



FCC 47 CFR PART 15 SUBPART C

CERTIFICATION TEST REPORT

FOR

RF ID Reader

MODEL NUMBER: HD5000

FCC ID: YGP5000-01

IC: 9610A-HD5000A

REPORT NUMBER: 10766018A

ISSUE DATE: 2015-OCT-09

Prepared for
CROWN EQUIPMENT CORP
407 W MONROE ST
NEW BREMEN, OH 45869
US

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Revision History

Rev.	Issue Date	Revisions	Revised By
--	2015-OCT-09	Initial Issue	BM

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: CROWN EQUIPMENT CORP
407 W MONROE ST
NEW BREMEN, OH 45869
US

EUT DESCRIPTION: RF ID Reader

MODEL: HD5000

SERIAL NUMBER: Non serialized

DATE TESTED: August 20, 2015 – September 21, 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 LLC By:



Michael Ferrer
EMC Engineer
UL LLC

Tested By:



Bart Mucha
EMC Engineer
UL LLC

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.4-2009, FCC CFR 47 Part 2, FCC CFR 47 Part 15

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 333 Pfingsten Road, Northbrook, IL 60062 USA.

UL NBK is accredited by NVLAP, Laboratory Code 100414-0.

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	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 with dual antennas. It is used to read tags built into a warehouse isles to allow for automation in steering warehouse forklift trucks.

The radio is manufactured by Crown Equipment.

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 Ant1	DSB	26.16	413.05
902 - 928MHz Ant2	DSB	27.50	562.34
	Total Power	29.89	975.39

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes two patch antennas. Each antenna has maximum gain of 4.5dBi.

5.4. SOFTWARE AND FIRMWARE

The firmware installed in the EUT during testing was 156190-900-02

The EUT driver software installed in the host support equipment during testing was Indy_Mac_Firmware_2.6.0.

The test utility software used during testing was RFID_PC_4.2.0.2

The software power setting was at 251.

5.5. WORST-CASE CONFIGURATION AND MODE

The EUT in normal use will be installed in single orientation with antennas pointing down. Radiated emissions measurements were conducted in simulated setup – see photos.

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
Laptop	HP	-	-	-
USB to CAN Adapter	phytools	-	-	-

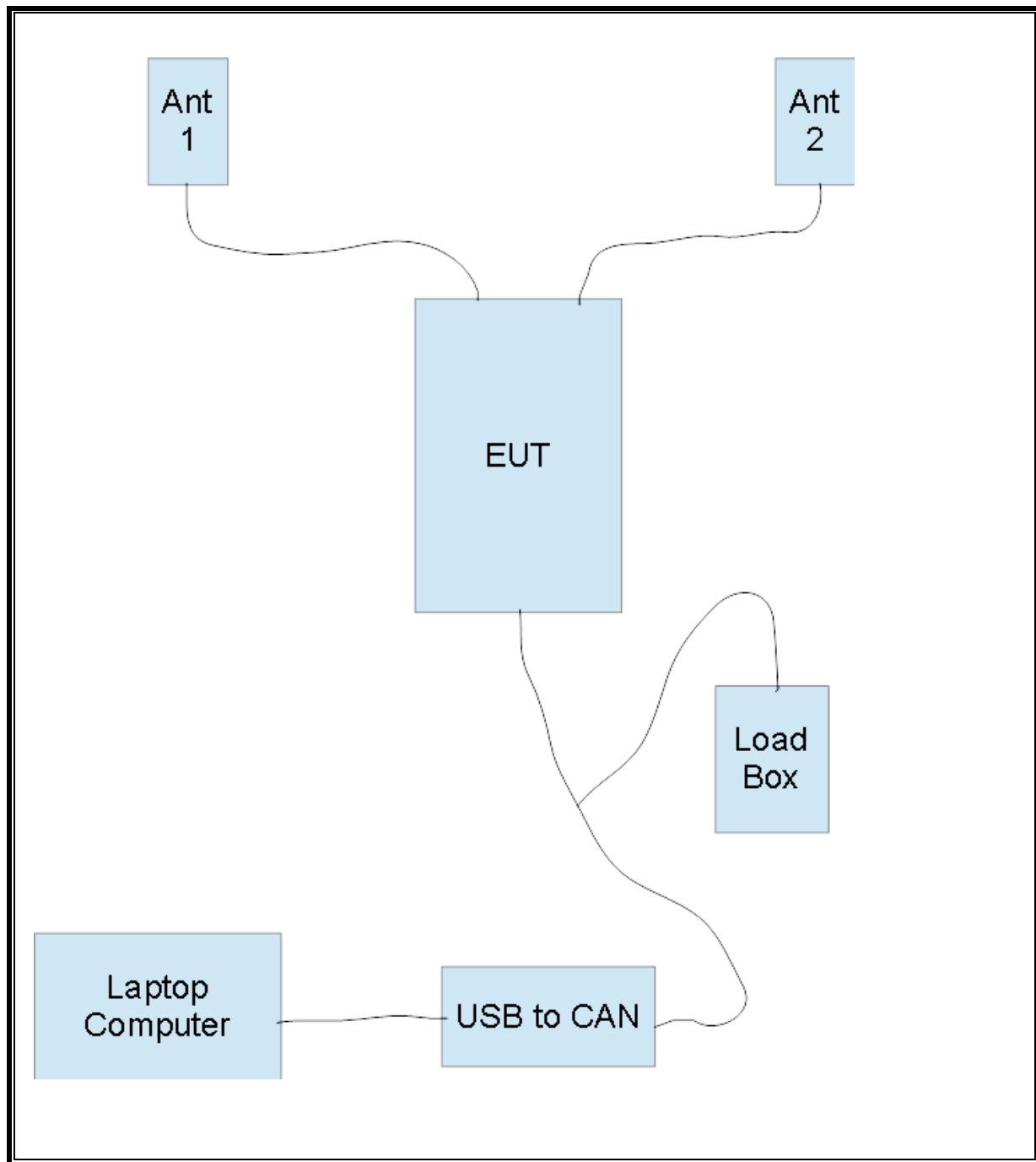
I/O CABLES

I/O Cable List						
Cable No	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	DC	1	custom	stranded	1m	part of harness, connected to 24VDC
2	CAN	1	custom	stranded	1m	part of harness, bundled with other cables
3	RF	2	SMA	50Ohm coax	0.5m	connected to antennas

TEST SETUP

The EUT is connected to a computer via the CAN to USB to a laptop computer. The laptop computer is running a software exercising the radio into .

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	T 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		
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

7. ANTENNA PORT TEST RESULTS

7.1. ON TIME AND DUTY CYCLE

LIMITS

None; for reporting purposes only.

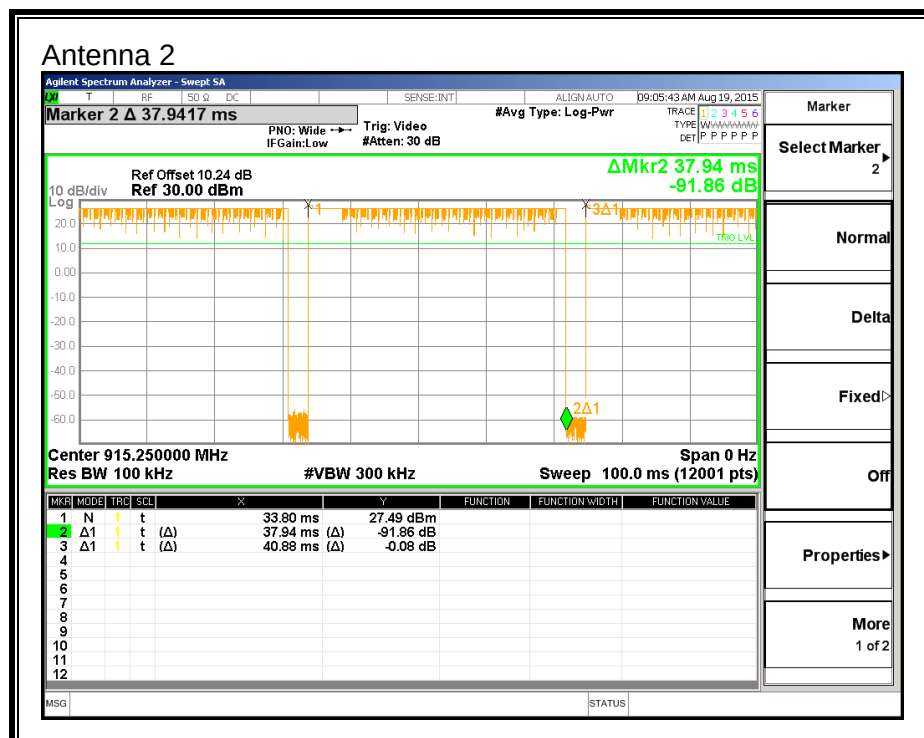
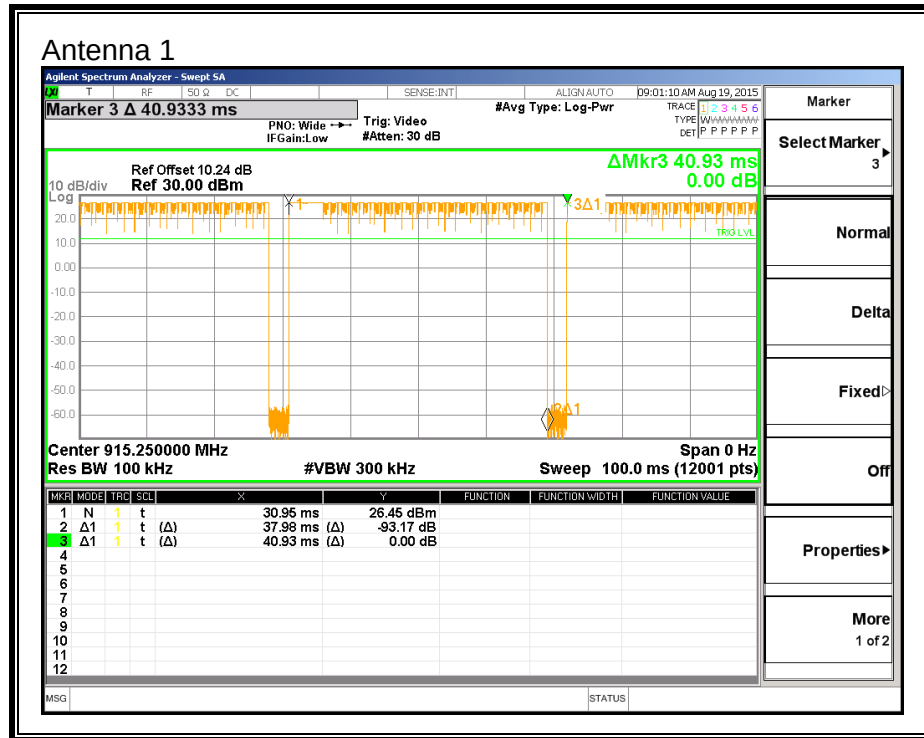
PROCEDURE

DA 00-705

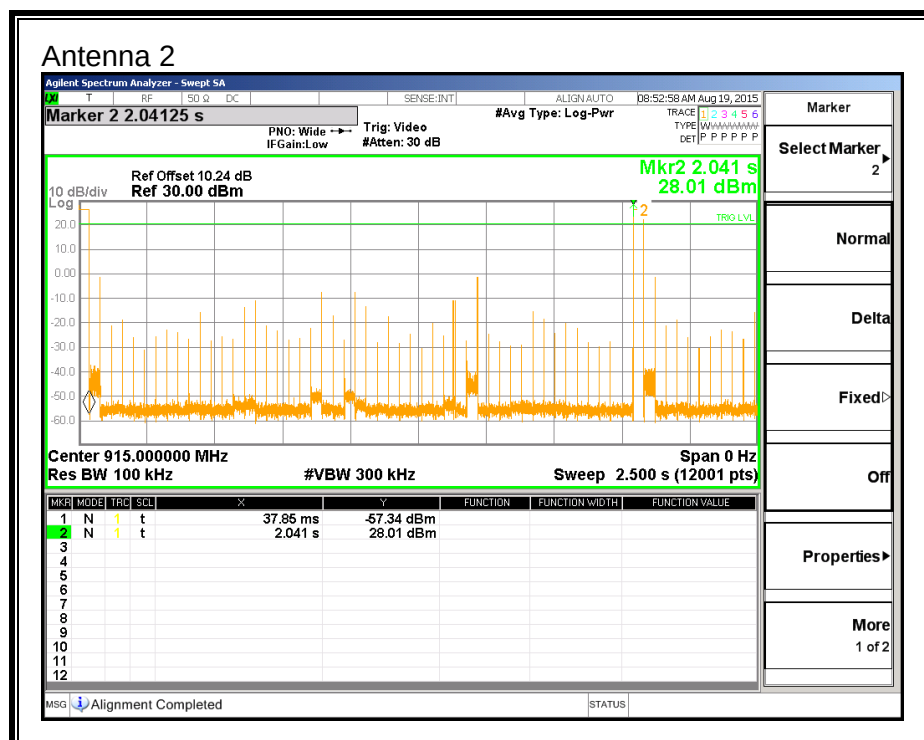
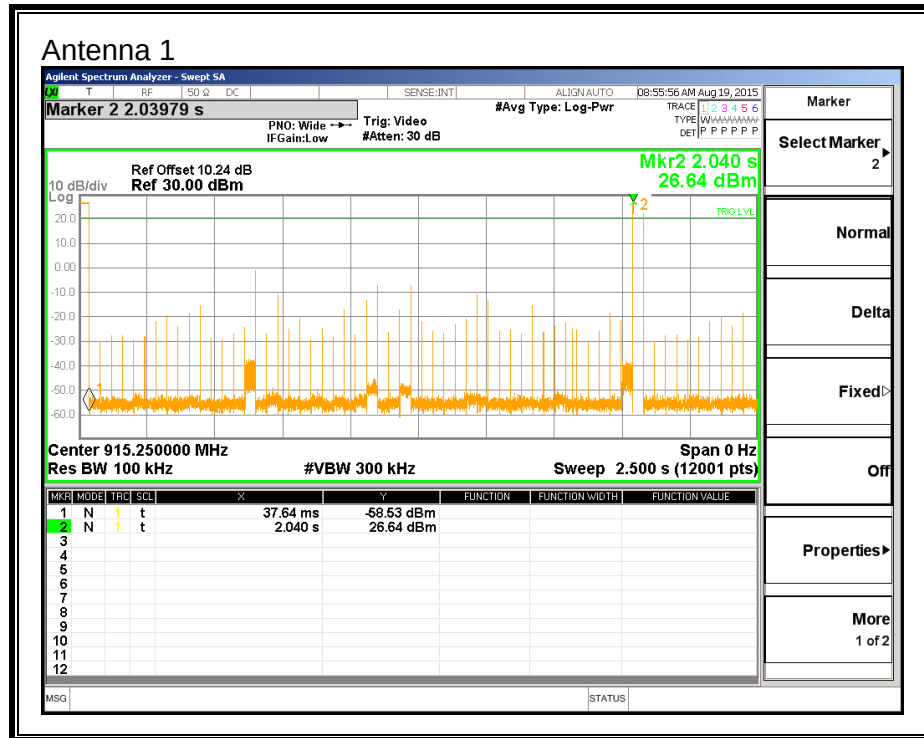
Mode	ON Time B (msec)	Period (msec)	Duty Cycle x (linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	1/B Minimum VBW (kHz)
Hopping Mode						
Antenna 1	37.640	100	0.376	37.64%	8.49	N/A
Antenna 2	37.850	100	0.379	37.85%	8.44	N/A

DUTY CYCLE PLOTS

HOPPING OFF



HOPPING ON



7.2. 20 dB AND 99% BANDWIDTH

LIMIT

None; for reporting purposes only.

TEST PROCEDURE

DA 00-705

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

RESULTS

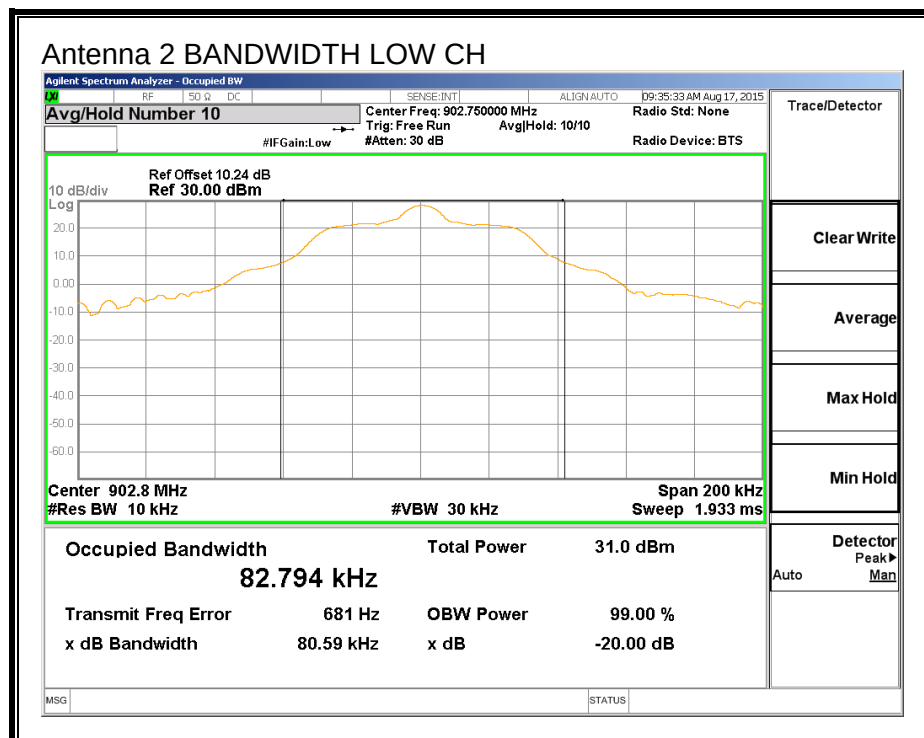
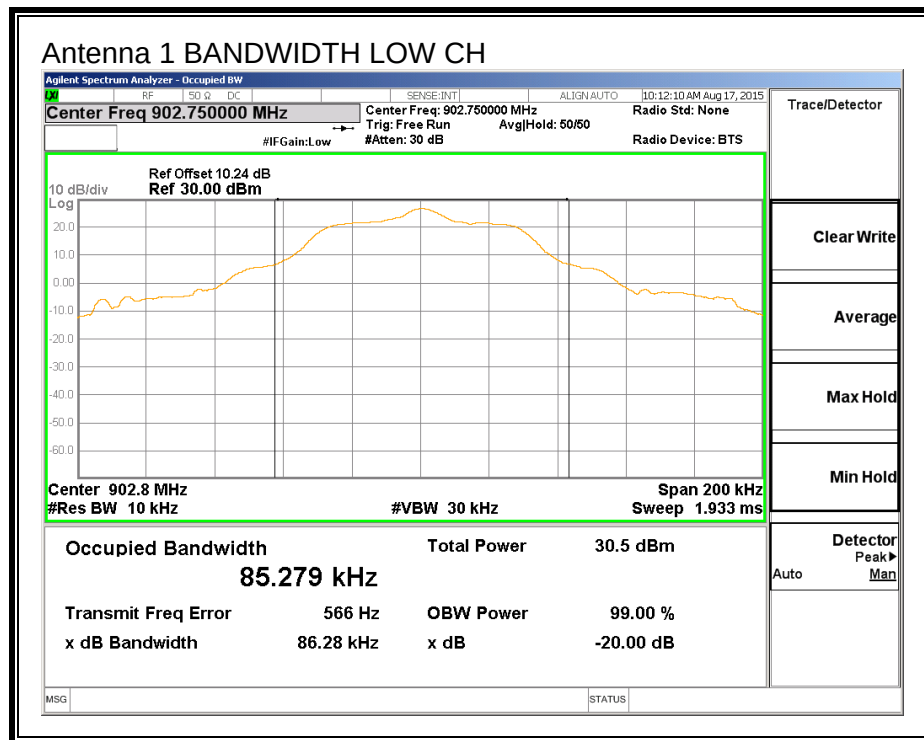
Antenna 1 (Right)

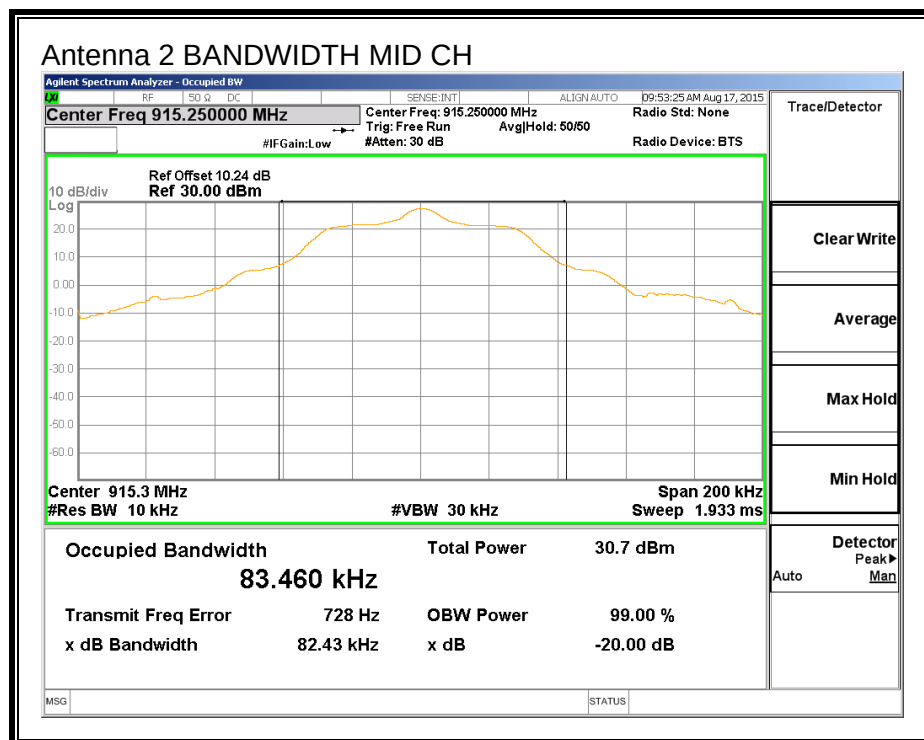
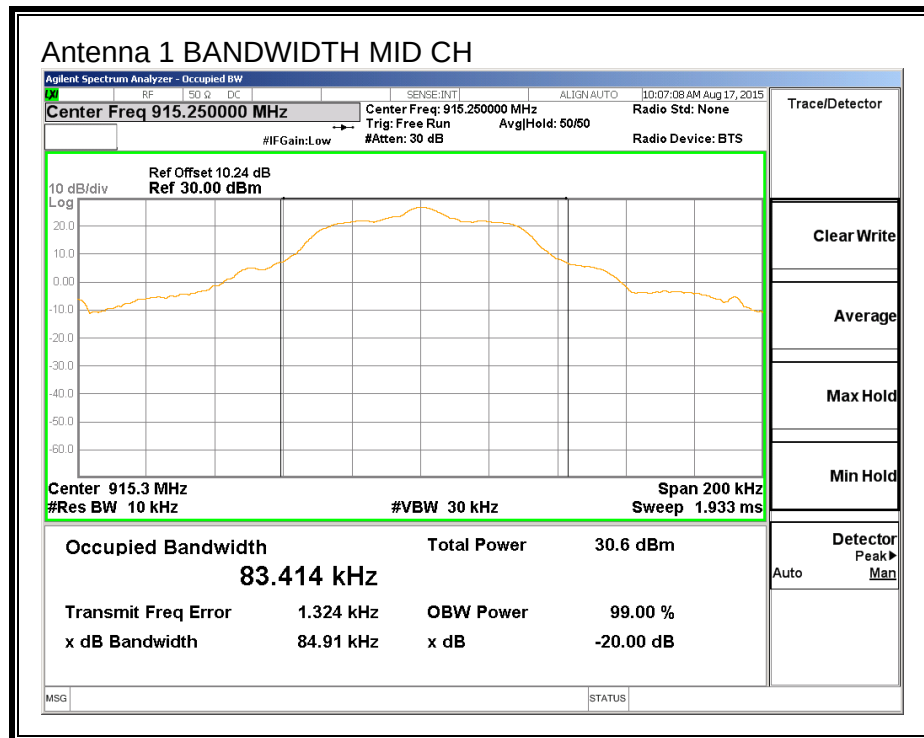
Channel	Frequency (MHz)	20 dB Bandwidth (kHz)	99% Bandwidth (kHz)
Low	902.75	86.28	81.83
Middle	915.25	84.91	81.896
High	927.25	85.63	83.158

