ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

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

OF

Product Name:	**ZiiSound D5x**
Brand Name:	**ZiiSound**
Model Name:	**MF8115**
Model Difference:	**N/A**
FCC ID:	**IBAMF8115**
IC:	**2315A-MF8115**
Report No.:	**ER/2011/50019**
Issue Date:	**May 27, 2011**
FCC Rule Part:	**§15.249**
IC Rule Part:	**RSS-210 issue 8: 2010, Annex 2.9**
Prepared for:	**Creative Technology Ltd 31 International Business Park, Creative Resource, Singapore 609921**
Prepared by:	**SGS Taiwan Ltd. Electronics & Communication Laboratory No. 134, Wu Kung Rd., Wuku Industrial Zone, Taipei County, Taiwan.**

Testing Laboratory
0513

VERIFICATION OF COMPLIANCE

Applicant:	Creative Technology Ltd 31 International Business Park, Creative Resource, Singapore 609921
Product Description:	ZiiSound D5x
FCC ID: **IC:**	IBAMF8115 2315A-MF8115
Brand Name:	ZiiSound
Model No.:	MF8115
Model Difference:	N/A
File Number:	ER/2011/50019
Date of test:	May 19, 2011 ~ May 26, 2011
Date of EUT Received:	May 19, 2011

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 8: 2010 Annex 2.9.

The test results of this report relate only to the tested sample identified in this report.

Test By:	Jay. Lin	***Date:***	May 27, 2011
	Jay Lin / Engineer		
Prepared By:	Celine Chou	***Date:***	May 27, 2011
	Celine Chou / Clerk		
Approved By:	Jim Chang	***Date:***	May 27, 2011
	Jim Chang / Supervisor		

Version

Version No.	Date	Description
00	May 27, 2011	Initial creation of document

TABLE OF CONTENTS

1. GENERAL INFORMATION

1.1. Product Description

Product Name:	ZiiSound D5x	
Brand Name:	ZiiSound	
Model Name:	MF8115	
Model Difference:	N/A	
Power Supply	15Vdc by AC/DC power adapter	
	Adaptor:	Model: GPE602-150350W(ADC0000005810), Supplier: Golden Profit Electronics Ltd
Audio Cable:	Model: N/A, Supplier: N/A	

5G:

Operation Frequency:	5725 ~ 5850MHz
Hardware Version	A
Software Version	1.0
Channel number:	3 channels
Modulation Type:	QPSK
Antenna Designation:	Fixed track Antenna, Gain: 2dBi

1.2. Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for **FCC ID**: **IBAMF8115** filing to comply with Section 15.249 of the FCC Part 15, Subpart C Rules and **IC: 2315A-MF8115** filing to comply with Industry Canada RSS-210 issue 8: 2010 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-4.

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 5736, 5762 and 5814 MHz 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 8,§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 8,§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 8,§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 8

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

Table 2-1 Equipment Used in Tested System

Item	Equipment	Mfr/Brand	Model/Type No.	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
§15.207/ RSS-Gen §7.2.2	Conducted Emission	Compliant
§15.249(a)(d)(e) RSS-210 issue 8,§A2.9(a)(b)	Field Strength Measurement (TX and RX)	Compliant
§15.215(c)	20dB band width Measurement	Compliant
RSS-Gen §4.6.1	99% Power Bandwidth	Compliant

Description of test modes

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

Channel low (5736MHz)、mid (5762MHz) and high (5814MHz) with highest data rate are chosen for full testing.

4. CONDUCTED EMISSIONS TEST

4.1 Measurement Procedure:

1. The EUT was placed on a table which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all frequency measured were complete.

