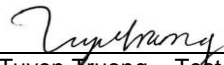
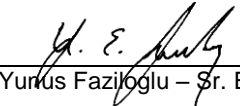




Test Report

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

Report No	EP2631-1
Client	SignalFire Telemetry Alfred Hamilton
Address	43 Broad Street, Unit A-403 Hudson, MA 01749
Phone	(978) 212 - 2868
Items tested	DIN Mount Gateway
FCC ID	W8V-GWDIN
IC ID	8373A-GWDIN
FRN	0018614347
Equipment Type	DSS
Equipment Code	Part 15, Frequency Hopping Spread Spectrum Transmitter
FCC/IC Rule Parts	47 CFR 15.247, RSS-247 Issue 1
Test Dates	February 29 and March 1 – 2 and 21, 2016
Results	As detailed within this report
Prepared by	 Tuyen Truong – Test Engineer
Authorized by	 Yurkus Faziloglu – Sr. EMC Engineer
Issue Date	4/18/2016
Conditions of Issue	This Test Report is issued subject to the conditions stated in the 'Conditions of Testing' section on page 45 of this report.

Curtis-Straus LLC is accredited to ISO/IEC 17025 by A2LA for the specific scope of accreditation under Certificate Number 1627-01. This report may contain data which is not covered by the A2LA accreditation. See our scope of accreditation at the end of this test report. Any opinions or interpretations expressed in this report are outside the scope of our A2LA accreditation as A2LA only accredits testing.

Testing Cert. No. 1627-01

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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. The product is the DIN Mount Gateway. It is a frequency hopping transmitter that operates in the range 905-925MHz. Product was tested with detachable antennas with 5.8dBi gain (Enclosure Mount Antenna, M/N: EEH-915) and 2.0dBi gain (Nearson Antenna, M/N: 467) respectively.

We found that the product met the above requirements without modification. Josh Schadel from SignalFire Telemetry was present during the testing. The test sample was received in good condition.

Release Control Record

Issue No.	Reason for change	Date Issued
1	Original Release	April 18, 2016



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Test Methodology

Radiated emission and AC line conducted emission testing was performed according to the procedures specified in ANSI C63.10 (2013) and RSS-247 Issue 1. 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 was not maximized separately.

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

AC mains conducted emissions was performed with a 50 Ω /50 μ H LISN and using a representative AC/DC power supply

Operating channel frequency = 905 MHz

Operating channel frequency = 915 MHz

Operating channel frequency = 925 MHz

When hopping, the product was configured for the transmission to be either in the range of 905-914.8MHz (Low Band), or 915-924.8MHz (High Band) respectively.

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

Frequency	RBW	VBW
0.15-30MHz	9kHz	30kHz
30-1000MHz	120kHz	1MHz
1-10GHz	1MHz	3MHz



Product Tested - Configuration Documentation

EUT Configuration											
Work Order:	P2631										
Company:	SignalFire Telemetry										
Company Address:	43 Broad St, Suite A-403										
	Hudson, MA, 01749										
Client present:	Josh Schadel										
Contact:	Alfred Hamilton										
	MN					PN			SN		
EUT:	GW-DIN				--				Sample 1		
EUT Description:	DIN Mount Gateway										
EUT TX Frequency:	905 - 925 MHz										
EUT Max Frequency:	26 MHz (Associated Circuitry)										
EUT Components	MN				SN						
DIN Mount Gateway	GW-DIN				Sample 1						
Enclosure Mount Antenna	EEH-915				Sample 1						
Nearson Antenna	467				Sample 1						
Support Equipment	MN				SN						
Lenovo Laptop	x100e				--						
AC/DC power brick	EPS090066				--						
Port Label	Port Type	# ports	# populated	cable type	shielded	ferrites	length (m)	in/out	under test	comment	
DC Power	Power DC	1	1	Power DC	No	No	2	in	yes		
Serial	RS-485	1	1	other	No	No	2	in	yes		
Serial	RS-232	1	0					in	no	Set up only	
Antenna	other	1	1	Coaxial	Yes	No	1	in	yes	Note: the coax cable was present only while testing with the EEH-915 antenna. The 467 antenna was attached directly to the antenna port for testing.	
Software Operating Mode Description:											
EUT is set to transmit on Low (905 MHz), Mid (915 MHz) and High (925 MHz) respectively.											
Performance Criteria:											
EMI testing only											

Statement of Conformity

The DIN Mount Gateway has been found to conform to the following parts of 47 CFR and RSS 247 as detailed below:

RSS-GEN	RSP-100	RSS 247	Part 15	Comments
6.3			15.15(b)	There are no controls accessible to the user that varies the output power to operate in violation of the regulatory requirements.
	3.1		15.19	The label is shown in the label exhibit.
	3.2		15.21	Information to the user is shown in the instruction manual exhibit.
			15.27	No special accessories are required for compliance.
6.1, 6.5			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.
8.1			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.
8.3			15.203	The antennas for this device are detachable antennas with Reverse Polarity SMA connectors. They are 5.8 dBi and 2.0dBi gains.
8.10			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 or RSS-Gen as applicable
8.8			15.207	The unit complies with the requirements of 15.207
			15.247	The unit complies with the requirements of 15.247
		RSS 247		The unit complies with the requirements of RSS-247
6.6				Occupied Bandwidth measurements were made.



Modifications Required for Compliance

No Modifications were required for compliance.



Test Results

Frequency Hopping Requirements

Channel Spacing

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20dB bandwidth of the hopping channel, whichever is greater.

[15.247 (a) (1)]

MEASUREMENTS / RESULTS

Channel Spacing						
Date: 01-Mar-16		Company: Signal Fire Telemetry		Work Order: P2631		
Engineer: Tuyen Truong		EUT Desc: DIN Mount Gateway		EUT Operating Voltage/Frequency: 9Vdc		
Temp: 21°C		Humidity: 33%		Pressure: 998mBar		
Frequency Range: 905 to 925 MHz				Measurement Distance: 1 m		
Notes: 20 dB Bandwidth = 59.6080 KHz (worst case)				EUT Max Freq: 905 to 925 MHz		
Frequency Hopping Systems (MHz)		Channel Spacing Reading (KHz)		FCC 15.247 - 20dB Band Width		
				Limit (KHz)	Margin (KHz)	Result (Pass/Fail)
Low Band	905-915 MHz	200.0		≥59.6080	+140.392	Pass
High Band	915-925 MHz	200.0		≥59.6080	+140.392	Pass
Table Result:		Pass	by +26.25 KHz	Frequency Range: 905-925 MHz		
Test Site: CEM5		Attenuation: Asset#791				
Analyzer: Brown						
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Spectrum Analyzers / Receivers / Preselectors	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Brown	9kHz-26.5GHz	E4407B	Agilent	SG44210511	1510	I	1/21/2017	1/21/2016
Conducted Test Sites (Mains / Telco)	FCC Code		VCCI Code			Cat	Calibration Due	Calibrated on
CEMI 5	719150		A-0015			III	NA	N/A
Preamps / Couplers Attenuators / Filters	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
HF 20dB 50W Attenuator	0.009-18 GHz	PE 7019-20	Pasternack	1	791	II	7/31/2016	7/31/2015
Meteorological Meters		MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Weather Clock (Pressure Only)		BA928	Oregon Scientific	C3166-1	831	I	3/19/2016	3/19/2014
TH A#2078		HTC-1	HDE		2078	II	4/2/2016	4/2/2015

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



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PLOTS

* Agilent 08:19:42 Mar 1, 2016

R T

Mkr1 Δ 200.0 kHz
0.043 dB

Ref 25 dBm

Atten 35 dB

Peak
Log
10
dB/M1 S2
S3 FC

Center 910 MHz

#Res BW 100 kHz

#VBW 300 kHz

Span 1 MHz

Sweep 5 ms (401 pts)

C:\temp.gif file saved

Channel Spacing - Running Low Band (905 - 915 MHz)

* Agilent 08:16:58 Mar 1, 2016

R T

Mkr1 Δ 200.0 kHz
-0.016 dB

Ref 25 dBm

Atten 35 dB

Peak
Log
10
dB/M1 S2
S3 FC

Center 920 MHz

#Res BW 100 kHz

#VBW 300 kHz

Span 1 MHz

Sweep 5 ms (401 pts)

C:\temp.gif file saved

Channel Spacing - Running High Band (915 - 925 MHz)



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Number of 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)]

MEASUREMENTS / RESULTS

Number of Channels

Date: 01-Mar-16

Company: Signal Fire Telemetry

Work Order: P2631

Engineer: Tuyen Truong

EUT Desc: DIN Mount Gateway

EUT Operating Voltage/Frequency: 9Vdc

Temp: 21°C

Humidity: 33%

Pressure: 998mBar

Frequency Range: 905-925 MHz

Notes:

EUT Tx Freq: 905 to 925 MHz

Frequency Hopping Systems		Channel	Frequency	Channel	Frequency
			(MHz)		(MHz)
Low Band	905-915 MHz	1	905.0	26	910.0
Low Band	905-915 MHz	2	905.2	27	910.2
Low Band	905-915 MHz	3	905.4	28	910.4
Low Band	905-915 MHz	4	905.6	29	910.6
Low Band	905-915 MHz	5	905.8	30	910.8
Low Band	905-915 MHz	6	906.0	31	911.0
Low Band	905-915 MHz	7	906.2	32	911.2
Low Band	905-915 MHz	8	906.4	33	911.4
Low Band	905-915 MHz	9	906.6	34	911.6
Low Band	905-915 MHz	10	906.8	35	911.8
Low Band	905-915 MHz	11	907.0	36	912.0
Low Band	905-915 MHz	12	907.2	37	912.2
Low Band	905-915 MHz	13	907.4	38	912.4
Low Band	905-915 MHz	14	907.6	39	912.6
Low Band	905-915 MHz	15	907.8	40	912.8
Low Band	905-915 MHz	16	908.0	41	913.0
Low Band	905-915 MHz	17	908.2	42	913.2
Low Band	905-915 MHz	18	908.4	43	913.4
Low Band	905-915 MHz	19	908.6	44	913.6
Low Band	905-915 MHz	20	908.8	45	913.8
Low Band	905-915 MHz	21	909.0	46	914.0
Low Band	905-915 MHz	22	909.2	47	914.2
Low Band	905-915 MHz	23	909.4	48	914.4
Low Band	905-915 MHz	24	909.6	49	914.6
Low Band	905-915 MHz	25	909.8	50	914.8

Test Site: CEM5

Attenuation: Asset#791

Analyzer: Brown

Rev. 2/28/2016

Spectrum Analyzers / Receivers/Preselectors	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Brown	9kHz-26.5GHz	E4407B	Agilent	SG44210511	1510	I	1/21/2017	1/21/2016
Conducted Test Sites (Mains / Telco)	FCC Code		VCCI Code			Cat	Calibration Due	Calibrated on
CEMI 5	719150		A-0015			III	NA	N/A
Preamps /Couplers Attenuators / Filters	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
HF 20dB 50W Attenuator	0.009-18 GHz	PE 7019-20	Pasternack	1	791	II	7/31/2016	7/31/2015
Meteorological Meters		MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Weather Clock (Pressure Only)		BA928	Oregon Scientific	C3166-1	831	I	3/19/2016	3/19/2014
TH A#2078		HTC-1	HDE		2078	II	4/2/2016	4/2/2015

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



Number of Channels

Date: 01-Mar-16

Company: Signal Fire Telemetry

Work Order: P2631

Engineer: Tuyen Truong

EUT Desc: DIN Mount Gateway

EUT Operating Voltage/Frequency: 9Vdc

Temp: 21°C

Humidity: 33%

Pressure: 998mBar

Frequency Range: 905-925 MHz

Notes: EUT Tx Freq: 905 to 925 MHz

Frequency Hoping Systems		Channel	Frequency	Channel	Frequency
			(MHz)		(MHz)
High Band	915-925 MHz	51	915.0	76	920.0
High Band	915-925 MHz	52	915.2	77	920.2
High Band	915-925 MHz	53	915.4	78	920.4
High Band	915-925 MHz	54	915.6	79	920.6
High Band	915-925 MHz	55	915.8	80	920.8
High Band	915-925 MHz	56	916.0	81	921.0
High Band	915-925 MHz	57	916.2	82	921.2
High Band	915-925 MHz	58	916.4	83	921.4
High Band	915-925 MHz	59	916.6	84	921.6
High Band	915-925 MHz	60	916.8	85	921.8
High Band	915-925 MHz	61	917.0	86	922.0
High Band	915-925 MHz	62	917.2	87	922.2
High Band	915-925 MHz	63	917.4	88	922.4
High Band	915-925 MHz	64	917.6	89	922.6
High Band	915-925 MHz	65	917.8	90	922.8
High Band	915-925 MHz	66	918.0	91	923.0
High Band	915-925 MHz	67	918.2	92	923.2
High Band	915-925 MHz	68	918.4	93	923.4
High Band	915-925 MHz	69	918.6	94	923.6
High Band	915-925 MHz	70	918.8	95	923.8
High Band	915-925 MHz	71	919.0	96	924.0
High Band	915-925 MHz	72	919.2	97	924.2
High Band	915-925 MHz	73	919.4	98	924.4
High Band	915-925 MHz	74	919.6	99	924.6
High Band	915-925 MHz	75	919.8	100	924.8

Test Site: CEM5

Attenuation: Asset#791

Analyzer: Brown

Note: Per client, only 100 channels (905-924.8MHz) are currently using. Channel 101th (925 MHz) shall be used in the future.

Rev. 2/28/2016

Spectrum Analyzers / Receivers / Preselectors Brown	Range 9kHz-26.5GHz	MN E4407B	Mfr Agilent	SN SG44210511	Asset 1510	Cat I	Calibration Due 1/21/2017	Calibrated on 1/21/2016
Conducted Test Sites (Mains / Telco) CEMI 5	FCC Code 719150		VCCI Code A-0015			Cat III	Calibration Due NA	Calibrated on N/A
Preamps / Couplers Attenuators / Filters HF 20dB 50W Attenuator	Range 0.009-18 GHz	MN PE 7019-20	Mfr Pasternack	SN 1	Asset 791	Cat II	Calibration Due 7/31/2016	Calibrated on 7/31/2015
Meteorological Meters Weather Clock (Pressure Only) TH A#2078		MN BA928 HTC-1	Mfr Oregon Scientific HDE	SN C3166-1	Asset 831 2078	Cat I II	Calibration Due 3/19/2016 4/2/2016	Calibrated on 3/19/2014 4/2/2015

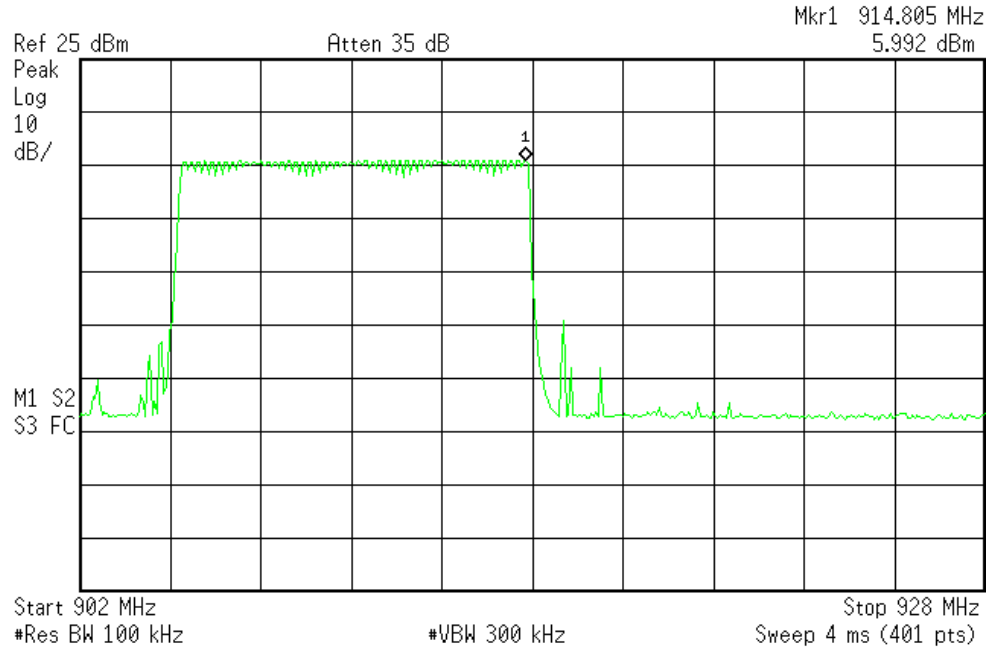
All equipment is calibrated using standards traceable to NIST or other nationally recognized calibration standard.



