CERTIFICATION TEST REPORT

Report Number: R12665892-E1

Applicant	:	Symmons Industries, Inc. 31 Brooks Drive, Braintree, MA 02184, USA
Model	:	WW-05256
FCC ID	:	2ASQP-WW05256
IC	:	24889-WW05256
EUT Description	:	Wireless Battery Power Temperature Sensor
Test Standard(s)	:	FCC 47 CFR PART 15 SUBPART C ISED RSS-247 ISSUE 2 ISED RSS-GEN ISSUE 5

Date Of Issue:
2019-06-11

Prepared by:
UL LLC
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NVLAP TESTING
NVLAP Lab code: 200246-0

REPORT REVISION HISTORY

Ver.	Issue Date	Revisions	Revised By
1	2019-06-11	Initial Issue	Brian T. Kiewra
2	2019-07-18	Updated Customer Name and Address	Lariah Ijames

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: Symmons Industries, Inc.
31 Brooks Drive, Braintree, MA 02184, USA

EUT DESCRIPTION: Wireless Battery Power Temperature Sensor

MODEL: WW-05256

SERIAL NUMBER: Non-Serialized

DATE TESTED: 2019-04-02 to 2019-05-16

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
CFR 47 Part 15 Subpart C	Compliant
ISED RSS-247 Issue 2	Compliant
ISED RSS-GEN Issue 5	Compliant

UL LLC tested the above equipment in accordance with the requirements set forth in the above standards. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. All samples tested were in good operating condition throughout the entire test program. Measurement Uncertainties are published for informational purposes only and were not taken into account unless noted otherwise.

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Approved & Released
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Prepared By:

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2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with FCC CFR 47 Part 2, FCC CFR 47 Part 15, ANSI C63.10-2013, KDB 558074 D01 15.247 Meas Guidance v05r02, RSS-GEN Issue 5, and RSS-247 Issue 2.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 12 Laboratory Drive, Research Triangle Park, North Carolina 27709, USA and 2800 Perimeter Park Dr., Suite B, Morrisville, North Carolina 27560, USA. The following table identifies which facilities were utilized for radiated emission measurements documented in this report. Specific facilities are also identified in the test results sections.

12 Laboratory Dr.	2800 Perimeter Park Dr.
ISED Site Code: 2180C	
☐ Chamber A RTP	☐ North Chamber
☐ Chamber C RTP	☒ South Chamber

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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

RADIATED EMISSIONS
Where relevant, the following sample calculation is provided:
Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB)
36.5 dBuV + 18.7 dB/m + 0.6 dB – 26.9 dB = 28.9 dBuV/m

MAINS CONDUCTED EMISSIONS
Where relevant, the following sample calculation is provided:
Final Voltage (dBuV) = Measured Voltage (dBuV) + Cable Loss (dB) + Limiter Factor (dB) + LISN Insertion Loss.
36.5 dBuV + 0 dB +10.1 dB+ 0 dB = 46.6 dBuV

4.3. MEASUREMENT UNCERTAINTY

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

PARAMETER	UNCERTAINTY
Radio Frequency (Spectrum Analyzer)	141.2 Hz
Occupied Channel Bandwidth	2.00%
RF output power, conducted	1.3 dB (PK), 0.45 dB (AV)
RF output power, radiated (SAC)	4.52 dB
Power Spectral Density, conducted	2.47 dB
Unwanted Emissions, conducted	2.50 dB
All emissions, radiated	4.88 dB
Temperature	2.26°C
Humidity	6.79%
DC Supply voltages	1.70%
Time	3.39%

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

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5. EQUIPMENT UNDER TEST

5.1. EUT DESCRIPTION

The EUT is a battery operated wireless temperature sensor.

5.2. MAXIMUM OUTPUT POWER

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

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
902.3 - 914.9	125kHz	13.53	22.54
903.0 - 914.2	500kHz	13.53	22.54

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes an planar F-antenna, with a maximum gain of -0.6 dBi.

5.4. SOFTWARE AND FIRMWARE

The EUT firmware installed during testing was v0.8.2

5.5. WORST-CASE CONFIGURATION AND MODE

Radiated emissions below 30MHz were performed with the EUT set to transmit at the channel with highest output power as worst-case scenario.

Radiated emissions between 30MHz and 10GHz were performed with the EUT set to transmit at the highest power and PSD on low, middle and high channels.

The fundamental of the EUT was investigated in three orthogonal orientations X,Y,Z, it was determined that X orientation was worst-case orientation; therefore, all final radiated testing was performed with the EUT in X orientation.

The EUT was tested as a hybrid system while operating with a 125kHz bandwidth, and was tested as a DTS device while operating with a 500kHz bandwidth.

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5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
Leak Sensor	Symmons	WW-05300-KIT	031219012	N/A

I/O CABLES

I/O Cable List						
Cable No.	**Port**	**# of Identical Ports**	**Connector Type**	**Cable Type**	**Cable Length (m)**	**Remarks**
1	Mains	1	Soldered	Mains	<1m	DC Mains
2	I/O	1	4 pin barrel	Sensor	<3m	Connected to leak sensor

SETUP DIAGRAMS

Please refer to R12665892-EP1 for setup diagrams

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6. MEASUREMENT METHOD

On Time and Duty Cycle: ANSI C63.10 Section 11.6

6 dB BW: ANSI C63.10 Subclause 11.8.1

Emissions BW (20dB): ANSI C63.10-2013 Section 6.9.2

Occupied BW (99%): ANSI C63.10-2013 Section 6.9.3

Carrier Frequency Separation: ANSI C63.10-2013 Section 7.8.2

Number of Hopping Frequencies: ANSI C63.10-2013 Section 7.8.3

Time of Occupancy (Dwell Time): ANSI C63.10-2013 Section 7.8.4

Output Power: ANSI C63.10 Subclause 11.9.2.3.2 (AVGPM-G)

PSD: ANSI C63.10 Subclause 11.10.5 (AVGPSD-2)

Out-of-Band Emissions in non-restricted band: ANSI C63.10-2013 Section 7.8.6, 7.8.8, 6.10.4, 11.11

Out-of-band emissions in restricted bands: ANSI C63.10-2013 Section 6.3-6.5, 6.10.5, 11.12.1

General Radiated Emissions: ANSI C63.10:2013 Sections 6.3 – 6.6

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7. TEST AND MEASUREMENT EQUIPMENT

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

Test Equipment Used - Radiated Disturbance Emissions Test Equipment (Morrisville - South Chamber)

Equipment ID	Description	Manufacturer	Model Number	Last Cal.	Next Cal.
0.009-30MHz (Loop Ant.)					
AT0079	Active Loop Antenna	ETS-Lindgren	6502	2019-01-24	2020-01-31
30-1000 MHz					
AT0074	Hybrid Broadband Antenna	Sunol Sciences Corp.	JB3	2018-07-24	2019-07-24
1-18 GHz					
AT0069	Double-Ridged Waveguide Horn Antenna, 1 to 18 GHz	ETS Lindgren	3117	2018-04-30	2019-04-30
AT0072	Double-Ridged Waveguide Horn Antenna, 1 to 18 GHz	ETS Lindgren	3117	2019-04-22	2020-04-22
Gain-Loss Chains					
S-SAC01	Gain-loss string: 0.009-30MHz	Various	Various	2018-09-06	2019-09-06
S-SAC02	Gain-loss string: 25-1000MHz	Various	Various	2018-05-20	2019-05-20
S-SAC03	Gain-loss string: 1-18GHz	Various	Various	2019-03-13	2020-03-13
Receiver & Software					
SA0025	Spectrum Analyzer	Agilent	N9030A	2019-02-28	2020-02-28
SOFTEMI	EMI Software	UL	Version 9.5	NA	NA
Additional Equipment used					
BRF007	902-928MHz notch filter,2W, F_{high} =1.5GHz	Micro-Tronics	BRC17691	2019-03-08	2020-03-08
s/n 181474409	Environmental Meter	Fisher Scientific	15-077-963	2018-07-27	2020-07-27

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Test Equipment Used - Wireless Conducted Measurement Equipment

Equipment ID	Description	Manufacturer	Model Number	Last Cal.	Next Cal.
T177 (PRE0079253)	Spectrum Analyzer	Agilent Technologies	E4446A	2019-04-22	2020-04-22
76022	DC Regulated Power Supply	CircuitSpecialists. Com	CSI3005X5	N/A	N/A
72822 (PRE0100902)	Spectrum Analyzer	Agilent Technologies	E4446A	2018-11-19	2019-11-19
PWM003 (PRE0137346)	RF Power Meter	Keysight Technologies	N1911A	2018-07-30	2019-07-30
PWS003 (PRE0137348)	Peak and Avg Power Sensor, 50MHz to 18GHz	Keysight Technologies	E1921A	2018-07-30	2019-07-30
SN 181562858	Environmental Meter	Fisher Scientific	14-650-118	2018-09-04	2020-09-04
76021	DC Regulated Power Supply	CircuitSpecialists. Com	CSI3005X5	N/A	N/A

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8. ANTENNA PORT TEST RESULTS

8.1. ON TIME AND DUTY CYCLE

LIMITS

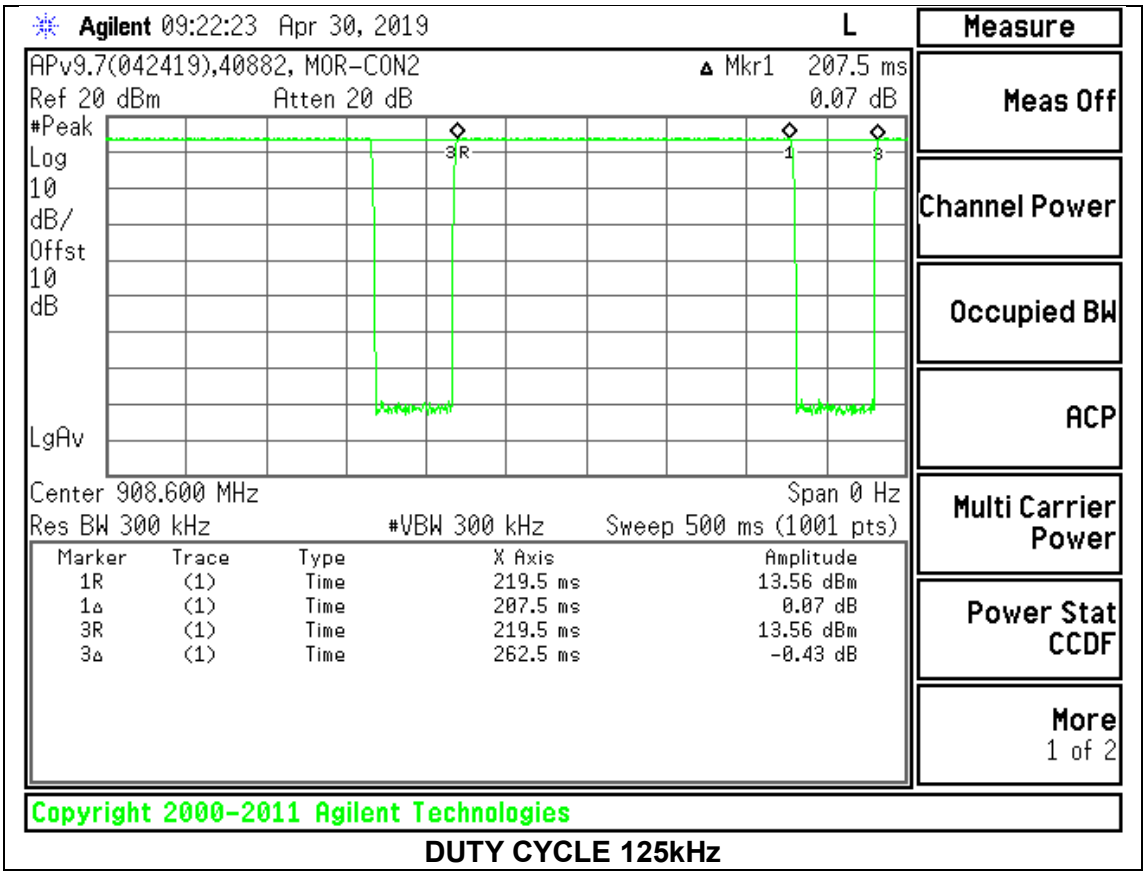
None; for reporting purposes only.

PROCEDURE

ANSI C63.10 Section 11.6 Zero-Span Spectrum Analyzer Method.

Mode	ON Time B (msec)	Period (msec)	Duty Cycle x (linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	1/B Minimum VBW (kHz)
902-928MHz Band						
125kHz BW	207.5	262.5	0.790	79.05%	1.02	0.005
500kHz BW	53.7	105.0	0.511	51.11%	2.91	0.019

DUTY CYCLE PLOTS



DUTY CYCLE 125kHz

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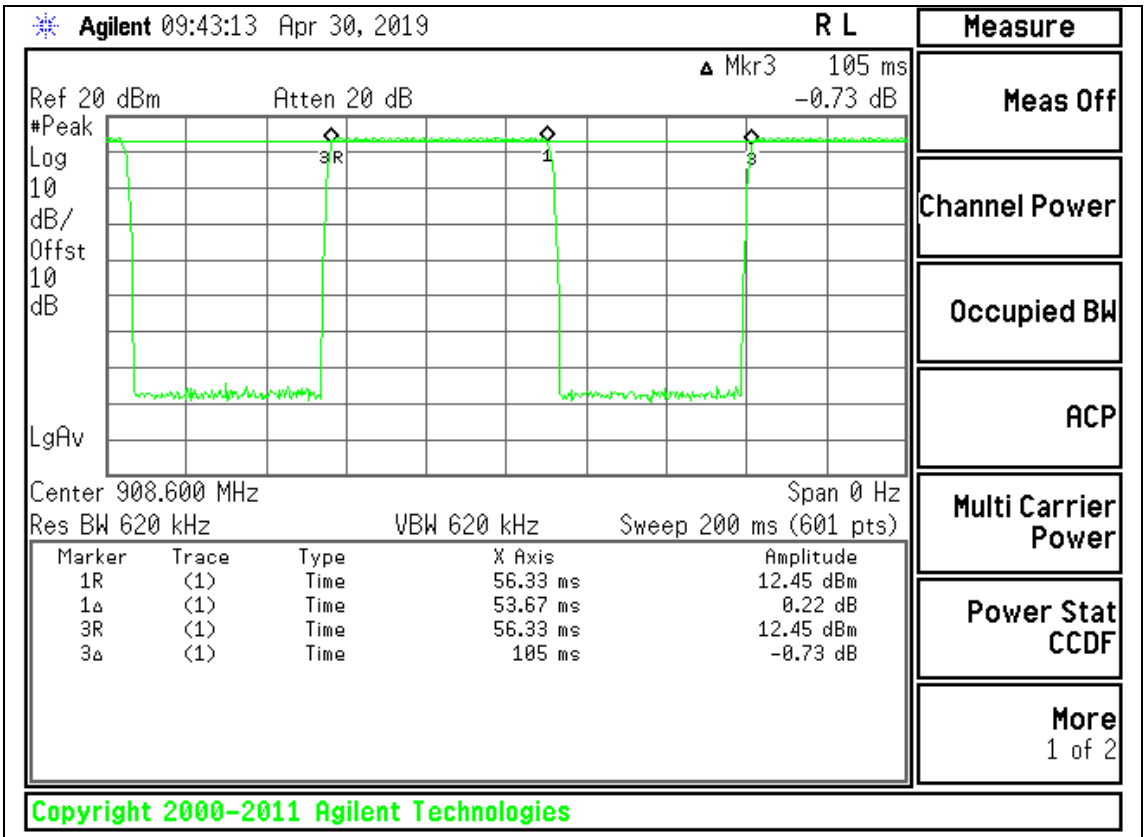

DUTY CYCLE 500kHz

Note – The resolution bandwidth was set to be slightly greater than the 6 dB DTS Emissions bandwidth (125kHz 6 dB BW is approx. 275 kHz and 500 kHz 6 dB BW is approx. 615 kHz)

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8.2. 99% BANDWIDTH

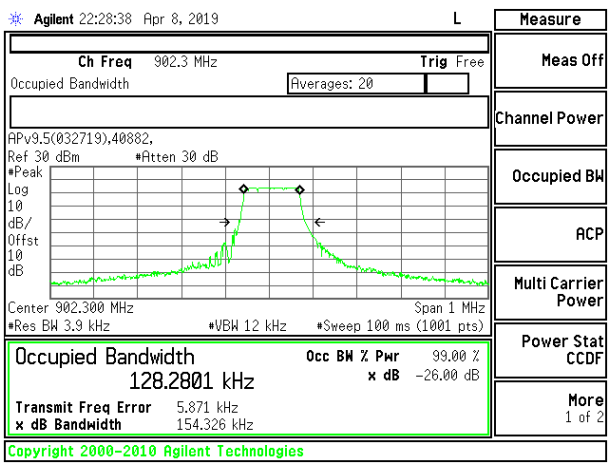
LIMITS

None; for reporting purposes only.

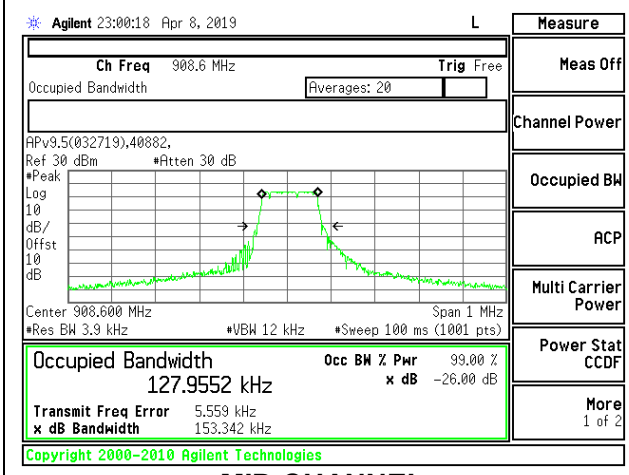
RESULTS

8.2.1. 125kHz BANDWIDTH

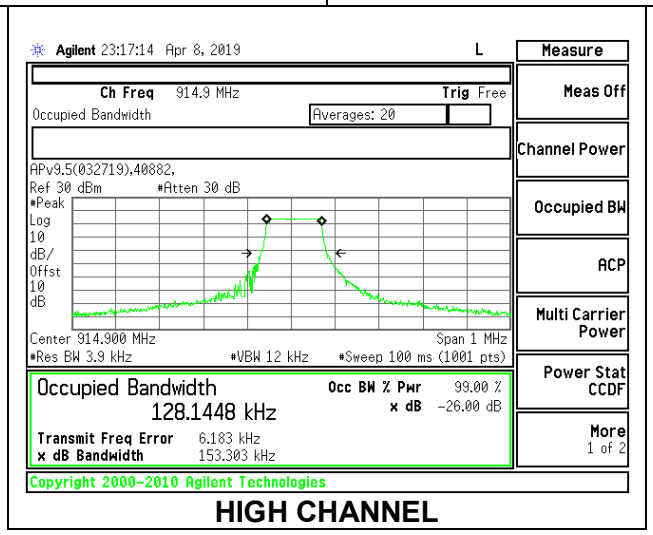
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	902.3	0.1282801
Middle	908.6	0.1279552
High	914.9	0.1281448



LOW CHANNEL



MID CHANNEL



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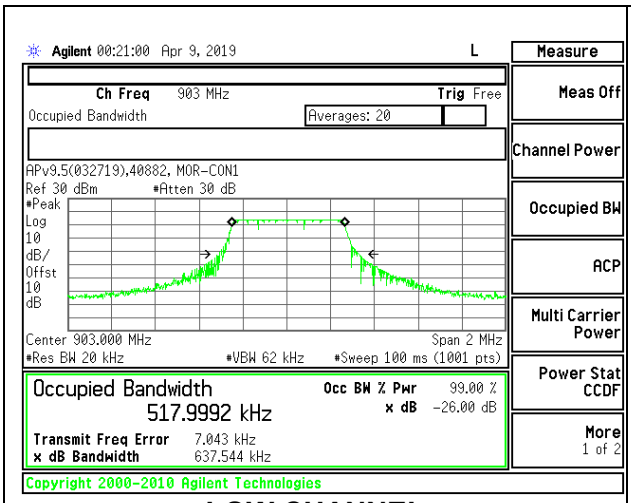
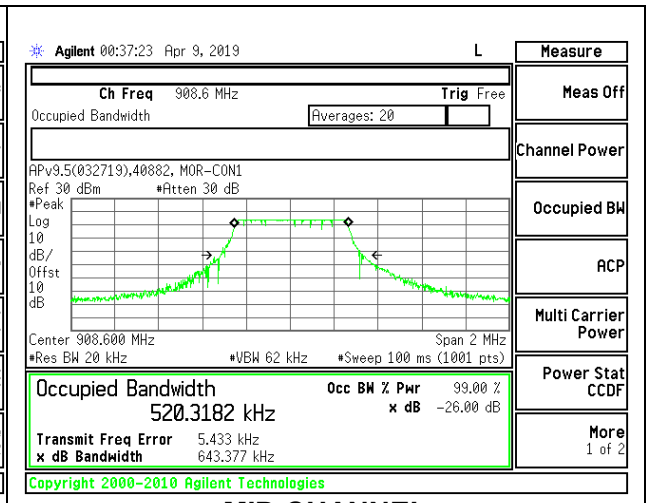
8.2.2. 500kHz BANDWIDTH

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	903.0	0.5180
Middle	908.6	0.5203
High	914.2	0.5149



LOW CHANNEL



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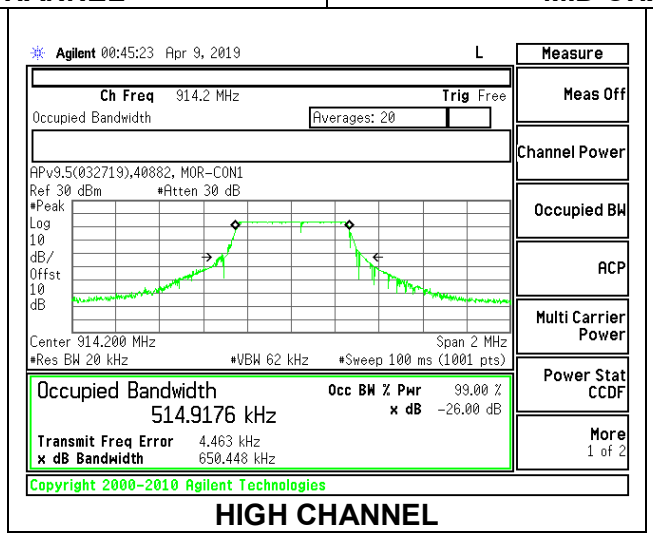

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8.3.6 dB BANDWIDTH

LIMITS

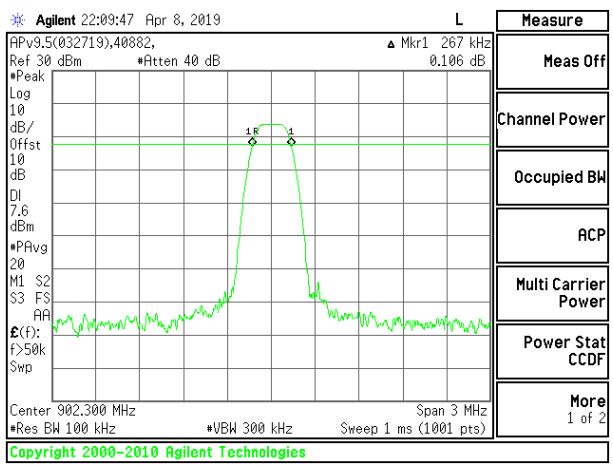
FCC §15.247 (a) (2)
RSS-247 5.2 (a)

The minimum 6 dB bandwidth shall be at least 500 kHz.