4.2 Test SET-UP (Block Diagram of Configuration)

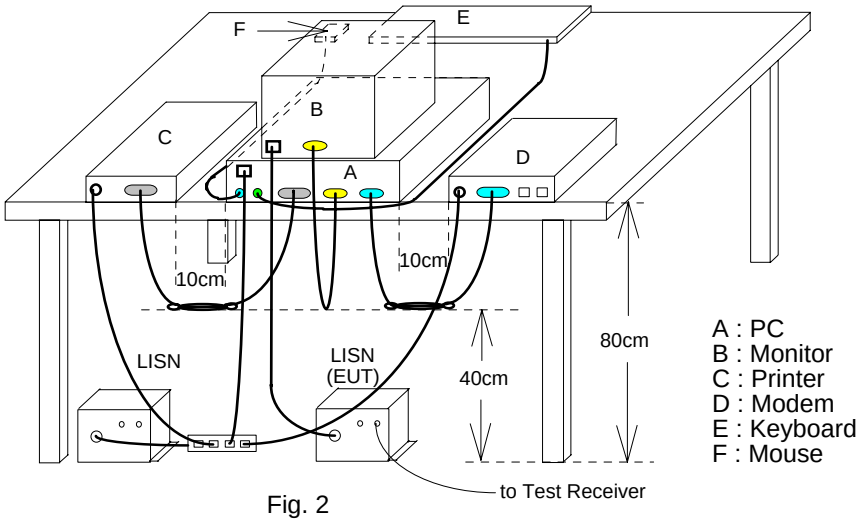


Fig. 2

4.3 Measurement Equipment Used:

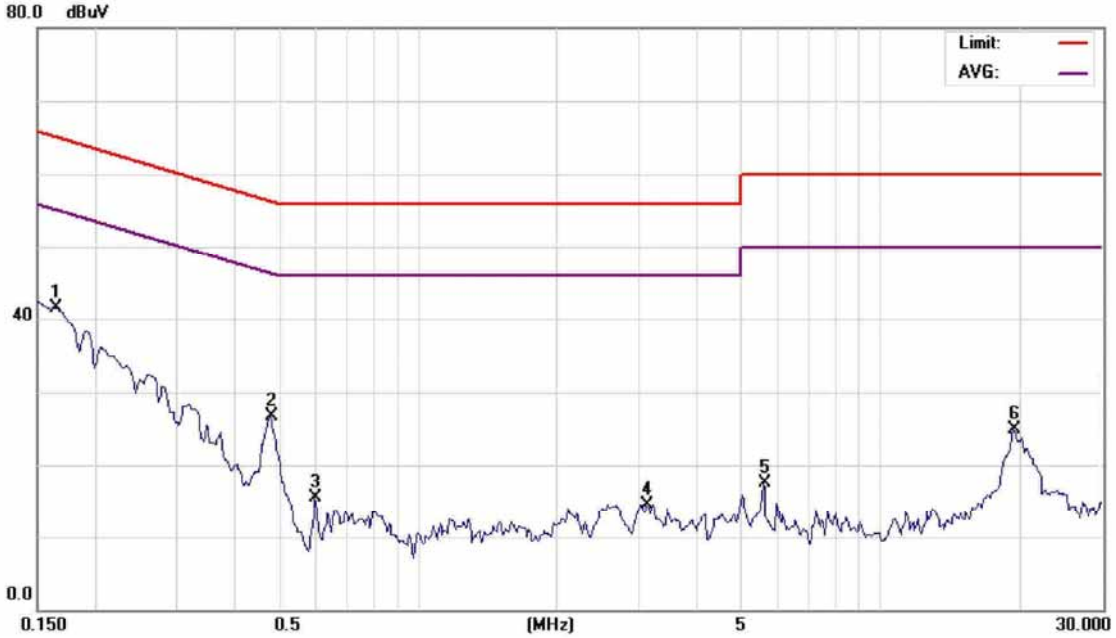
Conducted Emission Test Site					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
EMI Test Receiver	R&S	ESCS30	828985/004	09/15/2010	09/14/2011
LISN	Rolf-Heine	NNB-2/16Z	99012	02/02/2011	02/01/2012
LISN	FCC	FCC-LISN-50/250-25-2-01	04034	02/02/2011	02/01/2012
Coaxial Cables	N/A	WK CE Cable	N/A	11/28/2010	11/27/2011

4.4 Measurement Result:

Note: Refer to next page for measurement data and plots.

AC POWER LINE CONDUCTED EMISSION TEST DATA

Operation Mode:	Charger Mode			Test Date:	May 26, 2011
Temperature:	23 ℃	Humidity:	61 %	Test By:	Jay

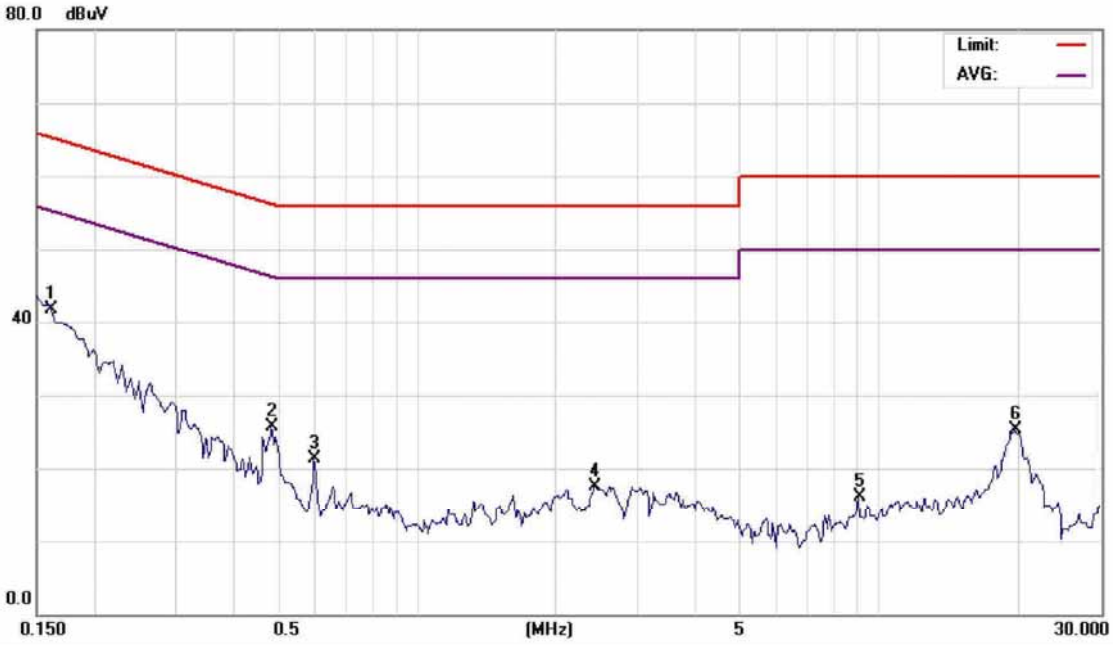


Site SGS CONDUCTED #1
Limit: FCC Class B Conduction(QP)
EUT: ZiiSound D5x
M/N: MF8115
Note: Operation mode

Phase: L1
Power: AC 120V/60Hz
Distance:

Temperature: 24 ℃
Humidity: 61%
Air Pressure: hpa

No.	Mk.	Freq.	Reading Level	Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	*	0.1650	41.39	0.13	41.52	65.21	-23.69	peak	
2		0.4800	26.54	0.12	26.66	56.34	-29.68	peak	
3		0.6000	15.47	0.12	15.59	56.00	-40.41	peak	
4		3.1300	14.42	0.16	14.58	56.00	-41.42	peak	
5		5.6200	17.31	0.21	17.52	60.00	-42.48	peak	
6		19.5200	24.58	0.25	24.83	60.00	-35.17	peak	



Site SGS CONDUCTED #1
Limit: FCC Class B Conduction(QP)
EUT: ZiiSound D5x
M/N: MF8115
Note: Operation mode

Phase: N
Power: AC 120V/60Hz
Distance:

Temperature: 24 ℃
Humidity: 61%
Air Pressure: hpa

No.	Mk.	Freq.	Reading Level	Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	*	0.1615	41.50	0.13	41.63	65.39	-23.76	peak	
2		0.4850	25.67	0.12	25.79	56.25	-30.46	peak	
3		0.6000	21.25	0.12	21.37	56.00	-34.63	peak	
4		2.4300	17.36	0.15	17.51	56.00	-38.49	peak	
5		9.0800	15.65	0.39	16.04	60.00	-43.96	peak	
6		19.7600	25.04	0.24	25.28	60.00	-34.72	peak	

