ID TECH

ADDENDUM TO TEST REPORT 93597-11

Iris VRX
Model: IRXV

Tested To The Following Standards:

FCC Part 15 Subpart C Sections 15.207, 15.225
and
RSS 210 Issue 8

Report No.: 93597-11A

Date of issue: January 10, 2013

ACCREDITED
Testing Certificates:
803.01, 803.02, 803.05, 803.06

This test report bears the accreditation symbol indicating that the testing performed herein meets the test and reporting requirements of ISO/IEC 17025 under the applicable scope of EMC testing for CKC Laboratories, Inc.

We strive to create long-term, trust based relationships by providing sound, adaptive, customer first testing services. We embrace each of our customers' unique EMC challenges, not as an interruption to set processes, but rather as the reason we are in business.

Testing the Future
CKC LABORATORIES, INC.

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ADMINISTRATIVE INFORMATION

Test Report Information

REPORT PREPARED FOR:

ID TECH
451 El Camino Real
Santa Clara, CA 95050

Representative: Richard Fellows
Customer Reference Number: 127289

REPORT PREPARED BY:

Dianne Dudley
CKC Laboratories, Inc.
5046 Sierra Pines Drive
Mariposa, CA 95338

Project Number: 93957

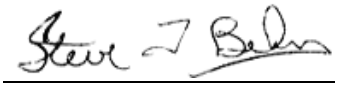
DATE OF EQUIPMENT RECEIPT: September 6, 2012
DATE(S) OF TESTING: September 6-10, 2012

Revision History

Original: Testing of IRIS VRX, IRXV to FCC Subpart C 15.207, 15.225 and RSS-210 Issue 8.
Addendum A: To replace Carrier and Spurious Emissions data sheet in section 15.225(a)(b)(c)(d). To correct test conditions of the -20dBc and RSS-210 99% Occupied Bandwidth sections and also in the 15.225(d) Field Strength of Spurious Emissions section.

Report Authorization

The test data contained in this report documents the observed testing parameters pertaining to and are relevant for only the sample equipment tested in the agreed upon operational mode(s) and configuration(s) as identified herein. Compliance assessment remains the client's responsibility. This report may not be used to claim product endorsement by A2LA or any government agencies. This test report has been authorized for release under quality control from CKC Laboratories, Inc.



Steve Behm
Director of Quality Assurance & Engineering Services
CKC Laboratories, Inc.

Test Facility Information

Our laboratories are configured to effectively test a wide variety of product types. CKC utilizes first class test equipment, anechoic chambers, data acquisition and information services to create accurate, repeatable and affordable test results.

TEST LOCATION(S):
CKC Laboratories, Inc.
5046 Sierra Pines Drive
Mariposa, CA 95338

Site Registration & Accreditation Information

Location	CB #	Taiwan	Canada	FCC	Japan
Mariposa A	US0103	SL2-IN-E-1147R	3082A-2	90477	R-563 C-578 T-1492 G-87

SUMMARY OF RESULTS

Standard / Specification: FCC Part 15 Subpart C

Description	Test Procedure/Method	Results
Conducted Emissions	FCC Part 15 Subpart C Section 15.207 / ANSI C63.4	Pass
Carrier and Spurious Emissions	FCC Part 15 Subpart C Section 15.225(a)(b)(c)(d) / ANSI C63.4	Pass
-20dBc & 99% Occupied Bandwidth	FCC Part 15 Subpart C Section 15.225 / ANSI C63.4 and RSS 210 Issue 8	Pass
Field Strength of Spurious Emissions	FCC Part 15 Subpart C Section 15.225(d) / 15.209	Pass
Frequency Stability	FCC Part 15 Subpart C Section 15.225(e) / ANSI C63.4 / ANSI C63.10	Pass

Conditions During Testing

This list is a summary of the conditions noted for or modifications made to the equipment during testing.

Summary of Conditions
None

EQUIPMENT UNDER TEST (EUT)

EQUIPMENT UNDER TEST

Iris VRX
Manuf: IDTECH
Model: IRXV
Serial: NA

PERIPHERAL DEVICES

The EUT was tested with the following peripheral device(s):

Linear Power Supply
Manuf: NA
Model: NA
Serial: NA

Laptop
Manuf: Dell
Model: PP18L
Serial: NA

FCC PART 15 SUBPART C

This report contains EMC emissions test results under United States Federal Communications Commission (FCC) 47 CFR 15C requirements for Unlicensed Radio Frequency Devices, Subpart C - Intentional Radiators.

15.207 AC Conducted Emissions

Test Data Sheets

Test Location: CKC Laboratories • 5046 Sierra Pines Dr. • Mariposa, CA 95338 • (209) 966-5240

Customer: **IDTECH**
Specification: **15.207 AC Mains - Average**
Work Order #: **93597** Date: 9/7/2012
Test Type: **Conducted Emissions** Time: 10:49:01
Equipment: **Iris VRX** Sequence#: 2
Manufacturer: IDTECH Tested By: Chuck Kendall/Eddie Mariscal
Model: IRXV 120V 60Hz
S/N:

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN01184	Spectrum Analyzer	8568B	5/4/2011	5/4/2013
T2	AN02608	High Pass Filter	HE9615-150K-50-720B	3/15/2012	3/15/2014
T3	ANMACOND	Cable		8/17/2012	8/17/2014
T4	ANP00082	Attenuator	PE7002-10	6/7/2011	6/7/2013
T5	AN00374	50uH LISN-Black Lead Amplitude (dB)	8028-TS-50-BNC	10/31/2011	10/31/2013
	AN00374	50uH LISN-White Lead Amplitude (dB)	8028-TS-50-BNC	10/31/2011	10/31/2013

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Iris VRX*	IDTECH	IRXV	NA

Support Devices:

Function	Manufacturer	Model #	S/N
Linear Power Supply	NA	NA	NA
Laptop	Dell	PP18L	NA

Test Conditions / Notes:

EUT is placed atop a wooden turntable of height 80cm. Power for EUT is being supplied through linear power supply located on turntable. Data is being transmitted from EUT to splitter via data cable. Data is then sent from the splitter to Dell laptop also located on turntable.

Frequencies of Interest: 150 kHz to 30MHz.
From 150kHz to 30 MHz: RBW = 9kHz; VBW = 30kHz
Highest Clock Freq: 180MHz
Transmit Freq: 13.56MHz

