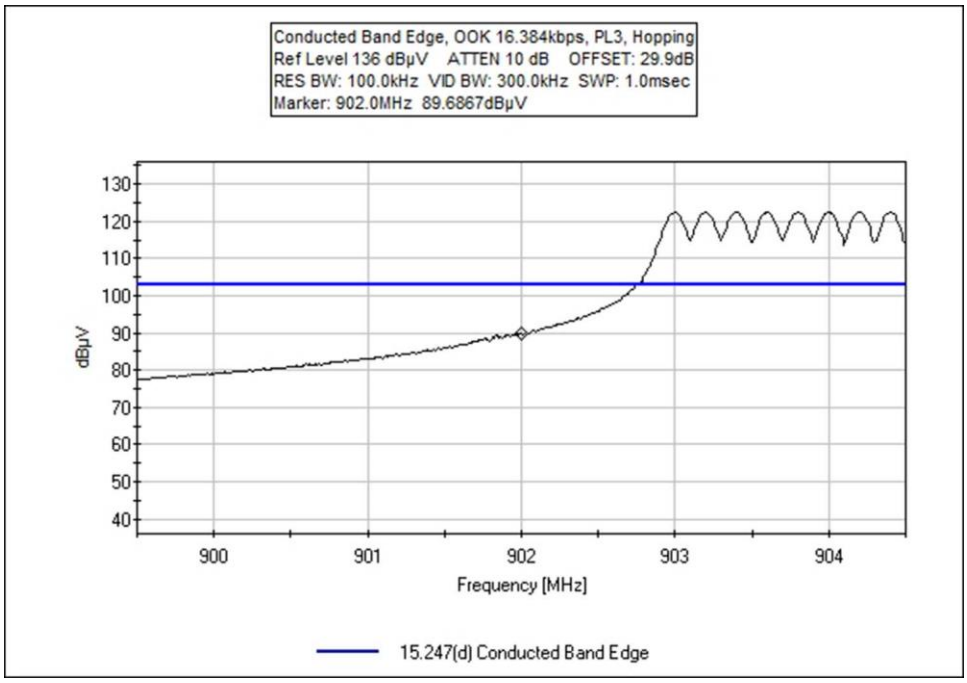
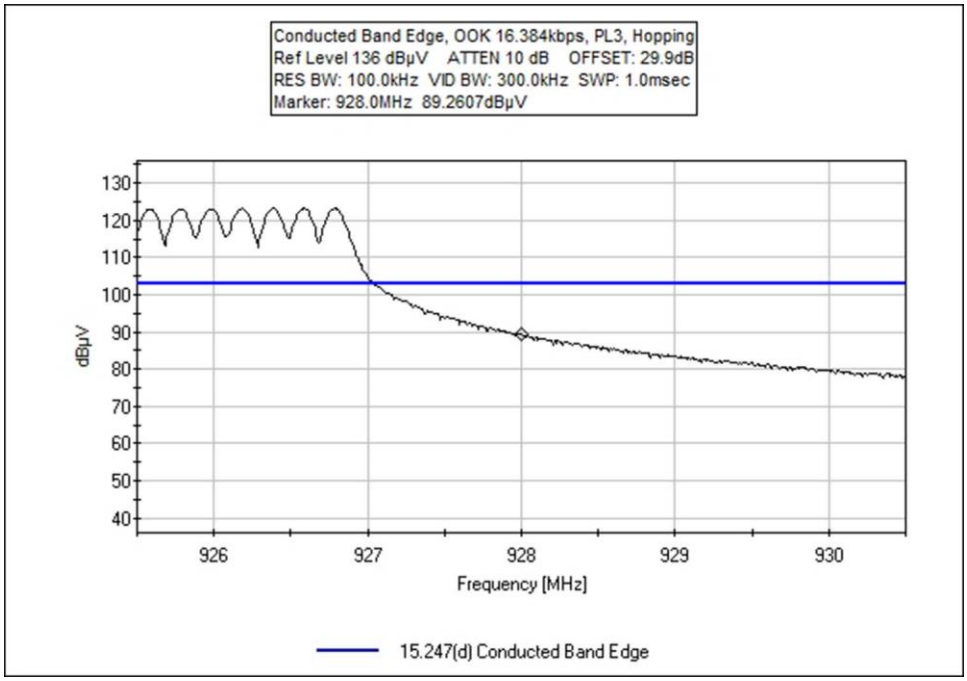
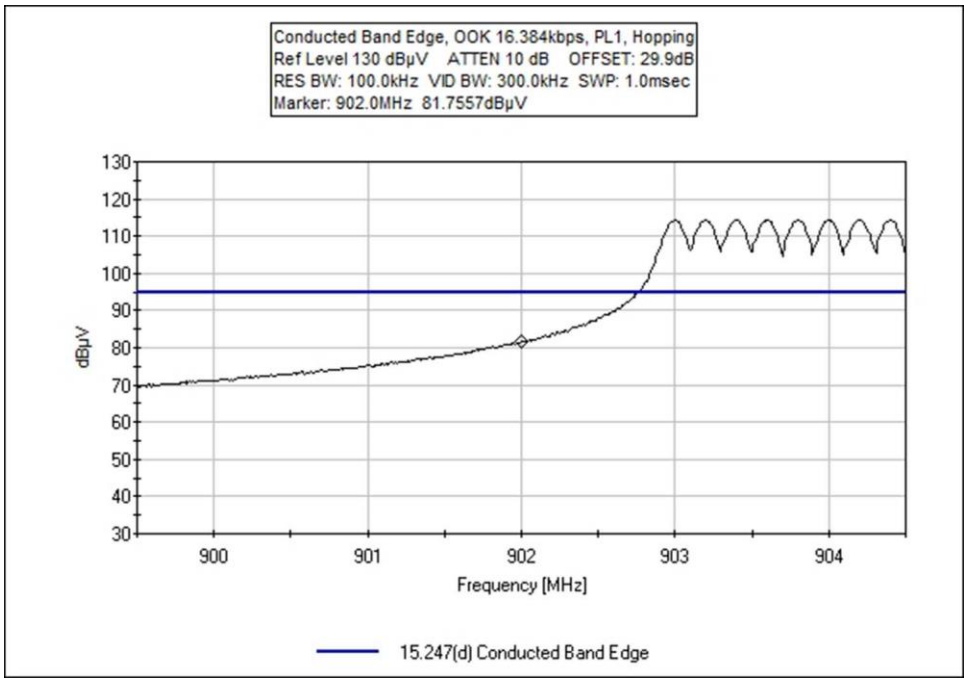
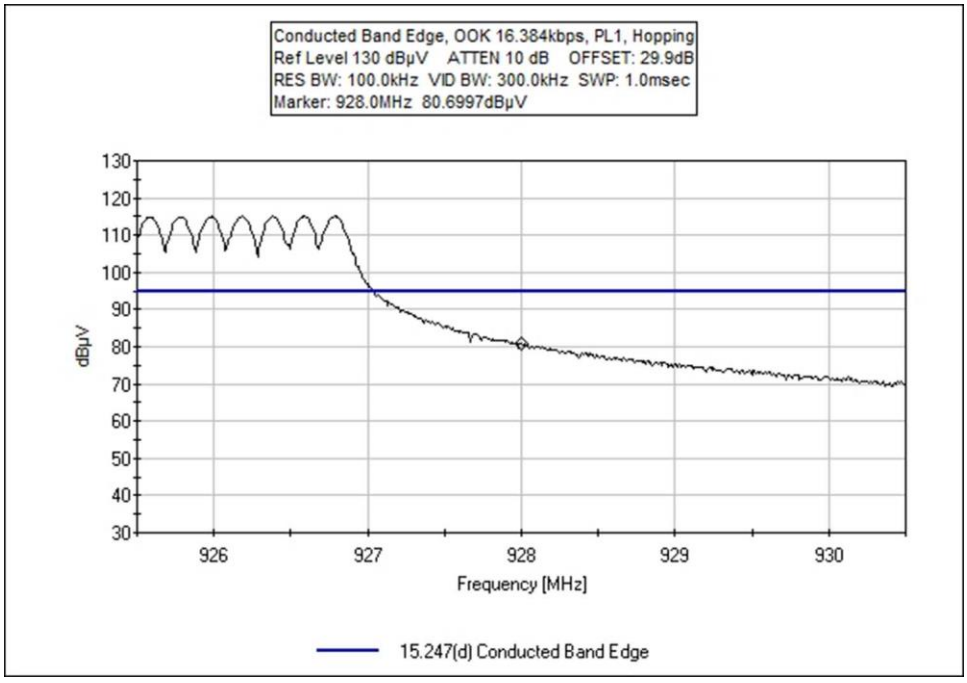
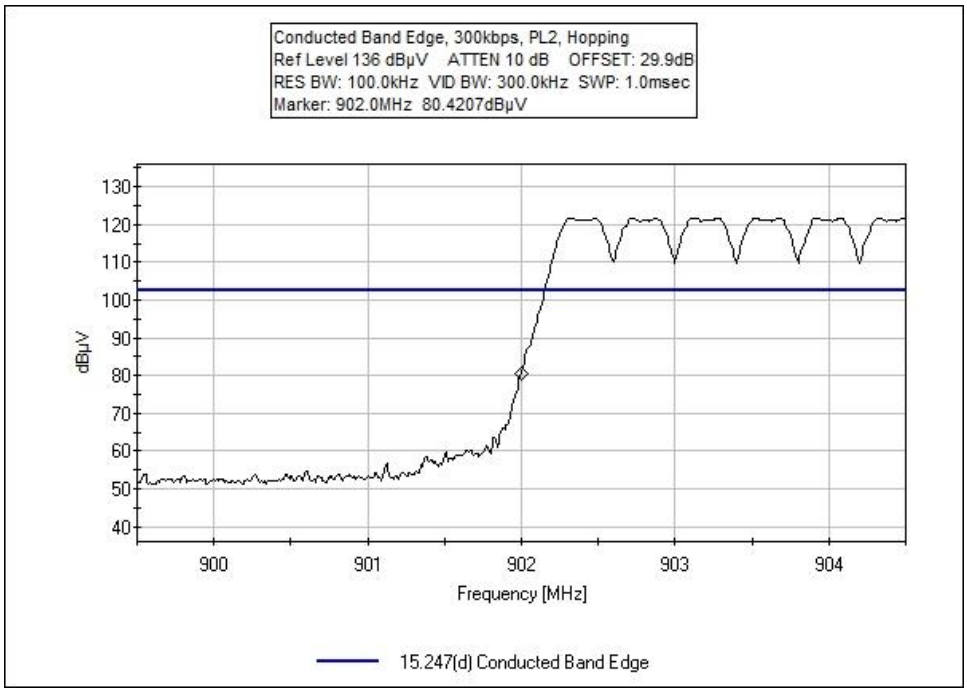
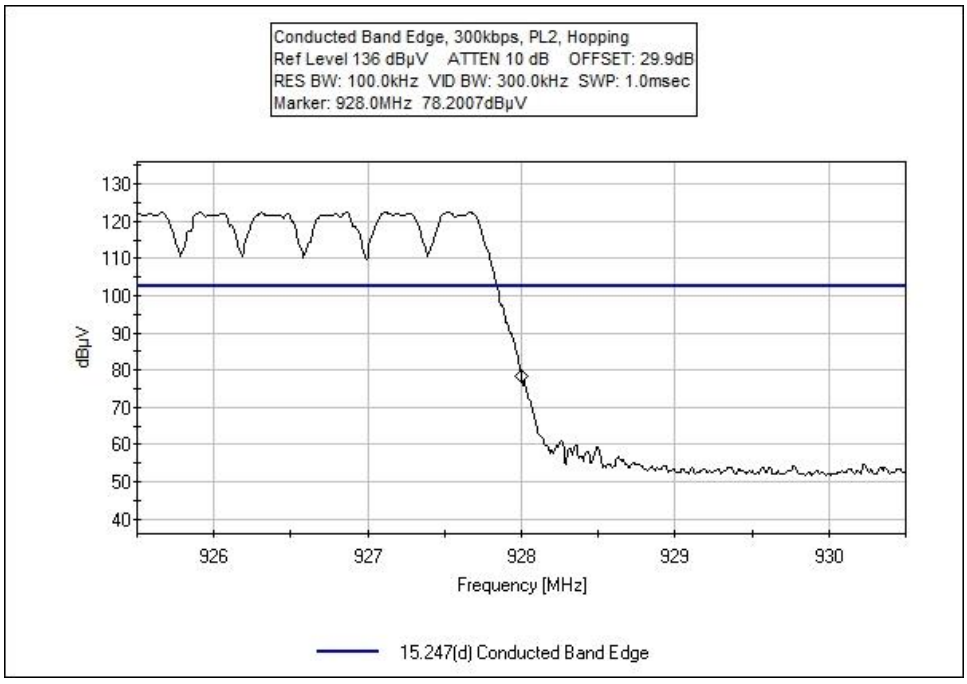

Conducted Band Edge, OOK 16.384kbps, PL3, Hopping
Ref Level 136 dBµV ATTEN 10 dB OFFSET: 29.9dB
RES BW: 100.0kHz VID BW: 300.0kHz SWP: 1.0msec
Marker: 902.0MHz 89.6867dBµV
dBµV
130
120
110
100
90
80
70
60
50
40
900
901
902
903
904
Frequency [MHz]
15.247(d) Conducted Band Edge


Conducted Band Edge, OOK 16.384kbps, PL3, Hopping
Ref Level 136 dBµV ATTEN 10 dB OFFSET: 29.9dB
RES BW: 100.0kHz VID BW: 300.0kHz SWP: 1.0msec
Marker: 928.0MHz 89.2607dBµV
dBµV
130
120
110
100
90
80
70
60
50
40
926
927
928
929
930
Frequency [MHz]
15.247(d) Conducted Band Edge


Conducted Band Edge, OOK 16.384kbps, PL1, Hopping
Ref Level 130 dBµV ATTEN 10 dB OFFSET: 29.9dB
RES BW: 100.0kHz VID BW: 300.0kHz SWP: 1.0msec
Marker: 902.0MHz 81.7557dBµV
dBµV
130
120
110
100
90
80
70
60
50
40
30
900
901
902
903
904
Frequency [MHz]
15.247(d) Conducted Band Edge


Conducted Band Edge, OOK 16.384kbps, PL1, Hopping
Ref Level 130 dBµV ATTEN 10 dB OFFSET: 29.9dB
RES BW: 100.0kHz VID BW: 300.0kHz SWP: 1.0msec
Marker: 928.0MHz 80.6997dBµV
dBµV
130
120
110
100
90
80
70
60
50
40
30
926
927
928
929
930
Frequency [MHz]
15.247(d) Conducted Band Edge


Conducted Band Edge, 300kbps, PL2, Hopping
Ref Level 136 dBµV ATTEN 10 dB OFFSET: 29.9dB
RES BW: 100.0kHz VID BW: 300.0kHz SWP: 1.0msec
Marker: 902.0MHz 80.4207dBµV
dBµV
130
120
110
100
90
80
70
60
50
40
900
901
902
903
904
Frequency [MHz]
15.247(d) Conducted Band Edge


Conducted Band Edge, 300kbps, PL2, Hopping
Ref Level 136 dBµV ATTEN 10 dB OFFSET: 29.9dB
RES BW: 100.0kHz VID BW: 300.0kHz SWP: 1.0msec
Marker: 928.0MHz 78.2007dBµV
dBµV
130
120
110
100
90
80
70
60
50
40
926
927
928
929
930
Frequency [MHz]
15.247(d) Conducted Band Edge

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) Conducted Band Edge**		
Work Order #:	**105379**	Date:	5/11/2021
Test Type:	**Conducted Emissions**	Time:	16:07:20
Tested By:	S. Yamamoto	Sequence#:	6
Software:	EMITest 5.03.19		3.6Vdc

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

Test Conditions / Notes:

The equipment under test (EUT) is connected to a laptop computer via USB to serial interface board. The laptop is running Command Line Interface (CLI) Tool. This software is used to run the scripts for setting the EUT parameters.

The RF output has been configured to a coaxial cable output with sma connector. The output is connected to the spectrum analyzer using a coaxial cable and power attenuator.

