

### Test Setup / Conditions / Data

Test Location: CKC Laboratories Inc • 110 N Olinda Pl • Brea CA 92823 • 714-993-6112  
 Customer: **Itron, Inc.**  
 Specification: **15.247(d) / 15.209 Radiated Spurious Emissions**  
 Work Order #: **103006** Date: 8/21/2019  
 Test Type: **Radiated Scan** Time: 14:59:47  
 Tested By: S. Yamamoto Sequence#: 7  
 Software: EMITest 5.03.12

#### *Equipment Tested:*

Device	Manufacturer	Model #	S/N
Configuration 2			

#### *Support Equipment:*

Device	Manufacturer	Model #	S/N
Configuration 2			

#### *Test Conditions / Notes:*

The equipment under test (EUT) is stand alone on the Styrofoam table. The EUT is set to continuously transmit when set to its low (902.2MHz) and high (927.75MHz) channel for this test. Additionally, The EUT is set to continuously frequency hop for this test. Measurement of band edge compliance.

Temperature: 25°C, Humidity: 51%, Pressure: 100kPa.  
 Site D. Test method ANSI C63.10 2013

Frequency Range: 611MHz to 996MHz  
 RBW=100kHz VBW=300kHz non restrict band  
 RBW=120kHz VBW=360kHz restrict band  
 Frequency tested: Low (902.2MHz) and High (927.75MHz). Frequency Hopping  
 Firmware power setting: 60 (max)  
 Firmware: 5.1.10.0  
 Test Software: CAM3 FCC Test Help V29.3

Modulation Types:  
 25kbps FSK

Antenna type: External Colinear Omnidirectional (antenna attached to chassis)  
 Antenna Gain: 2.8dBi  
 Duty Cycle: Tested at 100%

**Test Equipment:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	ANP04382	Cable	LDF-50	6/2/2018	6/2/2020
T2	ANP05569	Cable-Amplitude +15C to +45C (dB)	RG-214/U	12/24/2018	12/24/2020
T3	ANP05283	Attenuator	ATT-0218-06- NNN-02	4/5/2018	4/5/2020
T4	AN01994	Biconilog Antenna	CBL6111C	4/23/2018	4/23/2020
	AN02869	Spectrum Analyzer	E4440A	7/25/2019	7/25/2020

**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	960.000M	12.5	+3.4	+3.8	+5.9	+24.1	+0.0	49.7	54.0	-4.3	Vert
2	614.000M	8.9	+2.6	+2.9	+5.8	+20.4	+0.0	40.6	46.0	-5.4	Vert
3	614.000M	8.3	+2.6	+2.9	+5.8	+20.4	+0.0	40.0	46.0	-6.0	Vert
4	960.000M	8.7	+3.4	+3.8	+5.9	+24.1	+0.0	45.9	54.0	-8.1	Vert
5	902.000M	52.4	+3.2	+3.6	+5.9	+23.4	+0.0	88.5	106.3	-17.8	Vert
6	902.000M	50.4	+3.2	+3.6	+5.9	+23.4	+0.0	86.5	106.3	-19.8	Vert
7	928.000M	37.2	+3.3	+3.7	+5.9	+23.7	+0.0	73.8	106.3	-32.5	Vert
8	928.000M	34.6	+3.3	+3.7	+5.9	+23.7	+0.0	71.2	106.3	-35.1	Vert

Test Location: CKC Laboratories Inc • 110 N Olinda Pl • Brea CA 92823 • 714-993-6112  
 Customer: **Itron, Inc.**  
 Specification: **15.247(d) / 15.209 Radiated Spurious Emissions**  
 Work Order #: **103006** Date: 8/21/2019  
 Test Type: **Radiated Scan** Time: 16:45:42  
 Tested By: S. Yamamoto Sequence#: 8  
 Software: EMITest 5.03.12

***Equipment Tested:***

Device	Manufacturer	Model #	S/N
Configuration 3			

***Support Equipment:***

Device	Manufacturer	Model #	S/N
Configuration 3			

***Test Conditions / Notes:***

The equipment under test (EUT) is stand alone on the Styrofoam table. The EUT is set to continuously transmit when set to its low (902.2MHz) and high (927.75MHz) channel for this test. Additionally, The EUT is set to continuously frequency hop for this test. Measurement of band edge compliance.

Temperature: 26°C, Humidity: 43%, Pressure: 100kPa.  
 Site D. Test method ANSI C63.10 2013

Frequency Range: 611MHz to 996MHz  
 RBW=100kHz VBW=300kHz non restrict band  
 RBW=120kHz VBW=360kHz restrict band  
 Frequency tested: Low (902.2MHz) and High (927.75MHz). Frequency Hopping  
 Firmware power setting: 60 (max)  
 Firmware: 5.1.10.0  
 Test Software: CAM3 FCC Test Help V29.3

Modulation Types:  
 25kbps FSK

Antenna type: External Omnidirectional (antenna remote from chassis)  
 Antenna Gain: 5.5dBi  
 Duty Cycle: Tested at 100%

**Test Equipment:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	ANP04382	Cable	LDF-50	6/2/2018	6/2/2020
T2	ANP05569	Cable-Amplitude +15C to +45C (dB)	RG-214/U	12/24/2018	12/24/2020
T3	ANP05283	Attenuator	ATT-0218-06- NNN-02	4/5/2018	4/5/2020
T4	AN01994	Biconilog Antenna	CBL6111C	4/23/2018	4/23/2020
	AN02869	Spectrum Analyzer	E4440A	7/25/2019	7/25/2020