Note: 125kHz BW is a Hybrid (FHSS/DTS) system, therefore no minimum BW requirement.

8.3.1. 125kHz BANDWIDTH

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)
Low	902.3	0.267
Middle	908.6	0.264
High	914.9	0.276



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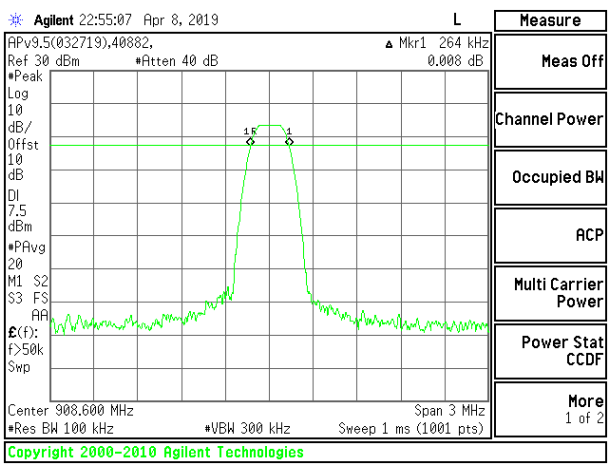
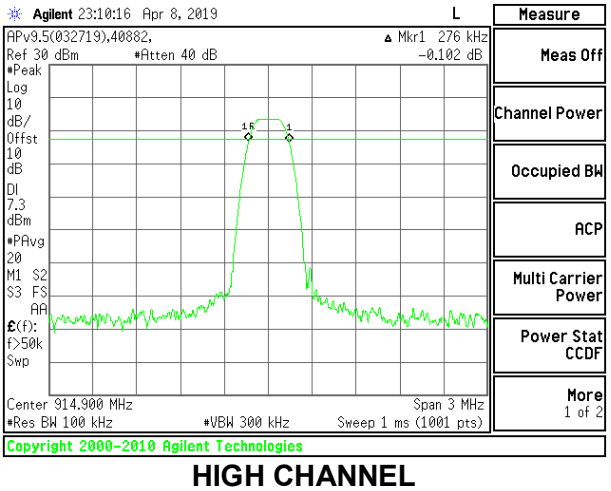


MID CHANNEL



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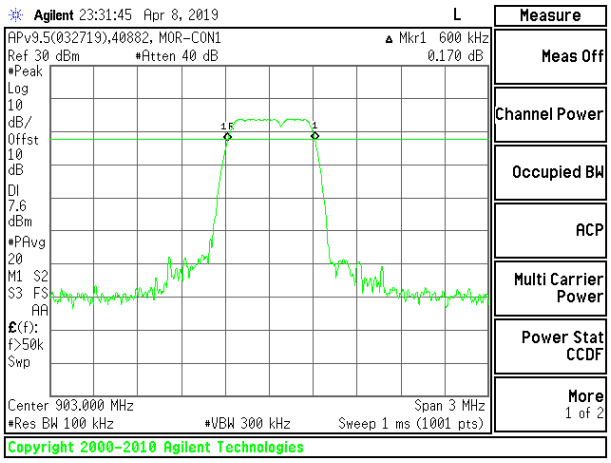
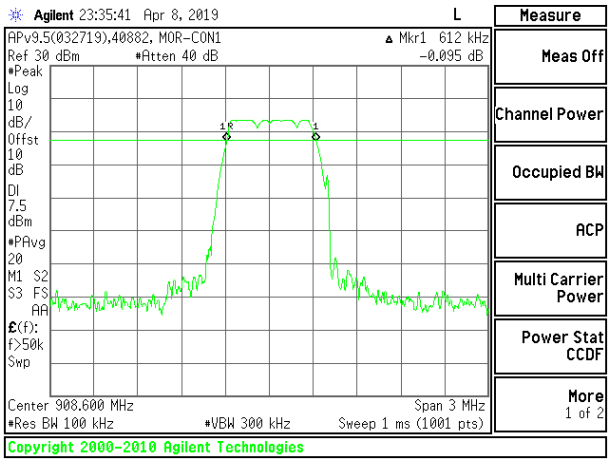
8.3.2. 500kHz BANDWIDTH

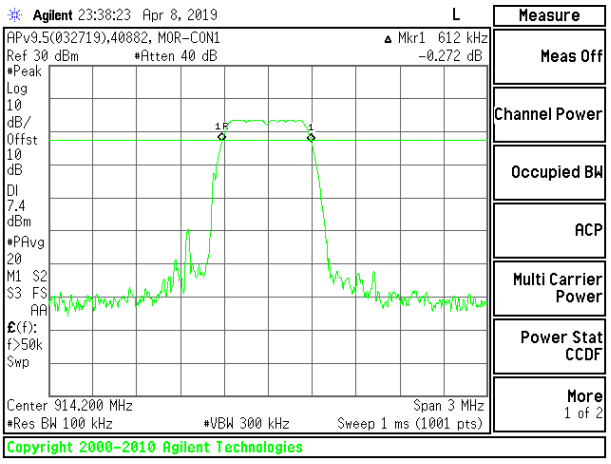
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	903.0	0.600	0.5
Middle	908.6	0.612	0.5
High	914.2	0.612	0.5



LOW CHANNEL



MID CHANNEL



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8.4.20 dB BANDWIDTH

LIMITS

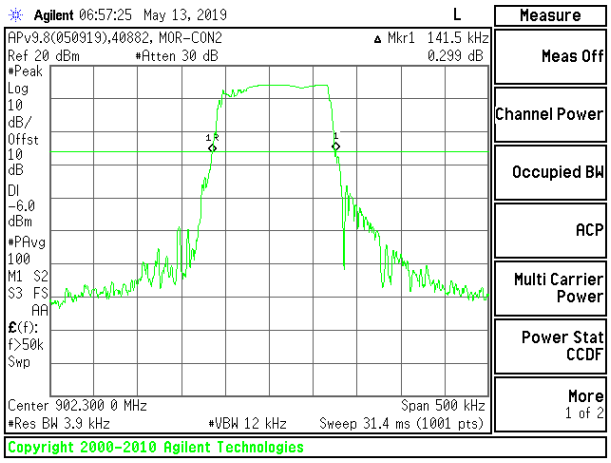
None; for reporting purposes only.

TEST PROCEDURE

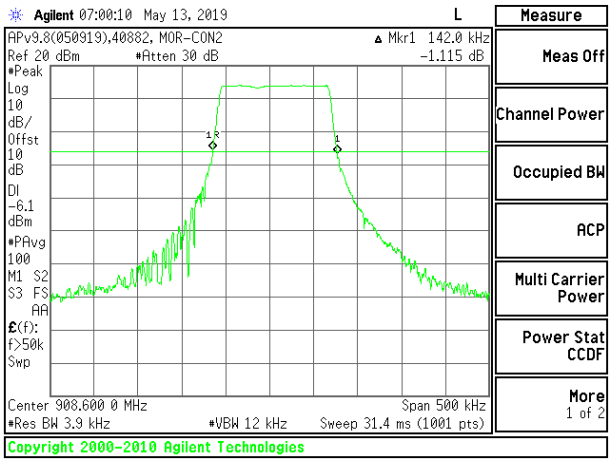
The transmitter output is connected to a spectrum analyzer. The RBW is set to between 1-5% of the 20 dB bandwidth. The VBW is set to ≥ RBW. The sweep time is coupled.

8.4.1. 125kHz - FHSS

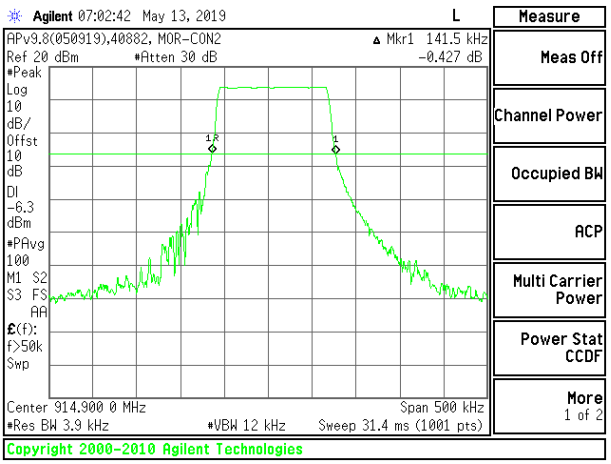
Channel	Frequency (MHz)	20dB Bandwidth (MHz)
Low	902.3	141.5
Mid	908.6	142.0
High	914.9	141.5



LOW CHANNEL



MID CHANNEL



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8.5. HOPPING FREQUENCY SEPARATION

LIMITS

FCC §15.247 (a) (1)
RSS-247 (5.1) (b)

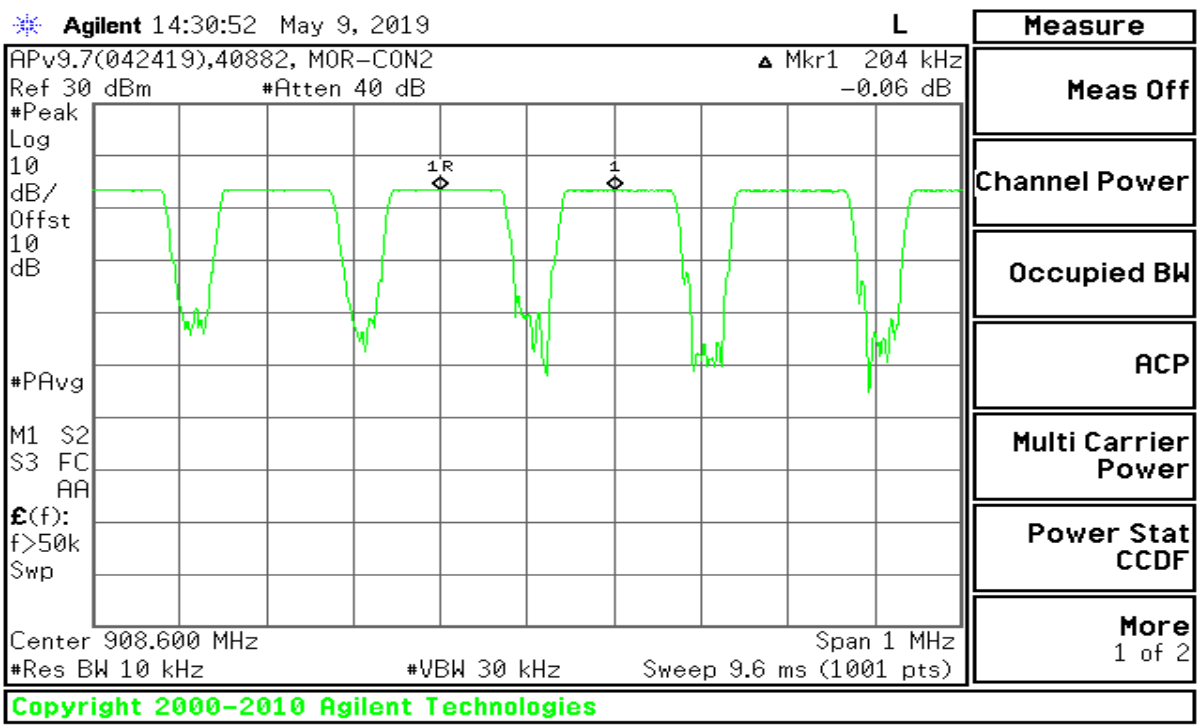
Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hoping channel, whichever is greater.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The RBW is set to approximately 30% of the channel spacing and the VBW is set to VBW >= RBW. The sweep time is coupled.

RESULTS

8.5.1. 125kHz BANDWIDTH - FHSS



HOPPING FREQUENCY SEPARATION PLOT

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8.6. NUMBER OF HOPPING CHANNELS

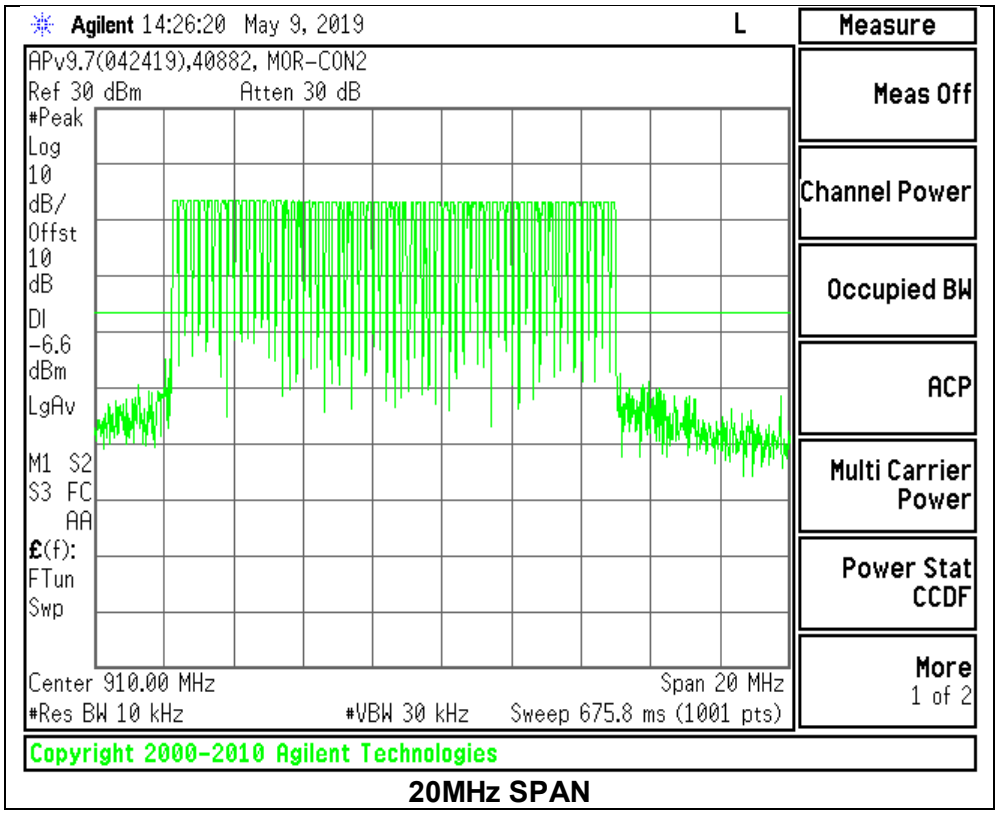
LIMITS

For reporting purposes only (ref FCC §15.247 (f) and RSS-247 (5.3) (a))

RESULTS

Normal Mode: 64 Total Channels (8 sub-bands with 8 channels per band) Observed. Note – The device will only operate on 1 sub-band or 8 channels at a time after the joining procedure.

8.6.1. 125kHz BANDWIDTH - FHSS



20MHz SPAN

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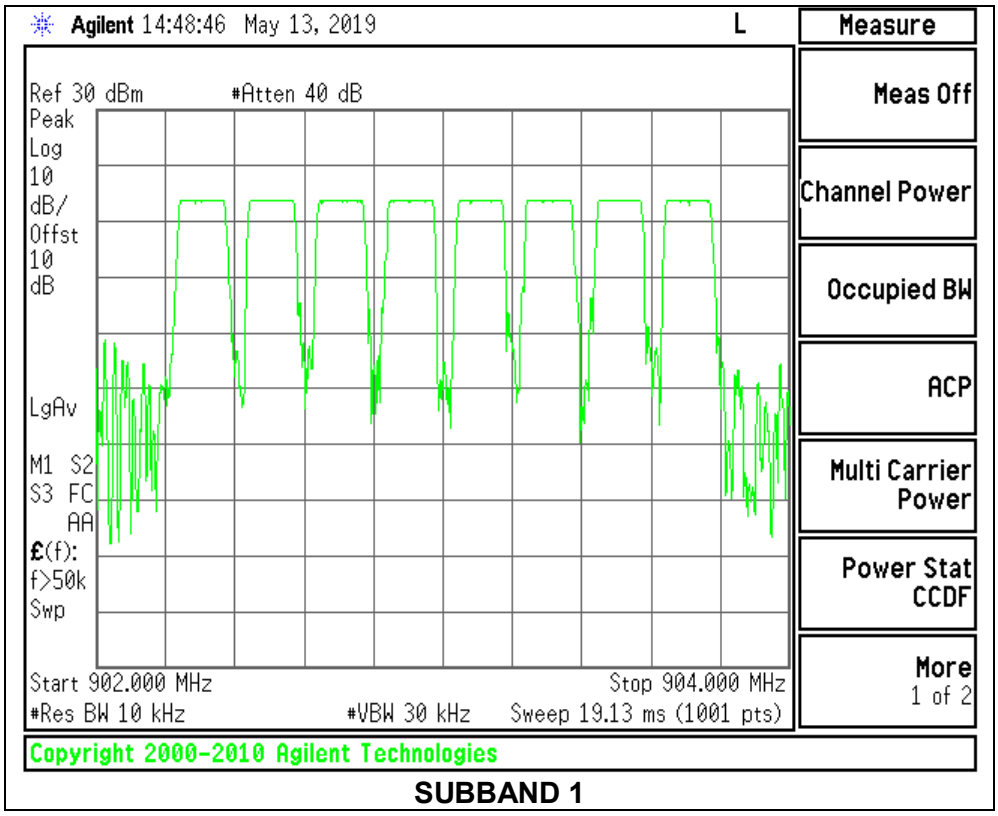
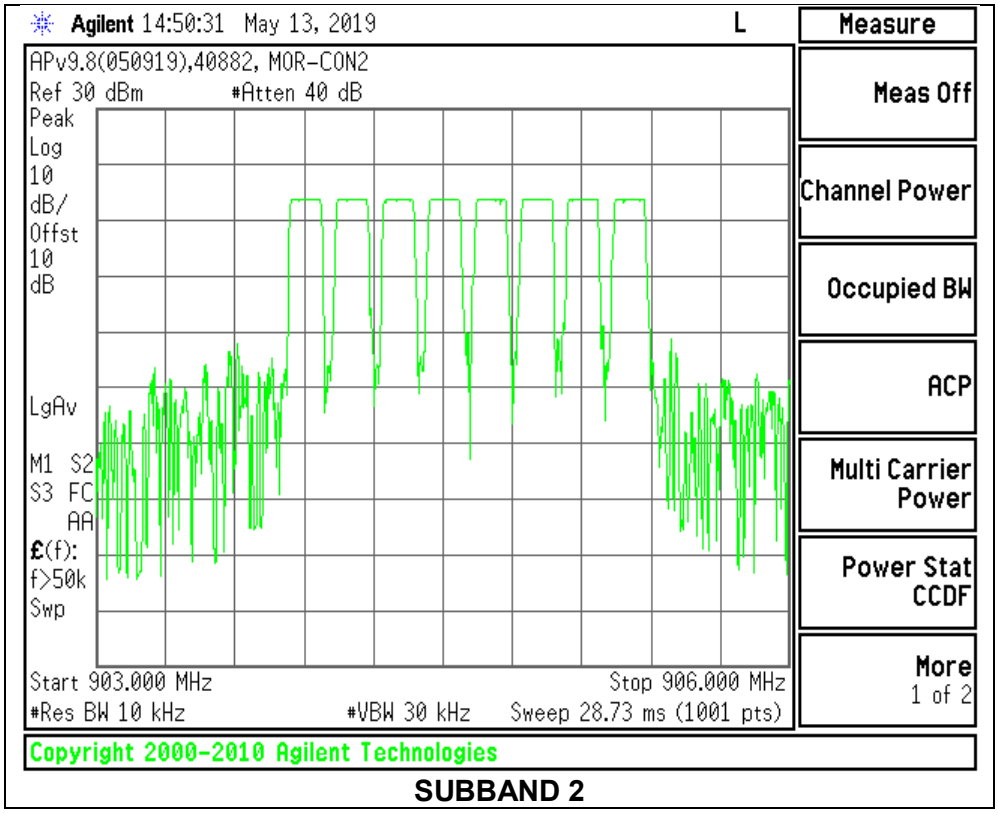


