

Ittron, Inc.

TEST REPORT FOR

**Water Endpoint
Model: RIVAW**

Tested to The Following Standards:

**FCC Part 15 Subpart C Section(s)
15.247
(FHSS AND HYBRID 902-928 MHz)**

Report No.: 99218-29

Date of issue: December 24, 2018



Test Certificate # 803.02

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

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

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ADMINISTRATIVE INFORMATION

Test Report Information

REPORT PREPARED FOR:

Itron, Inc.
2111 N. Molter Road
Liberty Lake, WA 99019

Representative: Jay Holcomb
Customer Reference Number: 162959

DATE OF EQUIPMENT RECEIPT:**DATE(S) OF TESTING:****REPORT PREPARED BY:**

Terri Rayle
CKC Laboratories, Inc.
5046 Sierra Pines Drive
Mariposa, CA 95338

Project Number: 99218

November 1, 2018

November 1-9, 2018 and December 6-11, 2018

Report Authorization

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

A handwritten signature in black ink, reading "Steve Behm", is positioned above a horizontal line.

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

Test Facility Information



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

TEST LOCATION(S):
CKC Laboratories, Inc.
110 Olinda Place
Brea, CA 92823

Software Versions

CKC Laboratories Proprietary Software	Version
EMITest Emissions	5.03.11

Site Registration & Accreditation Information

Location	NIST CB #	TAIWAN	CANADA	FCC	JAPAN
Brea A, CA	US0060	SL2-IN-E-1146R	3082D-1	US1025	A-0147

SUMMARY OF RESULTS

Standard / Specification: FCC Part 15 Subpart C - 15.247 (FHSS 902-928MHz)

Test Procedure	Description	Modifications	Results
15.247(a)(1)(i)	Occupied Bandwidth	NA	Pass
15.247(a)(1)	Carrier Separation	NA	Pass
15.247(a)(1)(i)	Number of Hopping Channels	NA	Pass
15.247(a)(1)(i)	Average Time of Occupancy	NA	NP
15.247(b)(2)	Output Power	NA	Pass
15.247 (f)	Hybrid Systems	NA	Pass
15.247(f)	Power Spectral Density	NA	Pass
15.247(d)	RF Conducted Emissions & Band Edge	NA	Pass
15.247(d)	Radiated Emissions & Band Edge	NA	Pass
15.207	AC Conducted Emissions	NA	NA1

NA = Not Applicable

NA1 = Not applicable because the EUT operates on battery power.

NP = CKC Laboratories was not contracted to perform test. See Manufacturer Declaration in Average Time of Occupancy section.

ISO/IEC 17025 Decision Rule

The declaration of pass or fail herein is based upon assessment to the specification(s) listed above, including where applicable, assessment of measurement uncertainties. For performance related tests, equipment was monitored for specified criteria identified in that section of testing.

Modifications During Testing

This list is a summary of the modifications made to the equipment during testing.

Summary of Conditions

No modifications were made during testing.

Modifications listed above must be incorporated into all production units.

Conditions During Testing

This list is a summary of the conditions noted to the equipment during testing.

Summary of Conditions

None

EQUIPMENT UNDER TEST (EUT)

During testing, numerous configurations may have been utilized. The configurations listed below support compliance to the standard(s) listed in the Summary of Results section.

Configuration 1

Equipment Tested:

Device	Manufacturer	Model #	S/N
Water Endpoint	Itron, Inc.	RIVAW	99218-cond2

Support Equipment:

Device	Manufacturer	Model #	S/N
Laptop	Dell	Latitude E6410	NA
Laptop AC/DC Adapter	Dell	LA65NS0-00	NA
USB to Serial Adapter	Itron, Inc.	500W	NA
DC Power Supply	Topward	6306D	988614

Configuration 2

Equipment Tested:

Device	Manufacturer	Model #	S/N
Water Endpoint	Itron, Inc.	RIVAW	99218-remote2

Support Equipment:

Device	Manufacturer	Model #	S/N
Laptop	Dell	Latitude E6410	NA
Laptop AC/DC Adapter	Dell	LA65NS0-00	NA
USB to Serial Adapter	Itron, Inc.	500W	NA

Configuration 3

Equipment Tested:

Device	Manufacturer	Model #	S/N
Water Endpoint	Itron, Inc.	RIVAW	99218-pit2

Support Equipment:

Device	Manufacturer	Model #	S/N
Laptop	Dell	Latitude E6410	NA
Laptop AC/DC Adapter	Dell	LA65NS0-00	NA
USB to Serial Adapter	Itron, Inc.	500W	NA

Configuration 4

Equipment Tested:

Device	Manufacturer	Model #	S/N
Water Endpoint	Itron, Inc.	RIVAW	99218-pit2

Support Equipment:

Device	Manufacturer	Model #	S/N
Laptop	Dell	Latitude E6410	NA
Laptop AC/DC Adapter	Dell	LA65NS0-00	NA
USB to Serial Adapter	Itron, Inc.	500W	NA
Antenna	Itron, Inc.	CFG-0900-003	18332108

Configuration 5

Equipment Tested:

Device	Manufacturer	Model #	S/N
Water Endpoint	Itron, Inc.	RIVAW	99218-pit2

Support Equipment:

Device	Manufacturer	Model #	S/N
Ground Plane	NA	NA	NA
Laptop	Dell	Latitude E6410	NA
Laptop AC/DC Adapter	Dell	LA65NS0-00	NA
USB to Serial Adapter	Itron, Inc.	500W	NA
Antenna	Itron, Inc.	CFG-0900-003	18332108

General Product Information:

Product Information	Manufacturer-Provided Details
Equipment Type:	Stand-Alone Equipment
Type of Wideband System:	Proprietary FHSS
Operating Frequency Range:	902.3 to 926.9MHz (100kbps FSK power level 3) 902.4 to 927.6 MHz (300kbps power level 2-Hybrid) 902.4 to 927.6 MHz (300kbps power level 3)
Number of Hopping Channels:	83 (100kbps FSK power level 3) 64 (300kbps power level 2-Hybrid) 64 (300kbps power level 3)
Modulation Type(s):	100kbps FSK 300kbps GFSK 300kbps GFSK Hybrid
Maximum Duty Cycle:	100%
Number of TX Chains:	1
Antenna Gain:	4.4 dBi Integral Omni Antenna 5.5 dBi External Omni Antenna
Beamforming Type:	NA
Antenna Connection Type:	Integral and External
Nominal Input Voltage:	6.0Vdc
Firmware / Software used for Test:	FW 4.1.6.0/ Command Line Interface (CLI) Tool 2.0.0.11

FCC Part 15 Subpart C

15.247(a) Transmitter Characteristics

Test Setup/Conditions			
Test Location:	Brea Lab A	Test Engineer:	Don Nguyen
Test Method:	ANSI C63.10 (2013)	Test Date(s):	12/6/2018
Configuration:	1		
Test Setup:	The EUT is placed on test bench. The serial port is connected to a support laptop via serial to USB adapter. The laptop is running software Command Line Interface Tool to turn on TX at 100% duty cycle. The EUT is powered from 6.0Vdc power supply. Frequency of measurement: 902.3 to 927.6MHz RBW=2kHz and 3.9kHz, VBW=6.2kHz and 12kHz		

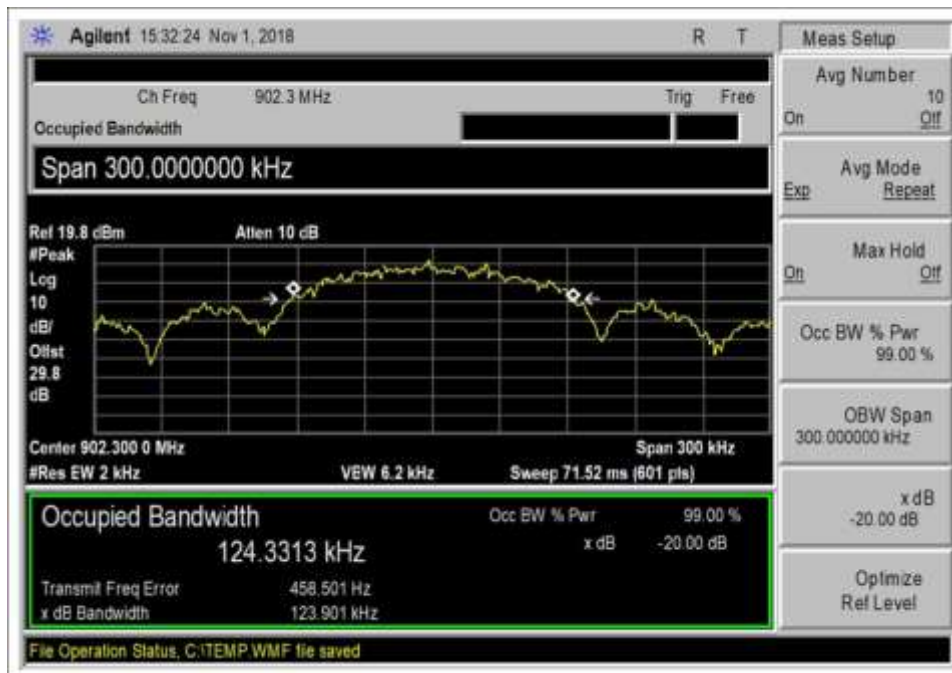
Environmental Conditions			
Temperature (°C)	22.4	Relative Humidity (%):	47.6

Test Equipment					
Asset#	Description	Manufacturer	Model	Cal Date	Cal Due
02672	Spectrum Analyzer	Agilent	E4446A	3/2/2017	3/2/2019
03432	Attenuator	Aeroflex/Weinschel	90-30-34	10/27/2017	10/27/2019
P07244	Cable	H&S	32022-29094K-29094K-24TC	7/5/2018	7/5/2020

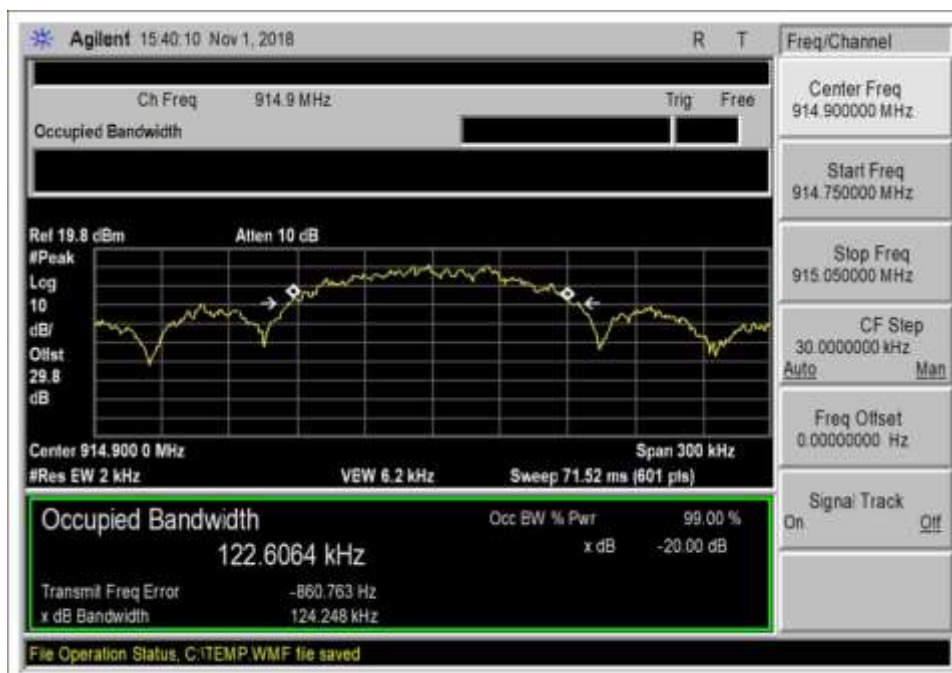
15.247(a)(1) 20 dB Bandwidth

Test Data Summary					
Frequency (MHz)	Antenna Port	Modulation	Measured (kHz)	Limit (kHz)	Results
902.3	1	100kbps FSK lv3	123.901	≤500	Pass
914.9	1	100kbps FSK lv3	124.248	≤500	Pass
926.9	1	100kbps FSK lv3	124.155	≤500	Pass
902.4	1	300kbps GFSK lv2	362.874	≤500	Pass
914.8	1	300kbps GFSK lv2	355.546	≤500	Pass
927.6	1	300kbps GFSK lv2	354.453	≤500	Pass
902.4	1	300kbps GFSK lv3	354.297	≤500	Pass
914.8	1	300kbps GFSK lv3	351.327	≤500	Pass
927.6	1	300kbps GFSK lv3	352.895	≤500	Pass

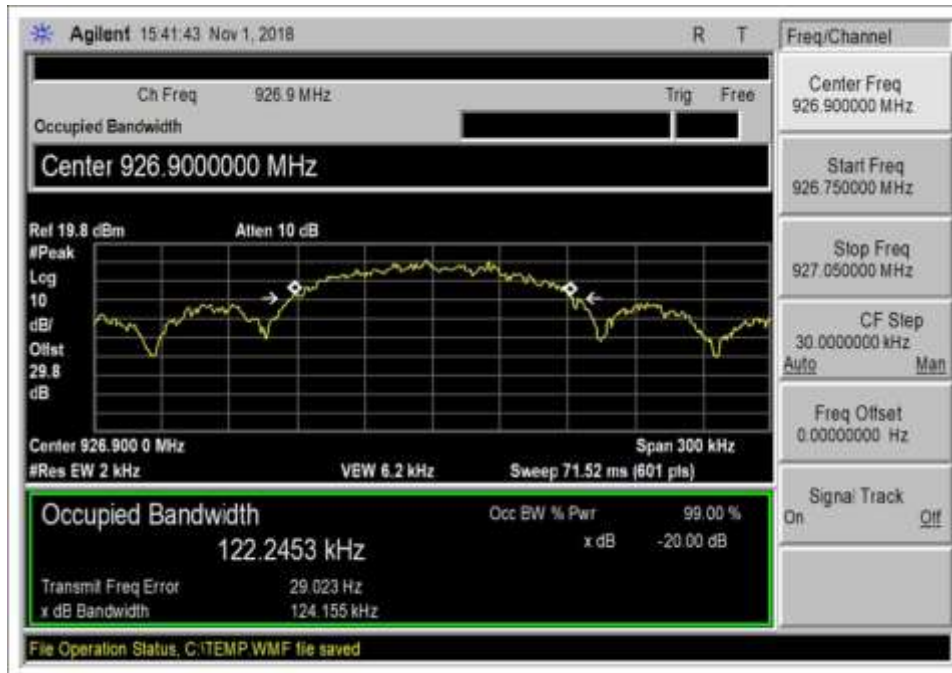
Plots



Low Channel, 100kbps, Power level 3



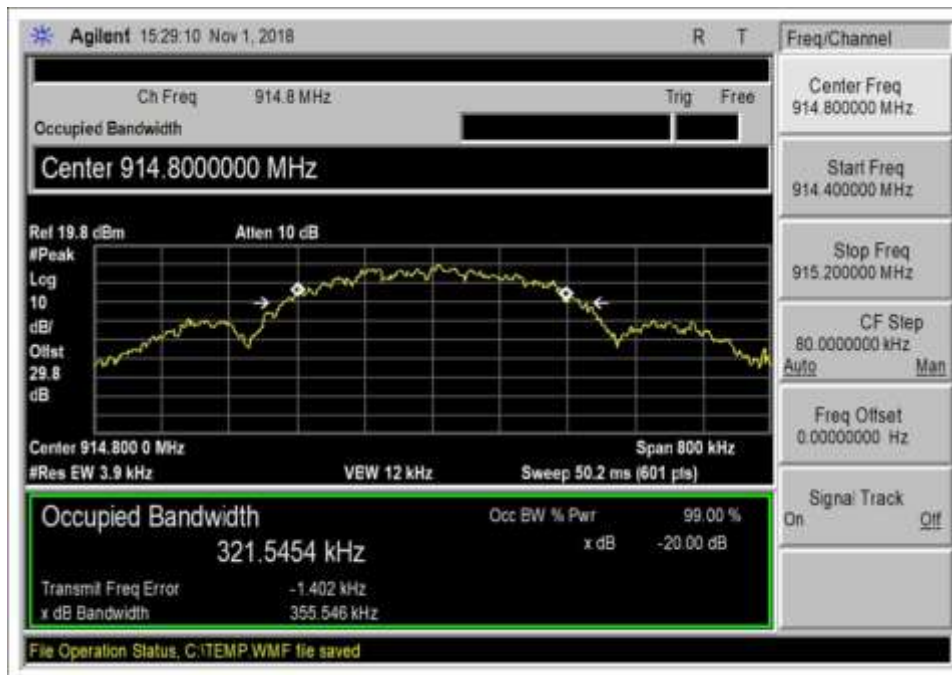
Middle Channel, 100kbps, Power level 3



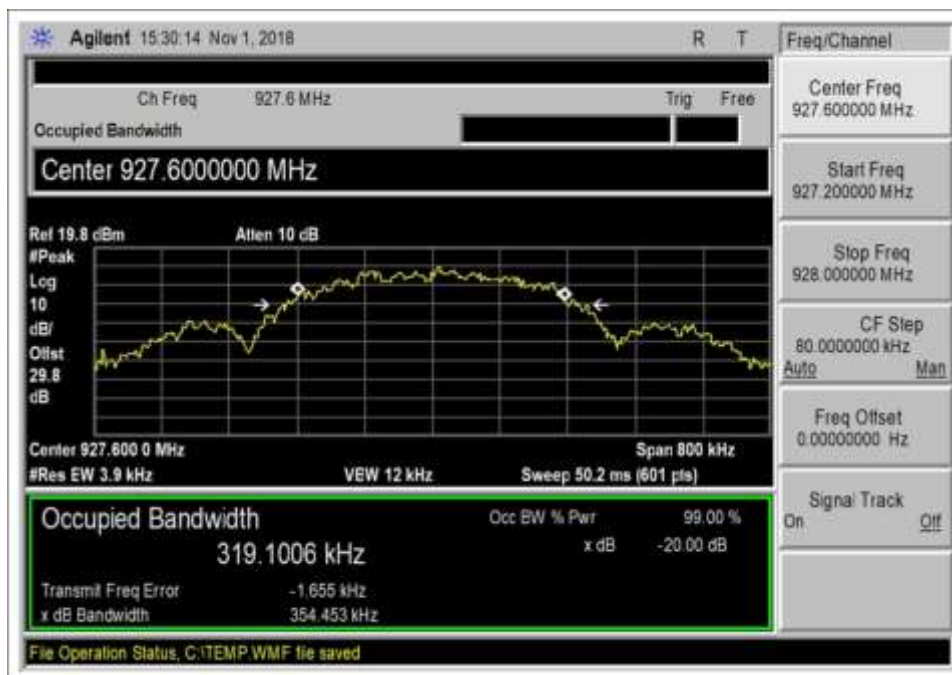
High Channel, 100kbps, Power level 3



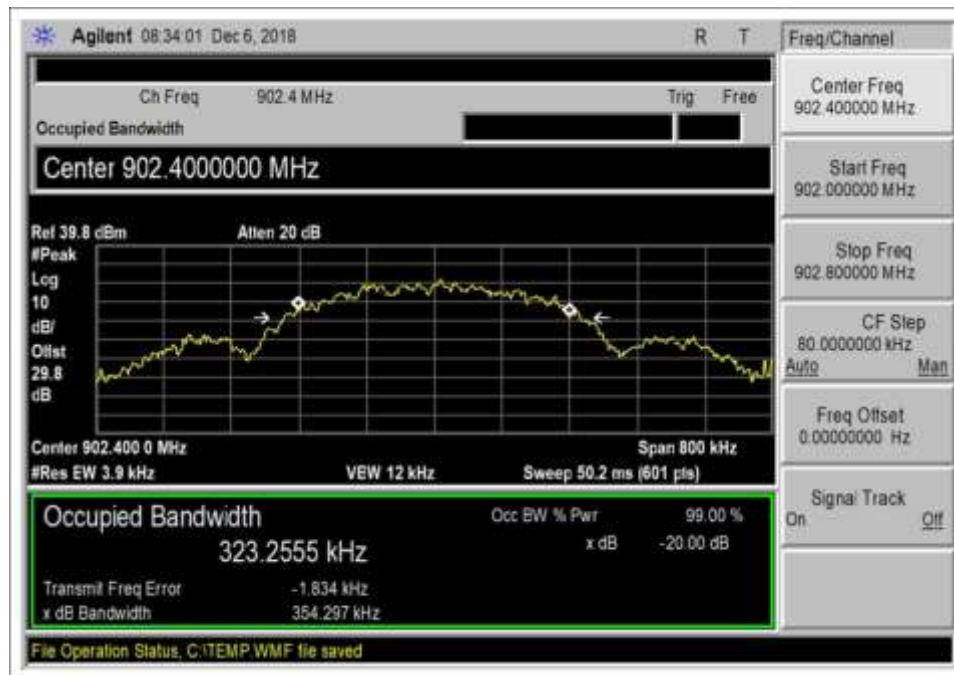
Low Channel, 300kbps, Power level 2



Middle Channel, 300kbps, Power level 2



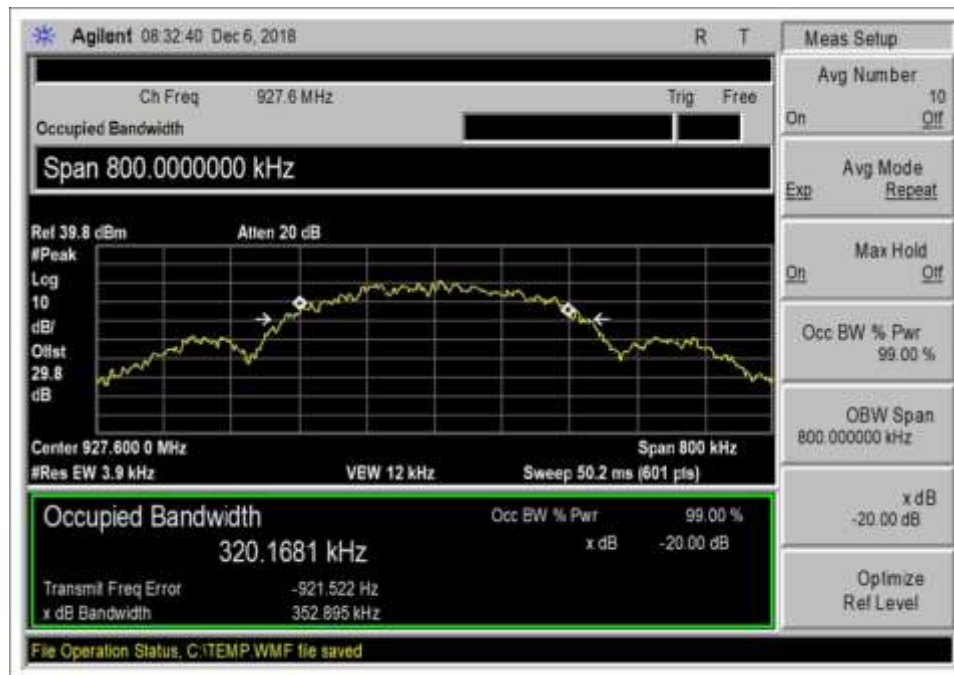
High Channel, 300kbps, Power level 2



Low Channel, 300kbps, Power level 3



Middle Channel, 300kbps, Power level 3

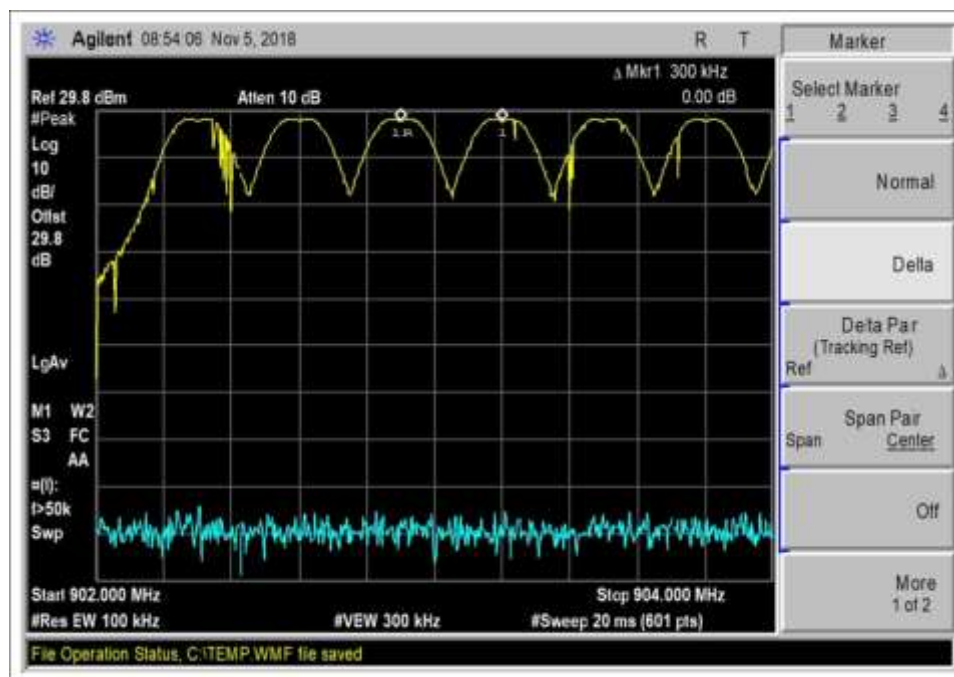


High Channel, 300kbps, Power level 3

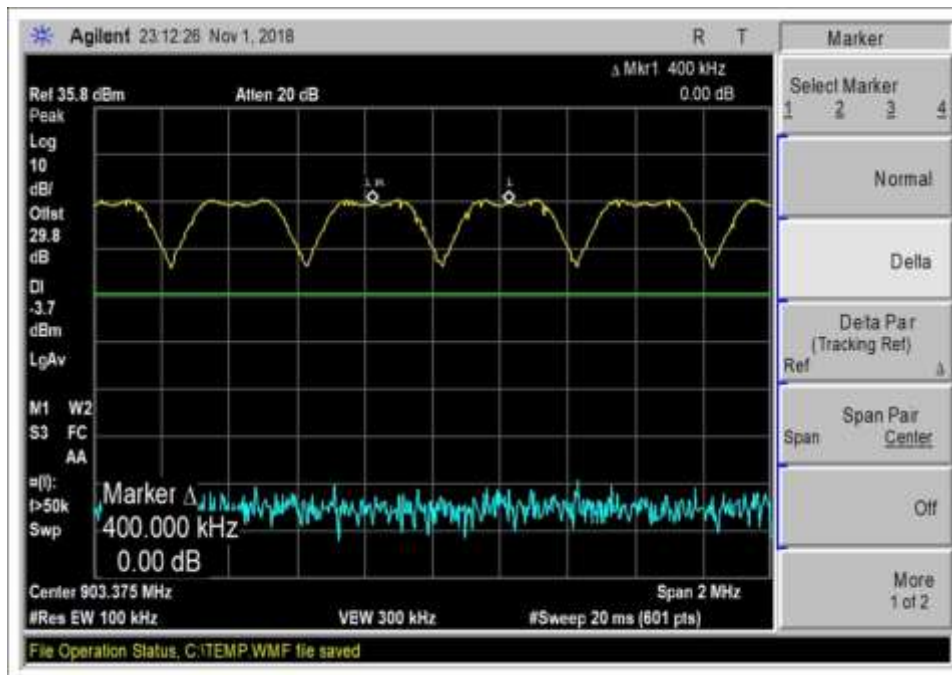
15.247(a)(1) Carrier Separation

Test Data Summary				
Limit applied: 20dB bandwidth of the hopping channel.				
Antenna Port	Operational Mode	Measured (kHz)	Limit (kHz)	Results
1	100kbps FSK lv3	300	> 124.248	Pass
1	300kbps GFSK lv2	400	> 362.874	Pass
1	300kbps GFSK lv3	400	> 354.297	Pass

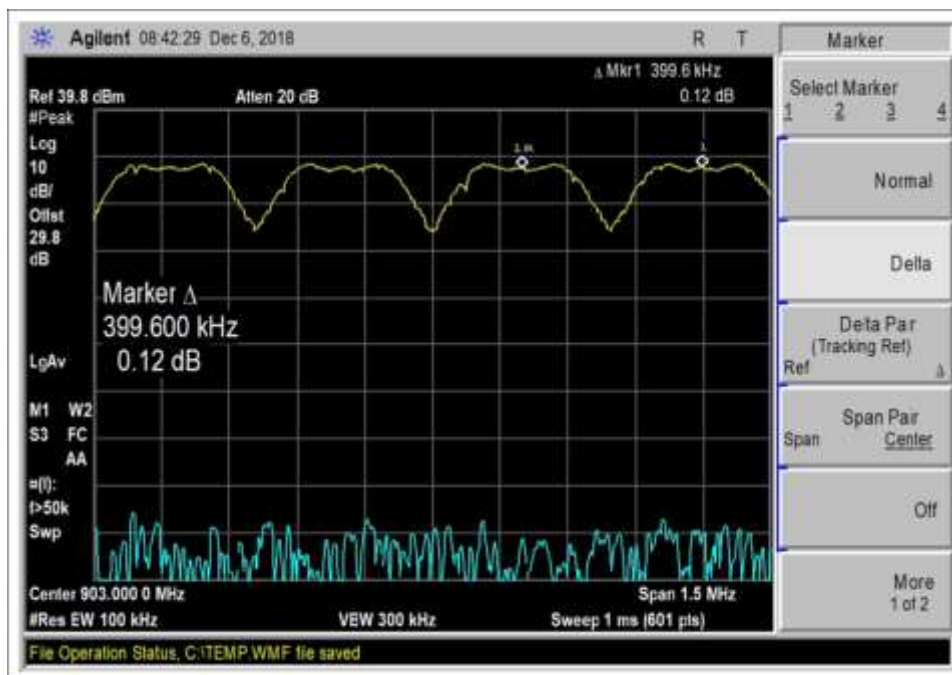
Plots



100kbps, Power level 3



300kbps, Power level 2

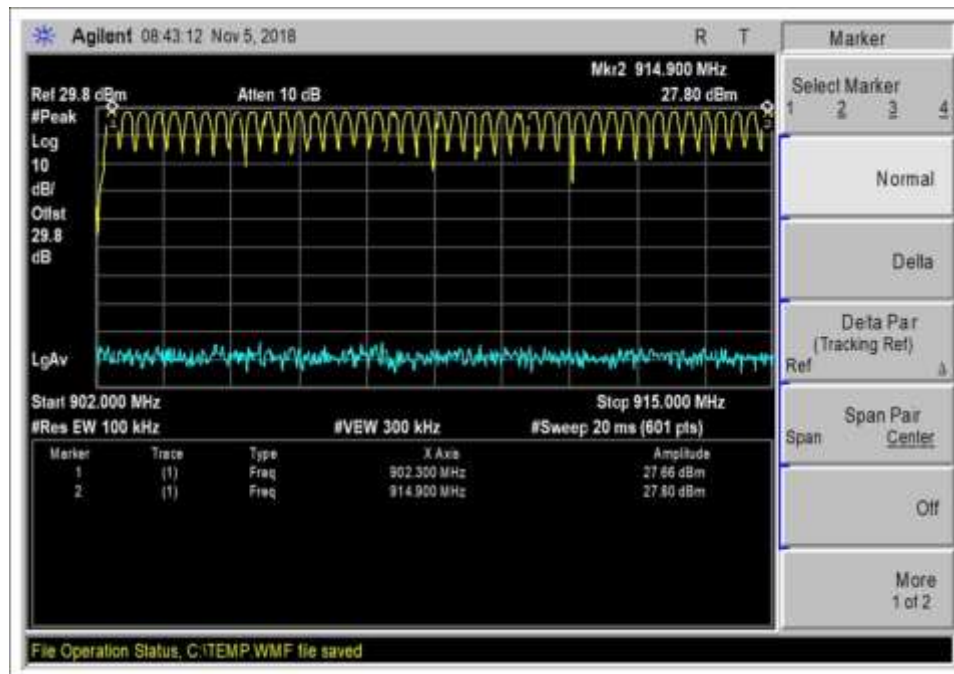


300kbps, Power level 3

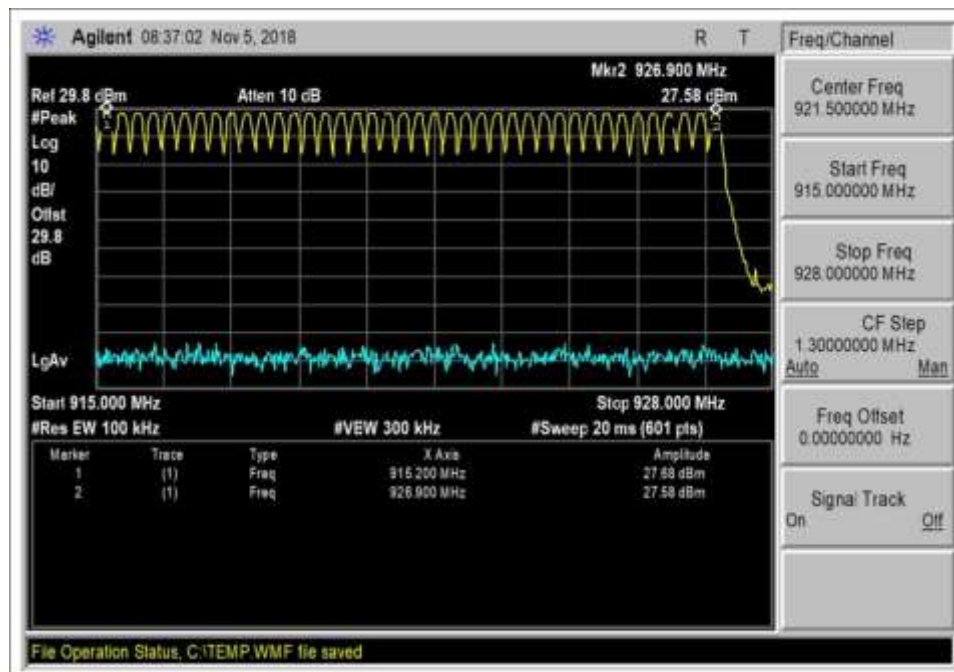
15.247(a)(1)(i) Number of Hopping Channels

Test Data Summary				
$\text{Limit} = \begin{cases} 50 \text{ Channels} & 20 \text{ dB BW} < 250 \text{ kHz} \\ 25 \text{ Channels} & 20 \text{ dB BW} \geq 250 \text{ kHz} \end{cases}$				
Antenna Port	Operational Mode	Measured (Channels)	Limit (Channels)	Results
1	100kbps FSK lv3	83	≥ 50	Pass
1	300kbps GFSK lv2	64	≥ 25	Pass
1	300kbps GFSK lv3	64	≥ 25	Pass

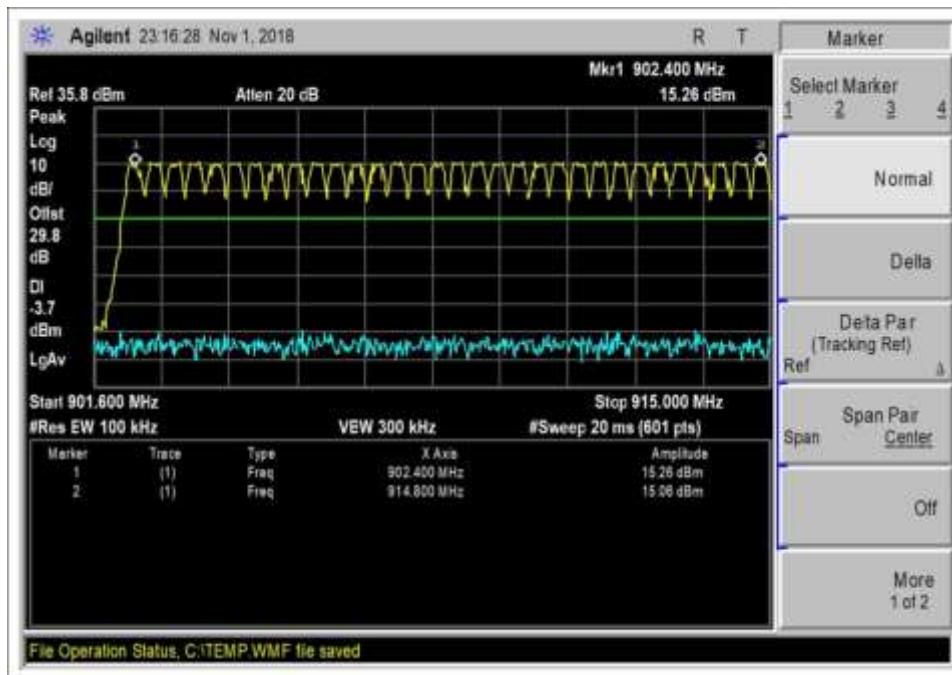
Plots



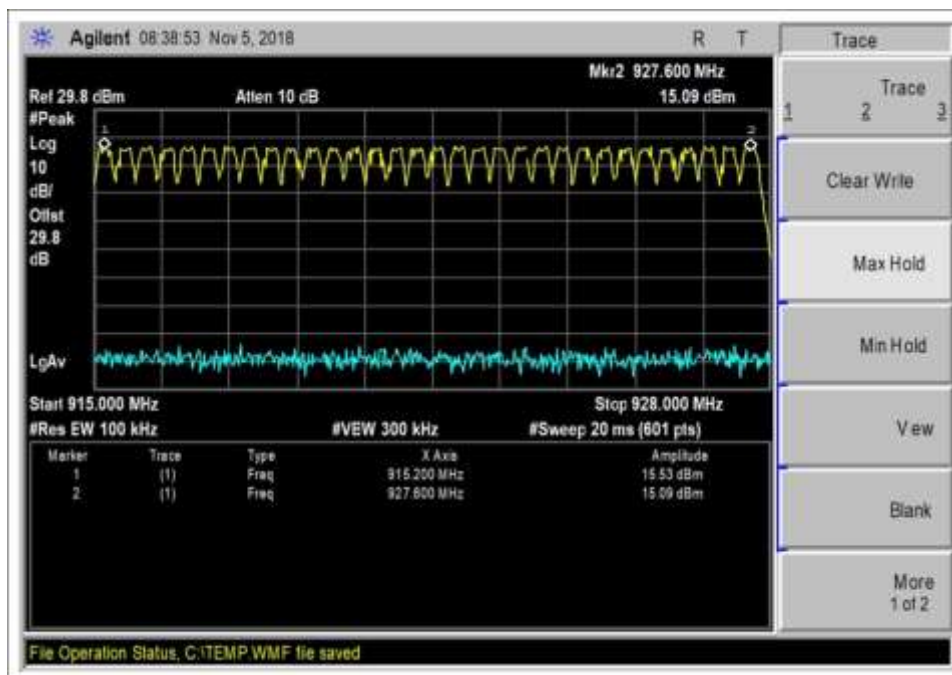
100kbps, Power level 3, #1



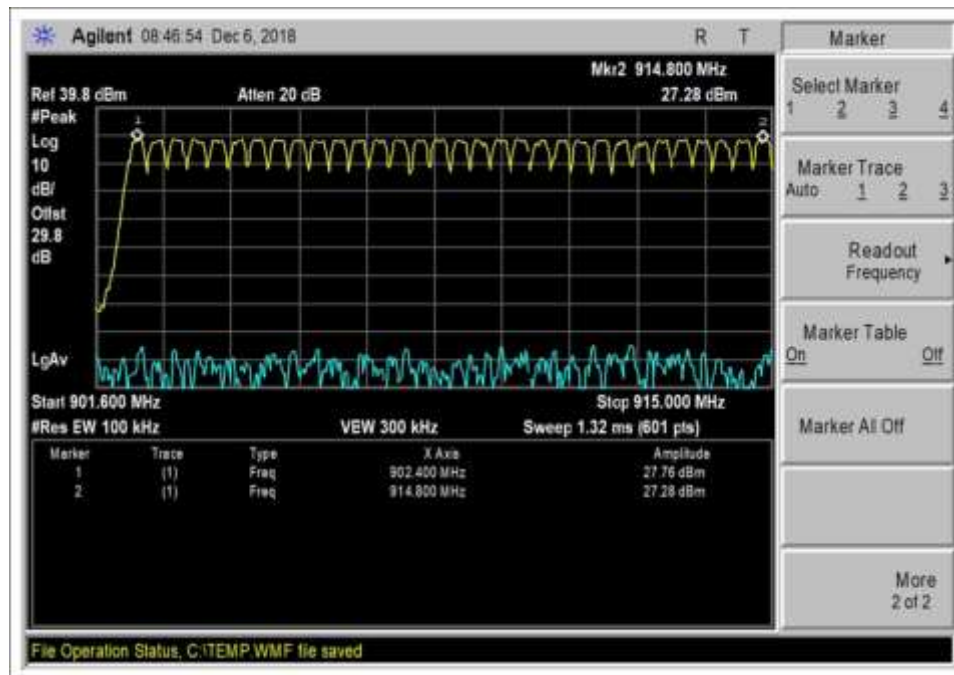
100kbps, Power level 3, #2



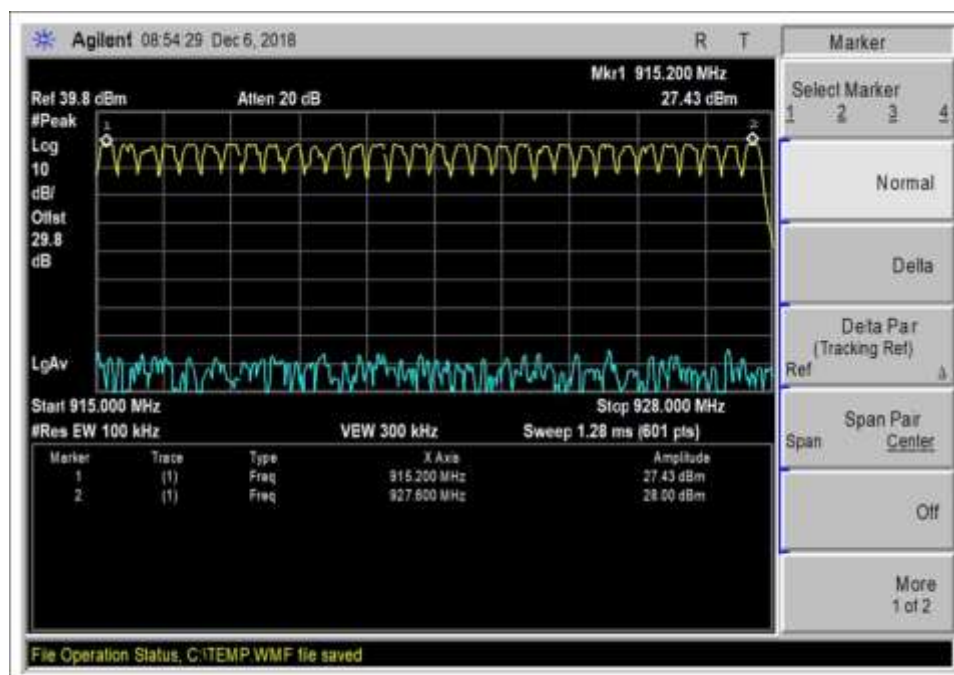
300kbps, Power level 2, #1



300kbps, Power level 2, #2



300kbps, Power level 3, #1



300kbps, Power level 3, #2

15.247(a)(1)(iii)/15.247(f) Average Time of Occupancy

CKC laboratories was not contracted to perform the testing due to the required equipment and firmware to exercise the EUT's multiple pseudo-random hopping sequences was not available and that the complexity of the different modulations and modes depend on the device to be in a fully operating network environment.

Therefore, the manufacturer declares the following:

With the multiple modulations, modes and hop tables, the mode with the worst-case Time of Occupancy to demonstrate 400mS compliance is 399.9 mS in 20 seconds, since this modulation is less than 250kHz Occupied Band Width. Each session of multiple short transmissions takes place on channels out of a minimum of 50 channels in a pseudorandom sequence. The algorithm that determines the pseudo-random hop sequence ensures all active channels are used equally on the average.

Itron employs hopping patterns based on pseudo-random sequence generators or pseudo-random hop tables.

The firmware uses the channels in the prescribed pseudo random order, therefore it maintains equal channel usage.

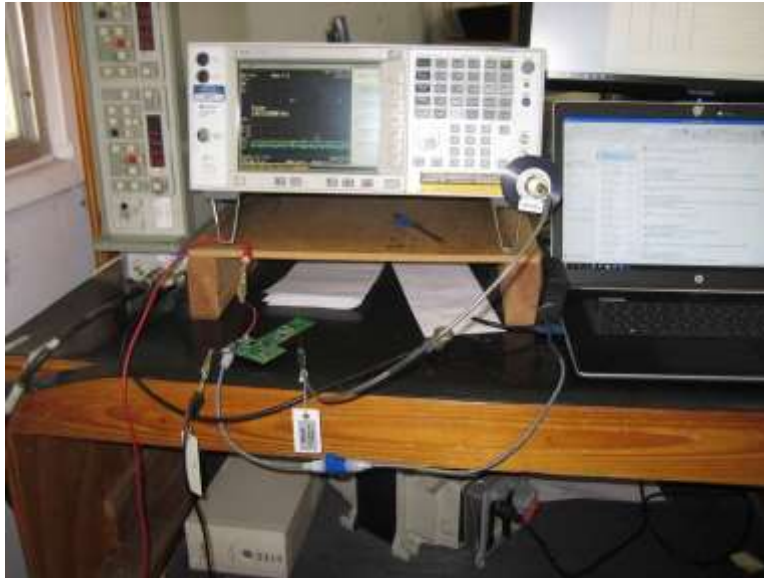
The system has receiver channel bandwidths that match the transmitter's modulation bandwidth that is enabled.

With the transmitter and receiver in synchronization within the network, transmitters switch frequencies in synchronization with the receiver.

When the transmitter needs to send a continuous or long data stream, total time of the packet transmissions is monitored to comply with dwell time requirement of 400ms in the appropriate 10s or 20s window depending on the modulation/mode enabled.

This device does not employ any hopping avoidance techniques.

