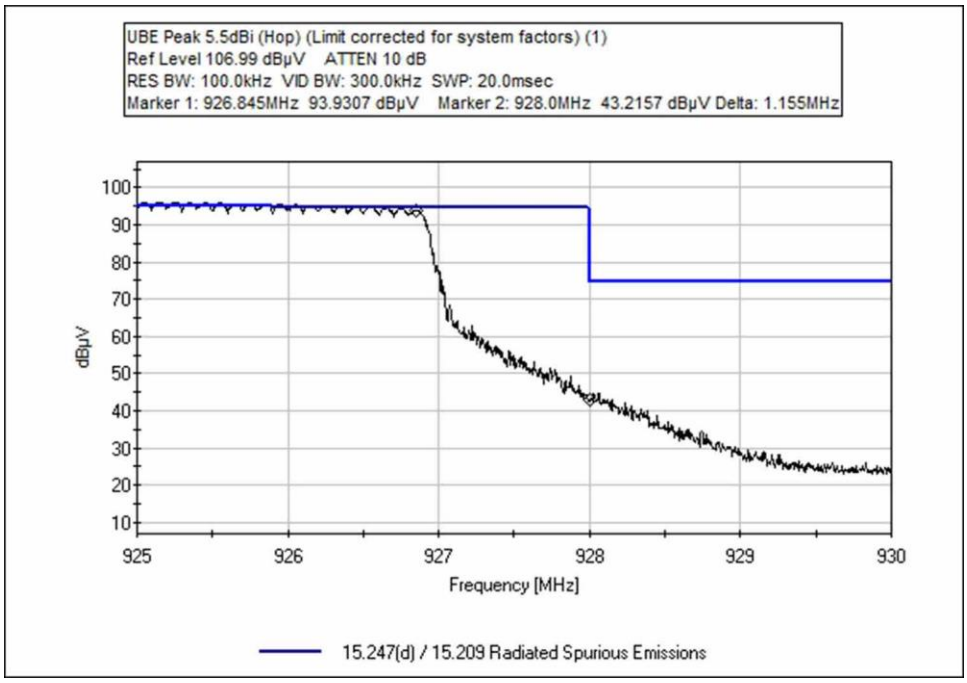
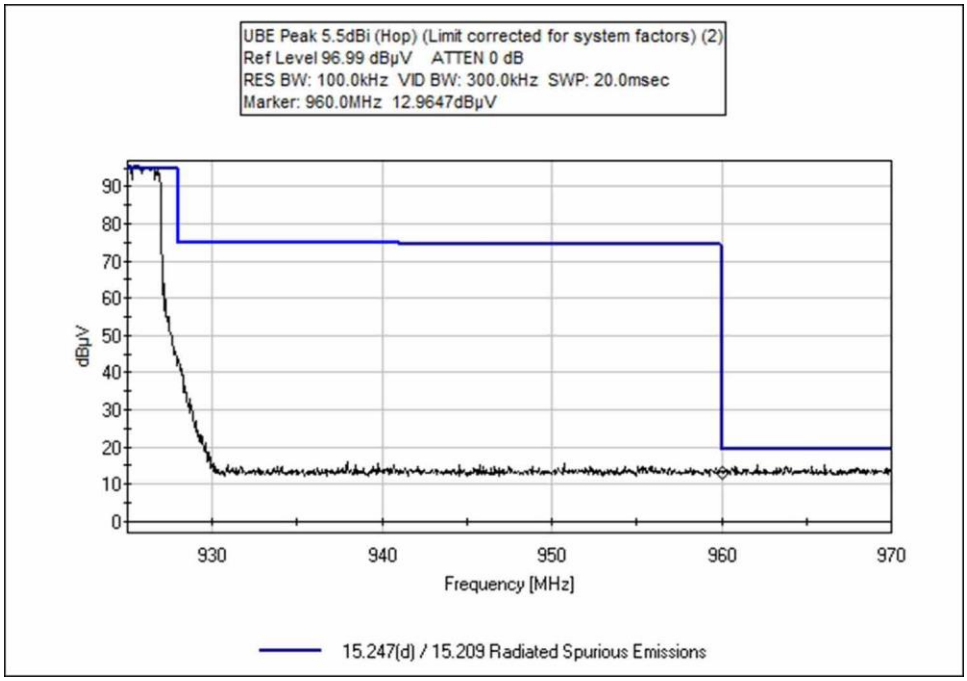
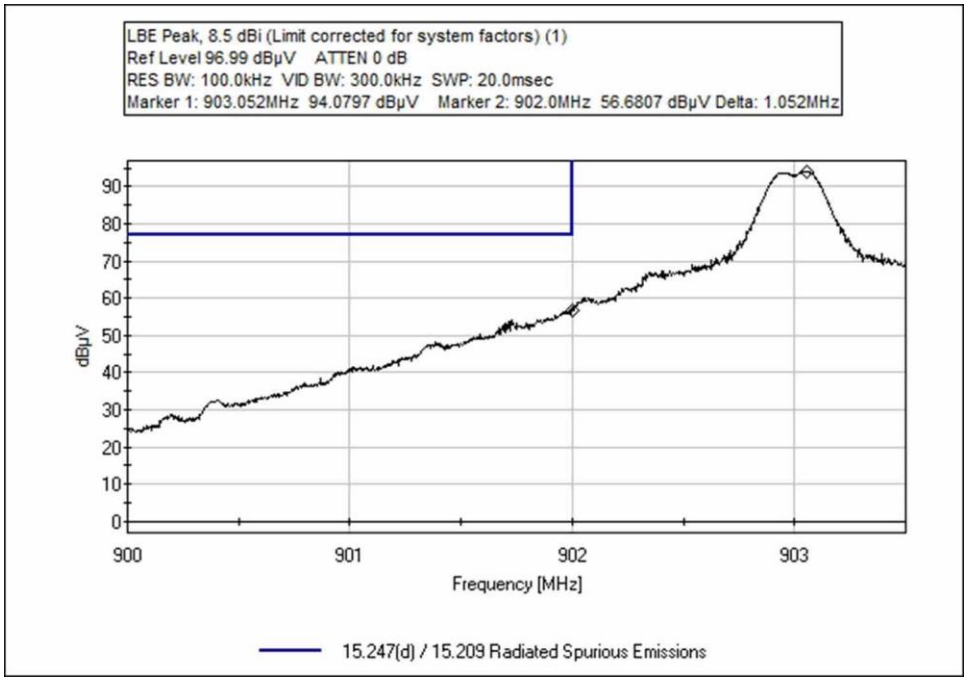
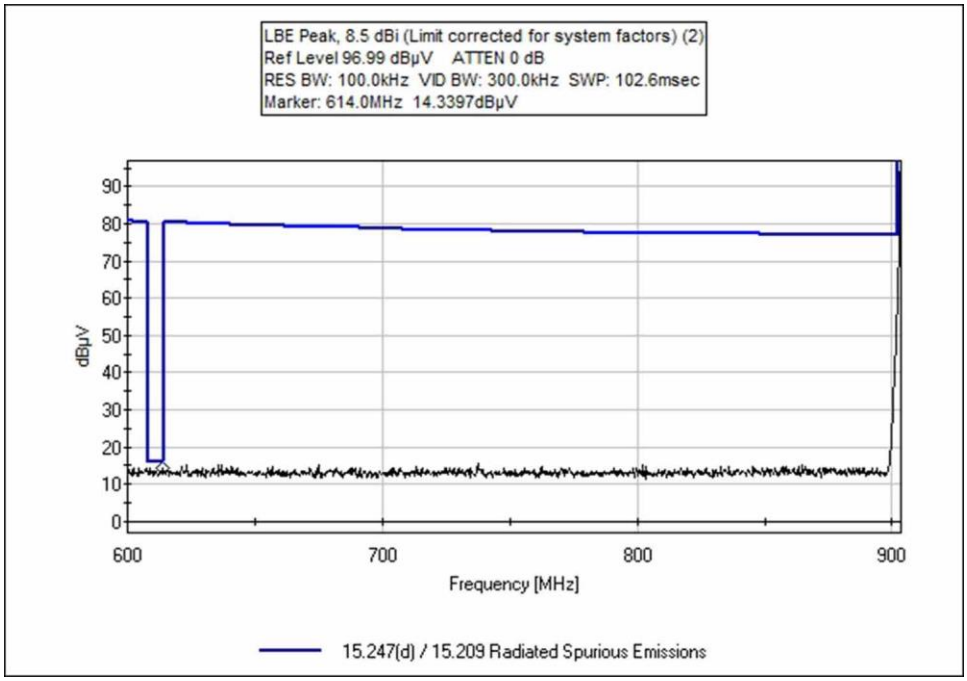
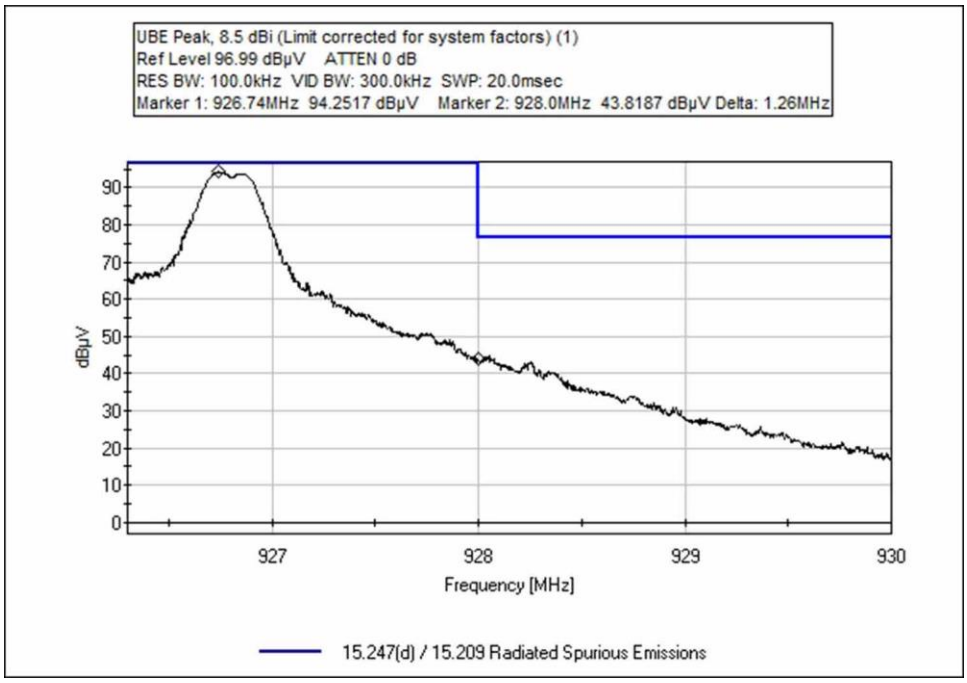

UBE Peak 5.5dBi (Hop) (Limit corrected for system factors) (1)
Ref Level 106.99 dBµV ATTEN 10 dB
RES BW: 100.0kHz VID BW: 300.0kHz SWP: 20.0msec
Marker 1: 926.845MHz 93.9307 dBµV Marker 2: 928.0MHz 43.2157 dBµV Delta: 1.155MHz
dBµV
Frequency [MHz]
15.247(d) / 15.209 Radiated Spurious Emissions

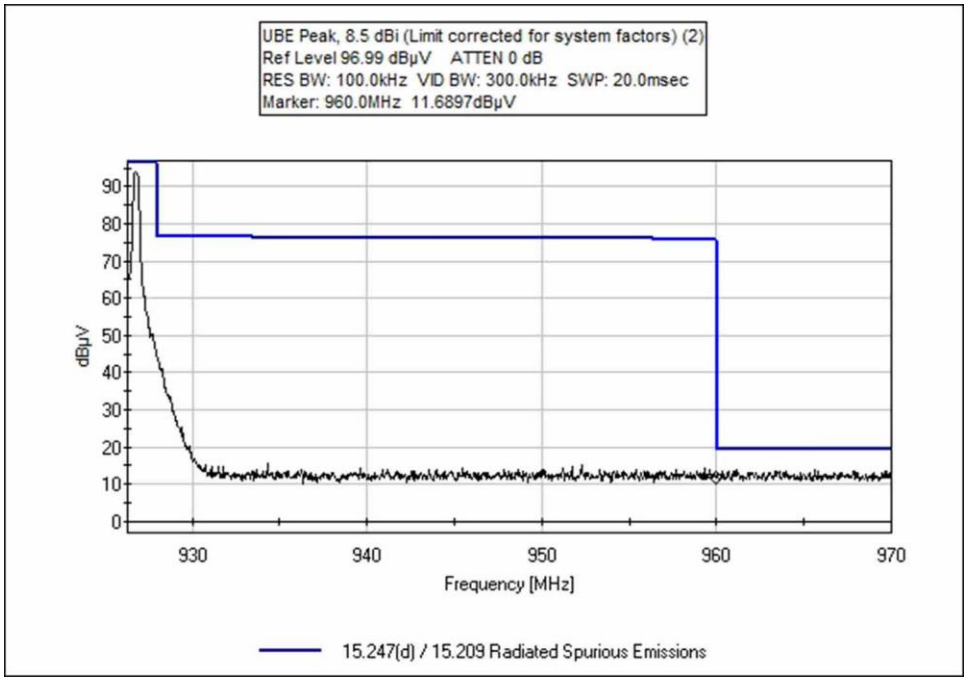

UBE Peak 5.5dBi (Hop) (Limit corrected for system factors) (2)
Ref Level 96.99 dBµV ATTEN 0 dB
RES BW: 100.0kHz VID BW: 300.0kHz SWP: 20.0msec
Marker: 960.0MHz 12.9647dBµV
dBµV
Frequency [MHz]
15.247(d) / 15.209 Radiated Spurious Emissions

