Variant FCC RF Test Report

APPLICANT	**:**	**ZTE CORPORATION**
EQUIPMENT	**:**	**WCDMA/GSM(GPRS) Dual-mode digital mobile phone**
BRAND NAME	**:**	**ZTE**
MODEL NAME	**:**	**Z223**
FCC ID	**:**	**Q78-Z222**
STANDARD	**:**	**FCC Part 15 Subpart C §15.247**
CLASSIFICATION	**:**	**(DSS) Spread Spectrum Transmitter**

This is a variant report which is only valid together with the original report. The product was received on Oct. 16, 2015 and testing was completed on Nov. 20, 2015. 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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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR2O2301-06	Rev. 01	This is a variant report for Z223. The product change description could be referred to Appendix C. All the test cases were performed on original report which can be referred to Sporton Report Number FR2O2301. Based on the original test report, only Conducted Band Edges, Conducted Spurious Emission and radiated spurious emissions were verified for the differences.	Nov. 25, 2015

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	15.247(d)	Conducted Band Edges	≤ 20dBc	Pass	-
3.2	15.247(d)	Conducted Spurious Emission	≤ 20dBc	Pass	-
3.3	15.247(d)	Radiated Band Edges and Radiated Spurious Emission	15.209(a) & 15.247(d)	Pass	Under limit 8.38 dB at 43.580 MHz
3.4	15.203 & 15.247(b)	Antenna Requirement	N/A	Pass	-

1 General Description

1.1 Applicant

ZTE CORPORATION

ZTE Plaza, Keji Road South, Hi-Tech Industrial Park, Nanshan District, Shenzhen, Guangdong, 518057, P. R. China

1.2 Manufacturer

ZTE CORPORATION

ZTE Plaza, Keji Road South, Hi-Tech Industrial Park, Nanshan District, Shenzhen, Guangdong, 518057, P. R. China

1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	WCDMA/GSM(GPRS) Dual-mode digital mobile phone
Brand Name	ZTE
Model Name	Z223
FCC ID	Q78-Z222
EUT supports Radios application	GSM/GPRS/EGPRS/WCDMA/HSDPA/ Bluetooth v2.0 + EDR
IMEI Code	Conducted: 868899020000317 Radiation: 868899020000382
HW Version	u38A
SW Version	V1.0.3
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	79
Carrier Frequency of Each Channel	2402+n*1 MHz; n=0~78
Antenna Type	PIFA Antenna
Type of Modulation	Bluetooth BR (1Mbps) : GFSK Bluetooth EDR (2Mbps) : π/4-DQPSK Bluetooth EDR (3Mbps) : 8-DPSK

1.5 Modification of EUT

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

1.6 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	03CH03-KS	306251

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

1.7 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 Public Notice DA 00-705
- ANSI C63.10-2009

Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. FCC permits the use of the 1.5 meter table as an alternative in C63.10-2013 through inquiry tracking number 961829.
3. 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 Test Mode

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

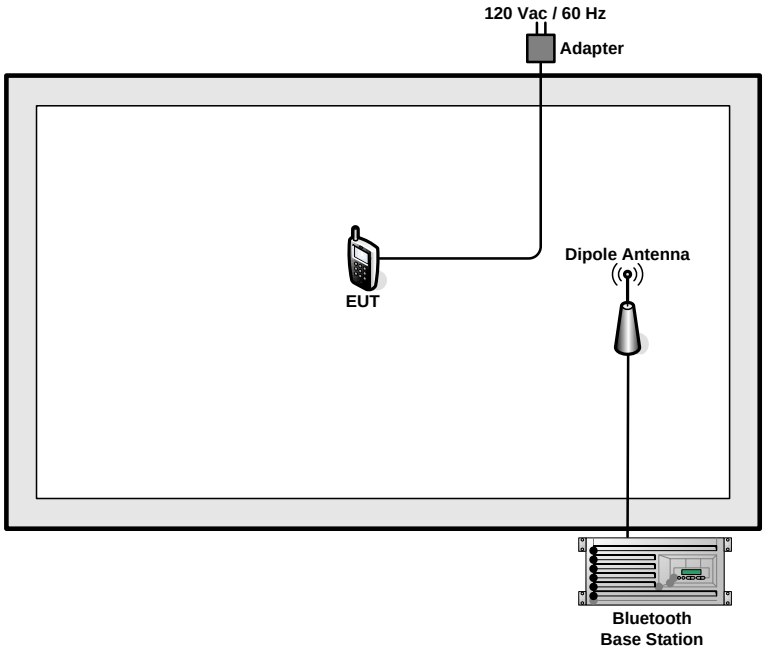
Summary table of Test Cases			
Test Item	**Data Rate / Modulation**		
	Bluetooth BR 1Mbps GFSK	**Bluetooth EDR 2Mbps π/4-DQPSK**	**Bluetooth EDR 3Mbps 8-DPSK**
Conducted Test Cases	Mode 1: CH00_2402 MHz Mode 2: CH39_2441 MHz Mode 3: CH78_2480 MHz	Mode 4: CH00_2402 MHz Mode 5: CH39_2441 MHz Mode 6: CH78_2480 MHz	Mode 7: CH00_2402 MHz Mode 8: CH39_2441 MHz Mode 9: CH78_2480 MHz
Radiated Test Cases	**Bluetooth BR 1Mbps GFSK**		
	Mode 1: CH00_2402 MHz Mode 2: CH39_2441 MHz Mode 3: CH78_2480 MHz		

Remark:

1. For Radiated Test Cases, The tests were performance with Adapter.
2. 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: 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, and different data rates were conducted to determine the final configuration (Z plane as worst plane) from all possible combinations, and the worst mode of radiated spurious emissions is Bluetooth 1Mbps mode, and recorded in this report.

2.2 Connection Diagram of Test System

<Bluetooth Tx Mode>



2.3 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	Bluetooth Base Station	R&S	CBT32	N/A	N/A	Unshielded, 1.8 m

2.4 EUT Operation Test Setup

For Bluetooth function, the engineering test program was provided and enabled to make EUT connect with Bluetooth base station to continuous transmit/receive.

2.5 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 Conducted Band Edges Measurement

3.1.1 Limit of Band Edges

In any 100 kHz bandwidth outside the intentional radiation frequency band, the radio frequency power shall be at least 20 dB below the highest level of the radiated power. In addition, radiated emissions which fall in the restricted bands must also comply with the radiated emission limits.

3.1.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.1.3 Test Procedures

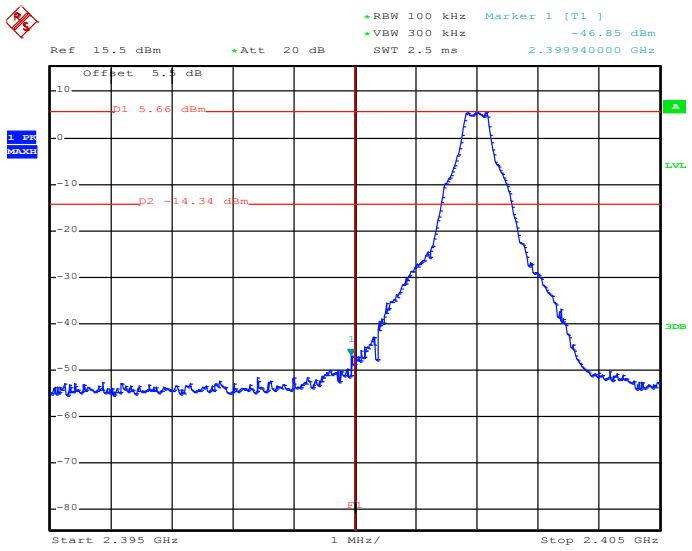
1. The testing follows the guidelines in Band-edge Compliance of RF Conducted Emissions of FCC Public Notice DA 00-705 Measurement Guidelines.
2. Set to the maximum power setting and enable the EUT transmit continuously.
3. Set RBW = 100kHz (≥ 1% span=10MHz), VBW = 300kHz (≥ RBW). Band edge emissions must be at least 20 dB down from the highest emission level within the authorized band as measured with a 100kHz RBW. The attenuation shall be 30 dB instead of 20 dB when RMS conducted output power procedure is used.
4. Enable hopping function of the EUT and then repeat step 2. and 3.
5. Measure and record the results in the test report.

