

Report No.: ER/2011/70003 Issue Date: Jul. 26, 2011

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# ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

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

OF

Product Name: ZiiSound D3X

Brand Name: ZiiSound

Model Name: MF8120

Model Difference: N/A

FCC ID: IBAMF8120

IC: 2315A-MF8120

**Report No.:** ER/2011/70003

**Issue Date: Jul. 26, 2011** 

**FCC Rule Part:** §15.249

IC Rule Part: RSS-210 issue 8: 2010, Annex 2.9

**Creative Technology Ltd** 

Prepared for: 31 International Business Park,

Creative Resource, Singapore 609921

SGS Taiwan Ltd.

Prepared by: Electronics & Communication Laboratory

No. 134, Wu Kung Rd., Wuku Industrial Zone,

Taipei County, Taiwan.





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# VERIFICATION OF COMPLIANCE

Creative Technology Ltd **Applicant:** 

31 International Business Park, Creative Resource, Singapore 609921

**Product Description:** ZiiSound D3X FCC ID: **IBAMF8120** IC: 2315A-MF8120

ZiiSound **Brand Name:** 

Model No.: MF8120

**Model Difference:** N/A

File Number: ER/2011/70003

**Date of test:** Jul. 04, 2011 ~ Jul. 25, 2011

**Date of EUT Received:** Jul. 04, 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:	Jazz Huang	Date:	Jul. 26, 2011	
Prepared By:	Jazz Huang / Engineer Gigi yek	Date:	Jul. 26, 2011	
Approved By:	Gigi Yeh / Clerk  Jim Chang / Supervisor	Date: 	Jul. 26, 2011	

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# Version

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00	Jul. 26, 2011	Initial creation of document

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#### 1. **GENERAL INFORMATION**

#### 1.1. **Product Description**

Product Name:	ZiiSound D3X		
Brand Name:	ZiiSound		
Model Name:	MF8120		
Model Difference:	N/A		
	14Vdc by AC/DC power adapter		
Power Supply	Adaptor: Model: SRC14001900, Supplier: TJIN GOAN INDUSTRIAL LTD		

# 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

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

This submittal(s) (test report) is intended for FCC ID: IBAMF8120 filing to comply with Section 15.249 of the FCC Part 15, Subpart C Rules and IC: 2315A-MF8120 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.

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# 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.

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#### 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	Conducted Limit (dBuV)		
(MHz)	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	Field strength of	Field strength of	Distance (m)	
(MHz)	Fundamental	Harmonics		
002 029	50 mV/m	500 uV/m	3	
902 - 928	(94dBuV/m)	(54dBuV/m)	3	
2400 2492.5	50 mV/m	500 uV/m	2	
2400 – 2483.5	(94dBuV/m)	(54dBuV/m)	3	
5725 5975	50 mV/m	500 uV/m	2	
5725 – 5875	(94dBuV/m)	(54dBuV/m)	3	

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# (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	ency Field strength Distance (m)		Field strength at 3m	
(MHz)	μV/m		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  $\xi$  15.205
- 4. Emission spurious frequency which appearing within the Restricted Bands specified in provision of  $\xi$ 15.205, then the general radiated emission limits in  $\xi$ 15.209 apply.

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#### 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.

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#### **3.** SUMMARY OF TEST RESULTS

FCC Rules	<b>Description Of Test</b>	Result	
§15.207/	Condented Englacies	Compliant	
RSS-Gen §7.2.2	Conducted Emission		
§15.249(a)(d)(e)	Field Strength Measurement	G1'	
RSS-210 issue 8,§A2.9(a)(b)	(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.

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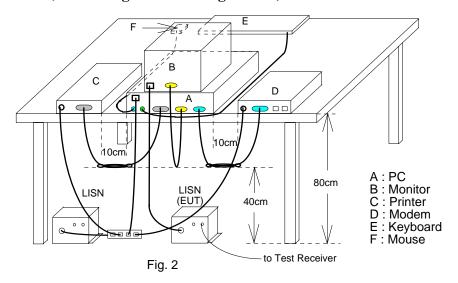
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#### 4. CONDUCTED EMISSIONS TEST

#### 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)**



#### 4.3 **Measurement Equipment Used:**

Conducted Emission Test Site							
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.		
TYPE		NUMBER	NUMBER	CAL.			
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.