PLOTS

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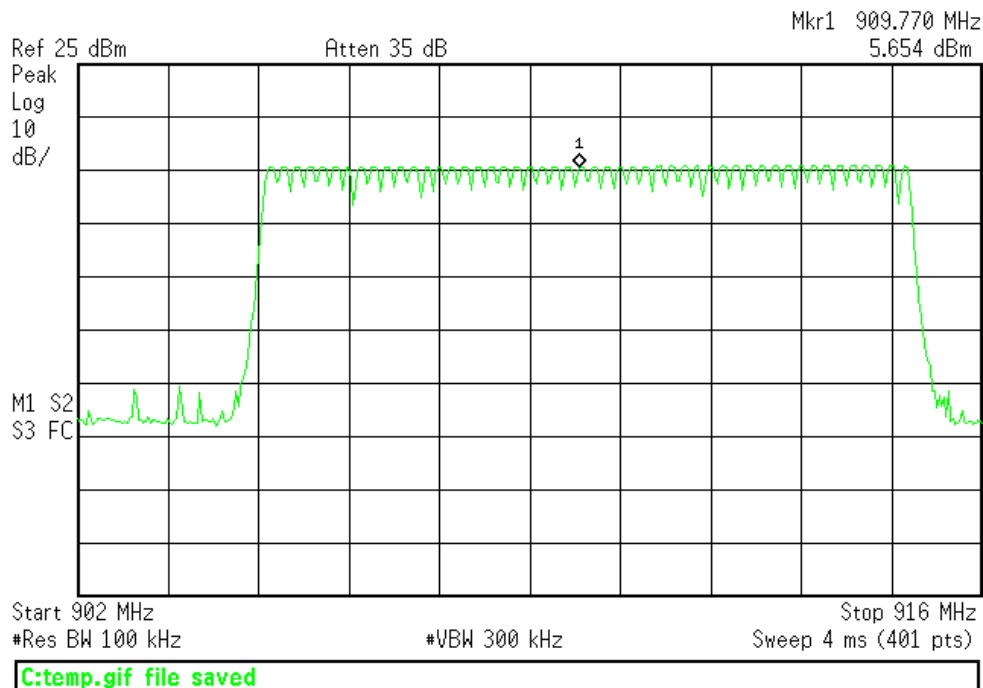
R T



Number of Channels - 50 Channels (Running Low Band)

Agilent 08:33:36 Mar 1, 2016

R T

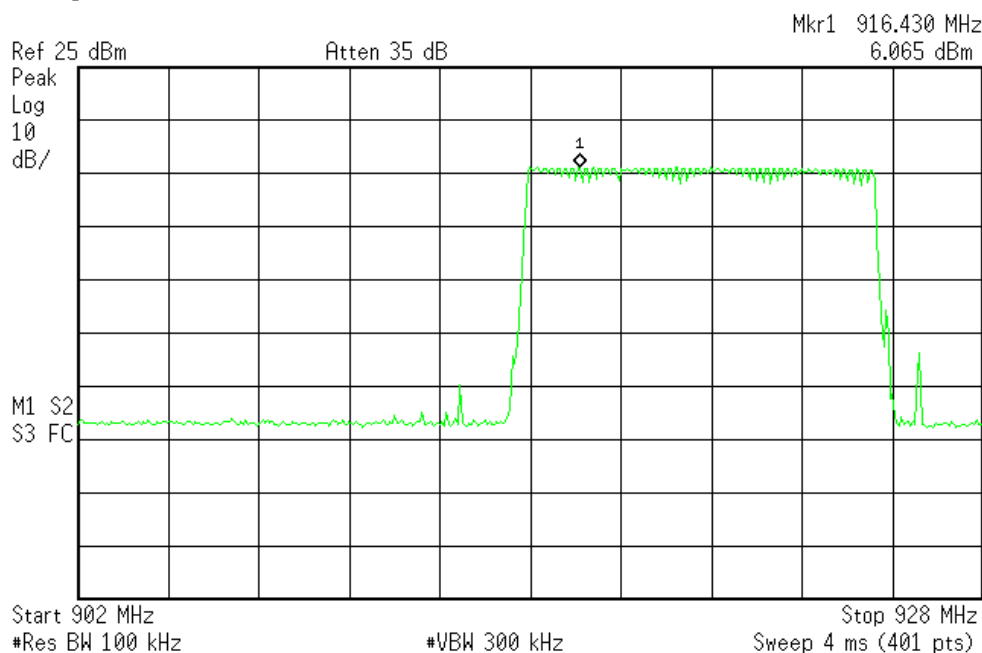


Number of Channels - 50 Channels (Running Low Band - Closed Up View)



Agilent 08:28:45 Mar 1, 2016

R T

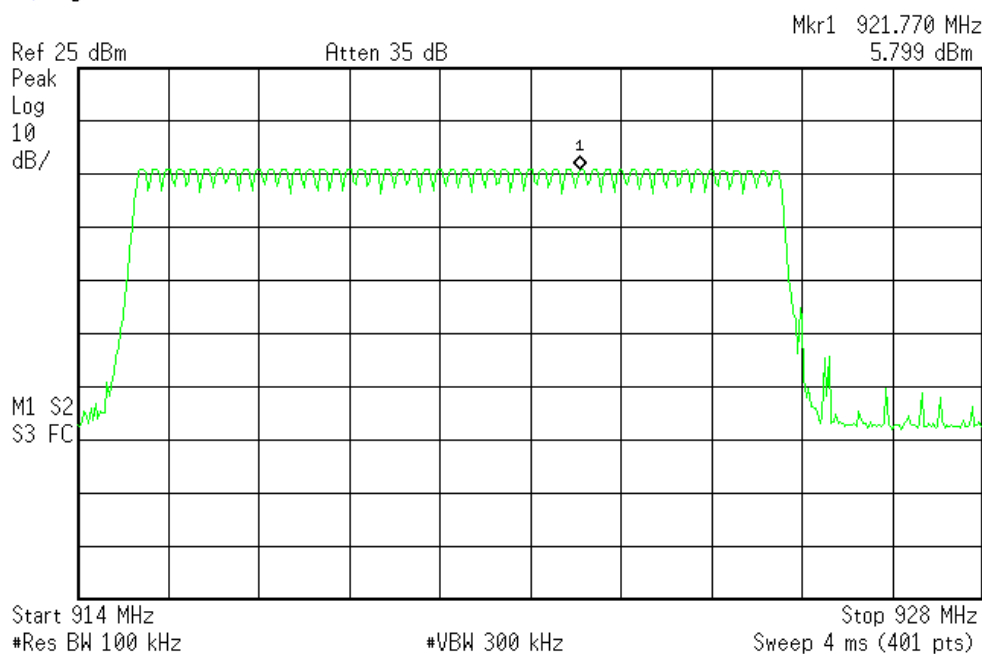


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Number of Channels - 50 Channels (Running High Band)

Agilent 08:31:10 Mar 1, 2016

R T



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Number of Channels - 50 Channels (Running High Band - Closed Up View)



Occupancy Time

For frequency hopping systems operating in the 902-928MHz band: if the 20dB bandwidth of the hopping channel is less than 250 kHz ...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)]

MEASUREMENTS / RESULTS

Occupancy Time							
Date: 01-Mar-16		Company: Signal Fire Telemetry			Work Order: P2631		
Engineer: Tuyen Truong		EUT Desc: DIN Mount Gateway			EUT Operating Voltage/Frequency: 9Vdc		
Temp: 21°C		Humidity: 33%		Pressure: 998mBar			
Frequency Range: 905-925 MHz							
Notes: 905.4 MHz (selected frequency)							
Frequency (MHz)	Individual Dwell Time (ms)	Total Transmissions Occurred in 20seconds	Total Transmissions Duration in 20 seconds (ms)	Adjusted Total Transmissions Duration in 20 seconds (s)	FCC 15.247		
					Limit (s)	Margin (s)	Result (Pass/Fail)
905.4	28.25	3	84.75	0.08475	0.4	-0.31525	Pass
Table Result: Pass by -0.31525 s Worst Freq: 905.4 MHz							
Test Site: CEM5		Attenuation: Asset#791					
Analyzer: Brown							
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Spectrum Analyzers / Receivers / Preselectors	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Brown	9kHz-26.5GHz	E4407B	Agilent	SG44210511	1510	I	1/21/2017	1/21/2016
Conducted Test Sites (Mains / Telco)	FCC Code		VCCI Code			Cat	Calibration Due	Calibrated on
CEMI 5	719150		A-0015			III	NA	N/A
Preamps / Couplers Attenuators / Filters	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
HF 20dB 50W Attenuator	0.009-18 GHz	PE 7019-20	Pasternack	1	791	II	7/31/2016	7/31/2015
Meteorological Meters		MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Weather Clock (Pressure Only)		BA928	Oregon Scientific	C3166-1	831	I	3/19/2016	3/19/2014
TH A#2078		HTC-1	HDE		2078	II	4/2/2016	4/2/2015

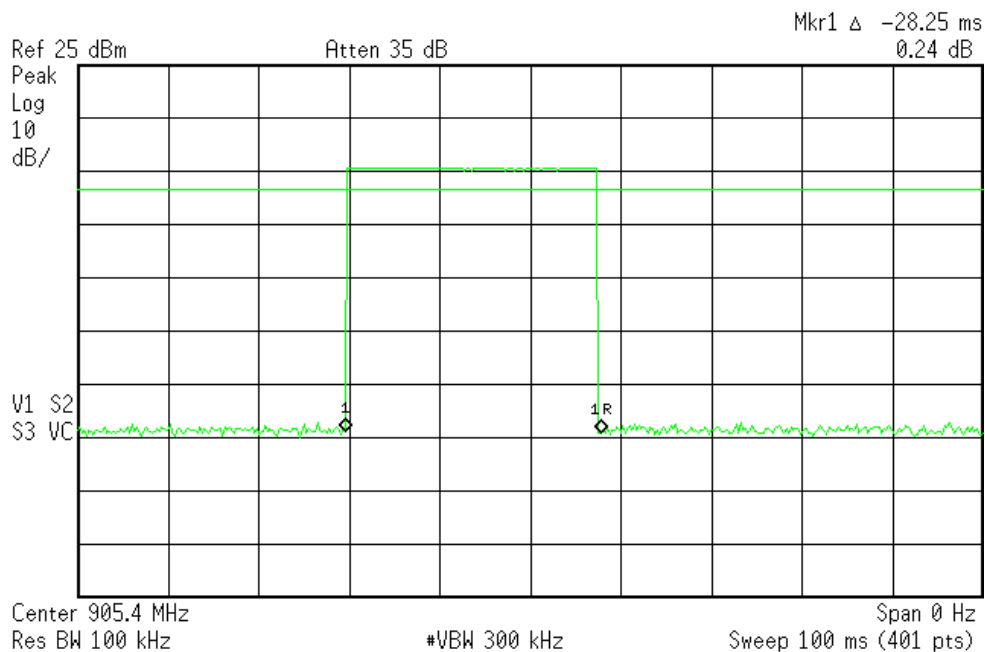
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PLOTS

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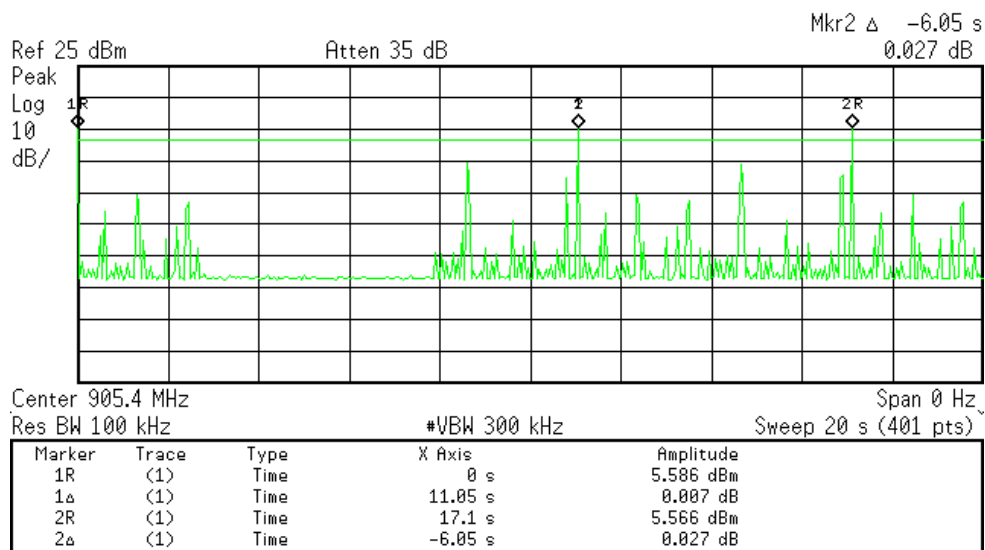
R T



Time Dwelled on a Carrier Frequency (905.4 MHz)

Agilent 11:37:22 Mar 1, 2016

R T



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Total Transmissions Times in 20seconds - 3x



Peak Power**LIMIT**

Conducted Output Power

1 Watt

[15.247(b) (2)]

MEASUREMENTS / RESULTS

Peak Power						
Date: 01-Mar-16		Company: Signal Fire Telemetry			Work Order: P2631	
Engineer: Tuyen Truong		EUT Desc: DIN Mount Gateway			EUT Operating Voltage/Frequency: 9Vdc	
Temp: 21°C		Humidity: 33%		Pressure: 998mBar		
Frequency Range: 905-925MHz						
Notes:						
Frequency (MHz)	Reading (dBm)	Attenuation (dB)	Final Conducted Reading (dBm)	FCC 15.247		
				Limit (dBm)	Margin (dB)	Result (Pass/Fail)
905	5.04	19.55	24.59	30.0	-5.41	Pass
915	5.22	19.55	24.77	30.0	-5.24	Pass
925	5.30	19.55	24.85	30.0	-5.15	Pass
Table Result: Pass by -5.15 dB				Worst Freq: 925.0 MHz		
Test Site: CEM5		Attenuation: Asset#791				
Analyzer: Brown						
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Rev. 2/28/2016

Spectrum Analyzers / Receivers / Preselectors	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Brown	9kHz-26.5GHz	E4407B	Agilent	SG44210511	1510	I	1/21/2017	1/21/2016
Conducted Test Sites (Mains / Telco)	FCC Code	VCCI Code		Cat		Calibration Due	Calibrated on	
CEM1 5	719150	A-0015		III		NA	N/A	
Preamps / Couplers Attenuators / Filters	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
HF 20dB 50W Attenuator	0.009-18 GHz	PE 7019-20	Pasternack	1	791	II	7/31/2016	7/31/2015
Meteorological Meters	MN		Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Weather Clock (Pressure Only)	BA928		Oregon Scientific	C3166-1	831	I	3/19/2016	3/19/2014
TH A#2078	HTC-1		HDE		2078	II	4/2/2016	4/2/2015

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

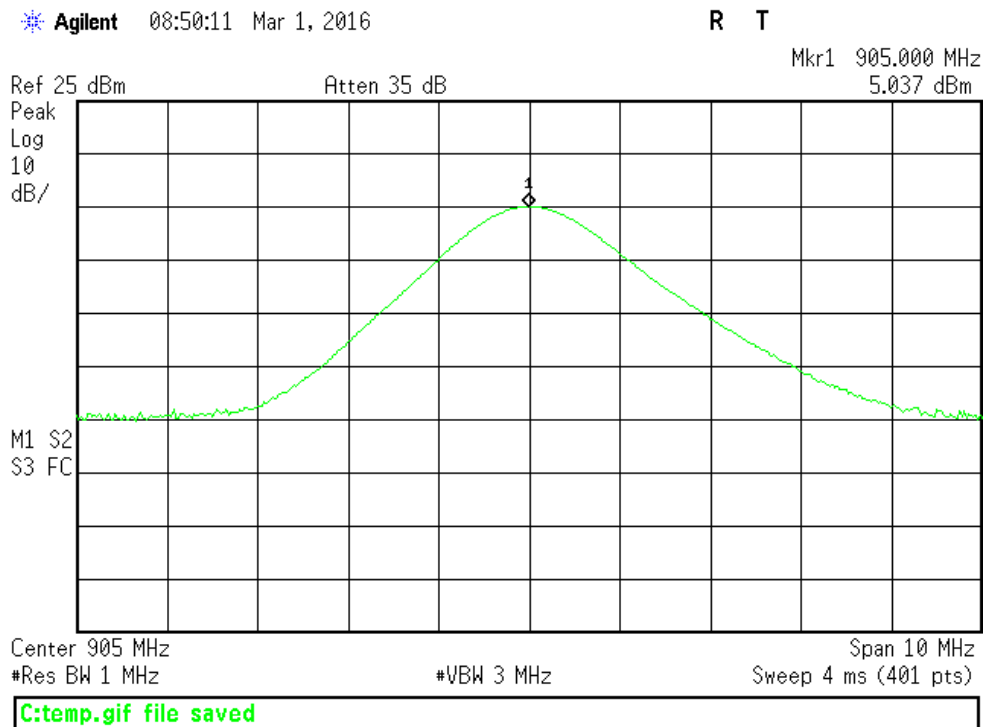


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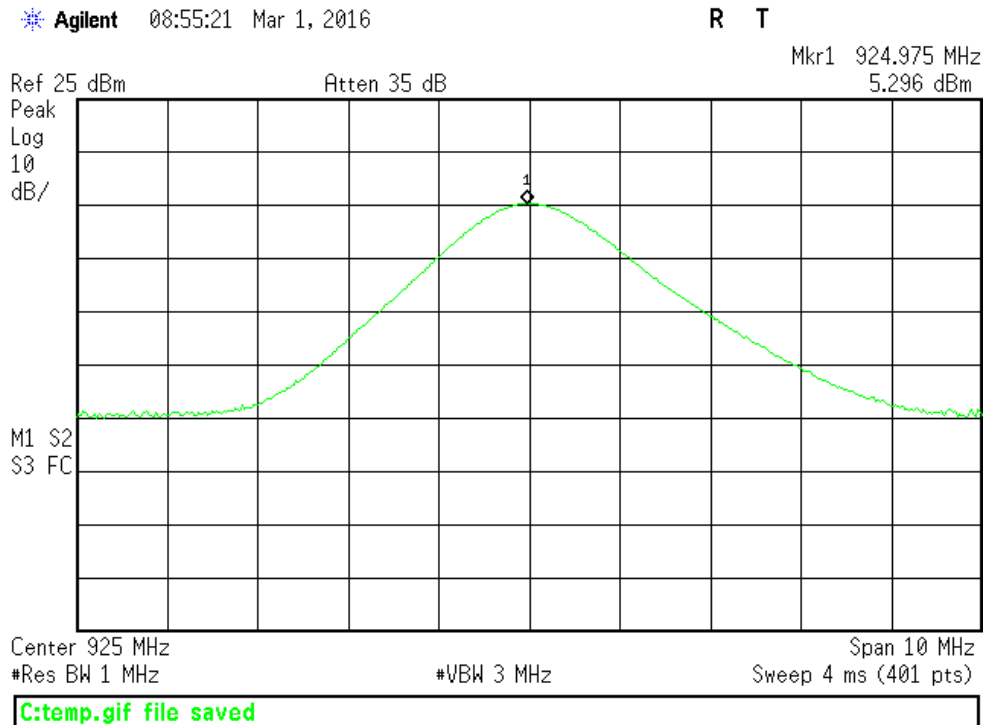
page 16 of 46