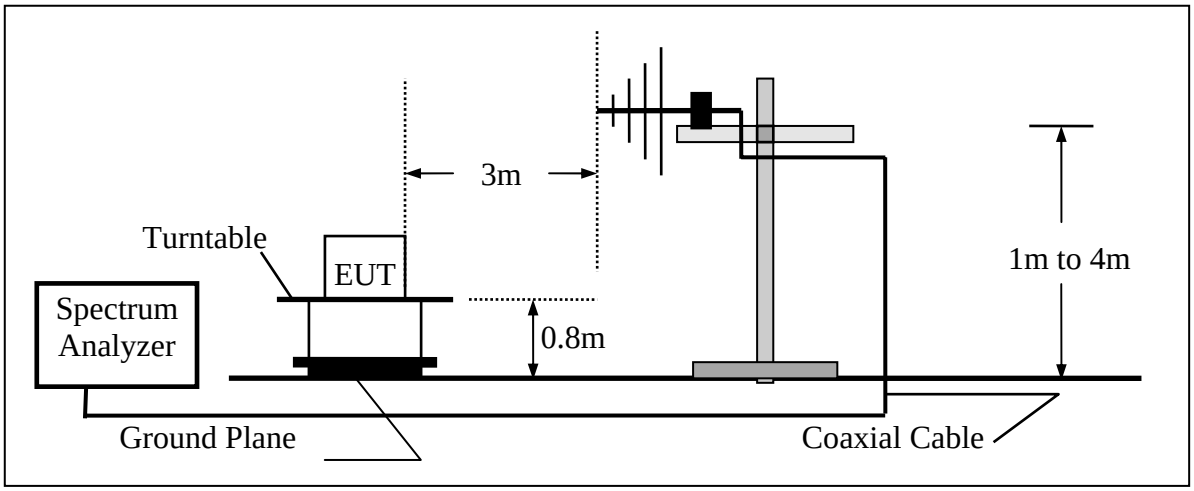
5. RADIATED EMISSION TEST (TX, RX)

5.1 Measurement Procedure

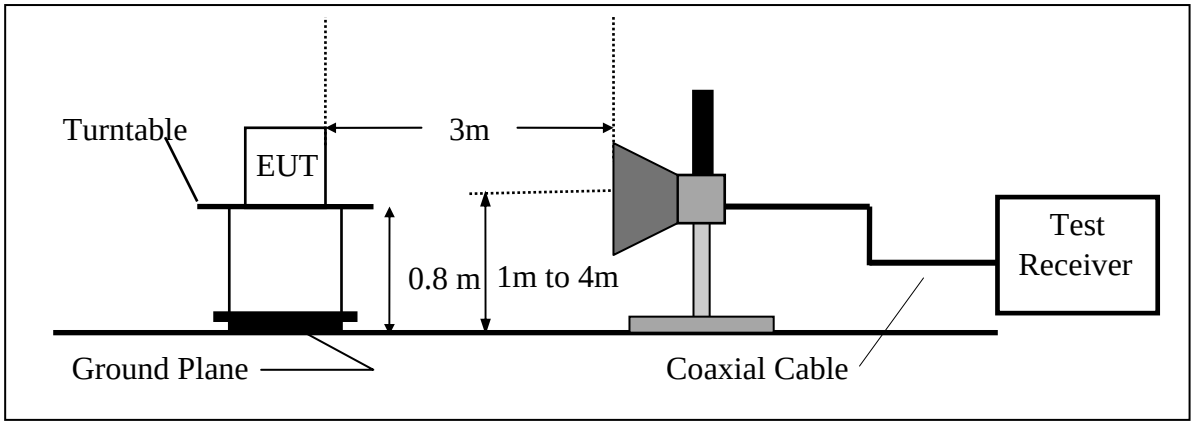
1. The EUT was placed on a turntable that is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
4. Repeat above 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	02/12/2011	02/11/2012
Loop antenna	MESSTEC	FLA30	03/10086	07/08/2009	07/07/2011
Bilog Antenna	SCHWAZBECK	VULB9160	9160-3136	11/15/2010	11/14/2011
Horn antenna	SCHWAZBECK	BBHA 9120D	9120D-673	05/09/2010	05/08/2012
Pre-Amplifier	Agilent	8447D	1937A02834	11/30/2010	11/29/2011
Pre-Amplifier	Agilent	8449B	3008A01973	01/05/2011	01/04/2012
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	01/05/2011	01/04/2012
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA-3M	3m	01/05/2011	01/04/2012
3m Site	SGS	966 chamber	N/A	11/08/2010	11/09/2011

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	May 26, 2011
Fundamental Frequency	5736MHz	Test By	Jay
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)
37.76	V	Peak	41.91	-13.73	28.18	40.00	-11.82
125.06	V	Peak	38.16	-14.21	23.95	43.50	-19.55
256.01	V	Peak	32.56	-13.76	18.80	46.00	-27.20
391.81	V	Peak	39.31	-11.01	28.30	46.00	-17.70
485.90	V	Peak	33.16	-9.35	23.81	46.00	-22.19
544.10	V	Peak	35.54	-8.28	27.26	46.00	-18.74
248.25	H	Peak	47.34	-13.91	33.43	46.00	-12.57
288.99	H	Peak	38.14	-12.68	25.46	46.00	-20.54
352.04	H	Peak	46.33	-11.52	34.81	46.00	-11.19
550.89	H	Peak	29.44	-8.18	21.26	46.00	-24.74
682.81	H	Peak	27.87	-5.51	22.36	46.00	-23.64
813.76	H	Peak	29.11	-3.53	25.58	46.00	-20.42

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.

Operation Mode	TX CH Mid	Test Date	May 26, 2011
Fundamental Frequency	5762MHz	Test By	Jay
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)
37.76	V	Peak	42.23	-13.73	28.50	40.00	-11.50
125.06	V	Peak	38.67	-14.21	24.46	43.50	-19.04
253.10	V	Peak	30.05	-13.80	16.25	46.00	-29.75
361.74	V	Peak	44.28	-11.40	32.88	46.00	-13.12
594.54	V	Peak	28.36	-7.18	21.18	46.00	-24.82
770.11	V	Peak	29.54	-3.97	25.57	46.00	-20.43
272.50	H	Peak	35.34	-13.12	22.22	46.00	-23.78
325.85	H	Peak	43.84	-11.92	31.92	46.00	-14.08
384.05	H	Peak	43.63	-11.08	32.55	46.00	-13.45
449.04	H	Peak	43.70	-9.78	33.92	46.00	-12.08
609.09	H	Peak	28.02	-6.83	21.19	46.00	-24.81
770.11	H	Peak	29.46	-3.97	25.49	46.00	-20.51

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.

