Itron, Inc

TEST REPORT FOR

IRM-STAR
Model: OW3

Tested to The Following Standards:

FCC Part 15 Subpart C Section(s)

15.207 & 15.247
(FHSS 902-928MHz)

Report No.: 108561-2

Date of issue: November 20, 2023

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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ADMINISTRATIVE INFORMATION

Test Report Information

REPORT PREPARED FOR:

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

Representative: Jack McPeck
Customer Reference Number: 283655

REPORT PREPARED BY:

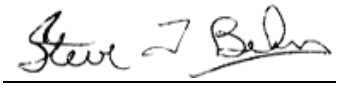
Viviana Prado
CKC Laboratories, Inc.
5046 Sierra Pines Drive
Mariposa, CA 95338

Project Number: 108561

DATE OF EQUIPMENT RECEIPT: September 8, 2023
DATE(S) OF TESTING: September 8, 11, 13, and 19, 2023 and October 13, 2023

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.
22116 23rd Drive SE, Suite A
Bothell, WA 98021

Software Versions

CKC Laboratories Proprietary Software	Version
EMITest Emissions	5.03.20

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 - 15.247 (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	Pass
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	Pass

NA = Not Applicable
NP = CKC Laboratories was not contracted to perform test.

ISO/IEC 17025 Decision Rule
The equipment sample utilized for testing is selected by the manufacturer. The declaration of pass or fail herein is a binary statement for simple acceptance rule (ILAC G8) based upon assessment to the specification(s) listed above, without consideration of measurement uncertainties. For performance related tests, equipment was monitored for specified criteria identified in that section of testing.

Modifications During Testing

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

Summary of Conditions
No modifications were made during testing.

Modifications listed above must be incorporated into all production units.

Conditions During Testing

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

Summary of Conditions
None

EQUIPMENT UNDER TEST (EUT)

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

Configuration 1

Equipment Tested:

Device	Manufacturer	Model #	S/N
IRM-STAR	Itron, Inc.	OW3	354233798

Support Equipment:

Device	Manufacturer	Model #	S/N
Integrated Multi-purpose Antenna	Cisco	ANT-5G-MP-OUT-N	NA
Integrated Multi-purpose Antenna	Cisco	ANT-5G-MP-OUT-N	NA
Laptop	Dell	Latitude E6430	NA
Integrated Multi-purpose Antenna	Cisco	ANT-5G-MP-OUT-N	NA
Router Host	Cisco	IR8140H	NA

Configuration 2

Equipment Tested:

Device	Manufacturer	Model #	S/N
IRM-STAR	Itron, Inc.	OW3	354233798

Support Equipment:

Device	Manufacturer	Model #	S/N
Integrated Multi-purpose Antenna	Cisco	ANT-5G-MP-OUT-N	NA
Integrated Multi-purpose Antenna	Cisco	ANT-5G-MP-OUT-N	NA
Laptop	Dell	Latitude E6430	NA
Antenna (5.5 dBi remote ISM)	PCTEL	BOA9025NM-ITR	NA
Router Host	Cisco	IR8140H	NA

Configuration 3

Equipment Tested:

Device	Manufacturer	Model #	S/N
IRM-STAR	Itron, Inc.	OW3	354233798

Support Equipment:

Device	Manufacturer	Model #	S/N
Integrated Multi-purpose Antenna	Cisco	ANT-5G-MP-OUT-N	NA
Integrated Multi-purpose Antenna	Cisco	ANT-5G-MP-OUT-N	NA
Laptop	Dell	Latitude E6430	NA
Antenna (8.15 dBi remote ISM)	PCTEL	BOA9028	NA
1dB Attenuator (Qty: 2)	Mini-Circuits	15542 UNAT-1+	NA
Surge Protector	Times Microwave Systems	LP-BTRW-NMP	NA
Router Host	Cisco	IR8140H	NA

Configuration 4

Equipment Tested:

Device	Manufacturer	Model #	S/N
IRM-STAR	Itron, Inc.	OW3	354233798

Support Equipment:

Device	Manufacturer	Model #	S/N
Laptop	Dell	Latitude E6430	NA
Router Host	Cisco	IR8140H	NA

Configuration 5

Equipment Tested:

Device	Manufacturer	Model #	S/N
IRM-STAR	Itron, Inc.	OW3	354233791

Support Equipment:

Device	Manufacturer	Model #	S/N
Integrated Multi-purpose Antenna	Cisco	ANT-5G-MP-OUT-N	NA
Integrated Multi-purpose Antenna	Cisco	ANT-5G-MP-OUT-N	NA
Laptop	Dell	Latitude E6430	NA
Integrated Multi-purpose Antenna	Cisco	ANT-5G-MP-OUT-N	NA
Router Host	Cisco	IR8140H	NA

Configuration 6

Equipment Tested:

Device	Manufacturer	Model #	S/N
IRM-STAR	Itron, Inc.	OW3	354233791

Support Equipment:

Device	Manufacturer	Model #	S/N
Integrated Multi-purpose Antenna	Cisco	ANT-5G-MP-OUT-N	NA
Integrated Multi-purpose Antenna	Cisco	ANT-5G-MP-OUT-N	NA
Laptop	Dell	Latitude E6430	NA
Antenna (5.5 dBi remote ISM)	PCTEL	BOA9025NM-ITR	NA
Router Host	Cisco	IR8140H	NA

Configuration 7

Equipment Tested:

Device	Manufacturer	Model #	S/N
IRM-STAR	Itron, Inc.	OW3	354233791

Support Equipment:

Device	Manufacturer	Model #	S/N
Integrated Multi-purpose Antenna	Cisco	ANT-5G-MP-OUT-N	NA
Integrated Multi-purpose Antenna	Cisco	ANT-5G-MP-OUT-N	NA
Laptop	Dell	Latitude E6430	NA
Antenna (8.15 dBi remote ISM)	PCTEL	BOA9028	NA
Router Host	Cisco	IR8140H	NA

Configuration 8

Equipment Tested:

Device	Manufacturer	Model #	S/N
IRM-STAR	Itron, Inc.	OW3	354233802

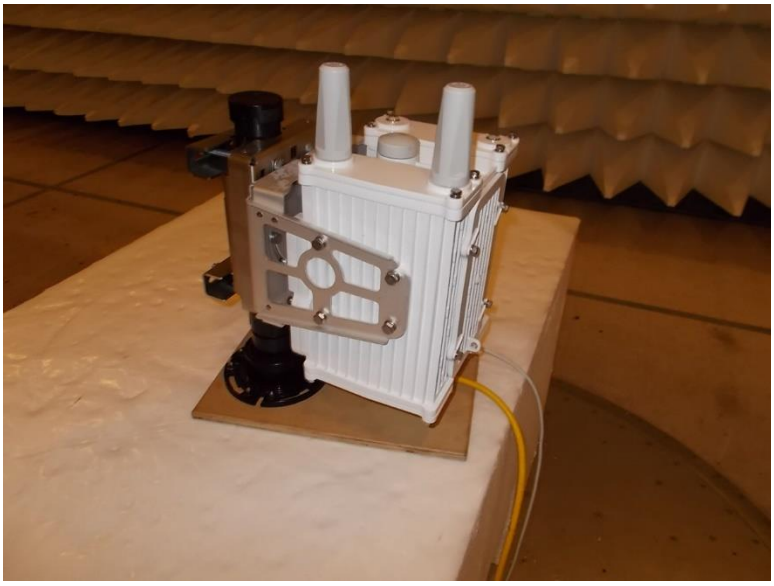
Support Equipment:

Device	Manufacturer	Model #	S/N
Laptop	Dell	Latitude E6430	NA
12V Power Supply	Cisco	IR8140 Power Module	NA

General Product Information:

Product Information	Manufacturer-Provided Details
Equipment Type:	Limited Modular, CISCO IR8140H Host
Type of Wideband System:	Proprietary FHSS
Operating Frequency Range:	902.20-927.75MHz
Number of Hopping Channels:	512
Receiver Bandwidth and Synchronization:	The manufacturer declares the receiver input bandwidth matches the transmit channel bandwidth and shifts frequencies in synchronization with the transmitter.
Modulation Type(s):	10k and 25k GFSK
Maximum Duty Cycle:	Tested 100% as worst case
Number of TX Chains:	1
Antenna Type(s) and Gain:	1 x external attached 2.0dBi 1 x external remote 5.5dBi 1 x external remote 8.15dBi (requires 3dB of cable loss/attenuators to be attached per manufacturer)
Beamforming Type:	N/A
Antenna Connection Type:	External Connector
Nominal Input Voltage:	115VAC, 60Hz
Firmware / Software used for Test:	CAM3 FCC Test Helper v1 Putty Release 0.78 Firmware 5.3.194
The validity of results is dependent on the stated product details, the accuracy of which the manufacturer assumes full responsibility.	

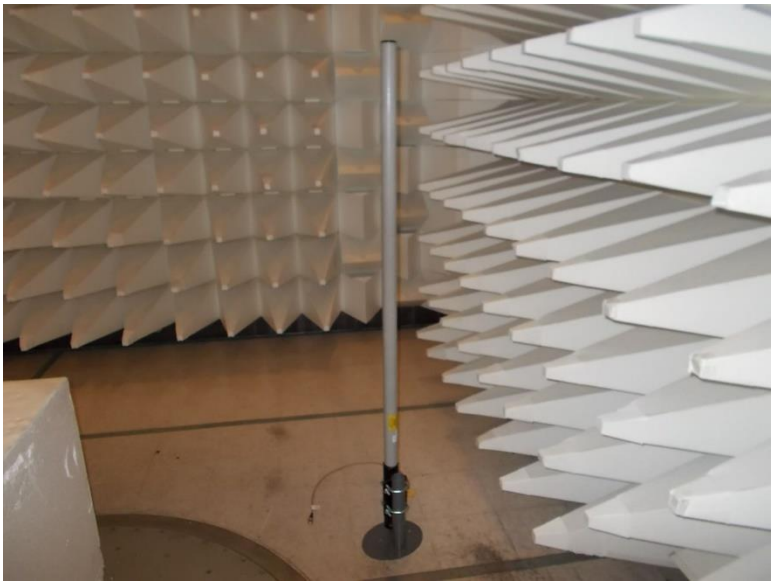
EUT Photo(s)



Support Equipment Photo(s)

Antenna Configuration 1 and Cellular

Antenna Configuration 2

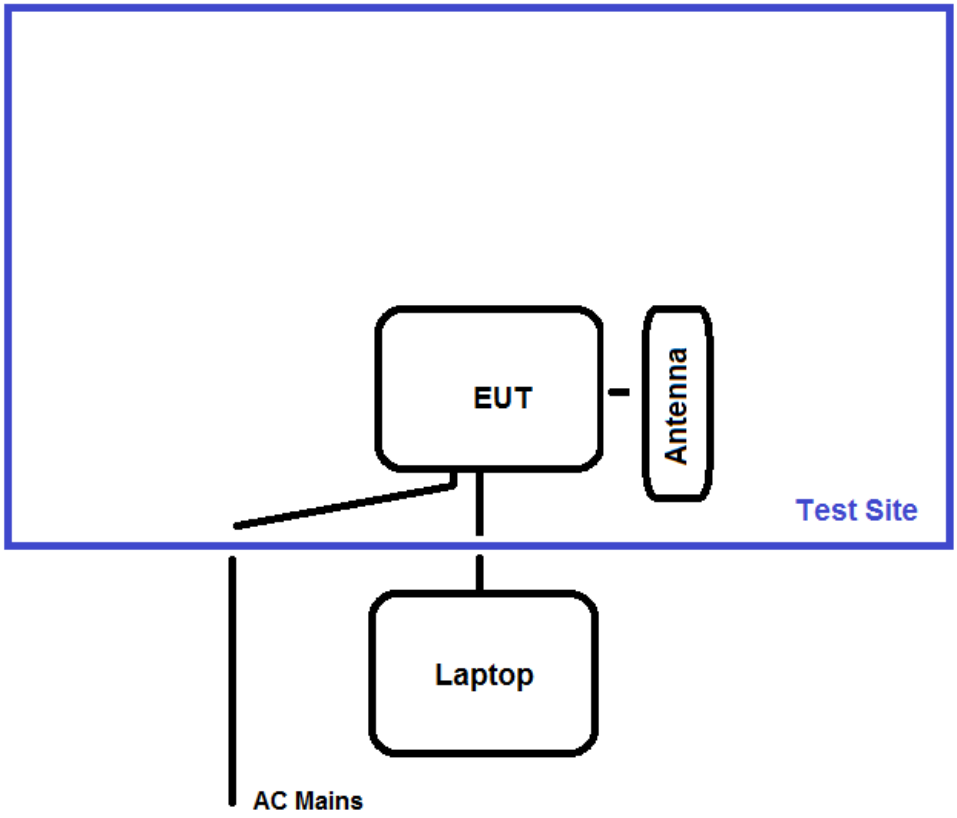


Antenna Configuration 3

Laptop

Block Diagram of Test Setup(s)

Test Setup Block Diagram



FCC Part 15 Subpart C

15.247(b)(2) Output Power

Test Data Summary - Voltage Variations					
Frequency (MHz)	Modulation / Ant Port	$V_{Minimum}$ (dBm)	$V_{Nominal}$ (dBm)	$V_{Maximum}$ (dBm)	Max Deviation from $V_{Nominal}$ (dB)
902.2	10kHz FSK	25.4	25.4	25.4	0.0
915.0	10kHz FSK	26.0	26.0	26.0	0.0
927.75	10kHz FSK	24.5	24.5	24.5	0.0
902.2	25kHz FSK	25.3	25.3	25.3	0.0
915.0	25kHz FSK	25.9	25.9	25.9	0.0
927.75	25kHz FSK	24.5	24.5	24.5	0.0

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

Parameter Definitions:

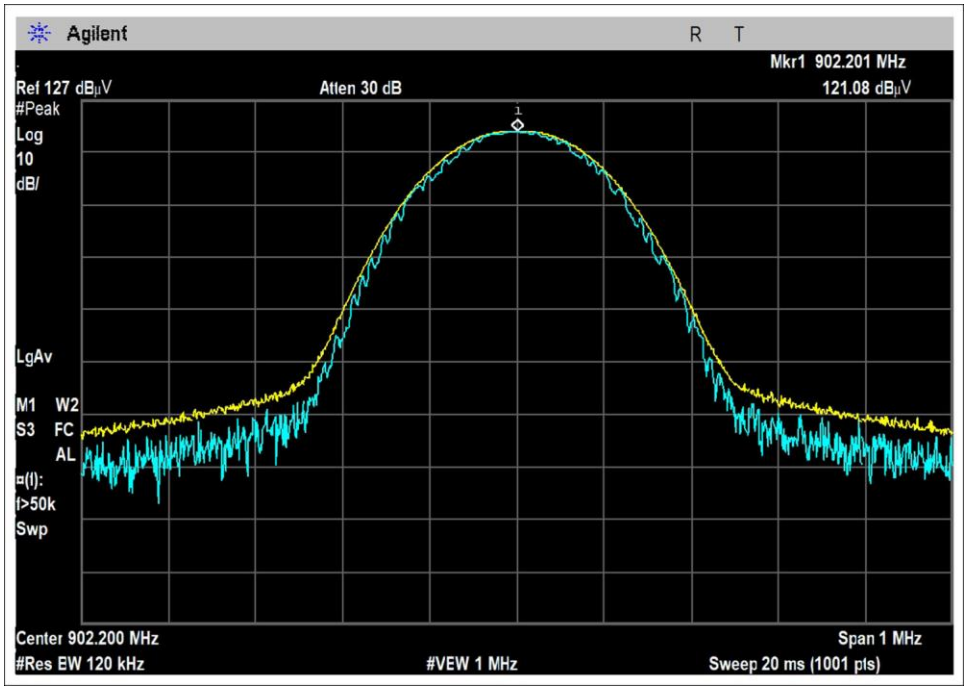
Measurements performed at input voltage Vnominal ± 15%.

Parameter	Value
$V_{Nominal}$:	132.25V/60Hz
$V_{Minimum}$:	115V/60Hz
$V_{Maximum}$:	97.75V/60Hz

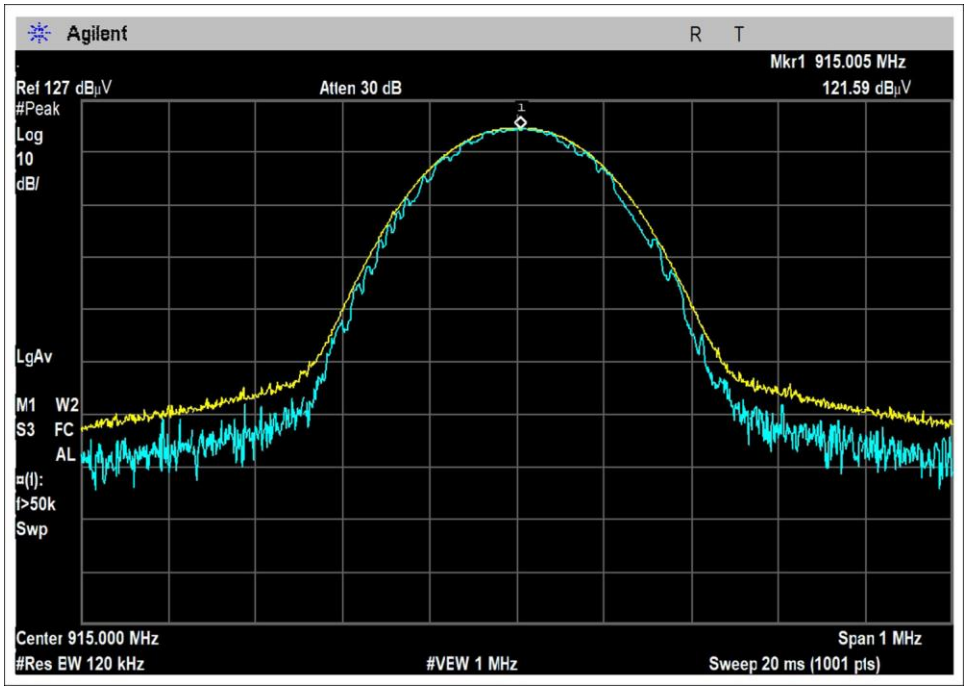
Test Data Summary - RF Conducted Measurement					
$Limit = \begin{cases} 30dBm\ Conducted/36dBm\ EIRP \mid \geq 50\ Channels \\ 24dBm\ Conducted/30dBm\ EIRP \mid < 50\ Channels\ (\min 25) \end{cases}$					
Frequency (MHz)	Modulation	Ant. Type / Gain (dBi)	Measured (dBm)	Limit (dBm)	Results
902.2	10kHz FSK	Multi-purpose 2dBi, Omni 5.5dBi and Remote ISM 8.15dBi with >2.15 cable loss.	25.4	≤30	Pass
915.0	10kHz FSK	Multi-purpose 2dBi, Omni 5.5dBi and Remote ISM 8.15dBi with >2.15 cable loss.	26.0	≤30	Pass
927.75	10kHz FSK	Multi-purpose 2dBi, Omni 5.5dBi and Remote ISM 8.15dBi with >2.15 cable loss.	24.5	≤30	Pass
902.2	25kHz FSK	Multi-purpose 2dBi, Omni 5.5dBi and Remote ISM 8.15dBi with >2.15 cable loss.	25.3	≤30	Pass
915.0	25kHz FSK	Multi-purpose 2dBi, Omni 5.5dBi and Remote ISM 8.15dBi with >2.15 cable loss.	25.9	≤30	Pass
927.75	25kHz FSK	Multi-purpose 2dBi, Omni 5.5dBi and Remote ISM 8.15dBi with >2.15 cable loss.	24.5	≤30	Pass

Plots

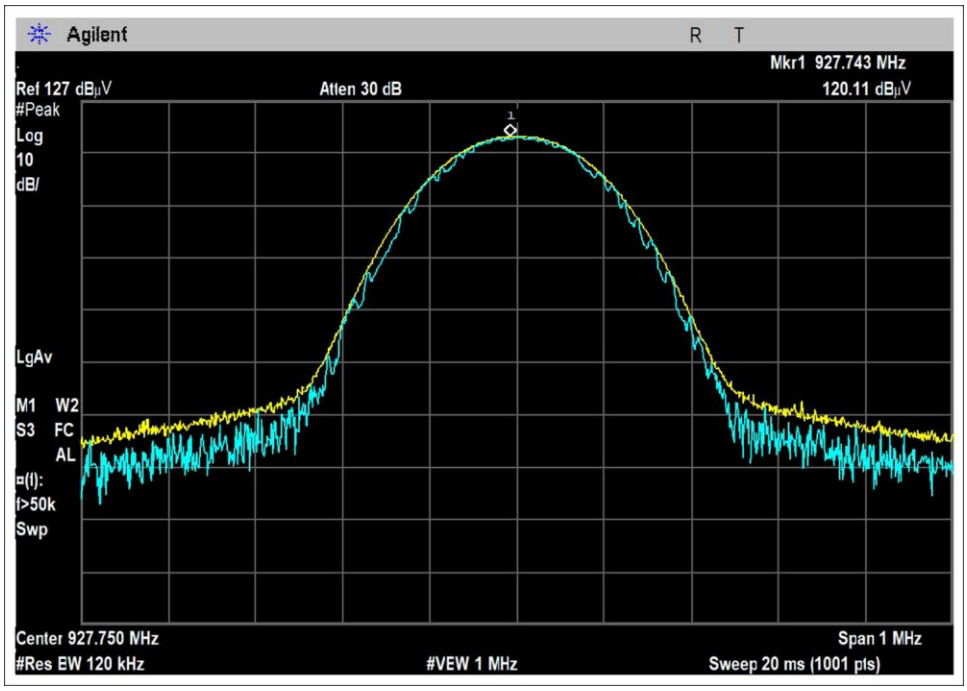
10kHz FSK



Low Channel

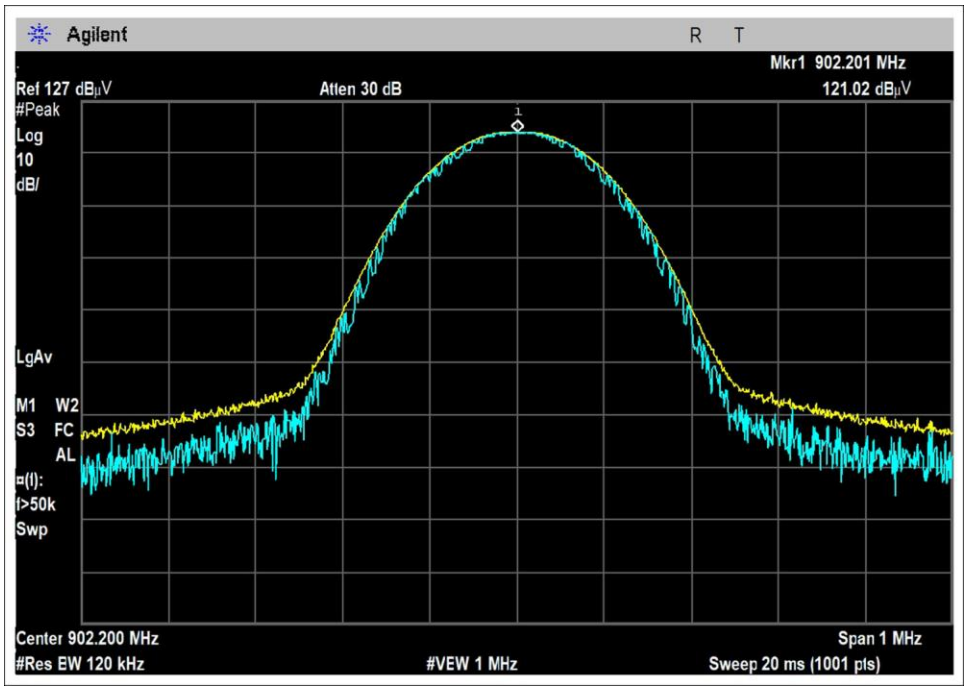


Middle Channel

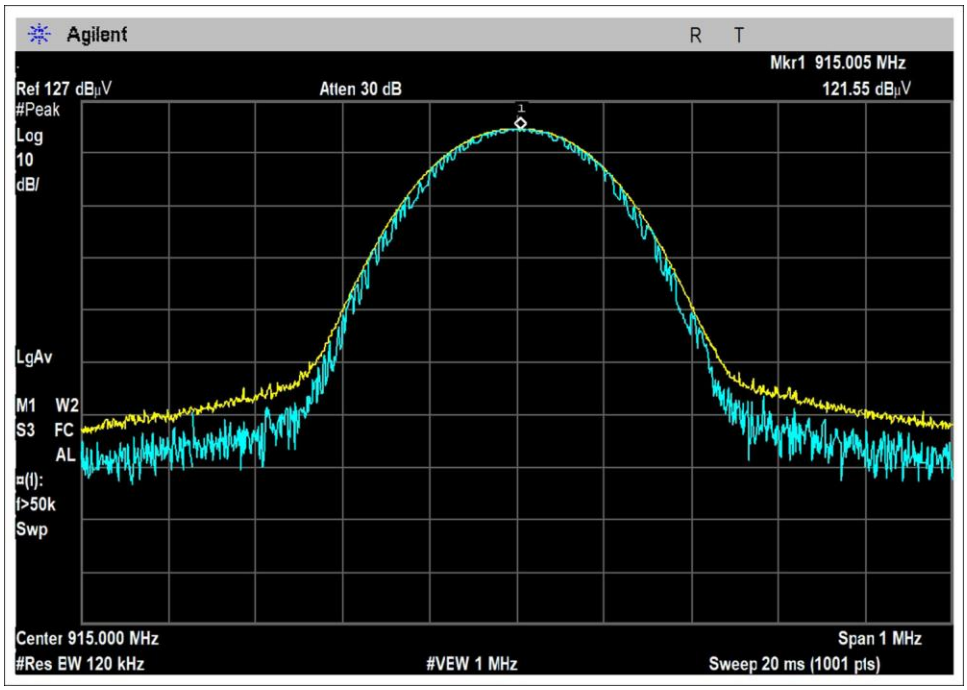


High Channel

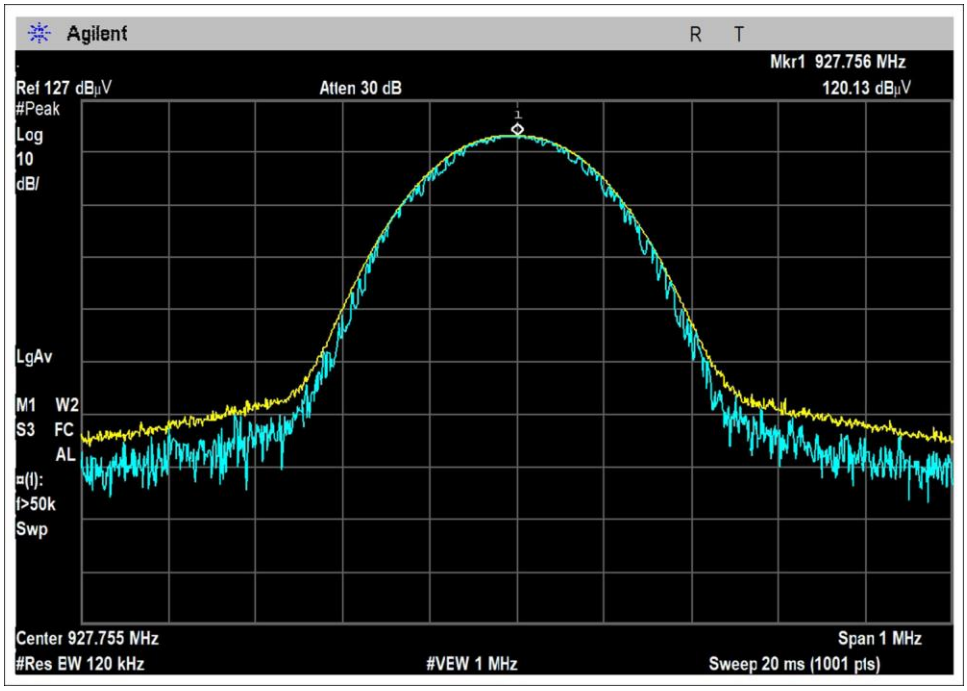
25kHz FSK



Low Channel



Middle Channel



High Channel

Test Setup / Conditions / Data

Test Location:	CKC Laboratories, Inc. • 22116 23rd Drive SE, Suite A • Bothell, WA 98021 • (425) 402-1717		
Customer:	**Itron, Inc.**		
Specification:	**15.247(b) Power Output (902-928 MHz DTS)**		
Work Order #:	**108561**	Date:	9/13/2023
Test Type:	**Conducted Emissions**	Time:	07:59:30
Tested By:	Steven Pittsford	Sequence#:	21
Software:	EMITest 5.03.20		230V 50Hz

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 4			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 4			

Test Conditions / Notes:

Test Environment Conditions:
Temperature: 24°C
Humidity: 47%
Pressure: 101.5kPa

Test Method: ANSI C63.10 (2013)

Frequency Range: 902.2, 915MHz, and 927.75MHz

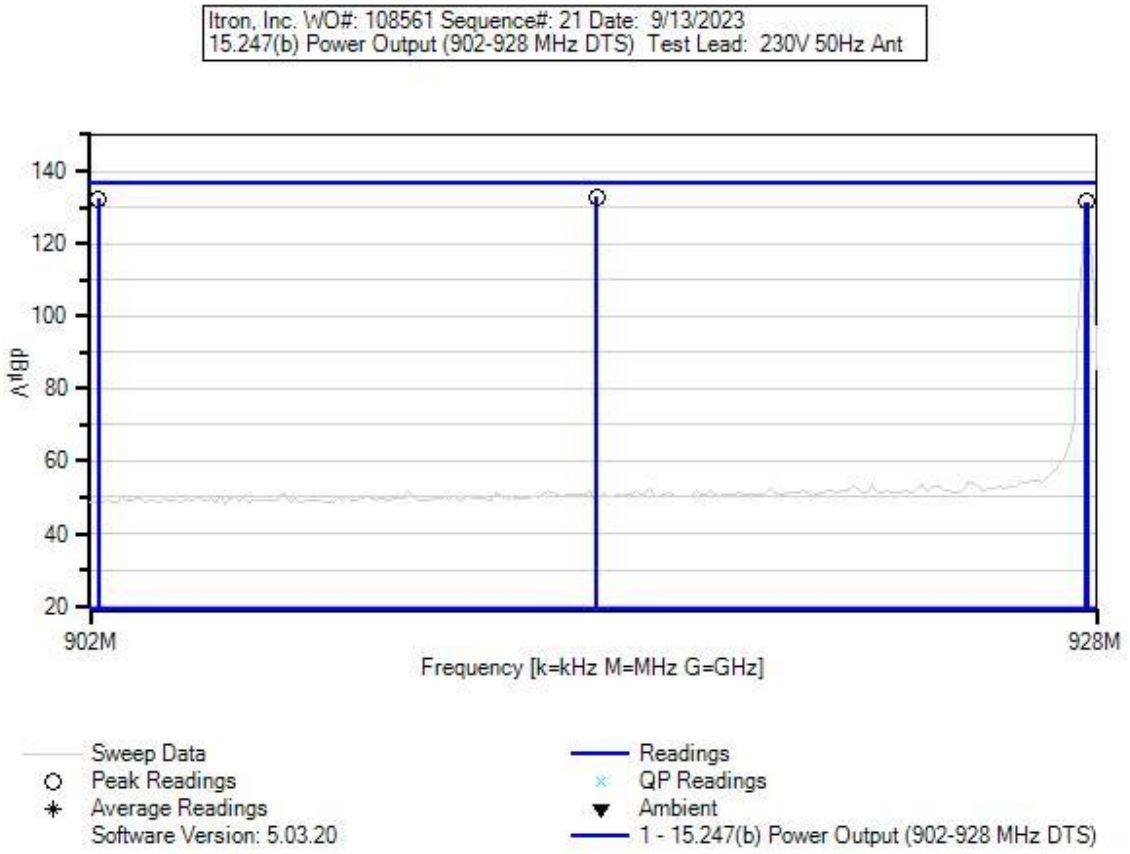
Test Setup:
Transmitting continuously with modulation at 902.20MHz, 915.00MHz, and 927.75MHz. 10k and 25k modulations investigated.

