



RADIATED SPURIOUS EMISSIONS PORTIONS OF

FCC PART 22H, 24E AND 90S

CERTIFICATION TEST REPORT

FOR

CDMA MOBILE PHONE

FCC MODEL NUMBER: S2151

FCC ID: V65S2151

REPORT NUMBER: 12U14701-1

ISSUE DATE: DECEMBER 03, 2012

Prepared for

KYOCERA COMMUNICATIONS, INC

8611 BALBOA AVENUE

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Prepared by

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NVLAP LAB CODE 200065-0

Revision History

<u>Rev.</u>	<u>Issue Date</u>	<u>Revisions</u>	<u>Revised By</u>
---	12/03/12	Initial Issue	T. Chan

1. ATTESTATION OF TEST RESULTS

COMPANY NAME: KYOCERA COMMUNICATIONS, INC
8611 BALBOA AVENUE
SAN DIEGO, CA 92123, U.S.A

EUT DESCRIPTION: CDMA TRI-BAND MOBILE PHONE

MODEL: S2151

SERIAL NUMBER: 268435457816730017

DATE TESTED: NOVEMBER 19-29, 2012

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
FCC PART 22H, 24E, AND 90S	PASS(Radiated Portion)

Compliance Certification Services, Inc. (UL CCS) tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL CCS based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL CCS and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL CCS will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of any government.

Approved & Released For UL CCS By:

Tested By:



THU CHAN
ENGINEERING MANAGER
UL CCS

Roy Zheng
EMC TECHNICIAN III
UL CCS

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with TIA-603-C, FCC CFR 47 Part 2, FCC CFR 47 Part 22, FCC CFR Part 24, and FCC Part 90 Subpart S.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 Benicia Street, Fremont, California, USA.

UL CCS is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at <http://www.ccsemc.com>.

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

$$\text{Field Strength (dBuV/m)} = \text{Measured Voltage (dBuV)} + \text{Antenna Factor (dB/m)} + \text{Cable Loss (dB)} - \text{Preamp Gain (dB)}$$

$$36.5 \text{ dBuV} + 18.7 \text{ dB/m} + 0.6 \text{ dB} - 26.9 \text{ dB} = 28.9 \text{ dBuV/m}$$

4.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	UNCERTAINTY
Conducted Disturbance, 0.15 to 30 MHz	3.52 dB
Radiated Disturbance, 30 to 1000 MHz	4.94 dB

Uncertainty figures are valid to a confidence level of 95%.

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a CDMA Tri-band Phone that is manufactured by Kyocera Communications, Inc.

5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum Peak ERP & EIRP output powers as follows:

RESULTS

Mode	Channel	f (MHz)	ERP	
			dBm	mW
CDMA2000, 1xRTT	1013	824.70	27.87	612.35
	384	836.52	28.84	765.60
	777	848.31	28.03	635.33

Mode	Channel	f (MHz)	EIRP	
			dBm	mW
CDMA2000, 1xRTT	25	1851.25	27.01	502.34
	600	1880.00	28.29	674.53
	1175	1908.75	28.51	709.58

Mode	Channel	f (MHz)	ERP	
			dBm	mW
CDMA2000, BC10	476	817.90	28.08	642.69
	580	819.15	26.54	450.82
	684	823.10	27.22	527.23

5.3. SOFTWARE AND FIRMWARE

The EUT is linked with Agilent Communication Test Set.

5.4. WORST-CASE CONFIGURATION AND MODE

The worst-position is the EUT with highest emissions. To determine the worst-case, the EUT was investigated for folded and unfolded X, Y, and Z-Positions, and the worst position among X, Y, or Z with headset, after the investigations, the worst-position was turned out to be folded at Y-Position with headset for cell band and BC10 bands, and folded at Z-Position with headset for PCS.

PROCEDURE USED TO ESTABLISH TEST SIGNAL

3G-CDMA2000 1xRTT

This procedure assumes the Agilent E5515C Test Set has the following applications installed and with valid license.

<u>Application</u>	<u>Rev, License</u>
CDMA2000 Mobil Test	B.10.11, L

1xRTT

- Call Setup > Shift & Preset
- Protocol Rev > 6 (IS-2000-0)
- Radio Config (RC) > RC3 (Fwd3, Rvs3)
- FCH Service Option (SO) Setup > 55
- Traffic Data Rate > Full
- TDSO SCH Info > F-SCH Parameters > F-SCH Data Rate > 153.6 kbps
> R-SCH Parameters > R-SCH Data Rate > 153.6 kbps
- Cell Info > Cell Parameters > System ID (SID) > 1234
> Network ID (NID) > 1
> Initial Registration Channel > 25 (PCS)

Once "Active Cell" show "Connected " then change "Rvs Power Ctrl" from "Active bits" to "**All Up bits**" to get the maximum power.