SUBBAND 1



SUBBAND 2

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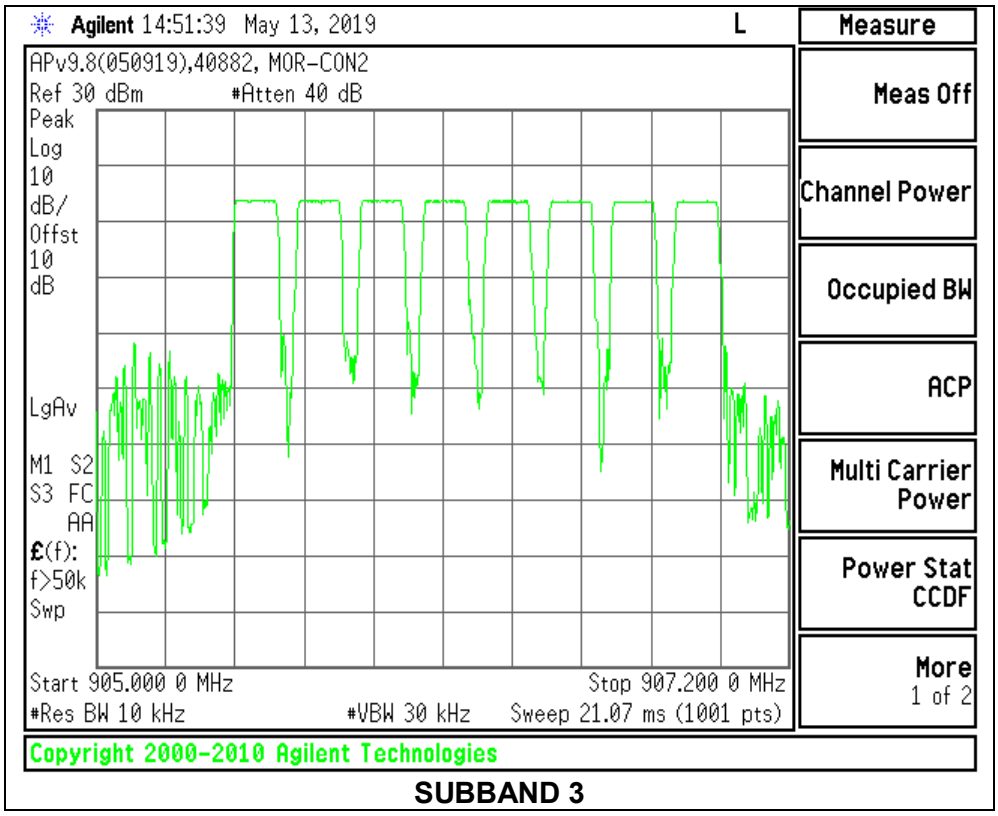
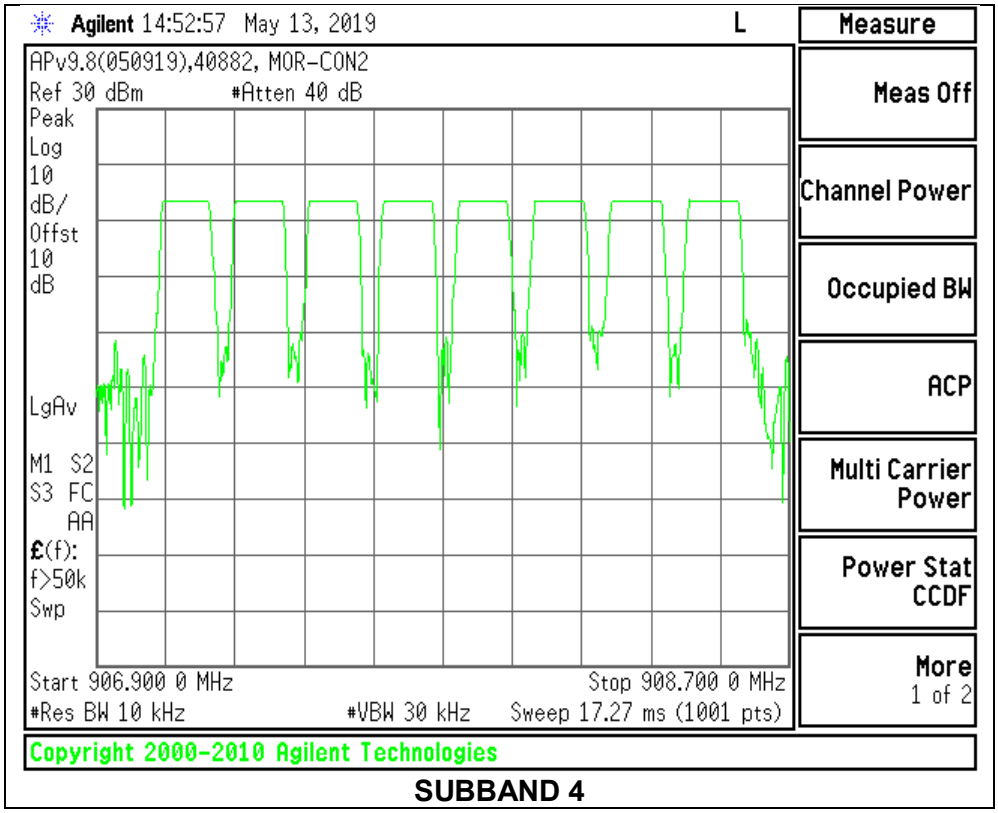


SUBBAND 3



SUBBAND 4

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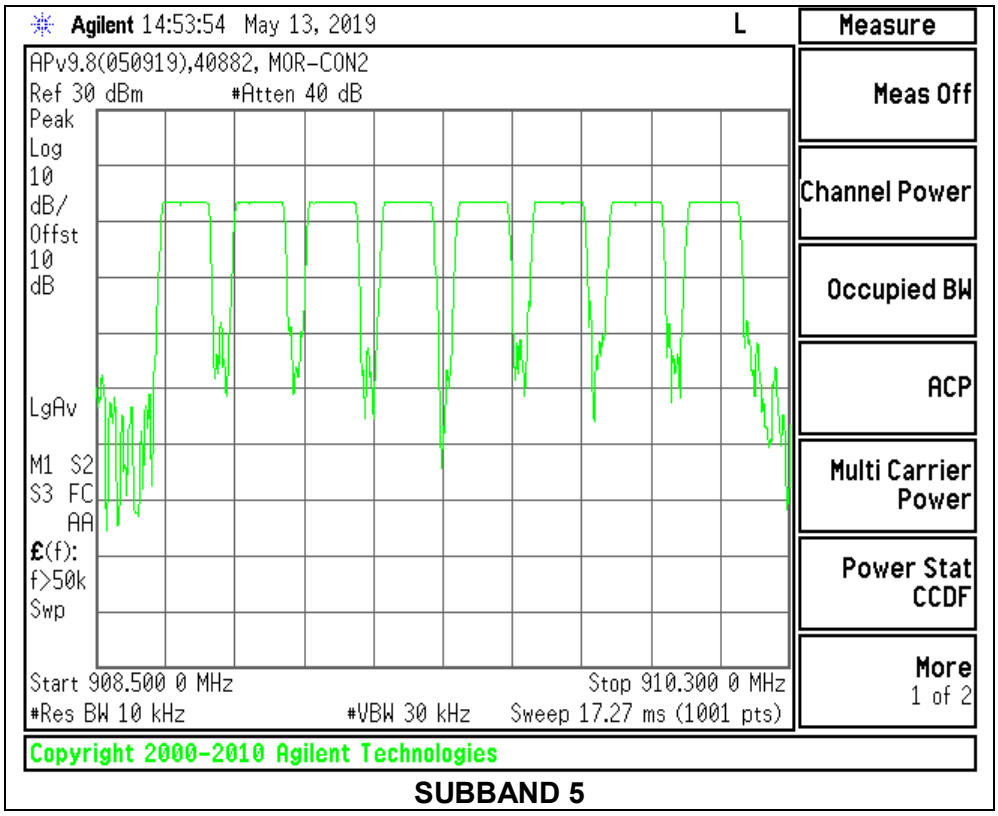
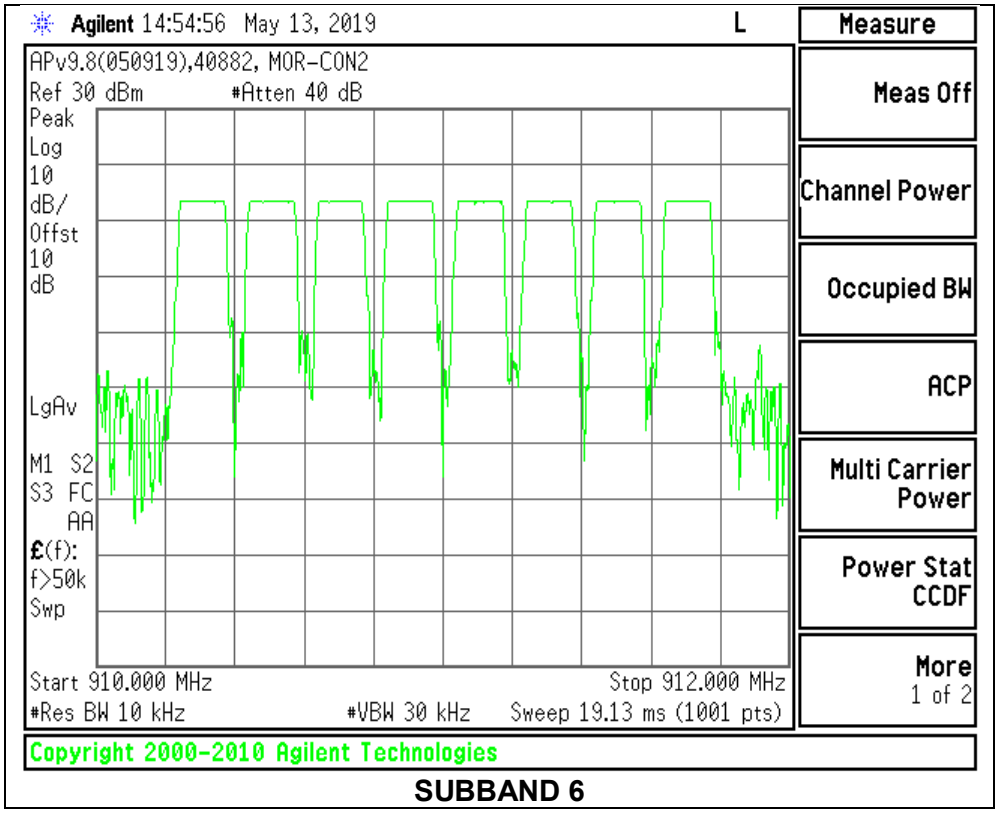


SUBBAND 5



SUBBAND 6

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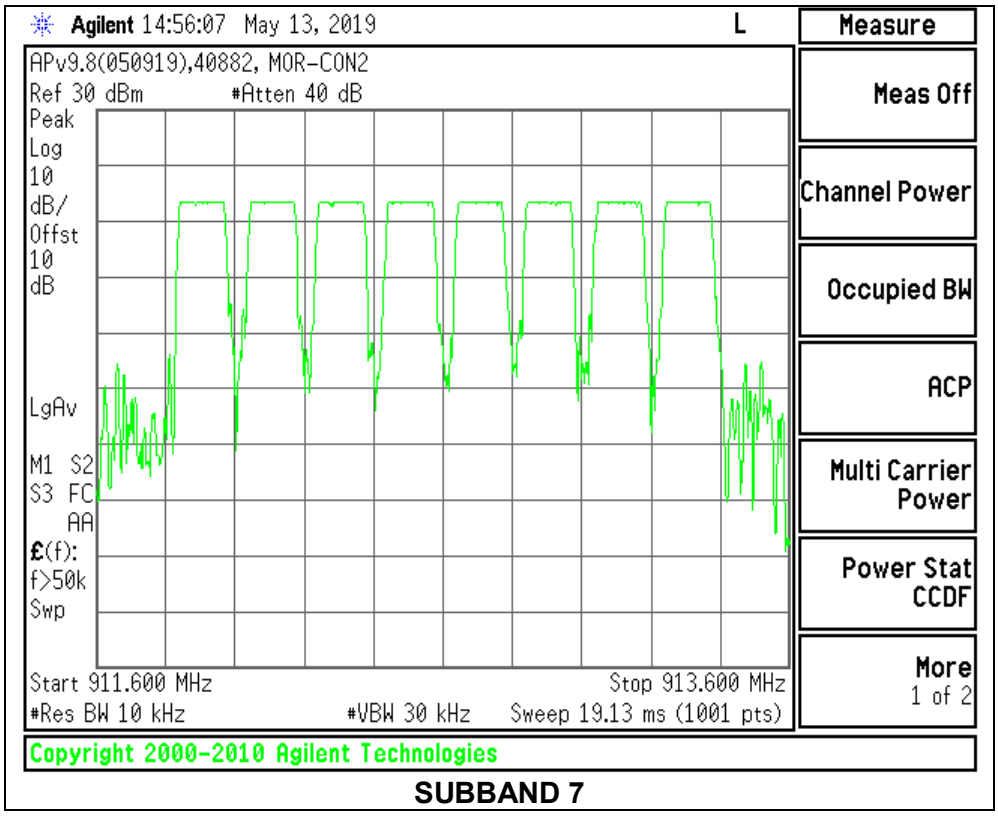
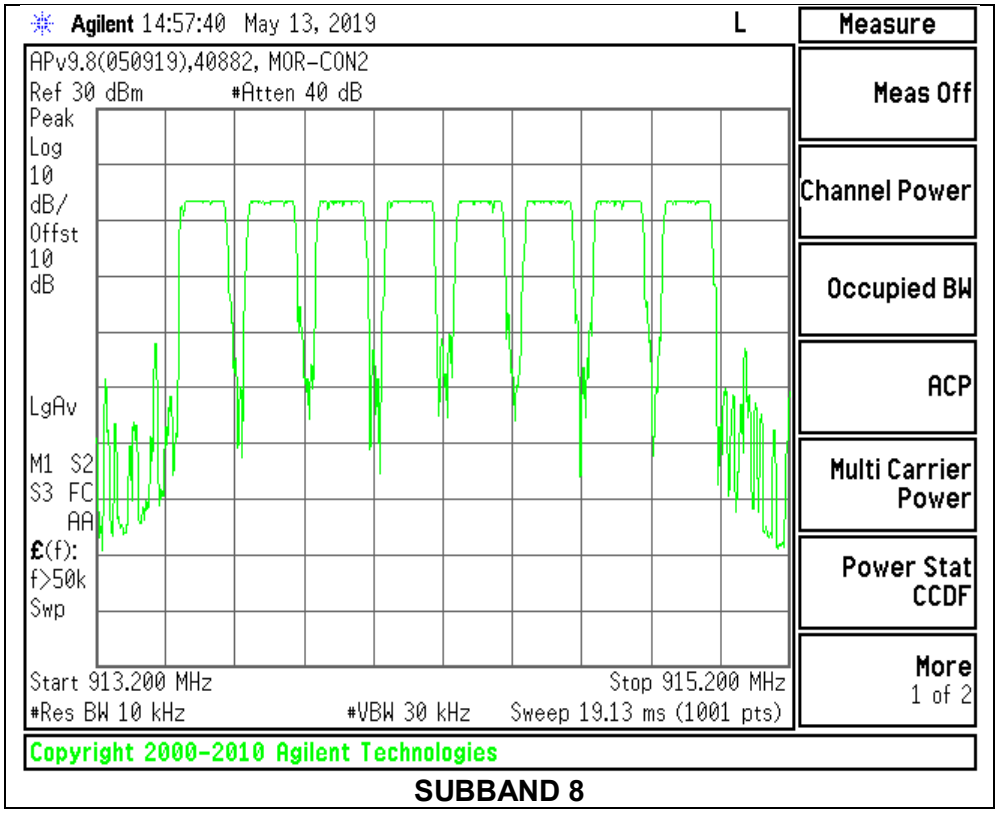


SUBBAND 7



SUBBAND 8

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8.7. AVERAGE TIME OF OCCUPANCY

LIMITS

FCC §15.247 (f)
RSS-247 (5.3) (a)

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

TEST PROCEDURE

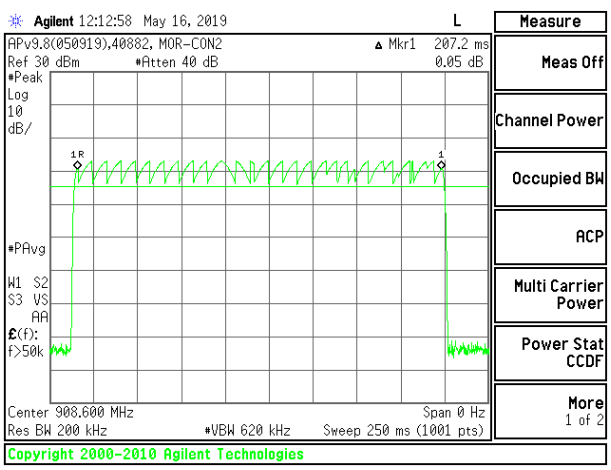
The transmitter output is connected to a spectrum analyzer. The span is set to 0 Hz, centered on a single, selected hopping channel. The width of a single pulse is measured in a fast scan. The number of pulses is measured in a 3.2 second scan, to enable resolution of each occurrence.

The average time of occupancy in the specified 3.2 second period (8 channels * 0.4 s) is equal to (# of pulses in 3.2 s) * pulse width.

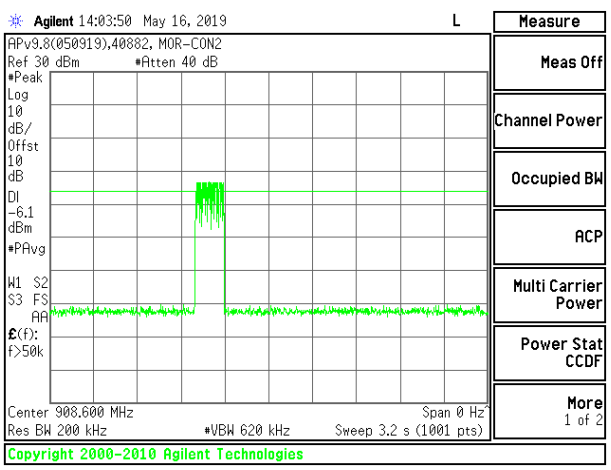
Note – The device will only operate on 1 sub-band or 8 channels at a time after the joining procedure.

8.7.1. 125kHz BANDWIDTH - FHSS

Pulse Width (msec)	Number of Pulses in 3.2 seconds	Average Time of Occupancy (sec)	Limit (sec)	Margin (sec)
207.2	1	0.2072	0.4	-0.1928



PULSE WIDTH



NUMBER OF PULSES IN 3.2 SECOND OBSERVATION PERIOD

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8.8. OUTPUT POWER

LIMITS

FCC §15.247 (b) (2)
RSS-247 5.4 (d)

TEST PROCEDURE
The transmitter output is connected to a power meter.

The cable assembly insertion loss of 10 dB was entered as an offset in the power meter to allow gated average reading of power.

RESULTS

8.8.1. 125kHz BANDWIDTH

Tested By:	40882
Date:	2019-05-02

Channel	Frequency (MHz)	AVG Power Reading (dBm)	Limit (dBm)	Margin (dB)
Low	902.3	13.53	30	-16.47
Middle	908.6	13.40	30	-16.60
High	914.9	13.26	30	-16.74

8.8.2. 500kHz BANDWIDTH

Tested By:	40882
Date:	2019-05-02

Channel	Frequency (MHz)	AVG Power Reading (dBm)	Limit (dBm)	Margin (dB)
Low	903.0	13.53	30	-16.47
Middle	908.6	13.40	30	-16.60
High	914.2	13.29	30	-16.71

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8.9. POWER SPECTRAL DENSITY

LIMITS

FCC §15.247 (e)
RSS-247 (5.2) (b)

The power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

FCC §15.247 (f)
RSS-247 (5.3) (b)

The power spectral density conducted from the intentional radiator to the antenna due to the digital modulation operation of the hybrid system, with the frequency hopping operation turned off, shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

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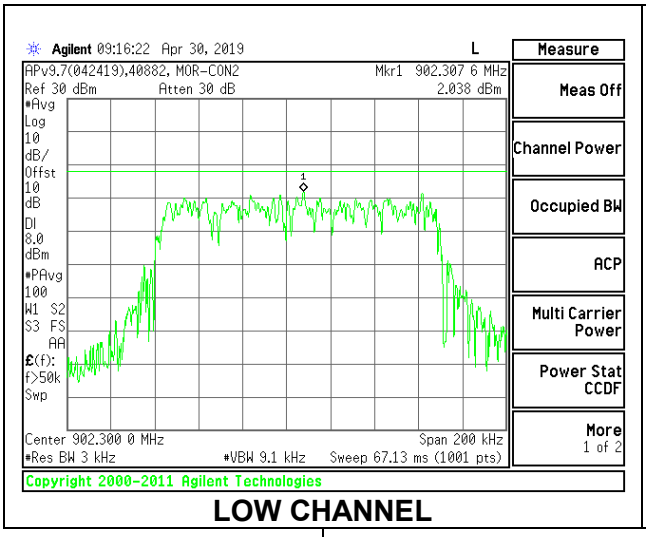
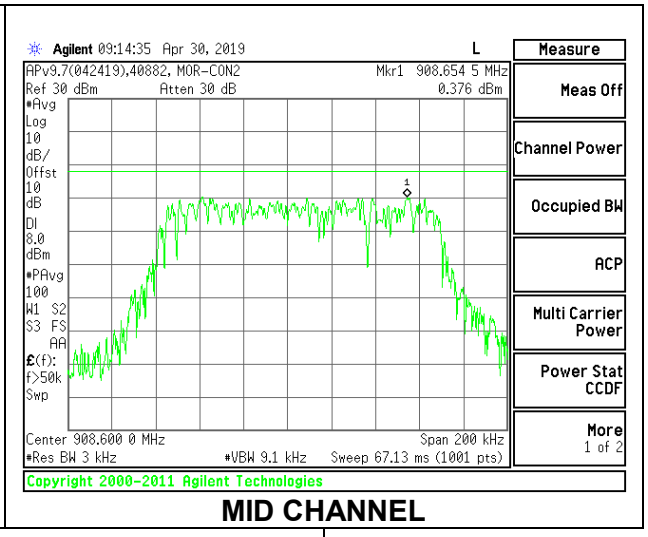
8.9.1. 125kHz BANDWIDTH - DTS

Duty Cycle Correction	1.02

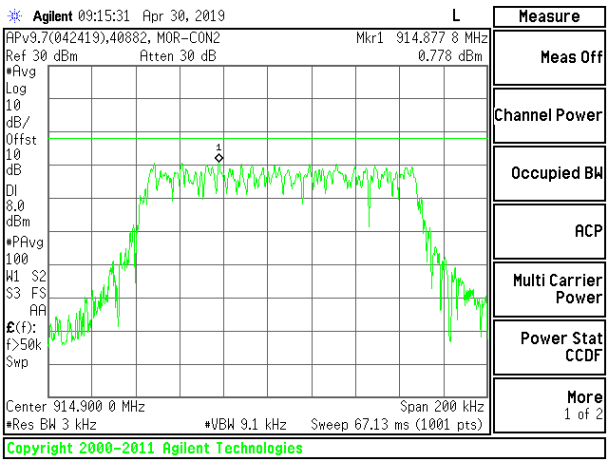
Channel	Frequency (MHz)	PSD (dBm/3kHz)	Corr'd PSD (dBm/3kHz)	Limit (dBm/3kHz)	Margin (dB)
Low	902.3	2.038	3.058	8	-4.94
Middle	908.6	0.376	1.396	8	-6.60
High	914.9	0.778	1.798	8	-6.20



LOW CHANNEL



MID CHANNEL



HIGH CHANNEL

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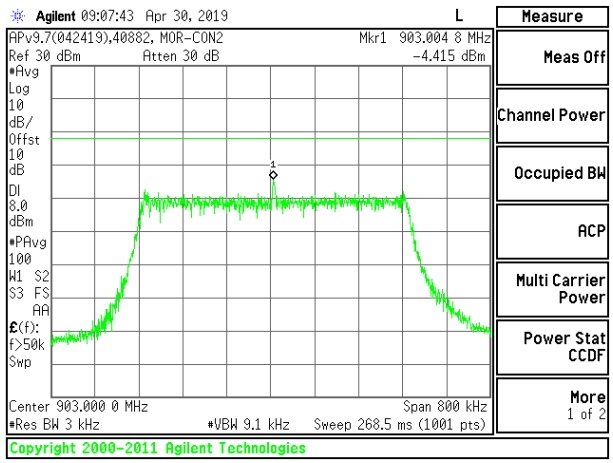
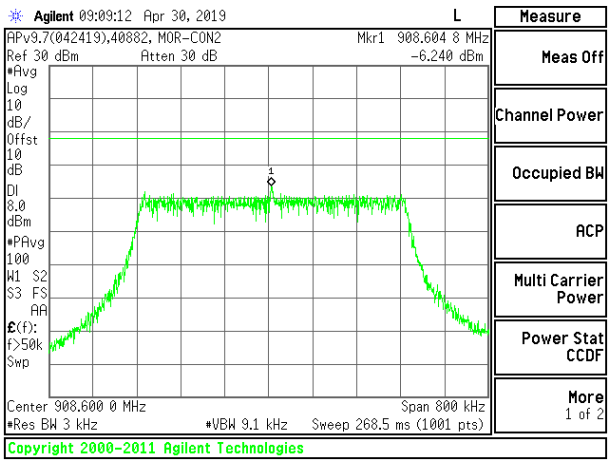
8.9.2. 500kHz BANDWIDTH

Duty Cycle Correction	2.91

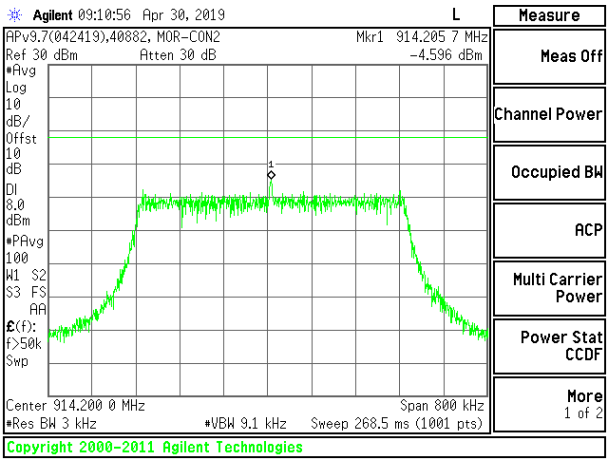
Channel	Frequency (MHz)	PSD (dBm/3kHz)	Corr'd PSD (dBm/3kHz)	Limit (dBm/3kHz)	Margin (dB)
Low	903.0	-4.415	-1.505	8	-9.51
Middle	908.6	-6.240	-3.330	8	-11.33
High	914.2	-4.596	-1.686	8	-9.69



LOW CHANNEL



MID CHANNEL



HIGH CHANNEL

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8.10. CONDUCTED SPURIOUS EMISSIONS

LIMITS

FCC §15.247 (d)
RSS-247 5.5

Output power was measured based on the use of an average measurement, therefore the required attenuation is 30 dB.