Frequency range of test: 899MHz to 931MHz.
Low Channel 903.0MHz
High Channel 926.8MHz
Hopping

RBW=100kHz, VBW=300kHz

Output level 3 OOK 16.384kbps

Test Environment Conditions:
Temperature: 22°C
Relative Humidity: 49%
Pressure: 99kPa

Site D

Reference 558074 D01 15.247 Meas Guidance v05r02 and ANSI C63.10-2013

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN02869	Spectrum Analyzer	E4440A	8/3/2020	8/3/2021
T2	AN03432	Attenuator	90-30-34	10/22/2019	10/22/2021
T3	ANP07656	Cable	32022-29094K-29094K-24TC	7/30/2020	7/30/2022

Measurement Data: Reading listed by margin. Test Lead: Antenna Port

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	dB	Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1	902.000M	59.9	+0.0	+29.6	+0.3		+0.0	89.8	103.1 Single	-13.3	Anten
2	902.000M	59.8	+0.0	+29.6	+0.3		+0.0	89.7	103.1 Hopping	-13.4	Anten
3	928.000M	59.4	+0.0	+29.6	+0.3		+0.0	89.3	103.1 Hopping	-13.8	Anten
4	928.000M	59.2	+0.0	+29.6	+0.3		+0.0	89.1	103.1 Single	-14.0	Anten

Test Location:	CKC Laboratories Inc. • 110 N Olinda Pl • Brea CA 92823 • 714-993-6112		
Customer:	**Itron, Inc.**		
Specification:	**15.247(d) Conducted Band Edge**		
Work Order #:	**105379**	Date:	5/11/2021
Test Type:	**Conducted Emissions**	Time:	17:05:29
Tested By:	S. Yamamoto	Sequence#:	7
Software:	EMITest 5.03.19		3.6Vdc

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

Test Conditions / Notes:

The equipment under test (EUT) is connected to a laptop computer via USB to serial interface board. The laptop is running Command Line Interface (CLI) Tool. This software is used to run the scripts for setting the EUT parameters.

The RF output has been configured to a coaxial cable output with sma connector. The output is connected to the spectrum analyzer using a coaxial cable and power attenuator.

Frequency range of test: 899MHz to 931MHz.
Low Channel 903.0MHz
High Channel 926.8MHz
Hopping

RBW=100kHz, VBW=300kHz

Output level 1 OOK 16.384kbps

Test Environment Conditions:
Temperature: 22°C
Relative Humidity: 49%
Pressure: 99kPa

Site D

Reference 558074 D01 15.247 Meas Guidance v05r02 and ANSI C63.10-2013

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN02869	Spectrum Analyzer	E4440A	8/3/2020	8/3/2021
T2	AN03432	Attenuator	90-30-34	10/22/2019	10/22/2021
T3	ANP07656	Cable	32022-29094K-29094K-24TC	7/30/2020	7/30/2022

Measurement Data: Reading listed by margin. Test Lead: Antenna Port

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	dB	Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1	902.000M	51.9	+0.0	+29.6	+0.3		+0.0	81.8	95.0 Hopping	-13.2	Anten
2	902.000M	51.7	+0.0	+29.6	+0.3		+0.0	81.6	95.0 Single	-13.4	Anten
3	928.000M	50.8	+0.0	+29.6	+0.3		+0.0	80.7	95.0 Hopping	-14.3	Anten
4	928.000M	50.8	+0.0	+29.6	+0.3		+0.0	80.7	95.0 Single	-14.3	Anten

Test Location:	CKC Laboratories Inc • 110 N Olinda Pl • Brea CA 92823 • 714-993-6112		
Customer:	**Itron, Inc.**		
Specification:	**15.247(d) Conducted Band Edge**		
Work Order #:	**105379**	Date:	5/13/2021
Test Type:	**Conducted Emissions**	Time:	10:12:55
Tested By:	S. Yamamoto	Sequence#:	9
Software:	EMITest 5.03.19		3.6Vdc

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

Test Conditions / Notes:

The equipment under test (EUT) is connected to a laptop computer via USB to serial interface board. The laptop is running Command Line Interface (CLI) Tool. This software is used to run the scripts for setting the EUT parameters.

The RF output has been configured to a coaxial cable output with sma connector. The output is connected to the spectrum analyzer using a coaxial cable and power attenuator.

Frequency range of test: 899MHz to 931MHz.
Low channel 902.4MHz
High channel 927.6MHz
Hopping

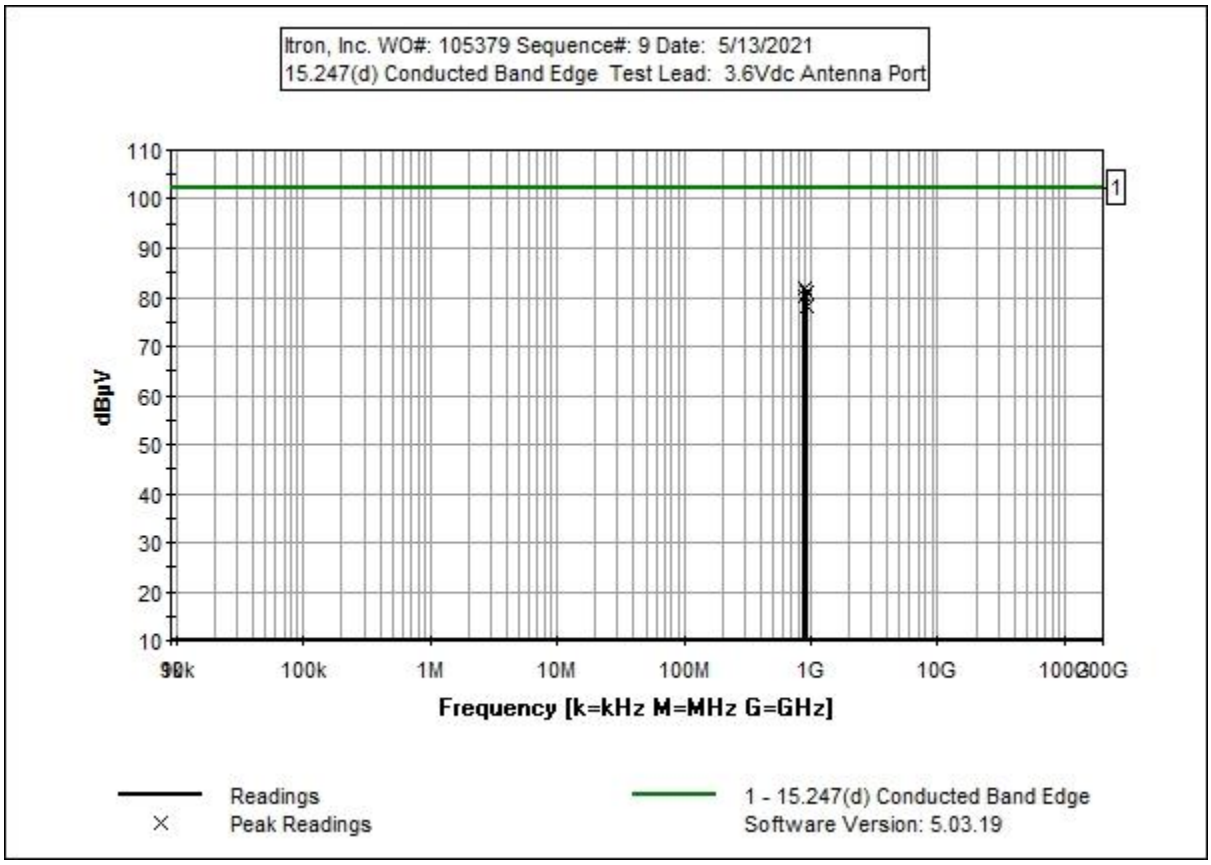
RBW=100kHz, VBW=300kHz

Output level 2 300kbps

Test Environment Conditions:
Temperature: 20°C
Relative Humidity: 53%
Pressure: 99kPa

Site D

Reference 558074 D01 15.247 Meas Guidance v05r02 and ANSI C63.10-2013



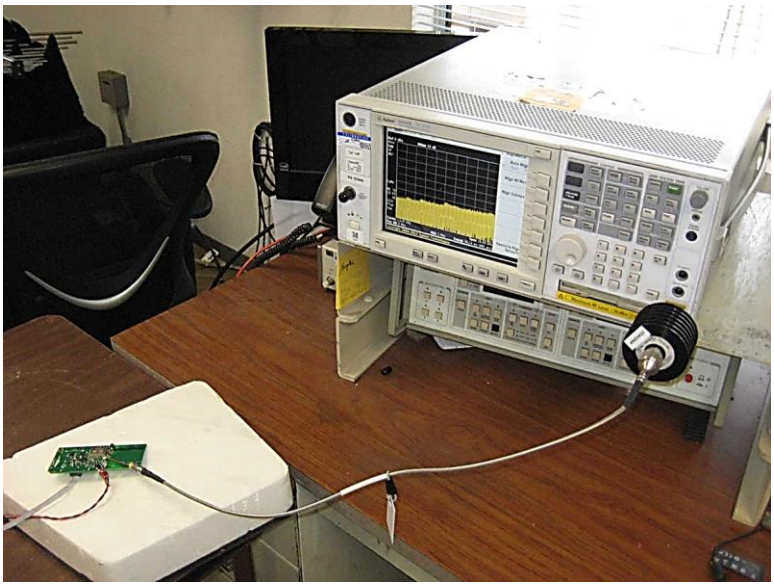
Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN02869	Spectrum Analyzer	E4440A	8/3/2020	8/3/2021
T2	AN03432	Attenuator	90-30-34	10/22/2019	10/22/2021
T3	ANP07656	Cable	32022-29094K-29094K-24TC	7/30/2020	7/30/2022

Measurement Data: Reading listed by margin. Test Lead: Antenna Port

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	dB	Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1	902.000M	51.8	+0.0	+29.6	+0.3		+0.0	81.7	102.4 Single	-20.7	Anten
2	928.000M	51.1	+0.0	+29.6	+0.3		+0.0	81.0	102.4 Single	-21.4	Anten
3	902.000M	50.5	+0.0	+29.6	+0.3		+0.0	80.4	102.4 Hopping	-22.0	Anten
4	928.000M	48.3	+0.0	+29.6	+0.3		+0.0	78.2	102.4 Hopping	-24.2	Anten

Test Setup Photo(s)



15.247(d) Radiated Emissions & Band Edge

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 #:	**105379**	Date:	5/18/2021
Test Type:	**Maximized Emissions**	Time:	15:11:57
Tested By:	S. Yamamoto	Sequence#:	18
Software:	EMITest 5.03.19		

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 2			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 2			

Test Conditions / Notes:

The equipment under test (EUT) is connected to a laptop computer via USB to serial interface board. The laptop is running Command Line Interface (CLI) Tool. This software is used to run the scripts for setting the EUT parameters.

Once the parameters have been set, the support equipment is removed from the EUT.

Frequency range of test: 9kHz to 9.28GHz.

Test Channels:
Low channel 903.0MHz
Middle channel 915.0MHz
High channel 926.8MHz

RBW=1MHz, VBW=3MHz

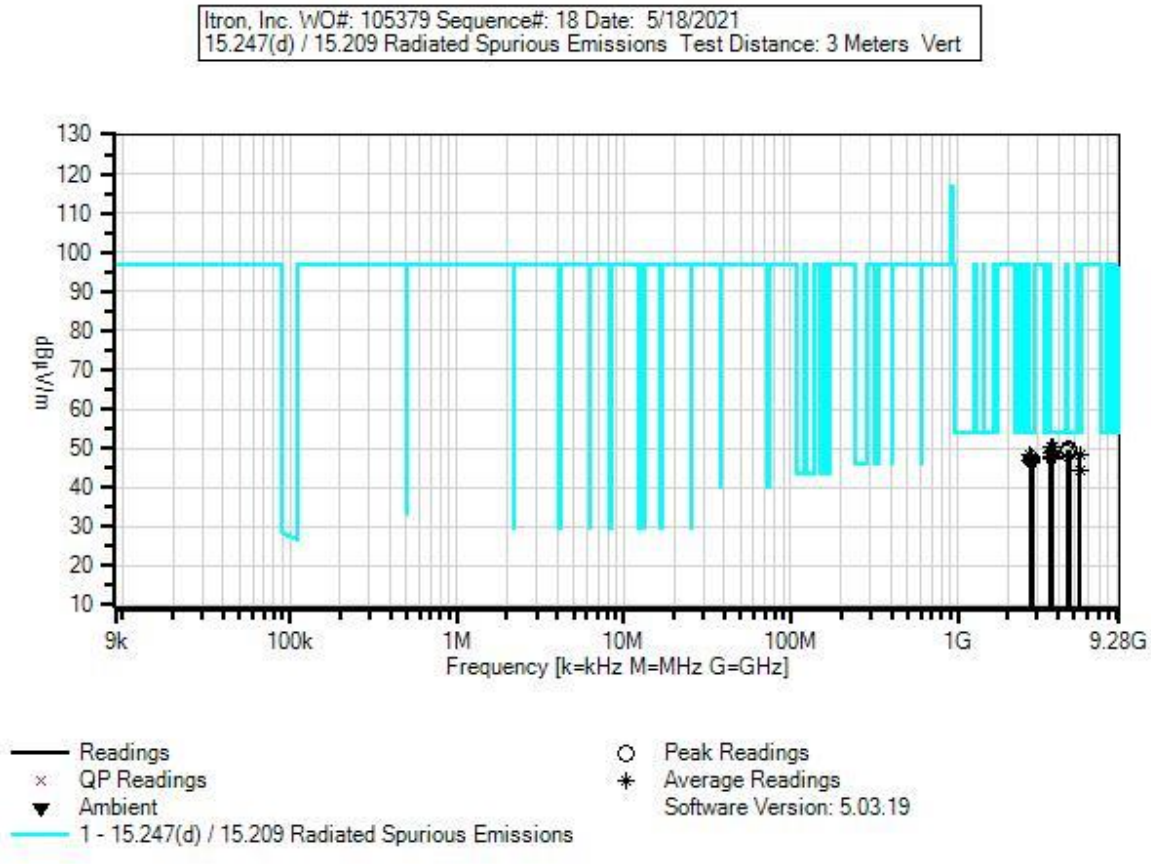
Output level 3 OOK

The manufacturer declares the worst case duty cycle is 28.05ms per 100ms. The duty cycle correction factor is 20 log (28.05/100) =-11.04dB. The average reading in the restricted bands is calculated from the peak reading with the duty cycle correction factor.

Test Environment Conditions:
Temperature: 21°C
Relative Humidity: 53%
Pressure: 99kPa

Site D

The EUT is powered from a new 3.6V lithium battery
Test Method: ANSI C63.10-2013



Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN02869	Spectrum Analyzer	E4440A	8/3/2020	8/3/2021
T2	ANP04382	Cable	LDF-50	5/15/2020	5/15/2022
T3	ANP07138	Cable	ANDL1-PNMNM-60	3/30/2021	3/30/2023
T4	AN00787	Preamp	83017A	5/31/2019	5/31/2021
T5	ANP07657	Cable	32022-29094K-29094K-24TC	7/30/2020	7/30/2022
T6	AN03169	High Pass Filter	HM1155-11SS	5/10/2021	5/10/2023
T7	AN01646	Horn Antenna	3115	3/17/2020	3/17/2022
	ANP06978	Cable	Sucoflex 104A	3/26/2020	3/26/2022
	AN00010	Preamp	8447D	1/2/2020	1/2/2022
	ANP05569	Cable-Amplitude +15C to +45C (dB)	RG-214/U	12/14/2020	12/14/2022
	ANP05283	Attenuator	ATT-0218-06-NNN-02	3/26/2020	3/26/2022
	AN01994	Biconilog Antenna	CBL6111C	4/14/2020	4/14/2022
	AN00314	Loop Antenna	6502	4/13/2020	4/13/2022