Worst-case Measurement Result @ Low, Middle and High Channel

Worst-case Measurement Result for Low, Middle and High Channel under Radio Configuration RC3 and Service Option 55.

5.5. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	Manufacturer	Model	Serial Number	FCC ID
Travel Adapter	Kyocera	SCP-36ADT	NA	NA
Headset	Generic	NA	NA	NA

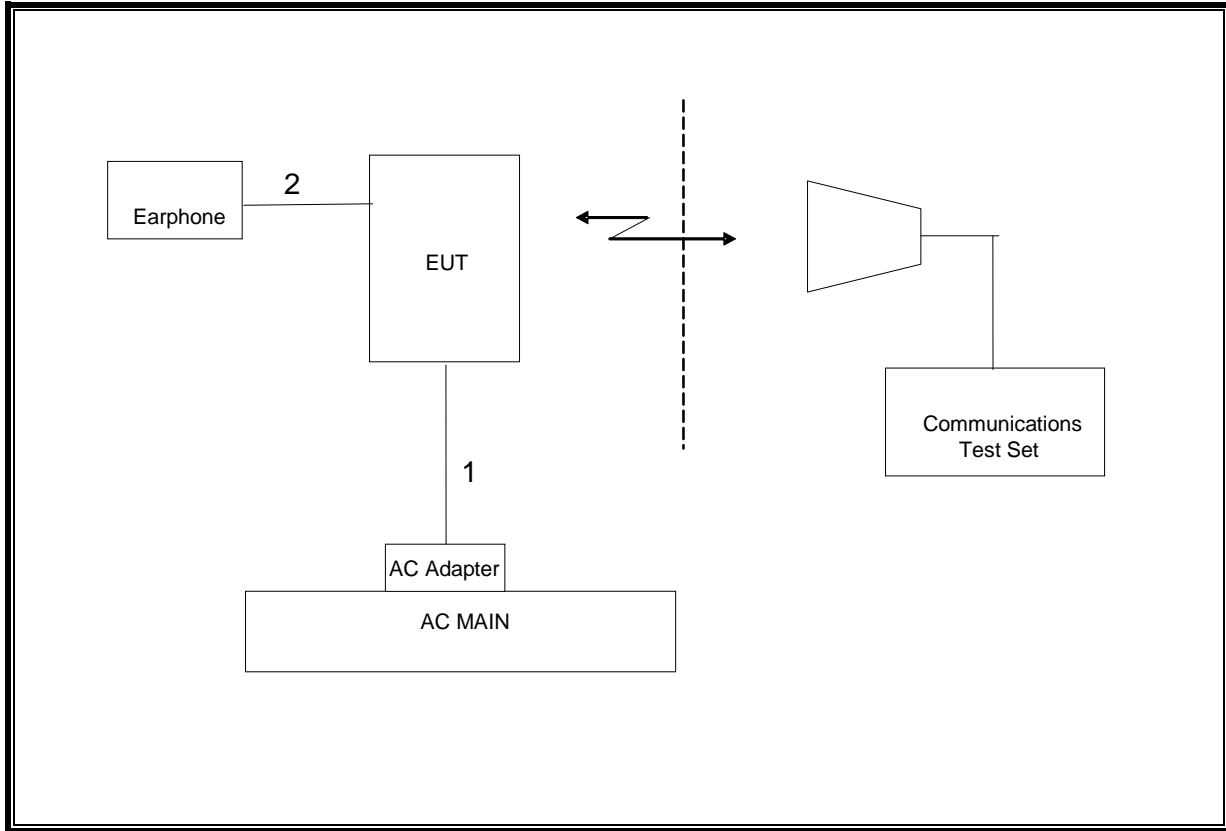
I/O CABLES

I/O CABLE LIST						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length	Remarks
1	DC	1	USB	Shielded	1.5m	N/A
2	Mic	1	Earphone	Un-shielded	1.5m	N/A

TEST SETUP

The EUT is a CDMA phone and-is tested as a standalone configuration. Communications Test Set is used to link the device under test.