RESULTS

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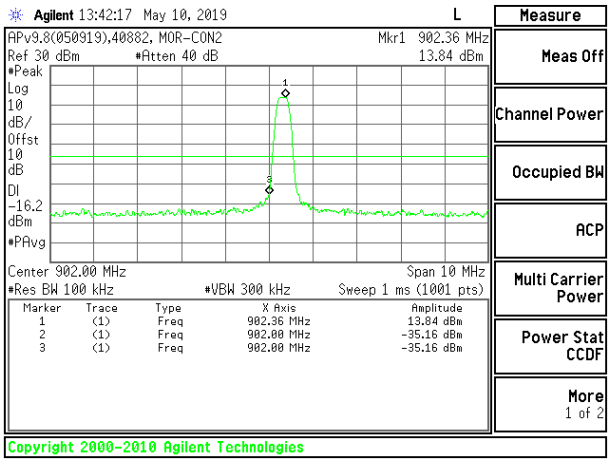
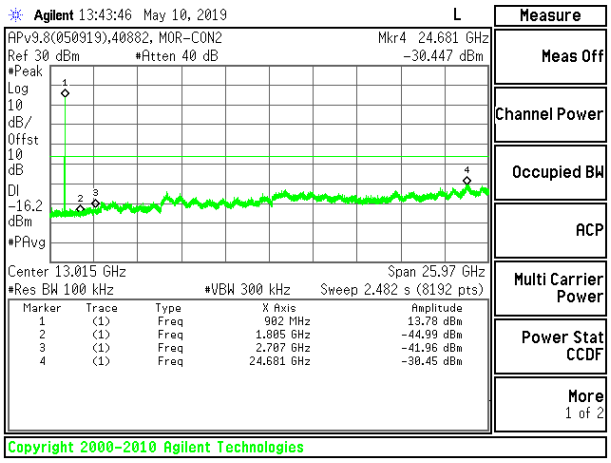
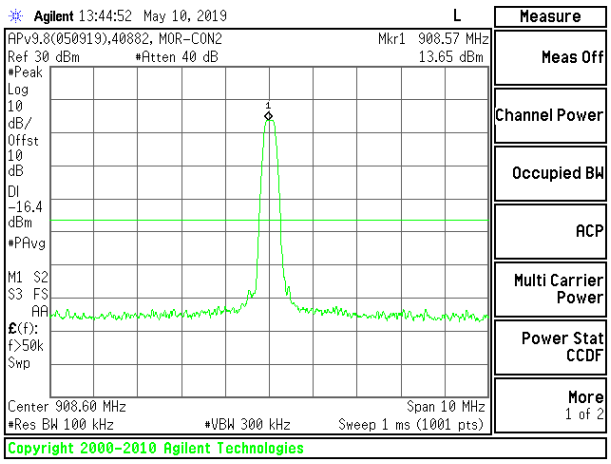
8.10.1. 125kHz BANDWIDTH - DTS



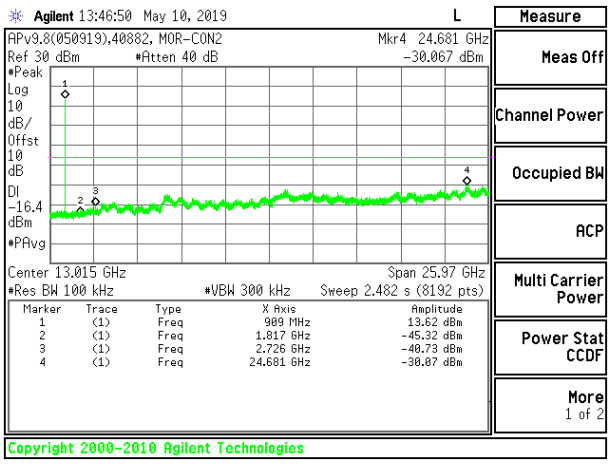
LOW CHANNEL BANDEDGE



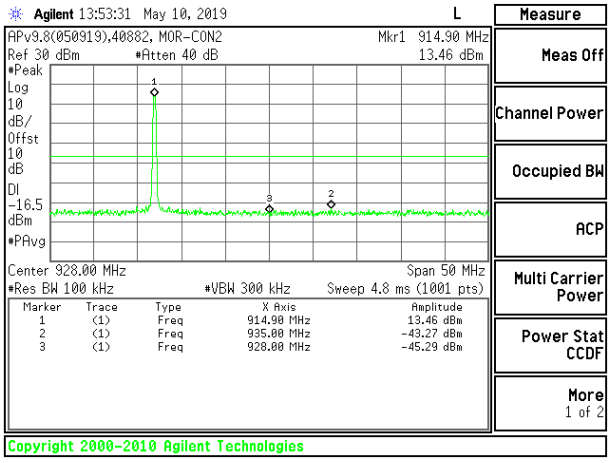
OUT-OF-BAND LOW CHANNEL



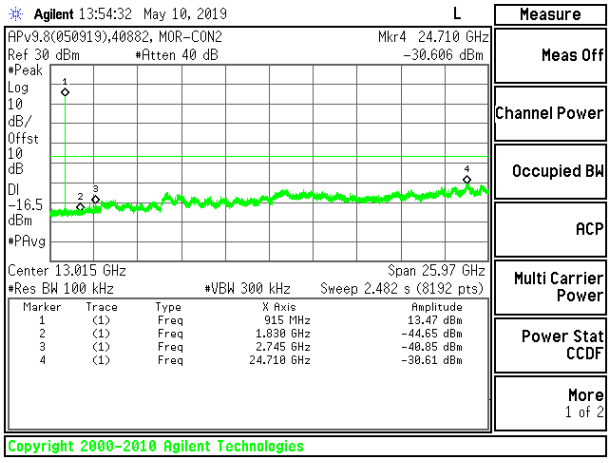
IN-BAND REFERENCE LEVEL



OUT-OF-BAND MID CHANNEL



HIGH CHANNEL BANDEDGE



OUT-OF-BAND HIGH CHANNEL

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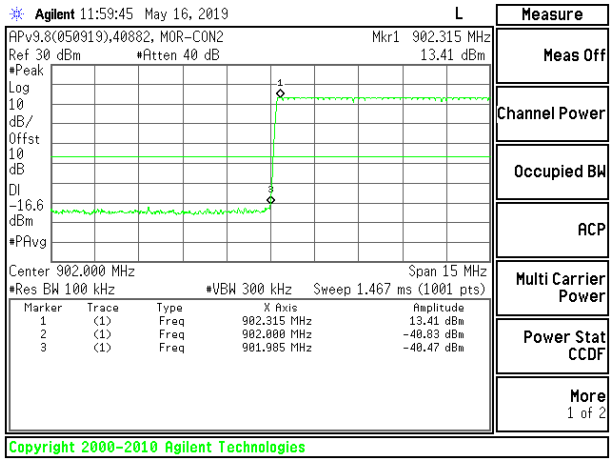
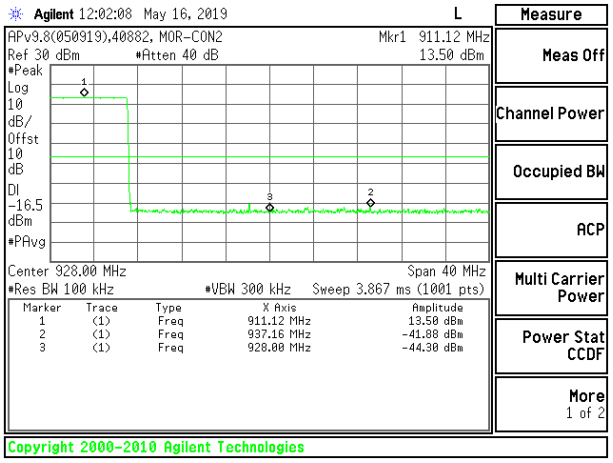
8.10.2. 125kHz BANDWIDTH - FHSS



LOW BANDEDGE



HIGH BANDEDGE

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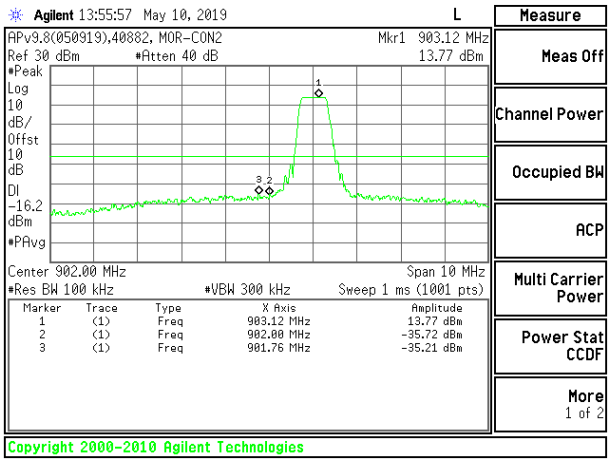
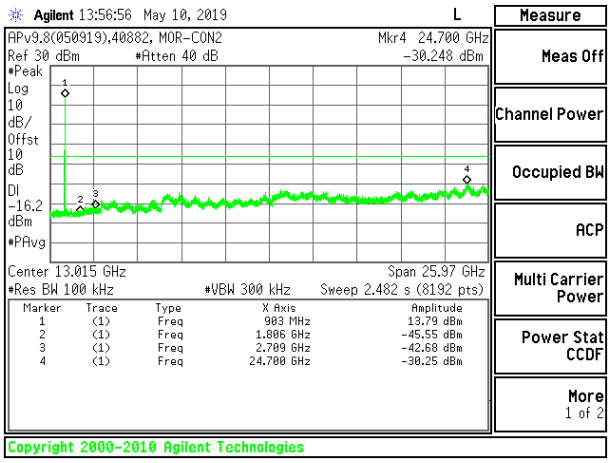
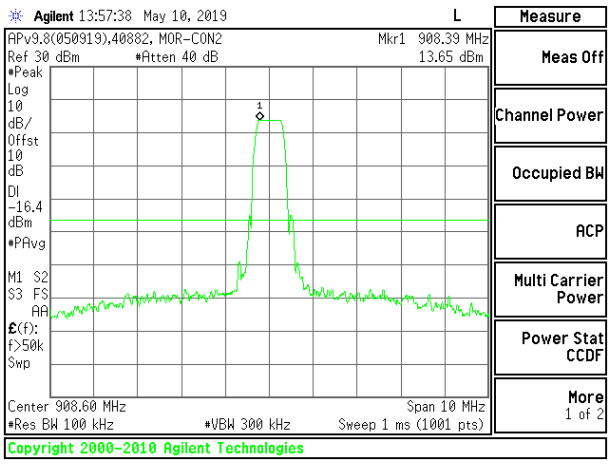
8.10.3. 500kHz BANDWIDTH



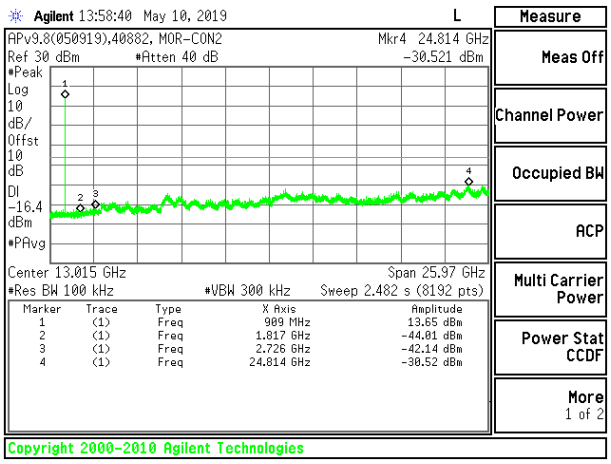
LOW CHANNEL BANDEDGE



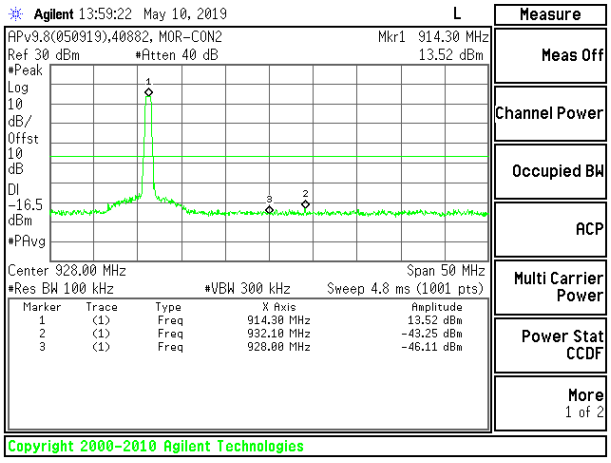
OUT-OF-BAND LOW CHANNEL



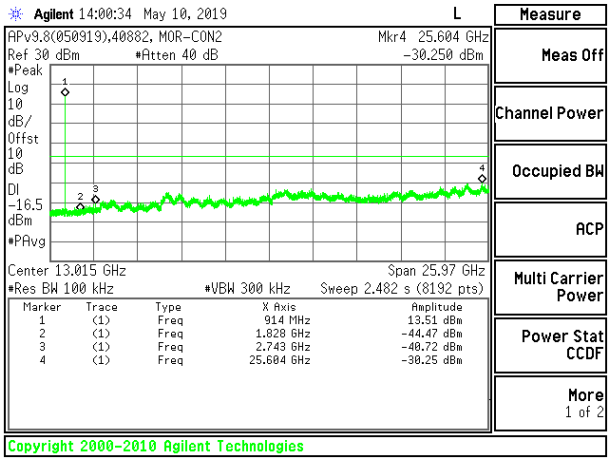
IN-BAND REFERENCE LEVEL



OUT-OF-BAND MID CHANNEL



HIGH CHANNEL BANDEDGE



OUT-OF-BAND HIGH CHANNEL

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9. RADIATED TEST RESULTS

LIMITS

FCC §15.205 and §15.209
RSS-GEN, Section 8.9 and 8.10.

Frequency Range (MHz)	Field Strength Limit (uV/m) at 3 m	Field Strength Limit (dBuV/m) at 3 m
0.009-0.490	2400/F(kHz) @ 300 m	-
0.490-1.705	24000/F(kHz) @ 30 m	-
1.705 - 30	30 @ 30m	-
30 - 88	100	40
88 - 216	150	43.5
216 - 960	200	46
Above 960	500	54

TEST PROCEDURE

The EUT is placed on a non-conducting table 80 cm above the ground plane for measurement below 1GHz; 1.5 m above the ground plane for measurement above 1GHz. The antenna to EUT distance is 3 meters. The EUT is configured in accordance with ANSI C63.10. The EUT is set to transmit in a continuous mode.

For measurements below 1 GHz the resolution bandwidth is set to 120 kHz for peak and/or quasi-peak detection measurements in the 30-1000MHz range, 9kHz for peak and/or quasi-peak detection measurements in the 0.15-30MHz range, and 200Hz for peak and/or quasi-peak detection measurements in the 9 to 150kHz range. Peak detection is used unless otherwise noted as quasi-peak. For below 30MHz testing, investigation was done on three antenna orientations (parallel, perpendicular, and ground-parallel).

For pre-scans above 1 GHz the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 30 KHz for peak measurements.

For final measurements above 1 GHz the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 3 MHz for peak measurements. For average measurements above 1GHz, the resolution bandwidth and video bandwidth are set as described in ANSI C63.10:2013 for the applicable measurement. The particular averaging method used for this test program was V1TR, where VBW =1/ T_{on} and T_{on} is the on time.

The spectrum from 30MHz to 10 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in each applicable band. Below 30MHz, the channel with the highest output power was tested.

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

KDB 414788 OPEN FIELD SITE (OFS) AND CHAMBER CORRELATION JUSTIFICATION

Base on FCC 15.31 (f) (2): measurements may be performed at a distance closer than that specified in the regulations; however, an attempt should be made to avoid making measurements in the near field. OFS and chamber correlation testing had been performed and chamber measured test result is the worst case test result.

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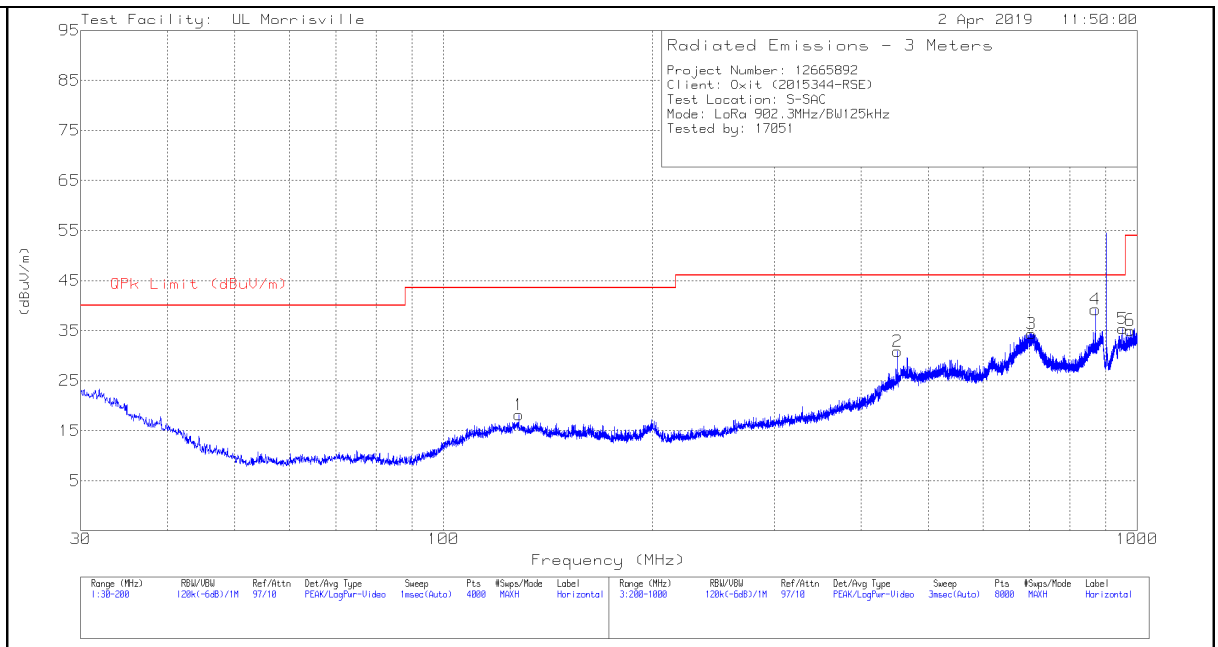
9.1. TRANSMITTER BELOW 1 GHz

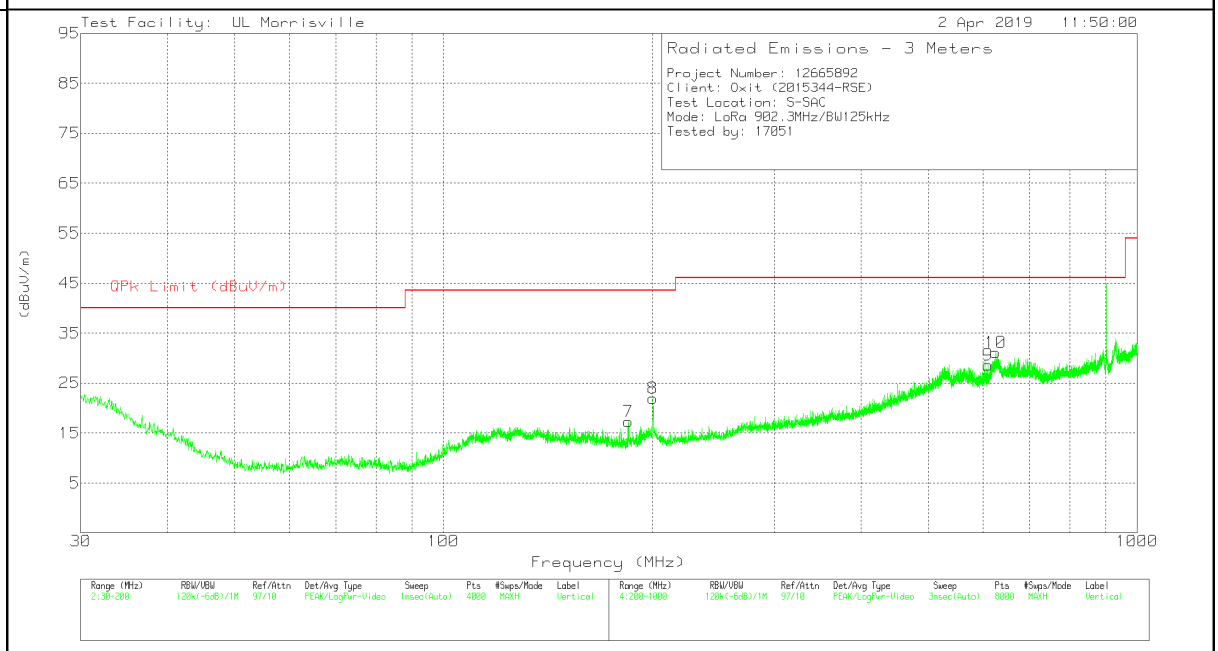
9.1.1. 125kHz BANDWIDTH

LOW CHANNEL

HORIZONTAL



VERTICAL



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Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AT0074 AF (dB/m)	Cbl/Amp	Filter (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 128.413	30.24	Pk	18.3	-30.7	.3	18.14	43.52	-25.38	0-360	398	H
2	451.1326	38.28	Pk	21.2	-29.1	.5	30.88	46.02	-15.14	0-360	102	H
3	704.4656	37.39	Pk	24.8	-28.4	.6	34.39	46.02	-11.63	0-360	102	H
4	870.2871	38.83	Pk	26.7	-27.3	1	39.23	46.02	-6.79	0-360	102	H
5	953.598	33.25	Pk	27.7	-26.5	.9	35.35	46.02	-10.67	0-360	102	H
6	* 977.8011	32.55	Pk	27.8	-26	.7	35.05	53.97	-18.92	0-360	102	H
7	184.57	31.56	Pk	15.8	-30.4	.3	17.26	43.52	-26.26	0-360	102	V
8	200.4001	34.15	Pk	17.7	-30.2	.3	21.95	43.52	-21.57	0-360	198	V
9	* 609.5532	33.27	Pk	23.6	-28.8	.5	28.57	46.02	-17.45	0-360	102	V
10	625.2553	35.31	Pk	24	-28.7	.5	31.11	46.02	-14.91	0-360	102	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector

