FCC 47 CFR PART 15 SUBPART C

CERTIFICATION TEST REPORT

FOR

RF ID Reader

MODEL NUMBER: A-405

FCC ID: WFQITCS-A-405
IC: 10717A-ITCSA405

REPORT NUMBER: 10906664A

ISSUE DATE: December 12, 2015

Prepared for
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St Louis, MO 63104

Prepared by
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NVLAP Lab code: 100414-0

Revision History

Rev.	Issue Date	Revisions	Revised By
--	12 December 2015	Initial Issue	BM

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: RF Controls LLC
1400 S 3rd Street
Suite 200
St. Louis, MO 63104

EUT DESCRIPTION: RF ID Reader

MODEL: A-405

SERIAL NUMBER: Non serialized

DATE TESTED: September 14, 2015 – December 8, 2015

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
CFR 47 Part 15 Subpart C	Pass

UL LLC 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 LLC 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 LLC and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL LLC 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.

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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 C63.10-2013, FCC CFR 47 Part 2, FCC CFR 47 Part 15, RSS-GEN Issue 4, and RSS-247 Issue 1.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 333 Pfingsten Road, Northbrook, IL 60062 USA. IC OATS number 2180A-1.

UL NBK is accredited by NVLAP, Laboratory Code 100414-0. The full scope of accreditation can be viewed at http://ts.nist.gov

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

Sample Calculations
Radiated Field Strength and Conducted Emissions data contained within this report is calculated on the following basis:
Field Strength (dBuV/m) = Meter Reading (dBuV) + AF (dB/m) - Gain (dB) + Cable Loss (dB)
Conducted Voltage (dBuV) = Meter Reading (dBuV) + Cable Loss (dB) + LISN IL (dB)
Conducted Current (dBuA) = Meter Reading (dBuV) + Cable Loss (dB) - Transducer Factor (dBohms)

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
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	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	1-6GHz	Horn	5.02dB
Radiated Emissions	6-18GHz	Horn	5.34dB
Radiated Emissions	18-26GHz	Horn	6.60dB
Conducted Ant Port	30MHz-26GHz	Spectrum Analyzer	2.94

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

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a RF ID reader built into antenna assembly.

The radio and antenna is manufactured by RF Controls.

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 - 928MHz	Basic	24.99	315.50

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio is mounted together with an antenna. The maximum linear antenna gain is 10.9dBi.

5.4. SOFTWARE AND FIRMWARE

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Firmware in EUT was:
RF_Reader_4xx0x0b_091113boot.hex    rev.: RF_Reader_4xx0x0b_091113boot.hex

EUT Driver was:
405_rfc_arcon-003.15.244.tar.gz rev.: 003.15.244
And :BSA_Ver0x0b_082815boot.hex  rev.: 0x0b_082815

Test Utility was:
ETH TO SERIAL CONFIG 1.0.0.97 rev.: 1.0.0.97
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5.5. WORST-CASE CONFIGURATION AND MODE

Device can be mounted in single orientation only (wall mounted). The antenna can be electronically set to either transmit in circular polarization, horizontal polarization and vertical polarization. In addition to different polarization settings the antenna can be steered to +/- 40° from its bore site beam. Based on experimental testing the antenna produces highes EiRP level when steered at 0° (boreside).

All emissions were measured with power levels established based on EiRP measurements where there the output power was set that total EiRP would not be more then 36dBm. In addition because the device uses high gain antenna (over 6dBi) it was ensured that the power output was equal to 30dBm – (AntGain_dBi – 6dB)

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
Laptopt Computer	Generic	-	-	-
PoE Adapter	StarTech	POEINJ100	-	

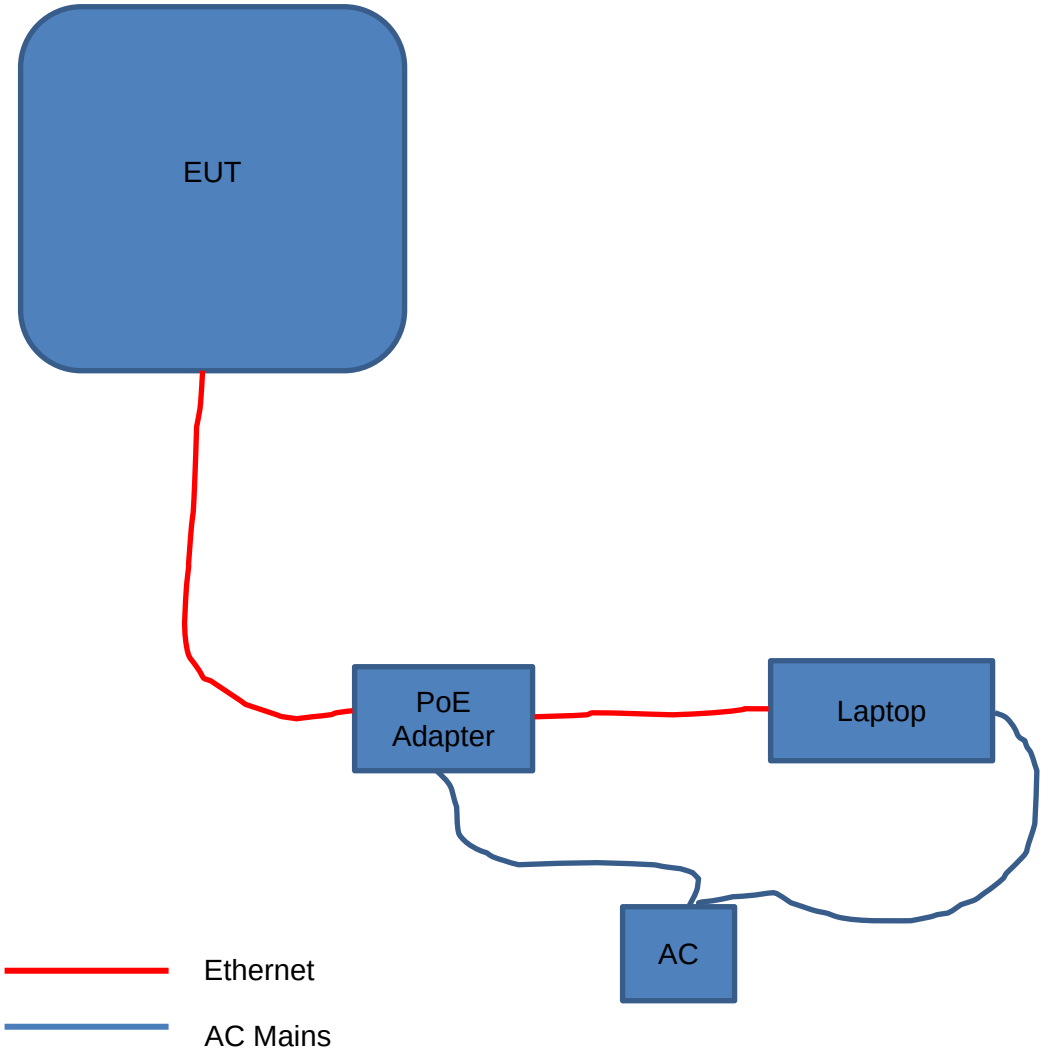
I/O CABLES

I/O Cable List						
Cable No	**Port**	**# of identical ports**	**Connector Type**	**Cable Type**	**Cable Length (m)**	**Remarks**
1	Ethernet + PoE	1	RJ-45	Cat 5	10m	generic cable

TEST SETUP

The device is stand alone combination of radio and antenna. Device is powered via 48VDC PoE and controller via Ethernet. PoE adapter is not sold with the device.

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**	**EMC No.**	**Cal Date**	**Cal Due**
Radiated Software	UL	UL EMC	Ver 9.5, July 22, 2014		
Conducted Software	UL	UL EMC	Ver 9.5, May 17 2012		
Radiated and Antenna Port Equipment					
EMI Test Receiver	Rohde & Schwarz	ESU	EMC4323	20141216	20151231
EMI Test Receiver	Rohde & Schwarz	ESCI	EMC4328	20141830	20151231
Bicon Antenna	Electro-Metrics	EM6912A	EMC4070	20141014	20151031
Log-P Antenna	Chase	UPA6109	EMC4313	20141119	20151130
Loop Antenna	EMCO	6502/1	EMC4026	20150420	20160430
Antenna Array	UL	BOMS	EMC4276	20141201	20151231
Spectrum Analyzer	Agilent	N9030A (PXA)	EMC4360	20141219	20151219
Line Conducted Emissions Equipment					
EMI Test Receiver	Rohde & Schwarz	ESR	EMC4377	23-Apr-15	23-Apr-16
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	9-Jan-15	10-Jan-16
LISN - L2	Solar	8602-50-TS-50-N	EMC4064	9-Jan-15	10-Jan-16

7. TEST RESULTS

7.1. SUBSTITUTION POWER MEASUREMENTS AND ANTENNA GAIN

The gain of the antenna was measured using substitution power measurement technique by replacing the EUT with known antenna and signal source.

All measurements are based on using linear antenna as the substitution antenna and linear antenna as the receiving antenna. The EUT can operate either in linear mode or circular mode.

FCC KDB412172D07 v01r01 was used a partial guidance.

	Frequency	Polarization	EUT FS dBuV/m @ 3m	Voltage at antenna dBm	Substitution Field Strength dBuV/m	EUT vs Substitution FS Delta dB	Substitution Voltage @ Antenna + Delta dBm	Substitution Antenna factor dBi	EIRP Level dBm	EUT Ant Gain dBi
Circular Polarization	902.75	Horizontal	131.16	-13.34	90.55	40.61	27.27	5.2	32.47	4.57
	902.75	Vertical	129.46	-13.34	89.13	40.33	26.99	5.2	32.19	4.29
	914.75	Horizontal	129.96	-13.32	90.3	39.66	26.34	5	31.34	3.44
	914.75	Vertical	128.55	-13.32	88.9	39.65	26.33	5	31.33	3.43
	927.25	Horizontal	128.43	-13.3	90.47	37.96	24.66	4.6	29.26	1.36
	927.25	Vertical	127.24	-13.3	88.85	38.39	25.09	4.6	29.69	1.79
Linear Polarization Vertical	902.75	Vertical	130.98	-13.34	88.13	42.85	29.51	5.2	34.71	10.91
	914.75	Vertical	128.21	-13.32	88.9	39.31	25.99	5	30.99	6.94
	927.25	Vertical	127.09	-13.3	88.85	38.24	24.94	4.6	29.54	5.49
Linear Polarization Horizontal	902.75	Horizontal	130.74	-13.34	90.55	40.19	26.85	5.2	32.05	8.11
	914.75	Horizontal	129.77	-13.32	90.3	39.47	26.15	5	31.15	7.21
	927.25	Horizontal	126.59	-13.3	90.47	36.12	22.82	4.6	27.42	3.48

7.2. ANTENNA PORT TEST RESULTS

7.3. ON TIME AND DUTY CYCLE

LIMITS

None; for reporting purposes only.

PROCEDURE

DA 00-705

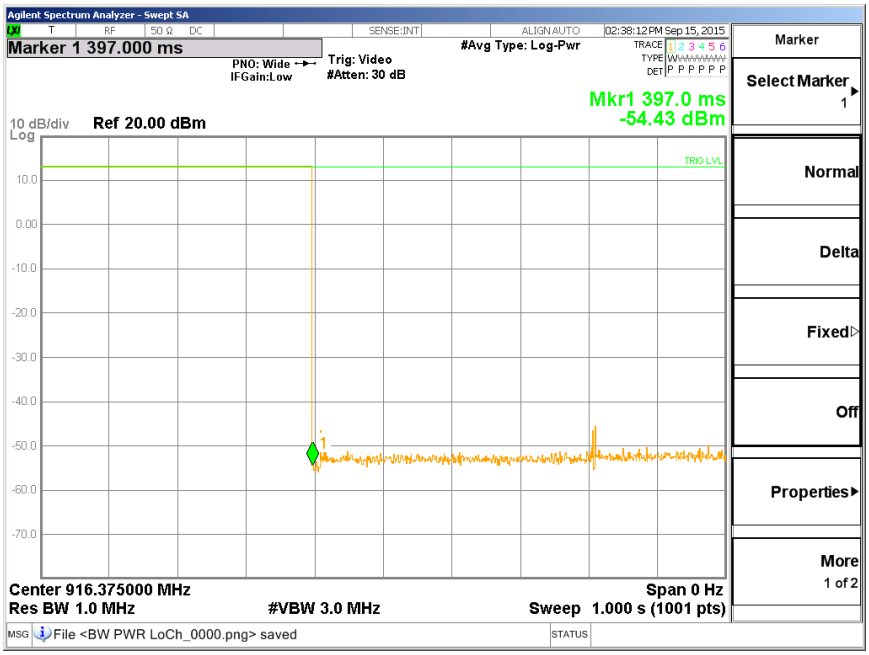
ON TIME AND DUTY CYCLE RESULTS

Mode	ON Time B (msec)	Period (msec)	Duty Cycle x (linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	1/B Minimum VBW (kHz)
Hopping Mode						
Antenna	397.000	100	3.970	397.00%	0.00	N/A

* No duty cycle correction possible.

DUTY CYCLE PLOTS

Pulse Duration



7.4. BASIC DATA RATE MODULATION

7.4.1. 20 dB AND 99% BANDWIDTH

LIMIT

None; for reporting purposes only.

TEST PROCEDURE

DA 00-705
RSS-Gen

The transmitter output is connected to a spectrum analyzer. The RBW is set to ≥ 1% of the 20 dB bandwidth. The VBW is set to ≥ RBW. The sweep time is coupled.

RESULTS

Operating Mode T25

Channel	Frequency (MHz)	20 dB Bandwidth (kHz)	99% Bandwidth (kHz)
Low	902.75	92.42	79.596
Middle	914.75	92.27	79.763
High	927.25	92.2	80.399

Operating Mode T12.5

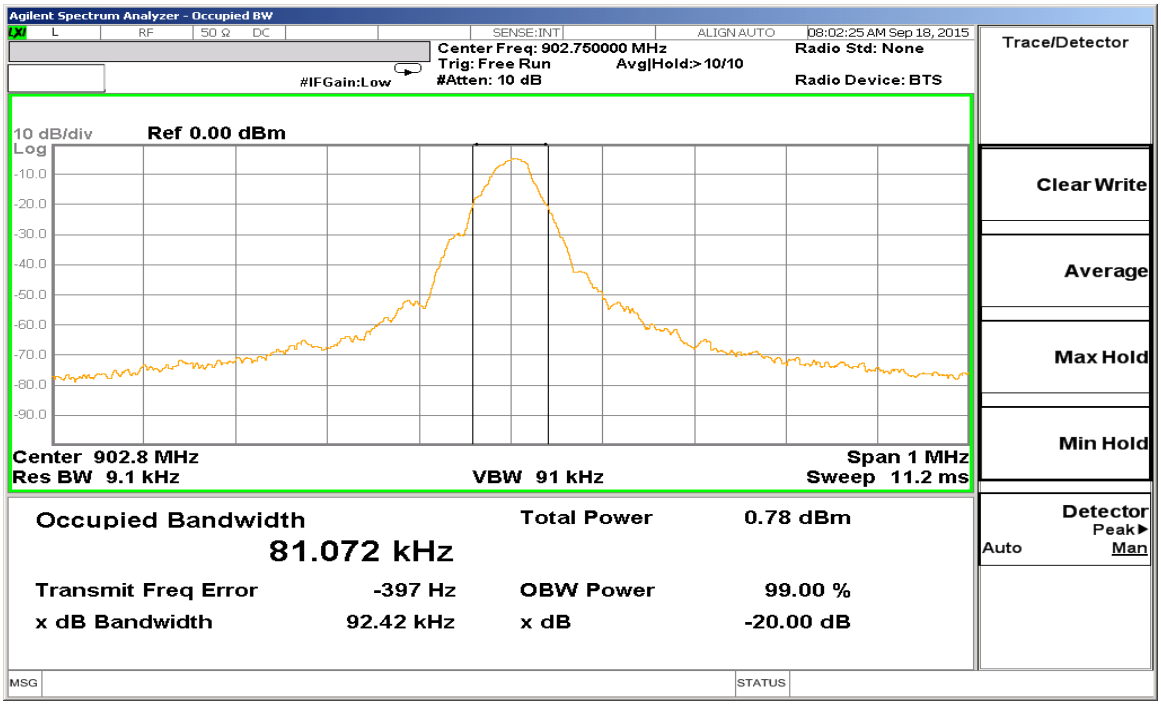
Channel	Frequency (MHz)	20 dB Bandwidth (kHz)	99% Bandwidth (kHz)
Low	902.75	137.4	123.74
Middle	914.75	138.4	123.99
High	927.25	137.7	123.97

Operating Mode T6.25

Channel	Frequency (MHz)	20 dB Bandwidth (kHz)	99% Bandwidth (kHz)
Low	902.75	261.2	241.95
Middle	914.75	262	243.04
High	927.25	261.4	243.02

Operating Mode T25, Low Channel

20dB BW



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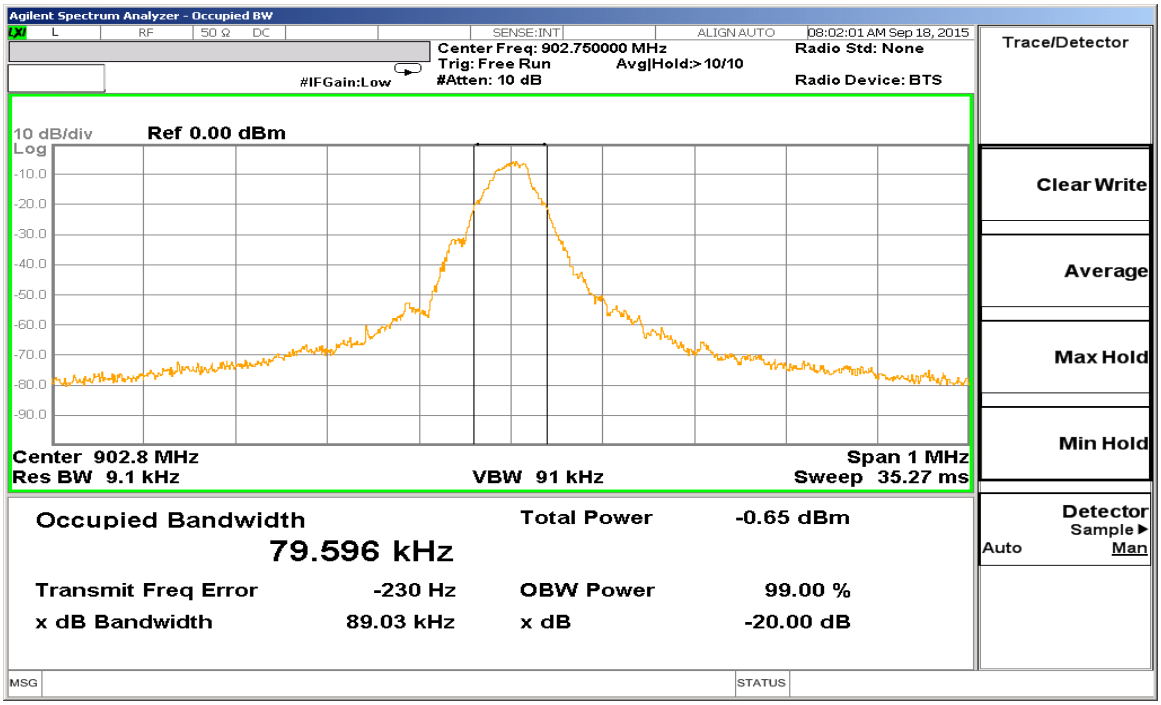
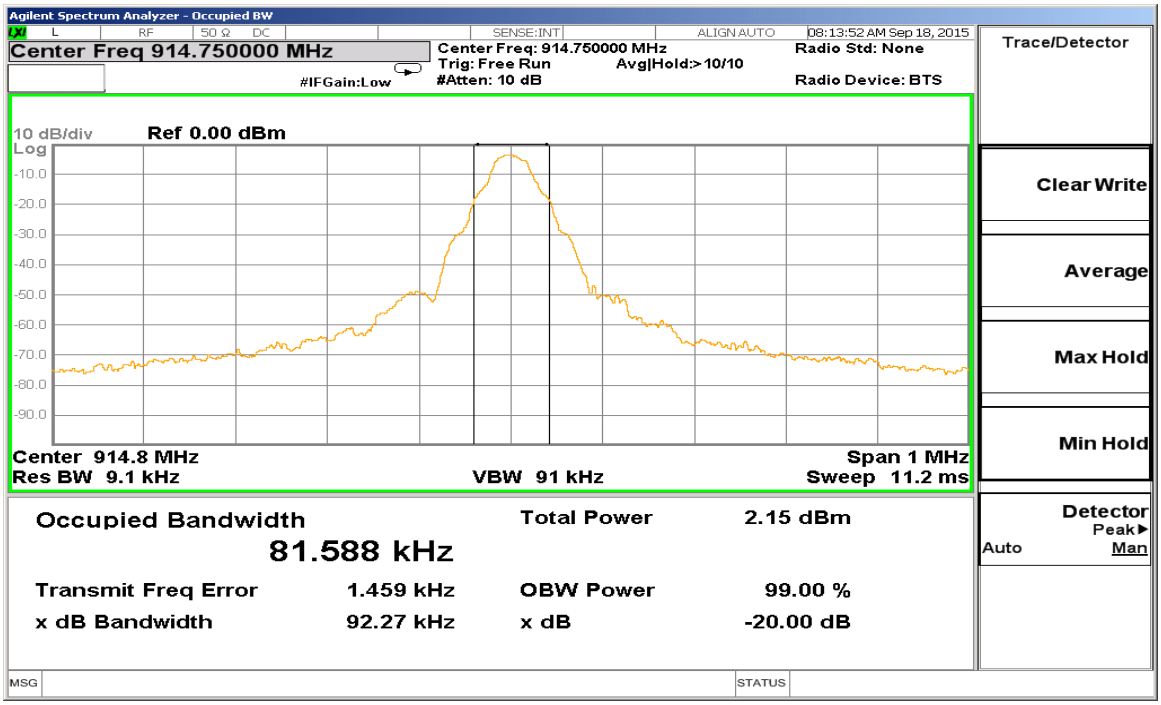
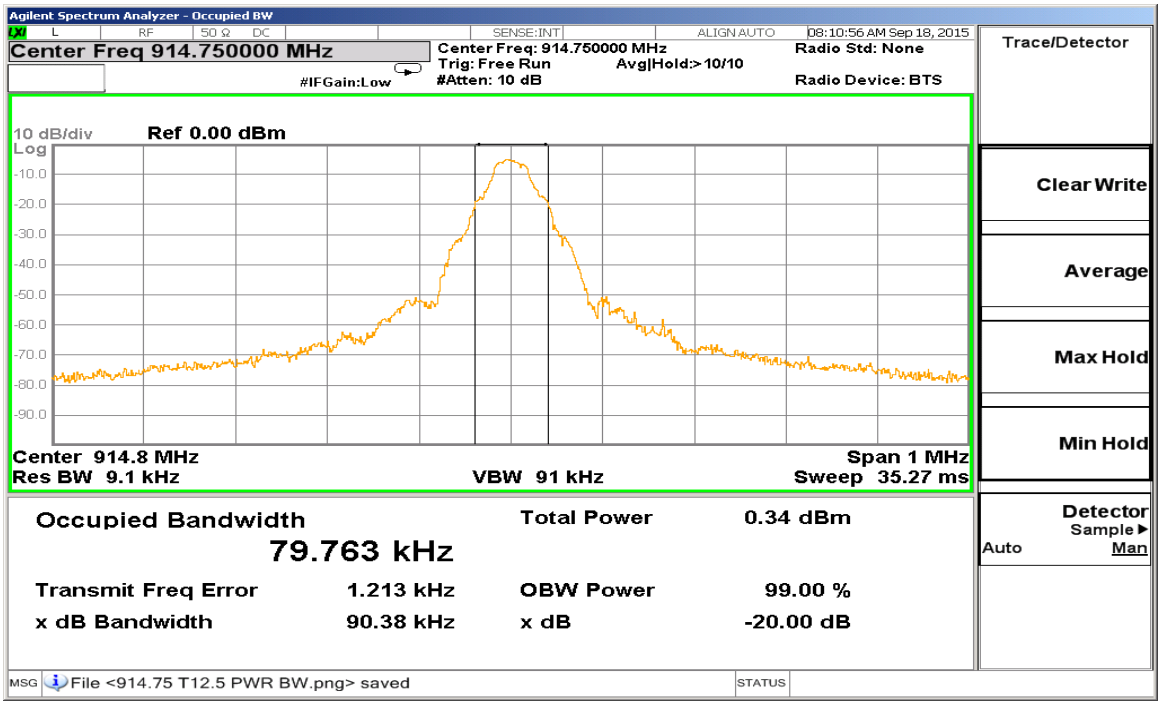