**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	11.0	+2.6	+2.9	+5.8	+20.4	+0.0	42.7	46.0	-3.3	Vert
2	960.000M	13.0	+3.4	+3.8	+5.9	+24.1	+0.0	50.2	54.0	-3.8	Vert
3	614.000M	9.7	+2.6	+2.9	+5.8	+20.4	+0.0	41.4	46.0	-4.6	Vert
4	960.000M	9.6	+3.4	+3.8	+5.9	+24.1	+0.0	46.8	54.0	-7.2	Vert
5	902.000M	54.6	+3.2	+3.6	+5.9	+23.4	+0.0	90.7	111.0	-20.3	Vert
6	902.000M	53.9	+3.2	+3.6	+5.9	+23.4	+0.0	90.0	111.0	-21.0	Vert
7	928.000M	39.4	+3.3	+3.7	+5.9	+23.7	+0.0	76.0	111.0	-35.0	Vert
8	928.000M	33.6	+3.3	+3.7	+5.9	+23.7	+0.0	70.2	111.0	-40.8	Vert

Test Location: CKC Laboratories Inc • 110 N Olinda Pl • Brea CA 92823 • 714-993-6112  
 Customer: **Itron, Inc.**  
 Specification: **15.247(d) / 15.209 Radiated Spurious Emissions**  
 Work Order #: **103006** Date: 8/21/2019  
 Test Type: **Radiated Scan** Time: 17:49:52  
 Tested By: S. Yamamoto Sequence#: 9  
 Software: EMITest 5.03.12

***Equipment Tested:***

Device	Manufacturer	Model #	S/N
Configuration 4			

***Support Equipment:***

Device	Manufacturer	Model #	S/N
Configuration 4			

***Test Conditions / Notes:***

The equipment under test (EUT) is stand alone on the Styrofoam table. The EUT is set to continuously transmit when set to its low (902.2MHz) and high (927.75MHz) channel for this test. Additionally, The EUT is set to continuously frequency hop for this test. Measurement of band edge compliance.

Temperature: 26°C, Humidity: 43%, Pressure: 100kPa.  
 Site D. Test method ANSI C63.10 2013

Frequency Range: 611MHz to 996MHz  
 RBW=100kHz VBW=300kHz non restrict band  
 RBW=120kHz VBW=360kHz restrict band  
 Frequency tested: Low (902.2MHz) and High (927.75MHz). Frequency Hopping  
 Firmware power setting: 60 (max)  
 Firmware: 5.1.10.0  
 Test Software: CAM3 FCC Test Help V29.3

Modulation Types:  
 25kbps FSK

Antenna type: External Omnidirectional (antenna remote from chassis)  
 Antenna Gain: 8.15dBi  
 With 2dB attenuator and 0.2dB coaxial cable  
 Duty Cycle: Tested at 100%

**Test Equipment:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	ANP04382	Cable	LDF-50	6/2/2018	6/2/2020
T2	ANP05569	Cable-Amplitude +15C to +45C (dB)	RG-214/U	12/24/2018	12/24/2020
T3	ANP05283	Attenuator	ATT-0218-06- NNN-02	4/5/2018	4/5/2020
T4	AN01994	Biconilog Antenna	CBL6111C	4/23/2018	4/23/2020
	AN02869	Spectrum Analyzer	E4440A	7/25/2019	7/25/2020

**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	10.4	+2.6	+2.9	+5.8	+20.4	+0.0	42.1	46.0	-3.9	Vert
2	614.000M	9.5	+2.6	+2.9	+5.8	+20.4	+0.0	41.2	46.0	-4.8	Vert
3	960.000M	10.9	+3.4	+3.8	+5.9	+24.1	+0.0	48.1	54.0	-5.9	Vert
4	960.000M	7.4	+3.4	+3.8	+5.9	+24.1	+0.0	44.6	54.0	-9.4	Vert
5	902.000M	52.4	+3.2	+3.6	+5.9	+23.4	+0.0	88.5	108.2	-19.7	Vert
6	902.000M	36.3	+3.2	+3.6	+5.9	+23.4	+0.0	72.4	108.2	-35.8	Vert
7	928.000M	35.6	+3.3	+3.7	+5.9	+23.7	+0.0	72.2	108.2	-36.0	Vert
8	928.000M	34.2	+3.3	+3.7	+5.9	+23.7	+0.0	70.8	108.2	-37.4	Vert



**Test Setup Photo(s)**



Below 1GHz, 2.8dBi



Below 1GHz, 2.8dBi



Above 1GHz, 2.8dBi



Below 1GHz, 5.5dBi



Below 1GHz, 5.5dBi



Above 1GHz, 5.5dBi





Below 1GHz, 8.15dBi



Below 1GHz, 8.15dBi



Above 1GHz, 8.15dBi

## 15.207 AC Conducted Emissions

### Test Setup / Conditions / Data

Test Location: CKC Laboratories Inc • 110 N Olinda Pl • Brea CA 92823 • 714-993-6112  
 Customer: **Itron, Inc.**  
 Specification: **15.207 AC Mains - Average**  
 Work Order #: **103006** Date: 8/20/2019  
 Test Type: **Conducted Emissions** Time: 17:05:24  
 Tested By: S. Yamamoto Sequence#: 5  
 Software: EMITest 5.03.12 120V 60Hz

#### Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 2			

#### Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 2			

#### Test Conditions / Notes:

The equipment under test (EUT) and support laptop are on the table. The EUT is set to continuously transmit on the middle channels for this test.

