

Itron, Inc.

TEST REPORT FOR

Gas Endpoint
Model: 500GC

Tested To The Following Standard:

FCC Part 15 Subpart C Section(s)

15.247
(FHSS 902-928 MHz)

Report No.: 99318-4

Date of issue: March 9, 2017



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 EMC testing for CKC Laboratories, Inc.

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

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ADMINISTRATIVE INFORMATION

Test Report Information

REPORT PREPARED FOR:

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

Representative: Jay Holcomb
Customer Reference Number: 110651

REPORT PREPARED BY:

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

Project Number: 99318

DATE OF EQUIPMENT RECEIPT:
DATE(S) OF TESTING:

January 30, 2017
January 30-31, 2017

Report Authorization

The test data contained in this report documents the observed testing parameters pertaining to and are relevant for only the sample equipment 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.
22116 23rd Drive S.E., Suite A
Canyon Park, Bothell, WA 98021

Software Versions

CKC Laboratories Proprietary Software	Version
EMITest Emissions	5.03.02

Site Registration & Accreditation Information

Location	CB #	TAIWAN	CANADA	FCC	JAPAN
Canyon Park, Bothell, WA	US0081	SL2-IN-E- 1145R	3082C-1	US1022	A-0148

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	NP
15.247(a)(1)	Carrier Separation	NA	NP
15.247(a)(1)(i)	Number of Hopping Channels	NA	NP
15.247(a)(1)(i)	Average Time of Occupancy	NA	NP
15.247(b)(2)	Output Power	NA	NP
15.247(d)	RF Conducted Emissions & Band Edge	NA	NP
15.247(d)	Radiated Emissions & Band Edge	NA	Pass
15.207	AC Conducted Emissions	NA	NP

NA = Not Applicable

NP = CKC Laboratories was not contracted to perform test.

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
Gas Endpoint	Itron, Inc.	500GC	0100001732

Support Equipment:

Device	Manufacturer	Model #	S/N
None			

Configuration 2

Equipment Tested:

Device	Manufacturer	Model #	S/N
Gas Endpoint	Itron, Inc.	500GC	0100001727

Support Equipment:

Device	Manufacturer	Model #	S/N
None			

Configuration 3

Equipment Tested:

Device	Manufacturer	Model #	S/N
Gas Endpoint	Itron, Inc.	500GC	0100001809

Support Equipment:

Device	Manufacturer	Model #	S/N
None			

Configuration 4

Equipment Tested:

Device	Manufacturer	Model #	S/N
Gas Endpoint	Itron, Inc.	500GC	0100001726

Support Equipment:

Device	Manufacturer	Model #	S/N
None			

General Product Information:

Product Information	Manufacturer-Provided Details
Equipment Type:	Stand-Alone Equipment
Type of Wideband System:	FHSS
Operating Frequency Range:	903-926.8MHz (OOK) 902.4-927.6MHz (FSK 150kbps) 902.2 to 927.75MHz (FSK 10kbps)
Number of Hopping Channels:	See supplemental report
Modulation Type(s):	OOK and FSK
Maximum Duty Cycle:	See supplemental report
Number of TX Chains:	2
Antenna Type(s) and Gain:	See supplemental report
Beamforming Type:	NA
Antenna Connection Type:	Integral
Nominal Input Voltage:	Battery
Firmware / Software used for Test:	See supplemental report

FCC Part 15 Subpart C

15.247(d) Radiated Emissions & Band Edge

Test Setup / Conditions / Data

Test Location: CKC Laboratories, Inc. • 22116 23rd Drive SE Suite A • Bothell, WA 98021 • 800-500-4EMC (4362)
 Customer: **Itron, Inc.**
 Specification: **15.247(d) / 15.209 Radiated Spurious Emissions**
 Work Order #: **99318** Date: 1/30/2017
 Test Type: **Maximized Emissions** Time: 11:49:51
 Tested By: Steven Pittsford Sequence#: 5
 Software: EMITest 5.03.02

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

Test Conditions / Notes:

Temperature: 20-24°C

Relative Humidity: 21-32%

Frequency range investigated: 9kHz-10GHz

Transmitter Frequency: 902.4-927.6MHz

Modulation: FSK 150kbps

Firmware Power Level: 3

EUT Firmware: App Version: 1.18.3.0, CSL Version: 2.22.1.0

Antenna Type: Internal Trace

Antenna Gain: 4.96dBi

Duty Cycle: Max

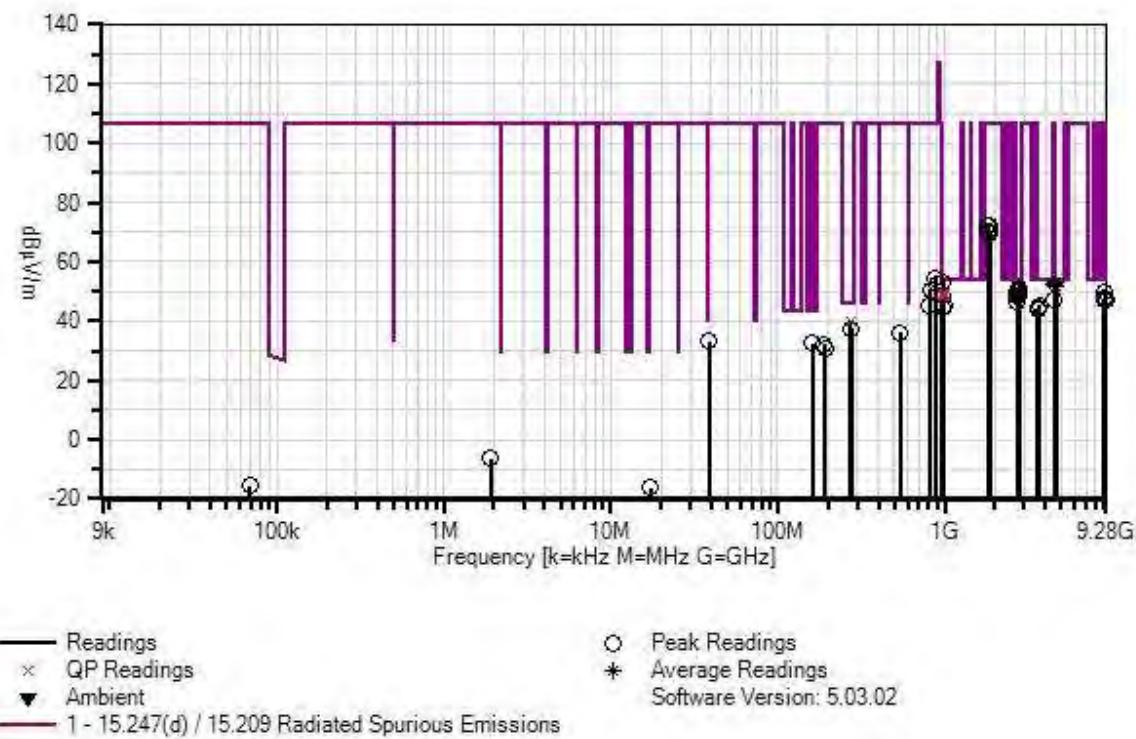
Test Method: ANSI C63.10 (2013)

The EUT is a transmitter operating hopping in band. The EUT is battery operated, fresh batteries installed.

The EUT has no IO ports. Parallel, Perpendicular, Ground parallel antenna polarities investigated below 30MHz, Horizontal and Vertical antenna polarities investigated above 30MHz, only worst case reported.

The EUT orientation selected based on manufacturer declared fixed installation orientation. Hopping operation selected as worst case based on previously collected data.

Itron, Inc. WO#: 99318 Sequence#: 5 Date: 1/30/2017
15.247(d) / 15.209 Radiated Spurious Emissions Test Distance: 3 Meters Horiz



Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	ANP05360	Cable	RG214	11/30/2016	11/30/2018
T2	ANP05963	Cable	RG-214	2/15/2016	2/15/2018
T3	ANP06540	Cable	Heliax	10/29/2015	10/29/2017
T4	AN01816	Log Periodic Antenna-ANSI 63.5	3146	1/8/2016	1/8/2018
T5	AN02872	Spectrum Analyzer	E4440A	11/18/2015	11/18/2017
T6	AN01991	Biconilog Antenna	CBL6111C	3/11/2016	3/11/2018
T7	ANP05657	Attenuator	PE7004-6	12/22/2015	12/22/2017
T8	AN00052	Loop Antenna	6502	4/8/2016	4/8/2018
T9	AN03540	Preamp	83017A	4/30/2015	4/30/2017
T10	AN01467	Horn Antenna- ANSI C63.5 Calibration	3115	8/12/2015	8/12/2017
T11	ANP05305	Cable	ETSI-50T	2/15/2016	2/15/2018
T12	ANP06935	Cable	32026-29801- 29801-18	3/11/2016	3/11/2018
T13	AN03170	High Pass Filter	HM1155-11SS	12/17/2015	12/17/2017

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

#	Freq	Rdng	T1	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
			T5	T6	T7	T8					
			T9	T10	T11	T12					
			T13								
	MHz	dB μ V	dB	dB	dB	dB	Table	dB μ V/m	dB μ V/m	dB	Ant
1	978.120M	24.1	+2.2	+2.5	+0.4	+23.9	+0.0	53.1	54.0	-0.9	Horiz
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
2	4576.000M	48.6	+0.0	+0.0	+0.9	+0.0	+0.0	53.0	54.0	-1.0	Horiz
	Ave		+0.0	+0.0	+0.0	+0.0					
			-34.1	+32.5	+4.2	+0.5					
			+0.4								
^	4576.000M	49.3	+0.0	+0.0	+0.9	+0.0	+0.0	53.7	54.0	-0.3	Horiz
			+0.0	+0.0	+0.0	+0.0					
			-34.1	+32.5	+4.2	+0.5					
			+0.4								
4	4512.000M	48.0	+0.0	+0.0	+0.9	+0.0	+0.0	52.4	54.0	-1.6	Horiz
	Ave		+0.0	+0.0	+0.0	+0.0					
			-34.1	+32.5	+4.2	+0.5					
			+0.4								
^	4512.000M	48.6	+0.0	+0.0	+0.9	+0.0	+0.0	53.0	54.0	-1.0	Horiz
			+0.0	+0.0	+0.0	+0.0					
			-34.1	+32.5	+4.2	+0.5					
			+0.4								

6	4550.000M	47.8	+0.0	+0.0	+0.9	+0.0	+0.0	52.1	54.0	-1.9	Horiz
	Ave		+0.0	+0.0	+0.0	+0.0					
			-34.1	+32.5	+4.2	+0.5					
			+0.3								
^	4550.000M	48.5	+0.0	+0.0	+0.9	+0.0	+0.0	52.8	54.0	-1.2	Horiz
			+0.0	+0.0	+0.0	+0.0					
			-34.1	+32.5	+4.2	+0.5					
			+0.3								
8	4638.000M	47.0	+0.0	+0.0	+0.9	+0.0	+0.0	51.7	54.0	-2.3	Horiz
	Ave		+0.0	+0.0	+0.0	+0.0					
			-34.1	+32.6	+4.3	+0.5					
			+0.5								
^	4638.000M	47.7	+0.0	+0.0	+0.9	+0.0	+0.0	52.4	54.0	-1.6	Horiz
			+0.0	+0.0	+0.0	+0.0					
			-34.1	+32.6	+4.3	+0.5					
			+0.5								
10	2745.589M	52.2	+0.0	+0.0	+0.7	+0.0	+0.0	51.0	54.0	-3.0	Horiz
			+0.0	+0.0	+0.0	+0.0					
			-34.5	+28.8	+3.0	+0.4					
			+0.4								
11	2746.000M	51.6	+0.0	+0.0	+0.7	+0.0	+0.0	50.4	54.0	-3.6	Horiz
			+0.0	+0.0	+0.0	+0.0					
			-34.5	+28.8	+3.0	+0.4					
			+0.4								
12	2745.433M	51.5	+0.0	+0.0	+0.7	+0.0	+0.0	50.3	54.0	-3.7	Horiz
	Ave		+0.0	+0.0	+0.0	+0.0					
			-34.5	+28.8	+3.0	+0.4					
			+0.4								
13	2730.000M	51.2	+0.0	+0.0	+0.7	+0.0	+0.0	50.0	54.0	-4.0	Horiz
			+0.0	+0.0	+0.0	+0.0					
			-34.5	+28.7	+3.0	+0.4					
			+0.5								
14	9152.000M	38.5	+0.0	+0.0	+1.4	+0.0	+0.0	49.9	54.0	-4.1	Horiz
			+0.0	+0.0	+0.0	+0.0					
			-34.7	+37.7	+6.1	+0.7					
			+0.2								
15	2746.612M	51.0	+0.0	+0.0	+0.7	+0.0	+0.0	49.8	54.0	-4.2	Horiz
	Ave		+0.0	+0.0	+0.0	+0.0					
			-34.5	+28.8	+3.0	+0.4					
			+0.4								
16	2782.000M	50.7	+0.0	+0.0	+0.7	+0.0	+0.0	49.6	54.0	-4.4	Horiz
			+0.0	+0.0	+0.0	+0.0					
			-34.5	+28.9	+3.0	+0.4					
			+0.4								
17	967.200M	20.9	+2.2	+2.5	+0.4	+23.3	+0.0	49.3	54.0	-4.7	Horiz
	QP		+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
^	967.200M	24.8	+2.2	+2.5	+0.4	+23.3	+0.0	53.2	54.0	-0.8	Horiz
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								

19	979.608M	20.2	+2.2	+2.5	+0.4	+24.0	+0.0	49.3	54.0	-4.7	Horiz
	QP		+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
^	979.520M	22.5	+2.2	+2.5	+0.4	+24.0	+0.0	51.6	54.0	-2.4	Horiz
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
21	988.006M	19.9	+2.2	+2.5	+0.4	+24.3	+0.0	49.3	54.0	-4.7	Horiz
	QP		+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
^	988.000M	22.9	+2.2	+2.5	+0.4	+24.3	+0.0	52.3	54.0	-1.7	Horiz
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
23	962.010M	20.8	+2.2	+2.5	+0.4	+23.0	+0.0	48.9	54.0	-5.1	Horiz
	QP		+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
^	961.960M	24.4	+2.2	+2.5	+0.4	+23.0	+0.0	52.5	54.0	-1.5	Horiz
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
25	2782.000M	49.9	+0.0	+0.0	+0.7	+0.0	+0.0	48.8	54.0	-5.2	Horiz
			+0.0	+0.0	+0.0	+0.0					
			-34.5	+28.9	+3.0	+0.4					
			+0.4								
26	980.406M	19.7	+2.2	+2.5	+0.4	+24.0	+0.0	48.8	54.0	-5.2	Horiz
	QP		+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
^	980.400M	23.5	+2.2	+2.5	+0.4	+24.0	+0.0	52.6	54.0	-1.4	Horiz
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
28	964.920M	20.3	+2.2	+2.5	+0.4	+23.2	+0.0	48.6	54.0	-5.4	Vert
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
29	993.213M	18.6	+2.3	+2.5	+0.4	+24.5	+0.0	48.3	54.0	-5.7	Horiz
	QP		+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
^	993.160M	22.9	+2.3	+2.5	+0.4	+24.5	+0.0	52.6	54.0	-1.4	Horiz
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
31	962.000M	20.1	+2.2	+2.5	+0.4	+23.0	+0.0	48.2	54.0	-5.8	Vert
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								

