FCC 47 CFR PART 15 SUBPART C
INDUSTRY CANADA RSS-210 ISSUE 8

CERTIFICATION TEST REPORT

FOR

900MHz FHSS RF ID Reader Radio

MODEL NUMBER: RFC-6100XR

FCC ID: WFQRFC-6100XR
IC: 10717A-RFC6100XR

REPORT NUMBER: 10185788A

ISSUE DATE: April 11, 2014

Prepared for
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Saint Louis, MO 63104

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NVLAP LAB CODE 100414-0

Revision History

Rev.	Issue Date	Revisions	Revised By
--	April 11, 2014	Initial Issue	BM

UL VERIFICATION SERVICES INC.
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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: **RF Controls LLC**
1400 South 3rd Street
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EUT DESCRIPTION: 900MHz FHSS RF ID Reader Radio

MODEL: RFC-6100XR

SERIAL NUMBER: Prototype

DATE TESTED: January 2014 to February 2014

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
CFR 47 Part 15 Subpart C	Pass
INDUSTRY CANADA RSS-210 Issue 8 Annex 8	Pass
INDUSTRY CANADA RSS-GEN Issue 3	Pass
FCC DA 00-705, Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems.	

UL Verification Services Inc. 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 Verification Services Inc. 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 Verification Services Inc. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Verification Services Inc. 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 Verification Services Inc. By:

Michael Ferrer
EMC Engineer
UL Verification Services Inc.

Tested By:

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EMC ENGINEER
UL Verification Services Inc.

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.10-2009, FCC CFR 47 Part 2, FCC CFR 47 Part 15, RSS-GEN Issue 3, and RSS-210 Issue 8, FCC publication DA 00-705.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 333 Pfingsten Road, Northbrook, IL, USA.

UL Verification Services Inc. is accredited by NVLAP, Laboratory Code 100414-0. The full scope of accreditation can be viewed at http://ts.nist.gov/standards/scopes/100414.htm.

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:

Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB)

36.5 dBuV + 18.7 dB/m + 0.6 dB – 26.9 dB = 28.9 dBuV/m

4.3. MEASUREMENT UNCERTAINTY

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

Test	Range	Equipment	Uncertainty k=2
Conducted Emissions	150k-30MHz	LISN	2.29dB
Radiated Emissions	30-200MHz	Bicon 3m Horz	3.30dB
Radiated Emissions	30-130MHz	Bicon 3m Vert	4.84dB
Radiated Emissions	130-200MHz	Bicon 3m Vert	4.94dB
Radiated Emissions	200-1000MHz	LogP 3m Horz	3.46dB
Radiated Emissions	200-1000MHz	LogP 3m Vert	4.98dB
Radiated Emissions	30-200MHz	Bicon 10m Horz	4.27dB
Radiated Emissions	30-200MHz	Bicon 10m Vert	4.28dB
Radiated Emissions	200-1000MHz	LogP 10m Horz	3.33dB
Radiated Emissions	200-1000MHz	LogP 10m Vert	3.39dB
Radiated Emissions	1-6GHz	Horn	5.02dB
Radiated Emissions	6-18GHz	Horn	5.34dB
Radiated Emissions	18-26GHz	Horn	6.60dB
Radiated Emissions	26-40GHz	Horn	7.02dB

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

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT (Equipment Under Test) is a 900MHz FHSS RF ID Reader.

The radio module is manufactured by RF Controls LLC

5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum peak conducted output power as follows:

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
902-928	T6.25	29.51	892.28

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes an Generic Patch Circularly Polarized Antenna with a maximum gain of 5.5dBi.

5.4. SOFTWARE AND FIRMWARE

The firmware installed in the EUT during testing was RFRFCC000b031914, rev. 00b.
The EUT driver software installed in the host support equipment during testing was EthtoSerialConfig.application, rev. 1.0.0.42.
The test utility software used during testing was EthtoSerialConfig.application, rev. 1.0.0.42.

5.5. WORST-CASE CONFIGURATION AND MODE

EUT can operate in three different modulation modes described by manufacturer as T6.25 (largest bandwidth), T12.5 (medium bandwidth), and T25 (smallest bandwidth). Preliminary measurements showed that the output power does not change with the bandwidth change. The only measurements conducted with all three bandwidths were the bandwidth measurements and the band-edge measurements.

The EUT can be powered by either external DC power supply or PoE. Different powering modes for the EUT does not change the radio characteristics.

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
Laptopt Computer	Generic	-	-	-
PoE Adapter	Generic	-	-	

I/O CABLES

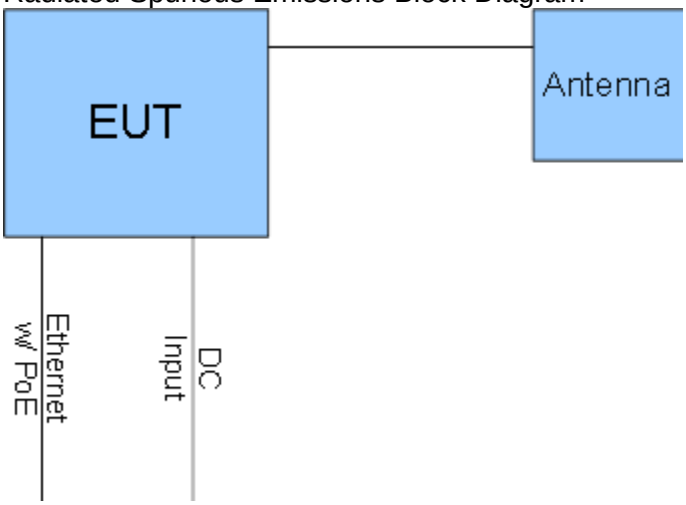
I/O Cable List						
Cable No	**Port**	**# of identical ports**	**Connector Type**	**Cable Type**	**Cable Length (m)**	**Remarks**
0	Enclosure	1	n/a	n/a	n/a	-
1	Ethernet	1	RJ-45	Cat5 or Cat6	> 3m	Standard Ethernet or PoE Ethernet
2	DC Input	1	Round	2-wire	< 3m	12-24V DC Input
3	RF Port	1	UHF-f	Coax	> 3m	50OHm In/Out Ant Port

TEST SETUP

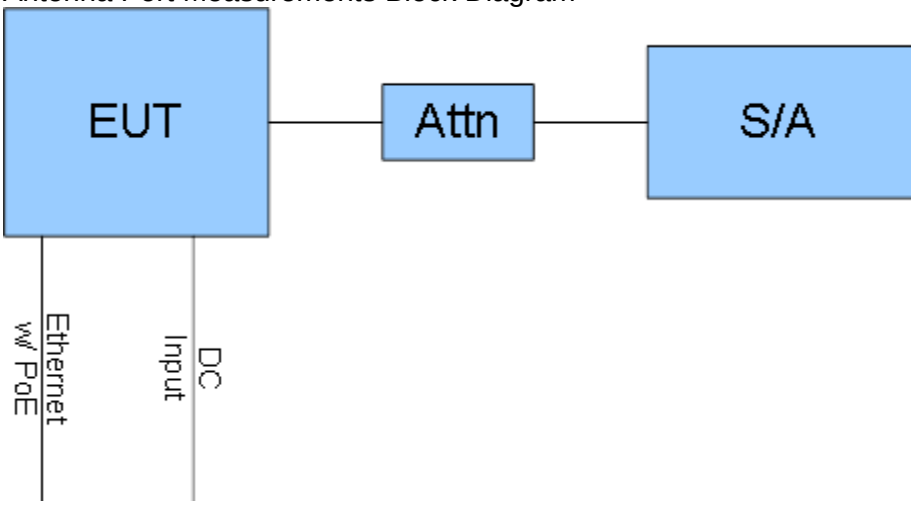
The EUT is a fully functional, standalone device that incorporates a 900MHz FHSS RF Transceiver. It was tested as such with standard 5.5dBi antenna attached. EUT can be powered via external DC power supply (not provided by the manufacturer) or 48V PoE adapter.

SETUP DIAGRAM FOR TESTS

Radiated Spurious Emissions Block Diagram



Antenna Port Measurements Block Diagram



6. TEST AND MEASUREMENT EQUIPMENT

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

Radiated Emissions – 10-Meter Chamber and Antenna Port

Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due Date
EMI Test Receiver	Rohde & Schwarz	ESU	EMC4323	20131227	20141231
Bicon Antenna	Chase	VBA6106A	EMC4078	20130213	20140228
Log-P Antenna	Chase	UPA6109	EMC4313	20131003	20141003
Spectrum Analyzer	Rhode & Schwarz	FSEK	EMC4182	20131226	20141231
Antenna Array	UL	BOMS	EMC4276	20130912	20140930
Spectrum Analyzer	Agilent	N9030A (PXA)	EMC4360	20131221	20141221
Attenuator	-	-	-	*-	*-
* Characterized at the time of testing.					

Conducted Emissions

Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due Date
EMI Test Receiver	Rohde & Schwarz	ESCI	EMC4328	Dec 30, 2013	Dec 30, 2014
Transient Limiter	Electro-Metrics	EM7600-2	EMC4224	N/A	N/A
HighPass Filter	Solar Electronics	2803-150	885551	N/A	N/A
Attenuator	HP	8494B	2831A00838	N/A	N/A
LISN - L1	Solar	8602-50-TS-50-N	EMC4052	Jan 15, 2014	Jan 16, 2015
LISN - L2	Solar	8602-50-TS-50-N	EMC4064	Jan 15, 2014	Jan 16, 2015
ISN	Teseq	ISN T8-Cat6	EMC4345	Jan 15, 2014	Jan 16, 2015

7. ANTENNA PORT TEST RESULTS

7.1.1. 20 dB AND 99% BANDWIDTH

LIMIT

None; for reporting purposes only.

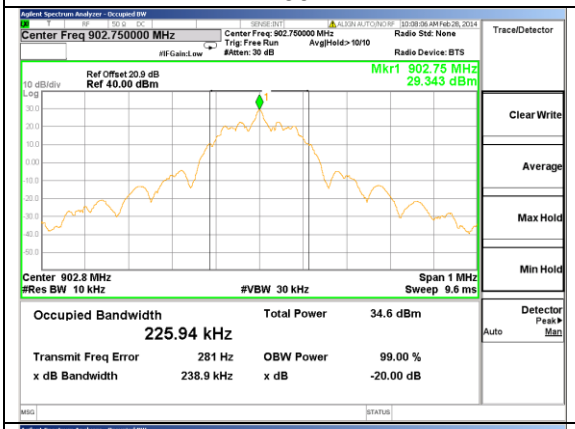
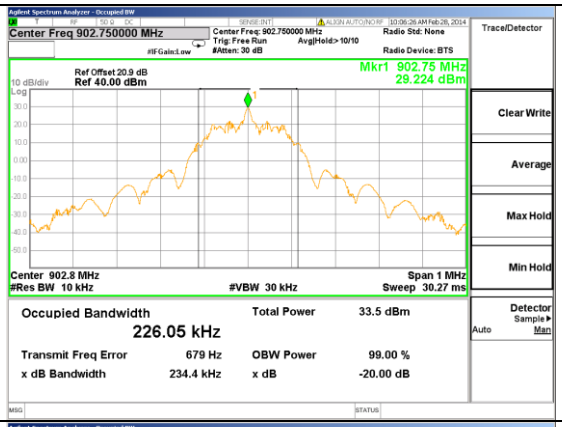
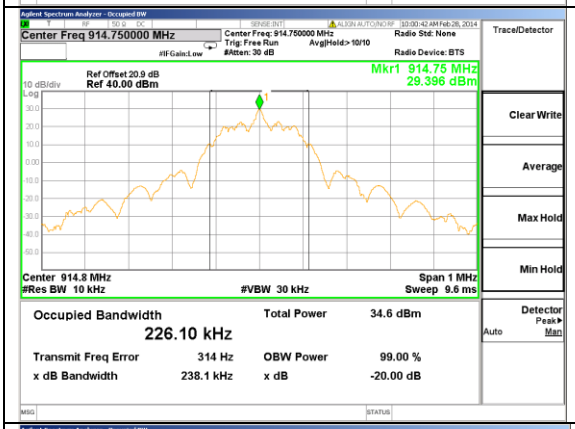
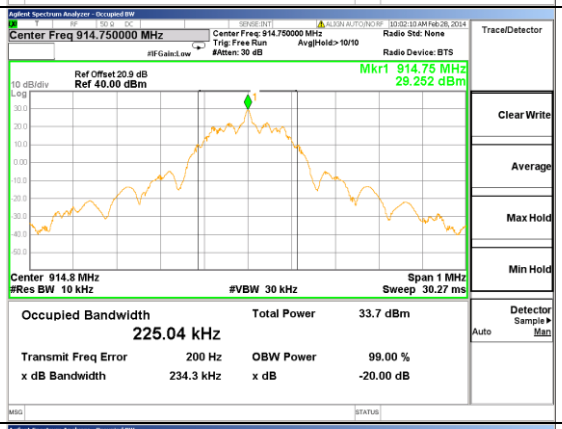
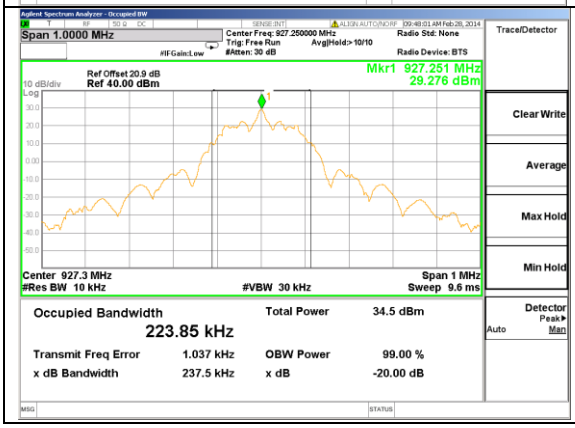
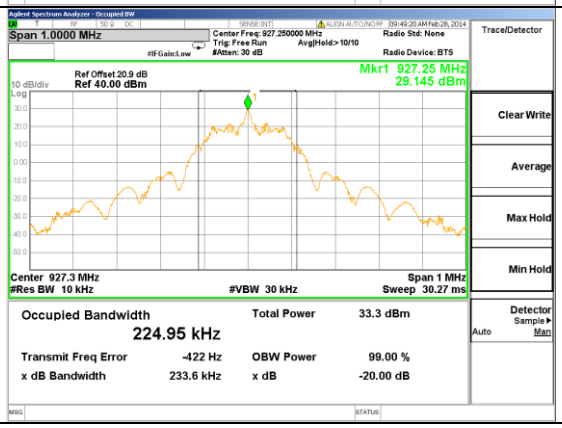
TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The RBW is set to ≥ 1% of the span. The VBW is set to ≥ RBW. The sweep time is coupled.

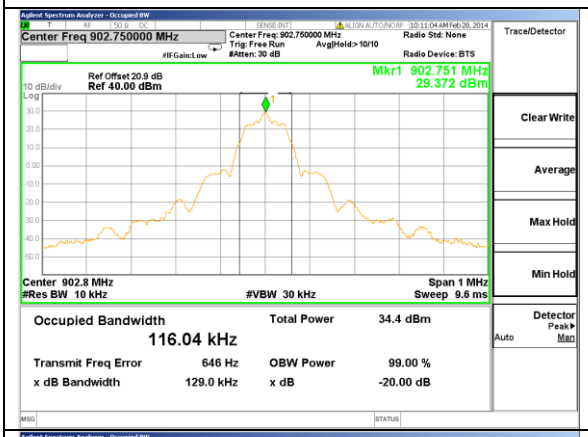
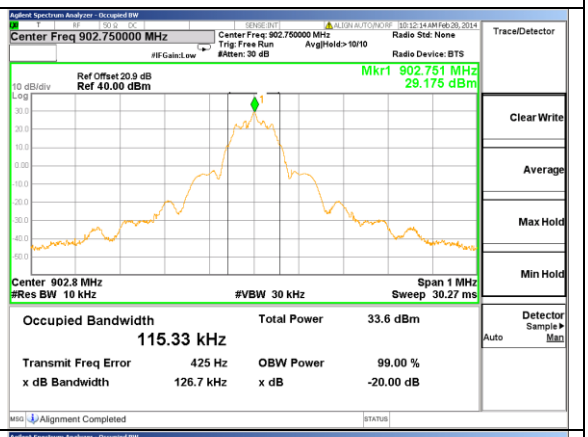
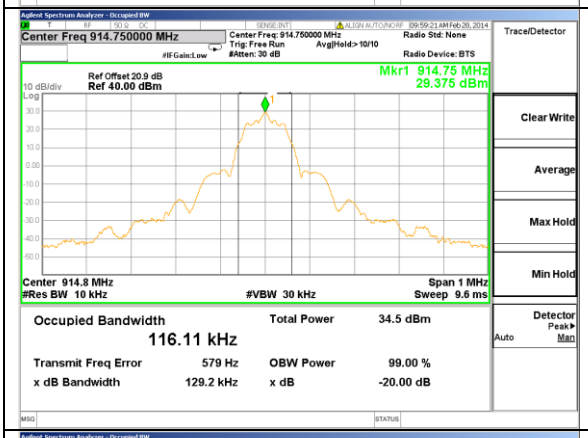
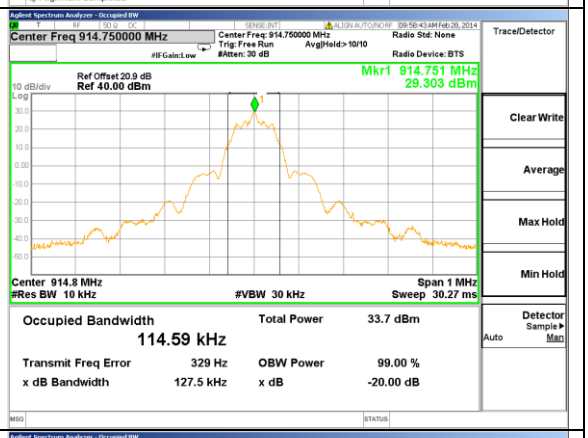
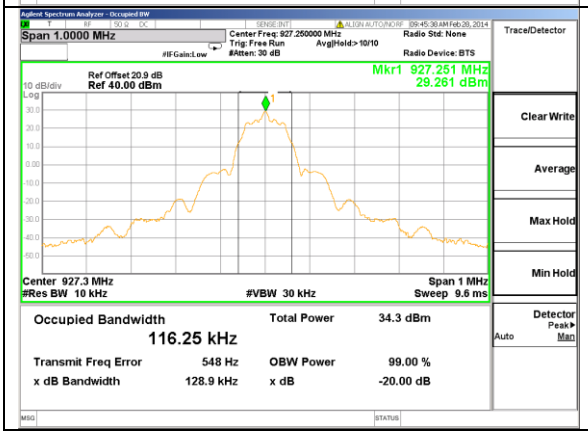
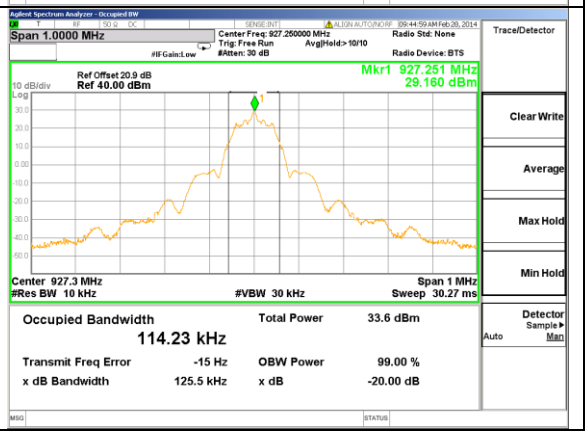
RESULTS

Channel	T=6.25 BW kHz		T=12.5 BW kHz		T=25 BW kHz	
	20dB BW	99% BW	20dB BW	99% BW	20dB BW	99% BW
Low	238.9	226.05	129.0	115.33	85.13	76.25
Middle	238.1	225.04	129.2	114.59	85.46	76.47
High	237.5	224.95	128.9	114.23	85.26	76.49

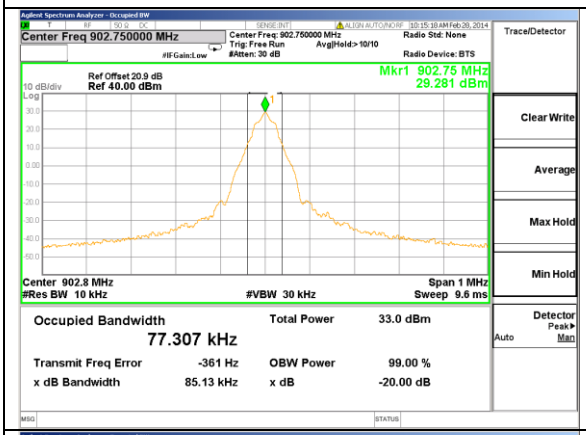
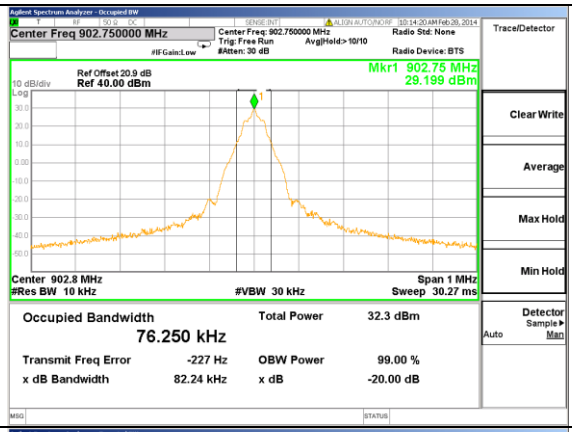
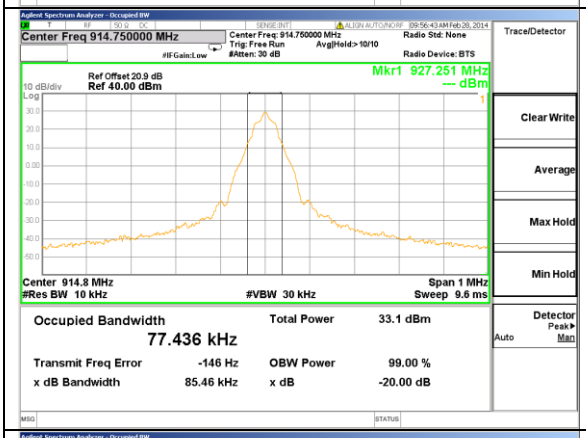
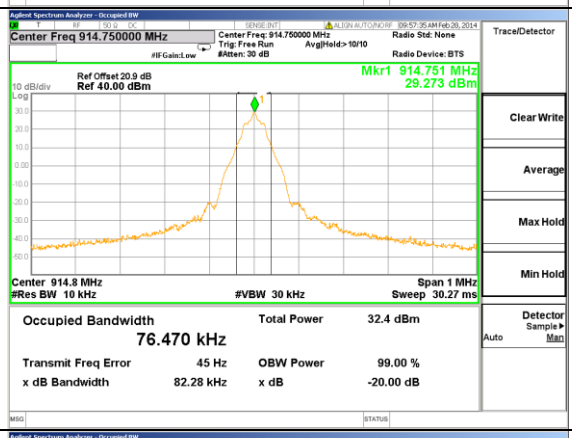
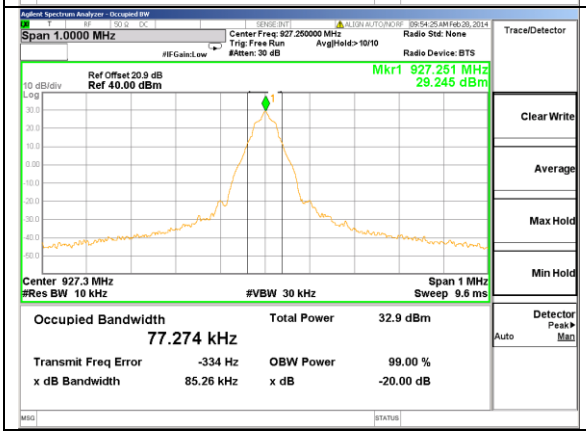
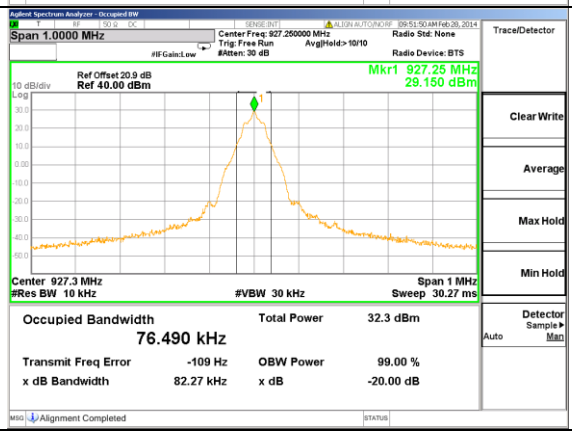
20 dB AND 99% BANDWIDTH for T=6.25

20dB	99%
	
	
	

20 dB AND 99% BANDWIDTH for T=12.5

20dB	99%
	
	
	

20 dB AND 99% BANDWIDTH for T=25

20dB	99%
	
	
	

7.1.2. HOPPING FREQUENCY SEPARATION

LIMIT

FCC §15.247 (a) (1)

IC RSS-210 A8.1 (b)

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hoping channel, whichever is greater.

