> 9.55	Det p	ector eak eak
No. M	33 131 222	Fred MHz 3.562 1.75 2.95	24 77 602	3 4	dBuV 66.79 44.70	Correct Factor dB/m -16.34 -22.03 -18.99	ment dBuV/m 20.45 22.67 29.49	d 4	imit BuV/m 10.00 13.50 16.00	-1! -2(	ver 9.55 0.83 6.51	Det po	ector eak eak
No. M	33 13 <sup>2</sup> 222 248	Fred MHz 3.562 1.75 2.95 3.55	24 77 02 19	3 4	evel dBu√ 86.79 44.70	Correct Factor dB/m -16.34 -22.03	ment dBuV/m 20.45 22.67	d 4	imit BuV/m 40.00 43.50	-1! -2(	ver <sup>IB</sup> 9.55	Det po	ector eak eak
No. M	33 13 <sup>2</sup> 222 248	Fred MHz 3.562 1.75 2.95	24 77 02 19	3 4 4	dBuV 66.79 44.70	Correct Factor dB/m -16.34 -22.03 -18.99	ment dBuV/m 20.45 22.67 29.49	d 4	imit BuV/m 10.00 13.50 16.00	-19 -20 -10	ver 9.55 0.83 6.51	Det population populat	ector eak eak



Page: 22 of 45

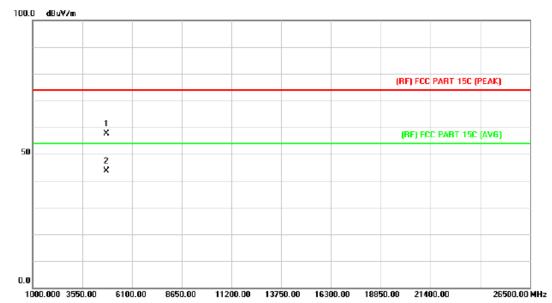
UT:		BLE	∃ An	ti-los	st Card	A 43	Model:		T	ONS	9668		
emperatu	ıre:	25°	С		TIPE	13	Relative H	umidity:	5	5%			
est Volta	ge:	DC	3.7	V		-		Ind.					
Ant. Pol.		Ver	tical			280							
est Mode	:	BLE	Ξ TX	(240	2 Mode	е	14/1/2						
Remark:		Onl	y wo	orse	case is	reported							
80.0 dBuV/m													_
													1
			+					(RF)FCC	: 15C 3	M Rac	liation		1
										Mar	gin -6	dB [	
30			+	₩			4 5						
30		1			2	3	XX.	e e				LLL by the profession	٦
Ma.		À			1	Many	J. 4 W.	Martin when	Marketers	pulphyland.	(Bedger		1
Mylanda	₩ <b>\</b>	$f \setminus$	_	way	EAR WAY	- W	/TW						-
	N <sub>u</sub> M	A. A.	optible of the same	MV									
0													1
30.000 40	50	60	70	80		(MHz)	300	400	500	600	700	1000	_  ).0
				Re	ading	Correct	Measure-						_
No.	Mk.	Free	q.	Le	evel	Factor	ment	Limit	0	ver			
		MHz	,	d	lBu∀	ID.	dBuV/m	dBuV/m	(	dB	De	etecto	r
		IVIIIZ			ıbu v	dB/m	ubuv/III	ubu v/III					
1	5	57.99			3.66	-24.59	19.07	40.00	-2	0.93	3 p	eak	
1 2			93	4						0.93		eak eak	
2	1	57.99 16.13	93 321	4:	3.66 4.64	-24.59	19.07 22.42	40.00 43.50	-2	1.08	3 p	eak	
3	1	57.999 16.13 57.55	93 321 588	4:	3.66 4.64 0.46	-24.59 -22.22 -20.45	19.07 22.42 20.01	40.00 43.50 43.50	-2 -2	1.08 3.49	9 k	eak eak	:
3 4	1 2	57.999 16.13 57.55 30.09	93 321 588 985	4:	3.66 4.64 0.46 5.40	-24.59 -22.22 -20.45 -18.65	19.07 22.42 20.01 26.75	40.00 43.50 43.50 46.00	-2 -2 -1	1.08 3.49 9.25	2 k 3 k	eak eak eak	: :
3	1 2	57.999 16.13 57.55	93 321 588 985 304	4:	3.66 4.64 0.46	-24.59 -22.22 -20.45	19.07 22.42 20.01	40.00 43.50 43.50	-2 -2 -1 -1	1.08 3.49	3 k 5 k	eak eak	



