



**Nemko**

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## CERTIFICATION TEST REPORT

**Report Number:** 2010 02301489 TX FCC

**Project Number:** 23972

**Nex Number:** 301489

**Applicant:** KSC INDUSTRIES INC.  
881 KUHN DRIVE BUILDING 200  
Chula Vista, CA 91914

**Equipment Under Test (EUT):** WIRELESS SURROUND SYSTEM

**Model:** SCT101

**FCC ID:** SUDSCT15M

**IC:** 5613A-SCT15M

**In Accordance With:** FCC Part 15 Subpart C, 15.247  
IC RSS-210 Issue 7 June 2007  
IC RSS-Gen Issue 2 June 2007

**Tested By:** Nemko USA Inc.  
11696 Sorrento Valley Road, Suite F  
San Diego, CA 92121

**Authorized By:** Alan Laudani, EMC/RF Test Engineer

**Date:** March 1, 2010

**Total Number of Pages:** 55



## Section1: Summary of Test Results

### General

#### All measurements are traceable to national standards

These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with FCC Part 15; Subpart C and IC RSS-210. Radiated tests were conducted in accordance with ANSI C63.4-2003. Radiated emissions are made on an open area test site. A description of the test facility is on file with the FCC and IC.

The assessment summary is as follows:

**Apparatus Assessed:** Wireless Surround System

**Model:** SCT101

**Specification:** FCC Part 15 Subpart C, 15.247  
IC RSS-210 Issue 7 June 2007

**Date Received in Laboratory:** February 19, 2010

**Compliance Status:** Complies

**Exclusions:** None

**Non-compliances:** None



## 1.1 Report Release History

REVISION	DATE	COMMENTS	
-	March 1, 2010	Prepared By:	Ferdinand Custodio
-	March 1, 2010	Initial Release:	Alan Laudani

Note that the results contained in this report relate only to the items tested and were obtained in the period between the date of initial receipt of samples and the date of issue of the report.

This test report has been completed in accordance with the requirements of ISO/IEC 17025.

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TESTED BY:

  
Ferdinand Custodio, EMC Test Engineer

Date: March 1, 2010



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## Section 2: Equipment Under Test

### 2.1 Product Identification

The Equipment Under Test was indentified as follows:

*KSC Industries Inc. SCT101 Wireless Surround System*



### 2.2 Samples Submitted for Assessment

The following sample of the apparatus and antenna have been submitted for type assessment:

Sample No.	Description	Serial No.
301489-1	SCT101 Transmitter	N/A



## 2.3 Theory of Operation

The SCT101 is part of the SurroundCast Wireless Surround System. The SurroundCast Wireless Surround System is an indoor speaker system designed to provide surround sound for home theater systems.

## 2.4 Technical Specifications of the EUT

<b>Manufacturer:</b>	KSC Industries Inc.
<b>Operating Frequency:</b>	2403.3 MHz to 2479.0 MHz in the 2400-2483.5 MHz Band
<b>Number of Operating Frequencies:</b>	20
<b>Rated Power:</b>	29.24 mW
<b>Modulation:</b>	FHSS
<b>Reference Designator:</b>	2M00F1D
<b>Antenna Connector:</b>	Integral
<b>Power Source:</b>	6VDC from external AC Adapter (Soundcast Class 2 Power supply Model:SY-0630)



## Section 3: Test Conditions

### 3.1 Specifications

The apparatus was assessed against the following specifications:

#### ***FCC Part 15 Subpart C, 15.247***

Operation within the bands 902-928 MHz, 2400-2483.5 MHz, 5725-5850 MHz and 24.0-24.25 GHz bands.

#### ***IC RSS-210 Issue 7 June 2007***

Low-power Licence-exempt Radio-communication Devices (All Frequency Bands): Category I Equipment. Annex 8 - Frequency Hopping and Digital Modulation Systems Operating in the Bands 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz

#### ***IC RSS-Gen Issue 2 June 2007***

General Requirements and Information for the Certification of Radio-communication Equipment

### 3.2 Deviations From Laboratory Test Procedures

No deviations from Laboratory Test Procedure

### 3.3 Test Environment

All tests were performed under the following environmental conditions:

Temperature range	18-22 °C
Humidity range	39-62 %
Pressure range	102.1 – 102.3 kPa
Power supply range	5.1 to 6.9VDC

### 3.4 Test Equipment

Nemko ID	Device	Manufacturer	Model	Serial Number	Cal Date	Cal Due Date
936	DC Power Supply 0-50V 0-10A 200W	Hewlett Packard	6002A	N/A	Verified by Asset #E1009	
E1009	Multimeter	Fluke	287	11610042	12/18/2009	12/18/2010
911	Spectrum Analyzer	Agilent	E4440A	US41421266	12/17/2009	12/17/2010
684	Transient Limiter	HP	11974A	3107A02636	9/10/2009	9/10/2010
574	High Pass Filter	Solar	7801-5.0	853135	8/14/2009	8/14/2010
384	LISN	Solar	9348-50-R-24-BNC	941716	8/31/2009	8/31/2010
E1018	9kHz to 7GHz Spectrum Analyzer	Rohde & Schwarz	FSP7	835363/0003	1/22/2010	1/22/2011
946	Peak Power Sensor	Hewlett Packard	84815A 0.05-18GHz (-40 to 20dBm)	3318A01726	9/16/2009	9/16/2010
947	Peak Power Analyzer	Hewlett Packard	8991A	3621A00906	9/16/2009	9/16/2010
116	Antenna, Bicon	EMCO	3110	1267	11/12/2008	11/12/2010
128	Antenna, Bicon	EMCO	3104	2882	2/9/2009	2/9/2011
110	Antenna, LPA	Electrometrics	LPA-25	1217	1/10/2009	2/10/2011
877	Antenna, DRG Horn, .7-18GHz	AH Systems	SAS-571	688	7/28/2008	7/28/2010
901	pre amp	Sonoma	310 N	130607	3/27/2009	3/27/2010
317	Preamplifier	HP	8449A	2749A00167	4/16/2009	4/16/2010
898	EMI Receiver & filter set	HP	8546A	3625A00348	5/31/2009	5/31/2010
899	Filter Section	HP	85460A	3448A00288	5/31/2009	5/31/2010

Registration of the OATS are on file with the Federal Communications Commission, under Registration Number 90579, the VCCI under registration number R-3027, and are also registered with Industry Canada under Site Numbers 2040B-1 and 2040B-2.



## **Section 4: Observations**

### **4.1 Modifications Performed During Assessment**

No modifications were performed during assessment.

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### **4.2 Record Of Technical Judgements**

No technical judgements were made during the assessment.

### **4.3 EUT Parameters Affecting Compliance**

The user of the apparatus could not alter parameters that would affect compliance.

### **4.4 Test Deleted**

No Tests were deleted from this assessment.

### **4.5 Additional Observations**

There were no additional observations made during this assessment.



## Section 5: Results Summary

This section contains the following:

FCC Part 15 Subpart C:  
IC RSS-210 Issue 7 June 2007 Annex 8  
IC RSS-Gen Issue 2 June 2007

The column headed "Required" indicates whether the associated clauses were invoked for the apparatus under test. The following abbreviations are used:

N No: not applicable / not relevant  
Y Yes: Mandatory i.e. the apparatus shall conform to these tests.  
N/T Not Tested, mandatory but not assessed. (See section 4.4 Test deleted)

The results contained in this section are representative of the operation of the apparatus as originally submitted.

### 5.1 Test Results

Part 15C	RSS	Test Description	Required	Result
15.207 (a)	RSS-Gen 7.2.2	Conducted Emission Limit	Y	Pass
15.247(a)(1)		Carrier Frequency Separation	Y	Pass
15.247(a)(1)(iii)		Number of Hopping Frequencies	Y	Pass
15.247(a)(1)(iii)		Time of Occupancy (Dwell Time)	Y	Pass
15.215(c)	RSS-Gen 4.6.1	20 dB Bandwidth	Y	Pass
15.247(b)(1)	RSS-Gen 4.8 & 4.9	Peak Output Power	Y	Pass
15.247(d)		Band-edge Compliance of RF Conducted Emissions	Y	Pass
15.247 (d)		Spurious RF Conducted Emissions	Y	Pass
15.247 (d)		Spurious Radiated Emissions	Y	Pass



## Appendix A: Test Results

### Section 15.207(a) – Power Line Conducted Emissions

15.207(a) Except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50  $\mu$ H/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

Frequency of emission (MHz)	Conducted limit (dB $\mu$ V)	
	Quasi-peak	Average
0.15–0.5	66 to 56*	56 to 46*
0.5–5	56	46
5–30	60	50

\*Decreases with the logarithm of the frequency.

### Test Conditions:

Sample Number:	SCT101	Temperature:	22
Date:	February 24, 2010	Humidity:	45
Modification State:	Test Mode (Hopping)	Tester:	FSCustodio
		Laboratory:	Shield Room #1

### Test Results:

See attached plots for Line 1 (Hot) and Line 2 (Neutral).

### Additional Observations:

- EUT was pretested using the following modes: Low channel, Mid channel, High channel and Hopping mode. Only the worst case presented (Hopping mode).
- Test parameters are internal to the automated test software used (R&S®ES-SCAN Version 2.3) for conducted emission test.
- Red limit line is Quasi Peak limit while pink limit line is Average limit.
- ▼represents final quasi peak measurements while ▼ represent final average measurements.
- Six sub ranges were created in order to have at least six measurements in each range.



# Nemko USA Inc.

## EMI Measurement Test Report

Device Under Test      Wireless Surround System (Transmitter)  
Operator Name      FSCustodio  
Test Specification      FCC Class B Conducted Emissions  
Comment      Line 1 Hopping (worst case)

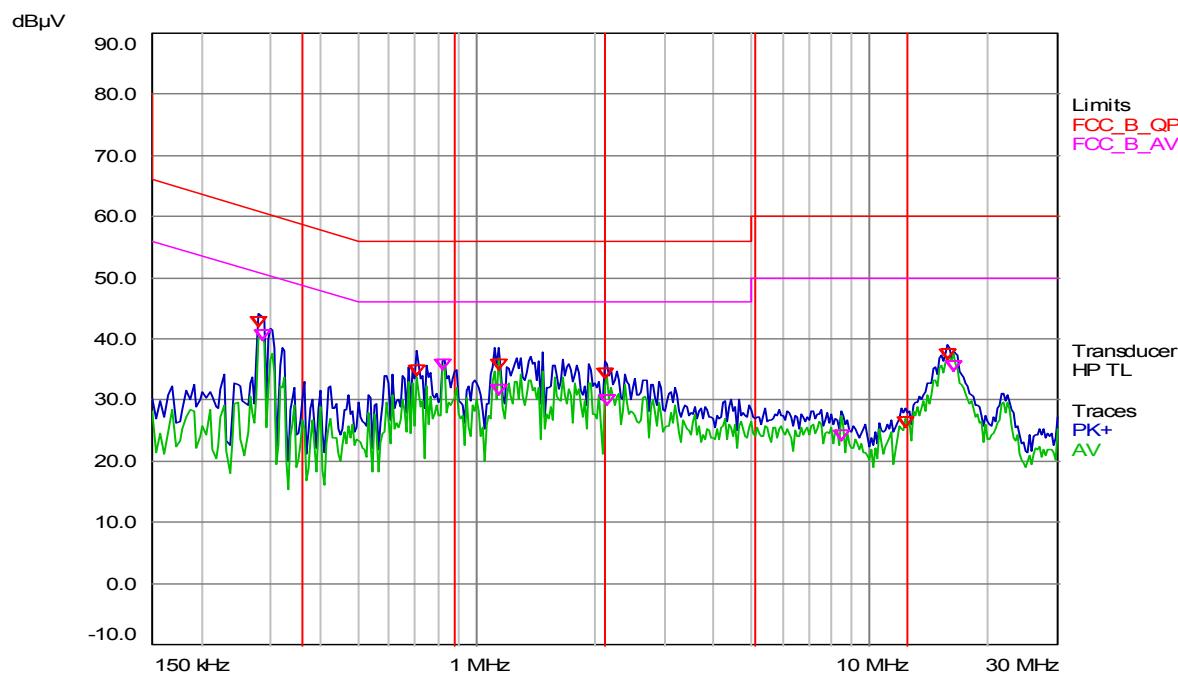
### Sweep Settings ( 1 Range )

Frequencies			Analyzer Settings					
Start	Stop	Sweep Points	Res BW	Sweep Time	Atten	Preamp	Pre-selector	Ref Level
150 kHz	30 MHz	8001	9 kHz (6dB)	1 s	Auto	Off	Off	80 dB $\mu$ V

### Final Measurement

Detectors: QP , AV  
Peaks: 6      Meas Time: 1 s  
                  Acc. Margin: 40 dB

### Pre-measurement Graph



**Final Measurement Results**

Trace	Frequency (MHz)	Level (dB $\mu$ V)	Limit (dB $\mu$ V)	Delta Limit (dB)
1 QP	0.280594	42.02	60.80	-18.78
2 AV	0.284325	39.67	50.69	-11.02
1 QP	0.702225	33.94	56.00	-22.06
2 AV	0.825356	34.81	46.00	-11.19
1 QP	1.13505	34.90	56.00	-21.10
2 AV	1.13505	30.88	46.00	-15.12
1 QP	2.131294	33.55	56.00	-22.45
2 AV	2.14995	29.04	46.00	-16.96
2 AV	8.500538	23.32	50.00	-26.68
1 QP	12.362381	25.62	60.00	-34.38
1 QP	15.698119	36.50	60.00	-23.50
2 AV	16.213031	34.61	50.00	-15.39

\* = limit exceeded



# Nemko USA Inc.

## EMI Measurement Test Report

Device Under Test      Wireless Surround System (Transmitter)  
Operator Name      FSCustodio  
Test Specification      FCC Class B Conducted Emissions  
Comment      Line 2 Hopping (worst case)

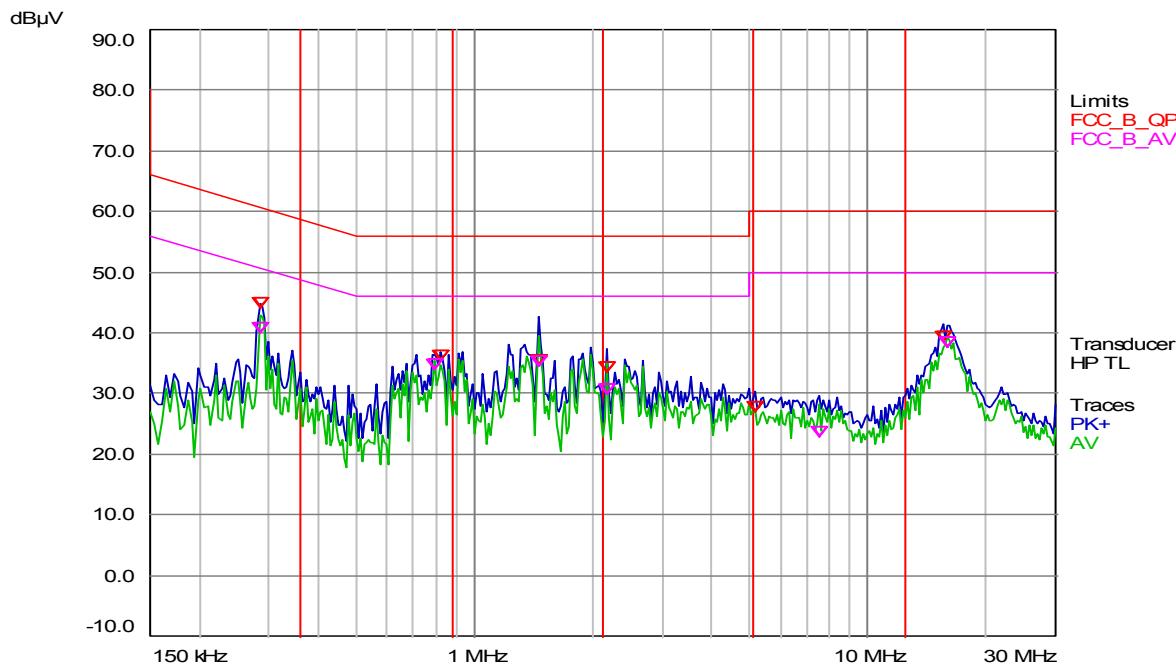
### Sweep Settings ( 1 Range )

Frequencies			Analyzer Settings					
Start	Stop	Sweep Points	Res BW	Sweep Time	Atten	Preamp	Pre-selector	Ref Level
150 kHz	30 MHz	8001	9 kHz (6dB)	1 s	Auto	Off	Off	80 dB $\mu$ V

### Final Measurement

Detectors: QP , AV  
Peaks: 6      Meas Time: 1 s  
                  Acc. Margin: 40 dB

### Pre-measurement Graph



**Final Measurement Results**

Trace	Frequency (MHz)	Level (dB $\mu$ V)	Limit (dB $\mu$ V)	Delta Limit (dB)
1 QP	0.284325	44.02	60.69	-16.67
2 AV	0.284325	40.05	50.69	-10.64
2 AV	0.791775	34.08	46.00	-11.92
1 QP	0.825356	35.42	56.00	-20.58
1 QP	1.459669	34.64	56.00	-21.36
2 AV	1.459669	34.51	46.00	-11.49
2 AV	2.176069	29.87	46.00	-16.13
1 QP	2.1798	33.54	56.00	-22.46
1 QP	5.168531	27.06	60.00	-32.94
2 AV	7.511756	22.86	50.00	-27.14
1 QP	15.6123	38.48	60.00	-21.52
2 AV	15.866025	37.67	50.00	-12.33

\* = limit exceeded



**Section 15.247(a)(1) – Carrier Frequency Separation**

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400–2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW. The system shall hop to channel frequencies that are selected at the system hopping rate from a pseudo randomly ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.

**Test Conditions:**

<b>Sample Number:</b>	SCT101	<b>Temperature:</b>	22
<b>Date:</b>	February 25, 2009	<b>Humidity:</b>	45
<b>Modification State:</b>	Between Channel 22 and 23	<b>Tester:</b>	FSCustodio

**Laboratory:** Nemko**Test Results:**

See attached plots.

