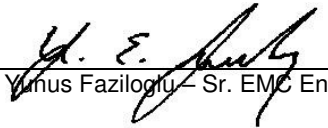




Test Report

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

Report No	EQ2569-1
Client	Ideal Industries, Inc.
Address	Becker Place Sycamore, IL 60178
Phone	(815) 895-1295
Items tested	SCD1000-EM
FCC ID	2AAMXSCD1000EM
IC	11250A-SCD1000EM
FRN	0002862225
Equipment Type	Digital Transmission System
Equipment Code	DTS
Emission Designator	767KG1D
FCC/IC Rule Parts	CFR Title 47 FCC Part 15.247, ISED Canada RSS-247 Issue 1
Test Dates	August 25, 29 and September 2, 2016
Results	As detailed within this report
Prepared by	 Tuyen Truong – Test Engineer
Authorized by	 Yunus Faziloglu – Sr. EMC Engineer
Issue Date	1/23/2017
Conditions of Issue	This Test Report is issued subject to the conditions stated in the 'Conditions of Testing' section on page 31 of this report.

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



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



Summary

This test report supports an application for certification of a transmitter operating pursuant to:
CFR Title 47 FCC Part 15.247, ISSED Canada RSS-247 Issue 1

The product is the SCD1000-EM. It is a digitally modulated transmitter that operates in the 902-928MHz frequency range. The product was tested with a permanently attached wire antenna with 4.55dBi gain.

We found that the product met the above requirements without modification. The test samples were received in good condition.

Model tested: SCD1000-EM

Additional model: SCLED1000EM

Results in this report also represent the additional model above. Per client, circuit and PCB are identical for both models. The only difference is where dim and dim return leads egress from the product housing.

Test Methodology

All testing was performed according to the following rules/procedures/documents;

CFR Title 47 FCC Part 15.247, ISED Canada RSS-247 Issue 1, ISED Canada RSS-Gen Issue 4, FCC KDB 558074 D01 DTS Measurement Guidance v03r05 and ANSI C63.10-2013.

Radiated emissions were maximized by rotating the device around three orthogonal axes as well as varying the test antenna's height and polarity. AC line conducted emissions testing was performed with a 50 Ω /50 μ H LISN. The EUT operating voltage was 120/277VAC at 60Hz.

RF measurements were performed at the antenna port on 3 channels as follows:

Low channel = 902.7MHz

Mid channel = 915MHz

High channel = 927.3MHz

The following bandwidths were used during radiated spurious and AC line conducted emissions tests:

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

Product Tested - Configuration Documentation

EUT Configuration										
Work Order:	Q2569									
Company:	Ideal Industries, Inc									
Company Address:	Becker Place									
	Sycamore, IL 60178									
Contact:	Tim Tunnell									
	MN			PN			SN			
EUT:	SCD1000-EM			--			02001D67 (Radiated & Conducted EMI)			
	SCD1000-EM			--			Sample 2 (RF Measurement)			
EUT Description:	Smart Connector									
EUT TX Frequency:	902.7 to 927.3 MHz									
Port Label	Port Type	# ports	# populated	cable type	shielded	ferrites	length (m)	in/out	under test	comment
AC Mains	Power AC	1	1	Power AC	No	No	1	in	yes	
Antenna	other	1	1	other	No	No	0.05	in	yes	
Load	Power AC	1	1	Power AC	No	No	3	in	yes	
Dimming	Power AC	1	1	other	No	No	3	in	yes	
Software Operating Mode Description:										
EUT was set to transmit at Low (902.7MHz), Middle (915MHz) and High (927.3MHz) channels.										

Statement of Conformity

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.
	4		15.21	Information to the user is shown in the instruction manual exhibit.
			15.27	No special accessories are required for compliance.
3, 6.1			15.31	The EUT was tested in accordance with the measurement standards in this section.
6.13			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 antenna for this device is a permanently attached wire antenna with 4.55dBi gain.
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	EUT meets the AC Line conducted emissions requirements of this section.
			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.

Test Results

Bandwidth

LIMIT

The minimum 6 dB bandwidth shall be at least 500 kHz. [15.247(a) (2)]

MEASUREMENTS / RESULTS

6dB BANDWIDTH				
Date: 25-Aug-16		Company: Ideal Industries, Inc.		Work Order: Q2569
Engineer: Tuyen Truong		EUT Desc: SCD1000		EUT Operating Voltage/Frequency: 120Vac/60Hz
Temp: 23.4°C		Humidity: 50%		Pressure: 1010mBar
Frequency Range: 902.7-927.3 MHz				
Notes:				
Frequency (MHz)	Reading (KHz)	6dB BW		
		Limit (KHz)	Margin (KHz)	Result (Pass/Fail)
902.7	647.903	≥500	+147.903	Pass
915	647.869	≥500	+147.869	Pass
927.3	648.396	≥500	+148.396	Pass
Test Site: CEM15		Attenuation: Asset#791		
Analyzer: SA#1328		Copyright Curtis-Straus LLC 2000		

Rev. 8/21/2016

Spectrum Analyzers / Receivers / Preselectors	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
SA EMI Chamber (1328)	9kHz-13.2 GHz	E4405B	Agilent	MY44210241	1328	I	2/26/2017	2/26/2016
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	4/28/2018	4/28/2016
TH A#2085		HTC-1	HDE		2085	II	4/5/2017	4/5/2016
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	8/14/2017	8/14/2016

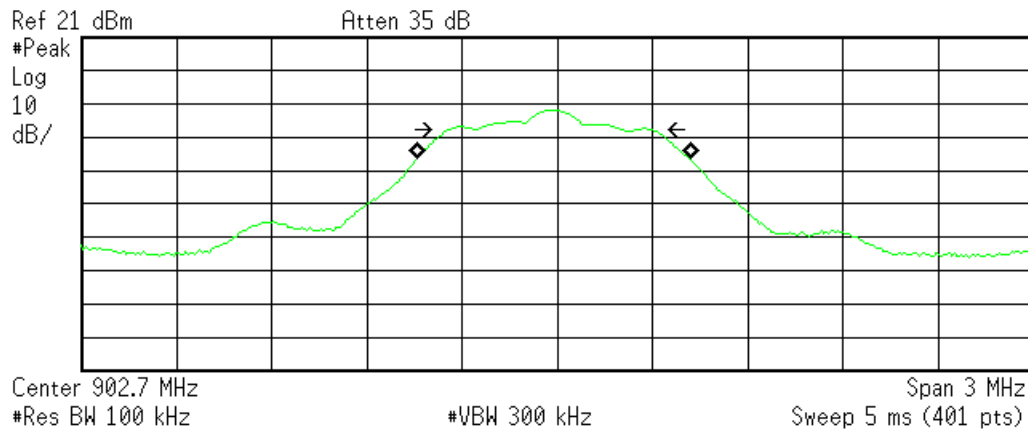
All equipment is calibrated using standards traceable to NIST or other nationally recognized calibration standard.



PLOT(s)

