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# FCC Test Report

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Report No.: AGC00334130601FE02

**FCC ID** : QLPSAM88  
**APPLICATION PURPOSE** : Original Equipment  
**PRODUCT DESIGNATION** : SAM88  
**BRAND NAME** : SOSTARK  
**MODEL NAME** : SAM88  
**CLIENT** : Sostark Pte Ltd  
**DATE OF ISSUE** : June 24,2013  
**STANDARD(S)** : FCC Part 15 Rules  
**REPORT VERSION** : V1.0

Attestation of Global Compliance (Shenzhen) Co., Ltd



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### Report Revise Record

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	June 24,2013	Valid	Original Report

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## 1. VERIFICATION OF CONFORMITY

Applicant	Sostark Pte Ltd
Address	20 Sin Ming Lane,#08-52,Midview City,Singapore 573968
Manufacturer	Zhangzhou Shadow Electron Industry Co.,Ltd
Address	88#,Xiangjing Road,Beidou Industrial Park,Jinfeng Industrial District,363000,Zhangzhou,Fujian,China
Product Designation	SAM88
Brand Name	SOSTARK
Test Model	SAM88
Date of test	Jun. 17,2013 to Jun. 21,2013
Deviation	None
Condition of Test Sample	Normal
Report Template	AGCRT-US-BGN/RF (2013-03-01)

We hereby certify that:

The above equipment was tested by Attestation of Global Compliance (Shenzhen) Co., Ltd. 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 requirement of FCC Part 15 Rules requirement.

Prepared By



Wall Huang June 24,2013

Checked By



Forrest Lei June 24,2013

Authorized By



Solger Zhang June 24,2013

## 2. GENERAL INFORMATION

### 2.1. PRODUCT DESCRIPTION

The EUT is designed as "SAM88". It is designed by way of utilizing the DSSS technology to achieve the system operation.

A major technical description of EUT is described as following

<b>Operation Frequency</b>	5736MHZ~5814MHZ
<b>Max. Output Power</b>	10.87dBm
<b>Modulation</b>	QPSK
<b>Number of channels</b>	3
<b>Hardware Version</b>	N/A
<b>Software Version</b>	N/A
<b>Antenna Designation</b>	Integrated Antenna
<b>Antenna Gain</b>	-5dBi

### 2.2. TABLE OF CARRIER FREQUENCYS

Frequency Band	Channel Number	Frequency
5736~5814MHZ	1	5736 MHZ
	2	5762 MHZ
	3	5814 MHZ

### **2.3. RELATED SUBMITTAL(S) / GRANT (S)**

This submittal(s) (test report) is intended for **FCC ID: QLPSAM88** filing to comply with the FCC Part 15 requirements.

### **2.5. TEST METHODOLOGY**

Because the EUT received power from lithium battery, so only radiated testing was performed according to the procedures in ANSI C63.4 (2003). Radiated testing was performed at an antenna to EUT distance 3 meters.

### **2.6. SPECIAL ACCESSORIES**

Refer to section 5.2.

### **2.7. EQUIPMENT MODIFICATIONS**

Not available for this EUT intended for grant.

### 3. MEASUREMENT UNCERTAINTY

Conducted measurement: +/- 2.75dB

Radiated measurement: +/- 3.2dB

### 4. DESCRIPTION OF TEST MODES

NO.	TEST MODE DESCRIPTION	WORST
1	Low channel TX	V
2	Middle channel TX	
3	High channel TX	

Note: test at maximum power condition.

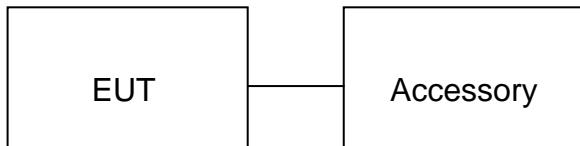
**Note:**

1. The EUT has been set to operate continuously on the lowest, middle and highest operation frequency individually.
2. All modes under which configuration applicable have been tested and the worst mode test data recording in the test report, if no other mode data.

## 5. SYSTEM TEST CONFIGURATION

### 5.1. CONFIGURATION OF EUT SYSTEM

Configure:



### 5.2. EQUIPMENT USED IN EUT SYSTEM

Item	Equipment	Mfr/Brand	Model/Type No.	Remark
1	SAM88	SOSTARK	SAM88	EUT
2	Battery	N/A	N/A	Accessory

Note: All the accessories have been used during the test in conduction emission test.

### 5.3. SUMMARY OF TEST RESULTS

FCC RULES	DESCRIPTION OF TEST	RESULT
§15.247	Peak Output Power	Compliant
§15.247	6 dB Bandwidth	Compliant
§15.247	Conducted Spurious Emission	Compliant
§15.247	Maximum Conducted Output Power SPECTRAL Density	Compliant
§15.209	Radiated Emission	Compliant
§15.247	Band Edges	Compliant
§15.207	Line Conduction Emission	N/A

**Note:** The EUT received power from lithium battery.

N/A means not applicable.

## 6. TEST FACILITY

<b>Site</b>	Attestation of Global Compliance (Shenzhen) Co., Ltd
<b>Location</b>	2/F., Building 2, No.1-No.4, Chaxi Sanwei Technical Industrial Park, Gushu, Xixiang, Bao'an District, Shenzhen, Guangdong, China
<b>Description</b>	The test site is constructed and calibrated to meet the FCC requirements in documents ANSI C63.4:2003.

## ALL TEST EQUIPMENT LIST

<b>Description</b>	<b>Manufacturer</b>	<b>Model</b>	<b>S/N</b>	<b>Cal. Date</b>	<b>Cal. Due</b>
Power meter	R&S	NRP-Z23	100323	07/18/2012	07/17/2013
Power Sensor	R&S	NRV-Z51	100712	07/18/2012	07/17/2013
RF attenuator	N/A	RFA20db	68	N/A	N/A
Spectrum Analyzer	Agilent	E4440A	US41421290	07/18/2012	07/17/2013
Amplifier	EM	EM30180	0607030	07/18/2012	07/17/2013
Horn Antenna	EM	EM-AH-10180	67	04/21/2013	04/20/2014
Horn Antenna	A.H. Systems Inc.	SAS-574	--	07/18/2012	07/17/2013
EMI Test Receiver	Rohde & Schwarz	ESCI	100694	07/18/2012	07/17/2013
Biological Antenna	A.H. Systems Inc.	SAS-521-4	26	06/08/2012	06/07/2013
Loop Antenna	A.H.	SAS-526B	264	07/15/2012	07/14/2013

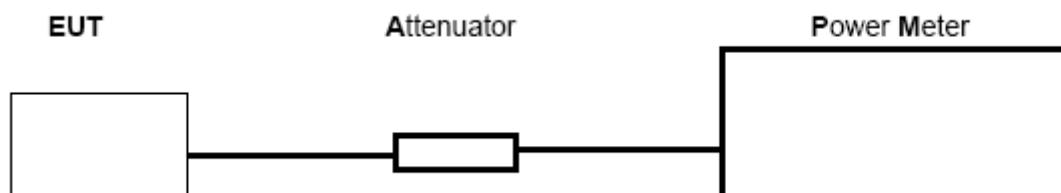
## 7. PEAK OUTPUT POWER

### 7.1. MEASUREMENT PROCEDURE

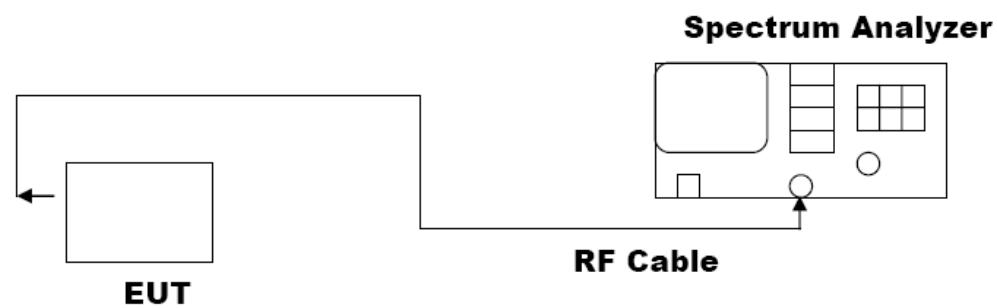
1. The EUT was placed on a table which is 0.8m above ground plane.
2. Connect EUT RF output port to power meter or spectrum analyzer through an RF attenuator
3. Set the EUT Work on the top, the middle and the bottom operation frequency individually.
4. Set the RBW greater than 6DB bandwidth of emission.
5. Record the maximum power.
6. The maximum peak power shall be less 1 Watt (30dBm).

**Note :** The EUT was tested according to KDB 558074 for compliance to FCC 47CFR 15.247 requirements.

### 7.2. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)



For average power



For peak power

### 7.3. LIMITS AND MEASUREMENT RESULT

TEST ITEM	PEAK POWER
-----------	------------

LIMITS AND MEASUREMENT RESULT				
Frequency (GHz)	Average Power (dBm)	Peak Power (dBm)	Applicable Limits (dBm)	Pass or Fail
5.736	9.28	10.87	30	Pass
5.762	9.04	10.25	30	Pass
5.814	9.13	10.33	30	Pass

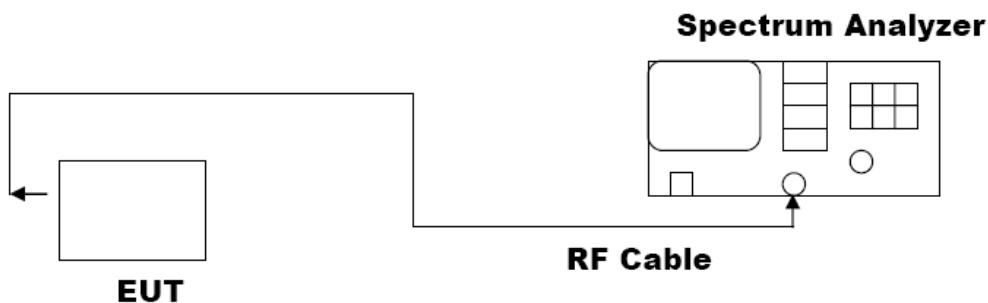
## 8. 6DB BANDWIDTH

### 8.1. MEASUREMENT PROCEDURE

1. The EUT was placed on a table which is 0.8m above ground plane.
2. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
3. Set the EUT Work on the top, the middle and the bottom operation frequency individually.
3. Set SPA Centre Frequency = Operation Frequency, RBW= 100 KHz, VBW $\geq$ RBW.
4. Set SPA Trace 1 Max hold, then View.