Operating Mode T25, Middle Channel

20dB BW

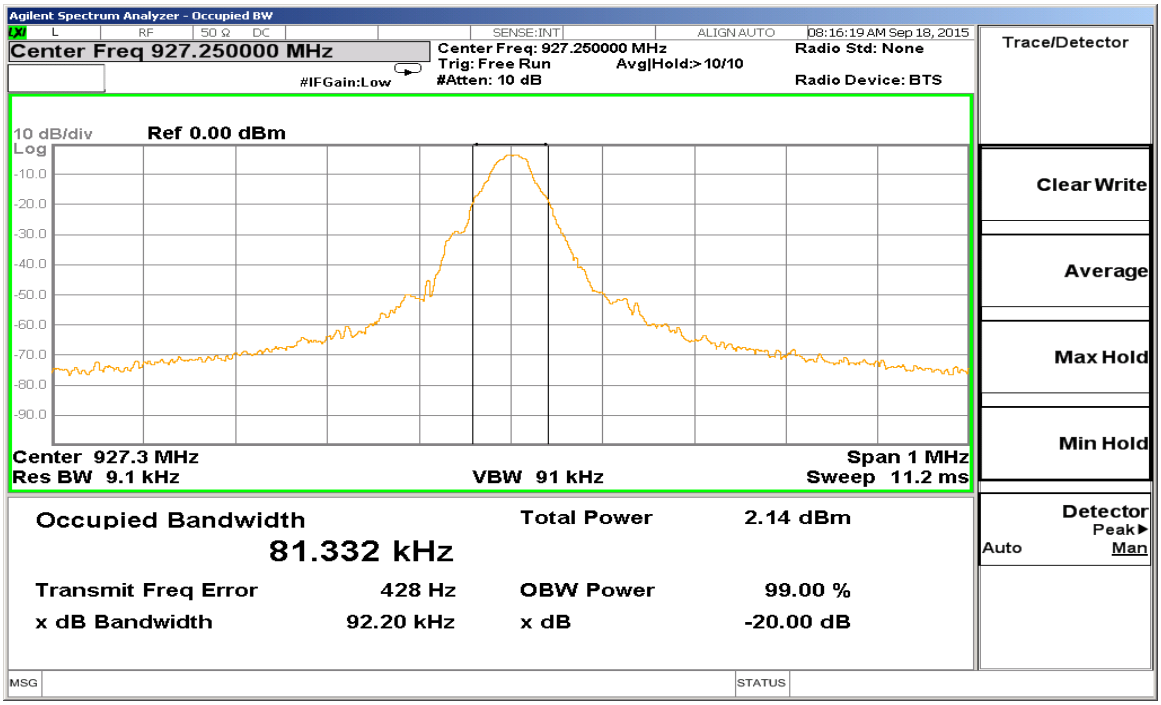


99%BW

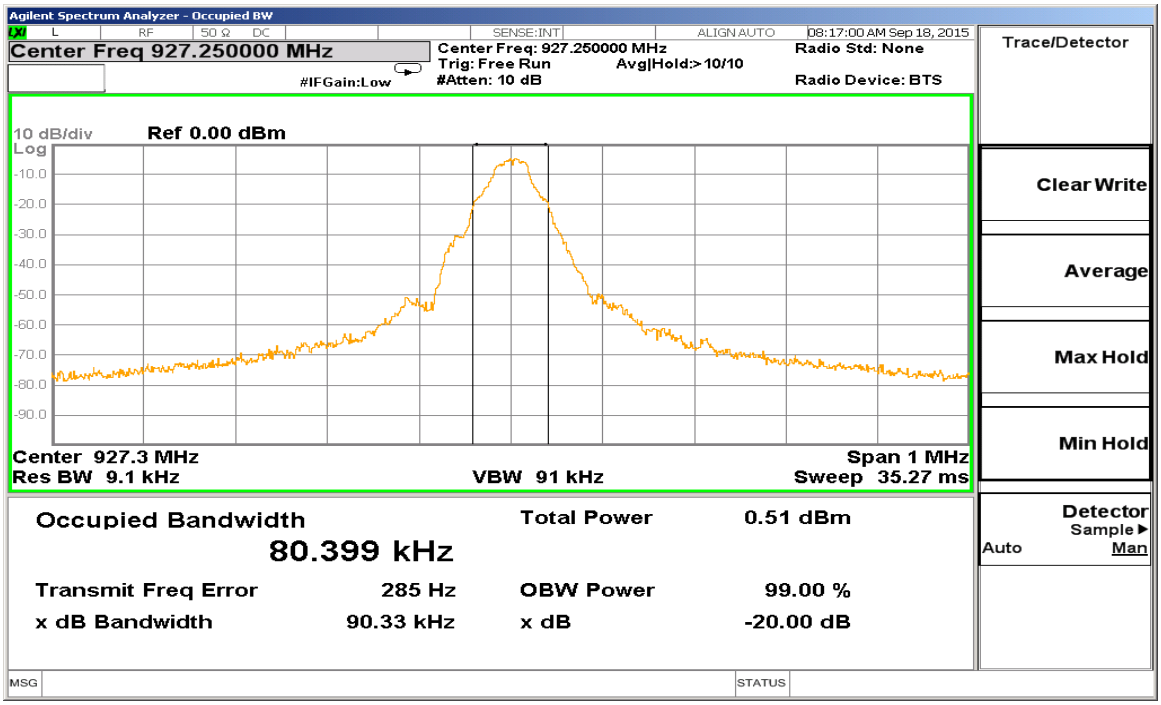


Operating Mode T25, High Channel

20dB BW

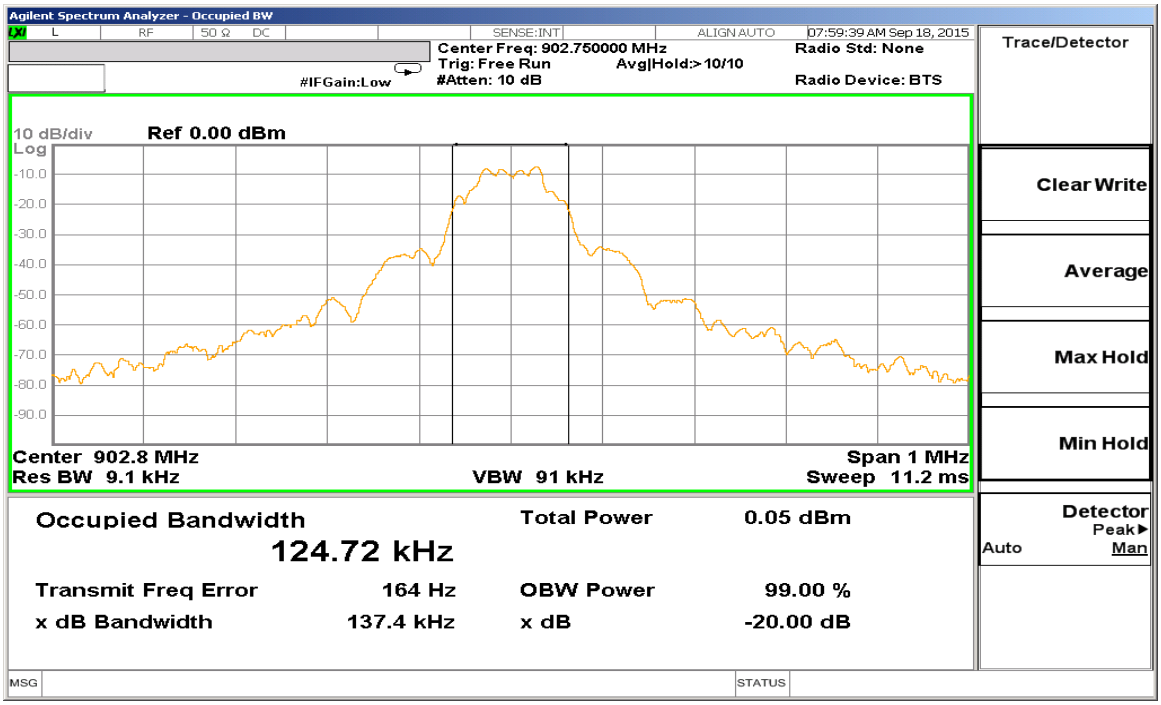


99%BW

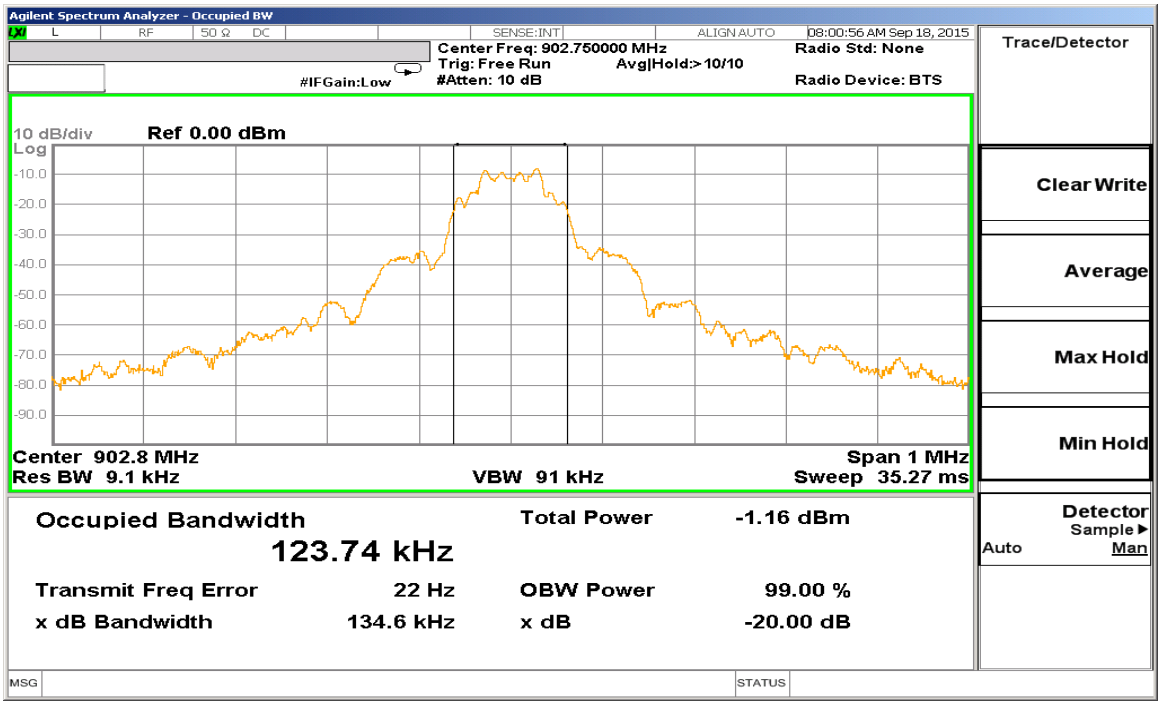


Operating Mode T12.5, Low Channel

20dB BW

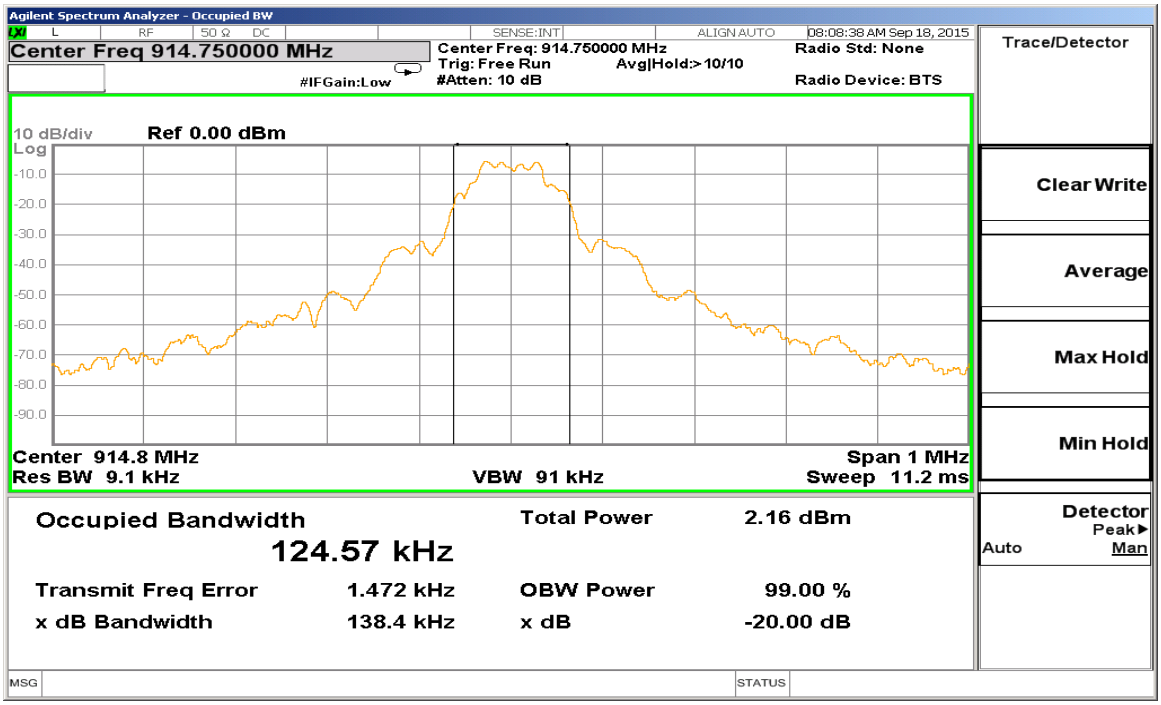


99%BW

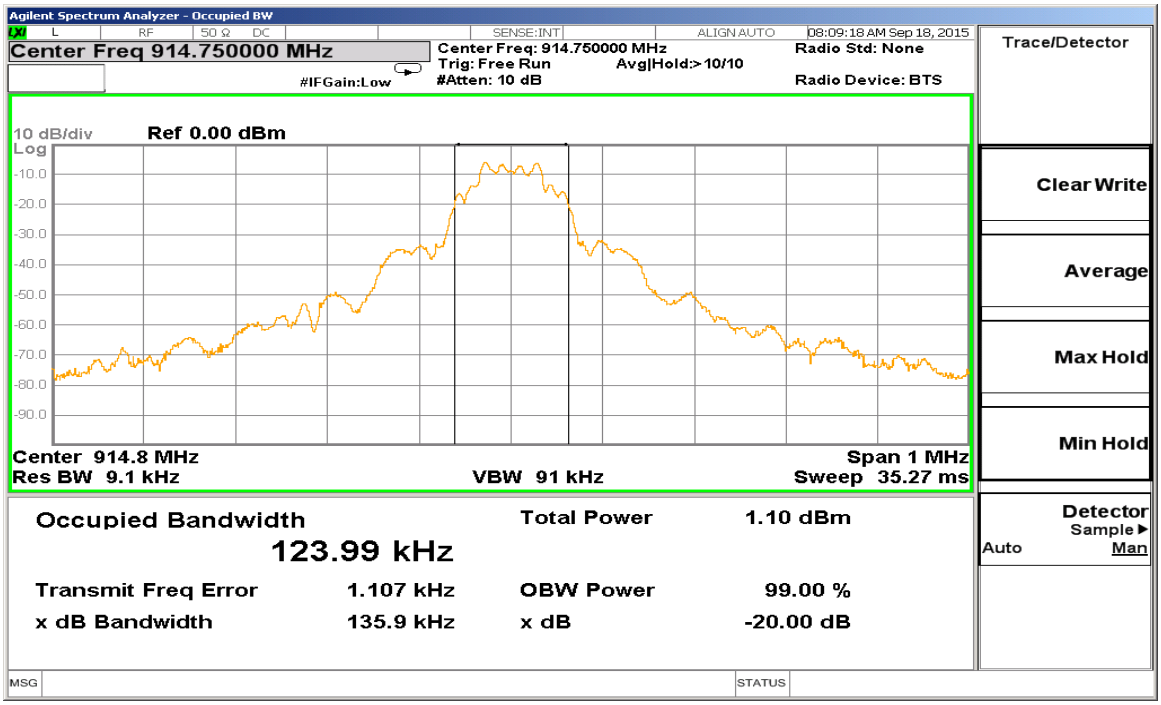


Operating Mode T12.5, Middle Channel

20dB BW

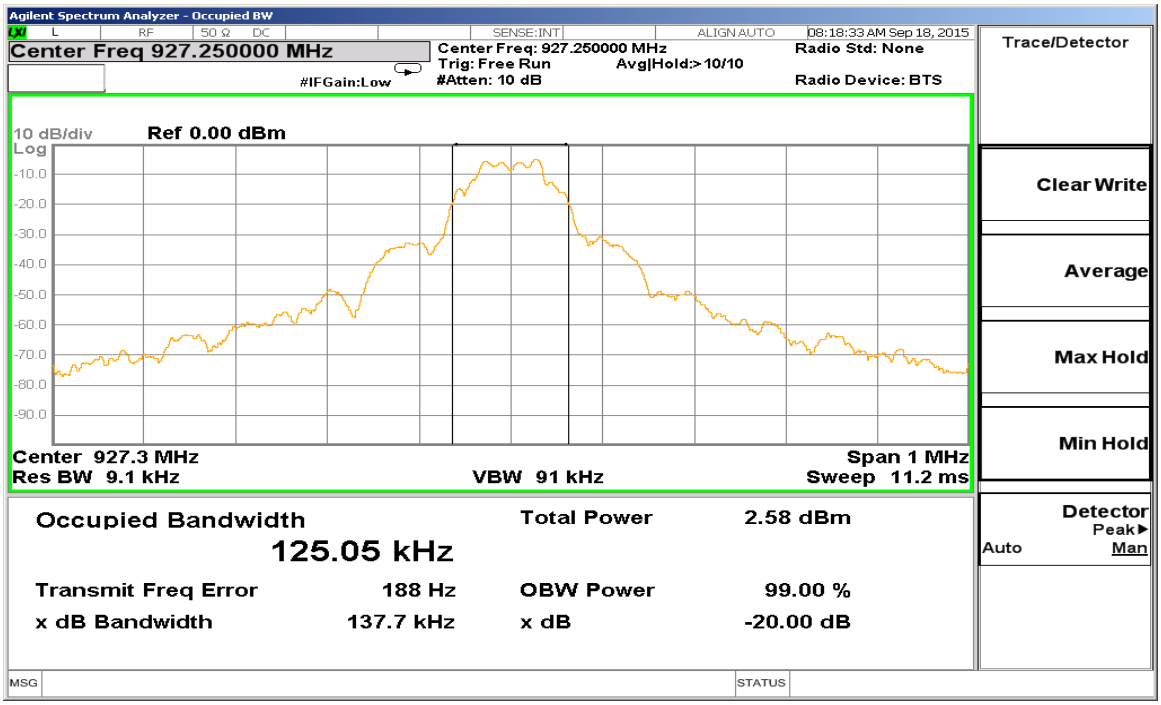


99%BW

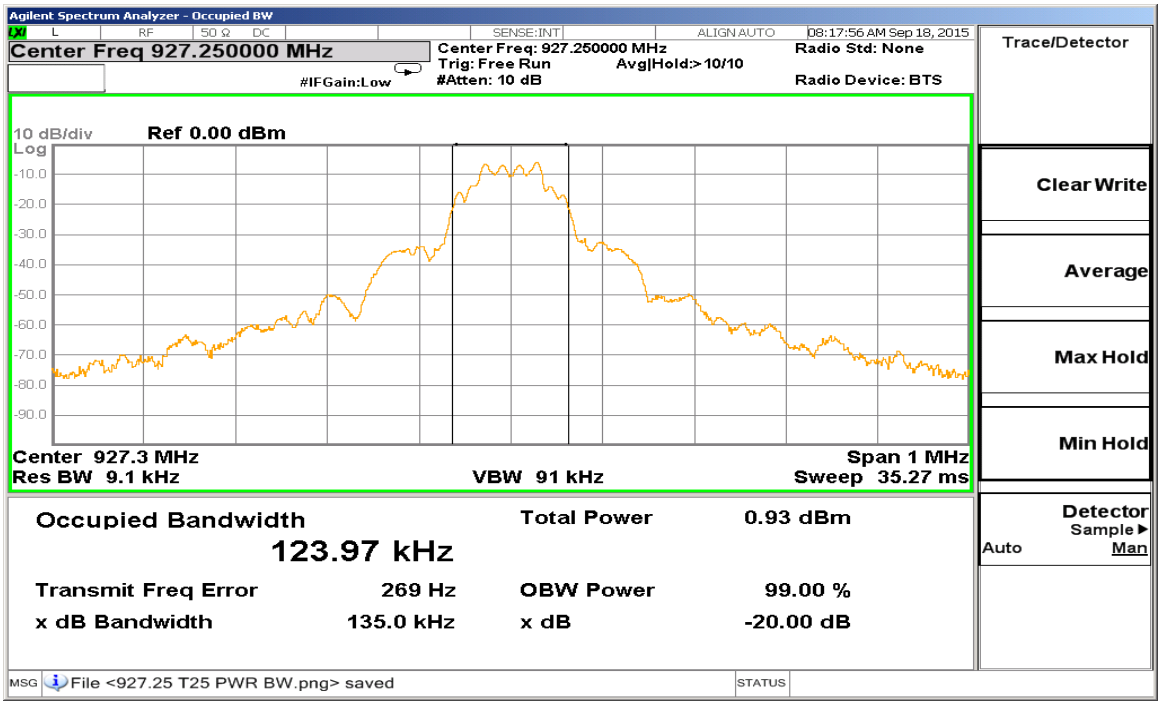


Operating Mode T12.5, High Channel

20dB BW

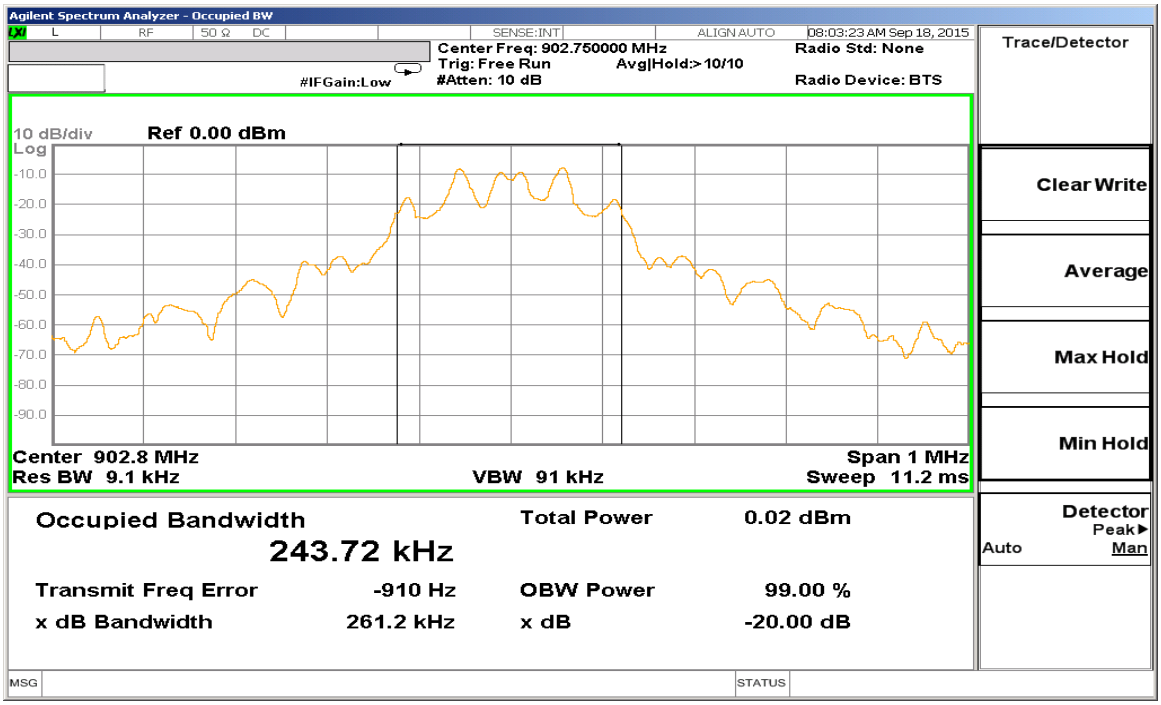


99%BW



Operating Mode T6.25, Low Channel

20dB BW



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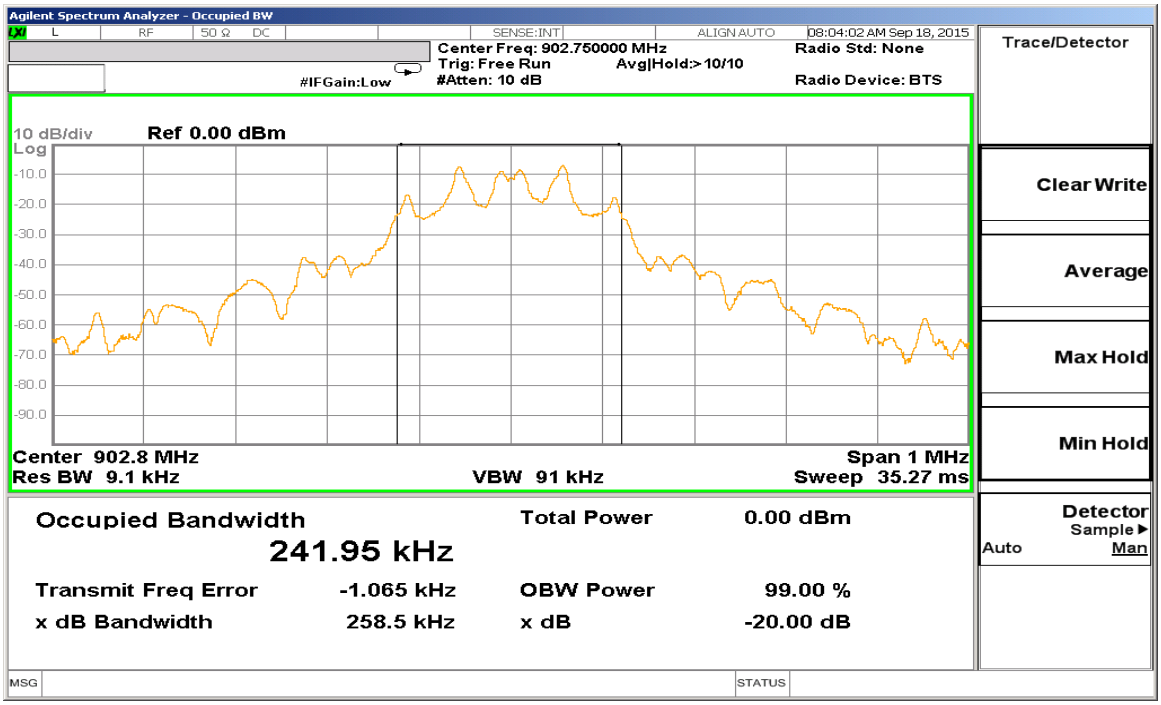
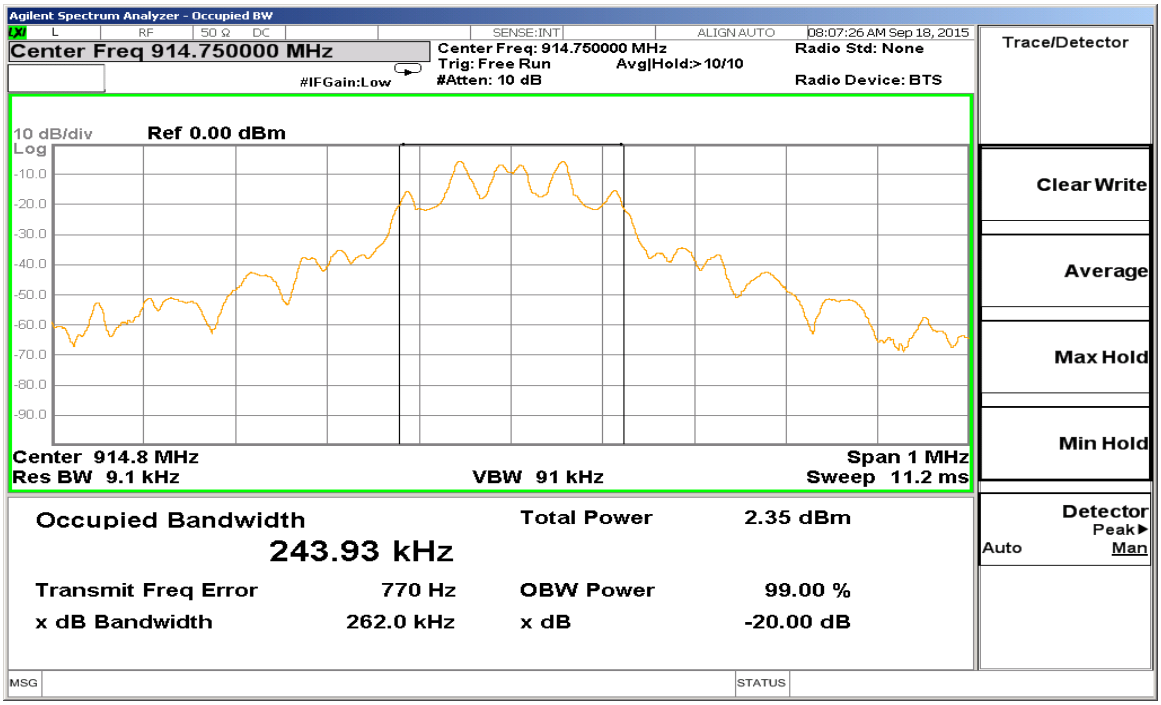
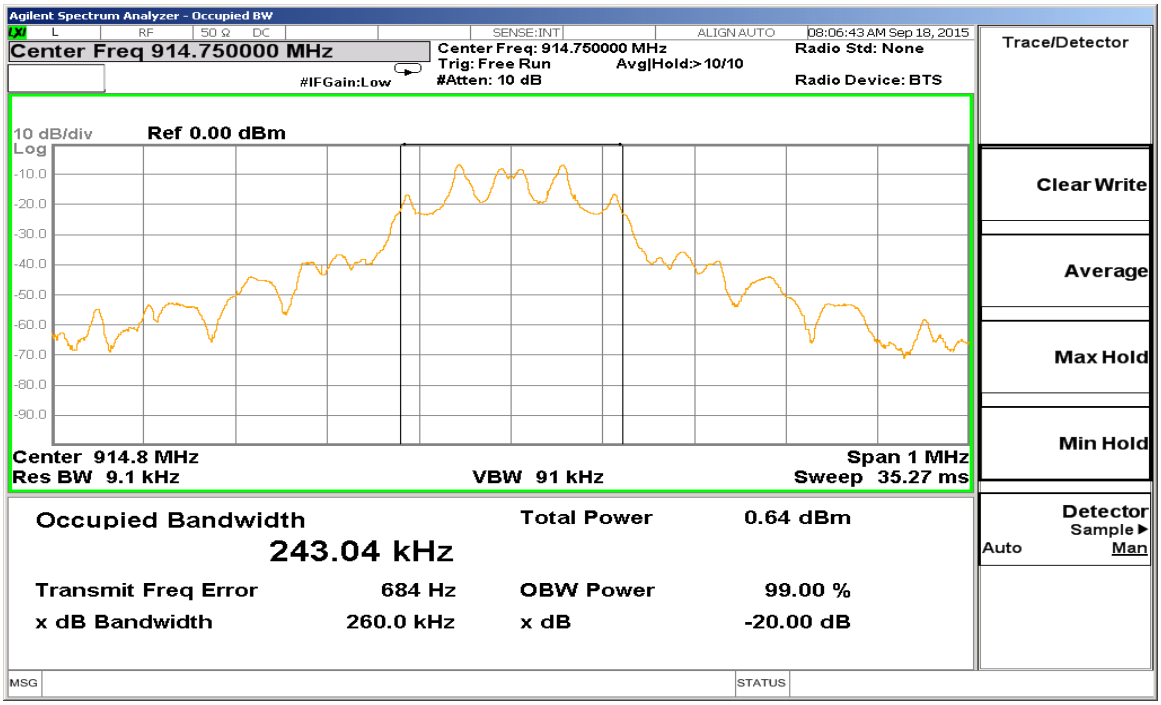


Operating Mode T6.25, Middle Channel

20dB BW

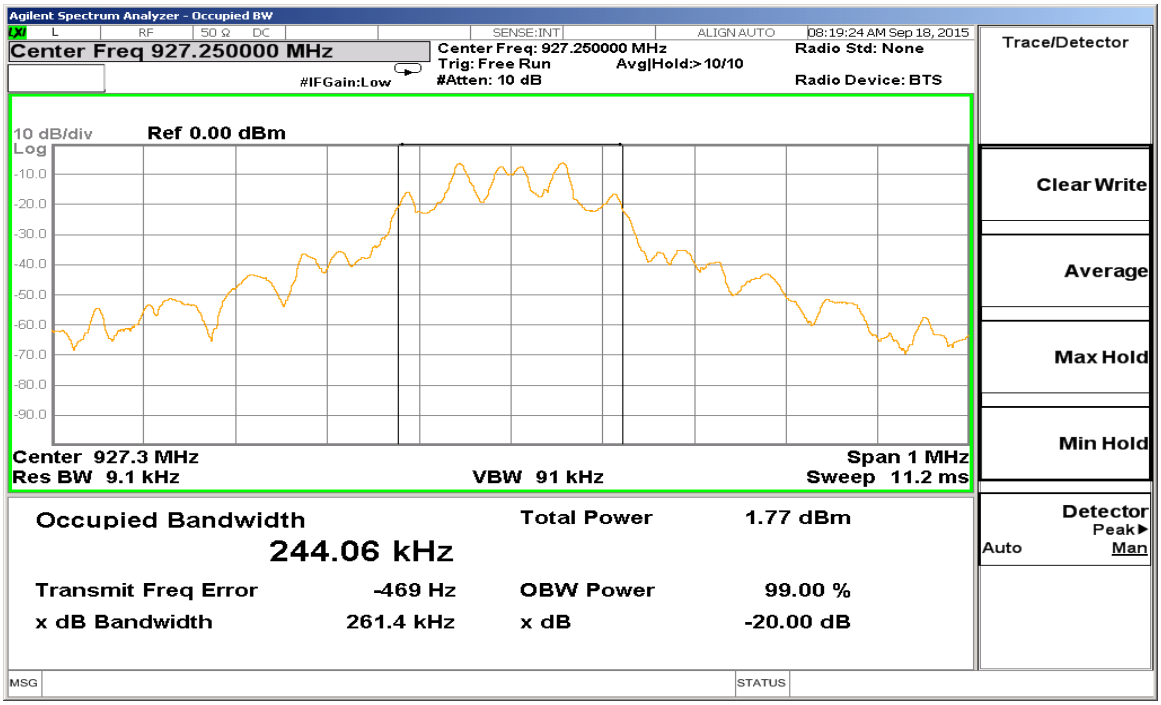


99%BW

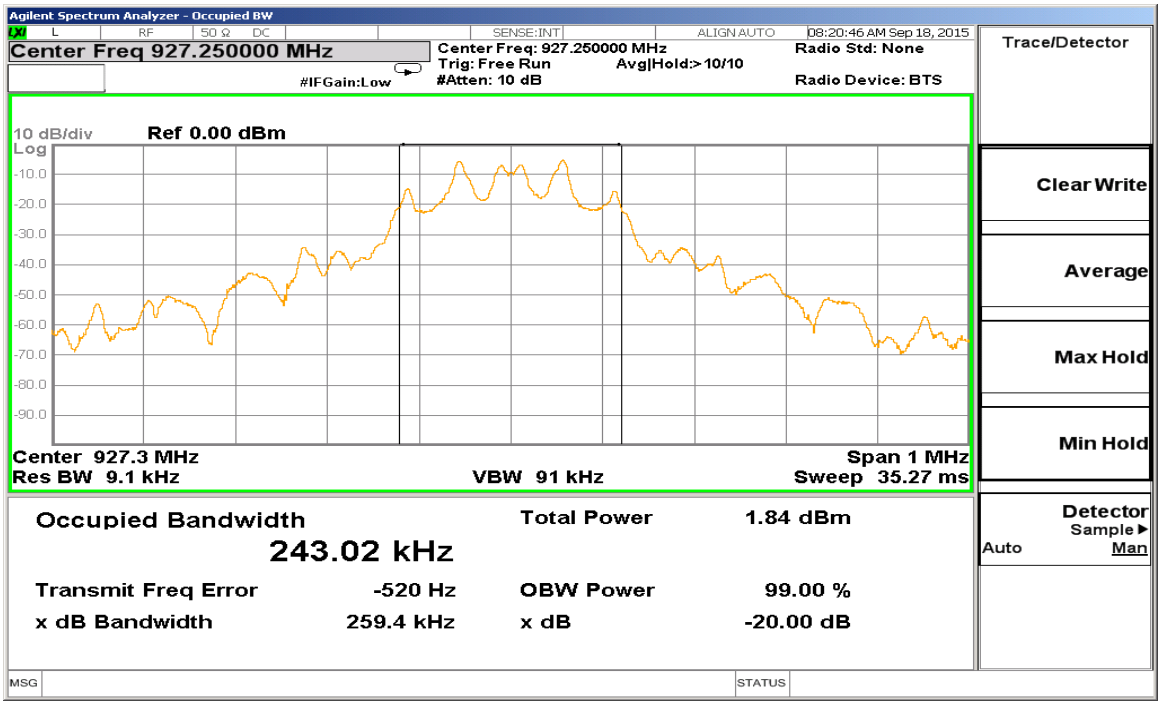


Operating Mode T6.25, High Channel

20dB BW



99%BW



7.4.2. HOPPING FREQUENCY SEPARATION

LIMIT

FCC §15.247 (a) (1)

IC RSS-247 5.1 (3)

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

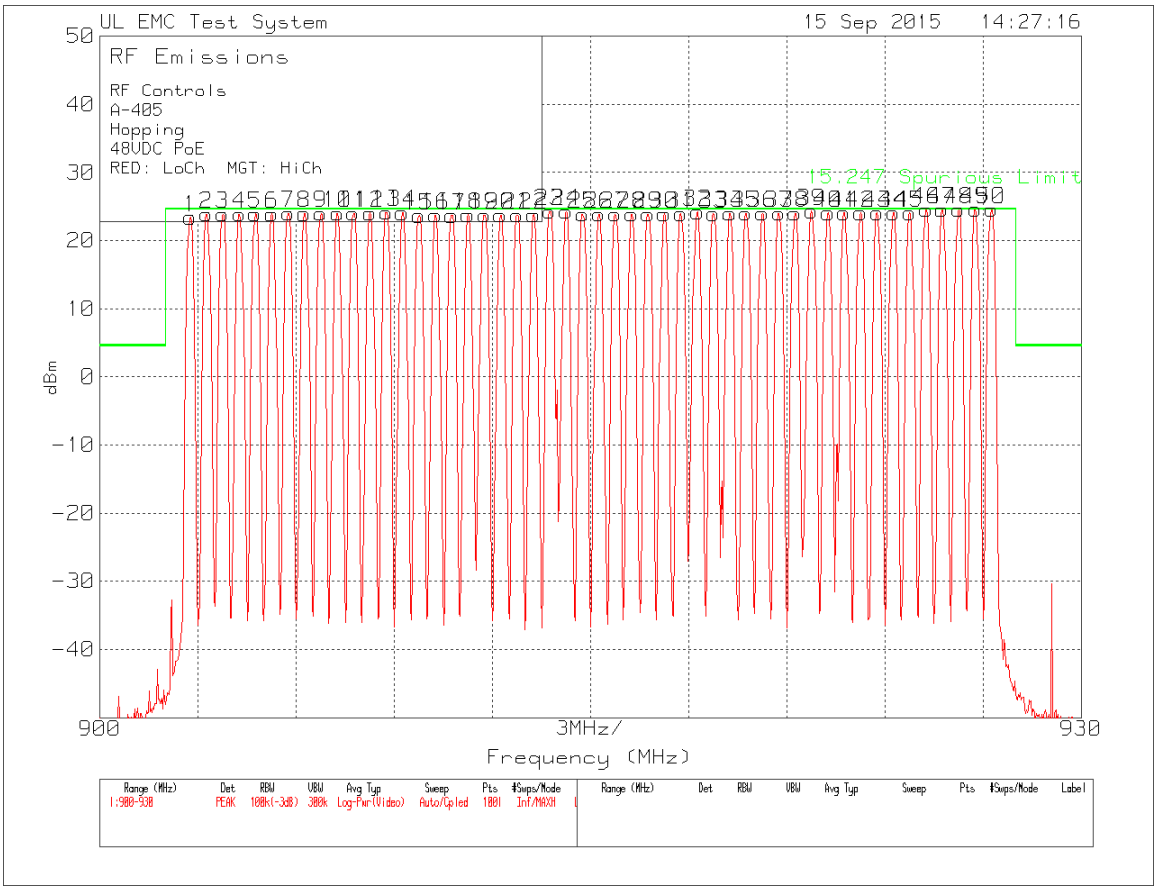
DA 00-705

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

Based on the marker data and the frequency associated with the markers the average channel separation is 500kHz.

