Itron, Inc.

TEST REPORT FOR

CGR ACT Module 3 (CAM3)
Model: OW3

Tested to The Following Standards:

FCC Part 15 Subpart C Section(s)

15.207 & 15.247
(FHSS 902-928 MHz)

Report No.: 103006-10

Date of issue: October 4, 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: 187363

REPORT PREPARED BY:

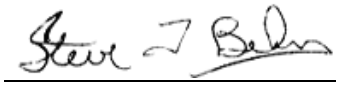
Morgan Tramontin
CKC Laboratories, Inc.
5046 Sierra Pines Drive
Mariposa, CA 95338

Project Number: 103006

DATE OF EQUIPMENT RECEIPT: August 20, 2019
DATE(S) OF TESTING: August 20-22, 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	Pass

NA = Not Applicable
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
The 2dB attenuator with 0.2dB coaxial cable was used for testing to simulate a long coax cable. The manuals explain how to calculate the coaxial cable loss and to be sure there is at least 2.2dB of total loss.

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
CGR ACT Module 3 (CAM3)	Itron, Inc.	OW3	CAM3-FCC1

Support Equipment:

Device	Manufacturer	Model #	S/N
Laptop	Dell	E7440	7021511606
USB to Ethernet adapter	Linksys	USB3GIGV1	15710S0B400416

Configuration 2

Equipment Tested:

Device	Manufacturer	Model #	S/N
CGR ACT Module 3 (CAM3)	Itron, Inc.	OW3	CAM3-FCC1

Support Equipment:

Device	Manufacturer	Model #	S/N
Laptop	Dell	E7440	7021511606
USB to Ethernet adapter	Linksys	USB3GIGV1	15710S0B400416
2.8dBi Colinear Omnidirectional Antenna	Cisco Systems, Inc.	07-1140-02	NA

Configuration 3

Equipment Tested:

Device	Manufacturer	Model #	S/N
CGR ACT Module 3 (CAM3)	Itron, Inc.	OW3	CAM3-FCC1

Support Equipment:

Device	Manufacturer	Model #	S/N
Laptop	Dell	E7440	7021511606
USB to Ethernet adapter	Linksys	USB3GIGV1	15710S0B400416
5.5dBi Colinear Omnidirectional Antenna	PCTEL	BOA9025NM-ITR	NA

Configuration 4

Equipment Tested:

Device	Manufacturer	Model #	S/N
CGR ACT Module 3 (CAM3)	Itron, Inc.	OW3	CAM3-FCC1

Support Equipment:

Device	Manufacturer	Model #	S/N
Laptop	Dell	E7440	7021511606
USB to Ethernet adapter	Linksys	USB3GIGV1	15710S0B400416
8.15dBi Colinear Omnidirectional Antenna	ANTENEX	FG9026	NA
2dB Attenuator	Mini-Circuits	UNAT-2+	NA
Coaxial Cable with 0.2dB loss at 915MHz	Mini-Circuits	141-24NM+	NA

General Product Information:

Product Information	Manufacturer-Provided Details
Equipment Type:	Limited Modular, Cisco CGR Host
Type of Wideband System:	Proprietary FHSS
Operating Frequency Range:	902.2 to 927.75MHz (FSK)
Number of Hopping Channels:	512
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):	FSK
Maximum Duty Cycle:	100%
Number of TX Chains:	1
Antenna Type(s) and Gain:	colinear omnidirectional 2.8dBi colinear omnidirectional 5.5dBi colinear omnidirectional 8.15dBi
Beamforming Type:	NA
Antenna Connection Type:	External Connector (Professional Installation)
Nominal Input Voltage:	120Vac and 220Vac
Firmware / Software used for Test:	Firmware: 5.1.10.0 Test Software: CAM3 FCC Test Help V29.3

FCC Part 15 Subpart C

15.247(a) Transmitter Characteristics

Test Setup/Conditions			
Test Location:	Brea Lab D	Test Engineer:	S. Yamamoto
Test Method:	ANSI C63.10 (2013)	Test Date(s):	8/21/2019
Configuration:	1		
Test Setup:	The equipment under test (EUT) is stand alone on the table. The antenna port of the EUT is connected to the spectrum analyzer using an attenuator and coaxial cable. The EUT is set to continuously transmit on its low, middle, and high channels for this test. Frequency Range: 902MHz to 928MHz Frequency tested: Low (902.2MHz), Middle (915MHz) and High (927.75MHz) and Hopping Firmware power setting: 60 (max) Firmware: 5.1.10.0 Test Software: CAM3 FCC Test Help V29.3 Modulation Types: 25kbps FSK Duty Cycle: Tested at 100%		

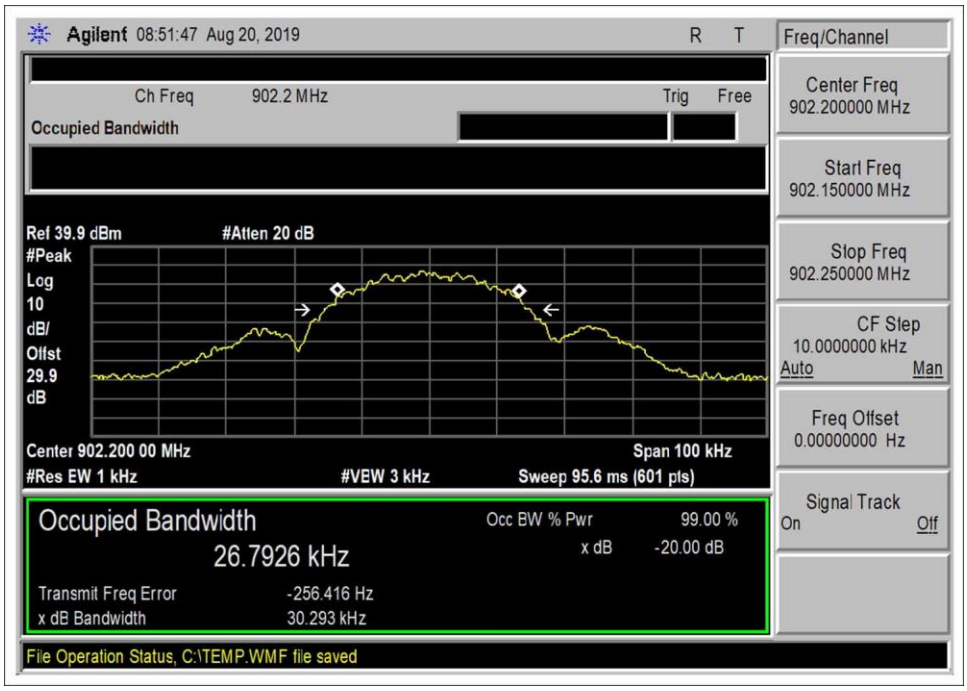
Environmental Conditions			
Temperature (ºC)	23	Relative Humidity (%):	58

Test Equipment					
Asset#	**Description**	**Manufacturer**	**Model**	**Cal Date**	**Cal Due**
03432	Attenuator	Aeroflex/Weinschel	90-30-34	10/27/2017	10/27/2019
P06978	Cable	Huber & Suhner Inc	Sucoflex 104A	3/31/2018	3/31/2020
02869	Spectrum Analyzer	Agilent	E4440A	7/25/2019	7/25/2020

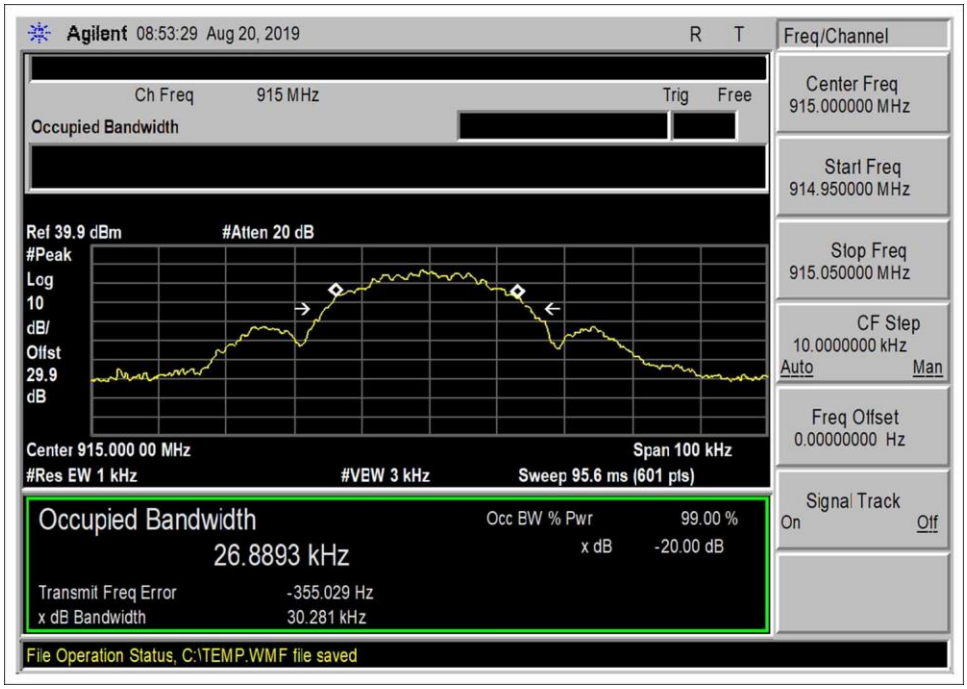
15.247(a)(1)(i) 20 dB Bandwidth

Test Data Summary					
Frequency (MHz)	**Antenna Port**	**Modulation**	**Measured (kHz)**	**Limit (kHz)**	**Results**
902.2	1	FSK	30.3	≤500	Pass
915	1	FSK	30.3		
927.75	1	FSK	30.3		

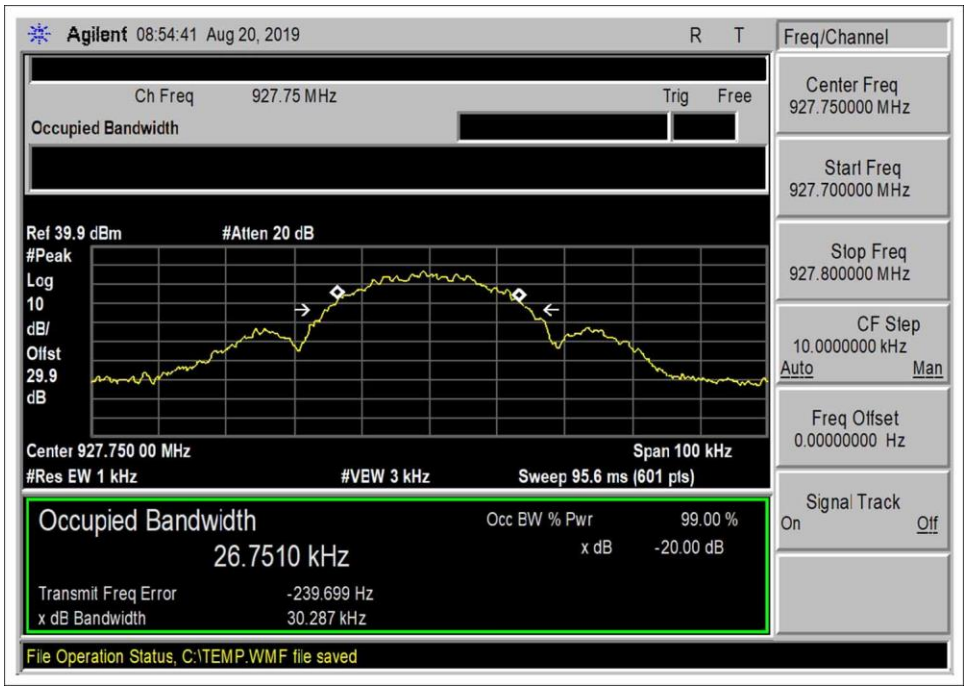
Plot(s)



Low Channel



Middle Channel

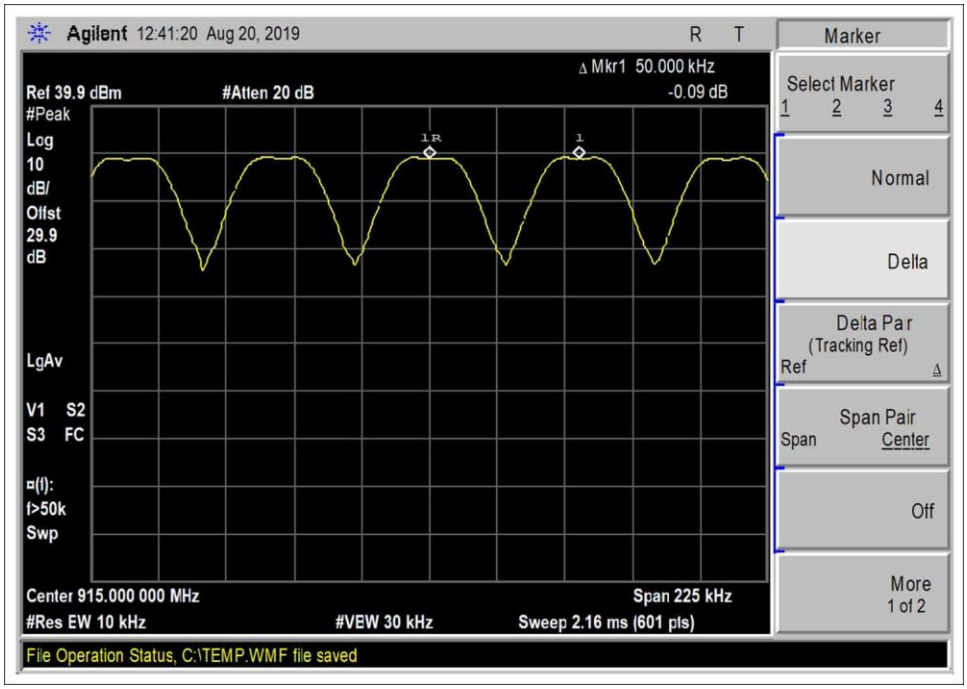


High Channel

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	Transmitting hopping	50.0	>30.3	Pass

