Itron, Inc.

ADDENDUM TEST REPORT TO 99315-4

Gas Endpoint
Model: 500GA

Tested To The Following Standards:

FCC Part 15 Subpart C Section(s)

15.247
(FHSS 902-928 MHz)

Report No.: 99315-4A

Date of issue: March 27, 2017

ACCREDITED
Testing Certificates:
803.01, 803.02, 803.05, 803.06

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.

TABLE OF CONTENTS

ADMINISTRATIVE INFORMATION

Test Report Information

REPORT PREPARED FOR:

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

Representative: Jay Holcomb
Customer Reference Number: 110651

REPORT PREPARED BY:

Joyce Walker
CKC Laboratories, Inc.
5046 Sierra Pines Drive
Mariposa, CA 95338

Project Number: 99315

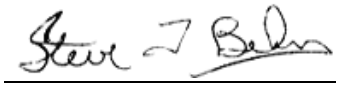
DATE OF EQUIPMENT RECEIPT: December 7, 2016
DATE(S) OF TESTING: December 7-16, 2016 and January 31, 2017

Revision History

Original: Testing of the Gas Endpoint, Model: 500GA to FCC Part 15 Subpart C Section 15.247.
Addendum A: To correct antenna gain numbers throughout the report.

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.	500GA	0100001729

Support Equipment:

Device	Manufacturer	Model #	S/N
None			

Configuration 2

Equipment Tested:

Device	Manufacturer	Model #	S/N
Gas Endpoint	Itron, Inc.	500GA	0100001738

Support Equipment:

Device	Manufacturer	Model #	S/N
None			

Configuration 3

Equipment Tested:

Device	Manufacturer	Model #	S/N
Gas Endpoint	Itron, Inc.	500GA	0100001737

Support Equipment:

Device	Manufacturer	Model #	S/N
None			

Configuration 4

Equipment Tested:

Device	Manufacturer	Model #	S/N
Gas Endpoint	Itron, Inc.	500GA	0100001736

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 #: **99315** Date: 12/16/2016
Test Type: **Maximized Emissions** Time: 19:49:09
Tested By: Steven Pittsford Sequence#: 9
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:

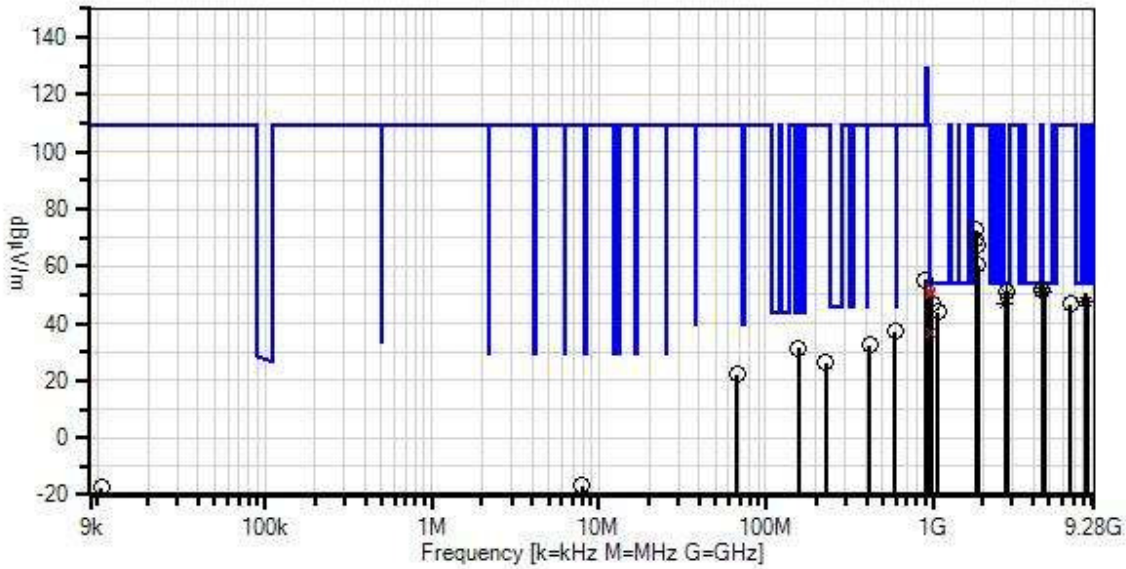
Temperature: 20-22ºC
Relative Humidity: 21-35%

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: 8.02 dBi
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 as worst case based on X, Y, Z investigation as well as previous engineering data.
Hopping operation selected as worst case based on previously collected data.

Itron, Inc. WO#: 99315 Sequence#: 9 Date: 12/16/2016
15.247(d) / 15.209 Radiated Spurious Emissions Test Distance: 3 Meters Perp



Readings
QP Readings
Ambient
1 - 15.247(d) / 15.209 Radiated Spurious Emissions
Peak Readings
Average Readings
Software Version: 5.03.02

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN02673	Spectrum Analyzer	E4446A	10/12/2015	10/12/2017
T2	AN03170	High Pass Filter	HM1155-11SS	12/17/2015	12/17/2017
T3	ANP06540	Cable	Heliax	10/29/2015	10/29/2017
T4	ANP05305	Cable	ETSI-50T	2/15/2016	2/15/2018
T5	AN03540	Preamp	83017A	4/30/2015	4/30/2017
T6	AN01467	Horn Antenna-ANSI C63.5 Calibration	3115	8/12/2015	8/12/2017
T7	ANP06935	Cable	32026-29801-29801-18	3/11/2016	3/11/2018
T8	AN02871	Spectrum Analyzer	E4440A	8/25/2015	8/25/2017
T9	ANP05963	Cable	RG-214	2/15/2016	2/15/2018
T10	ANP05360	Cable	RG214	11/30/2016	11/30/2018
T11	AN01816	Log Periodic Antenna-ANSI 63.5	3146	1/8/2016	1/8/2018
T12	AN02372	Bicon Antenna-ANSI 63.5	3104C	5/27/2015	5/27/2017
T13	AN00052	Loop Antenna	6502	4/8/2016	4/8/2018

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

#	Freq	Rdng	T1 T5 T9 T13	T2 T6 T10	T3 T7 T11	T4 T8 T12	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant
1	4511.987M Ave	47.8	+0.0 -34.1 +0.0 +0.0	+0.4 +32.5 +0.0	+0.9 +0.5 +0.0	+4.2 +0.0 +0.0	+0.0	52.2	54.0	-1.8	Horiz
2	980.400M QP	23.1	+0.0 +0.0 +2.5 +0.0	+0.0 +0.0 +2.2	+0.4 +0.0 +24.0	+0.0 +0.0 +0.0	+0.0	52.2	54.0	-1.8	Horiz
^	980.400M	23.7	+0.0 +0.0 +2.5 +0.0	+0.0 +0.0 +2.2	+0.4 +0.0 +24.0	+0.0 +0.0 +0.0	+0.0	52.8	54.0	-1.2	Horiz
4	4511.800M	47.6	+0.0 -34.1 +0.0 +0.0	+0.4 +32.5 +0.0	+0.9 +0.5 +0.0	+4.2 +0.0 +0.0	+0.0	52.0	54.0	-2.0	Horiz
5	4550.167M Ave	46.9	+0.0 -34.1 +0.0 +0.0	+0.3 +32.5 +0.0	+0.9 +0.5 +0.0	+4.2 +0.0 +0.0	+0.0	51.2	54.0	-2.8	Horiz
^	4550.100M	48.4	+0.0 -34.1 +0.0 +0.0	+0.3 +32.5 +0.0	+0.9 +0.5 +0.0	+4.2 +0.0 +0.0	+0.0	52.7	54.0	-1.3	Horiz

7	979.600M QP	22.0	+0.0 +0.0 +2.5 +0.0	+0.0 +0.0 +2.2	+0.4 +0.0 +24.0	+0.0 +0.0 +0.0	+0.0	51.1	54.0	-2.9	Horiz
^	979.600M	22.7	+0.0 +0.0 +2.5 +0.0	+0.0 +0.0 +2.2	+0.4 +0.0 +24.0	+0.0 +0.0 +0.0	+0.0	51.8	54.0	-2.2	Horiz
9	4637.977M Ave	46.4	+0.0 -34.1 +0.0 +0.0	+0.5 +32.6 +0.0	+0.9 +0.5 +0.0	+4.3 +0.0 +0.0	+0.0	51.1	54.0	-2.9	Horiz
^	4638.010M	47.4	+0.0 -34.1 +0.0 +0.0	+0.5 +32.6 +0.0	+0.9 +0.5 +0.0	+4.3 +0.0 +0.0	+0.0	52.1	54.0	-1.9	Horiz
11	4576.089M Ave	46.6	+0.0 -34.1 +0.0 +0.0	+0.4 +32.5 +0.0	+0.9 +0.5 +0.0	+4.2 +0.0 +0.0	+0.0	51.0	54.0	-3.0	Horiz
^	4576.000M	48.8	+0.0 -34.1 +0.0 +0.0	+0.4 +32.5 +0.0	+0.9 +0.5 +0.0	+4.2 +0.0 +0.0	+0.0	53.2	54.0	-0.8	Horiz
13	962.016M QP	22.6	+0.0 +0.0 +2.5 +0.0	+0.0 +0.0 +2.2	+0.4 +0.0 +23.0	+0.0 +0.0 +0.0	+0.0	50.7	54.0	-3.3	Horiz
^	962.000M	22.6	+0.0 +0.0 +2.5 +0.0	+0.0 +0.0 +2.2	+0.4 +0.0 +23.0	+0.0 +0.0 +0.0	+0.0	50.7	54.0	-3.3	Horiz
15	2745.600M	51.9	+0.0 -34.5 +0.0 +0.0	+0.4 +28.8 +0.0	+0.7 +0.4 +0.0	+3.0 +0.0 +0.0	+0.0	50.7	54.0	-3.3	Horiz
16	967.195M QP	22.0	+0.0 +0.0 +2.5 +0.0	+0.0 +0.0 +2.2	+0.4 +0.0 +23.3	+0.0 +0.0 +0.0	+0.0	50.4	54.0	-3.6	Horiz
^	967.100M	22.0	+0.0 +0.0 +2.5 +0.0	+0.0 +0.0 +2.2	+0.4 +0.0 +23.3	+0.0 +0.0 +0.0	+0.0	50.4	54.0	-3.6	Horiz

18	2745.470M Ave	51.3	+0.0 -34.5 +0.0 +0.0	+0.4 +28.8 +0.0	+0.7 +0.4 +0.0	+3.0 +0.0 +0.0	+0.0	50.1	54.0	-3.9	Horiz
19	2782.849M Ave	51.1	+0.0 -34.5 +0.0 +0.0	+0.4 +28.9 +0.0	+0.7 +0.4 +0.0	+3.0 +0.0 +0.0	+0.0	50.0	54.0	-4.0	Horiz
^	2782.800M	51.7	+0.0 -34.5 +0.0 +0.0	+0.4 +28.9 +0.0	+0.7 +0.4 +0.0	+3.0 +0.0 +0.0	+0.0	50.6	54.0	-3.4	Horiz
21	8352.000M Ave	38.2	+0.0 -35.0 +0.0 +0.0	+0.3 +36.6 +0.0	+1.5 +0.7 +0.0	+5.4 +0.0 +0.0	+0.0	47.7	54.0	-6.3	Horiz
^	8352.000M	39.3	+0.0 -35.0 +0.0 +0.0	+0.3 +36.6 +0.0	+1.5 +0.7 +0.0	+5.4 +0.0 +0.0	+0.0	48.8	54.0	-5.2	Horiz
23	8192.000M Ave	38.1	+0.0 -35.1 +0.0 +0.0	+0.3 +36.7 +0.0	+1.3 +0.7 +0.0	+5.3 +0.0 +0.0	+0.0	47.3	54.0	-6.7	Horiz
^	8192.000M	39.3	+0.0 -35.1 +0.0 +0.0	+0.3 +36.7 +0.0	+1.3 +0.7 +0.0	+5.3 +0.0 +0.0	+0.0	48.5	54.0	-5.5	Horiz
25	995.300M	17.2	+0.0 +0.0 +2.5 +0.0	+0.0 +0.0 +2.3	+0.4 +0.0 +24.6	+0.0 +0.0 +0.0	+0.0	47.0	54.0	-7.0	Horiz
26	2707.204M Ave	48.2	+0.0 -34.5 +0.0 +0.0	+0.5 +28.6 +0.0	+0.7 +0.4 +0.0	+3.0 +0.0 +0.0	+0.0	46.9	54.0	-7.1	Horiz
^	2707.204M	48.7	+0.0 -34.5 +0.0 +0.0	+0.5 +28.6 +0.0	+0.7 +0.4 +0.0	+3.0 +0.0 +0.0	+0.0	47.4	54.0	-6.6	Horiz
28	2730.000M Ave	48.0	+0.0 -34.5 +0.0 +0.0	+0.5 +28.7 +0.0	+0.7 +0.4 +0.0	+3.0 +0.0 +0.0	+0.0	46.8	54.0	-7.2	Horiz
^	2730.000M	48.6	+0.0 -34.5 +0.0 +0.0	+0.5 +28.7 +0.0	+0.7 +0.4 +0.0	+3.0 +0.0 +0.0	+0.0	47.4	54.0	-6.6	Horiz
30	1075.000M	46.4	+0.0 -37.2 +0.0 +0.0	+8.2 +24.2 +0.0	+0.4 +0.2 +0.0	+1.9 +0.0 +0.0	+0.0	44.1	54.0	-9.9	Horiz