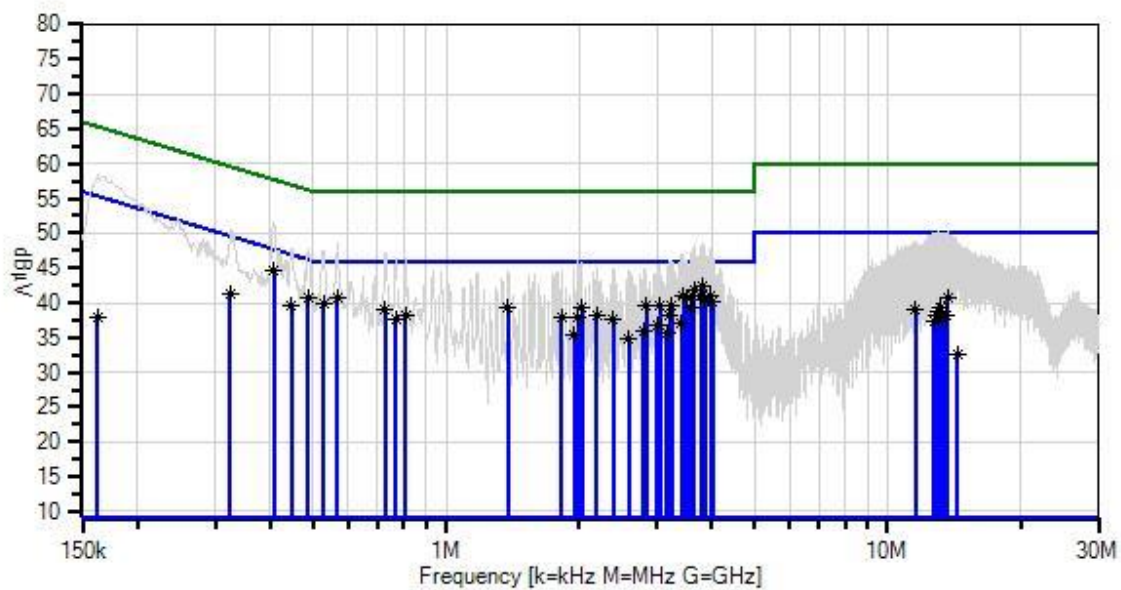
Temperature: 23°C, Humidity: 58%, Pressure: 100kPa.  
 Site D. Test method ANSI C63.10 2013

Frequency Range: 0.15MHz to 30MHz  
 RBW=9kHz VBW=30kHz  
 Frequency tested: Middle (915.0MHz)  
 Firmware power setting: 60 (max)  
 Firmware: 5.1.10.0  
 Test Software: CAM3 FCC Test Help V29.3

Modulation Types:  
 25kbps FSK

Antenna type: External Colinear Omnidirectional  
 Antenna Gain: 2.8dBi (attached)  
 Duty Cycle: Tested at 100%

Itron, Inc. WO#: 103006 Sequence#: 5 Date: 8/20/2019  
15.207 AC Mains - Average Test Lead: 120V 60Hz Line



— Sweep Data  
x QP Readings  
Software Version: 5.03.12

— Readings  
\* Average Readings  
— 1 - 15.207 AC Mains - Average

○ Peak Readings  
▼ Ambient  
— 2 - 15.207 AC Mains - Quasi-peak

**Test Equipment:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN02343	High Pass Filter	HE9615-150K-50-720B	12/24/2018	12/24/2020
T2	ANP01910	Cable	RG-142	10/25/2017	10/25/2019
T3	ANP06085	Attenuator	SA18N10W-09	11/15/2018	11/15/2020
T4	AN00847.1	50uH LISN-Line 1	3816/2NM	3/11/2019	3/11/2020
	AN00847.1	50uH LISN-Line 2	3816/2NM	3/11/2019	3/11/2020
	AN02869	Spectrum Analyzer	E4440A	7/25/2019	7/25/2020

**Measurement Data:**

Reading listed by margin.

Test Lead: Line

#	Freq MHz	Rdng dBμV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBμV	Spec dBμV	Margin dB	Polar Ant
1	406.704k	38.4	+0.2	+0.1	+5.8	+0.1	+0.0	44.6	47.7	-3.1	Line
	Ave										
^	406.703k	45.5	+0.2	+0.1	+5.8	+0.1	+0.0	51.7	47.7	+4.0	Line
									see average data above		
3	3.816M	36.1	+0.2	+0.2	+5.8	+0.1	+0.0	42.4	46.0	-3.6	Line
	Ave										
^	3.816M	42.3	+0.2	+0.2	+5.8	+0.1	+0.0	48.6	46.0	+2.6	Line
									see average data above		
5	3.654M	35.6	+0.2	+0.1	+5.8	+0.1	+0.0	41.8	46.0	-4.2	Line
	Ave										
^	3.654M	42.1	+0.2	+0.1	+5.8	+0.1	+0.0	48.3	46.0	+2.3	Line
									see average data above		
7	3.612M	34.9	+0.2	+0.1	+5.8	+0.1	+0.0	41.1	46.0	-4.9	Line
	Ave										
^	3.612M	41.6	+0.2	+0.1	+5.8	+0.1	+0.0	47.8	46.0	+1.8	Line
									see average data above		
9	3.773M	34.6	+0.2	+0.2	+5.8	+0.1	+0.0	40.9	46.0	-5.1	Line
	Ave										
^	3.773M	41.8	+0.2	+0.2	+5.8	+0.1	+0.0	48.1	46.0	+2.1	Line
									see average data above		
11	3.450M	34.7	+0.2	+0.1	+5.8	+0.1	+0.0	40.9	46.0	-5.1	Line
	Ave										
^	3.450M	40.8	+0.2	+0.1	+5.8	+0.1	+0.0	47.0	46.0	+1.0	Line
									see average data above		
13	3.977M	34.6	+0.2	+0.2	+5.8	+0.1	+0.0	40.9	46.0	-5.1	Line
	Ave										
^	3.977M	41.5	+0.2	+0.2	+5.8	+0.1	+0.0	47.8	46.0	+1.8	Line
									see average data above		



