Test Report



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

Report No	EO3616-1
Client	Powercast Corporation Charlie Greene
Address	566 Alpha Drive Pittsburgh, PA 15238
Phone	412-436-4077
Items tested FCC ID IC FRN	RS1800 2AAMXRS1800 11250A-RS1800 0002862225
Equipment Type Equipment Code	Part 15.247 Digitally Modulated DTS
FCC/IC Rule Parts	47 CFR 15.247, RSS-210 Issue 8
Test Dates	December 31, 2014, January 2, 5 and 7 and February 10, 2015
Results	As detailed within this report
Prepared by	Tuyen Truong A. – Test Engineer
Authorized by	Christopher Reynolds - EMC Supervisor
Issue Date	5/4/2015
Conditions of Issue	This Test Report is issued subject to the conditions stated in the ' <i>Conditions of Testing</i> ' section on page 26 of this report.

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





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



Summary

This test report supports an application for certification of a transmitter operating pursuant to 47 CFR 15.247. The product is the RS1800. It is a digitally modulated transmitter that operates in the range 902.7-927.3MHz. The product was tested with an integrated wire antenna with a gain of 2.0dBi.

We found that the product met the above requirements without modification. Charlie Greene from Powercast Corporation was present during the testing. The test samples were received in good condition.





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Test Methodology

Radiated emission and AC line conducted testing were performed according to the procedures specified in FCC Guidance for performing compliance measurement on DTS operating under section 15.247, April 19, 2013 and ANSI C63.10 (2009) and C63.4 (2003). Radiated Emissions were maximized by rotating the device around its axes as well as varying the test antenna's height and polarity.

Conducted emissions at the antenna port were performed with temporary connector for testing only, as required by rule section.

The EUT operating voltage is 120VAC, 60Hz

Low operating channel frequency = 902.7MHz Mid operating channel frequency = 915MHz High operating channel frequency = 927.3MHz

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





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May 4, 2015

Product Tested - Configuration Documentation

				EUT C	onfigura	ation				
Company Address:	Powercast Co	e USA 152	38							
		MN						SN		
EUT:		RS1800 RS1800						Sample 1 Sample 2		
EUT Description: EUT Tx Frequency:										
Support Equipment:		MN						SN		
None										
EUT Ports:										
Port Label	Port Type	No. of ports	No. Populated	Cable Type	Shielded	Ferrites	Length	Max Length	In/Out NEBS Type	Comment
AC Power IN	AC Power	1	1	2-wire	No	No	3m	N/A	In	
AC Power Out	AC Power	1	1	2-wire	No	No	1m	N/A	In	
Antenna	SMA	1	1	Coaxial	Yes	No	1inch	NA	In	Temporary connector (conductor testing only)
oftware / Operating Mode Desc	cription:									
ransmits at Low, Mid, or High Ch	annel from 902.	7-927.3M	Hz.							





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Statement of Conformity

The RS1800 has been found to conform to the following parts of 47 CFR and as detailed below:

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





May 4, 2015

Test Results

Bandwidth

LIMIT

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

MEASUREMENTS / RESULTS

Engineer	Chris Bramley
Date	12/31/2014
Site	Chamber 2
Environmental	20°C, 23%, 1017mBar
Conditions	

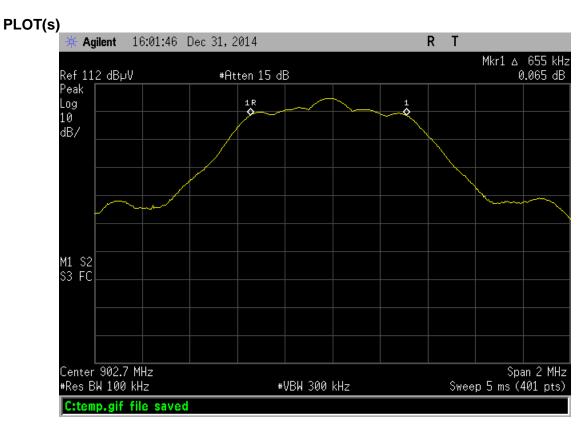
	6dB E	Bandwig	dth	
15:247(a)(2):	Specifies that the minimum 60	IB bandwidth shall be	at least 500kHz.	
Frequency		6dB BW	Limit	Margin
(MHz)	Mode	(MHz)	(kHz)	(MHz)
902.7	DMSS	0.655	>500	-0.155
915	DMSS	0.655	>500	-0.155
927.3	DMSS	0.655	>500	-0.155
Tested by:	Chris Bramley	RBW = 100KHz	VBW = 300KHz	
Date:	12/31/2014	Analyzer:	Brown SA	
	Powercast Corporation RS1800	Attenuator:	PE7019-20 #791	

Rev. 12/26/2014 Spectrum Analyzers / Receivers /Preselectors Brown	Range 9kHz-26.5GHz	MN E4407B	Mfr Agilent	SN SG44210511	Asset 1510	Cat I	Calibration Due 5/12/2015	Calibrated on 5/12/2014
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		∥	3/9/2015	3/9/2014
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	∥	7/14/2015	7/14/2014
Meteorological Meters Weather Clock (Pressure Only) TH A#1833		MN BA928 35519-044	Mfr Oregon Scientific Control Company	SN C3166-1 130318278	Asset 831 1833	Cat	Calibration Due 3/19/2016 6/13/2015	Calibrated on 3/19/2014 6/13/2013

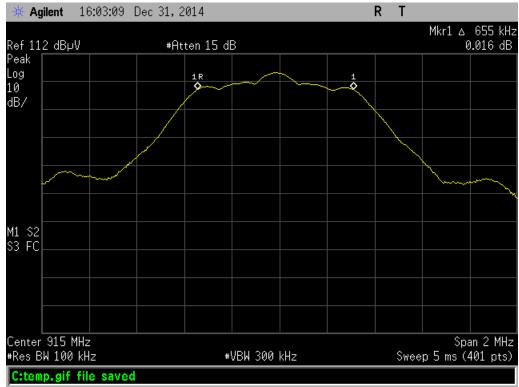
All equipment is calibrated using standards traceable to NIST or other nationally recognized calibration standard.

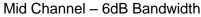






Low Channel - 6dB Bandwidth

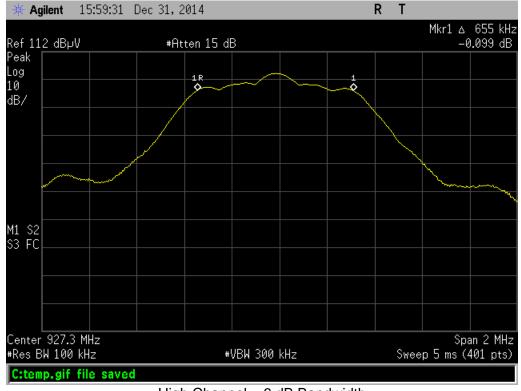






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High Channel – 6 dB Bandwidth





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Fundamental Emission Output Power

LIMIT Conducted Output Power 1 Watt [15.247(b) (3)]

MEASUREMENTS / RESULTS

Engineer	Chris Bramley
Date	12/31/2014
Site	Chamber 2
Environmental	20°C, 33%, 1017mBar
Conditions	

DTS Method 9.2.2.2 Method AVGSA-1 (Trace averaging with the EUT transmitting at full

power throughout each sweep)

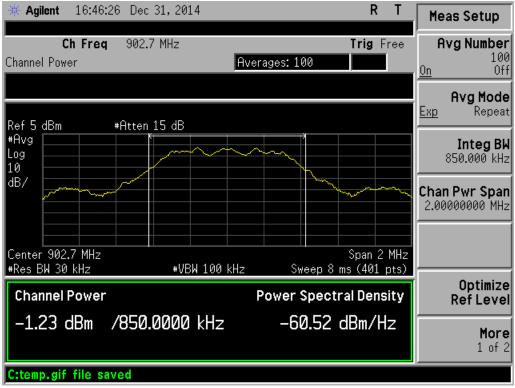
lested by:	Chris Bramley						W	'O: O3616	
Date:	12/31/2014		Analyz	er: Brown SA			R	BW = 30KHz	
Company:	Powercast Corpor	ation	Attenua	tor: PE7019-20	#791		v	BW = 100KHz	
EUT:	RS1800	Oper	ating Volta	ige: 120Vac/60	Hz		Li	mit = 1Watt or 3	OdBm
TX Mode:	DMSS								
Channel	Measured		Attenuator factor	Adjusted measure		Limit		Morein	
(MHz)	power (dBm)		(dB)	(dBm		(dBm)		Margin (dB)	Result
902.7	-1.23		19.57	18.3	,	30		-11.66	Pass
915	-2.78		19.57	16.7	9	30		-13.21	Pass
927.3	-3.72		19.57	15.8	5	30		-14.15	Pass
12/26/2014									
Spectrum Analyzers / Receive Brown	rs/Preselectors	Range 9kHz-26.5GHz	MN E4407B	Mfr Agilent	SN SG44210511	Asset 1510	Cat I	Calibration Due 5/12/2015	Calibrated 5/12/2014
	Sites	FCC Code 719150	IC Code 2762A-7	VCCI Code A-0015	Range 30-1000MHz		Cat ∥	Calibration Due 3/9/2015	Calibrated 3/9/2014
Radiated Emissions EMI Chamber 2		713130							
	tors / Filters	Range 0.009-18 GHz	MN PE 7019-20	Mfr Pasternack	SN 1	Asset 791	Cat II	Calibration Due 7/14/2015	Calibrated 7/14/2014

