Itron, Inc.

TEST REPORT FOR

AMR Transceiver Device For Communicating With Utility Meters
Models: IMRD-INT and IMRD-EXT

Tested to The Following Standards:

FCC Part 15 Subpart C Section(s)

15.207 & 15.231a
(PERIODIC OPERATION >70MHZ)

Report No.: 105444-5

Date of issue: August 31, 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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ADMINISTRATIVE INFORMATION

Test Report Information

REPORT PREPARED FOR:

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

Representative: Jay Holcomb
Customer Reference Number: 238223

REPORT PREPARED BY:

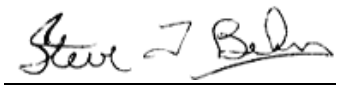
Terri Rayle
CKC Laboratories, Inc.
5046 Sierra Pines Drive
Mariposa, CA 95338

Project Number: 105444

DATE OF EQUIPMENT RECEIPT: June 25, 2021
DATE(S) OF TESTING: June 25, 2021, July 6 and 20, 2021
August 20, 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.
22116 23rd Drive S.E.,
Canyon Park, Bothell, WA 98021

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 - 15.231a

Test Procedure	Description	Modifications	Results
15.231(c)	Occupied Bandwidth	NA	Pass
15.231(b)	Field Strength of Fundamental	NA	Pass
15.231(a)	Periodic Operation Requirements	NA	Pass
15.231(b)	Field Strength of Spurious Emissions	NA	Pass
15.207	AC Conducted Emissions	NA	Pass

NA = Not Applicable

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

Equipment Tested:

Device	Manufacturer	Model #	S/N
AMR transceiver device for communicating with utility meters	Itron, Inc.	IMRD-EXT	105444-ext

Support Equipment:

Device	Manufacturer	Model #	S/N
Toughpad	Panasonic	FZ-G1	NA
DC Power Supply	Rigol	DP711	NA

Configuration 3

Equipment Tested:

Device	Manufacturer	Model #	S/N
AMR transceiver device for communicating with utility meters	Itron, Inc.	IMRD-EXT	105444-ext

Support Equipment:

Device	Manufacturer	Model #	S/N
Toughpad	Panasonic	FZ-G1	NA
DC Power Supply	Rigol	DP711	NA
Attached Antenna	L-comm	3dBi Rubber Duck	NA
TNC to RMA Adapter	Molex	73386-1250	NA

Configuration 5

Equipment Tested:

Device	Manufacturer	Model #	S/N
AMR transceiver device for communicating with utility meters	Itron, Inc.	IMRD-EXT	105444-ext

Support Equipment:

Device	Manufacturer	Model #	S/N
Toughpad	Panasonic	FZ-G1	NA
DC Power Supply	Rigol	DP711	NA
Ground Plane	Itron, Inc.	4ft	NA
Vehicle Antenna	PCTEL	5dBi Vehicle Mount	NA

Configuration 7

Equipment Tested:

Device	Manufacturer	Model #	S/N
AMR transceiver device for communicating with utility meters	Itron, Inc.	IMRD-INT	105444-int rad

Support Equipment:

Device	Manufacturer	Model #	S/N
Toughpad	Panasonic	FZ-G1	NA
DC Power Supply	Rigol	DP711	NA

Configuration 9

Equipment Tested9

Device	Manufacturer	Model #	S/N
AMR transceiver device for communicating with utility meters	Itron, Inc.	IMRD-INT	105444-int rad

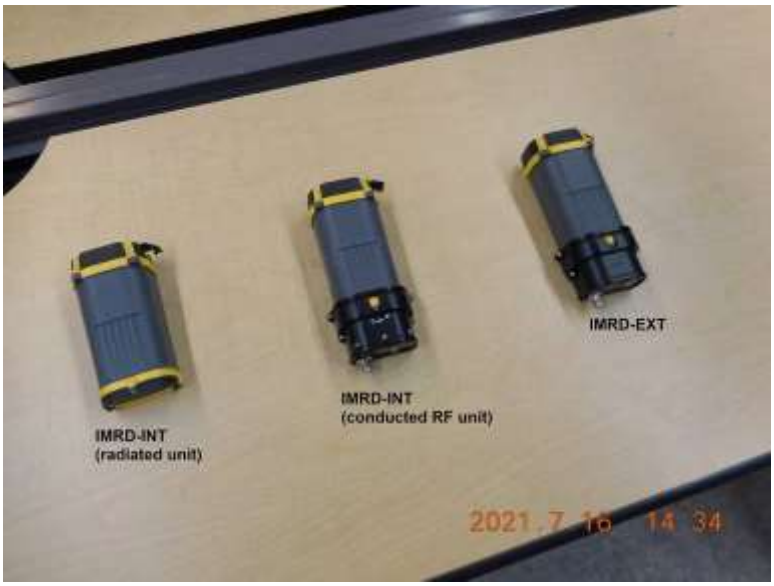
Support Equipment:

Device	Manufacturer	Model #	S/N
AC-USB Adapter	ELJINTEK. INC	GUSB05	NA

General Product Information:

Product Information	Manufacturer-Provided Details
Equipment Type:	Stand-Alone Equipment
Operating Frequency Range:	952-953MHz Note: At time of test, 952MHz is the frequency available for test. The manufacturer declares testing on this frequency is representative of worst case.
Modulation Type(s):	OOK
Maximum Duty Cycle:	Assume 100% as worst case
Antenna Type(s) and Gain:	Internal PIFA 2.0 dBi External Omni Vehicle 5 dBi External Omni Attached 3dBi
Antenna Connection Type:	Integral and External variant
Operational Trigger Type:	Manually Activated Trigger
Nominal Input Voltage:	120VAC 60Hz to AC Adapter on Internal Unit 13.8V DC on External Unit
Firmware / Software used for Test:	DSP Version 7.00.00.26 / FPGA Version 3.08 / MC3 Test v 4.0.3.5 900BcrCycles.exe (1/27/2010 last modified) and DSP Version 7.00.00.34 for 5 second turn off test

EUT Photo(s)

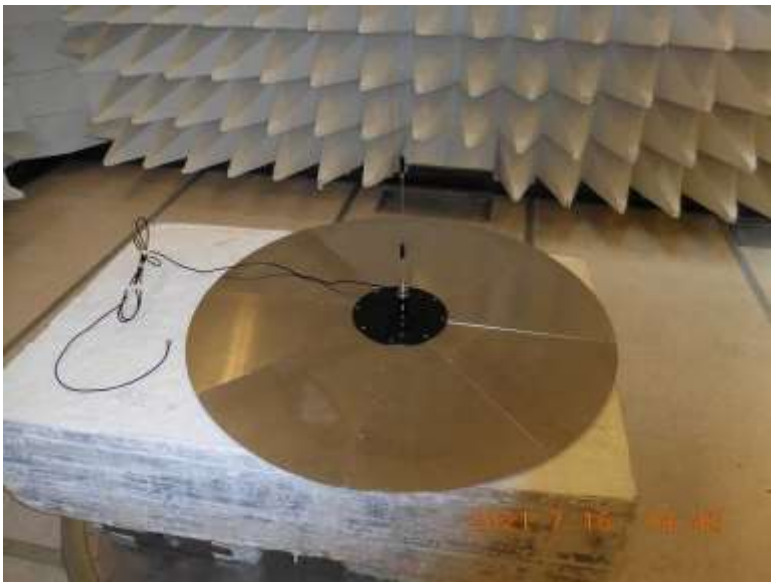


Support Equipment Photo(s)

AC-USB Adapter

Attached Antenna with adapter

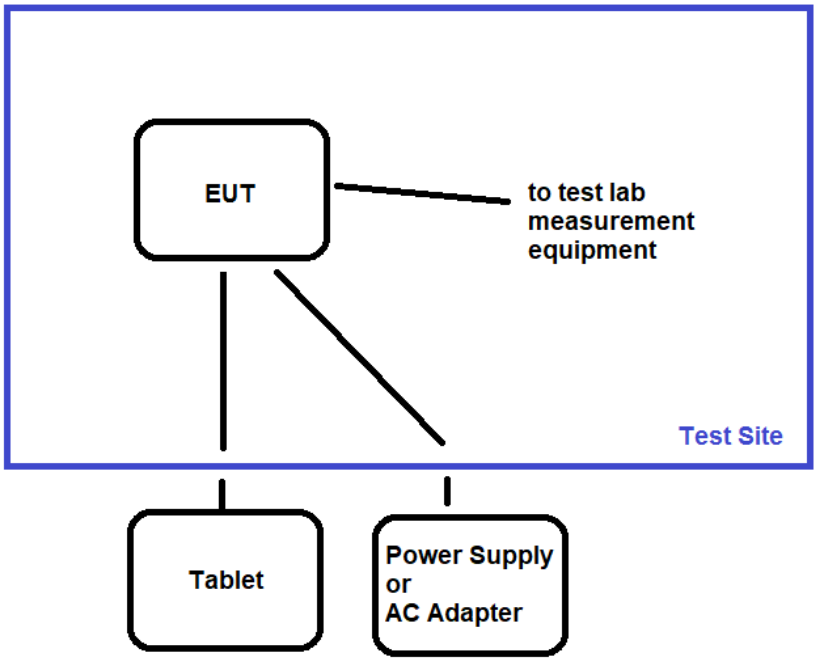
DC Power Supply



External Antenna + Ground Plane

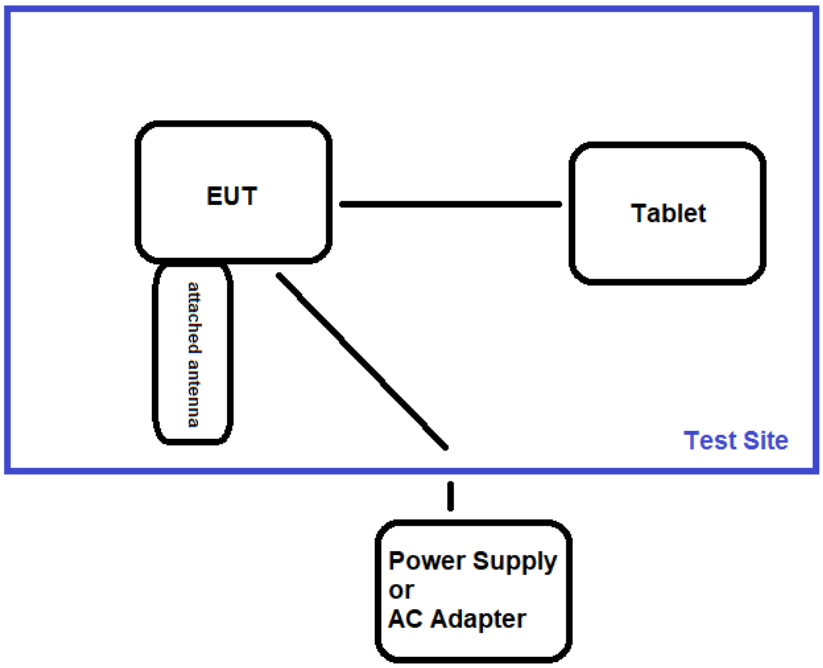
Tablet

Test Setup Block Diagram



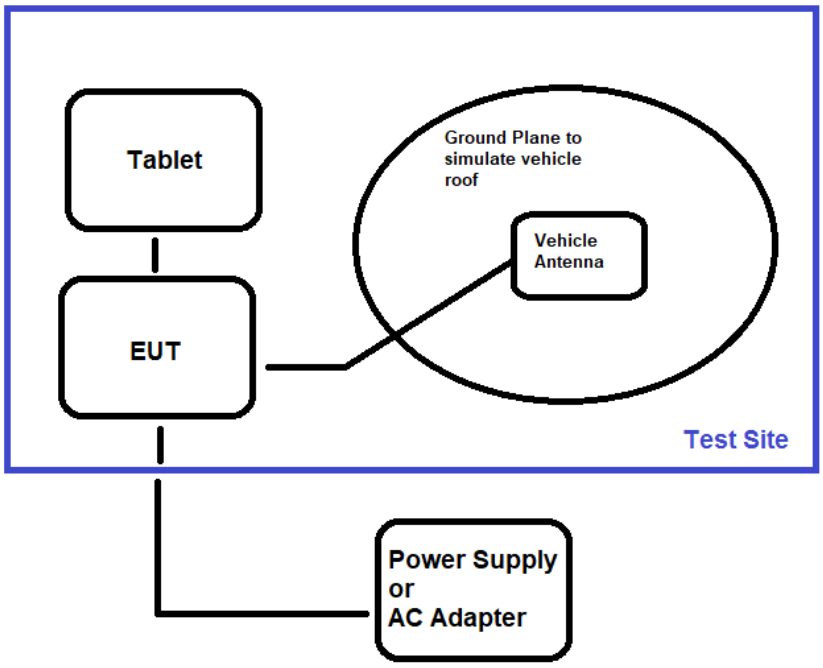
Configuration 1

Test Setup Block Diagram



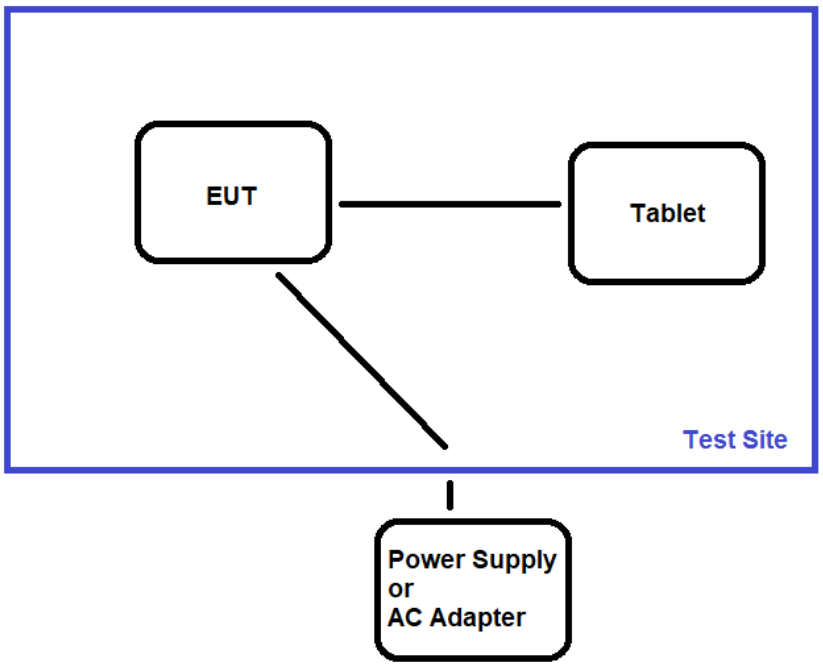
Configuration 3

Test Setup Block Diagram



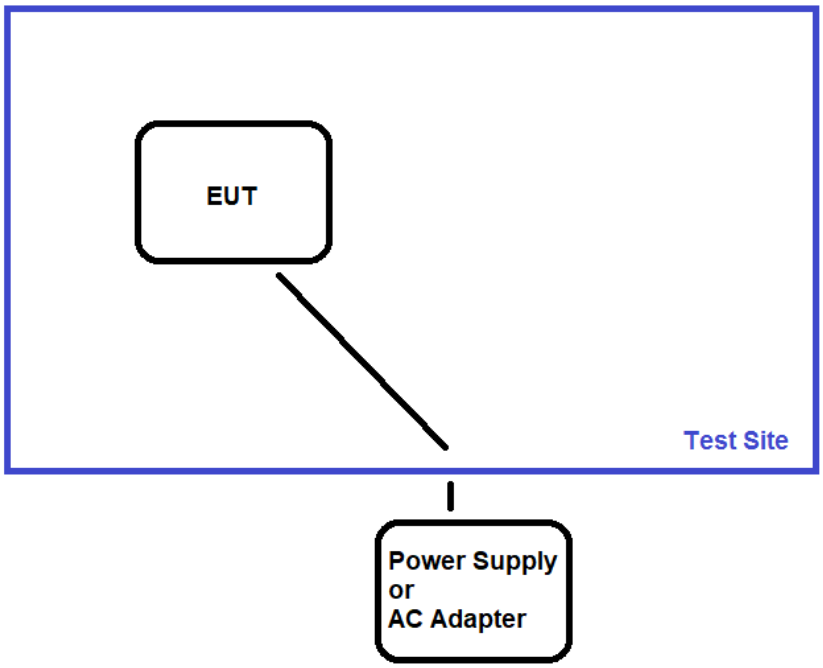
Configuration 5

Test Setup Block Diagram



Configuration 7

Test Setup Block Diagram



Configuration 9

FCC Part 15 Subpart C

15.231(c) Occupied Bandwidth (20dB BW)

Test Setup/Conditions			
Test Location:	Bothell Lab Bench	Test Engineer:	M. Atkinson
Test Method:	ANSI C63.10 (2013)	Test Date(s):	7/6/2021
Configuration:	1		
Test Setup:	EUT directly connected to spectrum analyzer through appropriate cables and attenuators. EUT is continuously transmitting with modulation.		

Environmental Conditions			
Temperature (ºC)	24	Relative Humidity (%):	50

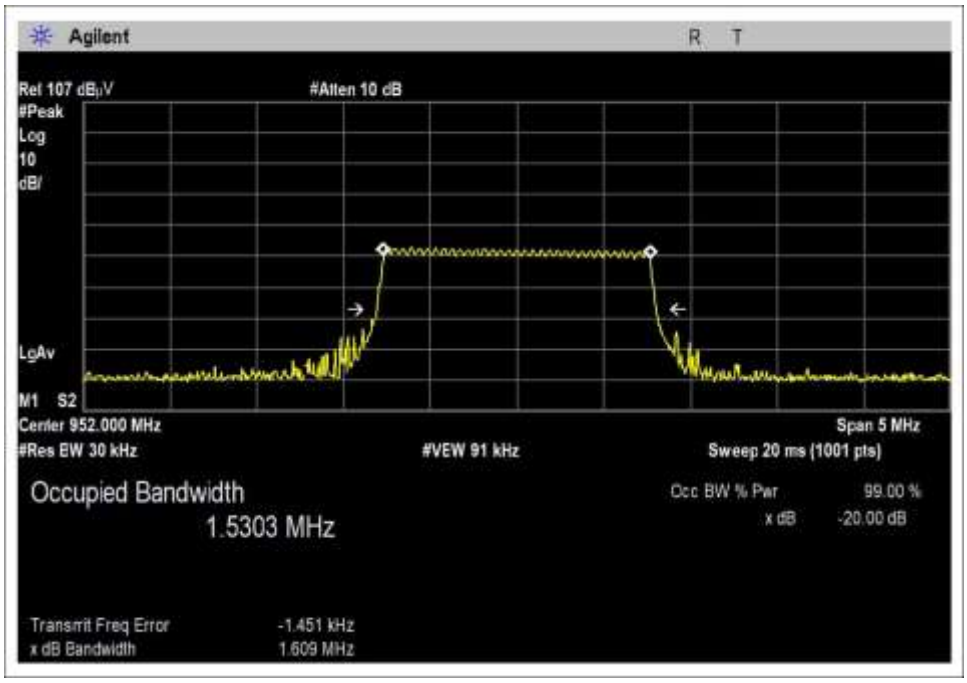
Test Equipment					
Asset#	**Description**	**Manufacturer**	**Model**	**Cal Date**	**Cal Due**
02871	Spectrum Analyzer	Agilent	E4440A	3/12/2020	3/12/2022
P07670	Attenuator	Pasternack	PE7389-20	8/20/2020	8/20/2022
P06454	Cable	Andrews	Heliax	1/20/2020	1/20/2022

Test Data Summary

$$Limit = \begin{cases} 0.25\%\ f_c \mid 70\ MHz < f_c < 900 MHz \\ 0.5\%\ f_c \mid f_c > 900 MHz \end{cases}$$

Frequency (MHz)	Antenna Port	Modulation	Measured (MHz)	Limit (MHz)	Results
952	1	OOK	1.609	≤4.76	Pass

Plot(s)



Test Setup Photo(s)

15.231(b) Field Strength of Fundamental

Test Equipment not on data sheets					
Asset#	**Description**	**Manufacturer**	**Model**	**Cal Date**	**Cal Due**
P06996	Multimeter	Fluke	87-5	6/16/2020	6/16/2022
P07527	Variac	Simpson	NA	1/27/2021	1/27/2023
02272	Power Source, AC	California Instruments	1251WP	1/18/2021	1/18/2023
P07355	Power Supply	YescomUSA	DCP305D	3/3/2020	3/3/2022
P06123	Attenuator	Aeroflex	18N-6	4/2/2021	4/2/2023

Test Data Summary - Voltage Variations					
Frequency (MHz)	**Modulation / Ant Port**	**$V_{Minimum}$ (dBuV/m@3m)**	**$V_{Nominal}$ (dBuV/m@3m)**	**$V_{Maximum}$ (dBuV/m@3m)**	**Max Deviation from $V_{Nominal}$ (dB)**
952	External Attached	77.4	77.6	77.6	0.2
952	External Vehicle	76.7	76.8	76.8	0.1
952	Internal	81.1	81.2	81.2	0.1

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

Parameter Definitions (Internal Antenna Version):

Measurements performed at input voltage Vnominal ± 15%.

