
FCC Test Report

Report No.: AGCW0B121001F2

FCC ID : QLPCS1

PRODUCT DESIGNATION : SUM

BRAND NAME : CS

TEST MODEL : CS1

CLIENT : Sostark Pte Ltd

DATE OF ISSUE : Nov. 03, 2012

STANDARD(S) : FCC Part 15 Rules

Attestation of Global Compliance Co., Ltd.

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1. VERIFICATION OF COMPLIANCE

Applicant:	Sostark Pte Ltd
Applicant Address:	Blk20,Sin Ming Lane,#08-52,Midview City,Singapore 573968
Manufacturer:	Sostark Pte Ltd
Manufacturer Address:	Blk20,Sin Ming Lane,#08-52,Midview City,Singapore 573968
Product Description:	SUM
Brand Name:	CS
Model Name:	CS1
FCC ID:	QLPCS1
Report Number:	AGCW0B121001F2
Date of Test:	Oct.31,2012 to Nov.02 , 2012

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 radiated emission limits of FCC Rules Part 15.249.

Tested By :



Bart Xie Nov. 03, 2012

Review By :



Forrest Lei Nov. 03, 2012

Approved By:



Solger Zhang Nov. 03, 2012

2. GENERAL INFORMATION

2.1. PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT)

Operation Frequency	903.88~923.88MHz
Modulation	GFSK
Antenna Designation	Integrated Antenna
Antenna Gain	-5dBi
Power Supply	DC3V,220mAh

2.2. TEST STANDARDS

The following report of is prepared on behalf of the Attestation of Global Compliance Co., Ltd. in accordance with FCC Part 15, Subpart C, and section 15.249, 15.203 and 15.209 of the Federal Communication Commission rules.

The objective is to determine compliance with FCC Part 15, Subpart C, and section 15.249, 15.203 and 15.209 of the Federal Communication Commission rules.

Maintenance of compliance is the responsibility of the manufacturer. Any modification of the product, which result in lowering the emission/immunity, should be checked to ensure compliance has been maintained.

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

This submittal(s) (test report) is intended for **FCC ID: QLPCS1** filing to comply with Section 15.249 of the FCC Part 15, Subpart C Rules.

2.4. TEST METHODOLOGY

All measurements contained in this report were conducted with ANSI C63.4-2003, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

The equipment under test (EUT) was configured to measure its highest possible emission level. The test modes were adapted accordingly in reference to the Operating Instructions. The EUT was tested in all three orthogonal planes and the worse case was showed.

2.5. TEST FACILITY

All measurement facilities used to collect the measurement data are located at

Attestation of Global Compliance (Shenzhen)Co., Ltd.

(1&2F, No.2 Building, Huafeng No.1 Technical, Industrial Park, Sanwei, Xixiang, Baoan District, Shenzhen, China)

The test site is constructed and calibrated to meet the FCC requirements in documents ANSI C63.4: 2003. FCC register No.: 259865

2.6. ACCESSORIES EQUIPMENT LIST AND DETAILS

Device Type	Manufacturer	Model Name	Serial No.	Data Cable	Power Cable
--	--	--	--	--	--

Note: "--"means it's not applicable.

2.7. EUT PORT&CABLE LIST AND DETAILS

I/O Port Type	Q'TY	Cable	Tested with
--	--	--	--

3. SUMMARY OF TEST RESULTS

Description of Test	Result
§15.203 Antenna Requirement	Compliant
§15.207 Power Line Conducted Emission	N/A
§15.209 General Requirement	Compliant
§15.249 Emission Bandwidth	Compliant
§15.249 Spurious Emission	Compliant

Note: Owing to the EUT power supply by battery, so Conducted Emission it's not applicable.

4 TEST MODES

No.	TEST MODES
1	903.88MHZ TX
2	913.88MHZ TX
3	923.88MHZ TX
Note: Above 3 modes have performed at maximum emission conditions.3 axis have been tested and only the worst mode data recorded in the test report if no others.	

5. § 15.203 - ANTENNA REQUIREMENT

5.1. STANDARD APPLICABLE

According to FCC 15.203, An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of Sections 15.211, 15.213, 15.217, 15.219, or 15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with Section 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this Part are not exceeded.

5.2. TEST RESULT

This product has a permanent antenna, fulfill the requirement of this section.

6. §15.209, §15.249 RADIATED EMISSION

6.1. MEASUREMENT UNCERTAINTY

Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement is +/-3.2 dB.

6.2. STANDARD APPLICABLE

Except as provided in paragraph (b) of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental Frequency (MHz)	Field Strength of Fundamental Field Strength (mV/m)	Field Strength of Harmonics (μ V/m)
902-928 MHz	50	500
2400 - 2483.5 MHz	50	500
5725 - 5875 MHz	50	500
24.0 - 24.25 GHz	250	2500

Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength (μ V/m)	Measurement Distance (m)
30-88	100*	3
88-216	150*	3
216-960	200*	3
Above 960	500	3

In the above emission table, the tighter limit applies at the band edges.

Frequency (MHz)	Field Strength (μ V/m at 3-meter)	Field Strength (dB μ V/m at 3-meter)
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

6.3. TEST EQUIPMENT LIST AND DETAILS

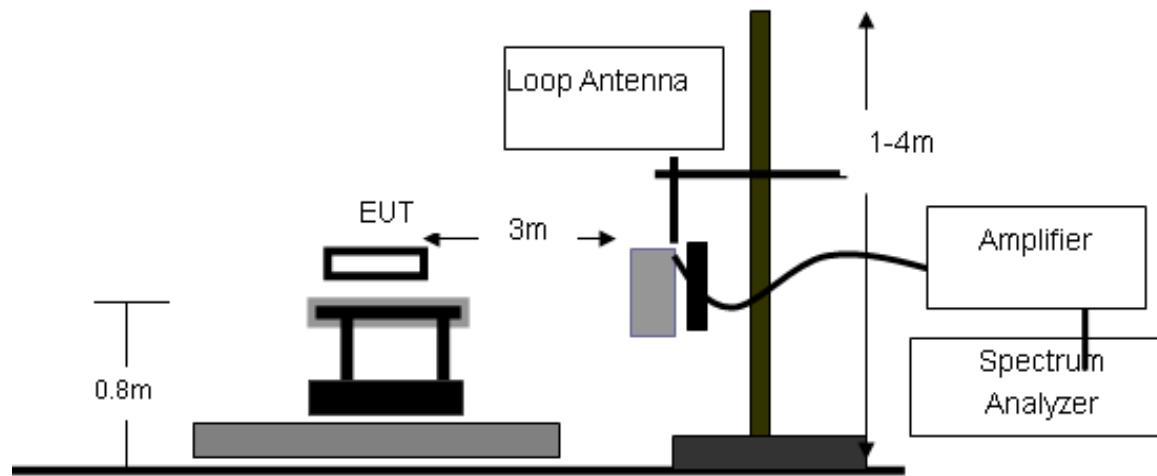
Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
PSA SERIES SPECTRUM ANALYZER	AGILENT	E4440A	US41421290	07/18/2012	07/17/2013
BICONICAL ANTENNA	A.H.	SAS-521-4	128	07/18/2012	07/17/2013
LOOP ANTENNA	R&S	HM525	N/A	07/18/2012	07/17/2013
HORN ANTENNA	EM	EM-AH-10180	N/A	07/18/2012	07/17/2013
AMPLIFIER	EM	EM30180	0607030	07/18/2012	07/17/2013
COAXIAL CABLE	SCHWARZBECK	AK9513	9513-10	07/18/2012	07/17/2013
POSITIONING CONTROLLER	MF	MF-7802	MF780208147	07/18/2012	07/17/2013