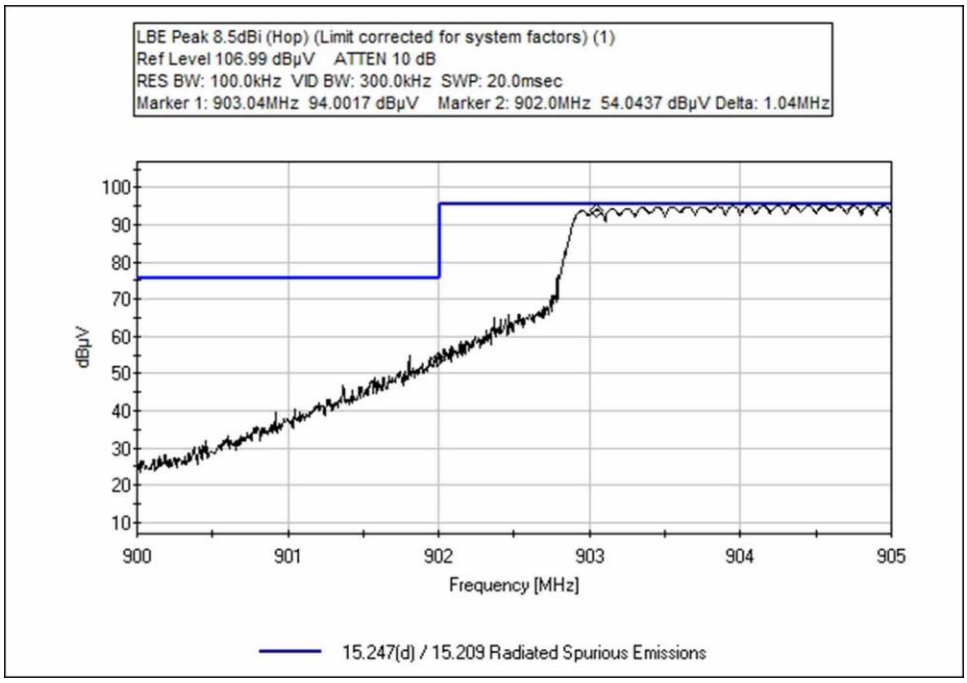
Configuration 2 - FSK 12.5 kbps

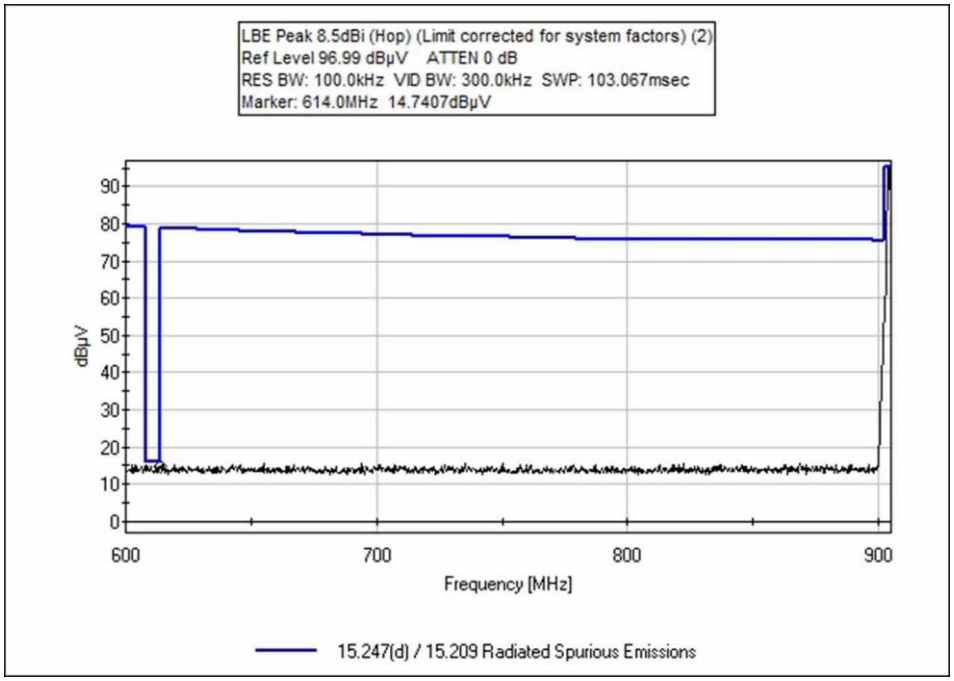


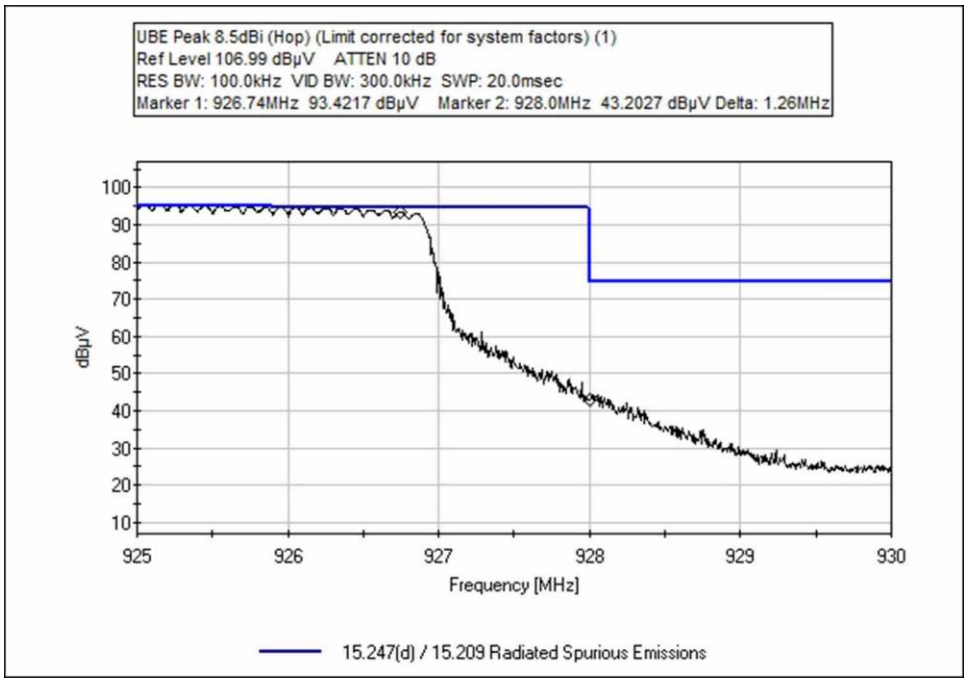


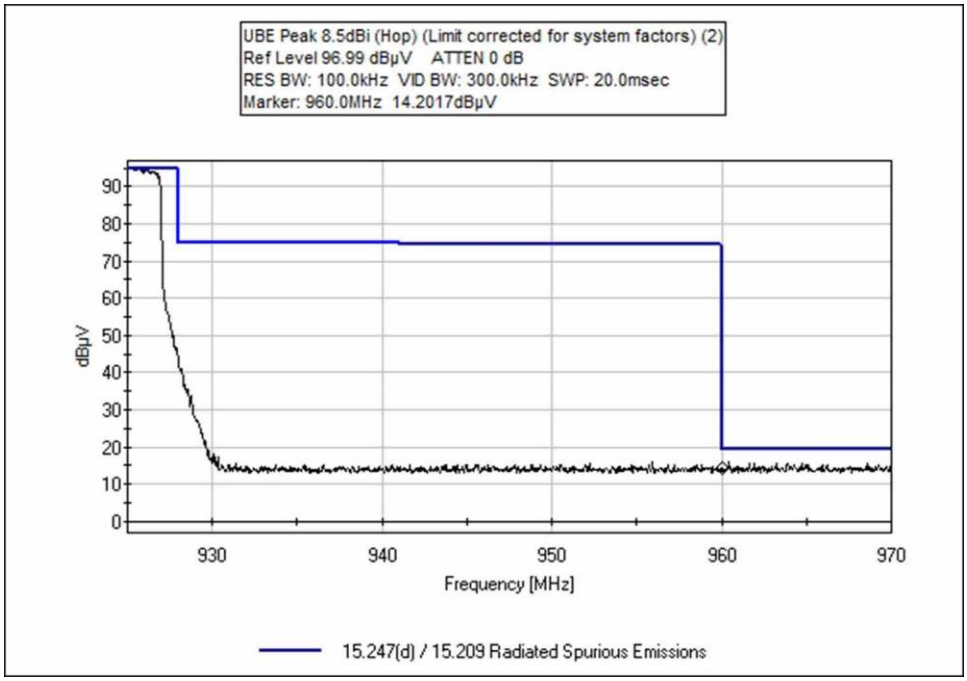

UBE Peak, 8.5 dBi (Limit corrected for system factors) (1)
Ref Level 96.99 dBµV ATTEN 0 dB
RES BW: 100.0kHz VID BW: 300.0kHz SWP: 20.0msec
Marker 1: 926.74MHz 94.2517 dBµV Marker 2: 928.0MHz 43.8187 dBµV Delta: 1.26MHz
dBµV
90
80
70
60
50
40
30
20
10
0
927
928
929
930
Frequency [MHz]
15.247(d) / 15.209 Radiated Spurious Emissions


UBE Peak, 8.5 dBi (Limit corrected for system factors) (2)
Ref Level 96.99 dBµV ATTEN 0 dB
RES BW: 100.0kHz VID BW: 300.0kHz SWP: 20.0msec
Marker: 960.0MHz 11.6897dBµV
dBµV
90
80
70
60
50
40
30
20
10
0
930
940
950
960
970
Frequency [MHz]
15.247(d) / 15.209 Radiated Spurious Emissions

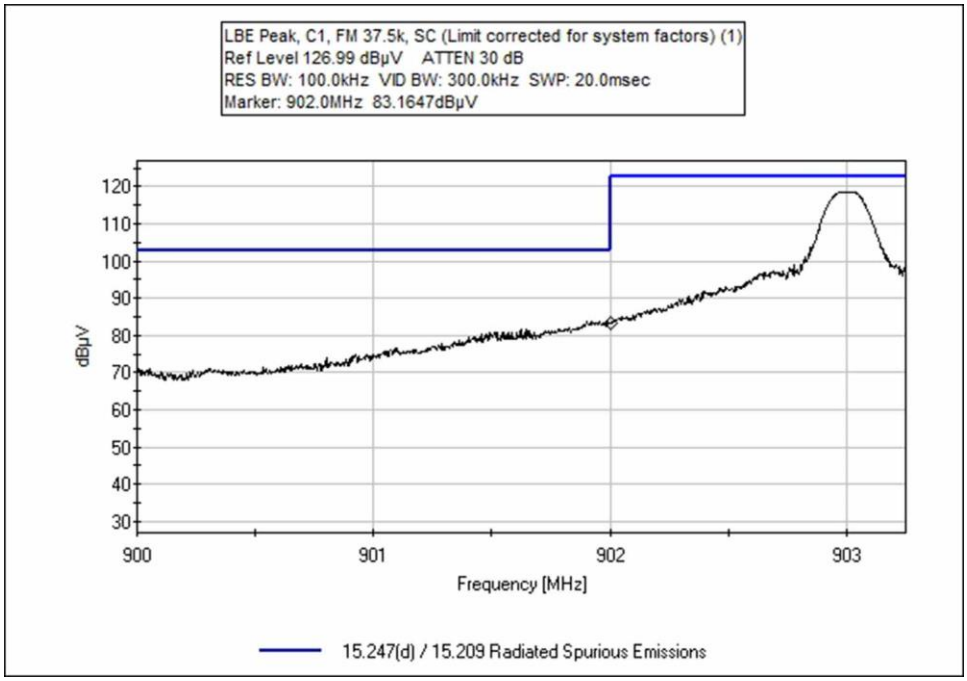

LBE Peak 8.5dBi (Hop) (Limit corrected for system factors) (1)
Ref Level 106.99 dBµV ATTEN 10 dB
RES BW: 100.0kHz VID BW: 300.0kHz SWP: 20.0msec
Marker 1: 903.04MHz 94.0017 dBµV Marker 2: 902.0MHz 54.0437 dBµV Delta: 1.04MHz
dBµV
Frequency [MHz]
15.247(d) / 15.209 Radiated Spurious Emissions

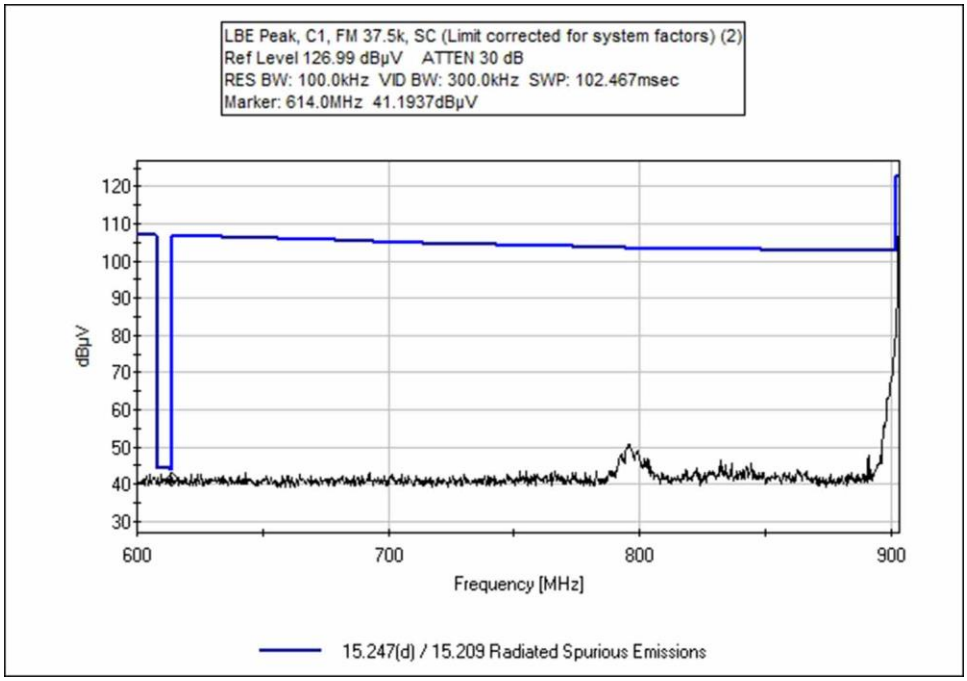

LBE Peak 8.5dBi (Hop) (Limit corrected for system factors) (2)
Ref Level 96.99 dBµV ATTEN 0 dB
RES BW: 100.0kHz VID BW: 300.0kHz SWP: 103.067msec
Marker: 614.0MHz 14.7407dBµV
dBµV
Frequency [MHz]
15.247(d) / 15.209 Radiated Spurious Emissions

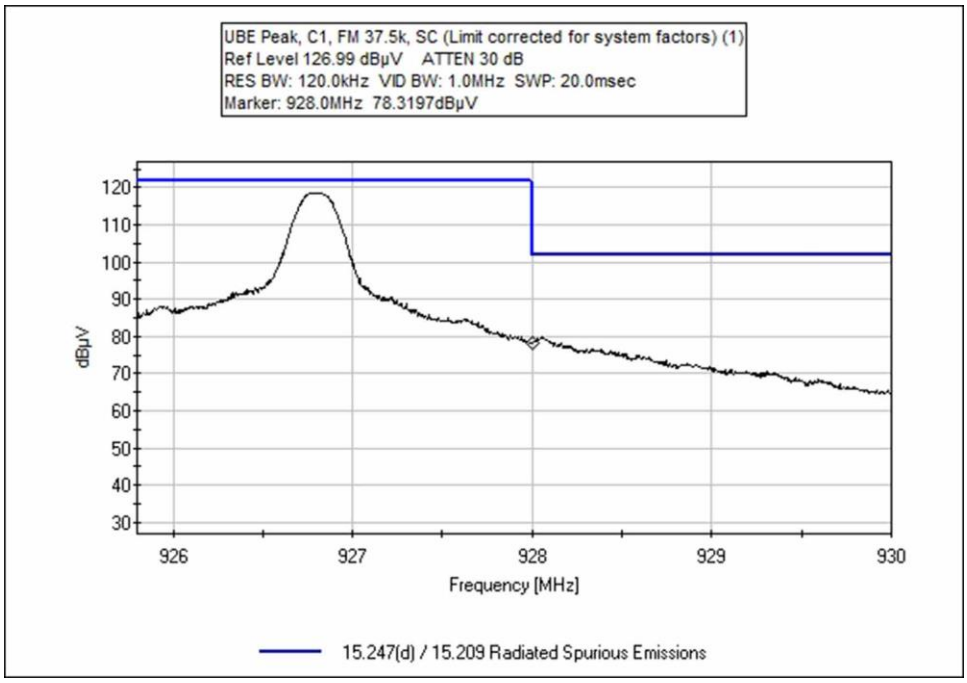

UBE Peak 8.5dBi (Hop) (Limit corrected for system factors) (1)
Ref Level 106.99 dBµV ATTEN 10 dB
RES BW: 100.0kHz VID BW: 300.0kHz SWP: 20.0msec
Marker 1: 926.74MHz 93.4217 dBµV Marker 2: 928.0MHz 43.2027 dBµV Delta: 1.26MHz
dBµV
Frequency [MHz]
15.247(d) / 15.209 Radiated Spurious Emissions

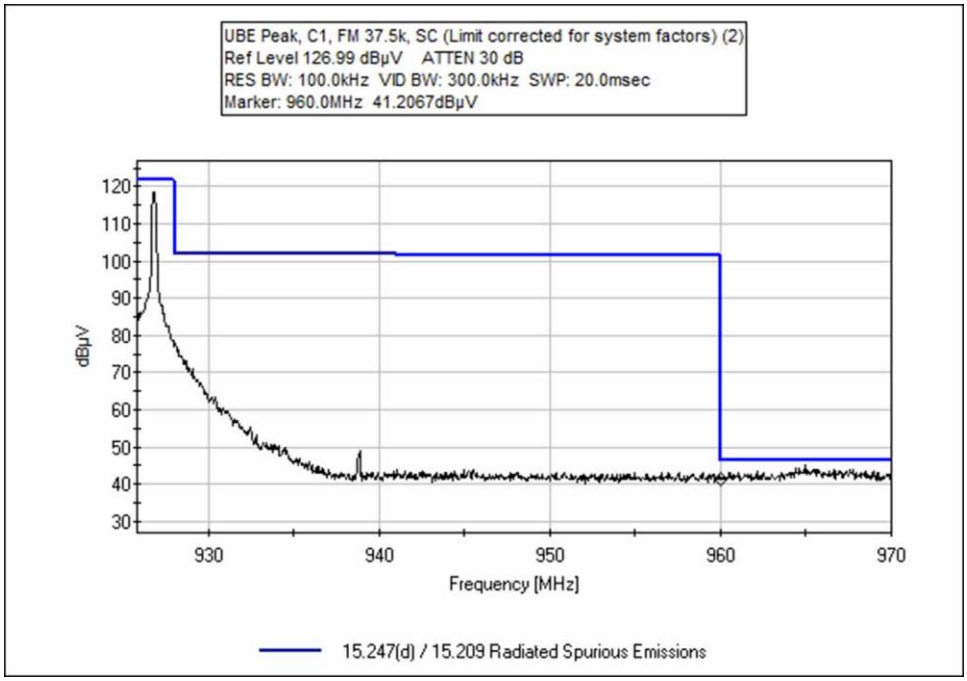

UBE Peak 8.5dBi (Hop) (Limit corrected for system factors) (2)
Ref Level 96.99 dBµV ATTEN 0 dB
RES BW: 100.0kHz VID BW: 300.0kHz SWP: 20.0msec
Marker: 960.0MHz 14.2017dBµV
dBµV
Frequency [MHz]
15.247(d) / 15.209 Radiated Spurious Emissions

