Electromagnetic Compatibility Test Report

Prepared in accordance with

CFR 47 Parts 22, 24, 27, RSS-132, RSS-133, RSS-139, CFR 47 Parts 15B, and ICES-003

Multiple Parts

On

Smart Watch

EF0001

Evado Filip US Ltd.
100 Glenspring Way
Morrisville, NC 27560 USA

Prepared by:

TUV Rheinland of North America, Inc.

Manufacturer's statement - attestation

The manufacturer; Company Name, as the responsible party for the equipment tested, hereby affirms:

a) That he has reviewed and concurs that the test shown in this report are reflective of the operational characteristics of the device for which certification is sought;

b) That the device in this test report will be representative of production units;

c) That all changes (in hardware and software/firmware) to the subject device will be reviewed.

d) That any changes impacting the attributes, functionality or operational characteristics documented in this report will be communicated to the body responsible for approving (certifying) the subject equipment.

Paal Selnaes	
Printed name of official	Signature of official
100 Glenspring Way Morrisville, NC 27560 USA	9 July 2013
Address	Date
919-807-9281	pal.selnes@evadofilip.com
Telephone number	Email address of official

Client:	FILIP	Evado Filip US Ltd. 100 Glenspring Way Morrisville, NC 27560 USA	Paal Selnaes 919-807-9281 pal.selnes@evadofilip.com
Identification:	EF0001	***Serial No.:***	PRODUCTION PROTOTYPE
Test item:	Smart Watch	***Date tested Completed:***	8 March 2013
Testing location:	TUV Rheinland of North America 762 Park Avenue Youngsville, NC 27596-9470 U.S.A.	Tel: (919) 554-3668 Fax: (919) 554-3542	
Test specification:	**Emissions: FCC Parts 22H, 24E, 27L, RSS-132 Issue 2, RSS-133 Issue 5, RSS-139 Issue 2:** FCC Parts 22H, 24E, 27L, RSS-132 Issue 2, RSS-133 Issue 5, RSS-139 Issue 2, FCC Parts 15.109(a), 15.107(a) and ICES-003, FCC Part 2.1093 and RSS-102, Issue 4		
Test Result	**The above product was found to be Compliant to the above test standard(s)**		

tested by: Mark Ryan	***reviewed by:*** Robert Richards
23 July 2013 *Date* *Signature*	23 July 2013 *Date* *Signature*
Other Aspects:	**None**

Abbreviations: OK, Pass, Compliant, Complies = passed Fail, Not Compliant, Does Not Comply = failed N/A = not applicable

FC	ilac-MRA A2LA ACCREDITED	**Industry Canada**
90552 and 100881	**Testing Cert #3331.05**	**2932H-1 and 2932H-2**

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1 General Information

1.1 Scope

This report is intended to document the status of conformance with the requirements of the CFR 47 Parts 22, 24, 27, RSS-132, RSS-133, RSS-139 based on the results of testing performed on 8 March 2013 on the Smart Watch , Model No. EF0001, manufactured by Evado Filip US Ltd.. This report only applies to the specific samples tested under the stated test conditions. It is the responsibility of the manufacturer to assure that additional production units of this model are manufactured with identical or EMI equivalent electrical and mechanical components. This report is further intended to document changes and modifications to the EUT throughout its life cycle. All documentation will be included as a supplement.

1.2 Purpose

Testing was performed to evaluate the EMC performance of the EUT (Equipment Under Test) in accordance with the applicable requirements, procedures, and criteria defined in the application of regulations and application of standards listed in this report.

1.3 Revision History

Revision	Date	Description of Revision
--	17 Jul 2013	Initial Release
A	23 Jul 2013	Corrected Typos and added unintentional Emissions data.

