# Testing the Future

# Itron, Inc.

**TEST REPORT FOR** 

CGR ACT Module 3 (CAM3)
Model: OW3

**Tested to The Following Standards:** 

FCC Part 15 Subpart C Section(s)

15.207 & 15.247 (FHSS 902-928 MHz)

Report No.: 101674-1

Date of issue: October 11, 2018





Test Certificate #803.05

This test report bears the accreditation symbol indicating that the testing performed herein meets the test and reporting requirements of ISO/IEC 17025 under the applicable scope of testing for CKC Laboratories, Inc.

We strive to create long-term, trust based relationships by providing sound, adaptive, customer first testing services. We embrace each of our customers' unique EMC challenges, not as an interruption to set processes, but rather as the reason we are in business.

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## **ADMINISTRATIVE INFORMATION**

## **Test Report Information**

REPORT PREPARED FOR: REPORT PREPARED BY:

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Mariposa, CA 95338

Representative: Jay Holcomb Project Number: 101674

Customer Reference Number: 159196

**DATE OF EQUIPMENT RECEIPT:** August 20, 2018 **DATE(S) OF TESTING:** August 20-29, 2018

## **Report Authorization**

The test data contained in this report documents the observed testing parameters pertaining to and are relevant for only the equipment provided by the client, tested in the agreed upon operational mode(s) and configuration(s) as identified herein. Compliance assessment remains the client's responsibility. This report may not be used to claim product endorsement by A2LA or any government agencies. This test report has been authorized for release under quality control from CKC Laboratories, Inc.

Steve Behm

Director of Quality Assurance & Engineering Services CKC Laboratories, Inc.

Steve I Be

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# **Test Facility Information**



Our laboratories are configured to effectively test a wide variety of product types. CKC utilizes first class test equipment, anechoic chambers, data acquisition and information services to create accurate, repeatable and affordable test results.

TEST LOCATION(S): CKC Laboratories, Inc. 22116 23rd Drive S.E., Suite A Canyon Park, Bothell, WA 98021

## **Software Versions**

CKC Laboratories Proprietary Software	Version
EMITest Emissions	5.03.11

# **Site Registration & Accreditation Information**

Location	NIST CB #	TAIWAN	CANADA	FCC	JAPAN
Canyon Park Bothell, WA	US0081	SL2-IN-E-1145R	3082C-1	US1022	A-0148

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## **SUMMARY OF RESULTS**

## Standard / Specification: FCC Part 15 Subpart C - 15.247 (FHSS 902-928MHz)

Test Procedure	Description	Modifications	Results
15.247(a)(1)(i)	Occupied Bandwidth	NA	Pass
15.247(a)(1)	Carrier Separation	NA	Pass
15.247(a)(1)(i)	Number of Hopping Channels	NA	Pass
15.247(a)(1)(i)	Average Time of Occupancy	NA	NP
15.247(b)(2)	Output Power	NA	Pass
15.247(d)	RF Conducted Emissions & Band Edge	NA	Pass
15.247(d)	Radiated Emissions & Band Edge	NA	Pass
15.247(f)	Hybrid Systems	NA	Pass
15.247(f)	Average Time of Occupancy	NA	NP
15.247(f)	Power Spectral Density	NA	Pass
15.207	AC Conducted Emissions	NA	Pass

NA = Not Applicable

NP = CKC Laboratories was not contracted to perform test: See Manufacturer's Declaration in Test Section.

## ISO/IEC 17025 Decision Rule

The declaration of pass or fail herein is based upon assessment to the specification(s) listed above, including where applicable, assessment of measurement uncertainties. For performance related tests, equipment was monitored for specified criteria identified in that section of testing.

# **Modifications During Testing**

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

## **Summary of Conditions**

No modifications were made during testing.

Modifications listed above must be incorporated into all production units.

# **Conditions During Testing**

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

## **Summary of Conditions**

There are 4 physical configurations tested, and 12 different modulations investigated.

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# **EQUIPMENT UNDER TEST (EUT)**

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

## **Configuration 1**

**Equipment Tested:** 

Device	Manufacturer	Model #	S/N
CGR ACT Module 3 (CAM3)	Itron, Inc.	OW3	FCC-1 (CGR), CAM3-FCC1
			(CAM Module, ID)

Support Equipment:

Device	Manufacturer	Model #	S/N
Connected Grid Router (Host	Cisco Systems, Inc.	CGR 1240	FTX2204G01J
Laptop	Dell	E6420	NA
AC Adapter (for Laptop)	Dell	DA130PE1-00	NA
USB to Ethernet adapter	Linksys	USB3GIGV1	NA

## **Configuration 2**

**Equipment Tested:** 

Device	Manufacturer	Model #	S/N
CGR ACT Module 3 (CAM3)	Itron, Inc.	OW3	FCC-1 (CGR), CAM3-FCC1
			(CAM Module, ID)

Support Equipment:

zuppert Zquipment			
Device	Manufacturer	Model #	S/N
2.8dBi Colinear Omni Antenna (attached)	Cisco Systems, Inc.	07-1140-02	NA
Connected Grid Router (Host	Cisco Systems, Inc.	CGR 1240	FTX2204G01J
Laptop	Dell	E6420	NA
AC Adapter (for Laptop)	Dell	DA130PE1-00	NA
USB to Ethernet adapter	Linksys	USB3GIGV1	NA

## **Configuration 3**

**Equipment Tested:** 

Device	Manufacturer	Model #	S/N
CGR ACT Module 3 (CAM3)	Itron, Inc.	OW3	FCC-1 (CGR) CAM3-FCC1
			(CAM Module, ID)

Support Equipment:

Device	Manufacturer	Model #	S/N
5.5dBi Colinear Omni Antenna (remote)	Cisco Systems, Inc.	ANT-WPAN-OM-	NA
		OUT-N	
Connected Grid Router (Host	Cisco Systems, Inc.	CGR 1240	FTX2204G01J
Laptop	Dell	E6420	NA
AC Adapter (for Laptop)	Dell	DA130PE1-00	NA
USB to Ethernet adapter	Linksys	USB3GIGV1	NA

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# Configuration 4

Equipment Tested:

Device	Manufacturer	Model #	S/N
CGR ACT Module 3 (CAM3)	Itron, Inc.	OW3	FCC-1 (CGR) CAM3-FCC1
			(CAM Module, ID)

Support Equipment:

Device	Manufacturer	Model #	S/N
8.15dBi Colinear Omni Antenna (remote)	Antenex	FG9026	NA
Connected Grid Router (Host	Cisco Systems, Inc.	CGR 1240	FTX2204G01J
Laptop	Dell	E6420	NA
AC Adapter (for Laptop)	Dell	DA130PE1-00	NA
USB to Ethernet adapter	Linksys	USB3GIGV1	NA
3dB Attenuator (for 8.15dBi antenna)	Mini-Circuits	BW-N3W5+	NA

# **General Product Information:**

Product Information	Manufacturer-Provided Details
Equipment Type:	Limited Modular, Cisco CGR Host
Type of Wideband System:	Proprietary FHSS
	902.2 to 927.75MHz (GFSK) (10k)
Operating Frequency Range:	902.4 to 927.6MHz (GFSK, OQPSK, OFDM)
	902.8 – 926.8MHz (OFDM) (1.2M)(Hybrid)
	512 – 50kHz steps (902.2 to 927.75MHz)
Number of Hopping Channels:	64 - 400kHz steps (902.4 to 927.6MHz)
	31 – 800kHz steps (902.8 to 926.8 MHz) (Hybrid)
	10k, 50k, 150kbps GFSK,
Modulation Type(s):	6.25k, 12.5kbps OQPSK,
Wiodulation Type(s).	200k, 600k OFDM
	1.2M OFDM (Hybrid)
Maximum Duty Cycle:	100%
Number of TX Chains:	1
	colinear omni 2.8dBi
Antenna Type(s) and Gain:	colinear omni 5.5dBi
	colinear omni 8.15dBi
Beamforming Type:	NA
Antenna Connection Type:	External Connector (Professional Installation)
Nominal Input Voltage:	100-240VAC
	Firmware: CAM3-DEV Major Number 4, Minor Number 7, Build Number
Firmware / Software used for Test:	153, Revision Number 787268
	Test Software: CAM3 FCC Test Helper v14

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# FCC Part 15 Subpart C

# 15.247(a) Transmitter Characteristics

Test Setup/Conditions					
Test Location:	Bothell Lab Bench	Test Engineer:	M. Atkinson		
Test Method:	ANSI C63.10 (2013)	Test Date(s):	8/20/18 to 8/21/18		
Configuration:	1				
Test Setup:	Number 787268 Test Software: CAM3 FCC Test Hel Duty Cycle: Tested at 100% Setup: The EUT is continuously tra	per v14 insmitting with modula directly to a spectru	m analyzer for direct conducted		

Environmental Conditions					
Temperature (ºC)	22-24	Relative Humidity (%):	38-42		

Test Equipment						
Asset# Description Manufacturer Model Cal Date Cal Du						
02673	Spectrum Analyzer	Agilent	E4446A	2/3/2017	2/3/2019	
P07228	Attenuator	Pasternack	PE7004-20	11/30/2017	11/30/2019	
P07226	Attenuator	Pasternack	PE7004-6	12/1/2017	12/1/2019	
P06008	Cable	Andrew	Heliax	4/10/2018	4/10/2020	

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# 15.247(a)(1) 20 dB Bandwidth

	Test Data Summary					
Frequency (MHz)	Antenna Port	Modulation	Measured (kHz)	Limit (kHz)	Results	
902.2	1	10k GFSK	20.35			
915.0	1	10k GFSK	19.52	≤500	Pass	
927.75	1	10k GFSK	20.05			
902.4	1	50k GFSK	101.90			
915.2	1	50k GFSK	101.32	≤500	Pass	
927.6	1	50k GFSK	102.02			
902.4	1	150k GFSK	182.35			
915.2	1	150k GFSK	180.73	≤500	Pass	
927.6	1	150k GFSK	181.72			
902.4	1	6.25k OQPSK	133.76			
915.2	1	6.25k OQPSK	133.07	≤500	Pass	
927.6	1	6.25k OQPSK	133.79			
902.4	1	12.5k OQPSK	132.90			
915.2	1	12.5k OQPSK	131.02	≤500	Pass	
927.6	1	12.5k OQPSK	130.97			
902.4	1	200k OFDM	333.63			
915.2	1	200k OFDM	334.71	≤500	Pass	
927.6	1	200k OFDM	335.18			
902.4	1	600k OFDM	331.95			
915.2	1	600k OFDM	332.68	≤500	Pass	
927.6	1	600k OFDM	332.79			
902.8	1	1.2M OFDM (Hybrid)	572.59			
914.8	1	1.2M OFDM (Hybrid)	577.51	*See Note	Pass	
926.8	1	1.2M OFDM (Hybrid)	577.22			

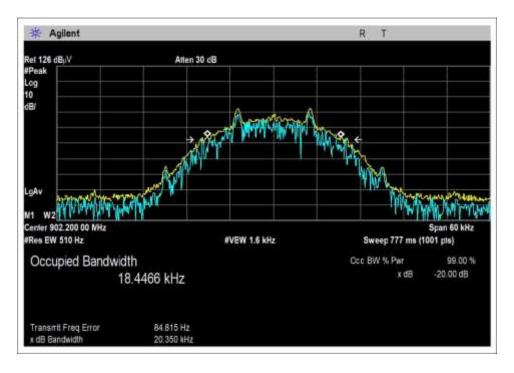
<sup>\*</sup>This mode a Hybrid mode and is not required to meet the FHSS bandwidth limit. However, the system must pass the DTS PSD limit of 8dBm in any 3kHz band. DTS bandwidth was measured for informational purposes. See Supplemental Section of data in 15.247 (f) Hybrid Systems.

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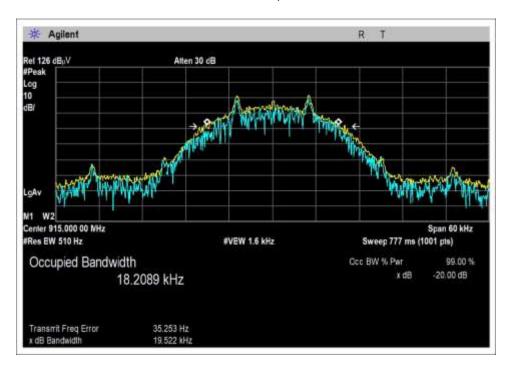


## **Plots**

## **GFSK**

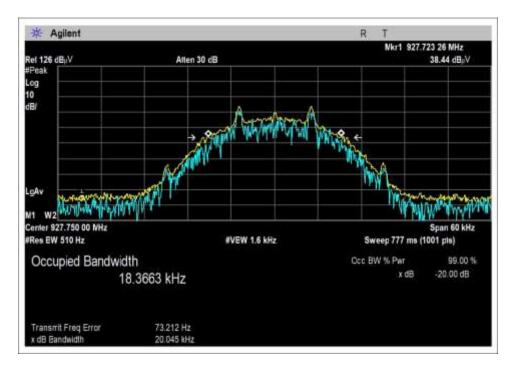


Low Channel, 10k

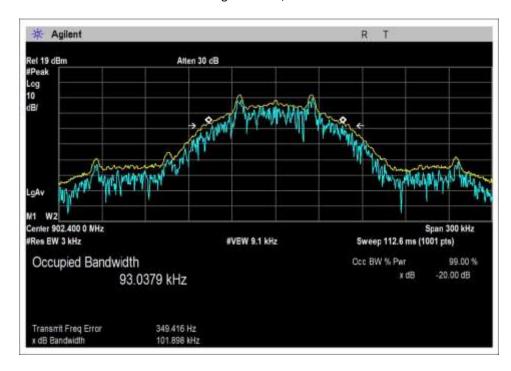


Middle Channel, 10k



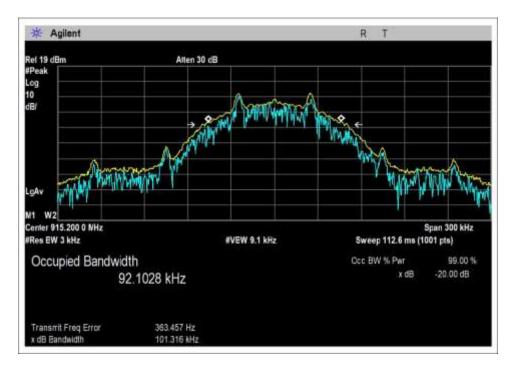


High Channel, 10k

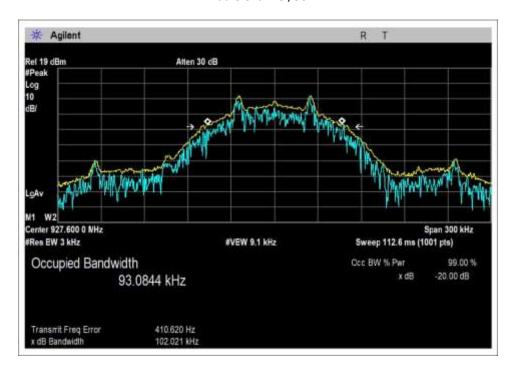


Low Channel, 50k



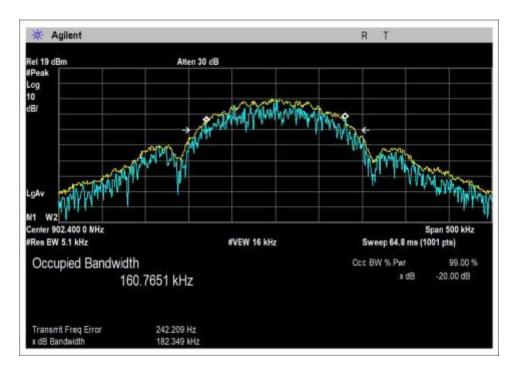


Middle Channel, 50k

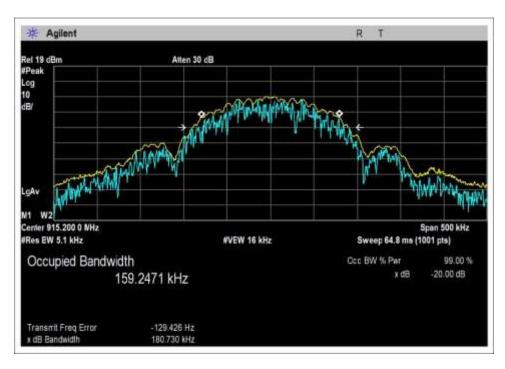


High Channel, 50k



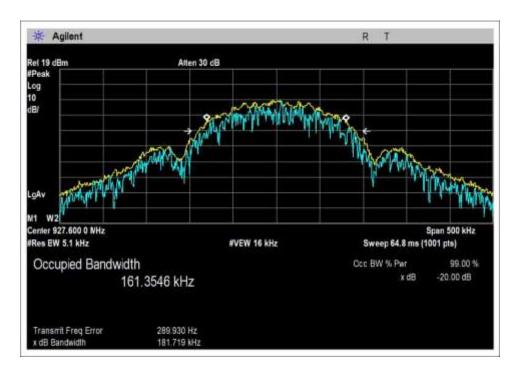


Low Channel, 150k



Middle Channel, 150k

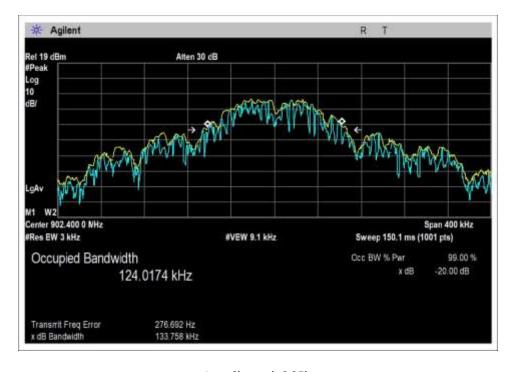




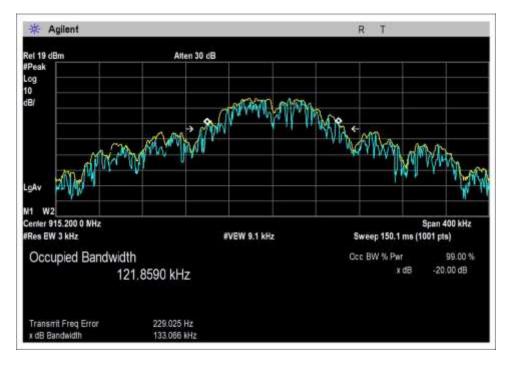
High Channel, 150k



## **OQPSK**

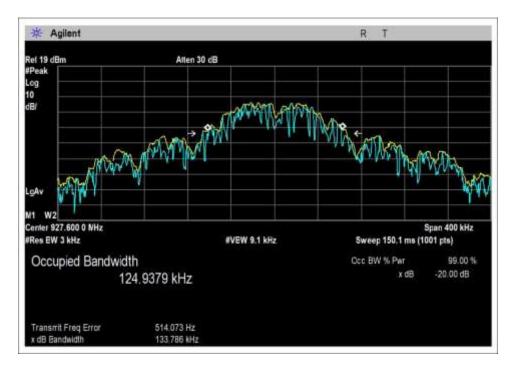


Low Channel, 6.25k

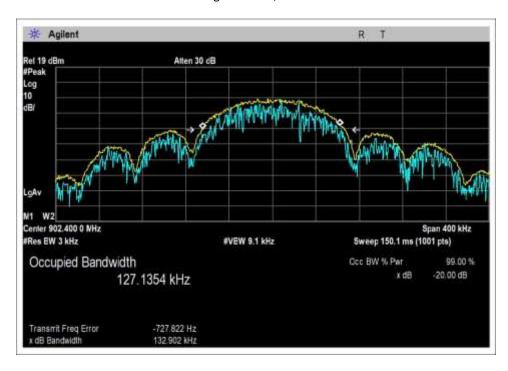


Middle Channel, 6.25k



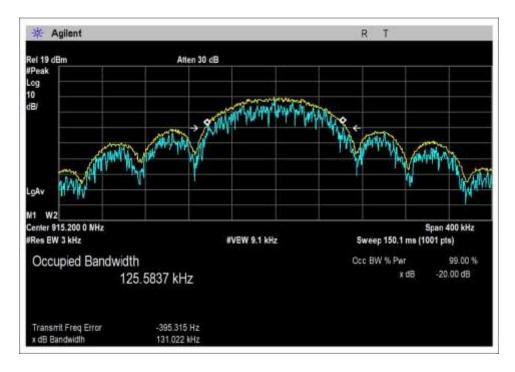


High Channel, 6.25k

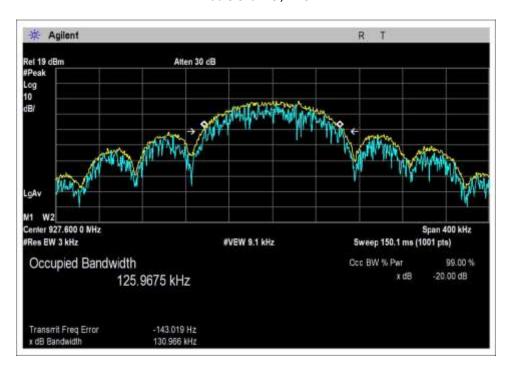


Low Channel, 12.5k





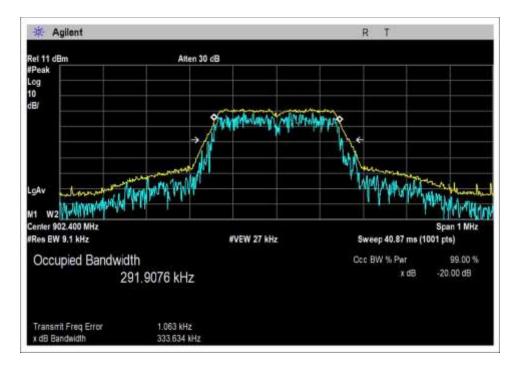
Middle Channel, 12.5k



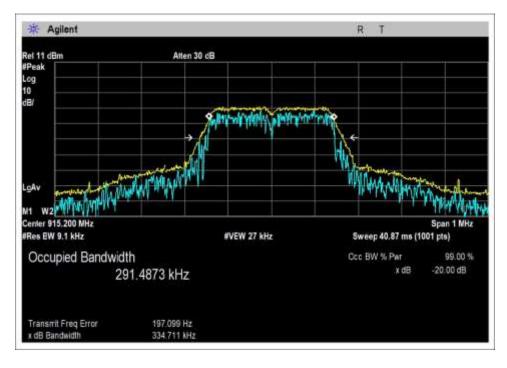
High Channel, 12.5k



### **OFDM**

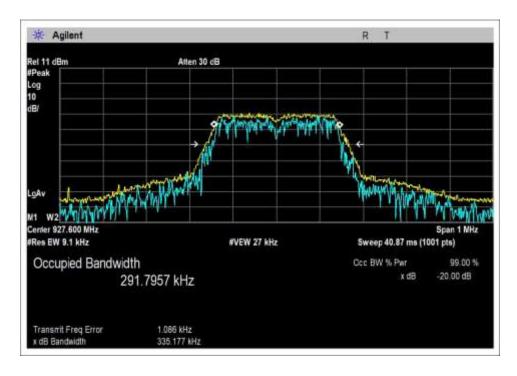


Low Channel, 200k

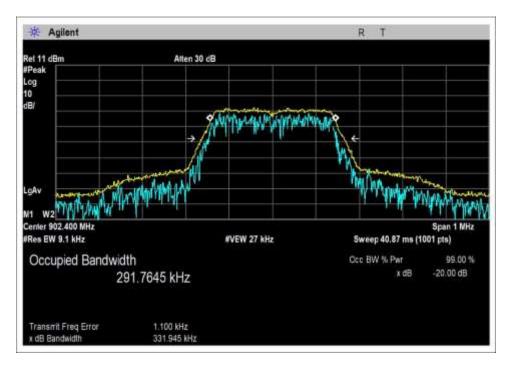


Middle Channel, 200k



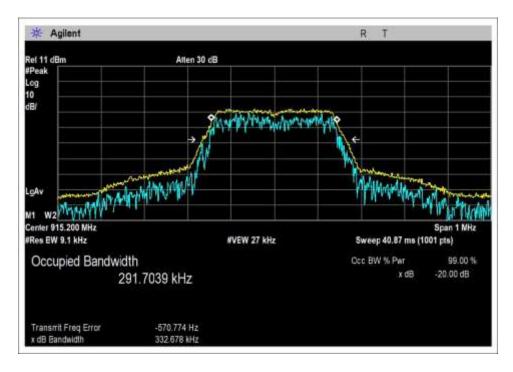


High Channel, 200k

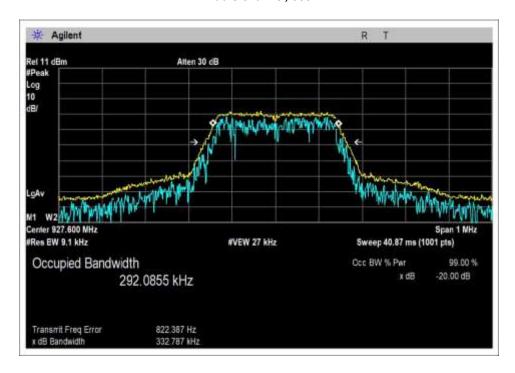


Low Channel, 600k



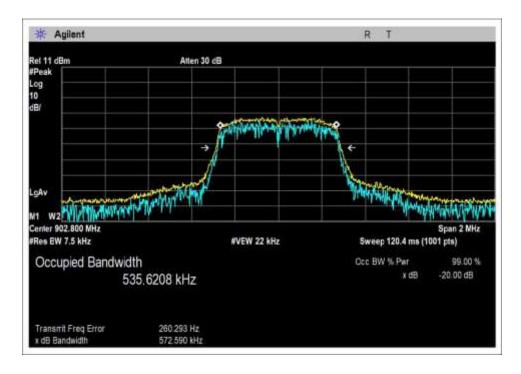


Middle Channel, 600k

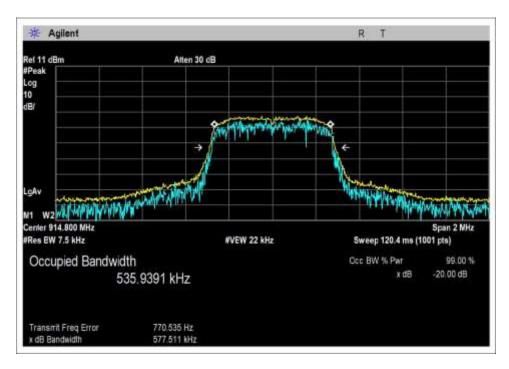


High Channel, 600k





Low Channel, 1.2M



Middle Channel, 1.2M





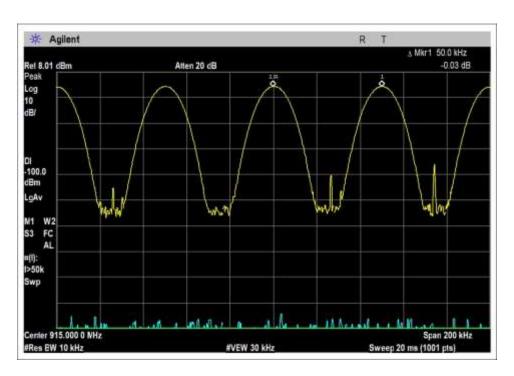
High Channel, 1.2M



# 15.247(a)(1) Carrier Separation

Test Data Summary						
Limit applied: 2	20dB bandwidth of the hopping channel.					
Antenna Operational Mode Measured Limit Res						
1	50kHz Channel Plan (10k GFSK)	50.0	>20.35	Pass		
1	400kHz Channel Plan (50k GFSK, 150k GFSK, 6.25 OQPSK, 12.5 OQPSK, 200k OFDM, 600k OFDM)	400.16	>335.18	Pass		
1	800kHz Channel Plan (1.2M OFDM Hybrid Mode)	800.9	>577.51	Pass		

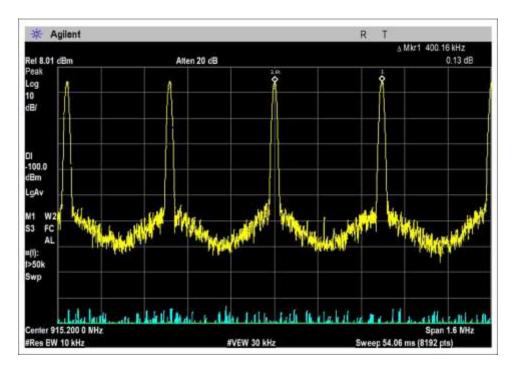
## Plots



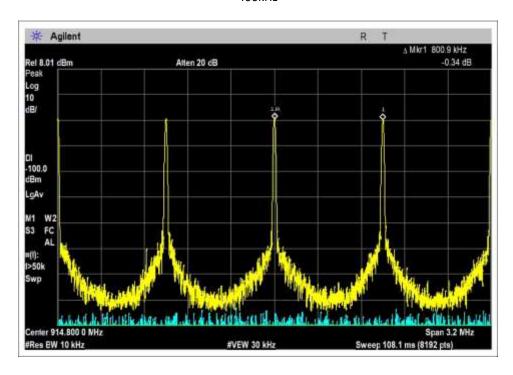
50kHz

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#### 400kHz



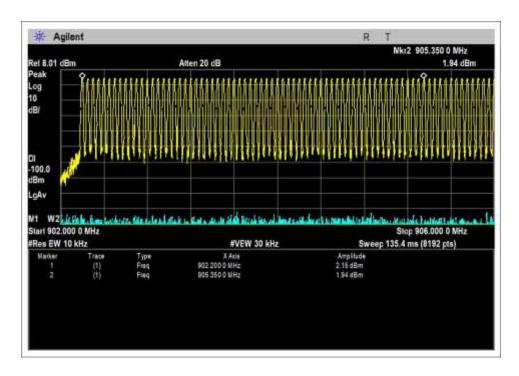
800kHz



# 15.247(a)(1)(i) Number of Hopping Channels

	Test Data Summary					
	$Limit = \begin{cases} 50 \text{ Channels }  20 \text{ dB } BW < 250 \text{kHz} \\ 25 \text{ Channels }  20 \text{ dB } BW \ge 250 \text{kHz} \end{cases}$					
Antenna Port	Operational Mode Measured Limit Results (Channels)					
1	50kHz Channel Plan (10k GFSK)	512	≥50	Pass		
1	400kHz Channel Plan (50k GFSK, 150k GFSK, 6.25 OQPSK, 12.5 OQPSK, 200k OFDM, 600k OFDM)	64	≥50	Pass		
1	800kHz Channel Plan (1.2M OFDM Hybrid Mode)	31	≥25	Pass		