Page: 23 of 45

## **Above 1GHz**

EUT:	BLE Anti-lost Card	Model:	TON9668						
Temperature:	25℃	Relative Humidity:	55%						
Test Voltage:	DC 3.7 V								
Ant. Pol.	Horizontal								
Test Mode:	BLE Mode TX 2402 MHz	A SULL OF THE SECOND							
Remark:	No report for the emission which more than 10 dB below the prescribed limit.								

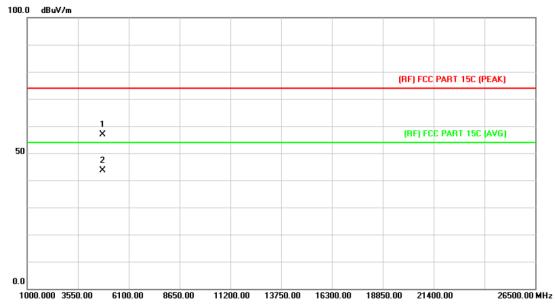


No	. Mk	. Freq.	_		Measure- ment	Limit	Over	
		MHz	dBu∨	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4803.727	44.07	13.44	57.51	74.00	-16.49	peak
2	*	4805.455	30.25	13.45	43.70	54.00	-10.30	AVG



Page: 24 of 45

EUT:	BLE Anti-lost Card	Model:	TON9668					
Temperature:	25℃	Relative Humidity:	55%					
Test Voltage:	DC 3.7 V							
Ant. Pol.	Vertical							
Test Mode:	BLE Mode TX 2402 MHz	40000	A Aller					
Remark:	No report for the emission w	hich more than 10 dB b	elow the					
	prescribed limit.							
100.0 dBuV/m								

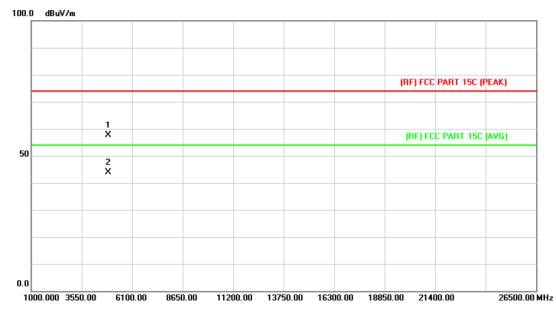


No	. Mk	. Freq.	Reading Level		Measure- ment	Limit	Over	
		MHz	dBu∨	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4803.685	43.56	13.44	57.00	74.00	-17.00	peak
2	*	4804.882	30.18	13.44	43.62	54.00	-10.38	AVG



Page: 25 of 45

BLE Anti-lost Card	Model:	TON9668				
25℃	Relative Humidity:	55%				
DC 3.7 V		333				
Horizontal	Horizontal					
BLE Mode TX 2442 MHz		A HALL				
Remark: No report for the emission which more than 10 dB below the						
prescribed limit.	- 100					
	25°C  DC 3.7 V  Horizontal  BLE Mode TX 2442 MHz  No report for the emission wh	25°C Relative Humidity:  DC 3.7 V  Horizontal  BLE Mode TX 2442 MHz  No report for the emission which more than 10 dB b				



No	. Mk	. Freq.			Measure- ment	Limit	Over	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4884.370	43.63	13.92	57.55	74.00	-16.45	peak
2	*	4884.990	29.87	13.92	43.79	54.00	-10.21	AVG



Page: 26 of 45

EUT:	BLE Anti-lost Card	Model:	TON9668				
Temperature:	25℃	Relative Humidity:	55%				
Test Voltage:	DC 3.7 V		المرا المرا				
Ant. Pol.	Vertical	Vertical					
Test Mode:	BLE Mode TX 2442 MHz		a William				
Remark:	No report for the emission which more than 10 dB below the						
	prescribed limit.						