15	3.493M	34.6	+0.2	+0.1	+5.8	+0.1	+0.0	40.8	46.0	-5.2	Line
Ave											
^	3.493M	40.0	+0.2	+0.1	+5.8	+0.1	+0.0	46.2	46.0	+0.2	Line
									see average data above		
17	568.143k	34.4	+0.3	+0.1	+5.8	+0.1	+0.0	40.7	46.0	-5.3	Line
Ave											
^	568.143k	42.3	+0.3	+0.1	+5.8	+0.1	+0.0	48.6	46.0	+2.6	Line
									see average data above		
19	486.696k	34.5	+0.3	+0.1	+5.8	+0.1	+0.0	40.8	46.2	-5.4	Line
Ave											
^	486.696k	41.5	+0.3	+0.1	+5.8	+0.1	+0.0	47.8	46.2	+1.6	Line
									see average data above		
21	3.854M	34.0	+0.2	+0.2	+5.8	+0.1	+0.0	40.3	46.0	-5.7	Line
Ave											
^	3.854M	42.1	+0.2	+0.2	+5.8	+0.1	+0.0	48.4	46.0	+2.4	Line
									see average data above		
23	4.020M	33.8	+0.2	+0.2	+5.8	+0.1	+0.0	40.1	46.0	-5.9	Line
Ave											
^	4.020M	40.7	+0.2	+0.2	+5.8	+0.1	+0.0	47.0	46.0	+1.0	Line
									see average data above		
25	527.420k	33.7	+0.3	+0.1	+5.8	+0.1	+0.0	40.0	46.0	-6.0	Line
Ave											
^	527.419k	41.3	+0.3	+0.1	+5.8	+0.1	+0.0	47.6	46.0	+1.6	Line
									see average data above		
27	2.842M	33.5	+0.2	+0.1	+5.8	+0.1	+0.0	39.7	46.0	-6.3	Line
Ave											
^	2.842M	38.6	+0.2	+0.1	+5.8	+0.1	+0.0	44.8	46.0	-1.2	Line
									see average data above		
29	3.246M	33.4	+0.2	+0.1	+5.8	+0.1	+0.0	39.6	46.0	-6.4	Line
Ave											
^	3.246M	40.1	+0.2	+0.1	+5.8	+0.1	+0.0	46.3	46.0	+0.3	Line
									see average data above		
31	3.046M	33.3	+0.2	+0.1	+5.8	+0.1	+0.0	39.5	46.0	-6.5	Line
Ave											
^	3.046M	39.2	+0.2	+0.1	+5.8	+0.1	+0.0	45.4	46.0	-0.6	Line
									see average data above		
33	2.030M	33.2	+0.2	+0.1	+5.8	+0.1	+0.0	39.4	46.0	-6.6	Line
Ave											
^	2.030M	39.5	+0.2	+0.1	+5.8	+0.1	+0.0	45.7	46.0	-0.3	Line
									see average data above		

35	3.573M	33.2	+0.2	+0.1	+5.8	+0.1	+0.0	39.4	46.0	-6.6	Line
Ave											
^	3.573M	41.0	+0.2	+0.1	+5.8	+0.1	+0.0	47.2	46.0	+1.2	Line
									see average data above		
37	1.379M	33.1	+0.2	+0.1	+5.8	+0.1	+0.0	39.3	46.0	-6.7	Line
Ave											
^	1.379M	38.5	+0.2	+0.1	+5.8	+0.1	+0.0	44.7	46.0	-1.3	Line
									see average data above		
39	728.129k	32.8	+0.3	+0.1	+5.8	+0.1	+0.0	39.1	46.0	-6.9	Line
Ave											
^	728.128k	40.9	+0.3	+0.1	+5.8	+0.1	+0.0	47.2	46.0	+1.2	Line
									see average data above		
41	447.427k	33.2	+0.3	+0.1	+5.8	+0.1	+0.0	39.5	46.9	-7.4	Line
Ave											
^	447.427k	41.5	+0.3	+0.1	+5.8	+0.1	+0.0	47.8	46.9	+0.9	Line
									see average data above		
43	810.303k	32.0	+0.3	+0.1	+5.8	+0.1	+0.0	38.3	46.0	-7.7	Line
Ave											
^	810.303k	39.9	+0.3	+0.1	+5.8	+0.1	+0.0	46.2	46.0	+0.2	Line
									see average data above		
45	3.208M	32.0	+0.2	+0.1	+5.8	+0.1	+0.0	38.2	46.0	-7.8	Line
Ave											
^	3.208M	39.8	+0.2	+0.1	+5.8	+0.1	+0.0	46.0	46.0	+0.0	Line
									see average data above		
47	2.191M	31.9	+0.2	+0.1	+5.8	+0.1	+0.0	38.1	46.0	-7.9	Line
Ave											
^	2.191M	38.7	+0.2	+0.1	+5.8	+0.1	+0.0	44.9	46.0	-1.1	Line
									see average data above		
49	1.830M	31.8	+0.2	+0.1	+5.8	+0.1	+0.0	38.0	46.0	-8.0	Line
Ave											
^	1.830M	38.5	+0.2	+0.1	+5.8	+0.1	+0.0	44.7	46.0	-1.3	Line
									see average data above		
51	1.987M	31.6	+0.2	+0.1	+5.8	+0.1	+0.0	37.8	46.0	-8.2	Line
Ave											
^	1.987M	39.9	+0.2	+0.1	+5.8	+0.1	+0.0	46.1	46.0	+0.1	Line
									see average data above		
53	324.529k	35.1	+0.1	+0.1	+5.8	+0.1	+0.0	41.2	49.6	-8.4	Line
Ave											
^	324.529k	44.3	+0.1	+0.1	+5.8	+0.1	+0.0	50.4	49.6	+0.8	Line
									see average data above		

