



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

Report No ER3666-2

Client TowGo, LLC Daniel Shepard

Address 8 Easton Hill Lane Stratham, NH 03885

Phone (603) 498-3300

FRN 0027037068

Equipment Type Digital Transmission System

Equipment Code DTS Emission Designator 1M07F1D

Test Dates 1/23/2017 and 1/24/2017

Results As detailed within this report

Prepared by

Zachary Johnson – EMC Engineer

Authorized by

Yungs Fazilogly - Sr. EMC Engineer

Issue Date

2/23/2018

Conditions of Issue

This Test Report is issued subject to the conditions stated in the 'Conditions of Testing' 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 12-07-15



Summary

This test report supports an application for certification of a transmitter operating pursuant to: CFR Title 47 FCC Part 15.247, ISED Canada RSS-247 Issue 2

2017S1H1 operates in the 2404-2480MHz frequency range and has a 0dBi PCB trace antenna. The Trailer Hitch Sensor is powered by a 12V DC vehicle battery.

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





Test Methodology

All testing was performed according to the following rules/procedures/documents; CFR Title 47 FCC Part 15.247, RSS-247 Issue 2, RSS-Gen Issue 4, FCC KDB 558074 D01 DTS Measurement Guidance v04 and ANSI C63.10-2013.

Radiated emissions were maximized by rotating the device around 3 orthogonal planes (X, Y and Z) as well as varying the test antenna's height and polarity. Worst case results were recorded.

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

2404MHz: Low Channel2444MHz: Mid Channel2480MHz: High Channel

AC line conducted emissions testing was not performed since the unit is powered by a vehicle battery.

The following bandwidths were used during radiated spurious emissions testing.

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





Product Tested - Configuration Documentation

				EUT	Configuration					
Work Order:	R3666									
Company:	TowGo	, LLC								
Company Address:	8 Easton	n Hill Lane								
	Strathar	m, NH, 0388	35							
Contact:	Daniel S	Shepard								
			MN			PN			SN	
EUT:			17S1H1							
EUT Description:	Hitch B	LE Sensor								
EUT Max Frequency:	2480 M	Hz								
EUT Min Frequency:	32 MHz	Z								
Support Equipment			M	N				SN		
BV 12V power supply										
Port Label Port	Type	# ports	# populated	cable type	shielded	ferrites	length (m)	in/out	under test	comment
Power, 12V DC Powe	r DC	1	1	Power DC	No	No	2	in	yes	
Software Operating Mode Do	escription	n:								
EUT has app for user feedback										
Performance Criteria:										
EMI only							. <u></u>			

	Clock Frequencies
frequencies (MHz)	2480, 2444, 2404, 64, 32



Statement of Conformity

The device was 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.
3, 6.1, 6.5			15.31	The EUT was tested in accordance with the
				measurement standards in this section.
6.13			15.33	Frequency range was investigated according to this
				section, unless noted in specific rule section under
				which the equipment operates.
8.1			15.35	The EUT emissions were measured using the
				measurement detector and bandwidth specified in
				this section, unless noted in specific rule section
			15.000	under which the equipment operates.
8.3			15.203	EUT has 0dBi PCB trace antenna
8.10			15.205	The fundamental is not in a Restricted band and the
			15.209	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	N/A. Vehicle battery powered only.
			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

None





Test Results

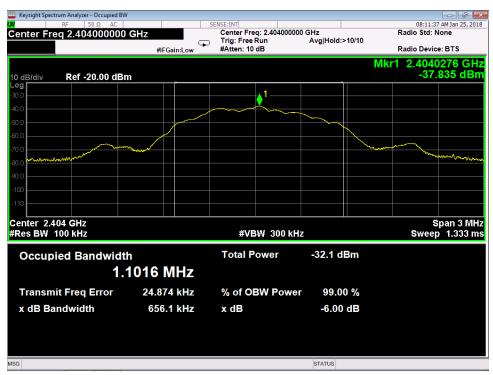
Bandwidth

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

MEASUREMENTS / RESULTS

		6dB Bandwidth						
Date: 1/24/2017	Company: TowGo		Work Order: R3666					
Engineer: Zac Johnson	EUT: Trailer Hitch	Sensor with BLE	Operating Voltage	Operating Voltage/Frequency: 12V DC				
Temp: 21.8°C	Humidity: 32%	Pressure: 999mBar						
Frequency Range: 240	04-2480 MHz Mea	surement Type: Conducted						
	Measu	rement Method: FCC KDB 55807	'4 D01 DTS Meas Guidar	nce V04				
Notes:								
				6dB Bandwi	dth			
Frequency		Reading	Limit	Margin	Result			
(MHz)		(kHz)	(kHz)	(kHz)	(Pass/Fail)			
2404		656.1	≥500	156	Pass			
2444		640.6	≥500	141	Pass			
2480		639.9	≥500	140	Pass			
Test Site: EMC-3	Cable: 2213 Cbl	Attenuato	or: 2107 40dB Pad		•			
Analyzer: 1118472 SA				Copyright Cu	tis-Straus LLC 2000			

PLOTS



Low Channel DTS Bandwidth



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Middle Channel DTS Bandwidth



High Channel DTS Bandwidth





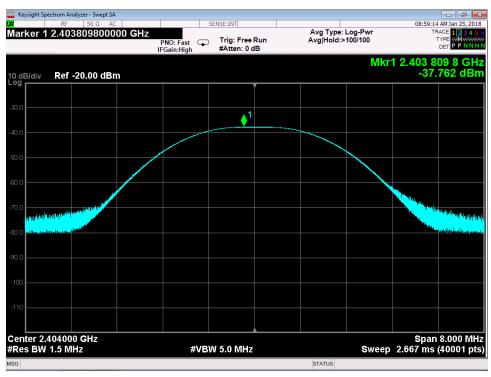
Peak Power

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

MEASUREMENTS / RESULTS

Date: 1/24/2017		Company: TowGo			Work Orde	r: R3666				
Engineer: Zac Johnso	on	EUT: Trailer Hit	ch Sensor with BLE		Operating	Operating Voltage/Frequency: 12V DC				
Temp: 21.8°C		Humidity: 32%								
Frequency Range:	2404-2480 MHz		Measurer	nent Type: Conducted						
Notes:		<u> </u>		1						
	Peak Reading Cable Loss Attenuator Loss Peak (Limit	Margin	Result			
Frequency	reak neauling						(Pass/Fail)			
Frequency (MHz)	(dBm)	(dB)	(dB)	(dBm)	(dBm)	(dB)	(Pass/Fail)			
		(dB) 0.71	(dB) 40.00	(dBm) 2.95	(dBm) 30.0	(dB) -27.05	(Pass/Fail) Pass			
(MHz)	(dBm)	` '	` '	` '	` '	· · · · · ·				
(MHz) 2404	(dBm) -37.76	0.71	40.00	2.95	30.0	-27.05	Pass			

