Itron, Inc.

TEST REPORT FOR

Water Endpoint
Models: Rivawa and Rivawra

Tested to The Following Standards:

FCC Part 15 Subpart C Section(s)

15.207 & 15.247
(FHSS 902-928 MHz)

Report No.: 103182-24

Date of issue: December 10, 2019

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.

Test Certificate # 803.01

Testing the Future
CKC LABORATORIES, INC.

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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: 191328

REPORT PREPARED BY:

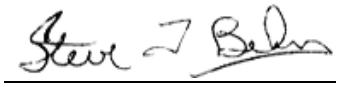
Terri Rayle
CKC Laboratories, Inc.
5046 Sierra Pines Drive
Mariposa, CA 95338

Project Number: 103182

DATE OF EQUIPMENT RECEIPT: November 1, 2019
DATE(S) OF TESTING: November 1-19, 2019

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.



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	5.03.12

Site Registration & Accreditation Information

Location	*NIST CB #	FCC	Japan
Canyon Park, Bothell, WA	US0081	US1022	A-0136
Brea, CA	US0060	US1025	A-0136
Fremont, CA	US0082	US1023	A-0136
Mariposa, CA	US0103	US1024	A-0136

*CKC's list of NIST designated countries can be found at: https://standards.gov/cabs/designations.html

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(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 manufacturer declares the EUT operates on battery power.
NP = CKC Laboratories was not contracted to perform this 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.	Rivawa	103182-cond

Support Equipment:

Device	Manufacturer	Model #	S/N
Laptop AC/DC Adapter	Dell	PA-1900-02D	NA
Laptop	Dell	Latitude E6420	8P954R1
DC Power Supply	Extech	382225	NA
USB to Serial Adapter	Itron, Inc.	500W	NA

Configuration 2

Equipment Tested:

Device	Manufacturer	Model #	S/N
Water Endpoint	Itron, Inc.	Rivawra	103182-remote

Support Equipment:

Device	Manufacturer	Model #	S/N
Laptop AC/DC Adapter	Dell	PA-1900-02D	NA
Laptop	Dell	Latitude E6420	8P954R1
USB to Serial Adapter	Itron, Inc.	500W	NA

Configuration 3

Equipment Tested:

Device	Manufacturer	Model #	S/N
Water Endpoint	Itron, Inc.	Rivawa	103182-pit

Support Equipment:

Device	Manufacturer	Model #	S/N
Laptop AC/DC Adapter	Dell	PA-1900-02D	NA
Laptop	Dell	Latitude E6420	8P954R1
USB to Serial Adapter	Itron, Inc.	500W	NA

Configuration 4

Equipment Tested:

Device	Manufacturer	Model #	S/N
Water Endpoint	Itron, Inc.	Rivawa	103182-pit
Antenna	Itron, Inc.	CFG-0900-003	18332108

Support Equipment:

Device	Manufacturer	Model #	S/N
Laptop AC/DC Adapter	Dell	PA-1900-02D	NA
Laptop	Dell	Latitude E6420	8P954R1
USB to Serial Adapter	Itron, Inc.	500W	NA

Configuration 5

Equipment Tested:

Device	Manufacturer	Model #	S/N
Water Endpoint	Itron, Inc.	Rivawa	103182-pit
Antenna	Itron, Inc.	CFG-0900-003	18332108

Support Equipment:

Device	Manufacturer	Model #	S/N
Laptop AC/DC Adapter	Dell	PA-1900-02D	NA
Laptop	Dell	Latitude E6420	8P954R1
USB to Serial Adapter	Itron, Inc.	500W	NA
Ground Plane	NA	NA	NA

General Product Information:

Product Information	Manufacturer-Provided Details
Equipment Type:	Stand-Alone Equipment
Type of Wideband System:	Proprietary Low power and FHSS
Operating Frequency Range:	902.2 – 927.75MHz, GFSK 25kbps, power level 3, 512 channels, 50kHz spacing 902.2 – 927.80MHz, GFSK,50kbps, power level 3, 129 channels, 200kHz spacing
Number of Hopping Channels:	512 (25kbps) and 129(50kbps)
Receiver Bandwidth and Synchronization:	The manufacturer declares the receiver input bandwidth matches the transmit channel bandwidth and shifts frequencies in synchronization with the transmitter.
Modulation Type(s):	25kbps GFSK, 50kbps GFSK
Maximum Duty Cycle:	100%
Number of TX Chains:	1
Antenna Type(s) and Gain:	4.78 dBi, Integral Omni Antenna 3.28 dBi, External Omni Antenna
Beamforming Type:	NA
Antenna Connection Type:	Integral (External connector provided to facilitate testing)
Nominal Input Voltage:	6Vdc battery
Firmware / Software used for Test:	App Version: 5.0.4.0, CSL version: 16.0.5.0 Hardware Rev: 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):	11/6/2019
Declarations:	The manufacturer declares the EUTs in Configuration 1, 2, 3, 4, and 5 have the same internal hardware. Hence, conducted measurements in Configuration 1 is representative for all EUTs.		
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. The EUT is powered from 6Vdc power supply to simulate fresh battery. Frequency of measurement: 902.2 to 927.8MHz RBW=1kHz, 3kHz, 4.7kHz, 10kHz, 20kHz VBW=3kHz, 9.1kHz, 15kHz, 30kHz, 62kHz		

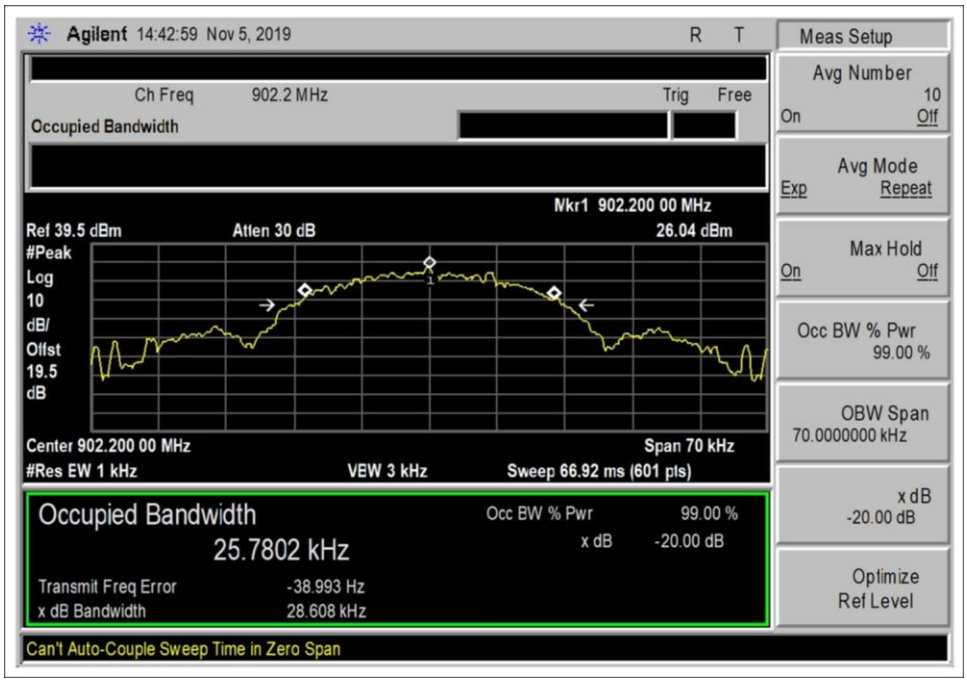
Environmental Conditions			
Temperature (ºC)	24.7	Relative Humidity (%):	42

Test Equipment					
Asset#	Description	Manufacturer	Model	Cal Date	Cal Due
02672	Spectrum Analyzer	Agilent	E4446A	3/13/2019	3/13/2021
03431	Attenuator	Aeroflex/Weinschel	89-20-21	12/19/2017	12/19/2019
P07243	Cable	H&S	32022-29094K-29094K-24TC	7/5/2018	7/5/2020

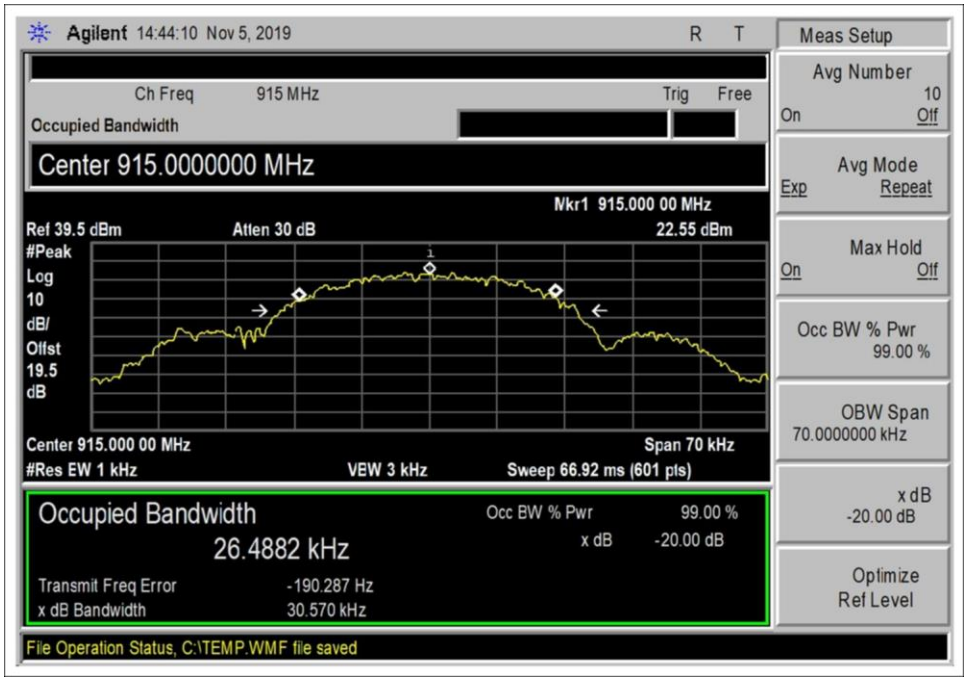
15.247(a)(1)(i) 20 dB Bandwidth

Test Data Summary					
Frequency (MHz)	Antenna Port	Modulation	Measured (kHz)	Limit (kHz)	Results
902.2	1	25kbps GFSK Level 3	28.608	≤500	Pass
915.0	1	25kbps GFSK Level 3	30.570	≤500	Pass
927.75	1	25kbps GFSK Level 3	29.193	≤500	Pass
902.2	1	50kbps GFSK Level 3	102.468	≤500	Pass
915.0	1	50kbps GFSK Level 3	97.233	≤500	Pass
927.8	1	50kbps GFSK Level 3	101.883	≤500	Pass

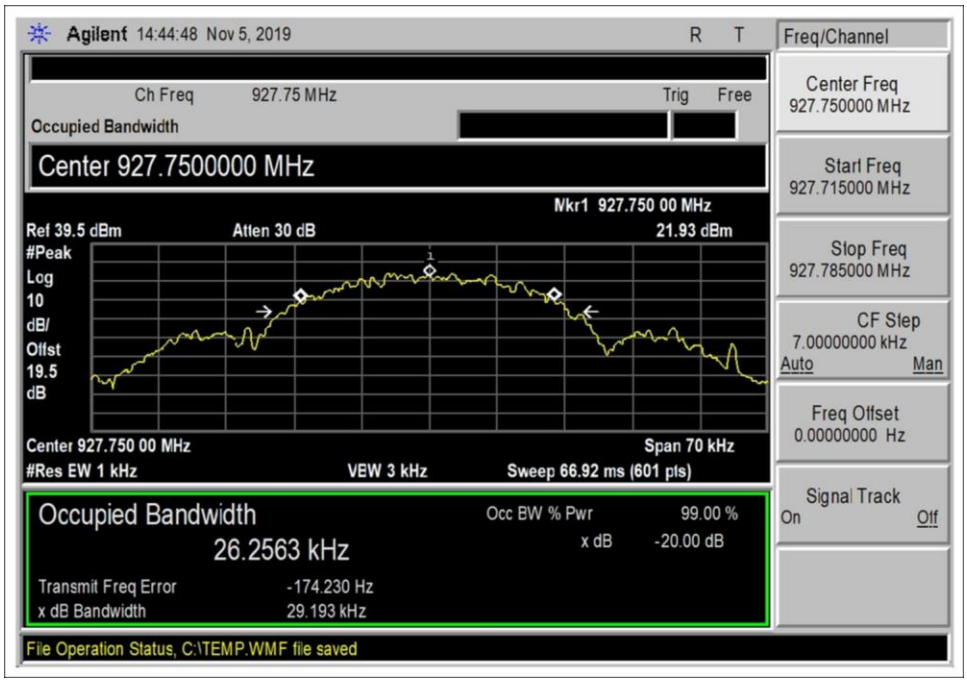
Plot(s)