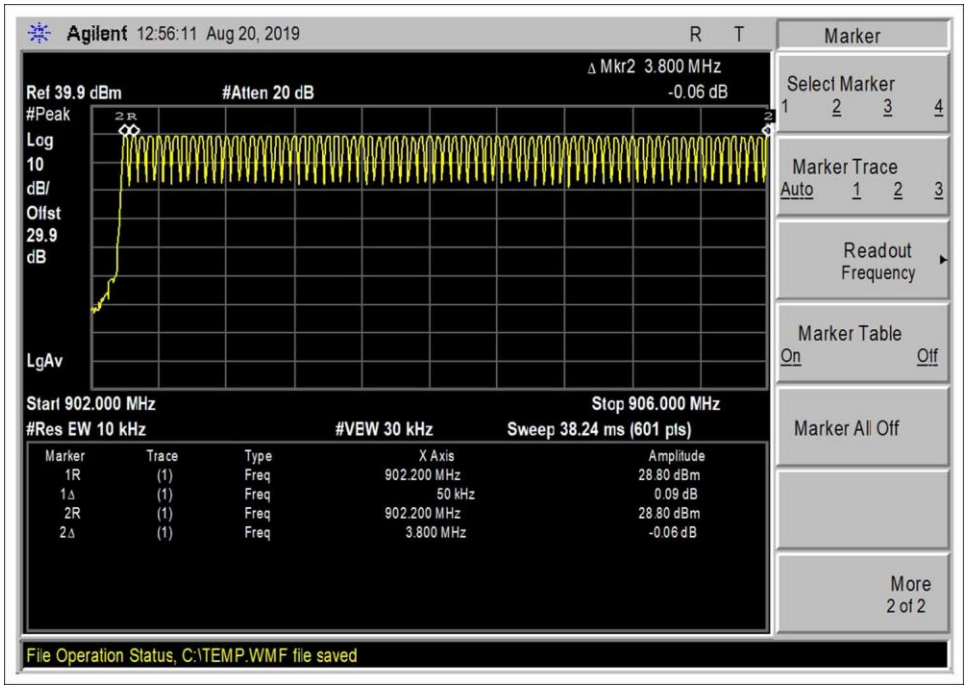
Plot(s)



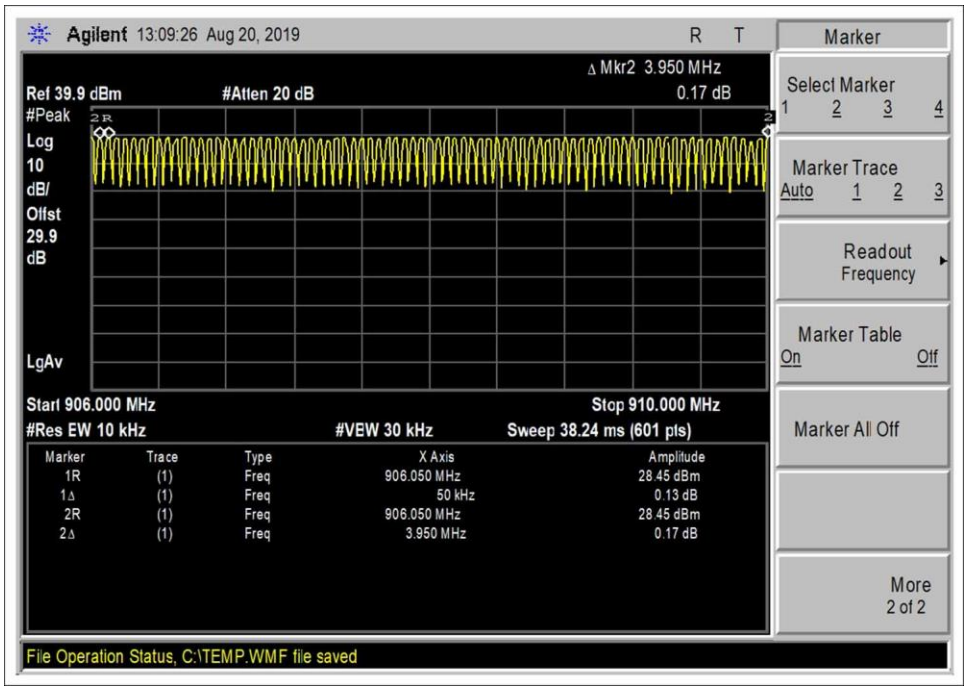
15.247(a)(1)(i) Number of Hopping Channels

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**	**Measured (Channels)**	**Limit (Channels)**	**Results**
1	Transmitting hopping	512	≥50	Pass

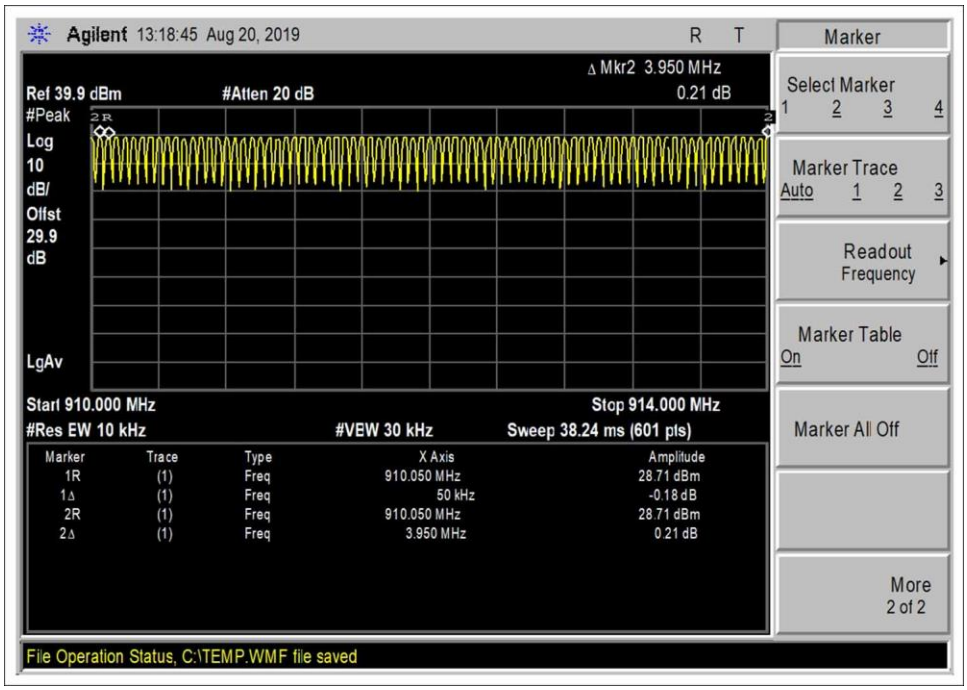
Plot(s)



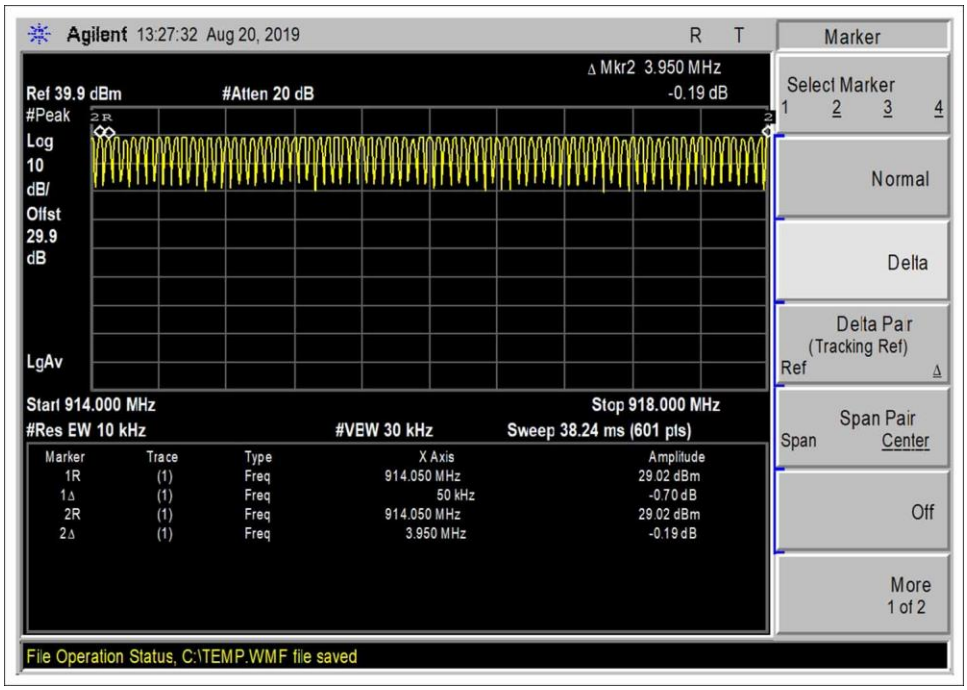
902MHz - 906MHz



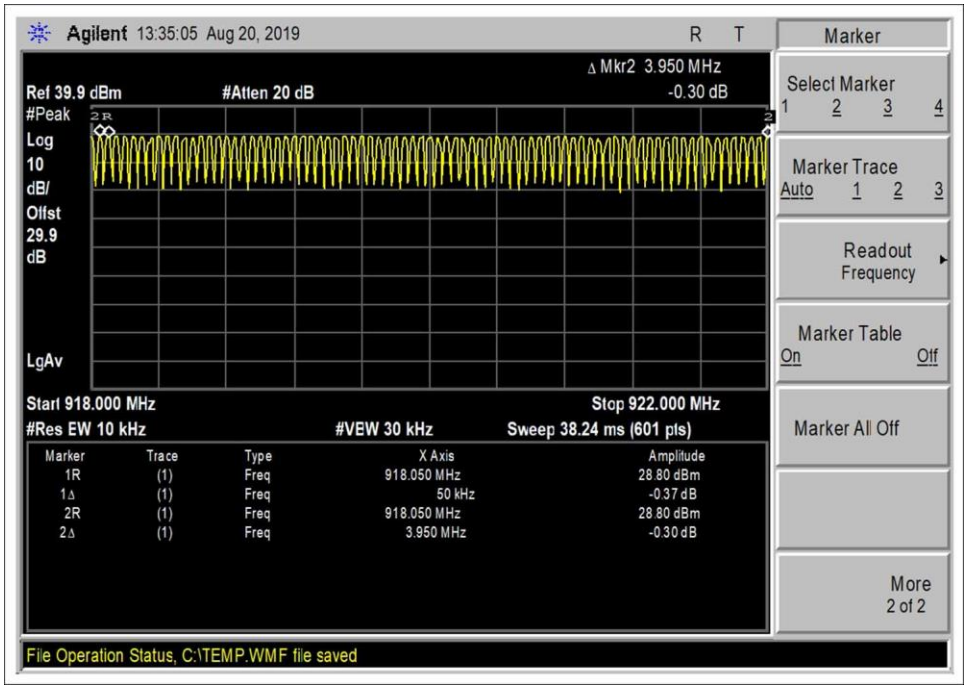
906MHz – 910MHz



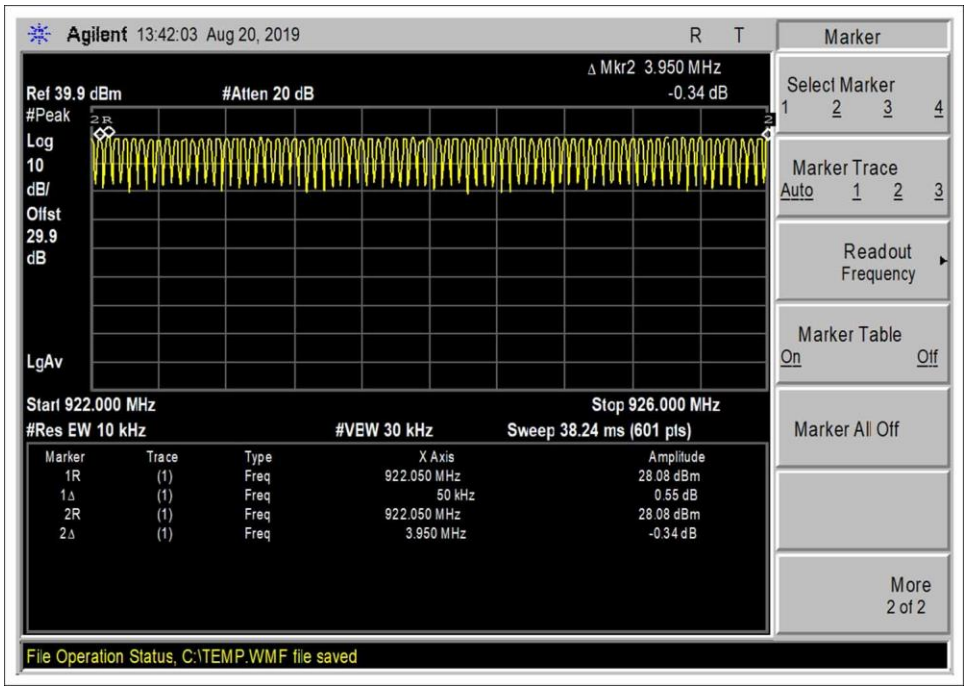
910MHz – 914MHz



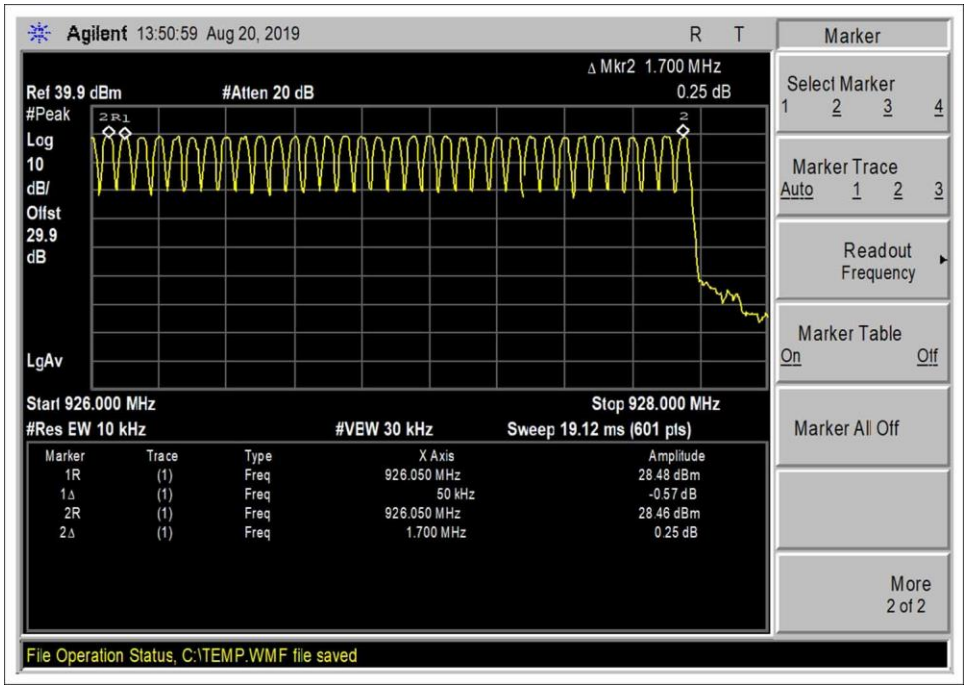
914MHz – 918MHz



918MHz – 922MHz



922MHz – 926MHz



926MHz – 928MHz

15.247(a)(1)(i) 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.

