
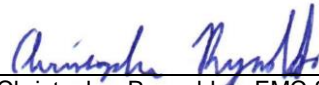




Test Report



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

Report No	EP2774-1
Client	Powercast Corporation Charles Greene
Address	566 Alpha Drive, Pittsburgh, PA 15238
Phone	412-436-4077
Items tested	Digital Display Tag
FCC ID	YESVT1006
IC ID	8985A-VT1006
FRN	0019814789
Equipment Type	Part 15.247 Digitally Modulated, Mobile
Equipment Code	DTS
Emission Designator	
FCC/IC Rule Parts	47 CFR 15.247, RSS-247 Issue 1
Test Dates	September 22-25, 2015
Results	As detailed within this report
Prepared by	 Jason Haley - Test Engineer
Authorized by	 Christopher Reynolds - EMC Supervisor
Issue Date	<u>12/29/2015</u>
Conditions of Issue	This Test Report is issued subject to the conditions stated in the 'Conditions of Testing' section on page 22 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 12-07-15



Summary

This test report supports an application for certification of a transmitter operating pursuant to 47 CFR 15.247 and RSS-247. The product is the VT1006 Digital Display Tag. It is a transmitter that operates in the range 2402-2480MHz.

We found that the product met the above requirements without modifications. The test sample was received in good condition.

Release Control Record

Issue No.	Reason for change	Date Issued
1	Original Release	January 14, 2016



Test Methodology

Radiated emissions testing was performed according to DTS guidance document 558074D01 v03r03 specified in FCC guidance for performing compliance measurements on DTS devices under section 15.247, April 19,2013, and ANSI C63.10 (2013), and RSS-GEN. Radiated Emissions were maximized by rotating the device around three orthogonal axes as well as varying the test antenna’s height and polarity. The device antenna cannot be maximized separately.

Conducted emission at the antenna port was not performed, because the EUT has a non-removable integrated antenna. All measurements were made using radiated methods.

AC Mains Conducted Emissions testing was not performed as the EUT is battery powered.

The following bandwidths were used during testing.

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



Product Tested - Configuration Documentation

EUT Configuration			
Work Order:	P2774		
Company:	Powercast Corporation		
Company Address:	566 Alpha Drive Pittsburgh, PA, 15238		
Contact:	Charlie Greene		
EUT:	MN VT1006	PN	SN 1
EUT Description:	Digital Display Tag		
EUT Max Frequency:	2480 MHz		
EUT Min Frequency:	2402 MHz		
EUT ISM Frequency:			
EUT Components	MN	SN	
Digital Display Tag	VT1006		
VT1006			
Software Operating Mode Description:			
The EUT is programmed to transmit 1Mbps on channels 37, 38, and 39 (low, mid, high channels 2402, 2426, 2480 MHz – standard beacon channels).			
Performance Criteria:			
N/A, emissions only			



Statement of Conformity

The VT1006 Digital Display Tag has been found to conform to the following parts of 47 CFR and RSS 247 as detailed below:

RSS-GEN	RSP-100	RSS 247	Part 15	Comments
6.3			15.15(b)	There are no controls accessible to the user that varies the output power to operate in violation of the regulatory requirements.
	3.1		15.19	The label is shown in the label exhibit.
	3.2		15.21	Information to the user is shown in the instruction manual exhibit.
			15.27	No special accessories are required for compliance.
6.1, 6.5			15.31	The EUT was tested in accordance with the measurement standards in this section.
			15.33	Frequency range was investigated according to this section, unless noted in specific rule section under which the equipment operates.
8.1			15.35	The EUT emissions were measured using the measurement detector and bandwidth specified in this section, unless noted in specific rule section under which the equipment operates.
8.3			15.203	The antenna for this device is hardwired to the PCB with a gain of 2.1dBi
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.

Modifications Required for Compliance

No modifications were required for compliance



Test Results

Bandwidth

LIMIT

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

MEASUREMENTS / RESULTS

Measurements of the Emission (DTS) Bandwidth			
Test Date: 9/25/2015		Company: Powercast	
Engineer: Jason Haley		EUT: VT1006	
		WO#: P2774	
		Operating Voltage: Battery	
Standard: FCC CFR 47 part 15.247 (a) (2), IAW ANSI C63.10_2013, Section 6.9.2			
Notes:			
Frequency (MHz)	Measured 6dB Occupied Bandwidth (kHz)	6dB Occupied Bandwidth Limit (kHz)	Test Result
2402	678	at least 500kHz	Pass
2426	714	at least 500kHz	Pass
2480	669	at least 500kHz	Pass

Rev.9/17/2015

Spectrum Analyzers / Receivers /Preselectors Gold	Range 100Hz-26.5 GHz	MN E4407B	Mfr Agilent	SN MY45113816	Asset 1284	Cat I	Calibration Due 4/22/2016	Calibrated on 4/22/2015
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 1517 HF Preamp	Range 1-20GHz	MN CS	Mfr CS	SN N/A	Asset 1517	Cat II	Calibration Due 8/6/2016	Calibrated on 8/6/2015
Antennas Blue Horn	Range 1-18Ghz	MN 3117	Mfr ETS	SN 157647	Asset 1861	Cat I	Calibration Due 2/8/2017	Calibrated on 2/8/2015
Cables Asset #2052 Asset #2053	Range 9kHz - 18GHz 9kHz - 18GHz		Mfr Florida RF Florida RF			Cat II II	Calibration Due 3/8/2016 3/8/2016	Calibrated on 3/8/2015 3/8/2015
Meteorological Meters Weather Clock (Pressure Only) TH A#2081		MN BA928 HTC-1	Mfr Oregon Scientific HDE	SN C3166-1	Asset 831 2081	Cat I II	Calibration Due 3/19/2016 4/2/2016	Calibrated on 3/19/2014