Test Setup Photo



15.247(f) Hybrid Systems

Test Setup/Conditions			
Test Location:	Brea Lab A	Test Engineer:	Don Nguyen
Test Method:	ANSI C63.10 (2013)	Test Date(s):	11/1/2018
Configuration:	1		
Test Setup:	The EUT is placed on test bench. The serial port is connected to a support laptop via serial to USB adapter. The laptop is running software Command Line Interface Tool to turn on TX at 100% duty cycle. The EUT is powered from 6.0Vdc power supply. Frequency of measurement: 902.4 to 927.6MHz RBW=3kHz, VBW=9kHz		

Environmental Conditions			
Temperature (°C)	25.1	Relative Humidity (%):	24.8

Test Equipment					
Asset#	Description	Manufacturer	Model	Cal Date	Cal Due
02672	Spectrum Analyzer	Agilent	E4446A	3/2/2017	3/2/2019
03432	Attenuator	Aeroflex/Weinschel	90-30-34	10/27/2017	10/27/2019
P07244	Cable	H&S	32022-29094K-29094K-24TC	7/5/2018	7/5/2020

15.247 (f) Power Spectral Density

Power Spectral Density

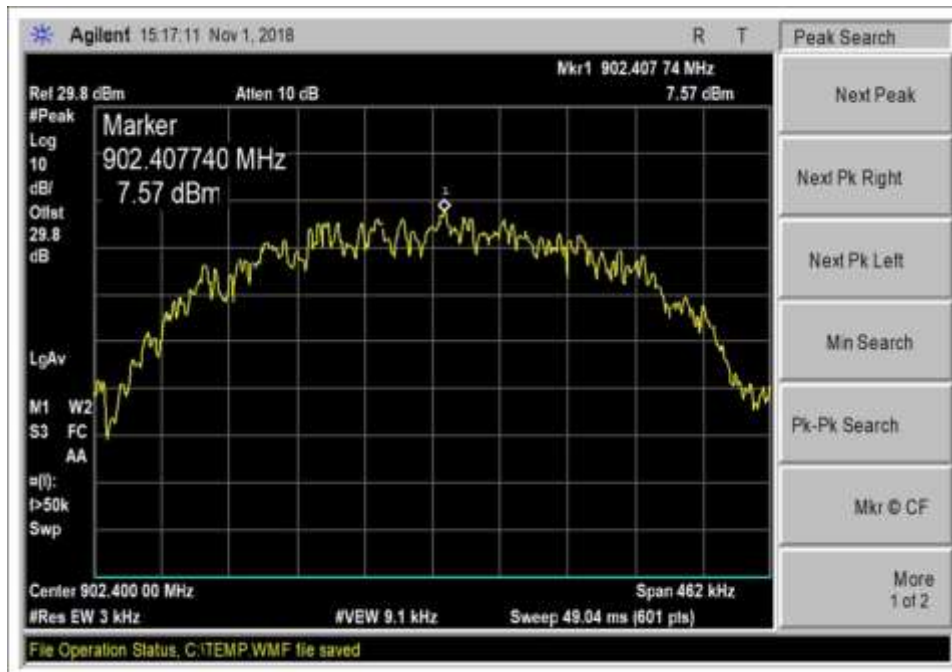
Test Data Summary - RF Conducted Measurement				
Measurement Method: PKPSD				
Frequency (MHz)	Modulation	Measured (dBm/3kHz)	Limit (dBm/3kHz)	Results
902.4	300kbps GFSK lv2 Hybrid	7.57	≤8	Pass
914.8	300kbps GFSK lv2 Hybrid	7.95	≤8	Pass
927.6	300kbps GFSK lv2 Hybrid	7.49	≤8	Pass

6dB Occupied Bandwidth (required for PSD measurement)

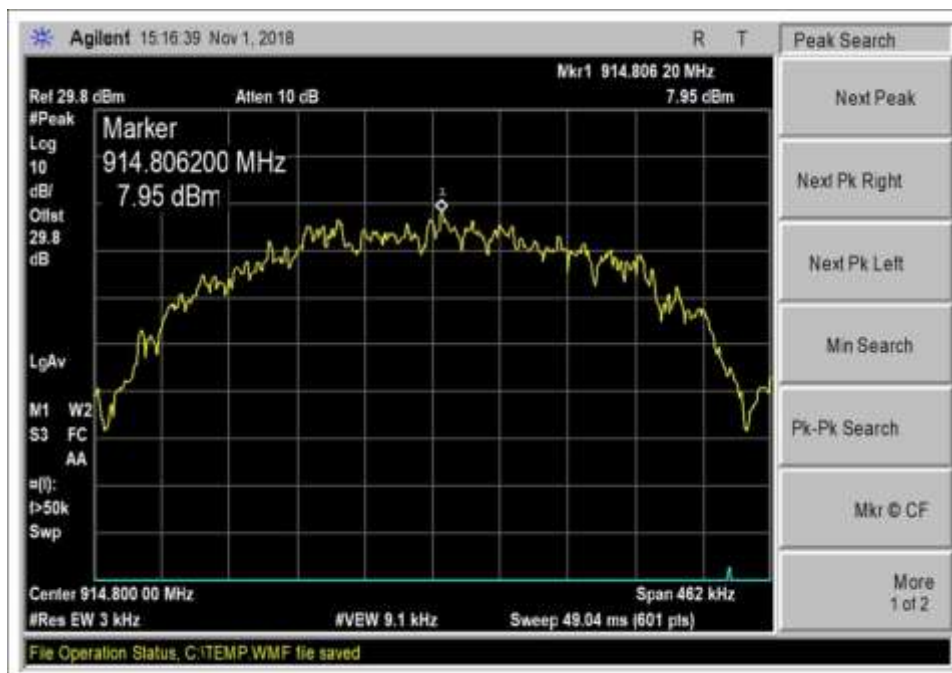
Test Data Summary					
Frequency (MHz)	Antenna Port	Modulation	Measured (kHz)	Limit (kHz)	Results
902.4	1	300kbps GFSK lv2 Hybrid	298.231	None	Pass
914.8	1	300kbps GFSK lv2 Hybrid	297.028		
927.6	1	300kbps GFSK lv2 Hybrid	297.253		

Plots

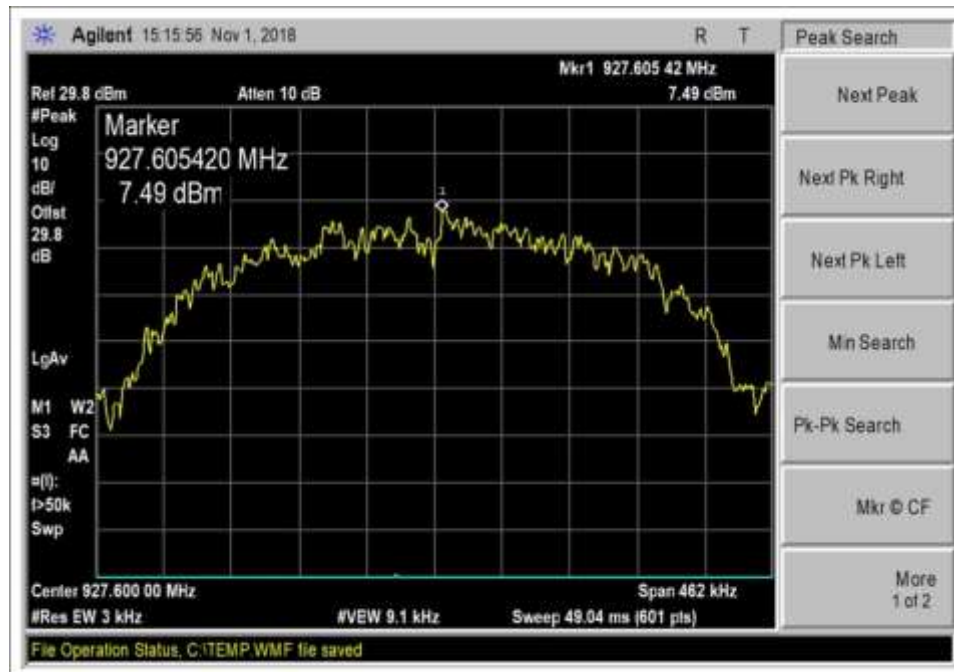
Power Spectral Density



Low Channel

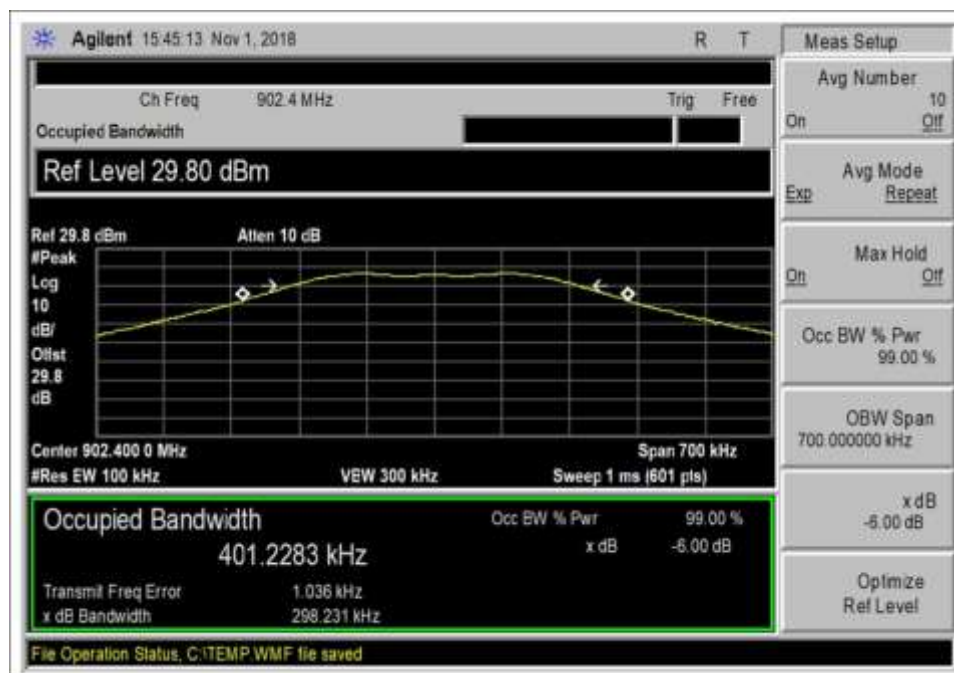


Middle Channel

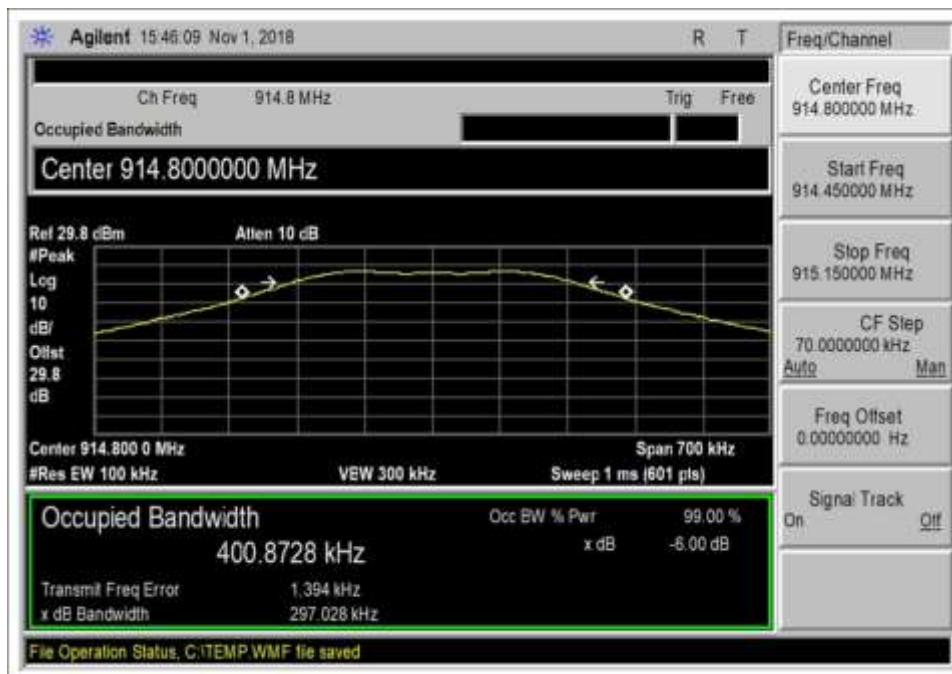


High Channel

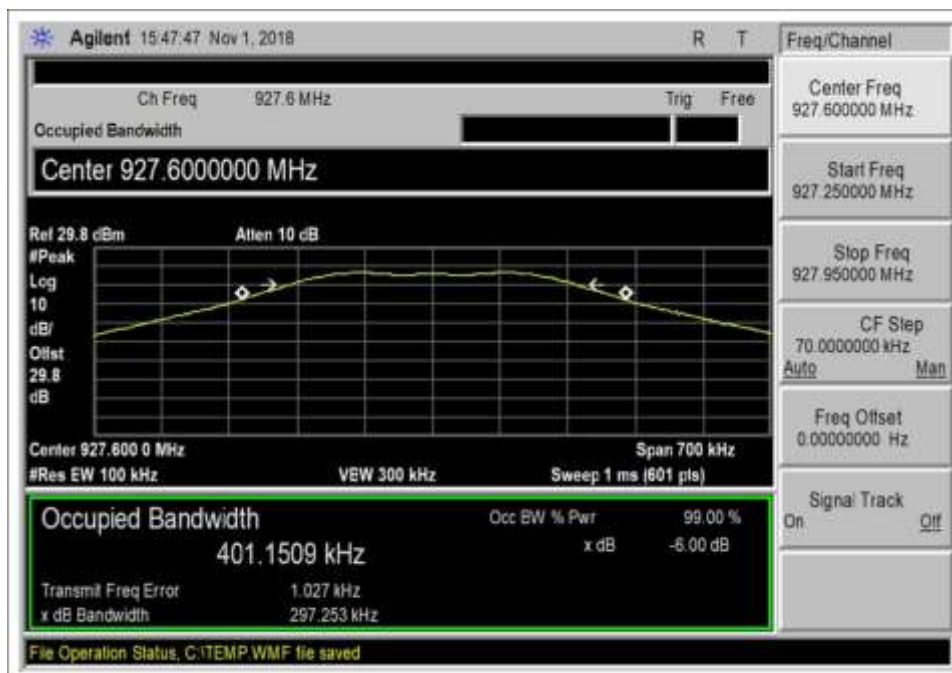
6dB Occupied Bandwidth



Low Channel

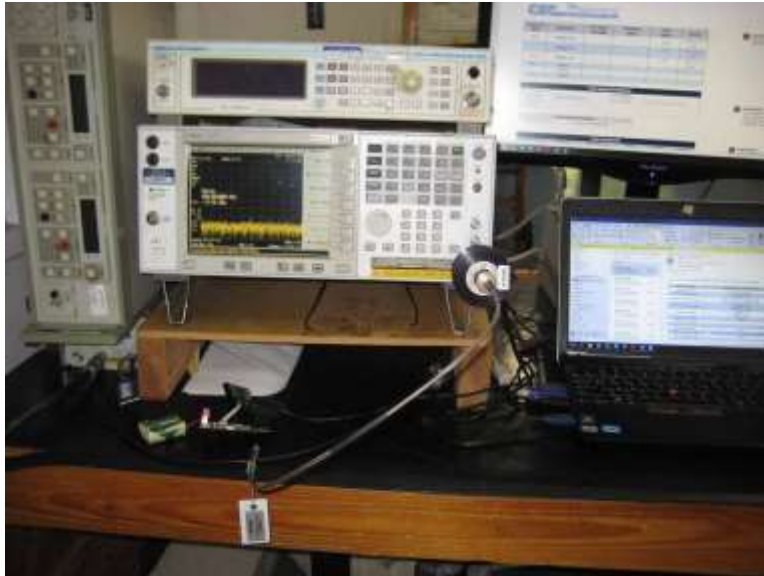


Middle Channel



High Channel

Test Setup Photo



15.247(b)(1) Output Power

Test Setup/Conditions			
Test Location:	Brea Lab A	Test Engineer:	Don Nguyen
Test Method:	ANSI C63.10 (2013)	Test Date(s):	12/6/2018
Configuration:	1		
Test Setup:	The EUT is placed on test bench. The serial port is connected to a support laptop via serial to USB adapter. The laptop is running software Command Line Interface Tool to turn on TX at 100% duty cycle. The EUT is powered from 6.0Vdc power supply. Frequency of measurement: 902.3 to 927.6MHz RBW=2MHz, VBW=6MHz		

Environmental Conditions			
Temperature (°C)	22.4	Relative Humidity (%):	47.7

Test Equipment					
Asset#	Description	Manufacturer	Model	Cal Date	Cal Due
02672	Spectrum Analyzer	Agilent	E4446A	3/2/2017	3/2/2019
03432	Attenuator	Aeroflex/Weinschel	90-30-34	10/27/2017	10/27/2019
P07244	Cable	H&S	32022-29094K-29094K-24TC	7/5/2018	7/5/2020

Test Data Summary - Voltage Variations

This equipment is battery powered. Power output tests were performed using a fresh battery.

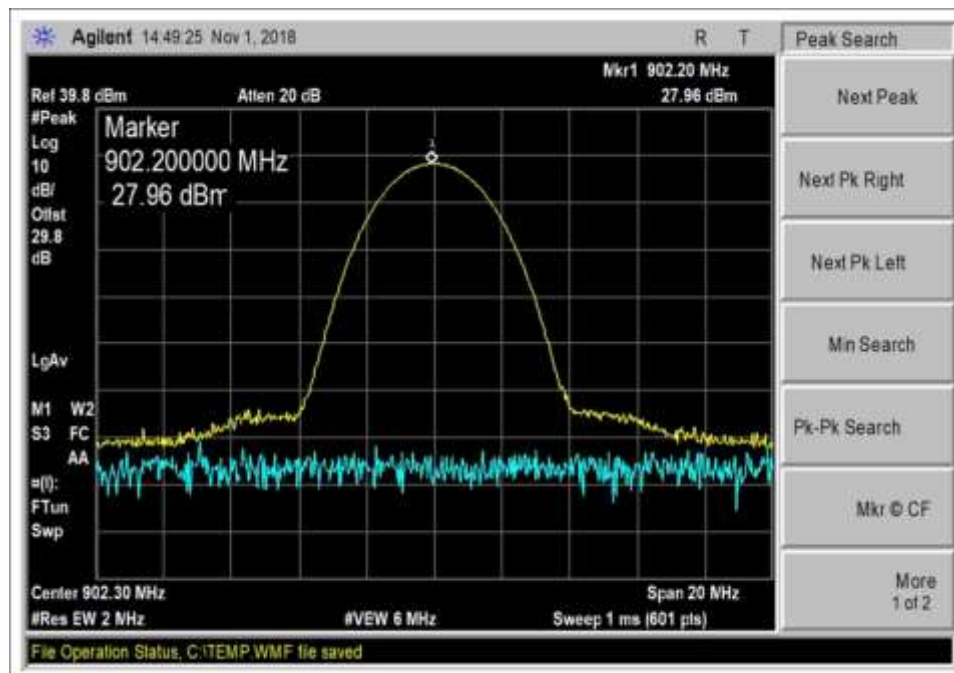
Parameter Definitions:

Measurements performed at input voltage according to manufacturer specification.

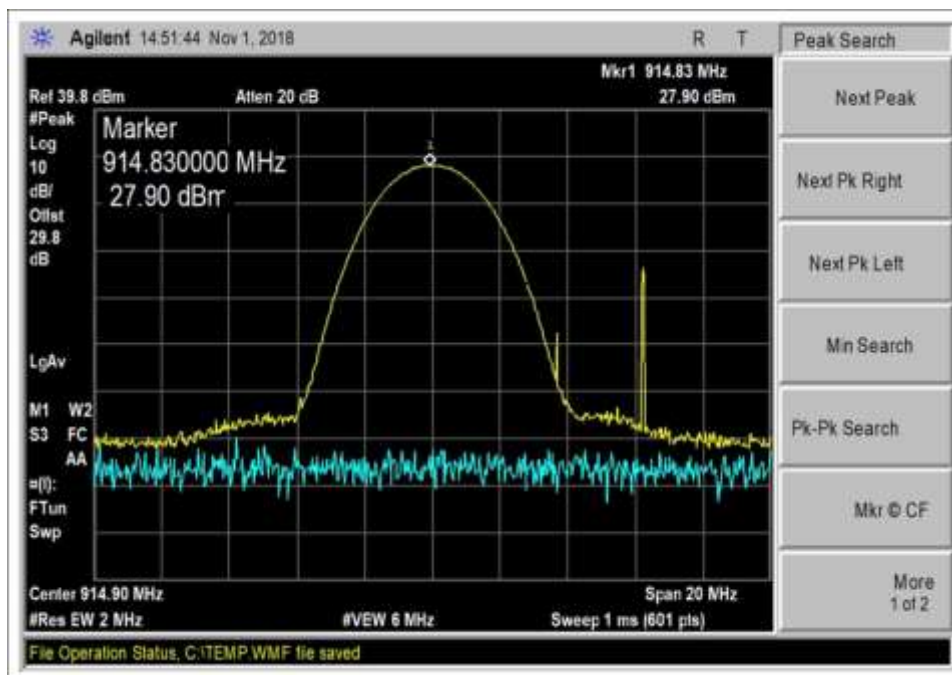
Parameter	Value
V _{Nominal} :	6.0Vdc
V _{Minimum} :	6.0Vdc
V _{Maximum} :	6.0Vdc

Test Data Summary - RF Conducted Measurement					
$\text{Limit} = \begin{cases} 30\text{dBm Conducted}/36\text{dBm EIRP} & \geq 50 \text{ Channels} \\ 24\text{dBm Conducted}/30\text{dBm EIRP} & < 50 \text{ Channels (min 25)} \end{cases}$					
Frequency (MHz)	Modulation	Ant. Type / Gain (dBi)	Measured (dBm)	Limit (dBm)	Results
902.3	100kbps FSK lv3	Integral Omni/4.4 External Omni/ 5.5	27.96	≤ 30	Pass
914.9	100kbps FSK lv3	Integral Omni/4.4 External Omni/ 5.5	27.90	≤ 30	Pass
926.9	100kbps FSK lv3	Integral Omni/4.4 External Omni/ 5.5	27.73	≤ 30	Pass
902.4	300kbps GFSK lv2	Integral Omni/4.4 External Omni/ 5.5	16.12	≤ 30	Pass
914.8	300kbps GFSK lv2	Integral Omni/4.4 External Omni/ 5.5	16.35	≤ 30	Pass
927.6	300kbps GFSK lv2	Integral Omni/4.4 External Omni/ 5.5	16.08	≤ 30	Pass
902.4	300kbps GFSK lv3	Integral Omni/4.4 External Omni/ 5.5	28.03	≤ 30	Pass
914.8	300kbps GFSK lv3	Integral Omni/4.4 External Omni/ 5.5	27.98	≤ 30	Pass
927.6	300kbps GFSK lv3	Integral Omni/4.4 External Omni/ 5.5	27.82	≤ 30	Pass

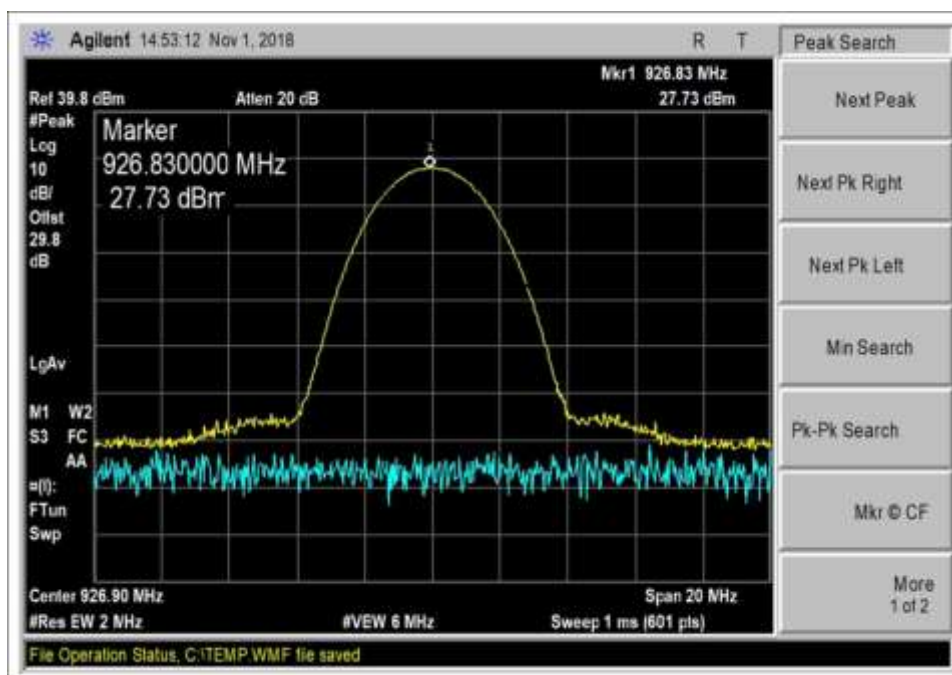
Plots



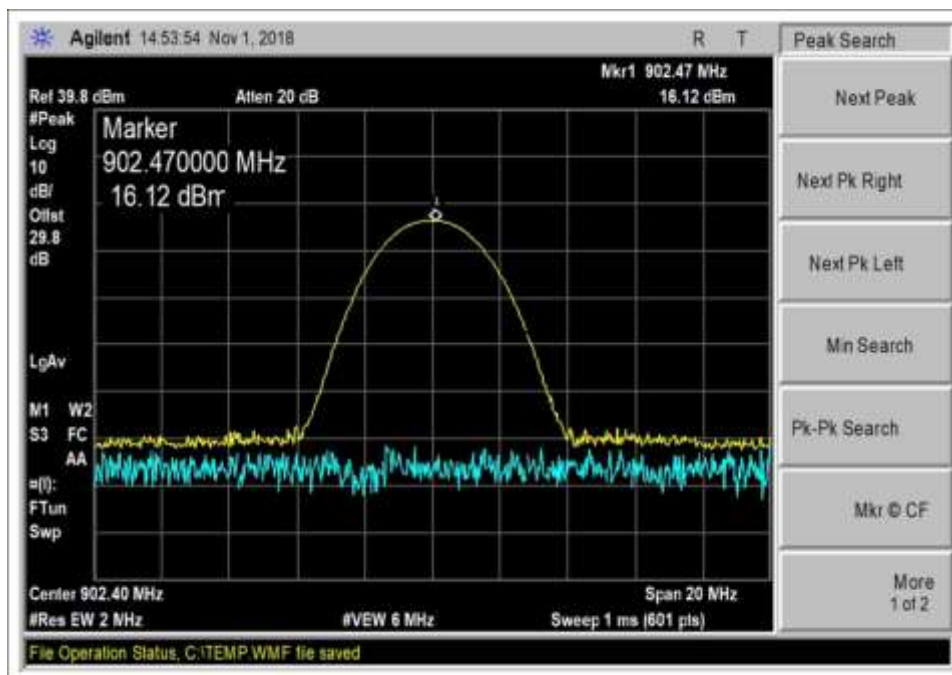
Low Channel, 100kbps, Power level 3



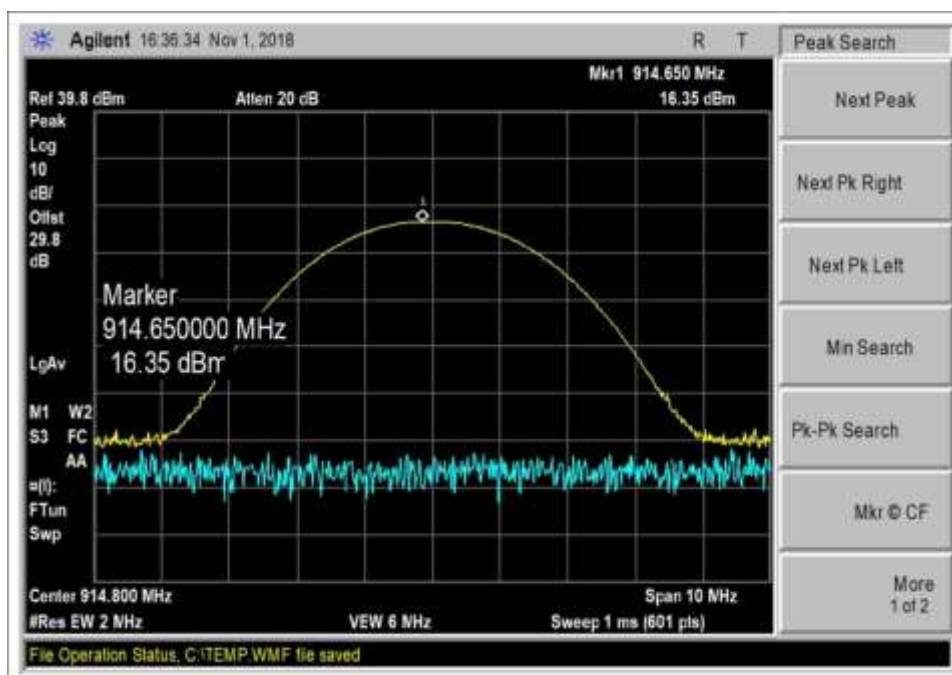
Middle Channel, 100kbps, Power level 3



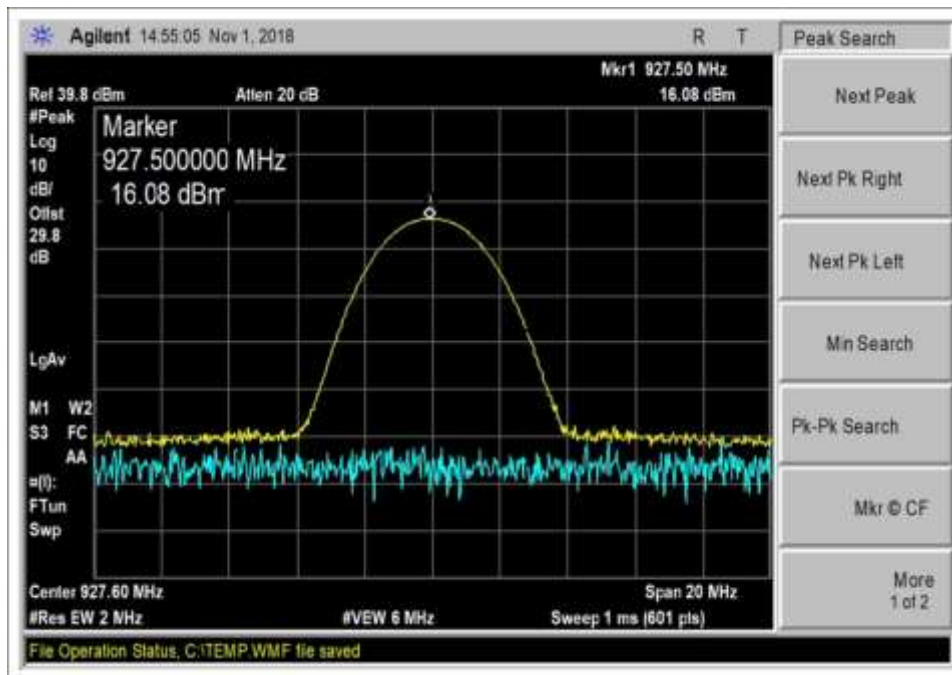
High Channel, 100kbps, Power level 3



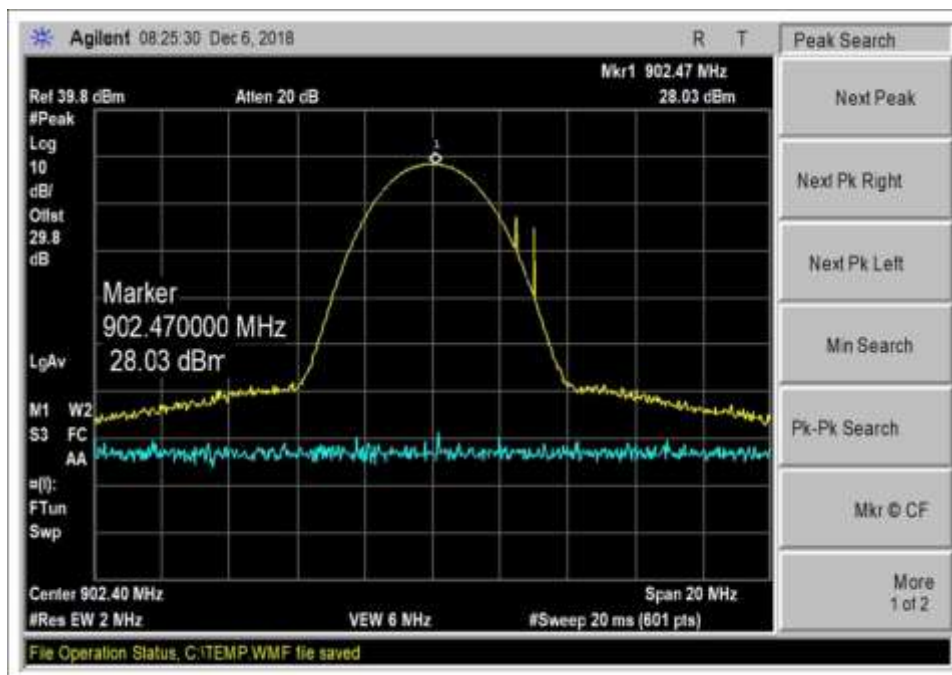
Low Channel, 300kbps, Power level 2



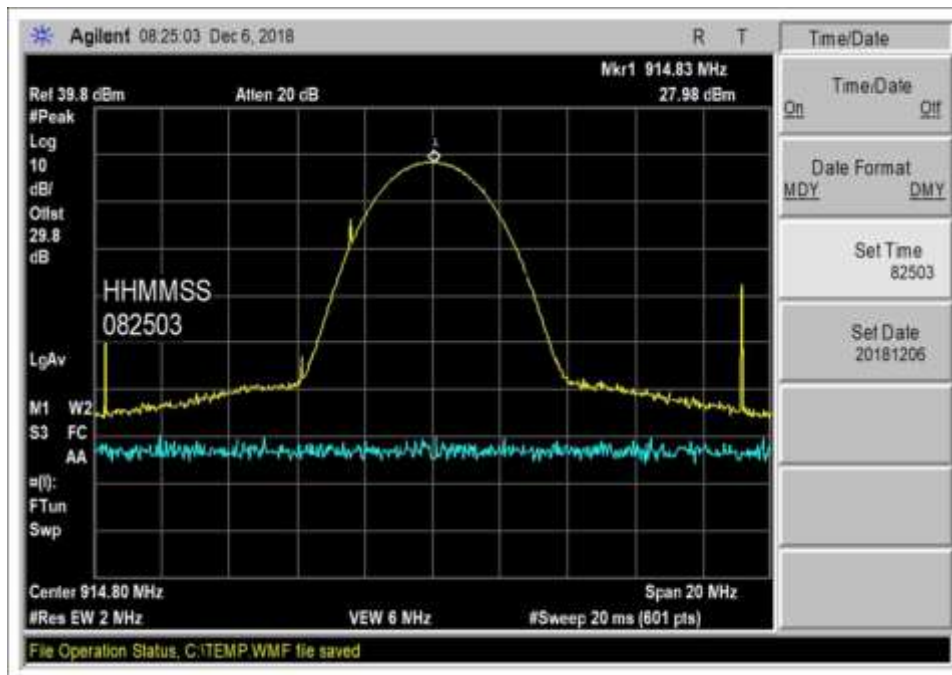
Middle Channel, 300kbps, Power level 2



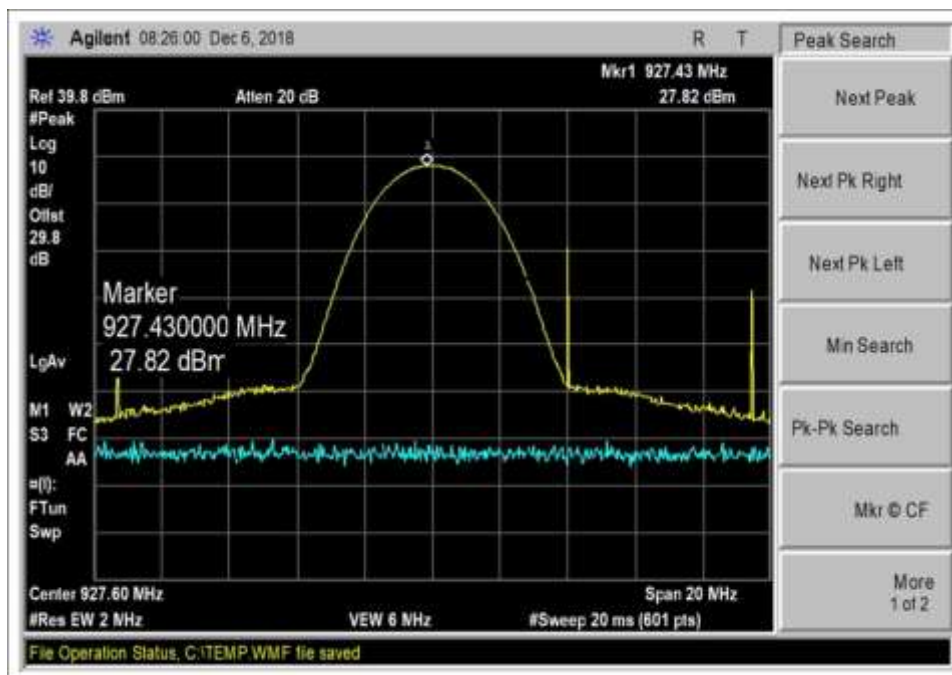
High Channel, 300kbps, Power level 2



Low Channel, 300kbps, Power level 3

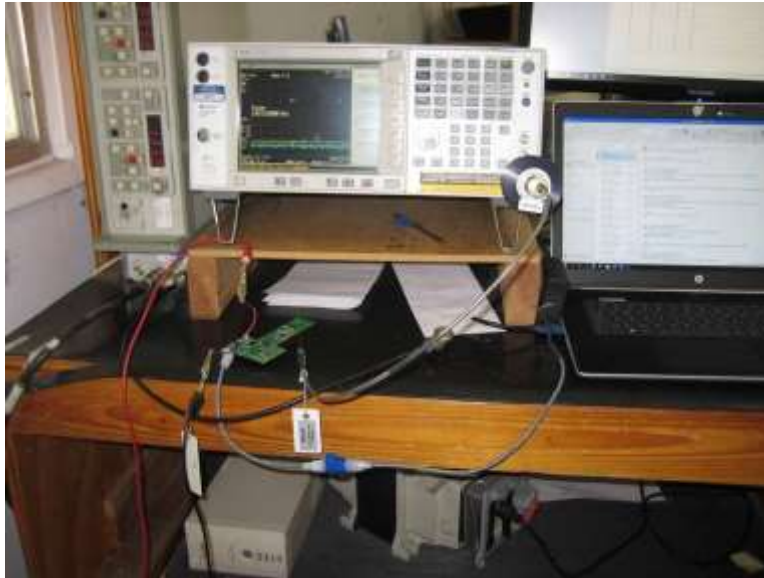


Middle Channel, 300kbps, Power level 3



High Channel, 300kbps, Power level 3

Test Setup Photo



15.247(d) RF Conducted Emissions & Band Edge

Test Setup / Conditions / Data

Test Location: CKC Laboratories, Inc. • 110 N. Olinda Place • Brea, CA 92823 • 714-993-6112
 Customer: **Itron, Inc.**
 Specification: **15.247(d) Conducted Spurious Emissions**
 Work Order #: **99218** Date: 11/2/2018
 Test Type: **Conducted Emissions** Time: 09:27:17
 Tested By: Don Nguyen Sequence#: 1
 Software: EMITest 5.03.11 6.0Vdc

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

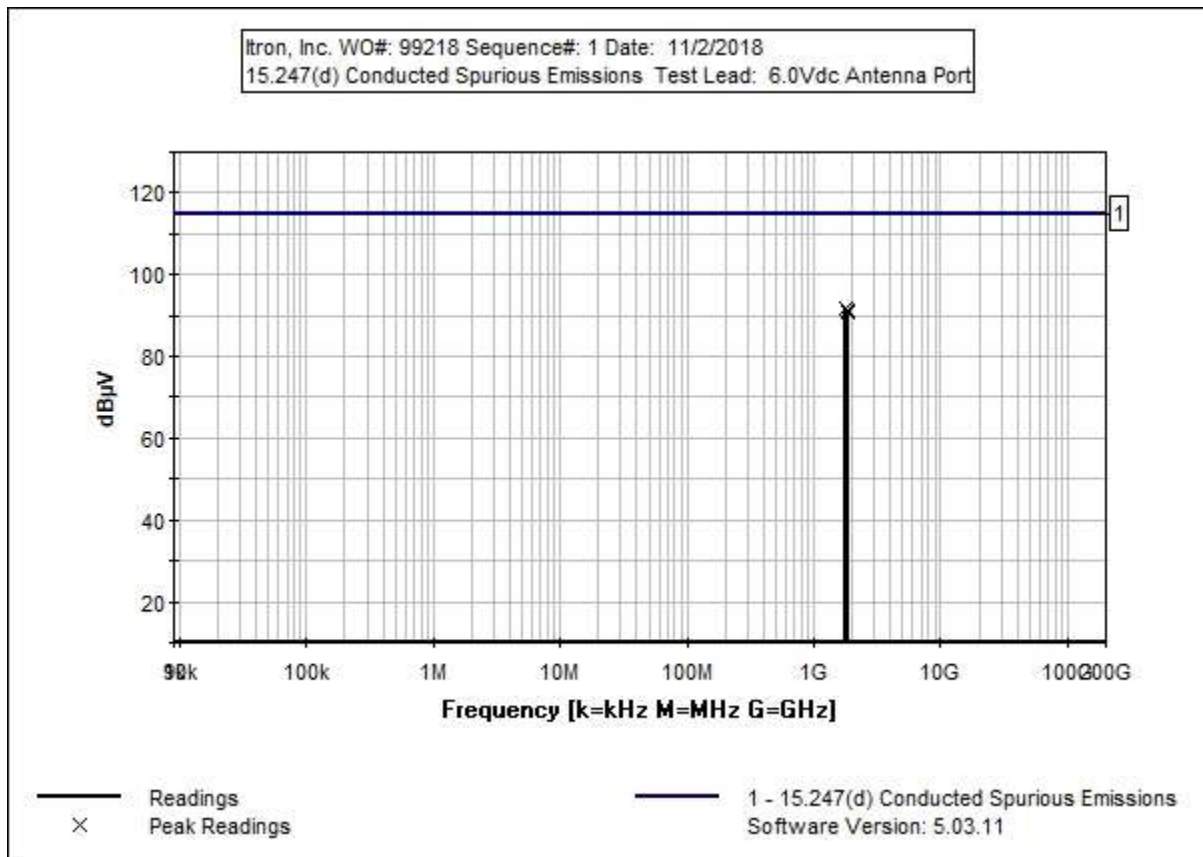
Test Conditions / Notes:

The EUT is placed on test bench. The serial port is connected to a support laptop via serial to USB adapter.
 The laptop is running software Command Line Interface Tool to turn on TX at 100% duty cycle.
 The EUT is powered from 6.0Vdc power supply to simulate fresh battery installed.

Modulation: 100kbps FSK

Frequency of measurement: 9kHz-9280MHz
 RBW=100kHz, VBW=300kHz
 Test Location: Brea Lab A
 Test Method: ANSI C63.10 (2013)

Data represent worst case emissions.



Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN03432	Attenuator	90-30-34	10/27/2017	10/27/2019
	AN02672	Spectrum Analyzer	E4446A	3/2/2017	3/2/2019
T2	ANP07244	Cable	32022-29094K-29094K-24TC	7/5/2018	7/5/2020

Measurement Data:

Reading listed by margin.

Test Lead: Antenna Port

#	Freq MHz	Rdng dBμV	T1 dB	T2 dB	dB	dB	Dist Table	Corr dBμV	Spec dBμV	Margin dB	Polar Ant
1	1804.543M	61.7	+29.7	+0.2			+0.0	91.6	115.0	-23.4	Anten
2	1829.750M	61.6	+29.7	+0.2			+0.0	91.5	115.0	-23.5	Anten
3	1853.847M	61.0	+29.7	+0.2			+0.0	90.9	115.0	-24.1	Anten



Test Location: CKC Laboratories, Inc. • 110 N. Olinda Place • Brea, CA 92823 • 714-993-6112
Customer: **Itron, Inc.**
Specification: **15.247(d) Conducted Spurious Emissions**
Work Order #: **99218** Date: 11/2/2018
Test Type: **Conducted Emissions** Time: 09:30:48
Tested By: Don Nguyen Sequence#: 2
Software: EMITest 5.03.11 6.0Vdc

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

Test Conditions / Notes:

The EUT is placed on test bench. The serial port is connected to a support laptop via serial to USB adapter.
The laptop is running software Command Line Interface Tool to turn on TX at 100% duty cycle.
The EUT is powered from 6.0Vdc power supply to simulate fresh battery installed.

Modulation: 300kbps GFSK power level 2

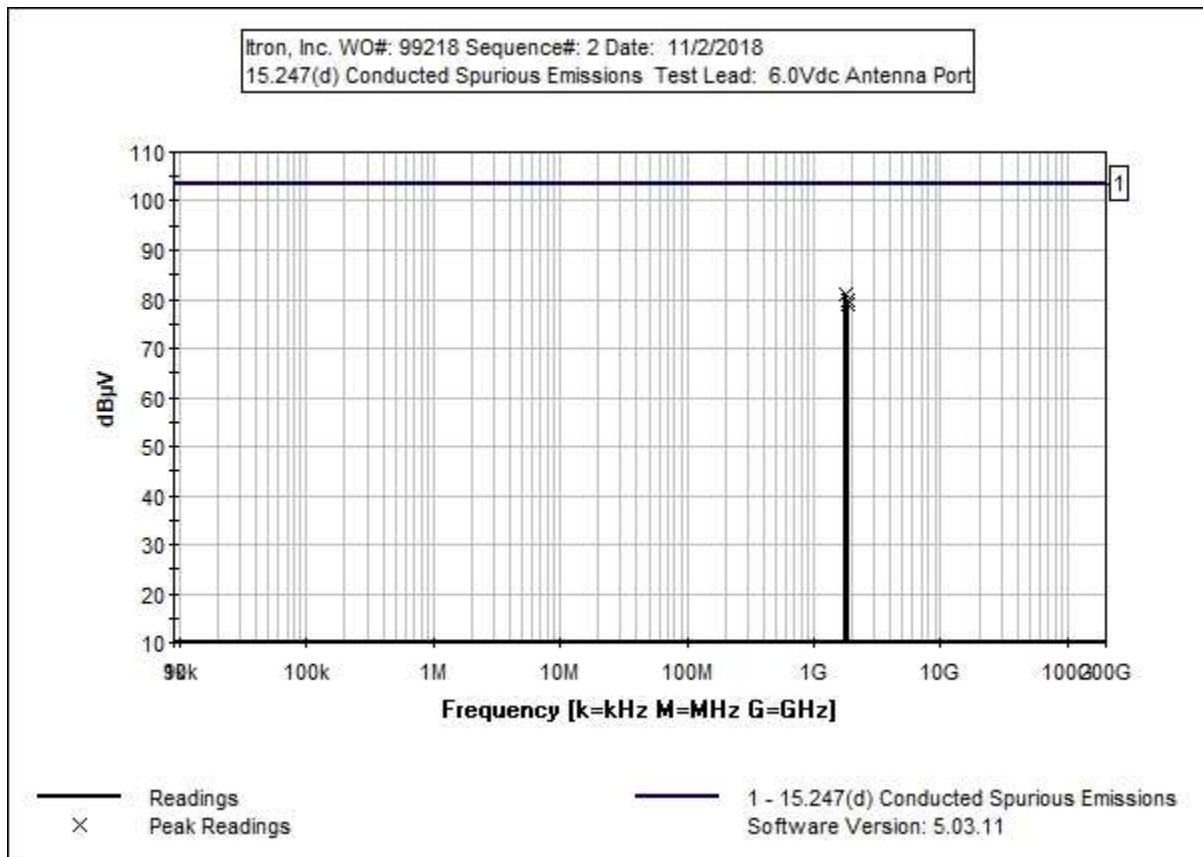
Frequency of measurement: 9kHz-9280MHz

RBW=100kHz, VBW=300kHz

Test Location: Brea Lab A

Test Method: ANSI C63.10 (2013)

Data represent worst case emissions.



Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN03432	Attenuator	90-30-34	10/27/2017	10/27/2019
	AN02672	Spectrum Analyzer	E4446A	3/2/2017	3/2/2019
T2	ANP07244	Cable	32022-29094K-29094K-24TC	7/5/2018	7/5/2020

Measurement Data:

Reading listed by margin.

Test Lead: Antenna Port

#	Freq MHz	Rdng dBμV	T1 dB	T2 dB	dB	dB	Dist Table	Corr dBμV	Spec dBμV	Margin dB	Polar Ant
1	1804.640M	51.3	+29.7	+0.2			+0.0	81.2	103.3	-22.1	Anten
2	1829.443M	50.1	+29.7	+0.2			+0.0	80.0	103.3	-23.3	Anten
3	1855.047M	49.0	+29.7	+0.2			+0.0	78.9	103.3	-24.4	Anten



Test Location: CKC Laboratories, Inc. • 110 N. Olinda Place • Brea, CA 92823 • 714-993-6112
Customer: **Itron, Inc.**
Specification: **15.247(d) Conducted Spurious Emissions**
Work Order #: **99218** Date: 12/6/2018
Test Type: **Conducted Emissions** Time: 10:25:54
Tested By: Don Nguyen Sequence#: 2
Software: EMITest 5.03.11 6.0Vdc

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

Test Conditions / Notes:

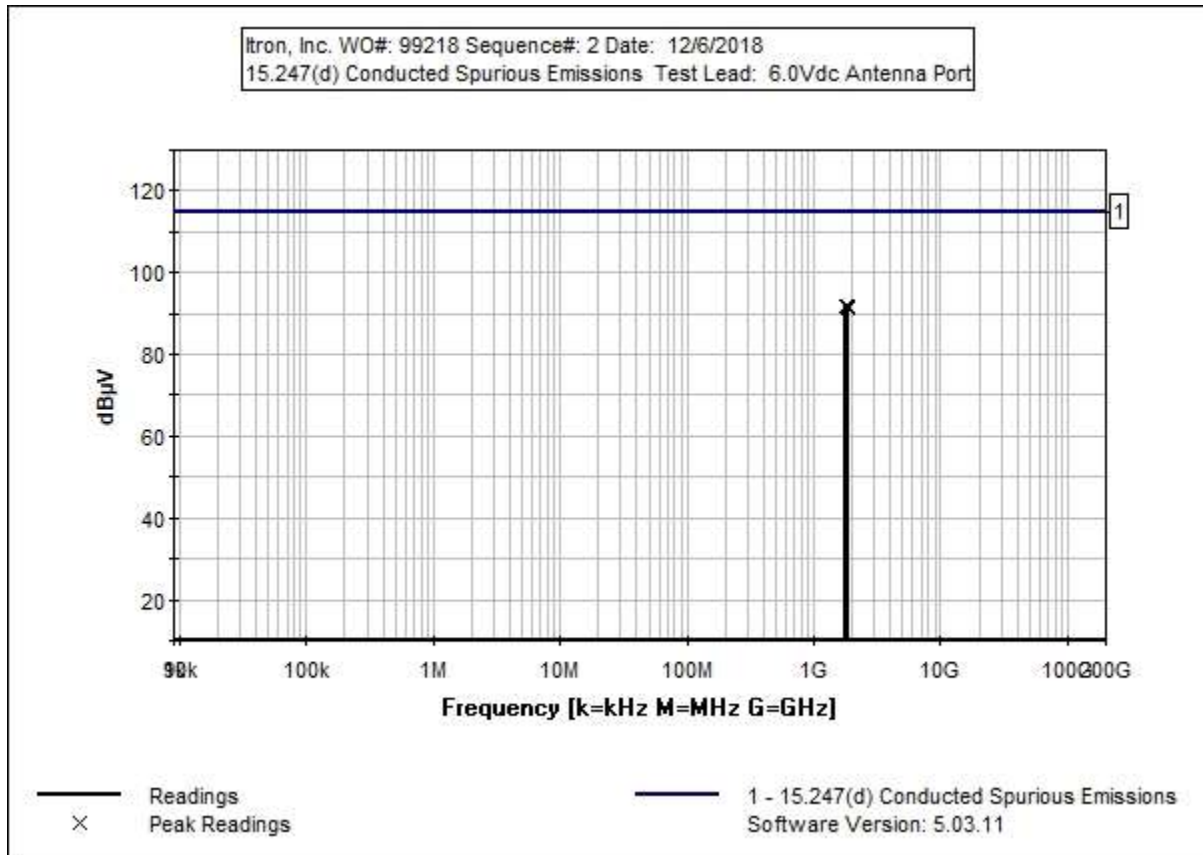
The EUT is placed on test bench. The serial port is connected to a support laptop via serial to USB adapter.
The laptop is running software Command Line Interface Tool to turn on TX at 100% duty cycle.
The EUT is powered from 6.0Vdc power supply to simulate fresh battery installed.

Modulation: 300kbps GFSK lv3

Frequency of measurement: 9kHz-9280MHz
RBW=100kHz, VBW=300kHz

Test Location: Brea Lab A
Test Method: ANSI C63.10 (2013)

Data represent worst case emissions.



Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN03432	Attenuator	90-30-34	10/27/2017	10/27/2019
	AN02672	Spectrum Analyzer	E4446A	3/2/2017	3/2/2019
T2	ANP07244	Cable	32022-29094K-29094K-24TC	7/5/2018	7/5/2020

Measurement Data:

Reading listed by margin.