**Note:** The EUT was tested according to KDB 558074 for compliance to FCC 47CFR 15.247 requirements.

### 8.2. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)

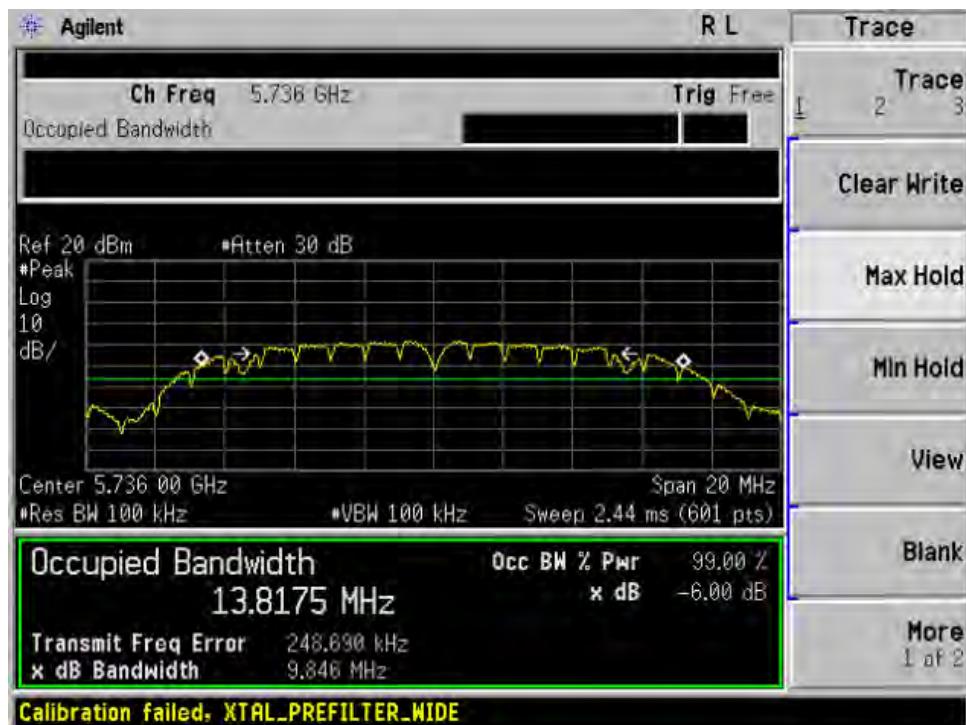


### 8.3. LIMITS AND MEASUREMENT RESULTS

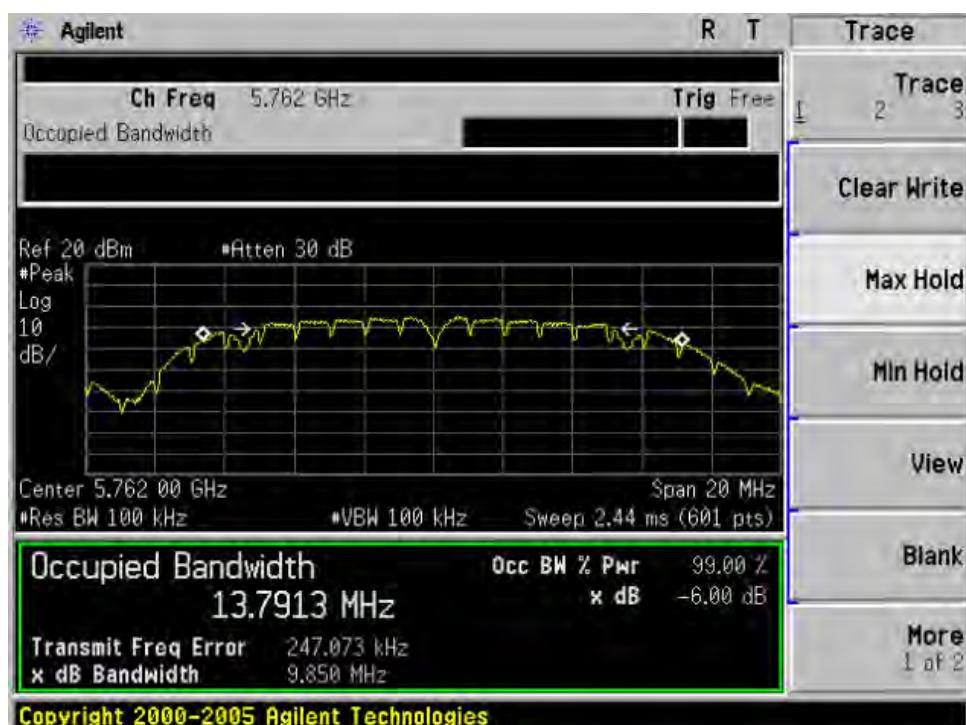
TEST ITEM	6DB BANDWIDTH
-----------	---------------

LIMITS AND MEASUREMENT RESULT			
Applicable Limits	Applicable Limits		
	Test Data (MHz)		Criteria
>500KHZ	Low Channel	9.846	PASS
	Middle Channel	9.850	PASS
	High Channel	9.843	PASS

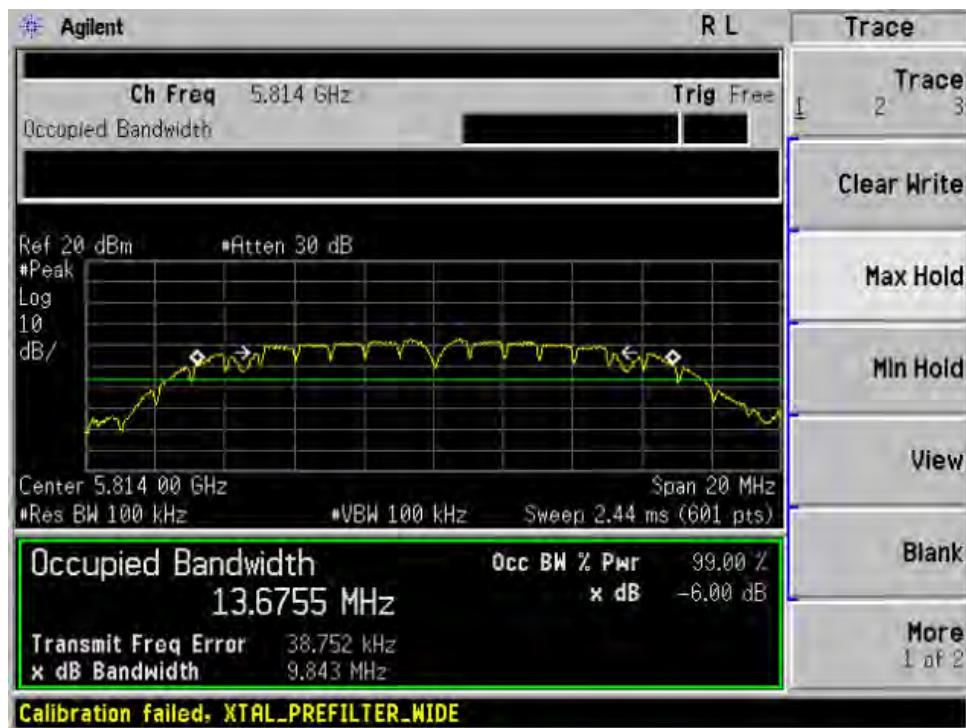
**TEST RESULT**  
**TEST PLOT OF BANDWIDTH FOR LOW CHANNEL**



**TEST PLOT OF BANDWIDTH FOR MIDDLE CHANNEL**



TEST PLOT OF BANDWIDTH FOR HIGH CHANNEL



## 9. CONDUCTED SPURIOUS EMISSION

### 9.1. MEASUREMENT PROCEDURE

1. The EUT was placed on a turn table which is 0.8m above ground plane.
1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
3. Set the EUT Work on the top, the middle and the bottom operation frequency individually.
4. Set SPA Trace 1 Max hold, then View.

**Note:** The EUT was tested according to KDB 558074 for compliance to FCC 47CFR 15.247 requirements.

Set RBW = 100 kHz, Set VBW > RBW, scan up through 10th harmonic.

### 9.2. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)

The same as described in section 8.2.

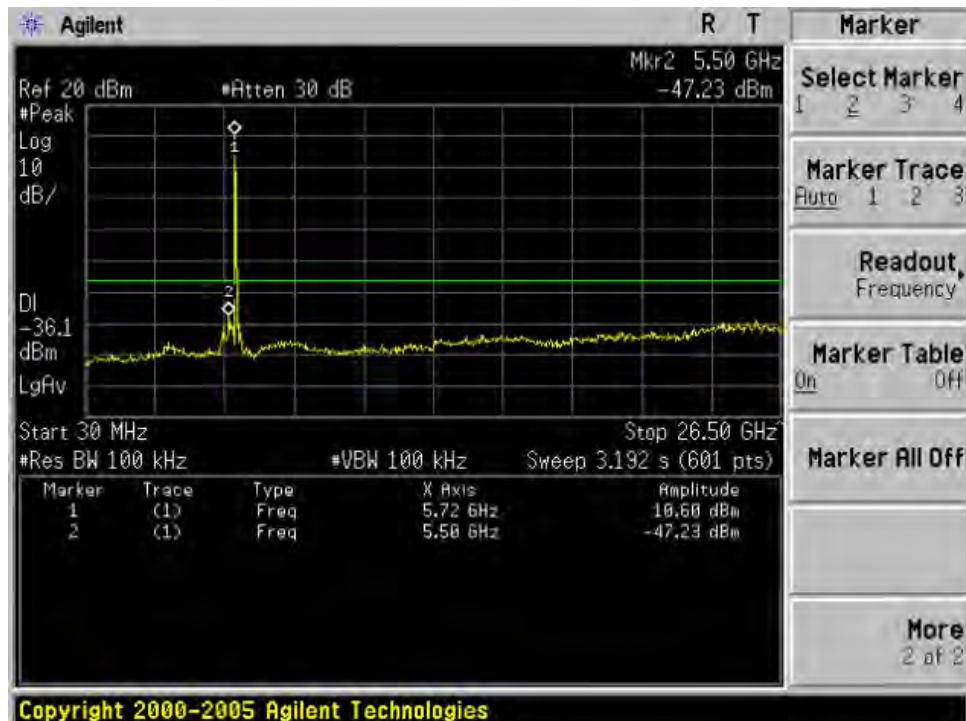
### 9.3. MEASUREMENT EQUIPMENT USED

The same as described in section 6.

