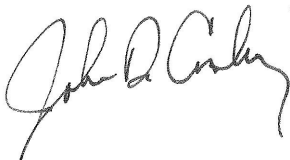
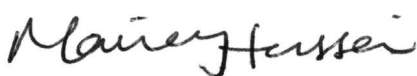




Test Report

Curtis-Straus LLC, a wholly owned subsidiary of BV CPS

Report No	EM0283-1
Client	DogWatch Inc.
Address	10 Michigan Drive Natick, MA 01760
Phone	508 - 650 - 0600
Items tested FCC ID FRN	Firefly L66DWFBLSH2 0018536615
Equipment Type Equipment Code	Part 15.247 Frequency Hopper DSS
FCC/IC Rule Parts	47 CFR 15.247, RSS 210 issue 8 and RSS GEN issue 3
Test Dates	March 24-25, 2012
Results	As detailed within this report
Prepared by	 John Cushing – Test Engineer
Authorized by	 Mairaj Hussain – EMC Supervisor
Issue Date	<u>May 18, 2012</u>
Conditions of Issue	This Test Report is issued subject to the conditions stated in the 'Conditions of Testing' section on page 34 of this report.

Curtis-Straus LLC is accredited by the American Association for Laboratory Accreditation for the specific scope of accreditation under Certificate Number 1627-01. This report may contain data which is not covered by the A2LA accreditation.



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Form Final Report REV 7-20-07 (DW)



Summary

This test report supports an application for certification of a transmitter operating pursuant to 47 CFR 15.247 and RSS-210. The product is the Firefly. It is a frequency hopping transmitter that operates in the range 917-927MHz.

We found that the product met the above requirements without modification. Fred Peterson from DogWatch Inc. was present during the testing. The test sample was received in good condition.

The EUT does not operate while in charging mode. Charging mode was tested for verification.

Test Methodology

Radiated emission and AC Line conducted testing was performed according to the procedures specified in ANSI C63.10 (2009) and C63.4 (2009) and RSS-GEN Issue 3. Radiated Emissions were maximized by rotating the device around three orthogonal axes as well as varying the test antenna's height and polarity. The device antenna cannot be maximized separately.

Conducted emission at the antenna port was performed, as required by rule section.

EUT operates at 120Vac 60Hz

Low operating channel frequency = 917MHz

Mid operating channel frequency = 922MHz

High operating channel frequency = 927MHz

The following bandwidths were used during radiated spurious and line conducted emissions.

Frequency	RBW	VBW
0.15-30MHz	9kHz	30kHz
30-1000MHz	120kHz	1MHz
1-25GHz	1MHz	3MHz

Release Control Record

Issue No.	Reason for change	Date Issued
1	Original Release	May 18, 2012



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page 3 of 35

Product Tested - Configuration Documentation

EUT Configuration										
Work Order: EM0283-1 Company: DogWatch Inc. Company Address: 10 Michigan Drive Natick, MA 01760 Contact: Fred Peterson Person Present: Fred Peterson										
MN			PN			SN				
EUT: BL100C						Sample 1				
Power Supply: SP5-0501000-NA						Sample 1				
EUT Description: Collar Unit										
EUT TX Frequency: 917-927MHz										
Support Equipment:			MN			SN				
None										
EUT Ports:										
Port Label	Port Type	No. of ports	No. Populated	Cable Type	Shielded	Ferrites	Length	Max Length	In/Out NEBS Type	Unpopulated Reason
DC Charging Port	DC	1	All	DC	No	None	8ft	8ft	In	NA
Software / Operating Mode Description:										
Running diag software to set channel, TX/RX mode, hopping mode.										



BUREAU
VERITAS

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Testing Cert. No. 1627-01

Statement of Conformity

The Firefly has been found to conform to the following parts of 47 CFR and RSS 210 as detailed below:

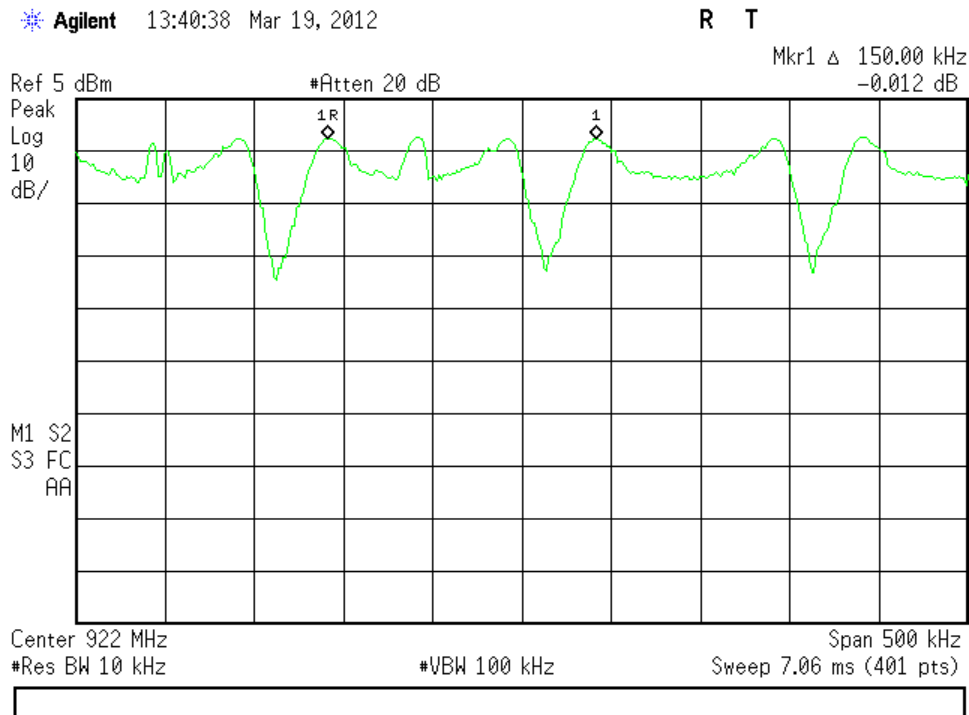
RSS-GEN	RSS 210	Part 15	Comments
5.3		15.15(b)	There are no controls accessible to the user that varies the output power.
5.2		15.19	The label is shown in the label exhibit.
7.1.5		15.21	Information to the user is shown in the instruction manual exhibit.
		15.27	No special accessories are required for compliance.
		15.31	The EUT was tested in accordance with the measurement standards in this section.
		15.33	Frequency range was investigated according to this section, unless noted in specific rule section under which the equipment operates.
		15.35	The EUT emissions were measured using the measurement detector and bandwidth specified in this section, unless noted in specific rule section under which the equipment operates.
7.1.4		15.203	The antenna for this device is printed on the PCB.
	2.6	15.205 15.209	The fundamental is not in a Restricted band and the spurious and harmonic emissions in the Restricted bands comply with the general emission limits of 15.209.
7.2.2		15.207	EUT meets the AC Line conducted emissions requirements of 15.207.
	Annex 8	15.247	The unit complies with the requirements of 15.247
4.6.1			Occupied Bandwidth measurements were made.

Test Results

Channel Separation

"Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25kHz or the 20dB bandwidth of the hopping channel whichever is greater."
[15.247(a)(1)]

The channels are separated by 150kHz, which is greater than the 20dB bandwidth



20dB Bandwidth Limit

"The maximum allowed 20dB bandwidth of the hopping channel is 500kHz."
[15.247(a)(i)(1)]

MEASUREMENTS / RESULTS

20dB Bandwidth				
Test Engineer: John Cushing Spectrum Analyzer: Rental #2 Site: Chamber 2 Temp: 25 °C Humidity: 21% Pressure: 1016mBar				
Channel	Frequency (MHz)	Bandwidth (kHz)	Limit (kHz)	Result
Low	917	118.5	500	Pass
Mid	922	119.5	500	Pass
High	927	117	500	Pass

3/17/2012							
Spectrum Analyzers / Receivers / Preselectors	Range	MN	Mfr	SN	Asset	Cat	Calibration Due
Rental SA #2	9kHz-26.5 GHz	E7405A	Agilent	MY45104194	rental	I	1/5/2013
Preamps / Couplers Attenuators / Filters	Range	MN	Mfr	SN	Asset	Cat	Calibration Due
HF 20dB 50W Attenuator	0.009-18 GHz	PE 7019-20	Pasternack	1	791	II	6/1/2013
Meteorological Meters		MN	Mfr	SN	Asset	Cat	Calibration Due
Temp./Humidity/Atm. Pressure Gauge		7400 Perception II	Davis	N/A	965	I	4/4/2013
CHAMBER2 Thermohygrometer		35519-044	Control Company	72457639	1347	II	8/19/2013

All equipment is calibrated using standards traceable to NIST or other nationally recognized calibration standard.

Low Channel



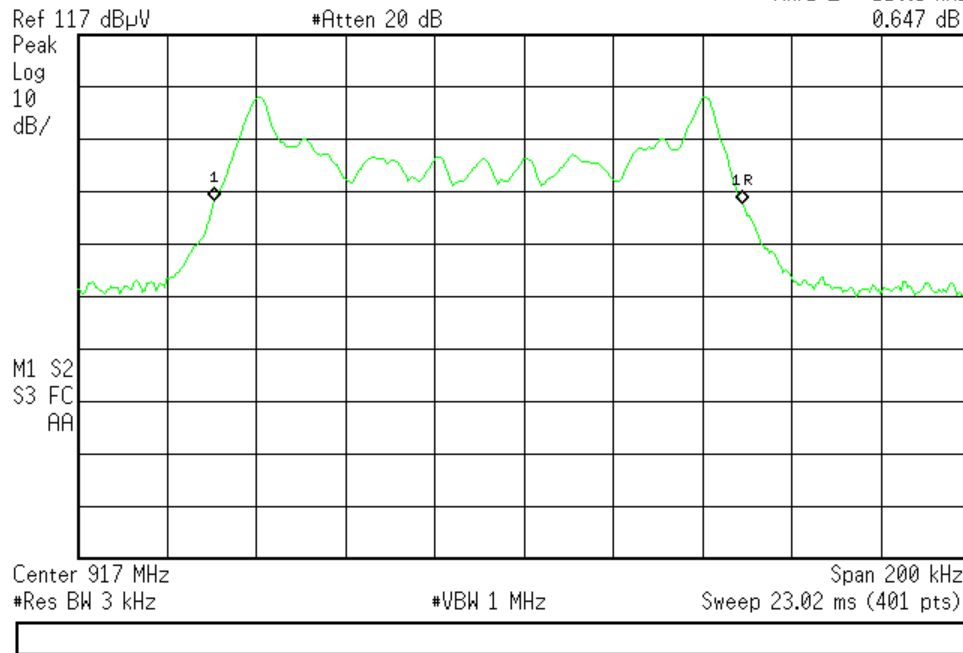
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Agilent 11:54:27 Mar 19, 2012