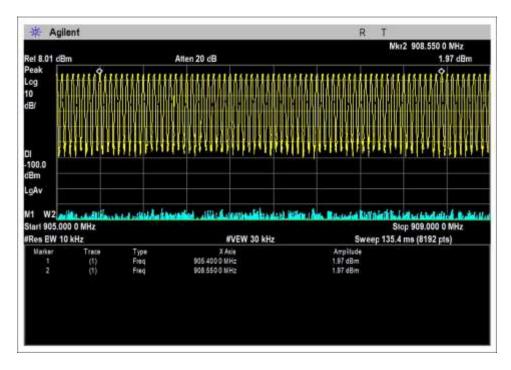
## **Plots**



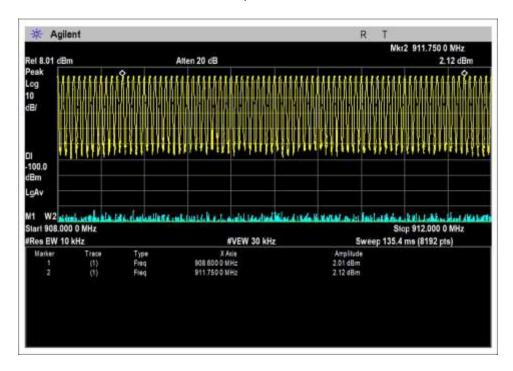
50kHz, 1st x 64ch

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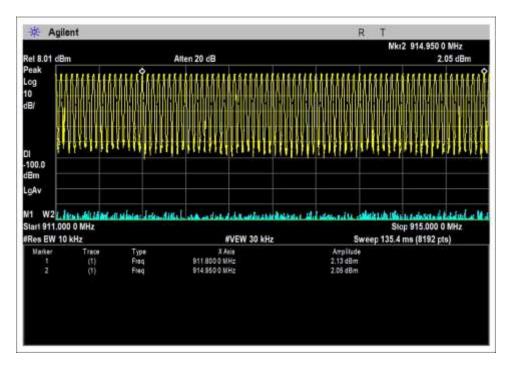


50kHz, 2<sup>nd</sup> x 64ch

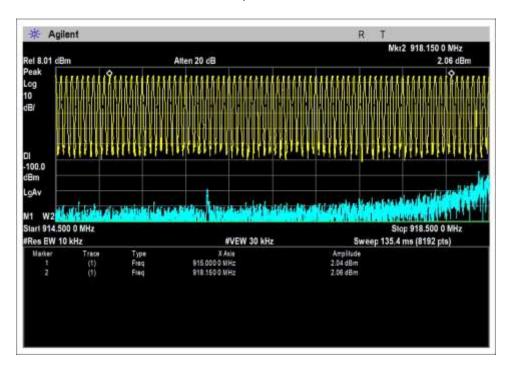


50kHz, 3<sup>rd</sup> x 64ch



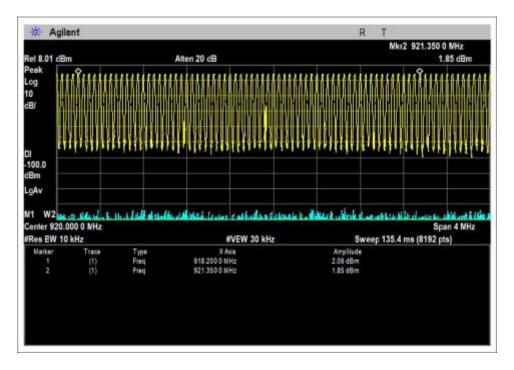


50kHz, 4<sup>th</sup> x 64ch

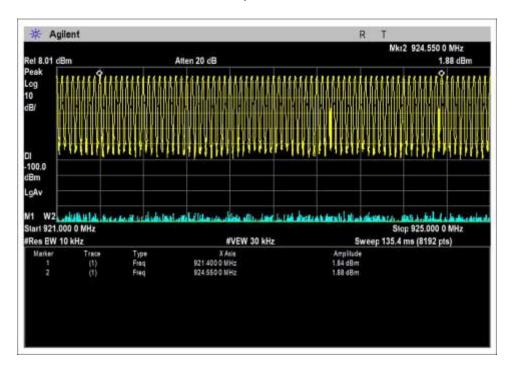


50kHz, 5<sup>th</sup> x 64ch



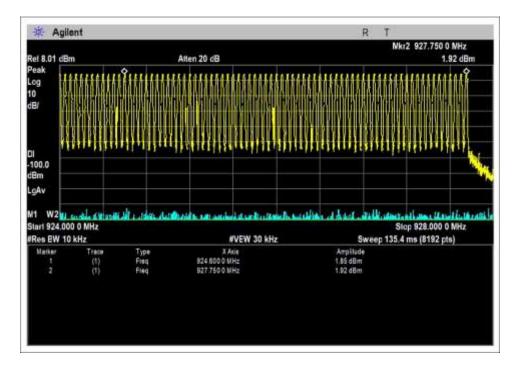


50kHz, 6<sup>th</sup> x 64ch

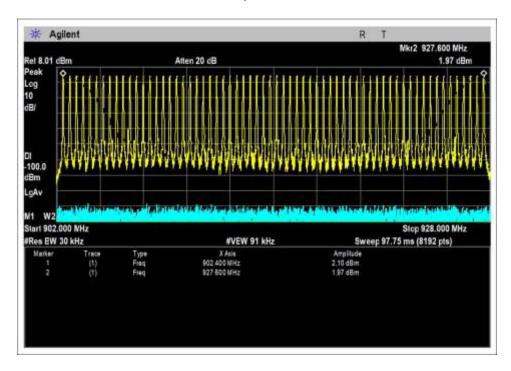


50kHz, 7<sup>th</sup> x 64ch



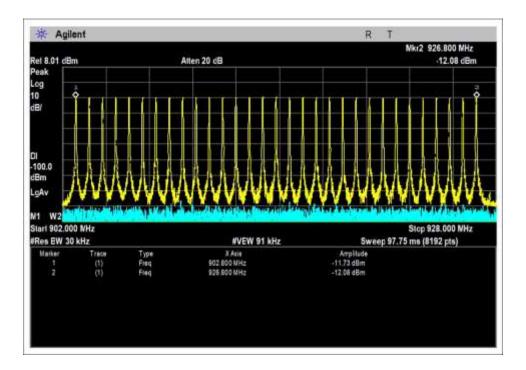


50kHz, 8<sup>th</sup> x 64ch



400kHz





800kHz



## 15.247(a)(1)(iii) Average Time of Occupancy

#### Manufacturer's Declaration

CKC Laboratories was not contracted to perform the testing due to the required equipment and firmware to exercise the EUT's multiple pseudo-random hopping sequences was not available and that the complexity of the different modulations and modes depend on the device to be in a fully operating network environment.

Therefore, the manufacturer declares the following:

With the multiple modulations, modes and hop tables, the mode with the worst-case Time of Occupancy to demonstrate 400mS compliance is 399.8mS in 10 seconds, since this modulation is > 250kHz and < 500 kHz OBW. Each session of multiple short transmissions takes place on one of 64 different channels in a pseudorandom sequence. The algorithm that determines the pseudo-random hop sequence ensures all 64 channels are used equally on the average.

Itron employs hopping patterns based on a pseudo-random sequence generated by an algorithm. The algorithm can have multiple components generated, that each has its own pseudo-random sequence.

The firmware insures the channels are used in the prescribed pseudo random order, therefore, it maintains equal channel usage.

The system has single channel receiver bandwidths that match the transmitter's modulation bandwidth that is enabled.

With the transmitter and receiver in synchronization within the network, transmitters switch frequencies in synchronization with the receiver.

When the transmitter needs to send a continuous or long data stream, total time of the packet transmissions is monitored to comply with dwell time requirement of 400ms in the appropriate 10s or 20s window depending on the modulation/mode enabled.

This device does not employ any hopping avoidance techniques.

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# Test Setup Photo



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# 15.247(b)(2) Output Power

Test Data Summary - Voltage Variations					
Frequency (MHz) Modulation / Ant Port (dBm) V <sub>Nominal</sub> V <sub>Maximum</sub> Max Deviation (dBm) (dBm) from V <sub>Nominal</sub> (					
(IVIHZ)		(dBm)	(dBm)	(dBm)	from V <sub>Nominal</sub> (dB)
902.2	10k GFSK	29.4	29.3	29.3	0.1
915	10k GFSK	29.3	29.4	29.4	0.1
927.75	10k GFSK	29.2	29.2	29.2	0.1

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

## **Parameter Definitions:**

Measurements performed at input voltage according to manufacturer specification.

Parameter	Value
V <sub>Nominal</sub> :	115VAC
V <sub>Minimum</sub> :	100VAC
V <sub>Maximum</sub> :	240VAC

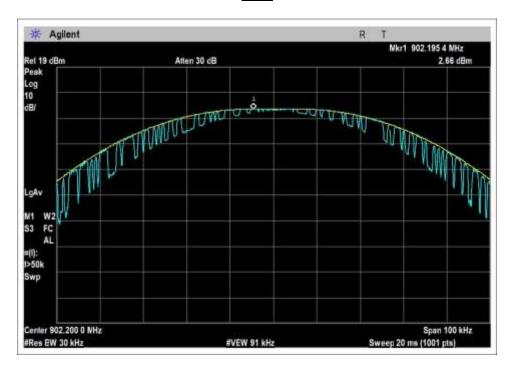
Test Data Summary - RF Conducted Measurement							
limit — )	$Limit = \begin{cases} 30dBm \ Conducted/36dBm \ EIRP \mid \geq 50 \ Channels \end{cases}$						
(24aBm Conducted/30aBm EIRP   < 50 Channels (min 25)							
Frequency (MHz)	Modulation	Ant. Type / Gain (dBi)	Measured (dBm)	Limit (dBm)	Results		
902.2		External Colinear Omni	29.3				
915	10k GFSK	(5.5dBi max)	29.4	≤30	Pass		
927.75		(J.Jubi illax)	29.2				
902.4		External Colinear Omni	29.2				
915.2	50k GFSK	(5.5dBi max)	29.2	≤30	Pass		
927.6		(J.Jubi illax)	29.1				
902.4		External Colinear Omni	29.3				
915.2	150k GFSK	(5.5dRi max) 29.3 ≤30	≤30	Pass			
927.6		(5.5dbi iliax)	29.2				
902.4	_	External Colinear Omni	29.4				
915.2	6.25k OQPSK	(5.5dBi max)	29.5	≤30	Pass		
927.6		(5.5dbi iliax)	29.2				
902.4		External Colinear Omni	29.4				
915.2	12.5k OQPSK	(5.5dBi max)	29.5	≤30	Pass		
927.6		(3.5dbi ilida)	29.3				
902.4		External Colinear Omni	24.8				
915.2	200k OFDM	(5.5dBi max)	24.8	≤30	Pass		
927.6		(S.Subi max)	24.6				
902.4		External Colinear Omni	24.6				
915.2	600k OFDM	(5.5dBi max)	24.5	≤30	Pass		
927.6		(J.Jubi illax)	24.5				
902.8		External Colinear Omni	24.6				
914.8	1.2M OFDM (Hybrid)	(5.5dBi max)	24.7	≤30	Pass		
926.8		(J.Jubi illax)	24.6				

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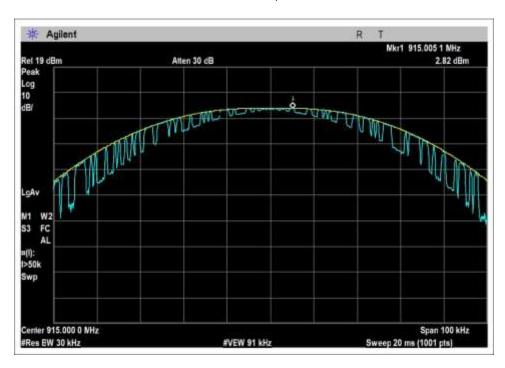


## **Plots**

## **GFSK**

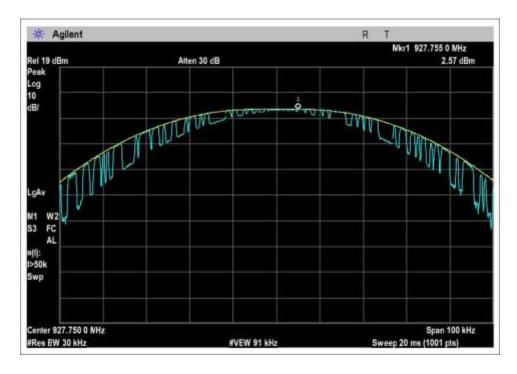


Low Channel, 10k

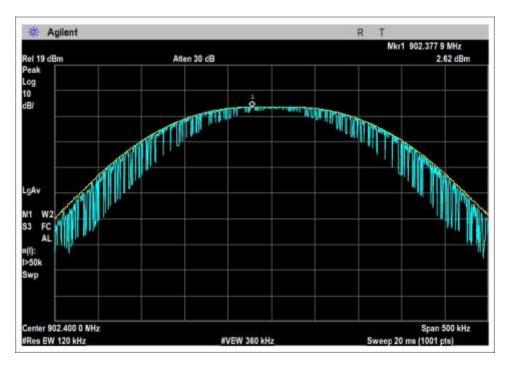


Middle Channel, 10k



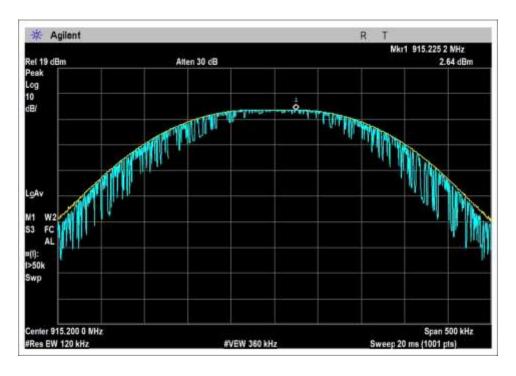


High Channel, 10k

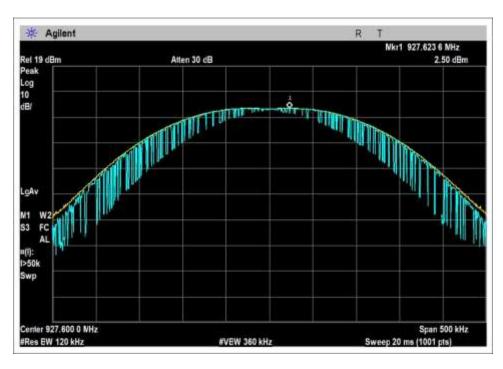


Low Channel, 50k



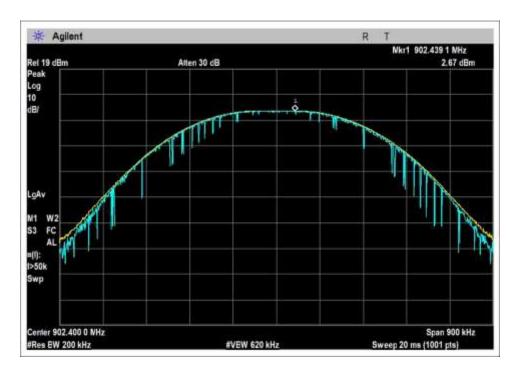


Middle Channel, 50k

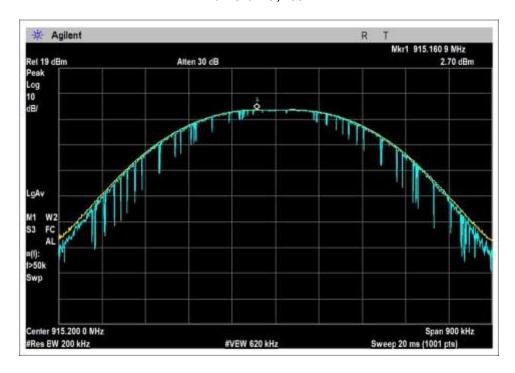


High Channel, 50k



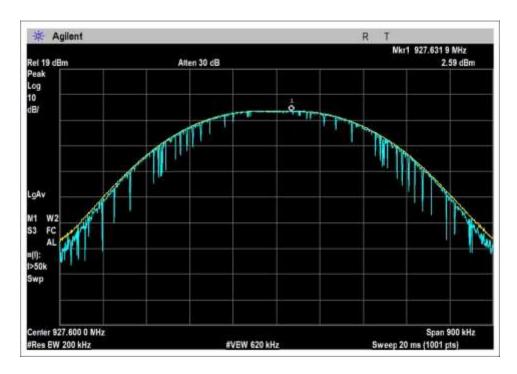


Low Channel, 150k



Middle Channel, 150k

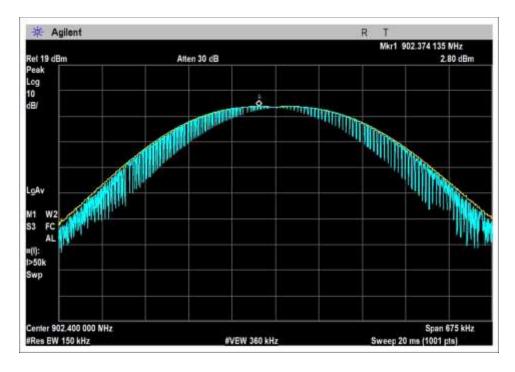




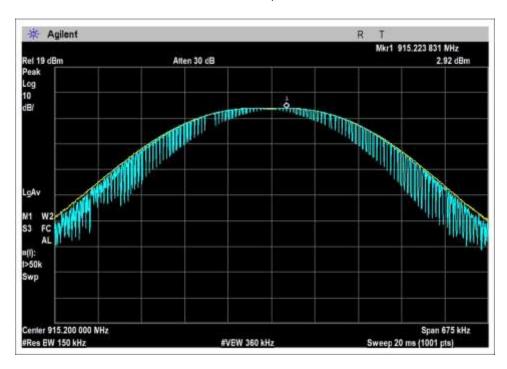
High Channel, 150k



## **OQPSK**

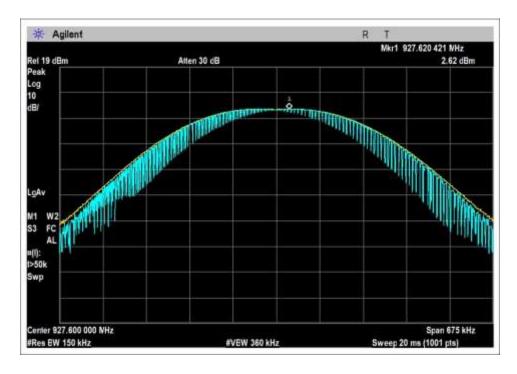


Low Channel, 6.25k

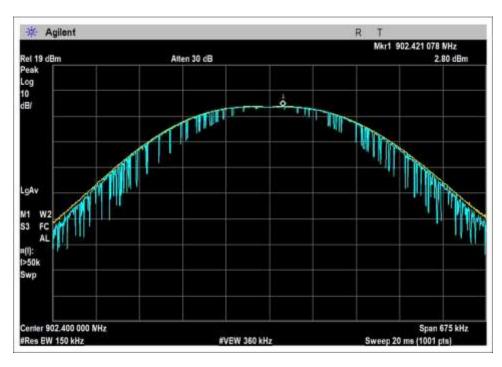


Middle Channel, 6.25k



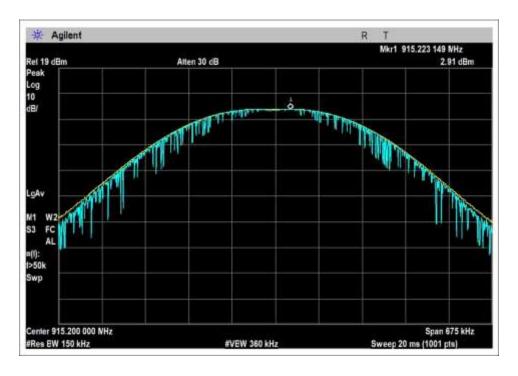


High Channel, 6.25k

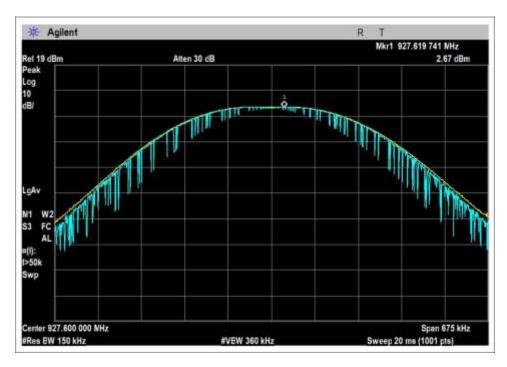


Low Channel, 12.5k





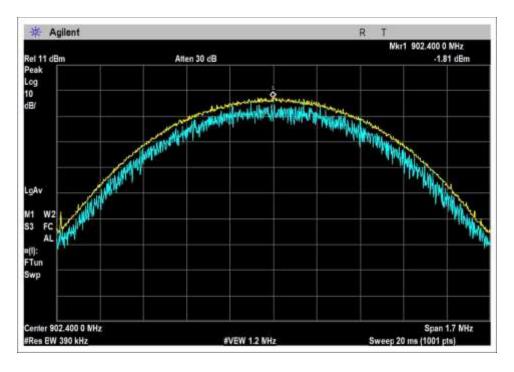
Middle Channel, 12.5k



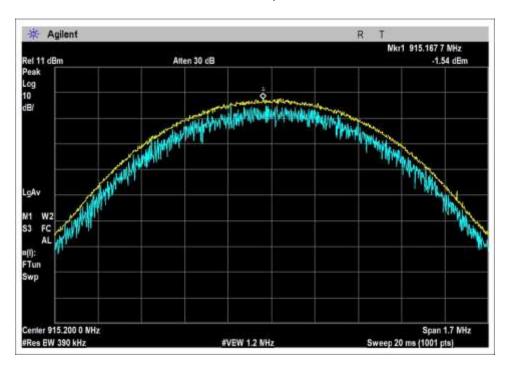
High Channel, 12.5k



## **OFDM**

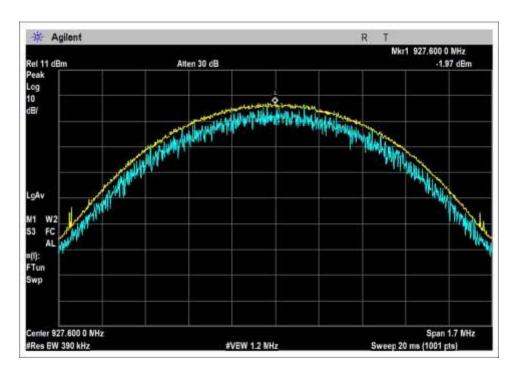


Low Channel, 200k

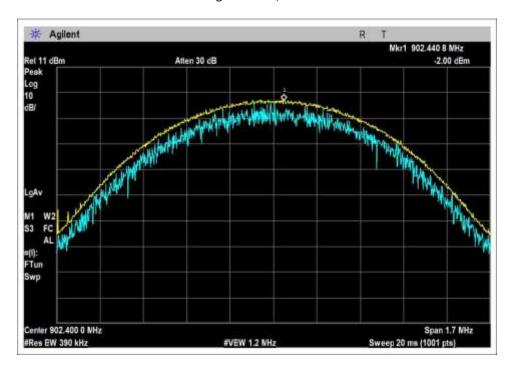


Middle Channel, 200k



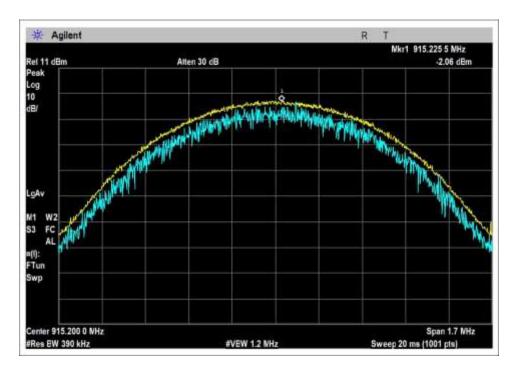


High Channel, 200k

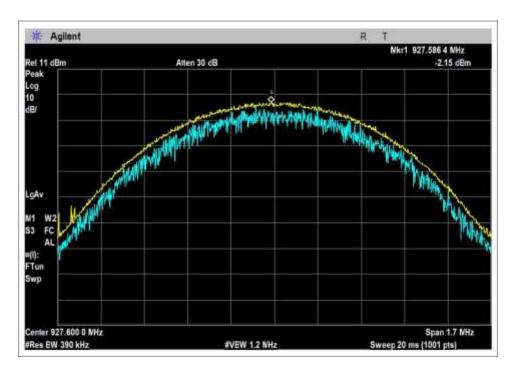


Low Channel, 600k



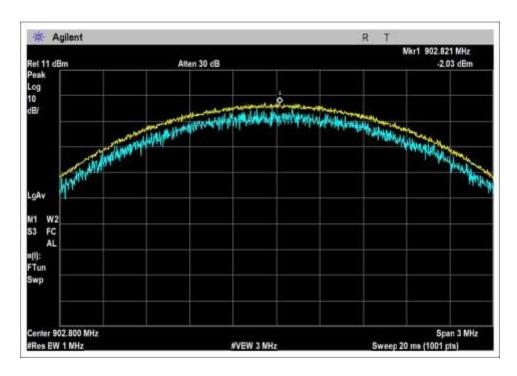


Middle Channel, 600k

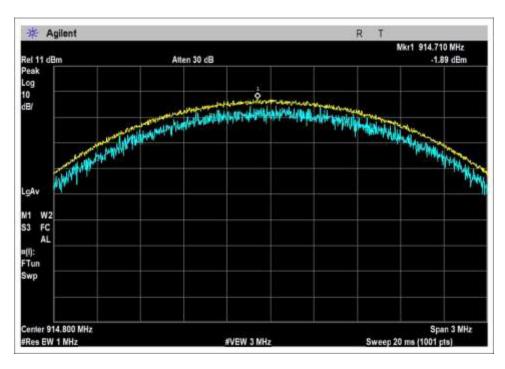


High Channel, 600k



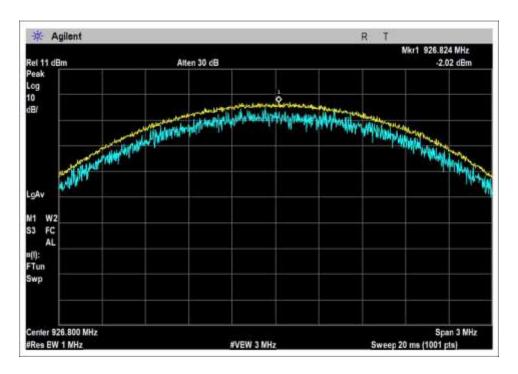


Low Channel, 1.2M



Middle Channel, 1.2M





High Channel, 1.2M



## **Test Setup / Conditions / Data**

Test Location: CKC Laboratories • 22116 23rd Drive SE, Suite A • Bothell, WA 98021 • 1-800-500-4EMC (4362)

Customer: **Itron, Inc.** 

Specification: 15.247(b) Power Output (902-928 MHz FHSS >50 Channels)

 Work Order #:
 101674
 Date: 8/21/2018

 Test Type:
 Conducted Emissions
 Time: 10:17:53

Tested By: Michael Atkinson Sequence#: 1

Software: EMITest 5.03.11 115VAC 60Hz

**Equipment Tested:** 

Device Manufacturer Model # S/N
Configuration 1

Support Equipment:

Device Manufacturer Model # S/N
Configuration 1

Test Conditions / Notes:

Frequency Range: Fundamental

Frequency tested: Low, Mid, High Channels

Firmware power setting: Max

Firmware: CAM3-DEV Major Number 4, Minor Number 7, Build Number 153, Revision Number 787268

Test Software: CAM3 FCC Test Helper v14

Modulation Types:

10k GFSK, 50k GFSK, 150k GFSK 6.25k OQPSK, 12.5k OQPSK

200k OFDM, 600k OFDM, 1.2M OFDM (Hybrid)

Antenna type: External Colinear Omni

Antenna Gain: 2.8dBi (attached), 5.5dBi (remote), 8.15dBi with 3dB attenuator (remote)

Duty Cycle: Tested at 100%

Test Location: Bothell Lab Bench Test Method: ANSI C63.10 (2013)

Temperature (°C): 22-24 Relative Humidity (%): 38-42

Setup: The EUT is continuously transmitting with modulation on ISM port.

The EUT ISM port is connected directly to a spectrum analyzer for direct conducted measurements.

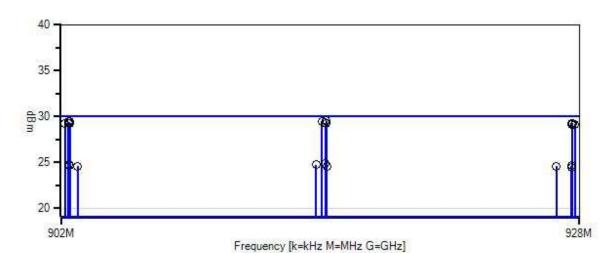
Low, Mid, High channels investigated, all modulation types investigated

Also, investigated voltage variations based on manufacturer specified Vmin and Vmax.