Operation Mode	TX CH High	Test Date	May 26, 2011
Fundamental Frequency	5814MHz	Test By	Jay
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)
46.49	V	Peak	41.44	-13.76	27.68	40.00	-12.32
124.09	V	Peak	38.50	-14.21	24.29	43.50	-19.21
362.71	V	Peak	36.29	-11.41	24.88	46.00	-21.12
605.21	V	Peak	30.34	-6.92	23.42	46.00	-22.58
663.41	V	Peak	29.11	-5.74	23.37	46.00	-22.63
917.55	V	Peak	29.45	-1.98	27.47	46.00	-18.53
248.25	H	Peak	34.02	-13.91	20.11	46.00	-25.89
327.79	H	Peak	41.99	-11.90	30.09	46.00	-15.91
359.80	H	Peak	44.67	-11.42	33.25	46.00	-12.75
516.94	H	Peak	28.77	-8.81	19.96	46.00	-26.04
638.19	H	Peak	28.85	-6.21	22.64	46.00	-23.36
778.84	H	Peak	29.27	-3.88	25.39	46.00	-20.61

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 :	May 26, 2011
Fundamental Frequency:	5736MHz	Test By:	Jay
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)	
5736.0	V	89.80	79.60	7.37	97.17	86.97	114.00	94.00	-7.03	F
1637.0	V	40.39	--	-4.44	35.95	--	74.00	54.00	-38.05	H
11472.0	V	--	--			--	74.00	54.00		H
12750.0	V	23.37	--	18.57	41.94	--	74.00	54.00	-32.06	H
17208.0	V	--	--			--	74.00	54.00		H
22944.0	V	--	--			--	74.00	54.00		H
28680.0	V	--	--			--	74.00	54.00		H
34416.0	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.

Operation Mode:	TX CH Low	Test Date :	May 26, 2011
Fundamental Frequency:	5736MHz	Test By:	Jay
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)	
5736.0	H	93.57	83.27	7.37	100.94	90.64	114.00	94.00	-3.36	F
1630.5	H	45.72	--	-4.44	41.28	--	74.00	54.00	-32.72	H
11472.0	H	--	--			--	74.00	54.00		H
12540.0	H	24.53	--	18.06	42.59	--	74.00	54.00	-31.41	H
17208.0	H	--	--			--	74.00	54.00		H
22944.0	H	--	--			--	74.00	54.00		H
28680.0	H	--	--			--	74.00	54.00		H
34416.0	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.

Operation Mode:	TX CH Mid	Test Date :	May 26, 2011
Fundamental Frequency:	5762MHz	Test By:	Jay
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)	
5762.0	V	89.23	78.23	7.41	96.64	85.64	114.00	94.00	-8.36	F
1650.0	V	43.62	--	-4.42	39.20	--	74.00	54.00	-34.80	H
11524.0	V	--	--			--	74.00	54.00		H
12718.5	V	22.81	--	18.50	41.31	--	74.00	54.00	-32.69	H
17286.0	V	--	--			--	74.00	54.00		H
23048.0	V	--	--			--	74.00	54.00		H
28810.0	V	--	--			--	74.00	54.00		H
34572.0	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.

Operation Mode:	TX CH Mid	Test Date :	May 26, 2011
Fundamental Frequency:	5762MHz	Test By:	Jay
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)	
5762.0	H	94.15	83.65	7.41	101.56	91.06	114.00	94.00	-2.94	F
1637.0	H	46.26	--	-4.44	41.82	--	74.00	54.00	-32.18	H
11524.0	H	--	--			--	74.00	54.00		H
12729.0	H	22.93	--	18.52	41.45	--	74.00	54.00	-32.55	H
17286.0	H	--	--			--	74.00	54.00		H
23048.0	H	--	--			--	74.00	54.00		H
28810.0	H	--	--			--	74.00	54.00		H
34572.0	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.

Operation Mode:	TX CH High	Test Date :	May 26, 2011
Fundamental Frequency:	5814MHz	Test By:	Jay
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)	
5814.0	V	88.99	78.59	7.51	96.50	86.10	114.00	94.00	-7.90	F
1604.5	V	41.29	--	-4.33	36.96	--	74.00	54.00	-37.04	H
11628.0	V	--	--			--	74.00	54.00		H
12750.0	V	23.59	--	18.57	42.16	--	74.00	54.00	-31.84	H
17442.0	V	--	--			--	74.00	54.00		H
23256.0	V	--	--			--	74.00	54.00		H
29070.0	V	--	--			--	74.00	54.00		H
34884.0	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.

Operation Mode:	TX CH High	Test Date :	May 26, 2011
Fundamental Frequency:	5814MHz	Test By:	Jay
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)	
5814.0	H	94.81	84.11	7.51	102.32	91.62	114.00	94.00	-2.38	F
1598.0	H	45.18	--	-4.35	40.83	--	74.00	54.00	-33.17	H
11628.0	H	--	--			--	74.00	54.00		H
12624.0	H	24.46	--	18.26	42.72	--	74.00	54.00	-31.28	H
17442.0	H	--	--			--	74.00	54.00		H
23256.0	H	--	--			--	74.00	54.00		H
29070.0	H	--	--			--	74.00	54.00		H
34884.0	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 (below 1GHz)

Operation Mode	RX CH Low	Test Date	May 26, 2011
Fundamental Frequency	5736MHz	Test By	Jay
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)
37.76	V	Peak	40.85	-13.73	27.12	40.00	-12.88
125.06	V	Peak	38.29	-14.21	24.08	43.50	-19.42
257.95	V	Peak	27.56	-13.71	13.85	46.00	-32.15
371.44	V	Peak	35.46	-11.21	24.25	46.00	-21.75
512.09	V	Peak	28.13	-8.88	19.25	46.00	-26.75
832.19	V	Peak	28.15	-3.37	24.78	46.00	-21.22
257.95	H	Peak	32.09	-13.71	18.38	46.00	-27.62
325.85	H	Peak	42.62	-11.92	30.70	46.00	-15.30
357.86	H	Peak	46.27	-11.45	34.82	46.00	-11.18
599.39	H	Peak	28.60	-7.05	21.55	46.00	-24.45
742.95	H	Peak	28.58	-4.47	24.11	46.00	-21.89
857.41	H	Peak	28.12	-3.10	25.02	46.00	-20.98

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.