HOPPING FREQUENCY SEPARATION



Marker No.	Test Frequency (MHz)	Marker No.	Test Frequency (MHz)	Marker No.	Test Frequency (MHz)	Marker No.	Test Frequency (MHz)	Marker No.	Test Frequency (MHz)
1	902.76	11	907.74	21	912.75	31	917.76	41	922.74
2	903.255	12	908.25	22	913.26	32	918.27	42	923.25
3	903.75	13	908.76	23	913.74	33	918.75	43	923.76
4	904.26	14	909.24	24	914.25	34	919.26	44	924.255
5	904.74	15	909.75	25	914.76	35	919.74	45	924.75
6	905.25	16	910.26	26	915.255	36	920.25	46	925.26
7	905.76	17	910.755	27	915.75	37	920.76	47	925.74
8	906.24	18	911.25	28	916.26	38	921.24	48	926.25
9	906.75	19	911.76	29	916.755	39	921.75	49	926.76
10	907.26	20	912.24	30	917.25	40	922.26	50	927.255

7.4.3. NUMBER OF HOPPING CHANNELS

LIMIT

FCC §15.247 (a) (1) (i)

IC RSS-247 5.1 (3)

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

TEST PROCEDURE

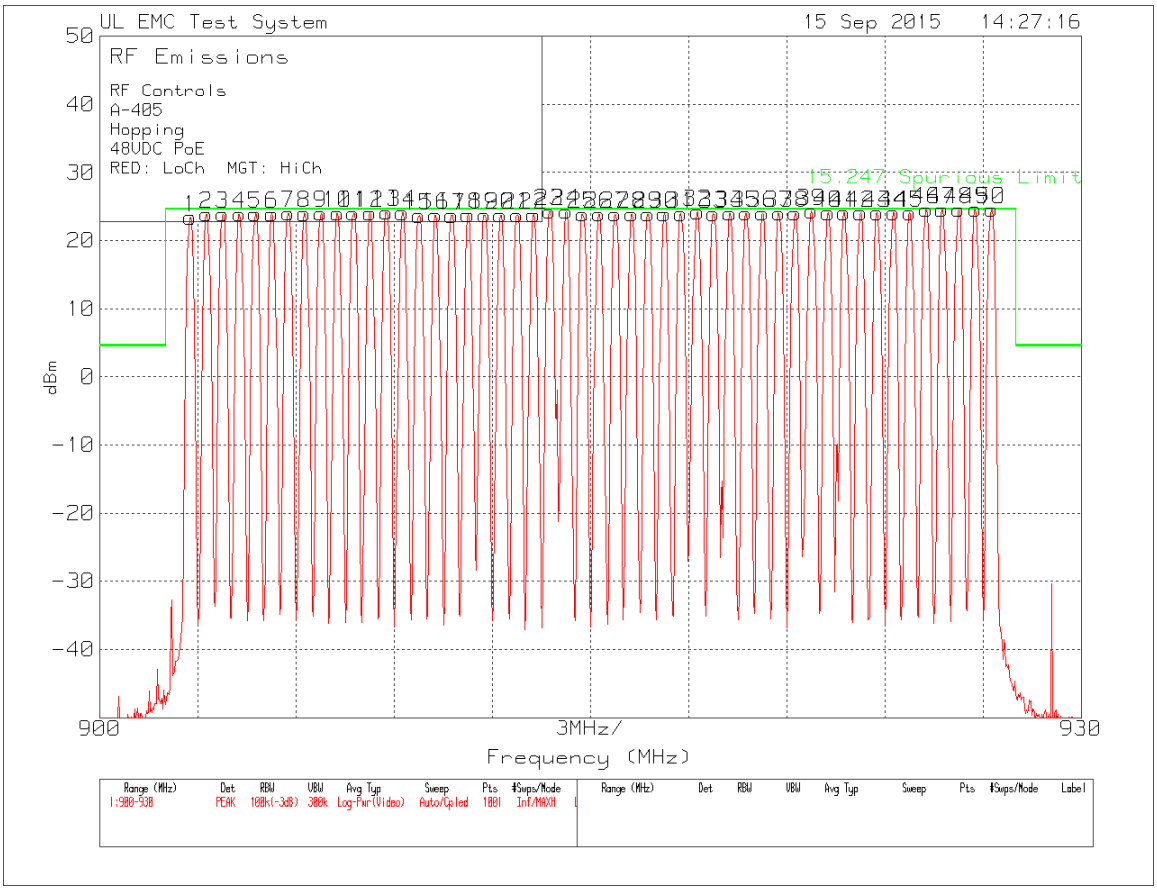
DA 00-705

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

The number of channels is 50. All 50 channels are used in all operating modes.

NUMBER OF HOPPING CHANNELS



Marker No.	Test Frequency (MHz)	Marker No.	Test Frequency (MHz)	Marker No.	Test Frequency (MHz)	Marker No.	Test Frequency (MHz)	Marker No.	Test Frequency (MHz)
1	902.76	11	907.74	21	912.75	31	917.76	41	922.74
2	903.255	12	908.25	22	913.26	32	918.27	42	923.25
3	903.75	13	908.76	23	913.74	33	918.75	43	923.76
4	904.26	14	909.24	24	914.25	34	919.26	44	924.255
5	904.74	15	909.75	25	914.76	35	919.74	45	924.75
6	905.25	16	910.26	26	915.255	36	920.25	46	925.26
7	905.76	17	910.755	27	915.75	37	920.76	47	925.74
8	906.24	18	911.25	28	916.26	38	921.24	48	926.25
9	906.75	19	911.76	29	916.755	39	921.75	49	926.76
10	907.26	20	912.24	30	917.25	40	922.26	50	927.255

7.4.4. AVERAGE TIME OF OCCUPANCY

LIMIT

FCC §15.247 (a) (1) (i)

IC RSS-247 5.1 (3)

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

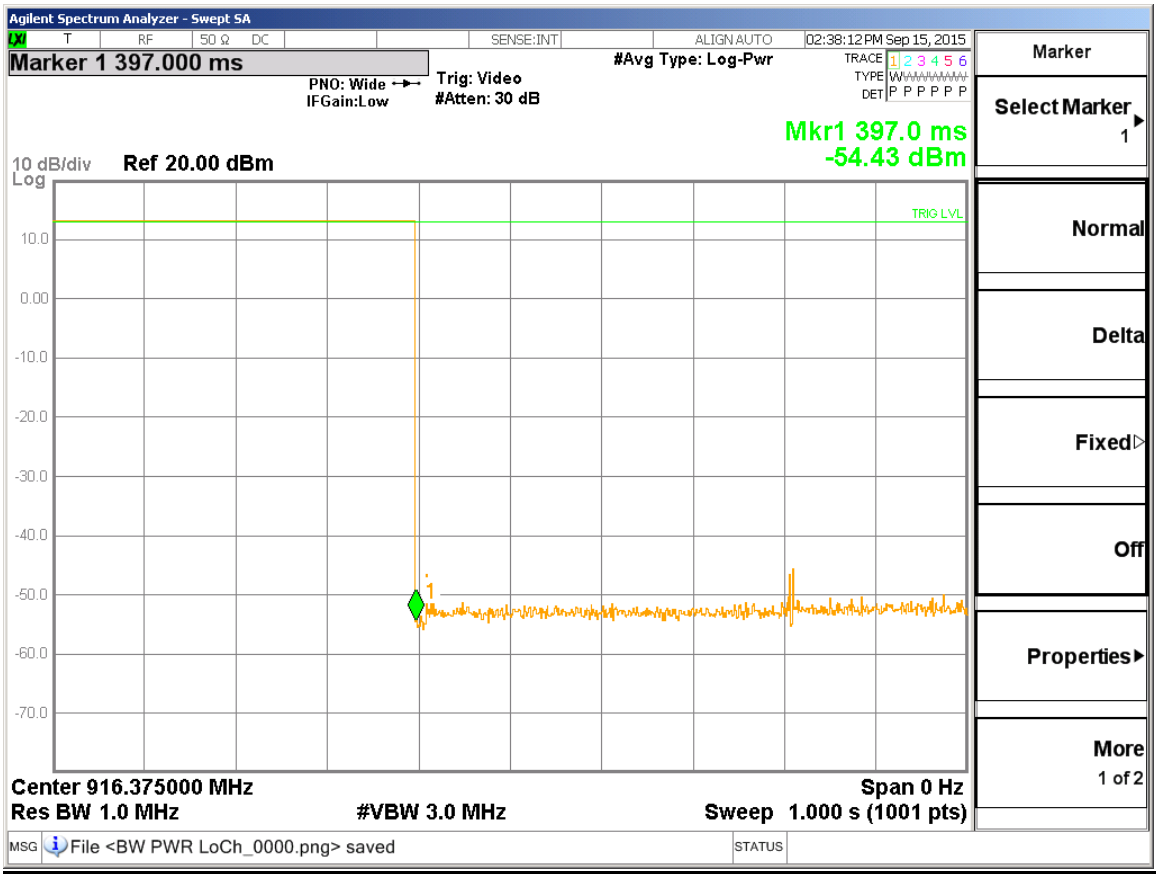
TEST PROCEDURE

DA 00-705

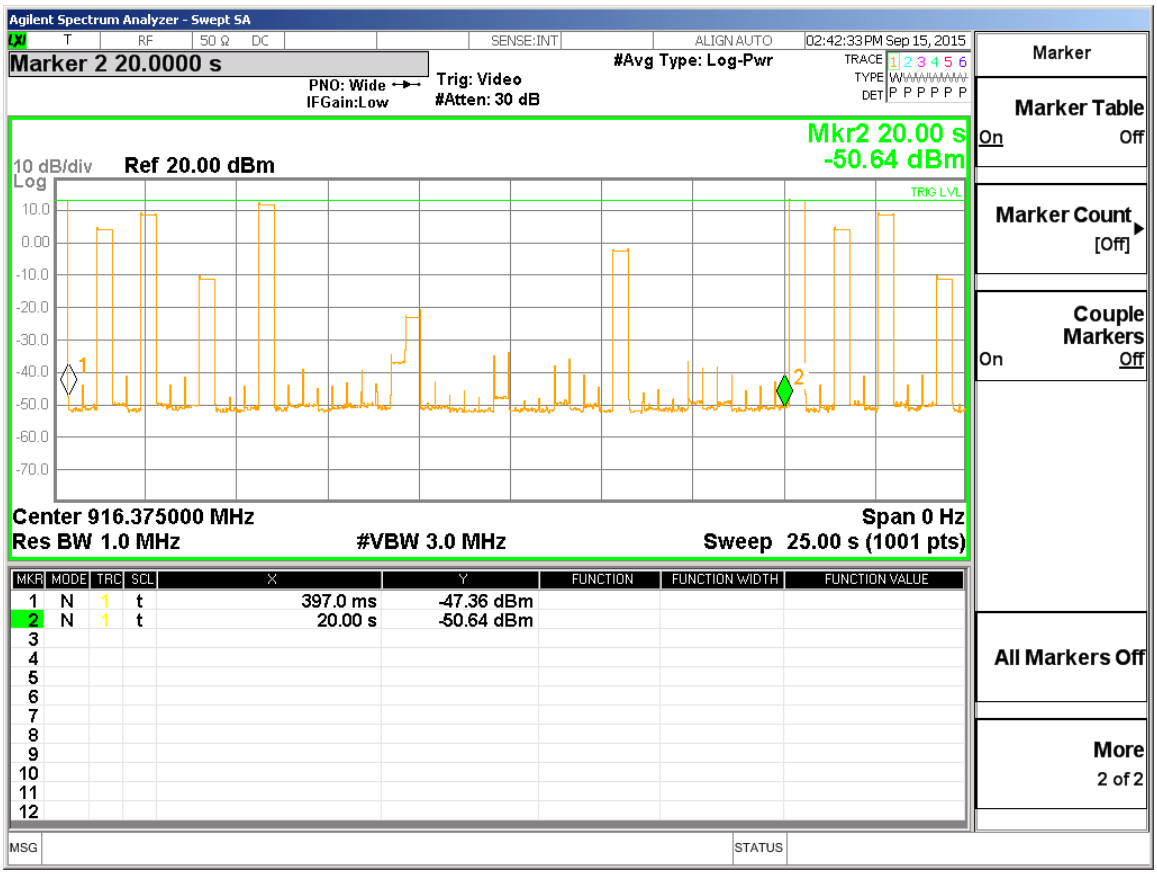
RESULTS

DH Packet	Pulse Width (msec)	Number of Pulses in 20 seconds	Average Time of Occupancy (sec)	Limit (sec)	Margin (sec)
Antenna Port 1	397	1	0.397	0.4	-0.003

PULSE WIDTH



NUMBER OF PULSES in 20 seconds



7.4.5. OUTPUT POWER

LIMIT

§15.247 (b) (2)

RSS-247 5.4 (1)

(2) For frequency hopping systems operating in the 902-928 MHz band: 1 watt for systems employing at least 50 hopping channels; and, 0.25 watts for systems employing less than 50 hopping channels, but at least 25 hopping channels, as permitted under paragraph (a)(1)(i) of this section.

TEST PROCEDURE

DA 00-705

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.

The output power was adjusted so the value measured in all cases when antenna gain is added the EiRP will not be more then 36dBm.

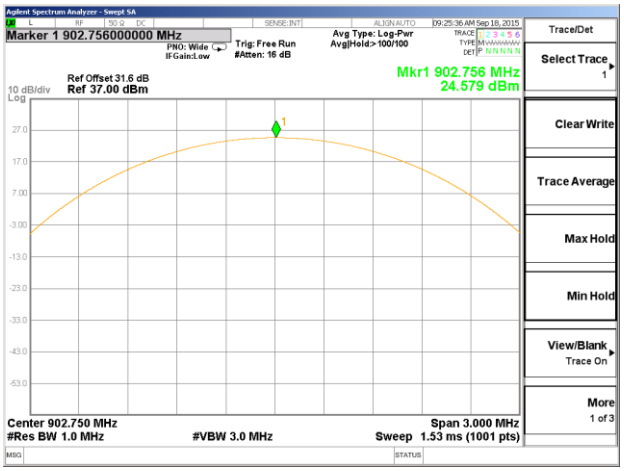
RESULTS

Setting = dBm

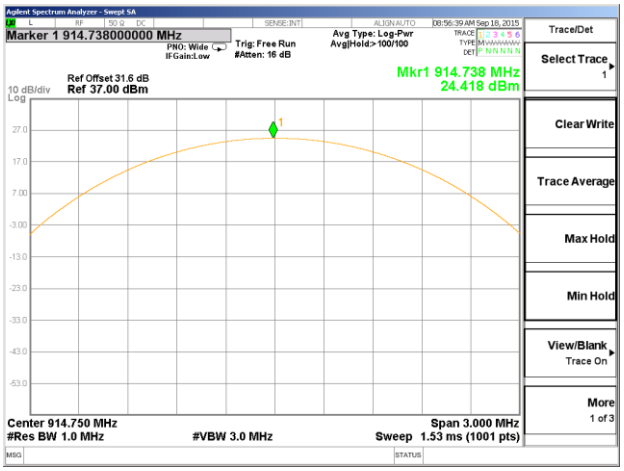
Channel	Frequency (MHz)	Output Power (dBm)	Directional Gain (dBi)	Limit (dBm)	Margin (dB)
T25, Low Channel	902.75	24.58	10.90	25	-0.52
T25, Middle Channel	914.75	24.42	10.90	25	-0.68
T25, High Channel	927.25	24.97	10.90	25	-0.13
T12.5, Low Channel	902.75	24.86	10.90	25	-0.24
T12.5, Middle Channel	914.75	24.91	10.90	25	-0.19
T12.5, High Channel	927.25	24.93	10.90	25	-0.17
T6.25, Low Channel	902.75	24.37	10.90	25	-0.73
T6.25, Middle Channel	914.75	24.42	10.90	25	-0.68
T6.25, High Channel	927.25	24.99	10.90	25	-0.11

OUTPUT POWER, T25

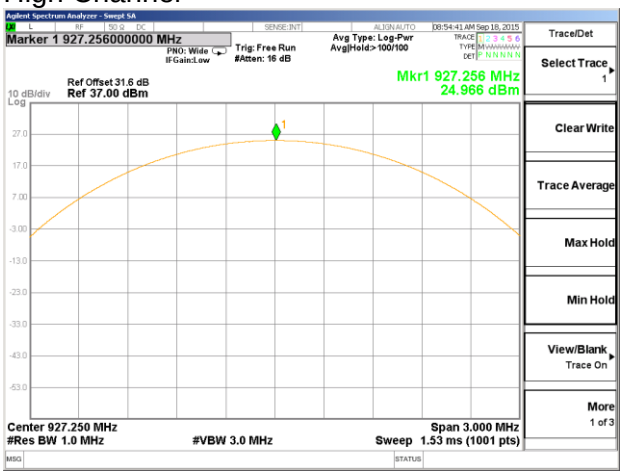
Low Channel



Middle Channel

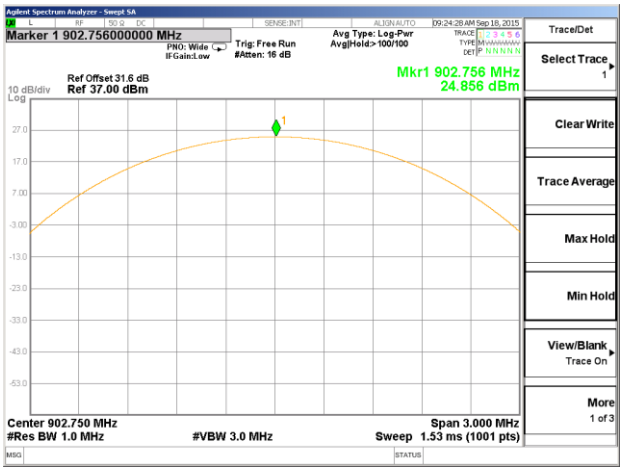


High Channel

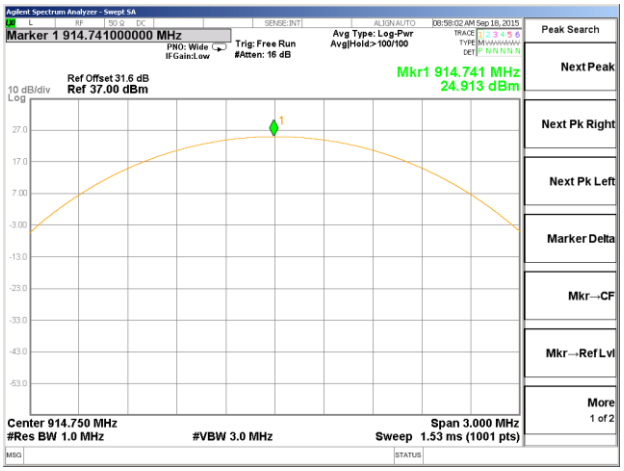


OUTPUT POWER, T12.5

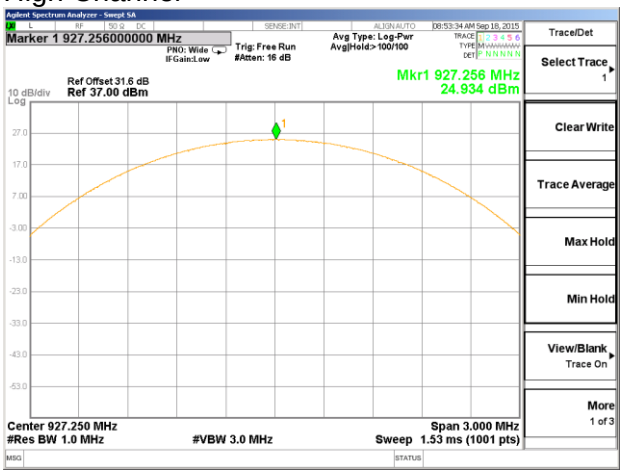
Low Channel



Middle Channel

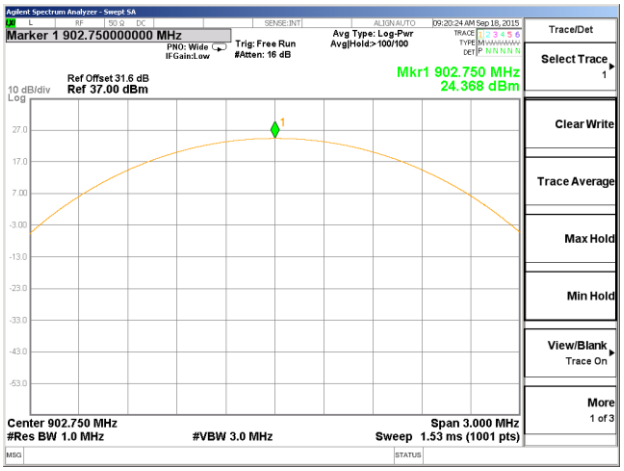


High Channel

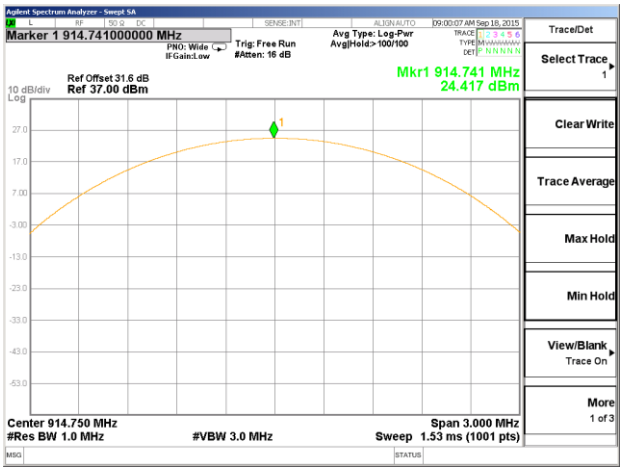


OUTPUT POWER, T6.25

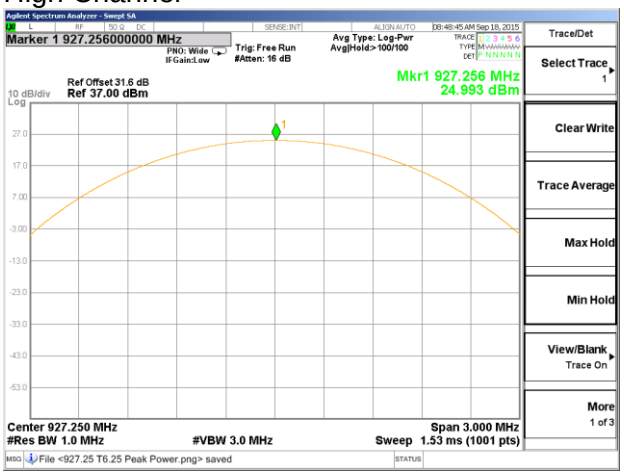
Low Channel



Middle Channel



High Channel



7.4.6. CONDUCTED SPURIOUS EMISSIONS

LIMITS

FCC §15.247 (d)

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

IC RSS-247 5.5

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided that the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of root-mean-square averaging over a time interval, as permitted under Section A8.4 (4), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general field strength limits specified in RSS-Gen is not required.

TEST PROCEDURE

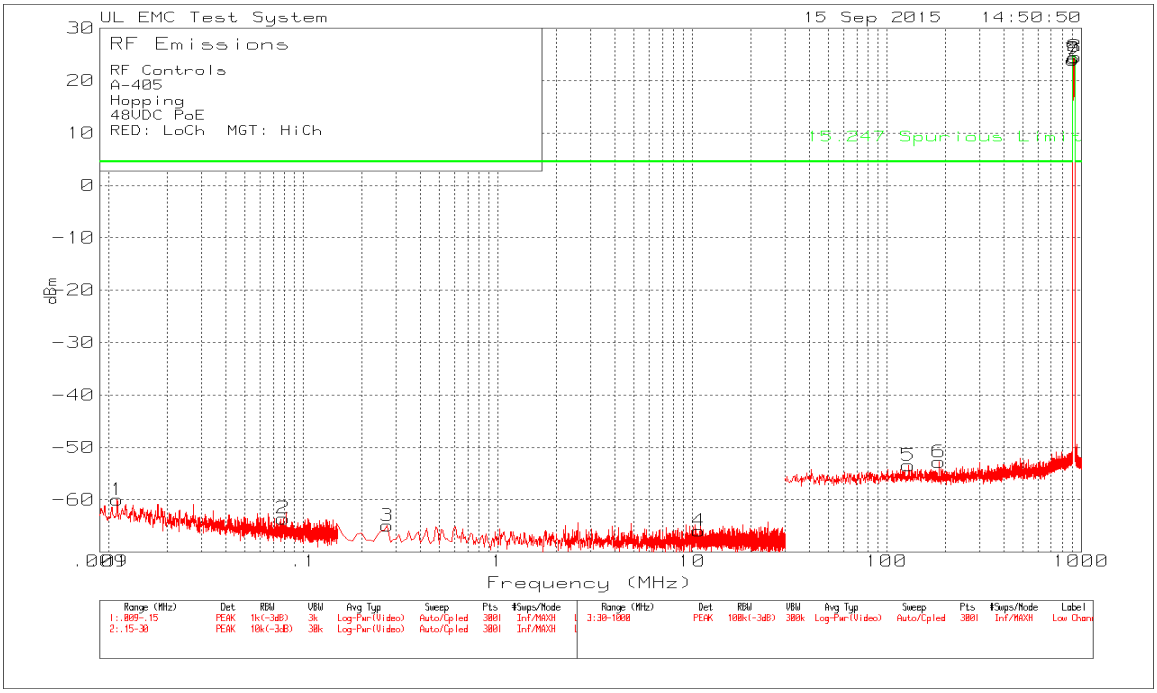
The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

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

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

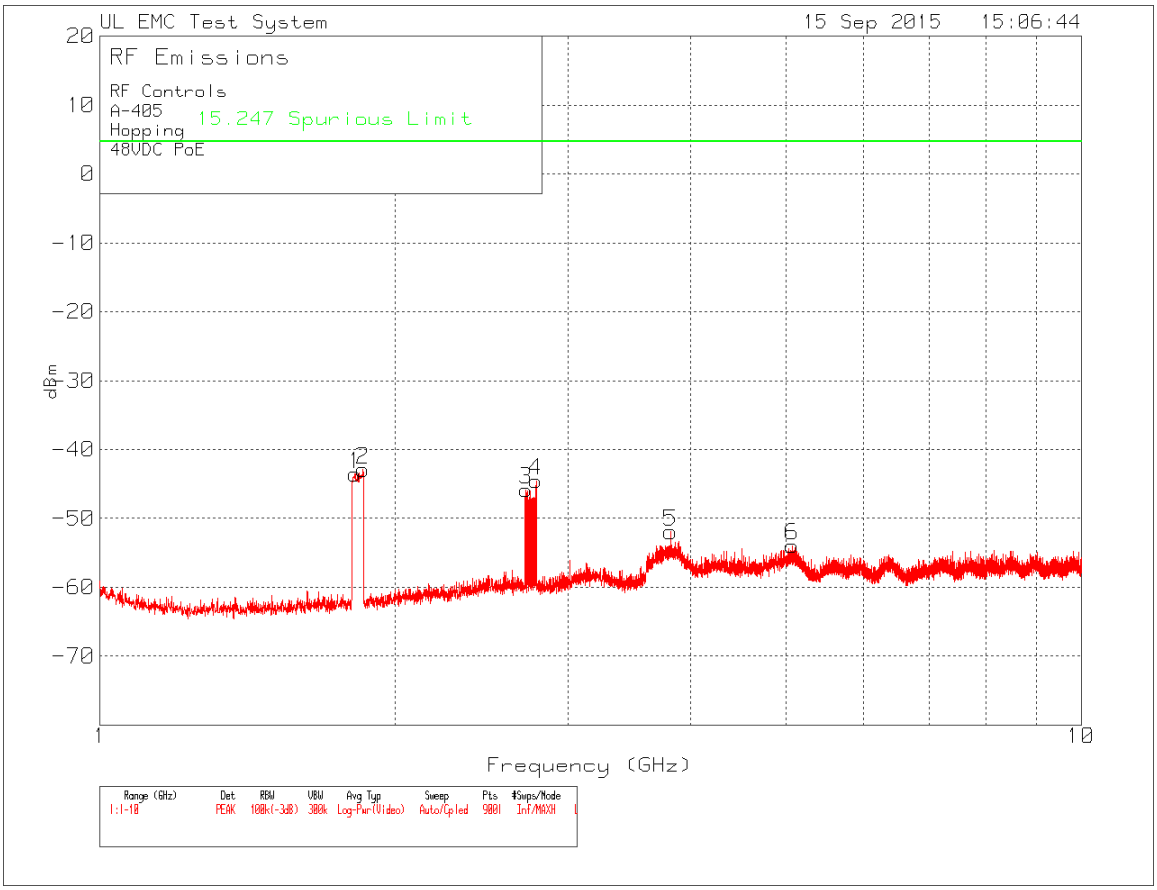
RESULTS

SPURIOUS EMISSIONS, 9kHz – 1GHz Hopping



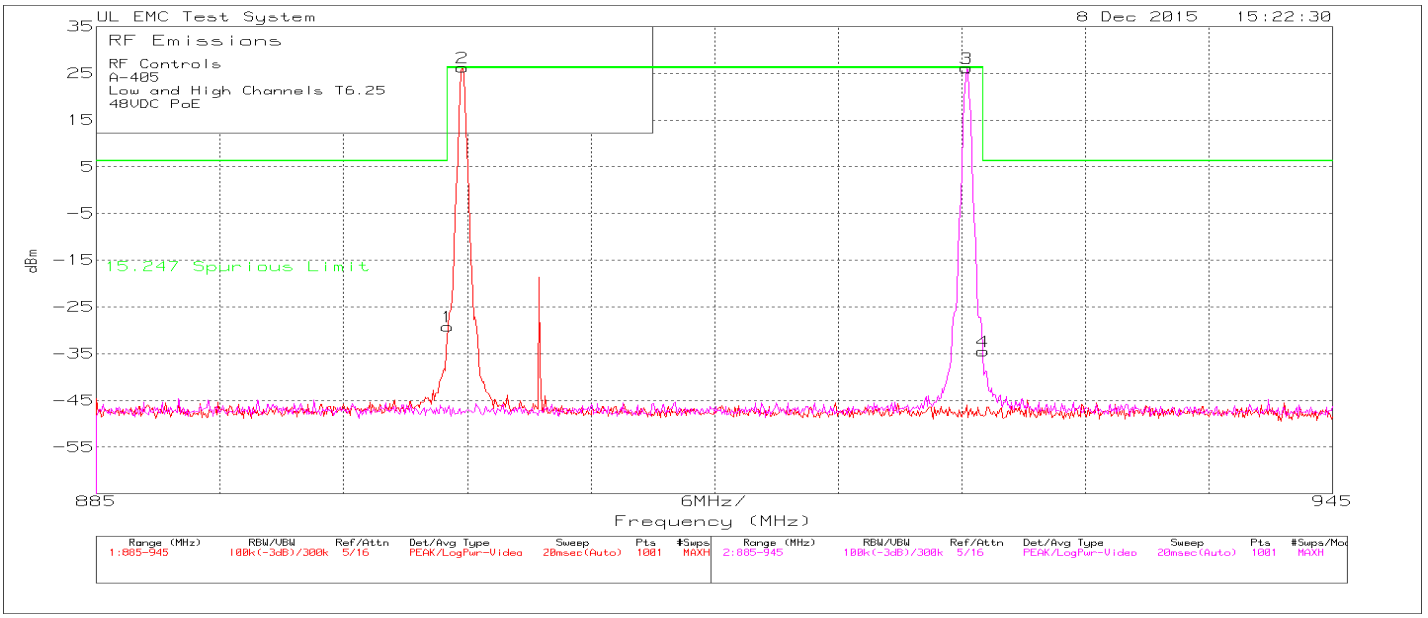
RF Controls							
A-405							
Hopping							
48VDC PoE							
RED: LoCh MGT: HiCh							
Trace Markers							
Marker No.	Test Frequency (MHz)	Meter Reading (dBm)	Detector	Path Factor dB	Level dBm	15.247 Spurious Limit	Margin (dB)
1	0.011021	-69.88	PK	9.9	-59.98	4.55	-64.53
2	0.078795	-73.45	PK	9.9	-63.55	4.55	-68.1
3	0.2694	-74.81	PK	9.9	-64.91	4.55	-69.46
4	10.82635	-75.84	PK	9.9	-65.94	4.55	-70.49
5	128.9399	-63.52	PK	10.1	-53.42	4.55	-57.97
6	185.5232	-62.94	PK	10.2	-52.74	4.55	-57.29
7	904.2924	13.4	PK	10.5	23.9	24.55	-0.65
8	927.2491	14.05	PK	10.5	24.55	24.55	0
9	914.3158	13.75	PK	10.5	24.25	24.55	-0.3
PK - Peak detector							

SPURIOUS EMISSIONS, 1GHz – 10GHz Hopping



RF Controls								
A-405								
Hopping								
48VDC PoE								
Trace Markers								
Marker No.	Test Frequency (GHz)	Meter Reading (dBm)	Detector	Cable Factor dB	Attenuator dB	Level dBm	Limit dBm	Margin (dB)
1	1.819	-54.34	PK	0.9	9.9	-43.5	4.7	-48.24
2	1.853	-53.79	PK	1	9.9	-42.9	4.7	-47.59
3	2.717	-56.96	PK	1.2	9.9	-45.9	4.7	-50.56
4	2.782	-55.65	PK	1.2	9.9	-44.6	4.7	-49.25
5	3.814	-63.34	PK	1.4	10	-51.9	4.7	-56.64
6	5.074	-65.65	PK	1.7	10	-54	4.7	-58.65
PK - Peak detector								