With the multiple modulations, modes and hop tables, the mode with the worst-case Time of Occupancy to demonstrate 400mS compliance is 399.8mS in 10 seconds, with a modulation that is > 250kHz and < 500 kHz OBW, and 400mS in 20 seconds for a modulation that is < 250kHz OBW. Each session of multiple short transmissions takes place on one of 64 or 512 different channels in a pseudorandom sequence. The algorithm that determines the pseudo-random hop sequence ensures all channels are used equally on the average.

Itron employs hopping patterns based on a pseudo-random sequence generated by an algorithm. The algorithm can have multiple components generated, that each has its own pseudo-random sequence.

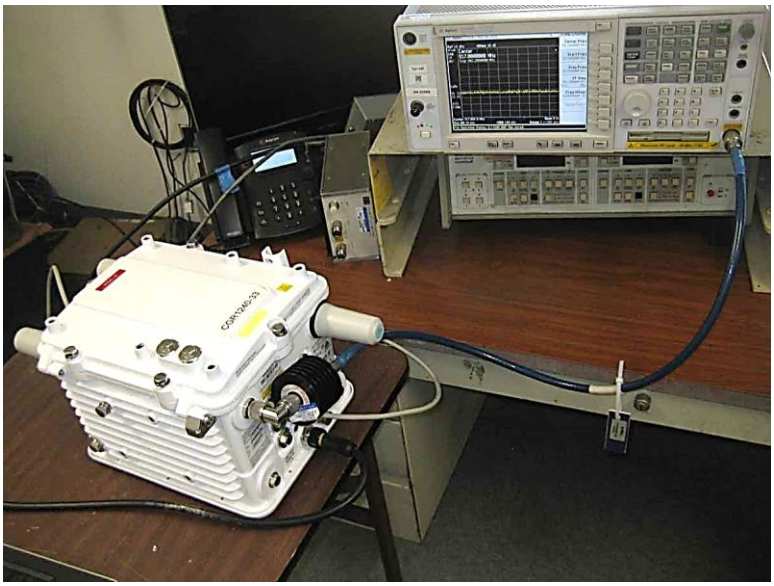
The firmware insures the channels are used in the prescribed pseudo random order, therefore, it maintains equal channel usage.

The system has single channel receiver 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(b)(2) Output Power

Test Data Summary - Voltage Variations					
Frequency (MHz)	Modulation / Ant Port	$V_{Minimum}$ (dBm)	$V_{Nominal}$ (dBm)	$V_{Maximum}$ (dBm)	Max Deviation from $V_{Nominal}$ (dB)
902.2	FSK / 1	28.77	28.77	28.77	0.00
915	FSK / 1	28.85	28.85	28.85	0.00
927.75	FSK / 1	28.62	28.62	28.62	0.00

Test performed using operational mode with the highest output power, representing worst case.

Parameter Definitions:

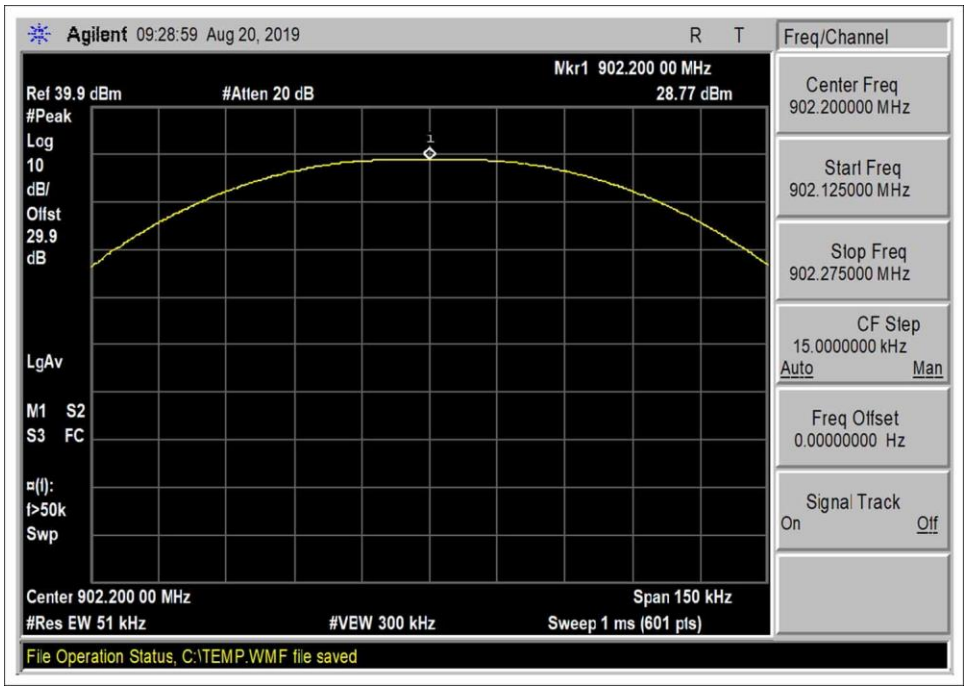
Measurements performed at input voltage according to manufacturer specification.

Parameter	Value
$V_{Nominal}$:	120Vac and 220Vac
$V_{Minimum}$:	102Vac
$V_{Maximum}$:	240Vac

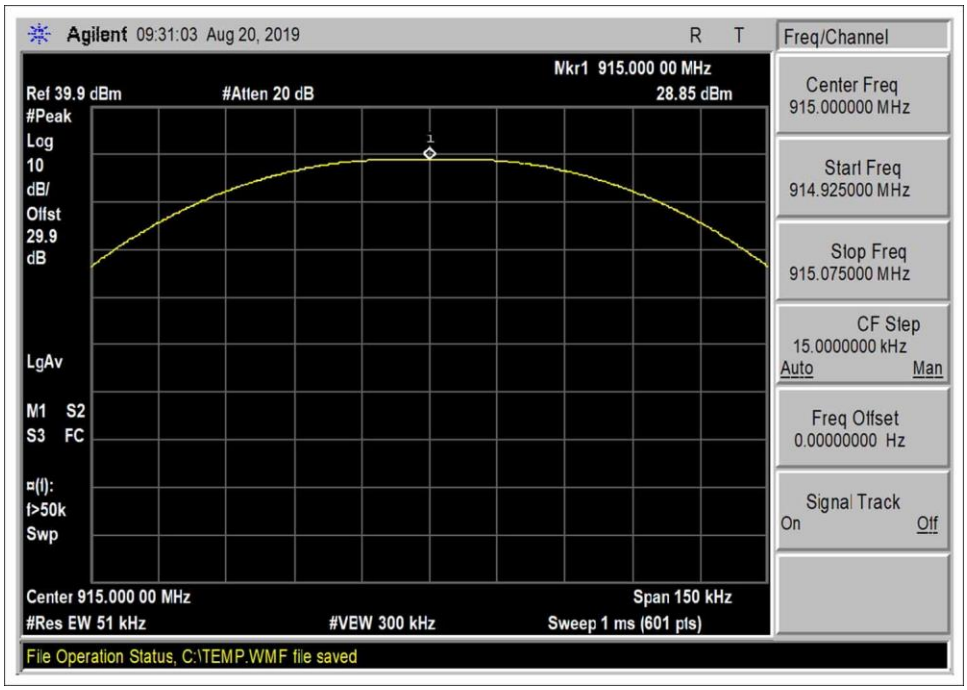
Test Data Summary - RF Conducted Measurement					
$Limit = \begin{cases} 30dBm\ Conducted/36dBm\ EIRP \mid \geq 50\ Channels \\ 24dBm\ Conducted/30dBm\ EIRP \mid < 50\ Channels\ (\min 25) \end{cases}$					
Frequency (MHz)	Modulation	Ant. Type / Gain (dBi)	Measured (dBm)	Limit (dBm)	Results
902.2	FSK	External Colinear Omnidirectional / 2.8dBi	28.77	≤30dBm conducted/36dBm EIRP	Pass
915	FSK	External Colinear Omnidirectional / 2.8dBi	28.85	≤30dBm conducted/36dBm EIRP	Pass
927.75	FSK	External Colinear Omnidirectional / 2.8dBi	28.62	≤30dBm conducted/36dBm EIRP	Pass
902.2	FSK	External Colinear Omnidirectional / 5.5dBi	28.77	≤30dBm conducted/36dBm EIRP	Pass
915	FSK	External Colinear Omnidirectional / 5.5dBi	28.85	≤30dBm conducted/36dBm EIRP	Pass
927.75	FSK	External Colinear Omnidirectional / 5.5dBi	28.62	≤30dBm conducted/36dBm EIRP	Pass
902.2	FSK	External Colinear Omnidirectional / 8.15dBi	28.77	≤30dBm conducted/36dBm EIRP	Pass
915	FSK	External Colinear Omnidirectional / 8.15dBi	28.85	≤30dBm conducted/36dBm EIRP	Pass
927.75	FSK	External Colinear Omnidirectional / 8.15dBi	28.62	≤30dBm conducted/36dBm EIRP	Pass

Note: 8.15 dBi external antenna uses a 2.0dB external attenuator and 0.2dB coaxial cable.

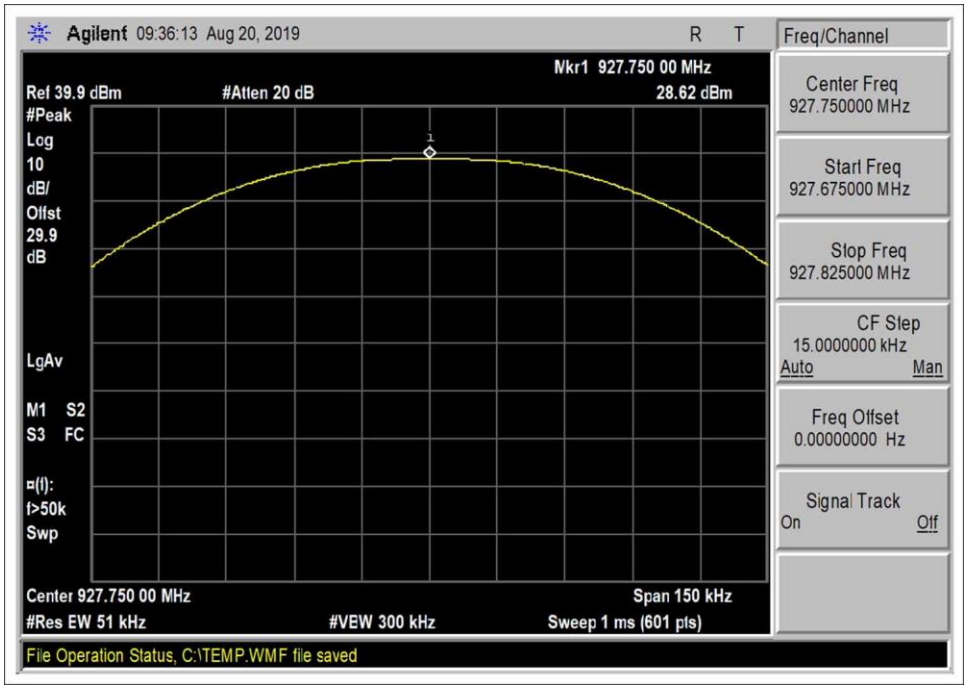
Plots



Low Channel



Middle Channel



High Channel

Test Setup / Conditions / Data

Test Location:	CKC Laboratories Inc • 110 N Olinda Pl • Brea CA 92823 • 714-993-6112		
Customer:	**Itron, Inc.**		
Specification:	**15.247(b) Power Output (902-928 MHz FHSS >50 Channels)**		
Work Order #:	**103006**	Date:	8/20/2019
Test Type:	**Conducted Emissions**	Time:	09:37:51
Tested By:	S. Yamamoto	Sequence#:	1
Software:	EMITest 5.03.12		120V 60Hz

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

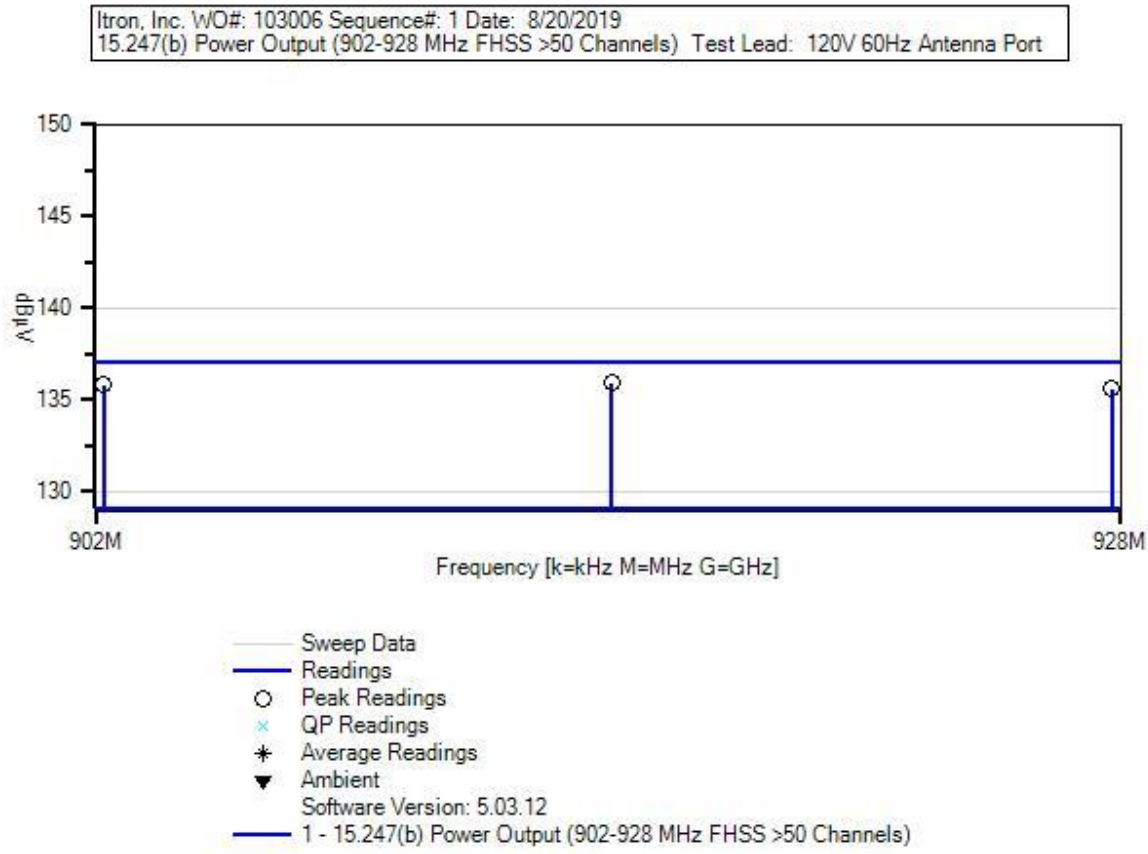
Test Conditions / Notes:

The equipment under test (EUT) is stand alone on the table. The antenna port of the EUT is connected to the spectrum analyzer using an attenuator and coaxial cable. The EUT is continuously transmitting and being set to the low, middle, and high channels for this test. Measurement of fundamental output power.
Temperature: 23°C, Humidity: 58%, Pressure:100kPa.
Site D. Test method ANSI C63.10 2013

Frequency Range: Fundamental
Frequency tested: Low (902.2MHz), Middle (915.0MHz), and High (927.75MHz)
Firmware power setting: 60 (max)
Firmware: 5.1.10.0
Test Software: CAM3 FCC Test Help V29.3

Modulation Types:
25kbps FSK

Antenna type: External Colinear Omnidirectional
Antenna Gain: 2.8dBi (attached), 5.5dBi (remote), 8.15dBi with 2dB attenuator and 0.2dB cable (remote)
Duty Cycle: Tested at 100%



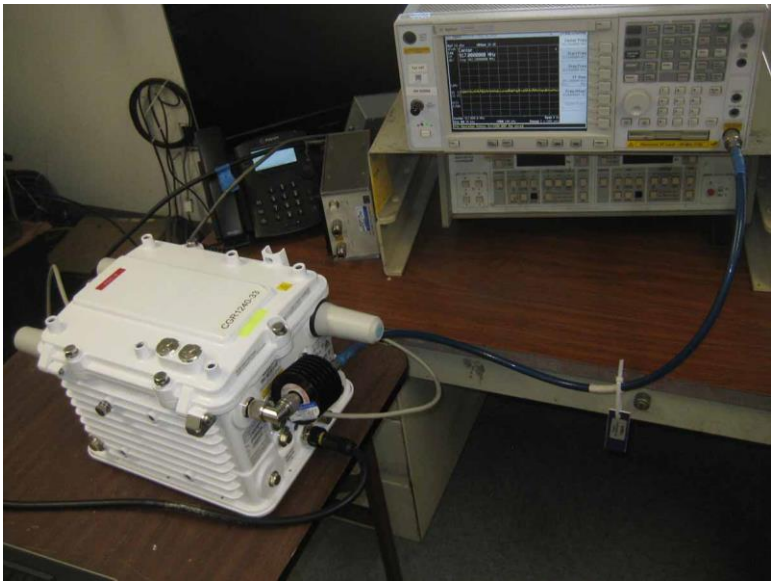
Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN03432	Attenuator	90-30-34	10/27/2017	10/27/2019
T2	ANP06978	Cable	Sucoflex 104A	3/31/2018	3/31/2020
	AN02869	Spectrum Analyzer	E4440A	7/25/2019	7/25/2020

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	915.000M	105.9	+29.6	+0.3			+0.0	135.9	137.0	-1.1	Anten
2	902.200M	105.9	+29.6	+0.3			+0.0	135.8	137.0	-1.2	Anten
3	927.750M	105.7	+29.6	+0.3			+0.0	135.6	137.0	-1.4	Anten

Test Setup Photo



15.247(d) RF Conducted Emissions & Band Edge

Test Setup / Conditions / Data

Test Location:	CKC Laboratories Inc • 110 N Olinda Pl • Brea CA 92823 • 714-993-6112		
Customer:	**Itron, Inc.**		
Specification:	**15.247(d) Conducted Spurious Emissions**		
Work Order #:	**103006**	Date:	8/20/2019
Test Type:	**Conducted Emissions**	Time:	12:23:17
Tested By:	S. Yamamoto	Sequence#:	4
Software:	EMITest 5.03.12		120V 60Hz

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

Test Conditions / Notes:

The equipment under test (EUT) is stand alone on the table. The antenna port of the EUT is connected to the spectrum analyzer using an attenuator and coaxial cable. The EUT is set to continuously transmit on its low, middle, and high channels for this test. Measurement of spurious emissions.
No emissions found within 35dB of the limit line.

Temperature range tested: From -10C to +55C
Temperature: 23°C, Humidity: 58%
Site D. Test method ANSI C63.10 2013

Frequency Range: 0.009MHz to 10GHz
RBW=100kHz VBW=300kHz
Frequency tested: Low (902.2MHz), Middle (915.0MHz) and High (927.75MHz)
Firmware power setting: 60 (max)
Firmware: 5.1.10.0
Test Software: CAM3 FCC Test Help V29.3

Modulation Types:
25kbps FSK

Antenna type: External Colinear Omnidirectional
Antenna Gain: 2.8dBi (attached), 5.5dBi (remote), 8.15dBi with 2dB attenuator and 0.2dB coaxial cable (remote)
Duty Cycle: Tested at 100%

Test Equipment:

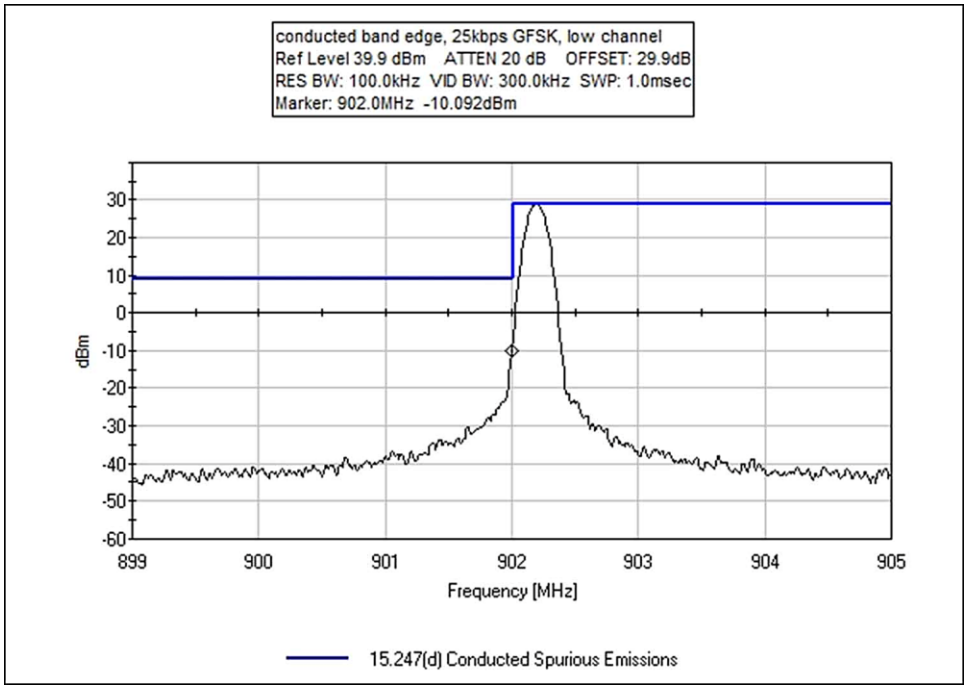
ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN03432	Attenuator	90-30-34	10/27/2017	10/27/2019
	ANP06978	Cable	Sucoflex 104A	3/31/2018	3/31/2020
	AN02869	Spectrum Analyzer	E4440A	7/25/2019	7/25/2020

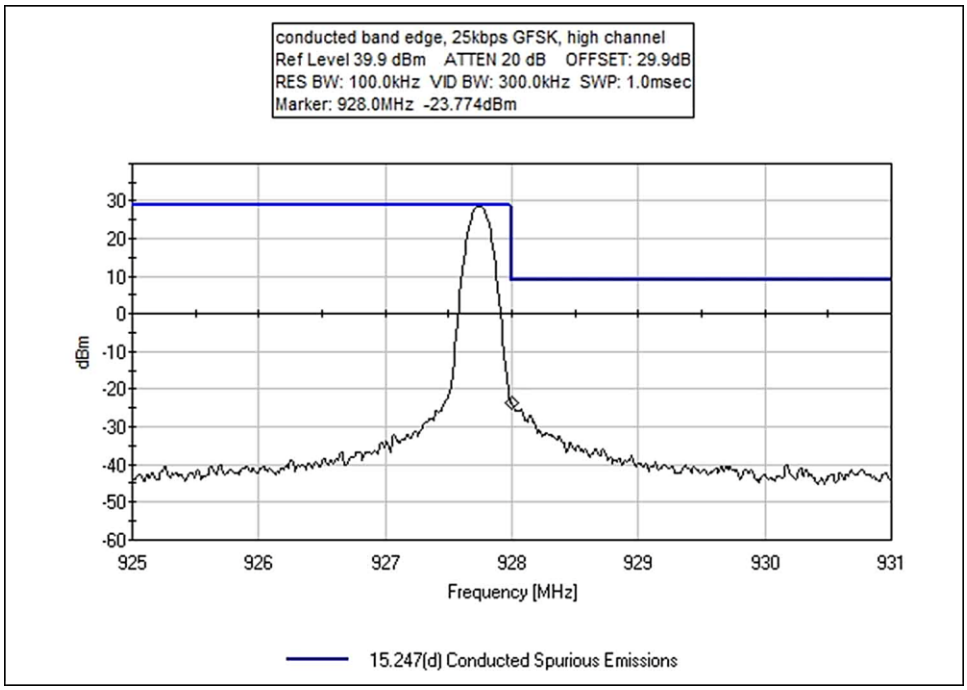
Band Edge

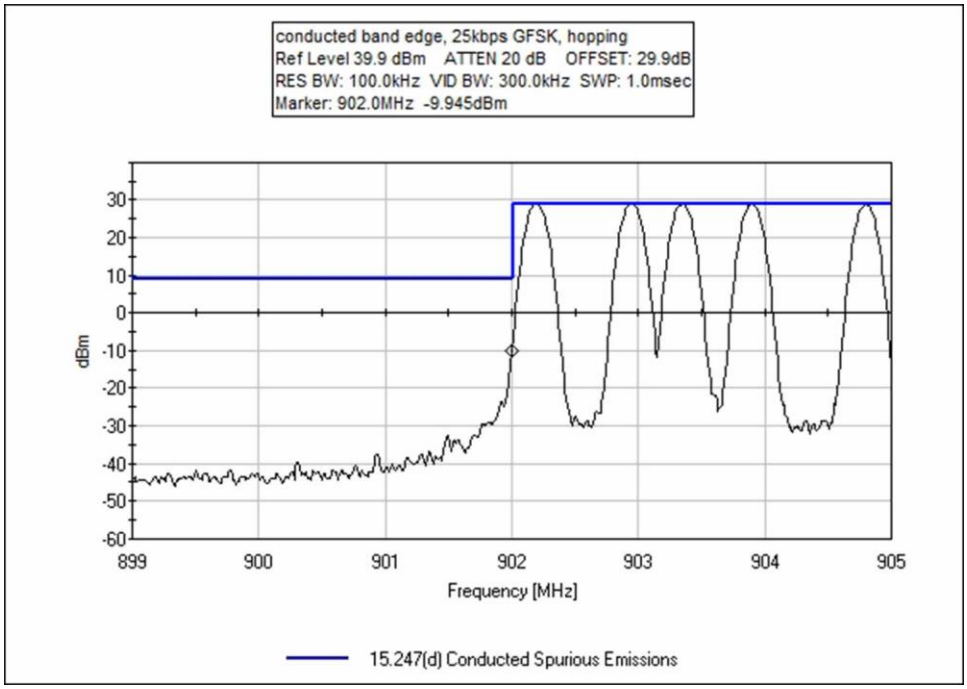
Band Edge Summary				
Limit applied: Max Power/100kHz - 20dB. Operating Mode: Single Channel (Low and High)				
Frequency (MHz)	**Modulation**	**Measured (dBm)**	**Limit (dBm)**	**Results**
902	FSK	-10.1	<8.8	Pass
928	FSK	-23.8	<8.8	Pass

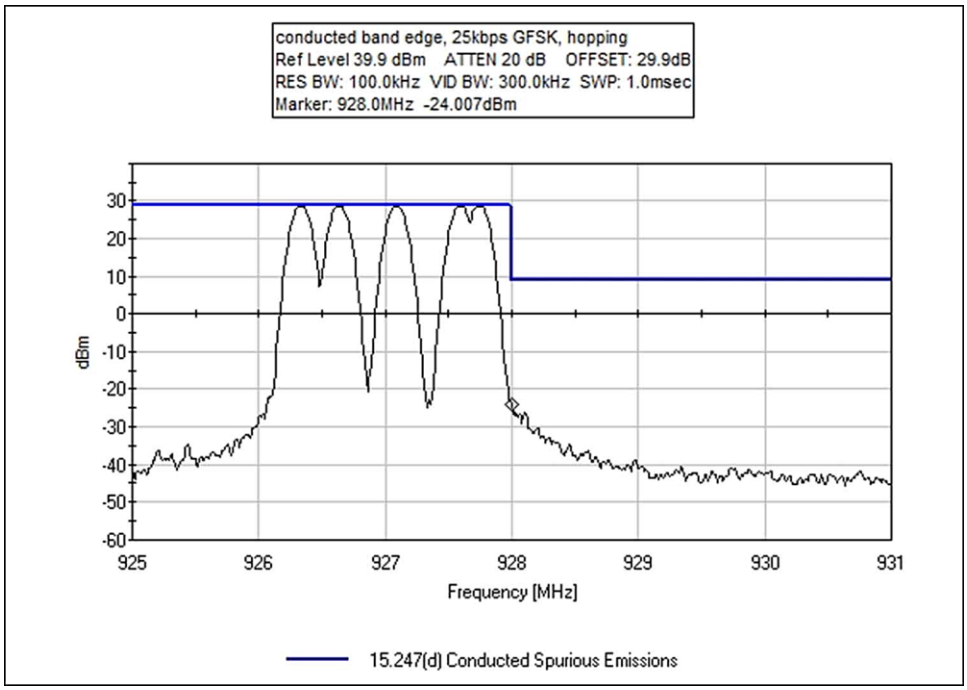
Band Edge Summary				
Limit applied: Max Power/100kHz - 20dB. Operating Mode: Hopping				
Frequency (MHz)	**Modulation**	**Measured (dBm)**	**Limit (dBm)**	**Results**
902	FSK	-9.9	<8.8	Pass
928	FSK	-24.0	<8.8	Pass