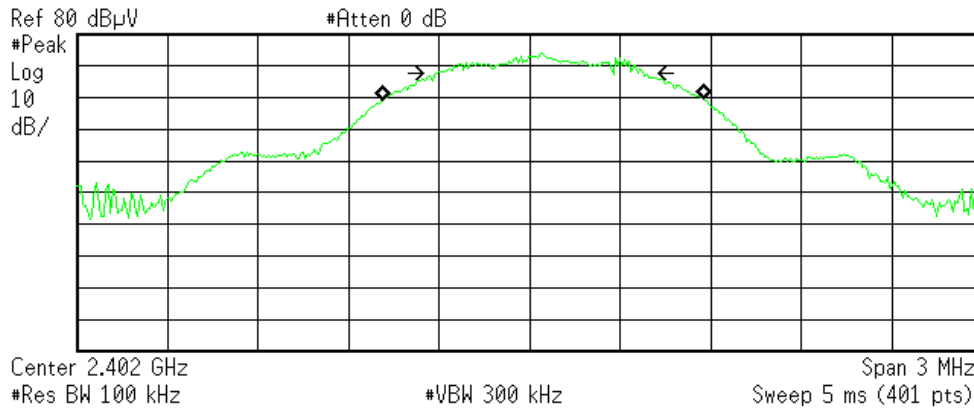
All equipment is calibrated using standards traceable to NIST or other nationally recognized calibration standard.



PLOT

Agilent 11:31:10 Sep 25, 2015

R T



Occupied Bandwidth
1.0712 MHz

Occ BW % Pwr 99.00 %
x dB -6.00 dB

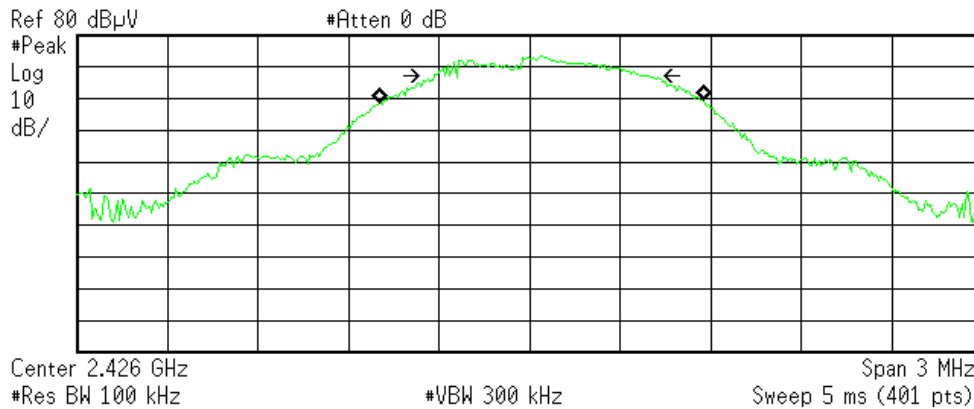
Transmit Freq Error 44.339 kHz
x dB Bandwidth 678.708 kHz

Bad, missing or unformatted disk

6dB Bandwidth Plot, Low Channel

Agilent 11:47:10 Sep 25, 2015

R T



Occupied Bandwidth
1.0708 MHz

Occ BW % Pwr 99.00 %
x dB -6.00 dB

Transmit Freq Error 39.063 kHz
x dB Bandwidth 714.905 kHz

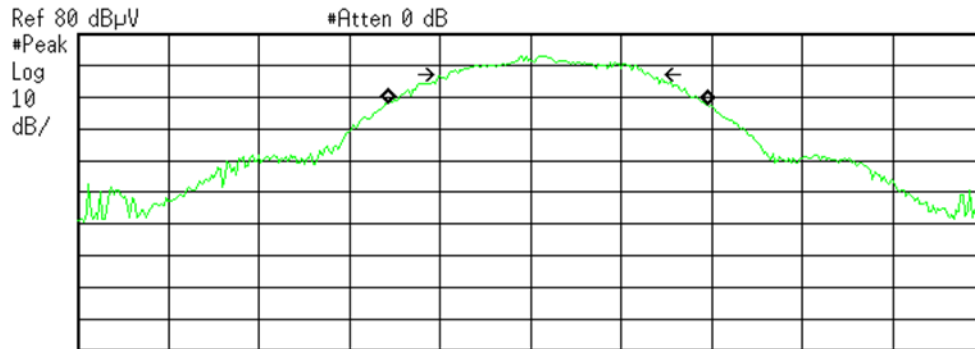
C:\temp.gif file saved

6dB Bandwidth Plot, Middle Channel



Agilent 11:50:41 Sep 25, 2015

R T



Ref 80 dBμV #Atten 0 dB
 Center 2.48 GHz Span 3 MHz
 #Res BW 100 kHz #VBW 300 kHz Sweep 5 ms (401 pts)