31	974.200M QP	8.1	+0.0 +0.0 +2.5 +0.0	+0.0 +0.0 +2.2	+0.4 +0.0 +23.7	+0.0 +0.0 +0.0	+0.0	36.9	54.0	-17.1	Horiz
^	974.200M	23.1	+0.0 +0.0 +2.5 +0.0	+0.0 +0.0 +2.2	+0.4 +0.0 +23.7	+0.0 +0.0 +0.0	+0.0	51.9	54.0	-2.1	Horiz
33	1804.500M	77.1	+0.0 -35.1 +0.0 +0.0	+0.4 +26.8 +0.0	+0.5 +0.3 +0.0	+2.5 +0.0 +0.0	+0.0	72.5	109.5	-37.0	Horiz
34	1820.000M	73.9	+0.0 -35.1 +0.0 +0.0	+0.4 +26.9 +0.0	+0.5 +0.3 +0.0	+2.5 +0.0 +0.0	+0.0	69.4	109.5	-40.1	Horiz
35	1830.500M	71.6	+0.0 -35.1 +0.0 +0.0	+0.4 +26.9 +0.0	+0.5 +0.3 +0.0	+2.5 +0.0 +0.0	+0.0	67.1	109.5	-42.4	Horiz
36	1855.000M	65.0	+0.0 -35.1 +0.0 +0.0	+0.3 +27.0 +0.0	+0.5 +0.3 +0.0	+2.5 +0.0 +0.0	+0.0	60.5	109.5	-49.0	Horiz
37	897.200M	27.8	+0.0 +0.0 +2.4 +0.0	+0.0 +0.0 +2.1	+0.3 +0.0 +22.6	+0.0 +0.0 +0.0	+0.0	55.2	109.5	-54.3	Horiz
38	6679.000M	39.9	+0.0 -34.2 +0.0 +0.0	+0.2 +34.6 +0.0	+1.2 +0.6 +0.0	+4.5 +0.0 +0.0	+0.0	46.8	109.5	-62.7	Horiz
39	593.400M	14.9	+0.0 +0.0 +2.1 +0.0	+0.0 +0.0 +1.6	+0.3 +0.0 +18.1	+0.0 +0.0 +0.0	+0.0	37.0	109.5	-72.5	Horiz

40	416.300M	13.6	+0.0 +0.0 +1.8 +0.0	+0.0 +0.0 +1.3	+0.3 +0.0 +15.4	+0.0 +0.0 +0.0	+0.0	32.4	109.5	-77.1	Horiz
41	157.160M	14.5	+0.0 +0.0 +1.4 +0.0	+0.0 +0.0 +0.7	+0.2 +0.0 +0.0	+0.0 +0.0 +14.6	+0.0	31.4	109.5	-78.1	Horiz
42	228.700M	13.3	+0.0 +0.0 +1.4 +0.0	+0.0 +0.0 +0.9	+0.2 +0.0 +10.5	+0.0 +0.0 +0.0	+0.0	26.3	109.5	-83.2	Horiz
43	67.570M	11.2	+0.0 +0.0 +0.7 +0.0	+0.0 +0.0 +0.5	+0.1 +0.0 +0.0	+0.0 +0.0 +9.6	+0.0	22.1	109.5	-87.4	Horiz
44	7.927M	13.9	+0.0 +0.0 +0.0 +9.3	+0.0 +0.0 +0.0	+0.0 +0.0 +0.0	+0.2 +0.0 +0.0	-40.0	-16.6	109.5	-126.1	Perp
45	10.470k	45.4	+0.0 +0.0 +0.0 +17.2	+0.0 +0.0 +0.0	+0.0 +0.0 +0.0	+0.0 +0.0 +0.0	-80.0	-17.4	109.5	-126.9	Perp

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 #:	**99315**	Date:	12/16/2016
Test Type:	**Maximized Emissions**	Time:	19:49:27
Tested By:	Michael Atkinson	Sequence#:	11
Software:	EMITest 5.03.02		

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 2			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 2			

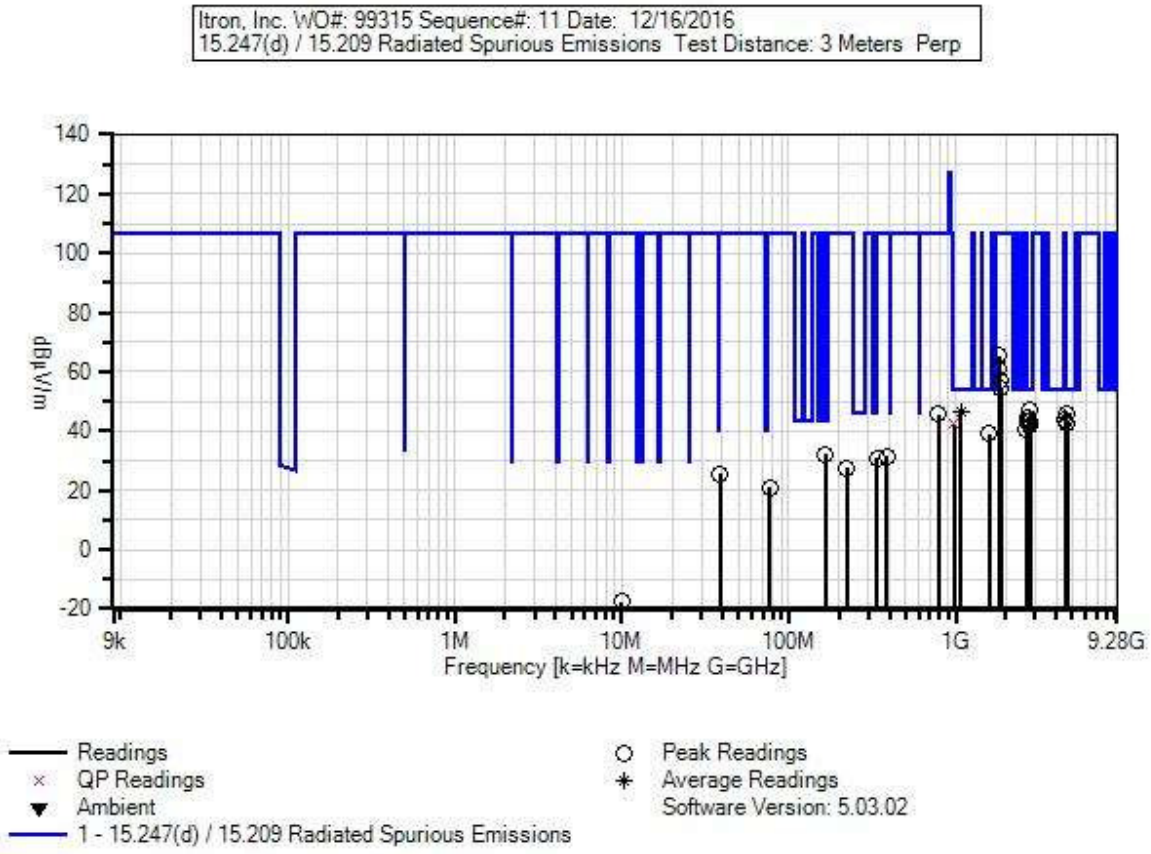
Test Conditions / Notes:

Temperature: 20-22ºC
Relative Humidity: 21-35%

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: 8.02 dBi
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 as worst case based on X, Y, Z investigation as well as previous engineering data.
Hopping operation selected as worst case based on previously collected data.


Itron, Inc. WO#: 99315 Sequence#: 11 Date: 12/16/2016
15.247(d) / 15.209 Radiated Spurious Emissions Test Distance: 3 Meters Perp
140
120
100
80
60
40
20
0
-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: 5.03.02

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN02673	Spectrum Analyzer	E4446A	10/12/2015	10/12/2017
T2	AN03170	High Pass Filter	HM1155-11SS	12/17/2015	12/17/2017
T3	ANP06540	Cable	Heliax	10/29/2015	10/29/2017
T4	ANP05305	Cable	ETSI-50T	2/15/2016	2/15/2018
T5	AN03540	Preamp	83017A	4/30/2015	4/30/2017
T6	AN01467	Horn Antenna-ANSI C63.5 Calibration	3115	8/12/2015	8/12/2017
T7	ANP06935	Cable	32026-29801-29801-18	3/11/2016	3/11/2018
T8	AN02871	Spectrum Analyzer	E4440A	8/25/2015	8/25/2017
T9	ANP05963	Cable	RG-214	2/15/2016	2/15/2018
T10	ANP05360	Cable	RG214	11/30/2016	11/30/2018
T11	AN01816	Log Periodic Antenna-ANSI 63.5	3146	1/8/2016	1/8/2018
T12	AN02372	Bicon Antenna-ANSI 63.5	3104C	5/27/2015	5/27/2017
T13	AN00052	Loop Antenna	6502	4/8/2016	4/8/2018

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

#	Freq	Rdng	T1 T5 T9 T13	T2 T6 T10	T3 T7 T11	T4 T8 T12	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant
1	2782.000M	48.2	+0.0 -34.5 +0.0 +0.0	+0.4 +28.9 +0.0	+0.7 +0.4 +0.0	+3.0 +0.0 +0.0	+0.0	47.1	54.0	-6.9	Horiz
2	1072.152M Ave	48.1	+0.0 -37.2 +0.0 +0.0	+8.8 +24.2 +0.0	+0.4 +0.2 +0.0	+1.9 +0.0 +0.0	+0.0	46.4	54.0	-7.6	Horiz
^	1072.152M	56.1	+0.0 -37.2 +0.0 +0.0	+8.8 +24.2 +0.0	+0.4 +0.2 +0.0	+1.9 +0.0 +0.0	+0.0	54.4	54.0	+0.4	Horiz
4	4576.000M	41.6	+0.0 -34.1 +0.0 +0.0	+0.4 +32.5 +0.0	+0.9 +0.5 +0.0	+4.2 +0.0 +0.0	+0.0	46.0	54.0	-8.0	Horiz
5	4515.041M Ave	40.1	+0.0 -34.1 +0.0 +0.0	+0.4 +32.5 +0.0	+0.9 +0.5 +0.0	+4.2 +0.0 +0.0	+0.0	44.5	54.0	-9.5	Horiz

^	4515.041M	44.1	+0.0 -34.1 +0.0 +0.0	+0.4 +32.5 +0.0	+0.9 +0.5 +0.0	+4.2 +0.0 +0.0	+0.0	48.5	54.0	-5.5	Horiz
7	2728.000M	45.5	+0.0 -34.5 +0.0 +0.0	+0.5 +28.7 +0.0	+0.7 +0.4 +0.0	+3.0 +0.0 +0.0	+0.0	44.3	54.0	-9.7	Horiz
8	4550.000M	39.6	+0.0 -34.1 +0.0 +0.0	+0.3 +32.5 +0.0	+0.9 +0.5 +0.0	+4.2 +0.0 +0.0	+0.0	43.9	54.0	-10.1	Horiz
9	2744.000M	44.6	+0.0 -34.5 +0.0 +0.0	+0.4 +28.8 +0.0	+0.7 +0.4 +0.0	+3.0 +0.0 +0.0	+0.0	43.4	54.0	-10.6	Horiz
10	2708.000M	44.2	+0.0 -34.5 +0.0 +0.0	+0.5 +28.6 +0.0	+0.7 +0.4 +0.0	+3.0 +0.0 +0.0	+0.0	42.9	54.0	-11.1	Horiz
11	4633.700M	38.0	+0.0 -34.1 +0.0 +0.0	+0.5 +32.6 +0.0	+0.9 +0.5 +0.0	+4.3 +0.0 +0.0	+0.0	42.7	54.0	-11.3	Horiz
12	165.490M	14.2	+0.0 +0.0 +1.4 +0.0	+0.0 +0.0 +0.8	+0.2 +0.0 +0.0	+0.0 +0.0 +15.6	+0.0	32.2	43.5	-11.3	Horiz
13	974.600M QP	13.6	+0.0 +0.0 +2.5 +0.0	+0.0 +0.0 +2.2	+0.4 +0.0 +23.8	+0.0 +0.0 +0.0	+0.0	42.5	54.0	-11.5	Horiz
^	974.600M	23.9	+0.0 +0.0 +2.5 +0.0	+0.0 +0.0 +2.2	+0.4 +0.0 +23.8	+0.0 +0.0 +0.0	+0.0	52.8	54.0	-1.2	Horiz
15	2732.000M	42.9	+0.0 -34.5 +0.0 +0.0	+0.5 +28.7 +0.0	+0.7 +0.4 +0.0	+3.0 +0.0 +0.0	+0.0	41.7	54.0	-12.3	Horiz
16	1576.000M	45.1	+0.0 -35.4 +0.0 +0.0	+0.5 +25.7 +0.0	+0.5 +0.3 +0.0	+2.3 +0.0 +0.0	+0.0	39.0	54.0	-15.0	Horiz
17	1806.000M	70.0	+0.0 -35.1 +0.0 +0.0	+0.4 +26.8 +0.0	+0.5 +0.3 +0.0	+2.5 +0.0 +0.0	+0.0	65.4	107.0	-41.6	Horiz
18	1820.000M	65.4	+0.0 -35.1 +0.0 +0.0	+0.4 +26.9 +0.0	+0.5 +0.3 +0.0	+2.5 +0.0 +0.0	+0.0	60.9	107.0	-46.1	Horiz