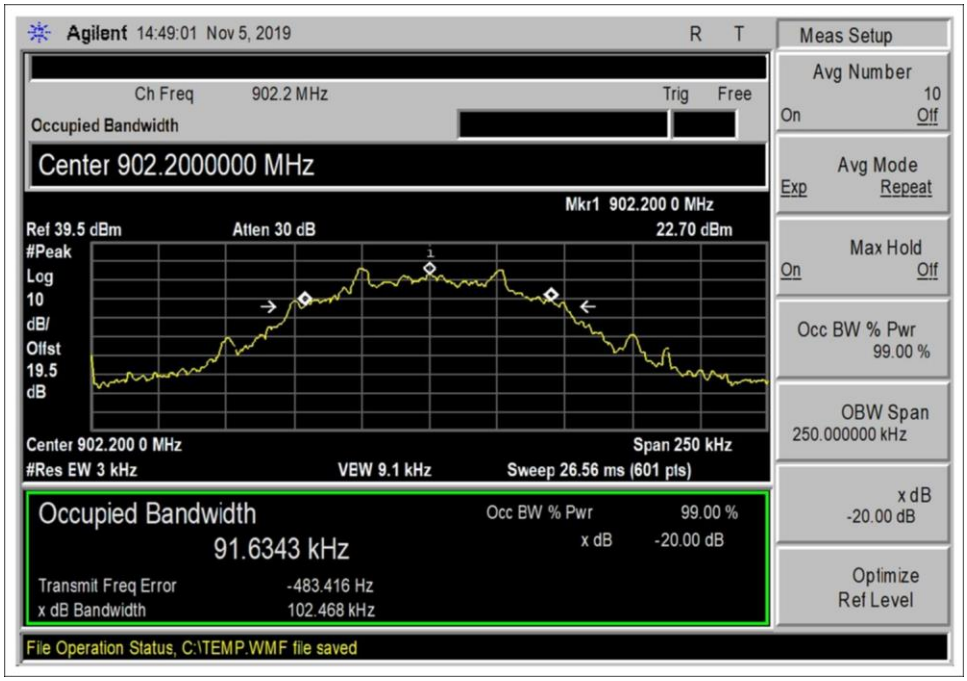
25kbps Low Channel



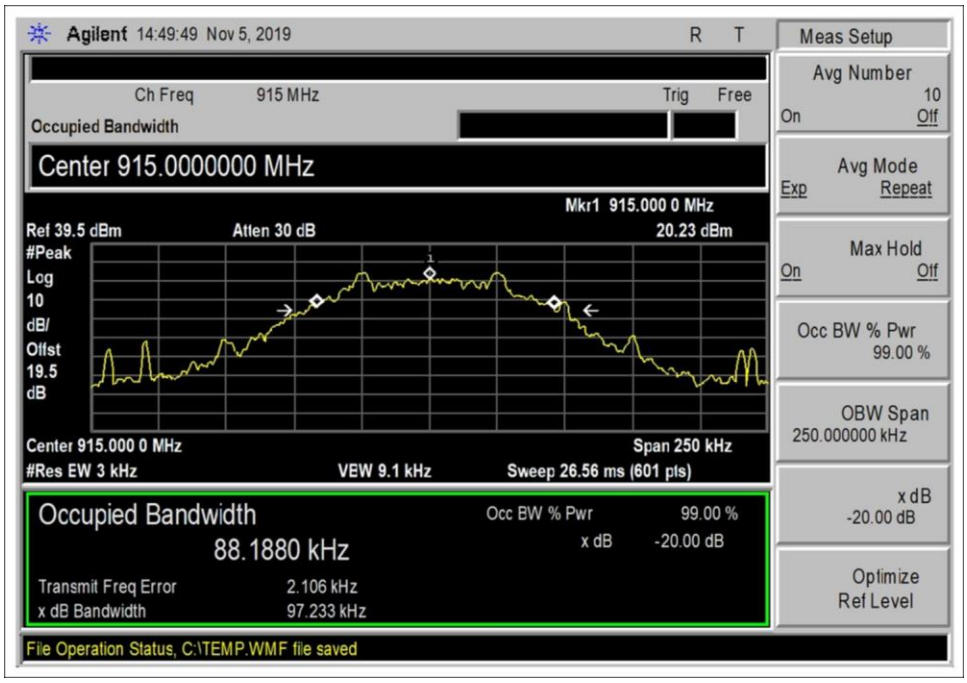
25kbps Middle Channel



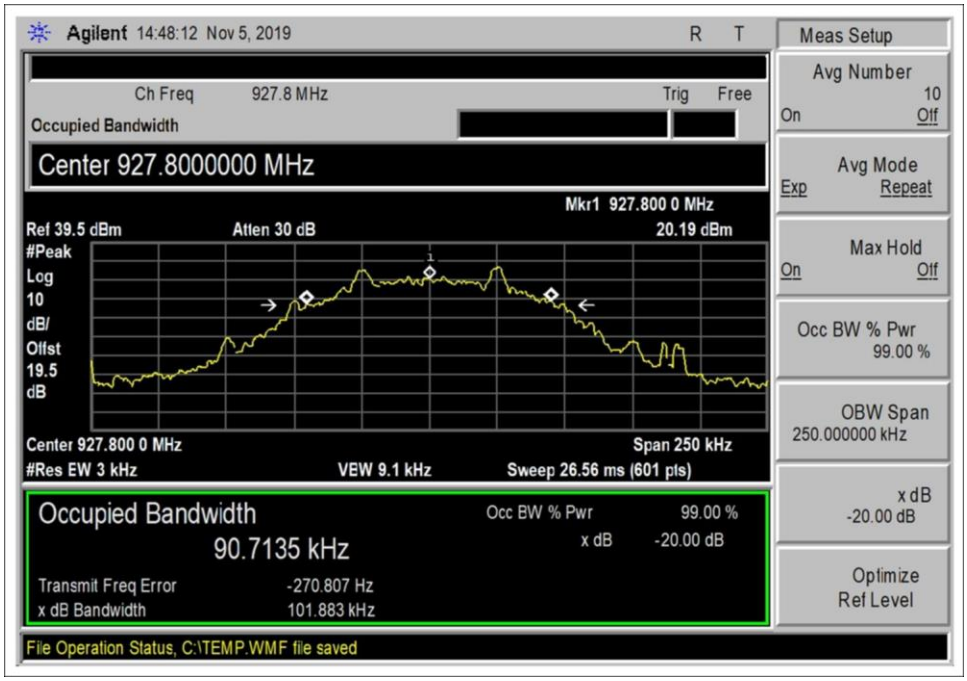
25kbps High Channel



50kbps Low Channel



50kbps Middle Channel

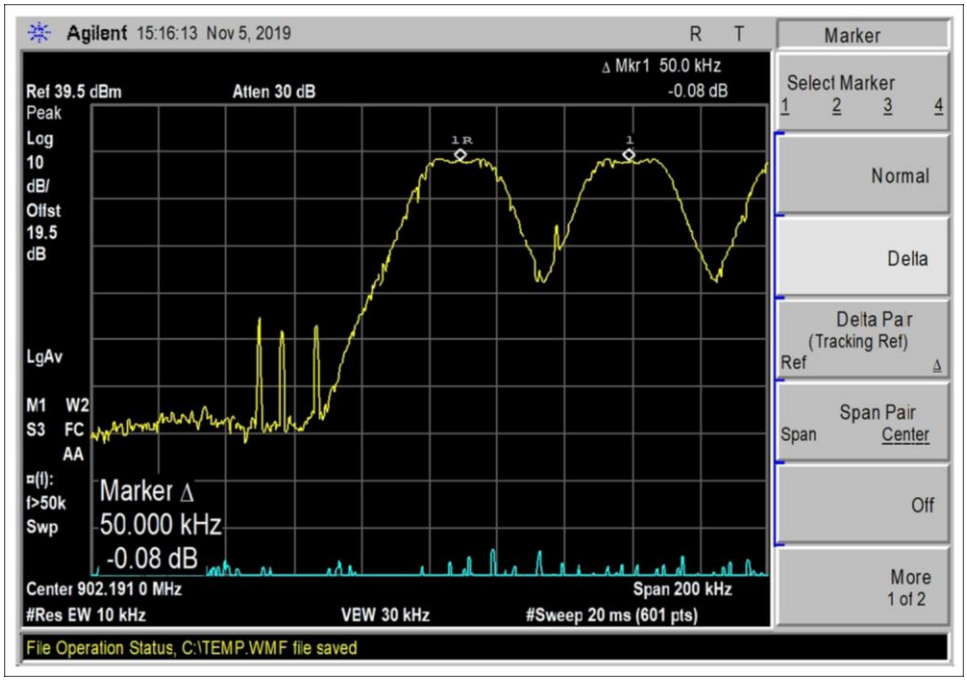


50kbps High Channel

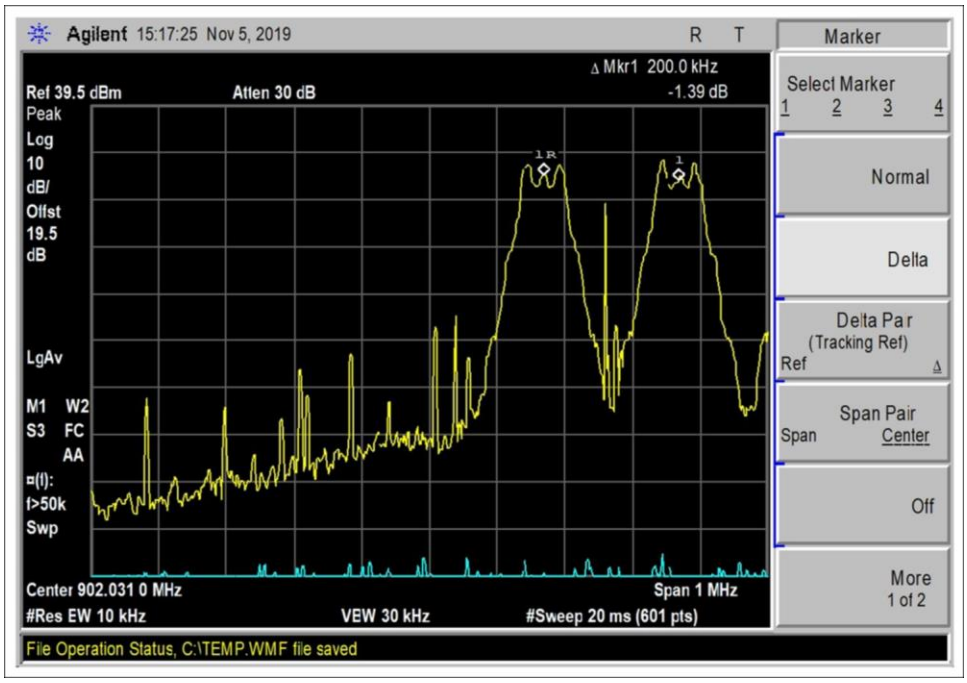
15.247(a)(1) Carrier Separation

Test Data Summary					
Limit applied: 20dB bandwidth of the hopping channel.					
Antenna Port	**Operational Mode**	**Modulation**	**Measured (kHz)**	**Limit (kHz)**	**Results**
1	Hopping	25kbps GFSK Level 3	50	>30.570	Pass
1	Hopping	50kbps GFSK Level 3	200	>102.468	Pass

Plot(s)



25kbps

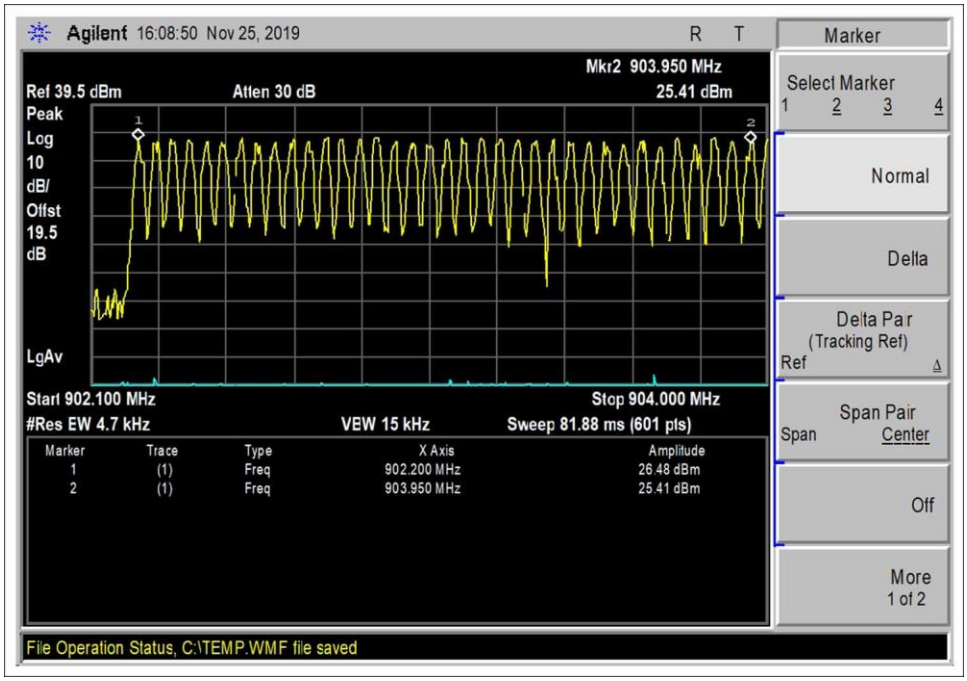

Agilent 15:17:25 Nov 5, 2019
R T
Marker
Δ Mkr1 200.0 kHz
-1.39 dB
Ref 39.5 dBm
Atten 30 dB
Peak
Log
10
dB/
Offst
19.5
dB
LgAv
M1 W2
S3 FC
AA
¤(l):
f>50k
Swp
Select Marker
1 2 3 4
Normal
Delta
Delta Par
(Tracking Ref)
Ref
Span Pair
Span Center
Off
More
1 of 2
Center 902.031 0 MHz
Span 1 MHz
#Res EW 10 kHz
VEW 30 kHz
#Sweep 20 ms (601 pts)
File Operation Status, C:\TEMP.WMF file saved

50kbps

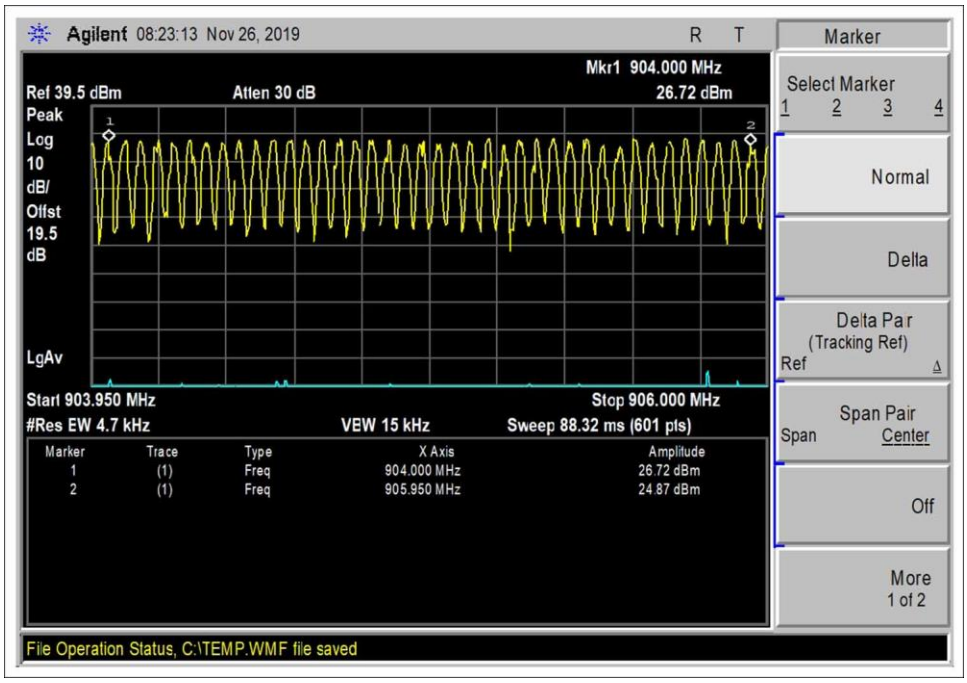
15.247(a)(1)(i) Number of Hopping Channels

Test Data Summary					
$Limit = \begin{cases} 50\ Channels \mid 20\ dB\ BW < 250kHz \\ 25\ Channels \mid 20\ dB\ BW \geq 250kHz \end{cases}$					
Antenna Port	**Operational Mode**	**Modulation**	**Measured (Channels)**	**Limit (Channels)**	**Results**
1	Hopping	25kbps GFSK Level 3	512	≥50	Pass
1	Hopping	50kbps GFSK Level 3	129	≥50	Pass

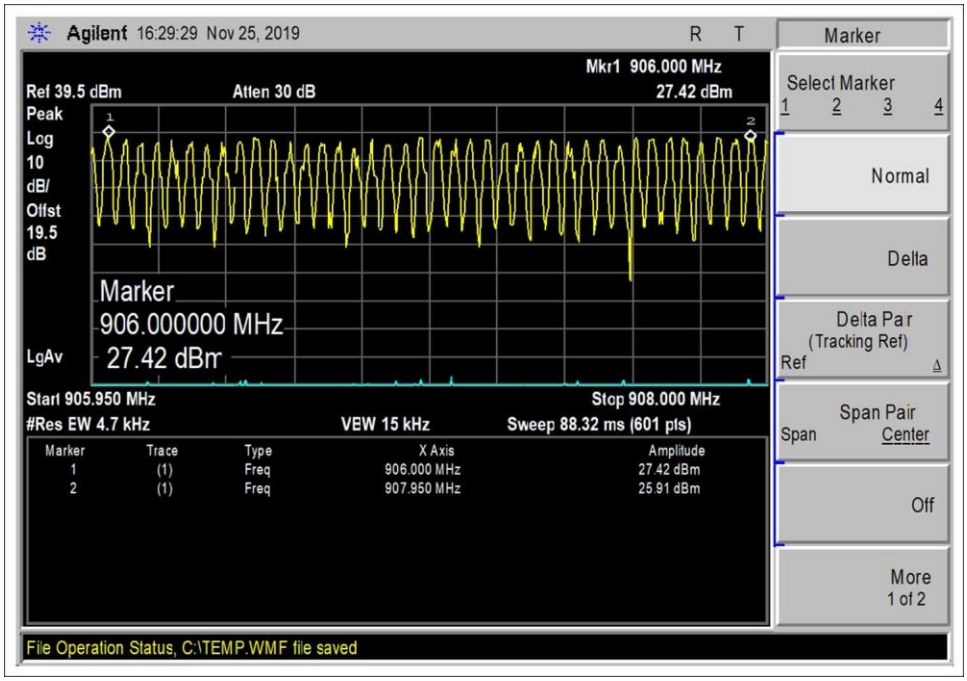
Plot(s)