Atmospheric Conditions:
Temperature = 22°C
Humidity = 35%
Pressure = 97kPa

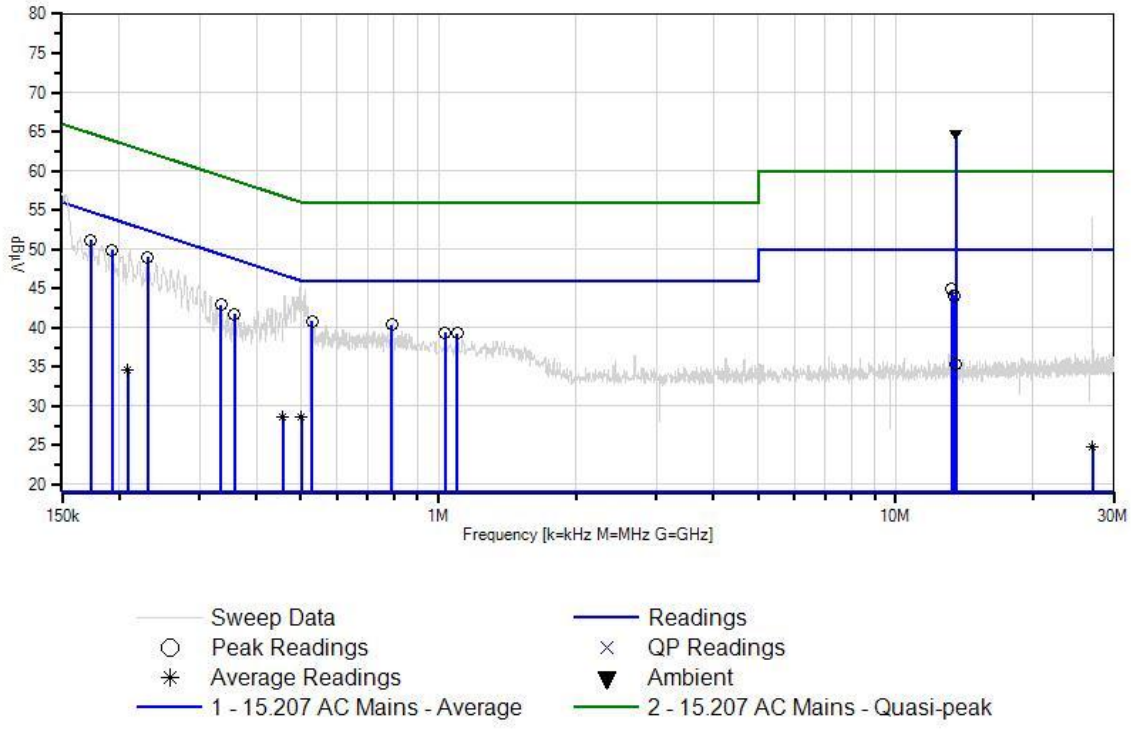
Ext Attn: 0 dB

Measurement Data: Reading listed by margin. Test Lead: Black

#	Freq	Rdng	T1 T5	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV	dBµV	dB	Ant
1	13.560M Ambient	53.4	+0.0 +0.1	+0.1	+1.1	+10.1	+0.0	64.8	50.0 EUT with Integral antenna installed	+14.8	Black
2	231.446k	33.9	+0.0 +4.7	+0.2	+0.2	+10.0	+0.0	49.0	52.4	-3.4	Black
3	173.270k	35.9	+0.0 +4.8	+0.4	+0.1	+10.0	+0.0	51.2	54.8	-3.6	Black
4	192.905k	34.9	+0.0 +4.7	+0.2	+0.1	+10.0	+0.0	49.9	53.9	-4.0	Black
5	13.283M	33.6	+0.0 +0.1	+0.1	+1.0	+10.1	+0.0	44.9	50.0	-5.1	Black
6	528.871k	26.1	+0.0 +4.3	+0.2	+0.2	+10.0	+0.0	40.8	46.0	-5.2	Black
7	789.936k	25.8	+0.0 +4.1	+0.2	+0.3	+10.0	+0.0	40.4	46.0	-5.6	Black
8	13.427M	32.8	+0.0 +0.1	+0.1	+1.0	+10.1	+0.0	44.1	50.0	-5.9	Black
9	334.709k	28.1	+0.0 +4.5	+0.1	+0.2	+10.0	+0.0	42.9	49.3	-6.4	Black
10	1.034M	24.9	+0.0 +4.0	+0.2	+0.3	+10.0	+0.0	39.4	46.0	-6.6	Black
11	1.098M	24.8	+0.0 +4.0	+0.2	+0.3	+10.0	+0.0	39.3	46.0	-6.7	Black
12	357.252k	26.9	+0.0 +4.5	+0.1	+0.2	+10.0	+0.0	41.7	48.8	-7.1	Black
13	13.560M	24.0	+0.0 +0.1	+0.1	+1.1	+10.1	+0.0	35.4	50.0 EUT with dummy load installed	-14.6	Black
14	501.000k Ave	13.9	+0.0 +4.3	+0.2	+0.2	+10.0	+0.0	28.6	46.0	-17.4	Black
^	498.329k	30.5	+0.0 +4.3	+0.2	+0.2	+10.0	+0.0	45.2	46.0	-0.8	Black

16 Ave	456.000k	13.7	+0.0 +4.4	+0.2	+0.2	+10.0	+0.0	28.5	46.8	-18.3	Black
^	460.514k	29.4	+0.0 +4.4	+0.2	+0.2	+10.0	+0.0	44.2	46.7	-2.5	Black
18 Ave	209.000k	19.5	+0.0 +4.7	+0.2	+0.2	+10.0	+0.0	34.6	53.2	-18.6	Black
^	211.085k	35.1	+0.0 +4.7	+0.2	+0.2	+10.0	+0.0	50.2	53.2	-3.0	Black
20 Ave	27.019M	13.0	+0.0 +0.1	+0.2	+1.5	+10.1	+0.0	24.9	50.0	-25.1	Black
^	27.019M	42.2	+0.0 +0.1	+0.2	+1.5	+10.1	+0.0	54.1	50.0	+4.1	Black

CKC Laboratories Date: 9/7/2012 Time: 10:49:01 IDTECH WO#: 93597
15.207 AC Mains - Average Test Lead: Black 120V 60Hz Sequence#: 2 Ext ATTN: 0 dB



Test Location: CKC Laboratories • 5046 Sierra Pines Dr. • Mariposa, CA 95338 • (209) 966-5240

Customer: **IDTECH**
Specification: **15.207 AC Mains - Average**
Work Order #: **93597** Date: 9/7/2012
Test Type: **Conducted Emissions** Time: 10:32:48
Equipment: **Iris VRX** Sequence#: 1
Manufacturer: IDTECH Tested By: Chuck Kendall/Eddie Mariscal
Model: IRXV 120V 60Hz
S/N:

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN01184	Spectrum Analyzer	8568B	5/4/2011	5/4/2013
T2	AN02608	High Pass Filter	HE9615-150K-50-720B	3/15/2012	3/15/2014
T3	ANMACOND	Cable		8/17/2012	8/17/2014
T4	ANP00082	Attenuator	PE7002-10	6/7/2011	6/7/2013
	AN00374	50uH LISN-Black Lead Amplitude (dB)	8028-TS-50-BNC	10/31/2011	10/31/2013
T5	AN00374	50uH LISN-White Lead Amplitude (dB)	8028-TS-50-BNC	10/31/2011	10/31/2013

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Iris VRX*	IDTECH	IRXV	NA

Support Devices:

Function	Manufacturer	Model #	S/N
Linear Power Supply	NA	NA	NA
Laptop	Dell	PP18L	NA

Test Conditions / Notes:

EUT is placed atop a wooden turntable of height 80cm. Power for EUT is being supplied through linear power supply located on turntable. Data is being transmitted from EUT to splitter via data cable. Data is then sent from the splitter to Dell laptop also located on turntable.
Frequencies of Interest: 150 kHz to 30MHz.
From 150kHz to 30 MHz: RBW = 9kHz; VBW = 30kHz
Highest Clock Freq: 180MHz
Transmit Freq: 13.56MHz
Atmospheric Conditions:
Temperature = 22°C
Humidity = 35%
Pressure = 97kPa

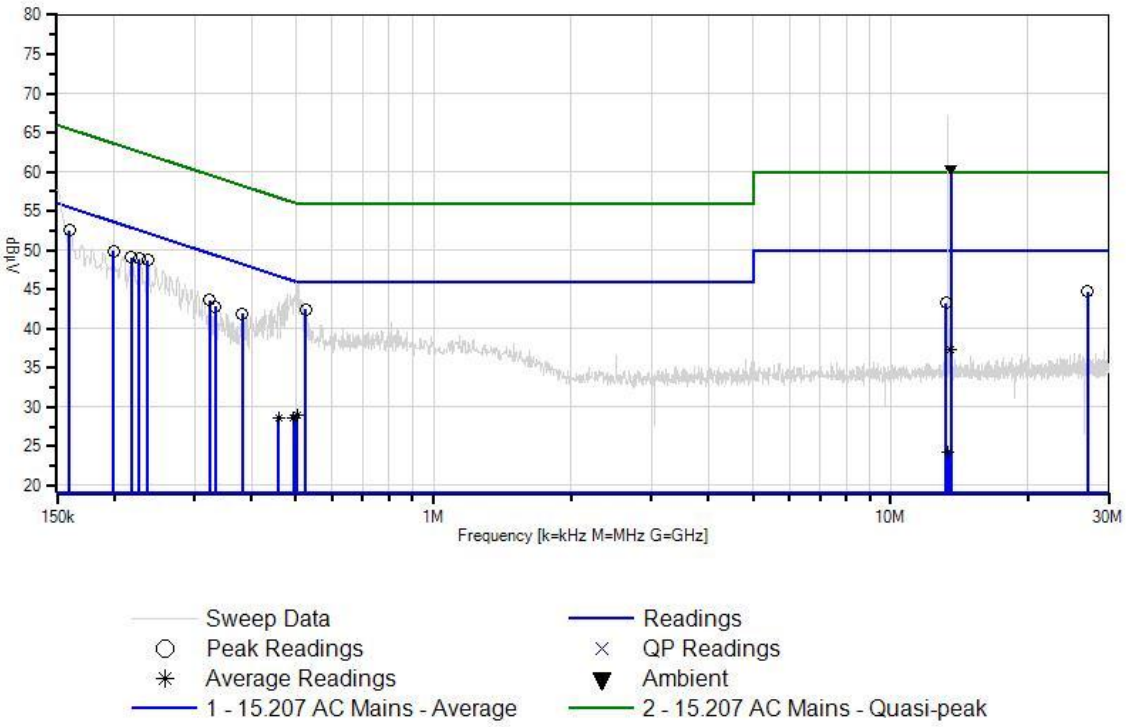
Ext Attn: 0 dB

Measurement Data: Reading listed by margin. Test Lead: White

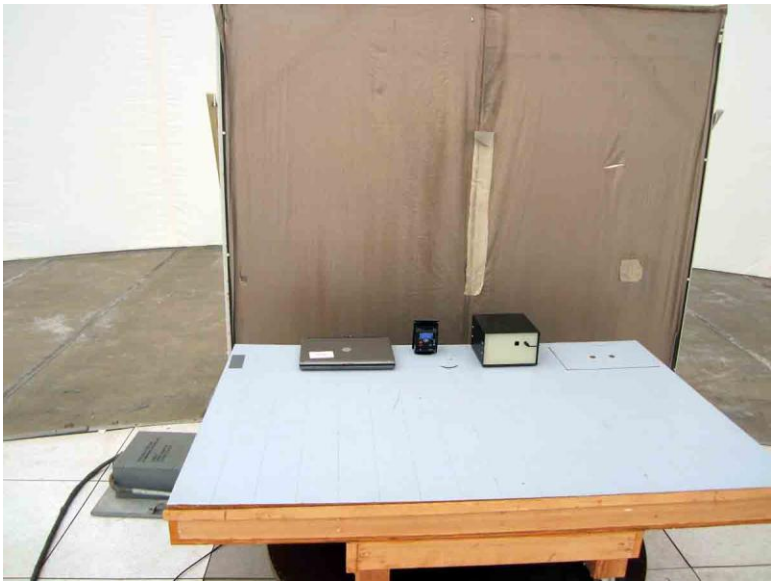
#	Freq	Rdng	T1 T5	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV	dBµV	dB	Ant
1	13.560M Ambient	49.0	+0.0 +0.1	+0.1	+1.1	+10.1	+0.0	60.4	50.0 EUT with integral antenna installed	+10.4	White
2	159.454k	36.8	+0.0 +4.8	+0.8	+0.1	+10.0	+0.0	52.5	55.5	-3.0	White