3.1.4 Test Setup

3.1.5 Test Result of Conducted Band Edges

Test Mode :	1Mbps	**Temperature :**	24~25℃
Test Channel :	00 and 78	**Relative Humidity :**	49~51%
		Test Engineer :	Issac Song

Low Band Edge Plot on Channel 00



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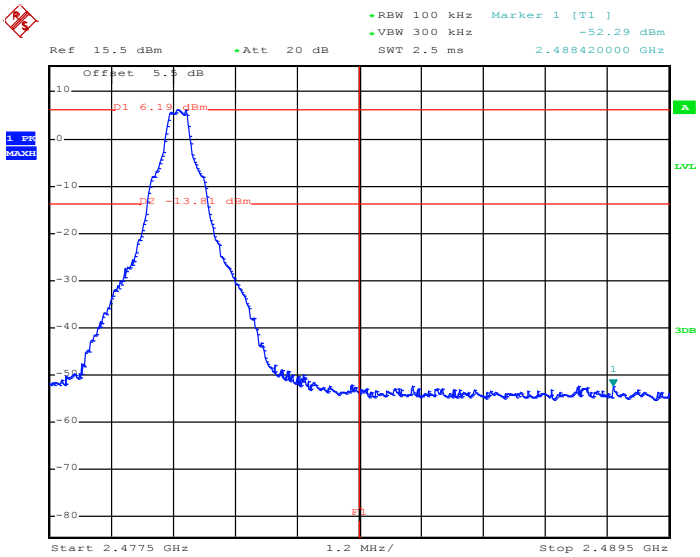
High Band Edge Plot on Channel 78



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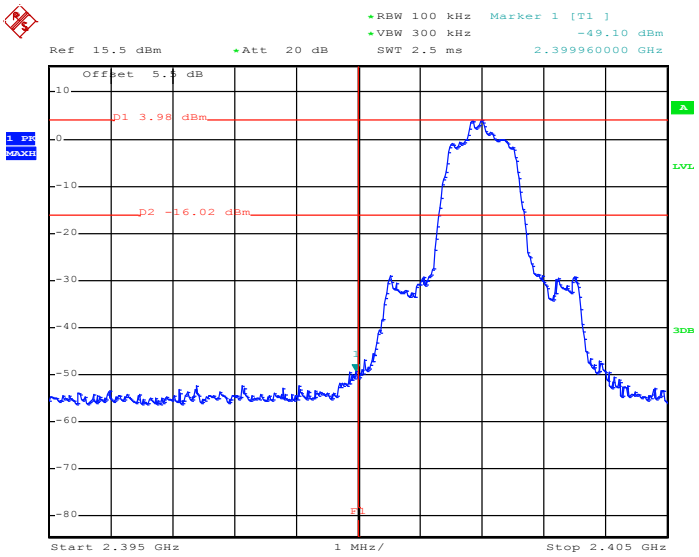
Test Mode :	2Mbps	**Temperature :**	24~25℃
Test Channel :	00 and 78	**Relative Humidity :**	49~51%
		Test Engineer :	Issac Song

Low Band Edge Plot on Channel 00



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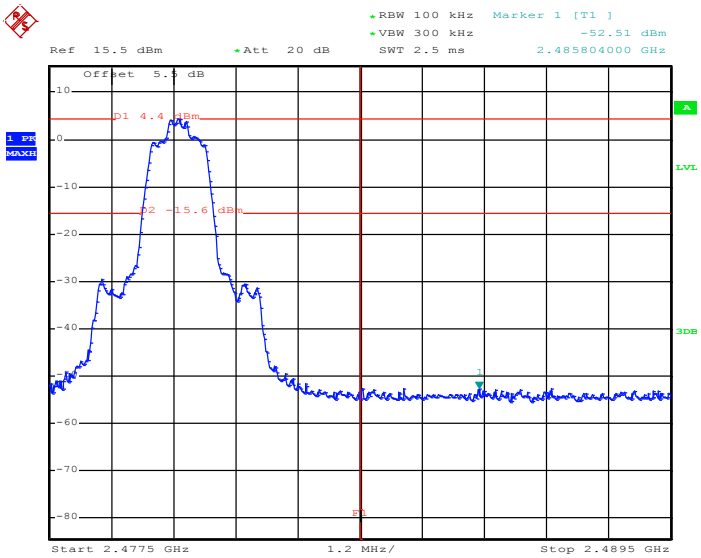
High Band Edge Plot on Channel 78



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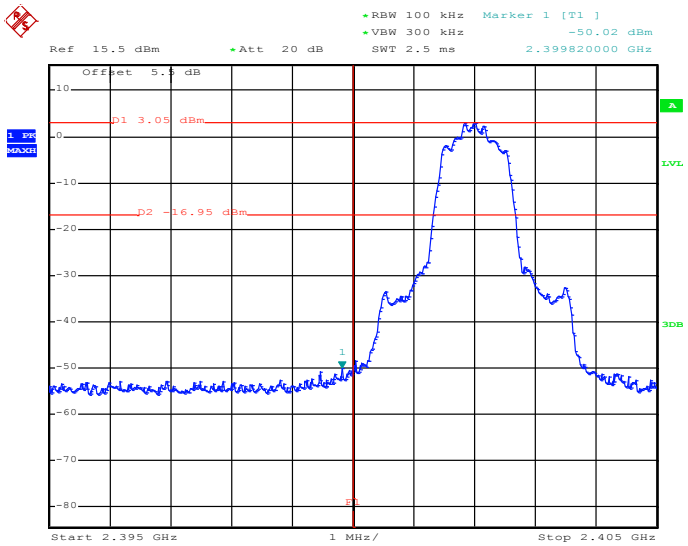
Test Mode :	3Mbps	**Temperature :**	24~25℃
Test Channel :	00 and 78	**Relative Humidity :**	49~51%
		Test Engineer :	Issac Song

Low Band Edge Plot on Channel 00



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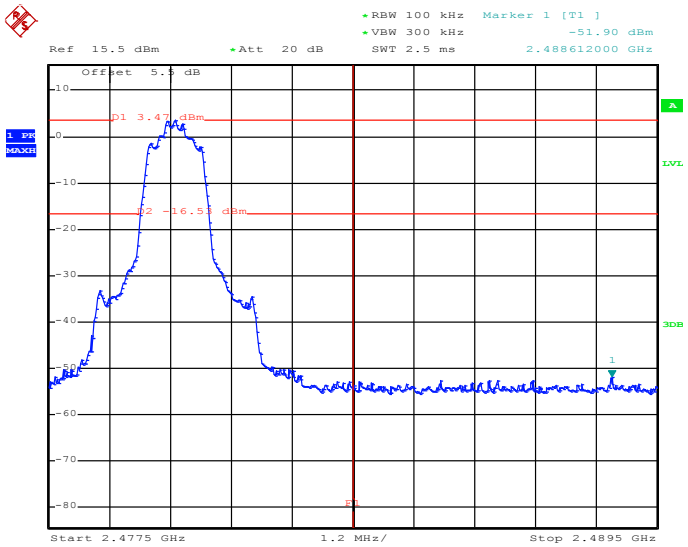
High Band Edge Plot on Channel 78

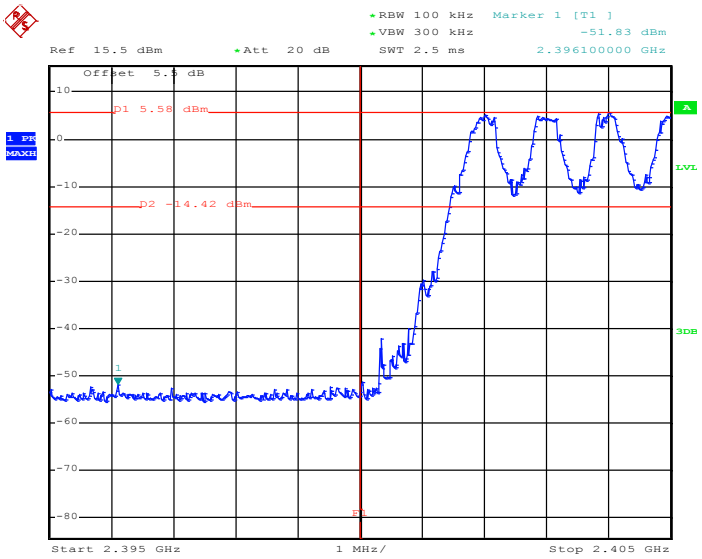


Date: 20.NOV.2015 16:15:48

3.1.6 Test Result of Conducted Hopping Mode Band Edges

Test Mode :	1Mbps	**Temperature :**	24~25℃
Test Engineer :	Issac Song	**Relative Humidity :**	49~51%

1Mbps Hopping Mode Low Band Edge Plot



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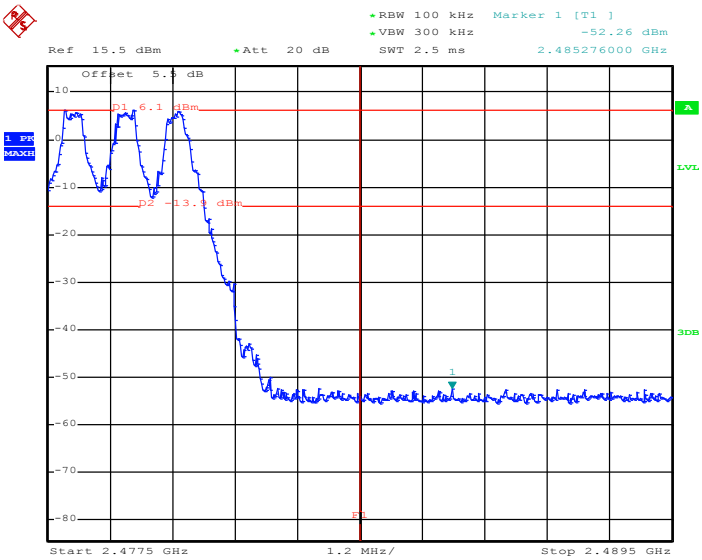
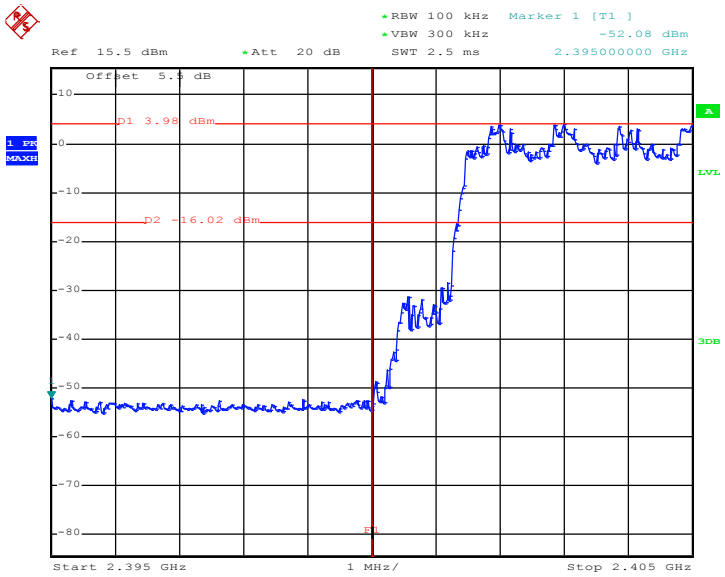
1Mbps Hopping Mode High Band Edge Plot