Top two LTE antenna ports have Cisco p/n ANT-5G-MP-OUT-N antennas attached.
Itron IRM-Star (CAM3) radio module has Cisco p/n ANT-5G-MP-OUT-N, PCTEL p/n BOA9025NM-ITR, or PCTEL p/n BOA9028 antenna attached. Worst case reported.
EUT Connected to support laptop via shielded Ethernet cable.

Vertical and horizontal antenna polarities investigated, worst case reported.

2 x 31 material ferrites with 3 wraps each on Ethernet cable underneath the ground plane. The ferrites are out of the test volume and these are NOT considered a modification.

No change during voltage variations.



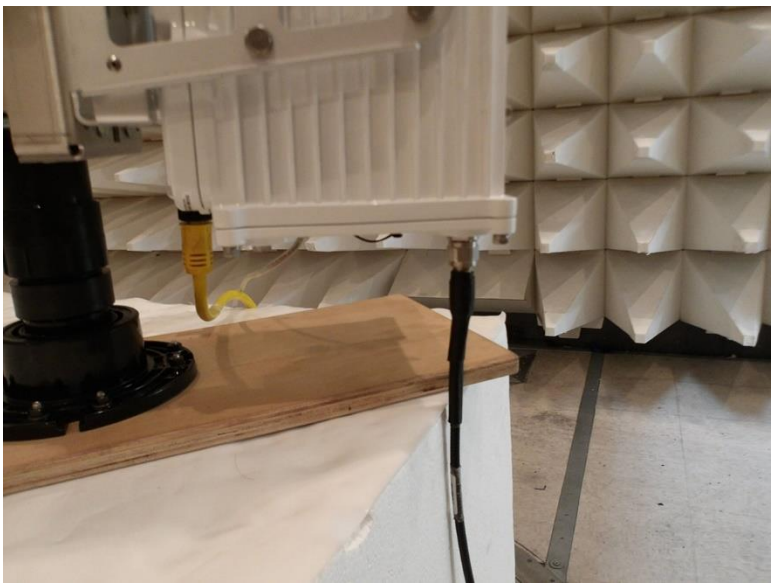
Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	ANP06219	Attenuator	768-10	3/23/2022	3/23/2024
T2	ANP05546	Cable	Heliax	8/1/2023	8/1/2025
T3	ANP06515	Cable	Heliax	3/1/2023	3/1/2025

Measurement Data: Reading listed by margin. Test Lead: Ant

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	dB	Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1	915.005M	121.6	+9.1	+0.7	+1.6		+0.0	133.0	137.0 915M 10k	-4.0	Ant
2	915.005M	121.5	+9.1	+0.7	+1.6		+0.0	132.9	137.0 915M 25k	-4.1	Ant
3	902.201M	121.1	+9.1	+0.6	+1.6		+0.0	132.4	137.0 902.2M 10k	-4.6	Ant
4	902.201M	121.0	+9.1	+0.6	+1.6		+0.0	132.3	137.0 902.2M 25k	-4.7	Ant
5	927.743M	120.1	+9.1	+0.7	+1.6		+0.0	131.5	137.0 927.75M 10k	-5.5	Ant
6	927.756M	120.1	+9.1	+0.7	+1.6		+0.0	131.5	137.0 927.75M 25k	-5.5	Ant

Test Setup Photo(s)



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 • (425) 402-1717		
Customer:	**Itron, Inc.**		
Specification:	**15.247(d) / 15.209 Radiated Spurious Emissions**		
Work Order #:	**108561**	Date:	9/11/2023
Test Type:	**Maximized Emissions**	Time:	6:31:38 AM
Tested By:	Steven Pittsford	Sequence#:	20
Software:	EMITest 5.03.20		

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1, 2, & 3			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1, 2, & 3			

Test Conditions / Notes:

Test Environment Conditions:
Temperature: 24°C
Humidity: 47%
Pressure: 101.5kPa

Test Method: ANSI C63.10 (2013)

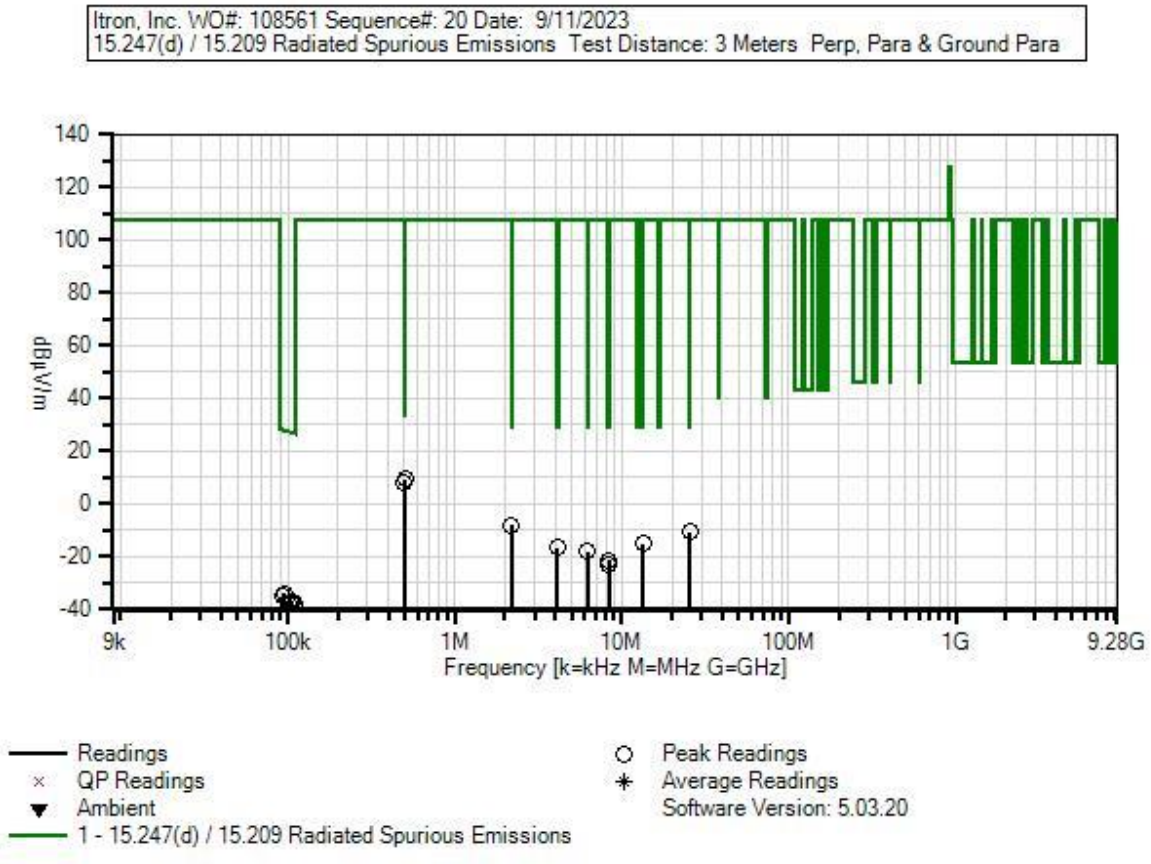
Frequency Range: 9k-30MHz

Test Setup:
Transmitting continuously with modulation at 902.20MHz, 915.00MHz, and 927.75MHz. 10k and 25k modulations investigated.

Top two LTE antenna ports have Cisco p/n ANT-5G-MP-OUT-N antennas attached.
Itron IRM-Star (CAM3) radio module has Cisco p/n ANT-5G-MP-OUT-N, PCTEL p/n BOA9025NM-ITR, or PCTEL p/n BOA9028 antenna attached. Worst case reported.
EUT Connected to support laptop via shielded Ethernet cable.

Perpendicular, parallel, and ground parallel antenna polarities investigated, worst case reported.

2 x 31 material ferrites with 3 wraps each on Ethernet cable underneath the ground plane. The ferrites are out of the test volume and these are NOT considered a modification.



Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN02673	Spectrum Analyzer	E4446A	3/2/2023	3/2/2025
T1	ANP05546	Cable	Heliax	8/1/2023	8/1/2025
T2	AN00052	Loop Antenna	6502	5/11/2022	5/11/2024
T3	ANP06515	Cable	Heliax	3/1/2023	3/1/2025

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

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	505.000k	40.0	+0.0	+9.3	+0.0		-40.0	9.3	33.5	-24.2	Perp,
2	495.800k	39.2	+0.0	+9.3	+0.0		-40.0	8.5	33.7	-25.2	Perp,
3	2.180M	22.7	+0.0	+9.2	+0.1		-40.0	-8.0	29.5	-37.5	Perp,
4	25.522M	23.3	+0.1	+5.7	+0.3		-40.0	-10.6	29.5	-40.1	Perp,
5	13.369M	16.1	+0.1	+8.6	+0.2		-40.0	-15.0	29.5	-44.5	Perp,
6	4.126M	14.5	+0.1	+8.9	+0.1		-40.0	-16.4	29.5	-45.9	Perp,
7	6.216M	13.1	+0.1	+8.9	+0.1		-40.0	-17.8	29.5	-47.3	Perp,
8	8.378M	9.5	+0.1	+8.9	+0.1		-40.0	-21.4	29.5	-50.9	Perp,
9	8.414M	7.7	+0.1	+9.0	+0.1		-40.0	-23.1	29.5	-52.6	Perp,
10	94.927k	36.8	+0.0	+9.4	+0.0		-80.0	-33.8	28.0	-61.8	Perp,
11	92.168k	35.4	+0.0	+9.5	+0.0		-80.0	-35.1	28.3	-63.4	Perp,
12	104.963k	33.8	+0.0	+9.4	+0.0		-80.0	-36.8	27.2	-64.0	Perp,
13	106.217k	33.5	+0.0	+9.4	+0.0		-80.0	-37.1	27.1	-64.2	Perp,
14	108.224k	32.6	+0.0	+9.4	+0.0		-80.0	-38.0	26.9	-64.9	Perp,
15	100.070k	33.0	+0.0	+9.4	+0.0		-80.0	-37.6	27.6	-65.2	Perp,

Test Location:	CKC Laboratories, Inc. • 22116 23rd Drive SE, Suite A • Bothell, WA 98021 • (425) 402-1717		
Customer:	**Itron, Inc.**		
Specification:	**15.247(d) / 15.209 Radiated Spurious Emissions**		
Work Order #:	**108561**	Date:	9/11/2023
Test Type:	**Maximized Emissions**	Time:	11:58:47
Tested By:	Steven Pittsford	Sequence#:	21
Software:	EMITest 5.03.20		

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1, 2, & 3			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1, 2, & 3			

Test Conditions / Notes:

Test Environment Conditions:
Temperature: 24°C
Humidity: 47%
Pressure: 101.5kPa

Test Method: ANSI C63.10 (2013)

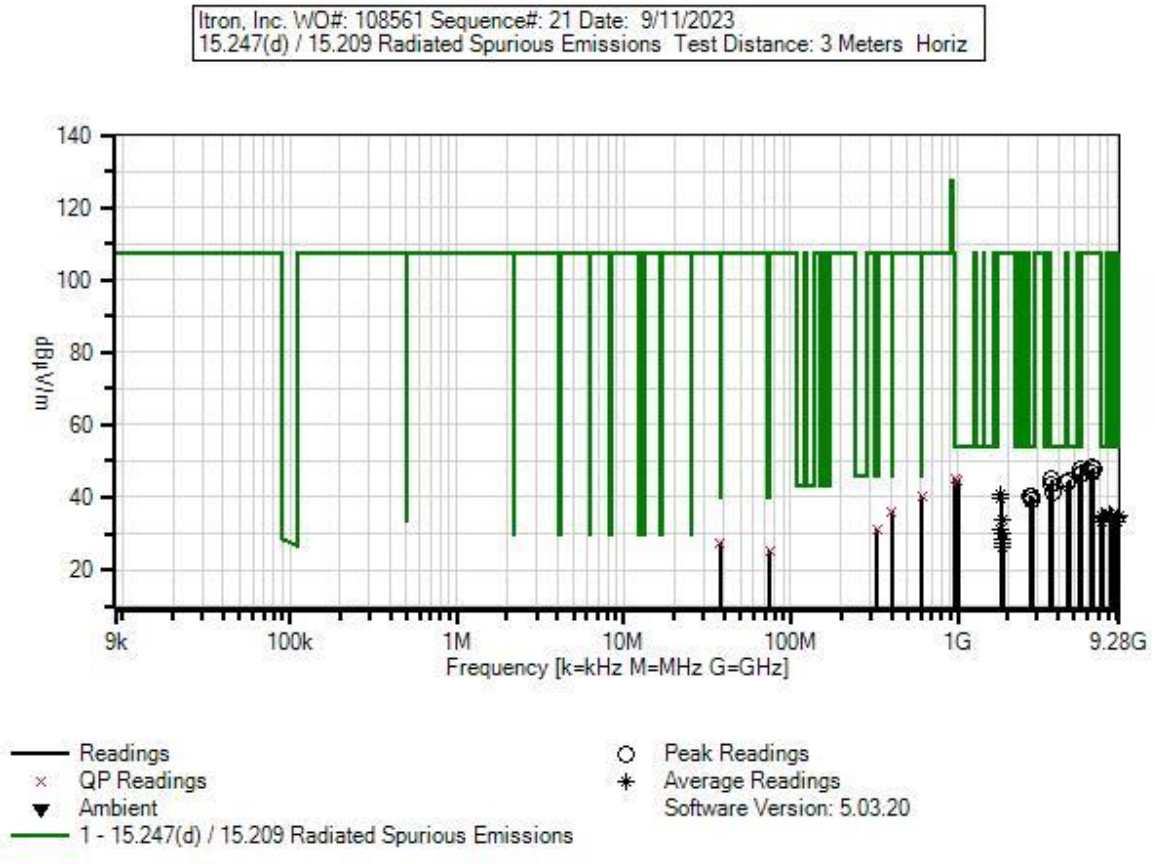
Frequency Range: 30MHz-9.28GHz

Test Setup:
Transmitting continuously with modulation at 902.20MHz, 915.00MHz, and 927.75MHz. 10k and 25k modulations investigated.

Top two LTE antenna ports have Cisco p/n ANT-5G-MP-OUT-N antennas attached.
Itron IRM-Star (CAM3) radio module has Cisco p/n ANT-5G-MP-OUT-N, PCTEL p/n BOA9025NM-ITR, or PCTEL p/n BOA9028 antenna attached. Worst case reported.
EUT Connected to support laptop via shielded Ethernet cable.

Vertical and horizontal antenna polarities investigated, worst case reported.

2 x 31 material ferrites with 3 wraps each on Ethernet cable underneath the ground plane. The ferrites are out of the test volume and these are NOT considered a modification.



Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN02673	Spectrum Analyzer	E4446A	3/2/2023	3/2/2025
T2	AN03824	Biconilog Antenna	3142E	5/9/2023	5/9/2025
T3	ANP05360	Cable	RG214	8/8/2023	8/8/2025
T4	ANP05333	Cable	Heliax	8/8/2023	8/8/2025
T5	ANP05546	Cable	Heliax	8/1/2023	8/1/2025
T6	ANP06515	Cable	Heliax	3/1/2023	3/1/2025
T7	AN03170	High Pass Filter	HM1155-11SS	9/16/2021	9/16/2023
T8	AN03540	Preamp	83017A	3/24/2023	3/24/2025
T9	AN02374ANSI	Horn Antenna	RGA-60	5/26/2023	5/26/2025
T10	ANP07504	Cable	CLU40-KMKM-02.00F	1/24/2023	1/24/2025

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

#	Freq	Rdng	T1 T5 T9	T2 T6 T10	T3 T7	T4 T8	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant
1	610.826M	9.3	+0.0	+27.2	+2.3	+1.2	+0.0	40.5	46.0	-5.5	Vert
	QP		+0.5	+0.0	+0.0	+0.0					129
			+0.0	+0.0							
^	610.826M	15.9	+0.0	+27.2	+2.3	+1.2	+0.0	47.1	46.0	+1.1	Vert
			+0.5	+0.0	+0.0	+0.0					129
			+0.0	+0.0							
3	5413.200M	37.6	+0.0	+0.0	+0.0	+0.0	+0.0	46.2	54.0	-7.8	Vert
			+1.7	+4.9	+0.4	-33.8			Low		160
			+34.4	+1.0							
4	964.260M	9.4	+0.0	+31.0	+2.6	+1.6	+0.0	45.3	54.0	-8.7	Vert
	QP		+0.7	+0.0	+0.0	+0.0					400
			+0.0	+0.0							
^	964.260M	15.4	+0.0	+31.0	+2.6	+1.6	+0.0	51.3	54.0	-2.7	Vert
			+0.7	+0.0	+0.0	+0.0					129
			+0.0	+0.0							
6	3662.060M	41.4	+0.0	+0.0	+0.0	+0.0	+0.0	45.0	54.0	-9.0	Vert
			+1.4	+3.7	+0.2	-34.0			Mid		145
			+31.4	+0.9							
7	4636.380M	38.9	+0.0	+0.0	+0.0	+0.0	+0.0	44.8	54.0	-9.2	Vert
			+1.3	+4.2	+0.4	-33.8			High		169
			+32.4	+1.4							
8	998.043M	9.5	+0.0	+30.3	+2.6	+1.6	+0.0	44.7	54.0	-9.3	Horiz
	QP		+0.7	+0.0	+0.0	+0.0					400
			+0.0	+0.0							
9	4576.970M	38.8	+0.0	+0.0	+0.0	+0.0	+0.0	44.5	54.0	-9.5	Vert
			+1.3	+4.2	+0.5	-33.8			Mid		145
			+32.2	+1.3							
10	403.640M	9.3	+0.0	+24.0	+1.5	+1.0	+0.0	36.2	46.0	-9.8	Vert
	QP		+0.4	+0.0	+0.0	+0.0					103
			+0.0	+0.0							
^	403.640M	16.1	+0.0	+24.0	+1.5	+1.0	+0.0	43.0	46.0	-3.0	Vert
			+0.4	+0.0	+0.0	+0.0					129
			+0.0	+0.0							
12	4511.000M	38.8	+0.0	+0.0	+0.0	+0.0	+0.0	44.1	54.0	-9.9	Vert
			+1.2	+4.2	+0.5	-33.8			Low		160
			+32.1	+1.1							
13	3608.800M	40.0	+0.0	+0.0	+0.0	+0.0	+0.0	43.7	54.0	-10.3	Vert
			+1.4	+3.7	+0.3	-34.0			Low		160
			+31.3	+1.0							
14	3708.790M	37.8	+0.0	+0.0	+0.0	+0.0	+0.0	41.6	54.0	-12.4	Vert
			+1.5	+3.6	+0.2	-33.9			High		169
			+31.6	+0.8							

15	37.664M QP	9.2	+0.0 +0.1 +0.0	+17.6 +0.0 +0.0	+0.4 +0.0	+0.3 +0.0	+0.0	27.6	40.0	-12.4	Vert 103
^	37.664M	15.8	+0.0 +0.1 +0.0	+17.6 +0.0 +0.0	+0.4 +0.0	+0.3 +0.0	+0.0	34.2	40.0	-5.8	Vert 99
17	2706.600M	40.6	+0.0 +1.2 +29.3	+0.0 +3.0 +0.5	+0.0 +0.2	+0.0 -34.5	+0.0	40.3	54.0 Low	-13.7	Vert 160
18	2783.625M	40.4	+0.0 +1.2 +29.3	+0.0 +3.0 +0.5	+0.0 +0.3	+0.0 -34.5	+0.0	40.2	54.0 High	-13.8	Vert 169
19	329.449M QP	9.2	+0.0 +0.4 +0.0	+19.4 +0.0 +0.0	+1.3 +0.0	+0.9 +0.0	+0.0	31.2	46.0	-14.8	Vert 103
^	329.449M	15.5	+0.0 +0.4 +0.0	+19.4 +0.0 +0.0	+1.3 +0.0	+0.9 +0.0	+0.0	37.5	46.0	-8.5	Vert 129
21	2747.475M	39.4	+0.0 +1.2 +29.3	+0.0 +3.0 +0.5	+0.0 +0.3	+0.0 -34.5	+0.0	39.2	54.0 Mid	-14.8	Vert 145
22	8119.800M Ave	22.2	+0.0 +2.6 +38.9	+0.0 +5.7 +0.9	+0.0 +0.6	+0.0 -35.4	+0.0	35.5	54.0 Low	-18.5	Vert 150
^	8119.800M	37.4	+0.0 +2.6 +38.9	+0.0 +5.7 +0.9	+0.0 +0.6	+0.0 -35.4	+0.0	50.7	54.0 Low	-3.3	Vert 160
24	7320.770M Ave	23.5	+0.0 +1.9 +37.2	+0.0 +5.3 +1.4	+0.0 +0.6	+0.0 -35.1	+0.0	34.8	54.0 Mid	-19.2	Vert 139
^	7320.770M	38.5	+0.0 +1.9 +37.2	+0.0 +5.3 +1.4	+0.0 +0.6	+0.0 -35.1	+0.0	49.8	54.0 Mid	-4.2	Vert 145
26	8233.145M Ave	22.2	+0.0 +2.6 +38.4	+0.0 +5.5 +0.7	+0.0 +0.8	+0.0 -35.4	+0.0	34.8	54.0 Mid	-19.2	Vert 139
^	8233.145M	37.8	+0.0 +2.6 +38.4	+0.0 +5.5 +0.7	+0.0 +0.8	+0.0 -35.4	+0.0	50.4	54.0 Mid	-3.6	Vert 145
28	7424.485M Ave	22.8	+0.0 +2.0 +37.4	+0.0 +5.6 +1.2	+0.0 +0.7	+0.0 -35.1	+0.0	34.6	54.0 High	-19.4	Vert 169
^	7424.485M	38.0	+0.0 +2.0 +37.4	+0.0 +5.6 +1.2	+0.0 +0.7	+0.0 -35.1	+0.0	49.8	54.0 High	-4.2	Vert 169
30	9149.705M Ave	21.1	+0.0 +2.4 +37.7	+0.0 +5.9 +0.8	+0.0 +1.1	+0.0 -34.7	+0.0	34.3	54.0 Mid	-19.7	Vert 139
^	9149.705M	36.7	+0.0 +2.4 +37.7	+0.0 +5.9 +0.8	+0.0 +1.1	+0.0 -34.7	+0.0	49.9	54.0 Mid	-4.1	Vert 145

32	8347.348M Ave	21.7	+0.0 +2.6 +38.3	+0.0 +5.5 +0.4	+0.0 +0.9	+0.0 -35.3	+0.0	34.1	54.0 High	-19.9	Vert 169
^	8347.350M	37.6	+0.0 +2.6 +38.3	+0.0 +5.5 +0.4	+0.0 +0.9	+0.0 -35.3	+0.0	50.0	54.0 High	-4.0	Vert 169
^	8347.350M	33.5	+0.0 +2.6 +38.3	+0.0 +5.5 +0.4	+0.0 +0.9	+0.0 -35.3	+0.0	45.9	54.0 High	-8.1	Vert 169
35	9022.000M Ave	19.9	+0.0 +2.4 +37.9	+0.0 +6.0 +1.2	+0.0 +0.7	+0.0 -34.8	+0.0	33.3	54.0 Low	-20.7	Vert 150
^	9022.000M	35.4	+0.0 +2.4 +37.9	+0.0 +6.0 +1.2	+0.0 +0.7	+0.0 -34.8	+0.0	48.8	54.0 Low	-5.2	Vert 160
37	6403.385M	38.5	+0.0 +2.1 +34.7	+0.0 +5.6 +1.0	+0.0 +0.5	+0.0 -34.3	+0.0	48.1	107.5 Mid	-59.4	Vert 145
38	5488.550M	38.8	+0.0 +1.7 +34.4	+0.0 +5.1 +1.3	+0.0 +0.4	+0.0 -33.8	+0.0	47.9	107.5 Mid	-59.6	Vert 145
39	6493.585M	37.5	+0.0 +2.1 +34.8	+0.0 +5.8 +1.2	+0.0 +0.6	+0.0 -34.3	+0.0	47.7	107.5 High	-59.8	Vert 169
40	6315.400M	37.6	+0.0 +2.1 +34.7	+0.0 +5.4 +0.9	+0.0 +0.4	+0.0 -34.2	+0.0	46.9	107.5 Low	-60.6	Vert 160
41	5564.535M	37.3	+0.0 +1.8 +34.4	+0.0 +5.2 +1.3	+0.0 +0.5	+0.0 -33.8	+0.0	46.7	107.5 High	-60.8	Vert 169
42	1804.450M Ave	44.7	+0.0 +0.7 +27.3	+0.0 +2.2 +0.4	+0.0 +0.6	+0.0 -35.1	+0.0	40.8	107.5 Low Config 2	-66.7	Horiz 201
43	1804.400M Ave	43.7	+0.0 +0.7 +27.3	+0.0 +2.2 +0.4	+0.0 +0.6	+0.0 -35.1	+0.0	39.8	107.5 Low Config 3	-67.7	Horiz 169
44	9278.025M Ave	21.7	+0.0 +2.4 +37.9	+0.0 +5.9 +0.4	+0.0 +1.3	+0.0 -34.6	+0.0	35.0	107.5 High	-72.5	Vert 169
^	9278.025M	36.7	+0.0 +2.4 +37.9	+0.0 +5.9 +0.4	+0.0 +1.3	+0.0 -34.6	+0.0	50.0	107.5 High	-57.5	Vert 169
46	1830.045M Ave	37.4	+0.0 +0.7 +27.6	+0.0 +2.3 +0.4	+0.0 +0.6	+0.0 -35.1	+0.0	33.9	107.5 Mid Config 3	-73.6	Horiz 187
47	7217.600M Ave	23.1	+0.0 +1.8 +36.8	+0.0 +5.2 +1.4	+0.0 +0.2	+0.0 -35.0	+0.0	33.5	107.5 Low	-74.0	Vert 150
^	7217.600M	38.4	+0.0 +1.8 +36.8	+0.0 +5.2 +1.4	+0.0 +0.2	+0.0 -35.0	+0.0	48.8	107.5 Low	-58.7	Vert 160

49	1804.450M Ave	35.2	+0.0 +0.7 +27.3	+0.0 +2.2 +0.4	+0.0 +0.6	+0.0 -35.1	+0.0	31.3	107.5 Low Config 1	-76.2	Horiz 208
^	1804.400M	54.5	+0.0 +0.7 +27.3	+0.0 +2.2 +0.4	+0.0 +0.6	+0.0 -35.1	+0.0	50.6	107.5 Low Config 3	-56.9	Horiz 160
^	1804.450M	48.9	+0.0 +0.7 +27.3	+0.0 +2.2 +0.4	+0.0 +0.6	+0.0 -35.1	+0.0	45.0	107.5 Low Config 2	-62.5	Horiz 191
^	1804.450M	43.8	+0.0 +0.7 +27.3	+0.0 +2.2 +0.4	+0.0 +0.6	+0.0 -35.1	+0.0	39.9	107.5 Low Config 1	-67.6	Horiz 208
53	1855.500M Ave	33.4	+0.0 +0.7 +27.8	+0.0 +2.3 +0.4	+0.0 +0.6	+0.0 -35.0	+0.0	30.2	107.5 High Config 2	-77.3	Horiz 163
54	1855.500M Ave	31.4	+0.0 +0.7 +27.8	+0.0 +2.3 +0.4	+0.0 +0.6	+0.0 -35.0	+0.0	28.2	107.5 High Config 1	-79.3	Horiz 183
^	1855.500M	44.4	+0.0 +0.7 +27.8	+0.0 +2.3 +0.4	+0.0 +0.6	+0.0 -35.0	+0.0	41.2	107.5 High Config 2	-66.3	Horiz 163
^	1855.500M	44.1	+0.0 +0.7 +27.8	+0.0 +2.3 +0.4	+0.0 +0.6	+0.0 -35.0	+0.0	40.9	107.5 High Config 1	-66.6	Horiz 183
57	1855.690M Ave	30.6	+0.0 +0.7 +27.8	+0.0 +2.3 +0.4	+0.0 +0.6	+0.0 -35.0	+0.0	27.4	107.5 High Config 3	-80.1	Horiz 180
^	1855.690M	44.7	+0.0 +0.7 +27.8	+0.0 +2.3 +0.4	+0.0 +0.6	+0.0 -35.0	+0.0	41.5	107.5 High Config 3	-66.0	Horiz 169
59	1830.000M Ave	30.8	+0.0 +0.7 +27.6	+0.0 +2.3 +0.4	+0.0 +0.6	+0.0 -35.1	+0.0	27.3	107.5 Mid Config 1	-80.2	Horiz 214
60	1830.000M Ave	29.6	+0.0 +0.7 +27.6	+0.0 +2.3 +0.4	+0.0 +0.6	+0.0 -35.1	+0.0	26.1	107.5 Mid Config 2	-81.4	Horiz 189
^	1830.045M	43.0	+0.0 +0.7 +27.6	+0.0 +2.3 +0.4	+0.0 +0.6	+0.0 -35.1	+0.0	39.5	107.5 Mid Config 3	-68.0	Horiz 145
^	1830.000M	43.0	+0.0 +0.7 +27.6	+0.0 +2.3 +0.4	+0.0 +0.6	+0.0 -35.1	+0.0	39.5	107.5 Mid Config 1	-68.0	Horiz 214
^	1830.000M	41.9	+0.0 +0.7 +27.6	+0.0 +2.3 +0.4	+0.0 +0.6	+0.0 -35.1	+0.0	38.4	107.5 Mid Config 2	-69.1	Horiz 189
64	74.634M QP	11.1	+0.0 +0.2 +0.0	+12.9 +0.0 +0.0	+0.6 +0.0	+0.4 +0.0	+0.0	25.2	107.5	-82.3	Vert 103
^	74.634M	16.4	+0.0 +0.2 +0.0	+12.9 +0.0 +0.0	+0.6 +0.0	+0.4 +0.0	+0.0	30.5	107.5	-77.0	Vert 129

Band Edge

Band Edge Summary					
Operating Mode: Single Channel (Low and High)					
Frequency (MHz)	**Modulation**	**Configuration /Antenna Type**	**Field Strength (dBuV/m @3m)**	**Limit (dBuV/m @3m)**	**Results**
614	10k	1	40.7	46.0	Pass
902	10k	1	77.5	106.5	Pass
928	10k	1	76.5	106.5	Pass
960	10k	1	45.4	54.0	Pass
614	25k	1	40.8	46.0	Pass
902	25k	1	77.7	106.5	Pass
928	25k	1	74.8	106.5	Pass
960	25k	1	45.4	54.0	Pass