Test Lead: Antenna Port

#	Freq MHz	Rdng dBμV	T1 dB	T2 dB			Dist Table	Corr dBμV	Spec dBμV	Margin dB	Polar Ant
1	1829.747M	61.9	+29.7	+0.2			+0.0	91.8	115.0	-23.2	Anten
2	1804.957M	61.8	+29.7	+0.2			+0.0	91.7	115.0	-23.3	Anten
3	1855.043M	61.2	+29.7	+0.2			+0.0	91.1	115.0	-23.9	Anten

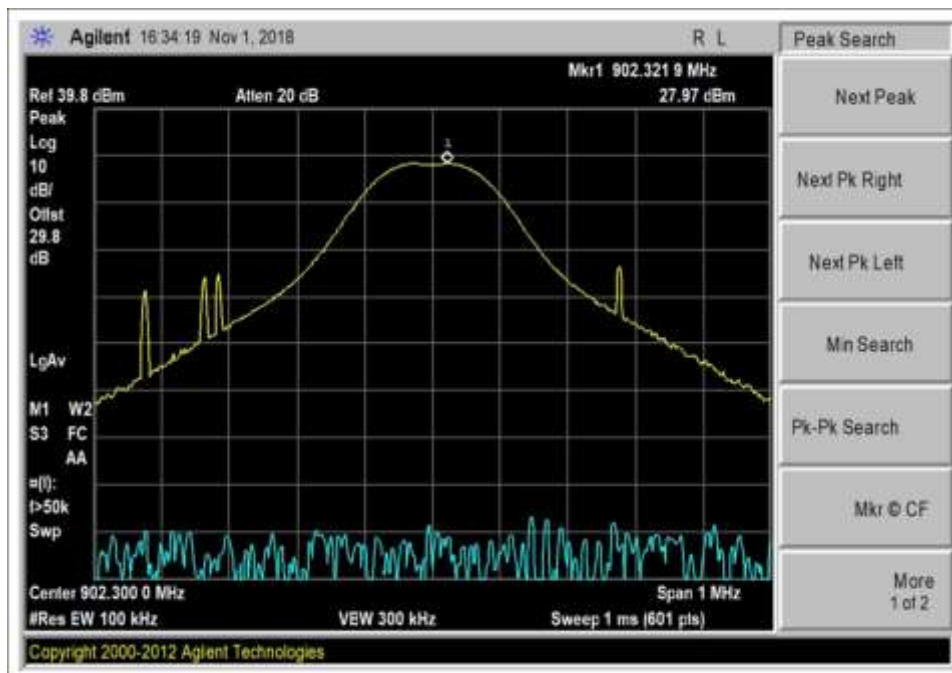
Band Edge

Band Edge Summary

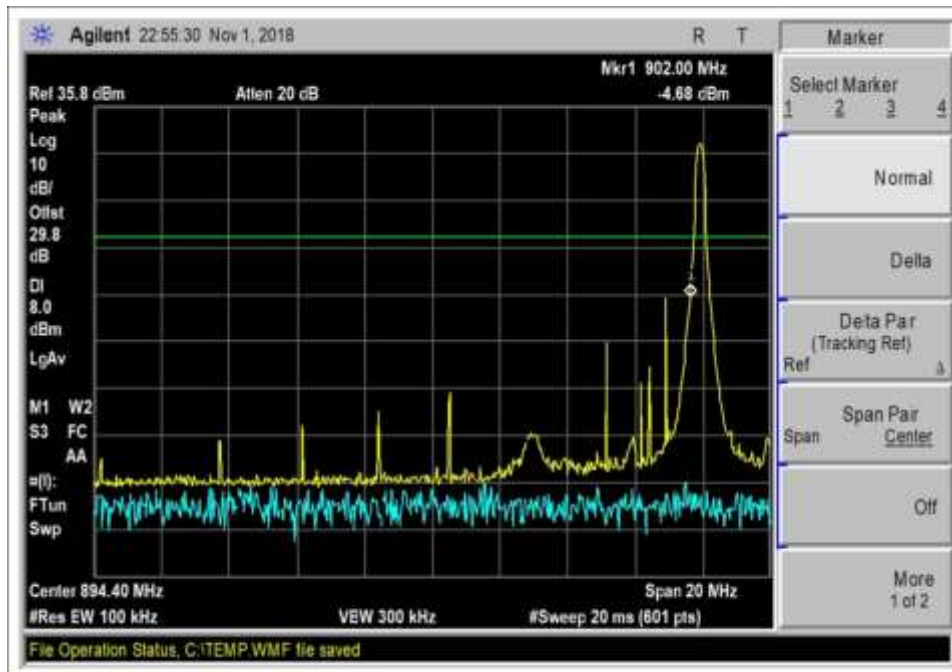
Limit applied: Max Power/100kHz - 20dB.

Frequency (MHz)	Modulation	Measured (dBm)	Limit (dBm)	Results
902	100kbps FSK lv3	-4.68	<8.0	Pass
928	100kbps FSK lv3	-38.37	<8.0	Pass
902	100kbps FSK lv3 hopping	-5.95	<8.0	Pass
928	100kbps FSK lv3 hopping	-33.74	<8.0	Pass
902	300kbps GFSK lv2	-17.30	<-3.7	Pass
928	300kbps GFSK lv2	-19.08	<-3.7	Pass
902	300kbps GFSK lv2 hopping	-13.05	<-3.7	Pass
928	300kbps GFSK lv2 hopping	-20.38	<-3.7	Pass
902	300kbps GFSK lv3	-8.83	<8.0	Pass
928	300kbps GFSK lv3	-7.59	<8.0	Pass
902	300kbps GFSK lv3 hopping	-7.06	<8.0	Pass
928	300kbps GFSK lv3 hopping	-6.88	<8.0	Pass

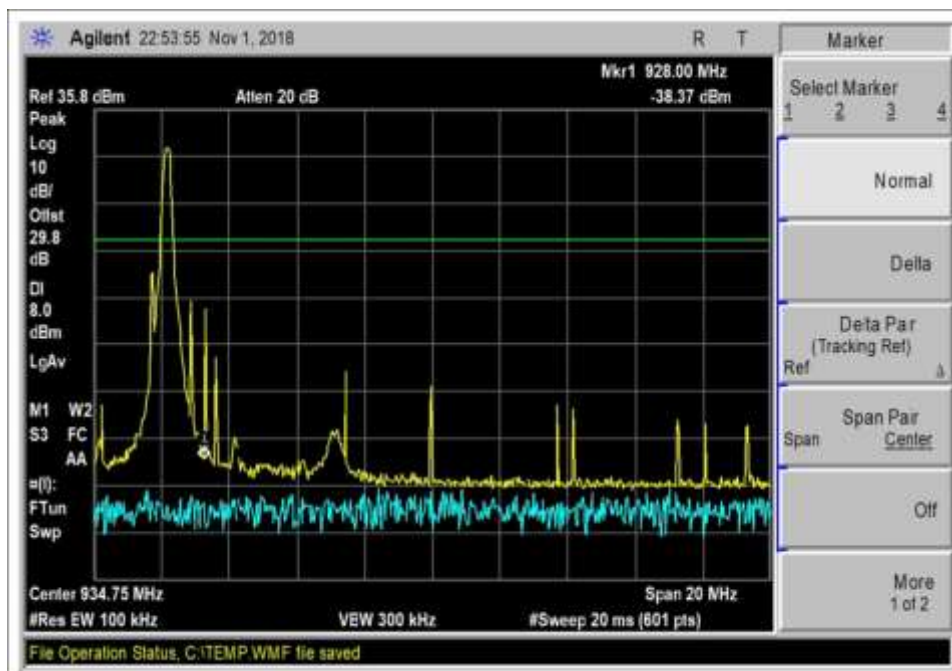
Band Edge Plots



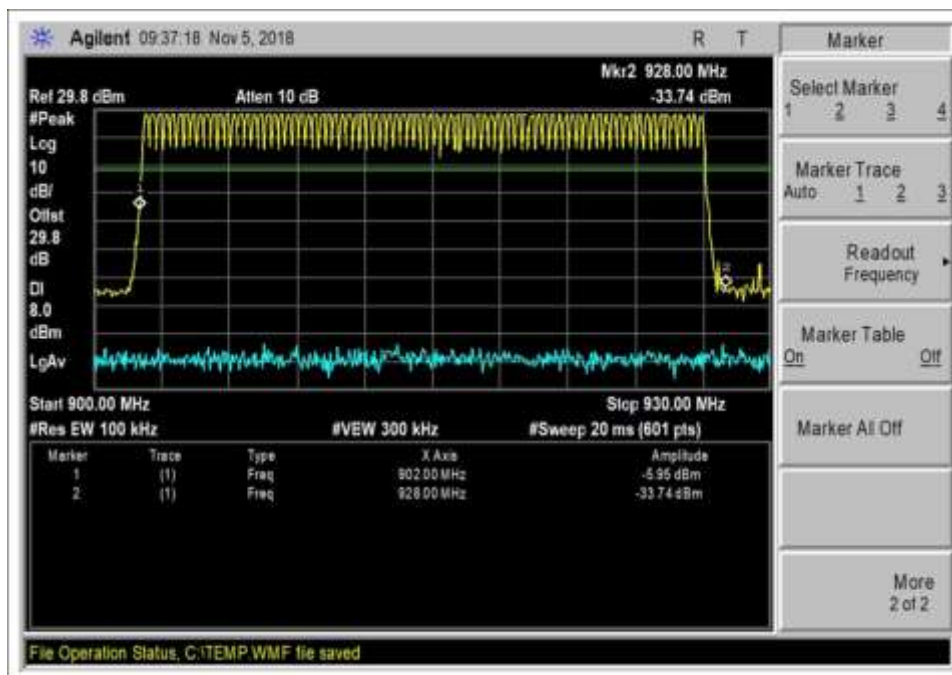
Peak, 100kbps, Power level 3



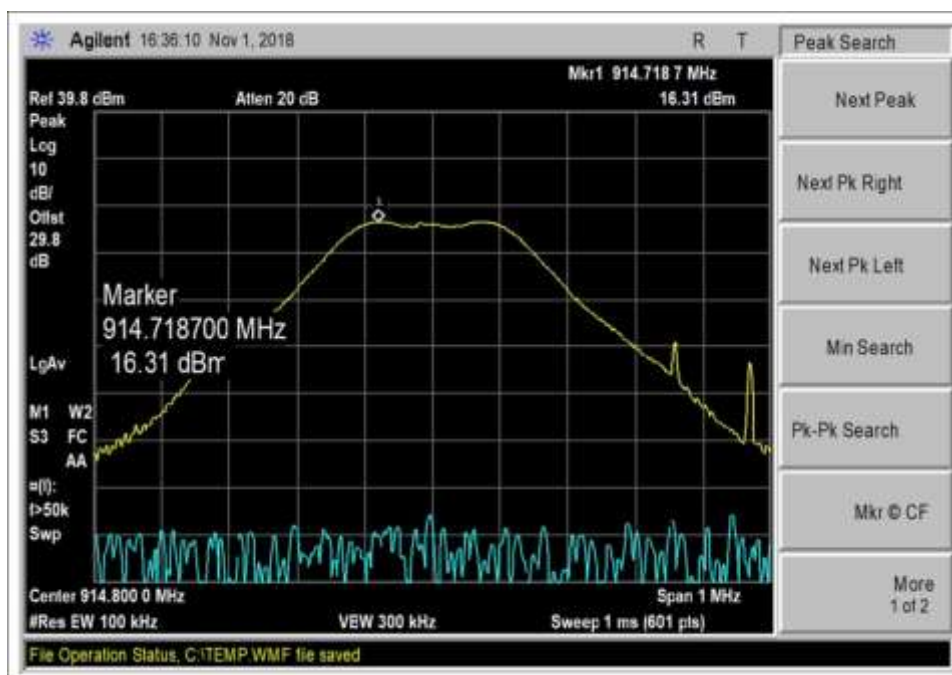
Low Channel, 100kbps, Power level 3



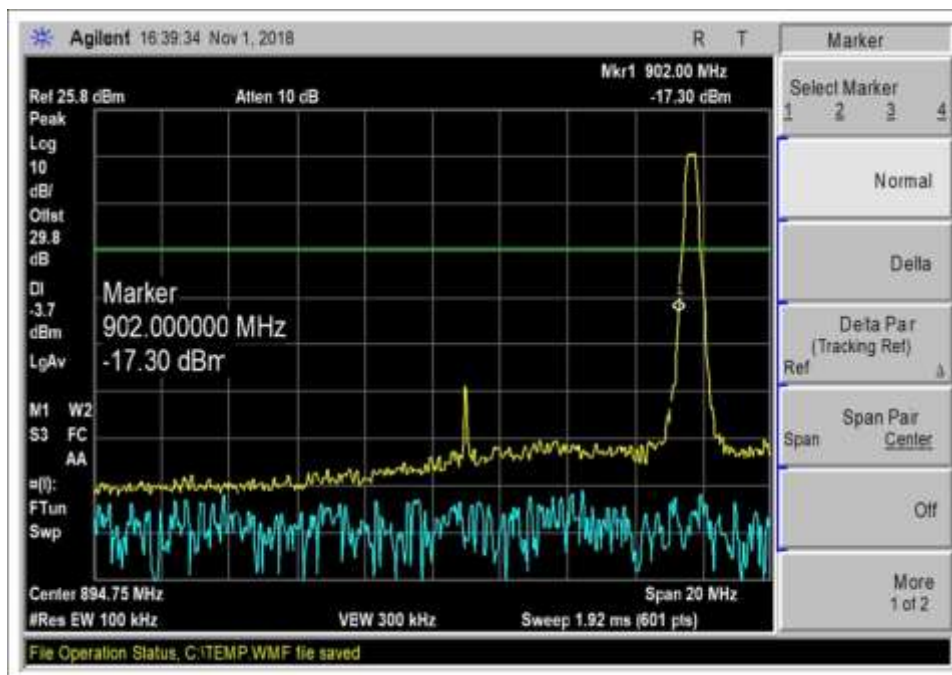
High Channel, 100kbps, Power level 3



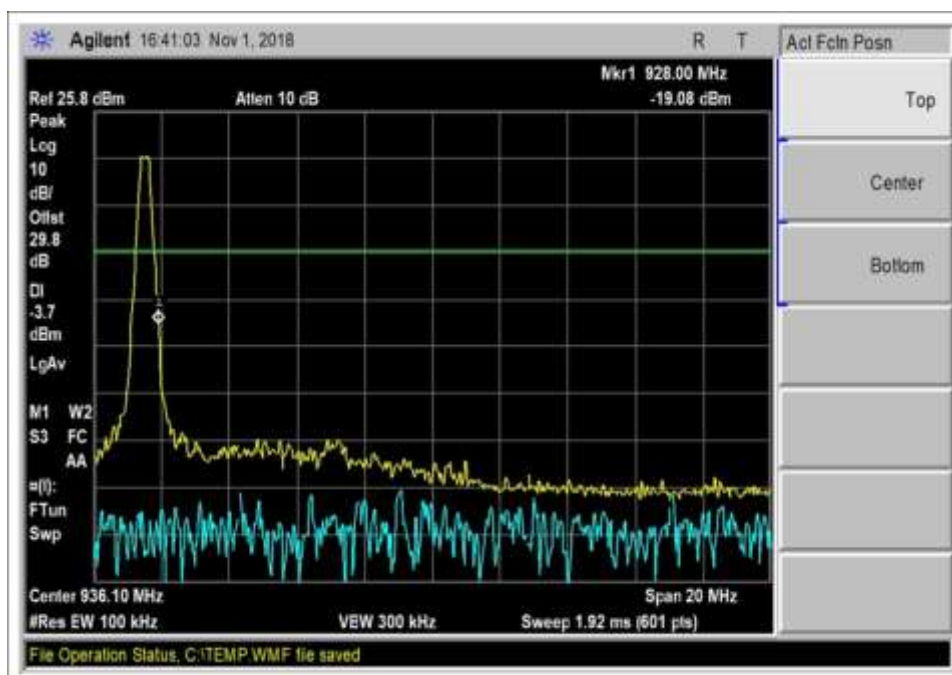
Hopping, 100kbps, Power level 3



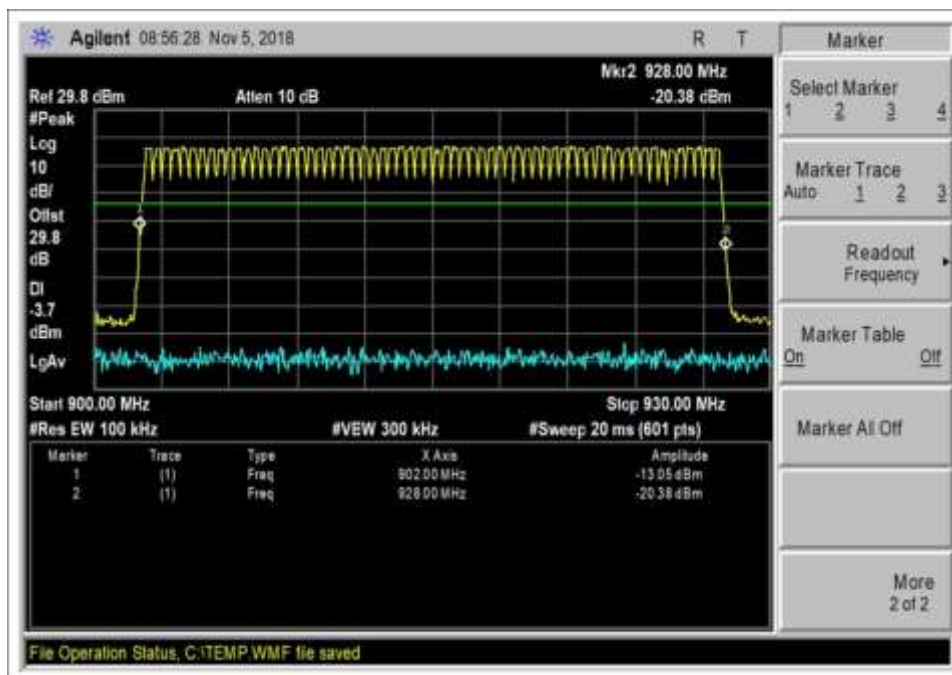
Peak, 300kbps, Power level 2



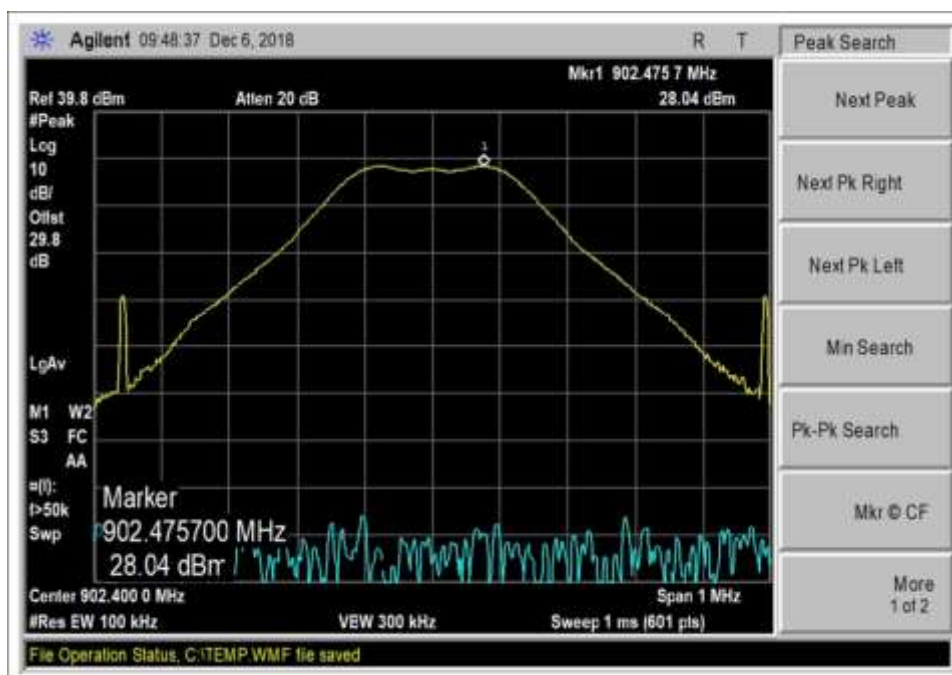
Low Channel, 300kbps, Power level 2



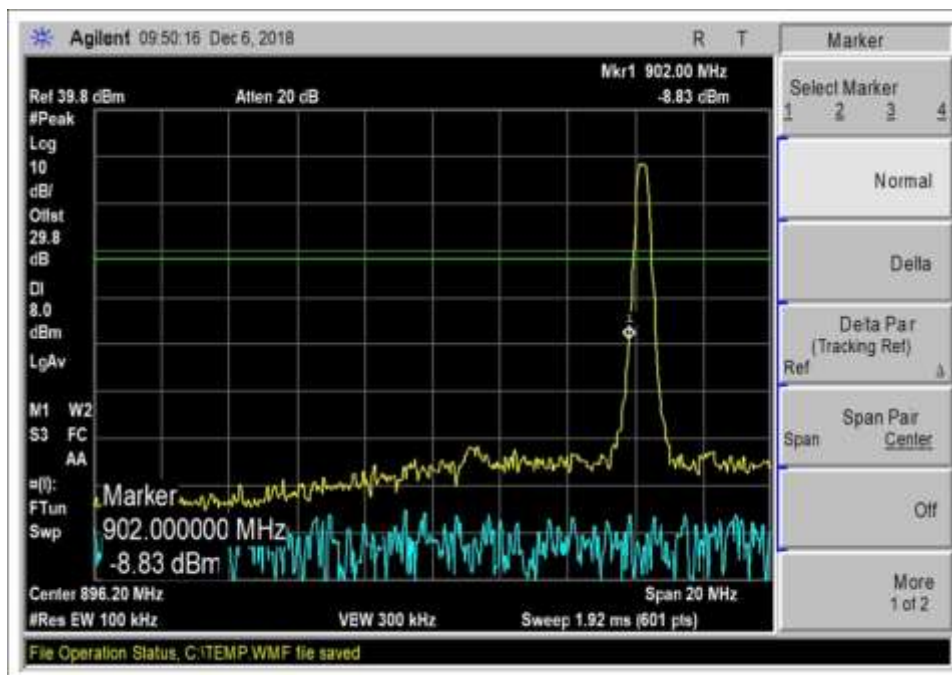
High Channel, 300kbps, Power level 2



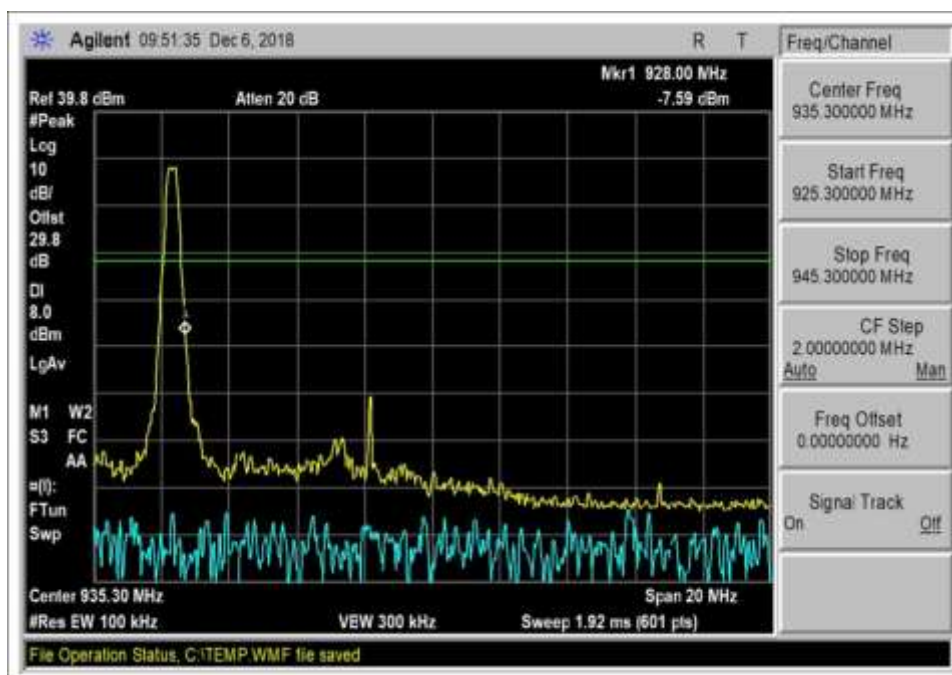
Hopping, 300kbps, Power level 2



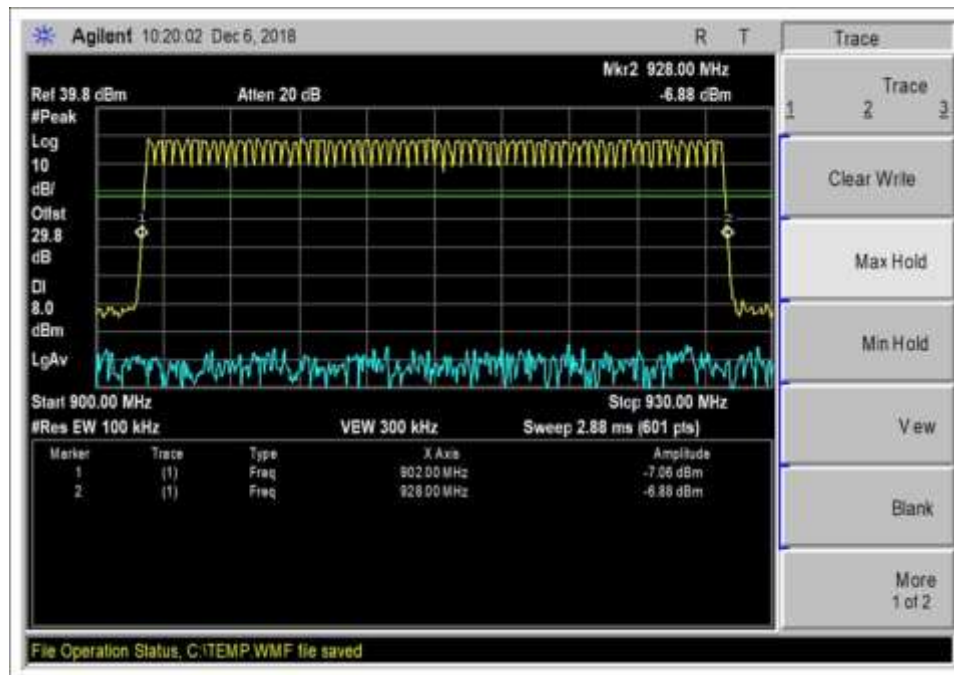
Peak, 300kbps, Power level 3



Low Channel, 300kbps, Power level 3



High Channel, 300kbps, Power level 3



Hopping, 300kbps, Power level 3

Test Setup Photo



15.247(d) Radiated Emissions & Band Edge

Test Setup / Conditions / Data

Test Location: CKC Laboratories, Inc. • 110 N. Olinda Place • Brea, CA 92823 • 714-993-6112
 Customer: **Itron, Inc.**
 Specification: **15.247(d) / 15.209 Radiated Spurious Emissions**
 Work Order #: **99218** Date: 11/6/2018
 Test Type: **Maximized Emissions** Time: 14:31:44
 Tested By: Don Nguyen Sequence#: 2
 Software: EMITest 5.03.11

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 2			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 2			

Test Conditions / Notes:

The EUT is placed on table top. The serial port is connected to a support laptop via serial to USB adapter.
 The laptop is running software Command Line Interface Tool to turn on TX at 100% duty cycle.
 The EUT is powered from fresh battery 6.0Vdc. Support equipment is removed during test.

Modulation: 100kbps FSK.

Frequency of measurement: 9k-9280MHz
 9 kHz -150 kHz;RBW=200 Hz,VBW=600 Hz;
 150 kHz-30 MHz;RBW=9 kHz,VBW=27 kHz;
 30 MHz-1000 MHz;RBW=120 kHz,VBW=360 kHz,
 1000 MHz-9280MHz;RBW=1 MHz,VBW=3 MHz.
 RBW=100kHz, VBW=300kHz (-20dbc limit)

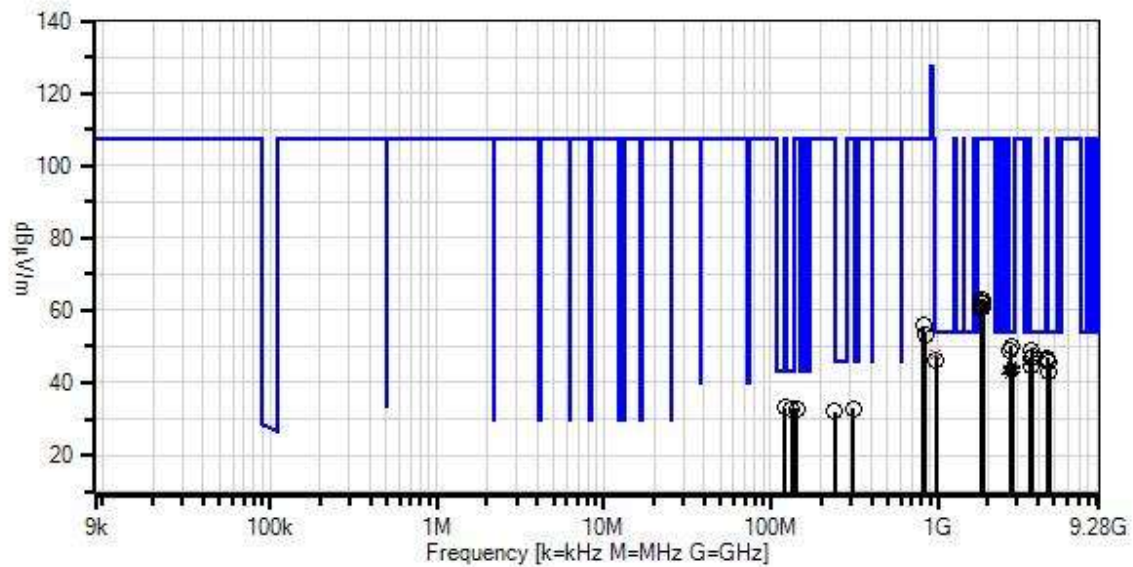
Site A

Test Method: ANSI C63.10 (2013)

Temperature: 23.0°C

Relative Humidity: 51.2%

Itron, Inc. W/O#: 99218 Sequence#: 2 Date: 11/6/2018
15.247(d) / 15.209 Radiated Spurious Emissions Test Distance: 3 Meters Horiz



— Readings
× QP Readings
▼ Ambient
○ Peak Readings
* Average Readings
Software Version: 5.03.11
1 - 15.247(d) / 15.209 Radiated Spurious Emissions

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN00314	Loop Antenna	6502	5/13/2018	5/13/2020
T1	AN01995	Biconilog Antenna	CBL6111C	4/23/2018	4/23/2020
T2	ANP05275	Attenuator	1W	4/5/2018	4/5/2020
T3	ANP05050	Cable	RG223/U	1/20/2017	1/20/2019
T4	ANP05198	Cable-Amplitude +15C to +45C (dB)	8268	12/7/2016	12/7/2018
T5	AN00309	Preamp	8447D	2/19/2018	2/19/2020
T6	AN02672	Spectrum Analyzer	E4446A	3/2/2017	3/2/2019
T7	AN00786	Preamp	83017A	5/12/2018	5/12/2020
T8	AN00849	Horn Antenna	3115	3/14/2018	3/14/2020
T9	ANP07139	Cable	ANDL1- PNMNM-48	3/1/2017	3/1/2019
T10	ANP07244	Cable	32022-29094K- 29094K-24TC	7/5/2018	7/5/2020
T11	AN03169	High Pass Filter	HM1155-11SS	6/15/2017	6/15/2019

Measurement Data:

Reading listed by margin.

Test Distance: 3 Meters

#	Freq	Rdng	T1 T5 T9	T2 T6 T10	T3 T7 T11	T4 T8	Dist	Corr	Spec	Margin	Polar
	MHz	dBμV	dB	dB	dB	dB	Table	dBμV/m	dBμV/m	dB	Ant
1	2744.700M	55.6	+0.0 +0.0 +3.2	+0.0 +0.0 +0.4	+0.0 -38.6 +0.2	+0.0 +29.4	+0.0	50.2	54.0	-3.8	Vert
2	2706.900M	54.8	+0.0 +0.0 +3.2	+0.0 +0.0 +0.4	+0.0 -38.6 +0.2	+0.0 +29.1	+0.0	49.1	54.0	-4.9	Vert
3	3659.600M	51.3	+0.0 +0.0 +3.8	+0.0 +0.0 +0.5	+0.0 -38.3 +0.2	+0.0 +31.6	+0.0	49.1	54.0	-4.9	Horiz
4	978.900M QP	38.3	+24.0 -27.4 +0.0	+6.1 +0.0 +0.0	+0.5 +0.0 +0.0	+6.2 +0.0	+0.0	47.7	54.0	-6.3	Vert
^	978.900M	43.0	+24.0 -27.4 +0.0	+6.1 +0.0 +0.0	+0.5 +0.0 +0.0	+6.2 +0.0	+0.0	52.4	54.0	-1.6	Vert
6	3707.600M	49.2	+0.0 +0.0 +3.8	+0.0 +0.0 +0.5	+0.0 -38.3 +0.2	+0.0 +31.9	+0.0	47.3	54.0	-6.7	Vert
7	3707.600M	49.0	+0.0 +0.0 +3.8	+0.0 +0.0 +0.5	+0.0 -38.3 +0.2	+0.0 +31.9	+0.0	47.1	54.0	-6.9	Horiz
8	3609.200M	49.7	+0.0 +0.0 +3.8	+0.0 +0.0 +0.6	+0.0 -38.4 +0.2	+0.0 +31.1	+0.0	47.0	54.0	-7.0	Horiz
9	4511.500M	46.8	+0.0 +0.0 +4.1	+0.0 +0.0 +0.7	+0.0 -37.8 +0.1	+0.0 +32.9	+0.0	46.8	54.0	-7.2	Horiz

10	4511.500M	46.4	+0.0 +0.0 +4.1	+0.0 +0.0 +0.7	+0.0 -37.8 +0.1	+0.0 +32.9	+0.0	46.4	54.0	-7.6	Vert
11	978.900M	36.7	+24.0 -27.4 +0.0	+6.1 +0.0 +0.0	+0.5 +0.0 +0.0	+6.2 +0.0	+0.0	46.1	54.0	-7.9	Horiz
12	4574.500M	45.8	+0.0 +0.0 +4.1	+0.0 +0.0 +0.7	+0.0 -37.8 +0.1	+0.0 +32.9	+0.0	45.8	54.0	-8.2	Vert
13	4634.500M	45.5	+0.0 +0.0 +4.2	+0.0 +0.0 +0.6	+0.0 -37.7 +0.2	+0.0 +32.8	+0.0	45.6	54.0	-8.4	Vert
14	4574.500M	45.4	+0.0 +0.0 +4.1	+0.0 +0.0 +0.7	+0.0 -37.8 +0.1	+0.0 +32.9	+0.0	45.4	54.0	-8.6	Horiz
15	3659.600M	47.0	+0.0 +0.0 +3.8	+0.0 +0.0 +0.5	+0.0 -38.3 +0.2	+0.0 +31.6	+0.0	44.8	54.0	-9.2	Vert
16	3609.200M	47.4	+0.0 +0.0 +3.8	+0.0 +0.0 +0.6	+0.0 -38.4 +0.2	+0.0 +31.1	+0.0	44.7	54.0	-9.3	Vert
17	2780.700M Ave	49.6	+0.0 +0.0 +3.3	+0.0 +0.0 +0.4	+0.0 -38.6 +0.2	+0.0 +29.5	+0.0	44.4	54.0	-9.6	Horiz
^	2780.700M	58.6	+0.0 +0.0 +3.3	+0.0 +0.0 +0.4	+0.0 -38.6 +0.2	+0.0 +29.5	+0.0	53.4	54.0	-0.6	Horiz
19	2780.700M Ave	49.2	+0.0 +0.0 +3.3	+0.0 +0.0 +0.4	+0.0 -38.6 +0.2	+0.0 +29.5	+0.0	44.0	54.0	-10.0	Vert
^	2780.700M	58.6	+0.0 +0.0 +3.3	+0.0 +0.0 +0.4	+0.0 -38.6 +0.2	+0.0 +29.5	+0.0	53.4	54.0	-0.6	Vert
21	134.000M	41.0	+11.8 -28.0 +0.0	+6.0 +0.0 +0.0	+0.1 +0.0 +0.0	+1.9 +0.0	+0.0	32.8	43.5	-10.7	Vert
22	2744.700M Ave	48.6	+0.0 +0.0 +3.2	+0.0 +0.0 +0.4	+0.0 -38.6 +0.2	+0.0 +29.4	+0.0	43.2	54.0	-10.8	Horiz
^	2744.700M	57.6	+0.0 +0.0 +3.2	+0.0 +0.0 +0.4	+0.0 -38.6 +0.2	+0.0 +29.4	+0.0	52.2	54.0	-1.8	Horiz
24	4634.500M	42.9	+0.0 +0.0 +4.2	+0.0 +0.0 +0.6	+0.0 -37.7 +0.2	+0.0 +32.8	+0.0	43.0	54.0	-11.0	Horiz
25	2706.900M Ave	47.9	+0.0 +0.0 +3.2	+0.0 +0.0 +0.4	+0.0 -38.6 +0.2	+0.0 +29.1	+0.0	42.2	54.0	-11.8	Horiz
^	2706.900M	57.0	+0.0 +0.0 +3.2	+0.0 +0.0 +0.4	+0.0 -38.6 +0.2	+0.0 +29.1	+0.0	51.3	54.0	-2.7	Horiz

27	242.450M	38.8	+12.4 -28.0 +0.0	+6.0 +0.0 +0.0	+0.2 +0.0 +0.0	+2.7 +0.0 +0.0	+0.0	32.1	46.0	-13.9	Horiz
28	1853.800M	71.3	+0.0 +0.0 +2.6	+0.0 +0.0 +0.2	+0.0 -38.9 +0.3	+0.0 +27.2	+0.0	62.7	107.4	-44.7	Horiz
29	1804.600M	71.4	+0.0 +0.0 +2.5	+0.0 +0.0 +0.2	+0.0 -38.9 +0.3	+0.0 +27.0	+0.0	62.5	107.4	-44.9	Horiz
30	1829.800M	70.6	+0.0 +0.0 +2.5	+0.0 +0.0 +0.2	+0.0 -38.9 +0.3	+0.0 +27.1	+0.0	61.8	107.4	-45.6	Vert
31	1829.800M	70.5	+0.0 +0.0 +2.5	+0.0 +0.0 +0.2	+0.0 -38.9 +0.3	+0.0 +27.1	+0.0	61.7	107.4	-45.7	Horiz
32	1853.800M	69.5	+0.0 +0.0 +2.6	+0.0 +0.0 +0.2	+0.0 -38.9 +0.3	+0.0 +27.2	+0.0	60.9	107.4	-46.5	Vert
33	1804.600M	69.8	+0.0 +0.0 +2.5	+0.0 +0.0 +0.2	+0.0 -38.9 +0.3	+0.0 +27.0	+0.0	60.9	107.4	-46.5	Vert
34	820.601M	48.8	+22.1 -27.2 +0.0	+6.0 +0.0 +0.0	+0.4 +0.0 +0.0	+5.6 +0.0	+0.0	55.7	107.4	-51.7	Vert
35	838.850M	46.1	+22.3 -27.2 +0.0	+6.1 +0.0 +0.0	+0.4 +0.0 +0.0	+5.7 +0.0	+0.0	53.4	107.4	-54.0	Vert
36	122.250M	41.5	+11.8 -28.0 +0.0	+6.0 +0.0 +0.0	+0.1 +0.0 +0.0	+1.8 +0.0	+0.0	33.2	107.4	-74.2	Vert
37	313.200M	37.8	+13.7 -28.0 +0.0	+6.0 +0.0 +0.0	+0.2 +0.0 +0.0	+3.2 +0.0	+0.0	32.9	107.4	-74.5	Horiz
38	142.750M	41.1	+11.6 -28.0 +0.0	+6.0 +0.0 +0.0	+0.1 +0.0 +0.0	+2.0 +0.0	+0.0	32.8	107.4	-74.6	Vert



Test Location: CKC Laboratories, Inc. • 110 N. Olinda Place • Brea, CA 92823 • 714-993-6112
Customer: **Itron, Inc.**
Specification: **15.247(d) / 15.209 Radiated Spurious Emissions**
Work Order #: **99218** Date: 11/6/2018
Test Type: **Maximized Emissions** Time: 15:54:25
Tested By: Don Nguyen Sequence#: 15
Software: EMITest 5.03.11

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 3			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 3			

Test Conditions / Notes:

The EUT is placed on table top. The serial port is connected to a support laptop via serial to USB adapter.
The laptop is running software Command Line Interface Tool to turn on TX at 100% duty cycle.
The EUT is powered from fresh battery 6.0Vdc. Support equipment is removed during test.

Modulation: 100kbps FSK.

Frequency of measurement: 9k-9280MHz
9 kHz -150 kHz;RBW=200 Hz,VBW=600 Hz;
150 kHz-30 MHz;RBW=9 kHz,VBW=27 kHz;
30 MHz-1000 MHz;RBW=120 kHz,VBW=360 kHz,
1000 MHz-9280MHz;RBW=1 MHz,VBW=3 MHz.
RBW=100kHz, VBW=300kHz (-20dbc limit)

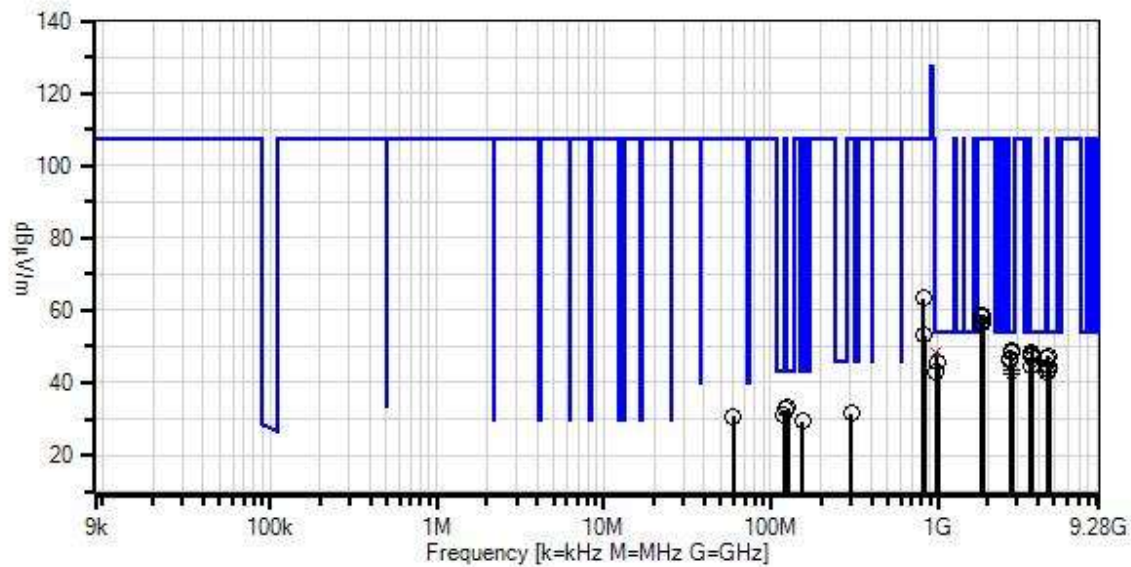
Site A

Test Method: ANSI C63.10 (2013)

Temperature: 22.3°C

Relative Humidity: 53.5%

Itron, Inc. W/O#: 99218 Sequence#: 15 Date: 11/6/2018
15.247(d) / 15.209 Radiated Spurious Emissions Test Distance: 3 Meters Horiz



— Readings
 × QP Readings
 ▼ Ambient
 — 1 - 15.247(d) / 15.209 Radiated Spurious Emissions

○ Peak Readings
 * Average Readings
 Software Version: 5.03.11

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN00314	Loop Antenna	6502	5/13/2018	5/13/2020
T1	AN00309	Preamp	8447D	2/19/2018	2/19/2020
T2	AN01995	Biconilog Antenna	CBL6111C	4/23/2018	4/23/2020
T3	ANP05275	Attenuator	1W	4/5/2018	4/5/2020
T4	ANP05050	Cable	RG223/U	1/20/2017	1/20/2019
T5	ANP05198	Cable-Amplitude +15C to +45C (dB)	8268	12/7/2016	12/7/2018
T6	AN02672	Spectrum Analyzer	E4446A	3/2/2017	3/2/2019
T7	AN00786	Preamp	83017A	5/12/2018	5/12/2020
T8	AN00849	Horn Antenna	3115	3/14/2018	3/14/2020
T9	ANP07139	Cable	ANDL1- PNMNM-48	3/1/2017	3/1/2019
T10	ANP07244	Cable	32022-29094K- 29094K-24TC	7/5/2018	7/5/2020
T11	AN03169	High Pass Filter	HM1155-11SS	6/15/2017	6/15/2019

Measurement Data:

Reading listed by margin.

Test Distance: 3 Meters

#	Freq	Rdng	T1 T5 T9	T2 T6 T10	T3 T7 T11	T4 T8	Dist	Corr	Spec	Margin	Polar
	MHz	dB μ V	dB	dB	dB	dB	Table	dB μ V/m	dB μ V/m	dB	Ant
1	2744.700M	54.4	+0.0 +0.0 +3.2	+0.0 +0.0 +0.4	+0.0 -38.6 +0.2	+0.0 +29.4	+0.0	49.0	54.0	-5.0	Vert
2	978.900M QP	39.2	-27.4 +6.2 +0.0	+24.0 +0.0 +0.0	+6.1 +0.0 +0.0	+0.5 +0.0	+0.0	48.6	54.0	-5.4	Vert
^	978.900M	43.7	-27.4 +6.2 +0.0	+24.0 +0.0 +0.0	+6.1 +0.0 +0.0	+0.5 +0.0	+0.0	53.1	54.0	-0.9	Vert
4	3659.600M	50.6	+0.0 +0.0 +3.8	+0.0 +0.0 +0.5	+0.0 -38.3 +0.2	+0.0 +31.6	+0.0	48.4	54.0	-5.6	Horiz
5	2744.700M	53.5	+0.0 +0.0 +3.2	+0.0 +0.0 +0.4	+0.0 -38.6 +0.2	+0.0 +29.4	+0.0	48.1	54.0	-5.9	Horiz
6	3659.600M	49.8	+0.0 +0.0 +3.8	+0.0 +0.0 +0.5	+0.0 -38.3 +0.2	+0.0 +31.6	+0.0	47.6	54.0	-6.4	Vert
7	4574.500M	47.3	+0.0 +0.0 +4.1	+0.0 +0.0 +0.7	+0.0 -37.8 +0.1	+0.0 +32.9	+0.0	47.3	54.0	-6.7	Horiz
8	3609.200M	49.8	+0.0 +0.0 +3.8	+0.0 +0.0 +0.6	+0.0 -38.4 +0.2	+0.0 +31.1	+0.0	47.1	54.0	-6.9	Horiz
9	3707.600M	48.7	+0.0 +0.0 +3.8	+0.0 +0.0 +0.5	+0.0 -38.3 +0.2	+0.0 +31.9	+0.0	46.8	54.0	-7.2	Vert

10	3707.600M	48.6	+0.0 +0.0 +3.8	+0.0 +0.0 +0.5	+0.0 -38.3 +0.2	+0.0 +31.9	+0.0	46.7	54.0	-7.3	Horiz
11	2706.900M	52.4	+0.0 +0.0 +3.2	+0.0 +0.0 +0.4	+0.0 -38.6 +0.2	+0.0 +29.1	+0.0	46.7	54.0	-7.3	Vert
12	4511.500M	46.5	+0.0 +0.0 +4.1	+0.0 +0.0 +0.7	+0.0 -37.8 +0.1	+0.0 +32.9	+0.0	46.5	54.0	-7.5	Horiz
13	2706.900M	52.1	+0.0 +0.0 +3.2	+0.0 +0.0 +0.4	+0.0 -38.6 +0.2	+0.0 +29.1	+0.0	46.4	54.0	-7.6	Horiz
14	999.300M	35.7	-27.5 +6.3 +0.0	+24.3 +0.0 +0.0	+6.1 +0.0 +0.0	+0.5 +0.0	+0.0	45.4	54.0	-8.6	Vert
15	4634.500M	44.4	+0.0 +0.0 +4.2	+0.0 +0.0 +0.6	+0.0 -37.7 +0.2	+0.0 +32.8	+0.0	44.5	54.0	-9.5	Horiz
16	4634.500M	44.4	+0.0 +0.0 +4.2	+0.0 +0.0 +0.6	+0.0 -37.7 +0.2	+0.0 +32.8	+0.0	44.5	54.0	-9.5	Vert
17	3609.200M	47.1	+0.0 +0.0 +3.8	+0.0 +0.0 +0.6	+0.0 -38.4 +0.2	+0.0 +31.1	+0.0	44.4	54.0	-9.6	Vert
18	4574.500M	43.7	+0.0 +0.0 +4.1	+0.0 +0.0 +0.7	+0.0 -37.8 +0.1	+0.0 +32.9	+0.0	43.7	54.0	-10.3	Vert
19	126.750M	41.1	-28.0 +1.9 +0.0	+11.9 +0.0 +0.0	+6.0 +0.0 +0.0	+0.1 +0.0	+0.0	33.0	43.5	-10.5	Horiz
20	2780.700M Ave	48.6	+0.0 +0.0 +3.3	+0.0 +0.0 +0.4	+0.0 -38.6 +0.2	+0.0 +29.5	+0.0	43.4	54.0	-10.6	Horiz
^	2780.700M	57.6	+0.0 +0.0 +3.3	+0.0 +0.0 +0.4	+0.0 -38.6 +0.2	+0.0 +29.5	+0.0	52.4	54.0	-1.6	Horiz
22	978.850M	33.5	-27.4 +6.2 +0.0	+24.0 +0.0 +0.0	+6.1 +0.0 +0.0	+0.5 +0.0	+0.0	42.9	54.0	-11.1	Horiz
23	4511.500M	42.7	+0.0 +0.0 +4.1	+0.0 +0.0 +0.7	+0.0 -37.8 +0.1	+0.0 +32.9	+0.0	42.7	54.0	-11.3	Vert
24	2780.700M Ave	47.4	+0.0 +0.0 +3.3	+0.0 +0.0 +0.4	+0.0 -38.6 +0.2	+0.0 +29.5	+0.0	42.2	54.0	-11.8	Vert
^	2780.700M	56.7	+0.0 +0.0 +3.3	+0.0 +0.0 +0.4	+0.0 -38.6 +0.2	+0.0 +29.5	+0.0	51.5	54.0	-2.5	Vert
26	119.500M	39.6	-28.0 +1.8 +0.0	+11.7 +0.0 +0.0	+6.0 +0.0 +0.0	+0.1 +0.0	+0.0	31.2	43.5	-12.3	Horiz

27	820.600M	56.4	-27.2 +5.6 +0.0	+22.1 +0.0 +0.0	+6.0 +0.0 +0.0	+0.4 +0.0 +0.0	+0.0	63.3	107.4	-44.1	Vert
28	1853.800M	67.3	+0.0 +0.0 +2.6	+0.0 +0.0 +0.2	+0.0 -38.9 +0.3	+0.0 +27.2	+0.0	58.7	107.4	-48.7	Horiz
29	1804.600M	67.4	+0.0 +0.0 +2.5	+0.0 +0.0 +0.2	+0.0 -38.9 +0.3	+0.0 +27.0	+0.0	58.5	107.4	-48.9	Vert
30	1829.800M	66.8	+0.0 +0.0 +2.5	+0.0 +0.0 +0.2	+0.0 -38.9 +0.3	+0.0 +27.1	+0.0	58.0	107.4	-49.4	Horiz
31	1829.800M	65.5	+0.0 +0.0 +2.5	+0.0 +0.0 +0.2	+0.0 -38.9 +0.3	+0.0 +27.1	+0.0	56.7	107.4	-50.7	Vert
32	1804.600M	65.3	+0.0 +0.0 +2.5	+0.0 +0.0 +0.2	+0.0 -38.9 +0.3	+0.0 +27.0	+0.0	56.4	107.4	-51.0	Horiz
33	1853.800M	64.8	+0.0 +0.0 +2.6	+0.0 +0.0 +0.2	+0.0 -38.9 +0.3	+0.0 +27.2	+0.0	56.2	107.4	-51.2	Vert
34	832.650M	45.9	-27.2 +5.6 +0.0	+22.2 +0.0 +0.0	+6.1 +0.0 +0.0	+0.4 +0.0	+0.0	53.0	107.4	-54.4	Vert
35	122.000M	41.0	-28.0 +1.8 +0.0	+11.8 +0.0 +0.0	+6.0 +0.0 +0.0	+0.1 +0.0	+0.0	32.7	107.4	-74.7	Horiz
36	301.500M	36.8	-28.0 +3.1 +0.0	+13.3 +0.0 +0.0	+6.0 +0.0 +0.0	+0.2 +0.0	+0.0	31.4	107.4	-76.0	Horiz
37	59.500M	45.8	-28.1 +1.2 +0.0	+5.8 +0.0 +0.0	+6.0 +0.0 +0.0	+0.1 +0.0	+0.0	30.8	107.4	-76.6	Vert
38	155.500M	38.2	-28.0 +2.1 +0.0	+11.0 +0.0 +0.0	+6.0 +0.0 +0.0	+0.1 +0.0	+0.0	29.4	107.4	-78.0	Horiz



Test Location: CKC Laboratories, Inc. • 110 N. Olinda Place • Brea, CA 92823 • 714-993-6112
 Customer: **Itron, Inc.**
 Specification: **15.247(d) / 15.209 Radiated Spurious Emissions**
 Work Order #: **99218** Date: 11/9/2018
 Test Type: **Maximized Emissions** Time: 09:29:14
 Tested By: Don Nguyen Sequence#: 14
 Software: EMITest 5.03.11

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 4			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 4			

Test Conditions / Notes:

The EUT is placed on table top. The serial port is connected to a support laptop via serial to USB adapter.
 The laptop is running software Command Line Interface Tool to turn on TX at 100% duty cycle.
 The EUT is powered from fresh battery 6.0Vdc. Support equipment is removed during test.