6.4. TEST PROCEDURE

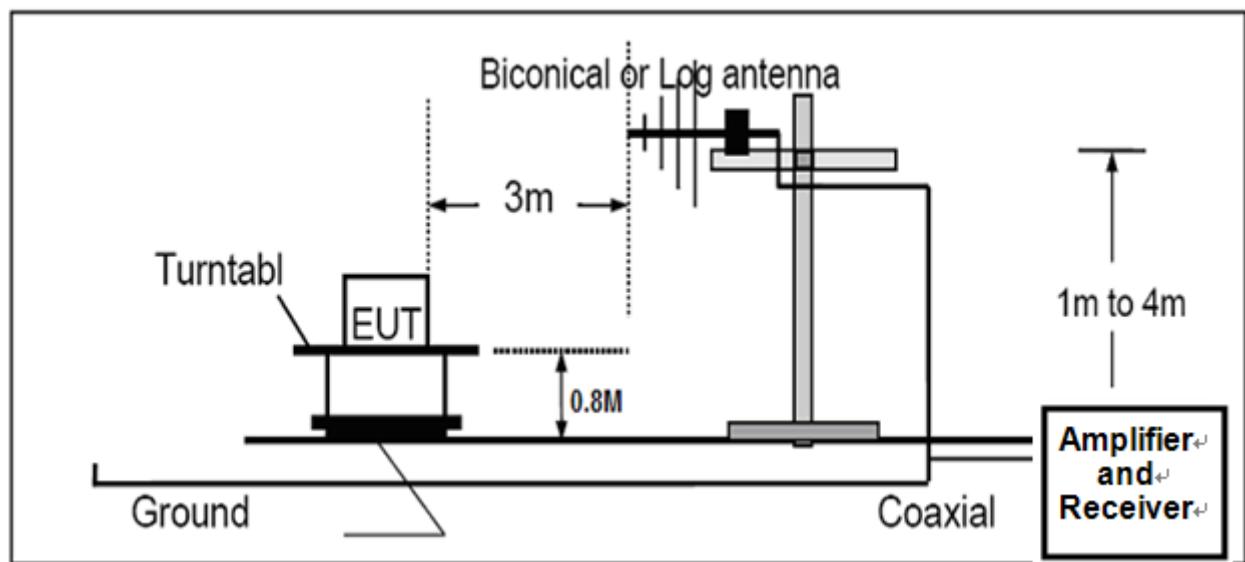
The setup of EUT is according with per ANSI C63.4-2003 measurement procedure. The specification used was with the FCC Part 15.249 and FCC Part 15.209 Limit.

6.5. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)

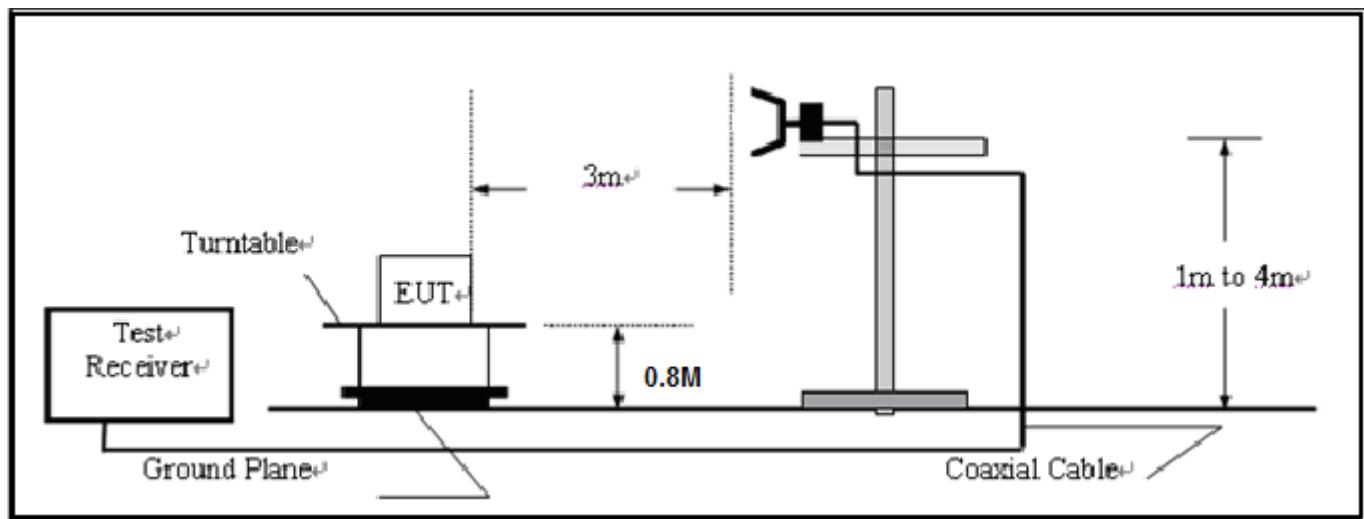
BELOW 30MHz:



30MHz-1000MHz:



ABOVE 1000MHz:



6.6. TEST RESULTS

6.6.1 TEST RESULT OF RADIATED EMISSION TEST (9KHZ-30MHZ)

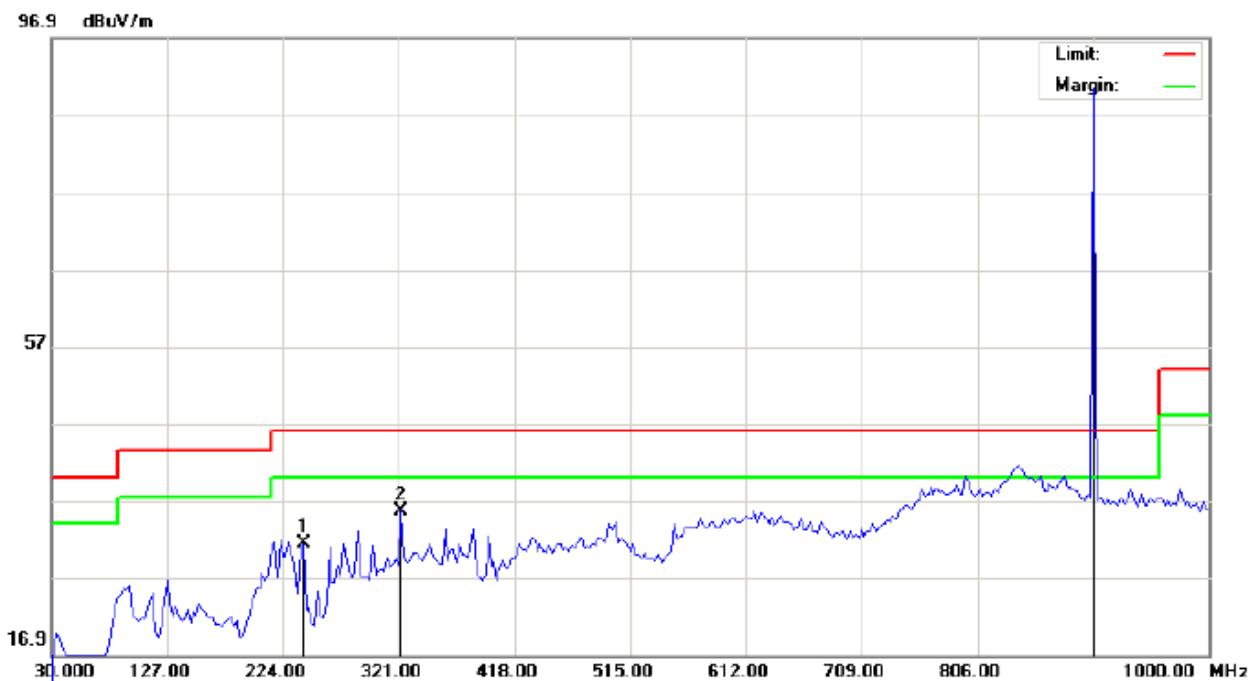
Freq. (MHz)	Level (dB uV)	Over Limit (dB)	Limit Line (dB uV)	Remark
--	--	--	--	Seen to Note