32	2730.000M	49.4	+0.0	+0.0	+0.7	+0.0	+0.0	48.2	54.0	-5.8	Horiz
			+0.0	+0.0	+0.0	+0.0					
			-34.5	+28.7	+3.0	+0.4					
			+0.5								
33	274.085M	24.6	+1.0	+1.5	+0.2	+12.8	+0.0	40.1	46.0	-5.9	Horiz
	QP		+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
^	274.085M	29.1	+1.0	+1.5	+0.2	+12.8	+0.0	44.6	46.0	-1.4	Horiz
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
35	9099.500M	36.5	+0.0	+0.0	+1.3	+0.0	+0.0	47.8	54.0	-6.2	Horiz
			+0.0	+0.0	+0.0	+0.0					
			-34.7	+37.7	+6.1	+0.7					
			+0.2								
36	9023.500M	36.0	+0.0	+0.0	+1.3	+0.0	+0.0	47.4	54.0	-6.6	Horiz
			+0.0	+0.0	+0.0	+0.0					
			-34.6	+37.8	+6.0	+0.7					
			+0.2								
37	4512.000M	42.7	+0.0	+0.0	+0.9	+0.0	+0.0	47.1	54.0	-6.9	Vert
			+0.0	+0.0	+0.0	+0.0					
			-34.1	+32.5	+4.2	+0.5					
			+0.4								
38	2706.000M	48.0	+0.0	+0.0	+0.7	+0.0	+0.0	46.7	54.0	-7.3	Horiz
			+0.0	+0.0	+0.0	+0.0					
			-34.5	+28.6	+3.0	+0.4					
			+0.5								
39	2708.000M	47.9	+0.0	+0.0	+0.7	+0.0	+0.0	46.6	54.0	-7.4	Horiz
			+0.0	+0.0	+0.0	+0.0					
			-34.5	+28.6	+3.0	+0.4					
			+0.5								
40	275.600M	21.8	+1.0	+1.6	+0.2	+12.8	+0.0	37.4	46.0	-8.6	Vert
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
41	993.240M	15.6	+2.3	+2.5	+0.4	+24.5	+0.0	45.3	54.0	-8.7	Vert
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
42	3710.000M	44.0	+0.0	+0.0	+0.7	+0.0	+0.0	45.3	54.0	-8.7	Horiz
			+0.0	+0.0	+0.0	+0.0					
			-34.1	+30.1	+3.8	+0.5					
			+0.3								
43	980.440M	15.7	+2.2	+2.5	+0.4	+24.0	+0.0	44.8	54.0	-9.2	Vert
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
44	3610.000M	43.5	+0.0	+0.0	+0.8	+0.0	+0.0	44.3	54.0	-9.7	Horiz
			+0.0	+0.0	+0.0	+0.0					
			-34.2	+29.8	+3.6	+0.4					
			+0.4								

45	3660.000M	43.0	+0.0	+0.0	+0.7	+0.0	+0.0	43.9	54.0	-10.1	Horiz
			+0.0	+0.0	+0.0	+0.0					
			-34.2	+29.9	+3.7	+0.5					
			+0.3								
46	1820.000M	76.5	+0.0	+0.0	+0.5	+0.0	+0.0	72.0	107.0	-35.0	Horiz
			+0.0	+0.0	+0.0	+0.0					
			-35.1	+26.9	+2.5	+0.3					
			+0.4								
47	1830.000M	76.4	+0.0	+0.0	+0.5	+0.0	+0.0	71.9	107.0	-35.1	Horiz
			+0.0	+0.0	+0.0	+0.0					
			-35.1	+26.9	+2.5	+0.3					
			+0.4								
48	1806.000M	74.7	+0.0	+0.0	+0.5	+0.0	+0.0	70.1	107.0	-36.9	Horiz
			+0.0	+0.0	+0.0	+0.0					
			-35.1	+26.8	+2.5	+0.3					
			+0.4								
49	1830.000M	74.4	+0.0	+0.0	+0.5	+0.0	+0.0	69.9	107.0	-37.1	Vert
			+0.0	+0.0	+0.0	+0.0					
			-35.1	+26.9	+2.5	+0.3					
			+0.4								
50	1856.000M	74.2	+0.0	+0.0	+0.5	+0.0	+0.0	69.8	107.0	-37.2	Horiz
			+0.0	+0.0	+0.0	+0.0					
			-35.1	+27.1	+2.5	+0.3					
			+0.3								
51	879.700M	27.3	+2.0	+2.4	+0.3	+22.4	+0.0	54.4	107.0	-52.6	Horiz
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
52	884.600M	25.4	+2.1	+2.4	+0.3	+22.4	+0.0	52.6	107.0	-54.4	Vert
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
53	823.700M	25.2	+1.9	+2.3	+0.3	+21.1	+0.0	50.8	107.0	-56.2	Horiz
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
54	9276.500M	35.9	+0.0	+0.0	+1.4	+0.0	+0.0	47.2	107.0	-59.8	Horiz
			+0.0	+0.0	+0.0	+0.0					
			-34.8	+37.6	+6.2	+0.7					
			+0.2								
55	811.800M	19.7	+1.9	+2.3	+0.3	+20.8	+0.0	45.0	107.0	-62.0	Vert
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
56	538.800M	14.4	+1.5	+2.0	+0.3	+17.8	+0.0	36.0	107.0	-71.0	Vert
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
57	38.840M	11.1	+0.3	+0.5	+0.1	+0.0	+0.0	33.1	107.0	-73.9	Vert
			+0.0	+15.1	+6.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								

58	160.390M	13.6	+0.7	+1.4	+0.2	+0.0	+0.0	32.5	107.0	-74.5	Horiz
			+0.0	+10.6	+6.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
59	190.310M	14.8	+0.8	+1.4	+0.2	+0.0	+0.0	32.2	107.0	-74.8	Horiz
			+0.0	+9.0	+6.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
60	192.180M	13.5	+0.8	+1.4	+0.2	+0.0	+0.0	30.9	107.0	-76.1	Vert
			+0.0	+9.0	+6.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
61	1.898M	24.1	+0.0	+0.0	+0.0	+0.0	-40.0	-6.2	107.0	-113.2	Para
			+0.0	+0.0	+0.0	+9.6					
			+0.0	+0.0	+0.1	+0.0					
			+0.0								
62	69.000k	54.2	+0.0	+0.0	+0.0	+0.0	-80.0	-15.6	107.0	-122.6	Para
			+0.0	+0.0	+0.0	+10.2					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
63	17.404M	15.1	+0.0	+0.0	+0.0	+0.0	-40.0	-16.2	107.0	-123.2	Para
			+0.0	+0.0	+0.0	+8.4					
			+0.0	+0.0	+0.3	+0.0					
			+0.0								



Test Location: CKC Laboratories, Inc. • 22116 23rd Drive SE Suite A • Bothell, WA 98021 • 800-500-4EMC (4362)
Customer: **Itron, Inc.**
Specification: **15.247(d) / 15.209 Radiated Spurious Emissions**
Work Order #: **99318** Date: 1/30/2017
Test Type: **Maximized Emissions** Time: 11:35:34
Tested By: Steven Pittsford Sequence#: 4
Software: EMITest 5.03.02

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 2			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 2			

Test Conditions / Notes:

Temperature: 20-24°C

Relative Humidity: 21-32%

Frequency range investigated: 9kHz-10GHz

Transmitter Frequency: 902.2 to 927.75 MHz

Modulation: FSK 10kbps

Firmware Power Level: 3

EUT Firmware: App Version: 1.18.3.0, CSL Version: 2.22.1.0

Antenna Type: Internal Trace

Antenna Gain: 4.96dBi

Duty Cycle: Max

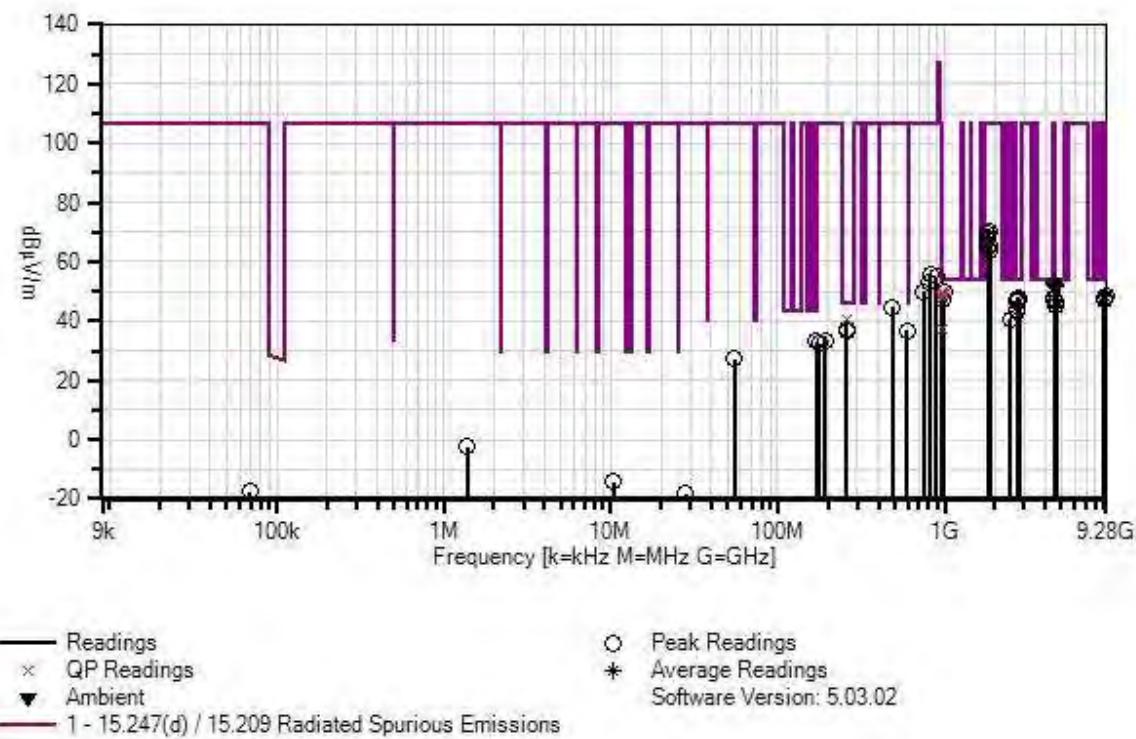
Test Method: ANSI C63.10 (2013)

The EUT is a transmitter operating hopping in band. The EUT is battery operated, fresh batteries installed.

The EUT has no IO ports. Parallel, Perpendicular, Ground parallel antenna polarities investigated below 30MHz, Horizontal and Vertical antenna polarities investigated above 30MHz, only worst case reported.

The EUT orientation selected based on manufacturer declared fixed installation orientation. Hopping operation selected as worst case based on previously collected data.

Itron, Inc. WO#: 99318 Sequence#: 4 Date: 1/30/2017
15.247(d) / 15.209 Radiated Spurious Emissions Test Distance: 3 Meters Vert



Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	ANP05360	Cable	RG214	11/30/2016	11/30/2018
T2	ANP05963	Cable	RG-214	2/15/2016	2/15/2018
T3	ANP06540	Cable	Heliax	10/29/2015	10/29/2017
T4	AN01816	Log Periodic Antenna-ANSI 63.5	3146	1/8/2016	1/8/2018
T5	AN02872	Spectrum Analyzer	E4440A	11/18/2015	11/18/2017
T6	AN01991	Biconilog Antenna	CBL6111C	3/11/2016	3/11/2018
T7	ANP05657	Attenuator	PE7004-6	12/22/2015	12/22/2017
T8	AN00052	Loop Antenna	6502	4/8/2016	4/8/2018
T9	AN03540	Preamp	83017A	4/30/2015	4/30/2017
T10	AN01467	Horn Antenna- ANSI C63.5 Calibration	3115	8/12/2015	8/12/2017
T11	ANP05305	Cable	ETSI-50T	2/15/2016	2/15/2018
T12	ANP06935	Cable	32026-29801- 29801-18	3/11/2016	3/11/2018
T13	AN03170	High Pass Filter	HM1155-11SS	12/17/2015	12/17/2017

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

#	Freq	Rdng	T1	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
			T5	T6	T7	T8					
			T9	T10	T11	T12					
			T13								
	MHz	dB μ V	dB	dB	dB	dB	Table	dB μ V/m	dB μ V/m	dB	Ant
1	4550.000M	48.9	+0.0	+0.0	+0.9	+0.0	+0.0	53.2	54.0	-0.8	Horiz
	Ave		+0.0	+0.0	+0.0	+0.0					
			-34.1	+32.5	+4.2	+0.5					
			+0.3								
^	4550.000M	49.6	+0.0	+0.0	+0.9	+0.0	+0.0	53.9	54.0	-0.1	Horiz
			+0.0	+0.0	+0.0	+0.0					
			-34.1	+32.5	+4.2	+0.5					
			+0.3								
3	4575.000M	48.1	+0.0	+0.0	+0.9	+0.0	+0.0	52.5	54.0	-1.5	Horiz
	Ave		+0.0	+0.0	+0.0	+0.0					
			-34.1	+32.5	+4.2	+0.5					
			+0.4								
^	4575.000M	49.0	+0.0	+0.0	+0.9	+0.0	+0.0	53.4	54.0	-0.6	Horiz
			+0.0	+0.0	+0.0	+0.0					
			-34.1	+32.5	+4.2	+0.5					
			+0.4								
5	4511.000M	47.8	+0.0	+0.0	+0.9	+0.0	+0.0	52.2	54.0	-1.8	Horiz
	Ave		+0.0	+0.0	+0.0	+0.0					
			-34.1	+32.5	+4.2	+0.5					
			+0.4								
^	4511.000M	48.9	+0.0	+0.0	+0.9	+0.0	+0.0	53.3	54.0	-0.7	Horiz
			+0.0	+0.0	+0.0	+0.0					
			-34.1	+32.5	+4.2	+0.5					
			+0.4								