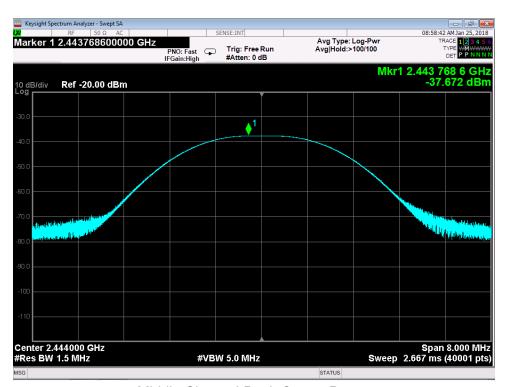
PLOTS



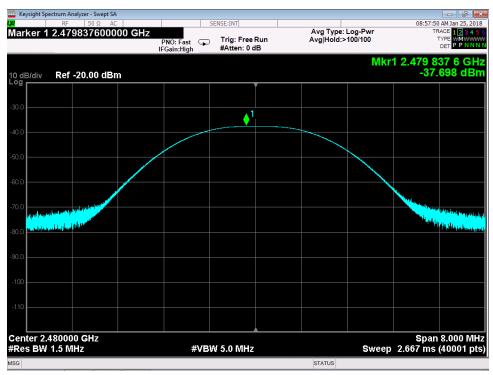
Low Channel Peak Output Power







Middle Channel Peak Output Power



High Channel Peak Output Power





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

Bandedge Frequency (MHz)

2400.0

2483.5

Cable: 2213 Cbl

						Ra	diated Ba	ndedae						
	22-Jan-18 Aristotelis Ca	sternopoulos		Company: EUT Desc: Humidity:	Hitch BLE			Pressure:	1014		EUT Operat	V ing Voltage/	Vork Order: Frequency:	
Tellip.	20.0	Freque	ncy Range:					riessure.	1014		Measureme	nt Distance:	3 m	
Notes:			,									T Max Freq:		
Antenna		Peak	Average	Preamp	Antenna	Cable	Adjusted	FCC Class B High Frequency - FCC					s B High Fr Average	equency -
Polarization (H / V)	Frequency (MHz)	Reading (dBµV)	Reading (dBµV)	Factor (dB)	Factor (dB/m)	Factor (dB)	Peak Reading (dBμV/m)	Avg Reading (dBμV/m)	Limit (dBµV/m)	Margin (dB)	Result (Pass/Fail)	Limit (dBµV/m)	Margin (dB)	Result (Pass/Fai
High Ch														
V	2483.50	20.0	12.7	0.0	32.4	3.2	55.6	48.3	74.0	-18.4	Pass	54.0	-5.7	Pass
V	2486.29	24.7	12.7	0.0	32.4	3.2	60.3	48.3	74.0	-13.7	Pass	54.0	-5.7	Pass
V	2488.08	25.1	12.7	0.0	32.4	3.2	60.7	48.3	74.0	-13.3	Pass	54.0	-5.7	Pass
Low Ch V	2390.00	21.8	12.5	0.0	32.2	3.1	 57.1	47.8	74.0	-16.9	Pass	54.0	-6.2	Pass
V	2376.71	24.2	12.5	0.0	32.2	3.1	59.4	47.8	74.0	-16.9	Pass	54.0	-6.2 -6.3	Pass
V	2339.75	24.6	12.4	0.0	32.0	3.1	59.7	47.5	74.0	-14.3	Pass	54.0	-6.5	Pass
•	2555.75	20	12											
Tabl	e Result:		Pass	by	-5.7	dB					W	orst Freq:	2483.5	MHz
Test Site:	EMI Chamber	1		Cable 1:	Asset #20	51				Cable 2:	Asset #2456	;	Cable 3:	
Analyzer:	Rental SA#1			Preamp:	None						reselector:			
Ssoft Radiate	ed Emissions C	Calculator	v 1.017.197										Copyright Curti	is-Straus LLC
ljusted Read	ling = Reading	- Preamp Fa	ctor + Anten	na Factor +	Cable Fac	tor								
					C	ond	ucted E	Banded	qe					
Date	: 1/24/2017	,	Co	mpany:					<u> </u>			Work	Order: F	R3666
Engineer	: Zac Johns	son		EUT:	Trailer F	litch Se	ensor with BL	.E		Ope	rating Vol	tage/Freq	uency: 1	2V DC
Temp	: 21.8°C		H	umidity:	32%		ı	Pressure: 99	99mBar					
Frequ	ency Rang	e : 2404-2	2480 MHz				Measureme							
						M	easurement	Method: F	CC KDB 5	58074 D0	1 DTS Mea	as Guidano	e V04	
Notes														

Delta to Peak

(dB)

53.1

53.9

Attenuator: 2107 40dB Pad



Low Bandedge

High Bandedge

Analyzer: 1118472 SA

Test Site: EMC-3



Limit

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(Pass/Fail)

Pass

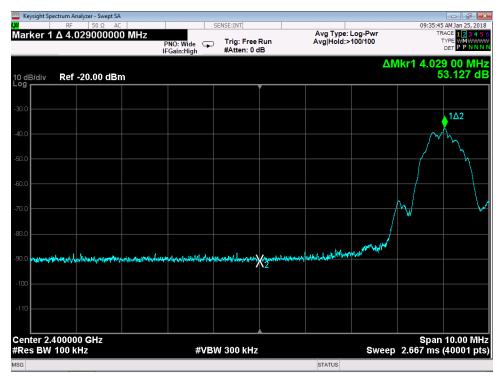
Pass

(dB)

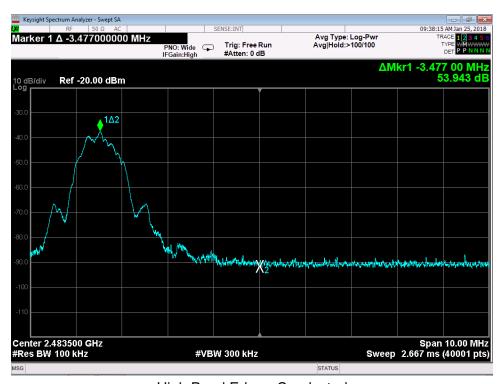
≥ 20

≥ 20

PLOTS



Low Band Edge - Conducted



High Band Edge - Conducted



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Radiated Spurious Emissions

Limits: Radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a).[15.247(d)] High, low, and center channel were tested above 1GHz.