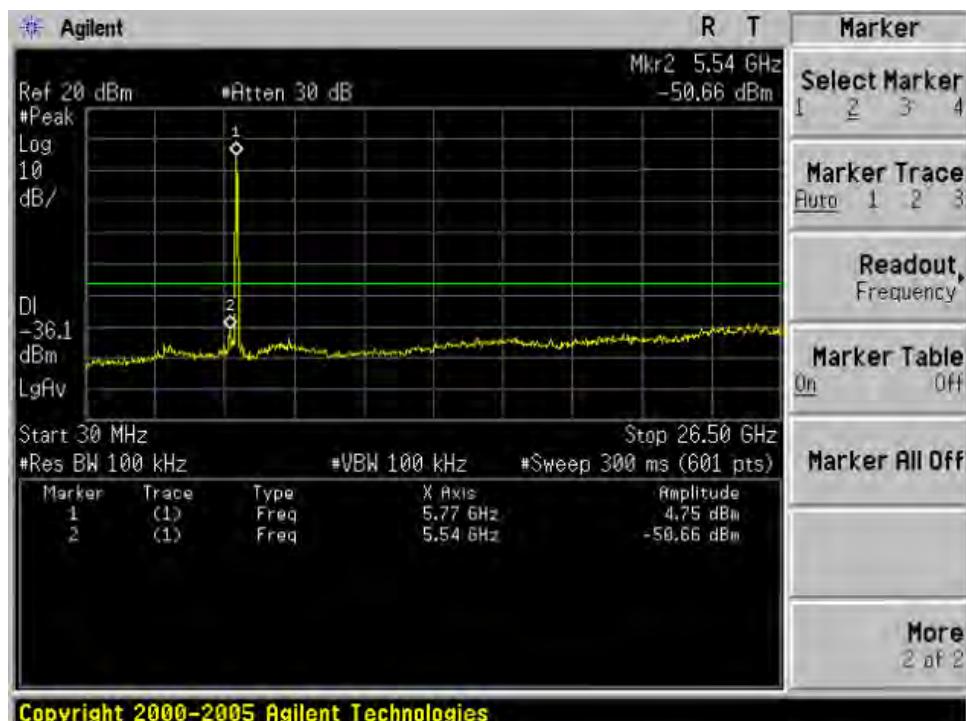
### 9.4. LIMITS AND MEASUREMENT RESULT

LIMITS AND MEASUREMENT RESULT		
Applicable Limits	Measurement Result	
	Test Data	Criteria
In any 100 KHz Bandwidth Outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produce by the intentional radiator shall be at least 20 dB below that in 100KHz bandwidth within the band that contains the highest level of the desired power. In addition, radiation emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in§15.209(a))	At least -20dBc than the limit Specified on the BOTTOM Channel	PASS
	At least -20dBc than the limit Specified on the TOP Channel	PASS

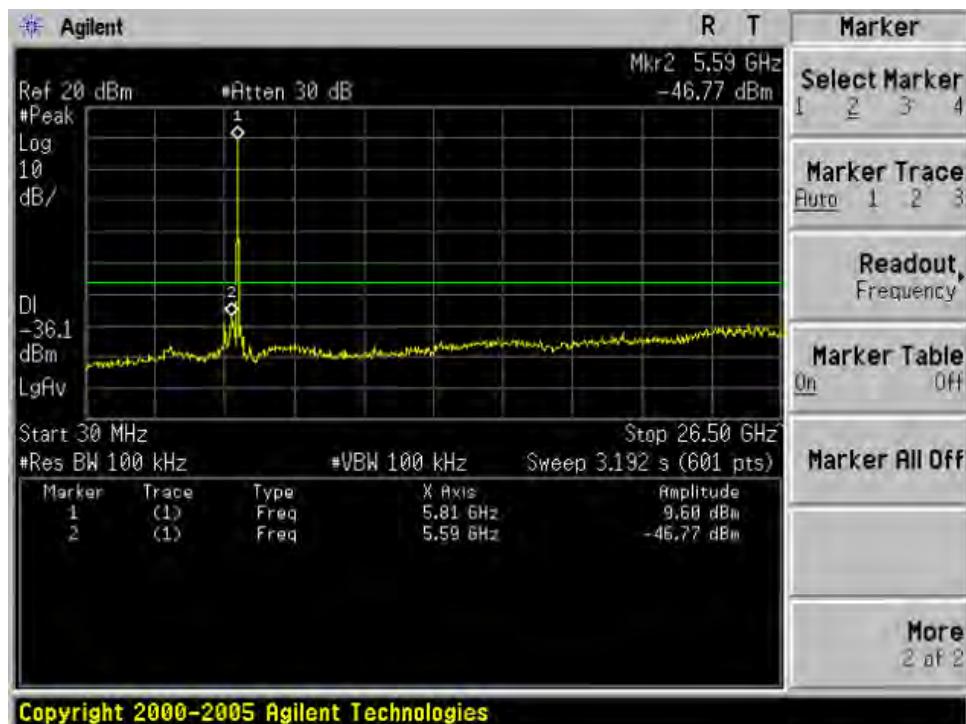
TEST PLOT OF OUT OF BAND EMISSIONS IN LOW CHANNEL



TEST PLOT OF OUT OF BAND EMISSIONS IN MIDDLE CHANNEL



TEST PLOT OF OUT OF BAND EMISSIONS IN HIGH CHANNEL



## 10. MAXIMUM CONDUCTED OUTPUT POWER SPECTRAL DENSITY

### 10.1 MEASUREMENT PROCEDURE

- (1). The EUT was placed on a turn table which is 0.8m above ground plane.
- (2). Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
- (3). Set the EUT Work on the top, the middle and the bottom operation frequency individually.
- (4). Set SPA Trace 1 Max hold, then View.

### 10.2 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)

Refer To Section 8.2.

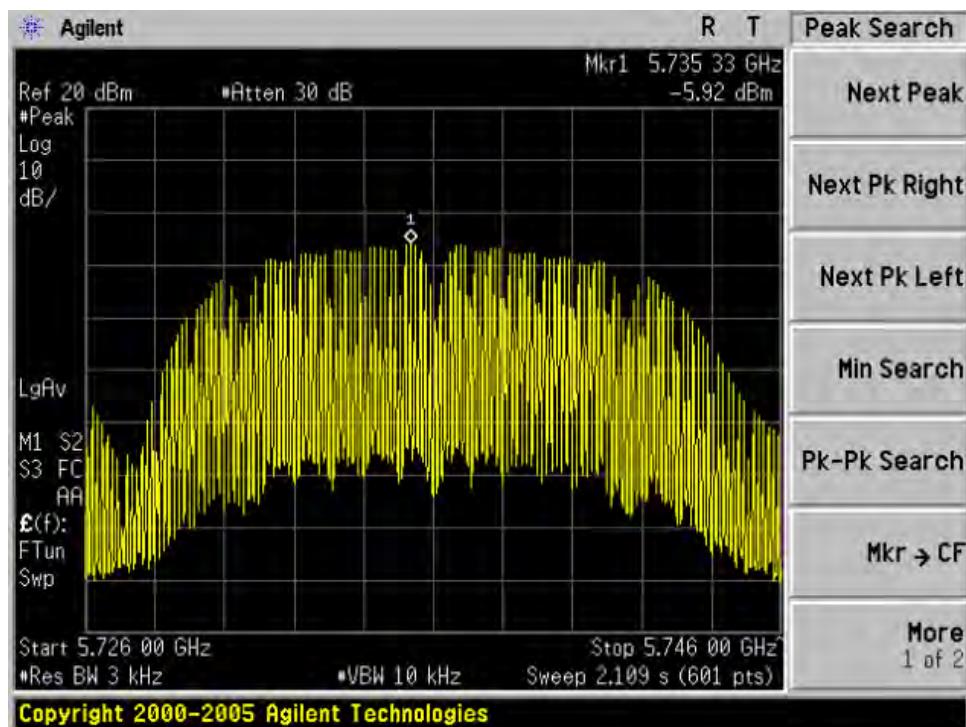
### 10.3 MEASUREMENT EQUIPMENT USED

Refer To Section 6.

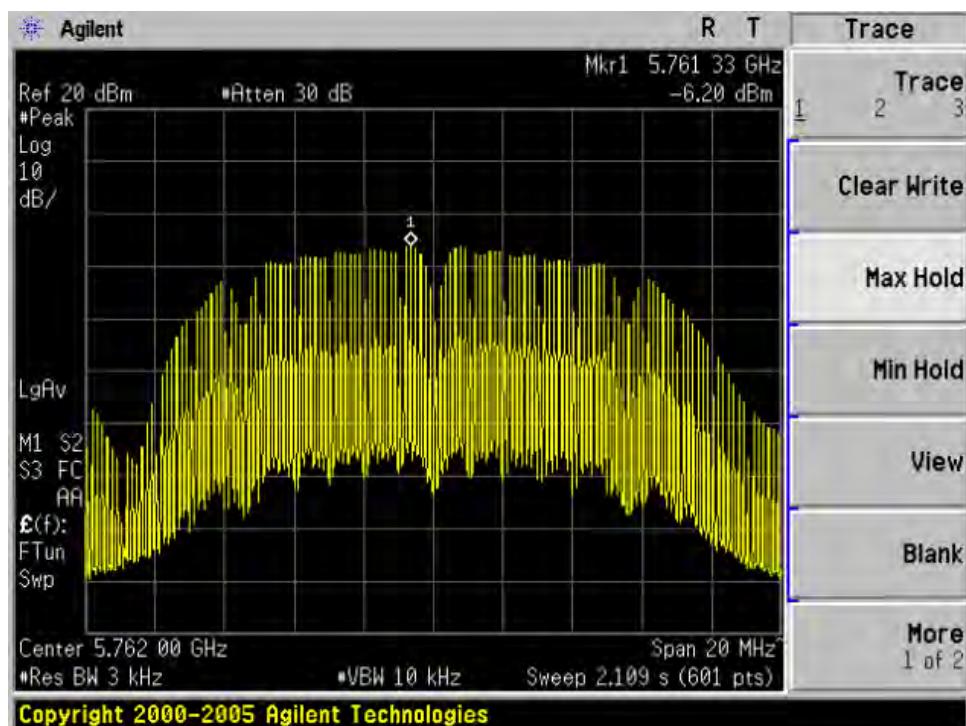
### 10.4 LIMITS AND MEASUREMENT RESULT

TEST ITEM	POWER PECTRAL DENSITY		
Channel No.	PSD (dBm)	Limit (dBm)	Result
Low Channel	-5.92	8	Pass
Middle Channel	-6.20	8	Pass
High Channel	-6.46	8	Pass