Band Edge Plots






conducted band edge, 25kbps GFSK, hopping
Ref Level 39.9 dBm ATTEN 20 dB OFFSET: 29.9dB
RES BW: 100.0kHz VID BW: 300.0kHz SWP: 1.0msec
Marker: 902.0MHz -9.945dBm
dBm
30
20
10
0
-10
-20
-30
-40
-50
-60
899
900
901
902
903
904
905
Frequency [MHz]
15.247(d) Conducted Spurious Emissions


conducted band edge, 25kbps GFSK, hopping
Ref Level 39.9 dBm ATTEN 20 dB OFFSET: 29.9dB
RES BW: 100.0kHz VID BW: 300.0kHz SWP: 1.0msec
Marker: 928.0MHz -24.007dBm
dBm
30
20
10
0
-10
-20
-30
-40
-50
-60
925
926
927
928
929
930
931
Frequency [MHz]
15.247(d) Conducted Spurious Emissions

Test Setup / Conditions / Data

Test Location:	CKC Laboratories Inc • 110 N Olinda Pl • Brea CA 92823 • 714-993-6112		
Customer:	**Itron, Inc.**		
Specification:	**15.247(d) Conducted Spurious Emissions**		
Work Order #:	**103006**	Date:	8/20/2019
Test Type:	**Conducted Emissions**	Time:	11:26:10
Tested By:	S. Yamamoto	Sequence#:	3
Software:	EMITest 5.03.12		120V 60Hz

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

Test Conditions / Notes:

The equipment under test (EUT) is stand alone on the table. The antenna port of the EUT is connected to the spectrum analyzer using an attenuator and coaxial cable. The EUT is set to continuously transmit on its low and high channels for this test. Additionally, The EUT is set to continuously frequency hop for this test. Measurement of band edge compliance.

Temperature: 23°C, Humidity: 58%, Pressure:100kPa.
Site D. Test method ANSI C63.10 2013

Frequency Range: 899MHz to 931MHz
Frequency tested: Low (902.2MHz) and High (927.75MHz) and Hopping
Firmware power setting: 60 (max)
Firmware: 5.1.10.0
Test Software: CAM3 FCC Test Help V29.3

Modulation Types:
25kbps FSK

Antenna type: External Colinear Omnidirectional
Antenna Gain: 2.8dBi (attached), 5.5dBi (remote), 8.15dBi with 2dB attenuator and 0.2dB coaxial cable (remote)
Duty Cycle: Tested at 100%

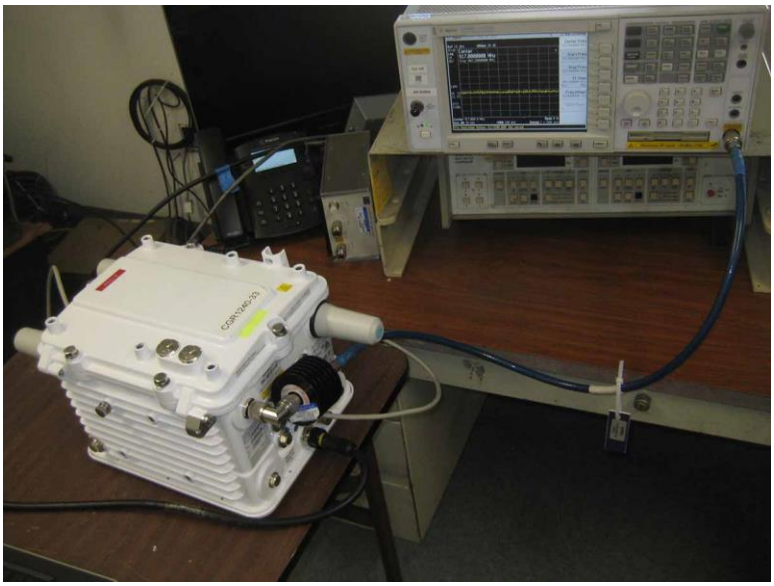
Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN03432	Attenuator	90-30-34	10/27/2017	10/27/2019
T2	ANP06978	Cable	Sucoflex 104A	3/31/2018	3/31/2020
	AN02869	Spectrum Analyzer	E4440A	7/25/2019	7/25/2020

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

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	dB	dB	Dist Table	Corr dBm	Spec dBm	Margin dB	Polar Ant
1	902.000M	-39.8	+29.6	+0.3			+0.0	-9.9	8.8 hopping	-18.7	Anten
2	902.000M	-40.0	+29.6	+0.3			+0.0	-10.1	8.8 single channel tx	-18.9	Anten
3	928.000M	-53.7	+29.6	+0.3			+0.0	-23.8	8.8 single channel tx	-32.6	Anten
4	928.000M	-53.9	+29.6	+0.3			+0.0	-24.0	8.8 hopping	-32.8	Anten

Test Setup Photo



15.247(d) Radiated Emissions & Band Edge

Test Setup / Conditions / Data

Test Location:	CKC Laboratories Inc • 110 N Olinda Pl • Brea CA 92823 • 714-993-6112		
Customer:	**Itron, Inc.**		
Specification:	**15.247(d) / 15.209 Radiated Spurious Emissions**		
Work Order #:	**103006**	Date:	8/22/2019
Test Type:	**Radiated Scan**	Time:	12:28:58
Tested By:	S. Yamamoto	Sequence#:	12
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 equipment under test (EUT) is stand alone on the Styrofoam table. The EUT is set to continuously transmit when set to its low (902.2MHz), middle (915.0MHz) and high (927.75MHz) channel for this test. Measurement of radiated spurious emissions.

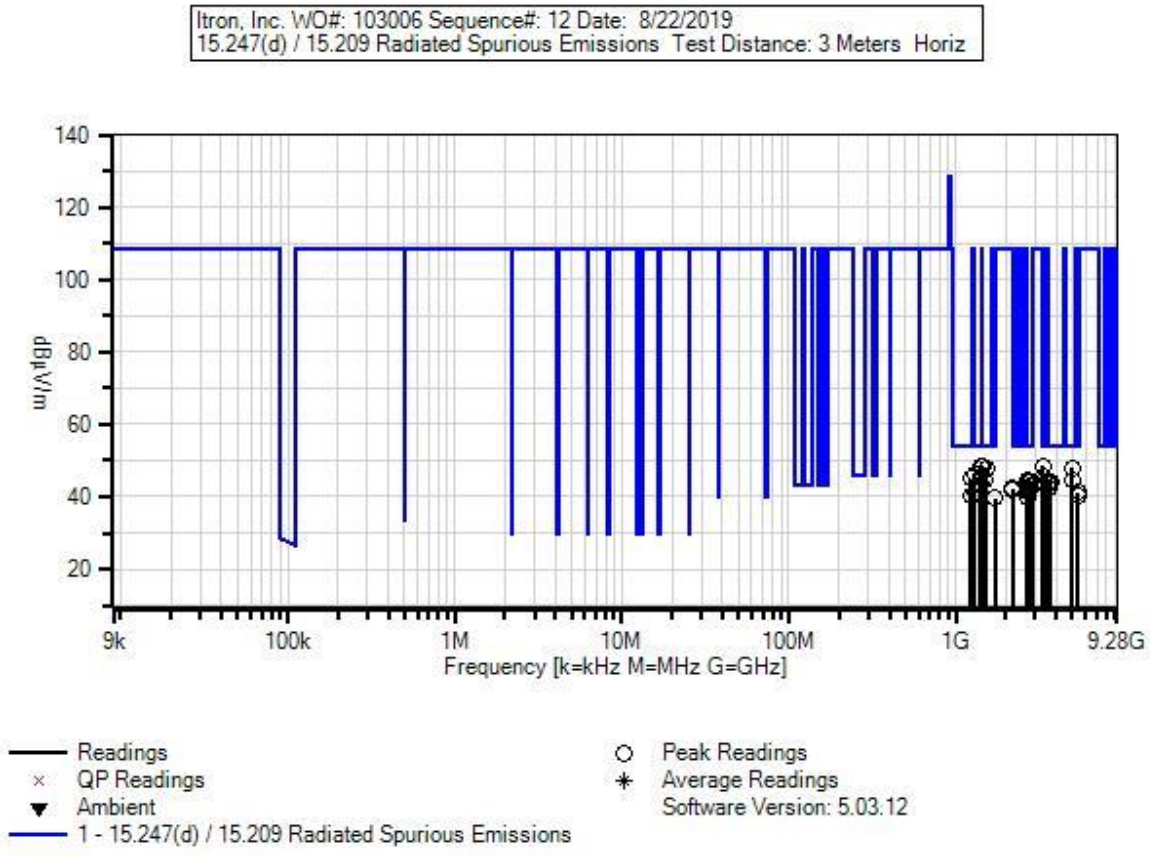
Temperature: 23°C, Humidity: 60%, Pressure:100kPa.
Site D. Test method ANSI C63.10 2013

Frequency Range: 9kHz to 10GHz
RBW=100kHz VBW=300kHz non restrict band!
RBW=200Hz VBW=620Hz restrict band 9kHz to 150kHz
RBW=9kHz VBW=27kHz restrict band 150kHz to 30MHz
RBW=120kHz VBW=360kHz restrict band 30MHz to 1000MHz
RBW=1MHz VBW=3MHz restrict band 1GHz to 10GHz

Frequency tested: Low (902.2MHz), middle (915.0MHz) and High (927.75MHz).
Firmware power setting: 60 (max)
Firmware: 5.1.10.0
Test Software: CAM3 FCC Test Help V29.3

Modulation Types:
25kbps FSK

Antenna type: External Colinear Omnidirectional (antenna attached to chassis)
Antenna Gain: 2.8dBi
Duty Cycle: Tested at 100%


Itron, Inc. WO#: 103006 Sequence#: 12 Date: 8/22/2019
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	ANP04382	Cable	LDF-50	6/2/2018	6/2/2020
	ANP05569	Cable-Amplitude +15C to +45C (dB)	RG-214/U	12/24/2018	12/24/2020
	ANP05283	Attenuator	ATT-0218-06-NNN-02	4/5/2018	4/5/2020
	AN01994	Biconilog Antenna	CBL6111C	4/23/2018	4/23/2020
	ANP06978	Cable	Sucoflex 104A	3/31/2018	3/31/2020
	AN00010	Preamp	8447D	2/19/2018	2/19/2020
	AN00314	Loop Antenna	6502	5/13/2018	5/13/2020
T2	ANP07138	Cable	ANDL1-PNMNM-60	3/4/2019	3/4/2021
T3	AN00787	Preamp	83017A	5/31/2019	5/31/2021
T4	ANP07247	Cable	32022-29094K-29094K-24TC	7/5/2018	7/5/2020
T5	AN03169	High Pass Filter	HM1155-11SS	5/8/2019	5/8/2021
T6	AN01646	Horn Antenna	3115	3/14/2018	3/14/2020
	AN02869	Spectrum Analyzer	E4440A	7/25/2019	7/25/2020

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

#	Freq	Rdng	T1 T5	T2 T6	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant
1	3338.900M	45.5	+6.6 +0.1	+4.8 +31.1	-40.1	+0.6	+0.0	48.6	54.0	-5.4	Vert
2	1451.500M	55.5	+4.2 +0.4	+3.0 +25.2	-40.0	+0.2	+0.0	48.5	54.0	-5.5	Vert
3	1410.700M	55.2	+4.1 +0.5	+2.9 +25.4	-40.1	+0.2	+0.0	48.2	54.0	-5.8	Vert
4	1526.300M	54.3	+4.4 +0.4	+3.0 +25.6	-39.9	+0.2	+0.0	48.0	54.0	-6.0	Vert
5	4990.170M	39.3	+8.5 +0.1	+5.9 +33.5	-39.8	+0.4	+0.0	47.9	54.0	-6.1	Vert
6	1303.200M	53.4	+3.9 +0.5	+2.8 +25.8	-40.3	+0.2	+0.0	46.3	54.0	-7.7	Vert
7	3353.000M	42.4	+6.6 +0.1	+4.8 +31.1	-40.1	+0.6	+0.0	45.5	54.0	-8.5	Horiz
8	1229.800M	52.8	+3.8 +0.7	+2.7 +25.3	-40.5	+0.2	+0.0	45.0	54.0	-9.0	Vert
9	4990.000M	36.1	+8.5 +0.1	+5.9 +33.5	-39.8	+0.4	+0.0	44.7	54.0	-9.3	Horiz
10	2706.621M	45.1	+5.7 +0.2	+4.4 +28.9	-40.0	+0.3	+0.0	44.6	54.0	-9.4	Horiz
11	1508.600M	51.1	+4.3 +0.4	+3.0 +25.5	-40.0	+0.2	+0.0	44.5	54.0	-9.5	Horiz
12	2693.500M	44.8	+5.7 +0.2	+4.4 +28.9	-40.0	+0.3	+0.0	44.3	54.0	-9.7	Horiz