Occupied Bandwidth
 1.0538 MHz

Occ BW % Pwr 99.00 %
 x dB -6.00 dB

Transmit Freq Error 55.040 kHz
 x dB Bandwidth 669.803 kHz

C:\temp.gif file saved

6dB Bandwidth Plot, High Channel



Fundamental Emission Output Power

LIMIT

Conducted Output Power

1 Watt

[15.247(b) (3)]

MEASUREMENTS / RESULTS

Calculations of EUT Power (EIRP)											
Test Date: 9/25/2015			Company: Powercast				WO#: P2774				
Engineer: Jason Haley			EUT: VT1006				Operating Voltage: Battery				
FCC CFR 47 part 15.247 (b) (3), IAW ANSI C63.10_2013, Section G.5.2 - "Direct calculation from the EUT power measured in a radiated test Standard: configuration [i.e., signal {antenna} substitution techniques not used]											
Notes: Adjusted Conducted power level = The Adjusted Peak Reading - 104.77 + 20*Log test distance (3) - EUT Antenna Gain											
Frequency (MHz)	Peak Reading (dBµV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Peak Reading (dBµV/m)	Adjusted Received power level (EIRP) (dBm)	EUT Antenna Gain (dBi)	Adjusted Conducted power level (dBm)	Limit (dBm)	Margin (dB)	Test Result (Pass/Fail)
2402	77.5	19.9	32.3	3.3	93.2	-2.03	2.1	-4.1	30.0	-34.1	Pass
2426	77.2	20.0	32.3	3.3	92.8	-2.43	2.1	-4.5	30.0	-34.5	Pass
2480	76.8	20.2	32.4	3.3	92.3	-2.93	2.1	-5.0	30.0	-35.0	Pass
Table Result: Pass by -34.1 dB Worst Freq: 2402.0 MHz											
Test Site: EMI Chamber 2			Cable 1: Asset #2052			Cable 2: Asset #2053			Cable 3: ---		
Analyzer: Gold			Preamp: Asset #1517			Antenna: Blue Horn			Preselector: ---		
CSsoft Radiated Emissions Calculator v 1.017.148 Copyright Curtis-Straus LLC 2000 Adjusted Reading = Reading - Preamp Factor + Antenna Factor + Cable Factor											

Per DTS guidance document 558074D01 v03r03 section 9.1.1

Rev.9/17/2015

Spectrum Analyzers / Receivers /Preselectors		Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Gold		100Hz-26.5 GHz	E4407B	Agilent	MY45113816	1284	I	4/22/2016	4/22/2015
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
1517 HF Preamp		1-20GHz	CS	CS	N/A	1517	II	8/6/2016	8/6/2015
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
Cables		Range		Mfr			Cat	Calibration Due	Calibrated on
Asset #2052		9kHz - 18GHz		Florida RF			II	3/8/2016	3/8/2015
Asset #2053		9kHz - 18GHz		Florida RF			II	3/8/2016	3/8/2015
Meteorological Meters			MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Weather Clock (Pressure Only)			BA928	Oregon Scientific	C3166-1	831	I	3/19/2016	3/19/2014
TH A#2081			HTC-1	HDE		2081	II	4/2/2016	

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



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Band Edge Measurements

LIMITS

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

MEASUREMENTS / RESULTS

Radiated Emissions Table - Band Edge Measurements															
Date: 25-Sep-15		Company: Powercast				Work Order: P2774									
Engineer: Jason Haley		EUT Desc: VT1006				EUT Operating Voltage/Frequency: Battery									
Temp: 22°C		Humidity: 41%				Pressure: 1022mBar									
Frequency Range: 1-6GHz										Measurement Distance: 3 m					
Notes: EUT oriented up and down vertically produced the highest emissions. Calling this the y-axis. Band-edge measurements made with RBW set to 100kHz, VBW 300kHz, Span 23MHz, IAW ANSI C63.10 2013, 6.10.2															
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 Part 15.209 - Peak			FCC Part 15.209 - Average			
									Limit (dBµV/m)	Margin (dB)	Result (Pass/Fail)	Limit (dBµV/m)	Margin (dB)	Result (Pass/Fail)	
H	2483.5	22.32	22.3	20.2	32.4	3.3	37.8	37.8	74.0	-36.2	Pass	54.0	-16.2	Pass	
H	2400.0	21.79	21.8	19.9	32.3	3.3	37.5	37.5	74.0	-36.5	Pass	54.0	-16.5	Pass	
Table Result:		Pass by -16.2 dB										Worst Freq: 2483.5 MHz			
Test Site: EMI Chamber 2		Cable 1: Asset #2052				Cable 2: Asset #2053				Cable 3: ---					
Analyzer: Gold		Preamp: Asset #1517				Antenna: Blue Horn				Preselector: ---					
CSsoft Radiated Emissions Calculator v 1.017.148 Adjusted Reading = Reading - Preamp Factor + Antenna Factor + Cable Factor Rev.9/17/2015															

Spectrum Analyzers / Receivers / Preselectors	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Gold	100Hz-26.5 GHz	E4407B	Agilent	MY45113816	1284	I	4/22/2016	4/22/2015
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
1517 HF Preamp	1-20GHz	CS	CS	N/A	1517	II	8/6/2016	8/6/2015
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
Cables	Range	Mfr	Cat	Calibration Due	Calibrated on			
Asset #2052	9kHz - 18GHz	Florida RF	II	3/8/2016	3/8/2015			
Asset #2053	9kHz - 18GHz	Florida RF	II	3/8/2016	3/8/2015			
Meteorological Meters	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on	
Weather Clock (Pressure Only)	BA928	Oregon Scientific	C3166-1	831	I	3/19/2016	3/19/2014	
TH A#2081	HTC-1	HDE		2081	II	4/2/2016		

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



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)]

An assessment was made to determine the highest channel setting and EUT orientation. Spurious Emissions were taken with the EUT transmitting the high channel.