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

#	Freq	Rdng	T1 T5	T2 T6	T3 T7	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant
1	3660.000M	44.4	+0.0	+7.4	+5.0	-40.0	+0.0	50.2	54.0	-3.8	Horiz
	Ave		+0.6	+0.4	+32.4						
^	3660.000M	55.4	+0.0	+7.4	+5.0	-40.0	+0.0	61.2	54.0	+7.2	Horiz
			+0.6	+0.4	+32.4						
3	3707.200M	43.8	+0.0	+7.4	+5.1	-39.9	+0.0	50.1	54.0	-3.9	Horiz
	Ave		+0.6	+0.4	+32.7						
^	3707.200M	54.8	+0.0	+7.4	+5.1	-39.9	+0.0	61.1	54.0	+7.1	Horiz
			+0.6	+0.4	+32.7						
5	4634.003M	41.9	+0.0	+8.3	+5.7	-39.9	+0.0	49.8	54.0	-4.2	Horiz
			+0.6	+0.2	+33.0						
6	4634.000M	41.8	+0.0	+8.3	+5.7	-39.9	+0.0	49.7	54.0	-4.3	Vert
			+0.6	+0.2	+33.0						
7	4575.001M	41.7	+0.0	+8.2	+5.7	-39.8	+0.0	49.5	54.0	-4.5	Vert
			+0.6	+0.3	+32.8						
8	3707.200M	43.2	+0.0	+7.4	+5.1	-39.9	+0.0	49.5	54.0	-4.5	Vert
	Ave		+0.6	+0.4	+32.7						
^	3707.200M	54.2	+0.0	+7.4	+5.1	-39.9	+0.0	60.5	54.0	+6.5	Vert
			+0.6	+0.4	+32.7						
10	4575.000M	41.6	+0.0	+8.2	+5.7	-39.8	+0.0	49.4	54.0	-4.6	Horiz
			+0.6	+0.3	+32.8						
11	4515.011M	41.4	+0.0	+8.1	+5.7	-39.7	+0.0	49.0	54.0	-5.0	Horiz
			+0.6	+0.3	+32.6						
12	4515.000M	41.4	+0.0	+8.1	+5.7	-39.7	+0.0	49.0	54.0	-5.0	Vert
			+0.6	+0.3	+32.6						
13	3612.000M	43.6	+0.0	+7.3	+4.9	-40.0	+0.0	48.9	54.0	-5.1	Horiz
	Ave		+0.6	+0.4	+32.1						
^	3612.000M	54.6	+0.0	+7.3	+4.9	-40.0	+0.0	59.9	54.0	+5.9	Horiz
			+0.6	+0.4	+32.1						
15	2709.000M	48.3	+0.0	+6.0	+4.2	-40.0	+0.0	48.4	54.0	-5.6	Vert
	Ave		+0.5	+0.3	+29.1						
^	2709.000M	59.3	+0.0	+6.0	+4.2	-40.0	+0.0	59.4	54.0	+5.4	Vert
			+0.5	+0.3	+29.1						
17	5418.000M	37.8	+0.0	+8.9	+6.1	-39.7	+0.0	48.3	54.0	-5.7	Horiz
	Ave		+0.8	+0.2	+34.2						
^	5418.000M	48.8	+0.0	+8.9	+6.1	-39.7	+0.0	59.3	54.0	+5.3	Horiz
			+0.8	+0.2	+34.2						
19	2745.000M	47.4	+0.0	+6.0	+4.2	-40.0	+0.0	47.7	54.0	-6.3	Vert
	Ave		+0.5	+0.3	+29.3						
^	2745.000M	58.4	+0.0	+6.0	+4.2	-40.0	+0.0	58.7	54.0	+4.7	Vert
			+0.5	+0.3	+29.3						
21	3660.000M	41.9	+0.0	+7.4	+5.0	-40.0	+0.0	47.7	54.0	-6.3	Vert
	Ave		+0.6	+0.4	+32.4						
^	3660.000M	52.9	+0.0	+7.4	+5.0	-40.0	+0.0	58.7	54.0	+4.7	Vert
			+0.6	+0.4	+32.4						
23	3612.000M	41.9	+0.0	+7.3	+4.9	-40.0	+0.0	47.2	54.0	-6.8	Vert
	Ave		+0.6	+0.4	+32.1						
^	3612.000M	52.9	+0.0	+7.3	+4.9	-40.0	+0.0	58.2	54.0	+4.2	Vert
			+0.6	+0.4	+32.1						

25	2745.000M	46.8	+0.0	+6.0	+4.2	-40.0	+0.0	47.1	54.0	-6.9	Horiz
	Ave		+0.5	+0.3	+29.3						
^	2745.000M	57.8	+0.0	+6.0	+4.2	-40.0	+0.0	58.1	54.0	+4.1	Horiz
			+0.5	+0.3	+29.3						
27	2709.000M	46.9	+0.0	+6.0	+4.2	-40.0	+0.0	47.0	54.0	-7.0	Horiz
	Ave		+0.5	+0.3	+29.1						
^	2709.000M	57.9	+0.0	+6.0	+4.2	-40.0	+0.0	58.0	54.0	+4.0	Horiz
			+0.5	+0.3	+29.1						
29	2780.400M	46.1	+0.0	+6.1	+4.3	-40.0	+0.0	46.8	54.0	-7.2	Horiz
	Ave		+0.5	+0.3	+29.5						
^	2780.400M	57.1	+0.0	+6.1	+4.3	-40.0	+0.0	57.8	54.0	+3.8	Horiz
			+0.5	+0.3	+29.5						
31	2780.400M	45.5	+0.0	+6.1	+4.3	-40.0	+0.0	46.2	54.0	-7.8	Vert
	Ave		+0.5	+0.3	+29.5						
^	2780.400M	56.5	+0.0	+6.1	+4.3	-40.0	+0.0	57.2	54.0	+3.2	Vert
			+0.5	+0.3	+29.5						
33	5418.000M	34.1	+0.0	+8.9	+6.1	-39.7	+0.0	44.6	54.0	-9.4	Vert
	Ave		+0.8	+0.2	+34.2						
^	5418.000M	45.1	+0.0	+8.9	+6.1	-39.7	+0.0	55.6	54.0	+1.6	Vert
			+0.8	+0.2	+34.2						

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 #:	**105379**	Date:	5/18/2021
Test Type:	**Maximized Emissions**	Time:	16:59:56
Tested By:	S. Yamamoto	Sequence#:	19
Software:	EMITest 5.03.19		

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 2			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 2			

Test Conditions / Notes:

The equipment under test (EUT) is connected to a laptop computer via USB to serial interface board. The laptop is running Command Line Interface (CLI) Tool. This software is used to run the scripts for setting the EUT parameters.

Once the parameters have been set, the support equipment is removed from the EUT.

Frequency range of test: 9kHz to 9.28GHz.

Test Channels
Low channel 903.0MHz
Middle channel 915.0MHz
High channel 926.8MHz

RBW=1MHz, VBW=3MHz

Output level 1 OOK

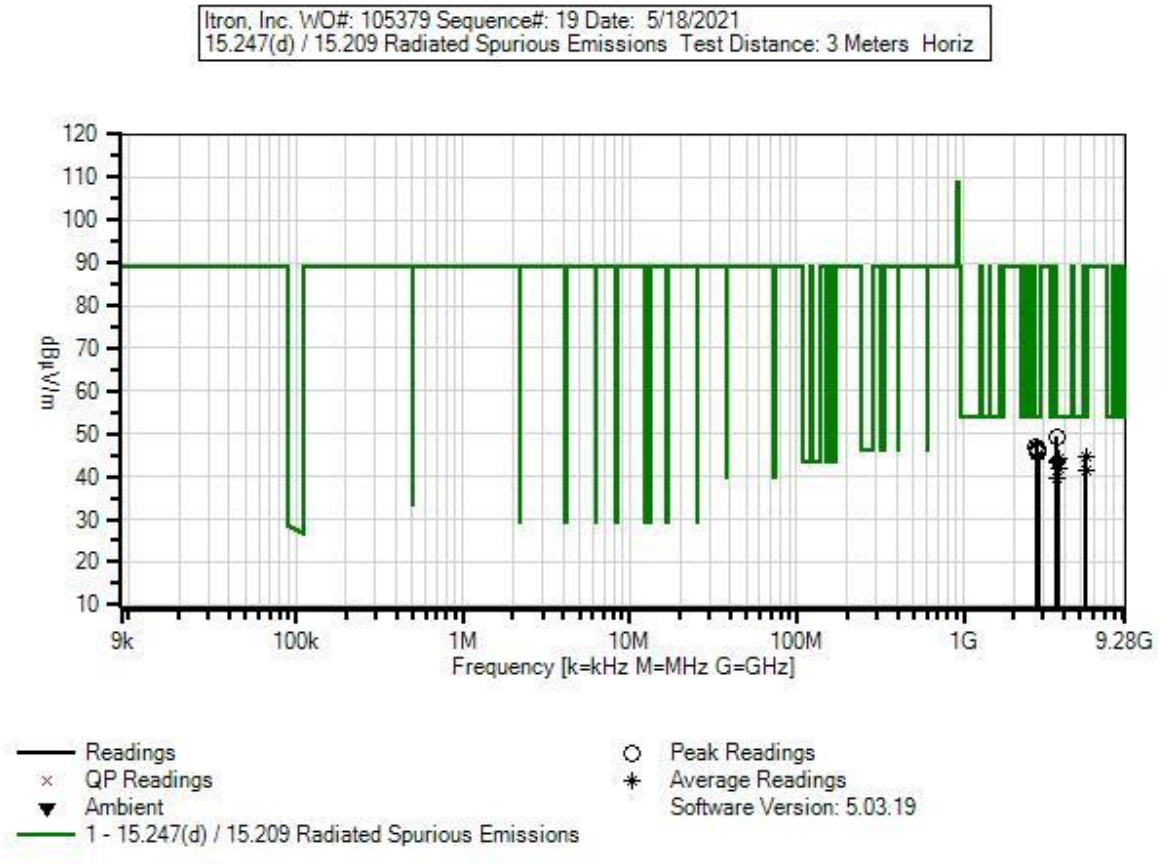
The manufacturer declares the worst case duty cycle is 28.05ms per 100ms. The duty cycle correction factor is 20 log (28.05/100) =-11.04dB. The average reading in the restricted bands is calculated from the peak reading with the duty cycle correction factor.

Test Environment Conditions:
Temperature: 21°C
Relative Humidity: 53%
Pressure: 99kPa

Site D

The EUT is powered from a new 3.6V lithium battery

Test Method: ANSI C63.10-2013



Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN02869	Spectrum Analyzer	E4440A	8/3/2020	8/3/2021
T2	ANP04382	Cable	LDF-50	5/15/2020	5/15/2022
T3	ANP07138	Cable	ANDL1-PNMNM-60	3/30/2021	3/30/2023
T4	AN00787	Preamp	83017A	5/31/2019	5/31/2021
T5	ANP07657	Cable	32022-29094K-29094K-24TC	7/30/2020	7/30/2022
T6	AN03169	High Pass Filter	HM1155-11SS	5/10/2021	5/10/2023
T7	AN01646	Horn Antenna	3115	3/17/2020	3/17/2022
	AN00010	Preamp	8447D	1/2/2020	1/2/2022
	AN00314	Loop Antenna	6502	4/13/2020	4/13/2022
	AN01994	Biconilog Antenna	CBL6111C	4/14/2020	4/14/2022
	ANP05283	Attenuator	ATT-0218-06-NNN-02	3/26/2020	3/26/2022
	ANP05569	Cable-Amplitude +15C to +45C (dB)	RG-214/U	12/14/2020	12/14/2022
	ANP06978	Cable	Sucoflex 104A	3/26/2020	3/26/2022

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

#	Freq	Rdng	T1 T5	T2 T6	T3 T7	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant
1	3611.953M	44.1	+0.0 +0.6	+7.3 +0.4	+4.9 +32.1	-40.0	+0.0	49.4	54.0	-4.6	Vert
2	2709.000M	46.9	+0.0 +0.5	+6.0 +0.3	+4.2 +29.1	-40.0	+0.0	47.0	54.0	-7.0	Horiz
3	2709.000M	46.6	+0.0 +0.5	+6.0 +0.3	+4.2 +29.1	-40.0	+0.0	46.7	54.0	-7.3	Vert
4	2745.020M	46.2	+0.0 +0.5	+6.0 +0.3	+4.2 +29.3	-40.0	+0.0	46.5	54.0	-7.5	Horiz
5	2745.000M	45.9	+0.0 +0.5	+6.0 +0.3	+4.2 +29.3	-40.0	+0.0	46.2	54.0	-7.8	Vert
6	2780.406M	45.1	+0.0 +0.5	+6.1 +0.3	+4.3 +29.5	-40.0	+0.0	45.8	54.0	-8.2	Vert
7	2780.321M	44.8	+0.0 +0.5	+6.1 +0.3	+4.3 +29.5	-40.0	+0.0	45.5	54.0	-8.5	Horiz
8	5418.000M Ave	34.3	+0.0 +0.8	+8.9 +0.2	+6.1 +34.2	-39.7	+0.0	44.8	54.0	-9.2	Horiz
^	5418.000M	45.3	+0.0 +0.8	+8.9 +0.2	+6.1 +34.2	-39.7	+0.0	55.8	54.0	+1.8	Horiz
10	3707.200M Ave	38.1	+0.0 +0.6	+7.4 +0.4	+5.1 +32.7	-39.9	+0.0	44.4	54.0	-9.6	Horiz
^	3707.200M	49.1	+0.0 +0.6	+7.4 +0.4	+5.1 +32.7	-39.9	+0.0	55.4	54.0	+1.4	Horiz
12	3612.000M Ave	38.2	+0.0 +0.6	+7.3 +0.4	+4.9 +32.1	-40.0	+0.0	43.5	54.0	-10.5	Horiz
^	3612.000M	49.2	+0.0 +0.6	+7.3 +0.4	+4.9 +32.1	-40.0	+0.0	54.5	54.0	+0.5	Horiz
14	3660.000M Ave	37.3	+0.0 +0.6	+7.4 +0.4	+5.0 +32.4	-40.0	+0.0	43.1	54.0	-10.9	Horiz
^	3660.000M	48.3	+0.0 +0.6	+7.4 +0.4	+5.0 +32.4	-40.0	+0.0	54.1	54.0	+0.1	Horiz
16	3707.200M Ave	35.5	+0.0 +0.6	+7.4 +0.4	+5.1 +32.7	-39.9	+0.0	41.8	54.0	-12.2	Vert
^	3707.200M	46.5	+0.0 +0.6	+7.4 +0.4	+5.1 +32.7	-39.9	+0.0	52.8	54.0	-1.2	Vert
18	5418.000M Ave	31.1	+0.0 +0.8	+8.9 +0.2	+6.1 +34.2	-39.7	+0.0	41.6	54.0	-12.4	Vert
^	5418.000M	42.1	+0.0 +0.8	+8.9 +0.2	+6.1 +34.2	-39.7	+0.0	52.6	54.0	-1.4	Vert
20	3660.000M Ave	33.9	+0.0 +0.6	+7.4 +0.4	+5.0 +32.4	-40.0	+0.0	39.7	54.0	-14.3	Vert
^	3660.000M	44.9	+0.0 +0.6	+7.4 +0.4	+5.0 +32.4	-40.0	+0.0	50.7	54.0	-3.3	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 #:	**105379**	Date:	5/25/2021
Test Type:	**Maximized Emissions**	Time:	15:10:09
Tested By:	S. Yamamoto	Sequence#:	21
Software:	EMITest 5.03.19		

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 2			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 2			

Test Conditions / Notes:

The equipment under test (EUT) is connected to a laptop computer via USB to serial interface board. The laptop is running Command Line Interface (CLI) Tool. This software is used to run the scripts for setting the EUT parameters.

Once the parameters have been set, the support equipment is removed from the EUT.

Frequency range of test: 9kHz to 9.28GHz.

Test Channels:
Low channel 902.4MHz
Middle channel 915.2MHz
High channel 927.6MHz

RBW=1MHz, VBW=3MHz

Output level 2 300kbps

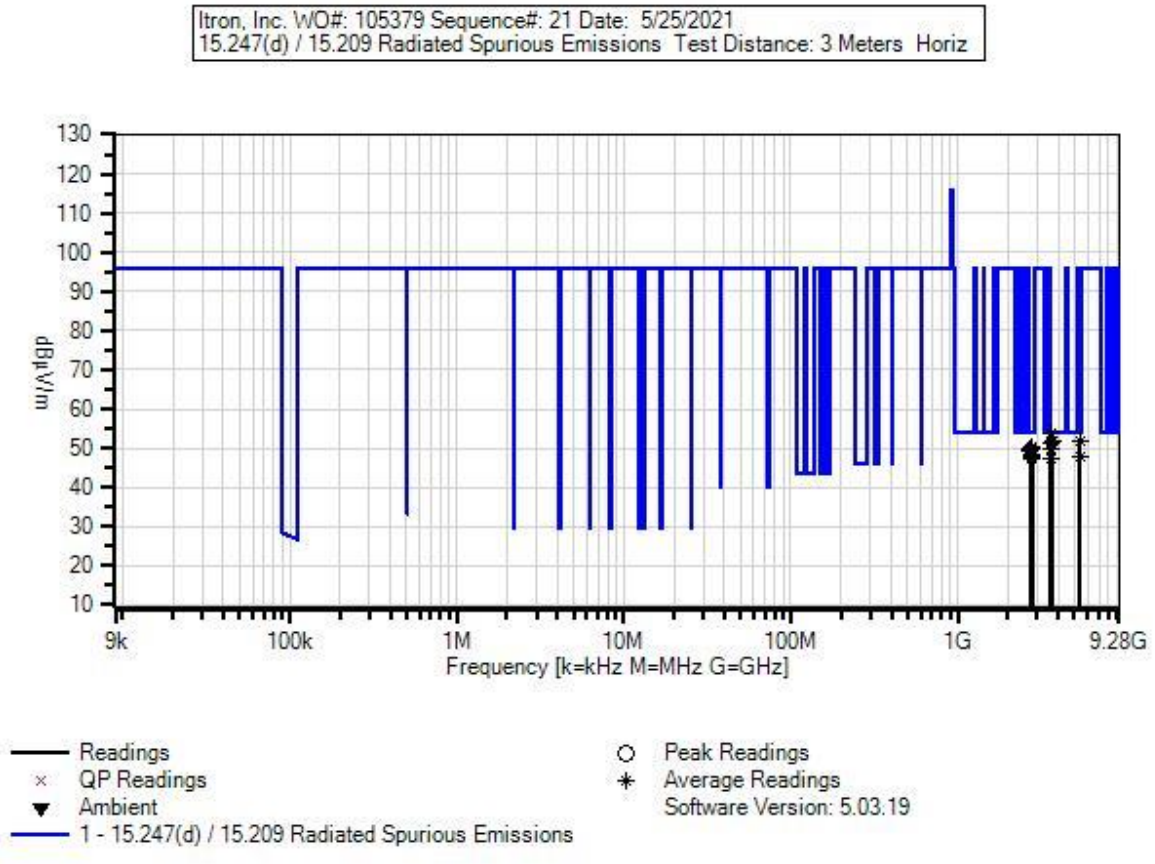
The manufacturer declares the worst case duty cycle is 45ms per 100ms. The duty cycle correction factor is 20log(45/100)=-6.94dB. The average reading in the restricted bands is calculated from the peak reading with the duty cycle correction factor.