MEASUREMENTS / RESULTS

Curtis Straus	- a Bureau V	eritas Compa	any	Work Order - F	3666				
Radiated Em	issions Elect	ric Field 3m [Distance	EUT Power Inp	ut - Battery				
Top Peaks V	ertical 30-100	00MHz		Test Site - CH-:	1				
Operator: ZJ				Conditions - 21	L.6°C; 32%RH	: 1018mBar			
Config 2	Center Char	nnel							
10:31:32 PM	Monday	January 22	20182	EUT Maximum	Frequency -	2480MHz			
			Adjusted	Lim1:			Worst		
	Peak	Correction	Peak	FCC pt15 109 Lim1		Lim1 Test	Margin	Antenna	Turntable
Frequency	Reading	Factor	Amplitude	_Class_B	Margin	Results	Lim1	Height	Azimuth
(MHz)	(dBµV)	(dB/m)	(dBµV/m)	(dBµV/m)	(dB)	(Pass/Fail)	(dB)	(cm)	(degrees)
179.695	58.6	-17.5	41.2	43.5	-2.4	PASS	-2.4	100	180
183.648	50	-17.4	32.6	43.5	-10.9	PASS		100	180
185.442	49.5	-17.4	32.1	43.5	-11.5	PASS		100	180
194.003	52.5	-16.8	35.8	43.5	-7.8	PASS		100	180
195.264	51.3	-16.6	34.7	43.5	-8.8	PASS		100	180
196.597	47.8	-16.3	31.4	43.5	-12.1	PASS		100	180

Curtis Straus	- a Bureau V	eritas Compa	any	Work Order - R	3666				
Radiated Emi	ssions Electr	ric Field 3m D	Distance	EUT Power Inpu	ut - Battery				
Top Peaks Ho	rizontal 30-1	.000MHz		Test Site - CH-1	-				
Operator: ZJ				Conditions - 21	.6°C; 32%RH;	1018mBar			
Config 2	Center Cha	nnel							
10:31:32 PM	Monday	January 22	20182	EUT Maximum	Frequency -	2480MHz			
			Adjusted	Lim1:			Worst		
	Peak	Correction	Peak	FCC_pt15_109	Lim1 Test	Margin	Antenna	EUT	
Frequency	Reading	Factor	Amplitude	_Class_B	Margin	Results	Lim1	Height	Azimuth
(MHz)	(dBµV)	(dB/m)	(dBµV/m)	(dBµV/m)	(dB)	(Pass/Fail)	(dB)	(cm)	(degrees)
30.582	33	-8.1	24.9	40	-15.1	PASS	-15.1	100	90
160.101	40.7	-16.5	24.2	43.5	-19.3	PASS		150	270
261.369	41.2	-15.6	25.6	46	-20.5	PASS		150	270
387.809	35.2	-12.1	23.1	46	-22.9	PASS		250	90
912.264	32.3	-2.4	29.9	46	-16.2	PASS		250	135
990.688	31.5	-1.1	30.4	54	-23.6	PASS		100	45

30-1000MHz





ssions Electr		any		Work Order	- K3000							
	ic Field 3m D	istance		EUT Power I	nput - 3.7V Ba	attery						
rtical 1-6GHz	!			Test Site - Cl	H1							
stotelis Cast	ernopoulos			Conditions -	23.6°C; 22%R	H; 1014mBar						
itch 12V												
el 0 (2404MH	Hz)			EUT Maximu	m Frequency	- 2480MHz						
	Correction Factor	Adjusted Peak Amplitude	Pk Lim: FCC_pt15_209 _Peak	-	Peak Limit Test Results	Worst	Av Lim: FCC_pt15_209 _Average	Margin to Average Limit	Average Limit Test Result	Average Limit Worst Margin		EUT Azimuth
(dBμV)	(dB/m)	(dBµV/m)	(dBµV/m)	(dB)	(Pass/Fail)	(dB)	(dBµV/m)	(dB)	(Pass/Fail)	(dB)	(cm)	(degrees)
50.4	-8.7	41.6	74	-32.4	PASS		54	-12.4	PASS		300	31
48.3	-3.9	44.4	74	-29.6	PASS		54	-9.6	PASS		100	3
49.2	-3.4	45.9	74	-28.1	PASS		54	-8.1	PASS		300	
48.4	-1	47.3	74	-26.7	PASS		54	-6.7	PASS		100	
46.8	0.6	47.4	74	-26.6	PASS	-26.6	54	-6.6	PASS	-6.6	100	
- a Bureau V	eritas Comp	oany		Work Orde	r - R3666							
issions Elect	ric Field 3m	Distance		EUT Power	Input - 3.7V E	Battery						
rizontal 1-6	GHz			Test Site - C	CH1							
istotelis Cas	ternopoulos	5		Conditions	- 23.6°C; 22%	RH; 1014mBa	ar					
i R	tch 12V el 0 (2404Mh kaw Peak keading dBμV) 50.4 48.3 49.2 48.4 46.8 - a Bureau V sssions Elect rizontal 1-6	Raw Peak Reading Factor (dBμV) (dB/m) 50.4 -8.7 48.3 -3.9 49.2 -3.4 48.4 -1 46.8 0.6 - a Bureau Veritas Compassions Electric Field 3 mrizontal 1-6GHz stotelis Casternopoulos	teth 12V el 0 (2404MHz) Raw Peak Reading Factor Amplitude dBμV) (dB/m) (dBμV/m) 50.4 -8.7 41.6 48.3 -3.9 44.4 49.2 -3.4 45.9 48.4 -1 47.3 46.8 0.6 47.4 - a Bureau Veritas Company ssions Electric Field 3m Distance rizontal 1-6GHz stotelis Casternopoulos	Raw Peak Reading Factor Adjusted Peak Peak Reading Factor Amplitude Peak Adjusted Peak Peak Amplitude Peak Amp	Adjusted Pk Lim: FCC_pt15_209 Margin to Peak P	Adjusted Peak FCC_pt15_209 Margin to Peak Limit Test Results	European European	EUT Maximum Frequency - 2480MHz EUT Maximum Frequency - 2480MHz Av Lim: FCC_pt15_209 Margin to Peak Limit Worst FCC_pt15_209 Average Margin to Test Results Margin Ma	EUT Maximum Frequency - 2480MHz EUT Maximum Frequency - 2480MHz EUT Maximum Frequency - 2480MHz Pk Limit	EUT Maximum Frequency - 2480MHz EUT Maximum Frequency - 2480MHz EUT Maximum Frequency - 2480MHz Av Lim: Margin to Average Limit Reading Factor Amplitude Peak Peak Limit Test Results Margin Margin	EUT Maximum Frequency - 2480MHz	EUT Maximum Frequency - 2480MHz Av Lim: Margin to Average Limit Test Result Margin Average Limit Test Result Margin Average Limit Test Result Margin Height Margin Margin