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





PLOTS

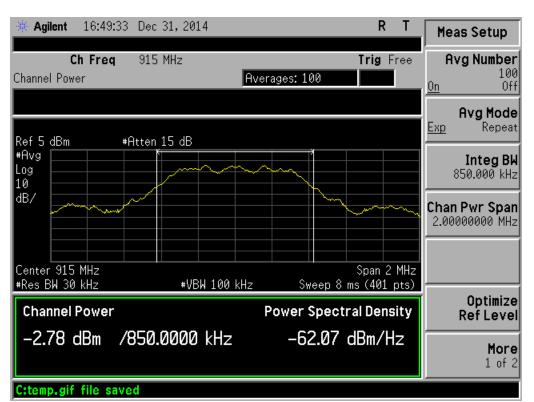


Low Channel – Channel Power

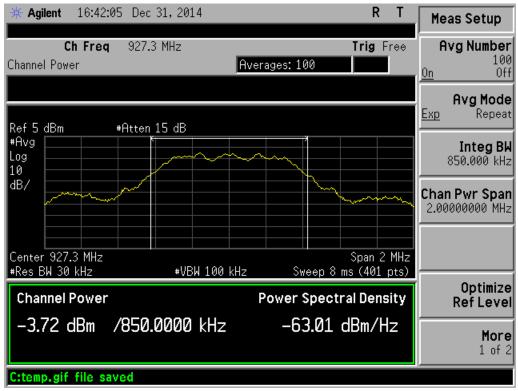


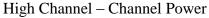


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Mid Channel - Channel Power









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

Date	: 02-Jan-15		Company:	Powercast	Corpora	tion					Work Order	: O3616
Engineer	: Tuyen Truong		EUT Desc:	Smart Cor	nector R	S1800		E	UT Opera	ting Voltage	e/Frequency	: 120Vac/60H
Temp	: 23°C		Humidity:	2%		Pressur	e: 1010 mBar					
	Freque	ncy Range:	30 to 1000	MHz				м	leasurem	ent Distance	:3 m	
Notes	: Low Channel T	TX							EL	JT Max Free	: 902.7-927.3	3MHz
											FCC 15.2	09
Antenna Polarization	Frequency	Reading	Preamp Factor	Antenna Factor	Cable Factor	Adjusted Reading	Limit	Margin	Result	Limit	Margin	Result
(H / V)	(MHz)	(dBµV)	(dB)	(dB/m)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	(Pass/Fail)	(dBµV/m)	(dB)	(Pass/Fail
v	403.2	44.7	25.9	15.7	1.5	36.0				46.0	-10.0	Pass
V	40.6 105.2	39.0 45.3	25.5 25.5	13.2 11.4	0.4 0.7	27.1 31.9				40.0 43.5	-12.9 -11.6	Pass Pass
h v	105.2	45.3 44.7	25.5 25.5	11.4	0.7	31.9				43.5 43.5	-11.6	Pass
h	243.4	44.9	25.6	11.7	1.2	32.3				46.0	-13.7	Pass
v	246.0	45.8	25.6	11.8	1.2	33.2				46.0	-12.8	Pass
v	282.6	44.5	25.7	13.3	1.2	33.3				46.0	-12.7	Pass
h	408.0	43.6	25.9	16.0	1.6	35.3				46.0	-10.7	Pass
Tabl	e Result:	Pass	by	-10.0	dB				И	/orst Freq	403.2	2 MHz
Test Site:	EMI Chamber	4										
Analyzer:		1	Cable 1: Preamp:	Asset #15 Green	05			Cable 2: A Antenna: R		7	Cable 3 Preselector	
ev.12/26/2014	Gold		Preamp:	Green				Antenna: R	Red-Black		Preselector	:
ev.12/26/2014	: Gold	eceivers/Pre	Preamp:	Green	05 nge 26.5 GHz	MN E4407B	Mfr Agilent		Red-Black Asset	Cat Calil		
ev.12/26/2014	: Gold n Analyzers / Re	eceivers/Pre	Preamp:	Green Ra 100Hz-2 FCC	nge			Antenna: R SN	Asset	Cat Calil I 3 Cat Calil	Preselector	: Calibrated
ev. 12/26/2014 Spectrum	n Analyzers / Re Gold Radiated Emis	eceivers /Pre d ssions Sites nber 1 ttenuators / I	Preamp: selectors	Green Ra 100Hz-2 FCC 719 Ra	nge 26.5 GHz Code 9150 nge	E4407B	Agilent VCCI Code	Antenna: R SN MY45113816 Range	Asset	Cat Calil I 3 Cat Calil II 3 Cat Calil	Preselector pration Due /28/2015 pration Due	Calibrated 3/28/201/ Calibrated
w.12/26/2014 Spectrum	: Gold n Analyzers / Re Gold Radiated Emis EMI Char nps /Couplers A	eceivers /Pre d assions Sites nber 1 ttenuators / I nn nas	Preamp: selectors	Green Ra 100Hz-2 FCC 719 Ra 0.009-2 Ra	nge 26.5 GHz Code 9150 nge	E4407B IC Code 2762A-6 MN	Agilent VCCI Code A-0015 Mfr	Antenna: R SN MY45113816 Range 30-1000MHz SN	Asset 6 1284 Asset	Cat Calii I 3 Cat Calii II 3 Cat Calii II 9 Cat Calii	Preselector pration Due /28/2015 pration Due /15/2015 pration Due	Calibrated 3/28/201- Calibrated 3/15/201- Calibrated 9/14/201- Calibrated
9v. 12/26/2014 Spectrum	: Gold n Analyzers / Re Gold Radiated Emis EMI Char nps /Couplers A Gree Antenn Red-Black Cable	eceivers /Pre d ssions Sites nber 1 ttenuators / I na s < Bilog es	Preamp: selectors	Creen Ra 100HZ-2 FCC 71S Ra 0.009-2 Ra 30-200 Ra	nge 26.5 GHz 26.5 GHz 1150 nge 000MHz nge 00MHz nge	E4407B IC Code 2762A-6 MN ZFL-1000-LN MN	Agilent VCCI Code A-0015 Mfr CS Mfr Sunol Mfr	Antenna: R SN MY45113816 Range 30-1000MHz SN N/A SN	Asset 5 1284 Asset 802 Asset	Cat Calil I 3 Cat Calil II 3 Cat Calil II 9 Cat Calil I 1 Cat Calil Cat Calil	Preselector pration Due /28/2015 pration Due /15/2015 pration Due /14/2015 pration Due /28/2015 pration Due	Calibrated 3/28/2014 Calibrated 3/15/2014 Calibrated 9/14/2014 Calibrated 1/28/2013 Calibrated
w.12/26/2014 Spectrum	n Analyzers / Re Gold Radiated Emis EMI Char nps /Couplers A Gree Antenn Red-Black	eceivers /Pre dessions Sites nber 1 ttenuators / I nas < Bilog es 1505	Preamp: selectors	Green Ra 100Hz-2 FCC 719 Ra 0.009-2 Ra 30-200 Ra 9kHz -	nge 26.5 GHz Code 0150 nge 000MHz nge 000MHz	E4407B IC Code 2762A-6 MN ZFL-1000-LN MN	Agilent VCCI Code A-0015 Mfr CS Mfr Sunol	Antenna: R SN MY45113816 Range 30-1000MHz SN N/A SN	Asset 5 1284 Asset 802 Asset	Cat Calil I 3 Cat Calil II 3 Cat Calil II 9 Cat Calil I 1 1 Cat Calil I 3	Preselector pration Due /28/2015 pration Due /15/2015 pration Due /28/2015	Calibrated 3/28/201 Calibrated 3/15/201 Calibrated 9/14/201 Calibrated 1/28/201
ev. 12/26/2014 Spectrum	r Gold n Analyzers / Re Gold Radiated Emis EMI Chan nps /Couplers A Gree Antenn Red-Black Cabla Asset #	eceivers /Pre ssions Sites nber 1 ttenuators / I n nas < Bilog es 1505 1787	Preamp: selectors	Green Ra 100Hz-2 FCC 719 Ra 0.009-2 Ra 30-200 Ra 9kHz -	nge 26.5 GHz 260de 1150 nge 000MHz nge 18GHz	E4407B IC Code 2762A-6 MN ZFL-1000-LN MN	Agilent VCCI Code A-0015 Mfr CS Mfr Sunol Mfr Florida RF	Antenna: R SN MY45113816 Range 30-1000MHz SN N/A SN	Asset 5 1284 Asset 802 Asset	Cat Calii I 3 Cat Calii II 9 Cat Calii I 9 Cat Calii I 1 1 Cat Calii I 3	Preselector pration Due /28/2015 pration Due /15/2015 pration Due /28/2015 pration Due /28/2015 pration Due /7/2015 /14/2015	 Calibrated 3/28/201. Calibrated 3/15/201. Calibrated 9/14/201. Calibrated 1/28/201. Calibrated 3/7/2014 3/14/201.
9v.12/26/2014 Spectrum Prean	: Gold n Analyzers / Re Gold Radiated Emis EMI Chan nps /Couplers A Gree Antenn Red-Black Asset #	eceivers /Pre ssions Sites nber 1 ttenuators / I nn nas < Bilog es 1505 1787 cal Meters	Preamp: selectors	Green Ra 100Hz-2 FCC 719 Ra 0.009-2 Ra 30-200 Ra 9kHz -	nge 26.5 GHz 260de 1150 nge 000MHz nge 18GHz	E4407B IC Code 2762A-6 MN ZFL-1000-LN MN JB1	Agilent VCCI Code A-0015 Mfr CS Mfr Sunol Mfr Florida RF Florida RF	Antenna: R SN MY45113816 Range 30-1000MHz SN N/A SN A091604-2 SN	Asset 5 1284 2 Asset 802 Asset 1106	Cat Calili I 3 Cat Calili II 9 Cat Calili I 9 Cat Calili I 1 Cat Calili I 3 Cat Calili I 3 Cat Calili Cat Calili I 3 Cat Calili Cat Calili Calili Cat Calili I 3 Cat Calili Cat Calili I 3 Cat Calili Cat Calili Cat Calili I 3 Cat Calili I 3 Cat Calili I 3 Cat Calili I 3 Cat Calili I 3 Cat Calili I 3 Cat Calili Cat Calili I 3 Cat Calili Cat Cat Calili Cat Calili C	Preselector pration Due /28/2015 pration Due /15/2015 pration Due /14/2015 pration Due /28/2015 pration Due /28/2015 pration Due /27/2015	 Calibratec 3/28/201 Calibratec 3/15/201 Calibratec 9/14/201 Calibratec 1/28/201 Calibratec 3/7/201