SETUP DIAGRAM FOR TESTS



6. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

TEST EQUIPMENT LIST				
Description	Manufacturer	Model	Asset	Cal Due
Spectrum Analyzer, 26.5 GHz	Agilent / HP	E4440A	C01161	12/16/12
Antenna, Horn, 18 GHz	EMCO	3115	C00943	CNR
Antenna, Bilog, 30MHz-1 GHz	Sunol Sciences	JB1	C01016	08/14/13
Communications Test Set	Agilent / HP	E5515C	1000732	02/13/13
Vector signal generator, 20 GHz	Agilent / HP	E8267C	C01066	11/20/13
Antenna, Horn, 18 GHz	EMCO	3115	C00945	10/25/13
Preamplifier, 26.5 GHz	Agilent / HP	8449B	C01052	10/22/13
Tuned Dipole 400~1000 MHz	ETS	3121C DB4	C00994	09/16/13
Highpass Filter, 1.5 GHz	Micro-Tronics	HPM13193	N02689	CNR
Highpass Filter, 2.7 GHz	Micro-Tronics	HPM13194	N02687	CNR

7. LIMITS AND RESULTS

7.1. RADIATED OUTPUT POWER

LIMITS

22.913(a) The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.

24.232(b) 6.4 Mobile /portable stations are limited to 2 watts e.i.r.p. peak power and the equipment must employ means to limit the power to the minimum necessary for successful communications.

90.635 Limitations on power and antenna height.

(a) The effective radiated power and antenna height for base stations may not exceed 1 kilowatt (30 dBw) and 304 m. (1,000 ft.) above average terrain (AAT), respectively, or the equivalent thereof as determined from the Table. These are maximum values, and applicants will be required to justify power levels and antenna heights requested.

(b) The maximum output power of the transmitter for mobile stations is 100 watts (20 dBw).

Table—Equivalent Power and Antenna Heights for Base Stations in the 851–869 MHz and 935–940 MHz Bands Which Have a Requirement for a 32 km (20 mi) Service Area Radius

Antenna height (ATT) meters (feet)	Effective radiated power (watts) ^{1,2,4}
Above 1,372 (4,500)	65
Above 1,220 (4,000) to 1,372 (4,500)	70
Above 1,067 (3,500) to 1,220 (4,000)	75
Above 915 (3,000) to 1,067 (3,500)	100
Above 763 (2,500) to 915 (3,000)	140
Above 610 (2,000) to 763 (2,500)	200
Above 458 (1,500) to 610 (2,000)	350
Above 305 (1,000) to 458 (1,500)	600
Up to 305 (1,000)	³ 1,000

1. Power is given in terms of effective radiated power (ERP).
2. Applicants in the Los Angeles, CA, area who demonstrate a need to serve both the downtown and fringe areas will be permitted to utilize an ERP of 1 kw at the following mountaintop sites: Santiago Park, Sierra Peak, Mount Lukens, and Mount Wilson.
3. Stations with antennas below 305 m (1,000 ft) (AAT) will be restricted to a maximum power of 1 kw (ERP).

TEST PROCEDURE

ANSI / TIA / EIA 603 Clause 2.2.17.

RESULTS

Mode	Channel	f (MHz)	ERP / EIRP	
			dBm	mW
Cell	1013	824.70	27.87	612.35
	384	836.52	28.84	765.60
	777	848.31	28.03	635.33
PCS	25	1851.25	27.01	502.34
	600	1880.00	28.29	674.53
	1175	1908.75	28.51	709.58
SECONDARY 800	476	817.90	28.08	642.69
	580	819.15	26.54	450.82
	684	823.10	27.22	527.23

CELL OUTPUT POWER (ERP)

High Frequency Substitution Measurement Compliance Certification Services Chamber B								
Company:		Kyocera						
Project #:		12U14701						
Date:		11/19/12						
Test Engineer:		Chin Pang						
Configuration:		EUT WITH HEADSET						
Mode:		TX, 850 MHz BAND, CDMA2000 MODE						
Test Equipment:								
Receiving: Sunol T243, and Chamber B N-type Cable (Setup this one for testing EUT)								
Substitution: Dipole S/N: 00022117, 4ft SMA Cable (SN # 208947003) Warehouse.								
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
824.70	28.37	V	0.5	0.0	27.87	38.5	-10.6	
824.70	22.52	H	0.5	0.0	22.02	38.5	-16.4	
Mid Ch								
836.52	29.34	V	0.5	0.0	28.84	38.5	-9.6	
836.52	23.16	H	0.5	0.0	22.66	38.5	-15.8	
High Ch								
848.31	28.53	V	0.5	0.0	28.03	38.5	-10.4	
848.31	21.75	H	0.5	0.0	21.25	38.5	-17.2	
Rev. 3.17.11								