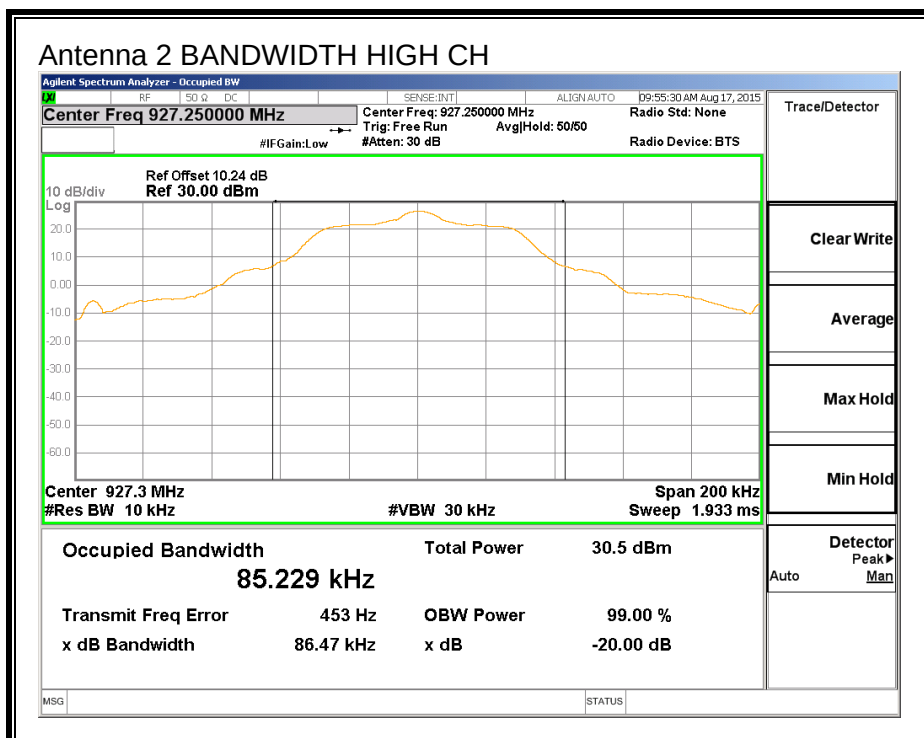
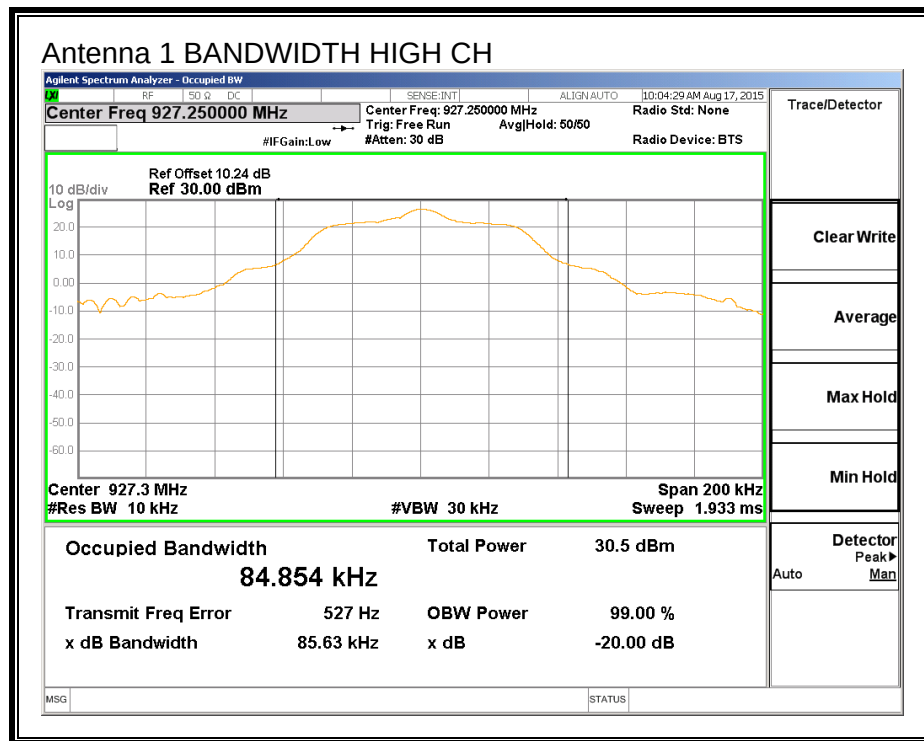
Antenna 2 (Left)

Channel	Frequency (MHz)	20 dB Bandwidth (kHz)	99% Bandwidth (kHz)
Low	902.75	80.59	81.561
Middle	915.25	82.43	80.441
High	927.25	86.47	82.799

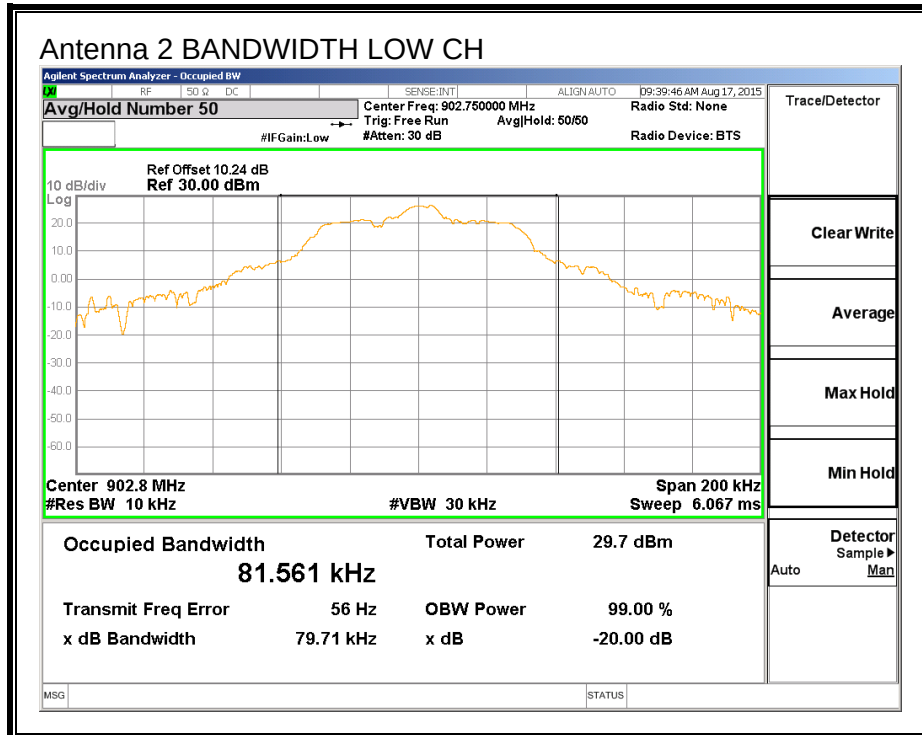
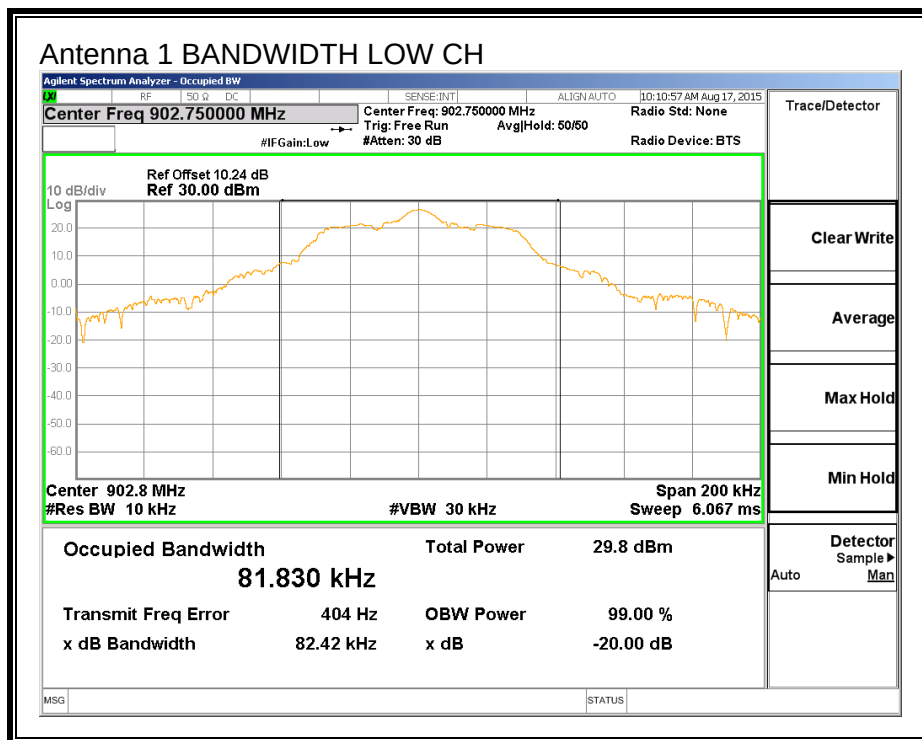
20 dB BANDWIDTH

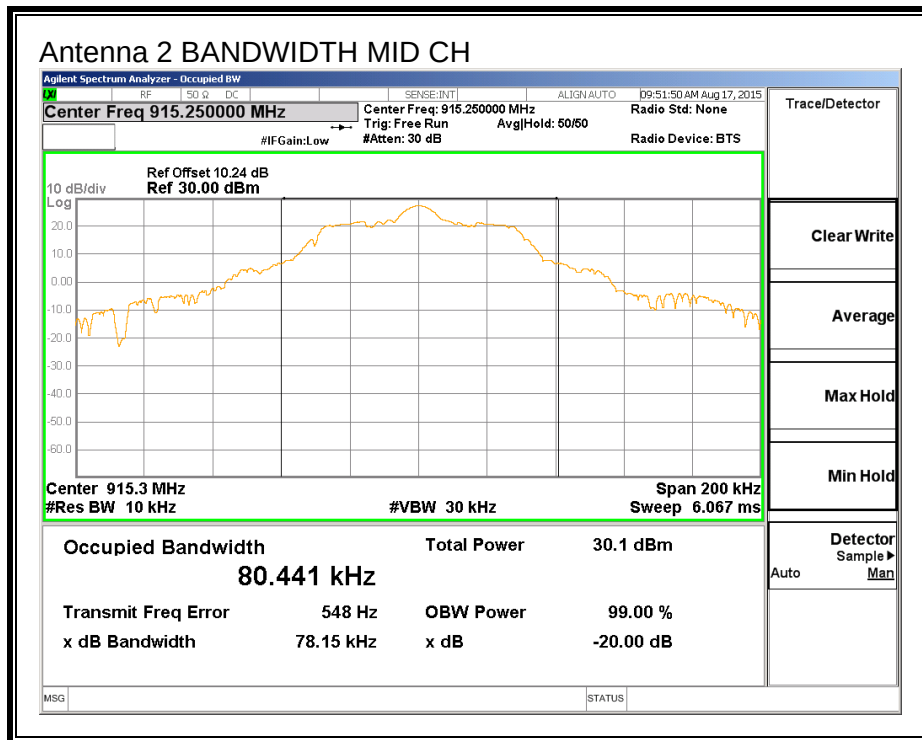
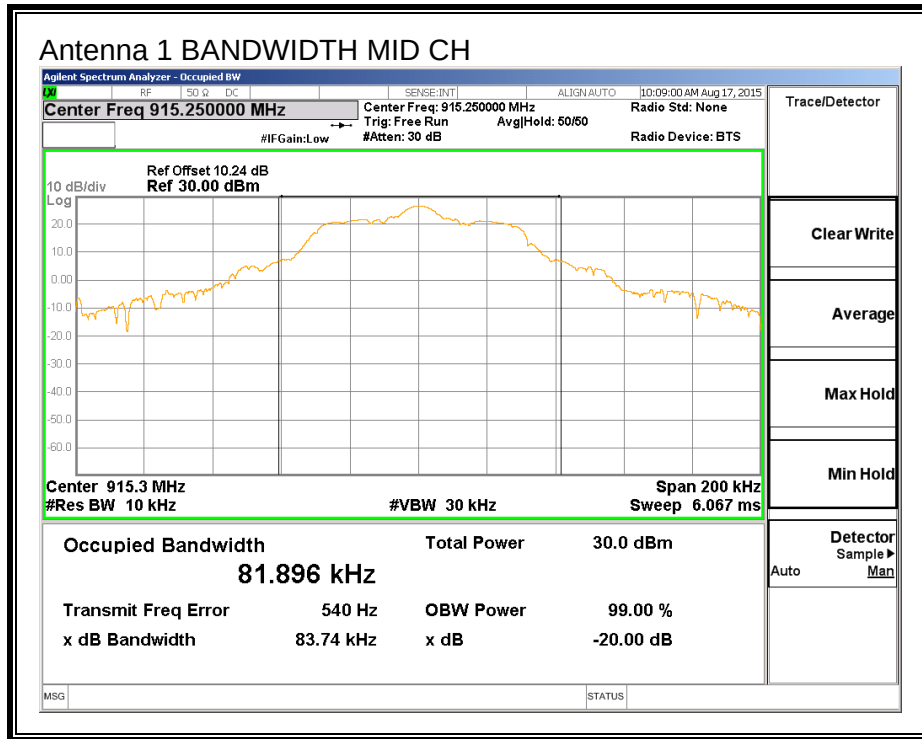


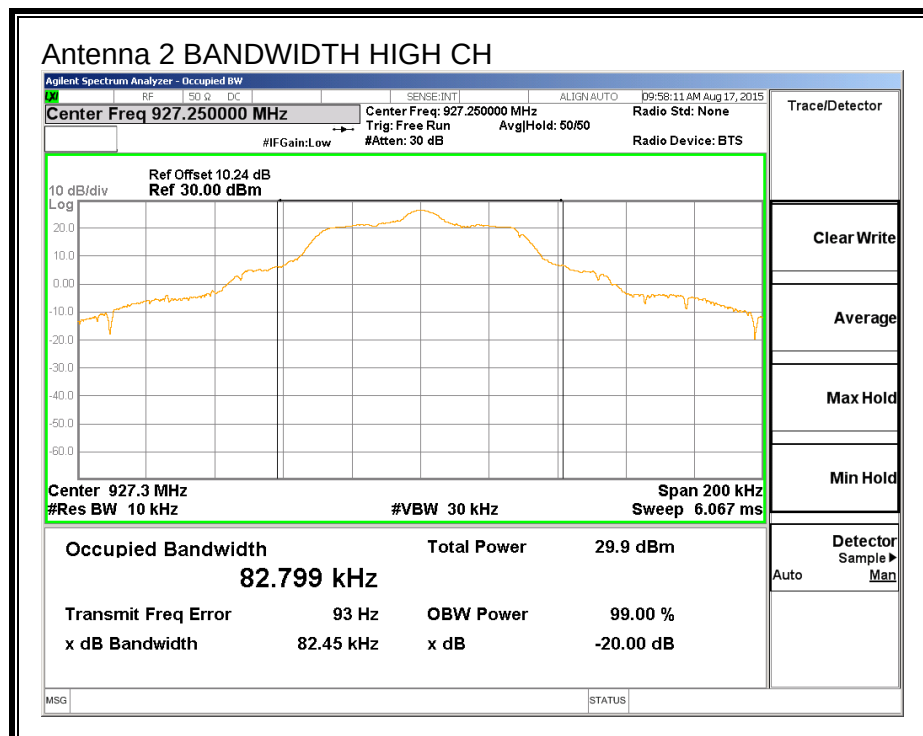
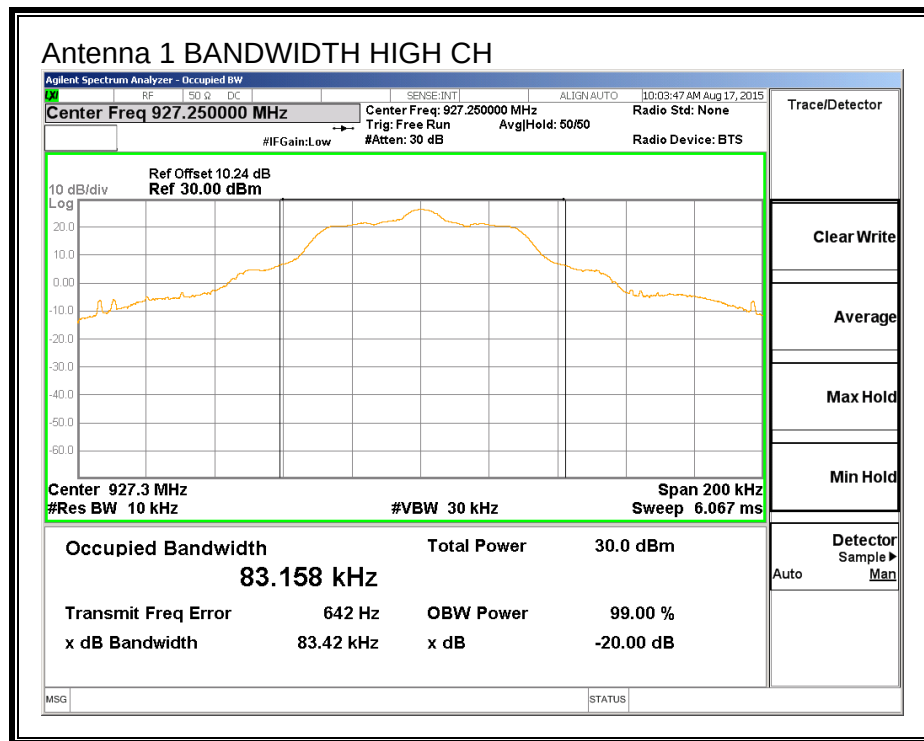




99% BANDWIDTH







7.3. 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 hopping channel, whichever is greater.