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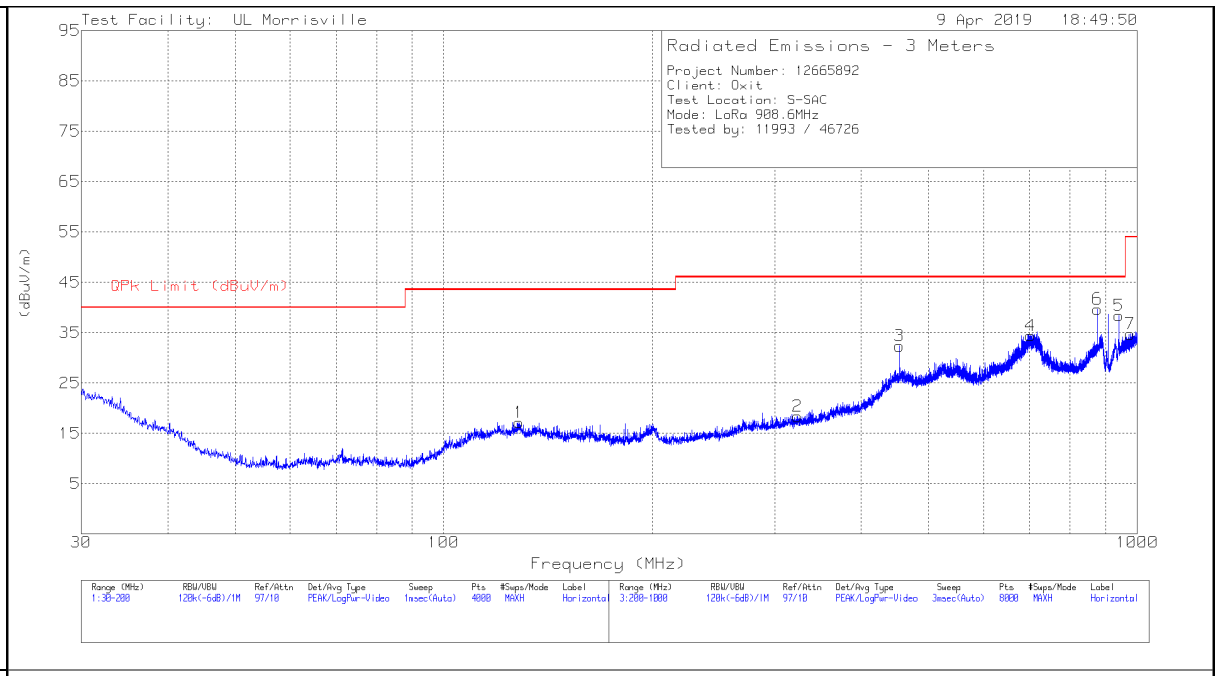
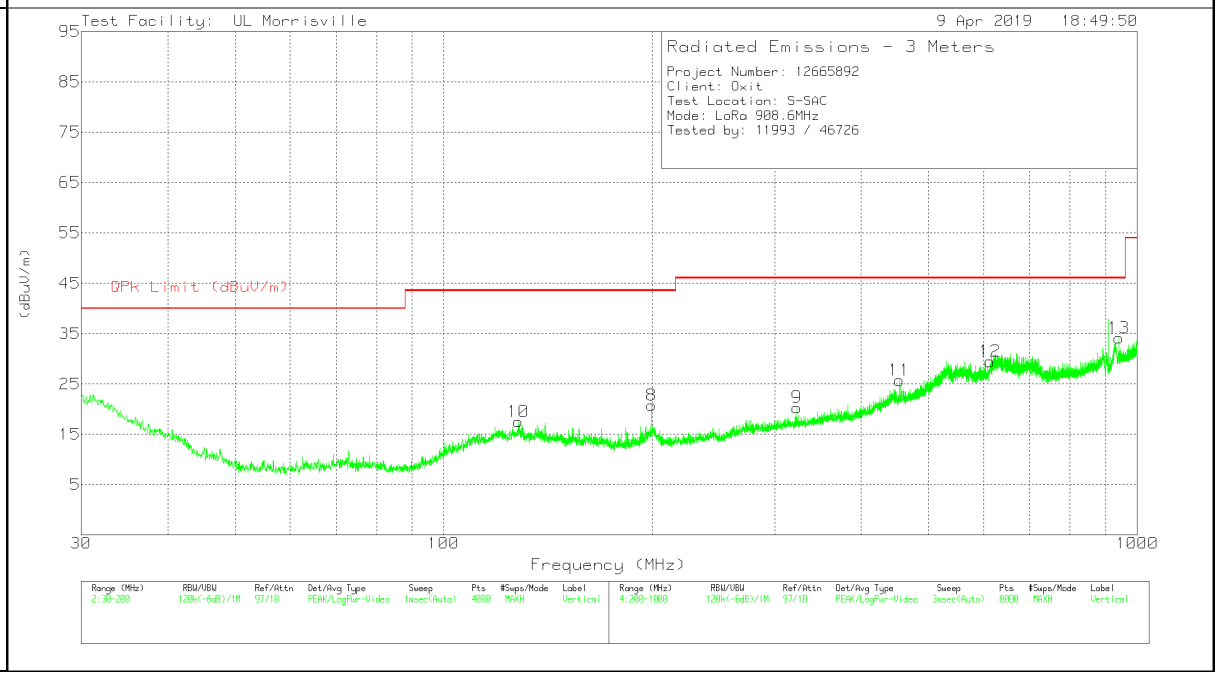
MID CHANNEL

HORIZONTAL



VERTICAL



UL LLC
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Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AT0074 AF (dB/m)	Cbl/Amp	Filter (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 128.3279	29.24	Pk	18.3	-30.7	.3	17.14	43.52	-26.38	0-360	102	H
2	* ** 323.5161	28.77	Pk	18.7	-29.4	.3	18.37	46.02	-27.65	0-360	298	H
5	** 940.5963	35.86	Pk	27.5	-26.6	1.6	38.36	46.02	-7.66	0-360	102	H
6	** 876.5879	39.18	Pk	26.8	-27.4	1.1	39.68	46.02	-6.34	0-360	102	H
7	* ** 977.101	32.23	Pk	27.8	-26	.7	34.73	53.97	-19.24	0-360	102	H
3	454.3331	39.56	Pk	21.3	-29	.5	32.36	46.02	-13.66	0-360	102	H
4	701.6652	37.48	Pk	24.8	-28.5	.6	34.38	46.02	-11.64	0-360	102	H
10	* ** 128.1154	29.6	Pk	18.3	-30.7	.3	17.5	43.52	-26.02	0-360	102	V
9	* ** 323.016	30.71	Pk	18.7	-29.4	.3	20.31	46.02	-25.71	0-360	102	V
12	* ** 613.2537	33.88	Pk	23.7	-28.6	.5	29.48	46.02	-16.54	0-360	102	V
13	** 940.5963	31.63	Pk	27.5	-26.6	1.6	34.13	46.02	-11.89	0-360	102	V
8	199.4488	33.06	Pk	17.7	-30.3	.3	20.76	43.52	-22.76	0-360	102	V
11	454.233	32.93	Pk	21.3	-29	.5	25.73	46.02	-20.29	0-360	102	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
Pk - Peak detector

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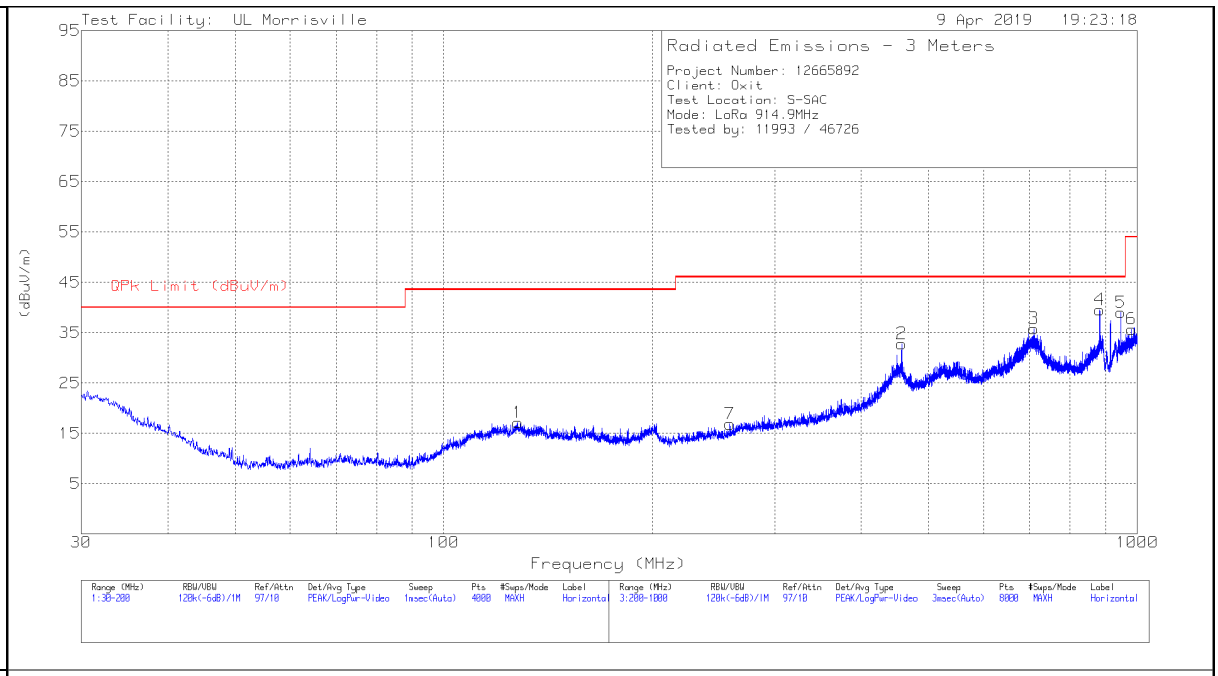
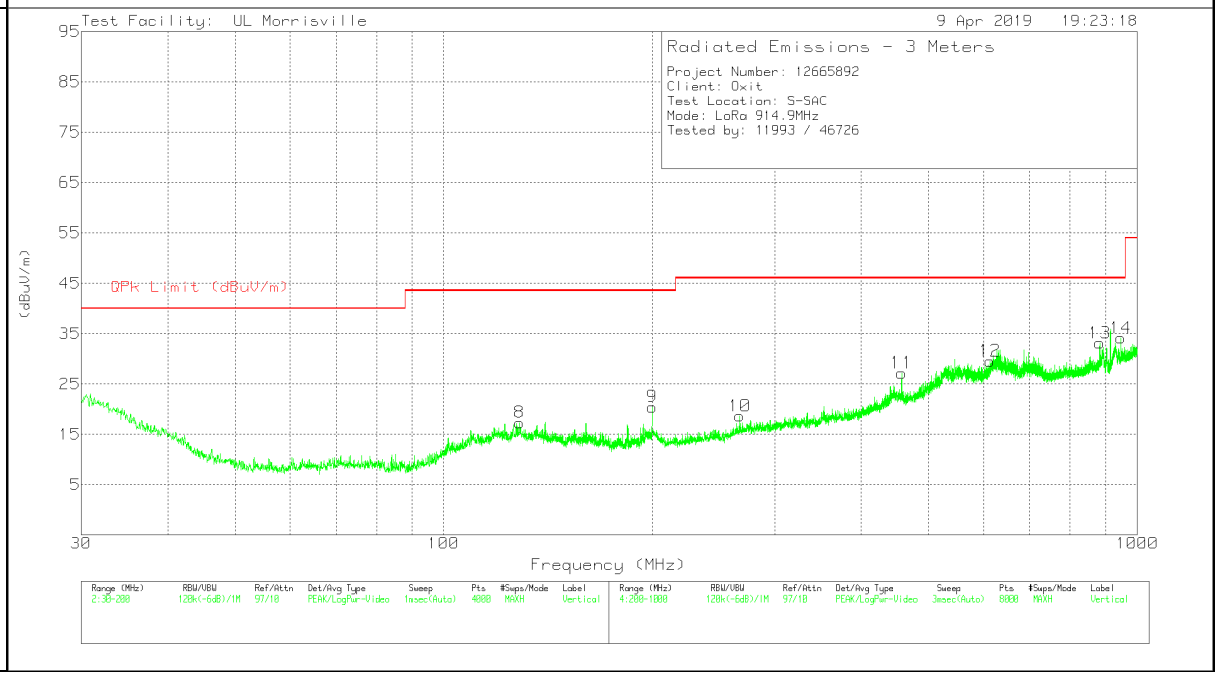
HIGH CHANNEL

HORIZONTAL



VERTICAL



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Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AT0074 AF (dB/m)	Cbl/Amp	Filter (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 127.9453	29.25	Pk	18.3	-30.7	.3	17.15	43.52	-26.37	0-360	99	H
4	** 882.8888	38.76	Pk	26.8	-27.2	1.2	39.56	46.02	-6.46	0-360	102	H
5	** 946.9971	36.81	Pk	27.6	-26.5	1.1	39.01	46.02	-7.01	0-360	102	H
6	* ** 981.5016	33.2	Pk	27.8	-26	.7	35.7	53.97	-18.27	0-360	102	H
7	* ** 258.6076	29.67	Pk	16.7	-29.8	.3	16.87	46.02	-29.15	0-360	198	H
2	457.4335	39.82	Pk	21.4	-28.8	.4	32.82	46.02	-13.2	0-360	102	H
3	709.1662	38.5	Pk	24.9	-28.2	.6	35.8	46.02	-10.22	0-360	102	H
8	* ** 128.6255	29.44	Pk	18.3	-30.7	.3	17.34	43.52	-26.18	0-360	101	V
10	* ** 267.3087	30.47	Pk	17.7	-29.8	.3	18.67	46.02	-27.35	0-360	102	V
12	* ** 613.2537	33.97	Pk	23.7	-28.6	.5	29.57	46.02	-16.45	0-360	102	V
13	** 882.9888	32.34	Pk	26.8	-27.2	1.2	33.14	46.02	-12.88	0-360	102	V
14	** 946.8971	31.95	Pk	27.6	-26.5	1.1	34.15	46.02	-11.87	0-360	102	V
9	199.7889	32.66	Pk	17.8	-30.3	.3	20.46	43.52	-23.06	0-360	101	V
11	457.4335	34.19	Pk	21.4	-28.8	.4	27.19	46.02	-18.83	0-360	102	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
Pk - Peak detector

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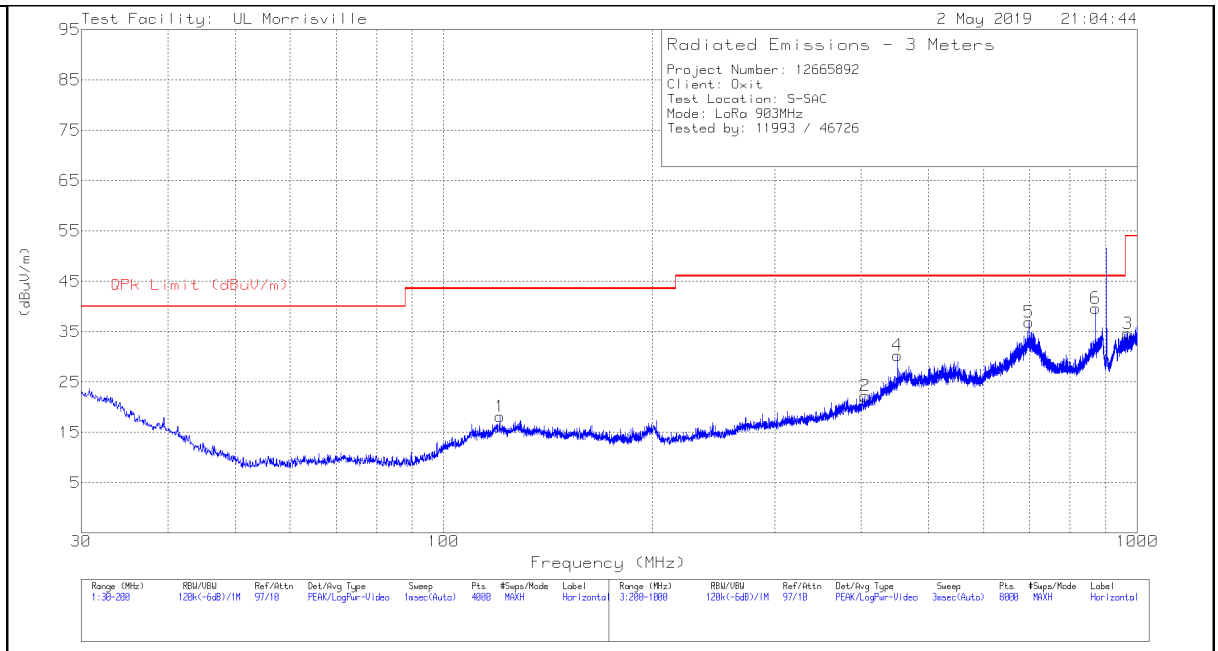
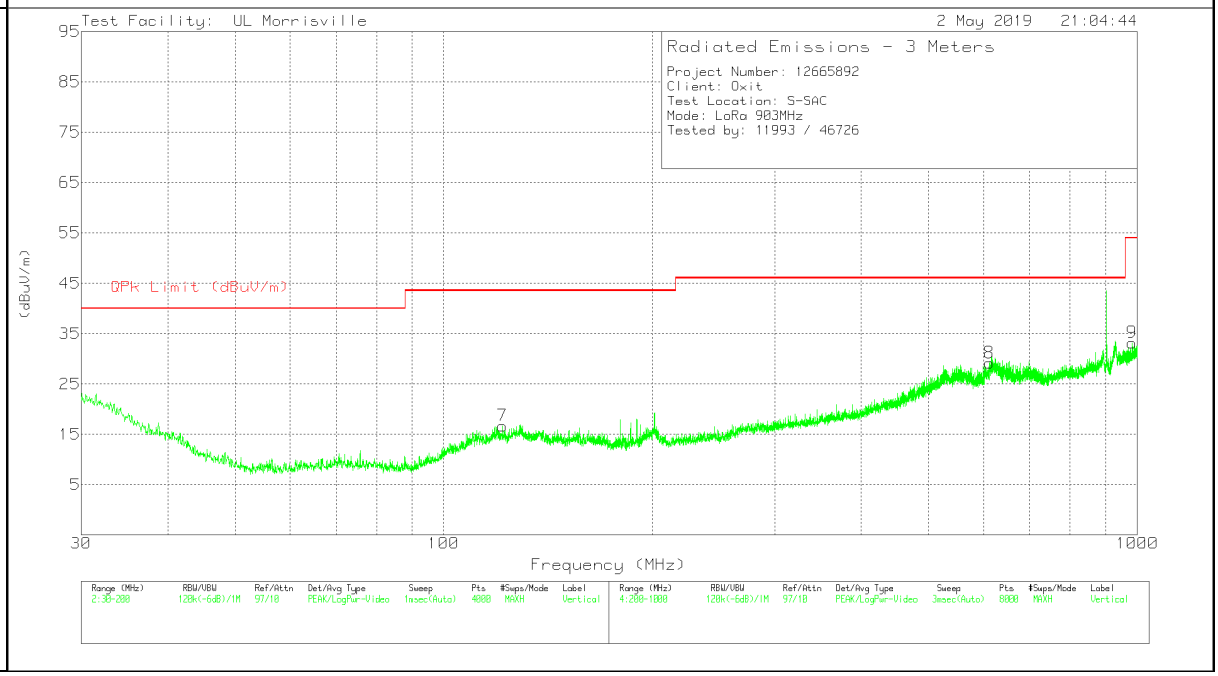
9.1.2. 500kHz BANDWIDTH

LOW CHANNEL

HORIZONTAL



VERTICAL



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Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AT0074 AF (dB/m)	Cbl/Amp	Filter (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 120.5059	30.57	Pk	18.1	-30.8	.3	18.17	43.52	-25.35	0-360	199	H
7	* ** 121.5687	29.02	Pk	18.2	-30.8	.3	16.72	43.52	-26.8	0-360	102	V
2	* ** 405.1267	30.34	Pk	20.5	-29.1	.5	22.24	46.02	-23.78	0-360	102	H
3	* ** 968.7999	32.3	Pk	27.7	-26.1	.7	34.6	53.97	-19.37	0-360	102	H
6	** 871.0872	39.17	Pk	26.8	-27.3	1	39.67	46.02	-6.35	0-360	102	H
8	* ** 611.7535	33.68	Pk	23.7	-28.7	.5	29.18	46.02	-16.84	0-360	102	V
9	* ** 983.9019	30.5	Pk	27.9	-25.9	.7	33.2	53.97	-20.77	0-360	102	V
4	451.4327	37.71	Pk	21.2	-29.1	.5	30.31	46.02	-15.71	0-360	102	H
5	697.6647	39.78	Pk	24.7	-28.2	.6	36.88	46.02	-9.14	0-360	102	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
Pk - Peak detector