7	4639.000M	47.0	+0.0	+0.0	+0.9	+0.0	+0.0	51.7	54.0	-2.3	Horiz
	Ave		+0.0	+0.0	+0.0	+0.0					
			-34.1	+32.6	+4.3	+0.5					
			+0.5								
^	4639.000M	47.8	+0.0	+0.0	+0.9	+0.0	+0.0	52.5	54.0	-1.5	Horiz
			+0.0	+0.0	+0.0	+0.0					
			-34.1	+32.6	+4.3	+0.5					
			+0.5								
9	993.040M	20.3	+2.3	+2.5	+0.4	+24.5	+0.0	50.0	54.0	-4.0	Horiz
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
10	980.207M	20.5	+2.2	+2.5	+0.4	+24.0	+0.0	49.6	54.0	-4.4	Horiz
	QP		+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
^	980.160M	22.6	+2.2	+2.5	+0.4	+24.0	+0.0	51.7	54.0	-2.3	Horiz
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
12	962.002M	21.5	+2.2	+2.5	+0.4	+23.0	+0.0	49.6	54.0	-4.4	Horiz
	QP		+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
13	988.008M	19.6	+2.2	+2.5	+0.4	+24.3	+0.0	49.0	54.0	-5.0	Horiz
	QP		+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
^	988.040M	22.7	+2.2	+2.5	+0.4	+24.3	+0.0	52.1	54.0	-1.9	Horiz
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
15	979.760M	19.8	+2.2	+2.5	+0.4	+24.0	+0.0	48.9	54.0	-5.1	Horiz
	QP		+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
^	979.720M	22.8	+2.2	+2.5	+0.4	+24.0	+0.0	51.9	54.0	-2.1	Horiz
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
17	9149.990M	37.2	+0.0	+0.0	+1.4	+0.0	+0.0	48.6	54.0	-5.4	Horiz
	Ave		+0.0	+0.0	+0.0	+0.0					
			-34.7	+37.7	+6.1	+0.7					
			+0.2								
^	9150.000M	38.6	+0.0	+0.0	+1.4	+0.0	+0.0	50.0	54.0	-4.0	Horiz
			+0.0	+0.0	+0.0	+0.0					
			-34.7	+37.7	+6.1	+0.7					
			+0.2								

19	257.938M	25.8	+1.0	+1.5	+0.2	+11.9	+0.0	40.4	46.0	-5.6	Horiz
	QP		+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
^	257.938M	32.1	+1.0	+1.5	+0.2	+11.9	+0.0	46.7	46.0	+0.7	Horiz
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
21	4510.000M	43.7	+0.0	+0.0	+0.9	+0.0	+0.0	48.1	54.0	-5.9	Vert
			+0.0	+0.0	+0.0	+0.0					
			-34.1	+32.5	+4.2	+0.5					
			+0.4								
22	2746.000M	49.2	+0.0	+0.0	+0.7	+0.0	+0.0	48.0	54.0	-6.0	Horiz
			+0.0	+0.0	+0.0	+0.0					
			-34.5	+28.8	+3.0	+0.4					
			+0.4								
23	9022.400M	36.4	+0.0	+0.0	+1.3	+0.0	+0.0	47.8	54.0	-6.2	Horiz
			+0.0	+0.0	+0.0	+0.0					
			-34.6	+37.8	+6.0	+0.7					
			+0.2								
24	9099.600M	36.5	+0.0	+0.0	+1.3	+0.0	+0.0	47.8	54.0	-6.2	Horiz
			+0.0	+0.0	+0.0	+0.0					
			-34.7	+37.7	+6.1	+0.7					
			+0.2								
25	967.040M	19.2	+2.2	+2.5	+0.4	+23.3	+0.0	47.6	54.0	-6.4	Horiz
	QP		+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
^	967.040M	23.0	+2.2	+2.5	+0.4	+23.3	+0.0	51.4	54.0	-2.6	Horiz
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
27	2784.000M	48.4	+0.0	+0.0	+0.7	+0.0	+0.0	47.3	54.0	-6.7	Horiz
			+0.0	+0.0	+0.0	+0.0					
			-34.5	+28.9	+3.0	+0.4					
			+0.4								
28	9060.000M	35.9	+0.0	+0.0	+1.3	+0.0	+0.0	47.3	54.0	-6.7	Vert
			+0.0	+0.0	+0.0	+0.0					
			-34.6	+37.8	+6.0	+0.7					
			+0.2								
29	4550.000M	42.8	+0.0	+0.0	+0.9	+0.0	+0.0	47.1	54.0	-6.9	Vert
			+0.0	+0.0	+0.0	+0.0					
			-34.1	+32.5	+4.2	+0.5					
			+0.3								
30	2730.000M	48.1	+0.0	+0.0	+0.7	+0.0	+0.0	46.9	54.0	-7.1	Horiz
			+0.0	+0.0	+0.0	+0.0					
			-34.5	+28.7	+3.0	+0.4					
			+0.5								
31	966.640M	18.5	+2.2	+2.5	+0.4	+23.3	+0.0	46.9	54.0	-7.1	Vert
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								

32	2706.000M	48.1	+0.0	+0.0	+0.7	+0.0	+0.0	46.8	54.0	-7.2	Horiz
			+0.0	+0.0	+0.0	+0.0					
			-34.5	+28.6	+3.0	+0.4					
			+0.5								
33	4574.000M	42.3	+0.0	+0.0	+0.9	+0.0	+0.0	46.7	54.0	-7.3	Vert
			+0.0	+0.0	+0.0	+0.0					
			-34.1	+32.5	+4.2	+0.5					
			+0.4								
34	258.100M	22.9	+1.0	+1.5	+0.2	+11.9	+0.0	37.5	46.0	-8.5	Vert
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
35	4640.000M	40.4	+0.0	+0.0	+0.9	+0.0	+0.0	45.1	54.0	-8.9	Vert
			+0.0	+0.0	+0.0	+0.0					
			-34.1	+32.6	+4.3	+0.5					
			+0.5								
36	258.100M	21.9	+1.0	+1.5	+0.2	+11.9	+0.0	36.5	46.0	-9.5	Vert
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
37	171.100M	15.1	+0.8	+1.4	+0.2	+0.0	+0.0	33.2	43.5	-10.3	Vert
			+0.0	+9.7	+6.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
38	2730.000M	44.8	+0.0	+0.0	+0.7	+0.0	+0.0	43.6	54.0	-10.4	Vert
			+0.0	+0.0	+0.0	+0.0					
			-34.5	+28.7	+3.0	+0.4					
			+0.5								
39	2706.000M	44.8	+0.0	+0.0	+0.7	+0.0	+0.0	43.5	54.0	-10.5	Vert
			+0.0	+0.0	+0.0	+0.0					
			-34.5	+28.6	+3.0	+0.4					
			+0.5								
40	973.440M	8.7	+2.2	+2.5	+0.4	+23.7	+0.0	37.5	54.0	-16.5	Horiz
	QP		+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
^	973.440M	27.6	+2.2	+2.5	+0.4	+23.7	+0.0	56.4	54.0	+2.4	Horiz
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
42	963.000M	9.0	+2.2	+2.5	+0.4	+23.0	+0.0	37.1	54.0	-16.9	Horiz
	QP		+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
^	963.000M	29.9	+2.2	+2.5	+0.4	+23.0	+0.0	58.0	54.0	+4.0	Horiz
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
44	1830.000M	74.7	+0.0	+0.0	+0.5	+0.0	+0.0	70.2	107.0	-36.8	Horiz
			+0.0	+0.0	+0.0	+0.0					
			-35.1	+26.9	+2.5	+0.3					
			+0.4								

45	1830.000M	74.5	+0.0	+0.0	+0.5	+0.0	+0.0	70.0	107.0	-37.0	Vert
			+0.0	+0.0	+0.0	+0.0					
			-35.1	+26.9	+2.5	+0.3					
			+0.4								
46	1820.000M	73.9	+0.0	+0.0	+0.5	+0.0	+0.0	69.4	107.0	-37.6	Vert
			+0.0	+0.0	+0.0	+0.0					
			-35.1	+26.9	+2.5	+0.3					
			+0.4								
47	1820.000M	72.5	+0.0	+0.0	+0.5	+0.0	+0.0	68.0	107.0	-39.0	Horiz
			+0.0	+0.0	+0.0	+0.0					
			-35.1	+26.9	+2.5	+0.3					
			+0.4								
48	1804.000M	71.9	+0.0	+0.0	+0.5	+0.0	+0.0	67.3	107.0	-39.7	Vert
			+0.0	+0.0	+0.0	+0.0					
			-35.1	+26.8	+2.5	+0.3					
			+0.4								
49	1855.000M	70.0	+0.0	+0.0	+0.5	+0.0	+0.0	65.5	107.0	-41.5	Horiz
			+0.0	+0.0	+0.0	+0.0					
			-35.1	+27.0	+2.5	+0.3					
			+0.3								
50	1804.000M	69.7	+0.0	+0.0	+0.5	+0.0	+0.0	65.1	107.0	-41.9	Horiz
			+0.0	+0.0	+0.0	+0.0					
			-35.1	+26.8	+2.5	+0.3					
			+0.4								
51	1856.000M	67.7	+0.0	+0.0	+0.5	+0.0	+0.0	63.3	107.0	-43.7	Vert
			+0.0	+0.0	+0.0	+0.0					
			-35.1	+27.1	+2.5	+0.3					
			+0.3								
52	823.700M	30.4	+1.9	+2.3	+0.3	+21.1	+0.0	56.0	107.0	-51.0	Horiz
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
53	890.200M	27.5	+2.1	+2.4	+0.3	+22.5	+0.0	54.8	107.0	-52.2	Horiz
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
54	806.200M	27.9	+1.9	+2.3	+0.3	+20.7	+0.0	53.1	107.0	-53.9	Horiz
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
55	746.700M	25.6	+1.8	+2.2	+0.3	+20.1	+0.0	50.0	107.0	-57.0	Horiz
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
56	9277.600M	36.9	+0.0	+0.0	+1.4	+0.0	+0.0	48.2	107.0	-58.8	Horiz
			+0.0	+0.0	+0.0	+0.0					
			-34.8	+37.6	+6.2	+0.7					
			+0.2								
57	486.300M	24.1	+1.4	+1.9	+0.3	+16.9	+0.0	44.6	107.0	-62.4	Horiz
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								

58	2460.000M	43.2	+0.0	+0.0	+0.6	+0.0	+0.0	40.7	107.0	-66.3	Vert
			+0.0	+0.0	+0.0	+0.0					
			-34.5	+27.7	+2.9	+0.4					
			+0.4								
59	590.600M	14.8	+1.6	+2.1	+0.3	+18.1	+0.0	36.9	107.0	-70.1	Vert
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
60	192.010M	16.0	+0.8	+1.4	+0.2	+0.0	+0.0	33.4	107.0	-73.6	Vert
			+0.0	+9.0	+6.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
61	177.900M	14.8	+0.8	+1.4	+0.2	+0.0	+0.0	32.5	107.0	-74.5	Horiz
			+0.0	+9.3	+6.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
62	55.160M	13.3	+0.4	+0.6	+0.1	+0.0	+0.0	27.4	107.0	-79.6	Horiz
			+0.0	+7.0	+6.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
63	1.389M	27.8	+0.0	+0.0	+0.0	+0.0	-40.0	-2.4	107.0	-109.4	Para
			+0.0	+0.0	+0.0	+9.7					
			+0.0	+0.0	+0.1	+0.0					
			+0.0								
64	10.416M	16.5	+0.0	+0.0	+0.0	+0.0	-40.0	-14.2	107.0	-121.2	Para
			+0.0	+0.0	+0.0	+9.1					
			+0.0	+0.0	+0.2	+0.0					
			+0.0								
65	69.000k	52.3	+0.0	+0.0	+0.0	+0.0	-80.0	-17.5	107.0	-124.5	Para
			+0.0	+0.0	+0.0	+10.2					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
66	28.231M	15.3	+0.0	+0.0	+0.0	+0.0	-40.0	-18.2	107.0	-125.2	Para
			+0.0	+0.0	+0.0	+6.2					
			+0.0	+0.0	+0.3	+0.0					
			+0.0								



Test Location: CKC Laboratories, Inc. • 22116 23rd Drive SE Suite A • Bothell, WA 98021 • 800-500-4EMC (4362)
Customer: **Itron, Inc.**
Specification: **15.247(d) / 15.209 Radiated Spurious Emissions**
Work Order #: **99318** Date: 1/30/2017
Test Type: **Maximized Emissions** Time: 12:50:21
Tested By: Steven Pittsford Sequence#: 6
Software: EMITest 5.03.02

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 3			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 3			

Test Conditions / Notes:

Temperature: 20-24°C

Relative Humidity: 21-32%

Frequency range investigated: 9kHz-10GHz

Transmitter Frequency: 903-926.8MHz

Modulation: OOK

Firmware Power Level: 3

EUT Firmware: App Version: 1.18.3.0, CSL Version: 2.22.1.0

Antenna Type: Internal Trace

Antenna Gain: 4.96dBi

Duty Cycle: Max

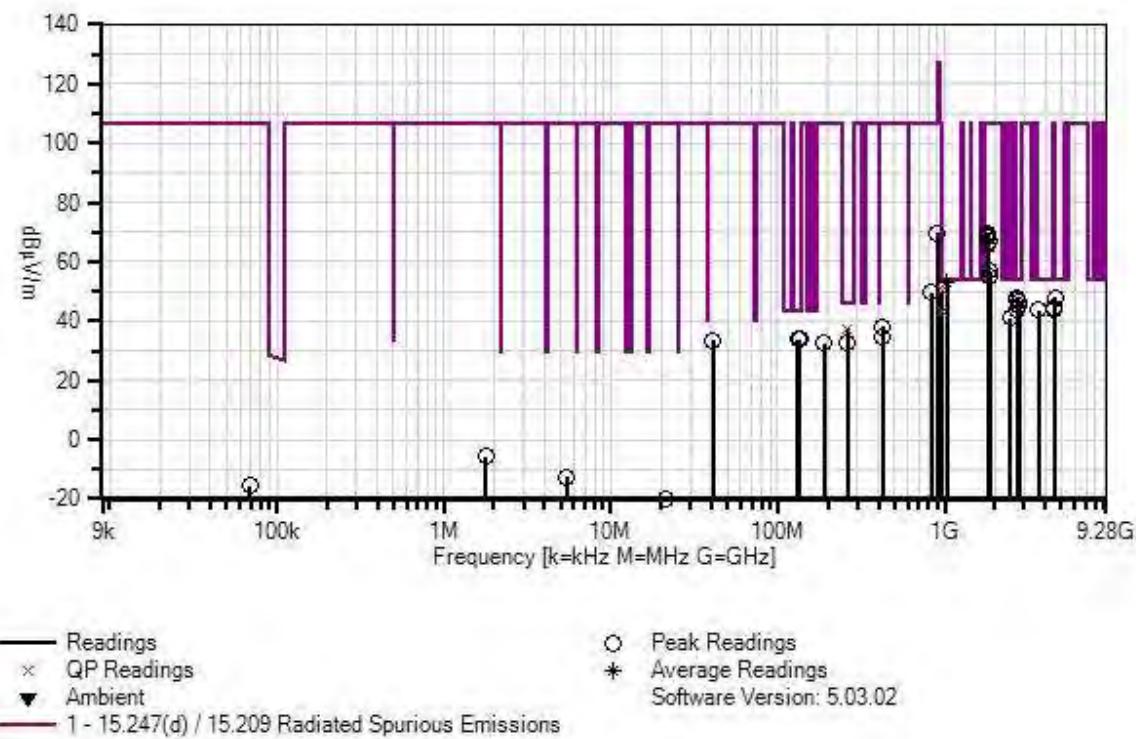
Test Method: ANSI C63.10 (2013)

The EUT is a transmitter operating hopping in band. The EUT is battery operated, fresh batteries installed.

