

Itron, Inc.

TEST REPORT FOR

500C

Models: WPITC0, WRMTC0 and GRMTC0

Tested to The Following Standards:

FCC Part 15 Subpart C Section(s)

15.249

Report No.: 104621-18

Date of issue: February 9, 2021



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

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

Test Certificate # 803.01

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TABLE OF CONTENTS

Administrative Information	3
Test Report Information	3
Report Authorization	3
Test Facility Information	4
Software Versions	4
Site Registration & Accreditation Information	4
Summary of Results	5
Modifications During Testing	5
Conditions During Testing	5
Equipment Under Test	6
General Product Information	7
FCC Part 15 Subpart C	10
15.215(c) Occupied Bandwidth (20dB BW)	10
15.249(a) Field Strength of Fundamental	14
15.249(a) Radiated Emissions and Bandedge	24
Supplemental Information	51
Measurement Uncertainty	51
Emissions Test Details	51

ADMINISTRATIVE INFORMATION

Test Report Information

REPORT PREPARED FOR:

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2111 N. Molter Road
Liberty Lake, WA 99019

Representative: Jay Holcomb
Customer Reference Number: 223674

REPORT PREPARED BY:

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5046 Sierra Pines Drive
Mariposa, CA 95338

Project Number: 104621

DATE OF EQUIPMENT RECEIPT:

December 21, 2020

DATE(S) OF TESTING:

December 21, 22, 30 and 31, 2020

January 7, 2021

Report Authorization

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



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

Test Facility Information



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

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

Software Versions

CKC Laboratories Proprietary Software	Version
EMITest Emissions	5.03.19

Site Registration & Accreditation Information

Location	*NIST CB #	FCC	Canada	Japan
Canyon Park, Bothell, WA	US0103	US1024	3082C	A-0136
Brea, CA	US0103	US1024	3082D	A-0136
Fremont, CA	US0103	US1024	3082B	A-0136
Mariposa, CA	US0103	US1024	3082A	A-0136

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

SUMMARY OF RESULTS

Standard / Specification: FCC Part 15 Subpart C - 15.249

Test Procedure	Description	Modifications	Results
15.215(c)	Occupied Bandwidth	NA	PASS
15.249(a)	Field Strength of Fundamental	NA	PASS
15.249(a)	Radiated Emissions and Band Edge	NA	PASS
15.207	AC Conducted Emissions	NA	NA1

NA = Not Applicable

NA1 = Not applicable, the manufacturer declares the EUT is battery operated.

ISO/IEC 17025 Decision Rule

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

Modifications During Testing

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

Summary of Conditions

No modifications were made during testing.

Modifications listed above must be incorporated into all production units.

Conditions During Testing

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

Summary of Conditions

None

EQUIPMENT UNDER TEST (EUT)

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

Configuration 1 ((GAS REMOTE)

Equipment Tested:

Device	Manufacturer	Model #	S/N
500C	Itron, Inc.	GRMTC0	RAD1

Support Equipment:

Device	Manufacturer	Model #	S/N
Laptop	Dell	Latitude E6420	8P954R1
Laptop Power Supply	Dell	ADP-65JB	None

Configuration 2 (WATER REMOTE)

Equipment Tested:

Device	Manufacturer	Model #	S/N
500C	Itron, Inc.	WRMTC	RAD1

Support Equipment:

Device	Manufacturer	Model #	S/N
Laptop	Dell	Latitude E6420	8P954R1
Laptop Power Supply	Dell	ADP-65JB	None

Configuration 3 (PIT)

Equipment Tested:

Device	Manufacturer	Model #	S/N
500C	Itron, Inc.	WPITCO	RAD1

Support Equipment:

Device	Manufacturer	Model #	S/N
Laptop	Dell	Latitude E6420	8P954R1
Laptop Power Supply	Dell	ADP-65JB	None

General Product Information:

Product Information	Manufacturer-Provided Details
Equipment Type:	Stand-Alone Equipment
Operating Frequency Range:	908 – 923.8MHz
Modulation Type(s):	OOK
Maximum Duty Cycle:	100%
Antenna Type(s) and Gain:	PCB Trace/ 1.1dBi
Antenna Connection Type:	Integral
Nominal Input Voltage:	3.6Vdc battery
Firmware / Software used for Test:	App Version: 0.0.25.0, CSL version: 8.1.3.0 Hardware Rev: 9

EUT and Accessory Photo(s)



GRMTC0

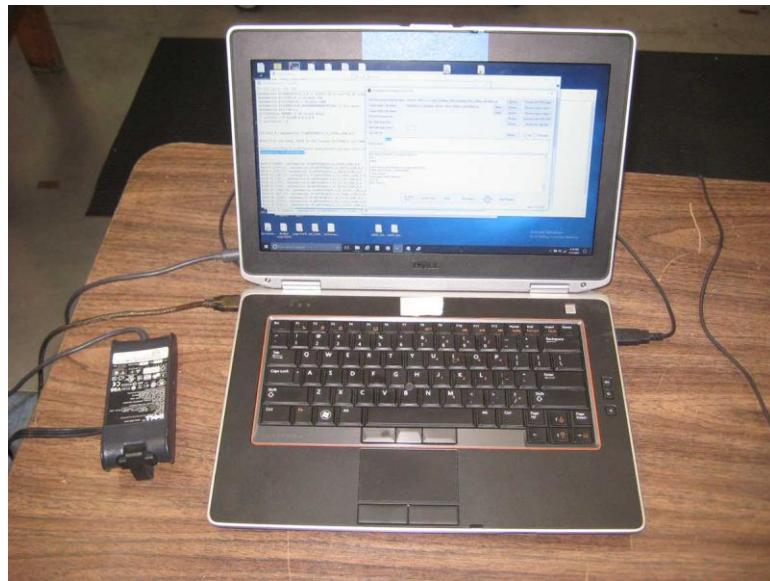


WPITCO



WRMTCO

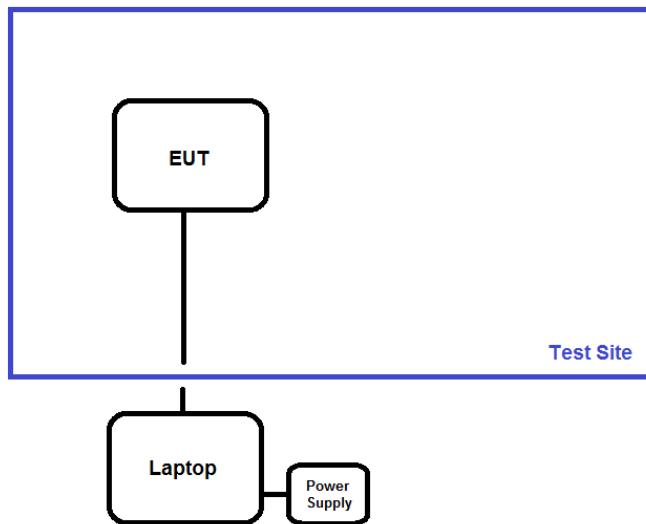
Support Equipment Photo(s)



Laptop and Laptop PSU

Block Diagram of Test Setup(s)

Test Setup Block Diagram



FCC Part 15 Subpart C

15.215(c) Occupied Bandwidth (20dB BW)

Test Setup/Conditions				
Test Location:	Brea Lab B	Test Engineer:	Don Nguyen	
Test Method:	ANSI C63.10 (2013)	Test Date(s):	12/21/2020	
Configuration:	1			
Test Setup:	<p>The EUT is placed on Styrofoam platform and powered from 3.6V fresh battery. The EUT is connected to a remote located laptop running CLI Tool ver.2.0.1.24.</p> <p>EUT has fixed orientation per manufacturer's specification.</p> <p>Operating frequency range/ mode</p> <p>908 - 923.8MHz, 200kHz steps, 80 channels, 16384 OOK LV0</p> <p>Frequency of measurement: 908-923.8MHz</p> <p>RBW=3.9kHz, VBW=12kHz</p> <p>Note: Three EUTs have the same internal hardware. Data measured on one EUT represents for all three EUTs.</p>			

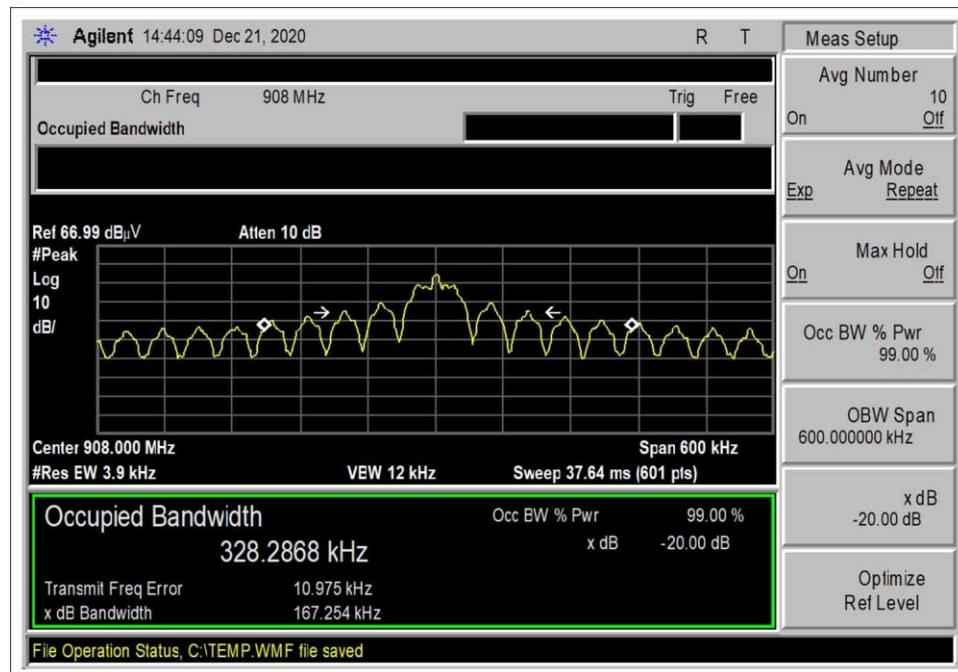
Environmental Conditions			
Temperature (°C)	25.1	Relative Humidity (%):	27

Test Equipment					
Asset#	Description	Manufacturer	Model	Cal Date	Cal Due
AN03643	Spectrum Analyzer	Agilent	E4440A	5/20/2020	5/20/2022
ANP01911	Cable	Pasternack	RG214/U	1/2/2020	1/2/2022
ANP05281	Attenuator	Weinschel	1B	4/7/2020	4/7/2022
AN01993	Biconilog Antenna	Chase	CBL6111C	6/11/2019	6/11/2021

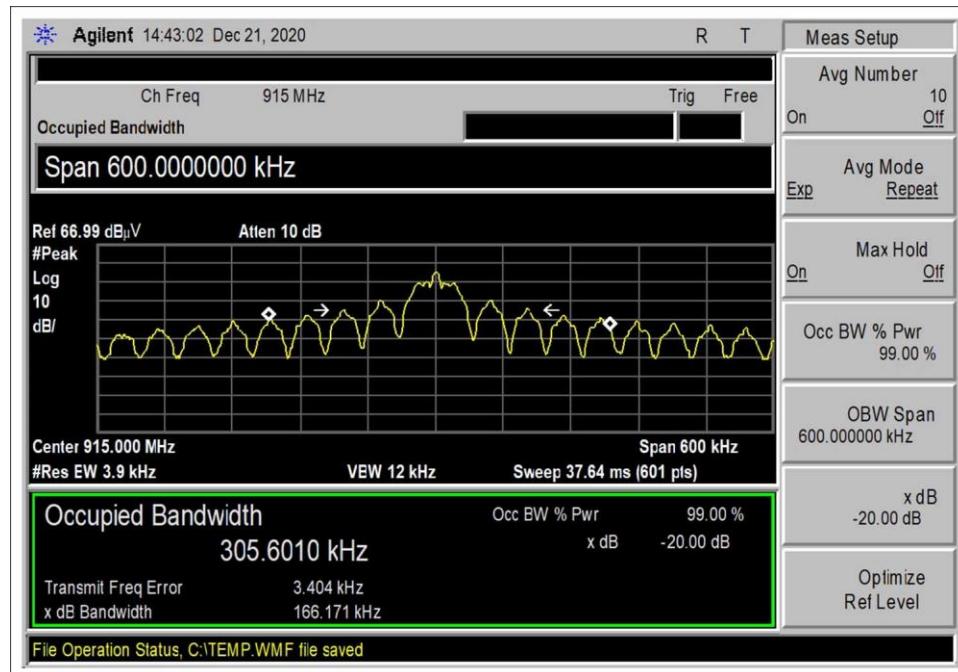
Test Data Summary				
Frequency (MHz)	Modulation	Measured (kHz)	Limit (kHz)	Results
908.0	OOK LV0	167.254	None	NA
915.0	OOK LV0	166.171	None	NA
923.8	OOK LV0	165.675	None	NA

NA = Not applicable, because FCC 15.215 does not give any limits so there is no criteria for pass or fail.