TEST PROCEDURE

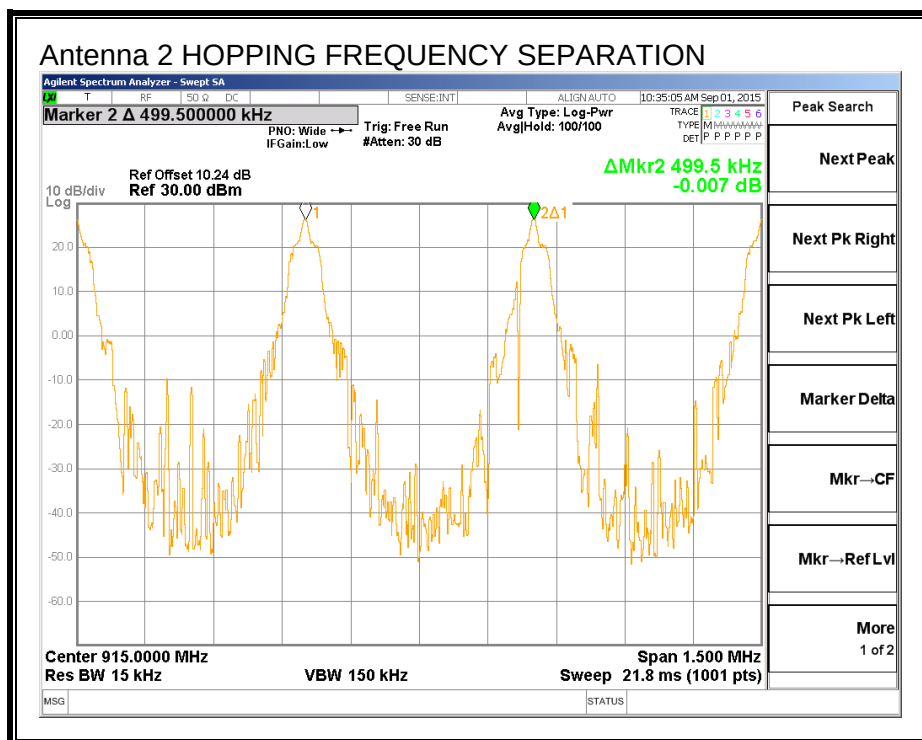
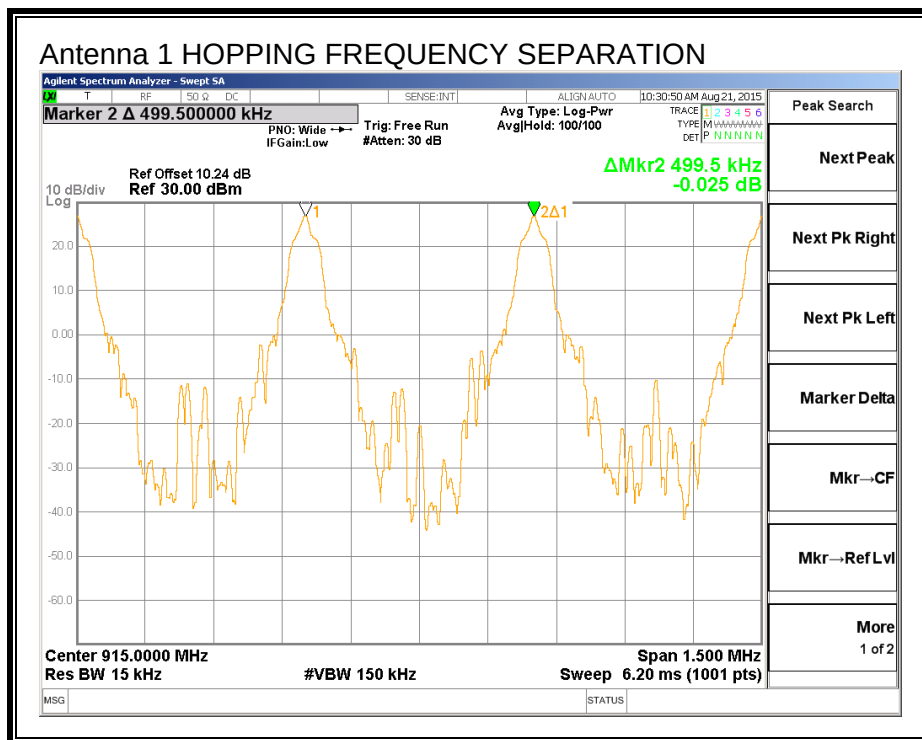
DA 00-705

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

The Frequency separation is 500kHz

HOPPING FREQUENCY SEPARATION



7.4. 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

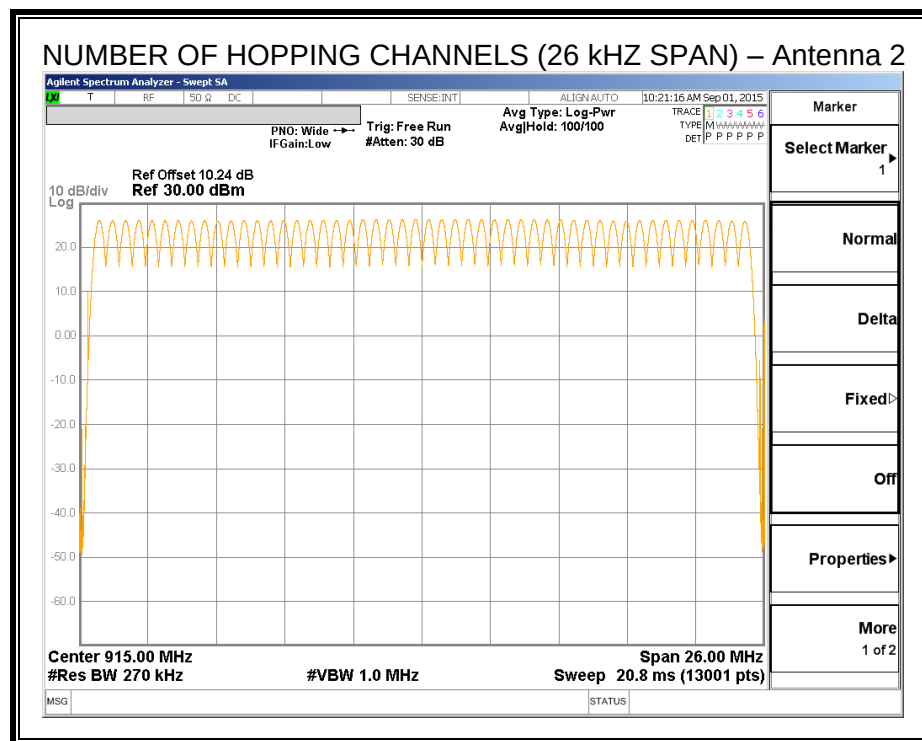
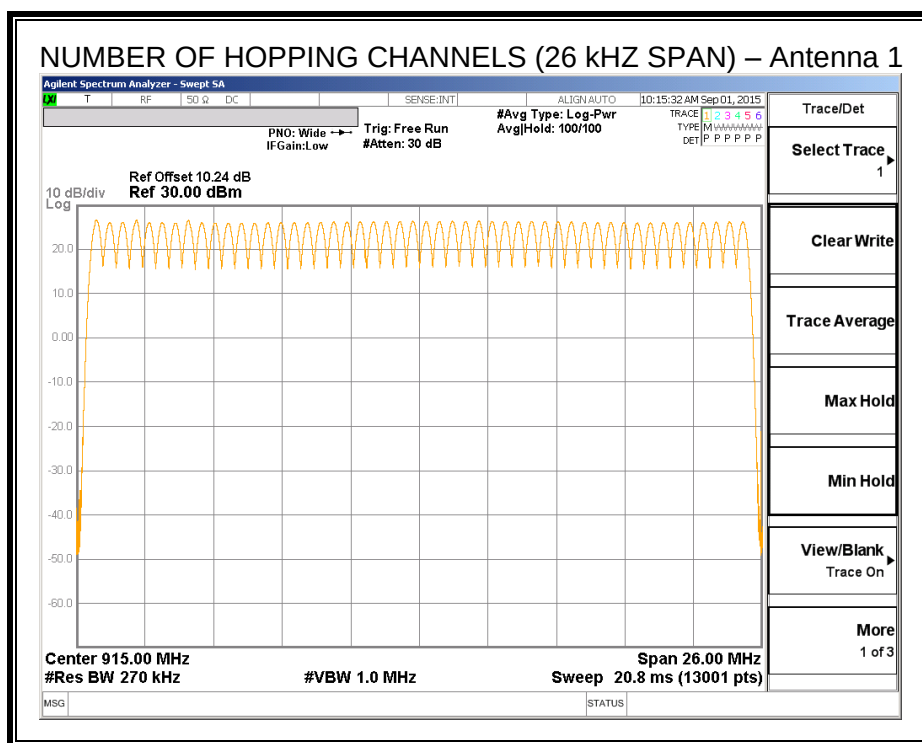
DA 00-705

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

Number of Channels: 50

NUMBER OF HOPPING CHANNELS



7.5. 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

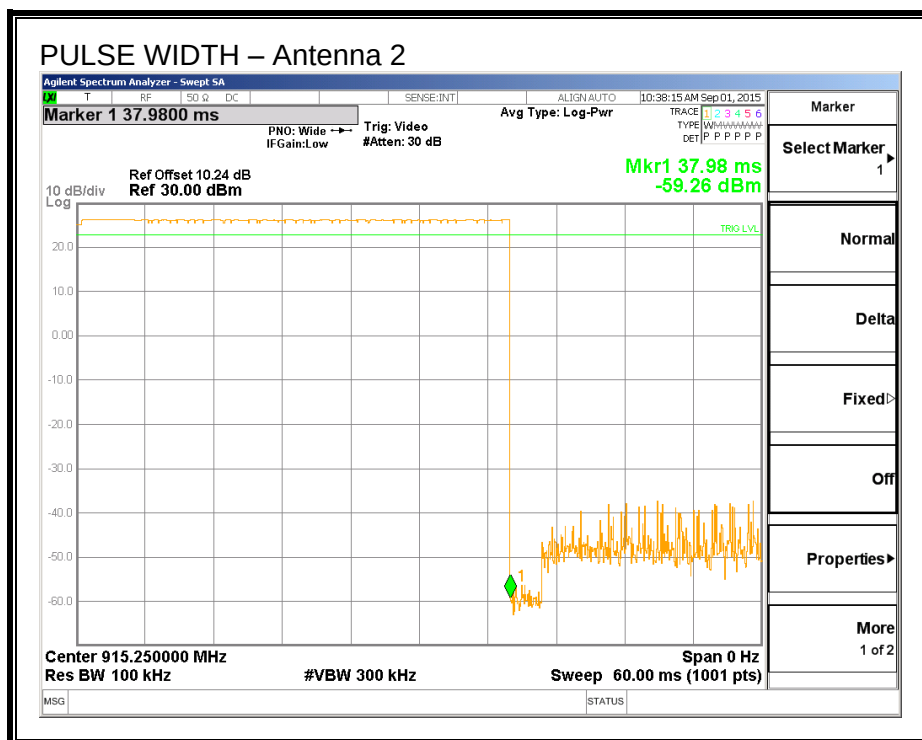
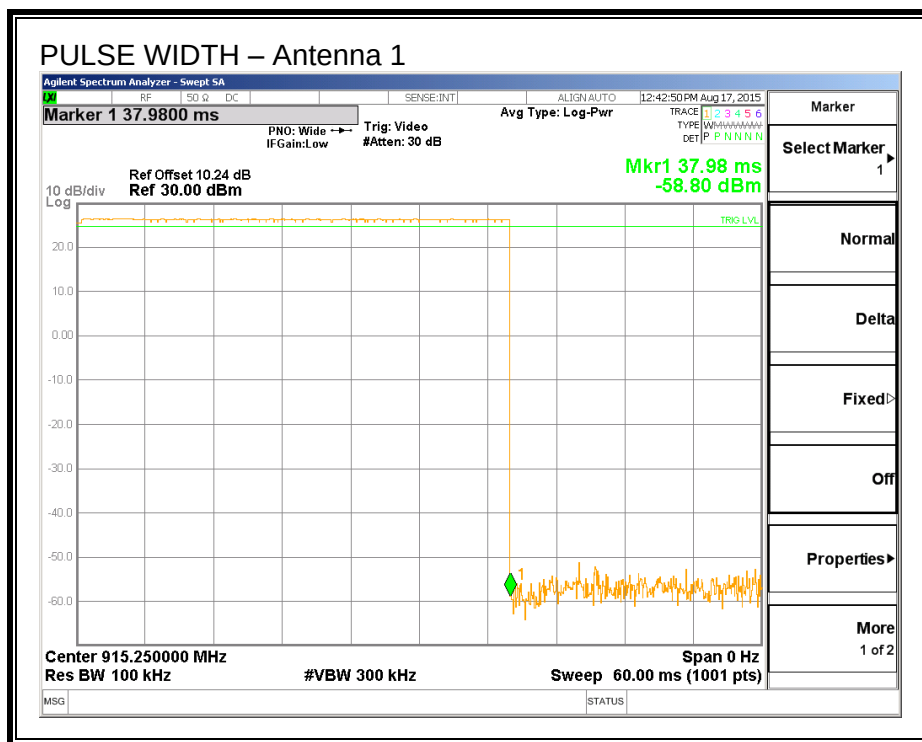
DA 00-705

RESULTS – Hold off on this table

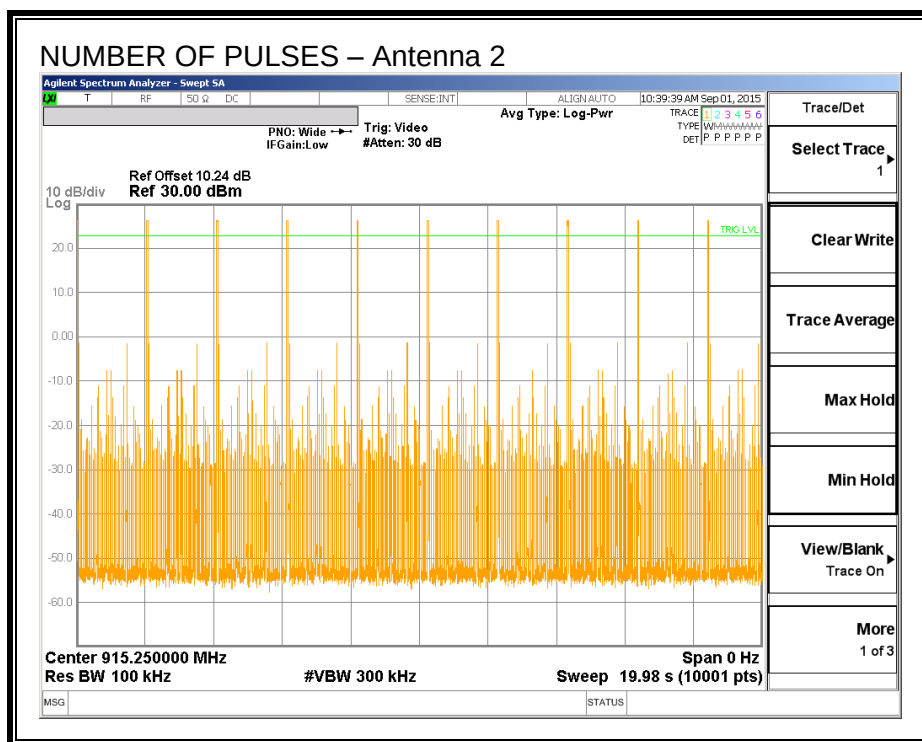
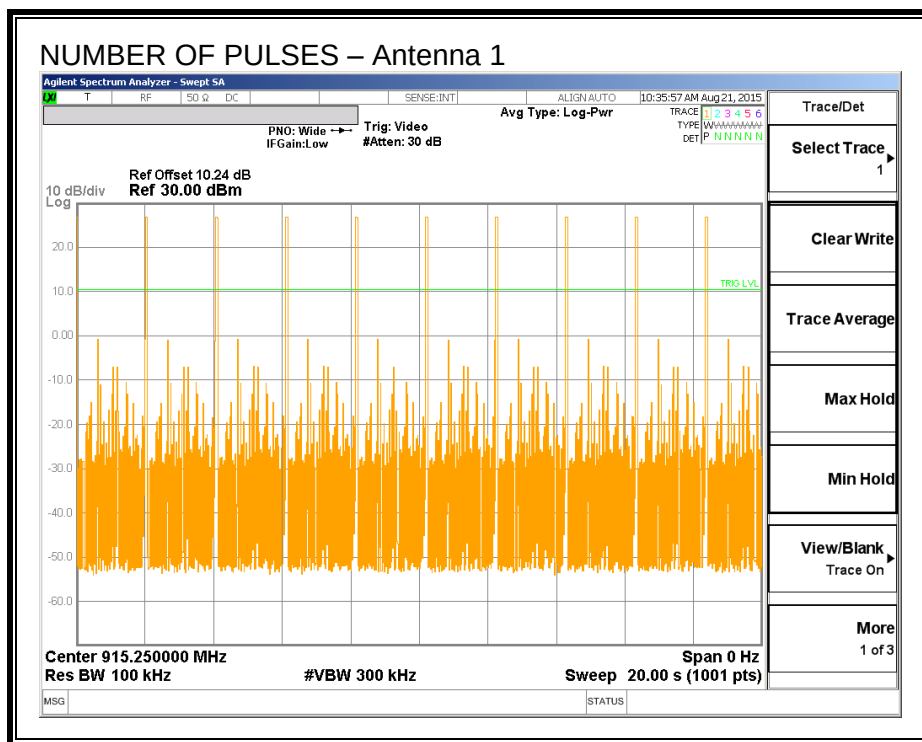
DH Packet	Pulse Width (msec)	Number of Pulses in 20 seconds	Average Time of Occupancy (sec)	Limit (sec)	Margin (sec)
Antenna Port 1	37.98	10	0.380	0.4	-0.020
Antenna Port 2	37.98	10	0.380	0.4	-0.020

Per the above the time of occupancy per channel in 100mS period is 37.98mS. Per DA 00-705 this will result in a duty cycle correction factor of -8.4dB. This correction factor can be used for radiated spurious emissions average or peak measurements.

PULSE WIDTH



NUMBER OF PULSES



7.6. 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

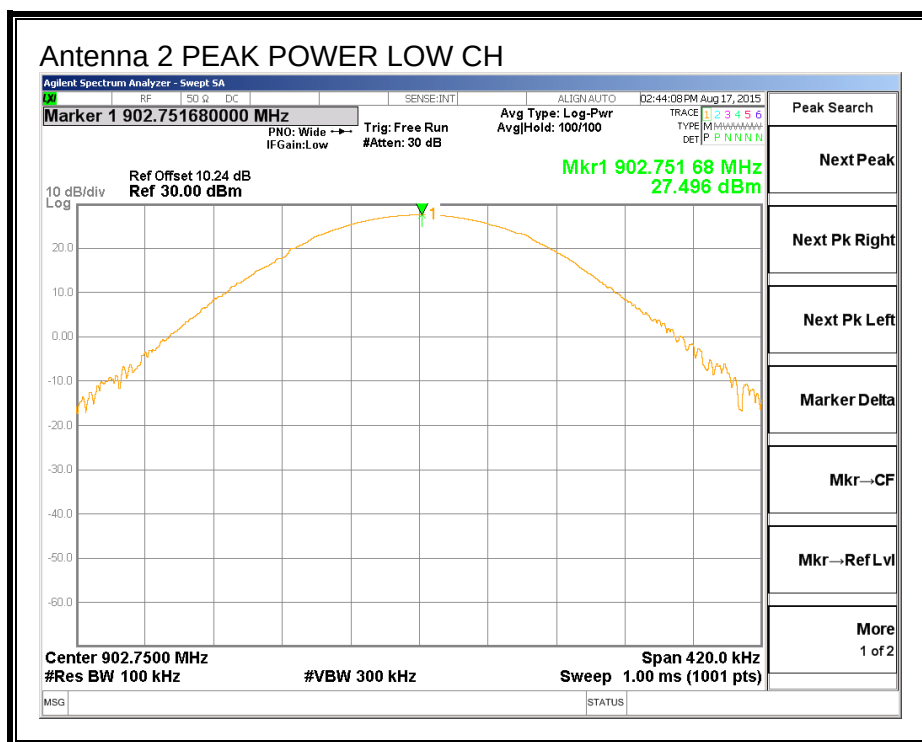
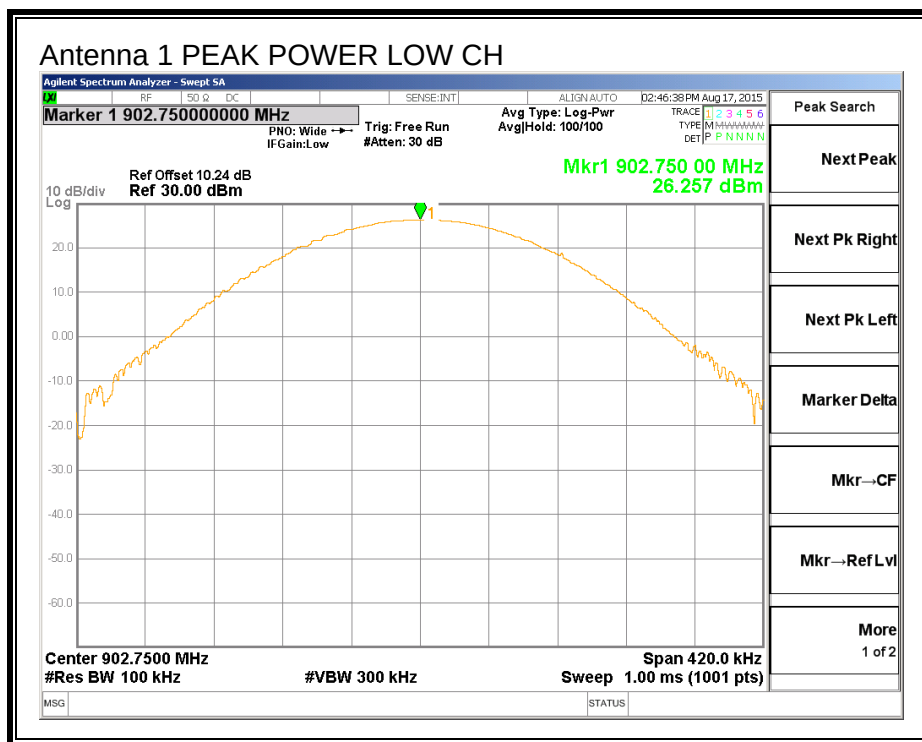
The transmitter output is connected to a spectrum analyzer the analyzer bandwidth is set to a value greater than the 20 dB bandwidth of the EUT.

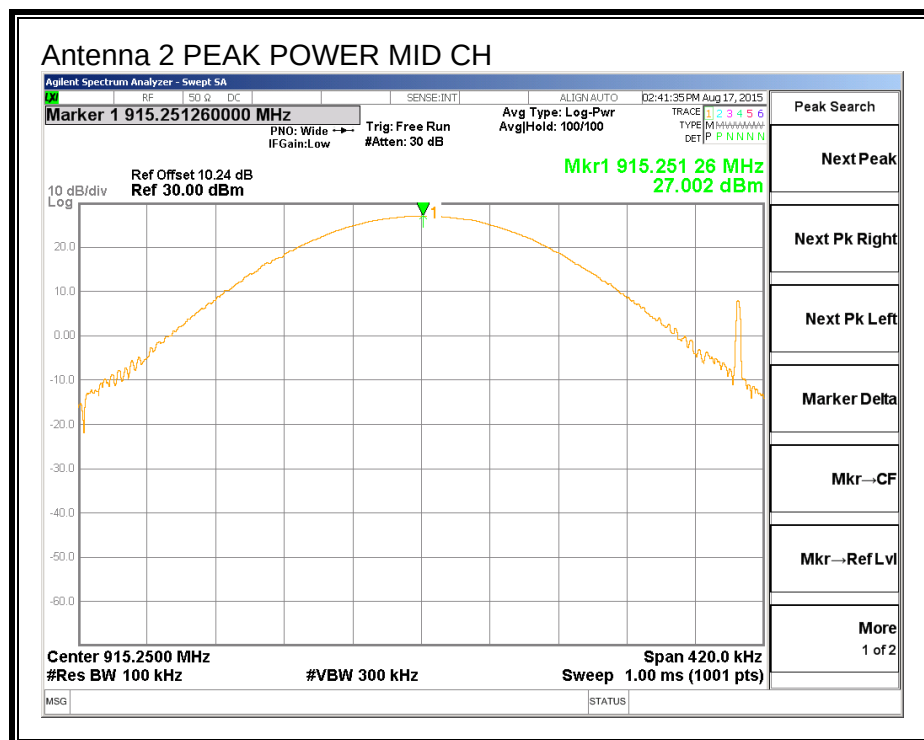
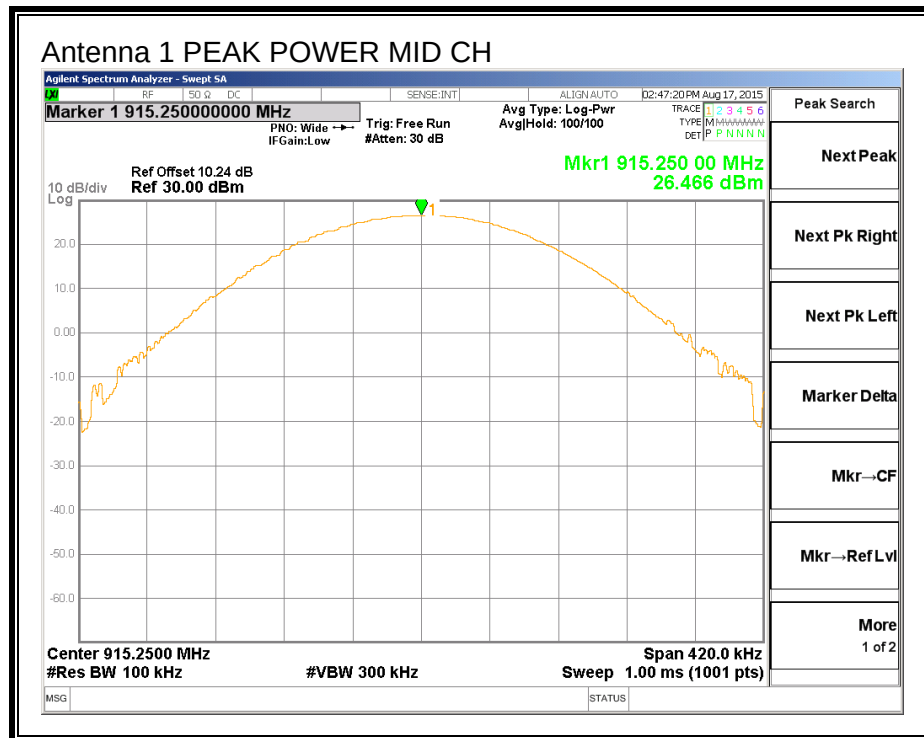
RESULTS