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Temperature:

Air Pressure:

58%

hpa

Humidity:

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# AC POWER LINE CONDUCTED EMISSION TEST DATA

Operation Mode:	Charger Mode			Test Date:	Jul, 25, 2011
Temperature:	23	Humidity:	58 %	Test By:	Jazz



Site SGS CONDUCTED#1

Limit: FCC Class B Conduction(QP)

EUT: ZiiSoundD3X M/N: MF8120

Note:

No. Mk.	Freq.	Reading Level	Factor	Measure- ment	Limit	Over		
	MHz	dBuV	dВ	dBuV	dBuV	dВ	Detector	Comment
1	0.1900	49.11	0.13	49.24	64.04	-14.80	peak	
2	0.2350	47.20	0.12	47.32	62.27	-14.95	peak	
3	0.3000	43.31	0.12	43.43	60.24	-16.81	peak	
4 *	0.5498	44.42	0.12	44.54	56.00	-11.46	QP	
5	0.5498	29.80	0.12	29.92	46.00	-16.08	AVG	
6	0.7700	36.80	0.11	36.91	56.00	-19.09	peak	
7	14.0600	30.28	0.41	30.69	60.00	-29.31	peak	

Phase:

Power:

Distance:

L1

AC 120V/60Hz

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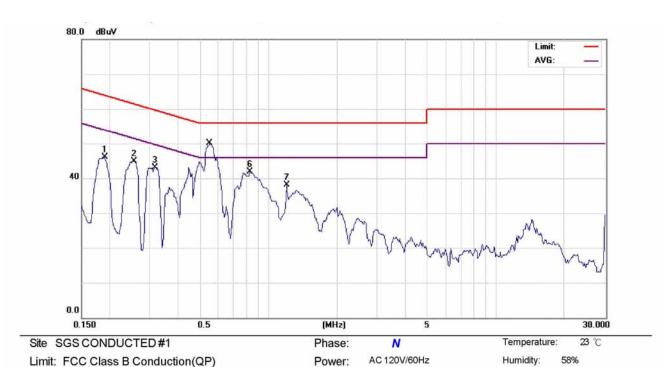


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Air Pressure:

hpa

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EUT: ZiiSoundD3X M/N: MF8120

Note:

No.	Mk.	Freq.	Reading Level	Factor	Measure- ment	Limit	Over			
		MHz	dBuV	dВ	dBuV	dBuV	dВ	Detector	Comment	
1		0.1900	45.86	0.17	46.03	64.04	-18.01	peak		
2		0.2550	44.74	0.16	44.90	61.59	-16.69	peak		
3		0.3150	42.98	0.15	43.13	59.84	-16.71	peak		
4	*	0.5500	46.73	0.16	46.89	56.00	-9.11	QP		
5		0.5500	31.99	0.16	32.15	46.00	-13.85	AVG		
6		0.8300	41.71	0.15	41.86	56.00	-14.14	peak		
7		1.2000	38.04	0.16	38.20	56.00	-17.80	peak		

Distance:

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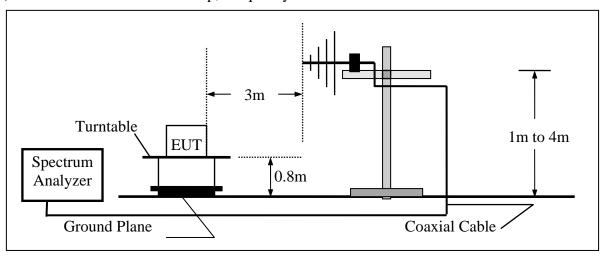
#### **5.** RADIATED EMISSION TEST (TX, RX)

#### 5.1 **Measurement Procedure**

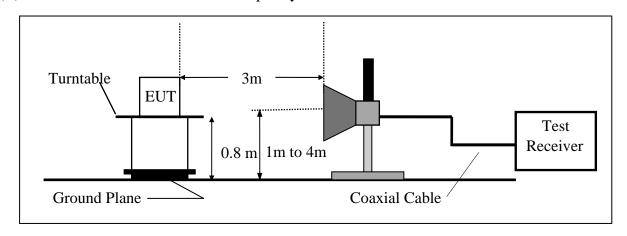
- The EUT was placed on a turntable that is 0.8m above ground plane.
- 2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
- 3. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
- 4. Repeat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