Band Edge Summary					
Operating Mode: Single Channel (Low and High)					
Frequency (MHz)	**Modulation**	**Configuration /Antenna Type**	**Field Strength (dBuV/m @3m)**	**Limit (dBuV/m @3m)**	**Results**
614	10k	2	40.8	46.0	Pass
902	10k	2	80.2	109.5	Pass
928	10k	2	78.8	109.5	Pass
960	10k	2	45.4	54.0	Pass
614	25k	2	40.8	46.0	Pass
902	25k	2	82.4	109.5	Pass
928	25k	2	78.4	109.5	Pass
960	25k	2	45.4	54.0	Pass

Band Edge Summary					
Operating Mode: Single Channel (Low and High)					
Frequency (MHz)	**Modulation**	**Configuration /Antenna Type**	**Field Strength (dBuV/m @3m)**	**Limit (dBuV/m @3m)**	**Results**
614	10k	3	40.8	46.0	Pass
902	10k	3	80.0	107.5	Pass
928	10k	3	75.4	107.5	Pass
960	10k	3	45.4	54.0	Pass
614	25k	3	40.6	46.0	Pass
902	25k	3	80.6	107.5	Pass
928	25k	3	75.9	107.5	Pass
960	25k	3	45.4	54.0	Pass

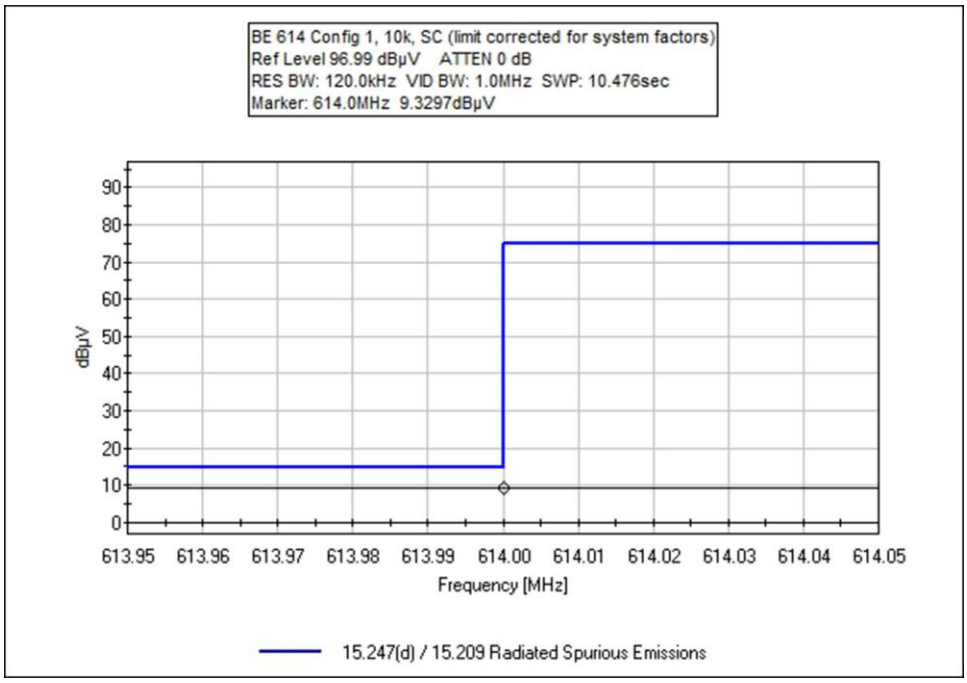
Band Edge Summary					
Operating Mode: Hopping					
Frequency (MHz)	**Modulation**	**Configuration /Antenna Type**	**Field Strength (dBuV/m @3m)**	**Limit (dBuV/m @3m)**	**Results**
614	10k	5	40.7	46.0	Pass
902	10k	5	77.8	106.5	Pass
928	10k	5	74.5	106.5	Pass
960	10k	5	45.3	54.0	Pass
614	25k	5	40.6	46.0	Pass
902	25k	5	76.9	106.5	Pass
928	25k	5	72.3	106.5	Pass
960	25k	5	45.3	54.0	Pass

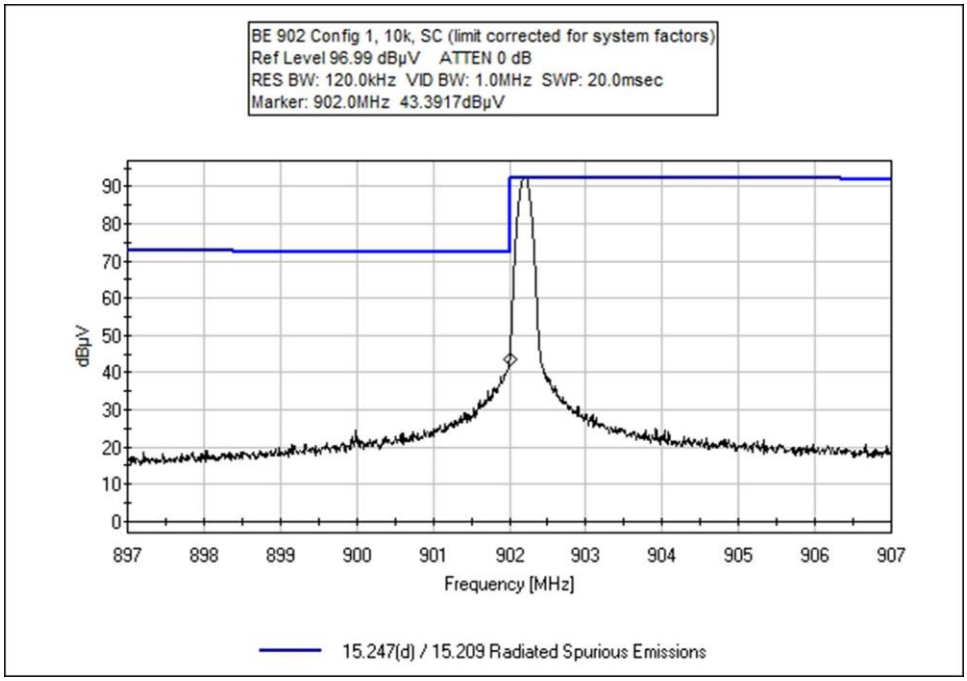
Band Edge Summary					
Operating Mode: Hopping					
Frequency (MHz)	**Modulation**	**Configuration /Antenna Type**	**Field Strength (dBuV/m @3m)**	**Limit (dBuV/m @3m)**	**Results**
614	10k	6	40.6	46.0	Pass
902	10k	6	81.8	109.5	Pass
928	10k	6	76.0	109.5	Pass
960	10k	6	45.3	54.0	Pass
614	25k	6	40.6	46.0	Pass
902	25k	6	80.5	109.5	Pass
928	25k	6	76.3	109.5	Pass
960	25k	6	45.2	54.0	Pass

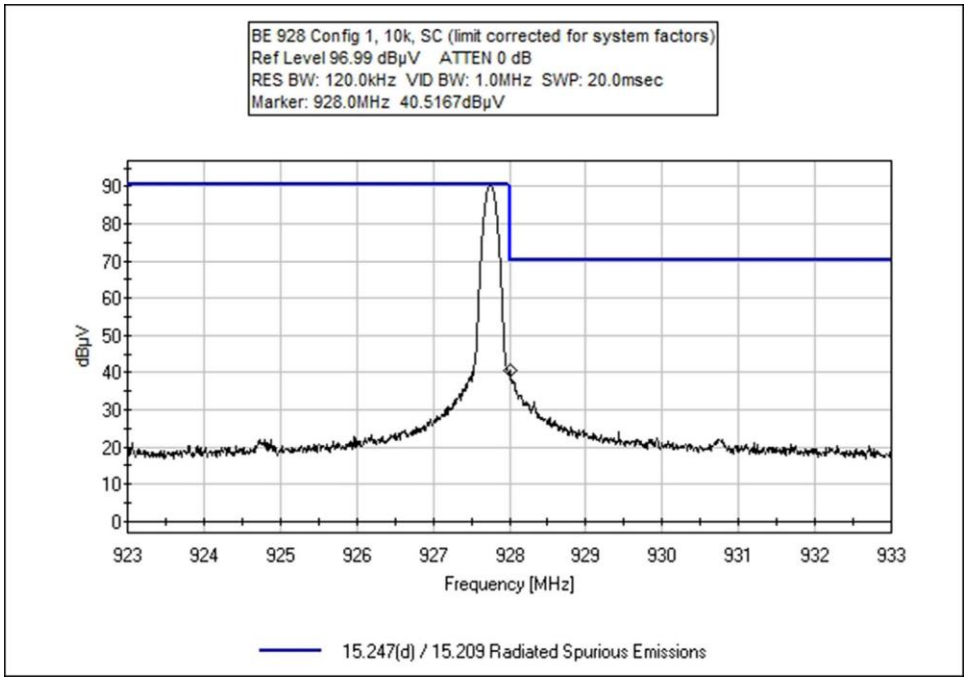
Band Edge Summary					
Operating Mode: Hopping					
Frequency (MHz)	**Modulation**	**Configuration /Antenna Type**	**Field Strength (dBuV/m @3m)**	**Limit (dBuV/m @3m)**	**Results**
614	10k	7	40.6	46.0	Pass
902	10k	7	77.9	107.5	Pass
928	10k	7	76.5	107.5	Pass
960	10k	7	45.3	54.0	Pass
614	25k	7	40.7	46.0	Pass
902	25k	7	78.0	107.5	Pass
928	25k	7	74.8	107.5	Pass
960	25k	7	45.3	54.0	Pass

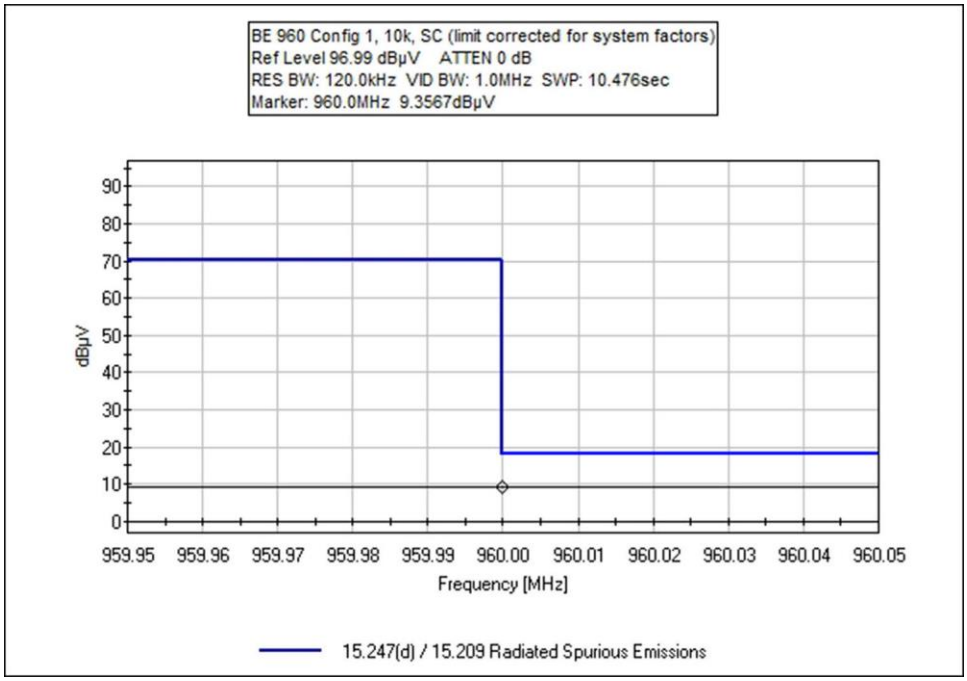
Band Edge Plots

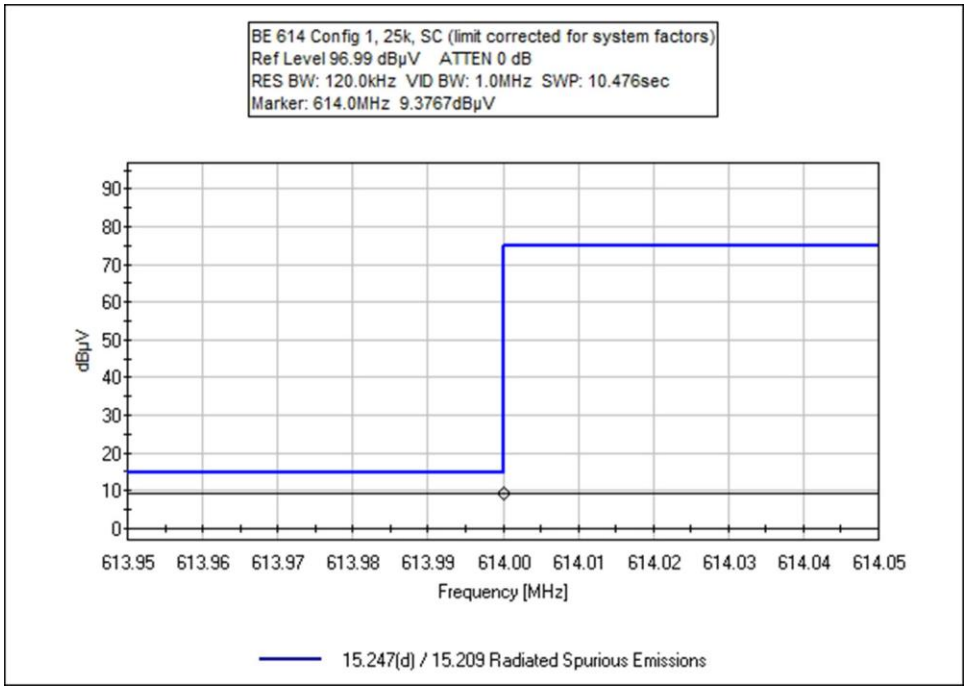
Configuration 1

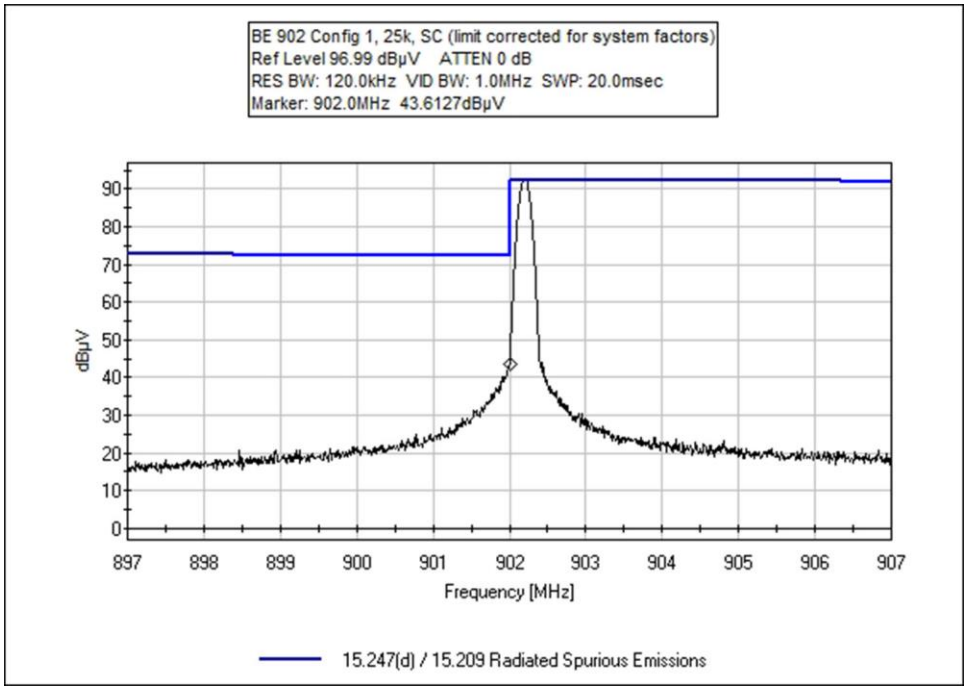


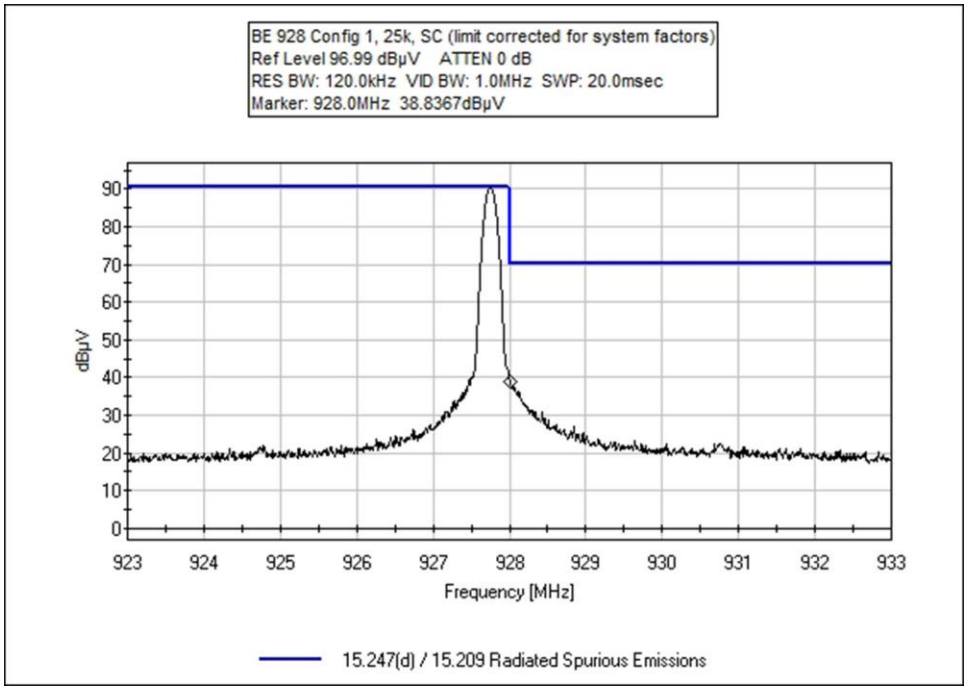


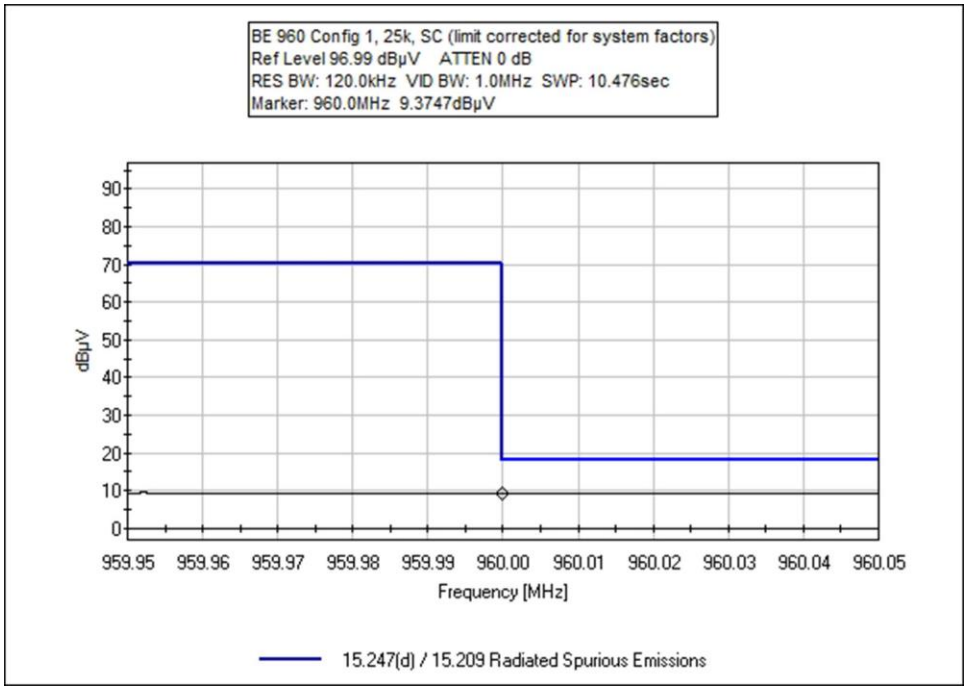

BE 928 Config 1, 10k, SC (limit corrected for system factors)
Ref Level 96.99 dBµV ATTEN 0 dB
RES BW: 120.0kHz VID BW: 1.0MHz SWP: 20.0msec
Marker: 928.0MHz 40.5167dBµV
dBµV
90
80
70
60
50
40
30
20
10
0
923
924
925
926
927
928
929
930
931
932
933
Frequency [MHz]
15.247(d) / 15.209 Radiated Spurious Emissions


BE 960 Config 1, 10k, SC (limit corrected for system factors)
Ref Level 96.99 dBµV ATTEN 0 dB
RES BW: 120.0kHz VID BW: 1.0MHz SWP: 10.476sec
Marker: 960.0MHz 9.3567dBµV
dBµV
90
80
70
60
50
40
30
20
10
0
959.95
959.96
959.97
959.98
959.99
960.00
960.01
960.02
960.03
960.04
960.05
Frequency [MHz]
15.247(d) / 15.209 Radiated Spurious Emissions

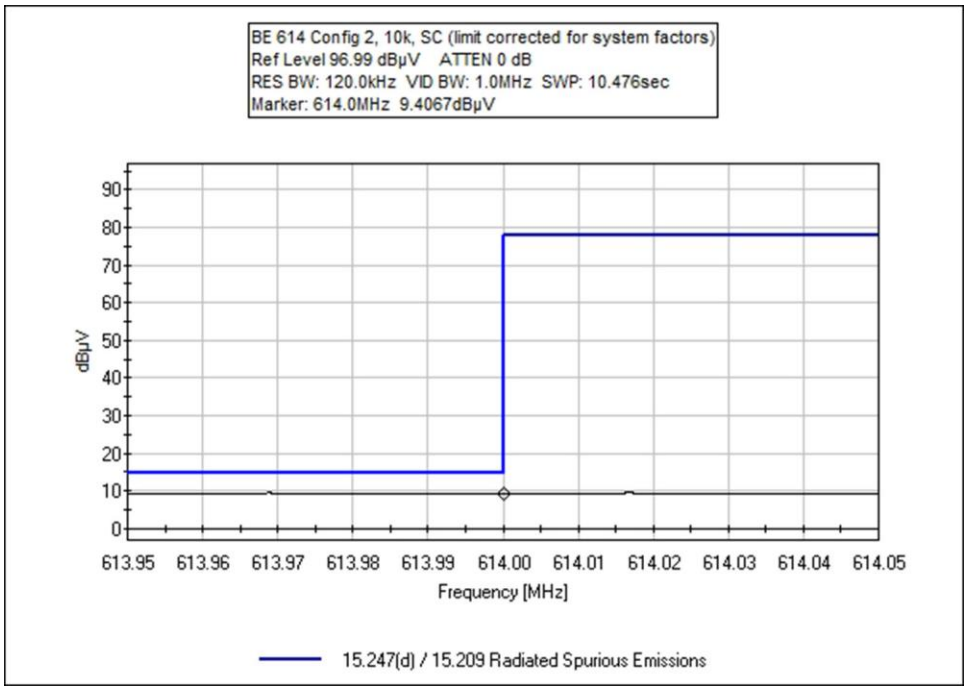

BE 614 Config 1, 25k, SC (limit corrected for system factors)
Ref Level 96.99 dBµV ATTEN 0 dB
RES BW: 120.0kHz VID BW: 1.0MHz SWP: 10.476sec
Marker: 614.0MHz 9.3767dBµV
dBµV
90
80
70
60
50
40
30
20
10
0
613.95 613.96 613.97 613.98 613.99 614.00 614.01 614.02 614.03 614.04 614.05
Frequency [MHz]
15.247(d) / 15.209 Radiated Spurious Emissions

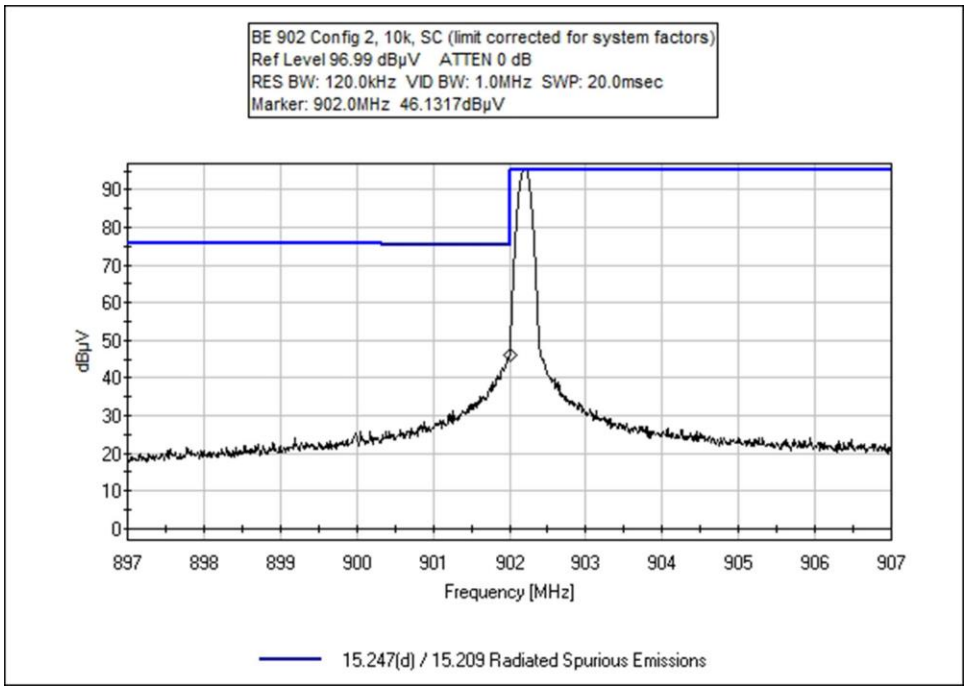

BE 902 Config 1, 25k, SC (limit corrected for system factors)
Ref Level 96.99 dBµV ATTEN 0 dB
RES BW: 120.0kHz VID BW: 1.0MHz SWP: 20.0msec
Marker: 902.0MHz 43.6127dBµV
dBµV
90
80
70
60
50
40
30
20
10
0
897 898 899 900 901 902 903 904 905 906 907
Frequency [MHz]
15.247(d) / 15.209 Radiated Spurious Emissions

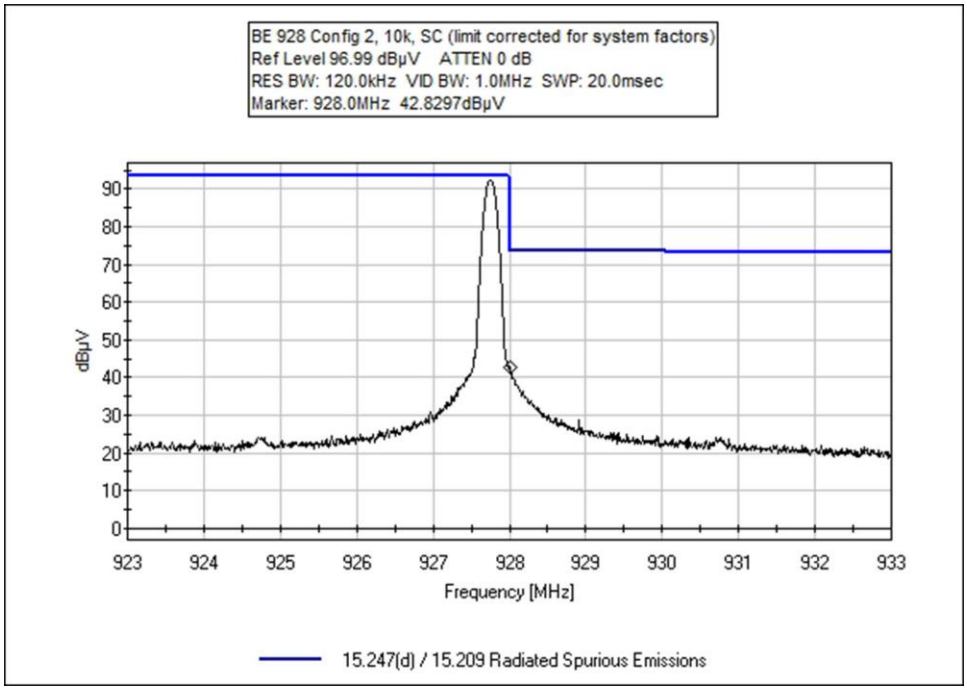

BE 928 Config 1, 25k, SC (limit corrected for system factors)
Ref Level 96.99 dBµV ATTEN 0 dB
RES BW: 120.0kHz VID BW: 1.0MHz SWP: 20.0msec
Marker: 928.0MHz 38.8367dBµV
dBµV
90
80
70
60
50
40
30
20
10
0
923
924
925
926
927
928
929
930
931
932
933
Frequency [MHz]
15.247(d) / 15.209 Radiated Spurious Emissions

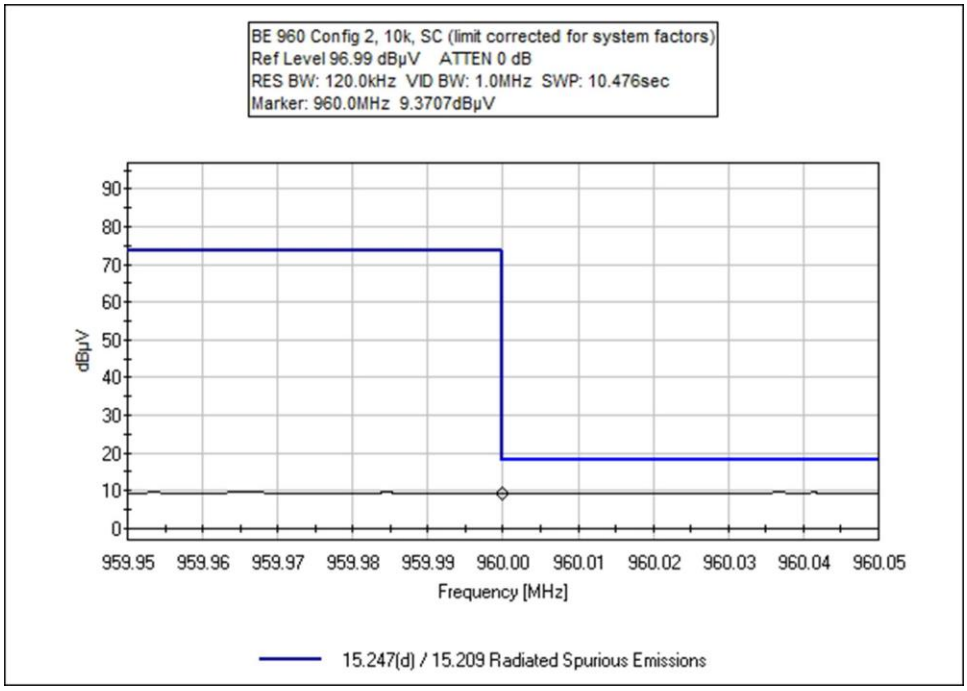

BE 960 Config 1, 25k, SC (limit corrected for system factors)
Ref Level 96.99 dBµV ATTEN 0 dB
RES BW: 120.0kHz VID BW: 1.0MHz SWP: 10.476sec
Marker: 960.0MHz 9.3747dBµV
dBµV
90
80
70
60
50
40
30
20
10
0
959.95
959.96
959.97
959.98
959.99
960.00
960.01
960.02
960.03
960.04
960.05
Frequency [MHz]
15.247(d) / 15.209 Radiated Spurious Emissions