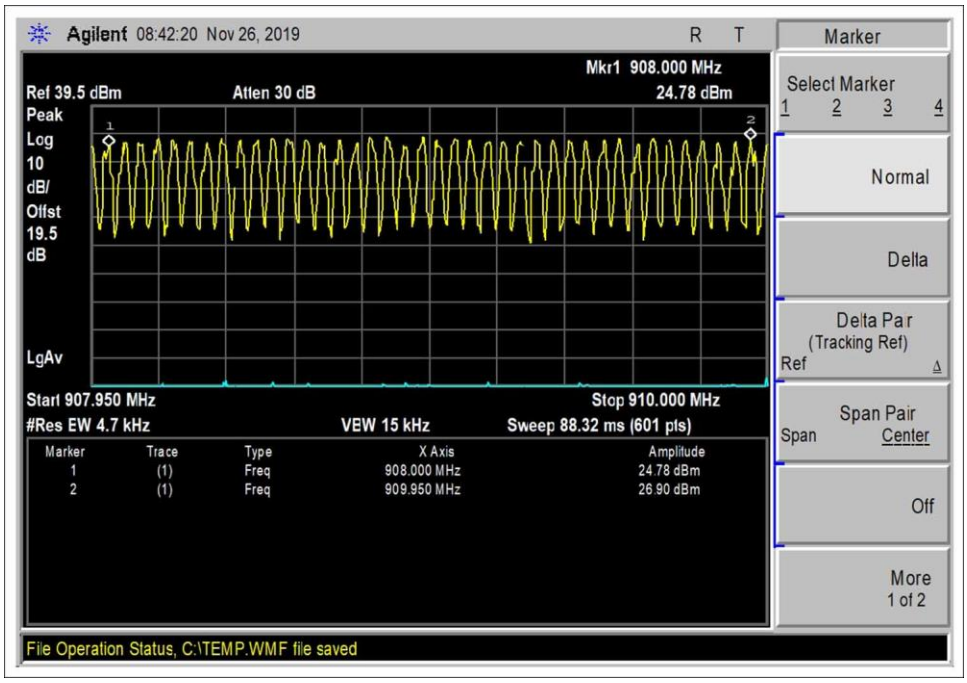
50kHz spacing_25k_902.2 to 903.95MHz



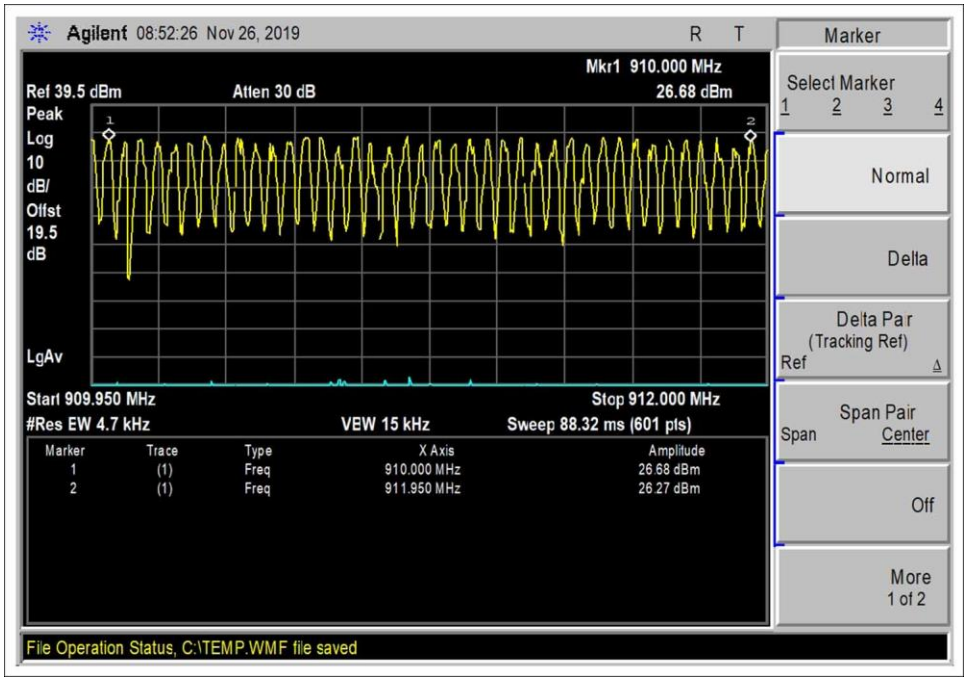
50kHz spacing_25k_ 904 to 905.95MHz



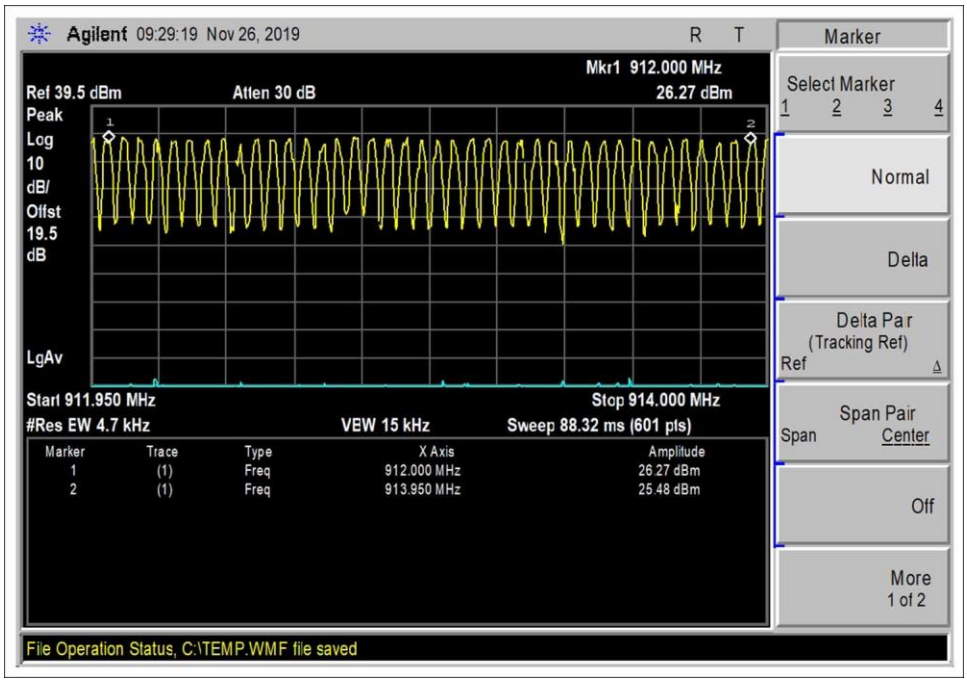
50kHz spacing_25k_ 906 to 907.95MHz



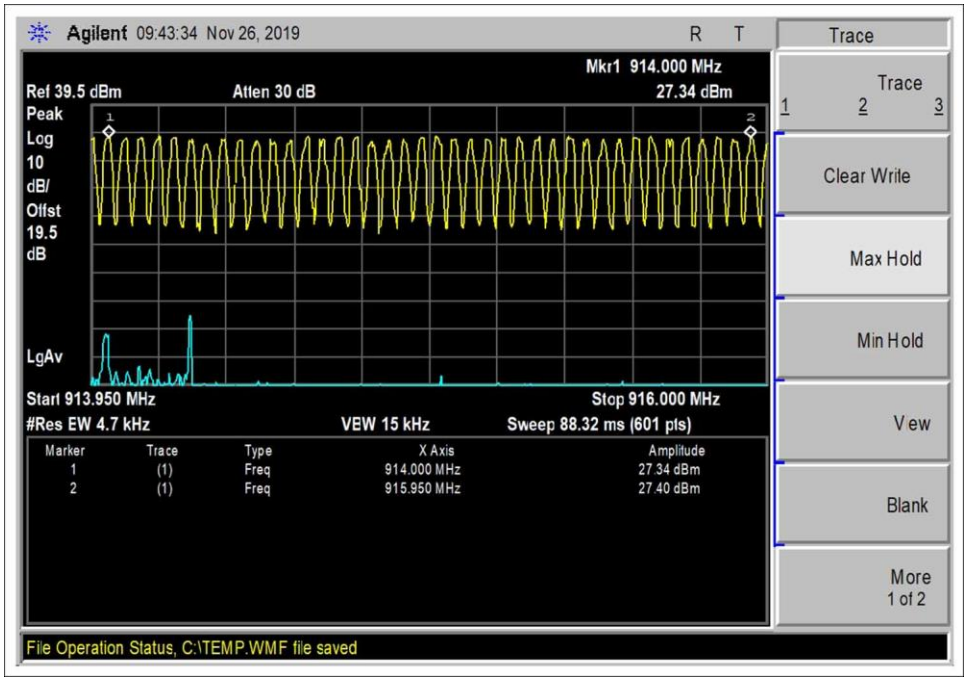
50kHz spacing_25k_ 908 to 909.95MHz



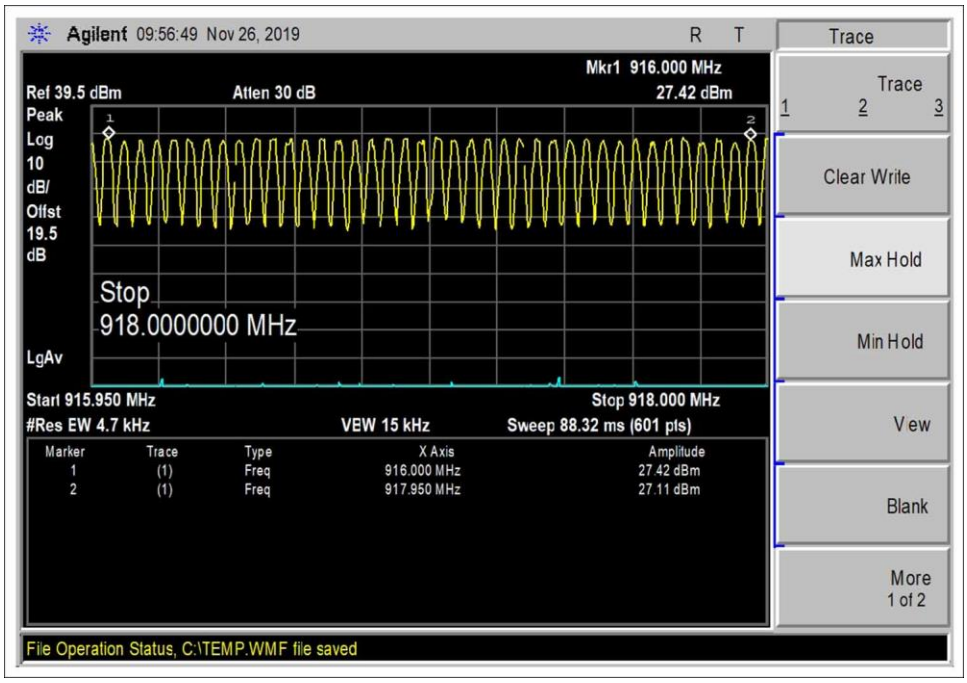
50kHz spacing_25k_ 910 to 911.95MHz



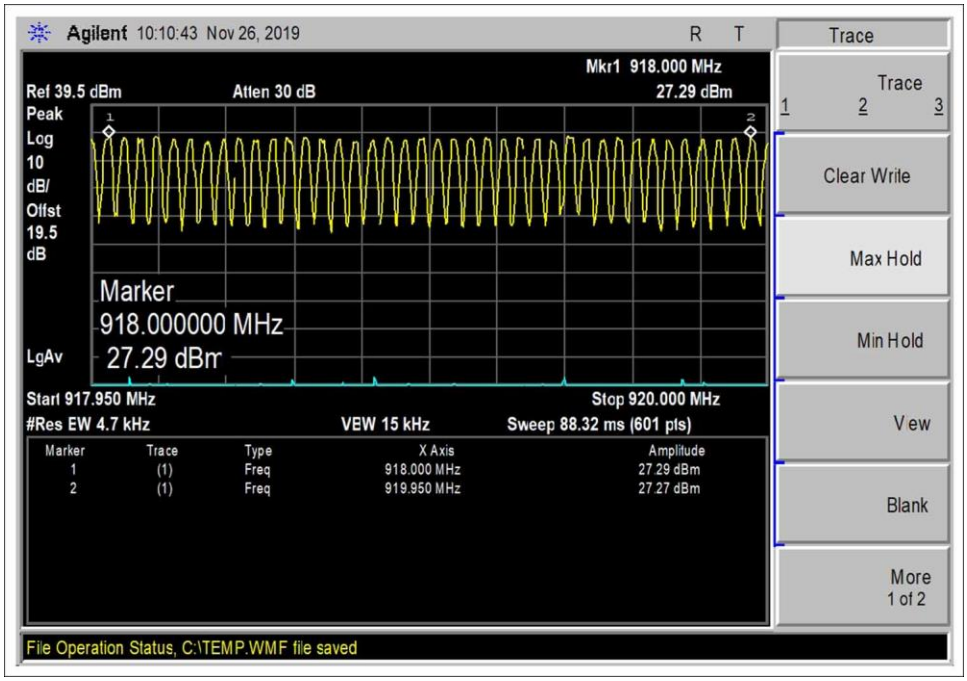
50kHz spacing_25k_ 912 to 913.95MHz



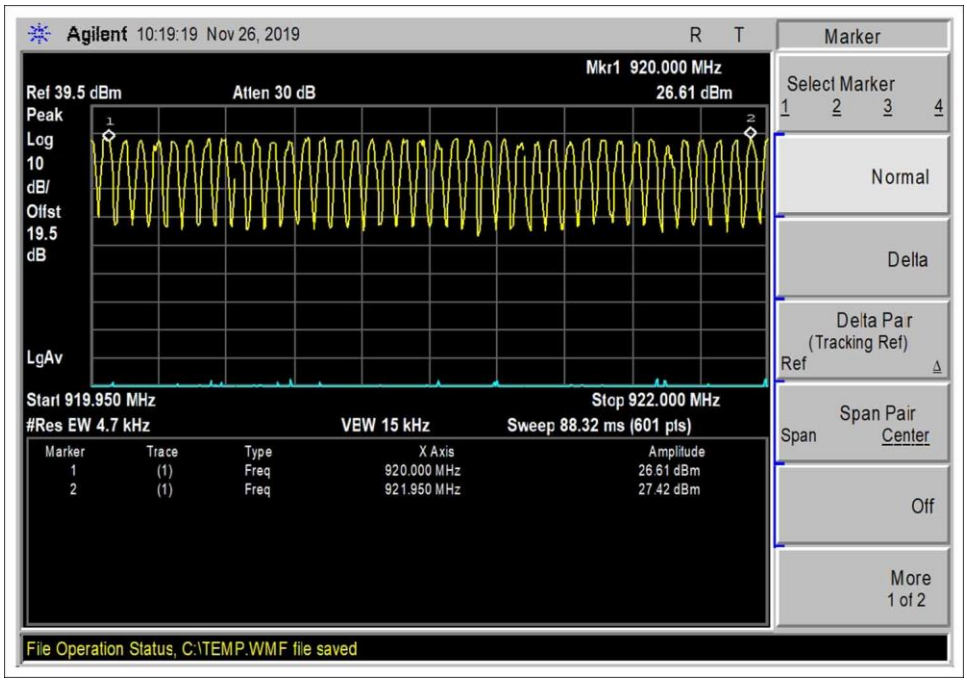
50kHz spacing_25k_ 914 to 915.95MHz



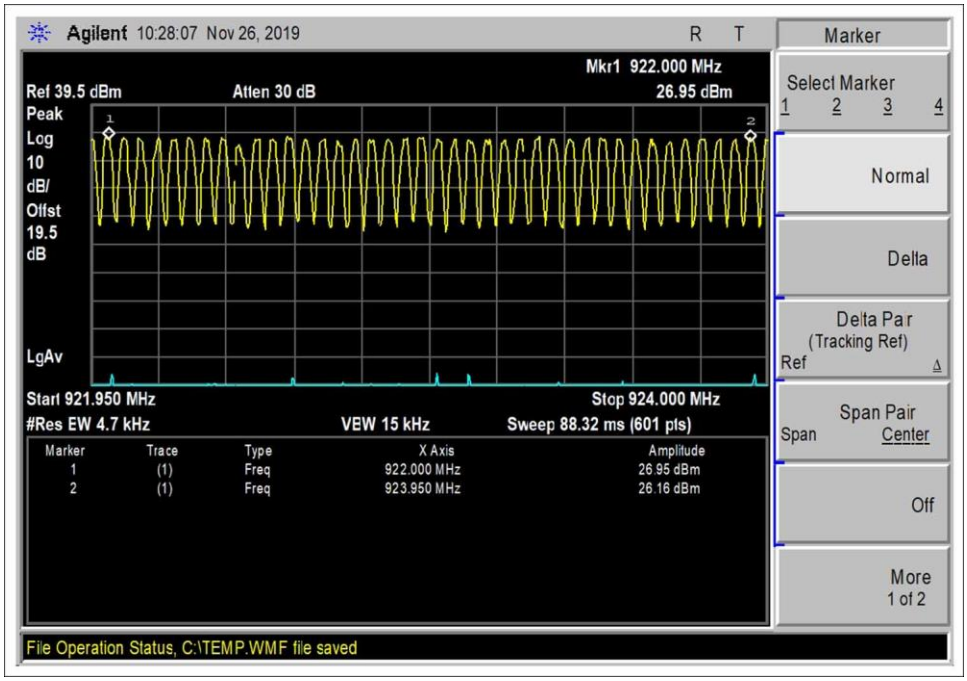
50kHz spacing_25k_ 916 to 917.95MHz



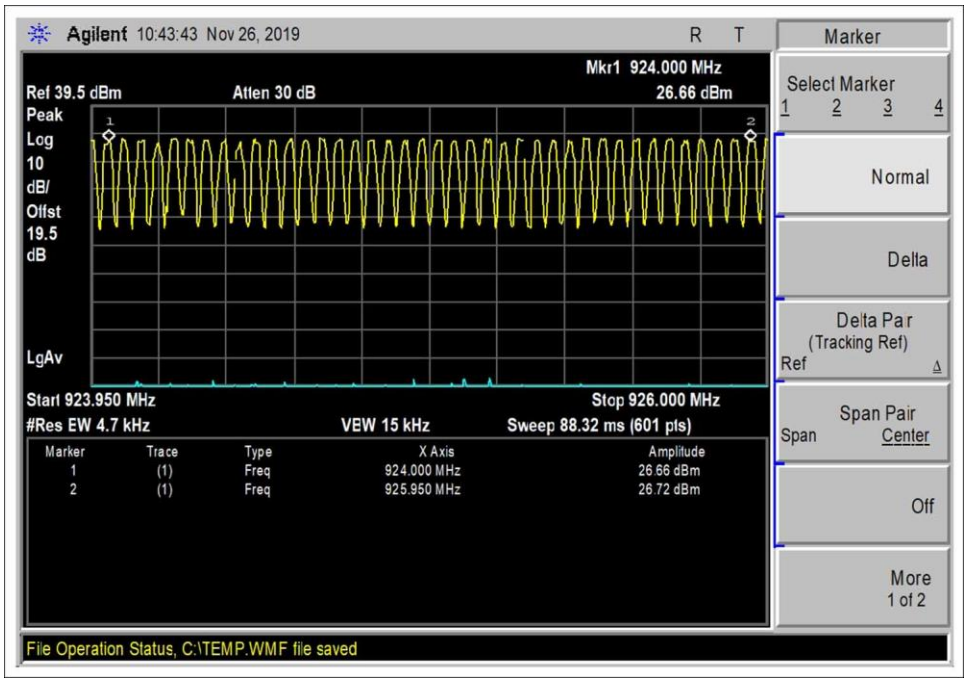
50kHz spacing_25k_ 918 to 919.95MHz



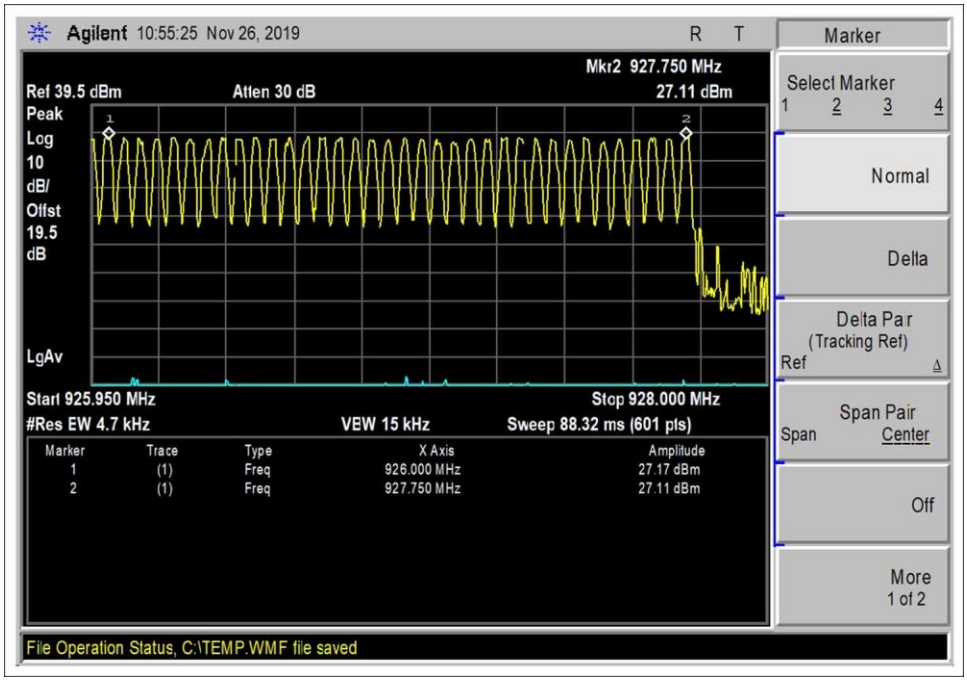
50kHz spacing_25k_ 920 to 921.95MHz



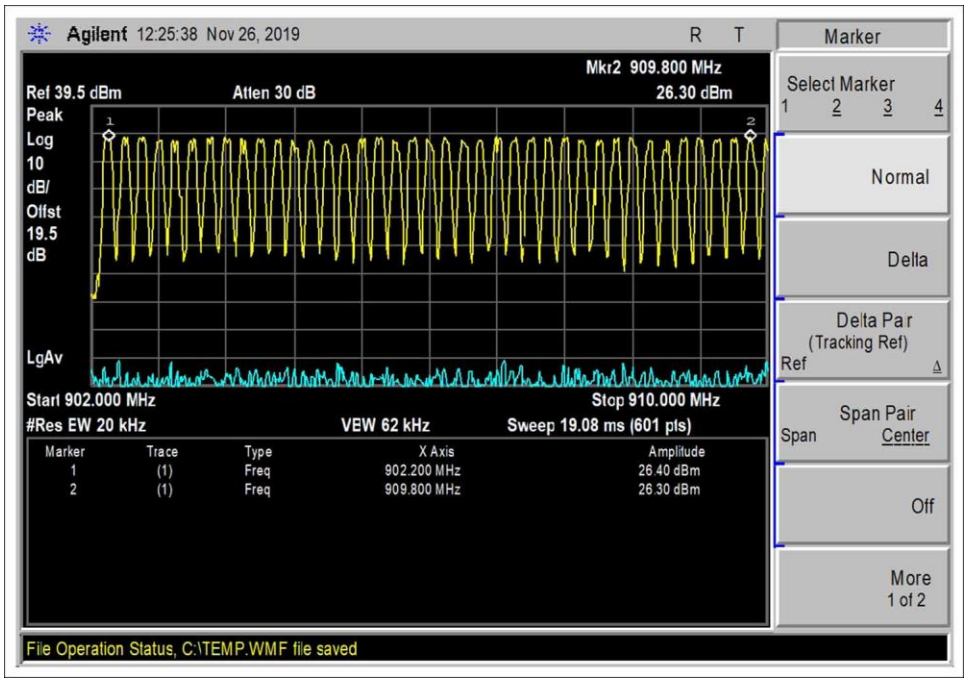
50kHz spacing_25k_ 922 to 923.95MHz



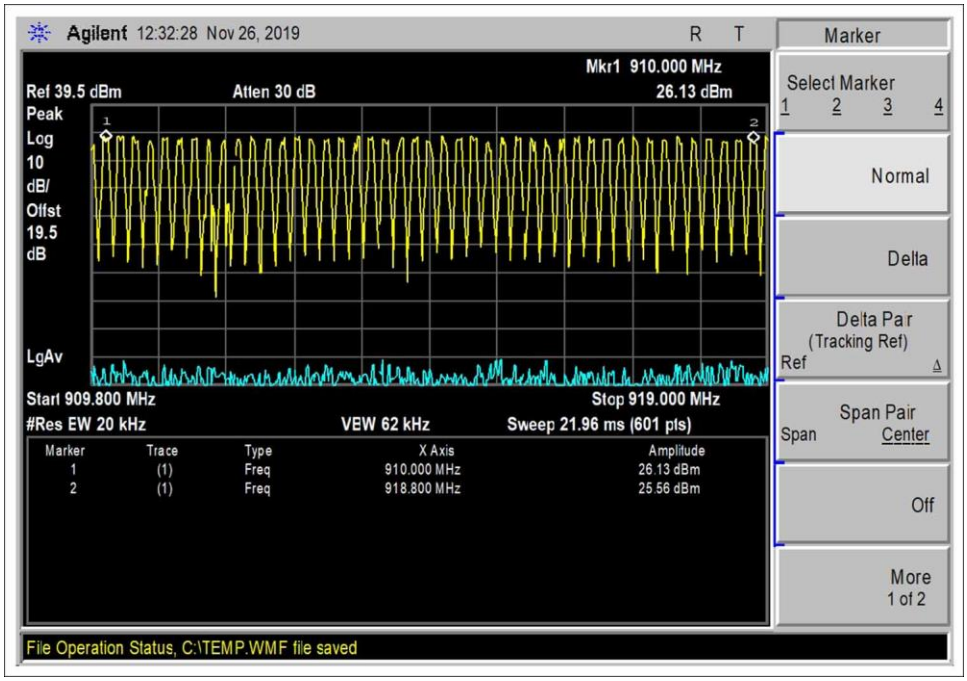
50kHz spacing_25k_ 924 to 925.95MHz



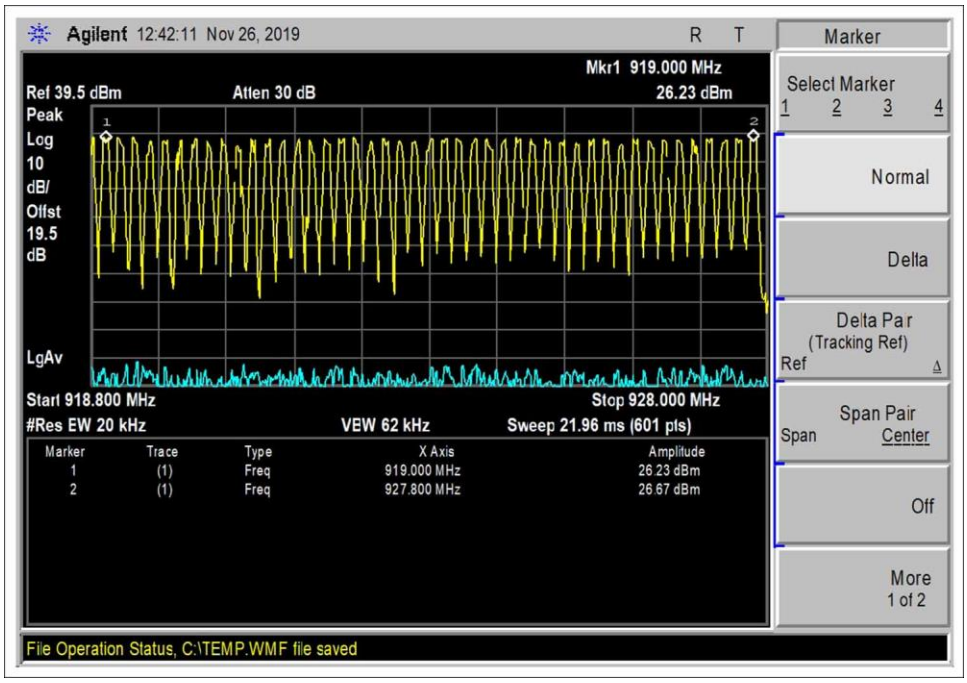
50kHz spacing_25k_ 926 to 927.75MHz



200kHz spacing_50k_902.2 to 909.8MHz

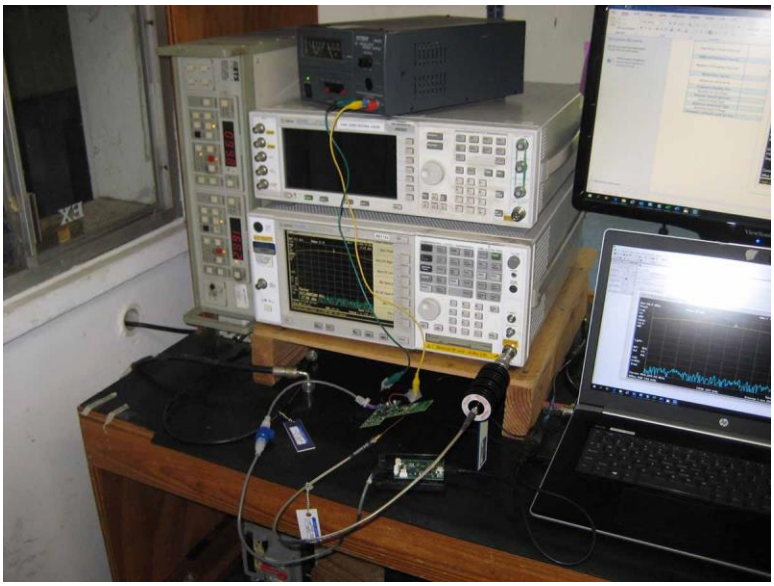


200kHz spacing_50k_910 to 918.8MHz



200kHz spacing_50k_919 to 927.8MHz

Test Setup Photo(s)



15.247(a)(1)(i) 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 Inc. 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.