Agilent 08:03:11 Aug 25, 2016

R T



Occupied Bandwidth
857.2500 kHz

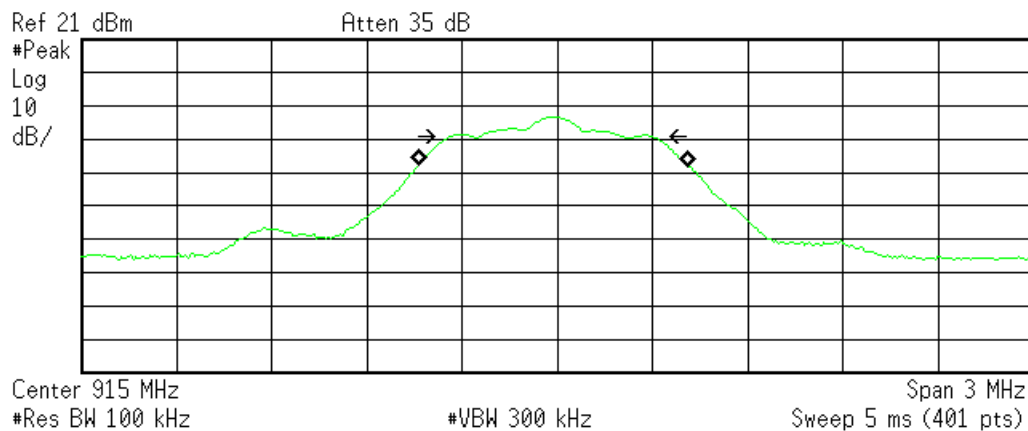
Occ BW % Pwr 99.00 %
x dB -6.00 dB

Transmit Freq Error -11.433 kHz
x dB Bandwidth 647.903 kHz

6dB Bandwidth – Low Channel

Agilent 08:19:33 Aug 25, 2016

R T



Occupied Bandwidth
852.7748 kHz

Occ BW % Pwr 99.00 %
x dB -6.00 dB

Transmit Freq Error -11.108 kHz
x dB Bandwidth 647.869 kHz

C:\temp.gif file saved

6dB Bandwidth – Mid Channel

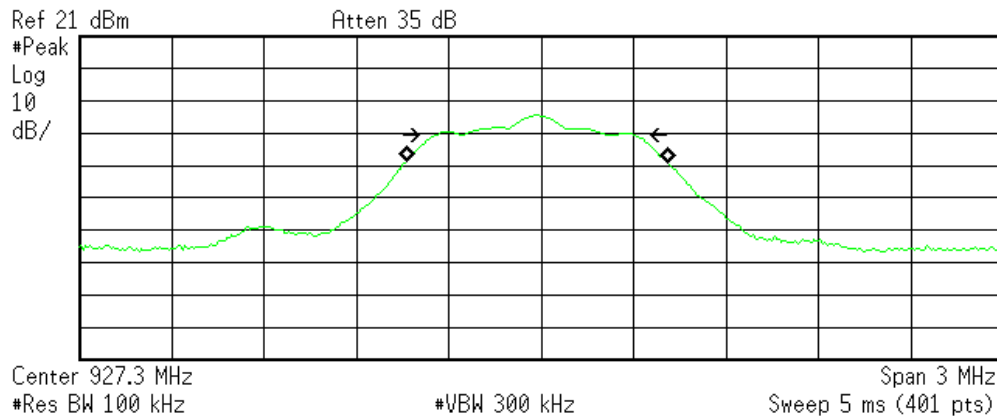


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Agilent 08:23:01 Aug 25, 2016

R T



Occupied Bandwidth
850.5329 kHz

Occ BW % Pwr 99.00 %
x dB -6.00 dB

Transmit Freq Error -12.914 kHz
x dB Bandwidth 648.396 kHz

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6dB Bandwidth – High Channel

Fundamental Emission Output Power**LIMIT**

Conducted Output Power

1 Watt

[15.247(b) (3)]

Per 558074 D01 DTS Measurement Guidance v03r05 Section 9.2.2.2 (AVGSA-1 Average Conducted Output Power)

MEASUREMENTS / RESULTS

Fundamental Emission Output Power										
Date: 25-Aug-16		Company: Ideal Industries, Inc.			Work Order: Q2569					
Engineer: Tuyen Truong		EUT Desc: SCD1000			EUT Operating Voltage/Frequency: 120Vac/60Hz					
Temp: 23.4°C		Humidity: 50%		Pressure: 1010mBar						
Frequency Range: 902.7-927.3 MHz										
Notes:										
Frequency (MHz)	Reading (dBm)	Attenuation (dB)	Final Conducted Reading (dBm)	FCC 15.247						
				Limit (dBm)	Margin (dB)	Result (Pass/Fail)				
				902.7	-1.96	19.42	17.46	30.0	-12.54	Pass
				915	-3.46	19.42	15.96	30.0	-14.04	Pass
				927.3	-4.61	19.42	14.81	30.0	-15.19	Pass
Table Result: Pass by -12.54 dB				Worst Freq: 902.7 MHz						
Test Site: CEMI5		Attenuation: Asset#791								
Analyzer: SA#1328										
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Spectrum Analyzers / Receivers/Preselectors	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
SA EMI Chamber (1328)	9kHz-13.2 GHz	E4405B	Agilent	MY44210241	1328	I	2/26/2017	2/26/2016
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	4/28/2018	4/28/2016
TH A#2085		HTC-1	HDE		2085	II	4/5/2017	4/5/2016
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	8/14/2017	8/14/2016

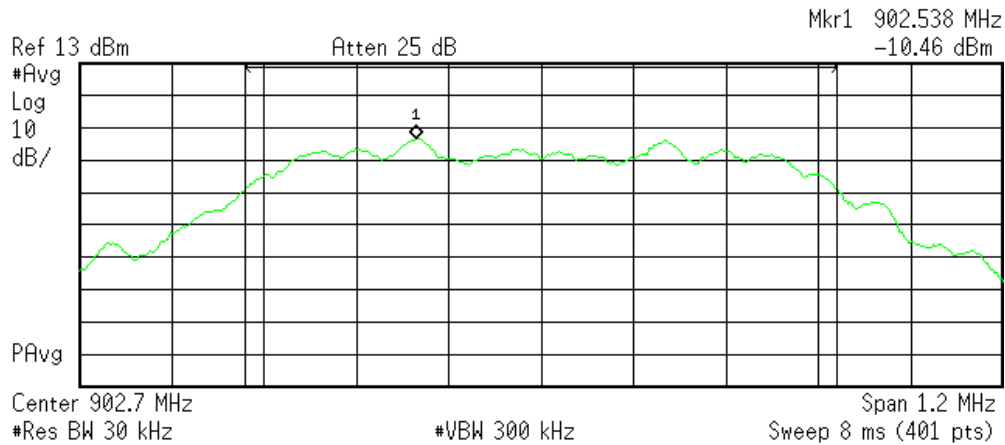
All equipment is calibrated using standards traceable to NIST or other nationally recognized calibration standard.



PLOTS

Agilent 08:38:53 Aug 25, 2016

R T



Channel Power

Power Spectral Density

-1.96 dBm /766.9552 kHz

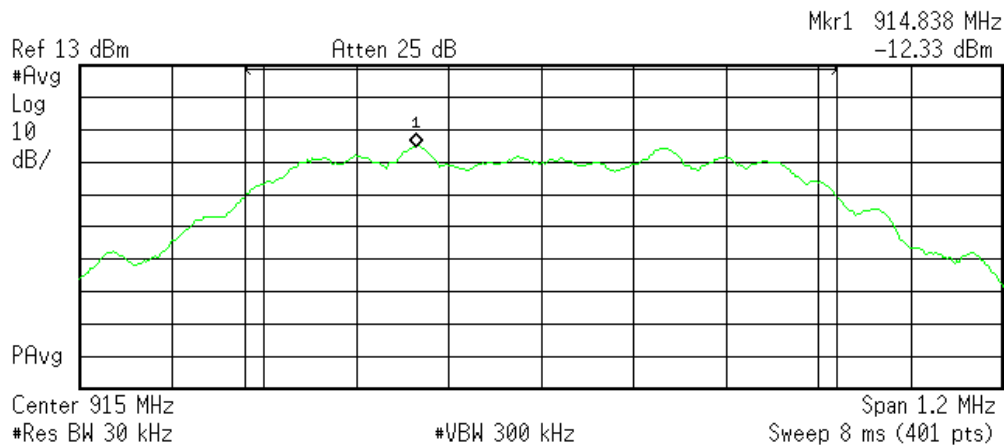
-60.81 dBm/Hz

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Channel Power – Low Channel

Agilent 08:41:39 Aug 25, 2016

R T



Channel Power

Power Spectral Density

-3.46 dBm /766.9552 kHz

-62.30 dBm/Hz

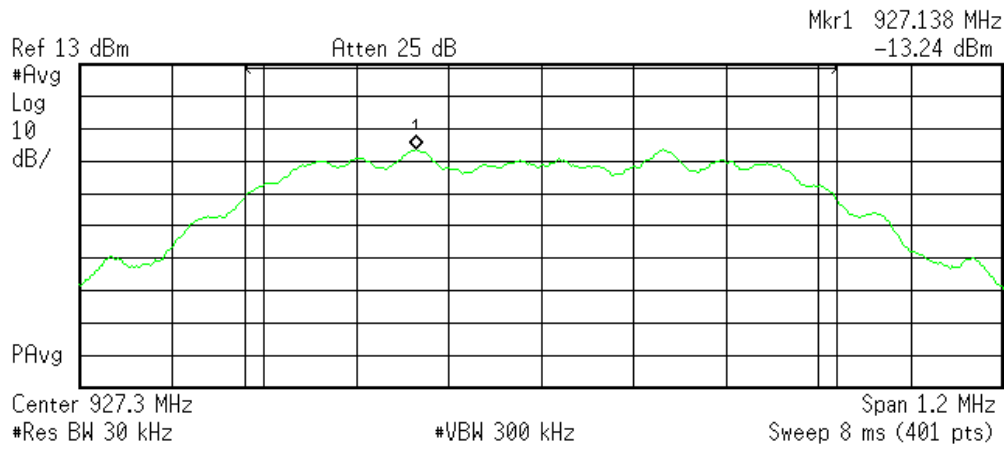
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Channel Power – Mid Channel



