FCC RF Test Report

APPLICANT	:	TCL Communication Ltd
EQUIPMENT	:	GSM Quad-band / UMTS Quad-band / LTE 4 band mobile phone
BRAND NAME	:	ALCATEL ONETOUCH
MODEL NAME	:	6045O
MARKETING NAME	:	ALCATEL ONETOUCH IDOL 3 (5.5)
FCC ID	:	2ACCJN005
STANDARD	:	FCC Part 15 Subpart C §15.247
CLASSIFICATION	:	(DTS) Digital Transmission System

The product testing was completed on Mar. 01, 2016. We, SPORTON INTERNATIONAL (KUNSHAN) INC., would like to declare that the tested sample has been evaluated in accordance with the test procedures and has been in compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL (KUNSHAN) INC., the test report shall not be reproduced except in full.

James Huang

Prepared by: James Huang / Manager

Jones Tsai

Approved by: Jones Tsai / Manager

Testing Laboratory 2627

SPORTON INTERNATIONAL (KUNSHAN) INC.
No. 3-2, PingXiang Road, Kunshan, Jiangsu Province, P. R. China

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APPENDIX A. RADIATED SPURIOUS EMISSION

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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR511301-29B	Rev. 01	This is a variant product of 6045O. Added a new battery, and only the worst case of Radiated spurious emission from original test report (Sporton Report Number FR511301-21B) were verified for the difference and the original test data were remain representative.	Mar. 07, 2016

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	15.247(a)(2)	6dB Bandwidth	≥ 0.5MHz	Pass	-
3.2	15.247(b)(1)	Peak Output Power	≤ 30dBm	Pass	-
3.3	15.247(e)	Power Spectral Density	≤ 8dBm/3kHz	Pass	-
3.4	15.247(d)	Conducted Band Edges and Spurious Emission	≤ 20dBc	Pass	-
3.5	15.247(d)	Radiated Band Edges and Spurious Emission	15.209(a) & 15.247(d)	Pass	Under limit 4.07 dB at 40.670 MHz
3.6	15.207	AC Conducted Emission	15.207(a)	Pass	Under limit 3.28 dB at 0.520 MHz
3.7	15.203 & 15.247(b)	Antenna Requirement	N/A	Pass	-

1 General Description

1.1 Applicant

TCL Communication Ltd
FLAT/RM 1910-12A BLOCK 3 19/F CHINA HONG KONG CITY 33 CANTON ROAD TSIMSHATSUI KL

1.2 Manufacturer

TCL Communication Ltd
FLAT/RM 1910-12A BLOCK 3 19/F CHINA HONG KONG CITY 33 CANTON ROAD TSIMSHATSUI KL

1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	GSM Quad-band / UMTS Quad-band / LTE 4 band mobile phone
Brand Name	ALCATEL ONETOUCH
Model Name	6045O
Marketing Name	ALCATEL ONETOUCH IDOL 3 (5.5)
FCC ID	2ACCJN005
EUT supports Radios application	GSM/GPRS/EGPRS/ WCDMA/HSPA/ HSPA+(16QAM uplink is not supported)/DC-HSDPA/LTE/NFC/ WLAN2.4GHz 802.11b/g/n HT20/ WLAN 5GHz 802.11a/n HT20/HT40/ Bluetooth v3.0+EDR/Bluetooth v4.1 LE
HW Version	03
SW Version	5A18
EUT Stage	Identical Prototype

Remark: The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

1.4 Product Specification subjective to this standard

Product Specification subjective to this standard	
Tx/Rx Frequency Range	2402 MHz ~ 2480 MHz
Number of Channels	40
Carrier Frequency of Each Channel	40 Channel(37 hopping + 3 advertising channel)
Maximum Output Power to Antenna	1.00 dBm (0.00126 W)
Antenna Type / Gain	PIFA Antenna with gain -3.0 dBi
Type of Modulation	Bluetooth v4.1 LE : GFSK

1.5 Modification of EUT

No modifications are made to the EUT during all test items.

1.6 Accessories and Support Equipment

Specification of Accessory				
AC Adapter	**Brand Name**	ALCATEL ONETOUCH	**Model Name**	UC13US
	Power Rating	I/P: 100-240Vac, 500mA, O/P: 5Vdc, 2000mA		
	P/N	CBA0059AG0C1		
Original Battery	**Brand Name**	ALCATEL ONETOUCH	**Model Name**	TLp029A2-S
	Power Rating	3.8Vdc, 2910mAh		
	P/N	C2910002C2YHVOJE		
Added Battery	**Brand Name**	ALCATEL ONETOUCH	**Model Name**	TLp029AJ
	Power Rating	3.8Vdc, 2910mAh		
	P/N	C2910003CJY9411D		
USB Cable	**Brand Name**	ALCATEL ONETOUCH	**Model Name**	CDA0000043C2
	Signal Line Type	1.01m shielded without core		

1.7 Testing Location

Test Site	SPORTON INTERNATIONAL (KUNSHAN) INC.			
Test Site Location	No. 3-2, PingXiang Road, Kunshan, Jiangsu Province, P. R. China TEL: +86-0512-5790-0158 FAX: +86-0512-5790-0958			
Test Site No.	**Sporton Site No.**			**FCC Registration No.**
	TH01-KS	03CH01-KS	CO01-KS	149928

Test Site	SPORTON INTERNATIONAL (KUNSHAN) INC.	
Test Site Location	No. 3-2, PingXiang Road, Kunshan, Jiangsu Province, P. R. China TEL: +86-0512-5790-0158 FAX: +86-0512-5790-0958	
Test Site No.	**Sporton Site No.**	**FCC Registration No.**
	03CH03-KS	306251

Note: The test site complies with ANSI C63.4 2009 requirement.

1.8 Applicable Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- FCC Part 15 Subpart C §15.247
- FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v03r02
- ANSI C63.10-2013

Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.

2 Test Configuration of Equipment Under Test

2.1 Descriptions of Test Mode

The RF output power was recorded in the following table:

Channel	Frequency	Bluetooth v4.1 LE RF Output Power
		Data Rate / Modulation
		GFSK
		1Mbps
Ch00	2402MHz	1.00 dBm
Ch19	2440MHz	0.74 dBm
Ch39	2480MHz	-0.63 dBm

a. The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: conduction (150 kHz to 30 MHz), radiation (9 kHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower). Pre-scanned tests, X, Y, Z in three orthogonal panels to determine the final configuration (Y plane as worst plane) from all possible combinations.

b. AC power line Conducted Emission was tested under maximum output power.

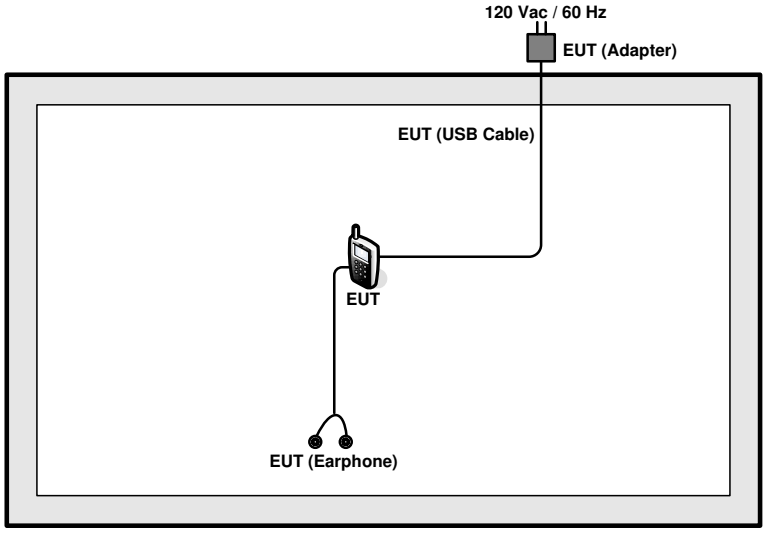
2.2 Test Mode

The following summary table is showing all test modes to demonstrate in compliance with the standard.

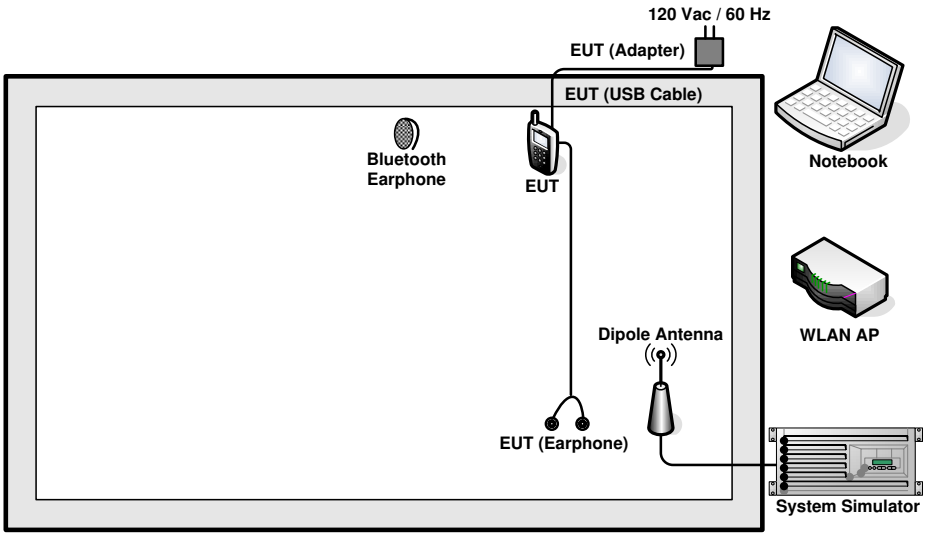
Summary table of Test Cases	
Test Item	**Data Rate / Modulation**
	Bluetooth v4.1 LE / GFSK
Conducted TCs	Mode 1: Bluetooth Tx CH00_2402 MHz_1Mbps Mode 2: Bluetooth Tx CH19_2440 MHz_1Mbps Mode 3: Bluetooth Tx CH39_2480 MHz_1Mbps
Radiated TCs	Mode 1: Bluetooth Tx CH00_2402 MHz_1Mbps Mode 2: Bluetooth Tx CH19_2440 MHz_1Mbps Mode 3: Bluetooth Tx CH39_2480 MHz_1Mbps
Radiated Test Cases for Spot Check	Mode 1: Bluetooth Tx CH39_2480 MHz_1Mbps
AC Conducted Emission	Mode 1: GSM850 Idle + Bluetooth Link + WLAN Link + Earphone + Battery 1 + USB Cable 1(Charging from Adapter 1)
Remark: For Radiated TCs, the tests were performed with adapter 1, battery, earphone and USB cable.	