#### **Test SET-UP (Block Diagram of Configuration)** 5.2

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



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



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# **Measurement Equipment Used:**

3.5 Weasurement Equi	966 Chamber								
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.				
Spectrum Analyzer	R&S	FSP 40	100034	03/30/2011	03/29/2012				
Bilog Antenna	SCHWAZBECK	VULB9160	3136	11/19/2010	11/18/2011				
Horn antenna	SCHWAZBECK	BBHA 9120D	309/320	01/22/2010	01/21/2012				
Loop antenna	MESSTEC	FLA30	03/10086	07/07/2011	07/06/2013				
Pre-Amplifier	Agilent	8447D	1937A02834	11/28/2010	11/27/2011				
Pre-Amplifier	Agilent	8449B	3008A01973	01/05/2011	01/04/2012				
Radio Communication Analyzer	R & S	CMU200	102189	08/12/2010	08/11/2012				
DC Block	Agilent	BLK-18	155452	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	09/06/2010	09/05/2011				

#### 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	

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### 5.5 Measurement Result

# Radiated Spurious Emission Measurement Result (below 1GHz)

Operation Mode TX CH Low Test Date Jul. 22, 2011

Fundamental Frequency 5736MHz Test By Jazz
Temperature 25 °C Pol Ver./Hor

Humidity 65 %

Freq.	Ant.Pol.	Detector Mode	Reading	Factor	Actual FS	Limit3m	Safe Margin
(MHz)	H/V	(PK/QP)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)
41.64	V	Peak	45.72	-13.51	32.21	40.00	-7.79
193.93	V	Peak	49.28	-15.68	33.60	43.50	-9.90
308.39	V	Peak	32.17	-12.25	19.92	46.00	-26.08
483.96	V	Peak	31.25	-9.38	21.87	46.00	-24.13
615.88	V	Peak	40.21	-6.68	33.53	46.00	-12.47
923.37	V	Peak	29.60	-1.90	27.70	46.00	-18.30
42.61	Н	Peak	29.21	-13.51	15.70	40.00	-24.30
198.78	Н	Peak	46.68	-15.88	30.80	43.50	-12.70
260.86	Н	Peak	47.94	-13.61	34.33	46.00	-11.67
399.57	Н	Peak	35.43	-10.90	24.53	46.00	-21.47
726.46	Н	Peak	35.16	-4.82	30.34	46.00	-15.66
959.26	Н	Peak	28.43	-1.54	26.89	46.00	-19.11

### 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.

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Operation Mode TX CH Mid Test Date Jul. 22, 2011

Fundamental Frequency 5762MHz Test By Jazz Pol Temperature 25 °C Ver./Hor

Humidity 65 %

Freq.	Ant.Pol.	Detector Mode	Reading	Factor	Actual FS	Limit3m	Safe Margin
(MHz)	H/V	(PK/QP)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)
45.52	V	Peak	46.45	-13.75	32.70	40.00	-7.30
192.96	V	Peak	48.68	-15.56	33.12	43.50	-10.38
308.39	V	Peak	31.98	-12.25	19.73	46.00	-26.27
483.96	V	Peak	30.50	-9.38	21.12	46.00	-24.88
615.88	V	Peak	39.59	-6.68	32.91	46.00	-13.09
986.42	V	Peak	28.01	-1.55	26.46	54.00	-27.54
42.61	Н	Peak	28.78	-13.51	15.27	40.00	-24.73
196.84	Н	Peak	46.68	-15.77	30.91	43.50	-12.59
263.77	Н	Peak	48.29	-13.43	34.86	46.00	-11.14
408.30	Н	Peak	36.32	-10.74	25.58	46.00	-20.42
726.46	Н	Peak	34.86	-4.82	30.04	46.00	-15.96
963.14	Н	Peak	28.18	-1.55	26.63	54.00	-27.37

### 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 / OP 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.

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Operation Mode TX CH High Test Date Jul. 22, 2011