PCS OUTPUT POWER (EIRP)

High Frequency Fundamental Measurement Compliance Certification Services Chamber B								
Company:		Kyocera						
Project #:		12U14701						
Date:		11/19/12						
Test Engineer:		Chin Pang						
Configuration:		EUT WITH HEADSET						
Mode:		TX, 1900 MHz BAND, CDMA2000						
Test Equipment:								
Receiving: Horn T217, and Chamber B SMA Cables								
Substitution: Horn T60 Substitution, 4ft SMA Cable (208947003) Warehouse								
f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1.851	19.9	V	0.85	8.01	27.01	33.0	-6.0	
1.851	19.1	H	0.85	8.01	26.22	33.0	-6.8	
Mid Ch								
1.880	21.0	V	0.85	8.13	28.29	33.0	-4.7	
1.880	21.0	H	0.85	8.13	28.26	33.0	-4.7	
High Ch								
1.909	21.2	V	0.85	8.13	28.51	33.0	-4.5	
1.909	21.0	H	0.85	8.13	28.29	33.0	-4.7	
Rev. 3.17.11								

BC10 OUTPUT POWER (ERP)

High Frequency Substitution Measurement Compliance Certification Services Chamber B								
Company:		Kyocera						
Project #:		12U14701						
Date:		11/27/12						
Test Engineer:		Roy Zheng						
Configuration:		EUT WITH HEADSET						
Mode:		BC 10						
Test Equipment:								
Receiving: Sunol T243, and Chamber B N-type Cable (Setup this one for testing EUT)								
Substitution: Dipole S/N: 00022117, 4ft SMA Cable (SN # 208947003) Warehouse.								
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
817.50	28.58	V	0.5	0.0	28.08	38.5	-10.4	
817.50	23.24	H	0.5	0.0	22.74	38.5	-15.7	
Mid Ch								
819.15	27.04	V	0.5	0.0	26.54	38.5	-11.9	
819.15	22.77	H	0.5	0.0	22.27	38.5	-16.2	
High Ch								
823.10	27.72	V	0.5	0.0	27.22	38.5	-11.2	
823.10	22.25	H	0.5	0.0	21.75	38.5	-16.7	
Rev. 3.17.11								

7.2. FIELD STRENGTH OF SPURIOUS RADIATION

LIMIT

§22.917 (e) and §24.238 (a) (i) & (b): Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log (P)$ dB.

§ 90.691 Emission mask requirements for EA-based systems.

(a) Out-of-band emission requirement shall apply only to the “outer” channels included in an EA license and to spectrum adjacent to interior channels used by incumbent licensees. The emission limits are as follows:

(1) For any frequency removed from the EA licensee's frequency block by up to and including 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least $116 \text{ Log}_{10}(f/6.1)$ decibels or $50 + 10 \text{ Log}_{10}(P)$ decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 12.5 kHz.

(2) For any frequency removed from the EA licensee's frequency block greater than 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least $43 + 10 \text{ Log}_{10}(P)$ decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 37.5 kHz.

(b) When an emission outside of the authorized bandwidth causes harmful interference, the Commission may, at its discretion, require greater attenuation than specified in this section.

TEST PROCEDURE

ANSI / TIA / EIA 603 Clause 3.2.12 & FCC 22.917 (b), FCC 24.238 (b), & FCC 90S

RESULTS

CELL SPURIOUS & HARMONIC (ERP)

Compliance Certification Services Above 1GHz High Frequency Substitution Measurement									
Company:		Kyocera							
Project #:		12U14701							
Date:		11/28/12							
Test Engineer:		Roy Zgeng							
Configuration:		EUT and earphone							
Mode:		TX, Cell BAND CDMA2000							
Chamber		Pre-amplifier			Filter		Limit		
5m Chamber B		T145 8449B			Filter 1		Part 22		
f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 824.7MHz									
1.649	-19.6	V	3.0	35.5	1.0	-54.1	-13.0	-41.1	
2.474	-20.1	V	3.0	35.4	1.0	-54.5	-13.0	-41.5	
1.649	-18.7	H	3.0	35.5	1.0	-53.2	-13.0	-40.2	
2.474	-21.7	H	3.0	35.4	1.0	-56.2	-13.0	-43.2	
Mid Ch, 836.52MHz									
1.673	-16.0	V	3.0	35.5	1.0	-50.5	-13.0	-37.5	
2.510	-20.1	V	3.0	35.4	1.0	-54.5	-13.0	-41.5	
1.673	-16.8	H	3.0	35.5	1.0	-51.4	-13.0	-38.4	
2.510	-22.1	H	3.0	35.4	1.0	-56.5	-13.0	-43.5	
High Ch, 848.31MHz									
1.697	-17.5	V	3.0	35.5	1.0	-52.0	-13.0	-39.0	
2.545	-19.8	V	3.0	35.4	1.0	-54.3	-13.0	-41.3	
1.697	-18.1	H	3.0	35.5	1.0	-52.6	-13.0	-39.6	
2.545	-21.8	H	3.0	35.4	1.0	-56.2	-13.0	-43.2	
Rev. 03.03.09									
Note: No other emissions were detected above the system noise floor.									