2.3 Connection Diagram of Test System

<Bluetooth v4.1 LE Tx Mode>



<AC Conducted Emission Mode>



2.4 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	System Simulator	R&S	CMU 200	N/A	N/A	Unshielded, 1.8 m
2.	WLAN AP	D-Link	DIR-855	KA2DIR855A2	N/A	Unshielded, 1.8 m
3.	Notebook	Lenovo	G480	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
4.	Bluetooth Earphone	Nokia	BH-102	PYAHS-107W	N/A	N/A

2.5 EUT Operation Test Setup

For Bluetooth v4.1 LE function, the engineering test program was provided and enabled to make EUT continuous transmit/receive.

For AC power line conducted emissions, the EUT was set to connect with the WLAN AP under large package sizes transmission.

2.6 Measurement Results Explanation Example

For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss between EUT conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly the EUT RF output level.

Example :

The spectrum analyzer offset is derived from RF cable loss.

Offset = RF cable loss.

Following shows an offset computation example with cable loss 5.5 dB.

Offset(dB) = RF cable loss(dB) = 5.5 (dB)

3 Test Result

3.1 6dB Bandwidth Measurement

3.1.1 Limit of 6dB Bandwidth

The minimum 6 dB bandwidth shall be at least 500 kHz.

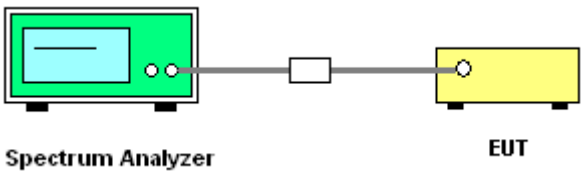
3.1.2 Measuring Instruments

The section 4.0 of List of Measuring Equipment of this test report is used for test.

3.1.3 Test Procedures

1. The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v03r02.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. Set the Video bandwidth (VBW) = 300 kHz. In order to make an accurate measurement. The 6 dB bandwidth must be greater than 500 kHz.
5. Measure and record the results in the test report.

3.1.4 Test Setup

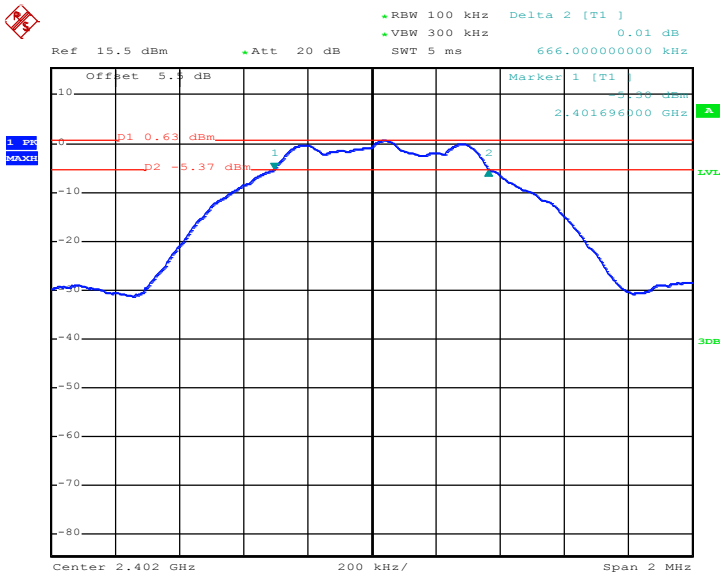


3.1.5 Test Result of 6dB Bandwidth

Test Mode :	Bluetooth v4.1 LE	**Temperature :**	24~25℃
Test Engineer :	Issac Song	**Relative Humidity :**	49~51%

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
00	2402	0.666	0.5	Pass
19	2440	0.662	0.5	Pass
39	2480	0.664	0.5	Pass

6 dB Bandwidth Plot on Channel 00



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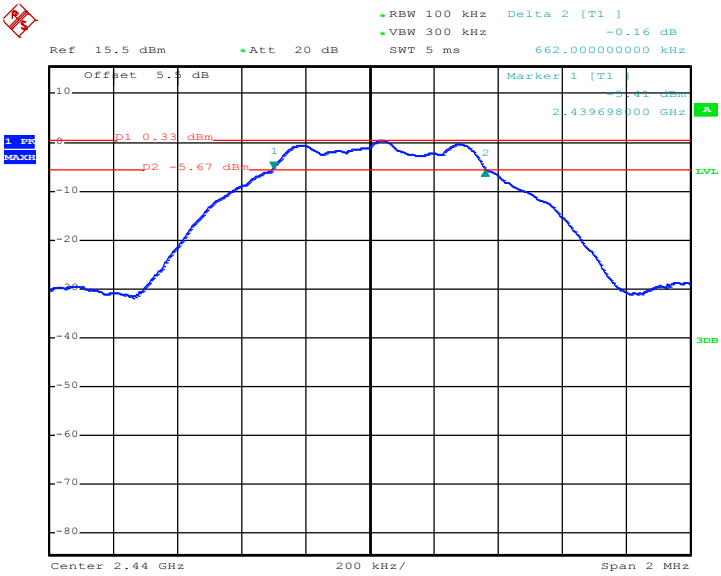
6 dB Bandwidth Plot on Channel 19



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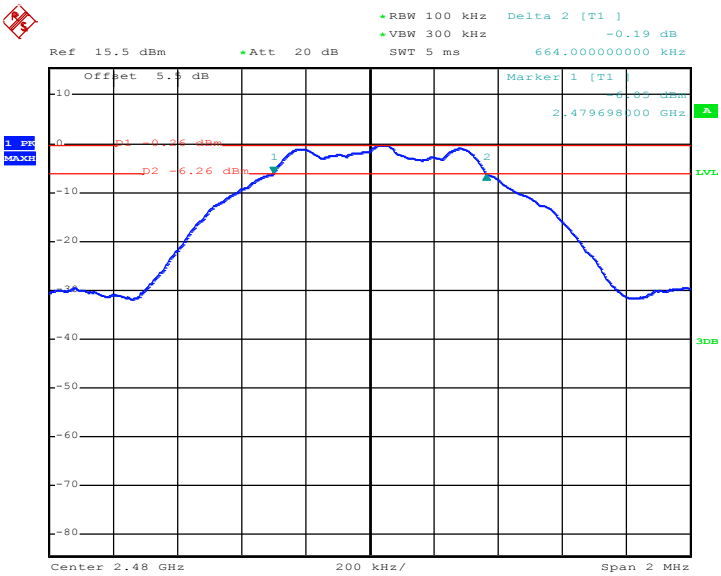
6 dB Bandwidth Plot on Channel 39



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3.2 Peak Output Power Measurement

3.2.1 Limit of Peak Output Power

For systems using digital modulation in the 2400-2483.5MHz, the limit for peak output power is 30dBm. If transmitting antenna of directional gain greater than 6dBi is used, the peak output power from the intentional radiator shall be reduced below the above stated value by the amount in dB that the directional gain of the antenna exceeds 6 dBi. In case of point-to-point operation, the limit has to be reduced by 1dB for every 3dB that the directional gain of the antenna exceeds 6dBi.

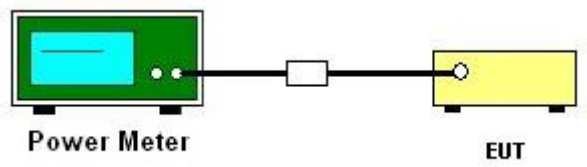
3.2.2 Measuring Instruments

The section 4.0 of List of Measuring Equipment of this test report is used for test.

3.2.3 Test Procedures

1. The testing follows the Measurement Procedure of FCC KDB No. 558074 DTS D01 Meas. Guidance v03r02.
2. The RF output of EUT was connected to the power meter by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Measure the conducted output power and record the results in the test report.

3.2.4 Test Setup



3.2.5 Test Result of Peak Output Power

Test Mode :	Bluetooth v4.1 LE	Temperature :	24~25℃
Test Engineer :	Issac Song	Relative Humidity :	49~51%

Channel	Frequency (MHz)	RF Power (dBm)		
		GFSK	Max. Limits (dBm)	Pass/Fail
		1 Mbps		
00	2402	1.00	30.00	Pass
19	2440	0.74	30.00	Pass
39	2480	-0.63	30.00	Pass

3.3 Power Spectral Density Measurement

3.3.1 Limit of Power Spectral Density

The peak power spectral density shall not be greater than 8dBm in any 3kHz band at any time interval of continuous transmission.

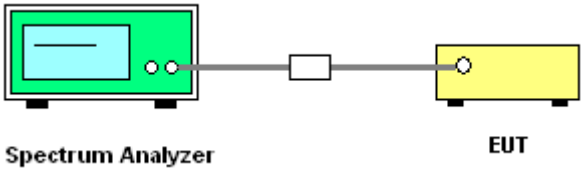
3.3.2 Measuring Instruments

The section 4.0 of List of Measuring Equipment of this test report is used for test.

3.3.3 Test Procedures

1. The testing follows Measurement Procedure 10.2 Method PKPSD of FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v03r02
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 3 kHz. Video bandwidth VBW = 10 kHz In order to make an accurate measurement, set the span to 1.5 times DTS Channel Bandwidth. (6dB BW)
5. Detector = peak, Sweep time = auto couple, Trace mode = max hold, Allow trace to fully stabilize. Use the peak marker function to determine the maximum power level.
6. Measure and record the results in the test report.
7. The Measured power density (dBm)/ 100kHz is a reference level and used as 20dBc down limit line for Conducted Band Edges and Conducted Spurious Emission.