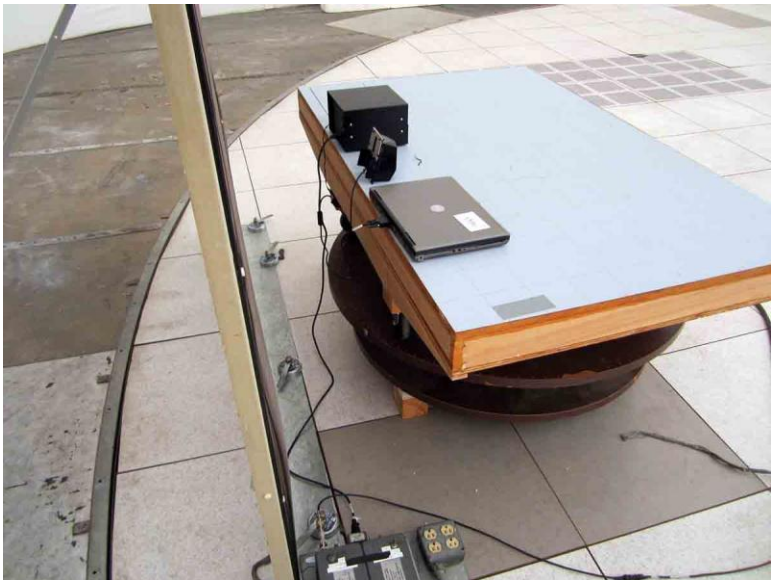
3	236.537k	33.7	+0.0 +4.6	+0.2	+0.2	+10.0	+0.0	48.7	52.2	-3.5	White
4	525.235k	27.8	+0.0 +4.3	+0.2	+0.2	+10.0	+0.0	42.5	46.0	-3.5	White
5	227.083k	33.8	+0.0 +4.7	+0.2	+0.2	+10.0	+0.0	48.9	52.6	-3.7	White
6	199.450k	34.9	+0.0 +4.7	+0.2	+0.1	+10.0	+0.0	49.9	53.6	-3.7	White
7	218.357k	34.0	+0.0 +4.7	+0.2	+0.2	+10.0	+0.0	49.1	52.9	-3.8	White
8	27.013M	32.8	+0.0 +0.1	+0.2	+1.5	+10.1	+0.0	44.7	50.0	-5.3	White
9	323.801k	28.8	+0.0 +4.5	+0.1	+0.2	+10.0	+0.0	43.6	49.6	-6.0	White
10	381.977k	27.1	+0.0 +4.5	+0.1	+0.2	+10.0	+0.0	41.9	48.2	-6.3	White
11	333.254k	28.0	+0.0 +4.5	+0.1	+0.2	+10.0	+0.0	42.8	49.4	-6.6	White
12	13.229M	32.0	+0.0 +0.1	+0.1	+1.0	+10.1	+0.0	43.3	50.0	-6.7	White
13	13.560M Ave	26.0	+0.0 +0.1	+0.1	+1.1	+10.1	+0.0	37.4	50.0 EUT with dummy load installed	-12.6	White
14	503.000k Ave	14.2	+0.0 +4.4	+0.2	+0.2	+10.0	+0.0	29.0	46.0	-17.0	White
^	506.328k	31.1	+0.0 +4.3	+0.2	+0.2	+10.0	+0.0	45.8	46.0	-0.2	White
^	499.783k	31.0	+0.0 +4.4	+0.2	+0.2	+10.0	+0.0	45.8	46.0	-0.2	White
17	494.000k Ave	13.8	+0.0 +4.4	+0.2	+0.2	+10.0	+0.0	28.6	46.1	-17.5	White
18	458.000k Ave	13.8	+0.0 +4.4	+0.2	+0.2	+10.0	+0.0	28.6	46.7	-18.1	White
^	457.606k	28.5	+0.0 +4.4	+0.2	+0.2	+10.0	+0.0	43.3	46.7	-3.4	White
20	13.364M Ave	12.9	+0.0 +0.1	+0.1	+1.0	+10.1	+0.0	24.2	50.0 EUT with integral antenna installed	-25.8	White
^	13.364M	55.8	+0.0 +0.1	+0.1	+1.0	+10.1	+0.0	67.1	50.0 EUT with integral antenna installed	+17.1	White

CKC Laboratories Date: 9/7/2012 Time: 10:32:48 IDTECH WO#: 93597
15.207 AC Mains - Average Test Lead: White 120V 60Hz Sequence#: 1 Ext ATTN: 0 dB



Test Setup Photos





15.225(a)(b)(c)(d) Carrier and Spurious Emissions

Test Location: CKC Laboratories, Inc. • 5046 Sierra Pines Drive • • 209-966-5240

Customer: **IDTECH**
Specification: **15.225 Carrier and Spurious Emissions (13.110-14.010 MHz Transmitter)**
Work Order #: **93957** Date: 10/8/2012
Test Type: **Maximized Emissions** Time: 10:51:28
Equipment: **Iris VRX** Sequence#: 1
Manufacturer: IDTECH Tested By: Chuck Kendall & Eddie Mariscal
Model: IRXV
S/N: NA

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN00226	Loop Antenna	6502	3/28/2012	3/28/2014
T2	ANP05686	Cable	RG214/U	1/24/2012	1/24/2014
	AN02660	Spectrum Analyzer	E4446A	8/23/2012	8/23/2014

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Iris VRX*	IDTECH	IRXV	NA

Support Devices:

Function	Manufacturer	Model #	S/N
Linear Power Supply	NA	NA	NA
Laptop	Dell	PP18L	NA

Test Conditions / Notes:

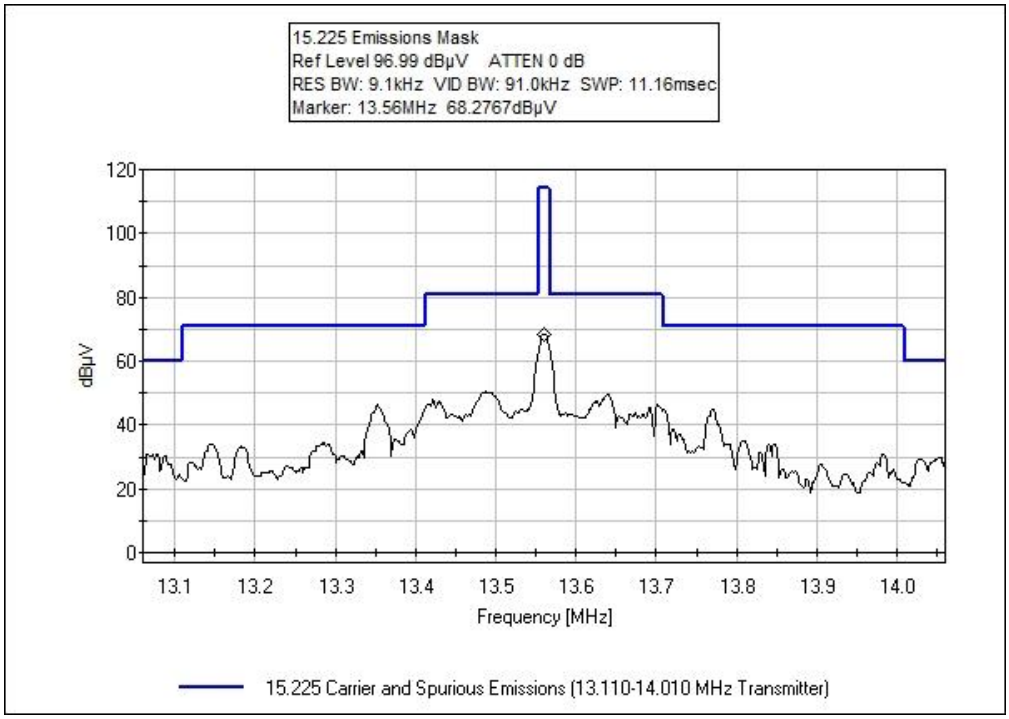
EUT is placed on a Styrofoam nonconductive support which is placed atop a wooden turntable of height 80cm. Power for the EUT is being supplied through linear power supply located on turntable. Data is being transmitted from EUT to splitter via Ethernet cable. Data is then sent from the splitter to Dell laptop also located on turntable. Linear power supply puts out 12 VDC to the EUT.
Highest Clock Freq.: 180MHz
Transmit Freq.: 13.56 MHz
Measurements made IAW 15.31(e) & 15.225 (e). The output power did not vary. The frequency tolerance did not vary beyond the limits.
Frequencies of Interest: 9kHz to 30MHz.
From 9k to 30 MHz: RBW = 9kHz; VBW = 30kHz
Environmental Conditions: Temperature = 20°C, Humidity = 40%, Pressure = 97kPa