PLOTS



Peak Power - Low Channel



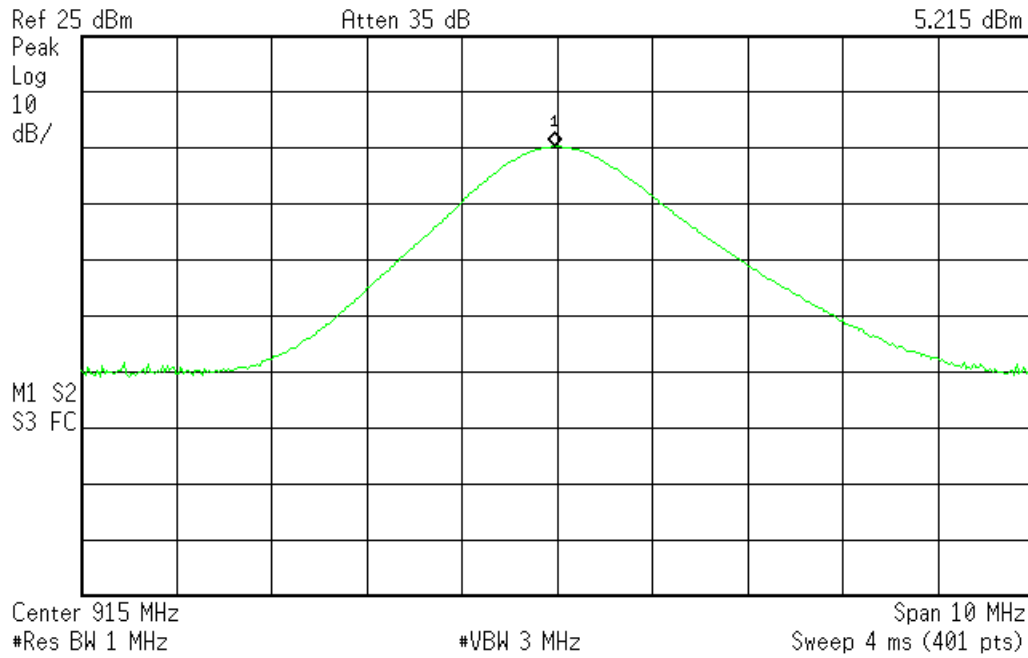
Peak Power - Mid Channel



Agilent 08:52:25 Mar 1, 2016

R T

Mkr1 914.975 MHz
5.215 dBm



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Peak Power - High Channel



Conducted Spurious Emissions

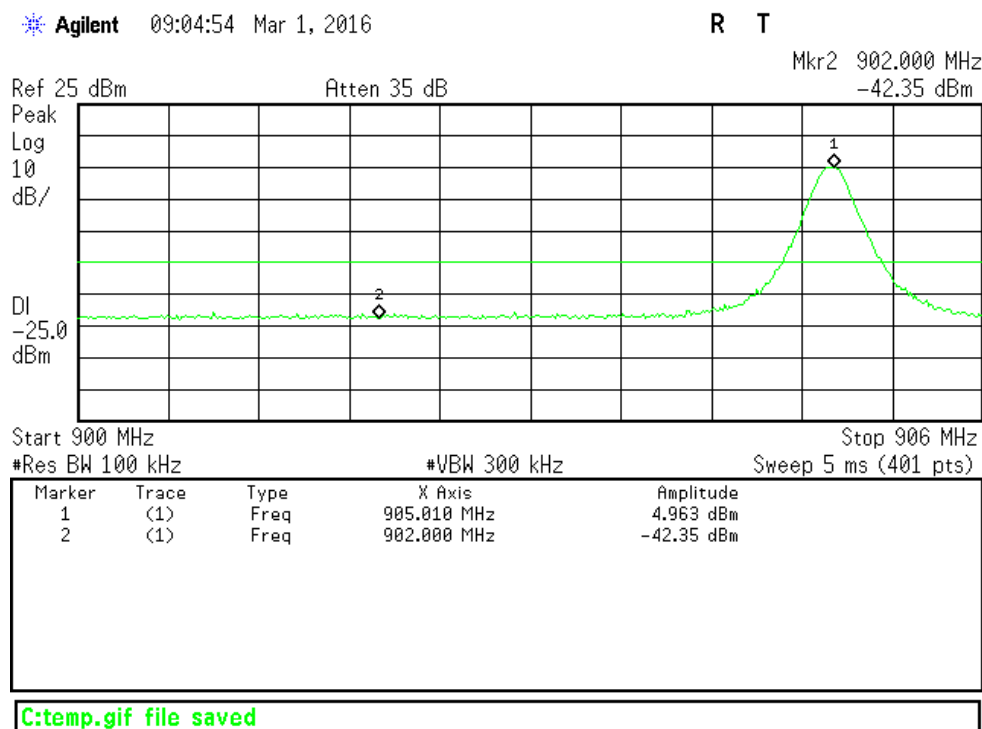
LIMITS

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 within the band that contains the highest level of the desired power, based on either a RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits.

[15.247(d)]

MEASUREMENTS / RESULTS

PLOTS

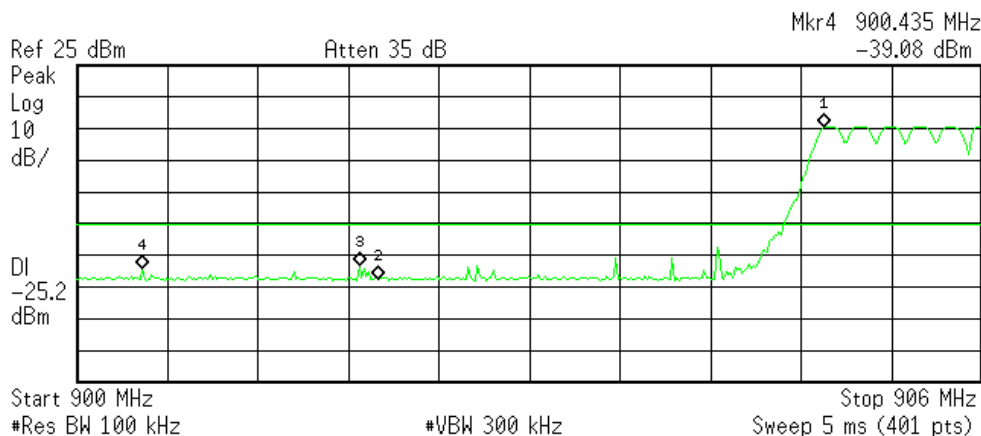


Band Edge - Running Low Channel (905 MHz)



Agilent 09:07:32 Mar 1, 2016

R T



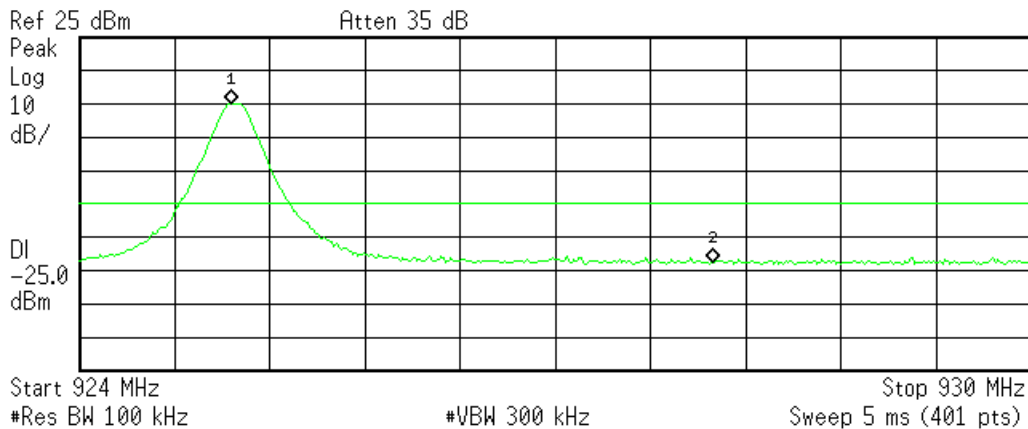
Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	904.950 MHz	5.188 dBm
2	(1)	Freq	902.000 MHz	-42.26 dBm
3	(1)	Freq	901.875 MHz	-38.07 dBm
4	(1)	Freq	900.435 MHz	-39.08 dBm

C:\temp.gif file saved

Band Edge - Running Low Band (Hopping Enable)

Agilent 08:58:17 Mar 1, 2016

R T



Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	924.960 MHz	4.981 dBm
2	(1)	Freq	928.000 MHz	-42.35 dBm

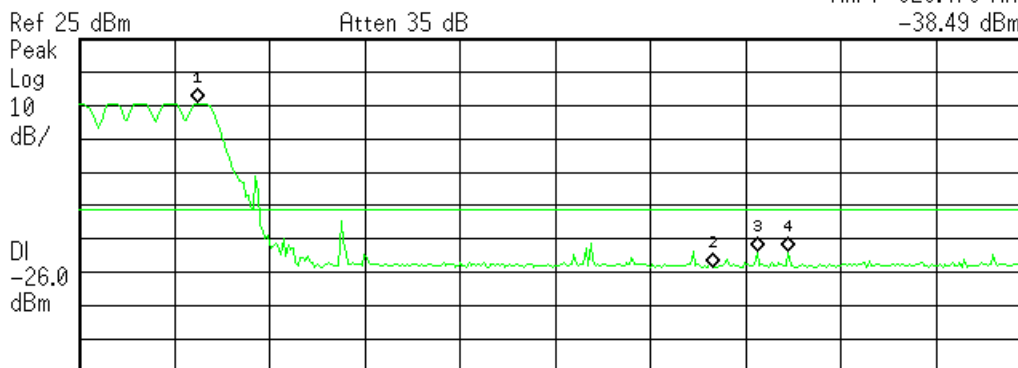
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Band Edge - Running High Channel (925 MHz)



✱ Agilent 09:03:35 Mar 1, 2016

R T

Mkr4 928.470 MHz
-38.49 dBm

Start 924 MHz Stop 930 MHz
#Res BW 100 kHz #VBW 300 kHz Sweep 5 ms (401 pts)

Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	924.750 MHz	5.629 dBm
2	(1)	Freq	928.000 MHz	-43.58 dBm
3	(1)	Freq	928.275 MHz	-38.68 dBm
4	(1)	Freq	928.470 MHz	-38.49 dBm

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Band Edge - Running High Band (Hopping Enable)

Rev. 2/28/2016

Spectrum Analyzers / Receivers / Preselectors

Brown

Range 9kHz-26.5GHz
MN E4407B

Mfr Agilent

SN SG44210511

Asset 1510

Cat I

Calibration Due 1/21/2017

Calibrated on 1/21/2016

Conducted Test Sites (Mains / Telco)

CEMI 5

FCC Code 719150

VCCI Code A-0015

Cat III

Calibration Due NA

Calibrated on N/A

Preamplifiers / Couplers / Attenuators / Filters

HF 20dB 50W Attenuator

Range 0.009-18 GHz
MN PE 7019-20

Mfr Pasternack

SN 1

Asset 791

Cat II

Calibration Due 7/31/2016

Calibrated on 7/31/2015

Meteorological MetersWeather Clock (Pressure Only)
TH A#2078

MN BA928

Mfr Oregon Scientific
HTC-1

SN C3166-1

Asset 831

Cat I

Calibration Due 3/19/2016

Calibrated on 3/19/2014

Cat II
Calibration Due 4/2/2016

Calibrated on 4/2/2015

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Conducted Spurious Emission

Maximum In Band in 100 KHz RBW

Date: 01-Mar-16		Company: Signal Fire Telemetry		Work Order: P2631	
Engineer: Tuyen Truong		EUT Desc: DIN Mount Gateway		EUT Operating Voltage/Frequency: 9Vdc	
Temp: 21°C		Humidity: 33%		Pressure: 998mBar	
Frequency Range: 902-928MHz					
Notes: Maximum In Band in 100 KHz RBW					
Frequency (MHz)	Reading (dBm)		Attenuation (dB)	Adjusted Reading (dBm)	
915	5.013		19.55	24.56	
Test Site: CEM5 Attenuation: Asset#791					
Analyzer: Brown					
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Conducted Spurious Emission

Date: 01-Mar-16		Company: Signal Fire Telemetry		Work Order: P2631		
Engineer: Tuyen Truong		EUT Desc: DIN Mount Gateway		EUT Operating Voltage/Frequency: 9Vdc		
Temp: 21°C		Humidity: 33%		Pressure: 998mBar		
Frequency Range: 30-10000 MHz						
Notes: TX on low channel The Limit here is set to -20dB from the max in-band peak PSD level in 100kHz RBW (Attenuation factor included or 19.55dB)						
Frequency (MHz)	Reading (dBm)	Attenuation (dB)	Final Conducted Reading (dBm)	FCC 15.247		
				Limit (dBm)	Margin (dB)	Result (Pass/Fail)
1810.0	-32.69	19.55	-13.14	4.56	-17.70	Pass
Table Result: Pass by -17.70 dB Worst Freq: 1810.0 MHz						
Test Site: CEM5		Attenuation: Asset#791				
Analyzer: Brown						
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Conducted Spurious Emission

Date: 01-Mar-16		Company: Signal Fire Telemetry		Work Order: P2631		
Engineer: Tuyen Truong		EUT Desc: DIN Mount Gateway		EUT Operating Voltage/Frequency: 9Vdc		
Temp: 21°C		Humidity: 33%		Pressure: 998mBar		
Frequency Range: 30-10000 MHz						
Notes: TX on mid channel The Limit here is set to -20dB from the max in-band peak PSD level in 100kHz RBW (Attenuation factor included or 19.55dB)						
Frequency (MHz)	Reading (dBm)	Attenuation (dB)	Final Conducted Reading (dBm)	FCC 15.247		
				Limit (dBm)	Margin (dB)	Result (Pass/Fail)
1830.0	-32.95	19.55	-13.40	4.56	-17.96	Pass
Table Result: Pass by -17.96 dB Worst Freq: 1830.0 MHz						
Test Site: CEM5		Attenuation: Asset#791				
Analyzer: Brown						
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Conducted Spurious Emission

Date: 01-Mar-16		Company: Signal Fire Telemetry		Work Order: P2631		
Engineer: Tuyen Truong		EUT Desc: DIN Mount Gateway		EUT Operating Voltage/Frequency: 9Vdc		
Temp: 21°C		Humidity: 33%		Pressure: 998mBar		
Frequency Range: 30-10000 MHz						
Notes: TX on high channel The Limit here is set to -20dB from the max in-band peak PSD level in 100kHz RBW (Attenuation factor included or 19.55dB)						
Frequency (MHz)	Reading (dBm)	Attenuation (dB)	Final Conducted Reading (dBm)	FCC 15.247		
				Limit (dBm)	Margin (dB)	Result (Pass/Fail)
1850.0	-32.08	19.55	-12.53	4.56	-17.09	Pass
Table Result: Pass by -17.09 dB			Worst Freq: 1850.0 MHz			
Test Site: CEM5		Attenuation: Asset#791				
Analyzer: Brown						