**Additional Observations:**

- Hopping function enabled.
- Span is 10 MHz
- RBW is 1% of 10 MHz
- VBW is 3X RBW
- Sweep is auto
- Detector is Peak
- Trace is Max Hold
- Marker-delta function is used between the peaks of the adjacent channels.
- Observed Carrier Frequency Separation is 2.05 MHz.
- 20dB Bandwidth as per Part 15.215 (c) is 2.0 MHz.
- Observed Carrier Frequency Separation > 20dB Bandwidth = Complies

FCC ID: SUDSCT15M  
IC: 5613A-SCT15MReport Number: 2010 02301489 TX FCC  
Specification: FCC Part 15 Subpart C, 15.247

**Section 15.247(a)(1)(iii) – Number of Hopping Frequencies**

(iii) Frequency hopping systems in the 2400–2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

**Test Conditions:**

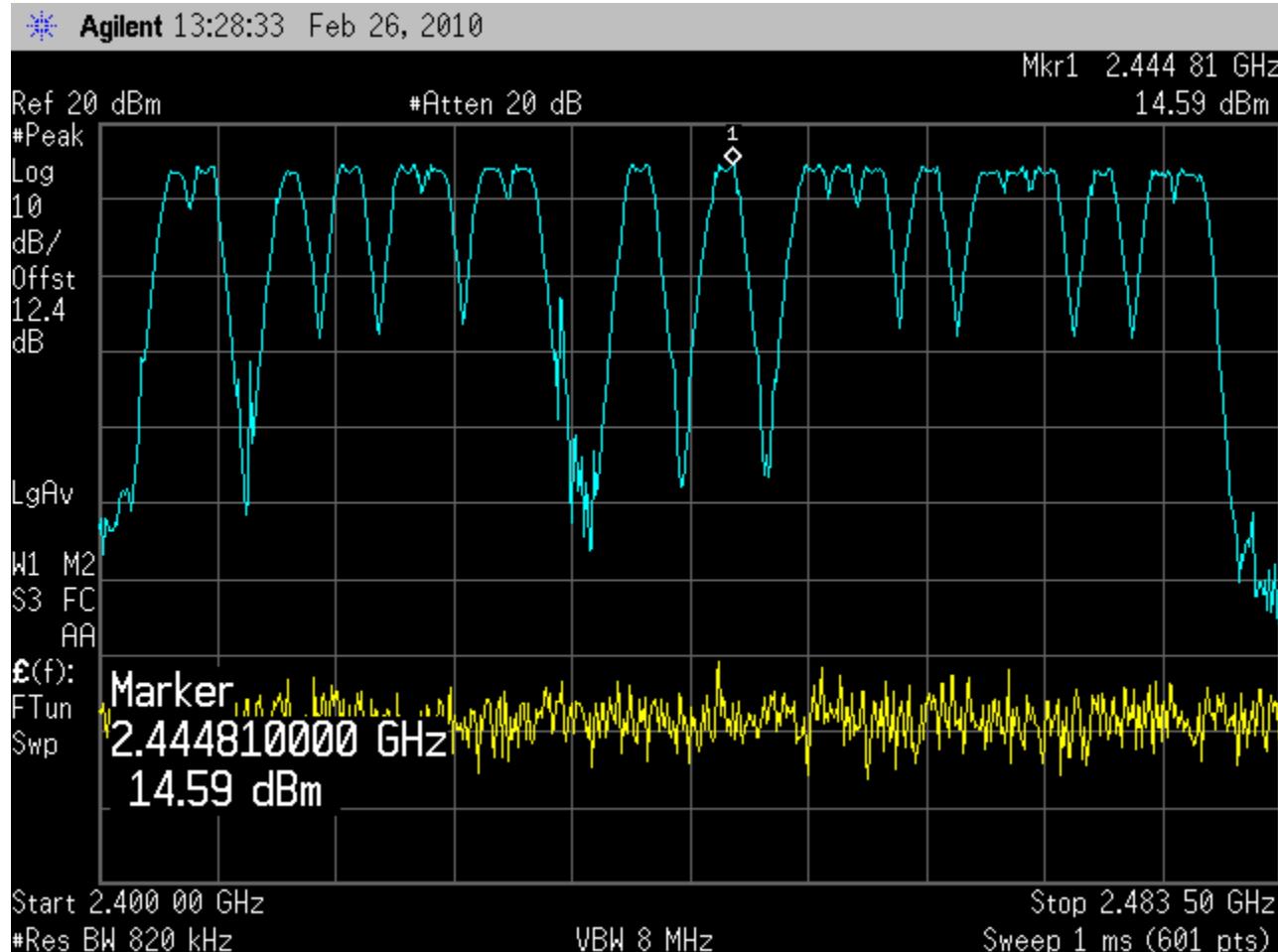
<b>Sample Number:</b>	SCT101	<b>Temperature:</b>	22
<b>Date:</b>	February 26, 2010	<b>Humidity:</b>	45
<b>Modification State:</b>	Channel 1 to 20	<b>Tester:</b>	FSCustodio

 **Laboratory:** | Nemko |**Test Results:**

See attached plots.

**Additional Observations:**

- Hopping function enabled.
- Span is set to capture all channels within the band of operation..
- RBW is 1% of the span
- VBW is > RBW
- Sweep is auto
- Detector is Peak
- Trace is Max Hold
- Observed Number of Hopping Frequencies is **20**.

FCC ID: SUDSCT15M  
IC: 5613A-SCT15MReport Number: 2010 02301489 TX FCC  
Specification: FCC Part 15 Subpart C, 15.247

**Section 15.247(a)(1)(iii) – Time of Occupancy (Dwell Time)**

(iii) Frequency hopping systems in the 2400–2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

**Test Conditions:**

<b>Sample Number:</b>	SCT101	<b>Temperature:</b>	22
<b>Date:</b>	February 26, 2010	<b>Humidity:</b>	45
<b>Modification State:</b>	Channel 1 to 20	<b>Tester:</b>	FSCustodio

 **Laboratory:** | Nemko |**Test Results:**

See attached plots.

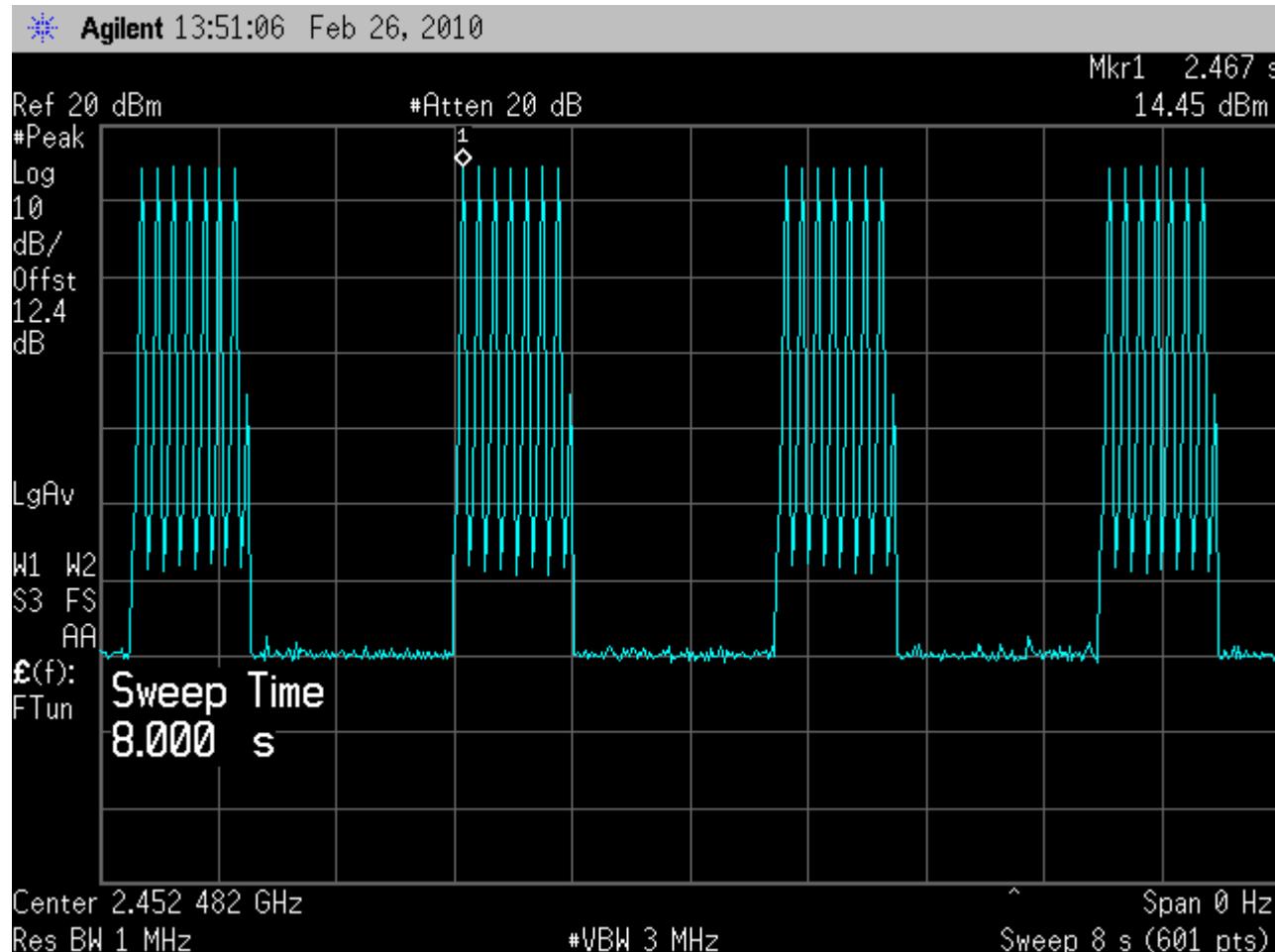
**Additional Observations:**

- Hopping function enabled.
- Span is Zero span
- RBW is 1 MHz
- VBW is 3X RBW
- Sweep is 0.4 seconds multiplied by the number of hopping channels employed (0.4 x 20 = 8 seconds).
- Detector is Peak
- Trace is Max Hold
- Limit is 400 ms, time of occupancy is:
  - = No. of transmission per required sweep < 400 ms
  - = 0.555 ms x 28
  - = **15.54 ms**

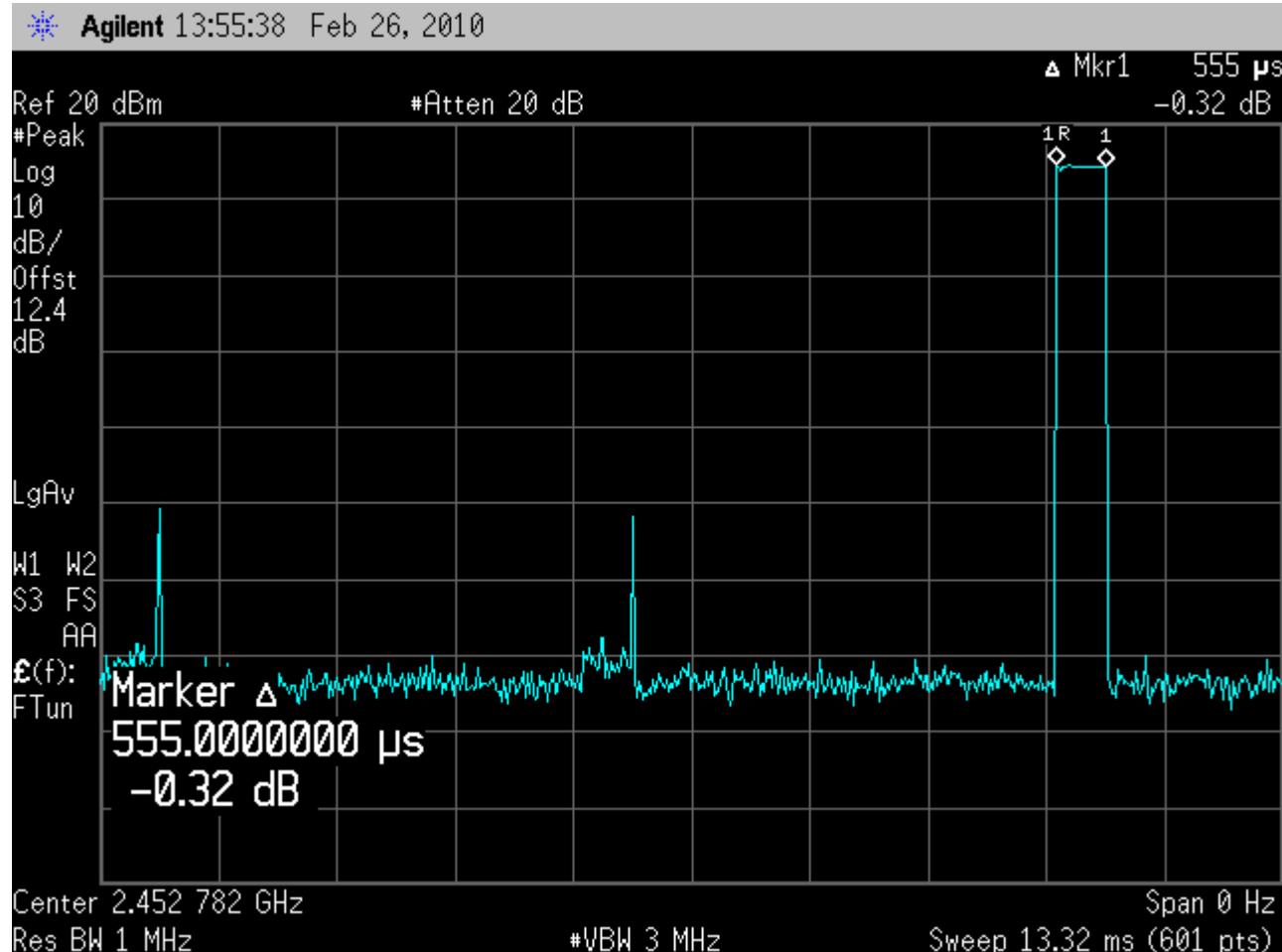
15.54 ms < 400 ms, EUT Complies

FCC ID: SUDSCT15M  
IC: 5613A-SCT15M

Report Number: 2010 02301489 TX FCC  
Specification: FCC Part 15 Subpart C, 15.247



Number of transmission per required sweep = **28**

FCC ID: SUDSCT15M  
IC: 5613A-SCT15MReport Number: 2010 02301489 TX FCC  
Specification: FCC Part 15 Subpart C, 15.247Single transmission time = **555 μs**

**Section 15.215(c) – 20 dB Bandwidth**

(c) Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated. The requirement to contain the designated bandwidth of the emission within the specified frequency band includes the effects from frequency sweeping, frequency hopping and other modulation techniques that may be employed as well as the frequency stability of the transmitter over expected variations in temperature and supply voltage. If a frequency stability is not specified in the regulations, it is recommended that the fundamental emission be kept within at least the central 80% of the permitted band in order to minimize the possibility of out-of-band operation.

**Test Conditions:**

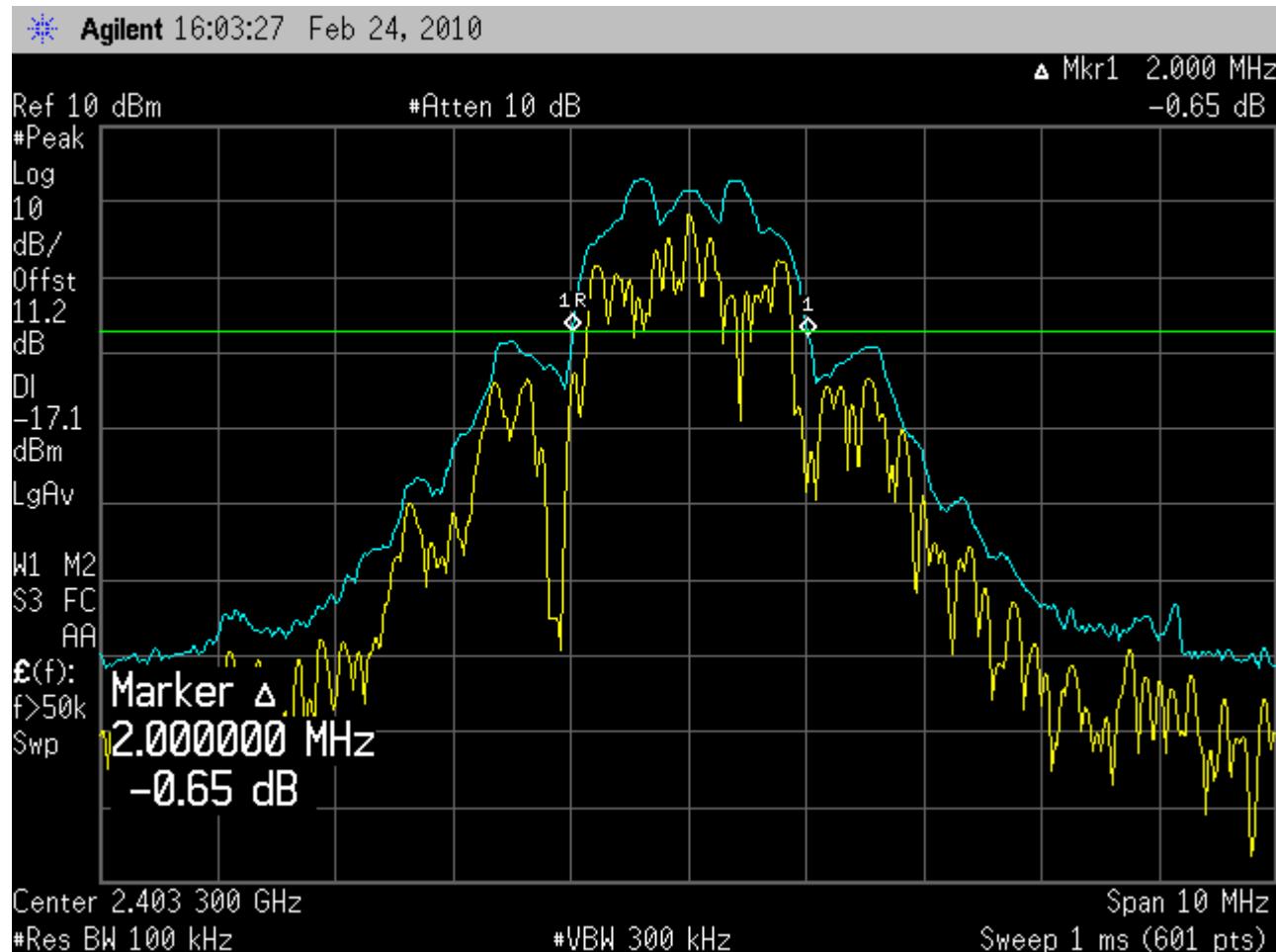
<b>Sample Number:</b>	SCT101	<b>Temperature:</b>	22
<b>Date:</b>	February 24, 2010	<b>Humidity:</b>	45
<b>Modification State:</b>	Low ,Mid and High Channel	<b>Tester:</b>	FSCustodio