Operation Mode	RX CH Mid	Test Date	May 26, 2011
Fundamental Frequency	5762MHz	Test By	Jay
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)
37.76	V	Peak	41.91	-13.73	28.18	40.00	-11.82
124.09	V	Peak	38.33	-14.21	24.12	43.50	-19.38
367.56	V	Peak	35.40	-11.31	24.09	46.00	-21.91
395.69	V	Peak	39.84	-10.94	28.90	46.00	-17.10
513.06	V	Peak	29.68	-8.88	20.80	46.00	-25.20
723.55	V	Peak	28.41	-4.88	23.53	46.00	-22.47
143.49	H	Peak	28.13	-12.80	15.33	43.50	-28.17
267.65	H	Peak	40.87	-13.30	27.57	46.00	-18.43
372.41	H	Peak	41.39	-11.17	30.22	46.00	-15.78
424.79	H	Peak	39.73	-10.38	29.35	46.00	-16.65
638.19	H	Peak	27.51	-6.21	21.30	46.00	-24.70
726.46	H	Peak	29.03	-4.82	24.21	46.00	-21.79

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.

Operation Mode	RX CH High	Test Date	May 26, 2011
Fundamental Frequency	5814MHz	Test By	Jay
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)
46.49	V	Peak	41.77	-13.76	28.01	40.00	-11.99
125.06	V	Peak	37.73	-14.21	23.52	43.50	-19.98
256.01	V	Peak	33.75	-13.76	19.99	46.00	-26.01
356.89	V	Peak	36.02	-11.48	24.54	46.00	-21.46
395.69	V	Peak	40.53	-10.94	29.59	46.00	-16.41
447.10	V	Peak	34.43	-9.82	24.61	46.00	-21.39
151.25	H	Peak	27.15	-12.20	14.95	43.50	-28.55
289.96	H	Peak	33.78	-12.68	21.10	46.00	-24.90
352.04	H	Peak	43.01	-11.52	31.49	46.00	-14.51
657.59	H	Peak	28.27	-5.93	22.34	46.00	-23.66
770.11	H	Peak	29.47	-3.97	25.50	46.00	-20.50
813.76	H	Peak	29.66	-3.53	26.13	46.00	-19.87

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 :	May 26, 2011
Fundamental Frequency:	5736MHz	Test By:	Jay
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)	
3645.5	V	35.37	--	1.48	36.85	--	74.00	54.00	-37.15	H
11472.0	V	--	--			--	74.00	54.00		H
12855.0	V	22.61	--	18.82	41.43	--	74.00	54.00	-32.57	H
17208.0	V	--	--			--	74.00	54.00		H
22944.0	V	--	--			--	74.00	54.00		H
28680.0	V	--	--			--	74.00	54.00		H
3912.0	H	35.22	--	2.39	37.61	--	74.00	54.00	-36.39	H
11472.0	H	--	--			--	74.00	54.00		H
13453.5	H	24.70	--	20.15	44.85	--	74.00	54.00	-29.15	H
17208.0	H	--	--			--	74.00	54.00		H
22944.0	H	--	--			--	74.00	54.00		H
28680.0	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.

Operation Mode:	RX CH Mid	Test Date :	May 26, 2011
Fundamental Frequency:	5762MHz	Test By:	Jay
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)	
2482.0	V	36.69	--	-0.52	36.17	--	74.00	54.00	-37.83	H
11101.5	V	22.06	--	18.26	40.32	--	74.00	54.00	-33.68	H
11524.0	V	--	--			--	74.00	54.00		H
17286.0	V	--	--			--	74.00	54.00		H
23048.0	V	--	--			--	74.00	54.00		H
28810.0	V	--	--			--	74.00	54.00		H
3684.5	H	34.78	--	1.58	36.36	--	74.00	54.00	-37.64	H
11524.0	H	--	--			--	74.00	54.00		H
13747.5	H	23.08	--	20.90	43.98	--	74.00	54.00	-30.02	H
17286.0	H	--	--			--	74.00	54.00		H
23048.0	H	--	--			--	74.00	54.00		H
28810.0	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.

Operation Mode:	RX CH High	Test Date :	May 26, 2011
Fundamental Frequency:	5814MHz	Test By:	Jay
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)	
3190.5	V	34.19	--	0.83	35.02	--	74.00	54.00	-38.98	H
11628.0	V	--	--			--	74.00	54.00		H
11878.5	V	22.66	--	18.41	41.07	--	74.00	54.00	-32.93	H
17442.0	V	--	--			--	74.00	54.00		H
23256.0	V	--	--			--	74.00	54.00		H
29070.0	V	--	--			--	74.00	54.00		H
2540.0	H	34.62	--	-0.15	34.47	--	74.00	54.00	-39.53	H
11628.0	H	--	--			--	74.00	54.00		H
12414.0	H	22.09	--	17.99	40.08	--	74.00	54.00	-33.92	H
17442.0	H	--	--			--	74.00	54.00		H
23256.0	H	--	--			--	74.00	54.00		H
29070.0	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.

6. 20 dB BAND WIDTH MEASUREMENT

6.1 Measurement Procedure

1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. Set ETU normal operating mode.
3. Set SPA Center Frequency = fundamental frequency, RBW = 10kHz, VBW = 30kHz, Span =2MHz.
4. Set SPA Max hold. Mark peak, -20dB.

6.2 Test SET-UP (Block Diagram of Configuration)

Same as 4.2 Radiated Emission Measurement.

6.3 Measurement Equipment Used:

Same as 4.2 Radiated Emission Measurement.