**Note:

The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be report.

6.6.2 TEST RESULT OF RADIATED EMISSION TEST (30MHZ-1GHZ)

Radiated Emission Measurement



Site: site #1

Polarization: *Horizontal*

Temperature: 26

Limit: FCC Class B 3M Radiation

Power:

Humidity: 60 %

EUT: SUM

Distance: 3m

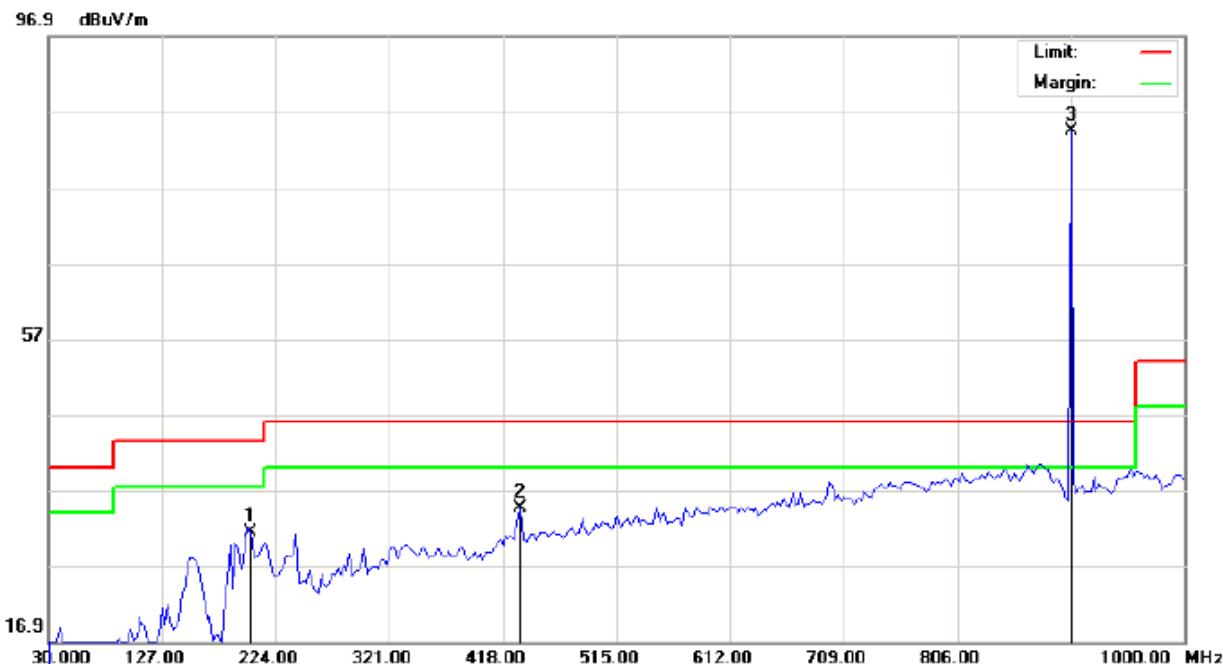
M/N: CS1

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		240.9750	19.53	11.92	31.45	46.00	-14.55	peak			
2		323.4250	17.11	18.42	35.53	46.00	-10.47	peak			
3	*	903.0000	63.76	26.62	90.38	93.97	-3.59	peak			

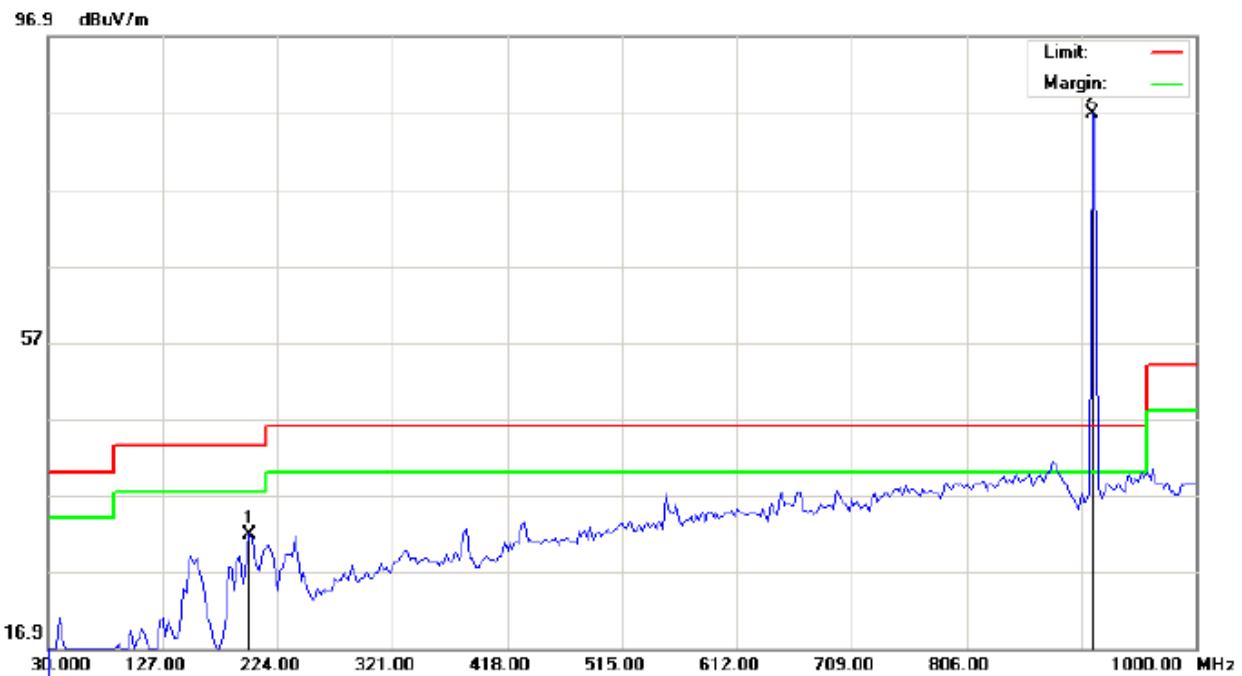
Radiated Emission Measurement



Site: site #1 Polarization: **Vertical** Temperature: 26
Limit: FCC Class B 3M Radiation Power: Humidity: 60 %
EUT: SUM Distance: 3m
M/N: CS1
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		202.1750	23.31	8.08	31.39	43.50	-12.11	peak			
2		432.5500	13.11	21.47	34.58	46.00	-11.42	peak			
3	*	903.0000	58.45	25.97	84.42	93.97	-9.55	peak			