3.3.4 Test Setup



3.3.5 Test Result of Power Spectral Density

Test Mode :	Bluetooth v4.1 LE	Temperature :	24~25℃
Test Engineer :	Issac Song	Relative Humidity :	49~51%

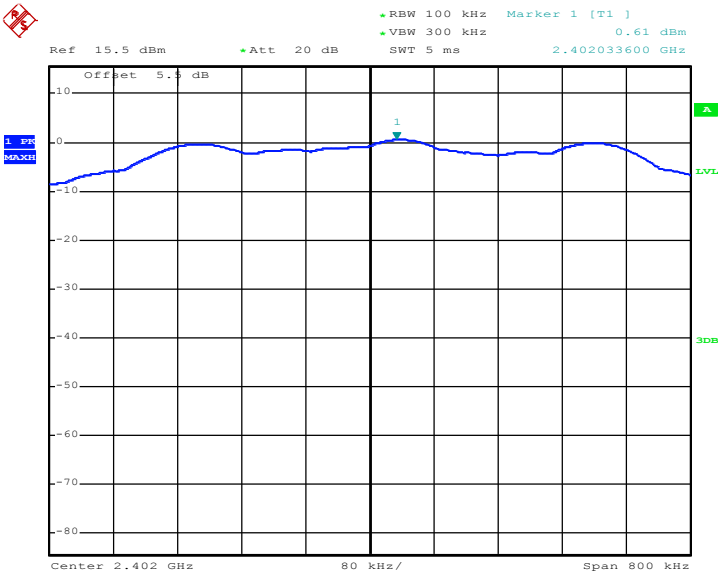
Channel	Frequency (MHz)	Power Density		Max. Limits (dBm/3kHz)	Pass/Fail
		PSD/100kHz (dBm)	PSD/3kHz (dBm)		
00	2402	0.61	-14.58	8	Pass
19	2440	0.36	-14.84	8	Pass
39	2480	-0.27	-15.44	8	Pass

Note:

1. *Measured power density (dBm) has offset with cable loss.*
2. *The Measured power density (dBm)/ 100kHz is reference level and used as 20dBc down for Conducted Band Edges and Conducted Spurious Emission limit line.*

3.3.6 Test Result of Power Spectral Density Plots (100kHz)

PSD 100kHz Plot on Channel 00



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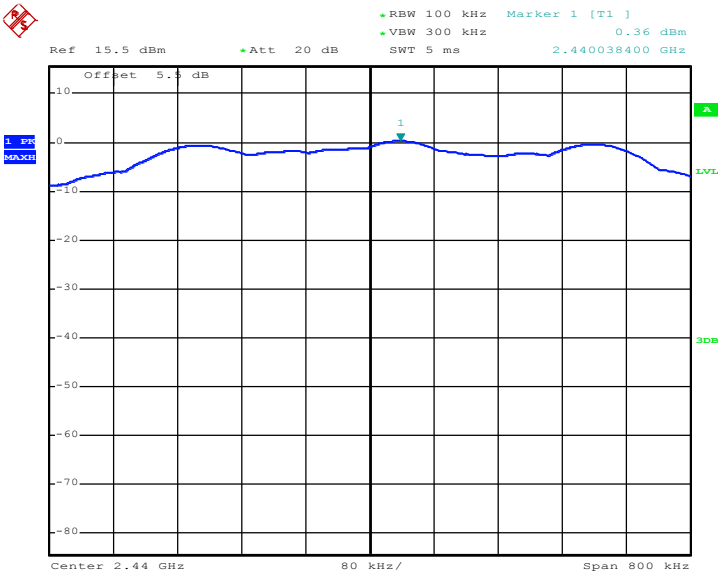
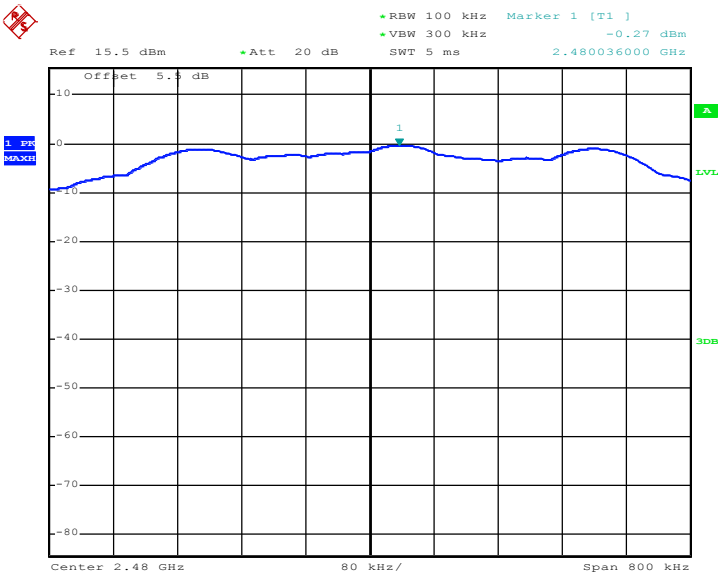
PSD 100kHz Plot on Channel 19



Date: 20.FEB.2015 01:21:59

PSD 100kHz Plot on Channel 39



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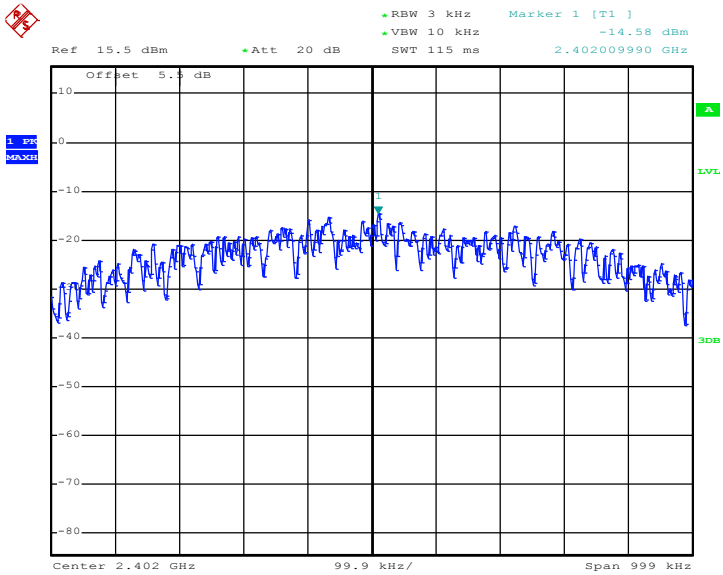
3.3.7 Test Result of Power Spectral Density Plots (3kHz)

PSD 3kHz Plot on Channel 00



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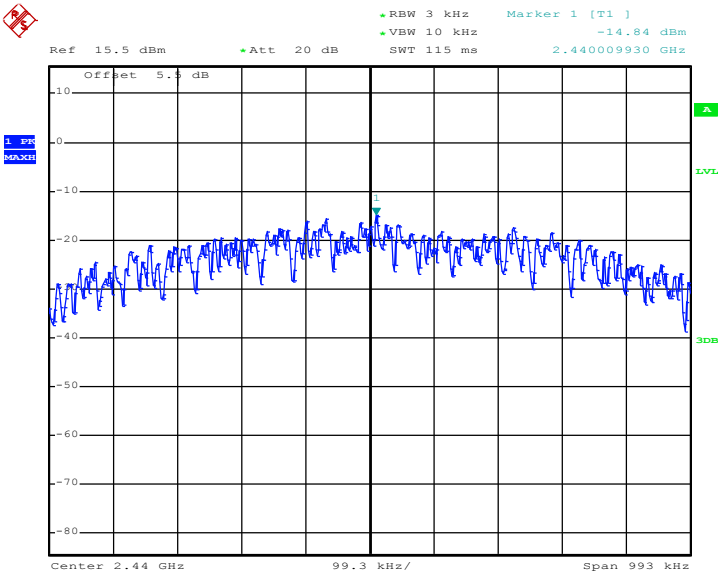
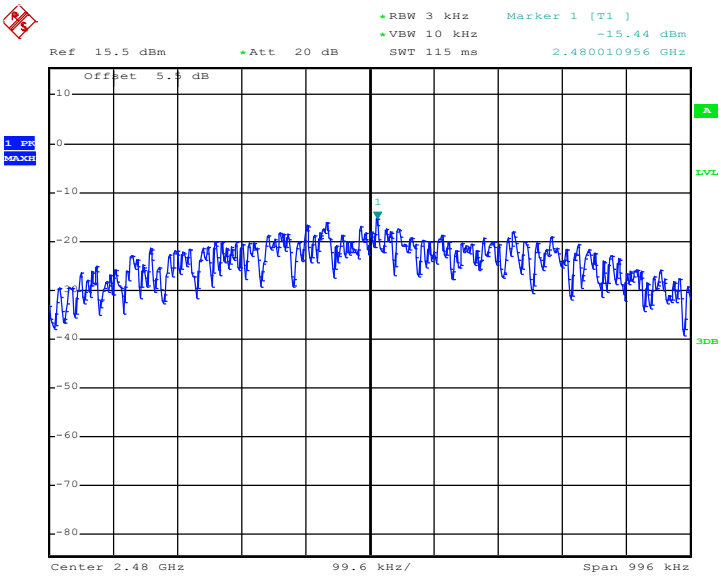
PSD 3kHz Plot on Channel 19



Date: 20.FEB.2015 01:21:27

PSD 3kHz Plot on Channel 39



Date: 20.FEB.2015 01:26:55

3.4 Conducted Band Edges and Spurious Emission Measurement

3.4.1 Limit of Conducted Band Edges and Spurious Emission

All harmonics/spurious must be at least 20 dB down from the highest emission level within the authorized band.

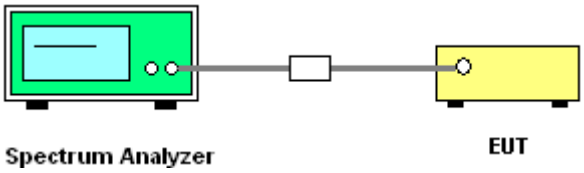
3.4.2 Measuring Instruments

The section 4.0 of List of Measuring Equipment of this test report is used for test.