Fundamental Frequency 5814MHz Test By Jazz Temperature 25 °C Pol Ver./Hor

Humidity 65 %

Freq.	Ant.Pol.	Detector Mode	Reading	Factor	Actual FS	Limit3m	Safe Margin
(MHz)	H/V	(PK/QP)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)
46.49	V	Peak	45.94	-13.76	32.18	40.00	-7.82
192.96	V	Peak	48.62	-15.56	33.06	43.50	-10.44
286.08	V	Peak	32.62	-12.81	19.81	46.00	-26.19
494.63	V	Peak	29.78	-9.21	20.57	46.00	-25.43
615.88	V	Peak	40.11	-6.68	33.43	46.00	-12.57
988.36	V	Peak	27.92	-1.56	26.36	54.00	-27.64
36.79	Н	Peak	29.56	-14.07	15.49	40.00	-24.51
198.78	Н	Peak	46.83	-15.88	30.95	43.50	-12.55
254.07	Н	Peak	48.35	-13.80	34.55	46.00	-11.45
410.24	Н	Peak	34.39	-10.70	23.69	46.00	-22.31
726.46	Н	Peak	35.58	-4.82	30.76	46.00	-15.24
962.17	Н	Peak	28.36	-1.54	26.82	54.00	-27.18

### 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.

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# Radiated Spurious Emission Measurement Result (above 1GHz)

Operation Mode: TX CH Low Test Date: Jul. 22, 2011

Fundamental Frequency: 5736MHz Test By: Jazz Pol: Temperature: 25 °C 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)	at 3m	Margin (dB)	
5736.0	V	95.24	85.29	7.37	102.61	92.66	114.00	94.00	-1.34	F
4900.0	V	25.94		5.49	31.43		74.00	54.00	-42.57	Н
11472.0	V						74.00	54.00		Н
11710.0	V	22.32		18.59	40.91		74.00	54.00	-33.09	Н
17208.0	V						74.00	54.00		Н
22944.0	V						74.00	54.00		Н
28680.0	V						74.00	54.00		Н
34416.0	V						74.00	54.00		Н

### Remark:

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

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Operation Mode: TX CH Low Test Date: Jul. 22, 2011

Fundamental Frequency: 5736MHz Test By: Jazz

Pol: Temperature: 25 °C Horizontal

Humidity: 65 %

		Peak	$\mathbf{AV}$		Actual	Actual	Peak Limit	<b>AV</b> Limit		
Freq.	Ant.Pol.	Reading	Reading	Factor	Peak FS	AV FS	at 3m	at 3m	Margin	
(MHz)	H/V	(dBuV)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
5736.0	Н	94.56	84.84	7.37	101.93	92.21	114.00	94.00	-1.79	F
4802.5	Н	25.05		5.25	30.30		74.00	54.00	-43.70	Н
11472.0	Н						74.00	54.00		Н
11574.0	Н	21.52		18.72	40.24		74.00	54.00	-33.76	Н
17208.0	Н						74.00	54.00		Н
22944.0	Н						74.00	54.00		Н
28680.0	Н						74.00	54.00		Н
34416.0	Н						74.00	54.00		Н

### Remark:

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

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Operation Mode: TX CH Mid Test Date: Jul. 22, 2011

Fundamental Frequency: 5762MHz Test By: Jazz Pol: Vertical Temperature: 25 °C

Humidity: 65 %

		Peak	$\mathbf{AV}$		Actual	Actual	Peak Limit	<b>AV</b> Limit		
Freq.	Ant.Pol.	Reading	Reading	Factor	Peak FS	AV FS	at 3m	at 3m	Margin	
(MHz)	H/V	(dBuV)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
5762.0	V	93.40	84.68	7.41	100.81	92.09	114.00	94.00	-1.91	F
4854.5	V	25.02		5.39	30.41		74.00	54.00	-43.59	Н
11524.0	V	21.32		18.70	40.02		74.00	54.00	-33.98	Н
17286.0	V						74.00	54.00		Н
23048.0	V						74.00	54.00		Н
28810.0	V						74.00	54.00		Н
34572.0	V						74.00	54.00		Н

# 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.

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Operation Mode: TX CH Mid Test Date: Jul. 22, 2011