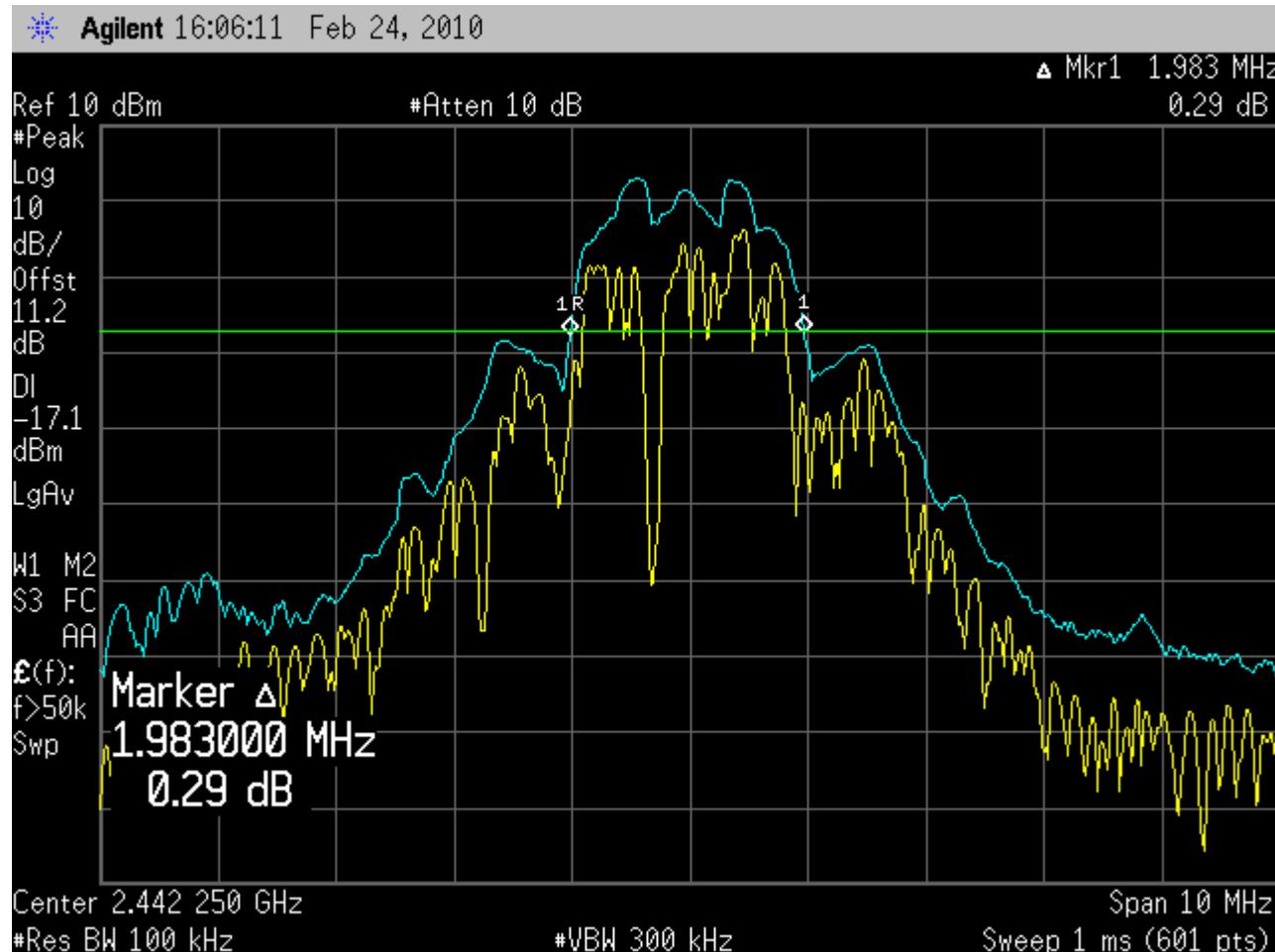
**Laboratory:** Nemko**Test Results:**

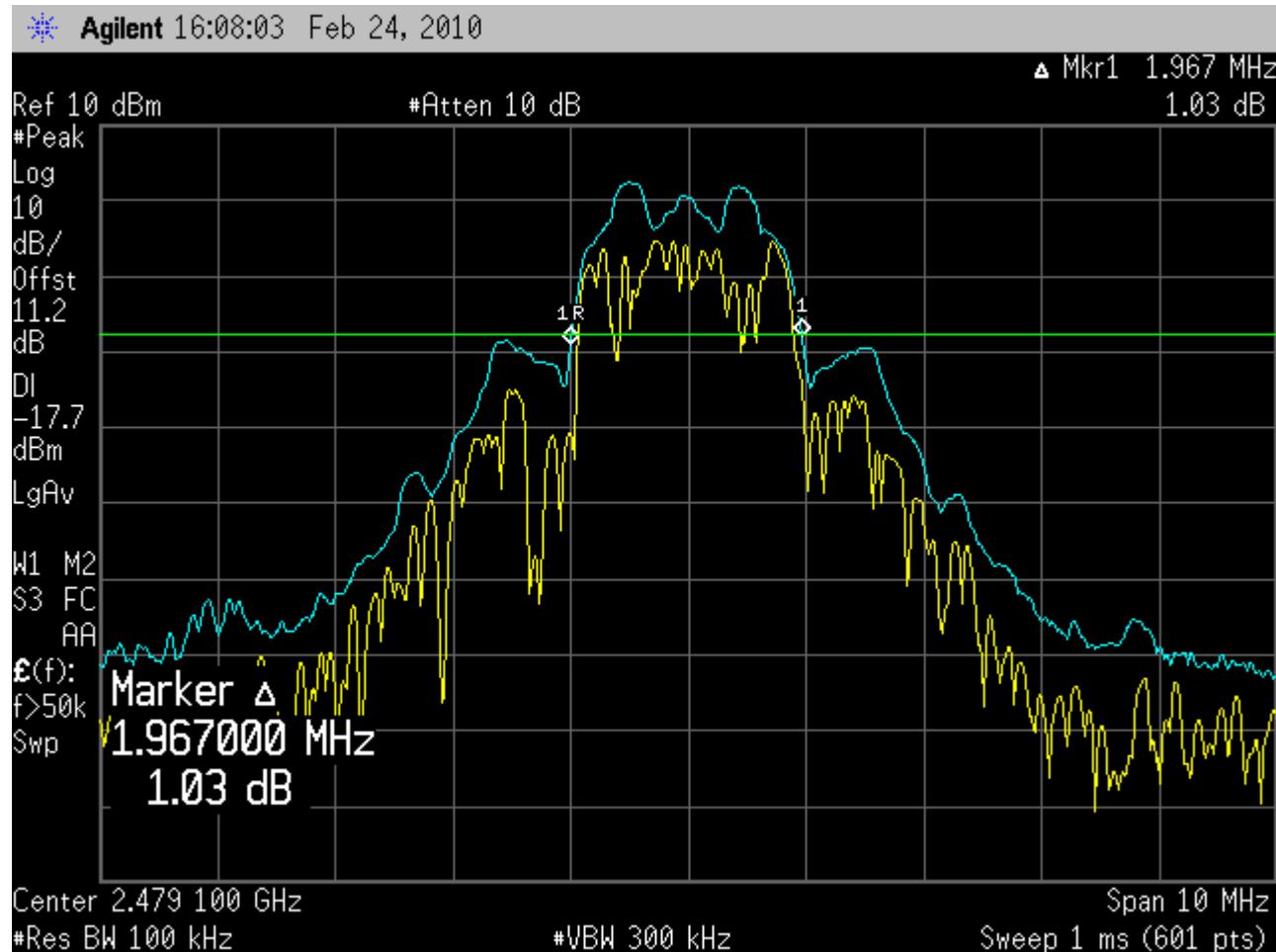
See attached plots.

**Additional Observations:**

- Hopping disabled. Low, Mid and High channels verified.
- Span is wide enough to capture the channel transmission
- RBW is 1% of the span
- VBW is 3X RBW
- Sweep is auto
- Detector is Peak
- Trace is Max Hold
- A peak output max hold reading was taken, a display line was drawn 20 dB lower than peak level. The 20 dB bandwidth was determined from where the channel output spectrum intersected the display line.
- Observed 20 dB BW is 2 MHz.
- $2403.3 \text{ MHz} - 1.0 \text{ MHz} = 2402.3 \text{ MHz}$  (within the frequency band)
- $2479.1 \text{ MHz} + 1.0 \text{ MHz} = 2480.1 \text{ MHz}$  (within the frequency band)

FCC ID: SUDSCT15M  
IC: 5613A-SCT15MReport Number: 2010 02301489 TX FCC  
Specification: FCC Part 15 Subpart C, 15.247(Low Channel) Observed 20 dB Bandwidth is **2.0 MHz**

(Mid Channel) Observed 20 dB Bandwidth is **1.983 MHz**



(High Channel) Observed 20 dB Bandwidth is **1.967 MHz**

**Section 15.247(b)(1) – Peak Output Power**

(1) For frequency hopping systems operating in the 2400–2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725–5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400–2483.5 MHz band: 0.125 watts.

**Test Conditions:**

<b>Sample Number:</b>	SCT101	<b>Temperature:</b>	21°C
<b>Date:</b>	February 25, 2010	<b>Humidity:</b>	37 %
<b>Modification State:</b>	Low, Mid and High Channels	<b>Tester:</b>	FSCustodio

**Laboratory:** Nemko**Test Results:**

Peak Power Analyzer used on this test

**Additional Observations:**

- This is a conducted test. A 20dB attenuator was placed between the sensor and the antenna port. Additional 2.4 dB was added for cable and connectors. Total offset used is 22.4 dB.
- Measurements were made at 5.1VDC, 6VDC and 6.9VDC.

Channel Range MHz	Peak Power Output dBm @ 5.1VDC	Peak Power Output dBm @ 6VDC	Peak Power Output dBm @ 6.9VDC
2403.3	14.12	14.12	14.23
2442.2	14.66	14.66	14.43
2479.1	14.56	14.23	14.23

Peak Output Power = 14.66 dBm or **29.24 mW**

**Section 15.247(d) – Band-edge Compliance of RF Conducted Emissions**

(d) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated 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) (see §15.205(c)).

**Test Conditions:**

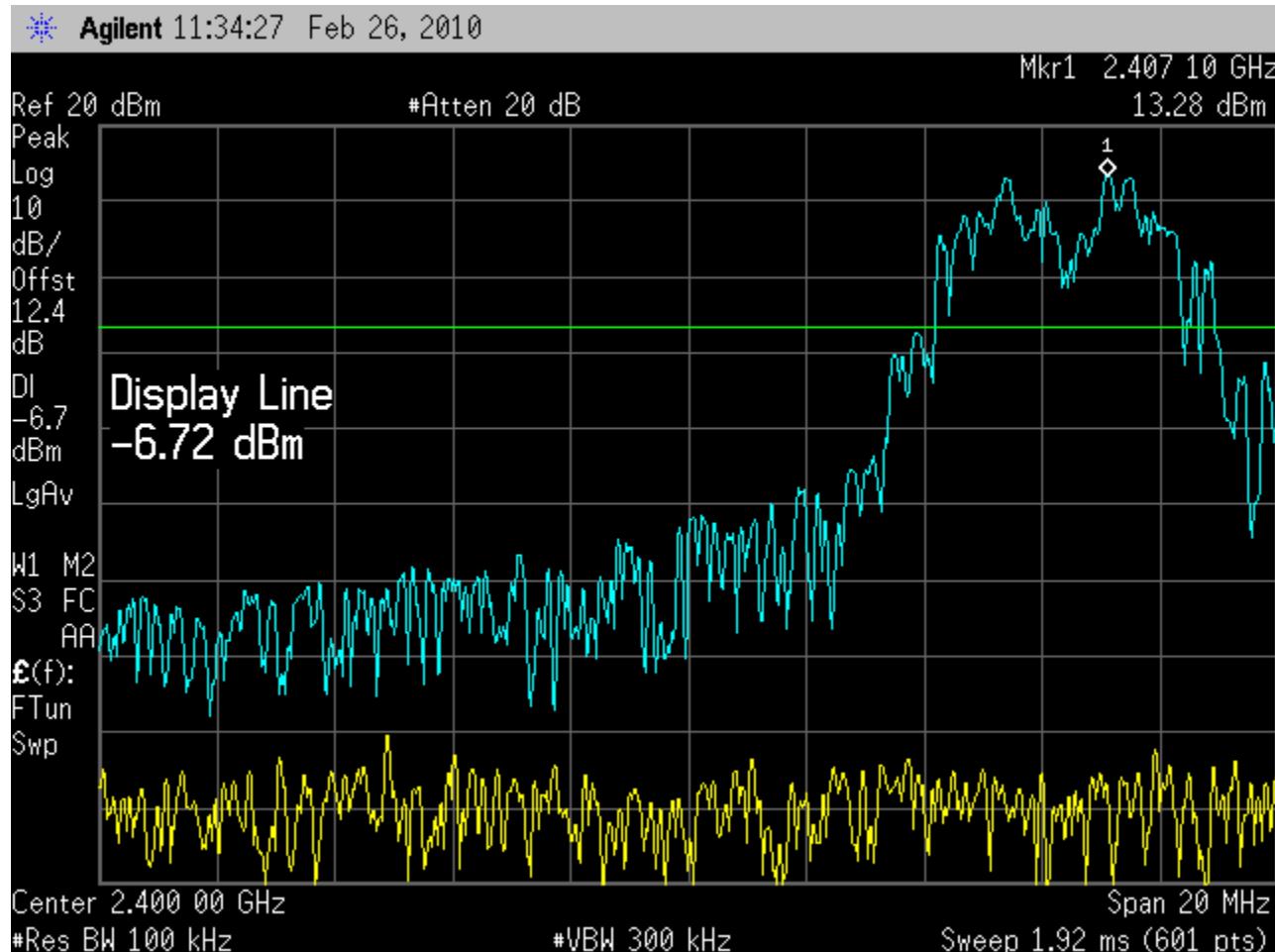
<b>Sample Number:</b>	SCT101	<b>Temperature:</b>	22
<b>Date:</b>	February 26, 2010	<b>Humidity:</b>	45
<b>Modification State:</b>	Low and High Channel	<b>Tester:</b>	FSCustodio