TEST PROCEDURE

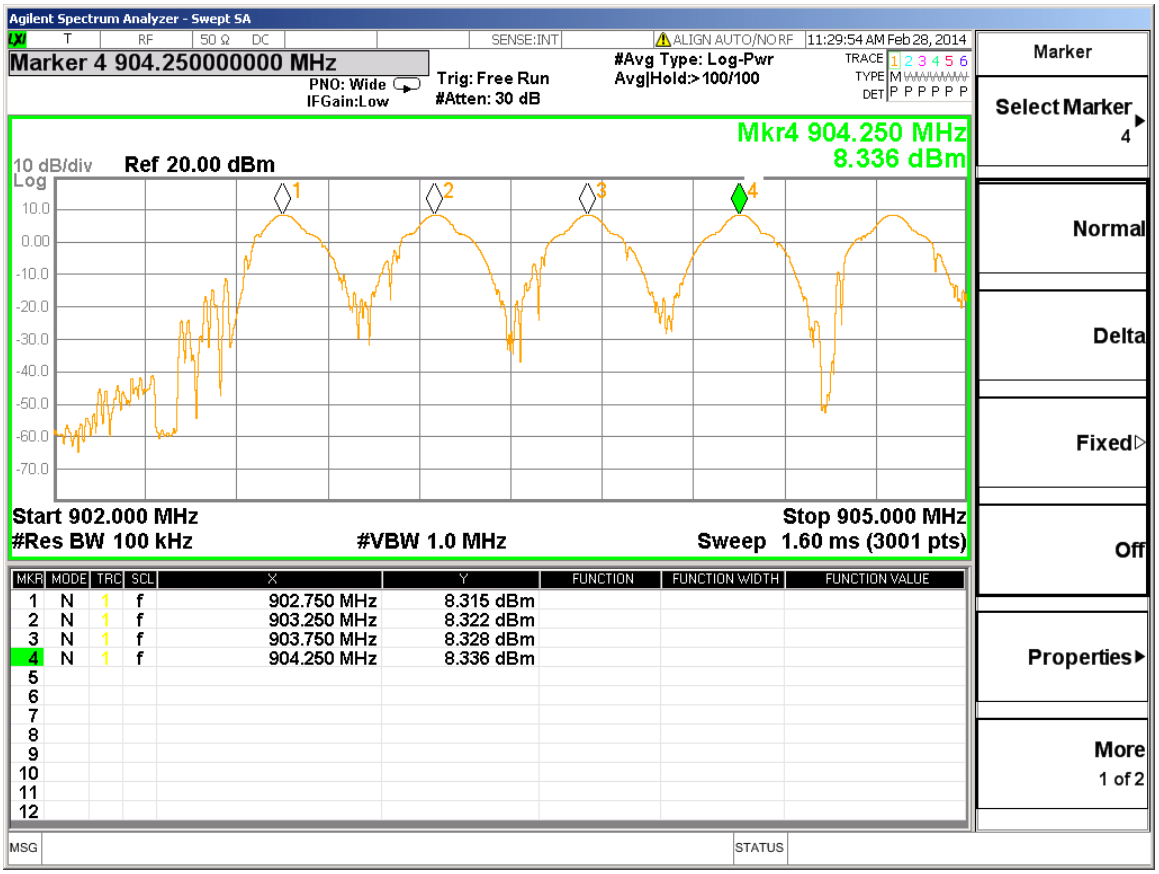
The transmitter output is connected to a spectrum analyzer. The RBW is set to 100 kHz and the VBW is set to 100 kHz. The sweep time is coupled.

RESULTS

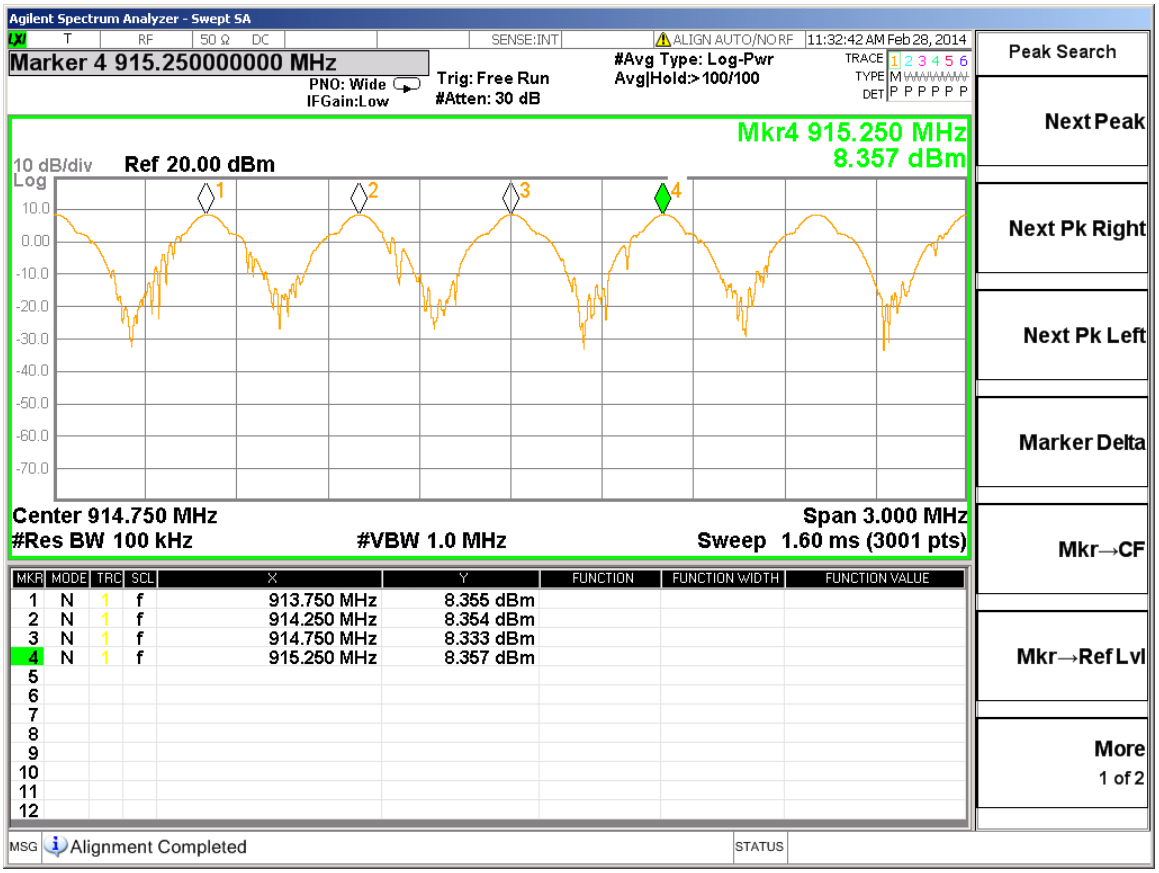
In all cases the frequency separation is 500kHz. There was no difference in bandwidth with different modulation applied.

HOPPING FREQUENCY SEPARATION

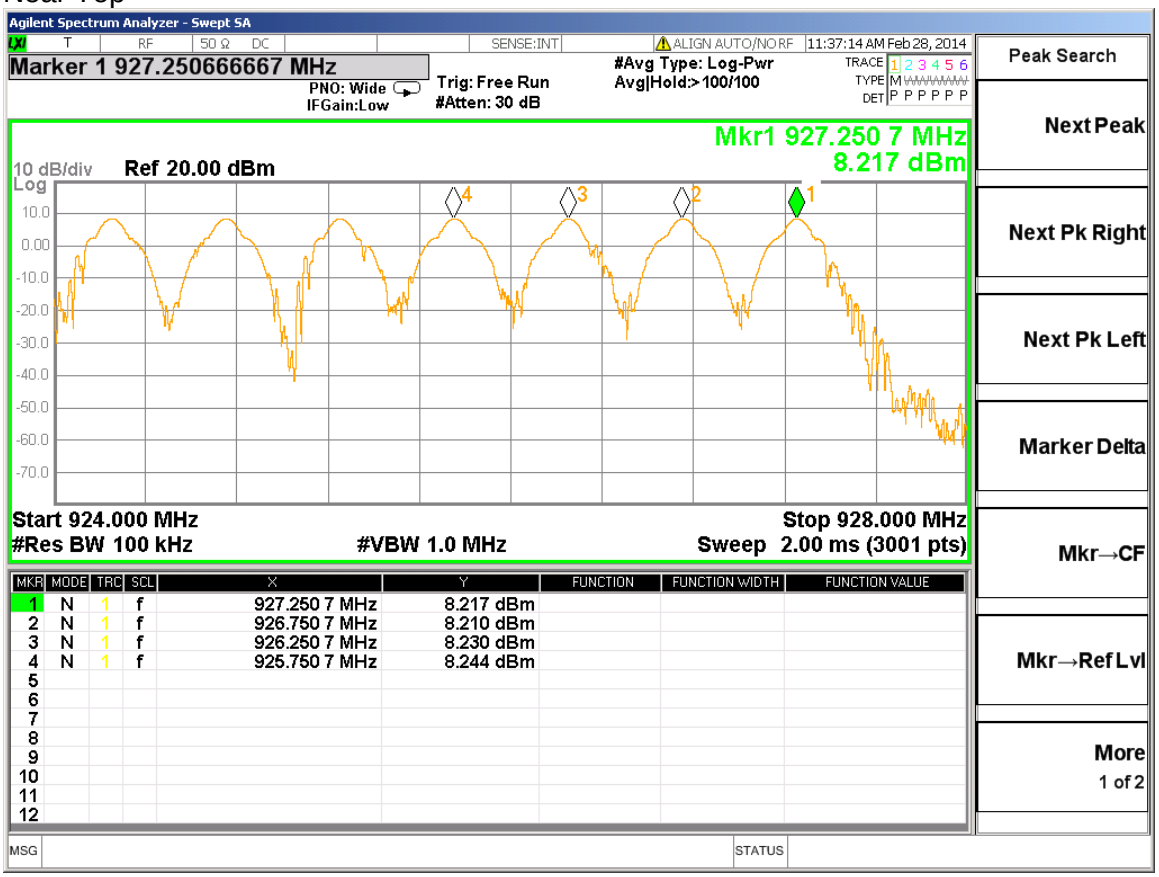
Near Bottom



Near Center



Near Top



7.1.3. NUMBER OF HOPPING CHANNELS

LIMIT

FCC §15.247 (a) (1) (i)

IC RSS-210 A8.1 (c)

For frequency hopping systems in the band 902-928 MHz: if the -20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping channels and the average time of occupancy on any channel shall not be greater than 0.4 seconds within a 20-second period. If the -20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping channels and the average time of occupancy on any channel shall not be greater than 0.4 seconds within a 10-second period. The maximum allowed -20 dB bandwidth of the hopping channel is 500 kHz.

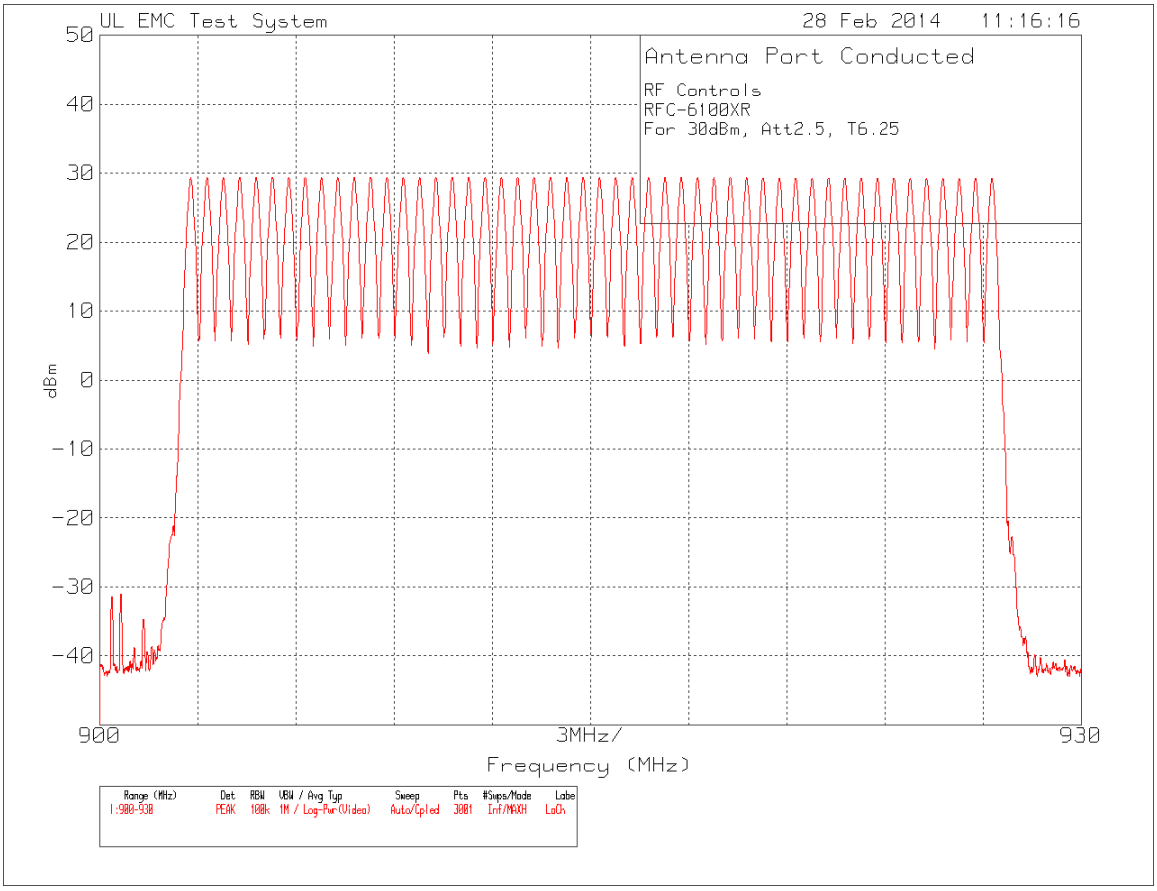
TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The span is set to cover the entire authorized band, in either a single sweep or in multiple contiguous sweeps. The RBW is set to a maximum of 1 % of the span. The analyzer is set to Max Hold.

RESULTS

Total number of channels is 50, regardless of modulation.

NUMBER OF HOPPING CHANNELS



7.1.4. AVERAGE TIME OF OCCUPANCY

LIMIT

FCC §15.247 (a) (1) (i)

IC RSS-210 A8.1 (c)

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.

TEST PROCEDURE

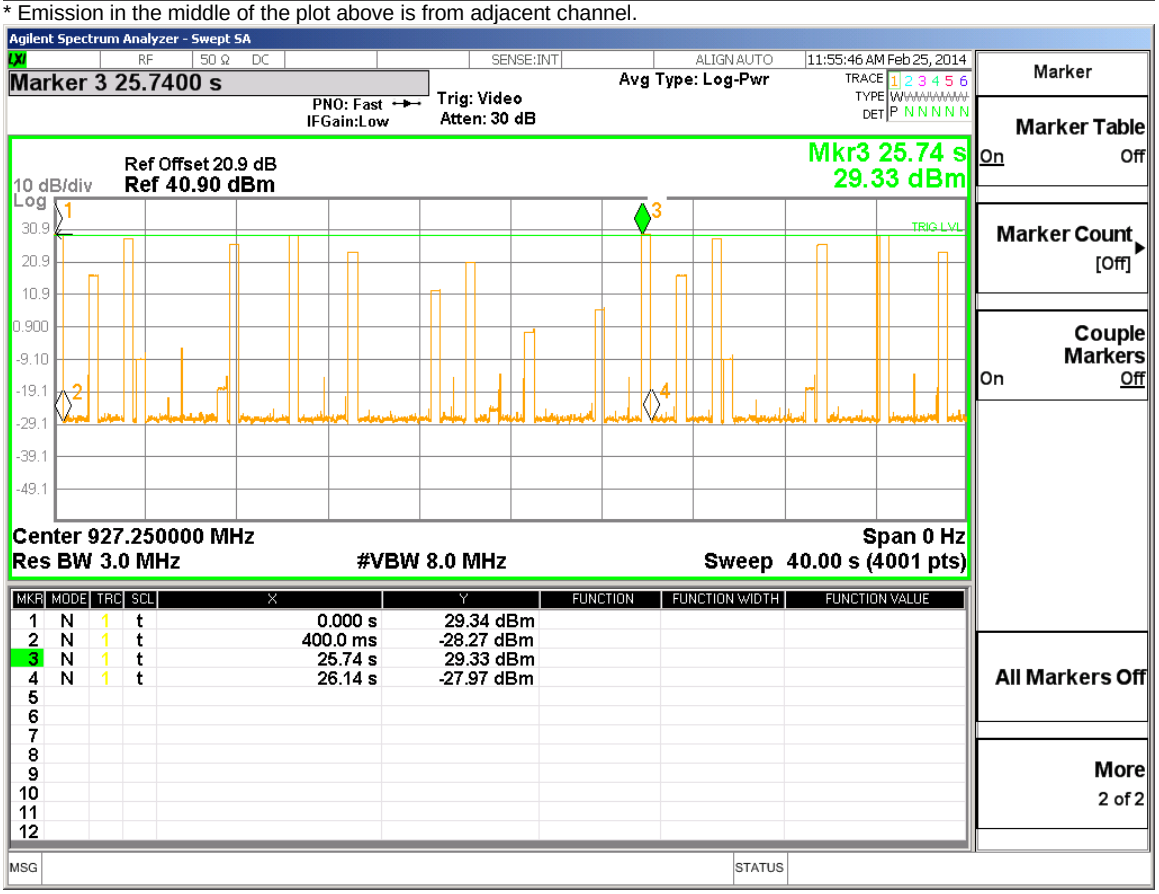
The transmitter output is connected to a spectrum analyzer. The span is set to 0 Hz, centered on a single, selected hopping channel. The width of a single pulse is measured in a fast scan. The number of pulses is measured in a 3.16 second scan, to enable resolution of each occurrence.

For frequency hopping systems in the band 902-928 MHz: if the -20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping channels and the average time of occupancy on any channel shall not be greater than 0.4 seconds within a 20-second period. If the -20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping channels and the average time of occupancy on any channel shall not be greater than 0.4 seconds within a 10-second period. The maximum allowed -20 dB bandwidth of the hopping channel is 500 kHz.

RESULTS

The Transmitter is active only 397.8mS in 20-second period.

* Emission in the middle of the plot above is from adjacent channel.



7.1.5. OUTPUT POWER

LIMIT

§15.247 (b) (2)

RSS-210 Issue 7 Clause A8.4

The maximum antenna gain is less than 6 dBi, therefore the limit is 30 dBm.

TEST PROCEDURE

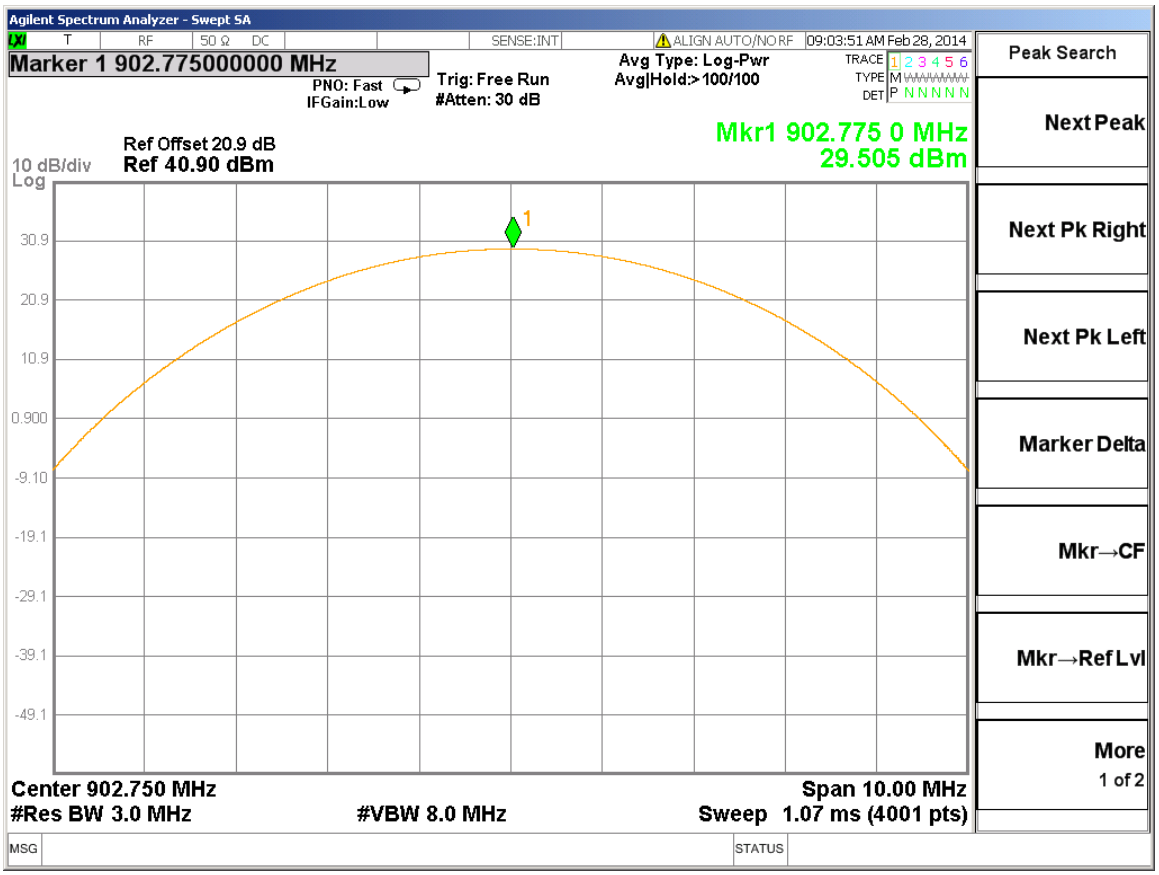
The transmitter output is connected to a spectrum analyzer the analyzer bandwidth is set to a value greater than the 20 dB bandwidth of the EUT.