Ext Attn: 0 dB

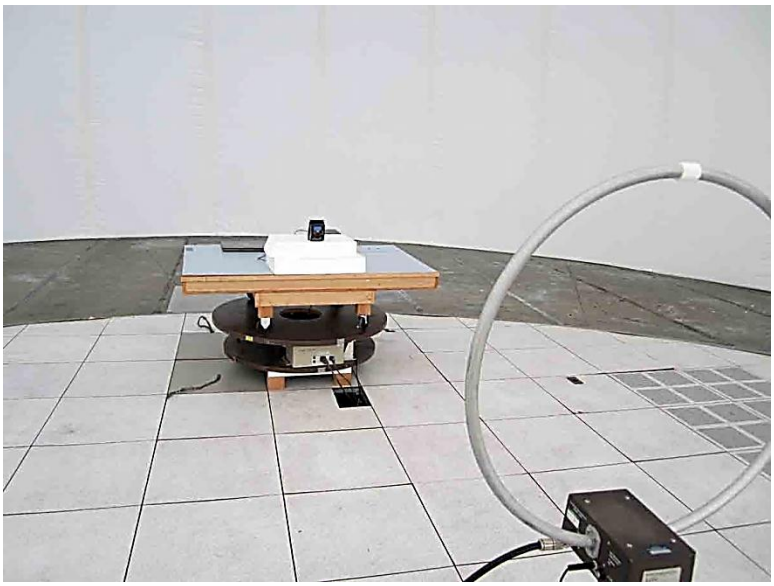
Measurement Data: Reading listed by margin. Test Distance: 3 Meters

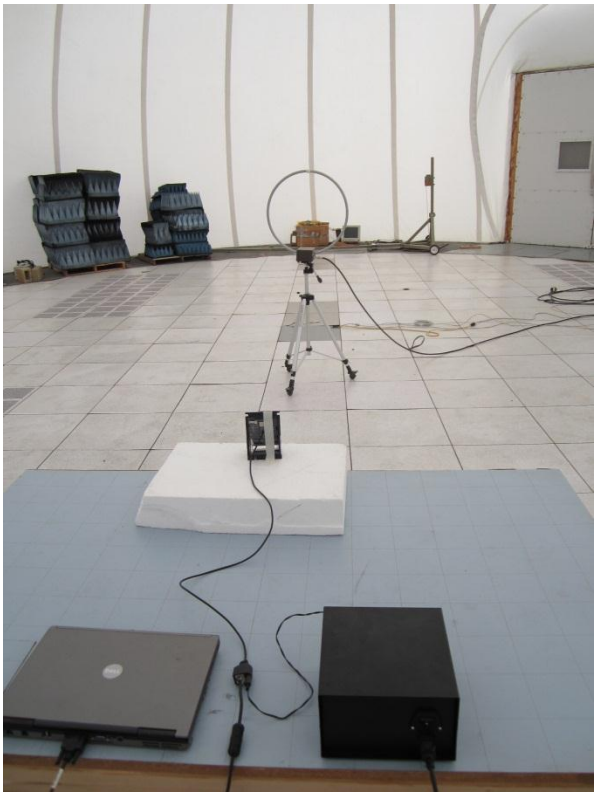
#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	dB	dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	13.560M	68.3	+9.6	+0.0			-40.0	37.9	84.0	-46.1	Vert
2	13.560M	58.3	+9.6	+0.0			-40.0	27.9	84.0	-56.1	Horiz

Test Data


15.225 Emissions Mask
Ref Level 96.99 dBµV ATTEN 0 dB
RES BW: 9.1kHz VID BW: 91.0kHz SWP: 11.16msec
Marker: 13.56MHz 68.2767dBµV
120
100
80
60
40
20
0
dBµV
13.1
13.2
13.3
13.4
13.5
13.6
13.7
13.8
13.9
14.0
Frequency [MHz]
15.225 Carrier and Spurious Emissions (13.110-14.010 MHz Transmitter)

Test Setup Photos





-20dBc & RSS 210 99% Occupied Bandwidth

Test Conditions / Setup

EUT is placed atop a Styrofoam nonconductive support which is placed atop a wooden turntable of height 80cm. Power for EUT is being supplied through linear power supply located on turntable. Data is being transmitted from EUT to splitter via Ethernet cable. Data is then sent from the splitter to Dell laptop also located on turntable.

Highest Clock Freq: 180MHz
Transmit Freq: 13.56 MHz

Measurements made In Accordance With 15.31(e) & 15.225 (e).
15.31(e) - No change in the output was observed during the variations of the DC input from 85% to 115% (10.2 VDC to 13.8 VDC).

Frequencies of Interest: 13.56 MHz
RBW = 1kHz; VBW = 3kHz

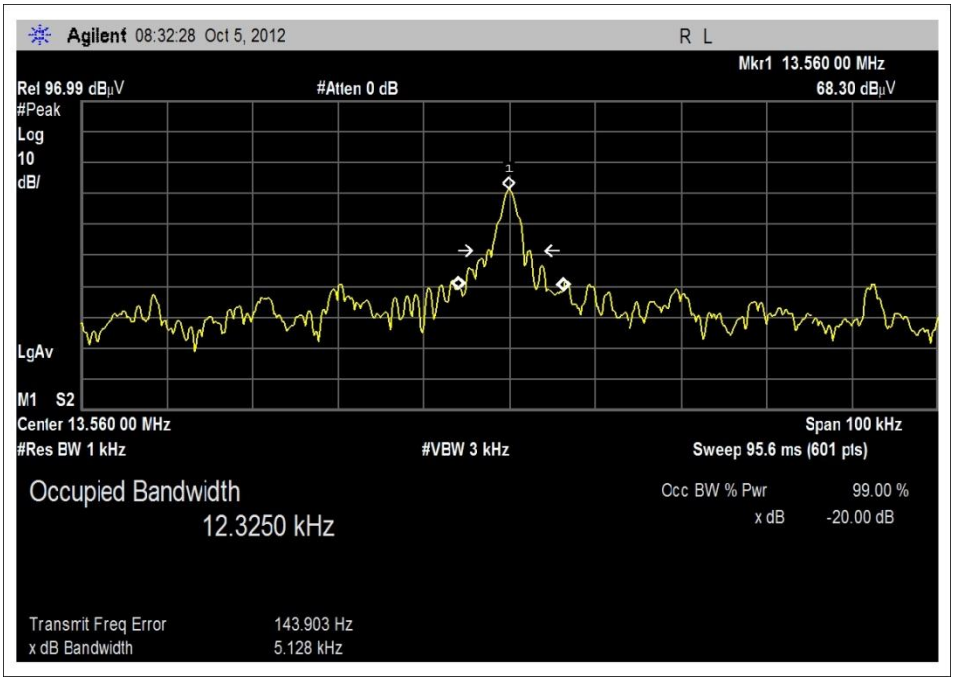
Environmental Conditions:
Temperature = 20°C
Humidity = 40%
Pressure = 97kPa

Engineer Name: Chuck Kendall & Eddie Mariscal

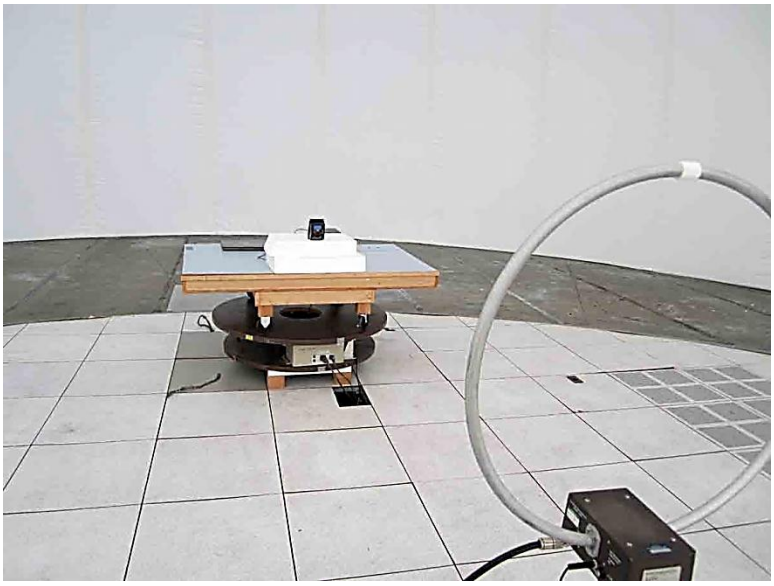
Test Equipment

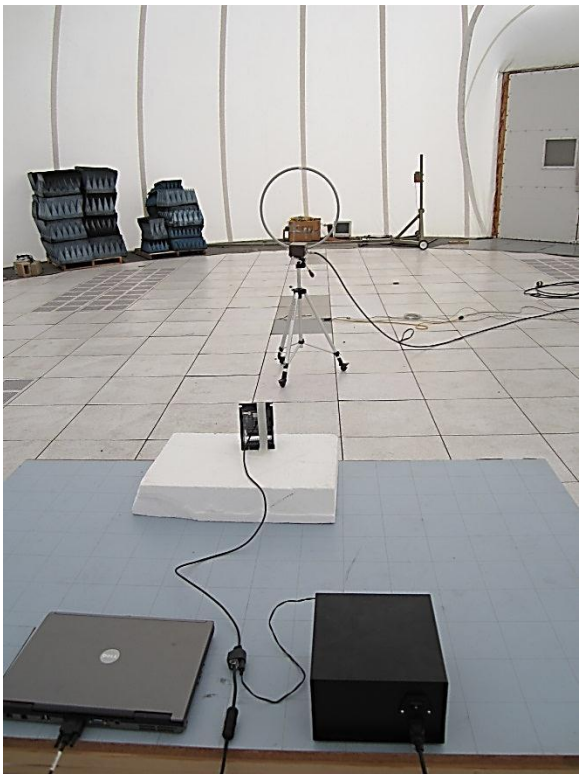
Asset/Serial #	Description	Model	Manufacturer	Cal Date	Cal Due
AN00226	Loop Antenna	6502	EMCO	3/28/2012	3/28/2014
ANP05686	Cable	RG214/U		1/24/2012	1/24/2014
AN02660	Spectrum Analyzer	E4446A	Agilent	8/23/2012	8/23/2014