Modulation: 100kbps FSK.

Frequency of measurement: 9k-9280MHz
 9 kHz -150 kHz;RBW=200 Hz,VBW=600 Hz;
 150 kHz-30 MHz;RBW=9 kHz,VBW=27 kHz;
 30 MHz-1000 MHz;RBW=120 kHz,VBW=360 kHz,
 1000 MHz-9280MHz;RBW=1 MHz,VBW=3 MHz.
 RBW=100kHz, VBW=300kHz (-20dbc limit)

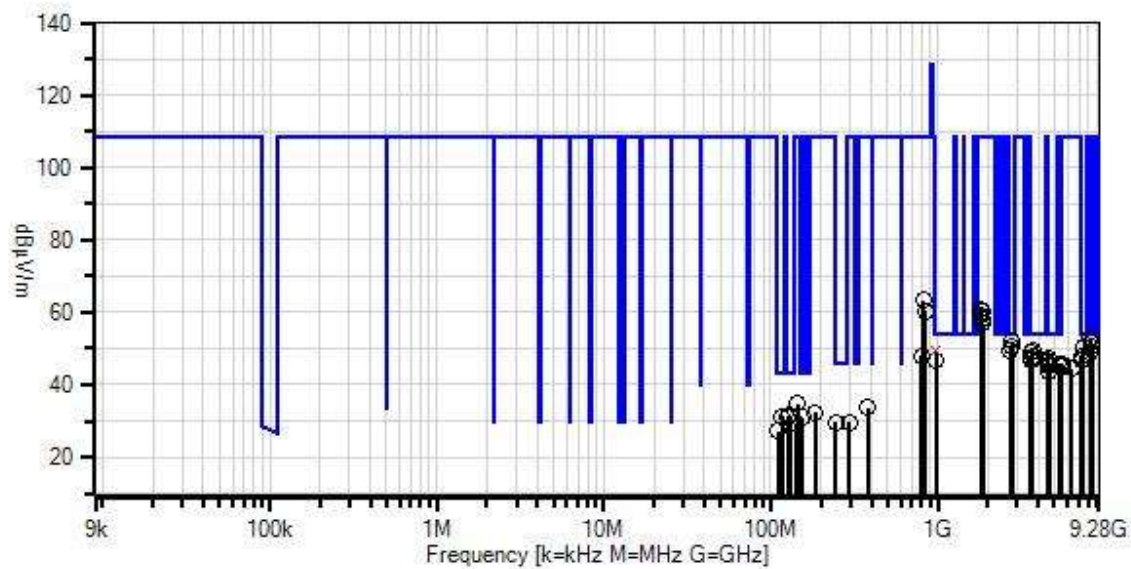
Site A

Test Method: ANSI C63.10 (2013)

Temperature: 21.5°C

Relative Humidity: 20.1%

Itron, Inc. W/O#: 99218 Sequence#: 14 Date: 11/9/2018
 15.247(d) / 15.209 Radiated Spurious Emissions Test Distance: 3 Meters Horiz



— Readings
 × QP Readings
 ▼ Ambient
 — 1 - 15.247(d) / 15.209 Radiated Spurious Emissions

○ Peak Readings
 * Average Readings
 Software Version: 5.03.11

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN00314	Loop Antenna	6502	5/13/2018	5/13/2020
T1	AN00309	Preamp	8447D	2/19/2018	2/19/2020
T2	AN01995	Biconilog Antenna	CBL6111C	4/23/2018	4/23/2020
T3	ANP05275	Attenuator	1W	4/5/2018	4/5/2020
T4	ANP05050	Cable	RG223/U	1/20/2017	1/20/2019
T5	ANP05198	Cable-Amplitude +15C to +45C (dB)	8268	12/7/2016	12/7/2018
	AN02672	Spectrum Analyzer	E4446A	3/2/2017	3/2/2019
T6	AN00786	Preamp	83017A	5/12/2018	5/12/2020
T7	AN00849	Horn Antenna	3115	3/14/2018	3/14/2020
T8	ANP07139	Cable	ANDL1- PNMNM-48	3/1/2017	3/1/2019
T9	ANP07244	Cable	32022-29094K- 29094K-24TC	7/5/2018	7/5/2020
T10	AN03169	High Pass Filter	HM1155-11SS	6/15/2017	6/15/2019

Measurement Data:

Reading listed by margin.

Test Distance: 3 Meters

#	Freq	Rdng	T1 T5 T9	T2 T6 T10	T3 T7	T4 T8	Dist	Corr	Spec	Margin	Polar
	MHz	dBμV	dB	dB	dB	dB	Table	dBμV/m	dBμV/m	dB	Ant
1	8120.683M	46.6	+0.0 +0.0 +0.4	+0.0 -37.4 +0.1	+0.0 +36.9	+0.0 +6.1	+0.0	52.7	54.0	-1.3	Horiz
2	2780.700M	57.1	+0.0 +0.0 +0.4	+0.0 -38.6 +0.2	+0.0 +29.5	+0.0 +3.3	+0.0	51.9	54.0	-2.1	Vert
3	8234.100M	45.0	+0.0 +0.0 +0.5	+0.0 -37.4 +0.2	+0.0 +36.9	+0.0 +6.2	+0.0	51.4	54.0	-2.6	Horiz
4	2780.700M	55.9	+0.0 +0.0 +0.4	+0.0 -38.6 +0.2	+0.0 +29.5	+0.0 +3.3	+0.0	50.7	54.0	-3.3	Horiz
5	2744.700M	56.1	+0.0 +0.0 +0.4	+0.0 -38.6 +0.2	+0.0 +29.4	+0.0 +3.2	+0.0	50.7	54.0	-3.3	Vert
6	8342.100M	44.0	+0.0 +0.0 +0.5	+0.0 -37.4 +0.2	+0.0 +37.1	+0.0 +6.2	+0.0	50.6	54.0	-3.4	Vert
7	2744.700M	56.0	+0.0 +0.0 +0.4	+0.0 -38.6 +0.2	+0.0 +29.4	+0.0 +3.2	+0.0	50.6	54.0	-3.4	Horiz
8	7415.200M	45.5	+0.0 +0.0 +0.3	+0.0 -37.4 +0.1	+0.0 +36.2	+0.0 +5.6	+0.0	50.3	54.0	-3.7	Horiz
9	2706.883M	55.3	+0.0 +0.0 +0.4	+0.0 -38.6 +0.2	+0.0 +29.1	+0.0 +3.2	+0.0	49.6	54.0	-4.4	Horiz

10	3707.600M	51.4	+0.0 +0.0 +0.5	+0.0 -38.3 +0.2	+0.0 +31.9	+0.0 +3.8	+0.0	49.5	54.0	-4.5	Vert
11	2706.883M	55.2	+0.0 +0.0 +0.4	+0.0 -38.6 +0.2	+0.0 +29.1	+0.0 +3.2	+0.0	49.5	54.0	-4.5	Vert
12	978.900M QP	39.8	-27.4 +6.2 +0.0	+24.0 +0.0 +0.0	+6.1 +0.0	+0.5 +0.0	+0.0	49.2	54.0	-4.8	Vert
^	978.900M	43.5	-27.4 +6.2 +0.0	+24.0 +0.0 +0.0	+6.1 +0.0	+0.5 +0.0	+0.0	52.9	54.0	-1.1	Vert
^	978.900M	43.4	-27.4 +6.2 +0.0	+24.0 +0.0 +0.0	+6.1 +0.0	+0.5 +0.0	+0.0	52.8	54.0	-1.2	Vert
15	3659.600M	51.2	+0.0 +0.0 +0.5	+0.0 -38.3 +0.2	+0.0 +31.6	+0.0 +3.8	+0.0	49.0	54.0	-5.0	Horiz
16	8120.683M	42.7	+0.0 +0.0 +0.4	+0.0 -37.4 +0.1	+0.0 +36.9	+0.0 +6.1	+0.0	48.8	54.0	-5.2	Vert
17	3707.600M	49.5	+0.0 +0.0 +0.5	+0.0 -38.3 +0.2	+0.0 +31.9	+0.0 +3.8	+0.0	47.6	54.0	-6.4	Horiz
18	3609.183M	50.1	+0.0 +0.0 +0.6	+0.0 -38.4 +0.2	+0.0 +31.1	+0.0 +3.8	+0.0	47.4	54.0	-6.6	Horiz
19	4574.500M	47.3	+0.0 +0.0 +0.7	+0.0 -37.8 +0.1	+0.0 +32.9	+0.0 +4.1	+0.0	47.3	54.0	-6.7	Horiz
20	3659.600M	49.4	+0.0 +0.0 +0.5	+0.0 -38.3 +0.2	+0.0 +31.6	+0.0 +3.8	+0.0	47.2	54.0	-6.8	Vert
21	3609.183M	49.7	+0.0 +0.0 +0.6	+0.0 -38.4 +0.2	+0.0 +31.1	+0.0 +3.8	+0.0	47.0	54.0	-7.0	Vert
22	978.950M	37.5	-27.4 +6.2 +0.0	+24.0 +0.0 +0.0	+6.1 +0.0	+0.5 +0.0	+0.0	46.9	54.0	-7.1	Horiz
23	7319.200M	42.3	+0.0 +0.0 +0.2	+0.0 -37.4 +0.1	+0.0 +35.9	+0.0 +5.6	+0.0	46.7	54.0	-7.3	Horiz
24	4511.483M	46.5	+0.0 +0.0 +0.7	+0.0 -37.8 +0.1	+0.0 +32.9	+0.0 +4.1	+0.0	46.5	54.0	-7.5	Horiz
25	4511.483M	46.2	+0.0 +0.0 +0.7	+0.0 -37.8 +0.1	+0.0 +32.9	+0.0 +4.1	+0.0	46.2	54.0	-7.8	Vert
26	5413.783M	44.4	+0.0 +0.0 +0.4	+0.0 -37.5 +0.1	+0.0 +33.9	+0.0 +4.6	+0.0	45.9	54.0	-8.1	Horiz

27	4634.500M	45.5	+0.0 +0.0 +0.6	+0.0 -37.7 +0.2	+0.0 +32.8	+0.0 +4.2	+0.0	45.6	54.0	-8.4	Horiz
28	4634.500M	45.1	+0.0 +0.0 +0.6	+0.0 -37.7 +0.2	+0.0 +32.8	+0.0 +4.2	+0.0	45.2	54.0	-8.8	Vert
29	4574.500M	43.6	+0.0 +0.0 +0.7	+0.0 -37.8 +0.1	+0.0 +32.9	+0.0 +4.1	+0.0	43.6	54.0	-10.4	Vert
30	129.400M	39.8	-28.0 +1.9 +0.0	+11.8 +0.0 +0.0	+6.0 +0.0	+0.1 +0.0	+0.0	31.6	43.5	-11.9	Vert
31	116.300M	39.9	-28.0 +1.8 +0.0	+11.4 +0.0 +0.0	+6.0 +0.0	+0.1 +0.0	+0.0	31.2	43.5	-12.3	Vert
32	126.200M	39.3	-28.0 +1.9 +0.0	+11.9 +0.0 +0.0	+6.0 +0.0	+0.1 +0.0	+0.0	31.2	43.5	-12.3	Horiz
33	110.200M	36.5	-28.1 +1.7 +0.0	+11.0 +0.0 +0.0	+6.0 +0.0	+0.1 +0.0	+0.0	27.2	43.5	-16.3	Horiz
34	243.200M	36.1	-28.0 +2.8 +0.0	+12.4 +0.0 +0.0	+6.0 +0.0	+0.2 +0.0	+0.0	29.5	46.0	-16.5	Horiz
35	820.650M	56.3	-27.2 +5.6 +0.0	+22.1 +0.0 +0.0	+6.0 +0.0	+0.4 +0.0	+0.0	63.2	108.5	-45.3	Vert
36	1804.583M	69.7	+0.0 +0.0 +0.2	+0.0 -38.9 +0.3	+0.0 +27.0	+0.0 +2.5	+0.0	60.8	108.5	-47.7	Vert
37	838.850M	53.1	-27.2 +5.7 +0.0	+22.3 +0.0 +0.0	+6.1 +0.0	+0.4 +0.0	+0.0	60.4	108.5	-48.1	Vert
38	1829.800M	69.0	+0.0 +0.0 +0.2	+0.0 -38.9 +0.3	+0.0 +27.1	+0.0 +2.5	+0.0	60.2	108.5	-48.3	Vert
39	1804.583M	68.1	+0.0 +0.0 +0.2	+0.0 -38.9 +0.3	+0.0 +27.0	+0.0 +2.5	+0.0	59.2	108.5	-49.3	Horiz
40	1829.800M	67.1	+0.0 +0.0 +0.2	+0.0 -38.9 +0.3	+0.0 +27.1	+0.0 +2.5	+0.0	58.3	108.5	-50.2	Horiz
41	1853.800M	65.5	+0.0 +0.0 +0.2	+0.0 -38.9 +0.3	+0.0 +27.2	+0.0 +2.6	+0.0	56.9	108.5	-51.6	Vert
42	1853.800M	65.4	+0.0 +0.0 +0.2	+0.0 -38.9 +0.3	+0.0 +27.2	+0.0 +2.6	+0.0	56.8	108.5	-51.7	Horiz
43	7218.383M	44.0	+0.0 +0.0 +0.2	+0.0 -37.4 +0.1	+0.0 +35.6	+0.0 +5.5	+0.0	48.0	108.5	-60.5	Horiz

44	796.900M	41.3	-27.2 +5.5 +0.0	+21.9 +0.0 +0.0	+6.0 +0.0 +0.0	+0.4 +0.0 +0.0	+0.0	47.9	108.5	-60.6	Horiz
45	5561.400M	44.1	+0.0 +0.0 +0.4	+0.0 -37.4 +0.1	+0.0 +33.9 +4.6	+0.0 +0.0 +0.0	+0.0	45.7	108.5	-62.8	Vert
46	5561.400M	43.7	+0.0 +0.0 +0.4	+0.0 -37.4 +0.1	+0.0 +33.9 +4.6	+0.0 +0.0 +0.0	+0.0	45.3	108.5	-63.2	Horiz
47	5489.400M	43.4	+0.0 +0.0 +0.4	+0.0 -37.5 +0.1	+0.0 +34.1 +4.6	+0.0 +0.0 +0.0	+0.0	45.1	108.5	-63.4	Horiz
48	6316.083M	42.3	+0.0 +0.0 +0.3	+0.0 -37.4 +0.2	+0.0 +34.1 +5.0	+0.0 +0.0 +0.0	+0.0	44.5	108.5	-64.0	Horiz
49	143.900M	43.2	-28.0 +2.0 +0.0	+11.5 +0.0 +0.0	+6.0 +0.0 +0.0	+0.1 +0.0 +0.0	+0.0	34.8	108.5	-73.7	Vert
50	379.650M	36.4	-27.9 +3.5 +0.0	+15.4 +0.0 +0.0	+6.0 +0.0 +0.0	+0.3 +0.0 +0.0	+0.0	33.7	108.5	-74.8	Vert
51	185.150M	42.9	-28.0 +2.3 +0.0	+9.1 +0.0 +0.0	+6.0 +0.0 +0.0	+0.1 +0.0 +0.0	+0.0	32.4	108.5	-76.1	Vert
52	154.450M	39.9	-28.0 +2.1 +0.0	+11.0 +0.0 +0.0	+6.0 +0.0 +0.0	+0.1 +0.0 +0.0	+0.0	31.1	108.5	-77.4	Horiz
53	293.700M	35.0	-28.0 +3.1 +0.0	+13.3 +0.0 +0.0	+6.0 +0.0 +0.0	+0.2 +0.0 +0.0	+0.0	29.6	108.5	-78.9	Horiz
54	140.200M	37.5	-28.0 +2.0 +0.0	+11.7 +0.0 +0.0	+6.0 +0.0 +0.0	+0.1 +0.0 +0.0	+0.0	29.3	108.5	-79.2	Horiz



Test Location: CKC Laboratories, Inc. • 110 N. Olinda Place • Brea, CA 92823 • 714-993-6112
 Customer: **Itron, Inc.**
 Specification: **15.247(d) / 15.209 Radiated Spurious Emissions**
 Work Order #: **99218** Date: 11/9/2018
 Test Type: **Maximized Emissions** Time: 11:18:31
 Tested By: Don Nguyen Sequence#: 11
 Software: EMITest 5.03.11

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 5			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 5			

Test Conditions / Notes:

The EUT is placed on table top. The serial port is connected to a support laptop via serial to USB adapter.
 The laptop is running software Command Line Interface Tool to turn on TX at 100% duty cycle.
 The EUT is powered from fresh battery 6.0Vdc. Support equipment is removed during test.

Modulation: 100kbps FSK

Frequency of measurement: 9k-9280MHz
 9 kHz -150 kHz;RBW=200 Hz,VBW=600 Hz;
 150 kHz-30 MHz;RBW=9 kHz,VBW=27 kHz;
 30 MHz-1000 MHz;RBW=120 kHz,VBW=360 kHz,
 1000 MHz-9280MHz;RBW=1 MHz,VBW=3 MHz.
 RBW=100kHz, VBW=300kHz (-20dbc limit)

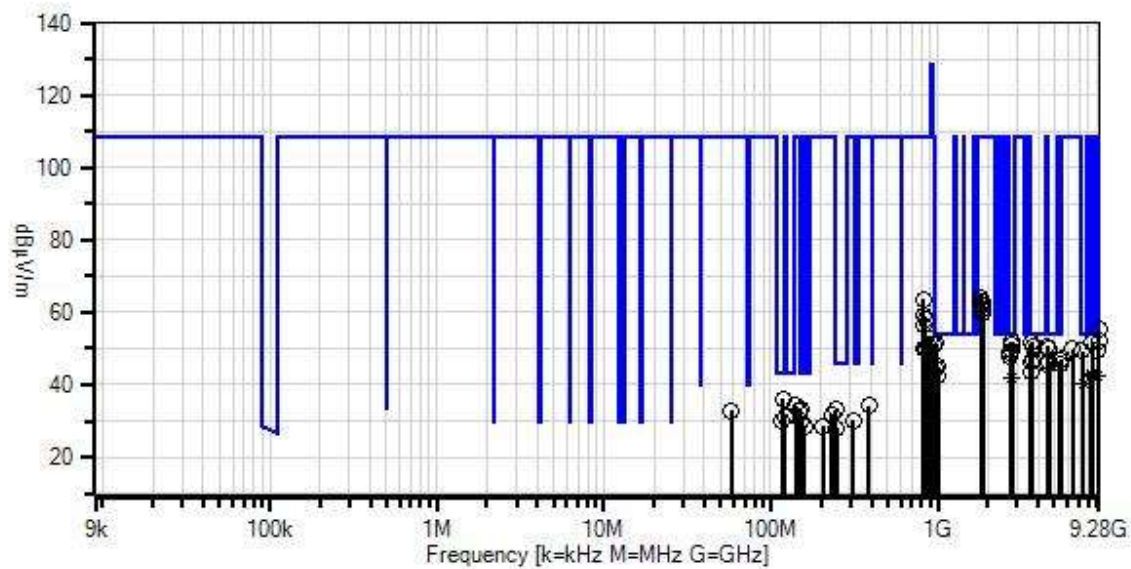
Site A

Test Method: ANSI C63.10 (2013)

Temperature: 22.3°C

Relative Humidity: 53.5%

Itron, Inc. W/O#: 99218 Sequence#: 11 Date: 11/9/2018
 15.247(d) / 15.209 Radiated Spurious Emissions Test Distance: 3 Meters Horiz



— Readings
 × QP Readings
 ▼ Ambient
 — 1 - 15.247(d) / 15.209 Radiated Spurious Emissions

○ Peak Readings
 * Average Readings
 Software Version: 5.03.11

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN00314	Loop Antenna	6502	5/13/2018	5/13/2020
T1	AN00309	Preamp	8447D	2/19/2018	2/19/2020
T2	AN01995	Biconilog Antenna	CBL6111C	4/23/2018	4/23/2020
T3	ANP05275	Attenuator	1W	4/5/2018	4/5/2020
T4	ANP05050	Cable	RG223/U	1/20/2017	1/20/2019
T5	ANP05198	Cable-Amplitude +15C to +45C (dB)	8268	12/7/2016	12/7/2018
T6	AN02672	Spectrum Analyzer	E4446A	3/2/2017	3/2/2019
T7	AN00786	Preamp	83017A	5/12/2018	5/12/2020
T8	AN00849	Horn Antenna	3115	3/14/2018	3/14/2020
T9	ANP07139	Cable	ANDL1- PNMNM-48	3/1/2017	3/1/2019
T10	ANP07244	Cable	32022-29094K- 29094K-24TC	7/5/2018	7/5/2020
T11	AN03169	High Pass Filter	HM1155-11SS	6/15/2017	6/15/2019

Measurement Data:

Reading listed by margin.

Test Distance: 3 Meters

#	Freq	Rdng	T1 T5 T9	T2 T6 T10	T3 T7 T11	T4 T8	Dist	Corr	Spec	Margin	Polar
	MHz	dB μ V	dB	dB	dB	dB	Table	dB μ V/m	dB μ V/m	dB	Ant
1	2780.700M	57.1	+0.0 +0.0 +3.3	+0.0 +0.0 +0.4	+0.0 -38.6 +0.2	+0.0 +29.5	+0.0	51.9	54.0	-2.1	Vert
2	8342.100M	45.1	+0.0 +0.0 +6.2	+0.0 +0.0 +0.5	+0.0 -37.4 +0.2	+0.0 +37.1	+0.0	51.7	54.0	-2.3	Horiz
3	8342.100M	45.0	+0.0 +0.0 +6.2	+0.0 +0.0 +0.5	+0.0 -37.4 +0.2	+0.0 +37.1	+0.0	51.6	54.0	-2.4	Vert
4	3659.600M	53.8	+0.0 +0.0 +3.8	+0.0 +0.0 +0.5	+0.0 -38.3 +0.2	+0.0 +31.6	+0.0	51.6	54.0	-2.4	Horiz
5	3609.200M	54.2	+0.0 +0.0 +3.8	+0.0 +0.0 +0.6	+0.0 -38.4 +0.2	+0.0 +31.1	+0.0	51.5	54.0	-2.5	Horiz
6	978.950M	42.0	-27.4 +6.2 +0.0	+24.0 +0.0 +0.0	+6.1 +0.0 +0.0	+0.5 +0.0	+0.0	51.4	54.0	-2.6	Vert
7	2744.700M	56.4	+0.0 +0.0 +3.2	+0.0 +0.0 +0.4	+0.0 -38.6 +0.2	+0.0 +29.4	+0.0	51.0	54.0	-3.0	Horiz
8	3707.600M	52.6	+0.0 +0.0 +3.8	+0.0 +0.0 +0.5	+0.0 -38.3 +0.2	+0.0 +31.9	+0.0	50.7	54.0	-3.3	Horiz
9	4511.500M	50.6	+0.0 +0.0 +4.1	+0.0 +0.0 +0.7	+0.0 -37.8 +0.1	+0.0 +32.9	+0.0	50.6	54.0	-3.4	Horiz

10	4574.500M	50.2	+0.0 +0.0 +4.1	+0.0 +0.0 +0.7	+0.0 -37.8 +0.1	+0.0 +32.9	+0.0	50.2	54.0	-3.8	Horiz
11	9149.000M	41.8	+0.0 +0.0 +6.3	+0.0 +0.0 +0.7	+0.0 -37.0 +0.2	+0.0 +37.7	+0.0	49.7	54.0	-4.3	Horiz
12	2744.700M	54.9	+0.0 +0.0 +3.2	+0.0 +0.0 +0.4	+0.0 -38.6 +0.2	+0.0 +29.4	+0.0	49.5	54.0	-4.5	Vert
13	7319.200M	44.8	+0.0 +0.0 +5.6	+0.0 +0.0 +0.2	+0.0 -37.4 +0.1	+0.0 +35.9	+0.0	49.2	54.0	-4.8	Horiz
14	2706.900M	54.4	+0.0 +0.0 +3.2	+0.0 +0.0 +0.4	+0.0 -38.6 +0.2	+0.0 +29.1	+0.0	48.7	54.0	-5.3	Vert
15	2706.900M	53.4	+0.0 +0.0 +3.2	+0.0 +0.0 +0.4	+0.0 -38.6 +0.2	+0.0 +29.1	+0.0	47.7	54.0	-6.3	Horiz
16	3707.600M	48.9	+0.0 +0.0 +3.8	+0.0 +0.0 +0.5	+0.0 -38.3 +0.2	+0.0 +31.9	+0.0	47.0	54.0	-7.0	Vert
17	118.000M	44.6	-28.0 +1.8 +0.0	+11.6 +0.0 +0.0	+6.0 +0.0 +0.0	+0.1 +0.0	+0.0	36.1	43.5	-7.4	Vert
18	5413.800M	45.0	+0.0 +0.0 +4.6	+0.0 +0.0 +0.4	+0.0 -37.5 +0.1	+0.0 +33.9	+0.0	46.5	54.0	-7.5	Horiz
19	4634.500M	46.3	+0.0 +0.0 +4.2	+0.0 +0.0 +0.6	+0.0 -37.7 +0.2	+0.0 +32.8	+0.0	46.4	54.0	-7.6	Horiz
20	4634.500M	46.2	+0.0 +0.0 +4.2	+0.0 +0.0 +0.6	+0.0 -37.7 +0.2	+0.0 +32.8	+0.0	46.3	54.0	-7.7	Vert
21	3659.600M	48.2	+0.0 +0.0 +3.8	+0.0 +0.0 +0.5	+0.0 -38.3 +0.2	+0.0 +31.6	+0.0	46.0	54.0	-8.0	Vert
22	4574.500M	46.0	+0.0 +0.0 +4.1	+0.0 +0.0 +0.7	+0.0 -37.8 +0.1	+0.0 +32.9	+0.0	46.0	54.0	-8.0	Vert
23	4511.500M	45.7	+0.0 +0.0 +4.1	+0.0 +0.0 +0.7	+0.0 -37.8 +0.1	+0.0 +32.9	+0.0	45.7	54.0	-8.3	Vert
24	999.900M	35.4	-27.5 +6.3 +0.0	+24.3 +0.0 +0.0	+6.1 +0.0 +0.0	+0.5 +0.0	+0.0	45.1	54.0	-8.9	Vert
25	978.950M	35.4	-27.4 +6.2 +0.0	+24.0 +0.0 +0.0	+6.1 +0.0 +0.0	+0.5 +0.0	+0.0	44.8	54.0	-9.2	Horiz
26	3609.200M	46.1	+0.0 +0.0 +3.8	+0.0 +0.0 +0.6	+0.0 -38.4 +0.2	+0.0 +31.1	+0.0	43.4	54.0	-10.6	Vert

27	8234.100M Ave	36.7	+0.0 +0.0 +6.2	+0.0 +0.0 +0.5	+0.0 -37.4 +0.2	+0.0 +36.9	+0.0	43.1	54.0	-10.9	Vert
^	8234.100M	46.5	+0.0 +0.0 +6.2	+0.0 +0.0 +0.5	+0.0 -37.4 +0.2	+0.0 +36.9	+0.0	52.9	54.0	-1.1	Vert
29	9149.000M Ave	34.5	+0.0 +0.0 +6.3	+0.0 +0.0 +0.7	+0.0 -37.0 +0.2	+0.0 +37.7	+0.0	42.4	54.0	-11.6	Vert
^	9149.000M	46.2	+0.0 +0.0 +6.3	+0.0 +0.0 +0.7	+0.0 -37.0 +0.2	+0.0 +37.7	+0.0	54.1	54.0	+0.1	Vert
31	8234.100M Ave	35.9	+0.0 +0.0 +6.2	+0.0 +0.0 +0.5	+0.0 -37.4 +0.2	+0.0 +36.9	+0.0	42.3	54.0	-11.7	Horiz
^	8234.100M	46.3	+0.0 +0.0 +6.2	+0.0 +0.0 +0.5	+0.0 -37.4 +0.2	+0.0 +36.9	+0.0	52.7	54.0	-1.3	Horiz
33	987.100M	32.7	-27.4 +6.2 +0.0	+24.1 +0.0 +0.0	+6.1 +0.0 +0.0	+0.5 +0.0	+0.0	42.2	54.0	-11.8	Vert
34	2780.700M Ave	47.2	+0.0 +0.0 +3.3	+0.0 +0.0 +0.4	+0.0 -38.6 +0.2	+0.0 +29.5	+0.0	42.0	54.0	-12.0	Horiz
^	2780.700M	59.1	+0.0 +0.0 +3.3	+0.0 +0.0 +0.4	+0.0 -38.6 +0.2	+0.0 +29.5	+0.0	53.9	54.0	-0.1	Horiz
36	120.750M	39.7	-28.0 +1.8 +0.0	+11.7 +0.0 +0.0	+6.0 +0.0 +0.0	+0.1 +0.0	+0.0	31.3	43.5	-12.2	Horiz
37	244.500M	39.5	-28.0 +2.8 +0.0	+12.5 +0.0 +0.0	+6.0 +0.0 +0.0	+0.2 +0.0	+0.0	33.0	46.0	-13.0	Vert
38	116.250M	38.8	-28.0 +1.8 +0.0	+11.4 +0.0 +0.0	+6.0 +0.0 +0.0	+0.1 +0.0	+0.0	30.1	43.5	-13.4	Horiz
39	7415.200M Ave	35.2	+0.0 +0.0 +5.6	+0.0 +0.0 +0.3	+0.0 -37.4 +0.1	+0.0 +36.2	+0.0	40.0	54.0	-14.0	Horiz
^	7415.200M	47.6	+0.0 +0.0 +5.6	+0.0 +0.0 +0.3	+0.0 -37.4 +0.1	+0.0 +36.2	+0.0	52.4	54.0	-1.6	Horiz
41	247.250M	34.2	-28.0 +2.8 +0.0	+12.7 +0.0 +0.0	+6.0 +0.0 +0.0	+0.2 +0.0	+0.0	27.9	46.0	-18.1	Horiz
42	1804.600M	72.9	+0.0 +0.0 +2.5	+0.0 +0.0 +0.2	+0.0 -38.9 +0.3	+0.0 +27.0	+0.0	64.0	108.3	-44.3	Vert
43	820.750M	56.6	-27.2 +5.6 +0.0	+22.1 +0.0 +0.0	+6.0 +0.0 +0.0	+0.4 +0.0	+0.0	63.5	108.3	-44.8	Vert

44	1853.800M	71.4	+0.0 +0.0 +2.6	+0.0 +0.0 +0.2	+0.0 -38.9 +0.3	+0.0 +27.2	+0.0	62.8	108.3	-45.5	Horiz
45	1804.600M	71.5	+0.0 +0.0 +2.5	+0.0 +0.0 +0.2	+0.0 -38.9 +0.3	+0.0 +27.0	+0.0	62.6	108.3	-45.7	Horiz
46	1829.800M	70.7	+0.0 +0.0 +2.5	+0.0 +0.0 +0.2	+0.0 -38.9 +0.3	+0.0 +27.1	+0.0	61.9	108.3	-46.4	Horiz
47	1829.800M	69.5	+0.0 +0.0 +2.5	+0.0 +0.0 +0.2	+0.0 -38.9 +0.3	+0.0 +27.1	+0.0	60.7	108.3	-47.6	Vert
48	1853.800M	68.2	+0.0 +0.0 +2.6	+0.0 +0.0 +0.2	+0.0 -38.9 +0.3	+0.0 +27.2	+0.0	59.6	108.3	-48.7	Vert
49	832.650M	52.0	-27.2 +5.6 +0.0	+22.2 +0.0 +0.0	+6.1 +0.0 +0.0	+0.4 +0.0	+0.0	59.1	108.3	-49.2	Vert
50	838.850M	50.9	-27.2 +5.7 +0.0	+22.3 +0.0 +0.0	+6.1 +0.0 +0.0	+0.4 +0.0	+0.0	58.2	108.3	-50.1	Vert
51	825.850M	49.7	-27.2 +5.6 +0.0	+22.1 +0.0 +0.0	+6.1 +0.0 +0.0	+0.4 +0.0	+0.0	56.7	108.3	-51.6	Vert
52	9269.000M	46.9	+0.0 +0.0 +6.3	+0.0 +0.0 +0.7	+0.0 -36.8 +0.2	+0.0 +37.8	+0.0	55.1	108.3	-53.2	Vert
53	900.850M	44.5	-27.2 +5.9 +0.0	+22.8 +0.0 +0.0	+6.1 +0.0 +0.0	+0.5 +0.0	+0.0	52.6	108.3	-55.7	Vert
54	9269.000M	43.8	+0.0 +0.0 +6.3	+0.0 +0.0 +0.7	+0.0 -36.8 +0.2	+0.0 +37.8	+0.0	52.0	108.3	-56.3	Horiz
55	874.850M	43.4	-27.2 +5.8 +0.0	+22.6 +0.0 +0.0	+6.1 +0.0 +0.0	+0.5 +0.0	+0.0	51.2	108.3	-57.1	Vert
56	952.950M	42.0	-27.3 +6.1 +0.0	+23.6 +0.0 +0.0	+6.1 +0.0 +0.0	+0.5 +0.0	+0.0	51.0	108.3	-57.3	Vert
57	823.000M	43.1	-27.2 +5.6 +0.0	+22.1 +0.0 +0.0	+6.0 +0.0 +0.0	+0.4 +0.0	+0.0	50.0	108.3	-58.3	Horiz
58	848.850M	42.4	-27.2 +5.7 +0.0	+22.4 +0.0 +0.0	+6.1 +0.0 +0.0	+0.4 +0.0	+0.0	49.8	108.3	-58.5	Vert
59	6404.300M	47.6	+0.0 +0.0 +5.0	+0.0 +0.0 +0.3	+0.0 -37.4 +0.2	+0.0 +34.1	+0.0	49.8	108.3	-58.5	Horiz
60	5561.400M	45.6	+0.0 +0.0 +4.6	+0.0 +0.0 +0.4	+0.0 -37.4 +0.1	+0.0 +33.9	+0.0	47.2	108.3	-61.1	Horiz

61	5489.400M	43.9	+0.0 +0.0 +4.6	+0.0 +0.0 +0.4	+0.0 -37.5 +0.1	+0.0 +34.1	+0.0	45.6	108.3	-62.7	Horiz
62	141.750M	42.6	-28.0 +2.0 +0.0	+11.6 +0.0 +0.0	+6.0 +0.0 +0.0	+0.1 +0.0	+0.0	34.3	108.3	-74.0	Vert
63	384.750M	36.8	-27.9 +3.5 +0.0	+15.5 +0.0 +0.0	+6.0 +0.0 +0.0	+0.3 +0.0	+0.0	34.2	108.3	-74.1	Vert
64	151.250M	42.0	-28.0 +2.1 +0.0	+11.2 +0.0 +0.0	+6.0 +0.0 +0.0	+0.1 +0.0	+0.0	33.4	108.3	-74.9	Vert
65	57.750M	47.4	-28.1 +1.2 +0.0	+6.2 +0.0 +0.0	+6.0 +0.0 +0.0	+0.1 +0.0	+0.0	32.8	108.3	-75.5	Vert
66	148.500M	41.1	-28.0 +2.0 +0.0	+11.4 +0.0 +0.0	+6.0 +0.0 +0.0	+0.1 +0.0	+0.0	32.6	108.3	-75.7	Vert
67	233.000M	38.9	-28.0 +2.7 +0.0	+11.7 +0.0 +0.0	+6.0 +0.0 +0.0	+0.2 +0.0	+0.0	31.5	108.3	-76.8	Vert
68	312.000M	35.1	-28.0 +3.2 +0.0	+13.7 +0.0 +0.0	+6.0 +0.0 +0.0	+0.2 +0.0	+0.0	30.2	108.3	-78.1	Horiz
69	152.000M	38.7	-28.0 +2.1 +0.0	+11.2 +0.0 +0.0	+6.0 +0.0 +0.0	+0.1 +0.0	+0.0	30.1	108.3	-78.2	Horiz
70	205.250M	38.4	-28.0 +2.4 +0.0	+9.5 +0.0 +0.0	+6.0 +0.0 +0.0	+0.2 +0.0	+0.0	28.5	108.3	-79.8	Vert
71	159.000M	37.2	-28.0 +2.1 +0.0	+10.8 +0.0 +0.0	+6.0 +0.0 +0.0	+0.1 +0.0	+0.0	28.2	108.3	-80.1	Horiz



Test Location: CKC Laboratories, Inc. • 110 N. Olinda Place • Brea, CA 92823 • 714-993-6112
 Customer: **Itron, Inc.**
 Specification: **15.247(d) / 15.209 Radiated Spurious Emissions**
 Work Order #: **99218** Date: 11/6/2018
 Test Type: **Maximized Emissions** Time: 15:14:42
 Tested By: Don Nguyen Sequence#: 1
 Software: EMITest 5.03.11

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 2			

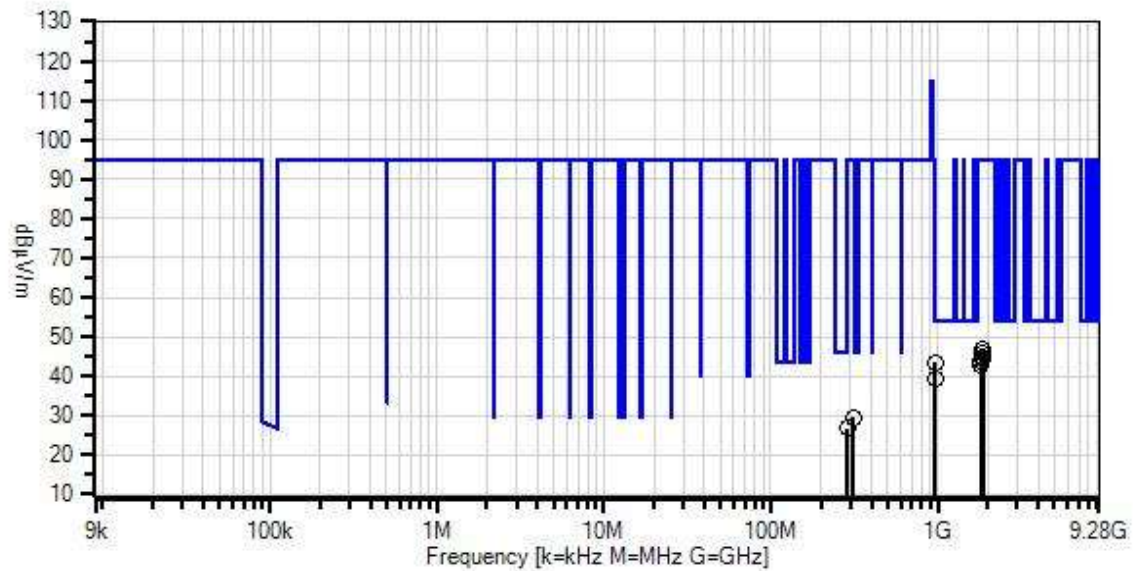
Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 2			

Test Conditions / Notes:

The EUT is placed on table top. The serial port is connected to a support laptop via serial to USB adapter. The laptop is running software Command Line Interface Tool to turn on TX at 100% duty cycle. The EUT is powered from fresh battery 6.0Vdc. Support equipment is removed during test. Modulation: 300kbps Hybrid. Frequency of measurement: 9k-9280MHz 9 kHz -150 kHz;RBW=200 Hz,VBW=600 Hz; 150 kHz-30 MHz;RBW=9 kHz,VBW=27 kHz; 30 MHz-1000 MHz;RBW=120 kHz,VBW=360 kHz, 1000 MHz-9280MHz;RBW=1 MHz,VBW=3 MHz. RBW=100kHz, VBW=300kHz (-20dbc limit) Site A Test Method: ANSI C63.10 (2013) Temperature: 21.9°C Relative Humidity: 47.3%
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Itron, Inc. WO#: 99218 Sequence#: 1 Date: 11/6/2018
 15.247(d) / 15.209 Radiated Spurious Emissions Test Distance: 3 Meters Vert



— Readings
 × QP Readings
 ▼ Ambient
 — 1 - 15.247(d) / 15.209 Radiated Spurious Emissions

○ Peak Readings
 * Average Readings
 Software Version: 5.03.11

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN00314	Loop Antenna	6502	5/13/2018	5/13/2020
T1	AN01995	Biconilog Antenna	CBL6111C	4/23/2018	4/23/2020
T2	ANP05275	Attenuator	1W	4/5/2018	4/5/2020
T3	ANP05050	Cable	RG223/U	1/20/2017	1/20/2019
T4	ANP05198	Cable-Amplitude +15C to +45C (dB)	8268	12/7/2016	12/7/2018
T5	AN00309	Preamp	8447D	2/19/2018	2/19/2020
	AN02672	Spectrum Analyzer	E4446A	3/2/2017	3/2/2019
T6	AN00786	Preamp	83017A	5/12/2018	5/12/2020
T7	AN00849	Horn Antenna	3115	3/14/2018	3/14/2020
T8	ANP07139	Cable	ANDL1- PNMNM-48	3/1/2017	3/1/2019
T9	ANP07244	Cable	32022-29094K- 29094K-24TC	7/5/2018	7/5/2020
T10	AN03169	High Pass Filter	HM1155-11SS	6/15/2017	6/15/2019

Measurement Data:

Reading listed by margin.

Test Distance: 3 Meters

#	Freq	Rdng	T1 T5 T9	T2 T6 T10	T3 T7	T4 T8	Dist	Corr	Spec	Margin	Polar
	MHz	dB μ V	dB	dB	dB	dB	Table	dB μ V/m	dB μ V/m	dB	Ant
1	966.798M	34.2	+23.8 -27.3 +0.0	+6.1 +0.0 +0.0	+0.5 +0.0	+6.2 +0.0	+0.0	43.5	54.0	-10.5	Vert
2	966.800M	29.9	+23.8 -27.3 +0.0	+6.1 +0.0 +0.0	+0.5 +0.0	+6.2 +0.0	+0.0	39.2	54.0	-14.8	Horiz
3	1855.200M	55.1	+0.0 +0.0 +0.2	+0.0 -38.9 +0.3	+0.0 +27.3	+0.0 +2.6	+0.0	46.6	94.7	-48.1	Horiz
4	1829.600M	54.8	+0.0 +0.0 +0.2	+0.0 -38.9 +0.3	+0.0 +27.1	+0.0 +2.5	+0.0	46.0	94.7	-48.7	Vert
5	1855.200M	53.3	+0.0 +0.0 +0.2	+0.0 -38.9 +0.3	+0.0 +27.3	+0.0 +2.6	+0.0	44.8	94.7	-49.9	Vert
6	1829.600M	53.4	+0.0 +0.0 +0.2	+0.0 -38.9 +0.3	+0.0 +27.1	+0.0 +2.5	+0.0	44.6	94.7	-50.1	Horiz

7	1804.850M	52.8	+0.0 +0.0 +0.2	+0.0 -38.9 +0.3	+0.0 +27.0	+0.0 +2.5	+0.0	43.9	94.7	-50.8	Vert
8	1804.850M	52.0	+0.0 +0.0 +0.2	+0.0 -38.9 +0.3	+0.0 +27.0	+0.0 +2.5	+0.0	43.1	94.7	-51.6	Horiz
9	310.450M	34.6	+13.6 -28.0 +0.0	+6.0 +0.0 +0.0	+0.2 +0.0	+3.2 +0.0	+0.0	29.6	94.7	-65.1	Horiz
10	287.200M	32.4	+13.2 -28.0 +0.0	+6.0 +0.0 +0.0	+0.2 +0.0	+3.0 +0.0	+0.0	26.8	94.7	-67.9	Horiz



Test Location: CKC Laboratories, Inc. • 110 N. Olinda Place • Brea, CA 92823 • 714-993-6112
Customer: **Itron, Inc.**
Specification: **15.247(d) / 15.209 Radiated Spurious Emissions**
Work Order #: **99218** Date: 11/6/2018
Test Type: **Maximized Emissions** Time: 16:01:53
Tested By: Don Nguyen Sequence#: 16
Software: EMITest 5.03.11

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 3			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 3			

Test Conditions / Notes:

The EUT is placed on table top. The serial port is connected to a support laptop via serial to USB adapter.
The laptop is running software Command Line Interface Tool to turn on TX at 100% duty cycle.
The EUT is powered from fresh battery 6.0Vdc. Support equipment is removed during test.

Modulation: 300kbps Hybrid.

Frequency of measurement: 9k-9280MHz
9 kHz -150 kHz;RBW=200 Hz,VBW=600 Hz;
150 kHz-30 MHz;RBW=9 kHz,VBW=27 kHz;
30 MHz-1000 MHz;RBW=120 kHz,VBW=360 kHz,
1000 MHz-9280MHz;RBW=1 MHz,VBW=3 MHz.
RBW=100kHz, VBW=300kHz (-20dbc limit)

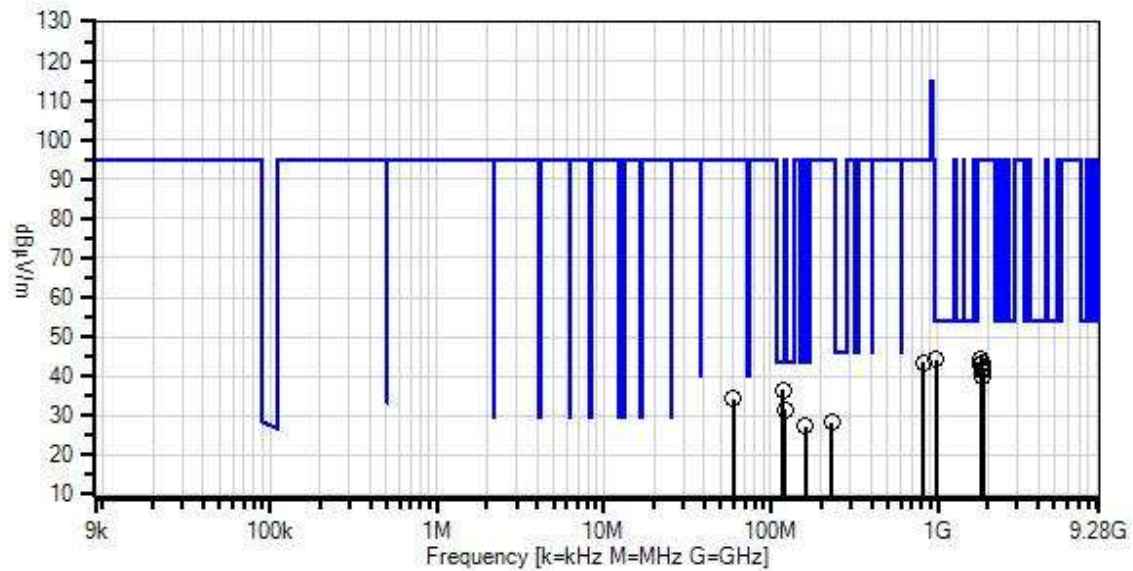
Site A

Test Method: ANSI C63.10 (2013)

Temperature: 22.3°C

Relative Humidity: 53.5%

Iron, Inc. WO#: 99218 Sequence#: 16 Date: 11/6/2018
15.247(d) / 15.209 Radiated Spurious Emissions Test Distance: 3 Meters Vert



- Readings
 - × QP Readings
 - ▼ Ambient
 - 1 - 15.247(d) / 15.209 Radiated Spurious Emissions
 - Peak Readings
 - * Average Readings
- Software Version: 5.03.11

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN00314	Loop Antenna	6502	5/13/2018	5/13/2020
T1	AN00309	Preamp	8447D	2/19/2018	2/19/2020
T2	AN01995	Biconilog Antenna	CBL6111C	4/23/2018	4/23/2020
T3	ANP05275	Attenuator	1W	4/5/2018	4/5/2020
T4	ANP05050	Cable	RG223/U	1/20/2017	1/20/2019
T5	ANP05198	Cable-Amplitude +15C to +45C (dB)	8268	12/7/2016	12/7/2018
T6	AN02672	Spectrum Analyzer	E4446A	3/2/2017	3/2/2019
T7	AN00786	Preamp	83017A	5/12/2018	5/12/2020
T8	AN00849	Horn Antenna	3115	3/14/2018	3/14/2020
T9	ANP07139	Cable	ANDL1- PNMNM-48	3/1/2017	3/1/2019
T10	ANP07244	Cable	32022-29094K- 29094K-24TC	7/5/2018	7/5/2020
T11	AN03169	High Pass Filter	HM1155-11SS	6/15/2017	6/15/2019

Measurement Data:

Reading listed by margin.