SPURIOUS EMISSIONS, Low and High Channel Bandedge, T6.25



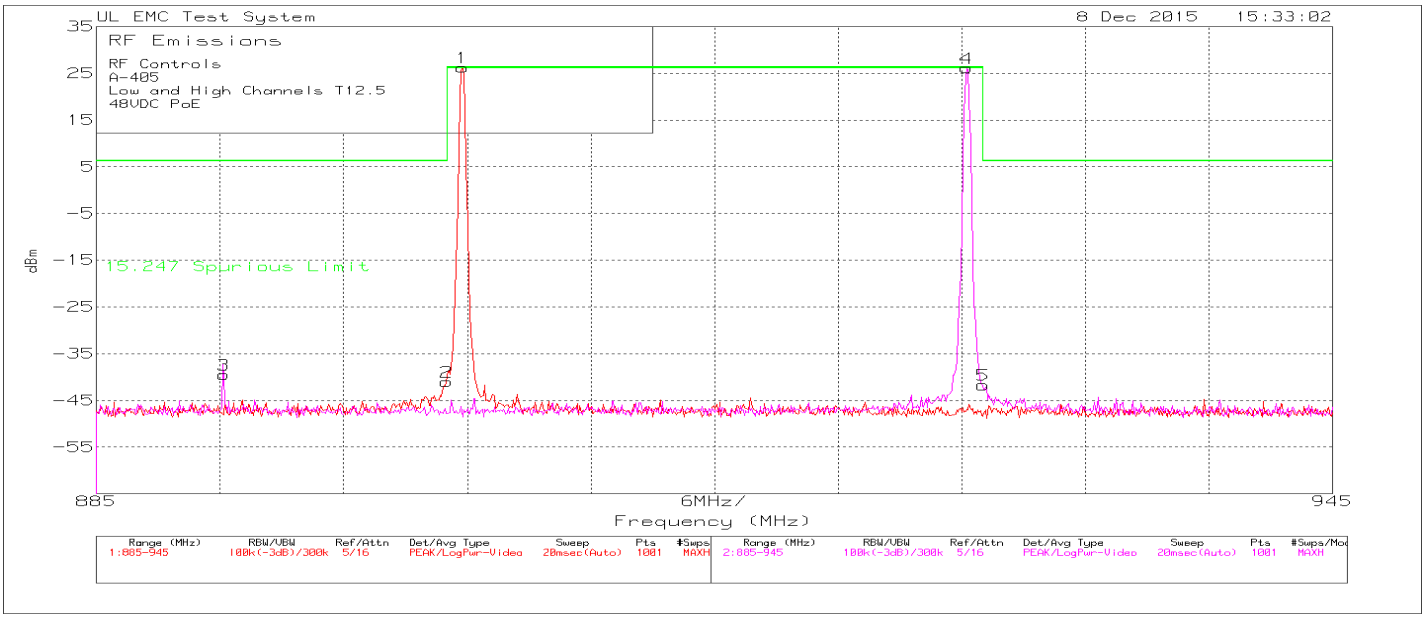
RF Controls
A-405
Low and High Channels T6.25
48VDC PoE

Trace Markers

No.	Test Frequency (MHz)	Meter Reading	Transducer Factor (dB)	Gain/Loss Factor (dB)	Corrected Reading dBm	Limit:1	2	3	4	5	6
Low Channel											
1	902.00	-60.81dBm Pk	31.6	0	-29.21	6.25	-	-	-	-	-
					Margin (dB)	-35.46	-	-	-	-	-
2	902.76	-5.35dBm Pk	31.6	0	26.25	26.25	-	-	-	-	-
					Margin (dB)	0	-	-	-	-	-
Hich Channel											
3	927.24	-5.45dBm Pk	31.6	0	26.15	26.25	-	-	-	-	-
					Margin (dB)	-.1	-	-	-	-	-
4	928.00	-66.06dBm Pk	31.6	0	-34.46	6.25	-	-	-	-	-
					Margin (dB)	-40.71	-	-	-	-	-

LIMIT 1: 15.247 Spurious Limit
Pk - Peak detector

SPURIOUS EMISSIONS, Low and High Channel Bandedge, T12.5



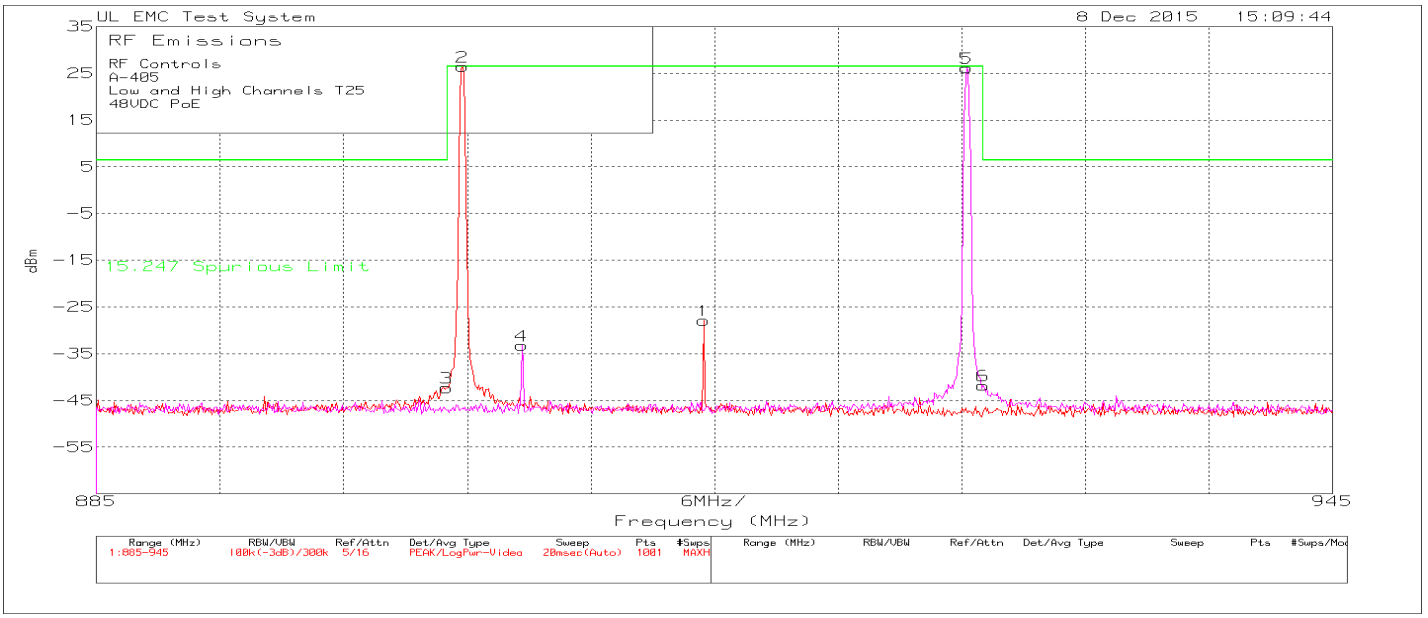
RF Controls
A-405
Low and High Channels T12.5
48VDC PoE

Trace Markers

No.	Test Frequency (MHz)	Meter Reading	Transducer Factor (dB)	Gain/Loss Factor (dB)	Corrected Reading dBm	Limit:1	2	3	4	5	6
Low Channel											
1	902.76	-5.36dBm Pk	31.6	0	26.24	26.24	-	-	-	-	-
					Margin (dB)	0	-	-	-	-	-
2	902.00	-72.62dBm Pk	31.6	0	-41.02	6.24	-	-	-	-	-
					Margin (dB)	-47.26	-	-	-	-	-
High Channel											
3	891.18	-71.09dBm Pk	31.6	0	-39.49	6.24	-	-	-	-	-
					Margin (dB)	-45.73	-	-	-	-	-
4	927.24	-5.44dBm Pk	31.6	0	26.16	26.24	-	-	-	-	-
					Margin (dB)	-.08	-	-	-	-	-
5	928.00	-73.31dBm Pk	31.6	0	-41.71	6.24	-	-	-	-	-
					Margin (dB)	-47.95	-	-	-	-	-

LIMIT 1: 15.247 Spurious Limit
Pk - Peak detector

SPURIOUS EMISSIONS, Low and High Channel Bandedge, T25



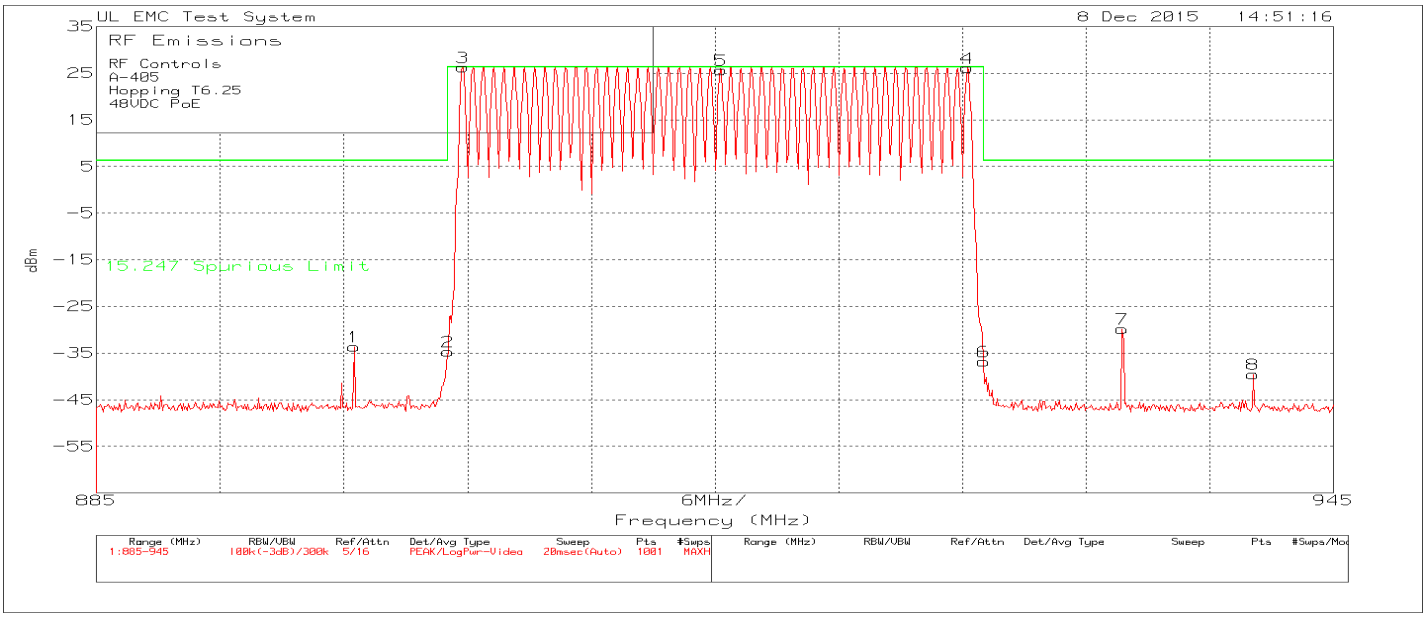
RF Controls
A-405
Low and High Channels T25
48VDC PoE

Trace Markers

No.	Test Frequency (MHz)	Meter Reading	Transducer Factor (dB)	Gain/Loss Factor (dB)	Corrected Reading dBm	Limit:1	2	3	4	5	6
Low Channel											
1	914.46	-59.51dBm Pk	31.6	0	-27.91	26.42	-	-	-	-	-
					Margin (dB)	-54.33	-	-	-	-	-
2	902.76	-5.18dBm Pk	31.6	0	26.42	26.42	-	-	-	-	-
					Margin (dB)	0	-	-	-	-	-
3	902.00	-73.92dBm Pk	31.6	0	-42.32	6.42	-	-	-	-	-
					Margin (dB)	-48.74	-	-	-	-	-
High Channel											
4	905.64	-64.85dBm Pk	31.6	0	-33.25	26.42	-	-	-	-	-
					Margin (dB)	-59.67	-	-	-	-	-
5	927.24	-5.44dBm Pk	31.6	0	26.16	26.42	-	-	-	-	-
					Margin (dB)	-.26	-	-	-	-	-
6	928.00	-73.43dBm Pk	31.6	0	-41.83	6.42	-	-	-	-	-
					Margin (dB)	-48.25	-	-	-	-	-

LIMIT 1: 15.247 Spurious Limit
Pk - Peak detector

SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON, T6.25



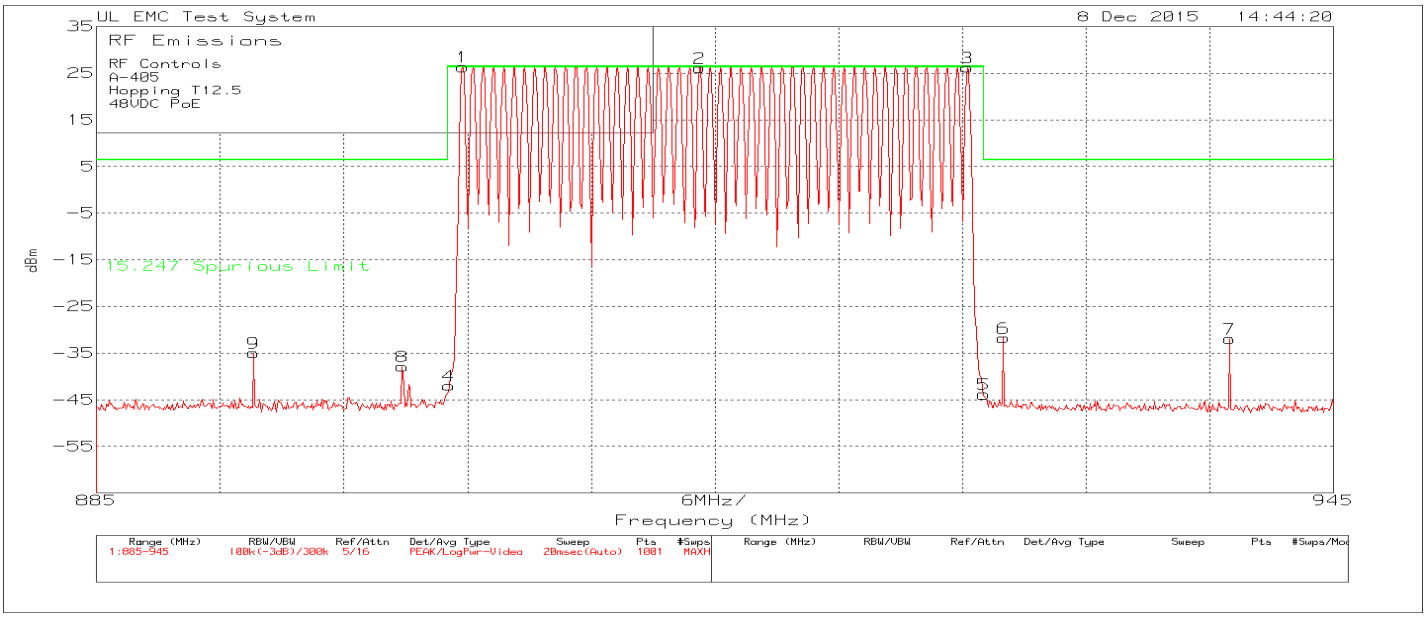
RF Controls
A-405
Low and High Channels T6.25
48VDC PoE

Trace Markers

No.	Test Frequency (MHz)	Meter Reading	Transducer Factor (dB)	Gain/Loss Factor (dB)	Corrected Reading dBm	Limit:1	2	3	4	5	6
Lower Band Edge											
1	902.00	-60.81dBm Pk	31.6	0	-29.21	6.25	-	-	-	-	-
					Margin (dB)	-35.46	-	-	-	-	-
2	902.76	-5.35dBm Pk	31.6	0	26.25	26.25	-	-	-	-	-
					Margin (dB)	0	-	-	-	-	-
Upper Band Edge											
3	927.24	-5.45dBm Pk	31.6	0	26.15	26.25	-	-	-	-	-
					Margin (dB)	-.1	-	-	-	-	-
4	928.00	-66.06dBm Pk	31.6	0	-34.46	6.25	-	-	-	-	-
					Margin (dB)	-40.71	-	-	-	-	-

LIMIT 1: 15.247 Spurious Limit
Pk - Peak detector

SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON, T12.5



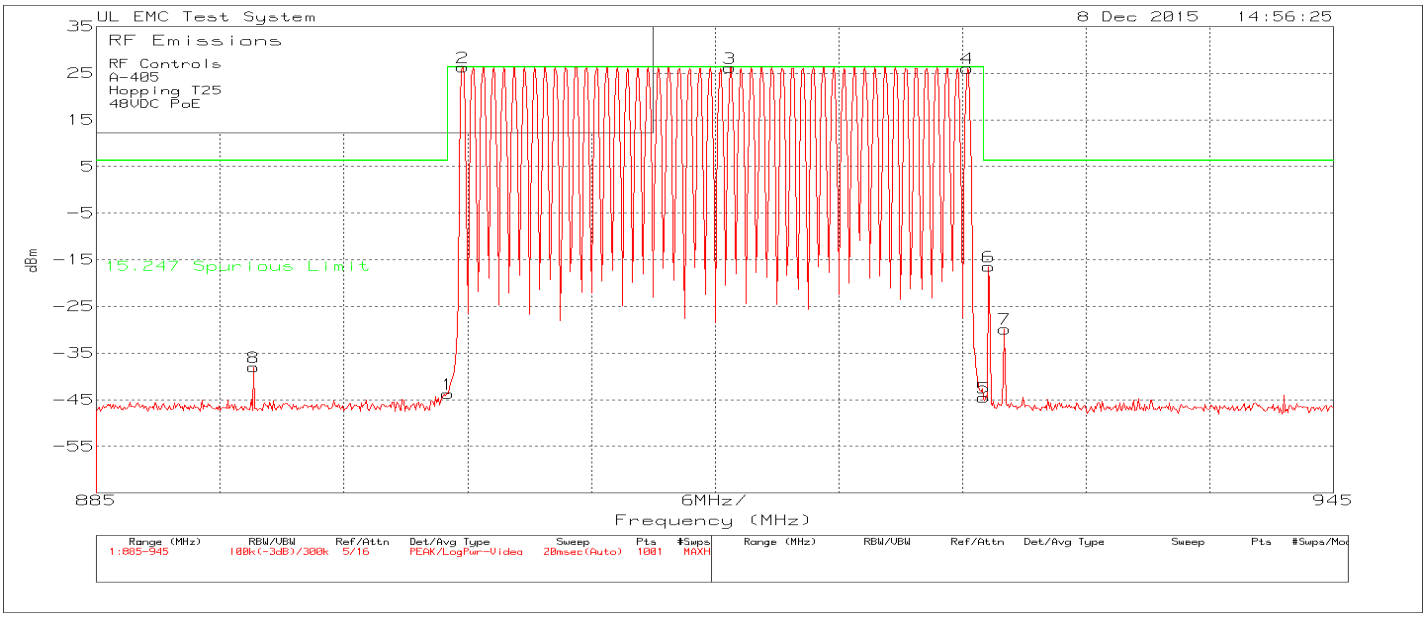
RF Controls
A-405
Low and High Channels T12.5
48VDC PoE

Trace Markers

No.	Test Frequency (MHz)	Meter Reading	Transducer Factor (dB)	Gain/Loss Factor (dB)	Corrected Reading dBm	Limit:1	2	3	4	5	6
Lower Band Edge											
1	902.76	-5.36dBm Pk	31.6	0	26.24	26.24	-	-	-	-	-
					Margin (dB)	0	-	-	-	-	-
2	902.00	-72.62dBm Pk	31.6	0	-41.02	6.24	-	-	-	-	-
					Margin (dB)	-47.26	-	-	-	-	-
Upper Band Edge											
3	891.18	-71.09dBm Pk	31.6	0	-39.49	6.24	-	-	-	-	-
					Margin (dB)	-45.73	-	-	-	-	-
4	927.24	-5.44dBm Pk	31.6	0	26.16	26.24	-	-	-	-	-
					Margin (dB)	-.08	-	-	-	-	-
5	928.00	-73.31dBm Pk	31.6	0	-41.71	6.24	-	-	-	-	-
					Margin (dB)	-47.95	-	-	-	-	-

LIMIT 1: 15.247 Spurious Limit
Pk - Peak detector

SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON, T25



RF Controls
A-405
Low and High Channels T25
48VDC PoE

Trace Markers

No.	Test Frequency (MHz)	Meter Reading	Transducer Factor (dB)	Gain/Loss Factor (dB)	Corrected Reading dBm	Limit:1	2	3	4	5	6
Lower Band Edge											
1	914.46	-59.51dBm Pk	31.6	0	-27.91	26.42	-	-	-	-	-
					Margin (dB)	-54.33	-	-	-	-	-
2	902.76	-5.18dBm Pk	31.6	0	26.42	26.42	-	-	-	-	-
					Margin (dB)	0	-	-	-	-	-
3	902.00	-73.92dBm Pk	31.6	0	-42.32	6.42	-	-	-	-	-
					Margin (dB)	-48.74	-	-	-	-	-
Upper Band Edge											
4	905.64	-64.85dBm Pk	31.6	0	-33.25	26.42	-	-	-	-	-
					Margin (dB)	-59.67	-	-	-	-	-
5	927.24	-5.44dBm Pk	31.6	0	26.16	26.42	-	-	-	-	-
					Margin (dB)	-.26	-	-	-	-	-
6	928.00	-73.43dBm Pk	31.6	0	-41.83	6.42	-	-	-	-	-
					Margin (dB)	-48.25	-	-	-	-	-

LIMIT 1: 15.247 Spurious Limit
Pk - Peak detector

8. RADIATED TEST RESULTS

8.1. LIMITS AND PROCEDURE

LIMITS

FCC §15.205 and §15.209

IC RSS-GEN Clause 8.9 (Transmitter)

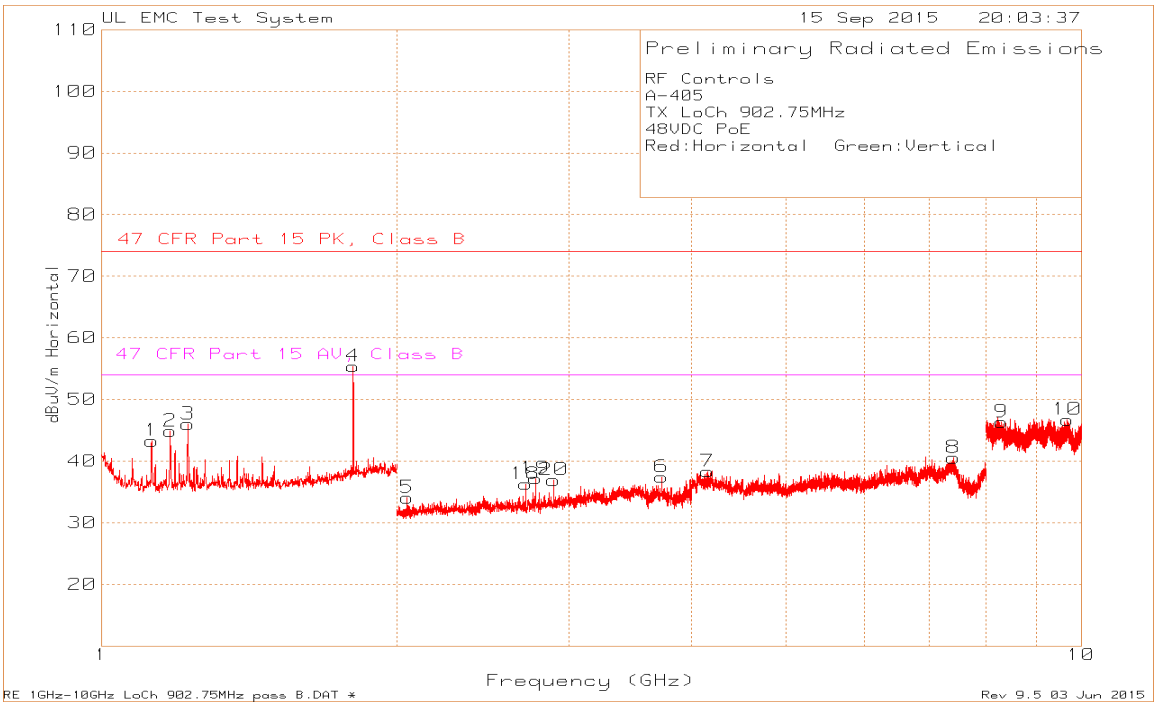
IC RSS-GEN Clause 7.1.2 (Receiver)

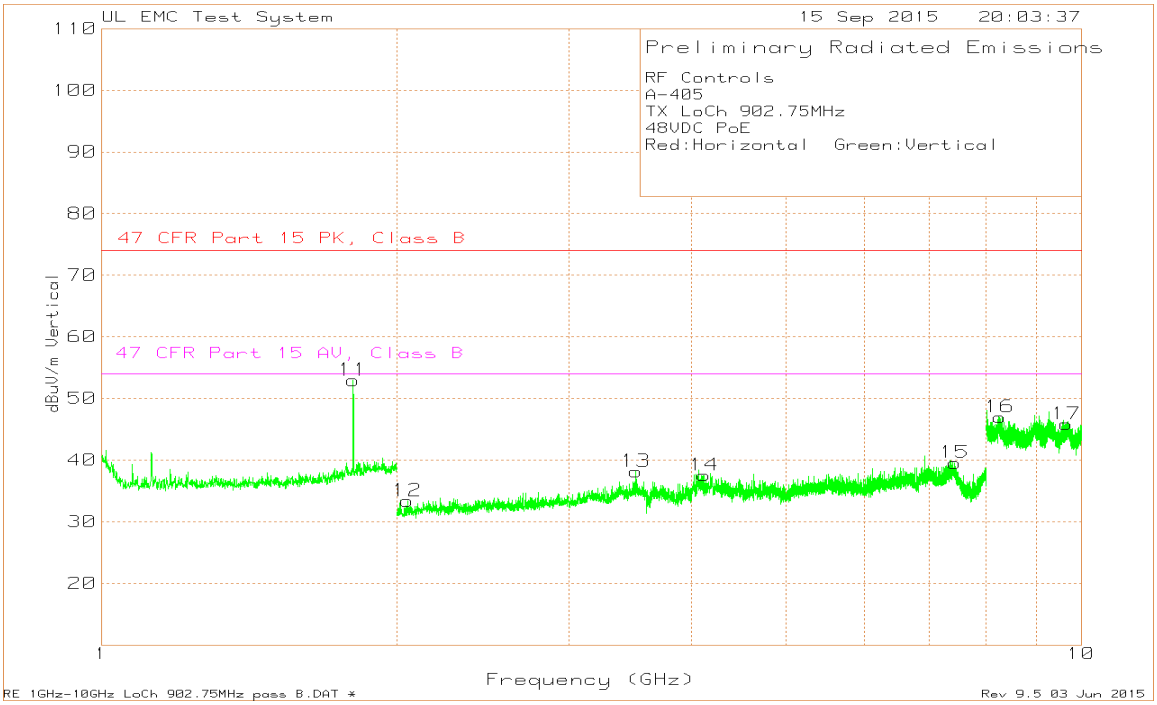
Frequency Range (MHz)	Field Strength Limit (uV/m) at 3 m	Field Strength Limit (dBuV/m) at 3 m
30 - 88	100	40
88 - 216	150	43.5
216 - 960	200	46
Above 960	500	54

8.2. TRANSMITTER ABOVE 1 GHz

8.2.1. Circular Polarization Data

Low Channel 0° (Boreside) Prescan Plot





Low Channel 0° (Boreside) Data

RF Controls
A-405
TX LoCh 902.75MHz
48VDC PoE
Red:Horizontal Green:Vertical
Trace Markers

Marker No.	Test Frequency (GHz)	Meter Reading (dBuV)	Detector	Path Factor dB	Band Reject Filter dB	Path Factor dB	Level dBuV/m	Limit 47 CFR Part 15 PK, Class B dBuV/m	Margin (dB)	Limit 47 CFR Part 15 AV, Class B dBuV/m	Margin (dB)	Azimuth [Degs]	Height [cm]	Polarity
1	1.125	74.2	Pk	25	0.5	-56.39	43.31	74	-30.69	54	-10.69	0-360	100	H
2	1.175	75.6	Pk	25.1	0.4	-56.26	44.84	74	-29.16	54	-9.16	0-360	100	H
3	1.225	76.6	Pk	25.2	0.4	-56.2	46	74	-28	54	-8	0-360	100	H
4	1.806	81.97	Pk	27	0.4	-53.99	55.38	74	-18.62	-	-	0-360	100	H
5	2.05	65.8	Pk	21.3	N/A	-53.05	34.05	74	-39.95	54	-19.95	0-360	100	H
6	3.731	64	Pk	23.7	N/A	-50.28	37.42	74	-36.58	54	-16.58	0-360	100	H
18	2.708	65.6	Pk	22.1	N/A	-51.42	36.28	74	-37.72	54	-17.72	0-360	100	H
19	2.772	66.24	Pk	22.2	N/A	-51.25	37.19	74	-36.81	54	-16.81	0-360	100	H
20	2.894	65.29	Pk	22.6	N/A	-50.96	36.93	74	-37.07	54	-17.07	0-360	100	H
7	4.155	60.96	Pk	28.3	N/A	-50.95	38.31	74	-35.69	54	-15.69	0-360	100	H
8	7.401	55.81	Pk	31.2	N/A	-46.49	40.52	74	-33.48	54	-13.48	0-360	100	H
9	8.294	57.64	Pk	36.5	N/A	-47.81	46.33	74	-27.67	54	-7.67	0-360	100	H
10	9.6775	58.02	Pk	36.4	N/A	-47.72	46.7	74	-27.3	54	-7.3	0-360	100	H
11	1.806	79.53	Pk	27	0.4	-53.99	52.94	74	-21.06	-	-	0-360	100	V
12	2.051	65.13	Pk	21.3	N/A	-53.06	33.37	74	-40.63	54	-20.63	0-360	100	V
13	3.511	64.58	Pk	23.5	N/A	-49.96	38.12	74	-35.88	54	-15.88	0-360	100	V
14	4.121	59.88	Pk	28.4	N/A	-50.75	37.53	74	-36.47	54	-16.47	0-360	100	V
15	7.427	55.45	Pk	30.8	N/A	-46.7	39.55	74	-34.45	54	-14.45	0-360	100	V
16	8.2575	57.93	Pk	36.4	N/A	-47.37	46.96	74	-27.04	54	-7.04	0-360	100	V
17	9.6545	57.44	Pk	36.4	N/A	-47.99	45.85	74	-28.15	54	-8.15	0-360	100	V

Pk - Peak detector

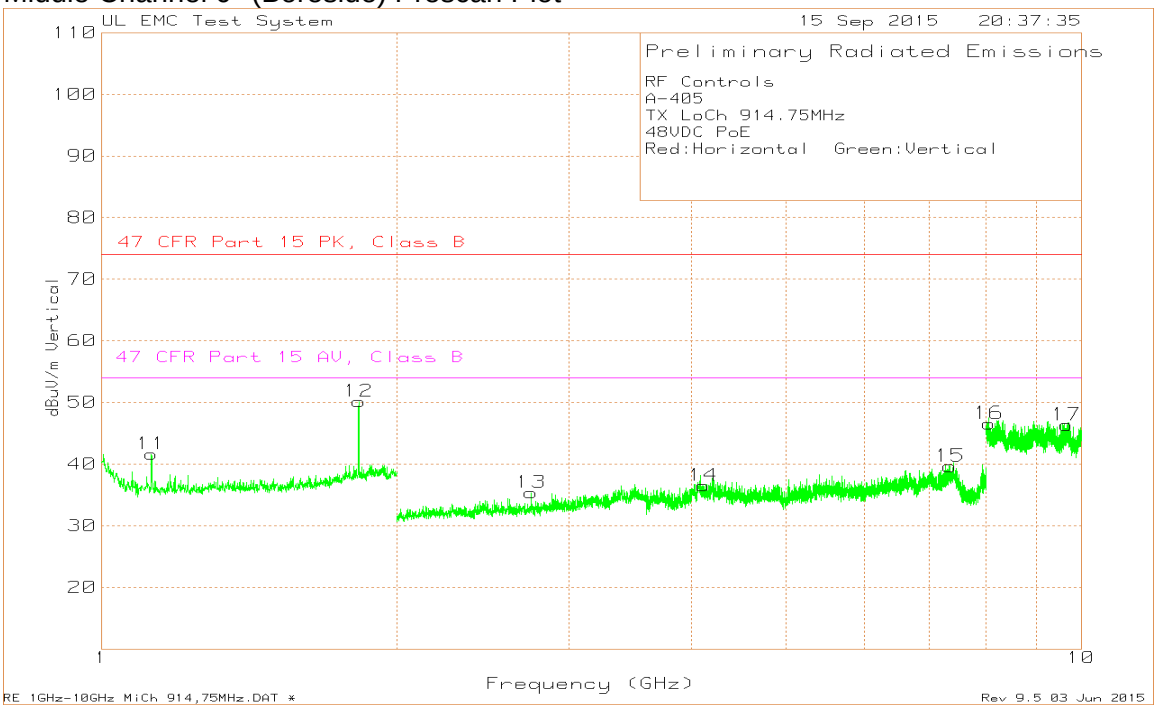
Radiated Emission Data

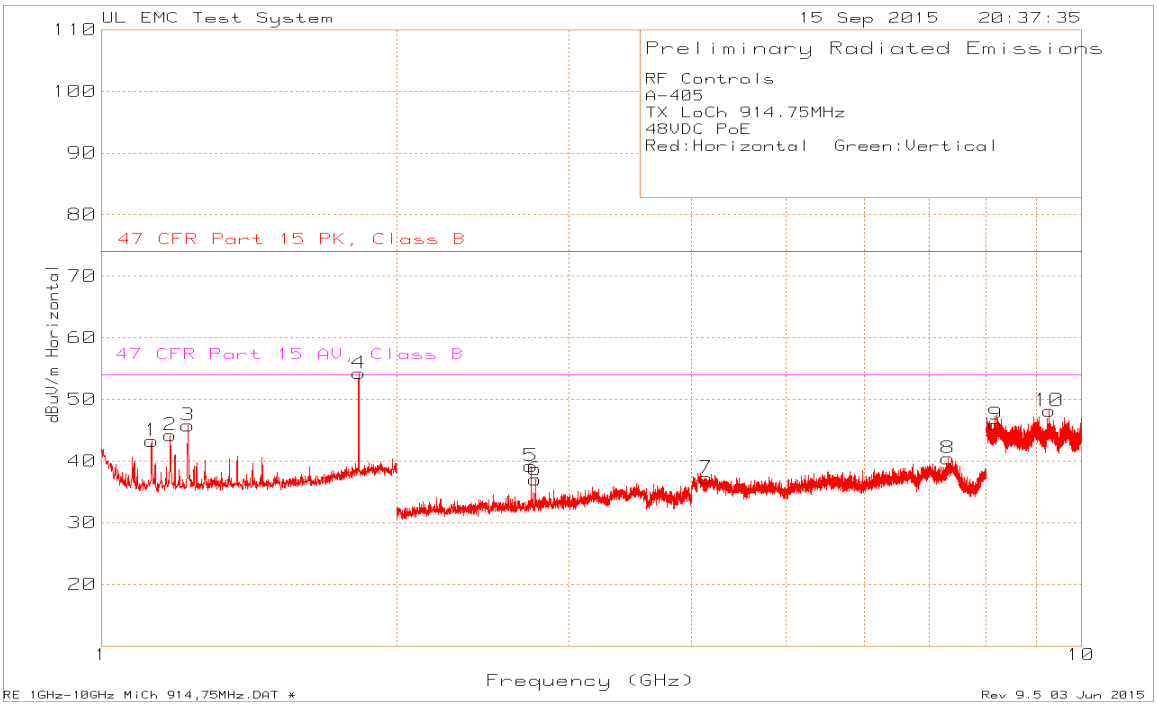
	Test Frequency (GHz)	Meter Reading (dBuV)	Detector	Path Factor dB	Band Reject Filter dB	Path Factor dB	Level dBuV/m	Limit 47 CFR Part 15 PK, Class B dBuV/m	Margin (dB)	Limit 47 CFR Part 15 AV, Class B dBuV/m	Margin (dB)	Azimuth [Degs]	Height [cm]	Polarity
	1.8055	82.08	Pk	27	0.4	-53.99	55.49	74	-18.51	-	-	87	100	H
	1.8055	81.17	Av	27	0.4	-53.99	54.58	74	-19.42	-	-	87	100	H
	1.8055	81.67	Pk	27	0.4	-53.99	55.08	74	-18.92	-	-	35	215	V
	1.8055	80.5	Av	27	0.4	-53.99	53.91	74	-20.09	-	-	35	215	V

Pk - Peak detector
Av - Average detection

* 1800 MHz not in restricted band.