MEASUREMENTS / RESULTS

Radiated Emissions Table												
Date: 25-Sep-15			Company: Powercast				Work Order: P2774					
Engineer: Jason Haley			EUT Desc: VT1006 Digital Display Tag				EUT Operating Voltage/Frequency: Battery					
Temp: 22°C			Humidity: 41%				Pressure: 1022mBar					
Frequency Range: 30-1000MHz							Measurement Distance: 3 m					
Notes: EUT oriented up and down vertically produced the highest emissions. Calling this the y-axis.							EUT Max Freq: 2483MHz					
Antenna Polarization (H/V)	Frequency (MHz)	Reading (dBµV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Reading (dBµV/m)	---			FCC Part 15.209		
							Limit (dBµV/m)	Margin (dB)	Result (Pass/Fail)	Limit (dBµV/m)	Margin (dB)	Result (Pass/Fail)
VQP	134.2	17.5	25.3	13.9	0.7	6.8	---	---	---	43.5	-36.7	Pass
VQP	138.4	16.9	25.3	13.5	0.6	5.7	---	---	---	43.5	-37.8	Pass
V	825.0	37.8	25.5	21.8	1.7	35.8	---	---	---	46.0	-10.2	Pass
V	66.2	42.4	25.4	8.3	0.5	25.8	---	---	---	40.0	-14.2	Pass
H	835.75	32.8	25.5	21.8	1.8	30.9	---	---	---	46.0	-15.1	Pass
V	385.4	39.3	25.1	15.2	1.1	30.5	---	---	---	46.0	-15.5	Pass
V	162.15	39.3	24.9	12.3	0.8	27.5	---	---	---	43.5	-16.0	Pass
V	66.9	40.3	25.4	8.4	0.5	23.8	---	---	---	40.0	-16.2	Pass
V	377.8	38.1	25.0	15.2	1.1	29.4	---	---	---	46.0	-16.6	Pass
V	381.6	38.0	25.0	15.2	1.1	29.3	---	---	---	46.0	-16.7	Pass
V	65.6	39.4	25.4	8.3	0.5	22.8	---	---	---	40.0	-17.2	Pass
H	171.8	29.4	24.4	11.5	0.8	17.3	---	---	---	43.5	-26.2	Pass
Table Result: Pass by -10.2 dB							Worst Freq: 825.0 MHz					
Test Site: EMI Chamber 2			Cable 1: Asset #2052				Cable 2: Asset #2053			Cable 3: ---		
Analyzer: Gold			Preamp: Blue-Blk				Antenna: Red-Black			Preselector: ---		
CSsoft Radiated Emissions Calculator v 1.017.148 Adjusted Reading = Reading - Preamp Factor + Antenna Factor + Cable Factor Copyright Curtis-Straus LLC 2000												

Rev.9/17/2015												
Spectrum Analyzers / Receivers/Preselectors			Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on		
Gold			100Hz-26.5 GHz	E4407B	Agilent	MY45113816	1284	I	4/22/2016	4/22/2015		
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-Black			0.009-2000MHz	ZFL-1000-LN	CS	N/A	800	II	12/26/2015	12/26/2014		
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		
Cables			Range		Mfr			Cat	Calibration Due	Calibrated on		
Asset #2052			9kHz - 18GHz		Florida RF			II	3/8/2016	3/8/2015		
Asset #2053			9kHz - 18GHz		Florida RF			II	3/8/2016	3/8/2015		
Meteorological Meters				MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on		
Weather Clock (Pressure Only)				BA928	Oregon Scientific	C3166-1	831	I	3/19/2016	3/19/2014		
TH A#2081				HTC-1	HDE		2081	II	4/2/2016			