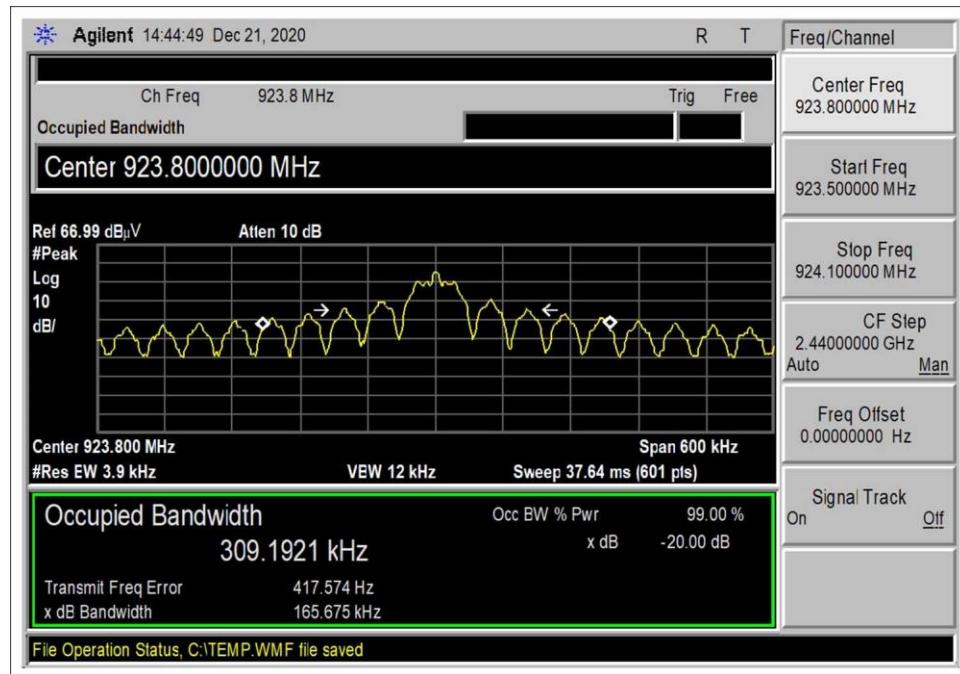
Plot(s)



Low Channel



Middle Channel



High Channel

Test Setup Photo(s)



15.249(a) Field Strength of Fundamental

Test Data Summary - Voltage Variations

Frequency (MHz)	Modulation / Ant Port	V _{Minimum} (dBuV/m)	V _{Nominal} (dBuV/m)	V _{Maximum} (dBuV/m)	Max Deviation from V _{Nominal} (dB)
908.0	OOK LV0	NA	NA	NA	NA
915.0	OOK LV0	NA	NA	NA	NA
923.8	OOK LV0	NA	NA	NA	NA

NA = Test performed using a fresh battery.

Parameter Definitions:

Measurements performed at input voltage according to manufacturer specification.

Parameter	Value
V _{Nominal} :	3.6Vdc
V _{Minimum} :	3.6Vdc
V _{Maximum} :	3.6Vdc

Test Data Summary - Voltage Variations

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

Test Data Summary – Radiated Field Strength Measurement Configuration 1

Frequency (MHz)	Modulation	Ant. Type	Measured (dBuV/m @ 3m)	Limit (dBuV/m @ 3m)	Results
908.0	OOK LV0	PCB Trace	92.2	≤94	Pass
915.0	OOK LV0	PCB Trace	91.3	≤94	Pass
923.8	OOK LV0	PCB Trace	92.7	≤94	Pass

Test Data Summary – Radiated Field Strength Measurement Configuration 2

Frequency (MHz)	Modulation	Ant. Type	Measured (dBuV/m @ 3m)	Limit (dBuV/m @ 3m)	Results
908.0	OOK LV0	PCB Trace	92.1	≤94	Pass
915.0	OOK LV0	PCB Trace	91.3	≤94	Pass
923.8	OOK LV0	PCB Trace	91.4	≤94	Pass

Test Data Summary – Radiated Field Strength Measurement Configuration 3

Frequency (MHz)	Modulation	Ant. Type	Measured (dBuV/m @ 3m)	Limit (dBuV/m @ 3m)	Results
908.0	OOK LV0	PCB Trace	92.5	≤94	Pass
915.0	OOK LV0	PCB Trace	93.0	≤94	Pass
923.8	OOK LV0	PCB Trace	92.9	≤94	Pass

Test Setup / Conditions / Data

Test Location: CKC Laboratories Inc. • 110 N. Olinda Pl. • Brea, CA 92823 • 714-993-6112
 Customer: **Itron, Inc.**
 Specification: **15.249 Carrier and Spurious Emissions (902-928 MHz Transmitter)**
 Work Order #: **104621** Date: 12/21/2020
 Test Type: **Radiated Emissions** Time: 13:43:07
 Tested By: Don Nguyen Sequence#: 1
 Software: EMITest 5.03.19

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

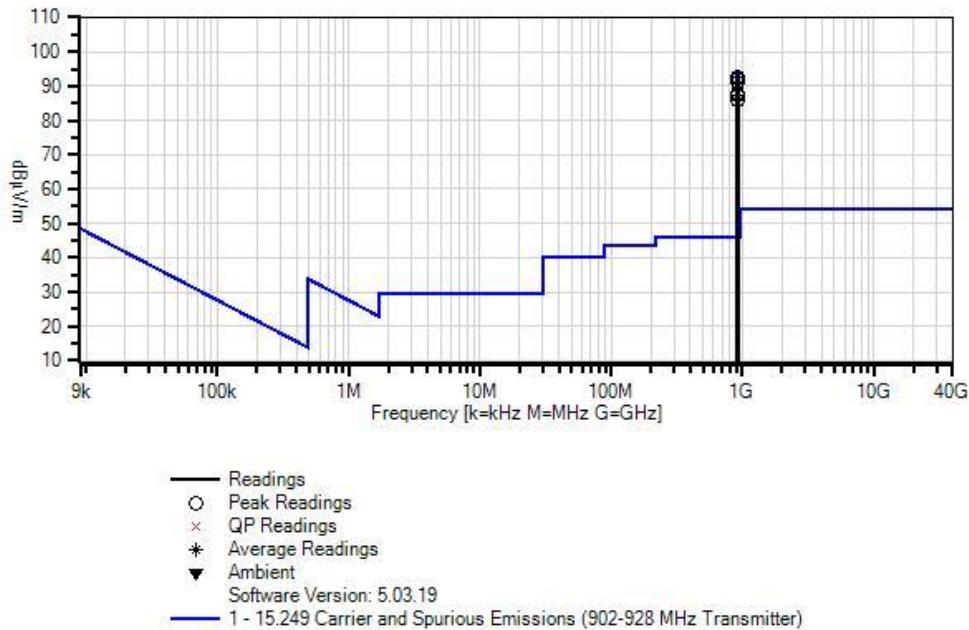
Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

Test Conditions / Notes:

The EUT is placed on Styrofoam platform and powered from 3.6V fresh battery. The EUT is connected to a remote located laptop running CLI Tool ver.2.0.1.24.
 EUT has fixed orientation per manufacturer's specification.
 Operating frequency range/ mode
 908 - 923.8MHz, 200kHz steps, 80 channels, 16384 OOK LV0
 Frequency of measurement: 908-923.8MHz
 RBW=1MHz, VBW=3MHz

Test Method: ANSI C63.10 (2013)
 Temperature (°C): 25.1
 Relative Humidity (%): 27

Itron, Inc. WO#: 104621 Sequence#: 1 Date: 12/21/2020
 15.249 Carrier and Spurious Emissions (902-928 MHz Transmitter) Test Distance: 3 Meters Horiz

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN03643	Spectrum Analyzer	E4440A	5/20/2020	5/20/2022
T1	ANP01911	Cable-Amplitude +15C to +45C (dB)	RG214/U	1/2/2020	1/2/2022
T2	ANP05281	Attenuator	1B	4/7/2020	4/7/2022
T3	AN01993	Biconilog Antenna	CBL6111C	6/11/2019	6/11/2021

Measurement Data:

Reading listed by margin.

Test Distance: 3 Meters

#	Freq MHz	Rdng dB μ V	T1 dB	T2 dB	T3 dB	Dist Table	Corr dB μ V/m	Spec dB μ V/m	Margin dB	Polar Ant
1	923.755M	59.6	+3.2	+6.0	+23.9	+0.0	92.7	94.0	-1.3	Vert
2	907.967M	59.4	+3.2	+6.0	+23.6	+0.0	92.2	94.0	-1.8	Vert
3	914.955M	58.4	+3.2	+6.0	+23.7	+0.0	91.3	94.0	-2.7	Vert
4	915.000M	54.7	+3.2	+6.0	+23.7	+0.0	87.6	94.0	-6.4	Horiz
5	908.000M	54.5	+3.2	+6.0	+23.6	+0.0	87.3	94.0	-6.7	Horiz
6	923.800M	52.8	+3.2	+6.0	+23.9	+0.0	85.9	94.0	-8.1	Horiz

Test Location: CKC Laboratories Inc. • 110 N. Olinda Pl. • Brea, CA 92823 • 714-993-6112
 Customer: **Itron, Inc.**
 Specification: **15.249 Carrier and Spurious Emissions (902-928 MHz Transmitter)**
 Work Order #: **104621** Date: 12/21/2020
 Test Type: **Radiated Emissions** Time: 14:05:08
 Tested By: Don Nguyen Sequence#: 2
 Software: EMITest 5.03.19

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 2			

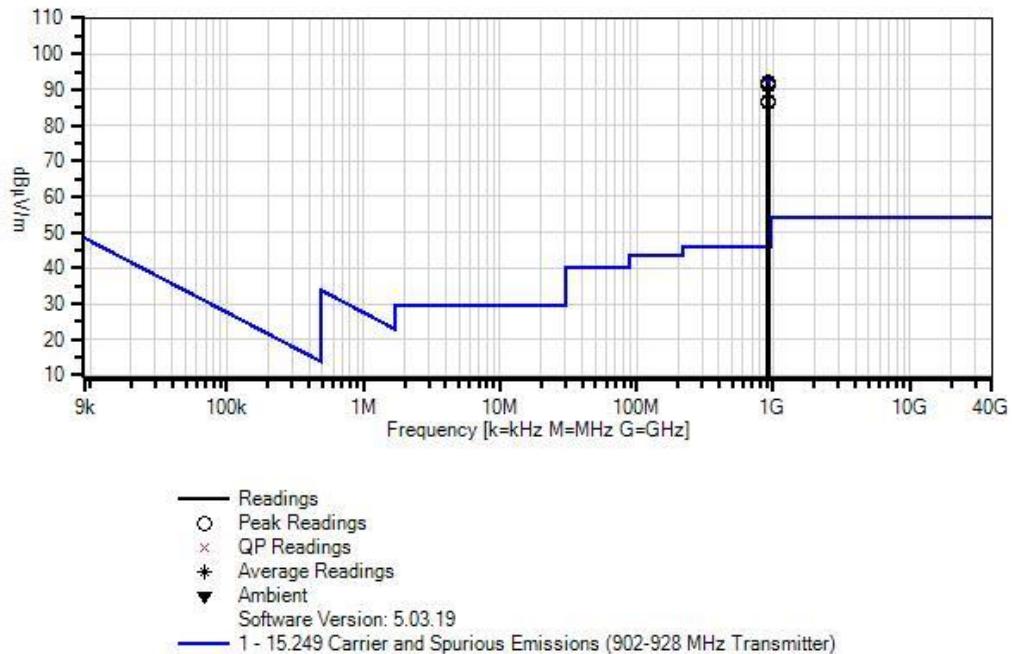
Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 2			

Test Conditions / Notes:

The EUT is placed on Styrofoam platform and powered from 3.6V fresh battery. The EUT is connected to a remote located laptop running CLI Tool ver.2.0.1.24.
 EUT has fixed orientation per manufacturer's specification.
 Operating frequency range/ mode
 908 - 923.8MHz, 200kHz steps, 80 channels, 16384 OOK LV0
 Frequency of measurement: 908-923.8MHz
 RBW=1MHz, VBW=3MHz

Test Method: ANSI C63.10 (2013)
 Temperature (°C): 25.1
 Relative Humidity (%): 27

Itron, Inc. WO#: 104621 Sequence#: 2 Date: 12/21/2020
 15.249 Carrier and Spurious Emissions (902-928 MHz Transmitter) Test Distance: 3 Meters Vert

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN03643	Spectrum Analyzer	E4440A	5/20/2020	5/20/2022
T1	ANP01911	Cable-Amplitude +15C to +45C (dB)	RG214/U	1/2/2020	1/2/2022
T2	ANP05281	Attenuator	1B	4/7/2020	4/7/2022
T3	AN01993	Biconilog Antenna	CBL6111C	6/11/2019	6/11/2021

Measurement Data:

Reading listed by margin.