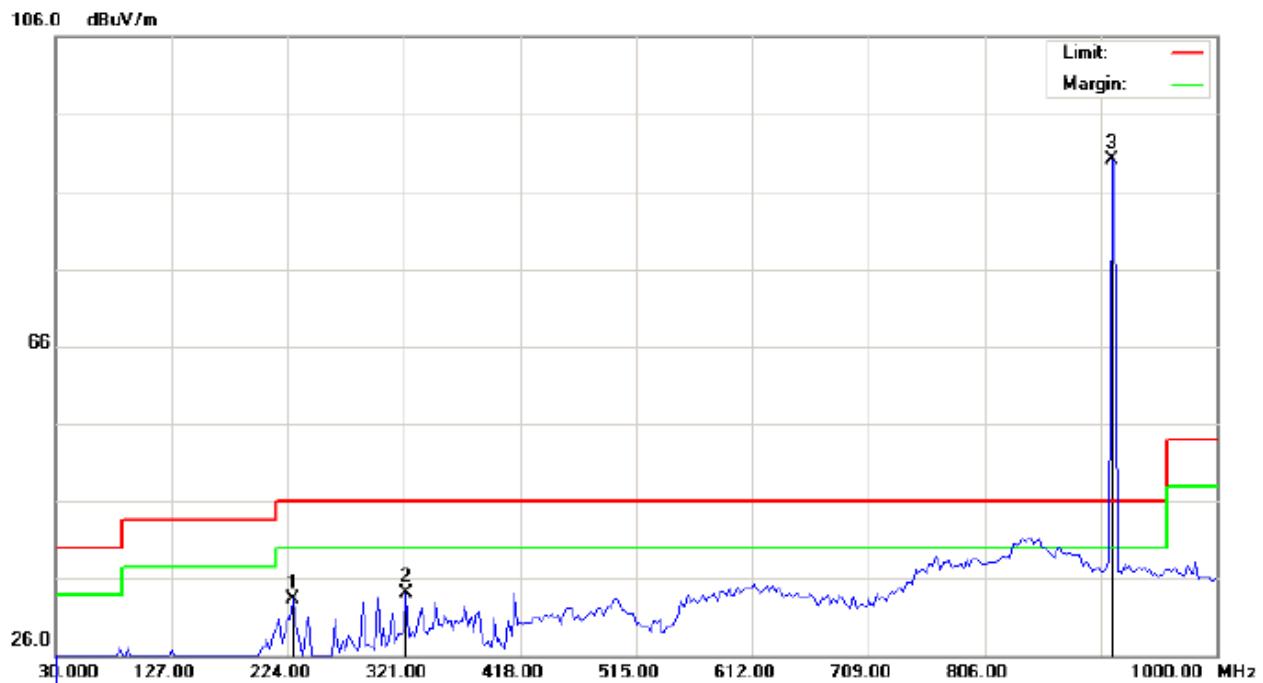
Radiated Emission Measurement



Site: site #1 Polarization: **Vertical** Temperature: 26
Limit: FCC Class B 3M Radiation Power: Humidity: 60 %
EUT: SUM Distance: 3m
M/N: CS1
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		199.7500	23.61	8.23	31.84	43.50	-11.66	peak			
2	*	912.7000	60.27	26.50	86.77	93.97	-7.20	peak			

Radiated Emission Measurement



Site: site #1

Polarization: *Horizontal*

Temperature: 26

Limit: FCC Class B 3M Radiation

Power:

Humidity: 60 %

EUT: SUM

Distance: 3m

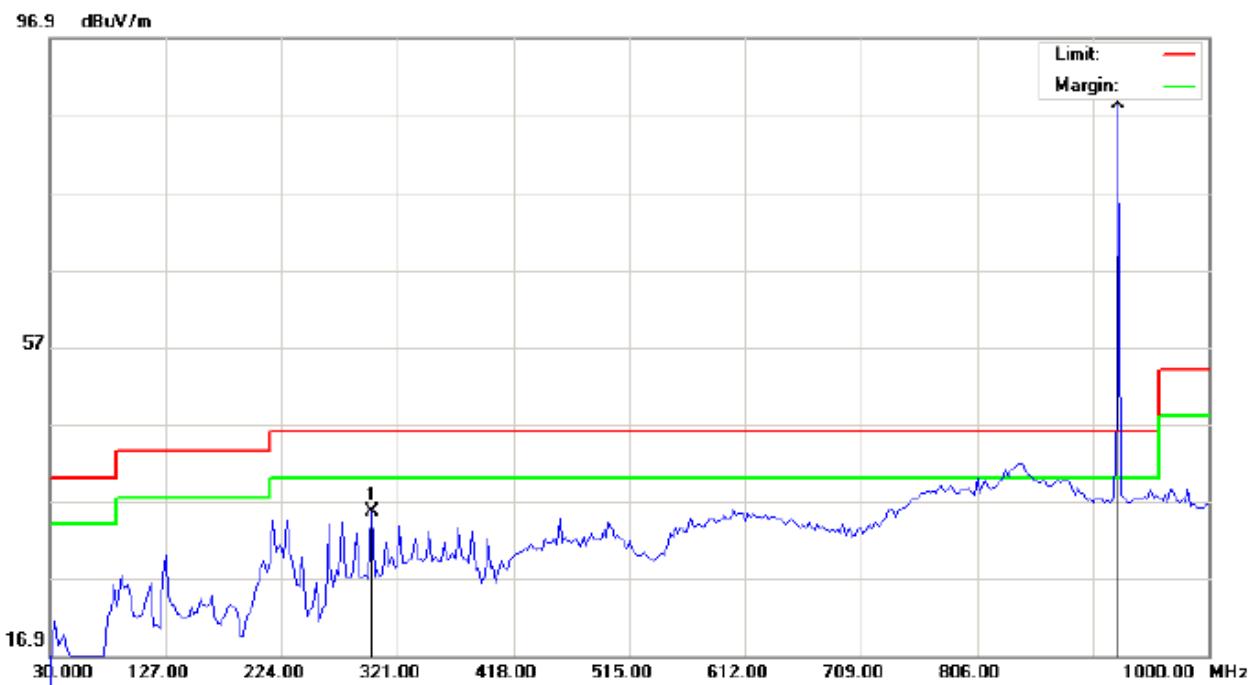
M/N: CS1

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		228.8500	20.89	12.50	33.39	46.00	-12.61	peak			
2		323.4250	15.73	18.42	34.15	46.00	-11.85	peak			
3	*	912.7000	63.47	26.65	90.12	93.97	-3.85	peak			