The EUT has no IO ports. Parallel, Perpendicular, Ground parallel antenna polarities investigated below 30MHz, Horizontal and Vertical antenna polarities investigated above 30MHz, only worst case reported.

The EUT orientation selected based on manufacturer declared fixed installation orientation. Hopping operation selected as worst case based on previously collected data.

Itron, Inc. WO#: 99318 Sequence#: 6 Date: 1/30/2017
15.247(d) / 15.209 Radiated Spurious Emissions Test Distance: 3 Meters Vert



Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	ANP05360	Cable	RG214	11/30/2016	11/30/2018
T2	ANP05963	Cable	RG-214	2/15/2016	2/15/2018
T3	ANP06540	Cable	Heliax	10/29/2015	10/29/2017
T4	AN01816	Log Periodic Antenna-ANSI 63.5	3146	1/8/2016	1/8/2018
T5	AN02872	Spectrum Analyzer	E4440A	11/18/2015	11/18/2017
T6	AN01991	Biconilog Antenna	CBL6111C	3/11/2016	3/11/2018
T7	ANP05657	Attenuator	PE7004-6	12/22/2015	12/22/2017
T8	AN00052	Loop Antenna	6502	4/8/2016	4/8/2018
T9	AN03540	Preamp	83017A	4/30/2015	4/30/2017
T10	AN01467	Horn Antenna- ANSI C63.5 Calibration	3115	8/12/2015	8/12/2017
T11	ANP05305	Cable	ETSI-50T	2/15/2016	2/15/2018
T12	ANP06935	Cable	32026-29801- 29801-18	3/11/2016	3/11/2018
T13	AN03170	High Pass Filter	HM1155-11SS	12/17/2015	12/17/2017

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

#	Freq	Rdng	T1	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
			T5	T6	T7	T8					
			T9	T10	T11	T12					
			T13								
	MHz	dB μ V	dB	dB	dB	dB	Table	dB μ V/m	dB μ V/m	dB	Ant
1	1026.406M	45.4	+0.0	+0.0	+0.4	+0.0	+0.0	53.2	54.0	-0.8	Horiz
	Ave		+0.0	+0.0	+0.0	+0.0					
			-37.5	+24.2	+1.8	+0.2					
			+18.7								
^	1026.406M	55.5	+0.0	+0.0	+0.4	+0.0	+0.0	55.9	54.0	+1.9	Horiz
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
3	964.560M	22.1	+2.2	+2.5	+0.4	+23.1	+0.0	50.3	54.0	-3.7	Horiz
	QP		+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
^	964.560M	24.6	+2.2	+2.5	+0.4	+23.1	+0.0	52.8	54.0	-1.2	Horiz
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
5	4576.000M	43.7	+0.0	+0.0	+0.9	+0.0	+0.0	48.1	54.0	-5.9	Horiz
			+0.0	+0.0	+0.0	+0.0					
			-34.1	+32.5	+4.2	+0.5					
			+0.4								
6	2710.000M	49.0	+0.0	+0.0	+0.7	+0.0	+0.0	47.7	54.0	-6.3	Vert
			+0.0	+0.0	+0.0	+0.0					
			-34.5	+28.6	+3.0	+0.4					
			+0.5								

7	2730.000M	48.6	+0.0	+0.0	+0.7	+0.0	+0.0	47.4	54.0	-6.6	Vert
			+0.0	+0.0	+0.0	+0.0					
			-34.5	+28.7	+3.0	+0.4					
			+0.5								
8	2780.000M	47.7	+0.0	+0.0	+0.7	+0.0	+0.0	46.6	54.0	-7.4	Horiz
			+0.0	+0.0	+0.0	+0.0					
			-34.5	+28.9	+3.0	+0.4					
			+0.4								
9	260.115M	22.7	+1.0	+1.5	+0.2	+12.0	+0.0	37.4	46.0	-8.6	Horiz
	QP		+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
^	260.200M	25.8	+1.0	+1.5	+0.2	+12.0	+0.0	40.5	46.0	-5.5	Horiz
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
11	2746.000M	46.5	+0.0	+0.0	+0.7	+0.0	+0.0	45.3	54.0	-8.7	Horiz
			+0.0	+0.0	+0.0	+0.0					
			-34.5	+28.8	+3.0	+0.4					
			+0.4								
12	4550.000M	40.5	+0.0	+0.0	+0.9	+0.0	+0.0	44.8	54.0	-9.2	Horiz
			+0.0	+0.0	+0.0	+0.0					
			-34.1	+32.5	+4.2	+0.5					
			+0.3								
13	4514.000M	40.3	+0.0	+0.0	+0.9	+0.0	+0.0	44.7	54.0	-9.3	Horiz
			+0.0	+0.0	+0.0	+0.0					
			-34.1	+32.5	+4.2	+0.5					
			+0.4								
14	131.830M	14.3	+0.7	+1.2	+0.1	+0.0	+0.0	34.0	43.5	-9.5	Horiz
			+0.0	+11.7	+6.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
15	134.720M	14.1	+0.7	+1.2	+0.1	+0.0	+0.0	33.8	43.5	-9.7	Vert
			+0.0	+11.7	+6.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
16	4550.000M	39.9	+0.0	+0.0	+0.9	+0.0	+0.0	44.2	54.0	-9.8	Vert
			+0.0	+0.0	+0.0	+0.0					
			-34.1	+32.5	+4.2	+0.5					
			+0.3								
17	2730.000M	45.0	+0.0	+0.0	+0.7	+0.0	+0.0	43.8	54.0	-10.2	Horiz
			+0.0	+0.0	+0.0	+0.0					
			-34.5	+28.7	+3.0	+0.4					
			+0.5								
18	3660.000M	42.7	+0.0	+0.0	+0.7	+0.0	+0.0	43.6	54.0	-10.4	Vert
			+0.0	+0.0	+0.0	+0.0					
			-34.2	+29.9	+3.7	+0.5					
			+0.3								

19	960.520M	15.2	+2.2	+2.5	+0.4	+22.9	+0.0	43.2	54.0	-10.8	Vert
	QP		+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
^	960.520M	22.2	+2.2	+2.5	+0.4	+22.9	+0.0	50.2	54.0	-3.8	Vert
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
21	260.200M	18.2	+1.0	+1.5	+0.2	+12.0	+0.0	32.9	46.0	-13.1	Vert
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
22	900.000M	42.3	+2.1	+2.4	+0.3	+22.6	+0.0	69.7	107.0	-37.3	Horiz
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
23	1820.000M	74.0	+0.0	+0.0	+0.5	+0.0	+0.0	69.5	107.0	-37.5	Horiz
			+0.0	+0.0	+0.0	+0.0					
			-35.1	+26.9	+2.5	+0.3					
			+0.4								
24	900.000M	41.9	+2.1	+2.4	+0.3	+22.6	+0.0	69.3	107.0	-37.7	Vert
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
25	1820.000M	73.2	+0.0	+0.0	+0.5	+0.0	+0.0	68.7	107.0	-38.3	Vert
			+0.0	+0.0	+0.0	+0.0					
			-35.1	+26.9	+2.5	+0.3					
			+0.4								
26	1806.000M	72.7	+0.0	+0.0	+0.5	+0.0	+0.0	68.1	107.0	-38.9	Vert
			+0.0	+0.0	+0.0	+0.0					
			-35.1	+26.8	+2.5	+0.3					
			+0.4								
27	1830.000M	71.7	+0.0	+0.0	+0.5	+0.0	+0.0	67.2	107.0	-39.8	Horiz
			+0.0	+0.0	+0.0	+0.0					
			-35.1	+26.9	+2.5	+0.3					
			+0.4								
28	1806.000M	70.2	+0.0	+0.0	+0.5	+0.0	+0.0	65.6	107.0	-41.4	Horiz
			+0.0	+0.0	+0.0	+0.0					
			-35.1	+26.8	+2.5	+0.3					
			+0.4								
29	1854.000M	61.5	+0.0	+0.0	+0.5	+0.0	+0.0	57.0	107.0	-50.0	Horiz
			+0.0	+0.0	+0.0	+0.0					
			-35.1	+27.0	+2.5	+0.3					
			+0.3								
30	1830.000M	59.4	+0.0	+0.0	+0.5	+0.0	+0.0	54.9	107.0	-52.1	Vert
			+0.0	+0.0	+0.0	+0.0					
			-35.1	+26.9	+2.5	+0.3					
			+0.4								
31	831.400M	23.7	+2.0	+2.3	+0.3	+21.3	+0.0	49.6	107.0	-57.4	Horiz
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								

32	2460.000M	43.5	+0.0	+0.0	+0.6	+0.0	+0.0	41.0	107.0	-66.0	Vert
			+0.0	+0.0	+0.0	+0.0					
			-34.5	+27.7	+2.9	+0.4					
			+0.4								
33	424.000M	19.1	+1.3	+1.8	+0.3	+15.7	+0.0	38.2	107.0	-68.8	Vert
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
34	424.000M	15.8	+1.3	+1.8	+0.3	+15.7	+0.0	34.9	107.0	-72.1	Horiz
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
35	41.050M	12.7	+0.4	+0.5	+0.1	+0.0	+0.0	33.5	107.0	-73.5	Vert
			+0.0	+13.8	+6.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
36	189.800M	15.1	+0.8	+1.4	+0.2	+0.0	+0.0	32.5	107.0	-74.5	Horiz
			+0.0	+9.0	+6.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
37	1.778M	24.5	+0.0	+0.0	+0.0	+0.0	-40.0	-5.8	107.0	-112.8	Para
			+0.0	+0.0	+0.0	+9.6					
			+0.0	+0.0	+0.1	+0.0					
			+0.0								
38	5.437M	18.1	+0.0	+0.0	+0.0	+0.0	-40.0	-12.4	107.0	-119.4	Para
			+0.0	+0.0	+0.0	+9.4					
			+0.0	+0.0	+0.1	+0.0					
			+0.0								
39	69.000k	54.2	+0.0	+0.0	+0.0	+0.0	-80.0	-15.6	107.0	-122.6	Para
			+0.0	+0.0	+0.0	+10.2					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
40	21.213M	12.1	+0.0	+0.0	+0.0	+0.0	-40.0	-19.7	107.0	-126.7	Para
			+0.0	+0.0	+0.0	+7.9					
			+0.0	+0.0	+0.3	+0.0					
			+0.0								



Test Location: CKC Laboratories, Inc. • 22116 23rd Drive SE Suite A • Bothell, WA 98021 • 800-500-4EMC (4362)
Customer: **Itron, Inc.**
Specification: **15.247(d) / 15.209 Radiated Spurious Emissions**
Work Order #: **99318** Date: 1/30/2017
Test Type: **Maximized Emissions** Time: 12:54:53
Tested By: Steven Pittsford Sequence#: 7
Software: EMITest 5.03.02

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 4			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 4			

Test Conditions / Notes:

Temperature: 20-24°C
Relative Humidity: 21-32%

Frequency range investigated: 9kHz-10GHz
Transmitter Frequency: 903-926.8MHz

Modulation: OOK

Firmware Power Level: 1

EUT Firmware: App Version: 1.18.3.0, CSL Version: 2.22.1.0

Antenna Type: Internal Trace

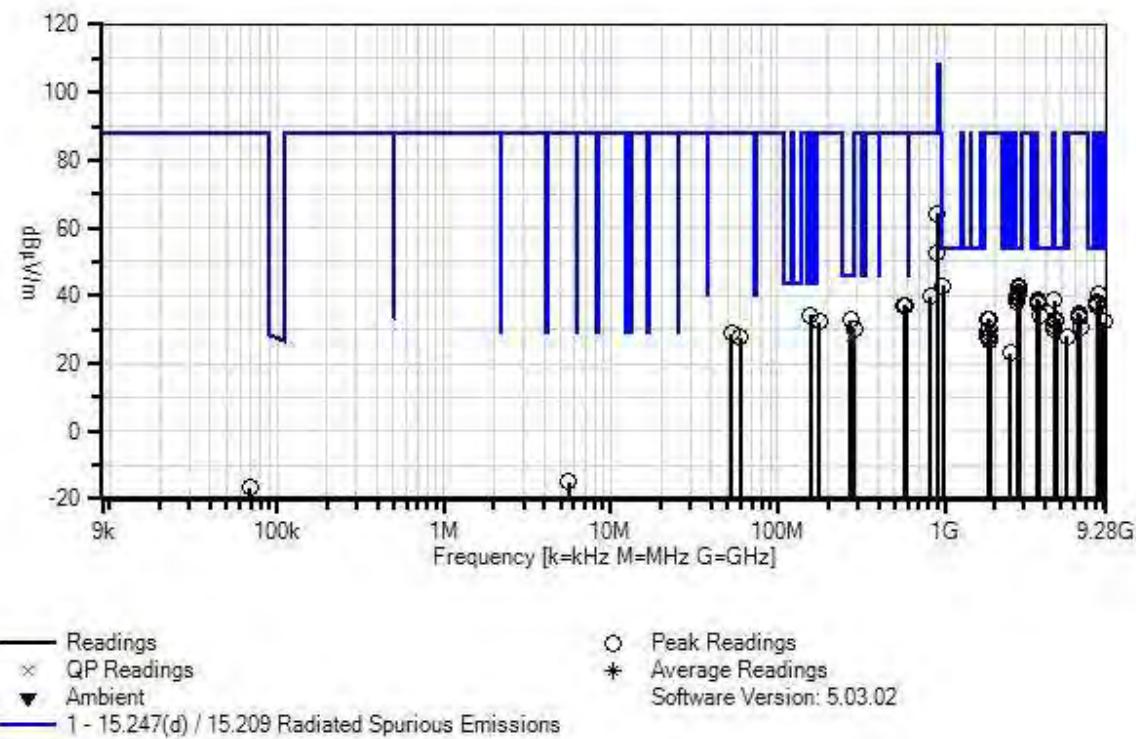
Antenna Gain: 5.39dBi

Duty Cycle: Max

Test Method: ANSI C63.10 (2013)

The EUT is a transmitter operating hopping in band. The EUT is battery operated, fresh batteries installed.
The EUT has no IO ports. Parallel, Perpendicular, Ground parallel antenna polarities investigated below 30MHz, Horizontal and Vertical antenna polarities investigated above 30MHz, only worst case reported.
The EUT orientation selected based on manufacturer declared fixed installation orientation. Hopping operation selected as worst case based on previously collected data.