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



Radiated Emissions Table															
Date: 25-Sep-15				Company: Powercast				Work Order: P2774							
Engineer: Jason Haley				EUT Desc: VT1006				EUT Operating Voltage/Frequency: Battery							
Temp: 22°C				Humidity: 41%				Pressure: 1022mBar							
Frequency Range: 6-18GHz							Measurement Distance: 1 m								
Notes: EUT oriented up and down vertically produced the highest emissions. Calling this the y-axis.											EUT Max Freq: 2483MHz				
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 Part 15.209 - Peak			FCC Part 15.209 - Average			
									Limit (dBµV/m)	Margin (dB)	Result (Pass/Fail)	Limit (dBµV/m)	Margin (dB)	Result (Pass/Fail)	
H noise floor	7206.0	35.01	20.3	16.6	35.9	5.8	60.1	45.4	83.5	-23.4	Pass	63.5	-18.1	Pass	
H noise floor	9608.0	33.25	19.1	17.0	37.3	6.2	59.8	45.6	83.5	-23.7	Pass	63.5	-17.9	Pass	
H noise floor	12010.0	33.11	19.5	16.7	39.3	6.8	62.5	48.9	83.5	-21.0	Pass	63.5	-14.6	Pass	
H noise floor	14412.0	35.59	21.2	16.7	39.8	8.1	66.8	52.4	83.5	-16.7	Pass	63.5	-11.1	Pass	
H noise floor	16814.0	34.14	21.1	16.1	41.9	9.1	69.0	56.0	83.5	-14.5	Pass	63.5	-7.5	Pass	
Table Result: Pass by -7.5 dB											Worst Freq: 16814.0 MHz				
Test Site: EMI Chamber 2				Cable 1: Asset #2052				Cable 2: Asset #2053				Cable 3: ---			
Analyzer: Gold				Preamp: Asset #1517				Antenna: Blue Horn				Preselector: ---			
CSsoft Radiated Emissions Calculator v 1.017.148															
Adjusted Reading = Reading - Preamp Factor + Antenna Factor + Cable Factor															
Rev.9/17/2015															

Spectrum Analyzers / Receivers / Preselectors	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Gold	100Hz-26.5 GHz	E4407B	Agilent	MY45113816	1284	I	4/22/2016	4/22/2015
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
1517 HF Preamp	1-20GHz	CS	CS	N/A	1517	II	8/6/2016	8/6/2015
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
Cables	Range	Mfr	Cat	Calibration Due	Calibrated on			
Asset #2052	9kHz - 18GHz	Florida RF	II	3/8/2016	3/8/2015			
Asset #2053	9kHz - 18GHz	Florida RF	II	3/8/2016	3/8/2015			
Meteorological Meters	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on	
Weather Clock (Pressure Only)	BA928	Oregon Scientific	C3166-1	831	I	3/19/2016	3/19/2014	
TH A#2081	HTC-1	HDE		2081	II	4/2/2016		

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



Radiated Emissions Table															
Date: 25-Sep-15				Company: Powercast				Work Order: P2774							
Engineer: Jason Haley				EUT Desc: VT1006				EUT Operating Voltage/Frequency: Battery							
Temp: 22°C				Humidity: 41%				Pressure: 1022mBar							
Frequency Range: 18-25GHz							Measurement Distance: 0.1 m								
Notes: EUT oriented up and down vertically produced the highest emissions. Calling this the y-axis.										EUT Max Freq: 2483MHz					
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 Part 15.209 - Peak			FCC Part 15.209 - Average			
									Limit (dBµV/m)	Margin (dB)	Result (Pass/Fail)	Limit (dBµV/m)	Margin (dB)	Result (Pass/Fail)	
H noise floor	19216.0	41.73	31.3	41.4	40.3	6.0	46.6	36.2	103.5	-56.9	Pass	83.5	-47.3	Pass	
H noise floor	21618.0	41.57	31.9	41.8	40.3	6.6	46.7	37.0	103.5	-56.8	Pass	83.5	-46.5	Pass	
H noise floor	24020.0	40.47	30.7	41.4	40.4	7.0	46.5	36.7	103.5	-57.0	Pass	83.5	-46.8	Pass	
H noise floor	24800.0	42.6	31.8	40.7	40.2	7.0	49.1	38.3	103.5	-54.4	Pass	83.5	-45.2	Pass	
Table Result: Pass by -45.2 dB Worst Freq: 24800.0 MHz															
Test Site: EMI Chamber 2				Cable 1: EMIR-HIGH-07				Cable 2: ---				Cable 3: ---			
Analyzer: Gold				Preamp: 18-26.5GHz				Antenna: 18-26.5GHz Horn				Preselector: ---			
CSsoft Radiated Emissions Calculator v 1.017.148 Adjusted Reading = Reading - Preamp Factor + Antenna Factor + Cable Factor Copyright Curtis-Straus LLC 2000															

Spectrum Analyzers / Receivers/Preselectors									
Gold	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on	
	100Hz-26.5 GHz	E4407B	Agilent	MY45113816	1284	I	4/22/2016	4/22/2015	
Radiated Emissions Sites									
EMI Chamber 2	FCC Code	IC Code	VCCI Code	Range		Cat	Calibration Due	Calibrated on	
	719150	2762A-7	A-0015	30-1000MHz		II	3/22/2017	3/22/2015	
Preamps/Couplers Attenuators / Filters									
HF (Yellow)	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on	
	18-26.5GHz	AFS4-18002650-60-8P-4	CS	467559	1266	II	3/13/2016	3/13/2015	
Antennas									
HF (White) Horn	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on	
	18-26.5GHz	801-WLM	Waveline	758	758	III	Verify before Use	date of test	
Cables									
REMI-High-07	Range		Mfr			Cat	Calibration Due	Calibrated on	
	1 - 26.5GHz	TRU-21B0707-120	TRU			II	8/7/2016	8/7/2015	
Meteorological Meters									
Weather Clock (Pressure Only)		MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on	
TH A#2081		BA928	Oregon Scientific	C3166-1	831	I	3/19/2016	3/19/2014	
		HTC-1	HDE		2081	II	4/2/2016		

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 3kHz band during any time interval of continuous transmission. [15.247(e)]

