

# Test Report

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

Report No EQ3665-1

Client Stack-On Products Company

Address 1360 North Old Rand Road

Wauconda, IL 60084

Phone (847) 469 - 5175

Items tested PC-1702-RFID

FCC ID 2ALP5-PC-1702-RFID

FRN 0026155481

Standards CFR Title 47 FCC Part 15.209, ISED Canada RSS-210 Issue 9

Test Dates February 28 and March 27, 2017

Prepared by

Tuven Truona – EMC Test Engineer

Authorized by

unis Fazilogia - Sr. EMC Engineer

Issue Date

4/11/2017

Conditions of Issue

This Test Report is issued subject to the conditions stated in the 'Conditions of Testing' section on page 12 of this report.





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Form Final Report REV 2-16-07 (DW)



#### Summary

On February 28 and March 27, 2017 we tested the PC-1702-RFID for compliance with the following requirements:

CFR Title 47 FCC Part 15.209, ISED Canada RSS-210 Issue 9 Section 4.4

EUT is a battery powered RFID reader operating at 125 kHz. Emissions were maximized around 3 orthogonal planes (X, Y and Z). EUT has an integral antenna.

We found that the product met the above requirements without modification. Test sample was received in good condition.



Reason for change Original Release Date Issued April 11, 2017

# **Product Tested - Configuration Documentation**

	E	UT Configuration	
Work Order:	Q3665		
Company:	Stack-On Products Company		
Company Address:	1360 North Old Rand Road		
	Wauconda, IL 60084		
Contact:	Rich Glogovsky		
	MN	PN	SN
EUT:	PC-1702-RFID		Sample 1
EUT Description:	Black storage case with key-lock		
EUT Max Frequency:	6 MHz (associated circuitry)		
EUT TX Frequency:	0.125 MHz		
		_	_
Software Operating Mode D	escription:	_	_
Case is locked and unlocked b	y RFID keys for every 2 seconds.	<u> </u>	·



Reason for change Original Release Date Issued April 11, 2017

# Compliance Statement

TEST	RESULT	STANDARD	Margin	COMMENTS
Radiated Emissions – Fundamental Frequency	PASS	CFR Title 47 FCC Part 15.209, ISED Canada RSS-210 Issue 9 Section 4.4	-59.6dB @ 0.125 MHz	PASS
Spurious Radiated Emissions	PASS	CFR Title 47 FCC Part 15.209, ISED Canada RSS-210 Issue 9 Section 4.4	-11.3dB @ 377.2 MHz	PASS
AC Power Line Conducted Emissions	N/A	CFR Title 47 FCC Part 15.207, ISED Canada RSS-Gen Issue 4 Section 8.8	N/A	EUT is battery powered

# Modifications Required for Compliance

None.