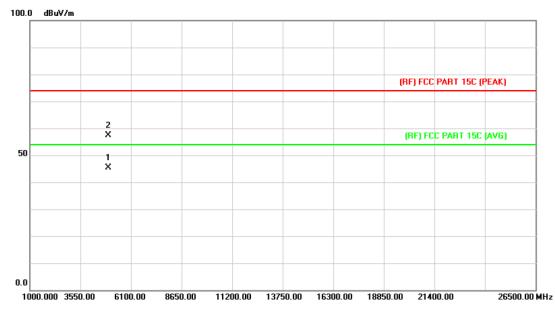


No	o. Mk	. Freq.	Reading Level		Measure- ment	Limit	Over	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4883.020	44.94	13.91	58.85	74.00	-15.15	peak
2	*	4883.070	32.04	13.91	45.95	54.00	-8.05	AVG



Page: 27 of 45

EUT:	BLE Anti-lost Card	Model:	TON9668						
LUI.	BLL Anti-lost Card	woder.	10119000						
Temperature:	25℃ Relative Humidity: 55%								
Test Voltage:	DC 3.7 V	DC 3.7 V							
Ant. Pol.	Horizontal	Horizontal							
Test Mode:	BLE Mode TX 2480 MHz	William -	a William						
Remark:	No report for the emission which more than 10 dB below the								
	prescribed limit.								

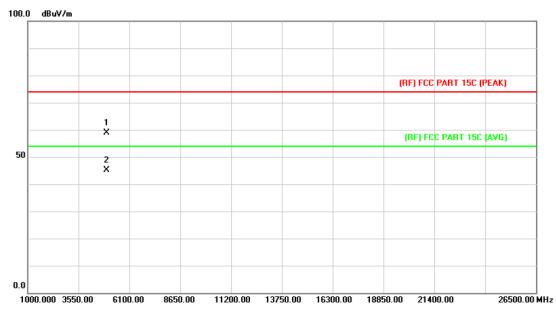


No	o. MI	k. Freq.	Reading Level		Measure- ment	Limit	Over	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4959.778	30.94	14.36	45.30	54.00	-8.70	AVG
2		4961.440	42.96	14.38	57.34	74.00	-16.66	peak



Page: 28 of 45

EUT:	BLE Anti-lost Card	Model:	TON9668						
Temperature:	25℃ Relative Humidity: 55%								
Test Voltage:	DC 3.7 V	DC 3.7 V							
Ant. Pol.	Vertical	Vertical							
Test Mode:	BLE Mode TX 2480 MHz		a William						
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		4959.889	44.42	14.36	58.78	74.00	-15.22	peak
2	*	4960.201	30.88	14.36	45.24	54.00	-8.76	AVG



Page: 29 of 45

# 6. Restricted Bands Requirement

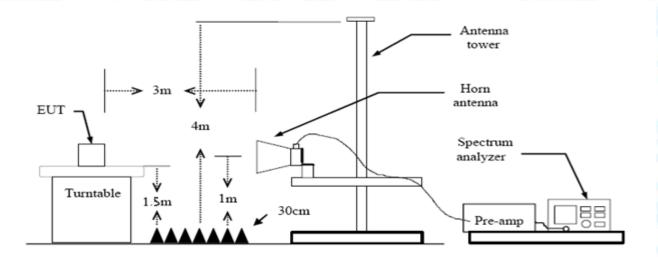
#### 6.1 Test Standard and Limit

6.1.1 Test Standard FCC Part 15.247(d) FCC Part 15.205

6.1.2 Test Limit

Restricted Frequency	Distance Me	eters (at 3m)
Band (MHz)	Peak (dBuV/m)	Peak (dBuV/m)
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



Page: 30 of 45

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.

## 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.

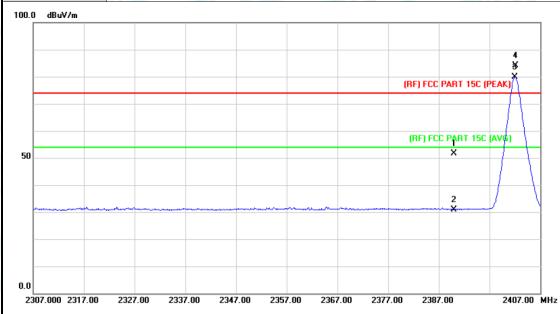
Test data please refer the following pages.