Itron, Inc. WO#: 99318 Sequence#: 7 Date: 1/30/2017
15.247(d) / 15.209 Radiated Spurious Emissions Test Distance: 3 Meters Horiz



Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	ANP05360	Cable	RG214	11/30/2016	11/30/2018
T2	ANP05963	Cable	RG-214	2/15/2016	2/15/2018
T3	ANP06540	Cable	Heliax	10/29/2015	10/29/2017
T4	AN01816	Log Periodic Antenna-ANSI 63.5	3146	1/8/2016	1/8/2018
	AN02872	Spectrum Analyzer	E4440A	11/18/2015	11/18/2017
T5	AN01991	Biconilog Antenna	CBL6111C	3/11/2016	3/11/2018
T6	ANP05657	Attenuator	PE7004-6	12/22/2015	12/22/2017
T7	AN00052	Loop Antenna	6502	4/8/2016	4/8/2018
T8	AN03540	Preamp	83017A	4/30/2015	4/30/2017
T9	AN01467	Horn Antenna- ANSI C63.5 Calibration	3115	8/12/2015	8/12/2017
T10	ANP05305	Cable	ETSI-50T	2/15/2016	2/15/2018
T11	ANP06935	Cable	32026-29801- 29801-18	3/11/2016	3/11/2018
T12	AN03170	High Pass Filter	HM1155-11SS	12/17/2015	12/17/2017
T13	AN12.2% DCCF	Test Data Adjustment		1/6/2017	1/6/2019

Measurement Data:

Reading listed by margin.

Test Distance: 3 Meters

#	Freq	Rdng	T1	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
			T5	T6	T7	T8					
			T9	T10	T11	T12					
			T13								
	MHz	dB μ V	dB	dB	dB	dB	Table	dB μ V/m	dB μ V/m	dB	Ant
1	971.400M	14.3	+2.2	+2.5	+0.4	+23.6	+0.0	43.0	54.0	-11.0	Vert
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
2	2780.000M	61.8	+0.0	+0.0	+0.7	+0.0	+0.0	42.5	54.0	-11.5	Horiz
			+0.0	+0.0	+0.0	-34.5					
			+28.9	+3.0	+0.4	+0.4					
			-18.2								
3	2780.000M	61.4	+0.0	+0.0	+0.7	+0.0	+0.0	42.1	54.0	-11.9	Vert
			+0.0	+0.0	+0.0	-34.5					
			+28.9	+3.0	+0.4	+0.4					
			-18.2								
4	2744.000M	60.8	+0.0	+0.0	+0.7	+0.0	+0.0	41.4	54.0	-12.6	Vert
			+0.0	+0.0	+0.0	-34.5					
			+28.8	+3.0	+0.4	+0.4					
			-18.2								
5	271.400M	17.7	+1.0	+1.5	+0.2	+12.6	+0.0	33.0	46.0	-13.0	Horiz
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								

6	2744.000M	60.0	+0.0	+0.0	+0.7	+0.0	+0.0	40.6	54.0	-13.4	Horiz
			+0.0	+0.0	+0.0	-34.5					
			+28.8	+3.0	+0.4	+0.4					
			-18.2								
7	8340.000M	49.3	+0.0	+0.0	+1.4	+0.0	+0.0	40.5	54.0	-13.5	Horiz
			+0.0	+0.0	+0.0	-35.0					
			+36.6	+5.4	+0.7	+0.3					
			-18.2								
8	2710.000M	59.5	+0.0	+0.0	+0.7	+0.0	+0.0	40.0	54.0	-14.0	Vert
			+0.0	+0.0	+0.0	-34.5					
			+28.6	+3.0	+0.4	+0.5					
			-18.2								
9	2730.000M	59.2	+0.0	+0.0	+0.7	+0.0	+0.0	39.8	54.0	-14.2	Vert
			+0.0	+0.0	+0.0	-34.5					
			+28.7	+3.0	+0.4	+0.5					
			-18.2								
10	2710.000M	58.7	+0.0	+0.0	+0.7	+0.0	+0.0	39.2	54.0	-14.8	Horiz
			+0.0	+0.0	+0.0	-34.5					
			+28.6	+3.0	+0.4	+0.5					
			-18.2								
11	2730.000M	58.5	+0.0	+0.0	+0.7	+0.0	+0.0	39.1	54.0	-14.9	Horiz
			+0.0	+0.0	+0.0	-34.5					
			+28.7	+3.0	+0.4	+0.5					
			-18.2								
12	3612.000M	56.4	+0.0	+0.0	+0.8	+0.0	+0.0	39.0	54.0	-15.0	Horiz
			+0.0	+0.0	+0.0	-34.2					
			+29.8	+3.6	+0.4	+0.4					
			-18.2								
13	4550.000M	52.4	+0.0	+0.0	+0.9	+0.0	+0.0	38.5	54.0	-15.5	Vert
			+0.0	+0.0	+0.0	-34.1					
			+32.5	+4.2	+0.5	+0.3					
			-18.2								
14	3640.000M	55.6	+0.0	+0.0	+0.7	+0.0	+0.0	38.4	54.0	-15.6	Horiz
			+0.0	+0.0	+0.0	-34.2					
			+29.9	+3.7	+0.5	+0.4					
			-18.2								
15	8190.000M	47.3	+0.0	+0.0	+1.3	+0.0	+0.0	38.3	54.0	-15.7	Horiz
			+0.0	+0.0	+0.0	-35.1					
			+36.7	+5.3	+0.7	+0.3					
			-18.2								
16	2710.000M	57.7	+0.0	+0.0	+0.7	+0.0	+0.0	38.2	54.0	-15.8	Vert
			+0.0	+0.0	+0.0	-34.5					
			+28.6	+3.0	+0.4	+0.5					
			-18.2								
17	3660.000M	55.1	+0.0	+0.0	+0.7	+0.0	+0.0	37.8	54.0	-16.2	Horiz
			+0.0	+0.0	+0.0	-34.2					
			+29.9	+3.7	+0.5	+0.3					
			-18.2								
18	3640.000M	54.6	+0.0	+0.0	+0.7	+0.0	+0.0	37.4	54.0	-16.6	Vert
			+0.0	+0.0	+0.0	-34.2					
			+29.9	+3.7	+0.5	+0.4					
			-18.2								

19	8190.000M	46.4	+0.0	+0.0	+1.3	+0.0	+0.0	37.4	54.0	-16.6	Horiz
			+0.0	+0.0	+0.0	-35.1					
			+36.7	+5.3	+0.7	+0.3					
			-18.2								
20	8125.000M	46.0	+0.0	+0.0	+1.3	+0.0	+0.0	37.0	54.0	-17.0	Horiz
			+0.0	+0.0	+0.0	-35.1					
			+36.7	+5.3	+0.7	+0.3					
			-18.2								
21	271.736M	12.8	+1.0	+1.5	+0.2	+12.6	+0.0	28.1	46.0	-17.9	Horiz
	QP		+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
22	3708.000M	51.2	+0.0	+0.0	+0.7	+0.0	+0.0	34.3	54.0	-19.7	Horiz
			+0.0	+0.0	+0.0	-34.1					
			+30.1	+3.8	+0.5	+0.3					
			-18.2								
23	4634.000M	46.7	+0.0	+0.0	+0.9	+0.0	+0.0	33.2	54.0	-20.8	Horiz
			+0.0	+0.0	+0.0	-34.1					
			+32.6	+4.3	+0.5	+0.5					
			-18.2								
24	4574.000M	46.1	+0.0	+0.0	+0.9	+0.0	+0.0	32.3	54.0	-21.7	Horiz
			+0.0	+0.0	+0.0	-34.1					
			+32.5	+4.2	+0.5	+0.4					
			-18.2								
25	4550.000M	45.4	+0.0	+0.0	+0.9	+0.0	+0.0	31.5	54.0	-22.5	Horiz
			+0.0	+0.0	+0.0	-34.1					
			+32.5	+4.2	+0.5	+0.3					
			-18.2								
26	900.000M	36.9	+2.1	+2.4	+0.3	+22.6	+0.0	64.3	88.0	-23.7	Horiz
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
27	4514.000M	43.8	+0.0	+0.0	+0.9	+0.0	+0.0	30.0	54.0	-24.0	Horiz
			+0.0	+0.0	+0.0	-34.1					
			+32.5	+4.2	+0.5	+0.4					
			-18.2								
28	5420.000M	40.8	+0.0	+0.0	+1.0	+0.0	+0.0	27.9	54.0	-26.1	Horiz
			+0.0	+0.0	+0.0	-34.2					
			+33.1	+4.5	+0.6	+0.3					
			-18.2								
29	900.000M	25.0	+2.1	+2.4	+0.3	+22.6	+0.0	52.4	88.0	-35.6	Vert
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
30	815.300M	14.4	+1.9	+2.3	+0.3	+20.9	+0.0	39.8	88.0	-48.2	Vert
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
31	571.000M	14.9	+1.6	+2.0	+0.3	+18.3	+0.0	37.1	88.0	-50.9	Horiz
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								

32	585.000M	14.7	+1.6	+2.1	+0.3	+18.2	+0.0	36.9	88.0	-51.1	Vert
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
33	6320.000M	45.6	+0.0	+0.0	+1.3	+0.0	+0.0	35.0	88.0	-53.0	Horiz
			+0.0	+0.0	+0.0	-34.2					
			+34.8	+4.7	+0.6	+0.4					
			-18.2								
34	6370.000M	45.4	+0.0	+0.0	+1.3	+0.0	+0.0	34.6	88.0	-53.4	Horiz
			+0.0	+0.0	+0.0	-34.2					
			+34.7	+4.7	+0.6	+0.3					
			-18.2								
35	157.500M	15.2	+0.7	+1.4	+0.2	+0.0	+0.0	34.2	88.0	-53.8	Horiz
			+10.7	+6.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
36	6405.000M	45.0	+0.0	+0.0	+1.2	+0.0	+0.0	34.0	88.0	-54.0	Horiz
			+0.0	+0.0	+0.0	-34.2					
			+34.6	+4.7	+0.6	+0.3					
			-18.2								
37	6320.000M	44.1	+0.0	+0.0	+1.3	+0.0	+0.0	33.5	88.0	-54.5	Vert
			+0.0	+0.0	+0.0	-34.2					
			+34.8	+4.7	+0.6	+0.4					
			-18.2								
38	1820.000M	55.8	+0.0	+0.0	+0.5	+0.0	+0.0	33.1	88.0	-54.9	Vert
			+0.0	+0.0	+0.0	-35.1					
			+26.9	+2.5	+0.3	+0.4					
			-18.2								
39	1806.000M	55.9	+0.0	+0.0	+0.5	+0.0	+0.0	33.1	88.0	-54.9	Vert
			+0.0	+0.0	+0.0	-35.1					
			+26.8	+2.5	+0.3	+0.4					
			-18.2								
40	1830.000M	55.4	+0.0	+0.0	+0.5	+0.0	+0.0	32.7	88.0	-55.3	Vert
			+0.0	+0.0	+0.0	-35.1					
			+26.9	+2.5	+0.3	+0.4					
			-18.2								
41	8925.000M	38.9	+0.0	+0.0	+1.4	+0.0	+0.0	32.2	88.0	-55.8	Vert
			+0.0	+0.0	+0.0	-34.6					
			+37.6	+6.0	+0.7	+0.4					
			-18.2								
42	176.200M	14.4	+0.8	+1.4	+0.2	+0.0	+0.0	32.2	88.0	-55.8	Vert
			+9.4	+6.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
43	6485.000M	41.7	+0.0	+0.0	+1.2	+0.0	+0.0	30.4	88.0	-57.6	Horiz
			+0.0	+0.0	+0.0	-34.2					
			+34.4	+4.6	+0.6	+0.3					
			-18.2								
44	288.200M	14.2	+1.0	+1.6	+0.2	+13.2	+0.0	30.2	88.0	-57.8	Vert
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								

45	1854.000M	52.7	+0.0	+0.0	+0.5	+0.0	+0.0	30.0	88.0	-58.0	Vert
			+0.0	+0.0	+0.0	-35.1					
			+27.0	+2.5	+0.3	+0.3					
			-18.2								
46	1806.000M	52.2	+0.0	+0.0	+0.5	+0.0	+0.0	29.4	88.0	-58.6	Horiz
			+0.0	+0.0	+0.0	-35.1					
			+26.8	+2.5	+0.3	+0.4					
			-18.2								
47	52.610M	14.1	+0.4	+0.6	+0.1	+0.0	+0.0	28.9	88.0	-59.1	Vert
			+7.7	+6.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
48	1830.000M	50.6	+0.0	+0.0	+0.5	+0.0	+0.0	27.9	88.0	-60.1	Horiz
			+0.0	+0.0	+0.0	-35.1					
			+26.9	+2.5	+0.3	+0.4					
			-18.2								
49	1820.000M	50.5	+0.0	+0.0	+0.5	+0.0	+0.0	27.8	88.0	-60.2	Horiz
			+0.0	+0.0	+0.0	-35.1					
			+26.9	+2.5	+0.3	+0.4					
			-18.2								
50	59.920M	14.6	+0.4	+0.7	+0.1	+0.0	+0.0	27.6	88.0	-60.4	Horiz
			+5.8	+6.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
51	1854.000M	49.6	+0.0	+0.0	+0.5	+0.0	+0.0	26.9	88.0	-61.1	Horiz
			+0.0	+0.0	+0.0	-35.1					
			+27.0	+2.5	+0.3	+0.3					
			-18.2								
52	2462.000M	43.8	+0.0	+0.0	+0.6	+0.0	+0.0	23.1	88.0	-64.9	Vert
			+0.0	+0.0	+0.0	-34.5					
			+27.7	+2.9	+0.4	+0.4					
			-18.2								
53	5.617M	15.4	+0.0	+0.0	+0.0	+0.0	-40.0	-15.1	88.0	-103.1	Para
			+0.0	+0.0	+9.4	+0.0					
			+0.0	+0.1	+0.0	+0.0					
			+0.0								
54	69.000k	53.1	+0.0	+0.0	+0.0	+0.0	-80.0	-16.7	88.0	-104.7	Para
			+0.0	+0.0	+10.2	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								

Band Edge

Band Edge Summary

Frequency (MHz)	Modulation	Ant. Type	Field Strength (dBuV/m @3m)	Limit (dBuV/m @3m)	Results
614	Worst Case	Integral	40.7 (QP)	<46	Pass
902	FSK 150kbps Power Level 3	Integral	75.2 (QP)	107	Pass
902	FSK 10kbps Power Level 3	Integral	79.0 (QP)	107	Pass
902	OOK Power Level 3	Integral	92.4 (Peak)	107	Pass
902	OOK Power level 1	Integral	74.0 (Peak)	88	Pass
928	FSK 150kbps Power Level 3	Integral	73.0 (QP)	107	Pass
928	FSK 10kbps Power Level 3	Integral	76.8 (QP)	107	Pass
928	OOK Power Level 3	Integral	88.0 (Peak)	107	Pass
928	OOK Power level 1	Integral	70.6 (Peak)	88	Pass
960	Worst Case	Integral	48.9 (QP)	<54	Pass

Worst case: FSK 150kbps Power Level 3

Emissions limits outside of restricted bands are 20dB from maximum measured inband emissions in 100kHz.