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Rev. 2/28/2016

Spectrum Analyzers / Receivers / Preselectors Brown	Range 9kHz-26.5GHz	MN E4407B	Mfr Agilent	SN SG44210511	Asset 1510	Cat I	Calibration Due 1/21/2017	Calibrated on 1/21/2016
Conducted Test Sites (Mains / Telco) CEMI 5	FCC Code 719150		VCCI Code A-0015			Cat III	Calibration Due NA	Calibrated on N/A
Preamps / Couplers Attenuators / Filters HF 20dB 50W Attenuator	Range 0.009-18 GHz	MN PE 7019-20	Mfr Pasternack	SN 1	Asset 791	Cat II	Calibration Due 7/31/2016	Calibrated on 7/31/2015
Meteorological Meters Weather Clock (Pressure Only) TH A#2078		MN BA928 HTC-1	Mfr Oregon Scientific HDE	SN C3166-1	Asset 831 2078	Cat I II	Calibration Due 3/19/2016 4/2/2016	Calibrated on 3/19/2014 4/2/2015

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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: 29-Feb-16			Company: Signal Fire Telemetry						Work Order: P2631			
Engineer: Tuyen Truong			EUT Desc: DIN Mount Gateway						EUT Operating Voltage/Frequency: 9Vdc			
Temp: 22.6°C			Humidity: 26%			Pressure: 993mBar						
Frequency Range: 30 to 1000 MHz							Measurement Distance: 3 m					
Notes: TX on low channel							EUT Max Freq: 905 to 925 MHz					
Tested with Enclosure Mount Antenna (MN: EEH-915)												
Antenna Polarization (H/V)	Frequency (MHz)	Reading (dBμV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Reading (dBμV/m)	---			FCC 15.209		
							Limit (dBμV/m)	Margin (dB)	Result (Pass/Fail)	Limit (dBμV/m)	Margin (dB)	Result (Pass/Fail)
v	37.12	46.3	25.4	16.0	0.4	37.3	---	---	---	40.0	-2.7	Pass
v	38.49	46.3	25.4	15.0	0.4	36.3	---	---	---	40.0	-3.7	Pass
h	72.19	54.0	25.4	8.4	0.5	37.5	---	---	---	40.0	-2.5	Pass
v	74.26	46.0	25.4	8.5	0.5	29.6	---	---	---	40.0	-10.4	Pass
v	92.17	55.8	25.5	8.3	0.6	39.2	---	---	---	43.5	-4.3	Pass
h	92.8	49.6	25.5	8.5	0.6	33.2	---	---	---	43.5	-10.3	Pass
v	112.0	34.0	25.4	13.2	0.6	22.4	---	---	---	43.5	-21.1	Pass
h	112.0	41.9	25.4	13.2	0.6	30.3	---	---	---	43.5	-13.2	Pass
v	351.0	25.8	25.7	14.3	1.0	15.4	---	---	---	46.0	-30.6	Pass
v	812.85	40.3	25.5	21.7	1.7	38.2	---	---	---	46.0	-7.8	Pass
h	977.3	34.5	25.2	23.2	1.8	34.3	---	---	---	54.0	-19.7	Pass
v	997.1	41.0	25.0	23.6	1.9	41.5	---	---	---	54.0	-12.5	Pass
Table Result: Pass by -2.5 dB Worst Freq: 72.19 MHz												
Test Site: EMI Chamber 2			Cable 1: Asset #2052				Cable 2: Asset #2053			Cable 3: ---		
Analyzer: Gold			Preamp: Red-White				Antenna: Red-White			Preselector: ---		
CSsoft Radiated Emissions Calculator v 1.017.157												
Adjusted Reading = Reading - Preamp Factor + Antenna Factor + Cable Factor												
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Rev. 2/28/2016

Spectrum Analyzers / Receivers/Preselectors Gold	Range 100Hz-26.5 GHz	MN E4407B	Mfr Agilent	SN MY45113816	Asset 1284	Cat I	Calibration Due 1/13/2017	Calibrated on 1/13/2016
Radiated Emissions Sites EMI Chamber 2	FCC Code 719150	IC Code 2762A-7	VCCI Code A-0015	Range 30-1000MHz		Cat II	Calibration Due 3/22/2017	Calibrated on 3/22/2015
Preamps/Couplers Attenuators / Filters Red-White	Range 0.009-2000MHz	MN ZFL-1000-LN	Mfr CS	SN N/A	Asset 1258	Cat II	Calibration Due 12/27/2016	Calibrated on 12/27/2015
Antennas Red-White Bilog	Range 30-2000MHz	MN JB1	Mfr Sunol	SN A091604-1	Asset 1105	Cat I	Calibration Due 8/12/2017	Calibrated on 8/12/2015
Meteorological Meters Weather Clock (Pressure Only) TH A#2081		MN BA928 HTC-1	Mfr Oregon Scientific HDE	SN C3166-1	Asset 831 2081	Cat I II	Calibration Due 3/19/2016 4/2/2016	Calibrated on 3/19/2014 4/2/2015
Cables Asset #2052 Asset #2053	Range 9kHz - 18GHz 9kHz - 18GHz		Mfr Florida RF Florida RF			Cat II II	Calibration Due 3/8/2016 3/8/2016	Calibrated on 3/8/2015 3/8/2015

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



Radiated Emissions Table

Date: 29-Feb-16		Company: Signal Fire Telemetry				Work Order: P2631									
Engineer: Tuyen Truong		EUT Desc: DIN Mount Gateway				EUT Operating Voltage/Frequency: 9Vdc									
Temp: 22.6°C		Humidity: 26%				Pressure: 993mBar									
Frequency Range: 1 to 6 GHz						Measurement Distance: 3 m									
Notes: TX on Low channel Tested with Enclosure Mount Antenna (MN: EEH-915)						EUT Max Freq: 905 to 925 MHz									
Antenna Polarization (H/V)	Frequency (MHz)	Peak Reading (dBuV)	Average Reading (dBuV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Peak Reading (dBuV/m)	Adjusted Avg Reading (dBuV/m)	FCC 15.209 High Frequency - Peak			FCC 15.209 High Frequency - Average			
									Limit (dBuV/m)	Margin (dB)	Result (Pass/Fail)	Limit (dBuV/m)	Margin (dB)	Result (Pass/Fail)	
v	2715.0	59.38	57.5	40.4	29.1	4.8	52.9	51.0	74.0	-21.1	Pass	54.0	-3.0	Pass	
h	2715.0	57.44	55.5	40.4	29.1	4.8	50.9	49.0	74.0	-23.1	Pass	54.0	-5.0	Pass	
h	3620.0	49.7	42.2	40.9	31.6	5.4	45.8	38.3	74.0	-28.2	Pass	54.0	-15.7	Pass	
h	4525.0	45.9	45.6	40.6	32.3	6.0	43.6	43.3	74.0	-30.4	Pass	54.0	-10.7	Pass	
h	5430.0	47.8	42.3	40.1	34.5	6.7	48.9	43.4	74.0	-25.1	Pass	54.0	-10.6	Pass	
v	5430.0	47.89	41.5	40.1	34.5	6.7	49.0	42.6	74.0	-25.0	Pass	54.0	-11.4	Pass	
Table Result:				Pass		by		-3.0 dB		Worst Freq:			2715.0 MHz		
Test Site: EMI Chamber 2				Cable 1: Asset #2052				Cable 2: Asset #2053				Cable 3: Asset #1785			
Analyzer: Gold				Preamp: Asset #2111				Antenna: Black Horn				Preselector: ---			
CSsoft Radiated Emissions Calculator v 1.017.157															
Adjusted Reading = Reading - Preamp Factor + Antenna Factor + Cable Factor															
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Radiated Emissions Table

Date: 29-Feb-16		Company: Signal Fire Telemetry				Work Order: P2631									
Engineer: Tuyen Truong		EUT Desc: DIN Mount Gateway				EUT Operating Voltage/Frequency: 9Vdc									
Temp: 22.6°C		Humidity: 26%				Pressure: 993mBar									
Frequency Range: 6 to 10 GHz						Measurement Distance: 1 m									
Notes: TX on Low channel Tested with Enclosure Mount Antenna (MN: EEH-915)						EUT Max Freq: 905 to 925 MHz									
Antenna Polarization (H / V)	Frequency (MHz)	Peak Reading (dBuV)	Average Reading (dBuV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Peak Reading (dBuV/m)	Adjusted Avg Reading (dBuV/m)	FCC 15.209 High Frequency - Peak			FCC 15.209 High Frequency - Average			
									Limit (dBuV/m)	Margin (dB)	Result (Pass/Fail)	Limit (dBuV/m)	Margin (dB)	Result (Pass/Fail)	
v	7240.0	49.87	44.3	40.0	37.7	7.7	55.3	49.7	83.5	-28.2	Pass	63.5	-13.8	Pass	
h	7240.0	53.24	48.8	40.0	37.7	7.7	58.6	54.2	83.5	-24.9	Pass	63.5	-9.3	Pass	
Table Result:		Pass		by		-9.3 dB		Worst Freq:		7240.0 MHz					
Test Site: EMI Chamber 2				Cable 1: Asset #2052				Cable 2: Asset #2053				Cable 3: Asset #1785			
Analyzer: Gold				Preamp: Asset #2111				Antenna: Black Horn				Preselector: ---			
CSsoft Radiated Emissions Calculator v 1.017.157															
Adjusted Reading = Reading - Preamp Factor + Antenna Factor + Cable Factor															
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Spectrum Analyzers / Receivers/Preselectors		Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Gold		100Hz-26.5 GHz	E4407B	Agilent	MY45113816	1284	I	1/13/2017	1/13/2016
Radiated Emissions Sites		FCC Code	IC Code	VCCI Code	Range		Cat	Calibration Due	Calibrated on
EMI Chamber 2		719150	2762A-7	A-0015	1-18GHz		I	4/29/2017	4/29/2015
Preamps/Couplers Attenuators / Filters		Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
A#2111 HF Preamp		0.5-18GHz	PAM-118A	COM-POWER	551063	2111	II	11/20/2016	11/20/2015
High Pass Filter		0.03-9 GHz	VHP-16	Mini-Circuits	NA	1288	II	1/7/2017	1/7/2016
Antennas		Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Black Horn		1-18GHz	3115	EMCO	9703-5148	56	I	8/21/2016	8/21/2014
Meteorological Meters			MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Weather Clock (Pressure Only)			BA928	Oregon Scientific	C3166-1	831	I	3/19/2016	3/19/2014
TH A#2081			HTC-1	HDE		2081	II	4/2/2016	4/2/2015
Cables		Range		Mfr			Cat	Calibration Due	Calibrated on
Asset #1785		9kHz - 18GHz		Florida RF			II	1/5/2017	1/5/2016
Asset #2052		9kHz - 18GHz		Florida RF			II	3/8/2016	3/8/2015
Asset #2053		9kHz - 18GHz		Florida RF			II	3/8/2016	3/8/2015

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Radiated Emissions Table

Date: 29-Feb-16			Company: Signal Fire Telemetry				Work Order: P2631					
Engineer: Tuyen Truong			EUT Desc: DIN Mount Gateway				EUT Operating Voltage/Frequency: 9Vdc					
Temp: 22.6°C			Humidity: 26%		Pressure: 993mBar							
Frequency Range: 30 to 1000 MHz							Measurement Distance: 3 m					
Notes: TX on mid channel Tested with Enclosure Mount Antenna (MN: EEH-915)							EUT Max Freq: 905 to 925 MHz					
Antenna Polarization (H/V)	Frequency (MHz)	Reading (dBuV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Reading (dBuV/m)	---			FCC 15.209		
							Limit (dBuV/m)	Margin (dB)	Result (Pass/Fail)	Limit (dBuV/m)	Margin (dB)	Result (Pass/Fail)
v	38.5	45.1	25.4	15.0	0.4	35.1	---	---	---	40.0	-4.9	Pass
h	52.57	48.4	25.4	7.4	0.4	30.8	---	---	---	40.0	-9.2	Pass
v	71.5	47.0	25.4	8.4	0.5	30.5	---	---	---	40.0	-9.5	Pass
h	72.22	48.3	25.4	8.4	0.5	31.8	---	---	---	40.0	-8.2	Pass
v	74.9	43.9	25.4	8.5	0.5	27.5	---	---	---	40.0	-12.5	Pass
v	92.15	56.6	25.5	8.3	0.6	40.0	---	---	---	43.5	-3.5	Pass
h	92.15	36.6	25.5	8.3	0.6	20.0	---	---	---	43.5	-23.5	Pass
v	112.1	35.7	25.4	13.2	0.6	24.1	---	---	---	43.5	-19.4	Pass
h	112.1	35.6	25.4	13.2	0.6	24.0	---	---	---	43.5	-19.5	Pass
v	823.5	40.3	25.5	21.7	1.7	38.2	---	---	---	46.0	-7.8	Pass
h	842.8	32.2	25.5	21.7	1.8	30.2	---	---	---	46.0	-15.8	Pass
v	932.0	38.8	25.5	22.4	1.6	37.3	---	---	---	46.0	-8.7	Pass
v	992.7	30.6	25.0	23.5	1.9	31.0	---	---	---	54.0	-23.0	Pass
Table Result: Pass by -3.5 dB Worst Freq: 92.15 MHz												
Test Site: EMI Chamber 2			Cable 1: Asset #2052			Cable 2: Asset #2053			Cable 3: ---			
Analyzer: Gold			Preamp: Red-White			Antenna: Red-White			Preselector: ---			
CSsoft Radiated Emissions Calculator v 1.017.157												
Adjusted Reading = Reading - Preamp Factor + Antenna Factor + Cable Factor												
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Spectrum Analyzers / Receivers / Preselectors Gold	Range 100Hz-26.5 GHz	MN E4407B	Mfr Agilent	SN MY45113816	Asset 1284	Cat I	Calibration Due 1/13/2017	Calibrated on 1/13/2016
Radiated Emissions Sites EMI Chamber 2	FCC Code 719150	IC Code 2762A-7	VCCI Code A-0015	Range 30-1000MHz		Cat II	Calibration Due 3/22/2017	Calibrated on 3/22/2015
Preamps / Couplers Attenuators / Filters Red-White	Range 0.009-2000MHz	MN ZFL-1000-LN	Mfr CS	SN N/A	Asset 1258	Cat II	Calibration Due 12/27/2016	Calibrated on 12/27/2015
Antennas Red-White Bilog	Range 30-2000MHz	MN JB1	Mfr Sunol	SN A091604-1	Asset 1105	Cat I	Calibration Due 8/12/2017	Calibrated on 8/12/2015
Meteorological Meters Weather Clock (Pressure Only) TH A#2081		MN BA928 HTC-1	Mfr Oregon Scientific HDE	SN C3166-1	Asset 831 2081	Cat I II	Calibration Due 3/19/2016 4/2/2016	Calibrated on 3/19/2014 4/2/2015
Cables Asset #2052 Asset #2053	Range 9kHz - 18GHz 9kHz - 18GHz		Mfr Florida RF Florida RF			Cat II II	Calibration Due 3/8/2016 3/8/2016	Calibrated on 3/8/2015 3/8/2015

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

Radiated Emissions Table

Date: 29-Feb-16		Company: Signal Fire Telemetry						Work Order: P2631							
Engineer: Tuyen Truong		EUT Desc: DIN Mount Gateway						EUT Operating Voltage/Frequency: 9Vdc							
Temp: 22.6°C		Humidity: 26%						Pressure: 993mBar							
Frequency Range: 1 to 6 GHz								Measurement Distance: 3 m							
Notes: TX on Mid channel								EUT Max Freq: 905 to 925 MHz							
Tested with Enclosure Mount Antenna (MN: EEH-915)															
Antenna Polarization (H / V)	Frequency (MHz)	Peak Reading (dBuV)	Average Reading (dBuV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Peak Reading (dBuV/m)	Adjusted Avg Reading (dBuV/m)	FCC 15.209 High Frequency - Peak			FCC 15.209 High Frequency - Average			
									Limit (dBuV/m)	Margin (dB)	Result (Pass/Fail)	Limit (dBuV/m)	Margin (dB)	Result (Pass/Fail)	
v	2745.0	59.24	57.3	40.4	29.1	4.7	52.6	50.7	74.0	-21.4	Pass	54.0	-3.3	Pass	
h	2745.0	55.01	51.9	40.4	29.1	4.7	48.4	45.3	74.0	-25.6	Pass	54.0	-8.7	Pass	
v	3660.0	53.73	49.2	40.8	31.8	5.3	50.0	45.5	74.0	-24.0	Pass	54.0	-8.5	Pass	
v	4575.0	50.98	47.7	40.7	32.5	6.2	49.0	45.7	74.0	-25.0	Pass	54.0	-8.3	Pass	
h	4575.0	52.05	47.9	40.7	32.5	6.2	50.1	45.9	74.0	-23.9	Pass	54.0	-8.1	Pass	
v	5489.0	50.36	46.1	40.0	34.5	6.9	51.8	47.5	74.0	-22.2	Pass	54.0	-6.5	Pass	
h	5489.8	50.88	46.8	40.0	34.5	6.9	52.3	48.2	74.0	-21.7	Pass	54.0	-5.8	Pass	
Table Result:				Pass		by		-3.3 dB		Worst Freq:				2745.0 MHz	
Test Site: EMI Chamber 2				Cable 1: Asset #2052				Cable 2: Asset #2053				Cable 3: Asset #1785			
Analyzer: Gold				Preamp: Asset #2111				Antenna: Black Horn				Preselector: ---			
CSsoft Radiated Emissions Calculator v 1.017.157															
Adjusted Reading = Reading - Preamp Factor + Antenna Factor + Cable Factor															
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Radiated Emissions Table

