ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

INTENTIONAL RADIATOR CERTIFICATION TO FCC PART 15 SUBPART C AND CANADA RSS-210 Class II Change REQUIREMENT

OF

Product Name:	**2.4GHz Wireless Digital Transceiver Module**
Brand Name:	**N/A**
Model Name:	**For FCC: DRF-TR001**
	For IC: LW2201, LW2100
Model Difference:	**Different model For different customer**
FCC ID:	**UDRX0738CSF**
IC:	**0976B-D0738CSF**
Report No.:	**ER/2009/10022~23**
Issue Date:	**Nov. 13, 2009**
FCC Rule Part:	**§15.249**
IC Rule Part:	**RSS-210 issue 7:2007, Annex 2.9**
Prepared for:	**Opcom Inc.**
	8F-5, No,6 Lane 609, Sec. 5, Chung Hsing Rd. Sanchung City, Tape Hsien, Taiwan
Prepared by:	**SGS Taiwan Ltd.**
	Electronics & Communication Laboratory
	No. 134, Wu Kung Rd., Wuku Industrial Zone, Taipei County, Taiwan.

Testing Laboratory
0513

Note: *This report shall not be reproduced except in full, without the written approval of SGS Taiwan Ltd. This document may be altered or revised by SGS Taiwan Ltd. personnel only, and shall be noted in the revision section of the document.*

VERIFICATION OF COMPLIANCE

Applicant:	Opcom Inc. 8F-5, No,6 Lane 609, Sec. 5, Chung Hsing Rd. Sanchung City, Tape Hsien, Taiwan
Product Description:	2.4GHz Wireless Digital Transceiver Module
FCC ID:	UDRX0738CSF
IC:	0976B-D0738CSF
Brand Name:	N/A
Model No.:	For FCC: DRF-TR001 For IC: LW2201, LW2100
Model Difference:	Different model For different customer
File Number:	ER/2009/10022-03
Date of test:	Oct. 22, 2009 ~ Nov. 10, 2009
Date of EUT Received:	Oct. 22, 2009

We hereby certify that:

The above equipment was tested by SGS Taiwan Ltd., Electronics & Communication Laboratory. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4 (2003) and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits of FCC Rules Part 15.249 and RSS-210 issue 7: 2007 Annex 2.9.
The test results of this report relate only to the tested sample identified in this report.

Test By:	Brian Chang	***Date:***	Nov. 13, 2009
	Brian Chang / Engineer		
Prepared By:	Eva Kao	***Date:***	Nov. 13, 2009
	Eva Kao / Asst. Supervisor		
Approved By:	Vincent Su	***Date:***	Nov. 13, 2009
	Vincent Su / Manager		

Version

Version No.	Date	Description
00	Nov. 13, 2009	Initial creation of document

Table of Contents

1 GENERAL INFORMATION

1.1 Product Description

The Opcom Inc., Model: DRF-TR001, LW2201, LW2100 (referred to as the EUT in this report) is a 2.4GHz Wireless Digital Transceiver Module.

A major technical descriptions of EUT is described as following:

A) Transition Frequency: 2402~2478MHz, 77 channels

B) Modulation Type: FSK

C) Power Supply: 3.3Vdc

D) Antenna Designation: Dipole Antenna with reversed SAM type, 1.8dBi. Please see EUT photo for details.

1.2 Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for FCC ID: **UDRX0738CSF** filing to comply with Section 15.249 of the FCC Part 15, Subpart C Rules and **IC: 0976B-D0738CSF** filing to comply with Industry Canada RSS-210 issue 7: 2007 Annex 2.9.

1.3 Test Methodology

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4 (2003) and RSS-Gen: 2007. Radiated testing was performed at an antenna to EUT distance 3 meters.

1.4 Test Facility

The measurement facilities used to collect the 3m Radiated Emission and AC power line conducted data are located on the address of SGS Taiwan Ltd. Electronics & Communication Laboratory No. 134, Wu Kung Rd., Wuku Industrial Zone, Taipei Country, Taiwan which are constructed and calibrated to meet the FCC requirements in documents ANSI C63.4: 2003. FCC Registration Number are: 990257 and 236194, Canada Registration Number: 4620A.

The 10 m Open Area Test Sites located on the address of SGS Taiwan Ltd. Electronics & Communication Laboratory No. 29, Pau-Tou-Tsuo Valley Chia-Pau Tsuen, Linkou Hsiang, Taipei county, which is constructed and calibrated to meet the CISPR 22/EN 55022 requirements. SGS Site No. 1(3 &10 meters) and FCC Registration Number: 94644.

1.5 Special Accessories

Not available for this EUT intended for grant.

1.6 Equipment Modifications

Not available for this EUT intended for grant.

2 System Test Configuration

2.1 EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

2.2 EUT Exercise

The Transmitter was operated in the engineering operating mode. the Tx frequency was fixed at 2402, 2440 and 2478MHz which were for the purpose of the measurements.