Test Setup / Conditions / Data

Test Location: CKC Laboratories, Inc. • 22116 23rd Drive SE Suite A • Bothell, WA 98021 • 800-500-4EMC (4362)
 Customer: **Itron, Inc.**
 Specification: **15.247(d) / 15.209 Radiated Spurious Emissions**
 Work Order #: **99318** Date: 1/31/2017
 Test Type: **Maximized Emissions** Time: 15:23:39
 Tested By: Steven Pittsford Sequence#: 5
 Software: EMITest 5.03.02

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

Test Conditions / Notes:

Temperature: 20-24°C

Relative Humidity: 21-32%

Frequency range investigated: Band Edge

Transmitter Frequency: 902.4-927.6MHz

Modulation: FSK 150kbps

Firmware Power Level: 3

EUT Firmware: App Version: 1.18.3.0, CSL Version: 2.22.1.0

Antenna Type: Internal Trace

Antenna Gain: 4.96dBi

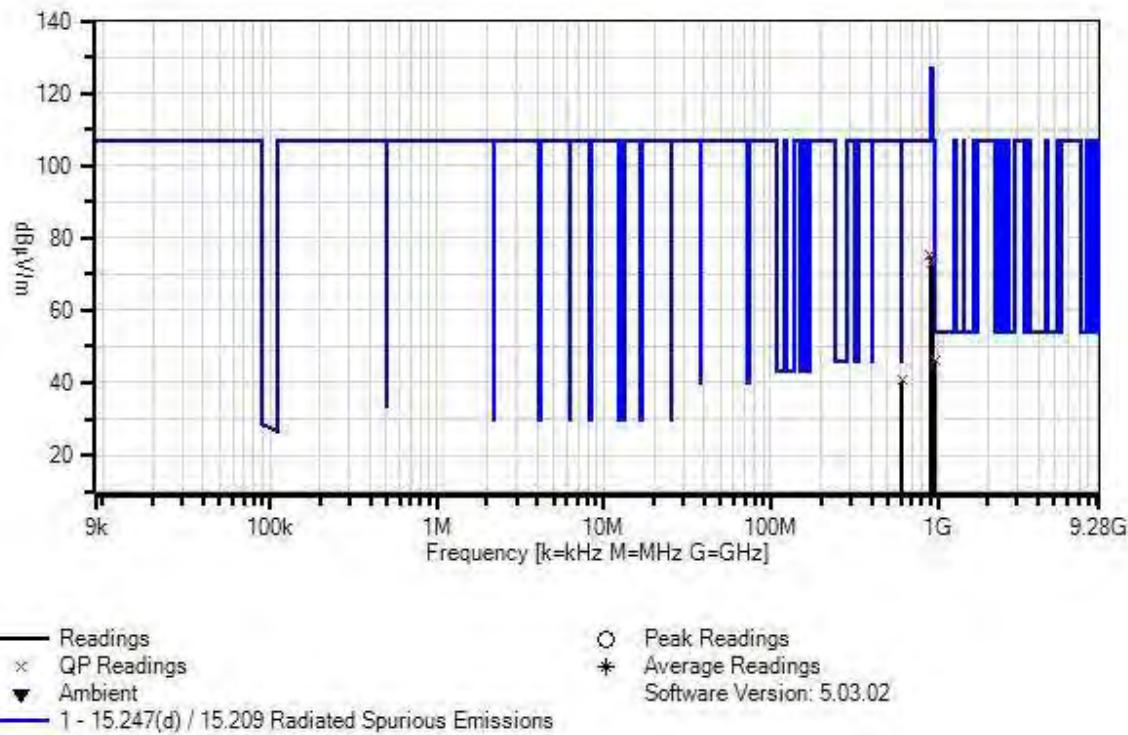
Duty Cycle: Max

Test Method: ANSI C63.10 (2013)

The EUT is a transmitter operating hopping in band. The EUT is battery operated, fresh batteries installed.

The EUT has no IO ports.

The EUT orientation selected based on manufacturer declared fixed installation orientation. Hopping operation selected as worst case based on previously collected data.

Itron, Inc. WO#: 99318 Sequence#: 5 Date: 1/31/2017
 15.247(d) / 15.209 Radiated Spurious Emissions Test Distance: 3 Meters Horiz

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	ANP05360	Cable	RG214	11/30/2016	11/30/2018
T2	ANP05963	Cable	RG-214	2/15/2016	2/15/2018
T3	ANP06540	Cable	Heliax	10/29/2015	10/29/2017
T4	AN01816	Log Periodic Antenna-ANSI 63.5	3146	1/8/2016	1/8/2018
	AN02872	Spectrum Analyzer	E4440A	11/18/2015	11/18/2017

Measurement Data:

Reading listed by margin.

Test Distance: 3 Meters

#	Freq MHz	Rdng dB μ V	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dB μ V/m	Spec dB μ V/m	Margin dB	Polar Ant
1	614.000M QP	18.1	+1.6	+2.1	+0.3	+18.5	+0.0	40.6	46.0	-5.4	Horiz
2	960.000M QP	18.2	+2.2	+2.5	+0.4	+22.8	+0.0	46.1	54.0	-7.9	Horiz
3	901.994M QP	47.8	+2.1	+2.4	+0.3	+22.6	+0.0	75.2	107.0	-31.8	Horiz
4	928.014M QP	45.7	+2.1	+2.4	+0.4	+22.4	+0.0	73.0	107.0	-34.0	Horiz



Test Location: CKC Laboratories, Inc. • 22116 23rd Drive SE Suite A • Bothell, WA 98021 • 800-500-4EMC (4362)
Customer: **Itron, Inc.**
Specification: **15.247(d) / 15.209 Radiated Spurious Emissions**
Work Order #: **99318** Date: 1/30/2017
Test Type: **Maximized Emissions** Time: 16:36:43
Tested By: Steven Pittsford Sequence#: 5
Software: EMITest 5.03.02

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 2			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 2			

Test Conditions / Notes:

Temperature: 20-24°C

Relative Humidity: 21-32%

Frequency range investigated: Band Edge

Transmitter Frequency: 902.2 to 927.75 MHz

Modulation: FSK 10kbps

Firmware Power Level: 3

EUT Firmware: App Version: 1.18.3.0, CSL Version: 2.22.1.0

Antenna Type: Internal Trace

Antenna Gain: 4.96dBi

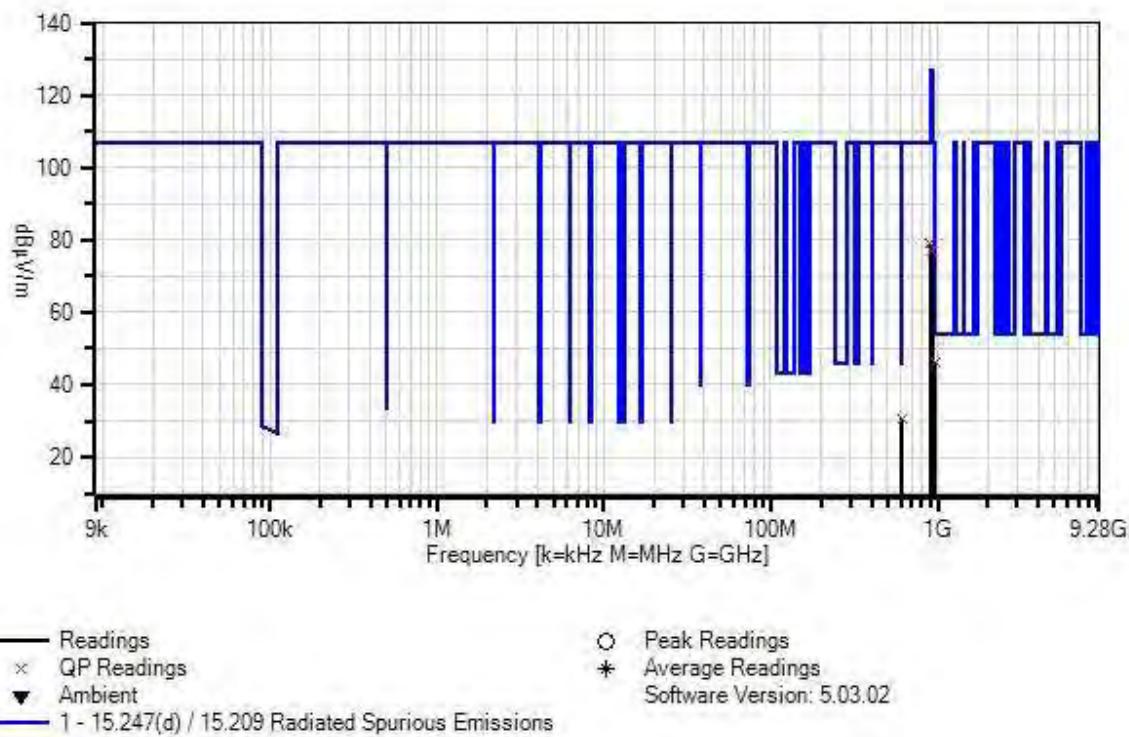
Duty Cycle: Max

Test Method: ANSI C63.10 (2013)

The EUT is a transmitter operating hopping in band. The EUT is battery operated, fresh batteries installed.

The EUT has no IO ports.

The EUT orientation selected based on manufacturer declared fixed installation orientation. Hopping operation selected as worst case based on previously collected data.

Itron, Inc. WO#: 99318 Sequence#: 5 Date: 1/30/2017
 15.247(d) / 15.209 Radiated Spurious Emissions Test Distance: 3 Meters Horiz

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	ANP05360	Cable	RG214	11/30/2016	11/30/2018
T2	ANP05963	Cable	RG-214	2/15/2016	2/15/2018
T3	ANP06540	Cable	Heliax	10/29/2015	10/29/2017
T4	AN01816	Log Periodic Antenna-ANSI 63.5	3146	1/8/2016	1/8/2018
	AN02872	Spectrum Analyzer	E4440A	11/18/2015	11/18/2017

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

#	Freq MHz	Rdng dB μ V	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dB μ V/m	Spec dB μ V/m	Margin dB	Polar Ant
1	960.000M QP	18.3	+2.2	+2.5	+0.4	+22.8	+0.0	46.2	54.0	-7.8	Horiz
2	614.000M QP	8.3	+1.6	+2.1	+0.3	+18.5	+0.0	30.8	46.0	-15.2	Horiz
3	901.986M QP	51.6	+2.1	+2.4	+0.3	+22.6	+0.0	79.0	107.0	-28.0	Horiz
4	928.016M QP	49.5	+2.1	+2.4	+0.4	+22.4	+0.0	76.8	107.0	-30.2	Horiz



Test Location: CKC Laboratories, Inc. • 22116 23rd Drive SE Suite A • Bothell, WA 98021 • 800-500-4EMC (4362)
Customer: **Itron, Inc.**
Specification: **15.247(d) / 15.209 Radiated Spurious Emissions**
Work Order #: **99318** Date: 1/31/2017
Test Type: **Maximized Emissions** Time: 14:58:39
Tested By: Steven Pittsford Sequence#: 4
Software: EMITest 5.03.02

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 3			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 3			

Test Conditions / Notes:

Temperature: 20-24°C

Relative Humidity: 21-32%

Frequency range investigated: Band Edge

Transmitter Frequency: 903-926.8MHz

Modulation: OOK

Firmware Power Level: 3

EUT Firmware: App Version: 1.18.3.0, CSL Version: 2.22.1.0

Antenna Type: Internal Trace

Antenna Gain: 4.96dBi

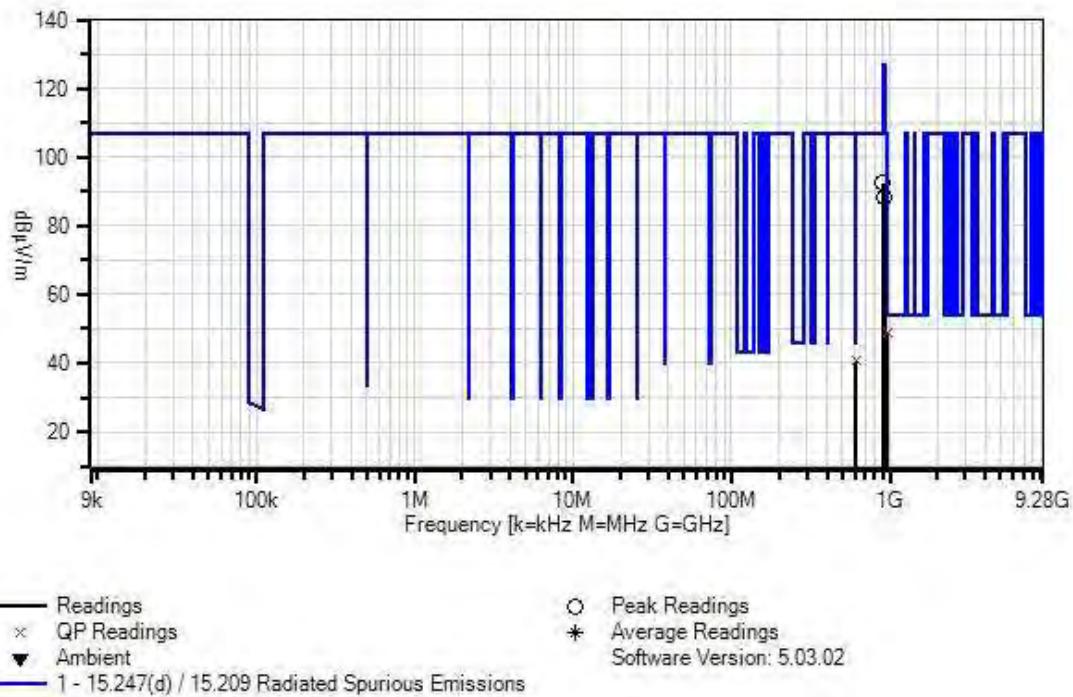
Duty Cycle: Max

Test Method: ANSI C63.10 (2013)

The EUT is a transmitter operating hopping in band. The EUT is battery operated, fresh batteries installed.

The EUT has no IO ports.

The EUT orientation selected based on manufacturer declared fixed installation orientation. Hopping operation selected as worst case based on previously collected data.