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Itron, Inc. WO#: 101674 Sequence#: 1 Date: 8/21/2018 15.247(b) Power Output (902-928 MHz FHSS >50 Channels) Test Lead: 115VAC 60Hz Antenna Port



Sweep Data
Readings

Peak Readings
 QP Readings

Average Readings

Ambient

Software Version: 5.03.11

1 - 15.247(b) Power Output (902-928 MHz FHSS >50 Channels)

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Test Equipment:

ID	Asset #	Description	Model	<b>Calibration Date</b>	Cal Due Date
	AN02673 Spectrum Anal		E4446A	2/3/2017	2/3/2019
T1	ANP07228	Attenuator	PE7004-20	11/30/2017	11/30/2019
T2	ANP07226	Attenuator	PE7004-6	12/1/2017	12/1/2019
T3	ANP06008	Cable	Heliax	4/10/2018	4/10/2020

Measurement Data:			eading lis	ted by ma	argin.			Test Lea		Test Lead: Antenna Port					
#	Freq	Rdng	T1	T2	T3		Dist	Corr	Spec	Margin	Polar				
	MHz	dΒμV	dB	dB	dB	dB	Table	dBm	dBm	dB	Ant				
1	915.224M	2.9	+20.0	+5.8	+0.8		+0.0	29.5	30.0	-0.5	Anten				
									6.25k OQP						
2	915.223M	2.9	+20.0	+5.8	+0.8		+0.0	29.5	30.0	-0.5	Anten				
									12.5 OQPS						
3	915.005M	2.8	+20.0	+5.8	+0.8		+0.0	29.4	30.0	-0.6	Anten				
									10k GFSK						
4	902.421M	2.8	+20.0	+5.8	+0.8		+0.0	29.4	30.0	-0.6	Anten				
									12.5 OQPS	K					
5	902.374M	2.8	+20.0	+5.8	+0.8		+0.0	29.4	30.0	-0.6	Anten				
									6.25k OQP	SK					
6	915.161M	2.7	+20.0	+5.8	+0.8		+0.0	29.3	30.0	-0.7	Anten				
									150k GFSK						
7	902.439M	2.7	+20.0	+5.8	+0.8		+0.0	29.3	30.0	-0.7	Anten				
									150k GFSK						
8	927.620M	2.7	+20.0	+5.8	+0.8		+0.0	29.3	30.0	-0.7	Anten				
									12.5 OQPS	K					
9	902.195M	2.7	+20.0	+5.8	+0.8		+0.0	29.3	30.0	-0.7	Anten				
									10k GFSK						
10	915.225M	2.6	+20.0	+5.8	+0.8		+0.0	29.2	30.0	-0.8	Anten				
									50k GFSK						
11	927.620M	2.6	+20.0	+5.8	+0.8		+0.0	29.2	30.0	-0.8	Anten				
									6.25k OQP	SK					
12	902.378M	2.6	+20.0	+5.8	+0.8		+0.0	29.2	30.0	-0.8	Anten				
									50k GFSK						
13	927.632M	2.6	+20.0	+5.8	+0.8		+0.0	29.2	30.0	-0.8	Anten				
									150k GFSK						
14	927.755M	2.6	+20.0	+5.8	+0.8		+0.0	29.2	30.0	-0.8	Anten				
									10k GFSK						
15	927.624M	2.5	+20.0	+5.8	+0.8		+0.0	29.1	30.0	-0.9	Anten				
									50k GFSK						
16	915.169M	-1.8	+20.0	+5.8	+0.8		+0.0	24.8	30.0	-5.2	Anten				
		-							200k OFDN						
17	902.400M	-1.8	+20.0	+5.8	+0.8		+0.0	24.8	30.0	-5.2	Anten				
									200k OFDN						

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18	914.710M	-1.9	+20.0	+5.8	+0.8	+0.0	24.7	30.0	-5.3	Anten
								1.2M OFDI	M	
19	927.600M	-2.0	+20.0	+5.8	+0.8	+0.0	24.6	30.0	-5.4	Anten
								200k OFDN	M	
20	902.441M	-2.0	+20.0	+5.8	+0.8	+0.0	24.6	30.0	-5.4	Anten
								600k OFDN	M	
21	926.824M	-2.0	+20.0	+5.8	+0.8	+0.0	24.6	30.0	-5.4	Anten
								1.2M OFDI	M	
22	902.821M	-2.0	+20.0	+5.8	+0.8	+0.0	24.6	30.0	-5.4	Anten
								1.2M OFDI	M	
23	915.226M	-2.1	+20.0	+5.8	+0.8	+0.0	24.5	30.0	-5.5	Anten
								600k OFDN	M	
24	927.586M	-2.2	+20.0	+5.8	+0.8	+0.0	24.5	30.0	-5.5	Anten
								600k OFDN	M	

# Test Setup Photo



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## 15.247(d) RF Conducted Emissions & Band Edge

## Test Setup / Conditions / Data

Test Location: CKC Laboratories • 22116 23rd Drive SE, Suite A • Bothell, WA 98021 • 1-800-500-4EMC (4362)

Customer: Itron, Inc.

Specification: 15.247(d) Conducted Spurious Emissions

Work Order #: 101674 Date: 8/29/2018 Test Type: **Conducted Emissions** Time: 09:14:02

Tested By: Michael Atkinson Sequence#: 6 Software: EMITest 5.03.11 115VAC 60Hz

**Equipment Tested:** 

Device Manufacturer Model # S/N Configuration 1

Support Equipment:

Device Manufacturer Model # S/N Configuration 1

Test Conditions / Notes:

Frequency Range: 9kHz-9.28GHz

Frequency tested: Low, Mid, and High Channels

Firmware power setting: Max

Firmware: CAM3-DEV Major Number 4, Minor Number 7, Build Number 153, Revision Number 787268

Test Software: CAM3 FCC Test Helper v14

Modulation Types:

10k GFSK, 50k GFSK, 150k GFSK 6.25k OQPSK, 12.5k OQPSK

200k OFDM, 600k OFDM, 1.2M OFDM (Hybrid)

Hopping modes: 10k GFSK, 6.25k OQPSK, 200k OFDM, 1.2M OFDM.

Antenna type: External Colinear Omni

Antenna Gain: 2.8dBi (attached), 5.5dBi (remote), 8.15dBi with 3dB attenuator (remote)

Duty Cycle: Tested at 100%

Test Location: Bothell Lab Bench Test Method: ANSI C63.10 (2013)

Temperature (°C): 22-24 Relative Humidity (%): 38-42

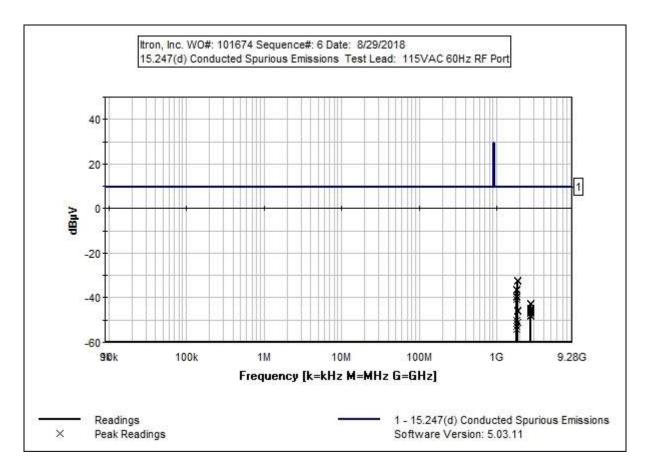
Setup: The EUT is continuously transmitting with modulation on ISM port.

The EUT ISM port is connected directly to a spectrum analyzer for direct conducted measurements.

Low, Mid, High channels investigated, all modulation types investigated

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Test Equipment:

- 4							
	ID	Asset #	Description	Model	<b>Calibration Date</b>	Cal Due Date	
	T1	AN02673 Spectrum Analyz		E4446A	2/3/2017	2/3/2019	
	T2	ANP07228	Attenuator	PE7004-20	11/30/2017	11/30/2019	
	T3	ANP07226	Attenuator	PE7004-6	12/1/2017	12/1/2019	
	T4	ANP06008	Cable	Heliax	4/10/2018	4/10/2020	

Measu	rement Data:	Re	eading lis	ted by ma	argin.			Test Lea	d: RF Port		
#	Freq	Rdng	T1	T2	Т3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dΒμV	dB	dB	dB	dB	Table	dΒμV	dΒμV	dB	Ant
1	1855.260M	-59.0	+0.0	+20.0	+5.9	+1.1	+0.0	-32.0	9.5	-41.5	RF Po
									6.25k OQPS		
2	1855.505M	-59.0	+0.0	+20.0	+5.9	+1.1	+0.0	-32.0	9.5	-41.5	RF Po
									10k GFSK		
3	1855.200M	-59.3	+0.0	+20.0	+5.9	+1.1	+0.0	-32.3	9.5	-41.8	RF Po
									50k GFSK		
4	1855.250M	-59.4	+0.0	+20.0	+5.9	+1.1	+0.0	-32.4	9.5	-41.9	RF Po
									150k GFSK		
5	1855.220M	-59.4	+0.0	+20.0	+5.9	+1.1	+0.0	-32.4	9.5	-41.9	RF Po
		12.5k OQPS									
6	1829.991M	-63.0	+0.0	+20.0	+5.9	+1.1	+0.0	-36.0	9.5	-45.5	RF Po
									10k GFSK		
7	1830.445M	-63.0	+0.0	+20.0	+5.9	+1.1	+0.0	-36.0	9.5	-45.5	RF Po
									6.25k OQPS		
8	1830.415M	-63.3	+0.0	+20.0	+5.9	+1.1	+0.0	-36.3	9.5	-45.8	RF Po
									50k GFSK		
9	1830.455M	-63.7	+0.0	+20.0	+5.9	+1.1	+0.0	-36.7	9.5	-46.2	RF Po
									150k GFSK		
10	1830.415M	-63.8	+0.0	+20.0	+5.9	+1.1	+0.0	-36.8	9.5	-46.3	RF Po
									12.5k OQPS		
11	1855.205M	-72.7	+0.0	+20.0	+5.9	+1.1	+0.0	-45.7	1.0	-46.7	RF Po
									200k OFDM		
12	1855.250M	-73.2	+0.0	+20.0	+5.9	+1.1	+0.0	-46.2	1.0	-47.2	RF Po
									600k OFDM		
13	1804.770M	-66.4	+0.0	+20.0	+5.9	+1.0	+0.0	-39.5	9.5	-49.0	RF Po
				• • • •					12.5k OQPS		
14	1804.417M	-66.4	+0.0	+20.0	+5.9	+1.0	+0.0	-39.5	9.5	-49.0	RF Po
	100101575		0.0	20.0		1.0		20.5	10k GFSK	10.1	25.2
15	1804.845M	-66.5	+0.0	+20.0	+5.9	+1.0	+0.0	-39.6	9.5	-49.1	RF Po
	1001010		0.0	20.0		1.0		20.0	6.25k OQPS		25.2
16	1804.810M	-66.8	+0.0	+20.0	+5.9	+1.0	+0.0	-39.9	9.5	-49.4	RF Po
1.7	100401534	67.0	0.0	20.0		1.0	0.0	40.0	50k GFSK	<b>50.</b> 4	DED
17	1804.815M	-67.8	+0.0	+20.0	+5.9	+1.0	+0.0	-40.9	9.5	-50.4	RF Po
10	1020 2051 5	7.0	0.0	20.0		1.1	0.0	40.0	150k GFSK		DED
18	1830.385M	-76.9	+0.0	+20.0	+5.9	+1.1	+0.0	-49.9	1.0	-50.9	RF Po
10	1020 4253 5	77.0	.00	. 20. 0		, 1 1	.00	<i>5</i> 0.0	200k OFDM		DED
19	1830.435M	-77.0	+0.0	+20.0	+5.9	+1.1	+0.0	-50.0	1.0	-51.0	RF Po
20	1004 700%	77.0	.00	120.0	. F O	, 1.0	.00	£0.2	600k OFDM		DE D
20	1804.790M	-77.2	+0.0	+20.0	+5.9	+1.0	+0.0	-50.3	1.0	-51.3	RF Po
<u> </u>									200k OFDM	1	

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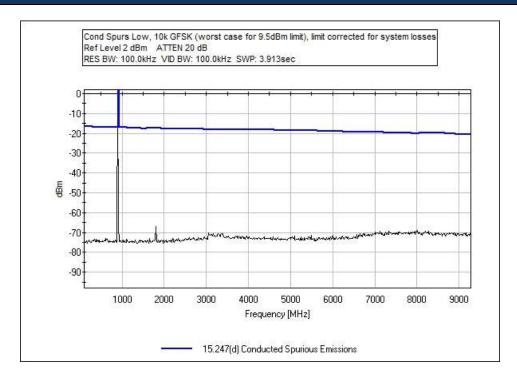


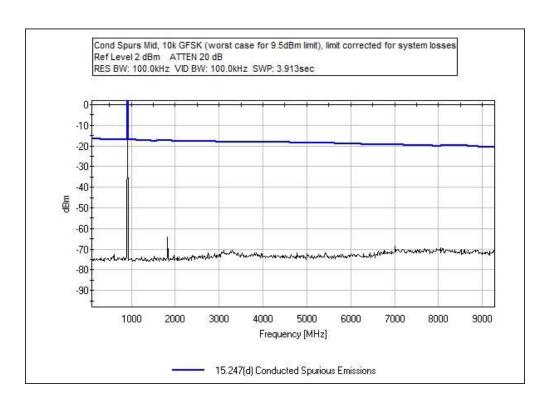
21   1853.635M   -78.1   +0.0   +20.0   +5.9   +1.1   +0.0   -51.1   1.0   -52.1   RF Po   1.2M OFDM   -70.0   +0.0   +20.0   +5.8   +1.5   +0.0   -42.7   9.5   -52.2   RF Po   10k GFSK   -70.1   +0.0   +20.0   +5.8   +1.5   +0.0   -42.8   9.5   -52.3   RF Po   602k OQPSK   -78.3   +0.0   +20.0   +5.9   +1.0   +0.0   -51.4   1.0   -52.4   RF Po   600k OFDM   -79.8   +0.0   +20.0   +5.9   +1.0   +0.0   -52.9   1.0   -53.9   RF Po   1.2M OFDM   -72.0   +0.0   +20.0   +5.8   +1.5   +0.0   -44.7   9.5   -54.2   RF Po   1.2M OFDM   -72.1   +0.0   +20.0   +5.8   +1.5   +0.0   -44.8   9.5   -54.2   RF Po   1.2M OFDM   -72.1   +0.0   +20.0   +5.8   +1.5   +0.0   -44.8   9.5   -54.2   RF Po   1.2M OFDM   -72.1   +0.0   +20.0   +5.8   +1.5   +0.0   -45.1   9.5   -54.6   RF Po   10k GFSK   -72.4   +0.0   +20.0   +5.8   +1.5   +0.0   -45.1   9.5   -54.6   RF Po   10k GFSK   -72.4   +0.0   +20.0   +5.8   +1.5   +0.0   -45.1   9.5   -54.6   RF Po   10k GFSK   -72.4   +0.0   +20.0   +5.8   +1.5   +0.0   -45.1   9.5   -54.6   RF Po   10k GFSK   -72.4   +0.0   +20.0   +5.8   +1.5   +0.0   -45.1   9.5   -54.6   RF Po   150k GFSK   -72.4   +0.0   +20.0   +5.8   +1.5   +0.0   -45.1   9.5   -55.1   RF Po   150k GFSK   -72.4   +0.0   +20.0   +5.8   +1.5   +0.0   -45.1   9.5   -55.1   RF Po   150k GFSK   -72.4   +0.0   +20.0   +5.8   +1.5   +0.0   -45.6   9.5   -55.1   RF Po   150k GFSK   -72.4   +0.0   +20.0   +5.8   +1.5   +0.0   -46.6   9.5   -55.5   RF Po   150k GFSK   -73.3   +0.0   +20.0   +5.8   +1.5   +0.0   -46.6   9.5   -55.5   RF Po   150k GFSK   -73.2   RF Po   12.5k OQPSK   -74.4   +0.0   +20.0   +5.8   +1.5   +0.0   -47.1   9.5   -56.6   RF Po   12.5k OQPSK   -75.2   RF Po   12.5k OQPSK   -75.8   +0.0   +20.0   +5.8   +1.5   +0.0   -48.5   9.5   -57.6   RF Po   12.5k OQPSK   -75.8   -75.8   RF Po   12.5k OQPSK   -75.8												
22 2745.000M	21	1853.635M	-78.1	+0.0	+20.0	+5.9	+1.1	+0.0	-51.1		-52.1	RF Po
10k GFSK   1.0	- 22	27.45.0003.4	70.0	. 0. 0	. 20. 0	. 7.0	. 1 . 7	. 0. 0	10.7		50.0	DED
23 2745.665M	22	2745.000M	-70.0	+0.0	+20.0	+5.8	+1.5	+0.0	-42.7		-52.2	RF Po
24   1804.805M   -78.3   +0.0   +20.0   +5.9   +1.0   +0.0   -51.4   1.0   -52.4   RF Po 600K OFDM     25   1805.535M   -79.8   +0.0   +20.0   +5.9   +1.0   +0.0   -52.9   1.0   -53.9   RF Po 1.2M OFDM     26   2745.660M   -72.0   +0.0   +20.0   +5.8   +1.5   +0.0   -44.7   9.5   -54.2   RF Po 12.5K OQPSK     27   2745.640M   -72.1   +0.0   +20.0   +5.8   +1.5   +0.0   -44.8   9.5   -54.3   RF Po 50k GFSK     28   2783.245M   -72.4   +0.0   +20.0   +5.8   +1.5   +0.0   -45.1   9.5   -54.6   RF Po 10k GFSK     29   2782.685M   -72.4   +0.0   +20.0   +5.8   +1.5   +0.0   -45.1   9.5   -54.6   RF Po 10k GFSK     30   2745.610M   -72.9   +0.0   +20.0   +5.8   +1.5   +0.0   -45.6   9.5   -55.1   RF Po 150k GFSK     31   1829.640M   -81.2   +0.0   +20.0   +5.8   +1.5   +0.0   -45.6   9.5   -55.1   RF Po 1.2M OFDM     32   2707.210M   -73.3   +0.0   +20.0   +5.8   +1.5   +0.0   -46.0   9.5   -55.5   RF Po 1.2M OFDM     33   2782.850M   -73.9   +0.0   +20.0   +5.8   +1.5   +0.0   -46.0   9.5   -55.5   RF Po 1.50k GFSK     34   2706.617M   -74.4   +0.0   +20.0   +5.8   +1.5   +0.0   -46.6   9.5   -56.6   RF Po 1.50k GFSK     35   2782.860M   -73.9   +0.0   +20.0   +5.8   +1.5   +0.0   -47.1   9.5   -56.6   RF Po 1.50k GFSK     36   2707.170M   -75.0   +0.0   +20.0   +5.8   +1.5   +0.0   -47.1   9.5   -56.6   RF Po 1.2K OQPSK     37   2707.245M   -75.4   +0.0   +20.0   +5.8   +1.5   +0.0   -48.1   9.5   -57.2   RF Po 6.25k OQPSK     38   2782.820M   -75.5   +0.0   +20.0   +5.8   +1.5   +0.0   -48.1   9.5   -57.5   RF Po 6.25k OQPSK     39   2707.215M   -75.5   +0.0   +20.0   +5.8   +1.5   +0.0   -48.2   9.5   -57.7   RF Po 6.25k OQPSK     39   2707.215M   -75.8   +0.0   +20.0   +5.8   +1.5   +0.0   -48.5   9.5   -57.7   RF Po 6.25k OQPSK     39   2707.215M   -75.8   +0.0   +20.0   +5.8   +1.5   +0.0   -48.5   9.5   -57.7   RF Po 6.25k OQPSK     39   2707.215M   -75.8   +0.0   +20.0   +5.8   +1.5   +0.0   -48.5   9.5   -57.7   RF Po 6.25k OQPSK     39   2707.215M   -75.8   +0.0   +20.0   +5.8   +1.5   +0.0   -48.5   9.												
24   1804.805M	23	2745.665M	-70.1	+0.0	+20.0	+5.8	+1.5	+0.0	-42.8			RF Po
25   1805.535M   -79.8   +0.0   +20.0   +5.9   +1.0   +0.0   -52.9   1.0   -53.9   RF Po   1.2M OFDM												
25   1805.535M   -79.8   +0.0   +20.0   +5.9   +1.0   +0.0   -52.9   1.0   -53.9   RF Po   1.2M OFDM	24	1804.805M	-78.3	+0.0	+20.0	+5.9	+1.0	+0.0	-51.4	1.0	-52.4	RF Po
1.2M OFDM										600k OFDM		
26 2745.660M	25	1805.535M	-79.8	+0.0	+20.0	+5.9	+1.0	+0.0	-52.9	1.0	-53.9	RF Po
12.5k OQPSK   12.5k OQPSK   2745.640M   -72.1   +0.0   +20.0   +5.8   +1.5   +0.0   -44.8   9.5   -54.3   RF Po S0k GFSK   28 2783.245M   -72.4   +0.0   +20.0   +5.8   +1.5   +0.0   -45.1   9.5   -54.6   RF Po 10k GFSK   29 2782.685M   -72.4   +0.0   +20.0   +5.8   +1.5   +0.0   -45.1   9.5   -54.6   RF Po S0k GFSK   30 2745.610M   -72.9   +0.0   +20.0   +5.8   +1.5   +0.0   -45.6   9.5   -55.1   RF Po 150k GFSK   31 1829.640M   -81.2   +0.0   +20.0   +5.8   +1.5   +0.0   -45.6   9.5   -55.1   RF Po 150k GFSK   32 2707.210M   -73.3   +0.0   +20.0   +5.8   +1.5   +0.0   -46.0   9.5   -55.5   RF Po 150k GFSK   33 2782.850M   -73.9   +0.0   +20.0   +5.8   +1.5   +0.0   -46.6   9.5   -55.5   RF Po 150k GFSK   34 2706.617M   -74.4   +0.0   +20.0   +5.8   +1.5   +0.0   -47.1   9.5   -56.6   RF Po 150k GFSK   35 2782.860M   -74.5   +0.0   +20.0   +5.8   +1.5   +0.0   -47.1   9.5   -56.6   RF Po 12.5k OQPSK   36 2707.170M   -75.0   +0.0   +20.0   +5.8   +1.5   +0.0   -47.2   9.5   -57.2   RF Po 12.5k OQPSK   37 2707.245M   -75.4   +0.0   +20.0   +5.8   +1.5   +0.0   -48.1   9.5   -57.6   RF Po 12.5k OQPSK   38 2782.820M   -75.5   +0.0   +20.0   +5.8   +1.5   +0.0   -48.1   9.5   -57.7   RF Po 12.5k OQPSK   39 2707.215M   -75.8   +0.0   +20.0   +5.8   +1.5   +0.0   -48.5   9.5   -57.7   RF Po 12.5k OQPSK   39 2707.215M   -75.8   +0.0   +20.0   +5.8   +1.5   +0.0   -48.5   9.5   -57.7   RF Po 12.5k OQPSK   39 2707.215M   -75.8   +0.0   +20.0   +5.8   +1.5   +0.0   -48.5   9.5   -57.7   RF Po 12.5k OQPSK   39 2707.215M   -75.8   +0.0   +20.0   +5.8   +1.5   +0.0   -48.5   9.5   -57.7   RF Po 12.5k OQPSK   39 2707.215M   -75.8   +0.0   +20.0   +5.8   +1.5   +0.0   -48.5   9.5   -58.0   RF Po										1.2M OFDM		
27 2745.640M	26	2745.660M	-72.0	+0.0	+20.0	+5.8	+1.5	+0.0	-44.7	9.5	-54.2	RF Po
28 2783.245M										12.5k OQPSK		
28         2783.245M         -72.4         +0.0         +20.0         +5.8         +1.5         +0.0         -45.1         9.5         -54.6         RF Po           29         2782.685M         -72.4         +0.0         +20.0         +5.8         +1.5         +0.0         -45.1         9.5         -54.6         RF Po           30         2745.610M         -72.9         +0.0         +20.0         +5.8         +1.5         +0.0         -45.6         9.5         -55.1         RF Po           31         1829.640M         -81.2         +0.0         +20.0         +5.9         +1.1         +0.0         -54.2         1.0         -55.2         RF Po           32         2707.210M         -73.3         +0.0         +20.0         +5.8         +1.5         +0.0         -46.0         9.5         -55.5         RF Po           33         2782.850M         -73.9         +0.0         +20.0         +5.8         +1.5         +0.0         -46.6         9.5         -56.1         RF Po           34         2706.617M         -74.4         +0.0         +20.0         +5.8         +1.5         +0.0         -47.1         9.5         -56.7         RF Po	27	2745.640M	-72.1	+0.0	+20.0	+5.8	+1.5	+0.0	-44.8	9.5	-54.3	RF Po
10k GFSK   29 2782.685M   -72.4   +0.0   +20.0   +5.8   +1.5   +0.0   -45.1   9.5   -54.6   RF Po   50k GFSK   30 2745.610M   -72.9   +0.0   +20.0   +5.8   +1.5   +0.0   -45.6   9.5   -55.1   RF Po   150k GFSK   31 1829.640M   -81.2   +0.0   +20.0   +5.9   +1.1   +0.0   -54.2   1.0   -55.2   RF Po   1.2M OFDM   32 2707.210M   -73.3   +0.0   +20.0   +5.8   +1.5   +0.0   -46.0   9.5   -55.5   RF Po   50k GFSK   33 2782.850M   -73.9   +0.0   +20.0   +5.8   +1.5   +0.0   -46.6   9.5   -56.1   RF Po   150k GFSK   34 2706.617M   -74.4   +0.0   +20.0   +5.8   +1.5   +0.0   -47.1   9.5   -56.6   RF Po   10k GFSK   35 2782.860M   -74.5   +0.0   +20.0   +5.8   +1.5   +0.0   -47.1   9.5   -56.6   RF Po   6.25k OQPSK   36 2707.170M   -75.0   +0.0   +20.0   +5.8   +1.5   +0.0   -47.2   9.5   -57.2   RF Po   12.5k OQPSK   37 2707.245M   -75.4   +0.0   +20.0   +5.8   +1.5   +0.0   -48.1   9.5   -57.6   RF Po   6.25k OQPSK   38 2782.820M   -75.5   +0.0   +20.0   +5.8   +1.5   +0.0   -48.2   9.5   -57.7   RF Po   12.5k OQPSK   39 2707.215M   -75.8   +0.0   +20.0   +5.8   +1.5   +0.0   -48.2   9.5   -57.7   RF Po   12.5k OQPSK   39 2707.215M   -75.8   +0.0   +20.0   +5.8   +1.5   +0.0   -48.5   9.5   -58.0   RF Po   12.5k OQPSK   39 2707.215M   -75.8   +0.0   +20.0   +5.8   +1.5   +0.0   -48.5   9.5   -58.0   RF Po   12.5k OQPSK   39 2707.215M   -75.8   +0.0   +20.0   +5.8   +1.5   +0.0   -48.5   9.5   -58.0   RF Po   12.5k OQPSK   39 2707.215M   -75.8   +0.0   +20.0   +5.8   +1.5   +0.0   -48.5   9.5   -58.0   RF Po   12.5k OQPSK   39 2707.215M   -75.8   +0.0   +20.0   +5.8   +1.5   +0.0   -48.5   9.5   -58.0   RF Po   12.5k OQPSK   39 2707.215M   -75.8   +0.0   +20.0   +5.8   +1.5   +0.0   -48.5   9.5   -58.0   RF Po   12.5k OQPSK   39 2707.215M   -75.8   +0.0   +20.0   +5.8   +1.5   +0.0   -48.5   9.5   -58.0   RF Po   12.5k OQPSK   39 2707.215M   -75.8   +0.0   +20.0   +5.8   +1.5   +0.0   -48.5   9.5   -58.0   RF Po   12.5k OQPSK   39 2707.215M   -75.8   +0.0   +20.0   +5.8   +1.5   +0.0   -48.5   9.5   -58.0   RF Po   12										50k GFSK		
10k GFSK   29 2782.685M	28	2783.245M	-72.4	+0.0	+20.0	+5.8	+1.5	+0.0	-45.1	9.5	-54.6	RF Po
29       2782.685M       -72.4       +0.0       +20.0       +5.8       +1.5       +0.0       -45.1       9.5       -54.6       RF Po         30       2745.610M       -72.9       +0.0       +20.0       +5.8       +1.5       +0.0       -45.6       9.5       -55.1       RF Po         31       1829.640M       -81.2       +0.0       +20.0       +5.9       +1.1       +0.0       -54.2       1.0       -55.2       RF Po         32       2707.210M       -73.3       +0.0       +20.0       +5.8       +1.5       +0.0       -46.0       9.5       -55.5       RF Po         50k GFSK         33       2782.850M       -73.9       +0.0       +20.0       +5.8       +1.5       +0.0       -46.6       9.5       -56.1       RF Po         34       2706.617M       -74.4       +0.0       +20.0       +5.8       +1.5       +0.0       -47.1       9.5       -56.6       RF Po         35       2782.860M       -74.5       +0.0       +20.0       +5.8       +1.5       +0.0       -47.2       9.5       -56.7       RF Po         36       2707.170M       -75.0       +0.0       +20.0       +5.8<										10k GFSK		
Sok GFSK   Sok GFSK	29	2782.685M	-72.4	+0.0	+20.0	+5.8	+1.5	+0.0	-45.1		-54.6	RF Po
30 2745.610M		2,02,0001,1	,	. 0.0	0.0			. 0.0	.0.1		2	111 10
150k GFSK   150k GFSK   150k GFSK   12M OFDM   150k GFSK   150k	30	2745 610M	-72.9	+0.0	+20.0	+5.8	+1.5	+0.0	-45 6		-55 1	RF Po
31       1829.640M       -81.2       +0.0       +20.0       +5.9       +1.1       +0.0       -54.2       1.0       -55.2       RF Po         32       2707.210M       -73.3       +0.0       +20.0       +5.8       +1.5       +0.0       -46.0       9.5       -55.5       RF Po         33       2782.850M       -73.9       +0.0       +20.0       +5.8       +1.5       +0.0       -46.6       9.5       -56.1       RF Po         34       2706.617M       -74.4       +0.0       +20.0       +5.8       +1.5       +0.0       -47.1       9.5       -56.6       RF Po         10k GFSK         35       2782.860M       -74.5       +0.0       +20.0       +5.8       +1.5       +0.0       -47.2       9.5       -56.7       RF Po         36       2707.170M       -75.0       +0.0       +20.0       +5.8       +1.5       +0.0       -47.7       9.5       -57.2       RF Po         12.5k OQPSK         37       2707.245M       -75.4       +0.0       +20.0       +5.8       +1.5       +0.0       -48.1       9.5       -57.6       RF Po         12.5k OQPSK         39		27 13.010101	, 2.,	10.0	120.0	15.0	11.0	10.0	15.0		55.1	111 10
1.2M OFDM	31	1829 640M	-81.2	+0.0	+20.0	+5.9	+1 1	+0.0	-54.2		-55.2	RF Po
32       2707.210M       -73.3       +0.0       +20.0       +5.8       +1.5       +0.0       -46.0       9.5       -55.5       RF Po         33       2782.850M       -73.9       +0.0       +20.0       +5.8       +1.5       +0.0       -46.6       9.5       -56.1       RF Po         150k GFSK         34       2706.617M       -74.4       +0.0       +20.0       +5.8       +1.5       +0.0       -47.1       9.5       -56.6       RF Po         10k GFSK         35       2782.860M       -74.5       +0.0       +20.0       +5.8       +1.5       +0.0       -47.2       9.5       -56.7       RF Po         6.25k OQPSK         36       2707.170M       -75.0       +0.0       +20.0       +5.8       +1.5       +0.0       -47.7       9.5       -57.2       RF Po         12.5k OQPSK         37       2707.245M       -75.4       +0.0       +20.0       +5.8       +1.5       +0.0       -48.1       9.5       -57.6       RF Po         38       2782.820M       -75.5       +0.0       +20.0       +5.8       +1.5       +0.0       -48.2       9.5       -57.7       RF Po	31	1029.010141	01.2	10.0	120.0	13.7	11.1	10.0	3 1.2		33.2	10110
SOK GFSK   SOK GFSK	32	2707 210M	73.3	±0.0	±20.0	<b>⊥5</b> 8	⊥1.5	±0.0	46.0		55.5	DE Do
33       2782.850M       -73.9       +0.0       +20.0       +5.8       +1.5       +0.0       -46.6       9.5       -56.1       RF Po         34       2706.617M       -74.4       +0.0       +20.0       +5.8       +1.5       +0.0       -47.1       9.5       -56.6       RF Po         35       2782.860M       -74.5       +0.0       +20.0       +5.8       +1.5       +0.0       -47.2       9.5       -56.7       RF Po         36       2707.170M       -75.0       +0.0       +20.0       +5.8       +1.5       +0.0       -47.7       9.5       -57.2       RF Po         37       2707.245M       -75.4       +0.0       +20.0       +5.8       +1.5       +0.0       -48.1       9.5       -57.6       RF Po         38       2782.820M       -75.5       +0.0       +20.0       +5.8       +1.5       +0.0       -48.1       9.5       -57.7       RF Po         39       2707.215M       -75.8       +0.0       +20.0       +5.8       +1.5       +0.0       -48.5       9.5       -57.7       RF Po	32	2707.210W	-13.3	+0.0	+20.0	±3.6	$\pm 1.5$	+0.0	-40.0		-33.3	KI I U
150k GFSK   34 2706.617M	22	2792 950M	72.0	+ΩΩ	±20.0	150	+1.5	ι Ο Ο	16.6		56 1	DE Do
34       2706.617M       -74.4       +0.0       +20.0       +5.8       +1.5       +0.0       -47.1       9.5       -56.6       RF Po         35       2782.860M       -74.5       +0.0       +20.0       +5.8       +1.5       +0.0       -47.2       9.5       -56.7       RF Po         36       2707.170M       -75.0       +0.0       +20.0       +5.8       +1.5       +0.0       -47.7       9.5       -57.2       RF Po         12.5k OQPSK         37       2707.245M       -75.4       +0.0       +20.0       +5.8       +1.5       +0.0       -48.1       9.5       -57.6       RF Po         38       2782.820M       -75.5       +0.0       +20.0       +5.8       +1.5       +0.0       -48.2       9.5       -57.7       RF Po         12.5k OQPSK         39       2707.215M       -75.8       +0.0       +20.0       +5.8       +1.5       +0.0       -48.5       9.5       -58.0       RF Po	33	2762.630W	-13.9	+0.0	+20.0	+3.6	+1.5	+0.0	-40.0		-50.1	KI TO
10k GFSK   35 2782.860M	2.1	2706 617M	74.4	+Ω.Ω	±20.0	15.0	+1.5	ι Ο Ο	47.1		56.6	DE Do
35 2782.860M	34	2700.017W	-/4.4	+0.0	+20.0	+3.6	+1.5	+0.0	-4/.1		-30.0	Kr ro
6.25k OQPSK         36 2707.170M       -75.0       +0.0       +20.0       +5.8       +1.5       +0.0       -47.7       9.5       -57.2       RF Po 12.5k OQPSK         37 2707.245M       -75.4       +0.0       +20.0       +5.8       +1.5       +0.0       -48.1       9.5       -57.6       RF Po 6.25k OQPSK         38 2782.820M       -75.5       +0.0       +20.0       +5.8       +1.5       +0.0       -48.2       9.5       -57.7       RF Po 12.5k OQPSK         39 2707.215M       -75.8       +0.0       +20.0       +5.8       +1.5       +0.0       -48.5       9.5       -58.0       RF Po	25	2702.07014	745	. 0. 0	. 20. 0	. 5 0	. 1 5	. 0. 0	17.0		567	DE D.
36 2707.170M -75.0 +0.0 +20.0 +5.8 +1.5 +0.0 -47.7 9.5 -57.2 RF Po 12.5k OQPSK  37 2707.245M -75.4 +0.0 +20.0 +5.8 +1.5 +0.0 -48.1 9.5 -57.6 RF Po 6.25k OQPSK  38 2782.820M -75.5 +0.0 +20.0 +5.8 +1.5 +0.0 -48.2 9.5 -57.7 RF Po 12.5k OQPSK  39 2707.215M -75.8 +0.0 +20.0 +5.8 +1.5 +0.0 -48.5 9.5 -58.0 RF Po	33	2782.860M	-/4.5	+0.0	+20.0	+5.8	+1.5	+0.0	-47.2			KF PO
12.5k OQPSK   37 2707.245M	25	2707 1703 5	75.0	. 0. 0	. 20. 0	. 7.0	. 1. 7	. 0. 0	47.7			DED
37 2707.245M -75.4 +0.0 +20.0 +5.8 +1.5 +0.0 -48.1 9.5 -57.6 RF Po 6.25k OQPSK  38 2782.820M -75.5 +0.0 +20.0 +5.8 +1.5 +0.0 -48.2 9.5 -57.7 RF Po 12.5k OQPSK  39 2707.215M -75.8 +0.0 +20.0 +5.8 +1.5 +0.0 -48.5 9.5 -58.0 RF Po	36	2/07.170M	-75.0	+0.0	+20.0	+5.8	+1.5	+0.0	-47.7			KF Po
6.25k OQPSK       38 2782.820M     -75.5     +0.0     +20.0     +5.8     +1.5     +0.0     -48.2     9.5     -57.7     RF Po       12.5k OQPSK       39 2707.215M     -75.8     +0.0     +20.0     +5.8     +1.5     +0.0     -48.5     9.5     -58.0     RF Po		2505 2453 5		0.0	20.6	<b>-</b> - 0		0.0	40.1			DE D
38 2782.820M -75.5 +0.0 +20.0 +5.8 +1.5 +0.0 -48.2 9.5 -57.7 RF Po 12.5k OQPSK 39 2707.215M -75.8 +0.0 +20.0 +5.8 +1.5 +0.0 -48.5 9.5 -58.0 RF Po	37	2/07.245M	-75.4	+0.0	+20.0	+5.8	+1.5	+0.0	-48.1			RF Po
39 2707.215M -75.8 +0.0 +20.0 +5.8 +1.5 +0.0 -48.5 9.5 -58.0 RF Po												
39 2707.215M -75.8 +0.0 +20.0 +5.8 +1.5 +0.0 -48.5 9.5 -58.0 RF Po	38	2782.820M	-75.5	+0.0	+20.0	+5.8	+1.5	+0.0	-48.2			RF Po
150k GFSK	39	2707.215M	-75.8	+0.0	+20.0	+5.8	+1.5	+0.0	-48.5		-58.0	RF Po
150k GI SK										150k GFSK		