1.4 *Summary of Test Results*

Applicant	Evado Filip US Ltd. 100 Glenspring Way Morrisville, NC 27560 USA	**Tel**	919-807-9281	**Contact**	Paal Selnaes
		Fax		**e-mail**	pal.selnes@evadofilip.com

Description	Smart Watch	**Model Number**	EF0001
Serial Number	PRODUCTION PROTOTYPE	**Test Voltage/Freq.**	120VAC/60Hz
Test Date Completed:	8 March 2013	**Test Engineer**	Mark Ryan

Standards	Description	Severity Level or Limit	Results	Test Result
FCC Parts 22H, 24E, 27L Standard	For operation in the Cellular Radiotelephone, Broadband PCS, and Miscellaneous Wireless Communications Services	See called out basic standards below	See Below	**Complies**
RSS-132 Issue 2, RSS-133 Issue 5, RSS-139 Issue 2 Standard	Licensed Cellular Telephone Sysems Operating in the 824-849 MHz Band , 2 GHz Personal Communications Services, and Advanced QWireless Services Equipment Operating in the 1710-1755MHz Band	See called out basic standards below	See Below	**Complies**
FCC Parts 22H, 24E, 27L, RSS-132 Issue 2, RSS-133 Issue 5, RSS-139 Issue 2	Effective Radiated Power / Equivalent Isotropic Radiated Power	See called out reuqirements below	--	Complies
FCC Parts 15.109(a), 15.107(a) and ICES-003	Radiated Emissions while EUT in Receive Mode	Below Class B limits of standards Rad: Conducted:	31.50 dBµV 55.46 dBµV	Complies
FCC Part 2.1093 and RSS-102, Issue 4	RF Exposure	SAR or MPE Requirements Conducted:	1.15 W/kg	Complies

2 Laboratory Information

2.1 Accreditations

2.1.1 US Federal Communications Commission

TUV Rheinland of North America located at 762 Park Avenue, Youngsville, NC 27596-9470 is accredited by the commission for performing testing services for the general public on a fee basis. This laboratory test facilities have been fully described in reports submitted to and accepted by the FCC (Registration No 90552 and 100881). The laboratory scope of accreditation includes: Title 47 CFR Part 15, and 18. The accreditation is updated every 3 years.

2.1.2 ILAC / A2LA

The laboratory has been assessed and accredited by A2LA in accordance with ISO Standard 17025:2005 (Certificate Number: 3331.05, Master Code: 134288). The scope of laboratory accreditation includes emission and immunity testing. The accreditation is updated annually.

2.1.3 Industry Canada

Registration No.: 2932H-1 The OATS has been accepted by Industry Canada to perform testing to 3 and to 10 meters, based on the test procedures described in ANSI C63.4-2009.

Registration No.: 2932H-2 The 5 meter chamber has been accepted by Industry Canada to perform testing to 3 meters, based on the test procedures described in ANSI C63.4-2009.

2.1.4 Japan – VCCI

The Voluntary Control Council for Interference by Information Technology Equipment (VCCI) is a group that consists of Information Technology Equipment (ITE) manufacturers and EMC test laboratories. The purpose of the Council is to take voluntary control measures against electromagnetic interference from Information Technology Equipment, and thereby contribute to the development of a socially beneficial and responsible state of affairs in the realm of Information Technology Equipment in Japan. TUV Rheinland at the 762 Park Ave. Youngsville, N.C 27596 address has been assessed and approved in accordance with the Regulations for Voluntary Control Measures. (Laboratory Registration No: A-0034).

2.1.5 Sample Calculation – radiated & conducted emissions

The field strength is calculated by subtracting the Amplifier Gain and adding the Cable Loss and Antenna Correction Factor to the measured reading. The basic equation is as follows:

Field Strength (dBμV/m) = RAW - AMP + CBL + ACF

Where: RAW = Measured level before correction (dBμV)

AMP = Amplifier Gain (dB)

CBL = Cable Loss (dB)

ACF = Antenna Correction Factor (dB/m)

$$\mu V/m = 10^{\frac{dB\mu V/m}{20}}$$

2.1.6 Sample radiated emissions calculation @ 30 MHz

Measurement +Antenna Factor–Amplifier Gain+Cable loss=Radiated Emissions (dBuV/m)