Reason for change Original Release Date Issued April 11, 2017

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# Test Results

#### RADIATED EMISSIONS

Date: 27-Mar-17 Company: Stack-on Products Company										V	Vork Orde	r: Q3665	
Engineer:	: Chris Bramley		EUT Desc:	PC-1702-RF	FID	EUT Operating Voltage/Frequency: Battery							
Temp: 24.4°C Humidity: 27%					% Pressure: 1008mBar								
·	Freque	ncy Range:	Fundamen	tal				N	/leasuren	nent [	Distance:	3 m	
Notes:	: EUT in Z-Orier	, ,								EUT	Tx Freq:	125kHz	
							<u> </u>			1		FCC 15.20	09
Antenna			Preamp	Antenna	Cable	Adjusted							
Polarization	Frequency	Reading	Factor		Factor	Reading					Limit	Margin	Result
(0° - 90°)	(MHz) 0.125	(dBµV) 21.7	(dB) 25.9	(dB/m) 50.2	(dB) 0.0	(dBµV/m) 46.0		<u> </u>		- (	dΒμV/m) 105.6	(dB) -59.6	(Pass/Fail) Pass
90	0.125	18.8	25.9	50.2	0.0	43.1					105.6	-59.6 -62.5	Pass
Tabl	e Result:	Pass	by	-59.6	dB			<u> </u>		Wors	t Freg:	0.12	5 MHz
Test Site:	: EMI Chamber	2	Cable 1:	Asset #2052	2			Cable 2:				-	-
	: Rental SA#1	2	Preamp:		_			Antenna: I		,55			
Ssoft Radiate													
	ed Emissions C	alculator	v 1.017.185	;				Amemia.	_g			Copyright Cu	urtis-Straus LLC 2
	ed Emissions C ding = Reading -				Cable F	actor		Amerina.	_g			Copyright Cu	urtis-Straus LLC 2
djusted Read ev. 3/27/2017	ding = Reading -	Preamp Fac	ctor + Anter	nna Factor +									
djusted Read ev. 3/27/2017 Spectrum		Preamp Fac	ctor + Anter		e	Factor  MN N9010A-526;R	<b>M</b> fr AT	<b>SN</b> SG53470118	Asset	Cat 	Calibrat		Calibrated o
djusted Read ev. 3/27/2017 Spectrum	ding = Reading -	ceivers /Pres nalyzer(11995) sions Sites	ctor + Anter	nna Factor + Range	e 5GHz N ode	MN		SN	Asset		1/27/	ion Due 2018	Calibrated of 1/27/2017
djusted Read ev. 3/27/2017 Spectrum Ren	ding = Reading -  Analyzers / Reital EXA Signal Ar  Radiated Emis	ceivers / Pres nalyzer(11995) sions Sites nber 2 tenuators / F	ctor + Anter electors 09)	Range 9KHz-26.5	e 5GHz N ode 60	MN N9010A-526;R IC Code	AT VCCI Code	<b>SN</b> SG53470118 <b>Range</b>	Asset 1199509 Asset	Cat	1/27/ Calibrat 12/21 Calibrat	ion Due 2018 ion Due /2018	Calibrated o
djusted Read ev. 3/27/2017 Spectrum Ren	ding = Reading - n Analyzers / Rei tal EXA Signal Ar Radiated Emis EMI Cham nps / Couplers At Red Antenn	Preamp Factories Pressions Sites Pressions Sites Pressions Factories Pressions Factories Pressions Pressions Factories Pressions Factories Pressions Pressions Factories Pressions Pression Pressions Pression	ctor + Anter electors 09)	Range 9KHz-26.5 FCC Co 71915 Range 0.009-2000 Range	e 5GHz N ode 60 e 0MHz ;	MN N9010A-526;R IC Code 2762A-7 MN ZFL-1000-LN MN	AT  VCCI Code A-0015  Mfr CS  Mfr	SN SG53470118 Range 30-1000MHz SN N/A SN	Asset 1199509 Asset 1686 Asset 798 Asset	Cat    Cat    Cat	1/27/ Calibrat 12/21 Calibrat 1/28/ Calibrat	ion Due 2018 ion Due /2018 ion Due 2018 ion Due	Calibrated o 1/27/2017 Calibrated o 12/21/2016 Calibrated o 1/28/2017