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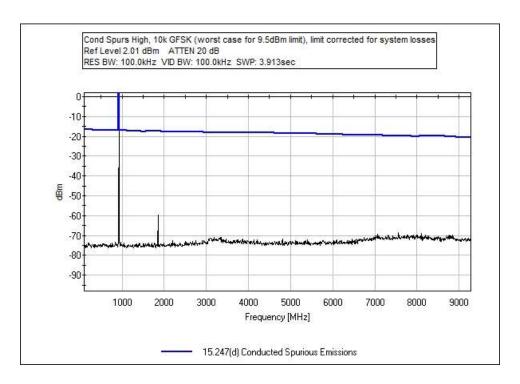
## **Plots**

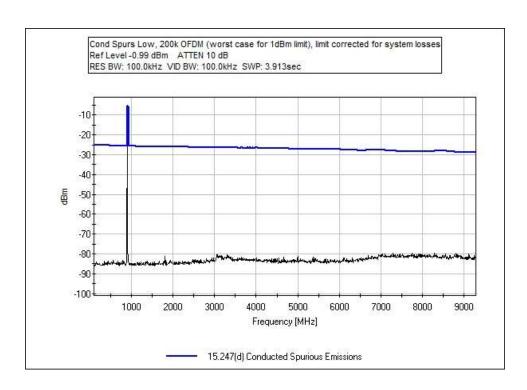




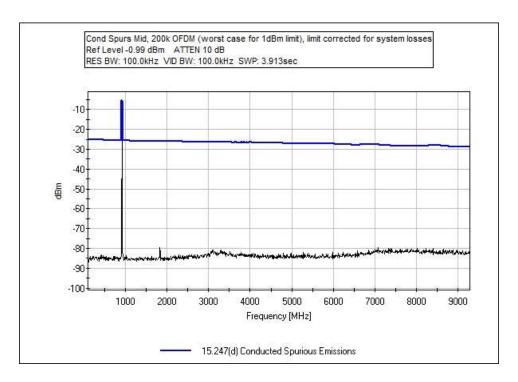
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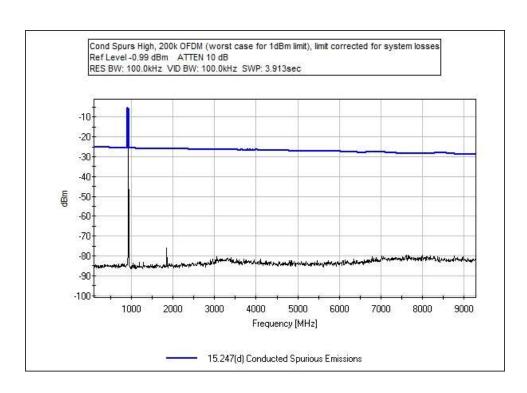














## **Band Edge**

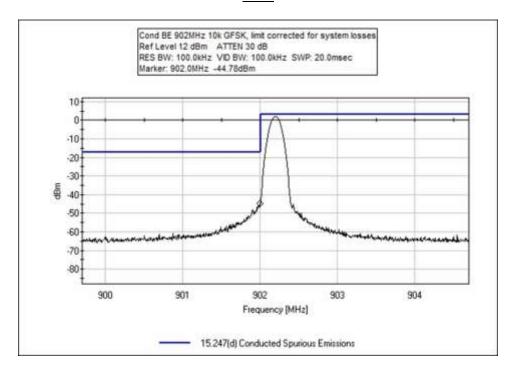
	Band Edge Summary Limit applied: Max Power/100kHz - 20dB.							
Limit applied	: Max Power/100kHz - 20dB.							
Frequency (MHz)	Modulation	Measured (dBm)	Limit (dBm)	Results				
902	10k GFSK	-18.2	<9.5	Pass				
928	10k GFSK	-23.0	<9.5	Pass				
902	50k GFSK	-27.8	<9.5	Pass				
928	50k GFSK	-28.8	<9.5	Pass				
902	150k GFSK	-27.9	<9.5	Pass				
928	150k GFSK	-26.0	<9.5	Pass				
902	6.25k OQPSK	-27.0	<9.5	Pass				
928	928 6.25k OQPSK 902 12.5k OQPSK 928 12.5k OQPSK		<9.5	Pass				
902			<9.5	Pass				
928			<9.5	Pass				
902	200k OFDM	-27.1	<1.0	Pass				
928	200k OFDM	-30.7	<1.0	Pass				
902	600k OFDM	-27.3	<1.0	Pass				
928	600k OFDM	-29.9	<1.0	Pass				
902	1.2M OFDM	-28.3	<1.0	Pass				
928	1.2M OFDM	-38.6	<1.0	Pass				
902	Hopping (10k GFSK)	-15.2	<9.5	Pass				
928	Hopping (10k GFSK)	-32.1	<9.5	Pass				
902	Hopping (6.25k OQPSK)	-31.0	<9.5	Pass				
928	Hopping (6.25k OQPSK)	-34.0	<9.5	Pass				
902	Hopping (200k OFDM)	-30.8	<1.0	Pass				
928	Hopping (200k OFDM)	-38.4	<1.0	Pass				
902	Hopping (1.2M OFDM) (Hybrid)	-38.1	<1.0	Pass				
928	Hopping (1.2M OFDM) (Hybrid)	-38.3	<1.0	Pass				

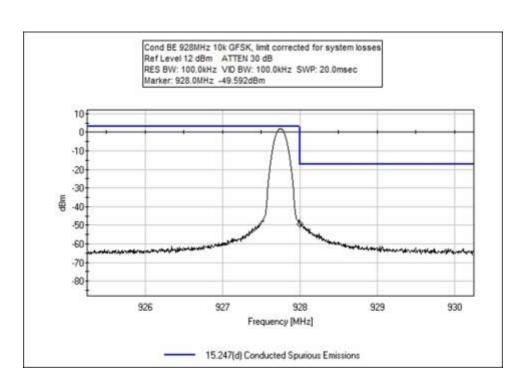
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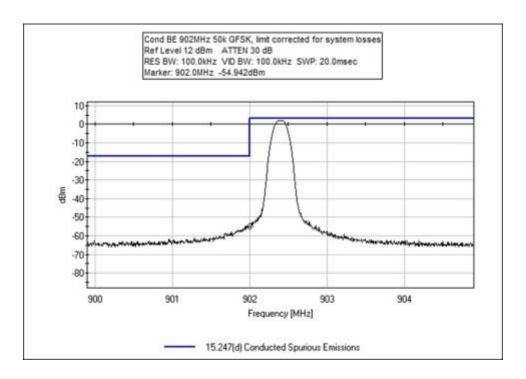
## **Band Edge Plots**

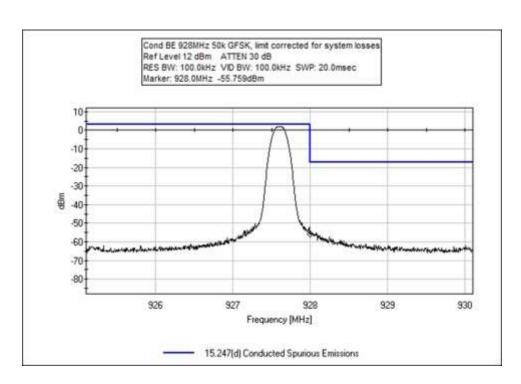
## **GFSK**



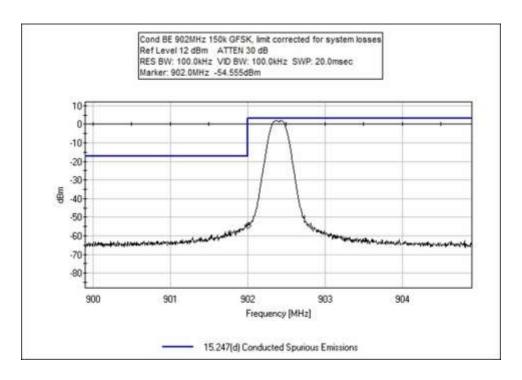


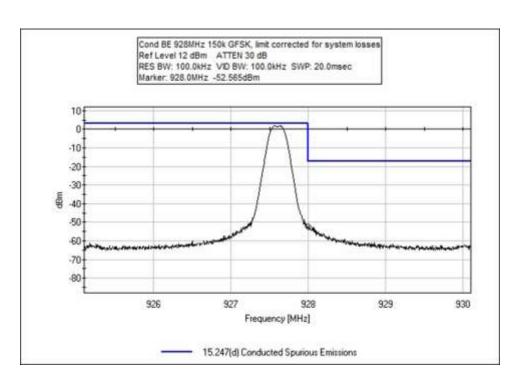






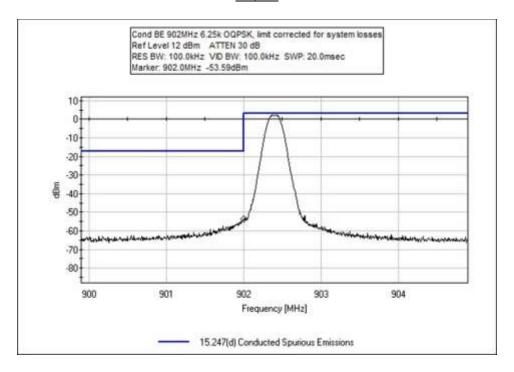


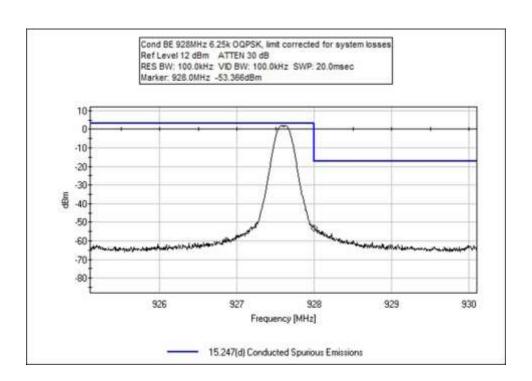




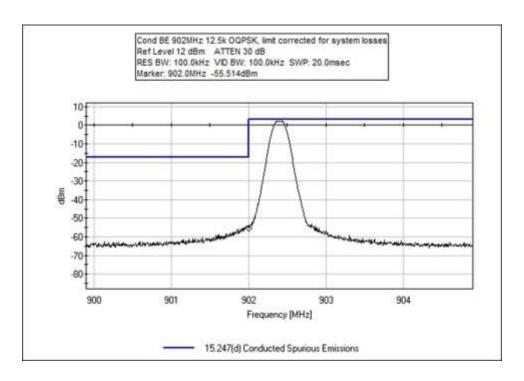


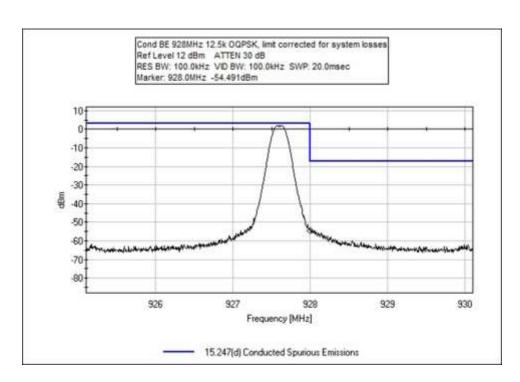
## **OQPSK**





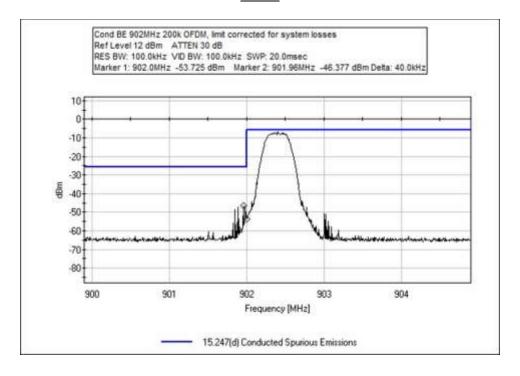


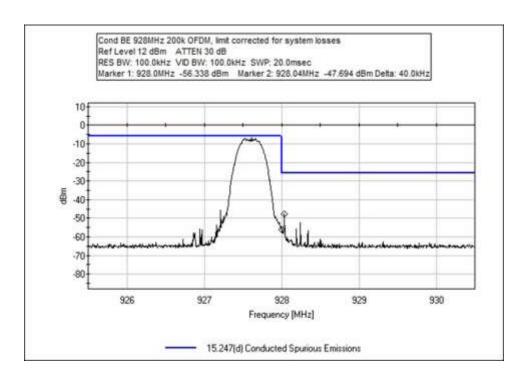




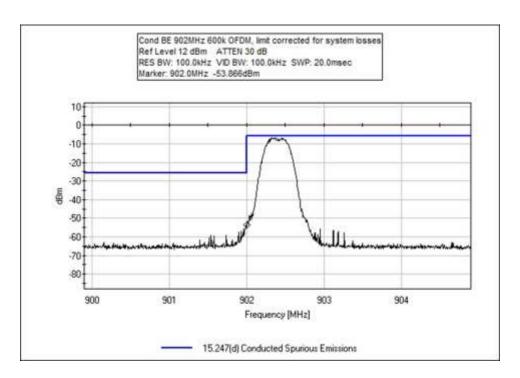


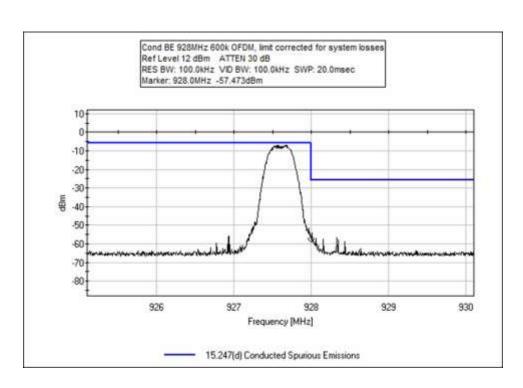
#### **OFDM**



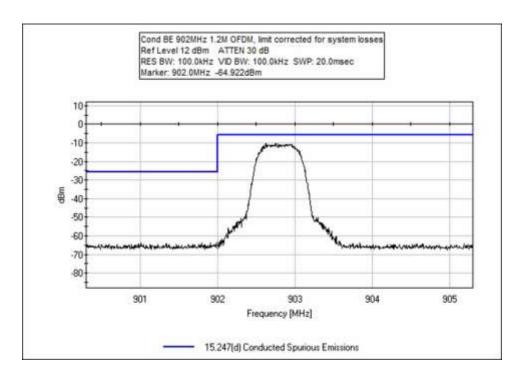


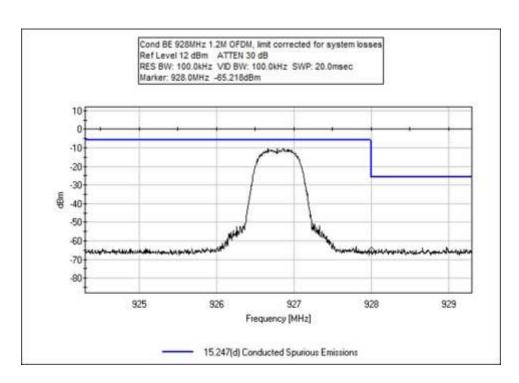






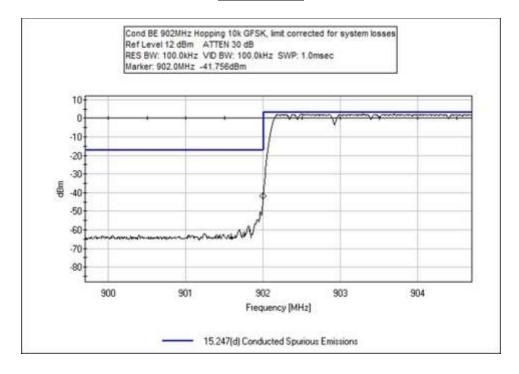


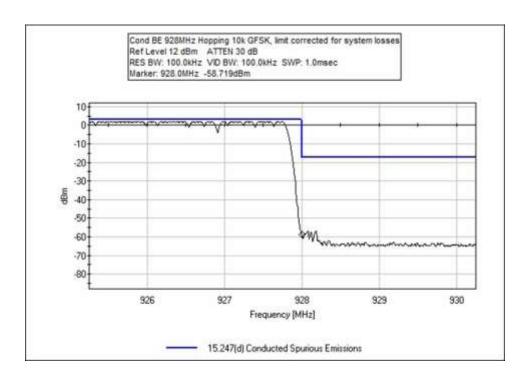






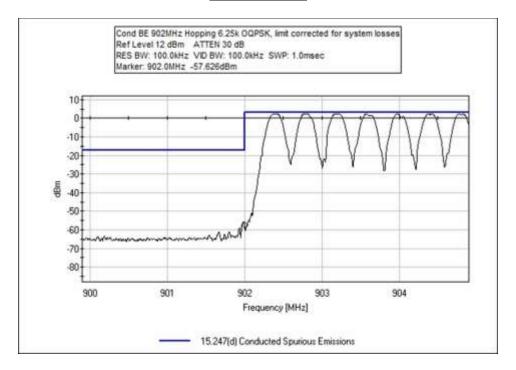
## **GFSK Hopping**

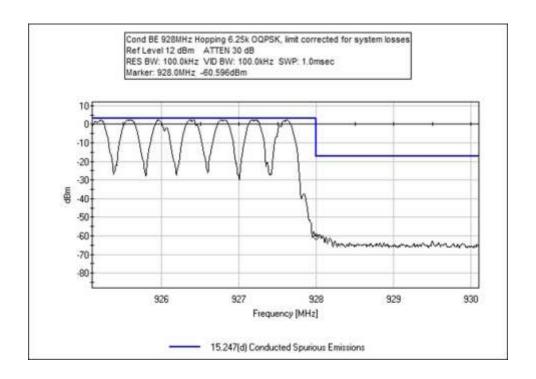






## **OQPSK Hopping**

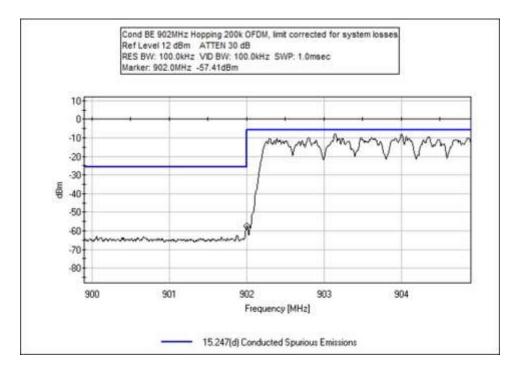


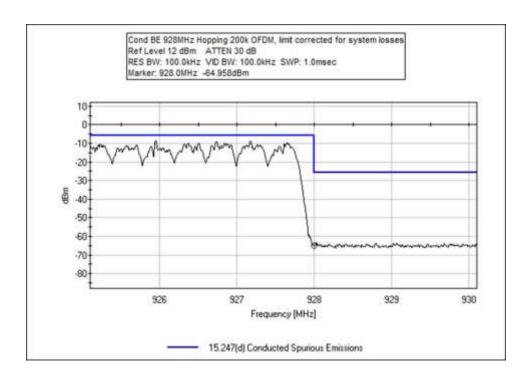


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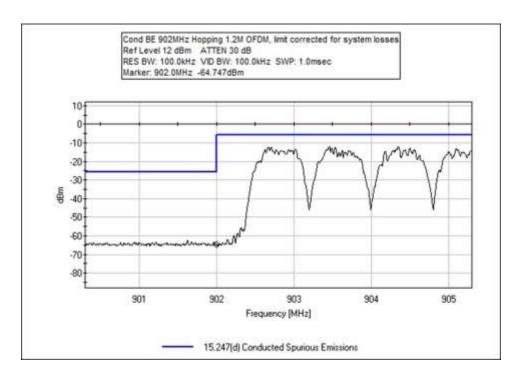


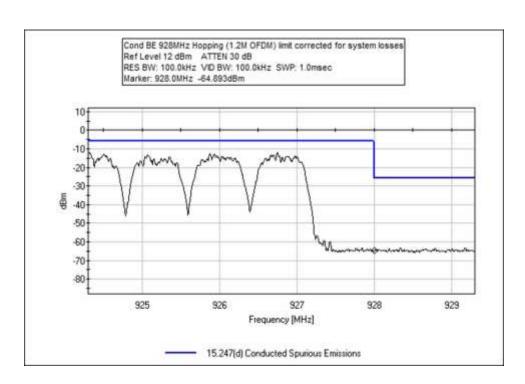
## **OFDM Hopping**













#### **Test Setup / Conditions / Data**

Test Location: CKC Laboratories • 22116 23rd Drive SE, Suite A • Bothell, WA 98021 • 1-800-500-4EMC (4362)

Customer: Itron, Inc.

Specification: 15.247(d) Conducted Spurious Emissions

 Work Order #:
 101674
 Date:
 8/28/2018

 Test Type:
 Conducted Emissions
 Time:
 14:58:40

Tested By: Michael Atkinson Sequence#: 5

Software: EMITest 5.03.11 115VAC 60Hz

**Equipment Tested:** 

Device Manufacturer Model # S/N
Configuration 1

Support Equipment:

Device Manufacturer Model # S/N
Configuration 1

#### Test Conditions / Notes:

Frequency Range: Fundamental

Frequency tested: Low and High Channels

Firmware power setting: Max

Firmware: CAM3-DEV Major Number 4, Minor Number 7, Build Number 153, Revision Number 787268

Test Software: CAM3 FCC Test Helper v14

Modulation Types:

10k GFSK, 50k GFSK, 150k GFSK 6.25k OQPSK, 12.5k OQPSK

200k OFDM, 600k OFDM, 1.2M OFDM (Hybrid)

Hopping modes: 10k GFSK, 6.25k OQPSK, 200k OFDM, 1.2M OFDM.

Antenna type: External Colinear Omni

Antenna Gain: 2.8dBi (attached), 5.5dBi (remote), 8.15dBi with 3dB attenuator (remote)

Duty Cycle: Tested at 100%

Test Location: Bothell Lab Bench Test Method: ANSI C63.10 (2013)

Temperature (°C): 22-24 Relative Humidity (%): 38-42

Setup: The EUT is continuously transmitting with modulation on ISM port.

The EUT ISM port is connected directly to a spectrum analyzer for direct conducted measurements.

Low, Mid, High channels investigated, all modulation types investigated

All modulation types investigated in addition to several modulations investigated as worst case for frequency hopping mode.

Hopping mode followed correct pseudo-random pattern, but Tx on time and time between hops were not controlled at time of test.