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





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	02-Jan-15		Company:	Powercast	Corpor	ation					We	ork Orde	r: O3616
Engineer:	Tuyen Truong		EUT Desc:	Smart Con	nector I	RS1800		1	EUT Oper	ating V	oltage/Fi	requency	120Vac/60
Temp:	23°C		Humidity:	2%		Pressu	ire: 1010 mBar						
	Freque	ncy Range:	30 to 1000	MHz				Ν	Neasuren	nent Dis	tance: 3	m	
Notes:	Mid Channel T	X							E	UT Max	Freq: 9	02.7-927.3	3MHz
										1	F	CC 15.20)9
Antenna			Preamp	Antenna	Cable	Adjusted							
Polarization	Frequency	Reading	Factor	Factor	Factor	Reading	Limit	Margin	Result		mit	Margin	Result
(H/V)	(MHz)	(dBµV)	(dB)	(dB/m)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	(Pass/Fail		uV/m)	(dB)	(Pass/Fa
v	40.6	38.3	25.5	13.2	0.4	26.4					0.0	-13.6	Pass
v	107.2	44.0	25.5	11.9	0.8	31.2					3.5	-12.3	Pass
V	242.7	44.0	25.6	11.8	1.1	31.3					6.0	-14.7	Pass
h	270.8	46.3	25.6	13.2	1.2	35.1					6.0	-10.9	Pass
V	280.3	44.1	25.7	13.4	1.2	33.0					6.0	-13.0	Pass
v	347.3	42.2	25.7	14.2	1.4	32.1					6.0	-13.9	Pass
v	409.5	44.5	25.9	16.1	1.6	36.3					6.0	-9.7	Pass
h	411.6	43.5	25.9	16.1	1.6	35.3					6.0	-10.7	Pass
V	805.0	32.3	25.6	21.3	2.1	30.1				4	6.0	-15.9	Pass
Table	e Result:	Pass	by	-9.7	dB				1	Norst I	Freq:	409.5	5 MHz
Test Site: Analyzer:	EMI Chamber Gold	1	Cable 1: Preamp:	Asset #150 Green	05			Cable 2: / Antenna:			Pr	Cable 3	
v.12/26/2014													
						MN	Mfr	SN	Asset				
	Analyzers / Re Gold		electors	Ran 100Hz-26		E4407B	Agilent	MY45113816		Cat C	3/28/20		Calibrated 3/28/2014
		sions Sites	selectors		5.5 GHz Code					Ι		015 n Due	
Spectrum	Gold Radiated Emis	sions Sites hber 1 ttenuators / F		100Hz-26 FCC C 7191 Ran	5.5 GHz Code 150 ge	E4407B	Agilent VCCI Code	MY45113816 Range		l Cat (3/28/20	015 n Due 015 n Due	3/28/2014 Calibrated
Spectrum	Gold Radiated Emis EMI Chan ps /Couplers Af	sions Sites nber 1 ttenuators / F n nas		100Hz-26 FCC C 7191 Ran	5.5 GHz Code 150 ge 00MHz ge	E4407B IC Code 2762A-6 MN	Agilent VCCI Code A-0015 Mfr	MY45113816 Range 30-1000MHz SN	1284 Asset	Cat C II Cat C II	3/28/20 Calibratio 3/15/20 Calibratio	n Due 015 n Due 015 n Due 015 n Due	3/28/2014 Calibrated 3/15/2014 Calibrated
Spectrum	Gold Radiated Emis EMI Chan ps /Couplers Ai Gree Antenr Red-Black Cable	d Inber 1 Ittenuators / F n nas I: Bilog		100Hz-26 FCC (719' Ran 0.009-20 Ran 30-200 Ran	S.5 GHz Code 150 ge 00MHz ge DMHz ge	E4407B IC Code 2762A-6 MN ZFL-1000-LN MN	Agilent VCCI Code A-0015 Mfr CS Mfr Sunol Mfr	MY45113816 Range 30-1000MHz SN N/A SN	1284 Asset 802 Asset	I Cat C II Cat C II Cat C I Cat C	3/28/20 Calibratio 3/15/20 Calibratio 9/14/20 Calibratio 1/28/20 Calibratio	n Due 015 n Due 015 n Due 015 n Due 015 n Due	3/28/2014 Calibrated 3/15/2014 Calibrated 9/14/2014 Calibrated 1/28/2013 Calibrated
Spectrum	Golc Radiated Emis EMI Chan ps /Couplers A Gree Antenr Red-Black Cable Asset #	d Inder 1 Ittenuators / F n nas k Bilog 25 1505		100Hz-26 FCC C 719 Ran 0.009-20 Ran 30-200 Ran 9kHz -	S.5 GHz Code 150 ge 00MHz ge 0MHz 18GHz	E4407B IC Code 2762A-6 MN ZFL-1000-LN MN	Agilent VCCI Code A-0015 Mfr CS Mfr Sunol Mfr Florida RF	MY45113816 Range 30-1000MHz SN N/A SN	1284 Asset 802 Asset	I Cat C II Cat C II Cat C I Cat C	3/28/20 Calibratio 3/15/20 Calibratio 9/14/20 Calibratio 1/28/20 Calibratio 3/7/20	n Due n Due 015 n Due 015 n Due 015 n Due 015 n Due 15	3/28/2014 Calibrated 3/15/2014 Calibrated 9/14/2014 Calibrated 1/28/2013 Calibrated 3/7/2014
Spectrum	Golc Radiated Emiss EMI Chan ps /Couplers Al Gree Antenr Red-Black Cable Asset # Asset #	sions Sites hber 1 ttenuators / F n nas k Bilog 55 1505 1787		100Hz-26 FCC (719' Ran 0.009-20 Ran 30-200 Ran	S.5 GHz Code 150 ge 00MHz ge 0MHz 18GHz	E4407B IC Code 2762A-6 MN ZFL-1000-LN MN JB1	Agilent VCCI Code A-0015 Mfr CS Mfr Sunol Mfr Florida RF Florida RF	MY45113816 Range 30-1000MHz SN N/A SN A091604-2	1284 Asset 802 Asset 1106	Cat C II Cat C II Cat C I Cat C II II	3/28/20 Calibratio 3/15/20 Calibratio 9/14/20 Calibratio 1/28/20 Calibratio 3/7/20 3/14/20	115 n Due 115 n Due 115 n Due 115 n Due 15 115	3/28/2014 Calibrated 3/15/2014 Calibrated 9/14/2014 Calibrated 1/28/2013 Calibrated 3/7/2014 3/14/2014
Spectrum	Golc Radiated Emis EMI Chan ps /Couplers A Gree Antenr Red-Black Cable Asset #	sions Sites her 1 ttenuators / F n nas E Bilog 1505 1787 sal Meters	ïlters	100Hz-26 FCC C 719 Ran 0.009-20 Ran 30-200 Ran 9kHz -	S.5 GHz Code 150 ge 00MHz ge 0MHz 18GHz	E4407B IC Code 2762A-6 MN ZFL-1000-LN MN	Agilent VCCI Code A-0015 Mfr CS Mfr Sunol Mfr Florida RF	MY45113816 Range 30-1000MHz SN N/A SN	1284 Asset 802 Asset	Cat C II Cat C II Cat C I Cat C II II	3/28/20 Calibratio 3/15/20 Calibratio 9/14/20 Calibratio 1/28/20 Calibratio 3/7/20	915 n Due 915 n Due 915 n Due 915 n Due 15 915 m Due 15 915 m Due	3/28/2014 Calibrated 3/15/2014 Calibrated 9/14/2014 Calibrated 1/28/2013 Calibrated 3/7/2014