Agilent 08:35:56 Aug 25, 2016

R T



Channel Power

Power Spectral Density

-4.61 dBm /766.9552 kHz

-63.46 dBm/Hz

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Channel Power – High Channel

Radiated Spurious Emissions

LIMITS

In any 100 kHz 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 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

[15.247(d)]

MEASUREMENTS / RESULTS

Spurious Conducted Emissions - Maximum In Band Peak PSD in 100 KHz RBW			
Date: 25-Aug-16		Company: Ideal Industries, Inc.	
Engineer: Tuyen Truong		EUT Desc: SCD1000	
Temp: 23.4°C		Humidity: 50%	
		Pressure: 1010mBar	
Frequency Range: 902.7-927.3 MHz			
Notes: Maximum In Band Peak PSD in 100 KHz RBW			
Frequency (MHz)	Reading (dBm)	Attenuation (dB)	Adjusted Reading (dBm)
902.7	-1.043	19.42	18.4
Test Site: CEMI5			
Attenuation: Asset#791			
Analyzer: SA#1328			
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Rev. 8/21/2016

SEP-2016

Spectrum Analyzers / Receivers / Preselectors	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
SA EMI Chamber (1328)	9kHz-13.2 GHz	E4405B	Agilent	MY44210241	1328	I	2/26/2017	2/26/2016
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	4/28/2018	4/28/2016
TH A#2085		HTC-1	HDE		2085	II	4/5/2017	4/5/2016
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	8/14/2017	8/14/2016

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



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Radiated Emissions Table - FCC 15.247(d) - non restricted band

Date: 08-Aug-16			Company: Ideal Industries, Inc.				Work Order: Q2569					
Engineer: Zachary Johnson			EUT Desc: SCD1000				EUT Operating Voltage/Frequency: 120V/60Hz					
Temp: 22.6°C			Humidity: 50%				Pressure: 1010mBar					
Frequency Range: 30-1000MHz							Measurement Distance: 3 m					
Notes: All 3 channels (Low, Mid and High) were investigated and only the worst case recorded.							EUT TX Freq: 902.7 to 927.3 MHz					
Adjusted FS readings compared to Peak Power Spectral Density (worst case) including the 4.55dBi Antenna gain with the limit being 30dB below which corresponds to 88.2dBµV/m												
Antenna Polarization (H / V)	Frequency (MHz)	Reading (dBµV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Reading (dBµV/m)	---			FCC 15.247 (d)		
							Limit (dBµV/m)	Margin (dB)	Result (Pass/Fail)	Limit (dBµV/m)	Margin (dB)	Result (Pass/Fail)
V	41.2	50.4	22.4	13.2	0.4	41.6	---	---	---	88.2	-46.6	Pass
V	54.2	47.7	22.5	7.5	0.5	33.2	---	---	---	88.2	-55.0	Pass
H	76.4	32.3	22.4	8.8	0.6	19.3	---	---	---	88.2	-68.9	Pass
V	80.7	43.3	22.5	8.0	0.6	29.4	---	---	---	88.2	-58.8	Pass
V	207.5	43.4	22.5	11.0	0.9	32.8	---	---	---	88.2	-55.4	Pass
H	800.3	34.5	22.4	21.3	2.2	35.6	---	---	---	88.2	-52.6	Pass
H	75.59	42.4	22.4	9.0	0.6	29.6	---	---	---	88.2	-58.6	Pass
H	821.52	36.5	22.3	21.7	2.2	38.1	---	---	---	88.2	-50.1	Pass
H	80.44	41.4	22.5	8.1	0.6	27.6	---	---	---	88.2	-60.6	Pass
H	799.21	37.6	22.4	21.3	2.1	38.6	---	---	---	88.2	-49.6	Pass
H	77.53	42.6	22.4	8.6	0.6	29.4	---	---	---	88.2	-58.8	Pass
H	799.21	40.1	22.4	21.3	2.1	41.1	---	---	---	88.2	-47.1	Pass
Table Result: Pass by -46.6 dB Worst Freq: 41.2 MHz												
Test Site: EMI Chamber 2			Cable 1: Asset #2052				Cable 2: Asset #1507			Cable 3: ---		
Analyzer: Rental SA#1			Preamp: Blue				Antenna: Red-Black			Preselector: ---		
CSsoft Radiated Emissions Calculator			v 1.017.169									
Adjusted Reading = Reading - Preamp Factor + Antenna Factor + Cable Factor												
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Note: No emissions found within 10dB of the limit, which was set -30dB down from the peak of Power Spectral Density of the Fundamental frequency (worst case). (See section 15.247(e) – Power Spectral Density) (i.e. Worst Case Conducted Power Spectral Density Reading + Antenna Gain = EIRP then calculated field strength based off of $P = (E_d)^2 / (30G)$. Field Strength – 30dB = Adjusted Limit dBµV/m

Rev. 9/1/2016

Spectrum Analyzers / Receivers/Preselectors SA #2 (1860)	Range 9kHz-26.5 GHz	MN E7405A	Mfr Agilent	SN MY45104916	Asset 1860	Cat I	Calibration Due 12/23/2016	Calibrated on 12/23/2015
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 5/13/2017	Calibrated on 5/13/2016
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 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 4/28/2018 4/5/2017	Calibrated on 4/28/2016 4/5/2016
Cables Asset #1507 Asset #2052	Range 9kHz - 18GHz 9kHz - 18GHz		Mfr Florida RF Florida RF			Cat II II	Calibration Due 2/14/2017 3/2/2017	Calibrated on 2/14/2016 3/2/2016

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



Radiated Emissions Table - FCC 15.247(d) - restricted band

Date: 08-Aug-16		Company: Ideal Industries, Inc.				Work Order: Q2569						
Engineer: Zachary Johnson		EUT Desc: SCD1000				EUT Operating Voltage/Frequency: 120V/60Hz						
Temp: 22.6°C		Humidity: 50%		Pressure: 1010mBar								
Frequency Range: 30-1000MHz						Measurement Distance: 3 m						
Notes: All 3 channels (Low, Mid and High) were investigated and only the worst case recorded.						EUT TX Freq: 902.7 to 927.3 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		
							Lim it (dBμV/m)	Margin (dB)	Result (Pass/Fail)	Lim it (dBμV/m)	Margin (dB)	Result (Pass/Fail)
H	270.0	33.9	22.6	13.2	1.2	25.7	---	---	---	46.0	-20.3	Pass
H	329.4	40.7	22.4	14.0	1.3	33.6	---	---	---	46.0	-12.4	Pass
H	332.64	45.1	22.4	14.1	1.3	38.1	---	---	---	46.0	-7.9	Pass
H	330.7	46.2	22.4	14.0	1.3	39.1	---	---	---	46.0	-6.9	Pass
Table Result: Pass by -6.9 dB Worst Freq: 330.7 MHz												
Test Site: EMI Chamber 2		Cable 1: Asset #2052				Cable 2: Asset #1507				Cable 3: ---		
Analyzer: Rental SA#1		Preamp: Blue				Antenna: Red-Black				Preselector: ---		
CSsoft Radiated Emissions Calculator v 1.017.169						Copyright Curtis-Straus LLC 2000						
Adjusted Reading = Reading - Preamp Factor + Antenna Factor + Cable Factor												

Rev. 9/1/2016

Spectrum Analyzers / Receivers/Preselectors	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
SA #2 (1860)	9kHz-26.5 GHz	E7405A	Agilent	MY45104916	1860	I	12/23/2016	12/23/2015
Radiated Emissions Sites	FCC Code	IC Code	VCCI Code	Range		Cat	Calibration Due	Calibrated on
EMI Chamber 2	719150	2762A-7	A-0015	30-1000MHz		II	3/22/2017	3/22/2015
Preamps/Couplers Attenuators / Filters	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Blue	0.009-2000MHz	ZFL-1000-LN	CS	N/A	759	II	5/13/2017	5/13/2016
Antennas	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Red-Black Bilog	30-2000MHz	JB1	Sunol	A091604-2	1106	I	2/9/2017	2/9/2015
Meteorological Meters		MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Weather Clock (Pressure Only)		BA928	Oregon Scientific	C3166-1	831	I	4/28/2018	4/28/2016
TH A#2081		HTC-1	HDE		2081	II	4/5/2017	4/5/2016
Cables	Range		Mfr			Cat	Calibration Due	Calibrated on
Asset #1507	9kHz - 18GHz		Florida RF			II	2/14/2017	2/14/2016
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.