Curtis Straus	s - a Bureau \	/eritas Comp	oany		Work Order	- R3666							
Radiated Em	nissions Elec	tric Field 3m	Distance		EUT Power	nput - 3.7V E	Battery						
Top Peaks H	orizontal 1-6	5GHz			Test Site - C	H1							
Operator: A	ristotelis Cas	sternopoulos	5		Conditions	- 23.6°C; 22%	RH; 1014mBa	ar					
EUT Power:	Hitch 12V												
Mode: Chan	nel 0 (2404N	1Hz)			EUT Maximu	ım Frequenc	y - 2480MHz						
Frequency	Raw Peak Reading	Correction Factor	Adjusted Peak Amplitude	Pk Lim: FCC_pt15_209 _Peak	Margin to Peak Limit	Peak Limit Results	Peak Limit Worst Margin	Av Lim: FCC_pt15_209 _Average	Margin to Avg Limit	Avg Limit Results	Avg Limit Worst Margin	Antenna Height	EUT Azimuth
(MHz)	(dBµV)	(dB/m)	(dBµV/m)	(dBµV/m)	(dB)	(Pass/Fail)	(dB)	(dBµV/m)	(dB)	(Pass/Fail)	(dB)	(cm)	(degrees)
1255.5	49.9	-8.6	41.3	74	-32.7	PASS		54	-12.7	PASS		200	315
2140.38	48.5	-4.4	44.2	74	-29.8	PASS		54	-9.8	PASS		300	231
2877.5	49.1	-3.4	45.7	74	-28.3	PASS		54	-8.3	PASS		200	44
5747.13	46.2	0.6	46.7	74	-27.3	PASS	-27.3	54	-7.3	PASS	-7.3	200	282

1GHz-6GHz Low Channel

Curtis Straus	- a Bureau Ve	ritas Compar	ny	Work Order - R3	3666								
Radiated Em	issions Electri	c Field 3m Di	stance	EUT Power Inpu	t - 3.7V Batte	ry							
Top Peaks Ve	ertical 1-6GHz			Test Site - CH1									
Operator: Ar	istotelis Caste	ernopoulos		Conditions - 23.	6°C; 22%RH; 1	1014mBar							
EUT Power: H	Hitch 12V												
Mode: Chani	nel 19 (2444M	Hz)		EUT Maximum F	requency - 2	480MHz							
			Adjusted	Pk Lim:			Peak Limit	Av Lim:	Margin to	Average	Average		
	Raw Peak	Correction	Peak	FCC_pt15_209_	_	Peak Limit		FCC_pt15_209_	Average	Limit Test	Limit Worst		EUT
Frequency	Reading	Factor	Amplitude	Peak	Peak Limit	Test Results	Margin	Average	Limit	Result	Margin	Height	Azimuth
(MHz)	(dBµV)	(dB/m)	(dBµV/m)	(dBµV/m)	(dB)	(Pass/Fail)	(dB)	(dBµV/m)	(dB)	(Pass/Fail)	(dB)	(cm)	(degrees)
1291.25	49.8	-8.4	41.4	74	-32.6	PASS		54	-12.6	PASS		100	232
2122.63	49.3	-4.5	44.7	74	-29.3	PASS		54	-9.3	PASS		300	190
3140.25	49.6	-3.9	45.6	74	-28.4	PASS		54	-8.4	PASS		300	230
5715	46.2	0.6	46.9	74	-27.1	PASS	-27.1	54	-7.1	PASS	-7.1	100	113

Curtis Strau	s - a Bureau \	eritas Comp	oany		Work Order	- R3666							
Radiated En	nissions Elect	tric Field 3m	Distance		EUT Power I	nput - 3.7V E	Battery						
Top Peaks H	lorizontal 1-6	5GHz			Test Site - C	H1							
Operator: A	ristotelis Cas	sternopoulos	5		Conditions -	23.6°C; 22%	RH; 1014mBa	ar					
EUT Power:	Hitch 12V												
Mode: Chan	nel 19 (2444	MHz)			EUT Maximu	ım Frequenc	y - 2480MHz						
			Adjusted	Pk Lim:			Peak Limit	Av Lim:			Avg Limit		
	Raw Peak	Correction	Peak	FCC_pt15_209	Margin to	Peak Limit	Worst	FCC_pt15_209	Margin to	Avg Limit	Worst	Antenna	EUT
Frequency	Reading	Factor	Amplitude	_Peak	Peak Limit	Results	Margin	_Average	Avg Limit	Results	Margin	Height	Azimuth
(MHz)	(dBµV)	(dB/m)	(dBµV/m)	(dBµV/m)	(dB)	(Pass/Fail)	(dB)	(dBµV/m)	(dB)	(Pass/Fail)	(dB)	(cm)	(degrees)
2165.13	48.5	-4.1	44.4	74	-29.6	PASS		54	-9.6	PASS		200	124
2865.38	49.4	-3.4	46.1	74	-27.9	PASS		54	-7.9	PASS		100	73
5852.38	46.6	0.5	47.1	74	-26.9	PASS	-26.9	54	-6.9	PASS	-6.9	100	308