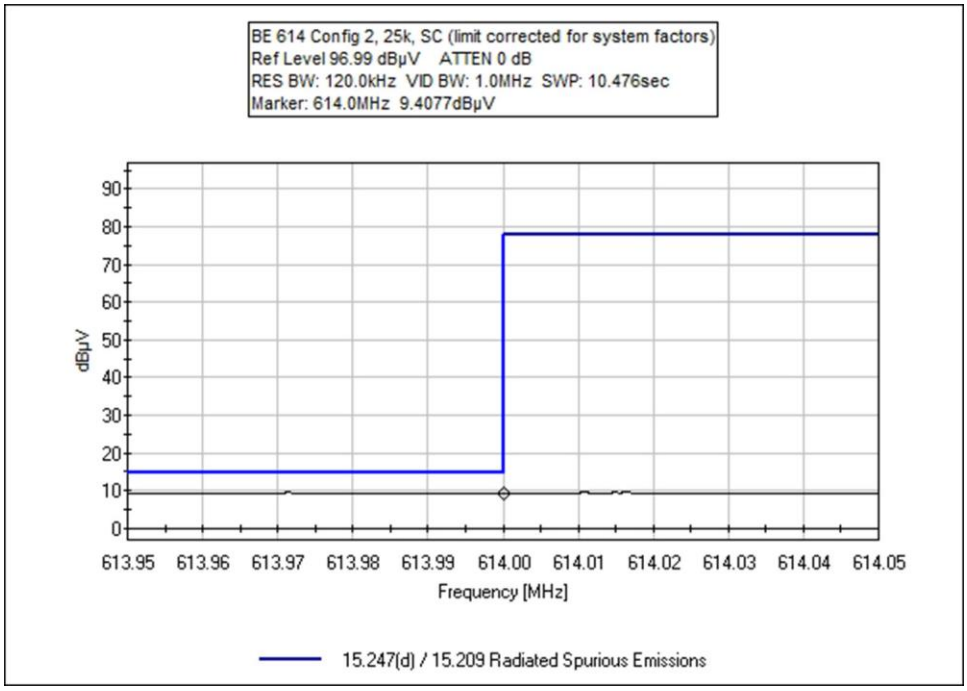
Configuration 2

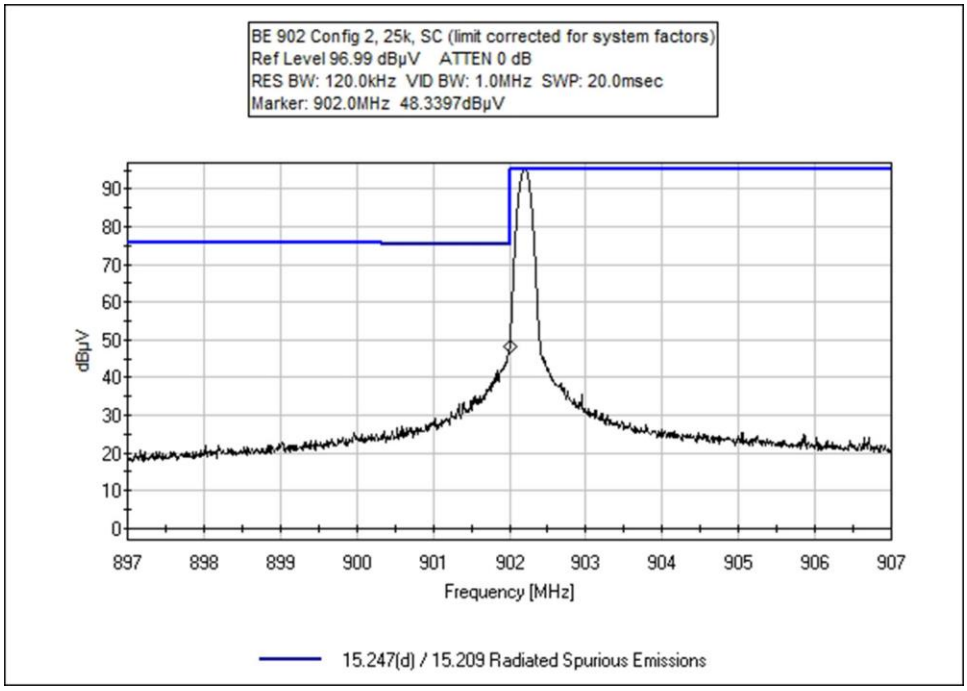


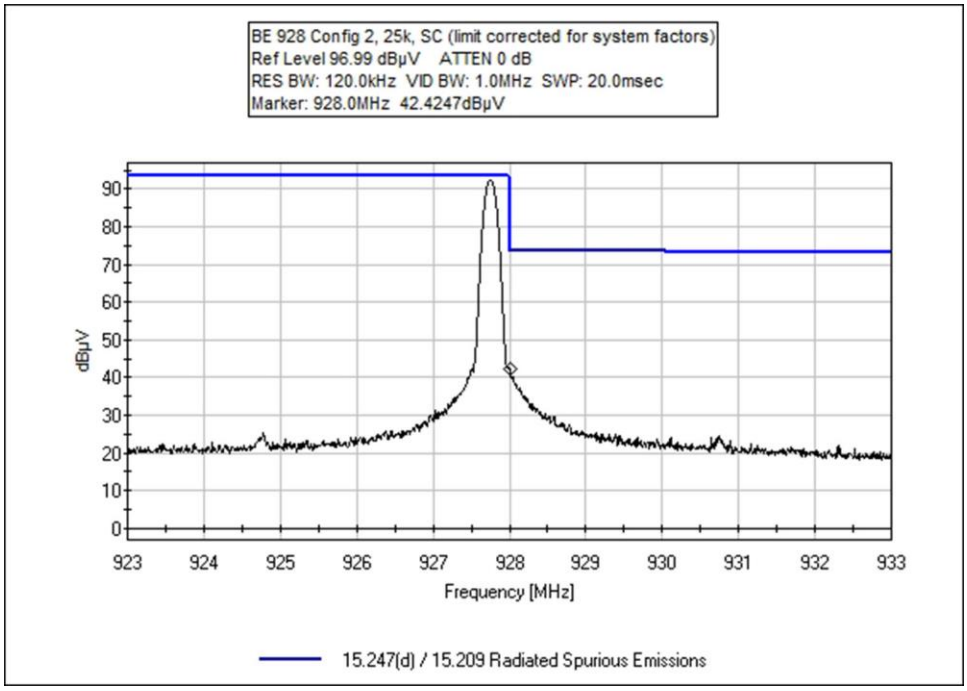


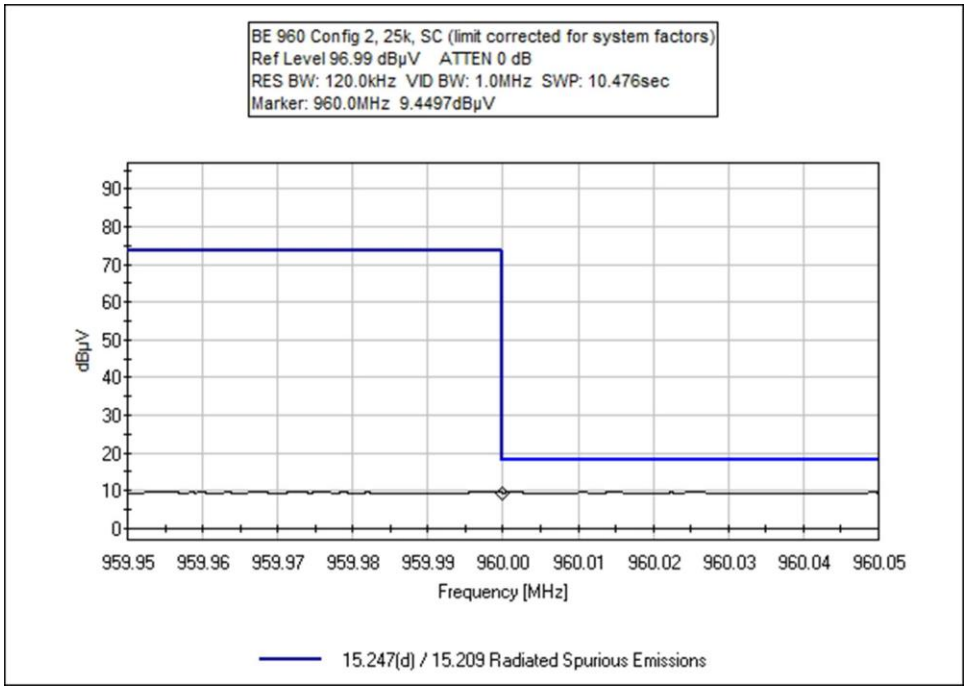

BE 928 Config 2, 10k, SC (limit corrected for system factors)
Ref Level 96.99 dBµV ATTEN 0 dB
RES BW: 120.0kHz VID BW: 1.0MHz SWP: 20.0msec
Marker: 928.0MHz 42.8297dBµV
dBµV
90
80
70
60
50
40
30
20
10
0
923
924
925
926
927
928
929
930
931
932
933
Frequency [MHz]
15.247(d) / 15.209 Radiated Spurious Emissions


BE 960 Config 2, 10k, SC (limit corrected for system factors)
Ref Level 96.99 dBµV ATTEN 0 dB
RES BW: 120.0kHz VID BW: 1.0MHz SWP: 10.476sec
Marker: 960.0MHz 9.3707dBµV
dBµV
90
80
70
60
50
40
30
20
10
0
959.95
959.96
959.97
959.98
959.99
960.00
960.01
960.02
960.03
960.04
960.05
Frequency [MHz]
15.247(d) / 15.209 Radiated Spurious Emissions

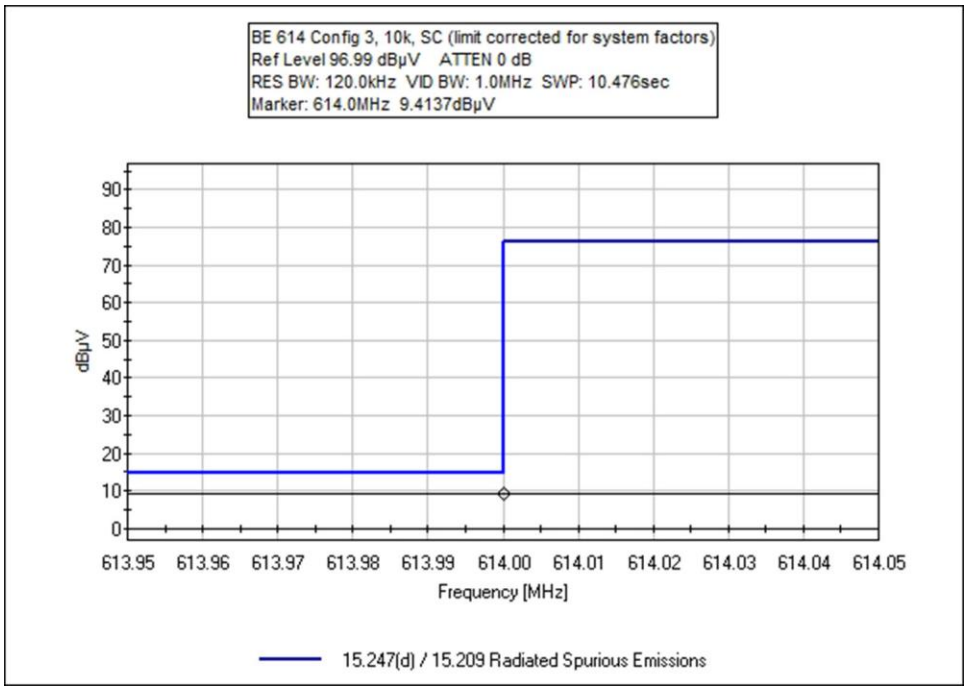

BE 614 Config 2, 25k, SC (limit corrected for system factors)
Ref Level 96.99 dBµV ATTEN 0 dB
RES BW: 120.0kHz VID BW: 1.0MHz SWP: 10.476sec
Marker: 614.0MHz 9.4077dBµV
dBµV
90
80
70
60
50
40
30
20
10
0
613.95 613.96 613.97 613.98 613.99 614.00 614.01 614.02 614.03 614.04 614.05
Frequency [MHz]
15.247(d) / 15.209 Radiated Spurious Emissions

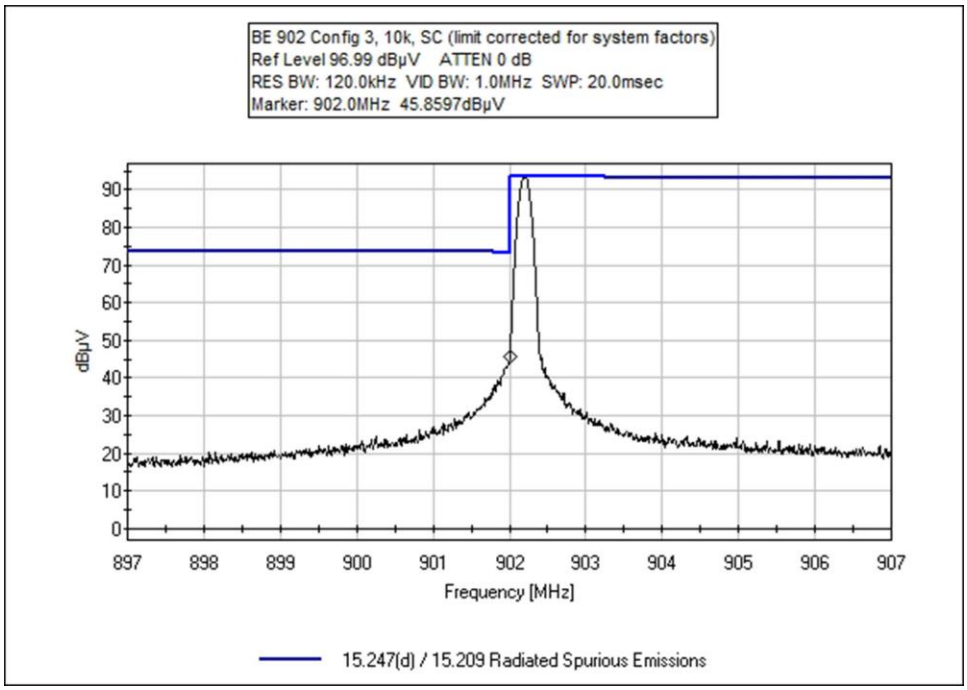

BE 902 Config 2, 25k, SC (limit corrected for system factors)
Ref Level 96.99 dBµV ATTEN 0 dB
RES BW: 120.0kHz VID BW: 1.0MHz SWP: 20.0msec
Marker: 902.0MHz 48.3397dBµV
dBµV
90
80
70
60
50
40
30
20
10
0
897 898 899 900 901 902 903 904 905 906 907
Frequency [MHz]
15.247(d) / 15.209 Radiated Spurious Emissions

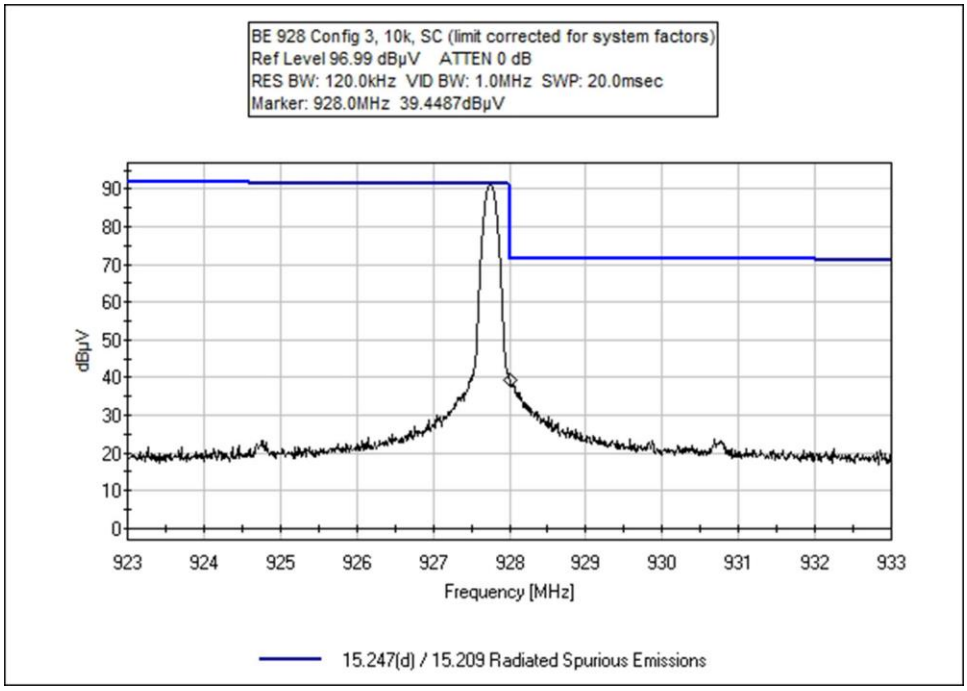

BE 928 Config 2, 25k, SC (limit corrected for system factors)
Ref Level 96.99 dBµV ATTEN 0 dB
RES BW: 120.0kHz VID BW: 1.0MHz SWP: 20.0msec
Marker: 928.0MHz 42.4247dBµV
dBµV
90
80
70
60
50
40
30
20
10
0
923
924
925
926
927
928
929
930
931
932
933
Frequency [MHz]
15.247(d) / 15.209 Radiated Spurious Emissions

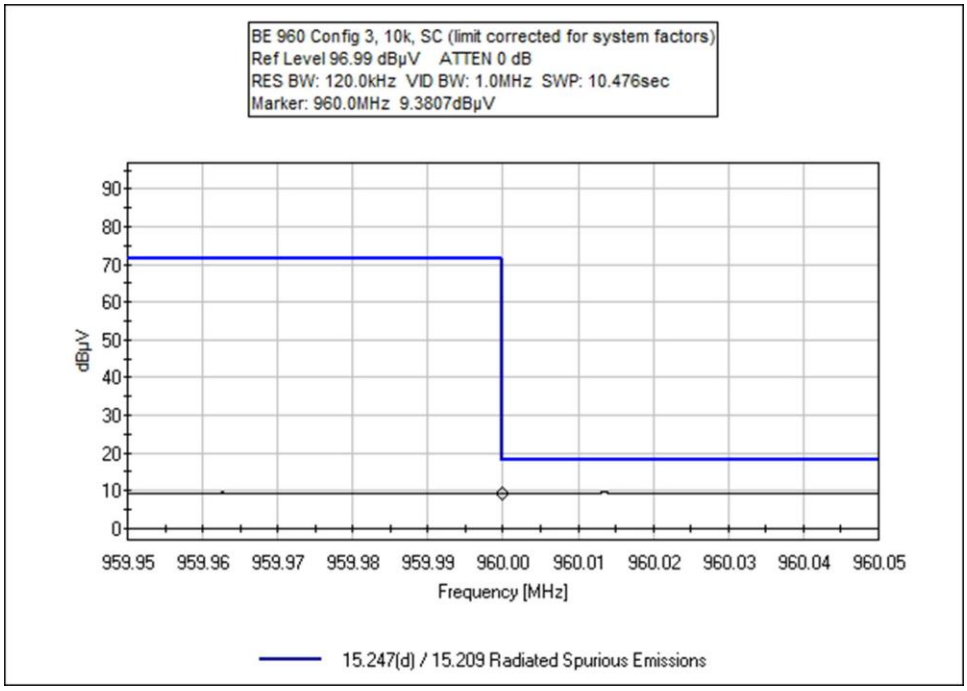

BE 960 Config 2, 25k, SC (limit corrected for system factors)
Ref Level 96.99 dBµV ATTEN 0 dB
RES BW: 120.0kHz VID BW: 1.0MHz SWP: 10.476sec
Marker: 960.0MHz 9.4497dBµV
dBµV
90
80
70
60
50
40
30
20
10
0
959.95
959.96
959.97
959.98
959.99
960.00
960.01
960.02
960.03
960.04
960.05
Frequency [MHz]
15.247(d) / 15.209 Radiated Spurious Emissions

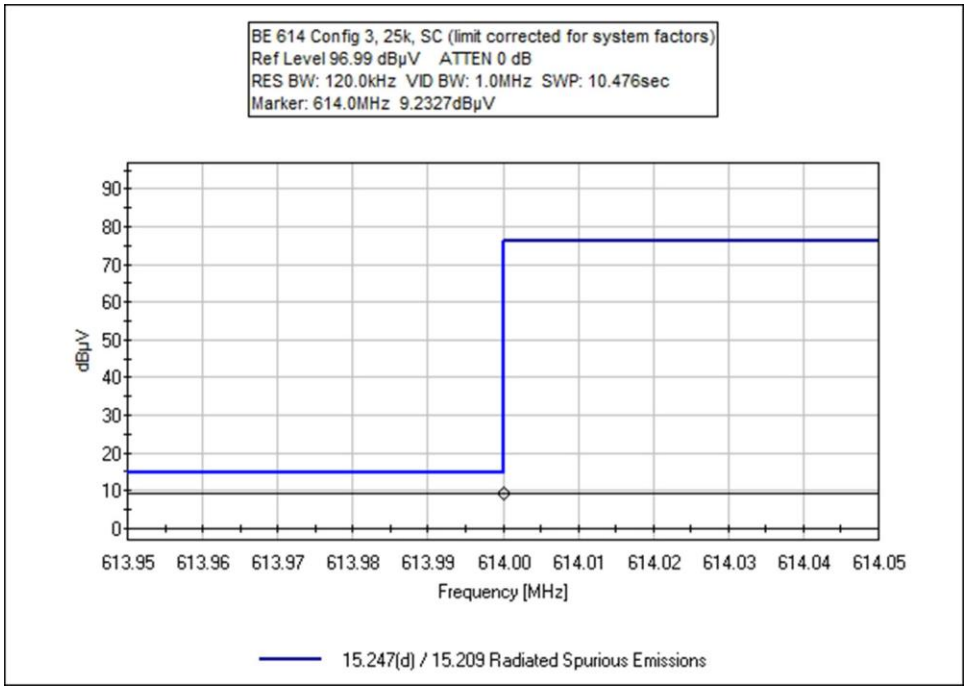
Configuration 3

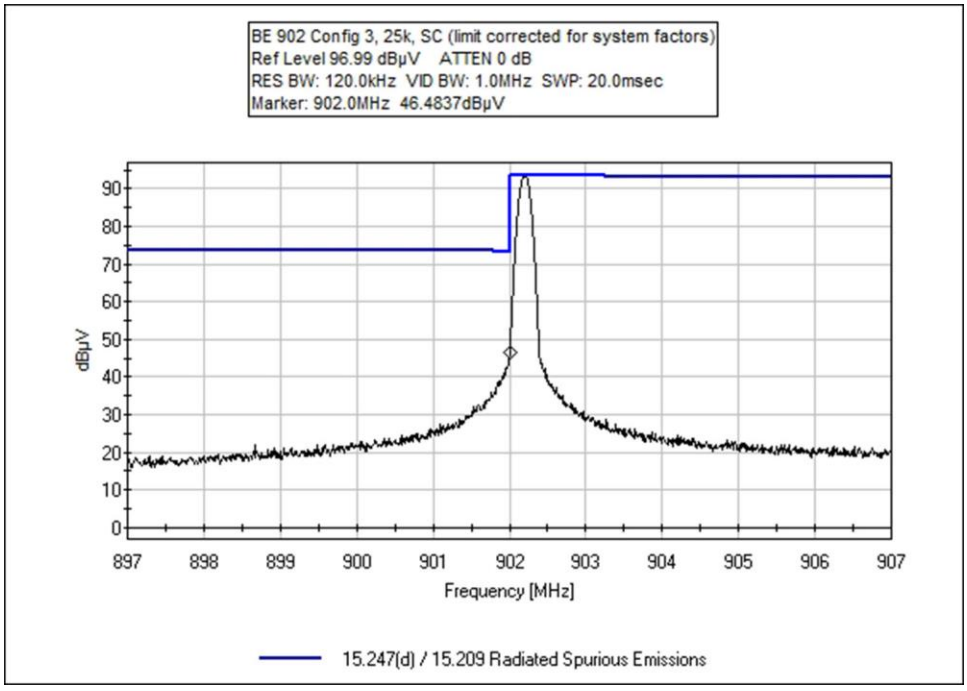


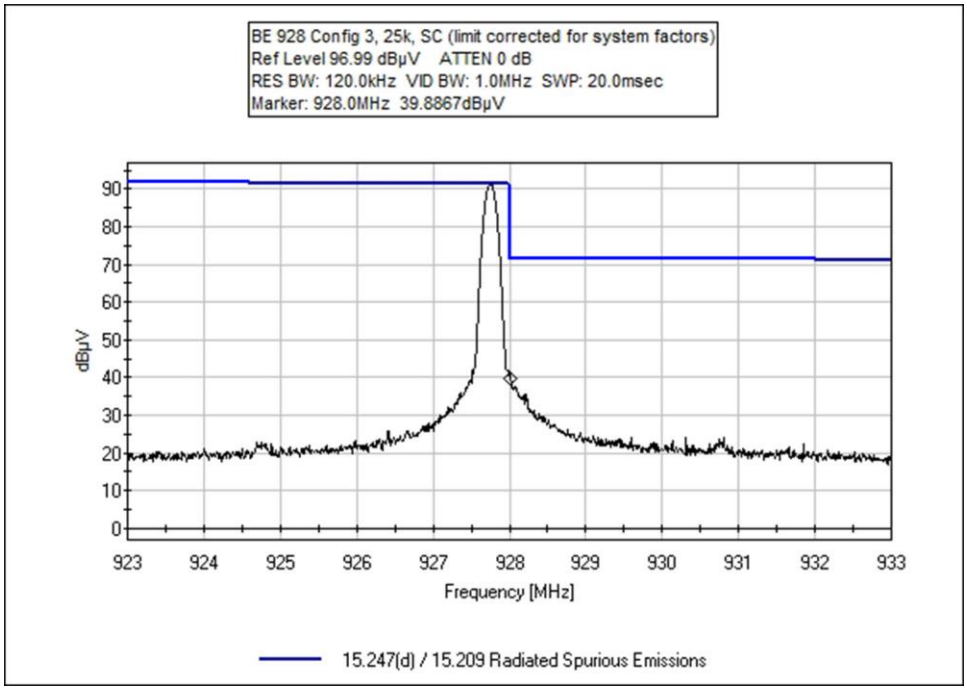


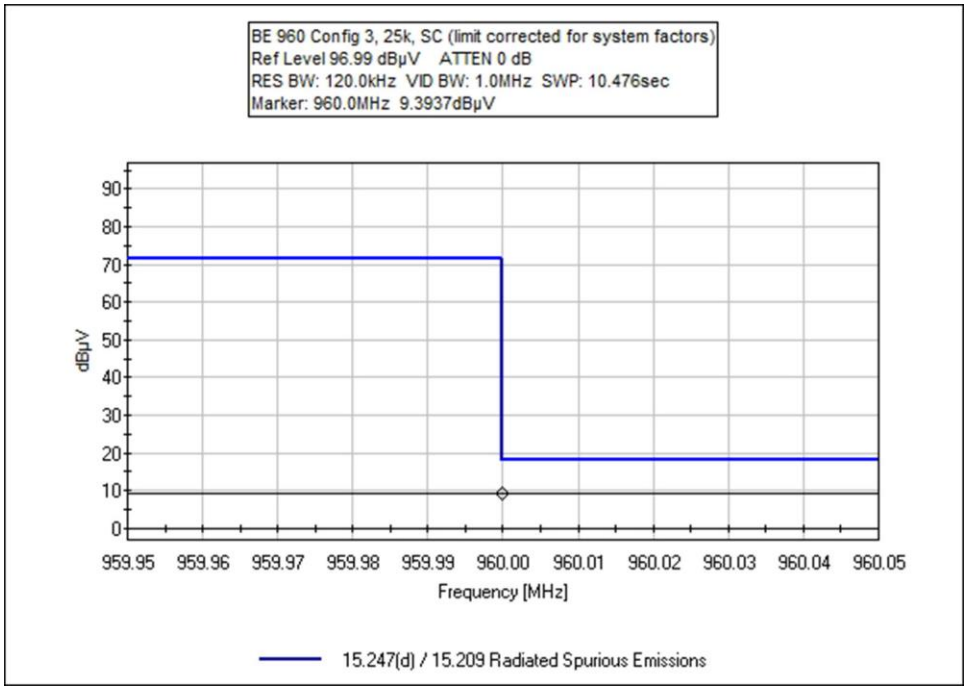

BE 928 Config 3, 10k, SC (limit corrected for system factors)
Ref Level 96.99 dBµV ATTEN 0 dB
RES BW: 120.0kHz VID BW: 1.0MHz SWP: 20.0msec
Marker: 928.0MHz 39.4487dBµV
dBµV
90
80
70
60
50
40
30
20
10
0
923
924
925
926
927
928
929
930
931
932
933
Frequency [MHz]
15.247(d) / 15.209 Radiated Spurious Emissions


BE 960 Config 3, 10k, SC (limit corrected for system factors)
Ref Level 96.99 dBµV ATTEN 0 dB
RES BW: 120.0kHz VID BW: 1.0MHz SWP: 10.476sec
Marker: 960.0MHz 9.3807dBµV
dBµV
90
80
70
60
50
40
30
20
10
0
959.95
959.96
959.97
959.98
959.99
960.00
960.01
960.02
960.03
960.04
960.05
Frequency [MHz]
15.247(d) / 15.209 Radiated Spurious Emissions

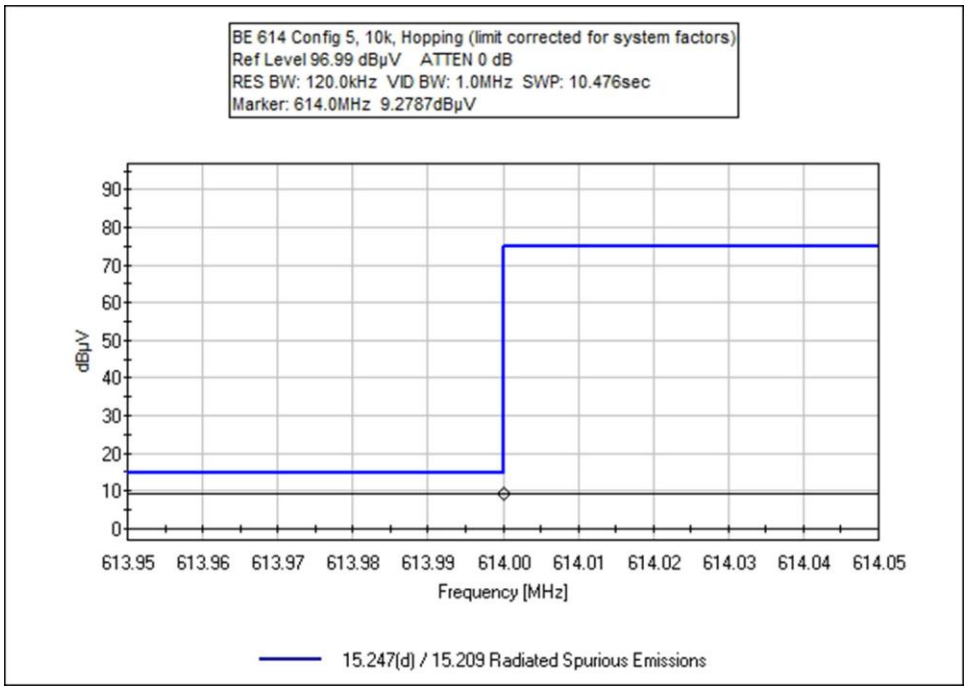

BE 614 Config 3, 25k, SC (limit corrected for system factors)
Ref Level 96.99 dBµV ATTEN 0 dB
RES BW: 120.0kHz VID BW: 1.0MHz SWP: 10.476sec
Marker: 614.0MHz 9.2327dBµV
dBµV
90
80
70
60
50
40
30
20
10
0
613.95 613.96 613.97 613.98 613.99 614.00 614.01 614.02 614.03 614.04 614.05
Frequency [MHz]
15.247(d) / 15.209 Radiated Spurious Emissions