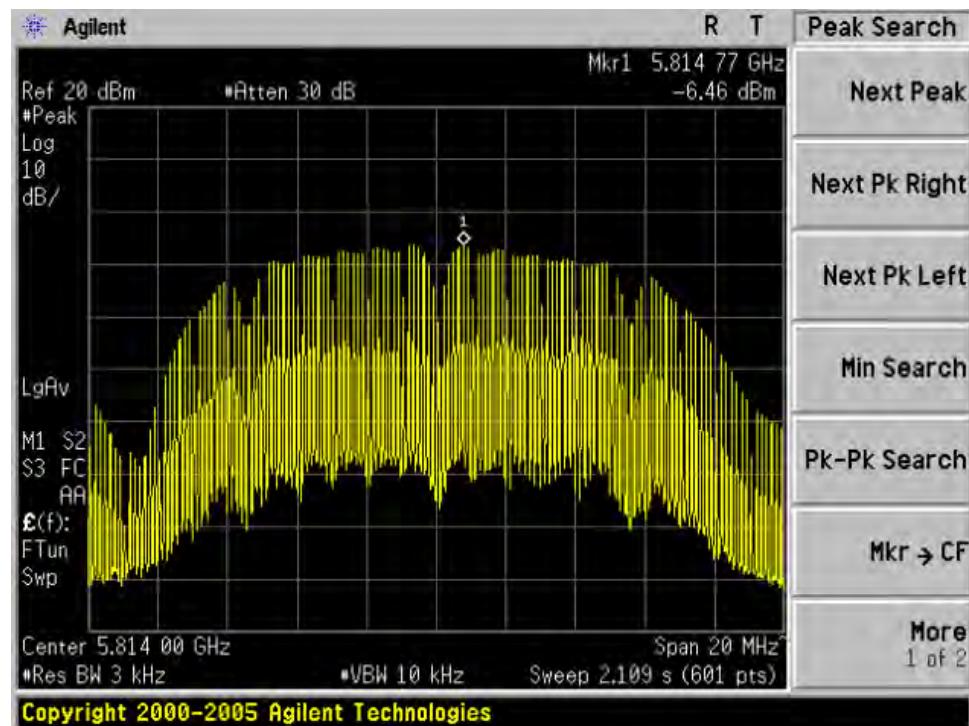
**TEST RESULT**  
**TEST PLOT OF SPECTRAL DENSITY FOR LOW CHANNEL**



**TEST PLOT OF SPECTRAL DENSITY FOR MIDDLE CHANNEL**



TEST PLOT OF SPECTRAL DENSITY FOR HIGH CHANNEL



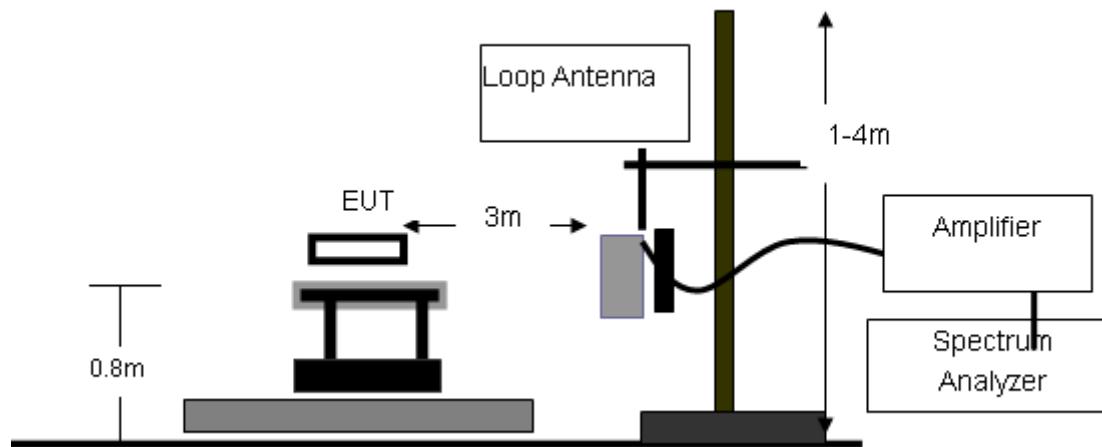
## 11. RADIATED EMISSION

### 11.1. MEASUREMENT PROCEDURE

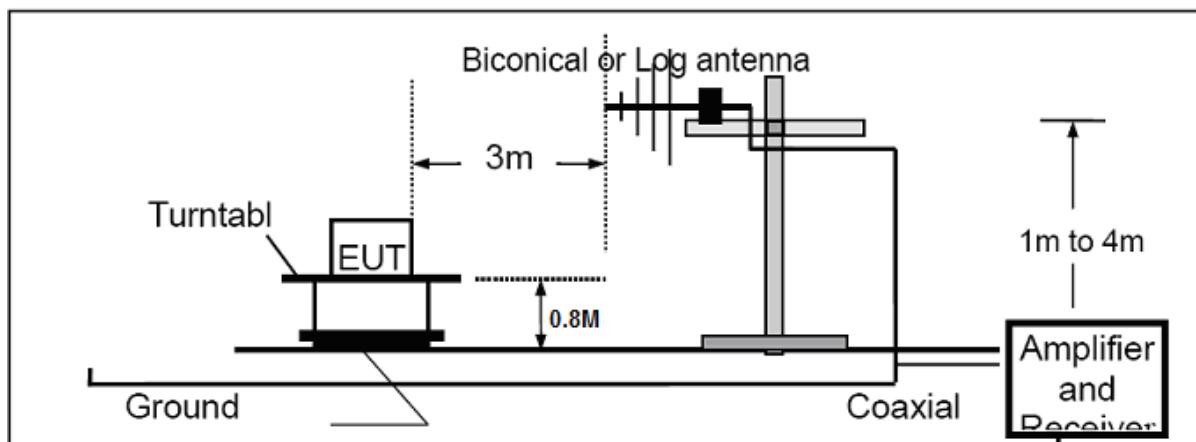
1. Configure the EUT according to ANSI C63.4. The EUT was placed on the top of the turntable 0.8 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
4. For each suspected emissions, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
6. For emissions above 1GHz, use 1MHz VBW and RBW for peak reading. Then 1MHz RBW and 10Hz VBW for average reading in spectrum analyzer.
7. When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum values.
8. If the emissions level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz.
9. For testing above 1GHz, the emissions level of the EUT in peak mode was lower than average limit (that means the emissions level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
10. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High - Low scan is not required in this case.

## 11.2. TEST SETUP

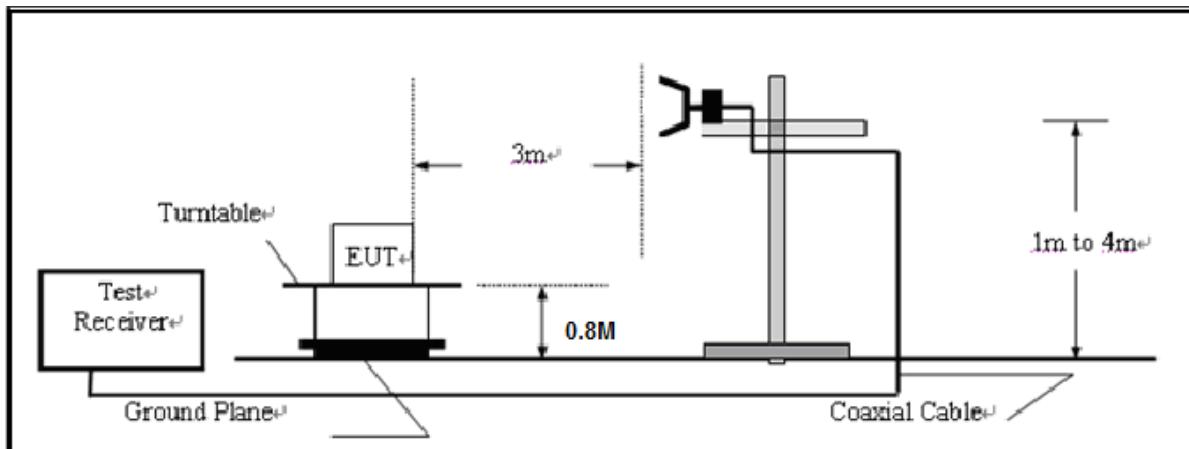
### RADIATED EMISSION TEST SETUP BELOW 30MHz



### RADIATED EMISSION TEST SETUP 30MHz-1000MHz



### RADIATED EMISSION TEST SETUP ABOVE 1000MHz



### 11.3. LIMITS AND MEASUREMENT RESULT

15.209(a) Limit in the below table has to be followed

<b>Frequencies (MHz)</b>	<b>Field Strength (micorvolts/meter)</b>	<b>Measurement Distance (meters)</b>
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

Note: All modes were tested For restricted band radiated emission,  
the test records reported below are the worst result compared to other modes.

### 11.4. TEST RESULT

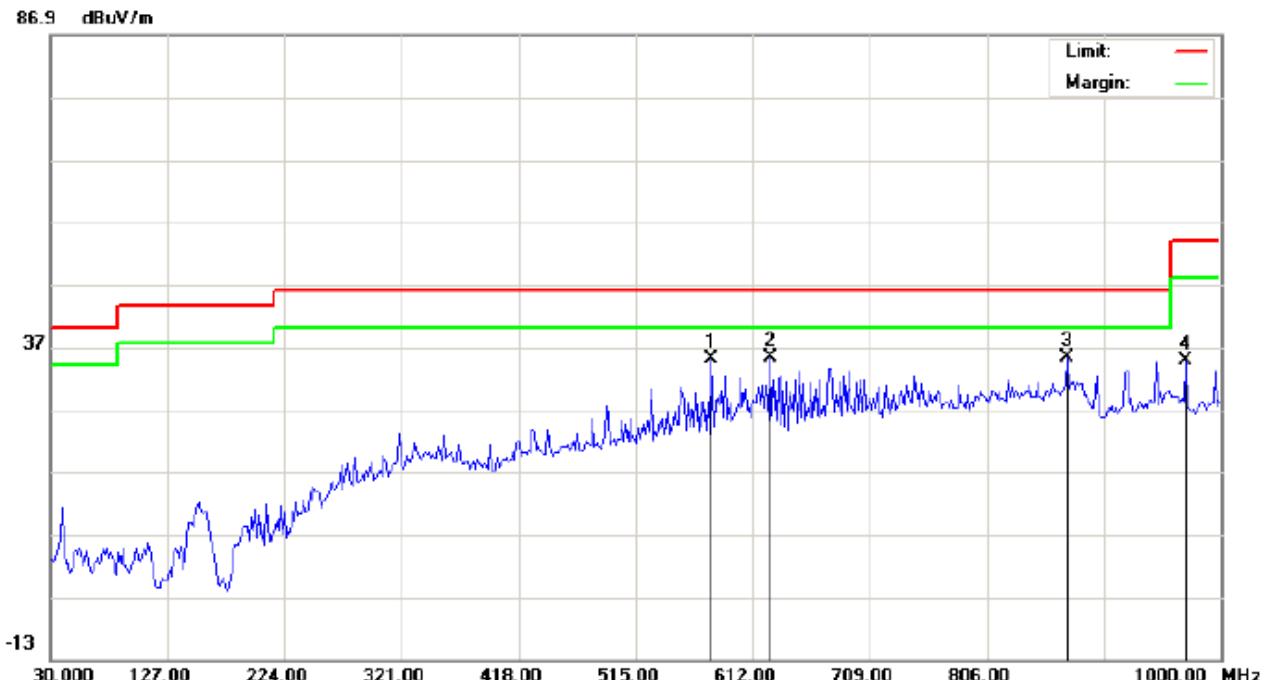
#### RADIATED EMISSION BELOW 30MHZ

No emission found between lowest internal used/generated frequencies to 30MHz.