RESULTS

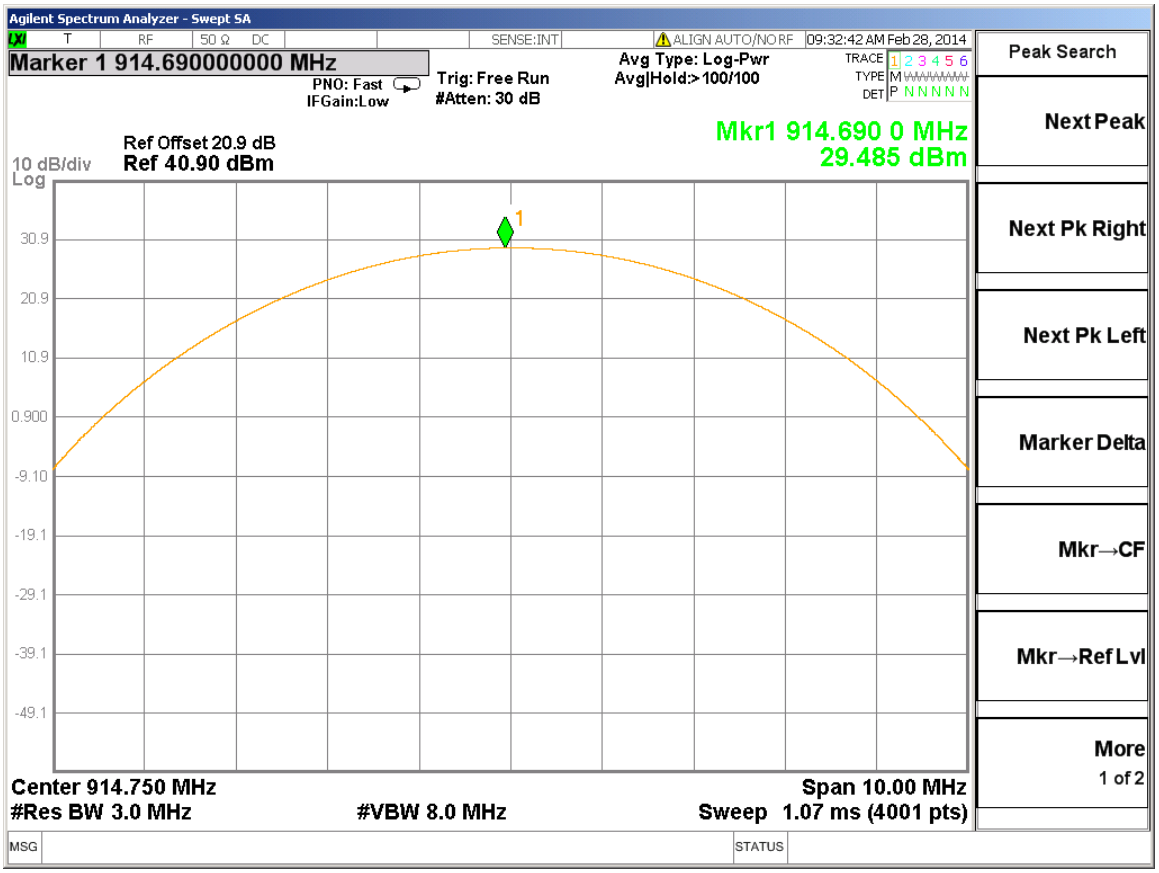
Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	902.75	29.51	30	-0.50
Middle	914.75	29.49	30	-0.52
High	927.25	29.32	30	-0.68

OUTPUT POWER

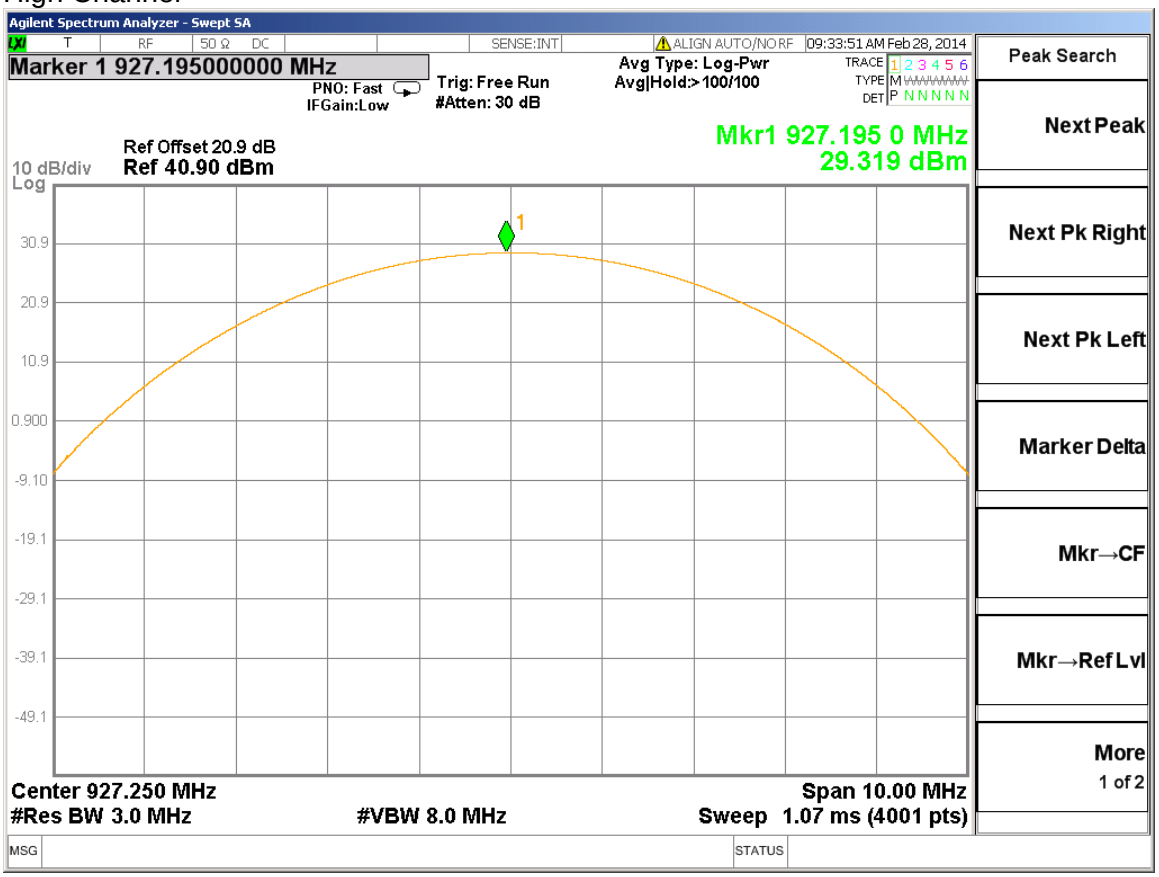
Low Channel



Middle Channel



High Channel



7.1.6. CONDUCTED SPURIOUS EMISSIONS

LIMITS

FCC §15.247 (d)

IC RSS-210 A8.5

Limit = -20 dBc

TEST PROCEDURE

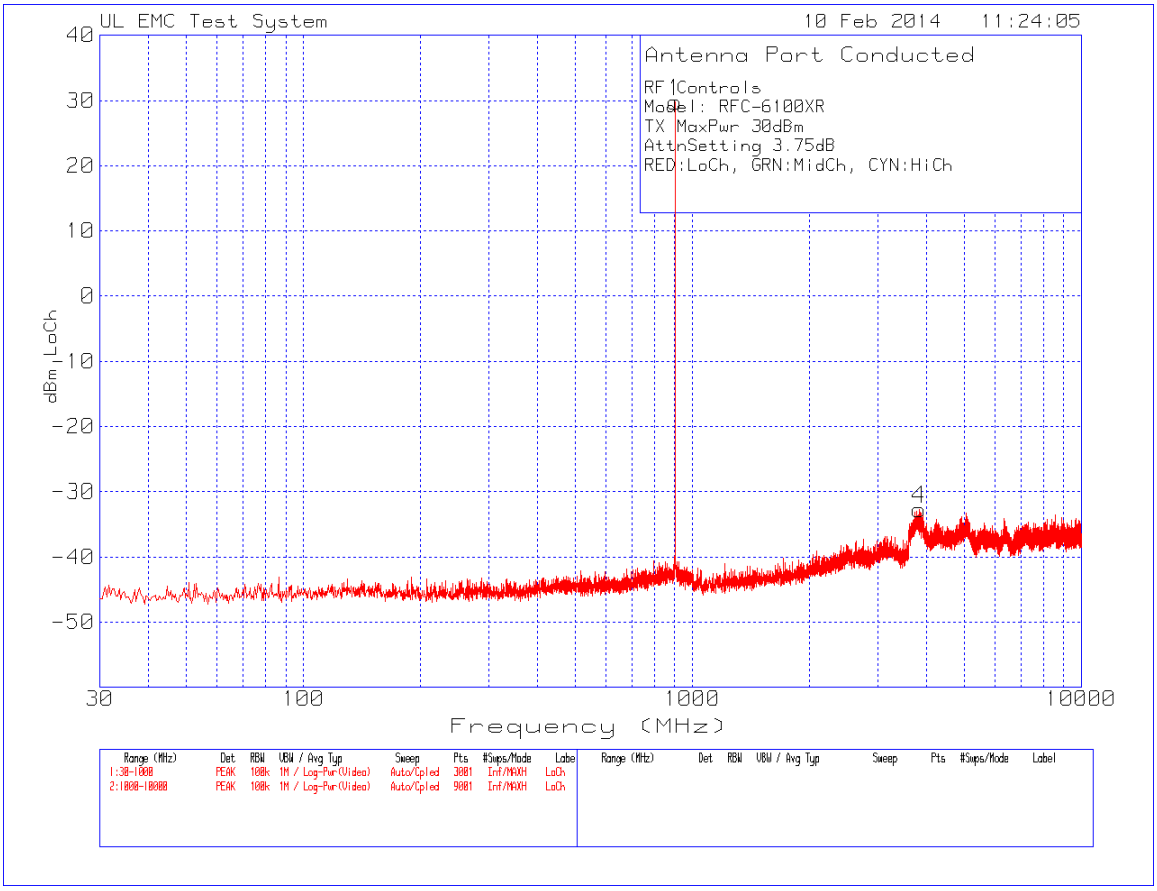
The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

The spectrum from 30 MHz to 10 GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

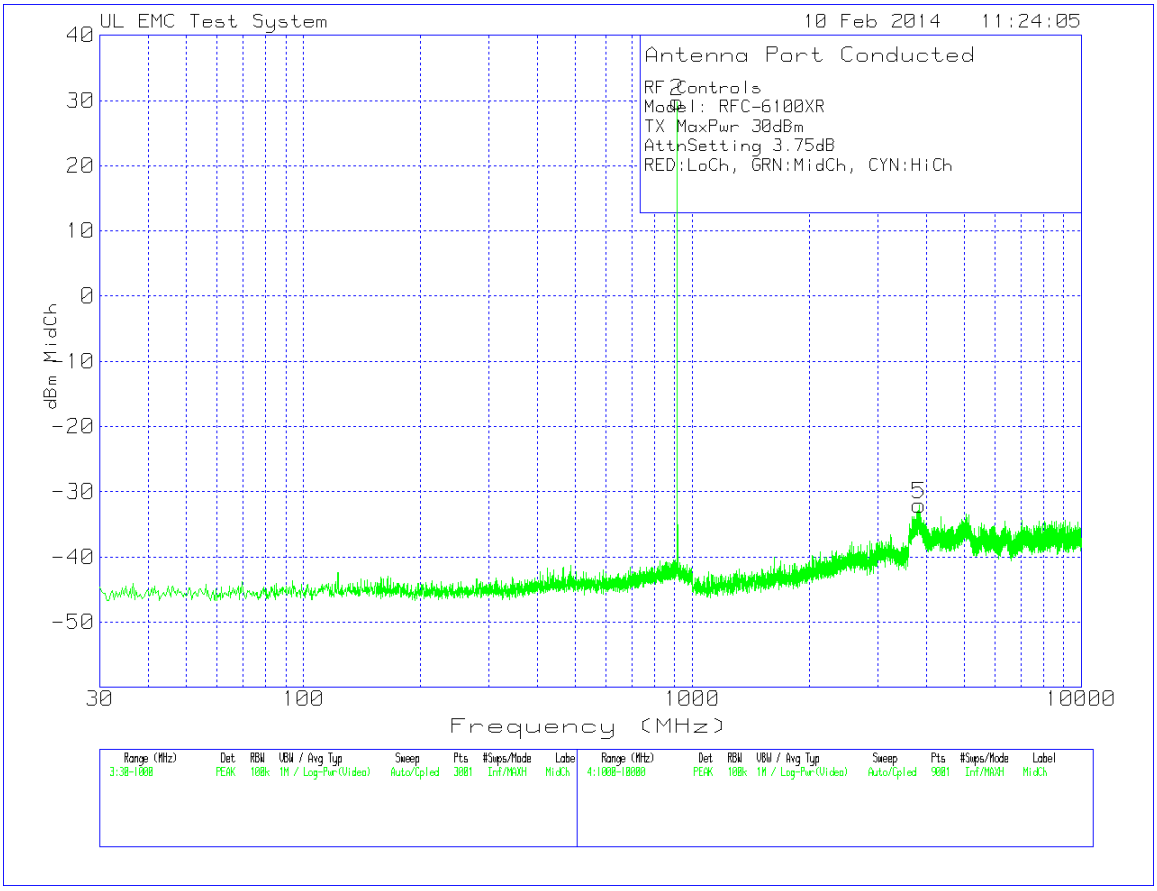
The band edges at 902 and 928 MHz are investigated with the transmitter set to the normal hopping mode and single channel mode.

RESULTS

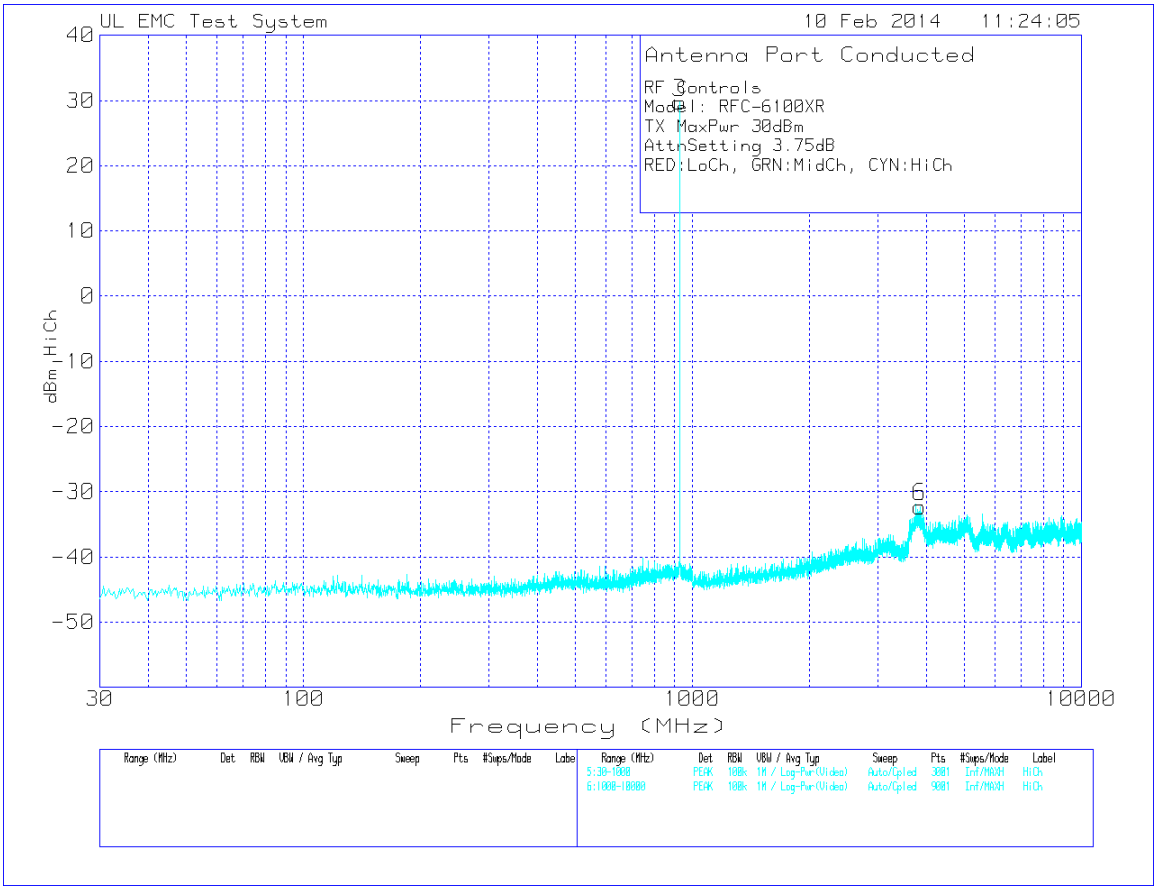
SPURIOUS EMISSIONS, LOW CHANNEL



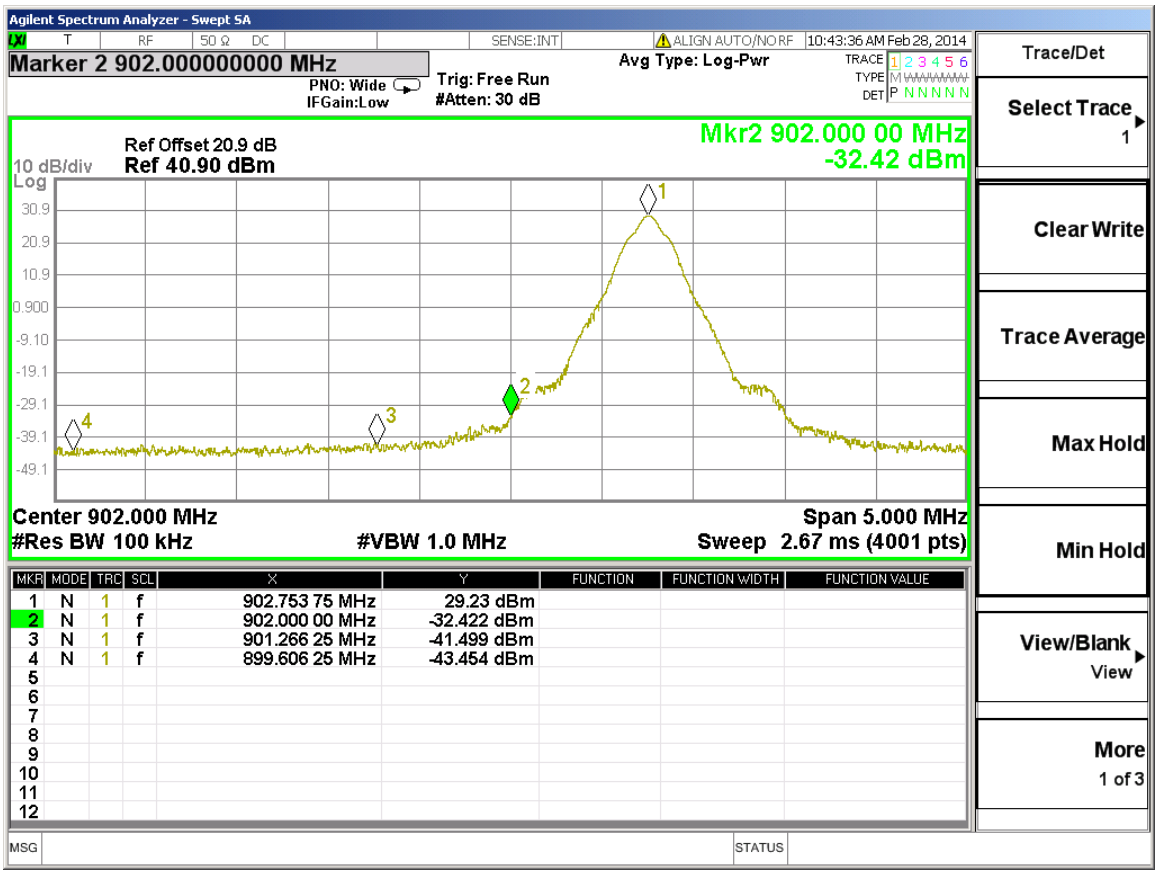
SPURIOUS EMISSIONS, MID CHANNEL



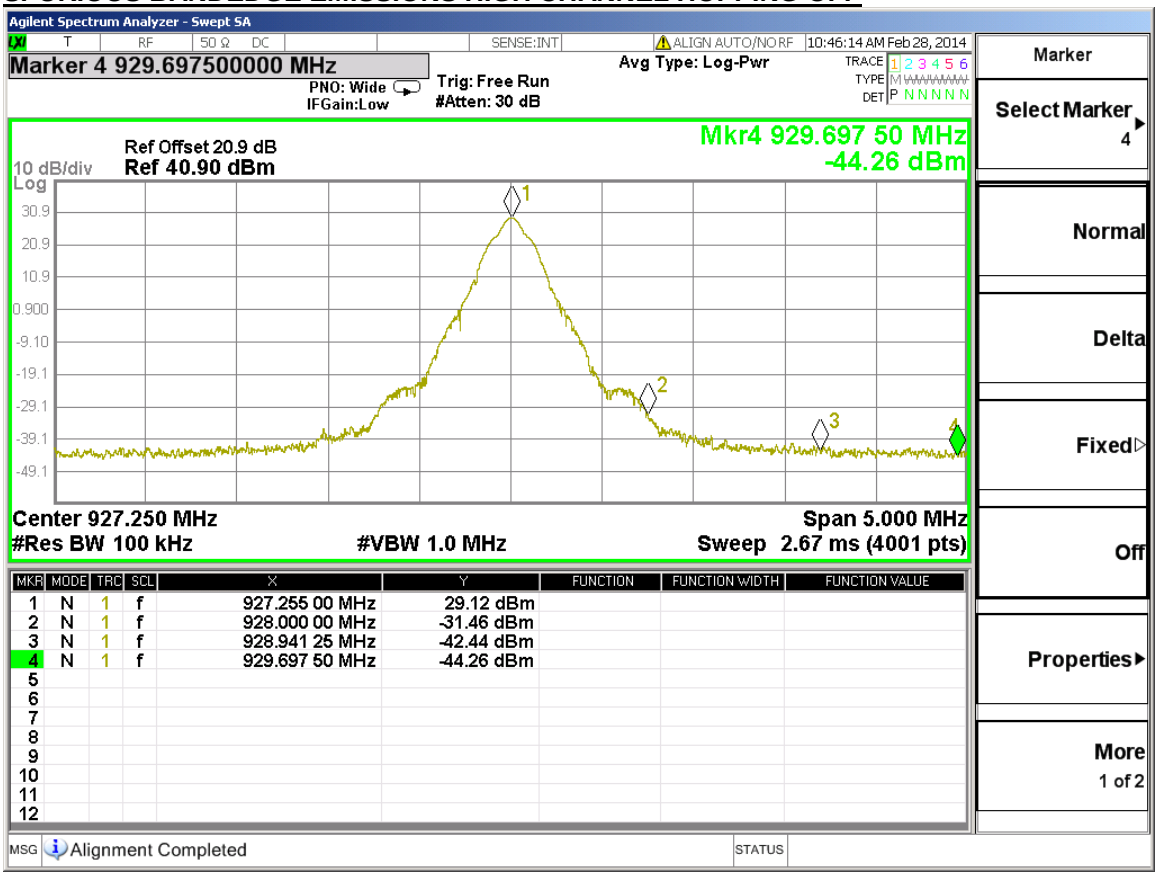
SPURIOUS EMISSIONS, HIGH CHANNEL



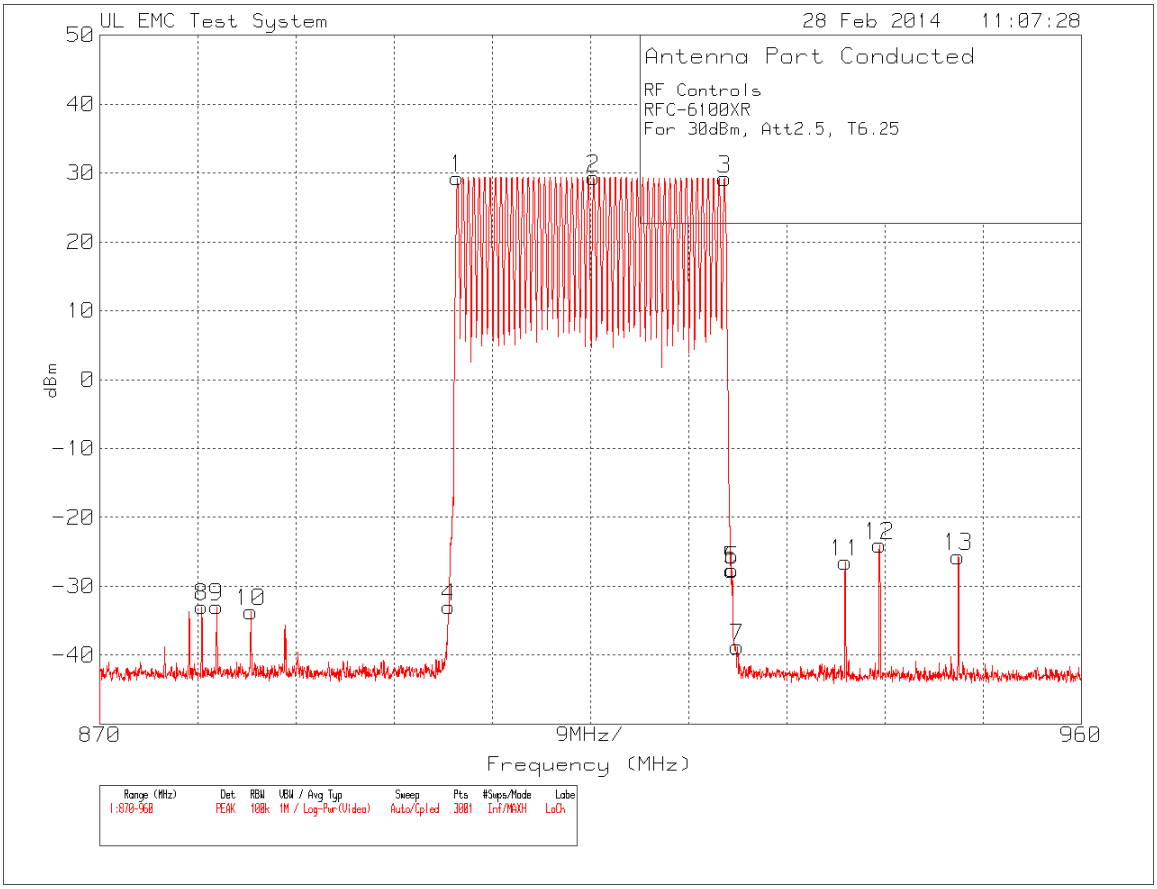
SPURIOUS BANDEDGE EMISSIONS LOW CHANNEL HOPPING OFF