3.4.3 Test Procedure

1. The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v03r02.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Set RBW = 100 kHz, VBW=300 kHz, Peak Detector. Unwanted Emissions measured in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz when maximum peak conducted output power procedure is used. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB per 15.247(d).
5. Measure and record the results in the test report.
6. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

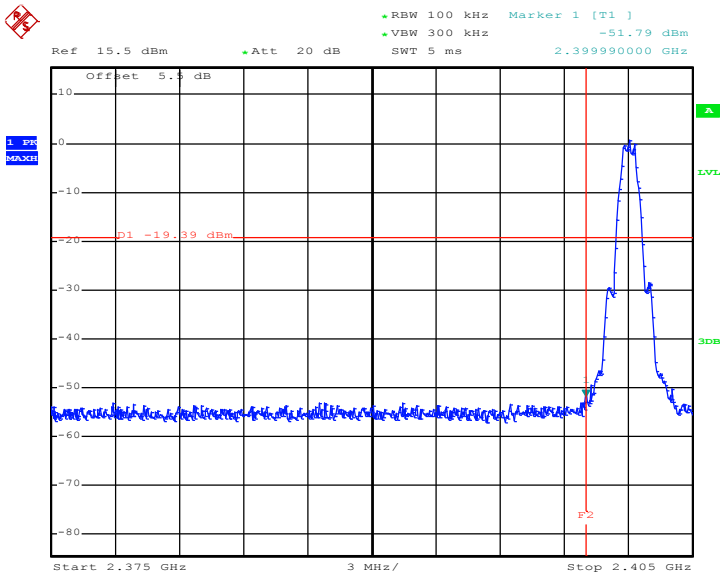
3.4.4 Test Setup



3.4.5 Test Result of Conducted Band Edges

Test Mode :	Bluetooth v4.1 LE	**Temperature :**	24~25℃
Test Channel :	00 and 39	**Relative Humidity :**	49~51%
		Test Engineer :	Issac Song

Low Band Edge Plot on Channel 00



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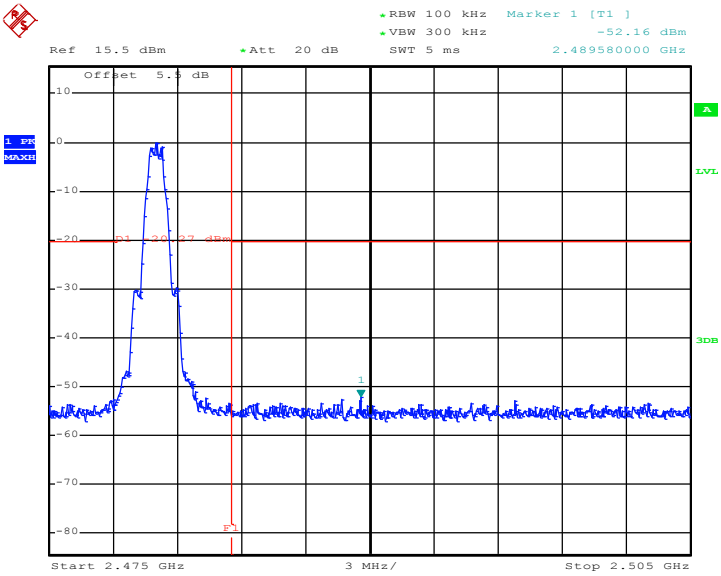
High Band Edge Plot on Channel 39



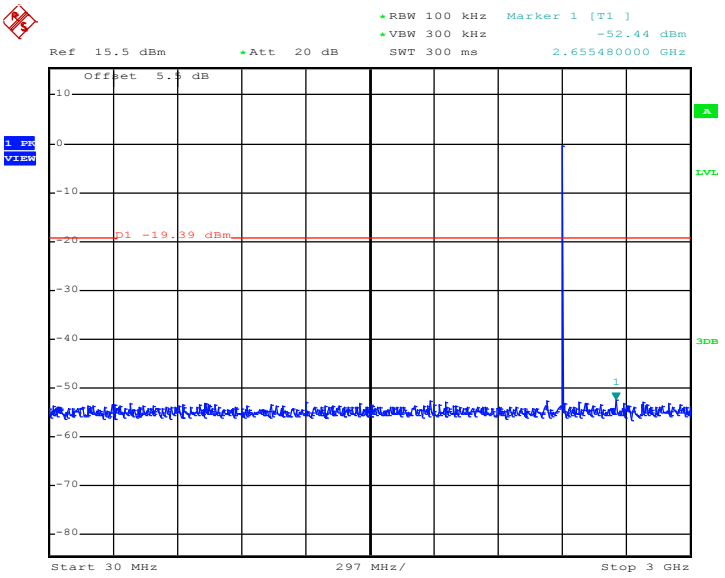
Date: 20.FEB.2015 01:29:26

3.4.6 Test Result of Conducted Spurious Emission

Test Mode :	Bluetooth v4.1 LE	**Temperature :**	24~25℃
Test Channel :	00	**Relative Humidity :**	49~51%
		Test Engineer :	Issac Song

Conducted Spurious Emission Plot on Bluetooth LE 1Mbps

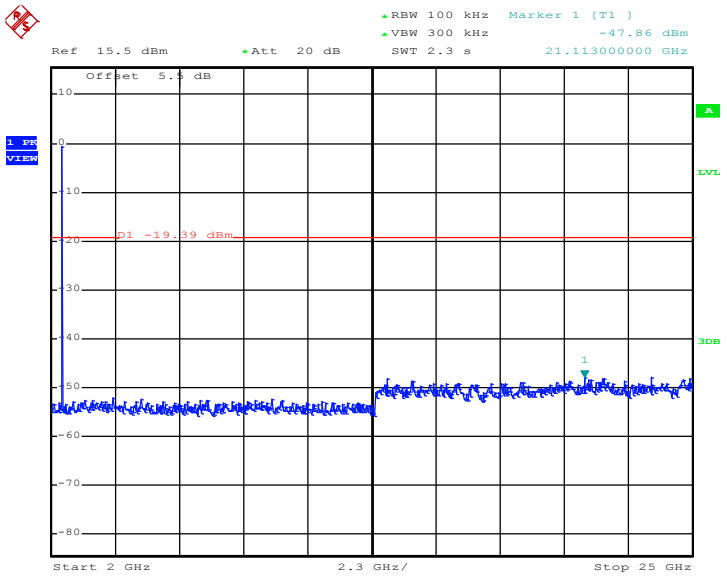
GFSK Channel 00



Date: 20.FEB.2015 01:18:27

Conducted Spurious Emission Plot on Bluetooth LE 1Mbps

GFSK Channel 00

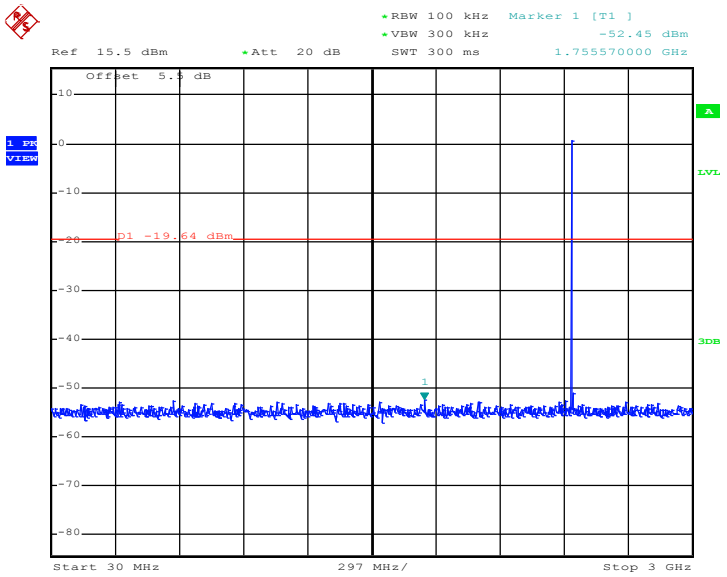


Date: 20.FEB.2015 01:18:45

Test Mode :	Bluetooth v4.1 LE	**Temperature :**	24~25℃
Test Channel :	19	**Relative Humidity :**	49~51%
		Test Engineer :	Issac Song

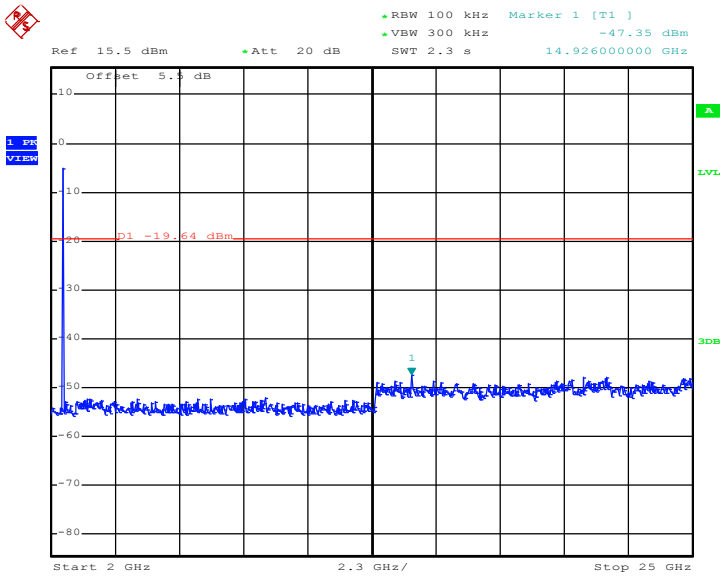
Conducted Spurious Emission Plot on Bluetooth LE 1Mbps