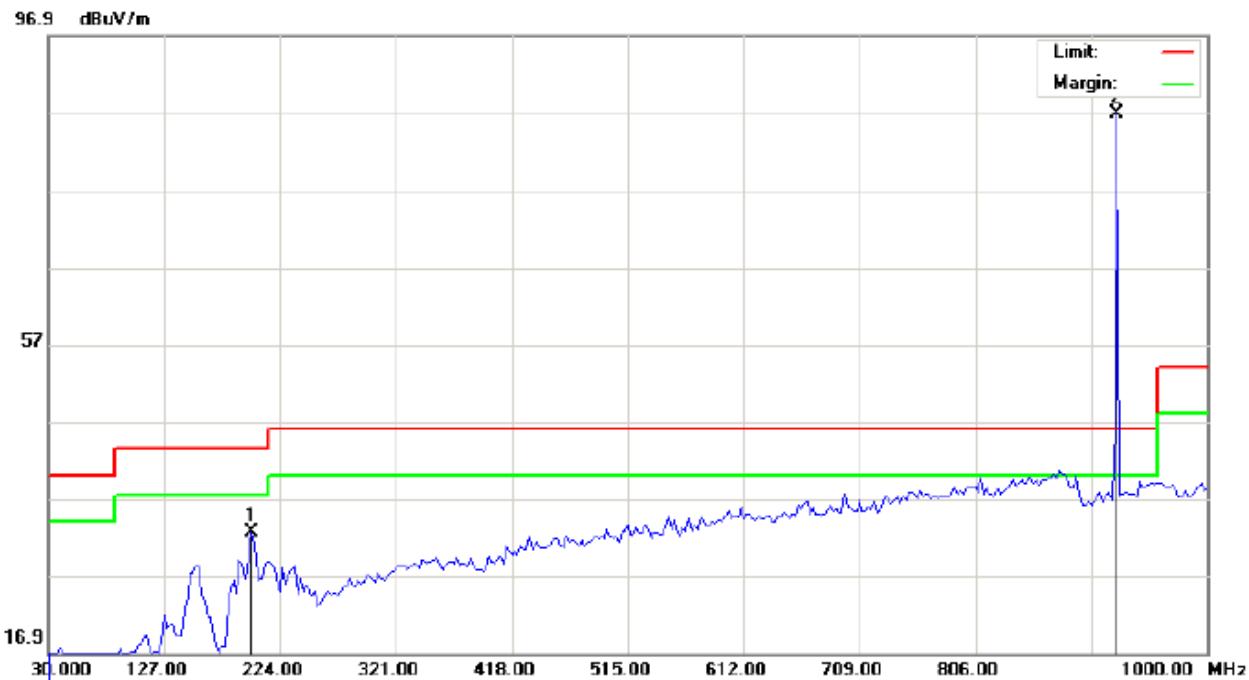
Radiated Emission Measurement



Site: site #1 Polarization: *Horizontal* Temperature: 26
Limit: FCC Class B 3M Radiation Power: Humidity: 60 %
EUT: SUM Distance: 3m
M/N: CS1
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		299.1750	18.52	17.01	35.53	46.00	-10.47	peak			
2	*	924.8250	61.74	26.61	88.35	93.97	-5.62	peak			

Radiated Emission Measurement

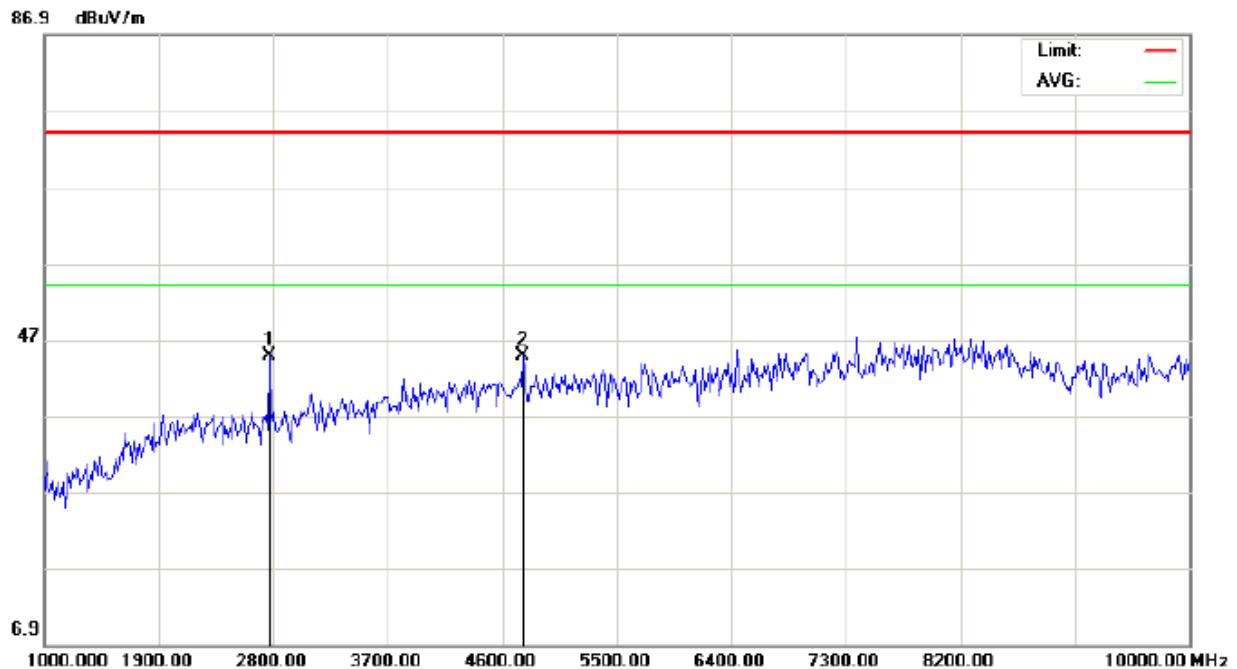


Site: site #1 Polarization: **Vertical** Temperature: 26
Limit: FCC Class B 3M Radiation Power: Humidity: 60 %
EUT: SUM Distance: 3m
M/N: CS1
Mode: High Channel TX
Note:

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		199.7500	24.35	8.23	32.58	43.50	-10.92	peak			
2	*	924.8250	59.82	26.95	86.77	93.97	-7.20	peak			