Date: 29-Feb-16				Company: Signal Fire Telemetry				Work Order: P2631							
Engineer: Tuyen Truong				EUT Desc: DIN Mount Gateway				EUT Operating Voltage/Frequency: 9Vdc							
Temp: 22.6°C				Humidity: 26%				Pressure: 993mBar							
Frequency Range: 6 to 10 GHz								Measurement Distance: 1 m							
Notes: TX on Mid channel								EUT Max Freq: 905 to 925 MHz							
Tested with Enclosure Mount Antenna (MN: EEH-915)															
Antenna Polarization (H / V)	Frequency (MHz)	Peak Reading (dBuV)	Average Reading (dBuV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Peak Reading (dBuV/m)	Adjusted Avg Reading (dBuV/m)	FCC 15.209 High Frequency - Peak			FCC 15.209 High Frequency - Average			
									Limit (dBuV/m)	Margin (dB)	Result (Pass/Fail)	Limit (dBuV/m)	Margin (dB)	Result (Pass/Fail)	
v	7320.0	52.02	47.4	40.1	37.9	7.9	57.7	53.1	83.5	-25.8	Pass	63.5	-10.4	Pass	
h	7320.0	53.64	49.7	40.1	37.9	7.9	59.3	55.4	83.5	-24.2	Pass	63.5	-8.1	Pass	
Table Result:				Pass by -8.1 dB				Worst Freq: 7320.0 MHz							
Test Site: EMI Chamber 2				Cable 1: Asset #2052				Cable 2: Asset #2053				Cable 3: Asset #1785			
Analyzer: Gold				Preamp: Asset #2111				Antenna: Black Horn				Preselector: ---			
CSsoft Radiated Emissions Calculator v 1.017.157								Copyright Curtis-Starr LLC 2006							
Adjusted Reading = Reading - Preamp Factor + Antenna Factor + Cable Factor															

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Spectrum Analyzers / Receivers/Preselectors Gold	Range 100Hz-26.5 GHz	MN E4407B	Mfr Agilent	SN MY45113816	Asset 1284	Cat I	Calibration Due 1/13/2017	Calibrated on 1/13/2016
Radiated Emissions Sites EMI Chamber 2	FCC Code 719150	IC Code 2762A-7	VCCI Code A-0015	Range 1-18GHz		Cat I	Calibration Due 4/29/2017	Calibrated on 4/29/2015
Preamps/Couplers Attenuators / Filters A#2111 HF Preamp High Pass Filter	Range 0.5-18GHz 0.03-9 GHz	MN PAM-118A VHP-16	Mfr COM-POWER Mini-Circuits	SN 551063 NA	Asset 2111 1288	Cat II II	Calibration Due 11/20/2016 1/7/2017	Calibrated on 11/20/2015 1/7/2016
Antennas Black Horn	Range 1-18GHz	MN 3115	Mfr EMCO	SN 9703-5148	Asset 56	Cat I	Calibration Due 8/21/2016	Calibrated on 8/21/2014
Meteorological Meters Weather Clock (Pressure Only) TH A#2081		MN BA928 HTC-1	Mfr Oregon Scientific HDE	SN C3166-1	Asset 831 2081	Cat I II	Calibration Due 3/19/2016 4/2/2016	Calibrated on 3/19/2014 4/2/2015
Cables Asset #1785 Asset #2052 Asset #2053	Range 9kHz - 18GHz 9kHz - 18GHz 9kHz - 18GHz		Mfr Florida RF Florida RF Florida RF			Cat II II II	Calibration Due 1/5/2017 3/8/2016 3/8/2016	Calibrated on 1/5/2016 3/8/2015 3/8/2015

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

Radiated Emissions Table

Date: 29-Feb-16			Company: Signal Fire Telemetry				Work Order: P2631					
Engineer: Tuyen Truong			EUT Desc: DIN Mount Gateway				EUT Operating Voltage/Frequency: 9Vdc					
Temp: 22.6°C			Humidity: 26%				Pressure: 993mBar					
Frequency Range: 30 to 1000 MHz							Measurement Distance: 3 m					
Notes: TX on high channel Tested with Enclosure Mount Antenna (MN: EEH-915)							EUT Max Freq: 905 to 925 MHz					
Antenna Polarization (H/V)	Frequency (MHz)	Reading (dBuV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Reading (dBuV/m)	---			FCC 15.209		
							Limit (dBuV/m)	Margin (dB)	Result (Pass/Fail)	Limit (dBuV/m)	Margin (dB)	Result (Pass/Fail)
v	37.22	46.0	25.4	15.9	0.4	36.9	---	---	---	40.0	-3.1	Pass
v	38.53	45.8	25.4	15.0	0.4	35.8	---	---	---	40.0	-4.2	Pass
v	71.5	46.5	25.4	8.4	0.5	30.0	---	---	---	40.0	-10.0	Pass
h	72.2	54.2	25.4	8.4	0.5	37.7	---	---	---	40.0	-2.3	Pass
v	91.45	56.5	25.5	8.2	0.6	39.8	---	---	---	43.5	-3.7	Pass
h	92.12	44.5	25.5	8.3	0.6	27.9	---	---	---	43.5	-15.6	Pass
v	112.2	33.0	25.4	13.2	0.6	21.4	---	---	---	43.5	-22.1	Pass
h	113.8	36.5	25.4	13.5	0.6	25.2	---	---	---	43.5	-18.3	Pass
v	832.9	41.8	25.5	21.7	1.8	39.8	---	---	---	46.0	-6.2	Pass
v	962.1	33.6	25.4	22.9	1.7	32.8	---	---	---	54.0	-21.2	Pass
h	997.2	35.7	25.0	23.6	1.9	36.2	---	---	---	54.0	-17.8	Pass
Table Result: Pass by -2.3 dB Worst Freq: 72.2 MHz												
Test Site: EMI Chamber 2			Cable 1: Asset #2052				Cable 2: Asset #2053			Cable 3: ---		
Analyzer: Gold			Preamp: Red-White				Antenna: Red-White			Preselector: ---		
CSsoft Radiated Emissions Calculator v 1.017.157												
Adjusted Reading = Reading - Preamp Factor + Antenna Factor + Cable Factor												
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Spectrum Analyzers / Receivers / Preselectors Gold	Range 100Hz-26.5 GHz	MN E4407B	Mfr Agilent	SN MY45113816	Asset 1284	Cat I	Calibration Due 1/13/2017	Calibrated on 1/13/2016
Radiated Emissions Sites EMI Chamber 2	FCC Code 719150	IC Code 2762A-7	VCCI Code A-0015	Range 30-1000MHz		Cat II	Calibration Due 3/22/2017	Calibrated on 3/22/2015
Preamps / Couplers Attenuators / Filters Red-White	Range 0.009-2000MHz	MN ZFL-1000-LN	Mfr CS	SN N/A	Asset 1258	Cat II	Calibration Due 12/27/2016	Calibrated on 12/27/2015
Antennas Red-White Bilog	Range 30-2000MHz	MN JB1	Mfr Sunol	SN A091604-1	Asset 1105	Cat I	Calibration Due 8/12/2017	Calibrated on 8/12/2015
Meteorological Meters Weather Clock (Pressure Only) TH A#2081		MN BA928 HTC-1	Mfr Oregon Scientific HDE	SN C3166-1	Asset 831 2081	Cat I II	Calibration Due 3/19/2016 4/2/2016	Calibrated on 3/19/2014 4/2/2015
Cables Asset #2052 Asset #2053	Range 9kHz - 18GHz 9kHz - 18GHz		Mfr Florida RF Florida RF			Cat II II	Calibration Due 3/8/2016 3/8/2016	Calibrated on 3/8/2015 3/8/2015

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

Radiated Emissions Table														
Date: 29-Feb-16				Company: Signal Fire Telemetry				Work Order: P2631						
Engineer: Tuyen Truong				EUT Desc: DIN Mount Gateway				EUT Operating Voltage/Frequency: 9Vdc						
Temp: 22.6°C				Humidity: 26%				Pressure: 993mBar						
Frequency Range: 1 to 6 GHz								Measurement Distance: 3 m						
Notes: TX on high channel Tested with Enclosure Mount Antenna (MN: EEH-915)								EUT Max Freq: 905 to 925 MHz						
Antenna Polarization (H / V)	Frequency (MHz)	Peak Reading (dBuV)	Average Reading (dBuV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Peak Reading (dBuV/m)	Adjusted Avg Reading (dBuV/m)	FCC 15.209 High Frequency - Peak			FCC 15.209 High Frequency - Average		
									Limit (dBuV/m)	Margin (dB)	Result (Pass/Fail)	Limit (dBuV/m)	Margin (dB)	Result (Pass/Fail)
v	2775.0	59.2	57.8	40.3	29.1	4.5	52.5	51.1	74.0	-21.5	Pass	54.0	-2.9	Pass
h	2775.0	53.25	49.5	40.3	29.1	4.5	46.6	42.8	74.0	-27.4	Pass	54.0	-11.2	Pass
h	3700.0	54.55	52.5	40.8	32.1	5.2	51.1	49.0	74.0	-22.9	Pass	54.0	-5.0	Pass
v	4625.0	49.62	45.0	40.7	32.6	6.2	47.7	43.1	74.0	-26.3	Pass	54.0	-10.9	Pass
h	4625.0	51.69	46.2	40.7	32.6	6.2	49.8	44.3	74.0	-24.2	Pass	54.0	-9.7	Pass
v	5550.0	49.53	45.9	39.9	34.4	6.8	50.8	47.2	74.0	-23.2	Pass	54.0	-6.8	Pass
h	5550.0	50.1	46.2	39.9	34.4	6.8	51.4	47.5	74.0	-22.6	Pass	54.0	-6.5	Pass
Table Result:				Pass by -2.9 dB				Worst Freq:				2775.0 MHz		
Test Site: EMI Chamber 2				Cable 1: Asset #2052				Cable 2: Asset #2053				Cable 3: Asset #1785		
Analyzer: Gold				Preamp: Asset #2111				Antenna: Black Horn				Preselector: ---		
CSsoft Radiated Emissions Calculator v 1.017.157														
Adjusted Reading = Reading - Preamp Factor + Antenna Factor + Cable Factor														
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Radiated Emissions Table														
Date: 29-Feb-16			Company: Signal Fire Telemetry						Work Order: P2631					
Engineer: Tuyen Truong			EUT Desc: DIN Mount Gateway						EUT Operating Voltage/Frequency: 9Vdc					
Temp: 22.6°C			Humidity: 26%						Pressure: 993mBar					
Frequency Range: 6 to 10 GHz									Measurement Distance: 1 m					
Notes: TX on high channel Tested with Enclosure Mount Antenna (MN: EEH-915)									EUT Max Freq: 905 to 925 MHz					
Antenna Polarization (H / V)	Frequency (MHz)	Peak Reading (dBuV)	Average Reading (dBuV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Peak Reading (dBuV/m)	Adjusted Avg Reading (dBuV/m)	FCC 15.209 High Frequency - Peak			FCC 15.209 High Frequency - Average		
									Limit (dBuV/m)	Margin (dB)	Result (Pass/Fail)	Limit (dBuV/m)	Margin (dB)	Result (Pass/Fail)
v	7400.0	49.39	44.3	40.0	37.9	7.7	55.0	49.9	83.5	-28.5	Pass	63.5	-13.6	Pass
h	7400.0	55.79	53.4	40.0	37.9	7.7	61.4	59.0	83.5	-22.1	Pass	63.5	-4.5	Pass
Table Result:		Pass		by		-4.5 dB				Worst Freq:		7400.0 MHz		
Test Site: EMI Chamber 2			Cable 1: Asset #2052						Cable 2: Asset #2053			Cable 3: Asset #1785		
Analyzer: Gold			Preamp: Asset #2111						Antenna: Black Horn			Preselector: ---		
CSsoft Radiated Emissions Calculator v 1.017.157														
Adjusted Reading = Reading - Preamp Factor + Antenna Factor + Cable Factor														
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Spectrum Analyzers / Receivers/Preselectors Gold	Range 10Hz-26.5 GHz	MN E4407B	Mfr Agilent	SN MY45113816	Asset 1284	Cat I	Calibration Due 1/13/2017	Calibrated on 1/13/2016
Radiated Emissions Sites EMI Chamber 2	FCC Code 719150	IC Code 2762A-7	VCCI Code A-0015	Range 1-18GHz		Cat I	Calibration Due 4/29/2017	Calibrated on 4/29/2015
Preamps/Couplers Attenuators / Filters A#2111 HF Preamp High Pass Filter	Range 0.5-18GHz 0.03-9 GHz	MN PAM-118A VHP-16	Mfr COM-POWER Mini-Circuits	SN 551063 NA	Asset 2111 1288	Cat II II	Calibration Due 11/20/2016 1/7/2017	Calibrated on 11/20/2015 1/7/2016
Antennas Black Horn	Range 1-18GHz	MN 3115	Mfr EMCO	SN 9703-5148	Asset 56	Cat I	Calibration Due 8/21/2016	Calibrated on 8/21/2014
Meteorological Meters Weather Clock (Pressure Only) TH A#2081		MN BA928 HTC-1	Mfr Oregon Scientific HDE	SN C3166-1	Asset 831 2081	Cat I II	Calibration Due 3/19/2016 4/2/2016	Calibrated on 3/19/2014 4/2/2015
Cables Asset #1785 Asset #2052 Asset #2053	Range kHz - 18GHz kHz - 18GHz kHz - 18GHz		Mfr Florida RF Florida RF Florida RF			Cat II II II	Calibration Due 1/5/2017 3/8/2016 3/8/2016	Calibrated on 1/5/2016 3/8/2015 3/8/2015

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

Radiated Emissions Table

Date: 02-Mar-16			Company: Signal Fire Telemetry			Work Order: P2631						
Engineer: Tuyen Truong			EUT Desc: DIN Mount Gateway			EUT Operating Voltage/Frequency: 9Vdc						
Temp: 24°C			Humidity: 28%			Pressure: 1011mBar						
Frequency Range: 30 to 1000 MHz						Measurement Distance: 3 m						
Notes: RX mode Tested with Enclosure Mount Antenna (MN: EEH-915)						EUT Max Freq: 905 to 925 MHz						
Antenna Polarization (H / V)	Frequency (MHz)	Reading (dBμV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Reading (dBμV/m)	---			FCC 15.209		
							Limit (dBμV/m)	Margin (dB)	Result (Pass/Fail)	Limit (dBμV/m)	Margin (dB)	Result (Pass/Fail)
v	37.5	40.6	25.4	15.8	0.4	31.4	---	---	---	40.0	-8.6	Pass
v	37.78	41.1	25.4	15.6	0.4	31.7	---	---	---	40.0	-8.3	Pass
v	73.5	45.0	25.4	8.5	0.5	28.6	---	---	---	40.0	-11.4	Pass
h	73.5	47.7	25.4	8.5	0.5	31.3	---	---	---	40.0	-8.7	Pass
v	108.0	23.6	25.4	12.5	0.5	11.2	---	---	---	43.5	-32.3	Pass
v	115.0	28.9	25.4	13.7	0.6	17.8	---	---	---	43.5	-25.7	Pass
v	608.0	25.7	25.7	18.6	1.5	20.1	---	---	---	46.0	-25.9	Pass
v	960.0	25.4	25.4	22.9	1.7	24.6	---	---	---	46.0	-21.4	Pass
Table Result: Pass by -8.6 dB Worst Freq: 37.5 MHz												
Test Site: EMI Chamber 2			Cable 1: Asset #2052			Cable 2: Asset #2053			Cable 3: ---			
Analyzer: Asset #1327			Preamp: Red-White			Antenna: Red-White			Preselector: ---			
CSsoft Radiated Emissions Calculator v 1.017.157						Copyright Curtis-Straus LLC 2000						
Adjusted Reading = Reading - Preamp Factor + Antenna Factor + Cable Factor												

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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 7/10/2016	Calibrated on 7/10/2015
Radiated Emissions Sites EMI Chamber 2	FCC Code 719150	IC Code 2762A-7	VCCI Code A-0015	Range 30-1000MHz		Cat II	Calibration Due 3/22/2017	Calibrated on 3/22/2015
Preamps/Couplers Attenuators / Filters Red-White	Range 0.009-2000MHz	MN ZFL-1000-LN	Mfr CS	SN N/A	Asset 1258	Cat II	Calibration Due 12/27/2016	Calibrated on 12/27/2015
Antennas Red-White Bilog	Range 30-2000MHz	MN JB1	Mfr Sunol	SN A091604-1	Asset 1105	Cat I	Calibration Due 8/12/2017	Calibrated on 8/12/2015
Meteorological Meters Weather Clock (Pressure Only) TH A#2081		MN BA928 HTC-1	Mfr Oregon Scientific HDE	SN C3166-1	Asset 831 2081	Cat I II	Calibration Due 3/19/2016 4/2/2016	Calibrated on 3/19/2014 4/2/2015
Cables Asset #2052 Asset #2053	Range 9kHz - 18GHz 9kHz - 18GHz		Mfr Florida RF Florida RF			Cat II II	Calibration Due 3/8/2016 3/8/2016	Calibrated on 3/8/2015 3/8/2015