1GHz-6GHz Center Channel



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Curtis Straus	- a Bureau Ver	itas Company		Work Order - R	3666								
Radiated Emi	ssions Electric	Field 3m Dist	ance	EUT Power Inpu	it - 3.7V Batte	ry							
Top Peaks Ve	rtical 1-6GHz			Test Site - CH1									
Operator: Ari	stotelis Caster	nopoulos		Conditions - 23.	.6°C; 22%RH; 1	.014mBar							
EUT Power: H	itch 12V												
Mode: Chann	el 39 (2480MH	z)		EUT Maximum I	requency - 24	180MHz							
Frequency	Raw Peak Reading	Correction Factor	Adjusted Peak Amplitude	Pk Lim: FCC_pt15_209_ Peak	Margin to	Peak Limit Test Results	Peak Limit Worst Margin	Av Lim: FCC_pt15_209 Average	Margin to Average Limit	Average Limit Test Result	Average Limit Worst Margin	Antenna Height	EUT Azimuth
requency	ricuaning	r deco.	ranpireade	. cun	r con Emile	restricsarts	g	_/trelage	Little	ricourt	iriai giii	g.iic	LOT / LITTUCE!
(MHz)	(dBµV)	(dB/m)	(dBµV/m)	(dBµV/m)	(dB)	(Pass/Fail)	(dB)	(dBµV/m)	(dB)	(Pass/Fail)	(dB)	(cm)	(degrees)
1219.5	50.3	-9.3	41	74	-33	PASS		54	-13	PASS		300	308
2053.63	50.2	-5.5	44.6	74	-29.4	PASS		54	-9.4	PASS		200	86
2892.5	49	-3.4	45.6	74	-28.4	PASS		54	-8.4	PASS		100) C
4518.13	48.3	-2.8	45.5	74	-28.5	PASS		54	-8.5	PASS		200	46
5749.63	48.1	0.6	48.6	74	-25.4	PASS	-25.4	54	-5.4	PASS	-5.4	100	34

Curtis Strau	s - a Bureau V	eritas Comp	any		Work Order	- R3666							
Radiated En	nissions Elect	ric Field 3m	Distance		EUT Power I	nput - 3.7V B	Battery						
Top Peaks H	orizontal 1-6	GHz			Test Site - Cl	H1							
Operator: A	ristotelis Cas	ternopoulos			Conditions -	23.6°C; 22%	RH; 1014mBa	r					
EUT Power:	Hitch 12V												
Mode: Chan	nel 39 (2480ľ	√Hz)			EUT Maximu	m Frequenc	y - 2480MHz						
			Adjusted	Pk Lim:			Peak Limit	Av Lim:			Avg Limit		
	Raw Peak	Correction	Peak	FCC_pt15_209	Margin to	Peak Limit	Worst	FCC_pt15_209	Margin to	Avg Limit	Worst	Antenna	EUT
Frequency	Reading	Factor	Amplitude	_Peak	Peak Limit	Results	Margin	_Average	Avg Limit	Results	Margin	Height	Azimuth
(MHz)	(dBµV)	(dB/m)	(dBµV/m)	(dBµV/m)	(dB)	(Pass/Fail)	(dB)	(dBµV/m)	(dB)	(Pass/Fail)	(dB)	(cm)	(degrees)
2087.88	49.6	-5.1	44.4	74	-29.6	PASS		54	-9.6	PASS		100	269
2931.38	49.5	-3.5	46	74	-28	PASS		54	-8	PASS		200	163
5734.63	46.6	0.6	47.1	74	-26.9	PASS	-26.9	54	-6.9	PASS	-6.9	100	34

1GHz-6GHz High Channel

Curtis Straus	- a Bureau Ve	ritas Compan	У	Work Order - R3	8666								
Radiated Emi	issions Electri	c Field 1m Dis	stance	EUT Power Inpu	t - Battery								
Top Peaks Ve	ertical 6-18GH	z		Test Site - CH-1									
Operator: ZJ				Conditions - 21.	6°C; 32%RH; 1	018mBar							
Config 2 - Lov	w Channel												
				EUT Maximum F	requency - 24	180MHz							
Frequency	Raw Peak Reading	Correction Factor	Adjusted Peak Amplitude	Pk Lim: FCC_pt15_109_ ClassB_Peak	Margin to Peak Limit	Peak Limit Test Results	Peak Limit Worst Margin	Av Lim: FCC_pt15_109_ ClassB_AVG	Margin to Avg Limit	Avg Limit Test Results	Avg Limit Worst Margin	Antenna Height	EUT Azimuth
(MHz)	(dBµV)	(dB/m)	(dBµV/m)	(dBµV/m)	(dB)	(Pass/Fail)	(dB)	(dBµV/m)	(dB)	(Pass/Fail)	(dB)	(cm)	(degrees)
7211.7	53.7	-2.2	51.6	83.5	-31.9	PASS		63.5	-11.9	PASS		150	73
11505.6	45.6	1.6	47.2	83.5	-36.3	PASS		63.5	-16.3	PASS		100	11:
12901.8	45.5	2.2	47.7	83.5	-35.8	PASS		63.5	-15.8	PASS		100	309
13808.4	47.2	1.2	48.4	83.5	-35.1	PASS		63.5	-15.1	PASS		200	150
14820.9	46.3	2.5	48.8	83.5	-34.7	PASS		63.5	-14.7	PASS		125	282
16958.4	46.9	5.2	52.1	83.5	-31.4	PASS	-31.4	63.5	-11.4	PASS	-11.4	175	202

Curtis Straus	- a Bureau Veri	tas Company		Work Order - R3	666								
Radiated Emi	ssions Electric	Field 1m Dista	ince	EUT Power Input	- Battery								
Top Peaks Ho	rizontal 6-18GI	Hz		Test Site - CH-1									
Operator: ZJ				Conditions - 21.0	5°C; 32%RH; 10)18mBar							
Config 2 - Lov	v Channel												
				EUT Maximum F	requency - 24	80MHz							
Frequency	Raw Peak Reading	Correction Factor	Adjusted Peak Amplitude	Pk Lim: FCC_pt15_109_ ClassB_Peak	Margin to Peak Limit	Peak Limit Test Results	Peak Limit Worst Margin	Av Lim: FCC_pt15_109_ ClassB_AVG	Margin to Avg Limit	Avg Limit Test Results	Avg Limit Worst Margin	Antenna Height	EUT Azimuth
(MHz)	(dBµV)	(dB/m)	(dBµV/m)	(dBµV/m)	(dB)	(Pass/Fail)	(dB)	(dBμV/m)	(dB)	(Pass/Fail)	(dB)	(cm)	(degrees)
7211.4	55.2	-2.2	53.1	83.5	-30.4	PASS	-30.4	1 63.5	-10.4	PASS	-10.4	150	111
11494.2	45.3	1.5	46.8	83.5	-36.7	PASS		63.5	-16.7	PASS		175	10
12899.4	45.9	2.1	. 48	83.5	-35.5	PASS		63.5	-15.5	PASS		100	229
13740.9	47.5	1.8	49.3	83.5	-34.2	PASS		63.5	-14.2	PASS		175	282
14324.4	48.2	1.2	49.5	83.5	-34	PASS		63.5	-14	PASS		100	34
17011.5	46.1	5.5	51.6	83.5	-31.9	PASS		63.5	-11.9	PASS		125	282