6.6.3 TEST RESULT OF RADIATED EMISSION TEST (ABOVE 1000MHZ)

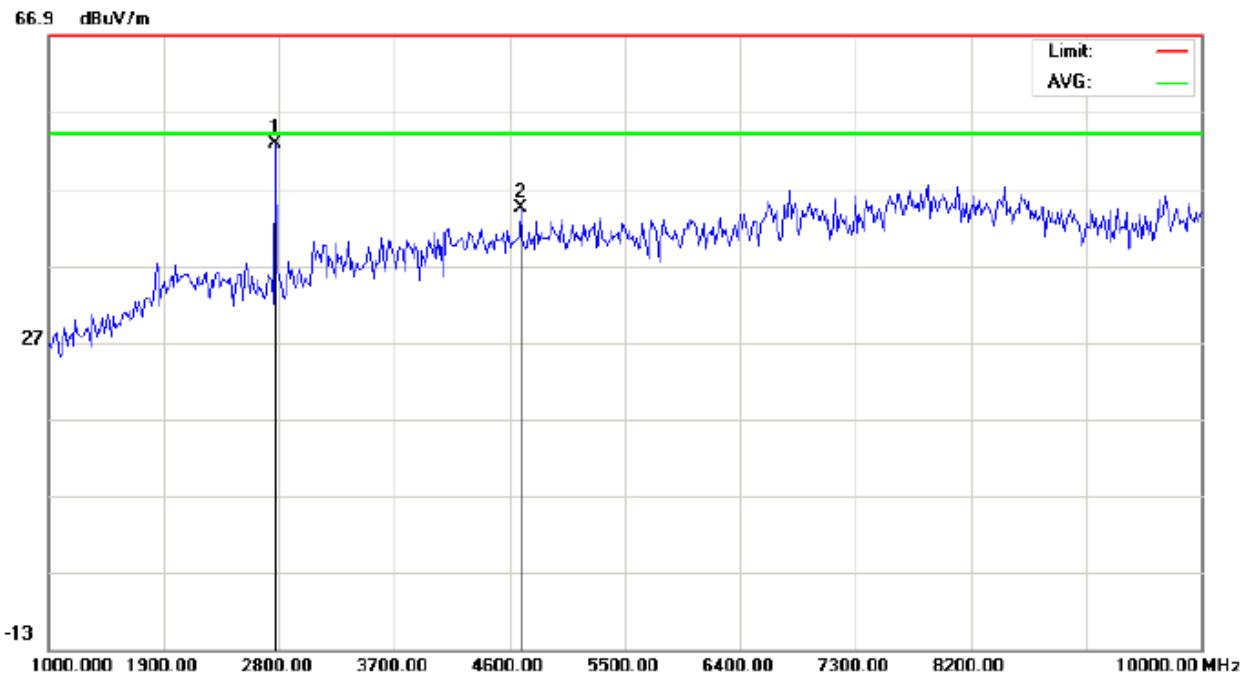
Radiated Emission Measurement



Site: site #1 Polarization: *Horizontal* Temperature: 26
Limit: FCC Class B 3M Radiation above 1GHZ(PK) Power: Humidity: 60 %
EUT: SUM Distance: 3m
M/N: CS1
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		2770.000	53.76	-8.92	44.84	74.00	-29.16	peak			
2	*	4765.000	47.32	-2.42	44.90	74.00	-29.10	peak			

Radiated Emission Measurement



Site: site #1 Polarization: **Vertical** Temperature: 26
Limit: FCC Class B 3M Radiation above 1GHZ(PK) Power: Humidity: 60 %
EUT: SUM Distance: 3m
M/N: CS1
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	*	2770.000	61.70	-8.92	52.78	74.00	-21.22	peak			
2		4690.000	47.09	-2.61	44.48	74.00	-29.52	peak			

**Note: Other channels have been tested and have enough margin. No recorded in the test report.

7. §15.249 EMISSION BANDWIDTH

7.1. STANDARD APPLICABLE

None; for reporting purposes only.

7.2. TEST EQUIPMENT LIST AND DETAILS

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
PSA SERIES SPECTRUM ANALYZER	AGILENT	E4440A	US41421290	07/18/2012	07/17/2013
RECEIVER ANTENNA	A.H.	SAS-521-4	N/A	07/18/2012	07/17/2013
COAXIAL CABLE	ETS	SUCOFLEX 104	25498514	07/18/2012	07/17/2013

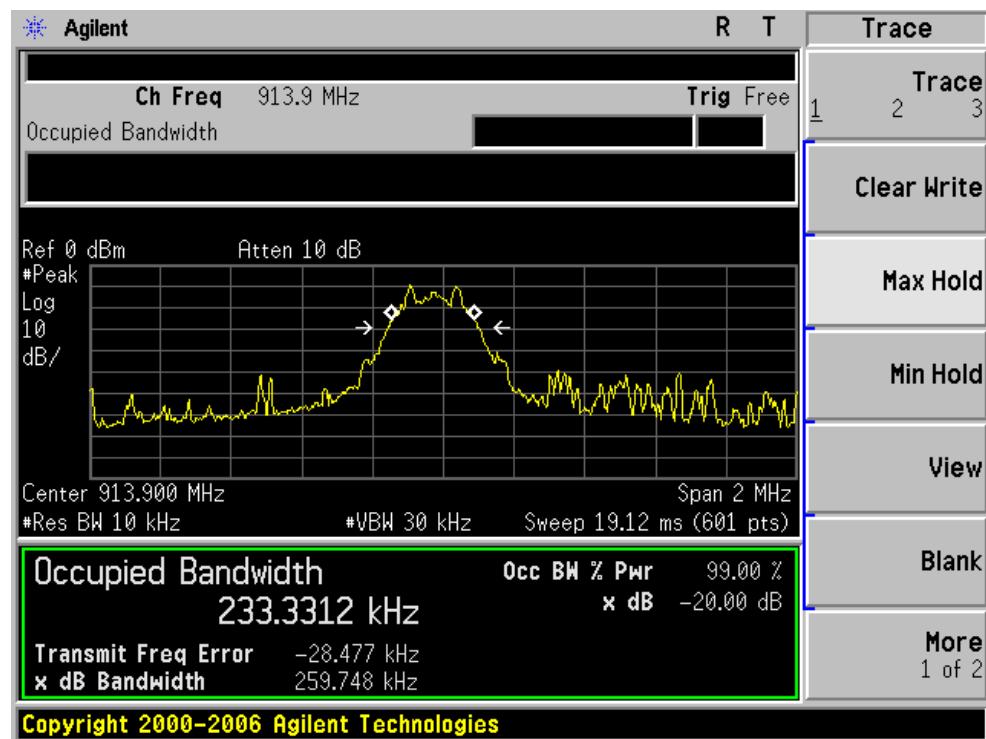
7.3. TEST PROCEDURE

With the EUT's antenna attached, the EUT's 20dB Bandwidth power was received by the test antenna, which was connected to the spectrum analyzer with the START, and STOP frequencies set to the EUT's operation band.