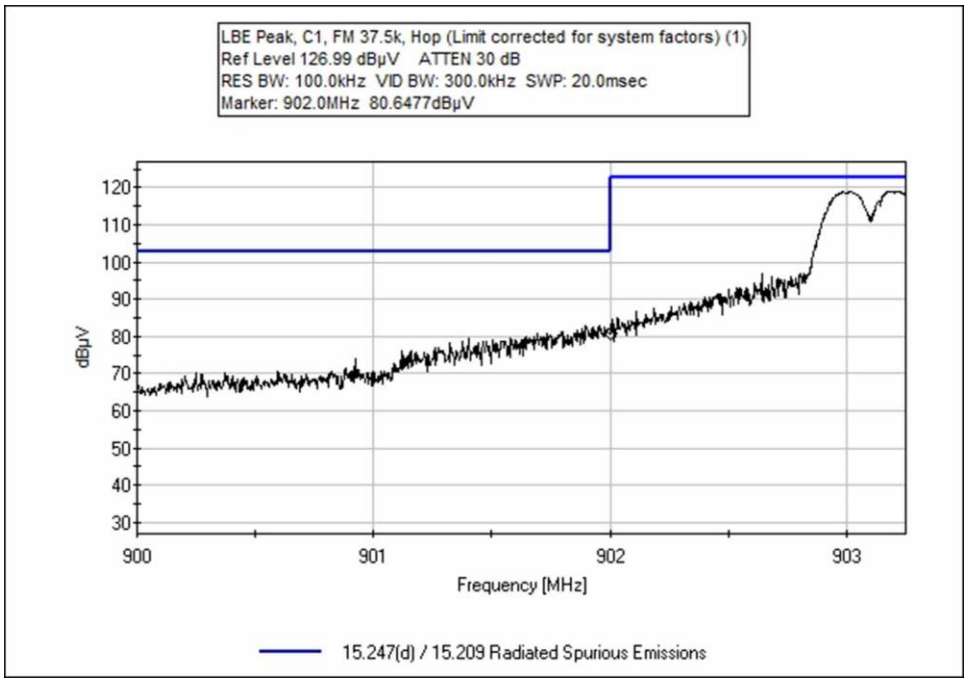
Configuration 1 – FM 37.5 kbps

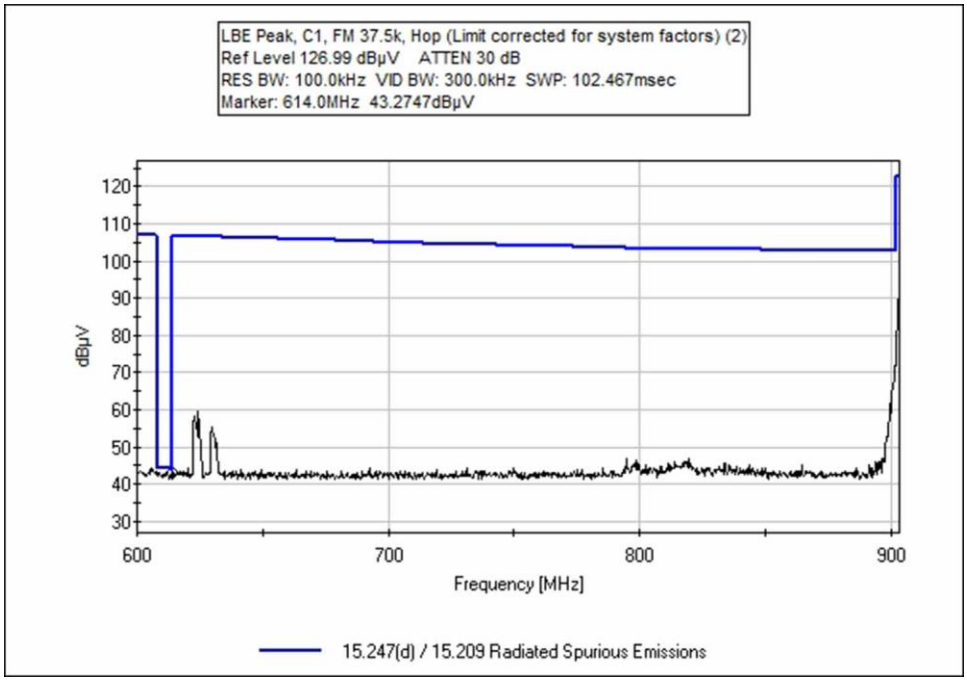


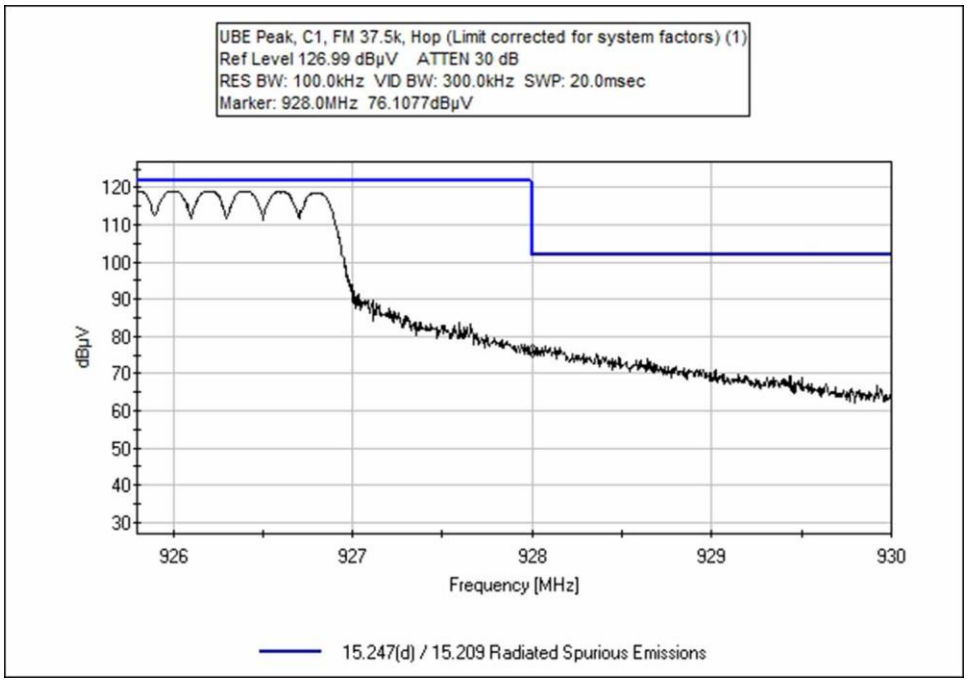


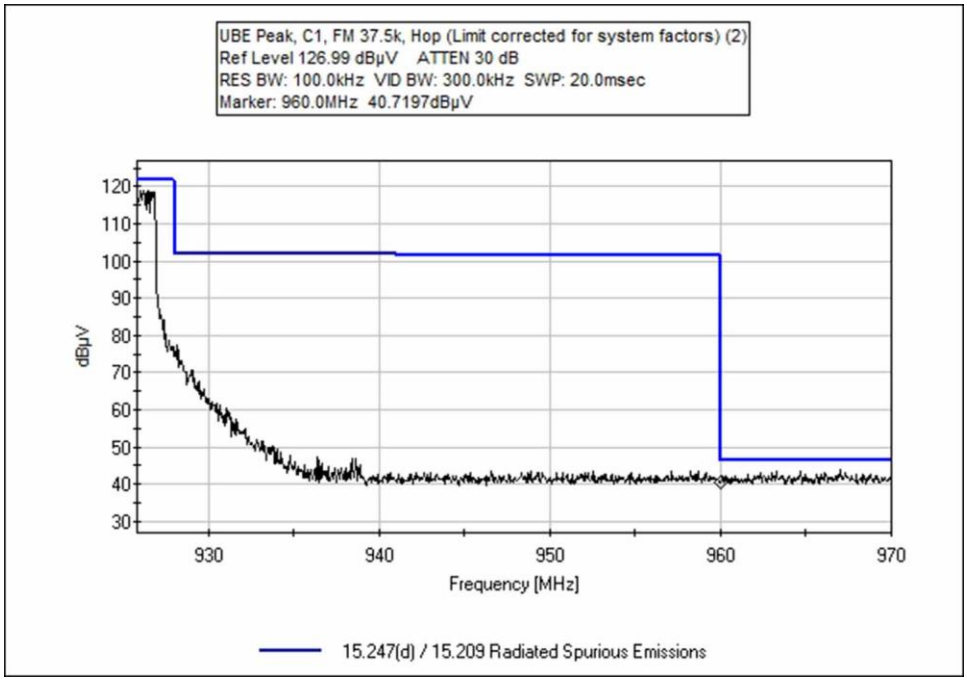

UBE Peak, C1, FM 37.5k, SC (Limit corrected for system factors) (1)
Ref Level 126.99 dBµV ATTEN 30 dB
RES BW: 120.0kHz VID BW: 1.0MHz SWP: 20.0msec
Marker: 928.0MHz 78.3197dBµV
dBµV
120
110
100
90
80
70
60
50
40
30
926
927
928
929
930
Frequency [MHz]
15.247(d) / 15.209 Radiated Spurious Emissions


UBE Peak, C1, FM 37.5k, SC (Limit corrected for system factors) (2)
Ref Level 126.99 dBµV ATTEN 30 dB
RES BW: 100.0kHz VID BW: 300.0kHz SWP: 20.0msec
Marker: 960.0MHz 41.2067dBµV
dBµV
120
110
100
90
80
70
60
50
40
30
930
940
950
960
970
Frequency [MHz]
15.247(d) / 15.209 Radiated Spurious Emissions

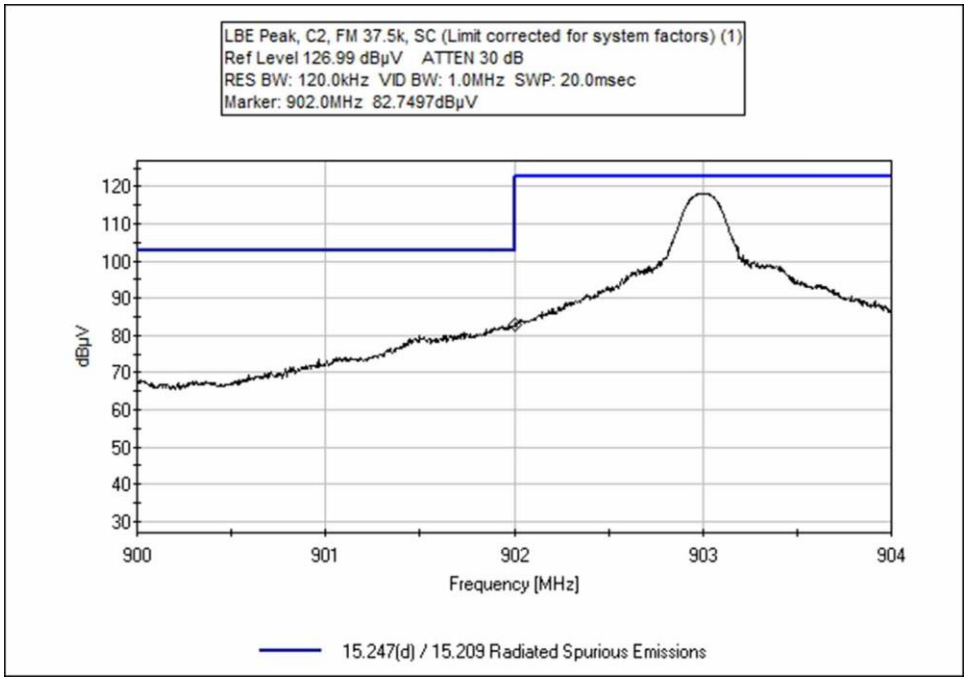

LBE Peak, C1, FM 37.5k, Hop (Limit corrected for system factors) (1)
Ref Level 126.99 dBµV ATTEN 30 dB
RES BW: 100.0kHz VID BW: 300.0kHz SWP: 20.0msec
Marker: 902.0MHz 80.6477dBµV
dBµV
120
110
100
90
80
70
60
50
40
30
900
901
902
903
Frequency [MHz]
15.247(d) / 15.209 Radiated Spurious Emissions

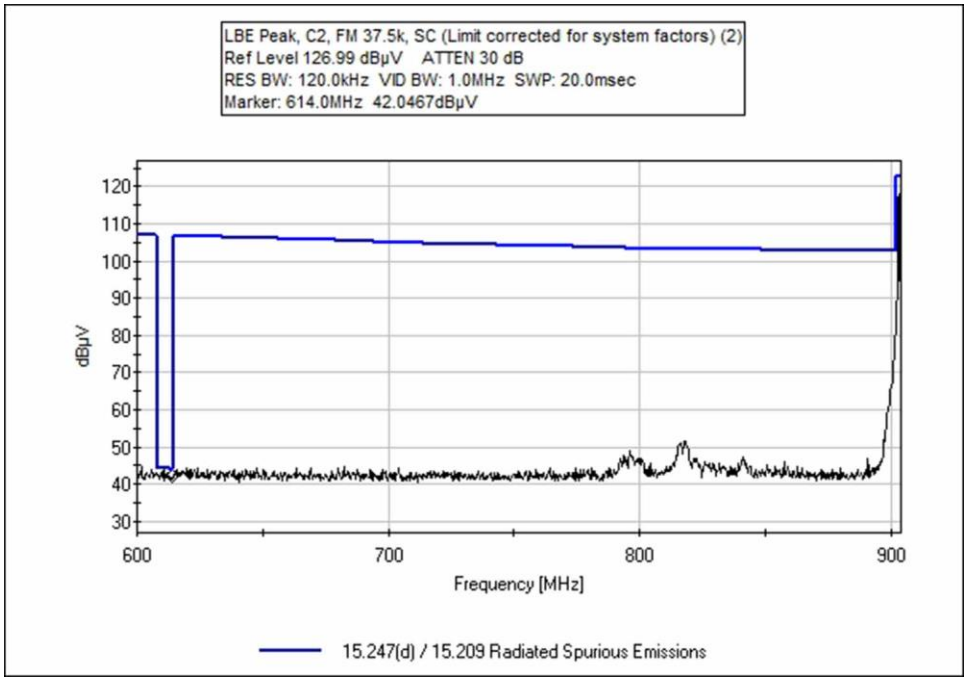

LBE Peak, C1, FM 37.5k, Hop (Limit corrected for system factors) (2)
Ref Level 126.99 dBµV ATTEN 30 dB
RES BW: 100.0kHz VID BW: 300.0kHz SWP: 102.467msec
Marker: 614.0MHz 43.2747dBµV
dBµV
120
110
100
90
80
70
60
50
40
30
600
700
800
900
Frequency [MHz]
15.247(d) / 15.209 Radiated Spurious Emissions

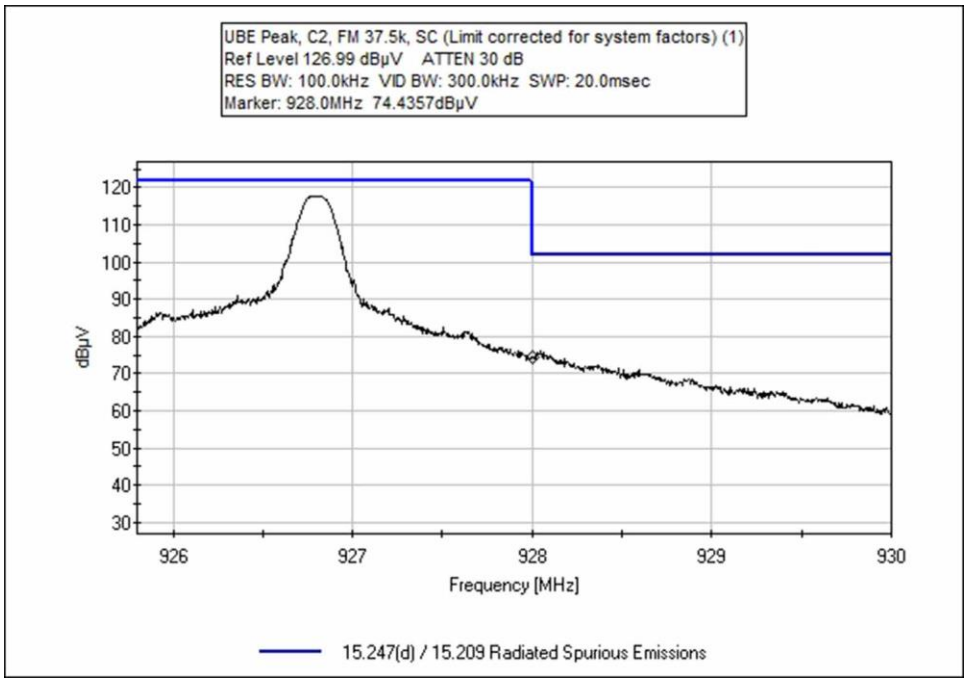

UBE Peak, C1, FM 37.5k, Hop (Limit corrected for system factors) (1)
Ref Level 126.99 dBµV ATTEN 30 dB
RES BW: 100.0kHz VID BW: 300.0kHz SWP: 20.0msec
Marker: 928.0MHz 76.1077dBµV
dBµV
120
110
100
90
80
70
60
50
40
30
926
927
928
929
930
Frequency [MHz]
15.247(d) / 15.209 Radiated Spurious Emissions

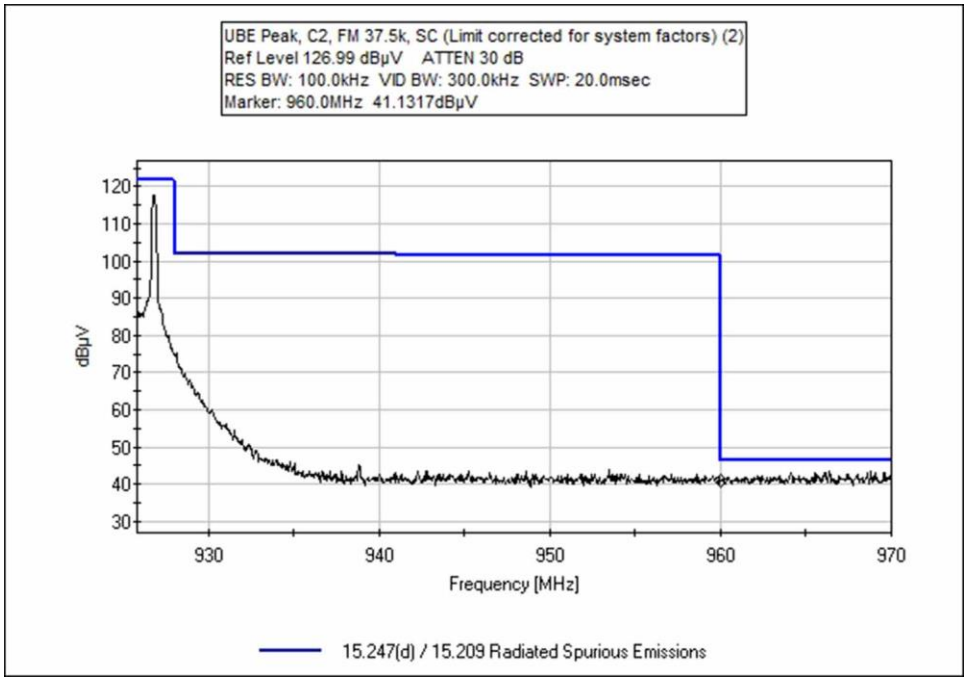

UBE Peak, C1, FM 37.5k, Hop (Limit corrected for system factors) (2)
Ref Level 126.99 dBµV ATTEN 30 dB
RES BW: 100.0kHz VID BW: 300.0kHz SWP: 20.0msec
Marker: 960.0MHz 40.7197dBµV
dBµV
120
110
100
90
80
70
60
50
40
30
930
940
950
960
970
Frequency [MHz]
15.247(d) / 15.209 Radiated Spurious Emissions