Parameter	Value
$V_{Nominal}$:	120 VAC
$V_{Minimum}$:	102.00 VAC
$V_{Maximum}$:	138.00 VAC

Parameter Definitions (External Antenna Version):

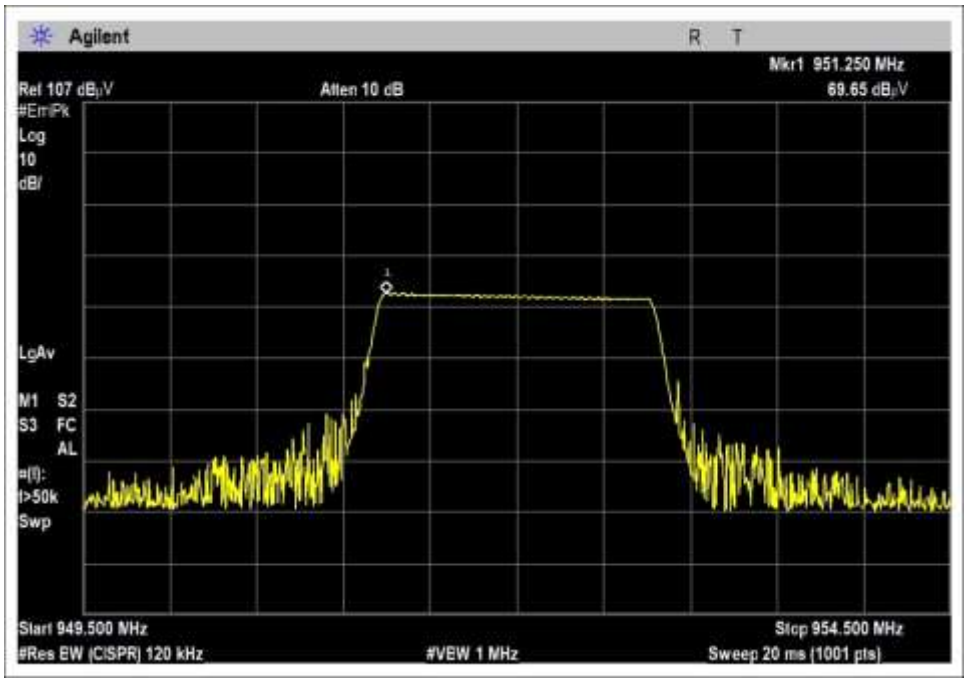
Measurements performed at input voltage Vnominal ± 15%.

Parameter	Value
$V_{Nominal}$:	13.8VDC
$V_{Minimum}$:	11.7VDC
$V_{Maximum}$:	15.9VDC

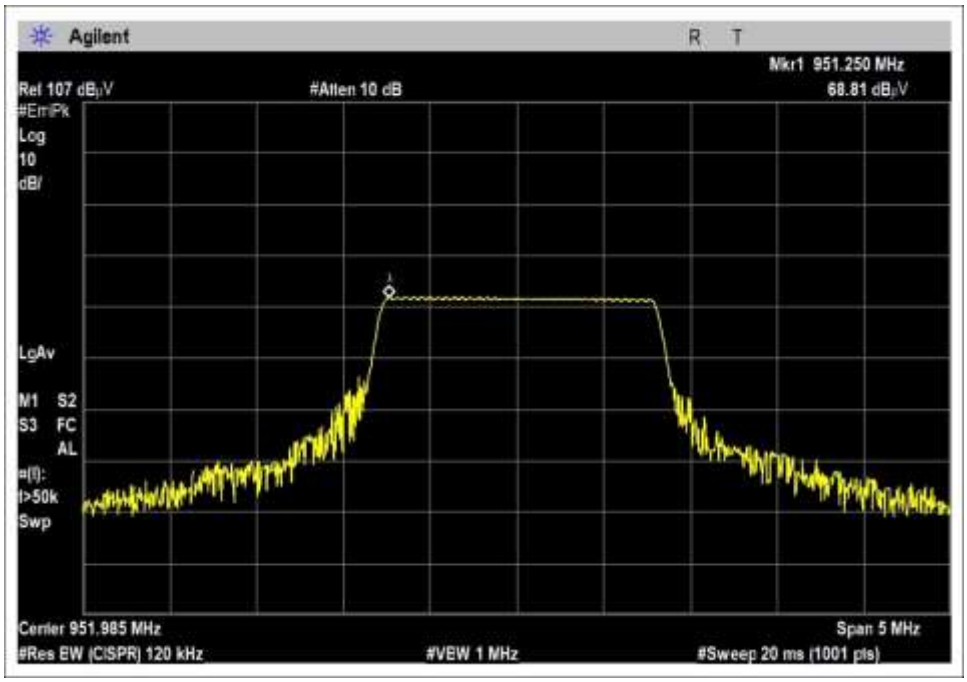
Test Data Summary – Radiated Field Strength Measurement					
Frequency (MHz)	**Modulation**	**Ant. Type**	**Measured (dBuV/m @ 3m)**	**Limit (dBuV/m @ 3m)**	**Results**
952	OOK	External Attached	77.6	≤81.9	Pass
952	OOK	External Vehicle	76.8	≤81.9	Pass
952	OOK	Internal	81.2	≤81.9	Pass

Note: Peaks values recorded as worst case, see data sheets for QP measurements.

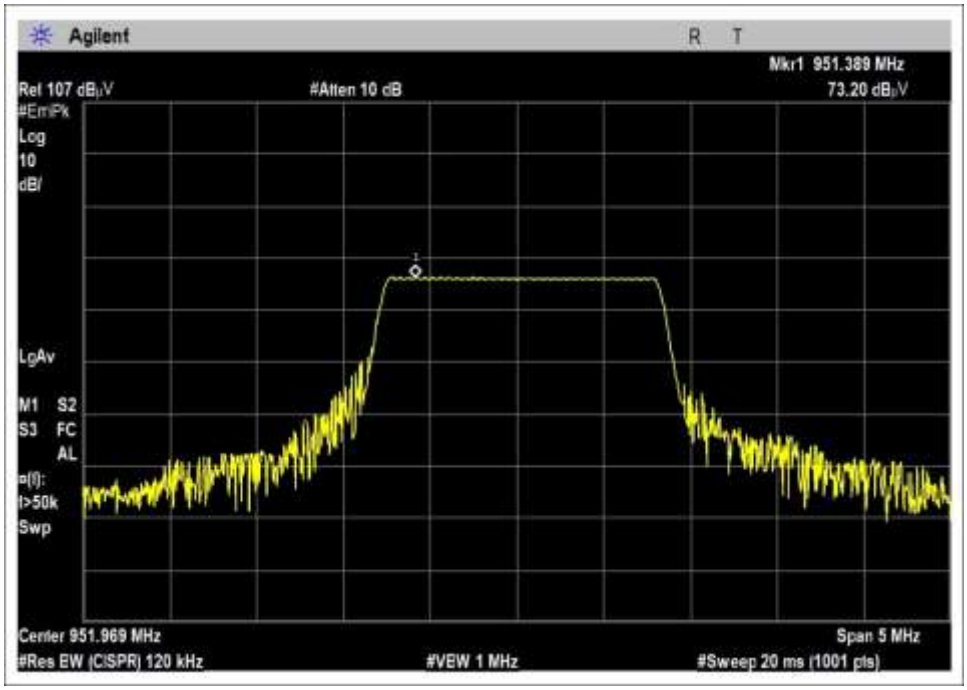
Plot(s)



Configuration 3



Configuration 5



Configuration 7

Test Setup / Conditions / Data

Test Location:	CKC Laboratories • 22116 23rd Drive SE, Suite A • Bothell, WA 98021 • 1-800-500-4EMC (4362)		
Customer:	**Itron, Inc.**		
Specification:	**15.231(b) Fundamental Field Strength**		
Work Order #:	**105444**	Date:	8/20/2021
Test Type:	**Maximized Emissions**	Time:	09:06:26
Tested By:	Michael Atkinson	Sequence#:	50
Software:	EMITest 5.03.19		

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 3			

Support Equipment:

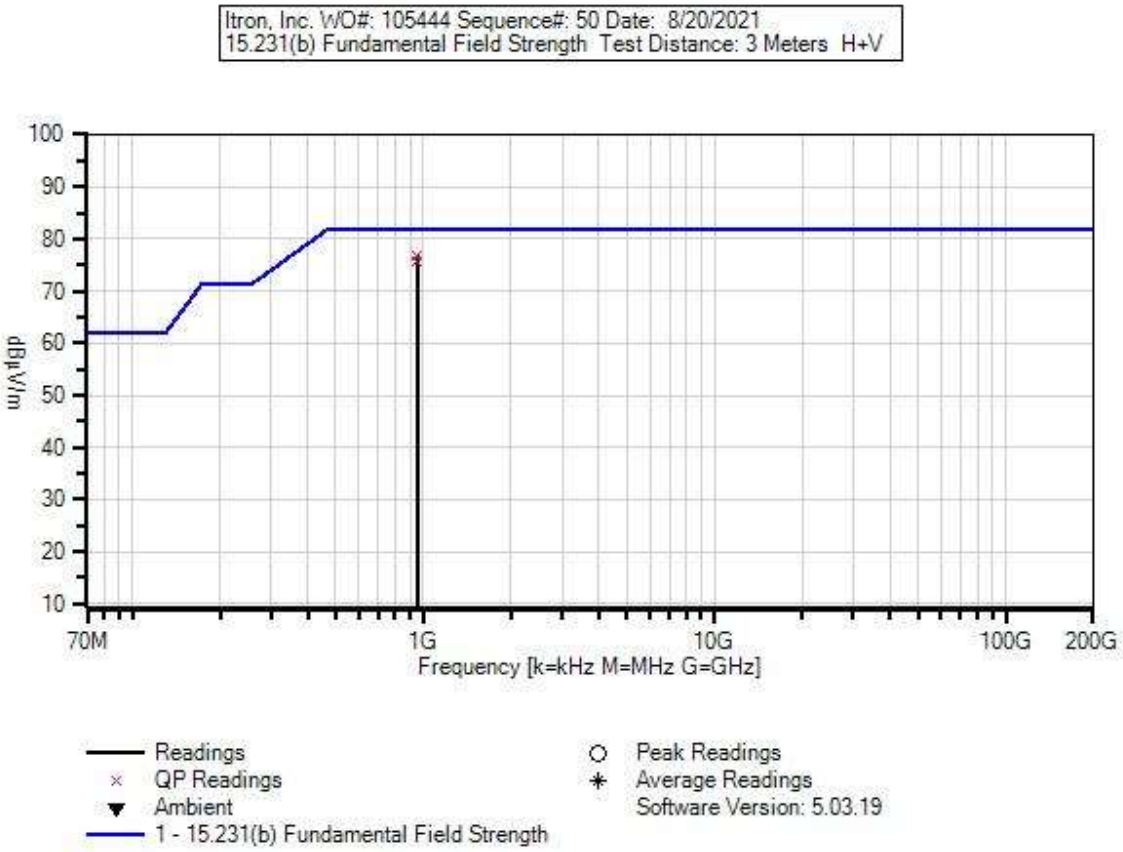
Device	Manufacturer	Model #	S/N
Configuration 3			

Test Conditions / Notes:

Setup: EUT is on foam table. EUT is connected to support tablet. EUT is transmitting using test software on support tablet to control EUT. XYZ axes investigated, horizontal and vertical antenna polarities investigated, worst case reported.

EUT with external attached antenna.

Test Location: Bothell Lab C3
Temperature (ºC): 22
Relative Humidity (%): 45
Test Method: ANSI C63.10 (2013)



Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	ANP06540	Cable	Heliax	8/23/2019	8/23/2021
T2	ANP05305	Cable	ETSI-50T	9/6/2019	9/6/2021
T3	ANP05360	Cable	RG214	2/3/2020	2/3/2022
T4	AN02307	Preamp	8447D	1/10/2020	1/10/2022
	AN02871	Spectrum Analyzer	E4440A	3/12/2020	3/12/2022
T5	AN03628	Biconilog Antenna	3142E	6/3/2021	6/3/2023

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

#	Freq	Rdng	T1 T5	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant
1	951.250M QP	68.8	+0.4 +31.1	+1.5	+2.2	-27.2	+0.0	76.8	81.9	-5.1	H+V
^	951.250M	69.6	+0.4 +31.1	+1.5	+2.2	-27.2	+0.0	77.6	81.9	-4.3	H+V
3	951.985M QP	67.8	+0.4 +31.1	+1.5	+2.2	-27.2	+0.0	75.8	81.9	-6.1	H+V

Test Location:	CKC Laboratories • 22116 23rd Drive SE, Suite A • Bothell, WA 98021 • 1-800-500-4EMC (4362)		
Customer:	**Itron, Inc.**		
Specification:	**15.231(b) Fundamental Field Strength**		
Work Order #:	**105444**	Date:	8/20/2021
Test Type:	**Maximized Emissions**	Time:	09:12:45
Tested By:	Michael Atkinson	Sequence#:	51
Software:	EMITest 5.03.19		

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 5			

Support Equipment:

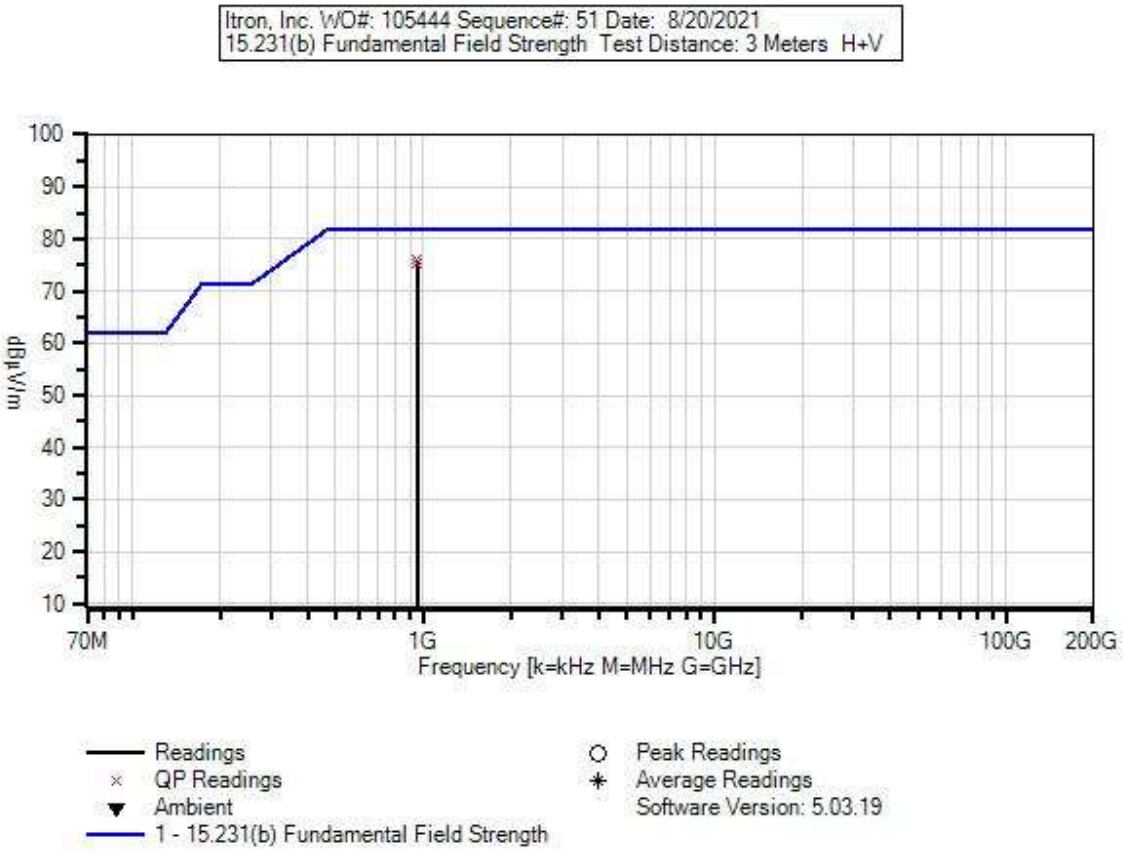
Device	Manufacturer	Model #	S/N
Configuration 5			

Test Conditions / Notes:

Setup: EUT is on foam table. EUT is connected to support tablet. EUT is transmitting using test software on support tablet to control EUT. XYZ axes investigated, horizontal and vertical antenna polarities investigated, worst case reported.