55	2.395M	31.3	+0.2	+0.1	+5.8	+0.1	+0.0	37.5	46.0	-8.5	Line
Ave											
^	2.395M	38.8	+0.2	+0.1	+5.8	+0.1	+0.0	45.0	46.0	-1.0	Line
									see average data above		
57	768.852k	31.2	+0.3	+0.1	+5.8	+0.1	+0.0	37.5	46.0	-8.5	Line
Ave											
^	768.852k	40.0	+0.3	+0.1	+5.8	+0.1	+0.0	46.3	46.0	+0.3	Line
									see average data above		
59	3.408M	31.0	+0.2	+0.1	+5.8	+0.1	+0.0	37.2	46.0	-8.8	Line
Ave											
^	3.408M	40.8	+0.2	+0.1	+5.8	+0.1	+0.0	47.0	46.0	+1.0	Line
									see average data above		
61	3.004M	30.5	+0.2	+0.1	+5.8	+0.1	+0.0	36.7	46.0	-9.3	Line
Ave											
^	3.004M	38.8	+0.2	+0.1	+5.8	+0.1	+0.0	45.0	46.0	-1.0	Line
									see average data above		
63	13.679M	34.1	+0.2	+0.3	+5.8	+0.2	+0.0	40.6	50.0	-9.4	Line
Ave											
^	13.679M	43.7	+0.2	+0.3	+5.8	+0.2	+0.0	50.2	50.0	+0.2	Line
									see average data above		
65	2.799M	29.7	+0.2	+0.1	+5.8	+0.1	+0.0	35.9	46.0	-10.1	Line
Ave											
^	2.799M	38.7	+0.2	+0.1	+5.8	+0.1	+0.0	44.9	46.0	-1.1	Line
									see average data above		
67	3.165M	29.6	+0.2	+0.1	+5.8	+0.1	+0.0	35.8	46.0	-10.2	Line
Ave											
^	3.165M	39.0	+0.2	+0.1	+5.8	+0.1	+0.0	45.2	46.0	-0.8	Line
									see average data above		
69	1.949M	29.2	+0.2	+0.1	+5.8	+0.1	+0.0	35.4	46.0	-10.6	Line
Ave											
^	1.949M	38.9	+0.2	+0.1	+5.8	+0.1	+0.0	45.1	46.0	-0.9	Line
									see average data above		
71	13.193M	32.7	+0.2	+0.3	+5.8	+0.2	+0.0	39.2	50.0	-10.8	Line
Ave											
^	13.193M	43.6	+0.2	+0.3	+5.8	+0.2	+0.0	50.1	50.0	+0.1	Line
									see average data above		
73	11.571M	32.4	+0.2	+0.3	+5.8	+0.2	+0.0	38.9	50.0	-11.1	Line
Ave											
^	11.571M	42.5	+0.2	+0.3	+5.8	+0.2	+0.0	49.0	50.0	-1.0	Line
									see average data above		
75	13.067M	32.2	+0.2	+0.3	+5.8	+0.2	+0.0	38.7	50.0	-11.3	Line
Ave											