25 dBuV/m + 17.5 dB – 20 dB + 1.0 dB = 23.5 dBuV/m

2.2 Expanded Measurement Uncertainty Emissions

Per CISPR 16-4-2:2011	**U_{lab}**	**U_{cispr}**
Radiated Disturbance @ 3m, 10m		
30 MHz – 1,000 MHz	Horz. 3m = 4.52, Horz. 10m = 4.51	5.2 dB
1.0 GHz – 6.0 GHz	3m = 4.25	5.2 dB
6.0 GHz – 18.0 GHz	3m = 4.93	5.5 dB
Conducted Disturbance @ Mains Terminals		
9 kHz – 150 kHz	2.84 dB	4.0 dB
150 kHz – 30 MHz	3.33 dB	3.6 dB
Disturbance Power		
30 MHz – 300 MHz	4.00 dB	4.5 dB

Measurement Uncertainty Immunity

The estimated combined standard uncertainty for ESD immunity measurements is ± 4.10%	Per IEC 61000-4-2
The estimated combined standard uncertainty for radiated immunity measurements is ± 2.05dB	Per IEC 61000-4-3
The estimated combined standard uncertainty for conducted immunity measurements; CDN is ± 1.83dB.	Per IEC 61000-4-6
The estimated combined standard uncertainty for harmonic current and flicker measurements; PM6000 is ± 2.5%.	Per CISPR 16-4-2

(Surge immunity is Per CISPR 16-4-2 methods)

The estimated combined standard uncertainty for EFT fast transient immunity measurements is ± 2.92%.
The estimated combined standard uncertainty for surge immunity measurements is ± 2.92%.

Measurement Uncertainty Immunity

The estimated combined standard uncertainty for power frequency magnetic field immunity measurements is ± 5.80 %
The estimated combined standard uncertainty for voltage variation and interruption measurements is ± 1.74 %

Expanded measurement uncertainty numbers are shown in the tables above. Compliance criteria are not based on measurement uncertainty. The expanded uncertainty at a level of 95% confidence is obtained by multiplying the combined standard uncertainty by a coverage factor of 2.

Calibration Traceability

All measurement instrumentation is traceable to the National Institute of Standards and Technology (NIST). Measurement method complies with ANSI/NCSL Z540-1-1994 and ISO Standard 17025:2005. Equipment calibration records are kept on file at the test facility.

2.3 Software Used

Manufacturer	Name	Version
Quantum Change/EMC Systems LLC.	Tile	3.2U
TopRudder	RadCon RF Immunity	1.1.13
TUV	Alt “R”	1
TUV	Alt “C”	1
VolTech Instruments	IEC61000-3 for PM6000	1.24.12
California Instruments	AC Source GUI 32	1.19
CTS	CTS 3.0	3.2.0.32
KeyTek ECAT	Surgeware	V5.31
KeyTek ECAT	Burstware	V5.31
Rohde & Schwarz	Click Rate Analyzer	1.7.0