EUT with external vehicle antenna

Test Location: Bothell Lab C3
Temperature (ºC): 22
Relative Humidity (%): 45
Test Method: ANSI C63.10 (2013)



Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	ANP06540	Cable	Heliax	8/23/2019	8/23/2021
T2	ANP05305	Cable	ETSI-50T	9/6/2019	9/6/2021
T3	ANP05360	Cable	RG214	2/3/2020	2/3/2022
T4	AN02307	Preamp	8447D	1/10/2020	1/10/2022
	AN02871	Spectrum Analyzer	E4440A	3/12/2020	3/12/2022
T5	AN03628	Biconilog Antenna	3142E	6/3/2021	6/3/2023

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

#	Freq	Rdng	T1 T5	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant
1	951.250M QP	67.9	+0.4 +31.1	+1.5	+2.2	-27.2	+0.0	75.9	81.9	-6.0	H+V
^	951.250M	68.8	+0.4 +31.1	+1.5	+2.2	-27.2	+0.0	76.8	81.9	-5.1	H+V
3	951.969M QP	67.3	+0.4 +31.1	+1.5	+2.2	-27.2	+0.0	75.3	81.9	-6.6	H+V

Test Location:	CKC Laboratories • 22116 23rd Drive SE, Suite A • Bothell, WA 98021 • 1-800-500-4EMC (4362)		
Customer:	**Itron, Inc.**		
Specification:	**15.231(b) Fundamental Field Strength**		
Work Order #:	**105444**	Date:	8/20/2021
Test Type:	**Maximized Emissions**	Time:	09:18:44
Tested By:	Michael Atkinson	Sequence#:	53
Software:	EMITest 5.03.19		

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 7			

Support Equipment:

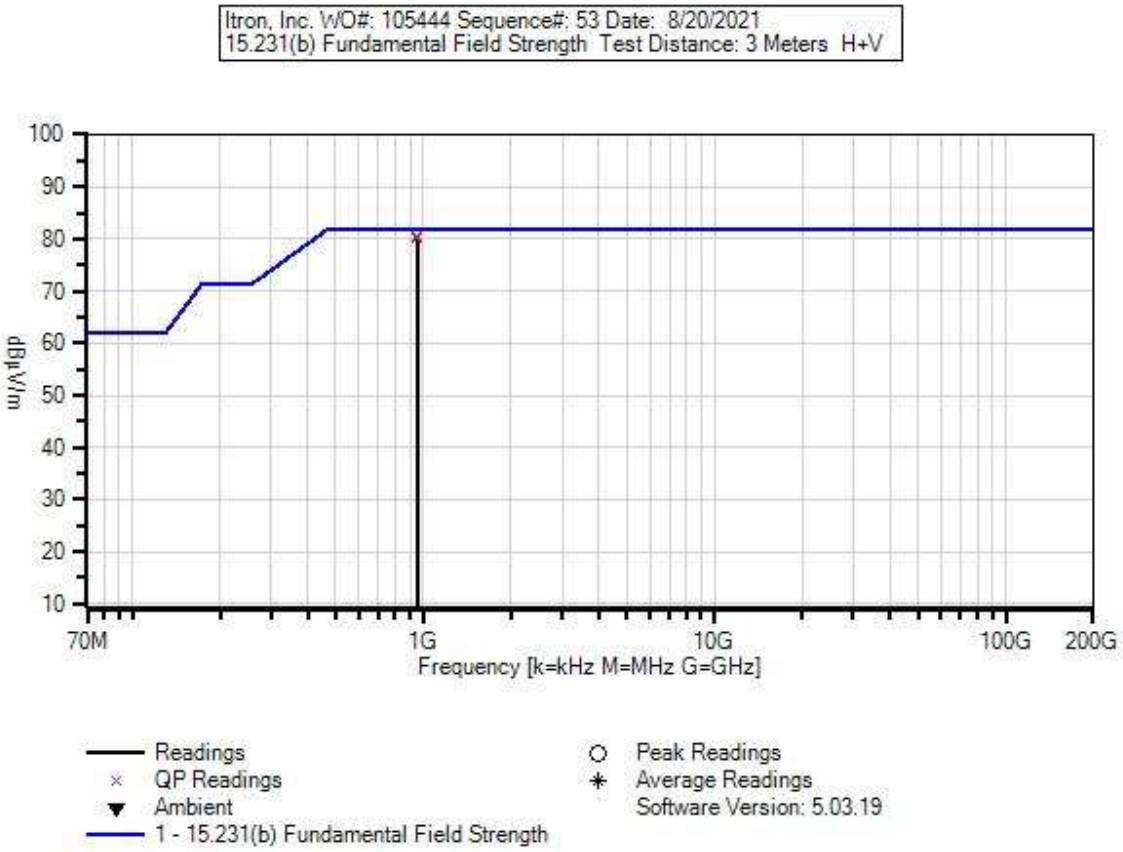
Device	Manufacturer	Model #	S/N
Configuration 7			

Test Conditions / Notes:

Setup: EUT is on foam table. EUT is connected to support tablet. EUT is transmitting using test software on support tablet to control EUT. XYZ axes investigated, horizontal and vertical antenna polarities investigated, worst case reported.

EUT with internal antenna.

Test Location: Bothell Lab C3
Temperature (ºC): 22
Relative Humidity (%): 45
Test Method: ANSI C63.10 (2013)



Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	ANP06540	Cable	Heliax	8/23/2019	8/23/2021
T2	ANP05305	Cable	ETSI-50T	9/6/2019	9/6/2021
T3	ANP05360	Cable	RG214	2/3/2020	2/3/2022
T4	AN02307	Preamp	8447D	1/10/2020	1/10/2022
	AN02871	Spectrum Analyzer	E4440A	3/12/2020	3/12/2022
T5	AN03628	Biconilog Antenna	3142E	6/3/2021	6/3/2023

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

#	Freq	Rdng	T1 T5	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant
1	951.389M QP	72.4	+0.4 +31.1	+1.5	+2.2	-27.2	+0.0	80.4	81.9	-1.5	H+V
^	951.389M	73.2	+0.4 +31.1	+1.5	+2.2	-27.2	+0.0	81.2	81.9	-0.7	H+V
3	951.990M QP	72.2	+0.4 +31.1	+1.5	+2.2	-27.2	+0.0	80.2	81.9	-1.7	H+V

Test Setup Photo(s)

Configuration 3

X Axis, View #1

X Axis, View #2

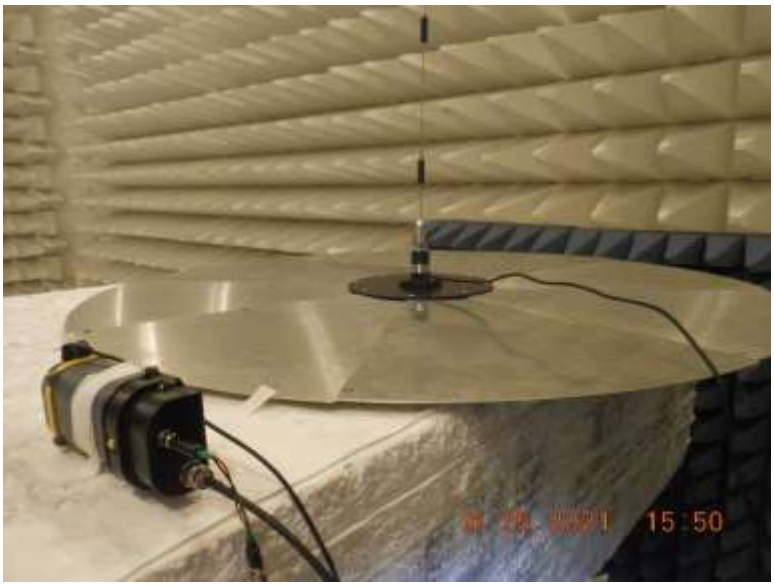
Y Axis

Z Axis

Below 1GHz

Configuration 5

X Axis



Y Axis

Z Axis

Below 1GHz

Configuration 7

X Axis

Y Axis

Z Axis

Below 1GHz

15.225(a) Periodic Operation Requirements

Test Setup/Conditions			
Test Location:	Bothell Lab Bench	Test Engineer:	M. Atkinson
Test Method:	ANSI C63.10 (2013)	Test Date(s):	7/20/2021
Configuration:	1		
Test Setup:	EUT directly connected to spectrum analyzer through appropriate cables and attenuators. EUT is setup to transmit with manual activation from test software.		
Declarations:	15.231(a)(2): The manufacturer declares the EUT cannot be activated automatically. 15.231(a)(3): The manufacturer declares the EUT has no polling or supervision transmission mode. 15.231(a)(4): The manufacturer declares the EUT has no alarm condition transmission mode. 15.231(a)(5): The manufacturer declares the EUT has no setup transmission duration.		

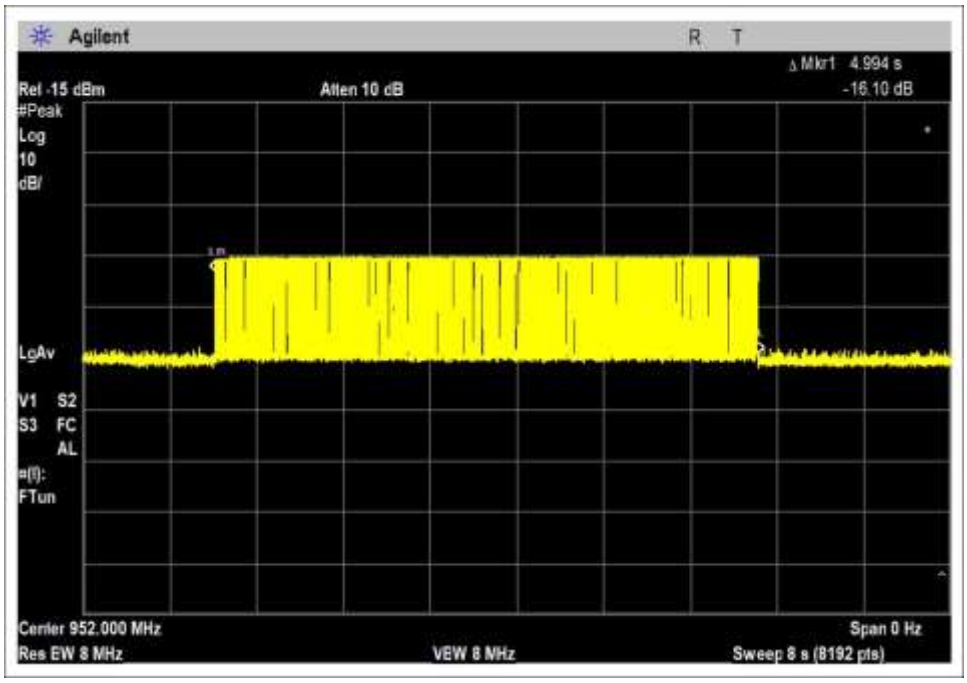
Environmental Conditions			
Temperature (ºC)	22	Relative Humidity (%):	50

Test Equipment					
Asset#	**Description**	**Manufacturer**	**Model**	**Cal Date**	**Cal Due**
02871	Spectrum Analyzer	Agilent	E4440A	3/12/2020	3/12/2022
P07670	Attenuator	Pasternack	PE7389-20	8/20/2020	8/20/2022
P06454	Cable	Andrews	Heliax	1/20/2020	1/20/2022

15.231(a)(1) Manual Triggered Deactivation Time

Test Data Summary					
Frequency (MHz)	**Antenna Port**	**Modulation**	**Measured (s)**	**Limit (s)**	**Results**
952	1	OOK	4.994	≤5	Pass

Plot(s)



5 Second

Test Setup Photo(s)

15.231(b) Radiated Emissions

Note: Per ANSI C63.10 (2013) 100kHz RBW was used for restricted band edge peak data per 6.10.5.2 (e) (6) (iii).

Test Setup / Conditions / Data

Test Location:	CKC Laboratories • 22116 23rd Drive SE, Suite A • Bothell, WA 98021 • 1-800-500-4EMC (4362)		
Customer:	**Itron, Inc.**		
Specification:	**15.231(b) Spurious Field Strength (>470 MHz Transmitter) (Band Edge)**		
Work Order #:	**105444**	Date:	7/6/2021
Test Type:	**Maximized Emissions**	Time:	20:00:45
Tested By:	Michael Atkinson	Sequence#:	14
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:

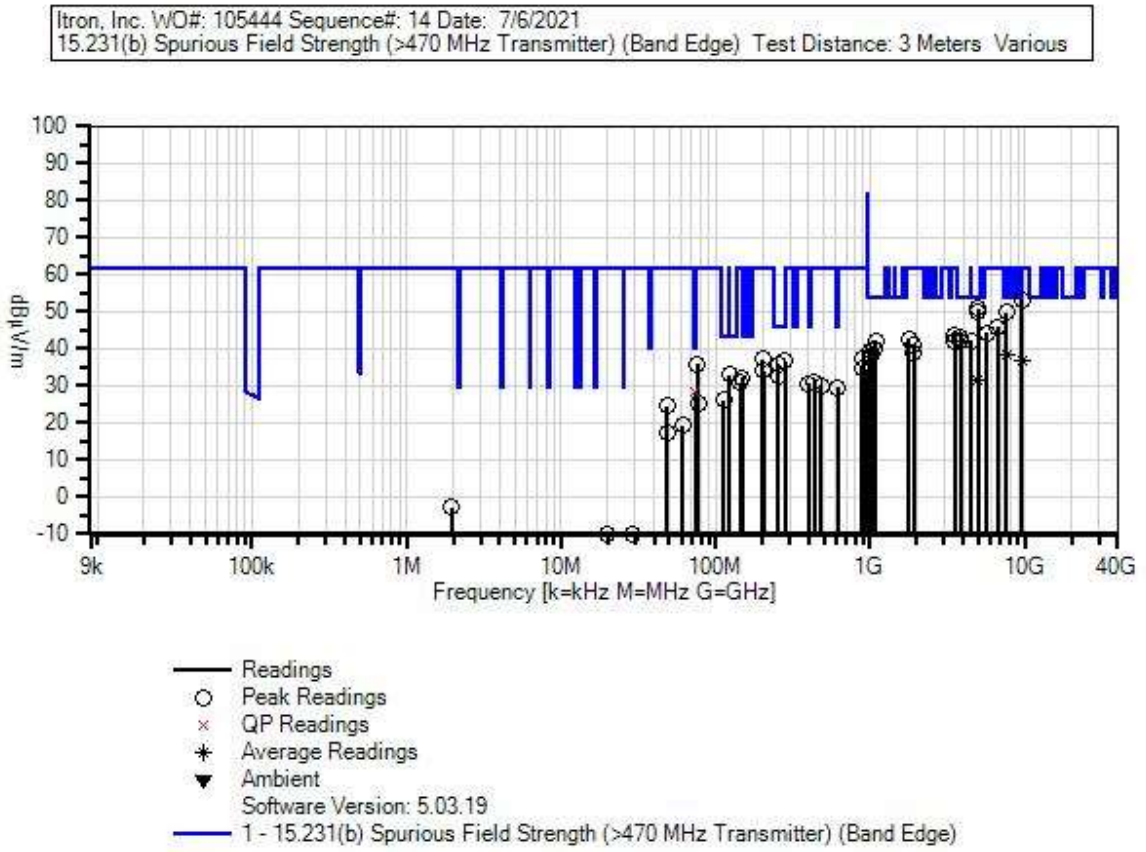
Frequency: 9kHz to 10GHz

Setup: EUT is on foam table. EUT is connected to support tablet. EUT is transmitting using test software on support tablet to control EUT. XYZ axes investigated, horizontal and vertical antenna polarities investigated above 30MHz, 3 orthogonal axes investigated below 30MHz, worst case reported.

EUT with external attached antenna.

Temperature (ºC): 22-23
Relative Humidity (%): 43-50
Test Location: Bothell Lab C3

Test Method: ANSI C63.10 (2013)



Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN02673	Spectrum Analyzer	E4446A	2/3/2021	2/3/2023
T2	ANP06540	Cable	Heliax	8/23/2019	8/23/2021
T3	ANP05305	Cable	ETSI-50T	9/6/2019	9/6/2021
T4	ANP05360	Cable	RG214	2/3/2020	2/3/2022
T5	AN03628	Biconilog Antenna	3142E	6/3/2021	6/3/2023
T6	AN02307	Preamp	8447D	1/10/2020	1/10/2022
T7	AN02374ANSI	Horn Antenna	RGA-60	5/25/2021	5/25/2023
T8	ANP06515	Cable	Heliax	7/1/2020	7/1/2022
T9	AN03540	Preamp	83017A	5/14/2021	5/14/2023
T10	ANP07505	Cable	CLU40-KMKM-02.00F	1/26/2021	1/26/2023
T11	AN00052	Loop Antenna	6502	5/4/2020	5/4/2022

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

#	Freq	Rdng	T1	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
			T5	T6	T7	T8					
			T9	T10	T11						
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant
1	4998.067M	46.1	+0.0	+0.9	+0.0	+0.0	+0.0	50.8	54.0	-3.2	Vert
			+0.0	+0.0	+0.0	+3.8					
			+0.0	+0.0	+0.0						
2	7615.860M	39.9	+0.0	+1.6	+0.0	+0.0	+0.0	49.9	54.0	-4.1	Horiz
			+0.0	+0.0	+37.4	+5.4					
			-34.9	+0.5	+0.0						
3	4976.000M	44.2	+0.0	+0.9	+0.0	+0.0	+0.0	49.8	54.0	-4.2	Horiz
			+0.0	+0.0	+33.8	+3.8					
			-33.4	+0.5	+0.0						
4	9519.840M	41.2	+0.0	+1.4	+0.0	+0.0	+0.0	53.2	61.9	-8.7	Vert
			+0.0	+0.0	+38.5	+5.5					
			-34.1	+0.7	+0.0						
5	282.200M	43.7	+0.0	+0.2	+0.8	+1.0	+0.0	36.8	46.0	-9.2	Horiz
			+18.1	-27.0	+0.0	+0.0					
			+0.0	+0.0	+0.0						
6	255.000M	42.5	+0.0	+0.2	+0.8	+1.0	+0.0	35.9	46.0	-10.1	Horiz
			+18.4	-27.0	+0.0	+0.0					
			+0.0	+0.0	+0.0						
7	3806.620M	39.8	+0.0	+0.9	+0.0	+0.0	+0.0	43.1	54.0	-10.9	Vert
			+0.0	+0.0	+32.4	+3.5					
			-33.8	+0.3	+0.0						
8	73.489M	42.5	+0.0	+0.1	+0.4	+0.5	+0.0	28.6	40.0	-11.4	Vert
	QP		+12.9	-27.8	+0.0	+0.0					
			+0.0	+0.0	+0.0						
^	73.507M	47.4	+0.0	+0.1	+0.4	+0.5	+0.0	33.4	40.0	-6.6	Vert
			+12.8	-27.8	+0.0	+0.0					
			+0.0	+0.0	+0.0						
10	3808.160M	38.6	+0.0	+0.9	+0.0	+0.0	+0.0	41.9	54.0	-12.1	Vert
			+0.0	+0.0	+32.4	+3.5					
			-33.8	+0.3	+0.0						
11	1084.000M	51.5	+0.0	+0.4	+0.0	+0.0	+0.0	41.9	54.0	-12.1	Vert
			+0.0	+0.0	+24.5	+1.8					
			-36.6	+0.3	+0.0						
12	252.100M	39.6	+0.0	+0.2	+0.8	+1.0	+0.0	32.8	46.0	-13.2	Vert
			+18.2	-27.0	+0.0	+0.0					
			+0.0	+0.0	+0.0						
13	1050.000M	50.2	+0.0	+0.4	+0.0	+0.0	+0.0	40.1	54.0	-13.9	Horiz
			+0.0	+0.0	+24.3	+1.7					
			-36.8	+0.3	+0.0						
14	1000.000M	49.9	+0.0	+0.4	+0.0	+0.0	+0.0	39.6	54.0	-14.4	Horiz
			+0.0	+0.0	+24.3	+1.7					
			-37.0	+0.3	+0.0						