Middle Channel 0° (Boreside) Prescan Plot





Middle Channel 0° (Boreside) Data

A-405
TX LoCh 914.75MHz
48VDC PoE
Red:Horizontal Green:Vertical
Trace Markers

Marker No.	Test Frequency (GHz)	Meter Reading (dBuV)	Detector	Path Factor dB	Band Reject Filter dB	Path Factor dB	Level dBuV/m	Limit 47 CFR Part 15 PK, Class B dBuV/m	Margin (dB)	Limit 47 CFR Part 15 AV, Class B dBuV/m	Margin (dB)	Azimuth [Degs]	Height [cm]	Polarity
1	1.125	74.2	Pk	25	0.5	-56.4	43.31	74	-30.69	54	-10.69	0-360	99	H
2	1.175	74.96	Pk	25.1	0.4	-56.3	44.2	74	-29.8	54	-9.8	0-360	99	H
3	1.225	76.4	Pk	25.2	0.4	-56.2	45.8	74	-28.2	54	-8.2	0-360	99	H
4	1.83	80.83	Pk	27.1	0.4	-54.1	54.27	74	-19.73	-	-	0-360	99	H
5	2.744	68.36	Pk	22.1	N/A	-51.3	39.19	74	-34.81	54	-14.81	0-360	99	H
6	2.771	66.09	Pk	22.2	N/A	-51.3	37.01	74	-36.99	54	-16.99	0-360	99	H
7	4.14	59.51	Pk	28.4	N/A	-50.7	37.22	74	-36.78	54	-16.78	0-360	99	H
8	7.31	55.72	Pk	30.5	N/A	-45.8	40.44	74	-33.56	54	-13.56	0-360	99	H
9	8.1835	57.53	Pk	36.3	N/A	-47.9	45.94	74	-28.06	54	-8.06	0-360	99	H
10	9.278	59.58	Pk	36.4	N/A	-47.8	48.16	74	-25.84	54	-5.84	0-360	99	H
11	1.124	72.51	Pk	25	0.5	-56.4	41.62	74	-32.38	54	-12.38	0-360	99	V
12	1.83	76.73	Pk	27.1	0.4	-54.1	50.17	74	-23.83	-	-	0-360	99	V
13	2.744	64.55	Pk	22.1	N/A	-51.3	35.38	74	-38.62	54	-18.62	0-360	99	V
14	4.113	58.88	Pk	28.4	N/A	-50.8	36.49	74	-37.51	54	-17.51	0-360	99	V
15	7.345	54.72	Pk	30.8	N/A	-45.9	39.62	74	-34.38	54	-14.38	0-360	99	V
16	8.0505	57.93	Pk	36.2	N/A	-47.6	46.54	74	-27.46	54	-7.46	0-360	99	V
17	9.663	57.79	Pk	36.4	N/A	-47.9	46.34	74	-27.66	54	-7.66	0-360	99	V

Pk - Peak detector

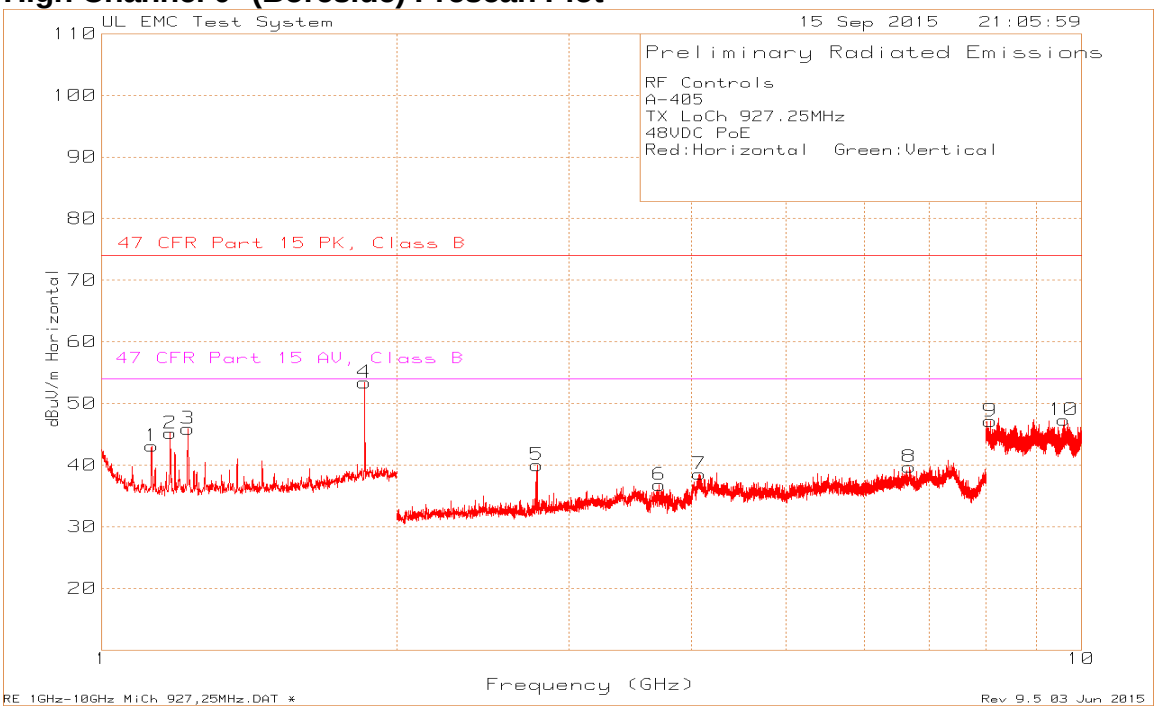
Radiated Emission Data

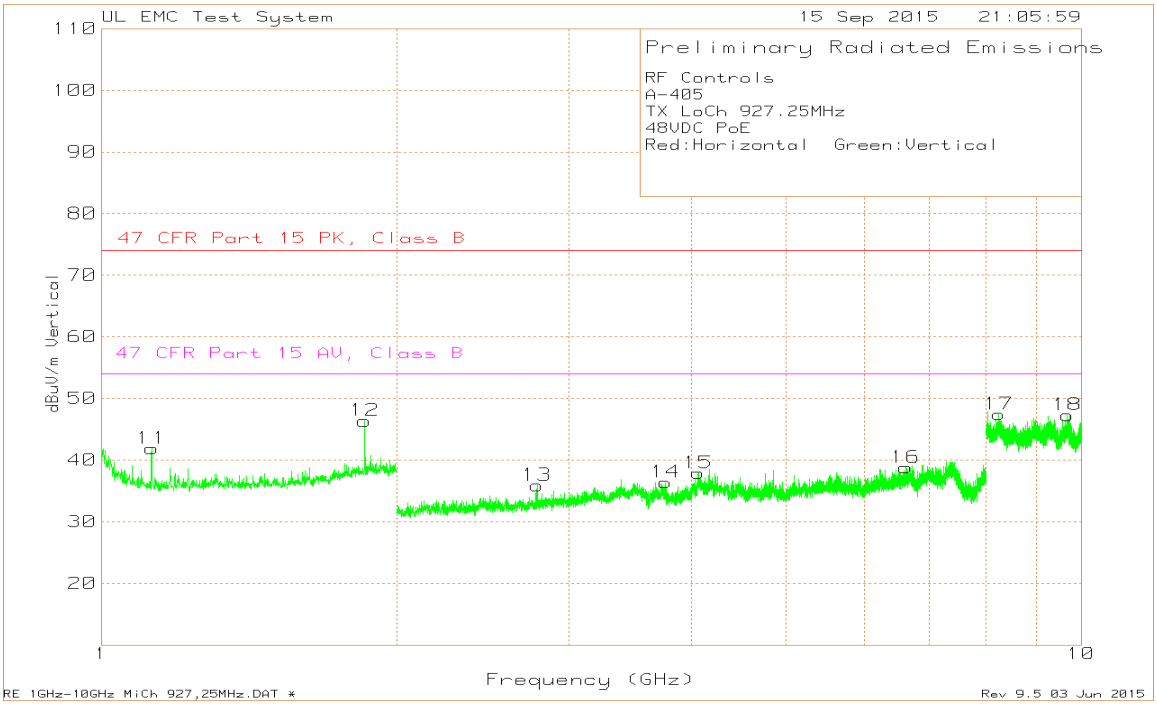
	Test Frequency (GHz)	Meter Reading (dBuV)	Detector	Path Factor dB	Band Reject Filter dB	Path Factor dB	Level dBuV/m	Limit 47 CFR Part 15 PK, Class B dBuV/m	Margin (dB)	Limit 47 CFR Part 15 AV, Class B dBuV/m	Margin (dB)	Azimuth [Degs]	Height [cm]	Polarity
	1.8295	81.1	Pk	27.1	0.4	-54.1	54.54	74	-19.46	-	-	87	100	H
	1.8295	79.64	Av	27.1	0.4	-54.1	53.08	74	-20.92	-	-	87	100	H
	1.8294	78.83	Pk	27.1	0.4	-54.1	52.27	74	-21.73	-	-	33	195	V
	1.8295	76.79	Av	27.1	0.4	-54.1	50.23	74	-23.77	-	-	33	195	V

Pk - Peak detector
Av - Average detection

* 1800 MHz not in restricted band.

High Channel 0° (Boreside) Prescan Plot





High Channel 0° (Boreside) Data

RF Controls
A-405
TX LoCh 927.25MHz
48VDC PoE
Red:Horizontal Green:Vertical
Trace Markers

Marker No.	Test Frequency (GHz)	Meter Reading (dBuV)	Detector	Path Factor dB	Band Reject Filter dB	Path Factor dB	Level dBuV/m	Limit 47 CFR Part 15 PK, Class B dBuV/m	Margin (dB)	Limit 47 CFR Part 15 AV, Class B dBuV/m	Margin (dB)	Azimuth [Degs]	Height [cm]	Polarity
1	1.125	74	Pk	25	0.5	-56.4	43.11	74	-30.89	54	-10.89	0-360	99	H
2	1.175	75.93	Pk	25.1	0.4	-56.3	45.17	74	-28.83	54	-8.83	0-360	99	H
3	1.225	76.49	Pk	25.2	0.4	-56.2	45.89	74	-28.11	54	-8.11	0-360	99	H
4	1.855	79.65	Pk	27.2	0.4	-53.9	53.38	74	-20.62	-	-	0-360	99	H
5	2.782	68.86	Pk	22.2	N/A	-51.1	40.01	74	-33.99	54	-13.99	0-360	99	H
6	3.709	62.98	Pk	23.6	N/A	-49.8	36.82	74	-37.18	54	-17.18	0-360	99	H
7	4.077	60.95	Pk	28.4	N/A	-50.8	38.55	74	-35.45	54	-15.45	0-360	99	H
8	6.678	56.84	Pk	28.9	N/A	-46.1	39.68	74	-34.32	54	-14.32	0-360	99	H
9	8.0775	59.08	Pk	36.2	N/A	-48.2	47.13	74	-26.87	54	-6.87	0-360	99	H
10	9.5995	59.46	Pk	36.4	N/A	-48.6	47.31	74	-26.69	54	-6.69	0-360	99	H
11	1.125	72.76	Pk	25	0.5	-56.4	41.87	74	-32.13	54	-12.13	0-360	99	V
12	1.855	72.64	Pk	27.2	0.4	-53.9	46.37	74	-27.63	-	-	0-360	99	V
13	2.782	64.7	Pk	22.2	N/A	-51.1	35.85	74	-38.15	54	-18.15	0-360	99	V
14	3.763	63.61	Pk	23.9	N/A	-51.1	36.39	74	-37.61	54	-17.61	0-360	99	V
15	4.064	60.43	Pk	28.4	N/A	-50.9	37.89	74	-36.11	54	-16.11	0-360	99	V
16	6.62	56.48	Pk	28.9	N/A	-46.6	38.8	74	-35.2	54	-15.2	0-360	99	V
17	8.238	57.95	Pk	36.4	N/A	-46.9	47.44	74	-26.56	54	-6.56	0-360	99	V
18	9.6805	58.58	Pk	36.4	N/A	-47.7	47.29	74	-26.71	54	-6.71	0-360	99	V

Pk - Peak detector

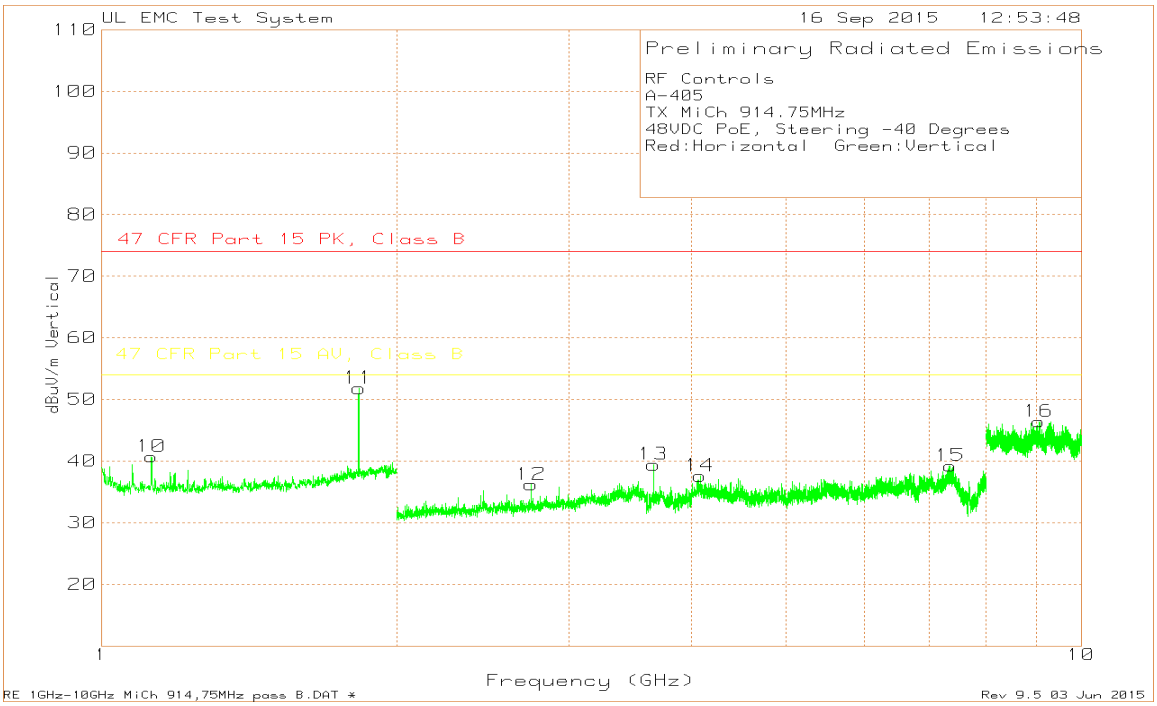
Radiated Emission Data

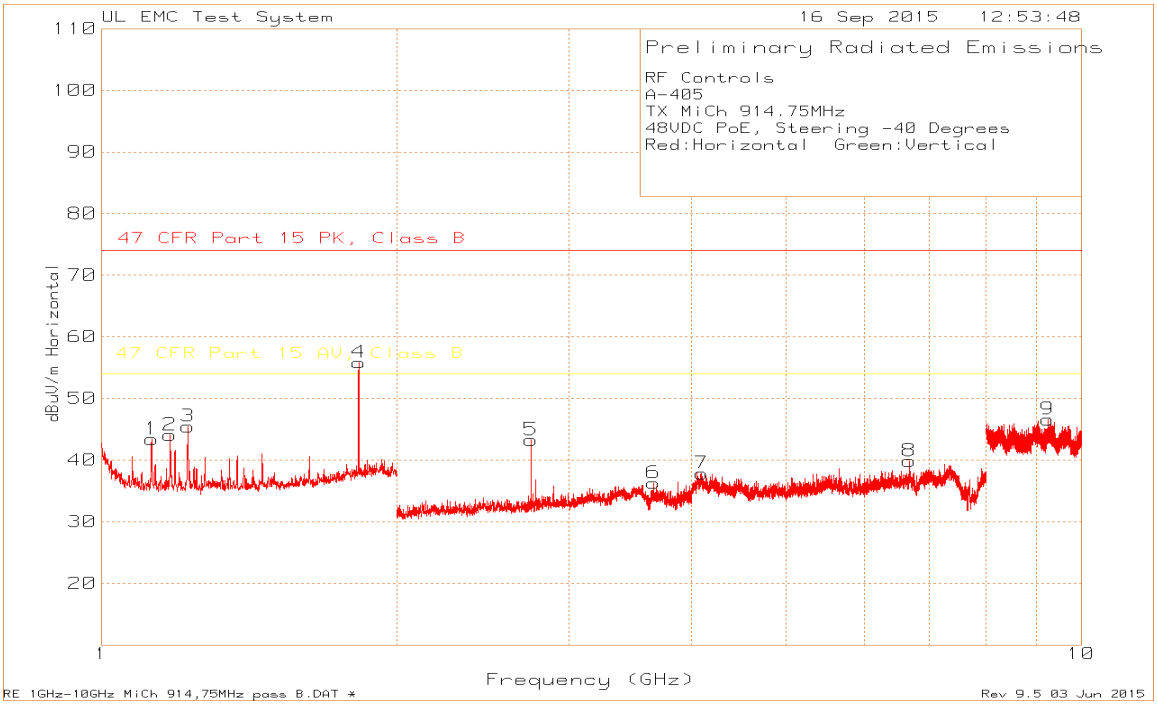
	Test Frequency (GHz)	Meter Reading (dBuV)	Detector	Path Factor dB	Band Reject Filter dB	Path Factor dB	Level dBuV/m	Limit 47 CFR Part 15 PK, Class B dBuV/m	Margin (dB)	Limit 47 CFR Part 15 AV, Class B dBuV/m	Margin (dB)	Azimuth [Degs]	Height [cm]	Polarity
	1.8545	80.02	Pk	27.2	0.4	-53.9	53.74	74	-20.26	-	-	147	100	H
	1.8545	78.8	Av	27.2	0.4	-53.9	52.52	74	-21.48	-	-	147	100	H
	1.8545	73.24	Pk	27.2	0.4	-53.9	46.96	74	-27.04	-	-	177	100	V
	1.8545	70.46	Av	27.2	0.4	-53.9	44.18	74	-29.82	-	-	177	100	V

Pk - Peak detector
Av - Average detection

* 1800 MHz not in restricted band.

Middle Channel -40°Prescan Plot





Middle Channel -40° Data

RF Controls
A-405
TX MiCh 914.75MHz
48VDC PoE, Steering -40 Degrees
Red:Horizontal Green:Vertical
Trace Markers

Marker No.	Test Frequency (GHz)	Meter Reading (dBuV)	Detector	Path Factor dB	Band Reject Filter dB	Path Factor dB	Level dBuV/m	Limit 47 CFR Part 15 PK, Class B dBuV/m	Margin (dB)	Limit 47 CFR Part 15 AV, Class B dBuV/m	Margin (dB)	Azimuth [Degs]	Height [cm]	Polarity
1	1.125	74.27	Pk	25	0.5	-56.39	43.38	74	-30.62	54	-10.62	0-360	102	H
2	1.174	74.84	Pk	25.1	0.4	-56.28	44.06	74	-29.94	54	-9.94	0-360	102	H
3	1.225	76.05	Pk	25.2	0.4	-56.2	45.45	74	-28.55	54	-8.55	0-360	102	H
4	1.83	82.39	Pk	27.1	0.4	-54.06	55.83	74	-18.17	-	-	0-360	102	H
5	2.744	72.42	Pk	22.1	N/A	-51.27	43.25	74	-30.75	54	-10.75	0-360	102	H
6	3.659	62.55	Pk	23.4	N/A	-49.66	36.29	74	-37.71	54	-17.71	0-360	102	H
7	4.098	60.13	Pk	28.4	N/A	-50.71	37.82	74	-36.18	54	-16.18	0-360	102	H
8	6.675	57.01	Pk	28.9	N/A	-46.08	39.83	74	-34.17	54	-14.17	0-360	102	H
9	9.242	57.9	Pk	36.4	N/A	-47.72	46.58	74	-27.42	54	-7.42	0-360	102	H
10	1.124	71.61	Pk	25	0.5	-56.39	40.72	74	-33.28	54	-13.28	0-360	102	V
11	1.83	78.34	Pk	27.1	0.4	-54.06	51.78	74	-22.22	-	-	0-360	102	V
12	2.744	65.35	Pk	22.1	N/A	-51.27	36.18	74	-37.82	54	-17.82	0-360	102	V
13	3.659	65.67	Pk	23.4	N/A	-49.66	39.41	74	-34.59	54	-14.59	0-360	102	V
14	4.081	59.93	Pk	28.4	N/A	-50.75	37.58	74	-36.42	54	-16.42	0-360	102	V
15	7.349	54.41	Pk	30.8	N/A	-45.99	39.22	74	-34.78	54	-14.78	0-360	102	V
16	9.0495	58.76	Pk	36.2	N/A	-48.55	46.41	74	-27.59	54	-7.59	0-360	102	V

Pk - Peak detector

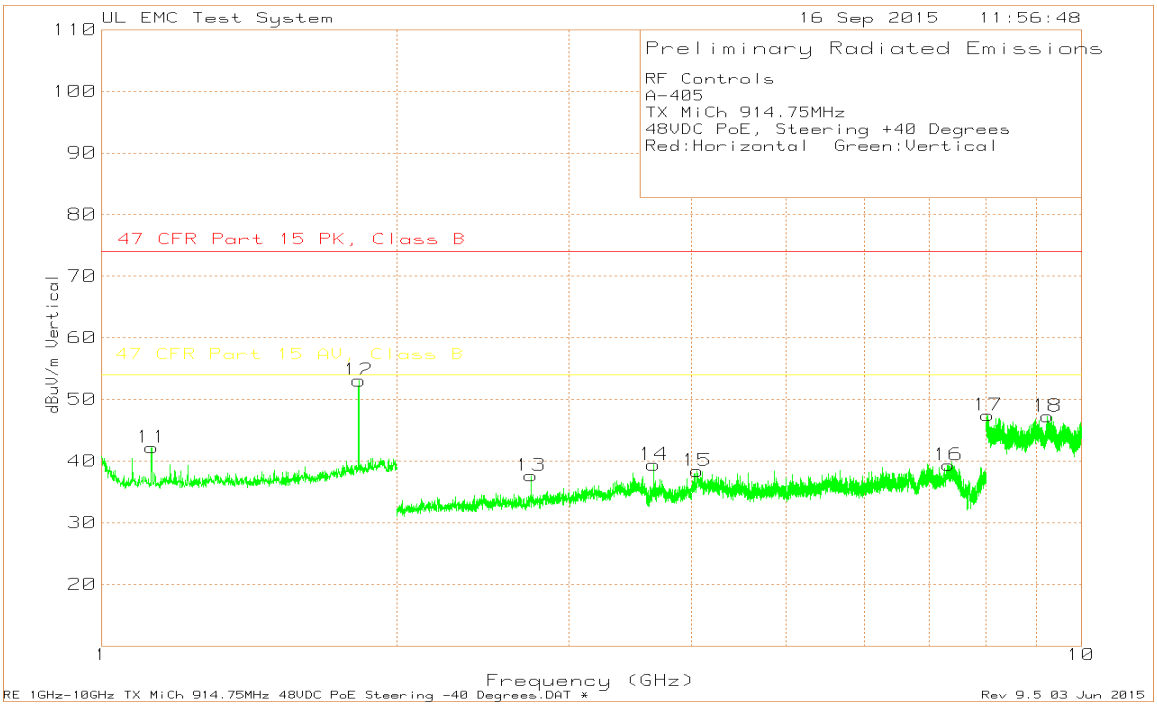
Radiated Emission Data

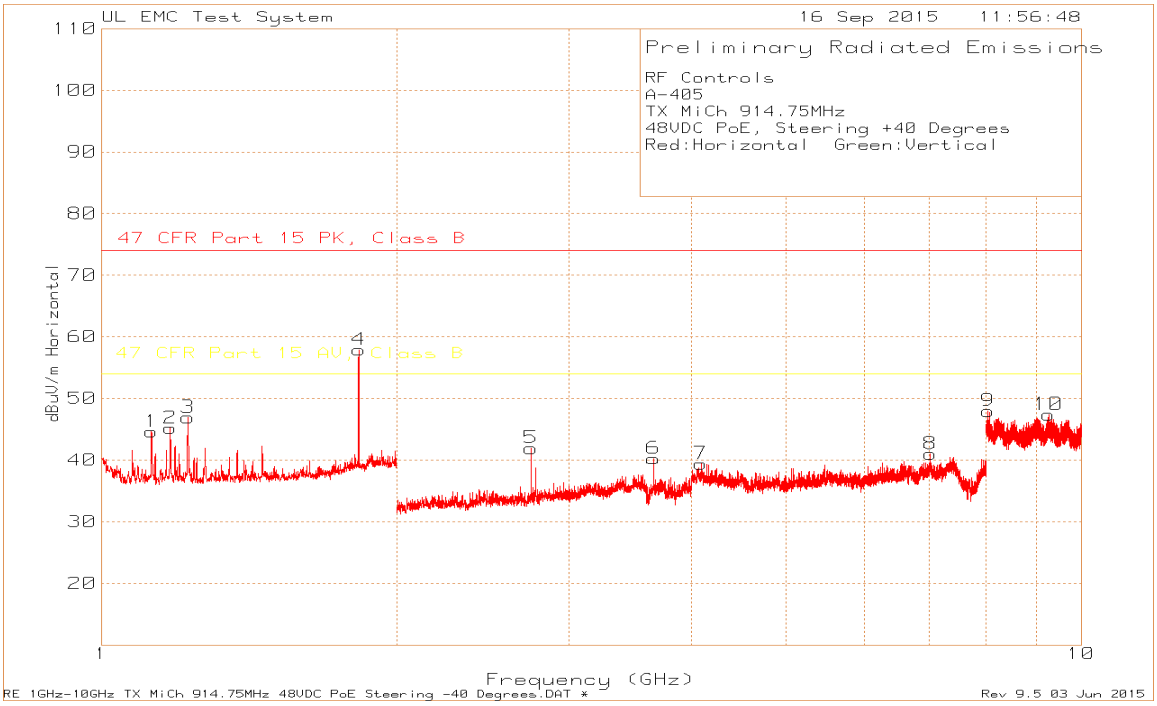
	Test Frequency (GHz)	Meter Reading (dBuV)	Detector	Path Factor dB	Band Reject Filter dB	Path Factor dB	Level dBuV/m	Limit 47 CFR Part 15 PK, Class B dBuV/m	Margin (dB)	Limit 47 CFR Part 15 AV, Class B dBuV/m	Margin (dB)	Azimuth [Degs]	Height [cm]	Polarity
	1.8294	82.61	Pk	27.1	0.4	-54.06	56.05	74	-17.95	-	-	82	127	H
	1.8295	77.77	Av	27.1	0.4	-54.06	51.21	74	-22.79	-	-	82	127	H
	1.8294	78.67	Pk	27.1	0.4	-54.06	52.11	74	-21.89	-	-	22	102	V
	1.8295	73.33	Av	27.1	0.4	-54.06	46.77	74	-27.23	-	-	22	102	V

Pk - Peak detector
Av - Average detection

* 1800 MHz not in restricted band.