SPURIOUS BANDEDGE EMISSIONS HIGH CHANNEL HOPPING OFF



SPURIOUS BANDEDGE EMISSIONS ALL CHANNELS HOPPING ON



RF Controls RFC-6100XR For 30dBm, Att2.5, T6.25 Trace Markers					
Marker No.	Test Frequency MHz	Meter Reading (dBm)	Detector	Path Factor dB	Level dBm
1	902.76	8.29	PK	21	29.29
2	915.27	8.41	PK	20.9	29.31
3	927.27	8.19	PK	21	29.19
4	902.00	-53.96	PK	21	-32.96
5	927.96	-48.63	PK	21	-27.63
6	928.00	-48.61	PK	21	-27.61
7	928.47	-59.83	PK	21	-38.83
8	879.33	-53.87	PK	20.9	-32.97
9	880.71	-53.86	PK	20.9	-32.96
10	883.83	-54.6	PK	20.9	-33.7
11	938.34	-47.48	PK	21	-26.48
12	941.49	-45.05	PK	21	-24.05
13	948.72	-46.67	PK	21	-25.67
PK - Peak detector					

8. RADIATED TEST RESULTS

8.1. LIMITS AND PROCEDURE

LIMITS

FCC §15.205 and §15.209

IC RSS-210 Clause 2.6 (Transmitter)

Frequency Range (MHz)	Field Strength Limit (uV/m) at 3 m	Field Strength Limit (dBuV/m) at 3 m
30 - 88	100	40
88 - 216	150	43.5
216 - 960	200	46
Above 960	500	54

TEST PROCEDURE

The EUT is placed on a non-conducting table 80 cm above the ground plane. The antenna to EUT distance is 3 meters. The EUT is configured in accordance with ANSI C63.4:2003. The EUT is set to transmit in a continuous mode.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

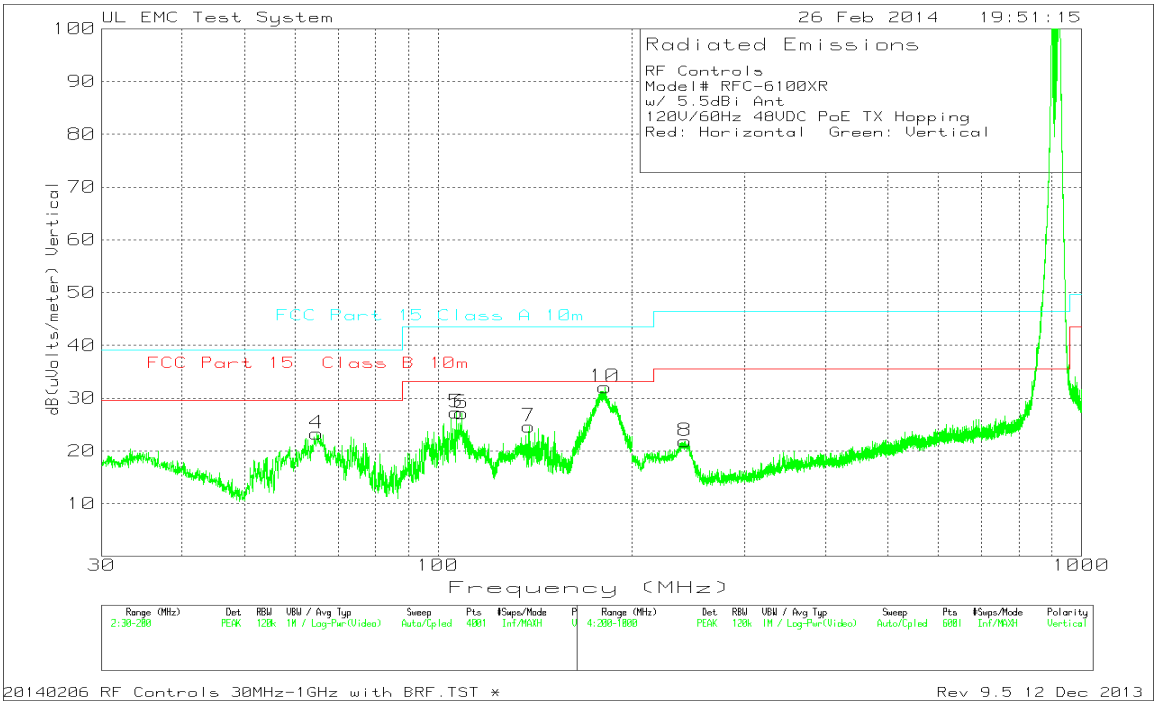
For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 1 MHz for peak measurements and 10 Hz for average measurements.

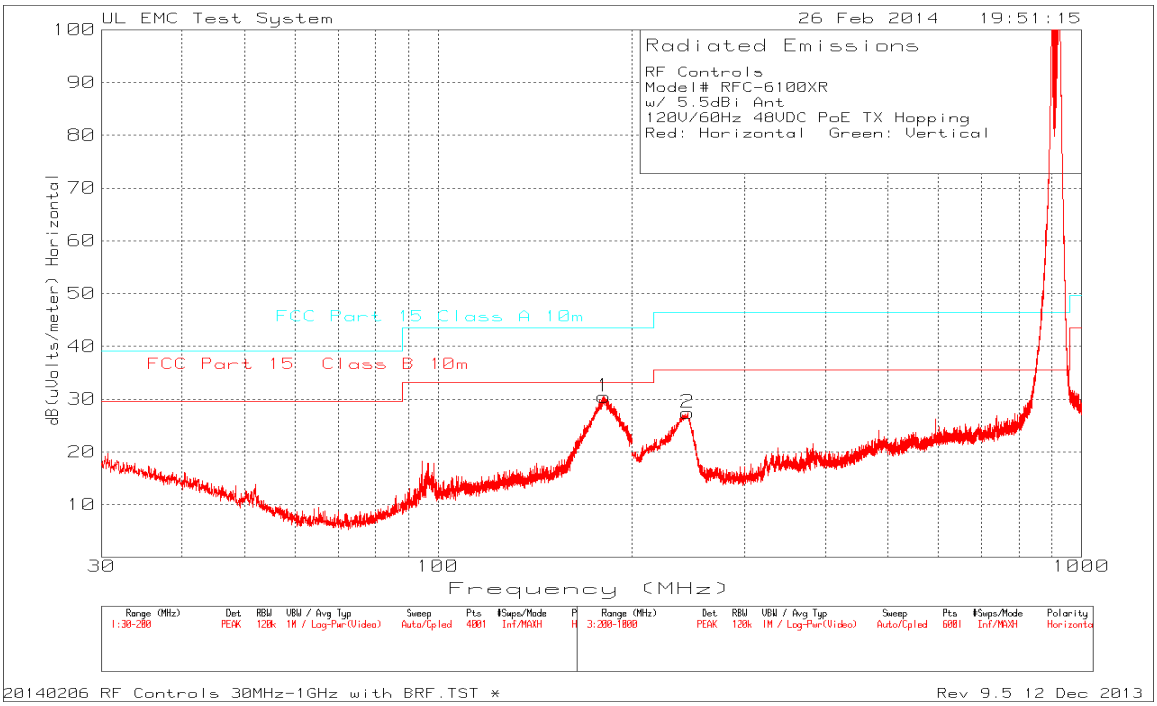
The spectrum from 30 MHz to 10 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in the 900 MHz band.

The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized in both the vertical and the horizontal positions.

8.2. RADIATED SPUROUS BELOW 1 GHz

8.2.1. Radiated Spurious Emissions 30MHz-1GHz TX Hopping, with PoE





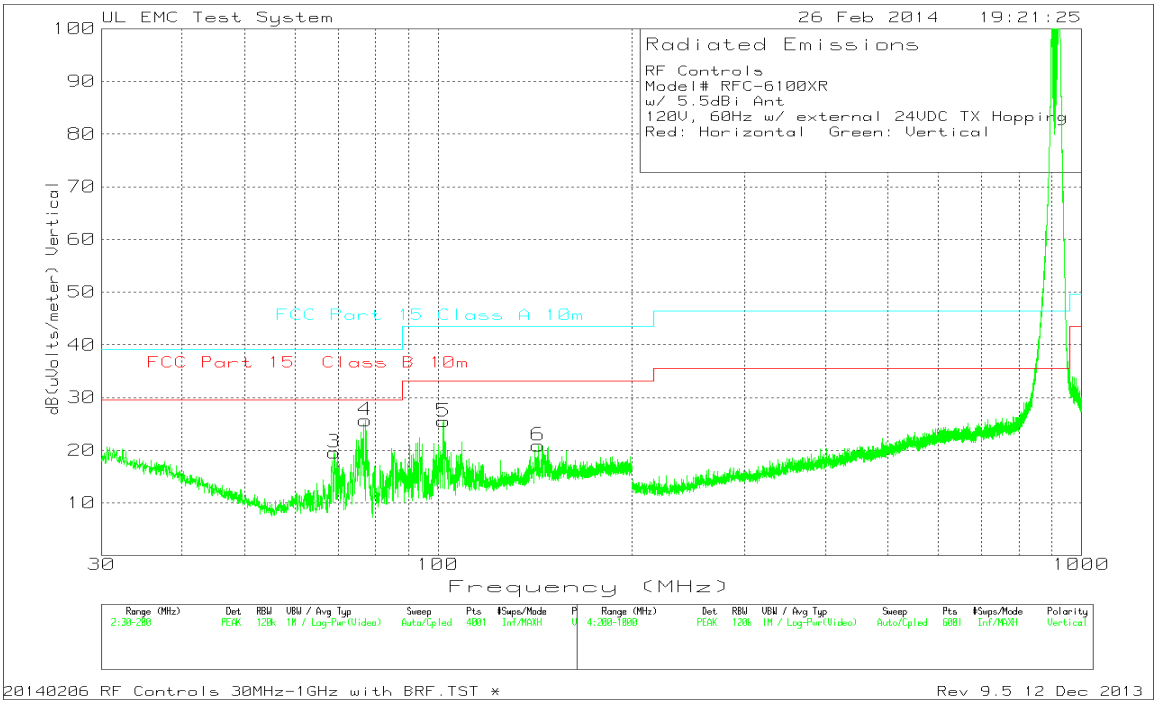
* The area between 800MHz to1GHz above the limit is product of the HPF. There are no restricted bandedges covered by the HPF and there were no spurious emissions recorded any restricted bands below 1GHz.

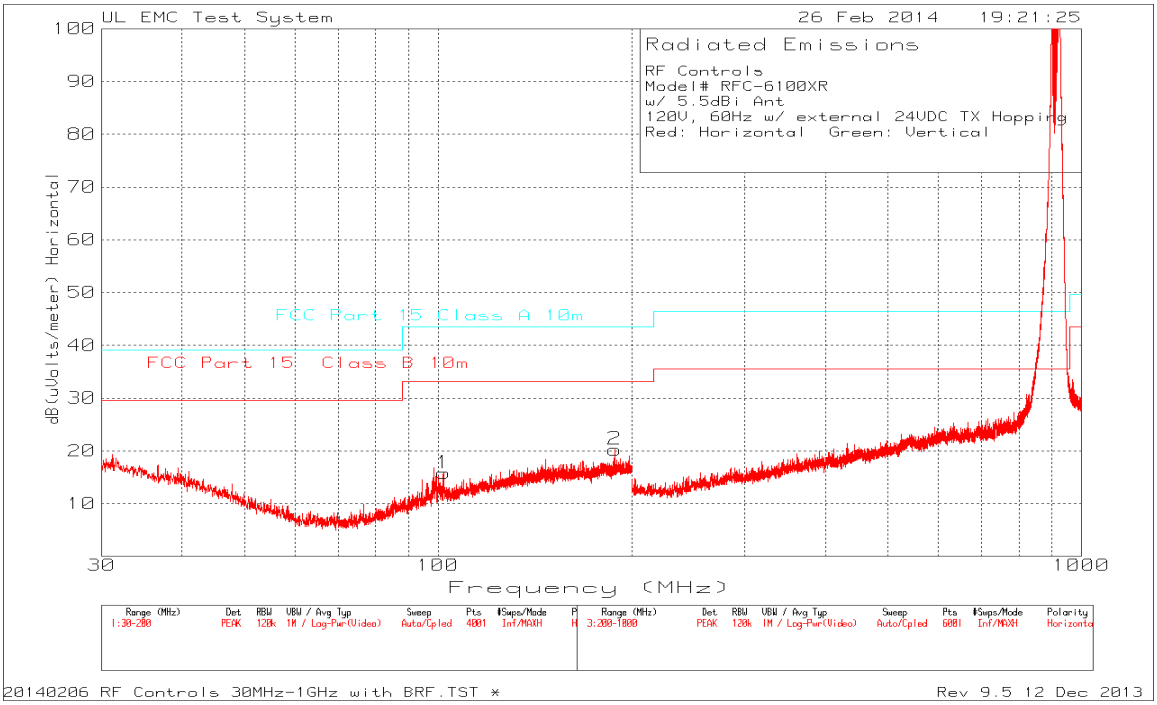
RF Controls
Model# RFC-6100XR
w/ 5.5dBi Ant
120V/60Hz 48VDC PoE TX Hopping
Red: Horizontal Green: Vertical
Trace Markers

Marker No.	Test Frequency MHz	Meter Reading dBuV	Detector	Antenna Factor dB/m	Path Factor dB	BRF dB	Level dBuV/m	47 CFR Part 15.209 Limit dBuV/m	Margin dB	Azimuth Degs	Height cm	Polarity
1	181.13	43.91	PK	15.8	-29.2	-	30.51	33.07	-2.56	0-360	400	H
4	64.8075	47.12	PK	6.2	-30	-	23.32	29.55	-6.23	0-360	249	V
5	106.67	45.45	PK	11.6	-29.8	-	27.25	33.07	-5.82	0-360	99	V
6	108.795	45	PK	12	-29.8	-	27.2	33.07	-5.87	0-360	99	V
7	138.4175	40.17	PK	14.2	-29.7	-	24.67	33.07	-8.4	0-360	99	V
10	181.64	45.41	PK	15.9	-29.2	-	32.11	33.07	-0.96	0-360	99	V
2	244.2667	42.21	PK	11.6	-26.6	0.2	27.41	35.57	-8.16	0-360	399	H
3	921.7333	43	PK	22.9	-24.9	82.8	123.8	35.57	88.23	0-360	199	H
8	242.2667	36.87	PK	11.5	-26.6	0.1	21.87	35.57	-13.7	0-360	399	V
9	909.7333	58.98	PK	23.3	-24.7	56.1	113.68	35.57	78.11	0-360	199	V
Radiated Emission Data												
	181.1853	43.04	QP	15.8	-29.2	-	29.64	33.07	-3.43	263	333	H
	181.1853	43.75	QP	15.8	-29.2	-	30.35	33.07	-2.72	360	100	V
	106.69733	41.99	QP	11.6	-29.8	-	23.79	33.07	-9.28	28	123	V
	108.8334	41.57	QP	12.1	-29.9	-	23.77	33.07	-9.3	251	120	V
	64.801	43.55	QP	6.2	-30	-	19.75	29.55	-9.8	35	239	V

PK - Peak detector
QP - Quasi-Peak detector

1.1.1. Radiated Spurious Emissions 30MHz-1GHz TX Hopping, with External 24VDC Supply





* The area between 800MHz to1GHz above the limit is product of the HPF. There are no restricted bandedges covered by the HPF and there were no spurious emissions recorded in any restricted bands below 1GHz.

RF Controls
Model# RFC-6100XR
w/ 5.5dBi Ant
120V, 60Hz w/ external 24VDC TX Hopping
Red: Horizontal Green: Vertical
Trace Markers

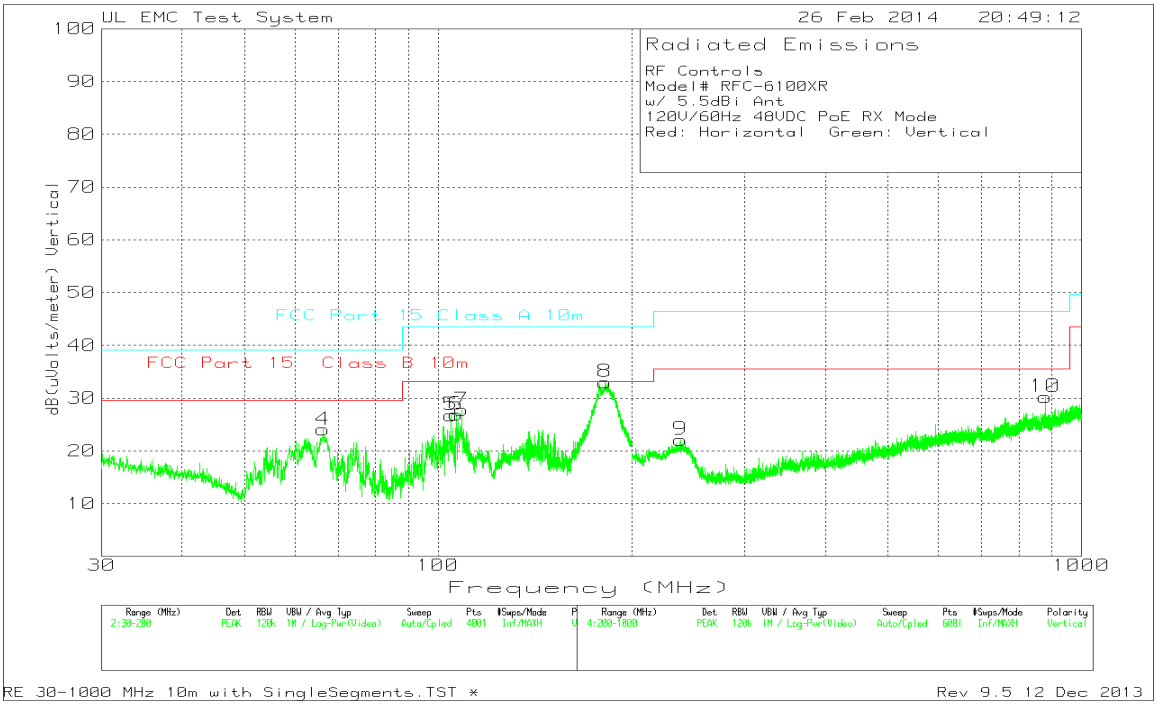
Marker No.	Test Frequency MHz	Meter Reading dBuV	Detector	Antenna Factor dB/m	Path Factor dB	BRF dB	Level dBuV/m	47 CFR Part 15.209 Limit dBuV/m	Margin dB	Azimuth Degs	Height cm	Polarity
1	101.9525	34.69	PK	10.9	-29.8	-	15.79	33.07	-17.28	0-360	400	H
2	188.525	33.49	PK	15.9	-29.1	-	20.29	33.07	-12.78	0-360	400	H
3	68.9725	43.52	PK	6.1	-30	-	19.62	29.55	-9.93	0-360	400	V
4	77.175	48.98	PK	6.6	-29.9	-	25.68	29.55	-3.87	0-360	400	V
5	101.91	44.39	PK	10.9	-29.8	-	25.49	33.07	-7.58	0-360	99	V
6	143.305	36.31	PK	14.3	-29.7	-	20.91	33.07	-12.16	0-360	99	V
7	907.2	60.23	PK	23.2	-24.8	55.4	114.03	35.57	78.46	0-360	99	H
8	909.7333	60.03	PK	23.3	-24.7	56.1	114.73	35.57	79.16	0-360	199	V

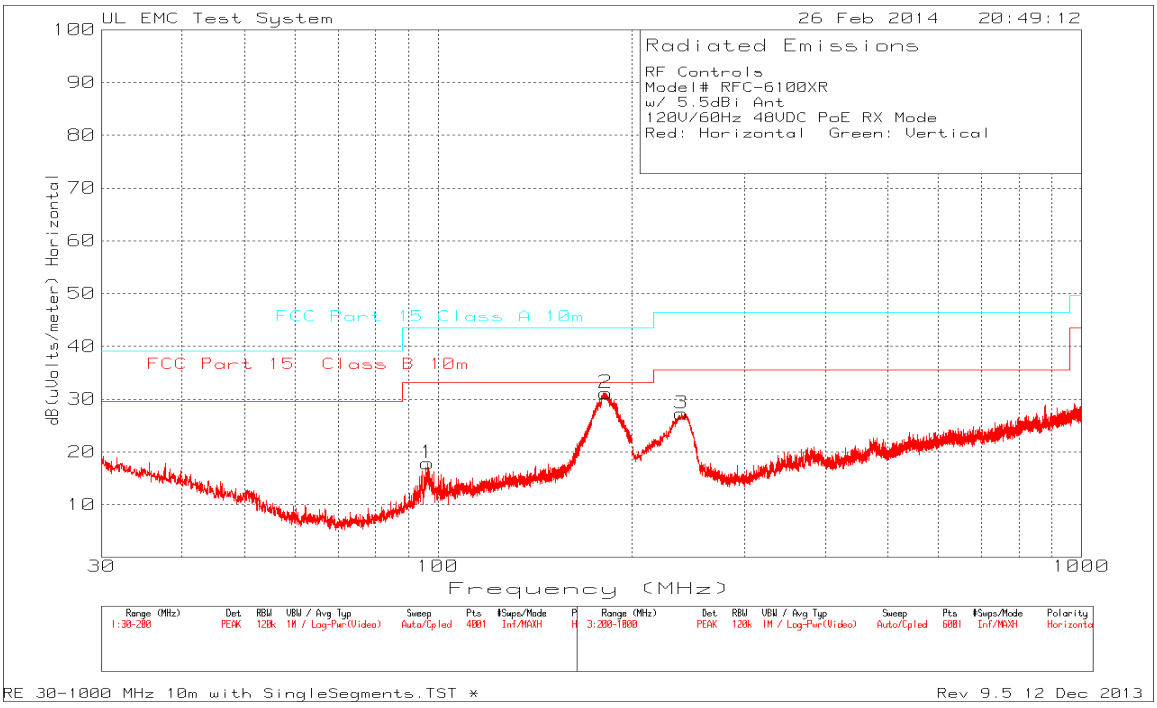
Radiated Emission Data

	Test Frequency MHz	Meter Reading dBuV	Detector	Antenna Factor dB/m	Path Factor dB	BRF dB	Level dBuV/m	FCC Part 15 Class B 10m dBuV/m	Margin dB	Azimuth Degs	Height cm	Polarity
	77.2014	48.08	QP	6.6	-29.9	-	24.78	29.55	-4.77	28	395	V