15	7615.600M	28.5	+0.0	+1.6	+0.0	+0.0	+0.0	38.5	54.0	-15.5	Vert
	Ave		+0.0	+0.0	+37.4	+5.4					
			-34.9	+0.5	+0.0						
^	7615.600M	40.6	+0.0	+1.6	+0.0	+0.0	+0.0	50.6	54.0	-3.4	Vert
			+0.0	+0.0	+37.4	+5.4					
			-34.9	+0.5	+0.0						
17	6664.570M	37.9	+0.0	+1.2	+0.0	+0.0	+0.0	46.0	61.9	-15.9	Horiz
			+0.0	+0.0	+35.4	+5.2					
			-34.1	+0.4	+0.0						
18	999.000M	30.8	+0.0	+0.4	+1.5	+2.3	+0.0	38.0	54.0	-16.0	Horiz
			+30.0	-27.0	+0.0	+0.0					
			+0.0	+0.0	+0.0						
19	614.000M	27.4	+0.0	+0.3	+1.2	+1.7	+0.0	29.6	46.0	-16.4	Horiz
			+27.2	-28.2	+0.0	+0.0					
			+0.0	+0.0	+0.0						
20	112.400M	38.8	+0.0	+0.1	+0.5	+0.6	+0.0	26.3	43.5	-17.2	Horiz
			+14.0	-27.7	+0.0	+0.0					
			+0.0	+0.0	+0.0						
21	5711.480M	37.8	+0.0	+1.0	+0.0	+0.0	+0.0	44.3	61.9	-17.6	Horiz
			+0.0	+0.0	+34.3	+4.5					
			-33.6	+0.3	+0.0						
22	3496.000M	41.7	+0.0	+0.8	+0.0	+0.0	+0.0	43.5	61.9	-18.4	Vert
			+0.0	+0.0	+31.2	+3.3					
			-33.8	+0.3	+0.0						
23	1764.000M	47.8	+0.0	+0.5	+0.0	+0.0	+0.0	42.7	61.9	-19.2	Vert
			+0.0	+0.0	+26.6	+2.3					
			-34.8	+0.3	+0.0						
24	960.000M	26.8	+0.0	+0.4	+1.5	+2.2	+0.0	34.5	54.0	-19.5	Horiz
			+30.7	-27.1	+0.0	+0.0					
			+0.0	+0.0	+0.0						
25	3500.000M	40.4	+0.0	+0.8	+0.0	+0.0	+0.0	42.3	61.9	-19.6	Horiz
			+0.0	+0.0	+31.3	+3.3					
			-33.8	+0.3	+0.0						
26	4464.000M	38.6	+0.0	+0.9	+0.0	+0.0	+0.0	42.3	61.9	-19.6	Horiz
			+0.0	+0.0	+32.3	+3.7					
			-33.5	+0.3	+0.0						
27	1904.000M	44.6	+0.0	+0.6	+0.0	+0.0	+0.0	41.3	61.9	-20.6	Vert
			+0.0	+0.0	+28.0	+2.4					
			-34.6	+0.3	+0.0						
28	4988.067M	26.0	+0.0	+0.9	+0.0	+0.0	+0.0	31.6	54.0	-22.4	Vert
	Ave		+0.0	+0.0	+33.8	+3.8					
			-33.4	+0.5	+0.0						
29	1904.360M	42.0	+0.0	+0.6	+0.0	+0.0	+0.0	38.7	61.9	-23.2	Horiz
			+0.0	+0.0	+28.0	+2.4					
			-34.6	+0.3	+0.0						
30	892.300M	32.0	+0.0	+0.3	+1.4	+2.1	+0.0	37.6	61.9	-24.3	Vert
			+29.2	-27.4	+0.0	+0.0					
			+0.0	+0.0	+0.0						
31	201.700M	46.6	+0.0	+0.2	+0.7	+0.9	+0.0	37.3	61.9	-24.6	Horiz
			+16.1	-27.2	+0.0	+0.0					
			+0.0	+0.0	+0.0						

32	9520.358M Ave	24.9	+0.0 +0.0 -34.1	+1.4 +0.0 +0.7	+0.0 +38.5 +0.0	+0.0 +5.5	+0.0	36.9	61.9	-25.0	Vert
33	75.600M	49.8	+0.0 +12.8 +0.0	+0.1 -27.8 +0.0	+0.4 +0.0 +0.0	+0.5 +0.0	+0.0	35.8	61.9	-26.1	Vert
34	879.700M	29.8	+0.0 +28.8 +0.0	+0.3 -27.4 +0.0	+1.4 +0.0 +0.0	+2.1 +0.0	+0.0	35.0	61.9	-26.9	Horiz
35	203.600M	43.3	+0.0 +16.3 +0.0	+0.2 -27.2 +0.0	+0.7 +0.0 +0.0	+0.9 +0.0	+0.0	34.2	61.9	-27.7	Vert
36	122.200M	46.1	+0.0 +13.1 +0.0	+0.1 -27.6 +0.0	+0.5 +0.0 +0.0	+0.7 +0.0	+0.0	32.9	61.9	-29.0	Vert
37	148.300M	43.7	+0.0 +14.6 +0.0	+0.2 -27.5 +0.0	+0.6 +0.0 +0.0	+0.7 +0.0	+0.0	32.3	61.9	-29.6	Vert
38	431.600M	33.5	+0.0 +22.8 +0.0	+0.2 -27.8 +0.0	+1.0 +0.0 +0.0	+1.4 +0.0	+0.0	31.1	61.9	-30.8	Vert
39	144.500M	43.2	+0.0 +14.0 +0.0	+0.1 -27.5 +0.0	+0.5 +0.0 +0.0	+0.7 +0.0	+0.0	31.0	61.9	-30.9	Horiz
40	395.700M	32.2	+0.0 +23.5 +0.0	+0.2 -27.6 +0.0	+1.0 +0.0 +0.0	+1.3 +0.0	+0.0	30.6	61.9	-31.3	Vert
41	480.100M	31.3	+0.0 +23.9 +0.0	+0.3 -28.0 +0.0	+1.1 +0.0 +0.0	+1.4 +0.0	+0.0	30.0	61.9	-31.9	Vert
42	76.600M	39.1	+0.0 +12.7 +0.0	+0.1 -27.8 +0.0	+0.4 +0.0 +0.0	+0.5 +0.0	+0.0	25.0	61.9	-36.9	Horiz
43	48.400M	38.9	+0.0 +12.7 +0.0	+0.1 -27.9 +0.0	+0.4 +0.0 +0.0	+0.4 +0.0	+0.0	24.6	61.9	-37.3	Vert
44	61.000M	33.5	+0.0 +12.6 +0.0	+0.1 -27.8 +0.0	+0.4 +0.0 +0.0	+0.5 +0.0	+0.0	19.3	61.9	-42.6	Horiz
45	48.400M	31.9	+0.0 +12.7 +0.0	+0.1 -27.9 +0.0	+0.4 +0.0 +0.0	+0.4 +0.0	+0.0	17.6	61.9	-44.3	Horiz
46	1.958M	27.7	+0.0 +0.0 +0.0	+0.0 +0.0 +0.0	+0.0 +0.0 +9.5	+0.0 +0.1	-40.0	-2.7	61.9	-64.6	Perp
47	28.650M	25.0	+0.0 +0.0 +0.0	+0.1 +0.0 +0.0	+0.0 +0.0 +4.8	+0.0 +0.3	-40.0	-9.8	61.9	-71.7	Perp
48	19.863M	22.6	+0.0 +0.0 +0.0	+0.1 +0.0 +0.0	+0.0 +0.0 +7.3	+0.0 +0.2	-40.0	-9.8	61.9	-71.7	Perp

Test Location:	CKC Laboratories • 22116 23rd Drive SE, Suite A • Bothell, WA 98021 • 1-800-500-4EMC (4362)		
Customer:	**Itron, Inc.**		
Specification:	**15.231(b) Spurious Field Strength (>470 MHz Transmitter) (Band Edge)**		
Work Order #:	**105444**	Date:	7/6/2021
Test Type:	**Maximized Emissions**	Time:	19:45:43
Tested By:	Michael Atkinson	Sequence#:	13
Software:	EMITest 5.03.19		

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 5			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 5			

Test Conditions / Notes:

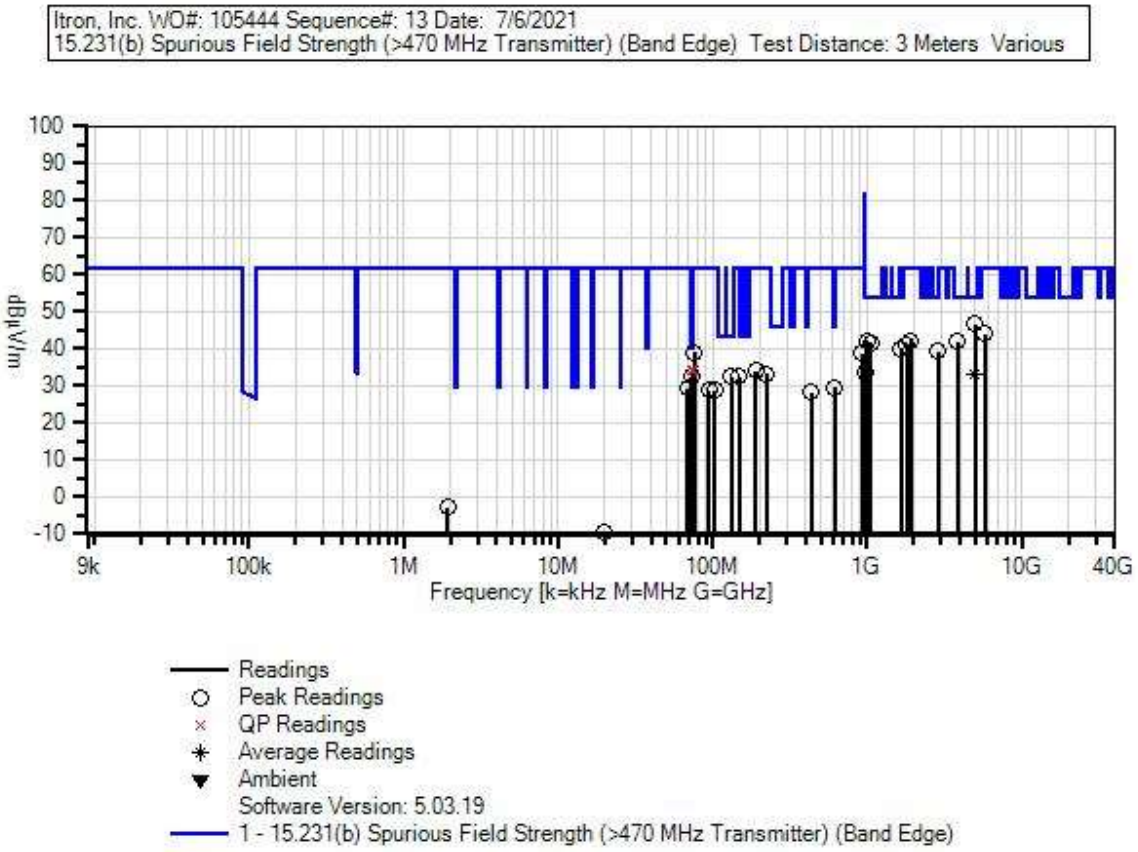
Frequency: 9kHz to 10GHz

Setup: EUT is on foam table. EUT is connected to support tablet. EUT is transmitting using test software on support tablet to control EUT. XYZ axes investigated, horizontal and vertical antenna polarities investigated above 30MHz, 3 orthogonal axes investigated below 30MHz, worst case reported.

EUT with external vehicle antenna.

Temperature (ºC): 22-23
Relative Humidity (%): 43-50
Test Location: Bothell Lab C3

Test Method: ANSI C63.10 (2013)



Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
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T2	ANP06540	Cable	Heliax	8/23/2019	8/23/2021
T3	ANP05305	Cable	ETSI-50T	9/6/2019	9/6/2021
T4	ANP05360	Cable	RG214	2/3/2020	2/3/2022
T5	AN03628	Biconilog Antenna	3142E	6/3/2021	6/3/2023
T6	AN02307	Preamp	8447D	1/10/2020	1/10/2022
T7	AN02374ANSI	Horn Antenna	RGA-60	5/25/2021	5/25/2023
T8	AN03540	Preamp	83017A	5/14/2021	5/14/2023
T9	ANP06515	Cable	Heliax	7/1/2020	7/1/2022
T10	ANP07505	Cable	CLU40-KMKM-02.00F	1/26/2021	1/26/2023
T11	AN00052	Loop Antenna	6502	5/4/2020	5/4/2022

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

#	Freq	Rdng	T1	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
			T5	T6	T7	T8					
			T9	T10	T11						
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant
1	74.600M	48.3	+0.0	+0.1	+0.4	+0.5	+0.0	34.3	40.0	-5.7	Horiz
	QP		+12.8	-27.8	+0.0	+0.0					
			+0.0	+0.0	+0.0						
^	74.600M	48.5	+0.0	+0.1	+0.4	+0.5	+0.0	34.5	40.0	-5.5	Horiz
			+12.8	-27.8	+0.0	+0.0					
			+0.0	+0.0	+0.0						
3	73.419M	47.9	+0.0	+0.1	+0.4	+0.5	+0.0	34.0	40.0	-6.0	Horiz
	QP		+12.9	-27.8	+0.0	+0.0					
			+0.0	+0.0	+0.0						
^	73.419M	48.0	+0.0	+0.1	+0.4	+0.5	+0.0	34.1	40.0	-5.9	Horiz
			+12.9	-27.8	+0.0	+0.0					
			+0.0	+0.0	+0.0						
5	4976.000M	41.0	+0.0	+0.9	+0.0	+0.0	+0.0	46.6	54.0	-7.4	Horiz
			+0.0	+0.0	+33.8	-33.4					
			+3.8	+0.5	+0.0						
6	131.800M	45.1	+0.0	+0.1	+0.5	+0.7	+0.0	32.5	43.5	-11.0	Vert
			+13.7	-27.6	+0.0	+0.0					
			+0.0	+0.0	+0.0						
7	1000.000M	52.6	+0.0	+0.4	+0.0	+0.0	+0.0	42.3	54.0	-11.7	Vert
			+0.0	+0.0	+24.3	-37.0					
			+1.7	+0.3	+0.0						
8	3807.590M	38.8	+0.0	+0.9	+0.0	+0.0	+0.0	42.1	54.0	-11.9	Vert
			+0.0	+0.0	+32.4	-33.8					
			+3.5	+0.3	+0.0						
9	1050.000M	51.9	+0.0	+0.4	+0.0	+0.0	+0.0	41.8	54.0	-12.2	Vert
			+0.0	+0.0	+24.3	-36.8					
			+1.7	+0.3	+0.0						
10	1660.000M	46.3	+0.0	+0.5	+0.0	+0.0	+0.0	40.2	54.0	-13.8	Vert
			+0.0	+0.0	+25.8	-34.9					
			+2.2	+0.3	+0.0						
11	2855.690M	40.0	+0.0	+0.7	+0.0	+0.0	+0.0	39.4	54.0	-14.6	Vert
			+0.0	+0.0	+29.5	-34.1					
			+3.0	+0.3	+0.0						
12	614.000M	27.5	+0.0	+0.3	+1.2	+1.7	+0.0	29.7	46.0	-16.3	Vert
			+27.2	-28.2	+0.0	+0.0					
			+0.0	+0.0	+0.0						
13	5714.390M	37.6	+0.0	+1.0	+0.0	+0.0	+0.0	44.1	61.9	-17.8	Vert
			+0.0	+0.0	+34.3	-33.6					
			+4.5	+0.3	+0.0						
14	1903.570M	45.6	+0.0	+0.6	+0.0	+0.0	+0.0	42.3	61.9	-19.6	Vert
			+0.0	+0.0	+28.0	-34.6					
			+2.4	+0.3	+0.0						
15	960.000M	26.1	+0.0	+0.4	+1.5	+2.2	+0.0	33.8	54.0	-20.2	Vert
			+30.7	-27.1	+0.0	+0.0					
			+0.0	+0.0	+0.0						

16	1794.000M	45.8	+0.0	+0.5	+0.0	+0.0	+0.0	41.3	61.9	-20.6	Horiz
			+0.0	+0.0	+27.1	-34.7					
			+2.3	+0.3	+0.0						
17	4987.942M	27.6	+0.0	+0.9	+0.0	+0.0	+0.0	33.2	54.0	-20.8	Vert
	Ave		+0.0	+0.0	+33.8	-33.4					
			+3.8	+0.5	+0.0						
^	4987.942M	47.0	+0.0	+0.9	+0.0	+0.0	+0.0	51.7	54.0	-2.3	Vert
			+0.0	+0.0	+0.0	+0.0					
			+3.8	+0.0	+0.0						
19	75.600M	53.2	+0.0	+0.1	+0.4	+0.5	+0.0	39.2	61.9	-22.7	Vert
			+12.8	-27.8	+0.0	+0.0					
			+0.0	+0.0	+0.0						
20	919.500M	32.1	+0.0	+0.4	+1.5	+2.1	+0.0	38.8	61.9	-23.1	Horiz
			+30.0	-27.3	+0.0	+0.0					
			+0.0	+0.0	+0.0						
21	190.000M	44.4	+0.0	+0.2	+0.7	+0.8	+0.0	34.1	61.9	-27.8	Vert
			+15.3	-27.3	+0.0	+0.0					
			+0.0	+0.0	+0.0						
22	223.000M	41.8	+0.0	+0.2	+0.7	+0.9	+0.0	33.3	61.9	-28.6	Horiz
			+16.8	-27.1	+0.0	+0.0					
			+0.0	+0.0	+0.0						
23	72.700M	46.5	+0.0	+0.1	+0.4	+0.5	+0.0	32.6	61.9	-29.3	Vert
			+12.9	-27.8	+0.0	+0.0					
			+0.0	+0.0	+0.0						
24	148.300M	43.8	+0.0	+0.2	+0.6	+0.7	+0.0	32.4	61.9	-29.5	Horiz
			+14.6	-27.5	+0.0	+0.0					
			+0.0	+0.0	+0.0						
25	68.800M	43.2	+0.0	+0.1	+0.4	+0.5	+0.0	29.3	61.9	-32.6	Vert
			+12.9	-27.8	+0.0	+0.0					
			+0.0	+0.0	+0.0						
26	94.000M	42.3	+0.0	+0.1	+0.5	+0.6	+0.0	28.9	61.9	-33.0	Vert
			+13.1	-27.7	+0.0	+0.0					
			+0.0	+0.0	+0.0						
27	103.700M	41.3	+0.0	+0.1	+0.5	+0.6	+0.0	28.9	61.9	-33.0	Vert
			+14.1	-27.7	+0.0	+0.0					
			+0.0	+0.0	+0.0						
28	431.600M	30.8	+0.0	+0.2	+1.0	+1.4	+0.0	28.4	61.9	-33.5	Vert
			+22.8	-27.8	+0.0	+0.0					
			+0.0	+0.0	+0.0						
29	1.928M	27.7	+0.0	+0.0	+0.0	+0.0	-40.0	-2.7	61.9	-64.6	Para
			+0.0	+0.0	+0.0	+0.0					
			+0.1	+0.0	+9.5						
30	19.743M	22.6	+0.0	+0.1	+0.0	+0.0	-40.0	-9.7	61.9	-71.6	Para
			+0.0	+0.0	+0.0	+0.0					
			+0.2	+0.0	+7.4						
31	28.500M	20.8	+0.0	+0.1	+0.0	+0.0	-40.0	-14.0	61.9	-75.9	Para
			+0.0	+0.0	+0.0	+0.0					
			+0.3	+0.0	+4.8						

Test Location:	CKC Laboratories • 22116 23rd Drive SE, Suite A • Bothell, WA 98021 • 1-800-500-4EMC (4362)		
Customer:	**Itron, Inc.**		
Specification:	**15.231(b) Spurious Field Strength (>470 MHz Transmitter) (Band Edge)**		
Work Order #:	**105444**	Date:	7/6/2021
Test Type:	**Maximized Emissions**	Time:	19:35:42
Tested By:	Michael Atkinson	Sequence#:	14
Software:	EMITest 5.03.19		

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 7			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 7			

Test Conditions / Notes:

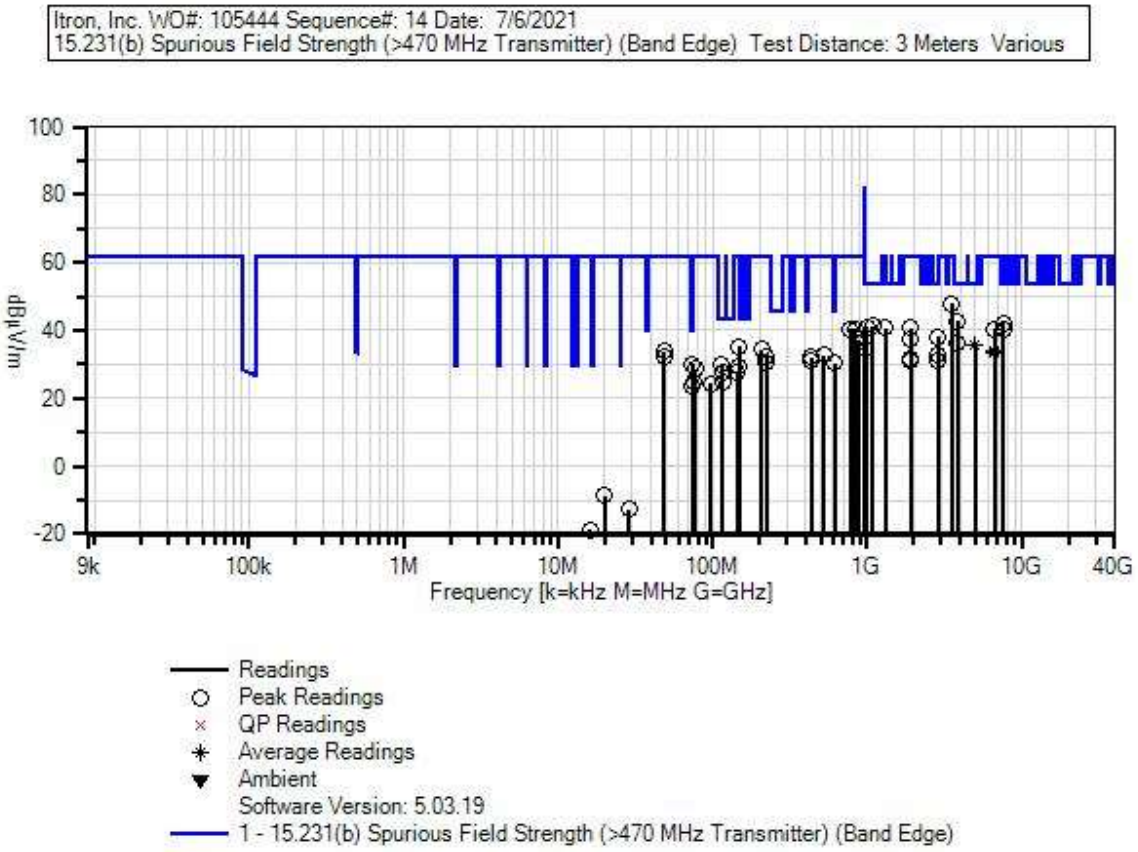
Frequency: 9kHz to 10GHz

Setup: EUT is on foam table. EUT is connected to support tablet. EUT is transmitting using test software on support tablet to control EUT. XYZ axes investigated, horizontal and vertical antenna polarities investigated above 30MHz, 3 orthogonal axes investigated below 30MHz, worst case reported.