19	1830.000M	61.5	+0.0 -35.1 +0.0 +0.0	+0.4 +26.9 +0.0	+0.5 +0.3 +0.0	+2.5 +0.0 +0.0	+0.0	57.0	107.0	-50.0	Horiz
20	1853.500M	58.6	+0.0 -35.1 +0.0 +0.0	+0.3 +27.0 +0.0	+0.5 +0.3 +0.0	+2.5 +0.0 +0.0	+0.0	54.1	107.0	-52.9	Horiz
21	791.600M	20.3	+0.0 +0.0 +2.3 +0.0	+0.0 +0.0 +1.9	+0.3 +0.0 +20.7	+0.0 +0.0 +0.0	+0.0	45.5	107.0	-61.5	Horiz
22	2628.000M	42.1	+0.0 -34.5 +0.0 +0.0	+0.3 +28.3 +0.0	+0.7 +0.4 +0.0	+3.0 +0.0 +0.0	+0.0	40.3	107.0	-66.7	Horiz
23	387.600M	13.8	+0.0 +0.0 +1.8 +0.0	+0.0 +0.0 +1.2	+0.3 +0.0 +14.4	+0.0 +0.0 +0.0	+0.0	31.5	107.0	-75.5	Horiz
24	336.200M	13.8	+0.0 +0.0 +1.7 +0.0	+0.0 +0.0 +1.1	+0.2 +0.0 +13.9	+0.0 +0.0 +0.0	+0.0	30.7	107.0	-76.3	Horiz
25	222.400M	14.5	+0.0 +0.0 +1.4 +0.0	+0.0 +0.0 +0.9	+0.2 +0.0 +10.4	+0.0 +0.0 +0.0	+0.0	27.4	107.0	-79.6	Horiz
26	39.010M	13.2	+0.0 +0.0 +0.5 +0.0	+0.0 +0.0 +0.3	+0.1 +0.0 +0.0	+0.0 +0.0 +11.4	+0.0	25.5	107.0	-81.5	Horiz
27	77.260M	12.6	+0.0 +0.0 +0.8 +0.0	+0.0 +0.0 +0.5	+0.1 +0.0 +0.0	+0.0 +0.0 +7.0	+0.0	21.0	107.0	-86.0	Horiz
28	9.996M	13.1	+0.0 +0.0 +0.0 +9.2	+0.0 +0.0 +0.0	+0.0 +0.0 +0.0	+0.2 +0.0 +0.0	-40.0	-17.5	107.0	-124.5	Perp
29	17.470k	44.6	+0.0 +0.0 +0.0 +14.5	+0.0 +0.0 +0.0	+0.0 +0.0 +0.0	+0.0 +0.0 +0.0	-80.0	-20.9	107.0	-127.9	Perp

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 #:	**99315**	Date:	12/16/2016
Test Type:	**Maximized Emissions**	Time:	19:49:02
Tested By:	Michael Atkinson	Sequence#:	12
Software:	EMITest 5.03.02		

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 3			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 3			

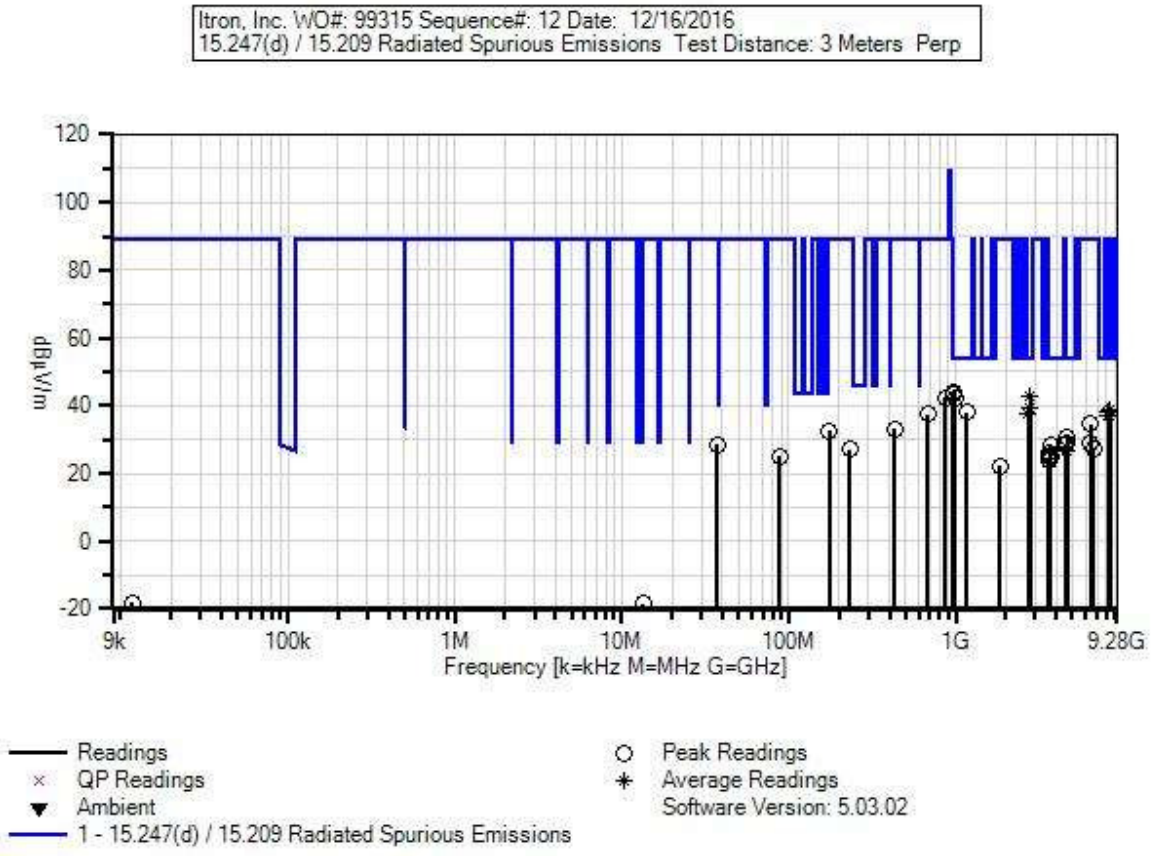
Test Conditions / Notes:

Temperature: 20-22ºC
Relative Humidity: 21-35%

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: 7.19 dBi
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 as worst case based on X, Y, Z investigation as well as previous engineering data.
Hopping operation selected as worst case based on previously collected data.


Itron, Inc. WO#: 99315 Sequence#: 12 Date: 12/16/2016
15.247(d) / 15.209 Radiated Spurious Emissions Test Distance: 3 Meters Perp
120
100
80
60
40
20
0
-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: 5.03.02

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN02673	Spectrum Analyzer	E4446A	10/12/2015	10/12/2017
T1	AN03170	High Pass Filter	HM1155-11SS	12/17/2015	12/17/2017
T2	ANP06540	Cable	Heliax	10/29/2015	10/29/2017
T3	ANP05305	Cable	ETSI-50T	2/15/2016	2/15/2018
T4	AN03540	Preamp	83017A	4/30/2015	4/30/2017
T5	AN01467	Horn Antenna-ANSI C63.5 Calibration	3115	8/12/2015	8/12/2017
T6	ANP06935	Cable	32026-29801-29801-18	3/11/2016	3/11/2018
T7	AN02871	Spectrum Analyzer	E4440A	8/25/2015	8/25/2017
T8	ANP05963	Cable	RG-214	2/15/2016	2/15/2018
T9	ANP05360	Cable	RG214	11/30/2016	11/30/2018
T10	AN01816	Log Periodic Antenna-ANSI 63.5	3146	1/8/2016	1/8/2018
T11	AN02372	Bicon Antenna-ANSI 63.5	3104C	5/27/2015	5/27/2017
T12	AN00052	Loop Antenna	6502	4/8/2016	4/8/2018
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 T5 T9 T13	T2 T6 T10	T3 T7 T11	T4 T8 T12	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant
1	972.500M	15.5	+0.0 +0.0 +2.2 +0.0	+0.4 +0.0 +23.6	+0.0 +0.0 +0.0	+0.0 +2.5 +0.0	+0.0	44.2	54.0	-9.8	Horiz
2	965.000M	15.2	+0.0 +0.0 +2.2 +0.0	+0.4 +0.0 +23.2	+0.0 +0.0 +0.0	+0.0 +2.5 +0.0	+0.0	43.5	54.0	-10.5	Horiz
3	975.000M	14.3	+0.0 +0.0 +2.2 +0.0	+0.4 +0.0 +23.8	+0.0 +0.0 +0.0	+0.0 +2.5 +0.0	+0.0	43.2	54.0	-10.8	Horiz
4	2780.450M Ave	62.3	+0.4 +28.9 +0.0 -18.2	+0.7 +0.4 +0.0	+3.0 +0.0 +0.0	-34.5 +0.0 +0.0	+0.0	43.0	54.0	-11.0	Horiz
^	2780.450M	64.2	+0.4 +28.9 +0.0 -18.2	+0.7 +0.4 +0.0	+3.0 +0.0 +0.0	-34.5 +0.0 +0.0	+0.0	44.9	54.0	-9.1	Horiz

6	987.300M	13.1	+0.0 +0.0 +2.2 +0.0	+0.4 +0.0 +24.3	+0.0 +0.0 +0.0	+0.0 +2.5 +0.0	+0.0	42.5	54.0	-11.5	Horiz
7	2745.030M Ave	58.5	+0.4 +28.8 +0.0 -18.2	+0.7 +0.4 +0.0	+3.0 +0.0 +0.0	-34.5 +0.0 +0.0	+0.0	39.1	54.0	-14.9	Horiz
^	2745.000M	60.4	+0.4 +28.8 +0.0 -18.2	+0.7 +0.4 +0.0	+3.0 +0.0 +0.0	-34.5 +0.0 +0.0	+0.0	41.0	54.0	-13.0	Horiz
9	8340.939M Ave	47.6	+0.3 +36.6 +0.0 -18.2	+1.4 +0.7 +0.0	+5.4 +0.0 +0.0	-35.0 +0.0 +0.0	+0.0	38.8	54.0	-15.2	Horiz
^	8341.000M	50.0	+0.3 +36.6 +0.0 -18.2	+1.4 +0.7 +0.0	+5.4 +0.0 +0.0	-35.0 +0.0 +0.0	+0.0	41.2	54.0	-12.8	Horiz
11	1165.000M	46.6	+1.3 +24.2 +0.0 +0.0	+0.4 +0.3 +0.0	+2.0 +0.0 +0.0	-36.7 +0.0 +0.0	+0.0	38.1	54.0	-15.9	Horiz
12	8190.000M Ave	47.1	+0.3 +36.7 +0.0 -18.2	+1.3 +0.7 +0.0	+5.3 +0.0 +0.0	-35.1 +0.0 +0.0	+0.0	38.1	54.0	-15.9	Horiz
^	8190.000M	48.4	+0.3 +36.7 +0.0 -18.2	+1.3 +0.7 +0.0	+5.3 +0.0 +0.0	-35.1 +0.0 +0.0	+0.0	39.4	54.0	-14.6	Horiz
14	2709.017M Ave	57.3	+0.5 +28.6 +0.0 -18.2	+0.7 +0.4 +0.0	+3.0 +0.0 +0.0	-34.5 +0.0 +0.0	+0.0	37.8	54.0	-16.2	Horiz
^	2709.017M	59.5	+0.5 +28.6 +0.0 -18.2	+0.7 +0.4 +0.0	+3.0 +0.0 +0.0	-34.5 +0.0 +0.0	+0.0	40.0	54.0	-14.0	Horiz
16	2728.000M Ave	57.1	+0.5 +28.7 +0.0 -18.2	+0.7 +0.4 +0.0	+3.0 +0.0 +0.0	-34.5 +0.0 +0.0	+0.0	37.7	54.0	-16.3	Horiz
^	2728.000M	58.1	+0.5 +28.7 +0.0 -18.2	+0.7 +0.4 +0.0	+3.0 +0.0 +0.0	-34.5 +0.0 +0.0	+0.0	38.7	54.0	-15.3	Horiz