PK - Peak detector
QP - Quasi-Peak detector

1.1.1. Radiated Spurious Emissions 30MHz-1GHz RX/ Digital Hopping, with PoE



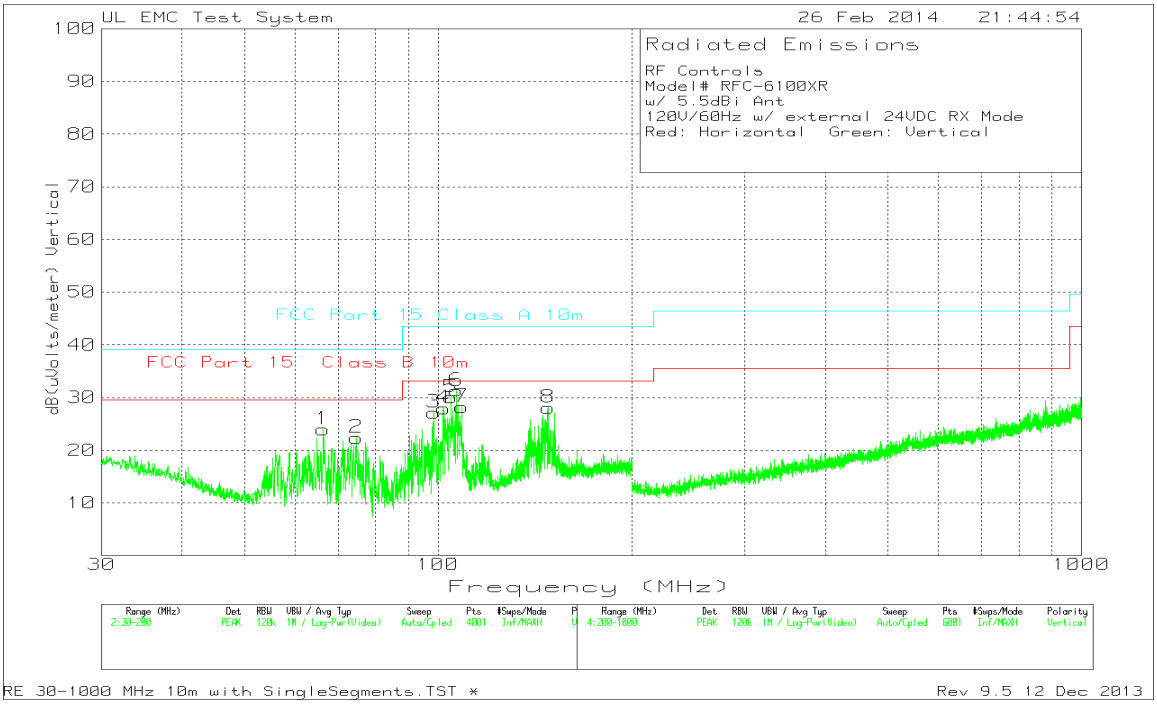


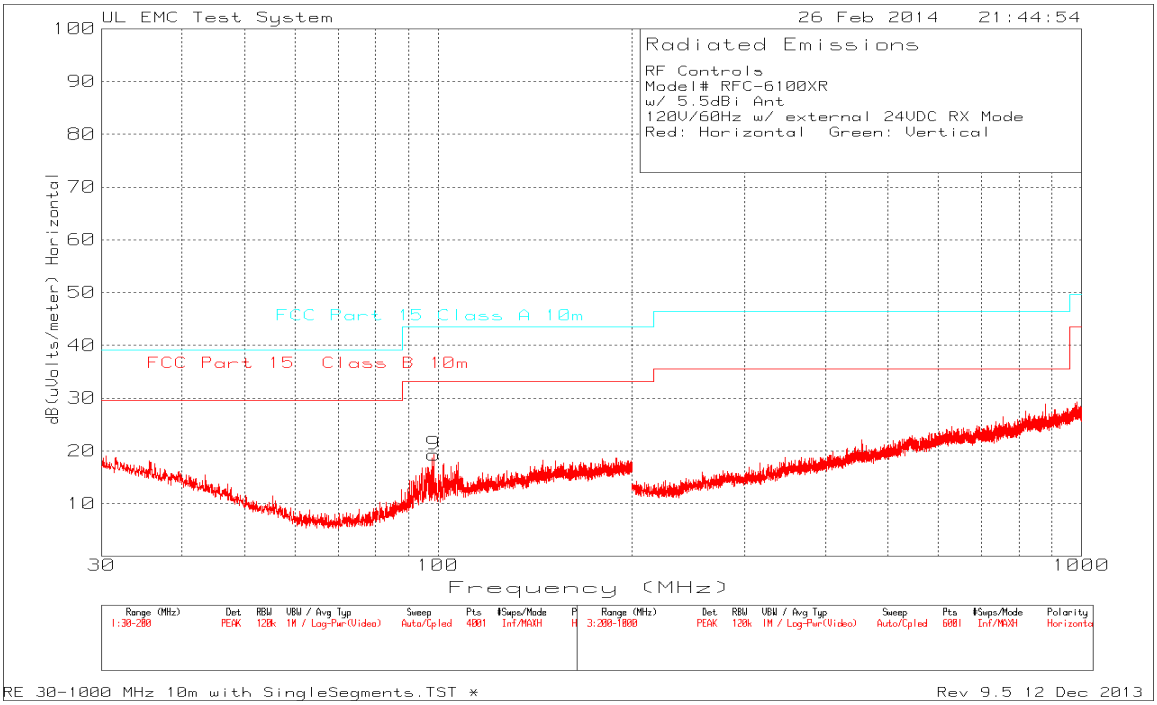
RF Controls
Model# RFC-6100XR
w/ 5.5dBi Ant
120V/60Hz 48VDC PoE RX Mode
Red: Horizontal Green: Vertical
Trace Markers

Marker No.	Test Frequency MHz	Meter Reading dBuV	Detector	Antenna Factor dB/m	Path Factor dB	Level dBuV/m	47 CFR Part 15.209 Limit dBuV/m	Margin dB	Azimuth Degs	Height cm	Polarity
1	96.385	37.62	PK	10	-29.8	17.82	33.07	-15.25	0-360	400	H
2	182.32	44.46	PK	15.9	-29.2	31.16	33.07	-1.91	0-360	400	H
4	66.21	47.83	PK	6.2	-30	24.03	29.55	-5.52	0-360	249	V
5	104.7575	45.16	PK	11.4	-29.8	26.76	33.07	-6.31	0-360	99	V
6	106.7125	45.07	PK	11.6	-29.8	26.87	33.07	-6.2	0-360	249	V
7	108.8163	45.65	PK	12	-29.9	27.75	33.07	-5.32	0-360	99	V
8	181.81	46.27	PK	15.9	-29.2	32.97	33.07	-0.1	0-360	99	V
3	238.9333	42.64	PK	11.2	-26.6	27.24	35.57	-8.33	0-360	399	H
9	238	37.5	PK	11.2	-26.6	22.1	35.57	-13.47	0-360	399	V
10	879.7333	32.29	PK	22.8	-24.9	30.19	35.57	-5.38	0-360	299	V
Radiated Emission Data											
	181.8642	43.42	QP	15.9	-29.2	30.12	33.07	-2.95	238	353	H
	181.8642	45.53	QP	15.9	-29.2	32.23	33.07	-0.84	32	100	V
	66.212059	43.42	QP	6.2	-30	19.62	29.55	-9.93	223	230	V
	104.74222	42.68	QP	11.3	-29.8	24.18	33.07	-8.89	60	119	V
	106.6875	42.51	QP	11.6	-29.8	24.31	33.07	-8.76	59	107	V
	108.77224	43.03	QP	12	-29.8	25.23	33.07	-7.84	89	115	V
	879.66413	31.07	QP	22.8	-24.9	28.97	35.57	-6.6	101	297	V

PK - Peak detector
QP - Quasi-Peak detector

8.2.2. Radiated Spurious Emissions 30MHz-1GHz RX/ Digital Hopping, with External 24VDC Supply





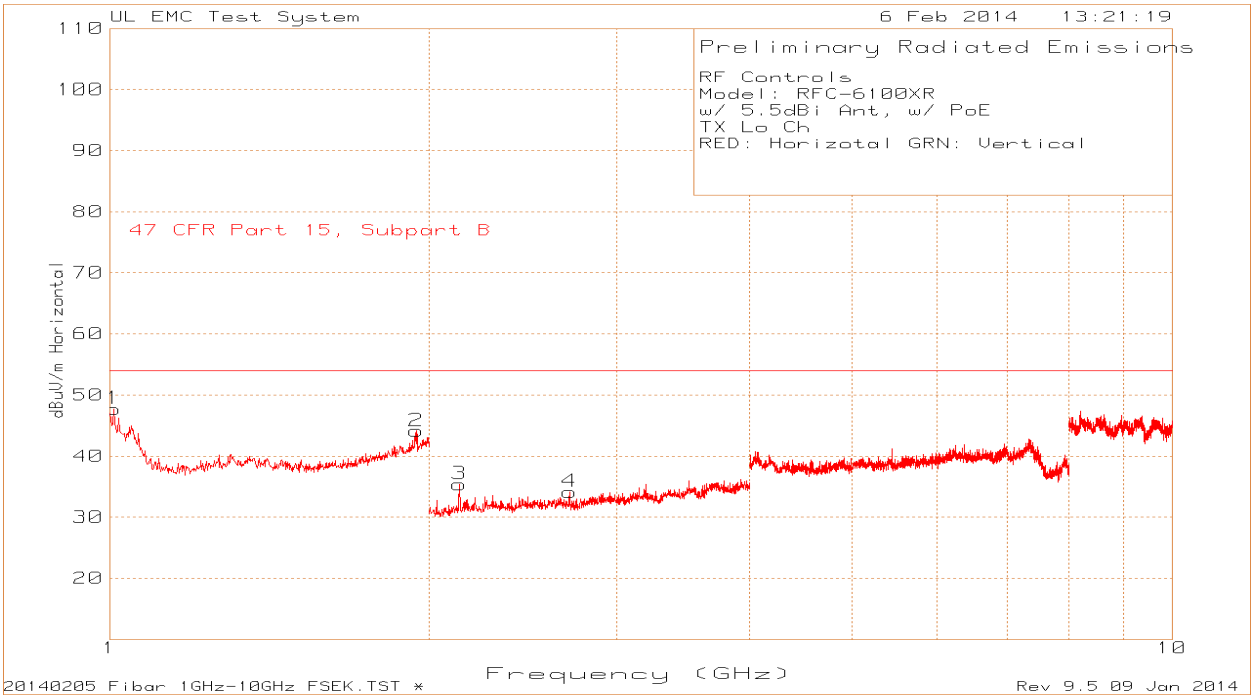
RF Controls
Model# RFC-6100XR
w/ 5.5dBi Ant
120V/60Hz w/ external 24VDC RX Mode
Red: Horizontal Green: Vertical
Trace Markers

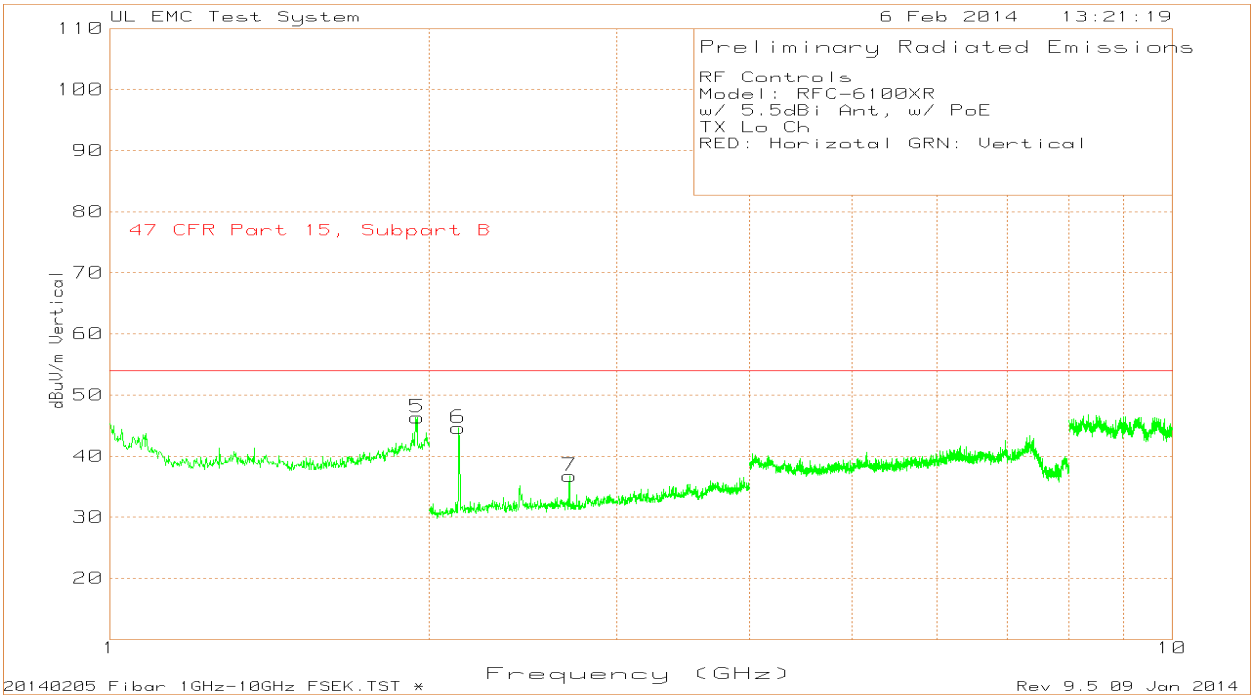
Marker No.	Test Frequency MHz	Meter Reading dBuV	Detector	Antenna Factor dB/m	Path Factor dB	Level dBuV/m	47 CFR Part 15.209 Limit dBuV/m	Margin dB	Azimuth Degs	Height cm	Polarity
9	98.425	38.83	PK	10.4	-29.9	19.33	33.07	-13.74	0-360	400	H
1	66.3375	47.77	PK	6.2	-30	23.97	29.55	-5.58	0-360	249	V
2	74.5825	45.93	PK	6.4	-30	22.33	29.55	-7.22	0-360	400	V
3	98.425	46.63	PK	10.4	-29.9	27.13	33.07	-5.94	0-360	99	V
4	101.91	46.85	PK	10.9	-29.8	27.95	33.07	-5.12	0-360	99	V
5	104.715	48.52	PK	11.3	-29.8	30.02	33.07	-3.05	0-360	99	V
6	106.7125	49.53	PK	11.6	-29.8	31.33	33.07	-1.74	0-360	99	V
7	108.8375	46.07	PK	12.1	-29.9	28.27	33.07	-4.8	0-360	99	V
8	148.15	43.09	PK	14.6	-29.6	28.09	33.07	-4.98	0-360	99	V
Radiated Emission Data											
	66.27139	46.61	QP	6.2	-30	22.81	29.55	-6.74	77	212	V
	98.4503	44.73	QP	10.4	-29.9	25.23	33.07	-7.84	115	125	V
	101.87178	46.38	QP	10.9	-29.8	27.48	33.07	-5.59	131	130	V
	104.7428	46.58	QP	11.3	-29.8	28.08	33.07	-4.99	125	129	V
	106.69669	46.59	QP	11.6	-29.8	28.39	33.07	-4.68	147	122	V
	108.83414	42.55	QP	12.1	-29.9	24.75	33.07	-8.32	101	116	V
	148.13002	40.57	QP	14.6	-29.6	25.57	33.07	-7.5	147	103	V

PK - Peak detector
QP - Quasi-Peak detector

8.3. TRANSMITTER ABOVE 1 GHz

8.3.1. Radiated Emissions 1GHz – 10GHz Low Channel External 24VDC



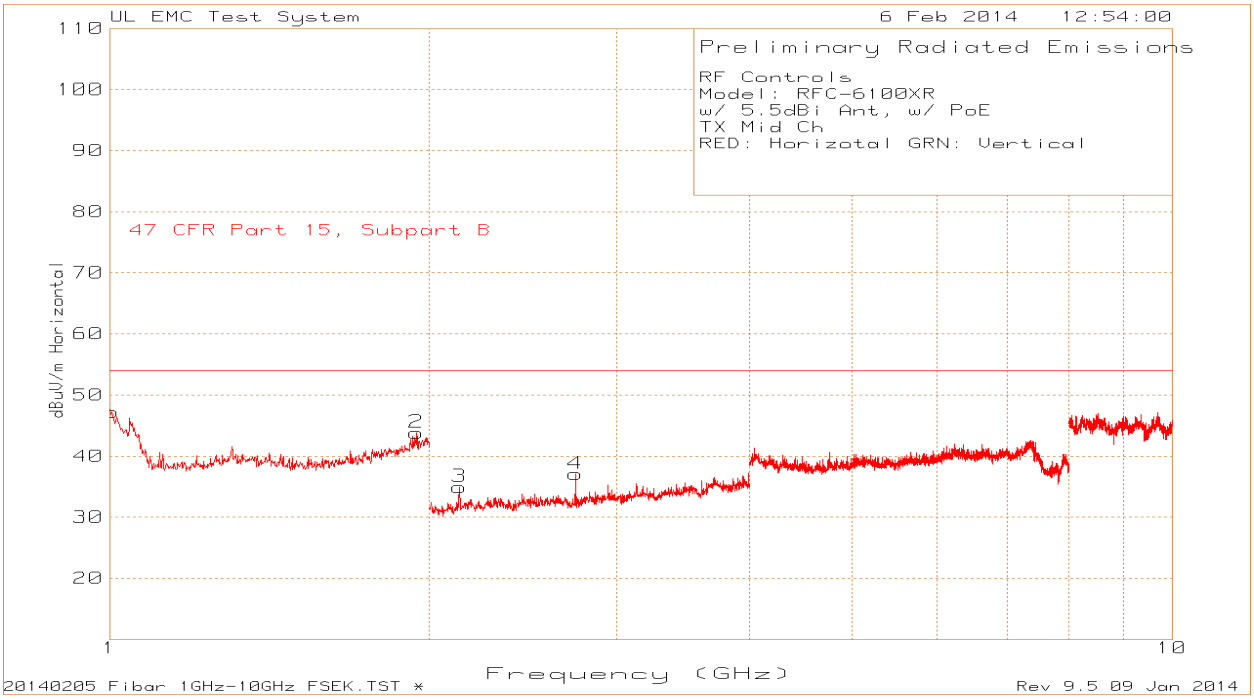


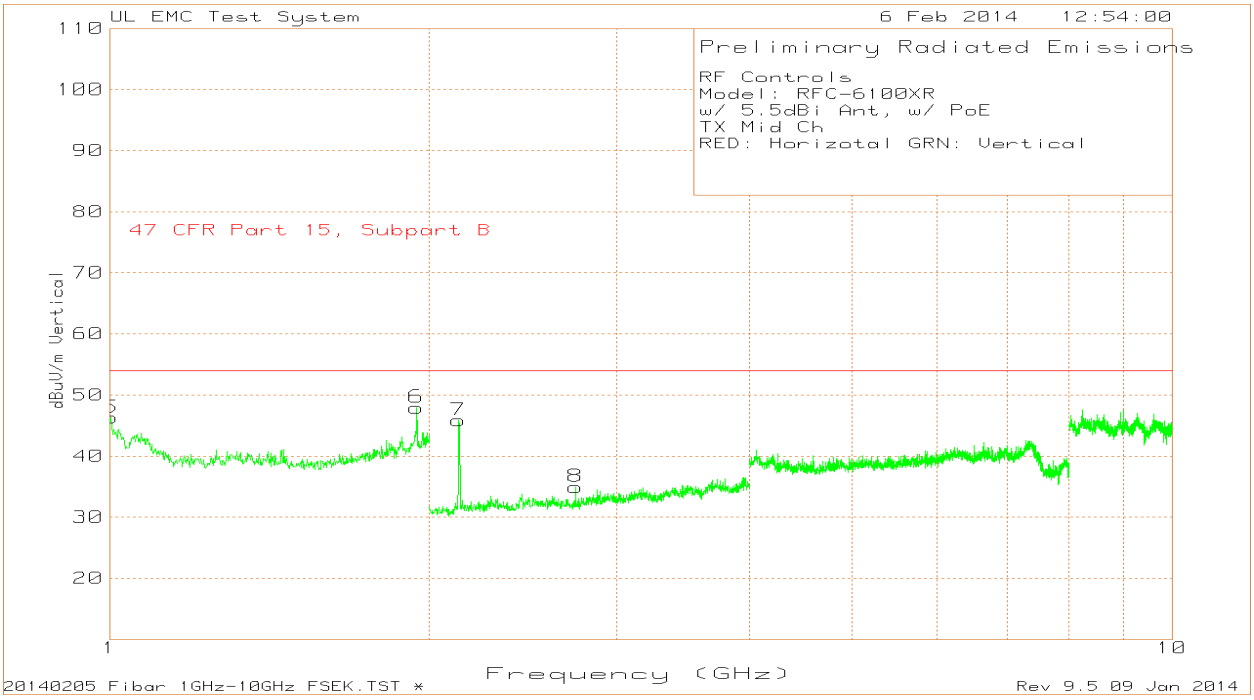
RF Controls
Model: RFC-6100XR
w/ 5.5dBi Ant, w/ PoE
TX Lo Ch
RED: Horizotal GRN: Vertical
Trace Markers
1 - 2GHz 1 - 2MHz

Marker No.	Test Frequency GHz	Meter Reading dBuV	Detector	Antenna Factor dB/m	Band Reject Filter dB	BOMS Factor dB	Level dBuV/m	47 CFR Part 15.209 Limit dBuV/m	Margin dB	Azimuth Degs	Height cm	Polarity
1	* 1.008	75.2	PK	27.4	1	-55.88	47.72	54	-6.28	0-360	100	H
2	1.9439	65.19	PK	31.4	0.5	-52.97	44.12	54	-9.88	0-360	149	H
3	2.1341	65.99	PK	21.5	-	-52.06	35.43	54	-18.57	0-360	150	H
4	* 2.7087	62.75	PK	22.1	-	-50.69	34.16	54	-19.84	0-360	150	H
5	1.9459	67.4	PK	31.4	0.5	-52.97	46.33	54	-7.67	0-360	150	V
6	2.1301	75.27	PK	21.5	-	-52.13	44.64	54	-9.36	0-360	150	V
7	* 2.7087	65.35	PK	22.1	-	-50.69	36.76	54	-17.24	0-360	150	V