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



Radiated Emissions Table

Date: 29-Feb-16		Company: Signal Fire Telemetry				Work Order: P2631									
Engineer: Tuyen Truong		EUT Desc: DIN Mount Gateway				EUT Operating Voltage/Frequency: 9Vdc									
Temp: 22.6°C		Humidity: 26%				Pressure: 993mBar									
Frequency Range: 1 to10 GHz						Measurement Distance: 3 m (1-6GHz) & 1m (6 -10GHz)									
Notes: RX mode Tested with Enclosure Mount Antenna (MN: EEH-915)						EUT Max Freq: 905 to 925 MHz									
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 15.209 High Frequency - Peak			FCC 15.209 High Frequency - Average			
									Limit (dBμV/m)	Margin (dB)	Result (Pass/Fail)	Limit (dBμV/m)	Margin (dB)	Result (Pass/Fail)	
									No emissions found within 10dB of the limit in this range						
Table Result: --- by --- dB												Worst Freq: --- MHz			
Test Site: EMI Chamber 2				Cable 1: Asset #2052				Cable 2: Asset #2053				Cable 3: Asset #1785			
Analyzer: Gold				Preamp: Asset #2111				Antenna: Black Horn				Preselector: ---			
CSsoft Radiated Emissions Calculator v 1.017.157												Copyright Curtis-Straus LLC 2006			
Adjusted Reading = Reading - Preamp Factor + Antenna Factor + Cable Factor															

Spectrum Analyzers / Receivers/Preselectors		Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Gold		10Hz-26.5 GHz	E4407B	Agilent	MY45113816	1284	I	1/13/2017	1/13/2016
Radiated Emissions Sites		FCC Code	IC Code	VCCI Code	Range		Cat	Calibration Due	Calibrated on
EMI Chamber 2		719150	2762A-7	A-0015	1-18GHz		I	4/29/2017	4/29/2015
Preamps/Couplers Attenuators / Filters		Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
A#2111 HF Preamp		0.5-18GHz	PAM-118A	COM-POWER	551063	2111	II	11/20/2016	11/20/2015
High Pass Filter		0.03-9 GHz	VHP-16	Mini-Circuits	NA	1288	II	1/7/2017	1/7/2016
Antennas		Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Black Horn		1-18GHz	3115	EMCO	9703-5148	56	I	8/21/2016	8/21/2014
Meteorological Meters			MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Weather Clock (Pressure Only)			BA928	regon Scientific	C3166-1	831	I	3/19/2016	3/19/2014
TH A#2081			HTC-1	HDE		2081	II	4/2/2016	4/2/2015
Cables		Range		Mfr			Cat	Calibration Due	Calibrated on
Asset #1785		kHz - 18GHz		Florida RF			II	1/5/2017	1/5/2016
Asset #2052		kHz - 18GHz		Florida RF			II	3/8/2016	3/8/2015
Asset #2053		kHz - 18GHz		Florida RF			II	3/8/2016	3/8/2015

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

Radiated Emissions Table

Date: 21-Mar-16		Company: Signal Fire Telemetry				Work Order: P2631						
Engineer: Tuyen Truong		EUT Desc: DIN Mount Gateway				EUT Operating Voltage/Frequency: 9Vdc						
Temp: 20.5°C		Humidity: 27%		Pressure: 993mBar								
Frequency Range: 30 to 1000 MHz						Measurement Distance: 3 m						
Notes: TX on low channel Tested with Nearson Antenna (MN: 467)						EUT Max Freq: 905 to 925 MHz						
Antenna Polarization (H / V)	Frequency (MHz)	Reading (dBμV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Reading (dBμV/m)	---			FCC 15.209		
							Limit (dBμV/m)	Margin (dB)	Result (Pass/Fail)	Limit (dBμV/m)	Margin (dB)	Result (Pass/Fail)
v	37.7	34.1	22.3	15.8	0.5	28.1	---	---	---	40.0	-11.9	Pass
v	74.85	43.9	22.4	9.1	0.6	31.2	---	---	---	40.0	-8.8	Pass
h	74.85	37.2	22.4	9.1	0.6	24.5	---	---	---	40.0	-15.5	Pass
v	108.0	42.9	22.5	12.3	0.8	33.5	---	---	---	43.5	-10.0	Pass
v	133.8	37.6	22.6	13.9	1.0	29.9	---	---	---	43.5	-13.6	Pass
v	207.3	39.6	22.5	11.0	1.0	29.1	---	---	---	43.5	-14.4	Pass
v	961.2	26.1	22.1	23.0	2.1	29.1	---	---	---	54.0	-24.9	Pass
Table Result: Pass by -8.8 dB Worst Freq: 74.85 MHz												
Test Site: EMI Chamber 2		Cable 1: Asset #1785				Cable 2: Asset #2052				Cable 3: ---		
Analyzer: ---		Preamp: Blue				Antenna: Red-Black				Preselector: ---		
CSsoft Radiated Emissions Calculator v 1.017.158												
Adjusted Reading = Reading - Preamp Factor + Antenna Factor + Cable Factor												
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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 7/10/2016	Calibrated on 7/10/2015
Radiated Emissions Sites EMI Chamber 2	FCC Code 719150	IC Code 2762A-7	VCCI Code A-0015	Range 30-1000MHz		Cat II	Calibration Due 3/22/2017	Calibrated on 3/22/2015
Preamps / Couplers Attenuators / Filters Blue	Range 0.009-2000MHz	MN ZFL-1000-LN	Mfr CS	SN N/A	Asset 759	Cat II	Calibration Due 5/17/2016	Calibrated on 5/17/2015
Antennas Red-Black Bilog	Range 30-2000MHz	MN JB1	Mfr Sunol	SN A091604-2	Asset 1106	Cat I	Calibration Due 2/9/2017	Calibrated on 2/9/2015
Meteorological Meters TH A#2081 Barometric A#2160		MN HTC-1 5396-0321	Mfr HDE Monarch Instruments	SN 2081 4000060	Asset 2160	Cat II I	Calibration Due 4/2/2016 3/7/2017	Calibrated on 4/2/2015 3/7/2016

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

Radiated Emissions Table

Date: 21-Mar-16		Company: Signal Fire Telemetry				Work Order: P2631								
Engineer: Tuyen Truong		EUT Desc: DIN Mount Gateway				EUT Operating Voltage/Frequency: 9Vdc								
Temp: 20.5°C		Humidity: 27%				Pressure: 993mBar								
Frequency Range: 1 to 6 GHz						Measurement Distance: 3 m								
Notes: Tx on low channel Tested with Nearson Antenna (MN: 467)						EUT Max Freq: 905 to 925 MHz								
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 15.209 High Frequency - Peak			FCC 15.209 High Frequency - Average		
									Limit (dBμV/m)	Margin (dB)	Result (Pass/Fail)	Limit (dBμV/m)	Margin (dB)	Result (Pass/Fail)
v	2715.0	40.54	37.7	20.2	29.1	3.8	53.2	50.4	74.0	-20.8	Pass	54.0	-3.6	Pass
h	2715.0	37.2	32.8	20.2	29.1	3.8	49.9	45.5	74.0	-24.1	Pass	54.0	-8.5	Pass
v	3620.0	38.6	34.9	19.1	31.6	4.1	55.2	51.5	74.0	-18.8	Pass	54.0	-2.5	Pass
h	3620.0	37.97	34.2	19.1	31.6	4.1	54.6	50.8	74.0	-19.4	Pass	54.0	-3.2	Pass
v	4525.0	34.978	27.2	17.9	32.3	4.8	54.2	46.4	74.0	-19.8	Pass	54.0	-7.6	Pass
h	4525.0	34.53	28.1	17.9	32.3	4.8	53.7	47.3	74.0	-20.3	Pass	54.0	-6.7	Pass
v	5429.0	37.59	29.3	17.6	34.5	5.2	59.7	51.4	74.0	-14.3	Pass	54.0	-2.6	Pass
h	5429.0	34.46	27.2	17.6	34.5	5.2	56.6	49.3	74.0	-17.4	Pass	54.0	-4.7	Pass
Table Result:		Pass		by		-2.5 dB		Worst Freq:		3620.0 MHz				
Test Site: EMI Chamber 2		Cable 1: Asset #1785		Cable 2: Asset #2052		Cable 3: ---								
Analyzer: ---		Preamp: Asset #1517		Antenna: Black Horn		Preselector: ---								
CSsoft Radiated Emissions Calculator v 1.017.158														
Adjusted Reading = Reading - Preamp Factor + Antenna Factor + Cable Factor														
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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 7/10/2016	Calibrated on 7/10/2015
Radiated Emissions Sites EMI Chamber 2	FCC Code 719150	IC Code 2762A-7	VCCI Code A-0015	Range 1-18GHz		Cat I	Calibration Due 4/29/2017	Calibrated on 4/29/2015
Preamps / Couplers Attenuators / Filters 1517 HF Preamp High Pass Filter	Range 1-20GHz 0.03-9 GHz	MN CS VHP-16	Mfr CS Mini-Circuits	SN N/A NA	Asset 1517 1288	Cat II II	Calibration Due 8/6/2016 1/7/2017	Calibrated on 8/6/2015 1/7/2016
Antennas Black Horn	Range 1-18GHz	MN 3115	Mfr EMCO	SN 9703-5148	Asset 56	Cat I	Calibration Due 8/21/2016	Calibrated on 8/21/2014
Meteorological Meters TH A#2081 Barometric A#2160		MN HTC-1 5396-0321	Mfr HDE Monarch Instruments	SN 2081 4000060	Asset 2160	Cat II I	Calibration Due 4/2/2016 3/7/2017	Calibrated on 4/2/2015 3/7/2016
Cables Asset #1785 Asset #2052	Range 9kHz - 18GHz 9kHz - 18GHz		Mfr Florida RF Florida RF			Cat II II	Calibration Due 1/5/2017 3/2/2017	Calibrated on 1/5/2016 3/2/2016

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



Radiated Emissions Table

Date: 02-Mar-16			Company: Signal Fire Telemetry						Work Order: P2631								
Engineer: Tuyen Truong			EUT Desc: DIN Mount Gateway						EUT Operating Voltage/Frequency: 9Vdc								
Temp: 24°C			Humidity: 28%						Pressure: 1011mBar								
Frequency Range: 6 to 10 GHz									Measurement Distance: 1 m								
Notes: TX on low channel									EUT Max Freq: 905 to 925 MHz								
Tested with Nearson Antenna (MN: 467)																	
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 15.209 High Frequency - Peak			FCC 15.209 High Frequency - Average					
									Limit (dBμV/m)	Margin (dB)	Result (Pass/Fail)	Limit (dBμV/m)	Margin (dB)	Result (Pass/Fail)			
v	7240.0	49.68	43.7	40.0	37.7	7.7	55.1	49.1	83.5	-28.4	Pass	63.5	-14.4	Pass			
h	7240.0	50.37	45.2	40.0	37.7	7.7	55.8	50.6	83.5	-27.7	Pass	63.5	-12.9	Pass			
v	8145.0	48.38	43.5	38.6	37.7	7.6	55.1	50.2	83.5	-28.4	Pass	63.5	-13.3	Pass			
h	8145.0	45.55	39.3	38.6	37.7	7.6	52.3	46.0	83.5	-31.2	Pass	63.5	-17.5	Pass			
v	9050.0	51.14	45.9	39.2	38.4	8.1	58.4	53.2	83.5	-25.1	Pass	63.5	-10.3	Pass			
Table Result:		Pass by -10.3 dB													Worst Freq: 9050.0 MHz		
Test Site: EMI Chamber 2			Cable 1: Asset #2052						Cable 2: Asset #2054			Cable 3: Asset #1785					
Analyzer: Asset #1327			Preamp: Asset #2111						Antenna: Black Horn			Preselector: ---					
CSsoft Radiated Emissions Calculator v 1.017.157																	
Adjusted Reading = Reading - Preamp Factor + Antenna Factor + Cable Factor																	
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Spectrum Analyzers / Receivers/Preselectors		Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
SA EMI Chamber (1327)		9kHz-13.2 GHz	E4405B	Agilent	MY45103416	1327	I	7/10/2016	7/10/2015
Radiated Emissions Sites		FCC Code	IC Code	VCCI Code	Range		Cat	Calibration Due	Calibrated on
EMI Chamber 2		719150	2762A-7	A-0015	1-18GHz		I	4/29/2017	4/29/2015
Preamps/Couplers Attenuators / Filters		Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
A#2111 HF Preamp		0.5-18GHz	PAM-118A	COM-POWER	551063	2111	II	11/20/2016	11/20/2015
High Pass Filter		0.03-9 GHz	VHP-16	Mini-Circuits	NA	1288	II	1/7/2017	1/7/2016
Antennas		Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Black Horn		1-18GHz	3115	EMCO	9703-5148	56	I	8/21/2016	8/21/2014
Meteorological Meters			MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Weather Clock (Pressure Only)			BA928	Oregon Scientific	C3166-1	831	I	3/19/2016	3/19/2014
TH A#2081			HTC-1	HDE		2081	II	4/2/2016	4/2/2015
Cables		Range		Mfr			Cat	Calibration Due	Calibrated on
Asset #1785		9kHz - 18GHz		Florida RF			II	1/5/2017	1/5/2016
Asset #2052		9kHz - 18GHz		Florida RF			II	3/8/2016	3/8/2015
Asset #2054		9kHz - 18GHz		Florida RF			II	3/8/2016	3/8/2015

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

Radiated Emissions Table

Date: 21-Mar-16			Company: Signal Fire Telemetry			Work Order: P2631						
Engineer: Tuyen Truong			EUT Desc: DIN Mount Gateway			EUT Operating Voltage/Frequency: 9Vdc						
Temp: 20.5°C			Humidity: 27%			Pressure: 993mBar						
Frequency Range: 30 to 1000 MHz						Measurement Distance: 3 m						
Notes: TX on mid channel Tested with Nearson Antenna (MN: 467)						EUT Max Freq: 905 to 925 MHz						
Antenna Polarization (H/V)	Frequency (MHz)	Reading (dBμV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Reading (dBμV/m)	---			FCC 15.209		
							Limit (dBμV/m)	Margin (dB)	Result (Pass/Fail)	Limit (dBμV/m)	Margin (dB)	Result (Pass/Fail)
v	37.76	34.4	22.3	15.8	0.5	28.4	---	---	---	40.0	-11.6	Pass
v	74.85	43.6	22.4	9.1	0.6	30.9	---	---	---	40.0	-9.1	Pass
h	74.85	40.7	22.4	9.1	0.6	28.0	---	---	---	40.0	-12.0	Pass
v	108.0	41.6	22.5	12.3	0.8	32.2	---	---	---	43.5	-11.3	Pass
h	110.0	38.6	22.5	12.7	0.8	29.6	---	---	---	43.5	-13.9	Pass
v	209.5	37.9	22.5	10.6	1.0	27.0	---	---	---	43.5	-16.5	Pass
h	221.0	35.7	22.5	10.8	1.0	25.0	---	---	---	46.0	-21.0	Pass
v	466.5	28.6	22.5	17.3	1.5	24.9	---	---	---	46.0	-21.1	Pass
h	466.5	30.3	22.5	17.3	1.5	26.6	---	---	---	46.0	-19.4	Pass
v	983.0	25.6	22.2	23.1	2.2	28.7	---	---	---	54.0	-25.3	Pass
Table Result: Pass by -9.1 dB Worst Freq: 74.85 MHz												
Test Site: EMI Chamber 2			Cable 1: Asset #1785			Cable 2: Asset #2052			Cable 3: ---			
Analyzer: ---			Preamp: Blue			Antenna: Red-Black			Preselector: ---			
CSsoft Radiated Emissions Calculator v 1.017.158												
Adjusted Reading = Reading - Preamp Factor + Antenna Factor + Cable Factor												
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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 7/10/2016	Calibrated on 7/10/2015
Radiated Emissions Sites EMI Chamber 2	FCC Code 719150	IC Code 2762A-7	VCCI Code A-0015	Range 30-1000MHz		Cat II	Calibration Due 3/22/2017	Calibrated on 3/22/2015
Preamps / Couplers Attenuators / Filters Blue	Range 0.009-2000MHz	MN ZFL-1000-LN	Mfr CS	SN N/A	Asset 759	Cat II	Calibration Due 5/17/2016	Calibrated on 5/17/2015
Antennas Red-Black Bilog	Range 30-2000MHz	MN JB1	Mfr Sunol	SN A091604-2	Asset 1106	Cat I	Calibration Due 2/9/2017	Calibrated on 2/9/2015
Meteorological Meters TH A#2081 Barometric A#2160		MN HTC-1 5396-0321	Mfr HDE Monarch Instruments	SN 2081 4000060	Asset 2160	Cat II I	Calibration Due 4/2/2016 3/7/2017	Calibrated on 4/2/2015 3/7/2016