Radiated Emissions Table

Date: 25-Aug-16		Company: Ideal Industries, Inc.				Work Order: Q2569							
Engineer: Zachary Johnson		EUT Desc: SCD1000				EUT Operating Voltage/Frequency: 120V/60Hz							
Temp: 22.6°C		Humidity: 50%				Pressure: 1010mBar							
Frequency Range: 1-6GHz						Measurement Distance: 3 m							
Notes: TX on Low channel						EUT TX Freq: 902.7 to 927.3 MHz							
Limit is set at 30dB below the fundamental													
Antenna Polarization (H / V)	Frequency (MHz)	Peak Reading (dBuV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Peak Reading (dBuV/m)				FCC 15.247(d)			
							Limit (dBuV/m)	Margin (dB)	Result (Pass/Fail)				
H	5508	34.1	18.2	34.8	5.5	56.2	88.2	-32.0	Pass				
V	5656	34.6	18.4	35	5.6	56.8	88.2	-31.4	Pass				
Table Result:				Pass by -31.4 dB		Worst Freq:				5656.0 MHz			
Test Site: EMI Chamber 2				Cable 1: Asset #2052				Cable 2: Asset #1507				Cable 3: ---	
Analyzer: Rental SA#1				Preamp: Asset #1517				Antenna: Blue Horn				Preselector: ---	
CSsoft Radiated Emissions Calculator v 1.017.169													
Adjusted Reading = Reading - Preamp Factor + Antenna Factor + Cable Factor													
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Radiated Emissions Table

Date: 25-Aug-16		Company: Ideal Industries, Inc.				Work Order: Q2569			
Engineer: Zachary Johnson		EUT Desc: SCD1000				EUT Operating Voltage/Frequency: 120V/60Hz			
Temp: 22.6°C		Humidity: 50%				Pressure: 1010mBar			
Frequency Range: 1-6GHz						Measurement Distance: 3 m			
Notes: TX on Mid channel						EUT TX Freq: 902.7 to 927.3 MHz			
Limit is set at 30dB below the fundamental									
Antenna Polarization (H / V)	Frequency (MHz)	Peak Reading (dBuV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Peak Reading (dBuV/m)	FCC 15.247(d)		
							Limit (dBuV/m)	Margin (dB)	Result (Pass/Fail)
H	1990.0	34.1	20.1	31.7	3.4	49.1	88.2	-39.1	Pass
V	5714.0	34.6	18.4	35.1	5.6	56.9	88.2	-31.3	Pass
Table Result:			Pass by -31.3 dB			Worst Freq:			5714.0 MHz
Test Site: EMI Chamber 2			Cable 1: Asset #2052			Cable 2: Asset #1507			Cable 3: ---
Analyzer: Rental SA#1			Preamp: Asset #1517			Antenna: Blue Horn			Preselector: ---
CSsoft Radiated Emissions Calculator v 1.017.169									
Adjusted Reading = Reading - Preamp Factor + Antenna Factor + Cable Factor									
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Testing Cert. No. 1627-01

Radiated Emissions Table

Date: 25-Aug-16		Company: Ideal Industries, Inc.				Work Order: Q2569						
Engineer: Zachary Johnson		EUT Desc: SCD1000				EUT Operating Voltage/Frequency: 120V/60Hz						
Temp: 22.6°C		Humidity: 50%		Pressure: 1010mBar								
Frequency Range: 1-6GHz						Measurement Distance: 3 m						
Notes: TX on High channel Limit is set at 30dB below the fundamental						EUT TX Freq: 902.7 to 927.3 MHz						
Antenna Polarization (H / V)	Frequency (MHz)	Peak Reading (dBμV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Peak Reading (dBμV/m)				FCC 15.247(d)		
										Limit (dBμV/m)	Margin (dB)	Result (Pass/Fail)
H	1082.0	34.9	21.2	28.5	2.5	44.7				88.2	-43.5	Pass
V	2411.0	40.4	20.9	32.3	3.6	55.4				88.2	-32.8	Pass
Table Result:			Pass		by -32.8 dB		Worst Freq: 2411.0 MHz					
Test Site: EMI Chamber 2		Cable 1: Asset #2052				Cable 2: Asset #1507		Cable 3: ---				
Analyzer: Rental SA#1		Preamp: Asset #1517				Antenna: Blue Horn		Preselector: ---				
CSsoft Radiated Emissions Calculator v 1.017.169												
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
Brown	9kHz-26.5GHz	E4407B	Agilent	SG44210511	1510	I	1/21/2017	1/21/2016
Radiated Emissions Sites	FCC Code	IC Code	VCCI Code	Range		Cat	Calibration Due	Calibrated on
EMI Chamber 2	719150	2762A-7	A-0015	30-1000MHz		II	3/22/2017	3/22/2015
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	8/14/2017	8/14/2016
2130 BRP	0.009-18000MHz	BRM18770	Micro-Tronics	1	2130	II	1/6/2017	1/6/2016
Antennas	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Blue Horn	1-18Ghz	3117	ETS	157647	1861	I	2/8/2017	2/8/2015
Meteorological Meters		MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Weather Clock (Pressure Only)		BA928	Oregon Scientific	C3166-1	831	I	4/28/2018	4/28/2016
TH A#2081		HTC-1	HDE		2081	II	4/5/2017	4/5/2016
Cables	Range		Mfr			Cat	Calibration Due	Calibrated on
Asset #1507	9kHz - 18GHz		Florida RF			II	2/14/2017	2/14/2016
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.

Radiated Emissions Table

Date: 29-Aug-16		Company: Ideal Industries, Inc.				Work Order: Q2569									
Engineer: Chris Bramley		EUT Desc: SCD1000				EUT Operating Voltage/Frequency: 120V/60Hz									
Temp: 24.5°C		Humidity: 40%				Pressure: 1010mBar									
Frequency Range: 6-10GHz								Measurement Distance: 1 m							
Notes: EUT Tx at 902.7MHz.								EUT Max Freq: 927.3MHz							
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	6318.9	34.09	24.3	16.2	35.8	8.0	61.7	51.9	83.5	-21.8	Pass	63.5	-11.6	Pass	
v	7221.6	41.47	34.2	15.9	35.9	8.0	69.5	62.2	83.5	-14.0	Pass	63.5	-1.3	Pass	
v	8124.3	34.48	22.5	15.9	36.1	8.1	62.8	50.8	83.5	-20.7	Pass	63.5	-12.7	Pass	
h	9027.0	33.56	20.5	15.8	36.6	8.0	62.4	49.3	83.5	-21.1	Pass	63.5	-14.2	Pass	
Table Result:		Pass		by		-1.3 dB		Worst Freq:				7221.6 MHz			
Test Site: EMI Chamber 1				Cable 1: Asset #2051				Cable 2: Asset #1784							
Analyzer: Rental SA#1				Preamp: Brown				Antenna: Blue Horn							
CSsoft Radiated Emissions Calculator v 1.017.170															
Adjusted Reading = Reading - Preamp Factor + Antenna Factor + Cable Factor															
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Radiated Emissions Table