18	8235.000M Ave	46.1	+0.3 +36.7 +0.0 -18.2	+1.3 +0.7 +0.0	+5.3 +0.0 +0.0	-35.1 +0.0 +0.0	+0.0	37.1	54.0	-16.9	Horiz
^	8235.000M	47.9	+0.3 +36.7 +0.0 -18.2	+1.3 +0.7 +0.0	+5.3 +0.0 +0.0	-35.1 +0.0 +0.0	+0.0	38.9	54.0	-15.1	Horiz
20	8127.000M Ave	46.0	+0.3 +36.7 +0.0 -18.2	+1.3 +0.7 +0.0	+5.3 +0.0 +0.0	-35.1 +0.0 +0.0	+0.0	37.0	54.0	-17.0	Horiz
^	8127.000M	48.5	+0.3 +36.7 +0.0 -18.2	+1.3 +0.7 +0.0	+5.3 +0.0 +0.0	-35.1 +0.0 +0.0	+0.0	39.5	54.0	-14.5	Horiz
22	4636.000M	44.3	+0.5 +32.6 +0.0 -18.2	+0.9 +0.5 +0.0	+4.3 +0.0 +0.0	-34.1 +0.0 +0.0	+0.0	30.8	54.0	-23.2	Horiz
23	4634.000M	42.4	+0.5 +32.6 +0.0 -18.2	+0.9 +0.5 +0.0	+4.3 +0.0 +0.0	-34.1 +0.0 +0.0	+0.0	28.9	54.0	-25.1	Horiz
24	3709.000M	45.4	+0.3 +30.1 +0.0 -18.2	+0.7 +0.5 +0.0	+3.8 +0.0 +0.0	-34.1 +0.0 +0.0	+0.0	28.5	54.0	-25.5	Horiz
25	4550.000M	42.4	+0.3 +32.5 +0.0 -18.2	+0.9 +0.5 +0.0	+4.2 +0.0 +0.0	-34.1 +0.0 +0.0	+0.0	28.5	54.0	-25.5	Horiz
26	4516.000M	42.1	+0.4 +32.5 +0.0 -18.2	+0.9 +0.5 +0.0	+4.2 +0.0 +0.0	-34.1 +0.0 +0.0	+0.0	28.3	54.0	-25.7	Horiz
27	4576.000M Ave	40.5	+0.4 +32.5 +0.0 -18.2	+0.9 +0.5 +0.0	+4.2 +0.0 +0.0	-34.1 +0.0 +0.0	+0.0	26.7	54.0	-27.3	Horiz
^	4576.000M	44.7	+0.4 +32.5 +0.0 -18.2	+0.9 +0.5 +0.0	+4.2 +0.0 +0.0	-34.1 +0.0 +0.0	+0.0	30.9	54.0	-23.1	Horiz
29	3660.000M	43.5	+0.3 +29.9 +0.0 -18.2	+0.7 +0.5 +0.0	+3.7 +0.0 +0.0	-34.2 +0.0 +0.0	+0.0	26.2	54.0	-27.8	Horiz
30	3706.000M	41.9	+0.3 +30.1 +0.0 -18.2	+0.7 +0.5 +0.0	+3.7 +0.0 +0.0	-34.1 +0.0 +0.0	+0.0	24.9	54.0	-29.1	Horiz

31	3612.000M	42.1	+0.4 +29.8 +0.0 -18.2	+0.8 +0.4 +0.0	+3.6 +0.0 +0.0	-34.2 +0.0 +0.0	+0.0	24.7	54.0	-29.3	Horiz
32	3640.000M	41.1	+0.4 +29.9 +0.0 -18.2	+0.7 +0.5 +0.0	+3.7 +0.0 +0.0	-34.2 +0.0 +0.0	+0.0	23.9	54.0	-30.1	Horiz
33	859.400M	15.8	+0.0 +0.0 +2.0 +0.0	+0.3 +0.0 +22.1	+0.0 +0.0 +0.0	+0.0 +2.3 +0.0	+0.0	42.5	89.3	-46.8	Horiz
34	680.900M	12.9	+0.0 +0.0 +1.7 +0.0	+0.3 +0.0 +20.4	+0.0 +0.0 +0.0	+0.0 +2.1 +0.0	+0.0	37.4	89.3	-51.9	Horiz
35	6373.000M	45.3	+0.3 +34.7 +0.0 -18.2	+1.3 +0.6 +0.0	+4.7 +0.0 +0.0	-34.2 +0.0 +0.0	+0.0	34.5	89.3	-54.8	Horiz
36	6373.000M	45.3	+0.3 +34.7 +0.0 -18.2	+1.3 +0.6 +0.0	+4.7 +0.0 +0.0	-34.2 +0.0 +0.0	+0.0	34.5	89.3	-54.8	Horiz
37	428.900M	14.0	+0.0 +0.0 +1.3 +0.0	+0.3 +0.0 +15.8	+0.0 +0.0 +0.0	+0.0 +1.8 +0.0	+0.0	33.2	89.3	-56.1	Horiz
38	174.840M	13.8	+0.0 +0.0 +0.8 +0.0	+0.2 +0.0 +0.0	+0.0 +0.0 +16.4	+0.0 +1.4 +0.0	+0.0	32.6	89.3	-56.7	Horiz
39	6409.000M	39.8	+0.3 +34.6 +0.0 -18.2	+1.2 +0.6 +0.0	+4.7 +0.0 +0.0	-34.2 +0.0 +0.0	+0.0	28.8	89.3	-60.5	Horiz
40	37.480M	16.2	+0.0 +0.0 +0.3 +0.0	+0.1 +0.0 +0.0	+0.0 +0.0 +11.5	+0.0 +0.5 +0.0	+0.0	28.6	89.3	-60.7	Horiz
41	6688.000M	38.7	+0.2 +34.6 +0.0 -18.2	+1.2 +0.6 +0.0	+4.5 +0.0 +0.0	-34.2 +0.0 +0.0	+0.0	27.4	89.3	-61.9	Horiz
42	230.800M	14.1	+0.0 +0.0 +0.9 +0.0	+0.2 +0.0 +10.6	+0.0 +0.0 +0.0	+0.0 +1.4 +0.0	+0.0	27.2	89.3	-62.1	Horiz
43	88.310M	11.9	+0.0 +0.0 +0.5 +0.0	+0.1 +0.0 +0.0	+0.0 +0.0 +11.8	+0.0 +0.9 +0.0	+0.0	25.2	89.3	-64.1	Horiz

44	1825.000M	44.9	+0.4 +26.9 +0.0 -18.2	+0.5 +0.3 +0.0	+2.5 +0.0 +0.0	-35.1 +0.0 +0.0	+0.0	22.2	89.3	-67.1	Horiz
45	11.770k	45.4	+0.0 +0.0 +0.0 +0.0	+0.0 +0.0 +0.0	+0.0 +0.0 +0.0	+0.0 +0.0 +16.6	-80.0	-18.0	89.3	-107.3	Perp
46	13.445M	12.6	+0.0 +0.0 +0.0 +0.0	+0.0 +0.0 +0.0	+0.2 +0.0 +0.0	+0.0 +0.0 +8.8	-40.0	-18.4	89.3	-107.7	Perp

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 #:	**99315**	Date:	12/16/2016
Test Type:	**Maximized Emissions**	Time:	19:49:20
Tested By:	Michael Atkinson	Sequence#:	10
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:

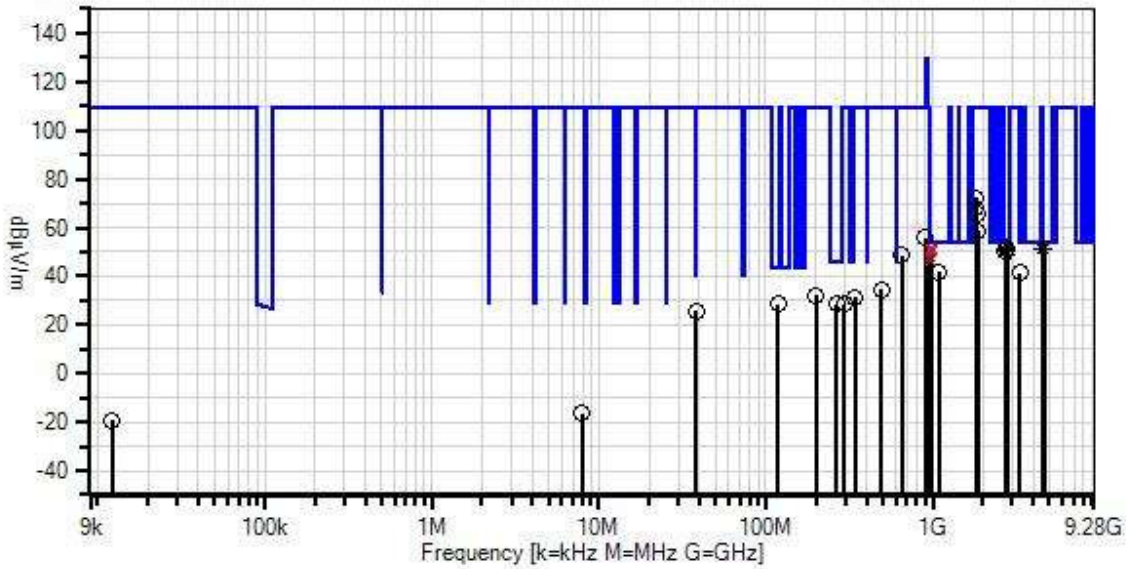
Temperature: 20-22ºC
Relative Humidity: 21-35%

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: 8.02 dBi
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 as worst case based on X, Y, Z investigation as well as previous engineering data.
Hopping operation selected as worst case based on previously collected data.

Itron, Inc. WO#: 99315 Sequence#: 10 Date: 12/16/2016
15.247(d) / 15.209 Radiated Spurious Emissions Test Distance: 3 Meters Perp



Readings
QP Readings
Ambient
1 - 15.247(d) / 15.209 Radiated Spurious Emissions
Peak Readings
Average Readings
Software Version: 5.03.02

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN02673	Spectrum Analyzer	E4446A	10/12/2015	10/12/2017
T2	AN03170	High Pass Filter	HM1155-11SS	12/17/2015	12/17/2017
T3	ANP06540	Cable	Heliax	10/29/2015	10/29/2017
T4	ANP05305	Cable	ETSI-50T	2/15/2016	2/15/2018
T5	AN03540	Preamp	83017A	4/30/2015	4/30/2017
T6	AN01467	Horn Antenna-ANSI C63.5 Calibration	3115	8/12/2015	8/12/2017
T7	ANP06935	Cable	32026-29801-29801-18	3/11/2016	3/11/2018
T8	AN02871	Spectrum Analyzer	E4440A	8/25/2015	8/25/2017
T9	ANP05963	Cable	RG-214	2/15/2016	2/15/2018
T10	ANP05360	Cable	RG214	11/30/2016	11/30/2018
T11	AN01816	Log Periodic Antenna-ANSI 63.5	3146	1/8/2016	1/8/2018
T12	AN02372	Bicon Antenna-ANSI 63.5	3104C	5/27/2015	5/27/2017
T13	AN00052	Loop Antenna	6502	4/8/2016	4/8/2018

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

#	Freq	Rdng	T1 T5 T9 T13	T2 T6 T10	T3 T7 T11	T4 T8 T12	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant
1	2783.277M Ave	52.9	+0.0 -34.5 +0.0 +0.0	+0.4 +28.9 +0.0	+0.7 +0.4 +0.0	+3.0 +0.0 +0.0	+0.0	51.8	54.0	-2.2	Horiz
^	2783.277M	54.7	+0.0 -34.5 +0.0 +0.0	+0.4 +28.9 +0.0	+0.7 +0.4 +0.0	+3.0 +0.0 +0.0	+0.0	53.6	54.0	-0.4	Horiz
3	4574.962M Ave	47.1	+0.0 -34.1 +0.0 +0.0	+0.4 +32.5 +0.0	+0.9 +0.5 +0.0	+4.2 +0.0 +0.0	+0.0	51.5	54.0	-2.5	Horiz
^	4575.000M	48.6	+0.0 -34.1 +0.0 +0.0	+0.4 +32.5 +0.0	+0.9 +0.5 +0.0	+4.2 +0.0 +0.0	+0.0	53.0	54.0	-1.0	Horiz
5	4549.969M Ave	47.1	+0.0 -34.1 +0.0 +0.0	+0.3 +32.5 +0.0	+0.9 +0.5 +0.0	+4.2 +0.0 +0.0	+0.0	51.4	54.0	-2.6	Horiz
^	4550.000M	48.3	+0.0 -34.1 +0.0 +0.0	+0.3 +32.5 +0.0	+0.9 +0.5 +0.0	+4.2 +0.0 +0.0	+0.0	52.6	54.0	-1.4	Horiz