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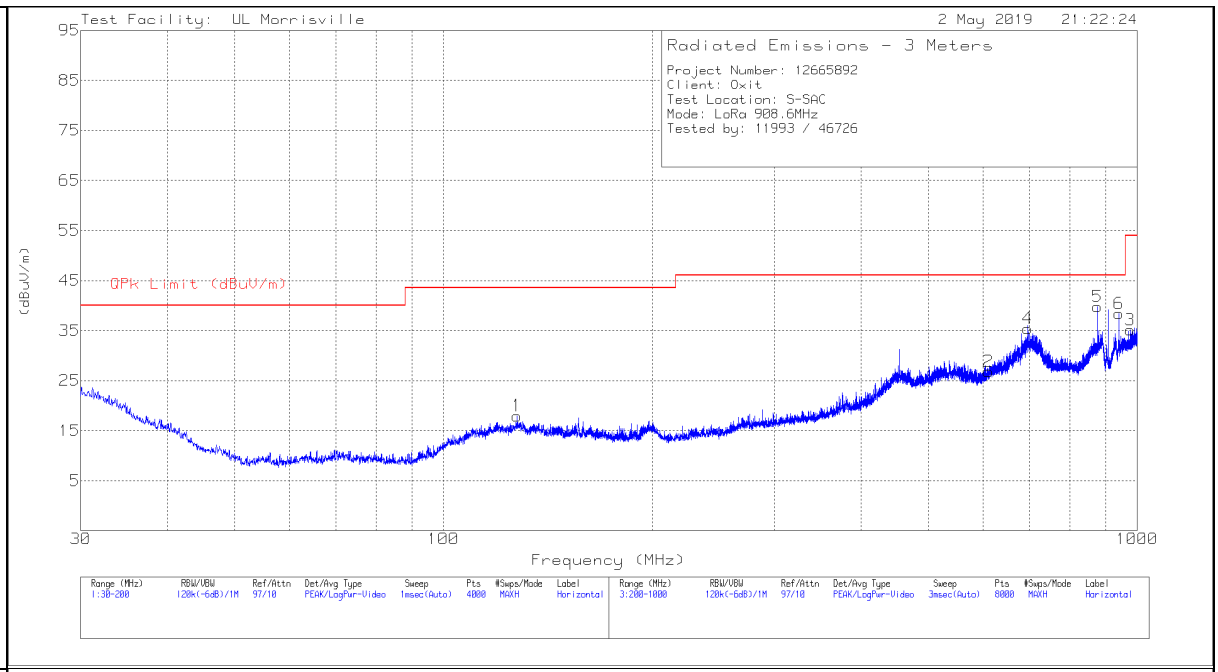
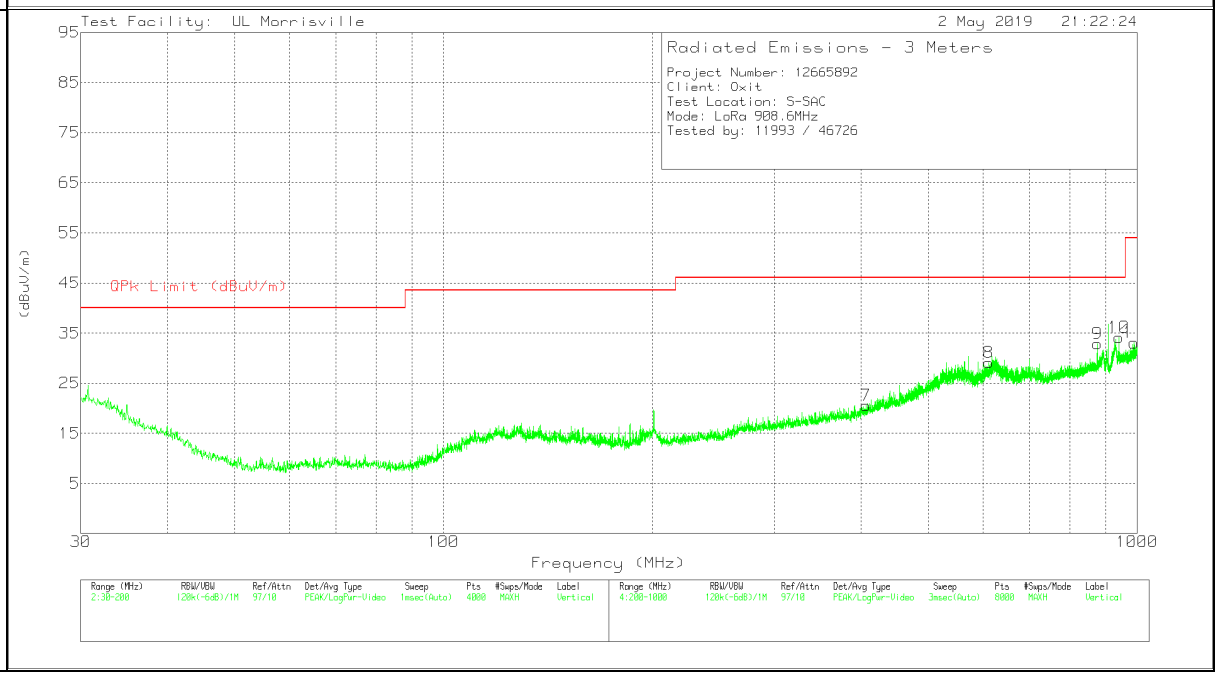
MID CHANNEL

HORIZONTAL



VERTICAL



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Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AT0074 AF (dB/m)	Cbl/Amp	Filter (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 127.6903	30.07	Pk	18.3	-30.7	.3	17.97	43.52	-25.55	0-360	298	H
2	* ** 610.2533	31.46	Pk	23.6	-28.7	.5	26.86	46.02	-19.16	0-360	299	H
3	* ** 976.4009	32.75	Pk	27.8	-26.1	.7	35.15	53.97	-18.82	0-360	102	H
5	** 876.688	39.29	Pk	26.8	-27.4	1.1	39.79	46.02	-6.23	0-360	102	H
6	** 940.6463	35.9	Pk	27.5	-26.6	1.6	38.4	46.02	-7.62	0-360	102	H
7	* ** 406.5268	28.55	Pk	20.6	-29.1	.5	20.55	46.02	-25.47	0-360	198	V
8	* ** 610.7534	33.61	Pk	23.7	-28.7	.5	29.11	46.02	-16.91	0-360	102	V
9	** 876.4879	32.35	Pk	26.8	-27.4	1.1	32.85	46.02	-13.17	0-360	102	V
10	** 940.4963	31.61	Pk	27.5	-26.6	1.6	34.11	46.02	-11.91	0-360	102	V
11	* ** 989.8027	30.18	Pk	28	-25.8	.7	33.08	53.97	-20.89	0-360	102	V
4	695.7644	38.22	Pk	24.7	-28.1	.6	35.42	46.02	-10.6	0-360	102	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
Pk - Peak detector

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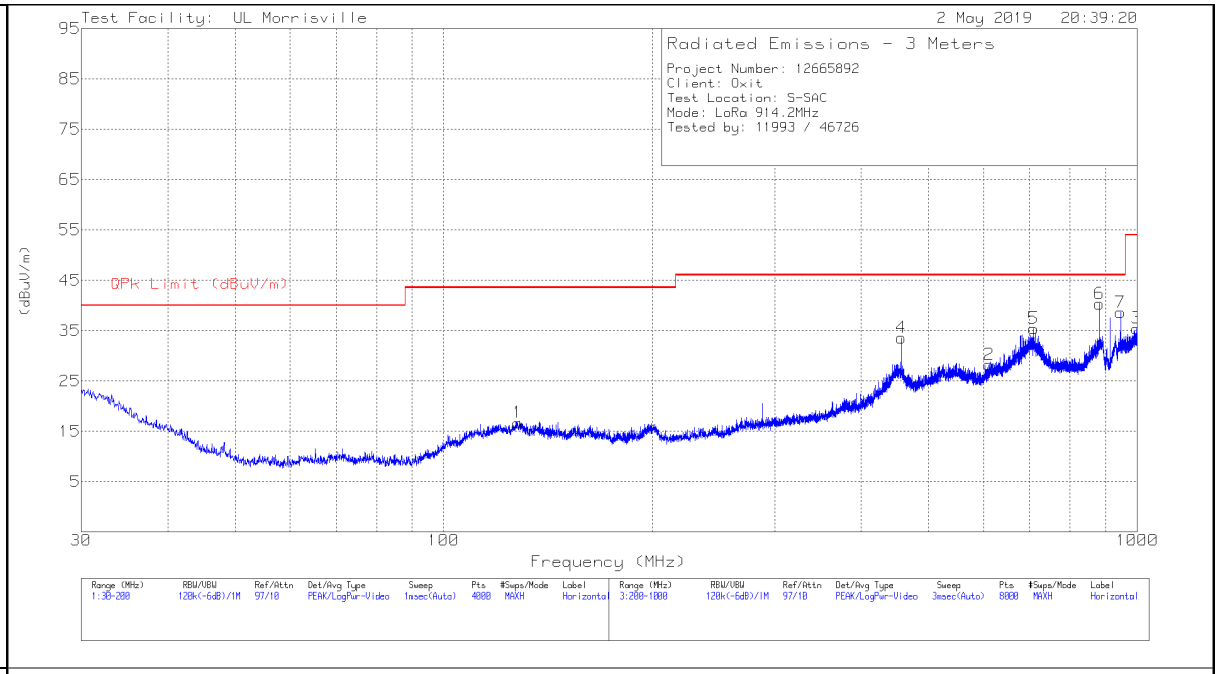
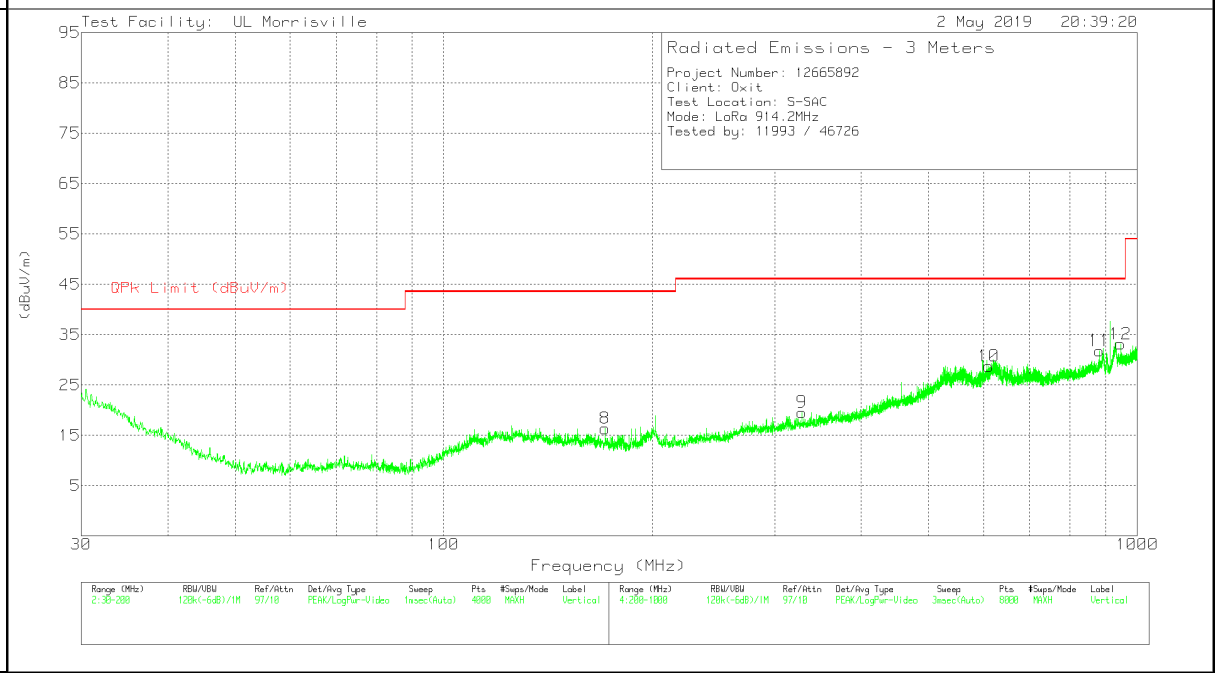
HIGH CHANNEL

HORIZONTAL



VERTICAL



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Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AT0074 AF (dB/m)	Cbl/Amp	Filter (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 127.9028	28.82	Pk	18.3	-30.7	.3	16.72	43.52	-26.8	0-360	398	H
8	* ** 170.7964	30.36	Pk	16.2	-30.5	.3	16.36	43.52	-27.16	0-360	101	V
2	* ** 611.4535	32.74	Pk	23.7	-28.7	.5	28.24	46.02	-17.78	0-360	299	H
3	* ** 997.3036	32.46	Pk	28	-25.7	.7	35.46	53.97	-18.51	0-360	102	H
6	** 882.1909	37.22	Qp	26.8	-27.2	1.2	38.02	46.02	-8	274	101	H
7	** 945.997	36.33	Pk	27.6	-26.5	1.2	38.63	46.02	-7.39	0-360	102	H
9	* ** 328.6167	29.97	Pk	18.8	-29.5	.3	19.57	46.02	-26.45	0-360	298	V
10	* ** 610.5534	33.23	Pk	23.7	-28.7	.5	28.73	46.02	-17.29	0-360	102	V
11	** 882.1887	31.02	Pk	26.8	-27.2	1.2	31.82	46.02	-14.2	0-360	298	V
12	** 945.997	30.82	Pk	27.6	-26.5	1.2	33.12	46.02	-12.9	0-360	102	V
4	457.1334	40.59	Pk	21.4	-28.8	.4	33.59	46.02	-12.43	0-360	102	H
5	708.9662	38.11	Pk	24.9	-28.2	.6	35.41	46.02	-10.61	0-360	102	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
Pk - Peak detector
Qp - Quasi-Peak detector

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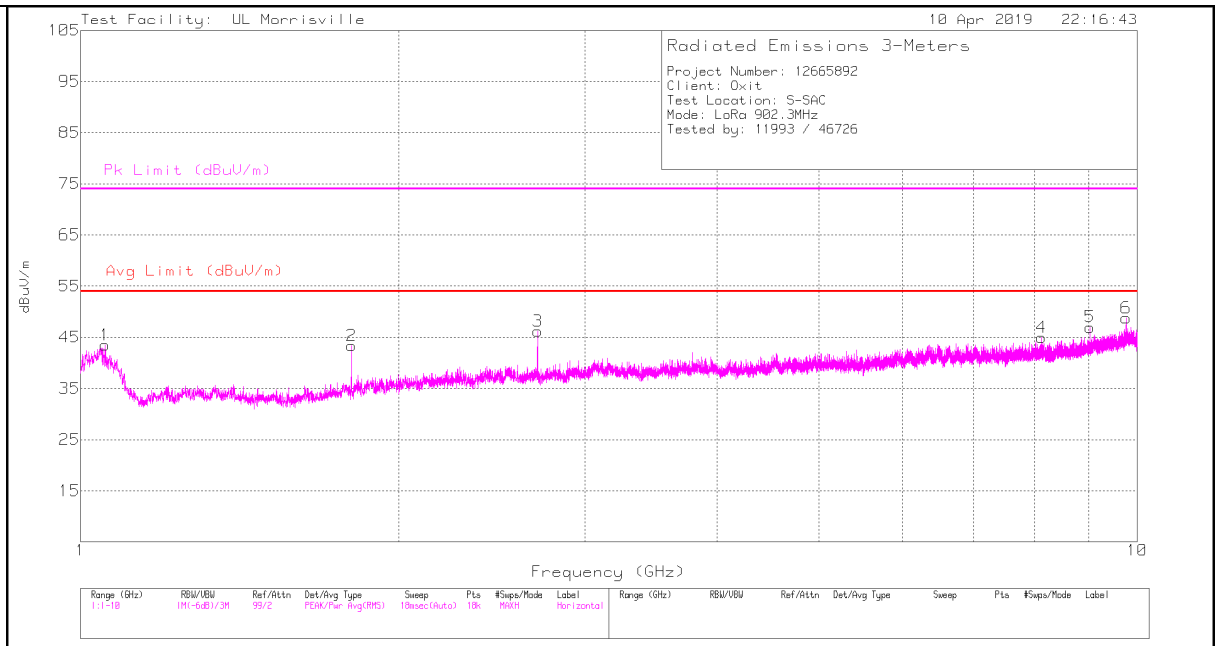
9.2. TRANSMITTER ABOVE 1GHZ

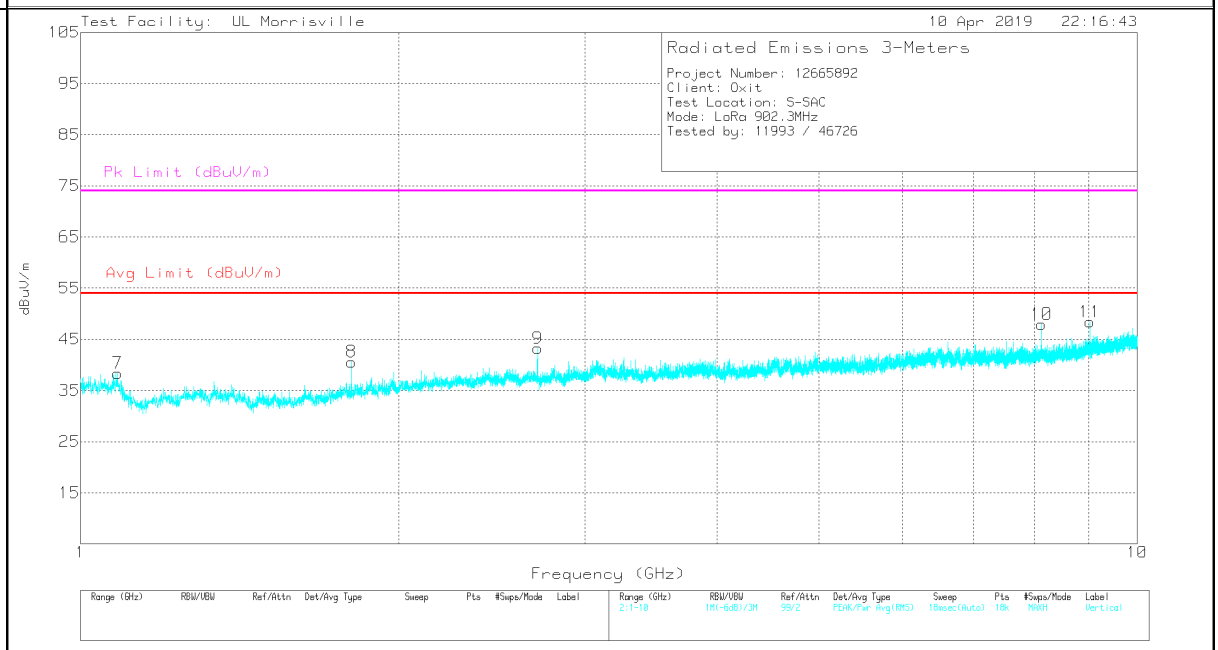
9.2.1. 125kHz BANDWIDTH

LOW CHANNEL

HORIZONTAL



VERTICAL



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Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0069 AF (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Filter (dB)	Corrected Reading dBuV/m	Avg Limit (dBuV/m)	Margin (dB)	Pk Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 1.056	52.66	PK-U	26.9	-35.4	1.3	45.46	-	-	74	-28.54	208	207	H
	* ** 1.055	40.46	V1TR	26.9	-35.4	1.3	33.26	54	-20.74	-	-	208	207	H
3	* ** 2.707	49.09	PK-U	32.3	-34	.5	47.89	-	-	74	-26.11	22	103	H
	* ** 2.707	45.03	V1TR	32.3	-34	.5	43.83	54	-10.17	-	-	22	103	H
4	* ** 8.121	39.58	PK-U	35.6	-27.8	.4	47.78	-	-	74	-26.22	311	256	H
	* ** 8.121	30.07	V1TR	35.6	-27.8	.4	38.27	54	-15.73	-	-	311	256	H
5	* ** 9.024	41.1	PK-U	36.1	-27.1	.7	50.8	-	-	74	-23.2	352	115	H
	* ** 9.023	33.43	V1TR	36.1	-27.1	.7	43.13	54	-10.87	-	-	352	115	H
7	* ** 1.085	48.26	PK-U	27.3	-35.3	1.1	41.36	-	-	74	-32.64	284	395	V
	* ** 1.085	35.91	V1TR	27.3	-35.3	1.1	29.01	54	-24.99	-	-	284	395	V
9	* ** 2.707	47.45	PK-U	32.3	-34	.5	46.25	-	-	74	-27.75	340	102	V
	* ** 2.707	42.59	V1TR	32.3	-34	.5	41.39	54	-12.61	-	-	340	102	V
10	* ** 8.12	42.74	PK-U	35.6	-27.8	.4	50.94	-	-	74	-23.06	204	342	V
	* ** 8.121	36.09	V1TR	35.6	-27.8	.4	44.29	54	-9.71	-	-	204	342	V
11	* ** 9.023	42.14	PK-U	36.1	-27.1	.7	51.84	-	-	74	-22.16	198	345	V
	* ** 9.023	35.3	V1TR	36.1	-27.1	.7	45	54	-9	-	-	198	345	V
2	1.804	47.55	Pk	30.1	-34.7	.4	43.35	-	-	-	-	0-360	199	H
8	1.804	44.8	Pk	30.1	-34.7	.4	40.6	-	-	-	-	0-360	101	V
6	9.761	37	Pk	37	-26.2	1	48.8	-	-	-	-	0-360	102	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
PK-U: Maximum Peak
V1TR: VB=1/Ton, RMS Average where: Ton is packet duration.
Note – 1/0.202s = 5 Hz. Therefore, 10 Hz was used.