Date: 29-Aug-16				Company: Ideal Industries, Inc.				Work Order: Q2569						
Engineer: Chris Bramley				EUT Desc: SCD1000				EUT Operating Voltage/Frequency: 120V/60Hz						
Temp: 24.5°C				Humidity: 40%				Pressure: 1010mBar						
Frequency Range: 6-10GHz								Measurement Distance: 1 m						
Notes: EUT Tx at 915MHz.								EUT Max Freq: 927.3MHz						
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	6405.0	34.43	23.0	16.0	35.8	8.2	62.4	51.0	83.5	-21.1	Pass	63.5	-12.5	Pass
v	7320.0	37.47	28.3	15.9	35.9	7.7	65.2	56.0	83.5	-18.3	Pass	63.5	-7.5	Pass
v	8235.0	33.88	21.5	16.0	36.1	8.1	62.1	49.7	83.5	-21.4	Pass	63.5	-13.8	Pass
h	9150.0	31.95	19.2	15.7	36.7	8.0	61.0	48.2	83.5	-22.5	Pass	63.5	-15.3	Pass
Table Result:				Pass by -7.5 dB				Worst Freq: 7320.0 MHz						
Test Site: EMI Chamber 1				Cable 1: Asset #2051				Cable 2: Asset #1784						
Analyzer: Rental SA#1				Preamp: Brown				Antenna: Blue Horn						
CSsoft Radiated Emissions Calculator v 1.017.170														Copyright Curtis-Straus LLC 2000
Adjusted Reading = Reading - Preamp Factor + Antenna Factor + Cable Factor														

Radiated Emissions Table

Date: 29-Aug-16				Company: Ideal Industries, Inc.					Work Order: Q2569					
Engineer: Chris Bramley				EUT Desc: SCD1000					EUT Operating Voltage/Frequency: 120V/60Hz					
Temp: 24.5°C				Humidity: 40%					Pressure: 1010mBar					
Frequency Range: 6-10GHz									Measurement Distance: 1 m					
Notes: EUT Tx at 927.3MHz									EUT Max Freq: 927.3MHz					
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	6491.1	33.78	22.5	16.1	35.8	7.2	60.7	49.4	83.5	-22.8	Pass	63.5	-14.1	Pass
v	7418.4	35.96	25.5	15.9	36.0	7.9	64.0	53.5	83.5	-19.5	Pass	63.5	-10.0	Pass
v	8345.7	33.12	19.5	16.0	36.1	8.2	61.4	47.8	83.5	-22.1	Pass	63.5	-15.7	Pass
h	9273.0	32.28	18.9	15.6	36.8	8.6	62.1	48.7	83.5	-21.4	Pass	63.5	-14.8	Pass
Table Result:				Pass by -10.0 dB					Worst Freq: 7418.4 MHz					
Test Site: EMI Chamber 1				Cable 1: Asset #2051					Cable 2: Asset #1784					
Analyzer: Rental SA#1				Preamp: Brown					Antenna: Blue Horn					
CSsoft Radiated Emissions Calculator v 1.017.170														
Adjusted Reading = Reading - Preamp Factor + Antenna Factor + Cable Factor														
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Spectrum Analyzers / Receivers / Preselectors

Brown	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
	9kHz-26.5GHz	E4407B	Agilent	SG44210511	1510	I	1/21/2017	1/21/2016
Radiated Emissions Sites								
EMI Chamber 1	FCC Code	IC Code	VCCI Code	Range		Cat	Calibration Due	Calibrated on
	719150	2762A-6	A-0015	30-1000MHz		II	3/21/2017	3/21/2015
Preamps / Couplers Attenuators / Filters								
Brown	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
	1-10GHz	CS	CS	N/A	1523	II	10/8/2016	10/8/2015
Antennas								
Blue Horn	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
	1-18GHz	3117	ETS	157647	1861	I	2/8/2017	2/8/2015
Meteorological Meters								
Weather Clock (Pressure Only)		MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
TH A#2080		BA928	Oregon Scientific	C3166-1	831	I	4/28/2018	4/28/2016
		HTC-1	HDE		2080	II	4/5/2017	4/5/2016
Cables								
Asset #1784	Range		Mfr			Cat	Calibration Due	Calibrated on
Asset #2051	9kHz - 18GHz		Florida RF			II	3/7/2017	3/7/2016
	9kHz - 18GHz		Florida RF			II	3/2/2017	3/2/2016

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Conducted Spurious Emissions

LIMITS

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth that contains the highest level of desired power based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB ...

[15.247(d)]

MEASUREMENTS / RESULTS

Spurious Conducted Emissions - Maximum In Band Peak PSD in 100 KHz RBW			
Date: 25-Aug-16		Company: Ideal Industries, Inc.	
Engineer: Tuyen Truong		EUT Desc: SCD1000	
Temp: 23.4°C		Humidity: 50%	
		Pressure: 1010mBar	
Frequency Range: 902.7-927.3 MHz			
Notes: Maximum In Band Peak PSD in 100 KHz RBW			
Frequency (MHz)	Reading (dBm)	Attenuation (dB)	Adjusted Reading (dBm)
902.7	-1.043	19.42	18.4
Test Site: CEMI5		Attenuation: Asset#791	
Analyzer: SA#1328			
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Band Edge						
Date: 25-Aug-16		Company: Ideal Industries, Inc.			Work Order: Q2569	
Engineer: Tuyen Truong		EUT Desc: SCD1000			EUT Operating Voltage/Frequency: 120Vac/60Hz	
Temp: 23.4°C		Humidity: 50%		Pressure: 1010mBar		
Frequency Range: 902.7-927.3 MHz						
Notes: The Limit here is set to -30dB from the max in-band peak PSD level in 100kHz RBW (Attenuation factor included or 19.42dBm)						
Frequency (MHz)	Reading (dBm)	Attenuation (dB)	Final Conducted Reading (dBm)	FCC 15.247		
				Limit (dBm)	Margin (dB)	Result (Pass/Fail)
902.0	-37.58	19.42	-18.16	-11.60	-6.56	Pass
928.0	-43.22	19.42	-23.80	-11.60	-12.20	Pass
Table Result: Pass by -6.56 dB Worst Freq: 902.0 MHz						
Test Site: CEM15		Attenuation: Asset#791				
Analyzer: SA#1328						
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Spectrum Analyzers / Receivers / Preselectors
SA EMI Chamber (1328)

Range 9kHz-13.2 GHz
MN E4405B

Mfr Agilent
SN MY44210241

Asset 1328

Cat I
Calibration Due 2/26/2017

Calibrated on 2/26/2016

Conducted Test Sites (Mains / Telco)
CEMI 5

FCC Code 719150

VCCI Code A-0015

Cat III
Calibration Due NA

Calibrated on N/A

Meteorological Meters
Weather Clock (Pressure Only)
TH A#2085

MN BA928
HTC-1

Mfr Oregon Scientific
HDE

SN C3166-1

Asset 831
2085

Cat I
Calibration Due 4/28/2018
4/5/2017

Calibrated on 4/28/2016
4/5/2016

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 8/14/2017

Calibrated on 8/14/2016

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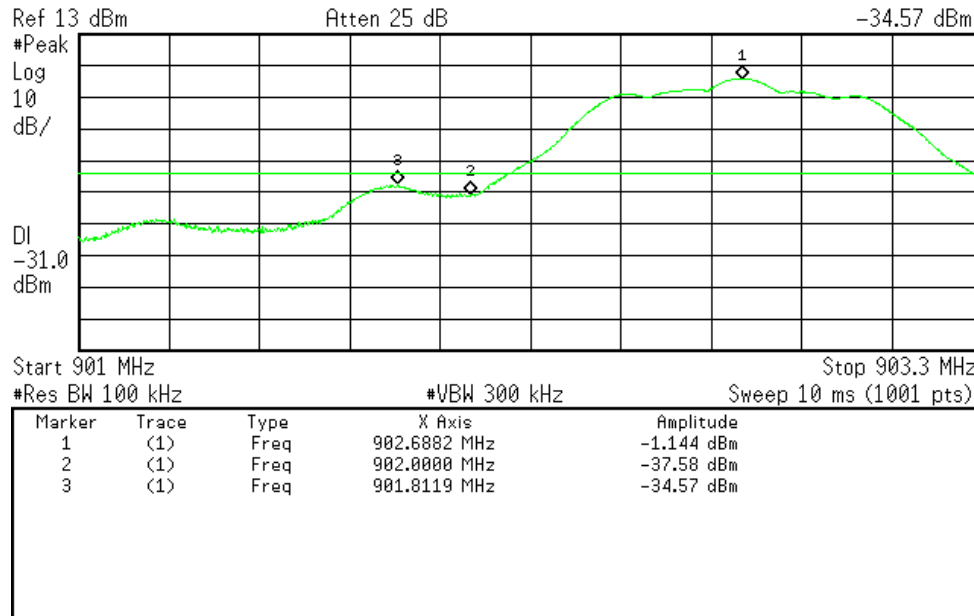