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):	11/1/2019
Declarations:	The manufacturer declares the EUTs in Configuration 1, 2, 3, 4, and 5 have the same internal hardware. Hence, conducted measurements in Configuration 1 is representative for all EUTs.		
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. The EUT is powered from 6Vdc power supply to simulate fresh battery. Frequency of measurement: 902.2 to 927.8MHz RBW=100kHz, 200kHz VBW=300kHz, 620kHz		

Environmental Conditions			
Temperature (ºC)	23	Relative Humidity (%):	30

Test Equipment					
Asset#	**Description**	**Manufacturer**	**Model**	**Cal Date**	**Cal Due**
02672	Spectrum Analyzer	Agilent	E4446A	3/13/2019	3/13/2021
03431	Attenuator	Aeroflex/Weinschel	89-20-21	12/19/2017	12/19/2019
P07243	Cable	H&S	32022-29094K-29094K-24TC	7/5/2018	7/5/2020

Parameter Definitions:

Measurements performed at input voltage according to manufacturer specification.

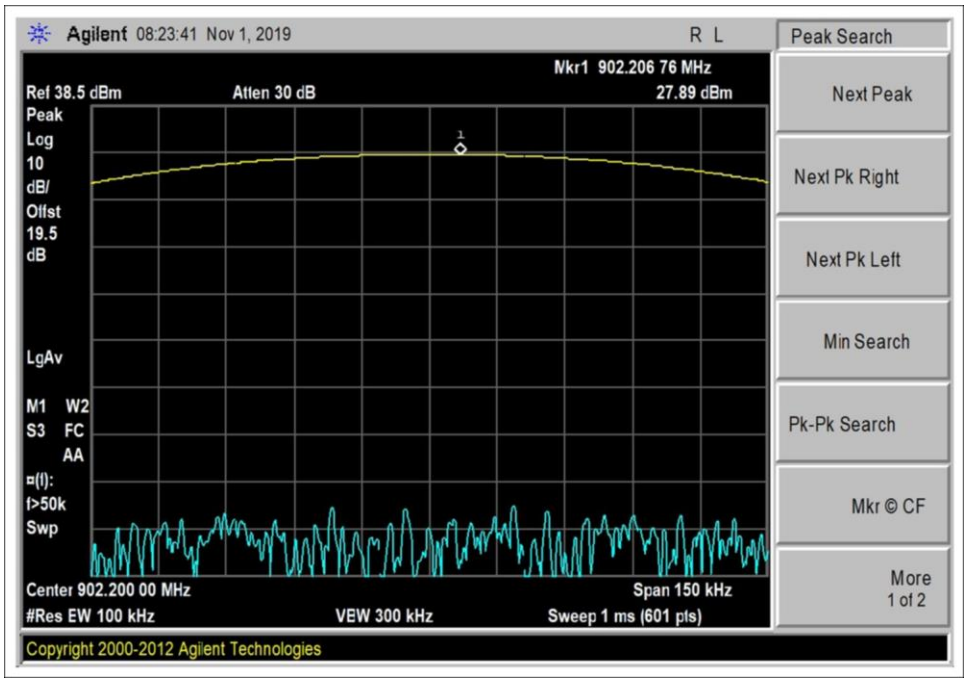
Parameter	Value
$V_{Nominal}$:	6Vdc
$V_{Minimum}$:	6Vdc
$V_{Maximum}$:	6Vdc

Test Data Summary - Voltage Variations

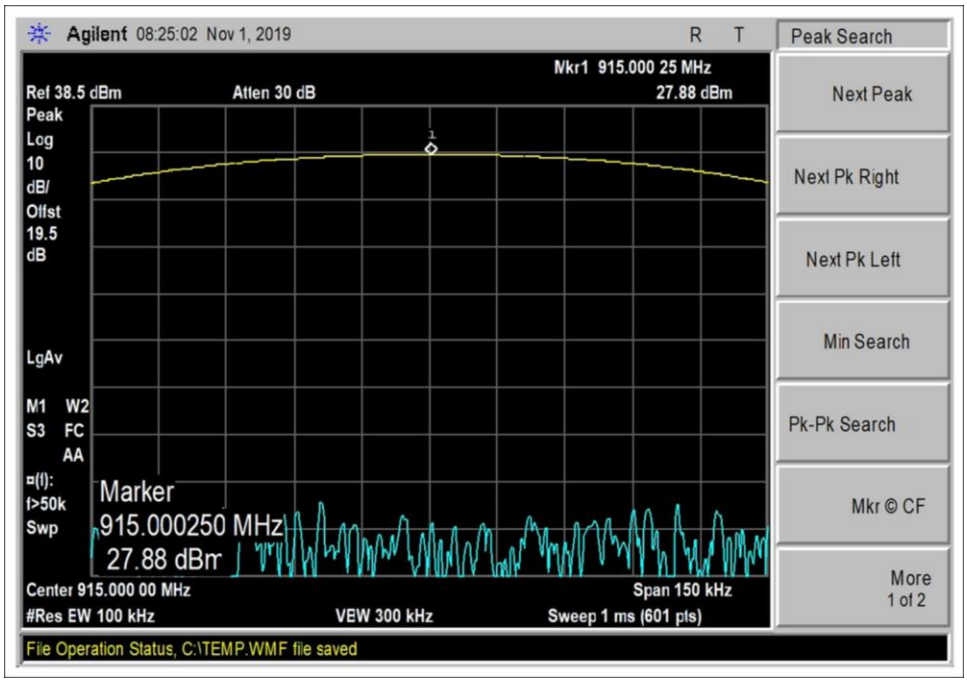
This equipment is battery powered. Power output tests were performed using external power supply to simulate fresh battery.