Test Distance: 3 Meters

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar
1	907.977M	59.3	+3.2	+6.0	+23.6	+0.0	92.1	94.0	-1.9	Vert
2	923.800M	58.3	+3.2	+6.0	+23.9	+0.0	91.4	94.0	-2.6	Vert
3	915.033M	58.4	+3.2	+6.0	+23.7	+0.0	91.3	94.0	-2.7	Vert
4	923.833M	53.8	+3.2	+6.0	+23.9	+0.0	86.9	94.0	-7.1	Horiz
5	907.953M	53.7	+3.2	+6.0	+23.6	+0.0	86.5	94.0	-7.5	Horiz
6	915.040M	53.6	+3.2	+6.0	+23.7	+0.0	86.5	94.0	-7.5	Horiz

Test Location: CKC Laboratories Inc. • 110 N. Olinda Pl. • Brea, CA 92823 • 714-993-6112
 Customer: **Itron, Inc.**
 Specification: **15.249 Carrier and Spurious Emissions (902-928 MHz Transmitter)**
 Work Order #: **104621** Date: 12/21/2020
 Test Type: **Radiated Emissions** Time: 14:27:06
 Tested By: Don Nguyen Sequence#: 3
 Software: EMITest 5.03.19

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 3			

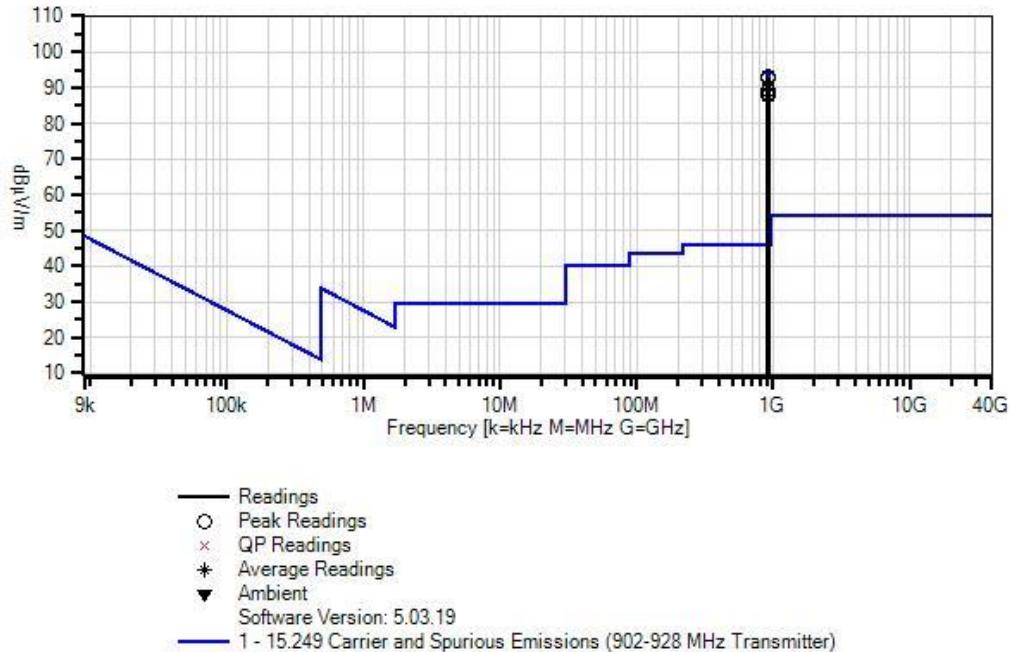
Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 3			

Test Conditions / Notes:

The EUT is placed on Styrofoam platform and powered from 3.6V fresh battery. The EUT is connected to a remote located laptop running CLI Tool ver.2.0.1.24.
 EUT has fixed orientation per manufacturer's specification.
 Operating frequency range/ mode
 908 - 923.8MHz, 200kHz steps, 80 channels, 16384 OOK LV0
 Frequency of measurement: 908-923.8MHz
 RBW=1MHz, VBW=3MHz

Test Method: ANSI C63.10 (2013)
 Temperature (°C): 25.1
 Relative Humidity (%): 27

Itron, Inc. WO#: 104621 Sequence#: 3 Date: 12/21/2020
 15.249 Carrier and Spurious Emissions (902-928 MHz Transmitter) Test Distance: 3 Meters Horiz

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN03643	Spectrum Analyzer	E4440A	5/20/2020	5/20/2022
T1	ANP01911	Cable-Amplitude +15C to +45C (dB)	RG214/U	1/2/2020	1/2/2022
T2	ANP05281	Attenuator	1B	4/7/2020	4/7/2022
T3	AN01993	Biconilog Antenna	CBL6111C	6/11/2019	6/11/2021
	AN00309	Preamplifier	8447D	12/24/2019	12/24/2021
	ANP05050	Cable	RG223/U	12/24/2018	12/24/2020

Measurement Data:

Reading listed by margin.

Test Distance: 3 Meters

#	Freq MHz	Rdng dBμV	T1 dB	T2 dB	T3 dB	Dist Table	Corr dBμV/m	Spec dBμV/m	Margin dB	Polar Ant
1	914.943M	60.1	+3.2	+6.0	+23.7	+0.0	93.0	94.0	-1.0	Vert
2	923.800M	59.8	+3.2	+6.0	+23.9	+0.0	92.9	94.0	-1.1	Vert
3	907.983M	59.7	+3.2	+6.0	+23.6	+0.0	92.5	94.0	-1.5	Vert
4	915.000M	56.1	+3.2	+6.0	+23.7	+0.0	89.0	94.0	-5.0	Horiz
5	908.000M	55.4	+3.2	+6.0	+23.6	+0.0	88.2	94.0	-5.8	Horiz
6	923.800M	54.9	+3.2	+6.0	+23.9	+0.0	88.0	94.0	-6.0	Horiz

Test Setup Photo(s)



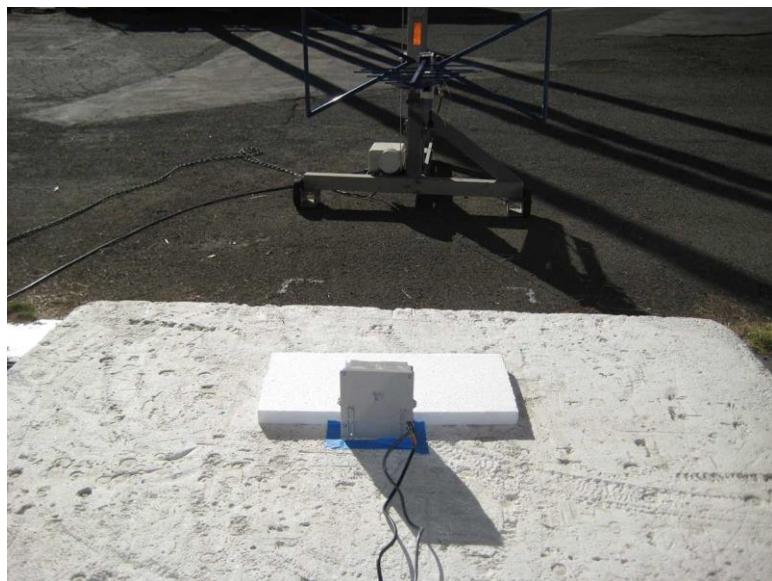
Configuration 1



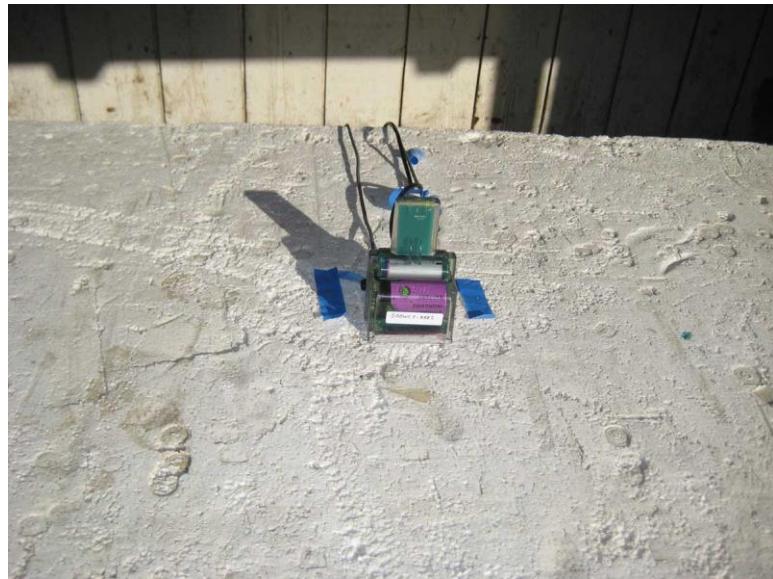
Configuration 1



Configuration 2



Configuration 2



Configuration 3



Configuration 3

15.249(a) Radiated Emissions and Bandedge

Test Setup / Conditions / Data

Test Location: CKC Laboratories Inc. • 110 N. Olinda Pl. • Brea, CA 92823 • 714-993-6112
 Customer: **Itron, Inc.**
 Specification: **15.249 Carrier and Spurious Emissions (902-928 MHz Transmitter)**
 Work Order #: **104621** Date: 1/7/2021
 Test Type: **Maximized Emissions** Time: 11:49:12
 Tested By: Don Nguyen Sequence#: 8
 Software: EMITest 5.03.19

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

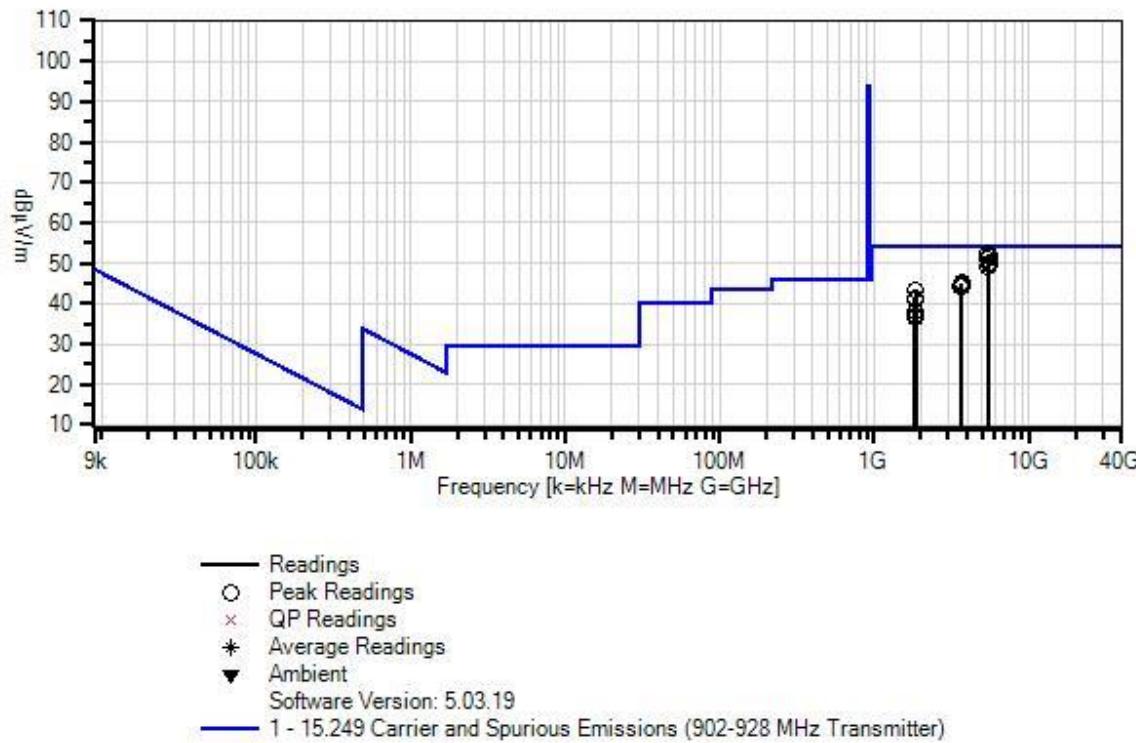
Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

Test Conditions / Notes:

The EUT is placed on Styrofoam platform and powered from 3.6V fresh battery. The EUT is connected to a remote located laptop running CLI Tool ver.2.0.1.24.
 EUT has fixed orientation per manufacturer's specification.
 Operating frequency range/ mode
 908 - 923.8MHz, 200kHz steps, 80 channels, 16384 OOK LV0
 Frequency of measurement: 9k-9280MHz
 9kHz to 150kHz RBW=0.2kHz, VBW=0.6kHz
 150kHz to 30MHz RBW=9kHz, VBW=27kHz
 30-1000MHz, RBW=120kHz, VBW=360kHz
 1000-9280MHz, RBW=1MHz, VBW=3MHz