Test Environment Conditions:
Temperature: 23°C
Humidity: 43%
Pressure: 99kPa

Site D

The EUT is powered from a new 3.6V lithium battery

Test Method: ANSI C63.10-2013



Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN02869	Spectrum Analyzer	E4440A	8/3/2020	8/3/2021
T2	ANP04382	Cable	LDF-50	5/15/2020	5/15/2022
T3	ANP07138	Cable	ANDL1-PNMNM-60	3/30/2021	3/30/2023
T4	AN00787	Preamp	83017A	5/31/2019	5/31/2021
T5	ANP07657	Cable	32022-29094K-29094K-24TC	7/30/2020	7/30/2022
T6	AN03169	High Pass Filter	HM1155-11SS	5/10/2021	5/10/2023
T7	AN01646	Horn Antenna	3115	3/17/2020	3/17/2022
	AN00010	Preamp	8447D	1/2/2020	1/2/2022
	AN01994	Biconilog Antenna	CBL6111C	4/14/2020	4/14/2022
	ANP05283	Attenuator	ATT-0218-06-NNN-02	3/26/2020	3/26/2022
	ANP05569	Cable-Amplitude +15C to +45C (dB)	RG-214/U	12/14/2020	12/14/2022
	ANP06978	Cable	Sucoflex 104A	3/26/2020	3/26/2022
	AN00314	Loop Antenna	6502	4/13/2020	4/13/2022

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

#	Freq	Rdng	T1 T5	T2 T6	T3 T7	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant
1	3609.298M	48.7	+0.0	+7.3	+4.9	-40.0	+0.0	54.0	54.0	+0.0	Horiz
	Ave		+0.6	+0.4	+32.1						
^	3609.298M	55.6	+0.0	+7.3	+4.9	-40.0	+0.0	60.9	54.0	+6.9	Horiz
			+0.6	+0.4	+32.1						
3	5414.841M	41.5	+0.0	+8.9	+6.1	-39.7	+0.0	52.0	54.0	-2.0	Horiz
	Ave		+0.8	+0.2	+34.2						
^	5414.841M	48.4	+0.0	+8.9	+6.1	-39.7	+0.0	58.9	54.0	+4.9	Horiz
			+0.8	+0.2	+34.2						
5	3710.092M	45.6	+0.0	+7.4	+5.1	-39.9	+0.0	51.9	54.0	-2.1	Horiz
	Ave		+0.6	+0.4	+32.7						
^	3710.092M	52.5	+0.0	+7.4	+5.1	-39.9	+0.0	58.8	54.0	+4.8	Horiz
			+0.6	+0.4	+32.7						
7	3710.696M	45.4	+0.0	+7.4	+5.1	-39.9	+0.0	51.7	54.0	-2.3	Horiz
	Ave		+0.6	+0.4	+32.7						
^	3710.696M	52.3	+0.0	+7.4	+5.1	-39.9	+0.0	58.6	54.0	+4.6	Horiz
			+0.6	+0.4	+32.7						
9	3660.497M	45.3	+0.0	+7.4	+5.0	-40.0	+0.0	51.1	54.0	-2.9	Horiz
	Ave		+0.6	+0.4	+32.4						
^	3660.497M	52.2	+0.0	+7.4	+5.0	-40.0	+0.0	58.0	54.0	+4.0	Horiz
			+0.6	+0.4	+32.4						
11	2745.377M	50.1	+0.0	+6.0	+4.2	-40.0	+0.0	50.4	54.0	-3.6	Horiz
	Ave		+0.5	+0.3	+29.3						
^	2745.377M	57.0	+0.0	+6.0	+4.2	-40.0	+0.0	57.3	54.0	+3.3	Horiz
			+0.5	+0.3	+29.3						
13	3661.098M	44.0	+0.0	+7.4	+5.0	-40.0	+0.0	49.8	54.0	-4.2	Vert
	Ave		+0.6	+0.4	+32.4						
^	3661.098M	50.9	+0.0	+7.4	+5.0	-40.0	+0.0	56.7	54.0	+2.7	Vert
			+0.6	+0.4	+32.4						
15	2706.974M	49.5	+0.0	+6.0	+4.2	-40.0	+0.0	49.6	54.0	-4.4	Vert
	Ave		+0.5	+0.3	+29.1						
^	2706.974M	56.4	+0.0	+6.0	+4.2	-40.0	+0.0	56.5	54.0	+2.5	Vert
			+0.5	+0.3	+29.1						
17	2745.364M	49.3	+0.0	+6.0	+4.2	-40.0	+0.0	49.6	54.0	-4.4	Vert
	Ave		+0.5	+0.3	+29.3						
^	2745.364M	56.2	+0.0	+6.0	+4.2	-40.0	+0.0	56.5	54.0	+2.5	Vert
			+0.5	+0.3	+29.3						
19	2706.974M	49.2	+0.0	+6.0	+4.2	-40.0	+0.0	49.3	54.0	-4.7	Horiz
	Ave		+0.5	+0.3	+29.1						
^	2706.974M	56.1	+0.0	+6.0	+4.2	-40.0	+0.0	56.2	54.0	+2.2	Horiz
			+0.5	+0.3	+29.1						
21	2783.015M	47.5	+0.0	+6.1	+4.3	-40.0	+0.0	48.2	54.0	-5.8	Horiz
	Ave		+0.5	+0.3	+29.5						
22	2783.030M	47.2	+0.0	+6.1	+4.3	-40.0	+0.0	47.9	54.0	-6.1	Horiz
	Ave		+0.5	+0.3	+29.5						
23	5414.857M	37.4	+0.0	+8.9	+6.1	-39.7	+0.0	47.9	54.0	-6.1	Vert
	Ave		+0.8	+0.2	+34.2						
^	5414.857M	44.3	+0.0	+8.9	+6.1	-39.7	+0.0	54.8	54.0	+0.8	Vert
			+0.8	+0.2	+34.2						

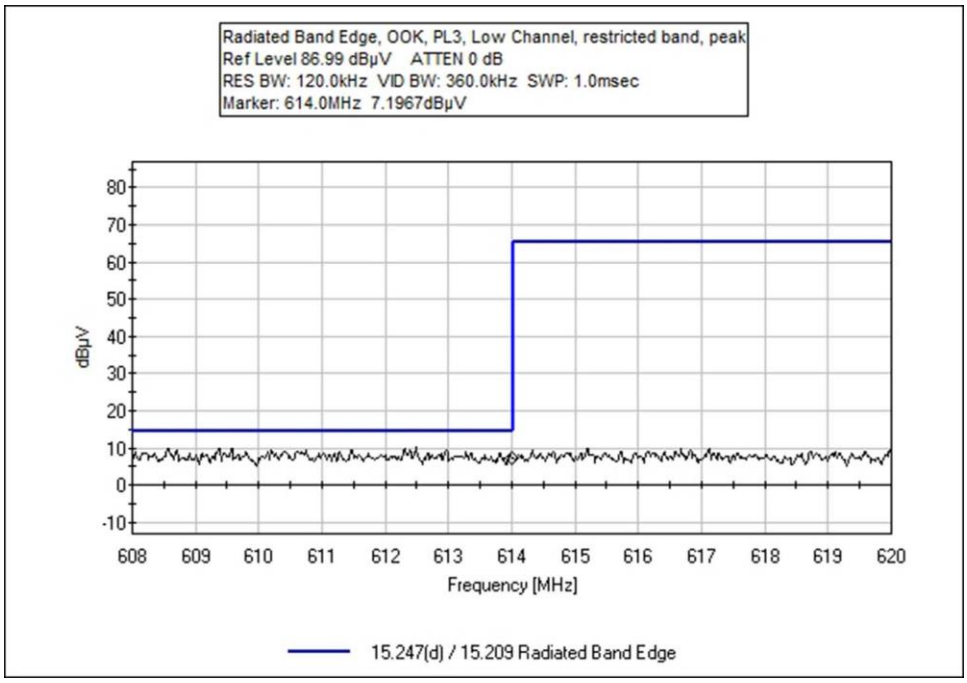
25	2783.030M	46.6	+0.0	+6.1	+4.3	-40.0	+0.0	47.3	54.0	-6.7	Horiz
	Ave		+0.5	+0.3	+29.5						
^	2783.015M	54.4	+0.0	+6.1	+4.3	-40.0	+0.0	55.1	54.0	+1.1	Horiz
			+0.5	+0.3	+29.5						
^	2783.030M	54.1	+0.0	+6.1	+4.3	-40.0	+0.0	54.8	54.0	+0.8	Horiz
			+0.5	+0.3	+29.5						
^	2783.030M	53.5	+0.0	+6.1	+4.3	-40.0	+0.0	54.2	54.0	+0.2	Horiz
			+0.5	+0.3	+29.5						
29	3609.274M	41.8	+0.0	+7.3	+4.9	-40.0	+0.0	47.1	54.0	-6.9	Vert
	Ave		+0.6	+0.4	+32.1						
^	3609.274M	48.7	+0.0	+7.3	+4.9	-40.0	+0.0	54.0	54.0	+0.0	Vert
			+0.6	+0.4	+32.1						

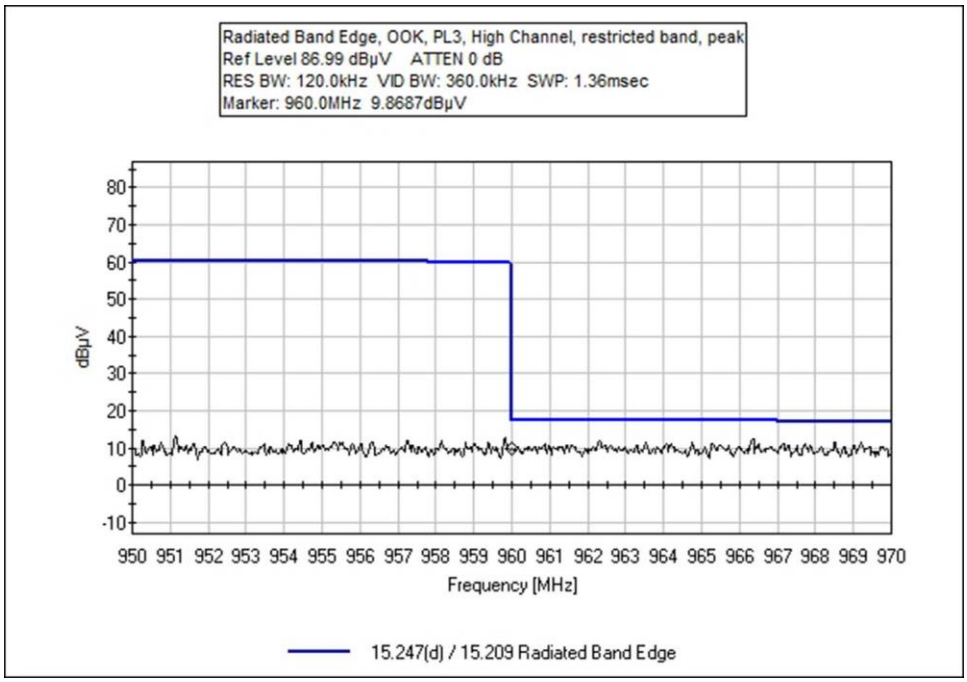
Band Edge

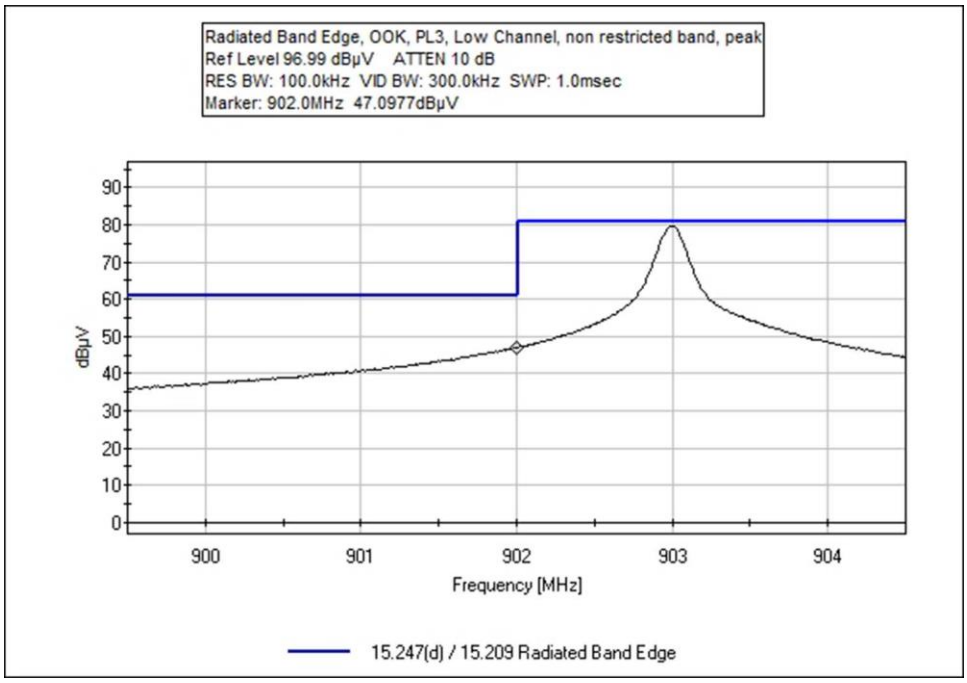
Band Edge Summary					
Operating Mode: Single Channel (Low and High)					
Frequency (MHz)	**Modulation**	**Ant. Type**	**Field Strength (dBuV/m @3m)**	**Limit (dBuV/m @3m)**	**Results**
614	OOK 16.384kbps (PL3)	PCB Trace	38.5	<46	Pass
902	OOK 16.384kbps (PL3)	PCB Trace	82.8	<96.7	Pass
928	OOK 16.384kbps (PL3)	PCB Trace	81.8	< 96.7	Pass
960	OOK 16.384kbps (PL3)	PCB Trace	46.6	<54	Pass
614	OOK 16.384kbps (PL1)	PCB Trace	40.3	<46	Pass
902	OOK 16.384kbps (PL1)	PCB Trace	75.3	<89	Pass
928	OOK 16.384kbps (PL1)	PCB Trace	73.7	<89	Pass
960	OOK 16.384kbps (PL1)	PCB Trace	46.3	<54	Pass
614	GFSK 300kbps (PL2)	PCB Trace	39.0	<46	Pass
902	GFSK 300kbps (PL2)	PCB Trace	73.6	<96	Pass
928	GFSK 300kbps (PL2)	PCB Trace	72.9	<96	Pass
960	GFSK 300kbps (PL2)	PCB Trace	45.6	<54	Pass