Page: 31 of 45

# (1) Radiation Test

EUT:	BLE Anti-lost Card	Model:	TON9668
Temperature:	25℃	Relative Humidity:	55%
Test Voltage:	DC 3.7 V		
Ant. Pol.	Horizontal	WHITE S	THU -
Test Mode:	BLE Mode TX 2402 MHz	1 20	W = 0
Remark:	N/A		1000



No	. Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∨	dB/m	dBuV/m	dBuV/m	dB	Detector
1		2390.000	50.75	0.77	51.52	74.00	-22.48	peak
2		2390.000	30.18	0.77	30.95	54.00	-23.05	AVG
3	*	2402.000	79.04	0.82	79.86	Fundamental	Frequency	AVG
4	X	2402.100	83.34	0.82	84.16	Fundamental	Frequency	peak



Page: 32 of 45

EUT	:		BLE A	nti-lost	Card	1	Mod			TON9668		
Геm	peratur	e:	25℃				Rela	tive I	Humidity:	55%		
Test	Voltag	e:	DC 3.	7 V				36		11/20		
Ant.	Pol.		Vertica	al		PR			4 T		500	
Test	Mode:		BLE N	/lode TX	2402	MHz		MM		A W	Meet	
Ren	nark:		N/A	W					100			
100.0	dBuV/m											
-									(RF) FC	C PART 15C (PEA	K)8	
											$\Lambda$	
50								(RF) F	CC PART 15C (AV	<del>9) \</del>		
30										1 X		
										2		
							***************************************			×		
0.0												
23	07.000 2317	7.00 2	2327.00	2337.00	2347.0	0 2357.	.00 23	67.00	2377.00 238	37.00	2407.00 MH	
				Read	ing	Correc	t Me	asur				
1	No. Mk	. F	req.	Leve	el	Facto	r n	nent	Limit	Over		
		N	1Hz	dBu'	V	dB/m	d	BuV/m	dBuV/n	n dB	Detector	
1		2390	0.000	43.5	7	0.77	4	4.34	74.00	-29.66	peak	
2		2390	0.000	31.4	1	0.77	3	32.18	54.00	-21.82	AVG	
3	Χ	2402	2.000	76.2	20	0.82	7	7.02	Fundamer	ital Frequency	peak	



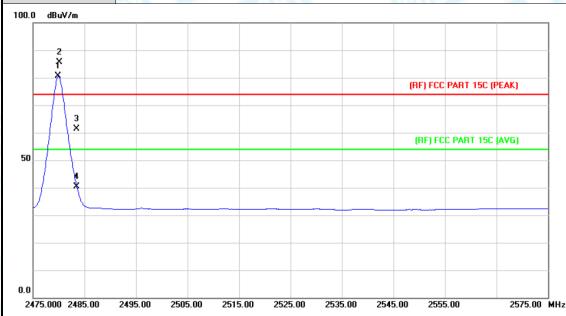
Page: 33 of 45

EUT: BLE A			BLE Anti-lost Card				Model:				TON9668				
Temperature:			<b>25</b> ℃					Relative Humidity:			55%				
Tes	Volt	age	:	DC 3	OC 3.7 V										
Ant.	Pol.			Horiz	ontal		PR				d v A				
Test	Mod	le:		BLE I	Mode T	X 248	30 MHz		La	M	32	THE PERSON NAMED IN			
Ren	nark:			N/A	MA		-		7						6
100.0	dBuV	//m													
															7
	2														1
	ř ×										(RF	) FCC F	PART 15C (PEA	AK)	+
	A														1
	$\perp$	3													
50	+	×									(R	F) FCC	PART 15C (A)	/G)	-
30	1	T													
	-	*													1
	_											_			1
0.0															
24	75.000	2485.	00 24	195.00	2505.00	2515.	.00 252	5.00	2535.	.00 2	2545.00	2555.	00	2575.00	МН
-					Read	ding	Corre	ect	Mea	sure	-				
	No.	Mk	. F	req.	Lev		Fact	or	m	ent	Lim	it	Over		
_			N	ИHz	dBu	ı۷	dB/m	1	dB	uV/m	dBu	V/m	dB	Detec	tor
-	1	*	247	9.900	75.	65	1.15	;	76	6.80	Fundan	nental	Frequency	AV	G
	2	Χ	248	0.200	80.	62	1.15	;	81	1.77	Fundan	nental	Frequency	pea	ak
-	3		248	3.500	56.	74	1.17	,	57	7.91	74.	00	-16.09	pea	ak
	4			3.500	36.		1.17		37			00	-16.43	AV	_