2.3 Test Procedure

2.3.1 Conducted Emissions

The EUT is a placed on as turn table which is 0.8 m above ground plane. According to the requirements in Section 7 and 13 of ANSI C63.4-2003 and RSS-Gen: 2007. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-Peak and Average detector mode.

2.3.2 Radiated Emissions

The EUT is a placed on as turn table which is 0.8 m above ground plane. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter(EUT) was rotated through three orthogonal axes according to the requirements in Section 8 and 13 of ANSI C63.4-2003 and RSS-Gen:2007.

2.4 Limitation

(1) Conducted Emission

According to section 15.207(a) and RSS-Gen §7.2.2 Conducted Emission Limits is as following.

Frequency (MHz)	Conducted Limit (dBuV)	
	Quasi-Peak	Average
0.15 – 0.5	66 - 56	56 - 46
0.5 – 5	56	46
5 - 30	60	50

(2) Radiated Emission 15.249(a) and RSS-210 issue 7,§A2.9(a)

The field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following.

Frequency (MHz)	Field strength of Fundamental	Field strength of Harmonics	Distance (m)
902 - 928	50 mV/m (94dBuV/m)	500 uV/m (54dBuV/m)	3
2400 – 2483.5	50 mV/m (94dBuV/m)	500 uV/m (54dBuV/m)	3
5725 – 5875	50 mV/m (94dBuV/m)	500 uV/m (54dBuV/m)	3

(3) Radiated Emission15.249 (d) and RSS-210 issue 7,§A2.9(b)

Emission Radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50dB below the level of the fundamental or to the general radiated emission limits in Section 15.209 and RSS-210 issue 7,§A2.9(a) as below, whichever is the lesser attenuation.

Frequency (MHz)	Field strength μV/m	Distance (m)	Field strength at 3m dBμV/m
1.705-30	30	30	69.54
30-88	100	3	40
88-216	150	3	43.5
216-960	200	3	46
Above 960	500	3	54

(4) Radiated Emission 15.249(e) and RSS-210 issue 7

For frequencies above 1000MHz, the above field strength limits are based on average limits. The peak filed strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20dB under any condition of modulation.

Remark:
1. Emission level in dBuV/m=20 log (uV/m)
2. Measurement was performed at an antenna to the closed point of EUT distance of meters.
3. Only spurious frequency is permitted to locate within the Restricted Bands specified in provision of ξ 15.205
4. Emission spurious frequency which appearing within the Restricted Bands specified in provision of ξ15.205, then the general radiated emission limits in ξ 15.209 apply.

2.5 Configuration of Tested System

Fig. 2-1 Configuration of TX

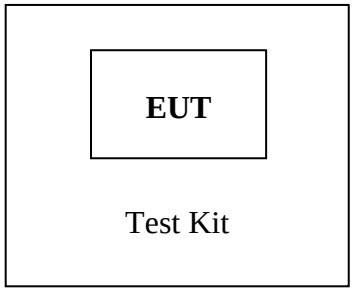


Table 2-2 Equipment Used in Tested System

Item	Equipment	Mfr/Brand	Model/ Type No.	FCC ID	Series No.	Data Cable	Power Cord
1.	N/A						

Note: All the above equipment/cables were placed in worse case positions to maximize emission signals during emission test.

Grounding: Grounding was in accordance with the manufacturer's requirements and conditions for the intended use.

3 Summary of Test Results

FCC Rules	Description Of Test	Result
§15.249(a)(d) RSS-210 issue 7,§A2.9(a)	Field Strength Measurement	Compliant
§15.249(e) RSS-210 issue 7,§A2.9(b)	TX Spurious Emission	Compliant

4 Description of test modes

The EUT has been tested under operating condition.
Test program used to control the EUT for staying in continuous transmitting mode is programmed.

Channel low (2402MHz)、mid (2440MHz) and high (2478MHz) with highest data rate are chosen for full testing.