Fundamental Frequency: 5762MHz Test By: Jazz

Pol: Temperature: 25 °C Horizontal

Humidity: 65 %

		Peak	$\mathbf{AV}$		Actual	Actual	Peak Limit	AV Limit		
Freq.	Ant.Pol.	Reading	Reading	Factor	Peak FS	AV FS	at 3m	at 3m	Margin	
(MHz)	H/V	(dBuV)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
5762.0	Н	93.67	83.80	7.41	101.08	91.21	114.00	94.00	-2.79	F
4490.5	Н	25.07		4.33	29.40		74.00	54.00	-44.60	Н
11524.0	Н	21.88		18.67	40.55		74.00	54.00	-33.45	Н
17286.0	Н						74.00	54.00		Н
23048.0	Н						74.00	54.00		Н
28810.0	Н						74.00	54.00		Н
34572.0	Н						74.00	54.00		Н

### 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.

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Operation Mode: TX CH High Test Date: Jul. 22, 2011

Fundamental Frequency: 5814MHz Test By: Jazz Temperature:  $25 \, ^{\circ}C$  Pol: Vertical

Humidity: 65 %

		Peak	$\mathbf{AV}$		Actual	Actual	Peak Limit	<b>AV</b> Limit		
Freq.	Ant.Pol.	Reading	Reading	Factor	Peak FS	AV FS	at 3m	at 3m	Margin	
(MHz)	H/V	(dBuV)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
5814.0	V	93.27	83.59	7.51	100.78	91.10	114.00	94.00	-2.90	F
4939.0	V	24.43		5.58	30.01		74.00	54.00	-43.99	Н
11628.0	V	21.51		18.70	40.21		74.00	54.00	-33.79	Н
17442.0	V						74.00	54.00		Н
23256.0	V						74.00	54.00		Н
29070.0	V						74.00	54.00		Н
34884.0	V						74.00	54.00		Н

### 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.

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Operation Mode: TX CH High Test Date: Jul. 22, 2011

Fundamental Frequency: 5814MHz Test By: Jazz

Temperature: 25 °C Pol: Horizontal

Humidity: 65 %

		Peak	$\mathbf{AV}$		Actual	Actual	Peak Limit	<b>AV</b> Limit		
Freq.	Ant.Pol.	Reading	Reading	Factor	Peak FS	AV FS	at 3m	at 3m	Margin	
(MHz)	H/V	(dBuV)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
5814.0	Н	91.74	81.99	7.51	99.25	89.50	114.00	94.00	-4.50	F
4802.5	Н	24.88		5.25	30.13		74.00	54.00	-43.87	Н
11628.0	Н	21.82		18.72	40.54		74.00	54.00	-33.46	Н
17442.0	H						74.00	54.00		Н
23256.0	Н						74.00	54.00		Н
29070.0	Н						74.00	54.00		Н
34884.0	Н						74.00	54.00		Н

### 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.

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# Radiated Spurious Emission Measurement Result (below 1GHz)

Operation Mode RX CH Low Test Date Jul. 22, 2011

Fundamental Frequency 5736MHz Test By Jazz Temperature Pol 25 °C Ver./Hor

Humidity 65 %

Freq.	Ant.Pol.	Detector Mode	Reading	Factor	<b>Actual FS</b>	Limit3m	Safe Margin
(MHz)	H/V	(PK/QP)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)
40.67	V	Peak	44.88	-13.38	31.50	40.00	-8.50
196.84	V	Peak	48.75	-15.77	32.98	43.50	-10.52
288.99	V	Peak	32.36	-12.68	19.68	46.00	-26.32
483.96	V	Peak	30.93	-9.38	21.55	46.00	-24.45
615.88	V	Peak	40.00	-6.68	33.32	46.00	-12.68
969.93	V	Peak	28.54	-1.54	27.00	54.00	-27.00
36.79	Н	Peak	30.52	-14.07	16.45	40.00	-23.55
199.75	Н	Peak	45.98	-15.99	29.99	43.50	-13.51
254.07	Н	Peak	48.61	-13.80	34.81	46.00	-11.19
402.48	Н	Peak	34.98	-10.87	24.11	46.00	-21.89
726.46	Н	Peak	35.10	-4.82	30.28	46.00	-15.72
959.26	Н	Peak	28.62	-1.54	27.08	46.00	-18.92

#### 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.

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Operation Mode RX CH Mid Test Date Jul. 22, 2011