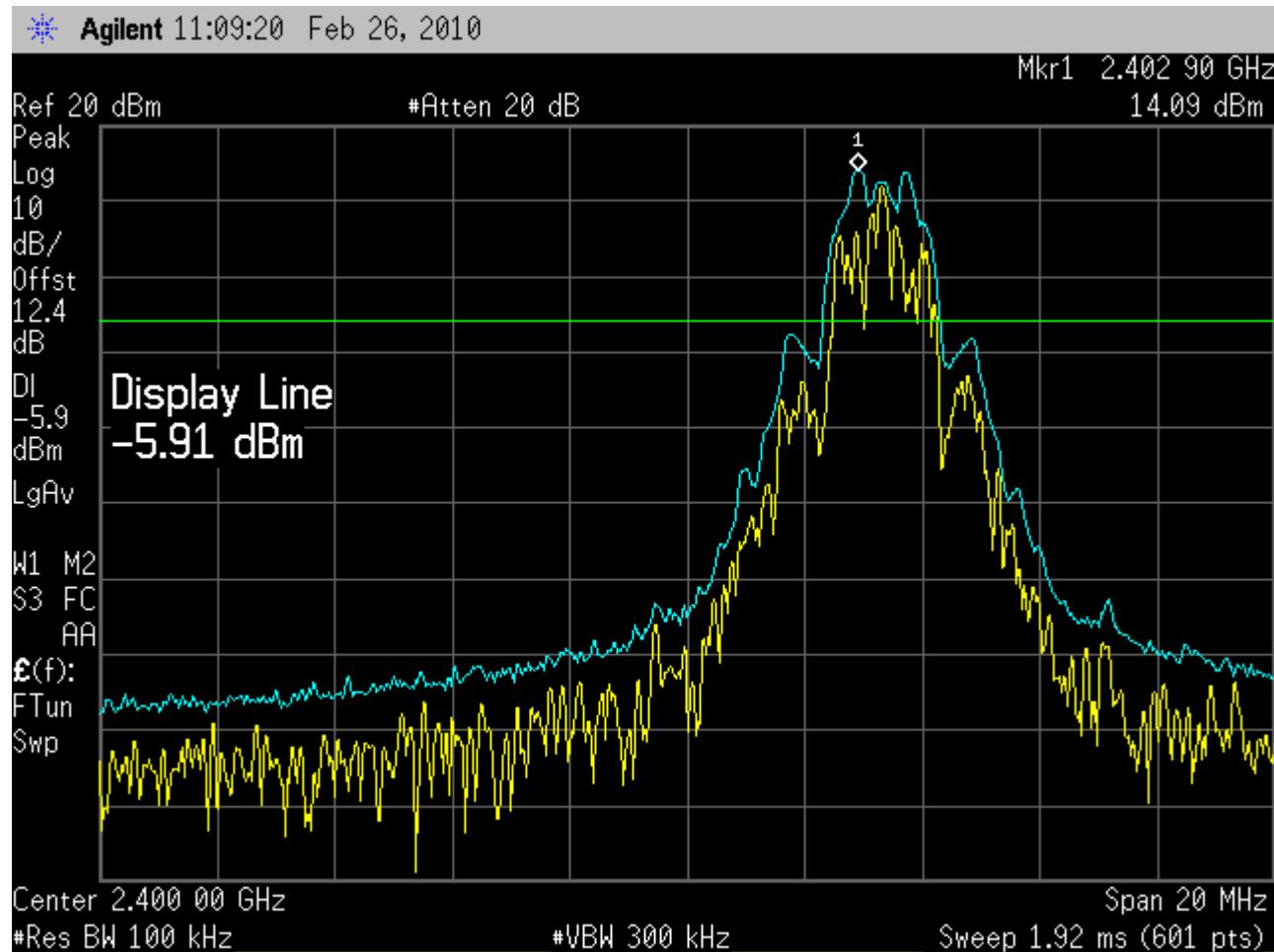
**Laboratory:** Nemko**Test Results:**

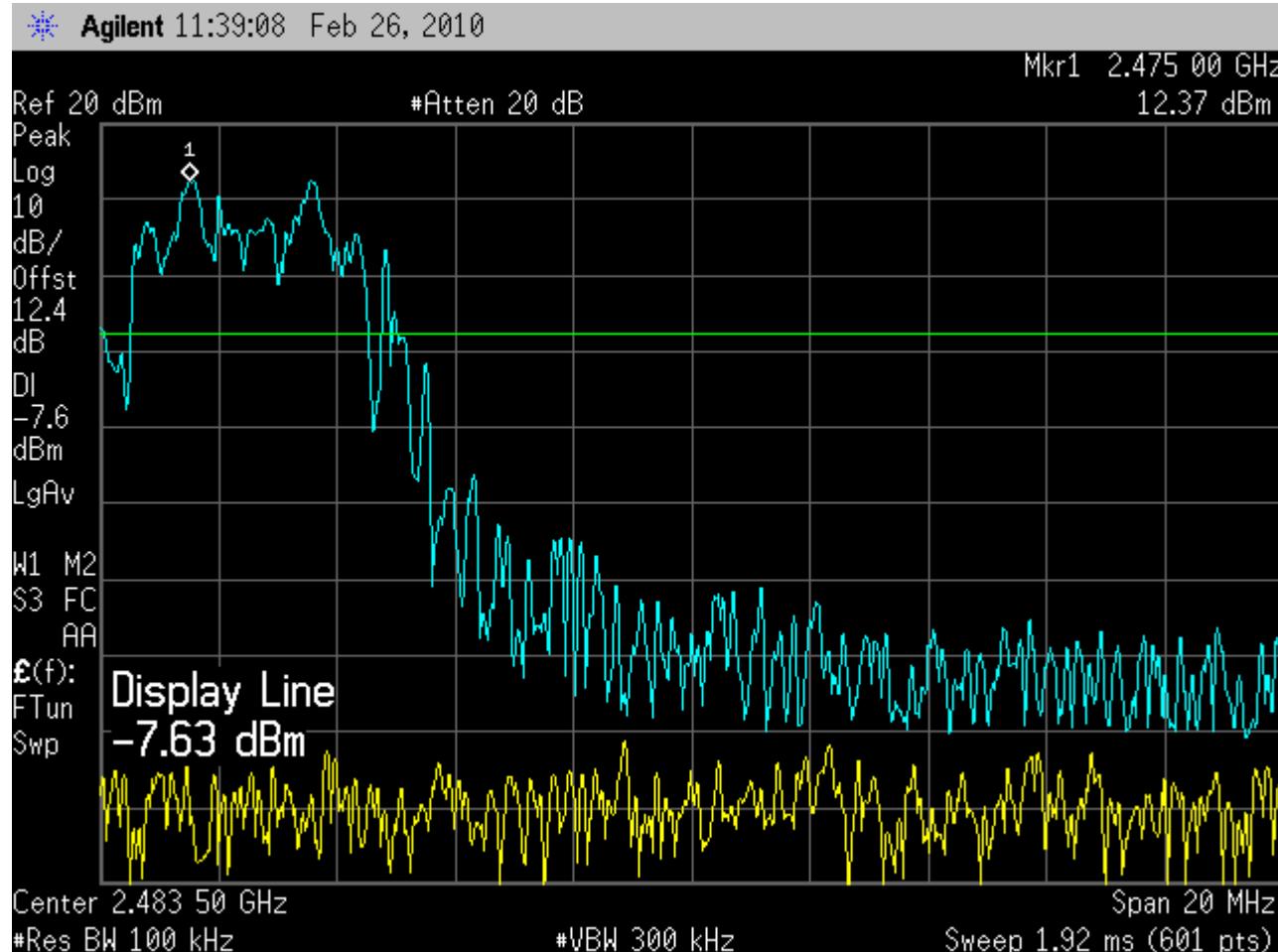
See attached plots.

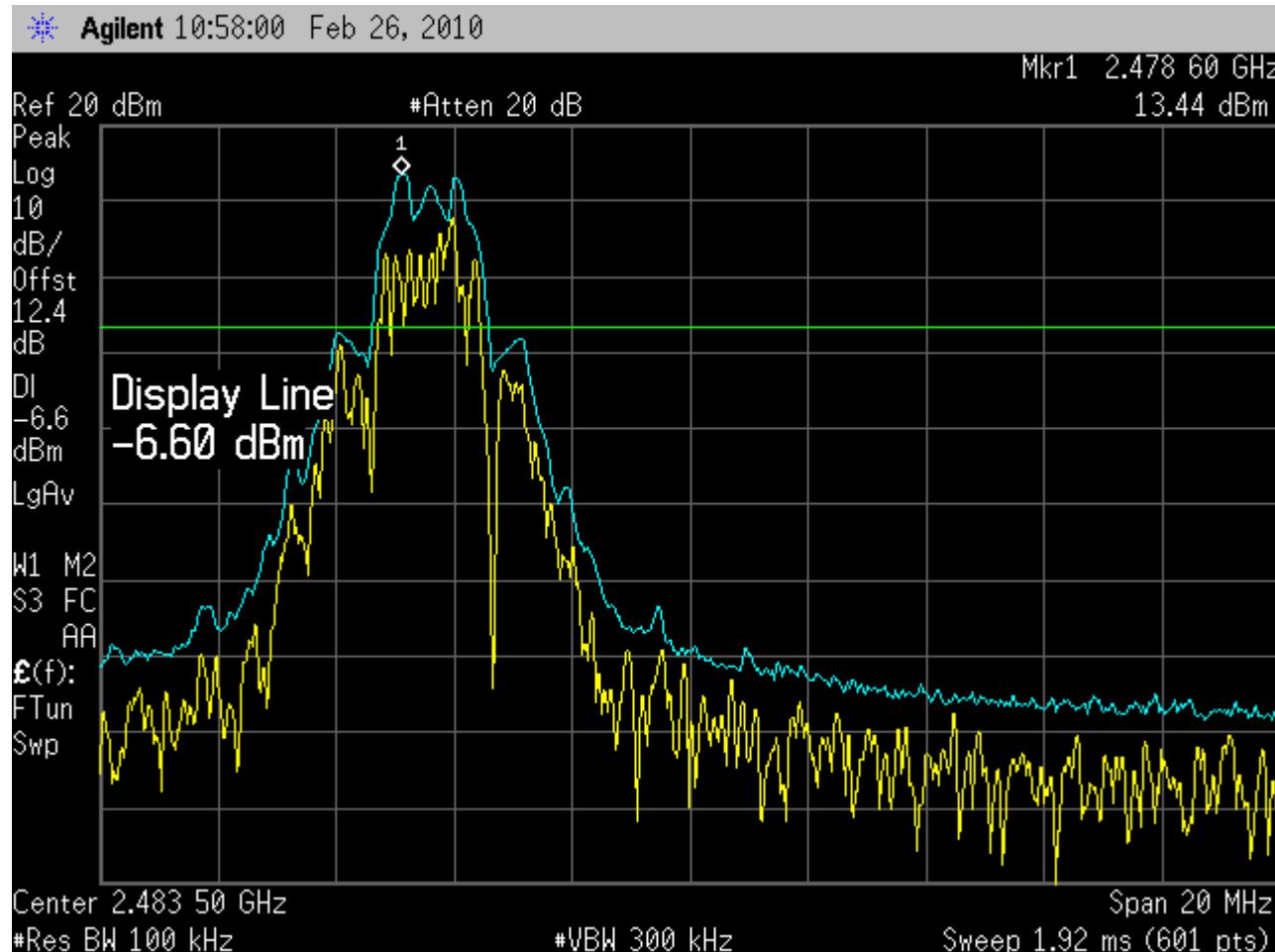
**Additional Observations:**

- This is a conducted test. The 12.4dB offset is from the external attenuator and cable used.
- Span is wide enough to capture the peak level of the emission operating on the channel closest to the band edges (Lower and Upper).
- RBW is 100kHz
- VBW is 3X RBW
- Sweep is auto.
- Detector is Peak
- Trace is Max Hold
- For each investigation, the peak level reading was taken and a display line was drawn 20 dBc below this level which will be the limit for this test.
- Test repeated between Hopping and Non-Hopping mode.

FCC ID: SUDSCT15M  
IC: 5613A-SCT15MReport Number: 2010 02301489 TX FCC  
Specification: FCC Part 15 Subpart C, 15.247**Lower Band edge (Hopping)**

**Lower Band edge (Non-Hopping)**

FCC ID: SUDSCT15M  
IC: 5613A-SCT15MReport Number: 2010 02301489 TX FCC  
Specification: FCC Part 15 Subpart C, 15.247**Upper Band edge (Hopping)**

**Upper Band edge (Non-Hopping)**

**Section 15.247(d) – Spurious RF Conducted Emissions**

(d) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated 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) (see §15.205(c)).

**Test Conditions:**

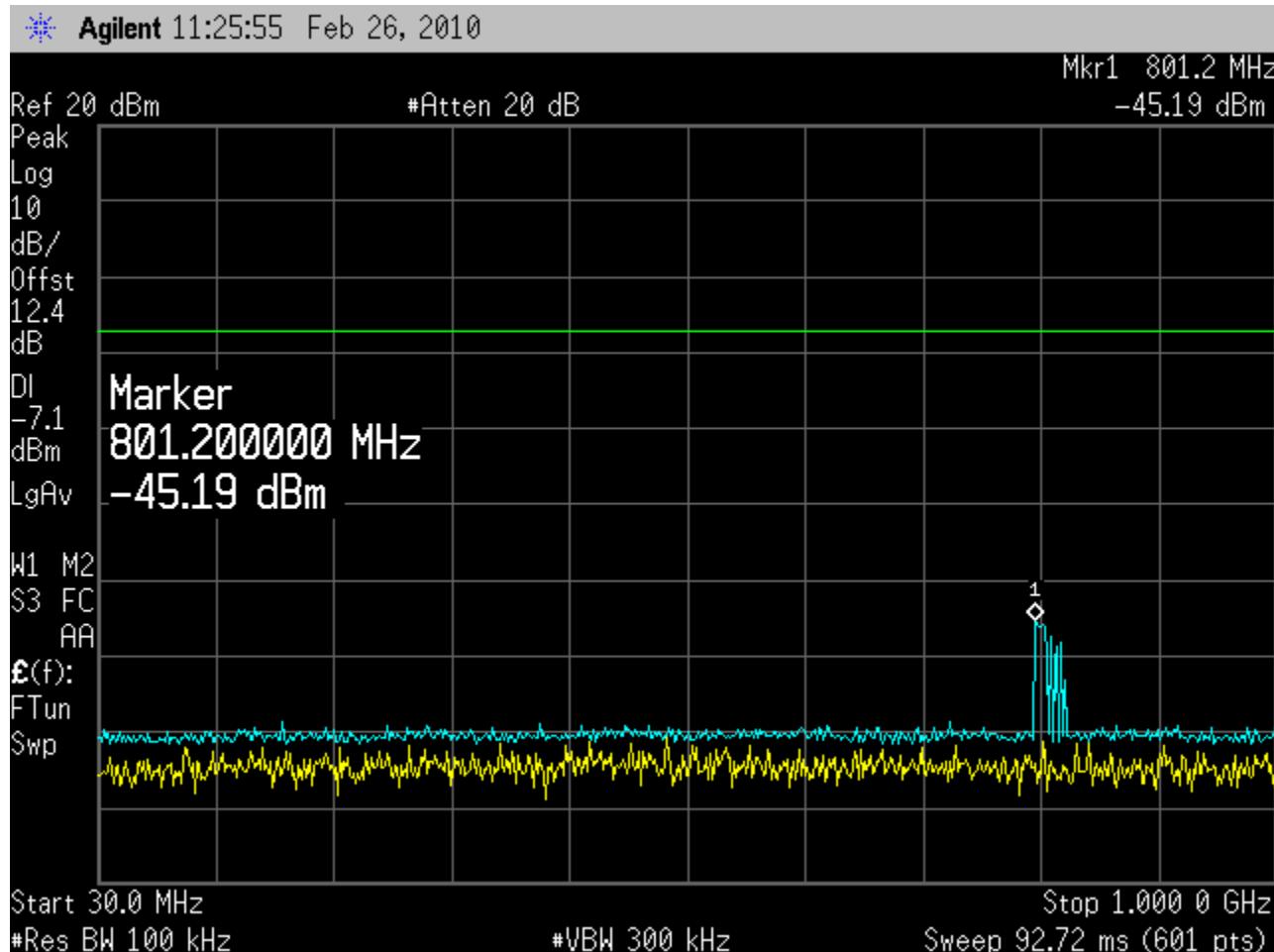
<b>Sample Number:</b>	SCT101	<b>Temperature:</b>	22
<b>Date:</b>	February 26, 2010	<b>Humidity:</b>	45
<b>Modification State:</b>	Hopping + Low, Mid and High	<b>Tester:</b>	FSCustodio

**Laboratory:** Nemko**Test Results:**

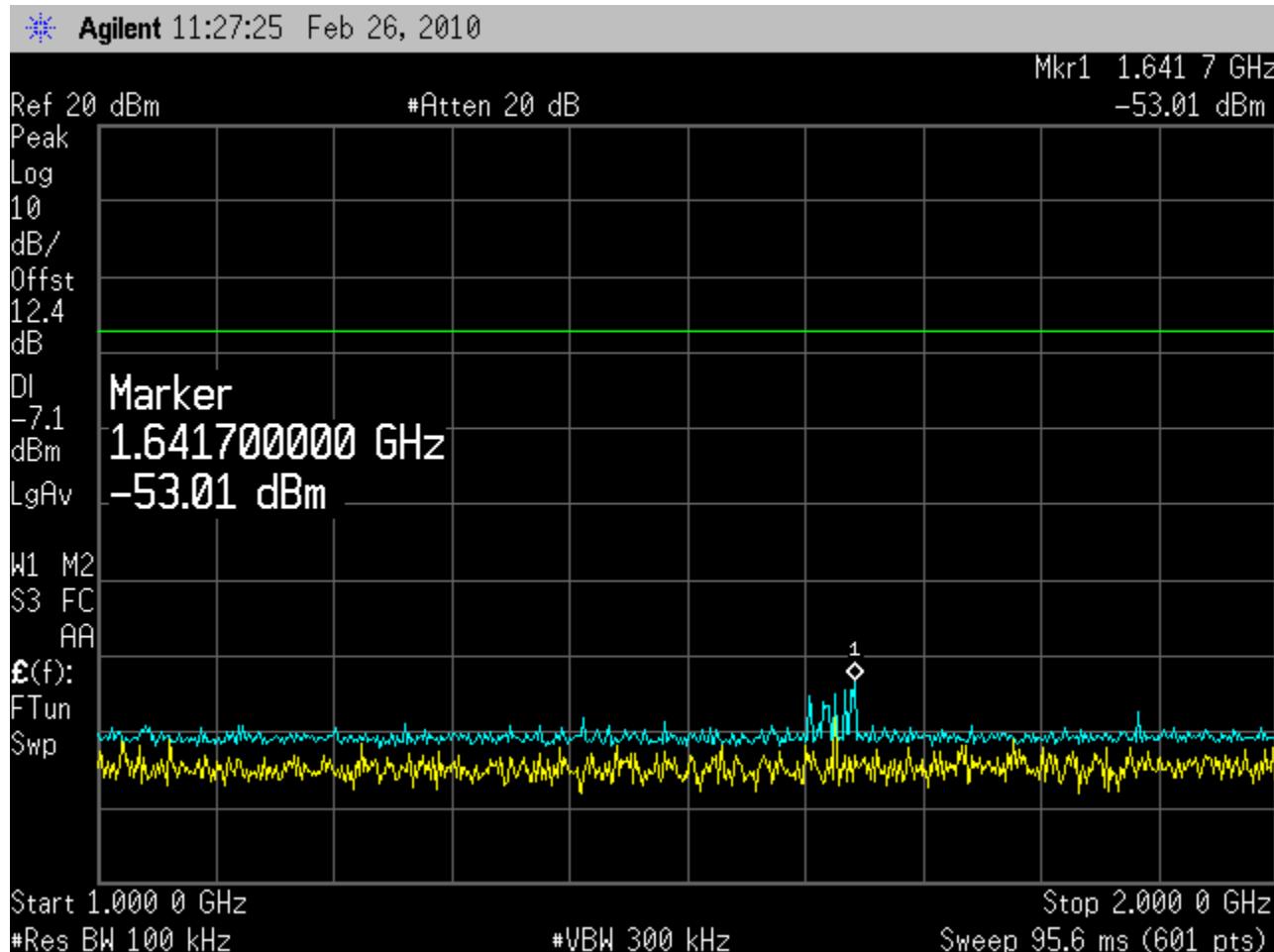
See attached plots.