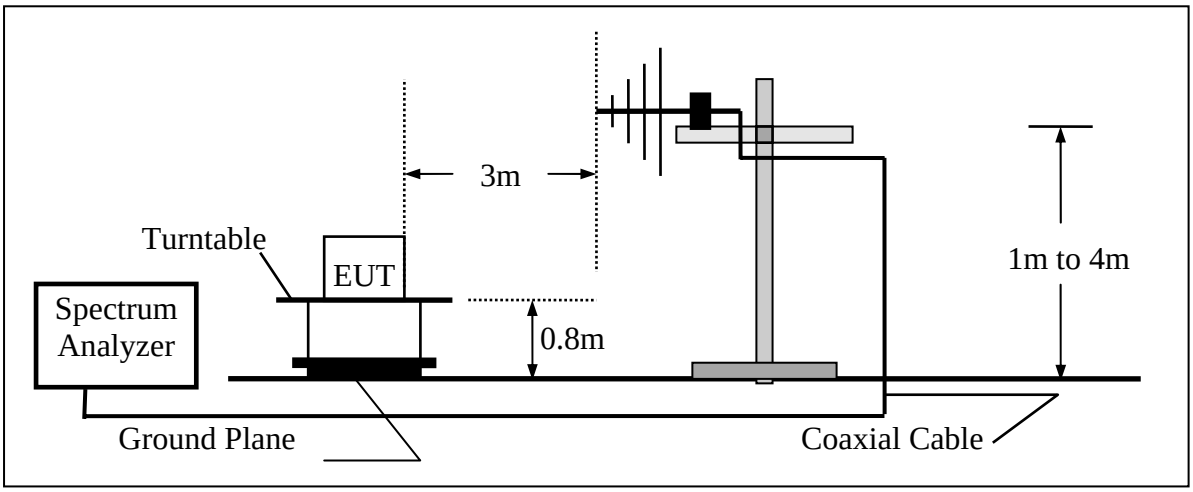
5 Radiated Emission Test

5.1 Measurement Procedure

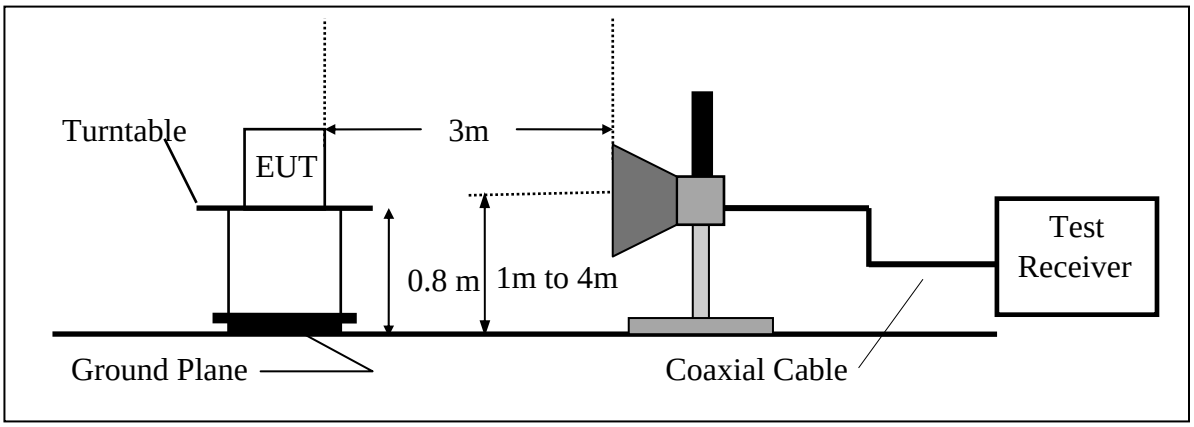
1. The EUT was placed on a turntable that is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
4. Repeat above procedures until all frequency measured were complete.

5.2 Test SET-UP (Block Diagram of Configuration)

(A) Radiated Emission Test Set-Up, Frequency Below 1000MHz



(B) Radiated Emission Test Set-UP Frequency Over 1 GHz



5.3 Measurement Equipment Used:

966 Chamber					
EQUIPMENT TYPE	**MFR**	**MODEL NUMBER**	**SERIAL NUMBER**	**LAST CAL.**	**CAL DUE.**
Spectrum Analyzer	R&S	FSP 40	100034	02/12/2009	02/11/2010
Loop antenna	MESSTEC	FLA30	03/10086	07/08/2009	07/07/2011
Bilog Antenna	SCHWAZBECK	VULB9160	3158	11/29/2007	11/28/2009
Horn antenna	SCHWAZBECK	BBHA 9120D	9120D-673	05/09/2008	05/08/2010
Pre-Amplifier	Agilent	8447D	1937A02834	11/30/2008	11/29/2009
Pre-Amplifier	Agilent	8449B	3008A01973	01/05/2009	01/04/2010
Turn Table	HD	DT420	N/A	N.C.R	N.C.R
Antenna Tower	HD	MA240-N	240/657	N.C.R	N.C.R
Controller	HD	HD100	N/A	N.C.R	N.C.R
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA-10M	10m	01/05/2009	01/04/2010
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA-3M	3m	01/05/2009	01/04/2010
3m Site	SGS	966 chamber	N/A	11/08/2009	11/09/2010

5.4 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor(if any) from the measured reading. The basic equation with a sample calculation is as follows:

FS = RA + AF + CL - AG

Where	FS = Field Strength	CL = Cable Attenuation Factor (Cable Loss)
	RA = Reading Amplitude	AG = Amplifier Gain
	AF = Antenna Factor	

5.5 Measurement Result

Radiated Spurious Emission Measurement Result (below 1GHz)