6.4 Measurement Results:

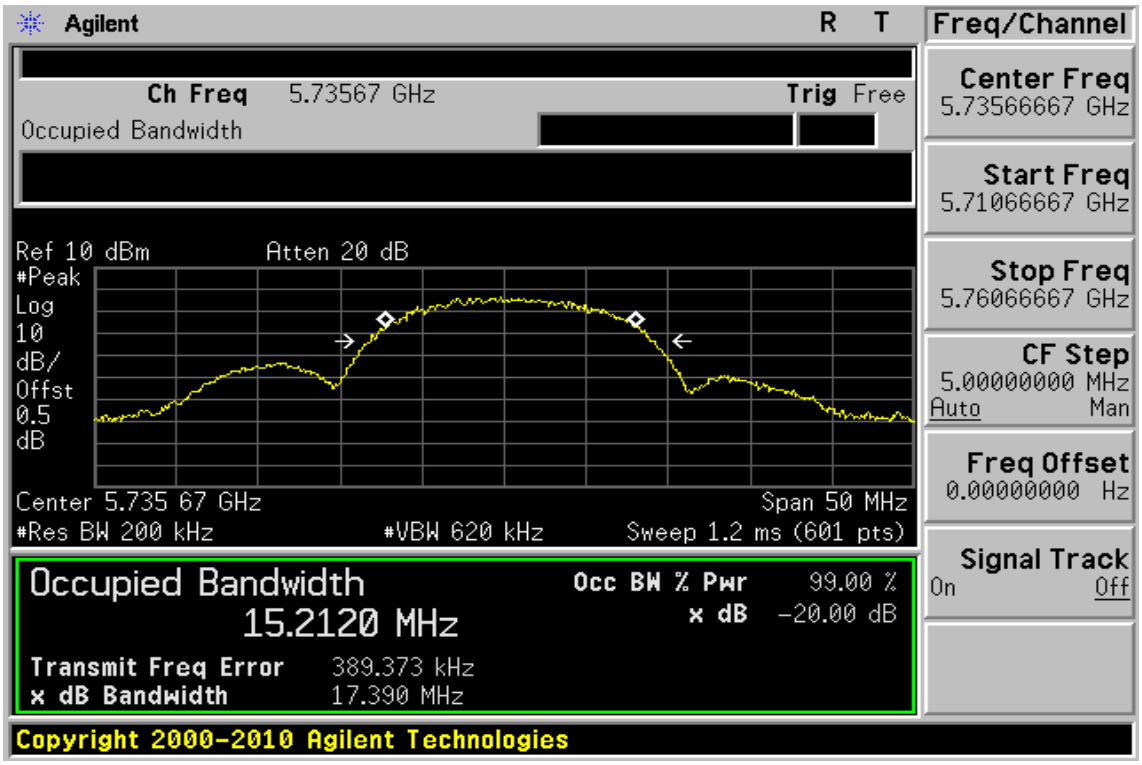
5736 Channel = 17.390 MHz

5762 Channel = 16.848 MHz

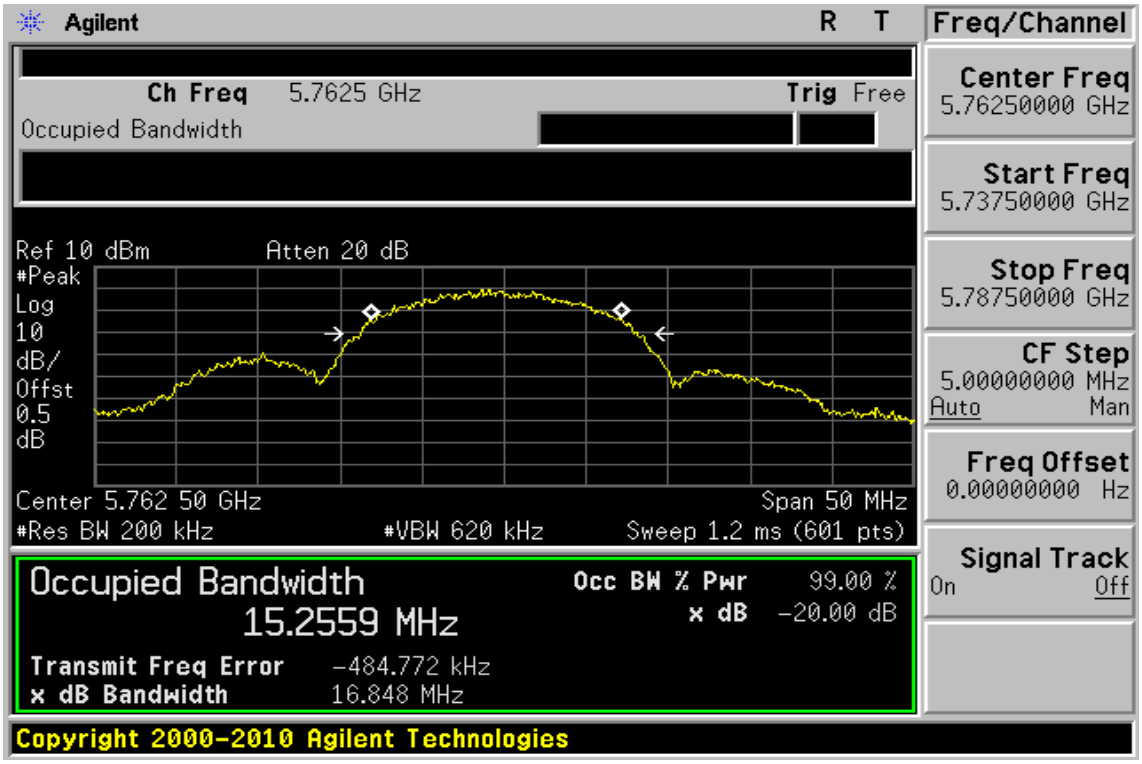
5814 Channel = 17.104 MHz

Refer to attached data chart.

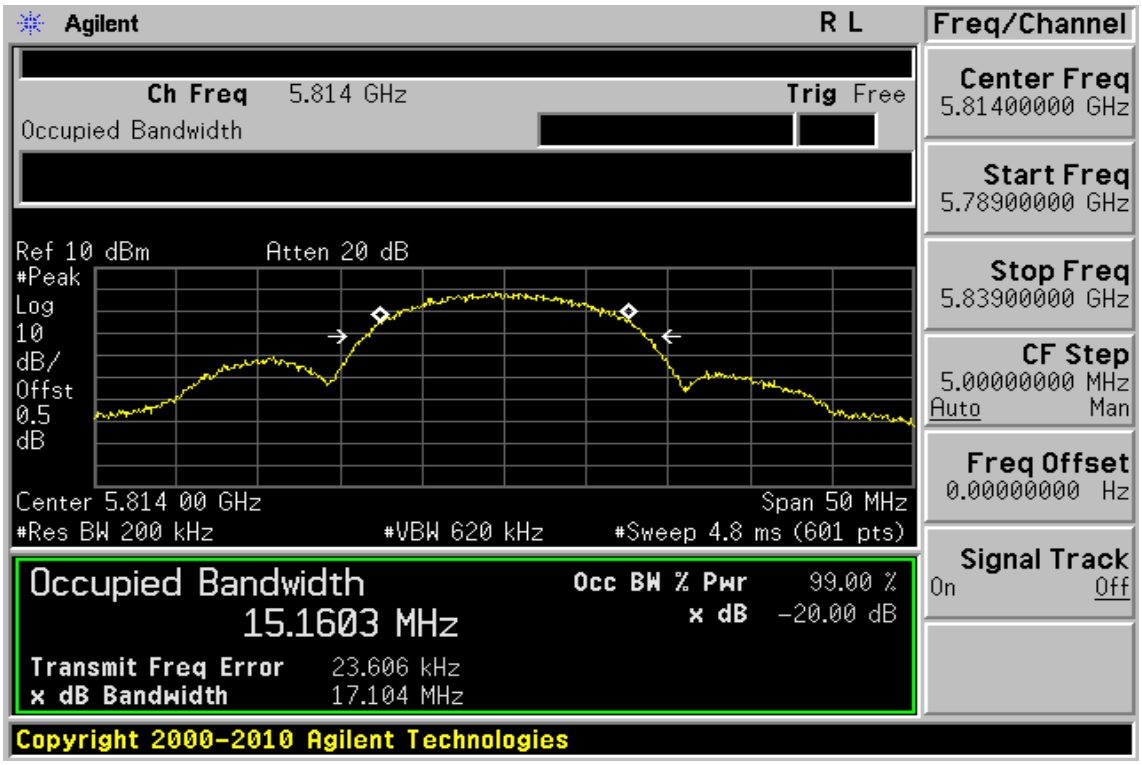
20dB Band Width test Plot (5736 MHz)