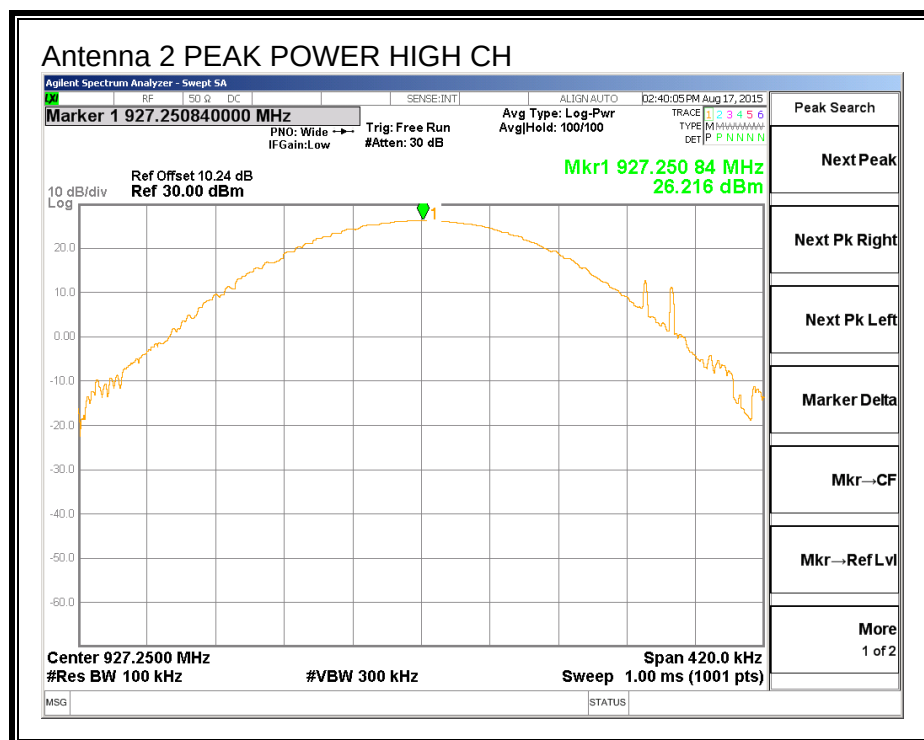
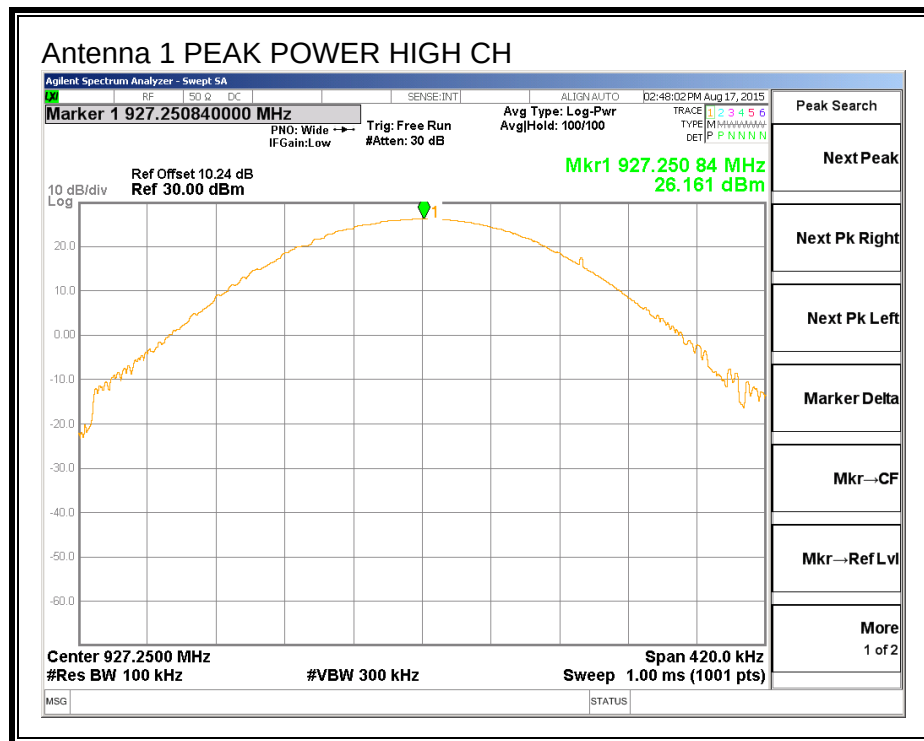
Setting = 251

Channel	Frequency (MHz)	Output Power (dBm)	Directional Gain (dBi)	Limit (dBm)	Margin (dB)
Antenna 1 Low	902.75	25.26	4.50	30	-4.74
Antenna 2 Low	902.75	27.50	4.50	30	-2.50
	Total Power	29.53			
Antenna 1 Middle	915.25	26.47	4.50	30	-3.53
Antenna 2 Middle	915.25	27.00	4.50	30	-3.00
	Total Power	29.75			
Antenna 1 High	927.25	16.16	4.50	30	-13.84
Antenna 2 High	927.25	26.22	4.50	30	-3.78
	Total Power	26.62			

OUTPUT POWER







7.7. AVERAGE POWER

LIMIT

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

RESULTS

The cable assembly insertion loss of 10.24 dB (including 10 dB pad and 0.24 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

Antenna 1

Channel	Frequency (MHz)	Average Power (dBm)
Low	902.75	25.07
Middle	915.25	25.22
High	927.25	25.13

Antenna 2

Channel	Frequency (MHz)	Average Power (dBm)
Low	902.75	24.85
Middle	915.25	25.06
High	927.25	24.94

7.8. 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

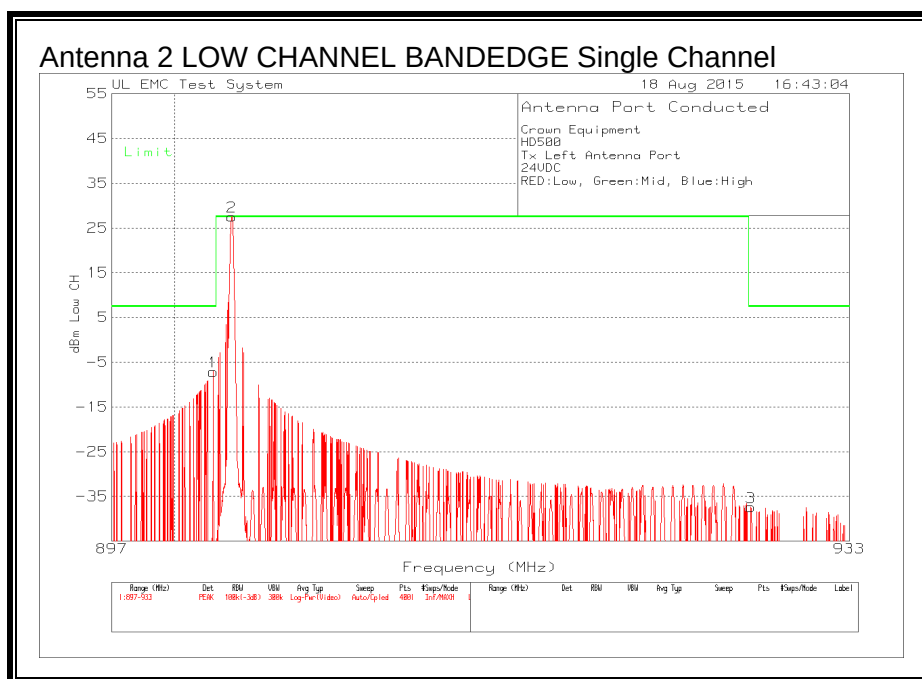
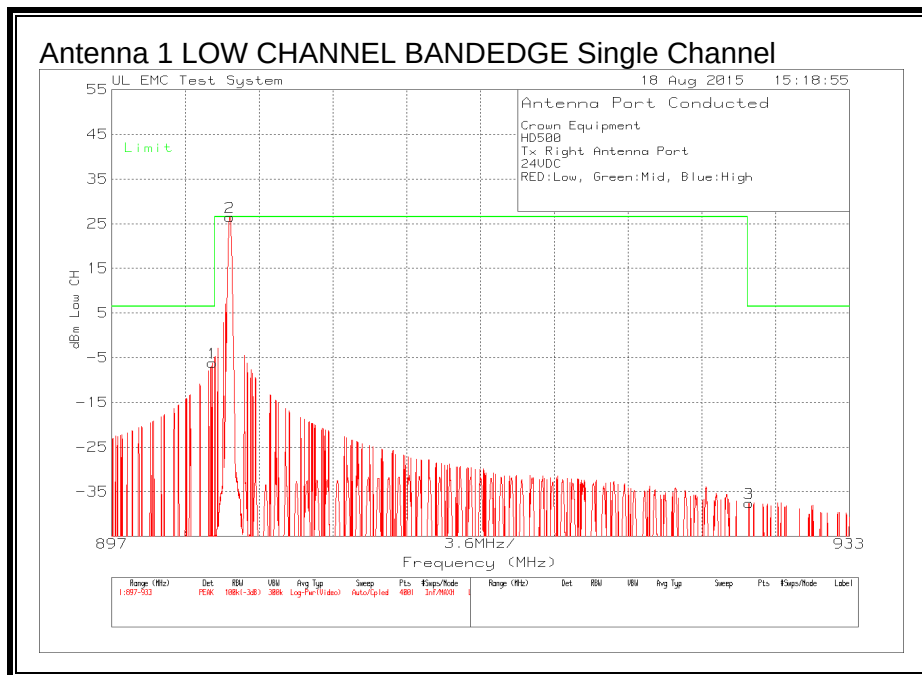
The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

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.

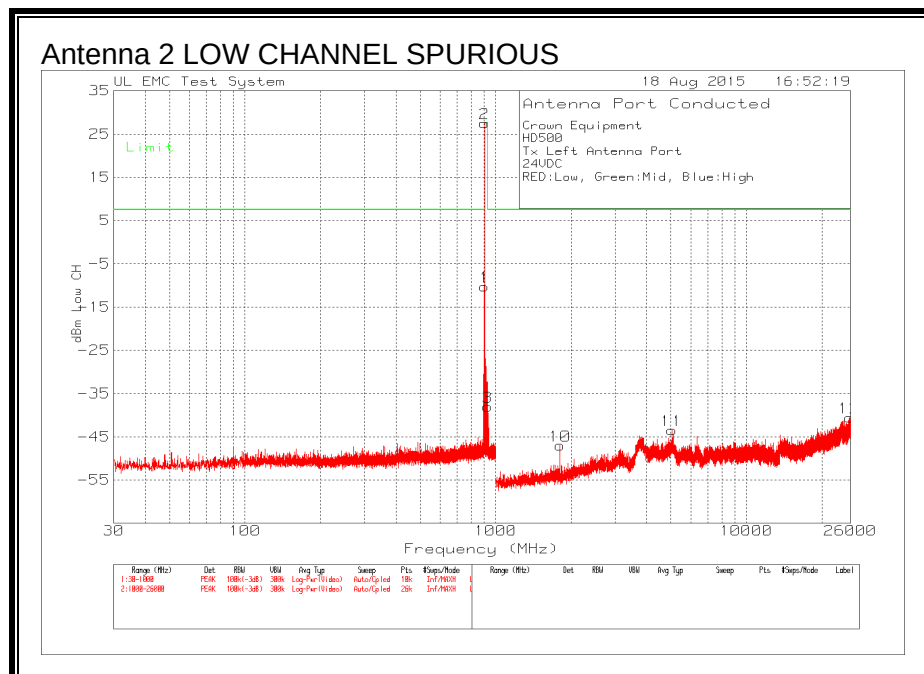
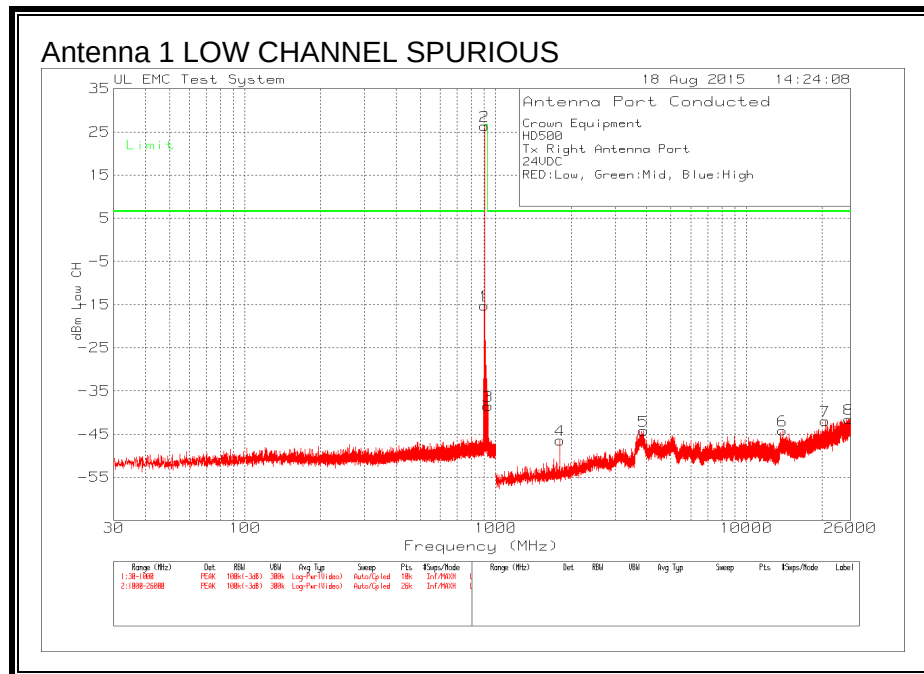
RESULTS

SPURIOUS EMISSIONS, LOW CHANNEL



Crown Equipment								
HD500								
Tx Right Antenna Port								
24VDC								
RED:Low , Green:Mid, Blue:High								
Trace Markers								
Marker No.	Test Frequency (MHz)	Meter Reading (dBuV)	Detector	dBuV to dBm	Path Factor dB	Level dBm	Limit	Margin (dB)
Low Channel								
1	902	90.65	PK	-107	10.2	-6.15	6.5	-12.65
2	902.7555	123.28	PK	-107	10.2	26.48	-	-
3	928.104	59.24	PK	-107	10.2	-37.56	6.5	-44.06
PK - Peak detector								

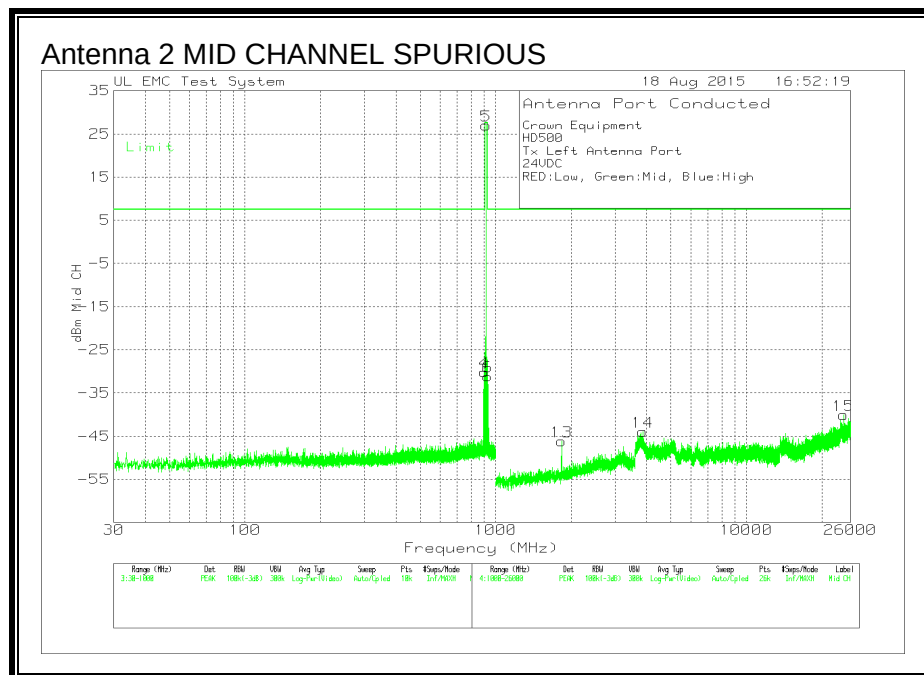
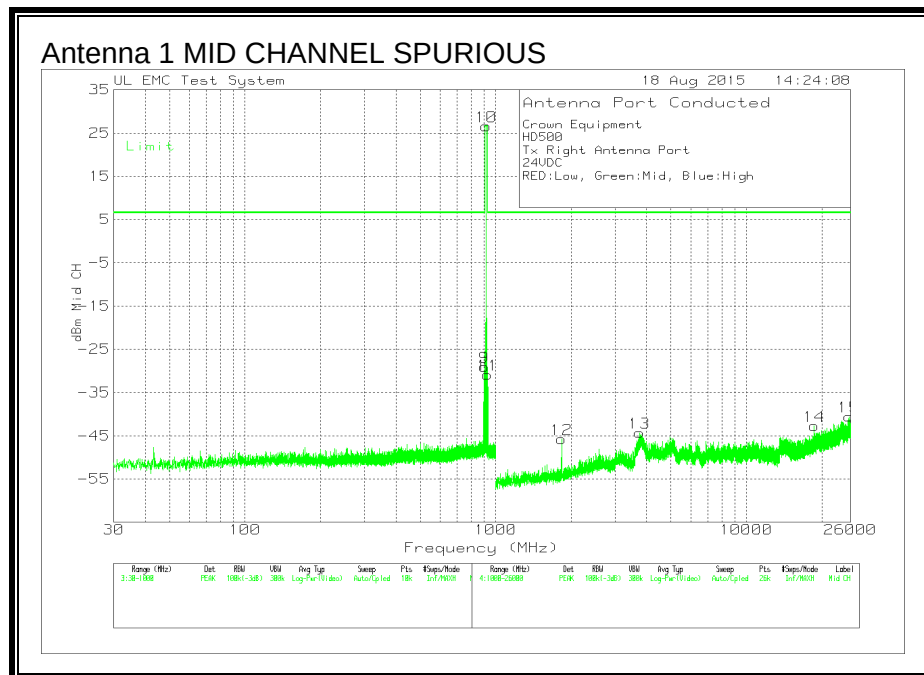
Crown Equipment								
HD500								
Tx Left Antenna Port								
24VDC								
RED:Low , Green:Mid, Blue:High								
Trace Markers								
Marker No.	Test Frequency (MHz)	Meter Reading (dBuV)	Detector	dBuV to dBm	Path Factor dB	Level dBm	Limit	Margin (dB)
Low Channel								
1	902	89.67	PK	-107	10.2	-7.13	7.5	-14.63
2	902.7555	124.3	PK	-107	10.2	27.5	-	-
3	928.113	59.41	PK	-107	10.2	-37.4	7.5	-44.89
PK - Peak detector								



Crown Equipment								
HD500								
Tx Right Antenna Port								
24VDC								
RED:Low , Green:Mid, Blue:High								
Trace Markers								
Marker No.	Test Frequency (MHz)	Meter Reading (dBuV)	Detector	dBuV to dBm	Path Factor dB	Level dBm	Limit	Margin (dB)
Low Channel								
1	900.284	81.53	PK	-107	10.2	-15.3	6.57	-21.84
2	902.7575	123.17	PK	-107	10.2	26.37	-	-
3	931.906	58.34	PK	-107	10.2	-38.5	6.57	-45.03
4	1805.738	50.27	PK	-107	10.3	-46.4	6.57	-53
5	* 3885.465	51.98	PK	-107	10.8	-44.2	6.57	-50.79
6	13942.765	51.53	PK	-107	11.3	-44.2	6.57	-50.74
7	* 20635.773	53.46	PK	-107	11.6	-41.9	6.57	-48.51
8	25695.192	53.98	PK	-107	11.5	-41.5	6.57	-48.09
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band								
PK - Peak detector								

Crown Equipment								
HD500								
Tx Left Antenna Port								
24VDC								
RED:Low , Green:Mid, Blue:High								
Trace Markers								
Marker No.	Test Frequency (MHz)	Meter Reading (dBuV)	Detector	dBuV to dBm	Path Factor dB	Level dBm	Limit	Margin (dB)
Low Channel								
1	901.448	86.52	PK	-107	10.2	-10.3	7.5	-17.78
2	902.709	124.3	PK	-107	10.2	27.5	-	-
3	928.996	58.78	PK	-107	10.2	-38	7.5	-45.52
10	1805.738	49.69	PK	-107	10.3	-47	7.5	-54.51
11	* 5045.035	52.64	PK	-107	10.9	-43.5	7.5	-50.96
12	25783.65	54.61	PK	-107	11.8	-40.6	7.5	-48.09
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band								
PK - Peak detector								