Page: 34 of 45

EUT:	BLE Anti-lost Card	Model:	TON9668
Temperature:	25℃	Relative Humidity:	55%
Test Voltage:	DC 3.7 V		1197
Ant. Pol.	Vertical		
Test Mode:	BLE Mode TX 2480 MHz	WHD 2	A WILL
Remark:	N/A		133 - 67
100.0 dBuV/m			



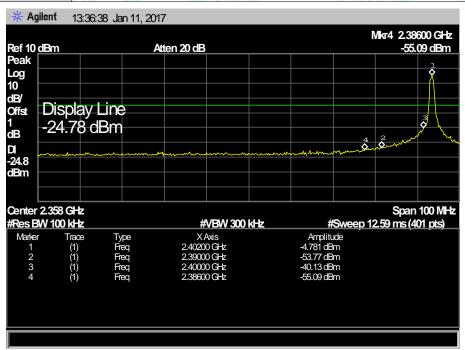
No	. Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	2479.900	79.44	1.15	80.59	Fundamental	Frequency	AVG
2	X	2480.100	84.39	1.15	85.54	Fundamental	Frequency	peak
3		2483.500	60.18	1.17	61.35	74.00	-12.65	peak
4		2483.500	39.22	1.17	40.39	54.00	-13.61	AVG

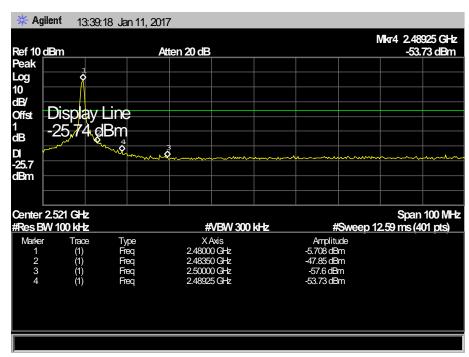


Page: 35 of 45

## (2) Conducted Test

EUT:	BLE Anti-lost Card Model:		TON9668				
Temperature:	25℃	Relative Humidity:	55%				
Test Voltage:	DC 3.7 V						
Test Mode:	BLE Mode TX 2402MHz / BLE Mode TX 2480MHz						
Remark: The EUT is programed in continuously transmitting mode							







Page: 36 of 45

# 7. Bandwidth Test

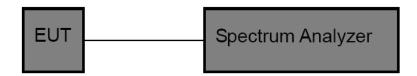
#### 7.1 Test Standard and Limit

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	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.



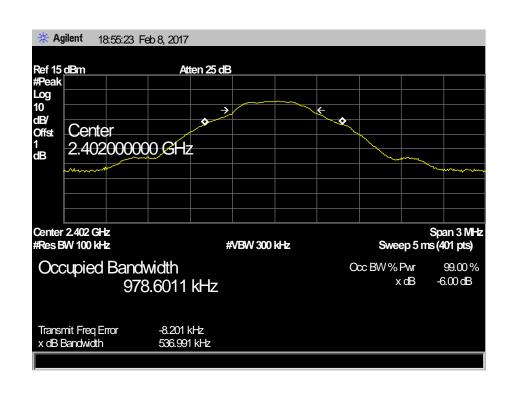
Page: 37 of 45

## 7.5 Test Data

EUT:	BLE Anti-lost Card	Model:	TON9668					
Temperature:	25℃	Relative Humidity:	55%					
Test Voltage:	DC 3.7 V	a W						
Test Mode:	BLE TX Mode	The same	1 - N					
Channel frequence	cy 6dB Bandwidth	99% Bandwidth	Limit					
(MHz)	(kHz)	(kHz)	(kHz)					
2402	536.991	978.6011						
2442	535.865	971.2077	>=500					
2480	531.633	969.7459						
	DIE M. I.							