Itron, Inc. WO#: 99318 Sequence#: 4 Date: 1/31/2017
 15.247(d) / 15.209 Radiated Spurious Emissions Test Distance: 3 Meters Horiz

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN01991	Biconilog Antenna	CBL6111C	3/11/2016	3/11/2018
	ANP05657	Attenuator	PE7004-6	12/22/2015	12/22/2017
T1	ANP05360	Cable	RG214	11/30/2016	11/30/2018
T2	ANP05963	Cable	RG-214	2/15/2016	2/15/2018
T3	ANP06540	Cable	Heliax	10/29/2015	10/29/2017
	AN02871	Spectrum Analyzer	E4440A	8/25/2015	8/25/2017
T4	AN01816	Log Periodic Antenna-ANSI 63.5	3146	1/8/2016	1/8/2018

Measurement Data:

Reading listed by margin.

Test Distance: 3 Meters

#	Freq MHz	Rdng dB μ V	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dB μ V/m	Spec dB μ V/m	Margin dB	Polar Ant
1	960.012M QP	21.0	+2.2	+2.5	+0.4	+22.8	+0.0	48.9	54.0	-5.1	Horiz
2	614.000M QP	18.2	+1.6	+2.1	+0.3	+18.5	+0.0	40.7	46.0	-5.3	Horiz
3	902.000M	65.0	+2.1	+2.4	+0.3	+22.6	+0.0	92.4	107.0	-14.6	Horiz
4	928.000M	60.7	+2.1	+2.4	+0.4	+22.4	+0.0	88.0	107.0	-19.0	Horiz



Test Location: CKC Laboratories, Inc. • 22116 23rd Drive SE Suite A • Bothell, WA 98021 • 800-500-4EMC (4362)
Customer: **Itron, Inc.**
Specification: **15.247(d) / 15.209 Radiated Spurious Emissions**
Work Order #: **99318** Date: 1/31/2017
Test Type: **Maximized Emissions** Time: 13:50:33
Tested By: Steven Pittsford Sequence#: 5
Software: EMITest 5.03.02

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 4			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 4			

Test Conditions / Notes:

Temperature: 20-24°C

Relative Humidity: 21-32%

Frequency range investigated: Band Edge

Transmitter Frequency: 903-926.8MHz

Modulation: OOK

Firmware Power Level: 1

EUT Firmware: App Version: 1.18.3.0, CSL Version: 2.22.1.0

Antenna Type: Internal Trace

Antenna Gain: 5.39dBi

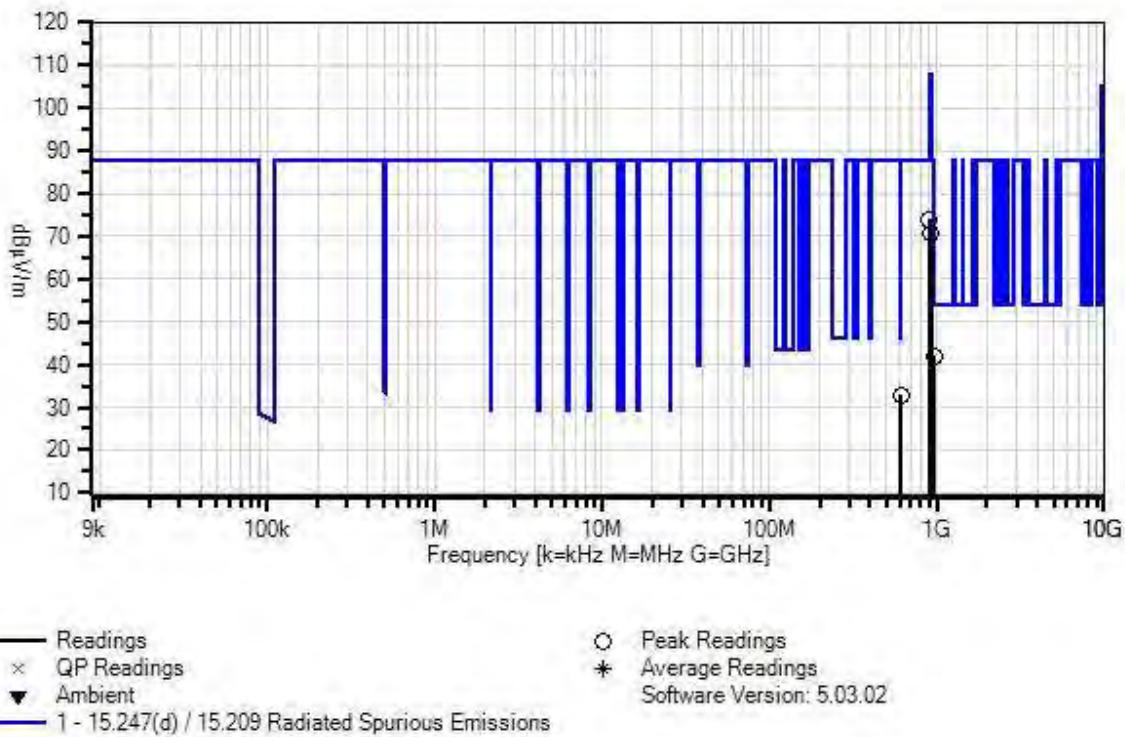
Duty Cycle: Max

Test Method: ANSI C63.10 (2013)

The EUT is a transmitter operating hopping in band. The EUT is battery operated, fresh batteries installed.

The EUT has no IO ports.

The EUT orientation selected based on manufacturer declared fixed installation orientation. Hopping operation selected as worst case based on previously collected data.

Itron, Inc. WO#: 99318 Sequence#: 5 Date: 1/31/2017
 15.247(d) / 15.209 Radiated Spurious Emissions Test Distance: 3 Meters Horiz

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	ANP05360	Cable	RG214	11/30/2016	11/30/2018
T2	ANP05963	Cable	RG-214	2/15/2016	2/15/2018
T3	ANP06540	Cable	Heliax	10/29/2015	10/29/2017
T4	AN01816	Log Periodic Antenna-ANSI 63.5	3146	1/8/2016	1/8/2018
	AN02872	Spectrum Analyzer	E4440A	11/18/2015	11/18/2017

Measurement Data:

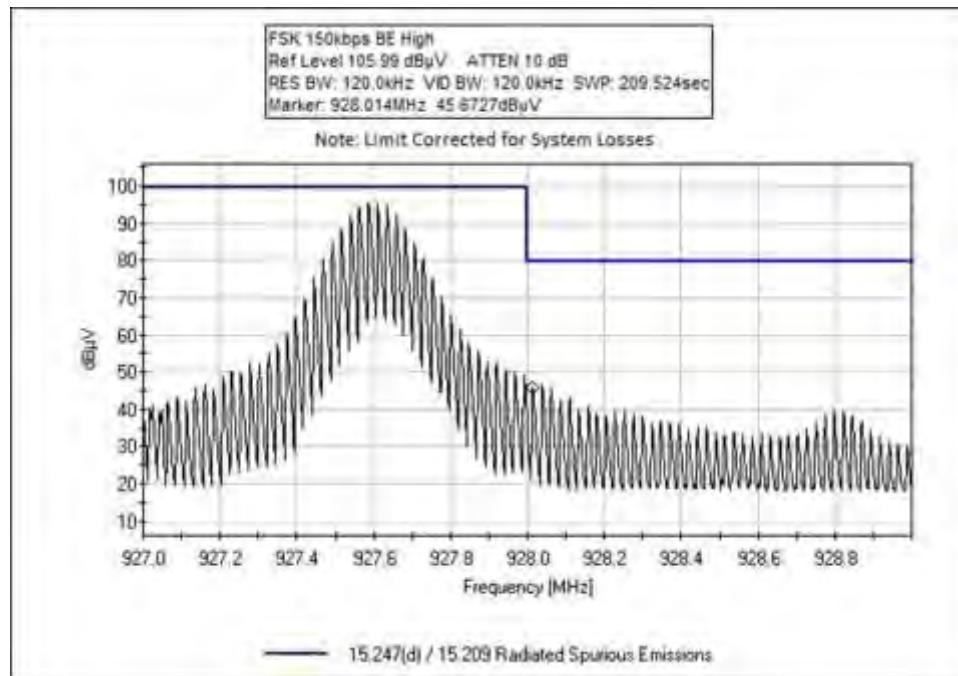
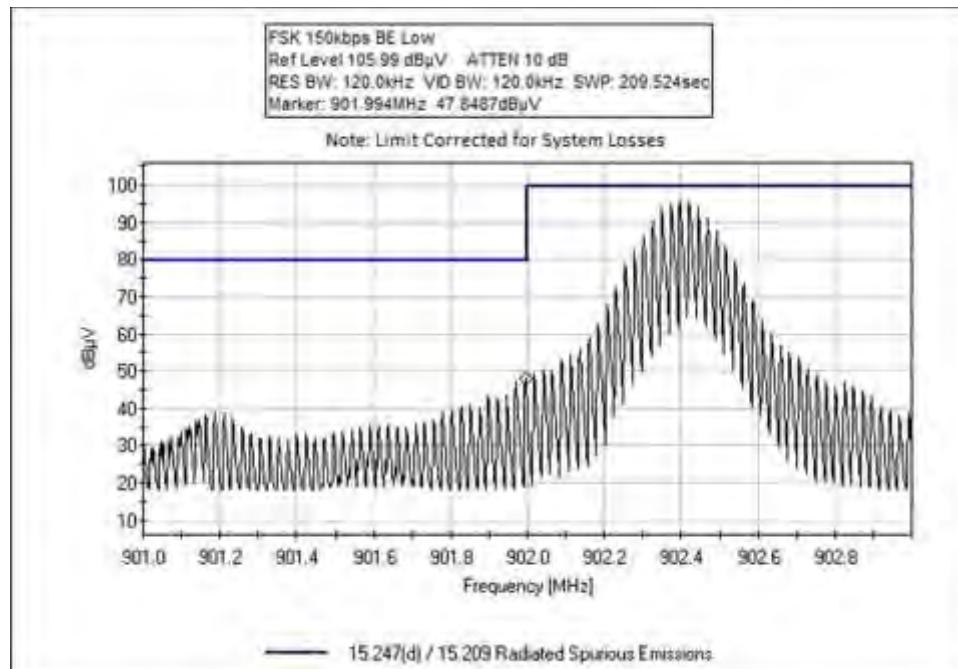
Reading listed by margin.

Test Distance: 3 Meters

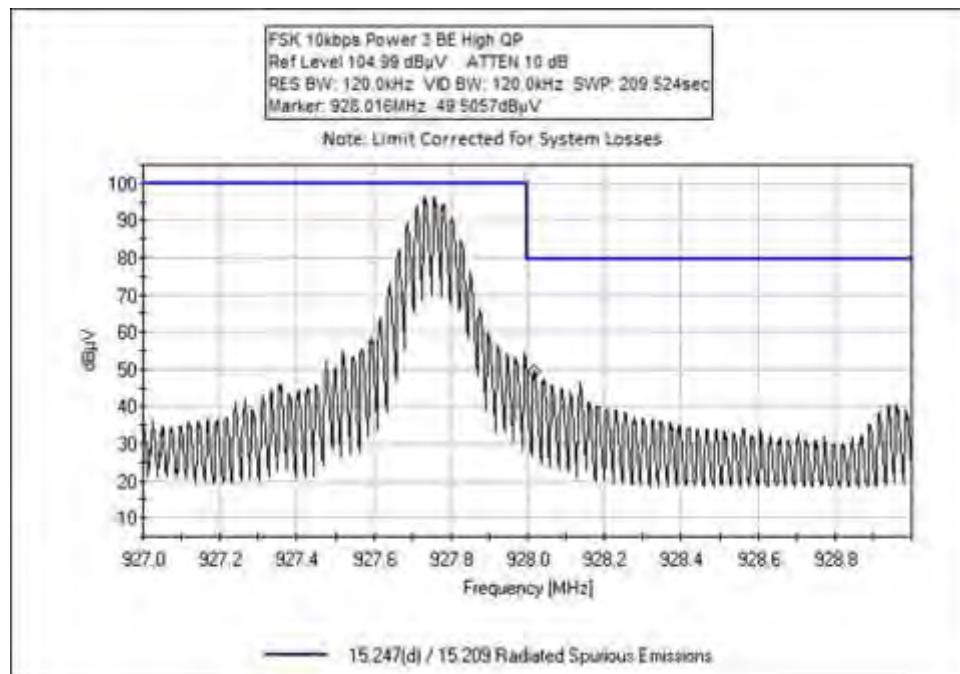
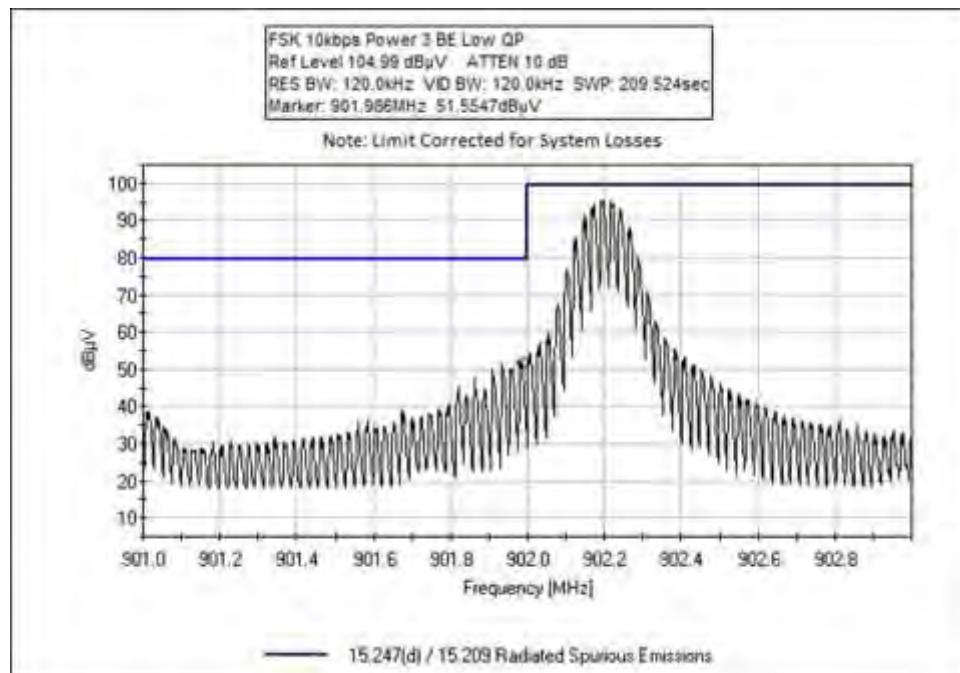
#	Freq MHz	Rdng dB μ V	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dB μ V/m	Spec dB μ V/m	Margin dB	Polar Ant
1	960.000M	14.2	+2.2	+2.5	+0.4	+22.8	+0.0	42.1	54.0	-11.9	Horiz
2	614.000M	10.3	+1.6	+2.1	+0.3	+18.5	+0.0	32.8	46.0	-13.2	Horiz
3	902.000M	46.6	+2.1	+2.4	+0.3	+22.6	+0.0	74.0	88.0	-14.0	Horiz
4	928.000M	43.3	+2.1	+2.4	+0.4	+22.4	+0.0	70.6	88.0	-17.4	Horiz