Test Plot


Agilent 08:32:28 Oct 5, 2012
R L
Mkr1 13.560 00 MHz
Ref 96.99 dBµV
#Atten 0 dB
68.30 dBµV
#Peak
Log
10
dB/
LgAv
M1 S2
Center 13.560 00 MHz
Span 100 kHz
#Res BW 1 kHz
#VBW 3 kHz
Sweep 95.6 ms (601 pts)
Occupied Bandwidth
12.3250 kHz
Occ BW % Pwr 99.00 %
x dB -20.00 dB
Transmit Freq Error 143.903 Hz
x dB Bandwidth 5.128 kHz

Test Setup Photos





15.225(d) Field Strength of Spurious Emissions

Test Data Sheet

Test Location: CKC Laboratories, Inc. • 5046 Sierra Pines Drive • Mariposa, CA • 209-966-5240

Customer: **IDTECH**
Specification: **15.209 Radiated Emissions**
Work Order #: **93957** Date: 10/5/2012
Test Type: **Maximized Emissions** Time: 09:10:16
Equipment: **Iris VRX** Sequence#: 1
Manufacturer: IDTECH Tested By: Chuck Kendall & Eddie Mariscal
Model: IRXV
S/N: NA

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN00226	Loop Antenna	6502	3/28/2012	3/28/2014
T2	ANP05686	Cable	RG214/U	1/24/2012	1/24/2014
	AN02660	Spectrum Analyzer	E4446A	8/23/2012	8/23/2014

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Iris VRX*	IDTECH	IRXV	NA

Support Devices:

Function	Manufacturer	Model #	S/N
Linear Power Supply	NA	NA	NA
Laptop	Dell	PP18L	NA

Test Conditions / Notes:

EUT is placed at a height of 1m atop a Styrofoam, nonconductive support which is placed atop a wooden turntable of height 80cm. Power for EUT is being supplied through linear power supply located on turntable. Data is being transmitted from EUT to splitter via Ethernet cable. Data is then sent from the splitter to Dell laptop also located on turntable.

Highest Clock Freq: 180MHz
Transmit Freq: 13.56 MHz

Measurements made IAW 15.31(e). No change in the output was observed during the variations of the DC input from 85% to 115% (10.2VDC to 13.8VDC).

Frequencies of Interest: 9kHz to 30MHz.
From 9k to 30 MHz: RBW = 9kHz; VBW = 30kHz

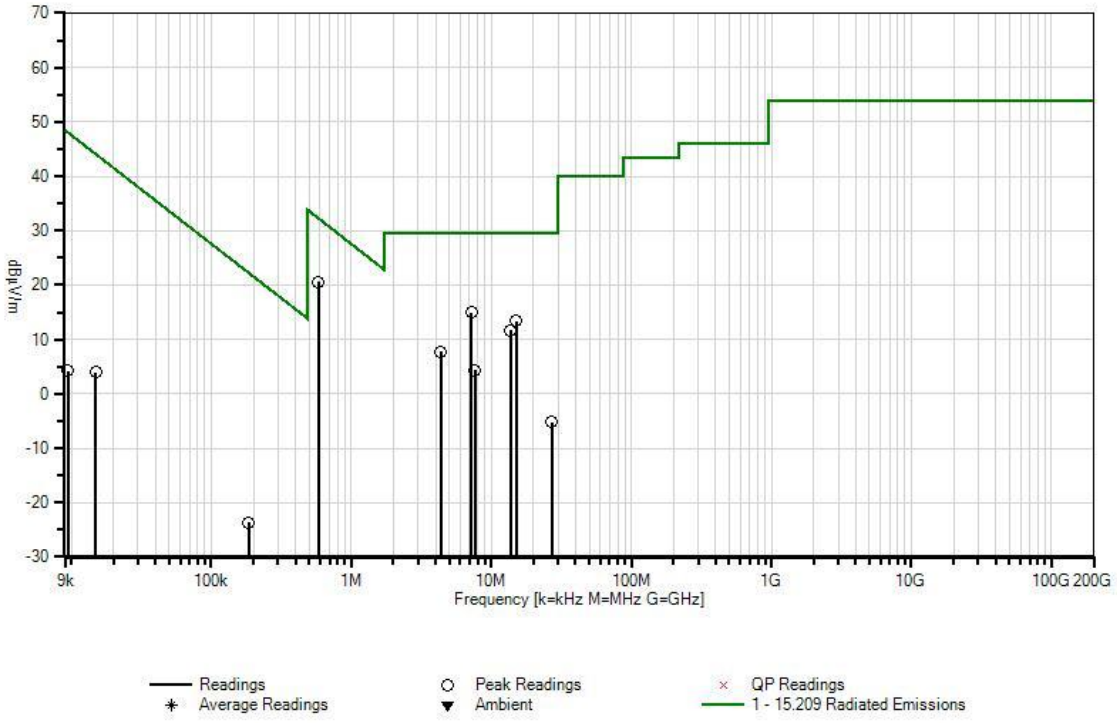
Environmental Conditions:
Temperature = 20°C
Humidity = 40%
Pressure = 97kPA

Ext Attn: 0 dB

Measurement Data: Reading listed by margin. Test Distance: 3 Meters

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	dB	dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	585.000k	50.5	+10.0	+0.0			-40.0	20.5	32.3	-11.8	Vert
2	7.194M	45.1	+9.9	+0.0			-40.0	15.0	29.5	-14.5	Vert
3	15.001M	43.9	+9.5	+0.0			-40.0	13.4	29.5	-16.1	Vert
4	13.681M	42.1	+9.6	+0.0			-40.0	11.7	29.5	-17.8	Vert
5	4.344M	37.9	+9.8	+0.0			-40.0	7.7	29.5	-21.8	Vert
6	7.601M	34.4	+9.9	+0.0			-40.0	4.3	29.5	-25.2	Vert
7	27.120M	27.9	+6.8	+0.1			-40.0	-5.2	29.5	-34.7	Vert
8	15.000k	69.5	+14.5	+0.0			-80.0	4.0	44.1	-40.1	Vert
9	9.500k	67.5	+16.7	+0.0			-80.0	4.2	48.0	-43.8	Vert
10	185.000k	46.4	+9.9	+0.0			-80.0	-23.7	22.3	-46.0	Vert
11	395.000k	39.7	+9.8	+0.0			-80.0	-30.5	15.7	-46.2	Vert
12	455.000k	38.2	+9.7	+0.0			-80.0	-32.1	14.4	-46.5	Vert

CKC Laboratories, Inc. Date: 10/5/2012 Time: 09:10:16 IDTECH WO#: 93957
15.209 Radiated Emissions Test Distance: 3 Meters Sequence#: 1 Ext ATTN: 0 dB



Test Location: CKC Laboratories • 5046 Sierra Pines Dr. • Mariposa, CA 95338 • (209) 966-5240

Customer: **IDTECH**
Specification: **15.225 Carrier and Spurious Emissions (13.110-14.010 MHz Transmitter)**
Work Order #: **93597** Date: 9/13/2012
Test Type: **Maximized Emissions** Time: 11:28:09
Equipment: **Iris VRX** Sequence#: 1
Manufacturer: IDTECH Tested By: Chuck Kendall/Eddie Mariscal
Model: IRXV
S/N:

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN02660	Spectrum Analyzer	E4446A	11/3/2011	11/3/2013
T2	ANP01403	Cable	58758-23	6/22/2011	6/22/2013
T3	ANP05904	Cable	32022-2-29094K-144TC	6/22/2011	6/22/2013
T4	AN03155	Preamp	83017A	8/3/2011	8/3/2013
T5	AN03012	Cable	32022-2-29094K-36TC	2/28/2012	2/28/2014
T6	AN00327	Horn Antenna	3115	4/13/2012	4/13/2014
T7	AN01991	Biconilog Antenna	CBL6111C	3/14/2012	3/14/2014
T8	AN00099	Preamp	8447D	3/9/2011	3/9/2013
T9	ANP05686	Cable	RG214/U	1/24/2012	1/24/2014
T10	AN00226	Loop Antenna	6502	3/28/2012	3/28/2014

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Iris VRX*	IDTECH	IRXV	NA

Support Devices:

Function	Manufacturer	Model #	S/N
Linear Power Supply	NA	NA	NA
Laptop	Dell	PP18L	NA

Test Conditions / Notes:

EUT is placed atop a Styrofoam nonconductive support which is placed atop a wooden turntable of height 80cm. Power for EUT is being supplied through linear power supply located on turntable. Data is being transmitted from EUT to splitter via Ethernet cable. Data is then sent from the splitter to Dell laptop also located on turntable.