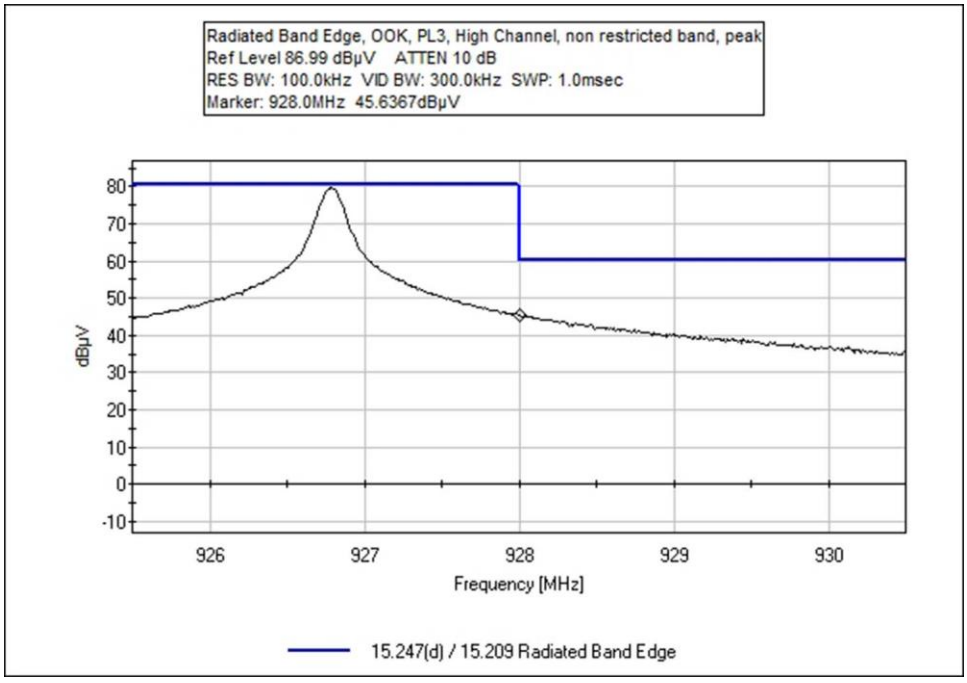
Band Edge Summary					
Operating Mode: Hopping					
Frequency (MHz)	**Modulation**	**Ant. Type**	**Field Strength (dBuV/m @3m)**	**Limit (dBuV/m @3m)**	**Results**
614	OOK 16.384kbps (PL3)	PCB Trace	38.8	<46	Pass
902	OOK 16.384kbps (PL3)	PCB Trace	82.3	<96.7	Pass
928	OOK 16.384kbps (PL3)	PCB Trace	82.0	< 96.7	Pass
960	OOK 16.384kbps (PL3)	PCB Trace	46.9	<54	Pass
614	OOK 16.384kbps (PL1)	PCB Trace	38.2	<46	Pass
902	OOK 16.384kbps (PL1)	PCB Trace	74.9	<89	Pass
928	OOK 16.384kbps (PL1)	PCB Trace	74.2	<89	Pass
960	OOK 16.384kbps (PL1)	PCB Trace	47.0	<54	Pass
614	GFSK 300kbps (PL2)	PCB Trace	39.6	<46	Pass
902	GFSK 300kbps (PL2)	PCB Trace	74.1	<96	Pass
928	GFSK 300kbps (PL2)	PCB Trace	73.0	<96	Pass
960	GFSK 300kbps (PL2)	PCB Trace	46.9	<54	Pass

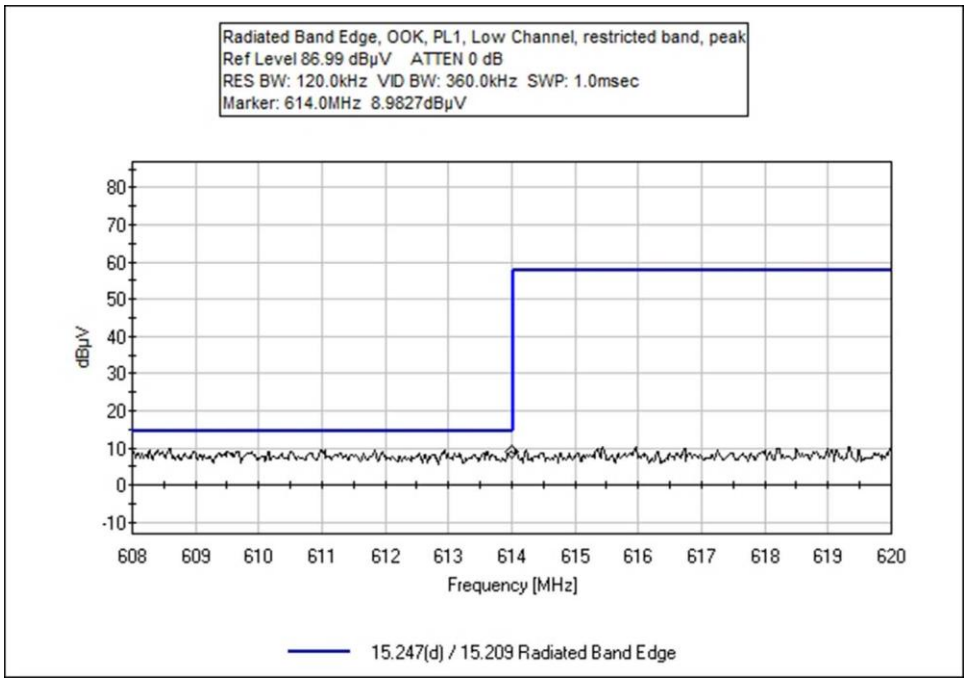
Band Edge Plots

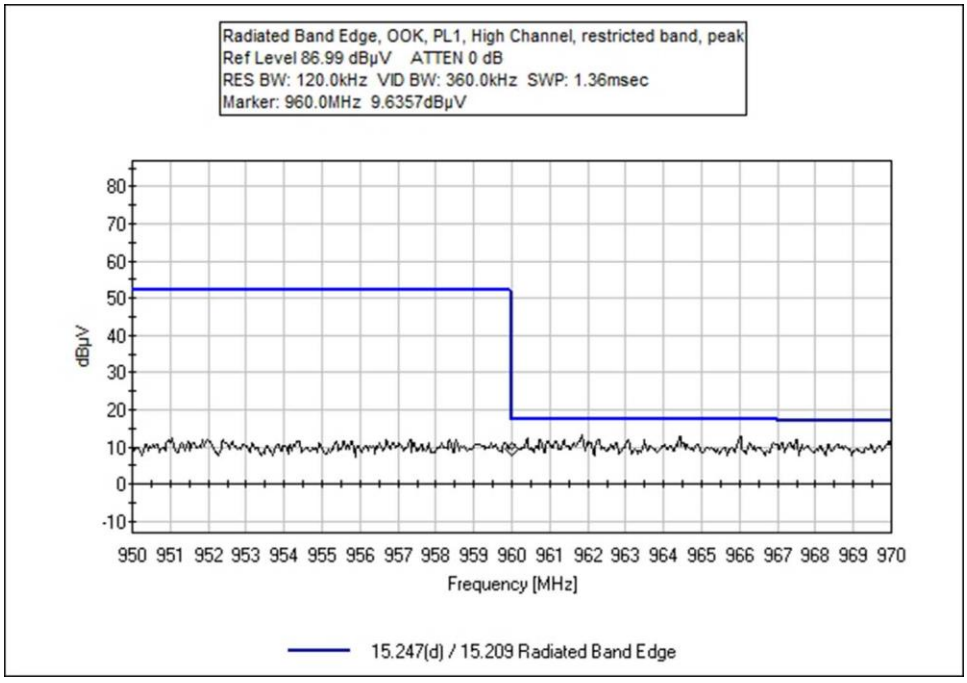


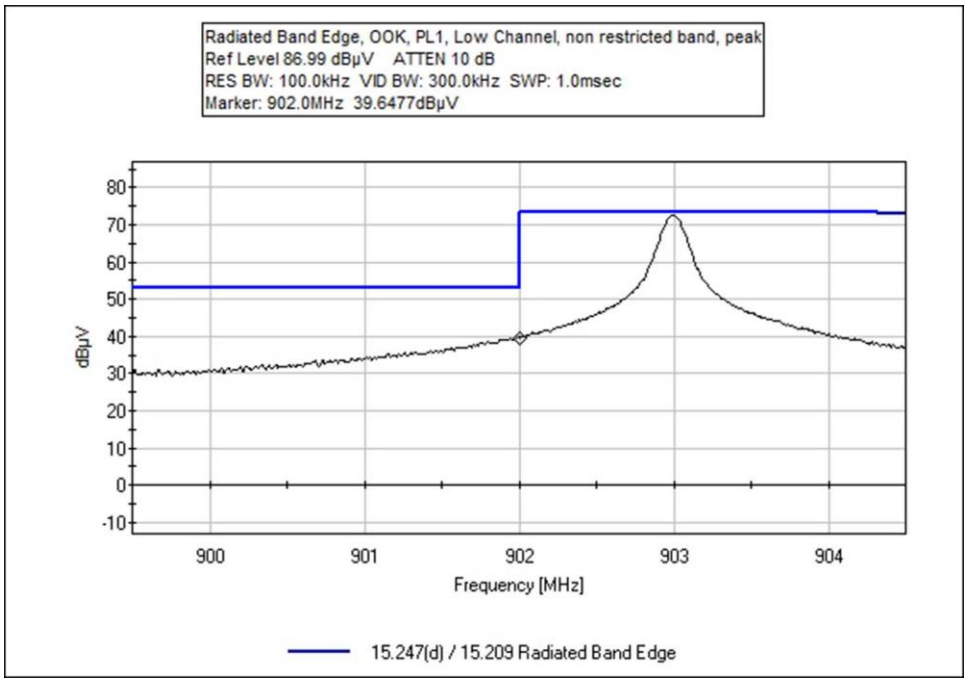


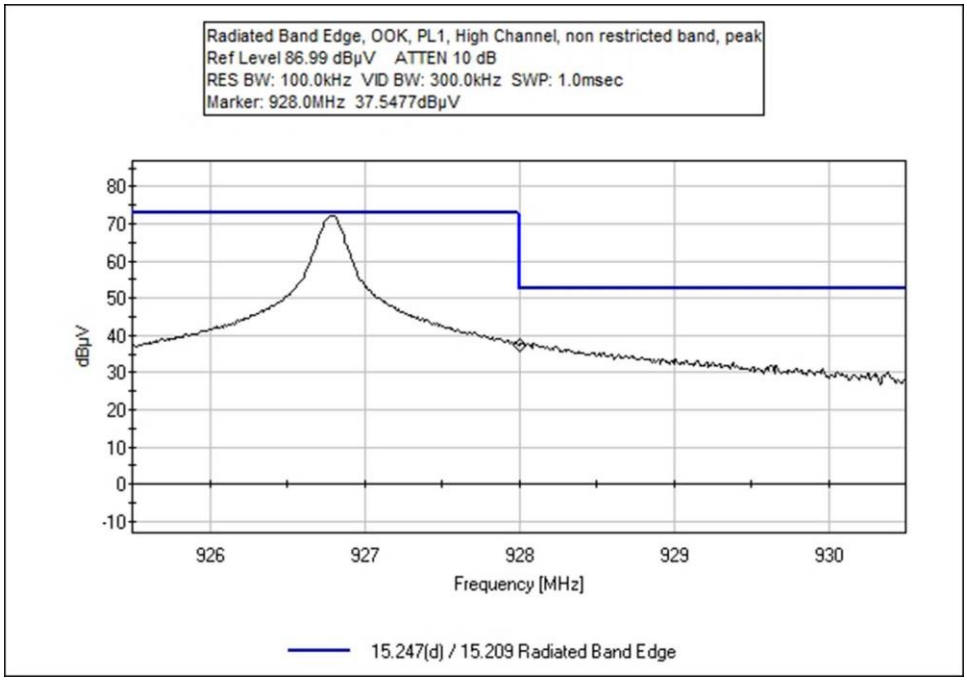

Radiated Band Edge, OOK, PL3, Low Channel, non restricted band, peak
Ref Level 96.99 dBµV ATTEN 10 dB
RES BW: 100.0kHz VID BW: 300.0kHz SWP: 1.0msec
Marker: 902.0MHz 47.0977dBµV
dBµV
90
80
70
60
50
40
30
20
10
0
900
901
902
903
904
Frequency [MHz]
15.247(d) / 15.209 Radiated Band Edge

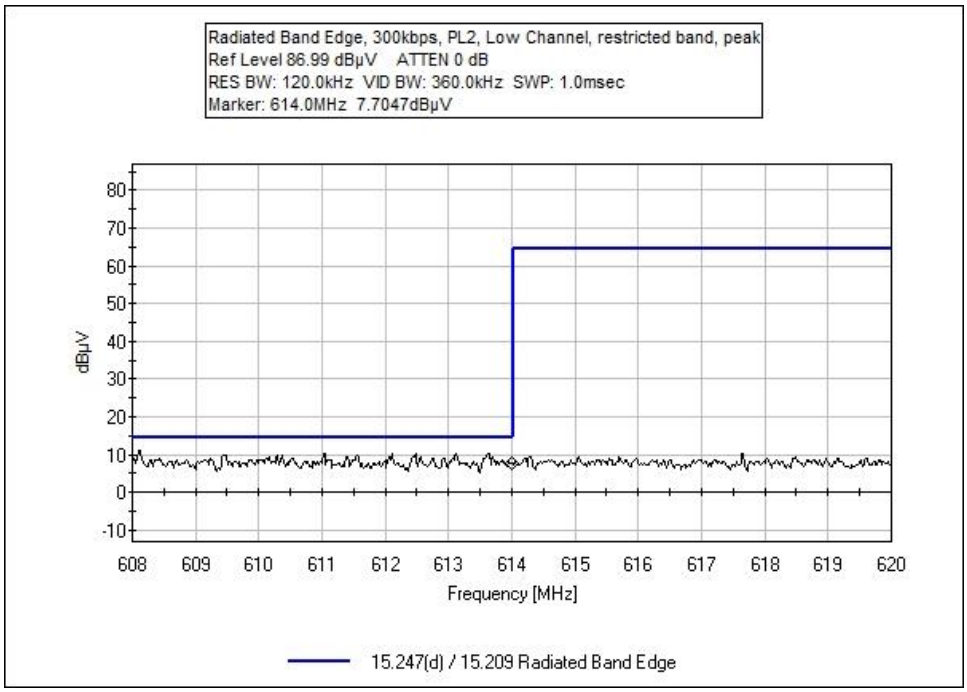

Radiated Band Edge, OOK, PL3, High Channel, non restricted band, peak
Ref Level 86.99 dBµV ATTEN 10 dB
RES BW: 100.0kHz VID BW: 300.0kHz SWP: 1.0msec
Marker: 928.0MHz 45.6367dBµV
dBµV
80
70
60
50
40
30
20
10
0
-10
926
927
928
929
930
Frequency [MHz]
15.247(d) / 15.209 Radiated Band Edge

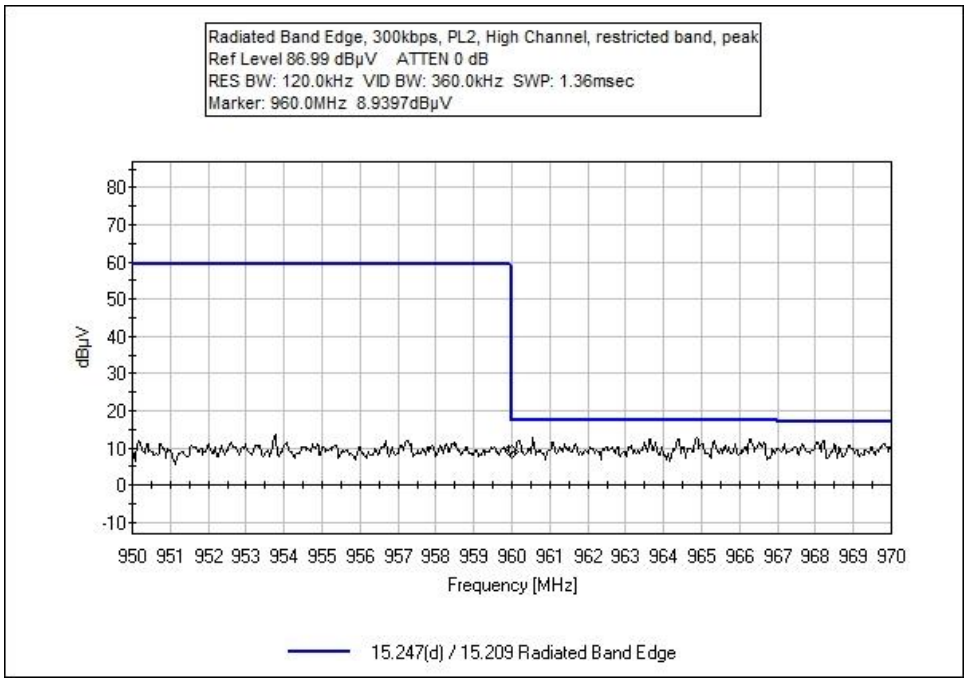

Radiated Band Edge, OOK, PL1, Low Channel, restricted band, peak
Ref Level 86.99 dBµV ATTEN 0 dB
RES BW: 120.0kHz VID BW: 360.0kHz SWP: 1.0msec
Marker: 614.0MHz 8.9827dBµV
dBµV
80
70
60
50
40
30
20
10
0
-10
608 609 610 611 612 613 614 615 616 617 618 619 620
Frequency [MHz]
15.247(d) / 15.209 Radiated Band Edge