20dB Band Width test Plot (5762 MHz)



20dB Band Width test Plot (5814 MHz)



7. 99% BAND WIDTH MEASUREMENT

7.1 Measurement Procedure

1 Place the EUT on the table and set it in transmitting mode.

2 Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.

3 Set the spectrum analyzer as RBW=1% of the approximate emission bandwidth, VBW = 3 times RBW, Span= approximately 20dB below the peak level. Sweep=auto

4 Turn on the 99% bandwidth function, max reading..

5 Repeat above procedures until all frequency measured were complete.

7.2 Test SET-UP (Block Diagram of Configuration)

Same as 4.2 Radiated Emission Measurement.

7.3 Measurement Equipment Used:

Same as 4.2 Radiated Emission Measurement.

7.4 Measurement Results:

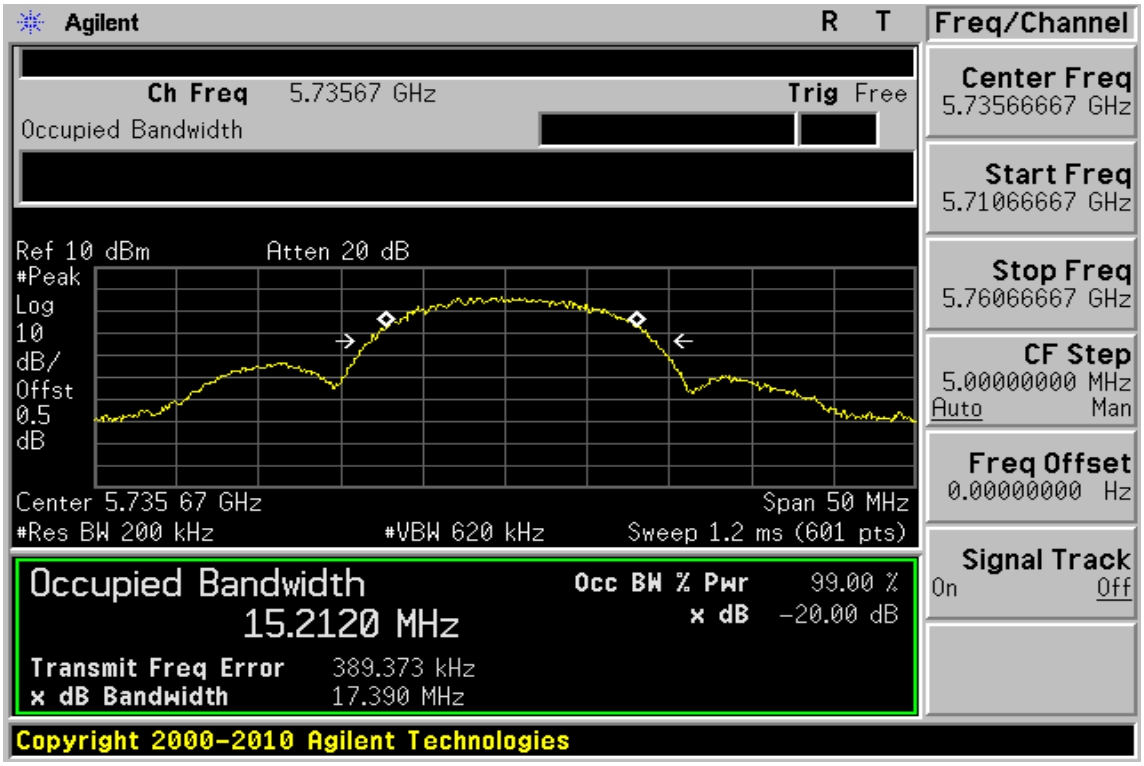
5736 Channel = 15.2120 MHz

5762 Channel = 15.2559 MHz

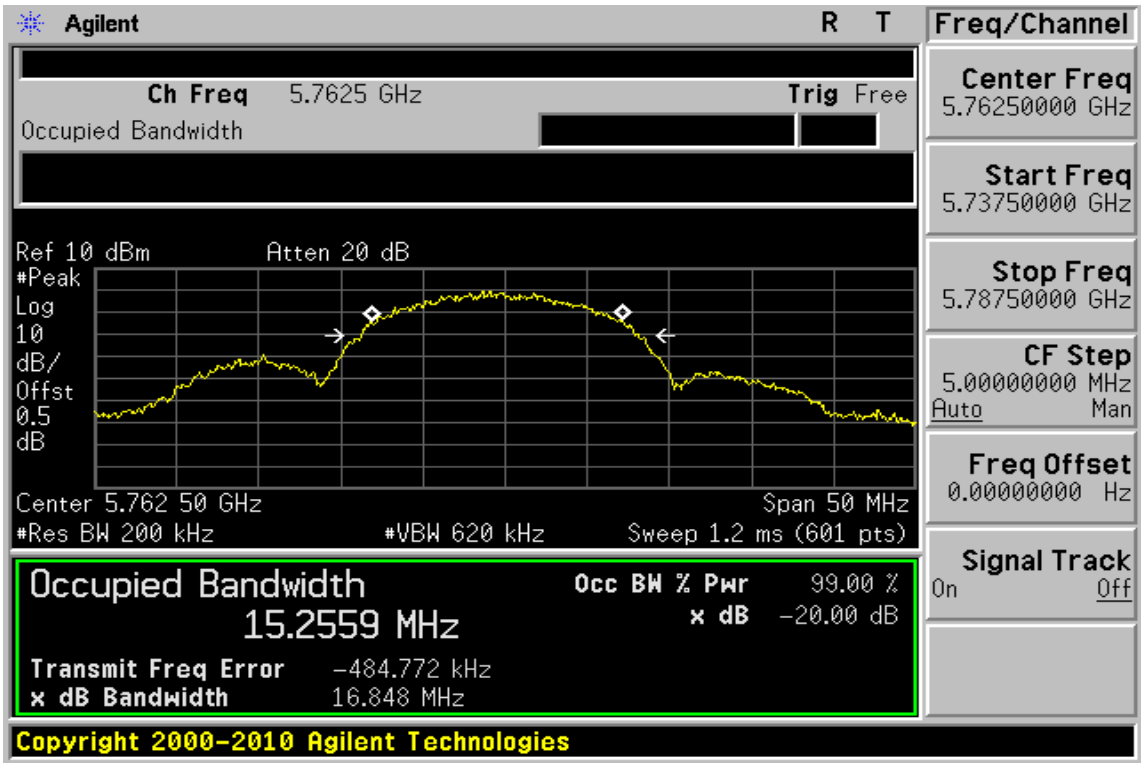
5814 Channel = 15.1603 MHz

Refer to attached data chart.

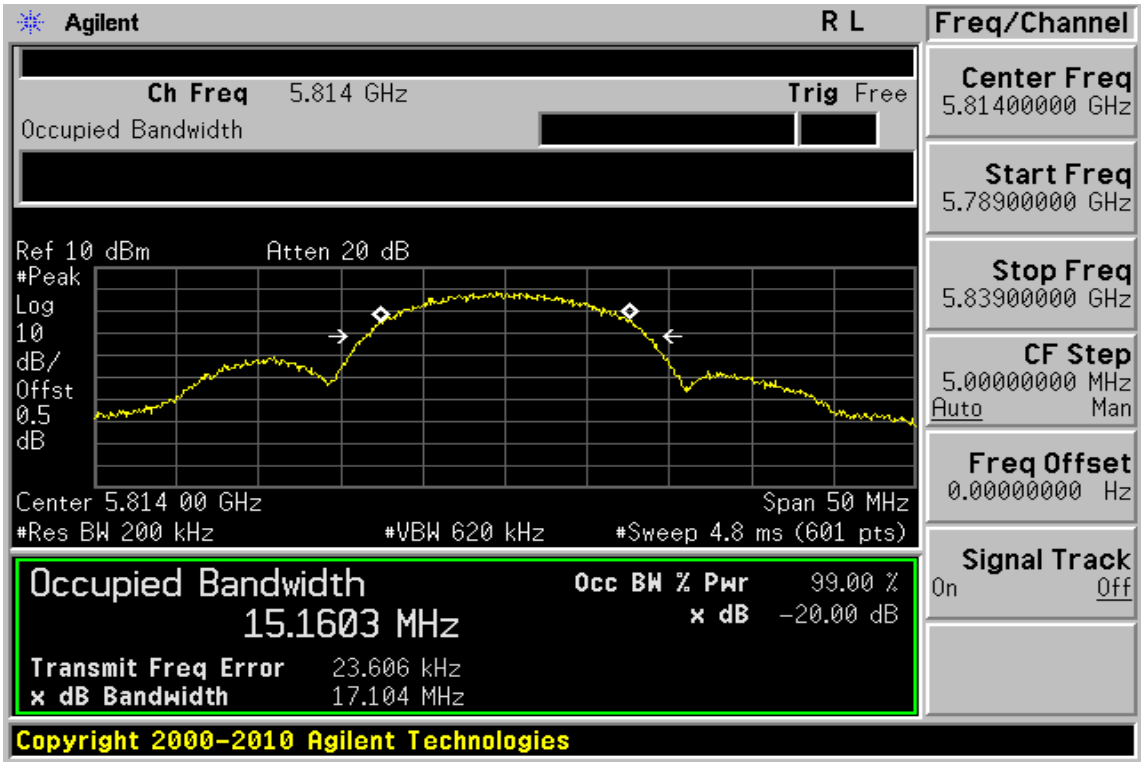
99% Band Width test Plot (5736 MHz)



99% Band Width test Plot (5762 MHz)



99% Band Width test Plot (5814 MHz)



8. MAXIMUM PERMISSIBLE EXPOSURE (MPE)

8.1 Standard Applicable

According to §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensure that the public is not exposed to radio frequency energy level in excess of the Commission's guideline.

This is a Mobile device, the MPE is required.

According to §1.1310 and §2.1093 RF exposure is calculated.

Limits for Maximum Permissive Exposure (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm^2)	Averaging Time (minute)
Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*($180/f^2$)	30