R T

Mkr1 Δ -118.5 kHz
0.647 dB

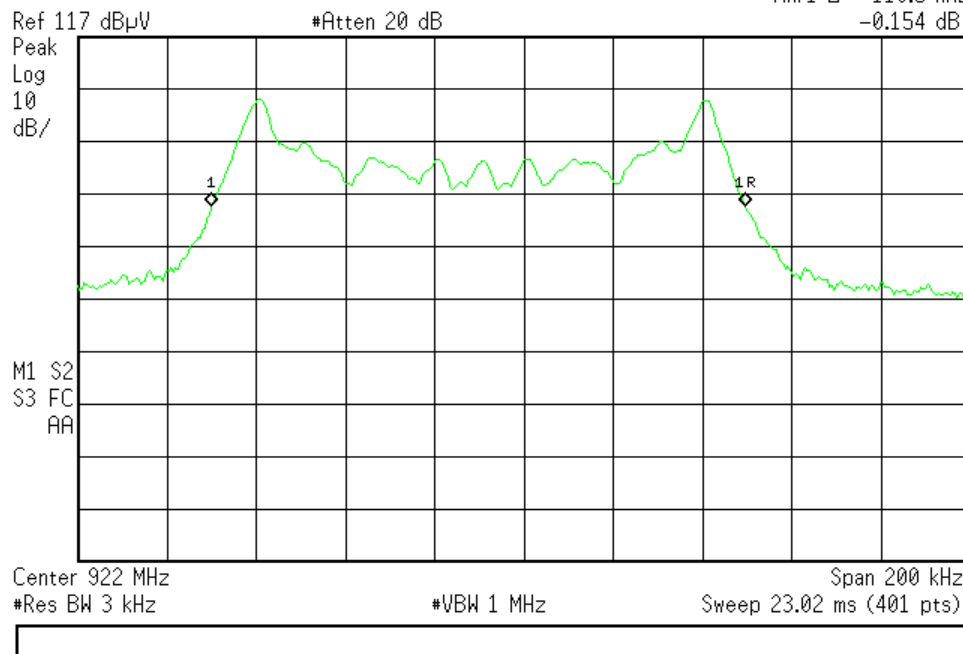


Mid Channel

Agilent 12:01:14 Mar 19, 2012

R T

Mkr1 Δ -119.5 kHz
-0.154 dB



High Channel



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Agilent 12:04:23 Mar 19, 2012

R T

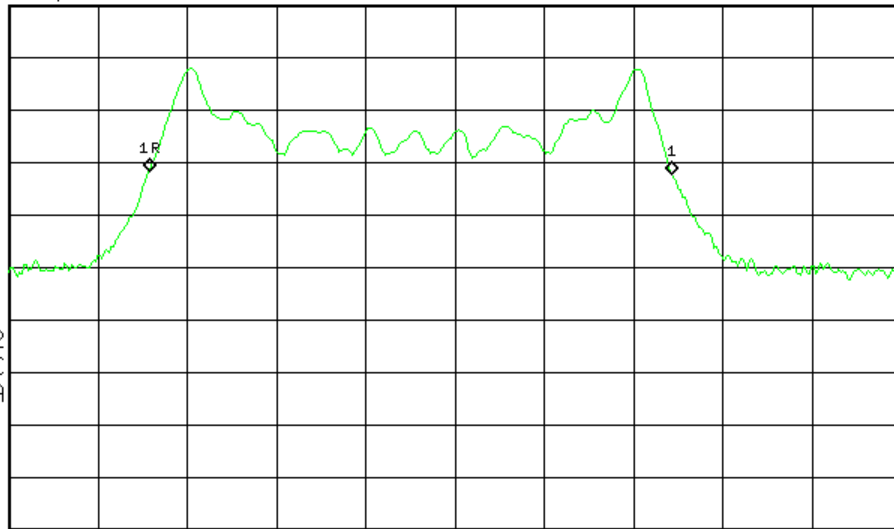
Mkr1 Δ 117.0 kHz
-0.519 dB

Ref 117 dB μ V

#Atten 20 dB

Peak
Log
10
dB/

M1 S2
S3 FC
AA



Center 927 MHz

#Res BW 3 kHz

#VBW 1 MHz

Span 200 kHz
Sweep 23.02 ms (401 pts)

Peak Power**LIMIT**

Conducted Output Power

1 Watt

[15.247(b) (2)]

MEASUREMENTS / RESULTS**DATA TABLE**

30dBm = 1Watt

Power Option 1

Peak Output Power

Test Engineer: John Cushing
 Spectrum Analyzer: Rental #2
 Site: Chamber 2
 Temp: 25°C
 Humidity: 21%
 Pressure: 1016mBar

Channel	Frequency (MHz)	Reading (dBm)	Attenuator Factor (dB)	Adjusted Reading (dBm)	Limit (dBm)	Result
Low	917	-2.355	19.6	17.245	30	Pass
Mid	922	-2.346	19.6	17.254	30	Pass
High	927	-2.38	19.6	17.22	30	Pass

3/17/2012							
Spectrum Analyzers / Receivers / Preselectors		Range	MN	Mfr	SN	Asset	Cat
Rental SA #2		9kHz-26.5 GHz	E7405A	Agilent	MY45104194	rental	I
Calibration Due							1/5/2013
Preamps / Couplers Attenuators / Filters		Range	MN	Mfr	SN	Asset	Cat
HF 20dB 50W Attenuator		0.009-18 GHz	PE 7019-20	Pasternack	1	791	II
Calibration Due							6/1/2013
Meteorological Meters			MN	Mfr	SN	Asset	Cat
Temp./Humidity/Atm. Pressure Gauge			7400 Perception II	Davis	N/A	965	I
CHAMBER2 Thermohygrometer			35519-044	Control Company	72457639	1347	II
Calibration Due							4/4/2013
							8/19/2013

All equipment is calibrated using standards traceable to NIST or other nationally recognized calibration standard.

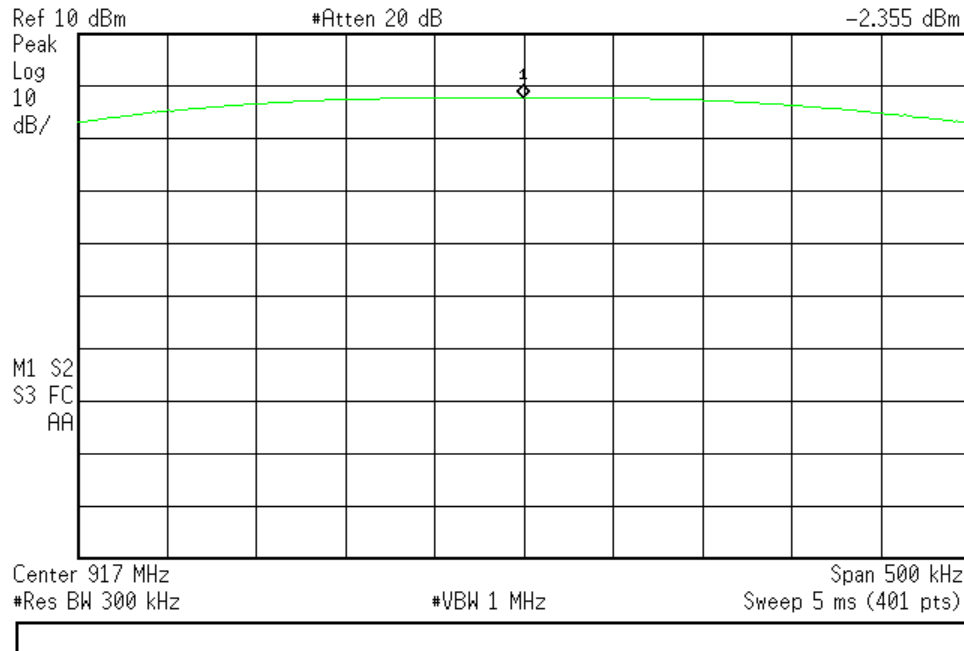


PLOTS

Low Channel

Agilent 12:14:58 Mar 19, 2012

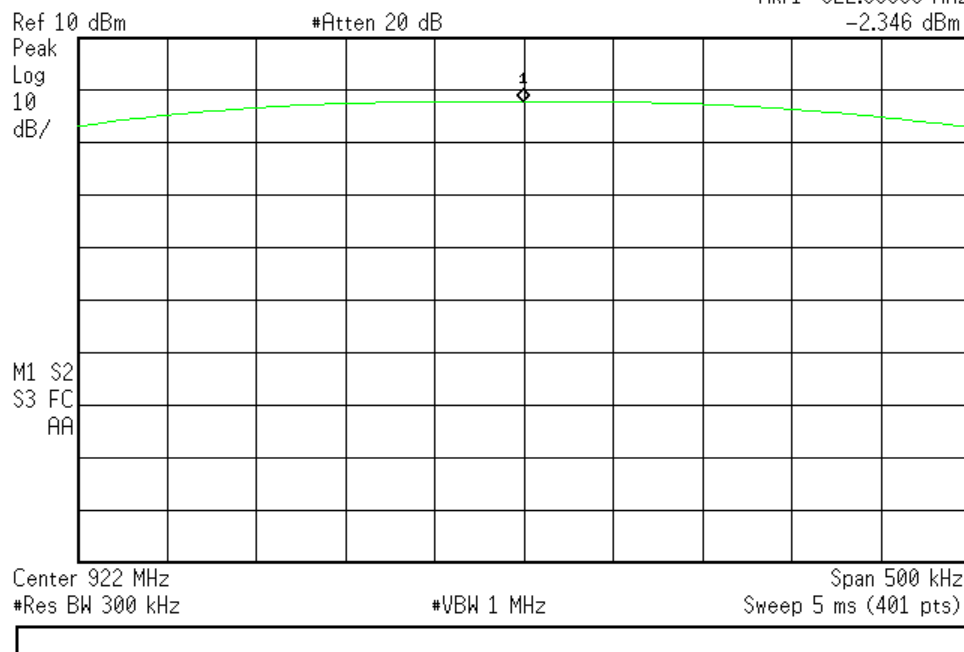
R T

Mkr1 917.00000 MHz
-2.355 dBm

Mid Channel

Agilent 12:13:38 Mar 19, 2012

R T

Mkr1 922.00000 MHz
-2.346 dBm

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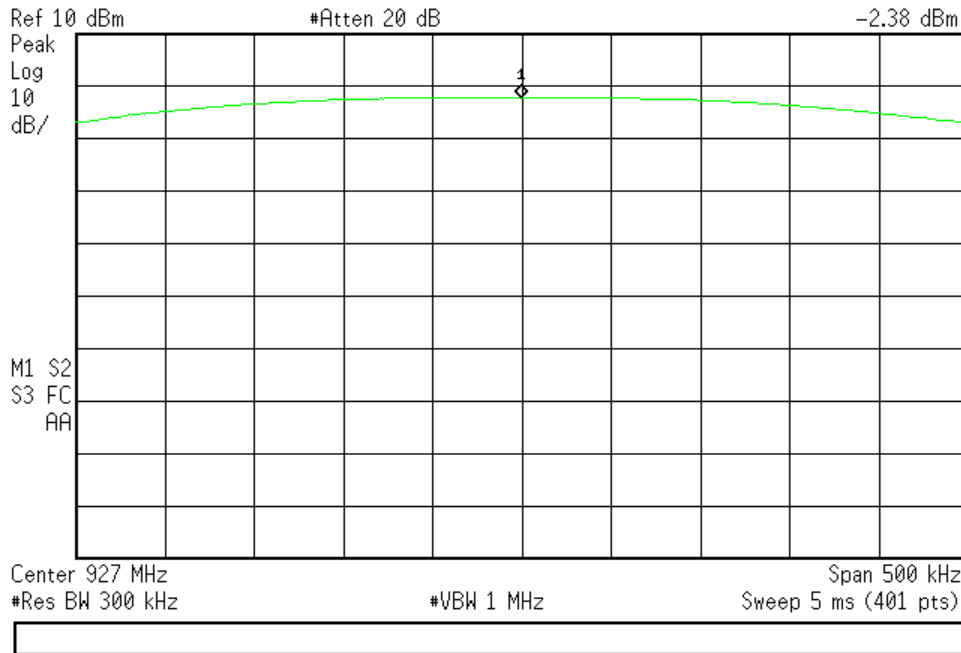