Middle Channel +40°Prescan Plot





Middle Channel +40° Data

RF Controls
A-405
TX MiCh 914.75MHz
48VDC PoE, Steering +40 Degrees
Red:Horizontal Green:Vertical
Trace Markers

Marker No.	Test Frequency (GHz)	Meter Reading (dBuV)	Detector	Path Factor dB	Band Reject Filter dB	Path Factor dB	Level dBuV/m	Limit 47 CFR Part 15 PK, Class B dBuV/m	Margin (dB)	Limit 47 CFR Part 15 AV, Class B dBuV/m	Margin (dB)	Azimuth [Degs]	Height [cm]	Polarity
1	1.124	75.49	Pk	25	0.5	-56.39	44.6	74	-29.4	54	-9.4	0-360	100	H
2	1.175	75.93	Pk	25.1	0.4	-56.26	45.17	74	-28.83	54	-8.83	0-360	100	H
3	1.225	77.51	Pk	25.2	0.4	-56.2	46.91	74	-27.09	54	-7.09	0-360	100	H
4	1.83	84.45	Pk	27.1	0.4	-54.06	57.89	74	-16.11	-	-	0-360	100	H
5	2.744	71.08	Pk	22.1	N/A	-51.27	41.91	74	-32.09	54	-12.09	0-360	100	H
6	3.659	66.5	Pk	23.4	N/A	-49.66	40.24	74	-33.76	54	-13.76	0-360	100	H
7	4.09	61.66	Pk	28.4	N/A	-50.69	39.37	74	-34.63	54	-14.63	0-360	100	H
8	7.015	57.39	Pk	29.3	N/A	-45.7	40.99	74	-33.01	54	-13.01	0-360	100	H
9	8.0315	59.13	Pk	36.1	N/A	-47.27	47.96	74	-26.04	54	-6.04	0-360	100	H
10	9.261	58.51	Pk	36.4	N/A	-47.55	47.36	74	-26.64	54	-6.64	0-360	100	H
11	1.125	73.09	Pk	25	0.5	-56.39	42.2	74	-31.8	54	-11.8	0-360	100	V
12	1.83	79.64	Pk	27.1	0.4	-54.06	53.08	74	-20.92	-	-	0-360	100	V
13	2.744	66.81	Pk	22.1	N/A	-51.27	37.64	74	-36.36	54	-16.36	0-360	100	V
14	3.66	65.64	Pk	23.4	N/A	-49.64	39.4	74	-34.6	54	-14.6	0-360	100	V
15	4.055	60.94	Pk	28.4	N/A	-50.95	38.39	74	-35.61	54	-15.61	0-360	100	V
16	7.317	54.59	Pk	30.6	N/A	-45.84	39.35	74	-34.65	54	-14.65	0-360	100	V
17	8.0285	58.53	Pk	36.1	N/A	-47.19	47.44	74	-26.56	54	-6.56	0-360	100	V
18	9.237	58.61	Pk	36.4	N/A	-47.78	47.23	74	-26.77	54	-6.77	0-360	100	V

Pk - Peak detector

Radiated Emission Data

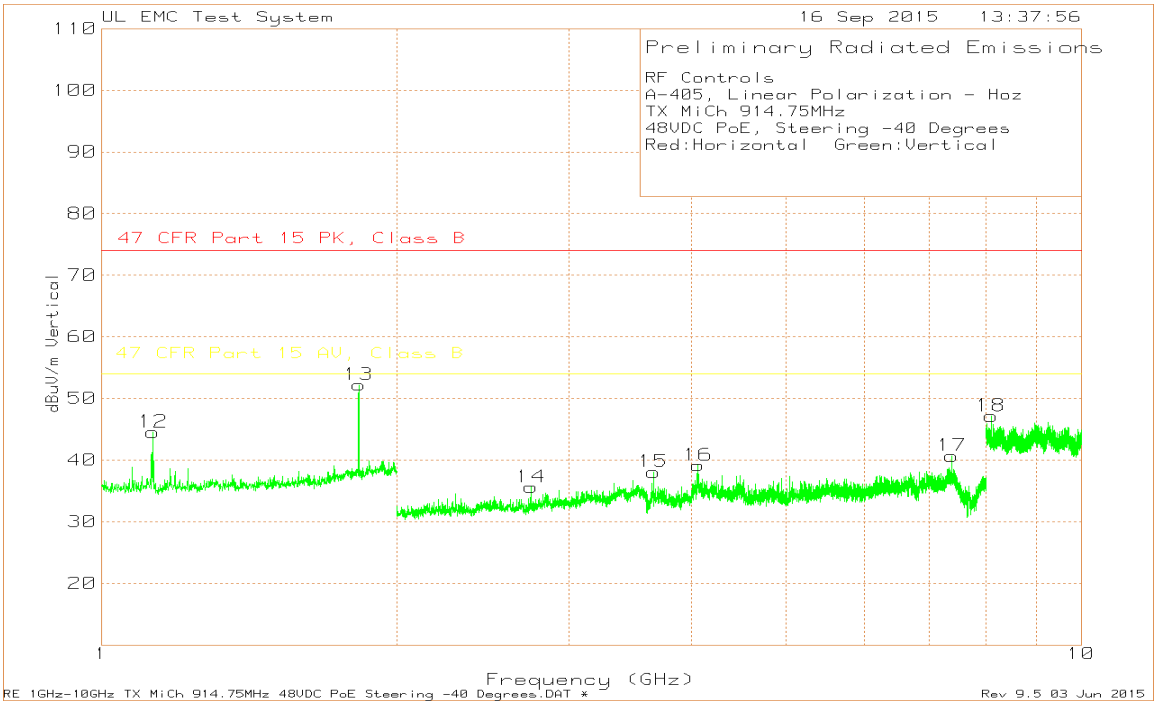
	Test Frequency (GHz)	Meter Reading (dBuV)	Detector	Path Factor dB	Band Reject Filter dB	Path Factor dB	Level dBuV/m	Limit 47 CFR Part 15 PK, Class B dBuV/m	Margin (dB)	Limit 47 CFR Part 15 AV, Class B dBuV/m	Margin (dB)	Azimuth [Degs]	Height [cm]	Polarity
	1.8295	84.03	Pk	27.1	0.4	-54.06	57.47	74	-16.53	-	-	82	100	H
	1.8295	79.17	Av	27.1	0.4	-54.06	52.61	74	-21.39	-	-	82	100	H
	1.8296	79.59	Pk	27.1	0.4	-54.06	53.03	74	-20.97	-	-	22	102	V
	1.8295	74.36	Av	27.1	0.4	-54.06	47.8	74	-26.2	-	-	22	102	V

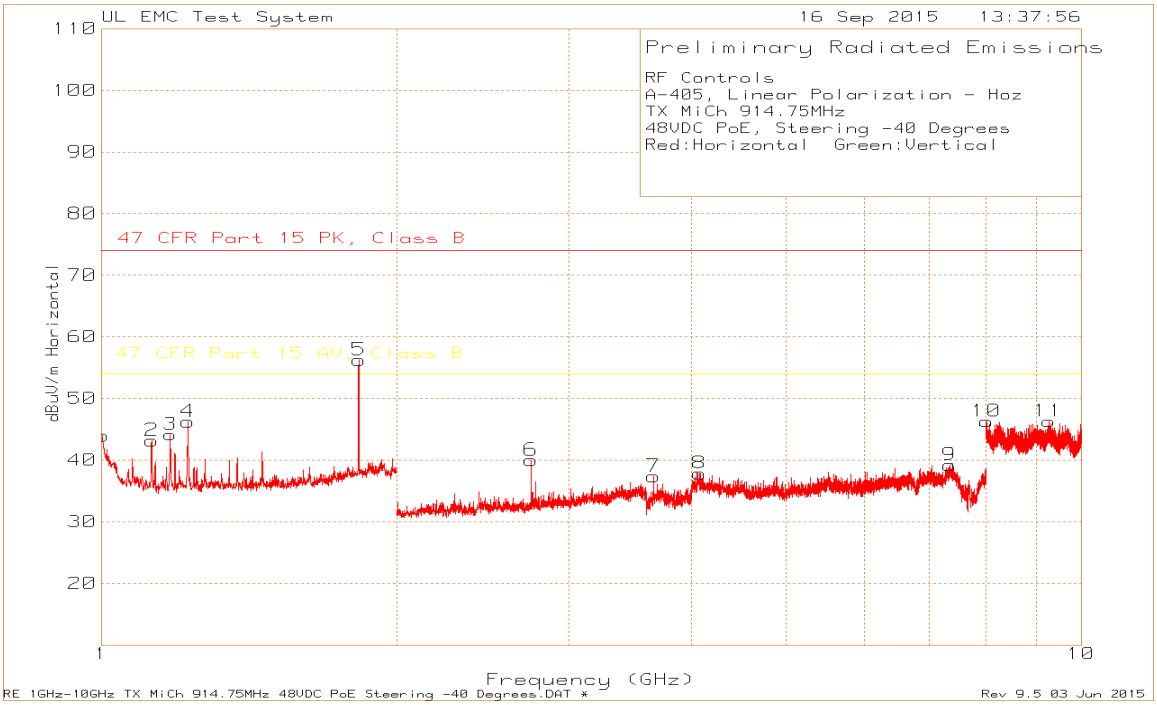
Pk - Peak detector
Av - Average detection

* 1800 MHz not in restricted band.

Horizontal Polarization Data

Middle Channel -40°Prescan Plot





Middle Channel -40° Data

RF Controls
A-405, Linear Polarization - Hoz
TX MiCh 914.75MHz
48VDC PoE, Steering -40 Degrees
Red:Horizontal Green:Vertical
Trace Markers

Marker No.	Test Frequency (GHz)	Meter Reading (dBuV)	Detector	Path Factor dB	Band Reject Filter dB	Path Factor dB	Level dBuV/m	Limit 47 CFR Part 15 PK, Class B dBuV/m	Margin (dB)	Limit 47 CFR Part 15 AV, Class B dBuV/m	Margin (dB)	Azimuth [Degs]	Height [cm]	Polarity
1	1.002	75.42	Pk	23.9	1.1	-56.4	43.98	74	-30.02	54	-10.02	0-360	100	H
2	1.125	74.03	Pk	25	0.5	-56.4	43.14	74	-30.86	54	-10.86	0-360	100	H
3	1.175	74.9	Pk	25.1	0.4	-56.3	44.14	74	-29.86	54	-9.86	0-360	100	H
4	1.225	76.81	Pk	25.2	0.4	-56.2	46.21	74	-27.79	54	-7.79	0-360	100	H
5	1.83	82.8	Pk	27.1	0.4	-54.1	56.24	74	-17.76	-	-	0-360	100	H
6	2.744	69.14	Pk	22.1	N/A	-51.3	39.97	74	-34.03	54	-14.03	0-360	100	H
7	3.66	63.59	Pk	23.4	N/A	-49.6	37.35	74	-36.65	54	-16.65	0-360	100	H
8	4.074	60.27	Pk	28.4	N/A	-50.9	37.82	74	-36.18	54	-16.18	0-360	100	H
9	7.338	54.39	Pk	30.7	N/A	-45.9	39.19	74	-34.81	54	-14.81	0-360	100	H
10	8.0075	57.15	Pk	36.1	N/A	-47	46.27	74	-27.73	54	-7.73	0-360	100	H
11	9.264	57.5	Pk	36.4	N/A	-47.6	46.3	74	-27.7	54	-7.7	0-360	100	H
12	1.128	75.39	Pk	25	0.5	-56.4	44.51	74	-29.49	54	-9.49	0-360	100	V
13	1.83	78.76	Pk	27.1	0.4	-54.1	52.2	74	-21.8	-	-	0-360	100	V
14	2.744	64.78	Pk	22.1	N/A	-51.3	35.61	74	-38.39	54	-18.39	0-360	100	V
15	3.659	64.33	Pk	23.4	N/A	-49.7	38.07	74	-35.93	54	-15.93	0-360	100	V
16	4.061	61.69	Pk	28.4	N/A	-51	39.14	74	-34.86	54	-14.86	0-360	100	V
17	7.377	56.02	Pk	31	N/A	-46.4	40.67	74	-33.33	54	-13.33	0-360	100	V
18	8.092	59.46	Pk	36.2	N/A	-48.5	47.13	74	-26.87	54	-6.87	0-360	100	V

Pk - Peak detector

Radiated Emission Data

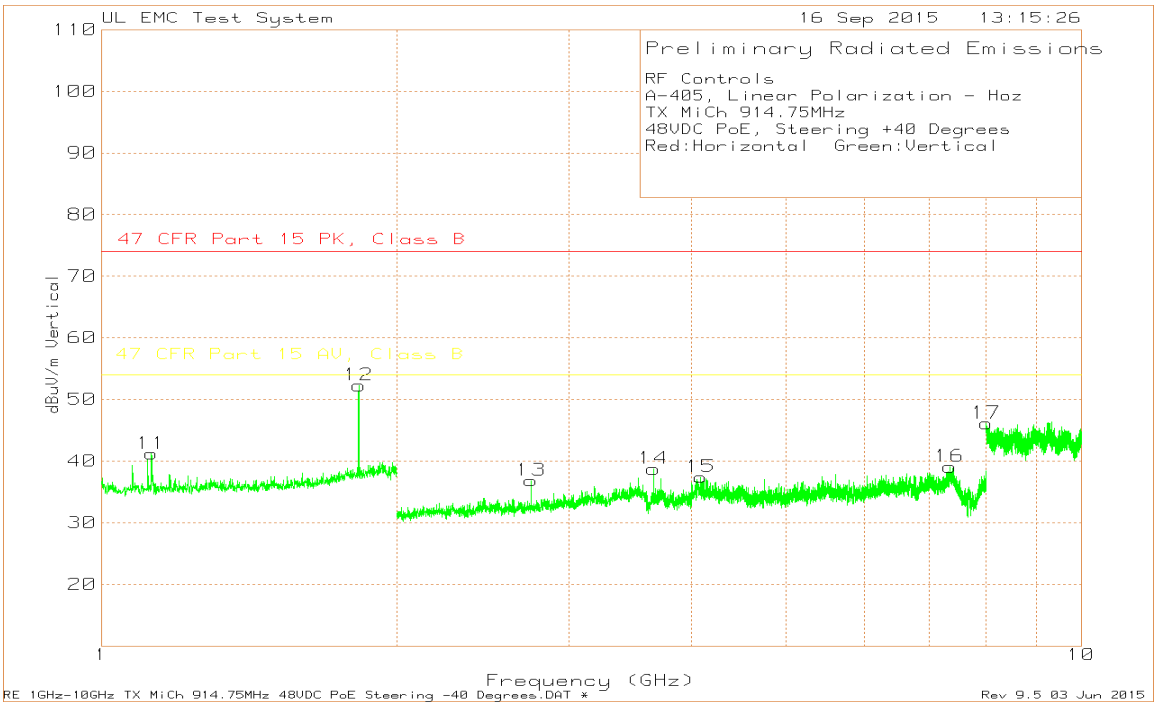
	Test Frequency (GHz)	Meter Reading (dBuV)	Detector	Path Factor dB	Band Reject Filter dB	Path Factor dB	Level dBuV/m	Limit 47 CFR Part 15 PK, Class B dBuV/m	Margin (dB)	Limit 47 CFR Part 15 AV, Class B dBuV/m	Margin (dB)	Azimuth [Degs]	Height [cm]	Polarity
	1.8294	83.15	Pk	27.1	0.4	-54.1	56.59	74	-17.41	-	-	83	127	H
	1.8295	78.36	Av	27.1	0.4	-54.1	51.8	74	-22.2	-	-	83	127	H
	1.8295	79.44	Pk	27.1	0.4	-54.1	52.88	74	-21.12	-	-	23	106	V
	1.8295	74.18	Av	27.1	0.4	-54.1	47.62	74	-26.38	-	-	23	106	V

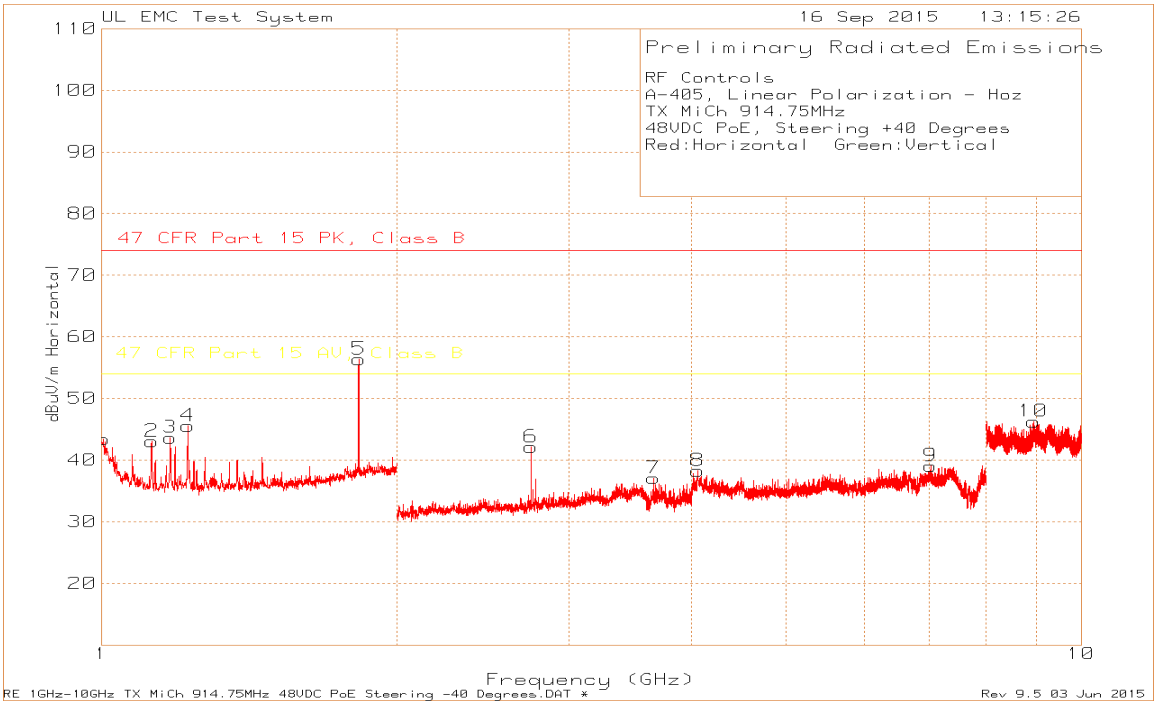
Pk - Peak detector

Av - Average detection

* 1800 MHz not in restricted band.

Middle Channel +40°Prescan Plot





Middle Channel +40° Data

RF Controls
A-405, Linear Polarization - Hoz
TX MiCh 914.75MHz
48VDC PoE, Steering +40 Degrees
Red:Horizontal Green:Vertical
Trace Markers

Marker No.	Test Frequency (GHz)	Meter Reading (dBuV)	Detector	Path Factor dB	Band Reject Filter dB	Path Factor dB	Level dBuV/m	Limit 47 CFR Part 15 PK, Class B dBuV/m	Margin (dB)	Limit 47 CFR Part 15 AV, Class B dBuV/m	Margin (dB)	Azimuth [Degs]	Height [cm]	Polarity
1	1.004	74.91	Pk	23.9	1.1	-56.49	43.42	74	-30.58	54	-10.58	0-360	102	H
2	1.125	73.91	Pk	25	0.5	-56.39	43.02	74	-30.98	54	-10.98	0-360	102	H
3	1.175	74.4	Pk	25.1	0.4	-56.26	43.64	74	-30.36	54	-10.36	0-360	102	H
4	1.225	76.13	Pk	25.2	0.4	-56.2	45.53	74	-28.47	54	-8.47	0-360	102	H
5	1.83	82.9	Pk	27.1	0.4	-54.06	56.34	74	-17.66	-	-	0-360	102	H
6	2.744	71.3	Pk	22.1	N/A	-51.27	42.13	74	-31.87	54	-11.87	0-360	102	H
7	3.66	63.32	Pk	23.4	N/A	-49.64	37.08	74	-36.92	54	-16.92	0-360	102	H
8	4.059	60.81	Pk	28.4	N/A	-50.95	38.26	74	-35.74	54	-15.74	0-360	102	H
9	7.019	55.51	Pk	29.3	N/A	-45.78	39.03	74	-34.97	54	-14.97	0-360	102	H
10	8.94	58.1	Pk	36.1	N/A	-47.96	46.24	74	-27.76	54	-7.76	0-360	102	H
11	1.124	72.08	Pk	25	0.5	-56.39	41.19	74	-32.81	54	-12.81	0-360	102	V
12	1.83	78.82	Pk	27.1	0.4	-54.06	52.26	74	-21.74	-	-	0-360	102	V
13	2.744	66.02	Pk	22.1	N/A	-51.27	36.85	74	-37.15	54	-17.15	0-360	102	V
14	3.659	64.98	Pk	23.4	N/A	-49.66	38.72	74	-35.28	54	-15.28	0-360	102	V
15	4.089	59.69	Pk	28.4	N/A	-50.69	37.4	74	-36.6	54	-16.6	0-360	102	V
16	7.342	54.2	Pk	30.8	N/A	-45.9	39.1	74	-34.9	54	-14.9	0-360	102	V
17	8	56.95	Pk	36.1	N/A	-46.96	46.09	74	-27.91	54	-7.91	0-360	102	V

Pk - Peak detector

Radiated Emission Data

	Test Frequency (GHz)	Meter Reading (dBuV)	Detector	Path Factor dB	Band Reject Filter dB	Path Factor dB	Level dBuV/m	Limit 47 CFR Part 15 PK, Class B dBuV/m	Margin (dB)	Limit 47 CFR Part 15 AV, Class B dBuV/m	Margin (dB)	Azimuth [Degs]	Height [cm]	Polarity
	1.8295	83.34	Pk	27.1	0.4	-54.06	56.78	74	-17.22	-	-	81	102	H
	1.8295	78.59	Av	27.1	0.4	-54.06	52.03	74	-21.97	-	-	81	102	H
	1.8296	79.1	Pk	27.1	0.4	-54.06	52.54	74	-21.46	-	-	23	100	V
	1.8295	73.75	Av	27.1	0.4	-54.06	47.19	74	-26.81	-	-	23	100	V

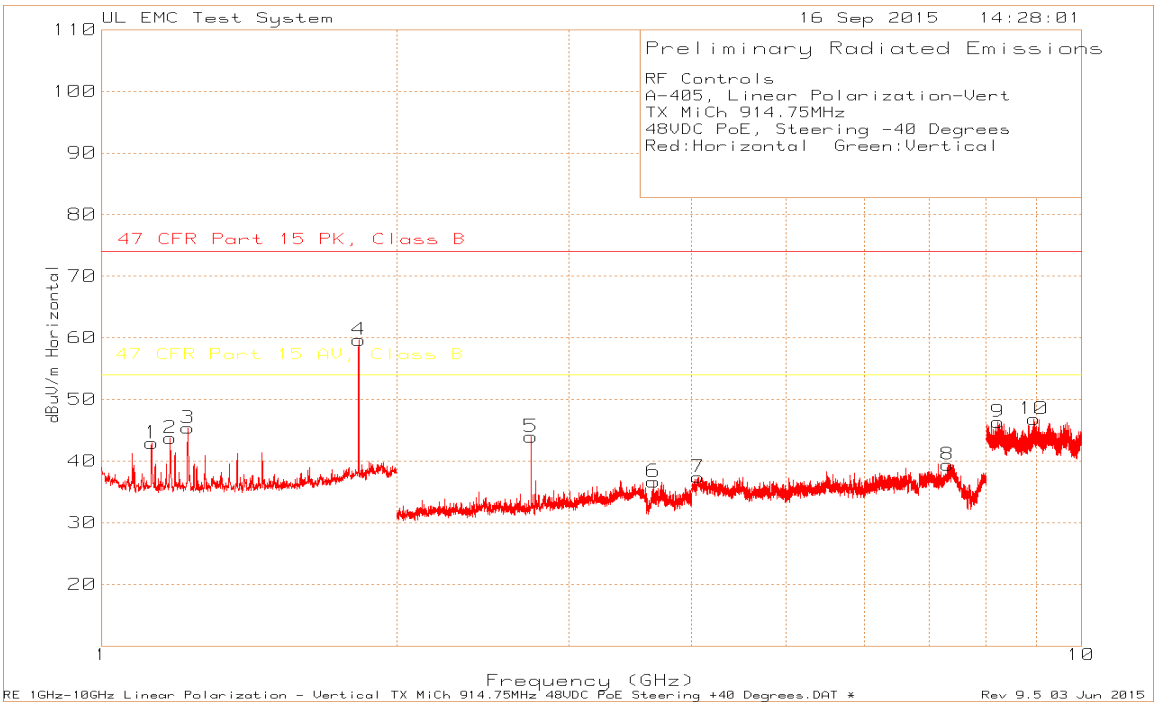
Pk - Peak detector

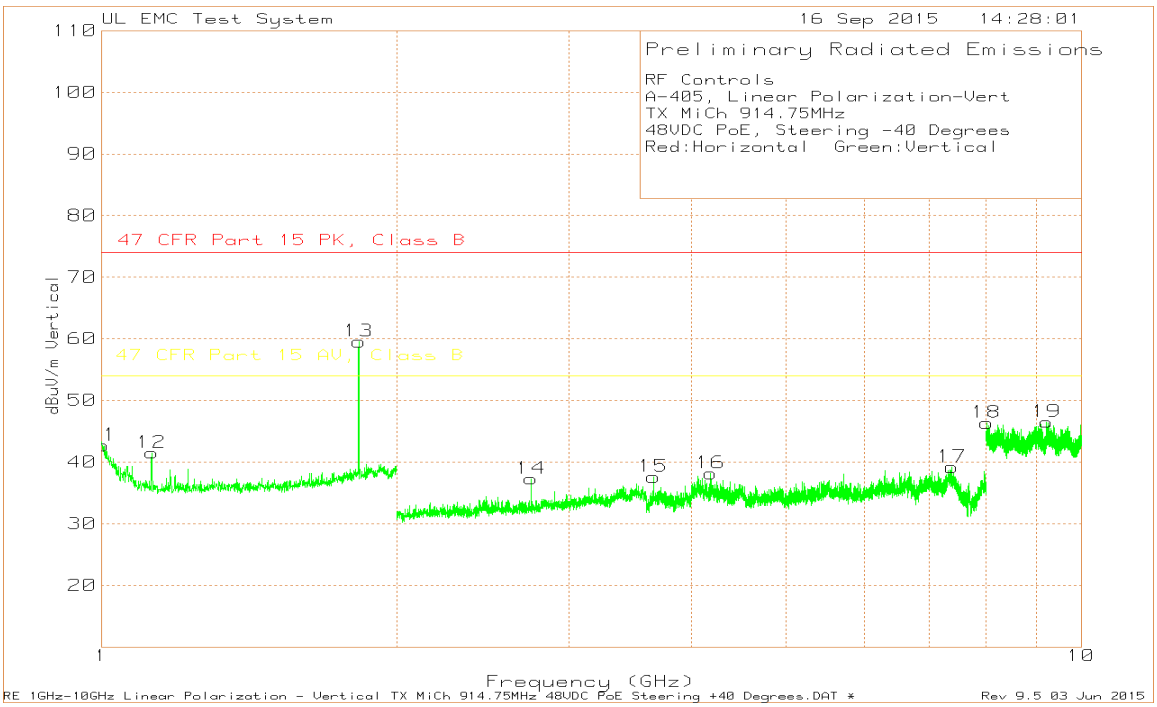
Av - Average detection

*** 1800 MHz not in restricted band.**

Vertical Polarization Data

Middle Channel -40°Prescan Plot





Middle Channel -40° Data

RF Controls
A-405, Linear Polarization-Vert
TX MiCh 914.75MHz
48VDC PoE, Steering -40 Degrees
Red:Horizontal Green:Vertical
Trace Markers

Marker No.	Test Frequency (GHz)	Meter Reading (dBuV)	Detector	Path Factor dB	Band Reject Filter dB	Path Factor dB	Level dBuV/m	Limit 47 CFR Part 15 PK, Class B dBuV/m	Margin (dB)	Limit 47 CFR Part 15 AV, Class B dBuV/m	Margin (dB)	Azimuth [Degs]	Height [cm]	Polarity
1	1.125	73.8	Pk	25	0.5	-56.39	42.91	74	-31.09	54	-11.09	0-360	100	H
2	1.175	74.51	Pk	25.1	0.4	-56.26	43.75	74	-30.25	54	-10.25	0-360	100	H
3	1.225	75.99	Pk	25.2	0.4	-56.2	45.39	74	-28.61	54	-8.61	0-360	100	H
4	1.83	86.22	Pk	27.1	0.4	-54.06	59.66	74	-14.34	-	-	0-360	100	H
5	2.744	73.11	Pk	22.1	N/A	-51.27	43.94	74	-30.06	54	-10.06	0-360	100	H
6	3.659	62.9	Pk	23.4	N/A	-49.66	36.64	74	-37.36	54	-17.36	0-360	100	H
7	4.064	59.94	Pk	28.4	N/A	-50.94	37.4	74	-36.6	54	-16.6	0-360	100	H
8	7.305	54.7	Pk	30.5	N/A	-45.77	39.43	74	-34.57	54	-14.57	0-360	100	H
9	8.221	57.05	Pk	36.4	N/A	-47.1	46.35	74	-27.65	54	-7.65	0-360	100	H
10	8.9485	58.67	Pk	36.1	N/A	-47.97	46.8	74	-27.2	54	-7.2	0-360	100	H
11	1.002	74.14	Pk	23.9	1.1	-56.44	42.7	74	-31.3	54	-11.3	0-360	100	V
12	1.125	72.4	Pk	25	0.5	-56.39	41.51	74	-32.49	54	-12.49	0-360	100	V
13	1.83	86.11	Pk	27.1	0.4	-54.06	59.55	74	-14.45	-	-	0-360	100	V
14	2.744	66.46	Pk	22.1	N/A	-51.27	37.29	74	-36.71	54	-16.71	0-360	100	V
15	3.659	63.85	Pk	23.4	N/A	-49.66	37.59	74	-36.41	54	-16.41	0-360	100	V
16	4.185	61.16	Pk	28.3	N/A	-51.28	38.18	74	-35.82	54	-15.82	0-360	100	V
17	7.378	54.53	Pk	31	N/A	-46.36	39.17	74	-34.83	54	-14.83	0-360	100	V
18	8.006	57.23	Pk	36.1	N/A	-46.97	46.36	74	-27.64	54	-7.64	0-360	100	V
19	9.2185	58.5	Pk	36.4	N/A	-48.4	46.5	74	-27.5	54	-7.5	0-360	100	V

Pk - Peak detector

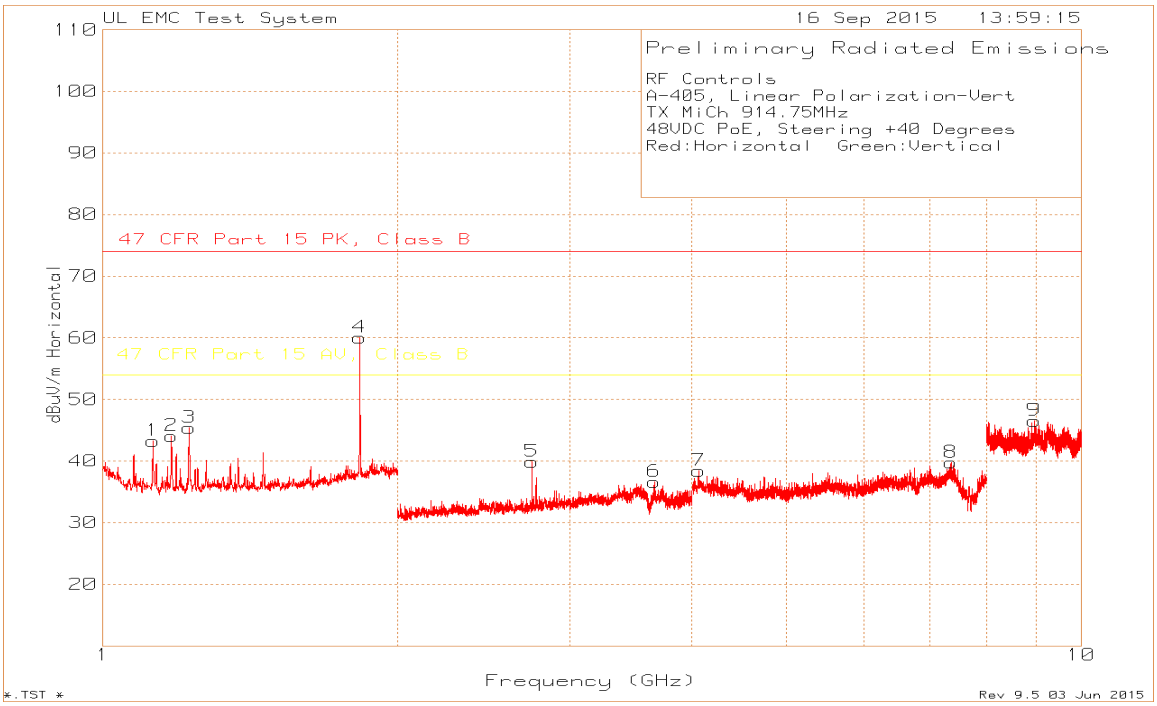
Radiated Emission Data

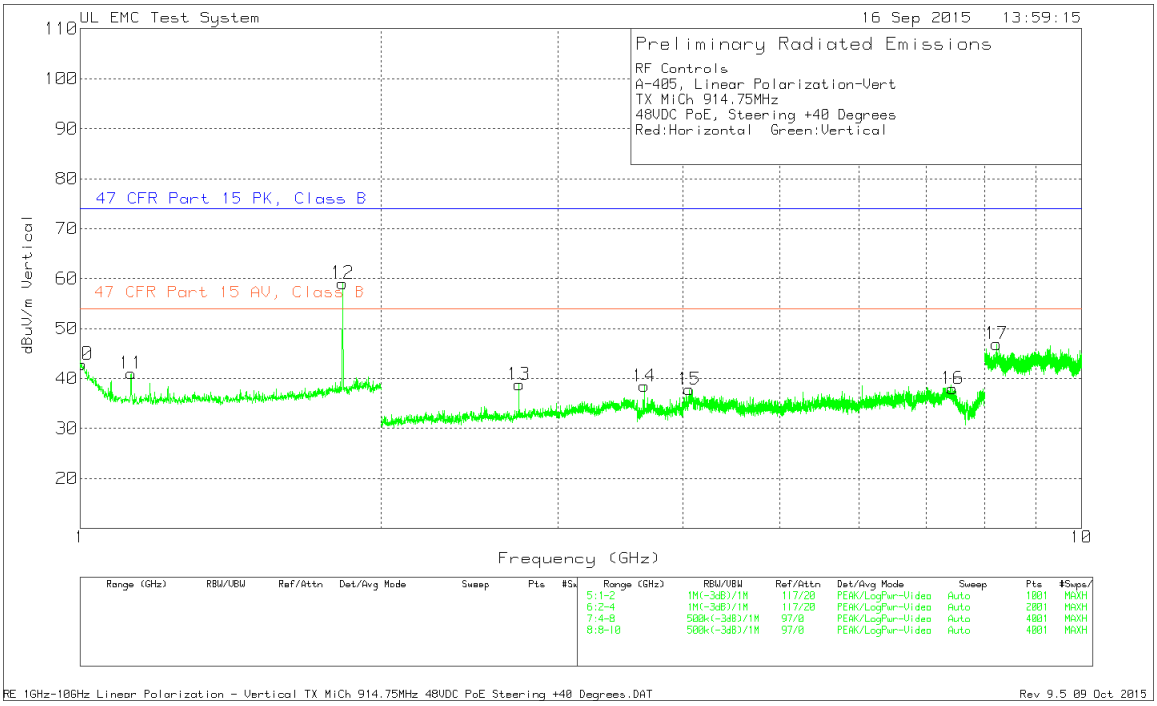
	Test Frequency (GHz)	Meter Reading (dBuV)	Detector	Path Factor dB	Band Reject Filter dB	Path Factor dB	Level dBuV/m	Limit 47 CFR Part 15 PK, Class B dBuV/m	Margin (dB)	Limit 47 CFR Part 15 AV, Class B dBuV/m	Margin (dB)	Azimuth [Degs]	Height [cm]	Polarity
	1.8295	86.25	Pk	27.1	0.4	-54.06	59.69	74	-14.31	-	-	136	118	H
	1.8295	82.08	Av	27.1	0.4	-54.06	55.52	74	-18.48	-	-	136	118	H
	1.8296	87.23	Pk	27.1	0.4	-54.06	60.67	74	-13.33	-	-	196	142	V
	1.8295	82.81	Av	27.1	0.4	-54.06	56.25	74	-17.75	-	-	196	142	V