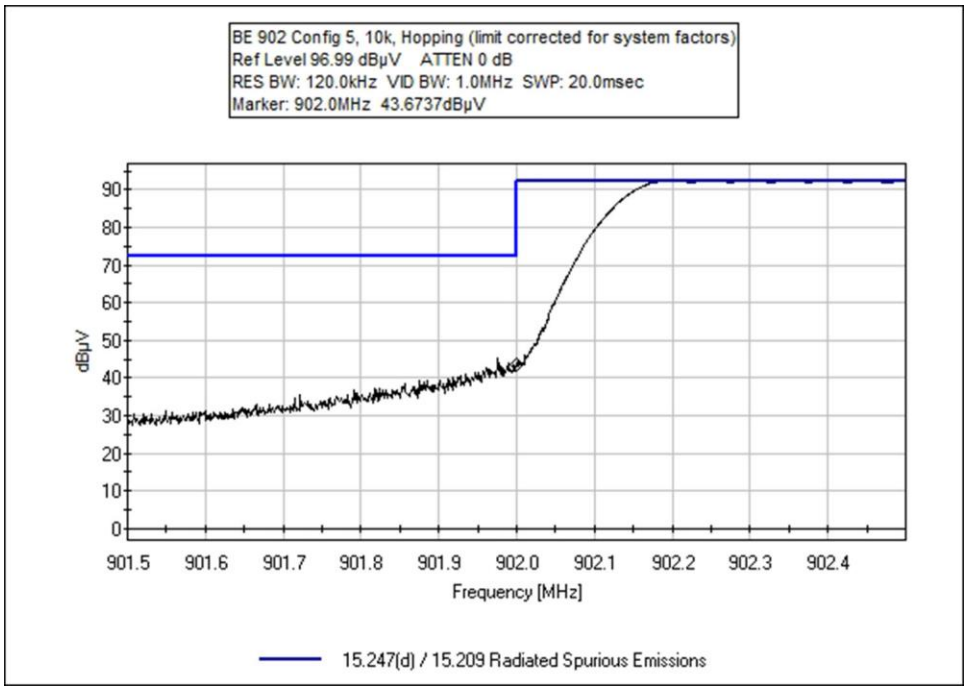

BE 902 Config 3, 25k, SC (limit corrected for system factors)
Ref Level 96.99 dBµV ATTEN 0 dB
RES BW: 120.0kHz VID BW: 1.0MHz SWP: 20.0msec
Marker: 902.0MHz 46.4837dBµV
dBµV
90
80
70
60
50
40
30
20
10
0
897 898 899 900 901 902 903 904 905 906 907
Frequency [MHz]
15.247(d) / 15.209 Radiated Spurious Emissions

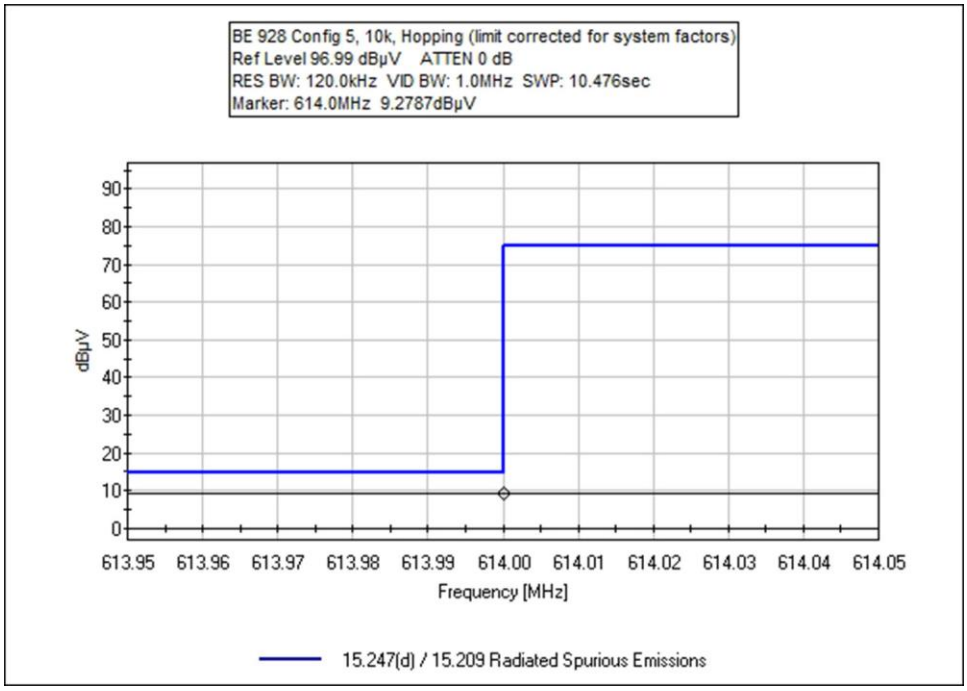

BE 928 Config 3, 25k, SC (limit corrected for system factors)
Ref Level 96.99 dBµV ATTEN 0 dB
RES BW: 120.0kHz VID BW: 1.0MHz SWP: 20.0msec
Marker: 928.0MHz 39.8867dBµV
dBµV
90
80
70
60
50
40
30
20
10
0
923
924
925
926
927
928
929
930
931
932
933
Frequency [MHz]
15.247(d) / 15.209 Radiated Spurious Emissions

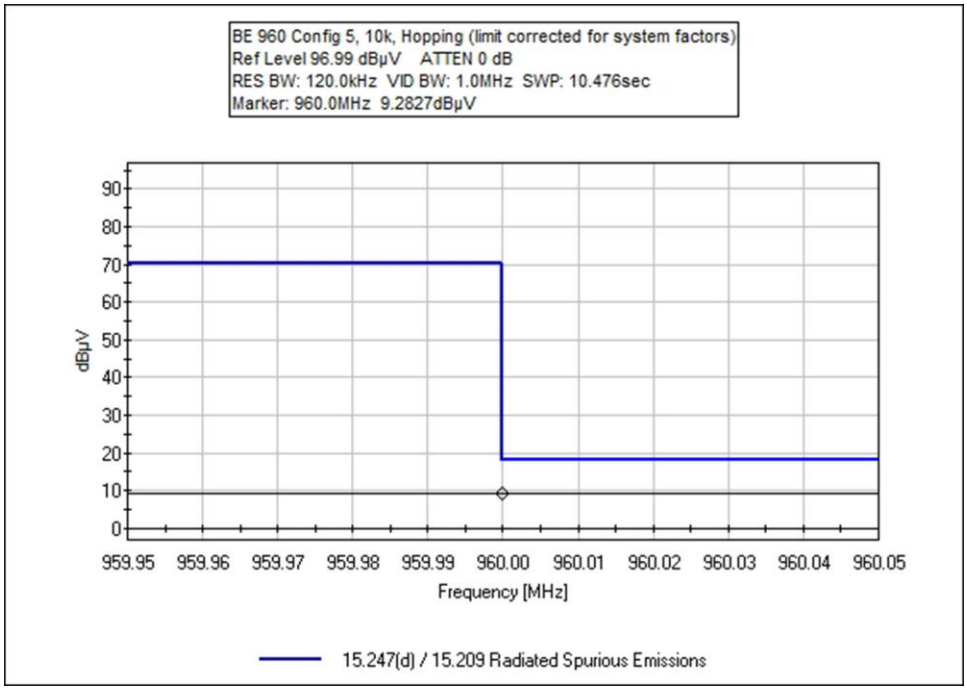

BE 960 Config 3, 25k, SC (limit corrected for system factors)
Ref Level 96.99 dBµV ATTEN 0 dB
RES BW: 120.0kHz VID BW: 1.0MHz SWP: 10.476sec
Marker: 960.0MHz 9.3937dBµV
dBµV
90
80
70
60
50
40
30
20
10
0
959.95
959.96
959.97
959.98
959.99
960.00
960.01
960.02
960.03
960.04
960.05
Frequency [MHz]
15.247(d) / 15.209 Radiated Spurious Emissions

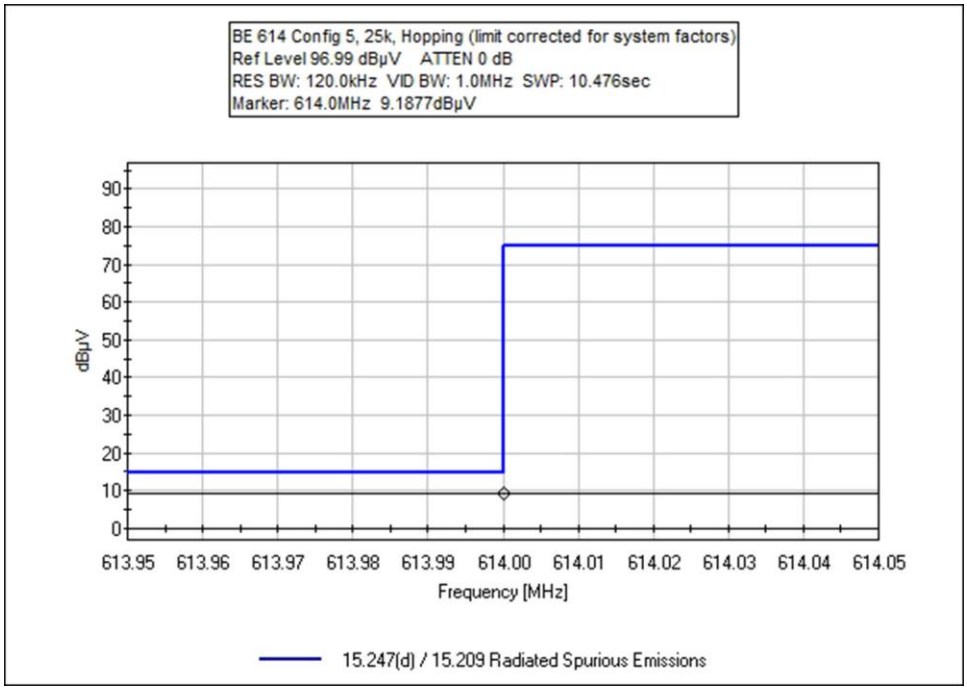
Configuration 5

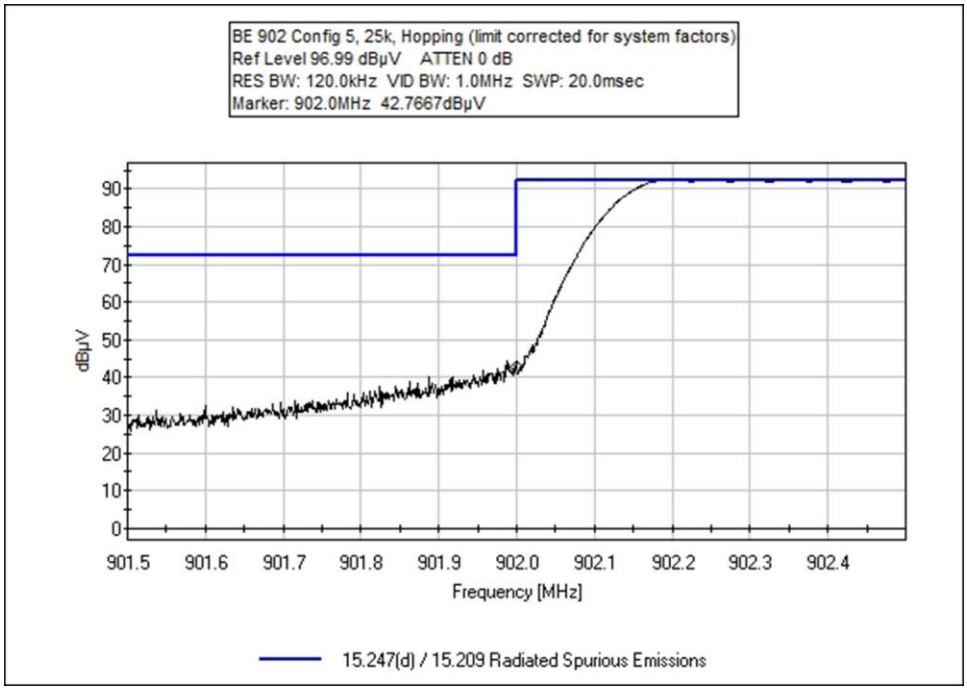


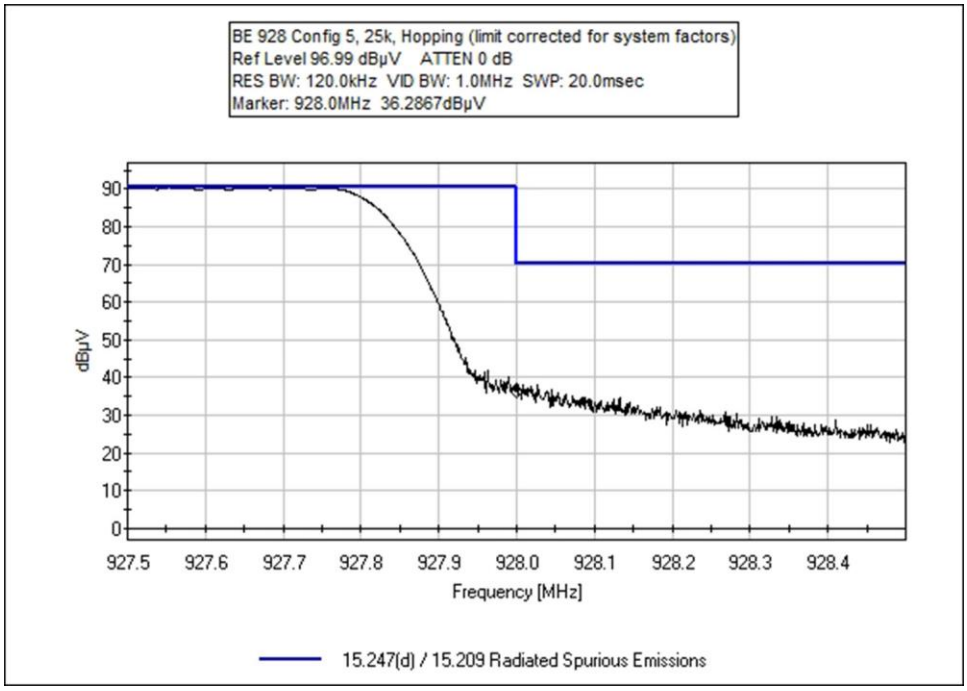


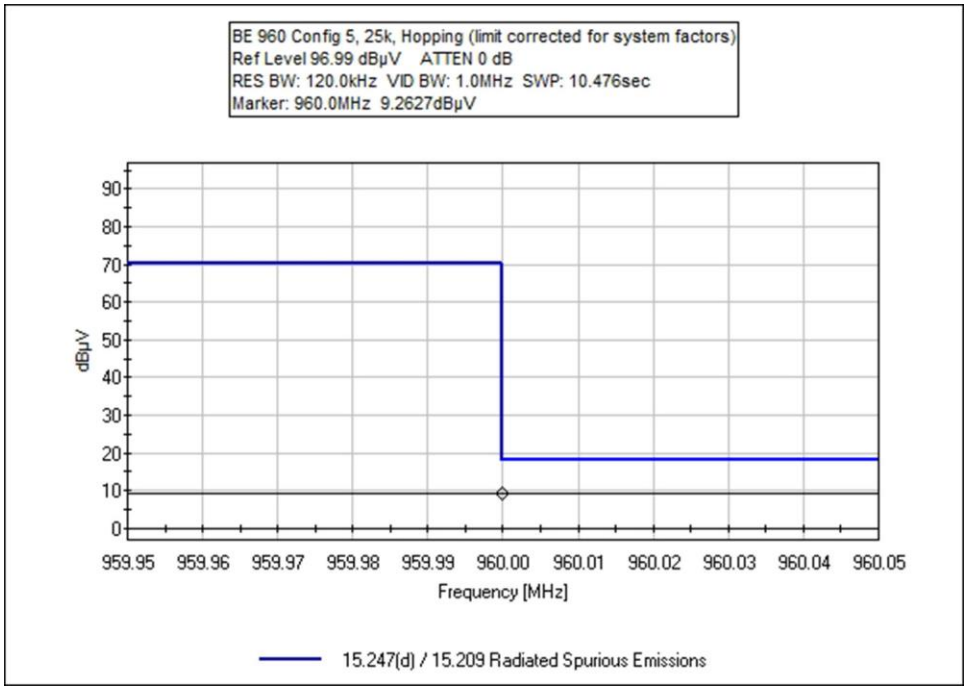

BE 928 Config 5, 10k, Hopping (limit corrected for system factors)
Ref Level 96.99 dBµV ATTEN 0 dB
RES BW: 120.0kHz VID BW: 1.0MHz SWP: 10.476sec
Marker: 614.0MHz 9.2787dBµV
dBµV
90
80
70
60
50
40
30
20
10
0
613.95 613.96 613.97 613.98 613.99 614.00 614.01 614.02 614.03 614.04 614.05
Frequency [MHz]
15.247(d) / 15.209 Radiated Spurious Emissions


BE 960 Config 5, 10k, Hopping (limit corrected for system factors)
Ref Level 96.99 dBµV ATTEN 0 dB
RES BW: 120.0kHz VID BW: 1.0MHz SWP: 10.476sec
Marker: 960.0MHz 9.2827dBµV
dBµV
90
80
70
60
50
40
30
20
10
0
959.95 959.96 959.97 959.98 959.99 960.00 960.01 960.02 960.03 960.04 960.05
Frequency [MHz]
15.247(d) / 15.209 Radiated Spurious Emissions

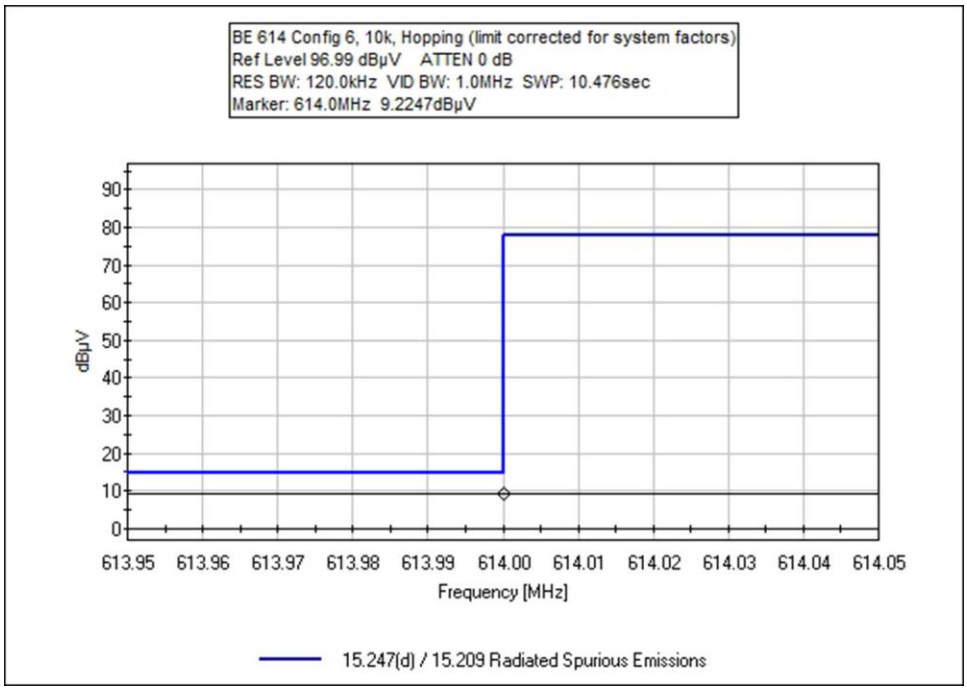

BE 614 Config 5, 25k, Hopping (limit corrected for system factors)
Ref Level 96.99 dBµV ATTEN 0 dB
RES BW: 120.0kHz VID BW: 1.0MHz SWP: 10.476sec
Marker: 614.0MHz 9.1877dBµV
dBµV
90
80
70
60
50
40
30
20
10
0
613.95 613.96 613.97 613.98 613.99 614.00 614.01 614.02 614.03 614.04 614.05
Frequency [MHz]
15.247(d) / 15.209 Radiated Spurious Emissions

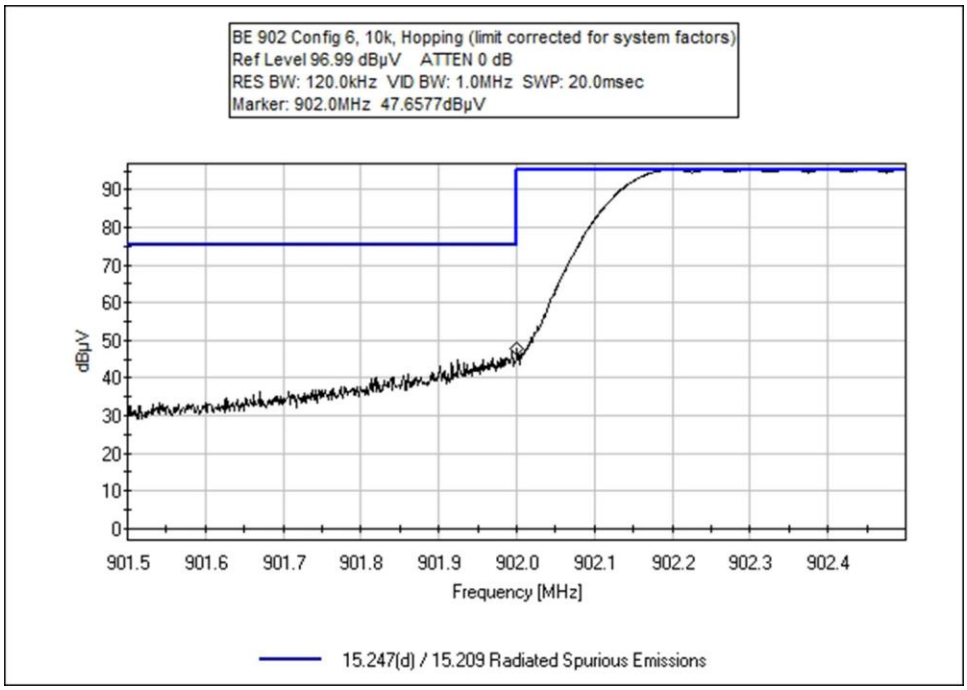

BE 902 Config 5, 25k, Hopping (limit corrected for system factors)
Ref Level 96.99 dBµV ATTEN 0 dB
RES BW: 120.0kHz VID BW: 1.0MHz SWP: 20.0msec
Marker: 902.0MHz 42.7667dBµV
dBµV
90
80
70
60
50
40
30
20
10
0
901.5 901.6 901.7 901.8 901.9 902.0 902.1 902.2 902.3 902.4
Frequency [MHz]
15.247(d) / 15.209 Radiated Spurious Emissions

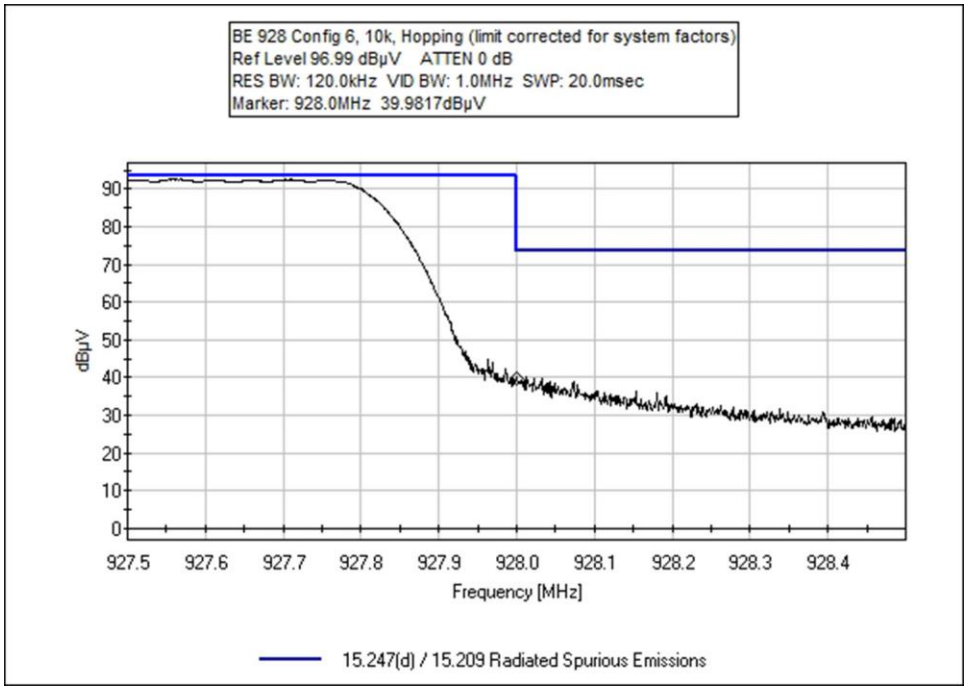

BE 928 Config 5, 25k, Hopping (limit corrected for system factors)
Ref Level 96.99 dBµV ATTEN 0 dB
RES BW: 120.0kHz VID BW: 1.0MHz SWP: 20.0msec
Marker: 928.0MHz 36.2867dBµV
dBµV
90
80
70
60
50
40
30
20
10
0
927.5
927.6
927.7
927.8
927.9
928.0
928.1
928.2
928.3
928.4
Frequency [MHz]
15.247(d) / 15.209 Radiated Spurious Emissions

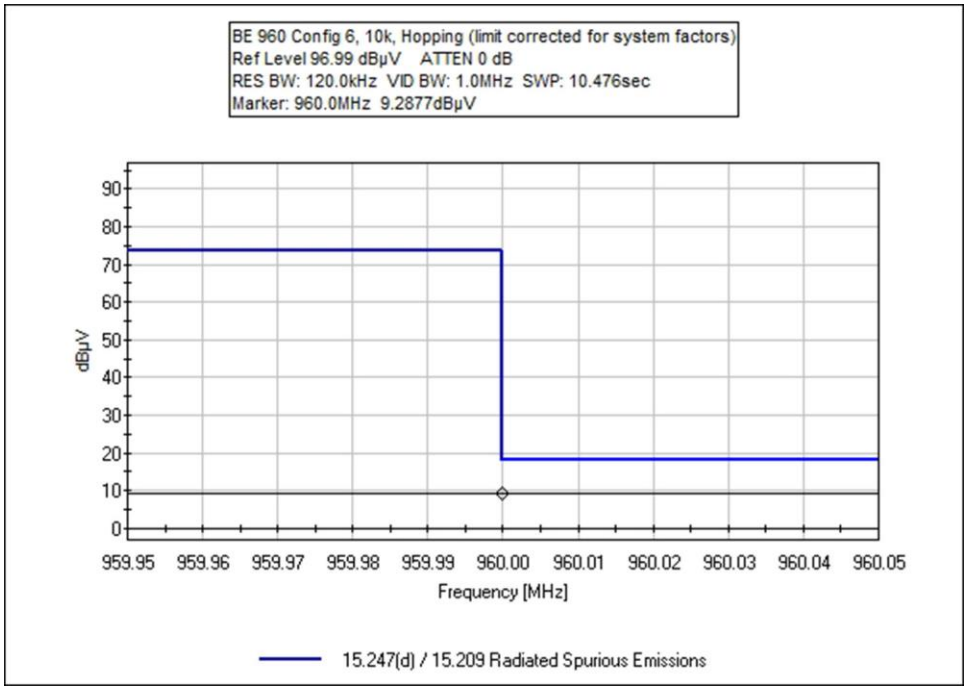

BE 960 Config 5, 25k, Hopping (limit corrected for system factors)
Ref Level 96.99 dBµV ATTEN 0 dB
RES BW: 120.0kHz VID BW: 1.0MHz SWP: 10.476sec
Marker: 960.0MHz 9.2627dBµV
dBµV
90
80
70
60
50
40
30
20
10
0
959.95
959.96
959.97
959.98
959.99
960.00
960.01
960.02
960.03
960.04
960.05
Frequency [MHz]
15.247(d) / 15.209 Radiated Spurious Emissions