6GHz-18GHz Low Channel



ACCREDITED
Testing Cert No. 1827.01

Curtis Straus	s - a Bureau V	eritas Compa	ny		Work Order	- R3666							
Radiated Em	nissions Electr	ic Field 1m D	istance		EUT Power I	nput - Battery	/						
Top Peaks V	ertical 6-18GF	łz			Test Site - Cl	H-1							
Operator: ZJ					Conditions -	21.6°C; 32%R	H; 1018mBar						
Config 2 - Mi	id Channel												
					EUT Maximu	m Frequency	- 2480MHz						
			Adjusted	Pk Lim:			Peak Limit	Av Lim:			Avg Limit		
	Raw Peak	Correction	Peak	FCC_pt15_109	Margin to	Peak Limit	Worst	FCC_pt15_109	Margin to	Avg Limit	Worst	Antenna	EUT
Frequency	Reading	Factor	Amplitude	_ClassB_Peak	Peak Limit	Test Results	Margin	_ClassB_AVG	Avg Limit	Test Results	Margin	Height	Azimuth
(MHz)	(dBµV)	(dB/m)	(dBµV/m)	(dBµV/m)	(dB)	(Pass/Fail)	(dB)	(dBµV/m)	(dB)	(Pass/Fail)	(dB)	(cm)	(degrees)
7331.4	52.4	-2.8	49.7	83.5	-33.8	PASS		63.5	-13.8	PASS		150	7:
11044.5	46.3	0.6	47	83.5	-36.5	PASS		63.5	-16.5	PASS		100	189
13245.3	46.5	1.8	48.3	83.5	-35.2	PASS		63.5	-15.2	PASS		125	203
13742.7	47.9	1.7	49.6	83.5	-33.9	PASS		63.5	-13.9	PASS		150	228
15540.9	46.6	2.6	49.2	83.5	-34.3	PASS		63.5	-14.3	PASS		125	164
17081.1	46.5	5.8	52.3	83.5	-31.2	PASS	-31.2	63.5	-11.2	PASS	-11.2	125	48

Curtis Straus	- a Bureau Ve	ritas Compan	У		Work Order	- R3666							
Radiated Em	issions Electri	c Field 1m Dis	tance		EUT Power Ir	put - Battery							
Top Peaks Ho	orizontal 6-18	GHz			Test Site - Ch	l-1							
Operator: ZJ					Conditions -	21.6°C; 32%RI	H; 1018mBar						
Config 2 - Mi	d Channel												
					EUT Maximu	m Frequency	- 2480MHz						
Frequency	Raw Peak Reading	Correction Factor	Adjusted Peak Amplitude	Pk Lim: FCC_pt15_109 _ClassB_Peak	_	Peak Limit Test Results	Peak Limit Worst Margin	Av Lim: FCC_pt15_109 _ClassB_AVG	_	Avg Limit Test Results	Avg Limit Worst Margin	Antenna Height	EUT Azimuth
(MHz)	(dBµV)	(dB/m)	(dBµV/m)	(dBµV/m)	(dB)	(Pass/Fail)	(dB)	(dBµV/m)	(dB)	(Pass/Fail)	(dB)	(cm)	(degrees)
7331.4	52.9	-2.8	50.1	83.5	-33.4	PASS		63.5	-13.4	PASS		125	125
12602.1	. 44	3.9	47.9	83.5	-35.6	PASS		63.5	-15.6	PASS		175	48
13320.3	45.7	2.4	48.1	83.5	-35.4	PASS		63.5	-15.4	PASS		125	86
13750.8	47.1	1.7	48.8	83.5	-34.7	PASS		63.5	-14.7	PASS		150	189
15336.3	47.3	2.1	49.3	83.5	-34.2	PASS		63.5	-14.2	PASS		175	243
16965.9	46.7	5.3	52	83.5	-31.5	PASS	-31.5	63.5	-11.5	PASS	-11.5	125	86

6GHz-18GHz Mid Channel

Curtis Strau	ıs - a Bureau	veritas Co	mpany		Work Orde	r - R3666							
Radiated E	missions Ele	ctric Field 1	.m Distance		EUT Power	Input - Batt	ery						
Top Peaks	Vertical 6-18	3GHz			Test Site - 0	CH-1							
Operator: 2	<u>z</u> J				Conditions	- 21.6°C; 32	%RH; 1018m	Bar					
Config 2 - H	ligh Channe	I											
					EUT Maxim	um Frequei	ncy - 2480MI	Hz					
	Raw Peak	Correction	.,	Pk Lim: FCC_pt15_109_		Peak Limit Test	Peak Limit Worst	Av Lim: FCC pt15 109	Margin to	Avg Limit Test	Avg Limit Worst	Antenna	EUT
Frequency		Factor		ClassB_Peak	Peak Limit		Margin	_ClassB_AVG	_	Results	Margin	Height	Azimuth
(MHz)	(dBµV)	(dB/m)	(dBµV/m)	(dBµV/m)	(dB)	(Pass/Fail)	(dB)	(dBµV/m)	(dB)	(Pass/Fail)	(dB)	(cm)	(degrees)
7440.9	49.7	-2.9	46.9	83.5	-36.6	PASS		63.5	-16.6	PASS		150	72
9972	48.4	-0.6	47.8	83.5	-35.7	PASS		63.5	-15.7	PASS		175	282
11478.9	45.6	1.2	46.9	83.5	-36.6	PASS		63.5	-16.6	PASS		125	85
12940.8	45.8	2.3	48.1	83.5	-35.4	PASS		63.5	-15.4	PASS		175	166
13699.8	46.3	2.2	48.5	83.5	-35	PASS		63.5	-15	PASS		125	204
16966.2	45.9	5.3	51.2	83.5	-32.3	PASS	-32.3	63.5	-12.3	PASS	-12.3	100	228