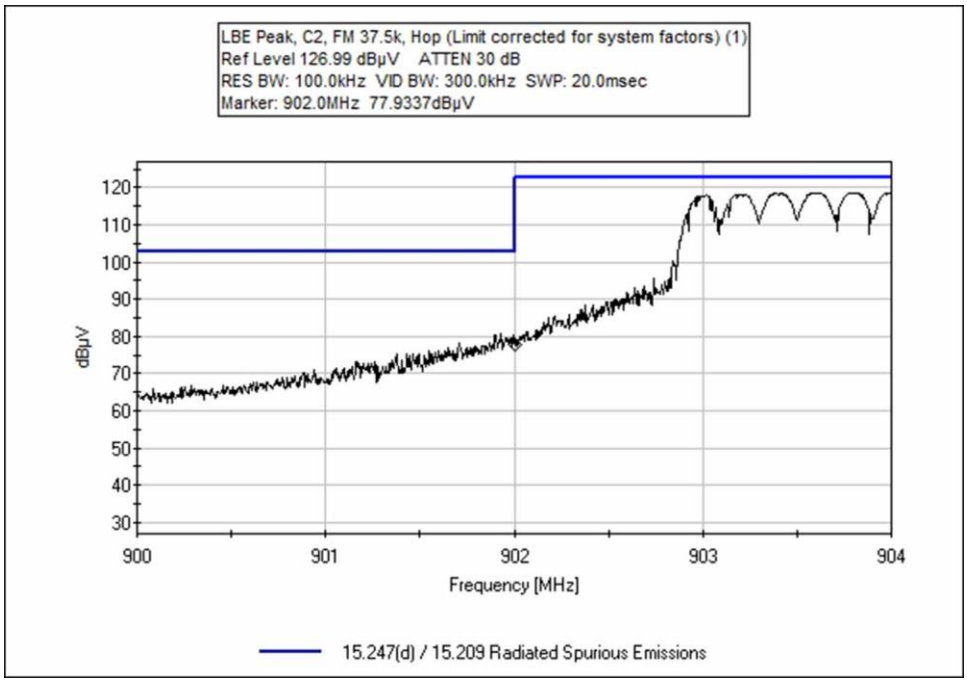
Configuration 2 – FM 37.5 kbps

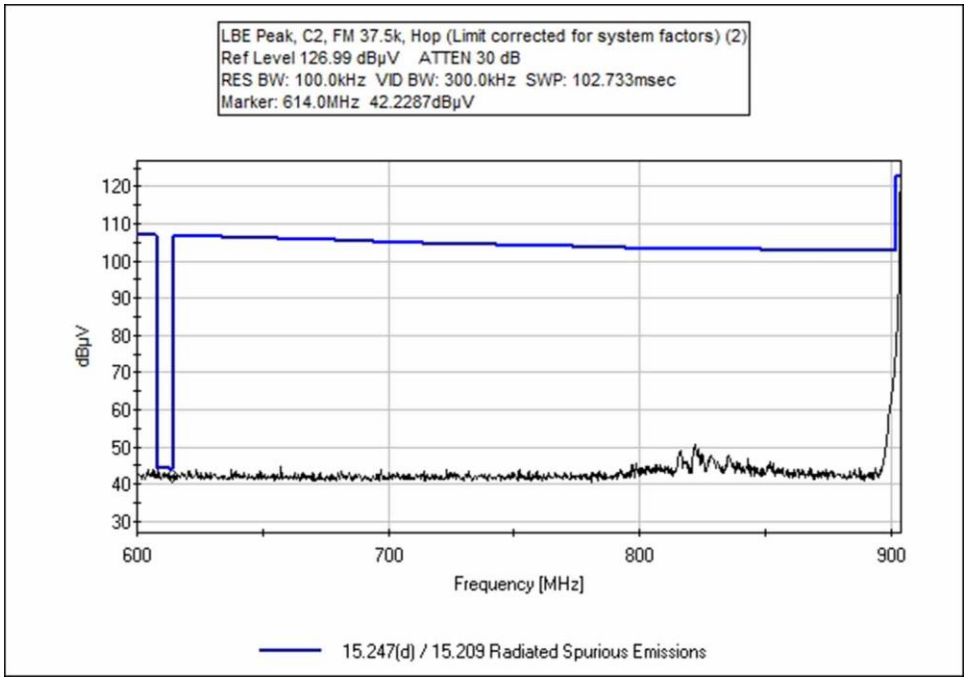


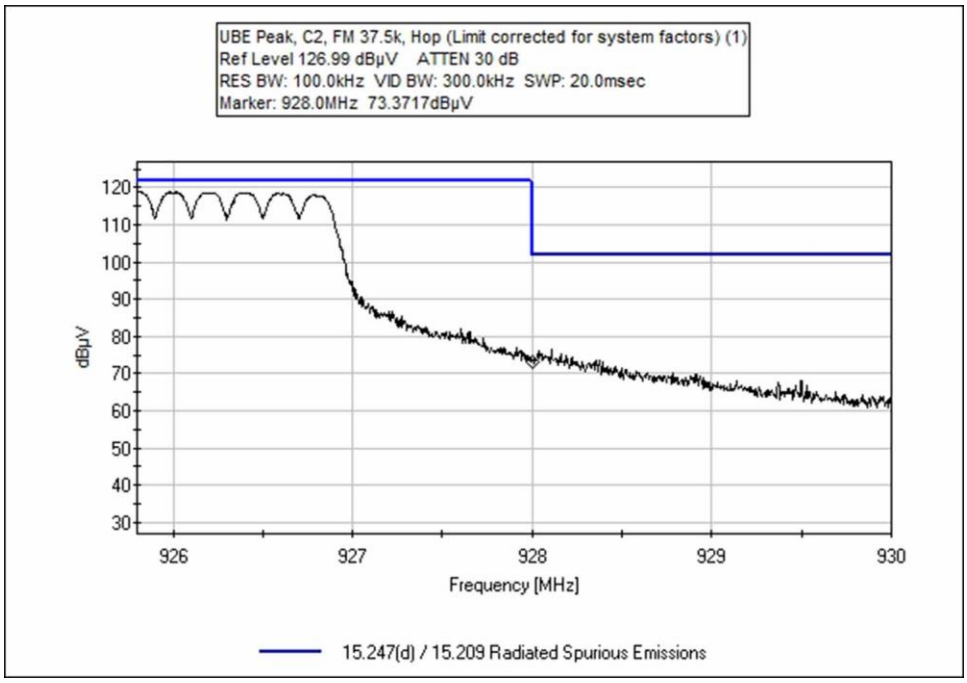


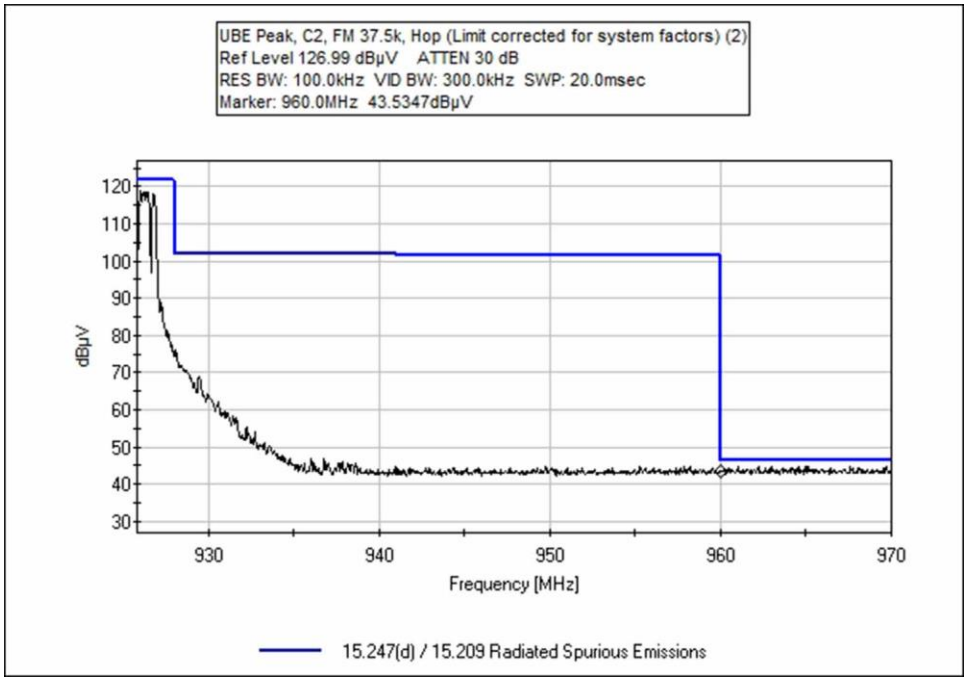

UBE Peak, C2, FM 37.5k, SC (Limit corrected for system factors) (1)
Ref Level 126.99 dBµV ATTEN 30 dB
RES BW: 100.0kHz VID BW: 300.0kHz SWP: 20.0msec
Marker: 928.0MHz 74.4357dBµV
dBµV
120
110
100
90
80
70
60
50
40
30
926
927
928
929
930
Frequency [MHz]
15.247(d) / 15.209 Radiated Spurious Emissions


UBE Peak, C2, FM 37.5k, SC (Limit corrected for system factors) (2)
Ref Level 126.99 dBµV ATTEN 30 dB
RES BW: 100.0kHz VID BW: 300.0kHz SWP: 20.0msec
Marker: 960.0MHz 41.1317dBµV
dBµV
120
110
100
90
80
70
60
50
40
30
930
940
950
960
970
Frequency [MHz]
15.247(d) / 15.209 Radiated Spurious Emissions

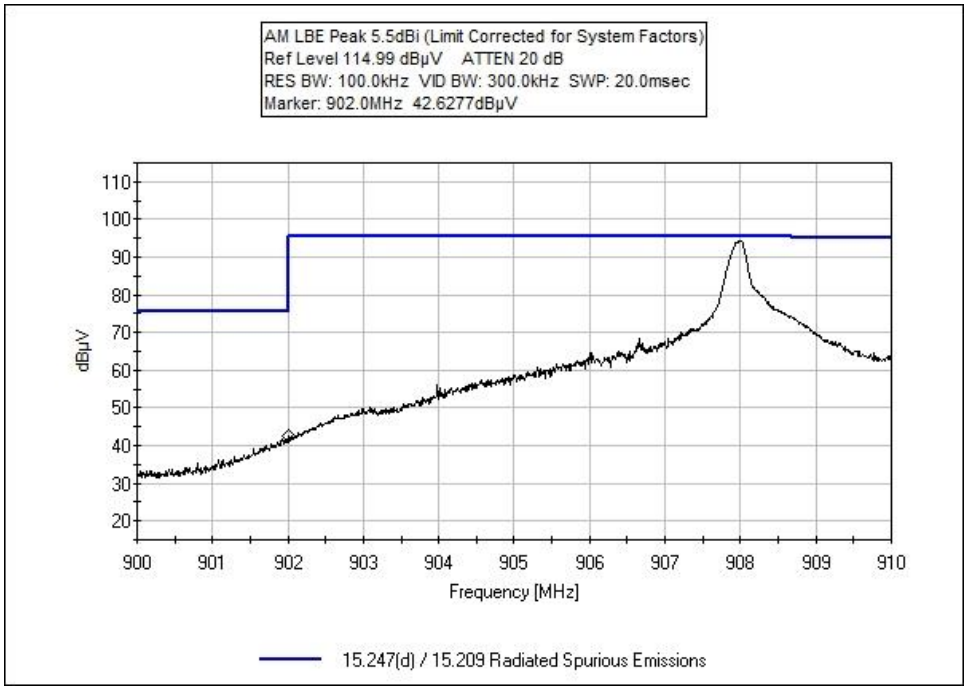

LBE Peak, C2, FM 37.5k, Hop (Limit corrected for system factors) (1)
Ref Level 126.99 dBµV ATTEN 30 dB
RES BW: 100.0kHz VID BW: 300.0kHz SWP: 20.0msec
Marker: 902.0MHz 77.9337dBµV
dBµV
120
110
100
90
80
70
60
50
40
30
900
901
902
903
904
Frequency [MHz]
15.247(d) / 15.209 Radiated Spurious Emissions

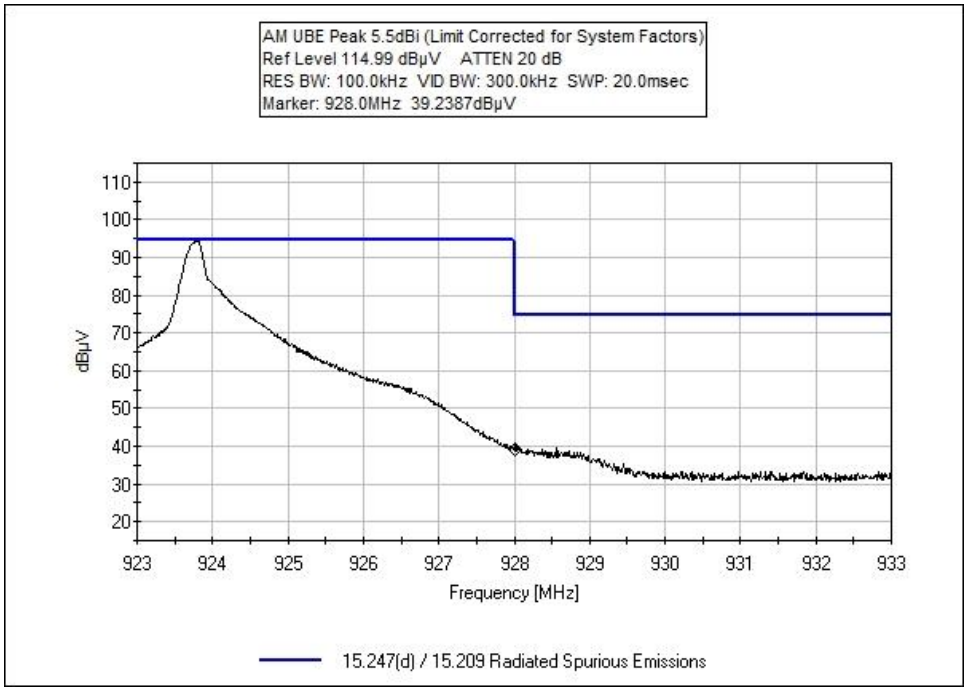

LBE Peak, C2, FM 37.5k, Hop (Limit corrected for system factors) (2)
Ref Level 126.99 dBµV ATTEN 30 dB
RES BW: 100.0kHz VID BW: 300.0kHz SWP: 102.733msec
Marker: 614.0MHz 42.2287dBµV
dBµV
120
110
100
90
80
70
60
50
40
30
600
700
800
900
Frequency [MHz]
15.247(d) / 15.209 Radiated Spurious Emissions

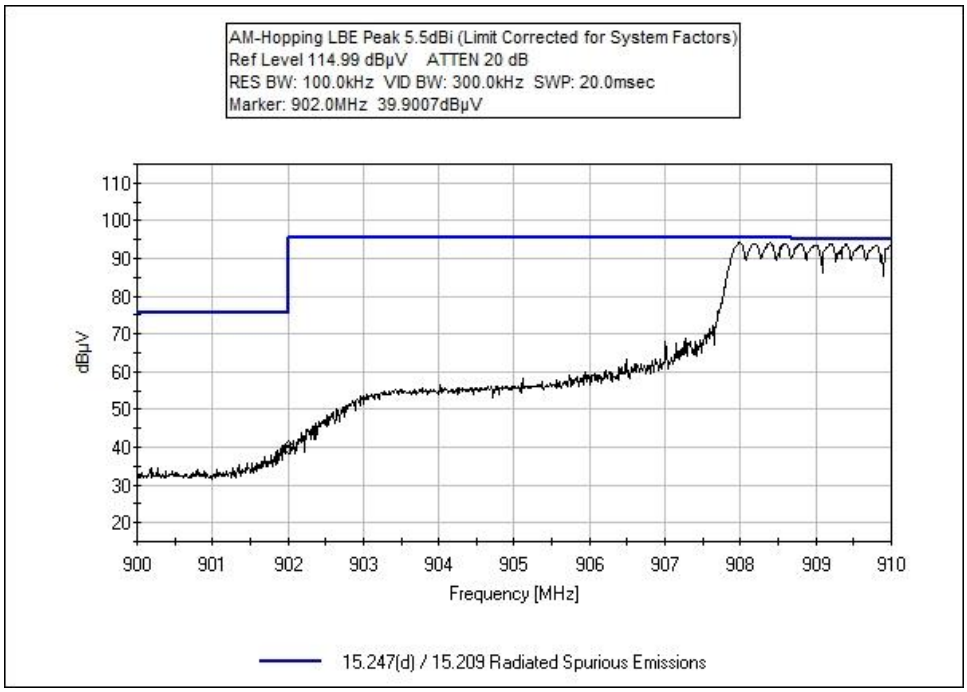

UBE Peak, C2, FM 37.5k, Hop (Limit corrected for system factors) (1)
Ref Level 126.99 dBµV ATTEN 30 dB
RES BW: 100.0kHz VID BW: 300.0kHz SWP: 20.0msec
Marker: 928.0MHz 73.3717dBµV
dBµV
120
110
100
90
80
70
60
50
40
30
926
927
928
929
930
Frequency [MHz]
15.247(d) / 15.209 Radiated Spurious Emissions