Pk - Peak detector

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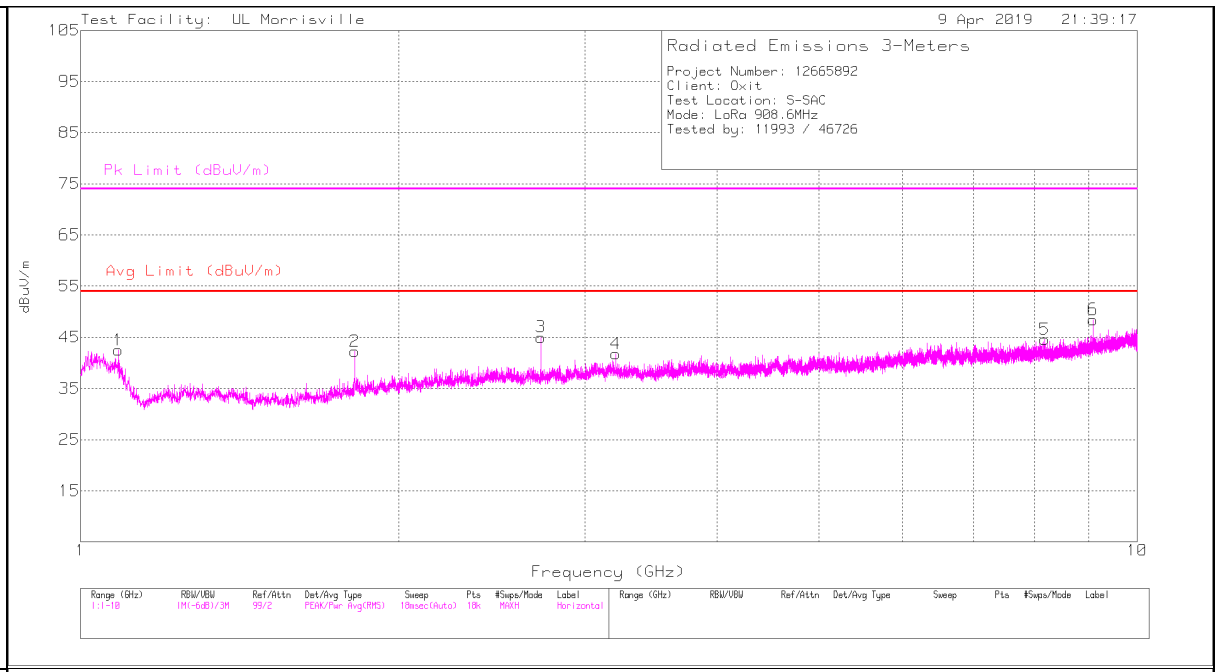
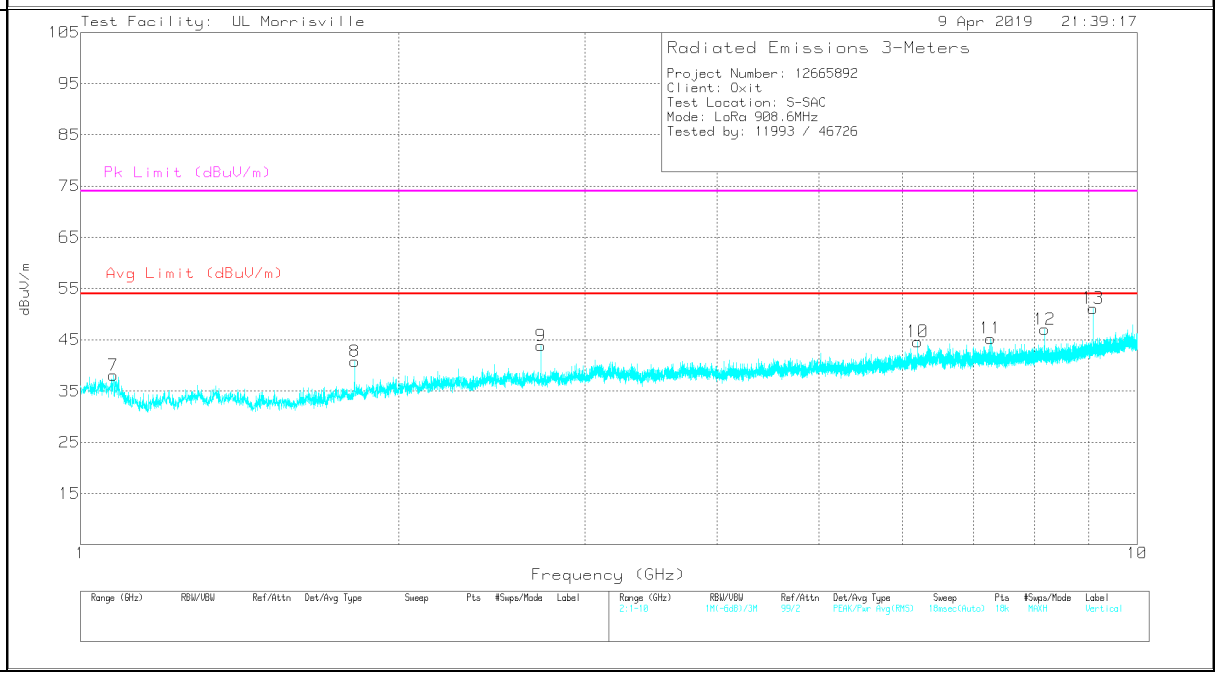
MID CHANNEL

HORIZONTAL



VERTICAL



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Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0069 AF (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Filter (dB)	Corrected Reading dBuV/m	Avg Limit (dBuV/m)	Margin (dB)	Pk Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 1.086	52.25	PK-U	27.3	-35.3	1.1	45.35	-	-	74	-28.65	43	151	H
	* ** 1.085	40	V1TR	27.3	-35.3	1.1	33.1	54	-20.9	-	-	43	151	H
3	* ** 2.726	48.68	PK-U	32.3	-34	.5	47.48	-	-	74	-26.52	23	352	H
	* ** 2.726	44.32	V1TR	32.3	-34	.5	43.12	54	-10.88	-	-	23	352	H
5	* ** 8.177	39.01	PK-U	35.7	-27.6	.4	47.51	-	-	74	-26.49	143	384	H
	* ** 8.177	29.12	V1TR	35.7	-27.7	.4	37.52	54	-16.48	-	-	143	384	H
6	* ** 9.086	42.34	PK-U	36.2	-26.6	.8	52.74	-	-	74	-21.26	356	101	H
	* ** 9.086	35	V1TR	36.2	-26.6	.8	45.4	54	-8.6	-	-	356	101	H
7	* ** 1.075	47.77	PK-U	27.1	-35.3	1.1	40.67	-	-	74	-33.33	296	392	V
	* ** 1.075	35.37	V1TR	27.1	-35.3	1.1	28.27	54	-25.73	-	-	296	392	V
9	* ** 2.726	47.29	PK-U	32.3	-34	.5	46.09	-	-	74	-27.91	0	100	V
	* ** 2.726	42.37	V1TR	32.3	-34	.5	41.17	54	-12.83	-	-	0	100	V
11	* ** 7.269	41.13	PK-U	35.5	-28.3	.5	48.83	-	-	74	-25.17	191	220	V
	* ** 7.269	33.01	V1TR	35.5	-28.3	.5	40.71	54	-13.29	-	-	191	220	V
12	* ** 8.178	42.07	PK-U	35.7	-27.7	.4	50.47	-	-	74	-23.53	212	364	V
	* ** 8.178	35.41	V1TR	35.7	-27.7	.4	43.81	54	-10.19	-	-	212	364	V
13	* ** 9.086	42.76	PK-U	36.2	-26.6	.8	53.16	-	-	74	-20.84	199	365	V
	* ** 9.086	36.41	V1TR	36.2	-26.6	.8	46.81	54	-7.19	-	-	199	365	V
2	1.817	46.25	Pk	30.2	-34.6	.4	42.25	-	-	-	-	0-360	101	H
8	1.817	44.76	Pk	30.2	-34.6	.4	40.76	-	-	-	-	0-360	101	V
4	3.211	41.86	Pk	32.9	-33.5	.5	41.76	-	-	-	-	0-360	199	H
10	6.197	38.75	Pk	35.4	-30.2	.7	44.65	-	-	-	-	0-360	101	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
PK-U: Maximum Peak
V1TR: VB=1/Ton, RMS Average where: Ton is packet duration
Note – 1/0.202s = 5 Hz. Therefore, 10 Hz was used.

Pk - Peak detector

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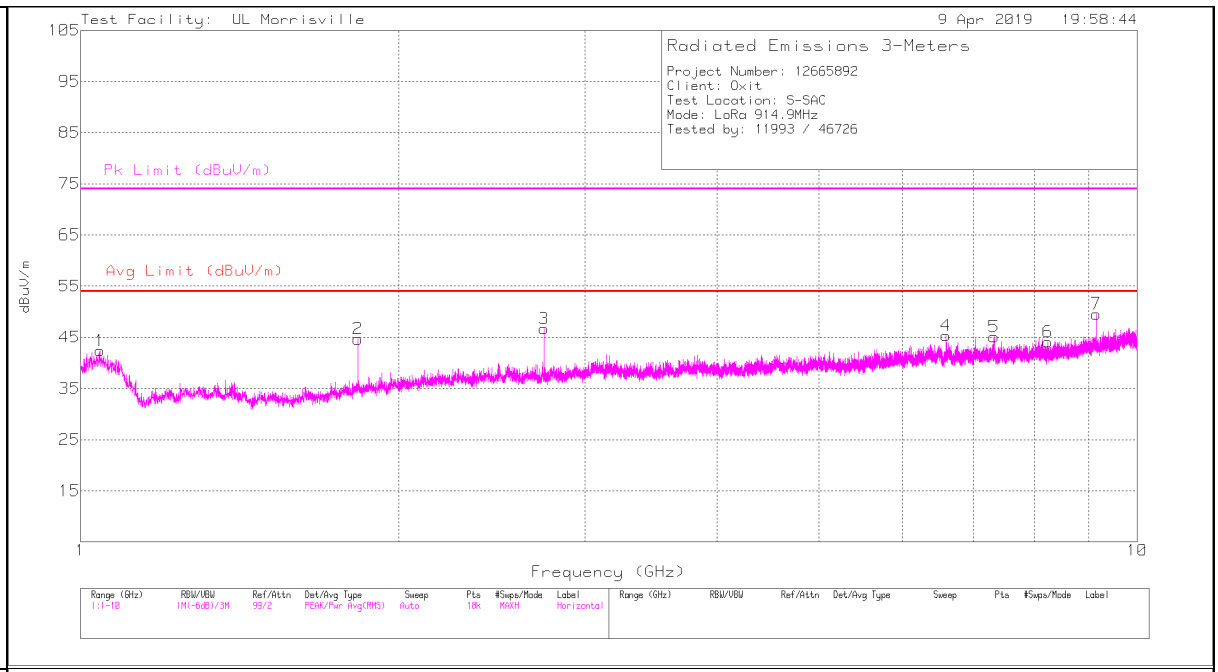
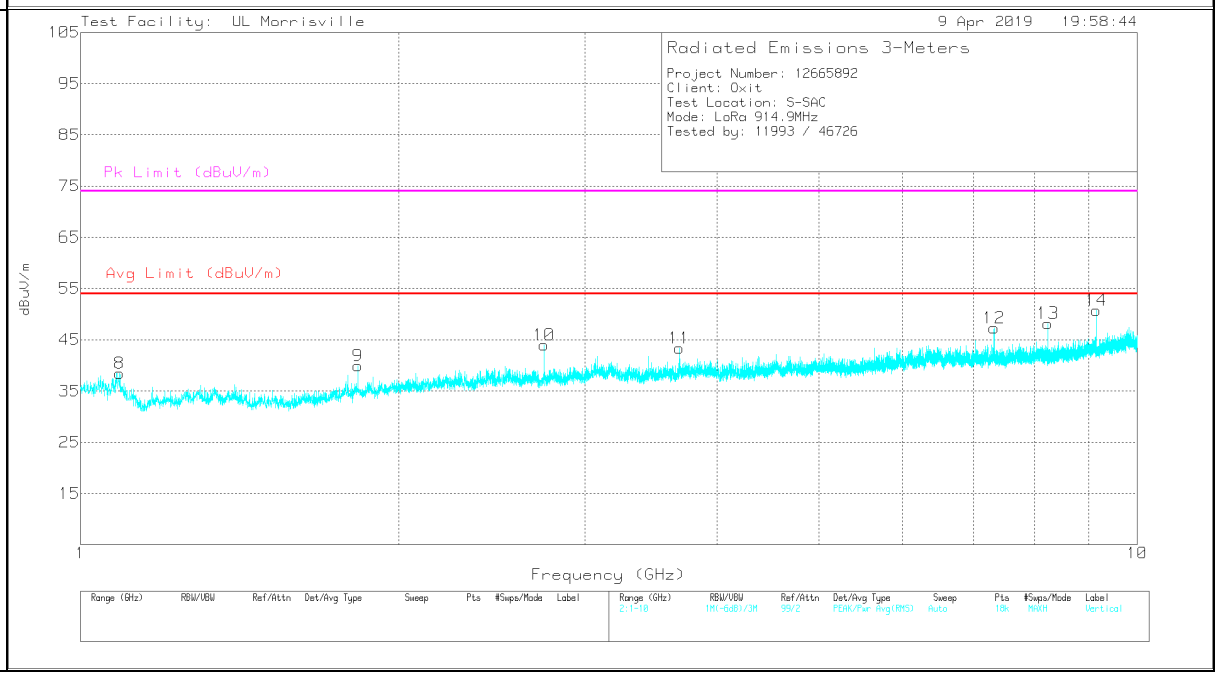
HIGH CHANNEL

HORIZONTAL



VERTICAL



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Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0069 AF (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Filter (dB)	Corrected Reading dBuV/m	Avg Limit (dBuV/m)	Margin (dB)	Pk Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 1.041	52.82	PK-U	26.9	-35.5	1.5	45.72	-	-	74	-28.28	15	162	H
	* ** 1.043	41.26	V1TR	26.9	-35.5	1.5	34.16	54	-19.84	-	-	15	162	H
3	* ** 2.745	49.88	PK-U	32.2	-33.8	.5	48.78	-	-	74	-25.22	8	254	H
	* ** 2.745	45.9	V1TR	32.2	-33.8	.5	44.8	54	-9.2	-	-	8	254	H
5	* ** 7.319	40.56	PK-U	35.5	-28.4	.5	48.16	-	-	74	-25.84	126	395	H
	* ** 7.319	31.55	V1TR	35.5	-28.4	.5	39.15	54	-14.85	-	-	126	395	H
6	* ** 8.235	39.64	PK-U	35.7	-27.7	.4	48.04	-	-	74	-25.96	342	108	H
	* ** 8.234	31.22	V1TR	35.7	-27.7	.4	39.62	54	-14.38	-	-	342	108	H
7	* ** 9.149	41.62	PK-U	36.3	-26.8	.8	51.92	-	-	74	-22.08	348	106	H
	* ** 9.149	34.79	V1TR	36.3	-26.8	.8	45.09	54	-8.91	-	-	348	106	H
8	* ** 1.085	48.1	PK-U	27.3	-35.3	1.1	41.2	-	-	74	-32.8	275	398	V
	* ** 1.085	36.19	V1TR	27.3	-35.3	1.1	29.29	54	-24.71	-	-	275	398	V
10	* ** 2.745	47.69	PK-U	32.2	-33.8	.5	46.59	-	-	74	-27.41	314	112	V
	* ** 2.745	42.95	V1TR	32.2	-33.8	.5	41.85	54	-12.15	-	-	314	112	V
11	* ** 3.687	41.6	PK-U	33.2	-32.9	.4	42.3	-	-	74	-31.7	360	321	V
	* ** 3.688	29.01	V1TR	33.2	-32.9	.4	29.71	54	-24.29	-	-	360	321	V
12	* ** 7.319	42.26	PK-U	35.5	-28.4	.5	49.86	-	-	74	-24.14	186	250	V
	* ** 7.319	35.81	V1TR	35.5	-28.4	.5	43.41	54	-10.59	-	-	186	250	V
13	* ** 8.234	41.86	PK-U	35.7	-27.7	.4	50.26	-	-	74	-23.74	210	314	V
	* ** 8.234	35.26	V1TR	35.7	-27.7	.4	43.66	54	-10.34	-	-	210	314	V
14	* ** 9.149	43.17	PK-U	36.3	-26.8	.8	53.47	-	-	74	-20.53	196	298	V
	* ** 9.149	36.98	V1TR	36.3	-26.8	.8	47.28	54	-6.72	-	-	196	298	V
9	1.829	43.84	Pk	30.3	-34.6	.4	39.94	-	-	-	-	0-360	101	V
2	1.83	48.57	Pk	30.3	-34.6	.4	44.67	-	-	-	-	0-360	100	H
4	6.593	38.55	Pk	35.5	-29.5	.8	45.35	-	-	-	-	0-360	100	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
PK-Z: Maximum Peak
V1TR: VB=1/Ton, RMS Average where: Ton is packet duration
Note – 1/0.202s = 5 Hz. Therefore, 10 Hz was used.

Pk - Peak detector

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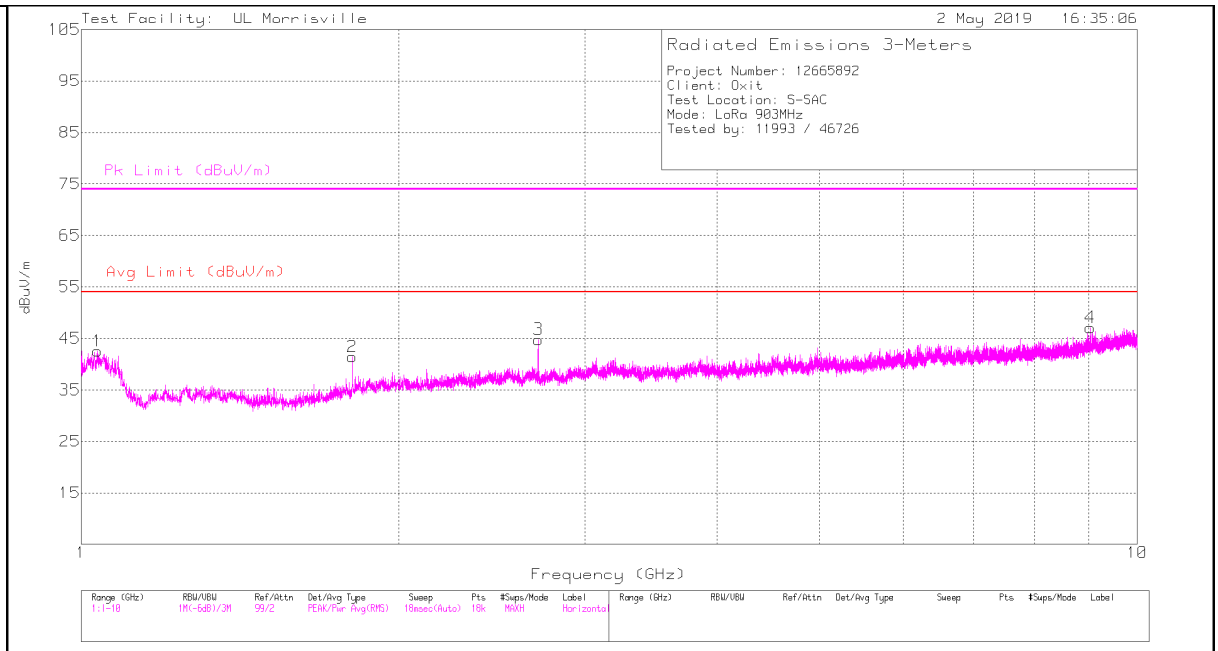
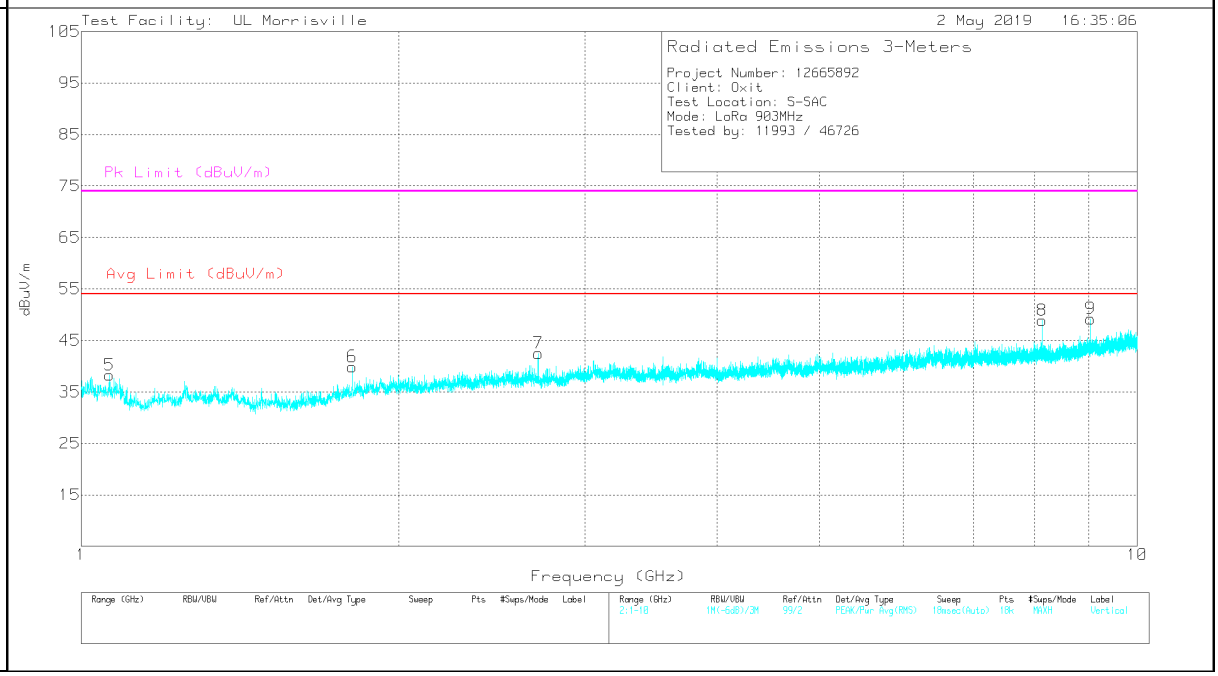
9.2.2. 500kHz BANDWIDTH

LOW CHANNEL

HORIZONTAL



VERTICAL



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Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0072 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Filter (dB)	Corrected Reading dBuV/m	Avg Limit (dBuV/m)	Margin (dB)	Pk Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 1.037	53.48	PK-U	27.1	-35.5	1.6	46.68	-	-	74	-27.32	213	268	H
	* ** 1.037	41.27	V1TR	27.1	-35.5	1.6	34.47	54	-19.53	-	-	213	268	H
3	* ** 2.709	48.14	PK-U	32.2	-34	.5	46.84	-	-	74	-27.16	18	238	H
	* ** 2.709	40.68	V1TR	32.2	-34	.5	39.38	54	-14.62	-	-	18	238	H
4	* ** 9.029	39.84	PK-U	36.6	-27	.7	50.14	-	-	74	-23.86	159	134	H
	* ** 9.029	28.17	V1TR	36.6	-27	.7	38.47	54	-15.53	-	-	159	134	H
5	* ** 1.062	47.29	PK-U	27.1	-35.4	1.2	40.19	-	-	74	-33.81	292	393	V
	* ** 1.062	35.24	V1TR	27.1	-35.4	1.2	28.14	54	-25.86	-	-	292	393	V
7	* ** 2.71	47.07	PK-U	32.2	-34	.5	45.77	-	-	74	-28.23	159	335	V
	* ** 2.709	38.98	V1TR	32.2	-34	.5	37.68	54	-16.32	-	-	159	335	V
8	* ** 8.128	42.85	PK-U	36	-27.8	.4	51.45	-	-	74	-22.55	203	333	V
	* ** 8.128	32.18	V1TR	36	-27.8	.4	40.78	54	-13.22	-	-	203	333	V
9	* ** 9.03	39.26	PK-U	36.6	-27	.7	49.56	-	-	74	-24.44	166	195	V
	* ** 9.03	27.21	V1TR	36.6	-27	.7	37.51	54	-16.49	-	-	166	195	V
2	1.806	45.42	Pk	30.2	-34.6	.4	41.42	-	-	-	-	0-360	101	H
6	1.806	43.88	Pk	30.2	-34.6	.4	39.88	-	-	-	-	0-360	101	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
PK-U: Maximum Peak
V1TR: VBW=1/Ton, RMS Average where: Ton is packet duration or approx. 53 ms.
Pk - Peak detector