**Additional Observations:**

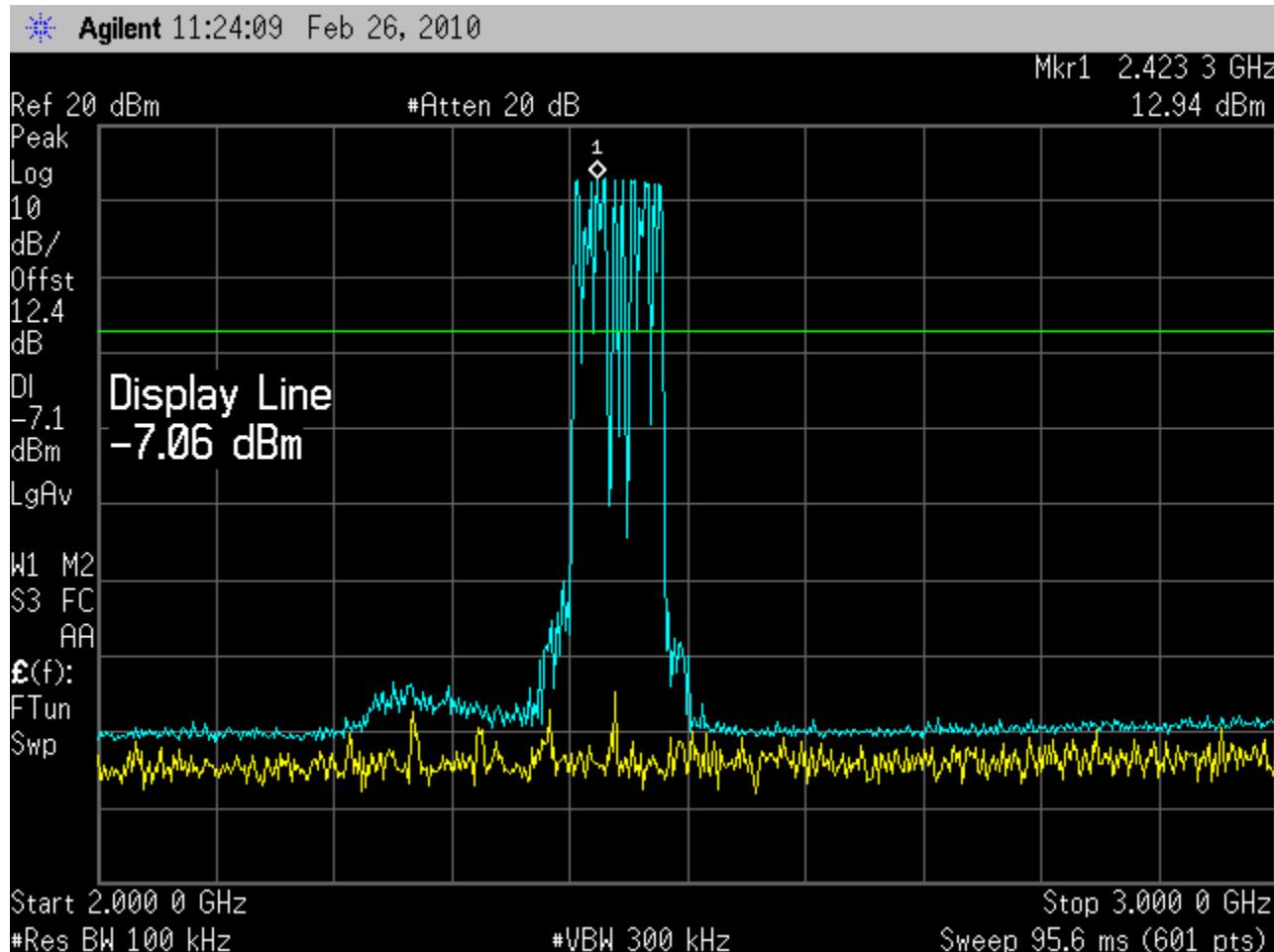
- This is a conducted test. The 12.4dB offset is from the external attenuator and cable used.
- The EUT was hopping during this investigation. Test results when hopping is disabled (transmitting at specific frequency) can be found under Appendix B.
- The peak level reading was taken at the carrier frequency then a display line was drawn 20 dBc below this level which will be the limit for this test.
- VBW is 3X RBW
- Sweep is auto.
- Detector is Peak
- Trace is Max Hold
- EUT complies.

FCC ID: SUDSCT15M  
IC: 5613A-SCT15MReport Number: 2010 02301489 TX FCC  
Specification: FCC Part 15 Subpart C, 15.247

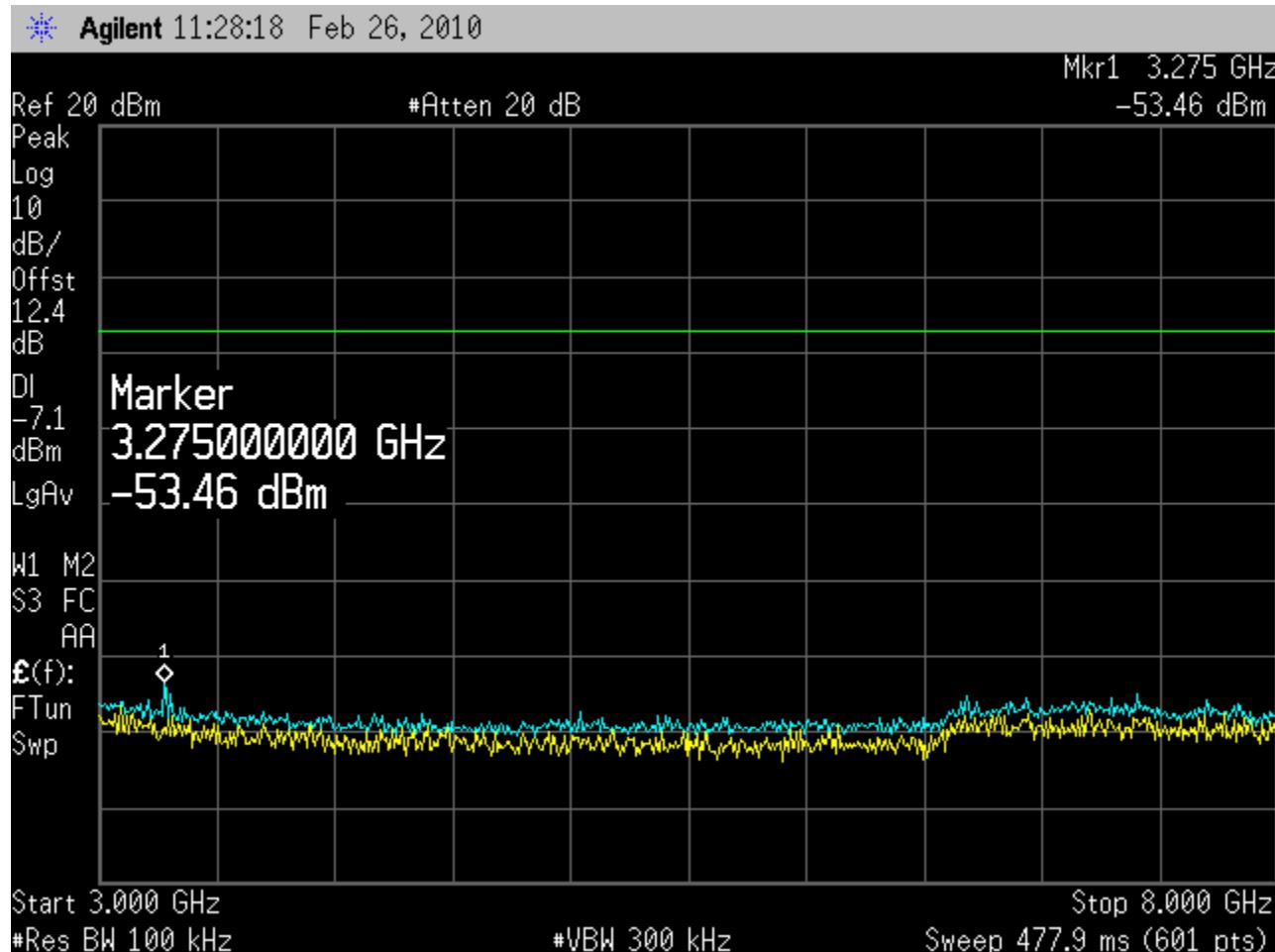
**Plots from 30 MHz to 1GHz** , Display Line is -7.1dBm which is 20dB below the highest in band emission.

FCC ID: SUDSCT15M  
IC: 5613A-SCT15MReport Number: 2010 02301489 TX FCC  
Specification: FCC Part 15 Subpart C, 15.247

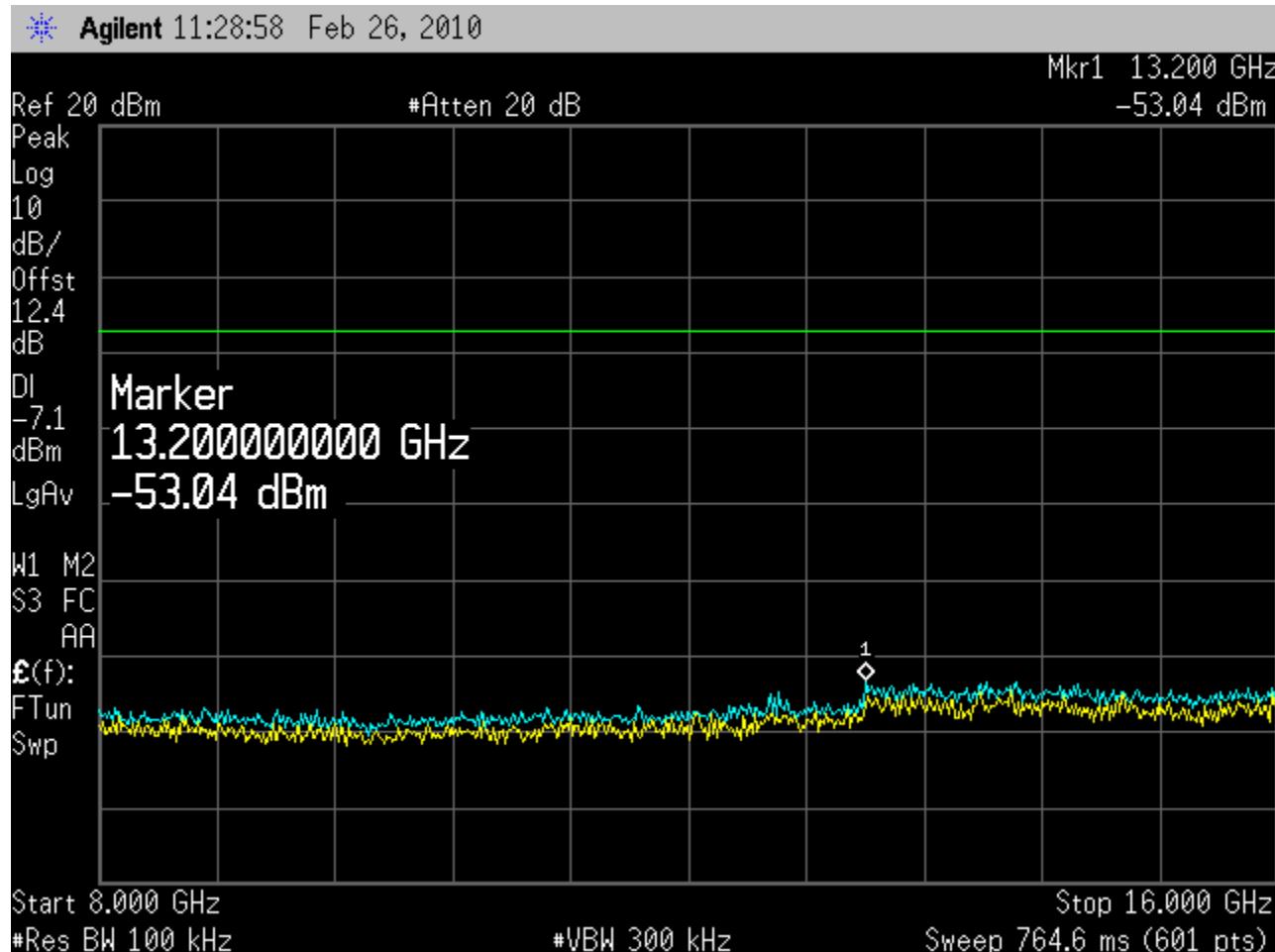
**Plots from 1GHz to 2GHz , Display Line is -7.1dBm which is 20dB below the highest in band emission.**

FCC ID: SUDSCT15M  
IC: 5613A-SCT15MReport Number: 2010 02301489 TX FCC  
Specification: FCC Part 15 Subpart C, 15.247

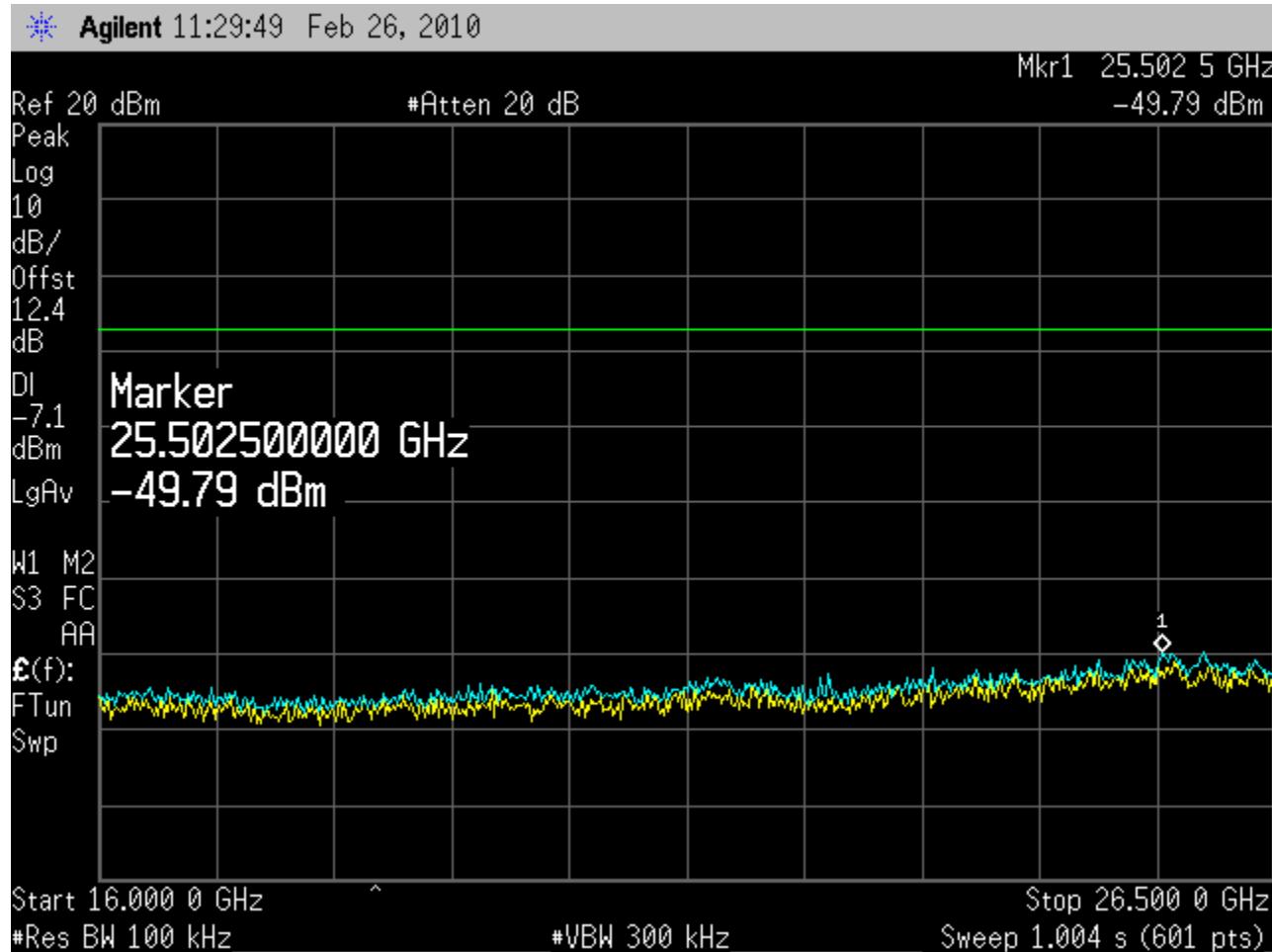
**Plots from 2GHz to 3GHz , Display Line is –7.1dBm which is 20dB below the highest in band emission.**



**Plots from 3GHz to 8GHz** Display Line is  $-7.1\text{dBm}$  which is 20dB below the highest in band emission.



**Plots from 8GHz to 16GHz** , Display Line is –7.1dBm which is 20dB below the highest in band emission.



**Plots from 16GHz to 26.5GHz** , Display Line is -7.1dBm which is 20dB below the highest in band emission.

**Section 15.247(d) – Spurious Radiated Emissions**

(d) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated 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) (see §15.205(c)).