Date: 20.NOV.2015 16:19:09

Test Mode :	2Mbps	Temperature :	24~25℃
Test Engineer :	Issac Song	Relative Humidity :	49~51%

2Mbps Hopping Mode Low Band Edge Plot



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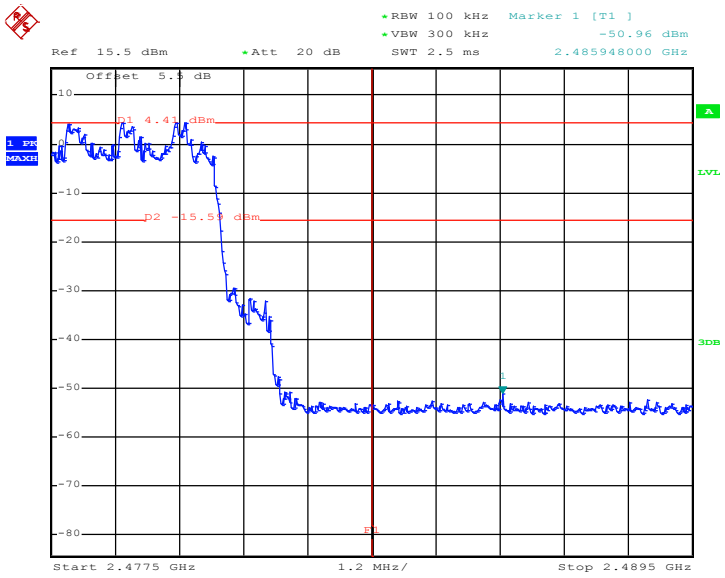
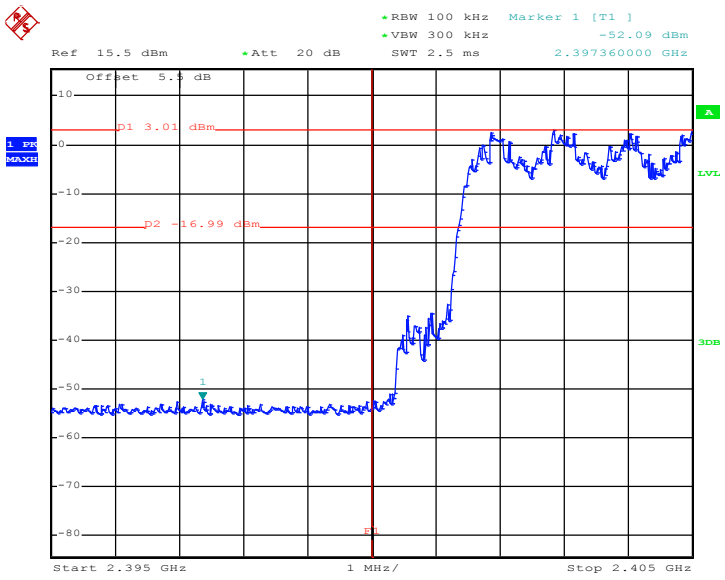
2Mbps Hopping Mode High Band Edge Plot



Date: 20.NOV.2015 16:28:09

Test Mode :	3Mbps	Temperature :	24~25℃
Test Engineer :	Issac Song	Relative Humidity :	49~51%

3Mbps Hopping Mode Low Band Edge Plot



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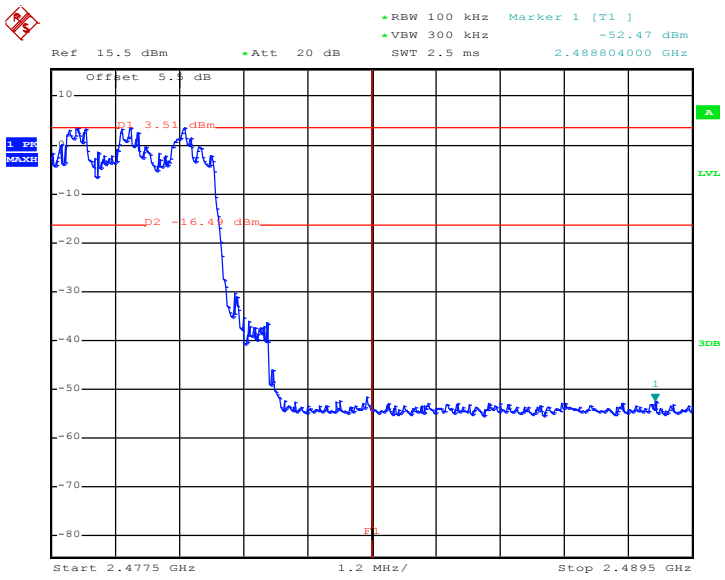
3Mbps Hopping Mode High Band Edge Plot



Date: 20.NOV.2015 16:29:24

3.2 Conducted Spurious Emission Measurement

3.2.1 Limit of Spurious Emission Measurement

In any 100 kHz bandwidth outside the intentional radiation frequency band, the radio frequency power shall be at least 20 dB below the highest level of the radiated power. In addition, radiated emissions which fall in the restricted bands must also comply with the radiated emission limits.

3.2.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.2.3 Test Procedure

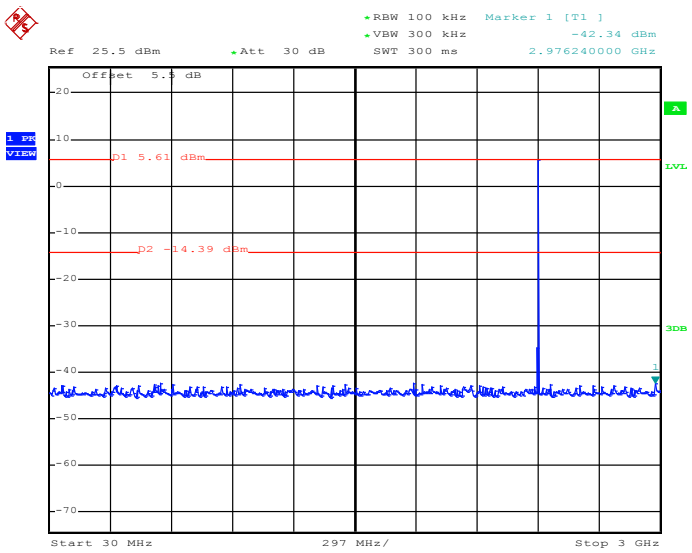
1. The testing follows the guidelines in Spurious RF Conducted Emissions of FCC Public Notice DA 00-705 Measurement Guidelines
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Set RBW = 100 kHz, VBW = 300kHz, scan up through 10th harmonic. All harmonics / spurs must be at least 20 dB down from the highest emission level within the authorized band as measured with a 100 kHz RBW.
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.

3.2.4 Test Setup

3.2.5 Test Result of Conducted Spurious Emission

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

1Mbps CSE Plot on Ch 00 between 30MHz ~ 3 GHz



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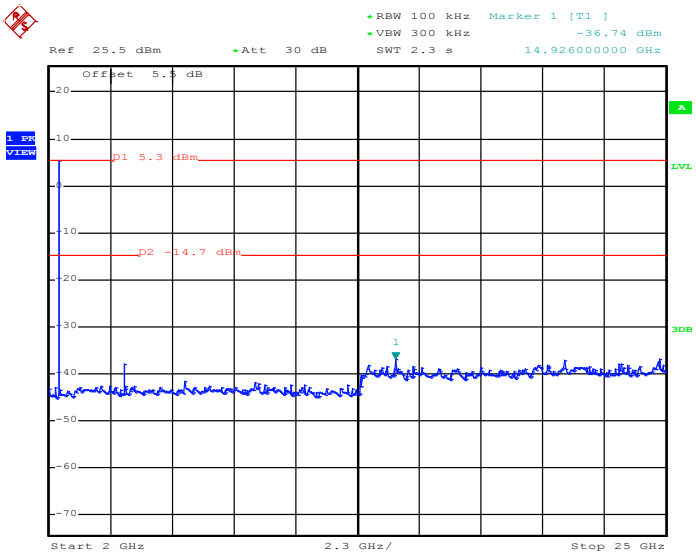
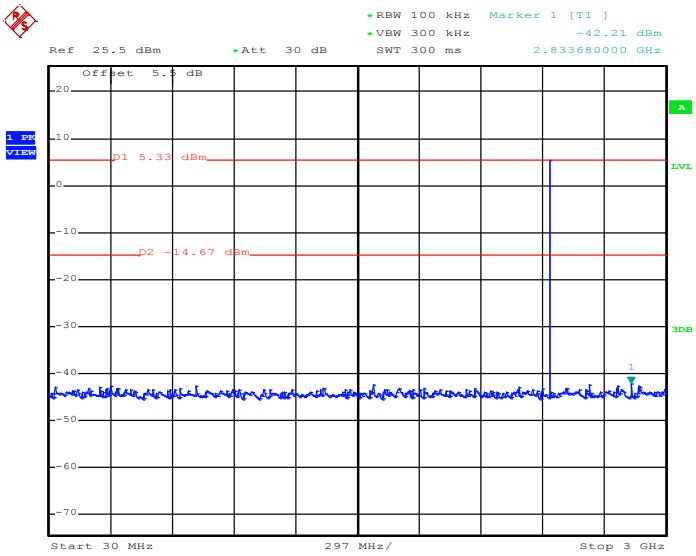
1Mbps CSE Plot on Ch 00 between 2 GHz ~ 25 GHz