7.4. SUMMARY OF TEST RESULTS/PLOTS

Channel	Emission Bandwidth (KHz)	Limit (KHz)
Low	259.68	N/A
Middle	259.75	
High	259.62	

Test Result: Pass



Middle Channel Test Result

8FCC LINE CONDUCTED EMISSION TEST

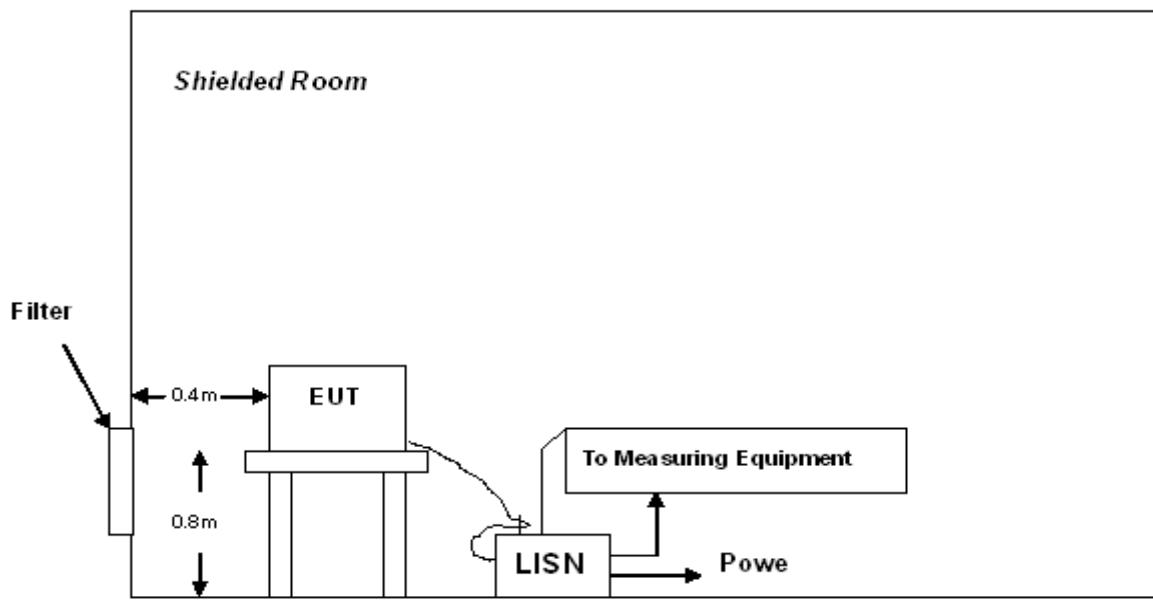
8.1 LIMITS

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

8.2 TEST SETUP



A: Powered through filter

8.3 PRELIMINARY PROCEDURE

- 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 power by adapter which received power by a LISN.
- 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 following 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.

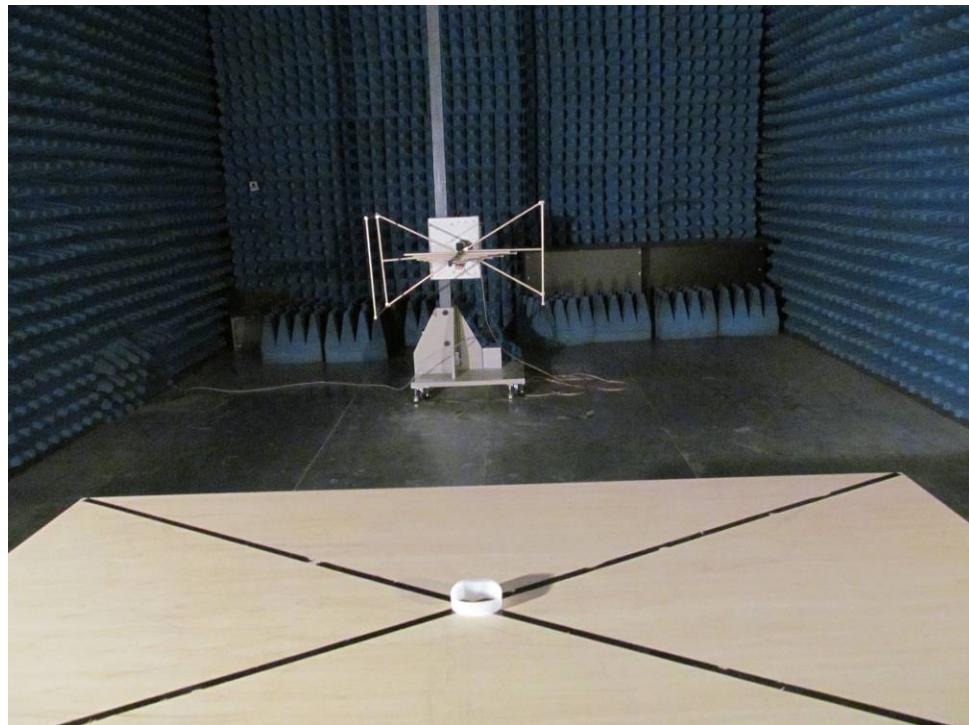
8.4 FINAL TEST PROCEDURE

- 10) EUT and support equipment was set up on the test bench as per step 2 of the preliminary test.
- 11) 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.
- 12) 3) The test data of the worst case condition(s) was reported on the Summary Data page.