Test Distance: 3 Meters

#	Freq	Rdng	T1 T5 T9	T2 T6 T10	T3 T7 T11	T4 T8	Dist	Corr	Spec	Margin	Polar
	MHz	dB μ V	dB	dB	dB	dB	Table	dB μ V/m	dB μ V/m	dB	Ant
1	118.250M	45.0	-28.0 +1.8 +0.0	+11.6 +0.0 +0.0	+6.0 +0.0 +0.0	+0.1 +0.0 +0.0	+0.0	36.5	43.5	-7.0	Vert
2	979.650M	34.9	-27.4 +6.2 +0.0	+24.0 +0.0 +0.0	+6.1 +0.0 +0.0	+0.5 +0.0 +0.0	+0.0	44.3	54.0	-9.7	Vert
3	121.300M	39.8	-28.0 +1.8 +0.0	+11.8 +0.0 +0.0	+6.0 +0.0 +0.0	+0.1 +0.0 +0.0	+0.0	31.5	43.5	-12.0	Horiz
4	1804.800M	53.4	+0.0 +0.0 +2.5	+0.0 +0.0 +0.2	+0.0 -38.9 +0.3	+0.0 +27.0 +0.3	+0.0	44.5	94.7	-50.2	Horiz
5	823.550M	36.6	-27.2 +5.6 +0.0	+22.1 +0.0 +0.0	+6.0 +0.0 +0.0	+0.4 +0.0 +0.0	+0.0	43.5	94.7	-51.2	Horiz
6	1829.600M	52.1	+0.0 +0.0 +2.5	+0.0 +0.0 +0.2	+0.0 -38.9 +0.3	+0.0 +27.1 +0.3	+0.0	43.3	94.7	-51.4	Horiz
7	1804.800M	51.8	+0.0 +0.0 +2.5	+0.0 +0.0 +0.2	+0.0 -38.9 +0.3	+0.0 +27.0 +0.3	+0.0	42.9	94.7	-51.8	Vert
8	1829.600M	50.5	+0.0 +0.0 +2.5	+0.0 +0.0 +0.2	+0.0 -38.9 +0.3	+0.0 +27.1 +0.3	+0.0	41.7	94.7	-53.0	Vert
9	1855.200M	49.7	+0.0 +0.0 +2.6	+0.0 +0.0 +0.2	+0.0 -38.9 +0.3	+0.0 +27.3 +0.3	+0.0	41.2	94.7	-53.5	Vert

10	1855.200M	48.2	+0.0	+0.0	+0.0	+0.0	+0.0	39.7	94.7	-55.0	Horiz
			+0.0	+0.0	-38.9	+27.3					
			+2.6	+0.2	+0.3						
11	59.750M	49.3	-28.1	+5.8	+6.0	+0.1	+0.0	34.3	94.7	-60.4	Vert
			+1.2	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0						
12	231.800M	35.8	-28.0	+11.6	+6.0	+0.2	+0.0	28.3	94.7	-66.4	Horiz
			+2.7	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0						
13	160.800M	36.6	-28.0	+10.6	+6.0	+0.1	+0.0	27.4	94.7	-67.3	Horiz
			+2.1	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0						



Test Location: CKC Laboratories, Inc. • 110 N. Olinda Place • Brea, CA 92823 • 714-993-6112
 Customer: **Itron, Inc.**
 Specification: **15.247(d) / 15.209 Radiated Spurious Emissions**
 Work Order #: **99218** Date: 11/9/2018
 Test Type: **Maximized Emissions** Time: 10:10:23
 Tested By: Don Nguyen Sequence#: 13
 Software: EMITest 5.03.11

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 4			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 4			

Test Conditions / Notes:

The EUT is placed on table top. The serial port is connected to a support laptop via serial to USB adapter.
 The laptop is running software Command Line Interface Tool to turn on TX at 100% duty cycle.
 The EUT is powered from fresh battery 6.0Vdc. Support equipment is removed during test.

Modulation: 300kbps Hybrid.

Frequency of measurement: 9k-9280MHz
 9 kHz -150 kHz;RBW=200 Hz,VBW=600 Hz;
 150 kHz-30 MHz;RBW=9 kHz,VBW=27 kHz;
 30 MHz-1000 MHz;RBW=120 kHz,VBW=360 kHz,
 1000 MHz-9280MHz;RBW=1 MHz,VBW=3 MHz.
 RBW=100kHz, VBW=300kHz (-20dbc limit)

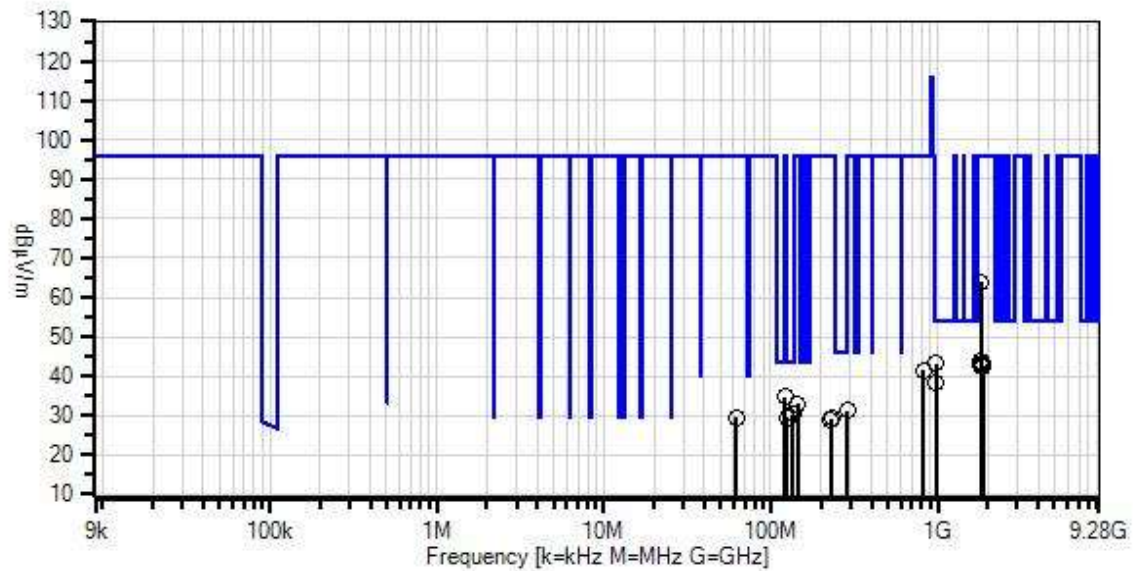
Site A

Test Method: ANSI C63.10 (2013)

Temperature: 22.3°C

Relative Humidity: 53.5%

Ittron, Inc. WO#: 99218 Sequence#: 13 Date: 11/9/2018
15.247(d) / 15.209 Radiated Spurious Emissions Test Distance: 3 Meters Vert



— Readings
× QP Readings
▼ Ambient
— 1 - 15.247(d) / 15.209 Radiated Spurious Emissions

○ Peak Readings
* Average Readings
Software Version: 5.03.11

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN00314	Loop Antenna	6502	5/13/2018	5/13/2020
T1	AN00309	Preamp	8447D	2/19/2018	2/19/2020
T2	AN01995	Biconilog Antenna	CBL6111C	4/23/2018	4/23/2020
T3	ANP05275	Attenuator	1W	4/5/2018	4/5/2020
T4	ANP05050	Cable	RG223/U	1/20/2017	1/20/2019
T5	ANP05198	Cable-Amplitude +15C to +45C (dB)	8268	12/7/2016	12/7/2018
T6	AN02672	Spectrum Analyzer	E4446A	3/2/2017	3/2/2019
T7	AN00786	Preamp	83017A	5/12/2018	5/12/2020
T8	AN00849	Horn Antenna	3115	3/14/2018	3/14/2020
T9	ANP07139	Cable	ANDL1- PNMNM-48	3/1/2017	3/1/2019
T10	ANP07244	Cable	32022-29094K- 29094K-24TC	7/5/2018	7/5/2020
T11	AN03169	High Pass Filter	HM1155-11SS	6/15/2017	6/15/2019

Measurement Data:

Reading listed by margin.

Test Distance: 3 Meters

#	Freq	Rdng	T1 T5 T9	T2 T6 T10	T3 T7 T11	T4 T8	Dist	Corr	Spec	Margin	Polar
	MHz	dB μ V	dB	dB	dB	dB	Table	dB μ V/m	dB μ V/m	dB	Ant
1	121.150M	43.2	-28.0 +1.8 +0.0	+11.7 +0.0 +0.0	+6.0 +0.0 +0.0	+0.1 +0.0 +0.0	+0.0	34.8	43.5	-8.7	Vert
2	979.650M	33.9	-27.4 +6.2 +0.0	+24.0 +0.0 +0.0	+6.1 +0.0 +0.0	+0.5 +0.0 +0.0	+0.0	43.3	54.0	-10.7	Vert
3	135.050M	38.4	-28.0 +2.0 +0.0	+11.8 +0.0 +0.0	+6.0 +0.0 +0.0	+0.1 +0.0 +0.0	+0.0	30.3	43.5	-13.2	Horiz
4	125.550M	37.5	-28.0 +1.9 +0.0	+11.9 +0.0 +0.0	+6.0 +0.0 +0.0	+0.1 +0.0 +0.0	+0.0	29.4	43.5	-14.1	Horiz
5	979.600M	28.9	-27.4 +6.2 +0.0	+24.0 +0.0 +0.0	+6.1 +0.0 +0.0	+0.5 +0.0 +0.0	+0.0	38.3	54.0	-15.7	Horiz
6	1804.600M	72.9	+0.0 +0.0 +2.5	+0.0 +0.0 +0.2	+0.0 -38.9 +0.3	+0.0 +27.0	+0.0	64.0	96.0	-32.0	Vert
7	1804.800M	52.9	+0.0 +0.0 +2.5	+0.0 +0.0 +0.2	+0.0 -38.9 +0.3	+0.0 +27.0	+0.0	44.0	96.0	-52.0	Horiz
8	1829.600M	52.4	+0.0 +0.0 +2.5	+0.0 +0.0 +0.2	+0.0 -38.9 +0.3	+0.0 +27.1	+0.0	43.6	96.0	-52.4	Vert
9	1804.800M	52.0	+0.0 +0.0 +2.5	+0.0 +0.0 +0.2	+0.0 -38.9 +0.3	+0.0 +27.0	+0.0	43.1	96.0	-52.9	Vert

10	1855.200M	51.3	+0.0 +0.0 +2.6	+0.0 +0.0 +0.2	+0.0 -38.9 +0.3	+0.0 +27.3	+0.0	42.8	96.0	-53.2	Vert
11	1829.600M	51.6	+0.0 +0.0 +2.5	+0.0 +0.0 +0.2	+0.0 -38.9 +0.3	+0.0 +27.1	+0.0	42.8	96.0	-53.2	Horiz
12	1855.200M	50.9	+0.0 +0.0 +2.6	+0.0 +0.0 +0.2	+0.0 -38.9 +0.3	+0.0 +27.3	+0.0	42.4	96.0	-53.6	Horiz
13	823.650M	34.5	-27.2 +5.6 +0.0	+22.1 +0.0 +0.0	+6.0 +0.0 +0.0	+0.4 +0.0	+0.0	41.4	96.0	-54.6	Vert
14	144.150M	41.4	-28.0 +2.0 +0.0	+11.5 +0.0 +0.0	+6.0 +0.0 +0.0	+0.1 +0.0	+0.0	33.0	96.0	-63.0	Vert
15	287.550M	36.9	-28.0 +3.0 +0.0	+13.2 +0.0 +0.0	+6.0 +0.0 +0.0	+0.2 +0.0	+0.0	31.3	96.0	-64.7	Horiz
16	61.900M	44.5	-28.1 +1.2 +0.0	+5.8 +0.0 +0.0	+6.0 +0.0 +0.0	+0.1 +0.0	+0.0	29.5	96.0	-66.5	Vert
17	231.650M	36.8	-28.0 +2.7 +0.0	+11.6 +0.0 +0.0	+6.0 +0.0 +0.0	+0.2 +0.0	+0.0	29.3	96.0	-66.7	Vert
18	228.050M	36.9	-28.0 +2.6 +0.0	+11.3 +0.0 +0.0	+6.0 +0.0 +0.0	+0.2 +0.0	+0.0	29.0	96.0	-67.0	Horiz



Test Location: CKC Laboratories, Inc. • 110 N. Olinda Place • Brea, CA 92823 • 714-993-6112
 Customer: **Itron, Inc.**
 Specification: **15.247(d) / 15.209 Radiated Spurious Emissions**
 Work Order #: **99218** Date: 11/6/2018
 Test Type: **Maximized Emissions** Time: 10:25:16
 Tested By: Don Nguyen Sequence#: 12
 Software: EMITest 5.03.11

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 5			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 5			

Test Conditions / Notes:

The EUT is placed on table top. The serial port is connected to a support laptop via serial to USB adapter.
 The laptop is running software Command Line Interface Tool to turn on TX at 100% duty cycle.
 The EUT is powered from fresh battery 6.0Vdc. Support equipment is removed during test.

Modulation: 300kbps Hybrid.

Frequency of measurement: 9k-9280MHz
 9 kHz -150 kHz;RBW=200 Hz,VBW=600 Hz;
 150 kHz-30 MHz;RBW=9 kHz,VBW=27 kHz;
 30 MHz-1000 MHz;RBW=120 kHz,VBW=360 kHz,
 1000 MHz-9280MHz;RBW=1 MHz,VBW=3 MHz.
 RBW=100kHz, VBW=300kHz (-20dbc limit)

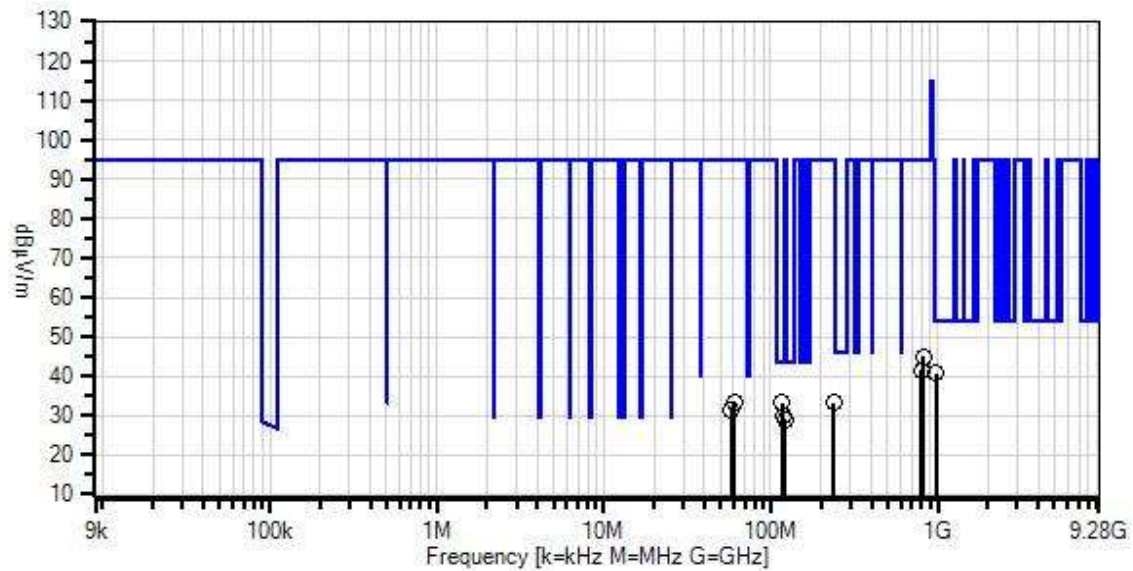
Site A

Test Method: ANSI C63.10 (2013)

Temperature: 22.3°C

Relative Humidity: 53.5%

Iron, Inc. WO#: 99218 Sequence#: 12 Date: 11/6/2018
15.247(d) / 15.209 Radiated Spurious Emissions Test Distance: 3 Meters Vert



— Readings
× QP Readings
▼ Ambient
— 1 - 15.247(d) / 15.209 Radiated Spurious Emissions

○ Peak Readings
* Average Readings
Software Version: 5.03.11

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN00314	Loop Antenna	6502	5/13/2018	5/13/2020
T1	AN00309	Preamp	8447D	2/19/2018	2/19/2020
T2	AN01995	Biconilog Antenna	CBL6111C	4/23/2018	4/23/2020
T3	ANP05275	Attenuator	1W	4/5/2018	4/5/2020
T4	ANP05050	Cable	RG223/U	1/20/2017	1/20/2019
T5	ANP05198	Cable-Amplitude +15C to +45C (dB)	8268	12/7/2016	12/7/2018
	AN02672	Spectrum Analyzer	E4446A	3/2/2017	3/2/2019

Measurement Data:

Reading listed by margin.

Test Distance: 3 Meters

#	Freq	Rdng	T1 T5	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dB μ V	dB	dB	dB	dB	Table	dB μ V/m	dB μ V/m	dB	Ant
1	116.550M	42.0	-28.0 +1.8	+11.4	+6.0	+0.1	+0.0	33.3	43.5	-10.2	Vert
2	979.550M	31.3	-27.4 +6.2	+24.0	+6.1	+0.5	+0.0	40.7	54.0	-13.3	Vert
3	117.900M	38.5	-28.0 +1.8	+11.5	+6.0	+0.1	+0.0	29.9	43.5	-13.6	Horiz
4	121.900M	37.4	-28.0 +1.8	+11.8	+6.0	+0.1	+0.0	29.1	43.5	-14.4	Horiz
5	823.550M	38.1	-27.2 +5.6	+22.1	+6.0	+0.4	+0.0	45.0	95.0	-50.0	Vert
6	797.600M	34.9	-27.2 +5.5	+21.9	+6.0	+0.4	+0.0	41.5	95.0	-53.5	Horiz
7	60.300M	48.7	-28.1 +1.2	+5.7	+6.0	+0.1	+0.0	33.6	95.0	-61.4	Vert
8	238.400M	40.2	-28.0 +2.7	+12.1	+6.0	+0.2	+0.0	33.2	95.0	-61.8	Horiz
9	57.800M	46.2	-28.1 +1.2	+6.2	+6.0	+0.1	+0.0	31.6	95.0	-63.4	Vert



Test Location: CKC Laboratories, Inc. • 110 N. Olinda Place • Brea, CA 92823 • 714-993-6112
Customer: **Itron, Inc.**
Specification: **15.247(d) / 15.209 Radiated Spurious Emissions**
Work Order #: **99218** Date: 12/11/2018
Test Type: **Maximized Emissions** Time: 08:53:47
Tested By: Don Nguyen Sequence#: 3
Software: EMITest 5.03.11

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 2			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 2			

Test Conditions / Notes:

The EUT is placed on table top. The serial port is connected to a support laptop via serial to USB adapter.
The laptop is running software Command Line Interface Tool to turn on TX at 100% duty cycle.
The EUT is powered from fresh battery 6.0Vdc. Support equipment is removed during test.

Modulation: 300kbps GFSK power level 3.

Frequency of measurement: 9k-9280MHz
9 kHz -150 kHz;RBW=200 Hz,VBW=600 Hz;
150 kHz-30 MHz;RBW=9 kHz,VBW=27 kHz;
30 MHz-1000 MHz;RBW=120 kHz,VBW=360 kHz,
1000 MHz-9280MHz;RBW=1 MHz,VBW=3 MHz.
RBW=100kHz, VBW=300kHz (-20dbc limit)

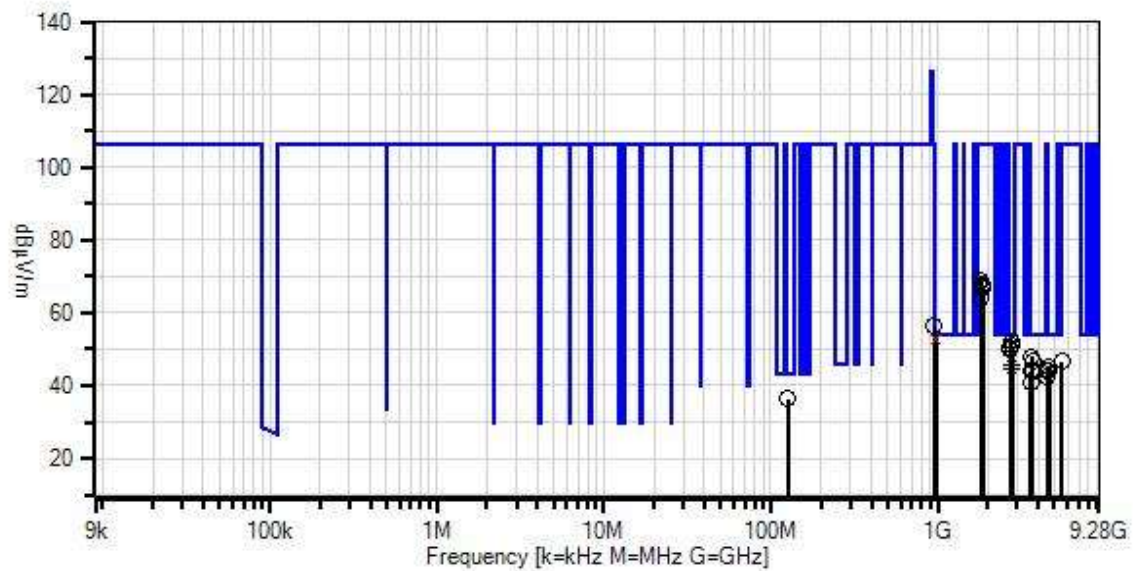
Site A

Test Method: ANSI C63.10 (2013)

Temperature: 20.2°C

Relative Humidity: 49.1%

Itron, Inc. W/O#: 99218 Sequence#: 3 Date: 12/11/2018
 15.247(d) / 15.209 Radiated Spurious Emissions Test Distance: 3 Meters Horiz



— Readings
 × QP Readings
 ▼ Ambient
 — 1 - 15.247(d) / 15.209 Radiated Spurious Emissions

○ Peak Readings
 * Average Readings
 Software Version: 5.03.11

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN00314	Loop Antenna	6502	5/13/2018	5/13/2020
	AN00309	Preamp	8447D	2/19/2018	2/19/2020
	ANP05050	Cable	RG223/U	1/20/2017	1/20/2019
T1	AN01995	Biconilog Antenna	CBL6111C	4/23/2018	4/23/2020
T2	ANP05275	Attenuator	1W	4/5/2018	4/5/2020
T3	ANP05198	Cable-Amplitude +15C to +45C (dB)	8268	12/4/2018	12/4/2020
T4	AN02672	Spectrum Analyzer	E4446A	3/2/2017	3/2/2019
T5	AN00786	Preamp	83017A	5/12/2018	5/12/2020
T6	AN00849	Horn Antenna	3115	3/14/2018	3/14/2020
T7	ANP07139	Cable	ANDL1- PNMNM-48	3/1/2017	3/1/2019
T8	ANP07244	Cable	32022-29094K- 29094K-24TC	7/5/2018	7/5/2020
T9	AN03169	High Pass Filter	HM1155-11SS	6/15/2017	6/15/2019

Measurement Data:

Reading listed by margin.

Test Distance: 3 Meters

#	Freq	Rdng	T1 T5 T9	T2 T6	T3 T7	T4 T8	Dist	Corr	Spec	Margin	Polar
	MHz	dB μ V	dB	dB	dB	dB	Table	dB μ V/m	dB μ V/m	dB	Ant
1	980.425M QP	16.4	+24.0 +0.0 +0.0	+6.1 +0.0	+6.2 +0.0	+0.0 +0.0	+0.0	52.7	54.0	-1.3	Vert
^	980.425M	19.4	+24.0 +0.0 +0.0	+6.1 +0.0	+6.2 +0.0	+0.0 +0.0	+0.0	55.7	54.0	+1.7	Vert
3	2744.400M	57.4	+0.0 -38.6 +0.2	+0.0 +29.4	+0.0 +3.2	+0.0 +0.4	+0.0	52.0	54.0	-2.0	Horiz
4	2782.800M	56.2	+0.0 -38.6 +0.2	+0.0 +29.5	+0.0 +3.3	+0.0 +0.4	+0.0	51.0	54.0	-3.0	Horiz
5	2707.200M	56.3	+0.0 -38.6 +0.2	+0.0 +29.1	+0.0 +3.2	+0.0 +0.4	+0.0	50.6	54.0	-3.4	Vert
6	2707.200M	55.6	+0.0 -38.6 +0.2	+0.0 +29.1	+0.0 +3.2	+0.0 +0.4	+0.0	49.9	54.0	-4.1	Horiz
7	3659.200M	50.0	+0.0 -38.3 +0.2	+0.0 +31.6	+0.0 +3.8	+0.0 +0.5	+0.0	47.8	54.0	-6.2	Horiz
8	3710.400M	48.7	+0.0 -38.3 +0.2	+0.0 +31.9	+0.0 +3.8	+0.0 +0.5	+0.0	46.8	54.0	-7.2	Horiz
9	125.850M	16.4	+11.9 +0.0 +0.0	+6.0 +0.0	+2.0 +0.0	+0.0 +0.0	+0.0	36.3	43.5	-7.2	Vert

10	2744.400M Ave	51.2	+0.0 -38.6 +0.2	+0.0 +29.4	+0.0 +3.2	+0.0 +0.4	+0.0	45.8	54.0	-8.2	Vert
^	2744.400M	59.1	+0.0 -38.6 +0.2	+0.0 +29.4	+0.0 +3.2	+0.0 +0.4	+0.0	53.7	54.0	-0.3	Vert
12	4574.000M	45.3	+0.0 -37.8 +0.1	+0.0 +32.9	+0.0 +4.1	+0.0 +0.7	+0.0	45.3	54.0	-8.7	Vert
13	4638.000M	45.0	+0.0 -37.7 +0.2	+0.0 +32.8	+0.0 +4.2	+0.0 +0.6	+0.0	45.1	54.0	-8.9	Vert
14	2782.800M Ave	50.0	+0.0 -38.6 +0.2	+0.0 +29.5	+0.0 +3.3	+0.0 +0.4	+0.0	44.8	54.0	-9.2	Vert
^	2782.800M	58.3	+0.0 -38.6 +0.2	+0.0 +29.5	+0.0 +3.3	+0.0 +0.4	+0.0	53.1	54.0	-0.9	Vert
16	4638.000M	44.1	+0.0 -37.7 +0.2	+0.0 +32.8	+0.0 +4.2	+0.0 +0.6	+0.0	44.2	54.0	-9.8	Horiz
17	4512.000M	44.1	+0.0 -37.8 +0.1	+0.0 +32.9	+0.0 +4.1	+0.0 +0.7	+0.0	44.1	54.0	-9.9	Horiz
18	3609.600M	46.7	+0.0 -38.4 +0.2	+0.0 +31.1	+0.0 +3.8	+0.0 +0.6	+0.0	44.0	54.0	-10.0	Horiz
19	3659.200M	46.2	+0.0 -38.3 +0.2	+0.0 +31.6	+0.0 +3.8	+0.0 +0.5	+0.0	44.0	54.0	-10.0	Vert
20	3710.400M	45.9	+0.0 -38.3 +0.2	+0.0 +31.9	+0.0 +3.8	+0.0 +0.5	+0.0	44.0	54.0	-10.0	Vert
21	4574.000M	43.9	+0.0 -37.8 +0.1	+0.0 +32.9	+0.0 +4.1	+0.0 +0.7	+0.0	43.9	54.0	-10.1	Horiz
22	4512.000M	42.2	+0.0 -37.8 +0.1	+0.0 +32.9	+0.0 +4.1	+0.0 +0.7	+0.0	42.2	54.0	-11.8	Vert
23	3609.600M	43.6	+0.0 -38.4 +0.2	+0.0 +31.1	+0.0 +3.8	+0.0 +0.6	+0.0	40.9	54.0	-13.1	Vert
24	1804.800M	77.6	+0.0 -38.9 +0.3	+0.0 +27.0	+0.0 +2.5	+0.0 +0.2	+0.0	68.7	106.3	-37.6	Vert
25	1829.600M	76.6	+0.0 -38.9 +0.3	+0.0 +27.1	+0.0 +2.5	+0.0 +0.2	+0.0	67.8	106.3	-38.5	Vert
26	1855.200M	75.7	+0.0 -38.9 +0.3	+0.0 +27.3	+0.0 +2.6	+0.0 +0.2	+0.0	67.2	106.3	-39.1	Horiz

27	1855.200M	75.0	+0.0 -38.9 +0.3	+0.0 +27.3	+0.0 +2.6	+0.0 +0.2	+0.0	66.5	106.3	-39.8	Vert
28	1829.600M	75.3	+0.0 -38.9 +0.3	+0.0 +27.1	+0.0 +2.5	+0.0 +0.2	+0.0	66.5	106.3	-39.8	Horiz
29	1804.800M	73.0	+0.0 -38.9 +0.3	+0.0 +27.0	+0.0 +2.5	+0.0 +0.2	+0.0	64.1	106.3	-42.2	Horiz
30	954.400M	20.7	+23.6 +0.0 +0.0	+6.1 +0.0	+6.0 +0.0	+0.0 +0.0	+0.0	56.4	106.3	-49.9	Vert
31	5565.600M	44.9	+0.0 -37.4 +0.1	+0.0 +33.9	+0.0 +4.6	+0.0 +0.4	+0.0	46.5	106.3	-59.8	Vert



Test Location: CKC Laboratories, Inc. • 110 N. Olinda Place • Brea, CA 92823 • 714-993-6112
 Customer: **Itron, Inc.**
 Specification: **15.247(d) / 15.209 Radiated Spurious Emissions**
 Work Order #: **99218** Date: 12/11/2018
 Test Type: **Maximized Emissions** Time: 09:08:17
 Tested By: Don Nguyen Sequence#: 16
 Software: EMITest 5.03.11

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 3			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 3			

Test Conditions / Notes:

The EUT is placed on table top. The serial port is connected to a support laptop via serial to USB adapter.
 The laptop is running software Command Line Interface Tool to turn on TX at 100% duty cycle.
 The EUT is powered from fresh battery 6.0Vdc. Support equipment is removed during test.

Modulation: 300kbps GFSK power level 3..

Frequency of measurement: 9k-9280MHz
 9 kHz -150 kHz;RBW=200 Hz,VBW=600 Hz;
 150 kHz-30 MHz;RBW=9 kHz,VBW=27 kHz;
 30 MHz-1000 MHz;RBW=120 kHz,VBW=360 kHz,
 1000 MHz-9280MHz;RBW=1 MHz,VBW=3 MHz.
 RBW=100kHz, VBW=300kHz (-20dbc limit)

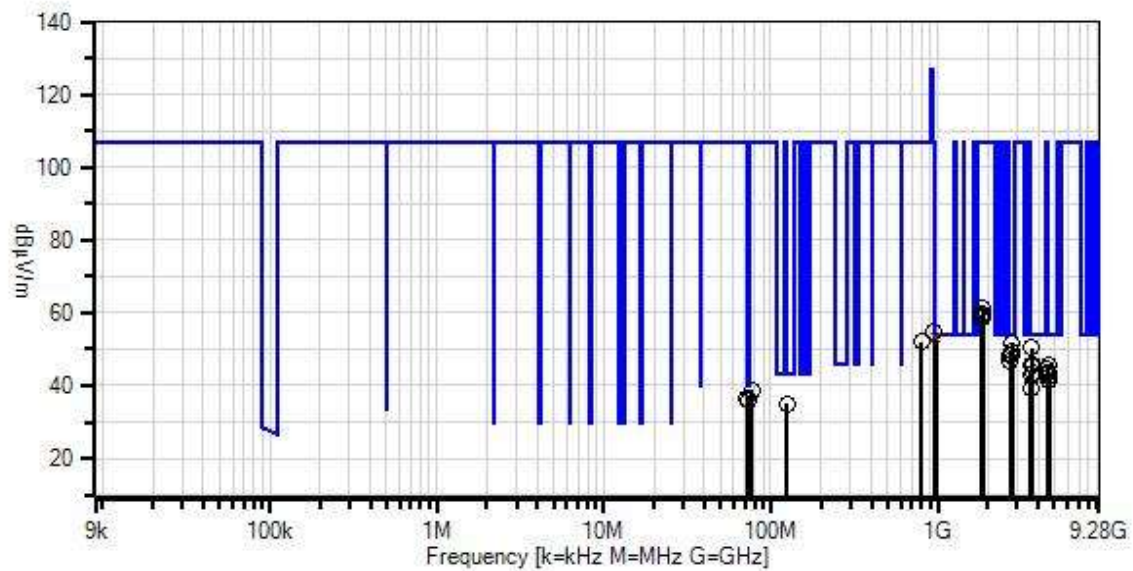
Site A

Test Method: ANSI C63.10 (2013)

Temperature: 22.3°C

Relative Humidity: 53.5%

Iron, Inc. WO#: 99218 Sequence#: 16 Date: 12/11/2018
15.247(d) / 15.209 Radiated Spurious Emissions Test Distance: 3 Meters Vert



— Readings
× QP Readings
▼ Ambient
— 1 - 15.247(d) / 15.209 Radiated Spurious Emissions

○ Peak Readings
* Average Readings
Software Version: 5.03.11

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN00314	Loop Antenna	6502	5/13/2018	5/13/2020
	AN00309	Preamp	8447D	2/19/2018	2/19/2020
	ANP05050	Cable	RG223/U	1/20/2017	1/20/2019
T1	AN01995	Biconilog Antenna	CBL6111C	4/23/2018	4/23/2020
T2	ANP05275	Attenuator	1W	4/5/2018	4/5/2020
T3	ANP05198	Cable-Amplitude +15C to +45C (dB)	8268	12/4/2018	12/4/2020
T4	AN02672	Spectrum Analyzer	E4446A	3/2/2017	3/2/2019
T5	AN00786	Preamp	83017A	5/12/2018	5/12/2020
T6	AN00849	Horn Antenna	3115	3/14/2018	3/14/2020
T7	ANP07139	Cable	ANDL1- PNMNM-48	3/1/2017	3/1/2019
T8	ANP07244	Cable	32022-29094K- 29094K-24TC	7/5/2018	7/5/2020
T9	AN03169	High Pass Filter	HM1155-11SS	6/15/2017	6/15/2019

Measurement Data:

Reading listed by margin.

Test Distance: 3 Meters

#	Freq	Rdng	T1 T5 T9	T2 T6	T3 T7	T4 T8	Dist	Corr	Spec	Margin	Polar
	MHz	dB μ V	dB	dB	dB	dB	Table	dB μ V/m	dB μ V/m	dB	Ant
1	980.400M QP	16.7	+24.0 +0.0 +0.0	+6.1 +0.0	+6.2 +0.0	+0.0 +0.0	+0.0	53.0	54.0	-1.0	Vert
^	980.400M	19.2	+24.0 +0.0 +0.0	+6.1 +0.0	+6.2 +0.0	+0.0 +0.0	+0.0	55.5	54.0	+1.5	Vert
3	2782.800M	57.0	+0.0 -38.6 +0.2	+0.0 +29.5	+0.0 +3.3	+0.0 +0.4	+0.0	51.8	54.0	-2.2	Vert
4	2782.800M	56.7	+0.0 -38.6 +0.2	+0.0 +29.5	+0.0 +3.3	+0.0 +0.4	+0.0	51.5	54.0	-2.5	Horiz
5	3659.200M	52.5	+0.0 -38.3 +0.2	+0.0 +31.6	+0.0 +3.8	+0.0 +0.5	+0.0	50.3	54.0	-3.7	Vert
6	74.250M	21.8	+6.9 +0.0 +0.0	+6.0 +0.0	+1.5 +0.0	+0.0 +0.0	+0.0	36.2	40.0	-3.8	Vert
7	2744.400M	54.8	+0.0 -38.6 +0.2	+0.0 +29.4	+0.0 +3.2	+0.0 +0.4	+0.0	49.4	54.0	-4.6	Horiz
8	2707.200M	54.3	+0.0 -38.6 +0.2	+0.0 +29.1	+0.0 +3.2	+0.0 +0.4	+0.0	48.6	54.0	-5.4	Vert
9	2744.400M	53.8	+0.0 -38.6 +0.2	+0.0 +29.4	+0.0 +3.2	+0.0 +0.4	+0.0	48.4	54.0	-5.6	Vert

10	2707.200M	52.6	+0.0 -38.6 +0.2	+0.0 +29.1 +3.2	+0.0 +3.2 +0.4	+0.0 +0.0 +0.0	+0.0 +0.0 +0.0	46.9	54.0	-7.1	Horiz
11	3659.200M	47.8	+0.0 -38.3 +0.2	+0.0 +31.6 +3.8	+0.0 +3.8 +0.5	+0.0 +0.0 +0.0	+0.0 +0.0 +0.0	45.6	54.0	-8.4	Horiz
12	4574.000M	45.5	+0.0 -37.8 +0.1	+0.0 +32.9 +4.1	+0.0 +4.1 +0.7	+0.0 +0.0 +0.0	+0.0 +0.0 +0.0	45.5	54.0	-8.5	Horiz
13	3710.400M	47.4	+0.0 -38.3 +0.2	+0.0 +31.9 +3.8	+0.0 +3.8 +0.5	+0.0 +0.0 +0.0	+0.0 +0.0 +0.0	45.5	54.0	-8.5	Horiz
14	124.250M	15.2	+11.9 +0.0 +0.0	+6.0 +0.0 +0.0	+1.9 +0.0 +0.0	+0.0 +0.0 +0.0	+0.0 +0.0 +0.0	35.0	43.5	-8.5	Horiz
15	4512.000M	44.5	+0.0 -37.8 +0.1	+0.0 +32.9 +4.1	+0.0 +4.1 +0.7	+0.0 +0.0 +0.0	+0.0 +0.0 +0.0	44.5	54.0	-9.5	Horiz
16	3710.400M	45.6	+0.0 -38.3 +0.2	+0.0 +31.9 +3.8	+0.0 +3.8 +0.5	+0.0 +0.0 +0.0	+0.0 +0.0 +0.0	43.7	54.0	-10.3	Vert
17	4512.000M	43.7	+0.0 -37.8 +0.1	+0.0 +32.9 +4.1	+0.0 +4.1 +0.7	+0.0 +0.0 +0.0	+0.0 +0.0 +0.0	43.7	54.0	-10.3	Vert
18	4638.000M	43.2	+0.0 -37.7 +0.2	+0.0 +32.8 +4.2	+0.0 +4.2 +0.6	+0.0 +0.0 +0.0	+0.0 +0.0 +0.0	43.3	54.0	-10.7	Vert
19	3609.600M	45.7	+0.0 -38.4 +0.2	+0.0 +31.1 +3.8	+0.0 +3.8 +0.6	+0.0 +0.0 +0.0	+0.0 +0.0 +0.0	43.0	54.0	-11.0	Vert
20	4574.000M	42.5	+0.0 -37.8 +0.1	+0.0 +32.9 +4.1	+0.0 +4.1 +0.7	+0.0 +0.0 +0.0	+0.0 +0.0 +0.0	42.5	54.0	-11.5	Vert
21	4638.000M	41.1	+0.0 -37.7 +0.2	+0.0 +32.8 +4.2	+0.0 +4.2 +0.6	+0.0 +0.0 +0.0	+0.0 +0.0 +0.0	41.2	54.0	-12.8	Horiz
22	3609.600M	41.7	+0.0 -38.4 +0.2	+0.0 +31.1 +3.8	+0.0 +3.8 +0.6	+0.0 +0.0 +0.0	+0.0 +0.0 +0.0	39.0	54.0	-15.0	Horiz
23	1855.200M	69.8	+0.0 -38.9 +0.3	+0.0 +27.3 +2.6	+0.0 +2.6 +0.2	+0.0 +0.0 +0.0	+0.0 +0.0 +0.0	61.3	106.7	-45.4	Horiz
24	1855.200M	68.4	+0.0 -38.9 +0.3	+0.0 +27.3 +2.6	+0.0 +2.6 +0.2	+0.0 +0.0 +0.0	+0.0 +0.0 +0.0	59.9	106.7	-46.8	Vert
25	1829.600M	68.0	+0.0 -38.9 +0.3	+0.0 +27.1 +2.5	+0.0 +2.5 +0.2	+0.0 +0.0 +0.0	+0.0 +0.0 +0.0	59.2	106.7	-47.5	Vert
26	1804.800M	68.0	+0.0 -38.9 +0.3	+0.0 +27.0 +2.5	+0.0 +2.5 +0.2	+0.0 +0.0 +0.0	+0.0 +0.0 +0.0	59.1	106.7	-47.6	Vert

27	1804.800M	67.8	+0.0 -38.9 +0.3	+0.0 +27.0	+0.0 +2.5	+0.0 +0.2	+0.0	58.9	106.7	-47.8	Horiz
28	1829.600M	67.5	+0.0 -38.9 +0.3	+0.0 +27.1	+0.0 +2.5	+0.0 +0.2	+0.0	58.7	106.7	-48.0	Horiz
29	954.400M	19.1	+23.6 +0.0 +0.0	+6.1 +0.0	+6.0 +0.0	+0.0 +0.0	+0.0	54.8	106.7	-51.9	Vert
30	798.450M	18.7	+21.9 +0.0 +0.0	+6.0 +0.0	+5.5 +0.0	+0.0 +0.0	+0.0	52.1	106.7	-54.6	Vert
31	77.250M	23.7	+7.4 +0.0 +0.0	+6.0 +0.0	+1.6 +0.0	+0.0 +0.0	+0.0	38.7	106.7	-68.0	Vert
32	72.000M	22.6	+6.5 +0.0 +0.0	+6.0 +0.0	+1.5 +0.0	+0.0 +0.0	+0.0	36.6	106.7	-70.1	Vert



Test Location: CKC Laboratories, Inc. • 110 N. Olinda Place • Brea, CA 92823 • 714-993-6112
 Customer: **Itron, Inc.**
 Specification: **15.247(d) / 15.209 Radiated Spurious Emissions**
 Work Order #: **99218** Date: 12/11/2018
 Test Type: **Maximized Emissions** Time: 09:12:45
 Tested By: Don Nguyen Sequence#: 15
 Software: EMITest 5.03.11

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 4			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 4			

Test Conditions / Notes:

The EUT is placed on table top. The serial port is connected to a support laptop via serial to USB adapter.
 The laptop is running software Command Line Interface Tool to turn on TX at 100% duty cycle.
 The EUT is powered from fresh battery 6.0Vdc. Support equipment is removed during test.

Modulation: 300kbps GFSK power level 3.

Frequency of measurement: 9k-9280MHz
 9 kHz -150 kHz;RBW=200 Hz,VBW=600 Hz;
 150 kHz-30 MHz;RBW=9 kHz,VBW=27 kHz;
 30 MHz-1000 MHz;RBW=120 kHz,VBW=360 kHz,
 1000 MHz-9280MHz;RBW=1 MHz,VBW=3 MHz.
 RBW=100kHz, VBW=300kHz (-20dbc limit)

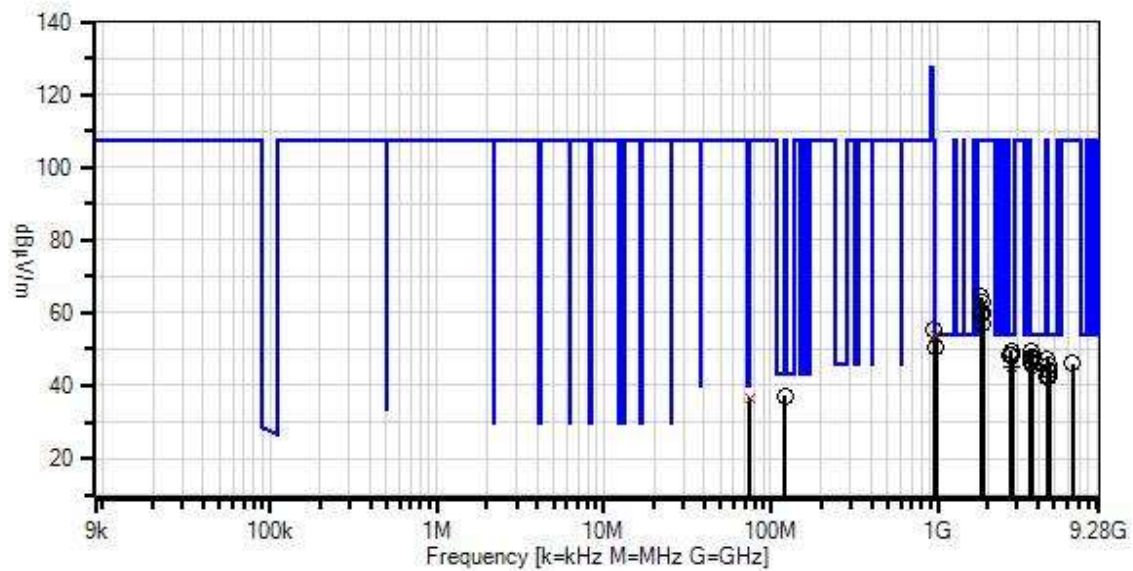
Site A

Test Method: ANSI C63.10 (2013)

Temperature: 21.0°C

Relative Humidity: 40.9%

Itron, Inc. W/O#: 99218 Sequence#: 15 Date: 12/11/2018
 15.247(d) / 15.209 Radiated Spurious Emissions Test Distance: 3 Meters Horiz



— Readings
 × QP Readings
 ▼ Ambient
 — 1 - 15.247(d) / 15.209 Radiated Spurious Emissions

○ Peak Readings
 * Average Readings
 Software Version: 5.03.11

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN00314	Loop Antenna	6502	5/13/2018	5/13/2020
	AN00309	Preamp	8447D	2/19/2018	2/19/2020
	ANP05050	Cable	RG223/U	1/20/2017	1/20/2019
T1	AN01995	Biconilog Antenna	CBL6111C	4/23/2018	4/23/2020
T2	ANP05275	Attenuator	1W	4/5/2018	4/5/2020
T3	ANP05198	Cable-Amplitude +15C to +45C (dB)	8268	12/4/2018	12/4/2020
T4	AN02672	Spectrum Analyzer	E4446A	3/2/2017	3/2/2019
T5	AN00786	Preamp	83017A	5/12/2018	5/12/2020
T6	AN00849	Horn Antenna	3115	3/14/2018	3/14/2020
T7	ANP07139	Cable	ANDL1- PNMNM-48	3/1/2017	3/1/2019
T8	ANP07244	Cable	32022-29094K- 29094K-24TC	7/5/2018	7/5/2020
T9	AN03169	High Pass Filter	HM1155-11SS	6/15/2017	6/15/2019

Measurement Data:

Reading listed by margin.