Plots

Conducted Band Edge

* Agilent 10:58:35 Aug 25, 2016

R T

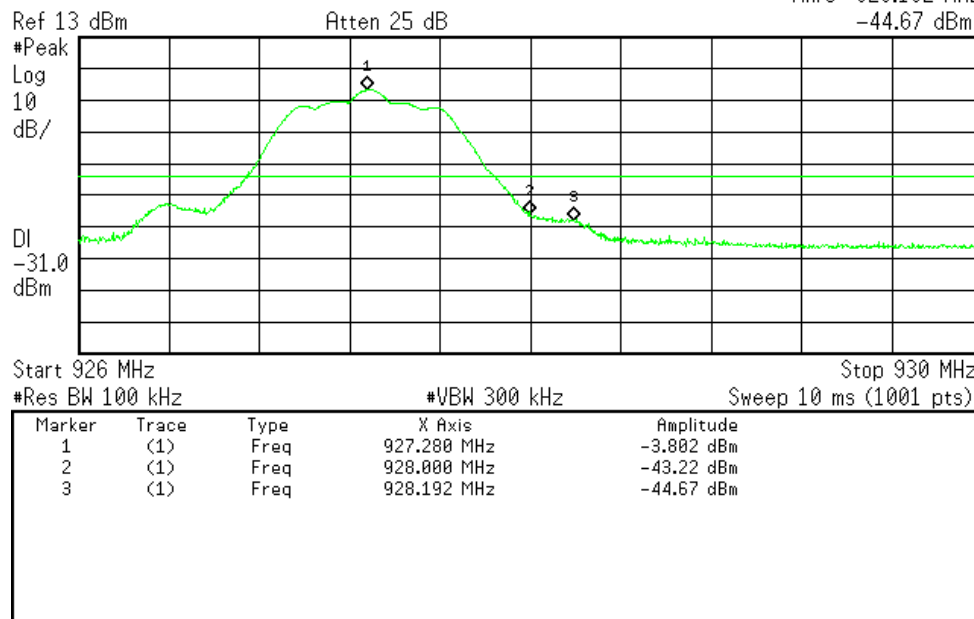
Mkr3 901.8119 MHz
-34.57 dBm

No Peak Found

Lower Channel – Band-edge (<-30dBm)

* Agilent 11:02:37 Aug 25, 2016

R T

Mkr3 928.192 MHz
-44.67 dBm

C:\temp.gif file saved

Upper Channel – Band-edge (<-30dBm)

Conducted Spurious Emission

Conducted spurious emissions at the antenna port were measured in accordance with FCC KDB 558074 D01 DTS Measurement Guidance v03r05 Section 11.0.

Frequency range up to 10GHz was investigated for all 3 channels (low, middle and high) at the EUT antenna port.

Spurious Conducted Emissions - Maximum In Band Peak PSD in 100 KHz RBW			
Date: 25-Aug-16		Company: Ideal Industries, Inc.	
Engineer: Tuyen Truong		EUT Desc: SCD1000	
Temp: 23.4°C		Humidity: 50%	
		Pressure: 1010mBar	
Frequency Range: 902.7-927.3 MHz			
Notes: Maximum In Band Peak PSD in 100 KHz RBW			
Frequency (MHz)	Reading (dBm)	Attenuation (dB)	Adjusted Reading (dBm)
902.7	-1.043	19.42	18.4
Test Site: CEM15		Attenuation: Asset#791	
Analyzer: SA#1328			
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Conducted Spurious Emission						
Date: 25-Aug-16		Company: Ideal Industries, Inc.			Work Order: Q2569	
Engineer: Tuyen Truong		EUT Desc: SCD1000			EUT Operating Voltage/Frequency: 120Vac/60Hz	
Temp: 23.4°C		Humidity: 50%		Pressure: 1010mBar		
Frequency Range: 902.7-927.3 MHz						
Notes: TX on low channel The Limit here is set to -30dB from the max in-band peak PSD level in 100kHz RBW (Attenuation factor included or 19.42dBm)						
Frequency (MHz)	Reading (dBm)	Attenuation (dB)	Final Conducted Reading (dBm)	FCC 15.247		
				Limit (dBm)	Margin (dB)	Result (Pass/Fail)
30.0	-53.74	19.42	-34.32	-11.60	-22.72	Pass
1805.4	-53.18	19.42	-33.76	-11.60	-22.16	Pass
Table Result: Pass by -22.16 dB Worst Freq: 1805.4 MHz						
Test Site: CEM15		Attenuation: Asset#791				
Analyzer: SA#1328						
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Conducted Spurious Emission						
Date: 25-Aug-16		Company: Ideal Industries, Inc.			Work Order: Q2569	
Engineer: Tuyen Truong		EUT Desc: SCD1000			EUT Operating Voltage/Frequency: 120Vac/60Hz	
Temp: 23.4°C		Humidity: 50%		Pressure: 1010mBar		
Frequency Range: 902.7-927.3 MHz						
Notes: TX on mid channel The Limit here is set to -30dB from the max in-band peak PSD level in 100kHz RBW (Attenuation factor included or 19.42dBm)						
Frequency (MHz)	Reading (dBm)	Attenuation (dB)	Final Conducted Reading (dBm)	FCC 15.247		
				Limit (dBm)	Margin (dB)	Result (Pass/Fail)
30.0	-53.93	19.42	-34.51	-11.60	-22.91	Pass
1830.0	-53.48	19.42	-34.06	-11.60	-22.46	Pass
Table Result: Pass by -22.46 dB Worst Freq: 1830.0 MHz						
Test Site: CEMI5		Attenuation: Asset#791				
Analyzer: SA#1328						
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Conducted Spurious Emission

Date: 25-Aug-16		Company: Ideal Industries, Inc.		Work Order: Q2569		
Engineer: Tuyen Truong		EUT Desc: SCD1000		EUT Operating Voltage/Frequency: 120Vac/60Hz		
Temp: 23.4°C		Humidity: 50%		Pressure: 1010mBar		
Frequency Range: 902.7-927.3 MHz						
Notes: TX on high channel The Limit here is set to -30dB from the max in-band peak PSD level in 100kHz RBW (Attenuation factor included or 19.42dBm)						
Frequency (MHz)	Reading (dBm)	Attenuation (dB)	Final Conducted Reading (dBm)	FCC 15.247		
				Limit (dBm)	Margin (dB)	Result (Pass/Fail)
30.0	-53.30	19.42	-33.88	-11.60	-22.28	Pass
1854.6	-53.19	19.42	-33.77	-11.60	-22.17	Pass
Table Result: Pass by -22.17 dB Worst Freq: 1854.6 MHz						
Test Site: CEMI5		Attenuation: Asset#791				
Analyzer: SA#1328						
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Spectrum Analyzers / Receivers / Preselectors
SA EMI Chamber (1328)

Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
9kHz-13.2 GHz	E4405B	Agilent	MY44210241	1328	I	2/26/2017	2/26/2016

Conducted Test Sites (Mains / Telco)
CEMI 5

FCC Code	VCCI Code	Cat	Calibration Due	Calibrated on
719150	A-0015	III	NA	N/A

Meteorological Meters
Weather Clock (Pressure Only)
TH A#2085

MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
BA928 HTC-1	Oregon Scientific HDE	C3166-1 2085	831 2085	I II	4/28/2018 4/5/2017	4/28/2016 4/5/2016

Preamps / Couplers Attenuators / Filters
HF 20dB 50W Attenuator

Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
0.009-18 GHz	PE 7019-20	Pasternack	1	791	II	8/14/2017	8/14/2016

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



Power Spectral Density

LIMIT

...the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3 kHz band during any time interval of continuous transmission.
[15.247(e)]

Per 558074 D01 DTS Measurement Guidance v03r05 DTS Method 10.3 AVGPDS-1 (trace averaging with EUT transmitting at full power throughout each sweep)