13	2745.030M	44.7	+5.7 +0.2	+4.4 +29.0	-40.0	+0.3	+0.0	44.3	54.0	-9.7	Horiz
14	3659.978M	39.6	+7.1 +0.2	+5.1 +31.8	-40.0	+0.4	+0.0	44.2	54.0	-9.8	Horiz
15	3710.297M	39.0	+7.1 +0.2	+5.1 +32.1	-39.9	+0.4	+0.0	44.0	54.0	-10.0	Horiz
16	3261.900M	40.6	+6.5 +0.1	+4.8 +31.4	-40.1	+0.6	+0.0	43.9	54.0	-10.1	Horiz
17	3711.120M	38.8	+7.1 +0.2	+5.1 +32.1	-39.9	+0.4	+0.0	43.8	54.0	-10.2	Vert
18	2885.300M	43.3	+5.9 +0.2	+4.5 +29.5	-40.0	+0.3	+0.0	43.7	54.0	-10.3	Horiz
19	1421.600M	50.7	+4.1 +0.5	+2.9 +25.4	-40.1	+0.2	+0.0	43.7	54.0	-10.3	Horiz
20	3608.823M	39.7	+7.0 +0.1	+5.0 +31.3	-40.0	+0.5	+0.0	43.6	54.0	-10.4	Vert
21	2783.090M	43.3	+5.8 +0.2	+4.4 +29.1	-40.0	+0.3	+0.0	43.1	54.0	-10.9	Vert
22	3608.811M	38.7	+7.0 +0.1	+5.0 +31.3	-40.0	+0.5	+0.0	42.6	54.0	-11.4	Horiz
23	3660.000M	37.8	+7.1 +0.2	+5.1 +31.8	-40.0	+0.4	+0.0	42.4	54.0	-11.6	Horiz
24	2201.600M	44.6	+5.3 +0.2	+3.8 +28.0	-39.8	+0.3	+0.0	42.4	54.0	-11.6	Horiz
25	2783.543M	42.2	+5.8 +0.2	+4.4 +29.1	-40.0	+0.3	+0.0	42.0	54.0	-12.0	Horiz
26	2200.700M	43.9	+5.3 +0.2	+3.8 +28.0	-39.8	+0.3	+0.0	41.7	54.0	-12.3	Vert
27	2706.600M	42.0	+5.7 +0.2	+4.4 +28.9	-40.0	+0.3	+0.0	41.5	54.0	-12.5	Vert
28	1301.900M	48.5	+3.9 +0.5	+2.8 +25.8	-40.3	+0.2	+0.0	41.4	54.0	-12.6	Horiz
29	5413.206M	31.6	+8.9 +0.2	+6.3 +33.8	-39.7	+0.2	+0.0	41.3	54.0	-12.7	Horiz
30	1236.600M	47.9	+3.8 +0.7	+2.7 +25.3	-40.5	+0.2	+0.0	40.1	54.0	-13.9	Horiz
31	5413.228M	30.3	+8.9 +0.2	+6.3 +33.8	-39.7	+0.2	+0.0	40.0	54.0	-14.0	Vert
32	1719.400M	44.6	+4.7 +0.3	+3.2 +26.5	-39.8	+0.2	+0.0	39.7	54.0	-14.3	Horiz
33	2691.600M	40.1	+5.7 +0.2	+4.4 +28.9	-40.0	+0.3	+0.0	39.6	54.0	-14.4	Vert

Test Location:	CKC Laboratories Inc • 110 N Olinda Pl • Brea CA 92823 • 714-993-6112		
Customer:	**Itron, Inc.**		
Specification:	**15.247(d) / 15.209 Radiated Spurious Emissions**		
Work Order #:	**103006**	Date:	8/22/2019
Test Type:	**Radiated Scan**	Time:	14:08:59
Tested By:	S. Yamamoto	Sequence#:	11
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 equipment under test (EUT) is stand alone on the Styrofoam table. The EUT is set to continuously transmit when set to its low (902.2MHz), middle (915.0MHz) and high (927.75MHz) channel for this test. Measurement of radiated spurious emissions.

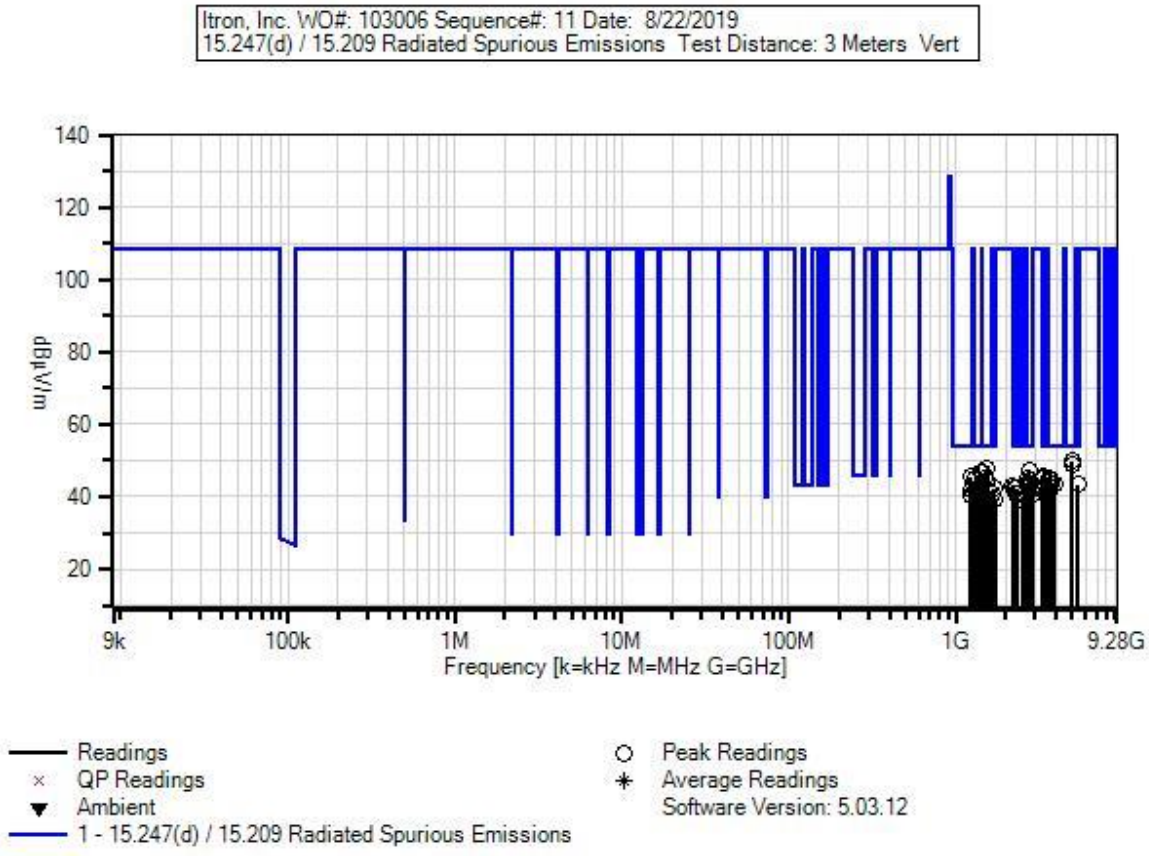
Temperature: 23°C, Humidity: 60%, Pressure:100kPa.
Site D. Test method ANSI C63.10 2013

Frequency Range: 9kHz to 10GHz
RBW=100kHz VBW=300kHz non restrict band
RBW=200Hz VBW=620Hz restrict band 9kHz to 150kHz
RBW=9kHz VBW=27kHz restrict band 150kHz to 30MHz
RBW=120kHz VBW=360kHz restrict band 30MHz to 1000MHz
RBW=1MHz VBW=3MHz restrict band 1GHz to 10GHz

Frequency tested: Low (902.2MHz), middle (915.0MHz) and High (927.75MHz).
Firmware power setting: 60 (max)
Firmware: 5.1.10.0
Test Software: CAM3 FCC Test Help V29.3

Modulation Types:
25kbps FSK

Antenna type: External Omnidirectional (antenna remote from chassis)
Antenna Gain: 5.5dBi
Duty Cycle: Tested at 100%


Itron, Inc. WO#: 103006 Sequence#: 11 Date: 8/22/2019
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	ANP04382	Cable	LDF-50	6/2/2018	6/2/2020
	ANP05569	Cable-Amplitude +15C to +45C (dB)	RG-214/U	12/24/2018	12/24/2020
	ANP05283	Attenuator	ATT-0218-06-NNN-02	4/5/2018	4/5/2020
	AN01994	Biconilog Antenna	CBL6111C	4/23/2018	4/23/2020
	ANP06978	Cable	Sucoflex 104A	3/31/2018	3/31/2020
	AN00010	Preamp	8447D	2/19/2018	2/19/2020
	AN00314	Loop Antenna	6502	5/13/2018	5/13/2020
T2	ANP07138	Cable	ANDL1-PNMNM-60	3/4/2019	3/4/2021
T3	AN00787	Preamp	83017A	5/31/2019	5/31/2021
T4	ANP07247	Cable	32022-29094K-29094K-24TC	7/5/2018	7/5/2020
T5	AN03169	High Pass Filter	HM1155-11SS	5/8/2019	5/8/2021
T6	AN01646	Horn Antenna	3115	3/14/2018	3/14/2020
	AN02869	Spectrum Analyzer	E4440A	7/25/2019	7/25/2020

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

#	Freq	Rdng	T1 T5	T2 T6	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant
1	4997.510M	41.3	+8.5 +0.1	+5.9 +33.5	-39.8	+0.4	+0.0	49.9	54.0	-4.1	Vert
2	4983.550M	40.3	+8.5 +0.1	+5.9 +33.5	-39.8	+0.4	+0.0	48.9	54.0	-5.1	Horiz
3	1545.800M	53.8	+4.4 +0.4	+3.0 +25.7	-39.9	+0.2	+0.0	47.6	54.0	-6.4	Vert
4	2745.003M	47.6	+5.7 +0.2	+4.4 +29.0	-40.0	+0.3	+0.0	47.2	54.0	-6.8	Vert
5	1409.200M	54.0	+4.1 +0.5	+2.9 +25.4	-40.1	+0.2	+0.0	47.0	54.0	-7.0	Vert
6	1452.500M	53.7	+4.2 +0.4	+3.0 +25.2	-40.0	+0.2	+0.0	46.7	54.0	-7.3	Vert
7	1231.800M	53.3	+3.8 +0.7	+2.7 +25.3	-40.5	+0.2	+0.0	45.5	54.0	-8.5	Vert
8	3356.700M	42.3	+6.6 +0.1	+4.8 +31.1	-40.1	+0.6	+0.0	45.4	54.0	-8.6	Vert
9	3333.300M	42.3	+6.6 +0.1	+4.8 +31.1	-40.1	+0.6	+0.0	45.4	54.0	-8.6	Horiz
10	3353.300M	42.1	+6.6 +0.1	+4.8 +31.1	-40.1	+0.6	+0.0	45.2	54.0	-8.8	Horiz
11	2707.070M	45.7	+5.7 +0.2	+4.4 +28.9	-40.0	+0.3	+0.0	45.2	54.0	-8.8	Horiz
12	1502.200M	51.7	+4.3 +0.4	+3.0 +25.5	-40.0	+0.2	+0.0	45.1	54.0	-8.9	Horiz

13	3609.147M	41.1	+7.0 +0.1	+5.0 +31.3	-40.0	+0.5	+0.0	45.0	54.0	-9.0	Vert
14	1312.200M	52.0	+3.9 +0.5	+2.8 +25.8	-40.3	+0.2	+0.0	44.9	54.0	-9.1	Vert
15	3711.118M	39.8	+7.1 +0.2	+5.1 +32.1	-39.9	+0.4	+0.0	44.8	54.0	-9.2	Vert
16	2783.285M	44.9	+5.8 +0.2	+4.4 +29.1	-40.0	+0.3	+0.0	44.7	54.0	-9.3	Vert
17	1520.000M	51.1	+4.3 +0.4	+3.0 +25.6	-39.9	+0.2	+0.0	44.7	54.0	-9.3	Horiz
18	3660.335M	39.7	+7.1 +0.2	+5.1 +31.8	-40.0	+0.4	+0.0	44.3	54.0	-9.7	Horiz
19	3659.995M	39.4	+7.1 +0.2	+5.1 +31.8	-40.0	+0.4	+0.0	44.0	54.0	-10.0	Vert
20	1464.300M	50.6	+4.2 +0.4	+3.0 +25.3	-40.0	+0.2	+0.0	43.7	54.0	-10.3	Horiz
21	1414.200M	50.6	+4.1 +0.5	+2.9 +25.4	-40.1	+0.2	+0.0	43.6	54.0	-10.4	Horiz
22	3710.995M	38.6	+7.1 +0.2	+5.1 +32.1	-39.9	+0.4	+0.0	43.6	54.0	-10.4	Horiz
23	5413.140M	33.6	+8.9 +0.2	+6.3 +33.8	-39.7	+0.2	+0.0	43.3	54.0	-10.7	Vert
24	2745.182M	43.7	+5.7 +0.2	+4.4 +29.0	-40.0	+0.3	+0.0	43.3	54.0	-10.7	Horiz
25	3909.200M	36.6	+7.4 +0.2	+5.3 +33.2	-39.9	+0.5	+0.0	43.3	54.0	-10.7	Vert
26	2663.300M	43.8	+5.7 +0.2	+4.3 +28.8	-39.9	+0.3	+0.0	43.2	54.0	-10.8	Vert
27	2200.900M	45.4	+5.3 +0.2	+3.8 +28.0	-39.8	+0.3	+0.0	43.2	54.0	-10.8	Horiz
28	3608.703M	39.1	+7.0 +0.1	+5.0 +31.3	-40.0	+0.5	+0.0	43.0	54.0	-11.0	Horiz
29	2783.198M	43.1	+5.8 +0.2	+4.4 +29.1	-40.0	+0.3	+0.0	42.9	54.0	-11.1	Horiz
30	2693.100M	43.3	+5.7 +0.2	+4.4 +28.9	-40.0	+0.3	+0.0	42.8	54.0	-11.2	Horiz
31	3261.700M	39.3	+6.5 +0.1	+4.8 +31.4	-40.1	+0.6	+0.0	42.6	54.0	-11.4	Horiz
32	2203.300M	44.7	+5.3 +0.2	+3.8 +28.0	-39.8	+0.3	+0.0	42.5	54.0	-11.5	Vert
33	2286.600M	44.4	+5.3 +0.2	+3.9 +28.0	-39.8	+0.3	+0.0	42.3	54.0	-11.7	Horiz
34	1689.200M	47.7	+4.7 +0.3	+3.2 +26.0	-39.8	+0.2	+0.0	42.3	54.0	-11.7	Vert
35	3333.300M	39.1	+6.6 +0.1	+4.8 +31.1	-40.1	+0.6	+0.0	42.2	54.0	-11.8	Vert
36	1239.000M	49.9	+3.8 +0.7	+2.7 +25.2	-40.5	+0.2	+0.0	42.0	54.0	-12.0	Horiz
37	1580.000M	48.0	+4.5 +0.3	+3.1 +25.6	-39.9	+0.2	+0.0	41.8	54.0	-12.2	Horiz
38	2877.500M	41.4	+5.9 +0.2	+4.5 +29.5	-40.0	+0.3	+0.0	41.8	54.0	-12.2	Horiz