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

Radiated Emissions Table														
Date: 21-Mar-16			Company: Signal Fire Telemetry						Work Order: P2631					
Engineer: Tuyen Truong			EUT Desc: DIN Mount Gateway						EUT Operating Voltage/Frequency: 9Vdc					
Temp: 20.5°C			Humidity: 27%						Pressure: 993mBar					
Frequency Range: 1 to 6 GHz									Measurement Distance: 3 m					
Notes: Tx on mid channel Tested with Nearson Antenna (MN: 467)									EUT Max Freq: 905 to 925 MHz					
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 15.209 High Frequency - Peak			FCC 15.209 High Frequency - Average		
									Limit (dBμV/m)	Margin (dB)	Result (Pass/Fail)	Limit (dBμV/m)	Margin (dB)	Result (Pass/Fail)
v	2745.0	40.57	33.4	20.2	29.1	3.7	53.2	46.0	74.0	-20.8	Pass	54.0	-8.0	Pass
v	3660.0	40.58	35.1	19.1	31.8	3.9	57.2	51.7	74.0	-16.8	Pass	54.0	-2.3	Pass
h	3660.0	37.91	33.6	19.1	31.8	3.9	54.5	50.2	74.0	-19.5	Pass	54.0	-3.8	Pass
v	4575.0	34.3	25.0	17.9	32.5	4.9	53.8	44.5	74.0	-20.2	Pass	54.0	-9.5	Pass
h	4575.0	35.36	28.3	17.9	32.5	4.9	54.9	47.8	74.0	-19.1	Pass	54.0	-6.2	Pass
v	5490.0	35.75	29.2	17.6	34.5	5.4	58.1	51.5	74.0	-15.9	Pass	54.0	-2.5	Pass
h	5490.0	37.06	28.5	17.6	34.5	5.4	59.4	50.8	74.0	-14.6	Pass	54.0	-3.2	Pass
Table Result: Pass by -2.3 dB									Worst Freq: 3660.0 MHz					
Test Site: EMI Chamber 2			Cable 1: Asset #1785						Cable 2: Asset #2052			Cable 3: ---		
Analyzer: ---			Preamp: Asset #1517						Antenna: Black Horn			Preselector: ---		
CSsoft Radiated Emissions Calculator v 1.017.158														
Adjusted Reading = Reading - Preamp Factor + Antenna Factor + Cable Factor														
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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 7/10/2016	Calibrated on 7/10/2015
Radiated Emissions Sites EMI Chamber 2	FCC Code 719150	IC Code 2762A-7	VCCI Code A-0015	Range 1-18GHz		Cat I	Calibration Due 4/29/2017	Calibrated on 4/29/2015
Preamps / Couplers Attenuators / Filters 1517 HF Preamp High Pass Filter	Range 1-20GHz 0.03-9 GHz	MN CS VHP-16	Mfr CS Mini-Circuits	SN N/A NA	Asset 1517 1288	Cat II II	Calibration Due 8/6/2016 1/7/2017	Calibrated on 8/6/2015 1/7/2016
Antennas Black Horn	Range 1-18GHz	MN 3115	Mfr EMCO	SN 9703-5148	Asset 56	Cat I	Calibration Due 8/21/2016	Calibrated on 8/21/2014
Meteorological Meters TH A#2081 Barometric A#2160		MN HTC-1 5396-0321	Mfr HDE Monarch Instruments	SN 2081 4000060	Asset 2160	Cat II I	Calibration Due 4/2/2016 3/7/2017	Calibrated on 4/2/2015 3/7/2016
Cables Asset #1785 Asset #2052	Range 9kHz - 18GHz 9kHz - 18GHz		Mfr Florida RF Florida RF			Cat II II	Calibration Due 1/5/2017 3/2/2017	Calibrated on 1/5/2016 3/2/2016

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



Radiated Emissions Table

Date: 02-Mar-16		Company: Signal Fire Telemetry				Work Order: P2631									
Engineer: Tuyen Truong		EUT Desc: DIN Mount Gateway				EUT Operating Voltage/Frequency: 9Vdc									
Temp: 24°C		Humidity: 28%				Pressure: 1011mBar									
Frequency Range: 6 to 10 GHz						Measurement Distance: 1 m									
Notes: TX on mid channel Tested with Nearson Antenna (MN: 467)						EUT Max Freq: 905 to 925 MHz									
Antenna Polarization (H/V)	Frequency (MHz)	Peak Reading (dBuV)	Average Reading (dBuV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Peak Reading (dBuV/m)	Adjusted Avg Reading (dBuV/m)	FCC 15.209 High Frequency - Peak			FCC 15.209 High Frequency - Average			
									Limit (dBuV/m)	Margin (dB)	Result (Pass/Fail)	Limit (dBuV/m)	Margin (dB)	Result (Pass/Fail)	
v	7320.0	47.79	41.5	40.1	37.9	7.9	53.5	47.2	83.5	-30.0	Pass	63.5	-16.3	Pass	
h	7320.0	50.95	46.7	40.1	37.9	7.9	56.7	52.4	83.5	-26.8	Pass	63.5	-11.1	Pass	
v	8235.0	49.76	45.0	38.5	37.8	7.6	56.7	51.9	83.5	-26.8	Pass	63.5	-11.6	Pass	
h	8235.0	47.67	40.5	38.5	37.8	7.6	54.6	47.4	83.5	-28.9	Pass	63.5	-16.1	Pass	
v	9150.0	48.42	42.9	39.2	38.3	8.3	55.8	50.3	83.5	-27.7	Pass	63.5	-13.2	Pass	
h	9150.0	46.15	39.1	39.2	38.3	8.3	53.6	46.5	83.5	-29.9	Pass	63.5	-17.0	Pass	
Table Result:		Pass		by		-11.1 dB		Worst Freq:		7320.0 MHz					
Test Site: EMI Chamber 2				Cable 1: Asset #2052				Cable 2: Asset #2054				Cable 3: Asset #1785			
Analyzer: Asset #1327				Preamp: Asset #2111				Antenna: Black Horn				Preselector: ---			
CSsoft Radiated Emissions Calculator v 1.017.157															
Adjusted Reading = Reading - Preamp Factor + Antenna Factor + Cable Factor															
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Spectrum Analyzers / Receivers / Preselectors		Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
SA EMI Chamber (1327)		9kHz-13.2 GHz	E4405B	Agilent	MY45103416	1327	I	7/10/2016	7/10/2015
Radiated Emissions Sites		FCC Code	IC Code	VCCI Code	Range		Cat	Calibration Due	Calibrated on
EMI Chamber 2		719150	2762A-7	A-0015	1-18GHz		I	4/29/2017	4/29/2015
Preamps / Couplers Attenuators / Filters		Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
A#2111 HF Preamp		0.5-18GHz	PAM-118A	COM-POWER	551063	2111	II	11/20/2016	11/20/2015
High Pass Filter		0.03-9 GHz	VHP-16	Mini-Circuits	NA	1288	II	1/7/2017	1/7/2016
Antennas		Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Black Horn		1-18GHz	3115	EMCO	9703-5148	56	I	8/21/2016	8/21/2014
Meteorological Meters			MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Weather Clock (Pressure Only)			BA928	Oregon Scientific	C3166-1	831	I	3/19/2016	3/19/2014
TH A#2081			HTC-1	HDE		2081	II	4/2/2016	4/2/2015
Cables		Range		Mfr			Cat	Calibration Due	Calibrated on
Asset #1785		9kHz - 18GHz		Florida RF			II	1/5/2017	1/5/2016
Asset #2052		9kHz - 18GHz		Florida RF			II	3/8/2016	3/8/2015
Asset #2054		9kHz - 18GHz		Florida RF			II	3/8/2016	3/8/2015

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

Radiated Emissions Table

Date: 21-Mar-16		Company: Signal Fire Telemetry					Work Order: P2631					
Engineer: Tuyen Truong		EUT Desc: DIN Mount Gateway					EUT Operating Voltage/Frequency: 9Vdc					
Temp: 20.5°C		Humidity: 27%					Pressure: 993mBar					
Frequency Range: 30 to 1000 MHz							Measurement Distance: 3 m					
Notes: TX on high channel Tested with Nearson Antenna (MN: 467)							EUT Max Freq: 905 to 925 MHz					
Antenna Polarization (H / V)	Frequency (MHz)	Reading (dBuV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Reading (dBuV/m)	---			FCC 15.209		
							Limit (dBuV/m)	Margin (dB)	Result (Pass/Fail)	Limit (dBuV/m)	Margin (dB)	Result (Pass/Fail)
v	37.76	34.1	22.3	15.8	0.5	28.1	---	---	---	40.0	-11.9	Pass
v	44.6	46.4	22.4	10.9	0.5	35.4	---	---	---	40.0	-4.6	Pass
v	74.85	43.5	22.4	9.1	0.6	30.8	---	---	---	40.0	-9.2	Pass
h	74.85	36.6	22.4	9.1	0.6	23.9	---	---	---	40.0	-16.1	Pass
v	110.0	42.3	22.5	12.7	0.8	33.3	---	---	---	43.5	-10.2	Pass
h	110.0	35.3	22.5	12.7	0.8	26.3	---	---	---	43.5	-17.2	Pass
v	207.0	37.2	22.5	11.0	1.0	26.7	---	---	---	43.5	-16.8	Pass
h	221.6	35.5	22.5	10.9	1.0	24.9	---	---	---	46.0	-21.1	Pass
v	466.5	27.7	22.5	17.3	1.5	24.0	---	---	---	46.0	-22.0	Pass
v	980.6	25.0	22.2	23.0	2.2	28.0	---	---	---	54.0	-26.0	Pass
Table Result: Pass by -4.6 dB Worst Freq: 44.6 MHz												
Test Site: EMI Chamber 2			Cable 1: Asset #1785					Cable 2: Asset #2052			Cable 3: ---	
Analyzer: ---			Preamp: Blue					Antenna: Red-Black			Preselector: ---	
CSsoft Radiated Emissions Calculator v 1.017.158												
Adjusted Reading = Reading - Preamp Factor + Antenna Factor + Cable Factor												
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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 7/10/2016	Calibrated on 7/10/2015
Radiated Emissions Sites EMI Chamber 2	FCC Code 719150	IC Code 2762A-7	VCCI Code A-0015	Range 30-1000MHz		Cat II	Calibration Due 3/22/2017	Calibrated on 3/22/2015
Preamps / Couplers Attenuators / Filters Blue	Range 0.009-2000MHz	MN ZFL-1000-LN	Mfr CS	SN N/A	Asset 759	Cat II	Calibration Due 5/17/2016	Calibrated on 5/17/2015
Antennas Red-Black Bilog	Range 30-2000MHz	MN JB1	Mfr Sunol	SN A091604-2	Asset 1106	Cat I	Calibration Due 2/9/2017	Calibrated on 2/9/2015
Meteorological Meters TH A#2081 Barometric A#2160		MN HTC-1 5396-0321	Mfr HDE Monarch Instruments	SN 2081 4000060	Asset 2160	Cat II I	Calibration Due 4/2/2016 3/7/2017	Calibrated on 4/2/2015 3/7/2016

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

Radiated Emissions Table

Date: 02-Mar-16		Company: Signal Fire Telemetry				Work Order: P2631								
Engineer: Tuyen Truong		EUT Desc: DIN Mount Gateway				EUT Operating Voltage/Frequency: 9Vdc								
Temp: 24°C		Humidity: 28%				Pressure: 1011mBar								
Frequency Range: 1 to 6 GHz						Measurement Distance: 3 m								
Notes: TX on high channel Tested with Nearson Antenna (MN: 467)						EUT Max Freq: 905 to 925 MHz								
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 15.209 High Frequency - Peak			FCC 15.209 High Frequency - Average		
									Limit (dBμV/m)	Margin (dB)	Result (Pass/Fail)	Limit (dBμV/m)	Margin (dB)	Result (Pass/Fail)
v	2775.0	57.83	55.6	40.3	29.1	4.6	51.2	49.0	74.0	-22.8	Pass	54.0	-5.0	Pass
h	2775.0	56.0	53.1	40.3	29.1	4.6	49.4	46.5	74.0	-24.6	Pass	54.0	-7.5	Pass
v	3700.0	56.75	54.5	40.8	32.1	5.1	53.2	50.9	74.0	-20.8	Pass	54.0	-3.1	Pass
h	3700.0	55.09	52.3	40.8	32.1	5.1	51.5	48.7	74.0	-22.5	Pass	54.0	-5.3	Pass
v	4625.0	51.67	46.5	40.7	32.6	6.1	49.7	44.5	74.0	-24.3	Pass	54.0	-9.5	Pass
h	4625.0	53.49	49.7	40.7	32.6	6.1	51.5	47.7	74.0	-22.5	Pass	54.0	-6.3	Pass
v	5550.0	53.6	50.9	39.9	34.4	6.6	54.7	52.0	74.0	-19.3	Pass	54.0	-2.0	Pass
h	5550.0	53.2	50.8	39.9	34.4	6.6	54.3	51.9	74.0	-19.7	Pass	54.0	-2.1	Pass
Table Result:						Pass by -2.0 dB		Worst Freq: 5550.0 MHz						
Test Site: EMI Chamber 2		Cable 1: Asset #2052				Cable 2: Asset #2054				Cable 3: Asset #1785				
Analyzer: Asset #1327		Preamp: Asset #2111				Antenna: Black Horn				Preselector: ---				
CSsoft Radiated Emissions Calculator v 1.017.157														
Adjusted Reading = Reading - Preamp Factor + Antenna Factor + Cable Factor														
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Radiated Emissions Table

Date: 02-Mar-16		Company: Signal Fire Telemetry				Work Order: P2631													
Engineer: Tuyen Truong		EUT Desc: DIN Mount Gateway				EUT Operating Voltage/Frequency: 9Vdc													
Temp: 24°C		Humidity: 28%				Pressure: 1011mBar													
Frequency Range: 6 to 10 GHz						Measurement Distance: 1 m													
Notes: TX on high channel Tested with Nearson Antenna (MN: 467)						EUT Max Freq: 905 to 925 MHz													
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 15.209 High Frequency - Peak			FCC 15.209 High Frequency - Average							
									Limit (dBμV/m)	Margin (dB)	Result (Pass/Fail)	Limit (dBμV/m)	Margin (dB)	Result (Pass/Fail)					
h	7400.0	54.59	51.5	40.0	37.9	7.7	60.2	57.1	83.5	-23.3	Pass	63.5	-6.4	Pass					
v	8325.0	49.31	44.2	38.7	37.9	8.5	57.0	51.9	83.5	-26.5	Pass	63.5	-11.6	Pass					
h	8325.0	46.53	40.3	38.7	37.9	8.5	54.2	48.0	83.5	-29.3	Pass	63.5	-15.5	Pass					
v	9250.0	47.43	33.9	39.3	38.3	8.6	55.0	41.5	83.5	-28.5	Pass	63.5	-22.0	Pass					
Table Result: Pass by -6.4 dB Worst Freq: 7400.0 MHz																			
Test Site: EMI Chamber 2					Cable 1: Asset #2052					Cable 2: Asset #2054					Cable 3: Asset #1785				
Analyzer: Asset #1327					Preamp: Asset #2111					Antenna: Black Horn					Preselector: ---				
CSsoft Radiated Emissions Calculator v 1.017.157																			
Adjusted Reading = Reading - Preamp Factor + Antenna Factor + Cable Factor																			
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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 7/10/2016	Calibrated on 7/10/2015
Radiated Emissions Sites EMI Chamber 2	FCC Code 719150	IC Code 2762A-7	VCCI Code A-0015	Range 1-18GHz		Cat I	Calibration Due 4/29/2017	Calibrated on 4/29/2015
Preamps / Couplers Attenuators / Filters A#2111 HF Preamp High Pass Filter	Range 0.5-18GHz 0.03-9 GHz	MN PAM-118A VHP-16	Mfr COM-POWER Mini-Circuits	SN 551063 NA	Asset 2111 1288	Cat II II	Calibration Due 11/20/2016 1/7/2017	Calibrated on 11/20/2015 1/7/2016
Antennas Black Horn	Range 1-18GHz	MN 3115	Mfr EMCO	SN 9703-5148	Asset 56	Cat I	Calibration Due 8/21/2016	Calibrated on 8/21/2014
Meteorological Meters Weather Clock (Pressure Only) TH A#2081		MN BA928 HTC-1	Mfr Oregon Scientific HDE	SN C3166-1	Asset 831 2081	Cat I II	Calibration Due 3/19/2016 4/2/2016	Calibrated on 3/19/2014 4/2/2015
Cables Asset #1785 Asset #2052 Asset #2054	Range 9kHz - 18GHz 9kHz - 18GHz 9kHz - 18GHz		Mfr Florida RF Florida RF Florida RF			Cat II II II	Calibration Due 1/5/2017 3/8/2016 3/8/2016	Calibrated on 1/5/2016 3/8/2015 3/8/2015