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djusted Read ev. 3/27/2017 Spectrum Ren Pream	ding = Reading -  Analyzers / Rei tal EXA Signal Ar  Radiated Emis EMI Charr  Ansy/Couplers At Red  Antenn Large Lo  Weteorologic  Weather Clock (P	Preamp Factorial Pressure Only of the Pressure Only	ctor + Anter electors 09)	Range 9KHz-26.5 FCC Co 71915 Range 0.009-2000 Range	e 5GHz N ode 60 e 0MHz ;	MN N9010A-526;R IC Code 2762A-7 MN ZFL-1000-LN MN 6511 MN BA928	AT  VCCI Code A-0015  Mfr CS  Mfr EMCO  Mfr Oregon Scientific	SN SG53470118 Range 30-1000MHz SN N/A SN 9704-1154	Asset 1199509 Asset 1686 Asset 798 Asset 67 Asset 831	Cat    Cat    Cat	1/27/ Calibrat 12/21 Calibrat 1/28/ Calibrat 6/14/ Calibrat 4/28/	ion Due 2018 ion Due /2018 ion Due 2018 ion Due 2018 ion Due 2018	Calibrated of 1/27/2017 Calibrated of 12/21/2016 Calibrated of 1/28/2017 Calibrated of 6/14/2016 Calibrated of 4/28/2016
djusted Read ev. 3/27/2017 Spectrum Ren	ding = Reading -  n Analyzers / Rei tal EXA Signal Ar  Radiated Emis EMI Cham  nps / Couplers At Red  Antenn Large Lo  Meteorologic	Preamp Factorial Pressure Only of the Pressure Only	ctor + Anter electors 09)	Range 9KHz-26.5 FCC Co 71915 Range 0.009-2000 Range	e 5GHz N ode 60 e 0MHz ;	MN N9010A-526;R IC Code 2762A-7 MN ZFL-1000-LN MN 6511 MN	AT  VCCI Code A-0015  Mfr CS  Mfr EMCO	SN SG53470118 Range 30-1000MHz SN N/A SN 9704-1154 SN	Asset 1199509 Asset 1686 Asset 798 Asset 67	Cat    Cat    Cat	1/27/ Calibrat 12/21 Calibrat 1/28/ Calibrat 6/14/ Calibrat 4/28/	ion Due 2018 ion Due /2018 ion Due 2018 ion Due 2018 ion Due 2018	Calibrated of 12/21/2016 Calibrated of 12/21/2016 Calibrated of 1/28/2017 Calibrated of 6/14/2016 Calibrated of 6/14/2016
djusted Read ev. 3/27/2017 Spectrum Ren	ding = Reading -  Analyzers / Rei tal EXA Signal Ar  Radiated Emis EMI Charr  Ansy/Couplers At Red  Antenn Large Lo  Weteorologic  Weather Clock (P	Preamp Factorial Pressure Only)	ctor + Anter electors 09)	Range 9KHz-26.5 FCC Co 71915 Range 0.009-2000 Range	e 5GHz N ode 60 e DMHz 2	MN N9010A-526;R IC Code 2762A-7 MN ZFL-1000-LN MN 6511 MN BA928	AT  VCCI Code A-0015  Mfr CS  Mfr EMCO  Mfr Oregon Scientific	SN SG53470118 Range 30-1000MHz SN N/A SN 9704-1154 SN	Asset 1199509 Asset 1686 Asset 798 Asset 67 Asset 831	Cat    Cat    Cat	1/27/ Calibrat 12/21 Calibrat 1/28/ Calibrat 6/14/ Calibrat 4/28/	ion Due 2018 ion Due //2018 ion Due 2018 ion Due 2018 ion Due 2018 ion Due 2018 2018	Calibrated of 1/27/2017 Calibrated of 12/21/2016 Calibrated of 1/28/2017 Calibrated of 6/14/2016 Calibrated of 4/28/2016
djusted Read ev. 3/27/2017 Spectrum Ren	ding = Reading - In Analyzers / Reital EXA Signal Ar Radiated Emis EMI Cham Inps / Couplers At Red Antenn Large Li Meteorologic Weather Clock (P TH A#20	Preamp Factories Present Prese	ctor + Anter electors 09)	Range 9KHz-26.5 FCC Co 71915 Range 0.009-2000 Range 20Hz-5M	e 6GHz N ode 10 e 0MHz ; e MHz	MN N9010A-526;R IC Code 2762A-7 MN ZFL-1000-LN MN 6511 MN BA928	AT  VCCI Code A-0015  Mfr CS  Mfr EMCO  Mfr Oregon Scientific HDE	SN SG53470118 Range 30-1000MHz SN N/A SN 9704-1154 SN	Asset 1199509 Asset 1686 Asset 798 Asset 67 Asset 831	Cat    Cat    Cat	1/27/ Calibrat 12/21 Calibrat 1/28/ Calibrat 6/14/ Calibrat 4/28/ 3/23/ Calibrat	ion Due 2018 ion Due /2018 ion Due 2018	Calibrated 1/27/2017 Calibrated 12/21/2016 Calibrated 1/28/2017 Calibrated 6/14/2016 Calibrated 4/28/2016 3/23/2017