Curtis Straus	- a Bureau Ve	ritas Compar	ny		Work Order	- R3666							
Radiated Em	issions Electri	c Field 1m Di	stance		EUT Power II	nput - Battery							
Top Peaks H	orizontal 6-18	GHz			Test Site - Cl	H-1							
Operator: ZJ					Conditions -	21.6°C; 32%R	H; 1018mBar						
Config 2 - Hi	gh Channel												
					EUT Maximu	m Frequency	- 2480MHz						
Frequency	Raw Peak Reading	Correction Factor	Adjusted Peak Amplitude	Pk Lim: FCC_pt15_109 _ClassB_Peak		Peak Limit Test Results	Peak Limit Worst Margin	Av Lim: FCC_pt15_109 _ClassB_AVG	Margin to Avg Limit	Avg Limit Test Results	Avg Limit Worst Margin	Antenna Height	EUT Azimuth
(MHz)	(dBµV)	(dB/m)	(dBµV/m)	(dBµV/m)	(dB)	(Pass/Fail)	(dB)	(dBµV/m)	(dB)	(Pass/Fail)	(dB)	(cm)	(degrees)
11901.6	46.2	1.9	48.2	83.5	-35.3	PASS		63.5	-15.3	PASS		200	267
12883.5	46.3	1.9	48.1	83.5	-35.4	PASS		63.5	-15.4	PASS		150	267
13404	45.2	3	48.2	83.5	-35.3	PASS		63.5	-15.3	PASS		175	281
13750.5	47.7	1.7	49.4	83.5	-34.1	PASS		63.5	-14.1	PASS		100	72
15567.6	46.4	2.8	49.2	83.5	-34.3	PASS		63.5	-14.3	PASS		150	189
16993.5	47.9	5.5	53.4	83.5	-30.1	PASS	-30.1	63.5	-10.1	PASS	-10.1	150	151

6GHz-18GHz High Channel

Date:	23-Jan-18			Company:	TowGo							'	Work Order:	: R3666
Engineer:	Zac Johnson			EUT Desc:	Trailer Hitc	h Sensor	with BLE				EUT Operat	ing Voltage	Frequency:	Battery
Temp:	24.1°C			Humidity:	21%			Pressure:	1004mBar					
		Freque	ncy Range:	18-25GHz							Measureme	nt Distance:	0.1 m	
Notes:											EU.	Γ Max Freq:	2480MHz	
Antenna		Peak	Average	Preamp	Antenna	Cable	Adjusted	Adjusted	FCC Clas	s B High Fre	equency -	FCC Cla	ss B High Fr Average	
olarization (H/V)	Frequency (MHz)	Reading (dBuV)	Reading (dBuV)	Factor (dB)	Factor (dB/m)	Factor (dB)	Peak Reading (dBμV/m)	Avg Reading (dBμV/m)	Limit (dBµV/m)	Margin (dB)	Result (Pass/Fail)	Limit (dBµV/m)	Margin (dB)	Result (Pass/Fail
H/V	. ,	missions Fo	V- F- /	(db)	(dB/III)	(ub)	(αδμν/π)	(ασμν/π)	(σομν/π)	(GD)	(1 833/1 811)	(обрутп)	(GD)	(1 433/1 411
Table	e Result:		Pass	by		dB					W	orst Freq:		MHz
Test Site:	EMI Chamber	1		Cable 1:	Asset #23	23				Cable 2:			Cable 3:	
Analyzor	Brown SA			Preamn:	18-26.5GH	7				Antenna:	18-26.5GHz	Horn I	Preselector:	

18-25GHz All Channels

Rev. 1/19/2018								
Spectrum Analyzers / Receivers / Preselectors	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Brown	9kHz-26.5GHz	E4407B	Agilent	SG44210511	1510	ı	7/26/2018	7/26/2017
Rental MXE EMI Receiver(1168255)	20Hz-8.4GHz	N9038A	Agilent	MY53290009	1168255	i	8/15/2018	8/15/2017
2093 MXE EMI Receiver	20Hz-26.5GHz	N9038A	Agilent	MY51210181	2093	İ	11/16/2018	11/16/2017
Radiated Emissions Sites	FCC Code	IC Code	VCCI Code	Range	Asset	Cat	Calibration Due	Calibrated on
EMI Chamber 1	719150	2762A-6	A-0015	30-1000MHz	1685	1	12/21/2018	12/21/2016
EMI Chamber 1	719150	2762A-6	A-0015	1-18GHz	1685	i	12/21/2018	12/21/2016
Preamps /Couplers Attenuators / Filters	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
2311 PA	1-1000MHz	PAM-103	COM-POWER	441174	2311		10/29/2018	10/29/2017
2311 FA 2111 HF Preamp	0.5-18GHz	PAM-118A	COM-POWER	551063	2111	ii	11/19/2018	11/19/2017
HF (Yellow)	18-26.5GHz	AFS4-18002650-60-8P-4	CS CS	467559	1266	ii	10/16/2018	10/16/2017
2116 BRF	0.009-18000MHz	BRM50702	Micro-Tronics	G226	2116	"	11/8/2018	11/8/2017
2110 BRF	0.009-16000IVITIZ	BHIVIOU/UZ	MICTO-TRONICS	G226	2116	"	11/0/2010	11/6/2017
Antennas	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Red-Brown Bilog	30-2000MHz	JB1	Sunol	A0032406	1218	- 1	1/13/2019	1/13/2017
HF (White) Horn	18-26.5GHz	801-WLM	Waveline	758	758	III	Verify before Use	date of test
Blue Horn	1-18Ghz	3117	ETS	157647	1861	1	2/14/2019	2/14/2017
Meteorological Meters/Chambers		MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Weather Clock (Pressure Only)		BA928	Oregon Scientific	C3166-1	831	1	4/28/2018	4/28/2016
TH A#2084		HTC-1	HDE		2084	II	3/23/2018	3/23/2017
Cables	Range		Mfr			Cat	Calibration Due	Calibrated on
Asset #2051	9kHz - 18GHz		Florida RF			II	3/5/2018	3/5/2017
Asset #2456	9KHz-18GHz		MegaPhase			ii.	10/29/2018	10/29/2017
Asset #2466	9KHz-18GHz		MegaPhase			ii.	10/29/2018	10/29/2017
Asset #2323	1-26.5GHz	TM26-S1S1-120	MEGAPHASE	17139101 002	2323	ii.	8/19/2018	8/19/2017

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

Test Equipment Used





Conducted Spurious Emissions

Limits: In any 100kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth that contains the highest level of desired power.