7	4511.007M Ave	46.9	+0.0 -34.1 +0.0 +0.0	+0.4 +32.5 +0.0	+0.9 +0.5 +0.0	+4.2 +0.0 +0.0	+0.0	51.3	54.0	-2.7	Horiz
^	4511.000M	47.9	+0.0 -34.1 +0.0 +0.0	+0.4 +32.5 +0.0	+0.9 +0.5 +0.0	+4.2 +0.0 +0.0	+0.0	52.3	54.0	-1.7	Horiz
9	2706.888M Ave	52.5	+0.0 -34.5 +0.0 +0.0	+0.5 +28.6 +0.0	+0.7 +0.4 +0.0	+3.0 +0.0 +0.0	+0.0	51.2	54.0	-2.8	Horiz
10	2745.000M	52.3	+0.0 -34.5 +0.0 +0.0	+0.4 +28.8 +0.0	+0.7 +0.4 +0.0	+3.0 +0.0 +0.0	+0.0	51.1	54.0	-2.9	Horiz
11	988.000M QP	21.7	+0.0 +0.0 +2.5 +0.0	+0.0 +0.0 +2.2	+0.4 +0.0 +24.3	+0.0 +0.0 +0.0	+0.0	51.1	54.0	-2.9	Horiz
^	988.000M	22.3	+0.0 +0.0 +2.5 +0.0	+0.0 +0.0 +2.2	+0.4 +0.0 +24.3	+0.0 +0.0 +0.0	+0.0	51.7	54.0	-2.3	Horiz
13	962.000M QP	22.9	+0.0 +0.0 +2.5 +0.0	+0.0 +0.0 +2.2	+0.4 +0.0 +23.0	+0.0 +0.0 +0.0	+0.0	51.0	54.0	-3.0	Horiz
^	962.000M	22.8	+0.0 +0.0 +2.5 +0.0	+0.0 +0.0 +2.2	+0.4 +0.0 +23.0	+0.0 +0.0 +0.0	+0.0	50.9	54.0	-3.1	Horiz
15	4638.738M Ave	46.2	+0.0 -34.1 +0.0 +0.0	+0.5 +32.6 +0.0	+0.9 +0.5 +0.0	+4.3 +0.0 +0.0	+0.0	50.9	54.0	-3.1	Horiz
^	4638.738M	47.5	+0.0 -34.1 +0.0 +0.0	+0.5 +32.6 +0.0	+0.9 +0.5 +0.0	+4.3 +0.0 +0.0	+0.0	52.2	54.0	-1.8	Horiz
17	967.017M QP	22.4	+0.0 +0.0 +2.5 +0.0	+0.0 +0.0 +2.2	+0.4 +0.0 +23.3	+0.0 +0.0 +0.0	+0.0	50.8	54.0	-3.2	Horiz
^	967.100M	23.5	+0.0 +0.0 +2.5 +0.0	+0.0 +0.0 +2.2	+0.4 +0.0 +23.3	+0.0 +0.0 +0.0	+0.0	51.9	54.0	-2.1	Horiz

19	993.024M QP	20.6	+0.0 +0.0 +2.5 +0.0	+0.0 +0.0 +2.3	+0.4 +0.0 +24.5	+0.0 +0.0 +0.0	+0.0	50.3	54.0	-3.7	Horiz
^	993.000M	20.3	+0.0 +0.0 +2.5 +0.0	+0.0 +0.0 +2.3	+0.4 +0.0 +24.5	+0.0 +0.0 +0.0	+0.0	50.0	54.0	-4.0	Horiz
21	2729.953M Ave	51.4	+0.0 -34.5 +0.0 +0.0	+0.5 +28.7 +0.0	+0.7 +0.4 +0.0	+3.0 +0.0 +0.0	+0.0	50.2	54.0	-3.8	Horiz
^	2730.000M	50.0	+0.0 -34.5 +0.0 +0.0	+0.5 +28.7 +0.0	+0.7 +0.4 +0.0	+3.0 +0.0 +0.0	+0.0	48.8	54.0	-5.2	Horiz
23	2707.000M	51.4	+0.0 -34.5 +0.0 +0.0	+0.5 +28.6 +0.0	+0.7 +0.4 +0.0	+3.0 +0.0 +0.0	+0.0	50.1	54.0	-3.9	Horiz
24	2744.500M Ave	50.2	+0.0 -34.5 +0.0 +0.0	+0.4 +28.8 +0.0	+0.7 +0.4 +0.0	+3.0 +0.0 +0.0	+0.0	49.0	54.0	-5.0	Horiz
25	979.754M QP	19.0	+0.0 +0.0 +2.5 +0.0	+0.0 +0.0 +2.2	+0.4 +0.0 +24.0	+0.0 +0.0 +0.0	+0.0	48.1	54.0	-5.9	Horiz
^	979.700M	22.5	+0.0 +0.0 +2.5 +0.0	+0.0 +0.0 +2.2	+0.4 +0.0 +24.0	+0.0 +0.0 +0.0	+0.0	51.6	54.0	-2.4	Horiz
27	968.800M QP	18.1	+0.0 +0.0 +2.5 +0.0	+0.0 +0.0 +2.2	+0.4 +0.0 +23.4	+0.0 +0.0 +0.0	+0.0	46.6	54.0	-7.4	Horiz
^	968.800M	24.9	+0.0 +0.0 +2.5 +0.0	+0.0 +0.0 +2.2	+0.4 +0.0 +23.4	+0.0 +0.0 +0.0	+0.0	53.4	54.0	-0.6	Horiz
29	1081.000M	45.1	+0.0 -37.2 +0.0 +0.0	+7.0 +24.2 +0.0	+0.4 +0.2 +0.0	+1.9 +0.0 +0.0	+0.0	41.6	54.0	-12.4	Horiz
30	118.570M	12.7	+0.0 +0.0 +1.2 +0.0	+0.0 +0.0 +0.6	+0.1 +0.0 +0.0	+0.0 +0.0 +13.9	+0.0	28.5	43.5	-15.0	Horiz
31	265.100M	13.4	+0.0 +0.0 +1.5 +0.0	+0.0 +0.0 +1.0	+0.2 +0.0 +12.3	+0.0 +0.0 +0.0	+0.0	28.4	46.0	-17.6	Horiz

32	1804.400M	76.9	+0.0 -35.1 +0.0 +0.0	+0.4 +26.8 +0.0	+0.5 +0.3 +0.0	+2.5 +0.0 +0.0	+0.0	72.3	109.5	-37.2	Horiz
33	1820.000M	72.6	+0.0 -35.1 +0.0 +0.0	+0.4 +26.9 +0.0	+0.5 +0.3 +0.0	+2.5 +0.0 +0.0	+0.0	68.1	109.5	-41.4	Horiz
34	1830.000M	70.1	+0.0 -35.1 +0.0 +0.0	+0.4 +26.9 +0.0	+0.5 +0.3 +0.0	+2.5 +0.0 +0.0	+0.0	65.6	109.5	-43.9	Horiz
35	1855.600M	63.1	+0.0 -35.1 +0.0 +0.0	+0.3 +27.1 +0.0	+0.5 +0.3 +0.0	+2.5 +0.0 +0.0	+0.0	58.7	109.5	-50.8	Horiz
36	896.500M	28.3	+0.0 +0.0 +2.4 +0.0	+0.0 +0.0 +2.1	+0.3 +0.0 +22.6	+0.0 +0.0 +0.0	+0.0	55.7	109.5	-53.8	Horiz
37	652.200M	24.5	+0.0 +0.0 +2.1 +0.0	+0.0 +0.0 +1.7	+0.3 +0.0 +20.0	+0.0 +0.0 +0.0	+0.0	48.6	109.5	-60.9	Horiz
38	3304.000M	41.3	+0.0 -34.3 +0.0 +0.0	+0.3 +29.5 +0.0	+0.7 +0.4 +0.0	+3.4 +0.0 +0.0	+0.0	41.3	109.5	-68.2	Horiz
39	494.000M	13.8	+0.0 +0.0 +2.0 +0.0	+0.0 +0.0 +1.4	+0.3 +0.0 +17.1	+0.0 +0.0 +0.0	+0.0	34.6	109.5	-74.9	Horiz
40	198.640M	13.6	+0.0 +0.0 +1.4 +0.0	+0.0 +0.0 +0.8	+0.2 +0.0 +0.0	+0.0 +0.0 +16.2	+0.0	32.2	109.5	-77.3	Horiz
41	342.100M	14.4	+0.0 +0.0 +1.7 +0.0	+0.0 +0.0 +1.2	+0.2 +0.0 +13.9	+0.0 +0.0 +0.0	+0.0	31.4	109.5	-78.1	Horiz
42	295.900M	12.4	+0.0 +0.0 +1.6 +0.0	+0.0 +0.0 +1.1	+0.2 +0.0 +13.4	+0.0 +0.0 +0.0	+0.0	28.7	109.5	-80.8	Horiz

43	38.330M	13.3	+0.0 +0.0 +0.5 +0.0	+0.0 +0.0 +0.3	+0.1 +0.0 +0.0	+0.0 +0.0 +11.5	+0.0	25.7	109.5	-83.8	Horiz
44	7.987M	14.2	+0.0 +0.0 +0.0 +9.3	+0.0 +0.0 +0.0	+0.0 +0.0 +0.0	+0.2 +0.0 +0.0	-40.0	-16.3	109.5	-125.8	Perp
45	12.230k	44.3	+0.0 +0.0 +0.0 +16.4	+0.0 +0.0 +0.0	+0.0 +0.0 +0.0	+0.0 +0.0 +0.0	-80.0	-19.3	109.5	-128.8	Perp
46	279.000k	16.2	+0.0 +0.0 +0.0 +9.6	+0.0 +0.0 +0.0	+0.0 +0.0 +0.0	+0.0 +0.0 +0.0	-80.0	-54.2	109.5	-163.7	Perp

Band Edge

Band Edge Summary					
Frequency (MHz)	**Modulation**	**Antenna Type**	**Field Strength (dBuV/m @3m)**	**Limit (dBuV/m @3m)**	**Results**
614	Worst Case	Integral	39.2 (QP)	<46	Pass
902	FSK 150kbps Power Level 3	Integral	80.2 (QP)	109.5	Pass
902	OOK Power level 3	Integral	96.3 (Peak)	107	Pass
902	OOK Power Level 1	Integral	78.5 (Peak)	89.3	Pass
902	FSK 10kbps Power Level 3	Integral	84.4 (QP)	109.5	Pass
928	FSK 150kbps Power Level 3	Integral	79.6 (QP)	109.5	Pass
928	OOK Power level 3	Integral	93.2 (Peak)	107	Pass
928	OOK Power Level 1	Integral	77.5 (Peak)	89.3	Pass
928	FSK 10kbps Power Level 3	Integral	86.3 (QP)	109.5	Pass
960	Worst Case	Integral	45.5 (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 #:	**99315**	Date:	1/31/2017
Test Type:	**Maximized Emissions**	Time:	17:53:19
Tested By:	Steven Pittsford	Sequence#:	1
Software:	EMITest 5.03.02		

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

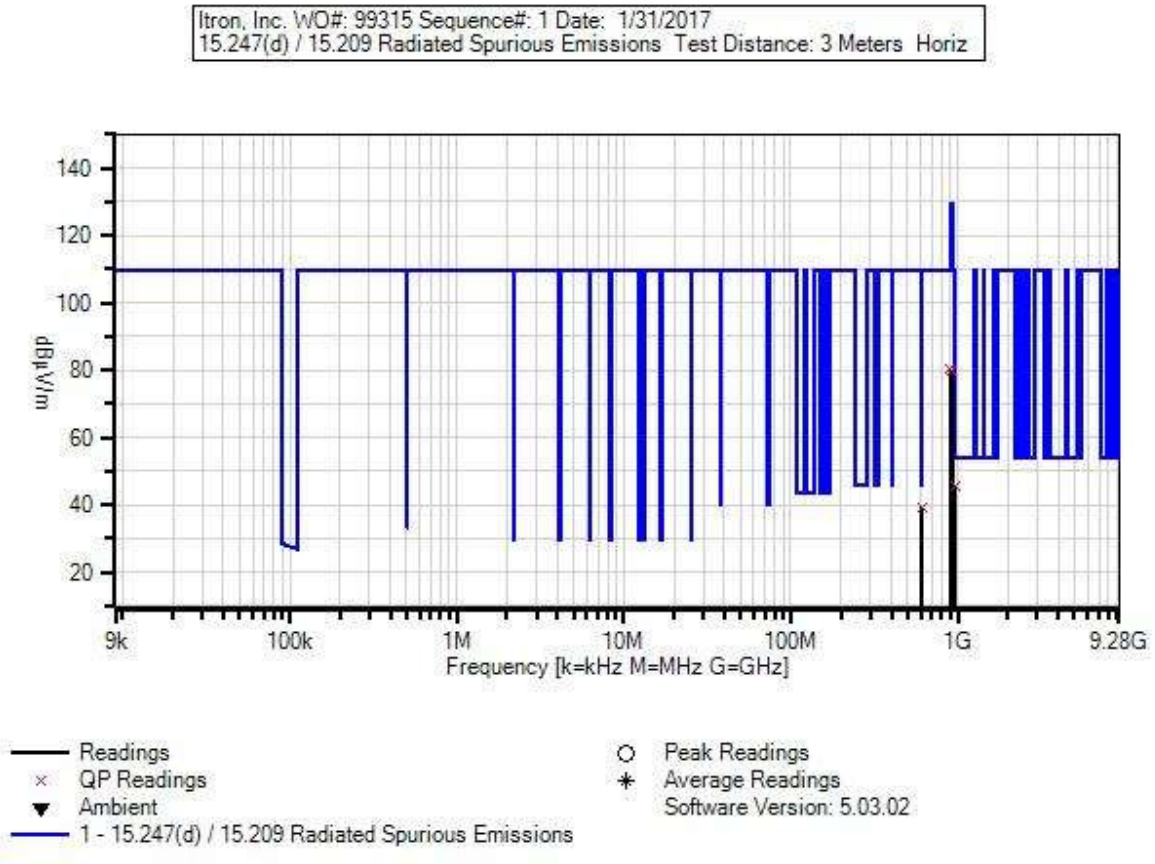
Test Conditions / Notes:

Temperature: 20-22ºC
Relative Humidity: 21-35%

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: 8.02 dBi
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 as worst case based on X, Y, Z investigation as well as previous engineering data.
Hopping operation selected as worst case based on previously collected data.



Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN01991	Biconilog Antenna	CBL6111C	3/11/2016	3/11/2018
T2	ANP05657	Attenuator	PE7004-6	12/22/2015	12/22/2017
T3	ANP05360	Cable	RG214	11/30/2016	11/30/2018
T4	ANP05963	Cable	RG-214	2/15/2016	2/15/2018
T5	ANP06540	Cable	Heliax	10/29/2015	10/29/2017
	AN02673	Spectrum Analyzer	E4446A	10/12/2015	10/12/2017

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

#	Freq	Rdng	T1 T5	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant
1	614.000M QP	9.0	+20.2 +0.3	+6.0	+1.6	+2.1	+0.0	39.2	46.0	-6.8	Horiz
2	960.000M QP	8.9	+25.4 +0.4	+6.1	+2.2	+2.5	+0.0	45.5	54.0	-8.5	Horiz
3	902.000M QP	44.5	+24.9 +0.3	+6.0	+2.1	+2.4	+0.0	80.2	109.5	-29.3	Horiz
4	928.004M QP	43.5	+25.1 +0.4	+6.1	+2.1	+2.4	+0.0	79.6	109.5	-29.9	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 #:	**99315**	Date:	12/16/2016
Test Type:	**Maximized Emissions**	Time:	18:23:49
Tested By:	Steven Pittsford	Sequence#:	3
Software:	EMITest 5.03.02		

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 2			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 2			

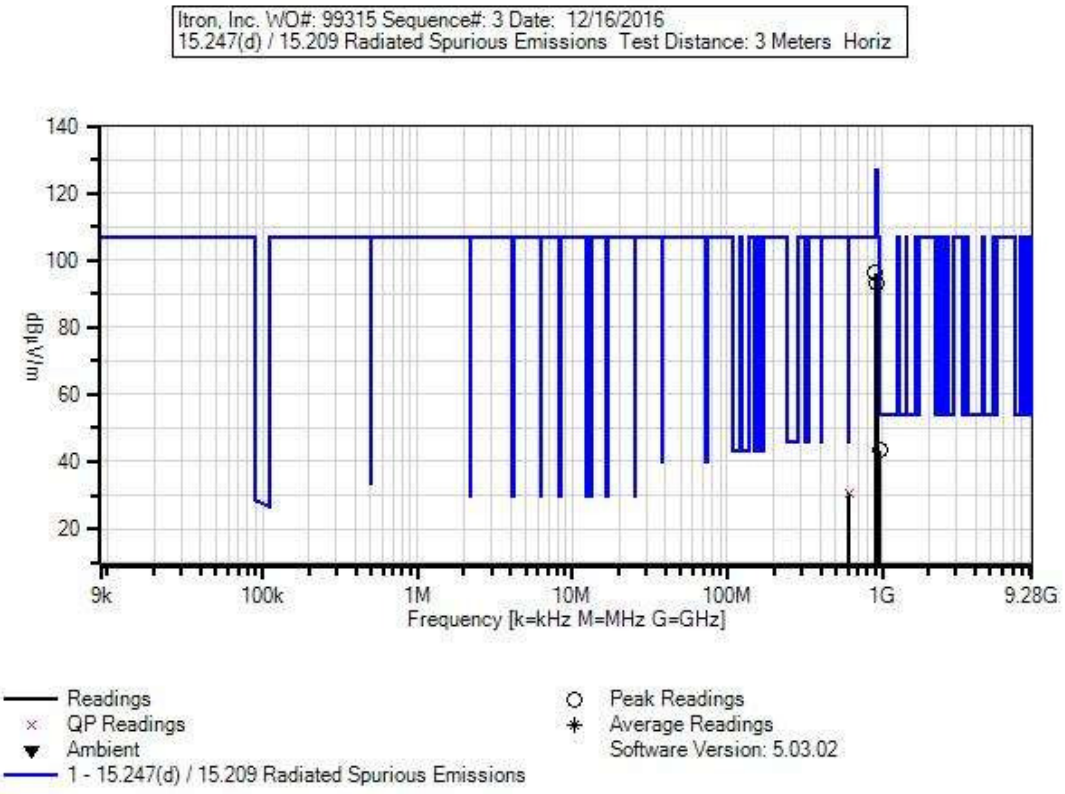
Test Conditions / Notes:

Temperature: 20-22ºC
Relative Humidity: 21-35%

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: 8.02 dBi
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 as worst case based on X, Y, Z investigation as well as previous engineering data.
Hopping operation selected as worst case based on previously collected data.



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
T4	AN02871	Spectrum Analyzer	E4440A	8/25/2015	8/25/2017
T5	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	Rdng	T1 T5	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant
1	960.000M	15.5	+2.2 +22.8	+2.5	+0.4	+0.0	+0.0	43.4	54.0	-10.6	Horiz
2	902.000M	68.9	+2.1 +22.6	+2.4	+0.3	+0.0	+0.0	96.3	107.0	-10.7	Horiz
3	928.000M	65.9	+2.1 +22.4	+2.4	+0.4	+0.0	+0.0	93.2	107.0	-13.8	Horiz
4	614.000M QP	8.1	+1.6 +18.5	+2.1	+0.3	+0.0	+0.0	30.6	46.0	-15.4	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 #:	**99315**	Date:	12/7/2016
Test Type:	**Maximized Emissions**	Time:	15:48:34
Tested By:	Steven Pittsford	Sequence#:	2
Software:	EMITest 5.03.02		

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 3			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 3			

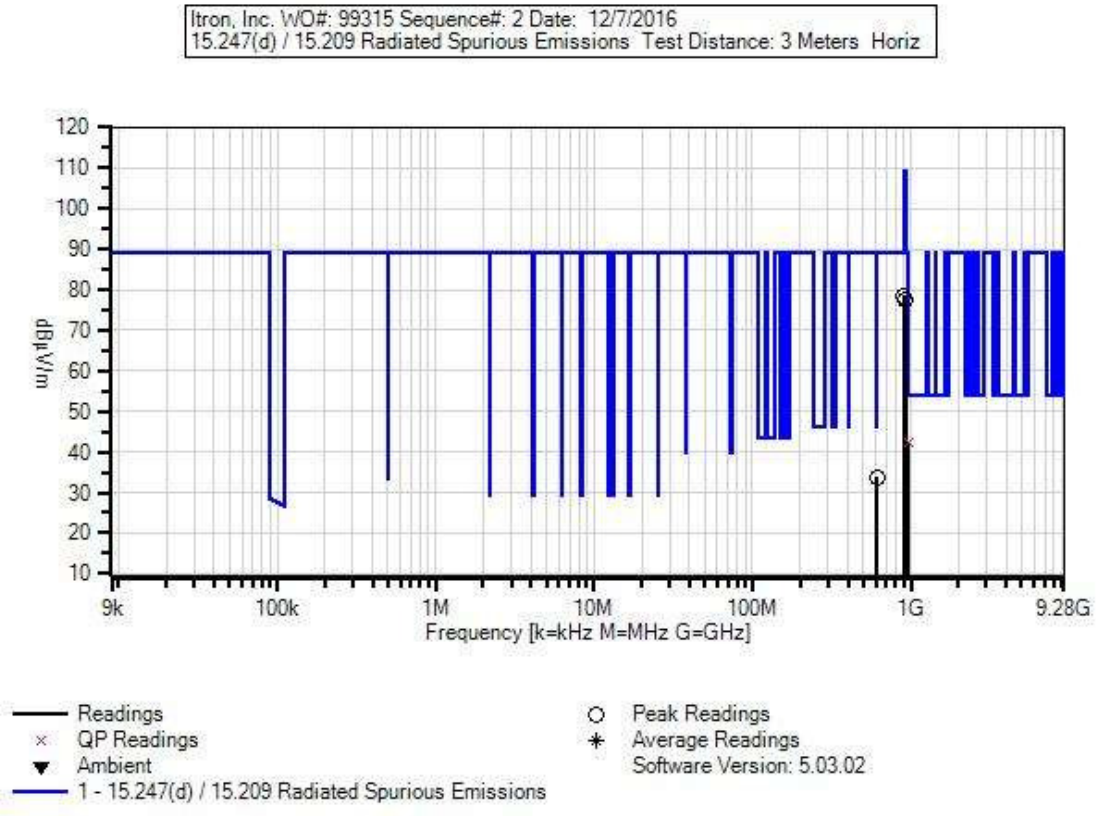
Test Conditions / Notes:

Temperature: 20-22ºC
Relative Humidity: 21-35%

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: 7.19 dBi
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 as worst case based on X, Y, Z investigation as well as previous engineering data.
Hopping operation selected as worst case based on previously collected data.



Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN01991	Biconilog Antenna	CBL6111C	3/11/2016	3/11/2018
T2	ANP05657	Attenuator	PE7004-6	12/22/2015	12/22/2017
T3	ANP05360	Cable	RG214	11/30/2016	11/30/2018
T4	ANP05963	Cable	RG-214	2/15/2016	2/15/2018
T5	ANP06540	Cable	Heliax	10/29/2015	10/29/2017
T6	AN02673	Spectrum Analyzer	E4446A	10/12/2015	10/12/2017
T7	AN02307	Preamp	8447D	2/15/2016	2/15/2018

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

#	Freq	Rdng	T1 T5	T2 T6	T3 T7	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant
1	902.000M	70.2	+24.9 +0.3	+6.0 +0.0	+2.1 -27.4	+2.4	+0.0	78.5	89.3	-10.8	Horiz
2	960.000M QP	32.8	+25.4 +0.4	+6.1 +0.0	+2.2 -27.1	+2.5	+0.0	42.3	54.0	-11.7	Horiz
3	928.000M	68.7	+25.1 +0.4	+6.1 +0.0	+2.1 -27.3	+2.4	+0.0	77.5	89.3	-11.8	Horiz
4	614.000M	31.8	+20.2 +0.3	+6.0 +0.0	+1.6 -28.1	+2.1	+0.0	33.9	46.0	-12.1	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 #:	**99315**	Date:	12/7/2016
Test Type:	**Maximized Emissions**	Time:	12:07:38
Tested By:	Steven Pittsford	Sequence#:	2
Software:	EMITest 5.03.02		

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 4			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 4			