Test Method: ANSI C63.10 (2013)
 Temperature (°C): 25.1
 Relative Humidity (%): 27

Itron, Inc. WO#: 104621 Sequence#: 8 Date: 1/7/2021
 15.249 Carrier and Spurious Emissions (902-928 MHz Transmitter) Test Distance: 3 Meters Vert

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN00314	Loop Antenna	6502	4/13/2020	4/13/2022
	ANP01911	Cable-Amplitude +15C to +45C (dB)	RG214/U	1/2/2020	1/2/2022
	ANP05281	Attenuator	1B	4/7/2020	4/7/2022
	AN01993	Biconilog Antenna	CBL6111C	6/11/2019	6/11/2021
	AN00309	Preamp	8447D	12/24/2019	12/24/2021
	ANP05050	Cable	RG223/U	12/14/2020	12/14/2022
	AN03643	Spectrum Analyzer	E4440A	5/20/2020	5/20/2022
T1	AN00786	Preamp	83017A	5/20/2020	5/20/2022
T2	AN00849	Horn Antenna	3115	3/17/2020	3/17/2022
T3	ANP06360	Cable	L1-PNMNM-48	8/8/2019	8/8/2021
T4	ANP07246	Cable	32022-29094K- 29094K-24TC	5/29/2020	5/29/2022
T5	AN03169	High Pass Filter	HM1155-11SS	5/8/2019	5/8/2021

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
1	5448.033M	49.4 +0.2	-37.2	+34.1	+5.1	+0.7	+0.0	52.3	54.0	-1.7	Horiz
2	5489.983M	49.1 +0.2	-37.2	+34.1	+5.1	+0.7	+0.0	52.0	54.0	-2.0	Horiz
3	5542.758M	48.6 +0.2	-37.3	+34.1	+5.1	+0.7	+0.0	51.4	54.0	-2.6	Horiz
4	5447.992M	48.1 +0.2	-37.2	+34.1	+5.1	+0.7	+0.0	51.0	54.0	-3.0	Vert
5	5542.758M	47.1 +0.2	-37.3	+34.1	+5.1	+0.7	+0.0	49.9	54.0	-4.1	Vert
6	5490.017M	46.6 +0.2	-37.2	+34.1	+5.1	+0.7	+0.0	49.5	54.0	-4.5	Vert
7	5447.983M	46.2 +0.2	-37.2	+34.1	+5.1	+0.7	+0.0	49.1	54.0	-4.9	Vert
8	3695.158M	46.1 +0.2	-38.1	+32.2	+4.0	+0.7	+0.0	45.1	54.0	-8.9	Vert
9	3695.158M	45.7 +0.2	-38.1	+32.2	+4.0	+0.7	+0.0	44.7	54.0	-9.3	Horiz
10	3632.017M	45.8 +0.2	-38.1	+31.9	+4.0	+0.7	+0.0	44.5	54.0	-9.5	Vert
11	3659.958M	45.5 +0.2	-38.1	+32.0	+4.0	+0.7	+0.0	44.3	54.0	-9.7	Horiz
12	3659.958M	45.4 +0.2	-38.1	+32.0	+4.0	+0.7	+0.0	44.2	54.0	-9.8	Vert
13	1847.558M	51.5 +0.2	-38.8	+27.0	+2.8	+0.4	+0.0	43.1	54.0	-10.9	Vert
14	1816.017M	49.9 +0.2	-38.8	+26.8	+2.8	+0.4	+0.0	41.3	54.0	-12.7	Vert
15	1829.958M	49.3 +0.2	-38.8	+26.9	+2.8	+0.4	+0.0	40.8	54.0	-13.2	Vert
16	1815.983M	46.7 +0.2	-38.8	+26.8	+2.8	+0.4	+0.0	38.1	54.0	-15.9	Horiz
17	1829.958M	45.6 +0.2	-38.8	+26.9	+2.8	+0.4	+0.0	37.1	54.0	-16.9	Horiz
18	1847.558M	45.0 +0.2	-38.8	+27.0	+2.8	+0.4	+0.0	36.6	54.0	-17.4	Horiz

Test Location: CKC Laboratories Inc. • 110 N. Olinda Pl. • Brea, CA 92823 • 714-993-6112
 Customer: **Itron, Inc.**
 Specification: **15.249 Carrier and Spurious Emissions (902-928 MHz Transmitter)**
 Work Order #: **104621** Date: 12/30/2020
 Test Type: **Maximized Emissions** Time: 12:50:09
 Tested By: Don Nguyen Sequence#: 6
 Software: EMITest 5.03.19

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 2			

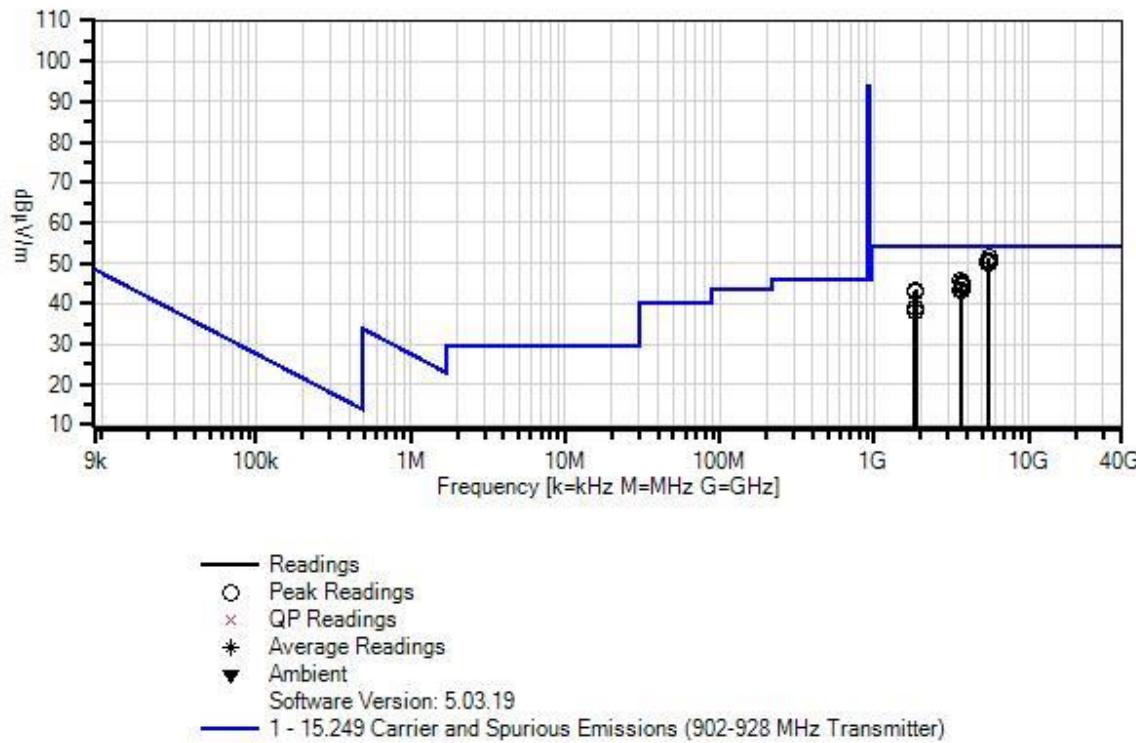
Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 2			

Test Conditions / Notes:

The EUT is placed on Styrofoam platform and powered from 3.6V fresh battery. The EUT is connected to a remote located laptop running CLI Tool ver.2.0.1.24.
 EUT has fixed orientation per manufacturer's specification.
 Operating frequency range/ mode
 908 - 923.8MHz, 200kHz steps, 80 channels, 16384 OOK LV0
 Frequency of measurement: 9k-9280MHz
 9kHz to 150kHz RBW=0.2kHz, VBW=0.6kHz
 150kHz to 30MHz RBW=9kHz, VBW=27kHz
 30-1000MHz, RBW=120kHz, VBW=360kHz
 1000-9280MHz, RBW=1MHz, VBW=3MHz

Test Method: ANSI C63.10 (2013)
 Temperature (°C): 25.1
 Relative Humidity (%): 27

Itron, Inc. WO#: 104621 Sequence#: 6 Date: 12/30/2020
 15.249 Carrier and Spurious Emissions (902-928 MHz Transmitter) Test Distance: 3 Meters Horiz

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN00314	Loop Antenna	6502	4/13/2020	4/13/2022
	ANP01911	Cable-Amplitude +15C to +45C (dB)	RG214/U	1/2/2020	1/2/2022
	ANP05281	Attenuator	1B	4/7/2020	4/7/2022
	AN01993	Biconilog Antenna	CBL6111C	6/11/2019	6/11/2021
	AN00309	Preamp	8447D	12/24/2019	12/24/2021
	ANP05050	Cable	RG223/U	12/14/2020	12/14/2022
	AN03643	Spectrum Analyzer	E4440A	5/20/2020	5/20/2022
T1	AN00786	Preamp	83017A	5/20/2020	5/20/2022
T2	AN00849	Horn Antenna	3115	3/17/2020	3/17/2022
T3	ANP06360	Cable	L1-PNMNM-48	8/8/2019	8/8/2021
T4	ANP07246	Cable	32022-29094K- 29094K-24TC	5/29/2020	5/29/2022
T5	AN03169	High Pass Filter	HM1155-11SS	5/8/2019	5/8/2021

Measurement Data:			Reading listed by margin.				Test Distance: 3 Meters				
#	Freq	Rdng	T1	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
			T5				Table	dB μ V/m	dB μ V/m		
			MHz	dB μ V	dB	dB	dB	Table	dB μ V/m	dB	Ant
1	5542.800M	48.5	-37.3 +0.2	+34.1	+5.1	+0.7	+0.0	51.3	54.0	-2.7	Vert
2	5542.800M	48.0	-37.3 +0.2	+34.1	+5.1	+0.7	+0.0	50.8	54.0	-3.2	Horiz
3	5448.000M	47.5	-37.2 +0.2	+34.1	+5.1	+0.7	+0.0	50.4	54.0	-3.6	Horiz
4	5448.000M	47.3	-37.2 +0.2	+34.1	+5.1	+0.7	+0.0	50.2	54.0	-3.8	Vert
5	5490.000M	47.3	-37.2 +0.2	+34.1	+5.1	+0.7	+0.0	50.2	54.0	-3.8	Vert
6	5490.000M	47.3	-37.2 +0.2	+34.1	+5.1	+0.7	+0.0	50.2	54.0	-3.8	Horiz
7	3632.000M	46.8	-38.1 +0.2	+31.9	+4.0	+0.7	+0.0	45.5	54.0	-8.5	Vert
8	3695.200M	46.3	-38.1 +0.2	+32.2	+4.0	+0.7	+0.0	45.3	54.0	-8.7	Horiz
9	3695.200M	45.8	-38.1 +0.2	+32.2	+4.0	+0.7	+0.0	44.8	54.0	-9.2	Vert
10	3660.000M	45.6	-38.1 +0.2	+32.0	+4.0	+0.7	+0.0	44.4	54.0	-9.6	Vert
11	1847.600M	51.9	-38.8 +0.2	+27.0	+2.8	+0.4	+0.0	43.5	54.0	-10.5	Vert
12	3632.000M	44.6	-38.1 +0.2	+31.9	+4.0	+0.7	+0.0	43.3	54.0	-10.7	Horiz
13	3660.000M	44.5	-38.1 +0.2	+32.0	+4.0	+0.7	+0.0	43.3	54.0	-10.7	Horiz
14	1830.000M	51.5	-38.8 +0.2	+26.9	+2.8	+0.4	+0.0	43.0	54.0	-11.0	Vert
15	1816.000M	51.3	-38.8 +0.2	+26.8	+2.8	+0.4	+0.0	42.7	54.0	-11.3	Vert
16	1847.600M	47.6	-38.8 +0.2	+27.0	+2.8	+0.4	+0.0	39.2	54.0	-14.8	Horiz
17	1816.000M	47.4	-38.8 +0.2	+26.8	+2.8	+0.4	+0.0	38.8	54.0	-15.2	Horiz
18	1830.000M	46.5	-38.8 +0.2	+26.9	+2.8	+0.4	+0.0	38.0	54.0	-16.0	Horiz

Test Location: CKC Laboratories Inc. • 110 N. Olinda Pl. • Brea, CA 92823 • 714-993-6112
 Customer: **Itron, Inc.**
 Specification: **15.249 Carrier and Spurious Emissions (902-928 MHz Transmitter)**
 Work Order #: **104621** Date: 12/31/2020
 Test Type: **Maximized Emissions** Time: 09:24:35
 Tested By: Don Nguyen Sequence#: 7
 Software: EMITest 5.03.19