EUT with internal antenna.

Temperature (ºC): 22-23
Relative Humidity (%): 43-50
Test Location: Bothell Lab C3

Test Method: ANSI C63.10 (2013)



Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN02673	Spectrum Analyzer	E4446A	2/3/2021	2/3/2023
T1	ANP06540	Cable	Heliax	8/23/2019	8/23/2021
T2	ANP05305	Cable	ETSI-50T	9/6/2019	9/6/2021
T3	ANP05360	Cable	RG214	2/3/2020	2/3/2022
T4	AN03628	Biconilog Antenna	3142E	6/3/2021	6/3/2023
T5	AN02307	Preamp	8447D	1/10/2020	1/10/2022
T6	ANP06515	Cable	Heliax	7/1/2020	7/1/2022
T7	AN03540	Preamp	83017A	5/14/2021	5/14/2023
T8	ANP07505	Cable	CLU40-KMKM-02.00F	1/26/2021	1/26/2023
T9	AN02374ANSI	Horn Antenna	RGA-60	5/25/2021	5/25/2023
T10	AN00052	Loop Antenna	6502	5/4/2020	5/4/2022

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	73.600M	44.2	+0.1 -27.8 +0.0	+0.4 +0.0 +0.0	+0.5 +0.0	+12.8 +0.0	+0.0	30.2	40.0	-9.8	Vert
2	3807.760M	39.3	+0.9 +0.0 +32.4	+0.0 +3.5 +0.0	+0.0 -33.8	+0.0 +0.3	+0.0	42.6	54.0	-11.4	Vert
3	7616.760M	32.2	+1.6 +0.0 +37.4	+0.0 +5.4 +0.0	+0.0 -34.9	+0.0 +0.5	+0.0	42.2	54.0 BW	-11.8	Vert
4	1082.000M	51.0	+0.4 +0.0 +24.4	+0.0 +1.8 +0.0	+0.0 -36.6	+0.0 +0.3	+0.0	41.3	54.0	-12.7	Horiz
5	1000.000M	51.3	+0.4 +0.0 +24.3	+0.0 +1.7 +0.0	+0.0 -37.0	+0.0 +0.3	+0.0	41.0	54.0	-13.0	Vert
6	1306.000M	48.5	+0.4 +0.0 +25.4	+0.0 +1.9 +0.0	+0.0 -35.7	+0.0 +0.2	+0.0	40.7	54.0	-13.3	Vert
7	7615.280M	30.3	+1.6 +0.0 +37.4	+0.0 +5.4 +0.0	+0.0 -34.9	+0.0 +0.5	+0.0	40.3	54.0 BW	-13.7	Horiz
8	114.400M	42.4	+0.1 -27.7 +0.0	+0.5 +0.0 +0.0	+0.6 +0.0	+13.9 +0.0	+0.0	29.8	43.5	-13.7	Horiz
9	3496.000M	46.1	+0.8 +0.0 +31.2	+0.0 +3.3 +0.0	+0.0 -33.8	+0.0 +0.3	+0.0	47.9	61.9	-14.0	Horiz
10	74.600M	38.9	+0.1 -27.8 +0.0	+0.4 +0.0 +0.0	+0.5 +0.0	+12.8 +0.0	+0.0	24.9	40.0	-15.1	Vert
11	614.000M	28.2	+0.3 -28.2 +0.0	+1.2 +0.0 +0.0	+1.7 +0.0	+27.2 +0.0	+0.0	30.4	46.0	-15.6	Vert
12	115.400M	40.4	+0.1 -27.7 +0.0	+0.5 +0.0 +0.0	+0.6 +0.0	+13.8 +0.0	+0.0	27.7	43.5	-15.8	Vert
13	2855.760M	38.7	+0.7 +0.0 +29.5	+0.0 +3.0 +0.0	+0.0 -34.1	+0.0 +0.3	+0.0	38.1	54.0	-15.9	Vert
14	73.512M	37.7	+0.1 -27.8 +0.0	+0.4 +0.0 +0.0	+0.5 +0.0	+12.8 +0.0	+0.0	23.7	40.0	-16.3	Vert
15	3808.360M	33.2	+0.9 +0.0 +32.4	+0.0 +3.5 +0.0	+0.0 -33.8	+0.0 +0.3	+0.0	36.5	54.0 BW	-17.5	Vert

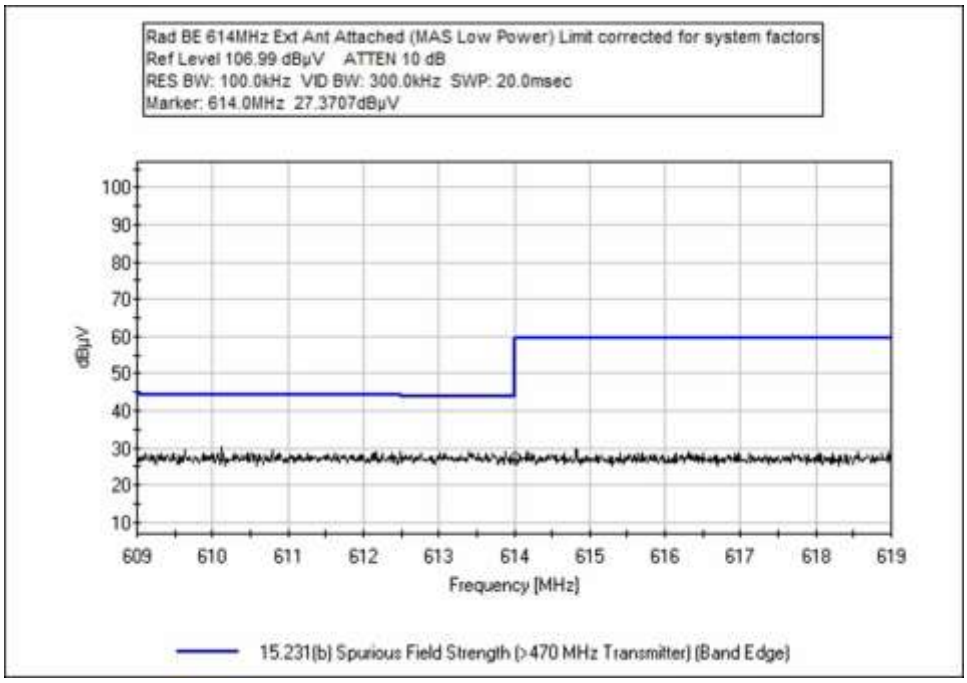
16	4988.000M Ave	29.9	+0.9 +0.0 +33.8	+0.0 +3.8 +0.0	+0.0 -33.4	+0.0 +0.5	+0.0	35.5	54.0	-18.5	Vert
^	4988.000M	48.0	+0.9 +0.0 +33.8	+0.0 +3.8 +0.0	+0.0 -33.4	+0.0 +0.5	+0.0	53.6	54.0	-0.4	Vert
18	115.400M	37.5	+0.1 -27.7 +0.0	+0.5 +0.0 +0.0	+0.6 +0.0	+13.8 +0.0	+0.0	24.8	43.5	-18.7	Vert
19	960.000M	26.9	+0.4 -27.1 +0.0	+1.5 +0.0 +0.0	+2.2 +0.0	+30.7 +0.0	+0.0	34.6	54.0	-19.4	Vert
20	1894.780M	44.2	+0.6 +0.0 +27.9	+0.0 +2.4 +0.0	+0.0 -34.6	+0.0 +0.3	+0.0	40.8	61.9	-21.1	Horiz
21	2855.840M	33.2	+0.7 +0.0 +29.5	+0.0 +3.0 +0.0	+0.0 -34.1	+0.0 +0.3	+0.0	32.6	54.0 BW	-21.4	Horiz
22	836.100M	34.8	+0.3 -27.6 +0.0	+1.4 +0.0 +0.0	+2.0 +0.0	+29.5 +0.0	+0.0	40.4	61.9	-21.5	Vert
23	778.800M	35.8	+0.3 -27.8 +0.0	+1.3 +0.0 +0.0	+1.9 +0.0	+28.8 +0.0	+0.0	40.3	61.9	-21.6	Vert
24	6664.350M	32.2	+1.2 +0.0 +35.4	+0.0 +5.2 +0.0	+0.0 -34.1	+0.0 +0.4	+0.0	40.3	61.9 BW	-21.6	Horiz
25	2855.880M	31.7	+0.7 +0.0 +29.5	+0.0 +3.0 +0.0	+0.0 -34.1	+0.0 +0.3	+0.0	31.1	54.0 BW	-22.9	Vert
26	872.000M	32.2	+0.3 -27.4 +0.0	+1.4 +0.0 +0.0	+2.0 +0.0	+28.8 +0.0	+0.0	37.3	61.9	-24.6	Vert
27	1903.760M	40.6	+0.6 +0.0 +28.0	+0.0 +2.4 +0.0	+0.0 -34.6	+0.0 +0.3	+0.0	37.3	61.9	-24.6	Vert
28	872.000M	31.4	+0.3 -27.4 +0.0	+1.4 +0.0 +0.0	+2.0 +0.0	+28.8 +0.0	+0.0	36.5	61.9	-25.4	Horiz
29	147.400M	46.9	+0.2 -27.5 +0.0	+0.6 +0.0 +0.0	+0.7 +0.0	+14.4 +0.0	+0.0	35.3	61.9	-26.6	Horiz
30	205.600M	43.4	+0.2 -27.2 +0.0	+0.7 +0.0 +0.0	+0.9 +0.0	+16.4 +0.0	+0.0	34.4	61.9	-27.5	Horiz
31	6664.240M Ave	25.9	+1.2 +0.0 +35.4	+0.0 +5.2 +0.0	+0.0 -34.1	+0.0 +0.4	+0.0	34.0	61.9	-27.9	Vert
^	6664.240M	41.1	+1.2 +0.0 +35.4	+0.0 +5.2 +0.0	+0.0 -34.1	+0.0 +0.4	+0.0	49.2	61.9	-12.7	Vert

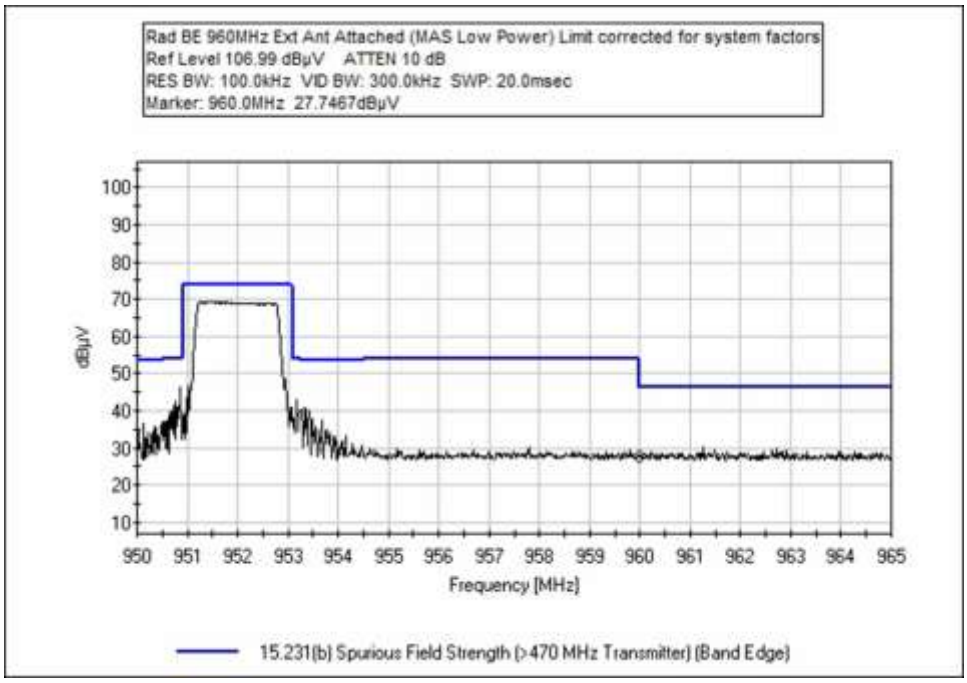
33	48.400M	48.1	+0.1 -27.9 +0.0	+0.4 +0.0 +0.0	+0.4 +0.0	+12.7 +0.0	+0.0	33.8	61.9	-28.1	Vert
34	6664.360M Ave	25.1	+1.2 +0.0 +35.4	+0.0 +5.2 +0.0	+0.0 -34.1	+0.0 +0.4	+0.0	33.2	61.9 BW	-28.7	Vert
^	6664.360M	36.6	+1.2 +0.0 +35.4	+0.0 +5.2 +0.0	+0.0 -34.1	+0.0 +0.4	+0.0	44.7	61.9 BW	-17.2	Vert
36	527.600M	31.8	+0.3 -28.2 +0.0	+1.1 +0.0 +0.0	+1.5 +0.0	+26.2 +0.0	+0.0	32.7	61.9	-29.2	Vert
37	222.100M	41.0	+0.2 -27.1 +0.0	+0.7 +0.0 +0.0	+0.9 +0.0	+16.7 +0.0	+0.0	32.4	61.9	-29.5	Vert
38	48.400M	46.6	+0.1 -27.9 +0.0	+0.4 +0.0 +0.0	+0.4 +0.0	+12.7 +0.0	+0.0	32.3	61.9	-29.6	Vert
39	431.600M	34.4	+0.2 -27.8 +0.0	+1.0 +0.0 +0.0	+1.4 +0.0	+22.8 +0.0	+0.0	32.0	61.9	-29.9	Vert
40	1904.310M	35.1	+0.6 +0.0 +28.0	+0.0 +2.4 +0.0	+0.0 -34.6	+0.0 +0.3	+0.0	31.8	61.9 BW	-30.1	Horiz
41	431.600M	33.6	+0.2 -27.8 +0.0	+1.0 +0.0 +0.0	+1.4 +0.0	+22.8 +0.0	+0.0	31.2	61.9	-30.7	Vert
42	1904.000M	34.2	+0.6 +0.0 +28.0	+0.0 +2.4 +0.0	+0.0 -34.6	+0.0 +0.3	+0.0	30.9	61.9 BW	-31.0	Vert
43	223.000M	38.9	+0.2 -27.1 +0.0	+0.7 +0.0 +0.0	+0.9 +0.0	+16.8 +0.0	+0.0	30.4	61.9	-31.5	Vert
44	148.300M	40.8	+0.2 -27.5 +0.0	+0.6 +0.0 +0.0	+0.7 +0.0	+14.6 +0.0	+0.0	29.4	61.9	-32.5	Vert
45	76.600M	42.8	+0.1 -27.8 +0.0	+0.4 +0.0 +0.0	+0.5 +0.0	+12.7 +0.0	+0.0	28.7	61.9	-33.2	Vert
46	144.500M	39.9	+0.1 -27.5 +0.0	+0.5 +0.0 +0.0	+0.7 +0.0	+14.0 +0.0	+0.0	27.7	61.9	-34.2	Vert

47	96.900M	37.3	+0.1 -27.7 +0.0	+0.5 +0.0 +0.0	+0.6 +0.0	+13.5 +0.0	+0.0	24.3	61.9	-37.6	Vert
48	19.833M	23.6	+0.1 +0.0 +0.0	+0.0 +0.2 +7.4	+0.0 +0.0	+0.0 +0.0	-40.0	-8.7	61.9	-70.6	Para
49	28.500M	22.0	+0.1 +0.0 +0.0	+0.0 +0.3 +4.8	+0.0 +0.0	+0.0 +0.0	-40.0	-12.8	61.9	-74.7	Para
50	16.024M	12.2	+0.1 +0.0 +0.0	+0.0 +0.2 +8.8	+0.0 +0.0	+0.0 +0.0	-40.0	-18.7	61.9	-80.6	Para

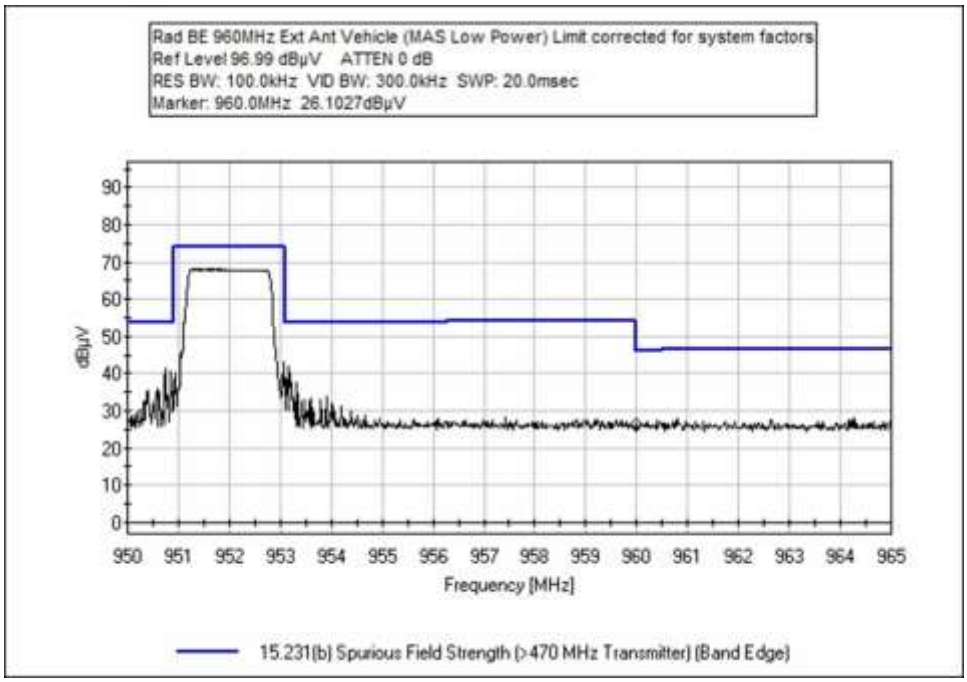
Plot(s)