	02-Jan-15		Company:		•					-	Vork Order:	
Engineer:	Tuyen Truong		EUT Desc:	Smart Con	nector R	S1800			EUT Operat	ing Voltage/	Frequency:	120Vac/60
Temp:	23°C		Humidity:	2%		Pressure:	1010 mBar					
	Freque	ncy Range:	30 to 1000	MHz					Measureme	nt Distance:	3 m	
Notes:	High Channel	ΓX							EU	Max Freq:	902.7-927.3	ИНz
											FCC 15.209	1
Antenna			Preamp	Antenna	Cable	Adjusted						
Polarization (H / V)	Frequency (MHz)	Reading (dBµV)	Factor (dB)	Factor (dB/m)	Factor (dB)	Reading (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result (Pass/Fail)	Limit (dBµV/m)	Margin (dB)	Result (Pass/Fail
(11/ V) V	40.5	38.8	25.5	13.3	0.4	27.0	(dbµV/iii)	(ub)	(1 233/1 21)	40.0	-13.0	Pass
v	108.75	40.8	25.5	12.3	0.4	28.4				43.5	-15.1	Pass
ĥ	275.0	42.9	25.7	13.3	1.2	31.7				46.0	-14.3	Pass
v	278.85	47.7	25.7	13.4	1.2	36.6				46.0	-9.4	Pass
v	409.05	44.2	25.9	16.0	1.6	35.9				46.0	-10.1	Pass
h	413.0	42.5	25.9	16.2	1.6	34.4				46.0	-11.6	Pass
h	864.0	39.3	25.6	22.0	2.3	38.0				46.0	-8.0	Pass
Table	e Result:	Pass	by	-8.0	dB				We	orst Freq:	864.0	MHz
Test Site:	EMI Chamber	1	Cable 1:	Asset #15)5			Cable 2:	Asset #1787		Cable 3:	



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Range		Mfr A gilopt	SN	Asset	Cat	Calibration Due	Calibrated on 3/28/2014
100HZ-26.5 GHZ	E4407 D	Aglient	101143113010	1204	1	3/20/2015	3/20/2014
FCC Code	IC Code	VCCI Code	Range		Cat	Calibration Due	Calibrated on
719150	2762A-6	A-0015	30-1000MHz		Ш	3/15/2015	3/15/2014
Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
0.009-2000MHz	ZFL-1000-LN	CS	N/A	802	Ш	9/14/2015	9/14/2014
Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
30-2000MHz	JB1	Sunol	A091604-2	1106	I	1/28/2015	1/28/2013
Range		Mfr			Cat	Calibration Due	Calibrated on
9kHz - 18GHz		Florida RF			Ш	3/7/2015	3/7/2014
9kHz - 18GHz		Florida RF			Ш	3/14/2015	3/14/2014
	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
	BA928	Oregon Scientific	C3166-1	831	1	3/19/2016	3/19/2014
	35519-044	Control Company	130318277	1832	Ш	6/13/2015	6/13/2013
	100Hz-26.5 GHz FCC Code 719150 Range 0.009-2000MHz Range 30-2000MHz Range 9kHz - 18GHz	100Hz-26.5 GHz E4407B FCC Code 719150 IC Code 2762A-6 Range 0.009-2000MHz MN ZFL-1000-LN Range 30-2000MHz MN JB1 Range 9kHz - 18GHz 9kHz - 18GHz MN BA928	100Hz-26.5 GHz E4407B Agilent FCC Code 719150 IC Code 2762A-6 VCCI Code A-0015 Range 0.009-2000MHz MN ZFL-1000-LN Mfr CS Range 30-2000MHz JB1 Sunol Range 9kHz - 18GHz Mfr Florida RF Florida RF 9kHz - 18GHz MN BA928 Mfr	100Hz-26.5 GHzE4407BAgilentMY45113816FCC Code 719150IC Code 2762A-6VCCI Code A-0015Range 30-1000MHzRange 0.009-2000MHzMN ZFL-1000-LNMfr SunolSN A091604-2Range 30-2000MHzMN JB1Mfr SunolSN A091604-2Range 9kHz - 18GHzMN JBHMfr Florida RF Florida RFSN A091604-2MN BA928Mfr Oregon ScientificSN C3166-1	100Hz-26.5 GHz E4407B Agilent MY45113816 1284 FCC Code 719150 IC Code 2762A-6 VCCI Code A-0015 Range 30-1000MHz Range 802 Range 0.009-2000MHz MN ZFL-1000-LN Mfr CS SN A91604-2 Asset 106 Range 30-2000MHz MN JB1 Mfr Sunol SN A091604-2 Asset 1106 Range 9kHz - 18GHz MN Florida RF Florida RF Mfr Sunol SN A091604-2 Asset 1106 MN 9kHz - 18GHz MN BA928 Mfr Oregon Scientific SN C3166-1 Asset 831	100Hz-26.5 GHz E4407B Agilent MY45113816 1284 I FCC Code 719150 IC Code 2762A-6 VCCI Code A-0015 Range 30-1000MHz Cat II Range 0.009-2000MHz MN ZFL-1000-LN Mfr CS SN N/A Asset 802 Cat II Range 30-2000MHz MN JB1 Mfr Sunol SN A091604-2 Asset 1106 Cat II Range 30-2000MHz MN JB1 Mfr Sunol SN A091604-2 Asset 1106 Cat II Range 9kHz - 18GHz MN BA928 Mfr Oregon Scientific SN C3166-1 Asset 831 Cat II	100Hz-26.5 GHz E4407B Agilent MY45113816 1284 I 3/28/2015 FCC Code 719150 IC Code 2762A-6 VCCI Code A-0015 Range 30-1000MHz Cat II Calibration Due 3/15/2015 Range 0.009-2000MHz MN ZFL-1000-LN Mfr CS SN N/A Asset 802 Cat II Calibration Due 9/14/2015 Range 0.009-2000MHz MN JB1 Mfr Sunol SN A091604-2 Asset 1106 Cat II Calibration Due 1/28/2015 Range 30-2000MHz MN JB1 Mfr Florida RF Florida RF SN Florida RF Asset II Cat II Calibration Due 3/7/2015 MN BA928 Mfr Oregon Scientific SN C3166-1 Asset 831 Cat II Calibration Due 3/19/2016