30-300	27.5	0.073	0.2	30
300-1500	/	/	F/1500	30
1500-15000	/	/	1.0	30

F = frequency in MHz

* = Plane-wave equipment power density

8.2 Maximum Permissible Exposure (MPE) Evaluation

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)
5736.0	V	89.80	79.60	7.37	97.17	86.97	114.00	94.00	-7.03
5736.0	H	93.57	83.27	7.37	100.94	90.64	114.00	94.00	-3.36
5762.0	V	89.23	78.23	7.41	96.64	85.64	114.00	94.00	-8.36
5762.0	H	94.15	83.65	7.41	101.56	91.06	114.00	94.00	-2.94
5814.0	V	88.99	78.59	7.51	96.50	86.10	114.00	94.00	-7.90
5814.0	H	94.81	84.11	7.51	102.32	91.62	114.00	94.00	-2.38

MPE Prediction

Prediction of MPE limit at a given distance

Equation from page 18 of OET Bulletin 65, Edition 97-01

$S=PG/4\pi R^2$

Where: S = Power density

P = Power input to antenna

G = Power gain of the antenna in the direction of interest relative to an isotropic radiator

R = Distance to the center of radiation of the antenna

dBm = dBuV/m - 95.2

maximum filed strength = 102.32 dBuV/m

102.32 dBuV/m - 95.2 = 7.12dBm

Maximum peak output power at antenna input terminal:	7.12	(dBm)
Maximum peak output power at antenna input terminal:	5.152286446	(mW)
Duty cycle:	100	(%)
Maximum Pav :	5.152286446	(mW)
Antenna gain (typical):	2	(dBi)
Maximum antenna gain:	1.584893192	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	5814	(MHz)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm2)
Power density at predication frequency at 20 (cm)	0.0016254	(mW/cm^2)

Measurement Result

The predicted power density level at 20 cm is 0.0016254mW/cm^2. This is below the uncontrolled exposure limit of 1 mW/cm^2 at 5814MHz.