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

	Date: 27-Mar-17 Engineer: Chris Bramley			Stack-on F		Company	FUT Operat	Work Order: Q366 EUT Operating Voltage/Frequency: Batter			
Ū	24.4°C		Humidity:			Pressure: 1008mE	•	cor operating voitage/Frequency. Batter			
	Freque	ncy Range:	9kHz - 1M	Hz			Measureme	nt Distance:	3 m		
Notes:	EUT in Z-Orien	tation					E	UT Tx Freq:	125kHz		
			L						FCC 15.209	)	
Antenna Polarization	Frequency	Reading	Pream p Factor	Antenna Factor	Cable Factor	Adjusted Reading		Limit	Margin	Result	
(0° - 90°)	(MHz)	(dBµV)	(dB)	(dB/m)	(dB)	(dBµV/m)		(dBµV/m)	(dB)	(Pass/Fai	
0	0.123	9.3	25.9	50.3	0.0	33.7		105.8	-72.1	Pass	
90	0.123	5.9	25.9	50.3	0.0	30.3		105.8	-75.5	Pass	
0	0.127	8.8	25.9	50.2	0.0	33.1		105.5	-72.4	Pass	
90	0.127	5.8	25.9	50.2	0.0	30.1		105.5	-75.4	Pass	
0	0.4	13.7	25.8	48.6	0.1	36.6		95.5	-58.9	Pass	
Table	e Result:	Pass	by	<b>-</b> 58.9	dB		W	orst Freq:	0.4	MHz	
Test Site:	EMI Chamber	2	Cable 1:	Asset #20	52		Cable 2: Asset #2053				
Analyzer	Rental SA#1		Preamp:	Red			Antenna: Lg Loop				





**Radiated Emissions Table** 

Date: 27-Mar-17 Company: Stack-on Products Company Work Order: Q3665 Engineer: Chris Bramley EUT Desc: PC-1702-RFID EUT Operating Voltage/Frequency: Battery

Temp: 24.4°C Humidity: 27% Pressure: 1008mBar

Frequency Range: 1-30MHz Measurement Distance: 3 m

Notes: EUT in Z-Orientation EUT Tx Freq: 125kHz

FCC 15.209 Antenna Preamp Antenna Cable Adjusted Result Polarization Frequency Reading Factor Factor Factor Reading Limit Margin (0° - 90°) (MHz) (dBµV) (dB) (dB/m) (dB) (dBµV/m) (dBµV/m) (Pass/Fail) 7.38 14.7 25.4 41.6 0.2 31.1 62.9 -31.8 Pass 21.9 14.4 25.3 37.5 0.4 27.0 40.0 Pass

Table Result: Pass -13.0 dB Worst Freq: 21.9 MHz by

Test Site: EMI Chamber 2 Analyzer: Rental SA#1

Cable 1: Asset #2052 Preamp: Red

Cable 2: Asset #2053

Antenna: Sm Loop (high)

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Ssoft Radiated Emissions Calculator v 1.017.185 Adjusted Reading = Reading - Preamp Factor + Antenna Factor + Cable Factor

Rev. 3/27/2017

Spectrum Analyzers / Receivers / Preselectors	<b>Range</b>	<b>MN</b>	<b>M</b> fr	<b>SN</b>	<b>Asset</b> 1199509	Cat	Calibration Due	Calibrated on
Rental EXA Signal Analyzer(1199509)	9KHz-26.5GHz	N9010A-526;R	AT	SG53470118		I	1/27/2018	1/27/2017
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	1686	II	12/21/2018	12/21/2016
Preamps/Couplers Attenuators / Filters	<b>Range</b> 0.009-2000MHz	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Red		ZFL-1000-LN	CS	N/A	798	II	1/28/2018	1/28/2017
Antennas	Range	MN	<b>M</b> fr	<b>SN</b>	Asset	Cat	Calibration Due	Calibrated on
Small Loop	10kHz-30MHz	PLA-130/A	ARA	1024	755	I	6/14/2018	6/14/2016
Meteorological Meters Weather Clock (Pressure Only) TH A#2078		MN BA928 HTC-1	Mfr Oregon Scientific HDE	<b>SN</b> C3166-1	Asset 831 2078	Cat   	Calibration Due 4/28/2018 3/23/2018	Calibrated on 4/28/2016 3/23/2017
Cables Asset #2052 Asset #2053	<b>Range</b> 9kHz - 18GHz 9kHz - 18GHz		<b>M</b> fr Florida RF Florida RF			Cat II	<b>Calibration Due</b> 3/5/2018 10/1/3017	Calibrated on 3/5/2017 10/30/2016

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

**Radiated Emissions Table** 

Date: 28-Feb-17 Company: Stack-On Products Company Engineer: Nirak So

Work Order: Q3665 EUT Desc: PC-1702-RFID EUT Operating Voltage/Frequency: battery

Temp: 25°C Humidity: 30% Pressure: 1000 mBar

> Frequency Range: 30 to 1000MHz Measurement Distance: 3 m

EUT Tx Freq: 0.125MHz Notes: All 3 orientations of EUT were investigated; only the worst case recorded.