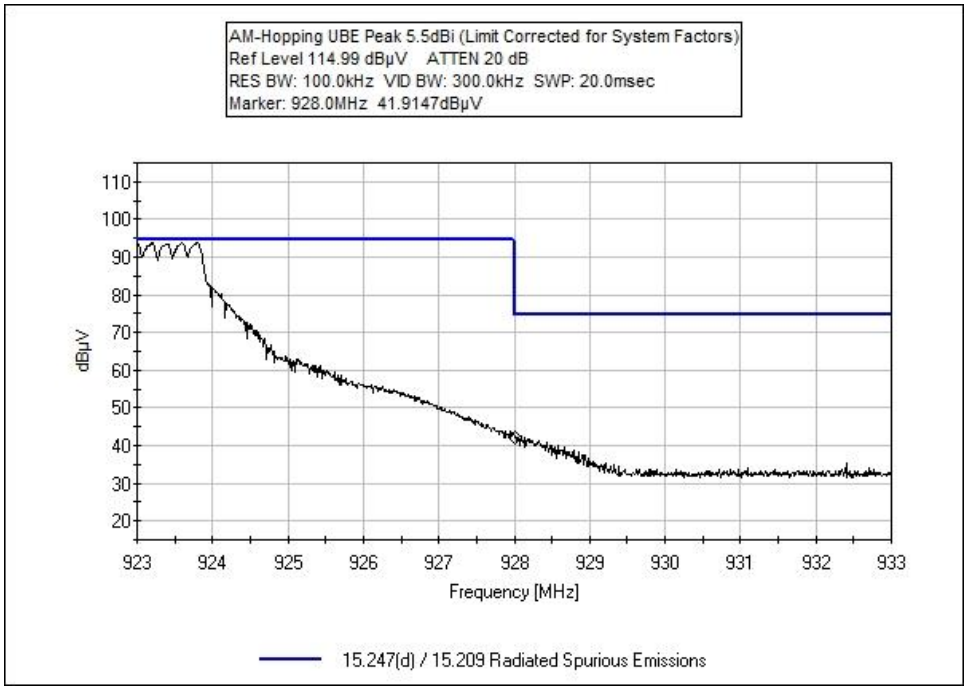

UBE Peak, C2, FM 37.5k, Hop (Limit corrected for system factors) (2)
Ref Level 126.99 dBµV ATTEN 30 dB
RES BW: 100.0kHz VID BW: 300.0kHz SWP: 20.0msec
Marker: 960.0MHz 43.5347dBµV
dBµV
120
110
100
90
80
70
60
50
40
30
930
940
950
960
970
Frequency [MHz]
15.247(d) / 15.209 Radiated Spurious Emissions

Configuration 1 – AM (5.5dBi)

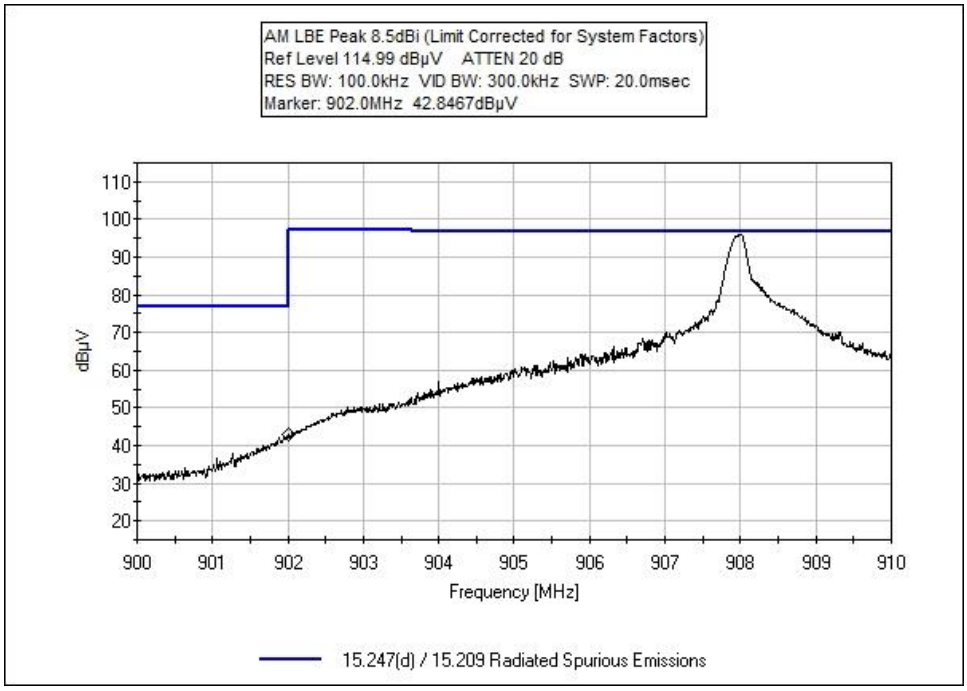


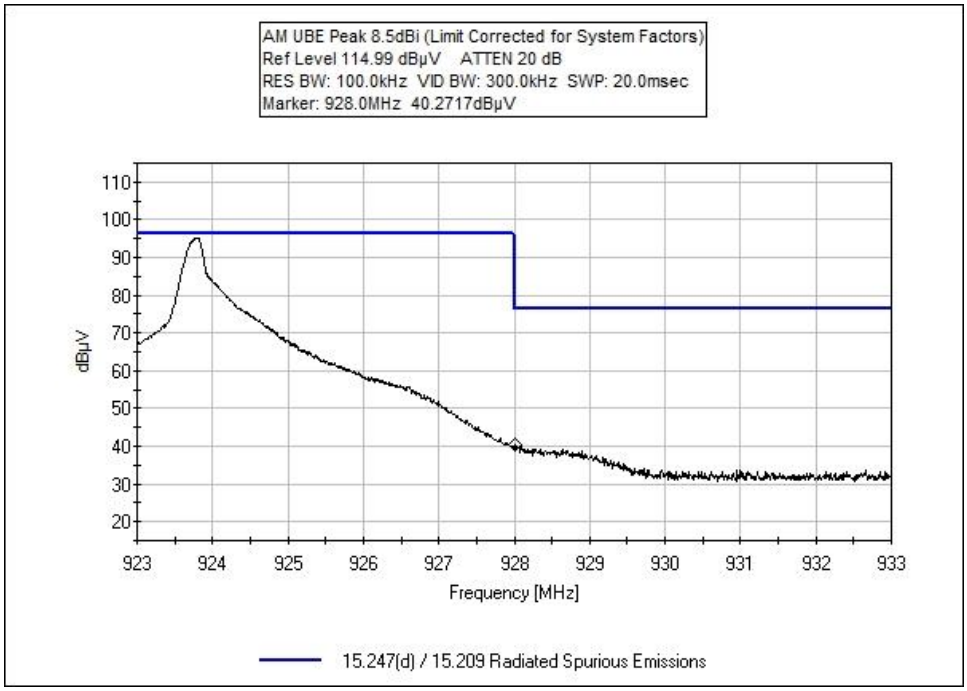


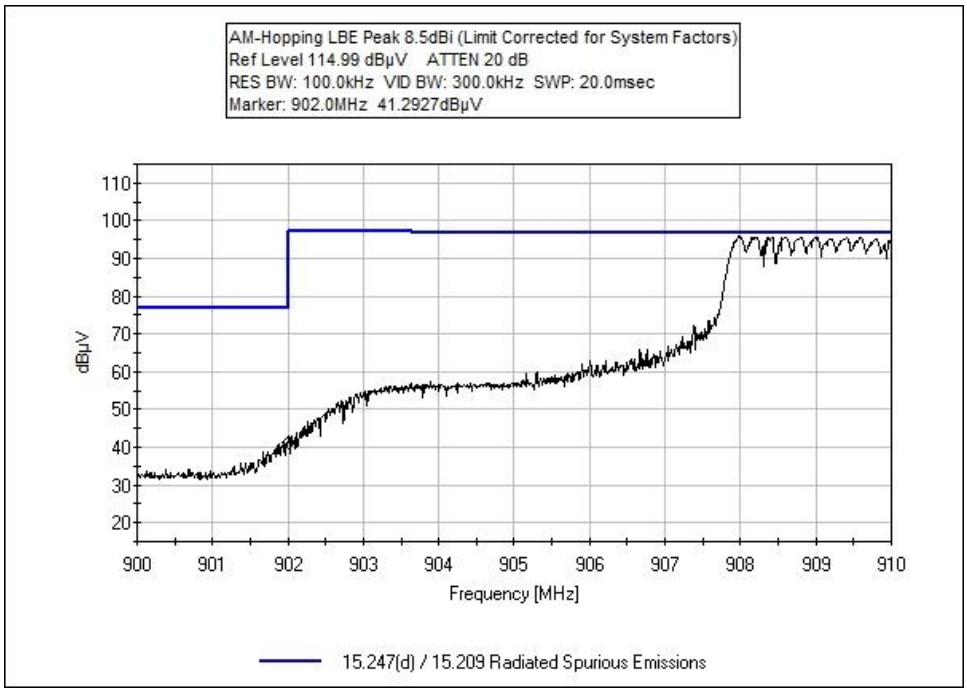

AM-Hopping LBE Peak 5.5dBi (Limit Corrected for System Factors)
Ref Level 114.99 dBµV ATTEN 20 dB
RES BW: 100.0kHz VID BW: 300.0kHz SWP: 20.0msec
Marker: 902.0MHz 39.9007dBµV
dBµV
110
100
90
80
70
60
50
40
30
20
900
901
902
903
904
905
906
907
908
909
910
Frequency [MHz]
15.247(d) / 15.209 Radiated Spurious Emissions

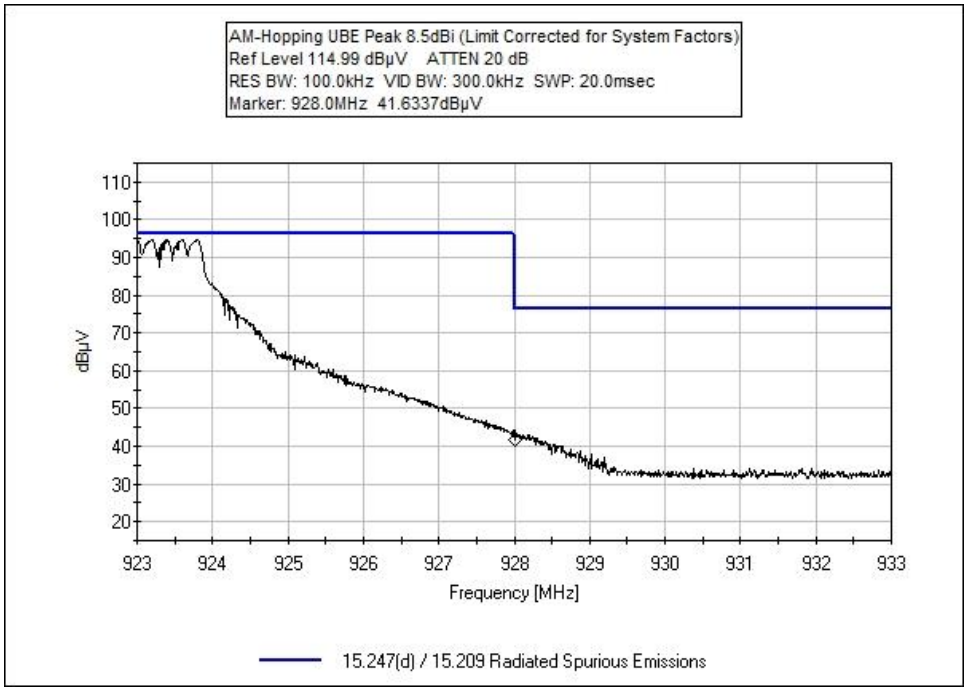

AM-Hopping UBE Peak 5.5dBi (Limit Corrected for System Factors)
Ref Level 114.99 dBµV ATTEN 20 dB
RES BW: 100.0kHz VID BW: 300.0kHz SWP: 20.0msec
Marker: 928.0MHz 41.9147dBµV
dBµV
110
100
90
80
70
60
50
40
30
20
923
924
925
926
927
928
929
930
931
932
933
Frequency [MHz]
15.247(d) / 15.209 Radiated Spurious Emissions

Configuration 2 – AM (8.5dBi)






AM-Hopping LBE Peak 8.5dBi (Limit Corrected for System Factors)
Ref Level 114.99 dBµV ATTEN 20 dB
RES BW: 100.0kHz VID BW: 300.0kHz SWP: 20.0msec
Marker: 902.0MHz 41.2927dBµV
dBµV
110
100
90
80
70
60
50
40
30
20
900
901
902
903
904
905
906
907
908
909
910
Frequency [MHz]
15.247(d) / 15.209 Radiated Spurious Emissions


AM-Hopping UBE Peak 8.5dBi (Limit Corrected for System Factors)
Ref Level 114.99 dBµV ATTEN 20 dB
RES BW: 100.0kHz VID BW: 300.0kHz SWP: 20.0msec
Marker: 928.0MHz 41.6337dBµV
dBµV
110
100
90
80
70
60
50
40
30
20
923
924
925
926
927
928
929
930
931
932
933
Frequency [MHz]
15.247(d) / 15.209 Radiated Spurious Emissions

Test Setup / Conditions / Data

Test Location: CKC Laboratories, Inc. · 22116 23rd Dr SE · Bothell, WA 98021 · 800-500-4362
Customer: **Itron, Inc.**
Specification: **15.247(d) / 15.209 Radiated Spurious Emissions**
Work Order #: **103221** Date: 11/22/2019
Test Type: **Radiated Scan** Time: 14:20:14
Tested By: Matthew Harrison Sequence#: 12
Software: EMITest 5.03.12

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

Test Conditions / Notes:

Temperature: 23° C
Humidity: 39%
Pressure: 101.1 kPa

Frequency Range: 600-970MHz
Frequency tested: 903.0-926.8 MHz
Firmware power setting: Max
Modulation: FSK 12.5k

Antenna type: Omnidirectional
Antenna Gain: 5.5 dBi.

Duty Cycle: 100% Modulated

Test Method: ANSI C63.10: 2013
Test Mode: Transmitting
Test Setup: EUT is setup in a tabletop configuration on a Styrofoam table:
Below 1GHz set 80cm high.

Co-Location testing was performed with Wi-Fi, Cell, and FHSS radios transmitting simultaneously in both CCU100C and CCU100RC configurations.

Modification #1 and #2 were in place during testing.

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN03628	Biconilog Antenna	3142E	6/11/2019	6/11/2021
T2	ANP06123	Attenuator	18N-6	4/5/2019	4/5/2021
T3	ANP05305	Cable	ETSI-50T	9/6/2019	9/6/2021
T4	ANP05360	Cable	RG214	1/31/2018	1/31/2020
T5	ANP06540	Cable	Heliax	8/23/2019	8/23/2021
	AN02673	Spectrum Analyzer	E4446A	2/22/2019	2/22/2021

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	903.049M	95.5	+23.8 +0.3	+5.8	+1.4	+2.0	+0.0	128.8	128.8	+0.0	Vert
2	926.733M	94.7	+24.2 +0.4	+5.8	+1.5	+2.0	+0.0	128.6	128.8	-0.2	Vert
3	960.000M	13.8	+24.6 +0.4	+5.8	+1.5	+2.1	+0.0	48.2	54.0	-5.8	Vert
4	614.000M QP	9.4	+21.2 +0.3	+5.8	+1.2	+1.5	+0.0	39.4	46.0	-6.6	Vert
^	614.000M	13.5	+21.2 +0.3	+5.8	+1.2	+1.5	+0.0	43.5	46.0	-2.5	Vert
6	902.000M	59.0	+23.8 +0.3	+5.8	+1.4	+2.0	+0.0	92.3	108.8	-16.5	Vert
7	928.000M	44.2	+24.2 +0.4	+5.8	+1.5	+2.0	+0.0	78.1	108.8	-30.7	Vert

Test Location: CKC Laboratories, Inc. · 22116 23rd Dr SE · Bothell, WA 98021 · 800-500-4362
Customer: **Itron, Inc.**
Specification: **15.247(d) / 15.209 Radiated Spurious Emissions**
Work Order #: **103221** Date: 12/18/2019
Test Type: **Radiated Scan** Time: 10:02:24
Tested By: Matthew Harrison Sequence#: 44
Software: EMITest 5.03.12

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

Test Conditions / Notes:

Temperature: 23° C
Humidity: 39%
Pressure: 101.1 kPa

Frequency Range: 600-970MHz
Frequency tested: 903.0-926.8 MHz
Firmware power setting: Max
Modulation: FSK 12.5k Hopping

Antenna type: Omnidirectional
Antenna Gain: 5.5 dBi.

Duty Cycle: 100% Modulated

Test Method: ANSI C63.10: 2013
Test Mode: Transmitting
Test Setup: EUT is setup in a tabletop configuration on a Styrofoam table:
Below 1GHz set 80cm high.

Co-Location testing was performed with Wi-Fi, Cell, and FHSS radios transmitting simultaneously in both CCU100C and CCU100RC configurations.

Modification #1 and #2 were in place during testing.