GFSK Channel 19



Conducted Spurious Emission Plot on Bluetooth LE 1Mbps

GFSK Channel 19

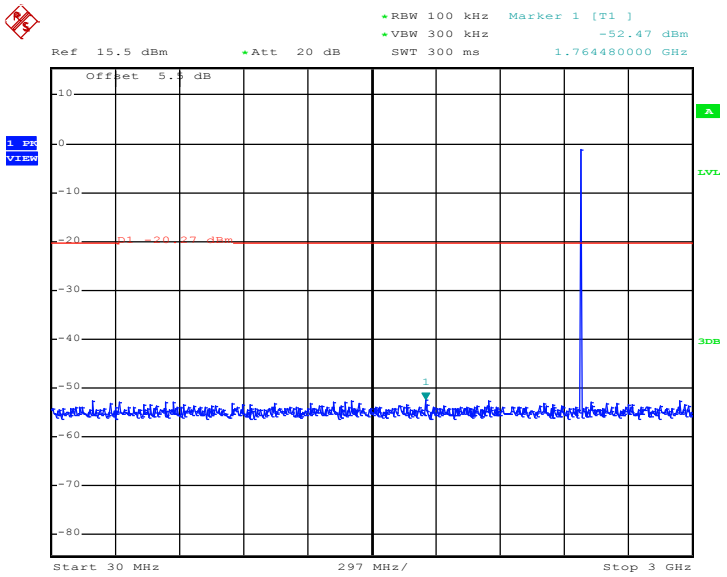


Date: 20.FEB.2015 01:22:47

Test Mode :	Bluetooth v4.1 LE	**Temperature :**	24~25℃
Test Channel :	39	**Relative Humidity :**	49~51%
		Test Engineer :	Issac Song

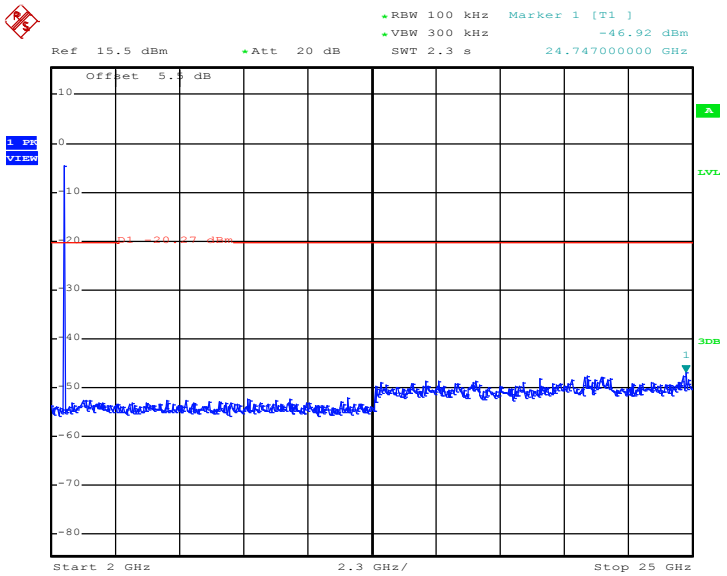
Conducted Spurious Emission Plot on Bluetooth LE 1Mbps

GFSK Channel 39



Conducted Spurious Emission Plot on Bluetooth LE 1Mbps

GFSK Channel 39



Date: 20.FEB.2015 01:30:07

3.5 Radiated Band Edges and Spurious Emission Measurement

3.5.1 Limit of Radiated Band Edges and Spurious Emission

In any 100 kHz bandwidth outside the intentional radiator frequency band, all harmonics/spurious must be at least 20 dB below the highest emission level within the authorized band. If the output power of this device was measured by spectrum analyzer, the attenuation under this paragraph shall be 30 dB instead of 20 dB. In addition, radiated emissions which fall in the restricted bands must also comply with the FCC section 15.209 limits as below.

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30.0	30	30
30 – 88	100	3
88 – 216	150	3
216 - 960	200	3
Above 960	500	3

3.5.2 Measuring Instruments

The section 4.0 of List of Measuring Equipment of this test report is used for test.

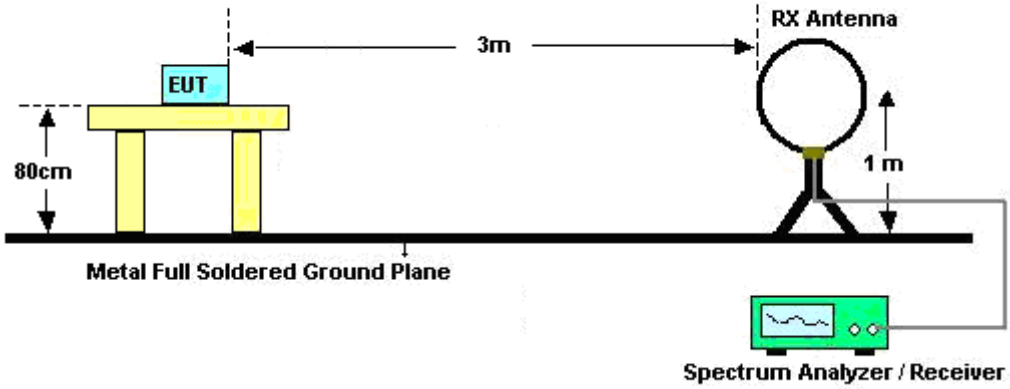
3.5.3 Test Procedures

1. The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v03r02.
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level.
3. The EUT was placed on a turntable with 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz respectively above ground.
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
5. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level
6. For measurement below 1GHz, If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.
7. Use the following spectrum analyzer settings:
   (1) Span shall wide enough to fully capture the emission being measured;
   (2) Set RBW=100 kHz for f < 1 GHz; VBW ≥ RBW; Sweep = auto; Detector function = peak; Trace = max hold;
   (3) Set RBW = 1 MHz, VBW= 3MHz for f ≥ 1 GHz for peak measurement.
   For average measurement:
   - VBW = 10 Hz, when duty cycle is no less than 98 percent.
   - VBW ≥ 1/T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.

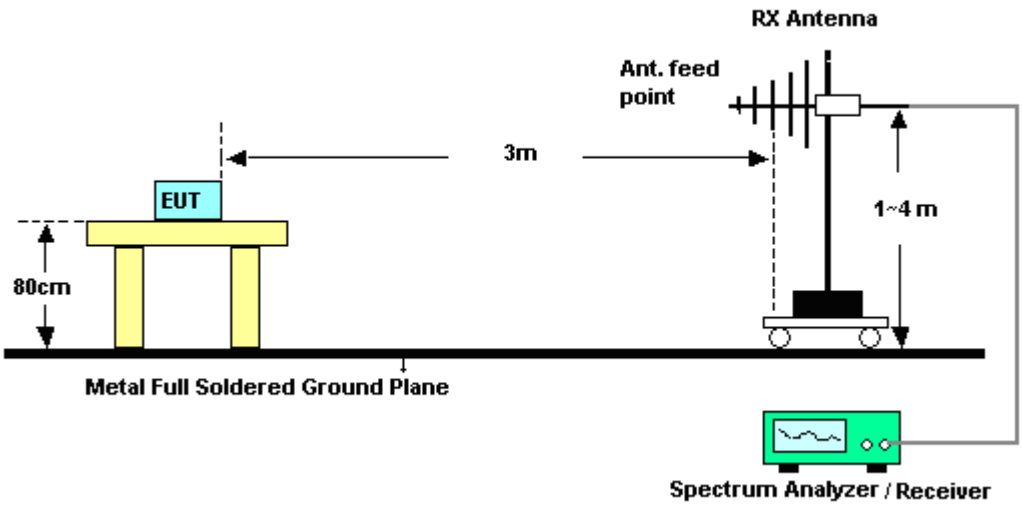
Band	Duty Cycle(%)	T(ms)	1/T(kHz)	VBW Setting
Bluetooth v4.1 LE	62.50	0.39	2.56	3kHz

3.5.4 Test Setup

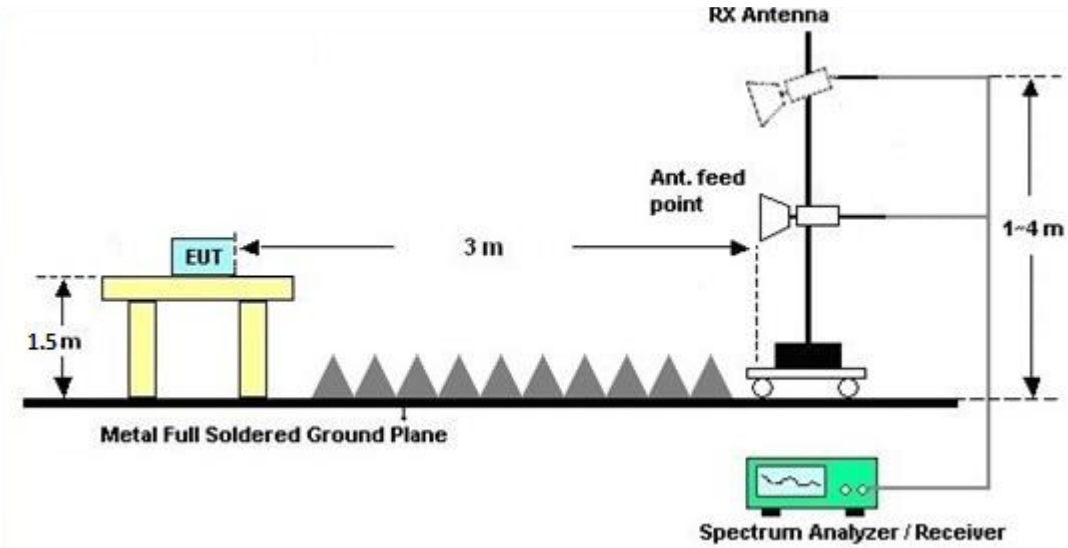
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



3.5.5 Test Results of Radiated Spurious Emissions (9 kHz ~ 30 MHz)

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not reported.

3.5.6 Test Result of Radiated Spurious at Band Edges

Please refer to Appendix A.

3.5.7 Test Result of Radiated Spurious Emission (30MHz ~ 10th Harmonic)

Please refer to Appendix A.

3.6 AC Conducted Emission Measurement

3.6.1 Limit of AC Conducted Emission

For equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table.