RADIATED EMISSION BELOW 1GHZ

<b>EUT</b>	SAM88	<b>Model Name</b>	SAM88
<b>Temperature</b>	25°C	<b>Relative Humidity</b>	55.4%
<b>Pressure</b>	960hPa	<b>Test Voltage</b>	Normal Voltage
<b>Test Mode</b>	5736MHZ TX	<b>Antenna</b>	Horizontal

Radiated Emission Measurement

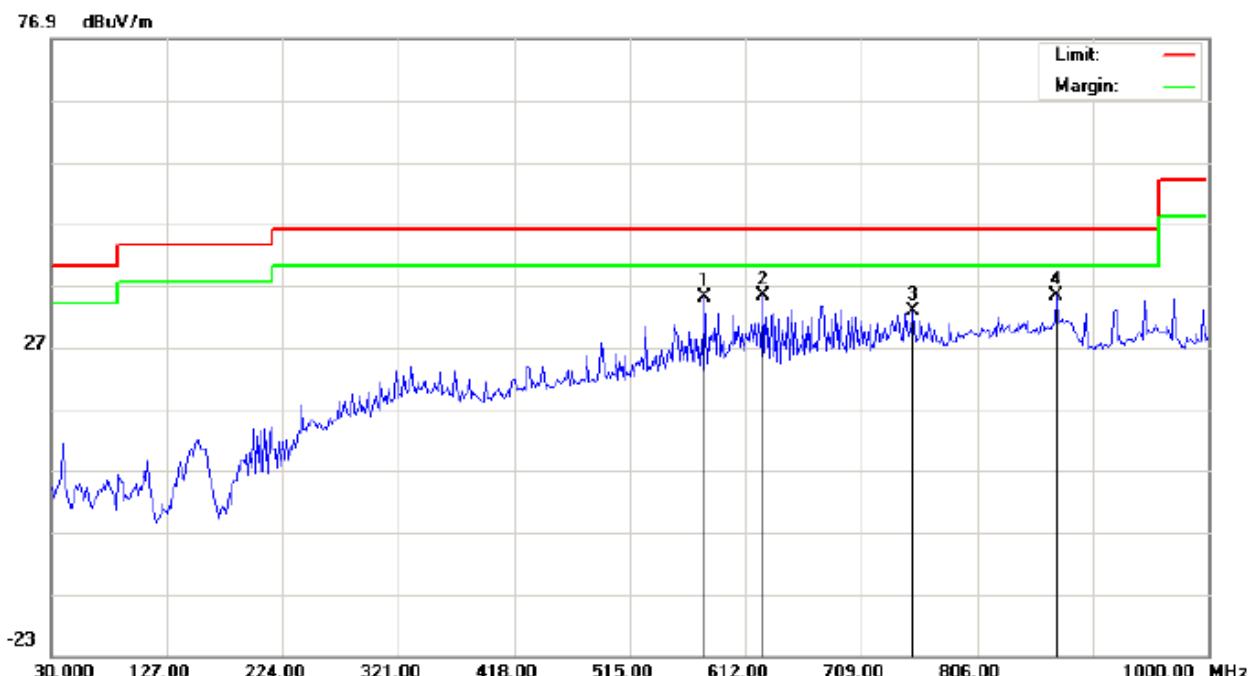


Site: site #1 Polarization: **Horizontal** Temperature: 26  
 Limit: FCC Class B 3M Radiation Power: Humidity: 60 %  
 EUT: SAM88 Distance:  
 M/N: SAM88  
 Mode: Low Channel TX  
 Note:

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1		578.0500	10.52	24.49	35.01	46.00	-10.99	peak			
2		626.5500	9.58	25.76	35.34	46.00	-10.66	peak			
3	*	872.2833	4.34	31.06	35.40	46.00	-10.60	peak			
4		970.9000	6.40	28.39	34.79	54.00	-19.21	peak			

<b>EUT</b>	SAM88	<b>Model Name</b>	SAM88
<b>Temperature</b>	25°C	<b>Relative Humidity</b>	55.4%
<b>Pressure</b>	960hPa	<b>Test Voltage</b>	Normal Voltage
<b>Test Mode</b>	5736MHZ TX	<b>Antenna</b>	Vertical

Radiated Emission Measurement

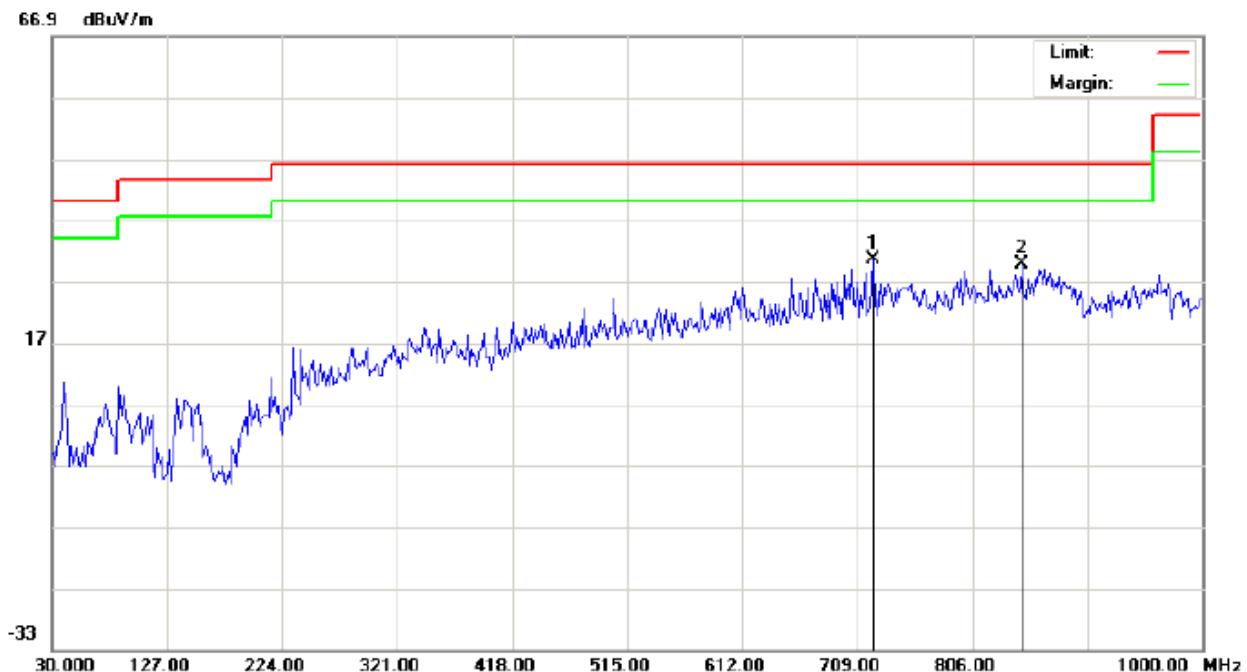


Site: site #1  
 Polarization: **Vertical**  
 Temperature: 26  
 Limit: FCC Class B 3M Radiation  
 Power:  
 Humidity: 60 %  
 EUT: SAM88  
 Distance:  
 M/N: SAM88  
 Mode: Low Channel TX  
 Note:

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna	Table	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		Height	Degree	
1		578.0500	10.52	24.49	35.01	46.00	-10.99	peak			
2		626.5500	9.58	25.76	35.34	46.00	-10.66	peak			
3		752.6500	3.95	28.87	32.82	46.00	-13.18	peak			
4	*	872.2833	4.34	31.06	35.40	46.00	-10.60	peak			

<b>EUT</b>	SAM88	<b>Model Name</b>	SAM88
<b>Temperature</b>	25°C	<b>Relative Humidity</b>	55.4%
<b>Pressure</b>	960hPa	<b>Test Voltage</b>	Normal Voltage
<b>Test Mode</b>	5762MHZ TX	<b>Antenna</b>	Horizontal

**Radiated Emission Measurement**

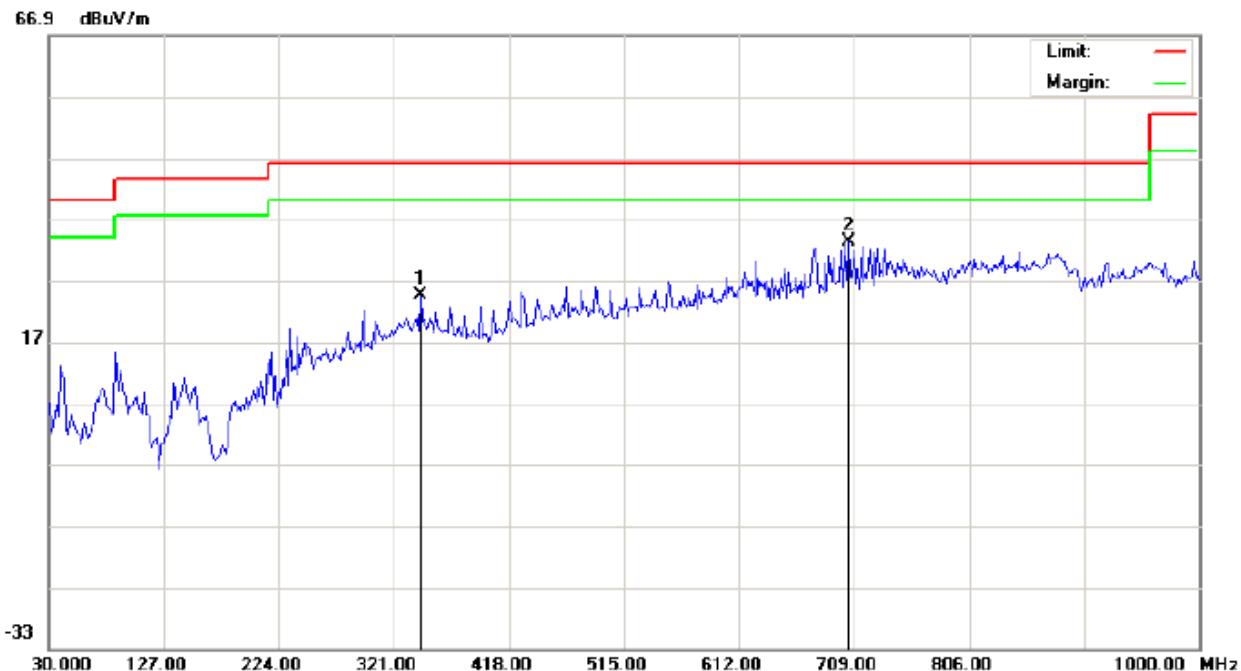


Site: site #1 Polarization: **Horizontal** Temperature: 26  
 Limit: FCC Class B 3M Radiation Power: Humidity: 60 %  
 EUT: SAM88 Distance:  
 M/N: SAM88  
 Mode: Middle Channel TX  
 Note:

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1	*	721.9333	2.86	27.68	30.54	46.00	-15.46	peak			
2		848.0333	-0.25	30.04	29.79	46.00	-16.21	peak			

<b>EUT</b>	SAM88	<b>Model Name</b>	SAM88
<b>Temperature</b>	25°C	<b>Relative Humidity</b>	55.4%
<b>Pressure</b>	960hPa	<b>Test Voltage</b>	Normal Voltage
<b>Test Mode</b>	5762MHZ TX	<b>Antenna</b>	Vertical

**Radiated Emission Measurement**



Site: site #1 Polarization: **Vertical** Temperature: 26  
 Limit: FCC Class B 3M Radiation Power: Humidity: 60 %  
 EUT: SAM88 Distance:  
 M/N: SAM88  
 Mode: Middle Channel TX  
 Note:

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna	Table	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1		343.6333	4.13	20.30	24.43	46.00	-21.57	peak			
2	*	704.1500	5.56	27.61	33.17	46.00	-12.83	peak			

<b>EUT</b>	SAM88	<b>Model Name</b>	SAM88
<b>Temperature</b>	25°C	<b>Relative Humidity</b>	55.4%
<b>Pressure</b>	960hPa	<b>Test Voltage</b>	Normal Voltage
<b>Test Mode</b>	5814MHZ TX	<b>Antenna</b>	Horizontal