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN03628	Biconilog Antenna	3142E	6/11/2019	6/11/2021
T2	ANP06123	Attenuator	18N-6	4/5/2019	4/5/2021
T3	ANP05305	Cable	ETSI-50T	9/6/2019	9/6/2021
T4	ANP05360	Cable	RG214	1/31/2018	1/31/2020
T5	ANP06540	Cable	Heliax	8/23/2019	8/23/2021
	AN02673	Spectrum Analyzer	E4446A	2/22/2019	2/22/2021

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	902.947M	95.2	+23.8 +0.3	+5.8	+1.4	+2.0	+0.0	128.5	128.8	-0.3	Vert
2	926.845M	93.9	+24.2 +0.4	+5.8	+1.5	+2.0	+0.0	127.8	128.8	-1.0	Vert
3	614.000M	13.7	+21.2 +0.3	+5.8	+1.2	+1.5	+0.0	43.7	46.0	-2.3	Vert
4	960.000M	13.0	+24.6 +0.4	+5.8	+1.5	+2.1	+0.0	47.4	54.0	-6.6	Vert
5	902.000M	54.4	+23.8 +0.3	+5.8	+1.4	+2.0	+0.0	87.7	108.8	-21.1	Vert
6	928.000M	43.2	+24.2 +0.4	+5.8	+1.5	+2.0	+0.0	77.1	108.8	-31.7	Vert

Test Location: CKC Laboratories, Inc. · 22116 23rd Dr SE · Bothell, WA 98021 · 800-500-4362
Customer: **Itron, Inc.**
Specification: **15.247(d) / 15.209 Radiated Spurious Emissions**
Work Order #: **103221** Date: 5/1/2020
Test Type: **Radiated Scan** Time: 13:06:49
Tested By: Matthew Harrison Sequence#: 13
Software: EMITest 5.03.12

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

Test Conditions / Notes:

Temperature: 23° C
Humidity: 39%
Pressure: 101.1 kPa

Frequency Range: 600-970MHz
Frequency tested: 903.0-926.8 MHz
Firmware power setting: Max
Modulation: AM

Antenna type: Omnidiretional
Antenna Gain: 5.5 dBi.

Duty Cycle: 100% Modulated

Test Method: ANSI C63.10: 2013
Test Mode: Transmitting
Test Setup: EUT is setup in a tabletop configuration on a Styrofoam table.
Below 1GHz set 80cm high

Co-Location testing was performed with Wi-Fi, Cell, and FHSS radios transmitter simultaneously in both CCU100C and CCU100RC configurations.

Modification #1 and #2 were in place during testing.

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN02872	Spectrum Analyzer	E4440A	11/18/2019	11/18/2021
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	ANP06123	Attenuator	18N-6	4/5/2019	4/5/2021

T5	AN03628	Biconilog Antenna	3142E	6/11/2019	6/11/2021

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

#	Freq	Rdng	T1	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
			T5								
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant
1	614.000M				+1.7	+5.8	+0.0	38.2	46.0	-7.8	Vert
		8.0	+0.3	+1.2							
	QP		+21.2								
2	960.000M				+2.2	+5.8	+0.0	42.5	54.0	-11.5	Vert
		8.0	+0.4	+1.5							
	QP		+24.6								
3	902.000M				+2.1	+5.8	+0.0	76.0	108.8	-32.8	Vert
		42.6	+0.3	+1.4							
			+23.8								
4	928.000M				+2.2	+5.8	+0.0	73.3	108.8	-35.5	Vert
		39.2	+0.4	+1.5							
			+24.2								

Test Location: CKC Laboratories, Inc. · 22116 23rd Dr SE · Bothell, WA 98021 · 800-500-4362
Customer: **Itron, Inc.**
Specification: **15.247(d) / 15.209 Radiated Spurious Emissions**
Work Order #: **103221** Date: 11/23/2019
Test Type: **Radiated Scan** Time: 06:58:55
Tested By: Matthew Harrison Sequence#: 15
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:

Temperature: 23° C
Humidity: 39%
Pressure: 101.1 kPa

Frequency Range: 600-970MHz
Frequency tested: 903.0-926.8 MHz
Firmware power setting: Max
Modulation: FSK 12.5k

Antenna type: Omnidirectional
Antenna Gain: 8.15 dBi.

Duty Cycle: 100% Modulated

Test Method: ANSI C63.10: 2013
Test Mode: Transmitting
Test Setup: EUT is setup in a tabletop configuration on a Styrofoam table:
Below 1GHz set 80cm high.

Co-Location testing was performed with Wi-Fi, Cell, and FHSS radios transmitting simultaneously in both CCU100C and CCU100RC configurations.

Modification #1 and #2 were in place during testing.

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN03628	Biconilog Antenna	3142E	6/11/2019	6/11/2021
T2	ANP06123	Attenuator	18N-6	4/5/2019	4/5/2021
T3	ANP05305	Cable	ETSI-50T	9/6/2019	9/6/2021
T4	ANP05360	Cable	RG214	1/31/2018	1/31/2020
T5	ANP06540	Cable	Heliax	8/23/2019	8/23/2021
	AN02673	Spectrum Analyzer	E4446A	2/22/2019	2/22/2021

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	926.740M	94.3	+24.2 +0.4	+5.8	+1.5	+2.0	+0.0	128.2	130.4	-2.2	Vert
2	903.052M	94.1	+23.8 +0.3	+5.8	+1.4	+2.0	+0.0	127.4	130.4	-3.0	Vert
3	614.000M QP	9.3	+21.2 +0.3	+5.8	+1.2	+1.5	+0.0	39.3	46.0	-6.7	Vert
^	614.000M	14.3	+21.2 +0.3	+5.8	+1.2	+1.5	+0.0	44.3	46.0	-1.7	Vert
5	960.000M	11.7	+24.6 +0.4	+5.8	+1.5	+2.1	+0.0	46.1	54.0	-7.9	Vert
6	902.000M	56.7	+23.8 +0.3	+5.8	+1.4	+2.0	+0.0	90.0	110.4	-20.4	Vert
7	928.000M	43.8	+24.2 +0.4	+5.8	+1.5	+2.0	+0.0	77.7	110.4	-32.7	Vert

Test Location: CKC Laboratories, Inc. · 22116 23rd Dr SE · Bothell, WA 98021 · 800-500-4362
Customer: **Itron, Inc.**
Specification: **15.247(d) / 15.209 Radiated Spurious Emissions**
Work Order #: **103221** Date: 12/18/2019
Test Type: **Radiated Scan** Time: 11:28:02
Tested By: Matthew Harrison Sequence#: 45
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:

Temperature: 23° C
Humidity: 39%
Pressure: 101.1 kPa

Frequency Range: 600-970MHz
Frequency tested: 903.0-926.8 MHz
Firmware power setting: Max
Modulation: FSK 12.5k Hopping

Antenna type: Omnidirectional
Antenna Gain: 8.15 dBi.

Duty Cycle: 100% Modulated

Test Method: ANSI C63.10: 2013
Test Mode: Transmitting
Test Setup: EUT is setup in a tabletop configuration on a Styrofoam table:
Below 1GHz set 80cm high.

Co-Location testing was performed with Wi-Fi, Cell, and FHSS radios transmitting simultaneously in both CCU100C and CCU100RC configurations.

Modification #1 and #2 were in place during testing.

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN03628	Biconilog Antenna	3142E	6/11/2019	6/11/2021
T2	ANP06123	Attenuator	18N-6	4/5/2019	4/5/2021
T3	ANP05305	Cable	ETSI-50T	9/6/2019	9/6/2021
T4	ANP05360	Cable	RG214	1/31/2018	1/31/2020
T5	ANP06540	Cable	Heliax	8/23/2019	8/23/2021
	AN02673	Spectrum Analyzer	E4446A	2/22/2019	2/22/2021

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	14.7	+21.2 +0.3	+5.8	+1.2	+1.5	+0.0	44.7	46.0	-1.3	Vert
2	903.050M	94.0	+23.8 +0.3	+5.8	+1.4	+2.0	+0.0	127.3	128.8	-1.5	Vert
3	926.740M	93.4	+24.2 +0.4	+5.8	+1.5	+2.0	+0.0	127.3	128.8	-1.5	Vert
4	960.000M	14.2	+24.6 +0.4	+5.8	+1.5	+2.1	+0.0	48.6	54.0	-5.4	Vert
5	902.000M	54.5	+23.8 +0.3	+5.8	+1.4	+2.0	+0.0	87.8	108.8	-21.0	Vert
6	928.000M	43.2	+24.2 +0.4	+5.8	+1.5	+2.0	+0.0	77.1	108.8	-31.7	Vert

Test Location: CKC Laboratories, Inc. · 22116 23rd Dr SE · Bothell, WA 98021 · 800-500-4362
Customer: **Itron, Inc.**
Specification: **15.247(d) / 15.209 Radiated Spurious Emissions**
Work Order #: **103221** Date: 4/15/2020
Test Type: **Radiated Scan** Time: 09:10:28
Tested By: Matthew Harrison Sequence#: 46
Software: EMITest 5.03.12

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

Test Conditions / Notes:

Temperature: 23° C
Humidity: 39%
Pressure: 101.1 kPa

Frequency Range: 600-970MHz
Frequency tested: 903.0-926.8 MHz
Firmware power setting: Max
Modulation: FSK 37.5k

Antenna type: Omnidiretional
Antenna Gain: 5.5 dBi.

Duty Cycle: 100% Modulated

Test Method: ANSI C63.10: 2013
Test Mode: Transmitting
Test Setup: EUT is setup in a tabletop configuration 80cm high on a Styrofoam table.
Modification #1 and #2 were in place during testing.

FM 37.5kbps

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN02307	Preamp	8447D	1/10/2020	1/10/2022
T2	AN03628	Biconilog Antenna	3142E	6/11/2019	6/11/2021
T3	ANP06123	Attenuator	18N-6	4/5/2019	4/5/2021
T4	ANP05305	Cable	ETSI-50T	9/6/2019	9/6/2021
T5	ANP05360	Cable	RG214	2/3/2020	2/3/2022
T6	ANP06540	Cable	Heliax	8/23/2019	8/23/2021
T7	AN02872	Spectrum Analyzer	E4440A	11/18/2019	11/18/2021

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

#	Freq	Rdng	T1	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
			T5	T6	T7						
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant
1	614.000M		-		+5.8	+1.2	+0.0	43.2	46.0	-2.8	Vert
		41.2	28.2	+21.2	+0.0						
			+1.7	+0.3							
2	903.017M		-		+5.8	+1.4	+0.0	125.0	128.8	-3.8	Vert
		118.9	27.3	+23.8	+0.0						
			+2.1	+0.3			60				110
3	960.000M		-		+5.8	+1.5	+0.0	49.3	54.0	-4.7	Vert
		41.9	27.1	+24.6	+0.0						
			+2.2	+0.4							
4	902.000M		-		+5.8	+1.4	+0.0	89.3	108.8	-19.5	Vert
		83.2	27.3	+23.8	+0.0						
			+2.1	+0.3							
5	928.000M		-		+5.8	+1.5	+0.0	85.1	108.8	-23.7	Vert
		78.2	27.2	+24.2	+0.0						
			+2.2	+0.4							

Test Location: CKC Laboratories, Inc. · 22116 23rd Dr SE · Bothell, WA 98021 · 800-500-4362
Customer: **Itron, Inc.**
Specification: **15.247(d) / 15.209 Radiated Spurious Emissions**
Work Order #: **103221** Date: 4/15/2020
Test Type: **Radiated Scan** Time: 09:04:16
Tested By: Matthew Harrison Sequence#: 47
Software: EMITest 5.03.12

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

Test Conditions / Notes:

Temperature: 23° C
Humidity: 39%
Pressure: 101.1 kPa

Frequency Range: 600-970MHz
Frequency tested: 903.0-926.8 MHz
Firmware power setting: Max
Modulation: FSK 37.5k Hopping

Antenna type: Omnidiretional
Antenna Gain: 5.5 dBi.

Duty Cycle: 100% Modulated

Test Method: ANSI C63.10: 2013
Test Mode: Transmitting
Test Setup: EUT is setup in a tabletop configuration 80cm high on a Styrofoam table.
Modification #1 and #2 were in place during testing.

FM 37.5kbps Hopping

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN02307	Preamp	8447D	1/10/2020	1/10/2022
T2	AN03628	Biconilog Antenna	3142E	6/11/2019	6/11/2021
T3	ANP06123	Attenuator	18N-6	4/5/2019	4/5/2021
T4	ANP05305	Cable	ETSI-50T	9/6/2019	9/6/2021
T5	ANP05360	Cable	RG214	2/3/2020	2/3/2022
T6	ANP06540	Cable	Heliax	8/23/2019	8/23/2021
	AN02872	Spectrum Analyzer	E4440A	11/18/2019	11/18/2021

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

#	Freq	Rdng	T1	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
			T5	T6							
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant
1	960.000M		-		+5.8	+1.5	+0.0	50.4	54.0	-3.6	Vert
		43.0	27.1	+24.6							
			+2.2	+0.4							
2	903.013M		-		+5.8	+1.4	+0.0	124.9	128.8	-3.9	Vert
		118.8	27.3	+23.8							
			+2.1	+0.3							
3	614.000M		-		+5.8	+1.2	+0.0	25.1	46.0	-20.9	Vert
		23.1	28.2	+21.2							
	QP		+1.7	+0.3							
^	614.000M		-		+5.8	+1.2	+0.0	45.3	46.0	-0.7	Vert
		43.3	28.2	+21.2							
			+1.7	+0.3							
5	902.000M		-		+5.8	+1.4	+0.0	86.7	108.8	-22.1	Vert
		80.6	27.3	+23.8							
			+2.1	+0.3							
6	928.000M		-		+5.8	+1.5	+0.0	83.0	108.8	-25.8	Vert
		76.1	27.2	+24.2							
			+2.2	+0.4							

Test Location: CKC Laboratories, Inc. · 22116 23rd Dr SE · Bothell, WA 98021 · 800-500-4362
Customer: **Itron, Inc.**
Specification: **15.247(d) / 15.209 Radiated Spurious Emissions**
Work Order #: **103221** Date: 5/1/2020
Test Type: **Radiated Scan** Time: 13:07:28
Tested By: Matthew Harrison Sequence#: 13
Software: EMITest 5.03.12

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

Test Conditions / Notes:

Temperature: 23° C
Humidity: 39%
Pressure: 101.1 kPa

Frequency Range: 600-970MHz
Frequency tested: 903.0-926.8 MHz
Firmware power setting: Max
Modulation: AM

Antenna type: Omnidiretional
Antenna Gain: 5.5 dBi.

Duty Cycle: 100% Modulated

Test Method: ANSI C63.10: 2013
Test Mode: Transmitting
Test Setup: EUT is setup in a tabletop configuration on a Styrofoam table.
Below 1GHz set 80cm high

Co-Location testing was performed with Wi-Fi, Cell, and FHSS radios transmitter simultaneously in both CCU100C and CCU100RC configurations.

Modification #1 and #2 were in place during testing.

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN02872	Spectrum Analyzer	E4440A	11/18/2019	11/18/2021
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	ANP06123	Attenuator	18N-6	4/5/2019	4/5/2021
T6	AN03628	Biconilog Antenna	3142E	6/11/2019	6/11/2021

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

#	Freq	Rdng	T1	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
			T5	T6							
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant
1	614.000M				+1.2	+1.7	+0.0	38.3	46.0	-7.7	Vert
		8.1	+0.0	+0.3							
	QP		+5.8	+21.2							
2	960.000M				+1.5	+2.2	+0.0	42.8	54.0	-11.2	Vert
		8.3	+0.0	+0.4							
	QP		+5.8	+24.6							
3	928.000M				+1.5	+2.2	+0.0	76.0	108.8	-32.8	Vert
		41.9	+0.0	+0.4							
			+5.8	+24.2							
4	902.000M				+1.4	+2.1	+0.0	73.3	108.8	-35.5	Vert
		39.9	+0.0	+0.3							
			+5.8	+23.8							

Test Location: CKC Laboratories, Inc. · 22116 23rd Dr SE · Bothell, WA 98021 · 800-500-4362
Customer: **Itron, Inc.**
Specification: **15.247(d) / 15.209 Radiated Spurious Emissions**
Work Order #: **103221** Date: 4/15/2020
Test Type: **Radiated Scan** Time: 11:28:44
Tested By: Matthew Harrison Sequence#: 50
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:

Temperature: 23° C
Humidity: 39%
Pressure: 101.1 kPa

Frequency Range: 600-970MHz
Frequency tested: 903.0-926.8 MHz
Firmware power setting: Max
Modulation: FSK 37.5k

Antenna type: Omnidiretional
Antenna Gain: 8.15 dBi.

Duty Cycle: 100% Modulated

Test Method: ANSI C63.10: 2013
Test Mode: Transmitting
Test Setup: EUT is setup in a tabletop configuration 80cm high on a Styrofoam table.
Modification #1 and #2 were in place during testing.

FM 37.5kbps

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN02307	Preamp	8447D	1/10/2020	1/10/2022
T2	AN03628	Biconilog Antenna	3142E	6/11/2019	6/11/2021
T3	ANP06123	Attenuator	18N-6	4/5/2019	4/5/2021
T4	ANP05305	Cable	ETSI-50T	9/6/2019	9/6/2021
T5	ANP05360	Cable	RG214	2/3/2020	2/3/2022
T6	ANP06540	Cable	Heliax	8/23/2019	8/23/2021
	AN02872	Spectrum Analyzer	E4440A	11/18/2019	11/18/2021

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

#	Freq	Rdng	T1 T5	T2 T6	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant
1	960.000M		-		+5.8	+1.5	+0.0	48.5	54.0	-5.5	Vert
		41.1	27.1	+24.6							
			+2.2	+0.4							
2	902.000M		-		+5.8	+1.4	+0.0	88.8	108.8	-20.0	Vert
		82.7	27.3	+23.8							
			+2.1	+0.3							
3	614.000M		-		+5.8	+1.2	+0.0	25.8	46.0	-20.2	Vert
		23.8	28.2	+21.2							
	QP		+1.7	+0.3							
^	614.000M		-		+5.8	+1.2	+0.0	44.0	46.0	-2.0	Vert
		42.0	28.2	+21.2							
			+1.7	+0.3							
5	928.000M		-		+5.8	+1.5	+0.0	81.3	108.8	-27.5	Vert
		74.4	27.2	+24.2							
			+2.2	+0.4							

Test Location: CKC Laboratories, Inc. · 22116 23rd Dr SE · Bothell, WA 98021 · 800-500-4362
Customer: **Itron, Inc.**
Specification: **15.247(d) / 15.209 Radiated Spurious Emissions**
Work Order #: **103221** Date: 4/15/2020
Test Type: **Radiated Scan** Time: 11:15:58
Tested By: Matthew Harrison Sequence#: 51
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:

Temperature: 23° C
Humidity: 39%
Pressure: 101.1 kPa

Frequency Range: 600-970MHz
Frequency tested: 903.0-926.8 MHz
Firmware power setting: Max
Modulation: FSK 37.5k Hopping

Antenna type: Omnidiretional
Antenna Gain: 8.15 dBi.