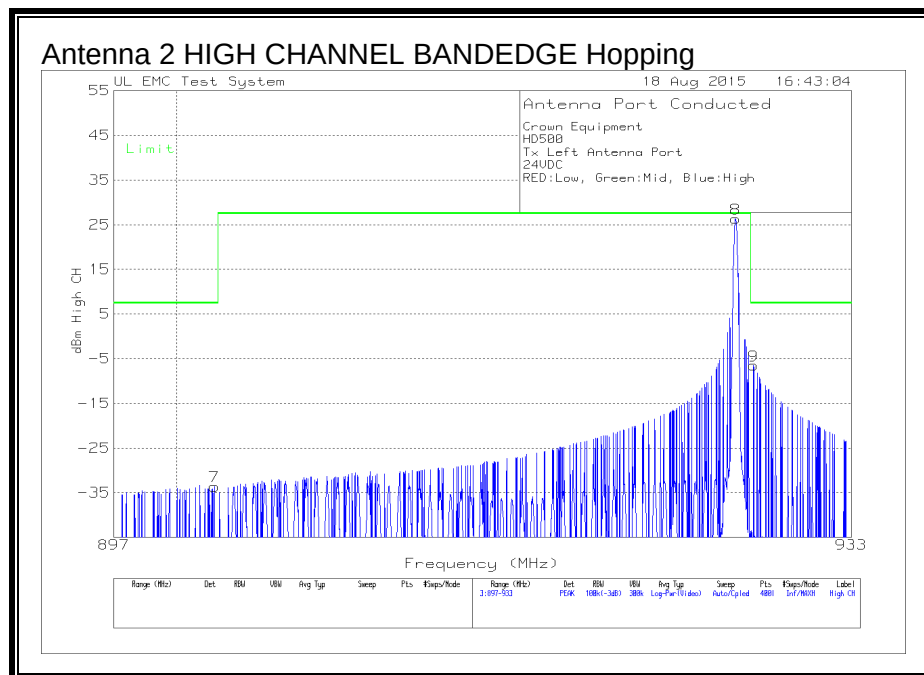
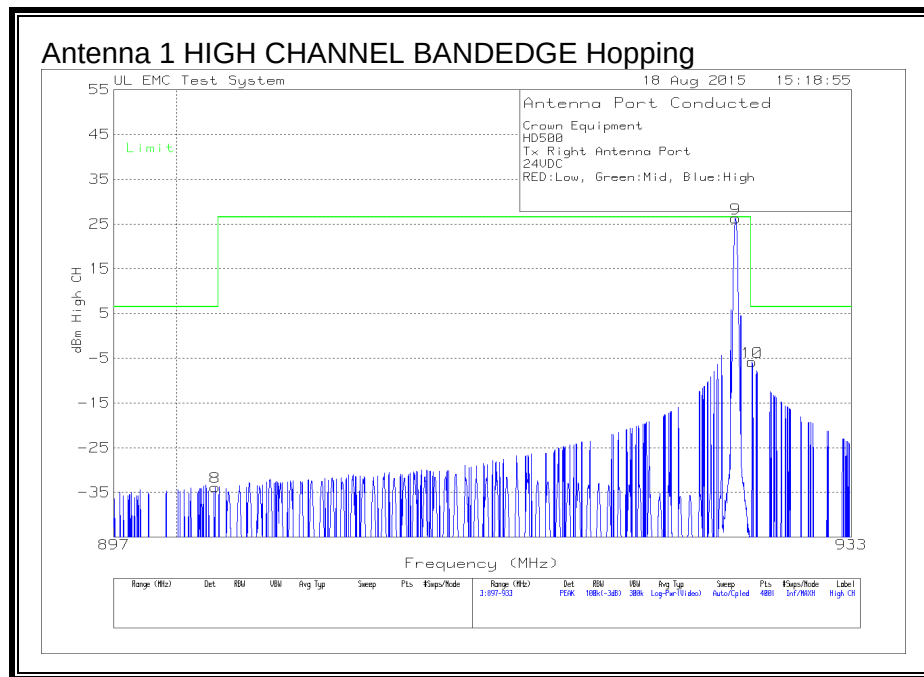
SPURIOUS EMISSIONS, MID CHANNEL



Crown Equipment								
HD500								
Tx Right Antenna Port								
24VDC								
RED:Low , Green:Mid, Blue:High								
Trace Markers								
Marker No.	Test Frequency (MHz)	Meter Reading (dBuV)	Detector	dBuV to dBm	Path Factor dB	Level dBm	Limit	Margin (dB)
Middle								
9	901.642	67.75	PK	-107	10.2	-29.1	6.57	-35.62
10	915.222	123.37	PK	-107	10.2	26.57	-	-
11	928.026	65.91	PK	-107	10.2	-30.9	6.57	-37.46
12	1830.737	50.85	PK	-107	10.4	-45.8	6.57	-52.32
13	* 3745.085	51.89	PK	-107	10.8	-44.3	6.57	-50.88
14	* 18647.389	52.79	PK	-107	11.5	-42.7	6.57	-49.28
15	25663.462	54.72	PK	-107	11.7	-40.6	6.57	-47.15
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band								
PK - Peak detector								

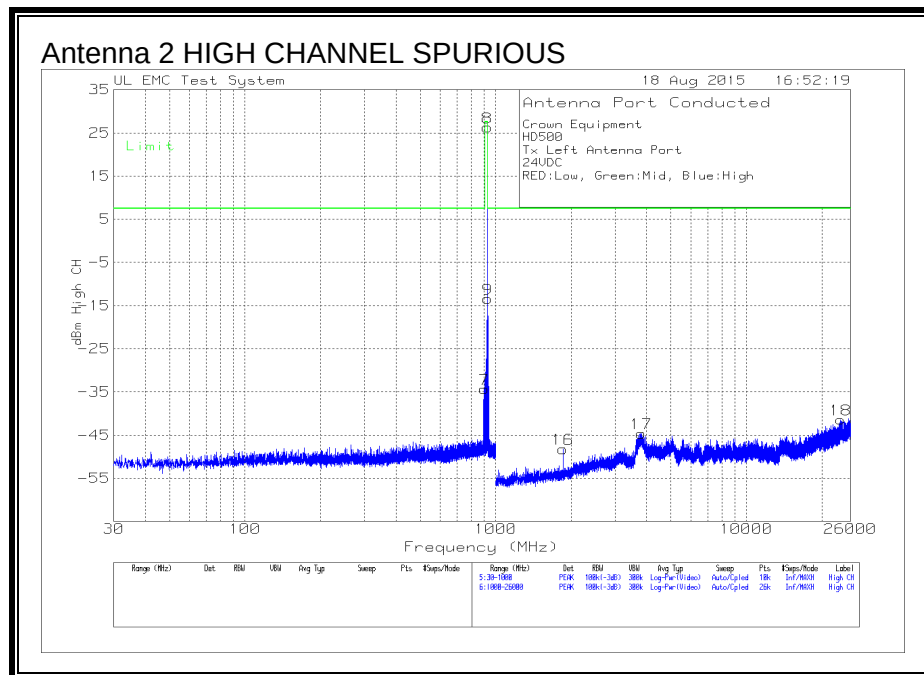
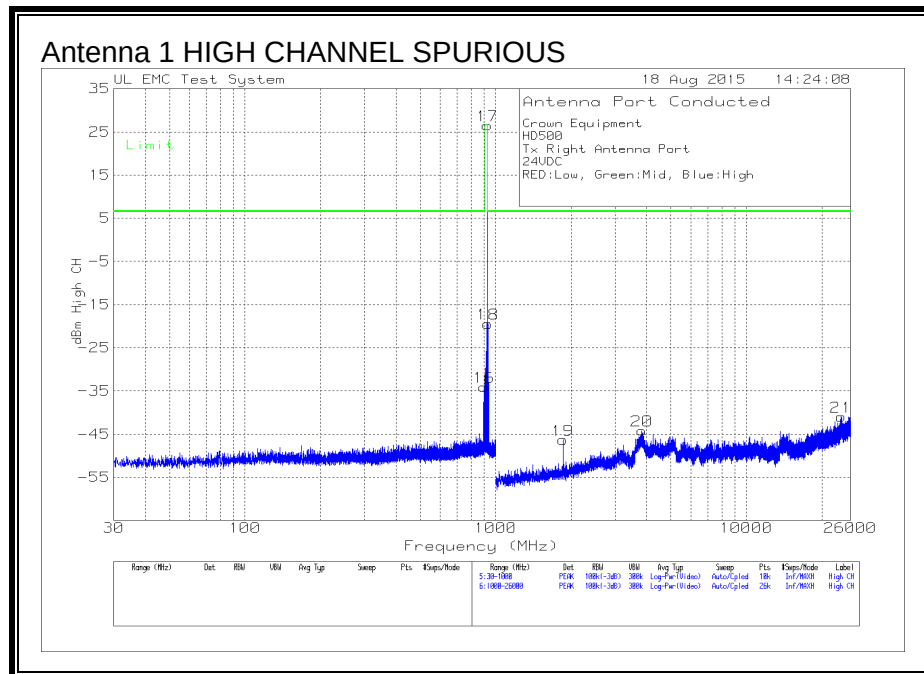
Crown Equipment								
HD500								
Tx Left Antenna Port								
24VDC								
RED:Low , Green:Mid, Blue:High								
Trace Markers								
Marker No.	Test Frequency (MHz)	Meter Reading (dBuV)	Detector	dBuV to dBm	Path Factor dB	Level dBm	Limit	Margin (dB)
Middle Channel								
4	901.06	66.64	PK	-107	10.2	-30.2	7.5	-37.66
5	915.222	123.79	PK	-107	10.2	26.99	-	-
6	928.511	65.65	PK	-107	10.2	-31.2	7.5	-38.65
13	1830.737	50.43	PK	-107	10.4	-46.2	7.5	-53.67
14	* 3859.504	52.25	PK	-107	10.8	-44	7.5	-51.45
15	24408.703	55.09	PK	-107	11.8	-40.1	7.5	-47.61
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band								
PK - Peak detector								

SPURIOUS EMISSIONS, HIGH CHANNEL



Crown Equipment								
HD500								
Tx Right Antenna Port								
24VDC								
RED:Low , Green:Mid, Blue:High								
Trace Markers								
Marker No.	Test Frequency (MHz)	Meter Reading (dBuV)	Detector	dBuV to dBm	Path Factor dB	Level dBm	Limit	Margin (dB)
High Channel								
8	901.851	62.96	PK	-107	10.2	-33.84	6.5	-40.34
9	927.2535	123.06	PK	-107	10.2	26.26	-	-
10	928	90.95	PK	-107	10.2	-5.85	6.5	-12.35
PK - Peak detector								

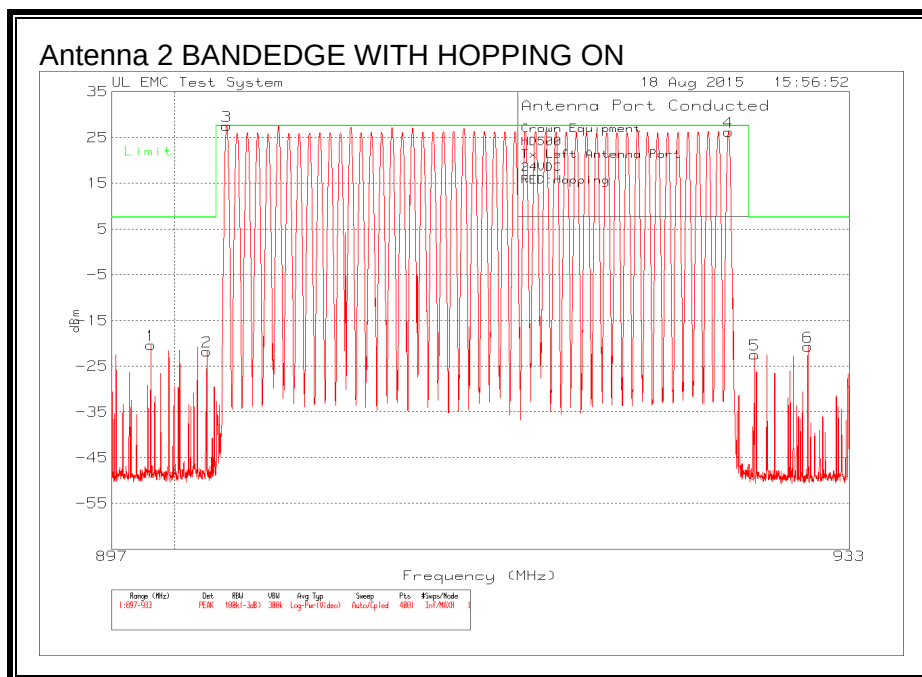
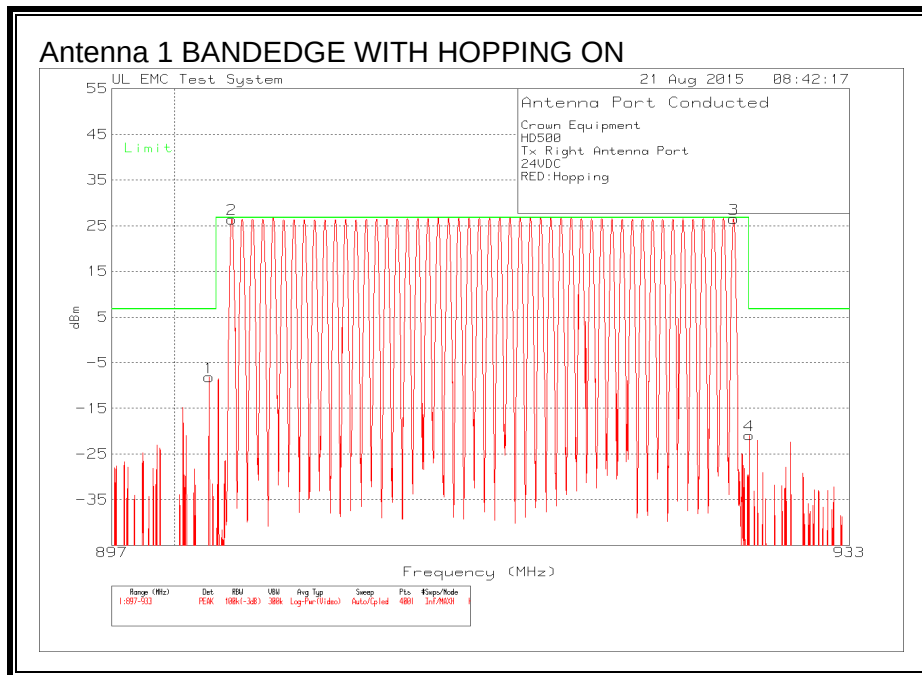
Crown Equipment								
HD500								
Tx Left Antenna Port								
24VDC								
RED:Low , Green:Mid, Blue:High								
Trace Markers								
Marker No.	Test Frequency (MHz)	Meter Reading (dBuV)	Detector	dBuV to dBm	Path Factor dB	Level dBm	Limit	Margin (dB)
High Channel								
7	901.824	63.2	PK	-107	10.2	-33.6	7.5	-41.1
8	927.2535	123.11	PK	-107	10.2	26.31	-	-
9	928	90.3	PK	-107	10.2	-6.5	7.5	-14
PK - Peak detector								



Crown Equipment								
HD500								
Tx Right Antenna Port								
24VDC								
RED:Low , Green:Mid, Blue:High								
Trace Markers								
Marker No.	Test Frequency (MHz)	Meter Reading (dBuV)	Detector	dBuV to dBm	Path Factor dB	Level dBm	Limit	Margin (dB)
High Channel								
16	898.926	62.74	PK	-107	10.2	-34.1	6.57	-40.63
17	927.25	123.31	PK	-107	10.2	26.51	-	-
18	931.13	77.34	PK	-107	10.2	-19.5	6.57	-26.03
19	1854.774	50.27	PK	-107	10.4	-46.3	6.57	-52.9
20	* 3830.659	52	PK	-107	10.8	-44.2	6.57	-50.77
21	* 23879.878	54.34	PK	-107	11.7	-41	6.57	-47.53
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band								
PK - Peak detector								

Crown Equipment								
HD500								
Tx Left Antenna Port								
24VDC								
RED:Low , Green:Mid, Blue:High								
Trace Markers								
Marker No.	Test Frequency (MHz)	Meter Reading (dBuV)	Detector	dBuV to dBm	Path Factor dB	Level dBm	Limit	Margin (dB)
High Channel								
7	901.157	62.48	PK	-107	10.2	-34.3	7.5	-41.82
8	927.25	123.09	PK	-107	10.2	26.29	-	-
9	929.19	83.39	PK	-107	10.2	-13.4	7.5	-20.91
16	1854.774	48.38	PK	-107	10.4	-48.2	7.5	-55.72
17	* 3812.39	51.58	PK	-107	10.8	-44.6	7.5	-52.12
18	* 23767.382	53.68	PK	-107	11.9	-41.4	7.5	-48.92
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band								
PK - Peak detector								

SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON



Crown Equipment								
HD500								
Tx Right Antenna Port								
24VDC								
RED:Hopping								
Trace Markers								
Marker No.	Test Frequency (MHz)	Meter Reading (dBuV)	Detector	dBuV to dBm	Path Factor dB	Level dBm	Limit	Margin (dB)
1	902	88.65	PK	-107	10.2	-8.15	6.74	-14.89
2	902.751	123.19	PK	-107	10.2	26.39	-	-
3	927.2535	123.3	PK	-107	10.2	26.5	-	-
4	928	75.87	PK	-107	10.2	-20.93	6.74	-27.67
PK - Peak detector								

Crown Equipment								
HD500								
Tx Left Antenna Port								
24VDC								
RED:Hopping								
Trace Markers								
Marker No.	Test Frequency (MHz)	Meter Reading (dBuV)	Detector	dBuV to dBm	Path Factor dB	Level dBm	Limit	Margin (dB)
1	898.863	76.4	PK	-107	10.2	-20.4	7.51	-27.91
2	902	75.01	PK	-107	10.2	-21.79	7.51	-29.3
3	902.5035	124.31	PK	-107	10.2	27.51	-	-
4	927.0015	123	PK	-107	10.2	26.2	-	-
5	928	74.3	PK	-107	10.2	-22.5	7.51	-30.01
6	930.939	76.09	PK	-107	10.2	-20.71	7.51	-28.22
PK - Peak detector								

8. RADIATED TEST RESULTS

8.1. LIMITS AND PROCEDURE

LIMITS

FCC §15.205 and §15.209

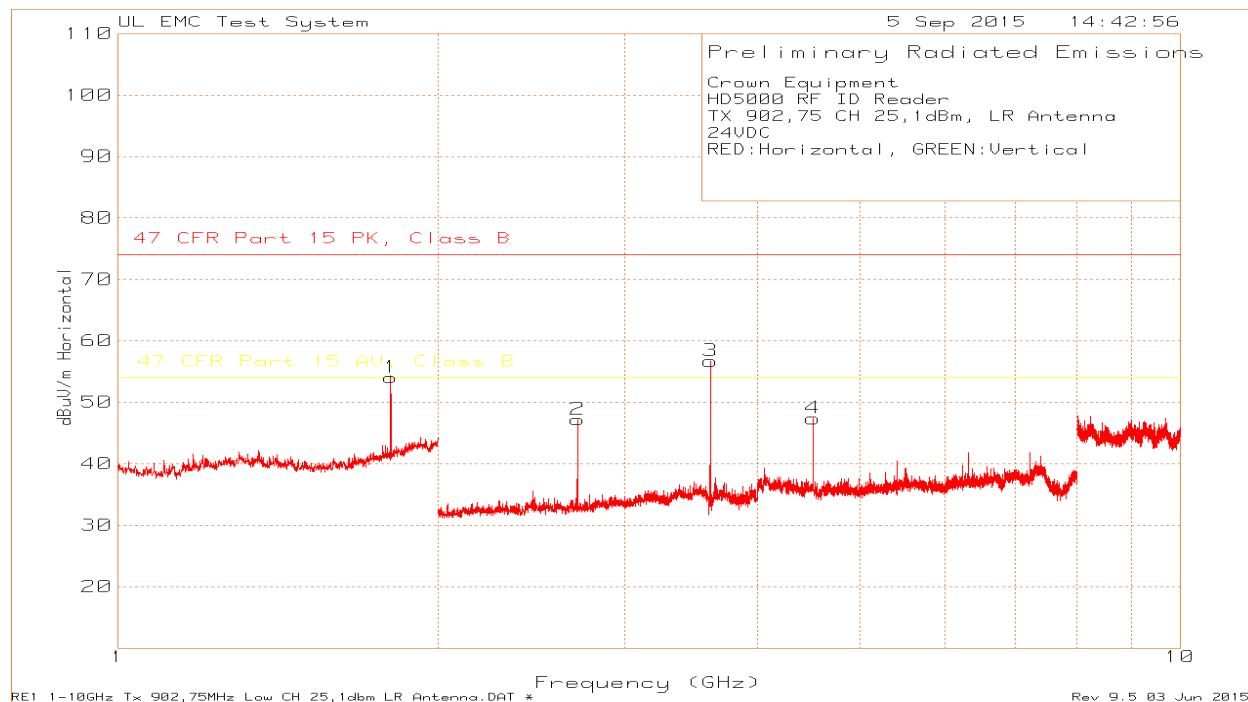
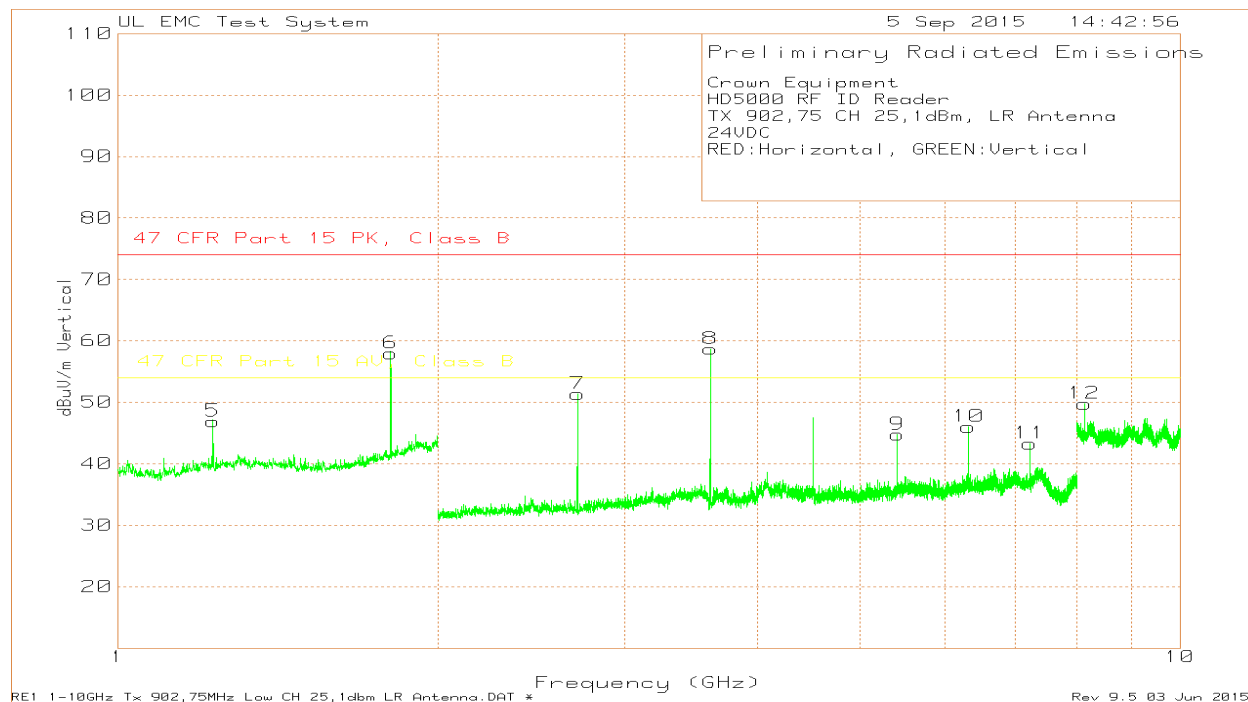
IC RSS-GEN Clause 8.9 (Transmitter)