^	13.067M	43.8	+0.2	+0.3	+5.8	+0.2	+0.0	50.3	50.0 see average data above	+0.3	Line
77	2.595M	28.5	+0.2	+0.1	+5.8	+0.1	+0.0	34.7	46.0	-11.3	Line
Ave											
^	2.595M	38.7	+0.2	+0.1	+5.8	+0.1	+0.0	44.9	46.0 see average data above	-1.1	Line
79	12.950M	31.8	+0.2	+0.3	+5.8	+0.2	+0.0	38.3	50.0	-11.7	Line
Ave											
^	12.950M	43.7	+0.2	+0.3	+5.8	+0.2	+0.0	50.2	50.0 see average data above	+0.2	Line
81	13.517M	31.7	+0.2	+0.3	+5.8	+0.2	+0.0	38.2	50.0	-11.8	Line
Ave											
^	13.517M	43.6	+0.2	+0.3	+5.8	+0.2	+0.0	50.1	50.0 see average data above	+0.1	Line
83	13.310M	31.2	+0.2	+0.3	+5.8	+0.2	+0.0	37.7	50.0	-12.3	Line
Ave											
^	13.310M	43.6	+0.2	+0.3	+5.8	+0.2	+0.0	50.1	50.0 see average data above	+0.1	Line
85	12.706M	30.8	+0.2	+0.3	+5.8	+0.2	+0.0	37.3	50.0	-12.7	Line
Ave											
^	12.706M	43.6	+0.2	+0.3	+5.8	+0.2	+0.0	50.1	50.0 see average data above	+0.1	Line
87	14.400M	26.2	+0.2	+0.3	+5.8	+0.2	+0.0	32.7	50.0	-17.3	Line
Ave											
^	14.400M	41.4	+0.2	+0.3	+5.8	+0.2	+0.0	47.9	50.0 see average data above	-2.1	Line
89	162.363k	31.6	+0.4	+0.1	+5.8	+0.1	+0.0	38.0	55.3	-17.3	Line
Ave											
^	162.362k	51.9	+0.4	+0.1	+5.8	+0.1	+0.0	58.3	55.3 see average data above	+3.0	Line

Test Location: CKC Laboratories Inc • 110 N Olinda Pl • Brea CA 92823 • 714-993-6112  
 Customer: **Itron, Inc.**  
 Specification: **15.207 AC Mains - Average**  
 Work Order #: **103006** Date: 8/20/2019  
 Test Type: **Conducted Emissions** Time: 17:25:47  
 Tested By: S. Yamamoto Sequence#: 6  
 Software: EMITest 5.03.12 120V 60Hz

***Equipment Tested:***

Device	Manufacturer	Model #	S/N
Configuration 2			

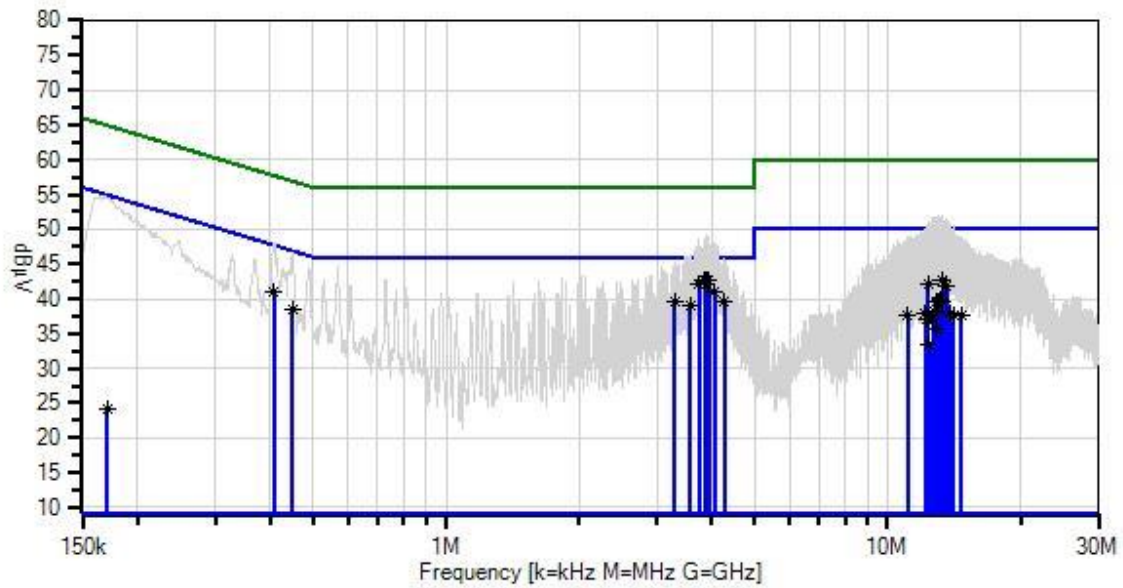
***Support Equipment:***

Device	Manufacturer	Model #	S/N
Configuration 2			

***Test Conditions / Notes:***

<p>The equipment under test (EUT) and support laptop are on the table. The EUT is set to continuously transmit on the middle channels for this test.</p> <p>Temperature: 23°C, Humidity: 58%, Pressure: 100kPa.          Site D. Test method ANSI C63.10 2013</p> <p>Frequency Range: 0.15MHz to 30MHz          RBW=9kHz VBW=30kHz          Frequency tested: Middle (915.0MHz)          Firmware power setting: 60 (max)          Firmware: 5.1.10.0          Test Software: CAM3 FCC Test Help V29.3</p> <p>Modulation Types:          25kbps FSK</p> <p>Antenna type: External Colinear Omni          Antenna Gain: 2.8dBi (attached)          Duty Cycle: Tested at 100%</p>
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Itron, Inc. WD#: 103006 Sequence#: 6 Date: 8/20/2019  
15.207 AC Mains - Average Test Lead: 120V 60Hz Neutral



— Sweep Data  
× QP Readings

Software Version: 5.03.12

— Readings  
\* Average Readings  
— 1 - 15.207 AC Mains - Average

○ Peak Readings  
▼ Ambient  
— 2 - 15.207 AC Mains - Quasi-peak

**Test Equipment:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN02343	High Pass Filter	HE9615-150K-50-720B	12/24/2018	12/24/2020
T2	ANP01910	Cable	RG-142	10/25/2017	10/25/2019
T3	ANP06085	Attenuator	SA18N10W-09	11/15/2018	11/15/2020
	AN00847.1	50uH LISN-Line 1	3816/2NM	3/11/2019	3/11/2020
T4	AN00847.1	50uH LISN-Line 2	3816/2NM	3/11/2019	3/11/2020
	AN02869	Spectrum Analyzer	E4440A	7/25/2019	7/25/2020

**Measurement Data:**

Reading listed by margin.