									EU	Max Freq:	6 MHz (Asso	ciated circuitry)
											FCC 15.2	09
Antenna			Preamp	Antenna	Cable	Adjusted						
Polarization	Frequency	Reading	Factor	Factor	Factor	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)
Quazi Peak (V)	162.4	36.7	25.3	12.4	0.8	24.6				43.5	-18.9	Pass
Quazi Peak (V)	218.0	36.0	25.1	10.8	0.9	22.6				46.0	-23.4	Pass
Quazi Peak (V)	363.64	41.2	24.6	14.9	1.1	32.6				46.0	-13.4	Pass
Quazi Peak (H)	367.56	30.1	24.6	15.0	1.1	21.6				46.0	-24.4	Pass
Quazi Peak (H)	377.2	43.2	24.7	15.1	1.1	34.7				46.0	-11.3	Pass
Peak (H)	466.365	36.8	25.5	17.3	1.4	30.0				46.0	-16.0	Pass
Quazi Peak (H)	553.8	30.1	25.5	18.3	1.3	24.2				46.0	-21.8	Pass
Quazi Peak (V)	612.9	32.5	24.7	18.9	1.7	28.4				46.0	-17.6	Pass
Quazi Peak (H)	630.0	38.0	24.8	19.5	1.7	34.4				46.0	-11.6	Pass
Quazi Peak (V)	824.43	29.2	25.4	21.7	1.9	27.4				46.0	-18.6	Pass

Table Result: Pass -11.3 dB 377.2 MHz Worst Freq:

Test Site: EMI Chamber 2 Analyzer: Rental EXA SA

Preamp: Red

Cable 2: Asset #2052 Antenna: Red-White

Cable 3: Preselector: ---

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CSsoft Radiated Emissions Calculator v 1.017.183 Adjusted Reading = Reading - Preamp Factor + Antenna Factor + Cable Factor





April 11, 2017

Rev. 2/26/2017 Spectrum Analyzers / Receivers / Preselectors Range MN Mfr SN Asset Cat **Calibration Due** Calibrated on 9KHz-26.5GHz N9010A-526;R ΑТ SG53470118 1199509 Rental EXA Signal Analyzer(1199509) 1 1/27/2018 1/27/2017 Radiated Emissions Sites FCC Code VCCI Code Cat **Calibration Due** Calibrated on 30-1000MHz EMI Chamber 2 719150 2762A-7 A-0015 3/22/2017 3/22/2015 Preamps/Couplers Attenuators / Filters Range MN Mfr SN Cat **Calibration Due** Calibrated on Asset 0.009-2000MHz ZFL-1000-LN 1/28/2018 1/28/2017 Range 30-2000MHz Mfr SN **Calibration Due** Calibrated on Antennas MN Asset Cat A091604-1 8/12/2015 Red-White Bilog JB1 Sunol 1105 8/12/2017 **Meteorological Meters** MN Mfr SN Cat **Calibration Due** Calibrated on Weather Clock (Pressure Only) TH A#2081 **BA928** Oregon Scientific HDE C3166-1 831 4/28/2018 4/28/2016 HTC-1 4/5/2016 2081 4/5/2017

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





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# Occupied Bandwidth

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

[RSS-GEN 6.6]