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

Date:	02-Jan-15			Company:	Powercast	Corporati	on					V	Vork Orde	er: O3616
Engineer:	Tuyen Truong			EUT Desc:	Smart Con	nector RS	\$1800			E	UT Opera	ting Voltage/	Frequenc	y: 120Vac/60H
Temp:	23°C			Humidity:	2%			Pressure:	1010 mBar					
		Freque	ency Range:	1-10GHz						М	easureme	ent Distance:	3 m	
Notes:											EU	T Max Freq:	902.7-927.	.3MHz
Antenna		Peak	Average	Preamp	Antenna	Cable	Adjusted	Adjusted	FCC 15.209 High	Frequer	icy - Peak	FCC 15.209	High Freq	equency - Average
Polarization	Frequency	Reading	Reading	Factor	Factor	Factor	Peak Reading	Avg Reading	Limit M	argin	Result	Limit	Margin	Result
(H/V)	(MHz)	(dBµV)	(dBµV)	(dB)	(dB/m)	(dB)	(dBµV/m)	(dBµV/m)	(dBµV/m)	dB)	(Pass/Fail)	(dBµV/m)	(dB)	(Pass/Fail)
v	2706.0	46.16	26.1	18.7	28.8	4.2	60.5	40.4		13.5	Pass	54.0	-13.6	Pass
v h	2745.0 2781.0	45.93 44.26	28.9 26.9	18.6 18.5	28.8 28.9	4.2 4.3	60.3 59.0	43.3 41.6	-	13.7 15.0	Pass Pass	54.0 54.0	-10.7 -12.4	Pass Pass
	e Result:	44.20	Pass	by	-10.7		59.0	41.0	74.0 -	15.0		orst Freq:		0 MHz
	•••		r ass	,	-10.7 Asset #150								-	
	EMI Chamber			Caple 1:						able z: A	sset #178	/	Cable	3:
Analyzer:	Gold			Preamp:		00				tenna: C	orange Hori	n F	reselecto	or:
										itenna: C	orange Hori	n F	reselecto	or:
ev.12/26/20	14		are /Proced	Preamp:	Brown		MN	Mfr	Ar					
ev.12/26/20		s / Receive Gold	ers/Presele	Preamp:	Brown Rar	n ge 26.5 GHz	MN E4407B	Mfr Agilent		Asset		n F Calibration 3/28/201	Due	
ev.12/26/20	14 um Analyzer:	Gold		Preamp:	Brown Rar 100Hz-2	n ge 26.5 GHz	E4407B	Agilent	80 SN MY45113816	Asset	Cat	Calibration 3/28/201	Due 5	Calibrated o 3/28/2014
ev.12/26/20	14 um Analyzer: Radiated	Gold Emissions	Sites	Preamp:	Brown Rar 100Hz-2 FCC	nge 26.5 GHz Code	E4407B	Agilent	SN MY45113816 Range	Asset 1284	Cat I Cat	Calibration 3/28/201 Calibration	Due 5 Due	Calibrated o 3/28/2014 Calibrated o
ev.12/26/20	14 um Analyzer: Radiated	Gold	Sites	Preamp:	Brown Rar 100Hz-2 FCC	n ge 26.5 GHz	E4407B	Agilent	80 SN MY45113816	Asset 1284	Cat I	Calibration 3/28/201	Due 5 Due	Calibrated of 3/28/2014
ev.12/26/20 Spectru	14 um Analyzer: Radiated	Gold Emissions Chamber 1	sSites	Preamp: ectors	Rar 100Hz-2 FCC 719	nge 26.5 GHz Code	E4407B	Agilent	SN MY45113816 Range	Asset 1284	Cat I Cat	Calibration 3/28/201 Calibration	Due 5 Due 5	Calibrated o 3/28/2014 Calibrated o 3/15/2014
ev.12/26/20 Spectru	14 um Analyzer: Radiated EMI	Gold Emissions Chamber 1	sSites	Preamp: ectors	Brown Rar 100Hz-2 FCC 0 719 Rar	nge 26.5 GHz Code 2150	E4407B IC Code 2762A-6	Agilent VCCI Code A-0015	SN MY45113816 Range 30-1000MHz	Asset 1284	Cat I Cat II	Calibration 3/28/201 Calibration 3/15/201	Due 5 Due 5 Due	Calibrated o 3/28/2014 Calibrated o 3/15/2014
ev.12/26/20 Spectru	14 um Analyzer: Radiated EMI amps /Couple	Gold Emissions Chamber 1 ers Attenu	sSites	Preamp: ectors	Brown Rar 100Hz-2 FCC 0 719 Rar	nge 16.5 GHz Code 1150 nge GHz	E4407B IC Code 2762A-6 MN	Agilent VCCI Code A-0015 Mfr	SN MY45113816 Range 30-1000MHz SN	Asset 1284 Asset	Cat I Cat II Cat II	Calibration 3/28/201 Calibration 3/15/201 Calibration	Due 5 Due 5 Due 5	Calibrated o 3/28/2014 Calibrated o 3/15/2014 Calibrated o
ev.12/26/20 Spectru	14 um Analyzer: Radiated EMI amps /Couple	Gold Emissions Chamber 1 ers Attenu Brown	sSites	Preamp: ectors	Brown Rar 100Hz-2 FCC (719 Rar 1-10	nge 16.5 GHz Code 1150 nge GHz nge	E4407B IC Code 2762A-6 MN CS	Agilent VCCI Code A-0015 Mfr CS	SN MY45113816 Range 30-1000MHz SN N/A	Asset 1284 Asset 1523	Cat I Cat II Cat II	Calibration 3/28/201 Calibration 3/15/201 Calibration 4/10/201	Due 5 Due 5 Due 5 Due	Calibrated o 3/28/2014 Calibrated o 3/15/2014 Calibrated o 4/10/2014
ev.12/26/20 Spectru	14 Radiated EMI amps /Couple A	Gold Emissions Chamber 1 ers Attenu Brown ntennas	sSites	Preamp: ectors	Brown Rar 100Hz-2 FCC 0 719 Rar 1-10 Rar 1-18	nge 16.5 GHz Code 1150 nge GHz nge	E4407B IC Code 2762A-6 MN CS MN	Agilent VCCI Code A-0015 Mfr CS Mfr	SN MY45113816 Range 30-1000MHz SN N/A SN	Asset 1284 Asset 1523 Asset	Cat I Cat II Cat II Cat	Calibration 3/28/201 Calibration 3/15/201 Calibration 4/10/201 Calibration	Due 5 5 Due 5 5 Due 15	Calibrated o 3/28/2014 Calibrated o 3/15/2014 Calibrated o 4/10/2014 Calibrated o 10/13/2014
ev.12/26/20 Spectru	14 m Analyzer: Radiated EMI amps /Couple A Or:	Gold Emissions Chamber 1 ers Attenu Brown ntennas ange Hom	sSites	Preamp: ectors	Brown Rar 100Hz-2 FCC (719 Rar 1-10 Rar 1-18 Rar	nge 16.5 GHz Code 1150 nge GHz GHz GHz	E4407B IC Code 2762A-6 MN CS MN	Agilent VCCI Code A-0015 Mfr CS Mfr EMCO	SN MY45113816 Range 30-1000MHz SN N/A SN	Asset 1284 Asset 1523 Asset	Cat I Cat I Cat I Cat I Cat	Calibration 3/28/201 Calibration 3/15/201 Calibration 4/10/201 Calibration 10/13/201	Due 5 Due 5 Due 5 Due 15 Due	Calibrated o 3/28/2014 Calibrated o 3/15/2014 Calibrated o 4/10/2014 Calibrated o
ev.12/26/20 Spectru	14 m Analyzer: Radiated EMI amps /Couple A Or: As	Gold Emissions Chamber 1 ers Attenu Brown ntennas ange Horn Cables	sSites	Preamp: ectors	Brown Rar 100Hz-2 FCC (719 Rar 1-10 Rar 1-18 Rar 9kHz -	nge 26.5 GHz Code 1150 nge GHz nge GHz nge	E4407B IC Code 2762A-6 MN CS MN	Agilent VCCI Code A-0015 Mfr CS Mfr EMCO Mfr	SN MY45113816 Range 30-1000MHz SN N/A SN	Asset 1284 Asset 1523 Asset	Cat I Cat I Cat I Cat I Cat	Calibration 3/28/201 Calibration 3/15/201 Calibration 4/10/201 Calibration 10/13/20 Calibration	Due 5 Due 5 Due 5 Due 15 Due 5 Due	Calibrated o 3/28/2014 Calibrated o 3/15/2014 Calibrated o 4/10/2014 Calibrated o 10/13/2014 Calibrated o
ev.12/26/20 Spectru	14 Radiated EMI amps /Couple A Or As As	Gold Emissions Chamber 1 ers Attenu Brown ntennas ange Horn Cables set #1505 set #1787 vlogical Mo	s Sites ators / Filte	Preamp: ectors	Brown Rar 100Hz-2 FCC (719 Rar 1-10 Rar 1-18 Rar 9kHz -	nge 26.5 GHz 200de 2150 mge GHz mge GHz nge 18GHz	E4407B IC Code 2762A-6 MN CS MN 3115	Agilent VCCI Code A-0015 Mfr CS Mfr EMCO Mfr Florida RF	SN MY45113816 Range 30-1000MHz SN N/A SN 0004-6123	Asset 1284 Asset 1523 Asset	Cat I Cat I Cat I Cat I Cat I I I	Calibration 3/28/201 Calibration 3/15/201 Calibration 4/10/201 Calibration 10/13/201 Calibration 3/7/2019	Due 5 Due 5 Due 15 Due 5 5 5 Due	Calibrated o 3/28/2014 Calibrated o 3/15/2014 Calibrated o 4/10/2014 Calibrated o 10/13/2014 Calibrated o 3/7/2014