PCS Spurious & Harmonic (EIRP)

Compliance Certification Services Above 1GHz High Frequency Substitution Measurement									
Company:		Kyocera							
Project #:		12U14701							
Date:		11/28/12							
Test Engineer:		Roy Zheng							
Configuration:		EUT and earphone							
Mode:		TX, PCS BAND CDMA2000							
Chamber		Pre-amplifier			Filter		Limit		
5m Chamber B		T145 8449B			Filter 1		Part 24		
f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1851.25MHz									
3.703	-13.2	V	3.0	35.4	1.0	-47.6	-13.0	-34.6	
5.554	-18.4	V	3.0	35.4	1.0	-52.8	-13.0	-39.8	
3.703	-12.8	H	3.0	35.4	1.0	-47.1	-13.0	-34.1	
5.554	-17.2	H	3.0	35.4	1.0	-51.6	-13.0	-38.6	
Mid Ch, 1880MHz									
3.760	-11.7	V	3.0	35.3	1.0	-46.1	-13.0	-33.1	
5.198	-18.9	V	3.0	35.3	1.0	-53.3	-13.0	-40.3	
3.760	-13.0	H	3.0	35.3	1.0	-47.3	-13.0	-34.3	
5.640	-17.7	H	3.0	35.4	1.0	-52.2	-13.0	-39.2	
High Ch, 1908.75MHz									
3.818	-17.8	V	3.0	35.3	1.0	-52.1	-13.0	-39.1	
5.726	-16.7	V	3.0	35.4	1.0	-51.2	-13.0	-38.2	
3.818	-16.2	H	3.0	35.3	1.0	-50.5	-13.0	-37.5	
5.726	-17.0	H	3.0	35.4	1.0	-51.5	-13.0	-38.5	
Rev. 03.03.09									
Note: No other emissions were detected above the system noise floor.									

Part 90 Spurious & Harmonic (ERP)

Compliance Certification Services Above 1GHz High Frequency Substitution Measurement									
Company:		Kyocera							
Project #:		12U14701							
Date:		11/28/12							
Test Engineer:		Roy Zgeng							
Configuration:		EUT and earphone							
Mode:		TX, BC10							
Chamber		Pre-amplifier			Filter		Limit		
3m Chamber		T34 8449B			Filter 1		Part 90		
f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 817.90MHz									
1.636	-18.6	V	3.0	37.4	1.0	-55.0	-13.0	-42.0	
2.454	-19.7	V	3.0	36.4	1.0	-55.1	-13.0	-42.1	
1.636	-19.2	H	3.0	37.4	1.0	-55.6	-13.0	-42.6	
2.454	-20.5	H	3.0	36.4	1.0	-55.9	-13.0	-42.9	
Mid Ch, 819.15MHz									
1.639	-16.4	V	3.0	37.4	1.0	-52.8	-13.0	-39.8	
2.458	-18.3	V	3.0	36.4	1.0	-53.7	-13.0	-40.7	
1.639	-19.5	H	3.0	37.4	1.0	-55.9	-13.0	-42.9	
2.458	-20.9	H	3.0	36.4	1.0	-56.3	-13.0	-43.3	
High Ch, 823.10MHz									
1.646	-20.0	V	3.0	37.4	1.0	-56.4	-13.0	-43.4	
2.469	-19.0	V	3.0	36.4	1.0	-54.4	-13.0	-41.4	
1.646	-20.2	H	3.0	37.4	1.0	-56.6	-13.0	-43.6	
2.469	-18.4	H	3.0	36.4	1.0	-53.8	-13.0	-40.8	
Rev. 03.03.09									
Note: No other emissions were detected above the system noise floor.									