High Channel

Agilent 12:12:01 Mar 19, 2012

R T

Mkr1 927.00000 MHz
-2.38 dBm



Band Edge Measurements

LIMITS

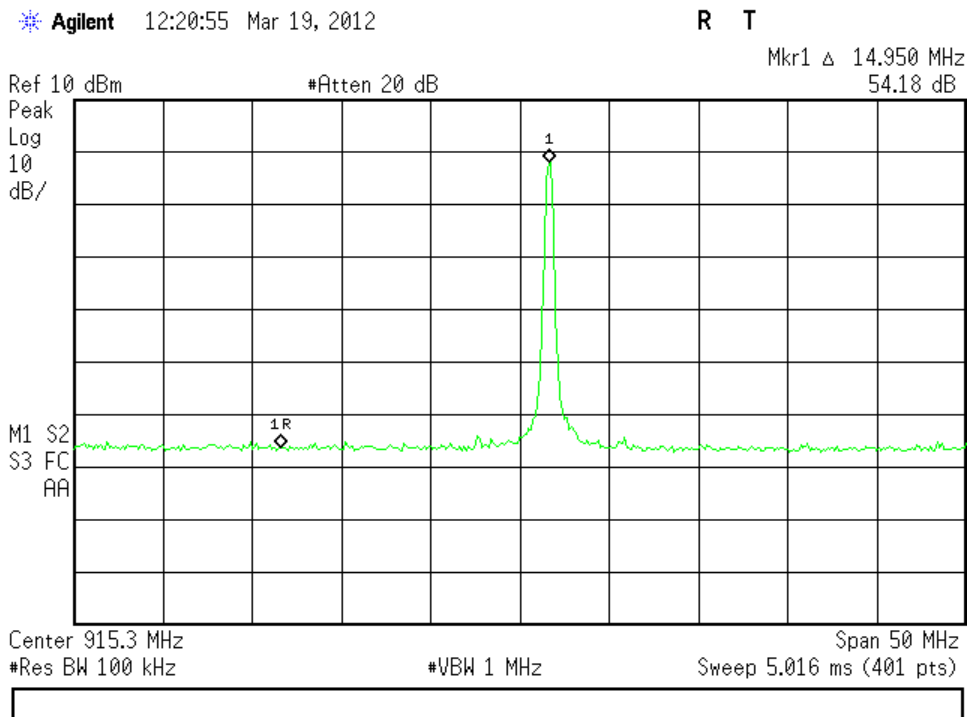
In any 100kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that...the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval,...the attenuation required under this paragraph shall be 30dB..

[15.247(d)]

MEASUREMENTS / RESULTS

PLOTS

Low Channel



High Channel

Agilent 12:24:44 Mar 19, 2012

R T

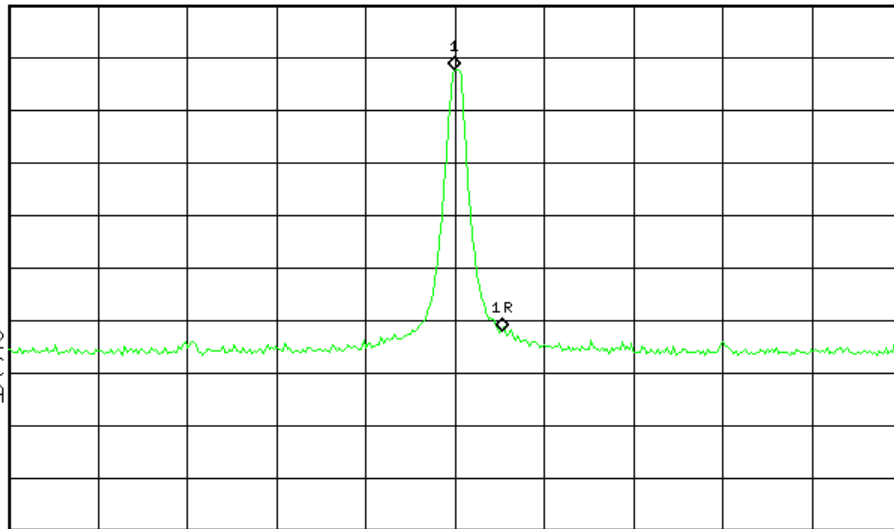
Mkr1 Δ -1.05 MHz
49.75 dB

Ref 10 dBm

#Atten 20 dB

Peak
Log
10
dB/

M1 S2
S3 FC
AA



Center 927 MHz

#Res BW 100 kHz

#VBW 1 MHz

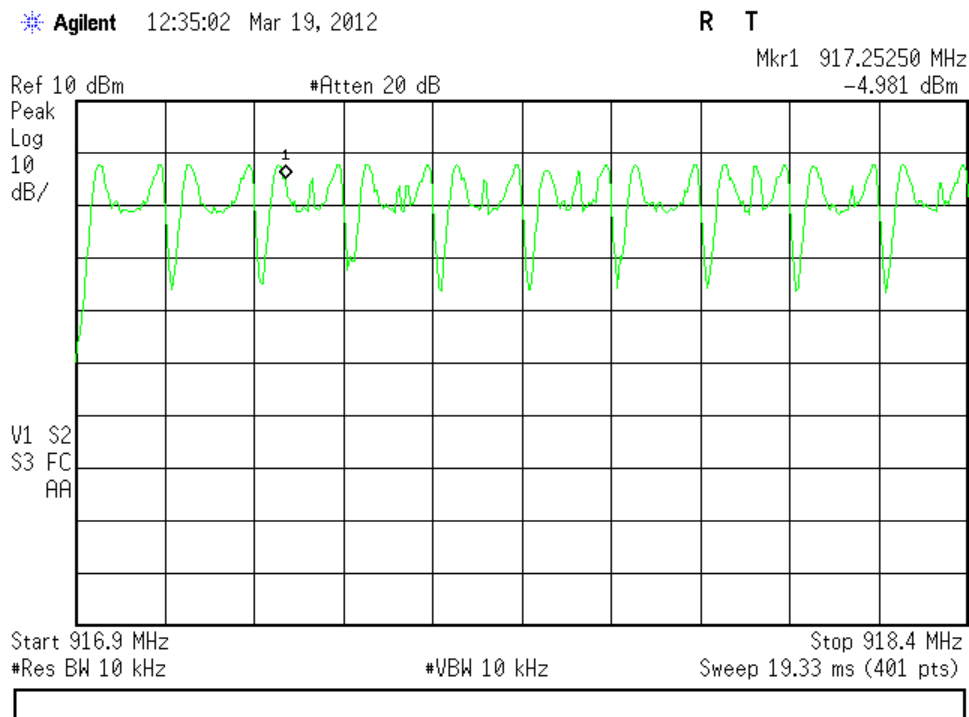
Span 20 MHz
Sweep 4 ms (401 pts)

Number of Hopping Channels

“For frequency hopping systems operating in the 902-928MHz band: if the 20dB bandwidth of the hopping channel is less than 250kHz, the system shall use at least 50 hopping frequencies.”
[15.247(a)(1)(i)]

Plots

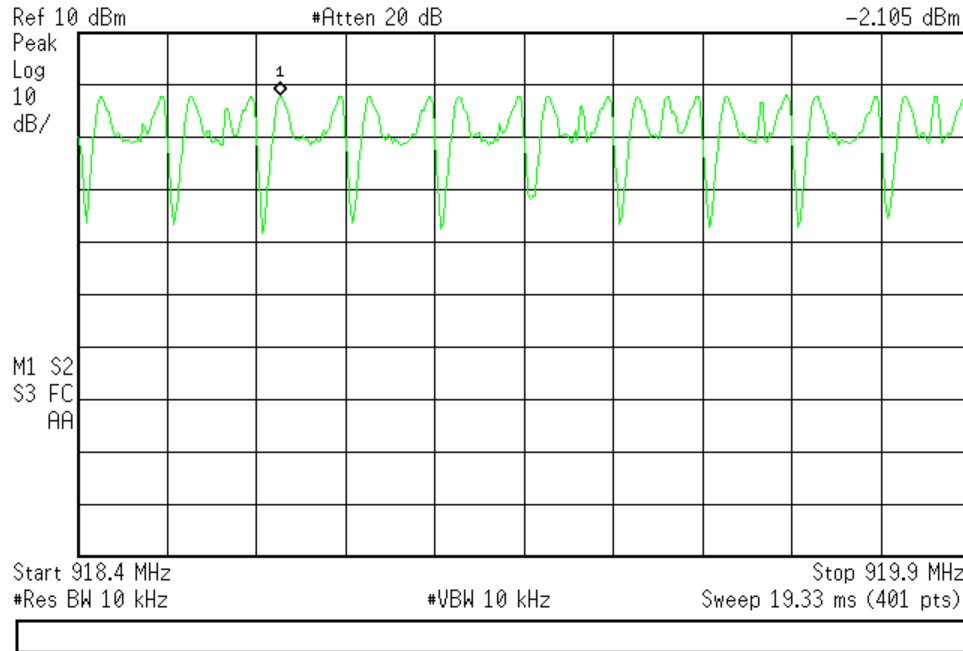
The system employs 64 hopping frequencies