Frequencies of Interest: 30MHz to 6GHz.
From 30 MHz to 1000MHz: RBW = 120kHz; VBW = 300kHz
From 1GHz to 6GHz: RBW=1MHz: VBW=3MHz

Highest Clock Freq: 180MHz
Transmit Freq: 13.56MHz

Atmospheric Conditions:
Temperature = 20°C
Humidity = 40%
Pressure = 97kPa

Ext Attn: 0 dB

Measurement Data: Reading listed by margin. Test Distance: 3 Meters

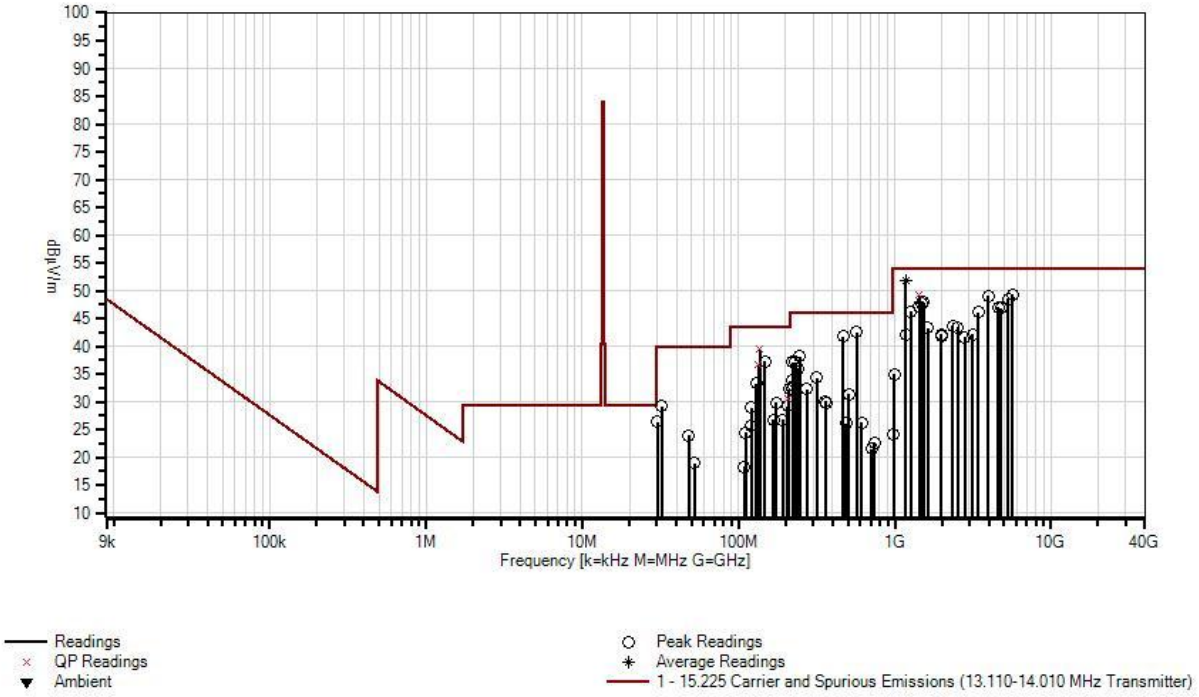
#	Freq	Rdng	T1 T5 T9	T2 T6 T10	T3 T7	T4 T8	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant
1	1170.133M	54.1	+0.0	+1.8	+1.9	-31.1	+0.0	51.7	54.0	-2.3	Horiz
	Ave		+0.5	+24.5	+0.0	+0.0					
			+0.0	+0.0							
^	1170.130M	57.5	+0.0	+1.8	+1.9	-31.1	+0.0	55.1	54.0	+1.1	Horiz
			+0.5	+24.5	+0.0	+0.0					
			+0.0	+0.0							
3	569.240M	48.9	+0.0	+1.0	+1.1	+0.0	+0.0	42.5	46.0	-3.5	Horiz
			+0.4	+0.0	+18.8	-27.7					
			+0.0	+0.0							
4	136.858M	53.1	+0.0	+0.5	+0.6	+0.0	+0.0	39.4	43.5	-4.1	Horiz
	QP		+0.1	+0.0	+12.0	-26.9					
			+0.0	+0.0							
^	136.867M	55.5	+0.0	+0.5	+0.6	+0.0	+0.0	41.8	43.5	-1.7	Horiz
			+0.1	+0.0	+12.0	-26.9					
			+0.0	+0.0							
6	464.803M	49.9	+0.0	+0.9	+1.0	+0.0	+0.0	41.8	46.0	-4.2	Horiz
			+0.3	+0.0	+17.0	-27.3					
			+0.0	+0.0							
7	1440.133M	51.7	+0.0	+2.0	+2.7	-31.1	+0.0	49.2	54.0	-4.8	Horiz
	QP		+0.5	+23.4	+0.0	+0.0					
			+0.0	+0.0							
^	1440.130M	55.0	+0.0	+2.0	+2.7	-31.1	+0.0	52.5	54.0	-1.5	Horiz
			+0.5	+23.4	+0.0	+0.0					
			+0.0	+0.0							
9	5670.500M	36.2	+0.0	+4.6	+3.7	-30.4	+0.0	49.1	54.0	-4.9	Horiz
			+1.2	+33.8	+0.0	+0.0					
			+0.0	+0.0							
10	3960.500M	38.6	+0.0	+3.5	+3.5	-30.5	+0.0	49.0	54.0	-5.0	Horiz
			+1.0	+32.9	+0.0	+0.0					
			+0.0	+0.0							
11	5300.000M	37.8	+0.0	+4.2	+3.0	-30.4	+0.0	48.5	54.0	-5.5	Vert
			+1.1	+32.8	+0.0	+0.0					
			+0.0	+0.0							
12	1530.100M	50.2	+0.0	+2.0	+2.7	-30.9	+0.0	47.9	54.0	-6.1	Horiz
			+0.5	+23.4	+0.0	+0.0					
			+0.0	+0.0							
13	1485.100M	50.2	+0.0	+2.0	+2.7	-30.9	+0.0	47.8	54.0	-6.2	Horiz
			+0.5	+23.3	+0.0	+0.0					
			+0.0	+0.0							
14	146.870M	51.4	+0.0	+0.5	+0.6	+0.0	+0.0	37.3	43.5	-6.2	Horiz
			+0.2	+0.0	+11.4	-26.8					
			+0.0	+0.0							
15	134.729M	50.5	+0.0	+0.5	+0.6	+0.0	+0.0	36.6	43.5	-6.9	Vert
	QP		+0.1	+0.0	+11.8	-26.9					
			+0.0	+0.0							

^	134.733M	52.8	+0.0 +0.1 +0.0	+0.5 +0.0 +0.0	+0.6 +11.8	+0.0 -26.9	+0.0	38.9	43.5	-4.6	Vert
17	1440.000M	49.6	+0.0 +0.5 +0.0	+2.0 +23.4 +0.0	+2.7 +0.0	-31.1 +0.0	+0.0	47.1	54.0	-6.9	Vert
18	4580.000M	37.5	+0.0 +1.1 +0.0	+3.9 +31.7 +0.0	+3.2 +0.0	-30.4 +0.0	+0.0	47.0	54.0	-7.0	Vert
19	4770.500M	37.0	+0.0 +1.1 +0.0	+4.0 +31.6 +0.0	+3.5 +0.0	-30.4 +0.0	+0.0	46.8	54.0	-7.2	Horiz
20	1260.100M	48.6	+0.0 +0.5 +0.0	+1.9 +24.1 +0.0	+2.1 +0.0	-31.0 +0.0	+0.0	46.2	54.0	-7.8	Horiz
21	247.317M	50.3	+0.0 +0.2 +0.0	+0.7 +0.0 +0.0	+0.8 +12.1	+0.0 -25.9	+0.0	38.2	46.0	-7.8	Vert
22	3425.000M	39.8	+0.0 +0.8 +0.0	+3.3 +29.6 +0.0	+3.1 +0.0	-30.5 +0.0	+0.0	46.1	54.0	-7.9	Vert
23	228.958M	51.0	+0.0 +0.2 +0.0	+0.6 +0.0 +0.0	+0.8 +10.8	+0.0 -26.2	+0.0	37.2	46.0	-8.8	Vert
24	222.730M	51.4	+0.0 +0.2 +0.0	+0.6 +0.0 +0.0	+0.8 +10.4	+0.0 -26.3	+0.0	37.1	46.0	-8.9	Horiz
25	238.175M	48.9	+0.0 +0.2 +0.0	+0.6 +0.0 +0.0	+0.8 +11.5	+0.0 -26.1	+0.0	35.9	46.0	-10.1	Vert
26	130.570M	47.7	+0.0 +0.1 +0.0	+0.5 +0.0 +0.0	+0.6 +11.3	+0.0 -26.9	+0.0	33.3	43.5	-10.2	Vert
27	2340.500M	40.4	+0.0 +0.7 +0.0	+2.5 +28.2 +0.0	+2.6 +0.0	-30.8 +0.0	+0.0	43.6	54.0	-10.4	Horiz
28	2522.000M	40.4	+0.0 +0.7 +0.0	+2.7 +28.7 +0.0	+1.6 +0.0	-30.7 +0.0	+0.0	43.4	54.0	-10.6	Vert
29	1620.000M	44.5	+0.0 +0.6 +0.0	+2.1 +24.1 +0.0	+2.7 +0.0	-30.8 +0.0	+0.0	43.2	54.0	-10.8	Vert
30	32.092M	38.9	+0.0 +0.0 +0.0	+0.2 +0.0 +0.0	+0.3 +16.8	+0.0 -27.0	+0.0	29.2	40.0	-10.8	Horiz
31	211.233M	47.6	+0.0 +0.2 +0.0	+0.6 +0.0 +0.0	+0.7 +9.5	+0.0 -26.3	+0.0	32.3	43.5	-11.2	Vert
32	315.280M	45.3	+0.0 +0.2 +0.0	+0.8 +0.0 +0.0	+0.9 +13.4	+0.0 -26.3	+0.0	34.3	46.0	-11.7	Horiz