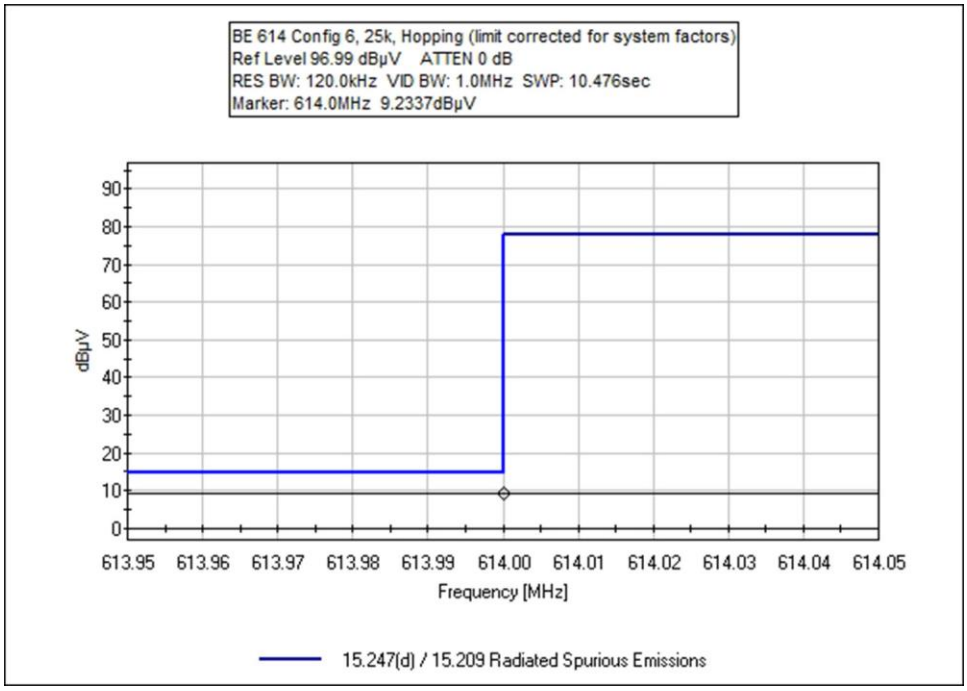
Configuration 6

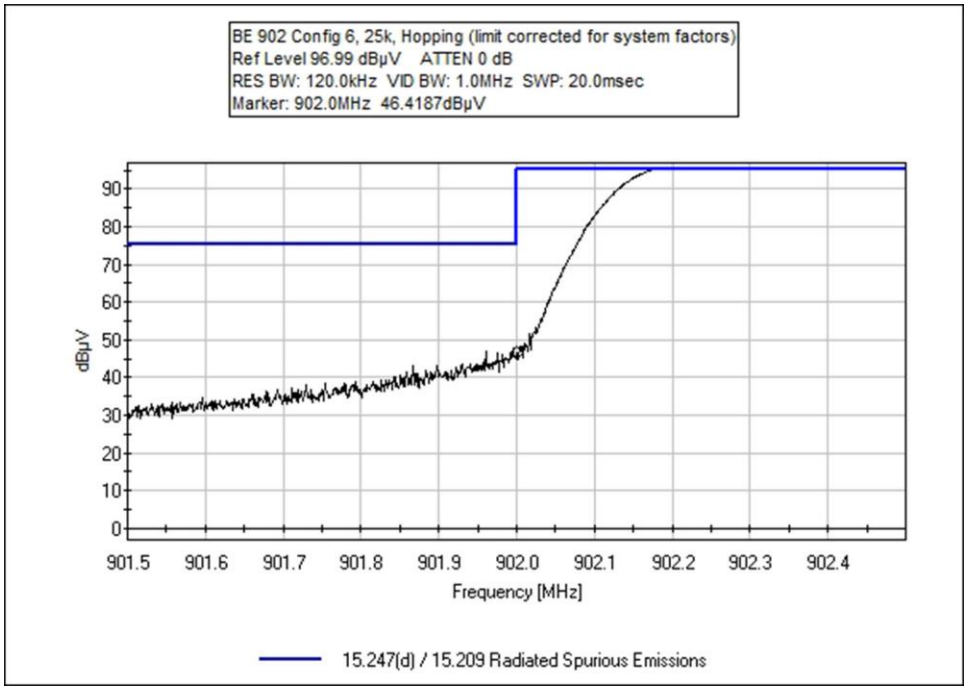


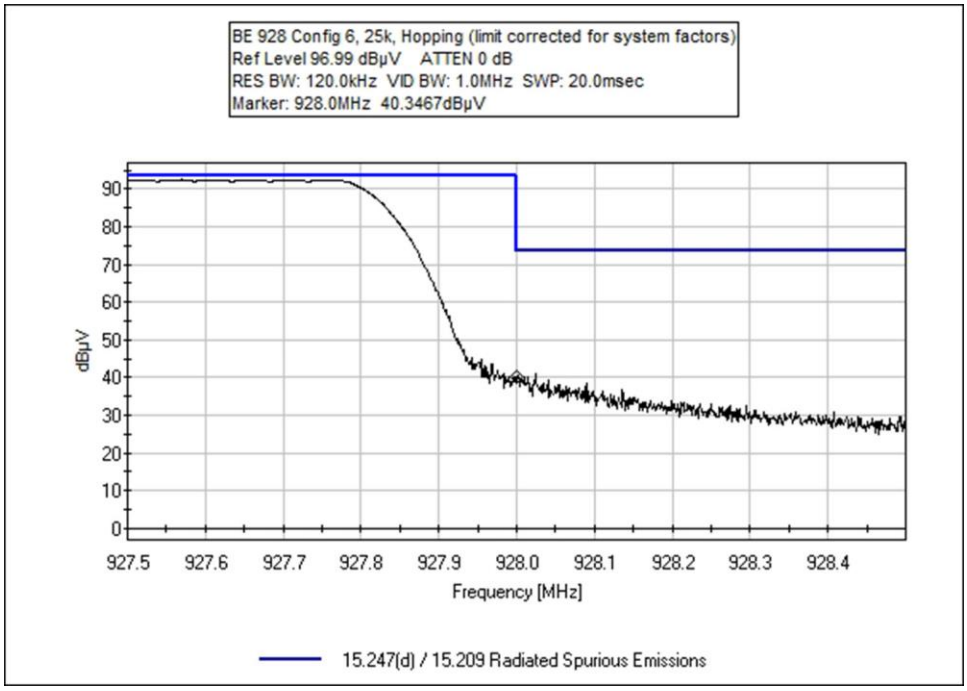


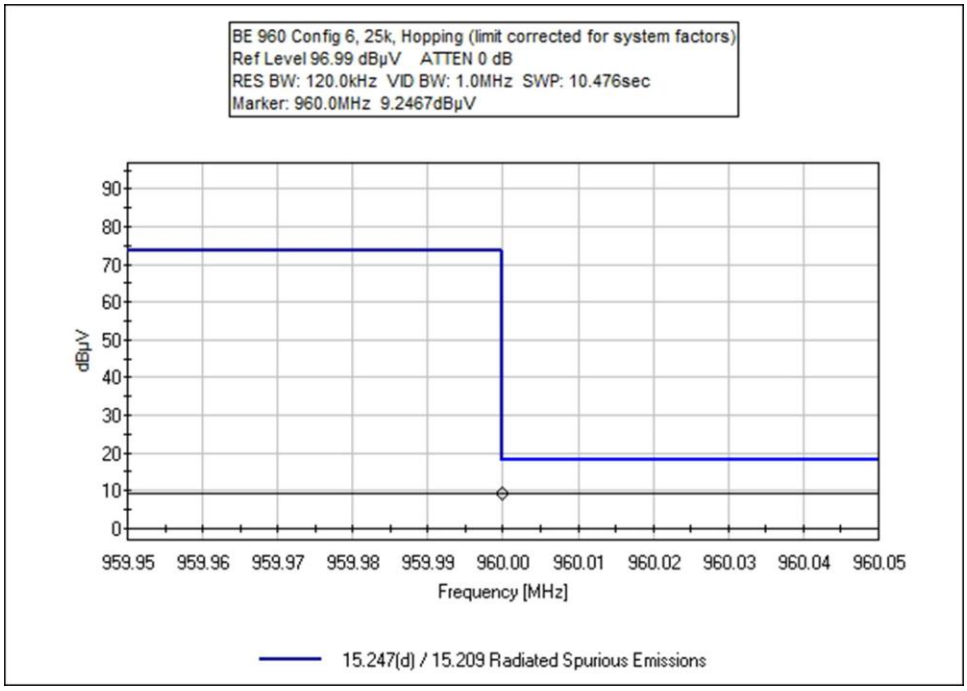

BE 928 Config 6, 10k, Hopping (limit corrected for system factors)
Ref Level 96.99 dBµV ATTEN 0 dB
RES BW: 120.0kHz VID BW: 1.0MHz SWP: 20.0msec
Marker: 928.0MHz 39.9817dBµV
dBµV
90
80
70
60
50
40
30
20
10
0
927.5
927.6
927.7
927.8
927.9
928.0
928.1
928.2
928.3
928.4
Frequency [MHz]
15.247(d) / 15.209 Radiated Spurious Emissions


BE 960 Config 6, 10k, Hopping (limit corrected for system factors)
Ref Level 96.99 dBµV ATTEN 0 dB
RES BW: 120.0kHz VID BW: 1.0MHz SWP: 10.476sec
Marker: 960.0MHz 9.2877dBµV
dBµV
90
80
70
60
50
40
30
20
10
0
959.95
959.96
959.97
959.98
959.99
960.00
960.01
960.02
960.03
960.04
960.05
Frequency [MHz]
15.247(d) / 15.209 Radiated Spurious Emissions

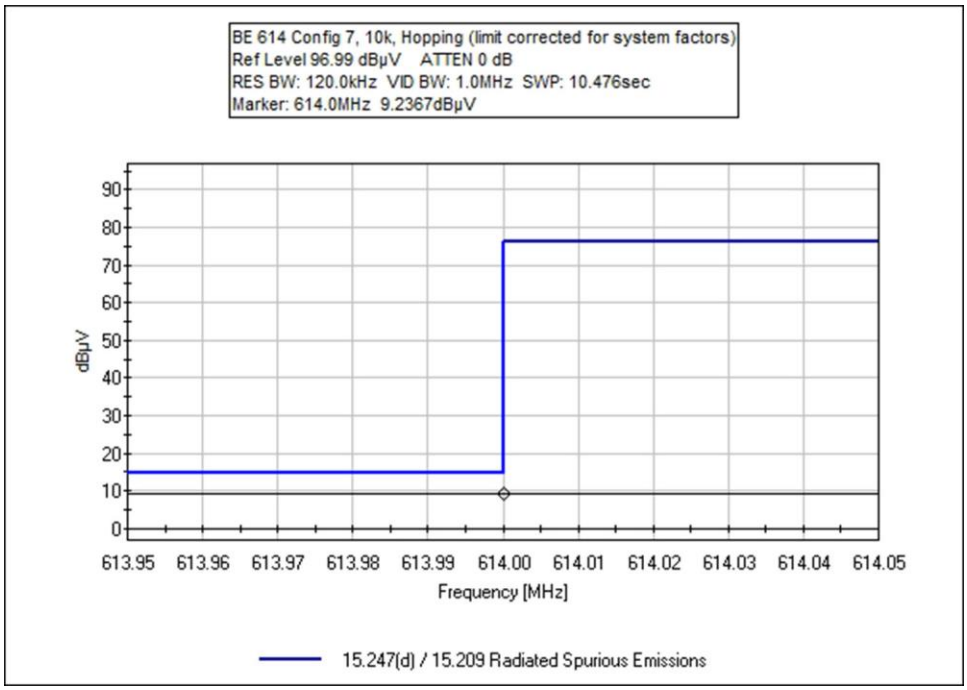

BE 614 Config 6, 25k, Hopping (limit corrected for system factors)
Ref Level 96.99 dBµV ATTEN 0 dB
RES BW: 120.0kHz VID BW: 1.0MHz SWP: 10.476sec
Marker: 614.0MHz 9.2337dBµV
dBµV
90
80
70
60
50
40
30
20
10
0
613.95 613.96 613.97 613.98 613.99 614.00 614.01 614.02 614.03 614.04 614.05
Frequency [MHz]
15.247(d) / 15.209 Radiated Spurious Emissions

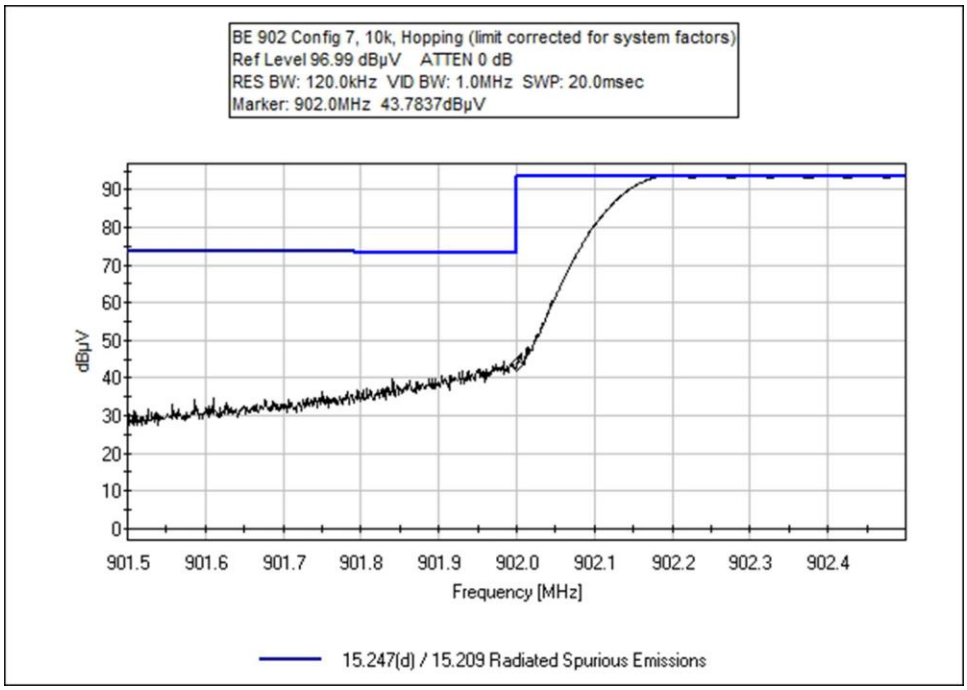

BE 902 Config 6, 25k, Hopping (limit corrected for system factors)
Ref Level 96.99 dBµV ATTEN 0 dB
RES BW: 120.0kHz VID BW: 1.0MHz SWP: 20.0msec
Marker: 902.0MHz 46.4187dBµV
dBµV
90
80
70
60
50
40
30
20
10
0
901.5 901.6 901.7 901.8 901.9 902.0 902.1 902.2 902.3 902.4
Frequency [MHz]
15.247(d) / 15.209 Radiated Spurious Emissions

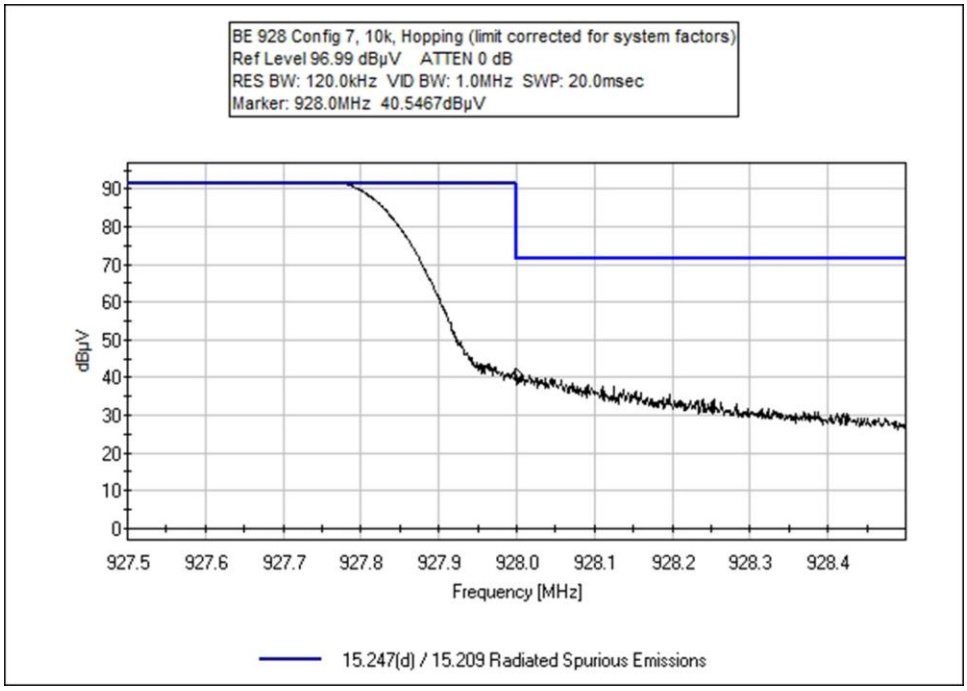

BE 928 Config 6, 25k, Hopping (limit corrected for system factors)
Ref Level 96.99 dBµV ATTEN 0 dB
RES BW: 120.0kHz VID BW: 1.0MHz SWP: 20.0msec
Marker: 928.0MHz 40.3467dBµV
dBµV
90
80
70
60
50
40
30
20
10
0
927.5
927.6
927.7
927.8
927.9
928.0
928.1
928.2
928.3
928.4
Frequency [MHz]
15.247(d) / 15.209 Radiated Spurious Emissions

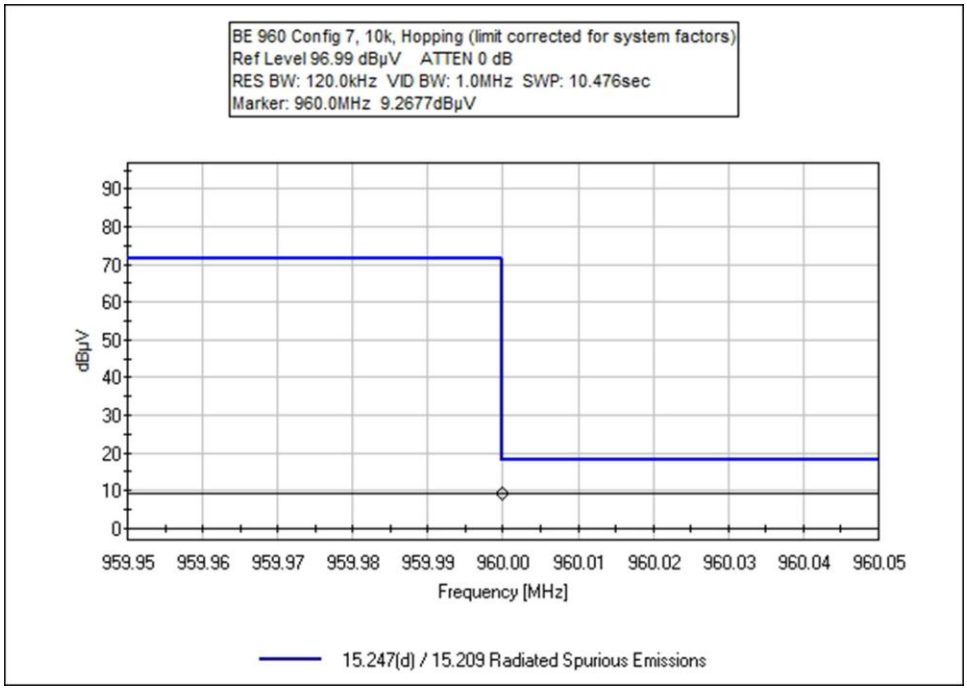

BE 960 Config 6, 25k, Hopping (limit corrected for system factors)
Ref Level 96.99 dBµV ATTEN 0 dB
RES BW: 120.0kHz VID BW: 1.0MHz SWP: 10.476sec
Marker: 960.0MHz 9.2467dBµV
dBµV
90
80
70
60
50
40
30
20
10
0
959.95
959.96
959.97
959.98
959.99
960.00
960.01
960.02
960.03
960.04
960.05
Frequency [MHz]
15.247(d) / 15.209 Radiated Spurious Emissions

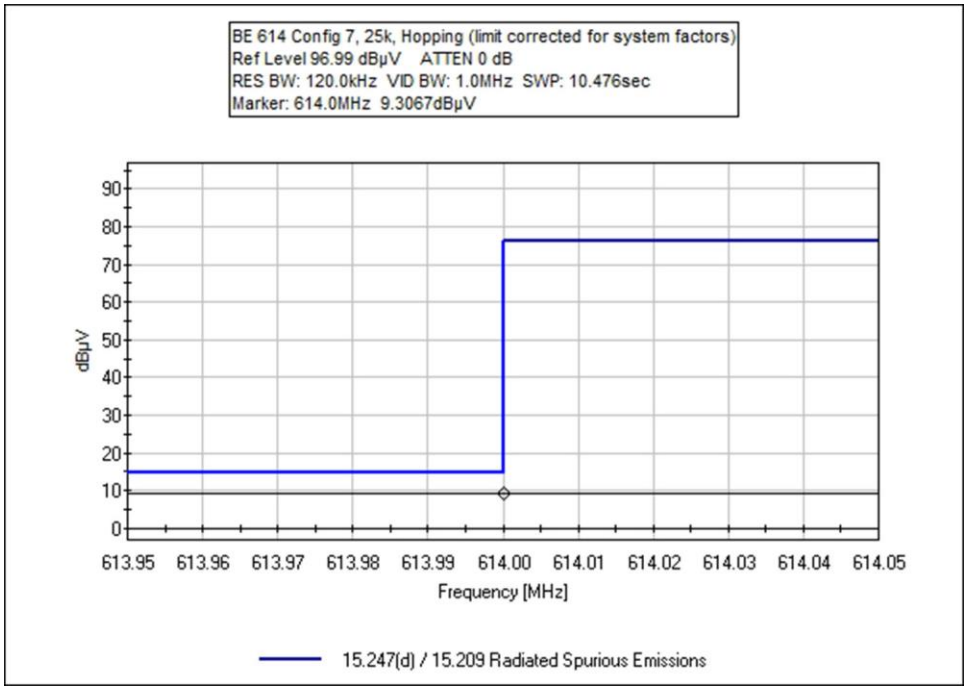
Configuration 7

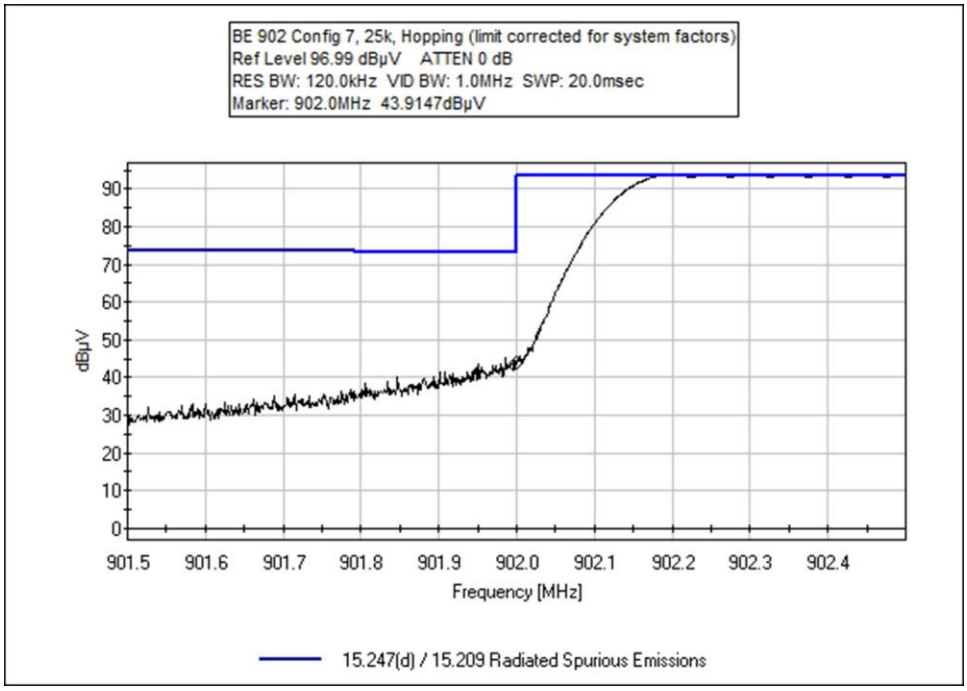


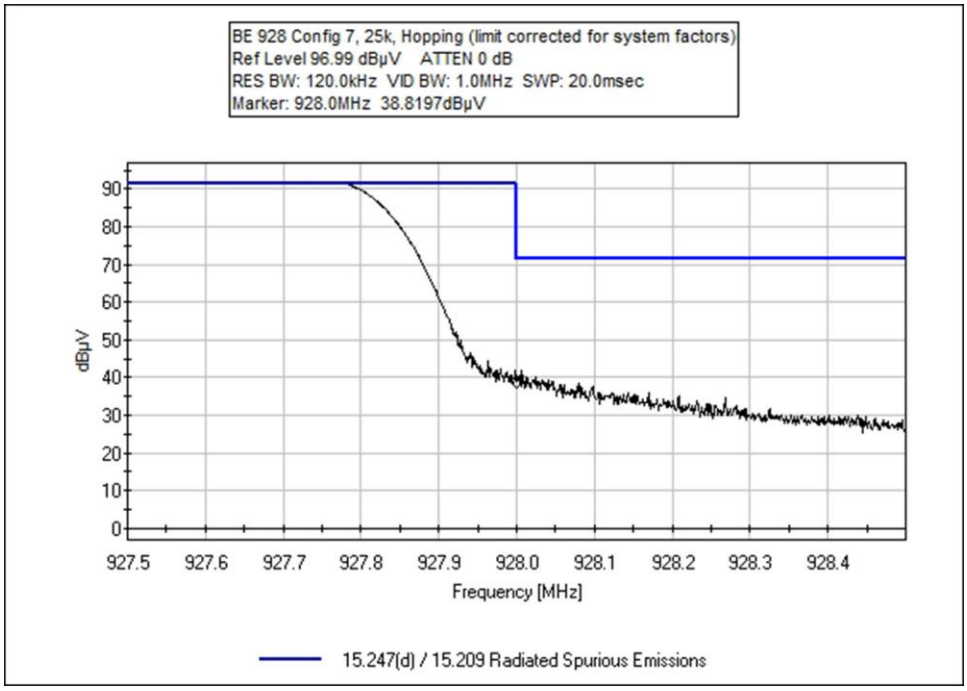


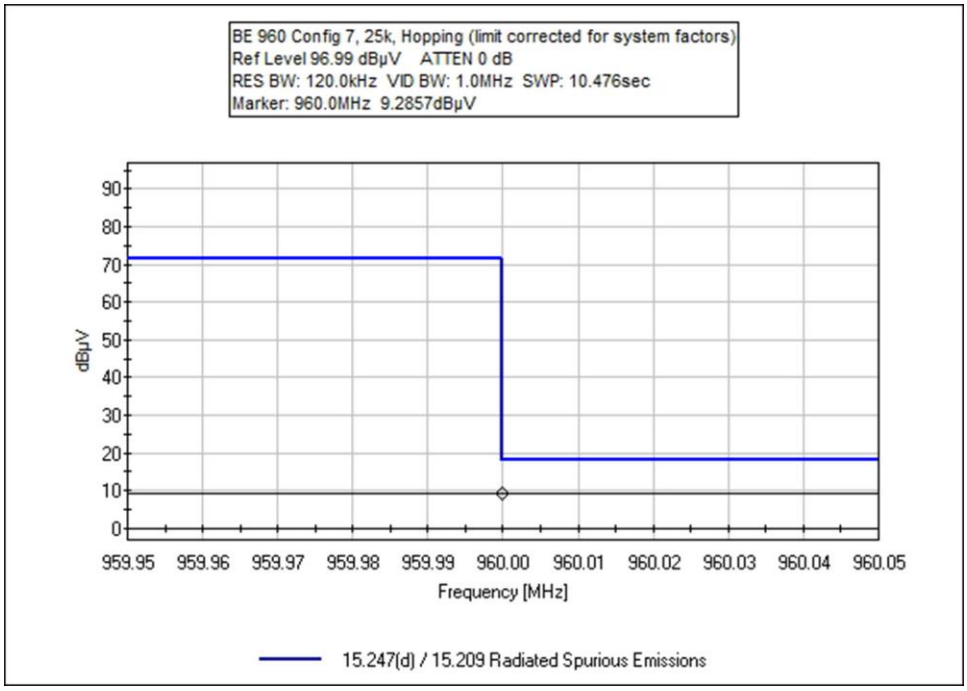

BE 928 Config 7, 10k, Hopping (limit corrected for system factors)
Ref Level 96.99 dBµV ATTEN 0 dB
RES BW: 120.0kHz VID BW: 1.0MHz SWP: 20.0msec
Marker: 928.0MHz 40.5467dBµV
dBµV
90
80
70
60
50
40
30
20
10
0
927.5
927.6
927.7
927.8
927.9
928.0
928.1
928.2
928.3
928.4
Frequency [MHz]
15.247(d) / 15.209 Radiated Spurious Emissions


BE 960 Config 7, 10k, Hopping (limit corrected for system factors)
Ref Level 96.99 dBµV ATTEN 0 dB
RES BW: 120.0kHz VID BW: 1.0MHz SWP: 10.476sec
Marker: 960.0MHz 9.2677dBµV
dBµV
90
80
70
60
50
40
30
20
10
0
959.95
959.96
959.97
959.98
959.99
960.00
960.01
960.02
960.03
960.04
960.05
Frequency [MHz]
15.247(d) / 15.209 Radiated Spurious Emissions


BE 614 Config 7, 25k, Hopping (limit corrected for system factors)
Ref Level 96.99 dBµV ATTEN 0 dB
RES BW: 120.0kHz VID BW: 1.0MHz SWP: 10.476sec
Marker: 614.0MHz 9.3067dBµV
dBµV
90
80
70
60
50
40
30
20
10
0
613.95 613.96 613.97 613.98 613.99 614.00 614.01 614.02 614.03 614.04 614.05
Frequency [MHz]
15.247(d) / 15.209 Radiated Spurious Emissions


BE 902 Config 7, 25k, Hopping (limit corrected for system factors)
Ref Level 96.99 dBµV ATTEN 0 dB
RES BW: 120.0kHz VID BW: 1.0MHz SWP: 20.0msec
Marker: 902.0MHz 43.9147dBµV
dBµV
90
80
70
60
50
40
30
20
10
0
901.5 901.6 901.7 901.8 901.9 902.0 902.1 902.2 902.3 902.4
Frequency [MHz]
15.247(d) / 15.209 Radiated Spurious Emissions


BE 928 Config 7, 25k, Hopping (limit corrected for system factors)
Ref Level 96.99 dBµV ATTEN 0 dB
RES BW: 120.0kHz VID BW: 1.0MHz SWP: 20.0msec
Marker: 928.0MHz 38.8197dBµV
dBµV
90
80
70
60
50
40
30
20
10
0
927.5
927.6
927.7
927.8
927.9
928.0
928.1
928.2
928.3
928.4
Frequency [MHz]
15.247(d) / 15.209 Radiated Spurious Emissions


BE 960 Config 7, 25k, Hopping (limit corrected for system factors)
Ref Level 96.99 dBµV ATTEN 0 dB
RES BW: 120.0kHz VID BW: 1.0MHz SWP: 10.476sec
Marker: 960.0MHz 9.2857dBµV
dBµV
90
80
70
60
50
40
30
20
10
0
959.95
959.96
959.97
959.98
959.99
960.00
960.01
960.02
960.03
960.04
960.05
Frequency [MHz]
15.247(d) / 15.209 Radiated Spurious Emissions

Test Setup / Conditions / Data

Test Location:	CKC Laboratories, Inc. • 22116 23rd Drive SE, Suite A • Bothell, WA 98021 • (425) 402-1717		
Customer:	**Itron, Inc.**		
Specification:	**15.247(d) / 15.209 Radiated Spurious Emissions**		
Work Order #:	**108561**	Date:	9/8/2023
Test Type:	**Maximized Emissions**	Time:	18:07:52
Tested By:	Michael Atkinson	Sequence#:	17
Software:	EMITest 5.03.20		

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

Test Conditions / Notes:

Test Environment Conditions:
Temperature: 23°C
Humidity: 48%
Pressure: 101.7kPa

Test Method: ANSI C63.10 (2013)

Frequency Range: Band Edge

Test Setup:
Transmitting continuously with modulation, 10k and 25k modulations investigated.

Top two LTE antenna ports have Cisco p/n ANT-5G-MP-OUT-N antennas attached.
Itron IRM-Star (CAM3) radio module has Cisco p/n ANT-5G-MP-OUT-N antenna attached.
EUT Connected to support laptop via shielded Ethernet cable.

Horizontal and Vertical antenna polarities investigated, worst case reported.

2 x 31 material ferrites with 3 wraps each on Ethernet cable underneath the ground plane. The ferrites are out of the test volume and these are NOT considered a modification.

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN03824	Biconilog Antenna	3142E	5/9/2023	5/9/2025
T2	ANP05333	Cable	Heliax	8/8/2023	8/8/2025
T3	ANP05360	Cable	RG214	8/8/2023	8/8/2025
T4	ANP05546	Cable	Heliax	8/1/2023	8/1/2025
	AN02673	Spectrum Analyzer	E4446A	3/2/2023	3/2/2025

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

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	614.000M QP	9.4	+27.4	+1.2	+2.3	+0.5	+0.0	40.8	46.0 25k	-5.2	Vert
2	614.000M QP	9.3	+27.4	+1.2	+2.3	+0.5	+0.0	40.7	46.0 10k	-5.3	Vert
3	960.000M QP	9.4	+31.1	+1.6	+2.6	+0.7	+0.0	45.4	54.0 25k	-8.6	Vert
4	960.000M QP	9.4	+31.1	+1.6	+2.6	+0.7	+0.0	45.4	54.0 10k	-8.6	Vert
5	902.000M	43.6	+29.5	+1.5	+2.5	+0.6	+0.0	77.7	106.5 25k	-28.8	Vert
6	902.000M	43.4	+29.5	+1.5	+2.5	+0.6	+0.0	77.5	106.5 10k	-29.0	Vert
7	928.000M	40.5	+31.2	+1.5	+2.6	+0.7	+0.0	76.5	106.5 10k	-30.0	Vert
8	928.000M	38.8	+31.2	+1.5	+2.6	+0.7	+0.0	74.8	106.5 25k	-31.7	Vert

Test Location:	CKC Laboratories, Inc. • 22116 23rd Drive SE, Suite A • Bothell, WA 98021 • (425) 402-1717		
Customer:	**Itron, Inc.**		
Specification:	**15.247(d) / 15.209 Radiated Spurious Emissions**		
Work Order #:	**108561**	Date:	9/8/2023
Test Type:	**Maximized Emissions**	Time:	18:58:25
Tested By:	Michael Atkinson	Sequence#:	18
Software:	EMITest 5.03.20		

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 2			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 2			

Test Conditions / Notes:

Test Environment Conditions:
Temperature: 23°C
Humidity: 48%
Pressure: 101.7kPa

Test Method: ANSI C63.10 (2013)

Frequency Range: Band Edge

Test Setup:
Transmitting continuously with modulation, 10k and 25k modulations investigated.