Operation Mode	TX CH Low	Test Date	Nov. 10, 2009
Fundamental Frequency	2402MHz	Test By	Jazz
Temperature	25 ℃	Pol	Ver./Hor
Humidity	65 %		

Freq. (MHz)	Ant.Pol. H/V	Detector Mode (PK/QP)	Reading (dBuV)	Factor (dB)	Actual FS (dBuV/m)	Limit3m (dBuV/m)	Safe Margin (dB)
62.98	V	Peak	45.88	-14.85	31.03	40.00	-8.97
90.14	V	Peak	44.87	-17.62	27.25	43.50	-16.25
383.08	V	Peak	45.05	-10.57	34.48	46.00	-11.52
90.14	H	Peak	43.43	-17.62	25.81	43.50	-17.69
383.08	H	Peak	43.69	-10.57	33.12	46.00	-12.88

Remark:

1 No further spurious emissions detected from the lowest internal frequency and 30MHz.

2 Measuring frequencies from the lowest internal frequency to the 1GHz.

3 Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak / QP detector mode.

4 Measurement result within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

5 The IF bandwidth of SPA between 30MHz to 1GHz was 100KHz, VBW=300KHz.

Radiated Spurious Emission Measurement Result (below 1GHz)

Operation Mode	TX CH Mid	Test Date	Nov. 10, 2009
Fundamental Frequency	2440MHz	Test By	Jazz
Temperature	25 ℃	Pol	Ver./Hor
Humidity	65 %		

Freq. (MHz)	Ant.Pol. H/V	Detector Mode (PK/QP)	Reading (dBuV)	Factor (dB)	Actual FS (dBuV/m)	Limit3m (dBuV/m)	Safe Margin (dB)
62.98	V	Peak	46.46	-14.85	31.61	40.00	-8.39
90.14	V	Peak	44.49	-17.62	26.87	43.50	-16.63
383.08	V	Peak	45.27	-10.57	34.70	46.00	-11.30
70.74	H	Peak	43.04	-16.27	26.77	40.00	-13.23
383.08	H	Peak	43.75	-10.57	33.18	46.00	-12.82

Remark:

1 No further spurious emissions detected from the lowest internal frequency and 30MHz.

2 Measuring frequencies from the lowest internal frequency to the 1GHz.

3 Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak / QP detector mode.

4 Measurement result within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

5 The IF bandwidth of SPA between 30MHz to 1GHz was 100KHz, VBW=300KHz.

Radiated Spurious Emission Measurement Result (below 1GHz)

Operation Mode	TX CH High	Test Date	Nov. 10, 2009
Fundamental Frequency	2478MHz	Test By	Jazz
Temperature	25 ℃	Pol	Ver./Hor
Humidity	65 %		

Freq. (MHz)	Ant.Pol. H/V	Detector Mode (PK/QP)	Reading (dBuV)	Factor (dB)	Actual FS (dBuV/m)	Limit3m (dBuV/m)	Safe Margin (dB)
62.98	V	Peak	45.80	-14.85	30.95	40.00	-9.05
383.08	V	Peak	44.22	-10.57	33.65	46.00	-12.35
90.14	H	Peak	44.62	-17.62	27.00	43.50	-16.50
383.08	H	Peak	44.21	-10.57	33.64	46.00	-12.36

Remark:

1 No further spurious emissions detected from the lowest internal frequency and 30MHz.

2 Measuring frequencies from the lowest internal frequency to the 1GHz.

3 Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak / QP detector mode.

4 Measurement result within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

5 The IF bandwidth of SPA between 30MHz to 1GHz was 100KHz, VBW=300KHz.

Radiated Spurious Emission Measurement Result (above 1GHz)

Operation Mode:	TX CH Low	Test Date :	Nov. 10, 2009
Fundamental Frequency:	2402MHz	Test By:	Jazz
Temperature :	25 ℃	Pol:	Vertical
Humidity :	65 %		

Freq. (MHz)	Ant.Pol. H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Factor (dB)	Actual Peak FS (dBuV/m)	Actual AV FS (dBuV/m)	Peak Limit at 3m (dBuV/m)	AV Limit at 3m (dBuV/m)	Margin (dB)	
2402.0	V	106.39	90.33	-1.36	105.03	88.97	114.00	94.00	-5.03	F
1188.5	V	53.80	--	-7.33	46.47	--	74.00	54.00	-7.53	S
4804.0	V	39.47	--	5.99	45.46	--	74.00	54.00	-8.54	H
7206.0	V	--	--			--	74.00	54.00		H
9608.0	V	--	--			--	74.00	54.00		H
12010.0	V	--	--			--	74.00	54.00		H
14412.0	V	--	--			--	74.00	54.00		H
16814.0	V	--	--			--	74.00	54.00		H
19216.0	V	--	--			--	74.00	54.00		H
21618.0	V	--	--			--	74.00	54.00		H
24020.0	V	--	--			--	74.00	54.00		H

Remark:

1 Measuring frequencies from the lowest internal frequency to the 10th of fundamental frequency

2 Field strength limits for frequency above 1000MHz are based on average limits. However, Peak mode field strength shall not exceed the average limits specified plus 20dB.