Date: 20.NOV.2015 16:32:20

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

1Mbps CSE Plot on Ch 39 between 30MHz ~ 3 GHz



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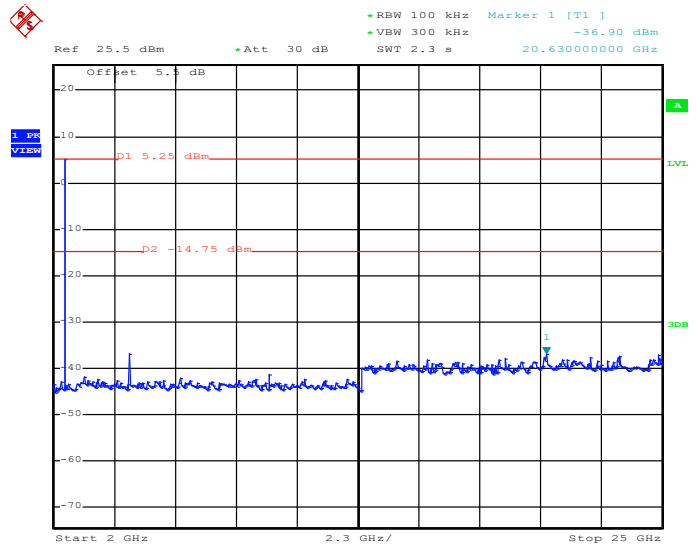
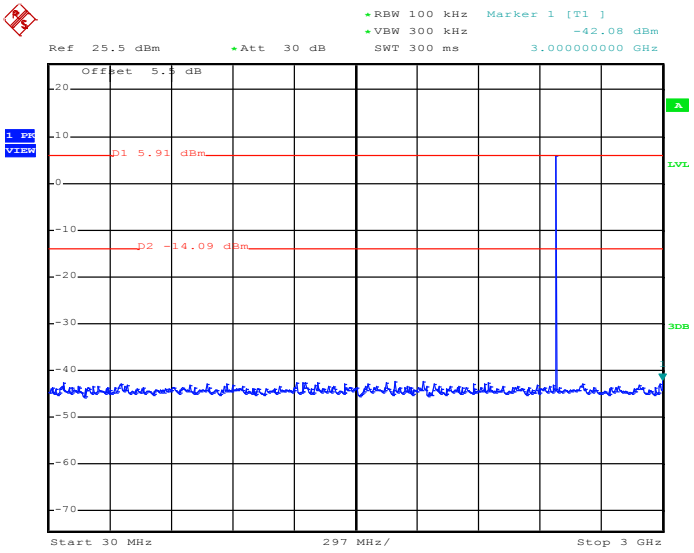
1Mbps CSE Plot on Ch 39 between 2 GHz ~ 25 GHz



Date: 20.NOV.2015 16:33:33

Test Mode :	1Mbps	**Temperature :**	24~25℃
Test Channel :	78	**Relative Humidity :**	49~51%
		Test Engineer :	Issac Song

1Mbps CSE Plot on Ch 78 between 30MHz ~ 3 GHz



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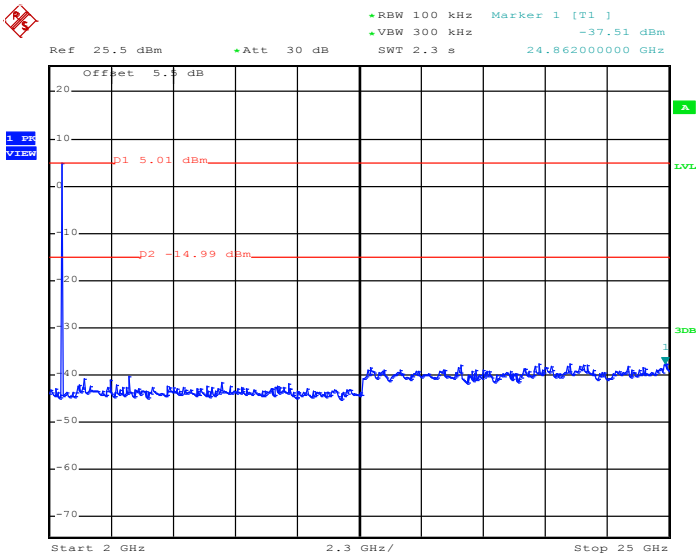
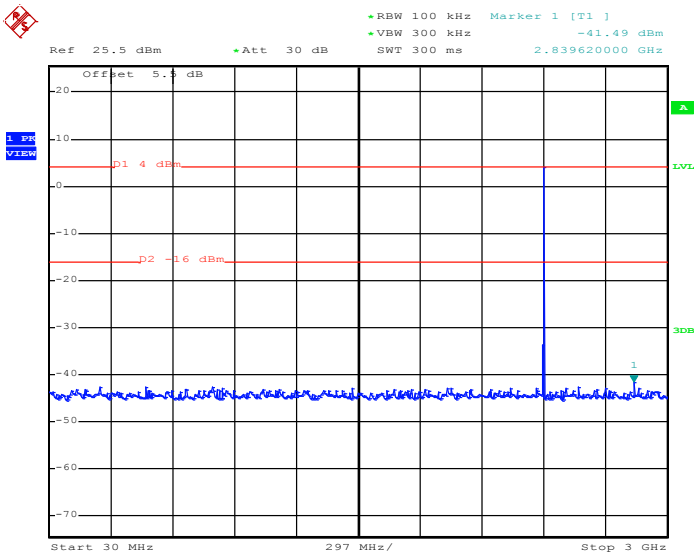
1Mbps CSE Plot on Ch 78 between 2 GHz ~ 25 GHz



Date: 20.NOV.2015 16:36:53

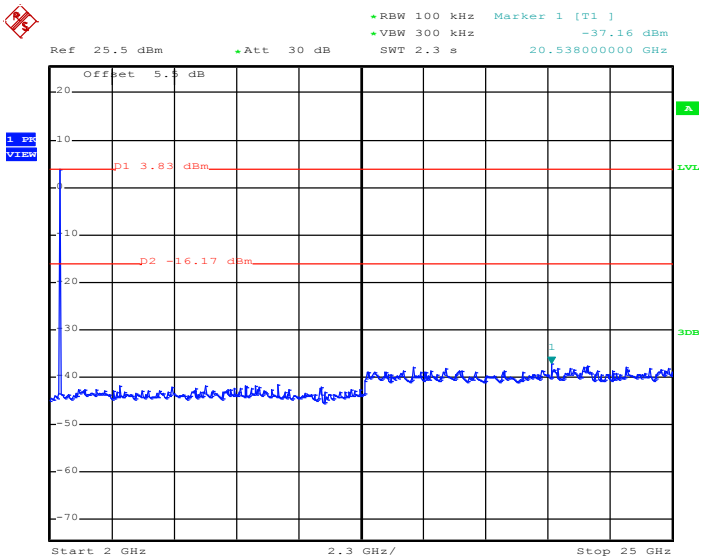
Test Mode :	2Mbps	Temperature :	24~25℃
Test Channel :	00	Relative Humidity :	49~51%
		Test Engineer :	Issac Song

2Mbps CSE Plot on Ch 00 between 30MHz ~ 3 GHz



Date: 20.NOV.2015 16:40:47

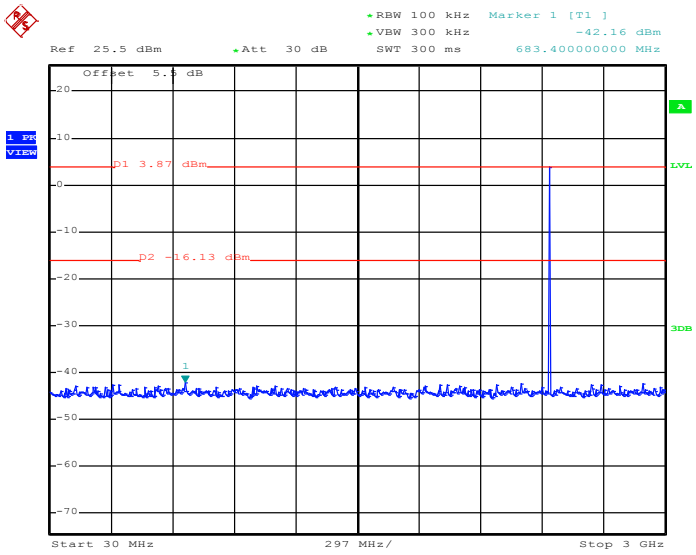
2Mbps CSE Plot on Ch 00 between 2 GHz ~ 25 GHz