#### **MEASUREMENTS / RESULTS**

Date: 01-Mar-17 Company: Stack-on F				s Company					Work Ord	der: Q3665	
Engineer:	Chris Bramley	EUT Desc:	EUT Desc: PC-1702-RFID				EUT Operating Voltage/Frequency: Battery				
Temp:	23°C	Humidity:	37%	Pressu	ıre: 985mBar						
	Frequenc	y Range: Fundamen	tal			N	/leasuren	nent D	Distance: 3 m		
Notes	EUT in Z-Orientat	tion						EUT	Tx Freq: 125kHz		
Antenna Polarization	Frequency				Occupied Band	lwidth					
(0° - 90°)	(MHz)				(KHz)						
0	0.125				5.123						
Tabl	e Result:	by	dB				ı	Wors	t Freq: 0.1	25 MHz	
	EMI Chamber 2		Asset #2052			Cable 2:	10001 1120				
CSsoft Radiate	Rental SA#1 ed Emissions Calc ling = Reading - Pi	Preamp: culator v 1.017.185 reamp Factor + Anter		e Factor		Antenna: I	Lg Loop		Copyright	Curtis-Straus LLC 2	
CSsoft Radiate Adjusted Read Rev. 3/27/2017 Spectrum	ed Emissions Calc	culator v 1.017.185 reamp Factor + Anter ivers /Preselectors		# Factor  MN  N9010A-526;R	<b>M</b> fr AT	<b>SN</b> SG53470118	Asset	Cat	Copyright  Calibration Due 1/27/2018		
CSsoft Radiate Adjusted Read Rev. 3/27/2017 Spectrum	ed Emissions Calc ling = Reading - Pu Analyzers / Recei	culator v 1.017.185 reamp Factor + Anter vers /Preselectors vzer(1199509) ns Sites	nna Factor + Cable Range	MN		SN	Asset		Calibration Due	Calibrated of 1/27/2017	
CSsoft Radiate Adjusted Read Rev. 3/27/2017 Spectrum Ren	ed Emissions Calc ling = Reading - Po A Analyzers / Receital EXA Signal Analy Radiated Emissio	culator v1.017.185 reamp Factor + Anter vers /Preselectors yzer(1199509) ns Sites or 2	nna Factor + Cable Range 9KHz-26.5GHz FCC Code	MN N9010A-526;R IC Code	AT VCCI Code	<b>SN</b> SG53470118 <b>Range</b>	Asset 1199509 Asset	Cat	Calibration Due 1/27/2018 Calibration Due	Calibrated or	
OSsoft Radiate Adjusted Read Rev. 3/27/2017 Spectrum Ren	ed Emissions Calo ling = Reading - Pi Analyzers / Recei tal EXA Signal Analy Radiated Emissio EMI Chambe	culator v1.017.185 reamp Factor + Anter vers /Preselectors yzer(1199509) ns Sites or 2 nuators / Filters	Range 9KHz-26.5GHz FCC Code 719150 Range	MN N9010A-526;R IC Code 2762A-7 MN	AT  VCCI Code  A-0015  Mfr	SN SG53470118 Range 30-1000MHz SN	Asset 1199509 Asset 1686 Asset	Cat	Calibration Due 1/27/2018 Calibration Due 12/21/2018 Calibration Due	Calibrated of 1/27/2017  Calibrated of 12/21/2016  Calibrated of 12/21/2016	
CSsoft Radiate Adjusted Read tev. 3/27/2017 Spectrum Ren Pream	ed Emissions Calc ling = Reading - Pi a Analyzers / Recei tal EXA Signal Analy Radiated Emissio EMI Chambe aps / Couplers Atten Red	culator v1.017.185 reamp Factor + Anter vers /Preselectors yzer(1199509) ms Sites or 2 nuators / Filters  Meters sure Only)	Range 9KHz-26.5GHz FCC Code 719150 Range 0.009-2000MHz Range	MN N9010A-526;R IC Code 2762A-7 MN ZFL-1000-LN MN	AT  VCCI Code  A-0015  Mfr  CS  Mfr	SN SG53470118 Range 30-1000MHz SN N/A SN	Asset 1199509 Asset 1686 Asset 798 Asset	Cat	Calibration Due 1/27/2018  Calibration Due 12/21/2018  Calibration Due 1/28/2018  Calibration Due	Calibrated o 1/27/2017 Calibrated o 12/21/2016 Calibrated o 1/28/2017 Calibrated o	

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More 1 of 2

ilent Spectrum Analyzer - Occupied BW 10:55:48 PM Mar 01, 2017 Measurements Center Freq: 125.225 kHz Trig: Free Run Avg #Atten: 6 dB Radio Std: None Avg|Hold:>10/10 Swept SA 125.185 kHz -44.623 dBm Ref -30.00 dBm **Channel Power** Occupied BW ACP Center 125.2 kHz #Res BW 150 Hz Span 10 kHz Sweep FFT Power Stat **#VBW 620 Hz** CCDF **Total Power** -40.1 dBm Occupied Bandwidth 5.123 kHz **Burst Power** Transmit Freq Error -86 Hz **OBW Power** 99.00 % x dB Bandwidth 5.648 kHz -26.00 dB x dB

99% Occupied Bandwidth

STATUS ! DC Coupled



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.