Fundamental Frequency 5762MHz Test By Jazz Pol Ver./Hor Temperature 25 °C

Humidity 65 %

Ant.Pol.	Detector Mode	Reading	Factor	Actual FS	Limit3m	Safe Margin
H/V	(PK/QP)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)
V	Peak	46.60	-13.51	33.09	40.00	-6.91
V	Peak	47.28	-14.38	32.90	43.50	-10.60
V	Peak	32.60	-12.25	20.35	46.00	-25.65
V	Peak	30.03	-9.38	20.65	46.00	-25.35
V	Peak	39.82	-6.68	33.14	46.00	-12.86
V	Peak	27.67	-1.54	26.13	54.00	-27.87
Н	Peak	29.96	-14.08	15.88	40.00	-24.12
Н	Peak	46.62	-15.99	30.63	43.50	-12.87
Н	Peak	48.39	-13.80	34.59	46.00	-11.41
Н	Peak	37.75	-11.02	26.73	46.00	-19.27
Н	Peak	34.63	-4.82	29.81	46.00	-16.19
Н	Peak	28.66	-1.54	27.12	54.00	-26.88
	H/V  V  V  V  V  H  H  H  H	Mode H/V (PK/QP)  V Peak V Peak V Peak V Peak V Peak V Peak H Peak	Ant.Pol.         Mode         Reading           H/V         (PK/QP)         (dBuV)           V         Peak         46.60           V         Peak         47.28           V         Peak         32.60           V         Peak         30.03           V         Peak         39.82           V         Peak         27.67           H         Peak         46.62           H         Peak         48.39           H         Peak         37.75           H         Peak         34.63	Ant.Pol.         Mode         Reading         Factor           H/V         (PK/QP)         (dBuV)         (dB)           V         Peak         46.60         -13.51           V         Peak         47.28         -14.38           V         Peak         32.60         -12.25           V         Peak         30.03         -9.38           V         Peak         39.82         -6.68           V         Peak         27.67         -1.54           H         Peak         46.62         -15.99           H         Peak         48.39         -13.80           H         Peak         37.75         -11.02           H         Peak         34.63         -4.82	Ant.Pol. H/VMode (PK/QP)Reading (dBuV)Factor 	Ant.Pol.         Mode         Reading         Factor         Actual FS         Limit3m           H/V         (PK/QP)         (dBuV)         (dB)         (dBuV/m)         (dBuV/m)           V         Peak         46.60         -13.51         33.09         40.00           V         Peak         47.28         -14.38         32.90         43.50           V         Peak         32.60         -12.25         20.35         46.00           V         Peak         30.03         -9.38         20.65         46.00           V         Peak         39.82         -6.68         33.14         46.00           V         Peak         27.67         -1.54         26.13         54.00           H         Peak         29.96         -14.08         15.88         40.00           H         Peak         46.62         -15.99         30.63         43.50           H         Peak         48.39         -13.80         34.59         46.00           H         Peak         37.75         -11.02         26.73         46.00           H         Peak         34.63         -4.82         29.81         46.00

#### 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.

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Operation Mode RX CH High Test Date Jul. 22, 2011

Fundamental Frequency 5814MHz Test By Jazz 25 °C Pol Ver./Hor Temperature

Humidity 65 %

Freq.	Ant.Pol.	Detector Mode	Reading	Factor	Actual FS	Limit3m	Safe Margin
(MHz)	H/V	(PK/QP)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)
42.61	V	Peak	44.45	-13.51	30.94	40.00	-9.06
179.38	V	Peak	48.65	-14.08	34.57	43.50	-8.93
308.39	V	Peak	32.09	-12.25	19.84	46.00	-26.16
483.96	V	Peak	30.80	-9.38	21.42	46.00	-24.58
615.88	V	Peak	39.82	-6.68	33.14	46.00	-12.86
957.32	V	Peak	28.06	-1.54	26.52	46.00	-19.48
43.58	Н	Peak	29.37	-13.62	15.75	40.00	-24.25
196.84	Н	Peak	46.58	-15.77	30.81	43.50	-12.69
257.95	Н	Peak	47.46	-13.71	33.75	46.00	-12.25
400.54	Н	Peak	34.50	-10.91	23.59	46.00	-22.41
726.46	Н	Peak	34.94	-4.82	30.12	46.00	-15.88
912.70	H	Peak	27.98	-2.05	25.93	46.00	-20.07

### 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.

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### Radiated Spurious Emission Measurement Result (above 1GHz)