PK - Peak detector
* Indicates frequencies in FCC/IC restricted bands

8.3.2. Radiated Emissions 1GHz – 10GHz Middle Channel External 24VDC



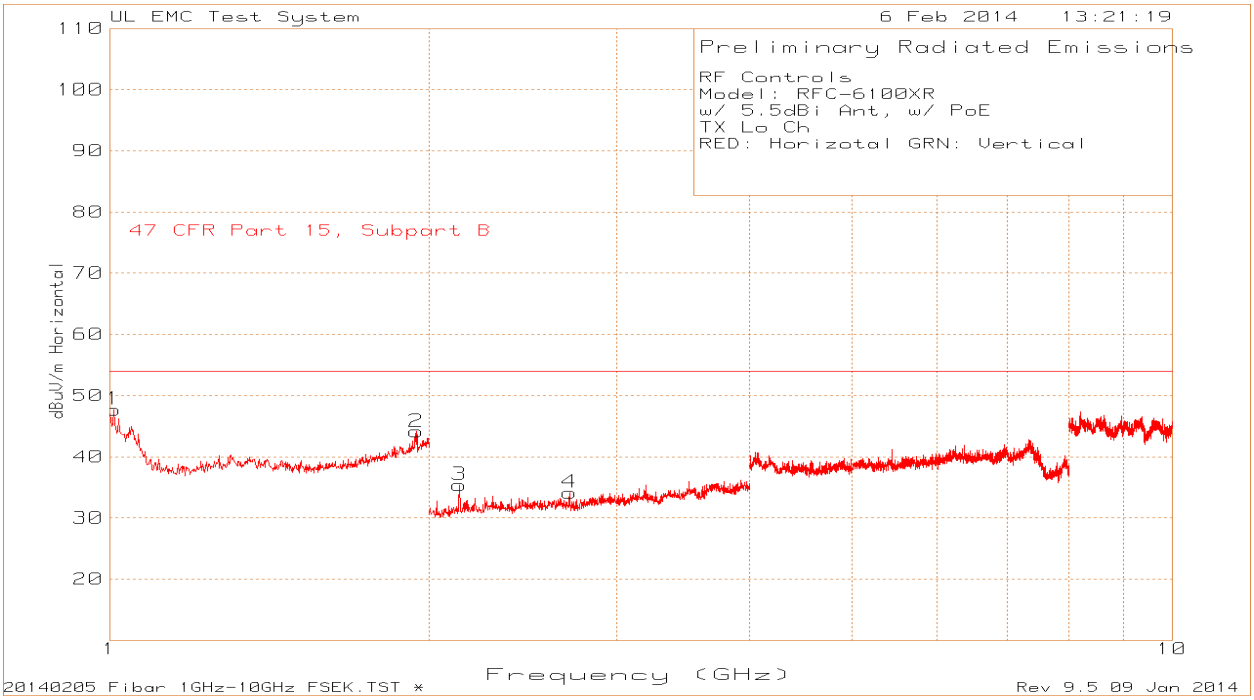


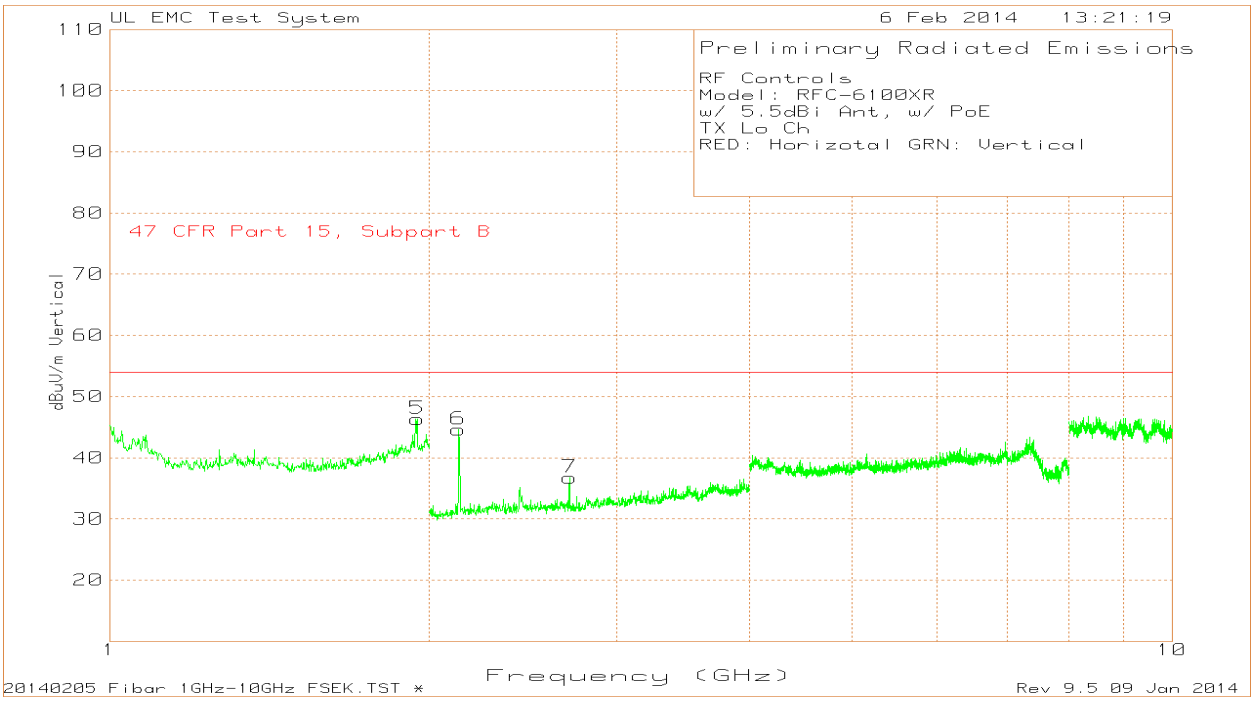
RF Controls
Model: RFC-6100XR
w/ 5.5dBi Ant, w/ external 24VDC
TX Mid Ch
RED: Horizotal GRN: Vertical
Trace Markers

Marker No.	Test Frequency GHz	Meter Reading dBuV	Detector	Antenna Factor dB/m	Band Reject Filter dB	BOMS Factor dB	Level dBuV/m	47 CFR Part 15.209 Limit dBuV/m	Margin dB	Azimuth Degs	Height cm	Polarity
1	* 1.002	77.7	PK	27.4	1.1	-55.85	50.35	54	-3.65	0-360	100	H
2	1.9519	63.97	PK	31.5	0.5	-52.97	43	54	-11	0-360	100	H
5	2.1321	69.2	PK	21.5	-	-52.09	38.61	54	-15.39	0-360	150	H
6	* 2.7447	66.48	PK	22.1	-	-50.67	37.91	54	-16.09	0-360	150	H
7	2.1321	69.2	PK	21.5	-	-52.09	38.61	54	-15.39	0-360	150	H
3	* 1.0741	74.22	PK	27.2	0.5	-55.88	46.04	54	-7.96	0-360	150	V
4	1.9439	69.74	PK	31.4	0.5	-52.97	48.67	54	-5.33	0-360	150	V
8	2.1341	76.4	PK	21.5	-	-52.06	45.84	54	-8.16	0-360	150	V
9	* 2.7447	64.46	PK	22.1	-	-50.67	35.89	54	-18.11	0-360	150	V

PK - Peak detector
* Indicates frequencies in FCC/IC restricted bands

8.3.3. Radiated Emissions 1GHz – 10GHz Middle Channel PoE Adapter



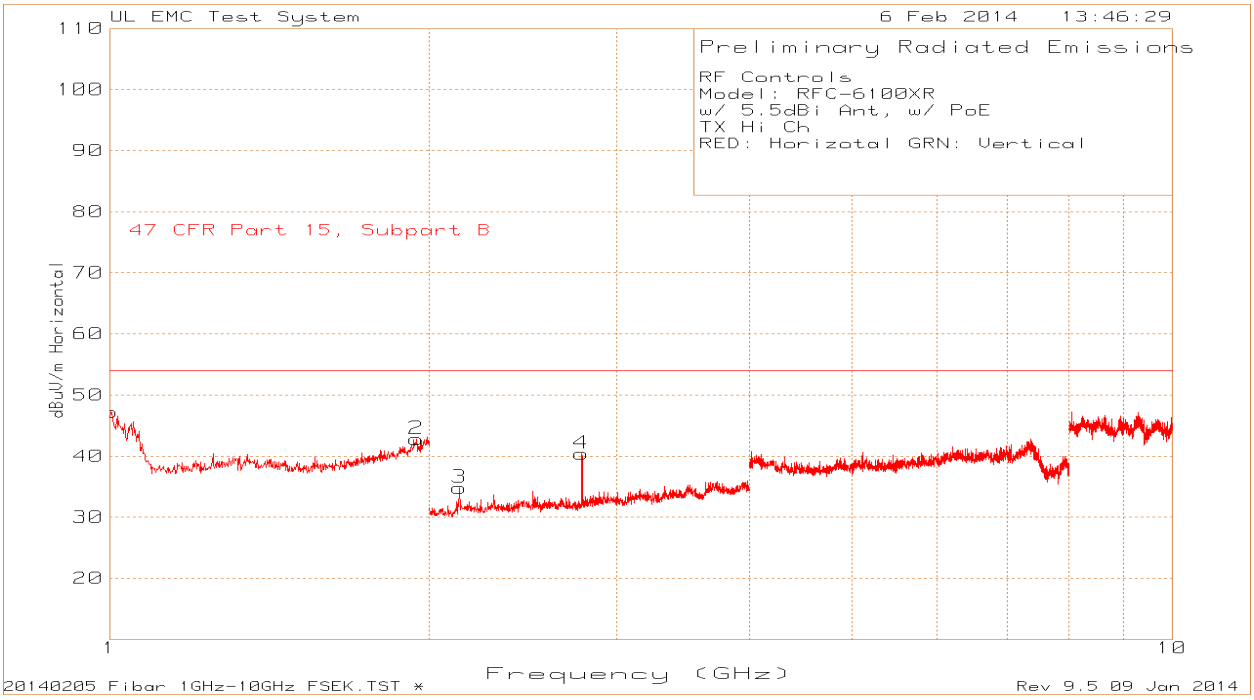


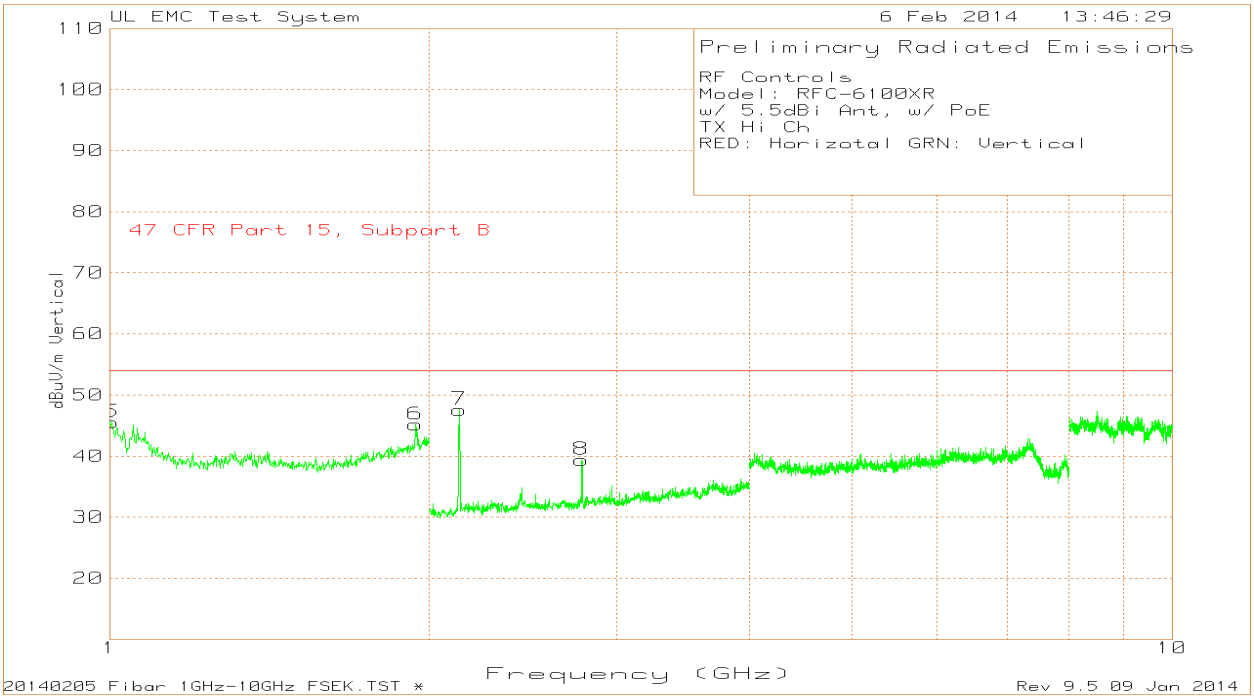
RF Controls
Model: RFC-6100XR
w/ 5.5dBi Ant, w/ PoE
TX Mid Ch
RED: Horizotal GRN: Vertical
Trace Markers

Marker No.	Test Frequency GHz	Meter Reading dBuV	Detector	Antenna Factor dB/m	Band Reject Filter dB	BOMS Factor dB	Level dBuV/m	47 CFR Part 15.209 Limit dBuV/m	Margin dB	Azimuth Degs	Height cm	Polarity
1	* 1.004	74.61	PK	27.4	1.1	-55.86	47.25	54	-6.75	0-360	100	H
2	1.9439	64.9	PK	31.4	0.5	-52.97	43.83	54	-10.17	0-360	149	H
3	2.1321	65.5	PK	21.5	-	-52.09	34.91	54	-19.09	0-360	150	H
4	* 2.7447	65.63	PK	22.1	-	-50.67	37.06	54	-16.94	0-360	150	H
5	* 1.002	73.64	PK	27.4	1.1	-55.85	46.29	54	-7.71	0-360	150	V
6	1.9439	69.05	PK	31.4	0.5	-52.97	47.98	54	-6.02	0-360	150	V
7	2.1301	76.47	PK	21.5	-	-52.13	45.84	54	-8.16	0-360	150	V
8	* 2.7447	63.49	PK	22.1	-	-50.67	34.92	54	-19.08	0-360	150	V

PK - Peak detector
* Indicates frequencies in FCC / IC restricted bands

8.3.4. Radiated Emissions 1GHz – 10GHz High Channel External 24VDC





RF Controls
Model: RFC-6100XR
w/ 5.5dBi Ant, w/ PoE
TX Hi Ch
RED: Horizotal GRN: Vertical
Trace Markers

Marker No.	Test Frequency GHz	Meter Reading dBuV	Detector	Antenna Factor dB/m	Band Reject Filter dB	BOMS Factor dB	Level dBuV/m	47 CFR Part 15.209 Limit dBuV/m	Margin dB	Azimuth Degs	Height cm	Polarity
1	* 1.002	74.57	PK	27.4	1.1	-55.85	47.22	54	-6.78	0-360	100	H
2	1.9439	63.86	PK	31.4	0.5	-52.97	42.79	54	-11.21	0-360	100	H
3	2.1341	65.36	PK	21.5	-	-52.06	34.8	54	-19.2	0-360	150	H
4	* 2.7808	68.73	PK	22.2	-	-50.48	40.45	54	-13.55	0-360	150	H
5	* 1.004	72.89	PK	27.4	1.1	-55.86	45.53	54	-8.47	0-360	150	V
6	1.9399	66.24	PK	31.4	0.5	-52.97	45.17	54	-8.83	0-360	150	V
7	2.1341	78.14	PK	21.5	-	-52.06	47.58	54	-6.42	0-360	150	V
8	* 2.7808	67.68	PK	22.2	-	-50.48	39.4	54	-14.6	0-360	150	V

PK - Peak detector
* Indicates frequencies in FCC / IC restricted bands

9. AC POWER LINE CONDUCTED EMISSIONS

LIMITS

FCC §15.207 (a)

RSS-Gen 7.2.2

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	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 PROCEDURE

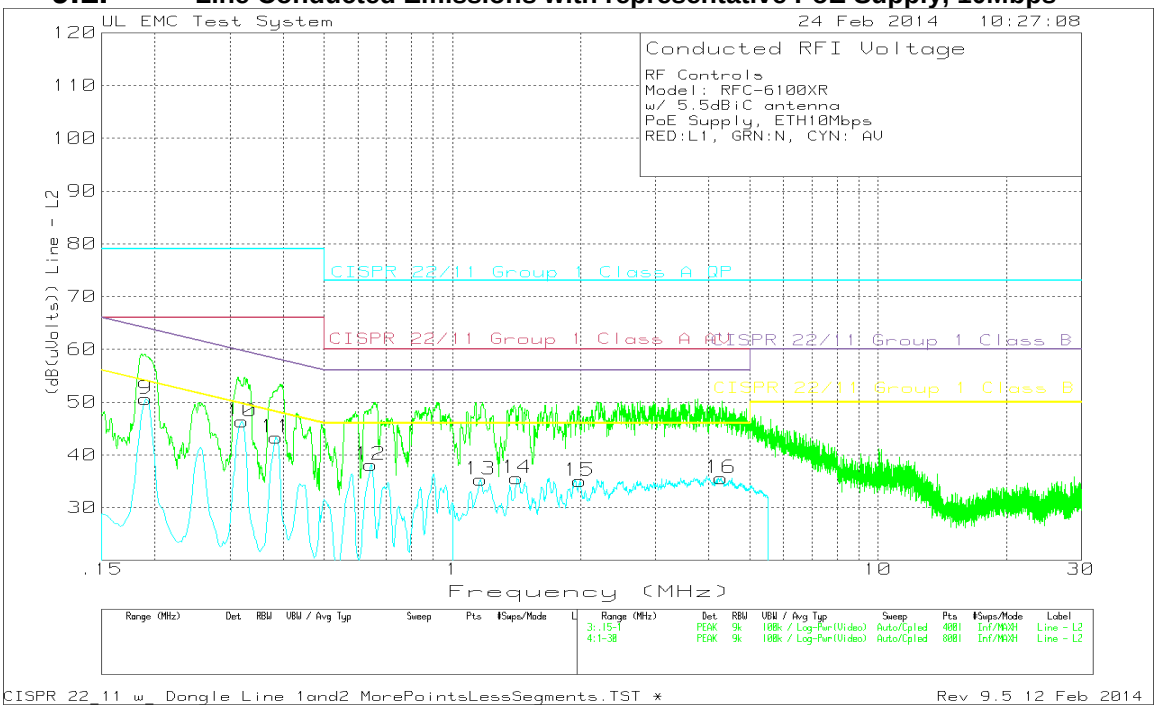
The EUT is placed on a non-conducting table 40 cm from the vertical ground plane and 80 cm above the horizontal ground plane. The EUT is configured in accordance with ANSI C63.4.

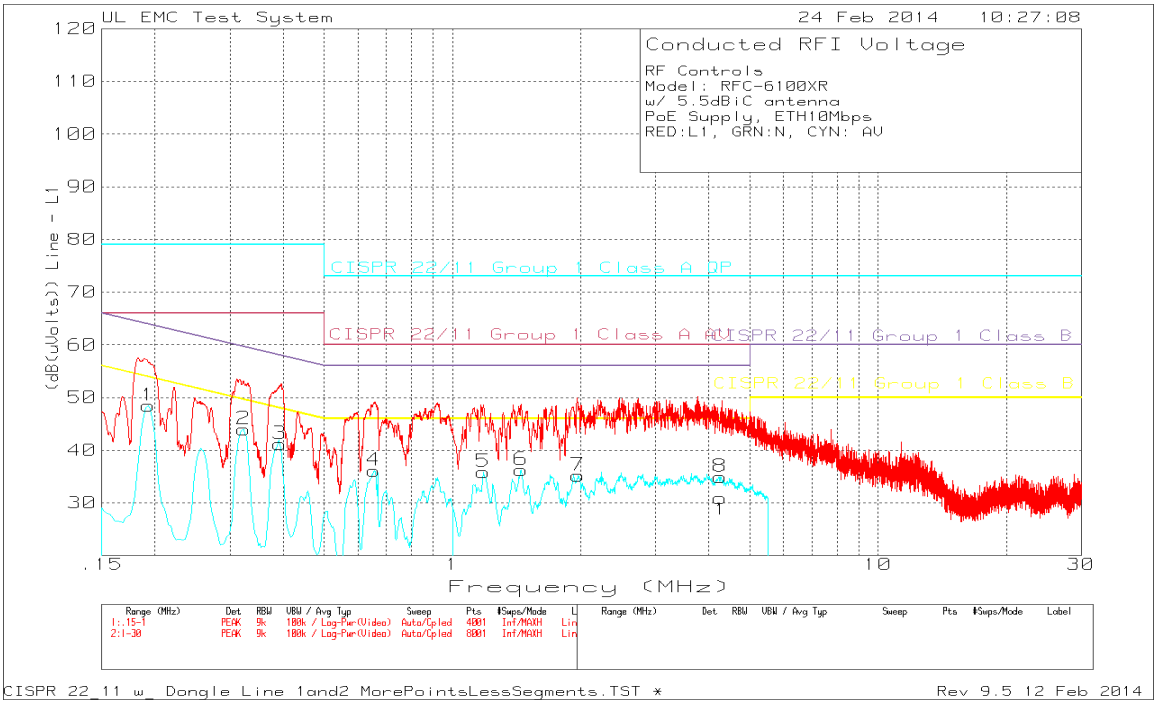
The receiver is set to a resolution bandwidth of 9 kHz. Peak detection is used unless otherwise noted as quasi-peak or average.

Line conducted data is recorded for both NEUTRAL and HOT lines.

RESULTS

9.1. Line Conducted Emissions with representative PoE Supply, 10Mbps





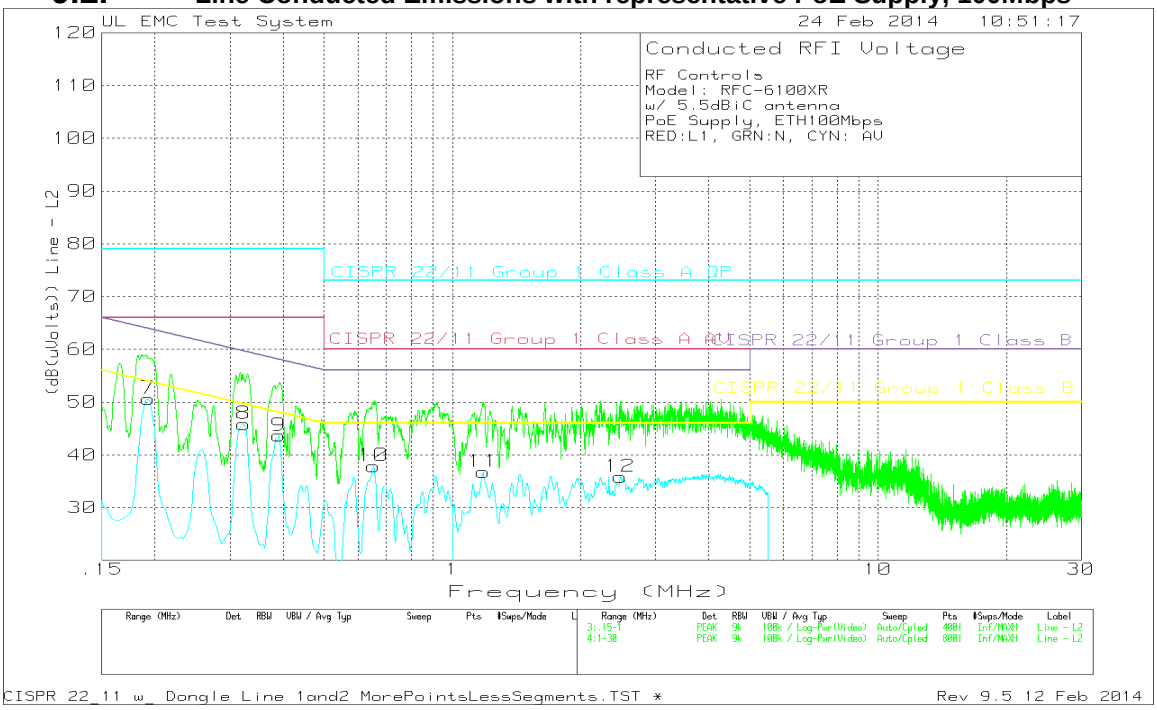
RF Controls
Model: RFC-6100XR
w/ 5.5dBiC antenna
PoE Supply, ETH10Mbps
RED:L1, GRN:N, CYN: AV
Trace Markers