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





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** d**B** instead of 20 d**P**.

this paragraph shall be 30 dB instead of 20 dB ... [15.247(d)]

MEASUREMENTS / RESULTS

Engineer	Tuyen Truong
Date	1/7/2015 and 2/10/2015
Site	Chamber 2
Environmental	20°C, 23%, 1017mBar
Conditions	20°C, 3%, 1011mbBar (2/10/2015)

Plots

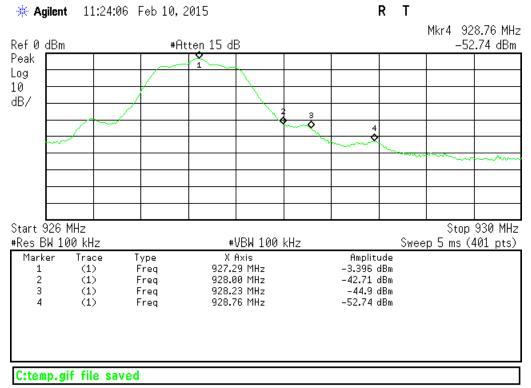
Conducted Band Edge

🔆 Agilent 11:26:02 Feb 10, 2015 R Т Mkr4 901.20 MHz Ref 3 dBm #Atten 15 dB -45.52 dBm Peak Log 10 dB/ Stop 904 MHz Start 900 MHz #Res BW 100 kHz Sweep 5 ms (401 pts) #VBW 100 kHz Marker Trace Type X Axis Amplitude 902.68 MHz -0.922 dBm 1 (1)Frea -39.57 dBm (1)902.00 MHz 2 Freq 3 (1)Freq 901.78 MHz -37.1 dBm 4 (1)Freq 901.20 MHz -45.52 dBm C:temp.gif file saved

Lower Channel – Band-edge (<-30dBm)







Upper Channel – Band-edge (<-30dBm)

Conducted Spurious Emission

Conducted Spurious Emissions at the Antenna Port:

For these scans, the spectrum analyzer was set to the following:

Span: 400MHz or less Resolution Bandwidth: 100 KHz Video Bandwidth: 300 KHz Points per sweep: 8192

The frequency range 30MHz-10GHz was tested at EUT antenna port and no emissions were found within 10dB of the limit, which was set at 30dB below the power of the transmit frequency. The low, mid, and high channels were tested.

Rev. 2/6/2015 Spectrum Analyzers / Receivers /Preselectors Gold	Range 100Hz-26.5 GHz	MN E4407B	Mfr Agilent	SN MY45113816	Asset 1284	Cat	Calibration Due 1/20/2016	Calibrated on 1/20/2015
Radiated Emissions Sites	FCC Code	IC Code	VCCI Code	Range		Cat	Calibration Due	Calibrated on
1DCC-OATS-3M-I	719150	2762A-8	A-0015	30-1000MHz		∥	5/17/2015	5/17/2013
Meteorological Meters Weather Clock (Pressure Only) TH A#1830		MN BA928 35519-044	Mfr Oregon Scientific Control Company	SN C3166-1 130320003	Asset 831 1830	Cat I	Calibration Due 3/19/2016 6/13/2015	Calibrated on 3/19/2014 6/13/2013
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	∥	7/14/2015	7/14/2014

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





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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)]

MEASUREMENTS / RESULTS

Engineer	Chris Bramley
Date	12/31/2014
Site	Chamber 2
Environmental Conditions	20°C, 23%, 1017mb

DTS Method 10.3 AVGPSD-1 (trace averaging with EUT transmitting at full power throughout each sweep)

	15	.247 (e) N	laximur	n Power	Spectral	Densit	У	
Tested by:	Chris Bramley							
Date:	12/31/2014		Analyzer: Bro	wn SA				
Company:	Powercast Corporat	tion	Attenuation: F	PE7019-20 #791	RBW = 3KHz	Span = 1.5M	Ηz	
EUT:	RS1800				VBW = 10KHz	Sweep = 100	1 pts	
channel (MHz)	mode	measured PSD (dBm)	attenuator factor (dB)	adjusted power measurement	bandwidth correction factor adjustment	limit (dBm)	margin (dB)	result
902.7	DMSS	-13.60	19.57	5.97	0	8	-2.03	Pass
915	DMSS	-15.25	19.57	4.32	0	8	-3.68	Pass
927.3	DMSS	-15.47	19.57	4.10	0	8	-3.9	Pass

Rev.	12/26/2014

U .	12/20/2014								
	Spectrum Analyzers / Receivers / Preselectors Brown	Range 9kHz-26.5GHz	MN E4407B	Mfr Agilent	SN SG44210511	Asset 1510	Cat I	Calibration Due 5/12/2015	Calibrated on 5/12/2014
	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		Ш	3/9/2015	3/9/2014
	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	7/14/2015	7/14/2014
	Meteorological Meters		MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
	Weather Clock (Pressure Only)		BA928	Oregon Scientific	C3166-1	831	1	3/19/2016	3/19/2014
	TH A#1833		35519-044	Control Company	130318278	1833	Ш	6/13/2015	6/13/2013

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

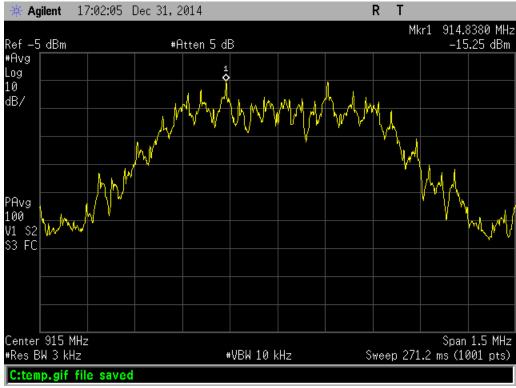




May 4, 2015



Channel Low - PSD

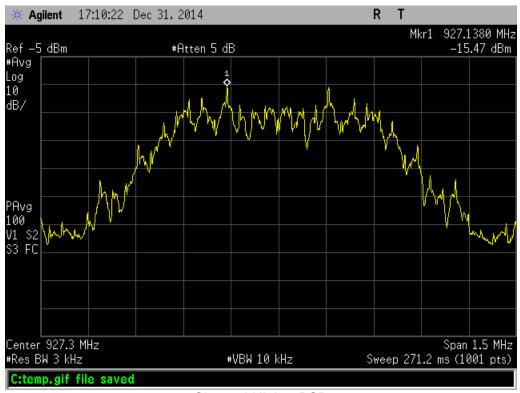


Channel Mid – PSD



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Channel High – PSD





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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