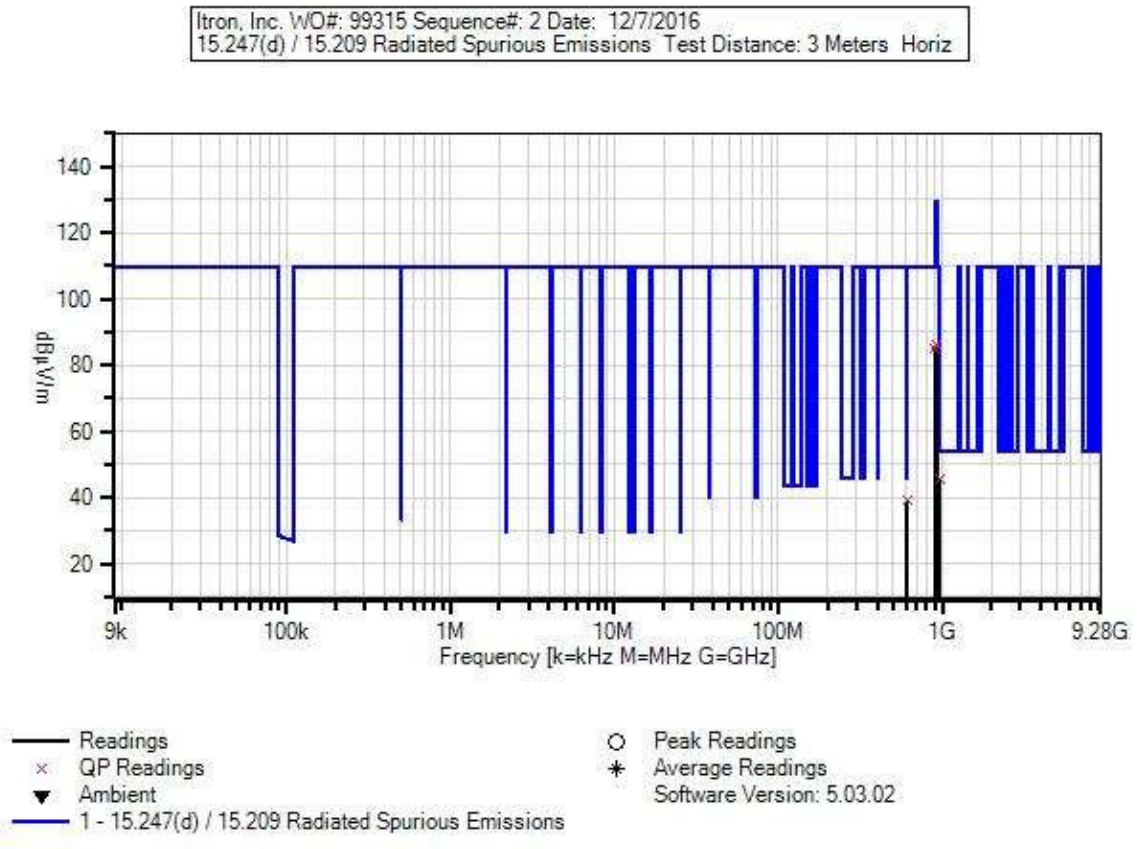
Test Conditions / Notes:

Temperature: 20-22ºC
Relative Humidity: 21-35%

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: 8.02 dBi
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 as worst case based on X, Y, Z investigation as well as previous engineering data.
Hopping operation selected as worst case based on previously collected data.



Test Equipment:

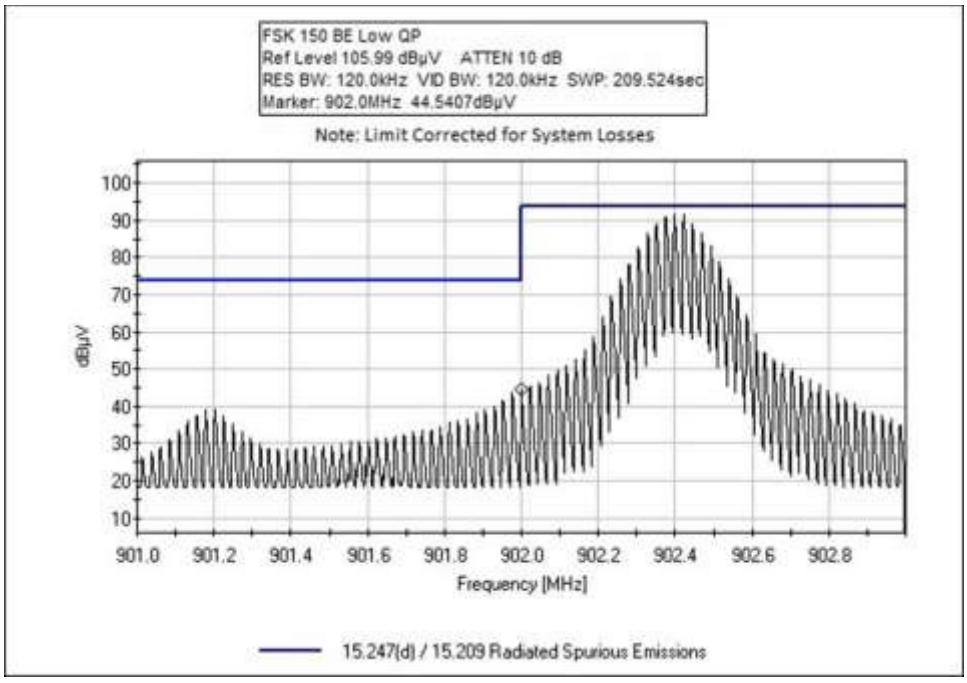
ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN01991	Biconilog Antenna	CBL6111C	3/11/2016	3/11/2018
T2	ANP05657	Attenuator	PE7004-6	12/22/2015	12/22/2017
T3	ANP05360	Cable	RG214	11/30/2016	11/30/2018
T4	ANP05963	Cable	RG-214	2/15/2016	2/15/2018
T5	ANP06540	Cable	Heliax	10/29/2015	10/29/2017
T6	AN02673	Spectrum Analyzer	E4446A	10/12/2015	10/12/2017

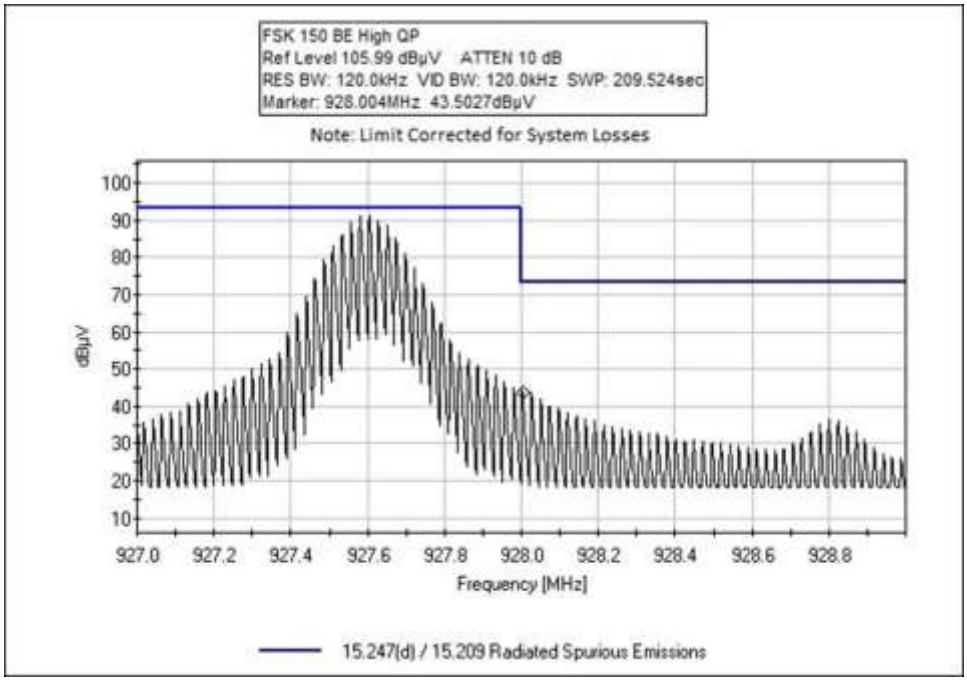
Measurement Data: Reading listed by margin. Test Distance: 3 Meters

#	Freq	Rdng	T1	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
			T5	T6							
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant
1	614.000M	8.8	+20.2	+6.0	+1.6	+2.1	+0.0	39.0	46.0	-7.0	Horiz
	QP		+0.3	+0.0							
2	960.000M	8.9	+25.4	+6.1	+2.2	+2.5	+0.0	45.5	54.0	-8.5	Horiz
	QP		+0.4	+0.0							
3	928.001M	50.2	+25.1	+6.1	+2.1	+2.4	+0.0	86.3	109.5	-23.2	Horiz
	QP		+0.4	+0.0							
4	902.000M	49.1	+24.9	+6.0	+2.1	+2.4	+0.0	84.8	109.5	-24.7	Horiz
	QP		+0.3	+0.0							