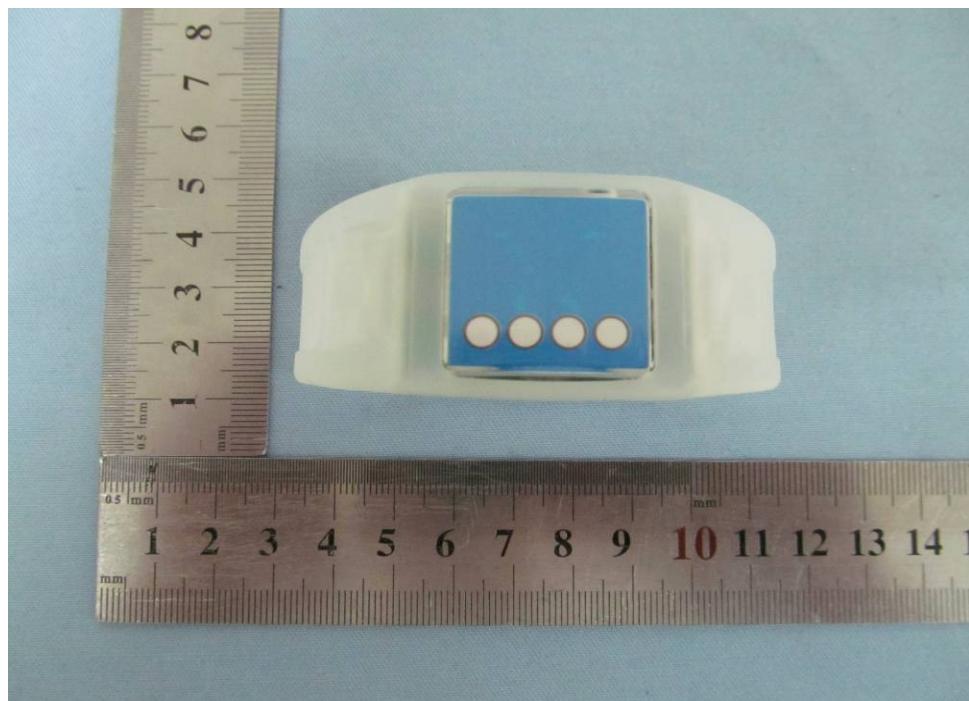
8.5 TEST RESULT OF POWER LINE

N/A

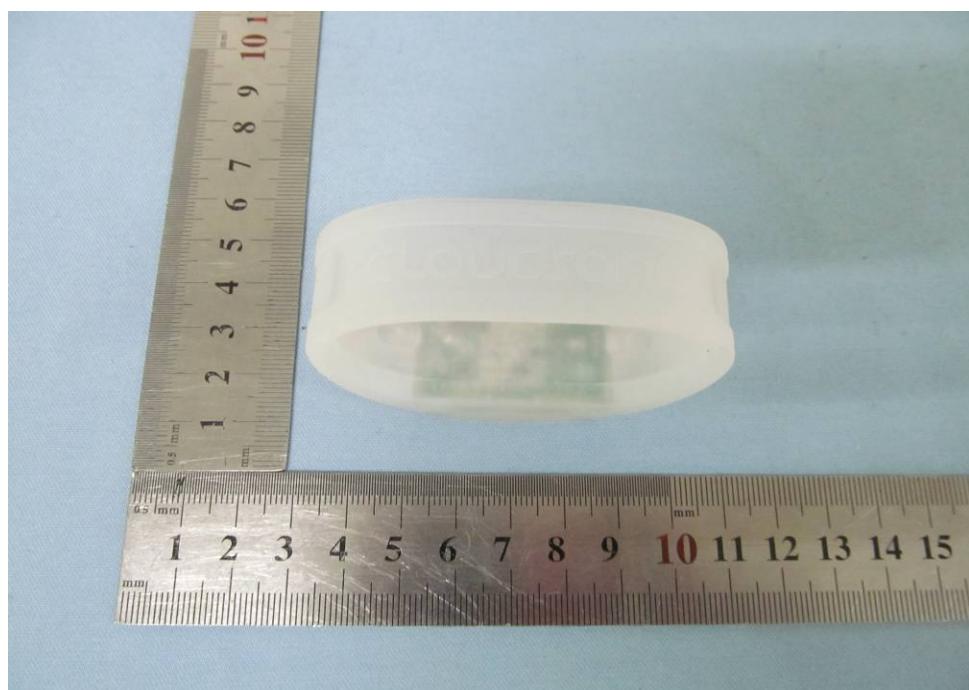
APPENDIX 1
PHOTOGRAPHS OF TEST SETUP
RADIATED EMISSION TEST SETUP



APPENDIX 2
PHOTOGRAPHS OF EUT
TOP VIEW OF EUT



BOTTOM VIEW OF EUT



FRONT VIEW OF EUT



BACK VIEW OF EUT



LEFT VIEW OF EUT



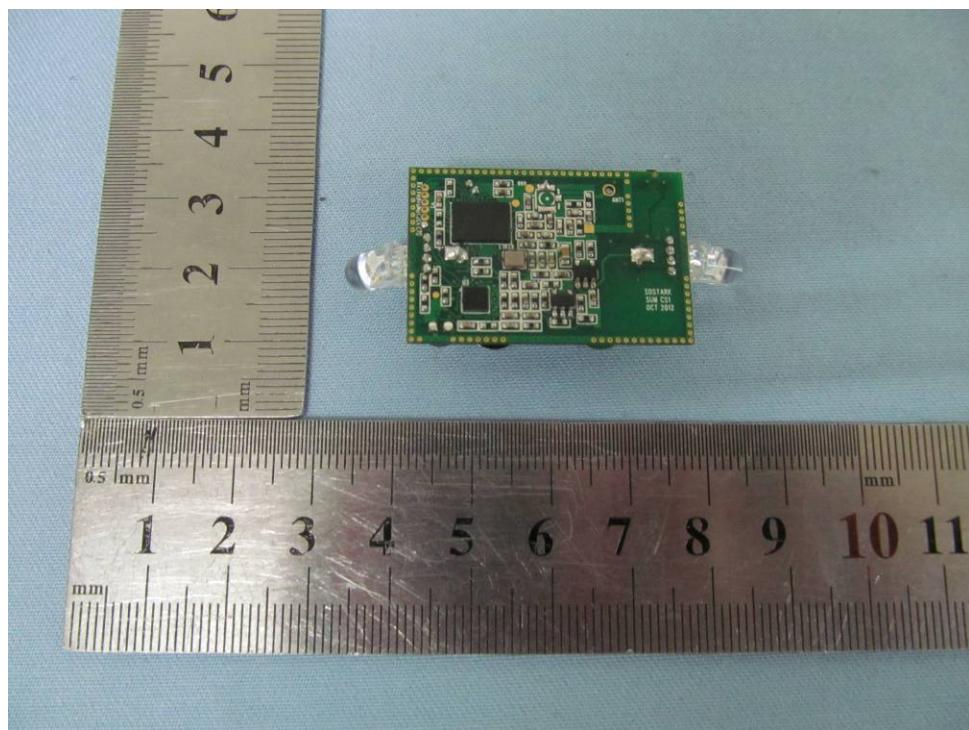
RIGHT VIEW OF EUT



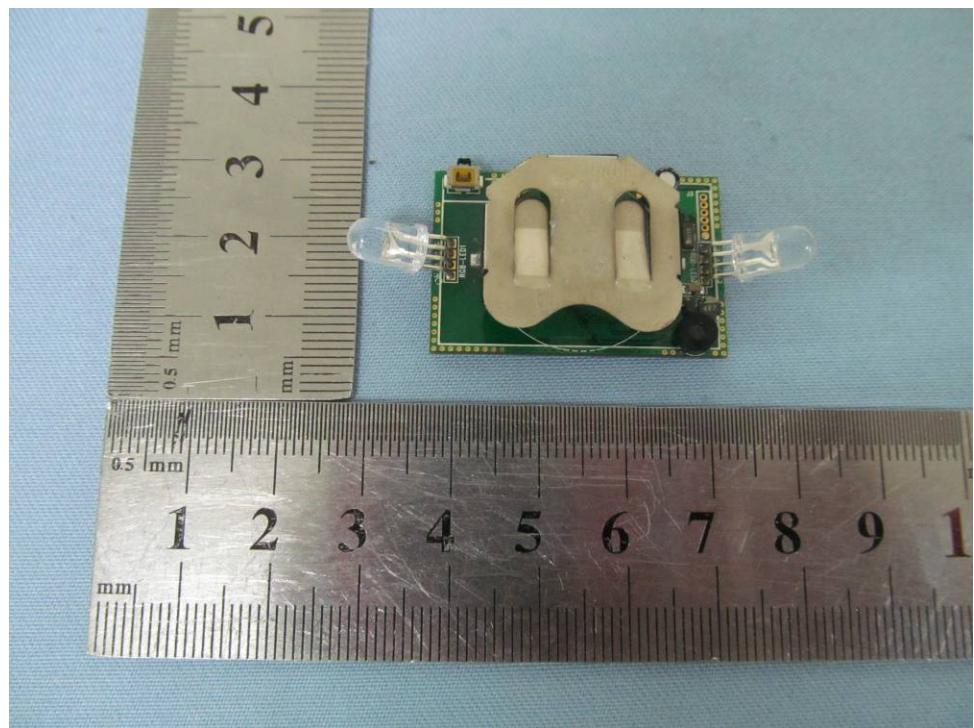
INTERNAL VIEW OF EUT-1



INTERNAL VIEW OF EUT-2



INTERNAL VIEW OF EUT-3



----- END OF REPORT -----