	<b>-</b>	
Measurement Radiated Emissions (30-1000MHz)	Expanded Uncertainty k=2	Maximum allowable uncertainty
NIST CISPR	5.6dB 4.6dB	N/A 5.2dB (Ucispr)
Radiated Emissions (1-26.5GHz)	4.6dB	N/A
Radiated Emissions (above 26.5GHz)	4.9dB	N/A
Magnetic Radiated Emissions	5.6dB	N/A
Conducted Emissions NIST 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 <sup>-8</sup>	1 x 10 <sup>-7</sup>
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 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 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.

  3. CLIENT SHALL, EXCEPT TO THE EXTENT OF COMPANY'S LIABILITY TO CLIENT HEREUNDER (WHICH IN NO EVENT SHALL EXCEED THE LIMITATION OF LIABILITY HEREIN), HOLD HARMLESS AND INDEMNIFY THE COMPANY, ITS AFFILIATES AND THEIR RESPECTIVE DIRECTORS, OFFICERS, EMPLOYEES, AGENTS AND SUBCONTRACTORS AGAINST





ALL ACTUAL OR ALLEGED THIRD PARTY CLAIMS FOR LOSS, DAMAGE OR EXPENSE OF WHATSOEVER NATURE AND HOWSOEVER ARISING FROM OR RELATING TO (i) THE PERFORMANCE, PURPORTED PERFORMANCE OR NON-PERFORMANCE OF ANY SERVICES BY THE COMPANY OR (ii) THE SALE, RESALE, MANUFACTURE, DISTRIBUTION OR USE OF ANY TESTED GOODS.

- 14. EXCEPT AS MAY OTHERWISE BE EXPRESSLY AGREED TO IN WRITING BY THE COMPANY AND NOTWITHSTANDING ANY PROVISION TO THE CONTRARY CONTAINED HEREIN OR IN ANY TEST REPORT, NO WARRANTY OR GUARANTEE, EXPRESS OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR USE. IS MADE.
- 15. (A) IN NO EVENT WHATSOEVER SHALL THE COMPANY BE LIABLE FOR ANY CONSEQUENTIAL, SPECIAL, INCIDENTAL, EXEMPLARY OR PUNITIVE DAMAGES IN CONNECTION WITH, RELATING TO OR ARISING OUT OF THE TEST REPORT OR THE SERVICES PROVIDED BY THE COMPANY HEREUNDER, INCLUDING WITHOUT LIMITATION LOSS OF OR DAMAGE TO PROPERTY; LOSS OF INCOME, PROFIT OR USE; OR ANY CLAIMS OR DEMANDS MADE AGAINST CLIENT OR ANY OTHER PERSON BY ANY THIRD PARTY IN CONNECTION WITH, RELATING TO OR ARISING OUT OF THE SERVICES PROVIDED BY THE COMPANY HEREUNDER.

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

- 16. The Company shall not be liable for any loss or damage resulting from any delay or failure in performance of its obligations hereunder resulting directly or indirectly from any event of force majeure or any event outside the control of the Company. If any such event occurs, the Company may immediately cancel or suspend its performance hereunder without incurring any liability whatsoever to Client.
- 17. Company's services, including these Conditions, shall be governed by, and construed in accordance with, the local laws of the country where the Company performs the tests or, in the case of tests performed in the United States of America, the laws of Massachusetts without regard to conflicts of laws principles. If any aspect(s) of these Conditions is found to be illegal or unenforceable, the validity, legality and enforceability of all remaining aspects of these Conditions shall not in any way be affected or impaired thereby. Any proceeding related to the subject matter hereof shall be brought, if at all, in the courts of the country where the Company performs the tests or, in the case of tests performed in the United States of America, in the courts of Massachusetts. Client waives the right to interpose any counterclaim or setoffs of any nature in any litigation arising hereunder.

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