MEASUREMENTS / RESULTS

Power Spectral Density Radiated Emissions Table											
Date: 25-Sep-15			Company: Powercast			Work Order: P2774					
Engineer: Jason Haley			EUT Desc: VT1006			EUT Operating Voltage/Frequency: Battery					
Temp: 22°C			Humidity: 41%			Pressure: 1022mBar					
Frequency Range: 1-6GHz						Measurement Distance: 3 m					
Notes: EUT oriented up and down vertically produced the highest emissions. Calling this the y-axis. PSD measurements made with RBW set to 3kHz, VBW 10kHz, Span 1MHz. T Max Freq: 2483MHz											
Antenna Polarization (H/V)	Frequency (MHz)	Peak Reading (dBµV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Peak Reading (dBµV/m)	Adjusted EIRP Reading (dBm)	Adjusted Conducted EIRP Reading (dBm)	FCC 15.247		
									Limit (dBm)	Margin (dB)	Result (Pass/Fail)
H, Y-axis	2402.0	64.51	19.9	32.3	3.3	80.2	-15.0	-17.1	8.0	-25.1	Pass
H, Y-axis	2426.0	63.42	20.0	32.3	3.3	79.0	-16.2	-18.3	8.0	-26.3	Pass
H, Y-axis	2480.0	62.19	20.2	32.4	3.3	77.7	-17.5	-19.6	8.0	-27.6	Pass
Table Result: Pass by -25.1 dB									Worst Freq: 2402.0 MHz		
Test Site: EMI Chamber 2			Cable 1: Asset #2052			Cable 2: Asset #2053			Cable 3: ---		
Analyzer: Gold			Preamp: Asset #1517			Antenna: Blue Horn			Preselector: ---		
CSsoft Radiated Emissions Calculator v 1.017.148 Adjusted Reading = Reading - Preamp Factor + Antenna Factor + Cable Factor											
Copyright Curtis-Straus LLC 2000											

Per DTS guidance document 558074D01 v03r03 section 10.2

Rev.9/17/2015

Spectrum Analyzers / Receivers /Preselectors	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Gold	100Hz-26.5 GHz	E4407B	Agilent	MY45113816	1284	I	4/22/2016	4/22/2015
Radiated Emissions Sites	FCC Code	IC Code	VCCI Code	Range	Asset	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	8/6/2016	8/6/2015
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
Cables	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Asset #2052	9kHz - 18GHz		Florida RF			II	3/8/2016	3/8/2015
Asset #2053	9kHz - 18GHz		Florida RF			II	3/8/2016	3/8/2015
Meteorological Meters	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Weather Clock (Pressure Only)		BA928	Oregon Scientific	C3166-1	831	I	3/19/2016	3/19/2014
TH A#2081		HTC-1	HDE		2081	II	4/2/2016	

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

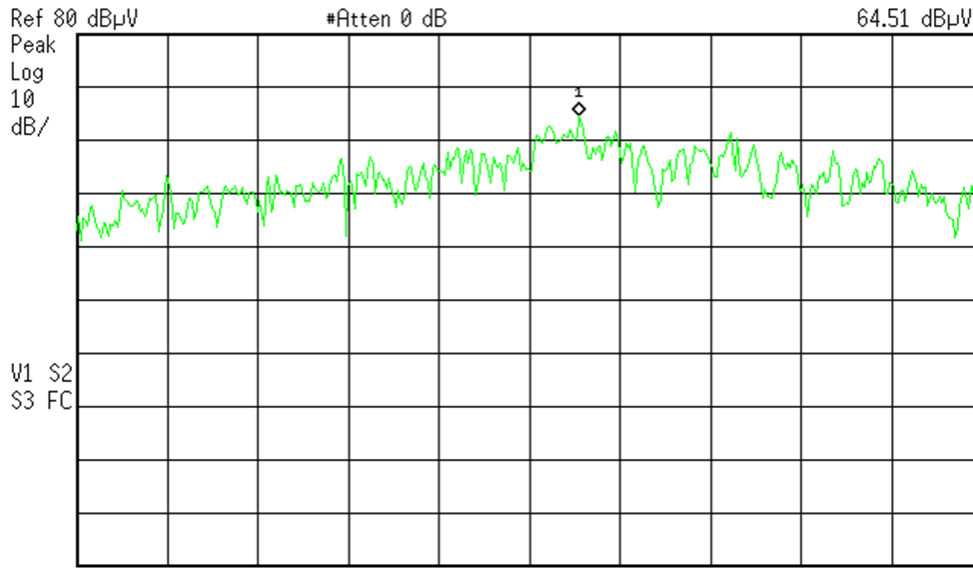


PLOTS

Agilent 12:04:29 Sep 25, 2015

R T

Mkr1 2.4020550 GHz
64.51 dBμV



Center 2.402 GHz Span 1 MHz
#Res BW 3 kHz #VBW 10 kHz Sweep 114.4 ms (401 pts)