3 “F” denotes fundamental frequency; “H” denotes harmonics frequency. “S” denotes spurious frequency.

4 Measurement of data within this frequency range shown “ - ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

5 Spectrum Peak mode IF bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, Sweep time= 200 ms., the VBW setting was 3 MHz.

6 Spectrum AV mode if bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

Radiated Spurious Emission Measurement Result (above 1GHz)

Operation Mode:	TX CH Low	Test Date :	Nov. 10, 2009
Fundamental Frequency:	2402MHz	Test By:	Jazz
Temperature :	25 ℃	Pol:	Horizontal
Humidity :	65 %		

Freq. (MHz)	Ant.Pol. H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Factor (dB)	Actual Peak FS (dBuV/m)	Actual AV FS (dBuV/m)	Peak Limit at 3m (dBuV/m)	AV Limit at 3m (dBuV/m)	Margin (dB)	
2402.0	V	91.97	--	-1.36	90.61	--	114.00	94.00	-3.39	F
1188.5	V	59.22	--	-7.33	51.89	--	74.00	54.00	-2.11	S
4804.0	V	37.28	--	5.99	43.27	--	74.00	54.00	-10.73	H
7206.0	V	--	--			--	74.00	54.00		H
9608.0	V	--	--			--	74.00	54.00		H
12010.0	V	--	--			--	74.00	54.00		H
14412.0	V	--	--			--	74.00	54.00		H
16814.0	V	--	--			--	74.00	54.00		H
19216.0	V	--	--			--	74.00	54.00		H
21618.0	V	--	--			--	74.00	54.00		H
24020.0	V	--	--			--	74.00	54.00		H

Remark:

1 Measuring frequencies from the lowest internal frequency to the 10th of fundamental frequency

2 Field strength limits for frequency above 1000MHz are based on average limits. However, Peak mode field strength shall not exceed the average limits specified plus 20dB.

3 “F” denotes fundamental frequency; “H” denotes harmonics frequency. “S” denotes spurious frequency.

4 Measurement of data within this frequency range shown “ - ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

5 Spectrum Peak mode IF bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, Sweep time= 200 ms., the VBW setting was 3 MHz.

6 Spectrum AV mode if bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

Radiated Spurious Emission Measurement Result (above 1GHz)

Operation Mode:	TX CH Mid	Test Date :	Nov. 10, 2009
Fundamental Frequency:	2440MHz	Test By:	Jazz
Temperature :	25 ℃	Pol:	Vertical
Humidity :	65 %		

Freq. (MHz)	Ant.Pol. H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Factor (dB)	Actual Peak FS (dBuV/m)	Actual AV FS (dBuV/m)	Peak Limit at 3m (dBuV/m)	AV Limit at 3m (dBuV/m)	Margin (dB)	
2440.0	V	105.61	90.02	-1.13	104.48	88.89	114.00	94.00	-5.11	F
1188.5	V	52.76	--	-7.33	45.43	--	74.00	54.00	-8.57	S
4880.0	V	39.79	--	6.17	45.96	--	74.00	54.00	-8.04	H
7320.0	V	--	--			--	74.00	54.00		H
9760.0	V	--	--			--	74.00	54.00		H
12200.0	V	--	--			--	74.00	54.00		H
14640.0	V	--	--			--	74.00	54.00		H
17080.0	V	--	--			--	74.00	54.00		H
19520.0	V	--	--			--	74.00	54.00		H
21960.0	V	--	--			--	74.00	54.00		H
24400.0	V	--	--			--	74.00	54.00		H

Remark:

1 Measuring frequencies from the lowest internal frequency to the 10th of fundamental frequency

2 Field strength limits for frequency above 1000MHz are based on average limits. However, Peak mode field strength shall not exceed the average limits specified plus 20dB.

3 “F” denotes fundamental frequency; “H” denotes harmonics frequency. “S” denotes spurious frequency.

4 Measurement of data within this frequency range shown “ - ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

5 Spectrum Peak mode IF bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, Sweep time= 200 ms., the VBW setting was 3 MHz.