Test Distance: 3 Meters

#	Freq	Rdng	T1 T5 T9	T2 T6	T3 T7	T4 T8	Dist	Corr	Spec	Margin	Polar
	MHz	dBμV	dB	dB	dB	dB	Table	dBμV/m	dBμV/m	dB	Ant
1	980.335M QP	17.6	+24.0 +0.0 +0.0	+6.1 +0.0	+6.2 +0.0	+0.0 +0.0	+0.0	53.9	54.0	-0.1	Vert
^	980.335M	22.0	+24.0 +0.0 +0.0	+6.1 +0.0	+6.2 +0.0	+0.0 +0.0	+0.0	58.3	54.0	+4.3	Vert
3	74.500M QP	22.3	+6.9 +0.0 +0.0	+6.0 +0.0	+1.5 +0.0	+0.0 +0.0	+0.0	36.7	40.0	-3.3	Vert
^	74.500M	24.2	+6.9 +0.0 +0.0	+6.0 +0.0	+1.5 +0.0	+0.0 +0.0	+0.0	38.6	40.0	-1.4	Vert
5	980.335M	14.2	+24.0 +0.0 +0.0	+6.1 +0.0	+6.2 +0.0	+0.0 +0.0	+0.0	50.5	54.0	-3.5	Horiz
6	2744.400M	55.1	+0.0 -38.6 +0.2	+0.0 +29.4	+0.0 +3.2	+0.0 +0.4	+0.0	49.7	54.0	-4.3	Vert
7	3659.200M	51.6	+0.0 -38.3 +0.2	+0.0 +31.6	+0.0 +3.8	+0.0 +0.5	+0.0	49.4	54.0	-4.6	Horiz
8	2707.167M	54.3	+0.0 -38.6 +0.2	+0.0 +29.1	+0.0 +3.2	+0.0 +0.4	+0.0	48.6	54.0	-5.4	Vert
9	2744.400M	53.9	+0.0 -38.6 +0.2	+0.0 +29.4	+0.0 +3.2	+0.0 +0.4	+0.0	48.5	54.0	-5.5	Horiz

10	2707.167M	53.9	+0.0 -38.6 +0.2	+0.0 +29.1 +3.2	+0.0 +3.2 +0.4	+0.0 +0.0 +0.0	+0.0 +0.0 +0.0	48.2	54.0	-5.8	Horiz
11	3609.567M	50.6	+0.0 -38.4 +0.2	+0.0 +31.1 +3.8	+0.0 +3.8 +0.6	+0.0 +0.0 +0.0	+0.0 +0.0 +0.0	47.9	54.0	-6.1	Horiz
12	121.350M	17.5	+11.8 +0.0 +0.0	+6.0 +0.0 +0.0	+1.9 +0.0 +0.0	+0.0 +0.0 +0.0	+0.0 +0.0 +0.0	37.2	43.5	-6.3	Horiz
13	3710.400M	49.5	+0.0 -38.3 +0.2	+0.0 +31.9 +3.8	+0.0 +3.8 +0.5	+0.0 +0.0 +0.0	+0.0 +0.0 +0.0	47.6	54.0	-6.4	Horiz
14	4511.967M	47.4	+0.0 -37.8 +0.1	+0.0 +32.9 +4.1	+0.0 +4.1 +0.7	+0.0 +0.0 +0.0	+0.0 +0.0 +0.0	47.4	54.0	-6.6	Horiz
15	3659.200M	48.9	+0.0 -38.3 +0.2	+0.0 +31.6 +3.8	+0.0 +3.8 +0.5	+0.0 +0.0 +0.0	+0.0 +0.0 +0.0	46.7	54.0	-7.3	Vert
16	3609.567M	48.9	+0.0 -38.4 +0.2	+0.0 +31.1 +3.8	+0.0 +3.8 +0.6	+0.0 +0.0 +0.0	+0.0 +0.0 +0.0	46.2	54.0	-7.8	Vert
17	3710.400M	47.7	+0.0 -38.3 +0.2	+0.0 +31.9 +3.8	+0.0 +3.8 +0.5	+0.0 +0.0 +0.0	+0.0 +0.0 +0.0	45.8	54.0	-8.2	Vert
18	4638.000M	45.5	+0.0 -37.7 +0.2	+0.0 +32.8 +4.2	+0.0 +4.2 +0.6	+0.0 +0.0 +0.0	+0.0 +0.0 +0.0	45.6	54.0	-8.4	Horiz
19	4638.000M	45.4	+0.0 -37.7 +0.2	+0.0 +32.8 +4.2	+0.0 +4.2 +0.6	+0.0 +0.0 +0.0	+0.0 +0.0 +0.0	45.5	54.0	-8.5	Vert
20	2782.800M Ave	50.4	+0.0 -38.6 +0.2	+0.0 +29.5 +3.3	+0.0 +3.3 +0.4	+0.0 +0.0 +0.0	+0.0 +0.0 +0.0	45.2	54.0	-8.8	Horiz
^	2782.800M	57.4	+0.0 -38.6 +0.2	+0.0 +29.5 +3.3	+0.0 +3.3 +0.4	+0.0 +0.0 +0.0	+0.0 +0.0 +0.0	52.2	54.0	-1.8	Horiz
22	2782.800M Ave	50.1	+0.0 -38.6 +0.2	+0.0 +29.5 +3.3	+0.0 +3.3 +0.4	+0.0 +0.0 +0.0	+0.0 +0.0 +0.0	44.9	54.0	-9.1	Vert
^	2782.800M	57.3	+0.0 -38.6 +0.2	+0.0 +29.5 +3.3	+0.0 +3.3 +0.4	+0.0 +0.0 +0.0	+0.0 +0.0 +0.0	52.1	54.0	-1.9	Vert
24	4574.000M	43.9	+0.0 -37.8 +0.1	+0.0 +32.9 +4.1	+0.0 +4.1 +0.7	+0.0 +0.0 +0.0	+0.0 +0.0 +0.0	43.9	54.0	-10.1	Horiz
25	4574.000M	42.5	+0.0 -37.8 +0.1	+0.0 +32.9 +4.1	+0.0 +4.1 +0.7	+0.0 +0.0 +0.0	+0.0 +0.0 +0.0	42.5	54.0	-11.5	Vert
26	4511.967M	42.4	+0.0 -37.8 +0.1	+0.0 +32.9 +4.1	+0.0 +4.1 +0.7	+0.0 +0.0 +0.0	+0.0 +0.0 +0.0	42.4	54.0	-11.6	Vert

27	1804.767M	73.2	+0.0 -38.9 +0.3	+0.0 +27.0	+0.0 +2.5	+0.0 +0.2	+0.0	64.3	107.4	-43.1	Horiz
28	1829.600M	71.8	+0.0 -38.9 +0.3	+0.0 +27.1	+0.0 +2.5	+0.0 +0.2	+0.0	63.0	107.4	-44.4	Horiz
29	1855.200M	68.8	+0.0 -38.9 +0.3	+0.0 +27.3	+0.0 +2.6	+0.0 +0.2	+0.0	60.3	107.4	-47.1	Horiz
30	1829.600M	68.7	+0.0 -38.9 +0.3	+0.0 +27.1	+0.0 +2.5	+0.0 +0.2	+0.0	59.9	107.4	-47.5	Vert
31	1804.767M	68.4	+0.0 -38.9 +0.3	+0.0 +27.0	+0.0 +2.5	+0.0 +0.2	+0.0	59.5	107.4	-47.9	Vert
32	1855.200M	65.4	+0.0 -38.9 +0.3	+0.0 +27.3	+0.0 +2.6	+0.0 +0.2	+0.0	56.9	107.4	-50.5	Vert
33	954.500M	19.4	+23.6 +0.0 +0.0	+6.1 +0.0	+6.0 +0.0	+0.0 +0.0	+0.0	55.1	106.7	-51.6	Vert
34	6403.600M	43.9	+0.0 -37.4 +0.2	+0.0 +34.1	+0.0 +5.0	+0.0 +0.3	+0.0	46.1	107.4	-61.3	Horiz



Test Location: CKC Laboratories, Inc. • 110 N. Olinda Place • Brea, CA 92823 • 714-993-6112
Customer: **Itron, Inc.**
Specification: **15.247(d) / 15.209 Radiated Spurious Emissions**
Work Order #: **99218** Date: 12/11/2018
Test Type: **Maximized Emissions** Time: 10:42:08
Tested By: Don Nguyen Sequence#: 12
Software: EMITest 5.03.11

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 5			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 5			

Test Conditions / Notes:

The EUT is placed on table top. The serial port is connected to a support laptop via serial to USB adapter.
The laptop is running software Command Line Interface Tool to turn on TX at 100% duty cycle.
The EUT is powered from fresh battery 6.0Vdc. Support equipment is removed during test.

Modulation: 300kbps GFSK power level 3.

Frequency of measurement: 9k-9280MHz
9 kHz -150 kHz;RBW=200 Hz,VBW=600 Hz;
150 kHz-30 MHz;RBW=9 kHz,VBW=27 kHz;
30 MHz-1000 MHz;RBW=120 kHz,VBW=360 kHz,
1000 MHz-9280MHz;RBW=1 MHz,VBW=3 MHz.
RBW=100kHz, VBW=300kHz (-20dbc limit)

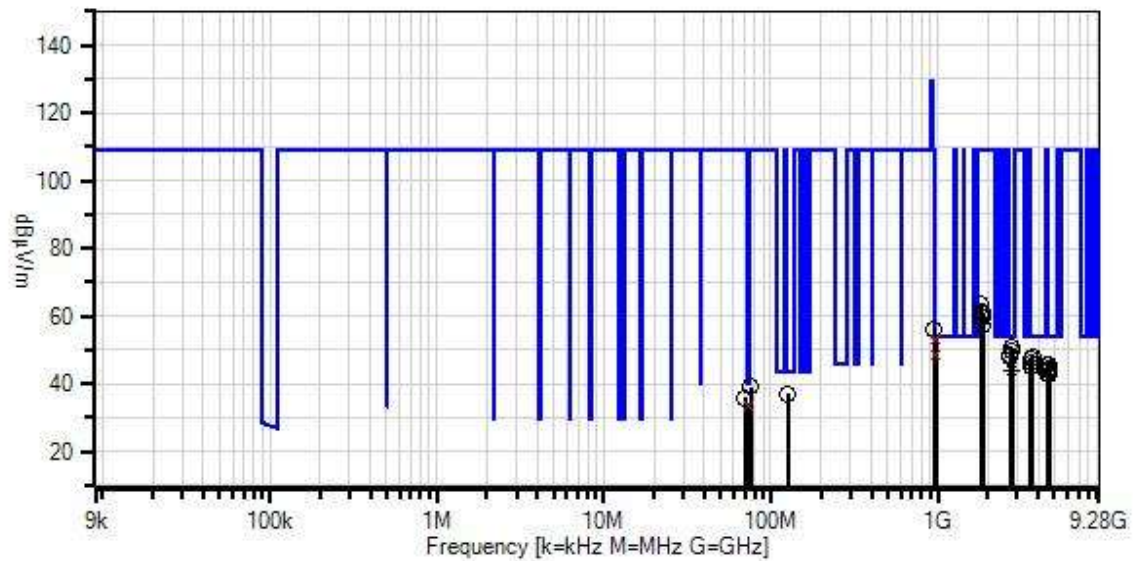
Site A

Test Method: ANSI C63.10 (2013)

Temperature: 22.1°C

Relative Humidity: 38.2%

Itron, Inc. WO#: 99218 Sequence#: 12 Date: 12/11/2018
 15.247(d) / 15.209 Radiated Spurious Emissions Test Distance: 3 Meters Vert



— Readings
 × QP Readings
 ▼ Ambient
 — 1 - 15.247(d) / 15.209 Radiated Spurious Emissions

○ Peak Readings
 * Average Readings
 Software Version: 5.03.11

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN00314	Loop Antenna	6502	5/13/2018	5/13/2020
	AN00309	Preamp	8447D	2/19/2018	2/19/2020
	ANP05050	Cable	RG223/U	1/20/2017	1/20/2019
T1	AN01995	Biconilog Antenna	CBL6111C	4/23/2018	4/23/2020
T2	ANP05275	Attenuator	1W	4/5/2018	4/5/2020
T3	ANP05198	Cable-Amplitude +15C to +45C (dB)	8268	12/4/2018	12/4/2020
T4	AN02672	Spectrum Analyzer	E4446A	3/2/2017	3/2/2019
T5	AN00786	Preamp	83017A	5/12/2018	5/12/2020
T6	AN00849	Horn Antenna	3115	3/14/2018	3/14/2020
T7	ANP07139	Cable	ANDL1- PNMNM-48	3/1/2017	3/1/2019
T8	ANP07244	Cable	32022-29094K- 29094K-24TC	7/5/2018	7/5/2020
T9	AN03169	High Pass Filter	HM1155-11SS	6/15/2017	6/15/2019

Measurement Data:

Reading listed by margin.

Test Distance: 3 Meters

#	Freq	Rdng	T1 T5 T9	T2 T6	T3 T7	T4 T8	Dist	Corr	Spec	Margin	Polar
	MHz	dB μ V	dB	dB	dB	dB	Table	dB μ V/m	dB μ V/m	dB	Ant
1	980.400M QP	17.0	+24.0 +0.0 +0.0	+6.1 +0.0	+6.2 +0.0	+0.0 +0.0	+0.0	53.3	54.0	-0.7	Vert
^	980.400M	21.9	+24.0 +0.0 +0.0	+6.1 +0.0	+6.2 +0.0	+0.0 +0.0	+0.0	58.2	54.0	+4.2	Vert
3	2782.800M	56.0	+0.0 -38.6 +0.2	+0.0 +29.5	+0.0 +3.3	+0.0 +0.4	+0.0	50.8	54.0	-3.2	Horiz
4	2744.400M	56.0	+0.0 -38.6 +0.2	+0.0 +29.4	+0.0 +3.2	+0.0 +0.4	+0.0	50.6	54.0	-3.4	Vert
5	2744.400M	55.1	+0.0 -38.6 +0.2	+0.0 +29.4	+0.0 +3.2	+0.0 +0.4	+0.0	49.7	54.0	-4.3	Horiz
6	980.500M QP	12.0	+24.0 +0.0 +0.0	+6.1 +0.0	+6.2 +0.0	+0.0 +0.0	+0.0	48.3	54.0	-5.7	Horiz
^	980.500M	16.1	+24.0 +0.0 +0.0	+6.1 +0.0	+6.2 +0.0	+0.0 +0.0	+0.0	52.4	54.0	-1.6	Horiz
8	2707.200M	53.9	+0.0 -38.6 +0.2	+0.0 +29.1	+0.0 +3.2	+0.0 +0.4	+0.0	48.2	54.0	-5.8	Vert
9	2707.200M	53.9	+0.0 -38.6 +0.2	+0.0 +29.1	+0.0 +3.2	+0.0 +0.4	+0.0	48.2	54.0	-5.8	Horiz

10	3710.400M	50.0	+0.0 -38.3 +0.2	+0.0 +31.9	+0.0 +3.8	+0.0 +0.5	+0.0	48.1	54.0	-5.9	Horiz
11	3710.400M	49.9	+0.0 -38.3 +0.2	+0.0 +31.9	+0.0 +3.8	+0.0 +0.5	+0.0	48.0	54.0	-6.0	Vert
12	126.150M	17.1	+11.9 +0.0 +0.0	+6.0 +0.0	+2.0 +0.0	+0.0 +0.0	+0.0	37.0	43.5	-6.5	Vert
13	74.000M QP	19.2	+6.8 +0.0 +0.0	+6.0 +0.0	+1.5 +0.0	+0.0 +0.0	+0.0	33.5	40.0	-6.5	Vert
^	74.000M	23.8	+6.8 +0.0 +0.0	+6.0 +0.0	+1.5 +0.0	+0.0 +0.0	+0.0	38.1	40.0	-1.9	Vert
15	3609.600M	50.0	+0.0 -38.4 +0.2	+0.0 +31.1	+0.0 +3.8	+0.0 +0.6	+0.0	47.3	54.0	-6.7	Horiz
16	3659.200M	48.6	+0.0 -38.3 +0.2	+0.0 +31.6	+0.0 +3.8	+0.0 +0.5	+0.0	46.4	54.0	-7.6	Vert
17	4512.000M	45.7	+0.0 -37.8 +0.1	+0.0 +32.9	+0.0 +4.1	+0.0 +0.7	+0.0	45.7	54.0	-8.3	Horiz
18	4638.000M	45.6	+0.0 -37.7 +0.2	+0.0 +32.8	+0.0 +4.2	+0.0 +0.6	+0.0	45.7	54.0	-8.3	Horiz
19	3659.200M	47.4	+0.0 -38.3 +0.2	+0.0 +31.6	+0.0 +3.8	+0.0 +0.5	+0.0	45.2	54.0	-8.8	Horiz
20	3609.600M	47.8	+0.0 -38.4 +0.2	+0.0 +31.1	+0.0 +3.8	+0.0 +0.6	+0.0	45.1	54.0	-8.9	Vert
21	4638.000M	44.5	+0.0 -37.7 +0.2	+0.0 +32.8	+0.0 +4.2	+0.0 +0.6	+0.0	44.6	54.0	-9.4	Vert
22	2782.800M Ave	48.9	+0.0 -38.6 +0.2	+0.0 +29.5	+0.0 +3.3	+0.0 +0.4	+0.0	43.7	54.0	-10.3	Vert
^	2782.800M	57.2	+0.0 -38.6 +0.2	+0.0 +29.5	+0.0 +3.3	+0.0 +0.4	+0.0	52.0	54.0	-2.0	Vert
24	4574.000M	43.6	+0.0 -37.8 +0.1	+0.0 +32.9	+0.0 +4.1	+0.0 +0.7	+0.0	43.6	54.0	-10.4	Horiz
25	4512.000M	43.0	+0.0 -37.8 +0.1	+0.0 +32.9	+0.0 +4.1	+0.0 +0.7	+0.0	43.0	54.0	-11.0	Vert
26	4574.000M	42.7	+0.0 -37.8 +0.1	+0.0 +32.9	+0.0 +4.1	+0.0 +0.7	+0.0	42.7	54.0	-11.3	Vert

27	1804.800M	72.6	+0.0 -38.9 +0.3	+0.0 +27.0	+0.0 +2.5	+0.0 +0.2	+0.0	63.7	109.2	-45.5	Horiz
28	1829.600M	70.1	+0.0 -38.9 +0.3	+0.0 +27.1	+0.0 +2.5	+0.0 +0.2	+0.0	61.3	109.2	-47.9	Horiz
29	1855.200M	69.4	+0.0 -38.9 +0.3	+0.0 +27.3	+0.0 +2.6	+0.0 +0.2	+0.0	60.9	109.2	-48.3	Horiz
30	1804.800M	68.8	+0.0 -38.9 +0.3	+0.0 +27.0	+0.0 +2.5	+0.0 +0.2	+0.0	59.9	109.2	-49.3	Vert
31	1829.600M	68.2	+0.0 -38.9 +0.3	+0.0 +27.1	+0.0 +2.5	+0.0 +0.2	+0.0	59.4	109.2	-49.8	Vert
32	1855.200M	65.6	+0.0 -38.9 +0.3	+0.0 +27.3	+0.0 +2.6	+0.0 +0.2	+0.0	57.1	109.2	-52.1	Vert
33	954.400M	20.3	+23.6 +0.0 +0.0	+6.1 +0.0	+6.0 +0.0	+0.0 +0.0	+0.0	56.0	109.2	-53.2	Vert
34	76.100M	24.3	+7.2 +0.0 +0.0	+6.0 +0.0	+1.6 +0.0	+0.0 +0.0	+0.0	39.1	109.2	-70.1	Vert
35	70.200M	22.2	+6.1 +0.0 +0.0	+6.0 +0.0	+1.5 +0.0	+0.0 +0.0	+0.0	35.8	109.2	-73.4	Vert

Band Edge

Band Edge Summary Configuration 2

Frequency (MHz)	Modulation	Ant. Type	Field Strength (dBuV/m @3m)	Limit (dBuV/m @3m)	Results
614	100kbps FSK lv3 (worst case)	Integral	40.2	<46	Pass
902	100kbps FSK lv3	Integral	90.9	<107.4	Pass
928	100kbps FSK lv3	Integral	63.4	<107.4	Pass
960	100kbps FSK lv3 (worst case)	Integral	45.8	<54	Pass
902	100kbps FSK Hopping	Integral	89.7	<107.4	Pass
928	100kbps FSK Hopping	Integral	62.8	<107.4	Pass
902	300kbps GFSK lv2	Integral	78.3	<94.7	Pass
928	300kbps GFSK lv2	Integral	77.5	<94.7	Pass
902	300kbps GFSK lv2 Hopping	Integral	78.7	<94.7	Pass
928	300kbps GFSK lv2 Hopping	Integral	79.7	<94.7	Pass
902	300kbps GFSK lv3	Integral	88.3	<106.3	Pass
928	300kbps GFSK lv3	Integral	87.9	<106.3	Pass
902	300kbps GFSK lv3 Hopping	Integral	89.2	<106.3	Pass
928	300kbps GFSK lv3 Hopping	Integral	86.9	<106.3	Pass

Band Edge Summary-Configuration 3

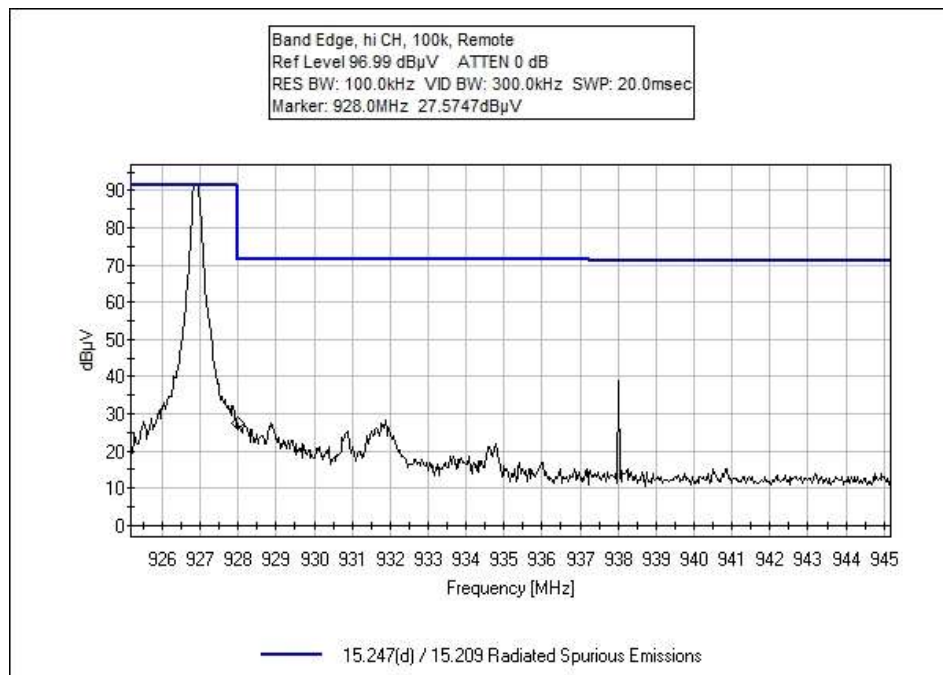
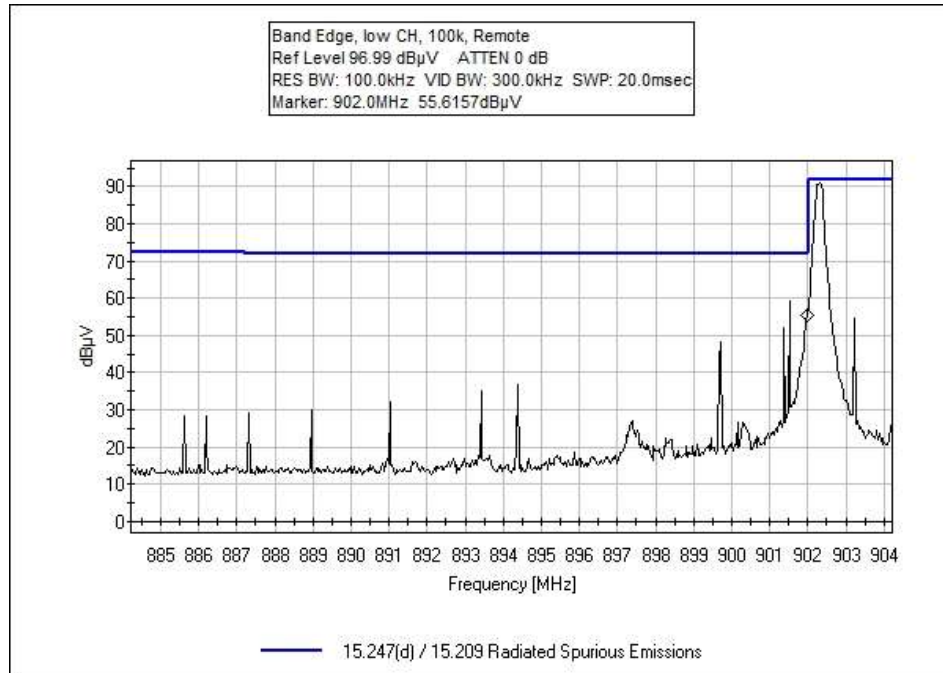
Frequency (MHz)	Modulation	Ant. Type	Field Strength (dBuV/m @3m)	Limit (dBuV/m @3m)	Results
614	100kbps FSK lv3 (worst case)	Integral	40.2	<46	Pass
902	100kbps FSK lv3	Integral	91.3	<107.4	Pass
928	100kbps FSK lv3	Integral	61.8	<107.4	Pass
960	100kbps FSK lv3 (worst case)	Integral	45.8	<54	Pass
902	100kbps FSK Hopping	Integral	91.1	<107.4	Pass
928	100kbps FSK Hopping	Integral	65.6	<107.4	Pass
902	300kbps GFSK lv2	Integral	42.9	<94.7	Pass
928	300kbps GFSK lv2	Integral	79.0	<94.7	Pass
902	300kbps GFSK lv2 Hopping	Integral	75.3	<94.7	Pass
928	300kbps GFSK lv2 Hopping	Integral	48.8	<94.7	Pass
902	300kbps GFSK lv3	Integral	88.6	<106.7	Pass
928	300kbps GFSK lv3	Integral	88.5	<106.7	Pass
902	300kbps GFSK lv3 Hopping	Integral	87.4	<106.7	Pass
928	300kbps GFSK lv3 Hopping	Integral	89.0	<106.7	Pass

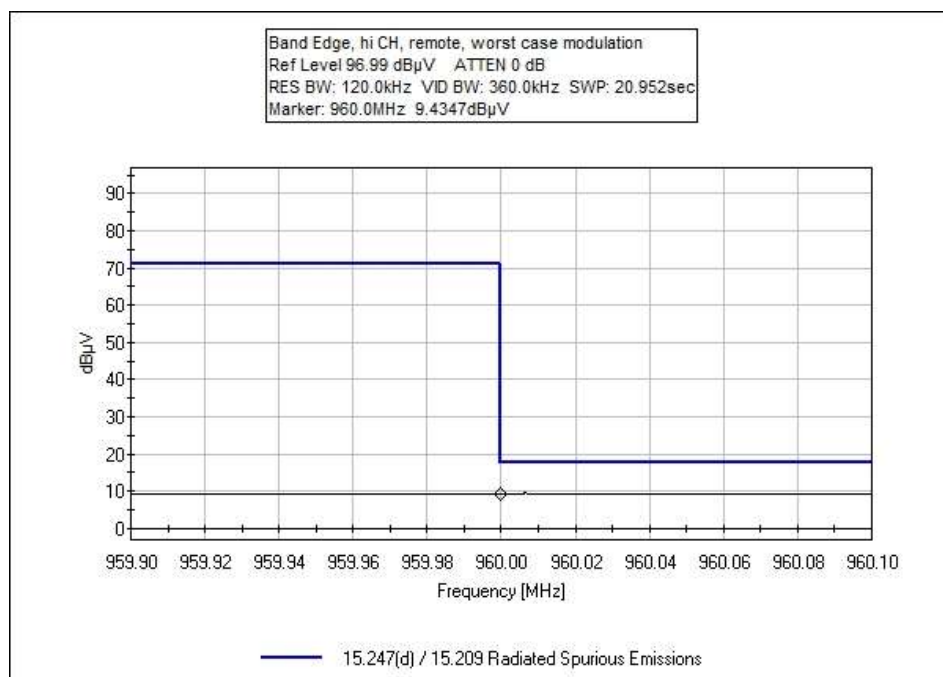
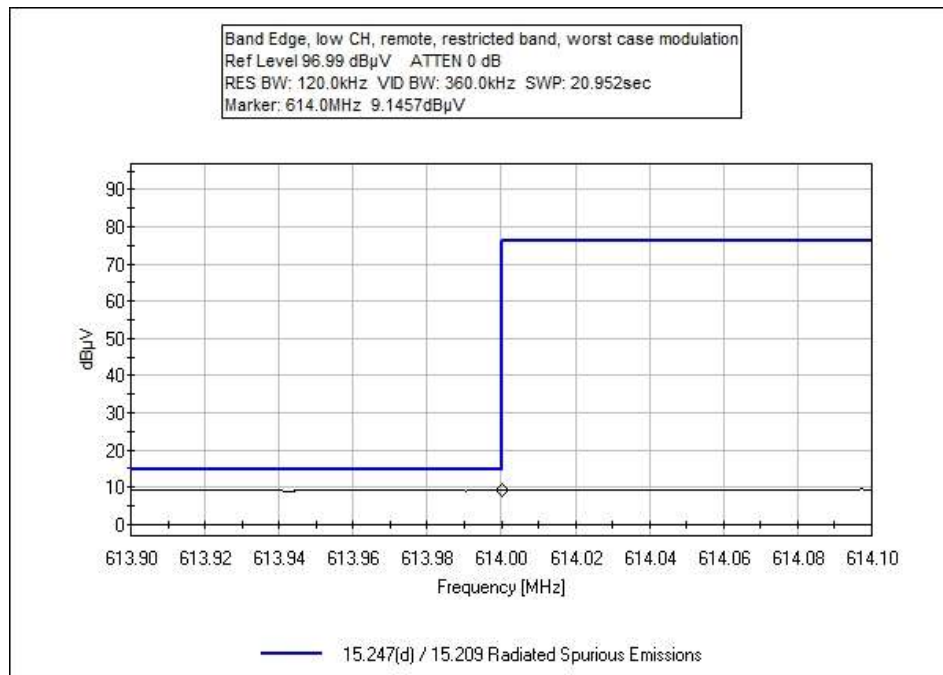
Band Edge Summary-Configuration 4					
Frequency (MHz)	Modulation	Ant. Type	Field Strength (dBuV/m @3m)	Limit (dBuV/m @3m)	Results
614	100kbps FSK lv3 (worst case)	Integral	40.2	<46	Pass
902	100kbps FSK lv3	Integral	93.3	<108.5	Pass
928	100kbps FSK lv3	Integral	64.8	<108.5	Pass
960	100kbps FSK lv3 (worst case)	Integral	45.8	<54	Pass
902	100kbps FSK Hopping	Integral	93.3	<108.5	Pass
928	100kbps FSK Hopping	Integral	64.5	<108.5	Pass
902	300kbps GFSK lv2	Integral	43.6	<96.0	Pass
928	300kbps GFSK lv2	Integral	77.7	<96.0	Pass
902	300kbps GFSK lv2 Hopping	Integral	78.7	<96.0	Pass
928	300kbps GFSK lv2 Hopping	Integral	47.7	<96.0	Pass
902	300kbps GFSK lv3	Integral	87.5	<107.4	Pass
928	300kbps GFSK lv3	Integral	88.2	<107.4	Pass
902	300kbps GFSK lv3 Hopping	Integral	87.1	<107.4	Pass
928	300kbps GFSK lv3 Hopping	Integral	88.5	<107.4	Pass

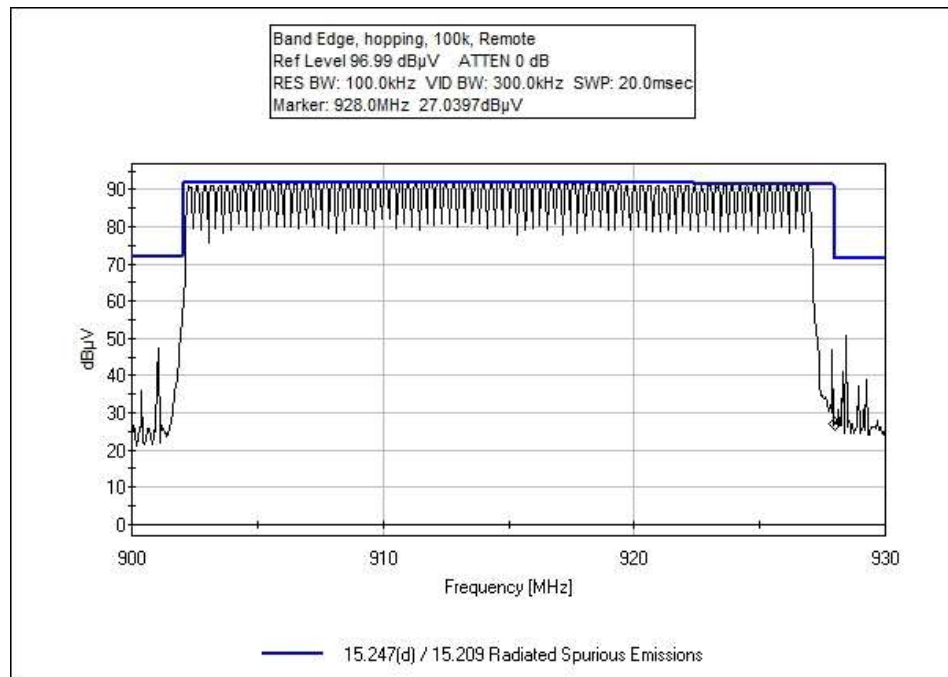
Band Edge Summary-Configuration 5					
Frequency (MHz)	Modulation	Ant. Type	Field Strength (dBuV/m @3m)	Limit (dBuV/m @3m)	Results
614	100kbps FSK lv3 (worst case)	Integral	40.2	<46	Pass
902	100kbps FSK lv3	Integral	92.0	<108.3	Pass
928	100kbps FSK lv3	Integral	60.5	<108.3	Pass
960	100kbps FSK lv3 (worst case)	Integral	45.7	<54	Pass
902	100kbps FSK Hopping	Integral	93.7	<108.3	Pass
928	100kbps FSK Hopping	Integral	60.5	<108.3	Pass
902	300kbps GFSK lv2	Integral	43.6	<95.0	Pass
928	300kbps GFSK lv2	Integral	77.7	<95.0	Pass
902	300kbps GFSK lv2 Hopping	Integral	78.6	<95.0	Pass
928	300kbps GFSK lv2 Hopping	Integral	49.0	<95.0	Pass
902	300kbps GFSK lv3	Integral	88.9	<109.2	Pass
928	300kbps GFSK lv3	Integral	90.6	<109.2	Pass
902	300kbps GFSK lv3 Hopping	Integral	88.8	<109.2	Pass
928	300kbps GFSK lv3 Hopping	Integral	90.9	<109.2	Pass

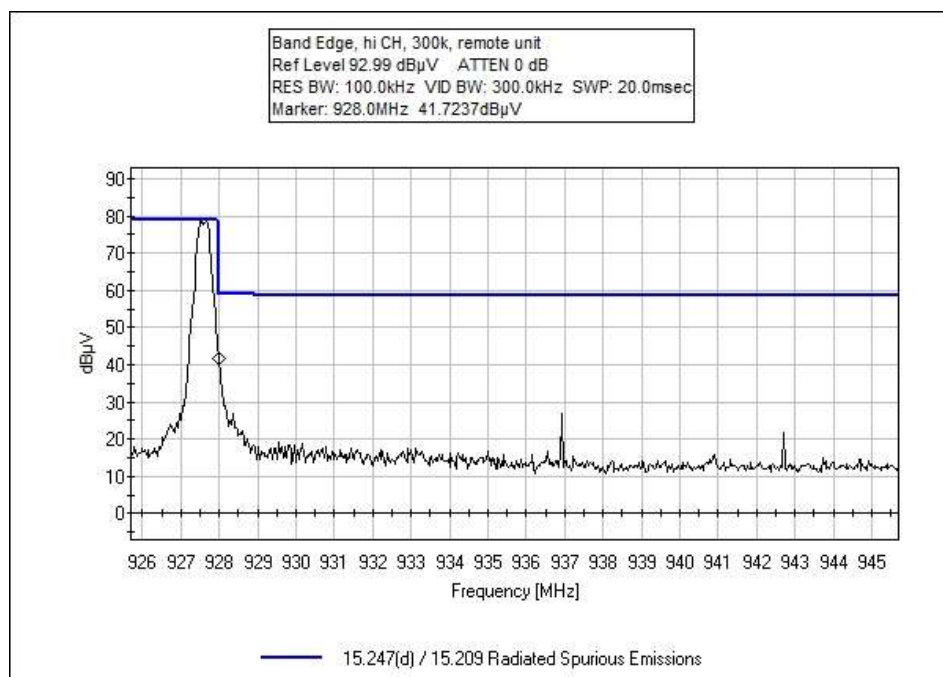
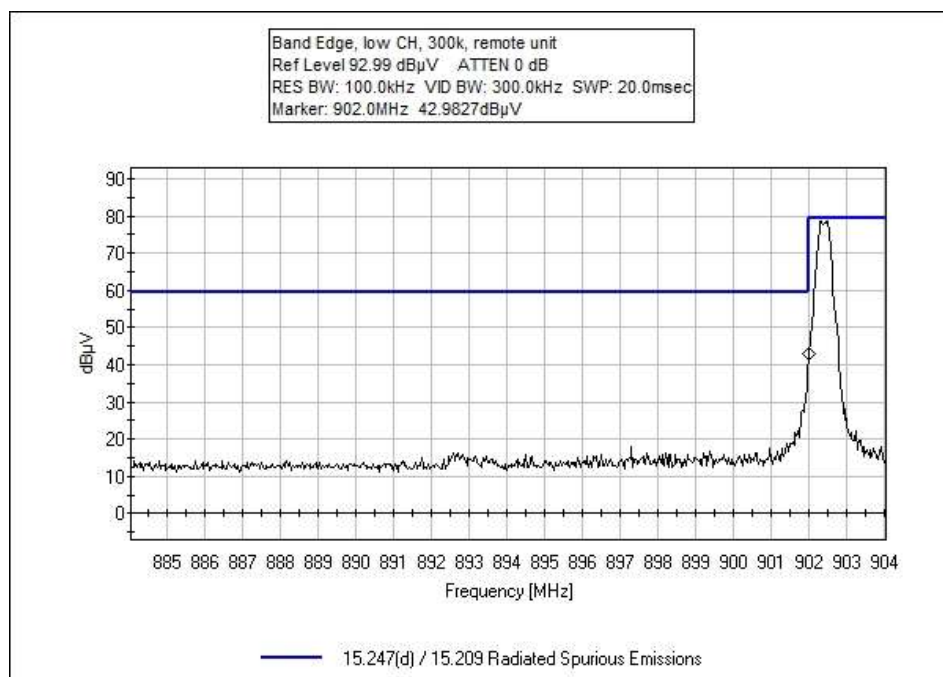
Band Edge Plots

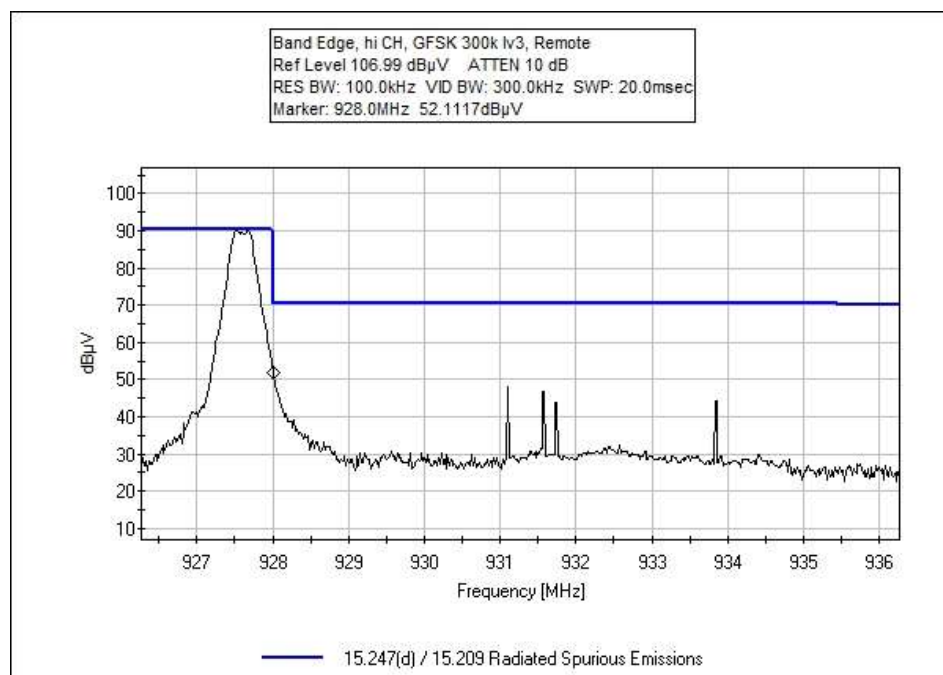
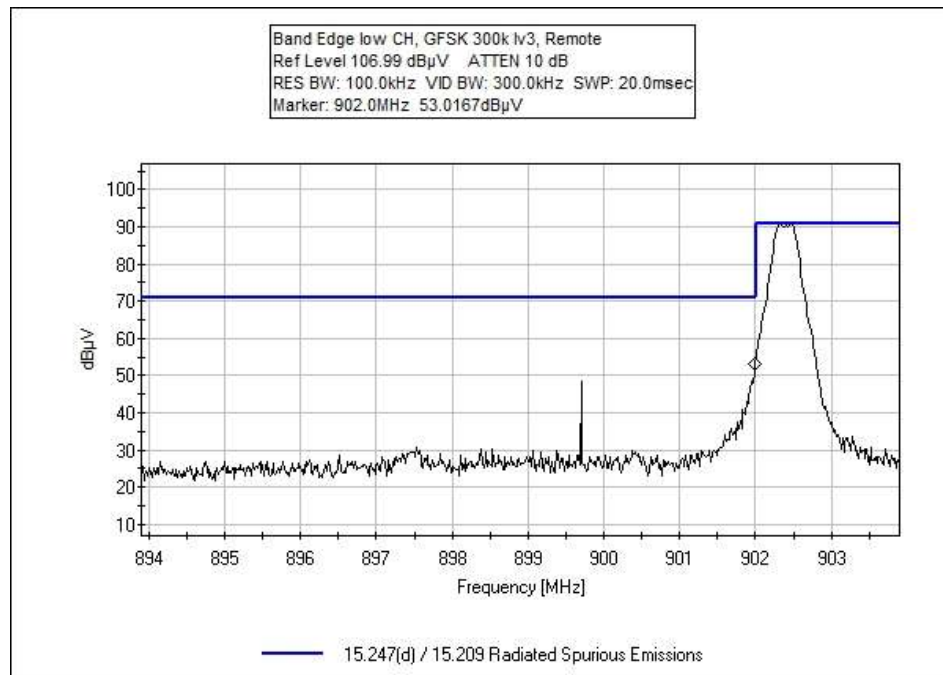
Configuration 2

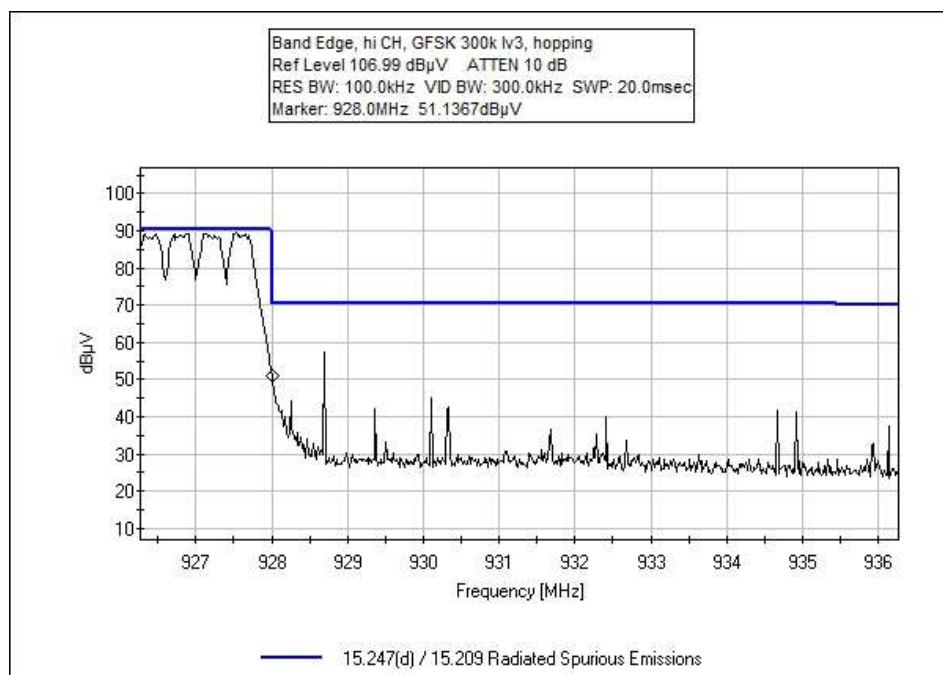
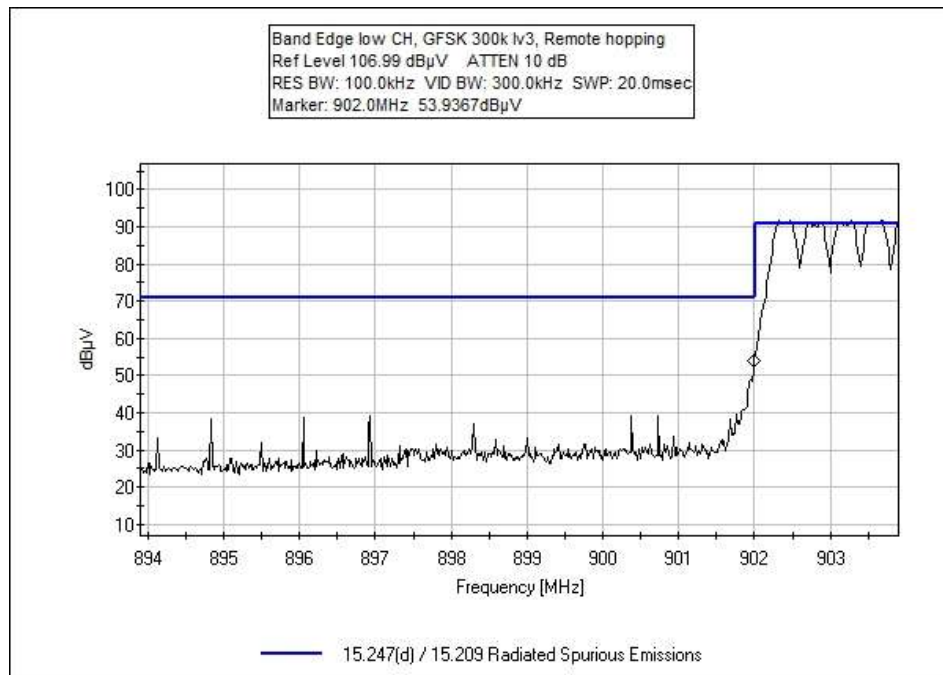




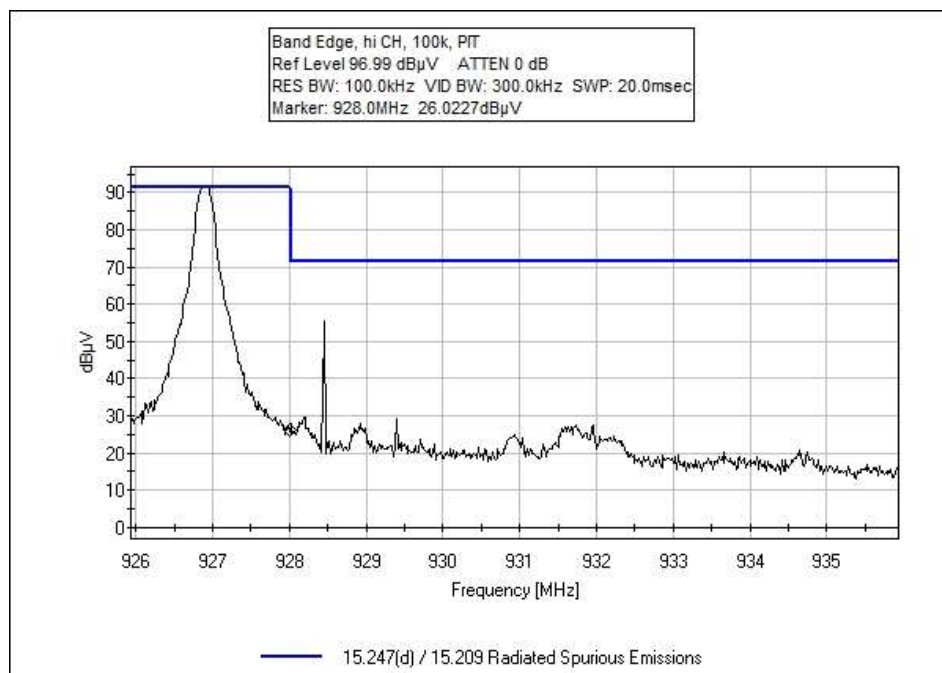
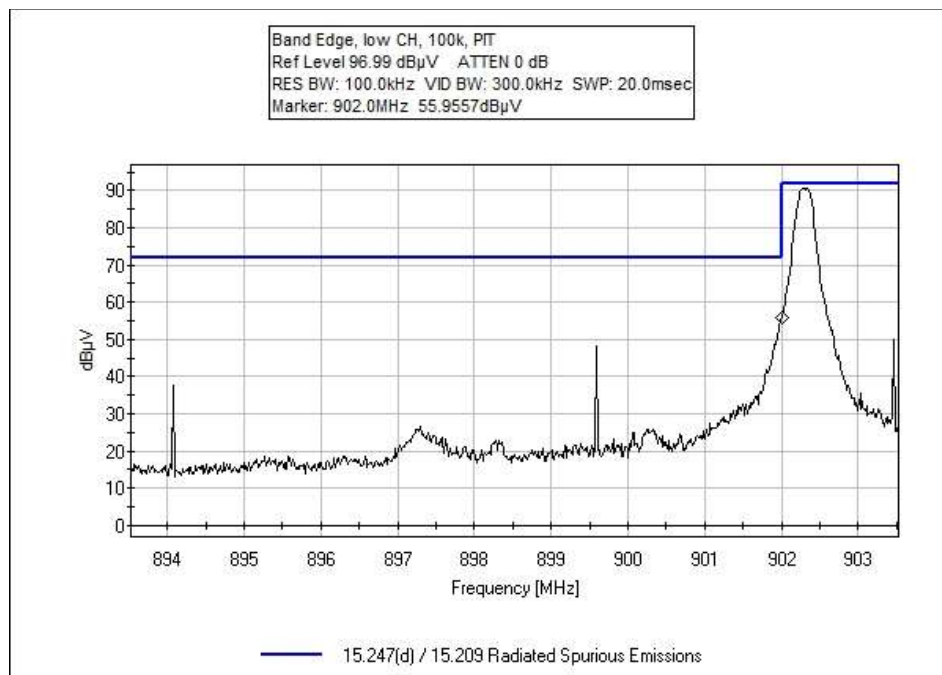


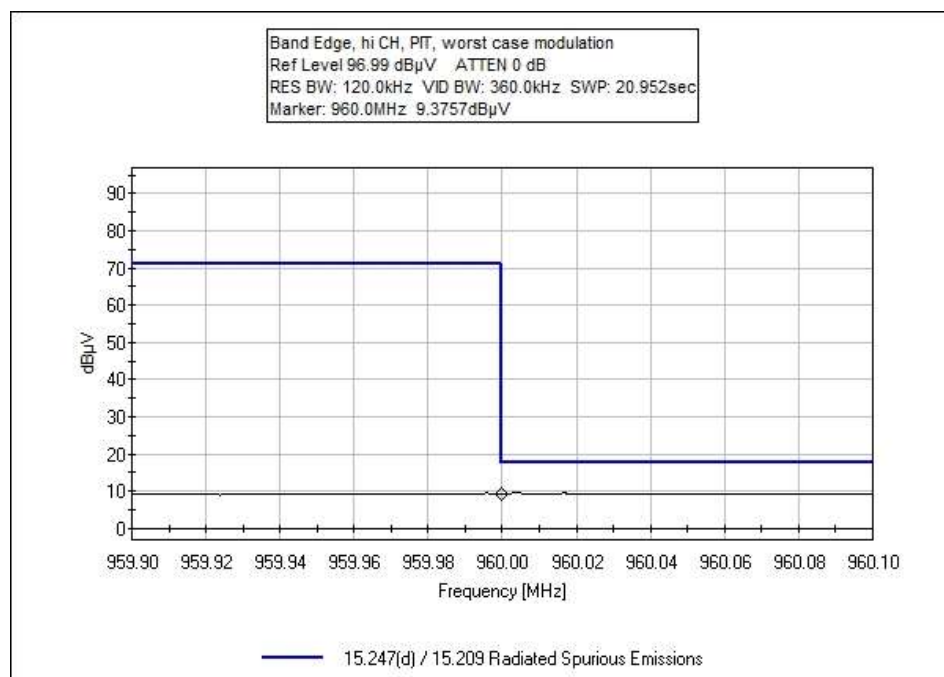
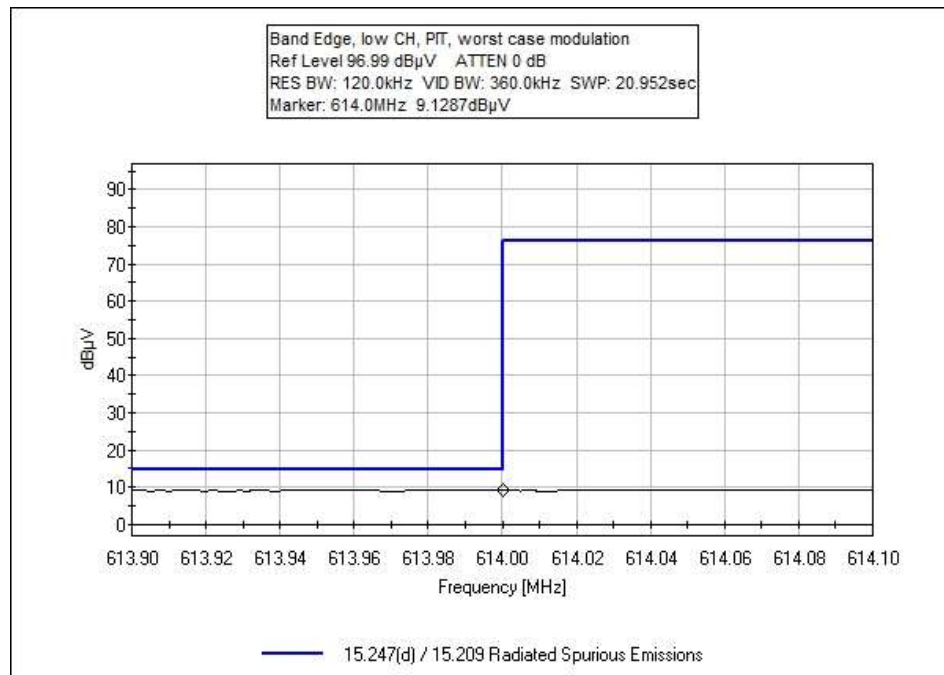