MEASUREMENTS / RESULTS

Power Spectral Density						
Date: 25-Aug-16		Company: Ideal Industries, Inc.			Work Order: Q2569	
Engineer: Tuyen Truong		EUT Desc: SCD1000		EUT Operating Voltage/Frequency: 120Vac/60Hz		
Temp: 23.4°C		Humidity: 50%		Pressure: 1010mBar		
Frequency Range: 902.7-927.3 MHz						
Notes:						
Frequency (MHz)	Reading (dBm)	Attenuation (dB)	Final Conducted Reading (dBm)	FCC 15.247		
				Limit (dBm)	Margin (dB)	Result (Pass/Fail)
902.7	-13.49	19.42	5.93	8.0	-2.07	Pass
915	-15.64	19.42	3.78	8.0	-4.22	Pass
927.3	-17.91	19.42	1.51	8.0	-6.49	Pass
Table Result: Pass by -2.07 dB				Worst Freq: 902.7 MHz		
Test Site: CEM15		Attenuation: Asset#791				
Analyzer: SA#1328						
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Spectrum Analyzers / Receivers/Preselectors	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
SA EMI Chamber (1328)	9kHz-13.2 GHz	E4405B	Agilent	MY44210241	1328	I	2/26/2017	2/26/2016
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	4/28/2018	4/28/2016
TH A#2085	HTC-1		HDE		2085	II	4/5/2017	4/5/2016
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	8/14/2017	8/14/2016

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



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PLOTS

Agilent 10:49:27 Aug 25, 2016

R T

Mkr1 902.5392 MHz
-13.49 dBm

Ref 13 dBm

Atten 25 dB

#Avg
Log
10
dB/

PAvg

100

W1 S2

S3 FS

Center 902.7 MHz

#Res BW 3 kHz

#VBW 10 kHz

Span 1.2 MHz
Sweep 217 ms (1001 pts)

C:\temp.gif file saved

PSD – Low Channel

Agilent 10:51:04 Aug 25, 2016

R T

Mkr1 914.8392 MHz
-15.64 dBm

Ref 13 dBm

Atten 25 dB

#Avg
Log
10
dB/

PAvg

100

W1 S2

S3 FS

Center 915 MHz

#Res BW 3 kHz

#VBW 10 kHz

Span 1.2 MHz
Sweep 217 ms (1001 pts)

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PSD – Mid Channel



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Agilent 10:52:25 Aug 25, 2016

R T

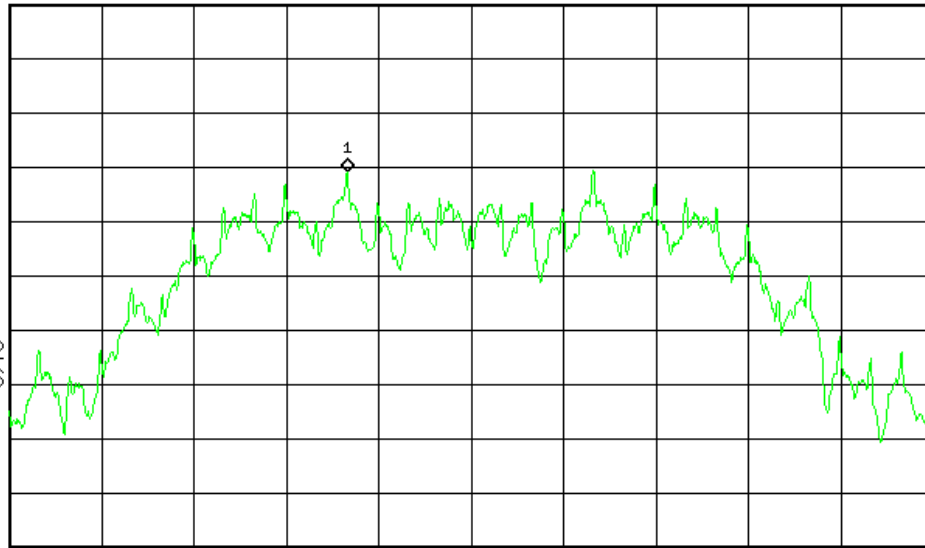
Mkr1 927.1392 MHz
-17.91 dBm

Ref 13 dBm

Atten 25 dB

#Avg
Log
10
dB/

PAvg
100
W1 S2
S3 FS



Center 927.3 MHz

#Res BW 3 kHz

#VBW 10 kHz

Span 1.2 MHz
Sweep 217 ms (1001 pts)

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PSD – 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 Conducted Emissions Data Table														
Date: 02-Sep-16 Engineer: Tuyen Truong Temp: 22.7 °C						Company: Ideal Industries, Inc. EUT Desc: SCD1000 Humidity: 47%				Work Order: Q2569 Pressure: 1010 mBar				
Notes:														
Frequency Range: 0.15 to 30 MHz EUT Input Voltage/Frequency: 120Vac/60Hz														
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)
0.43	25.2	26.3	17.6	19.9	0.0	0.0	-0.1	-20.3	57.2	-10.4	Pass	47.2	-6.8	Pass
0.90	23.1	21.4	11.2	10.8	-0.1	0.0	-0.1	-20.3	56.0	-12.4	Pass	46.0	-14.3	Pass
4.03	19.6	17.8	8.9	8.3	-0.1	-0.1	-0.2	-20.3	56.0	-15.8	Pass	46.0	-16.5	Pass
10.08	18.8	16.7	7.8	6.3	-0.1	-0.1	-0.2	-20.3	60.0	-20.6	Pass	50.0	-21.5	Pass
13.36	20.4	18.7	8.3	6.8	-0.2	-0.2	-0.2	-20.3	60.0	-18.9	Pass	50.0	-21.0	Pass
22.99	18.0	16.2	6.4	5.1	-0.2	-0.2	-0.3	-20.3	60.0	-21.3	Pass	50.0	-22.8	Pass
Result: Pass						Worst Margin: -6.8 dB				Frequency: 0.433 MHz				
Measurement Device: LISN Asset 1791						Cable: CEMI-01				Spectrum Analyzer: Rental SA #5				
Attenuator: 20dB Atten-4						Site: CEMI6				Equipment Factor Sheet rev: 8/24/2016				
C-S CEMI Calculator Version 3.0.14 Adjusted Reading = Raw Reading + LISN Insertion Loss + Cable Loss + Attenuation														

AC Conducted Emissions Data Table														
Date: 02-Sep-16 Engineer: Tuyen Truong Temp: 22.7 °C						Company: Ideal Industries, Inc. EUT Desc: SCD1000 Humidity: 47%				Work Order: Q2569 Pressure: 1010 mBar				
Notes:														
Frequency Range: 0.15 to 30 MHz EUT Input Voltage/Frequency: 277Vac/60Hz														
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)
0.43	26.7	27.1	19.2	18.4	0.0	0.0	-0.1	-20.3	57.2	-9.7	Pass	47.2	-7.6	Pass
0.90	18.5	20.8	14.6	9.9	-0.1	0.0	-0.1	-20.3	56.0	-14.7	Pass	46.0	-10.9	Pass
4.03	20.1	18.2	10.5	7.6	-0.1	-0.1	-0.2	-20.3	56.0	-15.4	Pass	46.0	-14.9	Pass
10.08	18.9	19.7	11.3	7.0	-0.1	-0.1	-0.2	-20.3	60.0	-19.6	Pass	50.0	-18.1	Pass
13.36	20.0	19.1	8.3	7.1	-0.2	-0.2	-0.2	-20.3	60.0	-19.3	Pass	50.0	-21.0	Pass
22.99	14.9	15.7	4.3	3.9	-0.2	-0.2	-0.3	-20.3	60.0	-23.6	Pass	50.0	-24.9	Pass
Result: Pass					Worst Margin: -7.6 dB					Frequency: 0.433 MHz				
Measurement Device: LISN Asset 1791					Cable: CEMI-01					Spectrum Analyzer: Rental SA #5				
					Attenuator: 20dB Atten-4					Site: CEMI 6				
C-S CEMI Calculator Version 3.0.14														
Adjusted Reading = Raw Reading + LISN Insertion Loss + Cable Loss + Attenuation														
Equipment Factor Sheet rev: 8/24/2016														