Duty Cycle: 100% Modulated

Test Method: ANSI C63.10: 2013
Test Mode: Transmitting
Test Setup: EUT is setup in a tabletop configuration 80cm high on a Styrofoam table.
Modification #1 and #2 were in place during testing.

FM 37.5kbps Hopping

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN02307	Preamp	8447D	1/10/2020	1/10/2022
T2	AN03628	Biconilog Antenna	3142E	6/11/2019	6/11/2021
T3	ANP06123	Attenuator	18N-6	4/5/2019	4/5/2021
T4	ANP05305	Cable	ETSI-50T	9/6/2019	9/6/2021
T5	ANP05360	Cable	RG214	2/3/2020	2/3/2022
T6	ANP06540	Cable	Heliax	8/23/2019	8/23/2021
	AN02872	Spectrum Analyzer	E4440A	11/18/2019	11/18/2021

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

#	Freq	Rdng	T1	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
			T5	T6							
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant
1	960.000M		-		+5.8	+1.5	+0.0	50.9	54.0	-3.1	Vert
		43.5	27.1	+24.6							
			+2.2	+0.4							
2	614.000M		-		+5.8	+1.2	+0.0	25.6	46.0	-20.4	Vert
		23.6	28.2	+21.2							
	QP		+1.7	+0.3							
^	614.000M		-		+5.8	+1.2	+0.0	44.2	46.0	-1.8	Vert
		42.2	28.2	+21.2							
			+1.7	+0.3							
4	902.000M		-		+5.8	+1.4	+0.0	84.0	108.8	-24.8	Vert
		77.9	27.3	+23.8							
			+2.1	+0.3							
5	928.000M		-		+5.8	+1.5	+0.0	80.3	108.8	-28.5	Vert
		73.4	27.2	+24.2							
			+2.2	+0.4							

Test Location: CKC Laboratories, Inc. · 22116 23rd Dr SE · Bothell, WA 98021 · 800-500-4362
Customer: **Itron, Inc.**
Specification: **15.247(d) / 15.209 Radiated Spurious Emissions**
Work Order #: **103221** Date: 5/1/2020
Test Type: **Radiated Scan** Time: 13:05:10
Tested By: Matthew Harrison Sequence#: 17
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:

Temperature: 23° C
Humidity: 39%
Pressure: 101.1 kPa

Frequency Range: 600-970MHz
Frequency tested: 903.0-926.8 MHz
Firmware power setting: Max
Modulation: AM

Antenna type: Omnidiretional
Antenna Gain: 8.15 dBi.

Duty Cycle: 100% Modulated

Test Method: ANSI C63.10: 2013
Test Mode: Transmitting
Test Setup: EUT is setup in a tabletop configuration on a Styrofoam table.
Below 1GHz set 80cm high

Co-Location testing was performed with Wi-Fi, Cell, and FHSS radios transmitter simultaneously in both CCU100C and CCU100RC configurations.

Modification #1 and #2 were in place during testing.

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN02872	Spectrum Analyzer	E4440A	11/18/2019	11/18/2021
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	ANP06123	Attenuator	18N-6	4/5/2019	4/5/2021
T5	AN03628	Biconilog Antenna	3142E	6/11/2019	6/11/2021

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				+1.7	+5.8	+0.0	38.3	46.0	-7.7	Vert
		8.1	+0.3	+1.2							
	QP		+21.2								
2	960.000M				+2.2	+5.8	+0.0	42.5	54.0	-11.5	Vert
		8.0	+0.4	+1.5							
	QP		+24.6								
3	902.000M				+2.1	+5.8	+0.0	76.2	110.4	-34.2	Vert
		42.8	+0.3	+1.4							
			+23.8								
4	928.000M				+2.2	+5.8	+0.0	74.4	110.4	-36.0	Vert
		40.3	+0.4	+1.5							
			+24.2								

Test Location: CKC Laboratories, Inc. · 22116 23rd Dr SE · Bothell, WA 98021 · 800-500-4362
Customer: **Itron, Inc.**
Specification: **15.247(d) / 15.209 Radiated Spurious Emissions**
Work Order #: **103221** Date: 5/1/2020
Test Type: **Radiated Scan** Time: 13:06:16
Tested By: Matthew Harrison Sequence#: 16
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:

Temperature: 23° C
Humidity: 39%
Pressure: 101.1 kPa

Frequency Range: 600-970MHz
Frequency tested: 903.0-926.8 MHz
Firmware power setting: Max
Modulation: AM

Antenna type: Omnidiretional
Antenna Gain: 8.15 dBi.

Duty Cycle: 100% Modulated

Test Method: ANSI C63.10: 2013
Test Mode: Transmitting
Test Setup: EUT is setup in a tabletop configuration on a Styrofoam table.
Below 1GHz set 80cm high

Co-Location testing was performed with Wi-Fi, Cell, and FHSS radios transmitter simultaneously in both CCU100C and CCU100RC configurations.

Modification #1 and #2 were in place during testing.

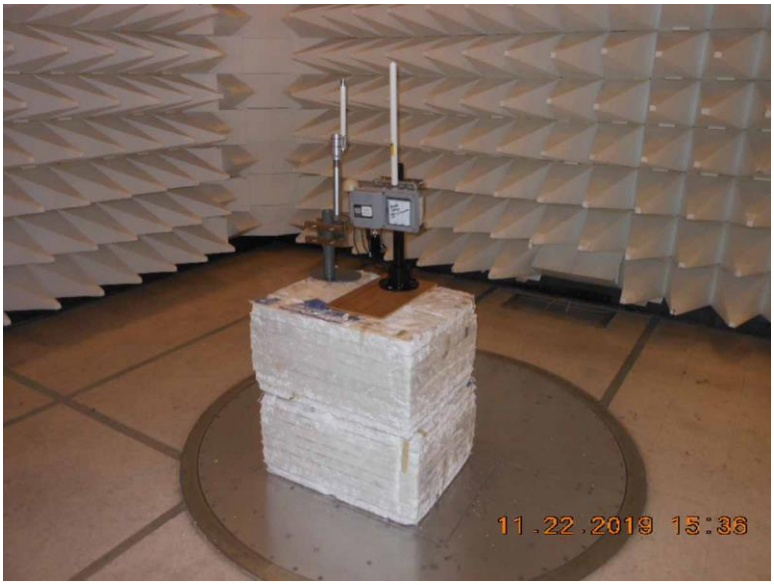
Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN02872	Spectrum Analyzer	E4440A	11/18/2019	11/18/2021
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	ANP06123	Attenuator	18N-6	4/5/2019	4/5/2021
T5	AN03628	Biconilog Antenna	3142E	6/11/2019	6/11/2021

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

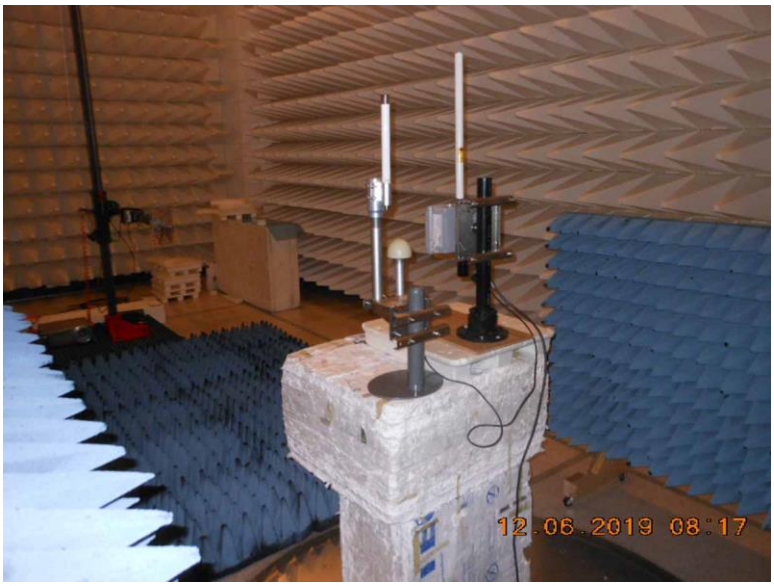
#	Freq	Rdng	T1 T5	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant
1	614.000M				+1.7	+5.8	+0.0	38.2	46.0	-7.8	Vert
		8.0	+0.3	+1.2							
	QP		+21.2								
2	960.000M				+2.2	+5.8	+0.0	42.5	54.0	-11.5	Vert
		8.0	+0.4	+1.5							
	QP		+24.6								
3	928.000M				+2.2	+5.8	+0.0	75.7	110.4	-34.7	Vert
		41.6	+0.4	+1.5							
			+24.2								
4	902.000M				+2.1	+5.8	+0.0	74.7	110.4	-35.7	Vert
		41.3	+0.3	+1.4							
			+23.8								

Test Setup Photo(s)

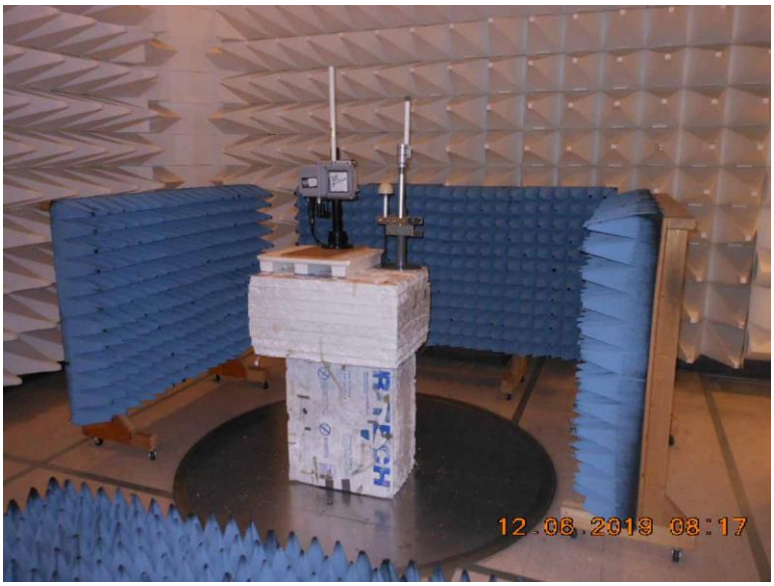


5.5dBi, Below 1GHz

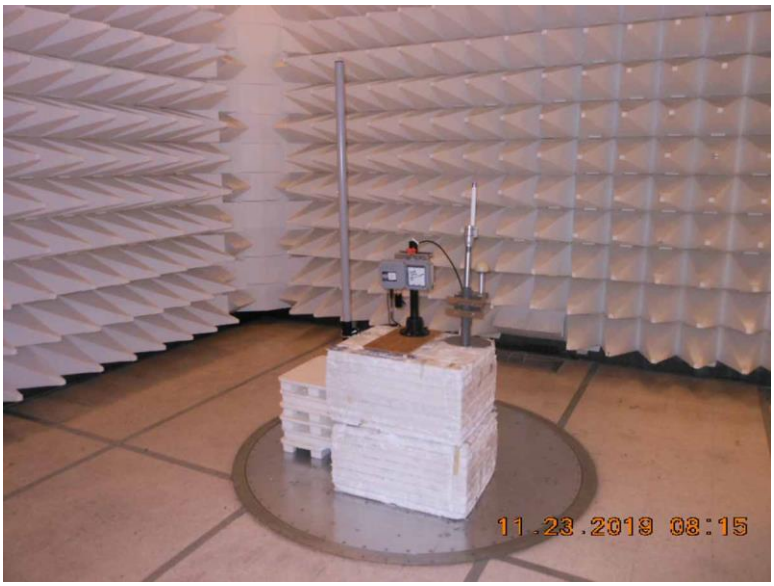
5.5dBi, Below 1GHz



5.5dBi, Above 1GHz

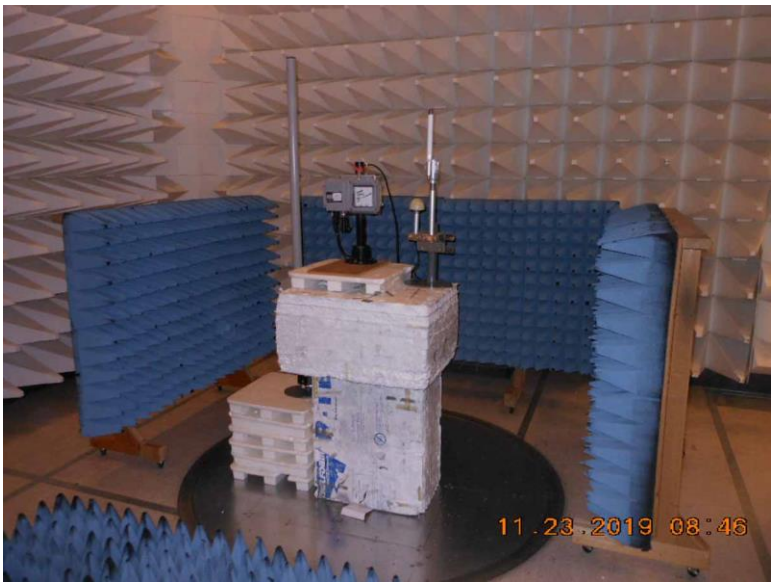


5.5dBi, Above 1GHz



8.15dBi, Below 1GHz

8.15dBi, Below 1GHz



8.15dBi, Above 1GHz

8.15dBi, Above 1GHz

15.207 AC Conducted Emissions

Test Setup / Conditions / Data

Test Location: CKC Laboratories, Inc. · 22116 23rd Dr SE · Bothell, WA 98021 · 800-500-4362
Customer: **Itron, Inc.**
Specification: **15.207 AC Mains - Average**
Work Order #: **103221** Date: 12/14/2019
Test Type: **Conducted Emissions** Time: 10:47:35
Tested By: Matthew Harrison Sequence#: 39
Software: EMITest 5.03.12 120V 60Hz

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 3			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 3			

Test Conditions / Notes:

Temperature: 23° C
Humidity: 39%
Pressure: 101.1 kPa

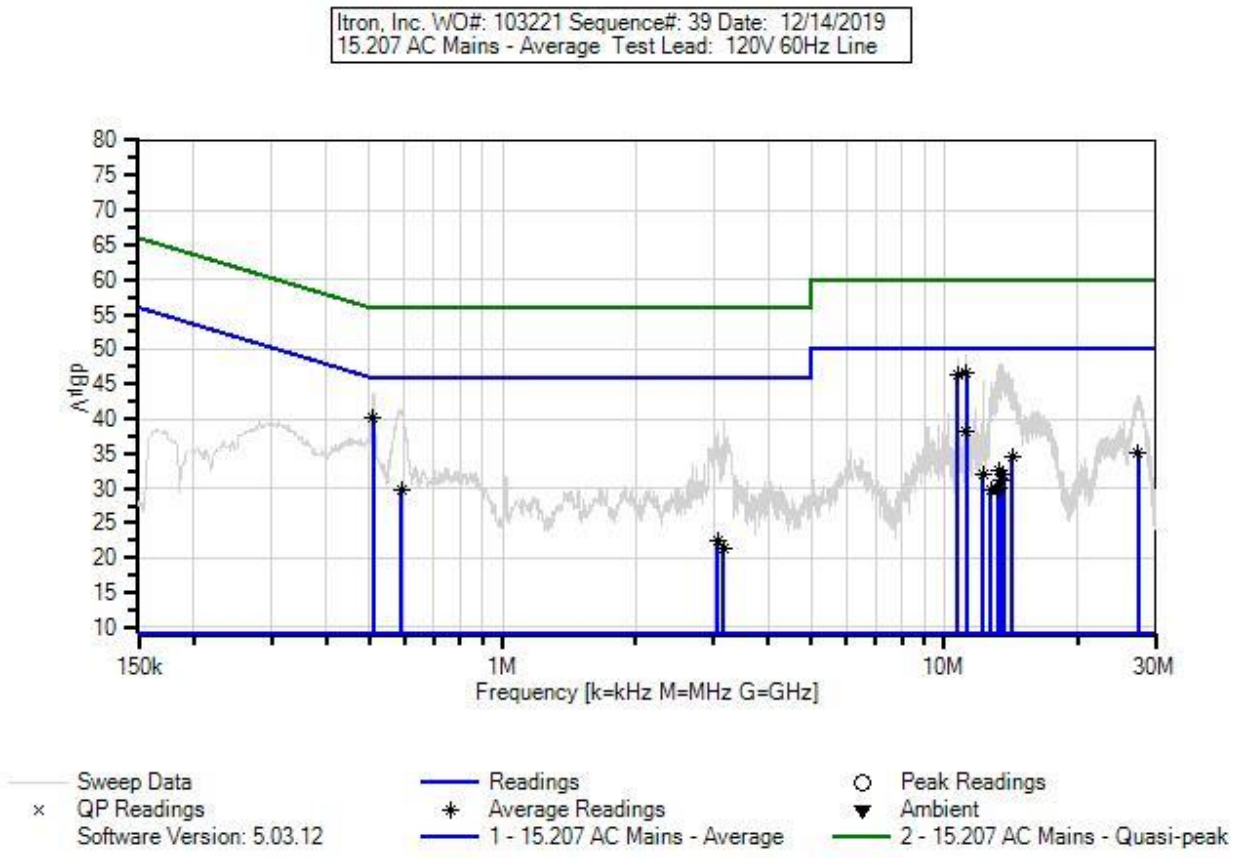
Frequency Range: 150kHz-30MHz
Frequency tested: 903, 915, 926.8 MHz
Firmware power setting: Max

Antenna type: Omnidirectional
Antenna Gain: 5.5 dBi. Worst Case out of both antennas

Duty Cycle: 100% Modulated

Test Method: ANSI C63.10: 2013
Test Mode: Transmitting
Test Setup: EUT is setup in a tabletop configuration 80cm high on a Styrofoam table.