6 Spectrum AV mode if bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

Radiated Spurious Emission Measurement Result (above 1GHz)

Operation Mode:	TX CH Mid	Test Date :	Nov. 10, 2009
Fundamental Frequency:	2440MHz	Test By:	Jazz
Temperature :	25 ℃	Pol:	Horizontal
Humidity :	65 %		

Freq. (MHz)	Ant.Pol. H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Factor (dB)	Actual Peak FS (dBuV/m)	Actual AV FS (dBuV/m)	Peak Limit at 3m (dBuV/m)	AV Limit at 3m (dBuV/m)	Margin (dB)	
2440.0	V	90.51	--	-1.13	89.38	--	114.00	94.00	-4.62	F
1188.5	V	58.54	--	-7.33	51.21	--	74.00	54.00	-2.79	S
4880.0	V	40.09	--	6.17	46.26	--	74.00	54.00	-7.74	H
7320.0	V	--	--			--	74.00	54.00		H
9760.0	V	--	--			--	74.00	54.00		H
12200.0	V	--	--			--	74.00	54.00		H
14640.0	V	--	--			--	74.00	54.00		H
17080.0	V	--	--			--	74.00	54.00		H
19520.0	V	--	--			--	74.00	54.00		H
21960.0	V	--	--			--	74.00	54.00		H
24400.0	V	--	--			--	74.00	54.00		H

Remark:

1 Measuring frequencies from the lowest internal frequency to the 10th of fundamental frequency

2 Field strength limits for frequency above 1000MHz are based on average limits. However, Peak mode field strength shall not exceed the average limits specified plus 20dB.

3 “F” denotes fundamental frequency; “H” denotes harmonics frequency. “S” denotes spurious frequency.

4 Measurement of data within this frequency range shown “ - ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

5 Spectrum Peak mode IF bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, Sweep time= 200 ms., the VBW setting was 3 MHz.

6 Spectrum AV mode if bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

Radiated Spurious Emission Measurement Result (above 1GHz)

Operation Mode:	TX CH High	Test Date :	Nov. 10, 2009
Fundamental Frequency:	2478MHz	Test By:	Jazz
Temperature :	25 ℃	Pol:	Vertical
Humidity :	65 %		

Freq. (MHz)	Ant.Pol. H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Factor (dB)	Actual Peak FS (dBuV/m)	Actual AV FS (dBuV/m)	Peak Limit at 3m (dBuV/m)	AV Limit at 3m (dBuV/m)	Margin (dB)	
2478.0	V	104.16	88.90	-0.92	103.24	87.98	114.00	94.00	-6.02	F
1240.5	V	53.63	--	-7.80	45.83	--	74.00	54.00	-8.17	S
4956.0	V	35.92	--	6.36	42.28	--	74.00	54.00	-11.72	H
7434.0	V	--	--			--	74.00	54.00		H
9912.0	V	--	--			--	74.00	54.00		H
12390.0	V	--	--			--	74.00	54.00		H
14868.0	V	--	--			--	74.00	54.00		H
17346.0	V	--	--			--	74.00	54.00		H
19824.0	V	--	--			--	74.00	54.00		H
22302.0	V	--	--			--	74.00	54.00		H
24780.0	V	--	--			--	74.00	54.00		H

Remark:

1 Measuring frequencies from the lowest internal frequency to the 10th of fundamental frequency

2 Field strength limits for frequency above 1000MHz are based on average limits. However, Peak mode field strength shall not exceed the average limits specified plus 20dB.

3 “F” denotes fundamental frequency; “H” denotes harmonics frequency. “S” denotes spurious frequency.

4 Measurement of data within this frequency range shown “ - ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

5 Spectrum Peak mode IF bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, Sweep time= 200 ms., the VBW setting was 3 MHz.

6 Spectrum AV mode if bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

Radiated Spurious Emission Measurement Result (above 1GHz)

Operation Mode:	TX CH High	Test Date :	Nov. 10, 2009
Fundamental Frequency:	2478MHz	Test By:	Jazz
Temperature :	25 ℃	Pol:	Horizontal
Humidity :	65 %		

Freq. (MHz)	Ant.Pol. H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Factor (dB)	Actual Peak FS (dBuV/m)	Actual AV FS (dBuV/m)	Peak Limit at 3m (dBuV/m)	AV Limit at 3m (dBuV/m)	Margin (dB)	
2478.0	V	89.01	--	-0.92	88.09	--	114.00	94.00	-5.91	F
1240.5	V	58.46	--	-7.80	50.66	--	74.00	54.00	-3.34	S
4956.0	V	--	--			--	74.00	54.00		H
7434.0	V	--	--			--	74.00	54.00		H
9912.0	V	--	--			--	74.00	54.00		H
12390.0	V	--	--			--	74.00	54.00		H
14868.0	V	--	--			--	74.00	54.00		H
17346.0	V	--	--			--	74.00	54.00		H
19824.0	V	--	--			--	74.00	54.00		H
22302.0	V	--	--			--	74.00	54.00		H
24780.0	V	--	--			--	74.00	54.00		H

Remark:

1 Measuring frequencies from the lowest internal frequency to the 10th of fundamental frequency

2 Field strength limits for frequency above 1000MHz are based on average limits. However, Peak mode field strength shall not exceed the average limits specified plus 20dB.

3 “F” denotes fundamental frequency; “H” denotes harmonics frequency. “S” denotes spurious frequency.