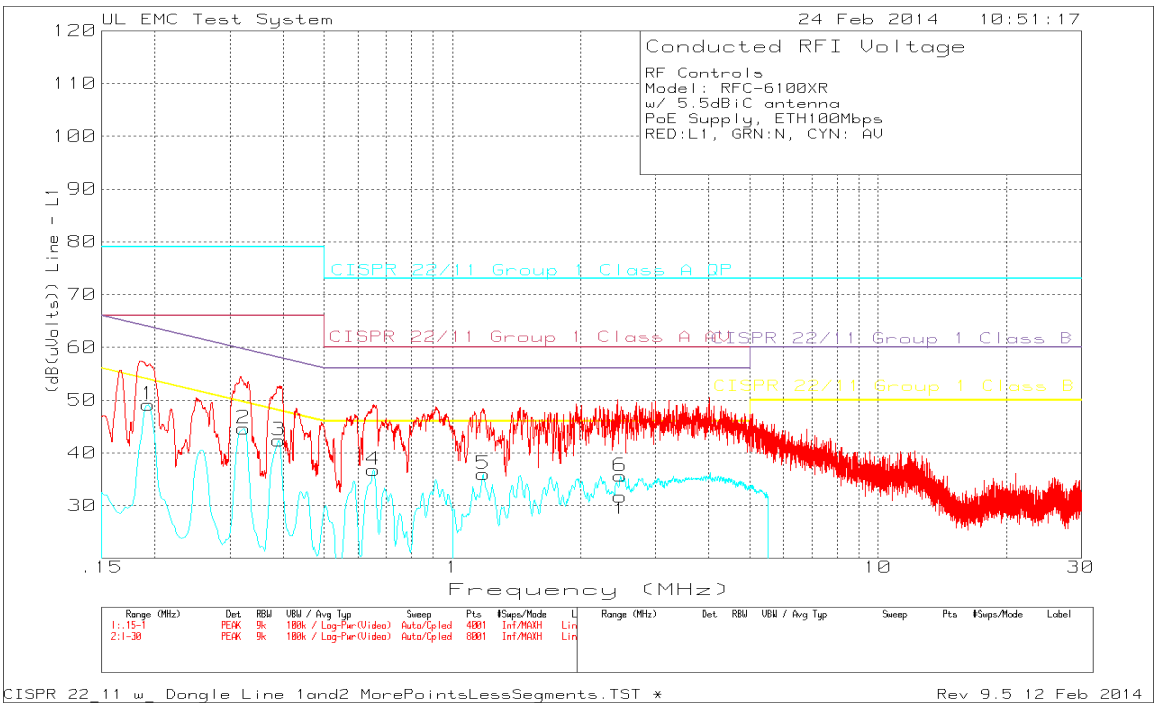
Test No.	Frequency (MHz)	Meter Reading	Transducer Factor (dB)	Gain/Loss Factor (dB)	Corrected Reading (dB(uVolts))	Limit:1	2	3	4	5	6
Line - L1											
1	.19275	36.73dBuV Av	.1	11.6	48.43	79	66	63.92	53.92	-	-
					Margin (dB)	-30.57	-17.57	-15.49	-5.49	-	-
2	.32325	33.05dBuV Av	.1	10.8	43.95	79	66	59.62	49.62	-	-
					Margin (dB)	-35.05	-22.05	-15.67	-5.67	-	-
3	.393	30.42dBuV Av	.1	10.7	41.22	79	66	58	48	-	-
					Margin (dB)	-37.78	-24.78	-16.78	-6.78	-	-
4	.654	25.43dBuV Av	.1	10.6	36.13	73	60	56	46	-	-
					Margin (dB)	-36.87	-23.87	-19.87	-9.87	-	-
5	1.1845	25.21dBuV Av	.1	10.6	35.91	73	60	56	46	-	-
					Margin (dB)	-37.09	-24.09	-20.09	-10.09	-	-
6	1.45	25.52dBuV Av	.1	10.6	36.22	73	60	56	46	-	-
					Margin (dB)	-36.78	-23.78	-19.78	-9.78	-	-
7	1.972	24.51dBuV Av	.1	10.6	35.21	73	60	56	46	-	-
					Margin (dB)	-37.79	-24.79	-20.79	-10.79	-	-
8	4.2625	24.15dBuV Av	.1	10.7	34.95	73	60	56	46	-	-
					Margin (dB)	-38.05	-25.05	-21.05	-11.05	-	-
Line - L2											
9	.1905	38.94dBuV Av	.1	11.6	50.64	79	66	64.01	54.01	-	-
					Margin (dB)	-28.36	-15.36	-13.37	-3.37	-	-
10	.321	35.4dBuV Av	.1	10.8	46.3	79	66	59.68	49.68	-	-
					Margin (dB)	-32.7	-19.7	-13.38	-3.38	-	-
11	.38625	32.42dBuV Av	.1	10.8	43.32	79	66	58.14	48.14	-	-
					Margin (dB)	-35.68	-22.68	-14.82	-4.82	-	-
12	.64275	27.47dBuV Av	.1	10.6	38.17	73	60	56	46	-	-
					Margin (dB)	-34.83	-21.83	-17.83	-7.83	-	-
13	1.1665	24.62dBuV Av	.1	10.6	35.32	73	60	56	46	-	-
					Margin (dB)	-37.68	-24.68	-20.68	-10.68	-	-
14	1.4185	24.88dBuV Av	.1	10.6	35.58	73	60	56	46	-	-
					Margin (dB)	-37.42	-24.42	-20.42	-10.42	-	-
15	1.9945	24.36dBuV Av	.1	10.6	35.06	73	60	56	46	-	-
					Margin (dB)	-37.94	-24.94	-20.94	-10.94	-	-
16	4.2715	24.81dBuV Av	.1	10.7	35.61	73	60	56	46	-	-
					Margin (dB)	-37.39	-24.39	-20.39	-10.39	-	-

LIMIT 1: CISPR 22/11 Group 1 Class A QP
LIMIT 2: CISPR 22/11 Group 1 Class A AV
LIMIT 3: CISPR 22/11 Group 1 Class B QP
LIMIT 4: CISPR 22/11 Group 1 Class B AV

PK - Peak detector
Av - Average detector

9.2. Line Conducted Emissions with representative PoE Supply, 100Mbps





RF Controls
Model: RFC-6100XR
w/ 5.5dBiC antenna
PoE Supply, ETH100Mbps
RED:L1, GRN:N, CYN: AV

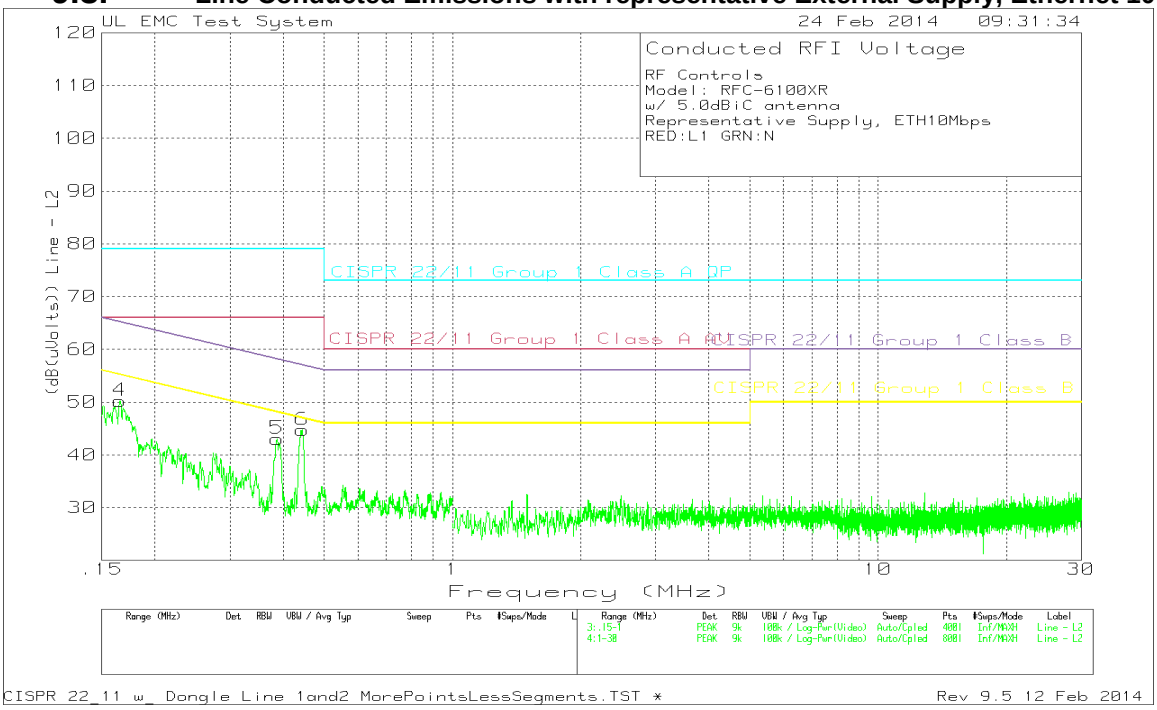
Trace Markers

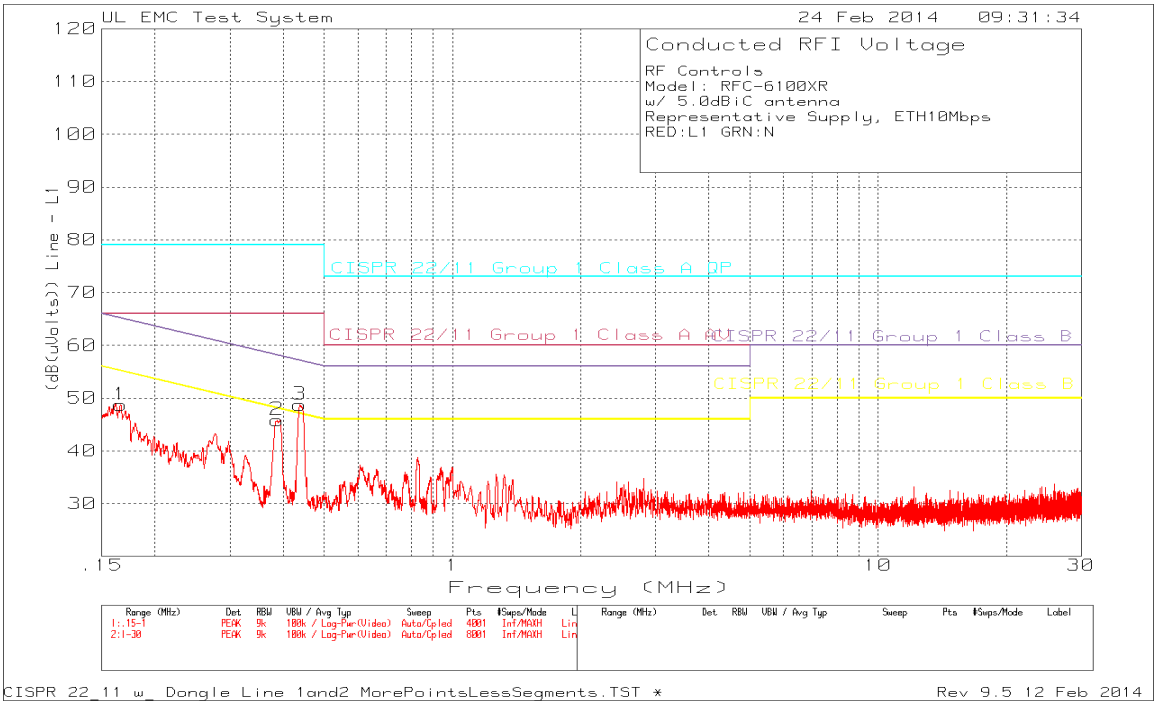
No.	Test Frequency (MHz)	Meter Reading	Transducer Factor (dB)	Gain/Loss Factor (dB)	Corrected Reading (dB(uVolts))	Limit:1	2	3	4	5	6
Line - L1											
1	.19275	37.49dBuV Av	.1	11.6	49.19	79	66	63.92	53.92	-	-
					Margin (dB)	-29.81	-16.81	-14.73	-4.73	-	-
2	.32325	33.74dBuV Av	.1	10.8	44.64	79	66	59.62	49.62	-	-
					Margin (dB)	-34.36	-21.36	-14.98	-4.98	-	-
3	.39075	31.62dBuV Av	.1	10.7	42.42	79	66	58.05	48.05	-	-
					Margin (dB)	-36.58	-23.58	-15.63	-5.63	-	-
4	.65175	26.11dBuV Av	.1	10.6	36.81	73	60	56	46	-	-
					Margin (dB)	-36.19	-23.19	-19.19	-9.19	-	-
5	1.18	25.27dBuV Av	.1	10.6	35.97	73	60	56	46	-	-
					Margin (dB)	-37.03	-24.03	-20.03	-10.03	-	-
6	2.4805	24.95dBuV Av	.1	10.6	35.65	73	60	56	46	-	-
					Margin (dB)	-37.35	-24.35	-20.35	-10.35	-	-
Line - L2											
7	.19275	38.96dBuV Av	.1	11.6	50.66	79	66	63.92	53.92	-	-
					Margin (dB)	-28.34	-15.34	-13.26	-3.26	-	-
8	.32325	34.95dBuV Av	.1	10.8	45.85	79	66	59.62	49.62	-	-
					Margin (dB)	-33.15	-20.15	-13.77	-3.77	-	-
9	.39075	32.73dBuV Av	.1	10.8	43.63	79	66	58.05	48.05	-	-
					Margin (dB)	-35.37	-22.37	-14.42	-4.42	-	-
10	.65175	27.2dBuV Av	.1	10.6	37.9	73	60	56	46	-	-
					Margin (dB)	-35.1	-22.1	-18.1	-8.1	-	-
11	1.18	26.04dBuV Av	.1	10.6	36.74	73	60	56	46	-	-
					Margin (dB)	-36.26	-23.26	-19.26	-9.26	-	-
12	2.4805	25.11dBuV Av	.1	10.6	35.81	73	60	56	46	-	-
					Margin (dB)	-37.19	-24.19	-20.19	-10.19	-	-

LIMIT 1: CISPR 22/11 Group 1 Class A QP
LIMIT 2: CISPR 22/11 Group 1 Class A AV
LIMIT 3: CISPR 22/11 Group 1 Class B QP
LIMIT 4: CISPR 22/11 Group 1 Class B AV

Av - Average detector

9.3. Line Conducted Emissions with representative External Supply, Ethernet 10Mbps





RF Controls
Model: RFC-6100XR
w/ 5.0dBiC antenna
Representative Supply, ETH10Mbps
RED:L1 GRN:N Trace Markers

No.	Test Frequency (MHz)	Meter Reading	Transducer Factor (dB)	Gain/Loss Factor (dB)	Corrected Reading (dB(uVolts))	Limit:1	2	3	4	5	6
Line - L1											
1	.16594	35.29dBuV PK	.1	13.3	48.69	79	66	65.16	55.16	-	-
					Margin (dB)	-30.31	-17.31	-16.47	-6.47	-	-
2	.38736	34.95dBuV PK	.1	10.8	45.85	79	66	58.12	48.12	-	-
					Margin (dB)	-33.15	-20.15	-12.27	-2.27	-	-
3	.43773	37.92dBuV PK	.1	10.7	48.72	79	66	57.1	47.1	-	-
					Margin (dB)	-30.28	-17.28	-8.38	1.62	-	-
Line - L2											
4	.16551	36.75dBuV PK	.1	13.4	50.25	79	66	65.18	55.18	-	-
					Margin (dB)	-28.75	-15.75	-14.93	-4.93	-	-
5	.38758	32.15dBuV PK	.1	10.8	43.05	79	66	58.12	48.12	-	-
					Margin (dB)	-35.95	-22.95	-15.07	-5.07	-	-
6	.44325	33.91dBuV PK	.1	10.7	44.71	79	66	57	47	-	-
					Margin (dB)	-34.29	-21.29	-12.29	-2.29	-	-

Quais-peak Data

Test Frequency (MHz)	Meter Reading	Transducer Factor (dB)	Gain/Loss Factor (dB)	Corrected Reading(dB(uVolts))	Limit:1	2	3	4	5
Line - L1 .15 - 1MHz									
.16555	30.65dBuV QP	.1	13.3	44.05	79	66	65.18	55.18	-	-
			Margin (dB):		-34.95	-21.95	-21.13	-11.13	-	-
.39115	31.59dBuV QP	.1	10.7	42.39	79	66	58.04	48.04	-	-
			Margin (dB):		-36.61	-23.61	-15.65	-5.65	-	-
.43924	36.39dBuV QP	.1	10.7	47.19	79	66	57.08	47.08	-	-
			Margin (dB):		-31.81	-18.81	-9.89	.11	-	-
Line - L2 .15 - 1MHz										
.16796	28.95dBuV QP	.1	13.2	42.25	79	66	65.06	55.06	-	-
			Margin (dB):		-36.75	-23.75	-22.81	-12.81	-	-
.38702	27dBuV QP	.1	10.8	37.9	79	66	58.13	48.13	-	-
			Margin (dB):		-41.1	-28.1	-20.23	-10.23	-	-
.44045	27.88dBuV QP	.1	10.7	38.68	79	66	57.05	47.05	-	-
			Margin (dB):		-40.32	-27.32	-18.37	-8.37	-	-

Average Data

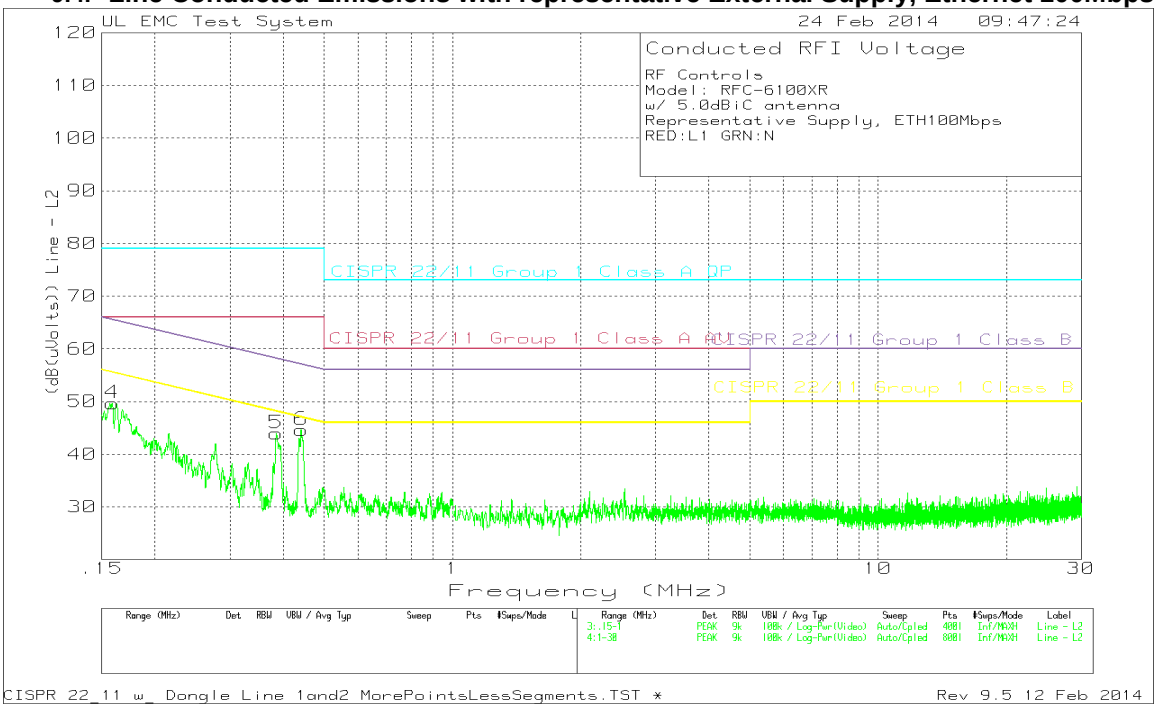
Test Frequency (MHz)	Meter Reading	Transducer Factor (dB)	Gain/Loss Factor (dB)	Corrected Reading(dB(uVolts))	Limit:1	2	3	4	5
Line - L1 .15 - 1MHz									
.16555	23.94dBuV Av .1	13.3	37.34	79	66	65.18	55.18	-	-
		Margin (dB):		-41.66	-28.66	-27.84	-17.84	-	-
.39115	29.09dBuV Av .1	10.7	39.89	79	66	58.04	48.04	-	-
		Margin (dB):		-39.11	-26.11	-18.15	-8.15	-	-
.43924	32.98dBuV Av .1	10.7	43.78	79	66	57.08	47.08	-	-
		Margin (dB):		-35.22	-22.22	-13.3	-3.3	-	-
Line - L2 .15 - 1MHz									
.16796	22.81dBuV Av .1	13.2	36.11	79	66	65.06	55.06	-	-
		Margin (dB):		-42.89	-29.89	-28.95	-18.95	-	-
.38702	20.61dBuV Av .1	10.8	31.51	79	66	58.13	48.13	-	-
		Margin (dB):		-47.49	-34.49	-26.62	-16.62	-	-
.44045	22.98dBuV Av .1	10.7	33.78	79	66	57.05	47.05	-	-
		Margin (dB):		-45.22	-32.22	-23.27	-13.27	-	-

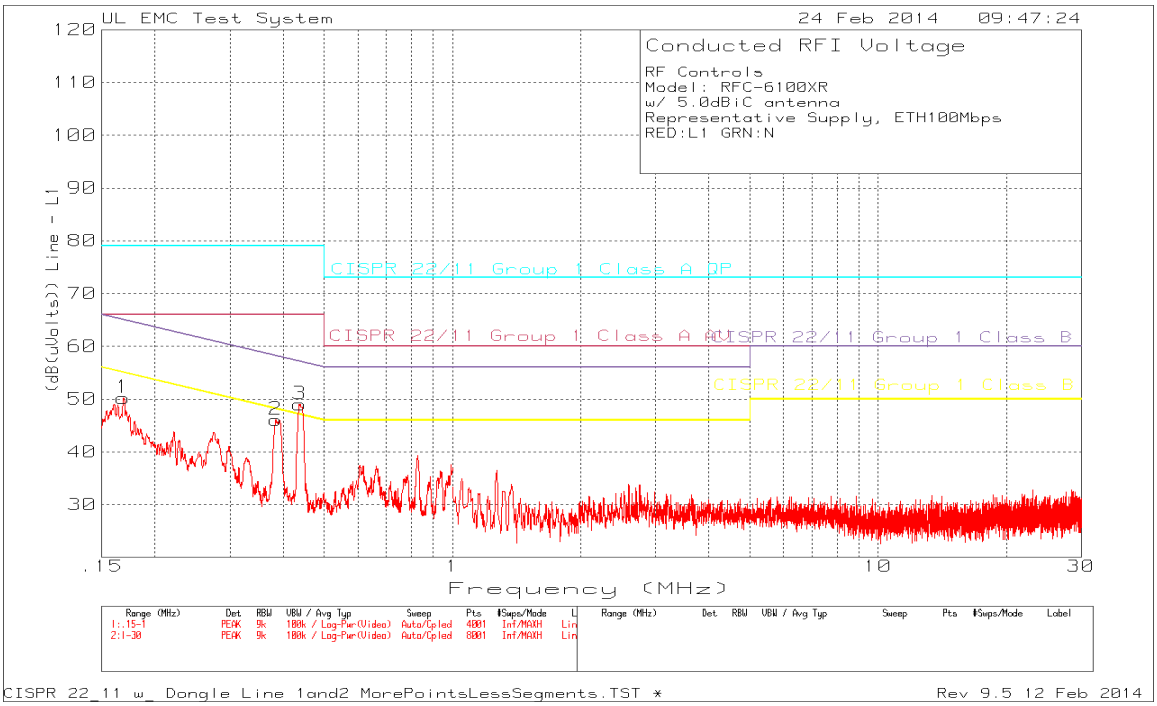
NOTE: "+" - Indicates an emission level in excess of the applicable limit (s).