Frequency of emission (MHz)	Conducted limit (dBμV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

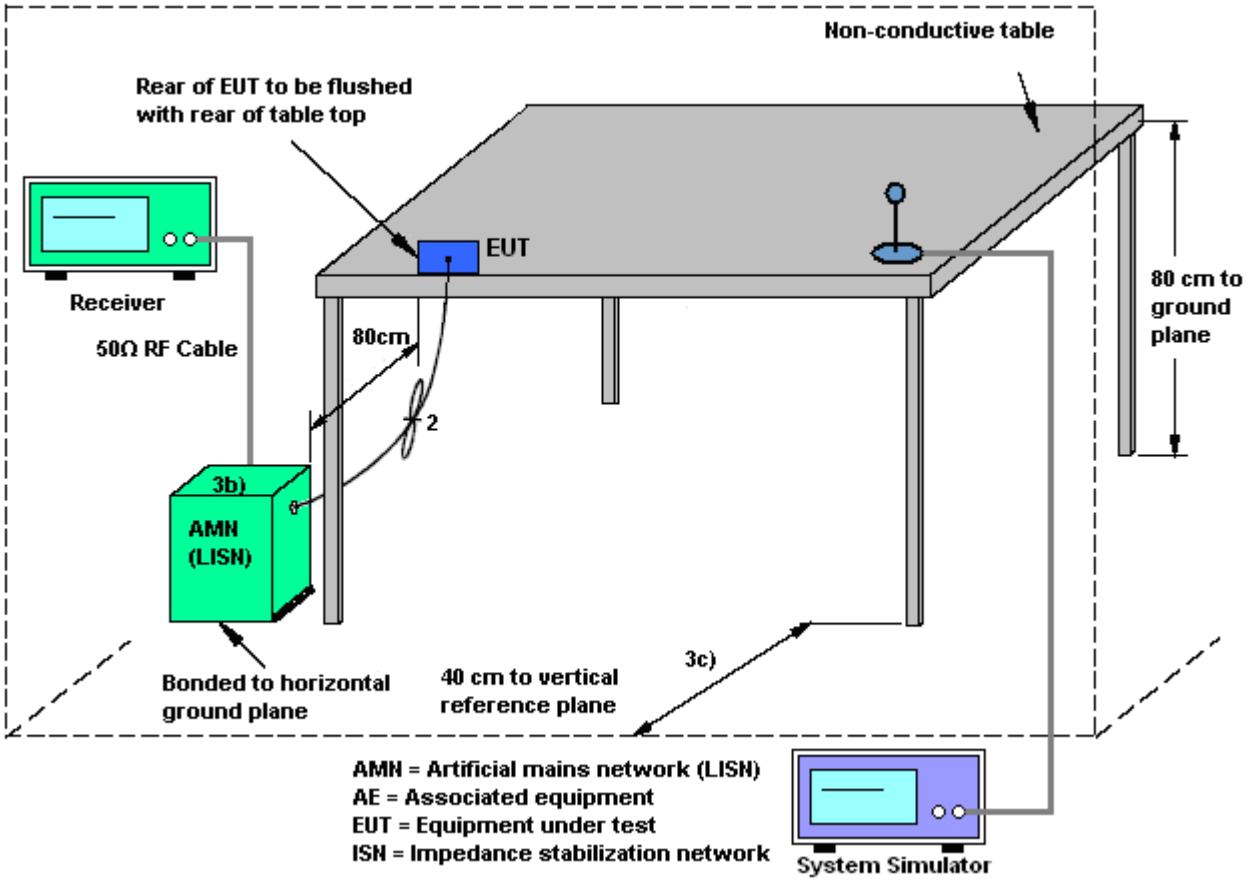
3.6.2 Measuring Instruments

The section 4.0 of List of Measuring Equipment of this test report is used for test.

3.6.3 Test Procedures

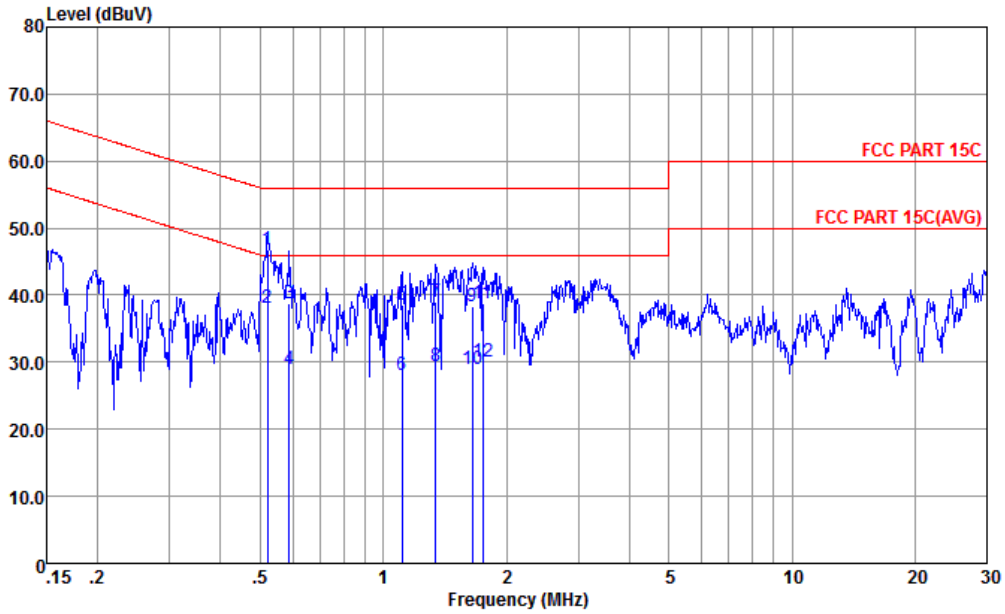
1. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.
4. The LISN provides 50 ohm coupling impedance for the measuring instrument.
5. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
6. Both sides of AC line were checked for maximum conducted interference.
7. The frequency range from 150 kHz to 30 MHz was searched.
8. Set the test-receiver system to Peak Detect Function and specified bandwidth (IF Bandwidth = 9kHz) with Maximum Hold Mode. Then measurement is also conducted by Average Detector and Quasi-Peak Detector Function respectively.

3.6.4 Test Setup



3.6.5 Test Result of AC Conducted Emission

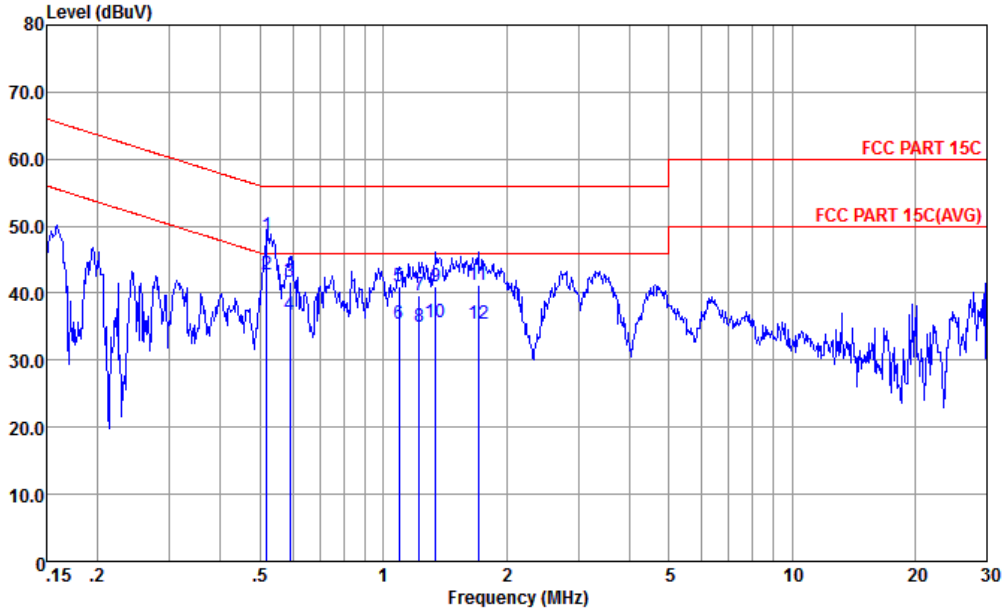
Test Mode :	Mode 1	**Temperature :**	22~24℃
Test Engineer :	Eko Guan	**Relative Humidity :**	33~35%
Test Voltage :	120Vac / 60Hz	**Phase :**	Line
Function Type :	GSM850 Idle + Bluetooth Link + WLAN Link + Earphone + Battery 1 + USB Cable 1(Charging from Adapter 1)		



Site : CO01-KS
Condition : FCC PART 15C LISN-L20140306 LINE

	Freq MHz	Level dBuV	Over Limit dB	Limit Line dBuV	Read Level dBuV	LISN Factor dB	Cable Loss dB	Remark
1	0.52	46.73	-9.27	56.00	35.90	0.20	10.63	QP
2 *	0.52	38.13	-7.87	46.00	27.30	0.20	10.63	Average
3	0.59	38.73	-17.27	56.00	27.90	0.20	10.63	QP
4	0.59	29.03	-16.97	46.00	18.20	0.20	10.63	Average
5	1.11	38.55	-17.45	56.00	27.80	0.10	10.65	QP
6	1.11	28.15	-17.85	46.00	17.40	0.10	10.65	Average
7	1.34	38.97	-17.03	56.00	28.20	0.10	10.67	QP
8	1.34	29.37	-16.63	46.00	18.60	0.10	10.67	Average
9	1.65	38.29	-17.71	56.00	27.50	0.10	10.69	QP
10	1.65	28.99	-17.01	46.00	18.20	0.10	10.69	Average
11	1.75	38.69	-17.31	56.00	27.90	0.10	10.69	QP
12	1.75	29.99	-16.01	46.00	19.20	0.10	10.69	Average

Test Mode :	Mode 1	**Temperature :**	22~24℃
Test Engineer :	Eko Guan	**Relative Humidity :**	33~35%
Test Voltage :	120Vac / 60Hz	**Phase :**	Neutral
Function Type :	GSM850 Idle + Bluetooth Link + WLAN Link + Earphone + Battery 1 + USB Cable 1(Charging from Adapter 1)		



Site : CO01-KS
Condition : FCC PART 15C LISN-N20140306 NEUTRAL

		Freq MHz	Level dBuV	Over Limit dB	Limit Line dBuV	Read Level dBuV	LISN Factor dB	Cable Loss dB	Remark
1		0.52	48.52	-7.48	56.00	37.60	0.29	10.63	QP
2	*	0.52	42.72	-3.28	46.00	31.80	0.29	10.63	Average
3		0.59	41.68	-14.32	56.00	30.80	0.25	10.63	QP
4		0.59	36.78	-9.22	46.00	25.90	0.25	10.63	Average
5		1.09	40.95	-15.05	56.00	30.20	0.10	10.65	QP
6		1.09	35.45	-10.55	46.00	24.70	0.10	10.65	Average
7		1.22	39.56	-16.44	56.00	28.80	0.10	10.66	QP
8		1.22	35.06	-10.94	46.00	24.30	0.10	10.66	Average
9		1.34	41.07	-14.93	56.00	30.30	0.10	10.67	QP
10		1.34	35.67	-10.33	46.00	24.90	0.10	10.67	Average
11		1.71	41.29	-14.71	56.00	30.50	0.10	10.69	QP
12		1.71	35.39	-10.61	46.00	24.60	0.10	10.69	Average

3.7 Antenna Requirements

3.7.1 Standard Applicable

If directional gain of transmitting antennas is greater than 6dBi, the power shall be reduced by the same level in dB comparing to gain minus 6dBi. 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 FCC rule.