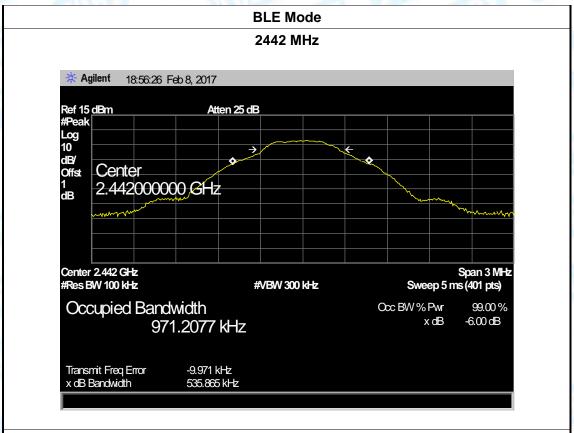
#### **BLE Mode**

#### 2402 MHz



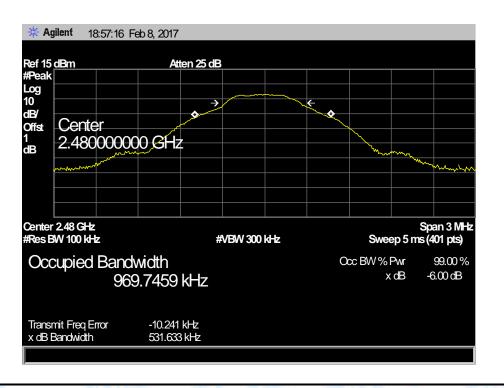


Page: 38 of 45



#### **BLE Mode**

#### 2480 MHz





Page: 39 of 45

# 8. Peak Output Power Test

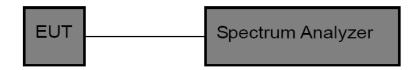
#### 8.1 Test Standard and Limit

8.1.1 Test Standard FCC Part 15.247 (b)(3)

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.

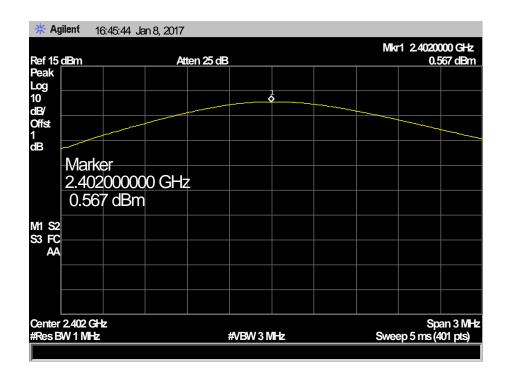


Page: 40 of 45

## 8.5 Test Data

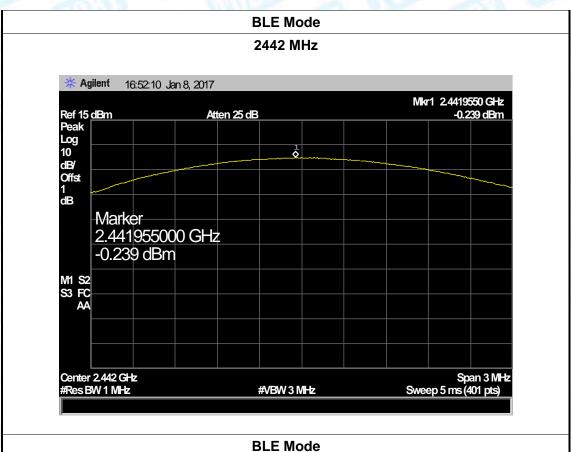
EUT: BLE Anti-le		lost Card	Model:	TON9668
Temperature:	25℃	100	Relative Humidity:	55%
Test Voltage:	DC 3.7 V	U.D	THE STATE OF THE S	7
Test Mode:	Test Mode: BLE TX N			32 ~ N
Channel frequen	cy (MHz)	Test Result	(dBm)	imit (dBm)
2402		0.567		
2442		-0.239	)	30
2480		0.261		
		BLE Mo	de	