Test Data Summary - RF Conducted Measurement					
$Limit = \begin{cases} 30dBm\ Conducted/36dBm\ EIRP \mid \geq 50\ Channels \\ 24dBm\ Conducted/30dBm\ EIRP \mid < 50\ Channels\ (\min 25) \end{cases}$					
Frequency (MHz)	**Modulation**	**Ant. Type / Gain (dBi)**	**Measured (dBm)**	**Limit (dBm)**	**Results**
902.2	25kbps GFSK Level 3	4.78 dBi, Integral Omni Antenna 3.28 dBi, External Omni Antenna	27.89	≤30	Pass
915.0	25kbps GFSK Level 3	4.78 dBi, Integral Omni Antenna 3.28 dBi, External Omni Antenna	27.88	≤30	Pass
927.75	25kbps GFSK Level 3	4.78 dBi, Integral Omni Antenna 3.28 dBi, External Omni Antenna	27.73	≤30	Pass
902.2	50kbps GFSK Level 3	4.78 dBi, Integral Omni Antenna 3.28 dBi, External Omni Antenna	27.91	≤30	Pass
915.0	50kbps GFSK Level 3	4.78 dBi, Integral Omni Antenna 3.28 dBi, External Omni Antenna	27.89	≤30	Pass
927.8	50kbps GFSK Level 3	4.78 dBi, Integral Omni Antenna 3.28 dBi, External Omni Antenna	27.73	≤30	Pass

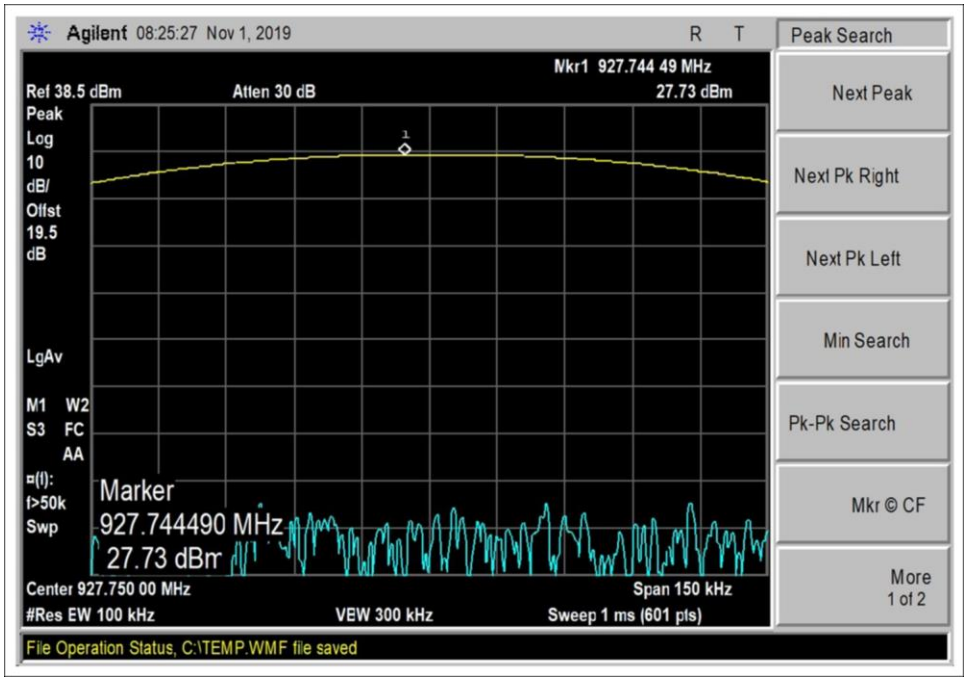
Plots



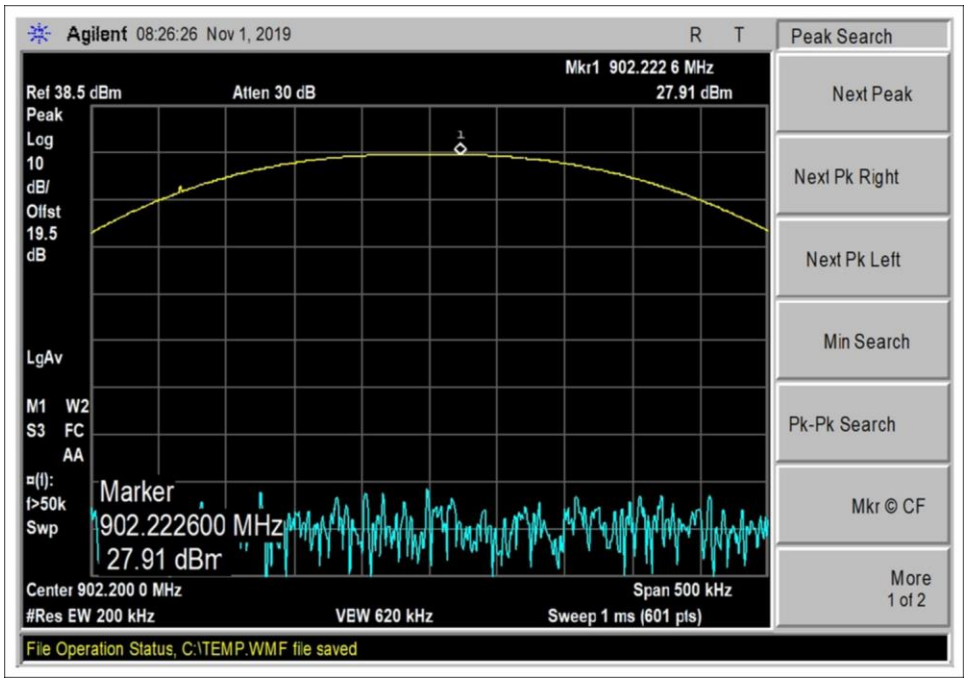
25kbps Low Channel



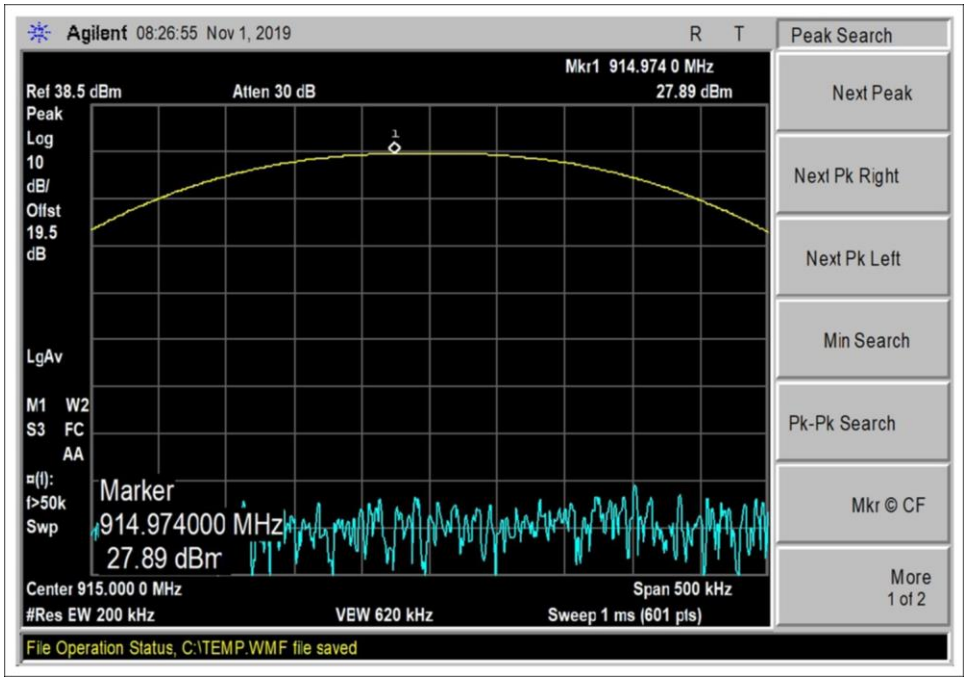
25kbps Middle Channel



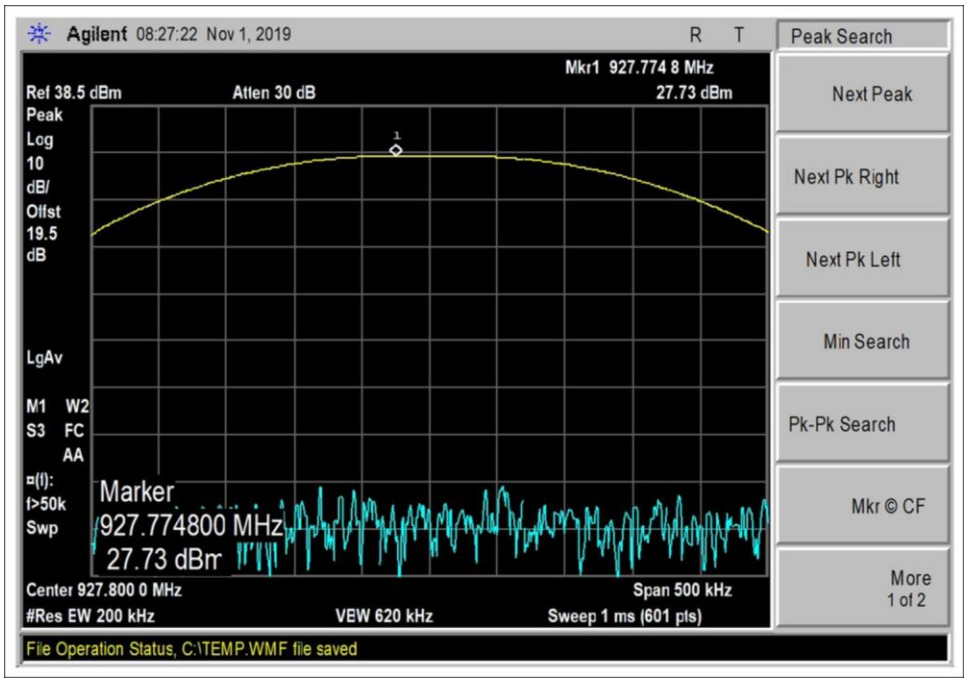
25kbps High Channel



50kbps Low Channel

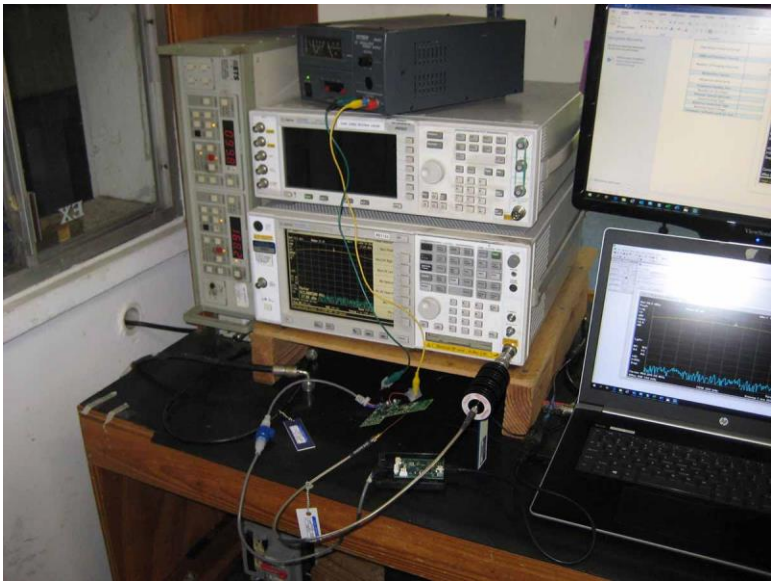


50kbps Middle Channel



50kbps High Channel

Test Setup Photo(s)



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 #:	**103182**	Date:	11/6/2019
Test Type:	**Conducted Emissions**	Time:	14:48:31
Tested By:	Don Nguyen	Sequence#:	1
Software:	EMITest 5.03.12		6.0Vdc

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

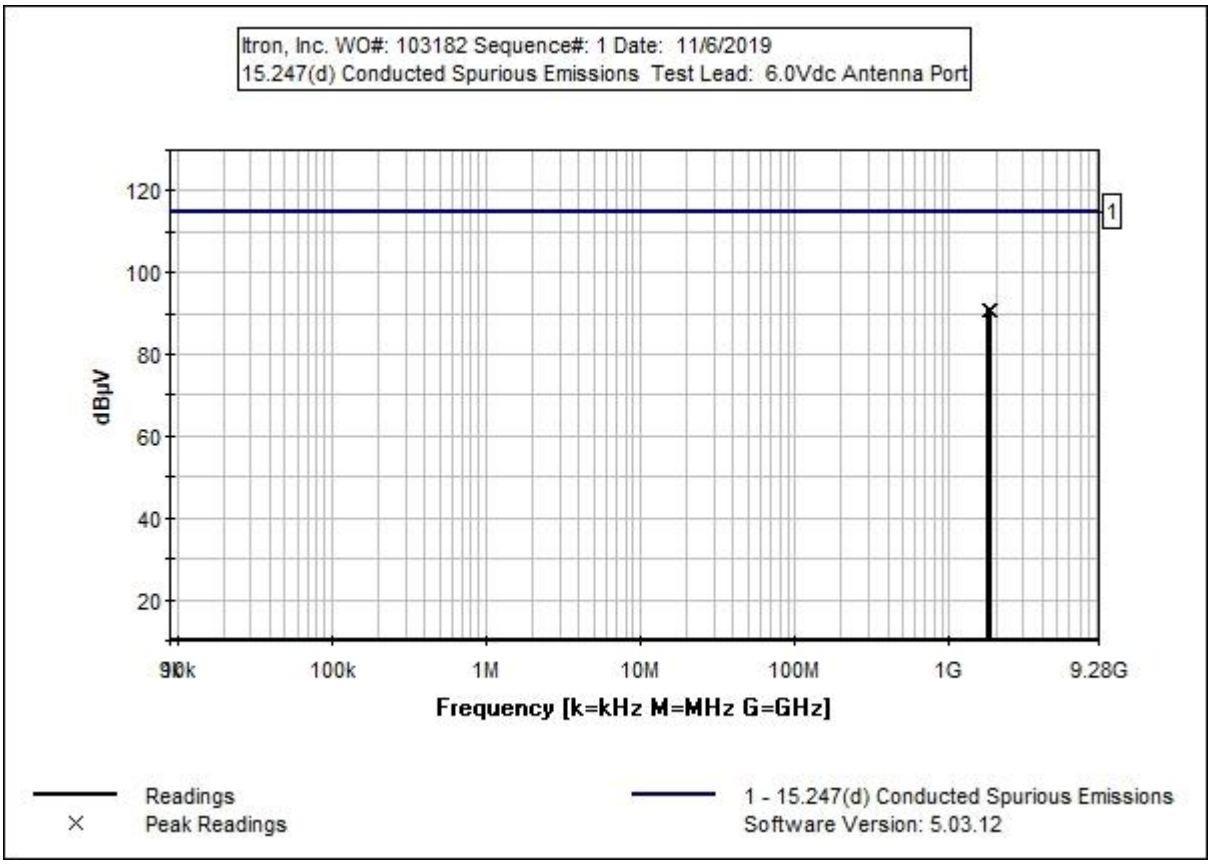
Device	Manufacturer	Model #	S/N
Configuration 1			

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.
The EUT is powered from 6Vdc power supply to simulate fresh battery.
Modulation: 25kbps GFSK Level 3

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

Test Location: Brea Lab A
Temperature (ºC): 22.0
Relative Humidity (%): 39.0
Test Method: ANSI C63.10 (2013)



Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN02672	Spectrum Analyzer	E4446A	3/13/2019	3/13/2021
T1	AN03431	Attenuator	89-20-21	12/19/2017	12/19/2019
T2	ANP07243	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	1830.000M	71.5	+19.3	+0.2			+0.0	91.0	114.9	-23.9	Anten
2	1804.400M	71.3	+19.3	+0.2			+0.0	90.8	114.9	-24.1	Anten
3	1855.500M	71.1	+19.3	+0.2			+0.0	90.6	114.9	-24.3	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 #:	**103182**	Date:	11/6/2019
Test Type:	**Conducted Emissions**	Time:	14:50:27
Tested By:	Don Nguyen	Sequence#:	2
Software:	EMITest 5.03.12		6.0Vdc

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

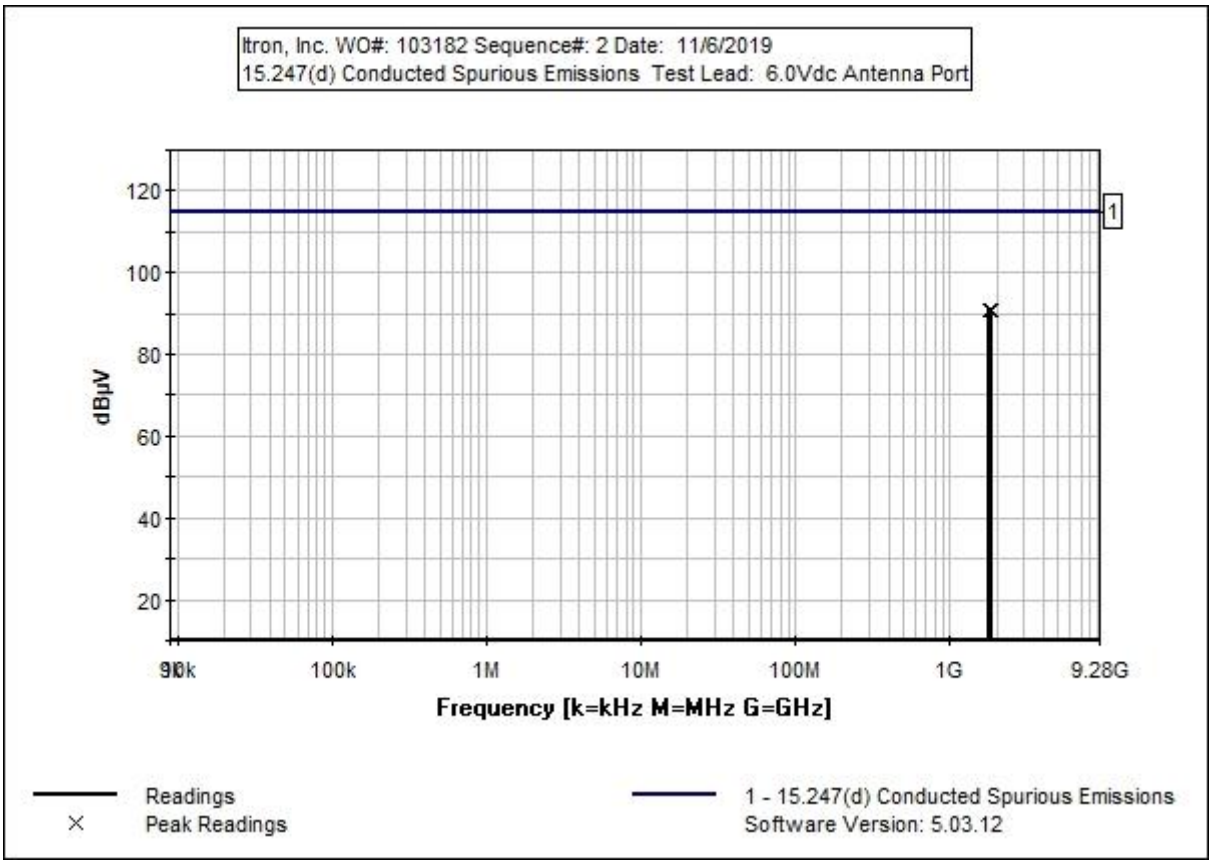
Test Conditions / Notes:

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. The EUT is powered from 6Vdc power supply to simulate fresh battery.