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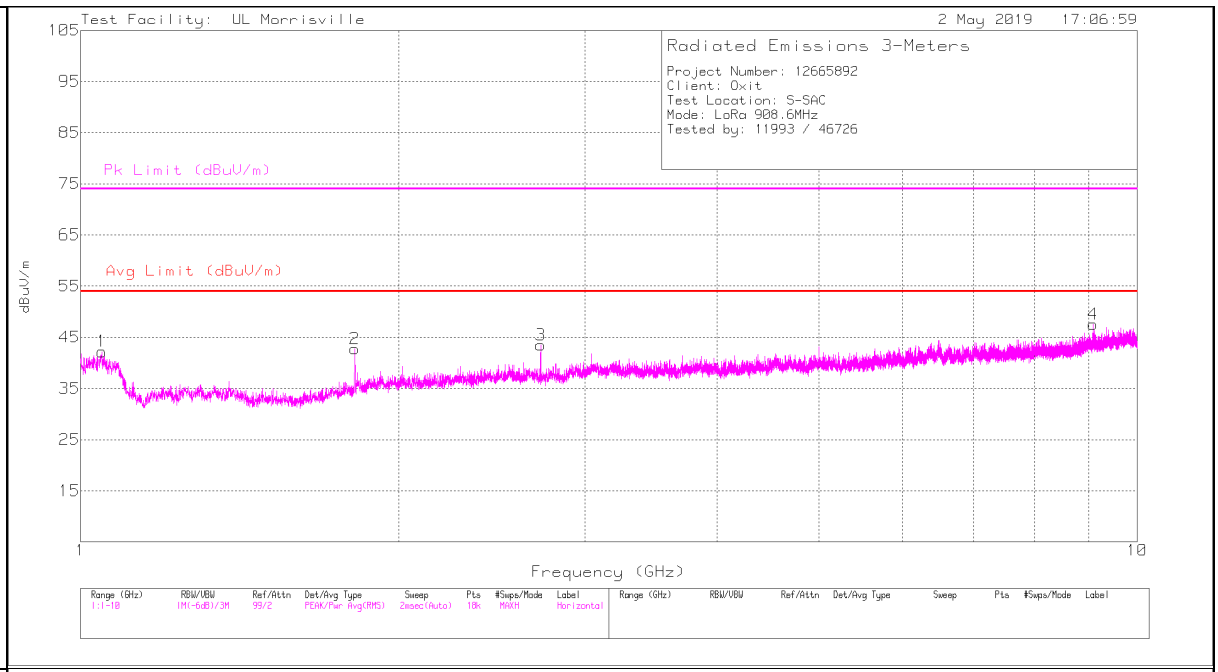
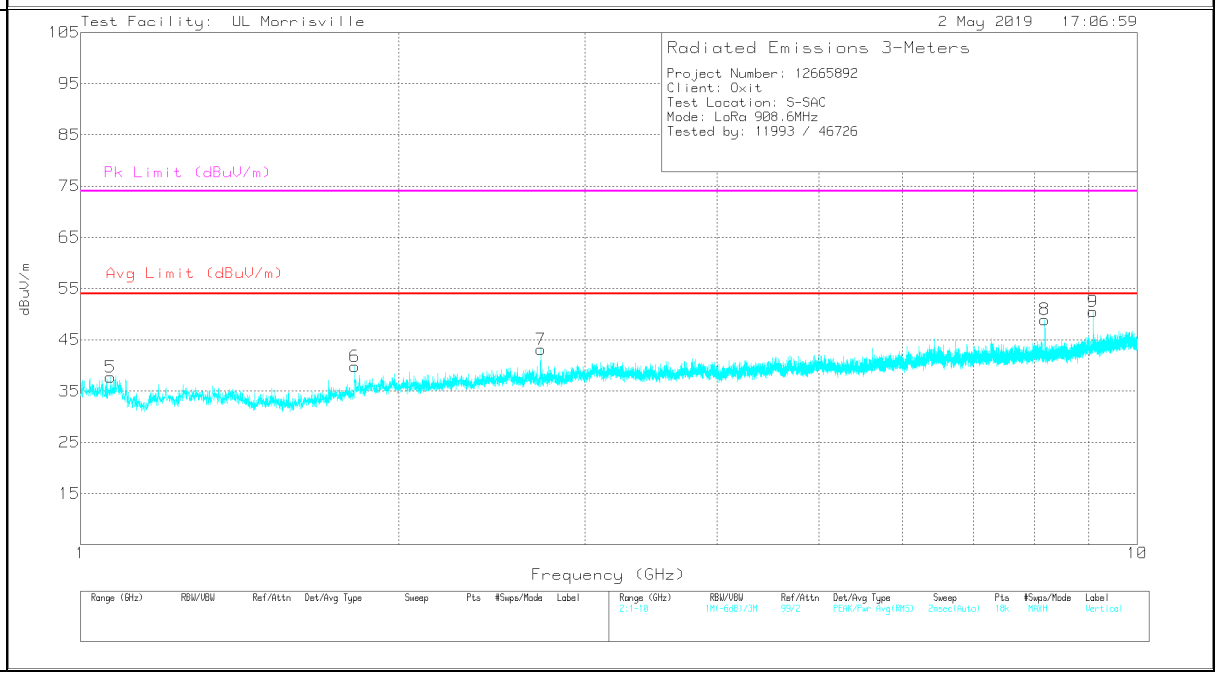
MID CHANNEL

HORIZONTAL



VERTICAL



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Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0072 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Filter (dB)	Corrected Reading dBuV/m	Avg Limit (dBuV/m)	Margin (dB)	Pk Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 1.045	53.09	PK-U	27	-35.5	1.5	46.09	-	-	74	-27.91	206	204	H
	* ** 1.045	41.08	V1TR	27	-35.5	1.5	34.08	54	-19.92	-	-	206	204	H
3	* ** 2.725	47.62	PK-U	32.3	-34	.5	46.42	-	-	74	-27.58	18	233	H
	* ** 2.726	40.77	V1TR	32.3	-34	.5	39.57	54	-14.43	-	-	18	233	H
4	* ** 9.085	41.78	PK-U	36.6	-26.6	.8	52.58	-	-	74	-21.42	355	108	H
	* ** 9.085	30.5	V1TR	36.6	-26.6	.8	41.3	54	-12.7	-	-	355	108	H
5	* ** 1.067	47.7	PK-U	27.2	-35.4	1.2	40.7	-	-	74	-33.3	104	397	V
	* ** 1.067	35.83	V1TR	27.2	-35.4	1.2	28.83	54	-25.17	-	-	104	397	V
7	* ** 2.726	46.74	PK-U	32.3	-34	.5	45.54	-	-	74	-28.46	14	395	V
	* ** 2.726	39.05	V1TR	32.3	-34	.5	37.85	54	-16.15	-	-	14	395	V
8	* ** 8.178	43	PK-U	36	-27.7	.4	51.7	-	-	74	-22.3	217	359	V
	* ** 8.177	33.18	V1TR	36	-27.7	.4	41.88	54	-12.12	-	-	217	359	V
9	* ** 9.088	42.71	PK-U	36.6	-26.6	.8	53.51	-	-	74	-20.49	189	318	V
	* ** 9.088	31.77	V1TR	36.6	-26.6	.8	42.57	54	-11.43	-	-	189	318	V
2	1.817	46.48	Pk	30.5	-34.6	.4	42.78	-	-	-	-	0-360	100	H
6	1.817	43.51	Pk	30.5	-34.6	.4	39.81	-	-	-	-	0-360	101	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
PK-U: Maximum Peak
V1TR: VB=1/Ton, RMS Average where: Ton is packet duration or approx. 53 ms.
Pk - Peak detector

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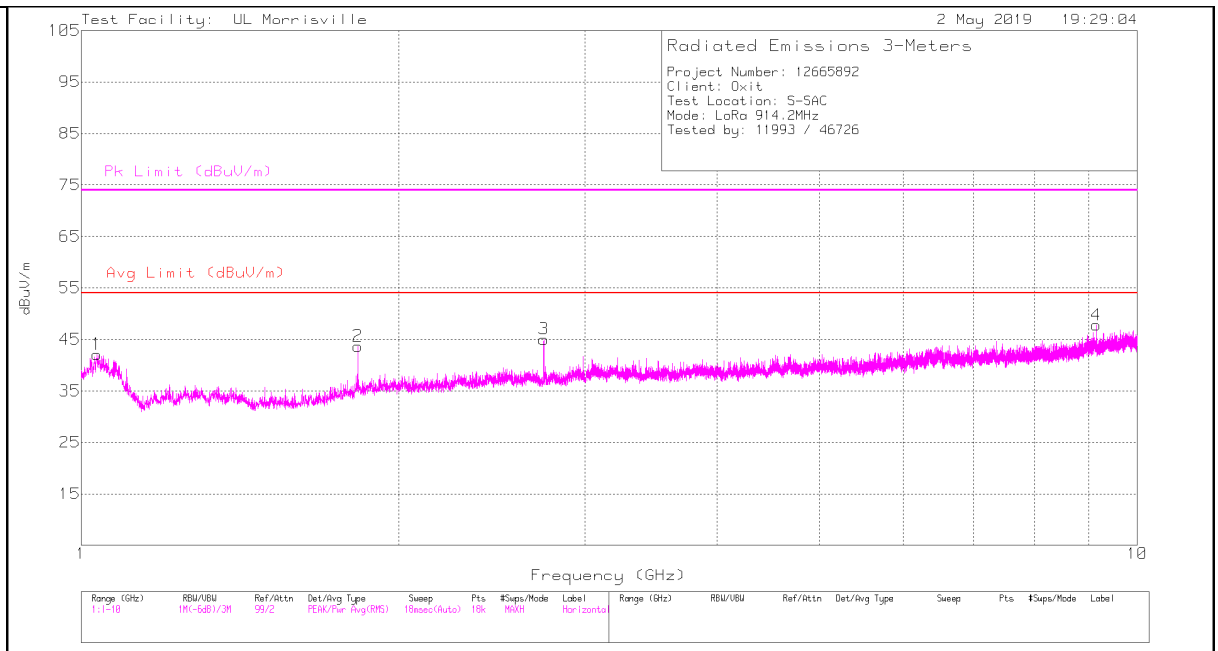
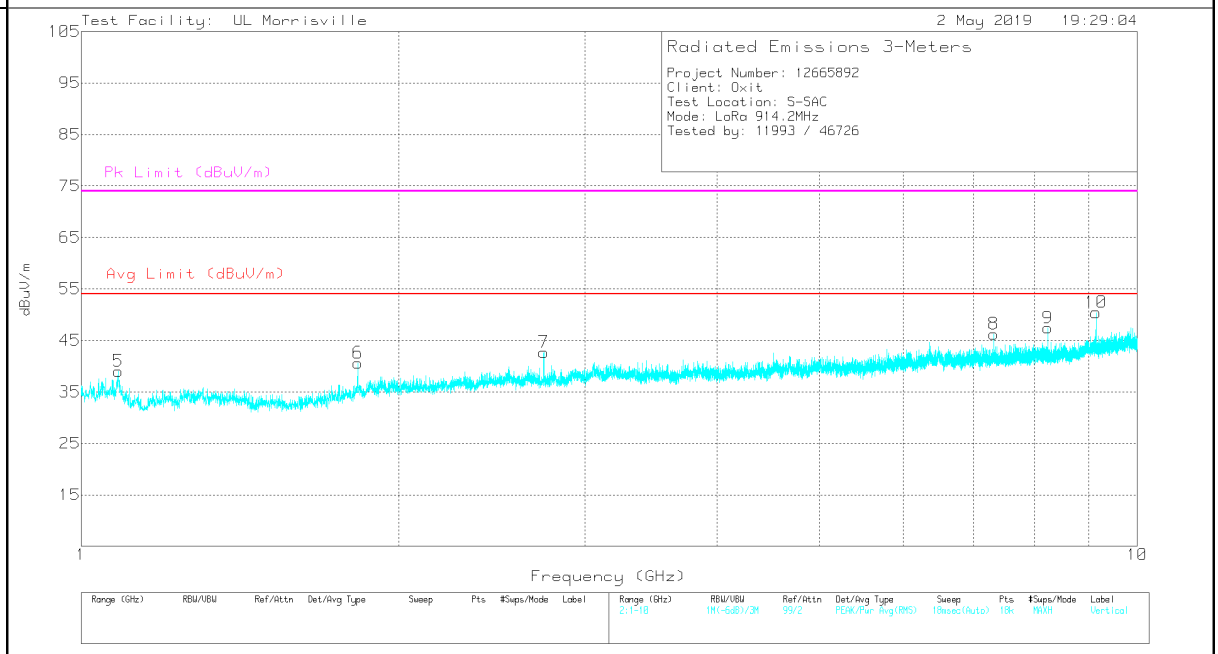
HIGH CHANNEL

HORIZONTAL



VERTICAL



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Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0072 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Filter (dB)	Corrected Reading dBuV/m	Avg Limit (dBuV/m)	Margin (dB)	Pk Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 1.036	52.52	PK-U	27.1	-35.5	1.6	45.72	-	-	74	-28.28	206	267	H
	* ** 1.036	40.53	V1TR	27.1	-35.5	1.6	33.73	54	-20.27	-	-	206	267	H
3	* ** 2.742	48.44	PK-U	32.3	-33.9	.5	47.34	-	-	74	-26.66	16	227	H
	* ** 2.742	41.61	V1TR	32.3	-33.9	.5	40.51	54	-13.49	-	-	16	227	H
4	* ** 9.142	40.04	PK-U	36.7	-26.7	.7	50.74	-	-	74	-23.26	1	110	H
	* ** 9.142	28.56	V1TR	36.7	-26.7	.7	39.26	54	-14.74	-	-	1	110	H
5	* ** 1.082	48.51	PK-U	27.4	-35.3	1.1	41.71	-	-	74	-32.29	273	395	V
	* ** 1.082	36.29	V1TR	27.4	-35.3	1.1	29.49	54	-24.51	-	-	273	395	V
7	* ** 2.743	46.82	PK-U	32.3	-33.9	.5	45.72	-	-	74	-28.28	357	393	V
	* ** 2.743	39.54	V1TR	32.3	-33.9	.5	38.44	54	-15.56	-	-	357	393	V
8	* ** 7.314	41.38	PK-U	35.7	-28.3	.5	49.28	-	-	74	-24.72	184	245	V
	* ** 7.314	29.53	V1TR	35.7	-28.3	.5	37.43	54	-16.57	-	-	184	245	V
9	* ** 8.226	42.38	PK-U	36	-27.7	.4	51.08	-	-	74	-22.92	218	349	V
	* ** 8.226	31.23	V1TR	36	-27.7	.4	39.93	54	-14.07	-	-	218	349	V
10	* ** 9.141	42.57	PK-U	36.7	-26.7	.7	53.27	-	-	74	-20.73	192	298	V
	* ** 9.141	31.75	V1TR	36.7	-26.7	.7	42.45	54	-11.55	-	-	192	298	V
2	1.828	47.29	Pk	30.6	-34.6	.4	43.69	-	-	-	-	0-360	199	H
6	1.828	44.22	Pk	30.6	-34.6	.4	40.62	-	-	-	-	0-360	101	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
PK-U: Maximum Peak
V1TR: VB=1/Ton, RMS Average where: Ton is packet duration or approx. 53 ms.
Pk - Peak detector

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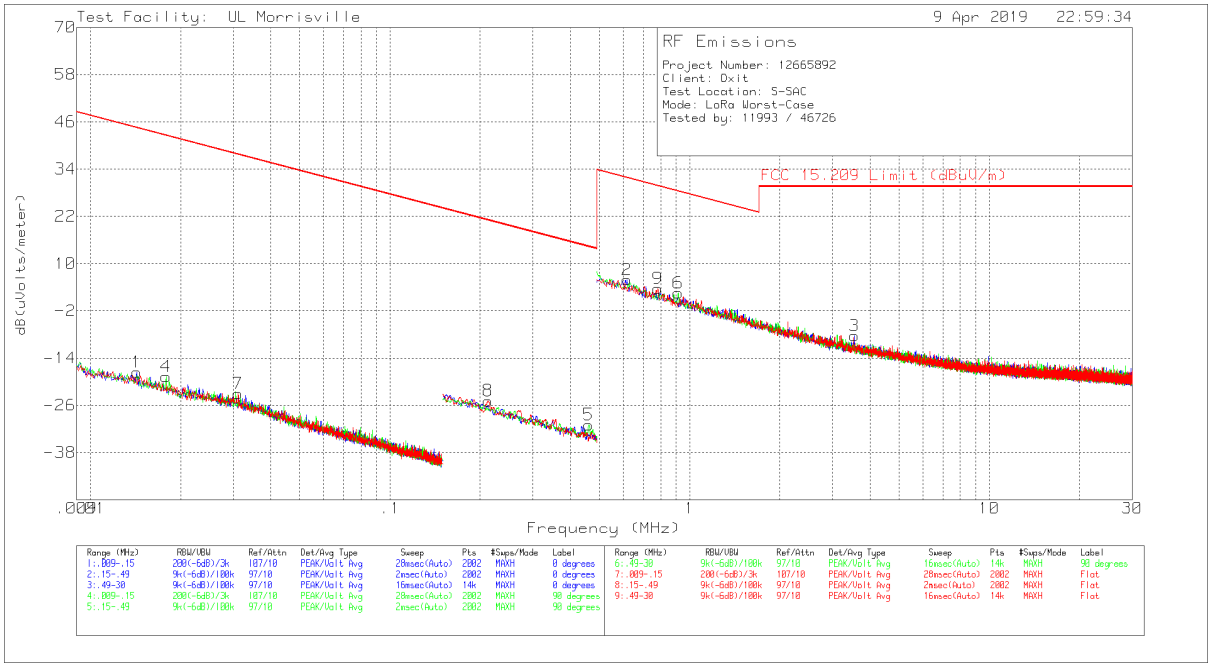
9.3. WORST CASE BELOW 30MHZ

Note: All measurements were made at a test distance of 3 m. The measured data was extrapolated from the test distance (3m) to the specification distance (300 m from 9-490 kHz and 30 m from 490 kHz – 30 MHz) to clearly show the relative levels of fundamental and spurious emissions and demonstrate compliance with the requirement that the level of any spurious emissions be below the level of the intentionally transmitted signal. The extrapolation factor for the limits were 40*Log (test distance / specification distance).

SPURIOUS EMISSIONS BELOW 30 MHz (125kHz BANDWIDTH)



ANTENNA- THREE ORIENTATIONS

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AT0079 AF (dB/m)	Cbl (dB)	Dist. Corr. Factor (dB)	Corrected Reading dB(uV/meter)	FCC 15.209 QP Limit (dBuV/m)	FCC 15.209 AV Limit (dBuV/m)	FCC 15.209 PK Limit (dBuV/m)	Worst-Case Margin (dB)	Azimuth (Degs)	Antenna Face
1	.01432	45.94	Pk	16.4	.1	-80	-17.56	-	44.49	64.49	-62.05	0-360	On
4	.01789	46.25	Pk	14.9	.1	-80	-18.75	-	42.55	62.55	-61.3	0-360	Off
7	.03112	43.46	Pk	13.4	.1	-80	-23.04	-	37.74	57.74	-60.78	0-360	Flat
8	.21248	44.32	Pk	10.7	.1	-80	-24.88	-	21.06	41.06	-45.94	0-360	Flat
5	.46093	38.24	Pk	10.7	.1	-80	-30.96	-	14.33	34.33	-45.29	0-360	Off
2	.61753	34.98	Pk	10.8	.1	-40	5.88	31.79	-	-	-25.91	0-360	On
9	.78301	32.75	Pk	10.8	.1	-40	3.65	29.73	-	-	-26.08	0-360	Flat
6	.91582	31.59	Pk	10.8	.1	-40	2.49	28.37	-	-	-25.88	0-360	Off
3	3.54871	20.19	Pk	11.2	.3	-40	-8.31	29.54	-	-	-37.85	0-360	On

Pk - Peak detector

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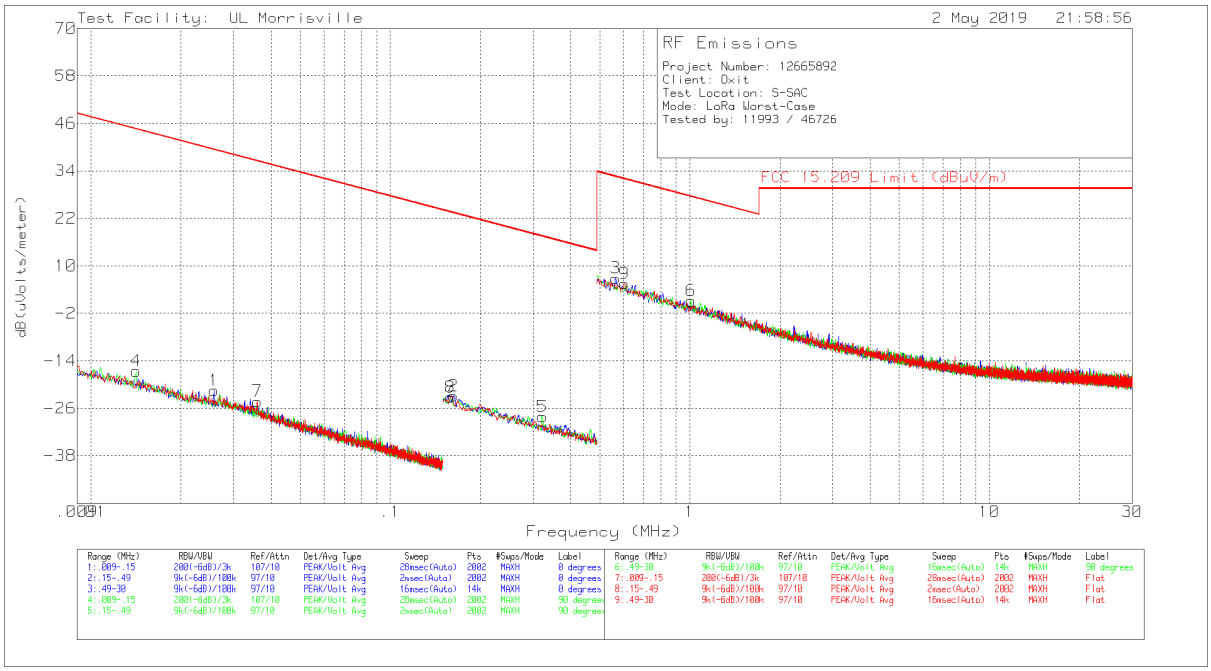
SPURIOUS EMISSIONS BELOW 30 MHz (500kHz BANDWIDTH)



ANTENNA- THREE ORIENTATIONS

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AT0079 AF (dB/m)	Cbl (dB)	Dist. Corr. Factor (dB)	Corrected Reading dB(uV/meter)	FCC 15.209 QP Limit (dBuV/m)	FCC 15.209 AV Limit (dBuV/m)	FCC 15.209 PK Limit (dBuV/m)	Worst-Case Margin (dB)	Azimuth (Degs)	Antenna Face
4	.01418	46.77	Pk	16.5	.1	-80	-16.63	-	44.57	64.57	-61.2	0-360	Off
1	.0258	44.69	Pk	13.7	.1	-80	-21.51	-	39.37	59.37	-60.88	0-360	On
7	.03602	42.8	Pk	12.8	.1	-80	-24.3	-	36.47	56.47	-60.77	0-360	Flat
8	.1585	45.95	Pk	10.7	.1	-80	-23.25	-	23.6	43.6	-46.85	0-360	Flat
2	.16275	46.27	Pk	10.7	.1	-80	-22.93	-	23.37	43.37	-46.3	0-360	On
5	.32204	41.11	Pk	10.6	.1	-80	-28.19	-	17.45	37.45	-45.64	0-360	Off
3	.56483	35.95	Pk	10.8	.1	-40	6.85	32.57	-	-	-25.72	0-360	On
9	.60489	34.58	Pk	10.8	.1	-40	5.48	31.97	-	-	-26.49	0-360	Flat
6	1.00857	29.96	Pk	11	.2	-40	1.16	27.53	-	-	-26.37	0-360	Off

Pk - Peak detector

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10. SETUP PHOTOS

Please refer to R12665892-EP1 for setup photos

END OF TEST REPORT

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