	te: 05-Jan-15 er: Tuyen Truong					Company: Po		Corporation				v	Nork Order	: O3616
	<pre>p: 10yen Truong p: 20.0 °C</pre>					EUT Desc: RS Humidity: 27							Pressure	: 1015 mBa
	es: Peak readings					numuny: 27	/0						11000010	. 101011120
						quency Range: 0.	15-30MHz		E	JT Input \	/oltage/	Frequency:	120Vac/60H	z
		i-Peak		rage	LISN									
F	QP1	dings QP2	AVG1	dings AVG2 I	Factors 1 L2	Cable Factor	ATTN Factor	QP Limi	FCC 15	-	esult	AVG Limit	FCC 15.207 Margin	Result
Frequency (MHz)	(dBuV)	(dBµV)	(dBuV)		B) (dB)		(dB)	(dBuV)	t Març (dB		ss/Fail)	(dBuV)	(dB)	(Pass/Fai
0.33	16.9	17.0	(dBpv) 16.9		.0 0.0		-20.4	(dDµ1) 59.5	-22.		Pass	(dBp1) 49.5	-12.1	Pass
1.19	14.7	13.1	14.7		.0 0.0		-20.4	56.0	-20.		Pass	46.0	-10.8	Pass
3.51	14.8	12.6	14.8	12.6 0	.0 0.0	-0.1	-20.4	56.0	-20.	7 F	ass	46.0	-10.7	Pass
4.18	15.6	13.7	15.6	13.7 (.0 0.0	-0.1	-20.4	56.0	-19.	9 F	Pass	46.0	-9.9	Pass
6.19	14.0	14.0	14.0		.1 -0.1		-20.4	60.0	-25.	5 F	Pass	50.0	-15.5	Pass
9.40	13.3	12.6	13.3		.1 -0.1		-20.3	60.0	-26.		Pass	50.0	-16.2	Pass
20.97	12.9	12.8	12.9	12.8 -	.1 -0.1	-0.3	-20.4	60.0	-26.	3 F	Pass	50.0	-16.3	Pass
Resul	t: Pass					Worst M	argin:	-9.	9 dB		Freq	uency:	4.180	MHz
urement Devic		T 1726/Line		SSET 1727/L in	2)	Cable: C				Snor		Analyzer:	Yellow	
	e. LIGIN AGOL	T T720(LINE	T) LIGIN AG		2)			n-4		oper	ctrum /			
	e. LIGIN ASSE	TT720(LINE			2)	Attenuator: 2		n-4		oper	ctrum /		CEMI6	
/26/2014						Attenuator: 2)dB Atter		Asset			Site:	CEMI6	rated on
	zers/Receive			Range	MN	Attenuator: 2)dB Atter	SN	Asset	Cat	Calibra	Site: ation Due	CEMI6 Calib	rated on
/26/2014					MN	Attenuator: 2)dB Atter		Asset 100		Calibra	Site:	CEMI6 Calib	rated on 0/2014
/26/2014 pectrum Analy:	zers/Receive	rs /Preseleo		Range	MN	Attenuator: 2	OdB Atter S 3523A	SN		Cat	Calibra 6/1	Site: ation Due	CEMI6 Calib 6/1	
/26/2014 pectrum Analy: LISNs/N	zers / Receive Yellow	rs /Preseled Probes		Range 9kHz-2.9GHz	MN 8594E MN	Attenuator: 20 Mfr Agilent	DdB Atter S 3523A S	SN A01958	100	Cat	Calibra 6/1 Calibra	Site: ation Due 0/2015	CEMI6 Calib 6/1 Calib	0/2014
/26/2014 pectrum Analy: LISNs/M	zers / Receive Yellow Measurement	ers /Preseled Probes 6		Range 9kHz-2.9GHz Range	MN 8594E MN z LI-150A	Attenuator: 2 Mfr Agilent Mfr	0dB Atter S 3523A S 201	5N A01958 5N	100 Asset	Cat I Cat	Calibra 6/1 Calibra 1/1	Site: ation Due 0/2015 ation Due	CEMI6 Calib 6/1 Calib 1/1	0/2014 rated on
/26/2014 pectrum Analy: LISNs/N L L	zers / Receive Yellow Measurement ISN Asset 1720 ISN Asset 1720	e rs /Presele e Probes 6 7	ctors	Range 9kHz-2.9GHz Range 150kHz-30MH	MN 8594E MN z LI-150A	Attenuator: 2 Mfr Agilent Mfr Com-Power	0dB Atter S 3523A S 201	SN A01958 SN 1092	100 Asset 1726	Cat I Cat I	Calibra 6/1 Calibra 1/1 1/1	Site: ation Due 0/2015 ation Due 5/2015	CEMI 6 Calib 6/1 Calib 1/1 1/1	0/2014 rated on 5/2014
/26/2014 pectrum Analy: LISNs/N L L	zers / Receive Yellow Measurement ISN Asset 1720	e rs /Presele e Probes 6 7	ctors	Range 9kHz-2.9GHz Range 150kHz-30MH 150kHz-30MH	MN 8594E MN z LI-150A	Attenuator: 20 Mfr Agilent Mfr Com-Power Com-Power	0dB Atter S 3523A S 201	SN A01958 SN 1092	100 Asset 1726	Cat I Cat I	Calibra 6/1 Calibra 1/1 1/1 Calibra	Site: ation Due 0/2015 ation Due 5/2015 5/2015	CEMI6 Calib 6/1 Calib 1/1 1/1 Calib	0/2014 rated on 5/2014 5/2014
/26/2014 pectrum Analy: LISNs/N L L	zers / Receive Yellow Measurement ISN Asset 172 ISN Asset 172 Test Sites (Ma	e rs /Presele e Probes 6 7	ctors	Range 9kHz-2.9GHz Range 150kHz-30MH 150kHz-30MH FCC Code 719150	MN 8594E MN z LI-150A	Attenuator: 2 Mfr Agilent Mfr Com-Power Com-Power VCCI Code A-0015	0dB Atter S 3523A S 201	SN A01958 SN 1092	100 Asset 1726	Cat Cat Cat 	Calibra 6/1 Calibra 1/1 1/1 Calibra	Site: ation Due 0/2015 ation Due 5/2015 5/2015 ation Due NA	CEMI6 Calib 6/1 Calib 1/1 1/1 Calib	0/2014 rated on 5/2014 5/2014 rated on N/A
/26/2014 pectrum Analy: LISNs/N L L	zers / Receive Yellow Measurement ISN Asset 1720 ISN Asset 1720 Test Sites (Ma CEMI 6	e rs /Presele e Probes 6 7	ctors	Range 9kHz-2.9GHz Range 150kHz-30MH 150kHz-30MH FCC Code	MN 8594E MN z LI-150A	Attenuator: 2 Mfr Agilent Mfr Com-Power Com-Power VCCI Code	0dB Atter S 3523A S 201	SN A01958 SN 1092	100 Asset 1726	Cat Cat Cat 	Calibra 6/1 Calibra 1/1 1/1 Calibra Calibra	Site: ation Due 0/2015 ation Due 5/2015 5/2015 ation Due	CEMI6 Calib 6/1 Calib 1/1 1/1 Calib	0/2014 rated on 5/2014 5/2014 rated on
/26/2014 pectrum Analy: LISNs/N L L	zers / Receive Yellow Measurement ISN Asset 172 ISN Asset 172 ISN Asset 172 Test Sites (Ma CEMI 6 CEMI 6 Cables CEMI-10	e rs /Presele e Probes 6 7	ctors	Range 9kHz-2.9GHz 150kHz-30MH 150kHz-30MH FCC Code 719150 Range 9kHz - 2GHz	MN 8594E MN z LI-150A z LI-150A	Attenuator: 2 Mfr Agilent Mfr Com-Power Com-Power VCCI Code A-0015 Mfr C-S	DdB Atter \$ 3523A \$ 201 201	SN A01958 SN 1092 1093	100 Asset 1726 1727	Cat I Cat I Cat III Cat II	Calibra 6/1 Calibra 1/1: 1/1: Calibra Calibra 5/3	Site: ation Due 0/2015 ation Due 5/2015 5/2015 ation Due NA ation Due 3/2015	CEMI6 Calib 6/1 Calib 1/1 1/1 Calib 5/3	0/2014 rated on 5/2014 5/2014 rated on N/A rated on 8/2014
/26/2014 pectrum Analyz LISNs/N L L Conducted	Zers / Receive Yellow Measurement ISN Asset 172 ISN Asset 172 Test Sites (Ma CEMI 6 Cables	rs /Preseled Probes 6 7 ins / Telco)	ctors	Range 9kHz-2.9GHz Range 150kHz-30MH 150kHz-30MH FCC Code 719150 Range	MN 8594E MN z LI-150A	Attenuator: 2 Mfr Agilent Mfr Com-Power Com-Power VCCI Code A-0015 Mfr	DdB Atter S 3523A 201 201 201	SN A01958 SN 1092	100 Asset 1726	Cat I Cat I Cat III Cat II	Calibra 6/1 Calibra 1/1 Calibra Calibra 5/3 Calibra	Site: ation Due 0/2015 ation Due 5/2015 5/2015 ation Due NA ation Due	CEMI6 Calib 6/1 Calib 1/1 1/1 Calib 5/3	0/2014 rated on 5/2014 5/2014 rated on N/A rated on
/26/2014 pectrum Analy; LISNs/N L Conducted	Zers / Receive Yellow Measurement ISN Asset 1721 ISN Asset 1722 Test Sites (Ma CEMI 6 Cables CEMI-10 Attenuators dB Attenuator-4	Probes 6 7 ins / Telco) 04	ctors	Range 9kHz-2.9GHz Range 150kHz-30MH 150kHz-30MH FCC Code 719150 Range 9kHz - 2GHz Range	MN 8594E MN z LI-150A z LI-150A	Attenuator: 2 Mfr Agilent Mfr Com-Power Com-Power VCCI Code A-0015 Mfr C-S	DdB Atter \$ 3523A \$ 201 201 \$ 8 N	SN A01958 SN 1092 1093 SN	100 Asset 1726 1727	Cat I Cat II Cat II Cat II Cat I	Calibr: 6/1 Calibr: 1/1: 1/1: Calibr: 5/3 Calibr: 6/3	Site: ation Due 0/2015 ation Due 5/2015 5/2015 ation Due NA ation Due 0/2015 ation Due 0/2015	CEMI6 Calib 6/1 Calib 1/1 1/1 Calib 5/3 Calib	0/2014 rated on 5/2014 5/2014 rated on N/A rated on 3/2014
/26/2014 pectrum Analy: LISNs/N L Conducted 20 Mete	Yellow Yellow Measurement ISN Asset 1721 ISN Asset 1722 Test Sites (Ma CEMI 6 Cables CEMI-10 Attenuators	Probes 6 7 ins / Telco) 04 eters	ctors	Range 9kHz-2.9GHz Range 150kHz-30MH 150kHz-30MH FCC Code 719150 Range 9kHz - 2GHz Range	MN 8594E MN z LI-150A z LI-150A	Attenuator: 2 Mfr Agilent Mfr Com-Power Com-Power VCCI Code A-0015 Mfr C-S Mfr	DdB Atter \$ 3523A \$ 201 201 201 \$ \$ N \$ \$	SN A01958 SN 1092 1093 SN SN	100 Asset 1726 1727 Asset	Cat I Cat II Cat II Cat II Cat I	Calibra 6/1 Calibra 1/1 (1) Calibra 5/3 Calibra 6/3 Calibra	Site: ation Due 0/2015 ation Due 5/2015 5/2015 ation Due NA ation Due 3/2015 ation Due	CEMI6 Calib 6/1 Calib 1/1 1/1 Calib 5/3 Calib Calib Calib	0/2014 rated on 5/2014 5/2014 rated on N/A rated on 3/2014 rated on