Modulation: 50kbps GFSK Level 3

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

Test Location: Brea Lab A
Temperature (ºC): 22.0
Relative Humidity (%): 39.0
Test Method: ANSI C63.10 (2013)



Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN02672	Spectrum Analyzer	E4446A	3/13/2019	3/13/2021
T1	AN03431	Attenuator	89-20-21	12/19/2017	12/19/2019
T2	ANP07243	Cable	32022-29094K-29094K-24TC	7/5/2018	7/5/2020

Measurement Data: Reading listed by margin. Test Lead: Antenna Port

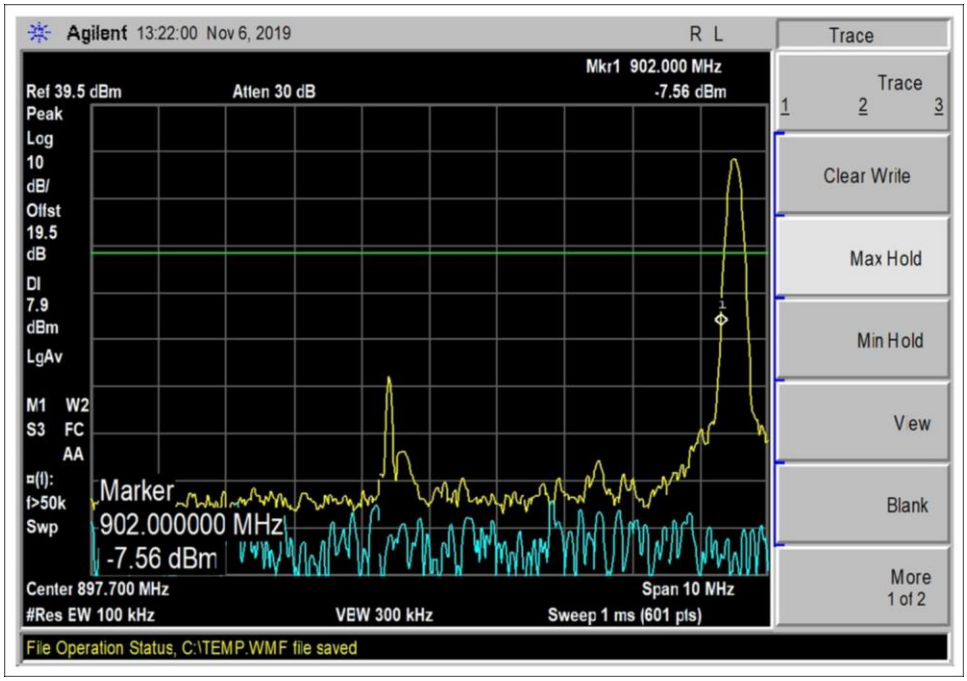
#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	dB	dB	Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1	1830.051M	71.5	+19.3	+0.2			+0.0	91.0	114.9	-23.9	Anten
2	1804.400M	71.1	+19.3	+0.2			+0.0	90.6	114.9	-24.3	Anten
3	1855.563M	71.1	+19.3	+0.2			+0.0	90.6	114.9	-24.3	Anten

Band Edge

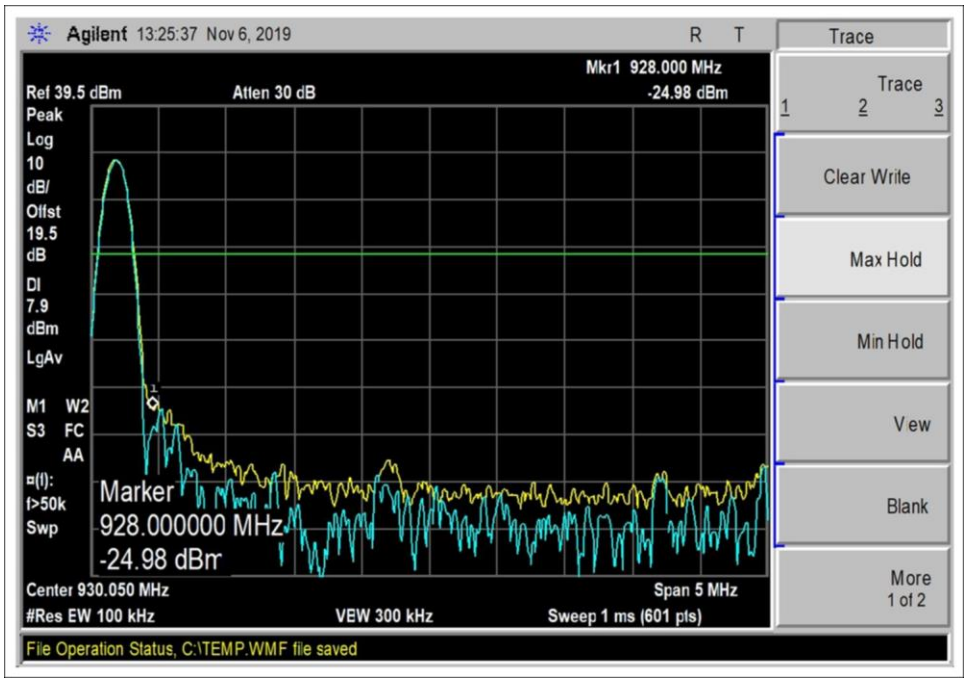
Band Edge Summary				
Limit applied: Max Power/100kHz - 20dB. Operating Mode: Single Channel (Low and High)				
Frequency (MHz)	**Modulation**	**Measured (dBm)**	**Limit (dBm)**	**Results**
902	25kbps GFSK Level 3	-7.56	<7.9	Pass
928	25kbps GFSK Level 3	-24.98	<7.9	Pass
902	50kbps GFSK Level 3	-7.08	<7.9	Pass
928	50kbps GFSK Level 3	-15.47	<7.9	Pass

Band Edge Summary				
Limit applied: Max Power/100kHz - 20dB. Operating Mode: Hopping				
Frequency (MHz)	**Modulation**	**Measured (dBm)**	**Limit (dBm)**	**Results**
902	25kbps GFSK Level 3	-16.50	<7.9	Pass
928	25kbps GFSK Level 3	-23.97	<7.9	Pass
902	50kbps GFSK Level 3	-7.39	<7.9	Pass
928	50kbps GFSK Level 3	-15.10	<7.9	Pass