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Test Equipment:

- 4							
	ID	Asset #	Description	Model	<b>Calibration Date</b>	Cal Due Date	
	T1	AN02673 Spectrum Analyz		E4446A	2/3/2017	2/3/2019	
	T2	ANP07228	Attenuator	PE7004-20	11/30/2017	11/30/2019	
	T3	ANP07226	Attenuator	PE7004-6	12/1/2017	12/1/2019	
	T4	ANP06008	Cable	Heliax	4/10/2018	4/10/2020	

Measu	rement Data:	Re	eading lis	ted by ma	argin.			Test Lea	ad: RF Port		
#	Freq	Rdng	T1	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dΒμV	dB	dB	dB	dB	Table	dΒμV	dΒμV	dB	Ant
1	901.960M	-46.4	+0.0	+20.0	+5.8	+0.8	+0.0	-19.8	1.0 200k OFD	-20.8	RF Po
2	928.040M	47.7	+ O O	+20.0	+5.8	· O. O.	+0.0	-21.1	1.0 -22.1		RF Po
2	928.040M	-47.7	+0.0	+20.0	+5.8	+0.8	+0.0	-21.1	200k OFD		KF P0
3	902.000M	-41.8	+0.0	+20.0	+5.8	+0.8	+0.0	-15.2	9.5	-24.7	RF Po
									Hopping () GFSK)	Hopping (10k GESK)	
4	902.000M	-44.8	+0.0	+20.0	+5.8	+0.8	+0.0	-18.2	9.5	-27.7	RF Po
									10k GFSK		
5	902.000M	-53.7	+0.0	+20.0	+5.8	+0.8	+0.0	-27.1	1.0	-28.1	RF Po
									200k OFD		
6	902.000M	-53.9	+0.0	+20.0	+5.8	+0.8	+0.0	-27.3	1.0	-28.3	RF Po
									600k OFD	M	
7	928.000M	-56.3	+0.0	+20.0	+5.8	+0.8	+0.0	-29.7	1.0	-30.7	RF Po
									200k OFD	M	
8	928.000M	-56.5	+0.0	+20.0	+5.8	+0.8	+0.0	-29.9	1.0	-30.9	RF Po
									600k OFD	M	
9	902.000M	-57.4	+0.0	+20.0	+5.8	+0.8	+0.0	-30.8	1.0	-31.8	RF Po
									Hopping (2		
									OFDM)		
10	928.000M	-49.6	+0.0	+20.0	+5.8	+0.8	+0.0	-23.0	9.5	-32.5	RF Po
									10k GFSK		
11	928.000M	-52.6	+0.0	+20.0	+5.8	+0.8	+0.0	-26.0	9.5	-35.5	RF Po
									150k GFS		
12	902.000M	-53.6	+0.0	+20.0	+5.8	+0.8	+0.0	-27.0	9.5	-36.5	RF Po
									6.25k OQI		
13	928.000M	-53.7	+0.0	+20.0	+5.8	+0.8	+0.0	-27.1	9.5	-36.6	RF Po
	7 - 010 0 0 - 1								6.25k OQI		
14	928.000M	-54.1	+0.0	+20.0	+5.8	+0.8	+0.0	-27.5	9.5	-37.0	RF Po
	y <b>_</b> 0.0001.1	0	. 0.0	. 20.0		. 0.0	. 0.0	27.10	12.5k OQF		111 10
15	928.000M	-54.4	+0.0	+20.0	+5.8	+0.8	+0.0	-27.8	9.5	-37.3	RF Po
10	)20.000III	5	10.0	120.0	13.0	10.0	10.0	27.0	50k GFSK		141 10
16	902.000M	-54.5	+0.0	+20.0	+5.8	+0.8	+0.0	-27.9	9.5	-37.4	RF Po
10	J02.0001 <b>11</b>	31.3	10.0	120.0	13.0	10.0	10.0	21.7	150k GFS		III I O
17	902.000M	-55.4	±0.0	±20.0	+5.8	±0.8	±0.0	-28.8		-38.3	RF Po
17	702.000IVI	-55.4	10.0	120.0	13.0	10.0	10.0	-20.0	50k GFSK		KI I U
18	902.000M	-55.5	+0.0	+20.0	+5.8	+0.8	+0.0	-28.9	9.5	-38.4	RF Po
									12.5k OQI	PSK	
19	902.000M	-64.7	+0.0	+20.0	+5.8	+0.8	+0.0	-38.1	1.0	-39.1	RF Po
									Hopping (1 OFDM)	1.2M	

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20	902.000M	-64.9	+0.0	+20.0	+5.8	+0.8	+0.0	-38.3	1.0	-39.3	RF Po
									1.2M OFD	M	
21	928.000M	-64.9	+0.0	+20.0	+5.8	+0.8	+0.0	-38.3	1.0	-39.3	RF Po
									Hopping (1	.2M	
									OFDM)		
22	928.000M	-65.0	+0.0	+20.0	+5.8	+0.8	+0.0	-38.4	1.0	-39.4	RF Po
									Hopping (2	00k	
									OFDM)		
23	928.000M	-65.2	+0.0	+20.0	+5.8	+0.8	+0.0	-38.6	1.0	-39.6	RF Po
									1.2M OFD	M	
24	902.000M	-57.6	+0.0	+20.0	+5.8	+0.8	+0.0	-31.0	9.5	-40.5	RF Po
									Hopping (6	5.25k	
									OQPSK)		
25	928.000M	-58.7	+0.0	+20.0	+5.8	+0.8	+0.0	-32.1	9.5	-41.6	RF Po
									Hopping (1	0k	
									GFSK)		
26	928.000M	-60.6	+0.0	+20.0	+5.8	+0.8	+0.0	-34.0	9.5	-43.5	RF Po
									Hopping (6	5.25k	
									OQPSK)		

# Test Setup Photo



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### 15.247(d) Radiated Emissions & Band Edge

#### Test Setup / Conditions / Data

Test Location: CKC Laboratories • 22116 23rd Drive SE, Suite A • Bothell, WA 98021 • 1-800-500-4EMC (4362)

Customer: **Itron. Inc.** 

Specification: 15.247(d) / 15.209 Radiated Spurious Emissions

Work Order #: 101674 Date: 8/28/2018
Test Type: Radiated Scan Time: 11:16:04
Tested By: Michael Atkinson Sequence#: 6

Software: EMITest 5.03.11

**Equipment Tested:** 

Device Manufacturer Model # S/N
Configuration 2

Support Equipment:

Device Manufacturer Model # S/N

Configuration 2

Test Conditions / Notes:

Frequency Range: 9kHz-9.28GHz

Frequency tested: Low, Mid, High Channels

Firmware power setting: Max

Firmware: CAM3-DEV Major Number 4, Minor Number 7, Build Number 153, Revision Number 787268

Test Software: CAM3 FCC Test Helper v14

Modulation Types:

10k GFSK, 50k GFSK, 150k GFSK 6.25k OQPSK, 12.5k OQPSK

200k OFDM, 600k OFDM, 1.2M OFDM (Hybrid)

Antenna type: External Colinear Omni Antenna Gain :2.8dBi (attached)

Duty Cycle: Tested at 100%

Test Location: Bothell Lab C3 Test Method: ANSI C63.10 (2013)

Temperature (°C): 22-24 Relative Humidity (%): 38-42

Setup: The EUT is continuously transmitting with modulation on ISM port.

The EUT is connected to external antenna.

Low, Mid, and High channels investigated, worst case reported.

All modulation types investigated.

Horizontal and Vertical measurement antennas investigated above 30MHz, worst case reported.

3 orthogonal axes investigated below 30MHz, worst case reported.

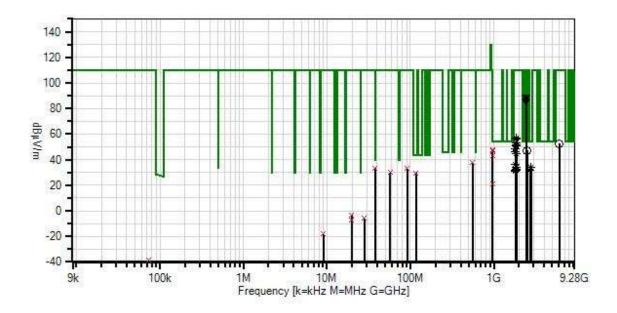
Fundamental of separate Wi-Fi module marked as ambient, and is to be ignored for this measurement.

No additional peak emissions observed within 20dB of the peak limit.

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Itron, Inc. WO#: 101674 Sequence#: 6 Date: 8/28/2018 15.247(d) / 15.209 Radiated Spurious Emissions Test Distance: 3 Meters Vert



× QP Readings

▼ Ambient

1 - 15.247(d) / 15.209 Radiated Spurious Emissions

O Peak Readings

Average Readings Software Version: 5.03.11

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Test Equipment:

ID	Asset #	Description	Model	<b>Calibration Date</b>	Cal Due Date
T1	AN02673	Spectrum Analyzer	E4446A	2/3/2017	2/3/2019
T2	ANP06540	Cable	Heliax	10/30/2017	10/30/2019
T3	ANP05305	Cable	ETSI-50T	10/24/2017	10/24/2019
T4	ANP05360	Cable	RG214	1/31/2018	1/31/2020
T5	AN03628	Biconilog Antenna	3142E	6/7/2017	6/7/2019
T6	ANP06515	Cable	Heliax	6/29/2018	6/29/2020
T7	AN00052	Loop Antenna	6502	5/7/2018	5/7/2020
T8	AN02871	Spectrum Analyzer	E4440A	2/24/2017	2/24/2019
Т9	AN03540	Preamp	83017A	5/2/2017	5/2/2019
T10	ANP06934	Cable	32026-29801-	3/13/2018	3/13/2020
			29801-18		
T11	AN01467	Horn Antenna-ANSI	3115	7/21/2017	7/21/2019
		C63.5 Calibration			
T12	AN03170	High Pass Filter	HM1155-11SS	11/27/2017	11/27/2019
T13	ANP07226	Attenuator	PE7004-6	12/1/2017	12/1/2019
T14	ANP06503	Cable	32026-29801-	3/13/2018	3/13/2020
			29801-36		

Measurement Data:	Re	eading lis	ted by ma	argin.		Те	est Distanc	e: 3 Meters		
# Freq	Rdng	T1	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
		T5	T6	T7	T8					
		T9	T10	T11	T12					
		T13	T14							
MHz	dΒμV	dB	dB	dB	dB	Table	$dB\muV/m$	$dB\mu V/m$	dB	Ant
1 963.745M	18.7	+0.0	+0.4	+1.6	+2.1	+0.0	47.6	54.0	-6.4	Vert
QP		+24.8	+0.0	+0.0	+0.0			10k GFSK		
		+0.0	+0.0	+0.0	+0.0					
		+0.0	+0.0							
2 37.700M	21.1	+0.0	+0.1	+0.3	+0.3	+0.0	33.5	40.0	-6.5	Vert
QP		+11.7	+0.0	+0.0	+0.0					
		+0.0	+0.0	+0.0	+0.0					
		+0.0	+0.0							
3 963.613M	18.6	+0.0	+0.4	+1.6	+2.1	+0.0	47.5	54.0	-6.5	Vert
QP		+24.8	+0.0	+0.0	+0.0			12.5 OQPS	K	
		+0.0	+0.0	+0.0	+0.0					
		+0.0	+0.0							
4 963.613M	18.5	+0.0	+0.4	+1.6	+2.1	+0.0	47.4	54.0	-6.6	Vert
QP		+24.8	+0.0	+0.0	+0.0			6.25k OQP	SK	
		+0.0	+0.0	+0.0	+0.0					
		+0.0	+0.0							
5 963.603M	18.5	+0.0	+0.4	+1.6	+2.1	+0.0	47.4	54.0	-6.6	Vert
QP		+24.8	+0.0	+0.0	+0.0			50k GFSK		
		+0.0	+0.0	+0.0	+0.0					
		+0.0	+0.0							
6 963.623M	18.4	+0.0	+0.4	+1.6	+2.1	+0.0	47.3	54.0	-6.7	Vert
QP		+24.8	+0.0	+0.0	+0.0			150k GFSK		
		+0.0	+0.0	+0.0	+0.0					
		+0.0	+0.0							

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7 062 00014	14.6	. 0. 0	. 0. 4	.1.6	. 2. 1	. 0. 0	42.5	540	10.5	<b>X</b> 74
7 962.908M	14.6	+0.0	+0.4	+1.6	+2.1	+0.0	43.5	54.0	-10.5	Vert
QP		$+24.8 \\ +0.0$	$+0.0 \\ +0.0$	$+0.0 \\ +0.0$	$+0.0 \\ +0.0$			1.2M OFDN	1	
		+0.0	+0.0	+0.0	+0.0					
8 963.613M	14.6	+0.0	+0.4	+1.6	+2.1	+0.0	43.5	54.0	-10.5	Vert
QP	14.0	+24.8	+0.4	+0.0	+2.1 +0.0	+0.0	43.3	200k OFDM		Vert
Qı		+0.0	+0.0	+0.0	+0.0			200k OI DIV	L	
		+0.0	+0.0	10.0	10.0					
9 963.658M	14.6	+0.0	+0.4	+1.6	+2.1	+0.0	43.5	54.0	-10.5	Vert
QP	1	+24.8	+0.0	+0.0	+0.0	. 0.0		600k OFDM		, 610
•		+0.0	+0.0	+0.0	+0.0					
		+0.0	+0.0							
10 116.155M	20.5	+0.0	+0.2	+0.6	+0.6	+0.0	29.5	43.5	-14.0	Horiz
QP		+7.6	+0.0	+0.0	+0.0					
		+0.0	+0.0	+0.0	+0.0					
		+0.0	+0.0							
11 2783.240M	28.3	+0.0	+0.5	+0.0	+0.0	+0.0	34.0	54.0	-20.0	Vert
Ave		+0.0	+2.6	+0.0	+0.0			10k GFSK		
		-33.8	+0.0	+28.9	+0.6					
		+5.8	+1.1							
12 2430.000M	84.6	+0.0	+0.4	+0.0	+0.0	+0.0	89.1	110.0	-20.9	Vert
Ambient		+0.0	+2.6	+0.0	+0.0					
		-34.0	+0.0	+28.1	+0.6					
		+5.8	+1.0							
13 2706.628M	26.5	+0.0	+0.5	+0.0	+0.0	+0.0	32.0	54.0	-22.0	Vert
Ave		+0.0	+2.6	+0.0	+0.0			10k GFSK		
		-33.8	+0.0	+28.7	+0.6					
		+5.8	+1.1							
^ 2706.628M	39.1	+0.0	+0.5	+0.0	+0.0	+0.0	44.6	54.0	-9.4	Vert
		+0.0	+2.6	+0.0	+0.0			10k GFSK		
		-33.8	+0.0	+28.7	+0.6					
15 2420 00015	01.6	+5.8	+1.1	0.0	0.0	0.0	0.6.1	110.0	22.0	** .
15 2430.000M	81.6	+0.0	+0.4	+0.0	+0.0	+0.0	86.1	110.0	-23.9	Horiz
Ambient		+0.0	+2.6	+0.0	+0.0					
		-34.0	+0.0	+28.1	+0.6					
16 963.600M	10.0	+5.8	+1.0	ΙΩΩ	ΙΩΩ	+0.0	21.0	54.0	22.0	Vant
	19.8	+0.0	+0.4	$+0.0 \\ +0.0$	$+0.0 \\ +0.0$	+0.0	21.0	54.0	-33.0	Vert
QP		+0.0 -37.1	+1.7 +0.3	+0.0	+30.1					
		-57.1 +5.8	+0.5	+0.0	±30.1					
17 963.604M	19.7	+0.0	+0.0	+0.0	+0.0	+0.0	20.9	54.0	-33.1	Vert
QP	17./	+0.0	+0.4 +1.7	+0.0	+0.0	+0.0	∠0.9	34.0	-33.1	v ert
$\kappa_{\rm r}$		-37.1	+0.3	+0.0	+30.1					
		+5.8	+0.0	10.0	150.1					
18 1855.490M	54.2	+0.0	+0.4	+0.0	+0.0	+0.0	56.6	102.0	-45.4	Vert
Ave	57.2	+0.0	+2.3	+0.0	+0.0	10.0	20.0	10k GFSK	13.7	, 011
11,0		-34.5	+0.0	+26.9	+0.7			ION OI DIK		
		+5.9	+0.7	. 20.7	. 0.7					
10 1055 24014	54.1	+0.0	+0.4	+0.0	+0.0	+0.0	56.4	102.0	-45.6	Vert
19 J 855, 240M							20			. 510
19 1855.240M Ave		+0.0	+2.3	+().()	+().()			50k GFSK		
Ave Ave		+0.0 -34.5	+2.3 +0.0	+0.0 +26.8	$+0.0 \\ +0.7$			50k GFSK		

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20 1855.192M	54.0	+0.0	+0.4	+0.0	+0.0	+0.0	56.3	102.0 -45.	7 Vert
Ave		+0.0	+2.3	+0.0	+0.0			12.5k OQPSK	
		-34.5	+0.0	+26.8	+0.7				
21 1077 1247	<b>72</b> 0	+5.9	+0.7	0.0	0.0	0.0	7.0	1020	0 **
21 1855.124M	53.9	+0.0	+0.4	+0.0	+0.0	+0.0	56.2	102.0 -45.	8 Vert
Ave		+0.0	+2.3	+0.0	+0.0			6.25k OQPSK	
		-34.5	+0.0	+26.8	+0.7				
22 1855.308M	53.4	+5.9	+0.7	+0.0	+0.0	+0.0	55.8	102.0 -46.	2 Vert
Ave	33.4	+0.0	+2.3	+0.0	+0.0 +0.0	+0.0	33.6	102.0 -40. 150k GFSK	z ven
Ave		-34.5	+2.3 +0.0	+26.9	+0.0			130K GFSK	
		+5.9	+0.7	±20.9	+0.7				
23 1830.040M	50.8	+0.0	+0.4	+0.0	+0.0	+0.0	52.9	102.0 -49.	1 Vert
Ave	30.0	+0.0	+2.3	+0.0	+0.0	10.0	32.7	102.0 -47. 10k GFSK	1 VCIt
7110		-34.5	+0.0	+26.6	+0.7			TOR OF DIC	
		+5.9	+0.7	120.0	10.7				
24 6115.000M	37.2	+0.0	+0.7	+0.0	+0.0	+0.0	52.6	102.0 -49.	4 Vert
2. 5115.500111	37.2	+0.0	+4.8	+0.0	+0.0	. 0.0	52.0	102.0	. , 011
		-33.4	+0.0	+35.0	+0.5				
		+5.9	+1.9						
25 1830.409M	49.2	+0.0	+0.4	+0.0	+0.0	+0.0	51.3	102.0 -50.	7 Vert
Ave		+0.0	+2.3	+0.0	+0.0			12.5k OQPSK	
		-34.5	+0.0	+26.6	+0.7				
		+5.9	+0.7						
26 1830.373M	49.2	+0.0	+0.4	+0.0	+0.0	+0.0	51.3	102.0 -50.	7 Vert
Ave		+0.0	+2.3	+0.0	+0.0			6.25k OQPSK	
		-34.5	+0.0	+26.6	+0.7				
		+5.9	+0.7						
27 1830.445M	48.9	+0.0	+0.4	+0.0	+0.0	+0.0	51.0	102.0 -51.	0 Vert
Ave		+0.0	+2.3	+0.0	+0.0			50k GFSK	
		-34.5	+0.0	+26.6	+0.7				
		+5.9	+0.7						
28 1830.461M	48.8	+0.0	+0.4	+0.0	+0.0	+0.0	50.9	102.0 -51.	1 Vert
Ave		+0.0	+2.3	+0.0	+0.0			150k GFSK	
		-34.5	+0.0	+26.6	+0.7				
20 1004 (203 7	450	+5.9	+0.7			0.0	40.7	102.0	2 **
29 1804.420M	46.8	+0.0	+0.5	+0.0	+0.0	+0.0	48.7	102.0 -53.	3 Vert
Ave		+0.0	+2.2	+0.0	+0.0			10k GFSK	
		-34.5	+0.0	+26.4	+0.7				
20 2514 00014	12.7	+5.9	+0.7	+ΩΩ	ι Ο Ο	+0.0	17.2	102.0 54	7 Vant
30 2514.000M	42.7	$^{+0.0}_{+0.0}$	+0.4 +2.7	$+0.0 \\ +0.0$	$+0.0 \\ +0.0$	+0.0	47.3	102.0 -54.	7 Vert
		+0.0 -34.0	+2.7	+0.0	+0.0				
		+5.8	+0.0	120.1	FU.U				
31 1804.860M	44.4	+0.0	+0.5	+0.0	+0.0	+0.0	46.3	102.0 -55.	7 Vert
Ave	-T-TT	+0.0	+2.2	+0.0	+0.0	10.0	TU.J	6.25k OQPSK	, , , , , ,
1110		-34.5	+0.0	+26.4	+0.7			0.23K OQI DIX	
		+5.9	+0.7	120.4	10.7				
32 1804.830M	44.4	+0.0	+0.5	+0.0	+0.0	+0.0	46.3	102.0 -55.	7 Vert
Ave		+0.0	+2.2	+0.0	+0.0	. 0.0	10.5	12.5k OQPSK	. , 011
· <del>-</del>		-34.5	+0.0	+26.4	+0.7			-2.0.1.0 %1.011	
		+5.9	+0.7						

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33 1804.830M	44.3	+0.0	+0.5	+0.0	+0.0	+0.0	46.2	102.0	-55.8	Vert
Ave		+0.0	+2.2	+0.0	+0.0			50k GFSK		
		-34.5	+0.0	+26.4	+0.7					
		+5.9	+0.7							
34 1804.905M	44.0	+0.0	+0.5	+0.0	+0.0	+0.0	45.9	102.0	-56.1	Vert
Ave		+0.0	+2.2	+0.0	+0.0			150k GFSK		
		-34.5	+0.0	+26.4	+0.7					
		+5.9	+0.7							
35 1830.128M	42.4	+0.0	+0.4	+0.0	+0.0	+0.0	44.5	102.0	-57.5	Vert
Ave		+0.0	+2.3	+0.0	+0.0			Rx		
		-34.5	+0.0	+26.6	+0.7					
		+5.9	+0.7							
36 556.200M	14.7	+0.0	+0.3	+1.2	+1.4	+0.0	37.8	102.0	-64.2	Vert
QP		+20.2	+0.0	+0.0	+0.0					
		+0.0	+0.0	+0.0	+0.0					
		+0.0	+0.0							
37 1804.432M	34.5	+0.0	+0.5	+0.0	+0.0	+0.0	36.4	102.0	-65.6	Horiz
Ave		+0.0	+2.2	+0.0	+0.0			10k GFSK		
		-34.5	+0.0	+26.4	+0.7					
20 01 5051 6	247	+5.9	+0.7	0.5	0.5	0.0	22.0	100.0	60.1	¥7 .
38 91.505M	24.7	+0.0	+0.1	+0.5	+0.5	+0.0	32.9	102.0	-69.1	Vert
QP		+7.1	+0.0	+0.0	+0.0					
		+0.0	+0.0	+0.0	+0.0					
20 01 50514	24.7	+0.0	+0.0	.0.5	.0.5	. 0. 0	22.0	102.0	<i>c</i> 0.1	<b>X</b> 7 4
39 91.505M	24.7	+0.0	+0.1	+0.5	+0.5	+0.0	32.9	102.0	-69.1	Vert
QP		$+7.1 \\ +0.0$	+0.0	$+0.0 \\ +0.0$	+0.0					
		+0.0 +0.0	+0.0 +0.0	+0.0	+0.0					
40 57.000M	22.5	+0.0	+0.0	+0.4	+0.4	+0.0	30.0	102.0	-72.0	Vort
QP	22.3	+0.0 +6.6	+0.1	+0.4 +0.0	+0.4 +0.0	+0.0	30.0	102.0	-72.0	Vert
Ųľ		+0.0	+0.0	+0.0	+0.0					
		+0.0	+0.0	+0.0	+0.0					
41 1855.247M	31.7	+0.0	+0.4	+0.0	+0.0	+0.0	34.0	110.0	-76.0	Vert
Ave	31.7	+0.0	+2.3	+0.0	+0.0	+0.0	34.0	200k OFDM	-70.0	VCIT
Ave		-34.5	+0.0	+26.8	+0.7			200k OI DIVI		
		+5.9	+0.7	120.0	10.7					
42 1855.267M	31.6	+0.0	+0.4	+0.0	+0.0	+0.0	33.9	110.0	-76.1	Vert
Ave	51.0	+0.0	+2.3	+0.0	+0.0	10.0	55.7	600k OFDM	, 0.1	, 011
1110		-34.5	+0.0	+26.8	+0.7			JUGA OF DIVI		
		+5.9	+0.7	0.0						
43 1853.580M	30.4	+0.0	+0.4	+0.0	+0.0	+0.0	32.7	110.0	-77.3	Vert
Ave	23.1	+0.0	+2.3	+0.0	+0.0	. 0.0	22.,	1.2M OFDM		. 510
· ·		-34.5	+0.0	+26.8	+0.7					
		+5.9	+0.7							
44 1804.830M	30.1	+0.0	+0.5	+0.0	+0.0	+0.0	32.0	110.0	-78.0	Vert
Ave	/ -	+0.0	+2.2	+0.0	+0.0			200k OFDM		
		-34.5	+0.0	+26.4	+0.7					
		+5.9	+0.7							
45 1829.570M	29.8	+0.0	+0.4	+0.0	+0.0	+0.0	31.9	110.0	-78.1	Vert
Ave		+0.0	+2.3	+0.0	+0.0			1.2M OFDM		
		-34.5	+0.0	+26.6	+0.7					
		+5.9	+0.7							

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46 1830.415M	29.4	+0.0	+0.4	+0.0	+0.0	+0.0	31.5	110.0	-78.5	Vert
Ave		+0.0	+2.3	+0.0	+0.0			600k OFD	M	
		-34.5	+0.0	+26.6	+0.7					
		+5.9	+0.7							
47 1830.409M	29.4	+0.0	+0.4	+0.0	+0.0	+0.0	31.5	110.0	-78.5	Vert
Ave		+0.0	+2.3	+0.0	+0.0			200k OFD	M	
		-34.5	+0.0	+26.6	+0.7					
		+5.9	+0.7							
48 1805.480M	29.5	+0.0	+0.5	+0.0	+0.0	+0.0	31.4	110.0	-78.6	Vert
Ave		+0.0	+2.2	+0.0	+0.0			1.2M OFD	DΜ	
		-34.5	+0.0	+26.4	+0.7					
		+5.9	+0.7							
49 1804.724M	29.4	+0.0	+0.5	+0.0	+0.0	+0.0	31.3	110.0	-78.7	Vert
Ave		+0.0	+2.2	+0.0	+0.0			600k OFD	M	
		-34.5	+0.0	+26.4	+0.7					
		+5.9	+0.7							
50 19.739M	28.4	+0.0	+0.0	+0.0	+0.0	-40.0	-3.3	102.0	-105.3	Groun
QP		+0.0	+0.2	+8.1	+0.0					
		+0.0	+0.0	+0.0	+0.0					
		+0.0	+0.0							
51 28.116M	27.6	+0.0	+0.1	+0.0	+0.0	-40.0	-5.9	102.0	-107.9	Para
QP		+0.0	+0.3	+6.1	+0.0					
		+0.0	+0.0	+0.0	+0.0					
		+0.0	+0.0							
52 19.711M	24.2	+0.0	+0.0	+0.0	+0.0	-40.0	-7.5	102.0	-109.5	Para
QP		+0.0	+0.2	+8.1	+0.0					
		+0.0	+0.0	+0.0	+0.0					
		+0.0	+0.0							
53 9.096M	12.5	+0.0	+0.0	+0.0	+0.0	-40.0	-18.0	102.0	-120.0	Perp
QP		+0.0	+0.2	+9.3	+0.0					
		+0.0	+0.0	+0.0	+0.0					
		+0.0	+0.0							
54 72.622k	31.8	+0.0	+0.0	+0.0	+0.0	-80.0	-38.6	102.0	-140.6	Para
QP		+0.0	+0.0	+9.6	+0.0					
		+0.0	+0.0	+0.0	+0.0					
		+0.0	+0.0							

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Test Location: CKC Laboratories • 22116 23rd Drive SE, Suite A • Bothell, WA 98021 • 1-800-500-4EMC (4362)

Customer: Itron, Inc.

Specification: 15.247(d) / 15.209 Radiated Spurious Emissions

Work Order #: 101674 Date: 8/28/2018
Test Type: Radiated Scan Time: 10:34:12
Tested By: Michael Atkinson Sequence#: 6

Software: EMITest 5.03.11

#### **Equipment Tested:**

Device	Manufacturer	Model #	S/N	
Configuration 3				

#### Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 3			

#### Test Conditions / Notes:

Frequency Range: 9kHz-9.28GHz

Frequency tested: Low, Mid, High Channels

Firmware power setting: Max

Firmware: CAM3-DEV Major Number 4, Minor Number 7, Build Number 153, Revision Number 787268

Test Software: CAM3 FCC Test Helper v14

Modulation Types:

10k GFSK, 50k GFSK, 150k GFSK 6.25k OQPSK, 12.5k OQPSK

200k OFDM, 600k OFDM, 1.2M OFDM (Hybrid)

Antenna type: External Colinear Omni

Antenna Gain :5.5dBi (remote)

Duty Cycle: Tested at 100%

Test Location: Bothell Lab C3 Test Method: ANSI C63.10 (2013)

Temperature (°C): 22-24 Relative Humidity (%): 38-42

Setup: The EUT is continuously transmitting with modulation on ISM port.

The EUT is connected to external antenna.

Low, Mid, and High channels investigated, worst case reported.

All modulation types investigated.

Horizontal and Vertical measurement antennas investigated above 30MHz, worst case reported.

#### 3 orthogonal axes investigated below 30MHz, worst case reported.

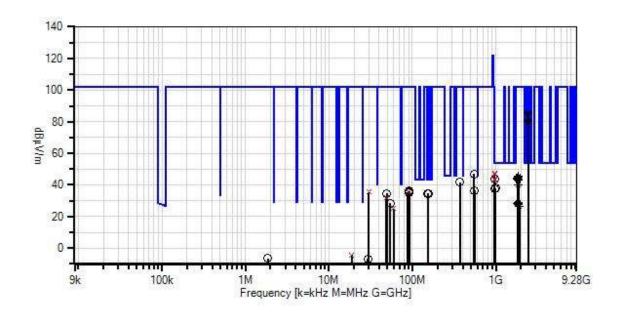
Fundamental of separate Wi-Fi module marked as ambient, and is to be ignored for this measurement.

No additional peak emissions observed within 20dB of the peak limit.