Pk - Peak detector
Av - Average detection

*** 1800 MHz not in restricted band.**

Middle Channel +40°Prescan Plot





Middle Channel +40° Data

RF Controls
A-405, Linear Polarization-Vert
TX MiCh 914.75MHz
48VDC PoE, Steering +40 Degrees
Red:Horizontal Green:Vertical
Trace Markers

Marker No.	Test Frequency (GHz)	Meter Reading (dBuV)	Detector	Path Factor dB	Band Reject Filter dB	Path Factor dB	Level dBuV/m	Limit 47 CFR Part 15 PK, Class B dBuV/m	Margin (dB)	Limit 47 CFR Part 15 AV, Class B dBuV/m	Margin (dB)	Azimuth [Degs]	Height [cm]	Polarity
1	1.125	74.19	Pk	25	0.5	-56.39	43.3	74	-30.7	54	-10.7	0-360	100	H
2	1.175	74.85	Pk	25.1	0.4	-56.26	44.09	74	-29.91	54	-9.91	0-360	100	H
3	1.225	76.02	Pk	25.2	0.4	-56.2	45.42	74	-28.58	54	-8.58	0-360	100	H
4	1.83	86.6	Pk	27.1	0.4	-54.06	60.04	74	-13.96	-	-	0-360	100	H
5	2.744	69.08	Pk	22.1	N/A	-51.27	39.91	74	-34.09	54	-14.09	0-360	100	H
6	3.66	62.89	Pk	23.4	N/A	-49.64	36.65	74	-37.35	54	-17.35	0-360	100	H
7	4.064	61	Pk	28.4	N/A	-50.94	38.46	74	-35.54	54	-15.54	0-360	100	H
8	7.359	55.13	Pk	30.9	N/A	-46.29	39.74	74	-34.26	54	-14.26	0-360	100	H
9	8.9495	58.44	Pk	36.1	N/A	-47.97	46.57	74	-27.43	54	-7.43	0-360	100	H
10	1.004	74.33	Pk	23.9	1.1	-56.49	42.84	74	-31.16	54	-11.16	0-360	100	V
11	1.125	71.92	Pk	25	0.5	-56.39	41.03	74	-32.97	54	-12.97	0-360	100	V
12	1.83	85.59	Pk	27.1	0.4	-54.06	59.03	74	-14.97	-	-	0-360	100	V
13	2.744	67.97	Pk	22.1	N/A	-51.27	38.8	74	-35.2	54	-15.2	0-360	100	V
14	3.659	64.76	Pk	23.4	N/A	-49.66	38.5	74	-35.5	54	-15.5	0-360	100	V
15	4.058	60.38	Pk	28.4	N/A	-50.95	37.83	74	-36.17	54	-16.17	0-360	100	V
16	7.434	53.92	Pk	30.7	N/A	-46.65	37.97	74	-36.03	54	-16.03	0-360	100	V
17	8.2245	57.55	Pk	36.4	N/A	-47.06	46.89	74	-27.11	54	-7.11	0-360	100	V

Pk - Peak detector

Radiated Emission Data

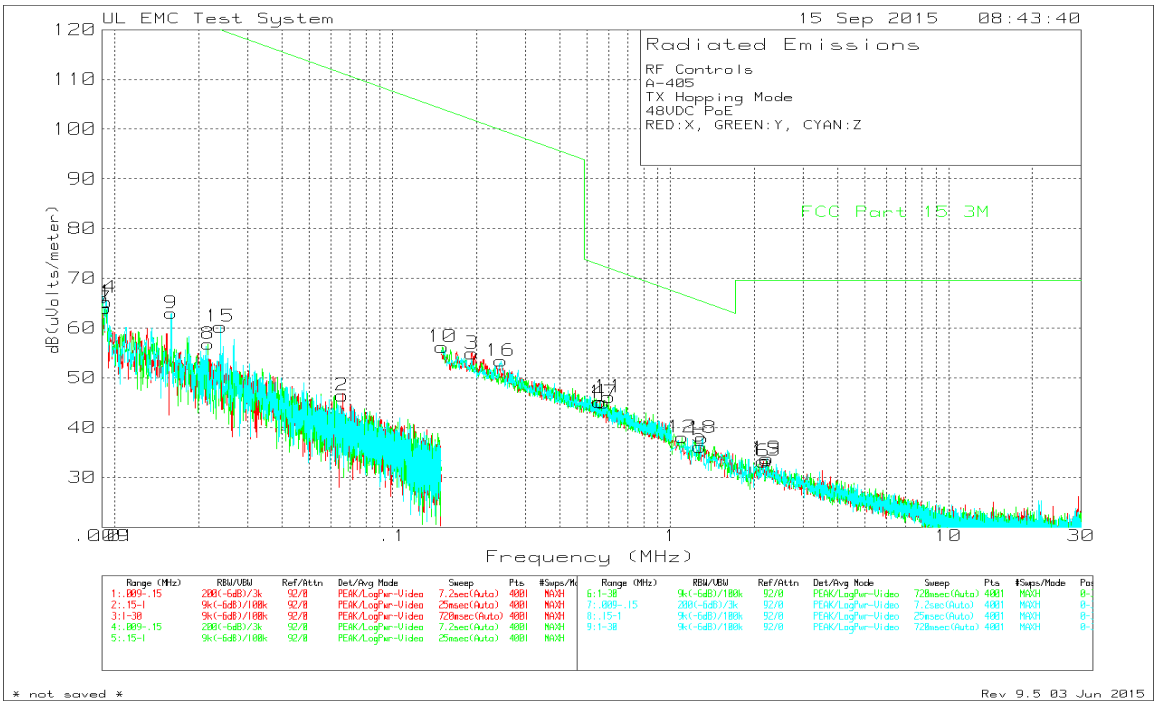
Test Frequency (GHz)	Meter Reading (dBuV)	Detector	Path Factor dB	Band Reject Filter dB	Path Factor dB	Level dBuV/m	Limit 47 CFR Part 15 PK, Class B dBuV/m	Margin (dB)	Limit 47 CFR Part 15 AV, Class B dBuV/m	Margin (dB)	Azimuth [Degs]	Height [cm]	Polarity
1.8295	87.4	Pk	27.1	0.4	-54.06	60.84	74	-13.16	-	-	229	108	H
1.8295	82.99	Av	27.1	0.4	-54.06	56.43	74	-17.57	-	-	229	108	H
1.8294	86.02	Pk	27.1	0.4	-54.06	59.46	74	-14.54	-	-	173	142	V
1.8295	81.48	Av	27.1	0.4	-54.06	54.92	74	-19.08	-	-	173	142	V

Pk - Peak detector
Av - Average detection

*** 1800 MHz not in restricted band.**

8.3. RADIATED EMISSIONS BELOW 1 GHz

9kHz – 30MHz TX Hopping Mode Scan



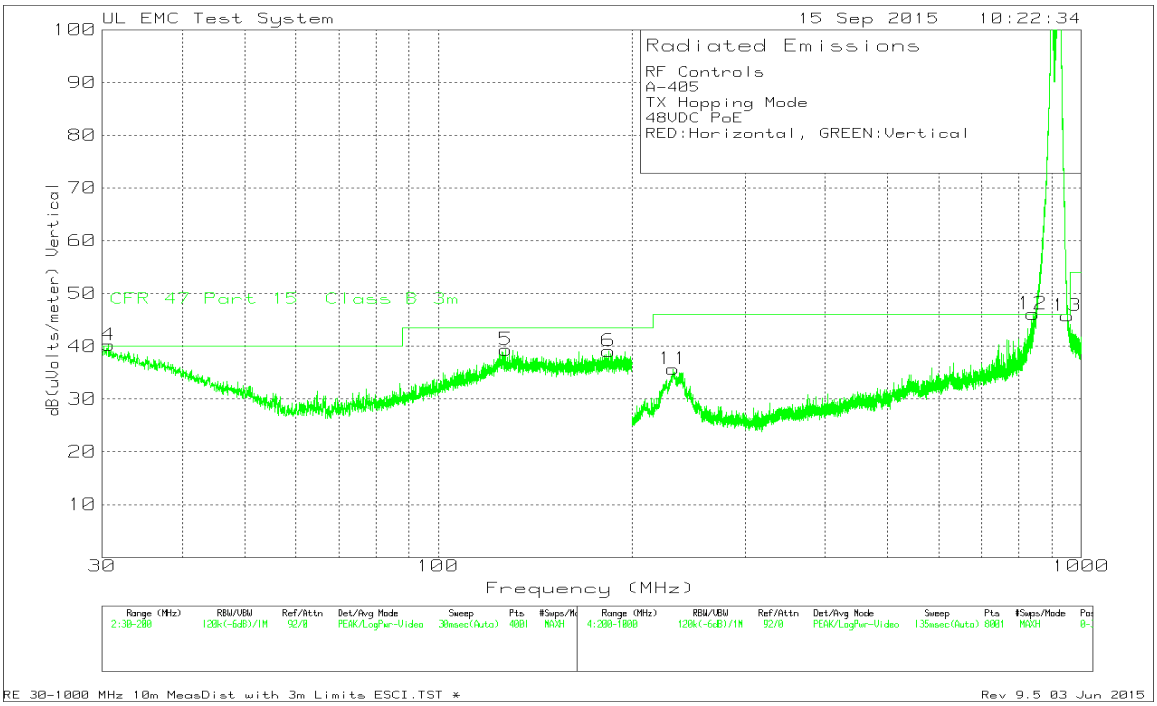
9kHz – 30MHz TX Hopping Mode Data

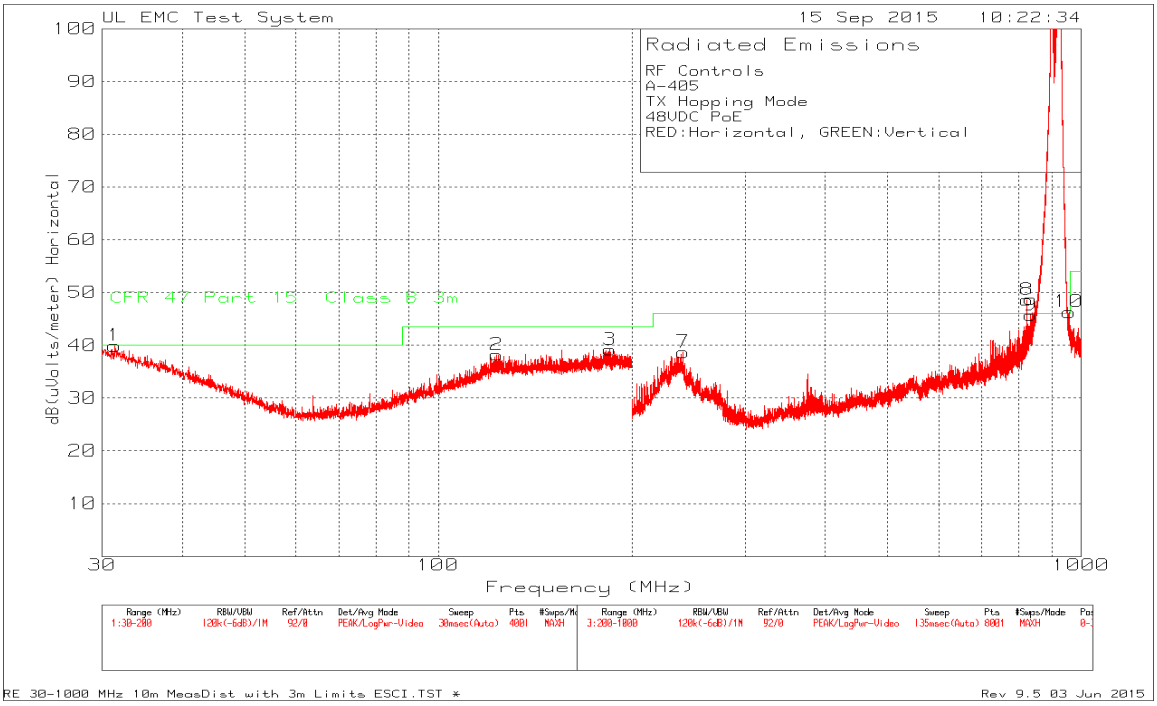
RF Controls
A-405
TX Hopping Mode
48VDC PoE
RED:X, GREEN:Y, CYAN:Z
Trace Markers

Marker No.	Test Frequency (MHz)	Meter Reading (dBuV)	Detector	Antenna Factor dB/m	Path Factor dB	Level dBuV/m	Limit FCC 15.109 dBuV/m	Margin (dB)	Azimuth [Degs]
1	0.009315	43.18	Pk	22	0	65.18	128.2	-63.02	0-360
2	0.06591	33.36	Pk	13.1	0	46.46	111.22	-64.76	0-360
3	0.19324	42.89	Pk	12	0	54.89	101.88	-46.99	0-360
4	0.55577	33.17	Pk	12	0	45.17	72.71	-27.54	0-360
5	1.2755	23.56	Pk	12.5	0.1	36.16	65.49	-29.33	0-360
6	2.15275	20.81	Pk	12.3	0.1	33.21	69.54	-36.33	0-360
7	0.009245	41.92	Pk	22.1	0	64.02	128.27	-64.25	0-360
8	0.02167	40.22	Pk	16.6	0	56.82	120.87	-64.05	0-360
10	0.15085	43.98	Pk	12.2	0	56.18	104.03	-47.85	0-360
11	0.599	34.12	Pk	12	0	46.12	72.06	-25.94	0-360
12	1.1015	25.33	Pk	12.6	0.1	38.03	66.76	-28.73	0-360
13	2.21075	21.06	Pk	12.2	0.1	33.36	69.54	-36.18	0-360
9	0.015965	44.52	Pk	18.5	0	63.02	123.52	-60.5	0-360
14	0.009035	43.72	Pk	22.4	0	66.12	128.47	-62.35	0-360
15	0.024015	43.86	Pk	16.4	0	60.26	119.98	-59.72	0-360
16	0.24521	41.42	Pk	12	0	53.42	99.81	-46.39	0-360
17	0.5727	33.02	Pk	12	0	45.02	72.45	-27.43	0-360
18	1.29725	25.29	Pk	12.5	0.1	37.89	65.34	-27.45	0-360
19	2.218	21.49	Pk	12.2	0.1	33.79	69.54	-35.75	0-360

Pk - Peak detector

30MHz – 1GHz TX Hopping Mode, Scan





30MHz – 1GHz TX Hopping Mode, Data

RF Controls
A-405
TX Hopping Mode
48VDC PoE
RED:Horizontal, GREEN:Vertical
Trace Markers

Marker No.	Test Frequency (MHz)	Meter Reading (dBuV)	Detector	Antenna Factor dB/m	Path Factor dB	10m to 3m Factor dB	Addiontal Attenuator dB	Level dBuV/m	CFR 47 Part 15 Class B 3m	Margin (dB)	Azimuth [Degs]	Height [cm]	Polarity
1	31.4025	32.01	Pk	17.6	-30.2	10.5	10	39.91	-	-	0-360	102	H
2	123.2875	33.5	Pk	14	-29.8	10.5	10	38.2	43.52	-5.32	0-360	398	H
3	184.9125	31.87	Pk	16	-29.2	10.5	10	39.17	-	-	0-360	249	H
4	30.7225	32.04	Pk	17.9	-30.2	10.5	10	40.24	-	-	0-360	251	V
5	127.3675	34.43	Pk	14.3	-29.9	10.5	10	39.33	43.52	-4.19	0-360	102	V
6	184.02	31.72	Pk	16.1	-29.2	10.5	10	39.12	-	-	0-360	102	V
7	240.5	45.55	Pk	11.4	-28.9	10.5	0.1	38.65	46.02	-7.37	0-360	299	H
8	823.3	40.2	Pk	22.6	-26.9	10.5	2.2	48.6	-	-	0-360	101	H
9	834.2	35.3	Pk	22.6	-26.8	10.5	4.1	45.7	-	-	0-360	101	H
10	957.7	33.6	Pk	23.5	-25.6	10.5	4.3	46.3	-	-	0-360	199	H
11	231.9	43.1	Pk	11	-29	10.5	0.1	35.7	-	-	0-360	103	V
12	841.3	33.33	Pk	22.5	-26.6	10.5	6.4	46.13	-	-	0-360	103	V
13	951.8	30.19	Pk	23.1	-26.6	10.5	8.6	45.79	-	-	0-360	302	V

Pk - Peak detector

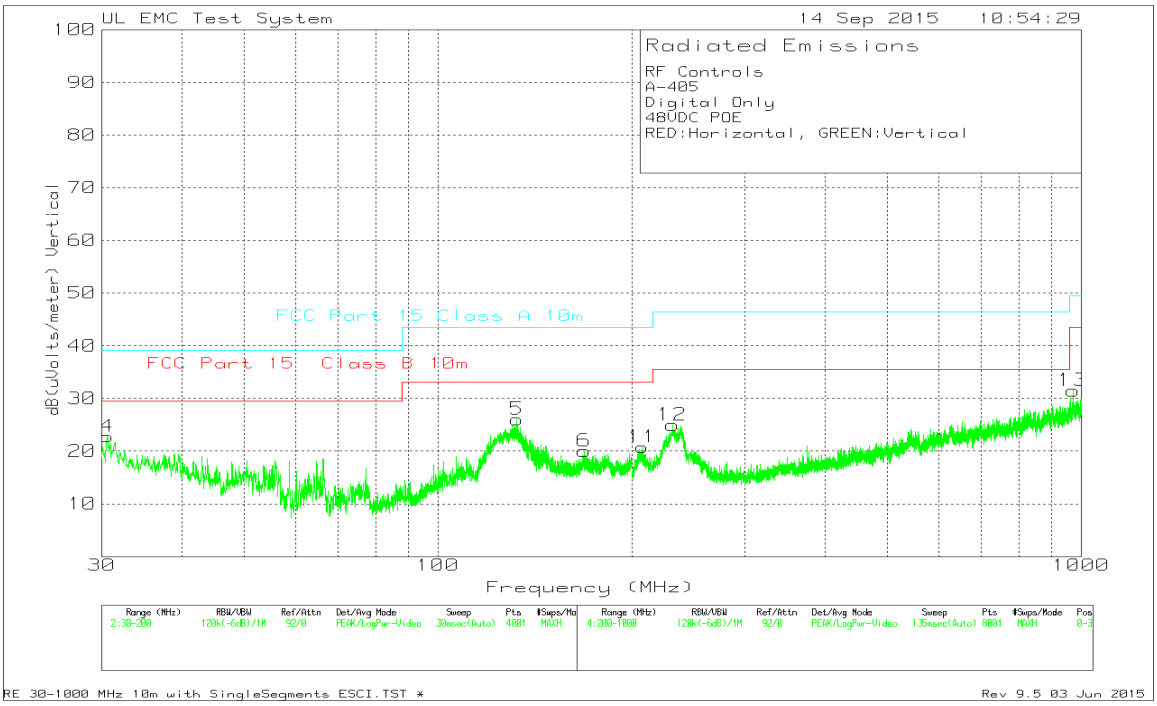
Radiated Emission Data

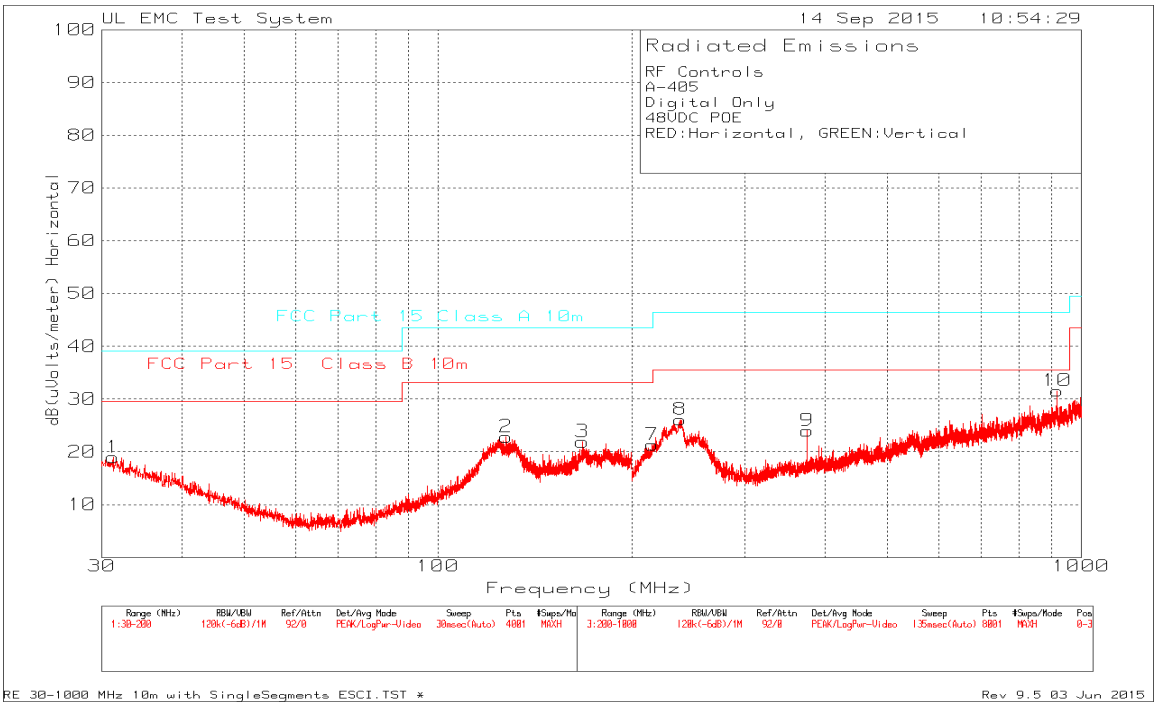
	Test Frequency (MHz)	Meter Reading (dBuV)	Detector	Antenna Factor dB/m	Path Factor dB	10m to 3m Factor dB	Addiontal Attenuator dB	Level dBuV/m	CFR 47 Part 15 Class B 3m	Margin (dB)	Azimuth [Degs]	Height [cm]	Polarity
	30.0916	25.86	Qp	18.2	-30.2	10.5	10	34.36	40	-5.64	265	309	H
	30.680006	26.66	Qp	17.9	-30.2	10.5	10	34.86	40	-5.14	261	104	V
	822.7165	35.74	Qp	22.6	-26.9	10.5	2.2	44.14	46.02	-1.88	198	271	H

Qp - Quasi-Peak detector

8.4. DIGITAL DEVICE BELOW 1 GHz

SPURIOUS EMISSIONS 30 TO 1000 MHz Scan (DIGITAL DEVICE,10Mbps)

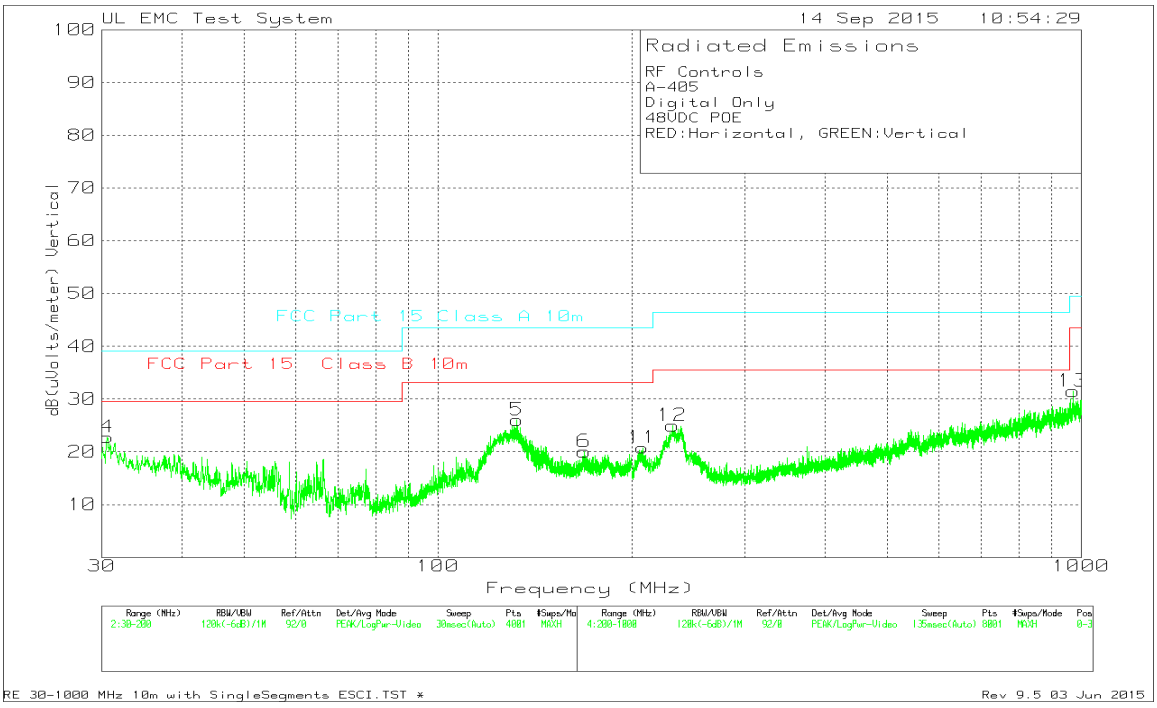


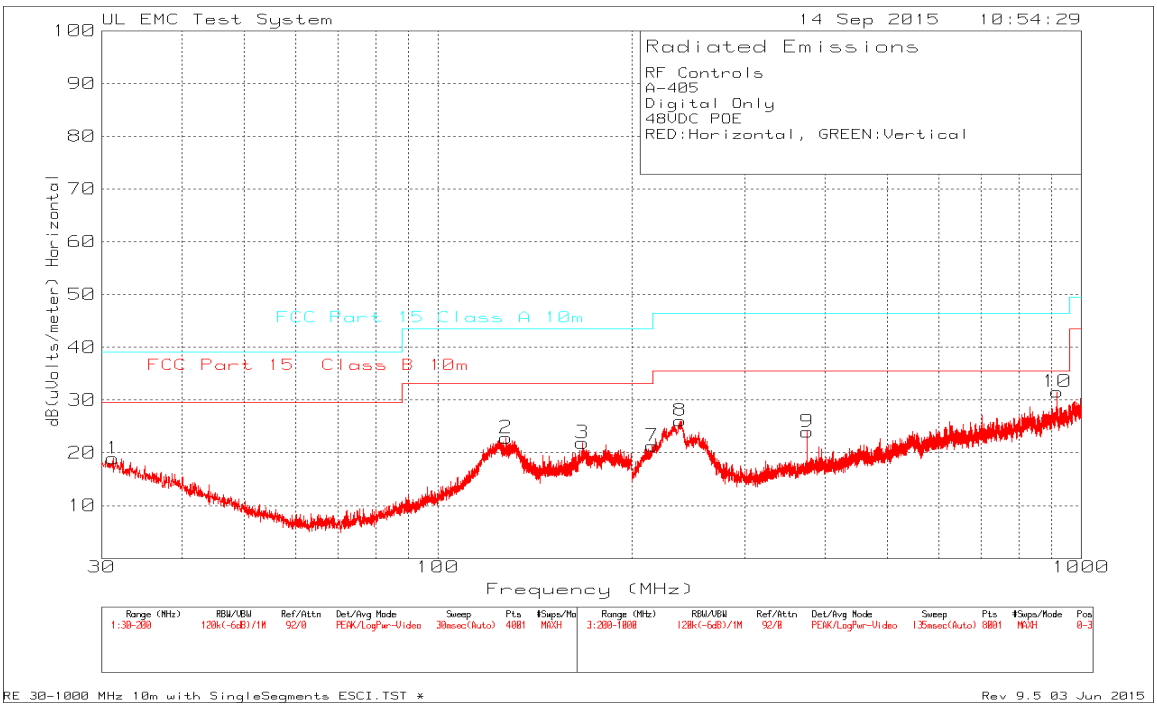


SPURIOUS EMISSIONS 30 TO 1000 MHz Data (DIGITAL DEVICE,10Mbps)

RF Controls													
A-405													
Digital Only 10Mbps													
48VDC POE													
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	Limit FCC Part 15 Class A 10m dBuV/m	Margin (dB)	Limit FCC Part 15 Class B 10m dBuV/m	Margin (dB)	Azimuth [Degs]	Height [cm]	Polarity
1	30.1275	31.16	Pk	18.2	-30.2	19.16	39.08	-19.92	29.55	-10.39	0-360	101	H
2	123.16	39.54	Pk	13.9	-29.8	23.64	43.52	-19.88	33.07	-9.43	0-360	398	H
3	169.91	35.54	Pk	15.5	-29.5	21.54	43.52	-21.98	33.07	-11.53	0-360	248	H
4	30.3825	32.26	Pk	18.1	-30.2	20.16	39.08	-18.92	29.55	-9.39	0-360	251	V
5	125.2425	40.36	Pk	14.1	-29.8	24.66	43.52	-18.86	33.07	-8.41	0-360	101	V
6	132.8075	39.68	Pk	14.6	-29.8	24.48	43.52	-19.04	33.07	-8.59	0-360	101	V
7	145.3875	36.81	Pk	15.1	-29.7	22.21	43.52	-21.31	33.07	-10.86	0-360	101	V
8	213.1	39.39	Pk	11	-29.1	21.29	43.52	-22.23	33.07	-11.78	0-360	299	H
9	238.7	44.13	Pk	11.3	-28.8	26.63	46.44	-19.81	35.57	-8.94	0-360	299	H
10	375	36.77	Pk	15.1	-28	23.87	46.44	-22.57	35.57	-11.7	0-360	199	H
11	918	34.43	Pk	22.9	-26.4	30.93	46.44	-15.51	35.57	-4.64	0-360	102	H
12	209.5	37.76	Pk	11.1	-29	19.86	43.52	-23.66	33.07	-13.21	0-360	103	V
13	232.8	42.23	Pk	11.1	-29	24.33	46.44	-22.11	35.57	-11.24	0-360	399	V
14	961.3	32.62	Pk	23.5	-25.9	30.22	49.54	-19.32	43.52	-13.3	0-360	302	V
Pk - Peak detector													
Radiated Emission Data													
	Test Frequency (MHz)	Meter Reading (dBuV)	Detector	Antenna Factor dB/m	Path Factor dB	Level dBuV/m	Limit FCC Part 15 Class A 10m dBuV/m	Margin (dB)	Limit FCC Part 15 Class B 10m dBuV/m	Margin (dB)	Azimuth [Degs]	Height [cm]	Polarity
	917.9696	35.32	Qp	22.9	-26.4	31.82	46.44	-14.62	35.57	-3.75	137	233	H
Qp - Quasi-Peak detector													

SPURIOUS EMISSIONS 30 TO 1000 MHz Scan (DIGITAL DEVICE,100Mbps)





SPURIOUS EMISSIONS 30 TO 1000 MHz Data (DIGITAL DEVICE,100Mbps)

RF Controls													
A-405													
Digital Only													
48VDC POE													
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	Limit FCC Part 15 Class A 10m dBuV/m	Margin (dB)	Limit FCC Part 15 Class B 10m dBuV/m	Margin (dB)	Azimuth [Degs]	Height [cm]	Polarity
1	31.2325	31.44	Pk	17.7	-30.2	18.94	39.08	-20.14	29.55	-10.61	0-360	251	H
2	127.6225	38.33	Pk	14.4	-29.9	22.83	43.52	-20.69	33.07	-10.24	0-360	398	H
3	167.6575	35.89	Pk	15.5	-29.5	21.89	43.52	-21.63	33.07	-11.18	0-360	251	H
4	30.595	35.06	Pk	17.9	-30.2	22.76	39.08	-16.32	29.55	-6.79	0-360	249	V
5	132.68	41.23	Pk	14.6	-29.8	26.03	43.52	-17.49	33.07	-7.04	0-360	102	V
6	168.8475	34.12	Pk	15.5	-29.6	20.02	43.52	-23.5	33.07	-13.05	0-360	102	V
7	215.3	39.43	Pk	11	-29.1	21.33	43.52	-22.19	33.07	-11.74	0-360	299	H
8	238.1	43.6	Pk	11.3	-28.8	26.1	46.44	-20.34	35.57	-9.47	0-360	299	H
9	375	36.89	Pk	15.1	-28	23.99	46.44	-22.45	35.57	-11.58	0-360	199	H
10	918	35.06	Pk	22.9	-26.4	31.56	46.44	-14.88	35.57	-4.01	0-360	199	H
11	207.9	38.58	Pk	11.2	-29	20.78	43.52	-22.74	33.07	-12.29	0-360	103	V
12	231.4	42.94	Pk	11	-29	24.94	46.44	-21.5	35.57	-10.63	0-360	399	V
13	970.9	32.58	Pk	24	-25.1	31.48	49.54	-18.06	43.52	-12.04	0-360	299	V
Pk - Peak detector													
Radiated Emission Data													
	Test Frequency (MHz)	Meter Reading (dBuV)	Detector	Antenna Factor dB/m	Path Factor dB	Level dBuV/m	Limit FCC Part 15 Class A 10m dBuV/m	Margin (dB)	Limit FCC Part 15 Class B 10m dBuV/m	Margin (dB)	Azimuth [Degs]	Height [cm]	Polarity
	917.9823	35.5	Qp	22.9	-26.4	32	46.44	-14.44	35.57	-3.57	137	238	H
Qp - Quasi-Peak detector													

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 C63.10.