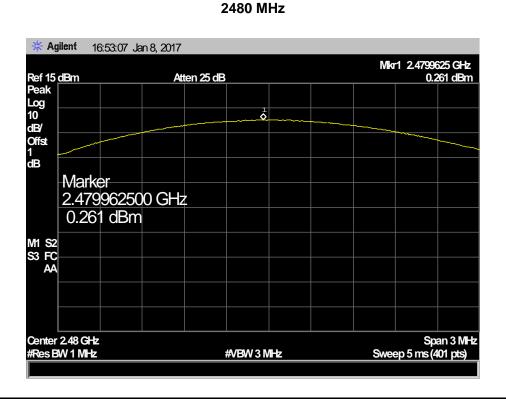




Page: 41 of 45









Page: 42 of 45

# 9. Power Spectral Density Test

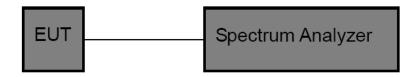
#### 9.1 Test Standard and Limit

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.

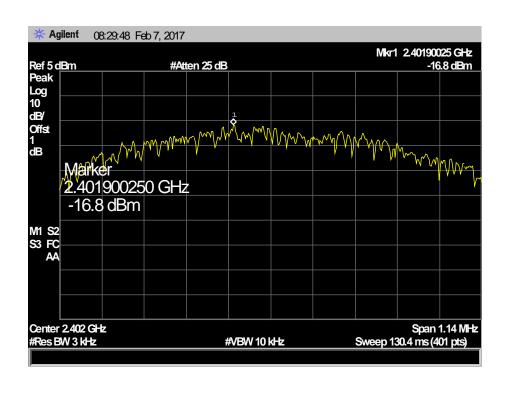


Page: 43 of 45

## 9.5 Test Data

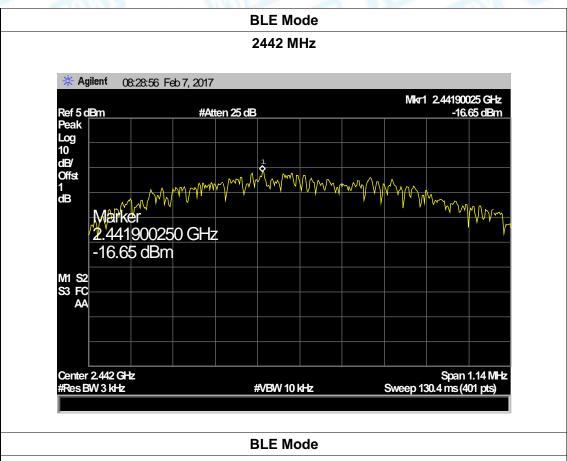
EUT: BLE Anti-lo		lost Card Model:			TON9668	
Temperature: 25°C		Relative I		Humidity: 55%		
Test Voltage:	DC 3.7 V					100
Test Mode:	Test Mode: BLE TX N		THE PERSON			
Channel Freq	uency	Power Density		Limit		Result
(MHz)		(dB	(dB	m)	Result	
2402		-16.8				
2442		-16.6	8 PA		PASS	
2480		-17.600				
		BLE N	/lode			



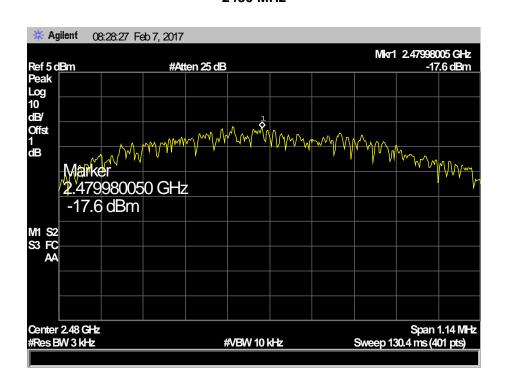




44 of 45 Page:









Page: 45 of 45

# 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 2 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 FPC Antenna. It complies with the standard requirement.

Antenna Type						
✓ Permanent attached antenna	CI					
□ Unique connector antenna	000					
☐ Professional installation antenna						

----END OF REPORT-----