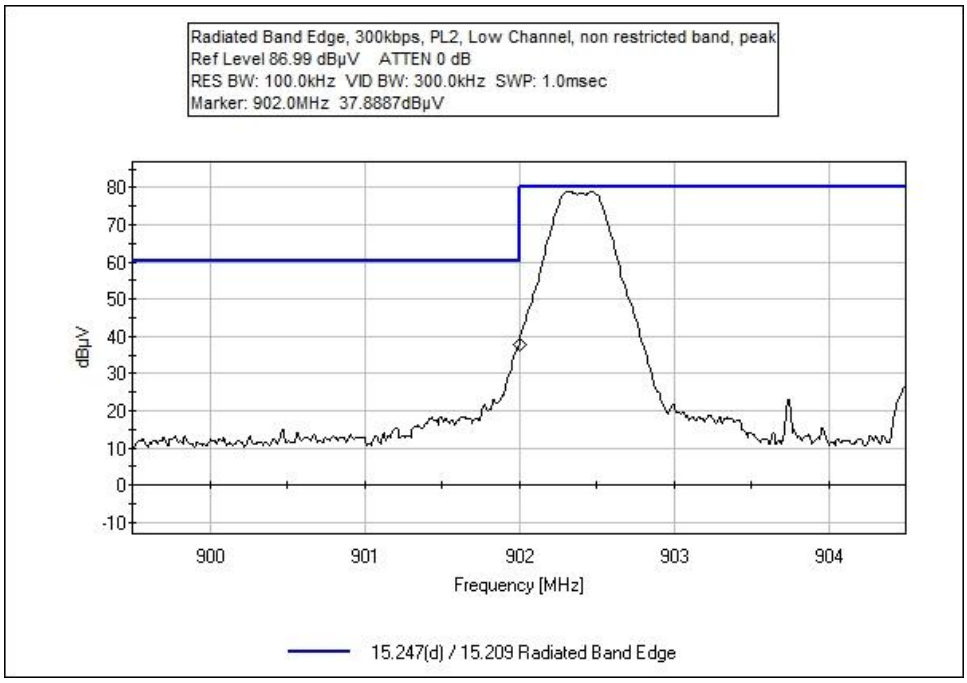

Radiated Band Edge, OOK, PL1, High Channel, restricted band, peak
Ref Level 86.99 dBµV ATTEN 0 dB
RES BW: 120.0kHz VID BW: 360.0kHz SWP: 1.36msec
Marker: 960.0MHz 9.6357dBµV
dBµV
80
70
60
50
40
30
20
10
0
-10
950 951 952 953 954 955 956 957 958 959 960 961 962 963 964 965 966 967 968 969 970
Frequency [MHz]
15.247(d) / 15.209 Radiated Band Edge

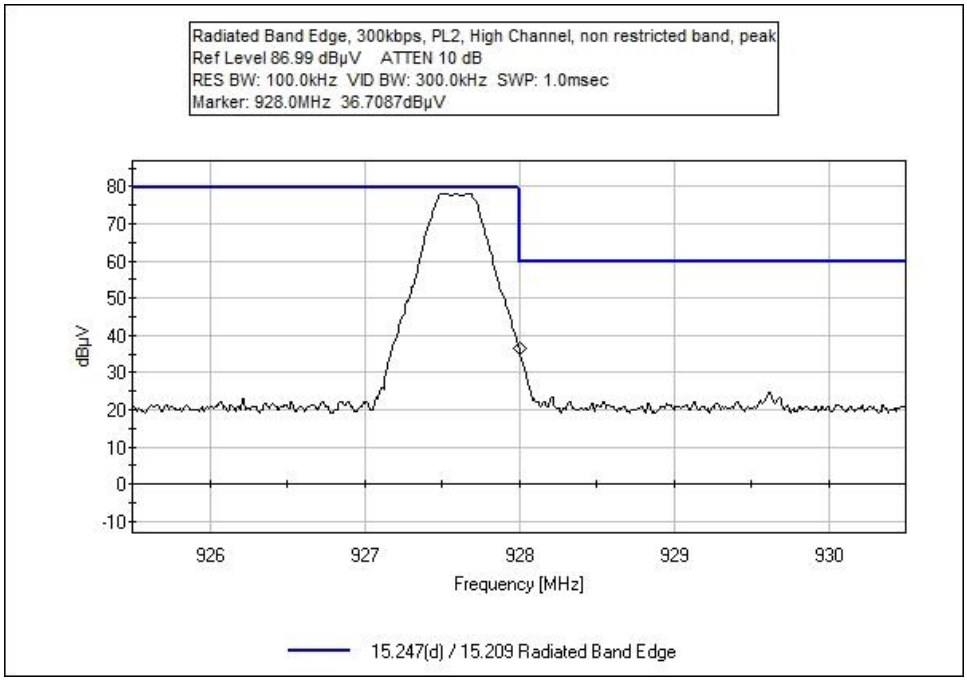

Radiated Band Edge, OOK, PL1, Low Channel, non restricted band, peak
Ref Level 86.99 dBµV ATTEN 10 dB
RES BW: 100.0kHz VID BW: 300.0kHz SWP: 1.0msec
Marker: 902.0MHz 39.6477dBµV
dBµV
80
70
60
50
40
30
20
10
0
-10
900
901
902
903
904
Frequency [MHz]
15.247(d) / 15.209 Radiated Band Edge

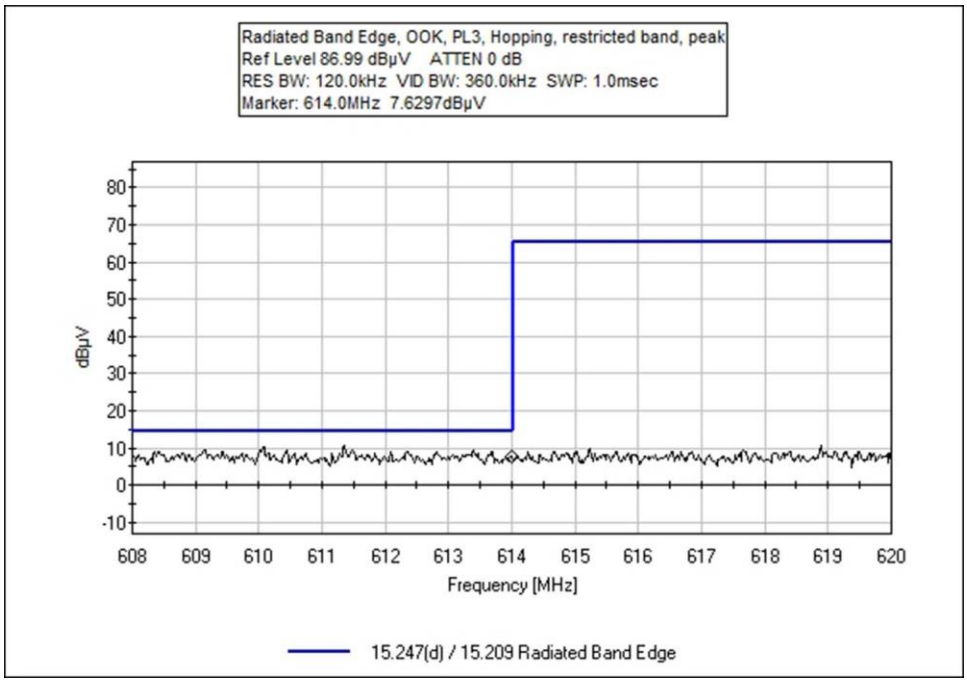

Radiated Band Edge, OOK, PL1, High Channel, non restricted band, peak
Ref Level 86.99 dBµV ATTEN 10 dB
RES BW: 100.0kHz VID BW: 300.0kHz SWP: 1.0msec
Marker: 928.0MHz 37.5477dBµV
dBµV
80
70
60
50
40
30
20
10
0
-10
926
927
928
929
930
Frequency [MHz]
15.247(d) / 15.209 Radiated Band Edge

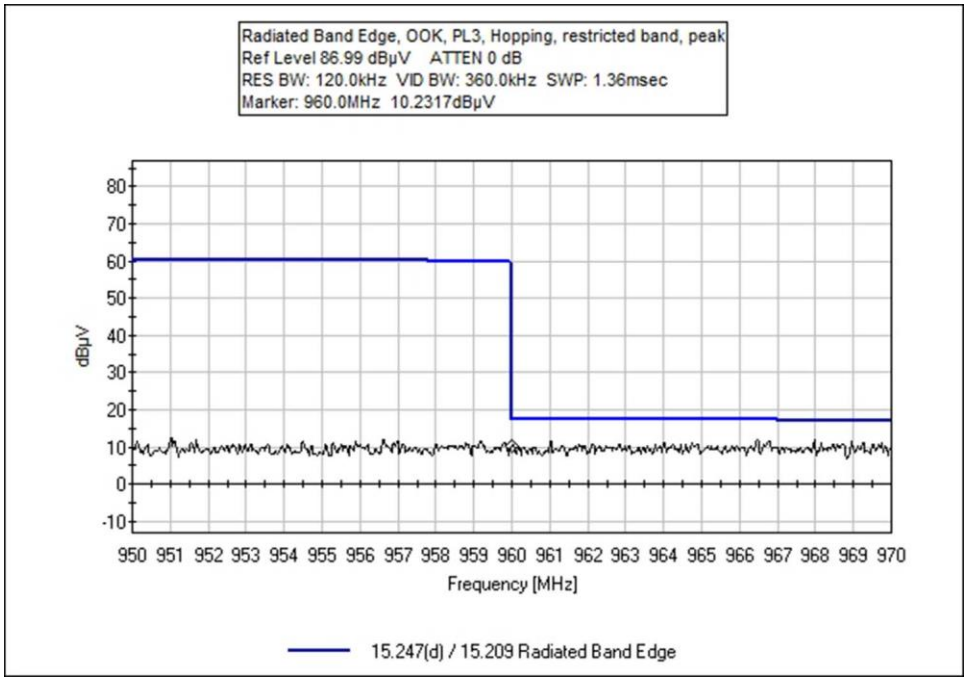

Radiated Band Edge, 300kbps, PL2, Low Channel, restricted band, peak
Ref Level 86.99 dBµV ATTEN 0 dB
RES BW: 120.0kHz VID BW: 360.0kHz SWP: 1.0msec
Marker: 614.0MHz 7.7047dBµV
dBµV
80
70
60
50
40
30
20
10
0
-10
608 609 610 611 612 613 614 615 616 617 618 619 620
Frequency [MHz]
15.247(d) / 15.209 Radiated Band Edge

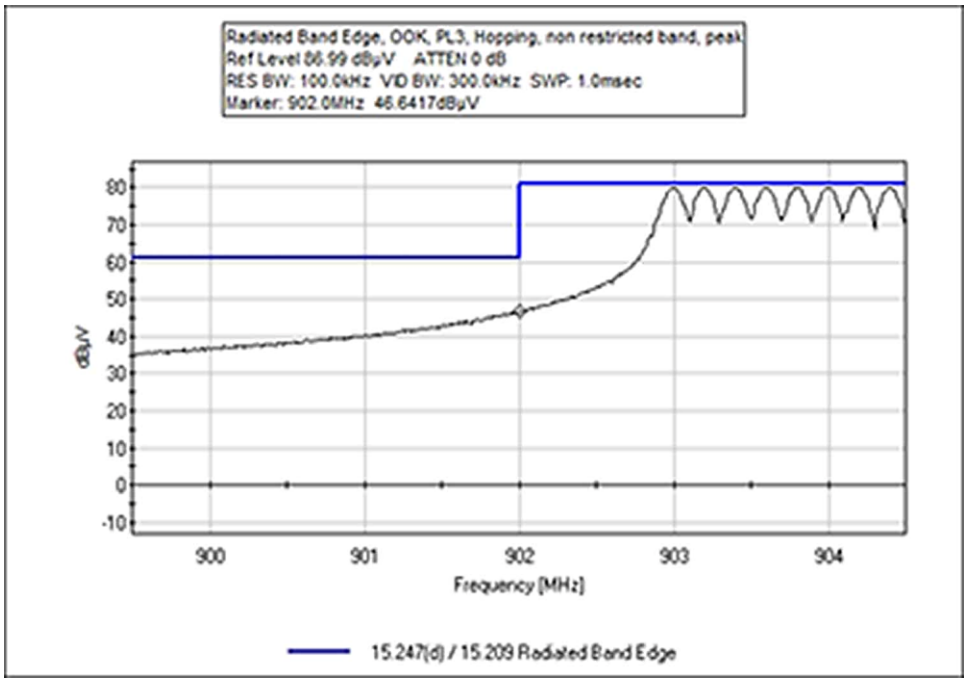

Radiated Band Edge, 300kbps, PL2, High Channel, restricted band, peak
Ref Level 86.99 dBµV ATTEN 0 dB
RES BW: 120.0kHz VID BW: 360.0kHz SWP: 1.36msec
Marker: 960.0MHz 8.9397dBµV
dBµV
80
70
60
50
40
30
20
10
0
-10
950 951 952 953 954 955 956 957 958 959 960 961 962 963 964 965 966 967 968 969 970
Frequency [MHz]
15.247(d) / 15.209 Radiated Band Edge

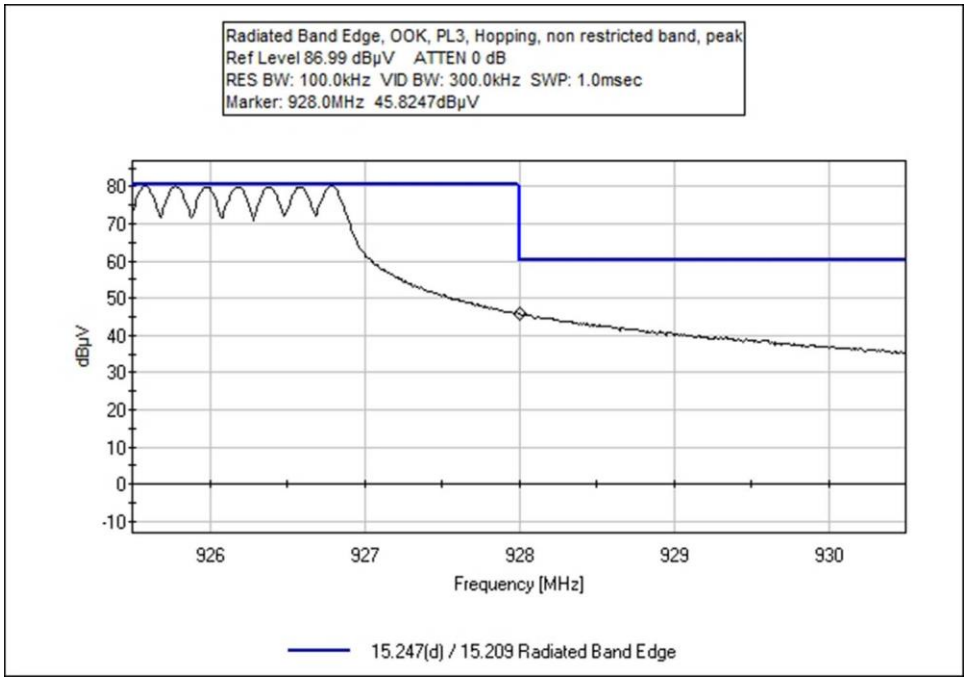

Radiated Band Edge, 300kbps, PL2, Low Channel, non restricted band, peak
Ref Level 86.99 dBµV ATTEN 0 dB
RES BW: 100.0kHz VID BW: 300.0kHz SWP: 1.0msec
Marker: 902.0MHz 37.8887dBµV
dBµV
80
70
60
50
40
30
20
10
0
-10
900
901
902
903
904
Frequency [MHz]
15.247(d) / 15.209 Radiated Band Edge

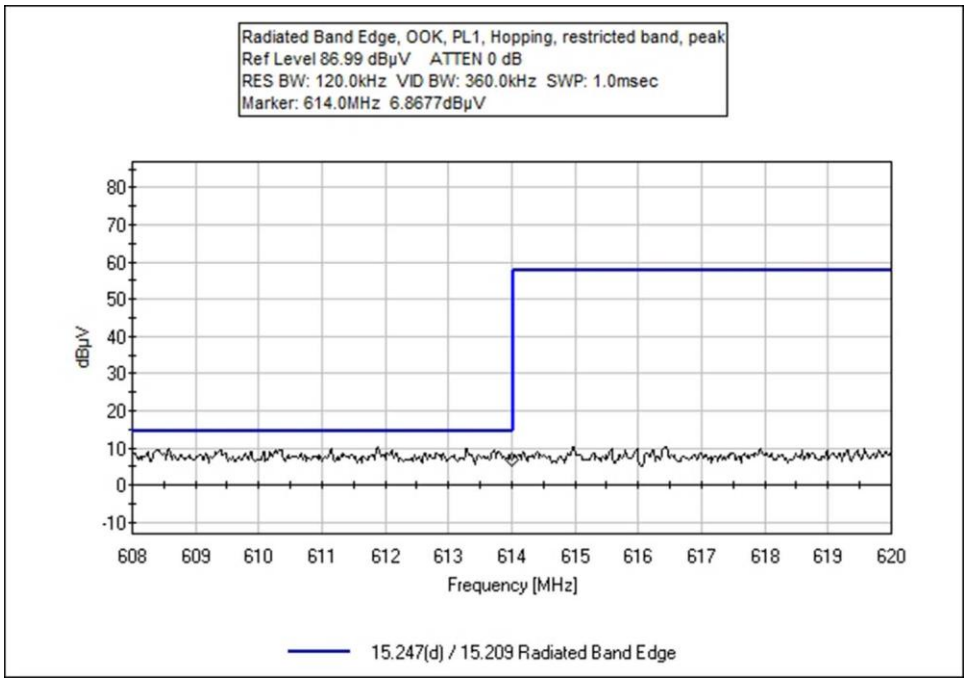

Radiated Band Edge, 300kbps, PL2, High Channel, non restricted band, peak
Ref Level 86.99 dBµV ATTEN 10 dB
RES BW: 100.0kHz VID BW: 300.0kHz SWP: 1.0msec
Marker: 928.0MHz 36.7087dBµV
dBµV
80
70
60
50
40
30
20
10
0
-10
926
927
928
929
930
Frequency [MHz]
15.247(d) / 15.209 Radiated Band Edge