39	1300.400M	48.8	+3.9 +0.5	+2.8 +25.8	-40.3	+0.2	+0.0	41.7	54.0	-12.3	Horiz
40	3605.000M	37.5	+7.0 +0.1	+5.0 +31.3	-40.0	+0.5	+0.0	41.4	54.0	-12.6	Vert
41	2310.800M	42.8	+5.3 +0.2	+3.9 +28.2	-39.8	+0.3	+0.0	40.9	54.0	-13.1	Vert
42	2893.300M	40.5	+5.9 +0.2	+4.5 +29.5	-40.0	+0.3	+0.0	40.9	54.0	-13.1	Vert
43	2706.033M	41.3	+5.7 +0.2	+4.4 +28.9	-40.0	+0.3	+0.0	40.8	54.0	-13.2	Vert
44	2344.700M	42.5	+5.3 +0.2	+3.9 +28.4	-39.8	+0.3	+0.0	40.8	54.0	-13.2	Horiz
45	1663.300M	46.1	+4.6 +0.3	+3.2 +26.0	-39.8	+0.2	+0.0	40.6	54.0	-13.4	Horiz
46	1221.200M	48.2	+3.8 +0.7	+2.6 +25.3	-40.6	+0.2	+0.0	40.2	54.0	-13.8	Horiz
47	1720.500M	44.0	+4.7 +0.3	+3.2 +26.5	-39.8	+0.2	+0.0	39.1	54.0	-14.9	Horiz
48	2490.800M	40.4	+5.5 +0.2	+4.1 +28.5	-39.9	+0.3	+0.0	39.1	54.0	-14.9	Vert

Test Location:	CKC Laboratories Inc • 110 N Olinda Pl • Brea CA 92823 • 714-993-6112		
Customer:	**Itron, Inc.**		
Specification:	**15.247(d) / 15.209 Radiated Spurious Emissions**		
Work Order #:	**103006**	Date:	8/22/2019
Test Type:	**Radiated Scan**	Time:	16:10:55
Tested By:	S. Yamamoto	Sequence#:	10
Software:	EMITest 5.03.12		

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 4			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 4			

Test Conditions / Notes:

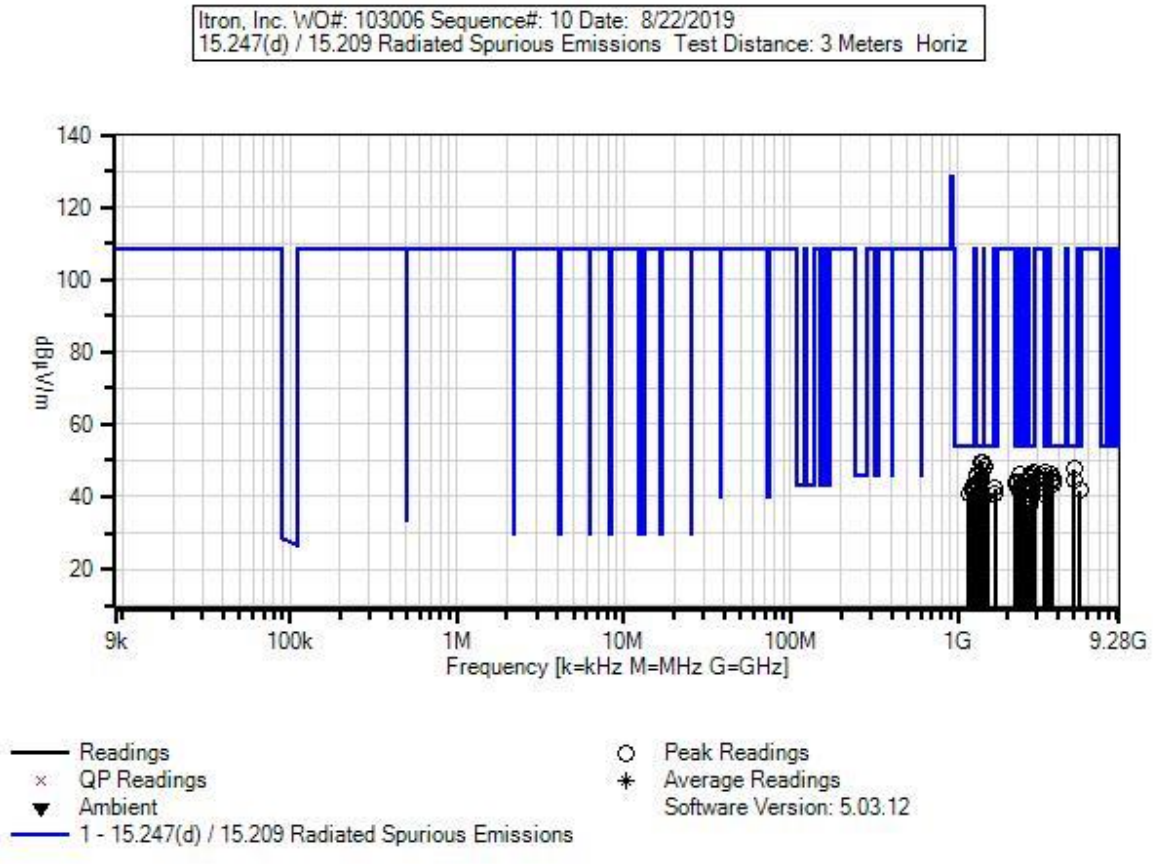
The equipment under test (EUT) is stand alone on the Styrofoam table. The EUT is set to continuously transmit when set to its low (902.2MHz), middle (915.0MHz) and high (927.75MHz) channel for this test. Measurement of radiated spurious emissions.

Temperature: 23°C, Humidity: 60%, Pressure:100kPa.
Site D. Test method ANSI C63.10 2013

Frequency Range: 9kHz to 10GHz
RBW=100kHz VBW=300kHz non restrict band
RBW=200Hz VBW=620Hz restrict band 9kHz to 150kHz
RBW=9kHz VBW=27kHz restrict band 150kHz to 30MHz
RBW=120kHz VBW=360kHz restrict band 30MHz to 1000MHz
RBW=1MHz VBW=3MHz restrict band 1GHz to 10GHz
Frequency tested: Low (902.2MHz), middle (915.0MHz) and High (927.75MHz).
Firmware power setting: 60 (max)
Firmware: 5.1.10.0
Test Software: CAM3 FCC Test Help V29.3

Modulation Types:
25kbps FSK

Antenna type: External Omnidirectional (antenna remote from chassis)
Antenna Gain: 8.15dBi
with 2dB external attenuator and 0.2dB coaxial cable
Duty Cycle: Tested at 100%



Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	ANP04382	Cable	LDF-50	6/2/2018	6/2/2020
	ANP05569	Cable-Amplitude +15C to +45C (dB)	RG-214/U	12/24/2018	12/24/2020
	ANP05283	Attenuator	ATT-0218-06-NNN-02	4/5/2018	4/5/2020
	AN01994	Biconilog Antenna	CBL6111C	4/23/2018	4/23/2020
	ANP06978	Cable	Sucoflex 104A	3/31/2018	3/31/2020
	AN00010	Preamp	8447D	2/19/2018	2/19/2020
	AN00314	Loop Antenna	6502	5/13/2018	5/13/2020
T2	ANP07138	Cable	ANDL1-PNMNM-60	3/4/2019	3/4/2021
T3	AN00787	Preamp	83017A	5/31/2019	5/31/2021
T4	ANP07247	Cable	32022-29094K-29094K-24TC	7/5/2018	7/5/2020
T5	AN03169	High Pass Filter	HM1155-11SS	5/8/2019	5/8/2021
T6	AN01646	Horn Antenna	3115	3/14/2018	3/14/2020
	AN02869	Spectrum Analyzer	E4440A	7/25/2019	7/25/2020

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

#	Freq	Rdng	T1 T5	T2 T6	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant
1	1379.200M	56.5	+4.1 +0.5	+2.9 +25.6	-40.1	+0.2	+0.0	49.7	54.0	-4.3	Vert
2	1411.700M	56.5	+4.1 +0.5	+2.9 +25.4	-40.1	+0.2	+0.0	49.5	54.0	-4.5	Vert
3	1457.500M	55.3	+4.2 +0.4	+3.0 +25.2	-40.0	+0.2	+0.0	48.3	54.0	-5.7	Horiz
4	4999.670M	39.0	+8.5 +0.1	+5.9 +33.5	-39.8	+0.4	+0.0	47.6	54.0	-6.4	Horiz
5	1420.000M	54.5	+4.1 +0.5	+2.9 +25.4	-40.1	+0.2	+0.0	47.5	54.0	-6.5	Horiz
6	3346.700M	43.9	+6.6 +0.1	+4.8 +31.1	-40.1	+0.6	+0.0	47.0	54.0	-7.0	Horiz
7	2865.000M	46.4	+5.9 +0.2	+4.5 +29.4	-40.0	+0.3	+0.0	46.7	54.0	-7.3	Horiz
8	1320.000M	53.5	+3.9 +0.5	+2.8 +25.8	-40.3	+0.2	+0.0	46.4	54.0	-7.6	Vert
9	2745.267M	46.7	+5.7 +0.2	+4.4 +29.0	-40.0	+0.3	+0.0	46.3	54.0	-7.7	Horiz
10	3607.893M	42.3	+7.0 +0.1	+5.0 +31.3	-40.0	+0.5	+0.0	46.2	54.0	-7.8	Horiz
11	3659.157M	41.5	+7.1 +0.2	+5.1 +31.8	-40.0	+0.4	+0.0	46.1	54.0	-7.9	Horiz
12	2329.200M	47.8	+5.3 +0.2	+3.9 +28.3	-39.8	+0.3	+0.0	46.0	54.0	-8.0	Horiz
13	2330.000M	47.8	+5.3 +0.2	+3.9 +28.3	-39.8	+0.3	+0.0	46.0	54.0	-8.0	Vert
14	1302.700M	52.8	+3.9 +0.5	+2.8 +25.8	-40.3	+0.2	+0.0	45.7	54.0	-8.3	Vert
15	2705.000M	46.0	+5.7 +0.2	+4.4 +28.9	-40.0	+0.3	+0.0	45.5	54.0	-8.5	Horiz
16	3335.000M	42.4	+6.6 +0.1	+4.8 +31.1	-40.1	+0.6	+0.0	45.5	54.0	-8.5	Horiz
17	2782.670M	45.5	+5.8 +0.2	+4.4 +29.1	-40.0	+0.3	+0.0	45.3	54.0	-8.7	Horiz
18	1360.000M	52.2	+4.0 +0.5	+2.9 +25.7	-40.2	+0.2	+0.0	45.3	54.0	-8.7	Horiz
19	2705.813M	45.7	+5.7 +0.2	+4.4 +28.9	-40.0	+0.3	+0.0	45.2	54.0	-8.8	Horiz
20	3710.747M	39.9	+7.1 +0.2	+5.1 +32.1	-39.9	+0.4	+0.0	44.9	54.0	-9.1	Horiz
21	4991.410M	35.9	+8.5 +0.1	+5.9 +33.5	-39.8	+0.4	+0.0	44.5	54.0	-9.5	Vert
22	3659.790M	39.8	+7.1 +0.2	+5.1 +31.8	-40.0	+0.4	+0.0	44.4	54.0	-9.6	Vert
23	2202.500M	46.3	+5.3 +0.2	+3.8 +28.0	-39.8	+0.3	+0.0	44.1	54.0	-9.9	Vert

24	3609.250M	40.2	+7.0 +0.1	+5.0 +31.3	-40.0	+0.5	+0.0	44.1	54.0	-9.9	Vert
25	3265.000M	40.7	+6.5 +0.1	+4.8 +31.3	-40.1	+0.6	+0.0	43.9	54.0	-10.1	Horiz
26	2268.300M	46.0	+5.3 +0.2	+3.9 +28.0	-39.8	+0.3	+0.0	43.9	54.0	-10.1	Vert
27	2210.800M	45.8	+5.3 +0.2	+3.8 +28.0	-39.8	+0.3	+0.0	43.6	54.0	-10.4	Horiz
28	3711.527M	38.5	+7.1 +0.2	+5.1 +32.1	-39.9	+0.4	+0.0	43.5	54.0	-10.5	Vert
29	1301.400M	50.2	+3.9 +0.5	+2.8 +25.8	-40.3	+0.2	+0.0	43.1	54.0	-10.9	Horiz
30	1234.800M	50.5	+3.8 +0.7	+2.7 +25.3	-40.5	+0.2	+0.0	42.7	54.0	-11.3	Vert
31	1661.700M	47.9	+4.6 +0.3	+3.2 +26.0	-39.8	+0.2	+0.0	42.4	54.0	-11.6	Horiz
32	1223.500M	50.3	+3.8 +0.7	+2.6 +25.3	-40.6	+0.2	+0.0	42.3	54.0	-11.7	Vert
33	2493.300M	43.6	+5.5 +0.2	+4.1 +28.5	-39.9	+0.3	+0.0	42.3	54.0	-11.7	Horiz
34	2390.000M	43.8	+5.4 +0.2	+4.0 +28.3	-39.8	+0.3	+0.0	42.2	54.0	-11.8	Horiz
35	2706.459M	42.4	+5.7 +0.2	+4.4 +28.9	-40.0	+0.3	+0.0	41.9	54.0	-12.1	Vert
36	5413.237M	32.1	+8.9 +0.2	+6.3 +33.8	-39.7	+0.2	+0.0	41.8	54.0	-12.2	Horiz
37	5413.047M	32.1	+8.9 +0.2	+6.3 +33.8	-39.7	+0.2	+0.0	41.8	54.0	-12.2	Vert
38	3356.700M	38.6	+6.6 +0.1	+4.8 +31.1	-40.1	+0.6	+0.0	41.7	54.0	-12.3	Vert
39	2744.860M	42.1	+5.7 +0.2	+4.4 +29.0	-40.0	+0.3	+0.0	41.7	54.0	-12.3	Vert
40	1232.100M	49.4	+3.8 +0.7	+2.7 +25.3	-40.5	+0.2	+0.0	41.6	54.0	-12.4	Horiz
41	2385.000M	42.9	+5.4 +0.2	+4.0 +28.3	-39.8	+0.3	+0.0	41.3	54.0	-12.7	Vert
42	3264.200M	37.6	+6.5 +0.1	+4.8 +31.3	-40.1	+0.6	+0.0	40.8	54.0	-13.2	Vert
43	1163.150M	48.2	+3.8 +1.2	+2.6 +25.5	-40.8	+0.2	+0.0	40.7	54.0	-13.3	Vert
44	1661.700M	46.2	+4.6 +0.3	+3.2 +26.0	-39.8	+0.2	+0.0	40.7	54.0	-13.3	Vert
45	2783.387M	40.6	+5.8 +0.2	+4.4 +29.1	-40.0	+0.3	+0.0	40.4	54.0	-13.6	Vert