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

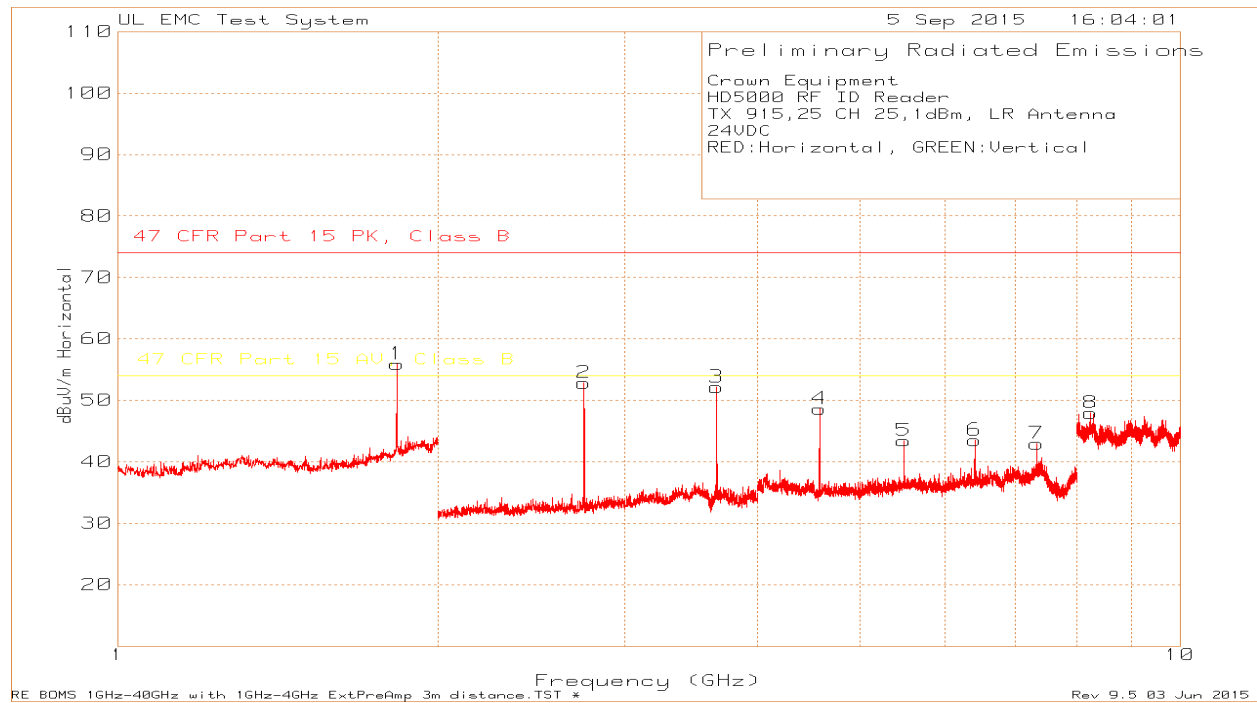
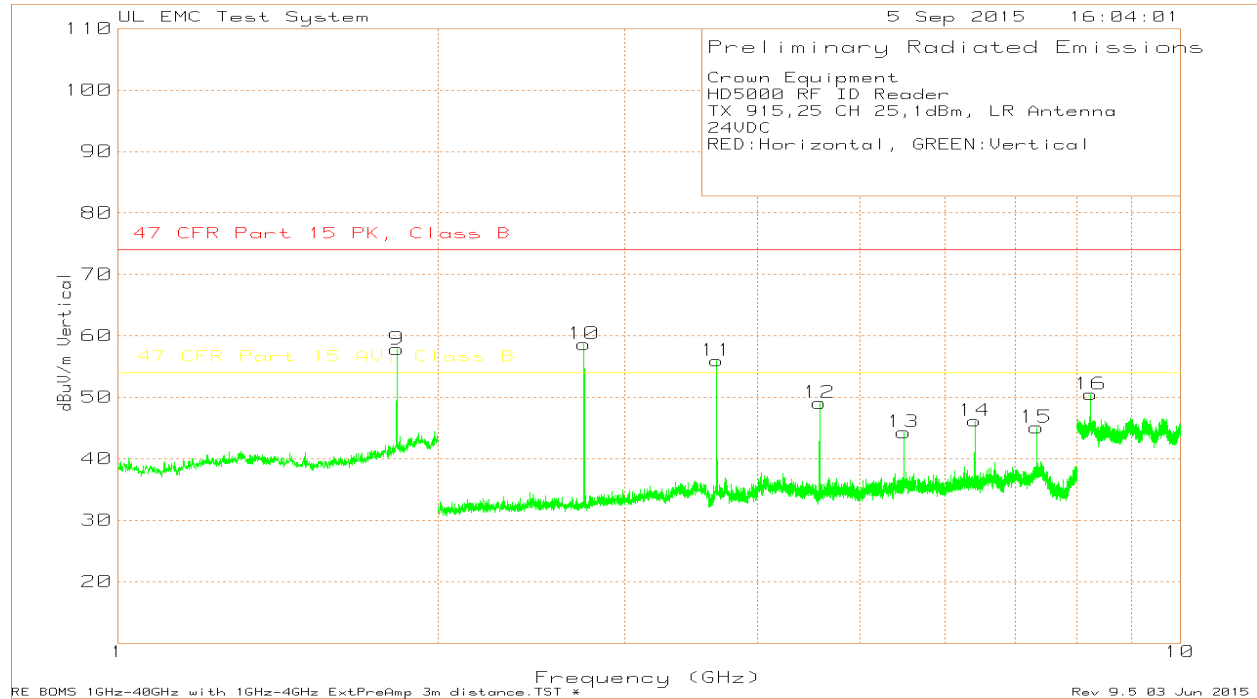
8.2. RADIATED EMISSIONS ABOVE 1 GHz

Low channel



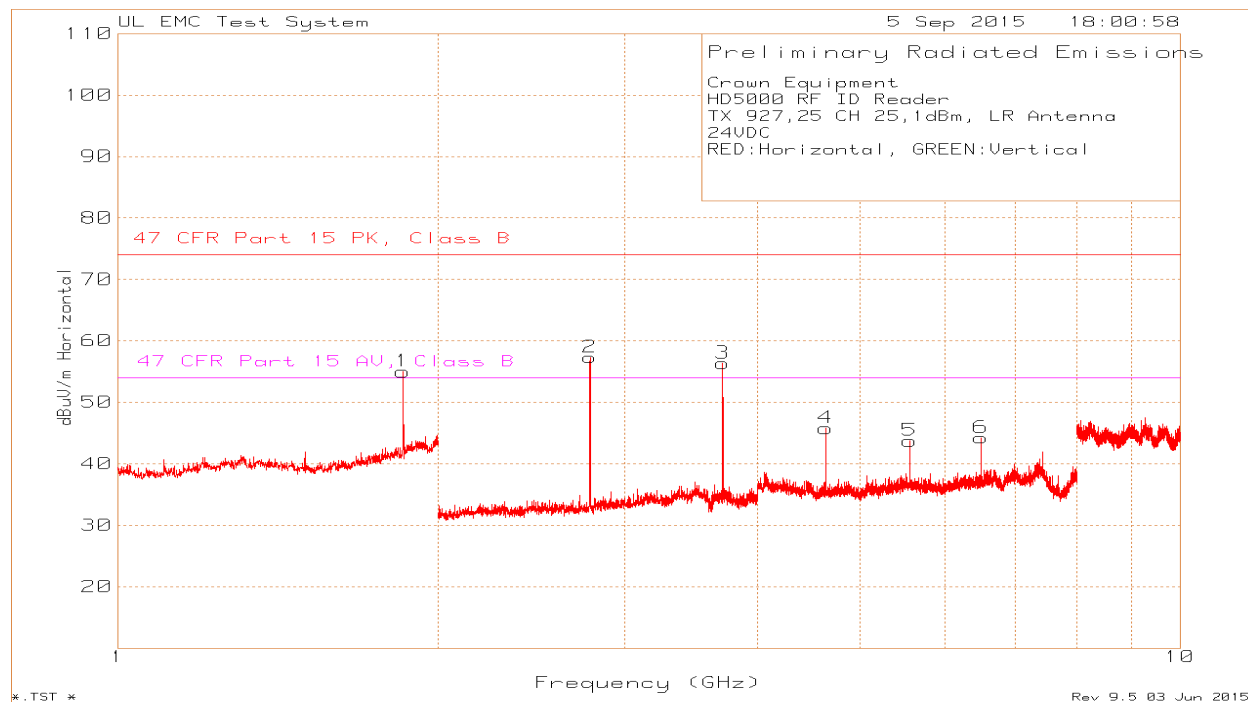
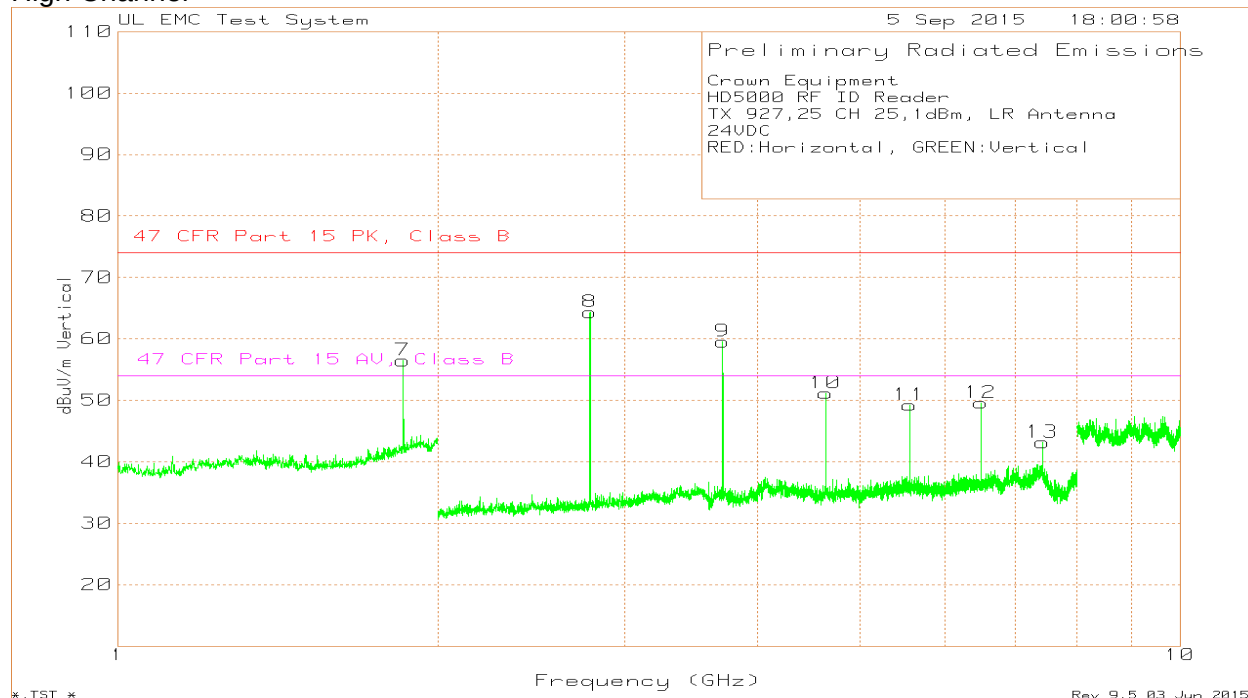
Crown Equipment																
HD5000 RF ID Reader																
TX 902,75 CH 25,1dBm, LR Antenna																
24VDC																
RED:Horizontal, GREEN:Vertical																
Marker No.	Test Frequency (GHz)	Meter Reading (dBuV)	Detector	Antenna Factor dB/m	BRF Factor dB	Path Factor dB	Level dBuV/m	Peak Limit dBuV/m	Peak Margin (dB)	DC Factor dB	Level with DC dB	47 CFR Part 15 AV, Class B	Margin (dB)	Azimuth [Degs]	Height [cm]	Polarity
1	1.8056	81.13	Pk	30.2	0.3	-53.99	57.64	74	-16.36	-	-	-	-	164	147	H
	1.8055	76.34	Av	30.2	0.3	-53.99	52.85			-8.4	44.45	54	-9.55	164	147	H
2	2.708	76.51	Pk	22.1		-51.42	47.19	74	-26.81	-8.4	38.79	54	-15.21	0-360	150	H
3	3.611	85.62	Pk	23.2		-50.9	57.92	74	-16.08	-	-	-	-	143	100	H
	3.611	80.75	Av	23.2		-50.9	53.05			-8.4	44.65	54	-9.35	143	100	H
4	4.5763	76.32	Pk	27.7		-51.82	52.2	74	-21.8	-	-	-	-	94	175	H
	4.5762	70.24	Av	27.7		-51.82	46.12			-8.4	37.72	54	-16.28	94	175	H
5	1.228	74.26	Pk	28.8	0.2	-56.18	47.08	74	-26.92	-8.4	38.68	54	-15.32	0-360	150	V
6	1.8055	81.88	Pk	30.2	0.3	-53.99	58.39	74	-15.61	-	-	-	-	153	100	V
	1.8055	76.32	Av	30.2	0.3	-53.99	52.83			-8.4	44.43	54	-9.57	153	100	V
7	2.7082	80.85	Pk	22.1		-51.42	51.53	74	-22.47	-	-	-	-	128	100	V
	2.7084	75.81	Av	22.1		-51.42	46.49			-8.4	38.09	54	-15.91	128	100	V
8	3.611	88.63	Pk	23.2		-50.9	60.93	74	-13.07	-	-	-	-	119	100	V
	3.611	85.6	Av	23.2		-50.9	57.9			-8.4	49.5	54	-4.5	119	100	V
9	5.417	66.2	Pk	27.9		-49.36	44.74	74	-29.26	-	-	54	-9.26	0-360	100	V
10	6.32	64.01	Pk	29.2		-47.18	46.03	74	-27.97	-	-	54	-7.97	0-360	100	V
11	7.222	60.01	Pk	29.9		-46.63	43.28	74	-30.72	-	-	54	-10.72	0-360	100	V
12	8.1249	66.8	Pk	36.2		-48.65	54.35	74	-19.65	-	-	-	-	148	155	V
	8.1248	58.22	Av	36.2		-48.65	45.77			-8.4	37.37	54	-16.63	148	155	V
Pk - Peak detector																

Middle Channel



Crown Equipment																	
HD5000 RF ID Reader																	
TX 915,25 CH 25,1dBm, LR Antenna																	
24VDC																	
RED:Horizontal, GREEN:Vertical																	
Marker No.	Test Frequency (GHz)	Meter Reading (dBuV)	Detector	Antenna Factor dB/m	BRF Factor dB	Path Factor dB	Level dBuV/m	Peak Limit dBuV/m	Peak Margin (dB)	DC Factor dB	Level with DC dB	47 CFR Part 15 AV, Class B	Margin (dB)	Azimuth [Degs]	Height [cm]	Polarity	
1	1.8305	79.57	Pk	30.6	0.4	-54.06	56.51	74	-17.49	-	-	-	-	72	100	H	
	1.8305	75.38	Av	30.6	0.4	-54.06	52.32	74	-21.68	-8.4	43.92	54	-10.08	72	100	H	
2	2.7457	83.6	Pk	22.1		-51.26	54.44	74	-19.56	-	-	-	-	87	174	H	
	2.7458	78.62	Av	22.1		-51.26	49.46	74	-24.54	-8.4	41.06	54	-12.94	87	174	H	
3	3.661	83.04	Pk	23.4		-49.63	56.81	74	-17.19	-	-	-	-	129	120	H	
	3.661	75.66	Av	23.4		-49.63	49.43	74	-24.57	-8.4	41.03	54	-12.97	129	120	H	
4	4.5763	76.32	Pk	27.7		-51.82	52.2	74	-21.8	-	-	-	-	94	175	H	
	4.5762	70.24	Av	27.7		-51.82	46.12	74	-27.88	-8.4	37.72	54	-16.28	94	175	H	
5	5.492	64.78	Pk	28.1		-49.45	43.43	74	-30.57	-	-	54	-10.57	0-360	149	H	
6	6.407	61.47	Pk	29.2		-47.18	43.49	74	-30.51	-	-	54	-10.51	0-360	149	H	
7	7.323	58.28	Pk	30.6		-45.95	42.93	74	-31.07	-	-	54	-11.07	0-360	149	H	
8	8.237	58.46	Pk	36.4		-46.92	47.94	74	-26.06	-	-	54	-6.06	0-360	150	H	
9	1.8305	81.37	Pk	30.6	0.4	-54.06	58.31	74	-15.69	-	-	-	-	173	155	V	
	1.8305	76.43	Av	30.6	0.4	-54.06	53.37	74	-20.63	-8.4	44.97	54	-9.03	173	155	V	
10	2.7458	89.09	Pk	22.1		-51.26	59.93	74	-14.07	-	-	-	-	324	100	V	
	2.7457	84.58	Av	22.1		-51.26	55.42	74	-18.58	-8.4	47.02	54	-6.98	324	100	V	
11	3.6611	85.98	Pk	23.4		-49.63	59.75	74	-14.25	-	-	-	-	124	100	V	
	3.6609	79.79	Av	23.4		-49.63	53.56	74	-20.44	-8.4	45.16	54	-8.84	124	100	V	
12	4.5763	77.82	Pk	27.7		-51.82	53.7	74	-20.3	-	-	-	-	159	140	V	
	4.5762	72.11	Av	27.7		-51.82	47.99	74	-26.01	-8.4	39.59	54	-14.41	159	140	V	
13	5.492	65.68	Pk	28.1		-49.45	44.33	74	-29.67	-	-	54	-9.67	0-360	150	V	
14	6.407	64.16	Pk	29.2		-47.18	46.18	74	-27.82	-	-	54	-7.82	0-360	100	V	
15	7.323	60.42	Pk	30.6		-45.95	45.07	74	-28.93	-	-	54	-8.93	0-360	150	V	
16	8.2375	65.73	Pk	36.4		-46.91	55.22	74	-18.78	-	-	-	-	218	160	V	
	8.2372	56.94	Av	36.4		-46.92	46.42	74	-27.58	-8.4	38.02	54	-15.98	218	160	V	
Pk - Peak detector																	

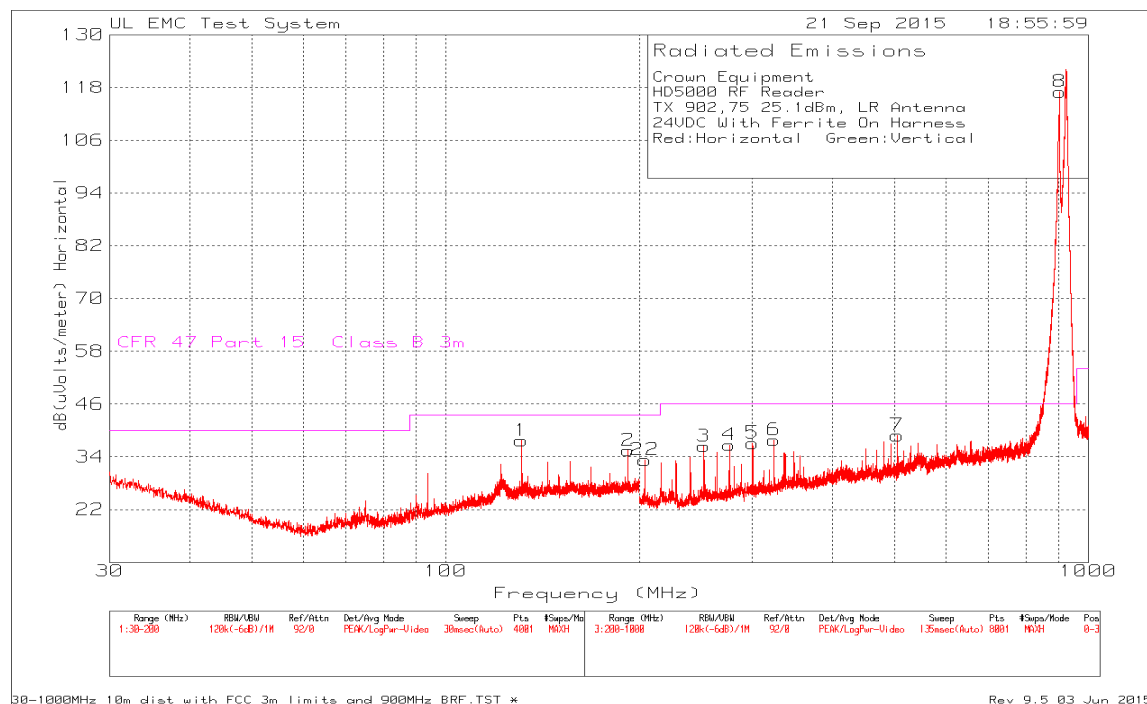
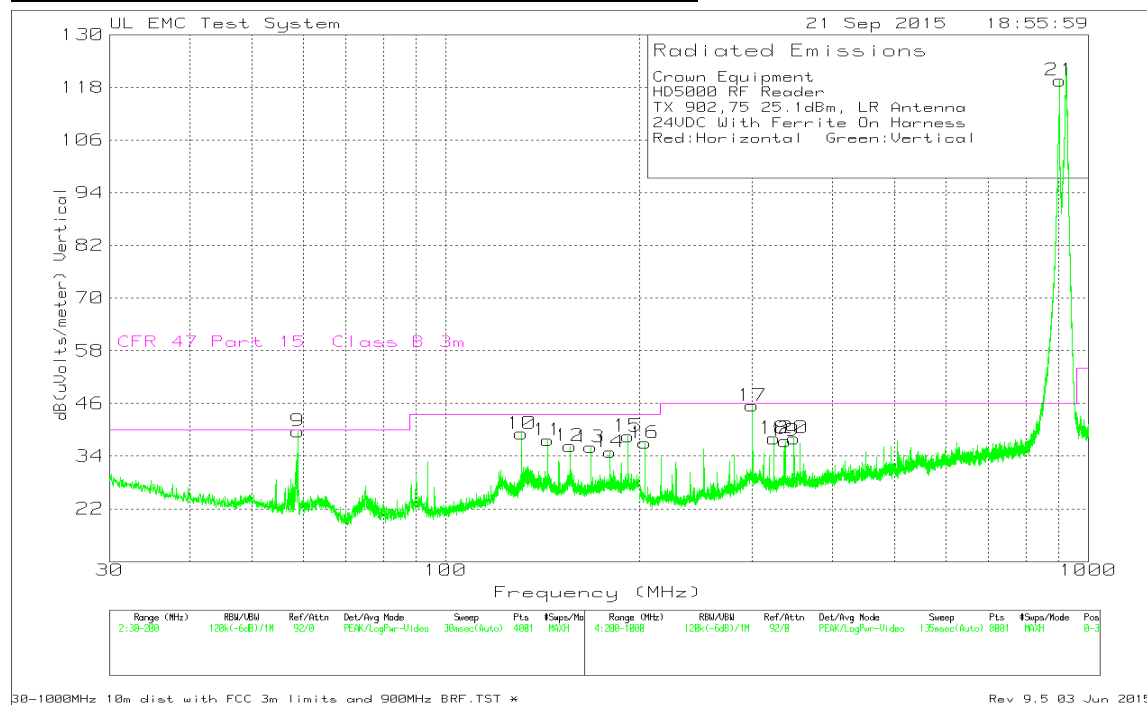
High Channel