Modification #1 and #2 were in place during testing.


Itron, Inc. WO#: 103221 Sequence#: 39 Date: 12/14/2019
15.207 AC Mains - Average Test Lead: 120V 60Hz Line
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
dBµV
150k
1M
10M
30M
Frequency [k=kHz M=MHz G=GHz]
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
	AN02673	Spectrum Analyzer	E4446A	2/22/2019	2/22/2021
T1	ANP06219	Attenuator	768-10	4/13/2018	4/13/2020
T2	ANP06515	Cable	Heliax	6/29/2018	6/29/2020
T3	ANP06540	Cable	Heliax	8/23/2019	8/23/2021
T4	AN01311	50uH LISN-Line1 (L)	3816/2	3/16/2018	3/16/2020
	AN01311	50uH LISN-Line2 (N)	3816/2	3/16/2018	3/16/2020
T5	AN02611	High Pass Filter	HE9615-150K-50-720B	1/15/2018	1/15/2020

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	11.232M				+0.0	+0.3	+0.0	46.6	50.0	-3.4	Line
		36.9	+9.1	+0.2							
	Ave		+0.1								
^	11.232M				+0.0	+0.3	+0.0	50.4	50.0	+0.4	Line
		40.7	+9.1	+0.2							
			+0.1								
3	10.706M				+0.0	+0.3	+0.0	46.2	50.0	-3.8	Line
		36.5	+9.1	+0.2							
	Ave		+0.1								
^	10.706M				+0.0	+0.3	+0.0	48.6	50.0	-1.4	Line
		38.9	+9.1	+0.2							
			+0.1								
5	509.967k				+0.0	+0.4	+0.0	40.1	46.0	-5.9	Line
		30.4	+9.1	+0.0							
	Ave		+0.2								
^	509.966k				+0.0	+0.4	+0.0	43.6	46.0	-2.4	Line
		33.9	+9.1	+0.0							
			+0.2								
7	11.211M				+0.0	+0.3	+0.0	38.2	50.0	-11.8	Line
		28.5	+9.1	+0.2							
	Ave		+0.1								
^	11.211M				+0.0	+0.3	+0.0	49.1	50.0	-0.9	Line
		39.4	+9.1	+0.2							
			+0.1								
9	27.513M				+0.1	+0.6	+0.0	35.0	50.0	-15.0	Line
		24.7	+9.1	+0.3							
	Ave		+0.2								
^	27.513M				+0.1	+0.6	+0.0	43.4	50.0	-6.6	Line
		33.1	+9.1	+0.3							
			+0.2								

11	14.211M				+0.0	+0.4	+0.0	34.5	50.0	-15.5	Line
		24.6	+9.1	+0.2							
	Ave		+0.2								
	14.211M				+0.0	+0.4	+0.0	45.9	50.0	-4.1	Line
		36.0	+9.1	+0.2							
			+0.2								
13	589.232k				+0.0	+0.4	+0.0	29.9	46.0	-16.1	Line
		20.2	+9.1	+0.0							
	Ave		+0.2								
	589.232k				+0.0	+0.4	+0.0	41.3	46.0	-4.7	Line
		31.6	+9.1	+0.0							
			+0.2								
15	13.355M				+0.0	+0.4	+0.0	32.5	50.0	-17.5	Line
		22.7	+9.1	+0.2							
	Ave		+0.1								
	13.355M				+0.0	+0.4	+0.0	47.8	50.0	-2.2	Line
		38.0	+9.1	+0.2							
			+0.1								

17	13.616M				+0.0	+0.4	+0.0	32.1	50.0	-17.9	Line
		22.2	+9.1	+0.2							
	Ave		+0.2								
^	13.616M				+0.0	+0.4	+0.0	47.9	50.0	-2.1	Line
		38.0	+9.1	+0.2							
			+0.2								
19	12.238M				+0.0	+0.4	+0.0	31.9	50.0	-18.1	Line
		22.1	+9.1	+0.2							
	Ave		+0.1								
^	12.238M				+0.0	+0.4	+0.0	45.5	50.0	-4.5	Line
		35.7	+9.1	+0.2							
			+0.1								
21	13.454M				+0.0	+0.4	+0.0	31.3	50.0	-18.7	Line
		21.5	+9.1	+0.2							
	Ave		+0.1								
^	13.454M				+0.0	+0.4	+0.0	47.9	50.0	-2.1	Line
		38.1	+9.1	+0.2							
			+0.1								
23	13.256M				+0.0	+0.4	+0.0	30.1	50.0	-19.9	Line
		20.3	+9.1	+0.2							
	Ave		+0.1								
^	13.256M				+0.0	+0.4	+0.0	46.6	50.0	-3.4	Line
		36.8	+9.1	+0.2							
			+0.1								
25	13.202M				+0.0	+0.4	+0.0	29.9	50.0	-20.1	Line
		20.1	+9.1	+0.2							
	Ave		+0.1								
^	13.202M				+0.0	+0.4	+0.0	46.9	50.0	-3.1	Line
		37.1	+9.1	+0.2							
			+0.1								
27	12.743M				+0.0	+0.4	+0.0	29.9	50.0	-20.1	Line
		20.1	+9.1	+0.2							
	Ave		+0.1								
^	12.743M				+0.0	+0.4	+0.0	45.4	50.0	-4.6	Line
		35.6	+9.1	+0.2							
			+0.1								
29	3.063M				+0.0	+0.3	+0.0	22.6	46.0	-23.4	Line
		13.0	+9.1	+0.1							
	Ave		+0.1								
^	3.063M				+0.0	+0.3	+0.0	38.0	46.0	-8.0	Line
		28.4	+9.1	+0.1							
			+0.1								
31	3.169M				+0.0	+0.3	+0.0	21.4	46.0	-24.6	Line
		11.8	+9.1	+0.1							
	Ave		+0.1								

^	3.169M				+0.0	+0.3	+0.0	40.0	46.0	-6.0	Line
		30.4	+9.1	+0.1							
			+0.1								

Test Location: CKC Laboratories, Inc. · 22116 23rd Dr SE · Bothell, WA 98021 · 800-500-4362
Customer: **Itron, Inc.**
Specification: **15.207 AC Mains - Average**
Work Order #: **103221** Date: 12/14/2019
Test Type: **Conducted Emissions** Time: 11:02:34
Tested By: Matthew Harrison Sequence#: 40
Software: EMITest 5.03.12 120V 60Hz

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 3			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 3			

Test Conditions / Notes:

Temperature: 23° C
Humidity: 39%
Pressure: 101.1 kPa

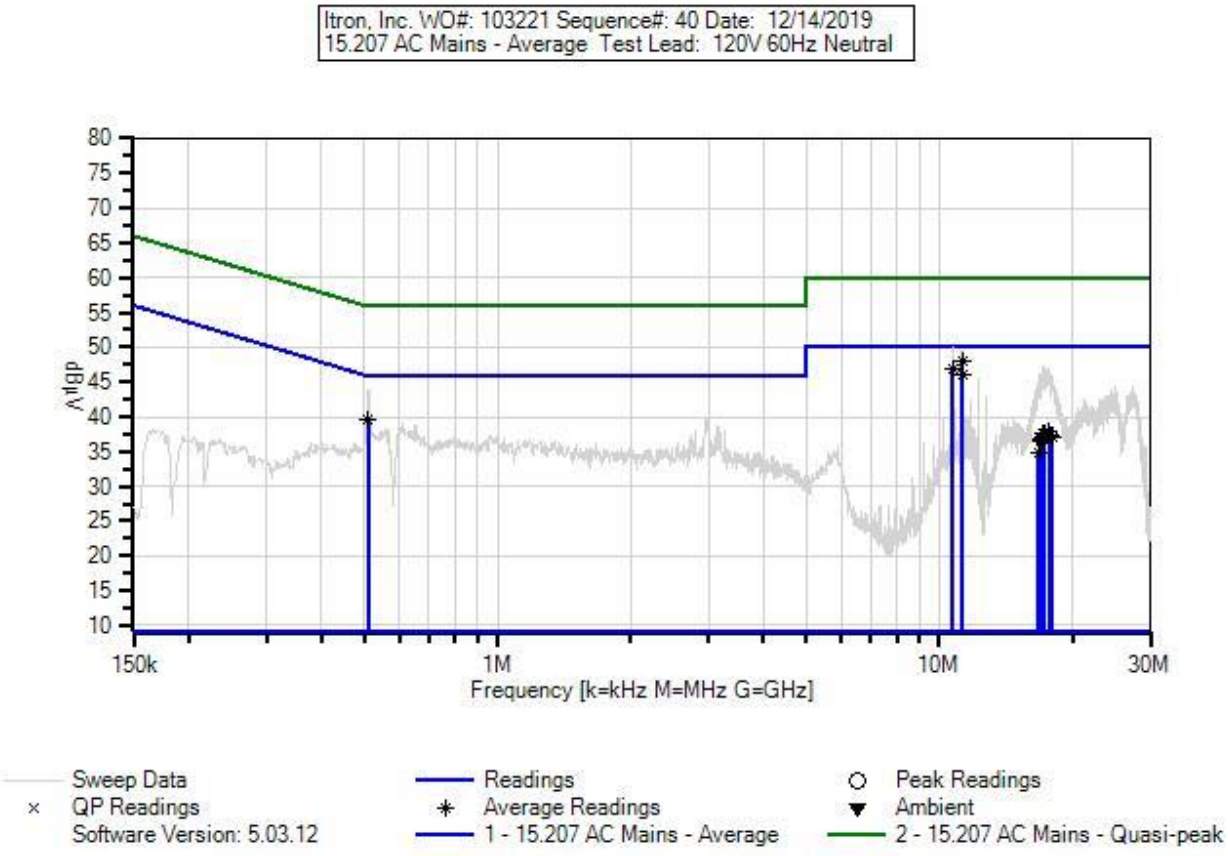
Frequency Range: 150kHz-30MHz
Frequency tested: 903, 915, 926.8 MHz
Firmware power setting: Max

Antenna type: Omnidirectional
Antenna Gain: 5.5 dBi. Worst Case out of both antennas

Duty Cycle: 100% Modulated

Test Method: ANSI C63.10: 2013
Test Mode: Transmitting
Test Setup: EUT is setup in a tabletop configuration 80cm high on a Styrofoam table.

Modification #1 and #2 were in place during testing.


Itron, Inc. WO#: 103221 Sequence#: 40 Date: 12/14/2019
15.207 AC Mains - Average Test Lead: 120V 60Hz Neutral
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
dBµV
150k
1M
10M
30M
Frequency [k=kHz M=MHz G=GHz]
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
	AN02673	Spectrum Analyzer	E4446A	2/22/2019	2/22/2021
T1	ANP06219	Attenuator	768-10	4/13/2018	4/13/2020
T2	ANP06515	Cable	Heliax	6/29/2018	6/29/2020
T3	ANP06540	Cable	Heliax	8/23/2019	8/23/2021
	AN01311	50uH LISN-Line1 (L)	3816/2	3/16/2018	3/16/2020
T4	AN01311	50uH LISN-Line2 (N)	3816/2	3/16/2018	3/16/2020
T5	AN02611	High Pass Filter	HE9615-150K-50-720B	1/15/2018	1/15/2020

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	11.251M				+0.0	+0.3	+0.0	48.0	50.0	-2.0	Neutr
		38.3	+9.1	+0.2							
	Ave		+0.1								
2	10.734M				+0.0	+0.3	+0.0	47.0	50.0	-3.0	Neutr
		37.3	+9.1	+0.2							
	Ave		+0.1								
^	10.734M				+0.0	+0.3	+0.0	49.9	50.0	-0.1	Neutr
		40.2	+9.1	+0.2							
			+0.1								
4	11.247M				+0.0	+0.3	+0.0	46.0	50.0	-4.0	Neutr
		36.3	+9.1	+0.2							
	Ave		+0.1								
^	11.251M				+0.0	+0.3	+0.0	50.7	50.0	+0.7	Neutr
		41.0	+9.1	+0.2							
			+0.1								
^	11.247M				+0.0	+0.3	+0.0	49.5	50.0	-0.5	Neutr
		39.8	+9.1	+0.2							
			+0.1								
7	510.693k				+0.0	+0.4	+0.0	39.5	46.0	-6.5	Neutr
		29.8	+9.1	+0.0							
	Ave		+0.2								
^	510.693k				+0.0	+0.4	+0.0	43.9	46.0	-2.1	Neutr
		34.2	+9.1	+0.0							
			+0.2								
9	17.725M				+0.1	+0.6	+0.0	38.0	50.0	-12.0	Neutr
		27.8	+9.1	+0.2							
	Ave		+0.2								
^	17.725M				+0.1	+0.6	+0.0	47.0	50.0	-3.0	Neutr
		36.8	+9.1	+0.2							
			+0.2								

11	17.256M				+0.1	+0.5	+0.0	37.7	50.0	-12.3	Neutr
		27.6	+9.1	+0.2							
	Ave		+0.2								
	^	17.256M			+0.1	+0.5	+0.0	46.7	50.0	-3.3	Neutr
		36.6	+9.1	+0.2							
			+0.2								
13	17.292M				+0.1	+0.5	+0.0	37.7	50.0	-12.3	Neutr
		27.6	+9.1	+0.2							
	Ave		+0.2								
	^	17.292M			+0.1	+0.5	+0.0	47.2	50.0	-2.8	Neutr
		37.1	+9.1	+0.2							
			+0.2								
15	17.229M				+0.1	+0.5	+0.0	37.5	50.0	-12.5	Neutr
		27.4	+9.1	+0.2							
	Ave		+0.2								
	^	17.229M			+0.1	+0.5	+0.0	47.1	50.0	-2.9	Neutr
		37.0	+9.1	+0.2							
			+0.2								

17	17.914M				+0.1	+0.6	+0.0	37.4	50.0	-12.6	Neutr
		27.2	+9.1	+0.2							
	Ave		+0.2								
	^	17.914M			+0.1	+0.6	+0.0	45.9	50.0	-4.1	Neutr
		35.7	+9.1	+0.2							
			+0.2								
19	17.932M				+0.1	+0.6	+0.0	37.3	50.0	-12.7	Neutr
		27.1	+9.1	+0.2							
	Ave		+0.2								
	^	17.932M			+0.1	+0.6	+0.0	45.8	50.0	-4.2	Neutr
		35.6	+9.1	+0.2							
			+0.2								
21	17.968M				+0.1	+0.6	+0.0	37.2	50.0	-12.8	Neutr
		27.0	+9.1	+0.2							
	Ave		+0.2								
	^	17.968M			+0.1	+0.6	+0.0	45.9	50.0	-4.1	Neutr
		35.7	+9.1	+0.2							
			+0.2								
23	17.112M				+0.1	+0.5	+0.0	37.0	50.0	-13.0	Neutr
		26.9	+9.1	+0.2							
	Ave		+0.2								
	^	17.112M			+0.1	+0.5	+0.0	47.2	50.0	-2.8	Neutr
		37.1	+9.1	+0.2							
			+0.2								
25	17.067M				+0.1	+0.5	+0.0	36.9	50.0	-13.1	Neutr
		26.8	+9.1	+0.2							
	Ave		+0.2								
	^	17.067M			+0.1	+0.5	+0.0	46.2	50.0	-3.8	Neutr
		36.1	+9.1	+0.2							
			+0.2								
27	17.031M				+0.1	+0.5	+0.0	36.7	50.0	-13.3	Neutr
		26.6	+9.1	+0.2							
	Ave		+0.2								
	^	17.031M			+0.1	+0.5	+0.0	45.8	50.0	-4.2	Neutr
		35.7	+9.1	+0.2							
			+0.2								
29	16.986M				+0.1	+0.5	+0.0	36.4	50.0	-13.6	Neutr
		26.3	+9.1	+0.2							
	Ave		+0.2								
	^	16.986M			+0.1	+0.5	+0.0	45.9	50.0	-4.1	Neutr
		35.8	+9.1	+0.2							
			+0.2								
31	16.788M				+0.1	+0.5	+0.0	34.9	50.0	-15.1	Neutr
		24.8	+9.1	+0.2							
	Ave		+0.2								

^	16.788M				+0.1	+0.5	+0.0	46.0	50.0	-4.0	Neutr
		35.9	+9.1	+0.2							
			+0.2								

Test Setup Photo(s)

Appendix A: Manufacturer Declaration

The following device/models were checked and worst-case provided for testing:

Device: CCU100

Model: CCU100C and CCU100RC

The manufacturer declares that the following additional models are identical electrically or any differences between them do not affect their EMC characteristics, and therefore meets the level of testing equivalent to the tested model.

The CCU100C and CCU100RC are representative of worst case testing of the following models per the manufacturer:

CCU100C Repeater
CCU100RC Repeater

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.