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 3			

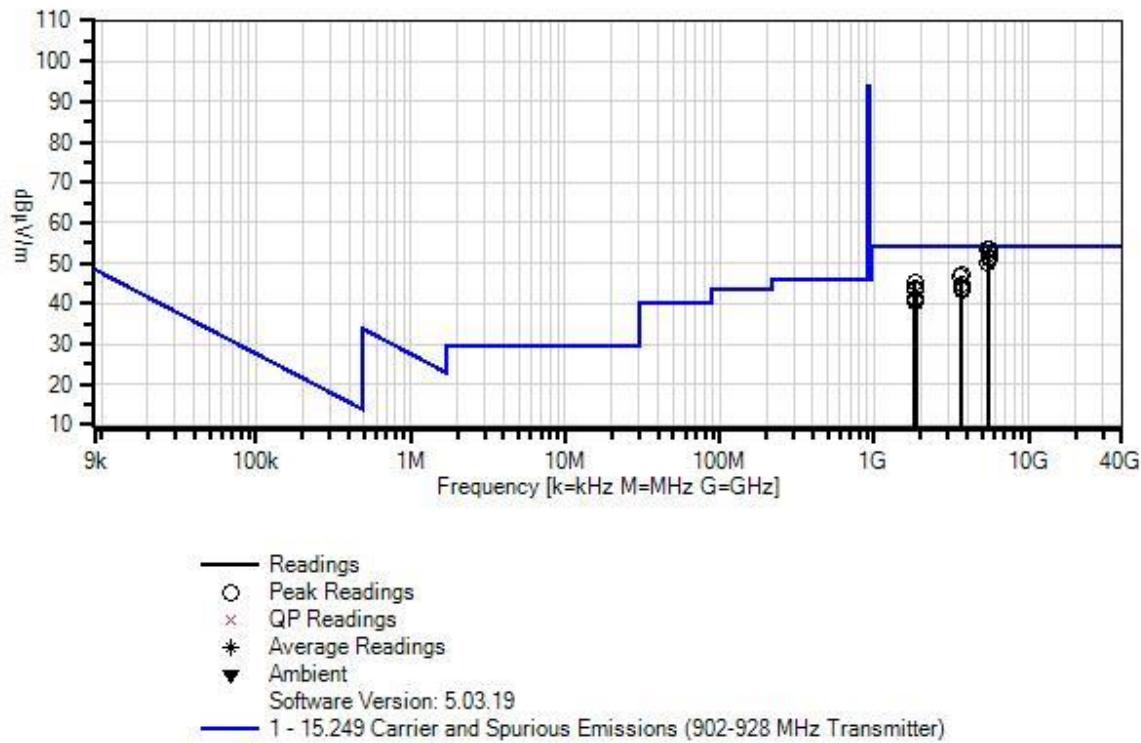
Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 3			

Test Conditions / Notes:

The EUT is placed on Styrofoam platform and powered from 3.6V fresh battery. The EUT is connected to a remote located laptop running CLI Tool ver.2.0.1.24.
 EUT has fixed orientation per manufacturer's specification.
 Operating frequency range/ mode
 908 - 923.8MHz, 200kHz steps, 80 channels, 16384 OOK LV0
 Frequency of measurement: 9k-9280MHz
 9kHz to 150kHz RBW=0.2kHz, VBW=0.6kHz
 150kHz to 30MHz RBW=9kHz, VBW=27kHz
 30-1000MHz, RBW=120kHz, VBW=360kHz
 1000-9280MHz, RBW=1MHz, VBW=3MHz

Test Method: ANSI C63.10 (2013)
 Temperature (°C): 25.1
 Relative Humidity (%): 27

Itron, Inc. WO#: 104621 Sequence#: 7 Date: 12/31/2020
 15.249 Carrier and Spurious Emissions (902-928 MHz Transmitter) Test Distance: 3 Meters Vert

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN00314	Loop Antenna	6502	4/13/2020	4/13/2022
	ANP01911	Cable-Amplitude +15C to +45C (dB)	RG214/U	1/2/2020	1/2/2022
	ANP05281	Attenuator	1B	4/7/2020	4/7/2022
	AN01993	Biconilog Antenna	CBL6111C	6/11/2019	6/11/2021
	AN00309	Preamp	8447D	12/24/2019	12/24/2021
	ANP05050	Cable	RG223/U	12/14/2020	12/14/2022
	AN03643	Spectrum Analyzer	E4440A	5/20/2020	5/20/2022
T1	AN00786	Preamp	83017A	5/20/2020	5/20/2022
T2	AN00849	Horn Antenna	3115	3/17/2020	3/17/2022
T3	ANP06360	Cable	L1-PNMNM-48	8/8/2019	8/8/2021
T4	ANP07246	Cable	32022-29094K- 29094K-24TC	5/29/2020	5/29/2022
T5	AN03169	High Pass Filter	HM1155-11SS	5/8/2019	5/8/2021

Measurement Data:			Reading listed by margin.				Test Distance: 3 Meters				
#	Freq	Rdng	T1	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
			T5				Table	dB μ V/m	dB μ V/m		
			MHz	dB μ V	dB	dB	dB	Table	dB μ V/m	dB	Ant
1	5448.000M	50.7	-37.2 +0.2	+34.1	+5.1	+0.7	+0.0	53.6	54.0	-0.4	Vert
2	5490.000M	50.5	-37.2 +0.2	+34.1	+5.1	+0.7	+0.0	53.4	54.0	-0.6	Vert
3	5542.800M	49.8	-37.3 +0.2	+34.1	+5.1	+0.7	+0.0	52.6	54.0	-1.4	Vert
4	5542.800M	48.8	-37.3 +0.2	+34.1	+5.1	+0.7	+0.0	51.6	54.0	-2.4	Horiz
5	5490.000M	48.0	-37.2 +0.2	+34.1	+5.1	+0.7	+0.0	50.9	54.0	-3.1	Horiz
6	5448.000M	47.1	-37.2 +0.2	+34.1	+5.1	+0.7	+0.0	50.0	54.0	-4.0	Horiz
7	3660.000M	48.2	-38.1 +0.2	+32.0	+4.0	+0.7	+0.0	47.0	54.0	-7.0	Vert
8	3632.000M	48.0	-38.1 +0.2	+31.9	+4.0	+0.7	+0.0	46.7	54.0	-7.3	Vert
9	1830.000M	53.7	-38.8 +0.2	+26.9	+2.8	+0.4	+0.0	45.2	54.0	-8.8	Vert
10	3695.200M	45.9	-38.1 +0.2	+32.2	+4.0	+0.7	+0.0	44.9	54.0	-9.1	Vert
11	1816.000M	52.5	-38.8 +0.2	+26.8	+2.8	+0.4	+0.0	43.9	54.0	-10.1	Vert
12	3660.000M	44.8	-38.1 +0.2	+32.0	+4.0	+0.7	+0.0	43.6	54.0	-10.4	Horiz
13	3695.200M	44.5	-38.1 +0.2	+32.2	+4.0	+0.7	+0.0	43.5	54.0	-10.5	Horiz
14	1847.600M	51.8	-38.8 +0.2	+27.0	+2.8	+0.4	+0.0	43.4	54.0	-10.6	Vert
15	1816.000M	49.8	-38.8 +0.2	+26.8	+2.8	+0.4	+0.0	41.2	54.0	-12.8	Horiz
16	1830.000M	49.4	-38.8 +0.2	+26.9	+2.8	+0.4	+0.0	40.9	54.0	-13.1	Horiz
17	1847.600M	48.7	-38.8 +0.2	+27.0	+2.8	+0.4	+0.0	40.3	54.0	-13.7	Horiz

Band Edge

Band Edge Summary GAS REMOTE - Configuration 1

Frequency (MHz)	Modulation	Ant. Type	Field Strength (dBuV/m @3m)	Limit (dBuV/m @3m)	Results
902	OOK LV0	PCB Trace	43.3	<46	Pass
928	OOK LV0	PCB Trace	42.8*	<46	Pass

*QP detector

Band Edge Summary WATER REMOTE - Configuration 2

Frequency (MHz)	Modulation	Ant. Type	Field Strength (dBuV/m @3m)	Limit (dBuV/m @3m)	Results
902	OOK LV0	PCB Trace	41.1	<46	Pass
928	OOK LV0	PCB Trace	40.9*	<46	Pass

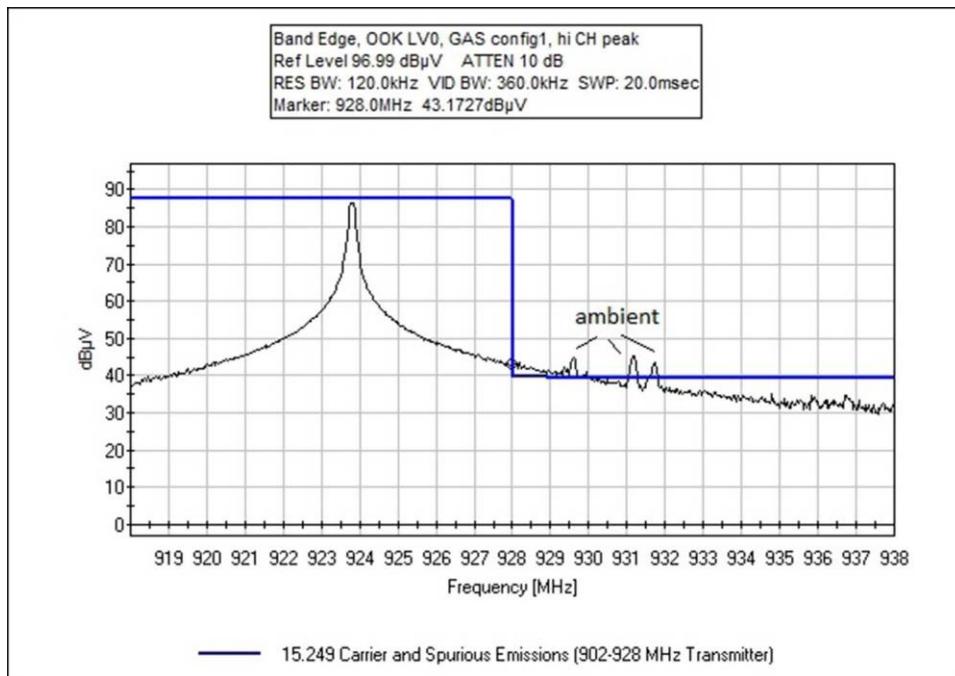
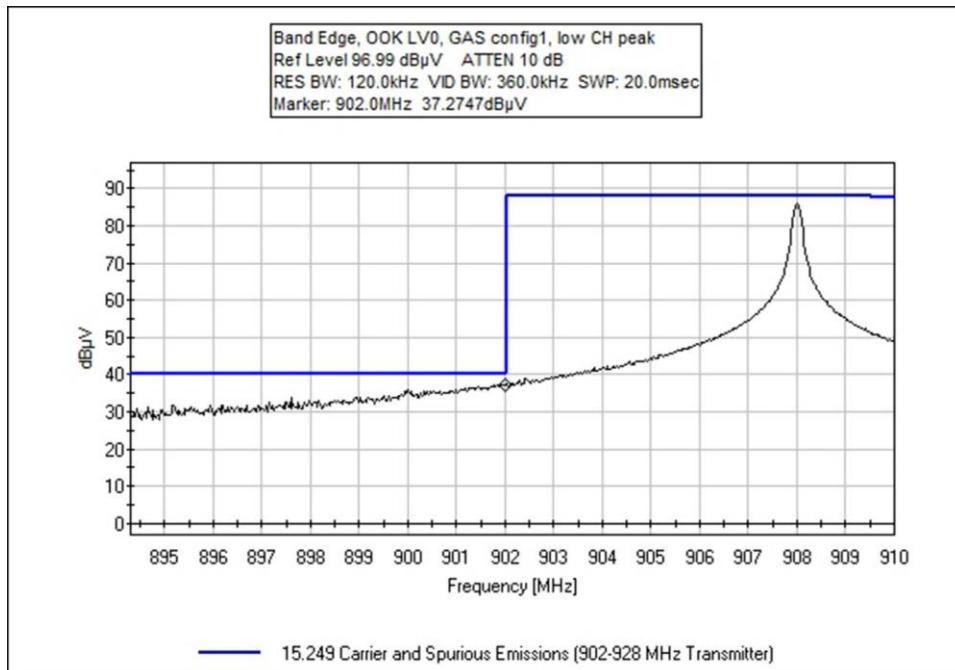
*QP detector