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Itron, Inc. WO#: 101674 Sequence#: 6 Date: 8/28/2018 15.247(d) / 15.209 Radiated Spurious Emissions Test Distance: 3 Meters Vert



Readings
 QP Readings

→ Ambient

- 1 - 15.247(d) / 15.209 Radiated Spurious Emissions

O Peak Readings

Average Readings
 Software Version: 5.03.11

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Test Equipment:

ID	Asset #	Description	Model	<b>Calibration Date</b>	Cal Due Date
	AN02673	Spectrum Analyzer	E4446A	2/3/2017	2/3/2019
T1	ANP06540	Cable	Heliax	10/30/2017	10/30/2019
T2	ANP05305	Cable	ETSI-50T	10/24/2017	10/24/2019
T3	ANP05360	Cable	RG214	1/31/2018	1/31/2020
T4	AN03628	Biconilog Antenna	3142E	6/7/2017	6/7/2019
T5	ANP06515	Cable	Heliax	6/29/2018	6/29/2020
T6	AN00052	Loop Antenna	6502	5/7/2018	5/7/2020
T7	AN02871	Spectrum Analyzer	E4440A	2/24/2017	2/24/2019
T8	AN03540	Preamp	83017A	5/2/2017	5/2/2019
Т9	AN01467	Horn Antenna-ANSI	3115	7/21/2017	7/21/2019
		C63.5 Calibration			
T10	AN03170	High Pass Filter	HM1155-11SS	11/27/2017	11/27/2019
T11	ANP07226	Attenuator	PE7004-6	12/1/2017	12/1/2019
T12	ANP06503	Cable	32026-29801-	3/13/2018	3/13/2020
			29801-36		

Measi	irement Data:	Re	eading lis	ted by ma	argin.	Test Distance: 3 Meters					
#	Freq	Rdng	T1	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
			T5	T6	T7	T8					
			T9	T10	T11	T12					
	MHz	dΒμV	dB	dB	dB	dB	Table	$dB\mu V/m$	dBμV/m	dB	Ant
1	963.742M	18.5	+0.4	+1.6	+2.1	+24.8	+0.0	47.4	54.0	-6.6	Vert
	QP		+0.0	+0.0	+0.0	+0.0			10k GFSK		
			+0.0	+0.0	+0.0	+0.0					
2	,	18.0	+0.4	+1.6	+2.1	+24.8	+0.0	46.9	54.0	-7.1	Vert
	QP		+0.0	+0.0	+0.0	+0.0			6.25k OQP	SK	
			+0.0	+0.0	+0.0	+0.0					
3		17.9	+0.4	+1.6	+2.1	+24.8	+0.0	46.8	54.0	-7.2	Vert
	QP		+0.0	+0.0	+0.0	+0.0			12.5 OQPS	K	
			+0.0	+0.0	+0.0	+0.0					
4	963.609M	17.9	+0.4	+1.6	+2.1	+24.8	+0.0	46.8	54.0	-7.2	Vert
	QP		+0.0	+0.0	+0.0	+0.0			150k GFSK		
			+0.0	+0.0	+0.0	+0.0					
5		17.8	+0.4	+1.6	+2.1	+24.8	+0.0	46.7	54.0	-7.3	Vert
	QP		+0.0	+0.0	+0.0	+0.0			50k GFSK		
			+0.0	+0.0	+0.0	+0.0					
6	963.778M	17.7	+0.4	+1.6	+2.1	+24.8	+0.0	46.6	54.0	-7.4	Vert
	QP		+0.0	+0.0	+0.0	+0.0			10k GFSK		
			+0.0	+0.0	+0.0	+0.0					
7	, , , , , , , , , , , , , , , , , , , ,	14.5	+0.4	+1.6	+2.1	+24.8	+0.0	43.4	54.0	-10.6	Vert
	QP		+0.0	+0.0	+0.0	+0.0			1.2M OFD	M	
			+0.0	+0.0	+0.0	+0.0					
8		14.4	+0.4	+1.6	+2.1	+24.8	+0.0	43.3	54.0	-10.7	Vert
	QP		+0.0	+0.0	+0.0	+0.0			600k OFDN	VI.	
			+0.0	+0.0	+0.0	+0.0			= 1.0	10 =	
9	, , , , , , , , , , , , , , , , , , , ,	14.4	+0.4	+1.6	+2.1	+24.8	+0.0	43.3	54.0	-10.7	Vert
	QP		+0.0	+0.0	+0.0	+0.0			200k OFDN	M	
			+0.0	+0.0	+0.0	+0.0					

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10 983.320M	9.4	+0.4	+1.6	+2.1	+24.4	+0.0	37.9	54.0	-16.1	Vert
		+0.0	+0.0	+0.0	+0.0					
		+0.0	+0.0	+0.0	+0.0					
11 982.720M	9.2	+0.4	+1.6	+2.1	+24.4	+0.0	37.7	54.0	-16.3	Vert
		+0.0	+0.0	+0.0	+0.0					
		+0.0	+0.0	+0.0	+0.0					
12 2434.000M	83.3	+0.0	+0.0	+0.0	+0.0	+0.0	84.8	102.0	-17.2	Vert
Ambient		+0.0	+0.0	+0.0	-34.0					
		+28.1	+0.6	+5.8	+1.0					
13 2434.000M	78.8	+0.0	+0.0	+0.0	+0.0	+0.0	80.3	102.0	-21.7	Horiz
Ambient		+0.0	+0.0	+0.0	-34.0					
		+28.1	+0.6	+5.8	+1.0					
14 545.100M	23.0	+0.3	+1.2	+1.4	+21.0	+0.0	46.9	102.0	-55.1	Vert
		+0.0	+0.0	+0.0	+0.0					
		+0.0	+0.0	+0.0	+0.0					
15 1855.194M	45.8	+0.0	+0.0	+0.0	+0.0	+0.0	45.4	102.0	-56.6	Vert
Ave		+0.0	+0.0	+0.0	-34.5			12.5k OQPS	K	
		+26.8	+0.7	+5.9	+0.7					
16 1855.224M	45.8	+0.0	+0.0	+0.0	+0.0	+0.0	45.4	102.0	-56.6	Vert
Ave		+0.0	+0.0	+0.0	-34.5			6.25k OQPS	K	
		+26.8	+0.7	+5.9	+0.7					
17 1855.200M	45.7	+0.0	+0.0	+0.0	+0.0	+0.0	45.3	102.0	-56.7	Vert
Ave		+0.0	+0.0	+0.0	-34.5			50k GFSK		
		+26.8	+0.7	+5.9	+0.7					
18 1855.170M	45.5	+0.0	+0.0	+0.0	+0.0	+0.0	45.1	102.0	-56.9	Vert
Ave		+0.0	+0.0	+0.0	-34.5			150k GFSK		
		+26.8	+0.7	+5.9	+0.7					
19 1804.882M	45.0	+0.0	+0.0	+0.0	+0.0	+0.0	44.2	102.0	-57.8	Vert
Ave		+0.0	+0.0	+0.0	-34.5			6.25k OQPS	K	
		+26.4	+0.7	+5.9	+0.7					
20 1804.910M	44.8	+0.0	+0.0	+0.0	+0.0	+0.0	44.0	102.0	-58.0	Vert
Ave		+0.0	+0.0	+0.0	-34.5			12.5k OQPS	K	
		+26.4	+0.7	+5.9	+0.7					
21 1804.440M	44.5	+0.0	+0.0	+0.0	+0.0	+0.0	43.7	102.0	-58.3	Vert
Ave		+0.0	+0.0	+0.0	-34.5			10k GFSK		
		+26.4	+0.7	+5.9	+0.7					
22 1804.889M			+0.0	+0.0	+0.0	+0.0		102.0	-58.3	Vert
Ave		+0.0	+0.0	+0.0	-34.5			150k GFSK		
		+26.4	+0.7	+5.9	+0.7					
23 1804.800M	44.5	+0.0	+0.0	+0.0	+0.0	+0.0	43.7	102.0	-58.3	Vert
Ave		+0.0	+0.0	+0.0	-34.5			50k GFSK		
		+26.4	+0.7	+5.9	+0.7					
24 957.860M	14.7	+0.4	+1.6	+2.1	+24.9	+0.0	43.7	102.0	-58.3	Vert
		+0.0	+0.0	+0.0	+0.0					
		+0.0	+0.0	+0.0	+0.0					
25 1855.520M	44.0	+0.0	+0.0	+0.0	+0.0	+0.0	43.7	102.0	-58.3	Vert
Ave		+0.0	+0.0	+0.0	-34.5			10k GFSK		
		+26.9	+0.7	+5.9	+0.7					
26 1830.024M	43.8	+0.0	+0.0	+0.0	+0.0	+0.0	43.2	102.0	-58.8	Vert
Ave		+0.0	+0.0	+0.0	-34.5			10k GFSK		
		+26.6	+0.7	+5.9	+0.7					
							•			

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27	260 2001	22.6	. 0. 2	. 1. 0	. 1 1	. 1.7.0	. 0. 0	41.7	102.0	60.2	<b>T</b> 7 ,
27	369.290M	23.6	+0.2	+1.0	+1.1	+15.8	+0.0	41.7	102.0	-60.3	Vert
			+0.0	+0.0	+0.0	+0.0					
20	1020 20014	40.0	+0.0	+0.0	+0.0	+0.0	.00	40.2	102.0	(1.7	XI4
	1830.388M	40.9	+0.0	+0.0	+0.0	+0.0	+0.0	40.3	102.0	-61.7	Vert
F	Ave		+0.0	+0.0	+0.0	-34.5			12.5k OQPS	)K	
20	1920 22514	40.0	+26.6	+0.7	+5.9	+0.7	. 0. 0	40.2	102.0	(1.7	XI4
	1830.235M	40.9	$^{+0.0}_{+0.0}$	+0.0	+0.0	+0.0	+0.0	40.3	102.0	-61.7	Vert
F	Ave			+0.0	+0.0	-34.5			6.25k OQPS	λ	
20	1920 22514	40.0	+26.6	+0.7	+5.9	+0.7	.00	40.2	102.0	<i>C</i> 1.0	XI4
	1830.235M	40.8	+0.0	+0.0	+0.0	+0.0	+0.0	40.2	102.0	-61.8	Vert
F	Ave		$+0.0 \\ +26.6$	$+0.0 \\ +0.7$	+0.0 +5.9	-34.5			150k GFSK		
21	1920 177M	40.9				+0.7	+ O O	40.2	102.0	61.0	Vont
	1830.177M	40.8	$^{+0.0}_{+0.0}$	+0.0	+0.0	+0.0	+0.0	40.2	102.0	-61.8	Vert
F	Ave		+0.0 +26.6	$+0.0 \\ +0.7$	+0.0	-34.5			50k GFSK		
22	552 500M	12.2			+5.9	+0.7	.00	26.6	102.0	CF 1	XI4
32	553.500M	13.3	+0.3	+1.2	+1.4	+20.4	+0.0	36.6	102.0	-65.4	Vert
1			$^{+0.0}_{+0.0}$	$+0.0 \\ +0.0$	+0.0	+0.0					
33	91.100M	28.0	+0.0	+0.0	+0.0	+0.0	+0.0	36.1	102.0	-65.9	Vert
33	91.100M	28.0	+0.1	+0.5 +0.0	+0.5		+0.0	30.1	102.0	-03.9	vert
			+0.0 +0.0	+0.0 +0.0	+0.0 +0.0	+0.0					
34	91.100M	27.9	+0.0	+0.5	+0.5	+0.0	+0.0	36.0	102.0	-66.0	Vort
34	91.100M	21.9	+0.1 +0.0				+0.0	30.0	102.0	-00.0	Vert
			+0.0 +0.0	+0.0	+0.0 +0.0	+0.0					
25	88.510M	27.6		+0.0		+0.0	+ O O	35.5	102.0	66.5	Vont
35		27.6	+0.1	+0.5	+0.5	+6.8	+0.0	33.3	102.0	-66.5	Vert
	QР		$^{+0.0}_{+0.0}$	$+0.0 \\ +0.0$	$+0.0 \\ +0.0$	$^{+0.0}_{+0.0}$					
^	88.460M	26.1	+0.0	+0.5	+0.5		+0.0	34.0	102.0	-68.0	Vort
,	88.40UM	20.1	+0.1 +0.0	+0.3	+0.3	$+6.8 \\ +0.0$	+0.0	34.0	102.0	-08.0	Vert
			+0.0	+0.0	+0.0	+0.0 +0.0					
37	30.000M	18.8	+0.0	+0.3	+0.0	+15.9	+0.0	35.4	102.0	-66.6	Vert
	20.000M QP	10.0	+0.1	+0.3	+0.0	+13.9	+0.0	33.4	102.0	-00.0	v ert
\	ŹΙ		+0.0	+0.0 +0.0	+0.0 +0.0	+0.0 +0.0					
38	90.830M	27.0	+0.0	+0.5	+0.5	+7.0	+0.0	35.1	102.0	-66.9	Vert
30	70.03UW	27.0	+0.1 +0.0	+0.5 +0.0	+0.5 +0.0	+7.0	+0.0	55.1	102.0	-00.9	v CI l
1			+0.0 +0.0	+0.0 +0.0	+0.0 +0.0	+0.0 +0.0					
39	152.200M	23.5	+0.0	+0.6	+0.7	+9.7	+0.0	34.7	102.0	-67.3	Vert
39	1.52.200IVI	43.3	+0.2	+0.0	+0.7	+9.7	+0.0	34.1	102.0	-07.3	v CI t
1			+0.0	+0.0 +0.0	+0.0	+0.0					
40	49.250M	26.8	+0.1	+0.4	+0.4	+6.9	+0.0	34.6	102.0	-67.4	Vert
1	T/.2301VI	20.0	+0.1	+0.4	+0.4	+0.0	10.0	57.0	102.0	07.7	V 01 t
			+0.0	+0.0	+0.0	+0.0					
41	154.740M	22.7	+0.2	+0.6	+0.7	+10.2	+0.0	34.4	102.0	-67.6	Vert
''	10 11, 1011	,	+0.0	+0.0	+0.0	+0.0	. 0.0	5 1. 1	102.0	07.0	, 010
1			+0.0	+0.0	+0.0	+0.0					
42	48.400M	23.7	+0.1	+0.4	+0.4	+7.1	+0.0	31.7	102.0	-70.3	Vert
	)P	23.7	+0.0	+0.0	+0.0	+0.0	. 0.0	51.7	102.0	, 0.5	, 010
`	<b>_</b> -		+0.0	+0.0	+0.0	+0.0					
٨	48.400M	29.8	+0.1	+0.4	+0.4	+7.1	+0.0	37.8	102.0	-64.2	Vert
			+0.0	+0.0	+0.0	+0.0	. 0.0	27.0	102.0	÷	. 510
			+0.0	+0.0	+0.0	+0.0					
L											

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Ho, 0										4		
Ho	44	53.970M	21.0	+0.1	+0.4	+0.4		+0.0	28.4	102.0	-73.6	Horiz
45   59,917M   17.4   +0.1   +0.4   +0.4   +0.7   +0.0   25.0   102.0   -77.0   Horiz   QP   +0.0												
QP         +0.0         200k OFDM         Vert           47 1830.405M         29.0         +0.0		50.0153.5	15 :						27.0	102.0		** .
Ho	_		17.4					+0.0	25.0	102.0	-77.0	Horiz
46   1830.255M		QP										
Ave	4.5	1020 25534	20.2					. 0. 0	20.7	1100	01.2	<b>T7</b> ·
+26.6			29.3					+0.0	28.7			vert
47 1830.405M		Ave								200k OFD.	M	
Ave	477	1020 4053 6	20.0					0.0	20.4	110.0	01.6	<b>T</b> 7 .
+26.6			29.0					+0.0	28.4			Vert
48   1829.700M   29.0   +0.0   +0.0   +0.0   +0.0   +0.0   -34.5     1.2M OFDM   +26.6   +0.7   +5.9   +0.7   +0.0   +0		Ave								600k OFD	M	
Ave	40	1020 70014	20.0					. 0. 0	20.4	110.0	01.6	<b>X</b> I
+26.6			29.0					+0.0	28.4			vert
49   1804.861M   29.1   +0.0   +0.0   +0.0   +0.0   +0.0   28.3   110.0   -81.7   Vert   +26.4   +0.7   +5.9   +0.7     +0.0		Ave								1.2M OFD	IVI	
Ave	40	1904 961M	20.1					ι Ο Ο	20.2	1100	Q1 7	Vont
+26.4 +0.7 +5.9 +0.7   +0.0   +0.0 +0.0 +0.0 +0.0   +0.0			49.1					+0.0	20.3			vert
50   1804.820M   29.1   +0.0   +0.0   +0.0   +0.0   +0.0   +0.0   28.3   110.0   -81.7   Vert   +0.0   +0.0   +0.0   +0.0   -34.5   600k OFDM   +26.4   +0.7   +5.9   +0.7     +0.0   +0.0   +0.0   +0.0   +0.0   27.5   110.0   -82.5   Vert   +26.8   +0.7   +5.9   +0.7     +0.0   +0.0   +0.0   +0.0   27.5   110.0   -82.5   Vert   +26.8   +0.7   +5.9   +0.7     +0.0   +0.0   +0.0   +0.0   +0.0   27.5   110.0   -82.5   Vert   +0.0   +0.0   +0.0   +0.0   +0.0   +0.0   +0.0   -34.5   600k OFDM   +26.8   +0.7   +5.9   +0.7     +0.0		AVE								ZUUK UFD.	171	
Ave	50	1804 820M	20.1					±0.0	28.3	110.0	81.7	Vort
+26.4			47.1					±0.0	20.3			v CI t
S1 1855.237M   27.9		Ave								OOOK OI D	141	
Ave	51	1855 237M	27.9					+0.0	27.5	110.0	-82.5	Vert
+26.8			21.7					10.0	27.5			VCIT
52 1855.060M         27.9         +0.0         +0.0         +0.0         +0.0         +0.0         27.5         110.0         -82.5         Vert           Ave         +0.0         +0.0         +0.0         -34.5         600k OFDM         600k OFDM           53 1853.610M         27.9         +0.0         +0.0         +0.0         +0.0         +0.0         +26.8         +0.7         +5.9         +0.7           54 1902.500M         26.2         +0.0		1110								LOOK OI D	. T. M.	
Ave	52.	1855 060M	27.9					+0.0	27.5	110.0	-82.5	Vert
+26.8			27.5					10.0	27.5			V 011
53 1853.610M       27.9       +0.0       +0.0       +0.0       +0.0       +0.0       27.5       110.0       -82.5       Vert         Ave       +0.0       +0.0       +0.0       -40.0       -34.5       1.2M OFDM         54 1902.500M       26.2       +0.0       +0.0       +0.0       +0.0       +0.0       -40.0       -83.5       Vert         Ave       +0.0       +0.0       +0.0       +0.0       -34.4       1.2M OFDM       1.2M OFDM         55 18.873M       27.3       +0.0       +0.0       +0.0       +0.0       -40.0       -4.3       102.0       -106.3       Para         QP       +0.2       +8.2       +0.0       +0.0       +0.0       +0.0       -40.0       -4.3       102.0       -106.3       Para         +0.2       +8.2       +0.0       +0.0       +0.0       -40.0       -40.0       -0.4       102.0       -102.4       Para         57       1.868M       23.8       +0.0       +0.0       +0.0       +0.0       -40.0       -6.4       102.0       -108.4       Para         +0.1       +9.7       +0.0       +0.0       +0.0       -6.9       102.0       -108.9       Par		11,0								00011 012		
Ave	53	1853.610M	27.9					+0.0	27.5	110.0	-82.5	Vert
+26.8 +0.7 +5.9 +0.7  54 1902.500M												
54 1902.500M       26.2       +0.0       +0.0       +0.0       +0.0       +0.0       26.5       110.0       -83.5       Vert         Ave       +0.0       +0.0       +0.0       +0.0       -34.4       1.2M OFDM         55 18.873M       27.3       +0.0       +0.0       +0.0       -40.0       -4.3       102.0       -106.3       Para         QP       +0.2       +8.2       +0.0       +0.0       +0.0       +0.0       -40.0       -0.4       102.0       -106.3       Para         **0.0       +0.0       +0.0       +0.0       +0.0       -40.0       -4.3       102.0       -106.3       Para         **0.1       +0.0       +0.0       +0.0       +0.0       -40.0       -4.3       102.0       -106.3       Para         **1.868M       31.2       +0.0       +0.0       +0.0       +0.0       +0.0       -40.0       -6.4       102.0       -108.4       Para         **5.8       +0.0       +0.0       +0.0       +0.0       -40.0       -6.4       102.0       -108.9       Para         **5.8       +0.0       +0.0       +0.0       -40.0       -6.9       102.0       -108.9       Para <td></td> <td></td> <td></td> <td>+26.8</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>				+26.8								
Ave	54	1902.500M	26.2					+0.0	26.5	110.0	-83.5	Vert
+27.3 +0.7 +5.9 +0.8  55 18.873M 27.3 +0.0 +0.0 +0.0 +0.0 -40.0 -40.0 -4.3 102.0 -106.3 Para QP +0.2 +8.2 +0.0 +0.0 +0.0 +0.0 +0.0 +0.0 +0.0 -40.0 -0.4 102.0 -102.4 Para +0.2 +8.2 +0.0 +0.0 +0.0 +0.0 +0.0 +0.0 +0.0 +0.0		Ave		+0.0	+0.0							
QP				+27.3			+0.8					
QP	55	18.873M	27.3					-40.0	-4.3	102.0	-106.3	Para
+0.0 +0.0 +0.0 +0.0 +0.0  18.873M 31.2 +0.0 +0.0 +0.0 +0.0 -40.0 -0.4 102.0 -102.4 Para +0.2 +8.2 +0.0 +0.0 +0.0 +0.0 +0.0 +0.0 +0.0  57 1.868M 23.8 +0.0 +0.0 +0.0 +0.0 +0.0 +0.1 +9.7 +0.0 +0.0 +0.0 +0.0 +0.0 +0.0 +0.0 +0.0 +0.0												
+0.2 +8.2 +0.0 +0.0 +0.0 +0.0 +0.0 +0.0 +0.0 +0.0 57 1.868M 23.8 +0.0 +0.0 +0.0 +0.0 -40.0 -6.4 102.0 -108.4 Para +0.1 +9.7 +0.0 +0.0 +0.0 +0.0 +0.0 +0.0 +0.0 +0.0 58 29.370M 26.9 +0.1 +0.0 +0.0 +0.0 -40.0 -6.9 102.0 -108.9 Para +0.3 +5.8 +0.0 +0.0 +0.0 +0.0 +0.0 +0.0				+0.0	+0.0	+0.0						
+0.0 +0.0 +0.0 +0.0 +0.0  57 1.868M 23.8 +0.0 +0.0 +0.0 +0.0 +0.0 -40.0 -6.4 102.0 -108.4 Para +0.1 +9.7 +0.0 +0.0 +0.0 +0.0 +0.0 +0.0 +0.0 -40.0  58 29.370M 26.9 +0.1 +0.0 +0.0 +0.0 -40.0 -6.9 102.0 -108.9 Para +0.3 +5.8 +0.0 +0.0 +0.0 +0.0 +0.0 +0.0	^	18.873M	31.2	+0.0	+0.0	+0.0	+0.0	-40.0	-0.4	102.0	-102.4	Para
57 1.868M 23.8 +0.0 +0.0 +0.0 +0.0 -40.0 -6.4 102.0 -108.4 Para +0.1 +9.7 +0.0 +0.0 +0.0 +0.0 +0.0 +0.0 +0.0 +0.					+8.2	+0.0	+0.0					
+0.1 +9.7 +0.0 +0.0 +0.0 +0.0 +0.0 +0.0 58 29.370M 26.9 +0.1 +0.0 +0.0 +0.0 -40.0 -6.9 102.0 -108.9 Para +0.3 +5.8 +0.0 +0.0 +0.0 +0.0 +0.0 +0.0				+0.0	+0.0	+0.0	+0.0					
+0.0 +0.0 +0.0 +0.0 58 29.370M 26.9 +0.1 +0.0 +0.0 +0.0 -40.0 -6.9 102.0 -108.9 Para +0.3 +5.8 +0.0 +0.0 +0.0 +0.0 +0.0 +0.0	57	1.868M	23.8			+0.0	+0.0	-40.0	-6.4	102.0	-108.4	Para
58 29.370M 26.9 +0.1 +0.0 +0.0 +0.0 -40.0 -6.9 102.0 -108.9 Para +0.3 +5.8 +0.0 +0.0 +0.0 +0.0 +0.0 +0.0												
$\begin{array}{cccccccccccccccccccccccccccccccccccc$												
+0.0 +0.0 +0.0 +0.0	58	29.370M	26.9					-40.0	-6.9	102.0	-108.9	Para
59 24.632M 21.2 +0.1 +0.0 +0.0 +0.0 -40.0 -11.3 102.0 -113.3 Groun												
	59	24.632M	21.2	+0.1	+0.0	+0.0	+0.0	-40.0	-11.3	102.0	-113.3	Groun
+0.3 +7.1 +0.0 +0.0												
+0.0 +0.0 +0.0 +0.0												
60 16.144M 19.5 +0.0 +0.0 +0.0 +0.0 -40.0 -11.5 102.0 -113.5 Perp	60	16.144M	19.5					-40.0	-11.5	102.0	-113.5	Perp
+0.2 +8.8 +0.0 +0.0												
+0.0 +0.0 +0.0 +0.0				+0.0	+0.0	+0.0	+0.0					

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Test Location: CKC Laboratories • 22116 23rd Drive SE, Suite A • Bothell, WA 98021 • 1-800-500-4EMC (4362)

Customer: Itron, Inc.

Specification: 15.247(d) / 15.209 Radiated Spurious Emissions

Work Order #: 101674 Date: 8/28/2018
Test Type: Radiated Scan Time: 11:04:00
Tested By: Michael Atkinson Sequence#: 7

Software: EMITest 5.03.11

#### Equipment Tested:

Device	Manufacturer	Model #	S/N	
Configuration 4				

#### Support Equipment:

Device	Manufacturer	Model #	S/N	
Configuration 4				

#### Test Conditions / Notes:

Frequency Range: 9kHz-9.28GHz

Frequency tested: Low, Mid, High Channels

Firmware power setting: Max

Firmware: CAM3-DEV Major Number 4, Minor Number 7, Build Number 153, Revision Number 787268

Test Software: CAM3 FCC Test Helper v14

Modulation Types:

10k GFSK, 50k GFSK, 150k GFSK 6.25k OQPSK, 12.5k OQPSK

200k OFDM, 600k OFDM, 1.2M OFDM (Hybrid)

Antenna type: External Colinear Omni

Antenna Gain: 8.15dBi with 3dB attenuator (remote)

Duty Cycle: Tested at 100%

Test Location: Bothell Lab C3 Test Method: ANSI C63.10 (2013)

Temperature (°C): 22-24 Relative Humidity (%): 38-42

Setup: The EUT is continuously transmitting with modulation on ISM port.

The EUT is connected to external antenna.

Low, Mid, and High channels investigated, worst case reported.

All modulation types investigated.

Horizontal and Vertical measurement antennas investigated above 30MHz, worst case reported.

#### 3 orthogonal axes investigated below 30MHz, worst case reported.

Note: Base of external antenna is below 1.5m height for testing above 1GHz, this is to keep antenna inside of test volume.

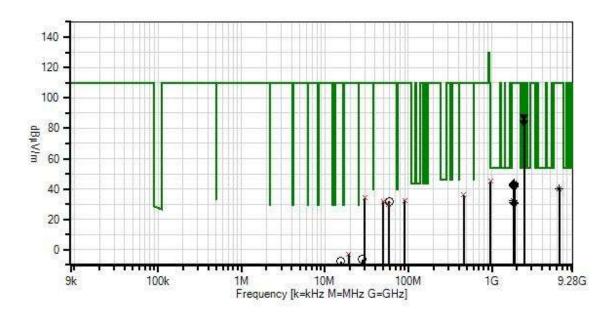
Fundamental of separate Wi-Fi module marked as ambient, and is to be ignored for this measurement.

No additional peak emissions observed within 20dB of the peak limit.