**Test Conditions:**

<b>Sample Number:</b>	SCT101	<b>Temperature:</b>	18
<b>Date:</b>	February 25, 2010	<b>Humidity:</b>	62
<b>Modification State:</b>	As required (Hopping or Single)	<b>Tester:</b>	FSCustodio
		<b>Laboratory:</b>	SOATS

**Test Results:**

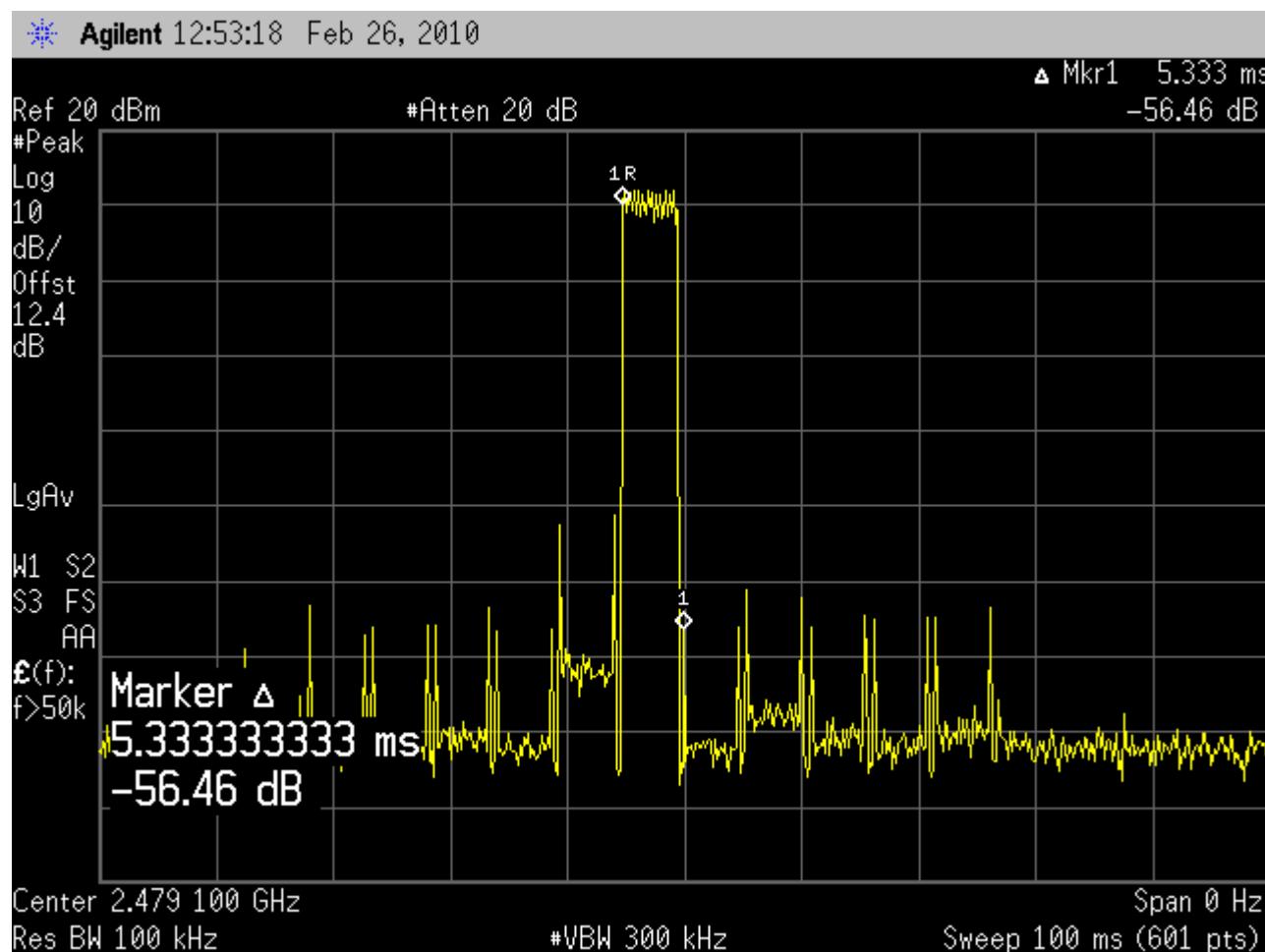
See attached plots.

**Additional Observations:**

- The Spectrum was searched from 30MHz to the 10<sup>th</sup> Harmonic, 25000 MHz. There are no emissions found that do not comply to the restricted bands defined in **FCC Part 15 Subpart C, 15.205 or Part 15.247(d)**.
- Duty Cycle Correction Factor used is -20 based from actual Duty Cycle of 5.33%.

**Sample Computation (base from “Hopping Mode” data):**

$$\begin{aligned} \text{Correction factor @ 46MHz} &= -17.3 \\ &= \text{Antenna factor} + \text{Cable loss} - \text{Preamp gain} \\ &= 12.7 + 1.2 - 31.2 \\ \text{Corrected reading} &= \text{Max. reading} + \text{Correction factor} \\ &= 43.5 + (-17.3) \\ &= 26.2 \text{ dB}\mu\text{V/m} \end{aligned}$$

**Duty Cycle Factor Computation:****A single transmission of 5.33ms per 100ms****Duty Cycle = 5.33%****DCCF = 20 log (0.053)  
= -25.46; limited to -20**



NEMKO USA, Inc.

**San Diego Headquarters:**11696 Sorrento Valley Rd.  
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**Radiated Emissions Data**

Job # :	23972	Date :	02/25/2010	Page	1	of	1
NEX#:	144765	Time :	3PM				
Staff :	FSC						
Client Name :	KSC Industries Inc.			EUT Voltage :	6VDC		
EUT Name :	Wireless Surround System			EUT Frequency :			
EUT Model # :	SCT101			Phase:			
EUT Serial # :	N/A			NOATS			
EUT Config. :	Hopping			SOATS			
Specification :	CFR47 Part 15, Subpart B, Class B			Distance < 1000 MHz:	3 m		
Loop Ant. #:	NA			Distance > 1000 MHz:	3 m		

Bicon Ant.#:	116_3m	Temp. (°C) :	18	Quasi-Peak	RBW: 120 kHz
Log Ant.#:	110_3m	Humidity (%) :	62	Peak	Video Bandw idth 300 kHz
DRG Ant. #	877	Spec An.#:	911	Average	RBW: 1 MHz
Cable LF#:	SOATS	Spec An. Display #:	NA		Video Bandw idth 3 MHz
Cable HF#:	SOATS	QP #:	911		RBW: 1 MHz
Preamp LF#:	901	PreSelect#:	NA		Video Bandw idth 10 Hz
Preamp HF#	317				

Meas. Freq. (MHz)	Meter Reading Vertical	Meter Reading Horizontal	Det.	EUT Side F/L/R/B	Ant. Height m	Max. Reading (dB $\mu$ V)	Corrected Reading (dB $\mu$ V/m)	Spec. limit (dB $\mu$ V/m)	CR/SL Diff. (dB)	Pass Fail	Comment
46.0	43.5	42.7	Q		1.0	43.5	26.2	40.0	-13.8	Pass	
53.3	41.5	44.9	Q		1.0	44.87	26.3	40.0	-13.7	Pass	
61.4	45.6	41.4	Q		1.0	45.6	23.6	40.0	-16.4	Pass	
112.0	48.8	48.4	Q		1.0	48.8	31.0	43.5	-12.5	Pass	
135.1	44.5	41.8	Q		1.0	44.5	29.0	43.5	-14.5	Pass	
171.8	45.7	42.1	Q		1.0	45.67	32.5	43.5	-11.0	Pass	
209.5	48.5	46.7	Q		1.0	48.5	31.3	43.5	-12.3	Pass	
220.0	47.6	45.6	Q		1.0	47.56	29.7	46.0	-16.3	Pass	
233.0	45.2	43.4	Q	B	1.0	45.2	27.6	46.0	-18.5	Pass	
279.6	45.4	43.7	Q	B	1.0	45.44	30.0	46.0	-16.1	Pass	
368.5	43.7	44.7	Q		1.0	44.67	31.0	46.0	-15.0	Pass	
822.7	38.6	37.8	Q		1.0	38.57	34.0	46.0	-12.1	Pass	

**Hopping Mode**

**Test Notes:** No other spurious emissions detected which is within 20dB of the limit as well as within the restricted bands defined in FCC Part 15 Subpart C, 15.205.

**Individual Channel Spurious Radiated Emissions Test Results:**

 <b>Nemko</b> <small>NEMKO USA, Inc.</small>		<b>San Diego Headquarters:</b> 11696 Sorrento Valley Rd. San Diego, CA 92121 Tel: (858) 755-5525 Fax: (858) 452-1810																			
<b>Radiated Emissions Data</b>																					
Job #:	23972	Date:	02/25/2010	Page	1	of	1														
NEX#:	144765	Time:	8AM																		
Staff:	FSC																				
Client Name:	KSC Industries Inc.																				
EUT Name:	Wireless Surround System																				
EUT Model #:	SCT101																				
EUT Serial #:	N/A																				
EUT Config.:	Low Channel																				
Specification:	CFR47 Part 15, Subpart B, Class B																				
Loop Ant. #:	NA																				
Bicon Ant.#:	116_3m	Temp. (°C):	18																		
Log Ant.#:	110_3m	Humidity (%):	62																		
DRG Ant. #	877	Spec An.#:	911																		
Cable LF#:	SOATS	Spec An. Display #:	NA																		
Cable HF#:	SOATS	QP #:	911																		
Preamp LF#:	901	PreSelect#:	NA																		
Preamp HF#:	317	DCCF:	20																		
<table border="1" style="float: right; margin-right: 20px;"> <tr> <td>Peak (Restr.)</td> <td>RBW: 1 MHz</td> </tr> <tr> <td colspan="2">Video Bandwidth 3 MHz</td> </tr> <tr> <td>Peak</td> <td>RBW: 100 KHz</td> </tr> <tr> <td colspan="2">Video Bandwidth 300 KHz</td> </tr> <tr> <td>Average</td> <td>=Peak-DCCF</td> </tr> </table>												Peak (Restr.)	RBW: 1 MHz	Video Bandwidth 3 MHz		Peak	RBW: 100 KHz	Video Bandwidth 300 KHz		Average	=Peak-DCCF
Peak (Restr.)	RBW: 1 MHz																				
Video Bandwidth 3 MHz																					
Peak	RBW: 100 KHz																				
Video Bandwidth 300 KHz																					
Average	=Peak-DCCF																				
Meas. Freq. (MHz)	Meter Vertical	Meter Reading	Det.	EUT Side	Ant. Height m	Max. Reading (dB $\mu$ V)	Corrected Reading (dB $\mu$ V/m)	Spec. limit (dB $\mu$ V/m)	CR/SL Diff. (dB)	Pass	Fail	Comment									
2401.9	74.2	77.3	P	BR	1.0	77.31	114.8														
2400.0	23.0	24.5	P	BR	1.0	24.53	62.1	94.8	-32.7	Pass		100kHz RBW									
2400.0	3.0	4.5	A	BR	1.0	4.53	42.1	74.8	-32.7	Pass		100kHz RBW									
2483.5	36.2	35.4	P	R	1.0	36.2	40.5	74.0	-33.5	Pass											
2483.5	16.2	15.4	A	R	1.0	16.2	20.5	54.0	-33.5	Pass											
4806.8	51.5	51.7	P	BR	1.0	51.7	66.4	74.0	-7.6	Pass											
4806.8	31.5	31.7	A	BR	1.0	31.7	46.4	54.0	-7.6	Pass											
7208.7	32.4	32.2	P		1.0	32.37	58.3	74.0	-15.7	Pass		NF 100kHz RBW									
7208.7	12.4	12.2	A		1.0	12.37	38.3	54.0	-15.7	Pass		NF 100kHz RBW									

**Low Channel**

**Test Notes:** No other spurious emissions detected which is within 20dB of the limit as well as within the restricted bands defined in FCC Part 15 Subpart C, 15.205.



NEMKO USA, Inc.

**San Diego Headquarters:**11696 Sorrento Valley Rd.  
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**Radiated Emissions Data**

Job # : 23972 Date : 02/25/2010 Page 1 of 1  
 NEX# : 144765 Time : 10AM  
 Staff : FSC

Client Name : KSC Industries Inc. EUT Voltage : 6VDC  
 EUT Name : Wireless Surround System  
 EUT Model # : SCT101  
 EUT Serial # : N/A  
 EUT Config. : Mid Channel  
 Phase: NOATS  
 SOATS X  
 Distance < 1000 MHz: 3 m  
 Distance > 1000 MHz: 3 m

Specification : CFR47 Part 15, Subpart B, Class B  
 Loop Ant. #: NA  
 Bicon Ant.#: 116\_3m Temp. (°C) : 18  
 Log Ant.#: 110\_3m Humidity (%) : 62  
 DRG Ant. # 877 Spec An.#: 911  
 Cable LF#: SOATS Spec An. Display #: NA  
 Cable HF#: SOATS QP #: 911  
 Preamp LF#: 901 PreSelect#: NA  
 Preamp HF# 317 DCCF 20

Peak (Restr.)	RBW: 1 MHz
Video Bandwidth 3 MHz	
Peak	RBW: 100 kHz
Video Bandwidth 300 kHz	
Average	=Peak-DCCF

Meas. Freq. (MHz)	Meter Reading Vertical	Meter Reading Horizontal	Det.	EUT Side F/L/R/B	Ant. Height m	Max. Reading (dB $\mu$ V)	Corrected Reading (dB $\mu$ V/m)	Spec. limit (dB $\mu$ V/m)	CR/SL Diff. (dB)	Pass Fail	Comment
2442.2	74.5	74.7	P	BR	1.0	74.67	112.2				
2400.0	28.8	27.5	P	BR	1.0	28.8	33.1	94.8	-61.7	Pass	100kHz RBW
2400.0	8.8	7.5	A	BR	1.0	8.8	13.1	74.8	-61.7	Pass	100kHz RBW
2483.5	36.5	35.3	P	R	1.0	36.5	40.8	74.0	-33.2	Pass	
2483.5	16.5	15.3	A	R	1.0	16.5	20.8	54.0	-33.2	Pass	
4884.4	50.9	50.1	P	BR	1.0	50.9	65.6	74.0	-8.4	Pass	
4884.4	30.9	30.1	A	BR	1.0	30.9	45.6	54.0	-8.4	Pass	
7326.6	32.3	32.1	P		1.0	32.3	58.4	74.0	-15.6	Pass	NF 100kHz RBW
7326.6	12.3	12.1	A		1.0	12.3	38.4	54.0	-15.6	Pass	NF 100kHz RBW

**Mid Channel**

**Test Notes:** No other spurious emissions detected which is within 20dB of the limit as well as within the restricted bands defined in FCC Part 15 Subpart C, 15.205.



NEMKO USA, Inc.

**San Diego Headquarters:**  
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Fax: (858) 452-1810



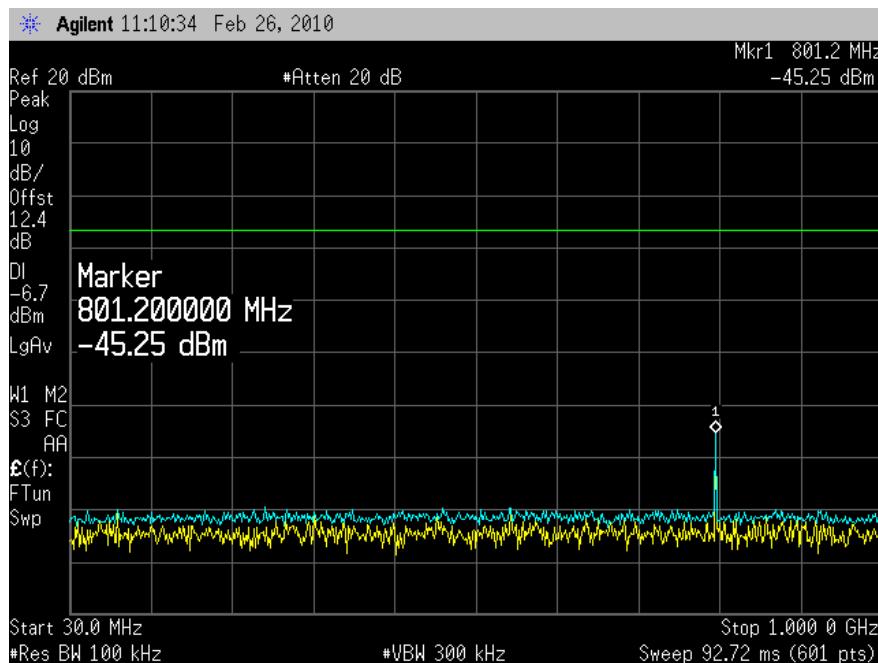
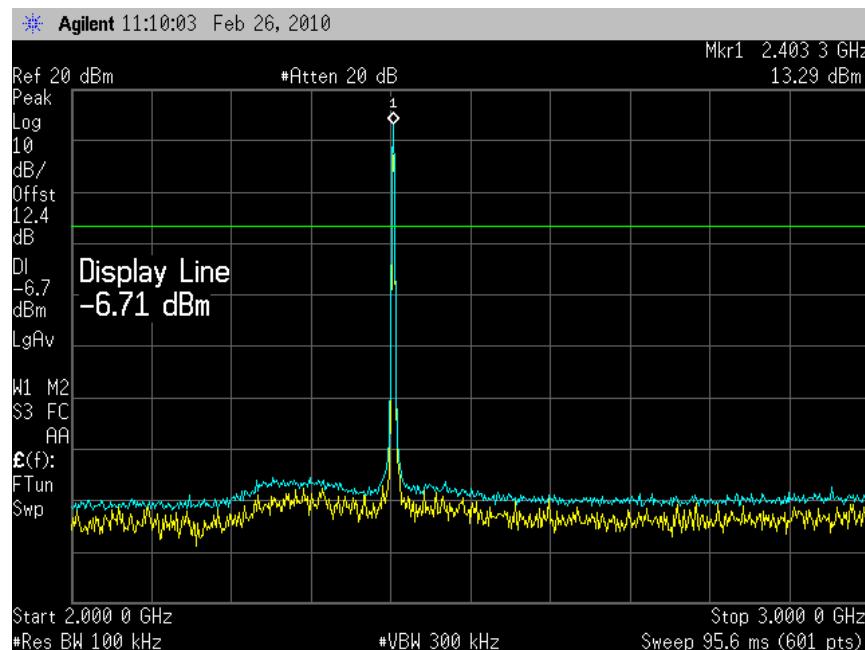
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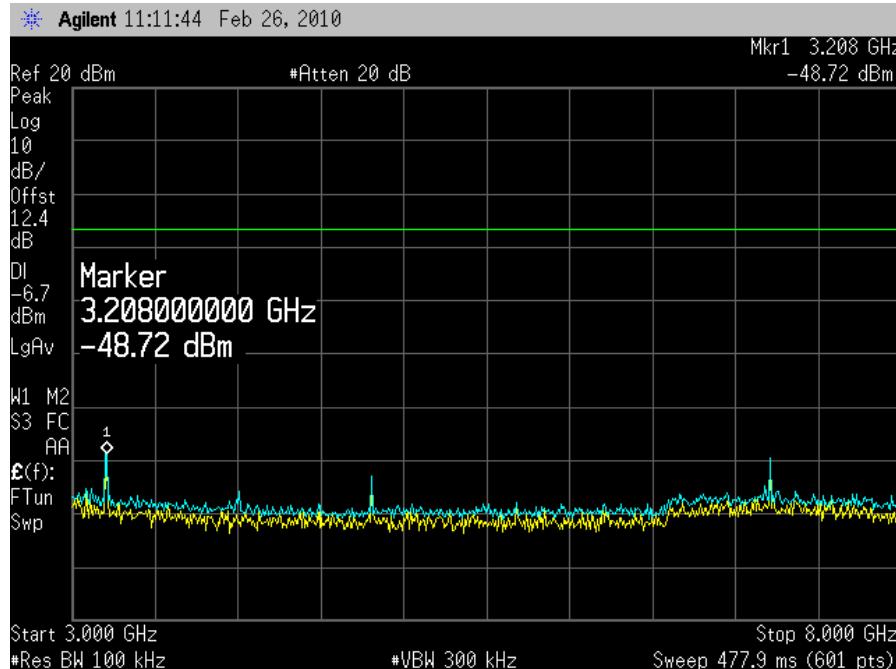
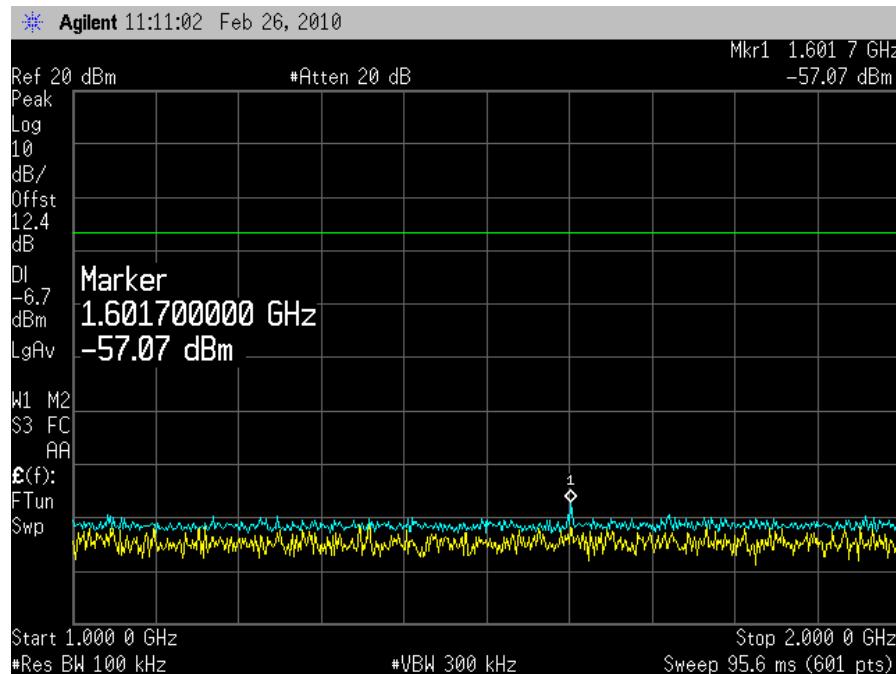
**Radiated Emissions Data**