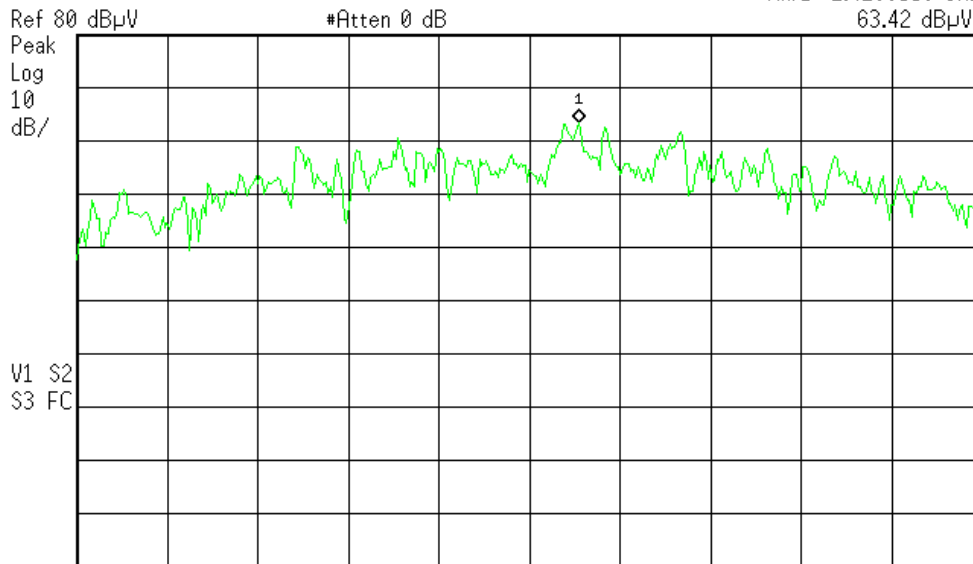
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Power Spectral Density, Low Channel

Agilent 12:01:47 Sep 25, 2015

R T

Mkr1 2.4260550 GHz
63.42 dBμV



Center 2.426 GHz Span 1 MHz
#Res BW 3 kHz #VBW 10 kHz Sweep 114.4 ms (401 pts)

C:\temp.gif file saved

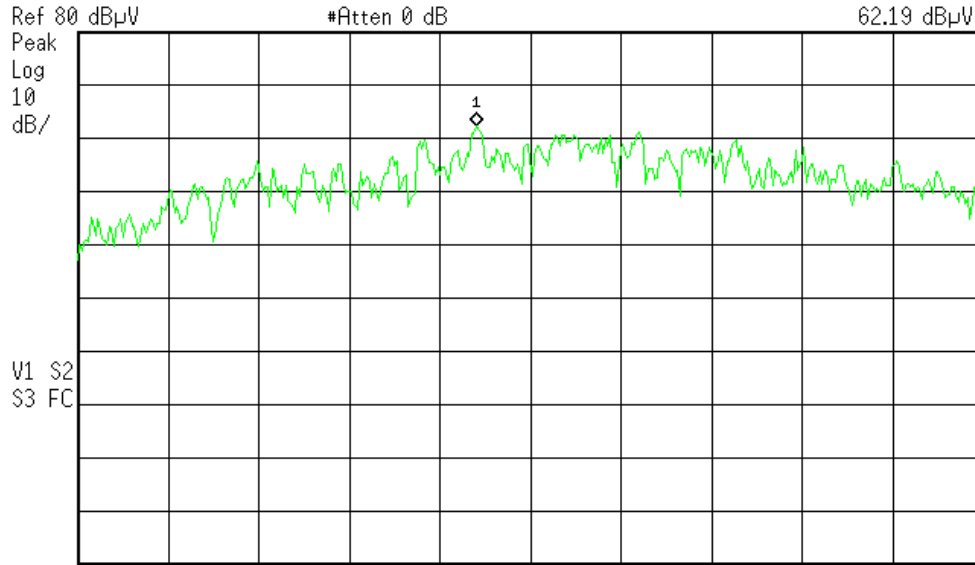
Power Spectral Density, Middle Channel



Agilent 11:58:56 Sep 25, 2015

R T

Mkr1 2.4799400 GHz
62.19 dBμV



Center 2.48 GHz Span 1 MHz
#Res BW 3 kHz #VBW 10 kHz Sweep 114.4 ms (401 pts)

C:\temp.gif file saved

Power Spectral Density, High Channel



Occupied Bandwidth

REQUIREMENT

When an occupied bandwidth is not specified in the applicable RSS, the transmitted signal bandwidth to be reported is to be its 99% emission bandwidth, as calculated or measured. [RSS-GEN 4.6.1]

Measurements of the Occupied Bandwidth (99%)	
Test Date: 9/25/2015	Company: Powercast
Engineer: Jason Haley	EUT: VT1006
WO#: P2774	
Operating Voltage: Battery	
Standard: RSS-GEN 4.6.1, PER ANSI C63.10_2013, Section 6.9.3	
Notes:	
Frequency (MHz)	99% Occupied Bandwidth (MHz)
2402	1.047
2426	1.0286
2480	1.0038

Rev.9/17/2015

Spectrum Analyzers / Receivers /Preselectors	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Gold	100Hz-26.5 GHz	E4407B	Agilent	MY45113816	1284	I	4/22/2016	4/22/2015
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
1517 HF Preamp	1-20GHz	CS	CS	N/A	1517	II	8/6/2016	8/6/2015
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
Cables	Range		Mfr			Cat	Calibration Due	Calibrated on
Asset #2052	9kHz - 18GHz		Florida RF			II	3/8/2016	3/8/2015
Asset #2053	9kHz - 18GHz		Florida RF			II	3/8/2016	3/8/2015
Meteorological Meters		MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Weather Clock (Pressure Only)		BA928	Oregon Scientific	C3166-1	831	I	3/19/2016	3/19/2014
TH A#2081		HTC-1	HDE		2081	II	4/2/2016	