4 Measurement of data within this frequency range shown “ - ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

5 Spectrum Peak mode IF bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, Sweep time= 200 ms., the VBW setting was 3 MHz.

6 Spectrum AV mode if bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

Radiated Spurious Emission Measurement Result (below 1GHz)

Operation Mode	RX CH Low	Test Date	Nov. 10, 2009
Fundamental Frequency	2402MHz	Test By	Jazz
Temperature	25 ℃	Pol	Ver./Hor
Humidity	65 %		

Freq. (MHz)	Ant.Pol. H/V	Detector Mode (PK/QP)	Reading (dBuV)	Factor (dB)	Actual FS (dBuV/m)	Limit3m (dBuV/m)	Safe Margin (dB)
51.34	V	Peak	45.74	-14.19	31.55	40.00	-8.45
90.14	V	Peak	51.36	-17.62	33.74	43.50	-9.76
191.99	V	Peak	45.53	-15.23	30.30	43.50	-13.20
264.74	V	Peak	44.60	-13.59	31.01	46.00	-14.99
383.08	V	Peak	42.19	-10.57	31.62	46.00	-14.38
814.73	V	Peak	33.59	-2.70	30.89	46.00	-15.11
51.34	H	Peak	43.34	-14.19	29.15	40.00	-10.85
288.99	H	Peak	50.08	-13.23	36.85	46.00	-9.15
383.08	H	Peak	43.00	-10.57	32.43	46.00	-13.57

Remark:

1 No further spurious emissions detected from the lowest internal frequency and 30MHz.

2 Measuring frequencies from the lowest internal frequency to the 1GHz.

3 Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak / QP detector mode.

4 Measurement result within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

5 The IF bandwidth of SPA between 30MHz to 1GHz was 100KHz, VBW=300KHz.

Radiated Spurious Emission Measurement Result (below 1GHz)

Operation Mode	RX CH Mid	Test Date	Nov. 10, 2009
Fundamental Frequency	2440MHz	Test By	Jazz
Temperature	25 ℃	Pol	Ver./Hor
Humidity	65 %		

Freq. (MHz)	Ant.Pol. H/V	Detector Mode (PK/QP)	Reading (dBuV)	Factor (dB)	Actual FS (dBuV/m)	Limit3m (dBuV/m)	Safe Margin (dB)
90.14	V	Peak	50.47	-17.62	32.85	43.50	-10.65
102.75	V	Peak	46.72	-16.78	29.94	43.50	-13.56
191.99	V	Peak	46.08	-15.23	30.85	43.50	-12.65
264.74	V	Peak	44.82	-13.59	31.23	46.00	-14.77
383.08	V	Peak	42.06	-10.57	31.49	46.00	-14.51
814.73	V	Peak	32.92	-2.70	30.22	46.00	-15.78
240.49	H	Peak	46.21	-14.11	32.10	46.00	-13.90
288.99	H	Peak	49.76	-13.23	36.53	46.00	-9.47
383.08	H	Peak	41.68	-10.57	31.11	46.00	-14.89

Remark:

1 No further spurious emissions detected from the lowest internal frequency and 30MHz.

2 Measuring frequencies from the lowest internal frequency to the 1GHz.

3 Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak / QP detector mode.

4 Measurement result within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

5 The IF bandwidth of SPA between 30MHz to 1GHz was 100KHz, VBW=300KHz.

Radiated Spurious Emission Measurement Result (below 1GHz)

Operation Mode	RX CH High	Test Date	Nov. 10, 2009
Fundamental Frequency	2478MHz	Test By	Jazz
Temperature	25 ℃	Pol	Ver./Hor
Humidity	65 %		

Freq. (MHz)	Ant.Pol. H/V	Detector Mode (PK/QP)	Reading (dBuV)	Factor (dB)	Actual FS (dBuV/m)	Limit3m (dBuV/m)	Safe Margin (dB)
51.34	V	Peak	45.38	-14.19	31.19	40.00	-8.81
90.14	V	Peak	50.20	-17.62	32.58	43.50	-10.92
191.99	V	Peak	45.89	-15.23	30.66	43.50	-12.84
264.74	V	Peak	44.59	-13.59	31.00	46.00	-15.00
383.08	V	Peak	41.73	-10.57	31.16	46.00	-14.84
814.73	V	Peak	33.93	-2.70	31.23	46.00	-14.77
67.83	H	Peak	42.73	-15.60	27.13	40.00	-12.87
240.49	H	Peak	46.72	-14.11	32.61	46.00	-13.39
288.99	H	Peak	49.93	-13.20	36.73	46.00	-9.27
383.08	H	Peak	42.97	-10.57	32.40	46.00	-13.60
814.73	H	Peak	34.00	-2.70	31.30	46.00	-14.70

Remark:

1 No further spurious emissions detected from the lowest internal frequency and 30MHz.

2 Measuring frequencies from the lowest internal frequency to the 1GHz.

3 Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak / QP detector mode.