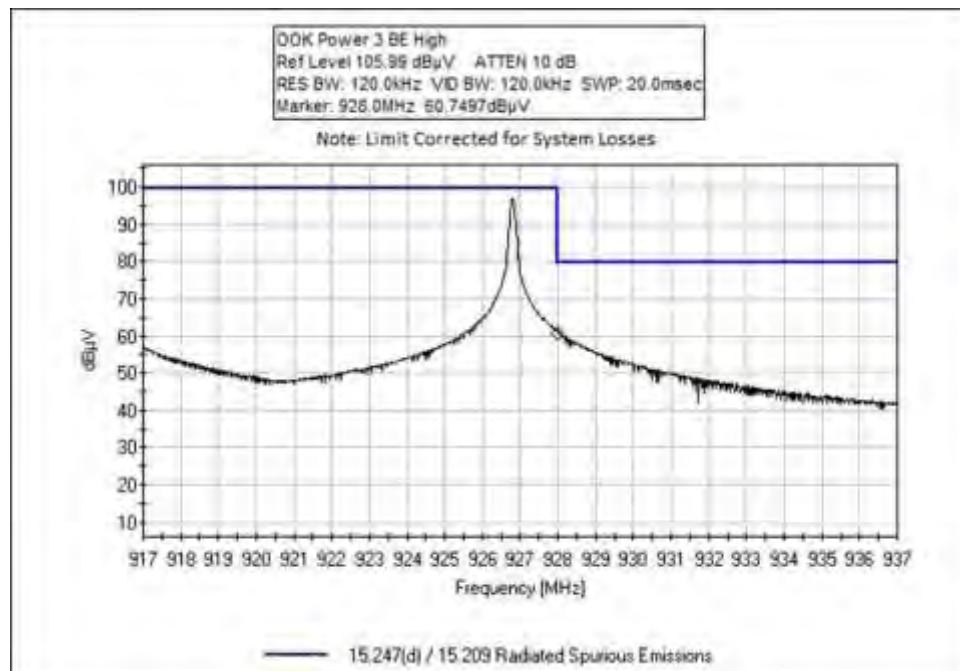
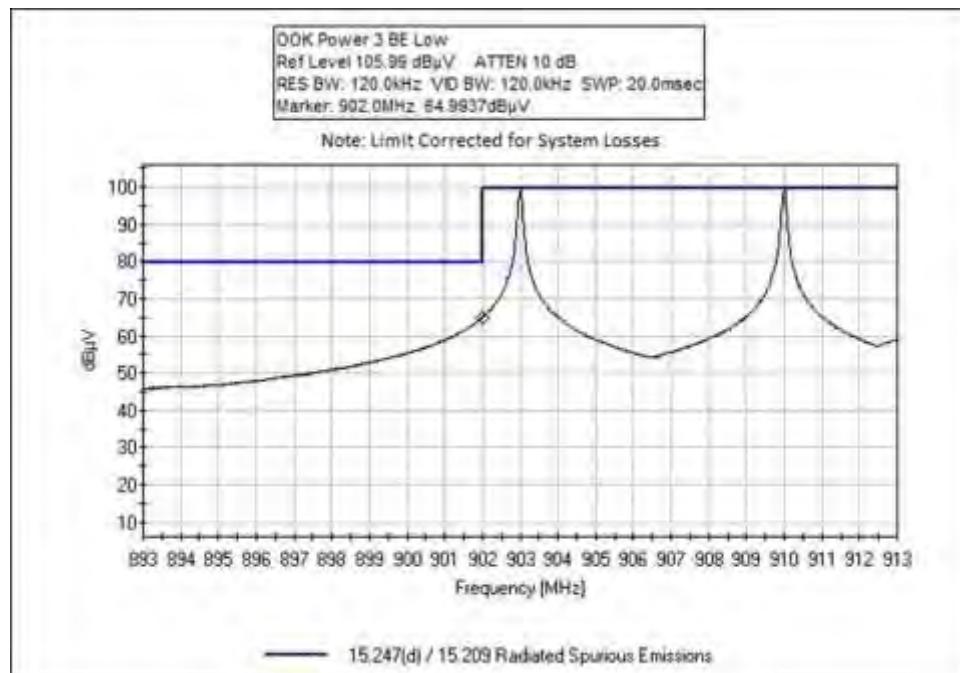
Band Edge Plots

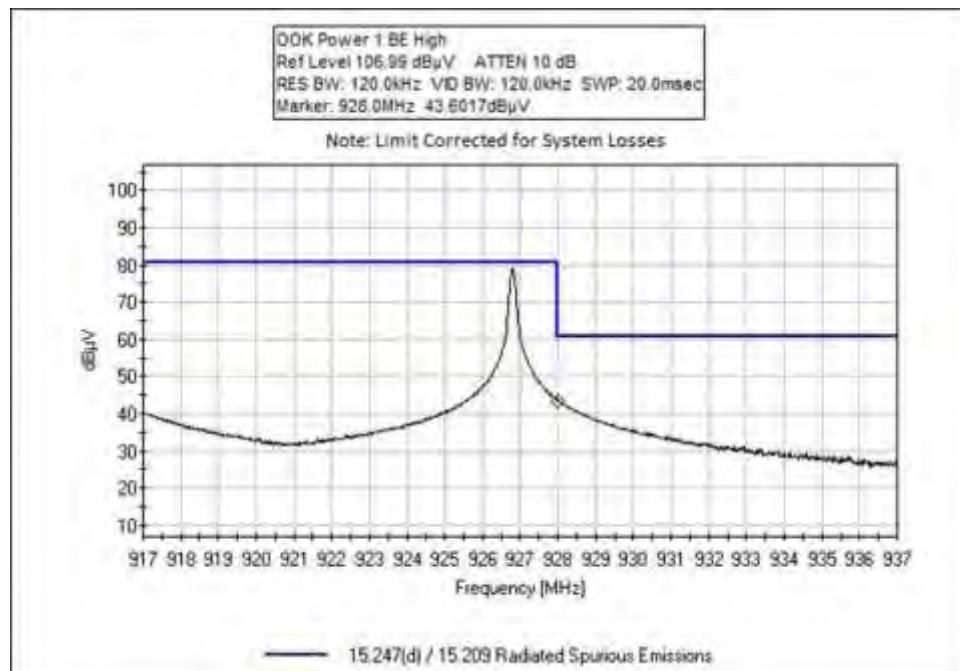
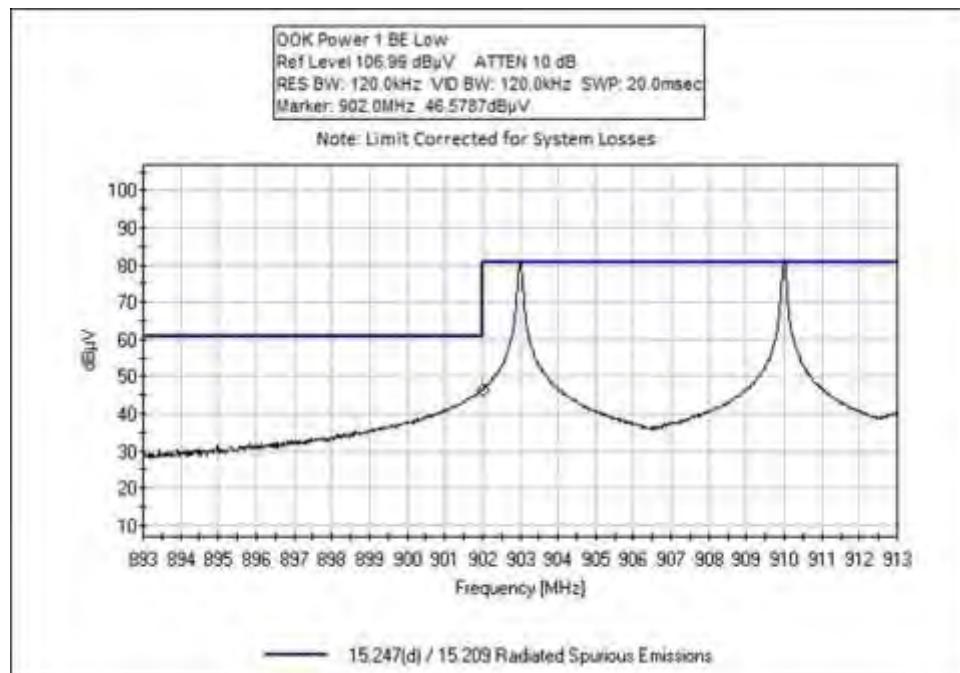
Configuration 1



Configuration 2



Configuration 3


Configuration 4


Test Setup Photos



Below 1GHz



Above 1 GHz

APPENDIX A: CUSTOMER PROVIDED INFORMATION

15.35(c) Duty Cycle Correction Factor

Applies to OOK Power Level 1 Only

Test Data Summary			
Antenna Port	Operational Mode	Measured On Time (mS / P _{obs})	Calculated DCCF (dB)
Integral	OOK Power Level 1	12.2	18.2

Observation Period, P_{obs} is the duration of the pulse train or maximum 100mS

Measured results are calculated as follows:

$$On\ Time = \left(\sum_{Bursts} RF\ Burst\ On\ Time + \sum_{Control} Control\ Signal\ On\ time \right) \Big|_{P_{obs} \text{ (max 100ms)}}$$

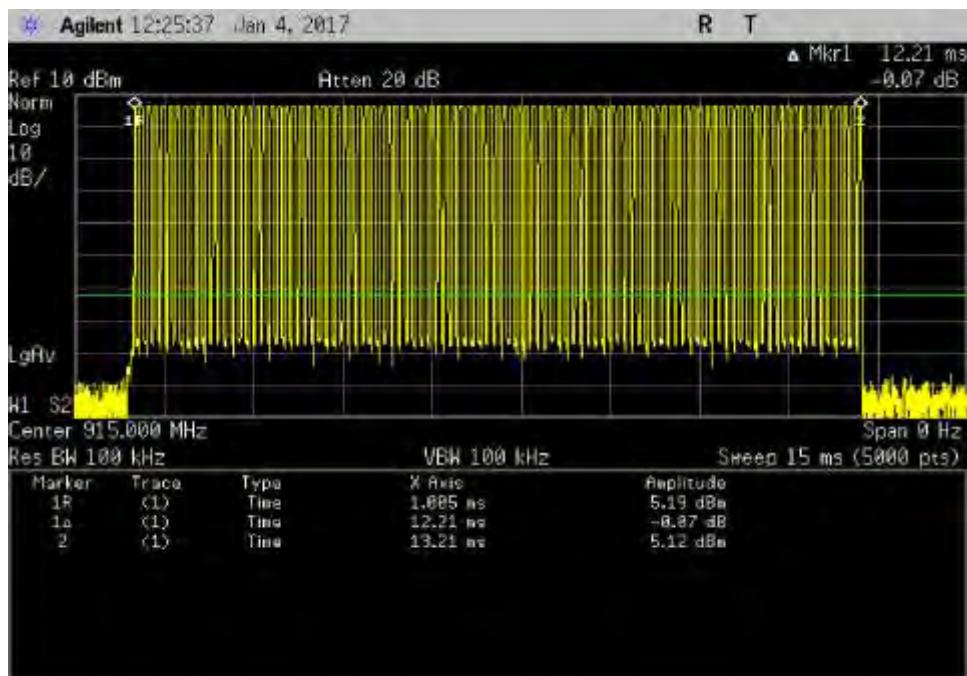
Measured Values:

Parameter	Value
Observation Period (P _{obs}):	100
Number of RF Bursts / P _{obs} :	1
On time of RF Burst:	12.2
Number of Control or other signals / P _{obs} :	0
On time of Control or other Signals:	0
Total Measured On Time:	12.2

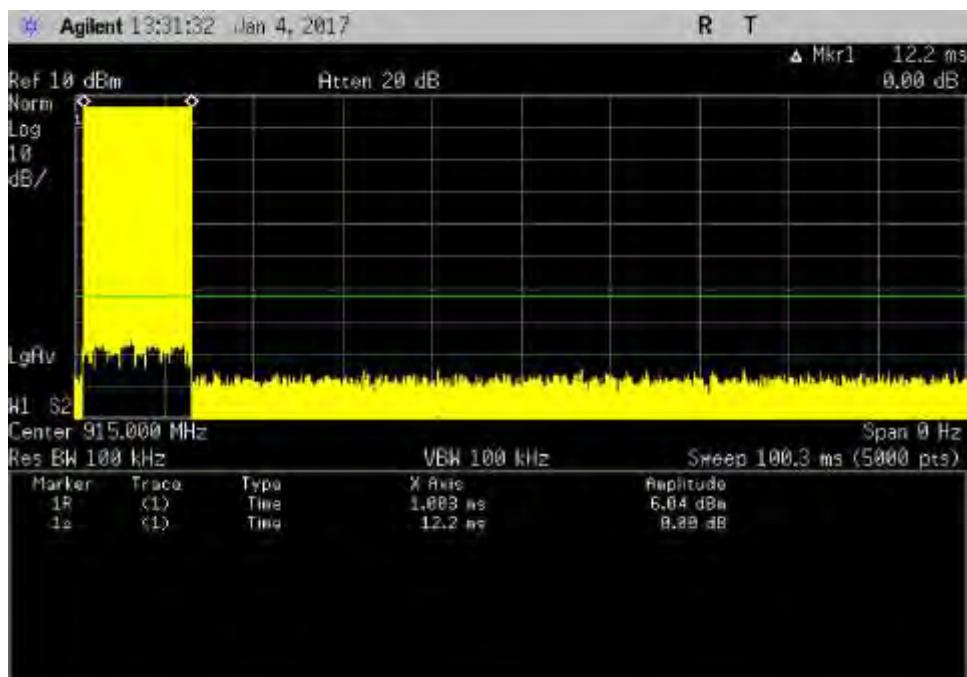
Duty Cycle Correction Factor (DCCF) is calculated in accordance with ANSI C63.10:

$$DCCF = 20 \cdot \log \left(\frac{On\ Time}{P_{obs}} \right)$$

Plots



DCCF Zoom In



DCCF Zoom Out

SUPPLEMENTAL INFORMATION

Measurement Uncertainty

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

Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of $k=2$. Compliance is deemed to occur provided measurements are below the specified limits.

Emissions Test Details

TESTING PARAMETERS

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

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

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

CORRECTION FACTORS

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

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

TEST INSTRUMENTATION AND ANALYZER SETTINGS

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

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

SPECTRUM ANALYZER/RECEIVER DETECTOR FUNCTIONS

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

Peak

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

Quasi-Peak

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

Average

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