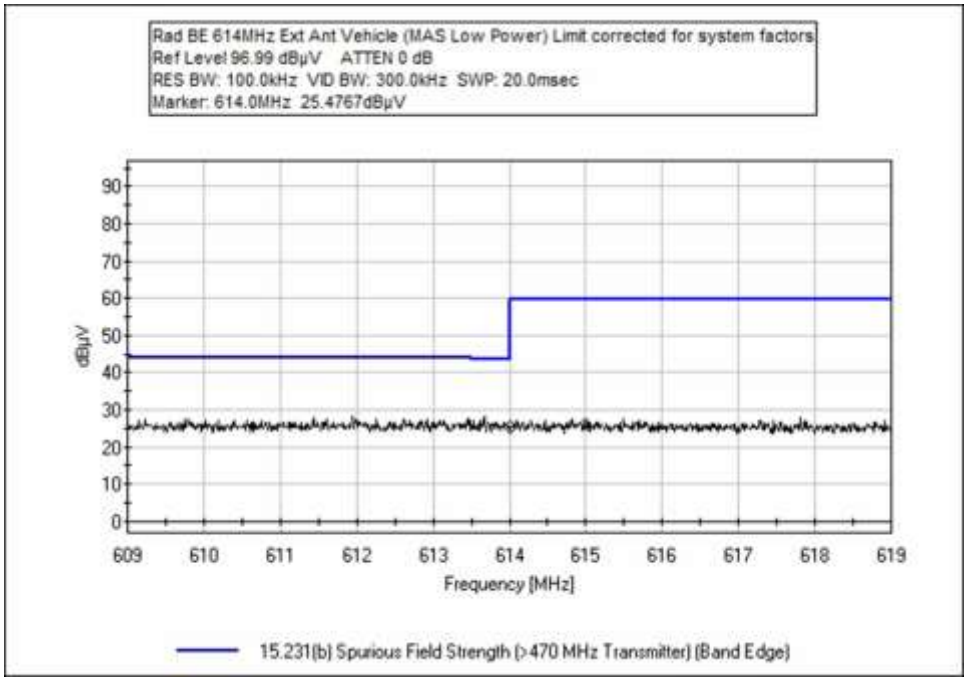
Configuration 3



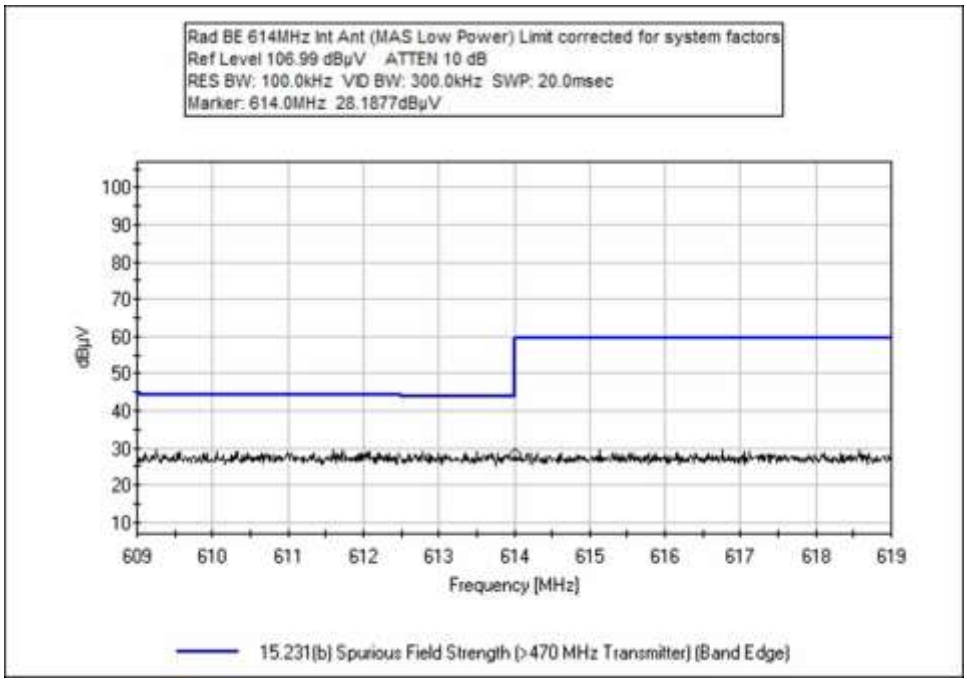


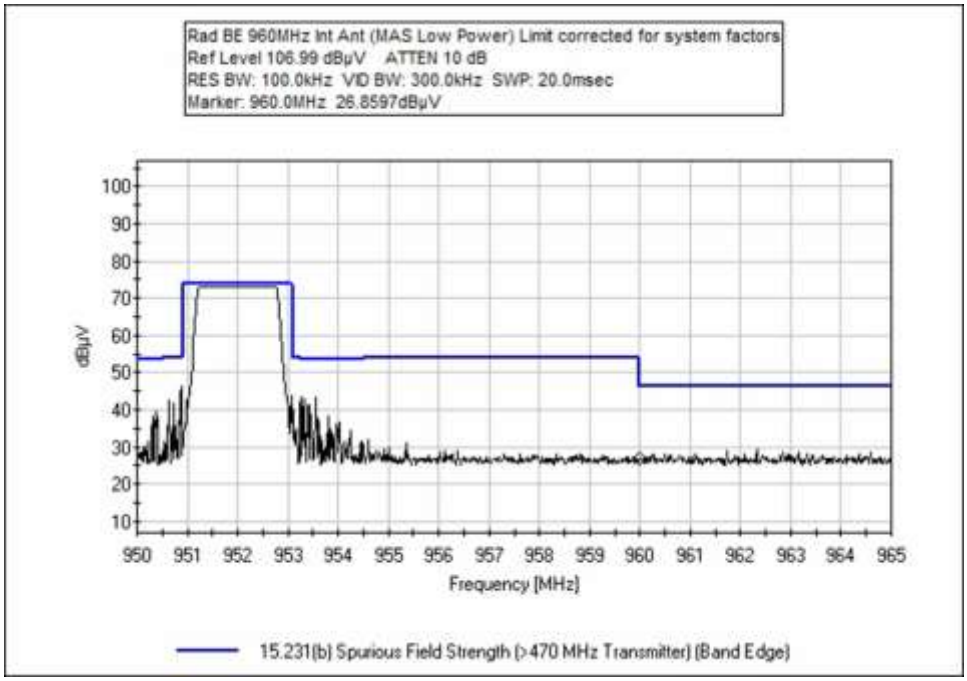
Configuration 5





Configuration 7





Test Setup Photo(s)

Configuration 3

X Axis, View #1

X Axis, View #2

Y Axis

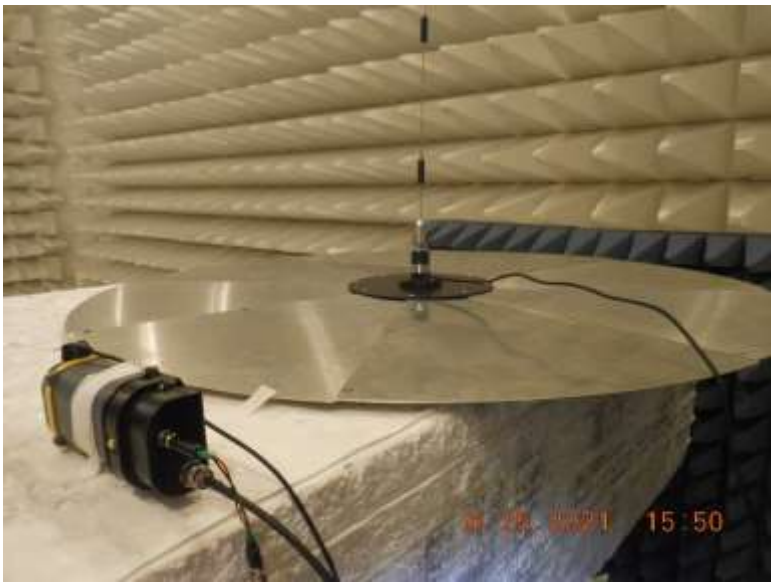
Z Axis

Below 1GHz

Above 1GHz

Configuration 5

X Axis



Y Axis

Z Axis

Below 1GHz

Above 1GHz

Configuration 7

X Axis

Y Axis

Z Axis

Below 1GHz

Above 1GHz

15.207 AC Conducted Emissions

Test Setup / Conditions / Data

Test Location:	CKC Laboratories • 22116 23rd Drive SE, Suite A • Bothell, WA 98021 • 1-800-500-4EMC (4362)		
Customer:	**Itron, Inc.**		
Specification:	**15.207 AC Mains - Average**		
Work Order #:	**105444**	Date:	7/9/2021
Test Type:	**Conducted Emissions**	Time:	17:43:57
Tested By:	Michael Atkinson	Sequence#:	24
Software:	EMITest 5.03.19		115VAC 60Hz

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 3			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 3			

Test Conditions / Notes:

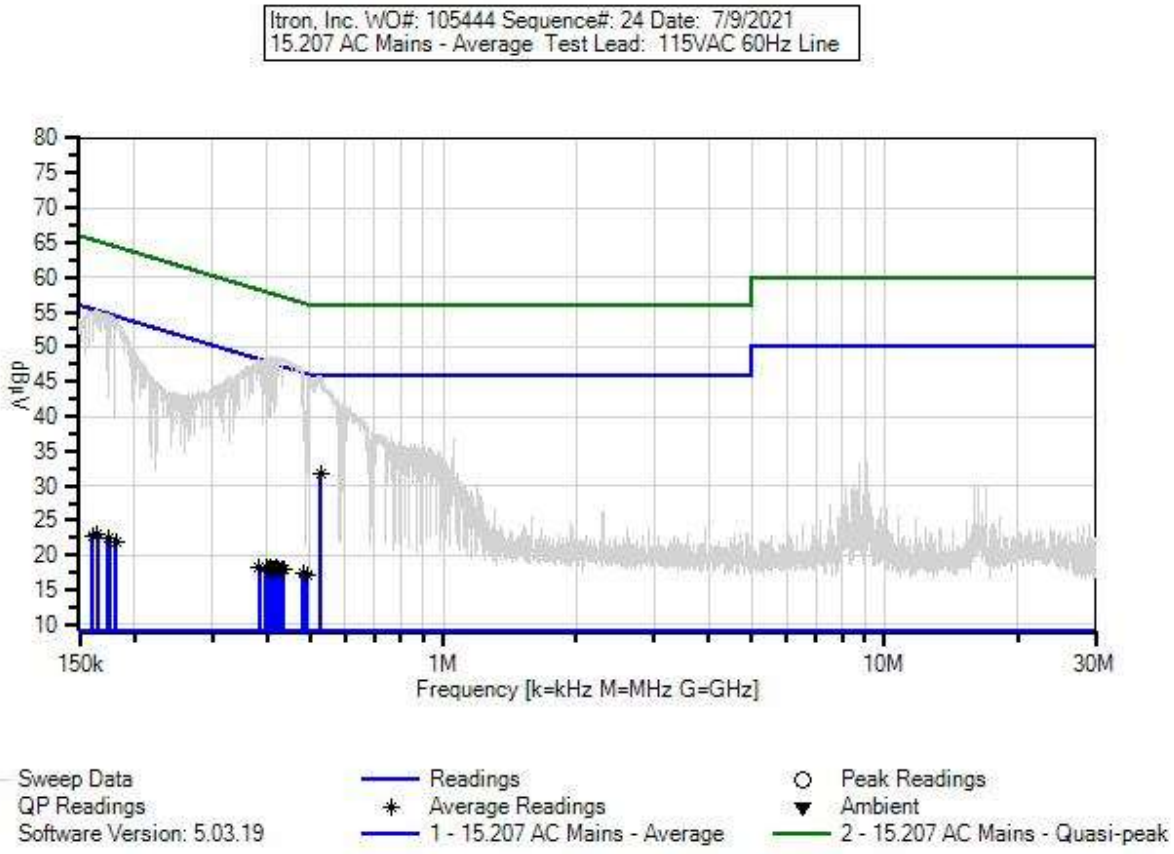
Frequency: 0.15-30MHz

Setup: EUT is on foam table. EUT is connected to support tablet with USB cable. EUT is transmitting using test software on support tablet to control EUT. EUT is connected to a DC power supply which connects to AC mains.

High power and Low power MAS investigated, worst case reported. EUT has external attached antenna connected. Also investigated with vehicle antenna, data collected is representative of worst case.

Temperature (ºC): 23
Relative Humidity (%): 45
Test Location: Bothell Lab C3

Test Method: ANSI C63.10 (2013)



Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN02673	Spectrum Analyzer	E4446A	2/3/2021	2/3/2023
T1	AN02611	High Pass Filter	HE9615-150K-50-720B	1/10/2020	1/10/2022
T2	ANP06540	Cable	Heliax	8/23/2019	8/23/2021
T3	ANP06515	Cable	Heliax	7/1/2020	7/1/2022
T4	ANP06219	Attenuator	768-10	4/7/2020	4/7/2022
T5	AN01492	50uH LISN-Line (L1)	3816/2NM	10/14/2019	10/14/2021
	AN01492	50uH LISN-Neutral (L2)	3816/2NM	10/14/2019	10/14/2021

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	526.851k	21.9	+0.3	+0.0	+0.0	+9.1	+0.0	31.8	46.0	-14.2	Line
	Ave		+0.5								
^	526.850k	36.1	+0.3	+0.0	+0.0	+9.1	+0.0	46.0	46.0	+0.0	Line
			+0.5								
3	482.703k	7.5	+0.2	+0.0	+0.0	+9.1	+0.0	17.3	46.3	-29.0	Line
	Ave		+0.5								
4	481.191k	7.5	+0.2	+0.0	+0.0	+9.1	+0.0	17.3	46.3	-29.0	Line
	Ave		+0.5								
^	482.703k	36.7	+0.2	+0.0	+0.0	+9.1	+0.0	46.5	46.3	+0.2	Line
			+0.5								
^	481.191k	36.6	+0.2	+0.0	+0.0	+9.1	+0.0	46.4	46.3	+0.1	Line
			+0.5								
7	434.322k	8.1	+0.2	+0.0	+0.0	+9.1	+0.0	18.1	47.2	-29.1	Line
	Ave		+0.7								
8	491.170k	7.1	+0.2	+0.0	+0.0	+9.1	+0.0	17.0	46.1	-29.1	Line
	Ave		+0.6								
^	491.169k	35.9	+0.2	+0.0	+0.0	+9.1	+0.0	45.8	46.1	-0.3	Line
			+0.6								
10	432.633k	8.1	+0.2	+0.0	+0.0	+9.1	+0.0	18.1	47.2	-29.1	Line
	Ave		+0.7								
^	434.321k	38.5	+0.2	+0.0	+0.0	+9.1	+0.0	48.5	47.2	+1.3	Line
			+0.7								
^	432.632k	38.2	+0.2	+0.0	+0.0	+9.1	+0.0	48.2	47.2	+1.0	Line
			+0.7								
13	425.156k	8.1	+0.2	+0.0	+0.0	+9.1	+0.0	18.1	47.3	-29.2	Line
	Ave		+0.7								
^	425.156k	38.5	+0.2	+0.0	+0.0	+9.1	+0.0	48.5	47.3	+1.2	Line
			+0.7								
15	418.392k	8.3	+0.2	+0.0	+0.0	+9.1	+0.0	18.2	47.5	-29.3	Line
	Ave		+0.6								
16	415.900k	8.2	+0.2	+0.0	+0.0	+9.1	+0.0	18.1	47.5	-29.4	Line
	Ave		+0.6								
17	406.643k	8.3	+0.2	+0.0	+0.0	+9.1	+0.0	18.2	47.7	-29.5	Line
	Ave		+0.6								
18	414.298k	8.2	+0.2	+0.0	+0.0	+9.1	+0.0	18.1	47.6	-29.5	Line
	Ave		+0.6								
^	418.391k	38.6	+0.2	+0.0	+0.0	+9.1	+0.0	48.5	47.5	+1.0	Line
			+0.6								
^	415.899k	38.3	+0.2	+0.0	+0.0	+9.1	+0.0	48.2	47.5	+0.7	Line
			+0.6								
21	409.669k	8.2	+0.2	+0.0	+0.0	+9.1	+0.0	18.1	47.7	-29.6	Line
	Ave		+0.6								
^	409.669k	38.7	+0.2	+0.0	+0.0	+9.1	+0.0	48.6	47.7	+0.9	Line
			+0.6								
^	414.297k	38.5	+0.2	+0.0	+0.0	+9.1	+0.0	48.4	47.6	+0.8	Line
			+0.6								

24 Ave	404.151k	8.2	+0.2 +0.6	+0.0	+0.0	+9.1	+0.0	18.1	47.8	-29.7	Line
^	406.642k	38.7	+0.2 +0.6	+0.0	+0.0	+9.1	+0.0	48.6	47.7	+0.9	Line
^	404.150k	38.4	+0.2 +0.6	+0.0	+0.0	+9.1	+0.0	48.3	47.8	+0.5	Line
27 Ave	396.674k	8.2	+0.2 +0.7	+0.0	+0.0	+9.1	+0.0	18.2	47.9	-29.7	Line
^	396.674k	38.4	+0.2 +0.7	+0.0	+0.0	+9.1	+0.0	48.4	47.9	+0.5	Line
29 Ave	383.323k	8.2	+0.2 +0.7	+0.0	+0.0	+9.1	+0.0	18.2	48.2	-30.0	Line
^	383.323k	38.3	+0.2 +0.7	+0.0	+0.0	+9.1	+0.0	48.3	48.2	+0.1	Line
31 Ave	173.894k	11.3	+0.4 +1.7	+0.0	+0.0	+9.1	+0.0	22.5	54.8	-32.3	Line
32 Ave	164.777k	11.5	+0.5 +1.8	+0.0	+0.0	+9.1	+0.0	22.9	55.2	-32.3	Line
33 Ave	175.361k	11.3	+0.4 +1.6	+0.0	+0.0	+9.1	+0.0	22.4	54.7	-32.3	Line
^	175.361k	43.7	+0.4 +1.6	+0.0	+0.0	+9.1	+0.0	54.8	54.7	+0.1	Line
^	173.893k	43.6	+0.4 +1.7	+0.0	+0.0	+9.1	+0.0	54.8	54.8	+0.0	Line
36 Ave	181.125k	10.9	+0.4 +1.5	+0.0	+0.0	+9.1	+0.0	21.9	54.4	-32.5	Line
^	181.125k	42.9	+0.4 +1.5	+0.0	+0.0	+9.1	+0.0	53.9	54.4	-0.5	Line
38 Ave	160.794k	11.4	+0.6 +1.7	+0.0	+0.0	+9.1	+0.0	22.8	55.4	-32.6	Line
^	164.776k	44.0	+0.5 +1.8	+0.0	+0.0	+9.1	+0.0	55.4	55.2	+0.2	Line
^	160.794k	43.7	+0.6 +1.7	+0.0	+0.0	+9.1	+0.0	55.1	55.4	-0.3	Line

Test Location:	CKC Laboratories • 22116 23rd Drive SE, Suite A • Bothell, WA 98021 • 1-800-500-4EMC (4362)		
Customer:	**Itron, Inc.**		
Specification:	**15.207 AC Mains - Average**		
Work Order #:	**105444**	Date:	7/9/2021
Test Type:	**Conducted Emissions**	Time:	17:34:31
Tested By:	Michael Atkinson	Sequence#:	23
Software:	EMITest 5.03.19		115VAC 60Hz