Crown Equipment																
HD5000 RF ID Reader																
TX 927, 25 CH 25, 1dBm, LR Antenna																
24VDC																
RED:Horizontal, GREEN:Vertical																
Marker No.	Test Frequency (GHz)	Meter Reading (dBuV)	Detector	Antenna Factor dB/m	BRF Factor dB	Path Factor dB	Level dBuV/m	Peak Limit dBuV/m	Peak Margin (dB)	DC Factor dB	Level with DC dB	47 CFR Part 15 AV, Class B	Margin (dB)	Azimuth [Degs]	Height [cm]	Polarity
1	1.855	77.67	Pk	30.9	0.3	-53.87	55	74	-19	-8.4	46.6	54	-7.4	0-360	100	H
2	2.7817	87.65	Pk	22.2		-51.05	58.8	74	-15.2	-	-	-	-	146	100	H
	2.7817	82.84	Av	22.2		-51.05	53.99	74	-20.01	-8.4	45.59	54	-8.41	146	100	H
3	3.7089	84.1	Pk	23.6		-49.76	57.94	74	-16.06	-	-	-	-	242	100	H
	3.709	81.04	Av	23.6		-49.76	54.88	74	-19.12	-8.4	46.48	54	-7.52	242	100	H
4	4.636	69.86	Pk	27.7		-51.75	45.81	74	-28.19	-8.4	37.41	54	-16.59	0-360	149	H
5	5.564	65.28	Pk	28.3		-49.82	43.76	74	-30.24	-8.4	35.36	54	-18.64	0-360	100	H
6	6.491	62.82	Pk	29.1		-47.68	44.24	74	-29.76	-8.4	35.84	54	-18.16	0-360	149	H
7	1.855	79.18	Pk	30.9	0.3	-53.87	56.51	74	-17.49	-8.4	48.11	54	-5.89	0-360	100	V
8	2.7817	93.86	Pk	22.2		-51.05	65.01	74	-8.99	-	-	-	-	325	100	V
	2.7817	90.49	Av	22.2		-51.05	61.64	74	-12.36	-8.4	53.24	54	-0.76	325	100	V
9	3.709	87.57	Pk	23.6		-49.76	61.41	74	-12.59	-	-	-	-	117	100	V
	3.709	84.48	Av	23.6		-49.76	58.32	74	-15.68	-8.4	49.92	54	-4.08	117	100	V
10	4.636	75.22	Pk	27.7		-51.75	51.17	74	-22.83	-8.4	42.77	54	-11.23	0-360	150	V
11	5.564	70.75	Pk	28.3		-49.82	49.23	74	-24.77	-8.4	40.83	54	-13.17	0-360	100	V
12	6.491	68.18	Pk	29.1		-47.68	49.6	74	-24.4	-8.4	41.2	54	-12.8	0-360	100	V
13	7.419	58.94	Pk	30.9		-46.71	43.13	74	-30.87	-8.4	34.73	54	-19.27	0-360	100	V
Pk - Peak detector																

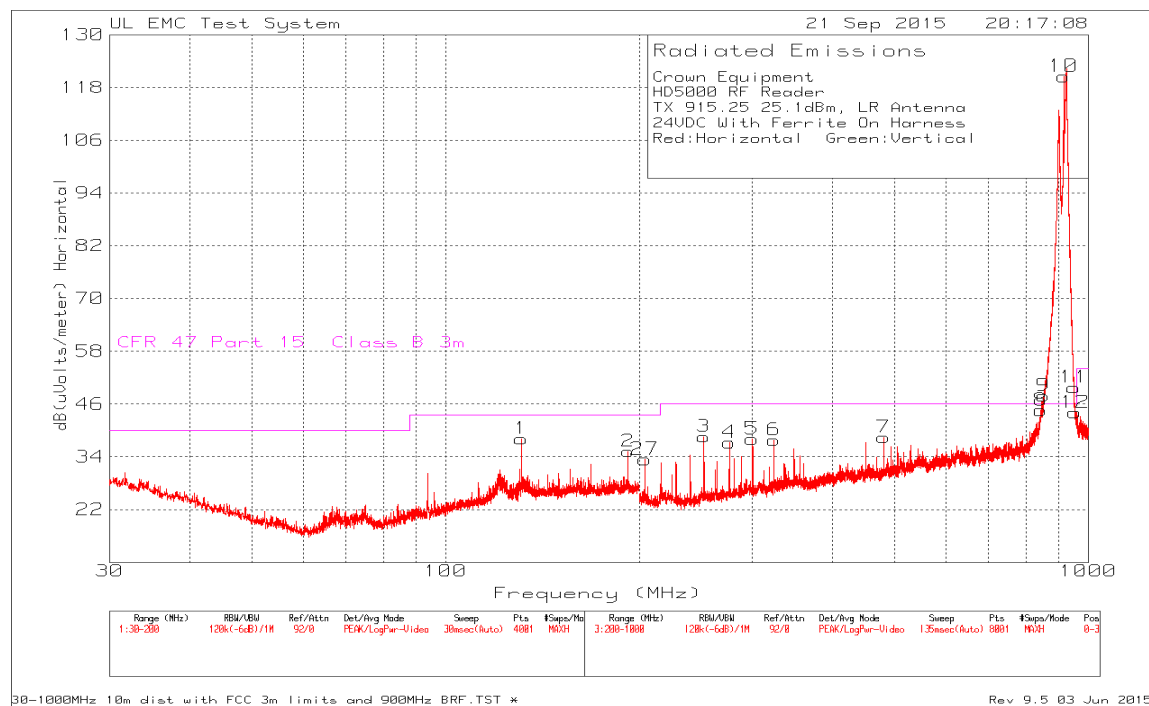
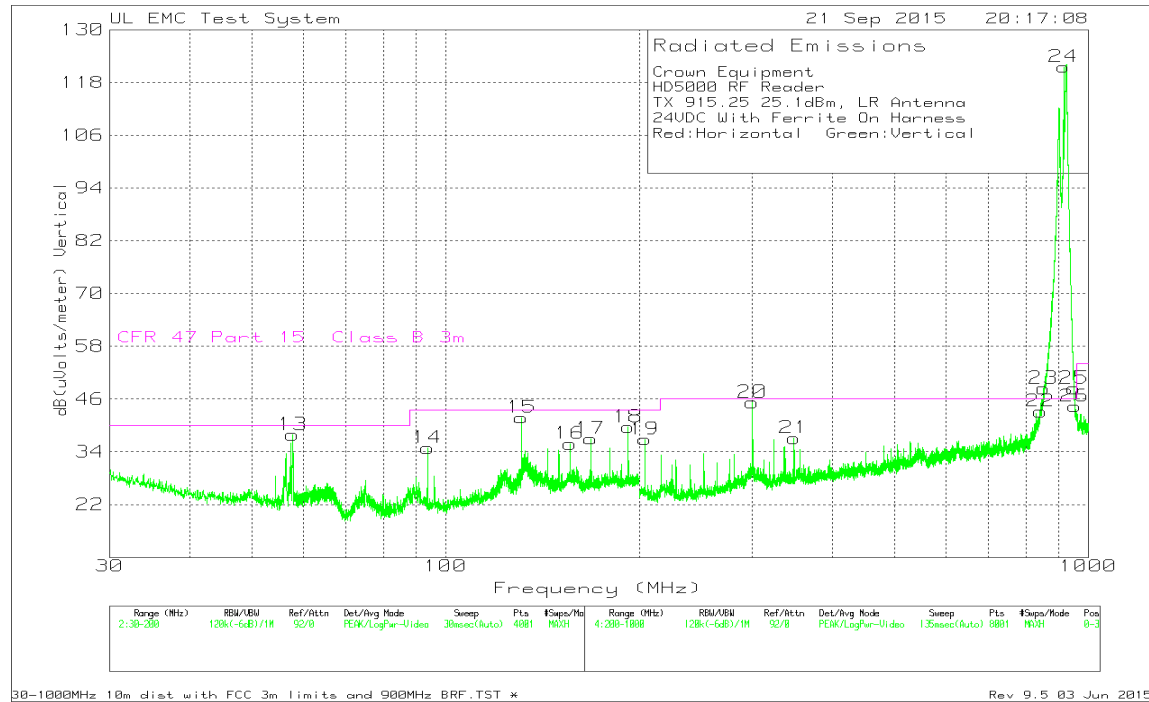
8.3. RADIATED EMISSIONS BELOW 1 GHz

SPURIOUS EMISSIONS 30 TO 1000 MHz Low Channel



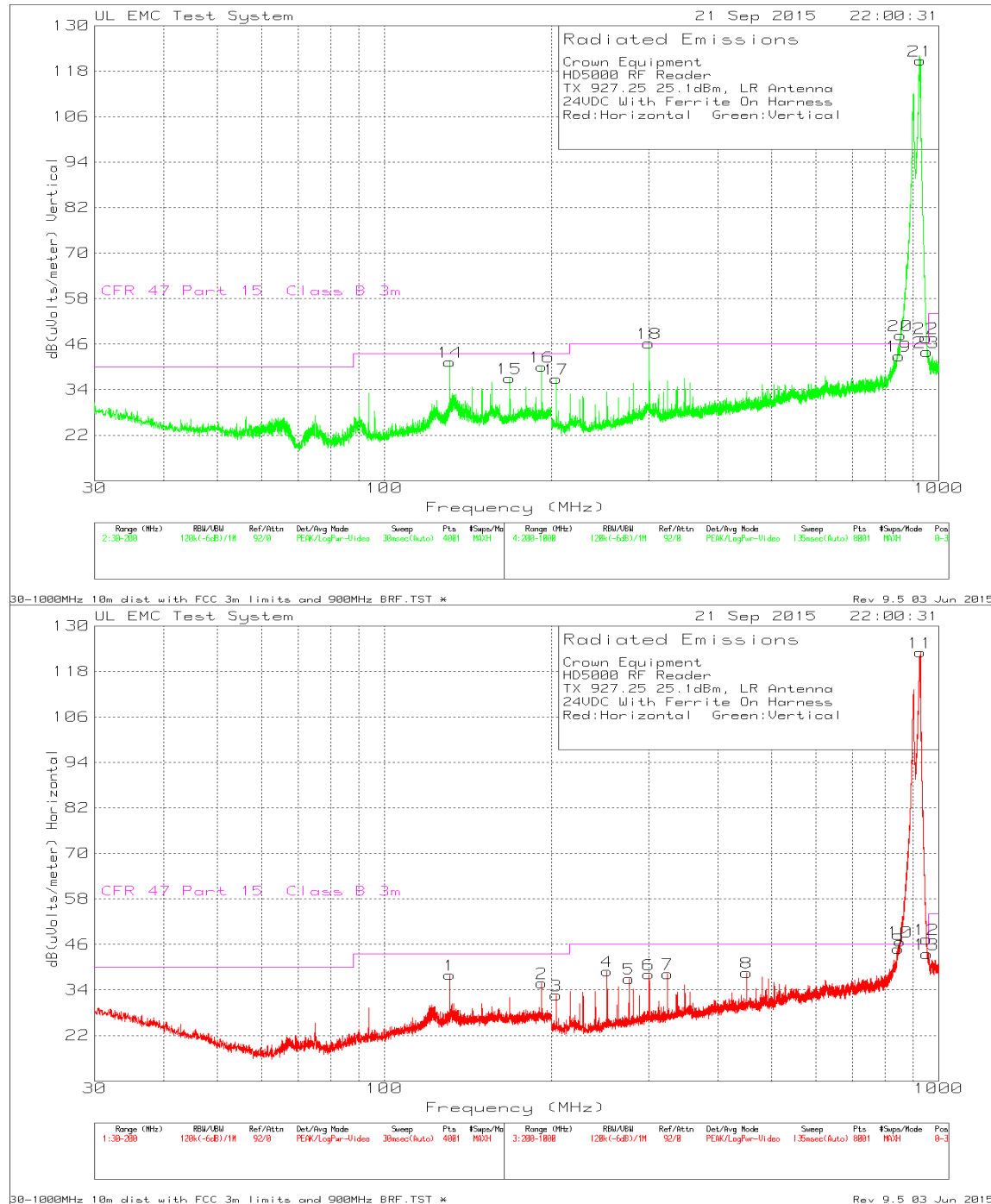
Crown Equipment HD5000 RF Reader TX 902.75 25.1dBm, LR Antenna 24VDC With Ferrite On Harness Red:Horizontal Green:Vertical													
Marker No.	Test Frequency (MHz)	Meter Reading (dBuV)	Detector	Antenna Factor dB/m	Path Factor dB	10m to 3m Factor dB	BRF Factor dB	Level dBuV/m	Part 15.209 3m Limit dBuV/m	Margin (dB)	Azimuth [Degs]	Height [cm]	Polarity
1	131.2775	42.48	Pk	14.5	-29.8	10.5	-	37.68	43.52	-5.84	0-360	398	H
2	192.2225	38.04	Pk	15.9	-29	10.5	-	35.44	43.52	-8.08	0-360	398	H
9	58.9	52.05	Pk	7.2	-30.1	10.5	-	39.65	40	-0.35	0-360	102	V
10	131.235	44.42	Pk	14	-29.8	10.5	-	39.12	43.52	-4.4	0-360	102	V
11	144.1975	42.55	Pk	14.4	-29.8	10.5	-	37.65	43.52	-5.87	0-360	102	V
12	156.1825	40.52	Pk	14.9	-29.6	10.5	-	36.32	43.52	-7.2	0-360	102	V
13	168.21	39.85	Pk	15.2	-29.5	10.5	-	36.05	43.52	-7.47	0-360	102	V
14	180.2375	37.84	Pk	15.9	-29.3	10.5	-	34.94	43.52	-8.58	0-360	102	V
15	192.2225	40.92	Pk	16.1	-29	10.5	-	38.52	43.52	-5	0-360	102	V
3	252.3	42.29	Pk	12.1	-28.7	10.5	0.2	36.39	46.02	-9.63	0-360	399	H
4	276.3	41.89	Pk	12.9	-28.7	10.5	0.1	36.69	46.02	-9.33	0-360	299	H
5	300.3	41.67	Pk	13.2	-28.5	10.5	0.2	37.07	46.02	-8.95	0-360	399	H
6	324.3	41.19	Pk	13.9	-28	10.5	0.2	37.79	46.02	-8.23	0-360	299	H
7	504.5	38.04	Pk	17.5	-27.4	10.5	0.2	38.84	46.02	-7.18	0-360	199	H
8	902.8	45.69	Pk	23	-26.4	10.5	64.2	116.99	46.02	70.97	0-360	103	H
22	204.2	40.39	Pk	11.3	-29	10.5	0.1	33.29	43.52	-10.23	0-360	399	H
23	843	29.33	Pk	22.4	-26.4	10.5	7.1	42.93	46.02	-3.09	0-360	399	H
24	852.6	29.65	Pk	21.9	-26.9	10.5	11.9	47.05	46.02	1.03	0-360	399	H
25	949.9	30.37	Pk	23	-26.6	10.5	11.2	48.47	46.02	2.45	0-360	103	H
26	953.5	28.92	Pk	23.3	-26.3	10.5	6.8	43.22	46.02	-2.8	0-360	199	H
16	204.2	44.1	Pk	11.3	-29	10.5	0.1	37	43.52	-6.52	0-360	102	V
17	300	50.11	Pk	13.2	-28.5	10.5	0.2	45.51	46.02	-0.51	0-360	102	V
18	324.3	41.43	Pk	13.9	-28	10.5	0.2	38.03	46.02	-7.99	0-360	399	V
19	337.5	40.14	Pk	14.6	-28	10.5	0.2	37.44	46.02	-8.58	0-360	102	V
20	348.4	40.47	Pk	15	-28.1	10.5	0.2	38.07	46.02	-7.95	0-360	102	V
21	902.8	48.24	Pk	23	-26.4	10.5	64.2	119.54	-	-	0-360	399	V
27	842.4	29.13	Pk	22.5	-26.5	10.5	6.8	42.43	-	-	0-360	302	V
28	853.2	29.89	Pk	21.9	-26.8	10.5	12.3	47.79	-	-	0-360	199	V
29	949.9	29.5	Pk	23	-26.6	10.5	11.2	47.6	-	-	0-360	302	V
30	953.5	28.65	Pk	23.3	-26.3	10.5	6.8	42.95	-	-	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	BRF Factor dB	Level dBuV/m	47 CFR Part 15.209 3m Limit dBuV/m	Margin (dB)	Azimuth [Degs]	Height [cm]	Polarity
	131.2538	41.84	Qp	14.5	-29.8	10.5	-	37.04	43.52	-6.48	257	396	H
	58.91	42.43	Qp	7.2	-30.1	10.5	-	30.03	40	-9.97	128	251	V
	58.9388	43.44	Qp	7.2	-30.1	10.5	-	31.04	40	-8.96	127	313	V
	131.249	46.72	Qp	14	-29.8	10.5	-	41.42	43.52	-2.1	24	103	V
	144.159	41.05	Qp	14.4	-29.8	10.5	-	36.15	43.52	-7.37	224	101	V
	192.212	40.87	Qp	16.1	-29	10.5	-	38.47	43.52	-5.05	111	102	V
	300.0039	49.81	Qp	13.2	-28.5	10.5	0.2	45.21	46.02	-0.81	258	123	V
	204.2233	43.83	Qp	11.3	-29	10.5	0.1	36.73	43.52	-6.79	148	102	V
Qp - Quasi-Peak detector													

SPURIOUS EMISSIONS 30 TO 1000 MHz Middle Channel



Crown Equipment													
HD5000 RF Reader													
TX 915.25 25.1dBm, LR Antenna													
24VDC With Ferrite On Harness													
Red:Horizontal Green:Vertical													
Marker No.	Test Frequency (MHz)	Meter Reading (dBuV)	Detector	Antenna Factor dB/m	Path Factor dB	10m to 3m Factor dB	BRF Factor dB	Level dBuV/m	47 CFR Part 15.209 3m Limit dBuV/m	Margin (dB)	Azimuth [Degs]	Height [cm]	Polarity
1	131.2775	42.9	Pk	14.5	-29.8	10.5	-	38.1	43.52	-5.42	0-360	400	H
2	192.2225	37.86	Pk	15.9	-29	10.5	-	35.26	43.52	-8.26	0-360	400	H
13	57.795	50.06	Pk	7.4	-30.1	10.5	-	37.86	40	-2.14	0-360	398	V
14	93.75	44.66	Pk	9.7	-30	10.5	-	34.86	43.52	-8.66	0-360	248	V
15	131.2775	46.98	Pk	14.1	-29.8	10.5	-	41.78	43.52	-1.74	0-360	101	V
16	156.14	40.02	Pk	14.9	-29.6	10.5	-	35.82	43.52	-7.7	0-360	101	V
17	168.21	40.78	Pk	15.2	-29.5	10.5	-	36.98	43.52	-6.54	0-360	101	V
18	192.2225	42.03	Pk	16.1	-29	10.5	-	39.63	43.52	-3.89	0-360	101	V
3	252.3	44.48	Pk	12.1	-28.7	10.5	0.2	38.58	46.02	-7.44	0-360	399	H
4	276.3	42.44	Pk	12.9	-28.7	10.5	0.1	37.24	46.02	-8.78	0-360	299	H
5	300	42.61	Pk	13.2	-28.5	10.5	0.2	38.01	46.02	-8.01	0-360	299	H
6	324.3	41.22	Pk	13.9	-28	10.5	0.2	37.82	46.02	-8.2	0-360	399	H
7	480.5	37.76	Pk	17.2	-27.2	10.5	0.2	38.46	46.02	-7.56	0-360	199	H
8	843.3	30.88	Pk	22.4	-26.4	10.5	7.2	44.58	46.02	-1.44	0-360	199	H
9	851.6	30.96	Pk	22	-27	10.5	11.4	47.86	46.02	1.84	0-360	199	H
10	915.3	49.76	Pk	23	-26.1	10.5	63.3	120.46	46.02	74.44	0-360	299	H
11	950	31.87	Pk	23	-26.6	10.5	11	49.77	46.02	3.75	0-360	299	H
12	953.3	29.67	Pk	23.3	-26.4	10.5	7	44.07	46.02	-1.95	0-360	399	H
27	204.2	40.47	Pk	11.3	-29	10.5	0.1	33.37	43.52	-10.15	0-360	399	H
19	204.2	43.95	Pk	11.3	-29	10.5	0.1	36.85	43.52	-6.67	0-360	103	V
20	300	49.81	Pk	13.2	-28.5	10.5	0.2	45.21	46.02	-0.81	0-360	103	V
21	348.4	39.52	Pk	15	-28.1	10.5	0.2	37.12	46.02	-8.9	0-360	103	V
22	842.7	29.89	Pk	22.4	-26.5	10.5	6.9	43.19	-	-	0-360	202	V
23	851.5	31.61	Pk	22	-27	10.5	11.3	48.41	-	-	0-360	399	V
24	915.3	50.85	Pk	23	-26.1	10.5	63.3	121.55	-	-	0-360	202	V
25	950.2	30.8	Pk	23	-26.6	10.5	10.7	48.4	-	-	0-360	302	V
26	952.3	29.16	Pk	23.2	-26.5	10.5	8	44.36	-	-	0-360	399	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	BRF Factor dB	Level dBuV/m	47 CFR Part 15.209 3m Limit dBuV/m	Margin (dB)	Azimuth [Degs]	Height [cm]	Polarity
	131.2563	42.63	Qp	14.5	-29.8	10.5	-	37.83	43.52	-5.69	274	395	H
	131.26	47.16	Qp	14.1	-29.8	10.5	-	41.96	43.52	-1.56	20	102	V
	192.216	41.94	Qp	16.1	-29	10.5	-	39.54	43.52	-3.98	119	101	V
	57.9188	37.28	Qp	7.3	-30.1	10.5	-	24.98	40	-15.02	125	101	V
	58.9	39.72	Qp	7.2	-30.1	10.5	-	27.32	40	-12.68	125	299	V
	204.2289	44.27	Qp	11.3	-29	10.5	0.1	37.17	43.52	-6.35	154	103	V
	300.0034	50.3	Qp	13.2	-28.5	10.5	0.2	45.7	46.02	-0.32	258	118	V
Qp - Quasi-Peak detector													