**Radiated Emission Measurement**

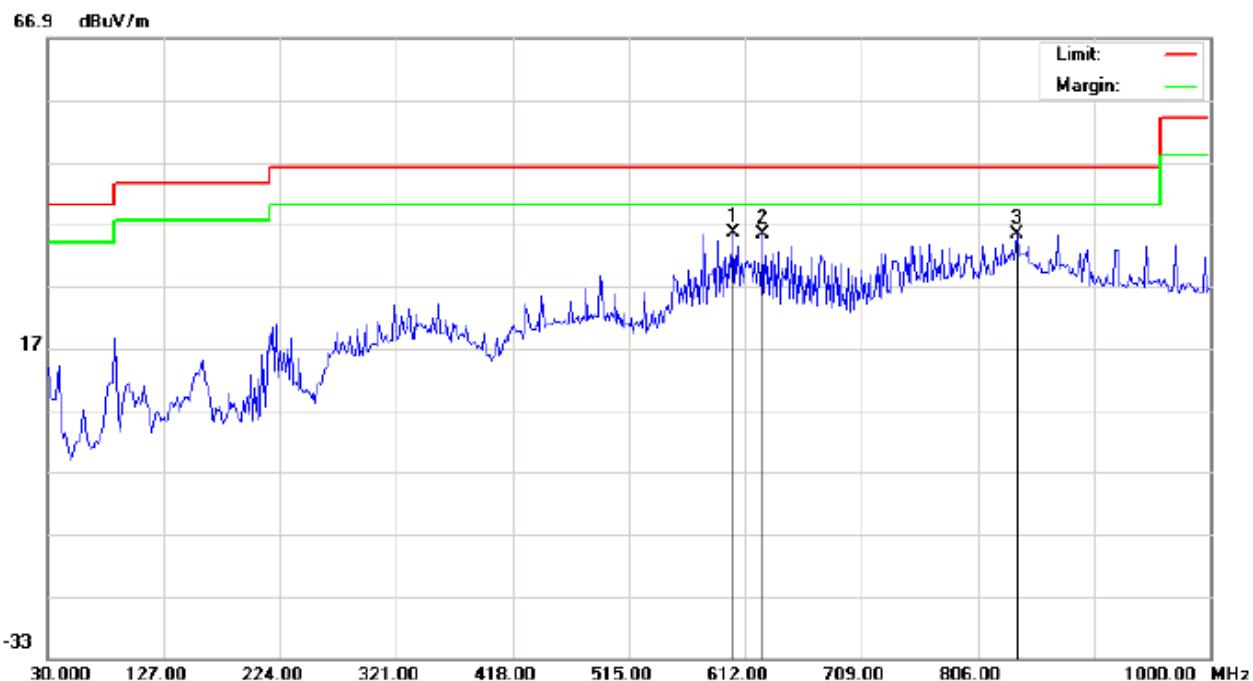


Site: site #1 Polarization: **Horizontal** Temperature: 26  
 Limit: FCC Class B 3M Radiation Power: Humidity: 60 %  
 EUT: SAM88 Distance:  
 M/N: SAM88  
 Mode: High Channel TX  
 Note:

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1		578.0500	10.80	24.49	35.29	46.00	-10.71	peak			
2	*	602.3000	10.52	25.04	35.56	46.00	-10.44	peak			
3		838.3333	2.78	32.49	35.27	46.00	-10.73	peak			

<b>EUT</b>	SAM88	<b>Model Name</b>	SAM88
<b>Temperature</b>	25°C	<b>Relative Humidity</b>	55.4%
<b>Pressure</b>	960hPa	<b>Test Voltage</b>	Normal Voltage
<b>Test Mode</b>	5814MHZ TX	<b>Antenna</b>	Vertical

**Radiated Emission Measurement**



Site: site #1 Polarization: **Vertical** Temperature: 26  
 Limit: FCC Class B 3M Radiation Power: Humidity: 60 %  
 EUT: SAM88 Distance:  
 M/N: SAM88  
 Mode: High Channel TX  
 Note:

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1	*	602.3000	10.52	25.04	35.56	46.00	-10.44	peak			
2		626.5500	9.62	25.76	35.38	46.00	-10.62	peak			
3		838.3333	2.78	32.49	35.27	46.00	-10.73	peak			

**Note:** Measurement= Reading + Factor, Over=Measure-Limit.

## RADIATED EMISSION ABOVE 1GHZ

<b>EUT</b>	SAM88	<b>Model Name</b>	SAM88
<b>Temperature</b>	25°C	<b>Relative Humidity</b>	55.4%
<b>Pressure</b>	960hPa	<b>Test Voltage</b>	Normal Voltage
<b>Test Mode</b>	High Channel TX	<b>Antenna</b>	Horizontal

### Radiated Emission Measurement



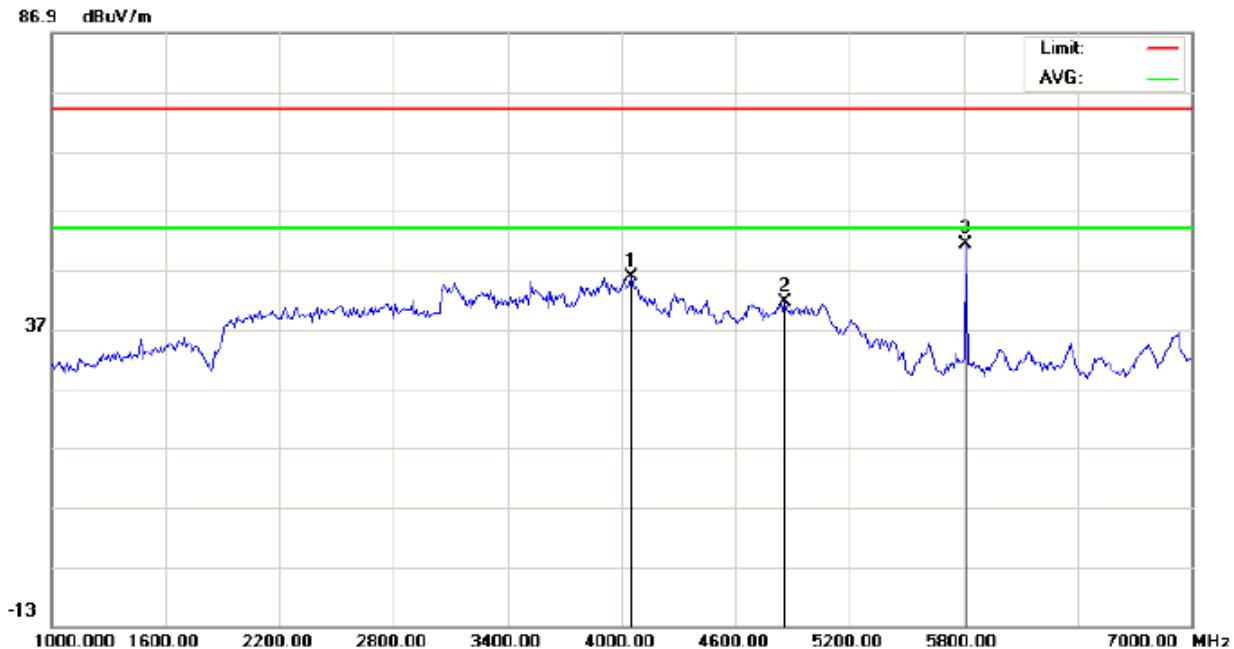
Site: site #1 Polarization: **Horizontal** Temperature: 26  
Limit: FCC Class B 3M Radiation above 1GHZ(PK) Power: Humidity: 60 %  
EUT: SAM88 Distance:  
M/N: SAM88  
Mode: High Channel TX  
Note:

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1		3070.000	30.53	11.71	42.24	74.00	-31.76	peak			
2		4020.000	28.25	14.86	43.11	74.00	-30.89	peak			
3	*	5810.000	54.28	-1.67	52.61	74.00	-21.39	peak			

**Note:** The mark 3 is the basic frequency.

<b>EUT</b>	SAM88	<b>Model Name</b>	SAM88
<b>Temperature</b>	25°C	<b>Relative Humidity</b>	55.4%
<b>Pressure</b>	960hPa	<b>Test Voltage</b>	Normal Voltage
<b>Test Mode</b>	High Channel TX	<b>Antenna</b>	Vertical

Radiated Emission Measurement



Site: site #1  
Polarization: **Vertical**  
Temperature: 26  
Limit: FCC Class B 3M Radiation above 1GHZ(PK) Power: Humidity: 60 %  
EUT: SAM88 Distance:  
M/N: SAM88  
Mode: High Channel TX  
Note:

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1		4050.000	31.31	14.36	45.67	74.00	-28.33	peak			
2		4860.000	33.70	7.83	41.53	74.00	-32.47	peak			
3	*	5810.000	52.87	-1.67	51.20	74.00	-22.80	peak			

The mark 3 is the basic frequency.

**Note:** Measurement= Reading + Factor, Over=Measure-Limit.

All modes radiation emission Above 7GHz at least have 20dB margin.

## **12. BAND EDGE EMISSION**

### **12.1. MEASUREMENT PROCEDURE**

1. Set the EUT Work on the top, the bottom operation frequency individually.
2. Set SPA Start or Stop Frequency = Operation Frequency,  $RBW \geq 1\% \text{span}$ ,  $VBW \geq RBW$
3. The band edges was measured and recorded.

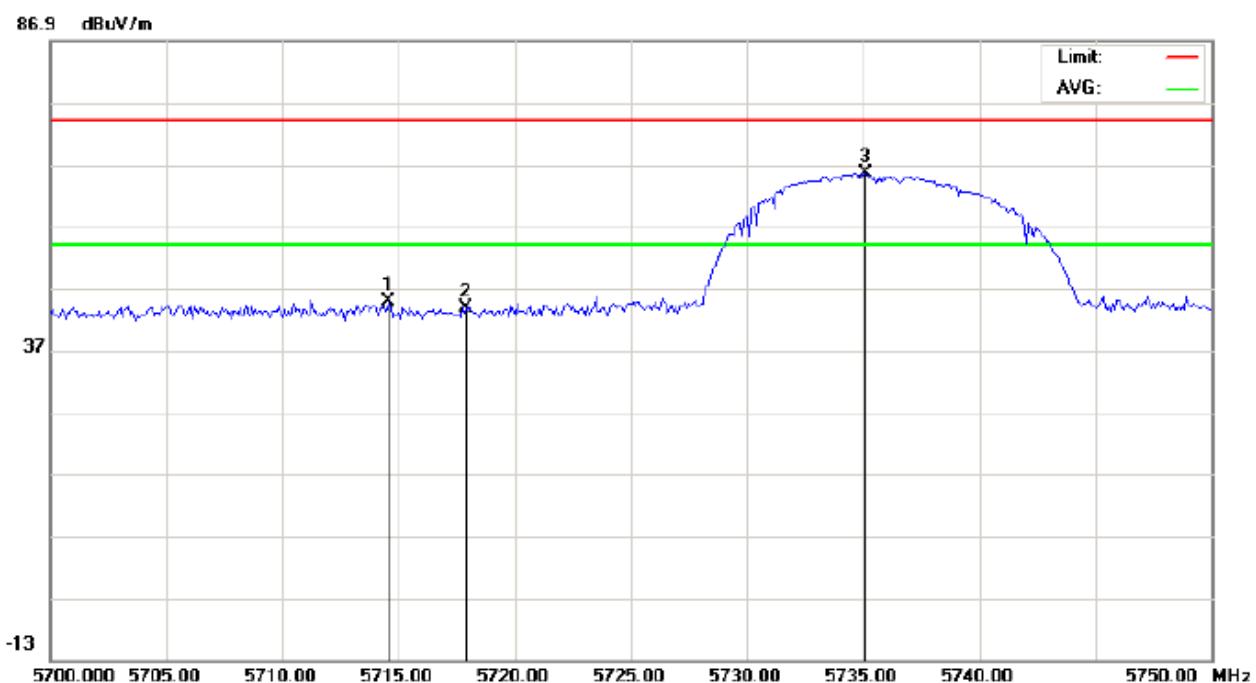
### **12.2. TEST SET-UP**

Radiated same as 11.2

### 12.3. TEST RESULT

<b>EUT</b>	SAM88	<b>Model Name</b>	SAM88
<b>Temperature</b>	25°C	<b>Relative Humidity</b>	55.4%
<b>Pressure</b>	960hPa	<b>Test Voltage</b>	Normal Voltage
<b>Test Mode</b>	Low Channel TX	<b>Antenna</b>	Horizontal