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 3			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 3			

Test Conditions / Notes:

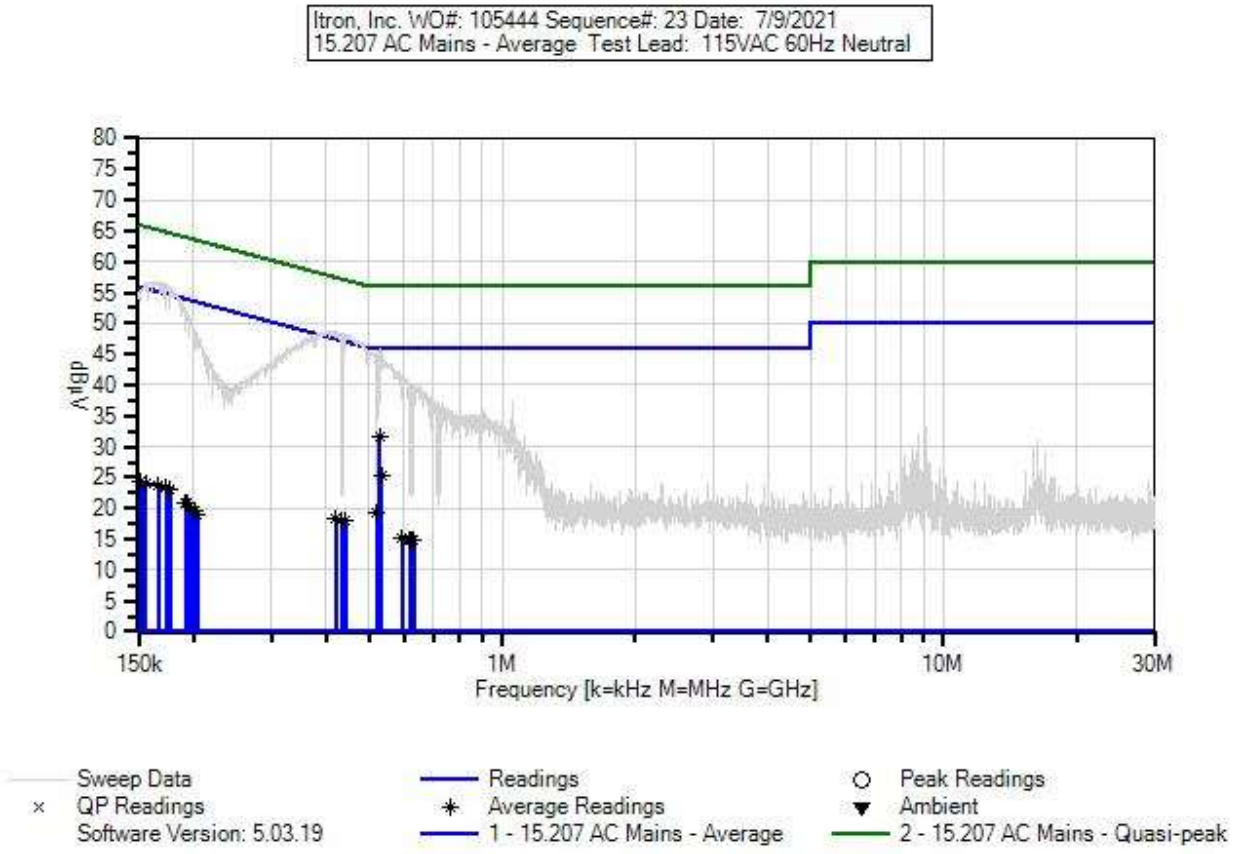
Frequency: 0.15-30MHz

Setup: EUT is on foam table. EUT is connected to support tablet with USB cable. EUT is transmitting using test software on support tablet to control EUT. EUT is connected to a DC power supply which connects to AC mains.

High power and Low power MAS investigated, worst case reported. EUT has external attached antenna connected. Also investigated with vehicle antenna, data collected is representative of worst case.

Temperature (ºC): 23
Relative Humidity (%): 45
Test Location: Bothell Lab C3

Test Method: ANSI C63.10 (2013)



Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN02673	Spectrum Analyzer	E4446A	2/3/2021	2/3/2023
T1	AN02611	High Pass Filter	HE9615-150K-50-720B	1/10/2020	1/10/2022
T2	ANP06540	Cable	Heliax	8/23/2019	8/23/2021
T3	ANP06515	Cable	Heliax	7/1/2020	7/1/2022
T4	ANP06219	Attenuator	768-10	4/7/2020	4/7/2022
	AN01492	50uH LISN-Line (L1)	3816/2NM	10/14/2019	10/14/2021
T5	AN01492	50uH LISN-Neutral (L2)	3816/2NM	10/14/2019	10/14/2021

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

#	Freq	Rdng	T1	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
			T5								
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV	dBµV	dB	Ant
1	528.363k	21.8	+0.3	+0.0	+0.0	+9.1	+0.0	31.7	46.0	-14.3	Neutr
	Ave		+0.5								
2	532.596k	15.3	+0.3	+0.0	+0.0	+9.1	+0.0	25.2	46.0	-20.8	Neutr
	Ave		+0.5								
^	528.362k	35.9	+0.3	+0.0	+0.0	+9.1	+0.0	45.8	46.0	-0.2	Neutr
			+0.5								
^	532.596k	35.8	+0.3	+0.0	+0.0	+9.1	+0.0	45.7	46.0	-0.3	Neutr
			+0.5								
5	520.501k	9.4	+0.2	+0.0	+0.0	+9.1	+0.0	19.2	46.0	-26.8	Neutr
	Ave		+0.5								
^	520.500k	35.7	+0.2	+0.0	+0.0	+9.1	+0.0	45.5	46.0	-0.5	Neutr
			+0.5								
7	441.881k	8.2	+0.2	+0.0	+0.0	+9.1	+0.0	18.0	47.0	-29.0	Neutr
	Ave		+0.5								
^	441.881k	38.6	+0.2	+0.0	+0.0	+9.1	+0.0	48.4	47.0	+1.4	Neutr
			+0.5								
9	432.810k	8.2	+0.2	+0.0	+0.0	+9.1	+0.0	18.1	47.2	-29.1	Neutr
	Ave		+0.6								
^	432.810k	37.6	+0.2	+0.0	+0.0	+9.1	+0.0	47.5	47.2	+0.3	Neutr
			+0.6								
11	419.460k	8.3	+0.2	+0.0	+0.0	+9.1	+0.0	18.2	47.5	-29.3	Neutr
	Ave		+0.6								
^	419.459k	38.9	+0.2	+0.0	+0.0	+9.1	+0.0	48.8	47.5	+1.3	Neutr
			+0.6								
13	592.468k	5.4	+0.3	+0.0	+0.0	+9.1	+0.0	15.3	46.0	-30.7	Neutr
	Ave		+0.5								
^	592.467k	31.6	+0.3	+0.0	+0.0	+9.1	+0.0	41.5	46.0	-4.5	Neutr
			+0.5								
15	618.170k	5.1	+0.3	+0.0	+0.0	+9.1	+0.0	15.0	46.0	-31.0	Neutr
	Ave		+0.5								
^	618.170k	30.1	+0.3	+0.0	+0.0	+9.1	+0.0	40.0	46.0	-6.0	Neutr
			+0.5								
17	632.382k	5.0	+0.3	+0.0	+0.0	+9.1	+0.0	14.9	46.0	-31.1	Neutr
	Ave		+0.5								
^	632.382k	30.1	+0.3	+0.0	+0.0	+9.1	+0.0	40.0	46.0	-6.0	Neutr
			+0.5								
19	625.427k	5.0	+0.3	+0.0	+0.0	+9.1	+0.0	14.9	46.0	-31.1	Neutr
	Ave		+0.5								
^	625.427k	30.2	+0.3	+0.0	+0.0	+9.1	+0.0	40.1	46.0	-5.9	Neutr
			+0.5								
21	166.243k	12.4	+0.5	+0.0	+0.0	+9.1	+0.0	23.7	55.1	-31.4	Neutr
	Ave		+1.7								
^	166.242k	45.5	+0.5	+0.0	+0.0	+9.1	+0.0	56.8	55.1	+1.7	Neutr
			+1.7								
23	176.722k	12.1	+0.4	+0.0	+0.0	+9.1	+0.0	23.2	54.6	-31.4	Neutr
	Ave		+1.6								
24	173.474k	12.2	+0.4	+0.0	+0.0	+9.1	+0.0	23.3	54.8	-31.5	Neutr
	Ave		+1.6								

^	173.473k	45.2	+0.4 +1.6	+0.0	+0.0	+9.1	+0.0	56.3	54.8	+1.5	Neutr
^	176.722k	44.9	+0.4 +1.6	+0.0	+0.0	+9.1	+0.0	56.0	54.6	+1.4	Neutr
27 Ave	155.972k	12.3	+0.8 +1.9	+0.0	+0.0	+9.1	+0.0	24.1	55.7	-31.6	Neutr
28 Ave	151.781k	12.1	+1.1 +1.9	+0.0	+0.0	+9.1	+0.0	24.2	55.9	-31.7	Neutr
^	155.972k	44.8	+0.8 +1.9	+0.0	+0.0	+9.1	+0.0	56.6	55.7	+0.9	Neutr
^	151.780k	43.2	+1.1 +1.9	+0.0	+0.0	+9.1	+0.0	55.3	55.9	-0.6	Neutr
31 Ave	192.652k	10.1	+0.3 +1.4	+0.0	+0.0	+9.1	+0.0	20.9	53.9	-33.0	Neutr
32 Ave	191.813k	10.2	+0.3 +1.4	+0.0	+0.0	+9.1	+0.0	21.0	54.0	-33.0	Neutr
33 Ave	196.215k	9.5	+0.2 +1.3	+0.0	+0.0	+9.1	+0.0	20.1	53.8	-33.7	Neutr
^	191.813k	41.5	+0.3 +1.4	+0.0	+0.0	+9.1	+0.0	52.3	54.0	-1.7	Neutr
^	192.651k	41.3	+0.3 +1.4	+0.0	+0.0	+9.1	+0.0	52.1	53.9	-1.8	Neutr
36 Ave	201.036k	8.9	+0.2 +1.3	+0.0	+0.0	+9.1	+0.0	19.5	53.6	-34.1	Neutr
^	196.214k	40.1	+0.2 +1.3	+0.0	+0.0	+9.1	+0.0	50.7	53.8	-3.1	Neutr
38 Ave	204.284k	8.4	+0.2 +1.3	+0.0	+0.0	+9.1	+0.0	19.0	53.4	-34.4	Neutr
^	201.035k	38.5	+0.2 +1.3	+0.0	+0.0	+9.1	+0.0	49.1	53.6	-4.5	Neutr
^	204.284k	37.5	+0.2 +1.3	+0.0	+0.0	+9.1	+0.0	48.1	53.4	-5.3	Neutr

Test Location:	CKC Laboratories • 22116 23rd Drive SE, Suite A • Bothell, WA 98021 • 1-800-500-4EMC (4362)		
Customer:	**Itron, Inc.**		
Specification:	**15.207 AC Mains - Quasi-peak**		
Work Order #:	**105444**	Date:	7/9/2021
Test Type:	**Conducted Emissions**	Time:	19:53:29
Tested By:	Michael Atkinson	Sequence#:	29
Software:	EMITest 5.03.19		115VAC 60Hz

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 9			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 9			

Test Conditions / Notes:

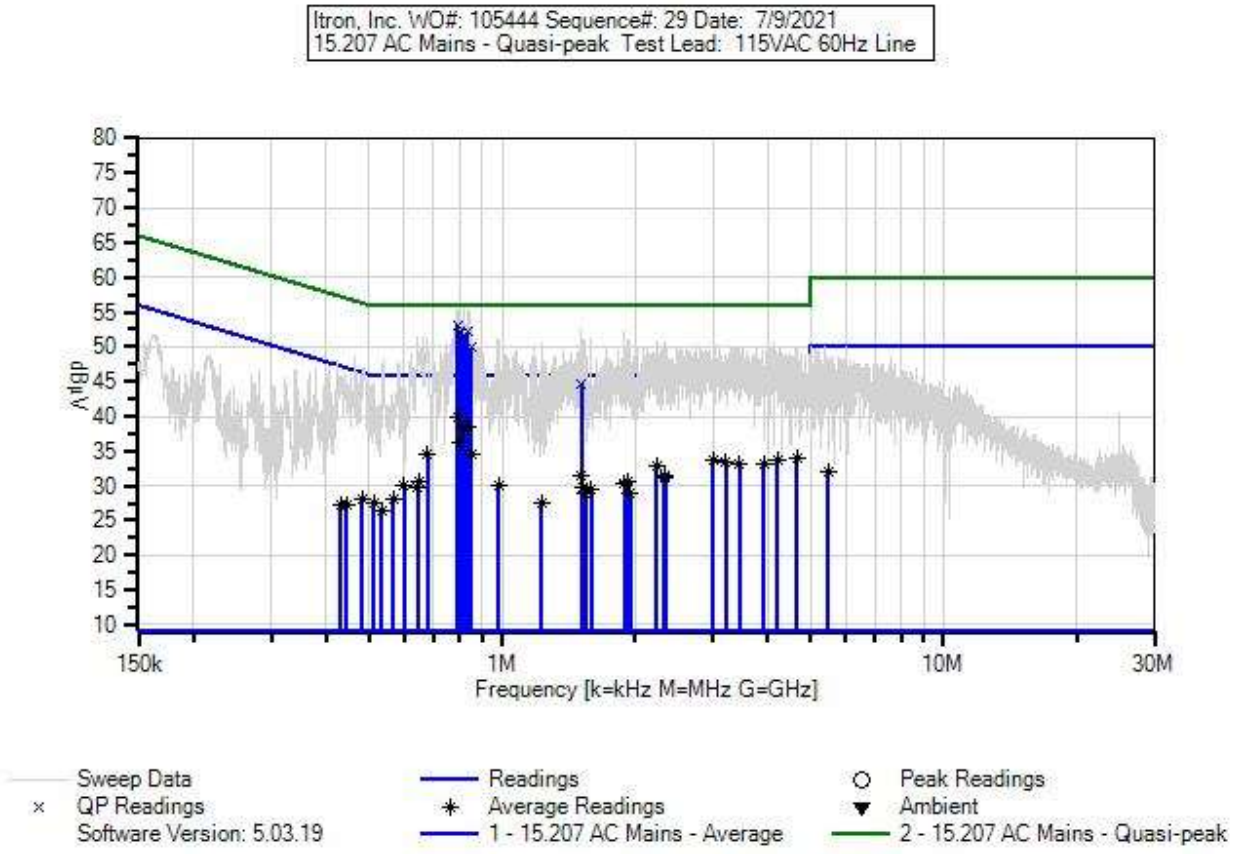
Frequency: 0.15-30MHz

Setup: EUT is on foam table. EUT is connected to AC-USB adapter which is connected to AC mains. EUT is configured to transmit while connected to AC-USB adapter.

High power and Low power MAS investigated, worst case reported. EUT has internal antenna.

Temperature (ºC): 23
Relative Humidity (%): 45
Test Location: Bothell Lab C3

Test Method: ANSI C63.10 (2013)



Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN02673	Spectrum Analyzer	E4446A	2/3/2021	2/3/2023
T1	AN02611	High Pass Filter	HE9615-150K-50-720B	1/10/2020	1/10/2022
T2	ANP06540	Cable	Heliax	8/23/2019	8/23/2021
T3	ANP06515	Cable	Heliax	7/1/2020	7/1/2022
T4	ANP06219	Attenuator	768-10	4/7/2020	4/7/2022
T5	AN01492	50uH LISN-Line (L1)	3816/2NM	10/14/2019	10/14/2021
	AN01492	50uH LISN-Neutral (L2)	3816/2NM	10/14/2019	10/14/2021

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

#	Freq	Rdng	T1	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
			T5								
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV	dBµV	dB	Ant
1	791.178k	43.4	+0.2	+0.0	+0.0	+9.1	+0.0	53.2	56.0	-2.8	Line
	QP		+0.5								
2	835.864k	42.4	+0.2	+0.0	+0.0	+9.1	+0.0	52.1	56.0	-3.9	Line
	QP		+0.4								
3	804.019k	42.1	+0.2	+0.0	+0.0	+9.1	+0.0	51.9	56.0	-4.1	Line
	QP		+0.5								
4	817.373k	42.1	+0.2	+0.0	+0.0	+9.1	+0.0	51.8	56.0	-4.2	Line
	QP		+0.4								
5	850.246k	40.2	+0.2	+0.0	+0.0	+9.1	+0.0	49.9	56.0	-6.1	Line
	QP		+0.4								
6	791.178k	30.0	+0.2	+0.0	+0.0	+9.1	+0.0	39.8	46.0	-6.2	Line
	Ave		+0.5								
^	791.177k	45.7	+0.2	+0.0	+0.0	+9.1	+0.0	55.5	46.0	+9.5	Line
			+0.5								
8	835.864k	28.9	+0.2	+0.0	+0.0	+9.1	+0.0	38.6	46.0	-7.4	Line
	Ave		+0.4								
^	835.864k	45.5	+0.2	+0.0	+0.0	+9.1	+0.0	55.2	46.0	+9.2	Line
			+0.4								
10	817.373k	28.4	+0.2	+0.0	+0.0	+9.1	+0.0	38.1	46.0	-7.9	Line
	Ave		+0.4								
^	817.373k	46.0	+0.2	+0.0	+0.0	+9.1	+0.0	55.7	46.0	+9.7	Line
			+0.4								
12	804.019k	26.3	+0.2	+0.0	+0.0	+9.1	+0.0	36.1	46.0	-9.9	Line
	Ave		+0.5								
^	804.018k	45.0	+0.2	+0.0	+0.0	+9.1	+0.0	54.8	46.0	+8.8	Line
			+0.5								
14	1.510M	34.9	+0.2	+0.0	+0.1	+9.1	+0.0	44.8	56.0	-11.2	Line
	QP		+0.5								
15	676.832k	24.7	+0.3	+0.0	+0.0	+9.1	+0.0	34.6	46.0	-11.4	Line
	Ave		+0.5								
^	676.832k	41.2	+0.3	+0.0	+0.0	+9.1	+0.0	51.1	46.0	+5.1	Line
			+0.5								
17	850.246k	24.9	+0.2	+0.0	+0.0	+9.1	+0.0	34.6	46.0	-11.4	Line
	Ave		+0.4								
^	850.246k	42.8	+0.2	+0.0	+0.0	+9.1	+0.0	52.5	46.0	+6.5	Line
			+0.4								
19	4.653M	24.1	+0.1	+0.0	+0.1	+9.1	+0.0	33.9	46.0	-12.1	Line
	Ave		+0.5								
^	4.653M	41.0	+0.1	+0.0	+0.1	+9.1	+0.0	50.8	46.0	+4.8	Line
			+0.5								
21	4.208M	24.0	+0.1	+0.0	+0.1	+9.1	+0.0	33.7	46.0	-12.3	Line
	Ave		+0.4								
^	4.208M	40.7	+0.1	+0.0	+0.1	+9.1	+0.0	50.4	46.0	+4.4	Line
			+0.4								
23	3.006M	23.9	+0.1	+0.0	+0.1	+9.1	+0.0	33.6	46.0	-12.4	Line
	Ave		+0.4								
^	3.006M	41.4	+0.1	+0.0	+0.1	+9.1	+0.0	51.1	46.0	+5.1	Line
			+0.4								