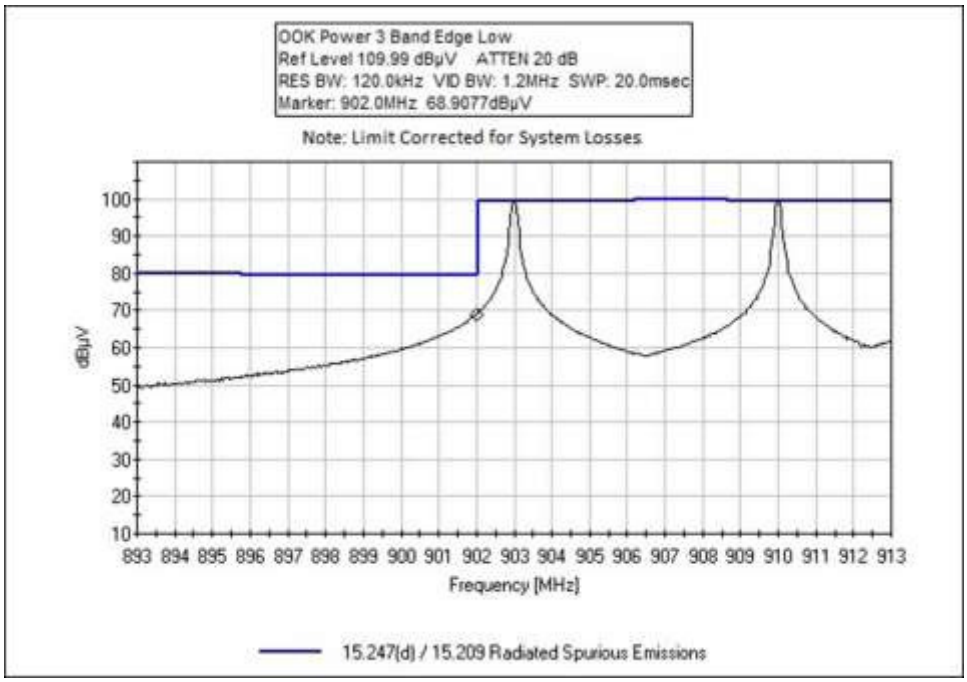
Band Edge Plots

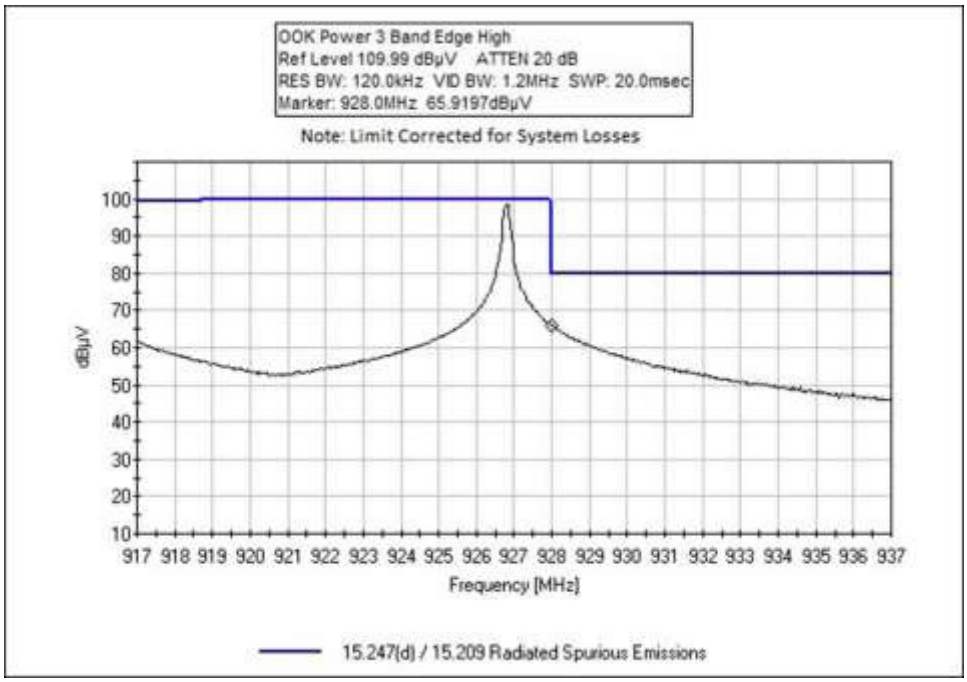
Configuration 1



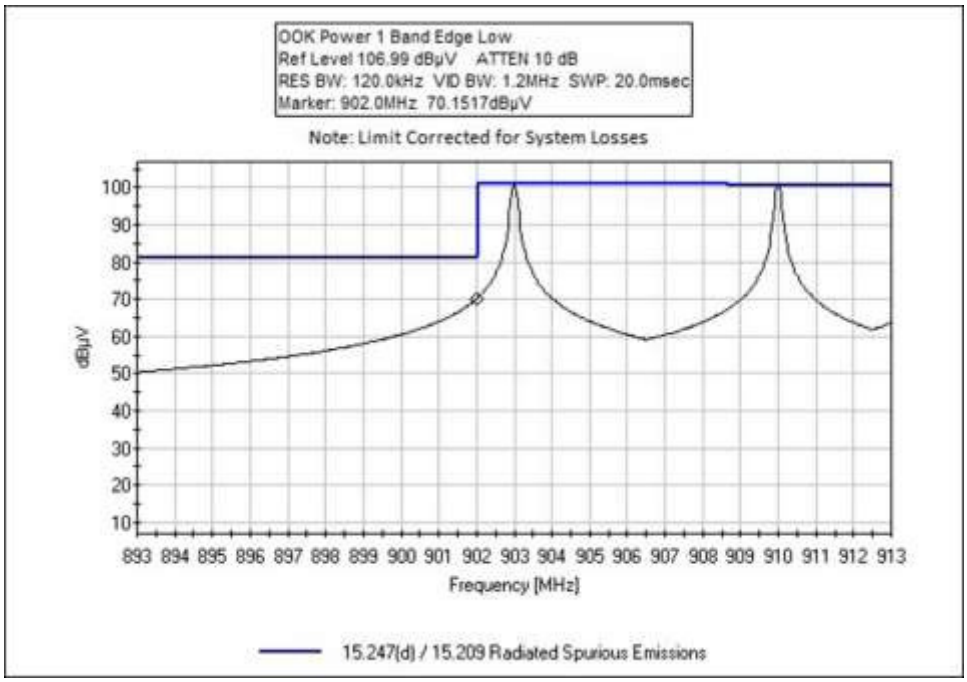


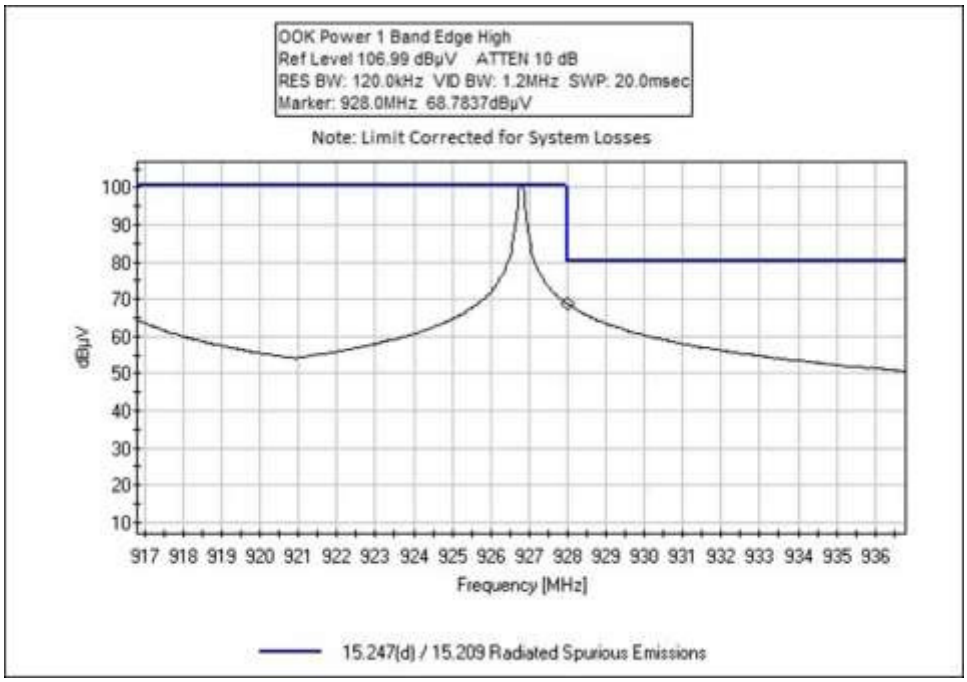
Configuration 2



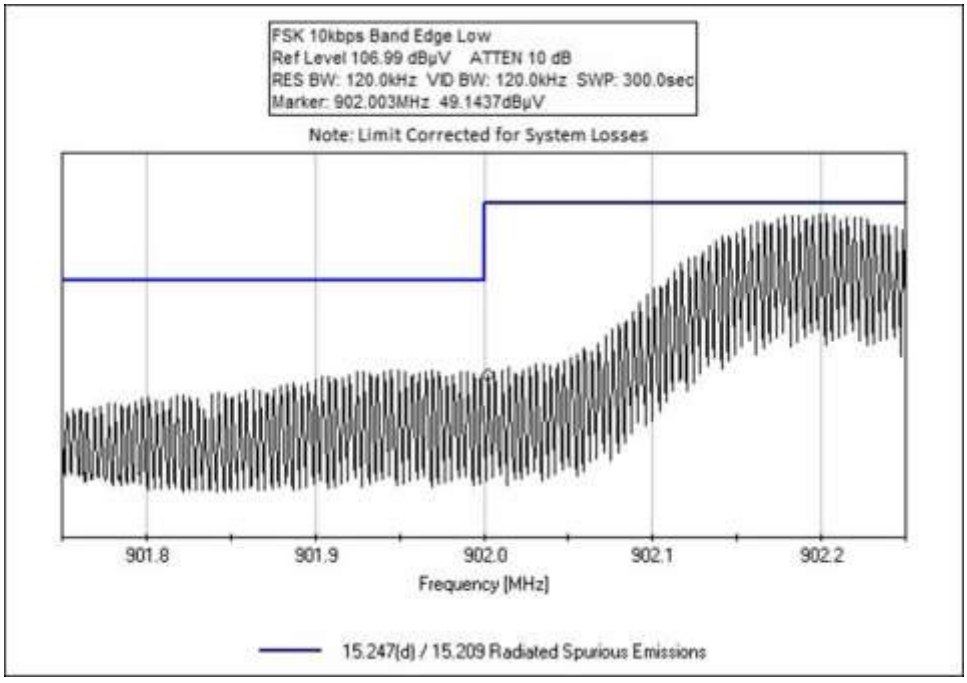


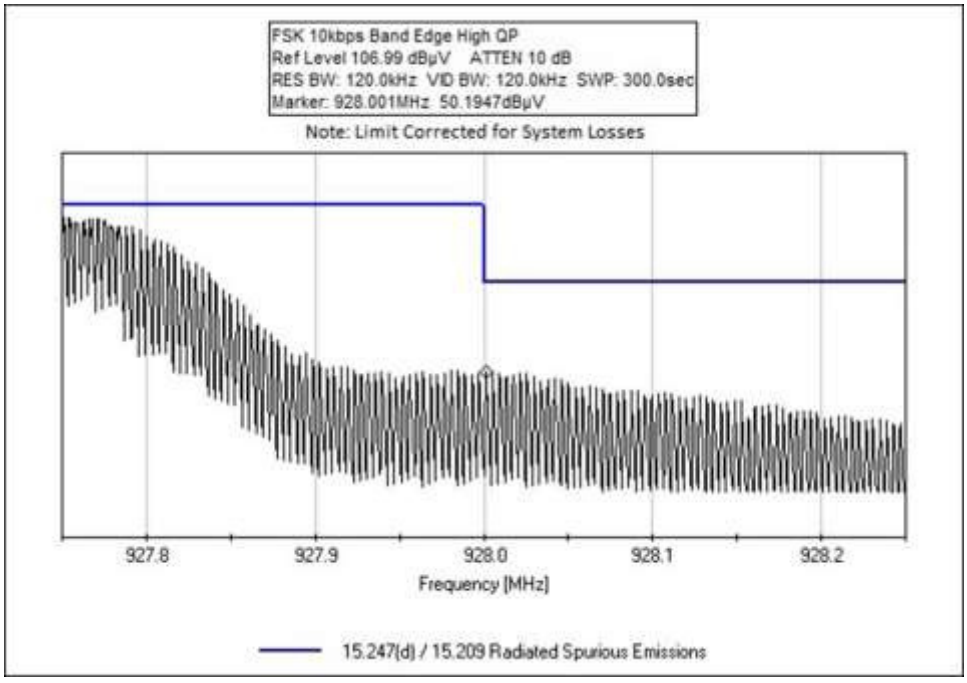
Configuration 3





Configuration 4





Test Setup Photos

Below 1GHz

Above 1GHz

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:

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

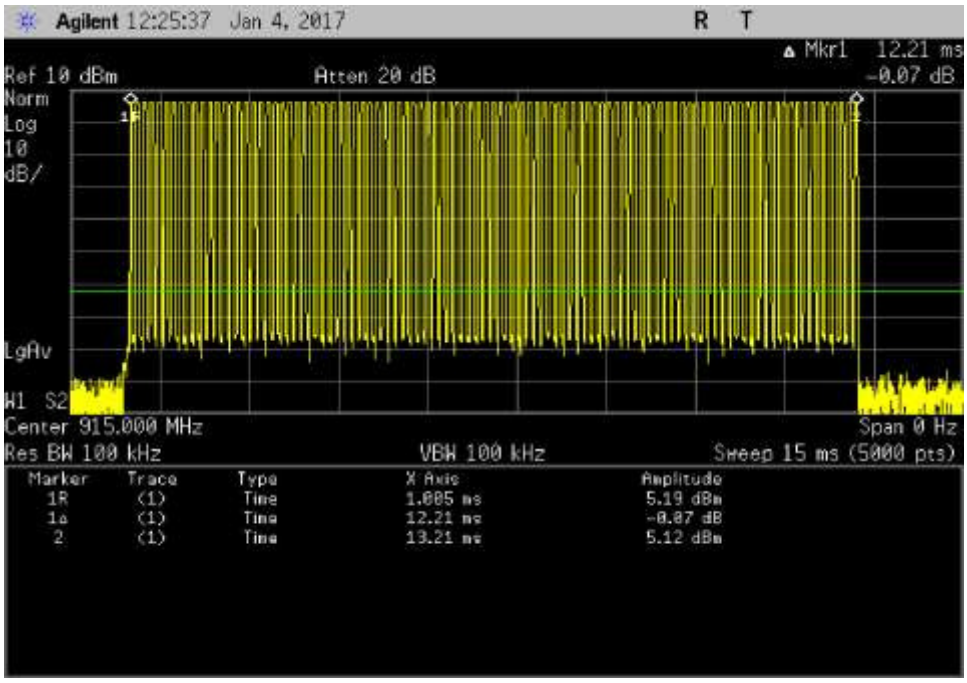
Measured Values:

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

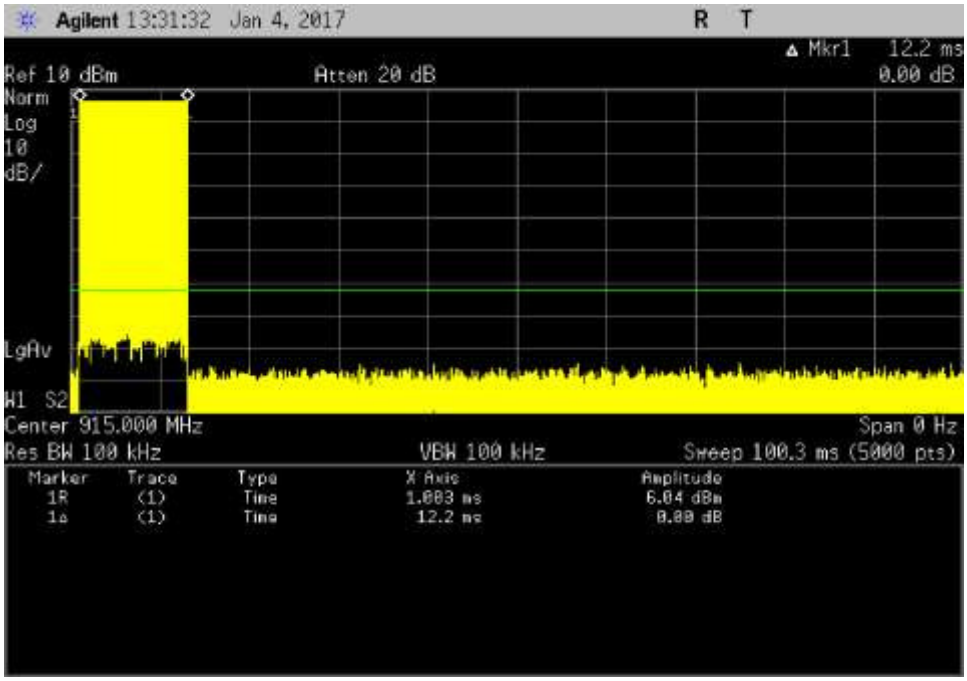
Duty Cycle Correction Factor (DCCF) is calculated in accordance with ANSI C63.10:

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

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 dBµV/m, the spectrum analyzer reading in dBµV 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	(dBµV)
+	Antenna Factor	(dB/m)
+	Cable Loss	(dB)
-	Distance Correction	(dB)
-	Preamplifier Gain	(dB)
=	Corrected Reading	(dBµV/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.