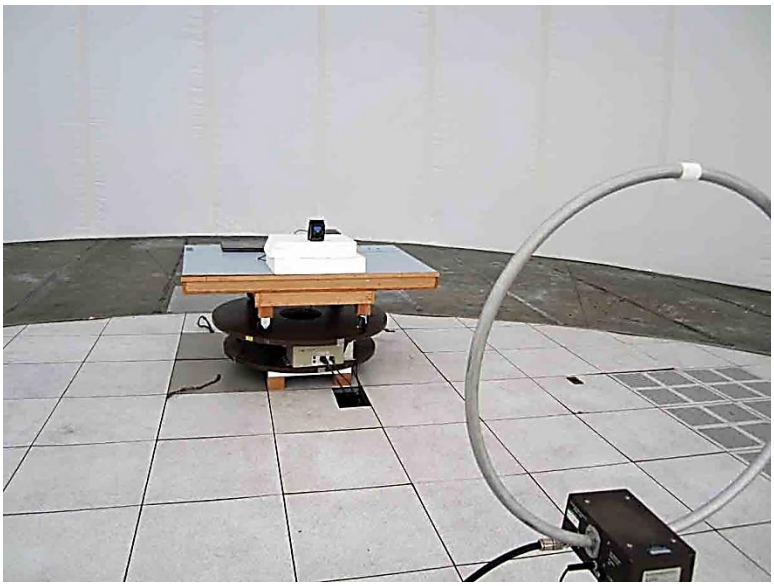
33	1980.100M	40.9	+0.0 +0.7 +0.0	+2.3 +26.6 +0.0	+2.3 +0.0	-30.6 +0.0	+0.0	42.2	54.0	-11.8	Horiz
34	3150.500M	39.0	+0.0 +0.8 +0.0	+3.0 +27.3 +0.0	+2.6 +0.0	-30.6 +0.0	+0.0	42.1	54.0	-11.9	Horiz
35	1170.000M	44.4	+0.0 +0.5 +0.0	+1.8 +24.5 +0.0	+1.9 +0.0	-31.1 +0.0	+0.0	42.0	54.0	-12.0	Vert
36	1980.000M	40.6	+0.0 +0.7 +0.0	+2.3 +26.6 +0.0	+2.3 +0.0	-30.6 +0.0	+0.0	41.9	54.0	-12.1	Vert
37	222.150M	48.3	+0.0 +0.2 +0.0	+0.6 +0.0 +0.0	+0.8 +10.3	+0.0 -26.3	+0.0	33.9	46.0	-12.1	Vert
38	2790.500M	39.1	+0.0 +0.8 +0.0	+2.9 +27.1 +0.0	+2.4 +0.0	-30.7 +0.0	+0.0	41.6	54.0	-12.4	Horiz
39	207.833M QP	46.2	+0.0 +0.2 +0.0	+0.6 +0.0 +0.0	+0.7 +9.2	+0.0 -26.3	+0.0	30.6	43.5	-12.9	Horiz
^	207.833M	55.6	+0.0 +0.2 +0.0	+0.6 +0.0 +0.0	+0.7 +9.2	+0.0 -26.3	+0.0	40.0	43.5	-3.5	Horiz
41	226.500M	46.9	+0.0 +0.2 +0.0	+0.6 +0.0 +0.0	+0.8 +10.7	+0.0 -26.3	+0.0	32.9	46.0	-13.1	Vert
42	30.242M	35.1	+0.0 +0.0 +0.0	+0.2 +0.0 +0.0	+0.3 +17.8	+0.0 -27.0	+0.0	26.4	40.0	-13.6	Vert
43	173.770M	45.5	+0.0 +0.2 +0.0	+0.5 +0.0 +0.0	+0.7 +9.8	+0.0 -26.8	+0.0	29.9	43.5	-13.6	Horiz
44	220.967M	46.8	+0.0 +0.2 +0.0	+0.6 +0.0 +0.0	+0.7 +10.3	+0.0 -26.3	+0.0	32.3	46.0	-13.7	Vert
45	272.880M	44.2	+0.0 +0.2 +0.0	+0.7 +0.0 +0.0	+0.9 +12.6	+0.0 -26.3	+0.0	32.3	46.0	-13.7	Vert
46	206.208M	44.9	+0.0 +0.2 +0.0	+0.6 +0.0 +0.0	+0.7 +9.1	+0.0 -26.3	+0.0	29.2	43.5	-14.3	Vert
47	120.758M	44.0	+0.0 +0.1 +0.0	+0.5 +0.0 +0.0	+0.6 +10.7	+0.0 -26.9	+0.0	29.0	43.5	-14.5	Horiz
48	505.320M	38.6	+0.0 +0.3 +0.0	+1.0 +0.0 +0.0	+1.0 +17.8	+0.0 -27.4	+0.0	31.3	46.0	-14.7	Vert
49	358.530M	40.0	+0.0 +0.3 +0.0	+0.8 +0.0 +0.0	+1.0 +14.6	+0.0 -26.7	+0.0	30.0	46.0	-16.0	Horiz

50	47.970M	40.6	+0.0 +0.1 +0.0	+0.3 +0.0 +0.0	+0.4 +9.3	+0.0 -26.7	+0.0	24.0	40.0	-16.0	Vert
51	363.320M	39.5	+0.0 +0.3 +0.0	+0.8 +0.0 +0.0	+1.0 +14.7	+0.0 -26.7	+0.0	29.6	46.0	-16.4	Vert
52	192.270M	42.8	+0.0 +0.2 +0.0	+0.6 +0.0 +0.0	+0.7 +8.9	+0.0 -26.4	+0.0	26.8	43.5	-16.7	Horiz
53	167.583M	42.3	+0.0 +0.2 +0.0	+0.5 +0.0 +0.0	+0.6 +9.9	+0.0 -26.8	+0.0	26.7	43.5	-16.8	Vert
54	120.620M	40.8	+0.0 +0.1 +0.0	+0.5 +0.0 +0.0	+0.6 +10.7	+0.0 -26.9	+0.0	25.8	43.5	-17.7	Vert
55	111.458M	39.7	+0.0 +0.1 +0.0	+0.4 +0.0 +0.0	+0.5 +10.5	+0.0 -26.8	+0.0	24.4	43.5	-19.1	Horiz
56	990.008M	37.0	+0.0 +0.5 +0.0	+1.3 +0.0 +0.0	+1.3 +21.5	+0.0 -26.7	+0.0	34.9	54.0	-19.1	Vert
57	613.490M	32.0	+0.0 +0.4 +0.0	+1.1 +0.0 +0.0	+1.1 +19.2	+0.0 -27.6	+0.0	26.2	46.0	-19.8	Horiz
58	489.050M	33.6	+0.0 +0.3 +0.0	+1.0 +0.0 +0.0	+1.0 +17.5	+0.0 -27.3	+0.0	26.1	46.0	-19.9	Horiz
59	52.258M	36.7	+0.0 +0.1 +0.0	+0.3 +0.0 +0.0	+0.4 +8.1	+0.0 -26.7	+0.0	18.9	40.0	-21.1	Horiz
60	743.320M	27.7	+0.0 +0.4 +0.0	+1.2 +0.0 +0.0	+1.2 +19.9	+0.0 -27.8	+0.0	22.6	46.0	-23.4	Vert
61	707.740M	27.1	+0.0 +0.4 +0.0	+1.2 +0.0 +0.0	+1.2 +19.4	+0.0 -27.8	+0.0	21.5	46.0	-24.5	Horiz
62	109.170M	33.5	+0.0 +0.1 +0.0	+0.4 +0.0 +0.0	+0.5 +10.5	+0.0 -26.8	+0.0	18.2	43.5	-25.3	Vert
63	978.990M	26.4	+0.0 +0.5 +0.0	+1.3 +0.0 +0.0	+1.3 +21.3	+0.0 -26.7	+0.0	24.1	54.0	-29.9	Horiz

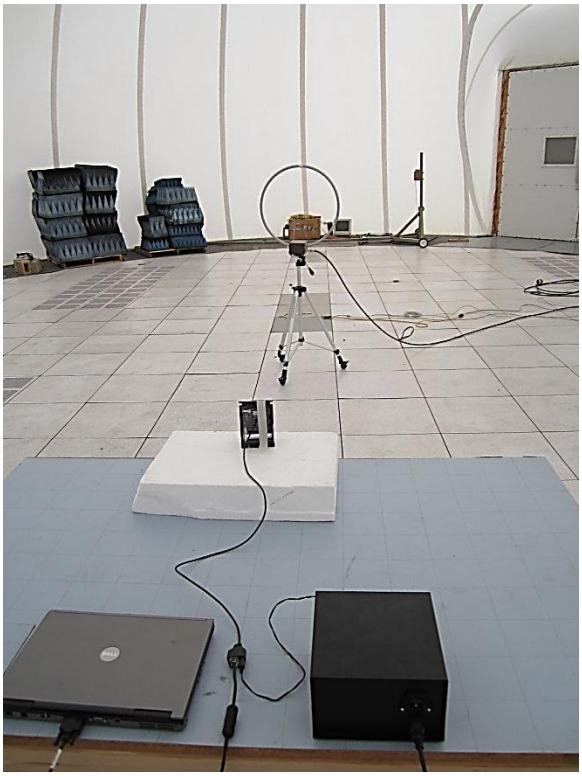
CKC Laboratories Date: 9/13/2012 Time: 11:28:09 IDTECH WO#: 93597
15.225 Carrier and Spurious Emissions (13.110-14.010 MHz Transmitter) Test Distance: 3 Meters Sequence#: 1
Ext ATTN: 0 dB