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Itron, Inc. WO#: 101674 Sequence#: 7 Date: 8/28/2018 15.247(d) / 15.209 Radiated Spurious Emissions Test Distance: 3 Meters Vert



× QP Readings
 ▼ Ambient

O Peak Readings

 Average Readings Software Version: 5.03.11

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Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	ANP06540	Cable	Heliax	10/30/2017	10/30/2019
T2	ANP05305	Cable	ETSI-50T	10/24/2017	10/24/2019
T3	ANP05360	Cable	RG214	1/31/2018	1/31/2020
T4	AN03628	Biconilog Antenna	3142E	6/7/2017	6/7/2019
T5	ANP06515	Cable	Heliax	6/29/2018	6/29/2020
T6	AN00052	Loop Antenna	6502	5/7/2018	5/7/2020
T7	AN02871	Spectrum Analyzer	E4440A	2/24/2017	2/24/2019
T8	AN03540	Preamp	83017A	5/2/2017	5/2/2019
Т9	ANP06934	Cable	32026-29801-	3/13/2018	3/13/2020
			29801-18		
T10	AN01467	Horn Antenna-ANSI	3115	7/21/2017	7/21/2019
		C63.5 Calibration			
T11	AN03170	High Pass Filter	HM1155-11SS	11/27/2017	11/27/2019
T12	ANP07226	Attenuator	PE7004-6	12/1/2017	12/1/2019
T13	ANP06503	Cable	32026-29801-	3/13/2018	3/13/2020
			29801-36		

Meas	urement Data:	R	eading lis	ted by ma	argin.		Te	est Distanc	e: 3 Meters		
#	Freq	Rdng	T1	T2	Т3	T4	Dist	Corr	Spec	Margin	Polar
			T5	T6	T7	T8					
			T9	T10	T11	T12					
			T13								
	MHz	dΒμV	dB	dB	dB	dB	Table	$dB\mu V/m$	dBμV/m	dB	Ant
1		14.5	+0.4	+1.6	+2.1	+24.8	+0.0	45.1	54.0	-8.9	Vert
	QP		+1.7	+0.0	+0.0	+0.0			10k GFSK		
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
2	2 2434.000M	84.7	+0.4	+0.0	+0.0	+0.0	+0.0	87.7	102.0	-14.3	Vert
	Ambient		+2.6	+0.0	+0.0	-34.0					
			+0.4	+28.1	+0.6	+5.8					
			+0.0								
3	3 2434.000M	80.7	+0.4	+0.0	+0.0	+0.0	+0.0	83.7	102.0	-18.3	Horiz
	Ambient		+2.6	+0.0	+0.0	-34.0					
			+0.4	+28.1	+0.6	+5.8					
			+0.0								
4	1830.060M	41.5	+0.4	+0.0	+0.0	+0.0	+0.0	44.2	102.0	-57.8	Vert
	Ave		+2.3	+0.0	+0.0	-34.5			10k GFSK		
			+0.3	+26.6	+0.7	+5.9					
			+0.0								
5	5 1830.180M	40.6	+0.4	+0.0	+0.0	+0.0	+0.0	43.3	102.0	-58.7	Vert
	Ave		+2.3	+0.0	+0.0	-34.5			50k GFSK		
			+0.3	+26.6	+0.7	+5.9					
			+0.0								
6	5 1804.247M	40.4	+0.5	+0.0	+0.0	+0.0	+0.0	43.1	102.0	-58.9	Vert
	Ave		+2.2	+0.0	+0.0	-34.5			12.5 OQPS	K	
			+0.3	+26.3	+0.7	+5.9					
			+0.0								

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7 1004 20514	40.0	.0.5	. 0. 0	.00	.0.0	.0.0	12.0	102.0 50.1	X7 .
7 1804.395M	40.2	+0.5 $+2.2$	$+0.0 \\ +0.0$	+0.0 +0.0	+0.0 -34.5	+0.0	42.9	102.0 -59.1 150k GFSK	Vert
Ave		+2.2	+26.4	+0.0	-34.3 +5.9			130K GF3K	
		+0.0	T20.4	+0.7	₹3.9				
8 1804.438M	40.2	+0.5	+0.0	+0.0	+0.0	+0.0	42.9	102.0 -59.1	Vert
Ave		+2.2	+0.0	+0.0	-34.5			6.25k OQPSK	
		+0.3	+26.4	+0.7	+5.9				
		+0.0							
9 1804.800M	40.1	+0.5	+0.0	+0.0	+0.0	+0.0	42.8	102.0 -59.2	2 Vert
Ave		+2.2	+0.0	+0.0	-34.5			50k GFSK	
		+0.3	+26.4	+0.7	+5.9				
40. 4020.0227	10.5	+0.0	0.0	0.0	0.0	0.0	40.4	1000 50	
10 1830.022M	42.6	+0.4	+0.0	+0.0	+0.0	+0.0	42.4	102.0 -59.6	6 Vert
Ave		+0.0	+0.0	+0.0	-34.5				
		+0.0	+26.6	+0.7	+5.9				
11 1021 144M	20.6	+0.7	+0.0	+ O O	+0.0	+0.0	42.3	102.0 -59.7	7 Vert
11 1831.144M Ave	39.6	+0.4 +2.3	$+0.0 \\ +0.0$	$^{+0.0}_{+0.0}$	+0.0 -34.5	+0.0	42.3	102.0 -39.7 12.5 OQPSK	ven
Avc		+0.3	+26.6	+0.7	+5.9			12.5 OQI 5K	
		+0.0	120.0	10.7	13.7				
12 1855.514M	39.6	+0.4	+0.0	+0.0	+0.0	+0.0	42.3	102.0 -59.7	7 Vert
Ave	37.0	+2.3	+0.0	+0.0	-34.5	10.0	12.5	10k GFSK	, 010
		+0.3	+26.9	+0.7	+5.9				
		+0.0							
13 1830.244M	39.6	+0.4	+0.0	+0.0	+0.0	+0.0	42.3	102.0 -59.7	7 Vert
Ave		+2.3	+0.0	+0.0	-34.5			6.25k OQPSK	
		+0.3	+26.6	+0.7	+5.9				
		+0.0							
14 1855.246M	39.5	+0.4	+0.0	+0.0	+0.0	+0.0	42.2	102.0 -59.8	8 Vert
Ave		+2.3	+0.0	+0.0	-34.5			50k GFSK	
		+0.3	+26.8	+0.7	+5.9				
45 4000 000 5	20.7	+0.0	0.0	0.0	0.0	0.0	42.2	1000 500	X X X
15 1830.292M	39.5	+0.4	+0.0	+0.0	+0.0	+0.0	42.2	102.0 -59.8	8 Vert
Ave		+2.3	+0.0	+0.0	-34.5			150k GFSK	
		+0.3 +0.0	+26.6	+0.7	+5.9				
16 1804.360M	39.1	+0.5	+0.0	+0.0	+0.0	+0.0	41.8	102.0 -60.2	2 Vert
Ave	39.1	+2.2	+0.0	+0.0	-34.5	+0.0	41.0	102.0 -00.2 10k GFSK	. VCII
1110		+0.3	+26.3	+0.7	+5.9			TOR OF SIX	
		+0.0	12010						
17 1855.225M	38.9	+0.4	+0.0	+0.0	+0.0	+0.0	41.6	102.0 -60.4	l Vert
Ave		+2.3	+0.0	+0.0	-34.5			150k GFSK	
		+0.3	+26.8	+0.7	+5.9				
		+0.0							
18 1855.258M	38.9	+0.4	+0.0	+0.0	+0.0	+0.0	41.6	102.0 -60.4	l Vert
Ave		+2.3	+0.0	+0.0	-34.5			6.25k OQPSK	
		+0.3	+26.8	+0.7	+5.9				
		+0.0							
19 1855.234M	38.9	+0.4	+0.0	+0.0	+0.0	+0.0	41.6	102.0 -60.4	l Vert
Ave		+2.3	+0.0	+0.0	-34.5			12.5k OQPSK	
		+0.3	+26.8	+0.7	+5.9				
		+0.0							

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20 6409.000M	25.3	+0.6	+0.0	+0.0	+0.0	+0.0	40.3	102.0	-61.7	Vert
Ave		+5.4	+0.0	+0.0	-33.6					
		+0.8	+35.4	+0.5	+5.9					
		+0.0								
^ 6409.000M	36.0	+0.6	+0.0	+0.0	+0.0	+0.0	51.0	102.0	-51.0	Vert
		+5.4	+0.0	+0.0	-33.6					
		+0.8	+35.4	+0.5	+5.9					
22 462 4003 4	14.5	+0.0	. 1. 1	. 1.0	. 17.0	. 0. 0	26.1	100.0	65.0	X7 .
22 462.400M	14.5	+0.2	+1.1	+1.3	+17.9	+0.0	36.1	102.0	-65.9	Vert
QP		+1.1	+0.0	+0.0	+0.0					
		+0.0 +0.0	+0.0	+0.0	+0.0					
^ 462.400M	19.7	+0.0	+1.1	+1.3	+17.9	+0.0	41.3	102.0	-60.7	Vert
402.400M	19.7	+0.2	+1.1 +0.0	+0.0	+17.9	+0.0	41.3	102.0	-00.7	vert
		+0.0	+0.0 +0.0	+0.0 +0.0	+0.0					
		+0.0	+0.0	+0.0	+0.0					
24 30.000M	17.3	+0.0	+0.3	+0.3	+15.9	+0.0	34.2	102.0	-67.8	Vert
QP	17.3	+0.1	+0.5	+0.5	+13.9	+0.0	34.2	102.0	-07.0	v CI t
Q1		+0.0	+0.0	+0.0	+0.0					
		+0.0	10.0	10.0	10.0					
25 89.900M	24.2	+0.1	+0.5	+0.5	+6.9	+0.0	32.7	102.0	-69.3	Vert
QP	22	+0.5	+0.0	+0.0	+0.0	10.0	32.7	102.0	07.5	, 011
ζ.		+0.0	+0.0	+0.0	+0.0					
		+0.0								
^ 89.900M	26.4	+0.1	+0.5	+0.5	+6.9	+0.0	34.9	102.0	-67.1	Vert
0,0,000		+0.5	+0.0	+0.0	+0.0					
		+0.0	+0.0	+0.0	+0.0					
		+0.0								
27 58.490M	23.9	+0.1	+0.4	+0.4	+6.6	+0.0	31.8	102.0	-70.2	Horiz
		+0.4	+0.0	+0.0	+0.0					
		+0.0	+0.0	+0.0	+0.0					
		+0.0								
28 50.300M	23.7	+0.1	+0.4	+0.4	+6.8	+0.0	31.8	102.0	-70.2	Vert
QP		+0.4	+0.0	+0.0	+0.0					
		+0.0	+0.0	+0.0	+0.0					
		+0.0								
^ 50.300M	26.8	+0.1	+0.4	+0.4	+6.8	+0.0	34.9	102.0	-67.1	Vert
		+0.4	+0.0	+0.0	+0.0					
		+0.0	+0.0	+0.0	+0.0					
		+0.0								
30 58.028M	21.7	+0.1	+0.4	+0.4	+6.6	+0.0	29.6	102.0	-72.4	Horiz
QP		+0.4	+0.0	+0.0	+0.0					
		+0.0	+0.0	+0.0	+0.0					
21 1004 4403 7	20.0	+0.0		0.0		0.0	22.5	1100		X7 ·
31 1804.410M	29.9	+0.5	+0.0	+0.0	+0.0	+0.0	32.6	110.0	-77.4	Vert
Ave		+2.2	+0.0	+0.0	+0.0			200k OFDN	/1	
		+0.0	+0.0	+0.0	+0.0					
22 100421237	20.0	+0.0	.0.0	.0.0	. 0. 0	.0.0	21.2	1100	70.0	<b>T7</b> ·
32 1804.313M	29.8	+0.5	+0.0	+0.0	+0.0	+0.0	31.2	110.0	-78.8	Vert
Ave		+2.2	+0.0	+0.0	-34.5			600k OFDN	/1	
		+0.3	+26.3	+0.7	+5.9					
		+0.0								

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1905 620M	20.7	.0.5	+0.0	+0.0	+0.0	ι Ο Ο	31.2	1100	70 0	Vont
1805.620M	29.7	+0.5	+0.0	+0.0	+0.0	+0.0	31.2	110.0	-78.8	Vert
Ave								1.2M OFD	1V1	
			T20.4	+0.7	<b>⊤</b> 3.9					
1804.349M	29.7		+0.0	+0.0	+0.0	+0.0	31.1	110.0	-78.9	Vert
Ave	_>					. 0.0	0111			, 010
		+0.0								
1804.360M	29.7	+0.5	+0.0	+0.0	+0.0	+0.0	31.1	110.0	-78.9	Vert
Ave		+2.2	+0.0	+0.0	-34.5			200k OFD	M	
			+26.3	+0.7	+5.9					
	29.2					+0.0	30.9			Vert
Ave								1.2M OFD	M	
			+26.6	+0.7	+5.9					
							• • •			
	28.7					+0.0	30.6			Vert
Ave								200k OFD.	M	
			+26.8	+0.7	+5.9					
1955 102M	20.7		+0.0	+0.0	+0.0	+Ω.Ω	20.6	110.0	70.4	Vert
	28.7					+0.0	30.0			vert
Ave								OUUK OFD.	IVI	
			+20.6	+0.7	+3.9					
1853 600M	28.6		+0.0	+0.0	+0.0	+0.0	30.5	110.0	70.5	Vert
	20.0					+0.0	30.3			VCI
110								1.2W OI D	141	
			120.0	10.7	13.7					
19.293M	28.9		+0.0	+0.0	+0.0	-40.0	-2.8	102.0	-104.8	Para
		+0.2								
		+0.0	+0.0	+0.0	+0.0					
		+0.0								
19.293M	33.5	+0.0	+0.0	+0.0	+0.0	-40.0	1.8	102.0	-100.2	Para
		+0.2	+8.1	+0.0	+0.0					
		+0.0	+0.0	+0.0	+0.0					
		+0.0								
28.051M	27.2	+0.1	+0.0	+0.0	+0.0	-40.0	-6.3	102.0	-108.3	Para
		+0.3	+6.1							
			+0.0	+0.0	+0.0					
15 55 5			0.0	0.0	0.0	40.0		400.0	100 -	<u> </u>
15.574M	23.2					-40.0	-7.6	102.0	-109.6	Groun
			+0.0	+0.0	+0.0					
0.20614	10.6		+0.0	ΙΟ Ο	10.0	40.0	11.0	102.0	112.0	Dama
9.396M	19.6					-40.0	-11.0	102.0	-115.0	Perp
		+0.2 +0.0	+9.2 +0.0	$^{+0.0}_{+0.0}$	+0.0					
		+∪.∪	+0.0	+0.0	+0.0					
7 357M	17 1	+0.0	+0.0	+0.0	+0.0	-40.0	-13 /	102.0	-115 A	Para
7.357M	17.1	+0.0	+0.0	+0.0	+0.0	-40.0	-13.4	102.0	-115.4	Para
7.357M	17.1	+0.0	+0.0 +9.4 +0.0	+0.0 +0.0 +0.0	+0.0 +0.0 +0.0	-40.0	-13.4	102.0	-115.4	Para
	1804.349M Ave 1804.360M Ave 1829.660M Ave 1855.239M Ave 1855.192M Ave 19.293M QP	1804.349M 29.7 Ave 29.7 Ave 29.7 Ave 29.7 Ave 29.2 1829.660M 29.2 Ave 28.7 Ave 28.7 Ave 28.7 Ave 28.6 19.293M 28.9 QP 28.051M 27.2	Ave +2.2 +0.3 +0.0 1804.349M 29.7 +0.5 Ave +2.2 +0.3 +0.0 1804.360M 29.7 +0.5 Ave +2.2 +0.3 +0.0 1829.660M 29.2 +0.4 Ave +2.3 +0.3 +0.0 1855.239M 28.7 +0.4 Ave +2.3 +0.3 +0.0 1855.192M 28.7 +0.4 Ave +2.3 +0.3 +0.0 1853.600M 28.6 +0.4 Ave +2.3 +0.3 +0.0 19.293M 28.9 +0.0 19.293M 28.9 +0.0 +0.0 19.293M 33.5 +0.0 +0.0 19.293M 27.2 +0.1 +0.0 +0.0 19.293M 27.2 +0.1 +0.0 +0.0 19.293M 27.2 +0.1 +0.0 +0.0 19.293M 27.2 +0.1 +0.0 +0.0 +0.0 19.293M 27.2 +0.1 +0.0 +0.0 +0.0 +0.0 19.293M 27.2 +0.1 +0.0 +0.0 +0.0 +0.0 +0.0 +0.0 19.293M 27.2 +0.1 +0.0 +0.0 +0.0 +0.0 +0.0 +0.0	Ave	Ave	Ave	Ave	Ave	Ave	Ave

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## Band Edge

		Band Edge Summary -	- Configuration 2		
Frequency			Field Strength	Limit	
(MHz)	Modulation	Ant. Type	(dBuV/m @3m)	(dBuV/m @3m)	Results
614			39.9	<46	Pass
902	401 0504	External Attached	98.3	<110	Pass
928	10k GFSK	Colinear Omni 2.8dBi	81.5	<110	Pass
960			46.7	<54	Pass
614			38.7	<46	Pass
902	E01 0501	External Attached	71.4	<110	Pass
928	50k GFSK	Colinear Omni 2.8dBi	72.9	<110	Pass
960			43.5	<54	Pass
614			38.7	<46	Pass
902	4501.0504	External Attached	72.0	<110	Pass
928	150k GFSK	Colinear Omni 2.8dBi	73.8	<110	Pass
960			43.5	<54	Pass
614			38.8	<46	Pass
902		External Attached	71.7	<110	Pass
928	6.25k OQPSK	Colinear Omni 2.8dBi	73.5	<110	Pass
960			43.6	<54	Pass
614			38.7	<46	Pass
902		External Attached	72.1	<110	Pass
928	12.5 OQPSK	Colinear Omni 2.8dBi	73.2	<110	Pass
960			43.6	<54	Pass
614			38.7	<46	Pass
902		External Attached	80.7	<102	Pass
928	200k OFDM	Colinear Omni 2.8dBi	82.2	<102	Pass
960			43.3	<54	Pass
614			38.7	<46	Pass
902	5001 05014	External Attached	77.7	<102	Pass
928	600k OFDM	Colinear Omni 2.8dBi	73.8	<102	Pass
960			43.2	<54	Pass
614			38.5	<46	Pass
902	1.2M OFDM	External Attached	61.0	<102	Pass
928	(Hybrid)	Colinear Omni 2.8dBi	52.1	<102	Pass
960			43.2	<54	Pass
614			38.5	<46	Pass
902	Hopping (10k	External Attached	74.2	<110	Pass
928	GFSK)	Colinear Omni 2.8dBi	75.9	<110	Pass
960			43.1	<54	Pass
614			38.5	<46	Pass
902	Hopping (6.25k	External Attached	72.0	<110	Pass
928	OQPSK)	Colinear Omni 2.8dBi	64.7	<110	Pass
960			43.1	<54	Pass
614	11	Francis I Att 1	38.6	<46	Pass
902	Hopping (200k	External Attached	66.3	<102	Pass
928	OFDM)	Colinear Omni 2.8dBi	64.7	<102	Pass

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Frequency (MHz)	Modulation	Ant. Type	Field Strength (dBuV/m @3m)	Limit (dBuV/m @3m)	Results
960			43.2	<54	Pass
614			38.5	<46	Pass
902	Hopping (1.2M	External Attached	51.4	<102	Pass
928	OFDM) (Hybrid)	Colinear Omni 2.8dBi	47.3	<102	Pass
960			43.2	<54	Pass

		Band Edge Summary -	- Configuration 3		
Frequency (MHz)	Modulation	Ant. Type	Field Strength (dBuV/m @3m)	Limit (dBuV/m @3m)	Results
614			38.8	<46	Pass
902	10k GFSK	External Remote	80.4	<110	Pass
928	TOK GLOK	Colinear Omni 5.5dBI	77.3	<110	Pass
960			43.6	<54	Pass
614		External Remote	38.8	<46	Pass
902	50k GFSK	Colinear Omni 5.5dBI	73.4	<110	Pass
928	SUK GESK		70.8	<110	Pass
960			43.5	<54	Pass
614		External Remote	38.9	<46	Pass
902	150k GFSK	Colinear Omni 5.5dBI	70.9	<110	Pass
928	150K GFSK		72.8	<110	Pass
960			43.6	<54	Pass
614		External Remote	38.8	<46	Pass
902	6.25k OQPSK	Colinear Omni 5.5dBI	72.3	<110	Pass
928	6.25K UQPSK		74.5	<110	Pass
960			43.5	<54	Pass
614		External Remote	38.8	<46	Pass
902	13 F OODSV	Colinear Omni 5.5dBI	73.1	<110	Pass
928	12.5 OQPSK		73.4	<110	Pass
960			43.5	<54	Pass
614		External Remote	38.7	<46	Pass
902	200k OFDM	Colinear Omni 5.5dBI	76.2	<102	Pass
928	200k OFDM		72.9	<102	Pass
960			43.4	<54	Pass
614		External Remote	38.8	<46	Pass
902	COOK OFDM	Colinear Omni 5.5dBI	76.2	<102	Pass
928	600k OFDM		72.7	<102	Pass
960			43.4	<54	Pass
614		External Remote	38.7	<46	Pass
902	1.2M OFDM	Colinear Omni 5.5dBI	59.5	<102	Pass
928	(Hybrid)		50.5	<102	Pass
960			43.4	<54	Pass
614		External Remote	38.7	<46	Pass
902	Hopping (10k	Colinear Omni 5.5dBI	74.4	<110	Pass
928	GFSK)		74.9	<110	Pass
960			43.4	<54	Pass

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Frequency (MHz)	Modulation	Ant. Type	Field Strength (dBuV/m @3m)	Limit (dBuV/m @3m)	Results
614		External Remote	38.7	<46	Pass
902	Hopping (6.25k	Colinear Omni 5.5dBI	65.3	<110	Pass
928	OQPSK)		67.5	<110	Pass
960			43.5	<54	Pass
614		External Remote	38.7	<46	Pass
902	Hopping (200k	Colinear Omni 5.5dBI	70.3	<102	Pass
928	OFDM)		63.8	<102	Pass
960			43.5	<54	Pass
614		External Remote	38.8	<46	Pass
902	Hopping (1.2M	Colinear Omni 5.5dBI	52.9	<102	Pass
928	OFDM) (Hybrid)		47.5	<102	Pass
960			43.4	<54	Pass

Band Edge Summary – Configuration 4							
Frequency (MHz)	Modulation	Ant. Type	Field Strength (dBuV/m @3m)	Limit (dBuV/m @3m)	Results		
614	10k GFSK	External Remote Colinear Omni 8.15dBi with 3dB attenuator	38.9	<46	Pass		
902			94.7	<110	Pass		
928			76.55	<110	Pass		
960			43.4	<54	Pass		
614		External Remote Colinear Omni 8.15dBi with 3dB attenuator	39.0	<46	Pass		
902	50k GFSK		71.0	<110	Pass		
928			70.1	<110	Pass		
960			43.4	<54	Pass		
614		External Remote	38.9	<46	Pass		
902	150k C50k	Colinear Omni 8.15dBi	71.3	<110	Pass		
928	150k GFSK	with 3dB attenuator	71.0	<110	Pass		
960			43.4	<54	Pass		
614		External Remote	38.9	<46	Pass		
902	C 3EL CODCK	Colinear Omni 8.15dBi	71.1	<110	Pass		
928	6.25k OQPSK	with 3dB attenuator	71.2	<110	Pass		
960			43.5	<54	Pass		
614		External Remote	38.9	<46	Pass		
902	13 F OODSV	Colinear Omni 8.15dBi	70.6	<110	Pass		
928	12.5 OQPSK	with 3dB attenuator	71.7	<110	Pass		
960			43.6	<54	Pass		
614	200k OFDM	External Remote	38.8	<46	Pass		
902		Colinear Omni 8.15dBi	73.4	<102	Pass		
928		with 3dB attenuator	67.3	<102	Pass		
960			43.5	<54	Pass		
614	600k OFDM	External Remote	38.8	<46	Pass		
902		Colinear Omni 8.15dBi	73.0	<102	Pass		
928		with 3dB attenuator	65.8	<102	Pass		
960			43.5	<54	Pass		
614	1.2M OFDM	External Remote	38.8	<46	Pass		

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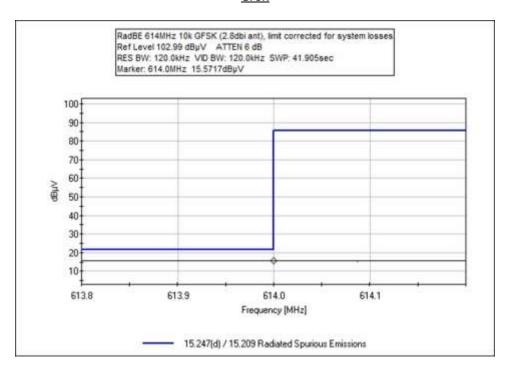
Frequency (MHz)	Modulation	Ant. Type	Field Strength (dBuV/m @3m)	Limit (dBuV/m @3m)	Results
902	(Hybrid)	Colinear Omni 8.15dBi	58.2	<102	Pass
928		with 3dB attenuator	47.5	<102	Pass
960			43.5	<54	Pass
614		External Remote	38.7	<46	Pass
902	Hopping (10k	Colinear Omni 8.15dBi	73.3	<110	Pass
928	GFSK)	with 3dB attenuator	70.9	<110	Pass
960			43.4	<54	Pass
614		External Remote	38.8	<46	Pass
902	Hopping (6.25k	Colinear Omni 8.15dBi	65.4	<110	Pass
928	OQPSK)	with 3dB attenuator	67.2	<110	Pass
960			43.4	<54	Pass
614		External Remote	38.7	<46	Pass
902	Hopping (200k	Colinear Omni 8.15dBi	67.9	<102	Pass
928	OFDM)	with 3dB attenuator	61.0	<102	Pass
960			43.5	<54	Pass
614		External Remote	38.8	<46	Pass
902	Hopping (1.2M	Colinear Omni 8.15dBi	55.4	<102	Pass
928	OFDM) (Hybrid)	with 3dB attenuator	45.8	<102	Pass
960			43.5	<54	Pass

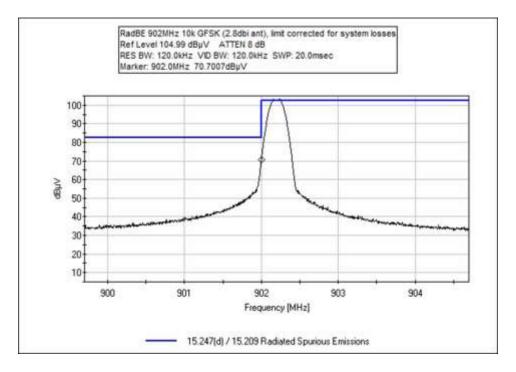
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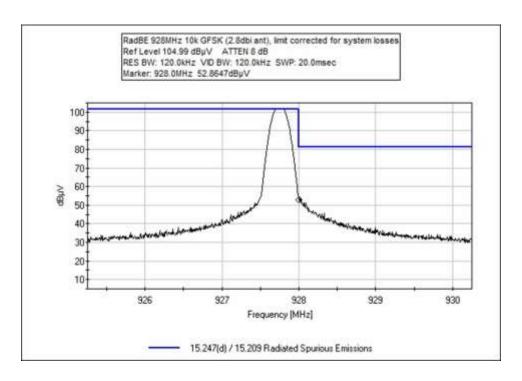
# Band Edge Plots Configuration 2