Test Lead: Neutral

#	Freq MHz	Rdng dBμV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBμV	Spec dBμV	Margin dB	Polar Ant
1	3.897M	36.4	+0.2	+0.2	+5.8	+0.1	+0.0	42.7	46.0	-3.3	Neutr
Ave											
^	3.897M	42.8	+0.2	+0.2	+5.8	+0.1	+0.0	49.1	46.0	+3.1	Neutr
									see average data above		
3	3.858M	36.3	+0.2	+0.2	+5.8	+0.1	+0.0	42.6	46.0	-3.4	Neutr
Ave											
^	3.858M	42.4	+0.2	+0.2	+5.8	+0.1	+0.0	48.7	46.0	+2.7	Neutr
									see average data above		
5	3.939M	36.3	+0.2	+0.2	+5.8	+0.1	+0.0	42.6	46.0	-3.4	Neutr
Ave											
^	3.939M	42.8	+0.2	+0.2	+5.8	+0.1	+0.0	49.1	46.0	+3.1	Neutr
									see average data above		
7	3.735M	35.8	+0.2	+0.1	+5.8	+0.1	+0.0	42.0	46.0	-4.0	Neutr
Ave											
^	3.735M	42.3	+0.2	+0.1	+5.8	+0.1	+0.0	48.5	46.0	+2.5	Neutr
									see average data above		
9	4.062M	34.6	+0.2	+0.2	+5.8	+0.1	+0.0	40.9	46.0	-5.1	Neutr
Ave											
^	4.062M	41.8	+0.2	+0.2	+5.8	+0.1	+0.0	48.1	46.0	+2.1	Neutr
									see average data above		
11	4.262M	33.4	+0.2	+0.2	+5.8	+0.1	+0.0	39.7	46.0	-6.3	Neutr
Ave											
^	4.262M	39.5	+0.2	+0.2	+5.8	+0.1	+0.0	45.8	46.0	-0.2	Neutr
									see average data above		
13	3.289M	33.4	+0.2	+0.1	+5.8	+0.1	+0.0	39.6	46.0	-6.4	Neutr
Ave											
^	3.288M	39.2	+0.2	+0.1	+5.8	+0.1	+0.0	45.4	46.0	-0.6	Neutr
									see average data above		

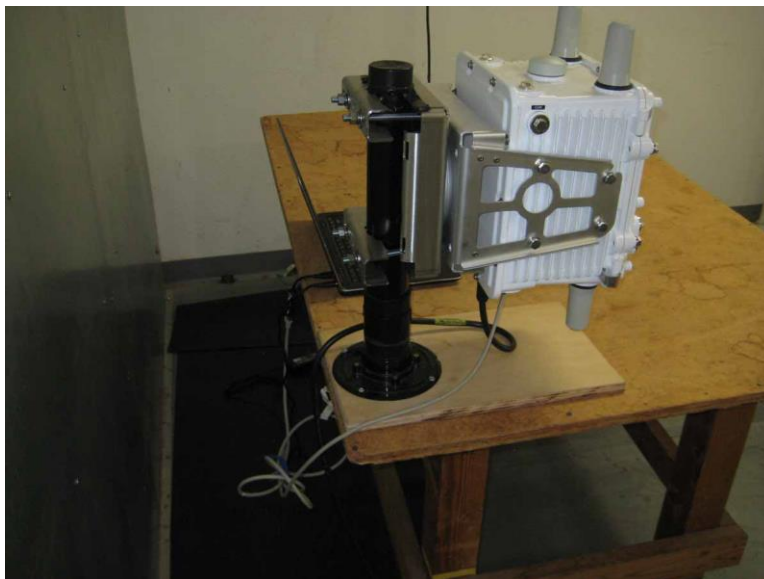
15	408.157k	34.8	+0.2	+0.1	+5.8	+0.0	+0.0	40.9	47.7	-6.8	Neutr
	Ave										
^	408.157k	42.0	+0.2	+0.1	+5.8	+0.0	+0.0	48.1	47.7	+0.4	Neutr
									see average data above		
17	3.573M	32.8	+0.2	+0.1	+5.8	+0.1	+0.0	39.0	46.0	-7.0	Neutr
	Ave										
^	3.573M	40.1	+0.2	+0.1	+5.8	+0.1	+0.0	46.3	46.0	+0.3	Neutr
									see average data above		
19	13.355M	36.2	+0.2	+0.3	+5.8	+0.2	+0.0	42.7	50.0	-7.3	Neutr
	Ave										
^	13.355M	45.7	+0.2	+0.3	+5.8	+0.2	+0.0	52.2	50.0	+2.2	Neutr
									see average data above		
21	12.337M	35.7	+0.2	+0.3	+5.8	+0.2	+0.0	42.2	50.0	-7.8	Neutr
	Ave										
^	12.337M	44.2	+0.2	+0.3	+5.8	+0.2	+0.0	50.7	50.0	+0.7	Neutr
									see average data above		
23	13.598M	35.4	+0.2	+0.3	+5.8	+0.2	+0.0	41.9	50.0	-8.1	Neutr
	Ave										
^	13.598M	45.0	+0.2	+0.3	+5.8	+0.2	+0.0	51.5	50.0	+1.5	Neutr
									see average data above		
25	449.608k	32.3	+0.3	+0.1	+5.8	+0.0	+0.0	38.5	46.9	-8.4	Neutr
	Ave										
^	449.607k	40.3	+0.3	+0.1	+5.8	+0.0	+0.0	46.5	46.9	-0.4	Neutr
									see average data above		
27	13.193M	33.4	+0.2	+0.3	+5.8	+0.2	+0.0	39.9	50.0	-10.1	Neutr
	Ave										
^	13.193M	45.3	+0.2	+0.3	+5.8	+0.2	+0.0	51.8	50.0	+1.8	Neutr
									see average data above		
29	13.274M	33.2	+0.2	+0.3	+5.8	+0.2	+0.0	39.7	50.0	-10.3	Neutr
	Ave										
^	13.274M	45.2	+0.2	+0.3	+5.8	+0.2	+0.0	51.7	50.0	+1.7	Neutr
									see average data above		
31	12.869M	33.2	+0.2	+0.3	+5.8	+0.2	+0.0	39.7	50.0	-10.3	Neutr
	Ave										
^	12.869M	45.1	+0.2	+0.3	+5.8	+0.2	+0.0	51.6	50.0	+1.6	Neutr
									see average data above		
33	13.067M	33.0	+0.2	+0.3	+5.8	+0.2	+0.0	39.5	50.0	-10.5	Neutr
	Ave										
^	13.067M	45.5	+0.2	+0.3	+5.8	+0.2	+0.0	52.0	50.0	+2.0	Neutr
									see average data above		