Agilent 12:37:45 Mar 19, 2012

R T

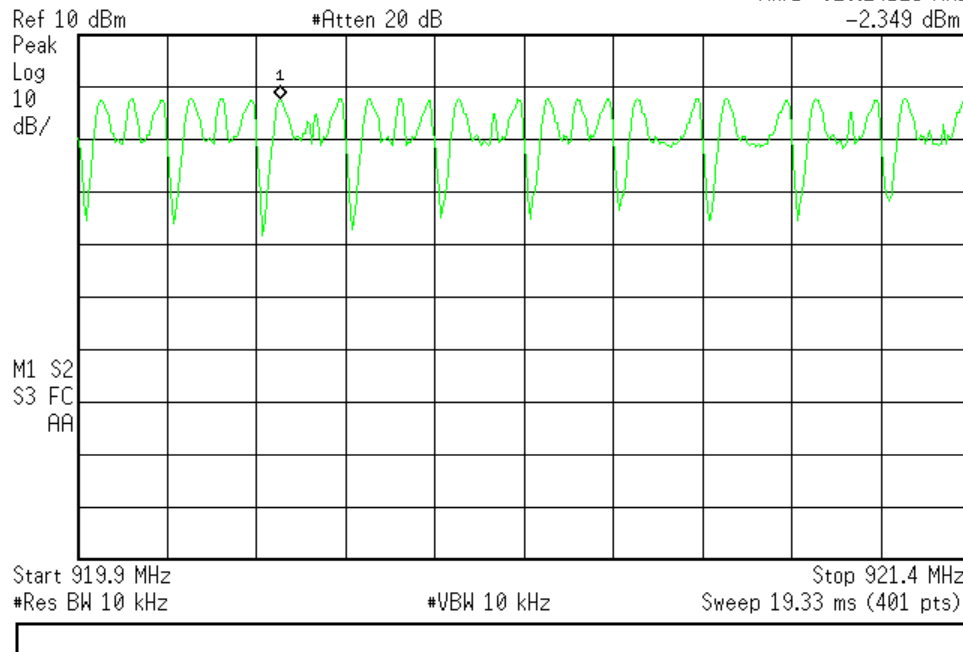
Mkr1 918.74125 MHz
-2.105 dBm



Agilent 12:40:06 Mar 19, 2012

R T

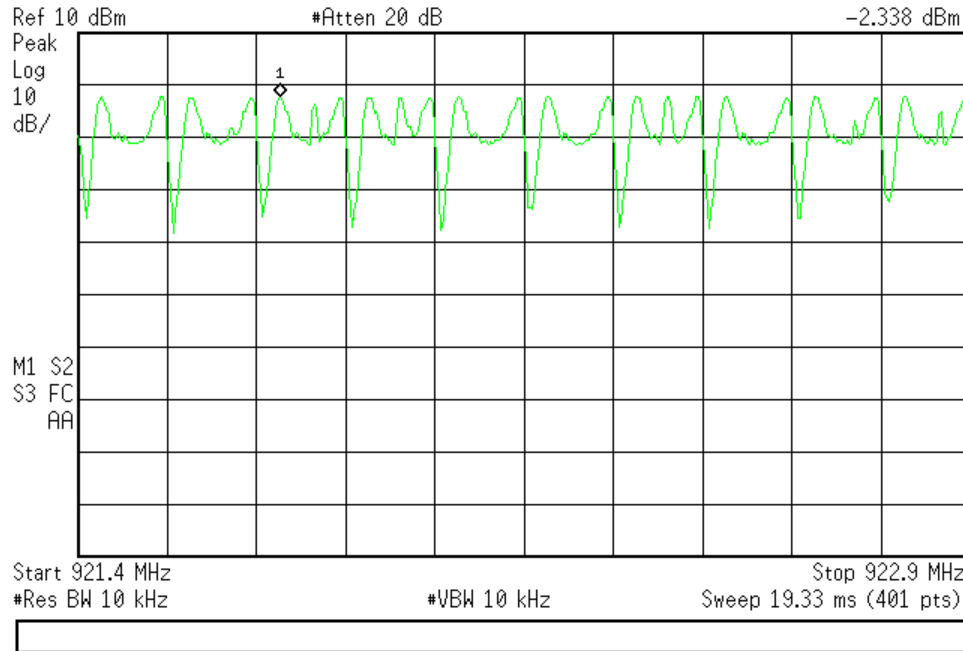
Mkr1 920.24125 MHz
-2.349 dBm



Agilent 12:42:22 Mar 19, 2012

R T

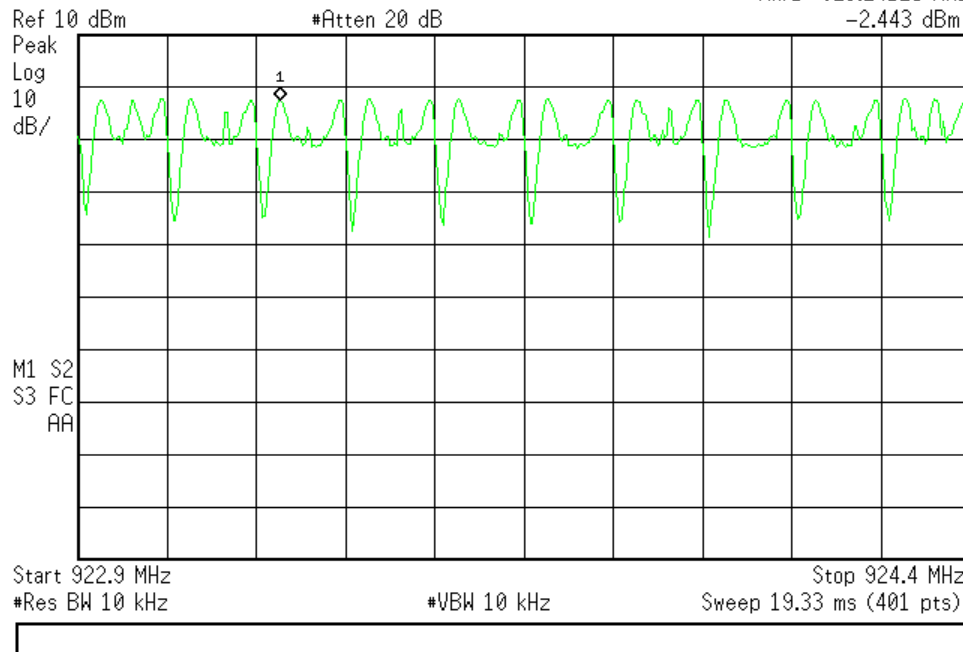
Mkr1 921.74125 MHz
-2.338 dBm



Agilent 12:44:20 Mar 19, 2012

R T

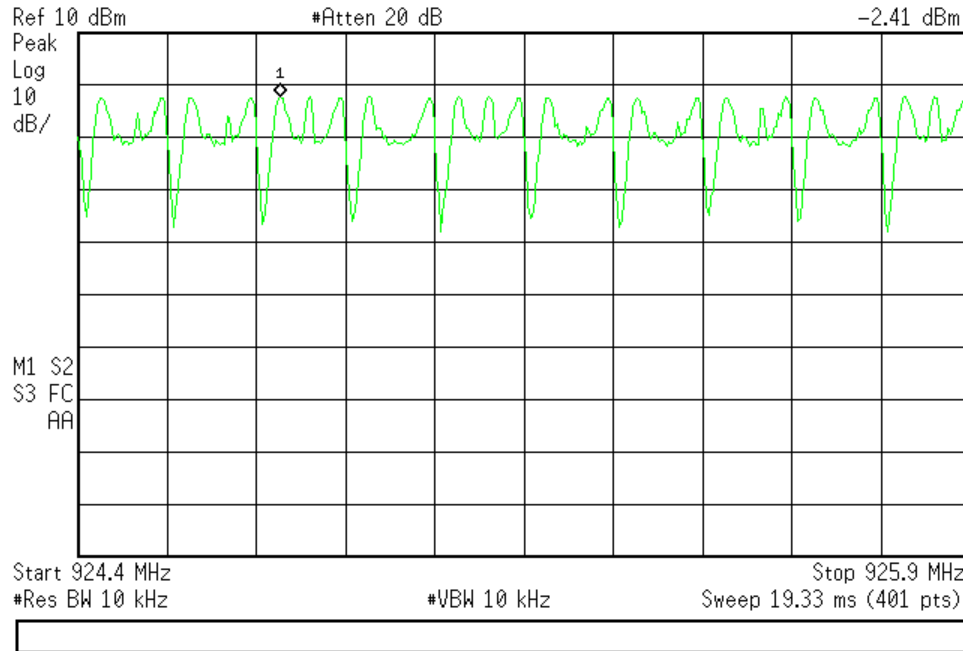
Mkr1 923.24125 MHz
-2.443 dBm



Agilent 12:48:03 Mar 19, 2012

R T

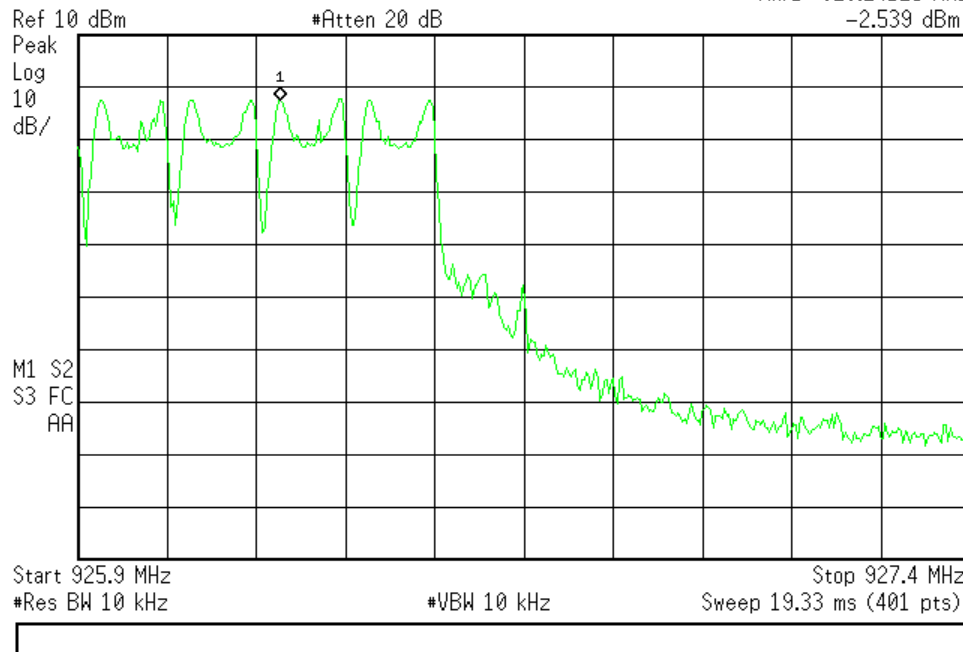
Mkr1 924.74125 MHz
-2.41 dBm



Agilent 12:49:40 Mar 19, 2012

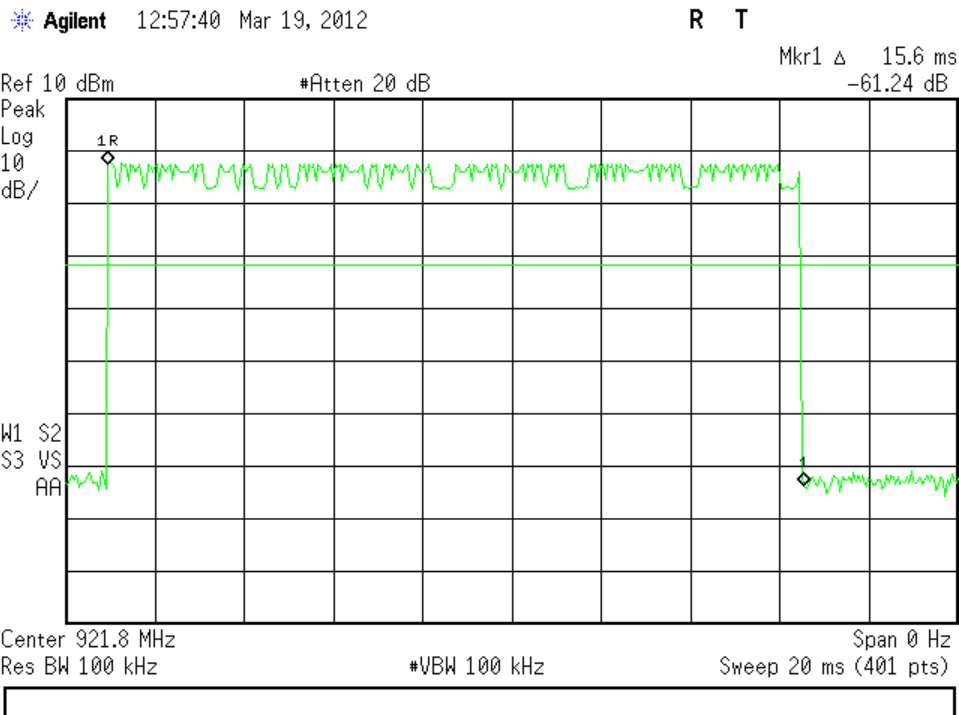
R T

Mkr1 926.24125 MHz
-2.539 dBm



Frequency Hopping Timing Requirements

“For a system using a 20dB bandwidth of less than 250kHz ... the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period.”
 [15.247(a)(1)(i)]

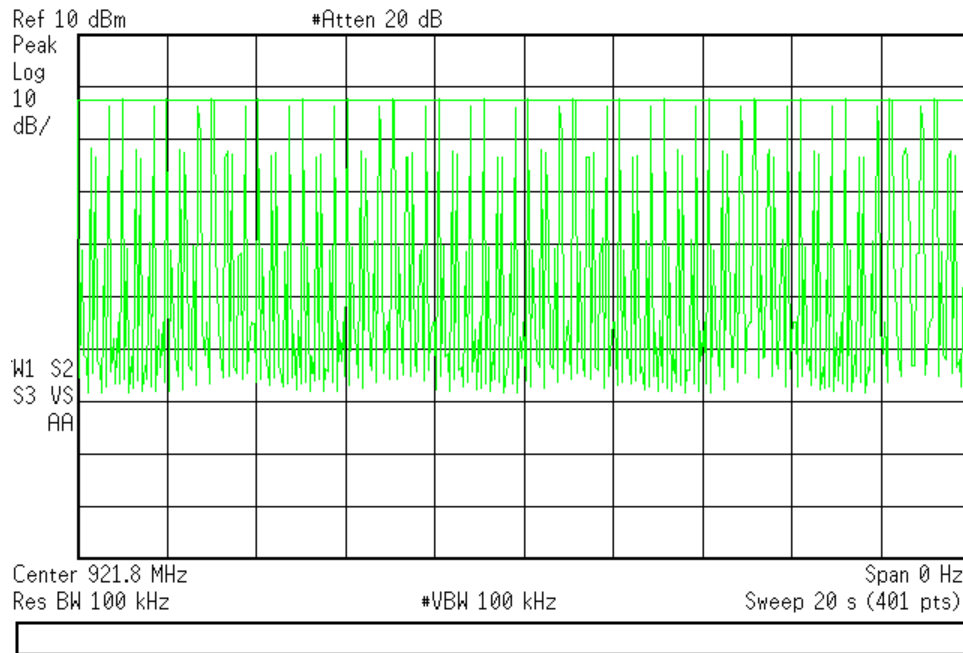


The duration for a single transmission is 15.6ms

The bandwidth for measuring was reduced to try and clarify the transmissions. The pulses that are above the display line are of the frequency under measurement.