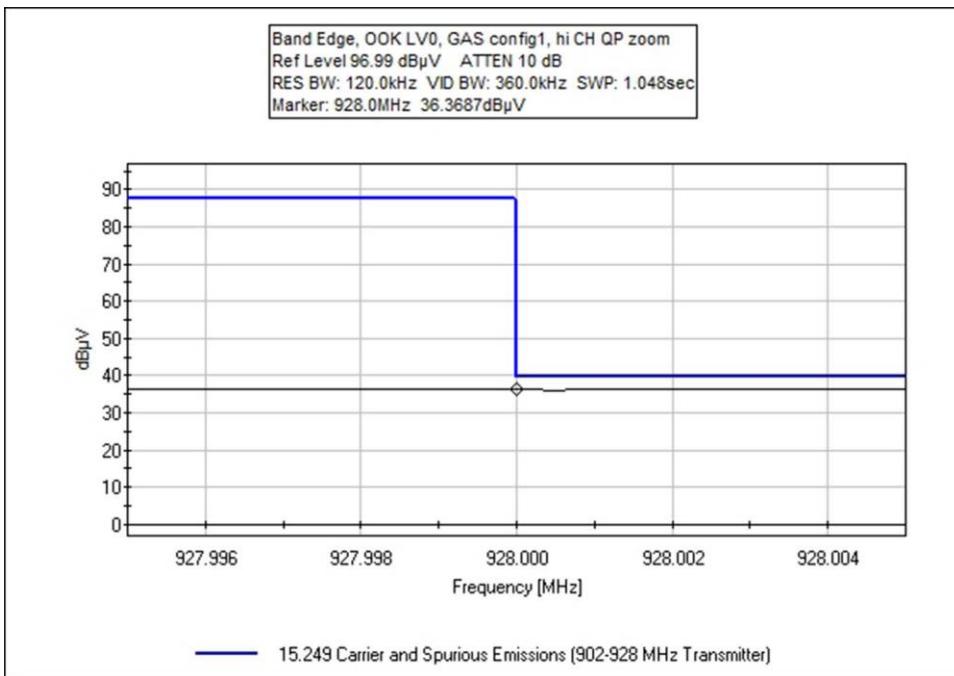
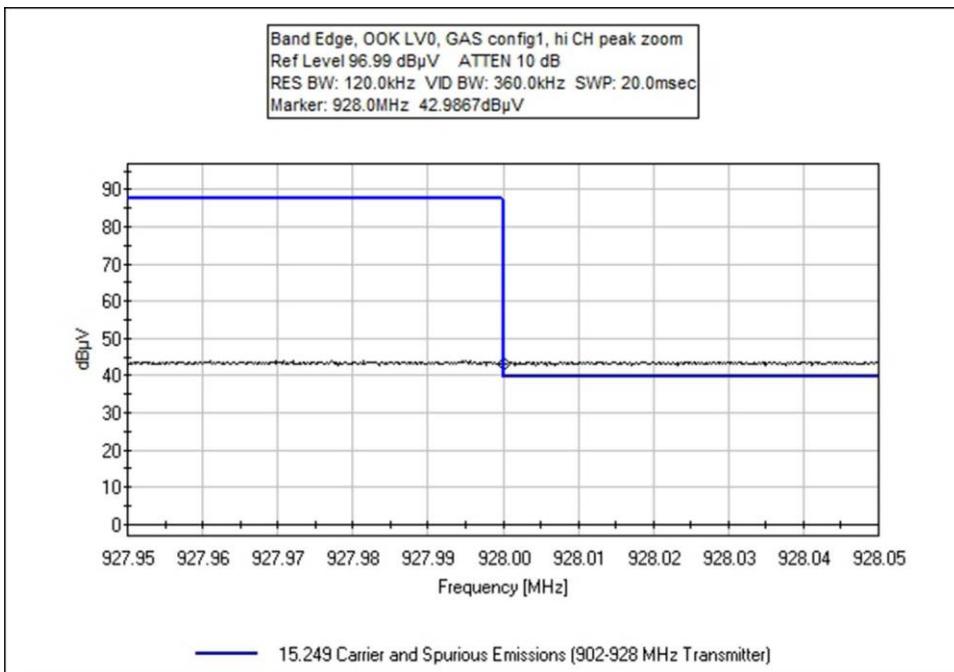
Band Edge Summary PIT - Configuration 3

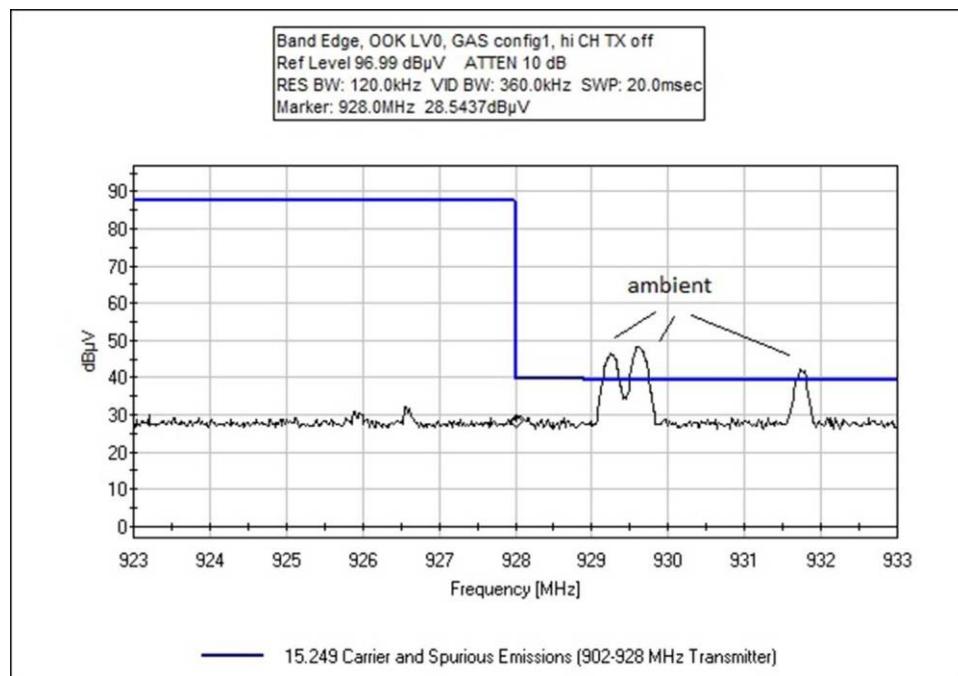
Frequency (MHz)	Modulation	Ant. Type	Field Strength (dBuV/m @3m)	Limit (dBuV/m @3m)	Results
902	OOK LV0	PCB Trace	43.7	<46	Pass
928	OOK LV0	PCB Trace	42.2*	<46	Pass

*QP detector

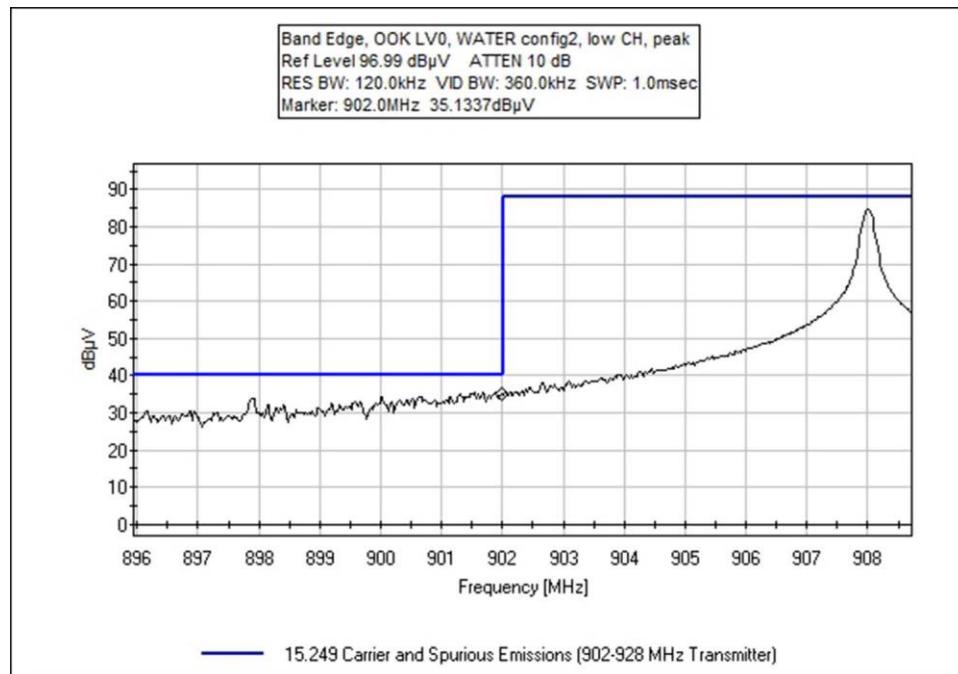
Band Edge Plots, Configuration 1

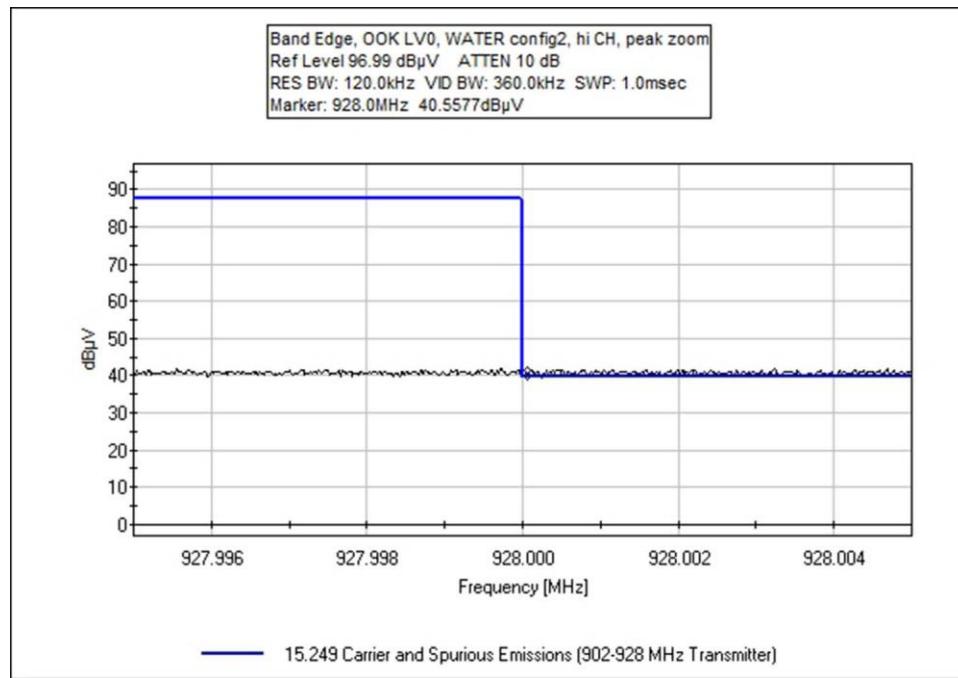
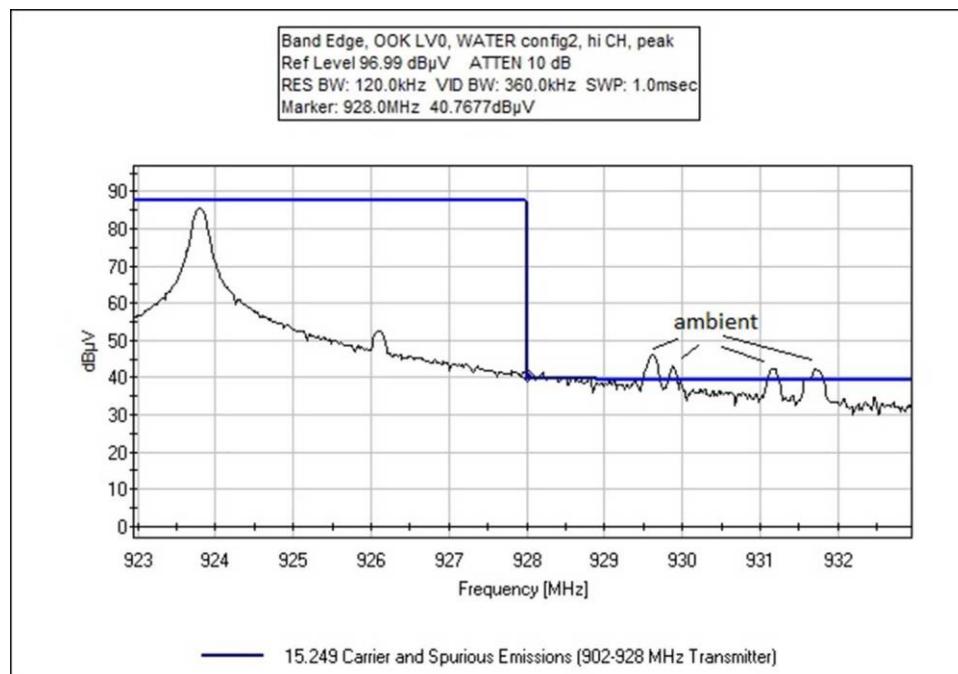