35	12.752M	31.7	+0.2	+0.3	+5.8	+0.2	+0.0	38.2	50.0	-11.8	Neutr
Ave											
^	12.752M	45.1	+0.2	+0.3	+5.8	+0.2	+0.0	51.6	50.0	+1.6	Neutr
									see average data above		
37	13.806M	31.3	+0.2	+0.3	+5.8	+0.2	+0.0	37.8	50.0	-12.2	Neutr
Ave											
^	13.806M	44.5	+0.2	+0.3	+5.8	+0.2	+0.0	51.0	50.0	+1.0	Neutr
									see average data above		
39	12.139M	31.3	+0.2	+0.3	+5.8	+0.2	+0.0	37.8	50.0	-12.2	Neutr
Ave											
^	12.139M	43.5	+0.2	+0.3	+5.8	+0.2	+0.0	50.0	50.0	+0.0	Neutr
									see average data above		
41	11.076M	31.2	+0.2	+0.3	+5.8	+0.2	+0.0	37.7	50.0	-12.3	Neutr
Ave											
^	11.076M	42.5	+0.2	+0.3	+5.8	+0.2	+0.0	49.0	50.0	-1.0	Neutr
									see average data above		
43	14.697M	31.2	+0.2	+0.3	+5.8	+0.2	+0.0	37.7	50.0	-12.3	Neutr
Ave											
^	14.697M	41.4	+0.2	+0.3	+5.8	+0.2	+0.0	47.9	50.0	-2.1	Neutr
									see average data above		
45	14.130M	31.1	+0.2	+0.3	+5.8	+0.2	+0.0	37.6	50.0	-12.4	Neutr
Ave											
^	14.130M	43.9	+0.2	+0.3	+5.8	+0.2	+0.0	50.4	50.0	+0.4	Neutr
									see average data above		
47	12.220M	30.6	+0.2	+0.3	+5.8	+0.2	+0.0	37.1	50.0	-12.9	Neutr
Ave											
^	12.220M	44.1	+0.2	+0.3	+5.8	+0.2	+0.0	50.6	50.0	+0.6	Neutr
									see average data above		
49	12.670M	30.5	+0.2	+0.3	+5.8	+0.2	+0.0	37.0	50.0	-13.0	Neutr
Ave											
^	12.670M	45.2	+0.2	+0.3	+5.8	+0.2	+0.0	51.7	50.0	+1.7	Neutr
									see average data above		

51	12.959M	29.2	+0.2	+0.3	+5.8	+0.2	+0.0	35.7	50.0	-14.3	Neutr
Ave											
^	12.959M	45.1	+0.2	+0.3	+5.8	+0.2	+0.0	51.6	50.0	+1.6	Neutr
									see average data above		
53	12.427M	26.9	+0.2	+0.3	+5.8	+0.2	+0.0	33.4	50.0	-16.6	Neutr
Ave											
^	12.427M	44.6	+0.2	+0.3	+5.8	+0.2	+0.0	51.1	50.0	+1.1	Neutr
									see average data above		
55	170.361k	18.0	+0.3	+0.1	+5.8	+0.0	+0.0	24.2	54.9	-30.7	Neutr
Ave											
^	170.360k	48.5	+0.3	+0.1	+5.8	+0.0	+0.0	54.7	54.9	-0.2	Neutr
									see average data above		

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

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

#### TEST INSTRUMENTATION AND ANALYZER SETTINGS

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

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

#### SPECTRUM ANALYZER/RECEIVER DETECTOR FUNCTIONS

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

##### **Peak**

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

##### **Quasi-Peak**

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

##### **Average**

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