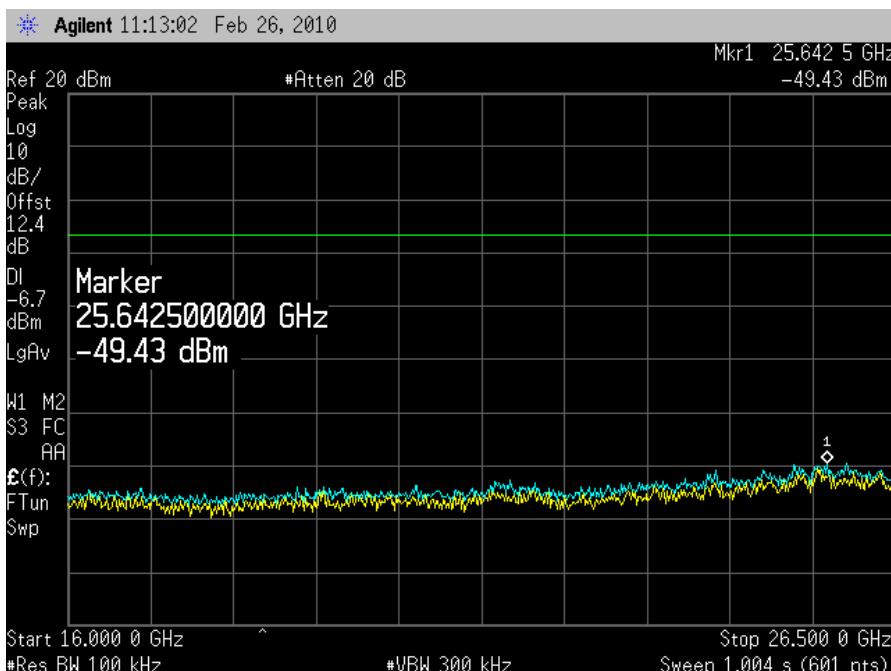
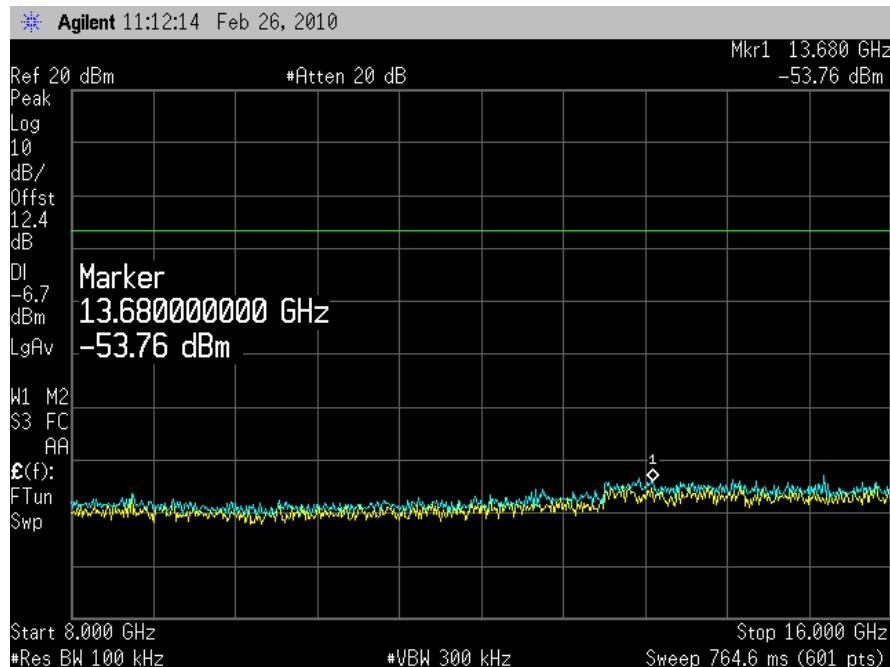
Job #:	23972	Date :	02/25/2010	Page	1	of	1				
NEX#:	144765	Time :	2PM								
Staff:	FSC										
Client Name :	KSC Industries Inc.	EUT Voltage :	6VDC								
EUT Name :	Wireless Surround System	EUT Frequency :									
EUT Model #:	SCT101	Phase:									
EUT Serial #:	N/A	NOATS									
EUT Config. :	High Channel	SOATS	X								
Specification :	CFR47 Part 15, Subpart B, Class B	Distance < 1000 MHz:	3 m								
Loop Ant. #:	NA	Distance > 1000 MHz:	3 m								
Bicon Ant. #:	116_3m	Temp. (°C) :	18	Peak (Restr.)	RBW: 1 MHz						
Log Ant. #:	110_3m	Humidity (%) :	62		Video Bandwidth 3 MHz						
DRG Ant. #	877	Spec An. #:	911	Peak	RBW: 100 KHz						
Cable LF#:	SOATS	Spec An. Display #:	NA		Video Bandwidth 300 KHz						
Cable HF#:	SOATS	QP #:	911	Average	=Peak-DCCF						
Preamp LF#:	901	PreSelect#:	NA								
Preamp HF#:	317	DCCF	20								
Meas. Freq. (MHz)	Meter Reading Vertical	Meter Reading Horizontal	Det.	EUT Side F/L/R/B	Ant. Height m	Max. Reading (dB $\mu$ V)	Corrected Reading (dB $\mu$ V/m)	Spec. limit (dB $\mu$ V/m)	CR/SL Diff. (dB)	Pass Fail	Comment
2479.1	73.9	76.6	P	BR	1.0	76.56	114.1				
2400.0	28.9	27.6	P	BR	1.0	28.9	33.2	94.8	-61.6	Pass	100kHz RBW
2400.0	8.9	7.6	A	BR	1.0	8.9	13.2	74.8	-61.6	Pass	100kHz RBW
2483.5	63.0	64.4	P	R	1.0	64.35	68.7	74.0	-5.3	Pass	
2483.5	43.0	44.4	A	R	1.0	44.35	48.7	54.0	-5.3	Pass	
4948.2	51.3	50.2	P	BR	1.0	51.3	66.0	74.0	-8.0	Pass	
4948.2	31.3	30.2	A	BR	1.0	31.3	46.0	54.0	-8.0	Pass	
7437.3	33.5	33.2	P		1.0	33.5	59.7	74.0	-14.3	Pass	NF 100kHz RBW
7437.3	12.3	12.5	A		1.0	12.5	38.7	54.0	-15.3	Pass	NF 100kHz RBW

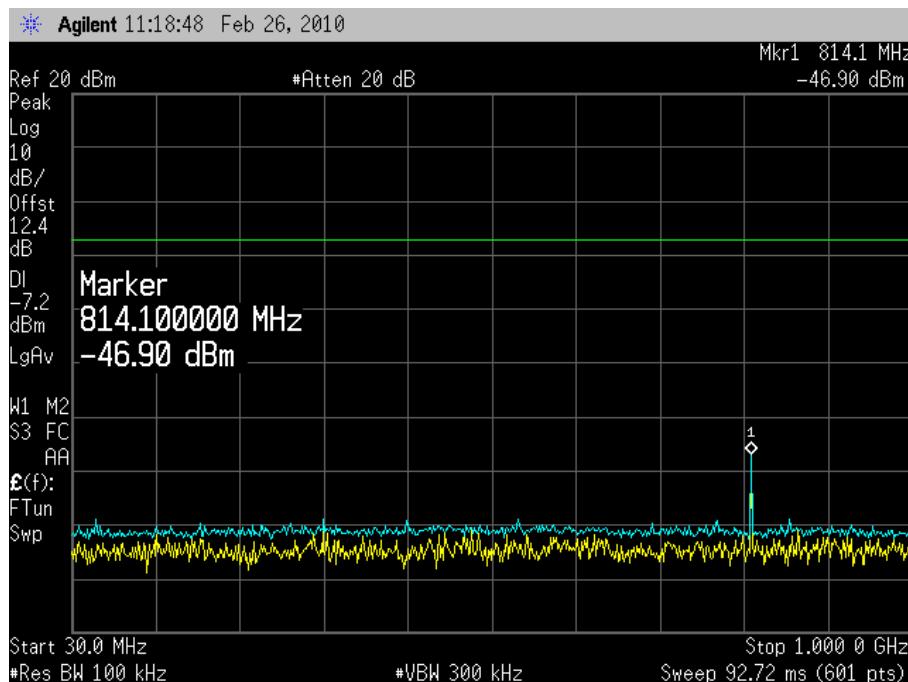
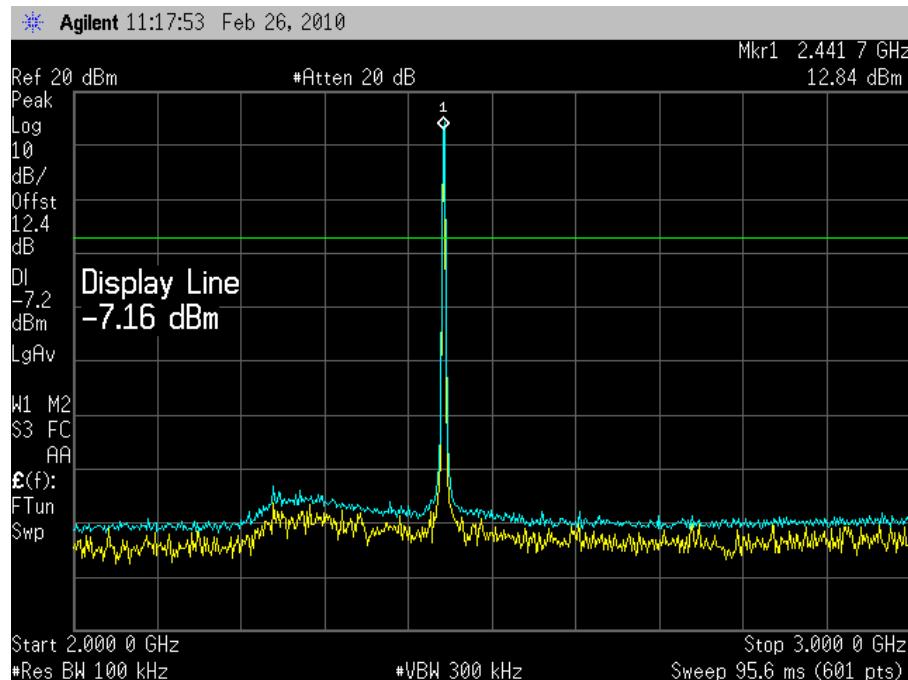
**High Channel**

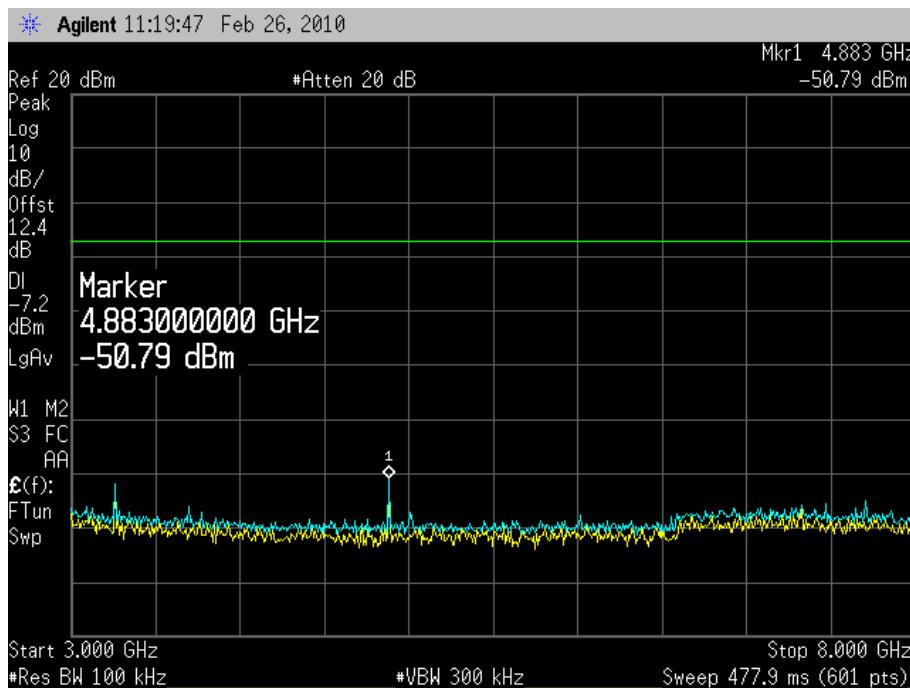
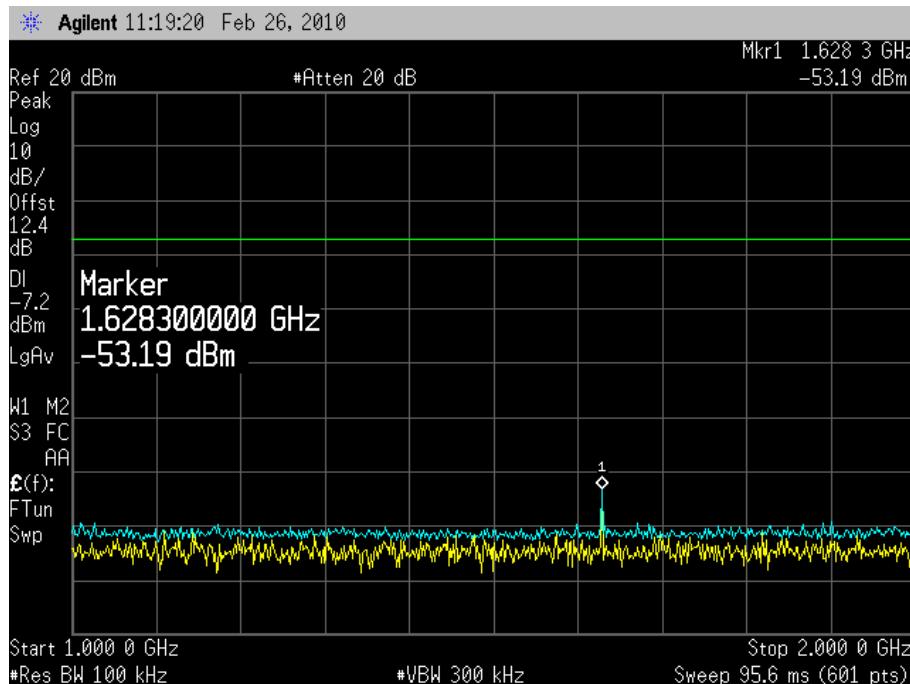
**Test Notes:** No other spurious emissions detected which is within 20dB of the limit as well as within the restricted bands defined in FCC Part 15 Subpart C, 15.205.