3.7.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.

3.7.3 Antenna Gain

The antenna peak gain of EUT is less than 6 dBi. Therefore, it is not necessary to reduce maximum peak output power limit.

4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSP40	100319	9kHz~40GHz	Oct. 28, 2014	Feb. 20, 2015	Oct. 27, 2015	Conducted (TH01-KS)
Pulse Power Senor	Anritsu	MA2411B	0917070	30MHz~40GHz	Jan. 23, 2015	Feb. 20, 2015	Jan. 22, 2016	Conducted (TH01-KS)
Power Meter	Anritsu	ML2495A	1005002	50MHz Bandwidth	Jan. 23, 2015	Feb. 20, 2015	Jan. 22, 2016	Conducted (TH01-KS)
EMI Test Receiver	R&S	ESCI	100534	9kHz~3GHz	Oct. 25, 2014	Feb. 19, 2015	Oct. 24, 2015	Radiation (03CH01-KS)
Spectrum Analyzer	R&S	FSP30	101399	9kHz~30GHz	May 04, 2014	Feb. 19, 2015	May 03, 2015	Radiation (03CH01-KS)
Loop Antenna	R&S	HFH2-Z2	100321	9kHz~30MHz	Nov. 13, 2014	Feb. 19, 2015	Nov. 12, 2015	Radiation (03CH01-KS)
Bilog Antenna	TeseQ	CBL6112D	23182	25Mhz-2Ghz	Jan. 17, 2015	Feb. 19, 2015	Jan. 16, 2016	Radiation (03CH01-KS)
Double Ridge Horn Antenna	ETS-Lindgren	3117	75959	1GHz~18GHz	Jan. 17, 2015	Feb. 19, 2015	Jan. 16, 2016	Radiation (03CH01-KS)
Active Horn Antenna	com-power	AHA-118	701030	1GHz~18GHz	Nov. 08, 2014	Feb. 19, 2015	Nov. 07, 2015	Radiation (03CH01-KS)
SHF-EHF Horn	Schwarzbeck	BBHA 9170	BBHA170249	15GHz~40GHz	Mar. 10, 2014	Feb. 19, 2015	Mar. 09, 2015	Radiation (03CH01-KS)
Amplifier	com-power	PA-103A	161069	1MHz~1GHz /32dB	May 04, 2014	Feb. 19, 2015	May 03, 2015	Radiation (03CH01-KS)
Amplifier	Agilent	8449B	3008A02371	1GHz~26.5GHz	Oct. 28, 2014	Feb. 19, 2015	Oct. 27, 2015	Radiation (03CH01-KS)
AC Power Source	Chroma	61601	F104090004	N/A	NCR	Feb. 19, 2015	NCR	Radiation (03CH01-KS)
Turn Table	MF	MF7802	N/A	0~360 degree	NCR	Feb. 19, 2015	NCR	Radiation (03CH01-KS)
Antenna Mast	MF	MF7802	N/A	1 m~4 m	NCR	Feb. 19, 2015	NCR	Radiation (03CH01-KS)
EMI Receiver	R&S	ESCI7	100768	9kHz~7GHz;	May 04, 2014	Feb. 27, 2015	May 03, 2015	Conduction (CO01-KS)
AC LISN	MessTec	AN3016	060103	9kHz~30MHz	Oct. 25, 2014	Feb. 27, 2015	Oct. 24, 2015	Conduction (CO01-KS)
AC LISN (for auxiliary equipment)	MessTec	AN3016	060105	9kHz~30MHz	Oct. 25, 2014	Feb. 27, 2015	Oct. 24, 2015	Conduction (CO01-KS)
AC Power Source	Chroma	61602	ABP000000811	AC 0V~300V, 45Hz~1000Hz	Oct. 25, 2014	Feb. 27, 2015	Oct. 24, 2015	Conduction (CO01-KS)

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
EMI Test Receiver	R&S	ESR7	101403	9kHz~7GHz;Max 30dBm	Sep. 10, 2015	Mar. 01, 2016	Sep. 09, 2016	Radiation (03CH03-KS)
EXA Spectrum Analyzer	Keysight	N9010A	MY55150244	10Hz-44GHz	Jun. 05, 2015	Mar. 01, 2016	Jun. 04, 2016	Radiation (03CH03-KS)
Loop Antenna	R&S	HFH2-Z2	100321	9kHz~30MHz	Nov. 07, 2015	Mar. 01, 2016	Nov. 06, 2016	Radiation (03CH03-KS)
Bilog Antenna	TeseQ	CBL6112D	35406	25MHz-2GHz	Jun. 25, 2015	Mar. 01, 2016	Jun. 24, 2016	Radiation (03CH03-KS)
Horn Antenna	Schwarzbeck	BBHA9120D	9120D-1356	1GHz~18GHz	Jun. 25, 2015	Mar. 01, 2016	Jun. 24, 2016	Radiation (03CH03-KS)
SHF-EHF Horn	Schwarzbeck	BBHA 9170	BBHA170249	15GHz ~40GHz	Mar. 03, 2015	Mar. 01, 2016	Mar. 02, 2016	Radiation (03CH03-KS)
Amplifier	Burgeon	BPA-530	102212	0.01MHz-3000MHz	Aug. 10, 2015	Mar. 01, 2016	Aug. 09, 2016	Radiation (03CH03-KS)
Amplifier	MITEQ	TTA1840-35-HG	1887435	18~40GHz	Aug. 27, 2015	Mar. 01, 2016	Aug. 26, 2016	Radiation (03CH03-KS)
high gain Amplifier	MITEQ	AMF-7D-00101800-30-10P	1889560	1GHz-18GHz	Aug. 10, 2015	Mar. 01, 2016	Aug. 09, 2016	Radiation (03CH03-KS)
Amplifier	Agilent	8449B	3008A02370	1GHz~26.5GHz	Oct. 24, 2015	Mar. 01, 2016	Oct. 23, 2016	Radiation (03CH03-KS)
AC Power Source	Chroma	61601	F104090004	N/A	NCR	Mar. 01, 2016	NCR	Radiation (03CH03-KS)
Turn Table	ChamPro	EM 1000-T	060762-T	0~360 degree	NCR	Mar. 01, 2016	NCR	Radiation (03CH03-KS)
Antenna Mast	ChamPro	EM 1000-A	060762-A	1 m~4 m	NCR	Mar. 01, 2016	NCR	Radiation (03CH03-KS)

NCR: No Calibration Required

5 Uncertainty of Evaluation

Uncertainty of Conducted Emission Measurement (150 kHz ~ 30 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	2.3dB

Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz) for 03CH01-KS

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	5.0dB

Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz) for 03CH03-KS

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	4.5dB

Appendix A. Radiated Spurious Emission

15C 2.4GHz 2400~2483.5MHz

BLE (Band Edge @ 3m)

BLE	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
BLE CH 00 2402MHz		2370.39	49.41	-24.59	74	48.12	31.28	6.17	36.16	157	139	P	H
		2380.83	36.91	-17.09	54	35.62	31.28	6.17	36.16	157	139	A	H
	*	2402.004	87.57	-	-	86.13	31.3	6.22	36.08	157	139	P	H
	*	2402.004	86.68	-	-	85.24	31.3	6.22	36.08	157	139	A	H
		2377.77	49.51	-24.49	74	48.22	31.28	6.17	36.16	201	109	P	V
		2375.79	36.87	-17.13	54	35.58	31.28	6.17	36.16	201	109	A	V
	*	2402.004	86.03	-	-	84.59	31.3	6.22	36.08	201	109	P	V
	*	2402.004	85.17	-	-	83.73	31.3	6.22	36.08	201	109	A	V
BLE CH 19 2440MHz	*	2439.997	80	-	-	84.57	31.34	6.28	35.91	150	231	P	H
	*	2439.997	79.1	-	-	83.67	31.34	6.28	35.91	150	231	A	H
	*	2439.997	79.34	-	-	83.91	31.34	6.28	35.91	211	112	P	V
	*	2440.08	78.46	-	-	83.03	31.34	6.28	35.91	211	112	A	V
BLE CH 39 2480MHz	*	2480.076	83.78	-	-	81.87	31.37	6.33	35.79	150	188	P	H
	*	2480.076	82.87	-	-	80.96	31.37	6.33	35.79	150	188	A	H
		2486.6	49.06	-24.94	74	47.15	31.37	6.33	35.79	150	188	P	H
		2483.52	39.51	-14.49	54	37.6	31.37	6.33	35.79	150	188	A	H
	*	2480.076	83.08	-	-	81.17	31.37	6.33	35.79	193	176	P	V
	*	2480.076	82.16	-	-	80.25	31.37	6.33	35.79	193	176	A	V
		2494.48	49.28	-24.72	74	47.3	31.39	6.33	35.74	193	176	P	V
		2483.52	39.05	-14.95	54	37.14	31.37	6.33	35.79	193	176	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

15C 2.4GHz 2400~2483.5MHz

BLE (Harmonic @ 3m)