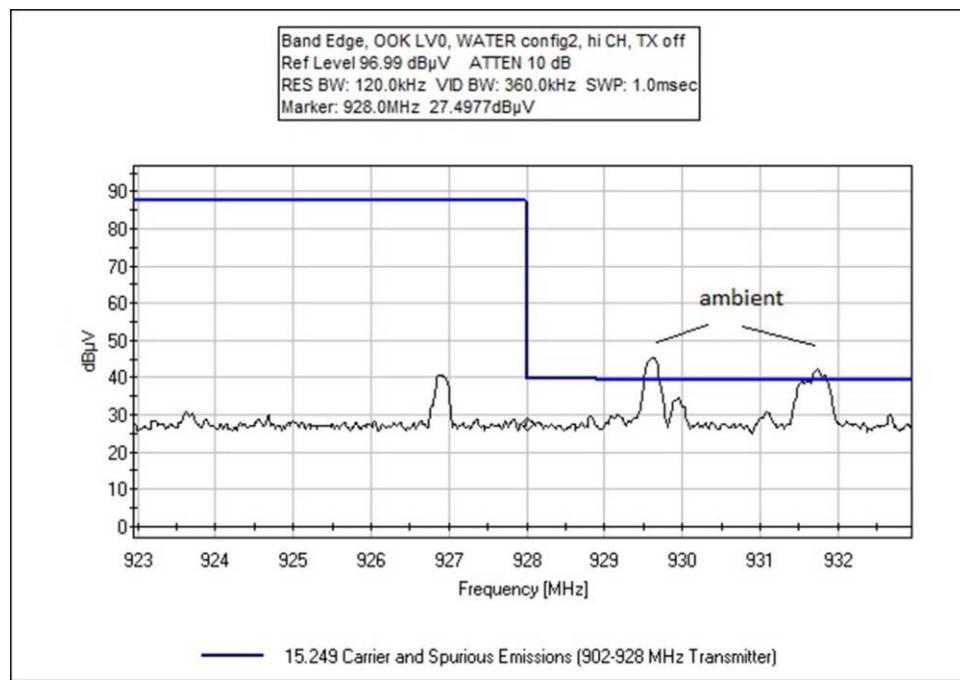
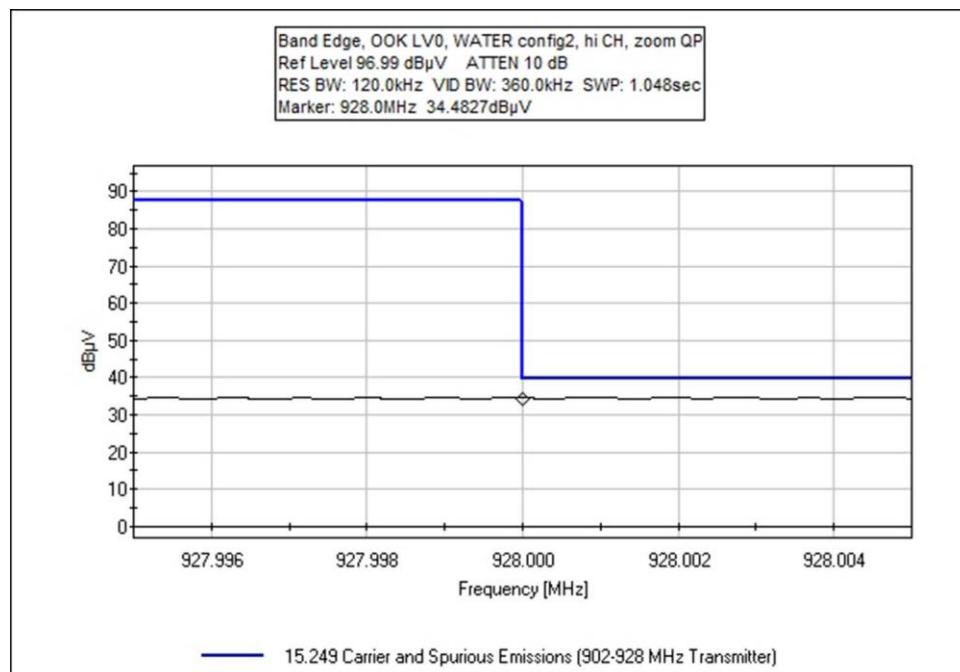




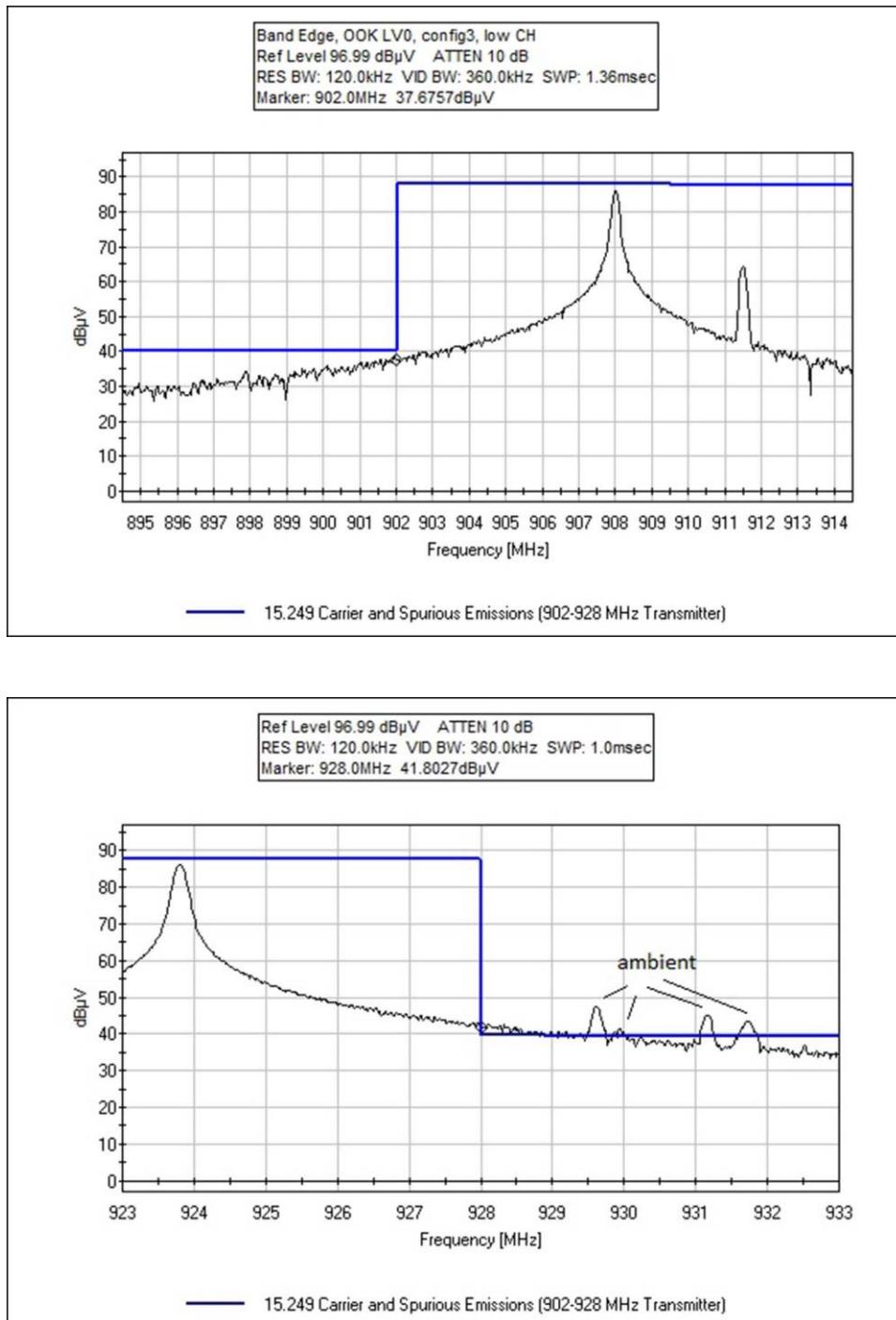
Band Edge Plots, Configuration 2

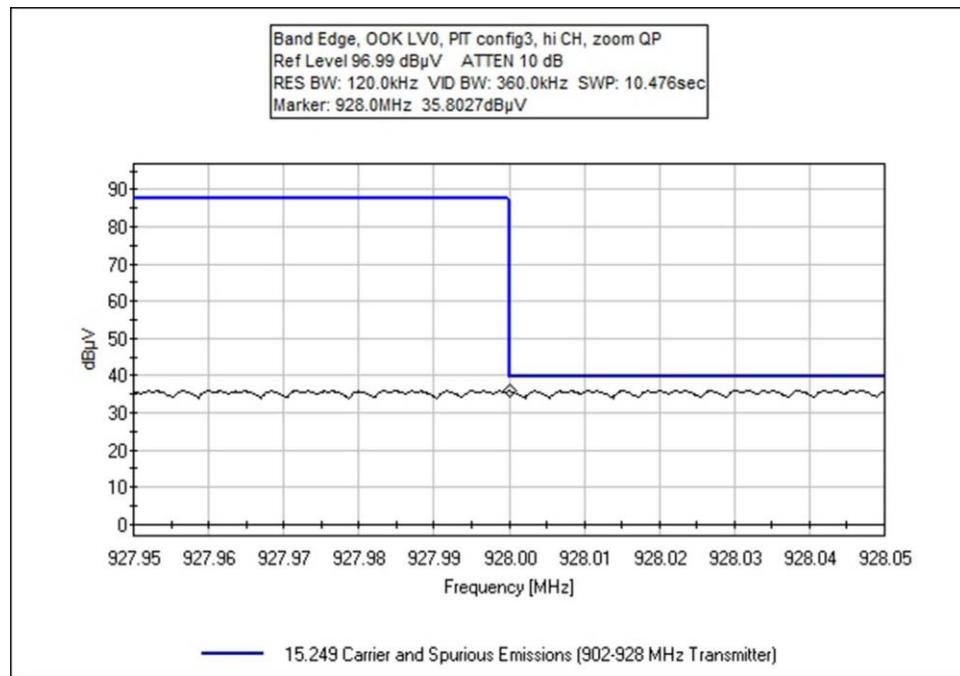
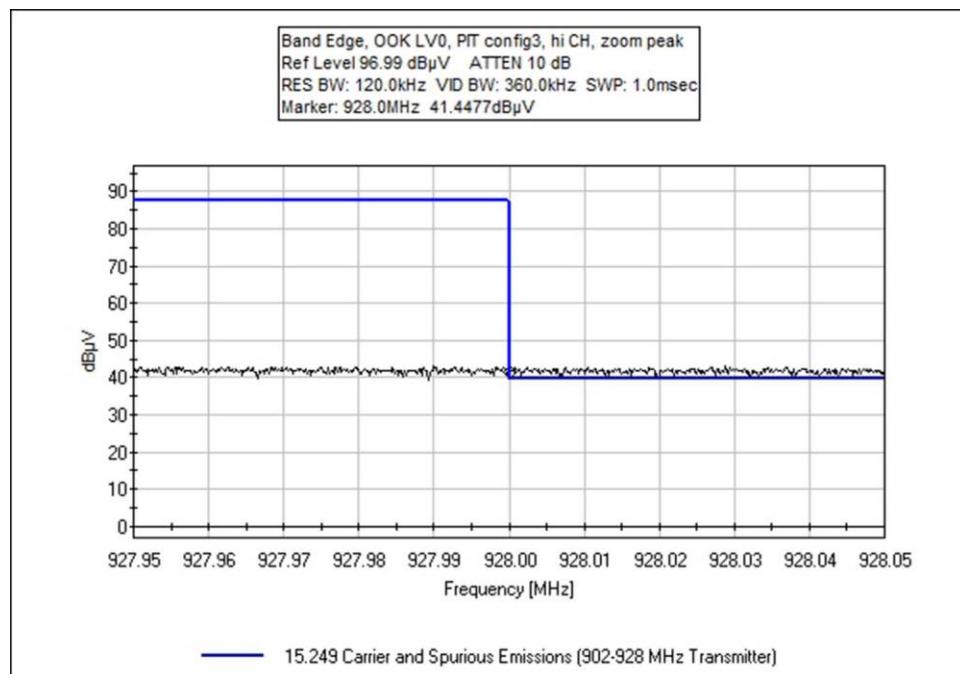