**Operation Mode: RX CH Low** Test Date: Jul. 22, 2011

Fundamental Frequency: 5736MHz Test By: Jazz Temperature: 25 °C Pol: V/H

**Humidity**: 65 %

		Peak	$\mathbf{AV}$		Actual	Actual	Peak Limit	<b>AV</b> Limit		
Freq.	Ant.Pol.	Reading	Reading	Factor	Peak FS	AV FS	at 3m	at 3m	Margin	
(MHz)	H/V	(dBuV)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
4744.0	V	24.99		5.10	30.09		74.00	54.00	-43.91	Н
11472.0	V	21.01		18.38	39.39		74.00	54.00	-34.61	Н
17208.0	V						74.00	54.00		Н
22944.0	V						74.00	54.00		Н
28680.0	V						74.00	54.00		Н
										Н
4815.5	Н	24.83		5.25	30.08		74.00	54.00	-43.92	
11472.0	Н	21.19		18.76	39.95		74.00	54.00	-34.05	Н
17208.0	Н						74.00	54.00		Н
22944.0	Н						74.00	54.00		Н
28680.0	Н						74.00	54.00		Н

### 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.

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Operation Mode: RX CH Mid Test Date: Jul. 22, 2011

Fundamental Frequency: 5762MHz Test By: Jazz Temperature: Pol: V/H 25 °C

65 % **Humidity**:

		Peak	$\mathbf{AV}$		Actual	Actual	Peak Limit	<b>AV</b> Limit		
Freq.	Ant.Pol.	Reading	Reading	Factor	Peak FS	AV FS	at 3m	at 3m	Margin	
(MHz)	H/V	(dBuV)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
4809.0	V	25.28		5.25	30.53		74.00	54.00	-43.47	Н
11524.0	V	21.13		18.38	39.51		74.00	54.00	-34.49	Н
17286.0	V						74.00	54.00		Н
23048.0	V						74.00	54.00		Н
28810.0	V						74.00	54.00		Н
										Н
4900.0	Н	24.39		5.49	29.88		74.00	54.00	-44.12	
11524.0	Н	20.70		18.76	39.46		74.00	54.00	-34.54	Н
17286.0	Н						74.00	54.00		Н
23048.0	Н						74.00	54.00		Н
28810.0	Н						74.00	54.00		Н

### 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.

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Operation Mode: RX CH High Test Date: Jul. 22, 2011

Fundamental Frequency: 5814MHz Test By: Jazz Temperature: 25 °C Pol: V/H

65 % **Humidity**:

		Peak	$\mathbf{AV}$		Actual	Actual	Peak Limit	<b>AV</b> Limit		
Freq.	Ant.Pol.	Reading	Reading	Factor	Peak FS	AV FS	at 3m	at 3m	Margin	
(MHz)	H/V	(dBuV)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
4802.5	V	24.88		5.25	30.13		74.00	54.00	-43.87	Н
11628.0	V	21.26		18.35	39.61		74.00	54.00	-34.39	Н
17442.0	V						74.00	54.00		Н
23256.0	V						74.00	54.00		Н
29070.0	V						74.00	54.00		Н
										Н
4594.5	Н	24.75		4.60	29.35		74.00	54.00	-44.65	
11628.0	Н	20.60		18.69	39.29		74.00	54.00	-34.71	Н
17442.0	Н						74.00	54.00		Н
23256.0	H						74.00	54.00		Н
29070.0	Н						74.00	54.00		Н

### 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.

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# 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 = 16.979 MHz

5762 Channel = 17.043 MHz

5814 Channel = 17.023 MHz

Refer to attached data chart.

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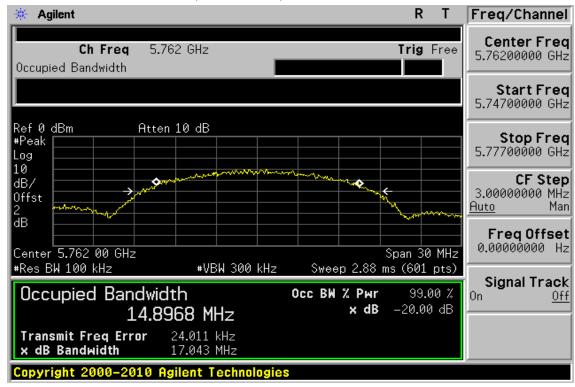
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# 20dB Band Width test Plot (5736 MHz)



# 20dB Band Width test Plot (5762 MHz)



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# 20dB Band Width test Plot (5814 MHz)



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# 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 = 14.9753 MHz

5762 Channel = 14.8968 MHz

5814 Channel = 14.9899 MHz

Refer to attached data chart.