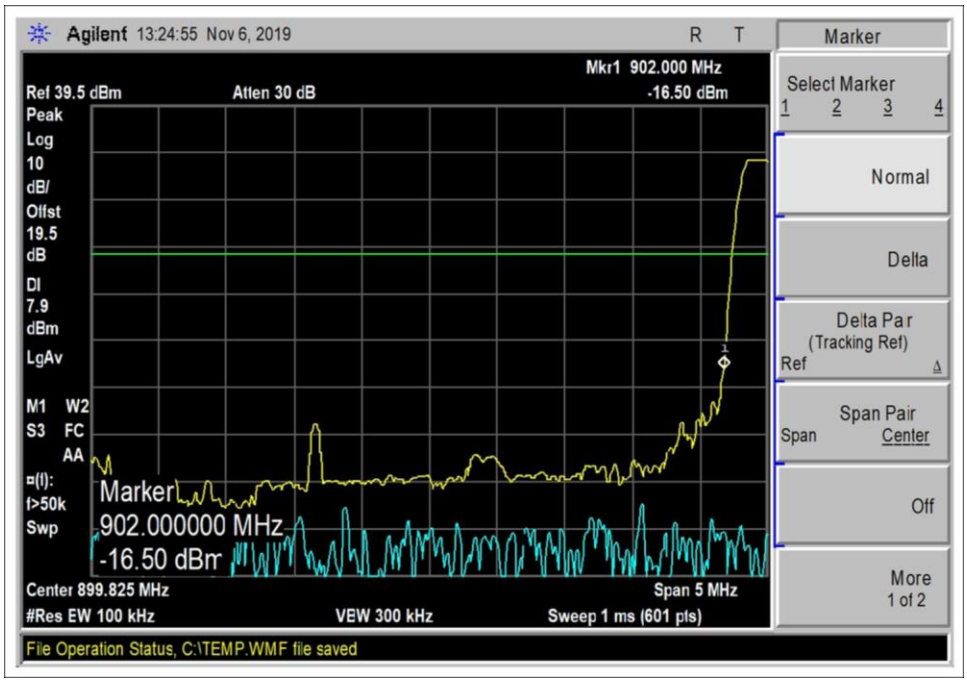
Band Edge Plots



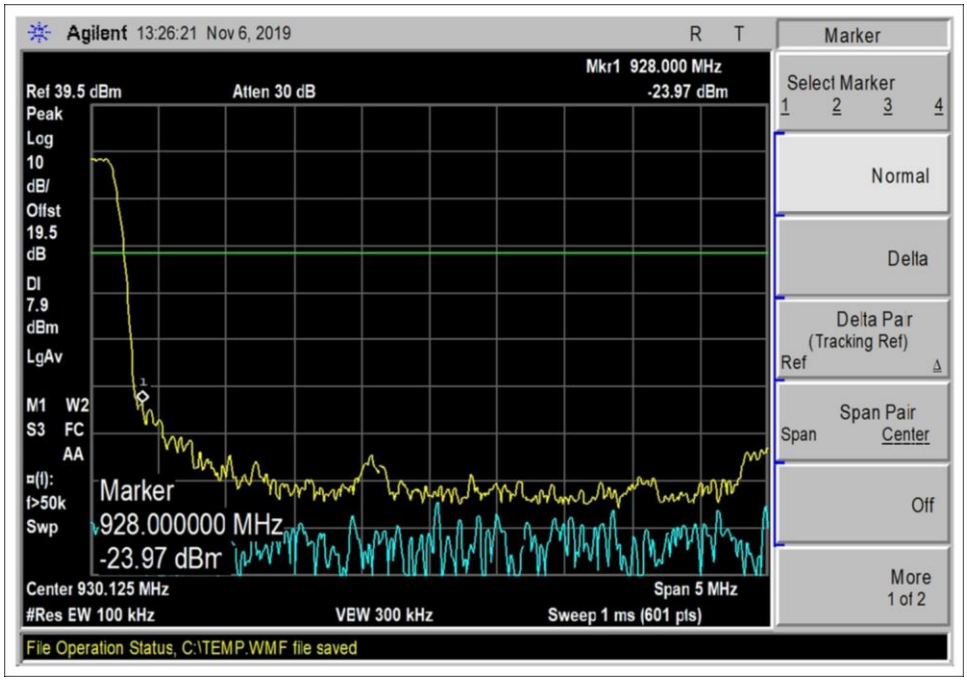
25kbps Low Channel



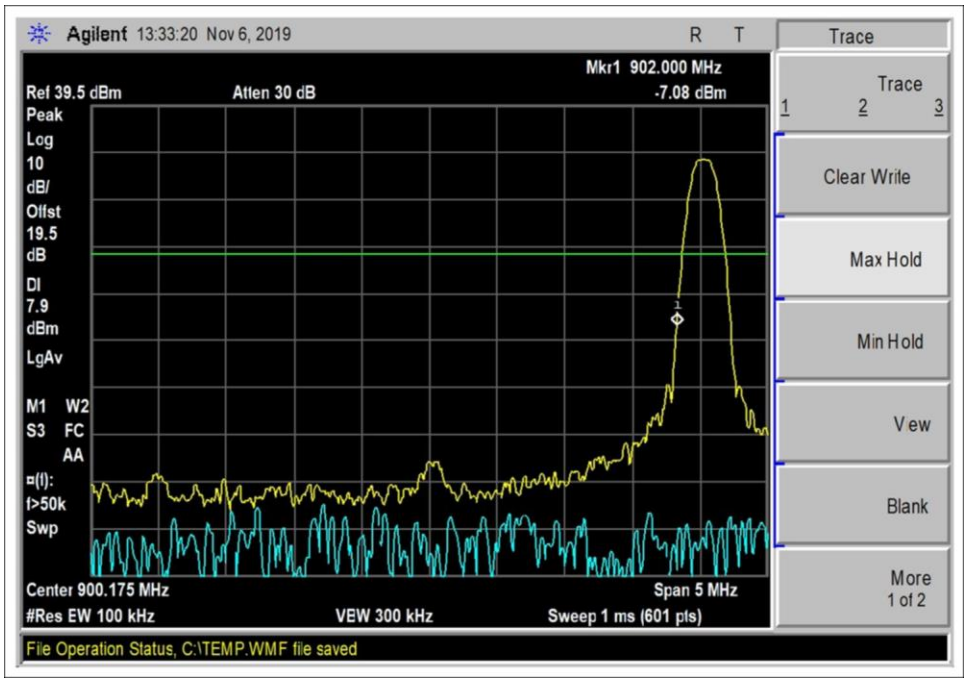
25kbps High Channel



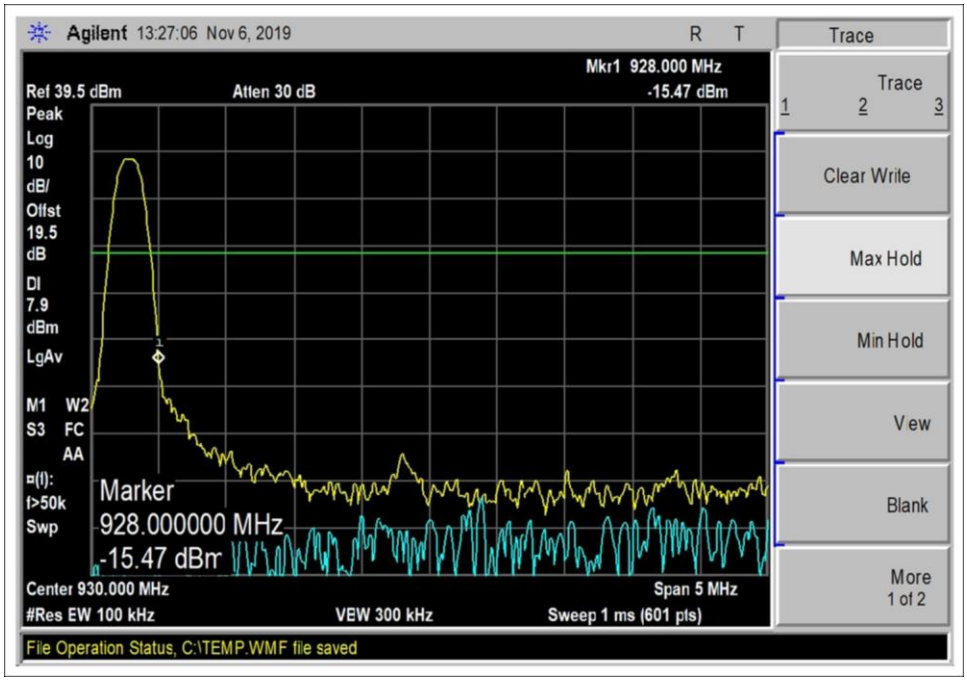
25kbps Low Channel Hopping



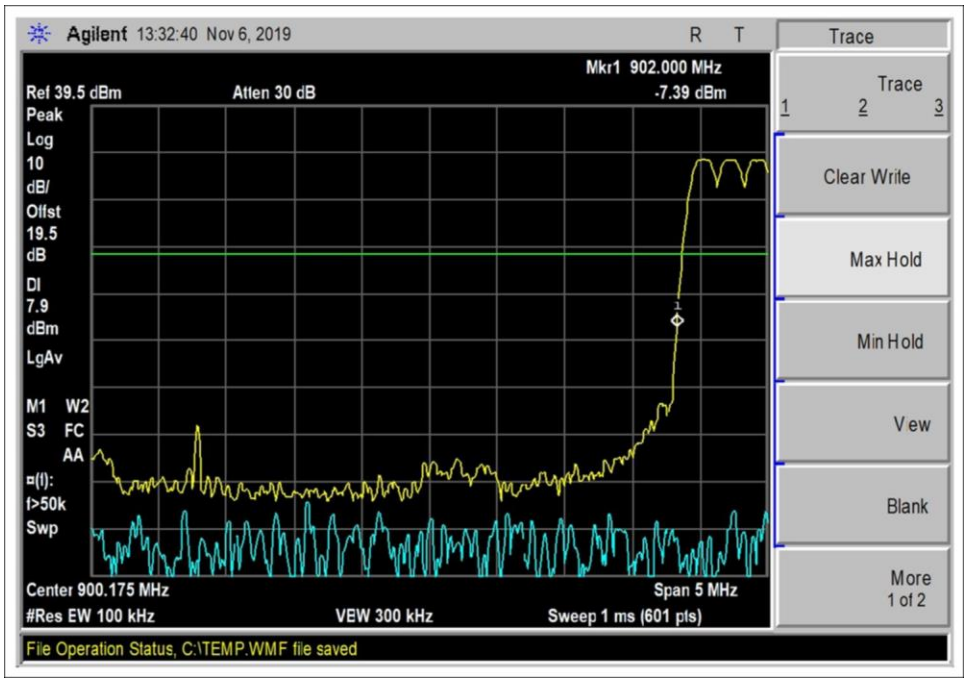
25kbps High Channel Hopping



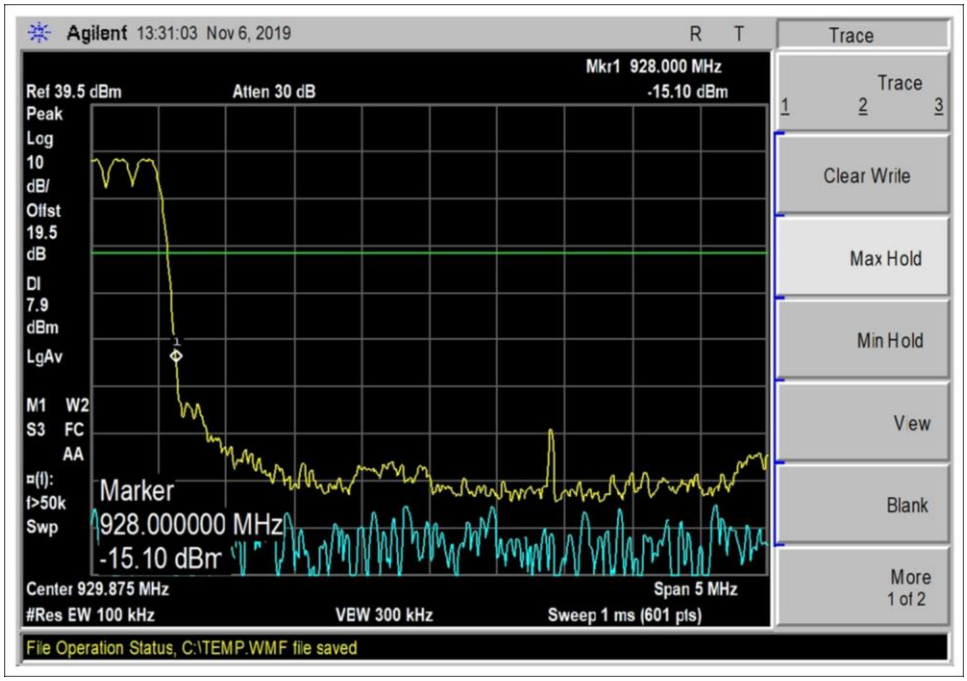
50kbps Low Channel



50kbps High Channel

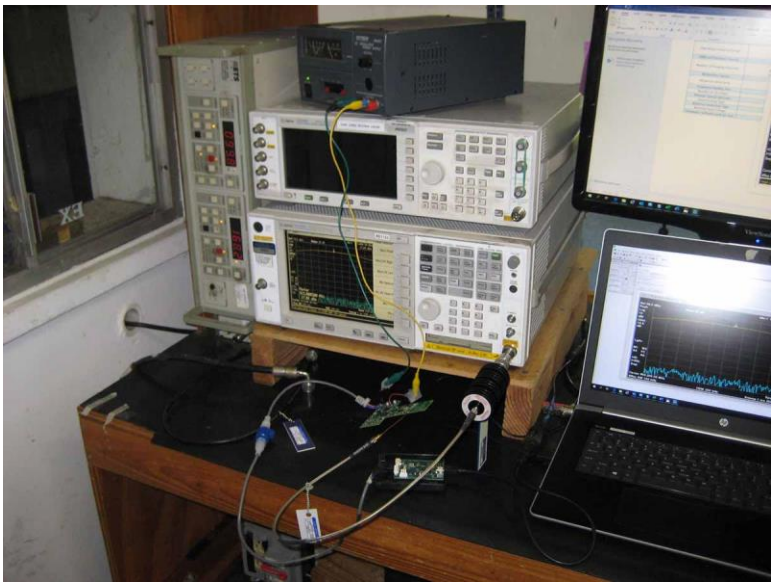


50kbps Low Channel Hopping



50kbps High Channel Hopping

Test Setup Photo(s)



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 #:	**103182**	Date:	11/18/2019
Test Type:	**Maximized Emissions**	Time:	15:58:31
Tested By:	Don Nguyen	Sequence#:	19
Software:	EMITest 5.03.12		

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 2			

Support Equipment:

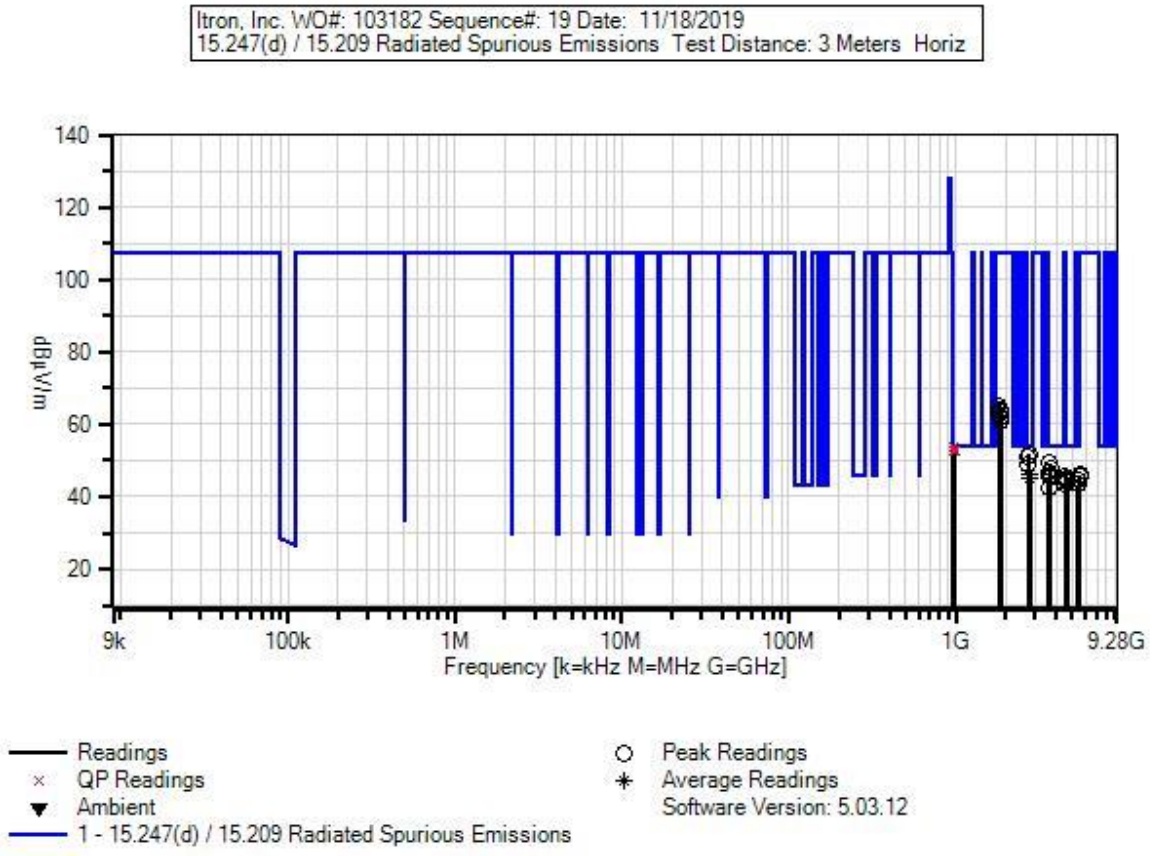
Device	Manufacturer	Model #	S/N
Configuration 2			

Test Conditions / Notes:

The EUT is placed on Styrofoam platform. 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.
The EUT is powered from fresh battery 6.0Vdc.
Modulation: 25kbps GFSK Level 3

Frequency of measurement: 9kHz-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 (ºC): 23
Relative Humidity (%): 47


Itron, Inc. WO#: 103182 Sequence#: 19 Date: 11/18/2019
15.247(d) / 15.209 Radiated Spurious Emissions Test Distance: 3 Meters Horiz
140
120
100
80
60
40
20
dBµV/m
9k
100k
1M
10M
100M
1G
9.28G
Frequency [k=kHz M=MHz G=GHz]
Readings
QP Readings
Ambient
1 - 15.247(d) / 15.209 Radiated Spurious Emissions
Peak Readings
Average Readings
Software Version: 5.03.12

Test Equipment:

ID	Asset #/Serial #	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	ANP05198	Cable-Amplitude +15C to +45C (dB)	8268	12/4/2018	12/4/2020
	AN00309	Preamp	8447D	2/19/2018	2/19/2020
	AN00314	Loop Antenna	6502	5/13/2018	5/13/2020
	ANP05050	Cable	RG223/U	12/24/2018	12/24/2020
T4	AN02672	Spectrum Analyzer	E4446A	3/13/2019	3/13/2021
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	3/4/2019	3/4/2021
T8	ANP07244	Cable	32022-29094K-29094K-24TC	7/5/2018	7/5/2020
T9	AN03169	High Pass Filter	HM1155-11SS	5/8/2019	5/8/2021

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	967.000M	17.8	+23.8	+6.1	+6.1	+0.0	+0.0	53.8	54.0	-0.2	Vert
	QP		+0.0	+0.0	+0.0	+0.0					
			+0.0								
^	967.000M	21.0	+23.8	+6.1	+6.1	+0.0	+0.0	57.0	54.0	+3.0	Vert
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
3	979.750M	16.5	+24.0	+6.1	+6.2	+0.0	+0.0	52.8	54.0	-1.2	Vert
	QP		+0.0	+0.0	+0.0	+0.0					
			+0.0								
^	979.750M	20.3	+24.0	+6.1	+6.2	+0.0	+0.0	56.6	54.0	+2.6	Vert
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
5	993.000M	16.1	+24.2	+6.1	+6.3	+0.0	+0.0	52.7	54.0	-1.3	Vert
	QP		+0.0	+0.0	+0.0	+0.0					
			+0.0								
^	993.000M	19.5	+24.2	+6.1	+6.3	+0.0	+0.0	56.1	54.0	+2.1	Vert
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
7	2745.000M	56.9	+0.0	+0.0	+0.0	+0.0	+0.0	51.7	54.0	-2.3	Horiz
			-38.6	+29.4	+3.4	+0.4					
			+0.2								
8	2745.000M	56.7	+0.0	+0.0	+0.0	+0.0	+0.0	51.5	54.0	-2.5	Vert
			-38.6	+29.4	+3.4	+0.4					
			+0.2								
9	2706.600M	56.3	+0.0	+0.0	+0.0	+0.0	+0.0	50.8	54.0	-3.2	Vert
			-38.6	+29.1	+3.4	+0.4					
			+0.2								

10	3660.000M	51.1	+0.0 -38.3 +0.2	+0.0 +31.6	+0.0 +4.1	+0.0 +0.5	+0.0	49.2	54.0	-4.8	Horiz
11	2706.600M	54.4	+0.0 -38.6 +0.2	+0.0 +29.1	+0.0 +3.4	+0.0 +0.4	+0.0	48.9	54.0	-5.1	Horiz
12	3711.000M	49.4	+0.0 -38.3 +0.2	+0.0 +31.9	+0.0 +4.1	+0.0 +0.5	+0.0	47.8	54.0	-6.2	Horiz
13	3660.000M	48.5	+0.0 -38.3 +0.2	+0.0 +31.6	+0.0 +4.1	+0.0 +0.5	+0.0	46.6	54.0	-7.4	Vert
14	2783.250M Ave	51.2	+0.0 -38.6 +0.2	+0.0 +29.5	+0.0 +3.5	+0.0 +0.4	+0.0	46.2	54.0	-7.8	Vert
^	2783.250M	59.4	+0.0 -38.6 +0.2	+0.0 +29.5	+0.0 +3.5	+0.0 +0.4	+0.0	54.4	54.0	+0.4	Vert
16	4511.000M	45.2	+0.0 -37.8 +0.2	+0.0 +32.9	+0.0 +4.5	+0.0 +0.7	+0.0	45.7	54.0	-8.3	Horiz
17	3711.000M	47.1	+0.0 -38.3 +0.2	+0.0 +31.9	+0.0 +4.1	+0.0 +0.5	+0.0	45.5	54.0	-8.5	Vert
18	3608.800M	47.9	+0.0 -38.4 +0.1	+0.0 +31.1	+0.0 +4.1	+0.0 +0.6	+0.0	45.4	54.0	-8.6	Horiz
19	2783.250M Ave	50.1	+0.0 -38.6 +0.2	+0.0 +29.5	+0.0 +3.5	+0.0 +0.4	+0.0	45.1	54.0	-8.9	Horiz
^	2783.250M	58.3	+0.0 -38.6 +0.2	+0.0 +29.5	+0.0 +3.5	+0.0 +0.4	+0.0	53.3	54.0	-0.7	Horiz
21	4638.750M	44.4	+0.0 -37.7 +0.2	+0.0 +32.8	+0.0 +4.7	+0.0 +0.6	+0.0	45.0	54.0	-9.0	Horiz
22	4575.000M	44.1	+0.0 -37.8 +0.2	+0.0 +33.0	+0.0 +4.6	+0.0 +0.7	+0.0	44.8	54.0	-9.2	Horiz
23	4575.000M	43.7	+0.0 -37.8 +0.2	+0.0 +33.0	+0.0 +4.6	+0.0 +0.7	+0.0	44.4	54.0	-9.6	Vert
24	4638.750M	43.7	+0.0 -37.7 +0.2	+0.0 +32.8	+0.0 +4.7	+0.0 +0.6	+0.0	44.3	54.0	-9.7	Vert
25	4511.000M	42.9	+0.0 -37.8 +0.2	+0.0 +32.9	+0.0 +4.5	+0.0 +0.7	+0.0	43.4	54.0	-10.6	Vert
26	5413.200M	41.1	+0.0 -37.5 +0.2	+0.0 +33.9	+0.0 +5.3	+0.0 +0.4	+0.0	43.4	54.0	-10.6	Vert

27	3608.800M	44.7	+0.0 -38.4 +0.1	+0.0 +31.1	+0.0 +4.1	+0.0 +0.6	+0.0	42.2	54.0	-11.8	Vert
28	1804.400M	73.8	+0.0 -38.9 +0.2	+0.0 +27.0	+0.0 +2.6	+0.0 +0.2	+0.0	64.9	107.6	-42.7	Vert
29	1830.000M	72.8	+0.0 -38.9 +0.2	+0.0 +27.1	+0.0 +2.6	+0.0 +0.2	+0.0	64.0	107.6	-43.6	Vert
30	1855.500M	72.1	+0.0 -38.9 +0.2	+0.0 +27.3	+0.0 +2.7	+0.0 +0.2	+0.0	63.6	107.6	-44.0	Vert
31	1804.400M	71.7	+0.0 -38.9 +0.2	+0.0 +27.0	+0.0 +2.6	+0.0 +0.2	+0.0	62.8	107.6	-44.8	Horiz
32	1855.500M	70.2	+0.0 -38.9 +0.2	+0.0 +27.3	+0.0 +2.7	+0.0 +0.2	+0.0	61.7	107.6	-45.9	Horiz
33	1830.000M	69.7	+0.0 -38.9 +0.2	+0.0 +27.1	+0.0 +2.6	+0.0 +0.2	+0.0	60.9	107.6	-46.7	Horiz
34	5566.500M	43.5	+0.0 -37.4 +0.2	+0.0 +33.9	+0.0 +5.5	+0.0 +0.4	+0.0	46.1	107.6	-61.5	Vert
35	5566.500M	42.8	+0.0 -37.4 +0.2	+0.0 +33.9	+0.0 +5.5	+0.0 +0.4	+0.0	45.4	107.6	-62.2	Horiz
36	5490.000M	42.0	+0.0 -37.5 +0.2	+0.0 +34.1	+0.0 +5.5	+0.0 +0.4	+0.0	44.7	107.6	-62.9	Vert
37	5490.000M	41.8	+0.0 -37.5 +0.2	+0.0 +34.1	+0.0 +5.5	+0.0 +0.4	+0.0	44.5	107.6	-63.1	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 #:	**103182**	Date:	11/19/2019
Test Type:	**Maximized Emissions**	Time:	09:51:30
Tested By:	Don Nguyen	Sequence#:	20
Software:	EMITest 5.03.12		

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 2			

Support Equipment:

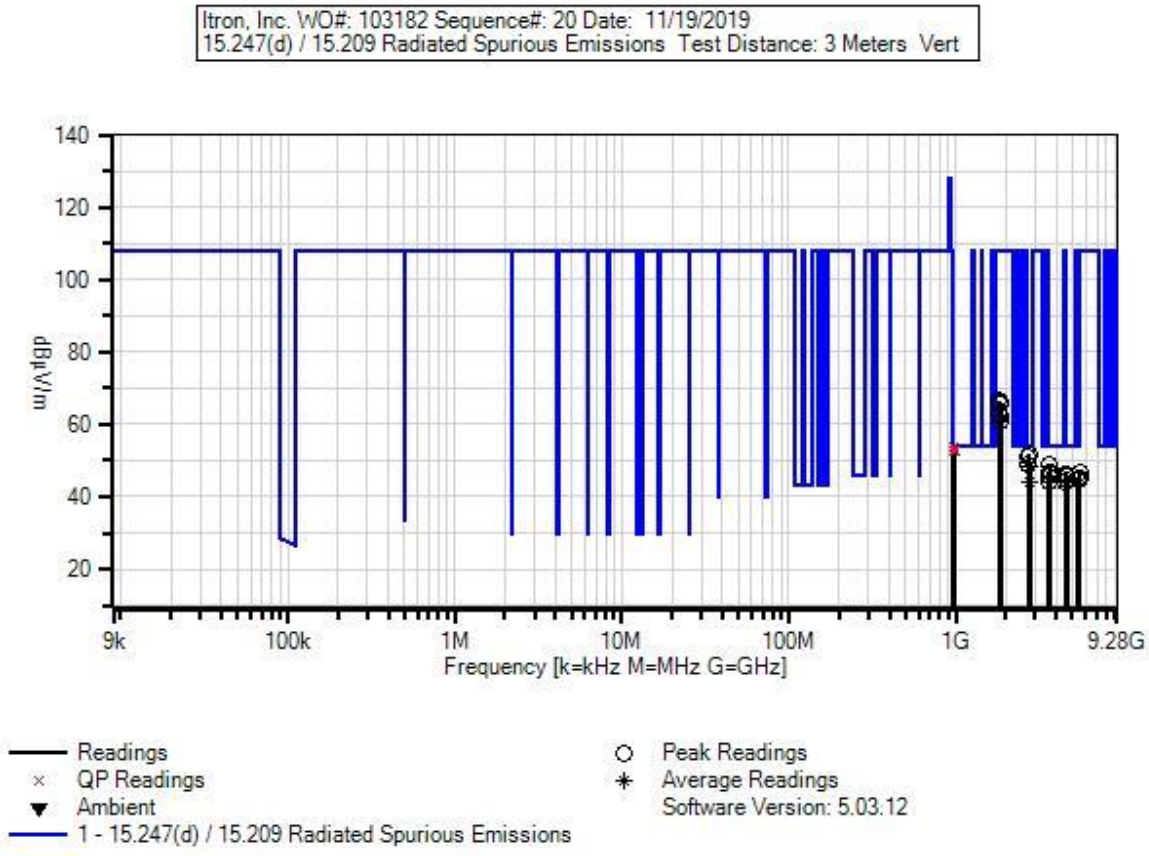
Device	Manufacturer	Model #	S/N
Configuration 2			

Test Conditions / Notes:

The EUT is placed on Styrofoam platform. 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.
The EUT is powered from fresh battery 6.0Vdc.
Modulation: 50kbps GFSK Level 3

Frequency of measurement: 9kHz-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 (ºC): 23
Relative Humidity (%): 47


Itron, Inc. WO#: 103182 Sequence#: 20 Date: 11/19/2019
15.247(d) / 15.209 Radiated Spurious Emissions Test Distance: 3 Meters Vert
140
120
100
80
60
40
20
dBµV/m
9k
100k
1M
10M
100M
1G
9.28G
Frequency [k=kHz M=MHz G=GHz]
Readings
QP Readings
Ambient
1 - 15.247(d) / 15.209 Radiated Spurious Emissions
Peak Readings
Average Readings
Software Version: 5.03.12

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	ANP05198	Cable-Amplitude +15C to +45C (dB)	8268	12/4/2018	12/4/2020
	AN00309	Preamp	8447D	2/19/2018	2/19/2020
	AN00314	Loop Antenna	6502	5/13/2018	5/13/2020
	ANP05050	Cable	RG223/U	12/24/2018	12/24/2020
T4	AN02672	Spectrum Analyzer	E4446A	3/13/2019	3/13/2021
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	3/4/2019	3/4/2021
T8	ANP07244	Cable	32022-29094K-29094K-24TC	7/5/2018	7/5/2020
T9	AN03169	High Pass Filter	HM1155-11SS	5/8/2019	5/8/2021

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	967.000M QP	17.5	+23.8 +0.0 +0.0	+6.1 +0.0	+6.1 +0.0	+0.0 +0.0	+0.0	53.5	54.0	-0.5	Vert
^	967.000M	20.8	+23.8 +0.0 +0.0	+6.1 +0.0	+6.1 +0.0	+0.0 +0.0	+0.0	56.8	54.0	+2.8	Vert
3	993.000M QP	16.1	+24.2 +0.0 +0.0	+6.1 +0.0	+6.3 +0.0	+0.0 +0.0	+0.0	52.7	54.0	-1.3	Vert
^	993.000M	19.7	+24.2 +0.0 +0.0	+6.1 +0.0	+6.3 +0.0	+0.0 +0.0	+0.0	56.3	54.0	+2.3	Vert
5	979.750M QP	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	Vert
^	979.750M	20.0	+24.0 +0.0 +0.0	+6.1 +0.0	+6.2 +0.0	+0.0 +0.0	+0.0	56.3	54.0	+2.3	Vert
7	2745.000M	57.0	+0.0 -38.6 +0.2	+0.0 +29.4	+0.0 +3.4	+0.0 +0.4	+0.0	51.8	54.0	-2.2	Vert
8	2745.000M	56.7	+0.0 -38.6 +0.2	+0.0 +29.4	+0.0 +3.4	+0.0 +0.4	+0.0	51.5	54.0	-2.5	Horiz
9	2706.600M	56.6	+0.0 -38.6 +0.2	+0.0 +29.1	+0.0 +3.4	+0.0 +0.4	+0.0	51.1	54.0	-2.9	Vert

10	2706.600M	54.5	+0.0 -38.6 +0.2	+0.0 +29.1	+0.0 +3.4	+0.0 +0.4	+0.0	49.0	54.0	-5.0	Horiz
11	3660.000M	50.6	+0.0 -38.3 +0.2	+0.0 +31.6	+0.0 +4.1	+0.0 +0.5	+0.0	48.7	54.0	-5.3	Horiz
12	2783.400M Ave	53.6	+0.0 -38.6 +0.2	+0.0 +29.5	+0.0 +3.5	+0.0 +0.4	+0.0	48.6	54.0	-5.4	Vert
^	2783.400M	61.4	+0.0 -38.6 +0.2	+0.0 +29.5	+0.0 +3.5	+0.0 +0.4	+0.0	56.4	54.0	+2.4	Vert
14	3711.200M	48.6	+0.0 -38.3 +0.2	+0.0 +31.9	+0.0 +4.1	+0.0 +0.5	+0.0	47.0	54.0	-7.0	Horiz
15	3660.000M	48.9	+0.0 -38.3 +0.2	+0.0 +31.6	+0.0 +4.1	+0.0 +0.5	+0.0	47.0	54.0	-7.0	Vert
16	3711.200M	48.1	+0.0 -38.3 +0.2	+0.0 +31.9	+0.0 +4.1	+0.0 +0.5	+0.0	46.5	54.0	-7.5	Vert
17	4575.000M	45.7	+0.0 -37.8 +0.2	+0.0 +33.0	+0.0 +4.6	+0.0 +0.7	+0.0	46.4	54.0	-7.6	Vert
18	4511.000M	45.6	+0.0 -37.8 +0.2	+0.0 +32.9	+0.0 +4.5	+0.0 +0.7	+0.0	46.1	54.0	-7.9	Horiz
19	3608.800M	48.2	+0.0 -38.4 +0.1	+0.0 +31.1	+0.0 +4.1	+0.0 +0.6	+0.0	45.7	54.0	-8.3	Horiz
20	4639.000M	44.8	+0.0 -37.7 +0.2	+0.0 +32.8	+0.0 +4.7	+0.0 +0.6	+0.0	45.4	54.0	-8.6	Vert
21	5413.200M	43.0	+0.0 -37.5 +0.2	+0.0 +33.9	+0.0 +5.3	+0.0 +0.4	+0.0	45.3	54.0	-8.7	Vert
22	5413.200M	42.7	+0.0 -37.5 +0.2	+0.0 +33.9	+0.0 +5.3	+0.0 +0.4	+0.0	45.0	54.0	-9.0	Horiz
23	4639.000M	44.2	+0.0 -37.7 +0.2	+0.0 +32.8	+0.0 +4.7	+0.0 +0.6	+0.0	44.8	54.0	-9.2	Horiz
24	4575.000M	44.1	+0.0 -37.8 +0.2	+0.0 +33.0	+0.0 +4.6	+0.0 +0.7	+0.0	44.8	54.0	-9.2	Horiz
25	3608.800M	46.8	+0.0 -38.4 +0.1	+0.0 +31.1	+0.0 +4.1	+0.0 +0.6	+0.0	44.3	54.0	-9.7	Vert

26	2783.400M Ave	49.2	+0.0 -38.6 +0.2	+0.0 +29.5	+0.0 +3.5	+0.0 +0.4	+0.0	44.2	54.0	-9.8	Horiz
^	2783.400M	57.7	+0.0 -38.6 +0.2	+0.0 +29.5	+0.0 +3.5	+0.0 +0.4	+0.0	52.7	54.0	-1.3	Horiz
28	4511.000M	43.7	+0.0 -37.8 +0.2	+0.0 +32.9	+0.0 +4.5	+0.0 +0.7	+0.0	44.2	54.0	-9.8	Vert
29	1804.400M	75.5	+0.0 -38.9 +0.2	+0.0 +27.0	+0.0 +2.6	+0.0 +0.2	+0.0	66.6	107.9	-41.3	Vert
30	1830.000M	75.2	+0.0 -38.9 +0.2	+0.0 +27.1	+0.0 +2.6	+0.0 +0.2	+0.0	66.4	107.9	-41.5	Vert
31	1855.600M	74.3	+0.0 -38.9 +0.2	+0.0 +27.3	+0.0 +2.7	+0.0 +0.2	+0.0	65.8	107.9	-42.1	Vert
32	1804.400M	71.9	+0.0 -38.9 +0.2	+0.0 +27.0	+0.0 +2.6	+0.0 +0.2	+0.0	63.0	107.9	-44.9	Horiz
33	1855.600M	70.9	+0.0 -38.9 +0.2	+0.0 +27.3	+0.0 +2.7	+0.0 +0.2	+0.0	62.4	107.9	-45.5	Horiz
34	1830.000M	69.6	+0.0 -38.9 +0.2	+0.0 +27.1	+0.0 +2.6	+0.0 +0.2	+0.0	60.8	107.9	-47.1	Horiz
35	5566.800M	43.9	+0.0 -37.4 +0.2	+0.0 +33.9	+0.0 +5.5	+0.0 +0.4	+0.0	46.5	107.9	-61.4	Vert
36	5566.800M	42.5	+0.0 -37.4 +0.2	+0.0 +33.9	+0.0 +5.5	+0.0 +0.4	+0.0	45.1	107.9	-62.8	Horiz
37	5490.000M	42.2	+0.0 -37.5 +0.2	+0.0 +34.1	+0.0 +5.5	+0.0 +0.4	+0.0	44.9	107.9	-63.0	Vert
38	5490.000M	41.8	+0.0 -37.5 +0.2	+0.0 +34.1	+0.0 +5.5	+0.0 +0.4	+0.0	44.5	107.9	-63.4	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 #:	**103182**	Date:	11/15/2019
Test Type:	**Maximized Emissions**	Time:	13:27:24
Tested By:	Don Nguyen	Sequence#:	18
Software:	EMITest 5.03.12		

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 3			

Support Equipment:

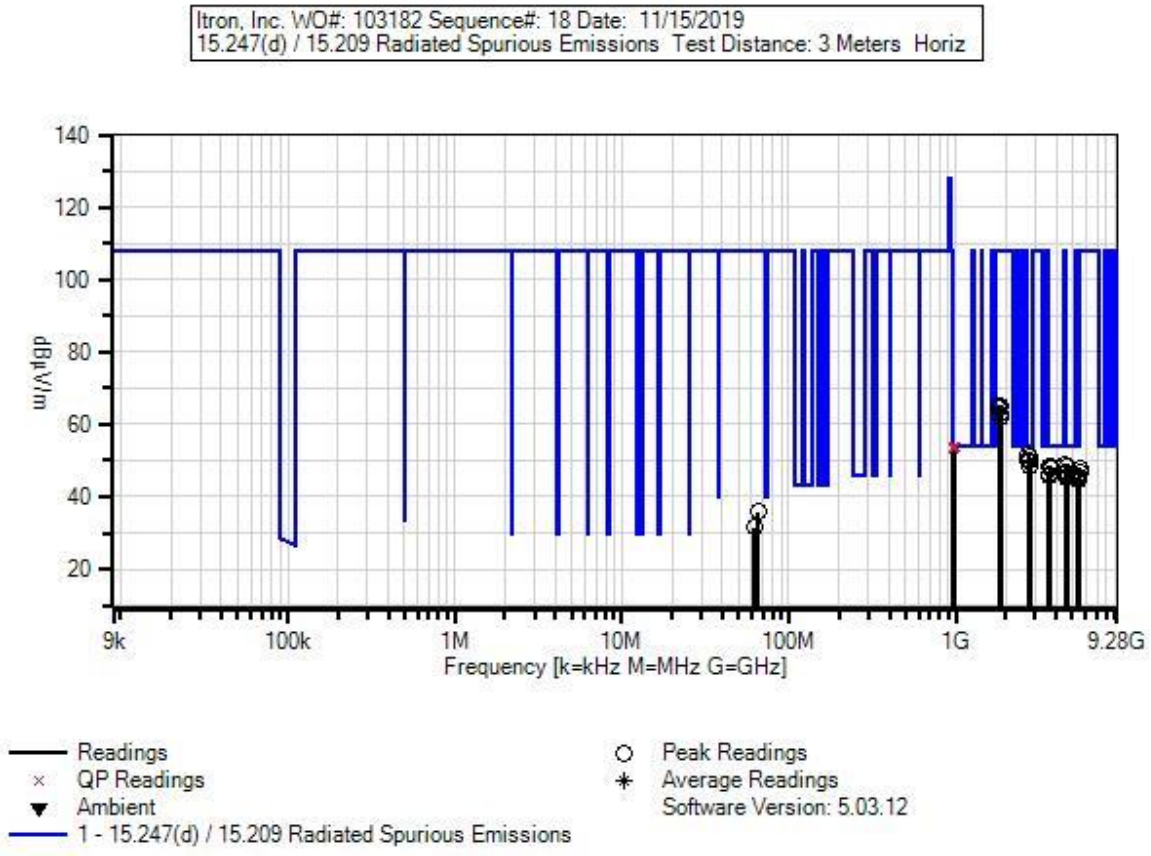
Device	Manufacturer	Model #	S/N
Configuration 3			

Test Conditions / Notes:

The EUT is placed on Styrofoam platform. 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.
The EUT is powered from fresh battery 6.0Vdc.
Modulation: 25kbps GFSK Level 3

Frequency of measurement: 9kHz-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 (ºC): 23
Relative Humidity (%): 47


Itron, Inc. WO#: 103182 Sequence#: 18 Date: 11/15/2019
15.247(d) / 15.209 Radiated Spurious Emissions Test Distance: 3 Meters Horiz
140
120
100
80
60
40
20
dBµV/m
9k
100k
1M
10M
100M
1G
9.28G
Frequency [k=kHz M=MHz G=GHz]
Readings
QP Readings
Ambient
1 - 15.247(d) / 15.209 Radiated Spurious Emissions
Peak Readings
Average Readings
Software Version: 5.03.12

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	ANP05198	Cable-Amplitude +15C to +45C (dB)	8268	12/4/2018	12/4/2020
	AN00309	Preamp	8447D	2/19/2018	2/19/2020
	AN00314	Loop Antenna	6502	5/13/2018	5/13/2020
	ANP05050	Cable	RG223/U	12/24/2018	12/24/2020
T4	AN02672	Spectrum Analyzer	E4446A	3/13/2019	3/13/2021
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	3/4/2019	3/4/2021
T8	ANP07244	Cable	32022-29094K-29094K-24TC	7/5/2018	7/5/2020
T9	AN03169	High Pass Filter	HM1155-11SS	5/8/2019	5/8/2021

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	967.000M	17.8	+23.8 +0.0 +0.0	+6.1 +0.0	+6.1 +0.0	+0.0 +0.0	+0.0	53.8	54.0	-0.2	Vert
	QP										
^	967.000M	21.7	+23.8 +0.0 +0.0	+6.1 +0.0	+6.1 +0.0	+0.0 +0.0	+0.0	57.7	54.0	+3.7	Vert
3	993.000M	17.2	+24.2 +0.0 +0.0	+6.1 +0.0	+6.3 +0.0	+0.0 +0.0	+0.0	53.8	54.0	-0.2	Vert
	QP										
^	993.000M	21.0	+24.2 +0.0 +0.0	+6.1 +0.0	+6.3 +0.0	+0.0 +0.0	+0.0	57.6	54.0	+3.6	Vert
5	980.200M	17.4	+24.0 +0.0 +0.0	+6.1 +0.0	+6.2 +0.0	+0.0 +0.0	+0.0	53.7	54.0	-0.3	Vert
	QP										
^	980.200M	21.3	+24.0 +0.0 +0.0	+6.1 +0.0	+6.2 +0.0	+0.0 +0.0	+0.0	57.6	54.0	+3.6	Vert
7	979.755M	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
	QP										
^	979.755M	20.1	+24.0 +0.0 +0.0	+6.1 +0.0	+6.2 +0.0	+0.0 +0.0	+0.0	56.4	54.0	+2.4	Vert
9	2706.600M	57.2	+0.0 -38.6 +0.2	+0.0 +29.1	+0.0 +3.4	+0.0 +0.4	+0.0	51.7	54.0	-2.3	Horiz