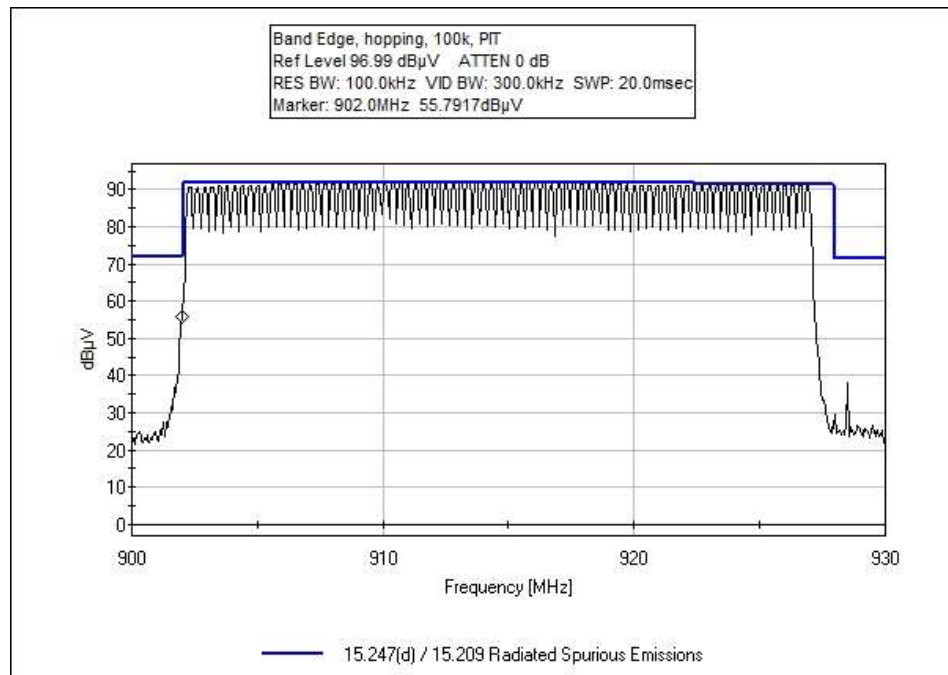


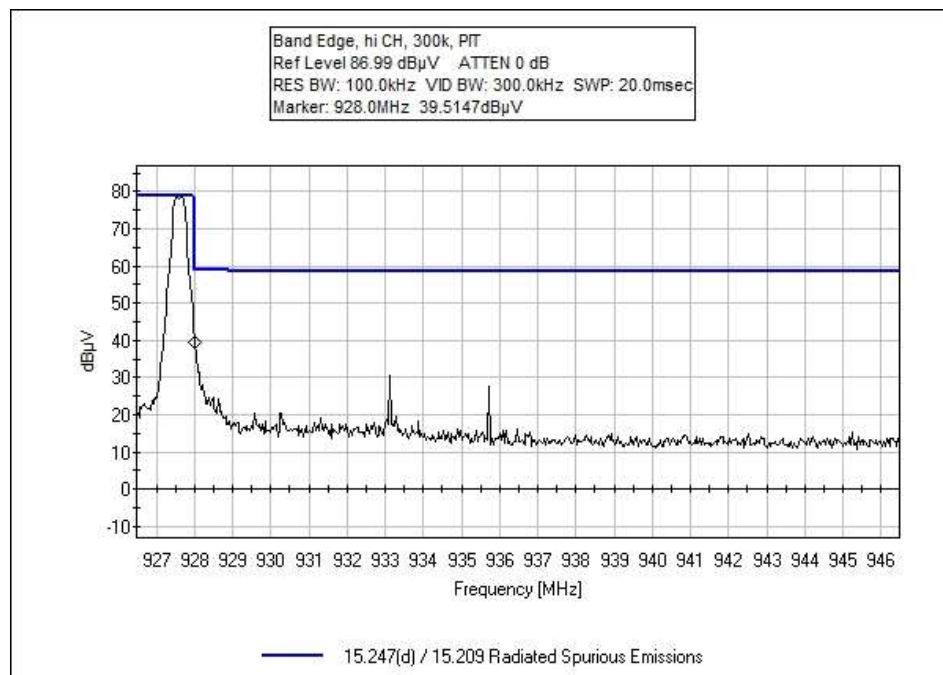
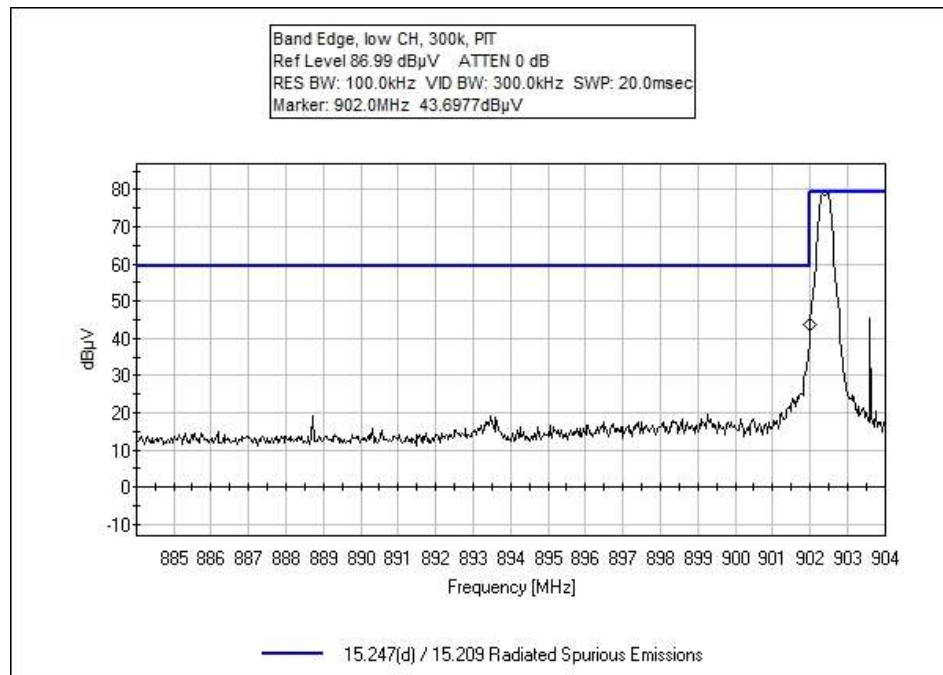


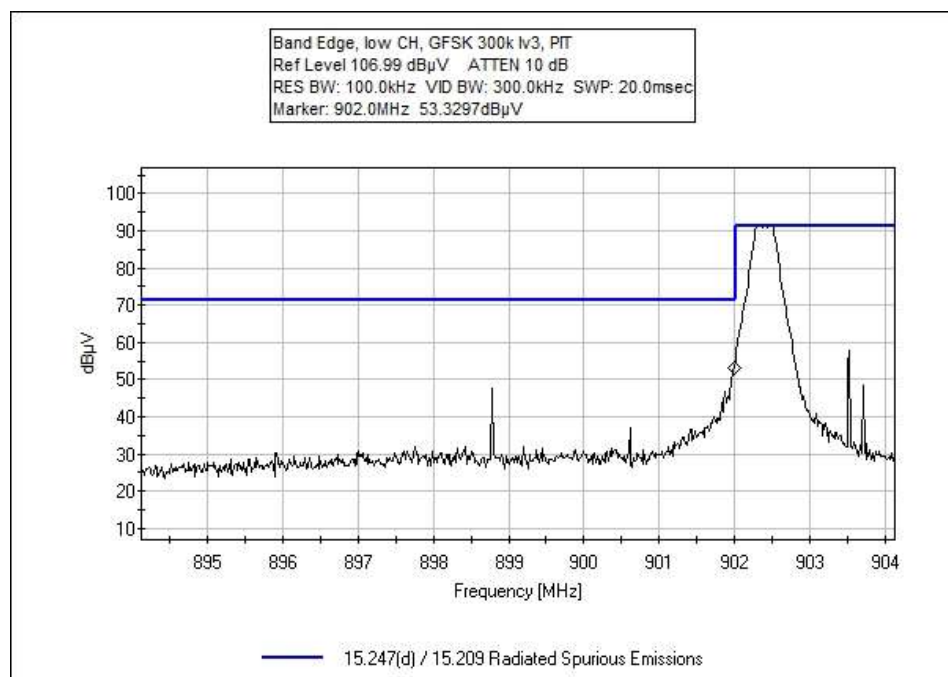
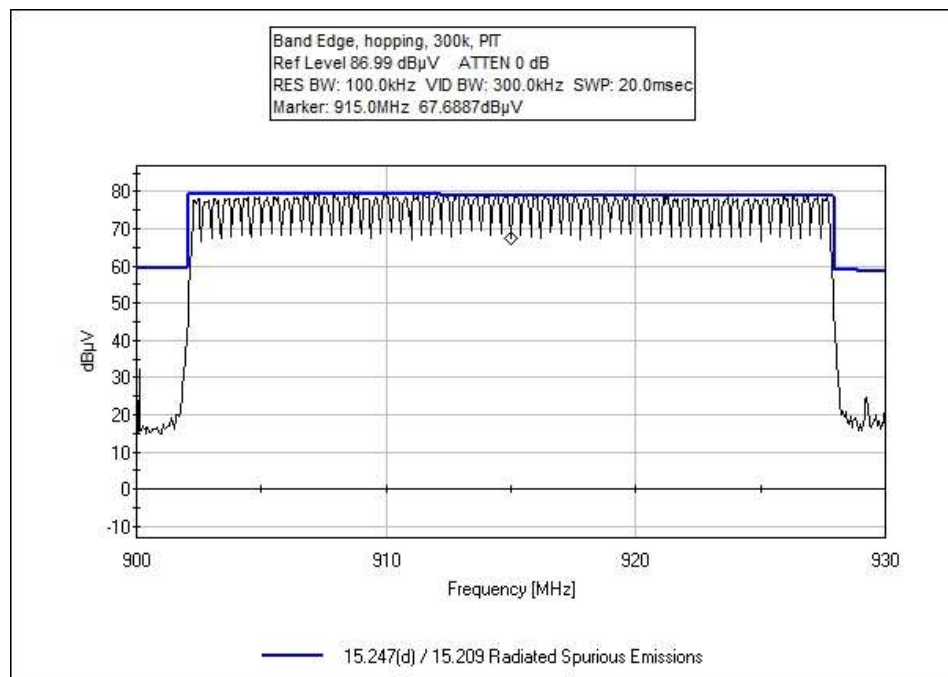
Configuration 3

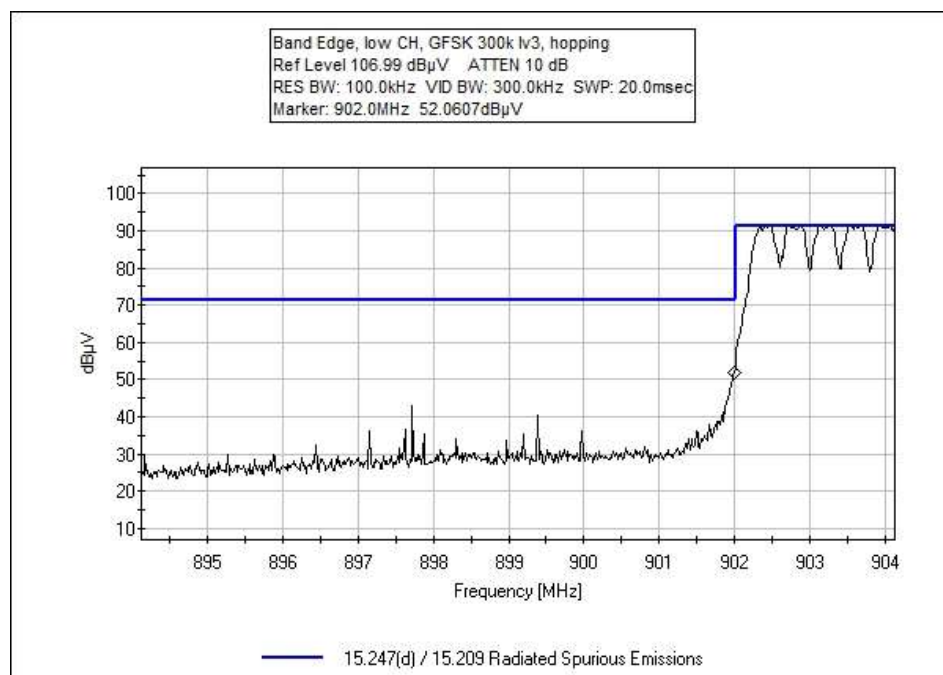
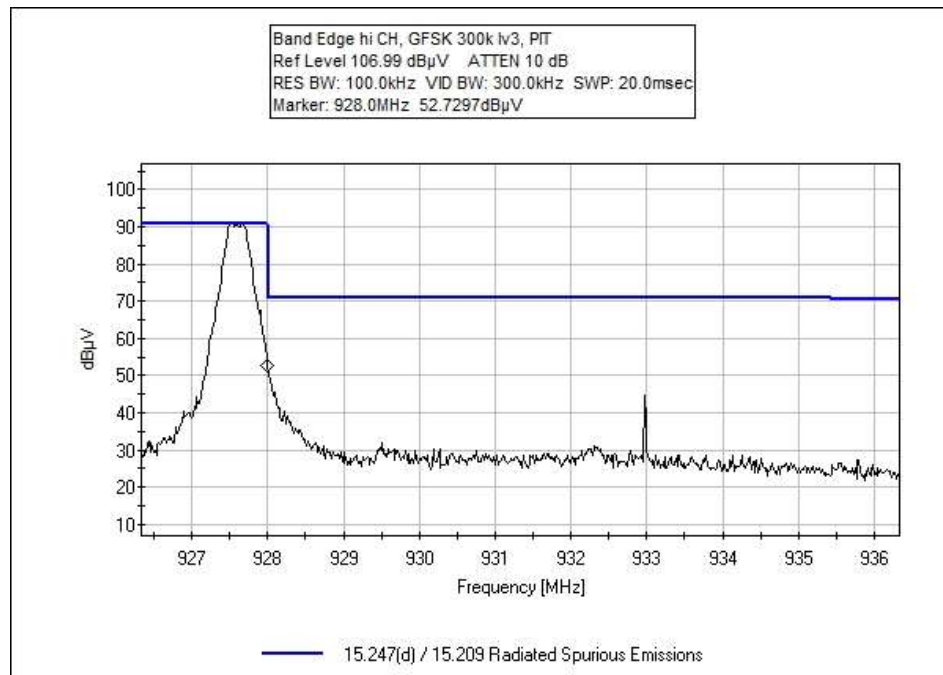


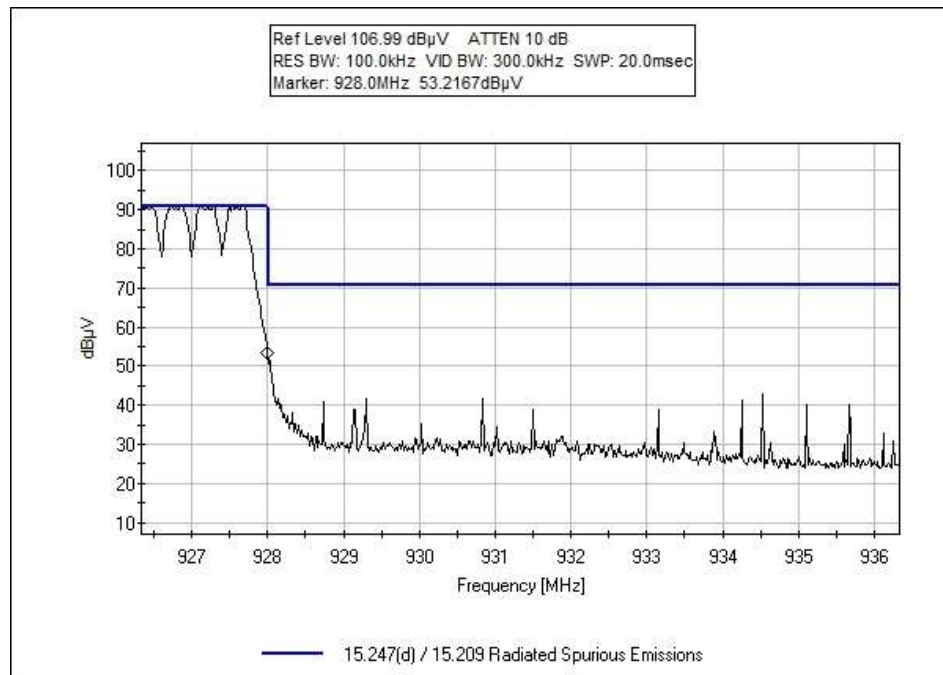




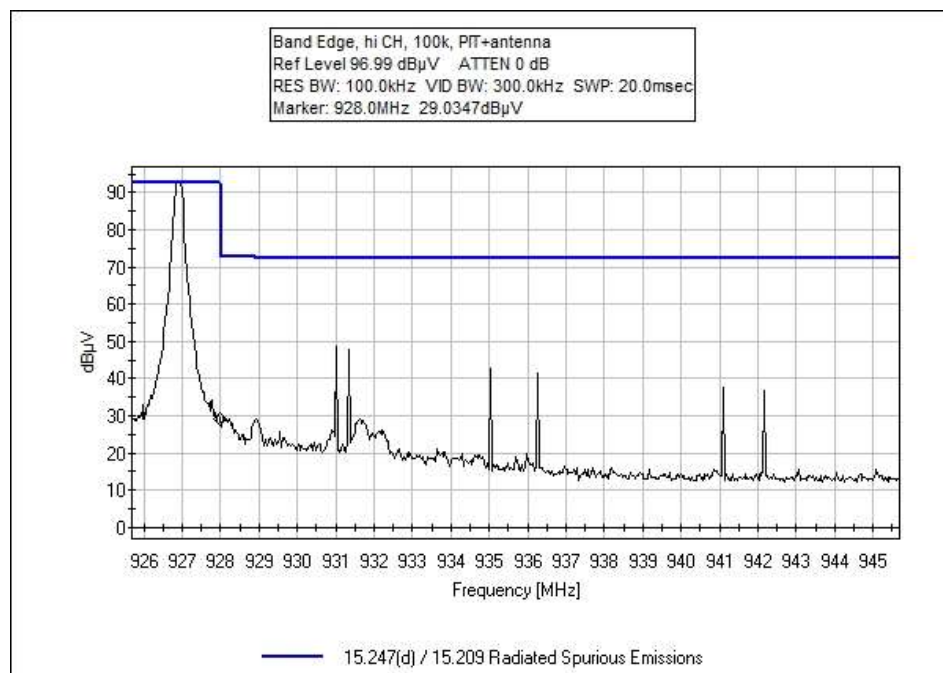
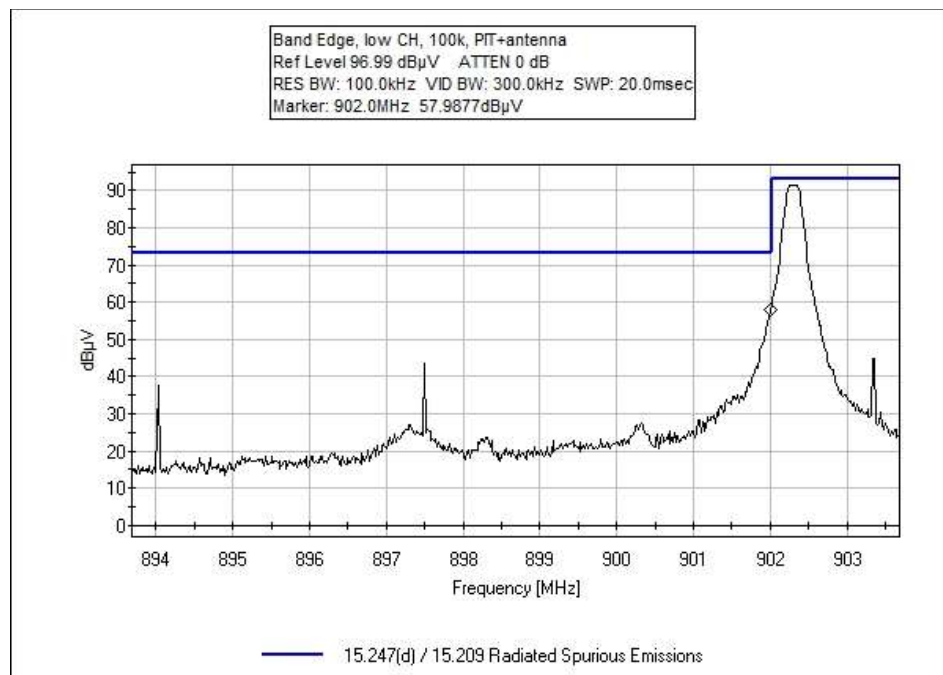


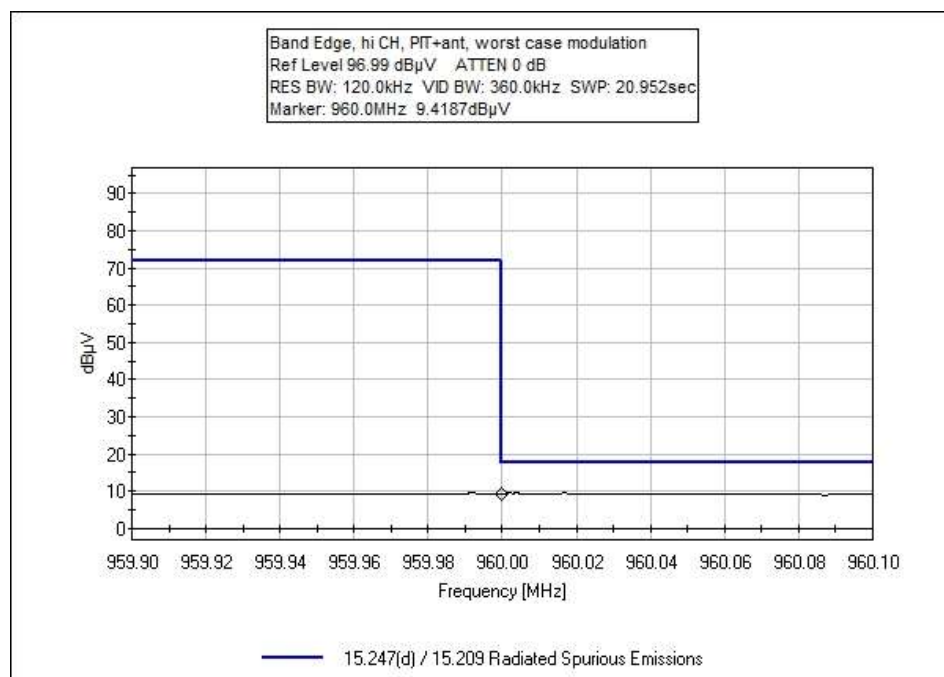
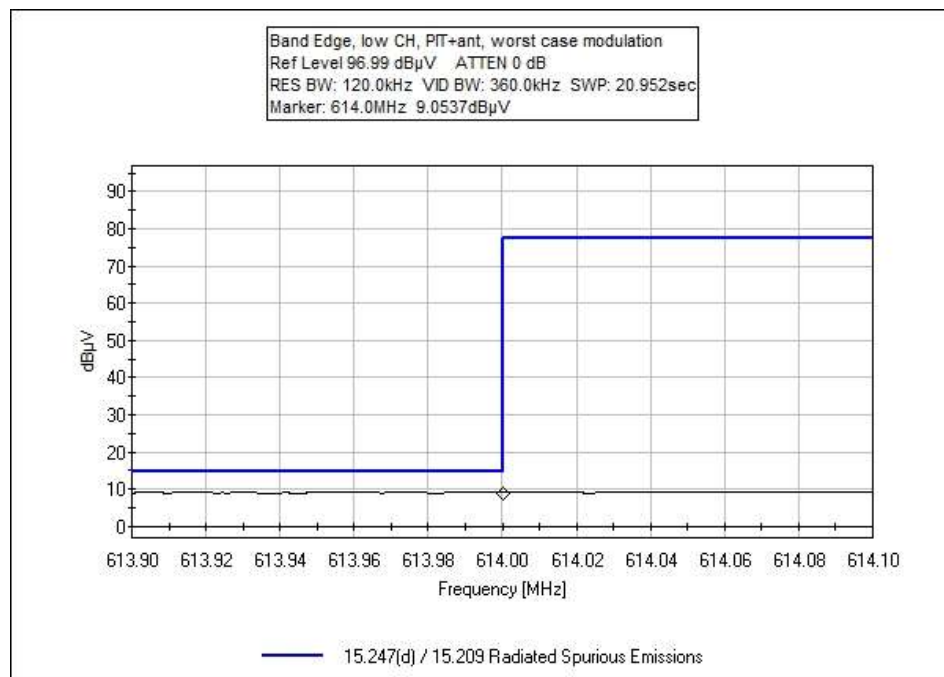


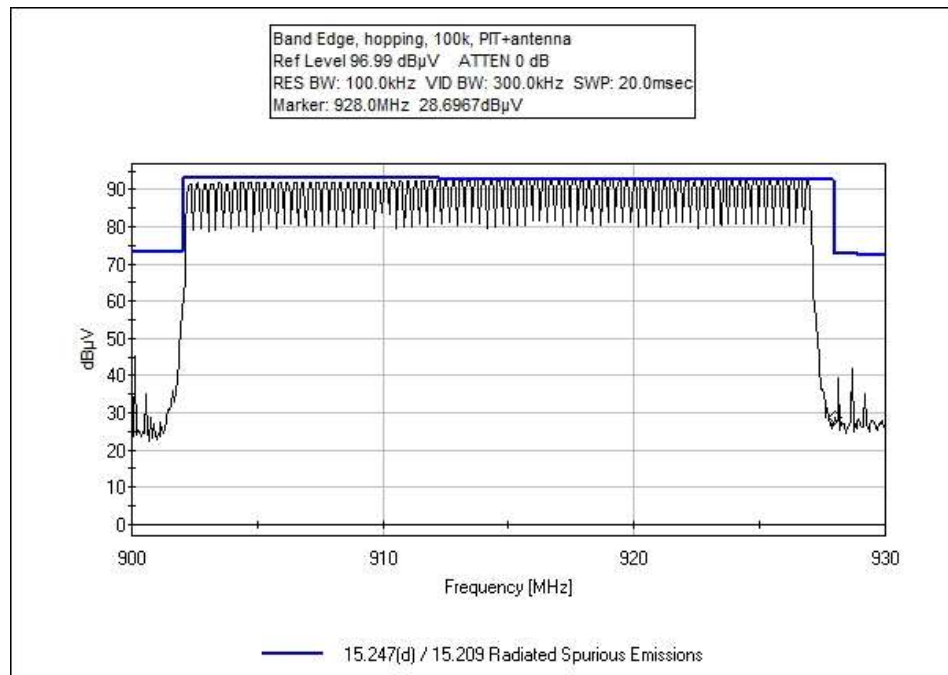


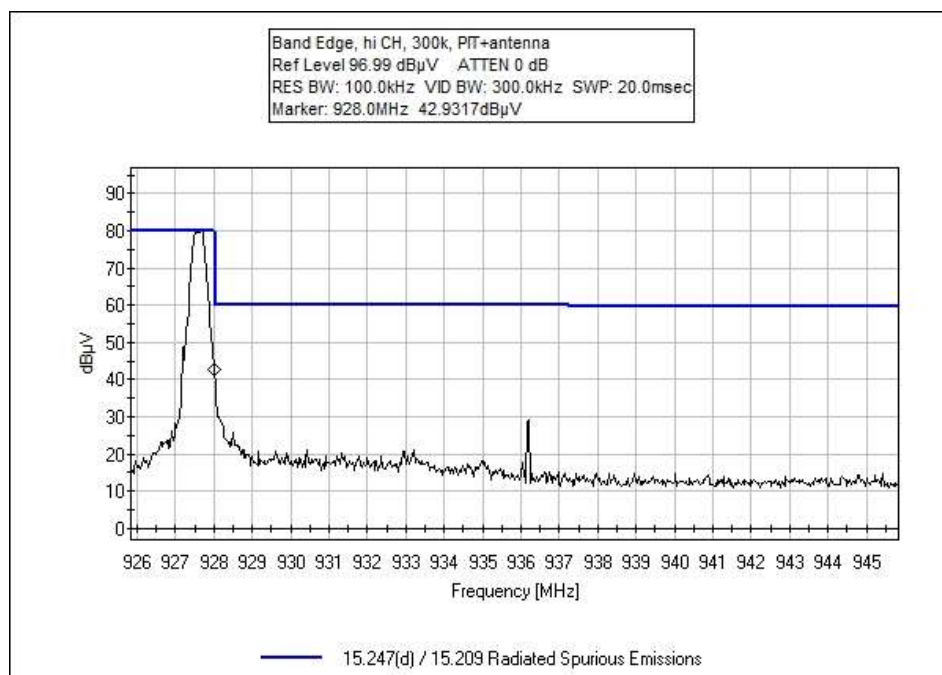
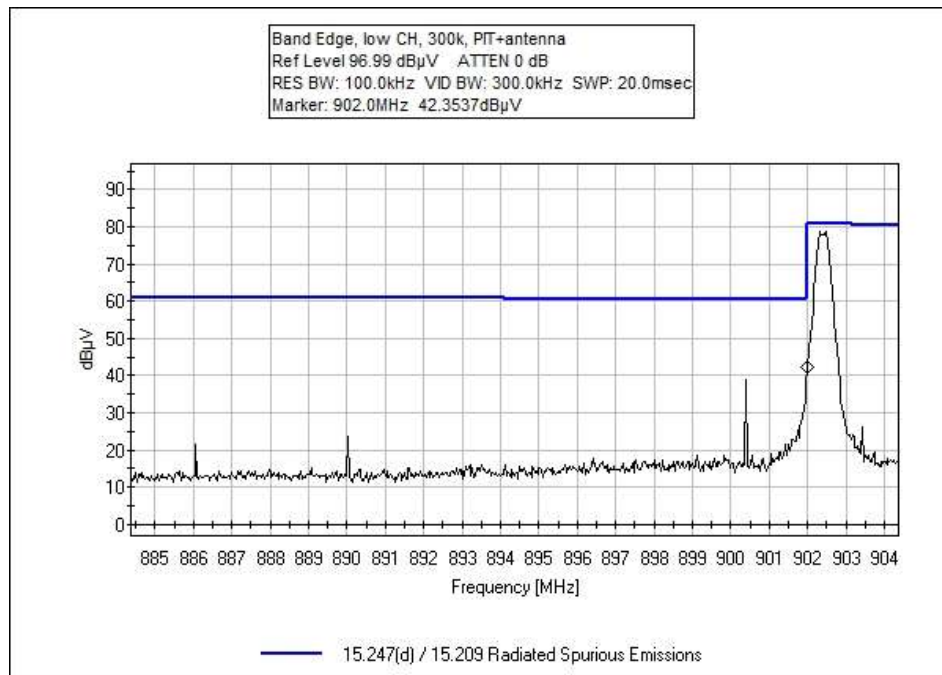


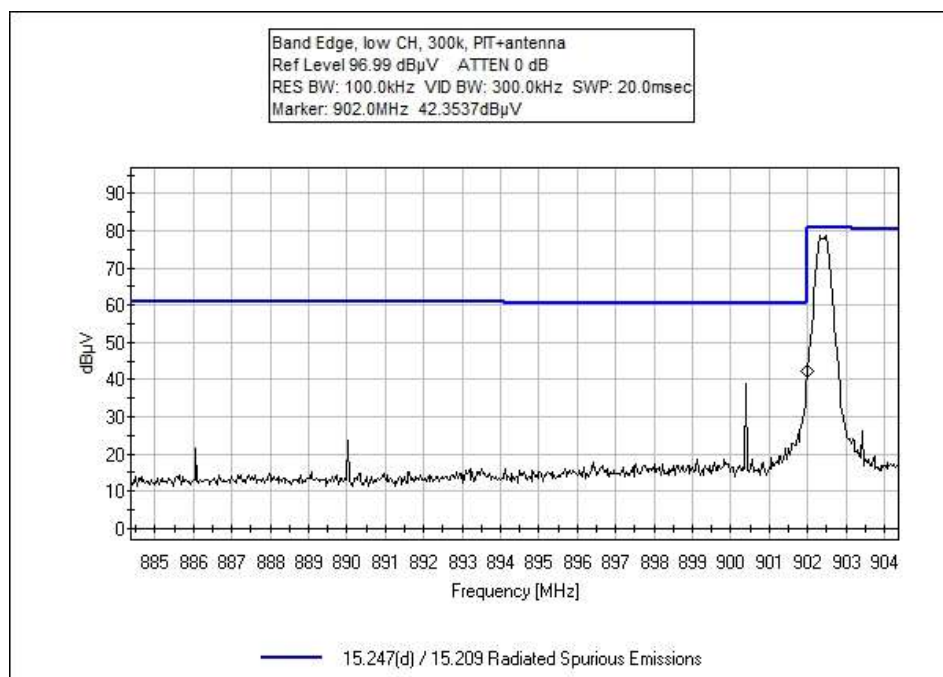
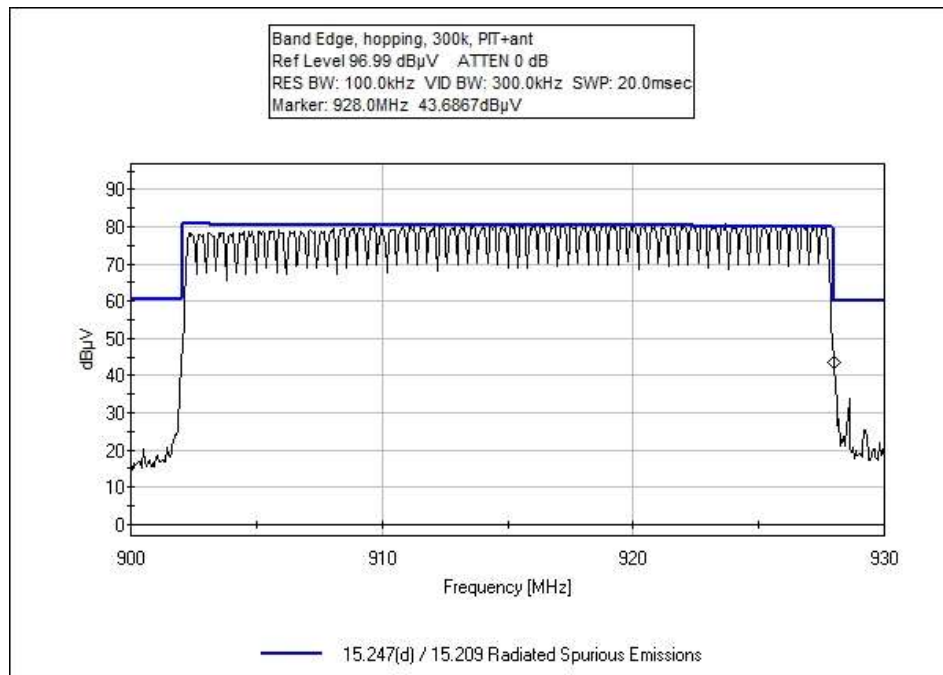
Configuration 4

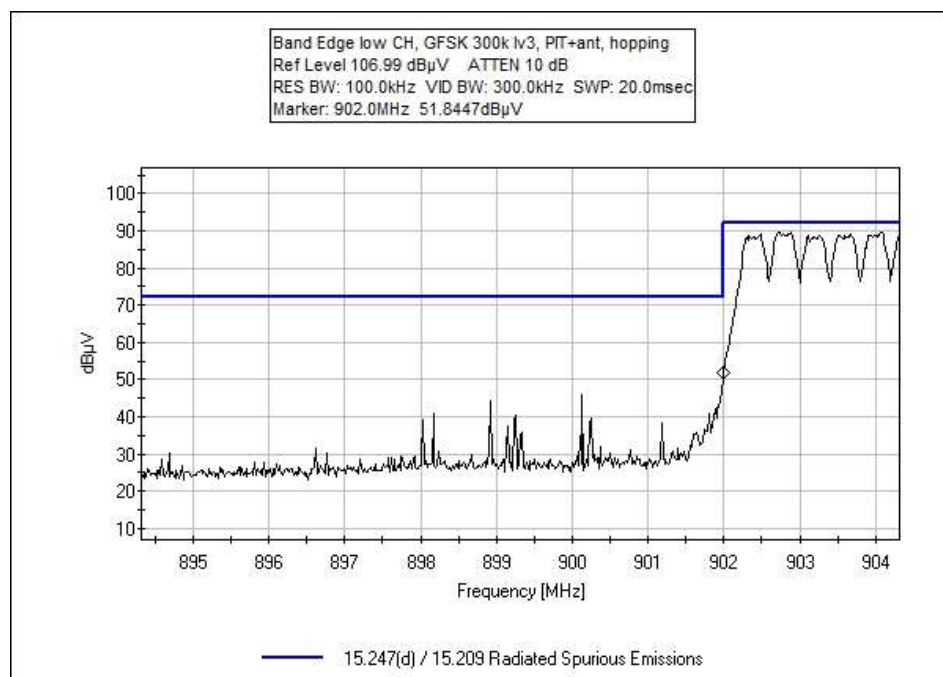
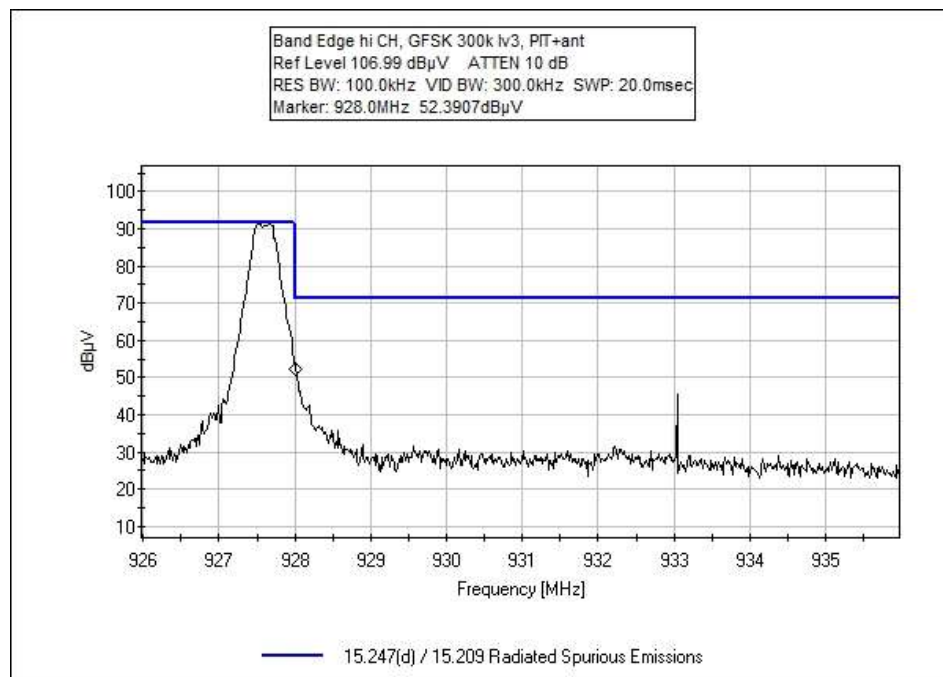


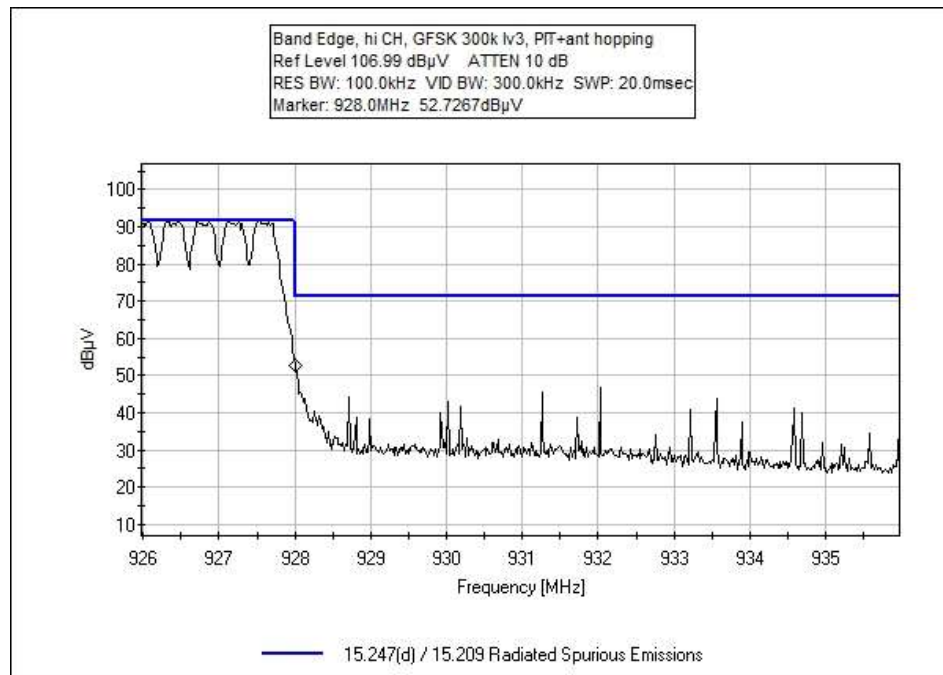




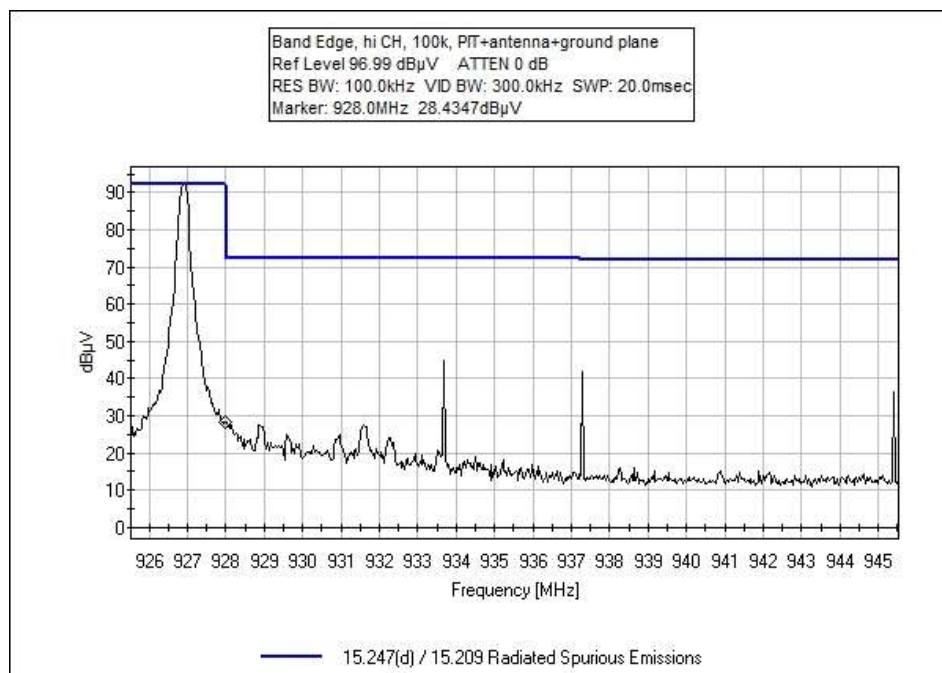
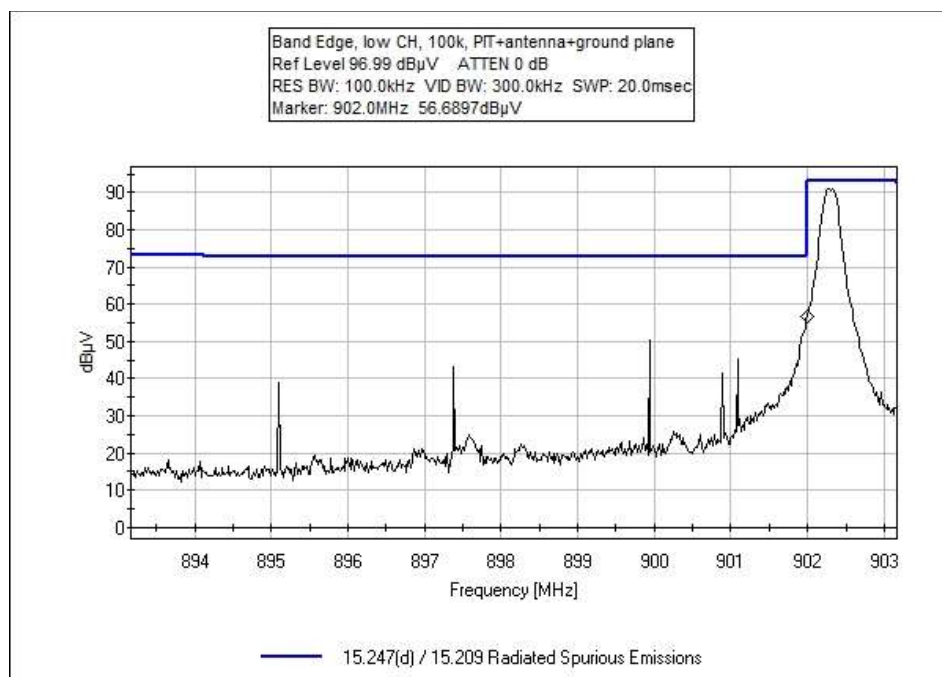


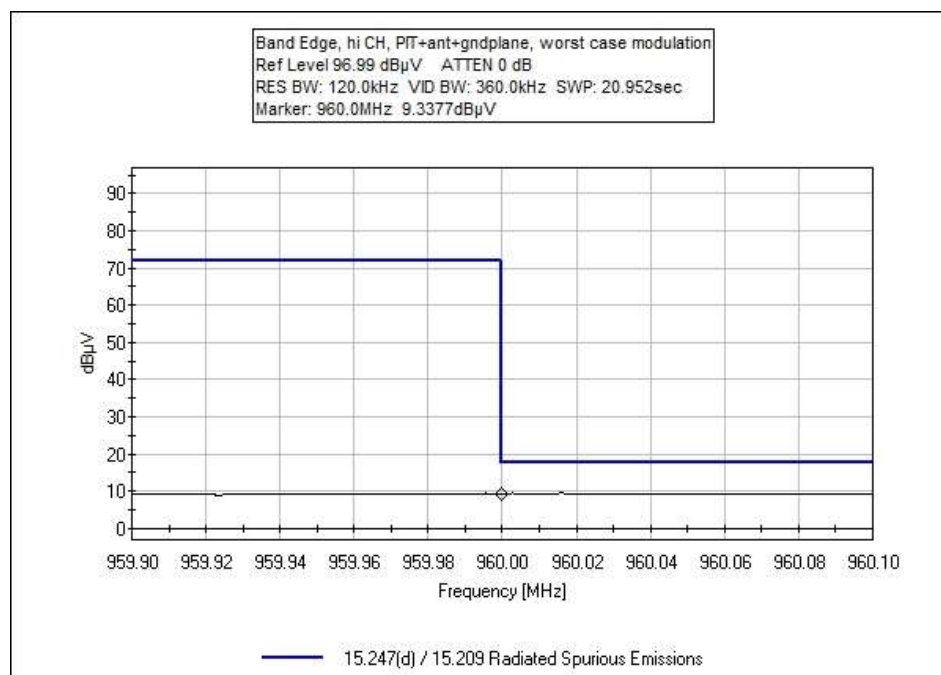
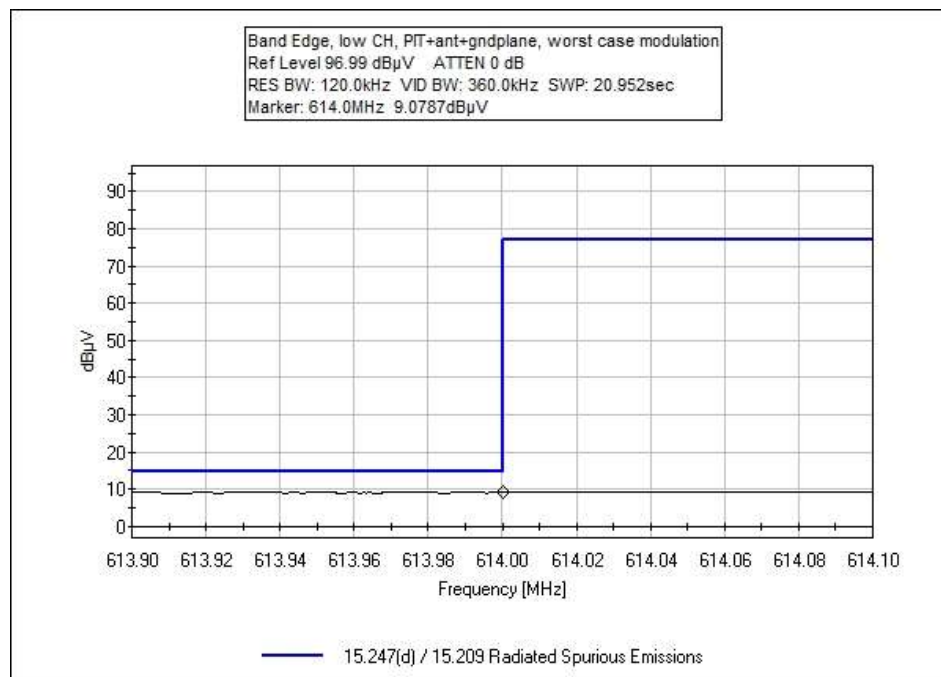