Agilent 13:02:02 Mar 19, 2012

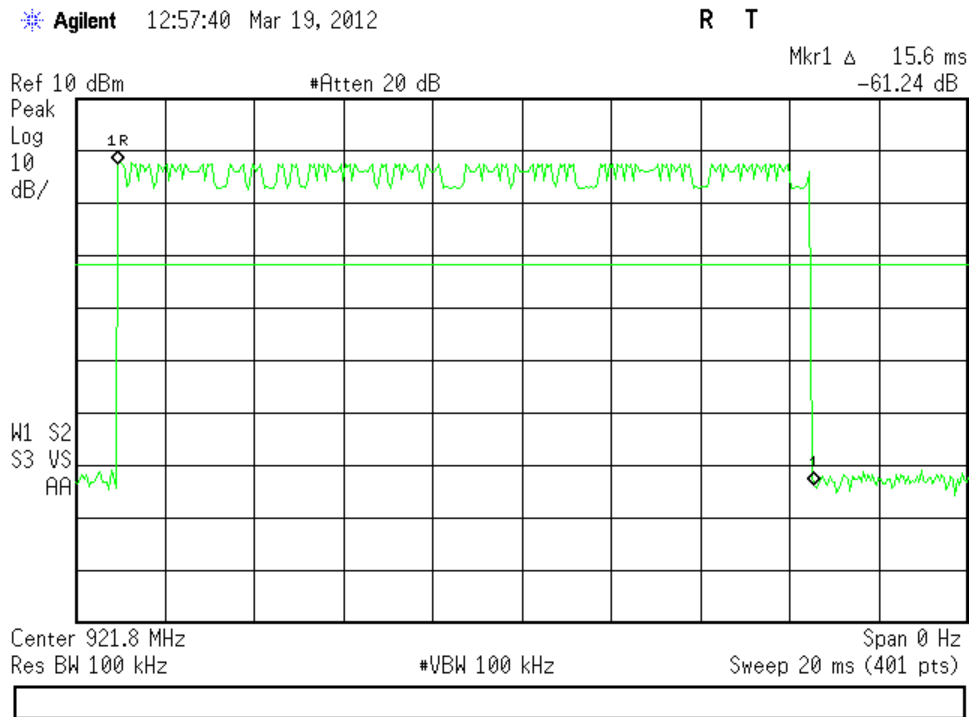
R T



In a 20 second window, the transmission occurs 20 times.
 $15.6\text{ms} \times 20 = 312\text{ms} = 0.312\text{seconds}$

Duty Cycle Correction Calculation

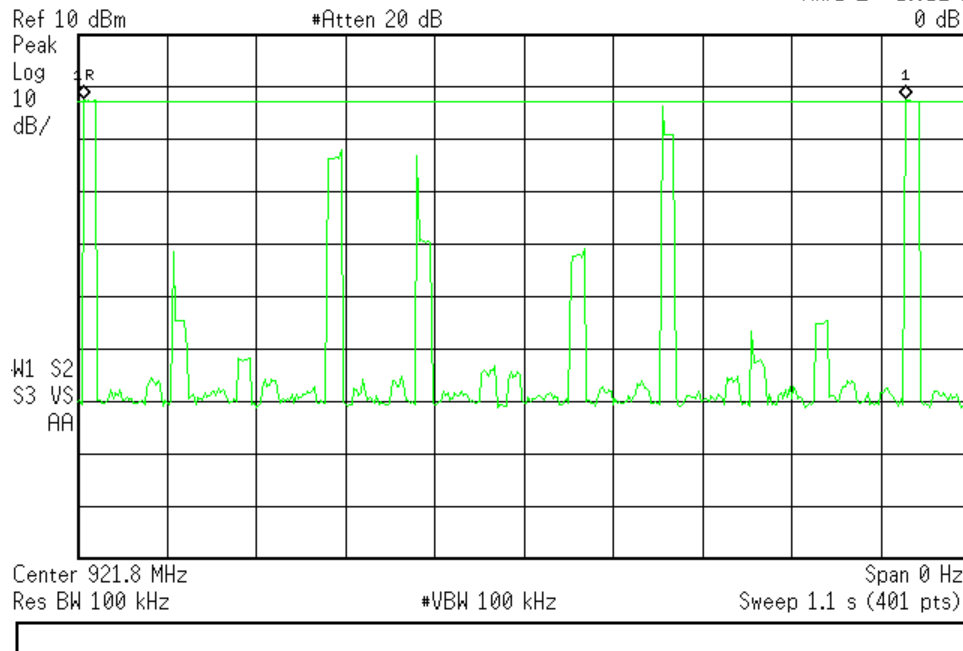
PLOTS



The duration for a single transmission is 15.65ms

* Agilent 13:12:40 Mar 19, 2012

R T

Mkr1 Δ 1.012 s
0 dB

The system takes 1.012 seconds to repeat transmitting frequency.
In 100ms, only a single transmission occurs

$$\text{DCCF} = 20 \times \log (15.6/100)$$

$$\text{DCCF} = -16.1375\text{dB}$$

Radiated Spurious Emissions

LIMITS

Radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a).

[15.247(d)]

MEASUREMENTS / RESULTS

Radiated Emissions Table												
Date: 19-Mar-12			Company: DogWatch Inc.				Work Order: M083					
Engineer: John Cushing			EUT Desc: Firefly				EUT Operating Voltage/Frequency: Battery					
Temp: 25.0°C			Humidity: 21%				Pressure: 1016mBar					
Frequency Range: 30-1000MHz							Measurement Distance: 3 m					
Notes: no emissions found readings are noise floor												
Antenna Polarization (H / V)	Frequency (MHz)	Reading (dBμV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Reading (dBμV/m)	---			FCC Class B		
							Limit (dBμV/m)	Margin (dB)	Result (Pass/Fail)	Limit (dBμV/m)	Margin (dB)	Result (Pass/Fail)
V	30.0	30.2	22.8	21.6	0.4	29.4	---	---	---	40.0	-10.6	Pass
V	79.8	30.4	22.8	7.8	0.7	16.1	---	---	---	40.0	-23.9	Pass
V	124.5	30.5	22.8	14.1	0.9	22.7	---	---	---	43.5	-20.8	Pass
V	335.0	30.4	22.9	13.9	1.5	22.9	---	---	---	46.0	-23.1	Pass
V	586.5	30.5	22.5	18.4	2.3	28.7	---	---	---	46.0	-17.3	Pass
V	815.0	31.0	22.0	21.4	2.9	33.3	---	---	---	46.0	-12.7	Pass
Table Result: Pass							by -10.6 dB			Worst Freq: 30.0 MHz		
Test Site: EMI Chamber 2			Cable 1: Asset #1506				Cable 2: Asset #1507					
Analyzer: Rental SA#2			Preamp: Blue				Antenna: Red-White					

3/17/2012										
Spectrum Analyzers / Receivers / Preselectors			Range	MN	Mfr	SN	Asset	Cat	Calibration Due	
Rental SA #2			9kHz-26.5 GHz	E7405A	Agilent	MY45104194	rental	I	1/5/2013	
Radiated Emissions Sites			FCC Code	IC Code	VCCI Code				Cat	Calibration Due
EMI Chamber 2			719150	2762A-7	R-3033, G-107				I	2/15/2014
Preamps /Couplers Attenuators / Filters			Range	MN	Mfr	SN	Asset	Cat	Calibration Due	
Blue			0.009-2000MHz	ZFL-1000-LN	CS	N/A	759	II	6/1/2012	
Antennas			Range	MN	Mfr	SN	Asset	Cat	Calibration Due	
Red-White Bilog			30-2000MHz	JB1	Sunol	A091604-1	1105	I	1/28/2013	
Meteorological Meters				MN	Mfr	SN	Asset	Cat	Calibration Due	
Temp./Humidity/Atm. Pressure Gauge				7400 Perception II	Davis	N/A	965	I	4/4/2013	
CHAMBER2 Thermohygrometer				35519-044	Control Company	72457639	1347	II	8/19/2013	
Cables			Range		Mfr				Cat	Calibration Due
Asset #1506			9kHz - 18GHz		Florida RF				II	2/2/2013
Asset #1507			9kHz - 26.5GHz		Florida RF				II	1/31/2013

All equipment is calibrated using standards traceable to NIST or other nationally recognized calibration standard.

Radiated Emissions Table																	
Date: 17-Apr-12			Company: Dogwatch							Work Order: M0283							
Engineer: John Cushing			EUT Desc: Firefly				EUT Operating Voltage/Frequency: Battery										
Temp: 23.2°C			Humidity: 22%				Pressure: 1009mBar										
Frequency Range: 30-1000MHz							Measurement Distance: 3 m										
Notes: charging mode																	
Antenna Polarization (H / V)	Frequency (MHz)	Reading (dBμV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Reading (dBμV/m)	---			FCC Class B							
							Limit (dBμV/m)	Margin (dB)	Result (Pass/Fail)	Limit (dBμV/m)	Margin (dB)	Result (Pass/Fail)					
NO EMISSIONS FOUND							---	---	---	---	---	---					
Table Result: ---							by --- dB			Worst Freq: --- MHz							
Test Site: EMI Chamber 1			Cable 1: Asset #1522				Cable 2: Asset #1505										
Analyzer: Asset #1328			Preamp: Black				Antenna: Red-Brown										



Rev. 4/19/2012

Spectrum Analyzers / Receivers / Preselectors SA EMI Chamber (1328)	Range 9kHz-13.2 GHz	MN E4405B	Mfr Agilent	SN MY44210241	Asset 1328	Cat I	Calibration Due 3/20/2013
Radiated Emissions Sites EMI Chamber 1	FCC Code 719150	IC Code 2762A-6	VCCI Code A-0015			Cat II	Calibration Due 2/16/2014
Preamps / Couplers Attenuators / Filters Black	Range 0.009-2000MHz	MN ZFL-1000-LN	Mfr CS	SN N/A	Asset 799	Cat II	Calibration Due 12/13/2012
Antennas Red-Brown Bilog	Range 30-2000MHz	MN JB1	Mfr Sunol	SN A0032406	Asset 1218	Cat I	Calibration Due 8/25/2012
Meteorological Meters Temp./Humidity/Atm. Pressure Gauge CHAMBER1 Thermohygrometer		MN 7400 Perception II 35519-044	Mfr Davis Control Company	SN N/A 72457642	Asset 965 1345	Cat I II	Calibration Due 4/4/2013 8/19/2013
Cables Asset #1505 Asset #1522	Range 9kHz - 18GHz 9kHz - 26.5GHz		Mfr Florida RF Florida RF			Cat II II	Calibration Due 8/19/2012 9/21/2012

All equipment is calibrated using standards traceable to NIST or other nationally recognized calibration standard.