Date: 20.NOV.2015 16:41:09

Test Mode :	2Mbps	Temperature :	24~25℃
Test Channel :	39	Relative Humidity :	49~51%
		Test Engineer :	Issac Song

2Mbps CSE Plot on Ch 39 between 30MHz ~ 3 GHz



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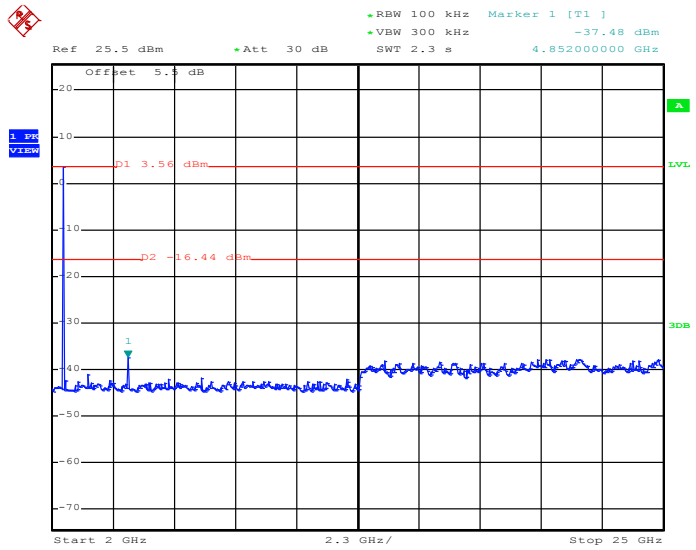
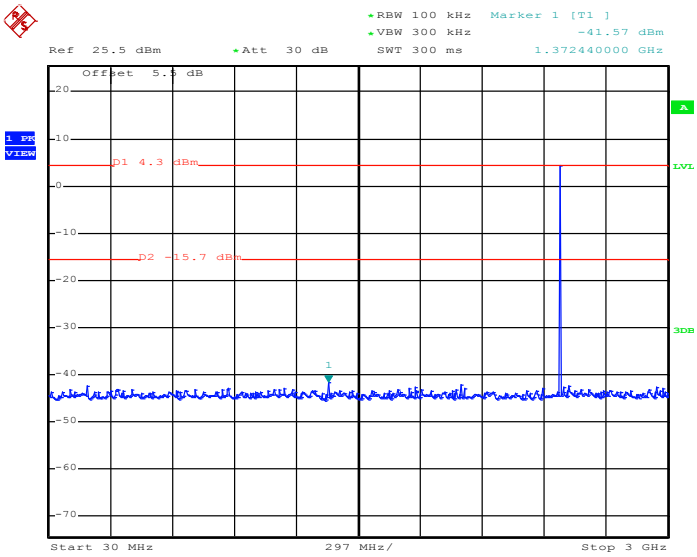
2Mbps CSE Plot on Ch 39 between 2 GHz ~ 25 GHz



Date: 20.NOV.2015 16:42:19

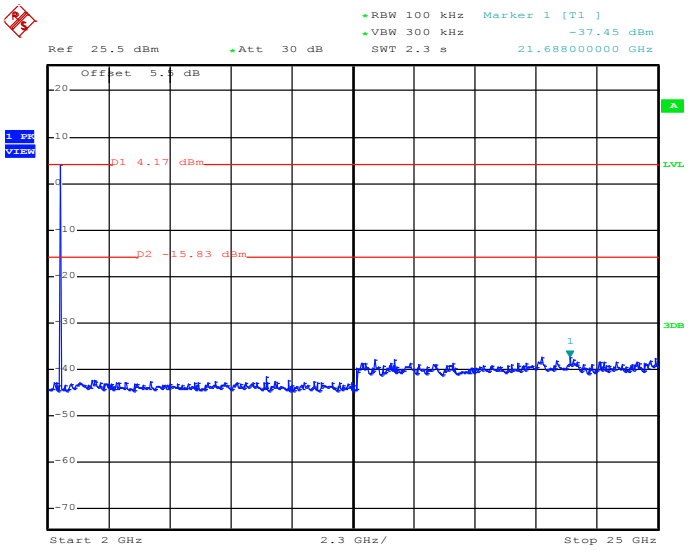
Test Mode :	2Mbps	Temperature :	24~25℃
Test Channel :	78	Relative Humidity :	49~51%
		Test Engineer :	Issac Song

2Mbps CSE Plot on Ch 78 between 30MHz ~ 3 GHz



Date: 20.NOV.2015 16:37:59

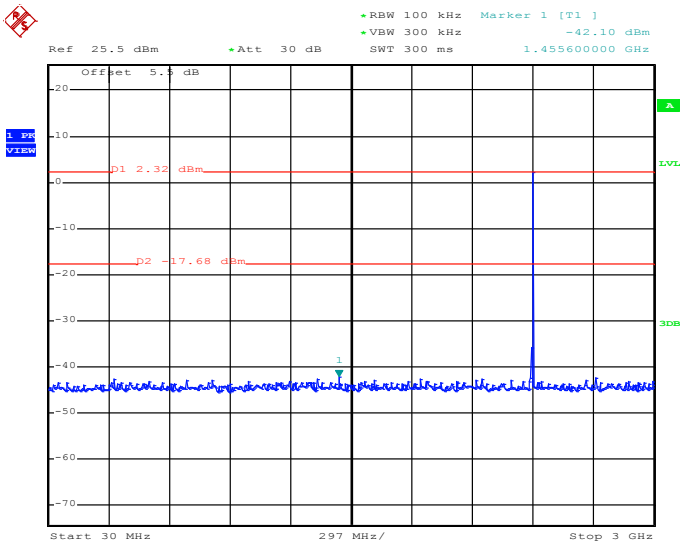
2Mbps CSE Plot on Ch 78 between 2 GHz ~ 25 GHz



Date: 20.NOV.2015 16:38:20

Test Mode :	3Mbps	Temperature :	24~25℃
Test Channel :	00	Relative Humidity :	49~51%
		Test Engineer :	Issac Song

3Mbps CSE Plot on Ch 00 between 30MHz ~ 3 GHz



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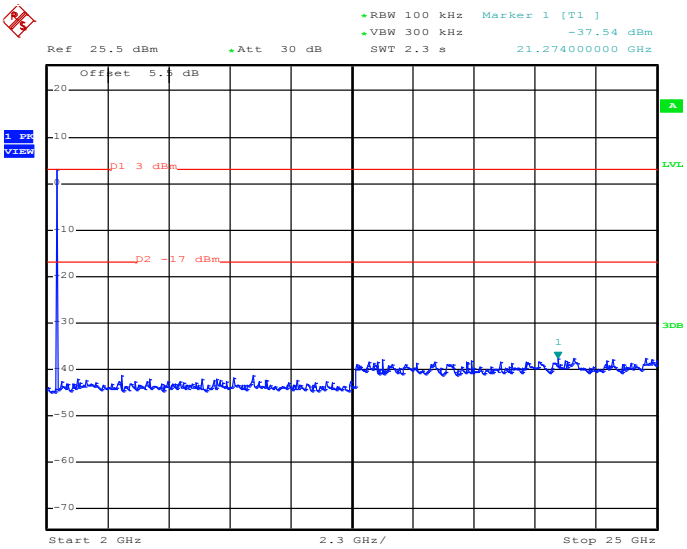
3Mbps CSE Plot on Ch 00 between 2 GHz ~ 25 GHz



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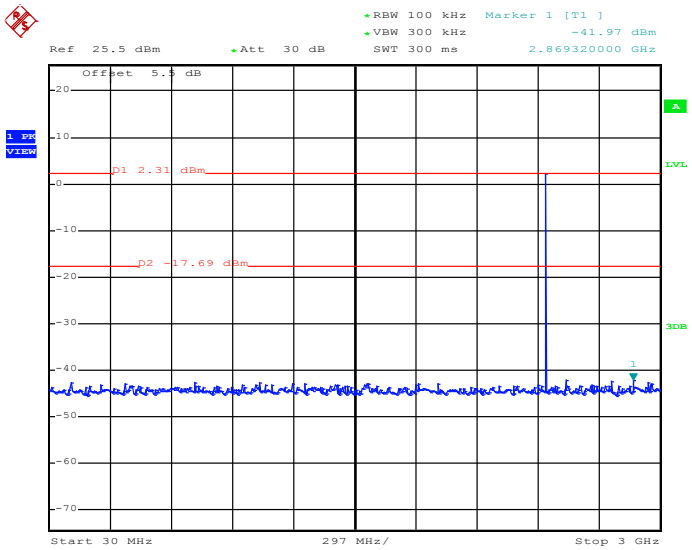
Test Mode :	3Mbps	Temperature :	24~25℃
Test Channel :	39	Relative Humidity :	49~51%
		Test Engineer :	Issac Song