25 Ave	3.214M	23.7	+0.1 +0.4	+0.0	+0.1	+9.1	+0.0	33.4	46.0	-12.6	Line
^	3.214M	40.6	+0.1 +0.4	+0.0	+0.1	+9.1	+0.0	50.3	46.0	+4.3	Line
27 Ave	3.911M	23.5	+0.1 +0.4	+0.0	+0.1	+9.1	+0.0	33.2	46.0	-12.8	Line
^	3.911M	41.9	+0.1 +0.4	+0.0	+0.1	+9.1	+0.0	51.6	46.0	+5.6	Line
29 Ave	3.452M	23.3	+0.1 +0.4	+0.0	+0.1	+9.1	+0.0	33.0	46.0	-13.0	Line
^	3.452M	40.9	+0.1 +0.4	+0.0	+0.1	+9.1	+0.0	50.6	46.0	+4.6	Line
31 Ave	2.238M	22.9	+0.2 +0.5	+0.0	+0.1	+9.1	+0.0	32.8	46.0	-13.2	Line
^	2.238M	40.9	+0.2 +0.5	+0.0	+0.1	+9.1	+0.0	50.8	46.0	+4.8	Line
33 Ave	1.510M	21.6	+0.2 +0.5	+0.0	+0.1	+9.1	+0.0	31.5	46.0	-14.5	Line
34 Ave	2.333M	21.6	+0.1 +0.5	+0.0	+0.1	+9.1	+0.0	31.4	46.0	-14.6	Line
35 Ave	2.341M	21.4	+0.1 +0.5	+0.0	+0.1	+9.1	+0.0	31.2	46.0	-14.8	Line
^	2.341M	40.9	+0.1 +0.5	+0.0	+0.1	+9.1	+0.0	50.7	46.0	+4.7	Line
^	2.333M	40.8	+0.1 +0.5	+0.0	+0.1	+9.1	+0.0	50.6	46.0	+4.6	Line
38 Ave	1.931M	20.9	+0.2 +0.4	+0.0	+0.1	+9.1	+0.0	30.7	46.0	-15.3	Line
^	1.931M	41.5	+0.2 +0.4	+0.0	+0.1	+9.1	+0.0	51.3	46.0	+5.3	Line
40 Ave	645.520k	20.8	+0.3 +0.5	+0.0	+0.0	+9.1	+0.0	30.7	46.0	-15.3	Line
41 Ave	1.888M	20.6	+0.2 +0.4	+0.0	+0.1	+9.1	+0.0	30.4	46.0	-15.6	Line
^	1.888M	42.4	+0.2 +0.4	+0.0	+0.1	+9.1	+0.0	52.2	46.0	+6.2	Line
43 Ave	979.684k	20.4	+0.2 +0.4	+0.0	+0.0	+9.1	+0.0	30.1	46.0	-15.9	Line
^	979.683k	41.5	+0.2 +0.4	+0.0	+0.0	+9.1	+0.0	51.2	46.0	+5.2	Line
45 Ave	599.100k	20.1	+0.3 +0.5	+0.0	+0.0	+9.1	+0.0	30.0	46.0	-16.0	Line
^	599.100k	39.3	+0.3 +0.5	+0.0	+0.0	+9.1	+0.0	49.2	46.0	+3.2	Line
47 Ave	643.570k	19.9	+0.3 +0.5	+0.0	+0.0	+9.1	+0.0	29.8	46.0	-16.2	Line
^	645.520k	41.5	+0.3 +0.5	+0.0	+0.0	+9.1	+0.0	51.4	46.0	+5.4	Line
^	643.570k	41.5	+0.3 +0.5	+0.0	+0.0	+9.1	+0.0	51.4	46.0	+5.4	Line

50 Ave	1.518M	19.9	+0.2 +0.4	+0.0	+0.1	+9.1	+0.0	29.7	46.0	-16.3	Line
^	1.510M	42.7	+0.2 +0.5	+0.0	+0.1	+9.1	+0.0	52.6	46.0	+6.6	Line
^	1.518M	41.4	+0.2 +0.4	+0.0	+0.1	+9.1	+0.0	51.2	46.0	+5.2	Line
53 Ave	1.593M	19.7	+0.2 +0.4	+0.0	+0.1	+9.1	+0.0	29.5	46.0	-16.5	Line
^	1.593M	41.3	+0.2 +0.4	+0.0	+0.1	+9.1	+0.0	51.1	46.0	+5.1	Line
55 Ave	1.543M	19.2	+0.2 +0.4	+0.0	+0.1	+9.1	+0.0	29.0	46.0	-17.0	Line
^	1.543M	41.0	+0.2 +0.4	+0.0	+0.1	+9.1	+0.0	50.8	46.0	+4.8	Line
57 Ave	1.949M	19.1	+0.2 +0.5	+0.0	+0.1	+9.1	+0.0	29.0	46.0	-17.0	Line
^	1.949M	40.9	+0.2 +0.5	+0.0	+0.1	+9.1	+0.0	50.8	46.0	+4.8	Line
59 Ave	567.840k	18.1	+0.3 +0.5	+0.0	+0.0	+9.1	+0.0	28.0	46.0	-18.0	Line
^	567.840k	39.3	+0.3 +0.5	+0.0	+0.0	+9.1	+0.0	49.2	46.0	+3.2	Line
61 Ave	5.476M	22.2	+0.1 +0.5	+0.0	+0.1	+9.1	+0.0	32.0	50.0	-18.0	Line
^	5.476M	41.2	+0.1 +0.5	+0.0	+0.1	+9.1	+0.0	51.0	50.0	+1.0	Line
63 Ave	482.060k	18.2	+0.2 +0.5	+0.0	+0.0	+9.1	+0.0	28.0	46.3	-18.3	Line
^	482.060k	40.4	+0.2 +0.5	+0.0	+0.0	+9.1	+0.0	50.2	46.3	+3.9	Line
65 Ave	1.230M	17.8	+0.2 +0.4	+0.0	+0.1	+9.1	+0.0	27.6	46.0	-18.4	Line
^	1.230M	40.9	+0.2 +0.4	+0.0	+0.1	+9.1	+0.0	50.7	46.0	+4.7	Line
67 Ave	511.700k	17.7	+0.2 +0.5	+0.0	+0.0	+9.1	+0.0	27.5	46.0	-18.5	Line
^	511.700k	39.4	+0.2 +0.5	+0.0	+0.0	+9.1	+0.0	49.2	46.0	+3.2	Line
69 Ave	533.530k	16.6	+0.3 +0.5	+0.0	+0.0	+9.1	+0.0	26.5	46.0	-19.5	Line
^	533.530k	39.2	+0.3 +0.5	+0.0	+0.0	+9.1	+0.0	49.1	46.0	+3.1	Line
71 Ave	444.570k	17.5	+0.2 +0.5	+0.0	+0.0	+9.1	+0.0	27.3	47.0	-19.7	Line
^	444.570k	40.6	+0.2 +0.5	+0.0	+0.0	+9.1	+0.0	50.4	47.0	+3.4	Line
73 Ave	430.720k	17.3	+0.2 +0.7	+0.0	+0.0	+9.1	+0.0	27.3	47.2	-19.9	Line
^	430.720k	39.8	+0.2 +0.7	+0.0	+0.0	+9.1	+0.0	49.8	47.2	+2.6	Line

Test Location:	CKC Laboratories • 22116 23rd Drive SE, Suite A • Bothell, WA 98021 • 1-800-500-4EMC (4362)		
Customer:	**Itron, Inc.**		
Specification:	**15.207 AC Mains - Quasi-peak**		
Work Order #:	**105444**	Date:	7/9/2021
Test Type:	**Conducted Emissions**	Time:	20:04:51
Tested By:	Michael Atkinson	Sequence#:	30
Software:	EMITest 5.03.19		115VAC 60Hz

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 9			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 9			

Test Conditions / Notes:

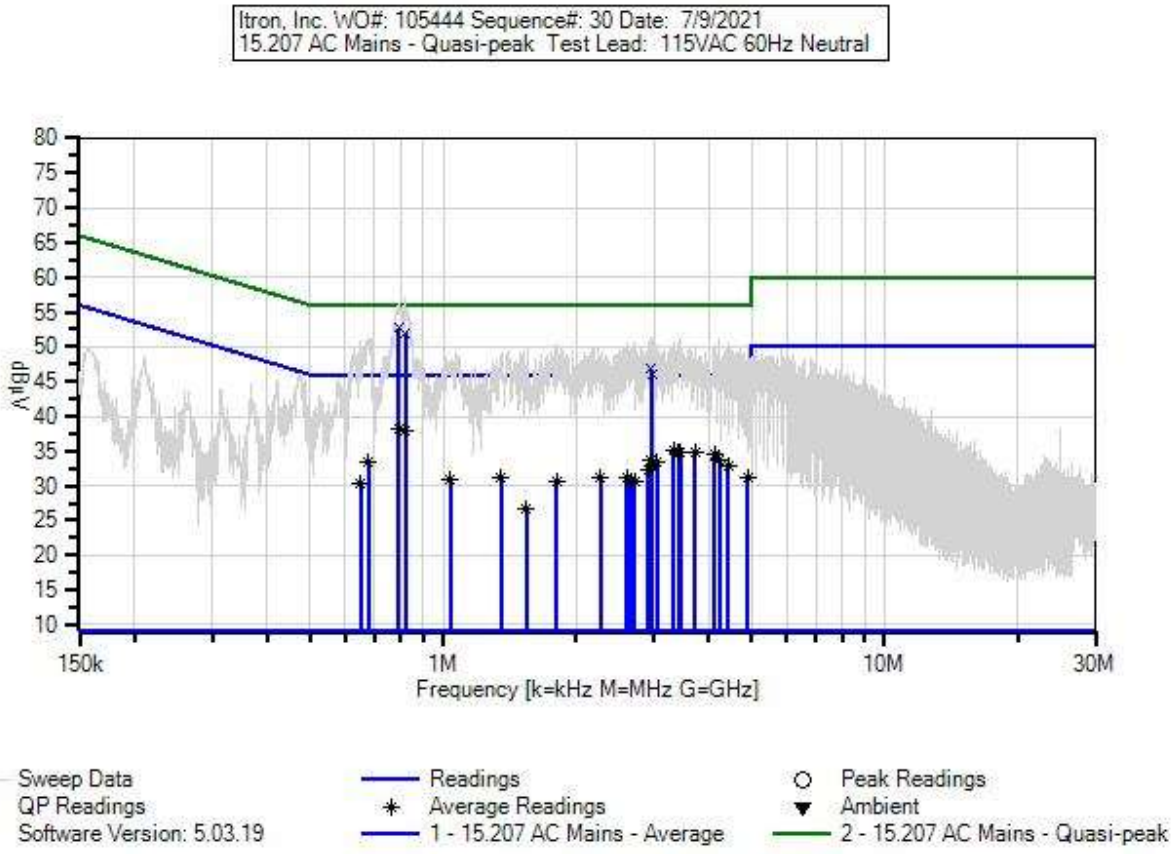
Frequency: 0.15-30MHz

Setup: EUT is on foam table. EUT is connected to AC-USB adapter which is connected to AC mains. EUT is configured to transmit while connected to AC-USB adapter.

High power and Low power MAS investigated, worst case reported. EUT has internal antenna.

Temperature (ºC): 23
Relative Humidity (%): 45
Test Location: Bothell Lab C3

Test Method: ANSI C63.10 (2013)



Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN02673	Spectrum Analyzer	E4446A	2/3/2021	2/3/2023
T1	AN02611	High Pass Filter	HE9615-150K-50-720B	1/10/2020	1/10/2022
T2	ANP06540	Cable	Heliax	8/23/2019	8/23/2021
T3	ANP06515	Cable	Heliax	7/1/2020	7/1/2022
T4	ANP06219	Attenuator	768-10	4/7/2020	4/7/2022
	AN01492	50uH LISN-Line (L1)	3816/2NM	10/14/2019	10/14/2021
T5	AN01492	50uH LISN-Neutral (L2)	3816/2NM	10/14/2019	10/14/2021

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

#	Freq	Rdng	T1	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
			T5								
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV	dBµV	dB	Ant
1	794.260k	43.0	+0.2	+0.0	+0.0	+9.1	+0.0	52.7	56.0	-3.3	Neutr
	QP		+0.4								
2	819.942k	42.4	+0.2	+0.0	+0.0	+9.1	+0.0	52.1	56.0	-3.9	Neutr
	QP		+0.4								
3	794.260k	28.5	+0.2	+0.0	+0.0	+9.1	+0.0	38.2	46.0	-7.8	Neutr
	Ave		+0.4								
^	794.259k	46.4	+0.2	+0.0	+0.0	+9.1	+0.0	56.1	46.0	+10.1	Neutr
			+0.4								
5	819.942k	28.2	+0.2	+0.0	+0.0	+9.1	+0.0	37.9	46.0	-8.1	Neutr
	Ave		+0.4								
^	819.941k	47.2	+0.2	+0.0	+0.0	+9.1	+0.0	56.9	46.0	+10.9	Neutr
			+0.4								
7	2.959M	37.0	+0.1	+0.0	+0.1	+9.1	+0.0	46.8	56.0	-9.2	Neutr
	QP		+0.5								
8	2.972M	36.2	+0.1	+0.0	+0.1	+9.1	+0.0	46.0	56.0	-10.0	Neutr
	QP		+0.5								
9	3.335M	25.3	+0.1	+0.0	+0.1	+9.1	+0.0	35.0	46.0	-11.0	Neutr
	Ave		+0.4								
^	3.335M	40.7	+0.1	+0.0	+0.1	+9.1	+0.0	50.4	46.0	+4.4	Neutr
			+0.4								
11	3.452M	25.0	+0.1	+0.0	+0.1	+9.1	+0.0	34.8	46.0	-11.2	Neutr
	Ave		+0.5								
^	3.452M	41.4	+0.1	+0.0	+0.1	+9.1	+0.0	51.2	46.0	+5.2	Neutr
			+0.5								
13	3.714M	25.0	+0.1	+0.0	+0.1	+9.1	+0.0	34.7	46.0	-11.3	Neutr
	Ave		+0.4								
^	3.714M	40.6	+0.1	+0.0	+0.1	+9.1	+0.0	50.3	46.0	+4.3	Neutr
			+0.4								
15	3.408M	24.9	+0.1	+0.0	+0.1	+9.1	+0.0	34.7	46.0	-11.3	Neutr
	Ave		+0.5								
^	3.408M	40.7	+0.1	+0.0	+0.1	+9.1	+0.0	50.5	46.0	+4.5	Neutr
			+0.5								
17	4.127M	24.8	+0.1	+0.0	+0.1	+9.1	+0.0	34.6	46.0	-11.4	Neutr
	Ave		+0.5								
^	4.127M	40.5	+0.1	+0.0	+0.1	+9.1	+0.0	50.3	46.0	+4.3	Neutr
			+0.5								
19	2.959M	24.0	+0.1	+0.0	+0.1	+9.1	+0.0	33.8	46.0	-12.2	Neutr
	Ave		+0.5								
^	2.959M	41.6	+0.1	+0.0	+0.1	+9.1	+0.0	51.4	46.0	+5.4	Neutr
			+0.5								
21	4.228M	24.1	+0.1	+0.0	+0.1	+9.1	+0.0	33.8	46.0	-12.2	Neutr
	Ave		+0.4								
^	4.228M	41.4	+0.1	+0.0	+0.1	+9.1	+0.0	51.1	46.0	+5.1	Neutr
			+0.4								
23	3.055M	23.8	+0.1	+0.0	+0.1	+9.1	+0.0	33.5	46.0	-12.5	Neutr
	Ave		+0.4								
^	3.055M	40.7	+0.1	+0.0	+0.1	+9.1	+0.0	50.4	46.0	+4.4	Neutr
			+0.4								

25 Ave	678.344k	23.4	+0.3 +0.5	+0.0	+0.0	+9.1	+0.0	33.3	46.0	-12.7	Neutr
^	678.344k	41.3	+0.3 +0.5	+0.0	+0.0	+9.1	+0.0	51.2	46.0	+5.2	Neutr
27 Ave	2.972M	23.0	+0.1 +0.5	+0.0	+0.1	+9.1	+0.0	32.8	46.0	-13.2	Neutr
^	2.972M	41.5	+0.1 +0.5	+0.0	+0.1	+9.1	+0.0	51.3	46.0	+5.3	Neutr
29 Ave	4.417M	23.1	+0.1 +0.4	+0.0	+0.1	+9.1	+0.0	32.8	46.0	-13.2	Neutr
^	4.417M	40.9	+0.1 +0.4	+0.0	+0.1	+9.1	+0.0	50.6	46.0	+4.6	Neutr
31 Ave	2.913M	22.6	+0.1 +0.4	+0.0	+0.1	+9.1	+0.0	32.3	46.0	-13.7	Neutr
^	2.913M	40.9	+0.1 +0.4	+0.0	+0.1	+9.1	+0.0	50.6	46.0	+4.6	Neutr
33 Ave	4.892M	21.5	+0.1 +0.5	+0.0	+0.1	+9.1	+0.0	31.3	46.0	-14.7	Neutr
^	4.892M	40.5	+0.1 +0.5	+0.0	+0.1	+9.1	+0.0	50.3	46.0	+4.3	Neutr
35 Ave	2.269M	21.4	+0.2 +0.5	+0.0	+0.1	+9.1	+0.0	31.3	46.0	-14.7	Neutr
^	2.269M	40.1	+0.2 +0.5	+0.0	+0.1	+9.1	+0.0	50.0	46.0	+4.0	Neutr
37 Ave	2.602M	21.6	+0.1 +0.4	+0.0	+0.1	+9.1	+0.0	31.3	46.0	-14.7	Neutr
^	2.602M	41.0	+0.1 +0.4	+0.0	+0.1	+9.1	+0.0	50.7	46.0	+4.7	Neutr
39 Ave	1.351M	21.5	+0.2 +0.4	+0.0	+0.0	+9.1	+0.0	31.2	46.0	-14.8	Neutr
^	1.351M	39.3	+0.2 +0.4	+0.0	+0.0	+9.1	+0.0	49.0	46.0	+3.0	Neutr
41 Ave	1.040M	21.1	+0.2 +0.4	+0.0	+0.0	+9.1	+0.0	30.8	46.0	-15.2	Neutr
^	1.040M	39.7	+0.2 +0.4	+0.0	+0.0	+9.1	+0.0	49.4	46.0	+3.4	Neutr
43 Ave	2.710M	20.9	+0.1 +0.5	+0.0	+0.1	+9.1	+0.0	30.7	46.0	-15.3	Neutr
^	2.710M	40.8	+0.1 +0.5	+0.0	+0.1	+9.1	+0.0	50.6	46.0	+4.6	Neutr
45 Ave	2.658M	21.0	+0.1 +0.4	+0.0	+0.1	+9.1	+0.0	30.7	46.0	-15.3	Neutr
^	2.658M	40.5	+0.1 +0.4	+0.0	+0.1	+9.1	+0.0	50.2	46.0	+4.2	Neutr

47 Ave	1.803M	20.7	+0.2 +0.5	+0.0	+0.1	+9.1	+0.0	30.6	46.0	-15.4	Neutr
^	1.803M	40.4	+0.2 +0.5	+0.0	+0.1	+9.1	+0.0	50.3	46.0	+4.3	Neutr
49 Ave	650.525k	20.3	+0.3 +0.5	+0.0	+0.0	+9.1	+0.0	30.2	46.0	-15.8	Neutr
^	650.525k	40.9	+0.3 +0.5	+0.0	+0.0	+9.1	+0.0	50.8	46.0	+4.8	Neutr
51 Ave	1.543M	17.0	+0.2 +0.4	+0.0	+0.1	+9.1	+0.0	26.8	46.0	-19.2	Neutr
^	1.543M	40.4	+0.2 +0.4	+0.0	+0.1	+9.1	+0.0	50.2	46.0	+4.2	Neutr

Test Setup Photo(s)

Configuration 3

Configuration 9

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.