PK - Peak detector
QP - Quasi-Peak detector
Av - average detection

LIMIT 1: CISPR 22/11 Group 1 Class A QP
LIMIT 2: CISPR 22/11 Group 1 Class A AV
LIMIT 3: CISPR 22/11 Group 1 Class B QP
LIMIT 4: CISPR 22/11 Group 1 Class B AV

9.4. Line Conducted Emissions with representative External Supply, Ethernet 100Mbps





RF Controls
Model: RFC-6100XR
w/ 5.0dBiC antenna
Representative Supply, ETH100Mbps
RED:L1 GRN:N Trace Markers

No.	Test Frequency (MHz)	Meter Reading	Transducer Factor (dB)	Gain/Loss Factor (dB)	Corrected Reading (dB(uVolts))	Limit:1	2	3	4	5	6
Line - L1											
1	.1687	37.01dBuV PK	.1	13.1	50.21	79	66	65.02	55.02	-	-
					Margin (dB)	-28.79	-15.79	-14.81	-4.81	-	-
2	.38449	35.21dBuV PK	.1	10.8	46.11	79	66	58.18	48.18	-	-
					Margin (dB)	-32.89	-19.89	-12.07	-2.07	-	-
3	.43719	38.22dBuV PK	.1	10.7	49.02	79	66	57.11	47.11	-	-
					Margin (dB)	-29.98	-16.98	-8.09	1.91	-	-
Line - L2											
4	.15871	35.71dBuV PK	.1	13.9	49.71	79	66	65.53	55.53	-	-
					Margin (dB)	-29.29	-16.29	-15.82	-5.82	-	-
5	.38566	33.03dBuV PK	.1	10.8	43.93	79	66	58.16	48.16	-	-
					Margin (dB)	-35.07	-22.07	-14.23	-4.23	-	-
6	.44113	33.87dBuV PK	.1	10.7	44.67	79	66	57.04	47.04	-	-
					Margin (dB)	-34.33	-21.33	-12.37	-2.37	-	-

Quais-peak Data

	Test Frequency (MHz)	Meter Reading	Transducer Factor (dB)	Gain/Loss Factor (dB)	Corrected Reading(dB(uVolts))	Limit:1	2	3	4	5
Line - L1										
.16807	29.12dBuV QP	.1	13.1	42.32	79	66	65.06	55.06	-	-
			Margin (dB):		-36.68	-23.68	-22.74	-12.74	-	-
.38846	32.76dBuV QP	.1	10.7	43.56	79	66	58.1	48.1	-	-
			Margin (dB):		-35.44	-22.44	-14.54	-4.54	-	-
.43814	36.55dBuV QP	.1	10.7	47.35	79	66	57.1	47.1	-	-
			Margin (dB):		-31.65	-18.65	-9.75	.25	-	-
Line - L2										
.16944	28.49dBuV QP	.1	13.1	41.69	79	66	64.99	54.99	-	-
			Margin (dB):		-37.31	-24.31	-23.3	-13.3	-	-
.38599	27.34dBuV QP	.1	10.8	38.24	79	66	58.15	48.15	-	-
			Margin (dB):		-40.76	-27.76	-19.91	-9.91	-	-
.4396	27.87dBuV QP	.1	10.7	38.67	79	66	57.07	47.07	-	-
			Margin (dB):		-40.33	-27.33	-18.4	-8.4	-	-

Average Data

Test Frequency (MHz)	Meter Reading	Transducer Factor (dB)	Gain/Loss Factor (dB)	Corrected Reading(dB(uVolts))	Limit:1	2	3	4	5
Line - L1 .15 - 1MHz									
.16807	23.41dBuV Av .1	13.1	36.61	79	66	65.06	55.06	-	-
		Margin (dB):		-42.39	-29.39	-28.45	-18.45	-	-
.38846	27.96dBuV Av .1	10.7	38.76	79	66	58.1	48.1	-	-
		Margin (dB):		-40.24	-27.24	-19.34	-9.34	-	-
.43814	33.74dBuV Av .1	10.7	44.54	79	66	57.1	47.1	-	-
		Margin (dB):		-34.46	-21.46	-12.56	-2.56	-	-
Line - L2 .15 - 1MHz									
.16944	21.91dBuV Av .1	13.1	35.11	79	66	64.99	54.99	-	-
		Margin (dB):		-43.89	-30.89	-29.88	-19.88	-	-
.38599	21.05dBuV Av .1	10.8	31.95	79	66	58.15	48.15	-	-
		Margin (dB):		-47.05	-34.05	-26.2	-16.2	-	-
.4396	22.28dBuV Av .1	10.7	33.08	79	66	57.07	47.07	-	-
		Margin (dB):		-45.92	-32.92	-23.99	-13.99	-	-

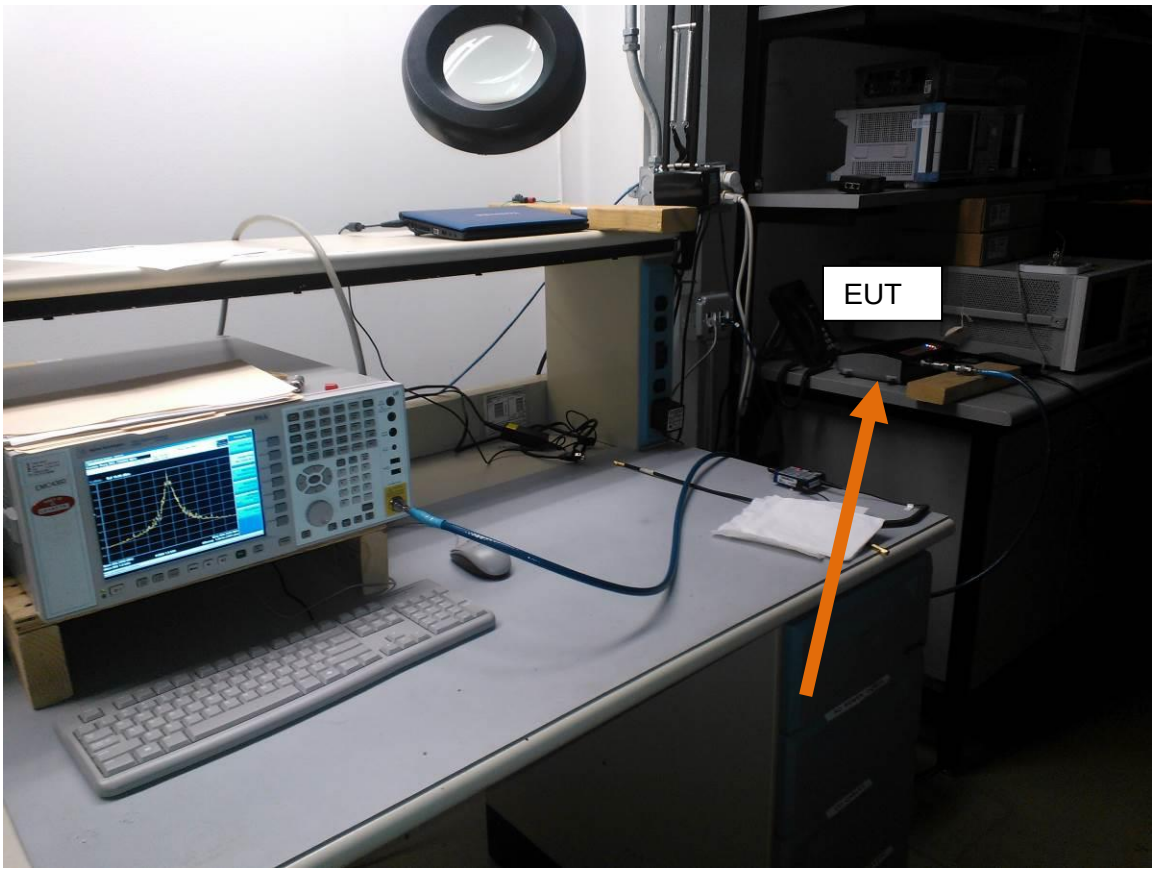
NOTE: "+" - Indicates an emission level in excess of the applicable limit (s).

PK - Peak detector
QP - Quasi-Peak detector
Av - average detection

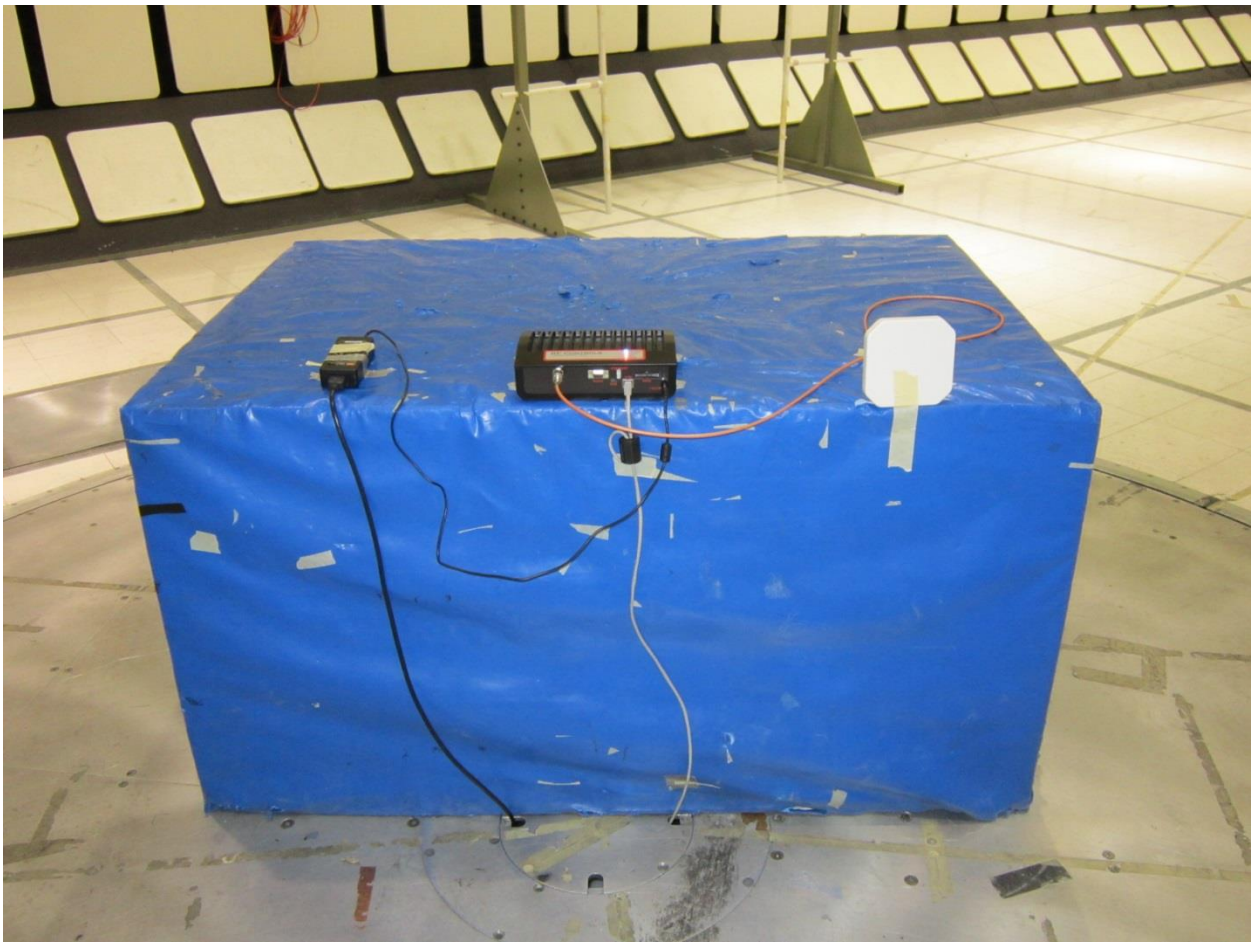
LIMIT 1: CISPR 22/11 Group 1 Class A QP
LIMIT 2: CISPR 22/11 Group 1 Class A AV
LIMIT 3: CISPR 22/11 Group 1 Class B QP
LIMIT 4: CISPR 22/11 Group 1 Class B AV

10. SETUP PHOTOS

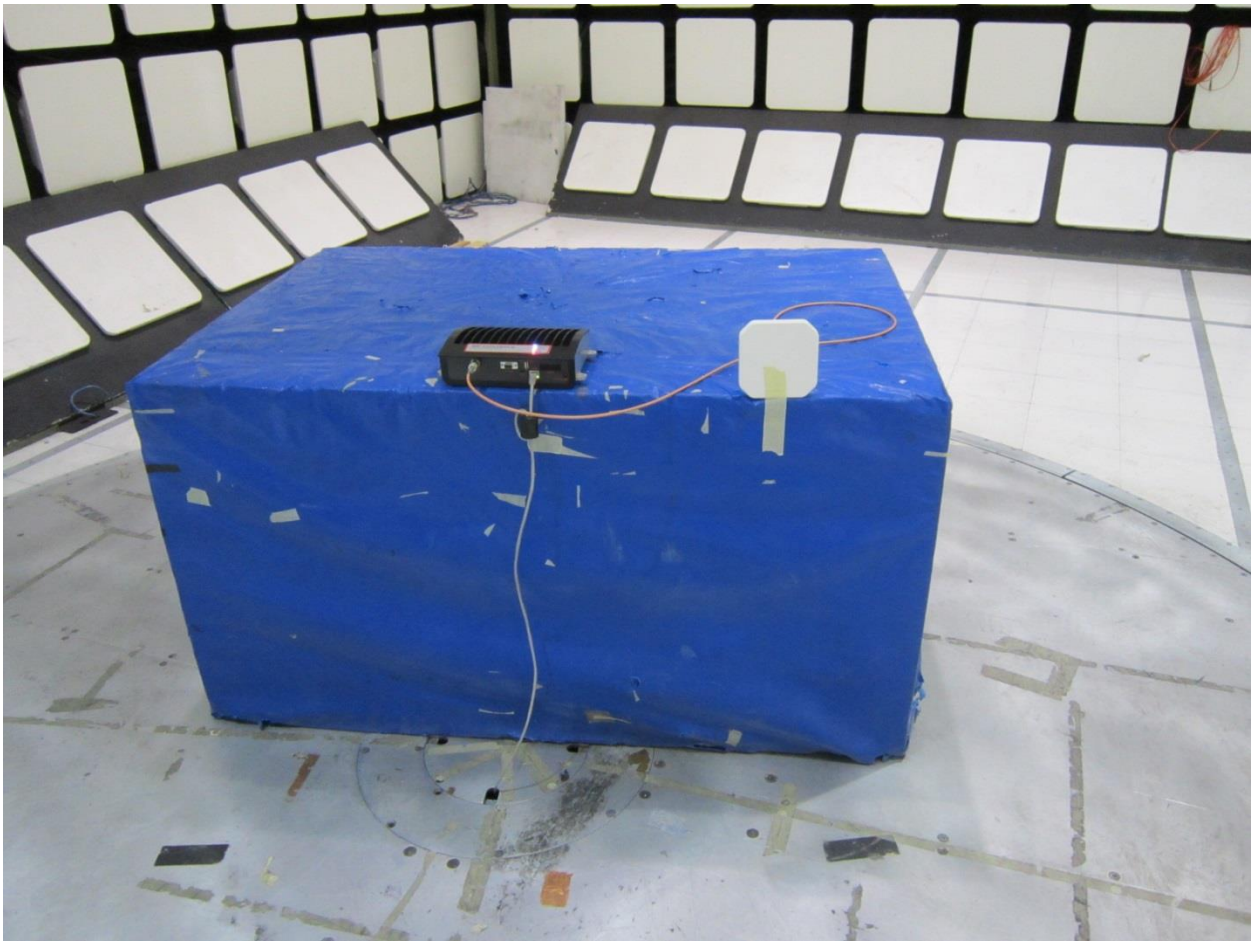
ANTENNA PORT CONDUCTED RF MEASUREMENT SETUP



RADIATED RF MEASUREMENT SETUP (BELOW 1 GHz)

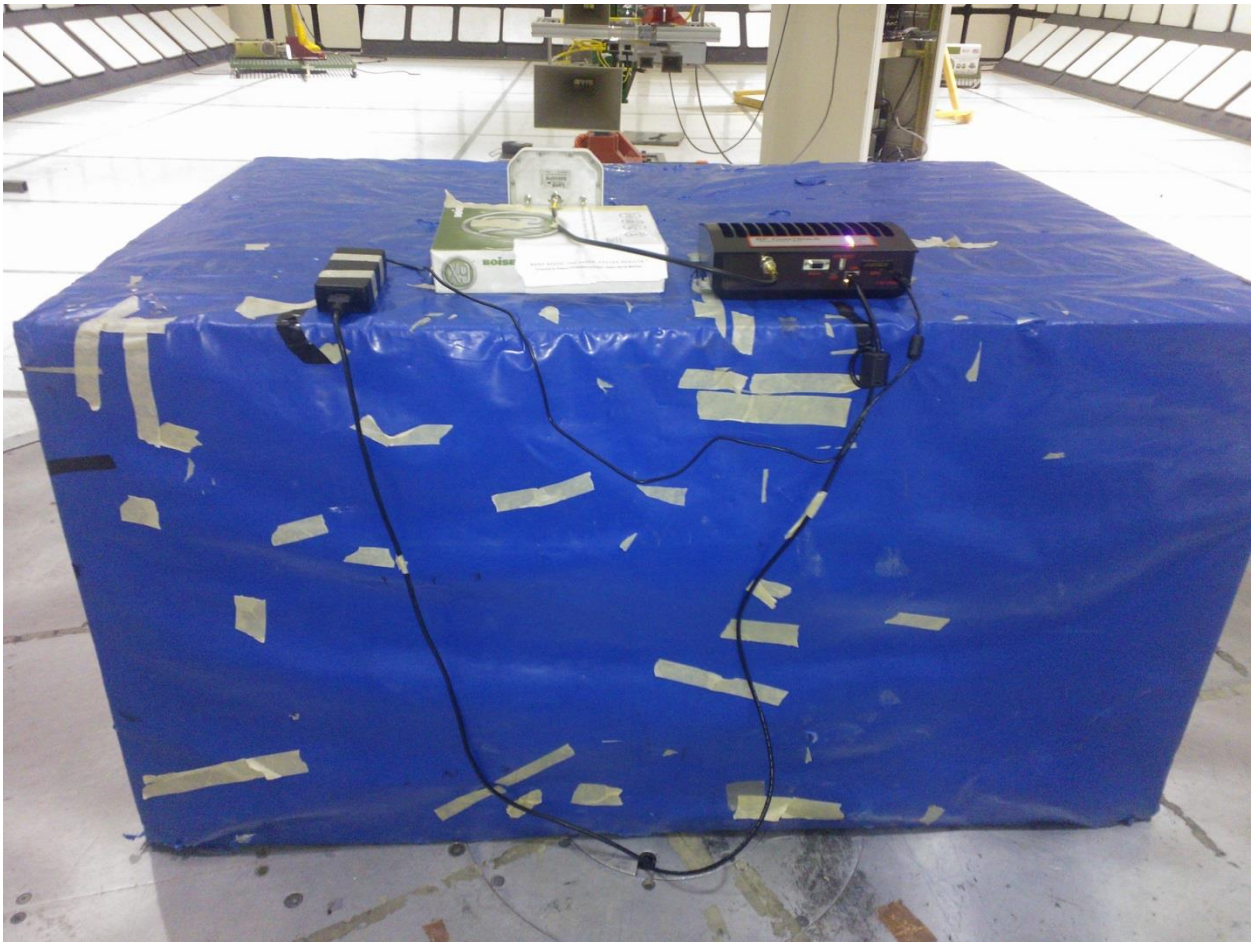


Reader powered with external 24VDC Supply

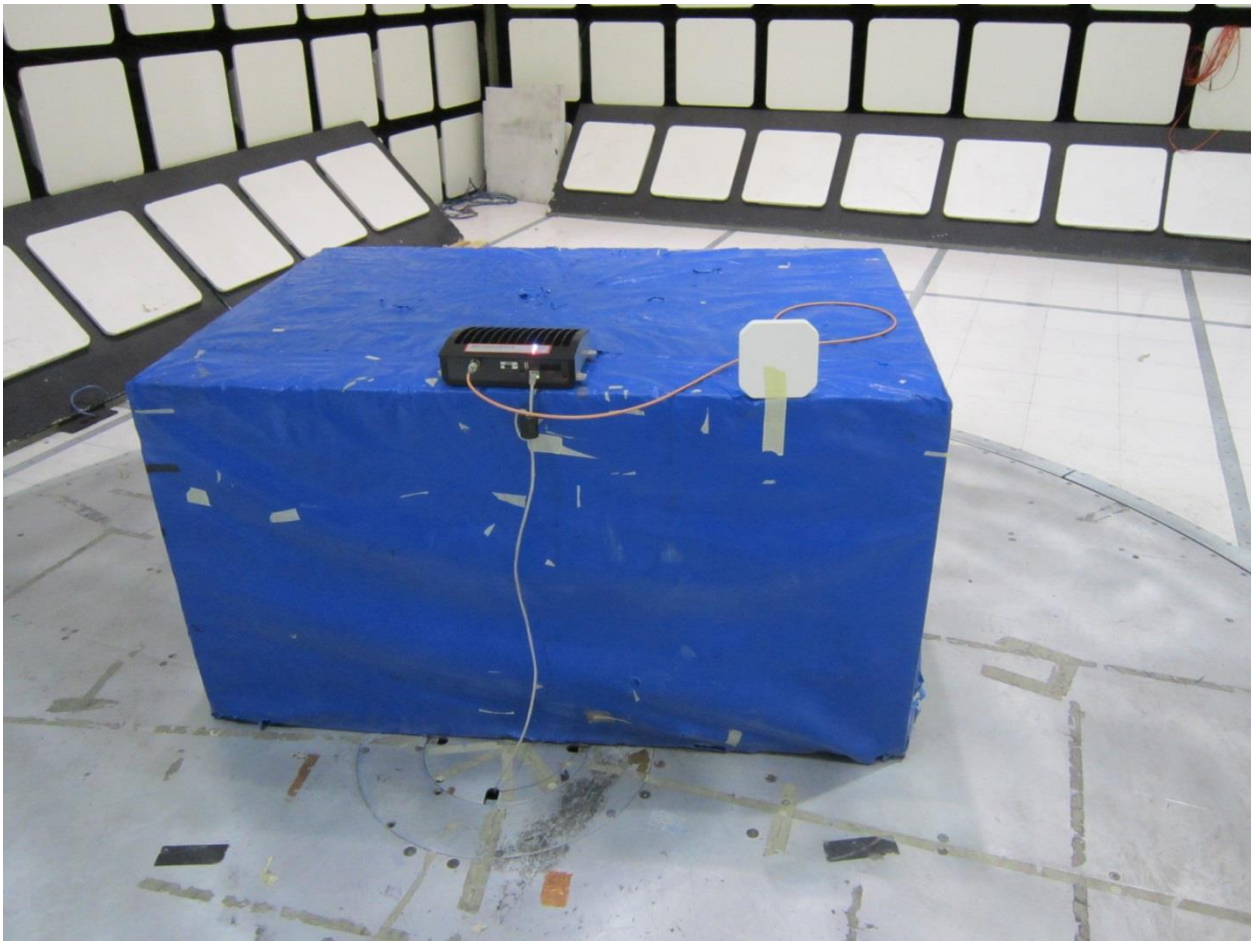


Reader powered with PoE adapter

RADIATED RF MEASUREMENT SETUP (ABOVE 1 GHz)

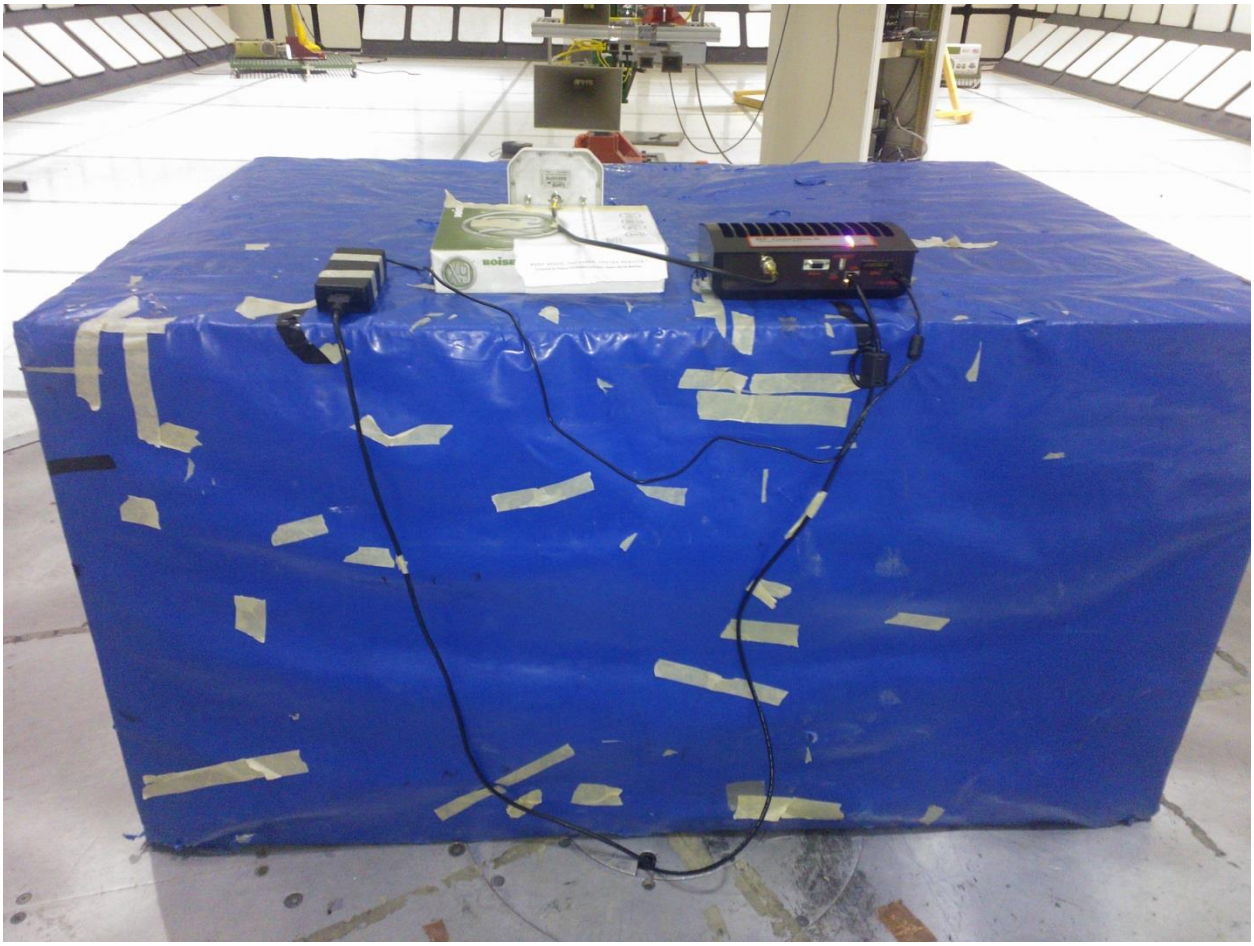


Reader powered with external 24VDC Supply. For PoE the external supply is removed and power is applied via ethernet.



Reader powered with PoE adapter

RADIATED RF MEASUREMENT SETUP (ABOVE 1 GHz)



Reader powered with external 24VDC Supply. For PoE the external supply is removed and power is applied via ethernet.

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POWERLINE CONDUCTED EMISSIONS MEASUREMENT SETUP

END OF REPORT

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