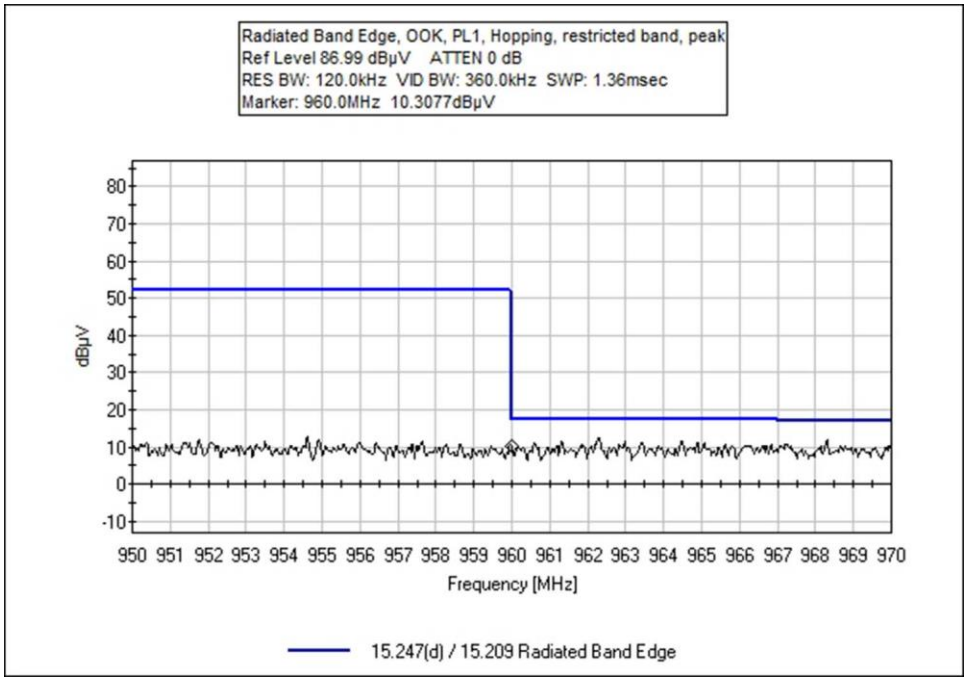

Radiated Band Edge, OOK, PL3, Hopping, restricted band, peak
Ref Level 86.99 dBµV ATTEN 0 dB
RES BW: 120.0kHz VID BW: 360.0kHz SWP: 1.0msec
Marker: 614.0MHz 7.6297dBµV
dBµV
80
70
60
50
40
30
20
10
0
-10
608 609 610 611 612 613 614 615 616 617 618 619 620
Frequency [MHz]
15.247(d) / 15.209 Radiated Band Edge

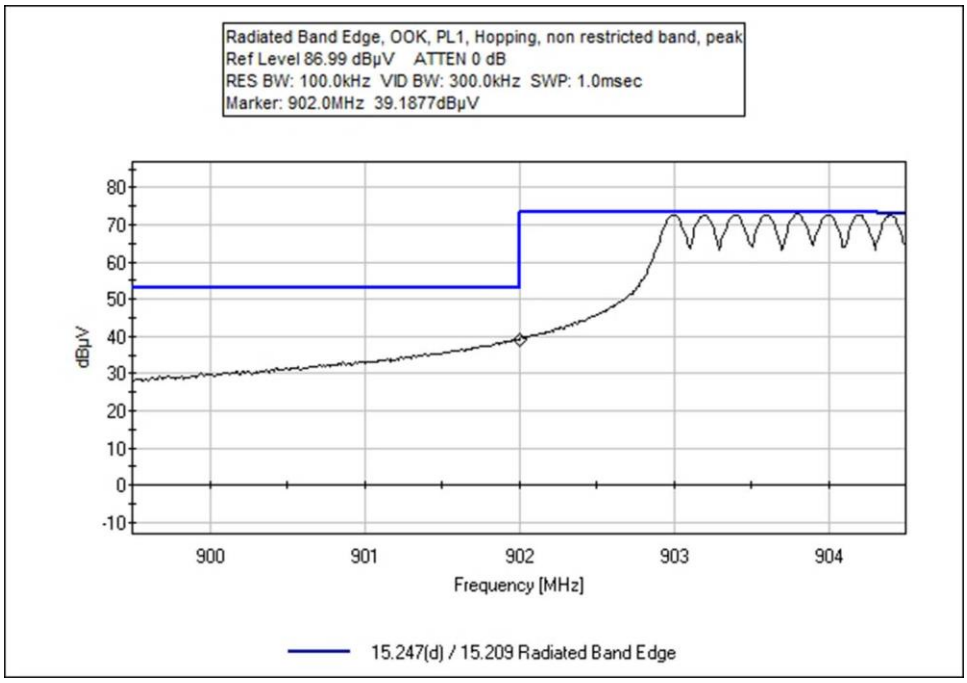

Radiated Band Edge, OOK, PL3, Hopping, restricted band, peak
Ref Level 86.99 dBµV ATTEN 0 dB
RES BW: 120.0kHz VID BW: 360.0kHz SWP: 1.36msec
Marker: 960.0MHz 10.2317dBµV
dBµV
80
70
60
50
40
30
20
10
0
-10
950 951 952 953 954 955 956 957 958 959 960 961 962 963 964 965 966 967 968 969 970
Frequency [MHz]
15.247(d) / 15.209 Radiated Band Edge

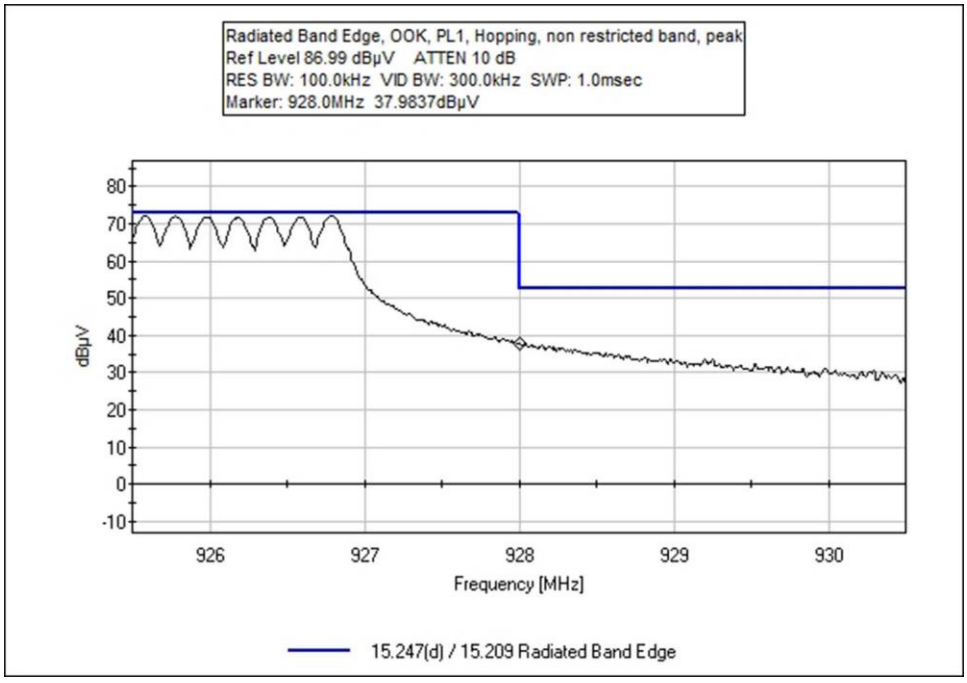

Radiated Band Edge, OOK, PL3, Hopping, non restricted band, peak
Ref Level 86.99 dBµV ATTEN 0 dB
RES BW: 100.0kHz VID BW: 300.0kHz SWP: 1.0msec
Marker: 902.0MHz 46.6417dBµV
dBµV
80
70
60
50
40
30
20
10
0
-10
900
901
902
903
904
Frequency [MHz]
15.247(d) / 15.209 Radiated Band Edge

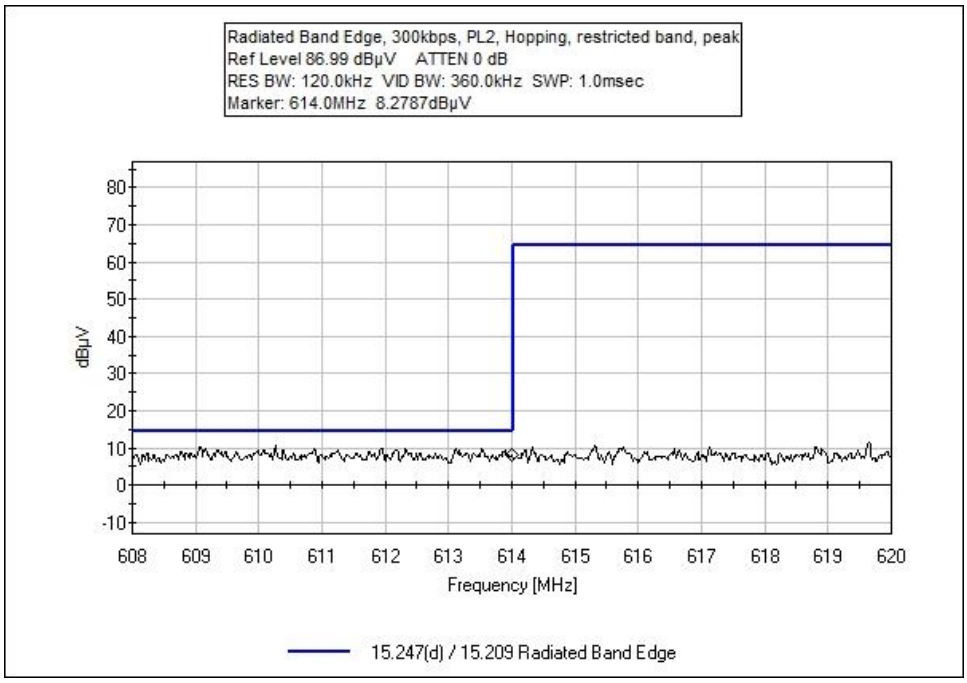

Radiated Band Edge, OOK, PL3, Hopping, non restricted band, peak
Ref Level 86.99 dBµV ATTEN 0 dB
RES BW: 100.0kHz VID BW: 300.0kHz SWP: 1.0msec
Marker: 928.0MHz 45.8247dBµV
dBµV
80
70
60
50
40
30
20
10
0
-10
926
927
928
929
930
Frequency [MHz]
15.247(d) / 15.209 Radiated Band Edge

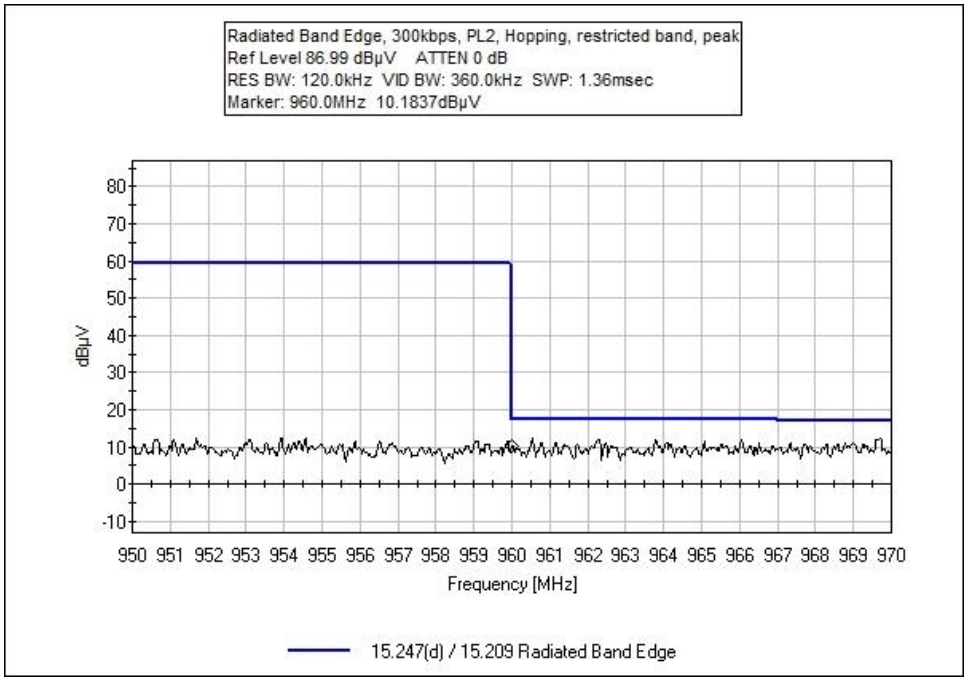

Radiated Band Edge, OOK, PL1, Hopping, restricted band, peak
Ref Level 86.99 dBµV ATTEN 0 dB
RES BW: 120.0kHz VID BW: 360.0kHz SWP: 1.0msec
Marker: 614.0MHz 6.8677dBµV
dBµV
80
70
60
50
40
30
20
10
0
-10
608 609 610 611 612 613 614 615 616 617 618 619 620
Frequency [MHz]
15.247(d) / 15.209 Radiated Band Edge

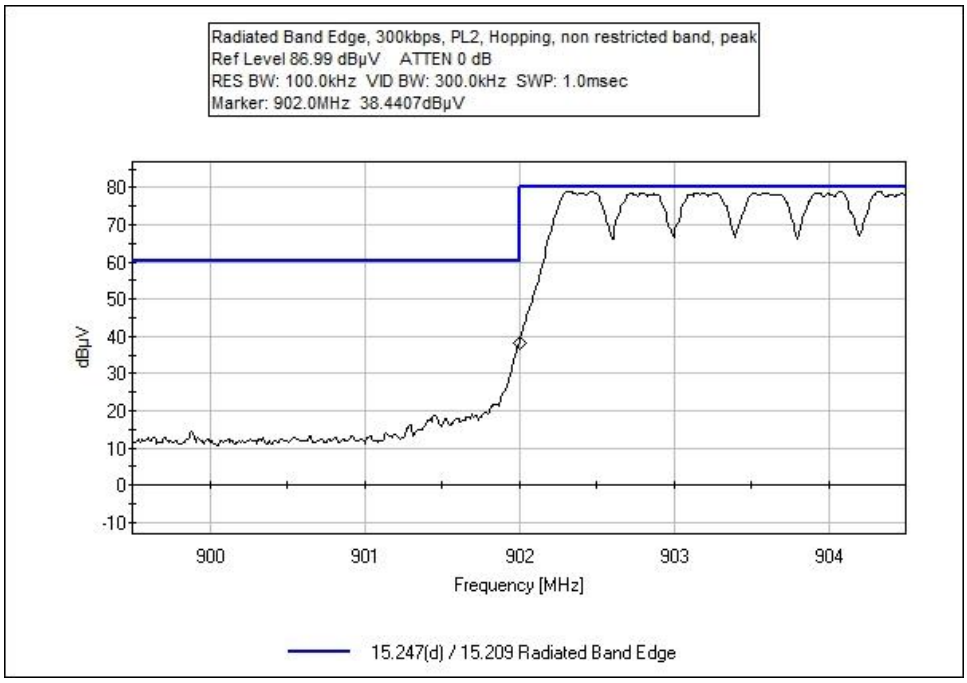

Radiated Band Edge, OOK, PL1, Hopping, restricted band, peak
Ref Level 86.99 dBµV ATTEN 0 dB
RES BW: 120.0kHz VID BW: 360.0kHz SWP: 1.36msec
Marker: 960.0MHz 10.3077dBµV
dBµV
80
70
60
50
40
30
20
10
0
-10
950 951 952 953 954 955 956 957 958 959 960 961 962 963 964 965 966 967 968 969 970
Frequency [MHz]
15.247(d) / 15.209 Radiated Band Edge