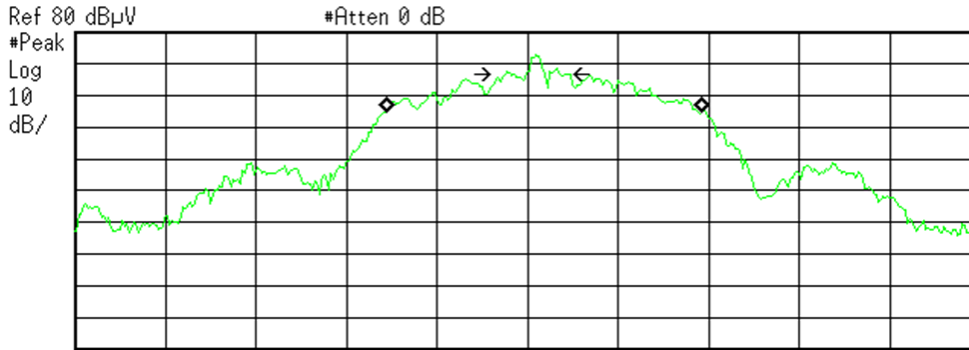
All equipment is calibrated using standards traceable to NIST or other nationally recognized calibration standard.



PLOTS

Agilent 11:42:04 Sep 25, 2015

R T



Center 2.402 GHz Span 3 MHz
 #Res BW 30 kHz #VBW 300 kHz Sweep 5 ms (401 pts)

Occupied Bandwidth
 1.0470 MHz

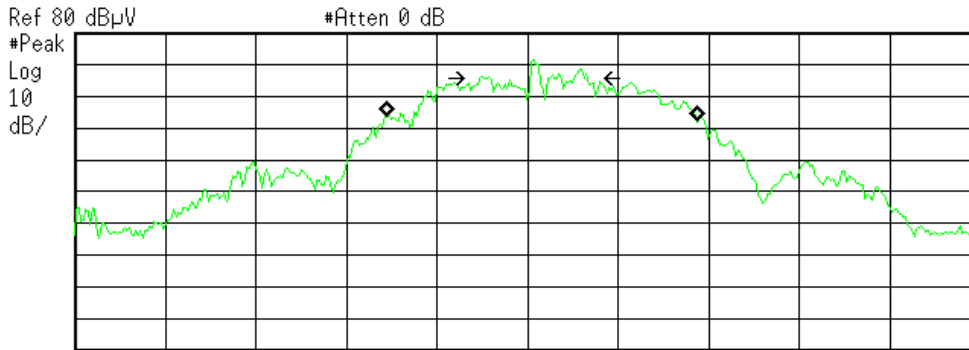
Occ BW % Pwr 99.00 %
 x dB -6.00 dB

Transmit Freq Error 56.825 kHz
 x dB Bandwidth 180.369 kHz

Occupied Bandwidth, Low Channel

Agilent 11:44:51 Sep 25, 2015

R T



Center 2.426 GHz Span 3 MHz
 #Res BW 30 kHz #VBW 300 kHz Sweep 5 ms (401 pts)

Occupied Bandwidth
 1.0286 MHz

Occ BW % Pwr 99.00 %
 x dB -6.00 dB

Transmit Freq Error 50.966 kHz
 x dB Bandwidth 357.938 kHz

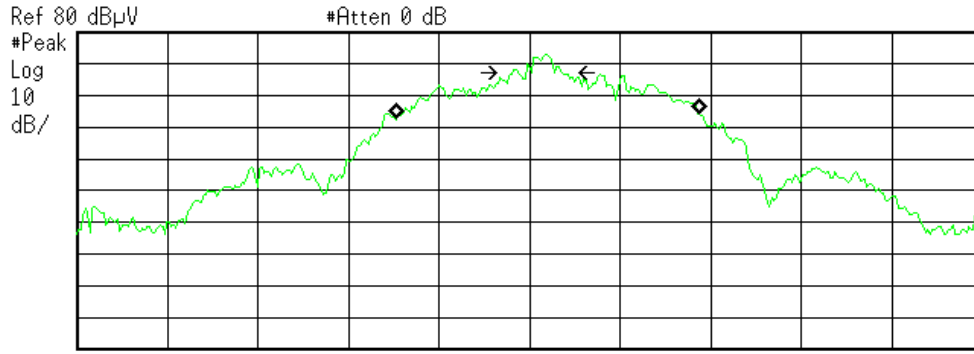
C:\temp.gif file saved

Occupied Bandwidth, Middle Channel



Agilent 11:53:29 Sep 25, 2015

R T



Center 2.48 GHz Span 3 MHz
 #Res BW 30 kHz #VBW 300 kHz Sweep 5 ms (401 pts)

Occupied Bandwidth
 1.0038 MHz

Occ BW % Pwr 99.00 %
 x dB -6.00 dB

Transmit Freq Error 59.967 kHz
 x dB Bandwidth 168.712 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 (Ucisprr)
Radiated Emissions (1-26.5GHz)	4.6dB	N/A
Radiated Emissions (above 26.5GHz)	4.9dB	N/A
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 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.



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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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