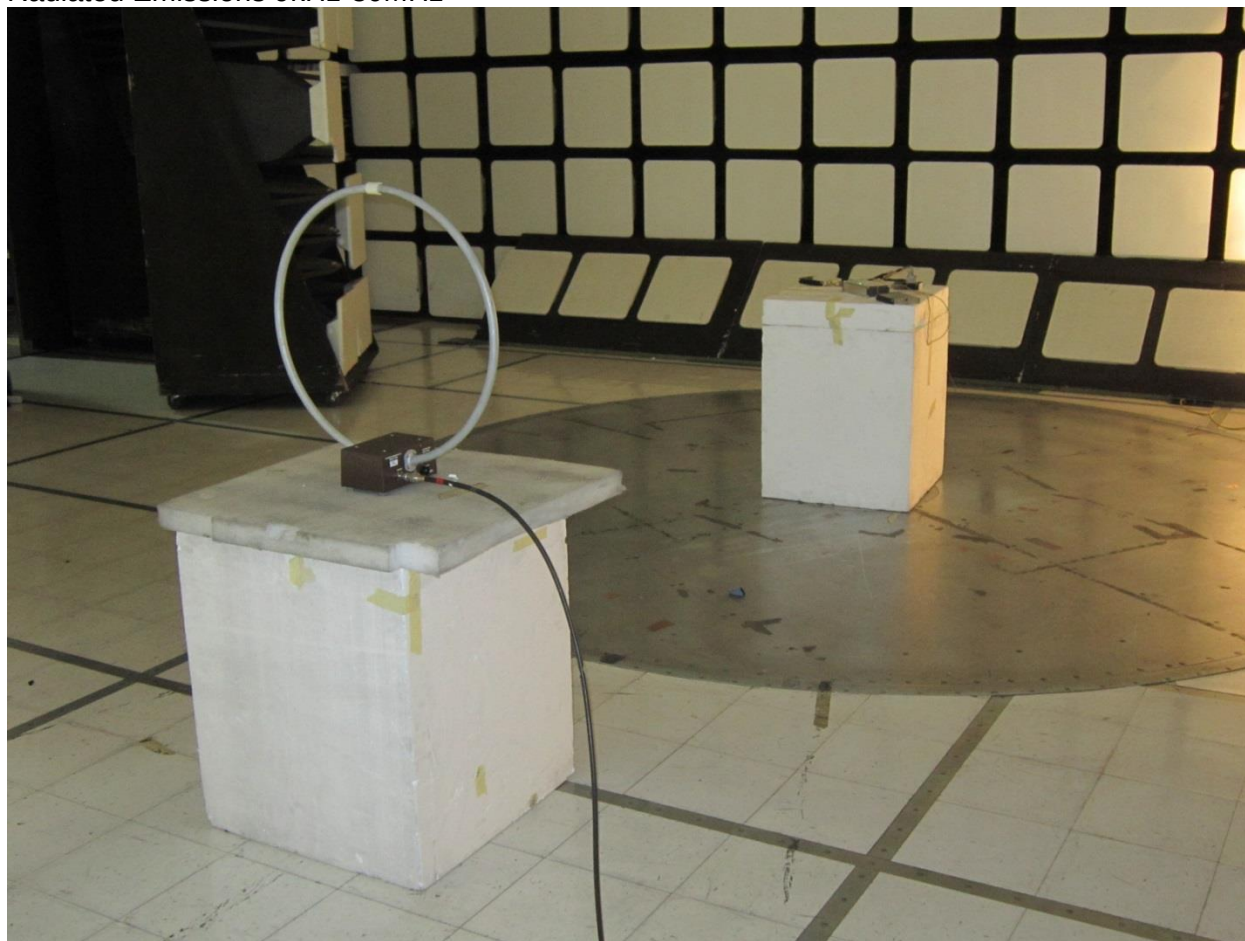
SPURIOUS EMISSIONS 30 TO 1000 MHz High Channel



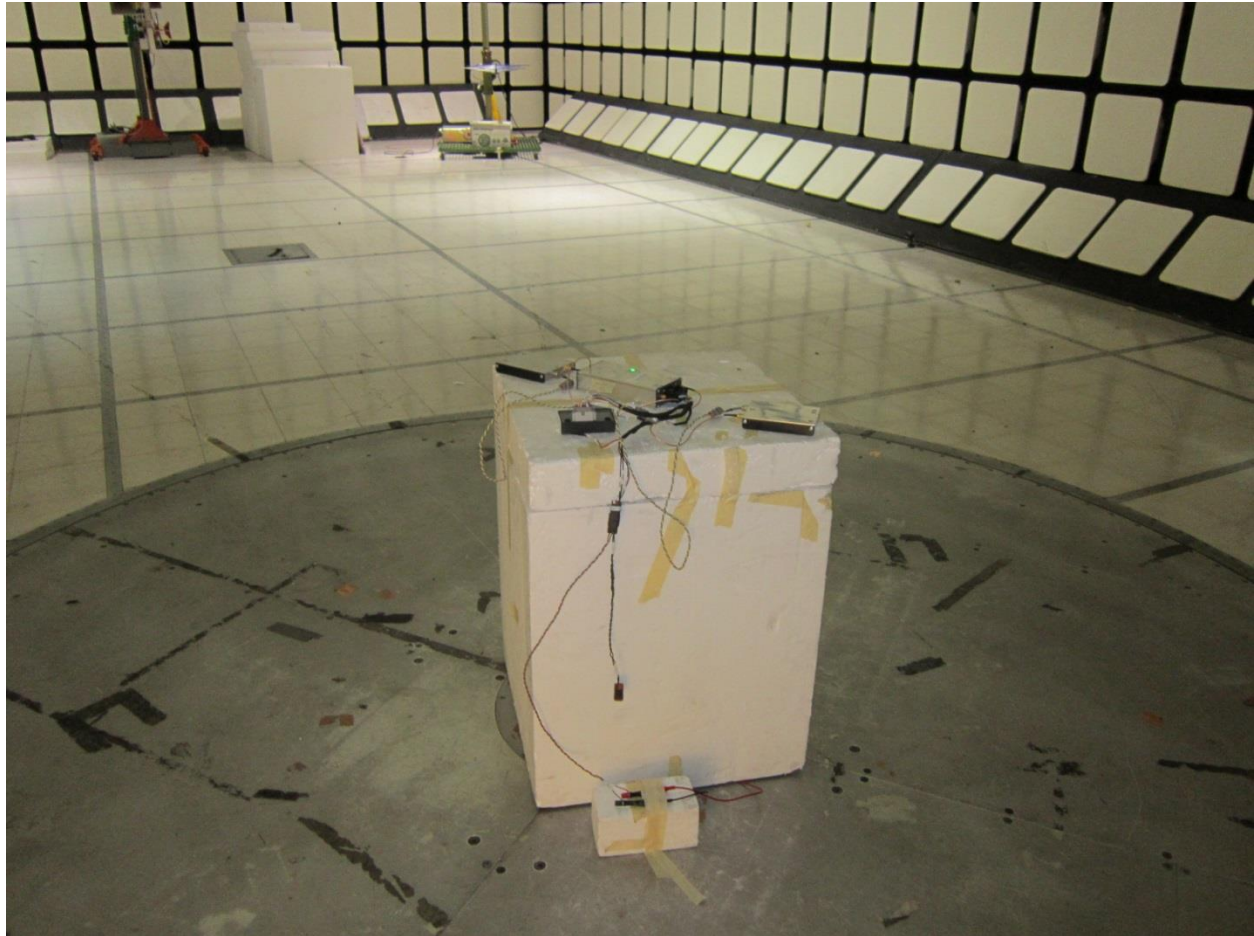
Crown Equipment HD5000 RF Reader TX 927.25 25.1dBm, LR Antenna 24VDC With Ferrite On Harness Red:Horizontal Green:Vertical													
Marker No.	Test Frequency (MHz)	Meter Reading (dBuV)	Detector	Antenna Factor dB/m	Path Factor dB	10m to 3m Factor dB	BRF Factor dB	Level dBuV/m	47 CFR Part 15.209 3m Limit dBuV/m	Margin (dB)	Azimuth [Degs]	Height [cm]	Polarity
1	131.2775	42.75	Pk	14.5	-29.8	10.5	-	37.95	43.52	-5.57	0-360	398	H
2	192.2225	38.38	Pk	15.9	-29	10.5	-	35.78	43.52	-7.74	0-360	398	H
14	131.235	46.6	Pk	14	-29.8	10.5	-	41.3	43.52	-2.22	0-360	101	V
15	168.21	40.8	Pk	15.2	-29.5	10.5	-	37	43.52	-6.52	0-360	101	V
16	192.2225	42.45	Pk	16.1	-29	10.5	-	40.05	43.52	-3.47	0-360	101	V
3	204.1	39.59	Pk	11.4	-29	10.5	0.1	32.59	43.52	-10.93	0-360	199	H
4	252.2	44.84	Pk	12.1	-28.7	10.5	0.2	38.94	46.02	-7.08	0-360	399	H
5	276.3	42.15	Pk	12.9	-28.7	10.5	0.1	36.95	46.02	-9.07	0-360	299	H
6	300	42.74	Pk	13.2	-28.5	10.5	0.2	38.14	46.02	-7.88	0-360	399	H
7	324.35	41.59	Pk	13.9	-28	10.5	0.2	38.19	46.02	-7.83	0-360	299	H
8	450	38.35	Pk	17.1	-27.6	10.5	0.2	38.55	46.02	-7.47	0-360	199	H
9	845.9	30.03	Pk	22.3	-26.4	10.5	8.4	44.83	46.02	-1.19	0-360	199	H
10	852.1	29.67	Pk	22	-27	10.5	11.6	46.77	46.02	0.75	0-360	199	H
11	927.3	42.51	Pk	22.8	-26.1	10.5	73.3	123.01	46.02	76.99	0-360	299	H
12	950.3	29.91	Pk	23	-26.6	10.5	10.5	47.31	46.02	1.29	0-360	399	H
13	952	27.96	Pk	23.2	-26.6	10.5	8.4	43.46	46.02	-2.56	0-360	299	H
17	204.2	43.95	Pk	11.3	-29	10.5	0.1	36.85	43.52	-6.67	0-360	103	V
18	300	50.81	Pk	13.2	-28.5	10.5	0.2	46.21	46.02	0.19	0-360	103	V
19	848.1	27.38	Pk	22.2	-26.7	10.5	9.5	42.88	-	-	0-360	103	V
20	853.3	30.46	Pk	21.9	-26.8	10.5	12.3	48.36	-	-	0-360	399	V
21	927.3	40.27	Pk	22.8	-26.1	10.5	73.3	120.77	-	-	0-360	103	V
22	949.9	29.5	Pk	23	-26.6	10.5	11.2	47.6	-	-	0-360	299	V
23	952.1	28.42	Pk	23.2	-26.5	10.5	8.3	43.92	-	-	0-360	199	V
Pk - Peak detector													
	Test Frequency (MHz)	Meter Reading (dBuV)	Detector	Antenna Factor dB/m	Path Factor dB	10m to 3m Factor dB	BRF Factor dB	Level dBuV/m	47 CFR Part 15.209 3m Limit dBuV/m	Margin (dB)	Azimuth [Degs]	Height [cm]	Polarity
	131.2515	42.48	Qp	14.5	-29.8	10.5	-	37.68	43.52	-5.84	278	395	H
	131.2555	46.8	Qp	14.1	-29.8	10.5	-	41.6	43.52	-1.92	15	103	V
	192.216	41.95	Qp	16.1	-29	10.5	-	39.55	43.52	-3.97	121	101	V
	168.1863	40.14	Qp	15.2	-29.5	10.5	-	36.34	43.52	-7.18	85	102	V
	300.0038	50.5	Qp	13.2	-28.5	10.5	0.2	45.9	46.02	-0.12	258	119	V
	204.224	44.31	Qp	11.3	-29	10.5	0.1	37.21	43.52	-6.31	149	102	V
Qp - Quasi-Peak detector													

9. SETUP PHOTOS

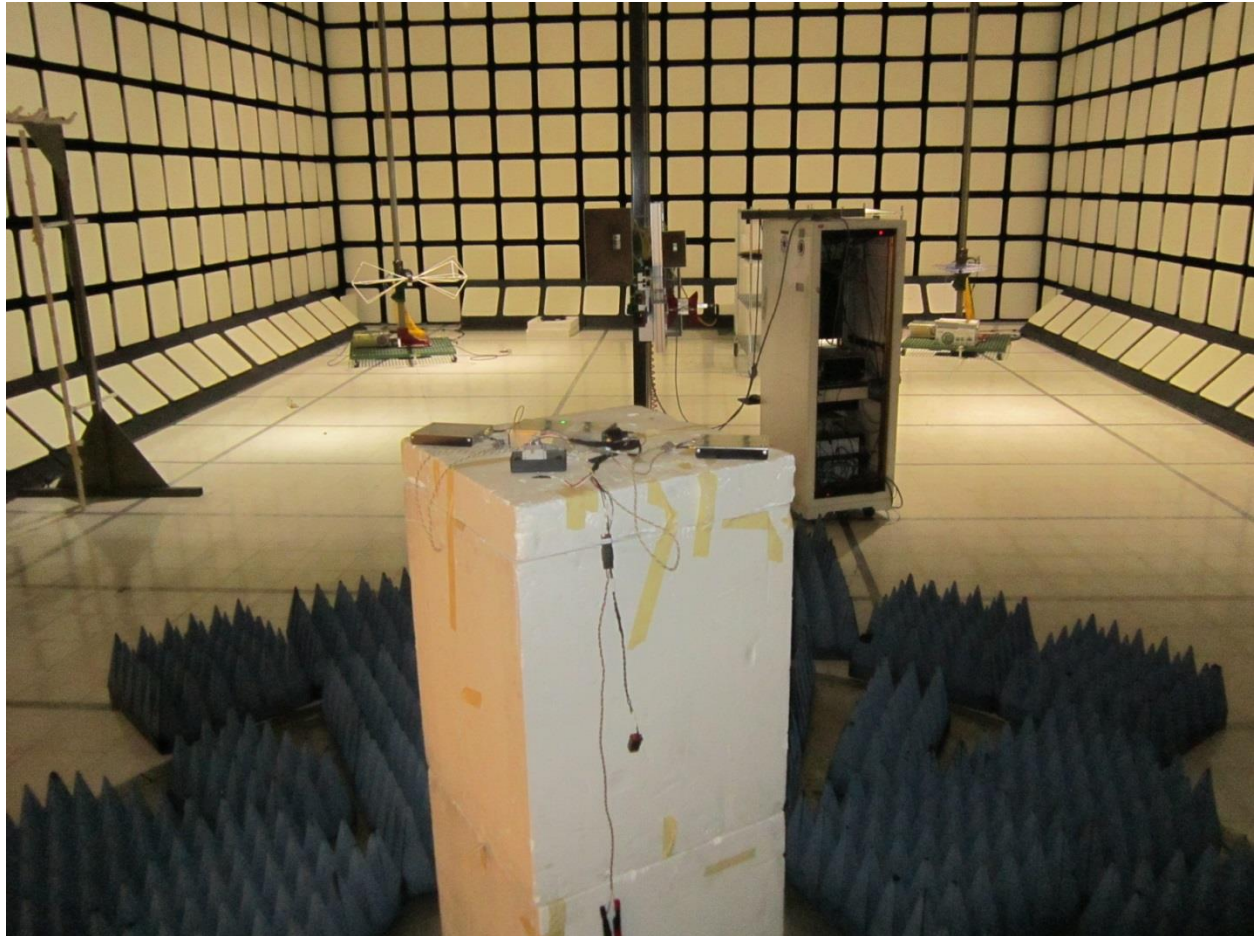
Radiated Emissions 9kHz-30MHz



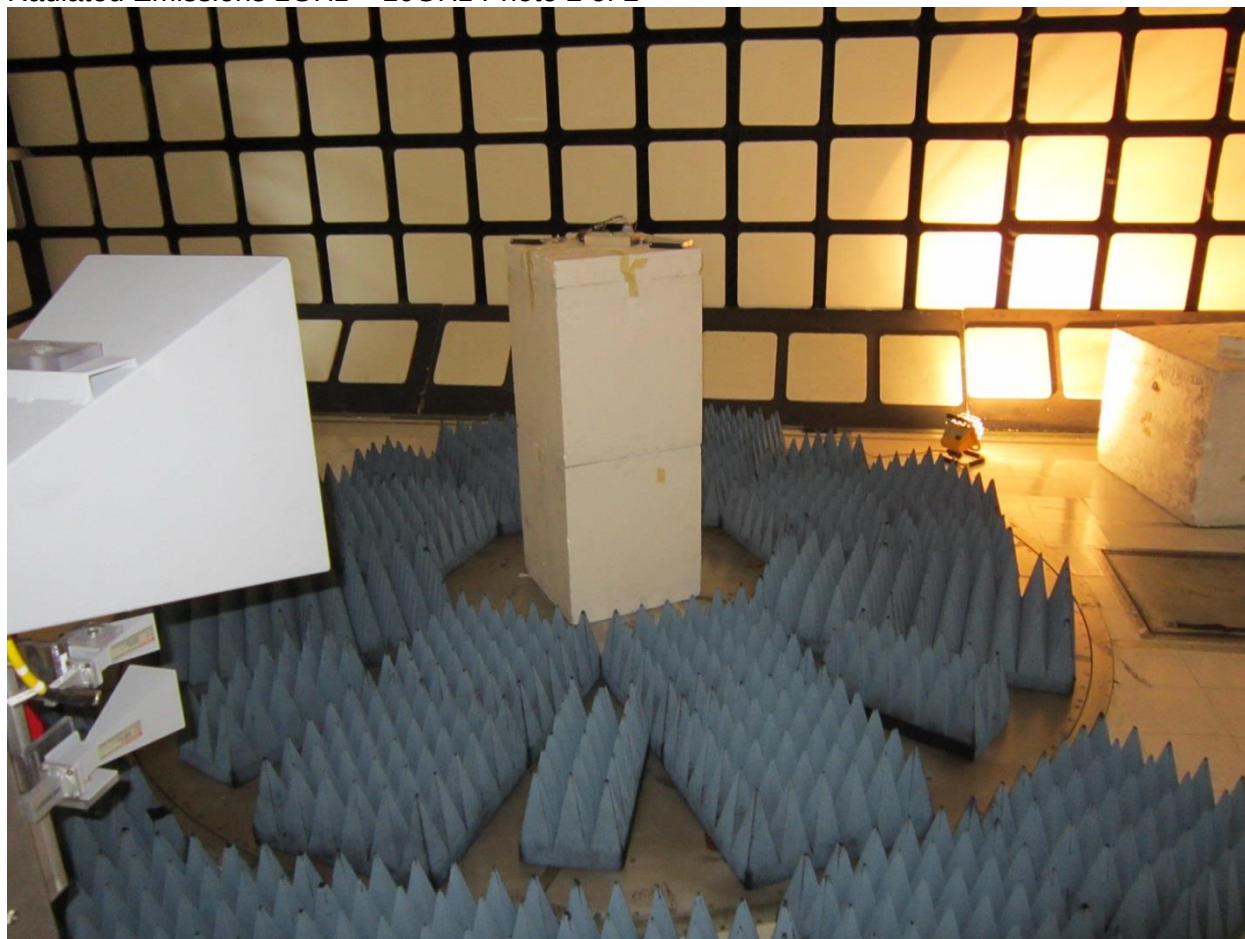
Radiated Emissions 30MHz – 1GHz



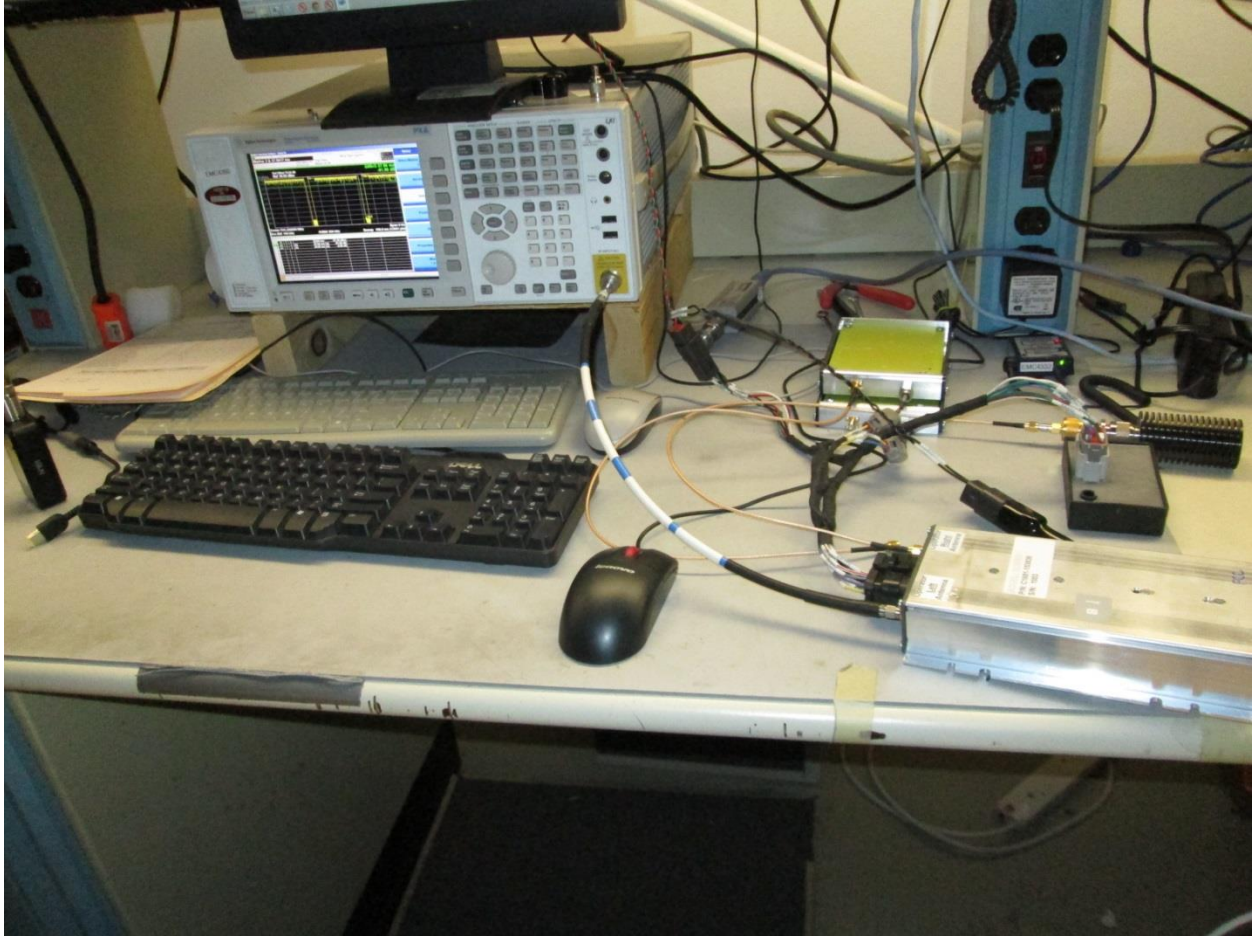
Radiated Emissions 1GHz – 10GHz Photo 1 of 2



Radiated Emissions 1GHz – 10GHz Photo 2 of 2



Antenna Port Measurements



END OF REPORT