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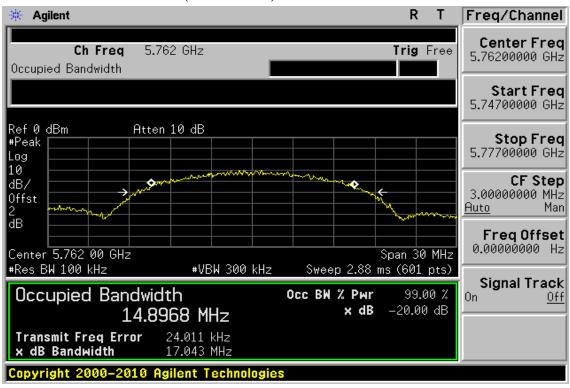
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# 99% Band Width test Plot (5736 MHz)



# 99% Band Width test Plot (5762 MHz)



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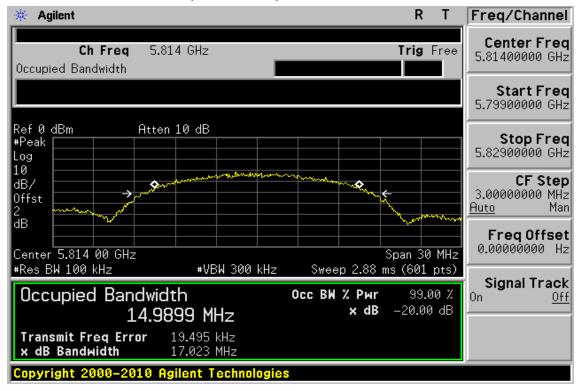
SGS Taiwan Ltd.No.134, Wu Kung Road, Wuku Industrial Zone, Taipei County, Taiwan/台北縣五股工業區五工路134號



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# 99% Band Width test Plot (5814 MHz)



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#### MAXIMUM PERMISSIBLE EXPOSURE (MPE) 8.

#### 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	Electric Field	Magnetic Field	Power Density	Averaging Time					
(MHz)	Strength (V/m)	Strength (A/m)	$(mW/cm^2)$	(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

#### 8.2 **Maximum Permissible Exposure (MPE) Evaluation**

		Peak	$\mathbf{AV}$		Actual	Actual	Peak Limit	<b>AV</b> Limit	
Freq.	Ant.Pol.	Reading	Reading	Factor	Peak FS	AV FS	at 3m	at 3m	Margin
(MHz)	H/V	(dBuV)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)
5736.0	V	95.24	85.29	7.37	102.61	92.66	114.00	94.00	-1.34
5736.0	Н	94.56	84.84	7.37	101.93	92.21	114.00	94.00	-1.79
5762.0	V	93.40	84.68	7.41	100.81	92.09	114.00	94.00	-1.91
5762.0	Н	93.67	83.80	7.41	101.08	91.21	114.00	94.00	-2.79
5814.0	V	93.27	83.59	7.51	100.78	91.10	114.00	94.00	-2.90
5814.0	Н	91.74	81.99	7.51	99.25	89.50	114.00	94.00	-4.50

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<sup>\* =</sup> Plane-wave equipment power density

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### **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 = 102.61 dBuV/m

102.61 dBuV/m - 95.2 = 7.41 dBm

Maximum peak output power at antenna input terminal:	7.41	(dBm)
Maximum peak output power at antenna input terminal:	5.508076964	(mW)
Duty cycle:	100	(%)
Maximum Pav :	5.508076964	(mW)
Antenna gain (typical):	2	(dBi)
Maximum antenna gain:	1.584893192	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	5736	(MHz)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm2)
Power density at predication frequency at 20 (cm)	0.0017376	(mW/cm^2)

### **Measurement Result**

The predicted power density level at 20 cm is 0.0016254mW/cm<sup>2</sup>. This is below the uncontrolled exposure limit of 1 mW/cm<sup>2</sup> at 5736MHz.

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