Radiated Emissions Table															
Date: 17-Apr-12				Company: Dogwatch				Work Order: M0283							
Engineer: John Cushing				EUT Desc: Firefly				EUT Operating Voltage/Frequency: Battery							
Temp: 22.8°C				Humidity: 27%				Pressure: 1010mBar							
Frequency Range: 1-10GHz								Measurement Distance: 3 m							
Notes: Duty Cycle Correction Factor = 16.1dB															
Antenna Polarization (H / V)	Frequency (MHz)	Peak Reading (dBμV)	Average Reading (dBμV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Peak Reading (dBμV/m)	Adjusted Avg Reading (dBμV/m)	FCC Class B High Frequency - Peak			FCC Class B High Frequency - Average			
									Limit (dBμV/m)	Margin (dB)	Result (Pass/Fail)	Limit (dBμV/m)	Margin (dB)	Result (Pass/Fail)	
V	2751.0	48.2	32.1	19.8	28.9	3.6	60.9	44.8	74.0	-13.1	Pass	54.0	-9.2	Pass	
V	3701.0	49.5	33.4	18.3	32.2	4.1	67.5	51.4	74.0	-6.5	Pass	54.0	-2.6	Pass	
H	4607.0	42.6	26.5	17.5	32.6	4.5	62.2	46.1	74.0	-11.8	Pass	54.0	-7.9	Pass	
Table Result:				Pass				by -2.6 dB				Worst Freq: 3701.0 MHz			
Test Site: EMI Chamber 1				Cable 1: Asset #1522				Cable 2: Asset #1505				Antenna: Orange Horn			
Analyzer: Asset #1327				Preamp: Brown											

Rev. 4/19/2012

Spectrum Analyzers / Receivers / Preselectors SA EMI Chamber (1327)	Range 9kHz-13.2 GHz	MN E4405B	Mfr Agilent	SN MY45103416	Asset 1327	Cat I	Calibration Due 4/26/2012
Radiated Emissions Sites EMI Chamber 1	FCC Code 719150	IC Code 2762A-6	VCCI Code A-0015			Cat II	Calibration Due 2/16/2014
Preamps / Couplers Attenuators / Filters Brown	Range 1-18GHz	MN CS	Mfr CS	SN N/A	Asset 1523	Cat II	Calibration Due 12/10/2012
Antennas Orange Horn	Range 1-18GHz	MN 3115	Mfr EMCO	SN 0004-6123	Asset 390	Cat I	Calibration Due 7/27/2013
Meteorological Meters Temp./Humidity/Atm. Pressure Gauge CHAMBER1 Thermohygrometer		MN 7400 Perception II 35519-044	Mfr Davis Control Company	SN N/A 72457642	Asset 965 1345	Cat I II	Calibration Due 4/4/2013 8/19/2013
Cables Asset #1505 Asset #1522	Range 9kHz - 18GHz 9kHz - 26.5GHz		Mfr Florida RF Florida RF			Cat II II	Calibration Due 8/19/2012 9/21/2012

All equipment is calibrated using standards traceable to NIST or other nationally recognized calibration standard.

Radiated Emissions Table																			
Date: 19-Mar-12				Company: DogWatch Inc.						Work Order: M083									
Engineer: John Cushing				EUT Desc: Firefly				EUT Operating Voltage/Frequency: 120V/60Hz											
Temp: 25.0°C				Humidity: 21%				Pressure: 1016mBar											
Frequency Range: 30-1000MHz								Measurement Distance: 3 m											
Notes: charging mode																			
Antenna Polarization (H / V)	Frequency (MHz)	Reading (dBμV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Reading (dBμV/m)	---			FCC Class B									
							Limit (dBμV/m)	Margin (dB)	Result (Pass/Fail)	Limit (dBμV/m)	Margin (dB)	Result (Pass/Fail)							
NO EMISSIONS FOUND																			
Test Site: EMI Chamber 2							Cable 1: Asset #1506				Cable 2: Asset #1507								
Analyzer: Rental SA#2							Preamp: Blue				Antenna: Red-White								



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3/17/2012								
Spectrum Analyzers / Receivers / Preselectors	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	
Rental SA #2	9kHz-26.5 GHz	E7405A	Agilent	MY45104194	rental	I	1/5/2013	
Radiated Emissions Sites	FCC Code	IC Code	VCCI Code			Cat	Calibration Due	
EMI Chamber 2	719150	2762A-7	R-3033, G-107			I	2/15/2014	
Preamps / Couplers Attenuators / Filters	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	
Blue	0.009-2000MHz	ZFL-1000-LN	CS	N/A	759	II	6/1/2012	
Antennas	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	
Red-White Bilog	30-2000MHz	JB1	Sunol	A091604-1	1105	I	1/28/2013	
Meteorological Meters		MN	Mfr	SN	Asset	Cat	Calibration Due	
Temp./Humidity/Atm. Pressure Gauge		7400 Perception II	Davis	N/A	965	I	4/4/2013	
CHAMBER2 Thermohygrometer		35519-044	Control Company	72457639	1347	II	8/19/2013	
Cables	Range		Mfr			Cat	Calibration Due	
Asset #1506	9kHz - 18GHz		Florida RF			II	2/2/2013	
Asset #1507	9kHz - 26.5GHz		Florida RF			II	1/31/2013	

All equipment is calibrated using standards traceable to NIST or other nationally recognized calibration standard.

Conducted Spurious Emissions

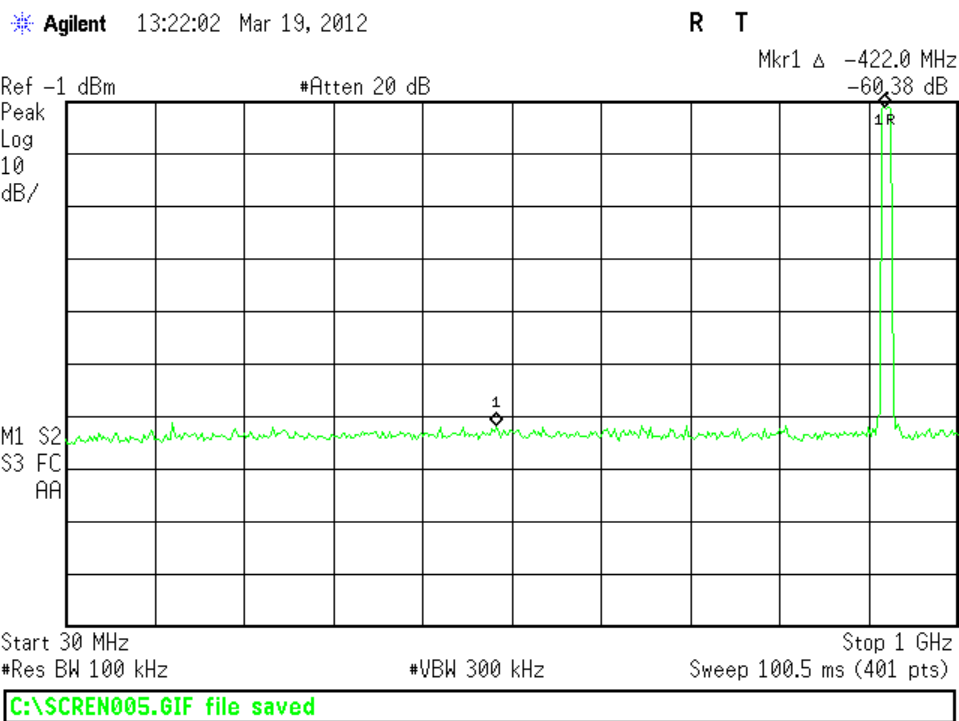
LIMITS

In any 100kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth that contains the highest level of desired power...

[15.247(d)]