[15.247(d)]

MEASUREMENTS / RESULTS

9kHz to 25GHz frequency range was investigated for 3 channels (low, middle and high) and no emissions within 20dB of their corresponding fundamentals were observed.



9kHz-25GHz Conducted Spurious (Low channel)







9kHz-25GHz Conducted Spurious (Mid channel)



9kHz-25GHz Conducted Spurious (High channel)





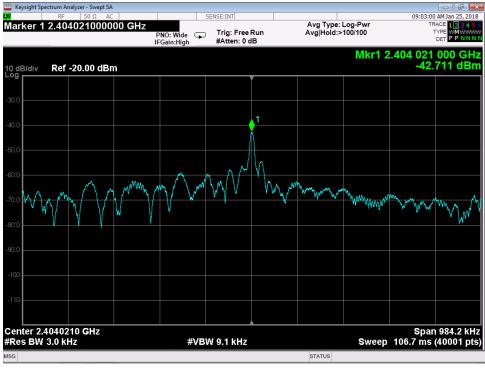
Power Spectral Density

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

		Peak Po	wer Spectral I	Density					
Date: 1/24/2017 Company: TowGo					Work Order: R3666				
Engineer: Zac Johns	nnson EUT: Trailer Hitch Sensor with BLE			Operating Voltage/Frequency: 12V DC					
Temp: 21.8°C	Humidity:	32%	Pressure: 999mBar						
Frequency Range	: 2404-2480 MHz	Measure	ment Type: Conducted						
Notes:									
Frequency	Peak Reading	Cable Loss	Attenuator Loss	Peak PSD	Limit	Margin	Result		
(MHz)	(dBm)	(dB)	(dB)	(dBm)	(dBm)	(dB)			
2404	-42.71	0.71	40.0	-2.00	8.0	-10.00	Pass		
2444	-42.76	0.71	40.0	-2.05	8.0	-10.05	Pass		
2480	-42.86	0.71	40.0	-2.15	8.0	-10.15	Pass		
Test Site: EMC-3	te: EMC-3 Cable: 2213 Cbl		Attenuator: 2107 40dB Pad						
Analyzer: 1118472 S	5A								

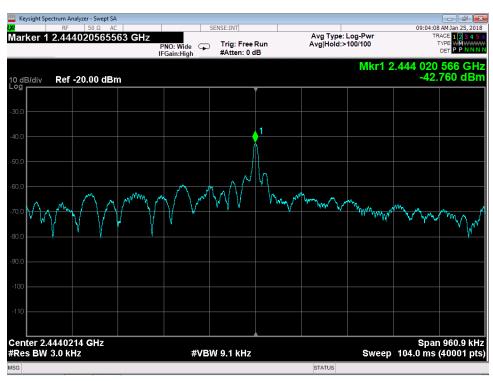
PLOTS



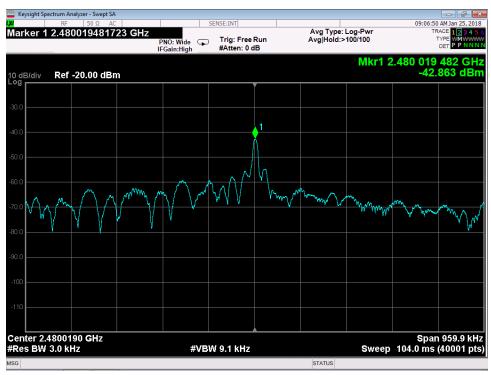
Low Channel PSD







Middle Channel PSD



High Channel PSD





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

	99	% Occupied Bandwidth	
Date: 1/24/2017	Company: TowGo	-	Work Order: R3666
Engineer: Zac Johnson	: Zac Johnson EUT: Trailer Hitch Sensor with BLE		Operating Voltage/Frequency: 12V DC
Temp: 21.8°C Humidity: 32%		Pressure: 999mBar	
Frequency Range: 2404	-2480 MHz	Measurement Type: Conducted	
Notes:			
Frequency		99% OBW	
(MHz)		(MHz)	
2404		1.065	
2444		1.067	
2480		1.066	
Test Site: EMC-3	Cable: 2213 Cbl	Attenuator: 2107 40dB Pad	
Analyzer: 1118472 SA			Copyright Curtis-Straus LLC

PLOTS



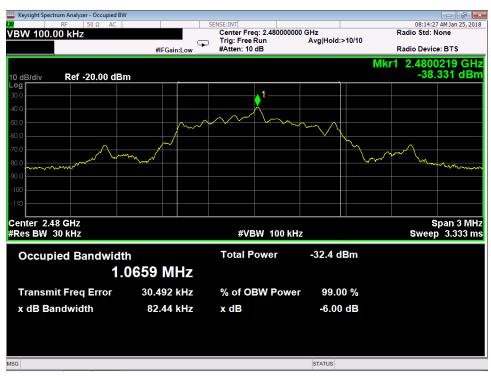
99% Occupied Bandwidth Low Channel







99% Occupied Bandwidth Middle Channel



99% Occupied Bandwidth High Channel



ACCREDITED

Testing Carl No. 1827-01

Test equipment below used for all conducted antenna port measurement tests within this report

Rev. 1/23/2018								
Spectrum Analyzers / Receivers / Preselectors	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Rental EXA Signal Analyzer(1118472)	9KHz-26.5GHz	N9010A-526;K	AT	MY51170010	1118472	1	7/25/2018	7/25/2017
Preamps /Couplers Attenuators / Filters	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
API - 40dB 100W Attenuator	0.009-18GHz	48-40-34	API Weinschel	CG7990	2107	II	10/4/2018	10/4/2017
Cables	Range		Mfr			Cat	Calibration Due	Calibrated on
Asset #2213	9KHz-18GHz		Mini-Circuits			II	10/4/2018	10/4/2017
Meteorological Meters/Chambers		MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Weather Clock (Pressure Only)		BA928	Oregon Scientific	C3166-1	831	- 1	4/28/2018	4/28/2016
TH A#2078		HTC-1	HDE		2078	II	3/23/2018	3/23/2017

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





Measurement Uncertainty

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

Measurement	Expanded Uncertainty k=2	Maximum allowable uncertainty
Radiated Emissions (30-1000MHz) 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 ⁻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		



ACCREDITED

Letino Cerl No. 1827 01

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.
- 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.
- 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 HEREI INDER

(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