Rev. 8/29/2016

Spectrum Analyzers / Receivers / Preselectors
SA EMI Chamber (1327)

Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
9kHz-13.2 GHz	E4405B	Agilent	MY45103416	1327	I	8/4/2017	8/4/2016

LISNs/Measurement Probes
LISN Asset 1791

Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
9KHz-30MHz	NNLK 8121	Schwarzbeck	NNLK 8121-603	1791	I	6/23/2017	6/23/2016

Conducted Test Sites (Mains / Telco)
CEMI 6

FCC Code	VCCI Code	Cat	Calibration Due	Calibrated on
719150	A-0015	III	NA	N/A

Meteorological Meters
Weather Clock (Pressure Only)
TH A#2082

MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
BA928	Oregon Scientific	C3166-1	831	I	4/28/2018	4/28/2016
HTC-1	HDE		2082	II	4/5/2017	4/5/2016

Cables
CEMI-01

Range	Mfr	Cat	Calibration Due	Calibrated on
9kHz - 2GHz	C-S	II	9/11/2016	9/11/2015

Attenuators
20dB Attenuator-60

Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
9kHz-2GHz			N/A		II	4/12/2017	4/12/2016

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



Occupied Bandwidth

REQUIREMENT

When an occupied bandwidth is not specified in the applicable RSS, the transmitted signal bandwidth to be reported is its 99% emission bandwidth, as calculated or measured.

[RSS-GEN 4.6.1]

MEASUREMENTS / RESULTS

99% OCCUPIED BANDWIDTH			
Date: 25-Aug-16		Company: Ideal Industries, Inc.	
Engineer: Tuyen Truong		EUT Desc: SCD1000	
Temp: 23.4°C		Humidity: 50%	
		Pressure: 1010mBar	
Frequency Range: 902.7-927.3 MHz			
Notes:			
Frequency (MHz)		Occupied Bandwidth Reading (KHz)	
902.7		764.7554	
915		765.6934	
927.3		766.9552	
Test Site: CEMI5		Attenuation: Asset#791	
Analyzer: SA#1328			
Copyright Curtis-Straus LLC 2000			

Rev. 8/21/2016

Spectrum Analyzers / Receivers / Preselectors	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
SA EMI Chamber (1328)	9kHz-13.2 GHz	E4405B	Agilent	MY44210241	1328	I	2/26/2017	2/26/2016
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	4/28/2018	4/28/2016
TH A#2085		HTC-1	HDE		2085	II	4/5/2017	4/5/2016
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	8/14/2017	8/14/2016

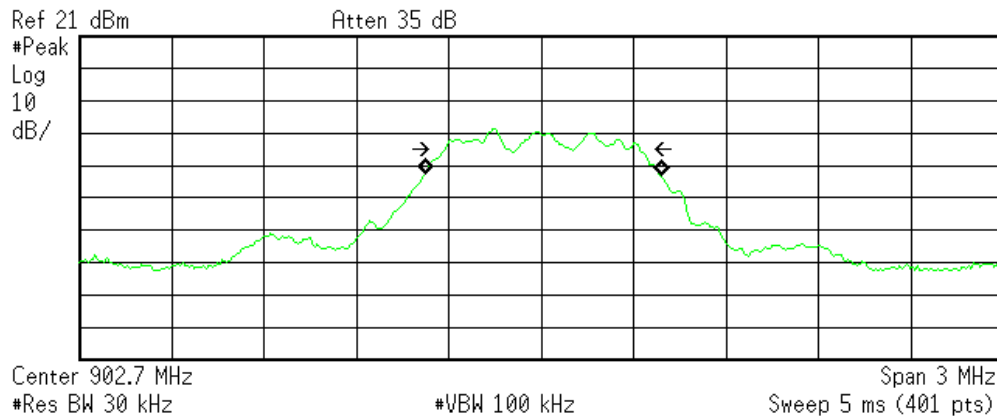
All equipment is calibrated using standards traceable to NIST or other nationally recognized calibration standard.



Plot(s)

Agilent 08:09:27 Aug 25, 2016

R T



Occupied Bandwidth
764.7554 kHz

Occ BW % Pwr 99.00 %
x dB -6.00 dB

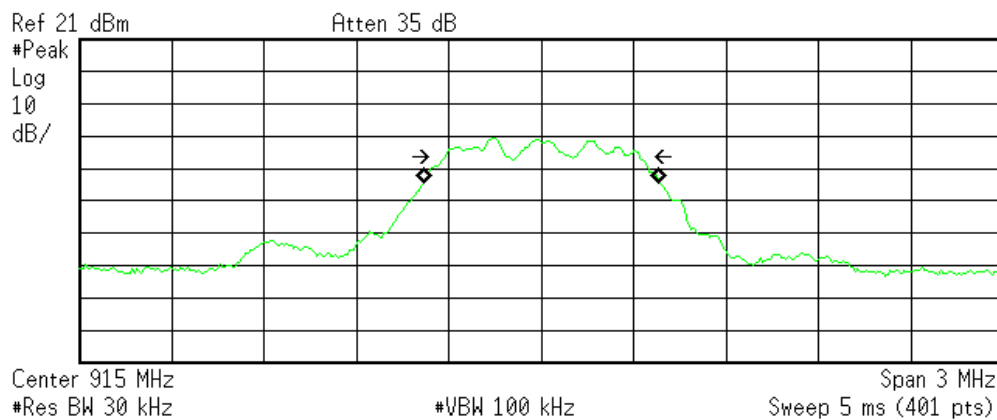
Transmit Freq Error 3.933 kHz
x dB Bandwidth 633.769 kHz

C:\temp.gif file saved

Occupied Bandwidth – Low Channel

Agilent 08:16:35 Aug 25, 2016

R T



Occupied Bandwidth
765.6934 kHz

Occ BW % Pwr 99.00 %
x dB -6.00 dB

Transmit Freq Error 3.254 kHz
x dB Bandwidth 634.038 kHz

C:\temp.gif file saved

Occupied Bandwidth – Middle Channel

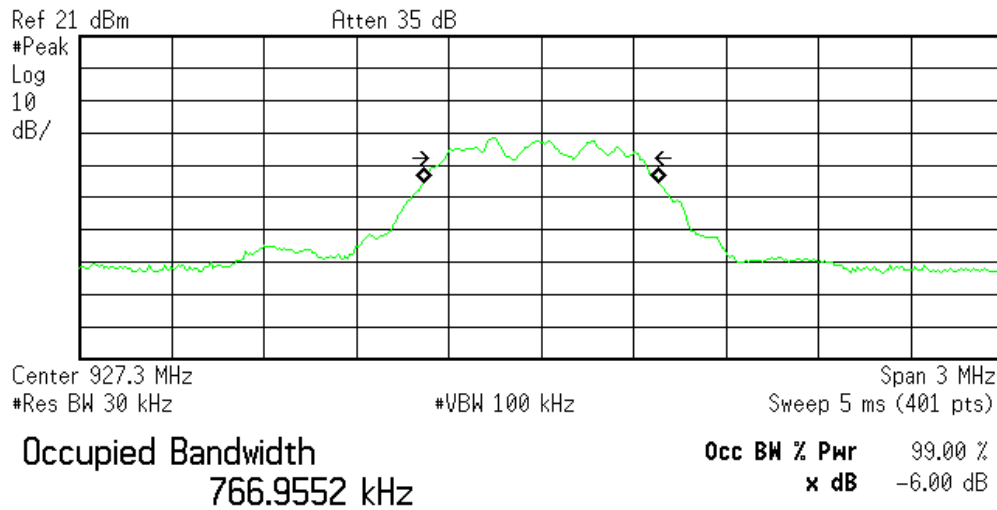


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Agilent 08:27:13 Aug 25, 2016

R T



Transmit Freq Error 742.731 Hz
x dB Bandwidth 634.287 kHz

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Occupied Bandwidth – High Channel

Measurement Uncertainty

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

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



Conditions Of Testing

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

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



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such claims including, without limitation, claims that the Test Report is inaccurate, incomplete or misleading or that additional or different testing is required, unless and then only to the extent that Client submits a written claim to the Company within both such time periods.

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.

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.

The complete list of the Approved Subcontractors Curtis-Straus may use to delegate the performance of work can be provided upon request.