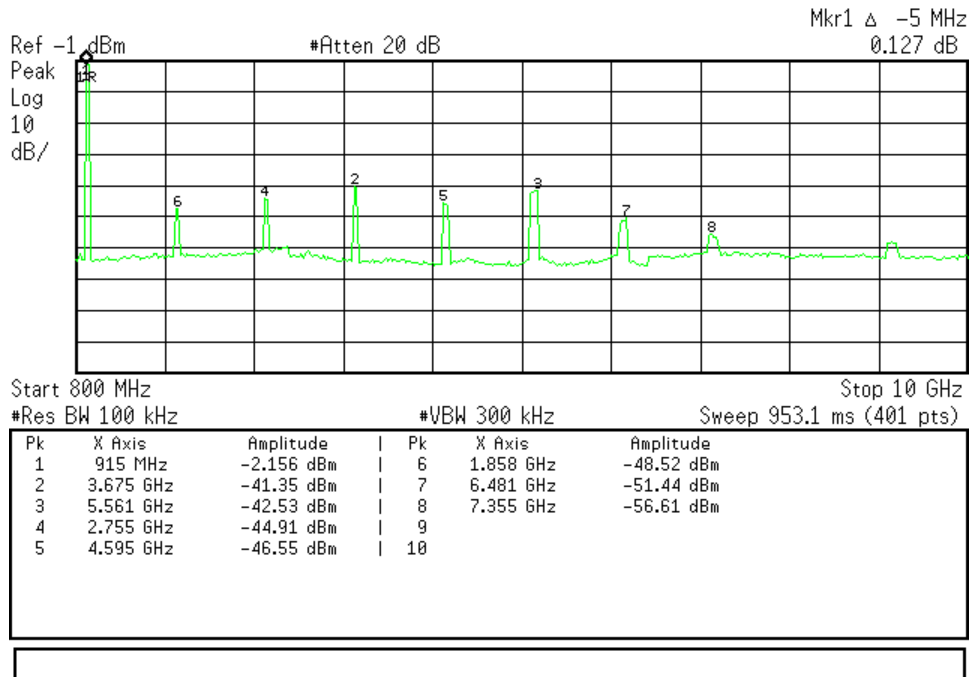
MEASUREMENTS / RESULTS

Transmit



* Agilent 13:30:39 Mar 19, 2012

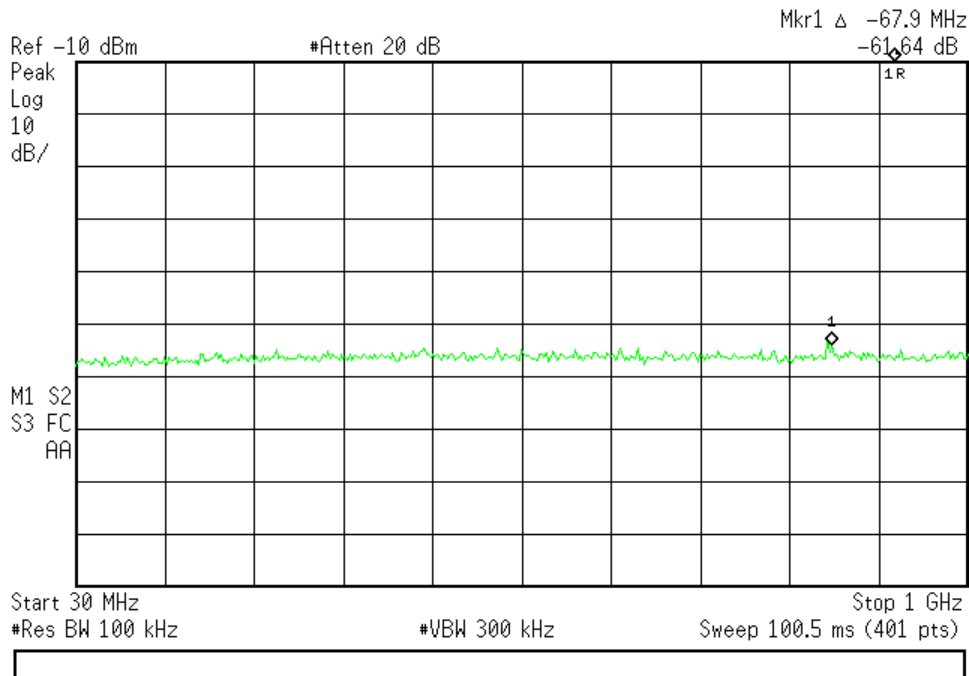
R T



Receive

* Agilent 13:32:35 Mar 19, 2012

R T



Agilent 13:33:44 Mar 19, 2012

R T

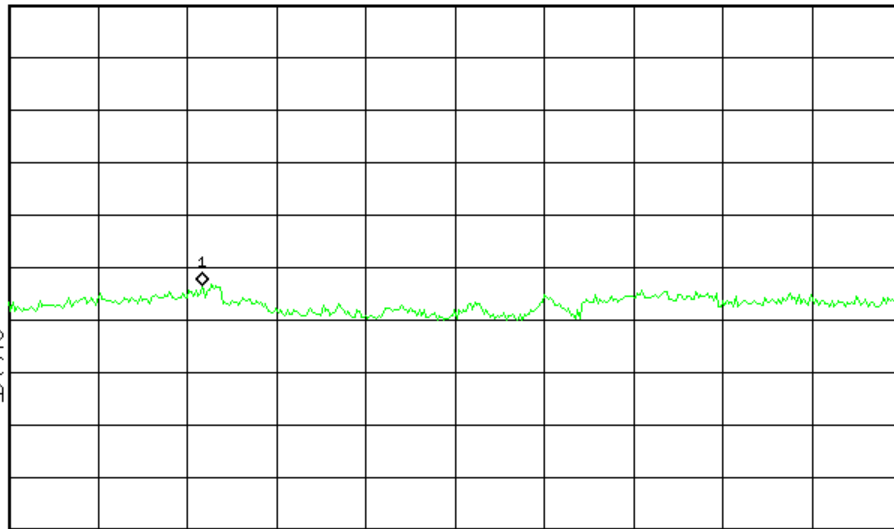
Mkr1 2.801 GHz
-63.34 dBm

Ref -10 dBm

#Atten 20 dB

Peak
Log
10
dB/

M1 S2
S3 FC
RA



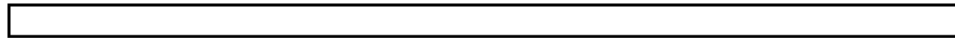
Start 800 MHz

Stop 10 GHz

#Res BW 100 kHz

#VBW 300 kHz

Sweep 953.1 ms (401 pts)



AC Line Conducted Emissions

LIMITS

Frequency of emission (MHz)	Quasi-peak limit (dBμV)	Average limit (dBμV)
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

[47 CFR 15.207(a)]

MEASUREMENTS / RESULTS

AC Conducted Emissions Data Table														
Date: 20-Mar-12 Engineer: John Cushing Temp: 22.0 °C					Company: Dogwatch EUT Desc: Firefly Humidity: 24%					Work Order: M0283 Pressure: 1021mB				
Notes:														
Frequency Range: 15-30MHz								EUT Input Voltage/Frequency: 120V/60Hz						
Frequency (MHz)	Quasi-Peak Readings		Average Readings		LISN Factors		Cable Factor (dB)	LISN Factor (dB)	FCC/CISPR Class B			FCC/CISPR Class B		
	OP1 (dBuV)	OP2 (dBuV)	AVG1 (dBuV)	AVG2 (dBuV)	L1 (dB)	L2 (dB)			QP Limit (dB)	Margin (dB)	Result (Pass/Fail)	AVG Limit (dB)	Margin (dB)	Result (Pass/Fail)
0.18	22.4	23.1	15.1	13.7	-0.1	-0.1	0.2	20.6	64.6	-20.8	Pass	54.6	-18.7	Pass
0.36	25.0	25.1	17.6	15.4	-0.1	-0.1	0.2	20.7	58.8	-12.9	Pass	48.8	-10.4	Pass
0.65	19.4	22.4	15.2	12.1	-0.1	-0.1	0.2	20.7	56.0	-12.8	Pass	46.0	-10.0	Pass
1.13	20.5	21.5	13.3	10.6	-0.1	-0.1	0.2	20.6	56.0	-13.7	Pass	46.0	-11.9	Pass
1.54	18.3	20.7	11.4	8.7	-0.1	-0.1	0.3	20.6	56.0	-14.5	Pass	46.0	-13.8	Pass
2.49	18.1	21.5	13.9	8.2	-0.1	-0.1	0.3	20.7	56.0	-13.7	Pass	46.0	-11.2	Pass
4.27	14.0	12.7	7.1	1.6	-0.1	-0.1	0.3	20.7	56.0	-21.1	Pass	46.0	-18.0	Pass
Result: Pass					Worst Margin:					-10.0 dB		Frequency: 0.65 MHz		
Measurement Device: 230VAC LISN Asset 1495					Cable: CEMI-02					Spectrum Analyzer: Black				
					Attenuator: 20dB Atten-4					Site: CEMI 3				

3/17/2012

Spectrum Analyzers / Receivers / Preselectors Black	Range 9kHz-12.8GHz	MN 8596E	Mfr Agilent	SN 3710A00944	Asset 337	Cat I	Calibration Due 12/2/2012
LISNs/Measurement Probes 230VAC LISN Asset 1495	Range 10kHz-50MHz	MN 9252-50-R-24-BNC	Mfr Solar	SN 84716	Asset 1495	Cat I	Calibration Due 5/26/2012
Conducted Test Sites (Mains / Telco) CEMI 3	FCC Code 719150		VCCI Code C-3362, T-1577			Cat III	Calibration Due NA
Meteorological Meters Temp./Humidity/Atm. Pressure Gauge CEMI3 Thermohygrrometer		MN 7400 Perception II 35519-044	Mfr Davis Control Company	SN N/A 72457729	Asset 965 1338	Cat I II	Calibration Due 4/4/2013 8/19/2013
Cables CEMI-02	Range 9kHz - 2GHz		Mfr C-S			Cat II	Calibration Due 4/4/2012
Attenuators 20dB Atten-4	Range 9kHz-2GHz	MN	Mfr	SN N/A	Asset	Cat II	Calibration Due 6/11/2012

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Occupied Bandwidth

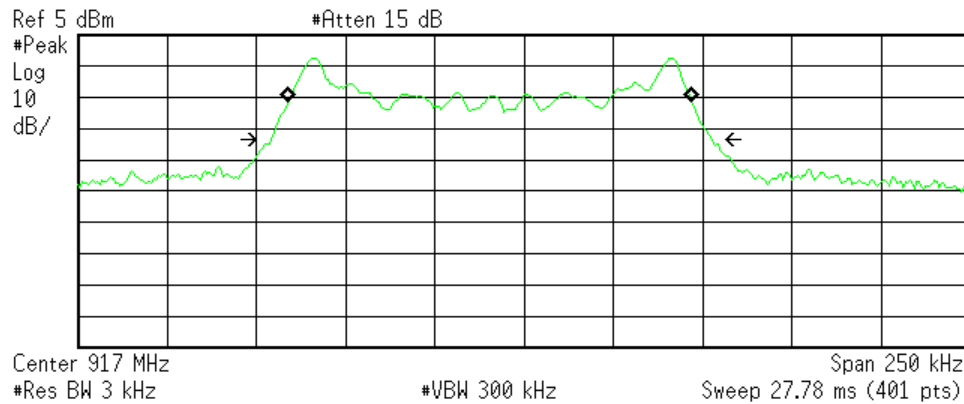
REQUIREMENT

When an occupied bandwidth is no specified in the applicable RSS, the transmitted signal bandwidth to be reported is to be its 99% emission bandwidth, as calculated or measured. [RSS-GEN 4.6.1]

Low Channel

Agilent 04:34:04 Mar 20, 2012

R T



Occupied Bandwidth
112.8401 kHz

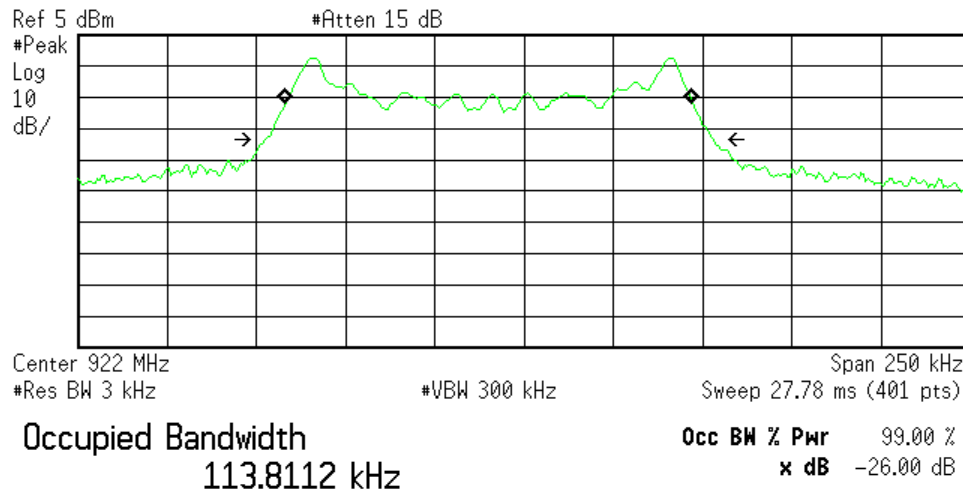
Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -9.528 kHz
x dB Bandwidth 123.548 kHz

Mid Channel

✱ Agilent 04:32:58 Mar 20, 2012

R T

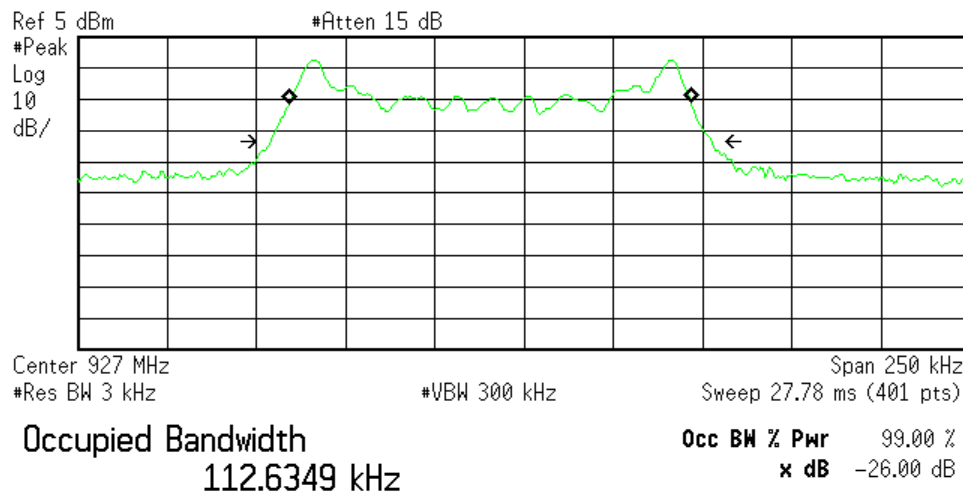


Transmit Freq Error -9.738 kHz
x dB Bandwidth 125.465 kHz

High Channel

✱ Agilent 04:35:47 Mar 20, 2012

R T



Transmit Freq Error -9.529 kHz
x dB Bandwidth 123.676 kHz

Measurement Uncertainty

The listed uncertainties are the worst case uncertainty for the entire range of measurement. Please note that the uncertainty values are provided for informational purposes only and are not used in determining the PASS/FAIL results.