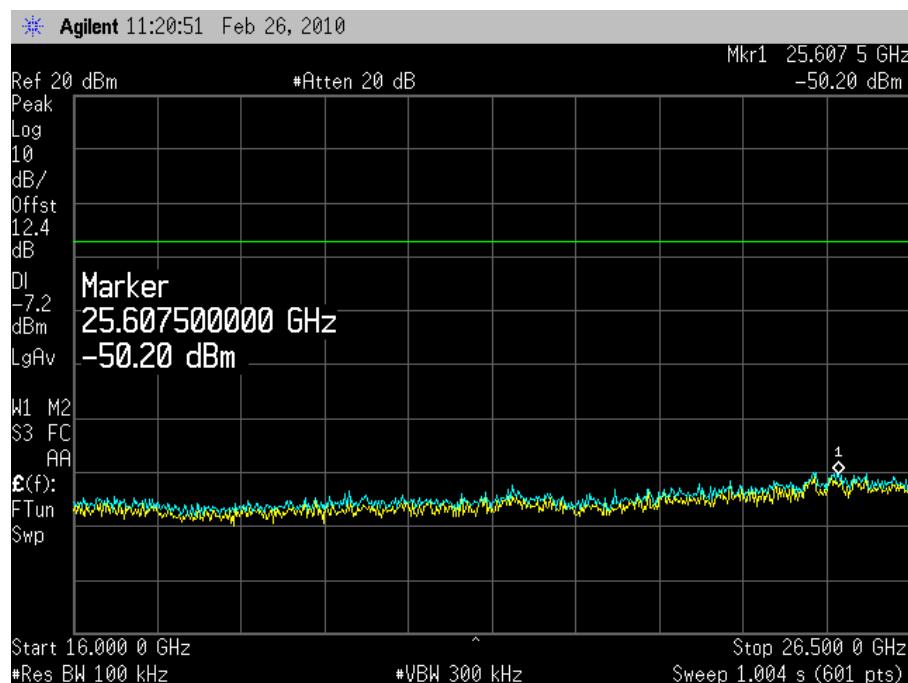
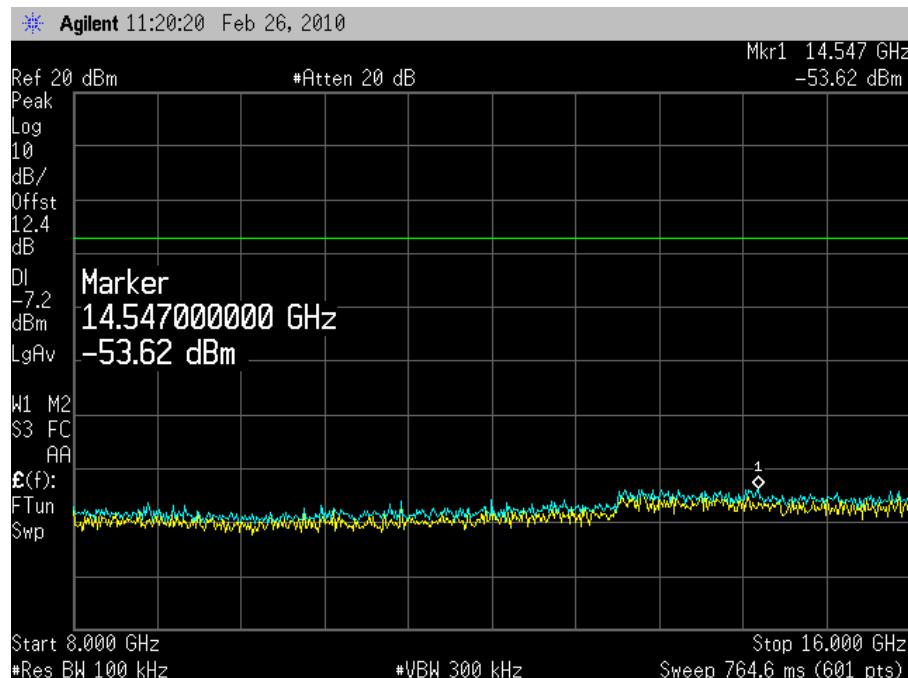
**Appendix B: Section 15.247(d) – Spurious RF Conducted Emissions Test Results (Low, Mid and High Channels)****LOW Channel**

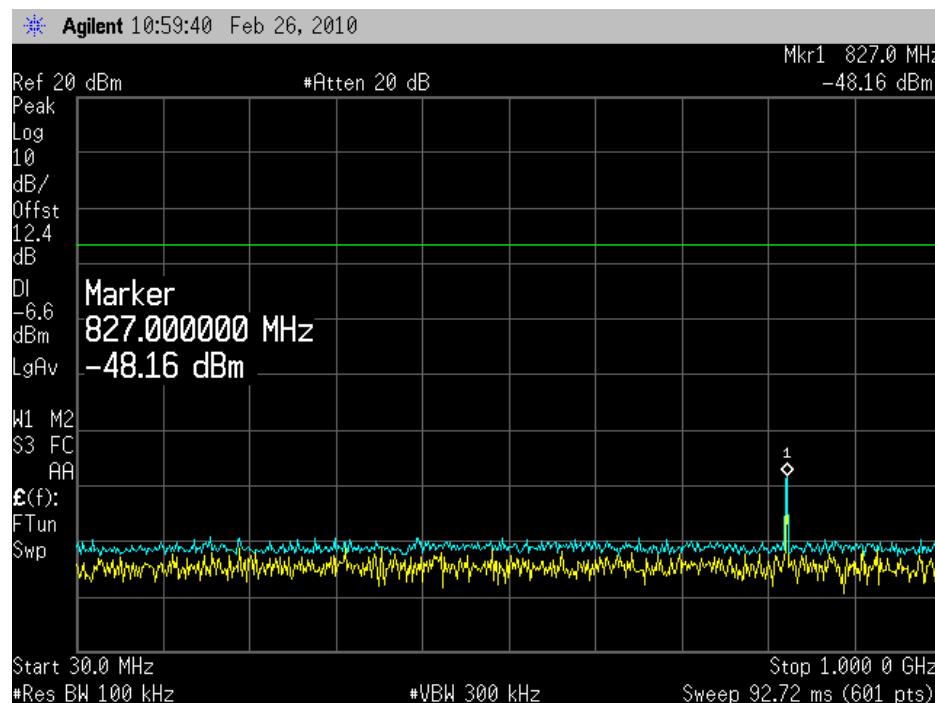
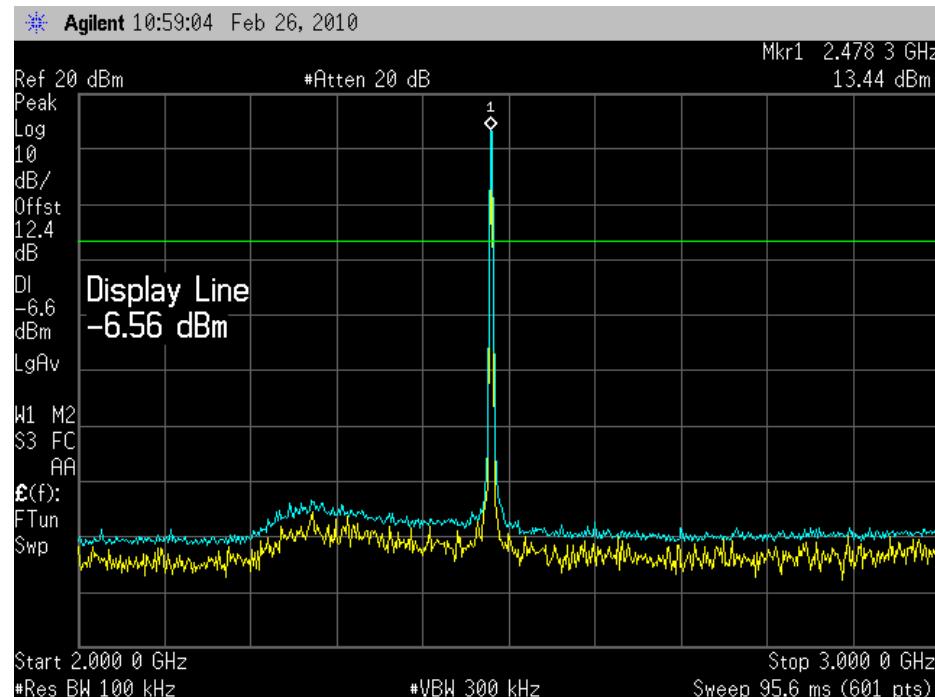
FCC ID: SUDSCT15M  
IC: 5613A-SCT15MReport Number: 2010 02301489 TX FCC  
Specification: FCC Part 15 Subpart C, 15.247**LOW Channel**

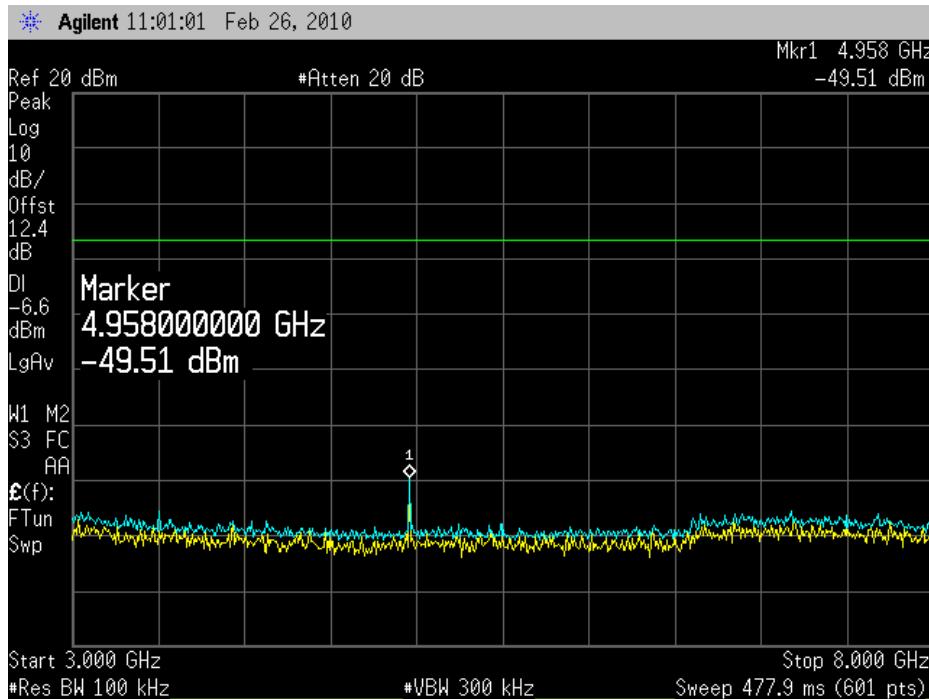
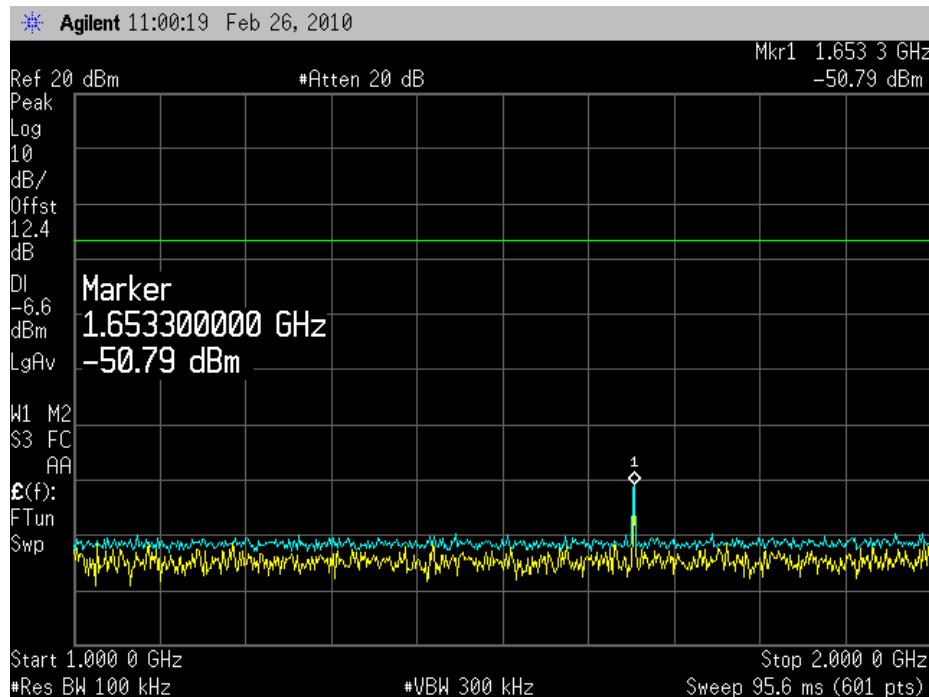
FCC ID: SUDSCT15M  
IC: 5613A-SCT15MReport Number: 2010 02301489 TX FCC  
Specification: FCC Part 15 Subpart C, 15.247**LOW Channel**

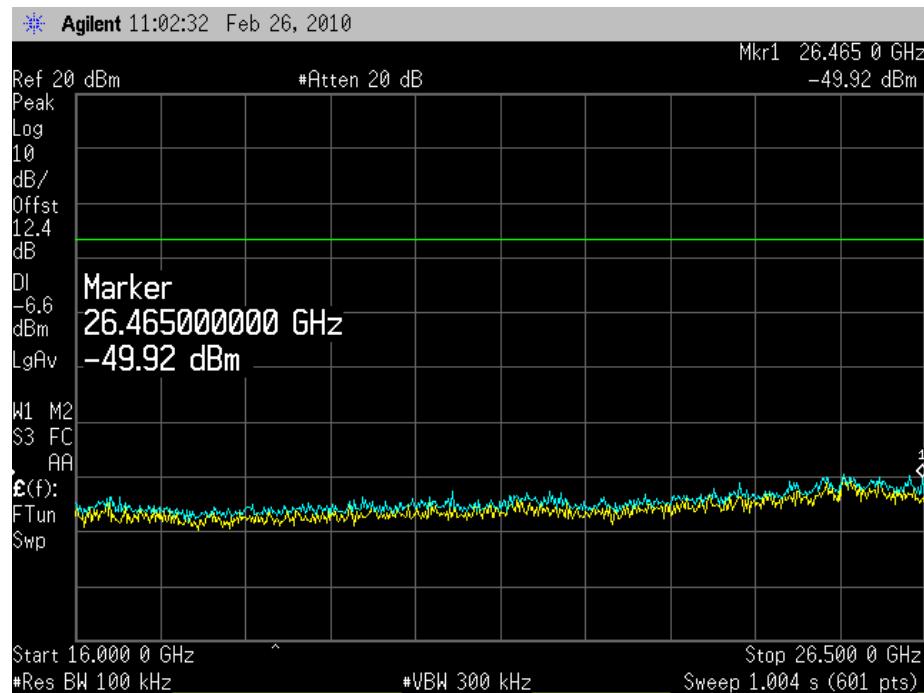
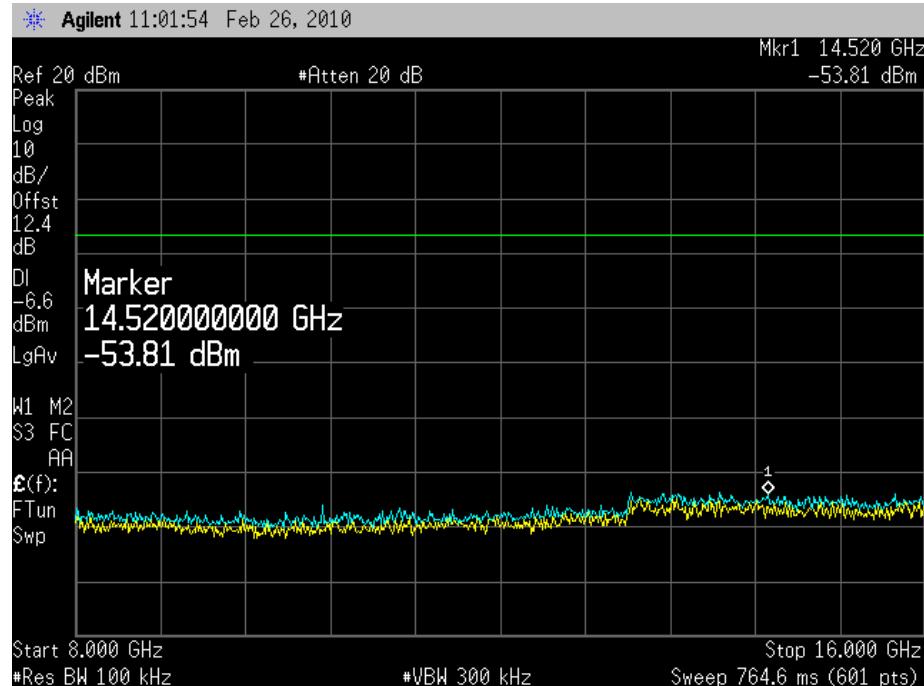
FCC ID: SUDSCT15M  
IC: 5613A-SCT15MReport Number: 2010 02301489 TX FCC  
Specification: FCC Part 15 Subpart C, 15.247**MID Channel**

FCC ID: SUDSCT15M  
IC: 5613A-SCT15MReport Number: 2010 02301489 TX FCC  
Specification: FCC Part 15 Subpart C, 15.247**MID Channel**

FCC ID: SUDSCT15M  
IC: 5613A-SCT15MReport Number: 2010 02301489 TX FCC  
Specification: FCC Part 15 Subpart C, 15.247**MID Channel**

FCC ID: SUDSCT15M  
IC: 5613A-SCT15MReport Number: 2010 02301489 TX FCC  
Specification: FCC Part 15 Subpart C, 15.247**HIGH Channel**

FCC ID: SUDSCT15M  
IC: 5613A-SCT15MReport Number: 2010 02301489 TX FCC  
Specification: FCC Part 15 Subpart C, 15.247**HIGH Channel**

FCC ID: SUDSCT15M  
IC: 5613A-SCT15MReport Number: 2010 02301489 TX FCC  
Specification: FCC Part 15 Subpart C, 15.247**HIGH Channel**



## **Appendix C: Block Diagram of Test Setups**

### **Test Site For Radiated Emissions**