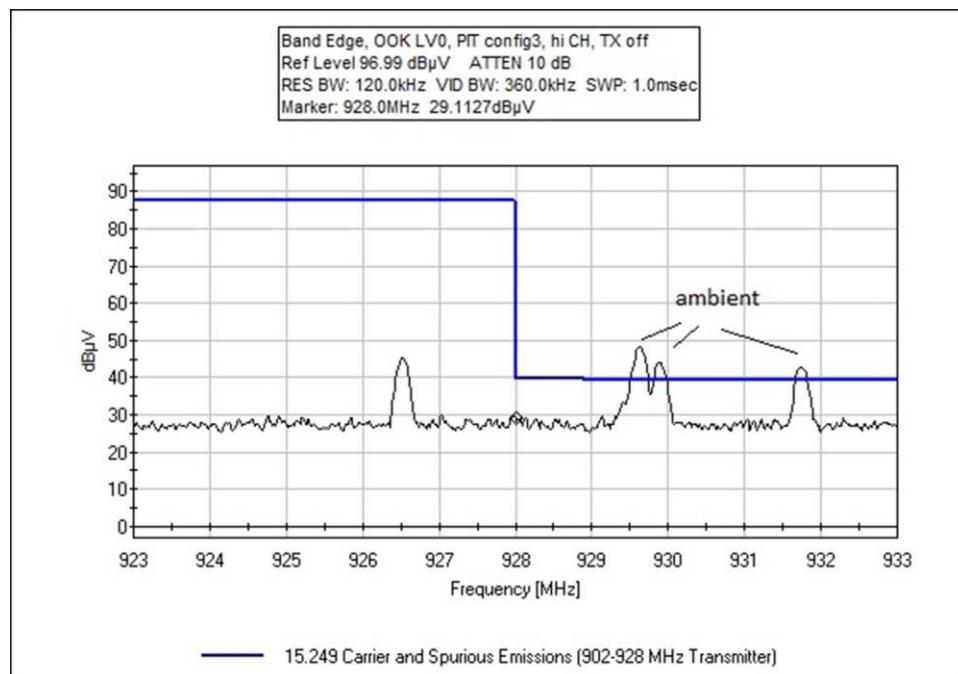




Band Edge Plots, Configuration 3







Test Setup / Conditions / Data

Test Location: CKC Laboratories Inc. • 110 N. Olinda Pl. • Brea, CA 92823 • 714-993-6112
 Customer: **Itron, Inc.**
 Specification: **15.249 Carrier and Spurious Emissions (902-928 MHz Transmitter)**
 Work Order #: **104621** Date: 12/22/2020
 Test Type: **Radiated Emissions** Time: 08:25:45
 Tested By: Don Nguyen Sequence#: 6
 Software: EMITest 5.03.19

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

Test Conditions / Notes:

The EUT is placed on Styrofoam platform and powered from 3.6V fresh battery. The EUT is connected to a remote located laptop running CLI Tool ver.2.0.1.24.
 EUT has fixed orientation per manufacturer's specification.
 Operating frequency range/ mode
 908 - 923.8MHz, 200kHz steps, 80 channels, 16384 OOK LV0
 Frequency of measurement: 902-928
 RBW=120kHz, VBW=360kHz

Test Method: ANSI C63.10 (2013)
 Temperature (°C): 25.1
 Relative Humidity (%): 27

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN03643	Spectrum Analyzer	E4440A	5/20/2020	5/20/2022
T2	ANP01911	Cable-Amplitude +15C to +45C (dB)	RG214/U	1/2/2020	1/2/2022
T3	ANP05281	Attenuator	1B	4/7/2020	4/7/2022
T4	AN01993	Biconilog Antenna	CBL6111C	6/11/2019	6/11/2021
T5	AN00309	Preamp	8447D	12/24/2019	12/24/2021
T6	ANP05050	Cable	RG223/U	12/24/2018	12/24/2020

Measurement Data:

Reading listed by margin.

Test Distance: 3 Meters

#	Freq	Rdng	T1	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dB μ V	dB	dB	dB	dB	Table	dB μ V/m	dB μ V/m	dB	Ant
1	902.000M	37.3	+0.0	+3.2	+6.0	+23.5	+0.0	43.3	46.0	-2.7	Vert
			-27.1	+0.4							
2	928.000M	36.4	+0.0	+3.3	+6.0	+23.9	+0.0	42.8	46.0	-3.2	Vert
	QP		-27.2	+0.4							
^	928.000M	43.0	+0.0	+3.3	+6.0	+23.9	+0.0	49.4	46.0	+3.4	Vert
			-27.2	+0.4							

Test Location: CKC Laboratories Inc. • 110 N. Olinda Pl. • Brea, CA 92823 • 714-993-6112
 Customer: **Itron, Inc.**
 Specification: **15.249 Carrier and Spurious Emissions (902-928 MHz Transmitter)**
 Work Order #: **104621** Date: 12/21/2020
 Test Type: **Radiated Emissions** Time: 15:48:07
 Tested By: Don Nguyen Sequence#: 5
 Software: EMITest 5.03.19

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 2			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 2			

Test Conditions / Notes:

The EUT is placed on Styrofoam platform and powered from 3.6V fresh battery. The EUT is connected to a remote located laptop running CLI Tool ver.2.0.1.24.
EUT has fixed orientation per manufacturer's specification.
Operating frequency range/ mode
908 - 923.8MHz, 200kHz steps, 80 channels, 16384 OOK LV0
Frequency of measurement: 902-928
RBW=120kHz, VBW=360kHz
Test Method: ANSI C63.10 (2013)
Temperature (°C): 25.1
Relative Humidity (%): 27

Test Equipment:

ID	Asset #/Serial #	Description	Model	Calibration Date	Cal Due Date
T1	AN03643	Spectrum Analyzer	E4440A	5/20/2020	5/20/2022
T2	ANP01911	Cable-Amplitude +15C to +45C (dB)	RG214/U	1/2/2020	1/2/2022
T3	ANP05281	Attenuator	1B	4/7/2020	4/7/2022
T4	AN01993	Biconilog Antenna	CBL6111C	6/11/2019	6/11/2021
T5	AN00309	Preamp	8447D	12/24/2019	12/24/2021
T6	ANP05050	Cable	RG223/U	12/24/2018	12/24/2020

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

#	Freq	Rdng	T1	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
			T5	T6			Table	dB μ V/m	dB μ V/m		
	MHz	dB μ V	dB	dB	dB	dB				dB	Ant
1	902.000M	35.1	+0.0	+3.2	+6.0	+23.5	+0.0	41.1	46.0	-4.9	Vert
			-27.1	+0.4							
2	928.000M	34.5	+0.0	+3.3	+6.0	+23.9	+0.0	40.9	46.0	-5.1	Vert
	QP		-27.2	+0.4							
^	928.000M	40.6	+0.0	+3.3	+6.0	+23.9	+0.0	47.0	46.0	+1.0	Vert
			-27.2	+0.4							

Test Location: CKC Laboratories Inc. • 110 N. Olinda Pl. • Brea, CA 92823 • 714-993-6112
 Customer: **Itron, Inc.**
 Specification: **15.249 Carrier and Spurious Emissions (902-928 MHz Transmitter)**
 Work Order #: **104621** Date: 12/21/2020
 Test Type: **Radiated Emissions** Time: 15:30:56
 Tested By: Don Nguyen Sequence#: 4
 Software: EMITest 5.03.19

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 3			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 3			

Test Conditions / Notes:

The EUT is placed on Styrofoam platform and powered from 3.6V fresh battery. The EUT is connected to a remote located laptop running CLI Tool ver.2.0.1.24.
 EUT has fixed orientation per manufacturer's specification.
 Operating frequency range/ mode
 908 - 923.8MHz, 200kHz steps, 80 channels, 16384 OOK LV0
 Frequency of measurement: 902-928
 RBW=120kHz, VBW=360kHz
 Test Method: ANSI C63.10 (2013)
 Temperature (°C): 25.1
 Relative Humidity (%): 27

Test Equipment:

ID	Asset #/Serial #	Description	Model	Calibration Date	Cal Due Date
T1	AN03643	Spectrum Analyzer	E4440A	5/20/2020	5/20/2022
T2	ANP01911	Cable-Amplitude +15C to +45C (dB)	RG214/U	1/2/2020	1/2/2022
T3	ANP05281	Attenuator	1B	4/7/2020	4/7/2022
T4	AN01993	Biconilog Antenna	CBL6111C	6/11/2019	6/11/2021
T5	AN00309	Preamp	8447D	12/24/2019	12/24/2021
T6	ANP05050	Cable	RG223/U	12/24/2018	12/24/2020

Measurement Data:

Reading listed by margin.

Test Distance: 3 Meters

#	Freq	Rdng	T1	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
			T5	T6			Table	dB μ V/m	dB μ V/m		
	MHz	dB μ V	dB	dB	dB	dB				dB	Ant
1	902.000M	37.7	+0.0	+3.2	+6.0	+23.5	+0.0	43.7	46.0	-2.3	Vert
			-27.1	+0.4							
2	928.000M	35.8	+0.0	+3.3	+6.0	+23.9	+0.0	42.2	46.0	-3.8	Vert
	QP		-27.2	+0.4							
^	928.000M	41.4	+0.0	+3.3	+6.0	+23.9	+0.0	47.8	46.0	+1.8	Vert
			-27.2	+0.4							

Test Setup Photo(s)



Configuration 1, Below 1GHz



Configuration 1, Below 1GHz



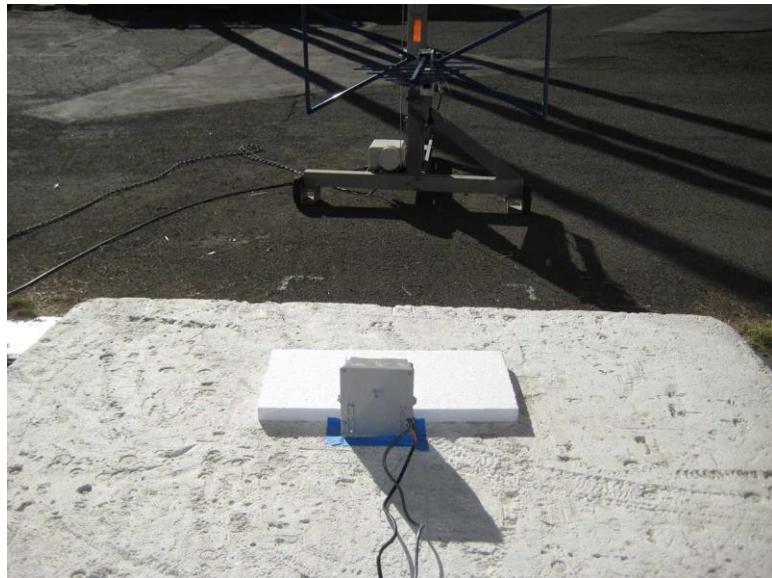
Configuration 1, Above 1GHz



Configuration 1, Above 1GHz



Configuration 2, Below 1GHz



Configuration 2, Below 1GHz



Configuration 2, Above 1GHz



Configuration 2, Above 1GHz



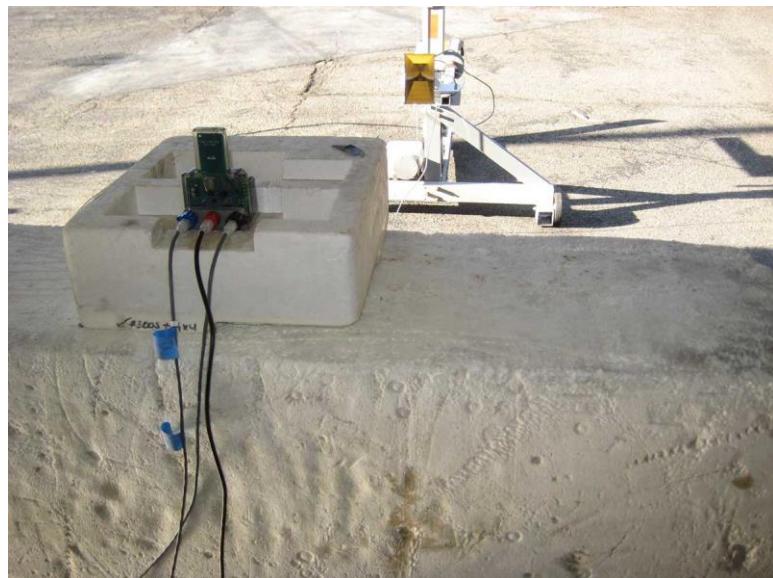
Configuration 3, Below 1GHz



Configuration 3, Below 1GHz



Configuration 3, Above 1GHz



Configuration 3, Above 1GHz

SUPPLEMENTAL INFORMATION

Measurement Uncertainty

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

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

Emissions Test Details

TESTING PARAMETERS

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

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

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

CORRECTION FACTORS

The basic spectrum analyzer reading was converted using correction factors as shown in the highest emissions readings in the tables. For radiated emissions in dB μ V/m, the spectrum analyzer reading in dB μ 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	(dB μ V)
+ Antenna Factor	(dB/m)
+ Cable Loss	(dB)
- Distance Correction	(dB)
- Preamplifier Gain	(dB)
= Corrected Reading	(dB μ V/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.