Top two LTE antenna ports are have Cisco p/n ANT-5G-MP-OUT-N antennas attached.
Itron IRM-Star (CAM3) radio module has PCTEL p/n BOA9025NM-ITR antenna attached
EUT Connected to support laptop via shielded Ethernet cable.

Horizontal and Vertical antenna polarities investigated, worst case reported.

2 x 31 material ferrites with 3 wraps each on Ethernet cable underneath the ground plane. The ferrites are out of the test volume and these are NOT considered a modification.

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN03824	Biconilog Antenna	3142E	5/9/2023	5/9/2025
T2	ANP05333	Cable	Heliax	8/8/2023	8/8/2025
T3	ANP05360	Cable	RG214	8/8/2023	8/8/2025
T4	ANP05546	Cable	Heliax	8/1/2023	8/1/2025
	AN02673	Spectrum Analyzer	E4446A	3/2/2023	3/2/2025

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

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	614.000M QP	9.4	+27.4	+1.2	+2.3	+0.5	+0.0	40.8	46.0 25k	-5.2	Vert
2	614.000M QP	9.4	+27.4	+1.2	+2.3	+0.5	+0.0	40.8	46.0 10k	-5.2	Vert
3	960.000M QP	9.4	+31.1	+1.6	+2.6	+0.7	+0.0	45.4	54.0 25k	-8.6	Vert
4	960.000M QP	9.4	+31.1	+1.6	+2.6	+0.7	+0.0	45.4	54.0 10k	-8.6	Vert
5	902.000M	48.3	+29.5	+1.5	+2.5	+0.6	+0.0	82.4	109.5 25k	-27.1	Vert
6	902.000M	46.1	+29.5	+1.5	+2.5	+0.6	+0.0	80.2	109.5 10k	-29.3	Vert
7	928.000M	42.8	+31.2	+1.5	+2.6	+0.7	+0.0	78.8	109.5 10k	-30.7	Vert
8	928.000M	42.4	+31.2	+1.5	+2.6	+0.7	+0.0	78.4	109.5 25k	-31.1	Vert

Test Location:	CKC Laboratories, Inc. • 22116 23rd Drive SE, Suite A • Bothell, WA 98021 • (425) 402-1717		
Customer:	**Itron, Inc.**		
Specification:	**15.247(d) / 15.209 Radiated Spurious Emissions**		
Work Order #:	**108561**	Date:	9/8/2023
Test Type:	**Maximized Emissions**	Time:	19:38:58
Tested By:	Michael Atkinson	Sequence#:	19
Software:	EMITest 5.03.20		

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 3			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 3			

Test Conditions / Notes:

Test Environment Conditions:
Temperature: 23°C
Humidity: 48%
Pressure: 101.7kPa

Test Method: ANSI C63.10 (2013)

Frequency Range: Band Edge

Test Setup:
Transmitting continuously with modulation, 10k and 25k modulations investigated.

Top two LTE antenna ports have Cisco p/n ANT-5G-MP-OUT-N antennas attached.
Itron IRM-Star (CAM3) radio module has PCTEL p/n BOA9028 antenna attached.
EUT Connected to support laptop via shielded Ethernet cable.

Horizontal and Vertical antenna polarities investigated, worst case reported.

2 x 31 material ferrites with 3 wraps each on Ethernet cable underneath the ground plane. The ferrites are out of the test volume and these are NOT considered a modification.

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN03824	Biconilog Antenna	3142E	5/9/2023	5/9/2025
T2	ANP05333	Cable	Heliax	8/8/2023	8/8/2025
T3	ANP05360	Cable	RG214	8/8/2023	8/8/2025
T4	ANP05546	Cable	Heliax	8/1/2023	8/1/2025
	AN02673	Spectrum Analyzer	E4446A	3/2/2023	3/2/2025

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

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	614.000M QP	9.4	+27.4	+1.2	+2.3	+0.5	+0.0	40.8	46.0 10k	-5.2	Vert
2	614.000M QP	9.2	+27.4	+1.2	+2.3	+0.5	+0.0	40.6	46.0 25k	-5.4	Vert
3	960.000M QP	9.4	+31.1	+1.6	+2.6	+0.7	+0.0	45.4	54.0 25k	-8.6	Vert
4	960.000M QP	9.4	+31.1	+1.6	+2.6	+0.7	+0.0	45.4	54.0 10k	-8.6	Vert
5	902.000M	46.5	+29.5	+1.5	+2.5	+0.6	+0.0	80.6	107.5 25k	-26.9	Vert
6	902.000M	45.9	+29.5	+1.5	+2.5	+0.6	+0.0	80.0	107.5 10k	-27.5	Vert
7	928.000M	39.9	+31.2	+1.5	+2.6	+0.7	+0.0	75.9	107.5 25k	-31.6	Vert
8	928.000M	39.4	+31.2	+1.5	+2.6	+0.7	+0.0	75.4	107.5 10k	-32.1	Vert

Test Location:	CKC Laboratories, Inc. • 22116 23rd Drive SE, Suite A • Bothell, WA 98021 • (425) 402-1717		
Customer:	**Itron, Inc.**		
Specification:	**15.247(d) / 15.209 Radiated Spurious Emissions**		
Work Order #:	**108561**	Date:	9/19/2023
Test Type:	**Maximized Emissions**	Time:	09:03:18
Tested By:	Michael Atkinson	Sequence#:	37
Software:	EMITest 5.03.20		

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 5			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 5			

Test Conditions / Notes:

Test Environment Conditions:
Temperature: 23°C
Humidity: 48%
Pressure: 101.7kPa

Test Method: ANSI C63.10 (2013)

Frequency Range: Band Edge

Test Setup:
Transmitting with modulation, hopping mode, 10k and 25k modulations investigated.

Top two LTE antenna ports have Cisco p/n ANT-5G-MP-OUT-N antennas attached.
Itron IRM-Star (CAM3) radio module has Cisco p/n ANT-5G-MP-OUT-N antenna attached.
EUT Connected to support laptop via shielded Ethernet cable.

Horizontal and Vertical antenna polarities investigated, worst case reported.

2 x 31 material ferrites with 3 wraps each on Ethernet cable underneath the ground plane. The ferrites are out of the test volume and these are NOT considered a modification.

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN03824	Biconilog Antenna	3142E	5/9/2023	5/9/2025
T2	ANP05333	Cable	Heliax	8/8/2023	8/8/2025
T3	ANP05360	Cable	RG214	8/8/2023	8/8/2025
T4	ANP05546	Cable	Heliax	8/1/2023	8/1/2025
	AN02673	Spectrum Analyzer	E4446A	3/2/2023	3/2/2025

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

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	614.000M QP	9.3	+27.4	+1.2	+2.3	+0.5	+0.0	40.7	46.0 10k	-5.3	Vert
2	614.000M QP	9.2	+27.4	+1.2	+2.3	+0.5	+0.0	40.6	46.0 25k	-5.4	Vert
3	960.000M QP	9.3	+31.1	+1.6	+2.6	+0.7	+0.0	45.3	54.0 25k	-8.7	Vert
4	960.000M QP	9.3	+31.1	+1.6	+2.6	+0.7	+0.0	45.3	54.0 10k	-8.7	Vert
5	902.000M	43.7	+29.5	+1.5	+2.5	+0.6	+0.0	77.8	106.5 10k	-28.7	Vert
6	902.000M	42.8	+29.5	+1.5	+2.5	+0.6	+0.0	76.9	106.5 25k	-29.6	Vert
7	928.000M	38.5	+31.2	+1.5	+2.6	+0.7	+0.0	74.5	106.5 10k	-32.0	Vert
8	928.000M	36.3	+31.2	+1.5	+2.6	+0.7	+0.0	72.3	106.5 25k	-34.2	Vert

Test Location:	CKC Laboratories, Inc. • 22116 23rd Drive SE, Suite A • Bothell, WA 98021 • (425) 402-1717		
Customer:	**Itron, Inc.**		
Specification:	**15.247(d) / 15.209 Radiated Spurious Emissions**		
Work Order #:	**108561**	Date:	9/19/2023
Test Type:	**Maximized Emissions**	Time:	09:44:40
Tested By:	Michael Atkinson	Sequence#:	38
Software:	EMITest 5.03.20		

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 6			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 6			

Test Conditions / Notes:

Test Environment Conditions:
Temperature: 23°C
Humidity: 48%
Pressure: 101.7kPa

Test Method: ANSI C63.10 (2013)

Frequency Range: Band Edge

Test Setup:
Transmitting with modulation, hopping mode, 10k and 25k modulations investigated.

Top two LTE antenna ports have Cisco p/n ANT-5G-MP-OUT-N antennas attached.
Itron IRM-Star (CAM3) radio module has PCTEL p/n BOA9025NM-ITR antenna attached.
EUT Connected to support laptop via shielded Ethernet cable.

Horizontal and Vertical antenna polarities investigated, worst case reported.

2 x 31 material ferrites with 3 wraps each on Ethernet cable underneath the ground plane. The ferrites are out of the test volume and these are NOT considered a modification.

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN03824	Biconilog Antenna	3142E	5/9/2023	5/9/2025
T2	ANP05333	Cable	Heliax	8/8/2023	8/8/2025
T3	ANP05360	Cable	RG214	8/8/2023	8/8/2025
T4	ANP05546	Cable	Heliax	8/1/2023	8/1/2025
	AN02673	Spectrum Analyzer	E4446A	3/2/2023	3/2/2025

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

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	614.000M QP	9.2	+27.4	+1.2	+2.3	+0.5	+0.0	40.6	46.0 25k	-5.4	Vert
2	614.000M QP	9.2	+27.4	+1.2	+2.3	+0.5	+0.0	40.6	46.0 10k	-5.4	Vert
3	960.000M QP	9.3	+31.1	+1.6	+2.6	+0.7	+0.0	45.3	54.0 10k	-8.7	Vert
4	960.000M QP	9.2	+31.1	+1.6	+2.6	+0.7	+0.0	45.2	54.0 25k	-8.8	Vert
5	902.000M	47.7	+29.5	+1.5	+2.5	+0.6	+0.0	81.8	109.5 10k	-27.7	Vert
6	902.000M	46.4	+29.5	+1.5	+2.5	+0.6	+0.0	80.5	109.5 25k	-29.0	Vert
7	928.000M	40.3	+31.2	+1.5	+2.6	+0.7	+0.0	76.3	109.5 25k	-33.2	Vert
8	928.000M	40.0	+31.2	+1.5	+2.6	+0.7	+0.0	76.0	109.5 10k	-33.5	Vert

Test Location:	CKC Laboratories • 22116 23rd Drive SE, Suite A • Bothell, WA. 98021 • 1-800-500-4EMC (4362)		
Customer:	**Itron, Inc.**		
Specification:	**15.247(d) / 15.209 Radiated Spurious Emissions**		
Work Order #:	**108561**	Date:	9/19/2023
Test Type:	**Maximized Emissions**	Time:	10:37:31
Tested By:	Michael Atkinson	Sequence#:	39
Software:	EMITest 5.03.20		

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 7			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 7			

Test Conditions / Notes:

Test Environment Conditions:
Temperature: 23°C
Humidity: 48%
Pressure: 101.7kPa

Test Method: ANSI C63.10 (2013)

Frequency Range: Band Edge

Test Setup:
Transmitting with modulation, hopping mode, 10k and 25k modulations investigated.

Top two LTE antenna ports have Cisco p/n ANT-5G-MP-OUT-N antennas attached.
Itron IRM-Star (CAM3) radio module has PCTEL p/n BOA9028 antenna attached.
EUT Connected to support laptop via shielded Ethernet cable.

Horizontal and Vertical antenna polarities investigated, worst case reported.

2 x 31 material ferrites with 3 wraps each on Ethernet cable underneath the ground plane. The ferrites are out of the test volume and these are NOT considered a modification.

Test Equipment:

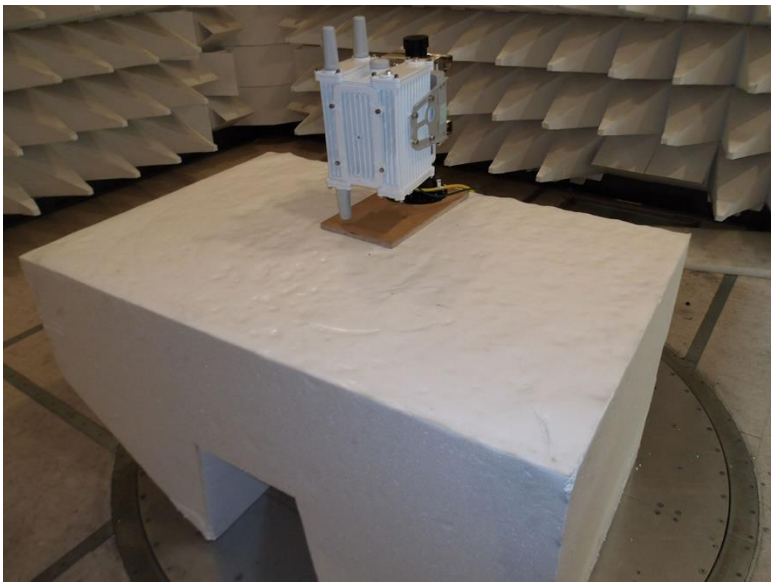
ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN03824	Biconilog Antenna	3142E	5/9/2023	5/9/2025
T2	ANP05333	Cable	Heliax	8/8/2023	8/8/2025
T3	ANP05360	Cable	RG214	8/8/2023	8/8/2025
T4	ANP05546	Cable	Heliax	8/1/2023	8/1/2025
	AN02673	Spectrum Analyzer	E4446A	3/2/2023	3/2/2025

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

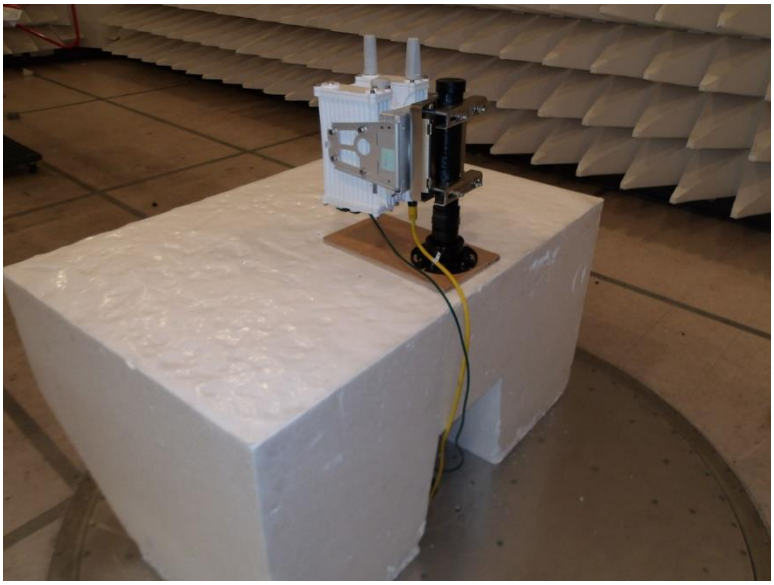
#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	614.000M QP	9.3	+27.4	+1.2	+2.3	+0.5	+0.0	40.7	46.0 25k	-5.3	Vert
2	614.000M QP	9.2	+27.4	+1.2	+2.3	+0.5	+0.0	40.6	46.0 10k	-5.4	Vert
3	960.000M QP	9.3	+31.1	+1.6	+2.6	+0.7	+0.0	45.3	54.0 25k	-8.7	Vert
4	960.000M QP	9.3	+31.1	+1.6	+2.6	+0.7	+0.0	45.3	54.0 10k	-8.7	Vert
5	902.000M	43.9	+29.5	+1.5	+2.5	+0.6	+0.0	78.0	107.5 25k	-29.5	Vert
6	902.000M	43.8	+29.5	+1.5	+2.5	+0.6	+0.0	77.9	107.5 10k	-29.6	Vert
7	928.000M	40.5	+31.2	+1.5	+2.6	+0.7	+0.0	76.5	107.5 10k	-31.0	Vert
8	928.000M	38.8	+31.2	+1.5	+2.6	+0.7	+0.0	74.8	107.5 25k	-32.7	Vert

Test Setup Photo(s)

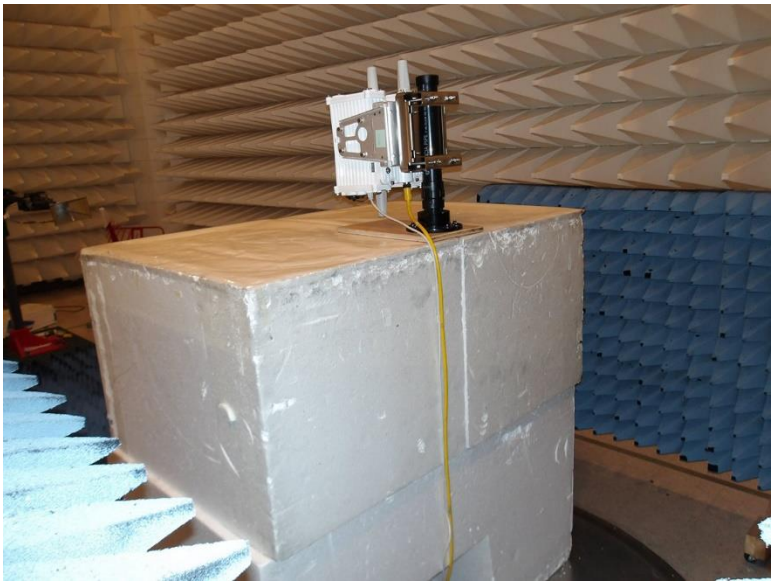
Configuration 1



Below 1GHz, 80cm; View 1

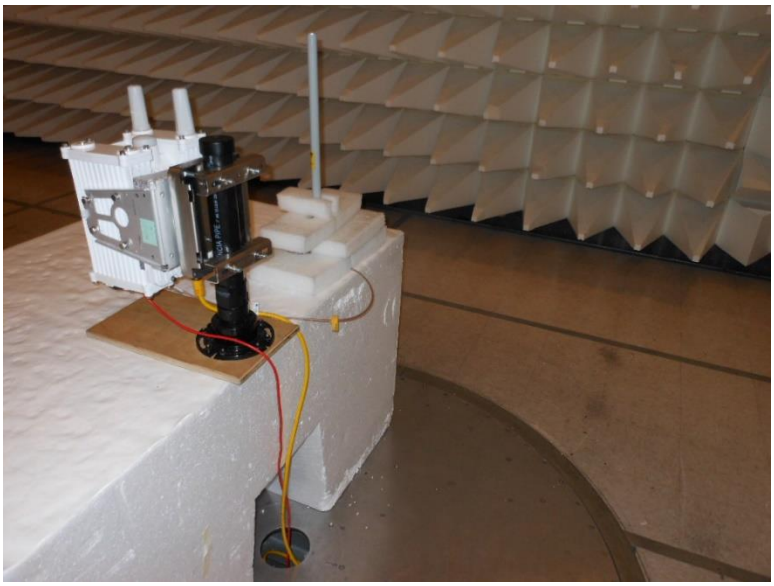


Below 1GHz, 80cm; View 2

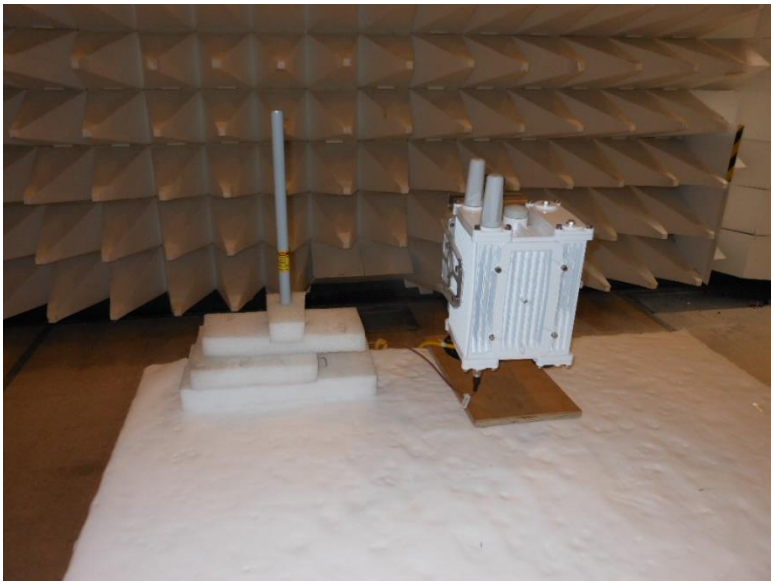


Above 1GHz, 150cm

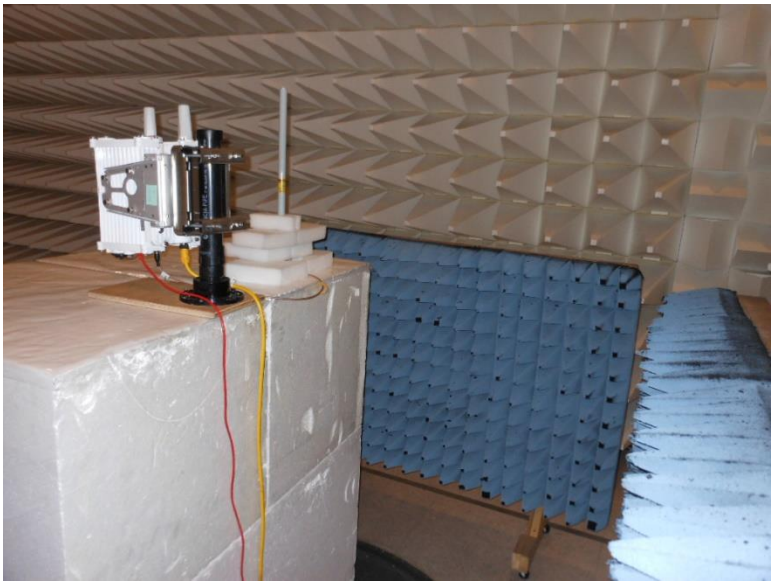
Configuration 2



Below 1GHz, View 1

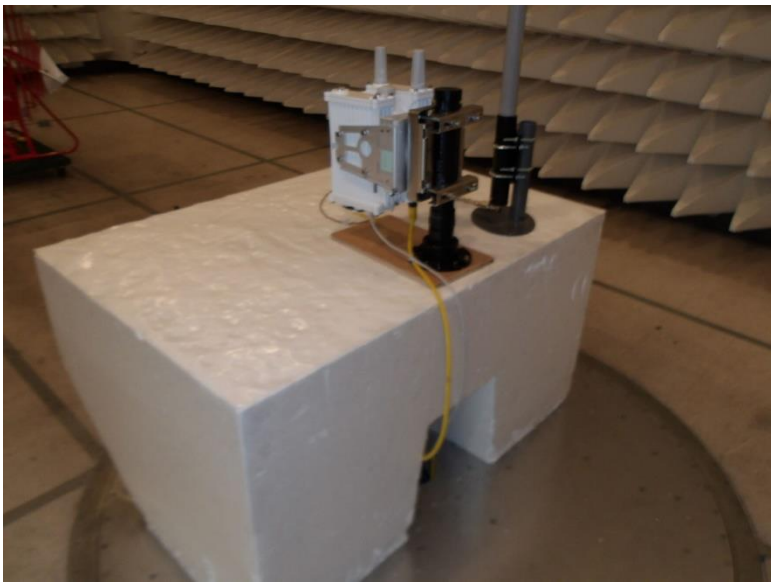


Below 1GHz, View 2



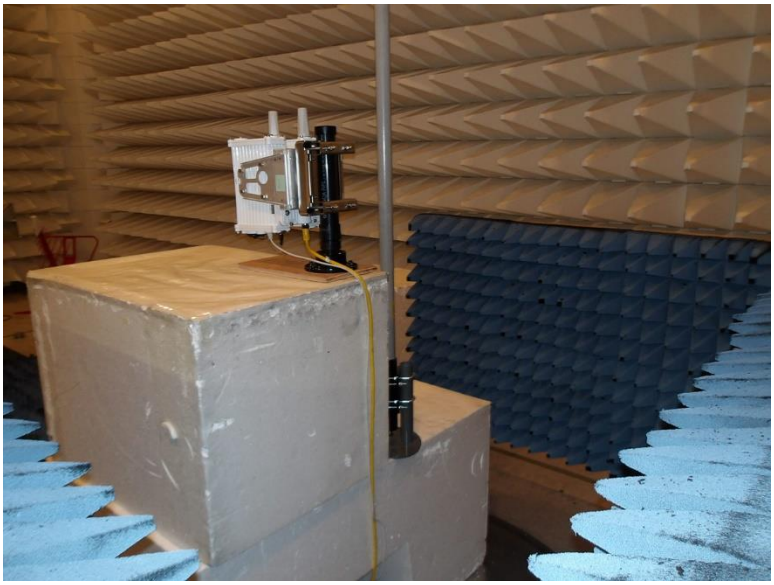
Above 1GHz, 1.5m

Configuration 3



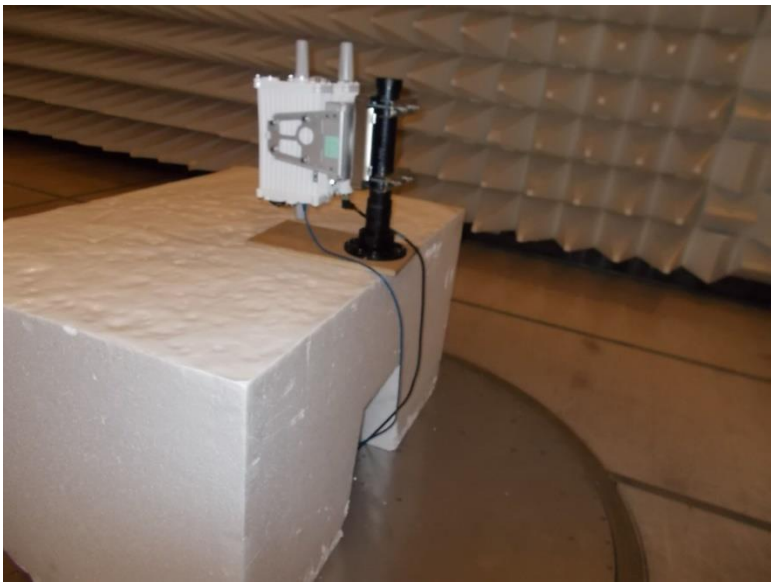
Below 1GHz, 80cm; View 1

Below 1GHz, 80cm; View 2

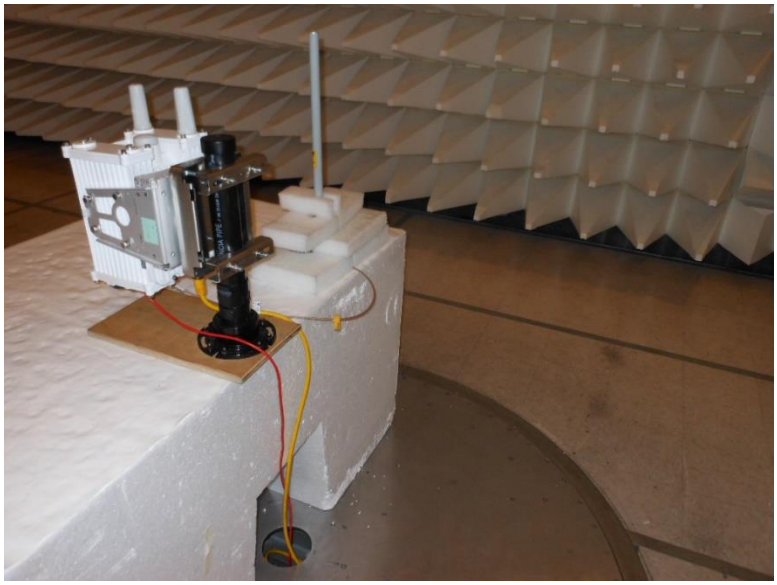


Above 1GHz, 150cm

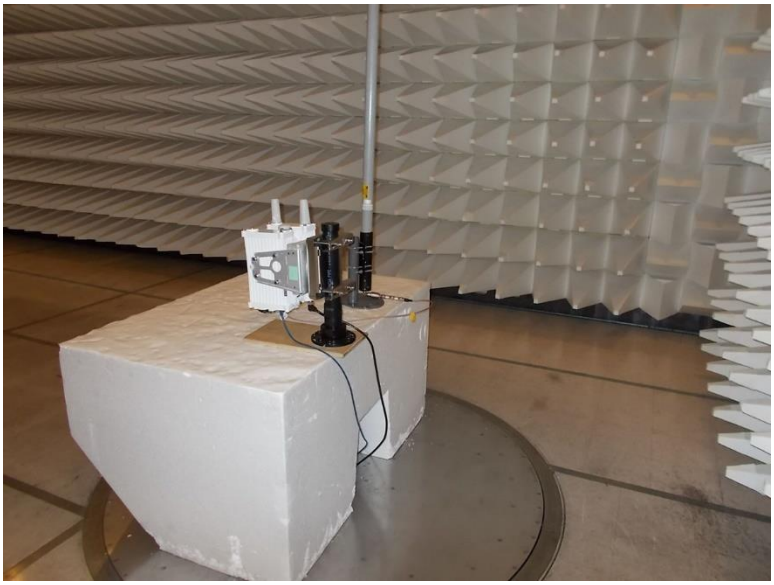
Hopping Only



Configuration 5



Configuration 6



Configuration 7

15.207 AC Conducted Emissions

Test Setup / Conditions / Data

Test Location:	CKC Laboratories, Inc. • 22116 23rd Drive SE, Suite A • Bothell, WA 98021 • (425) 402-1717		
Customer:	**Itron, Inc.**		
Specification:	**15.207 AC Mains - Quasi-peak**		
Work Order #:	**108561**	Date:	10/13/2023
Test Type:	**Conducted Emissions**	Time:	15:47:58
Tested By:	Michael Atkinson	Sequence#:	50
Software:	EMITest 5.03.20		115V 60Hz

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 8			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 8			

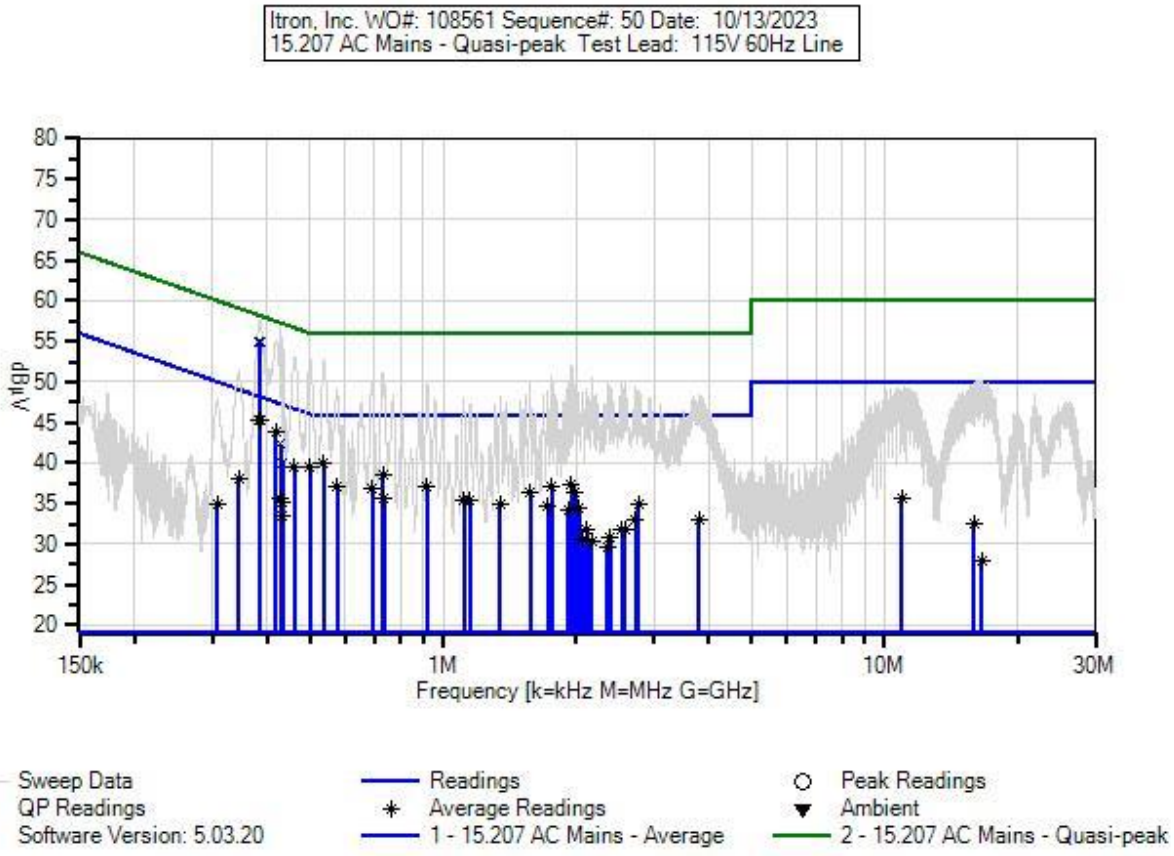
Test Conditions / Notes:

Test Environment Conditions:
Temperature: 22°C
Humidity: 47%
Pressure: 100.5kPa

Test Method: ANSI C63.10 (2013)

Frequency Range: 150k-30MHz

Test Setup:
Unit has ISM radio transmitting at 915MHz, 10k, and 25k data rates investigated, worst case reported. This is a test setup to show the ISM module can pass 15.207 limits. Antenna port terminated into 50ohm load.



Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	ANP06219	Attenuator	768-10	3/23/2022	3/23/2024
T2	ANP05546	Cable	Heliax	8/1/2023	8/1/2025
T3	ANP06515	Cable	Heliax	3/1/2023	3/1/2025
T4	AN01492	50uH LISN-Line (L1)	3816/2NM	3/18/2022	3/18/2024
	AN01492	50uH LISN-Neutral (L2)	3816/2NM	3/18/2022	3/18/2024
	AN02673	Spectrum Analyzer	E4446A	3/2/2023	3/2/2025
T5	AN02611	High Pass Filter	HE9615-150K-50-720B	1/5/2022	1/5/2024

Measurement Data: Reading listed by margin. Test Lead: Line

#	Freq	Rdng	T1 T5	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV	dBµV	dB	Ant
1	384.100k	36.1	+9.1	+0.0	+0.0	+0.1	+0.0	45.4	48.2	-2.8	Line
	Ave		+0.1								
2	384.925k	36.1	+9.1	+0.0	+0.0	+0.1	+0.0	45.4	48.2	-2.8	Line
	Ave		+0.1								
3	384.100k	45.6	+9.1	+0.0	+0.0	+0.1	+0.0	54.9	58.2	-3.3	Line
	QP		+0.1								
4	384.925k	45.6	+9.1	+0.0	+0.0	+0.1	+0.0	54.9	58.2	-3.3	Line
	QP		+0.1								
^	384.100k	48.4	+9.1	+0.0	+0.0	+0.1	+0.0	57.7	48.2	+9.5	Line
			+0.1								
^	384.925k	48.4	+9.1	+0.0	+0.0	+0.1	+0.0	57.7	48.2	+9.5	Line
			+0.1								
7	418.748k	34.6	+9.1	+0.0	+0.0	+0.1	+0.0	43.9	47.5	-3.6	Line
	Ave		+0.1								
^	418.747k	45.8	+9.1	+0.0	+0.0	+0.1	+0.0	55.1	47.5	+7.6	Line
			+0.1								
9	537.132k	30.7	+9.1	+0.0	+0.0	+0.1	+0.0	40.0	46.0	-6.0	Line
	Ave		+0.1								
^	537.131k	43.5	+9.1	+0.0	+0.0	+0.1	+0.0	52.8	46.0	+6.8	Line
			+0.1								
11	499.032k	30.1	+9.1	+0.0	+0.0	+0.1	+0.0	39.4	46.0	-6.6	Line
	Ave		+0.1								
^	499.031k	43.8	+9.1	+0.0	+0.0	+0.1	+0.0	53.1	46.0	+7.1	Line
			+0.1								
13	460.932k	30.1	+9.1	+0.0	+0.0	+0.1	+0.0	39.4	46.7	-7.3	Line
	Ave		+0.1								
^	460.931k	43.8	+9.1	+0.0	+0.0	+0.1	+0.0	53.1	46.7	+6.4	Line
			+0.1								
15	729.447k	29.3	+9.1	+0.0	+0.0	+0.1	+0.0	38.6	46.0	-7.4	Line
	Ave		+0.1								
^	729.446k	41.9	+9.1	+0.0	+0.0	+0.1	+0.0	51.2	46.0	+5.2	Line
			+0.1								
17	1.955M	27.9	+9.1	+0.0	+0.1	+0.2	+0.0	37.4	46.0	-8.6	Line
	Ave		+0.1								
^	1.955M	42.6	+9.1	+0.0	+0.1	+0.2	+0.0	52.1	46.0	+6.1	Line
			+0.1								
19	575.232k	27.9	+9.1	+0.0	+0.0	+0.1	+0.0	37.2	46.0	-8.8	Line
	Ave		+0.1								
^	575.231k	39.8	+9.1	+0.0	+0.0	+0.1	+0.0	49.1	46.0	+3.1	Line
			+0.1								
21	1.764M	27.7	+9.1	+0.1	+0.1	+0.2	+0.0	37.2	46.0	-8.8	Line
	Ave		+0.0								
^	1.764M	41.2	+9.1	+0.1	+0.1	+0.2	+0.0	50.7	46.0	+4.7	Line
			+0.0								

23 Ave	921.129k	27.7	+9.1 +0.1	+0.0	+0.1	+0.1	+0.0	37.1	46.0	-8.9	Line
^	921.128k	40.3	+9.1 +0.1	+0.0	+0.1	+0.1	+0.0	49.7	46.0	+3.7	Line
25 Ave	690.742k	27.5	+9.1 +0.2	+0.0	+0.0	+0.1	+0.0	36.9	46.0	-9.1	Line
^	690.741k	40.8	+9.1 +0.2	+0.0	+0.0	+0.1	+0.0	50.2	46.0	+4.2	Line
27 Ave	1.994M	26.9	+9.1 +0.1	+0.0	+0.1	+0.2	+0.0	36.4	46.0	-9.6	Line
^	1.994M	40.3	+9.1 +0.1	+0.0	+0.1	+0.2	+0.0	49.8	46.0	+3.8	Line
29 Ave	1.574M	26.7	+9.1 +0.1	+0.1	+0.1	+0.2	+0.0	36.3	46.0	-9.7	Line
^	1.574M	40.3	+9.1 +0.1	+0.1	+0.1	+0.2	+0.0	49.9	46.0	+3.9	Line
31 Ave	735.191k	26.3	+9.1 +0.1	+0.0	+0.0	+0.1	+0.0	35.6	46.0	-10.4	Line
^	735.191k	41.1	+9.1 +0.1	+0.0	+0.0	+0.1	+0.0	50.4	46.0	+4.4	Line
33 Ave	1.113M	25.9	+9.1 +0.1	+0.0	+0.1	+0.1	+0.0	35.3	46.0	-10.7	Line
^	1.113M	38.6	+9.1 +0.1	+0.0	+0.1	+0.1	+0.0	48.0	46.0	+2.0	Line
35 Ave	1.152M	25.8	+9.1 +0.1	+0.1	+0.1	+0.1	+0.0	35.3	46.0	-10.7	Line
^	1.152M	38.3	+9.1 +0.1	+0.1	+0.1	+0.1	+0.0	47.8	46.0	+1.8	Line
37 Ave	1.344M	25.5	+9.1 +0.1	+0.1	+0.1	+0.1	+0.0	35.0	46.0	-11.0	Line
^	1.344M	38.4	+9.1 +0.1	+0.1	+0.1	+0.1	+0.0	47.9	46.0	+1.9	Line
39 Ave	345.200k	28.9	+9.1 +0.0	+0.0	+0.0	+0.1	+0.0	38.1	49.1	-11.0	Line
^	345.200k	41.9	+9.1 +0.0	+0.0	+0.0	+0.1	+0.0	51.1	49.1	+2.0	Line
41 Ave	2.765M	25.4	+9.1 +0.0	+0.0	+0.1	+0.2	+0.0	34.8	46.0	-11.2	Line
^	2.765M	39.6	+9.1 +0.0	+0.0	+0.1	+0.2	+0.0	49.0	46.0	+3.0	Line
43 Ave	1.727M	25.2	+9.1 +0.0	+0.1	+0.1	+0.2	+0.0	34.7	46.0	-11.3	Line
^	1.727M	39.5	+9.1 +0.0	+0.1	+0.1	+0.2	+0.0	49.0	46.0	+3.0	Line
45 Ave	429.251k	26.4	+9.1 +0.1	+0.0	+0.0	+0.1	+0.0	35.7	47.3	-11.6	Line
46 Ave	2.032M	24.9	+9.1 +0.1	+0.0	+0.1	+0.2	+0.0	34.4	46.0	-11.6	Line
^	2.032M	39.3	+9.1 +0.1	+0.0	+0.1	+0.2	+0.0	48.8	46.0	+2.8	Line

48 Ave	1.918M	24.9	+9.1 +0.0	+0.0	+0.1	+0.2	+0.0	34.3	46.0	-11.7	Line
^	1.918M	40.5	+9.1 +0.0	+0.0	+0.1	+0.2	+0.0	49.9	46.0	+3.9	Line
50 Ave	431.387k	25.8	+9.1 +0.1	+0.0	+0.0	+0.1	+0.0	35.1	47.2	-12.1	Line
51 Ave	3.802M	23.4	+9.1 +0.0	+0.1	+0.1	+0.2	+0.0	32.9	46.0	-13.1	Line
^	3.802M	39.0	+9.1 +0.0	+0.1	+0.1	+0.2	+0.0	48.5	46.0	+2.5	Line
53 Ave	2.729M	23.5	+9.1 +0.0	+0.0	+0.1	+0.2	+0.0	32.9	46.0	-13.1	Line
^	2.729M	40.0	+9.1 +0.0	+0.0	+0.1	+0.2	+0.0	49.4	46.0	+3.4	Line
55 Ave	433.717k	24.2	+9.1 +0.1	+0.0	+0.0	+0.1	+0.0	33.5	47.2	-13.7	Line
56 Ave	2.581M	22.3	+9.1 +0.0	+0.0	+0.1	+0.2	+0.0	31.7	46.0	-14.3	Line
^	2.581M	40.5	+9.1 +0.0	+0.0	+0.1	+0.2	+0.0	49.9	46.0	+3.9	Line
58 Ave	2.542M	22.3	+9.1 +0.0	+0.0	+0.1	+0.2	+0.0	31.7	46.0	-14.3	Line
^	2.542M	40.6	+9.1 +0.0	+0.0	+0.1	+0.2	+0.0	50.0	46.0	+4.0	Line
60 Ave	2.114M	22.2	+9.1 +0.1	+0.0	+0.1	+0.2	+0.0	31.7	46.0	-14.3	Line
^	2.114M	39.6	+9.1 +0.1	+0.0	+0.1	+0.2	+0.0	49.1	46.0	+3.1	Line
62 Ave	10.940M	25.9	+9.1 +0.0	+0.1	+0.1	+0.4	+0.0	35.6	50.0	-14.4	Line
^	10.940M	39.7	+9.1 +0.0	+0.1	+0.1	+0.4	+0.0	49.4	50.0	-0.6	Line
64 QP	429.251k	33.0	+9.1 +0.1	+0.0	+0.0	+0.1	+0.0	42.3	57.3	-15.0	Line
65 Ave	307.700k	25.7	+9.1 +0.0	+0.0	+0.0	+0.1	+0.0	34.9	50.0	-15.1	Line
^	307.700k	38.2	+9.1 +0.0	+0.0	+0.0	+0.1	+0.0	47.4	50.0	-2.6	Line
67 Ave	2.394M	21.4	+9.1 +0.0	+0.0	+0.1	+0.2	+0.0	30.8	46.0	-15.2	Line
^	2.394M	40.0	+9.1 +0.0	+0.0	+0.1	+0.2	+0.0	49.4	46.0	+3.4	Line
69 Ave	2.073M	21.0	+9.1 +0.1	+0.0	+0.1	+0.2	+0.0	30.5	46.0	-15.5	Line
^	2.073M	39.2	+9.1 +0.1	+0.0	+0.1	+0.2	+0.0	48.7	46.0	+2.7	Line
71 Ave	2.175M	20.9	+9.1 +0.1	+0.0	+0.1	+0.2	+0.0	30.4	46.0	-15.6	Line
^	2.175M	41.1	+9.1 +0.1	+0.0	+0.1	+0.2	+0.0	50.6	46.0	+4.6	Line

73	2.358M Ave	20.3	+9.1 +0.0	+0.0	+0.1	+0.2	+0.0	29.7	46.0	-16.3	Line
^	2.358M	40.8	+9.1 +0.0	+0.0	+0.1	+0.2	+0.0	50.2	46.0	+4.2	Line
75	433.717k QP	30.7	+9.1 +0.1	+0.0	+0.0	+0.1	+0.0	40.0	57.2	-17.2	Line
^	429.250k	47.5	+9.1 +0.1	+0.0	+0.0	+0.1	+0.0	56.8	47.3	+9.5	Line
^	433.717k	46.2	+9.1 +0.1	+0.0	+0.0	+0.1	+0.0	55.5	47.2	+8.3	Line
^	431.386k	45.6	+9.1 +0.1	+0.0	+0.0	+0.1	+0.0	54.9	47.2	+7.7	Line
79	15.930M Ave	22.6	+9.1 +0.0	+0.1	+0.2	+0.4	+0.0	32.4	50.0	-17.6	Line
^	15.930M	39.9	+9.1 +0.0	+0.1	+0.2	+0.4	+0.0	49.7	50.0	-0.3	Line
81	16.590M Ave	18.0	+9.1 +0.1	+0.1	+0.2	+0.5	+0.0	28.0	50.0	-22.0	Line
^	16.590M	40.1	+9.1 +0.1	+0.1	+0.2	+0.5	+0.0	50.1	50.0	+0.1	Line

Test Location:	CKC Laboratories, Inc. • 22116 23rd Drive SE, Suite A • Bothell, WA 98021 • (425) 402-1717		
Customer:	**Itron, Inc.**		
Specification:	**15.207 AC Mains - Quasi-peak**		
Work Order #:	**108561**	Date:	10/13/2023
Test Type:	**Conducted Emissions**	Time:	16:04:12
Tested By:	Michael Atkinson	Sequence#:	51
Software:	EMITest 5.03.20		115V 60Hz

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 8			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 8			

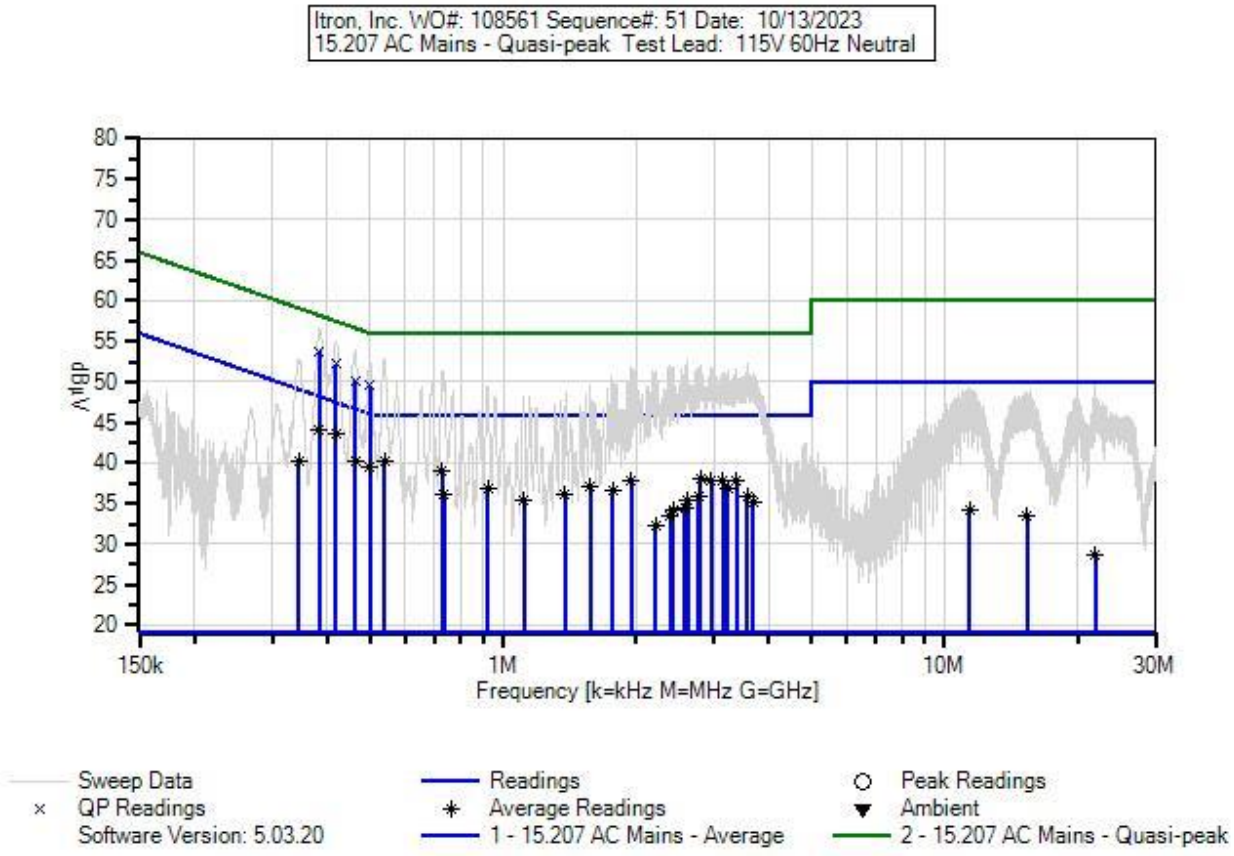
Test Conditions / Notes:

Test Environment Conditions:
Temperature: 22°C
Humidity: 47%
Pressure: 100.5kPa

Test Method: ANSI C63.10 (2013)

Frequency Range: 150k-30MHz

Test Setup:
Unit has ISM radio transmitting at 915MHz, 10k, and 25k data rates investigated, worst case reported. This is a test setup to show the ISM module can pass 15.207 limits. Antenna port terminated into 50ohm load.



Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	ANP06219	Attenuator	768-10	3/23/2022	3/23/2024
T2	ANP05546	Cable	Heliax	8/1/2023	8/1/2025
T3	ANP06515	Cable	Heliax	3/1/2023	3/1/2025
	AN01492	50uH LISN-Line (L1)	3816/2NM	3/18/2022	3/18/2024
T4	AN01492	50uH LISN-Neutral (L2)	3816/2NM	3/18/2022	3/18/2024
T5	AN02673	Spectrum Analyzer	E4446A	3/2/2023	3/2/2025
T6	AN02611	High Pass Filter	HE9615-150K-50-720B	1/5/2022	1/5/2024

Measurement Data: Reading listed by margin. Test Lead: Neutral

#	Freq	Rdng	T1	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
			T5	T6							
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV	dBµV	dB	Ant
1	417.324k	34.5	+9.1	+0.0	+0.0	+0.0	+0.0	43.7	47.5	-3.8	Neutr
	Ave		+0.0	+0.1							
2	383.679k	34.9	+9.1	+0.0	+0.0	+0.0	+0.0	44.1	48.2	-4.1	Neutr
	Ave		+0.0	+0.1							
3	383.679k	44.5	+9.1	+0.0	+0.0	+0.0	+0.0	53.7	58.2	-4.5	Neutr
	QP		+0.0	+0.1							
^	383.679k	47.5	+9.1	+0.0	+0.0	+0.0	+0.0	56.7	48.2	+8.5	Neutr
			+0.0	+0.1							
5	417.324k	43.0	+9.1	+0.0	+0.0	+0.0	+0.0	52.2	57.5	-5.3	Neutr
	QP		+0.0	+0.1							
^	417.323k	45.8	+9.1	+0.0	+0.0	+0.0	+0.0	55.0	47.5	+7.5	Neutr
			+0.0	+0.1							
7	538.946k	30.9	+9.1	+0.0	+0.0	+0.0	+0.0	40.1	46.0	-5.9	Neutr
	Ave		+0.0	+0.1							
^	538.946k	43.7	+9.1	+0.0	+0.0	+0.0	+0.0	52.9	46.0	+6.9	Neutr
			+0.0	+0.1							
9	462.746k	40.9	+9.1	+0.0	+0.0	+0.0	+0.0	50.1	56.6	-6.5	Neutr
	QP		+0.0	+0.1							
10	498.427k	40.3	+9.1	+0.0	+0.0	+0.0	+0.0	49.5	56.0	-6.5	Neutr
	QP		+0.0	+0.1							
11	498.427k	30.3	+9.1	+0.0	+0.0	+0.0	+0.0	39.5	46.0	-6.5	Neutr
	Ave		+0.0	+0.1							
^	498.426k	43.7	+9.1	+0.0	+0.0	+0.0	+0.0	52.9	46.0	+6.9	Neutr
			+0.0	+0.1							
13	462.746k	30.9	+9.1	+0.0	+0.0	+0.0	+0.0	40.1	46.6	-6.5	Neutr
	Ave		+0.0	+0.1							
^	462.745k	44.7	+9.1	+0.0	+0.0	+0.0	+0.0	53.9	46.6	+7.3	Neutr
			+0.0	+0.1							
15	728.540k	29.7	+9.1	+0.0	+0.0	+0.0	+0.0	38.9	46.0	-7.1	Neutr
	Ave		+0.0	+0.1							
^	728.539k	42.2	+9.1	+0.0	+0.0	+0.0	+0.0	51.4	46.0	+5.4	Neutr
			+0.0	+0.1							
17	2.803M	28.8	+9.1	+0.0	+0.1	+0.0	+0.0	38.0	46.0	-8.0	Neutr
	Ave		+0.0	+0.0							
^	2.803M	42.8	+9.1	+0.0	+0.1	+0.0	+0.0	52.0	46.0	+6.0	Neutr
			+0.0	+0.0							
19	3.374M	28.7	+9.1	+0.0	+0.1	+0.0	+0.0	37.9	46.0	-8.1	Neutr
	Ave		+0.0	+0.0							
^	3.374M	42.5	+9.1	+0.0	+0.1	+0.0	+0.0	51.7	46.0	+5.7	Neutr
			+0.0	+0.0							
21	2.956M	28.5	+9.1	+0.0	+0.1	+0.0	+0.0	37.7	46.0	-8.3	Neutr
	Ave		+0.0	+0.0							
^	2.956M	42.7	+9.1	+0.0	+0.1	+0.0	+0.0	51.9	46.0	+5.9	Neutr
			+0.0	+0.0							

23	3.142M	28.5	+9.1	+0.0	+0.1	+0.0	+0.0	37.7	46.0	-8.3	Neutr
	Ave		+0.0	+0.0							
^	3.142M	42.0	+9.1	+0.0	+0.1	+0.0	+0.0	51.2	46.0	+5.2	Neutr
			+0.0	+0.0							
25	1.954M	28.4	+9.1	+0.0	+0.1	+0.0	+0.0	37.7	46.0	-8.3	Neutr
	Ave		+0.0	+0.1							
^	1.954M	42.5	+9.1	+0.0	+0.1	+0.0	+0.0	51.8	46.0	+5.8	Neutr
			+0.0	+0.1							
27	1.573M	27.7	+9.1	+0.1	+0.1	+0.0	+0.0	37.1	46.0	-8.9	Neutr
	Ave		+0.0	+0.1							
^	1.573M	40.3	+9.1	+0.1	+0.1	+0.0	+0.0	49.7	46.0	+3.7	Neutr
			+0.0	+0.1							
29	345.290k	31.0	+9.1	+0.0	+0.0	+0.0	+0.0	40.1	49.1	-9.0	Neutr
	Ave		+0.0	+0.0							
^	345.290k	43.9	+9.1	+0.0	+0.0	+0.0	+0.0	53.0	49.1	+3.9	Neutr
			+0.0	+0.0							
31	922.000k	27.6	+9.1	+0.0	+0.1	+0.0	+0.0	36.9	46.0	-9.1	Neutr
	Ave		+0.0	+0.1							
^	922.000k	40.1	+9.1	+0.0	+0.1	+0.0	+0.0	49.4	46.0	+3.4	Neutr
			+0.0	+0.1							
33	3.224M	27.6	+9.1	+0.0	+0.1	+0.0	+0.0	36.8	46.0	-9.2	Neutr
	Ave		+0.0	+0.0							
^	3.224M	42.2	+9.1	+0.0	+0.1	+0.0	+0.0	51.4	46.0	+5.4	Neutr
			+0.0	+0.0							
35	1.768M	27.3	+9.1	+0.1	+0.1	+0.0	+0.0	36.6	46.0	-9.4	Neutr
	Ave		+0.0	+0.0							
^	1.768M	41.0	+9.1	+0.1	+0.1	+0.0	+0.0	50.3	46.0	+4.3	Neutr
			+0.0	+0.0							
37	735.191k	26.9	+9.1	+0.0	+0.0	+0.0	+0.0	36.1	46.0	-9.9	Neutr
	Ave		+0.0	+0.1							
^	735.191k	41.7	+9.1	+0.0	+0.0	+0.0	+0.0	50.9	46.0	+4.9	Neutr
			+0.0	+0.1							
39	1.382M	26.6	+9.1	+0.1	+0.1	+0.0	+0.0	36.0	46.0	-10.0	Neutr
	Ave		+0.0	+0.1							
^	1.382M	39.0	+9.1	+0.1	+0.1	+0.0	+0.0	48.4	46.0	+2.4	Neutr
			+0.0	+0.1							
41	2.767M	26.7	+9.1	+0.0	+0.1	+0.0	+0.0	35.9	46.0	-10.1	Neutr
	Ave		+0.0	+0.0							
^	2.767M	42.8	+9.1	+0.0	+0.1	+0.0	+0.0	52.0	46.0	+6.0	Neutr
			+0.0	+0.0							
43	3.572M	26.7	+9.1	+0.0	+0.1	+0.0	+0.0	35.9	46.0	-10.1	Neutr
	Ave		+0.0	+0.0							
^	3.572M	43.2	+9.1	+0.0	+0.1	+0.0	+0.0	52.4	46.0	+6.4	Neutr
			+0.0	+0.0							
45	2.615M	26.3	+9.1	+0.0	+0.1	+0.0	+0.0	35.5	46.0	-10.5	Neutr
	Ave		+0.0	+0.0							
^	2.615M	43.3	+9.1	+0.0	+0.1	+0.0	+0.0	52.5	46.0	+6.5	Neutr
			+0.0	+0.0							

47	1.113M	26.1	+9.1	+0.0	+0.1	+0.0	+0.0	35.4	46.0	-10.6	Neutr
	Ave		+0.0	+0.1							
^	1.113M	38.8	+9.1	+0.0	+0.1	+0.0	+0.0	48.1	46.0	+2.1	Neutr
			+0.0	+0.1							
49	3.686M	25.9	+9.1	+0.1	+0.1	+0.0	+0.0	35.2	46.0	-10.8	Neutr
	Ave		+0.0	+0.0							
^	3.686M	41.7	+9.1	+0.1	+0.1	+0.0	+0.0	51.0	46.0	+5.0	Neutr
			+0.0	+0.0							
51	2.579M	25.3	+9.1	+0.0	+0.1	+0.0	+0.0	34.5	46.0	-11.5	Neutr
	Ave		+0.0	+0.0							
^	2.579M	43.0	+9.1	+0.0	+0.1	+0.0	+0.0	52.2	46.0	+6.2	Neutr
			+0.0	+0.0							
53	2.433M	24.9	+9.1	+0.0	+0.1	+0.0	+0.0	34.1	46.0	-11.9	Neutr
	Ave		+0.0	+0.0							
^	2.433M	42.6	+9.1	+0.0	+0.1	+0.0	+0.0	51.8	46.0	+5.8	Neutr
			+0.0	+0.0							
55	2.396M	24.3	+9.1	+0.0	+0.1	+0.0	+0.0	33.5	46.0	-12.5	Neutr
	Ave		+0.0	+0.0							
^	2.395M	42.9	+9.1	+0.0	+0.1	+0.0	+0.0	52.1	46.0	+6.1	Neutr
			+0.0	+0.0							
57	2.212M	22.9	+9.1	+0.0	+0.1	+0.0	+0.0	32.2	46.0	-13.8	Neutr
	Ave		+0.0	+0.1							
^	2.212M	42.1	+9.1	+0.0	+0.1	+0.0	+0.0	51.4	46.0	+5.4	Neutr
			+0.0	+0.1							
59	11.365M	24.8	+9.1	+0.1	+0.1	+0.2	+0.0	34.3	50.0	-15.7	Neutr
	Ave		+0.0	+0.0							
^	11.365M	39.9	+9.1	+0.1	+0.1	+0.2	+0.0	49.4	50.0	-0.6	Neutr
			+0.0	+0.0							
61	15.355M	23.9	+9.1	+0.1	+0.2	+0.2	+0.0	33.5	50.0	-16.5	Neutr
	Ave		+0.0	+0.0							
^	15.355M	39.5	+9.1	+0.1	+0.2	+0.2	+0.0	49.1	50.0	-0.9	Neutr
			+0.0	+0.0							
63	21.940M	18.6	+9.1	+0.1	+0.2	+0.5	+0.0	28.6	50.0	-21.4	Neutr
	Ave		+0.0	+0.1							
^	21.940M	39.4	+9.1	+0.1	+0.2	+0.5	+0.0	49.4	50.0	-0.6	Neutr
			+0.0	+0.1							

Test Setup Photo(s)

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 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.