3Mbps CSE Plot on Ch 39 between 30MHz ~ 3 GHz



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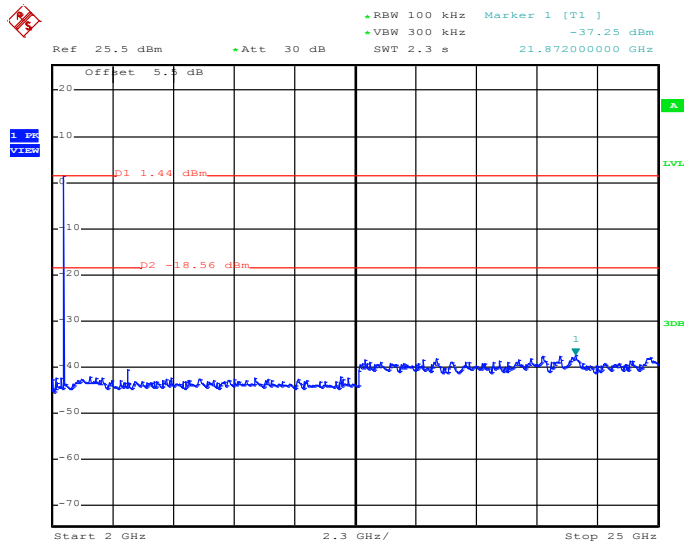
3Mbps CSE Plot on Ch 39 between 2 GHz ~ 25 GHz



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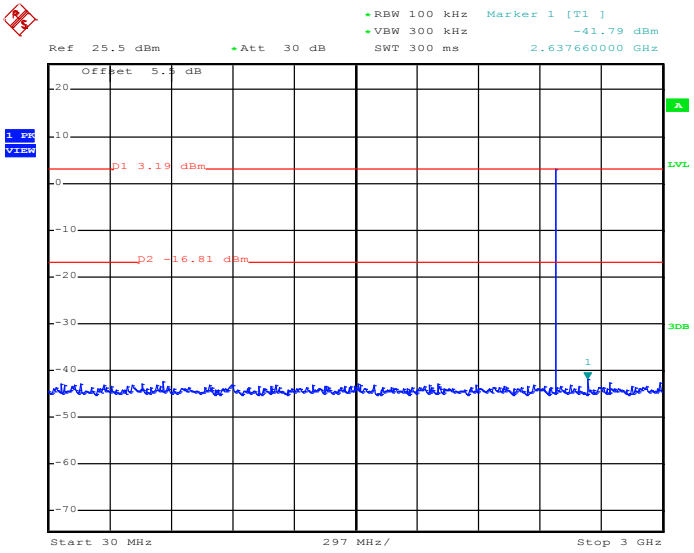
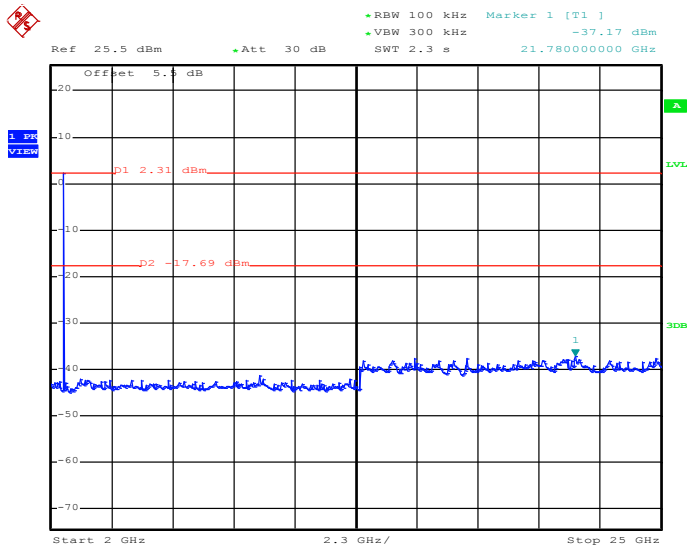
Test Mode :	3Mbps	Temperature :	24~25℃
Test Channel :	78	Relative Humidity :	49~51%
		Test Engineer :	Issac Song

3Mbps CSE Plot on Ch 78 between 30MHz ~ 3 GHz



Date: 20.NOV.2015 16:53:04

3Mbps CSE Plot on Ch 78 between 2 GHz ~ 25 GHz



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3.3 Radiated Band Edges and Spurious Emission Measurement

3.3.1 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. 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

3.3.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

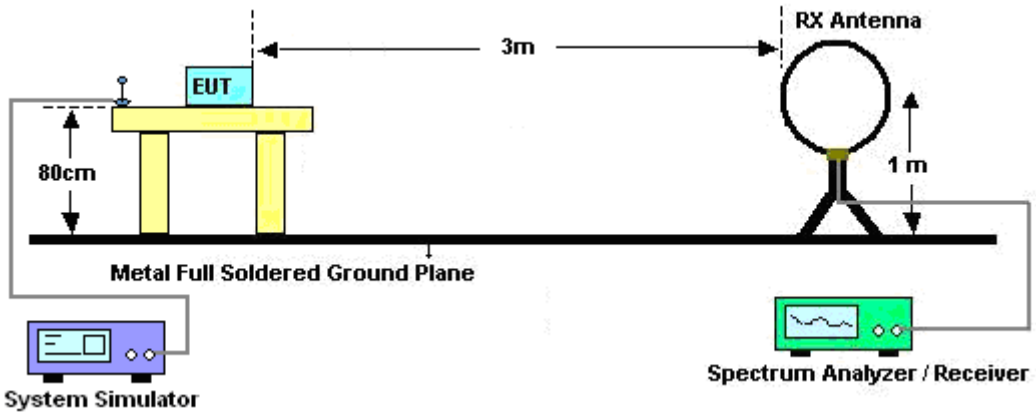
3.3.3 Test Procedures

1. The testing follows the guidelines in Spurious Radiated Emissions of FCC Public Notice DA 00-705 Measurement Guidelines.
2. 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.
3. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
4. For each suspected emission, the EUT was arranged to its worst case and then tune the Antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level to comply with the guidelines.
5. Set to the maximum power setting and enable the EUT transmit continuously.
6. Use the following spectrum analyzer settings:
   (1) Span shall wide enough to fully capture the emission being measured;
   (2) Set RBW=100 kHz for f < 1 GHz, RBW=1MHz for f>1GHz ; VBW ≥ RBW; Sweep = auto; Detector function = peak; Trace = max hold for peak
   (3) For average measurement: use duty cycle correction factor method per 15.35(c).
   Duty cycle = On time/100 milliseconds
   On time = $N_1*L_1+N_2*L_2+...+N_{n-1}*LN_{n-1}+N_n*L_n$
   Where N_1 is number of type 1 pulses, L_1 is length of type 1 pulses, etc.
   Average Emission Level = Peak Emission Level + 20*log(Duty cycle)
7. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level

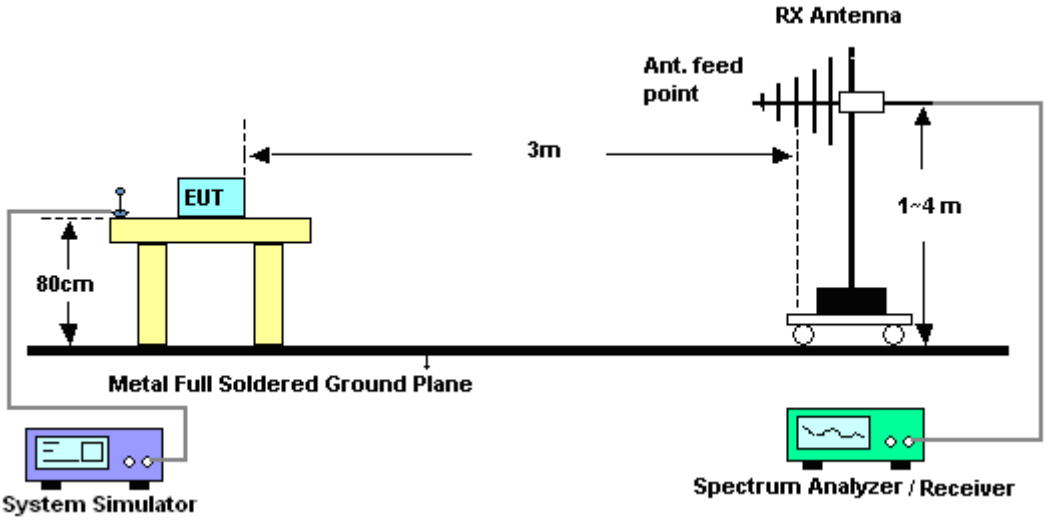
Note: The average levels were calculated from the peak level corrected with duty cycle correction factor (-24.79dB) derived from 20log (dwell time/100ms). This correction is only for signals that hop with the fundamental signal, such as band-edge and harmonic. Other spurious signals that are independent of the hopping signal would not use this correction.