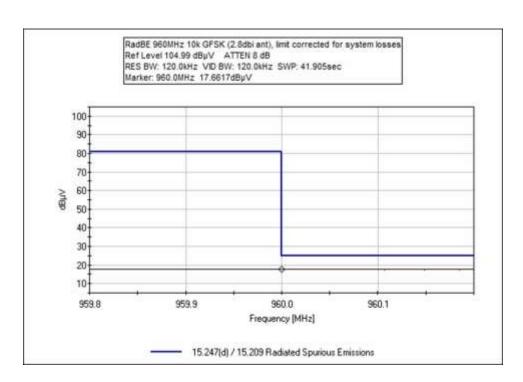
#### **GFSK**



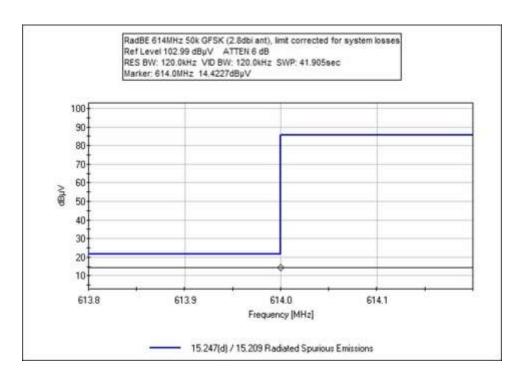


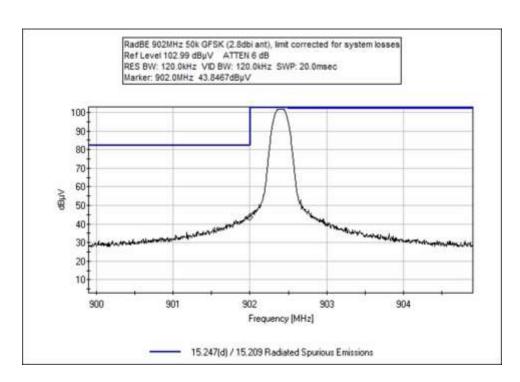




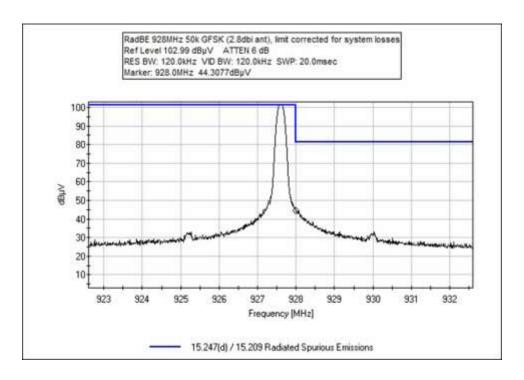


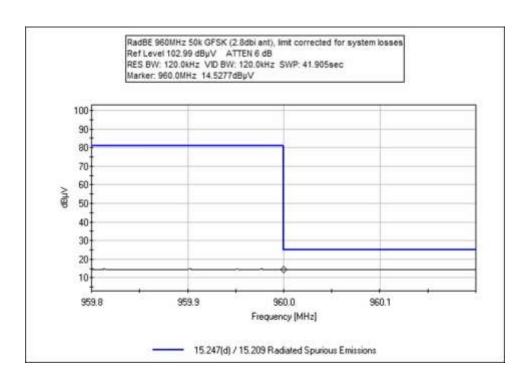




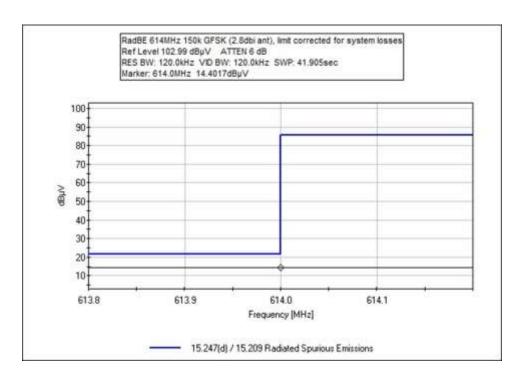


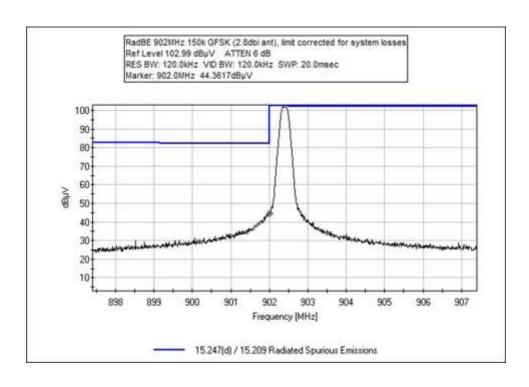




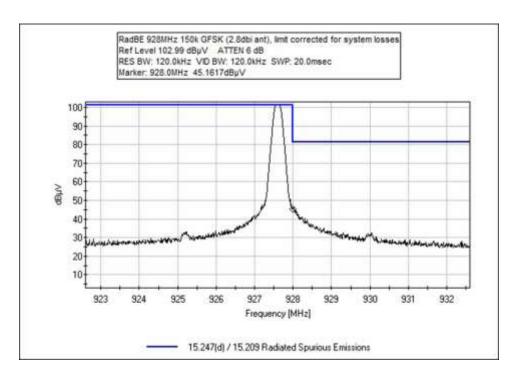


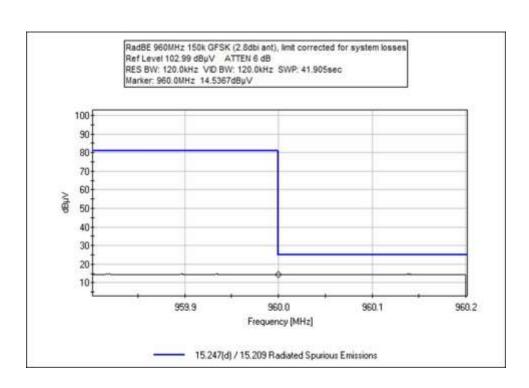






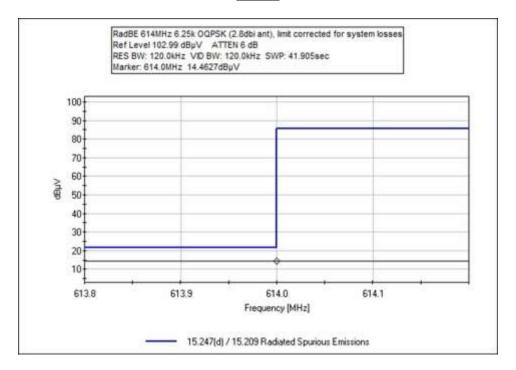


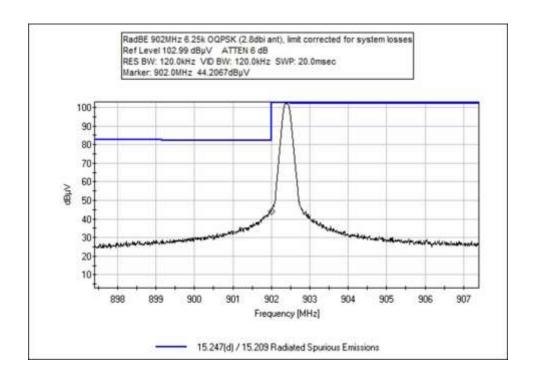




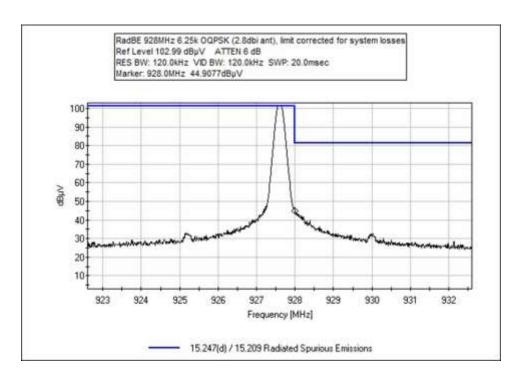


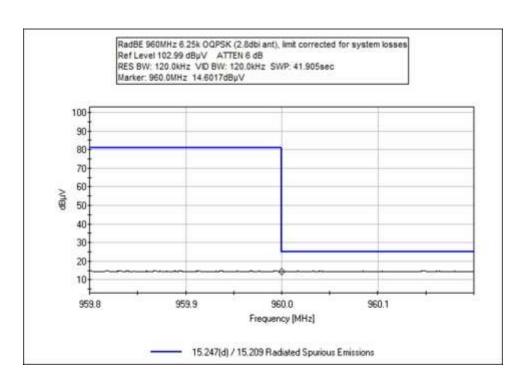
#### **OQPSK**



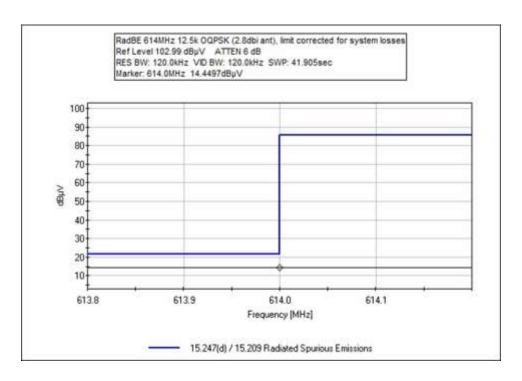


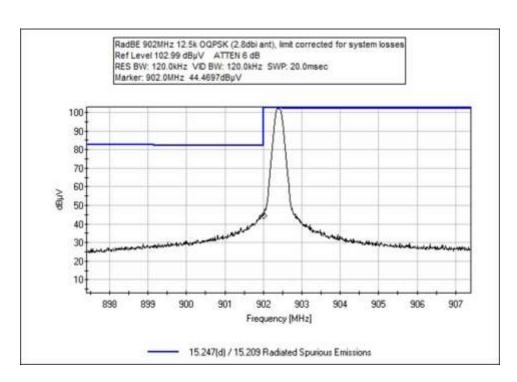




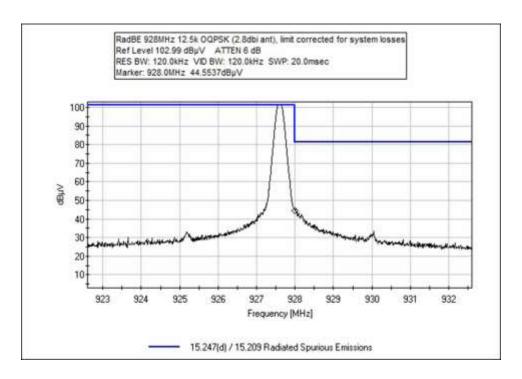


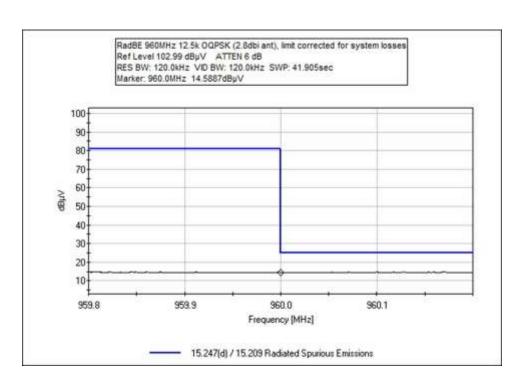






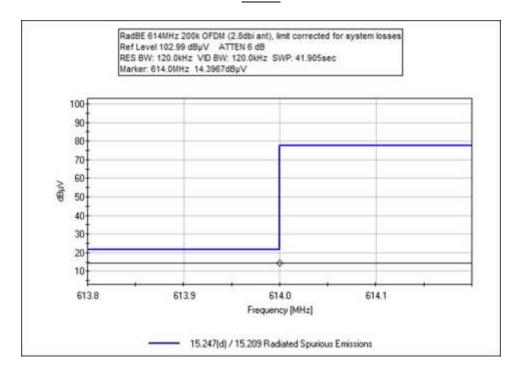


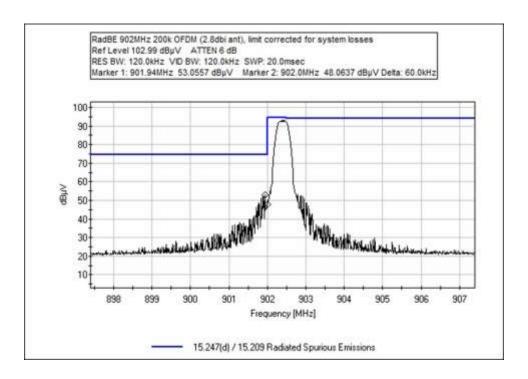




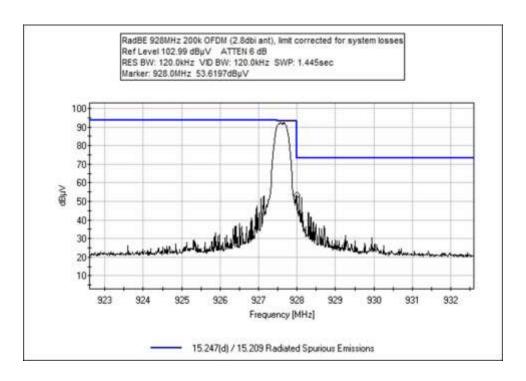


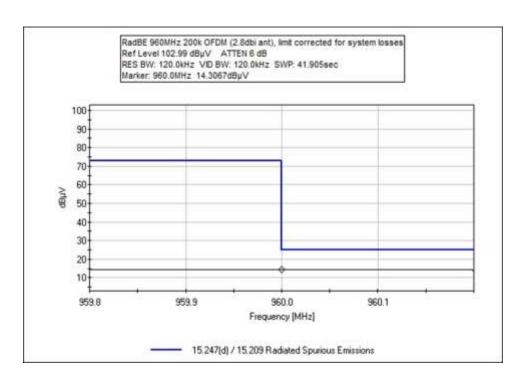
#### **OFDM**



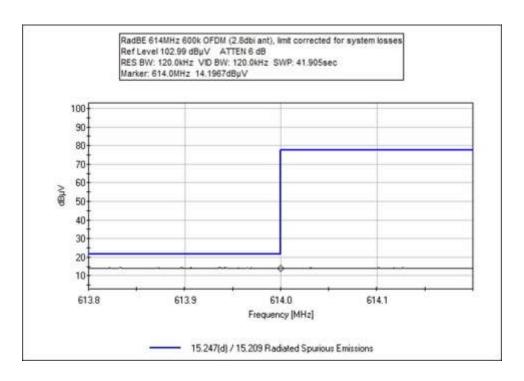


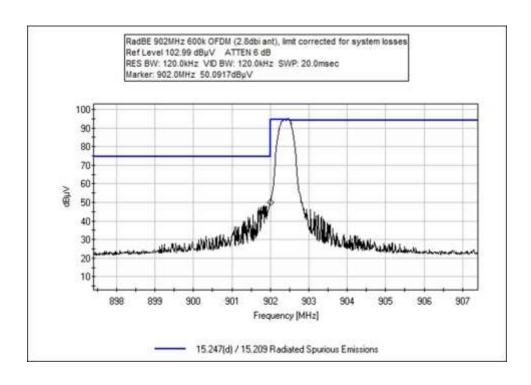




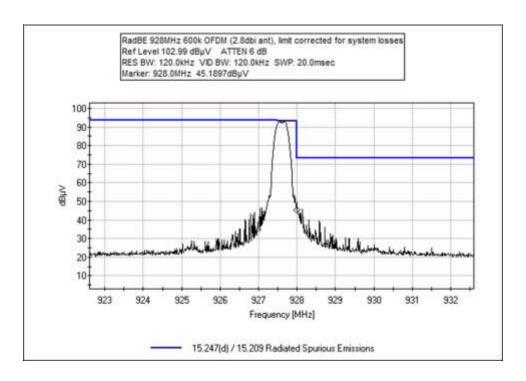


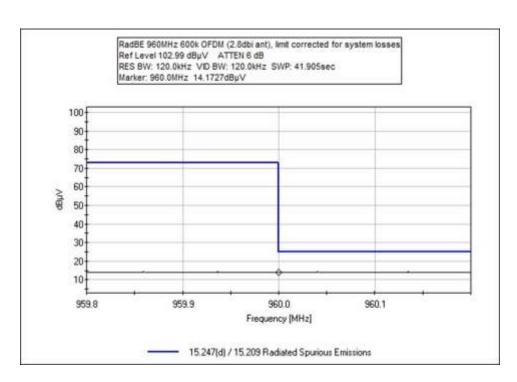




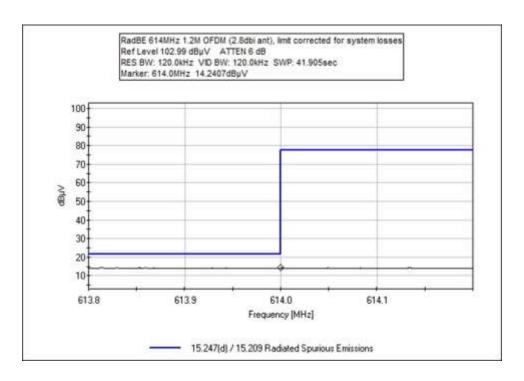


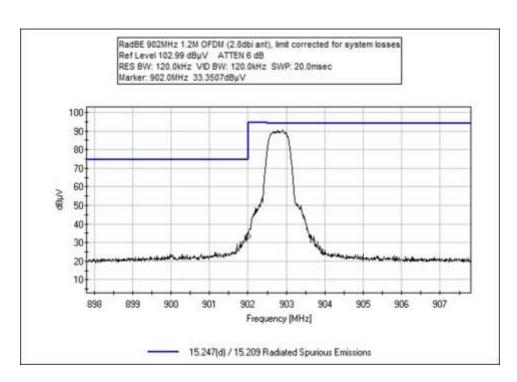




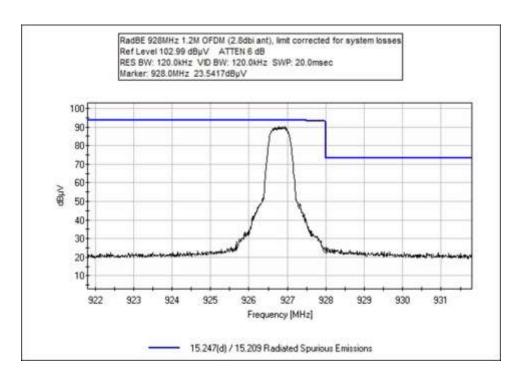


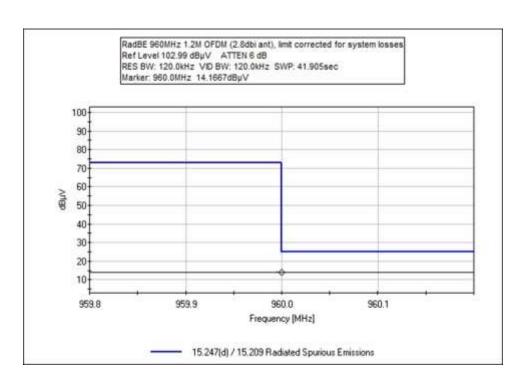






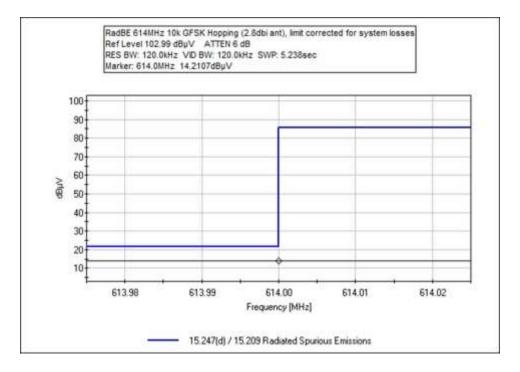


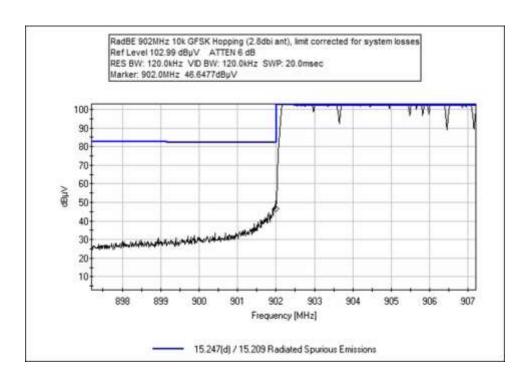






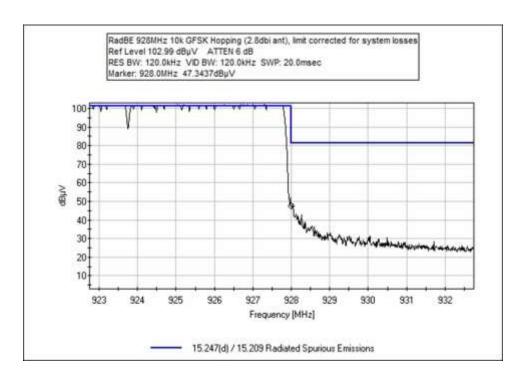
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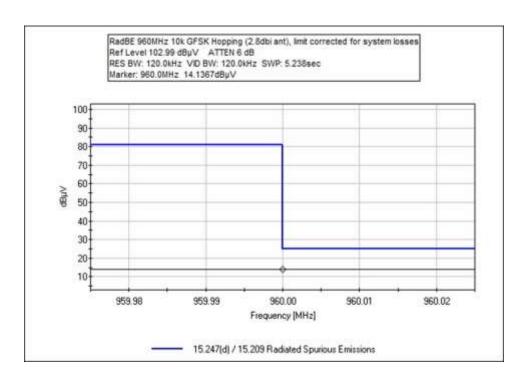




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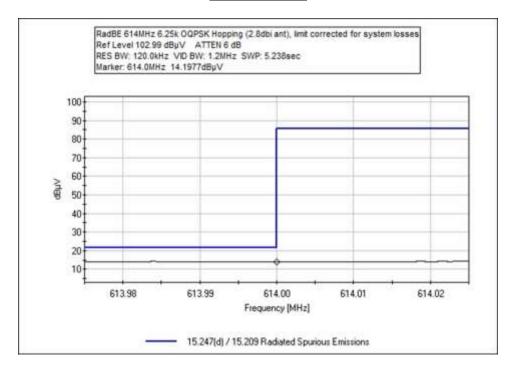


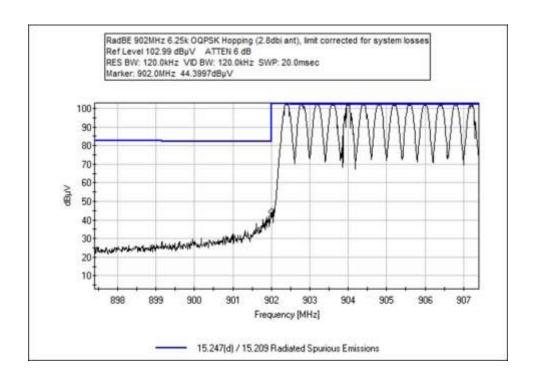




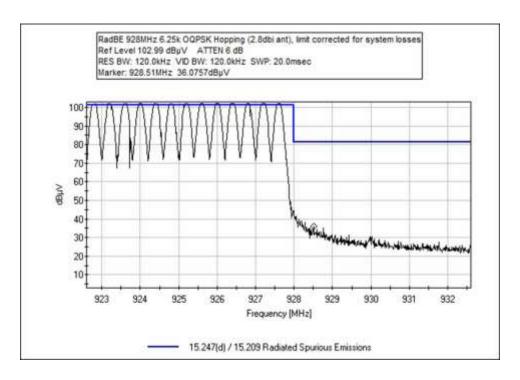


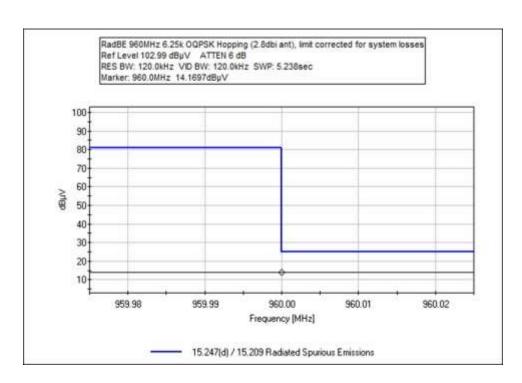
## **OQPSK Hopping**





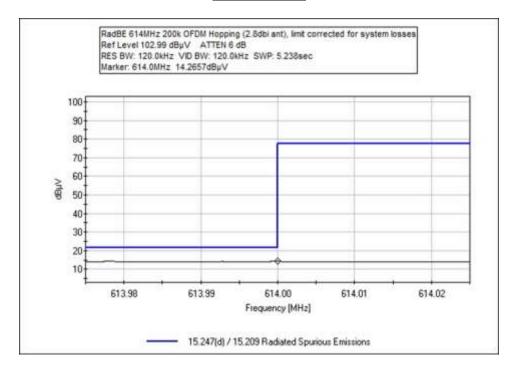


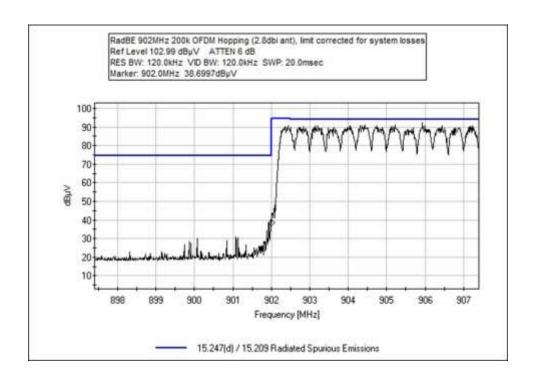




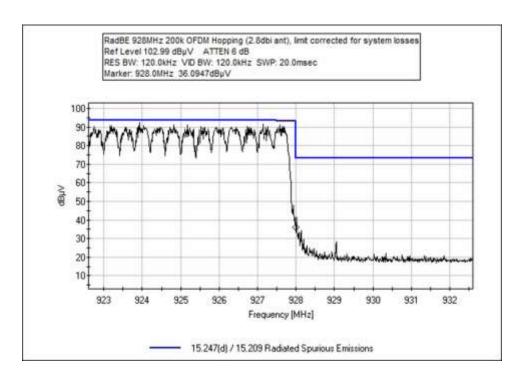


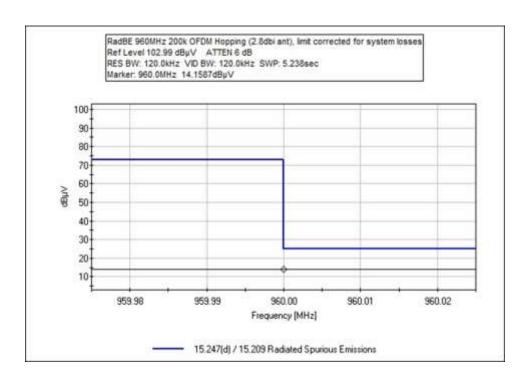
## **OFDM Hopping**



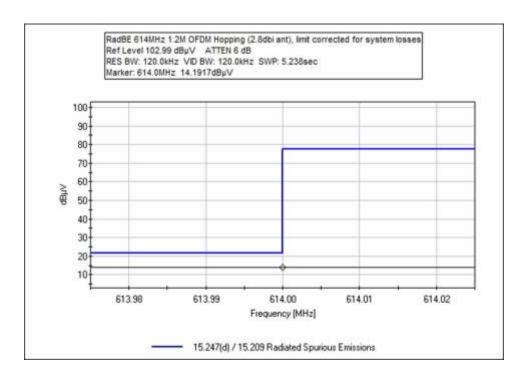


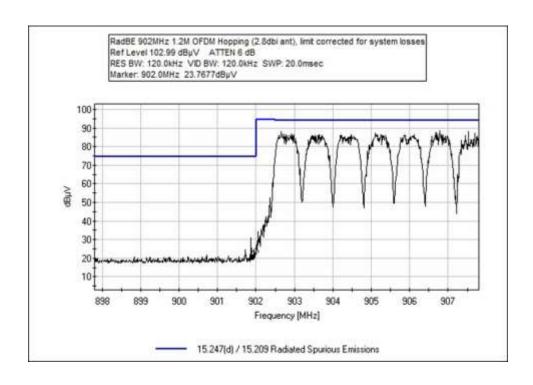




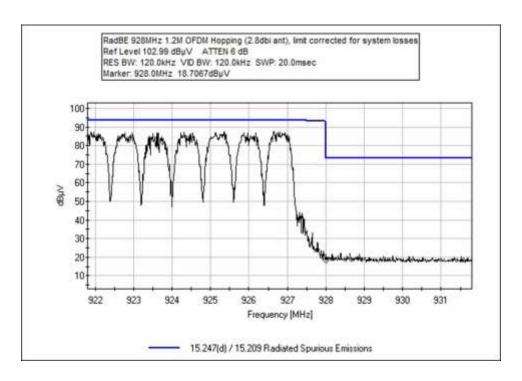


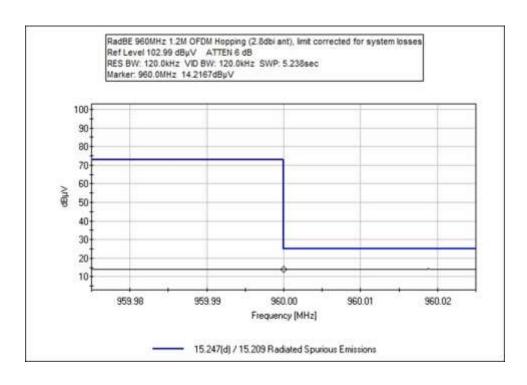








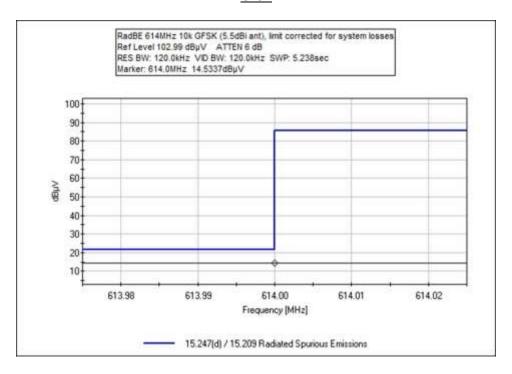


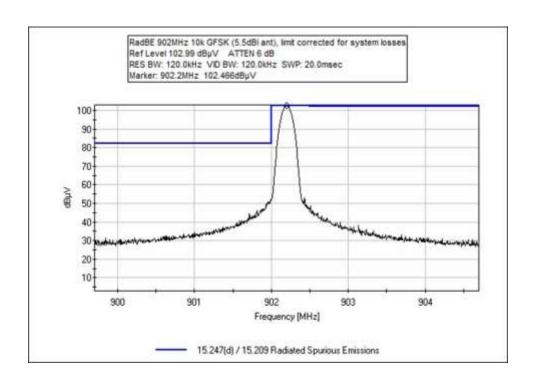




# **Configuration 3**

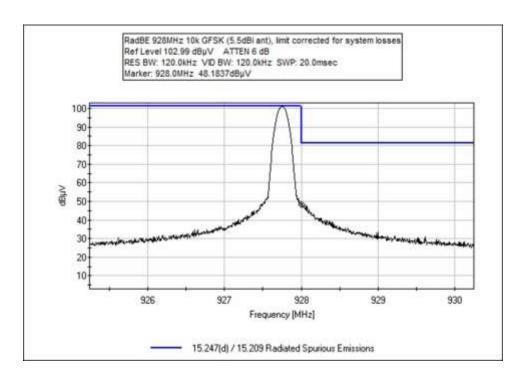
## **GFSK**

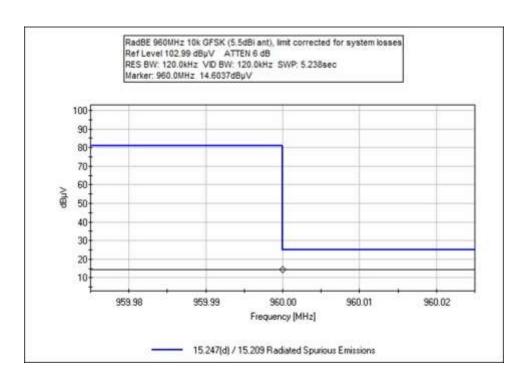




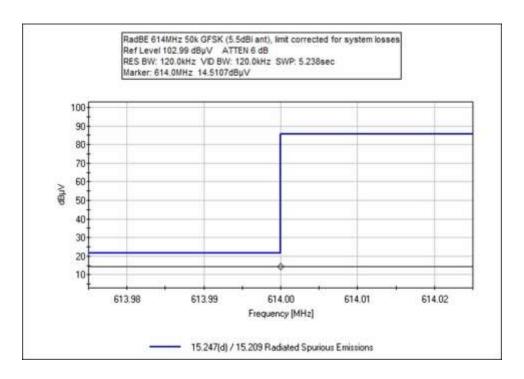
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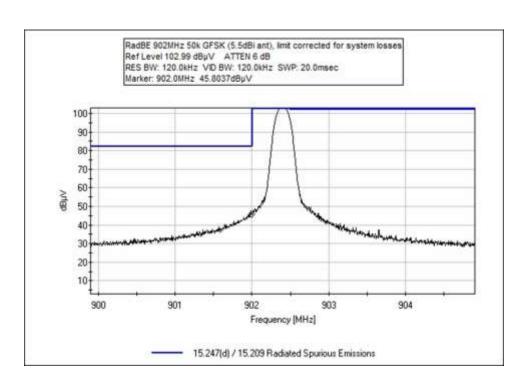




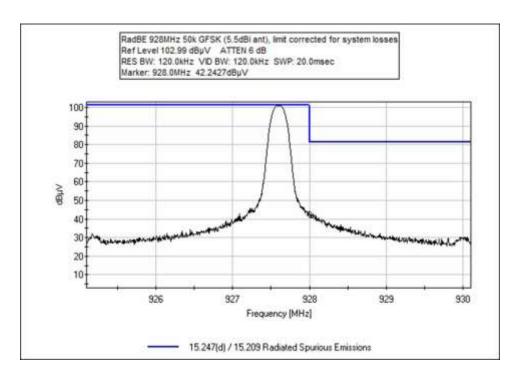


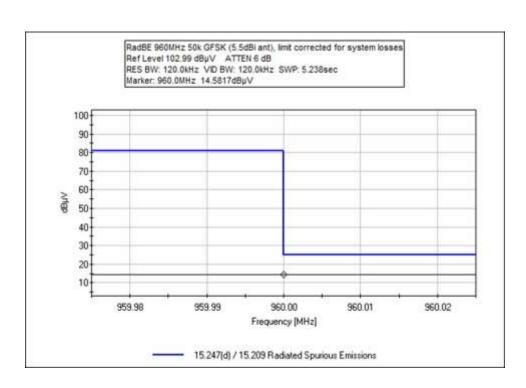




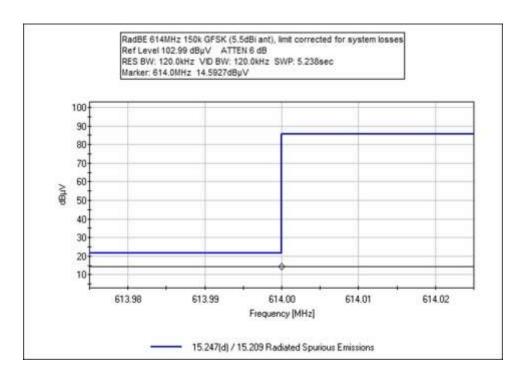


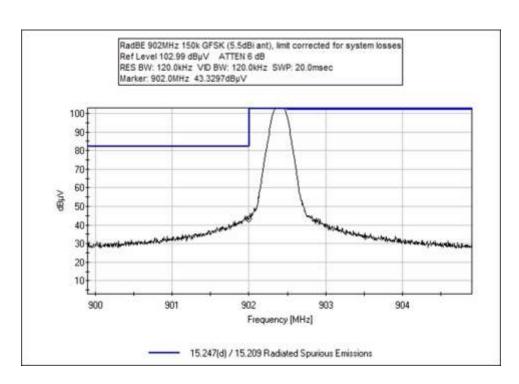




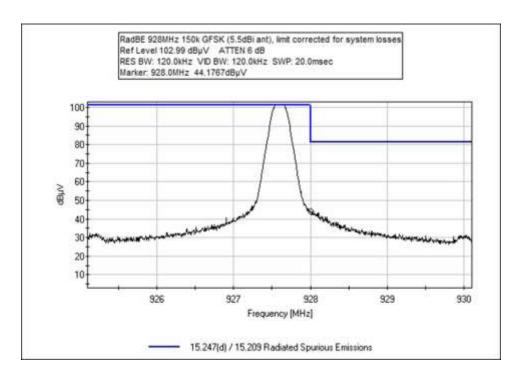


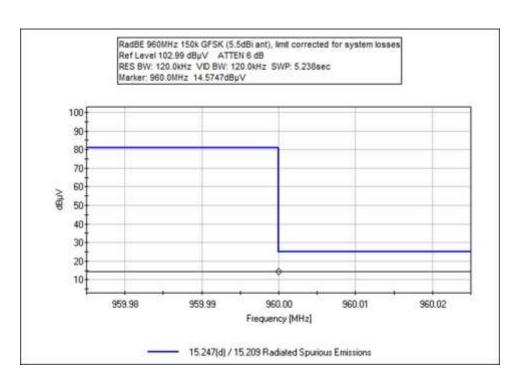














## **OQPSK**