### Radiated Emission Measurement

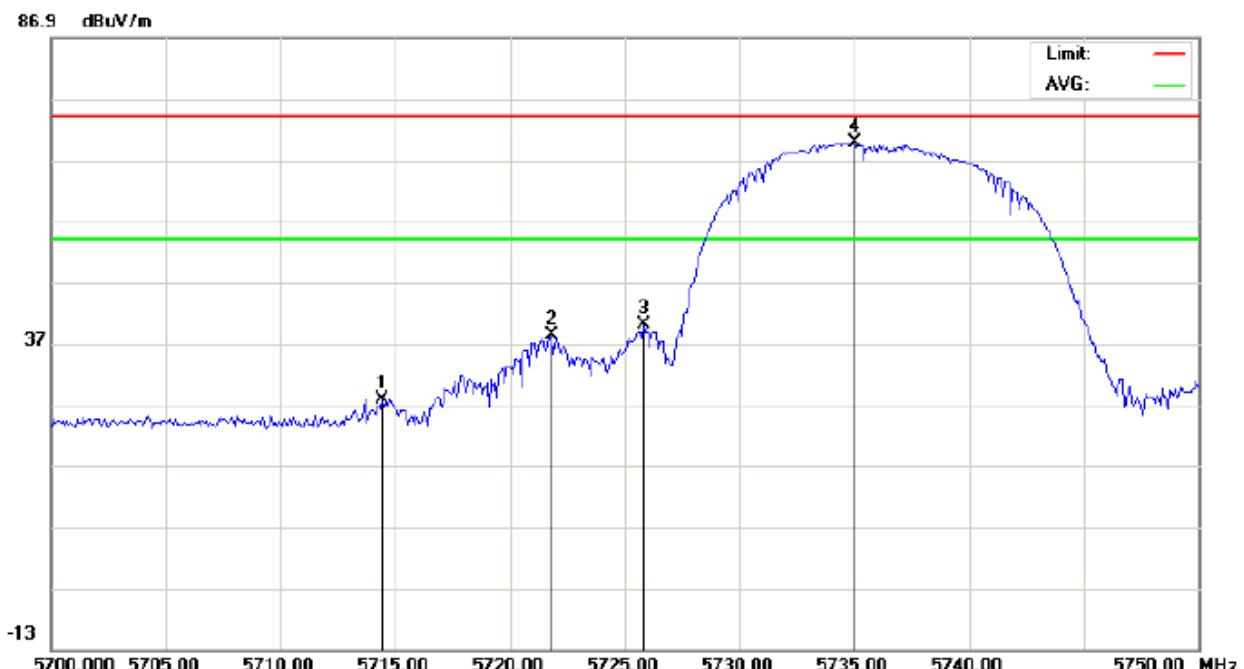


Site: site #1 Polarization: *Horizontal* Temperature: 26  
Limit: FCC Class B 3M Radiation above 1GHZ(PK) Power: Humidity: 60 %  
EUT: SAM88 Distance:  
M/N: SAM88  
Mode: Low Channel TX  
Note:

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1		5714.583	46.43	-1.71	44.72	74.00	-29.28	peak			
2		5717.917	45.50	-1.71	43.79	74.00	-30.21	peak			
3	*	5735.083	67.16	-1.70	65.46	74.00	-8.54	peak			

<b>EUT</b>	SAM88	<b>Model Name</b>	SAM88
<b>Temperature</b>	25°C	<b>Relative Humidity</b>	55.4%
<b>Pressure</b>	960hPa	<b>Test Voltage</b>	Normal Voltage
<b>Test Mode</b>	Low Channel TX	<b>Antenna</b>	Vertical

### Radiated Emission Measurement

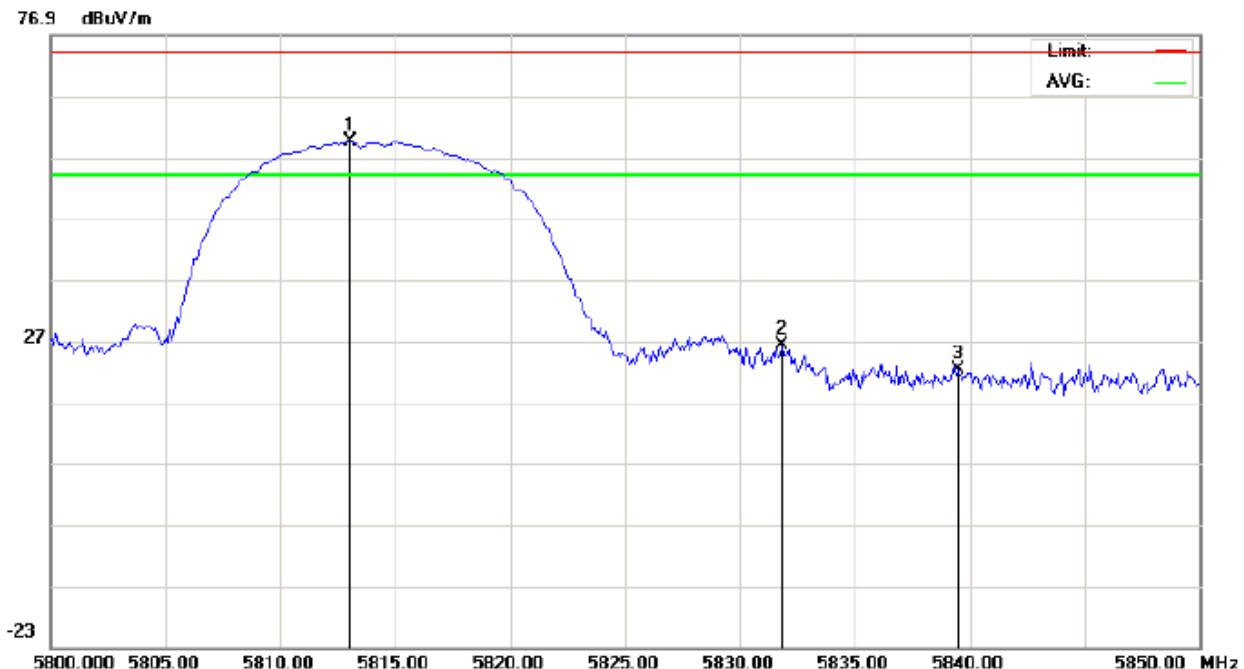


Site: site #1 Polarization: **Vertical** Temperature: 26  
Limit: FCC Class B 3M Radiation above 1GHZ(PK) Power: Humidity: 60 %  
EUT: SAM88 Distance:  
M/N: SAM88  
Mode: Low Channel TX  
Note:

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1		5714.417	29.57	-1.71	27.86	74.00	-46.14	peak			
2		5721.833	39.99	-1.71	38.28	74.00	-35.72	peak			
3		5725.833	41.83	-1.71	40.12	74.00	-33.88	peak			
4	*	5735.000	71.47	-1.70	69.77	74.00	-4.23	peak			

<b>EUT</b>	SAM88	<b>Model Name</b>	SAM88
<b>Temperature</b>	25°C	<b>Relative Humidity</b>	55.4%
<b>Pressure</b>	960hPa	<b>Test Voltage</b>	Normal Voltage
<b>Test Mode</b>	High Channel TX	<b>Antenna</b>	Horizontal

### Radiated Emission Measurement



Site: site #1 Polarization: **Horizontal** Temperature: 26  
Limit: FCC Class B 3M Radiation above 1GHZ(PK) Power: Humidity: 60 %  
EUT: SAM88 Distance:  
M/N: SAM88  
Mode: High channel TX  
Note:

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1	*	5813.000	61.19	-1.67	59.52	74.00	-14.48	peak			
2		5831.833	28.00	-1.66	26.34	74.00	-47.66	peak			
3		5839.500	24.03	-1.65	22.38	74.00	-51.62	peak			

<b>EUT</b>	SAM88	<b>Model Name</b>	SAM88
<b>Temperature</b>	25°C	<b>Relative Humidity</b>	55.4%
<b>Pressure</b>	960hPa	<b>Test Voltage</b>	Normal Voltage
<b>Test Mode</b>	High Channel TX	<b>Antenna</b>	Vertical

**Radiated Emission Measurement**



Site: site #1 Polarization: **Vertical** Temperature: 26  
 Limit: FCC Class B 3M Radiation above 1GHZ(PK) Power: Humidity: 60 %  
 EUT: SAM88 Distance:  
 M/N: SAM88  
 Mode:High Channel TX  
 Note:

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1	*	5814.000	60.83	-1.67	59.16	74.00	-14.84	peak			
2		5833.833	22.17	-1.66	20.51	74.00	-53.49	peak			
3		5840.417	22.45	-1.65	20.80	74.00	-53.20	peak			

**Note: Measurement= Reading + Factor, Over=Measure-Limit.**

## 13. FCC LINE CONDUCTED EMISSION TEST

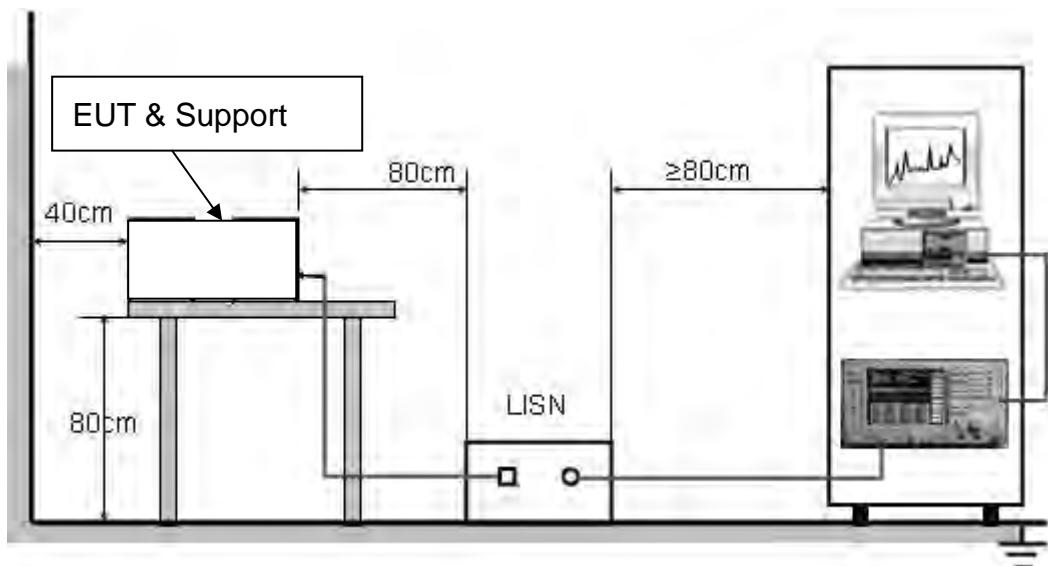
### 13.1. LIMITS OF LINE CONDUCTED EMISSION TEST

Frequency	Maximum RF Line Voltage	
	Q.P. (dBuV)	Average (dBuV)
150kHz~500kHz	66-56	56-46
500kHz~5MHz	56	46
5MHz~30MHz	60	50

Note:

1. The lower limit shall apply at the transition frequency.
2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.

### 13.2. BLOCK DIAGRAM OF LINE CONDUCTED EMISSION TEST



### **13.3. PRELIMINARY PROCEDURE OF LINE CONDUCTED EMISSION TEST**

1. The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. When the EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.4 (see Test Facility for the dimensions of the ground plane used). When the EUT is a floor-standing equipment, it is placed on the ground plane which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.
2. Support equipment, if needed, was placed as per ANSI C63.4.
3. All I/O cables were positioned to simulate typical actual usage as per ANSI C63.4.
4. All support equipments received AC120V/60Hz power from a LISN, if any.
5. The EUT received DC Voltage.
6. The test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
7. Analyzer / Receiver scanned from 150 kHz to 30MHz for emissions in each of the test modes.
8. During the above scans, the emissions were maximized by cable manipulation.
9. The test mode(s) were scanned during the preliminary test.