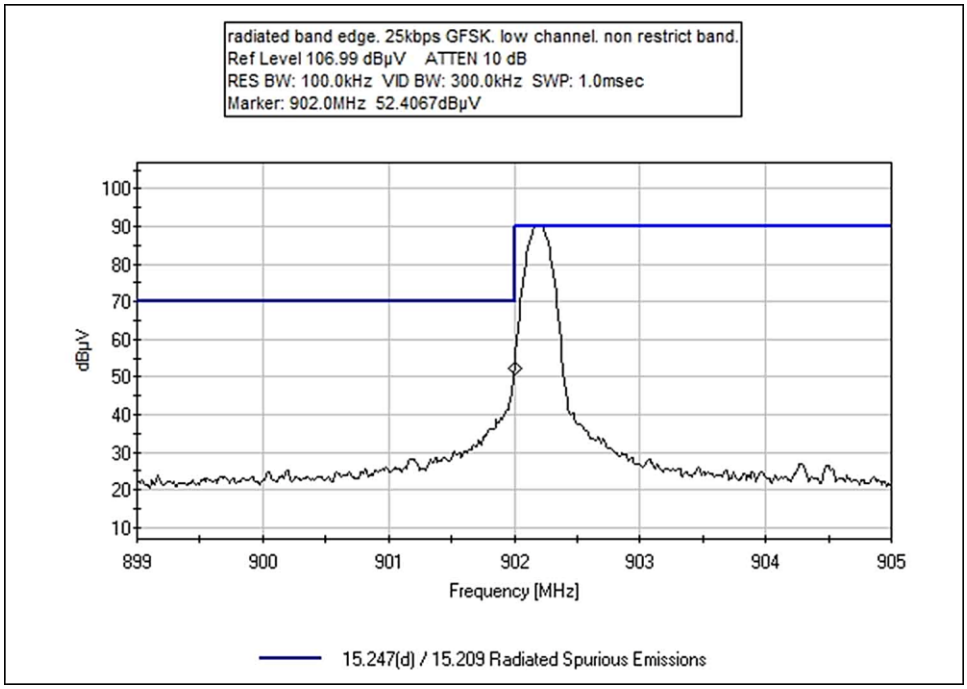
46	1494.200M Ave	46.5	+4.3 +0.4	+3.0 +25.5	-40.0	+0.2	+0.0	39.9	54.0	-14.1	Vert
^	1494.200M	58.6	+4.3 +0.4	+3.0 +25.5	-40.0	+0.2	+0.0	52.0	54.0	-2.0	Vert
48	1515.000M Ave	46.2	+4.3 +0.4	+3.0 +25.6	-39.9	+0.2	+0.0	39.8	54.0	-14.2	Vert
^	1515.000M	58.0	+4.3 +0.4	+3.0 +25.6	-39.9	+0.2	+0.0	51.6	54.0	-2.4	Vert
50	1456.700M Ave	45.7	+4.2 +0.4	+3.0 +25.2	-40.0	+0.2	+0.0	38.7	54.0	-15.3	Vert
^	1456.700M	57.9	+4.2 +0.4	+3.0 +25.2	-40.0	+0.2	+0.0	50.9	54.0	-3.1	Vert
52	2694.200M	38.2	+5.7 +0.2	+4.4 +28.9	-40.0	+0.3	+0.0	37.7	54.0	-16.3	Vert

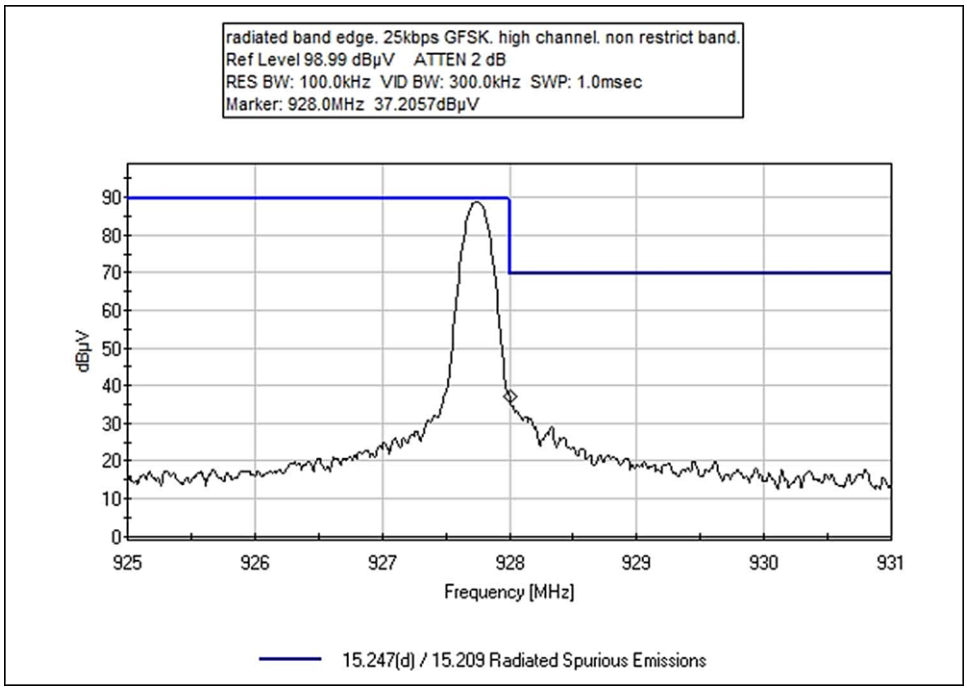
Band Edge

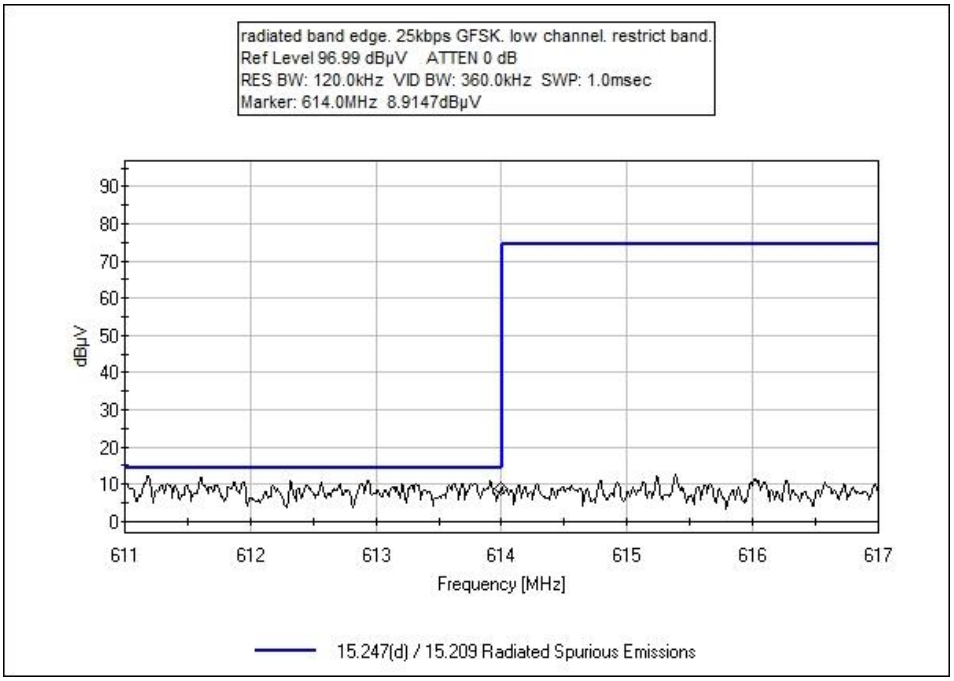
Band Edge Summary					
Operating Mode: Single Channel (Low and High)					
Frequency (MHz)	**Modulation**	**Ant. Type**	**Field Strength (dBuV/m @3m)**	**Limit (dBuV/m @3m)**	**Results**
614	FSK	External Colinear Omnidirectional / 2.8dBi	40.6	<46	Pass
902	FSK	External Colinear Omnidirectional / 2.8dBi	88.5	<106.3	Pass
928	FSK	External Colinear Omnidirectional / 2.8dBi	73.8	< 106.3	Pass
960	FSK	External Colinear Omnidirectional / 2.8dBi	45.9	<54	Pass
614	FSK	External Colinear Omnidirectional / 5.5dBi	41.4	<46	Pass
902	FSK	External Colinear Omnidirectional / 5.5dBi	90.0	<111	Pass
928	FSK	External Colinear Omnidirectional / 5.5dBi	76.0	<111	Pass
960	FSK	External Colinear Omnidirectional / 5.5dBi	46.8	<54	Pass
614	FSK	External Colinear Omnidirectional / 8.15dBi	41.2	<46	Pass
902	FSK	External Colinear Omnidirectional / 8.15dBi	88.5	<108.2	Pass
928	FSK	External Colinear Omnidirectional / 8.15dBi	72.2	<108.2	Pass
960	FSK	External Colinear Omnidirectional / 8.15dBi	44.6	<54	Pass

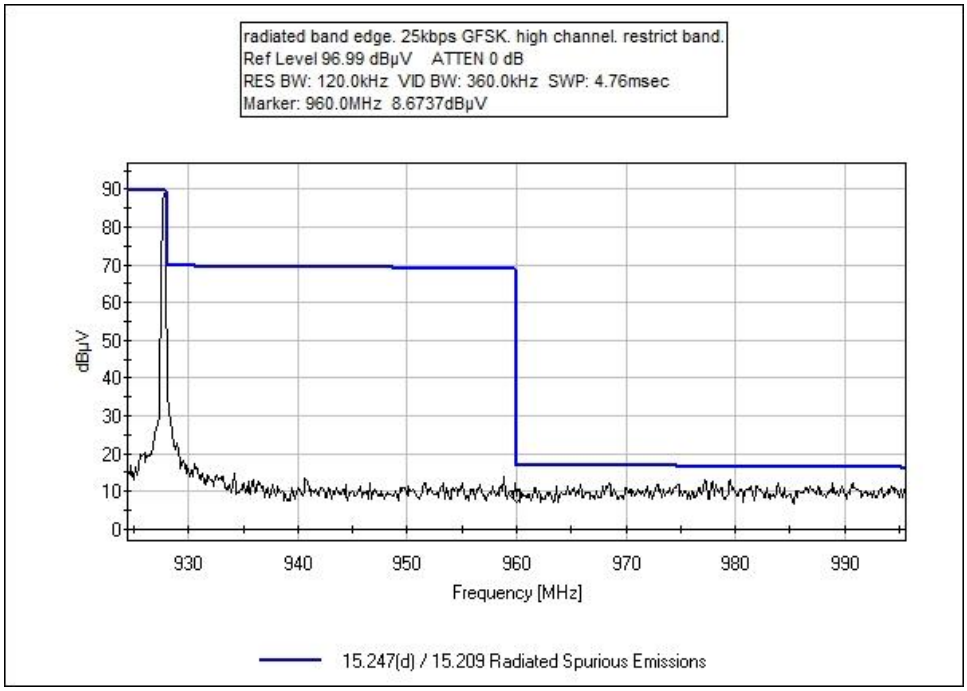
Band Edge Summary					
Operating Mode: Hopping					
Frequency (MHz)	**Modulation**	**Ant. Type**	**Field Strength (dBuV/m @3m)**	**Limit (dBuV/m @3m)**	**Results**
614	FSK	External Colinear Omnidirectional / 2.8dBi	40.0	<46	Pass
902	FSK	External Colinear Omnidirectional / 2.8dBi	86.5	<106.3	Pass
928	FSK	External Colinear Omnidirectional / 2.8dBi	71.2	<106.3	Pass
960	FSK	External Colinear Omnidirectional / 2.8dBi	49.7	<54	Pass
614	FSK	External Colinear Omnidirectional / 5.5dBi	42.7	<46	Pass
902	FSK	External Colinear Omnidirectional / 5.5dBi	90.7	<111	Pass
928	FSK	External Colinear Omnidirectional / 5.5dBi	70.2	<111	Pass
960	FSK	External Colinear Omnidirectional / 5.5dBi	50.2	<54	Pass
614	FSK	External Colinear Omnidirectional / 8.15dBi	42.1	<46	Pass
902	FSK	External Colinear Omnidirectional / 8.15dBi	72.4	<108.2	Pass
928	FSK	External Colinear Omnidirectional / 8.15dBi	70.8	<108.2	Pass
960	FSK	External Colinear Omnidirectional / 8.15dBi	48.1	<54	Pass

Band Edge Plots






radiated band edge. 25kbps GFSK. low channel. restrict band.
Ref Level 96.99 dBµV ATTEN 0 dB
RES BW: 120.0kHz VID BW: 360.0kHz SWP: 1.0msec
Marker: 614.0MHz 8.9147dBµV
dBµV
90
80
70
60
50
40
30
20
10
0
611
612
613
614
615
616
617
Frequency [MHz]
15.247(d) / 15.209 Radiated Spurious Emissions


radiated band edge. 25kbps GFSK. high channel. restrict band.
Ref Level 96.99 dBµV ATTEN 0 dB
RES BW: 120.0kHz VID BW: 360.0kHz SWP: 4.76msec
Marker: 960.0MHz 8.6737dBµV
dBµV
90
80
70
60
50
40
30
20
10
0
930
940
950
960
970
980
990
Frequency [MHz]
15.247(d) / 15.209 Radiated Spurious Emissions