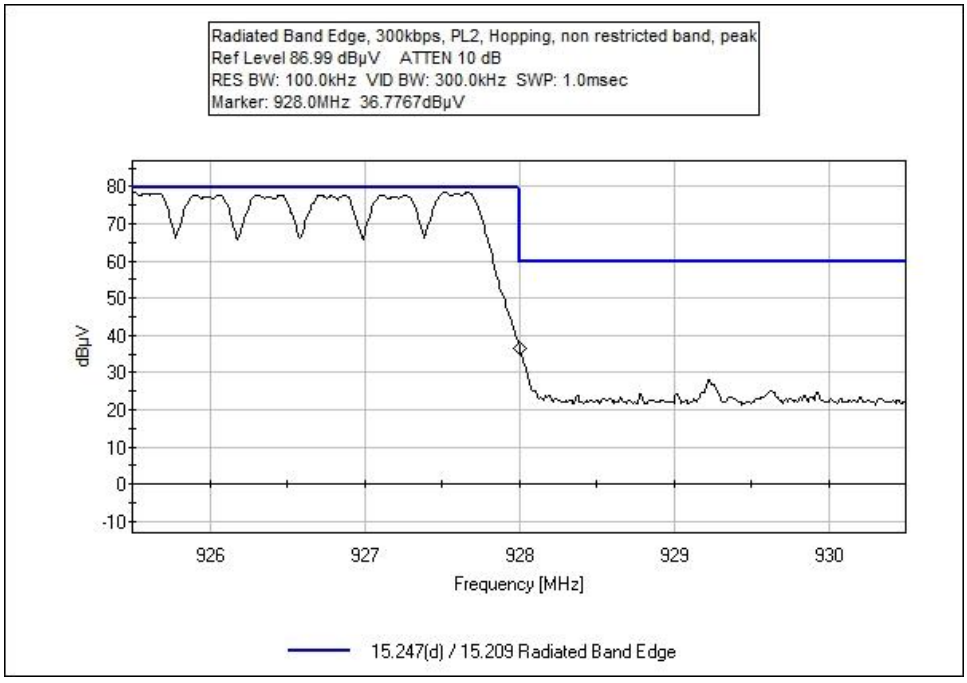

Radiated Band Edge, OOK, PL1, Hopping, non restricted band, peak
Ref Level 86.99 dBµV ATTEN 0 dB
RES BW: 100.0kHz VID BW: 300.0kHz SWP: 1.0msec
Marker: 902.0MHz 39.1877dBµV
dBµV
80
70
60
50
40
30
20
10
0
-10
900
901
902
903
904
Frequency [MHz]
15.247(d) / 15.209 Radiated Band Edge


Radiated Band Edge, OOK, PL1, Hopping, non restricted band, peak
Ref Level 86.99 dBµV ATTEN 10 dB
RES BW: 100.0kHz VID BW: 300.0kHz SWP: 1.0msec
Marker: 928.0MHz 37.9837dBµV
dBµV
80
70
60
50
40
30
20
10
0
-10
926
927
928
929
930
Frequency [MHz]
15.247(d) / 15.209 Radiated Band Edge


Radiated Band Edge, 300kbps, PL2, Hopping, restricted band, peak
Ref Level 86.99 dBµV ATTEN 0 dB
RES BW: 120.0kHz VID BW: 360.0kHz SWP: 1.0msec
Marker: 614.0MHz 8.2787dBµV
dBµV
80
70
60
50
40
30
20
10
0
-10
608 609 610 611 612 613 614 615 616 617 618 619 620
Frequency [MHz]
15.247(d) / 15.209 Radiated Band Edge


Radiated Band Edge, 300kbps, PL2, Hopping, restricted band, peak
Ref Level 86.99 dBµV ATTEN 0 dB
RES BW: 120.0kHz VID BW: 360.0kHz SWP: 1.36msec
Marker: 960.0MHz 10.1837dBµV
dBµV
80
70
60
50
40
30
20
10
0
-10
950 951 952 953 954 955 956 957 958 959 960 961 962 963 964 965 966 967 968 969 970
Frequency [MHz]
15.247(d) / 15.209 Radiated Band Edge


Radiated Band Edge, 300kbps, PL2, Hopping, non restricted band, peak
Ref Level 86.99 dBµV ATTEN 0 dB
RES BW: 100.0kHz VID BW: 300.0kHz SWP: 1.0msec
Marker: 902.0MHz 38.4407dBµV
dBµV
80
70
60
50
40
30
20
10
0
-10
900
901
902
903
904
Frequency [MHz]
15.247(d) / 15.209 Radiated Band Edge


Radiated Band Edge, 300kbps, PL2, Hopping, non restricted band, peak
Ref Level 86.99 dBµV ATTEN 10 dB
RES BW: 100.0kHz VID BW: 300.0kHz SWP: 1.0msec
Marker: 928.0MHz 36.7767dBµV
dBµV
80
70
60
50
40
30
20
10
0
-10
926
927
928
929
930
Frequency [MHz]
15.247(d) / 15.209 Radiated Band Edge

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 Band Edge**		
Work Order #:	**105379**	Date:	5/26/2021
Test Type:	**Maximized Emissions**	Time:	18:10:53
Tested By:	S. Yamamoto	Sequence#:	25
Software:	EMITest 5.03.19		

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 2			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 2			

Test Conditions / Notes:

The equipment under test (EUT) is connected to a laptop computer via USB to serial interface board. The laptop is running Command Line Interface (CLI) Tool. This software is used to run the scripts for setting the EUT parameters.

Once the parameters have been set, the support equipment is removed from the EUT.

Frequency range of test: 608MHz to 970MHz.

Test Channels:
Low channel 903MHz
High channel 926.8MHz

RBW=100kHz, VBW=300kHz non restr band
RBW=120kHz, VBW=360kHz restr band

Output level 3 OOK

Test Environment Conditions:
Temperature: 24°C
Relative Humidity: 48%
Pressure: 99kPa

Site D

The EUT is powered from a new 3.6V lithium battery

Test Method: ANSI C63.10-2013

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN02869	Spectrum Analyzer	E4440A	8/3/2020	8/3/2021
T2	ANP04382	Cable	LDF-50	5/15/2020	5/15/2022
T3	ANP05569	Cable-Amplitude +15C to +45C (dB)	RG-214/U	12/14/2020	12/14/2022
T4	ANP05283	Attenuator	ATT-0218-06-NNN-02	3/26/2020	3/26/2022
T5	AN01994	Biconilog Antenna	CBL6111C	4/14/2020	4/14/2022

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

#	Freq	Rdng	T1 T5	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant
1	960.000M	10.2	+0.0 +23.6	+3.5	+3.7	+5.9	+0.0	46.9	54.0	-7.1	Vert
									OOK, PL3 Hopping		
2	614.000M	7.6	+0.0 +19.9	+2.8	+2.8	+5.8	+0.0	38.9	46.0	-7.1	Vert
									OOK, PL3 Hopping		
3	960.000M	9.9	+0.0 +23.6	+3.5	+3.7	+5.9	+0.0	46.6	54.0	-7.4	Vert
									OOK, PL3 Single		
4	614.000M	7.2	+0.0 +19.9	+2.8	+2.8	+5.8	+0.0	38.5	46.0	-7.5	Vert
									OOK, PL3 Single		
5	902.000M	47.1	+0.0 +22.9	+3.4	+3.5	+5.9	+0.0	82.8	96.7	-13.9	Vert
									OOK, PL3 Single		
6	902.000M	46.6	+0.0 +22.9	+3.4	+3.5	+5.9	+0.0	82.3	96.7	-14.4	Vert
									OOK, PL3 Hopping		
7	928.000M	45.8	+0.0 +23.2	+3.5	+3.6	+5.9	+0.0	82.0	96.7	-14.7	Vert
									OOK, PL3 Hopping		
8	928.000M	45.6	+0.0 +23.2	+3.5	+3.6	+5.9	+0.0	81.8	96.7	-14.9	Vert
									OOK, PL3 Single		

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 Band Edge**		
Work Order #:	**105379**	Date:	5/26/2021
Test Type:	**Maximized Emissions**	Time:	18:39:40
Tested By:	S. Yamamoto	Sequence#:	26
Software:	EMITest 5.03.19		

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 2			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 2			

Test Conditions / Notes:

The equipment under test (EUT) is connected to a laptop computer via USB to serial interface board. The laptop is running Command Line Interface (CLI) Tool. This software is used to run the scripts for setting the EUT parameters.

Once the parameters have been set, the support equipment is removed from the EUT.

Frequency range of test: 608MHz to 970MHz.

Test Channels:
Low Channel 903MHz
High Channel 926.8MHz

RBW=100kHz, VBW=300kHz non restr band
RBW=120kHz, VBW=360kHz restr band

Output level 1 OOK

Test Environment Conditions:
Temperature: 24°C
Relative Humidity: 48%
Pressure: 99kPa

Site D

The EUT is powered from a new 3.6V lithium battery

Test Method: ANSI C63.10-2013

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN02869	Spectrum Analyzer	E4440A	8/3/2020	8/3/2021
T2	ANP04382	Cable	LDF-50	5/15/2020	5/15/2022
T3	ANP05569	Cable-Amplitude +15C to +45C (dB)	RG-214/U	12/14/2020	12/14/2022
T4	ANP05283	Attenuator	ATT-0218-06-NNN-02	3/26/2020	3/26/2022
T5	AN01994	Biconilog Antenna	CBL6111C	4/14/2020	4/14/2022

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

#	Freq	Rdng	T1 T5	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant
1	614.000M	9.0	+0.0 +19.9	+2.8	+2.8	+5.8	+0.0	40.3	46.0	-5.7	Vert
									OOK, PL1 Single		
2	960.000M	10.3	+0.0 +23.6	+3.5	+3.7	+5.9	+0.0	47.0	54.0	-7.0	Vert
									OOK, PL1 Hopping		
3	960.000M	9.6	+0.0 +23.6	+3.5	+3.7	+5.9	+0.0	46.3	54.0	-7.7	Vert
									OOK, PL1 Single		
4	614.000M	6.9	+0.0 +19.9	+2.8	+2.8	+5.8	+0.0	38.2	46.0	-7.8	Vert
									OOK, PL1 Hopping		
5	902.000M	39.6	+0.0 +22.9	+3.4	+3.5	+5.9	+0.0	75.3	89.0	-13.7	Vert
									OOK, PL1 Single		
6	902.000M	39.2	+0.0 +22.9	+3.4	+3.5	+5.9	+0.0	74.9	89.0	-14.1	Vert
									OOK, PL1 Hopping		
7	928.000M	38.0	+0.0 +23.2	+3.5	+3.6	+5.9	+0.0	74.2	89.0	-14.8	Vert
									OOK, PL1 Hopping		
8	928.000M	37.5	+0.0 +23.2	+3.5	+3.6	+5.9	+0.0	73.7	89.0	-15.3	Vert
									OOK, PL1 Single		

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 Band Edge**		
Work Order #:	**105379**	Date:	5/27/2021
Test Type:	**Maximized Emissions**	Time:	10:28:49
Tested By:	S. Yamamoto	Sequence#:	28
Software:	EMITest 5.03.19		

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 2			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 2			

Test Conditions / Notes:

The equipment under test (EUT) is connected to a laptop computer via USB to serial interface board. The laptop is running Command Line Interface (CLI) Tool. This software is used to run the scripts for setting the EUT parameters.

Once the parameters have been set, the support equipment is removed from the EUT.

Frequency range of test: 608MHz to 970MHz.

Test Channels:
Low channel 902.4MHz
High channel 927.6MHz

RBW=100kHz, VBW=300kHz non restr band
RBW=120kHz, VBW=360kHz restr band

Output level 2 300kbps

Test Environment Conditions:
Temperature: 20°C
Relative Humidity: 52%
Pressure: 99kPa

Site D

The EUT is powered from a new 3.6V lithium battery

Test Method: ANSI C63.10-2013

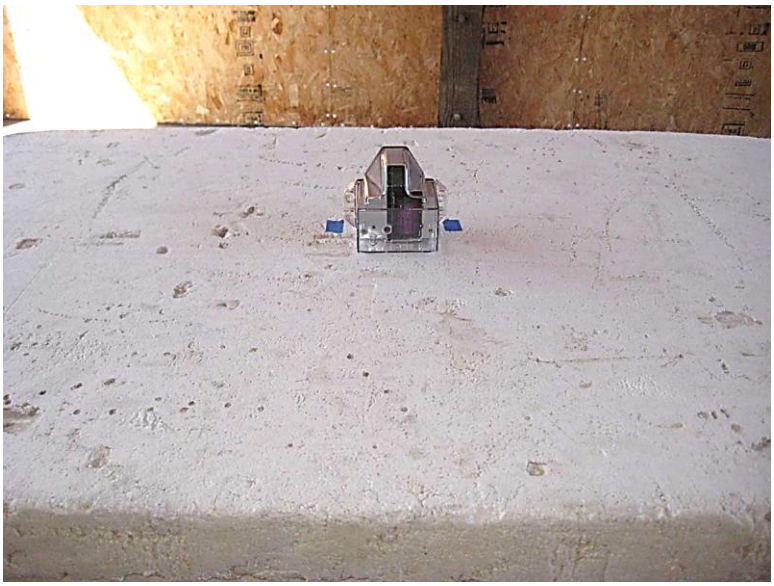
Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN02869	Spectrum Analyzer	E4440A	8/3/2020	8/3/2021
T2	ANP04382	Cable	LDF-50	5/15/2020	5/15/2022
T3	ANP05569	Cable-Amplitude +15C to +45C (dB)	RG-214/U	12/14/2020	12/14/2022
T4	ANP05283	Attenuator	ATT-0218-06-NNN-02	3/26/2020	3/26/2022
T5	AN01994	Biconilog Antenna	CBL6111C	4/14/2020	4/14/2022

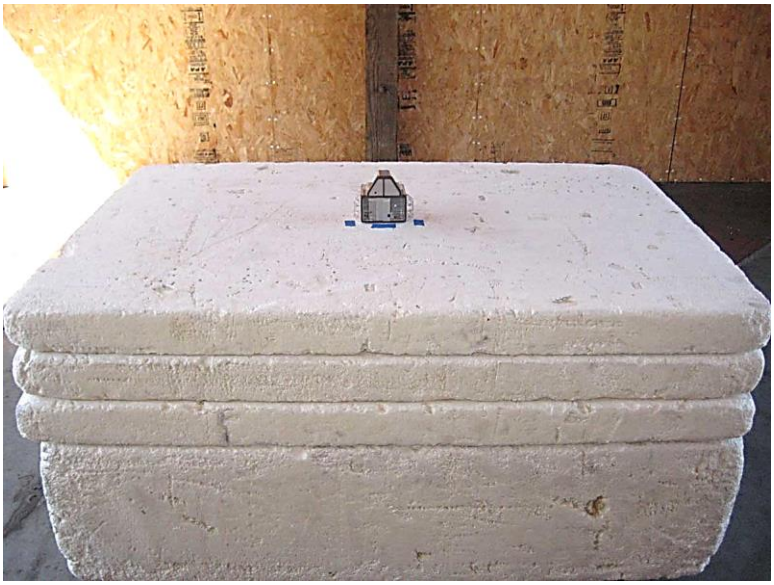
Measurement Data: Reading listed by margin. Test Distance: 3 Meters

#	Freq	Rdng	T1 T5	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant
1	614.000M	8.3	+0.0 +19.9	+2.8	+2.8	+5.8	+0.0	39.6	46.0 300kbps, PL2 Hopping	-6.4	Vert
2	614.000M	7.7	+0.0 +19.9	+2.8	+2.8	+5.8	+0.0	39.0	46.0 300kbps, PL2 Single	-7.0	Vert
3	960.000M	10.2	+0.0 +23.6	+3.5	+3.7	+5.9	+0.0	46.9	54.0 300kbps, PL2 Hopping	-7.1	Vert
4	960.000M	8.9	+0.0 +23.6	+3.5	+3.7	+5.9	+0.0	45.6	54.0 300kbps, PL2 Single	-8.4	Vert
5	902.000M	38.4	+0.0 +22.9	+3.4	+3.5	+5.9	+0.0	74.1	96.0 300kbps, PL2 Hopping	-21.9	Vert
6	902.000M	37.9	+0.0 +22.9	+3.4	+3.5	+5.9	+0.0	73.6	96.0 300kbps, PL2 Single	-22.4	Vert
7	928.000M	36.8	+0.0 +23.2	+3.5	+3.6	+5.9	+0.0	73.0	96.0 300kbps, PL2 Hopping	-23.0	Vert
8	928.000M	36.7	+0.0 +23.2	+3.5	+3.6	+5.9	+0.0	72.9	96.0 300kbps, PL2 Single	-23.1	Vert

Test Setup Photo(s)



Below 1GHz; Front View



Below 1GHz, Back View

Above 1GHz

SUPPLEMENTAL INFORMATION

Measurement Uncertainty

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

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

Emissions Test Details

TESTING PARAMETERS

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

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

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

CORRECTION FACTORS

The basic spectrum analyzer reading was converted using correction factors as shown in the highest emissions readings in the tables. For radiated emissions in 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.