BLE	Note	Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Peak Avg.	Pol.
		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
BLE CH 00 2402MHz		4803	43.91	-30.09	74	36.91	34.88	8.71	36.59	150	154	P	H
		4803	44.88	-29.12	74	37.88	34.88	8.71	36.59	150	224	P	V
BLE CH 19 2440MHz		4881	46.84	-27.16	74	40	34.92	8.76	36.84	150	20	P	H
		7323	46.3	-27.7	74	38.81	35.57	10.84	38.92	150	0	P	H
		4881	46.74	-27.26	74	39.9	34.92	8.76	36.84	150	123	P	V
		7320	45.29	-28.71	74	37.8	35.57	10.84	38.92	150	170	P	V
BLE CH 39 2480MHz		4959	45.69	-28.31	74	39.06	34.97	8.81	37.15	150	124	P	H
		7440	47.18	-26.82	74	39.58	35.59	10.92	38.91	150	54	P	H
		4959	46.37	-27.63	74	39.74	34.97	8.81	37.15	150	245	P	V
		7440	45.94	-28.06	74	38.34	35.59	10.92	38.91	150	0	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

15C Emission below 1GHz

2.4GHz BLE (LF)

BLE	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
2.4GHz BLE LF		30	19.12	-20.88	40	31.79	19.2	0.79	32.66	-	-	P	H
		59.1	19.18	-20.82	40	44.63	6.36	0.79	32.6	-	-	P	H
		113.42	19.98	-23.52	43.5	39.98	11.41	1.23	32.64	-	-	P	H
		153.19	28.15	-15.35	43.5	47.68	11.59	1.44	32.56	100	236	P	H
		179.38	26.67	-16.83	43.5	47.12	10.58	1.44	32.47	-	-	P	H
		215.27	27.19	-16.31	43.5	47.56	10.51	1.61	32.49	-	-	P	H
		30	27.78	-12.22	40	40.45	19.2	0.79	32.66	100	0	P	V
		35.82	23.89	-16.11	40	39.46	16.26	0.79	32.62	-	-	P	V
		52.31	21.67	-18.33	40	45.31	8.18	0.79	32.61	-	-	P	V
		68.8	20.92	-19.08	40	44.78	7.99	0.79	32.64	-	-	P	V
		153.19	23.57	-19.93	43.5	43.1	11.59	1.44	32.56	-	-	P	V
		213.33	27.72	-15.78	43.5	48.18	10.42	1.61	32.49	-	-	P	V
Remark	1. No other spurious found. 2. All results are PASS against limit line.												

Radiated Spurious Emission for Spot Check

15C 2.4GHz 2400~2483.5MHz

BLE (Band Edge @ 3m)

BLE	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
BLE CH 39 2480MHz	*	2479.826	91.32	-	-	94.93	27.64	5.69	36.94	100	146	P	H
	*	2479.993	91.03	-	-	94.64	27.64	5.69	36.94	100	146	A	H
		2486.44	55.88	-18.12	74	59.49	27.64	5.69	36.94	100	146	P	H
		2493.16	46.03	-7.97	54	49.48	27.77	5.71	36.93	100	146	A	H
	*	2479.826	89.29	-	-	92.9	27.64	5.69	36.94	374	119	P	V
	*	2480.076	88.92	-	-	92.53	27.64	5.69	36.94	374	119	A	V
		2490.36	55.93	-18.07	74	59.38	27.77	5.71	36.93	374	119	P	V
		2493.4	46.02	-7.98	54	49.47	27.77	5.71	36.93	374	119	A	V
Remark	3. No other spurious found. 4. All results are PASS against Peak and Average limit line.												

15C 2.4GHz 2400~2483.5MHz

BLE (Harmonic @ 3m)

BLE	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
BLE CH 39 2480MHz		4959	37.71	-36.29	74	58.59	31.72	9.32	61.92	100	360	P	H
		7440	39.26	-34.74	74	52.82	34.44	11.3	59.3	100	216	P	H
		4959	37.33	-36.67	74	58.21	31.72	9.32	61.92	100	257	P	V
		7440	40.65	-33.35	74	54.21	34.44	11.3	59.3	100	0	P	V
Remark	3. No other spurious found. 4. All results are PASS against Peak and Average limit line.												

15C Emission below 1GHz

2.4GHz BLE (LF)

BLE	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
2.4GHz BLE LF		41.64	26.88	-13.12	40	43.32	13.64	0.78	30.86	-	-	P	H
		153.19	32.26	-11.24	43.5	47.54	13.62	1.5	30.4	115	78	P	H
		257.95	32.36	-13.64	46	47.6	13.47	1.79	30.5	-	-	P	H
		364.65	27.54	-18.46	46	39.67	16.15	2.35	30.63	-	-	P	H
		433.52	26.21	-19.79	46	36.91	17.27	2.59	30.56	-	-	P	H
		520.82	23.07	-22.93	46	32.15	18.42	2.86	30.36	-	-	P	H
		40.67	35.93	-4.07	40	52.12	13.92	0.77	30.88	195	85	P	V
		75.59	28.06	-11.94	40	48.37	9.13	1.06	30.5	-	-	P	V
		149.31	27	-16.5	43.5	42.13	13.79	1.48	30.4	-	-	P	V
		267.65	28.06	-17.94	46	42.89	13.8	1.87	30.5	-	-	P	V
		470.38	24.45	-21.55	46	34.44	17.76	2.71	30.46	-	-	P	V
		743.92	23.89	-22.11	46	30.18	20.75	3.45	30.49	-	-	P	V
Remark	3. No other spurious found. 4. All results are PASS against limit line.												

Note symbol

*	**Fundamental Frequency** which can be ignored. However, the level of any unwanted emissions shall not exceed the level of the fundamental frequency per 15.209(c).
!	Test result is **over limit** line.
P/A	**P**eak or **A**verage
H/V	**H**orizontal or **V**ertical

A calculation example for radiated spurious emission is shown as below:

WIFI Ant. 1+2	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11b CH 01 2412MHz		2390	55.45	-18.55	74	54.51	32.22	4.58	35.86	103	308	P	H
		2390	43.54	-10.46	54	42.6	32.22	4.58	35.86	103	308	A	H

1. Level(dBμV/m) =

Antenna Factor(dB/m) + Cable Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)

2. Over Limit(dB) = Level(dBμV/m) – Limit Line(dBμV/m)

For Peak Limit @ 2390MHz:

1. Level(dBμV/m)

= Antenna Factor(dB/m) + Cable Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)

= 32.22(dB/m) + 4.58(dB) + 54.51(dBμV) – 35.86 (dB)

= 55.45 (dBμV/m)

2. Over Limit(dB)

= Level(dBμV/m) – Limit Line(dBμV/m)

= 55.45(dBμV/m) – 74(dBμV/m)

= -18.55(dB)

For Average Limit @ 2390MHz:

1. Level(dBμV/m)

= Antenna Factor(dB/m) + Cable Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)

= 32.22(dB/m) + 4.58(dB) + 42.6(dBμV) – 35.86 (dB)

= 43.54 (dBμV/m)

2. Over Limit(dB)

= Level(dBμV/m) – Limit Line(dBμV/m)

= 43.54(dBμV/m) – 54(dBμV/m)

= -10.46(dB)

Both peak and average measured complies with the limit line, so test result is "PASS".

APPENDIX C PRODUCT EQUALITY DECLARATION

TCT Mobile

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ZhangJiang High-Tech Park, Pudong Area
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TEL: +86(0)21 61460666
FAX: +86(0)21 61460602

Declaration of changes from Initial (Idol 3 5.5 LATAM-6045B) to Variant (Idol 3 5.5 cricket – 6045O)

General: 6045O is a variant product of 6045B.

SOFTWARE MODIFICATIONS:

- Protocol Stack changes: NO
- MMS/STK/USAT/USIM changes: NO
- DM/SUPL/VT/FUMO/SWP/HCI: NO
- Reversible Call: NO
- Other changes detailed: 6045O have no IMS,DTM, have TTY.

HARDWARE MODIFICATIONS:

- Baseband changes: NO
- Band changes: YES

product	GSM	UMTS	LTE
6045B	850/900/1800/1900	FDD 850/900/1900/2100	B1/2/3/4/7/28
6045O	850/900/1800/1900	FDD 850/1900/1700/2100	B2/4/5/12

- Antenna changes: yes
- PCB Layout changes: no
- Main components changes:

	Base Band	Transceiver	ASM	Power Amplifier	Tx SAW Filter	Rx SAW Filter（SAW Duplexer）
GSM 850	NO	NO	NO	NO	N/A	NO
GSM 900	NO	NO	NO	NO	N/A	NO
GSM 1800	NO	NO	NO	NO	N/A	NO
GSM 1900	NO	NO	NO	NO	N/A	NO

	Base Band	Transceiver	ASM	Power Amplifier	Tx SAW Filter	Rx SAW Filter（SAW Duplexer）
UMTS FDD I	NO	NO	NO	NO	N/A	NO
UMTS FDD II	NO	NO	NO	NO	NA	NO
UMTS FDD IV	NO	NO	NO	NO	N/A	NO
UMTS FDD V	NO	NO	NO	NO	N/A	NO

	Base Band	Transceiver	ASM	Power Amplifier	Tx SAW Filter	Rx SAW Filter（SAW Duplexer）
LTE B2	NO	NO	NO	NO	N/A	NO
LTE B4	NO	NO	NO	NO	N/A	NO
LTE B5	NO	NO	NO	NO	N/A	NO
LTE B12	NO	NO	NO	NO	N/A	YES

- Bluetooth changes: NO
- WiFi changes: NO
- FM changes: NO
- Other components changes:NO

TP/LCD/ Camera changes: NO

- Other changes detailed: 6045O support HSDPA Category 14 and GPRS/EDGE class 10. 6045B support HSDPA Category 24 and GPRS/EDGE class 12.

MECHANICAL MODIFICATIONS:

- Use new metal front/back cover or keypad: NO
- Mechanical shell changes: NO

  Whole size of EUT: NO

  Distance of Ear reference point to bottom of handset: NO

  Other trinkets to change the surface of handset: NO
- Other changes detailed

APPROVED BY:

Project Manager:
Signature: 李海光
Date: 2015.8.27