Test Setup Photos



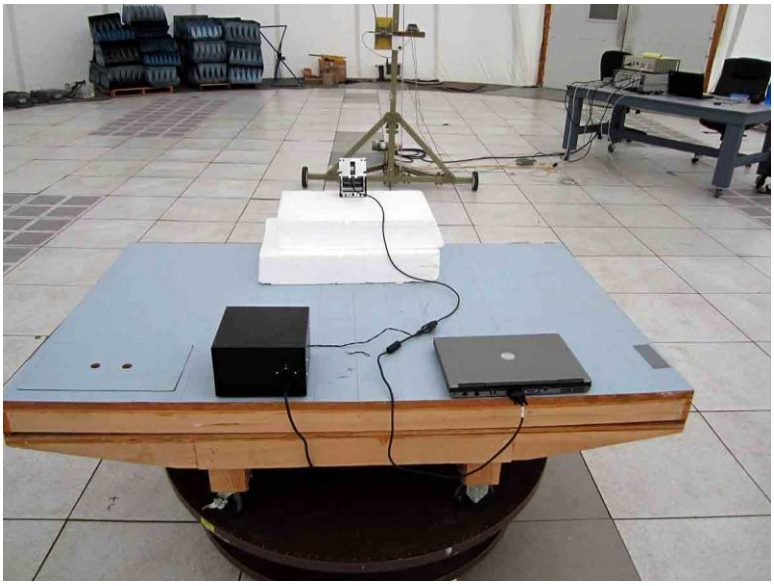
9kHz to 30MHz



9kHz to 30MHz

30MHz-1GHz

1-6GHz



1-6GHz

15.225(e) Frequency Stability

Test Location: CKC Laboratories, Inc. • 5046 Sierra Pines Drive • Mariposa, CA 95338 • 209-966-5240

Customer: **IDTECH**
Specification: **15.225 (e) Frequency Stability**
Work Order #: **93957** Date: 9/10/2012
Test Type: **Maximized Emissions** Time: 11:32:42
Equipment: **Iris VRX** Sequence#: 1
Manufacturer: IDTECH Tested By: Chuck Kendall & Eddie Mariscal
Model: IRXV
S/N: NA

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN00226	Loop Antenna	6502	3/28/2012	3/28/2014
T2	ANP05686	Cable	RG214/U	1/24/2012	1/24/2014
	01879	Temp Chamber	S-1.2Min	12/1/2010	12/1/2012
	P00756	Multimeter	70	7/31/2012	7/31/2014
	AN02660	Spectrum Analyzer	E4446A	3/28/2012	3/28/2014

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Iris VRX*	IDTECH	IRXV	NA

Support Devices:

Function	Manufacturer	Model #	S/N
Linear Power Supply	NA	NA	NA

Test Conditions / Notes:

Equipment is located in a temperature chamber. A loop antenna is set inside the chamber and connected to a spectrum analyzer. Voltage variations are performed using a DC power supply and monitored using a digital volt meter. Enclosure temperature is monitored using a digital thermometer with a sensor attached directly to the case of the EUT. RBW set to 200Hz to ensure accurate readings.

Test Data

Customer:		ID Tech	
WO#:		93597	
Date:		7-Sep-12	
Test Engineer:		Eddie M./Chuck K.	
Test Specification		FCC 15.225(e)	
Device Model #:		IRXV	
Operating Voltage:		12	**VDC**
Frequency Limit:		0.01	**%**
Temperature Variations			
		Freq (MHz)	**Dev. (PPM)**
Channel Frequency:		**13.56**	
Temp (C)	**Voltage**		
-20	12	13.56004	0.00031
-10	12	13.56004	0.00026
0	12	13.56005	0.00040
10	12	13.56006	0.00043
20	12	13.56005	0.00038
30	12	13.56004	0.00027
40	12	13.56002	0.00017
50	12	13.55999	0.00007
Voltage Variations (±15%)			
85%	10.2	13.56005	0.00037
100%	12	13.56005	0.00036
115%	13.8	13.56006	0.00044
Max Deviation (%)			**0.00044**
			PASS

Test Setup Photos

SUPPLEMENTAL INFORMATION

Measurement Uncertainty

Uncertainty Value	Parameter
4.73 dB	Radiated Emissions
3.34 dB	Mains Conducted Emissions
3.30 dB	Disturbance Power

The reported measurement uncertainties are calculated based on the worst case of all laboratory environments from CKC Laboratories, Inc. test sites. Only those parameters which require estimation of measurement uncertainty are reported. The reported worst case measurement uncertainty is less than the maximum values derived in CISPR 16-4-2. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k=2. Compliance is deemed to occur provided measurements are below the specified limits.

Emissions Test Details

TESTING PARAMETERS

Unless otherwise indicated, the following configuration parameters are used for equipment setup: The cables were routed consistent with the typical application by varying the configuration of the test sample. Interface cables were connected to the available ports of the test unit. The effect of varying the position of the cables was investigated to find the configuration that produced maximum emissions. Cables were of the type and length specified in the individual requirements. The length of cable that produced maximum emissions was selected.

The equipment under test (EUT) was set up in a manner that represented its normal use, as shown in the setup photographs. Any special conditions required for the EUT to operate normally are identified in the comments that accompany the emissions tables.

The emissions data was taken with a spectrum analyzer or receiver. Incorporating the applicable correction factors for distance, antenna, cable loss and amplifier gain, the data was reduced as shown in the table below. The corrected data was then compared to the applicable emission limits. Preliminary and final measurements were taken in order to ensure that all emissions from the EUT were found and maximized.

CORRECTION FACTORS

The basic spectrum analyzer reading was converted using correction factors as shown in the highest emissions readings in the tables. For radiated emissions in dBµV/m, the spectrum analyzer reading in dBµV was corrected by using the following formula. This reading was then compared to the applicable specification limit.

SAMPLE CALCULATIONS		
	Meter reading	(dBµV)
+	Antenna Factor	(dB)
+	Cable Loss	(dB)
-	Distance Correction	(dB)
-	Preamplifier Gain	(dB)
=	Corrected Reading	(dBµV/m)

TEST INSTRUMENTATION AND ANALYZER SETTINGS

The test instrumentation and equipment listed were used to collect the emissions data. A spectrum analyzer or receiver was used for all measurements. Unless otherwise specified, the following table shows the measuring equipment bandwidth settings that were used in designated frequency bands. For testing emissions, an appropriate reference level and a vertical scale size of 10 dB per division were used.

MEASURING EQUIPMENT BANDWIDTH SETTINGS PER FREQUENCY RANGE			
TEST	BEGINNING FREQUENCY	ENDING FREQUENCY	BANDWIDTH SETTING
CONDUCTED EMISSIONS	150 kHz	30 MHz	9 kHz
RADIATED EMISSIONS	9 kHz	150 kHz	200 Hz
RADIATED EMISSIONS	150 kHz	30 MHz	9 kHz
RADIATED EMISSIONS	30 MHz	1000 MHz	120 kHz
RADIATED EMISSIONS	1000 MHz	>1 GHz	1 MHz

SPECTRUM ANALYZER/RECEIVER DETECTOR FUNCTIONS

The notes that accompany the measurements contained in the emissions tables indicate the type of detector function used to obtain the given readings. Unless otherwise noted, all readings were made in the "positive peak" detector mode. Whenever a "quasi-peak" or "average" reading was recorded, the measurement was annotated with a "QP" or an "Ave" on the appropriate rows of the data sheets. In cases where quasi-peak or average limits were employed and data exists for multiple measurement types for the same frequency then the peak measurement was retained in the report for reference, however the numbering for the affected row was removed and an arrow or carrot ("^") was placed in the far left-hand column indicating that the row above takes precedence for comparison to the limit. The following paragraphs describe in more detail the detector functions and when they were used to obtain the emissions data.

Peak

In this mode, the spectrum analyzer or receiver recorded all emissions at their peak value as the frequency band selected was scanned. By combining this function with another feature called "peak hold," the measurement device had the ability to measure intermittent or low duty cycle transient emission peak levels. In this mode the measuring device made a slow scan across the frequency band selected and measured the peak emission value found at each frequency across the band.

Quasi-Peak

Quasi-peak measurements were taken using the quasi-peak detector when the true peak values exceeded or were within 2 dB of a quasi-peak specification limit. Additional QP measurements may have been taken at the discretion of the operator.

Average

Average measurements were taken using the average detector when the true peak values exceeded or were within 2 dB of an average specification limit. Additional average measurements may have been taken at the discretion of the operator. If the specification or test procedure requires trace averaging, then the averaging was performed using 100 samples or as required by the specification. All other average measurements are performed using video bandwidth averaging. To make these measurements, the test engineer reduces the video bandwidth on the measuring device until the modulation of the signal is filtered out. At this point the measuring device is set into the linear mode and the scan time is reduced.