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

Radiated Emissions Table

Date: 21-Mar-16				Company: Signal Fire Telemetry				Work Order: P2631				
Engineer: Tuyen Truong				EUT Desc: DIN Mount Gateway				EUT Operating Voltage/Frequency: 9Vdc				
Temp: 20.5°C				Humidity: 27%				Pressure: 993mBar				
Frequency Range: 30 to 1000 MHz								Measurement Distance: 3 m				
Notes: EUT is set to RX mode Tested with Nearson Antenna (MN: 467)								EUT Max Freq: 905 to 925 MHz				
Antenna Polarization (H / V)	Frequency (MHz)	Reading (dBμV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Reading (dBμV/m)	---			FCC 15.209		
							Limit (dBμV/m)	Margin (dB)	Result (Pass/Fail)	Limit (dBμV/m)	Margin (dB)	Result (Pass/Fail)
v	37.75	30.0	22.3	15.8	0.5	24.0	---	---	---	40.0	-16.0	Pass
v	74.84	40.5	22.4	9.1	0.6	27.8	---	---	---	40.0	-12.2	Pass
v	110.0	37.5	22.5	12.7	0.8	28.5	---	---	---	43.5	-15.0	Pass
v	125.0	43.0	22.4	14.4	0.9	35.9	---	---	---	43.5	-7.6	Pass
v	209.5	35.4	22.5	10.6	1.0	24.5	---	---	---	43.5	-19.0	Pass
v, nf	905.0	23.6	21.8	22.6	2.0	26.4	---	---	---	46.0	-19.6	Pass
v, nf	915.0	24.9	21.9	22.7	2.0	27.7	---	---	---	46.0	-18.3	Pass
v, nf	925.0	24.4	22.0	22.7	2.1	27.2	---	---	---	46.0	-18.8	Pass
v, nf	968.0	25.9	22.2	23.0	2.1	28.8	---	---	---	54.0	-25.2	Pass
Table Result: Pass by -7.6 dB Worst Freq: 125.0 MHz												
Test Site: EMI Chamber 2				Cable 1: Asset #1785				Cable 2: Asset #2052			Cable 3: ---	
Analyzer: ---				Preamp: Blue				Antenna: Red-Black			Preselector: ---	
CSsoft Radiated Emissions Calculator v 1.017.158												
Adjusted Reading = Reading - Preamp Factor + Antenna Factor + Cable Factor												
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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 7/10/2016	Calibrated on 7/10/2015
Radiated Emissions Sites EMI Chamber 2	FCC Code 719150	IC Code 2762A-7	VCCI Code A-0015	Range 30-1000MHz		Cat II	Calibration Due 3/22/2017	Calibrated on 3/22/2015
Preamps / Couplers Attenuators / Filters Blue	Range 0.009-2000MHz	MN ZFL-1000-LN	Mfr CS	SN N/A	Asset 759	Cat II	Calibration Due 5/17/2016	Calibrated on 5/17/2015
Antennas Red-Black Bilog	Range 30-2000MHz	MN JB1	Mfr Sunol	SN A091604-2	Asset 1106	Cat I	Calibration Due 2/9/2017	Calibrated on 2/9/2015
Meteorological Meters TH A#2081 Barometric A#2160		MN HTC-1 5396-0321	Mfr HDE Monarch Instruments	SN 4000060	Asset 2081 2160	Cat II I	Calibration Due 4/2/2016 3/7/2017	Calibrated on 4/2/2015 3/7/2016

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



Radiated Emissions Table																			
Date: 21-Mar-16				Company: Signal Fire Telemetry				Work Order: P2631											
Engineer: Tuyen Truong				EUT Desc: DIN Mount Gateway				EUT Operating Voltage/Frequency: 9Vdc											
Temp: 20.5°C				Humidity: 27%				Pressure: 993mBar											
Frequency Range: 1 to 10 GHz								Measurement Distance: 3 m (1-6GHz) & 1m (6 -10GHz)											
Notes: EUT is set to RX mode Tested with Nearson Antenna (MN: 467)								EUT Max Freq: 905 to 925 MHz											
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 15.209 High Frequency - Peak			FCC 15.209 High Frequency - Average							
									Limit (dBµV/m)	Margin (dB)	Result (Pass/Fail)	Limit (dBµV/m)	Margin (dB)	Result (Pass/Fail)					
No emissions found within 10dB of the limit in this range																			
Table Result:				---				by		---		dB		Worst Freq:		---		MHz	
Test Site: EMI Chamber 2				Cable 1: Asset #1785				Cable 2: Asset #2052				Cable 3: ---							
Analyzer: ---				Preamp: Asset #1517				Antenna: Black Horn				Preselector: ---							
CSsoft Radiated Emissions Calculator v 1.017.158																			
Adjusted Reading = Reading - Preamp Factor + Antenna Factor + Cable Factor																			
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Spectrum Analyzers / Receivers / Preselectors		Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
SA EMI Chamber (1327)		9kHz-13.2 GHz	E4405B	Agilent	MY45103416	1327	I	7/10/2016	7/10/2015
Radiated Emissions Sites		FCC Code	IC Code	VCCI Code	Range		Cat	Calibration Due	Calibrated on
EMI Chamber 2		719150	2762A-7	A-0015	1-18GHz		I	4/29/2017	4/29/2015
Preamps / Couplers Attenuators / Filters		Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
1517 HF Preamp		1-20GHz	CS	CS	N/A	1517	II	8/6/2016	8/6/2015
High Pass Filter		0.03-9 GHz	VHP-16	Mini-Circuits	NA	1288	II	1/7/2017	1/7/2016
Antennas		Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Black Horn		1-18GHz	3115	EMCO	9703-5148	56	I	8/21/2016	8/21/2014
Meteorological Meters			MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
TH A#2081			HTC-1	HDE		2081	II	4/2/2016	4/2/2015
Barometric A#2160			5396-0321	Monarch Instruments	4000060	2160	I	3/7/2017	3/7/2016
Cables		Range		Mfr			Cat	Calibration Due	Calibrated on
Asset #1785		9kHz - 18GHz		Florida RF			II	1/5/2017	1/5/2016
Asset #2052		9kHz - 18GHz		Florida RF			II	3/2/2017	3/2/2016

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



20dB Bandwidth and Occupied Bandwidth

REQUIREMENT

The 20dB bandwidth of the hopping channel is less than 250 KHz; the system shall use at least 50 hopping frequencies. [15.247(a) (1) (i)]

When an occupied bandwidth is not 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 6.6]

MEASUREMENTS / RESULTS

20dB BANDWIDTH and 99% OCCUPIED BANDWIDTH			
Date: 01-Mar-16		Company: Signal Fire Telemetry	
Engineer: Tuyen Truong		EUT Desc: DIN Mount Gateway	
Temp: 21°C		Humidity: 33%	
		Pressure: 998mBar	
Frequency Range: 902.7-927.3 MHz			
Notes:			
Frequency (MHz)	20 dB Bandwidth Reading		Occupied Bandwidth Reading
	(KHz)		(KHz)
905	59.6080		68.1735
915	59.1580		64.7994
925	59.2270		66.9736
Test Site: CEM5		Attenuation: Asset#791	
Analyzer: Brown			
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Spectrum Analyzers / Receivers/Preselectors		Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Brown		9kHz-26.5GHz	E4407B	Agilent	SG44210511	1510	I	1/21/2017	1/21/2016
Conducted Test Sites (Mains / Telco)		FCC Code	VCCI Code				Cat	Calibration Due	Calibrated on
CEMI 5		719150	A-0015				III	NA	N/A
Preamps/Couplers Attenuators / Filters		Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
HF 20dB 50W Attenuator		0.009-18 GHz	PE 7019-20	Pasternack	1	791	II	7/31/2016	7/31/2015
Meteorological Meters			MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Weather Clock (Pressure Only)			BA928	Oregon Scientific	C3166-1	831	I	3/19/2016	3/19/2014
TH A#2078			HTC-1	HDE		2078	II	4/2/2016	4/2/2015

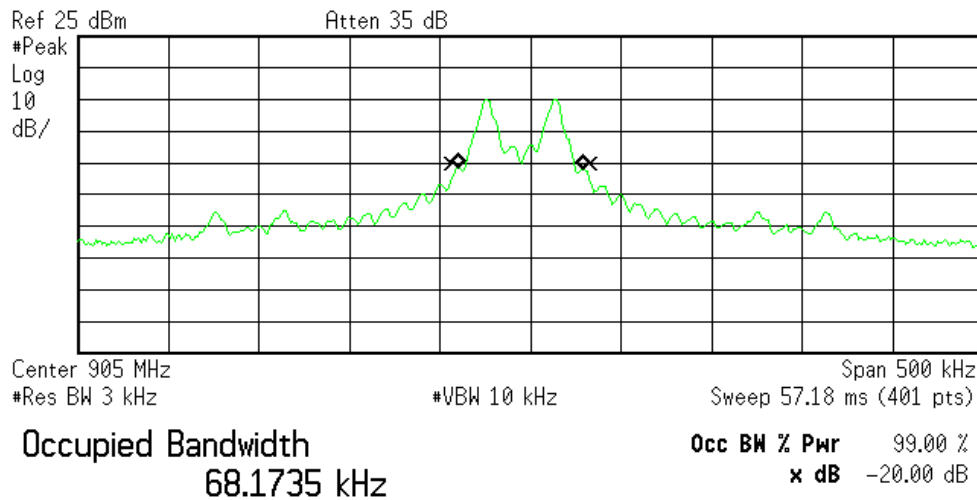
All equipment is calibrated using standards traceable to NIST or other nationally recognized calibration standard.



PLOTS

* Agilent 09:17:02 Mar 1, 2016

R T



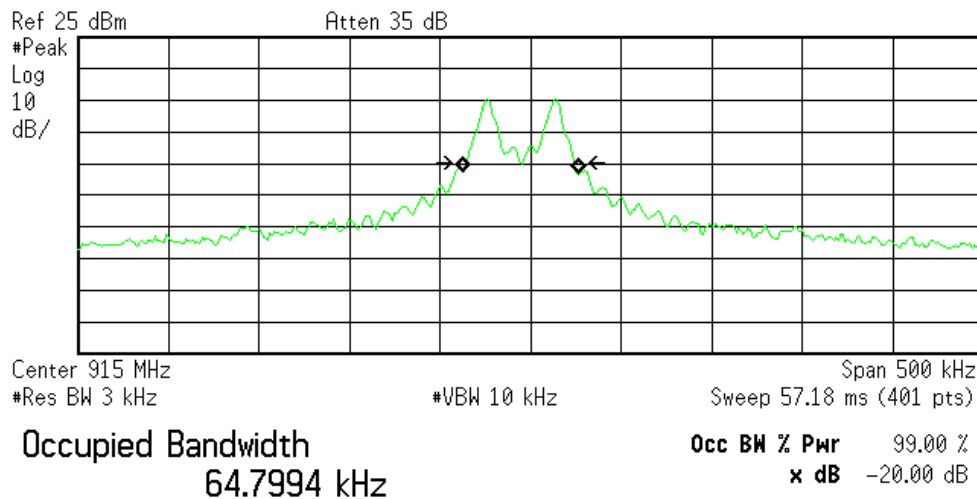
Transmit Freq Error -5.578 kHz
x dB Bandwidth 59.608 kHz

C:\temp.gif file saved

Occupied Bandwidth - Low Channel

* Agilent 09:24:19 Mar 1, 2016

R T



Transmit Freq Error -5.559 kHz
x dB Bandwidth 59.158 kHz

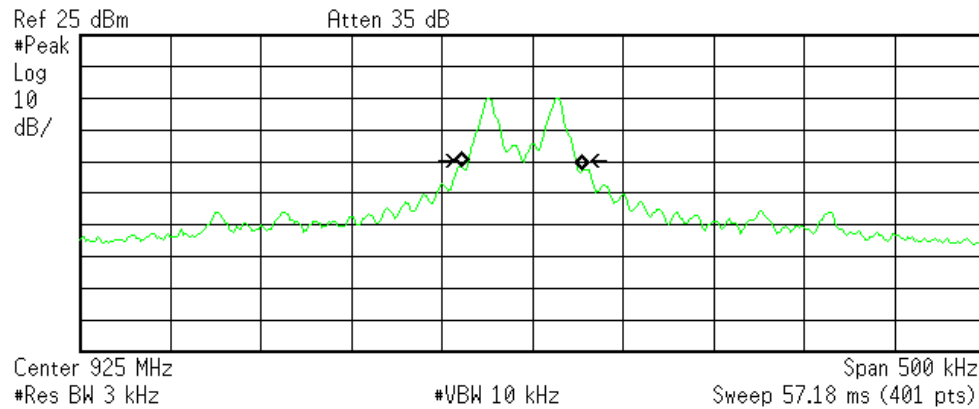
C:\temp.gif file saved

Occupied Bandwidth - Mid Channel



Agilent 09:30:17 Mar 1, 2016

R T



Occupied Bandwidth
66.9736 kHz

Occ BW % Pwr 99.00 %
x dB -20.00 dB

Transmit Freq Error -5.504 kHz
x dB Bandwidth 59.227 kHz

C:\temp.gif file saved

Occupied Bandwidth - High Channel



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 Side of a DC Supply Conducted Emissions														
Date: 01-Mar-16 Engineer: Tuyen Truong Temp: 22.2 °C							Company: Signal Fire Telemetry EUT Desc: DIN Mount Gateway Humidity: 36%					Work Order: P2631 Pressure: 998 mBar		
Notes: EUT is tested with Enclosure Mount Antenna (M/N: EEH-915)														
Frequency Range: 0.15 to 30 MHz														
EUT Input Voltage/Frequency: 9Vdc														
Frequency (MHz)	Quasi-Peak Readings		Average Readings		LISN Factors		Cable Factor (dB)	ATTN Factor (dB)	FCC 15.207			FCC 15.207		
	QP1 (dBµV)	QP2 (dBµV)	AVG1 (dBµV)	AVG2 (dBµV)	L1 (dB)	L2 (dB)			QP Limit (dBµV)	Margin (dB)	Result (Pass/Fail)	AVG Limit (dBµV)	Margin (dB)	Result (Pass/Fail)
0.18	29.9	29.0	11.3	16.3	-0.4	-0.4	-0.1	-19.0	64.3	-14.9	Pass	54.3	-18.5	Pass
1.09	27.7	28.1	15.8	16.5	-0.5	-0.5	-0.1	-19.0	56.0	-8.3	Pass	46.0	-9.9	Pass
11.42	21.4	9.3	11.1	1.8	-0.2	-0.2	-0.2	-19.0	60.0	-19.3	Pass	50.0	-19.6	Pass
13.06	20.2	11.8	12.4	1.1	-0.2	-0.2	-0.2	-19.0	60.0	-20.5	Pass	50.0	-18.3	Pass
15.82	18.5	16.7	12.3	6.5	-0.2	-0.2	-0.2	-19.0	60.0	-22.2	Pass	50.0	-18.3	Pass
18.58	17.5	20.0	7.7	9.7	-0.2	-0.2	-0.3	-19.0	60.0	-20.6	Pass	50.0	-20.9	Pass
23.99	27.0	16.2	21.4	8.4	-0.2	-0.2	-0.3	-19.0	60.0	-13.5	Pass	50.0	-9.1	Pass
Result: Pass							Worst Margin: -8.3 dB			Frequency: 1.090 MHz				
Measurement Device: LISN Asset 2092							Cable: CEMI-01			Spectrum Analyzer: Gold				
							Attenuator: 20dB Attenuator-06			Site: CEMI 5				
C-S CEMI Calculator Version 3.0.14														
Adjusted Reading = Raw Reading + LISN Insertion Loss + Cable Loss + Attenuation														
Equipment Factor Sheet rev: 2/18/2016														

Rev. 2/28/2016

Spectrum Analyzers / Receivers/Preselectors		Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Gold		100Hz-26.5 GHz	E4407B	Agilent	MY45113816	1284	I	1/13/2017	1/13/2016
LISNs/Measurement Probes		Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
LISN Asset 2092		9KHz-30MHz	NNLK 8121	Schwarzbeck	NNLK 8121-662	2092	I	6/30/2016	6/30/2015
Conducted Test Sites (Mains / Telco)		FCC Code		VCCI Code			Cat	Calibration Due	Calibrated on
CEMI 5		719150		A-0015			III	NA	N/A
Meteorological Meters			MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Weather Clock (Pressure Only)			BA928	Oregon Scientific	C3166-1	831	I	3/19/2016	3/19/2014
TH A#2078			HTC-1	HDE		2078	II	4/2/2016	4/2/2015
Cables		Range		Mfr			Cat	Calibration Due	Calibrated on
CEMI-01		9kHz - 2GHz		C-S			II	9/11/2016	9/11/2015
Attenuators		Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
20dB Attenuator-06		9kHz-2GHz	PE7000-20	Pasternack	N/A		II	7/29/2016	7/29/2015

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



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)	5.6dB	N/A
NIST	4.6dB	5.2dB (Ucisp)
CISPR		
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		



Product Documentation

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



Curtis-Straus LLC, a wholly owned subsidiary of BV CPS
One Distribution Center Circle, #1 • Littleton, MA • TEL (978) 486-8880 • FAX (978) 486-8828



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," "BVCPSS," "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



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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.

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.

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