Measurement	Expanded Uncertainty k=2	Maximum allowable uncertainty
Radiated Emissions (30-1000MHz)		
NIST	5.6dB	N/A
CISPR	4.6dB	5.2dB (Ucisp)
Radiated Emissions (1-26.5GHz)	4.6dB	N/A
Radiated Emissions (above 26.5GHz)	4.9dB	N/A
Magnetic Radiated Emissions	5.6dB	N/A
Conducted Emissions		
NIST	3.9dB	N/A
CISPR	3.6dB	3.6dB (Ucisp)
Telco Conducted Emissions (Current)	2.9dB	N/A
Telco Conducted Emissions (Voltage)	4.4dB	N/A
Electrostatic Discharge	11.5%	N/A
Radiated RF Immunity (Uniform Field)	1.6dB	N/A
Electrical Fast Transients	23.1%	N/A
Surge	23.1%	N/A
Conducted RF Immunity	3dB	N/A
Magnetic Immunity	12.8%	N/A
Dips and Interrupts	2.3V	N/A
Harmonics	3.5%	N/A
Flicker	3.5%	N/A
Radio frequency (@ 2.4GHz)	3.23×10^{-8}	1×10^{-7}
RF power, conducted	0.40dB	0.75dB
Maximum frequency deviation:		
• Within 300Hz and 6kHz of audio frequency / Within 6kHz and 25kHz of audio frequency	3.4% 0.3dB	5% 3dB
Adjacent channel power	1.9dB	3dB
Conducted spurious emission of transmitter, valid up to 12.75GHz	2.39dB	3dB
Conducted emission of receivers	1.3dB	3dB
Radiated emission of transmitter, valid up to 26.5GHz	3.9dB	6dB
Radiated emission of transmitter, valid up to 80GHz	3.3dB	6dB
Radiated emission of receiver, valid up to 26.5GHz	3.9dB	6dB
Radiated emission of receiver, valid up to 80GHz	3.3dB	6dB
Humidity	2.37%	5%
Temperature	0.7°C	1.0°C
Time	4.1%	10%
RF Power Density, Conducted	0.4dB	3dB
DC and low frequency voltages	1.3%	3%
Voltage (AC, <10kHz)	1.3%	2%
Voltage (DC)	0.62%	1%
The above reflects a 95% confidence level		



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Product Documentation

The following documentation has been provided by the client for inclusion in this report.

Conditions Of Testing

[Bureau Veritas Consumer Products Services, Inc., a Massachusetts corporation], and/or its affiliates (collectively, the "Company") will conduct, at the request of the Submitter ("Client"), the tests specified on the submitted Test Request Form or equivalent in accordance with, and subject to, the following terms and conditions (collectively, "Conditions"):

1. All orders for tests are subject to acceptance by the Company, and no order will constitute a binding commitment of the Company unless and until such order is accepted by it, as evidenced by the issuance of a written report ("Test Report") by the Company. The Test Report is issued solely by the Company, is intended for the exclusive use of Client and shall not be published, used for advertising purposes, copied or replicated for distribution to any other person or entity or otherwise publicly disclosed without the prior written consent of the Company. By submitting a request for services to the Company, Client consents to the disclosure to accreditation bodies of those records of Client relevant to the accreditation body's assessment of the Company's competence and compliance with relevant accreditation criteria. The Company shall not be liable for any loss or damage whatsoever resulting from the failure of the Company to provide its services within any time period for completion estimated by the Company. If Client anticipates using the Test Report in any legal proceeding, arbitration, dispute resolution forum or other proceeding, it shall so notify the Company prior to submitting the Test Report in such proceeding. The Company has no obligation to provide a fact or expert witness at such proceeding unless the Company agrees in advance to do so for a separate and additional fee.
2. The Test Report will set forth the findings of the Company solely with respect to the test samples identified therein. Unless specifically and expressly indicated in the Test Report, the results set forth in such Test Report are not intended to be indicative or representative of the quality or characteristics of the lot from which a test sample is taken, and Client shall not rely upon the Test Report as being so indicative or representative of the lot or of the tested product in general. The Test Report will reflect the findings of the Company at the time of testing only, and the Company shall have no obligation to update the Test Report after its issuance. The Test Report will set forth the results of the tests performed by the Company based upon the written information provided to the Company. The Test Report will be based solely on the samples and written information submitted to the Company by Client, and the Company shall not be obligated to conduct any independent investigation or inquiry with respect thereto.
3. The Company may, in its sole discretion, destroy samples which have been furnished to the Company for testing and which have not been destroyed in the course of testing. The Company may delegate the performance of all or a portion of the services contemplated hereunder to an affiliate, agent or subcontractor of the Company, and Client consents to such delegation.
4. These Conditions and the Test Report represent the entire understanding of the parties hereto with respect to the subject matter hereof and of the Test Report, and no modification, variance or extrapolation with respect thereto shall be permitted without the prior written consent of the Company.
5. The names, service marks, trademarks and copyrights of the Company and its affiliates, including the names "BUREAU VERITAS," "BUREAU VERITAS CONSUMER PRODUCTS SERVICES," "BVCPS," "MTL," "ACTS," "MTL-ACTS" and "CURTIS-STRAUS" (collectively, the "Marks") are and shall remain the sole property of the Company or its affiliates and shall not be used by Client except solely to the extent that Client obtains the prior written approval of the Company and then only in the manner prescribed by the Company. Client shall not contest the validity of the Marks or take any action that might impair the value or goodwill associated with the Marks or the image or reputation of the Company or its affiliates.
6. Payment in full shall be due 30 days after the date of invoice. Interest shall be due on overdue amounts from the due date until paid at an interest rate of 1.5% per month or, if less, the maximum rate permitted by law. The Company reserves the right, at any time and from time to time, to revoke any credit extended to Client. Client shall reimburse the Company for any costs it incurs in collecting past due amounts, including court costs and fees and expenses of attorneys and collection agencies. The Test Report may not be used or relied upon by Client if and for so long as Client fails to pay when due any invoice issued by the Company or any affiliate of it to Client or any affiliate or subsidiary of Client together with interest and penalties, if any, accrued thereon.
7. The Company disclaims any and all responsibility or liability arising out of or in connection with e-mail transmissions of such information.
8. Client understands and agrees that the Company is neither an insurer nor a guarantor, that the Company does not take the place of Client or any designer, manufacturer, agent, buyer, distributor or transportation or shipping company, and that the Company disclaims all liability in such capacities. Client further understands that if it seeks assurance against loss or damage, it should obtain appropriate insurance.
9. Client agrees that the Company, by providing the services, does not take the place of Client nor any third party, nor does the Company release them from any of their obligations, nor does the Company otherwise assume, abridge, abrogate or undertake to discharge any duty of any third party to Client or any duty of Client or any third party to any other third party, and Client will not release any third party from its obligations and duties with respect to the tested goods.
10. Client shall, on a timely basis, (a) provide adequate instructions to the Company in order to enable the Company to perform properly its services, (b) provide, or cause Client's suppliers and contractors to provide, the Company with all documents necessary to enable the Company to perform its services, (c) furnish the Company with all relevant information regarding Client's intended use and purposes of the tested goods, (d) advise the Company of essential dates and deadlines relevant to the tested goods and (e) fully exercise all rights and remedies available to Client against third parties in respect of the tested goods.
11. The Company shall undertake due care and ordinary skill in the performance of its services to Client, and the Company shall accept responsibility only where such skill has not been exercised and, even in such event, only to the extent of the limitation of liability set forth herein.
12. If Client desires to assert a claim arising from or relating to (i) the performance, purported performance or non-performance of any services by the Company or (ii) the sale, resale, manufacture, distribution or use of any tested goods, it must submit that claim to the Company in a writing that sets forth with particularity the basis for such claim within 60 days from discovery of the potential claim and not more than six months after the date of issuance of the Test Report to Client. Client waives any and all such claims including, without limitation, claims that the Test Report is inaccurate, incomplete or misleading or that additional or different testing is required, unless and then only to the extent that Client submits a written claim to the Company within both such time periods.



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13. CLIENT SHALL, EXCEPT TO THE EXTENT OF COMPANY'S LIABILITY TO CLIENT HEREUNDER (WHICH IN NO EVENT SHALL EXCEED THE LIMITATION OF LIABILITY HEREIN), HOLD HARMLESS AND INDEMNIFY THE COMPANY, ITS AFFILIATES AND THEIR RESPECTIVE DIRECTORS, OFFICERS, EMPLOYEES, AGENTS AND SUBCONTRACTORS AGAINST ALL ACTUAL OR ALLEGED THIRD PARTY CLAIMS FOR LOSS, DAMAGE OR EXPENSE OF WHATSOEVER NATURE AND HOWSOEVER ARISING FROM OR RELATING TO (i) THE PERFORMANCE, PURPORTED PERFORMANCE OR NON-PERFORMANCE OF ANY SERVICES BY THE COMPANY OR (ii) THE SALE, RESALE, MANUFACTURE, DISTRIBUTION OR USE OF ANY TESTED GOODS.

14. EXCEPT AS MAY OTHERWISE BE EXPRESSLY AGREED TO IN WRITING BY THE COMPANY AND NOTWITHSTANDING ANY PROVISION TO THE CONTRARY CONTAINED HEREIN OR IN ANY TEST REPORT, NO WARRANTY OR GUARANTEE, EXPRESS OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR USE, IS MADE.

15. (A) IN NO EVENT WHATSOEVER SHALL THE COMPANY BE LIABLE FOR ANY CONSEQUENTIAL, SPECIAL, INCIDENTAL, EXEMPLARY OR PUNITIVE DAMAGES IN CONNECTION WITH, RELATING TO OR ARISING OUT OF THE TEST REPORT OR THE SERVICES PROVIDED BY THE COMPANY HEREUNDER, INCLUDING WITHOUT LIMITATION LOSS OF OR DAMAGE TO PROPERTY; LOSS OF INCOME, PROFIT OR USE; OR ANY CLAIMS OR DEMANDS MADE AGAINST CLIENT OR ANY OTHER PERSON BY ANY THIRD PARTY IN CONNECTION WITH, RELATING TO OR ARISING OUT OF THE SERVICES PROVIDED BY THE COMPANY HEREUNDER.

(B) NOTWITHSTANDING ANY PROVISION TO THE CONTRARY CONTAINED HEREIN, AND IN RECOGNITION OF THE RELATIVE RISKS AND BENEFITS TO CLIENT AND THE COMPANY ASSOCIATED WITH THE TESTING SERVICES CONTEMPLATED HEREBY, THE RISKS HAVE BEEN ALLOCATED SUCH THAT UNDER NO CIRCUMSTANCES WHATSOEVER SHALL THE LIABILITY OF THE COMPANY TO CLIENT OR ANY THIRD PARTY IN RESPECT OF ANY CLAIM FOR LOSS, DAMAGE OR EXPENSE, OF WHATSOEVER NATURE OR MAGNITUDE, AND HOWSOEVER ARISING, EXCEED AN AMOUNT EQUAL TO FIVE (5) TIMES THE AMOUNT OF THE FEES PAID TO THE COMPANY FOR THE SPECIFIC SERVICES WHICH GAVE RISE TO SUCH CLAIM OR U.S.\$10,000, WHICHEVER IS THE LESSER AMOUNT.

16. The Company shall not be liable for any loss or damage resulting from any delay or failure in performance of its obligations hereunder resulting directly or indirectly from any event of force majeure or any event outside the control of the Company. If any such event occurs, the Company may immediately cancel or suspend its performance hereunder without incurring any liability whatsoever to Client.

17. Company's services, including these Conditions, shall be governed by, and construed in accordance with, the local laws of the country where the Company performs the tests or, in the case of tests performed in the United States of America, the laws of Massachusetts without regard to conflicts of laws principles. If any aspect(s) of these Conditions is found to be illegal or unenforceable, the validity, legality and enforceability of all remaining aspects of these Conditions shall not in any way be affected or impaired thereby. Any proceeding related to the subject matter hereof shall be brought, if at all, in the courts of the country where the Company performs the tests or, in the case of tests performed in the United States of America, in the courts of Massachusetts. Client waives the right to interpose any counterclaim or setoffs of any nature in any litigation arising hereunder.

Rev.160009121(2)_#684340 v13CS