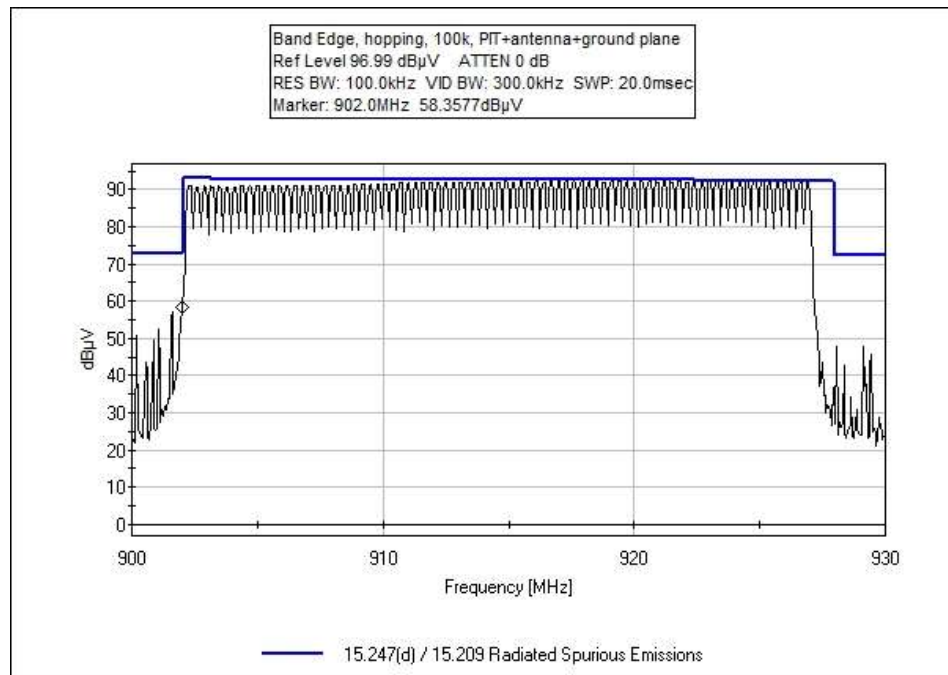


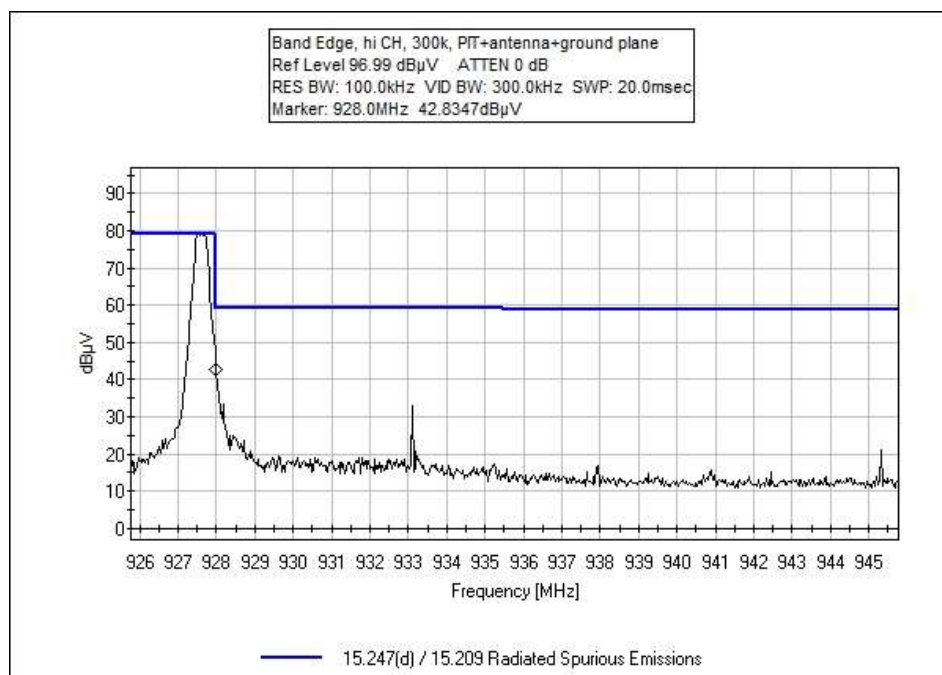
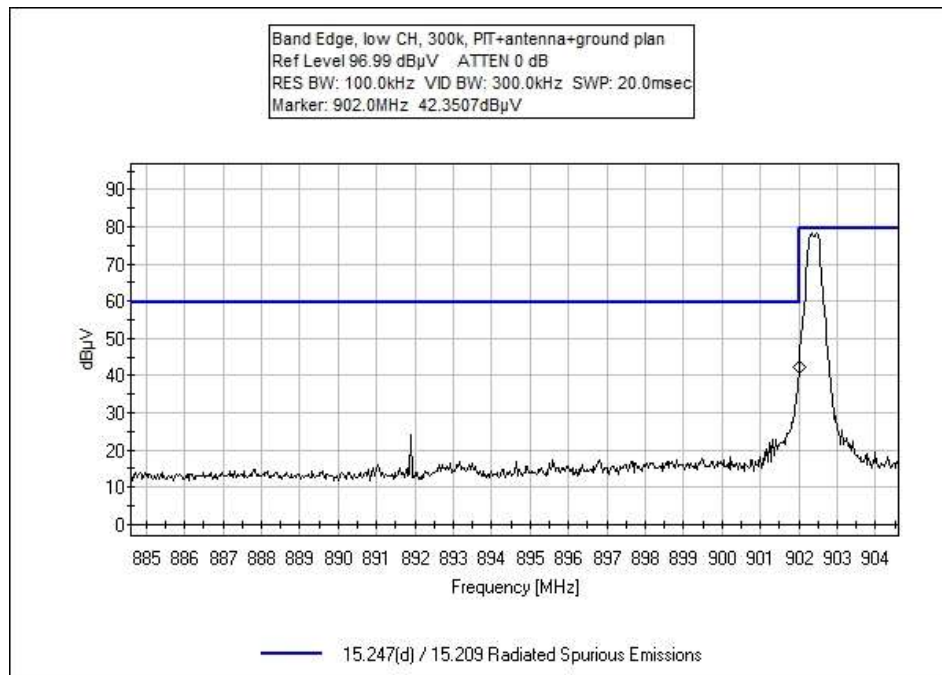


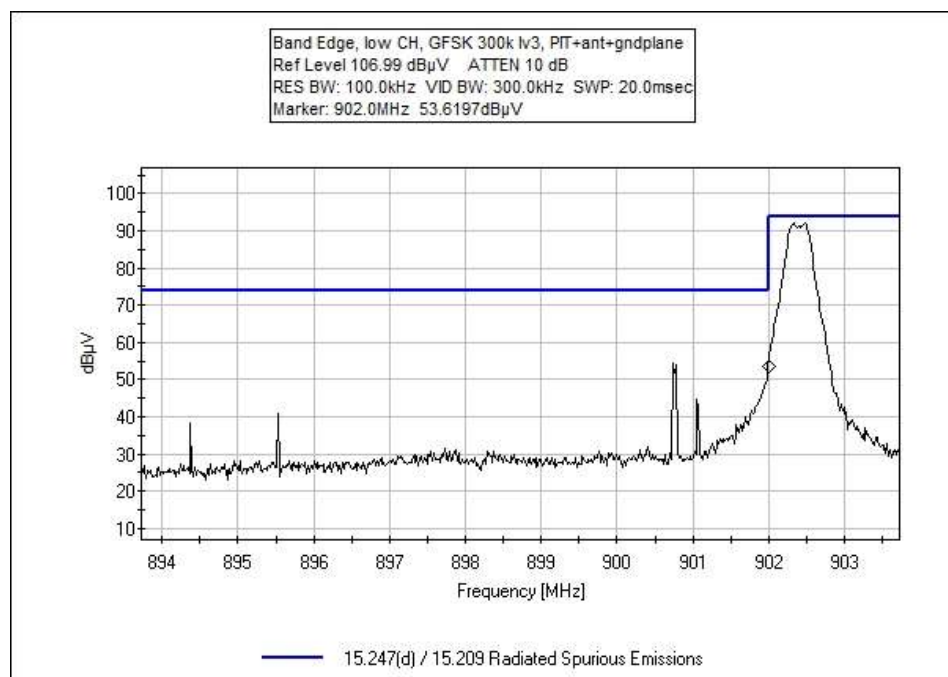
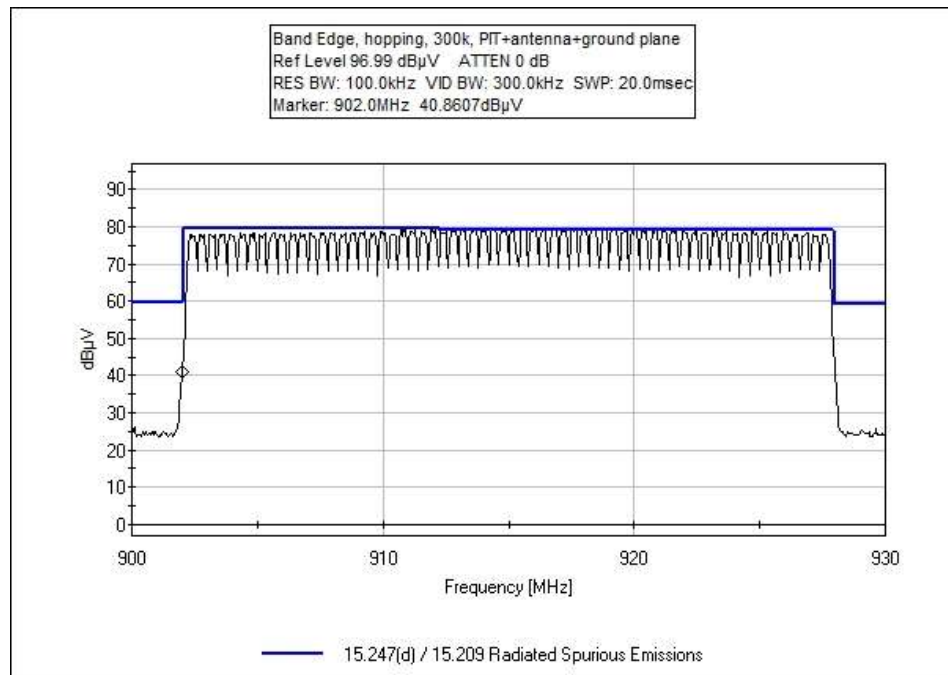
Configuration 5

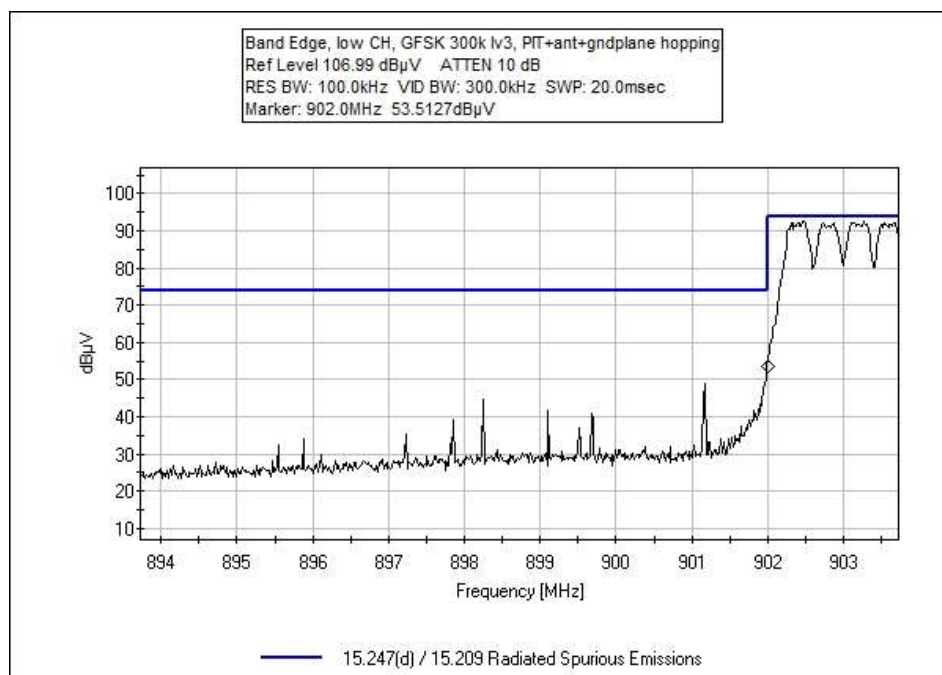
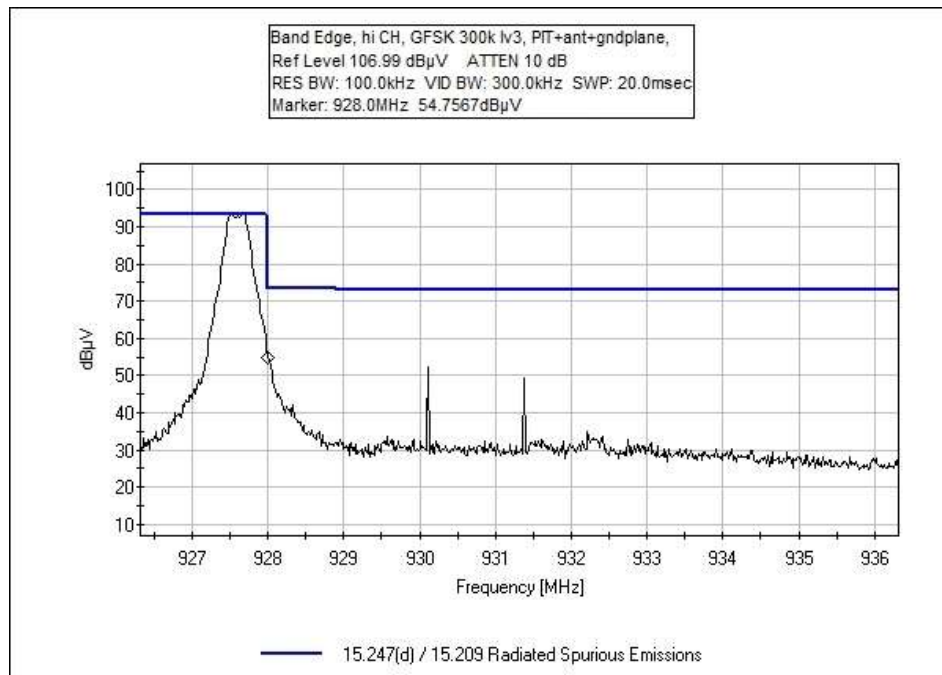


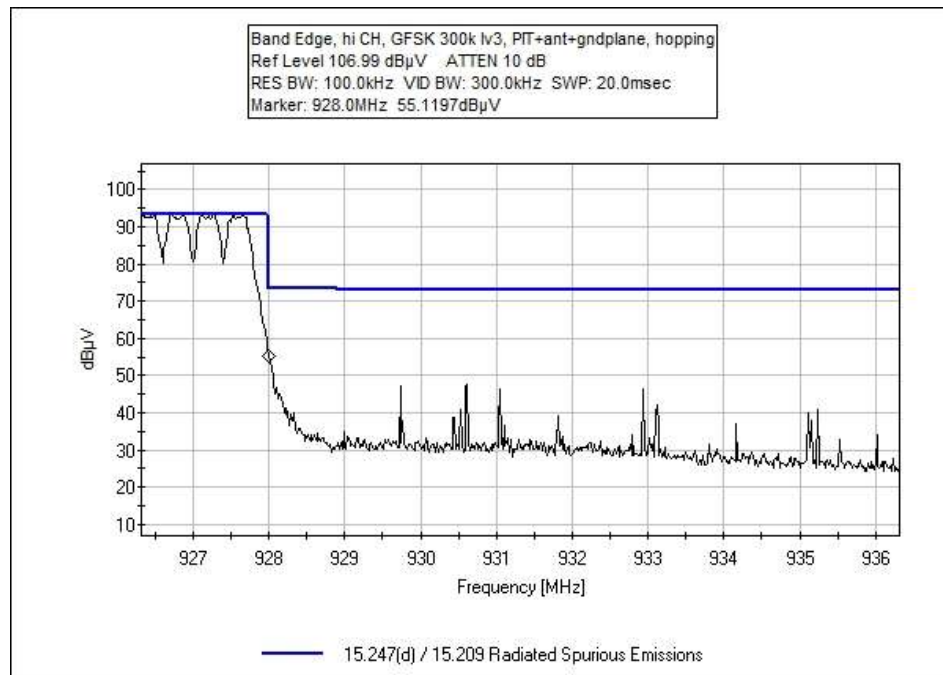












Test Setup / Conditions / Data

Test Location: CKC Laboratories, Inc. • 110 N. Olinda Place • Brea, CA 92823 • 714-993-6112
 Customer: **Itron, Inc.**
 Specification: **15.247(d) / 15.209 Radiated Spurious Emissions**
 Work Order #: **99218** Date: 11/5/2018
 Test Type: **Maximized Emissions** Time: 14:42:57
 Tested By: Don Nguyen Sequence#: 1
 Software: EMITest 5.03.11

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 2			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 2			

Test Conditions / Notes:

The EUT is placed on table top. The serial port is connected to a support laptop via serial to USB adapter.
 The laptop is running software Command Line Interface Tool to turn on TX at 100% duty cycle.
 The EUT is powered from fresh battery 6.0Vdc. Support equipment is removed during test.

Modulation: 100kbps FSK.

Frequency of measurement: 902-928MHz
 RBW=100kHz, VBW=300kHz (-20dBc limit)
 RBW=120kHz, VBW=360kHz (restricted band limit)
 Site A, Test Method: ANSI C63.10 (2013)
 Temperature: 25.0°C, Relative Humidity: 44.8%

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN01995	Biconilog Antenna	CBL6111C	4/23/2018	4/23/2020
T2	ANP05275	Attenuator	1W	4/5/2018	4/5/2020
T3	ANP05050	Cable	RG223/U	1/20/2017	1/20/2019
T4	ANP05198	Cable-Amplitude +15C to +45C (dB)	8268	12/7/2016	12/7/2018
T5	AN02672	Spectrum Analyzer	E4446A	3/2/2017	3/2/2019

Measurement Data:

Reading listed by margin.

Test Distance: 3 Meters

#	Freq	Rdng	T1	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dBμV	T5 dB	dB	dB	dB	Table	dBμV/m	dBμV/m	dB	Ant
1	614.000M	9.1	+20.0	+6.0	+0.4	+4.7	+0.0	40.2	46.0	-5.8	Vert
	QP		+0.0								
2	960.000M	9.4	+23.7	+6.1	+0.5	+6.1	+0.0	45.8	54.0	-8.2	Vert
	QP		+0.0								
3	902.000M	55.6	+22.8	+6.1	+0.5	+5.9	+0.0	90.9	107.4	-16.5	Vert
			+0.0								
4	902.000M	54.4	+22.8	+6.1	+0.5	+5.9	+0.0	89.7	107.4	-17.7	Vert
			+0.0						Hopping		
5	928.000M	27.6	+23.2	+6.1	+0.5	+6.0	+0.0	63.4	107.4	-44.0	Vert
			+0.0								
6	928.000M	27.0	+23.2	+6.1	+0.5	+6.0	+0.0	62.8	107.4	-44.6	Vert
			+0.0						Hopping		

Test Location: CKC Laboratories, Inc. • 110 N. Olinda Place • Brea, CA 92823 • 714-993-6112
 Customer: **Itron, Inc.**
 Specification: **15.247(d) / 15.209 Radiated Spurious Emissions**
 Work Order #: **99218** Date: 11/5/2018
 Test Type: **Maximized Emissions** Time: 14:22:32
 Tested By: Don Nguyen Sequence#: 7
 Software: EMITest 5.03.11

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 3			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 3			

Test Conditions / Notes:

The EUT is placed on table top. The serial port is connected to a support laptop via serial to USB adapter.
 The laptop is running software Command Line Interface Tool to turn on TX at 100% duty cycle.
 The EUT is powered from fresh battery 6.0Vdc. Support equipment is removed during test.

Modulation: 100kbps FSK

Frequency of measurement: 902-928MHz
 RBW=100kHz, VBW=300kHz (-20dBc limit)
 RBW=120kHz, VBW=360kHz (restricted band limit)
 Site A, Test Method: ANSI C63.10 (2013)
 Temperature: 24.8°C, Relative Humidity: 42.5%

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN01995	Biconilog Antenna	CBL6111C	4/23/2018	4/23/2020
T2	ANP05275	Attenuator	1W	4/5/2018	4/5/2020
T3	ANP05050	Cable	RG223/U	1/20/2017	1/20/2019
T4	ANP05198	Cable-Amplitude +15C to +45C (dB)	8268	12/7/2016	12/7/2018
T5	AN02672	Spectrum Analyzer	E4446A	3/2/2017	3/2/2019

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

#	Freq	Rdng	T1 T5	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dBμV	dB	dB	dB	dB	Table	dBμV/m	dBμV/m	dB	Ant
1	614.000M	9.1	+20.0 +0.0	+6.0	+0.4	+4.7	+0.0	40.2	46.0	-5.8	Vert
	QP										
2	960.000M	9.4	+23.7 +0.0	+6.1	+0.5	+6.1	+0.0	45.8	54.0	-8.2	Vert
	QP										
3	902.000M	56.0	+22.8 +0.0	+6.1	+0.5	+5.9	+0.0	91.3	107.4	-16.1	Vert
4	902.000M	55.8	+22.8 +0.0	+6.1	+0.5	+5.9	+0.0	91.1	107.4 Hopping	-16.3	Vert
5	928.000M	29.8	+23.2 +0.0	+6.1	+0.5	+6.0	+0.0	65.6	107.4 Hopping	-41.8	Vert
6	928.000M	26.0	+23.2 +0.0	+6.1	+0.5	+6.0	+0.0	61.8	107.4	-45.6	Vert

Test Location: CKC Laboratories, Inc. • 110 N. Olinda Place • Brea, CA 92823 • 714-993-6112
 Customer: **Itron, Inc.**
 Specification: **15.247(d) / 15.209 Radiated Spurious Emissions**
 Work Order #: **99218** Date: 11/5/2018
 Test Type: **Maximized Emissions** Time: 15:22:49
 Tested By: Don Nguyen Sequence#: 8
 Software: EMITest 5.03.11

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 4			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 4			

Test Conditions / Notes:

The EUT is placed on table top. The serial port is connected to a support laptop via serial to USB adapter.
 The laptop is running software Command Line Interface Tool to turn on TX at 100% duty cycle.
 The EUT is powered from fresh battery 6.0Vdc. Support equipment is removed during test.

Modulation: 100kbps FSK

Frequency of measurement: 902-928MHz
 RBW=100kHz, VBW=300kHz (-20dBc limit)
 RBW=120kHz, VBW=360kHz (restricted band limit)
 Site A, Test Method: ANSI C63.10 (2013)
 Temperature: 24.8°C, Relative Humidity: 42.5%

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN01995	Biconilog Antenna	CBL6111C	4/23/2018	4/23/2020
T2	ANP05275	Attenuator	1W	4/5/2018	4/5/2020
T3	ANP05050	Cable	RG223/U	1/20/2017	1/20/2019
T4	ANP05198	Cable-Amplitude +15C to +45C (dB)	8268	12/7/2016	12/7/2018
T5	AN02672	Spectrum Analyzer	E4446A	3/2/2017	3/2/2019

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

#	Freq	Rdng	T1 T5	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dBμV	dB	dB	dB	dB	Table	dBμV/m	dBμV/m	dB	Ant
1	614.000M QP	9.1	+20.0 +0.0	+6.0	+0.4	+4.7	+0.0	40.2	46.0	-5.8	Vert
2	960.000M QP	9.4	+23.7 +0.0	+6.1	+0.5	+6.1	+0.0	45.8	54.0	-8.2	Vert
3	902.000M	58.0	+22.8 +0.0	+6.1	+0.5	+5.9	+0.0	93.3	108.5	-15.2	Vert
4	902.000M	58.0	+22.8 +0.0	+6.1	+0.5	+5.9	+0.0	93.3	108.5 Hopping	-15.2	Vert
5	928.000M	29.0	+23.2 +0.0	+6.1	+0.5	+6.0	+0.0	64.8	108.5	-43.7	Vert
6	928.000M	28.7	+23.2 +0.0	+6.1	+0.5	+6.0	+0.0	64.5	108.5 Hopping	-44.0	Vert

Test Location: CKC Laboratories, Inc. • 110 N. Olinda Place • Brea, CA 92823 • 714-993-6112
 Customer: **Itron, Inc.**
 Specification: **15.247(d) / 15.209 Radiated Spurious Emissions**
 Work Order #: **99218** Date: 11/6/2018
 Test Type: **Maximized Emissions** Time: 09:25:39
 Tested By: Don Nguyen Sequence#: 10
 Software: EMITest 5.03.11

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 5			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 5			

Test Conditions / Notes:

The EUT is placed on table top. The serial port is connected to a support laptop via serial to USB adapter. The laptop is running software Command Line Interface Tool to turn on TX at 100% duty cycle. The EUT is powered from fresh battery 6.0Vdc. Support equipment is removed during test. Modulation: 100kbps FSK Frequency of measurement: 902-928MHz RBW=100kHz, VBW=300kHz (-20dBc limit) RBW=120kHz, VBW=360kHz (restricted band limit) Site A, Test Method: ANSI C63.10 (2013) Temperature: 21.9°C, Relative Humidity: 52.4%

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN01995	Biconilog Antenna	CBL6111C	4/23/2018	4/23/2020
T2	ANP05275	Attenuator	1W	4/5/2018	4/5/2020
T3	ANP05050	Cable	RG223/U	1/20/2017	1/20/2019
T4	ANP05198	Cable-Amplitude +15C to +45C (dB)	8268	12/7/2016	12/7/2018
T5	AN02672	Spectrum Analyzer	E4446A	3/2/2017	3/2/2019

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

#	Freq	Rdng	T1 T5	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dBμV	dB	dB	dB	dB	Table	dBμV/m	dBμV/m	dB	Ant
1	614.000M QP	9.1	+20.0 +0.0	+6.0	+0.4	+4.7	+0.0	40.2	46.0	-5.8	Vert
2	960.000M QP	9.3	+23.7 +0.0	+6.1	+0.5	+6.1	+0.0	45.7	54.0	-8.3	Vert
3	902.000M	58.3	+22.8 +0.0	+6.1	+0.5	+5.9	+0.0	93.7	108.3 Hopping	-14.7	Vert
4	902.000M	56.7	+22.8 +0.0	+6.1	+0.5	+5.9	+0.0	92.0	108.3	-16.3	Vert
5	928.000M	28.4	+23.2 +0.0	+6.1	+0.5	+6.0	+0.0	64.2	108.3	-44.1	Vert
6	928.000M	24.7	+23.2 +0.0	+6.1	+0.5	+6.0	+0.0	60.5	108.3 Hopping	-47.8	Vert

Test Location: CKC Laboratories, Inc. • 110 N. Olinda Place • Brea, CA 92823 • 714-993-6112
 Customer: **Itron, Inc.**
 Specification: **15.247(d) / 15.209 Radiated Spurious Emissions**
 Work Order #: **99218** Date: 11/5/2018
 Test Type: **Maximized Emissions** Time: 09:15:40
 Tested By: Don Nguyen Sequence#: 0
 Software: EMITest 5.03.11

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 2			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 2			

Test Conditions / Notes:

The EUT is placed on table top. The serial port is connected to a support laptop via serial to USB adapter.
 The laptop is running software Command Line Interface Tool to turn on TX at 100% duty cycle.
 The EUT is powered from fresh battery 6.0Vdc. Support equipment is removed during test.

Modulation: 300kbps Hybrid.

Frequency of measurement: 902-928MHz
 RBW=100kHz, VBW=300kHz (-20dBc limit)
 RBW=120kHz, VBW=360kHz (restricted band limit)
 Site A, Test Method: ANSI C63.10 (2013)
 Temperature: 25.4°C, Relative Humidity: 28.9%

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN01995	Biconilog Antenna	CBL6111C	4/23/2018	4/23/2020
T2	ANP05275	Attenuator	1W	4/5/2018	4/5/2020
T3	ANP05050	Cable	RG223/U	1/20/2017	1/20/2019
T4	ANP05198	Cable-Amplitude +15C to +45C (dB)	8268	12/7/2016	12/7/2018
T5	AN02672	Spectrum Analyzer	E4446A	3/2/2017	3/2/2019

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

#	Freq	Rdng	T1 T5	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dBμV	dB	dB	dB	dB	Table	dBμV/m	dBμV/m	dB	Ant
1	614.000M	12.8	+20.0 +0.0	+6.0	+0.4	+4.7	+0.0	43.9	46.0	-2.1	Vert
2	960.000M	12.6	+23.7 +0.0	+6.1	+0.5	+6.1	+0.0	49.0	54.0	-5.0	Vert
3	928.000M	43.9	+23.2 +0.0	+6.1	+0.5	+6.0	+0.0	79.7	94.7 Hopping	-15.0	Vert
4	902.000M	43.4	+22.8 +0.0	+6.1	+0.5	+5.9	+0.0	78.7	94.7 Hopping	-16.0	Vert
5	902.000M	43.0	+22.8 +0.0	+6.1	+0.5	+5.9	+0.0	78.3	94.7	-16.4	Vert
6	928.000M	41.7	+23.2 +0.0	+6.1	+0.5	+6.0	+0.0	77.5	94.7	-17.2	Vert

Test Location: CKC Laboratories, Inc. • 110 N. Olinda Place • Brea, CA 92823 • 714-993-6112
 Customer: **Itron, Inc.**
 Specification: **15.247(d) / 15.209 Radiated Spurious Emissions**
 Work Order #: **99218** Date: 11/5/2018
 Test Type: **Maximized Emissions** Time: 13:34:57
 Tested By: Don Nguyen Sequence#: 1
 Software: EMITest 5.03.11

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 3			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 3			

Test Conditions / Notes:

The EUT is placed on table top. The serial port is connected to a support laptop via serial to USB adapter. The laptop is running software Command Line Interface Tool to turn on TX at 100% duty cycle. The EUT is powered from fresh battery 6.0Vdc. Support equipment is removed during test. Modulation: 300kbps Hybrid. Frequency of measurement: 902-928MHz RBW=100kHz, VBW=300kHz (-20dBc limit) RBW=120kHz, VBW=360kHz (restricted band limit) Site A, Test Method: ANSI C63.10 (2013) Temperature: 25.4°C, Relative Humidity: 28.9%					
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Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN01995	Biconilog Antenna	CBL6111C	4/23/2018	4/23/2020
T2	ANP05275	Attenuator	1W	4/5/2018	4/5/2020
T3	ANP05050	Cable	RG223/U	1/20/2017	1/20/2019
T4	ANP05198	Cable-Amplitude +15C to +45C (dB)	8268	12/7/2016	12/7/2018
T5	AN02672	Spectrum Analyzer	E4446A	3/2/2017	3/2/2019

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

#	Freq	Rdng	T1 T5	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dBμV	dB	dB	dB	dB	Table	dBμV/m	dBμV/m	dB	Ant
1	614.000M	11.8	+20.0 +0.0	+6.0	+0.4	+4.7	+0.0	42.9	46.0	-3.1	Vert
2	960.000M	12.4	+23.7 +0.0	+6.1	+0.5	+6.1	+0.0	48.8	54.0	-5.2	Vert
3	902.000M	43.7	+22.8 +0.0	+6.1	+0.5	+5.9	+0.0	79.0	94.7	-15.7	Vert
4	902.000M	40.2	+22.8 +0.0	+6.1	+0.5	+5.9	+0.0	75.5	94.7 Hopping	-19.2	Vert
5	928.000M	39.5	+23.2 +0.0	+6.1	+0.5	+6.0	+0.0	75.3	94.7	-19.4	Vert
6	928.000M	38.9	+23.2 +0.0	+6.1	+0.5	+6.0	+0.0	74.7	94.7 Hopping	-20.0	Vert

Test Location: CKC Laboratories, Inc. • 110 N. Olinda Place • Brea, CA 92823 • 714-993-6112
 Customer: **Itron, Inc.**
 Specification: **15.247(d) / 15.209 Radiated Spurious Emissions**
 Work Order #: **99218** Date: 11/5/2018
 Test Type: **Maximized Emissions** Time: 15:44:17
 Tested By: Don Nguyen Sequence#: 8
 Software: EMITest 5.03.11

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 4			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 4			

Test Conditions / Notes:

The EUT is placed on table top. The serial port is connected to a support laptop via serial to USB adapter. The laptop is running software Command Line Interface Tool to turn on TX at 100% duty cycle. The EUT is powered from fresh battery 6.0Vdc. Support equipment is removed during test. Modulation: 300kbps Hybrid Frequency of measurement: 902-928MHz RBW=100kHz, VBW=300kHz (-20dBc limit) RBW=120kHz, VBW=360kHz (restricted band limit) Site A, Test Method: ANSI C63.10 (2013) Temperature: 21.9°C, Relative Humidity: 52.4%			
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Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN01995	Biconilog Antenna	CBL6111C	4/23/2018	4/23/2020
T2	ANP05275	Attenuator	1W	4/5/2018	4/5/2020
T3	ANP05050	Cable	RG223/U	1/20/2017	1/20/2019
T4	ANP05198	Cable-Amplitude +15C to +45C (dB)	8268	12/7/2016	12/7/2018
T5	AN02672	Spectrum Analyzer	E4446A	3/2/2017	3/2/2019

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

#	Freq	Rdng	T1 T5	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dBμV	dB	dB	dB	dB	Table	dBμV/m	dBμV/m	dB	Ant
1	614.000M	12.5	+20.0 +0.0	+6.0	+0.4	+4.7	+0.0	43.6	46.0	-2.4	Vert
2	960.000M	11.3	+23.7 +0.0	+6.1	+0.5	+6.1	+0.0	47.7	54.0	-6.3	Vert
3	928.000M	43.7	+23.2 +0.0	+6.1	+0.5	+6.0	+0.0	79.5	96.0 Hopping	-16.5	Vert
4	928.000M	42.9	+23.2 +0.0	+6.1	+0.5	+6.0	+0.0	78.7	96.0	-17.3	Vert
5	902.000M	43.3	+22.8 +0.0	+6.1	+0.5	+5.9	+0.0	78.6	96.0 Hopping	-17.4	Vert
6	902.000M	42.4	+22.8 +0.0	+6.1	+0.5	+5.9	+0.0	77.7	96.0	-18.3	Vert

Test Location: CKC Laboratories, Inc. • 110 N. Olinda Place • Brea, CA 92823 • 714-993-6112
 Customer: **Itron, Inc.**
 Specification: **15.247(d) / 15.209 Radiated Spurious Emissions**
 Work Order #: **99218** Date: 11/6/2018
 Test Type: **Maximized Emissions** Time: 09:04:46
 Tested By: Don Nguyen Sequence#: 9
 Software: EMITest 5.03.11

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 5			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 5			

Test Conditions / Notes:

The EUT is placed on table top. The serial port is connected to a support laptop via serial to USB adapter. The laptop is running software Command Line Interface Tool to turn on TX at 100% duty cycle. The EUT is powered from fresh battery 6.0Vdc. Support equipment is removed during test. Modulation: 300kbps Hybrid Frequency of measurement: 902-928MHz RBW=100kHz, VBW=300kHz (-20dBc limit) RBW=120kHz, VBW=360kHz (restricted band limit) Site A, Test Method: ANSI C63.10 (2013) Temperature: 21.9°C, Relative Humidity: 52.4%			
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Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN01995	Biconilog Antenna	CBL6111C	4/23/2018	4/23/2020
T2	ANP05275	Attenuator	1W	4/5/2018	4/5/2020
T3	ANP05050	Cable	RG223/U	1/20/2017	1/20/2019
T4	ANP05198	Cable-Amplitude +15C to +45C (dB)	8268	12/7/2016	12/7/2018
T5	AN02672	Spectrum Analyzer	E4446A	3/2/2017	3/2/2019

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

#	Freq	Rdng	T1 T5	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dBμV	dB	dB	dB	dB	Table	dBμV/m	dBμV/m	dB	Ant
1	614.000M	12.5	+20.0 +0.0	+6.0	+0.4	+4.7	+0.0	43.6	46.0	-2.4	Vert
2	960.000M	12.6	+23.7 +0.0	+6.1	+0.5	+6.1	+0.0	49.0	54.0	-5.0	Vert
3	928.000M	42.8	+23.2 +0.0	+6.1	+0.5	+6.0	+0.0	78.6	95.0	-16.4	Vert
4	902.000M	42.4	+22.8 +0.0	+6.1	+0.5	+5.9	+0.0	77.7	95.0	-17.3	Vert
5	928.000M	41.3	+23.2 +0.0	+6.1	+0.5	+6.0	+0.0	77.1	95.0 Hopping	-17.9	Vert
6	902.000M	40.9	+22.8 +0.0	+6.1	+0.5	+5.9	+0.0	76.2	95.0 Hopping	-18.8	Vert

Test Location: CKC Laboratories, Inc. • 110 N. Olinda Place • Brea, CA 92823 • 714-993-6112
 Customer: **Itron, Inc.**
 Specification: **15.247(d) / 15.209 Radiated Spurious Emissions**
 Work Order #: **99218** Date: 12/10/2018
 Test Type: **Maximized Emissions** Time: 16:00:49
 Tested By: Don Nguyen Sequence#: 14
 Software: EMITest 5.03.11

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 2			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 2			

Test Conditions / Notes:

The EUT is placed on table top. The serial port is connected to a support laptop via serial to USB adapter.
 The laptop is running software Command Line Interface Tool to turn on TX at 100% duty cycle.
 The EUT is powered from fresh battery 6.0Vdc. Support equipment is removed during test.

Modulation: 300kbps GFSK power level 3.

Frequency of measurement: 902-928MHz
 RBW=100kHz, VBW=300kHz (-20dBc limit)
 RBW=120kHz, VBW=360kHz (restricted band limit)

Site A

Test Method: ANSI C63.10 (2013)

Temperature: 23.8°C

Relative Humidity: 37.5%

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN01995	Biconilog Antenna	CBL6111C	4/23/2018	4/23/2020
T2	ANP05275	Attenuator	1W	4/5/2018	4/5/2020
T3	AN02672	Spectrum Analyzer	E4446A	3/2/2017	3/2/2019
T4	ANP05050	Cable	RG223/U	1/20/2017	1/20/2019
T5	ANP05198	Cable-Amplitude +15C to +45C (dB)	8268	12/4/2018	12/4/2020

Measurement Data:

Reading listed by margin.

Test Distance: 3 Meters

#	Freq	Rdng	T1 T5	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dBμV	dB	dB	dB	dB	Table	dBμV/m	dBμV/m	dB	Ant
1	902.000M	53.9	+22.8 +5.9	+6.1	+0.0	+0.5	+0.0	89.2	106.3 hopping	-17.1	Vert
2	902.000M	53.0	+22.8 +5.9	+6.1	+0.0	+0.5	+0.0	88.3	106.3	-18.0	Vert
3	928.000M	52.1	+23.2 +6.0	+6.1	+0.0	+0.5	+0.0	87.9	106.3	-18.4	Vert
4	928.000M	51.1	+23.2 +6.0	+6.1	+0.0	+0.5	+0.0	86.9	106.3 hopping	-19.4	Vert

Test Location: CKC Laboratories, Inc. • 110 N. Olinda Place • Brea, CA 92823 • 714-993-6112
 Customer: **Itron, Inc.**
 Specification: **15.247(d) / 15.209 Radiated Spurious Emissions**
 Work Order #: **99218** Date: 12/10/2018
 Test Type: **Maximized Emissions** Time: 15:08:21
 Tested By: Don Nguyen Sequence#: 13
 Software: EMITest 5.03.11

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 3			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 3			

Test Conditions / Notes:

The EUT is placed on table top. The serial port is connected to a support laptop via serial to USB adapter.
 The laptop is running software Command Line Interface Tool to turn on TX at 100% duty cycle.
 The EUT is powered from fresh battery 6.0Vdc. Support equipment is removed during test.

Modulation: 300kbps GFSK power level 3.

Frequency of measurement: 902-928MHz
 RBW=100kHz, VBW=300kHz (-20dBc limit)
 RBW=120kHz, VBW=360kHz (restricted band limit)

Site A

Test Method: ANSI C63.10 (2013)

Temperature: 24.2°C

Relative Humidity: 37.0%

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN01995	Biconilog Antenna	CBL6111C	4/23/2018	4/23/2020
T2	ANP05275	Attenuator	1W	4/5/2018	4/5/2020
T3	AN02672	Spectrum Analyzer	E4446A	3/2/2017	3/2/2019
T4	ANP05050	Cable	RG223/U	1/20/2017	1/20/2019
T5	ANP05198	Cable-Amplitude +15C to +45C (dB)	8268	12/4/2018	12/4/2020

Measurement Data:

Reading listed by margin.

Test Distance: 3 Meters

#	Freq	Rdng	T1 T5	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dBμV	dB	dB	dB	dB	Table	dBμV/m	dBμV/m	dB	Ant
1	928.000M	53.2	+23.2 +6.0	+6.1	+0.0	+0.5	+0.0	89.0	106.7 hopping	-17.7	Vert
2	902.000M	53.3	+22.8 +5.9	+6.1	+0.0	+0.5	+0.0	88.6	106.7	-18.1	Vert
3	928.000M	52.7	+23.2 +6.0	+6.1	+0.0	+0.5	+0.0	88.5	106.7	-18.2	Vert
4	902.000M	52.1	+22.8 +5.9	+6.1	+0.0	+0.5	+0.0	87.4	106.7 hopping	-19.3	Vert

Test Location: CKC Laboratories, Inc. • 110 N. Olinda Place • Brea, CA 92823 • 714-993-6112
 Customer: **Itron, Inc.**
 Specification: **15.247(d) / 15.209 Radiated Spurious Emissions**
 Work Order #: **99218** Date: 12/10/2018
 Test Type: **Maximized Emissions** Time: 14:40:31
 Tested By: Don Nguyen Sequence#: 12
 Software: EMITest 5.03.11

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 4			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 4			

Test Conditions / Notes:

The EUT is placed on table top. The serial port is connected to a support laptop via serial to USB adapter.
 The laptop is running software Command Line Interface Tool to turn on TX at 100% duty cycle.
 The EUT is powered from fresh battery 6.0Vdc. Support equipment is removed during test.

Modulation: 300kbps GFSK power level 3.

Frequency of measurement: 902-928MHz
 RBW=100kHz, VBW=300kHz (-20dBc limit)
 RBW=120kHz, VBW=360kHz (restricted band limit)

Site A

Test Method: ANSI C63.10 (2013)

Temperature: 24.6°C

Relative Humidity: 36.3%

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN01995	Biconilog Antenna	CBL6111C	4/23/2018	4/23/2020
T2	ANP05275	Attenuator	1W	4/5/2018	4/5/2020
T3	AN02672	Spectrum Analyzer	E4446A	3/2/2017	3/2/2019
T4	ANP05050	Cable	RG223/U	1/20/2017	1/20/2019
T5	ANP05198	Cable-Amplitude +15C to +45C (dB)	8268	12/4/2018	12/4/2020

Measurement Data:

Reading listed by margin.

Test Distance: 3 Meters

#	Freq	Rdng	T1 T5	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dBμV	dB	dB	dB	dB	Table	dBμV/m	dBμV/m	dB	Ant
1	928.000M	52.7	+23.2 +6.0	+6.1	+0.0	+0.5	+0.0	88.5	107.4 hopping	-18.9	Vert
2	928.000M	52.4	+23.2 +6.0	+6.1	+0.0	+0.5	+0.0	88.2	107.4	-19.2	Vert
3	902.000M	52.2	+22.8 +5.9	+6.1	+0.0	+0.5	+0.0	87.5	107.4	-19.9	Vert
4	902.000M	51.8	+22.8 +5.9	+6.1	+0.0	+0.5	+0.0	87.1	107.4 hopping	-20.3	Vert

Test Location: CKC Laboratories, Inc. • 110 N. Olinda Place • Brea, CA 92823 • 714-993-6112
 Customer: **Itron, Inc.**
 Specification: **15.247(d) / 15.209 Radiated Spurious Emissions**
 Work Order #: **99218** Date: 12/10/2018
 Test Type: **Maximized Emissions** Time: 14:12:45
 Tested By: Don Nguyen Sequence#: 11
 Software: EMITest 5.03.11

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 5			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 5			

Test Conditions / Notes:

The EUT is placed on table top. The serial port is connected to a support laptop via serial to USB adapter.
 The laptop is running software Command Line Interface Tool to turn on TX at 100% duty cycle.
 The EUT is powered from fresh battery 6.0Vdc. Support equipment is removed during test.

Modulation: 300kbps GFSK power level 3.

Frequency of measurement: 902-928MHz
 RBW=100kHz, VBW=300kHz (-20dBc limit)
 RBW=120kHz, VBW=360kHz (restricted band limit)

Site A

Test Method: ANSI C63.10 (2013)

Temperature: 24.6°C

Relative Humidity: 36.2%

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN01995	Biconilog Antenna	CBL6111C	4/23/2018	4/23/2020
T2	ANP05275	Attenuator	1W	4/5/2018	4/5/2020
T3	AN02672	Spectrum Analyzer	E4446A	3/2/2017	3/2/2019
T4	ANP05050	Cable	RG223/U	1/20/2017	1/20/2019
T5	ANP05198	Cable-Amplitude +15C to +45C (dB)	8268	12/4/2018	12/4/2020

Measurement Data:

Reading listed by margin.

Test Distance: 3 Meters

#	Freq	Rdng	T1 T5	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dBμV	dB	dB	dB	dB	Table	dBμV/m	dBμV/m	dB	Ant
1	928.000M	55.1	+23.2 +6.0	+6.1	+0.0	+0.5	+0.0	90.9	109.2 hopping	-18.3	Vert
2	928.000M	54.8	+23.2 +6.0	+6.1	+0.0	+0.5	+0.0	90.6	109.2	-18.6	Vert
3	902.000M	53.6	+22.8 +5.9	+6.1	+0.0	+0.5	+0.0	88.9	109.2	-20.3	Vert
4	902.000M	53.5	+22.8 +5.9	+6.1	+0.0	+0.5	+0.0	88.8	109.2 hopping	-20.4	Vert

Test Setup Photos

Configuration 2



Below 1GHz



Below 1GHz



Above 1GHz, Cone placement

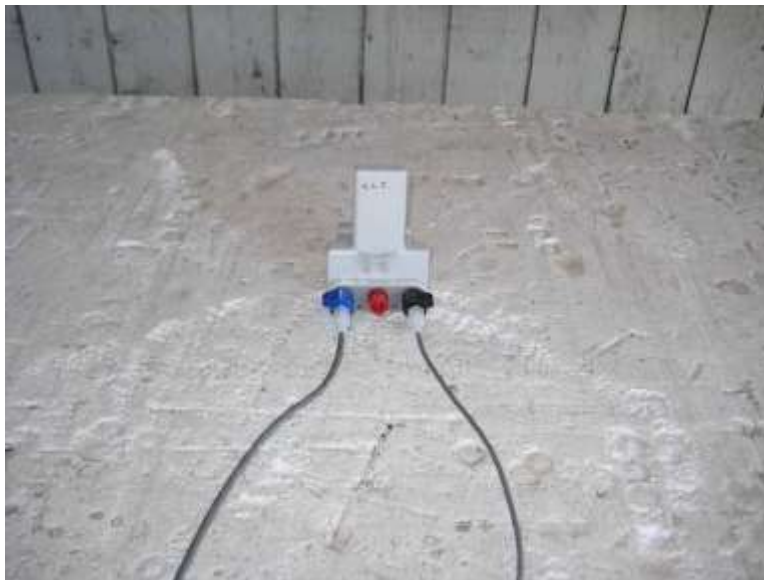


Above 1GHz, Cone placement

Configuration 3



Below 1GHz



Below 1GHz



Above 1GHz, Cone placement

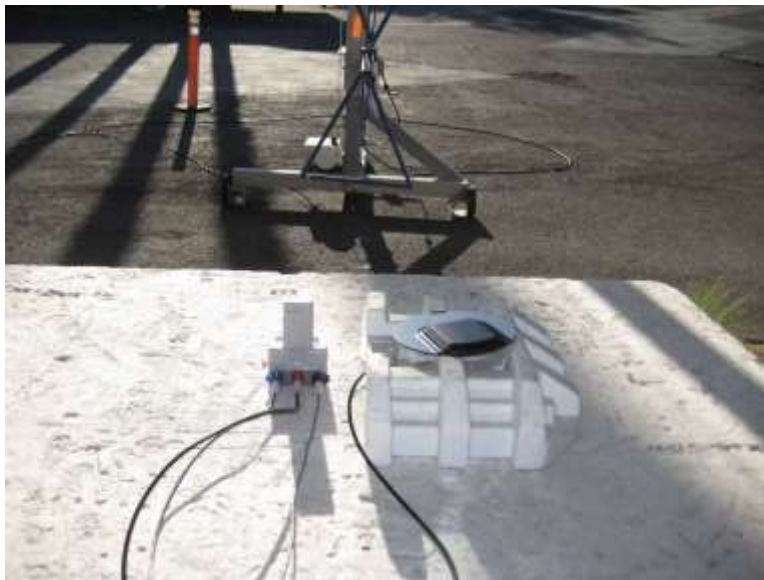


Above 1GHz, Cone placement

Configuration 4



Below 1GHz



Below 1GHz



Above 1GHz, Cone placement



Above 1GHz, Cone placement

Configuration 5



Below 1GHz



Below 1GHz



Above 1GHz, Cone placement



Above 1GHz, Cone placement

SUPPLEMENTAL INFORMATION

Measurement Uncertainty

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

Uncertainties reported are worst case for all CKC Laboratories' sites and represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of $k=2$. Compliance is deemed to occur provided measurements are below the specified limits.

Emissions Test Details

TESTING PARAMETERS

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

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

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

CORRECTION FACTORS

The basic spectrum analyzer reading was converted using correction factors as shown in the highest emissions readings in the tables. For radiated emissions in $\text{dB}\mu\text{V}/\text{m}$, the spectrum analyzer reading in $\text{dB}\mu\text{V}$ was corrected by using the following formula. This reading was then compared to the applicable specification limit. Individual measurements were compared with the displayed limit value in the margin column. The margin was calculated based on subtracting the limit value from the corrected measurement value; a positive margin represents a measurement exceeding the limit, while a negative margin represents a measurement less than the limit.

SAMPLE CALCULATIONS		
	Meter reading	($\text{dB}\mu\text{V}$)
+	Antenna Factor	(dB/m)
+	Cable Loss	(dB)
-	Distance Correction	(dB)
-	Preamplifier Gain	(dB)
=	Corrected Reading	($\text{dB}\mu\text{V}/\text{m}$)

TEST INSTRUMENTATION AND ANALYZER SETTINGS

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

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

SPECTRUM ANALYZER/RECEIVER DETECTOR FUNCTIONS

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

Peak

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

Quasi-Peak

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

Average

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