3.3.4 Test Setup

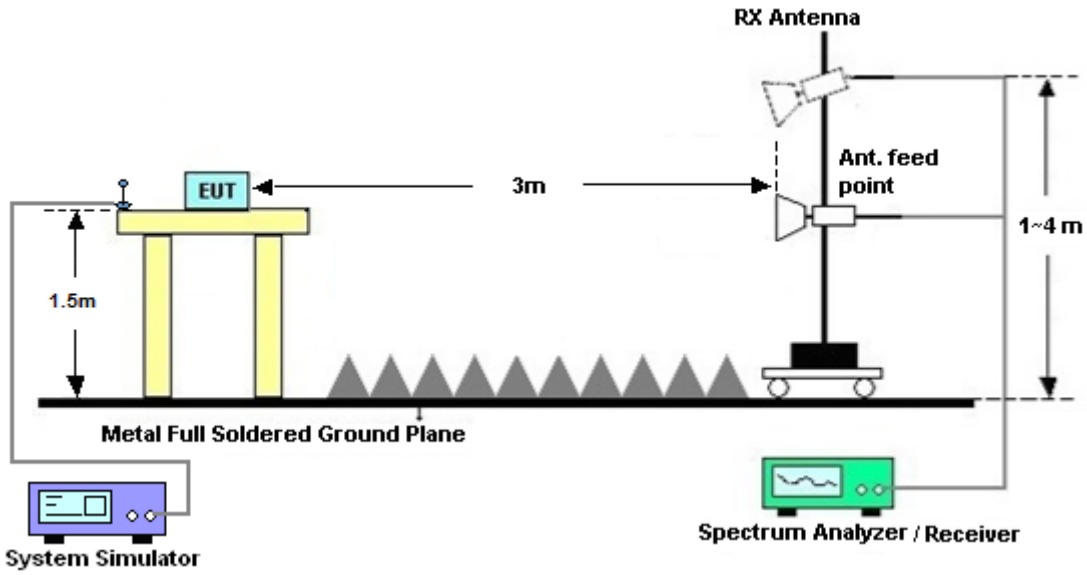
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz

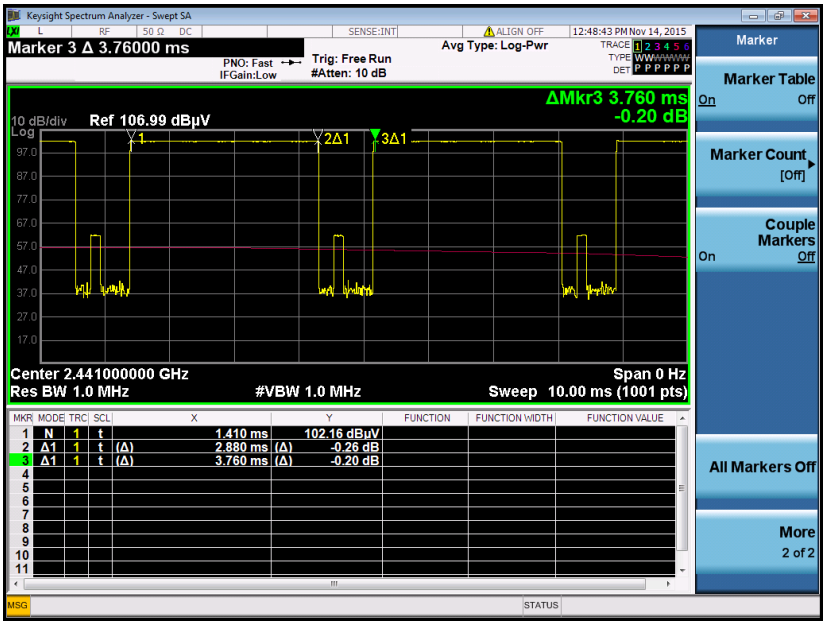


3.3.5 Test Results of Radiated Spurious Emissions (9 kHz ~ 30 MHz)

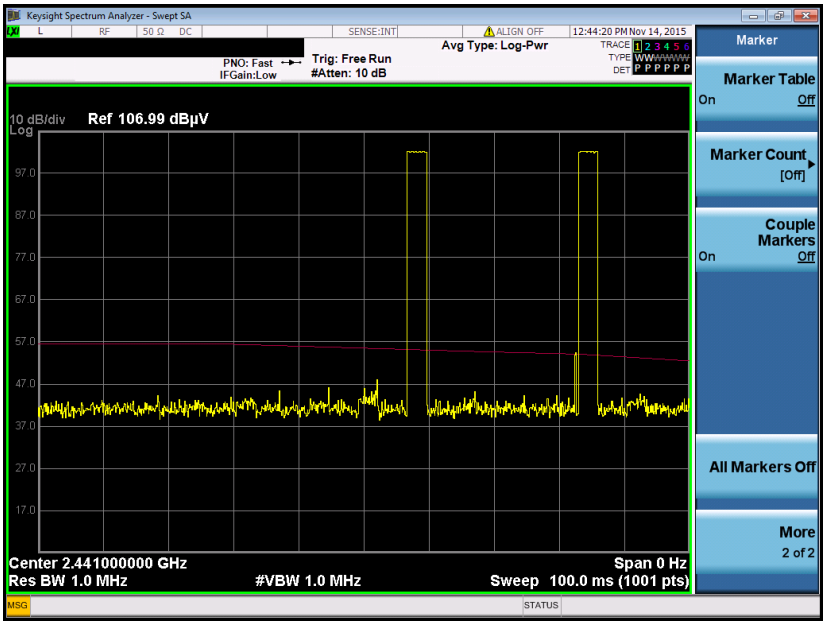
The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not reported.

3.3.6 Duty cycle correction factor for average measurement

DH5 on time (One Pulse) Plot on Channel 39



DH5 on time (Count Pulses) Plot on Channel 39



Note:

1. Worst case Duty cycle = on time/100 milliseconds = 2 * 2.88 / 100 = 5.76 %
2. Worst case Duty cycle correction factor = 20*log(Duty cycle) = -24.79 dB
3. DH5 has the highest duty cycle worst case and is reported.

Duty Cycle Correction Factor Consideration for AFH mode:

Bluetooth normal hopping rate is 1600Hz and reduced to 800Hz in AFH mode; due to the reduced number of hopping frequencies, with the same packet configuration the dwell time in each channel frequency within 100msec period is longer in AFH mode than normal mode.

In AFH mode, the minimum hopping frequencies are 20, to get the longest dwell time DH5 packet is observed; the period to have DH5 packet completing one hopping sequence is

2.88 ms x 20 channels = 57.6 ms

There cannot be 2 complete hopping sequences within 100ms period, considering the random hopping behavior, maximum 2 hops can be possibly observed within the period. [100ms / 57.6ms] = 2 hops

Thus, the maximum possible ON time:

2.88 ms x 2 = 5.76 ms

Worst case Duty Cycle Correction factor, which is derived from the maximum possible ON time,

20 x log(5.76 ms/100ms) = -24.79 dB

3.3.7 Test Result of Radiated Spurious at Band Edges

Please refer to Appendix A.

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

Please refer to Appendix A.

3.4 Antenna Requirements

3.4.1 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.

3.4.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.

3.4.3 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. 24, 2015	Nov. 20, 2015	Oct. 23, 2016	Conducted (TH01-KS)
Pulse Power Senor	Anritsu	MA2411B	0917070	30MHz~40GHz	Jan. 23, 2015	Nov. 20, 2015	Jan. 22, 2016	Conducted (TH01-KS)
Power Meter	Anritsu	ML2495A	1005002	50MHz Bandwidth	Jan. 23, 2015	Nov. 20, 2015	Jan. 22, 2016	Conducted (TH01-KS)
EMI Test Receiver	R&S	ESCI	100534	9kHz~3GHz	Oct. 24, 2015	Nov. 14, 2015	Oct. 23, 2016	Radiation (03CH03-KS)
EXA Spectrum Analyzer	Keysight	N9010A	MY55150244	10Hz-44GHz	Jun. 05, 2015	Nov. 14, 2015	Jun. 04, 2016	Radiation (03CH03-KS)
Loop Antenna	R&S	HFH2-Z2	100321	9kHz~30MHz	Nov. 10, 2015	Nov. 14, 2015	Nov. 09, 2016	Radiation (03CH03-KS)
Bilog Antenna	TeseQ	CBL6112D	35406	25MHz-2GHz	Jun. 25, 2015	Nov. 14, 2015	Jun. 24, 2016	Radiation (03CH03-KS)
Horn Antenna	Schwarzbeck	BBHA9120 D	9120D-1356	1GHz~18GHz	Jun. 25, 2015	Nov. 14, 2015	Jun. 24, 2016	Radiation (03CH03-KS)
SHF-EHF Horn	Schwarzbeck	BBHA 9170	BBHA170249	15GHz ~40GHz	Mar. 03, 2015	Nov. 14, 2015	Mar. 02, 2016	Radiation (03CH03-KS)
Amplifier	Burgeon	BPA-530	102212	0.01MHz-3000MHz	Aug. 10, 2015	Nov. 14, 2015	Aug. 09, 2016	Radiation (03CH03-KS)
Amplifier	Agilent	8449B	3008A02370	1GHz~26.5GHz	Oct. 24, 2015	Nov. 14, 2015	Oct. 23, 2016	Radiation (03CH03-KS)
AC Power Source	Chroma	61601	F104090004	N/A	NCR	Nov. 14, 2015	NCR	Radiation (03CH03-KS)
Turn Table	ChamPro	EM 1000-T	060762-T	0~360 degree	NCR	Nov. 14, 2015	NCR	Radiation (03CH03-KS)
Antenna Mast	ChamPro	EM 1000-A	060762-A	1 m~4 m	NCR	Nov. 14, 2015	NCR	Radiation (03CH03-KS)

5 Uncertainty of Evaluation

Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

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

Appendix A. Radiated Test Results

2.4GHz 2400~2483.5MHz

BT (Band Edge @ 3m)