Then, the EUT configuration and cable configuration of the above highest emission level were recorded for reference of final testing.

### **13.4. FINAL PROCEDURE OF LINE CONDUCTED EMISSION TEST**

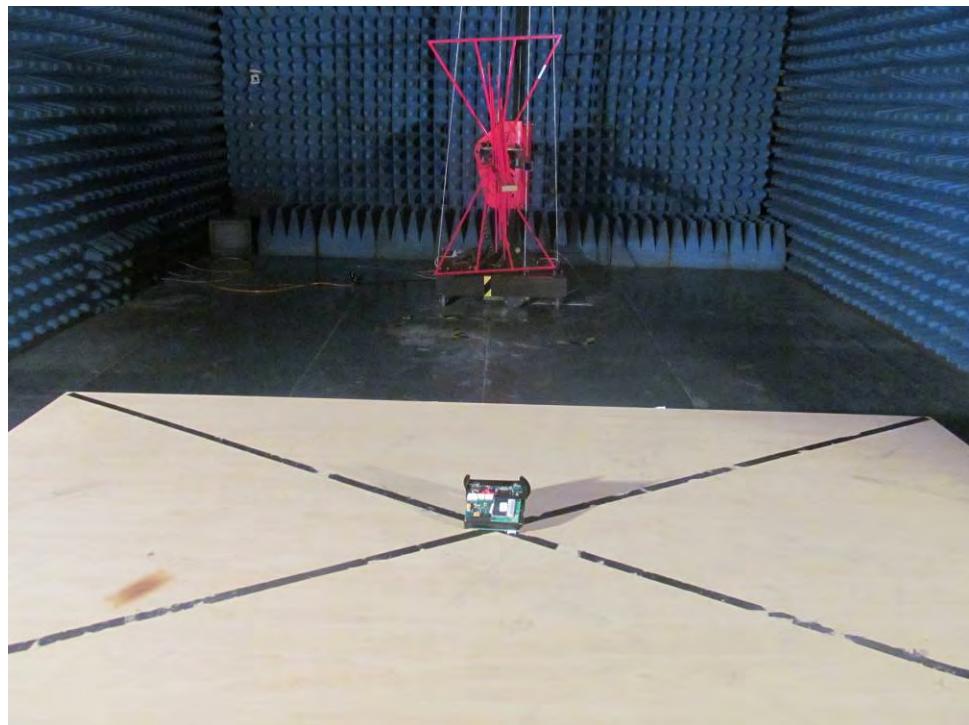
1. EUT and support equipment was set up on the test bench as per step 2 of the preliminary test.
2. A scan was taken on both power lines, Line 1 and Line 2, recording at least the six highest emissions. Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit. If EUT emission level was less -2dB to the A.V. limit in Peak mode, then the emission signal was re-checked using Q.P and Average detector.
3. The test data of the worst case condition(s) was reported on the Summary Data page.

**13.5. TEST RESULT OF LINE CONDUCTED EMISSION TEST**

**N/A**

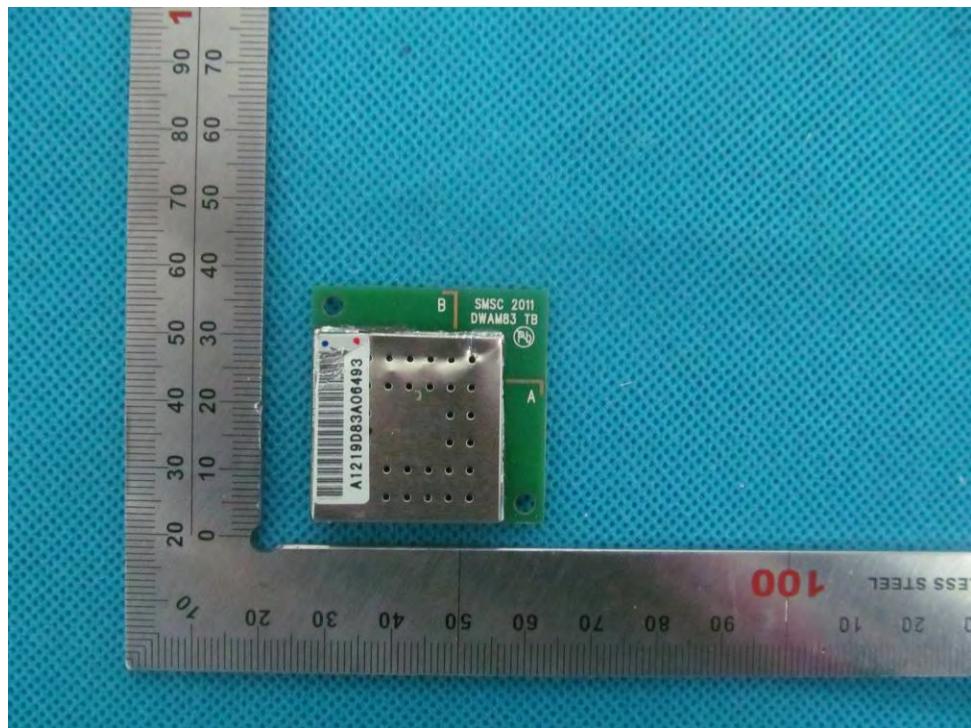
## APPENDIX A: PHOTOGRAPHS OF TEST SETUP

### FCC RADIATED EMISSION TEST SETUP

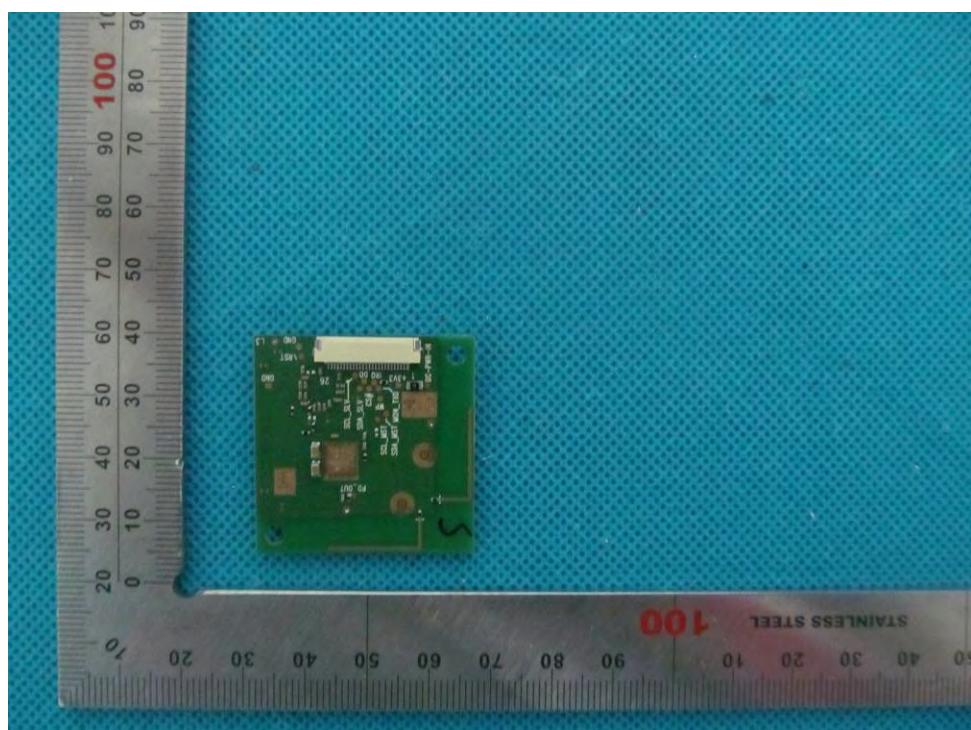


## APPENDIX B: PHOTOGRAPHS OF EUT

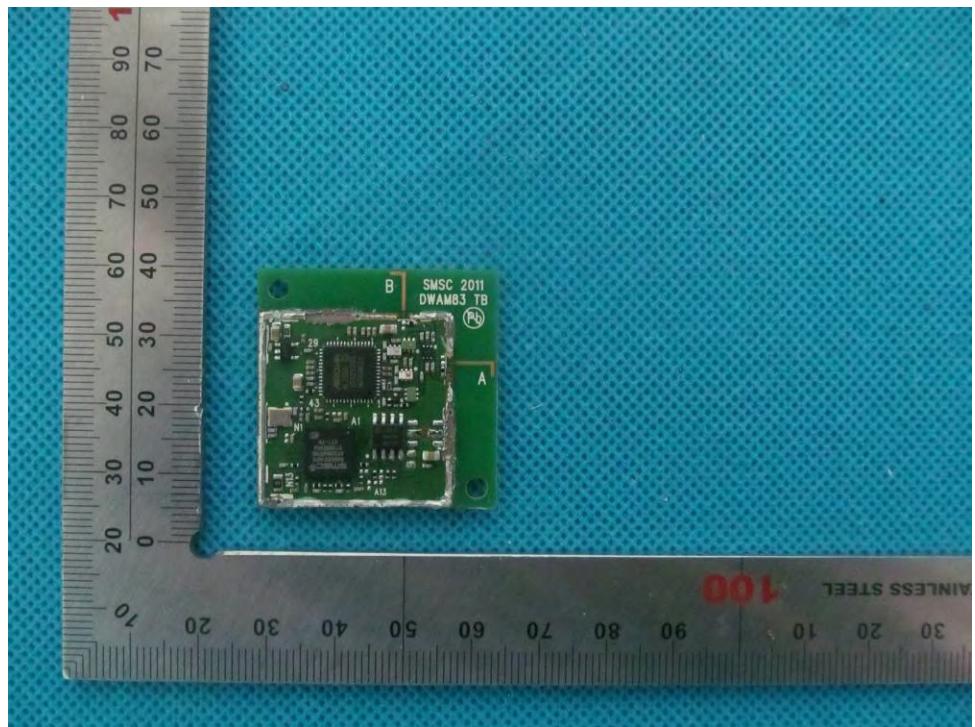
### TOP VIEW OF EUT



BOTTOM VIEW OF EUT



OPEN VIEW OF EUT



----END OF REPORT----