4 Measurement result within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

5 The IF bandwidth of SPA between 30MHz to 1GHz was 100KHz, VBW=300KHz.

Radiated Spurious Emission Measurement Result (above 1GHz)

Operation Mode:	RX CH Low	Test Date :	Nov. 10, 2009
Fundamental Frequency:	2402MHz	Test By:	Jazz
Temperature :	25 ℃	Pol:	V/H
Humidity :	65 %		

Freq. (MHz)	Ant.Pol. H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Factor (dB)	Actual Peak FS (dBuV/m)	Actual AV FS (dBuV/m)	Peak Limit at 3m (dBuV/m)	AV Limit at 3m (dBuV/m)	Margin (dB)	
4804.0	V	--	--			--	74.00	54.00		H
7206.0	V	--	--			--	74.00	54.00		H
9608.0	V	--	--			--	74.00	54.00		H
12010.0	V	--	--			--	74.00	54.00		H
4804.0	H	--	--			--	74.00	54.00		H
7206.0	H	--	--			--	74.00	54.00		H
9608.0	H	--	--			--	74.00	54.00		H
12010.0	H	--	--			--	74.00	54.00		H

Remark:

1 Measuring frequencies from the lowest internal frequency to the 10th of fundamental frequency

2 Field strength limits for frequency above 1000MHz are based on average limits. However, Peak mode field strength shall not exceed the average limits specified plus 20dB.

3 “F” denotes fundamental frequency; “H” denotes harmonics frequency. “S” denotes spurious frequency.

4 Measurement of data within this frequency range shown “ - ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

5 Spectrum Peak mode IF bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, Sweep time= 200 ms., the VBW setting was 3 MHz.

6 Spectrum AV mode if bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

Radiated Spurious Emission Measurement Result (above 1GHz)

Operation Mode:	RX CH Mid	Test Date :	Nov. 10, 2009
Fundamental Frequency:	2440MHz	Test By:	Jazz
Temperature :	25 ℃	Pol:	V/H
Humidity :	65 %		

Freq. (MHz)	Ant.Pol. H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Factor (dB)	Actual Peak FS (dBuV/m)	Actual AV FS (dBuV/m)	Peak Limit at 3m (dBuV/m)	AV Limit at 3m (dBuV/m)	Margin (dB)	
4880.0	V	--	--			--	74.00	54.00		H
7320.0	V	--	--			--	74.00	54.00		H
9760.0	V	--	--			--	74.00	54.00		H
12200.0	V	--	--			--	74.00	54.00		H
4880.0	H	--	--			--	74.00	54.00		H
7320.0	H	--	--			--	74.00	54.00		H
9760.0	H	--	--			--	74.00	54.00		H
12200.0	H	--	--			--	74.00	54.00		H

Remark:

1 Measuring frequencies from the lowest internal frequency to the 10th of fundamental frequency

2 Field strength limits for frequency above 1000MHz are based on average limits. However, Peak mode field strength shall not exceed the average limits specified plus 20dB.

3 “F” denotes fundamental frequency; “H” denotes harmonics frequency. “S” denotes spurious frequency.

4 Measurement of data within this frequency range shown “ - ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

5 Spectrum Peak mode IF bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, Sweep time= 200 ms., the VBW setting was 3 MHz.

6 Spectrum AV mode if bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

Radiated Spurious Emission Measurement Result (above 1GHz)

Operation Mode:	RX CH High	Test Date :	Nov. 10, 2009
Fundamental Frequency:	2478MHz	Test By:	Jazz
Temperature :	25 ℃	Pol:	V/H
Humidity :	65 %		

Freq. (MHz)	Ant.Pol. H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Factor (dB)	Actual Peak FS (dBuV/m)	Actual AV FS (dBuV/m)	Peak Limit at 3m (dBuV/m)	AV Limit at 3m (dBuV/m)	Margin (dB)	
4956.0	V	--	--			--	74.00	54.00		H
7434.0	V	--	--			--	74.00	54.00		H
9912.0	V	--	--			--	74.00	54.00		H
12390.0	V	--	--			--	74.00	54.00		H
4956.0	H	--	--			--	74.00	54.00		H
7434.0	H	--	--			--	74.00	54.00		H
9912.0	H	--	--			--	74.00	54.00		H
12390.0	H	--	--			--	74.00	54.00		H

Remark:

1 Measuring frequencies from the lowest internal frequency to the 10th of fundamental frequency

2 Field strength limits for frequency above 1000MHz are based on average limits. However, Peak mode field strength shall not exceed the average limits specified plus 20dB.

3 “F” denotes fundamental frequency; “H” denotes harmonics frequency. “S” denotes spurious frequency.

4 Measurement of data within this frequency range shown “ - ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

5 Spectrum Peak mode IF bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, Sweep time= 200 ms., the VBW setting was 3 MHz.

6 Spectrum AV mode if bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.