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





May 4, 2015

Occupied Bandwidth

REQUIREMENT

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

Engineer	Tuyen Truong
Date	2/10/2015
Site	3m Indoor
Environmental Conditions	20°C, 3%, 1011mb

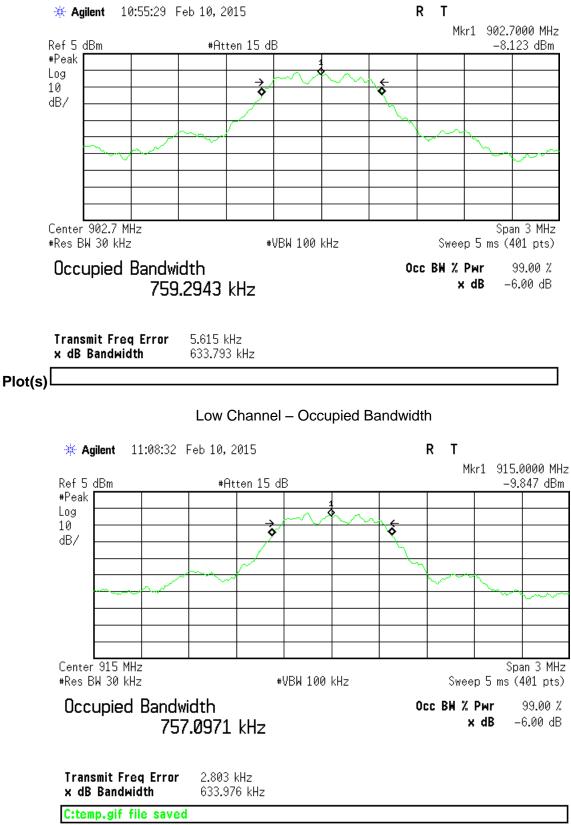
99% Occupied Bandwidth				
		99% Occupied Bandwidth (KHz)		
902.7	DMSS	759.2943		
915	DMSS	757.0971		
927.3	DMSS	756.3676		
Tested by:	: Tuyen Truong	RBW = 30KHz VBW = 100KHz		
Date:	2/10/2015	Analyzer: Gold SA		
Company:	Powercast Corporation	Attenuator: PE7019-20 #791		
EUT:	RS1800	Temp/Humidity/Pressure: 20° Celcius, 3% and 1011mBar		





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May 4, 2015

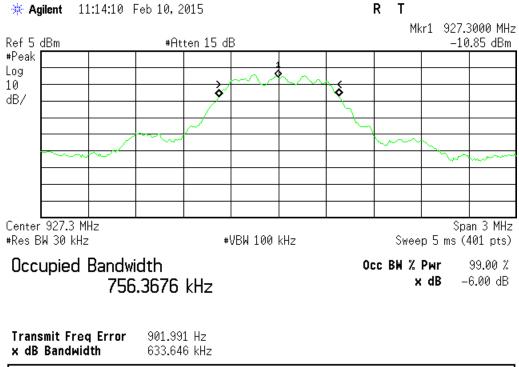


Mid Channel - Occupied Bandwidth



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C:temp.gif file saved

High Channel - Occupied Bandwidth





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 Radiated Emissions (1-26.5GHz)	4.6dB 4.6dB	5.2dB (Ucispr) N/A
Radiated Emissions (120.5012)	4.9dB	N/A
Magnetic Radiated Emissions	5.6dB	N/A
Conducted Emissions		
NIST CISPR	3.9dB 3.6dB	N/A 3.6dB (Ucispr)
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 x 10 ⁻⁸	1 x 10 ⁻⁷
RF power, conducted	0.40dB	0.75dB
Maximum frequency deviation: • Within 300Hz and 6kHz of audio frequency / Within 6kHz and 25kHz of audio frequency	3.4% 0.3dB	5% 3dB
Adjacent channel power	1.9dB	3dB
Conducted spurious emission of transmitter, valid up to 12.75GHz	2.39dB	3dB
Conducted emission of receivers	1.3dB	3dB
Radiated emission of transmitter, valid up to 26.5GHz	3.9dB	6dB
Radiated emission of transmitter, valid up to 80GHz	3.3dB	6dB
Radiated emission of receiver, valid up to 26.5GHz	3.9dB	6dB
Radiated emission of receiver, valid up to 80GHz	3.3dB	6dB
Humidity	2.37%	5%
Temperature	0.7°C	1.0°C
Time	4.1%	10%
RF Power Density, Conducted	0.4dB	3dB
DC and low frequency voltages	1.3%	3%
Voltage (AC, <10kHz)	1.3%	2%
Voltage (DC)	0.62%	1%
The above reflects a 95% confidence level		



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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 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.

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.
 The Company disclaims any and all responsibility or liability arising out of or in connection with e-mail transmissions of such information.

The Company disclaims any and all responsibility or liability arising out of or in connection with e-mail transmissions of such information.
 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 were such skill has not been exercised and, even in such event, only to the extent of the limitation of liability set forth herein.

12. If Client desires to assert a claim arising from or relating to (i) the performance, purported performance or non-performance of any services by the Company or (ii) the sale, resale, manufacture, distribution or use of any tested goods, it must submit that claim to the Company in a writing that sets forth with particularity the basis for such claim within 60 days from discovery of the potential claim and not more than six months after the date of issuance of the Test Report to Client. Client waives any and all such claims including, without limitation, claims that the Test Report is inaccurate, incomplete or misleading or that additional or different testing is required, unless and then only to the extent that Client submits a written claim to the Company within both such time periods.

13. CLIÉNT 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.





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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.

The complete list of the Approved Subcontractors Curtis-Straus may use to delegate the performance of work can be provided upon request. Rev.160009121(2)_#684340 v14CS





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