BT	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)
BT CH00 2402MHz		2386.44	46.98	-27.02	74	51.41	27	5.59	37.02	222	189	P	H
		2386.44	22.19	-31.81	54	-	-	-	-	-	-	A	H
	*	2401.91	101.77	-	-	106.2	27	5.59	37.02	222	189	P	H
	*	2401.91	76.98	-	-	-	-	-	-	-	-	A	H
		2380.2	44.2	-29.8	74	48.7	26.95	5.57	37.02	106	197	P	V
		2380.2	19.41	-34.59	54	-	-	-	-	-	-	A	V
	*	2401.91	95.8	-	-	100.23	27	5.59	37.02	106	197	P	V
	*	2401.91	71.01	-	-	-	-	-	-	-	-	A	V
BT CH 39 2441MHz	*	2440.92	97.78	-	-	101.71	27.39	5.65	36.97	246	187	P	H
	*	2440.92	72.99	-	-	-	-	-	-	-	-	A	H
	*	2440.92	92.43	-	-	96.36	27.39	5.65	36.97	125	195	P	V
	*	2440.92	67.64	-	-	-	-	-	-	-	-	A	V
BT CH 78 2480MHz	*	2479.88	94.44	-	-	98.05	27.64	5.69	36.94	158	187	P	H
	*	2479.88	69.65	-	-	-	-	-	-	-	-	A	H
		2483.56	52.78	-21.22	74	56.39	27.64	5.69	36.94	158	187	P	H
		2483.56	27.99	-26.01	54	-	-	-	-	-	-	A	H
	*	2479.88	89.96	-	-	93.57	27.64	5.69	36.94	106	193	P	V
	*	2479.88	65.17	-	-	-	-	-	-	-	-	A	V
		2483.64	45.91	-28.09	74	49.52	27.64	5.69	36.94	106	193	P	V
		2483.64	21.12	-32.88	54	-	-	-	-	-	-	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

2.4GHz 2400~2483.5MHz

BT (Harmonic @ 3m)

BT	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)
BT CH 00 2402MHz		4803	44.85	-29.15	74	42.22	31.48	7.84	36.69	155	237	P	H
		4803	46.72	-27.28	74	44.09	31.48	7.84	36.69	135	264	P	V
BT CH 39 2441MHz		4881	50.68	-23.32	74	47.86	31.59	7.89	36.66	142	262	P	H
		7323	45.08	-28.92	74	38.09	34.08	9.62	36.71	155	242	P	H
		4884	52.27	-21.73	74	49.45	31.59	7.89	36.66	155	224	P	V
		4884	27.48	-26.52	54	-	-	-	-	-	-	A	V
		7323	45.16	-28.84	74	38.17	34.08	9.62	36.71	121	238	P	V
BT CH 78 2480MHz		4962	50.08	-23.92	74	47.04	31.72	7.95	36.63	125	183	P	H
		7440	44.71	-29.29	74	37.27	34.44	9.77	36.77	100	194	P	H
		4959	53.82	-20.18	74	50.78	31.72	7.95	36.63	249	267	P	V
		4959	29.03	-24.97	54	-	-	-	-	-	-	A	V
		7440	44.72	-29.28	74	37.28	34.44	9.77	36.77	122	291	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Emission below 1GHz

2.4GHz BT(LF)

BT	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 BT LF		89.17	22.76	-20.74	43.5	40.56	11.56	1.14	30.5	100	145	P	H
		345.25	21.99	-24.01	46	34.58	15.71	2.29	30.59	-	-	P	H
		422.85	23.1	-22.9	46	33.98	17.18	2.55	30.61	-	-	P	H
		521.79	21.21	-24.79	46	30.28	18.43	2.86	30.36	-	-	P	H
		722.58	22.29	-23.71	46	28.76	20.58	3.4	30.45	-	-	P	H
		964.11	26.47	-27.53	54	29.33	23.66	4.01	30.53	-	-	P	H
		43.58	31.62	-8.38	40	48.54	13.08	0.82	30.82	100	184	P	V
		152.22	25.95	-17.55	43.5	41.18	13.68	1.49	30.4	-	-	P	V
		179.38	30.81	-12.69	43.5	47.6	11.98	1.63	30.4	-	-	P	V
		323.91	27.6	-18.4	46	40.61	15.33	2.21	30.55	-	-	P	V
		408.3	18.72	-27.28	46	29.82	17.07	2.5	30.67	-	-	P	V
		789.51	22.06	-23.94	46	27.49	21.51	3.56	30.5	-	-	P	V
Remark	1. No other spurious found. 2. 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.
!	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	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1+2		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(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

ZTE CORPORATION

Product Change Description

As the applicant of the below model, [ZTE Corporation] declares that the product,

[Z223]

[ZTE Corporation]

is the variant of the initial certified product,

[Z222]

[ZTE Corporation]

SOFTWARE MODIFICATIONS:

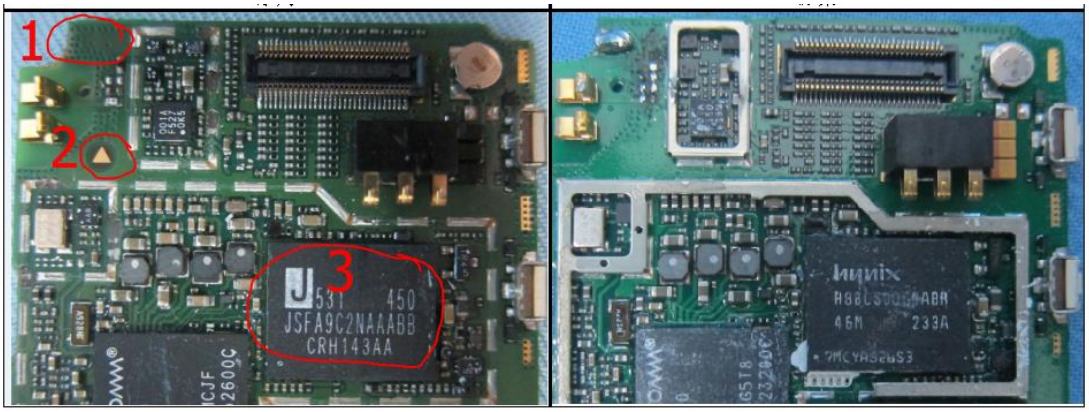
Protocol Stack changes: NO
MMS/STK changes: NO
JAVA changes: NO
Other changes detailed: Driver for camera and NV change

HARDWARE MODIFICATION:

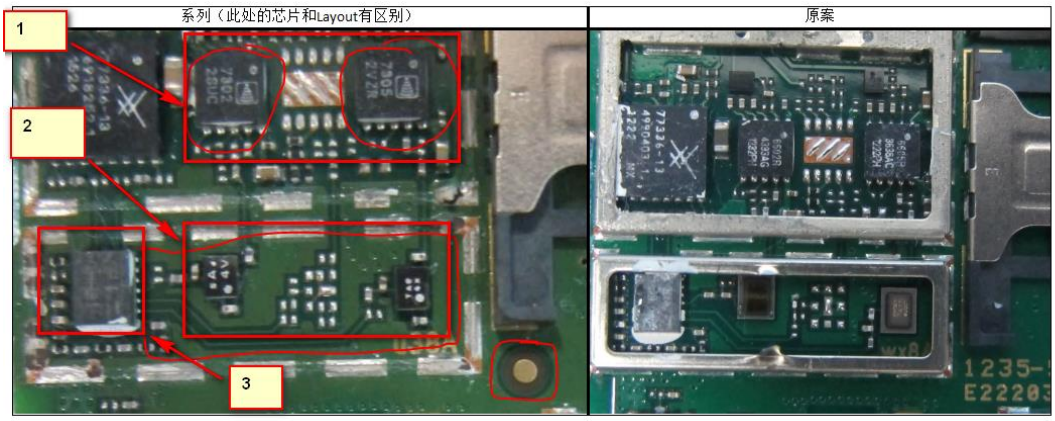
Band changes: NO
Power Amplifier changes: NO
Antenna changes: NO
PCB Layout changes: NO
Components on PCB changes: Yes/ LDO Component
LCD changes: NO
Speaker changes: NO
Camera changes: Yes
Vibrator changes: NO
Bluetooth changes: NO
FM changes: NO

Other changes: Band 5/Band 2 balance SAW duplexer/ SP8T RF Switch

1, HARDWARE MODIFICATION



1. No difference here. //Normally there is no solder ball as in the right picture.
2. This is just for the new manufacturing process, and there is no difference in electrical characteristics.
3. The manufacturers of the IC is different, and so the silkprint is different respectively.



1, RF PA. Manufacturer is different. The old device is obsoleted
2, RF duplexer. Package 2520 is obsoleted. The new device is 1814 package. Duing to the package of duplexers change, the layout is modified .
3,RF switch. Manufacturer is different. The old device is obsoleted
4,Duing to duplexer change, the antenna is modified a little.

RF NV change.

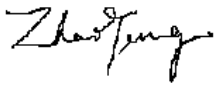
RF switch is changed, so that some NV which controls the the switch logic is changed.

MECHANICAL MODIFICATIONS:

Use new metal front/back cover or keypad: Yes/Front cover and back cover
Mechanical shell changes: NO
Other changes detailed: NO

ACCESSORY MODIFICATIONS:

Battery changes: NO
AC Adaptor changes: NO
Earphone changes: NO



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