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

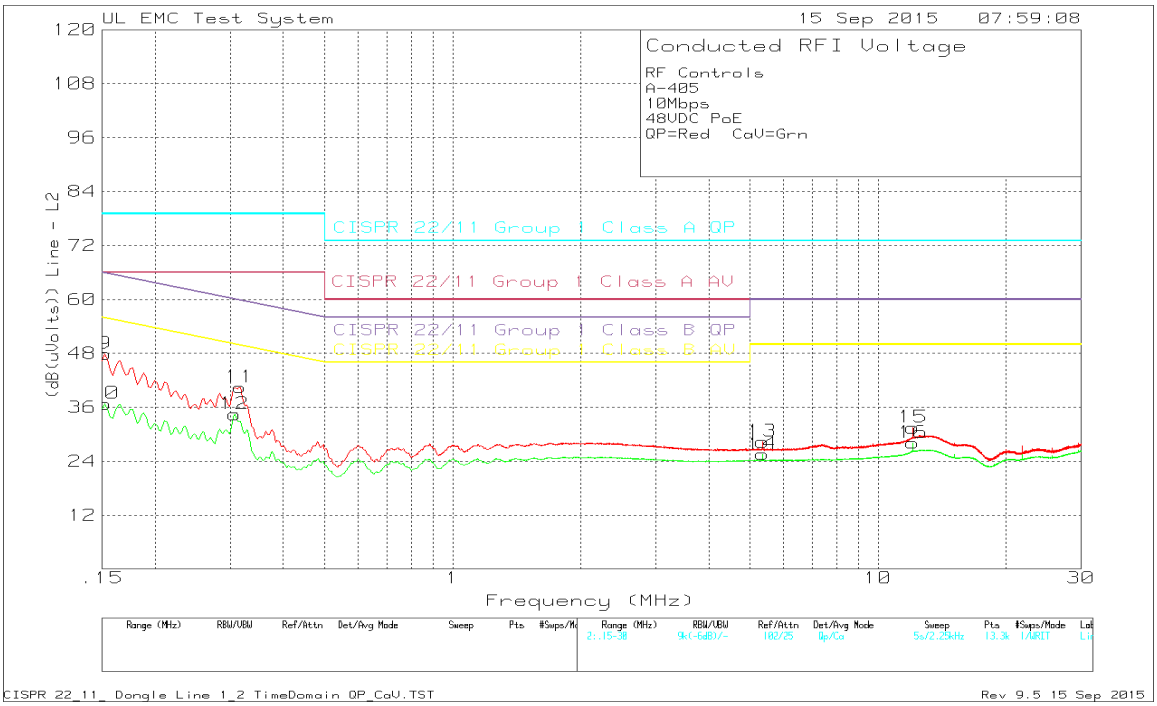
Line conducted data is recorded for both NEUTRAL and HOT lines.

RESULTS

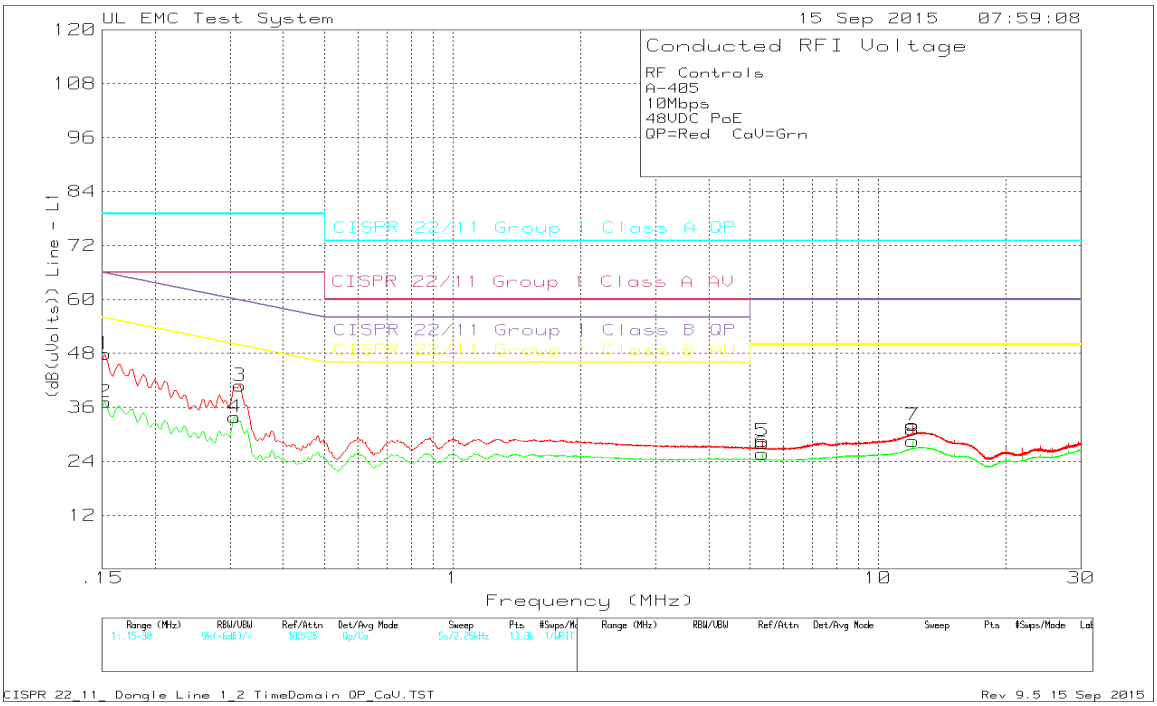
Compliant

Line Conducted Emissions Scans, 10Mbps

Neutral



Line



Line Conducted Emissions Data, 10Mbps

RF Controls
A-405
10Mbps
48VDC PoE
QP=Red CaV=Grn

Trace Markers

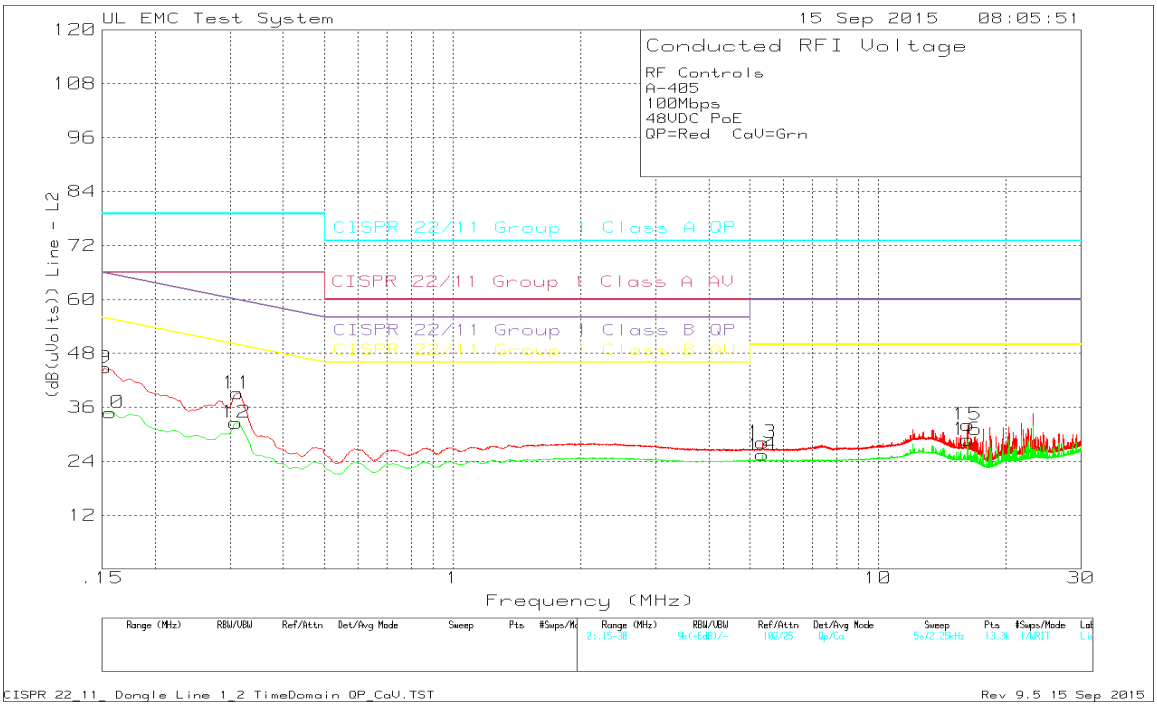
No.	Test Frequency (MHz)	Meter Reading	Transducer Factor (dB)	Gain/Loss Factor (dB)	Corrected Reading (dB(uVolts))	Limit:1	2	3	4	5	6
Line											
1	.15225	35.04dBuV Qp	.1	12.7	47.84	79	-	65.88	-	-	-
					Margin (dB)	-31.16	-	-18.04	-	-	-
2	.15225	24.4dBuV Ca	.1	12.7	37.2	-	66	-	55.88	-	-
					Margin (dB)	-	-28.8	-	-18.68	-	-
3	.3165	29.92dBuV Qp	.1	10.8	40.82	79	-	59.8	-	-	-
					Margin (dB)	-38.18	-	-18.98	-	-	-
4	.3075	22.92dBuV Ca	.1	10.8	33.82	-	66	-	50.04	-	-
					Margin (dB)	-	-32.18	-	-16.22	-	-
5	5.3475	17.6dBuV Qp	.1	10.8	28.5	73	-	60	-	-	-
					Margin (dB)	-44.5	-	-31.5	-	-	-
6	5.3475	14.77dBuV Ca	.1	10.8	25.67	-	60	-	50	-	-
					Margin (dB)	-	-34.33	-	-24.33	-	-
7	12.05925	20.33dBuV Qp	.7	11	32.03	73	-	60	-	-	-
					Margin (dB)	-40.97	-	-27.97	-	-	-
8	12.05925	16.83dBuV Ca	.7	11	28.53	-	60	-	50	-	-
					Margin (dB)	-	-31.47	-	-21.47	-	-
Neutral											
9	.15225	35dBuV Qp	.1	12.8	47.9	79	-	65.88	-	-	-
					Margin (dB)	-31.1	-	-17.98	-	-	-
10	.15225	23.9dBuV Ca	.1	12.8	36.8	-	66	-	55.88	-	-
					Margin (dB)	-	-29.2	-	-19.08	-	-
11	.3165	29.47dBuV Qp	.1	10.9	40.47	79	-	59.8	-	-	-
					Margin (dB)	-38.53	-	-19.33	-	-	-
12	.3075	23.44dBuV Ca	.1	10.9	34.44	-	66	-	50.04	-	-
					Margin (dB)	-	-31.56	-	-15.6	-	-
13	5.3475	17.38dBuV Qp	.1	10.9	28.38	73	-	60	-	-	-
					Margin (dB)	-44.62	-	-31.62	-	-	-
14	5.3475	14.6dBuV Ca	.1	10.9	25.6	-	60	-	50	-	-
					Margin (dB)	-	-34.4	-	-24.4	-	-
15	12.05925	19.29dBuV Qp	1	11.2	31.49	73	-	60	-	-	-
					Margin (dB)	-41.51	-	-28.51	-	-	-
16	12.05925	15.9dBuV Ca	1	11.2	28.1	-	60	-	50	-	-
					Margin (dB)	-	-31.9	-	-21.9	-	-

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

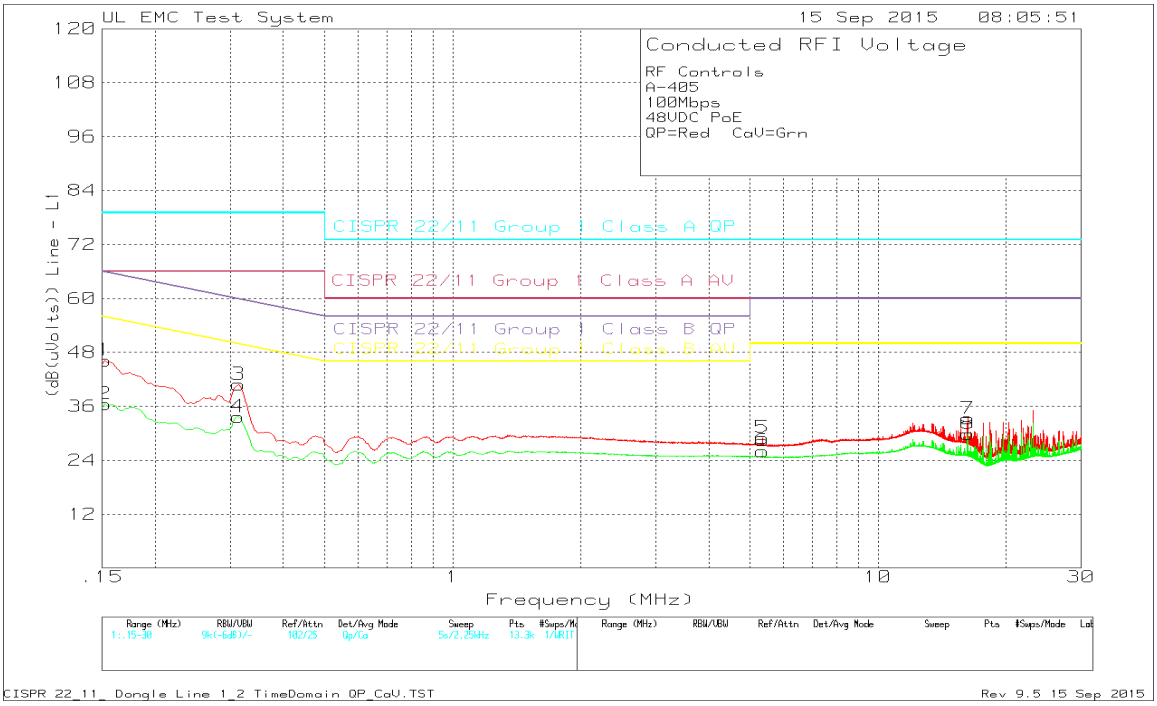
Qp - Quasi-Peak detector
RMS - RMS detection

Line Conducted Emissions Scans 100Mbps

Neutral



Line



Line Conducted Emissions Data, 100Mbps

RF Controls
A-405
100Mbps
48VDC PoE
QP=Red CaV=Grn

Trace Markers

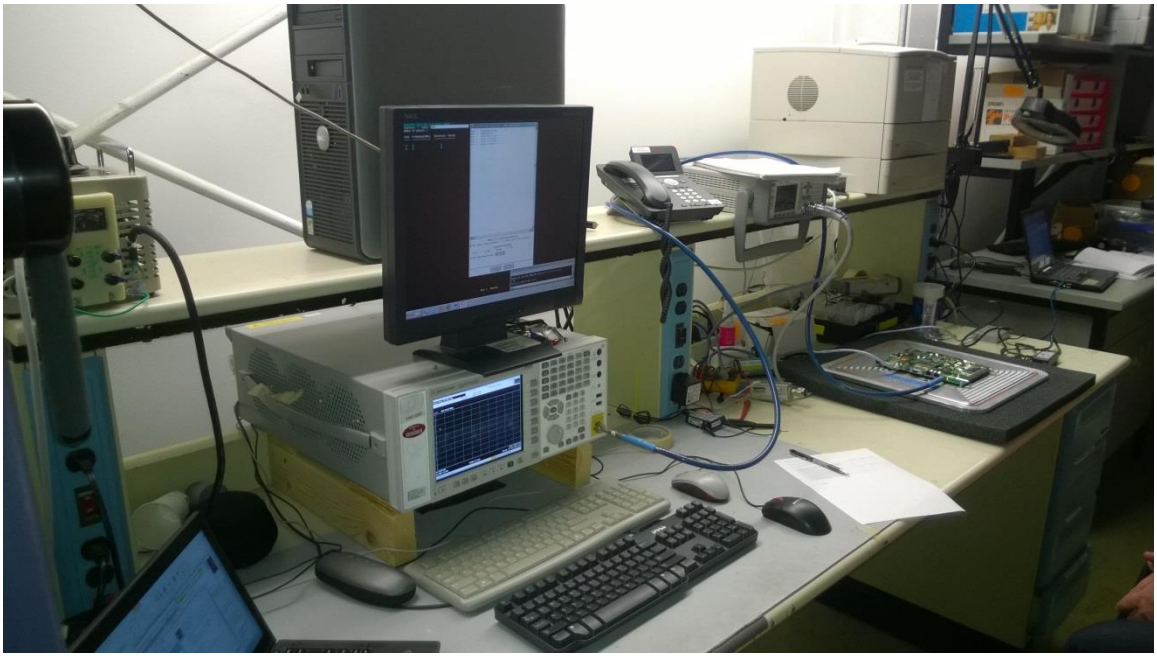
No.	Test Frequency (MHz)	Meter Reading	Transducer Factor (dB)	Gain/Loss Factor (dB)	Corrected Reading (dB(uVolts))	Limit:1	2	3	4	5	6
Line											
1	.15225	33.4dBuV Qp	.1	12.7	46.2	79	-	65.88	-	-	-
					Margin (dB)	-32.8	-	-19.68	-	-	-
2	.15225	23.68dBuV Ca	.1	12.7	36.48	-	66	-	55.88	-	-
					Margin (dB)	-	-29.52	-	-19.4	-	-
3	.31425	29.92dBuV Qp	.1	10.8	40.82	79	-	59.86	-	-	-
					Margin (dB)	-38.18	-	-19.04	-	-	-
4	.31312	22.74dBuV Ca	.1	10.8	33.64	-	66	-	49.89	-	-
					Margin (dB)	-	-32.36	-	-16.25	-	-
5	5.3475	18.07dBuV Qp	.1	10.8	28.97	73	-	60	-	-	-
					Margin (dB)	-44.03	-	-31.03	-	-	-
6	5.3475	15.14dBuV Ca	.1	10.8	26.04	-	60	-	50	-	-
					Margin (dB)	-	-33.96	-	-23.96	-	-
7	16.2285	21.49dBuV Qp	.6	11.2	33.29	73	-	60	-	-	-
					Margin (dB)	-39.71	-	-26.71	-	-	-
8	16.2285	18.05dBuV Ca	.6	11.2	29.85	-	60	-	50	-	-
					Margin (dB)	-	-30.15	-	-20.15	-	-
Neutral											
9	.15225	31.91dBuV Qp	.1	12.8	44.81	79	-	65.88	-	-	-
					Margin (dB)	-34.19	-	-21.07	-	-	-
10	.15675	22.04dBuV Ca	.1	12.7	34.84	-	66	-	55.63	-	-
					Margin (dB)	-	-31.16	-	-20.79	-	-
11	.312	28.1dBuV Qp	.1	10.9	39.1	79	-	59.92	-	-	-
					Margin (dB)	-39.9	-	-20.82	-	-	-
12	.30975	21.57dBuV Ca	.1	10.9	32.57	-	66	-	49.98	-	-
					Margin (dB)	-	-33.43	-	-17.41	-	-
13	5.3475	17.15dBuV Qp	.1	10.9	28.15	73	-	60	-	-	-
					Margin (dB)	-44.85	-	-31.85	-	-	-
14	5.3475	14.45dBuV Ca	.1	10.9	25.45	-	60	-	50	-	-
					Margin (dB)	-	-34.55	-	-24.55	-	-
15	16.2285	20.23dBuV Qp	.6	11.3	32.13	73	-	60	-	-	-
					Margin (dB)	-40.87	-	-27.87	-	-	-
16	16.2285	16.89dBuV Ca	.6	11.3	28.79	-	60	-	50	-	-
					Margin (dB)	-	-31.21	-	-21.21	-	-

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

Qp - Quasi-Peak detector
RMS - RMS detection

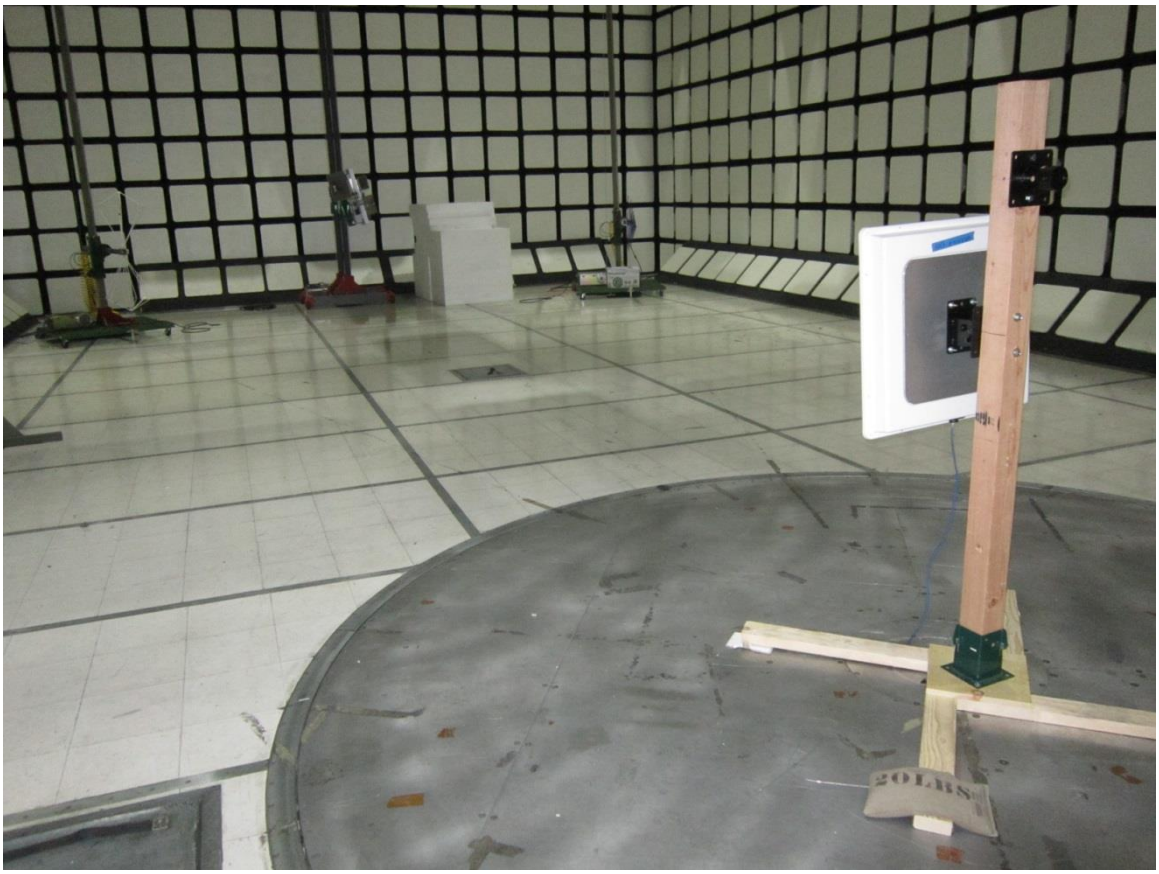
10. SETUP PHOTOS

Antenna Port Measurements

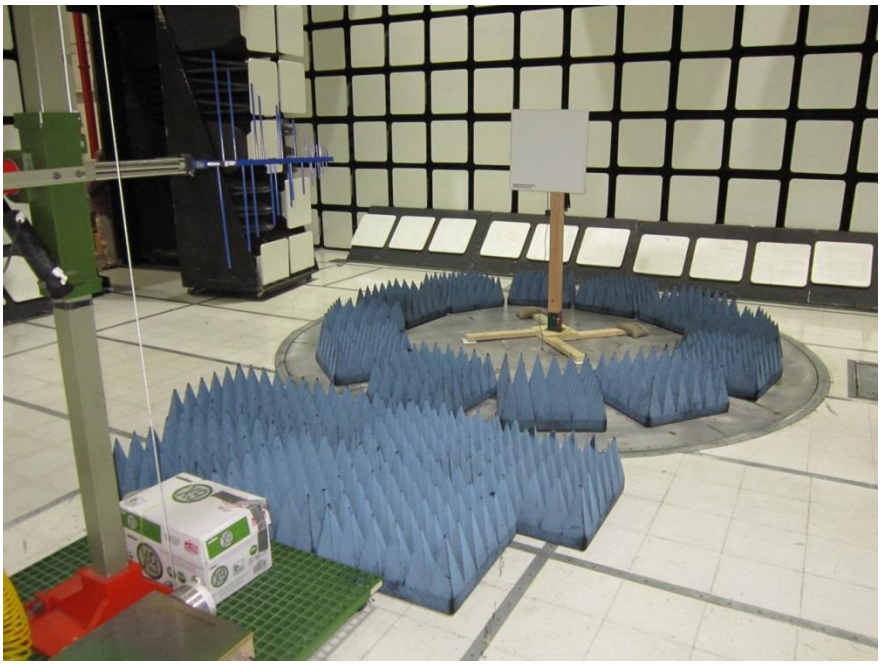


Radiated emissions 9kHz – 30MHz

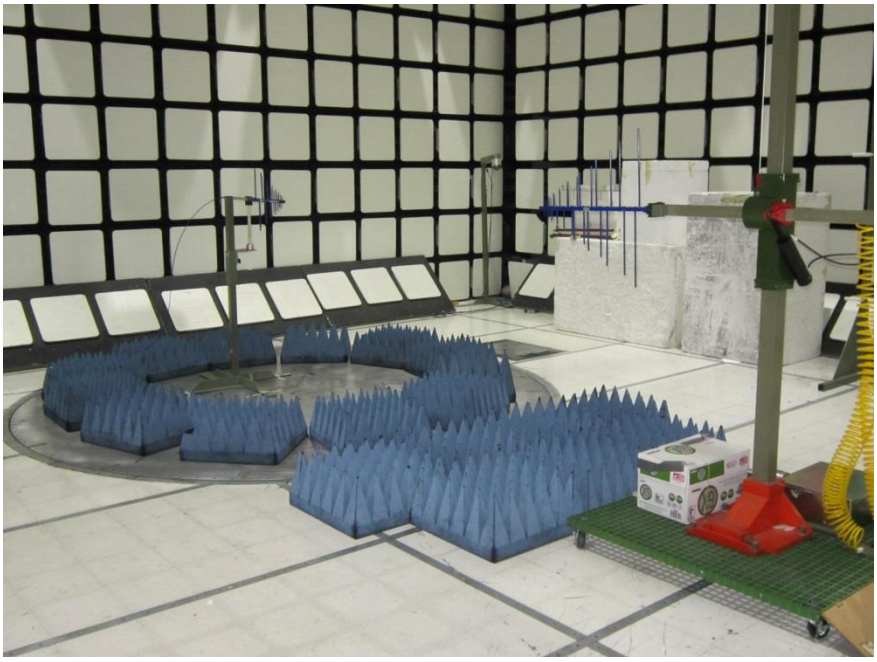
Radiated Emissions below 30MHz - 1GHz



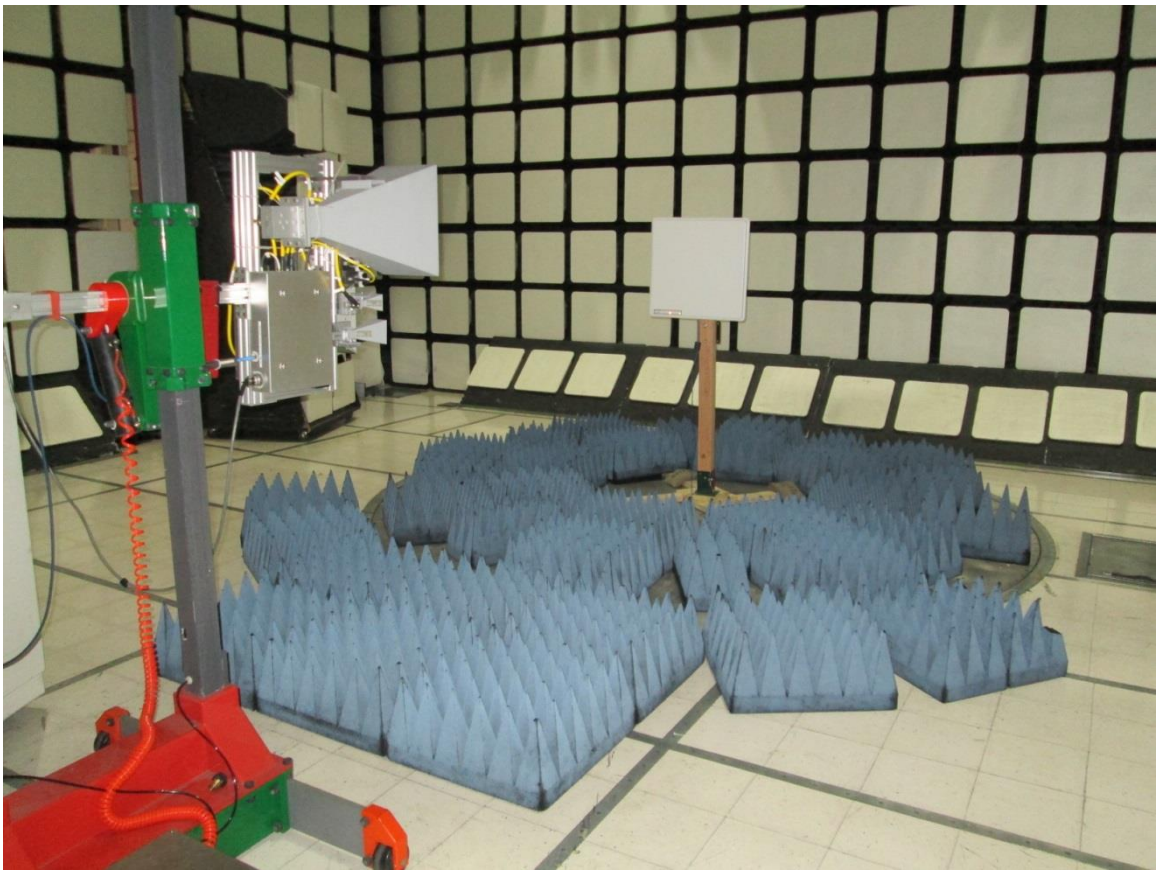
Antenna Gain Measurements



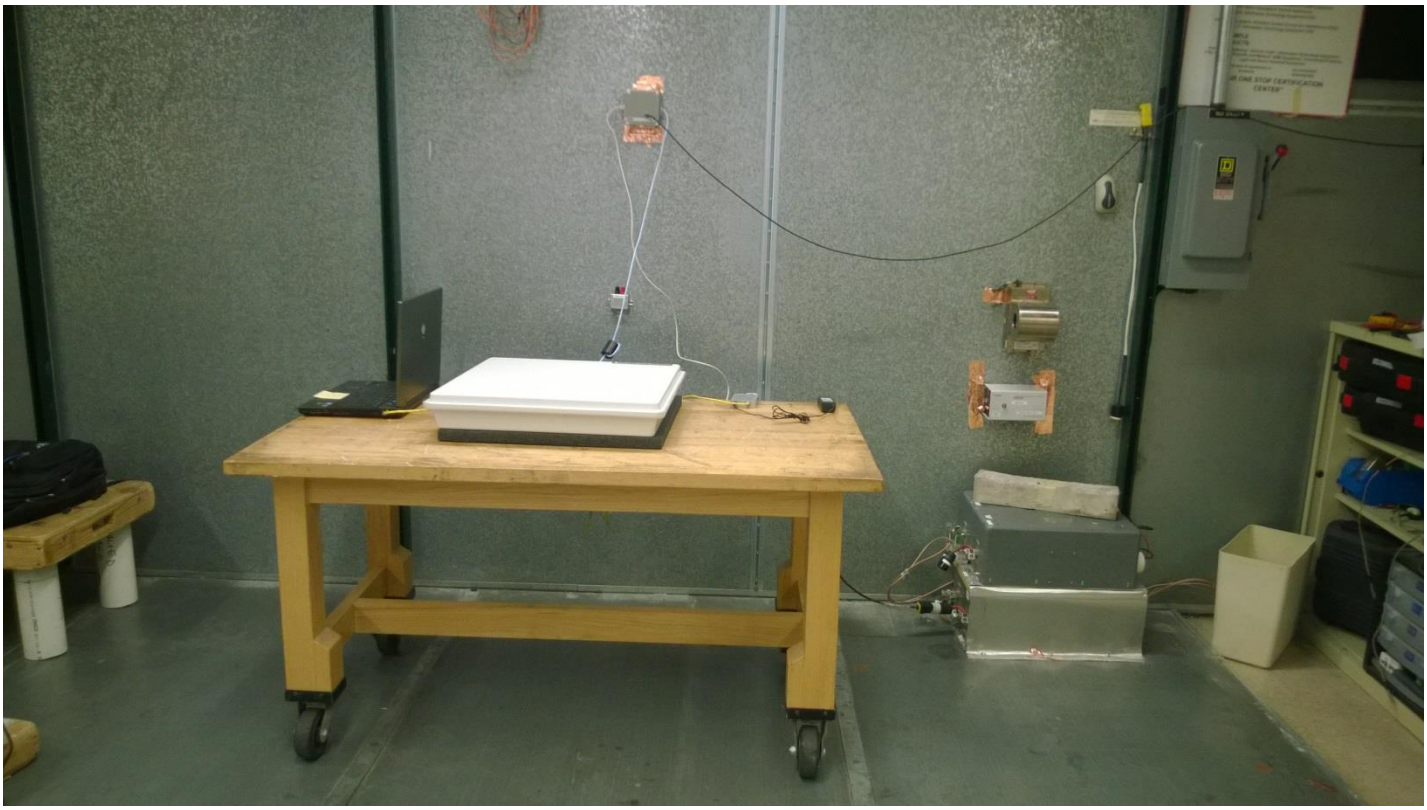
Antenna Gain Substitution Measurements



Radiated Emissions above 1GHz



Line Conducted Emissions



*Setup shown in the photo is for the EU Telecomuunication Port Conducted Emissions testing. For FCC the ISN was no in the circuit and the blue Ethernet line with the ferrite on was connected directly to the PoE adapter on the table.

END OF REPORT