2.4 Measurement Equipment Used

Equipment	Manufacturer	Model #	Serial/Inst #	Last Cal dd/mm/yy	Next Cal dd/mm/yy
Radiated Emissions (5 Meter Chamber) and Conducted RF Measurements					
Receiver, EMI	Rohde & Schwarz	ESIB40	100043	04-Sep-12	04-Sep-13
Receiver, EMI	Rohde & Schwarz	ESCI 7	100917	05-Sep-12	05-Sep-13
Spectrum Analyzer	Agilent Tec.	E7405A	US39440161	28-Sep-12	28-Sep-13
Amplifier, preamp	Agilent Technologies	8449B	3008A01480	14-Nov-11	14-Nov-13
Ant. BiconiLog	Chase	CBL6140A	1108	24-Aug-11	24-Aug-13
Antenna Horn 1-18GHz	EMCO	3115	5770	26-Sep-12	26-Sep-14
Cable, Coax	MicroCaox	MKR300C-0-0-1200-500500	002	01-Sep-12	01-Sep-13
Cable, Coax	MicroCaox	MKR300C-0-1968-500310	005	01-Sep-12	01-Sep-13
Cable, Coax	MicroCaox	UFB29C-1-5905-50U-50U	009	01-Sep-12	01-Sep-13
Cable, Coax	Andrew	FSJ1-50A	045	01-Sep-12	01-Sep-13
1.5 GHz High Pass Filter	Bonn Electronik	BHF 1500	025155	14-Nov-11	14-Nov-13
3.0 GHz High Pass Filter	Bonn Electronik	BHF 3000	025155	14-Nov-11	14-Nov-13
High Pass Filter	Micro-tronics	BRM50702	049	14-Nov-11	14-Nov-13
Conducted Emissions (AC/DC and Signal I/O)					
Receiver, EMI	Rohde & Schwarz	ESCI 7	100917	05-Sep-12	05-Sep-13
Cable, Coax	Pasternack	RG-223	051	01-Sep-12	01-Sep-13
LISN 15-18 (NSLK 8126)	Schwarzbeck Mess-Electronik	NSLK 8126	003885	11-Jan-12	11-Jan-14
Transient Limiter	Schaffner	CFL-9206	1649	01-Aug-11	01-Aug-13
General Laboratory Equipment					
Meter, Multi	Fluke	179	90580752	06-Sep-12	06-Sep-13
RFI (5m) Test System	TUV Rheinland	5 Meter		CNR	CNR
Meter, Temp/Humid/Barom	Davis	7400	PB00205A13	09-May-12	09-May-13
Meter, Temp/Humid/Barom	Davis	7400	PB00205A05	09-May-12	09-May-13

3 Product Information

3.1 Product Description

See Section Appendix A.

3.2 Equipment Modifications

No modifications were needed to bring product into compliance.

3.3 Test Plan

The EUT product information, test configuration, mode of operation, test types, test procedures, test levels, pass/failure criteria, in this report were carried out per the product test plan located in appendix A of this report

4 Effective Radiated Power / Equivalent Isotropic Radiated Power

Results	**Complies** (as tested per this report)				**Date**	4 March 2013	
Standard	FCC Parts 22H, 24E, 27L, RSS-132 Issue 2, RSS-133 Issue 5, RSS0139 Issue 2						
Product Model	SMART WATCH			**Serial#**	PRODUCTION PROTOTYPE		
Test Set-up	Tested in a 5m Semi Anechoic chamber, placed on a 1.0m x 1.5m non-conductive table 80cm above the ground plane on a turn-table. See test plans for details						
EUT Powered By	120V 60Hz	**Temp**	70º F	**Humidity**	21%	**Pressure**	997 mbar
Perf. Criteria	(Below Limit)			**Perf. Verification**	Readings Under Limit		
Mod. to EUT	None			**Test Performed By**	Mark Ryan		

4.1 Limits for FCC and Industry Canada:

For the frequencies used by this device;

4.1.1 ERP and EiRP Limits of Fundamental Frequencies:

(i) For FCC Part 22.913(a)(2): The ERP of mobile transmitters must not exceed 7.0 Watts.
For RSS-132 clause 5.4 The EiRP of mobile transmitters must not exceed 11.5 Watts.

(ii) For FCC Part 24.232(c): The EiRP of mobile transmitters must not exceed 2 Watts.
For SRSP-510 clause 5.1.2 The EiRP of mobile transmitters must not exceed 2 Watts.

(iii) For FCC Part 27.(d)(2): The EiRP of mobile transmitters are limited to 1 Watt.
For RSS-139 clause 6.4: The average EiRP for mobile transmitters must not exceed 1 Watt.

Rule Part	*1Max Output Power (dBm)	*2Max Output Power (W)	*3ERP Ant Gain (dB)	*4EiRP Ant Gain (dBi)	Output ERP		Output EiRP		Limit (W)	Margin (W)	Result
					dBm	*5W	dBm	*5W			
FCC 22.913(a)(2)	33.00	1.995	-5.15	-3.00	27.85	0.609	NA	NA	7.0	-6.391	**PASS**
RSS-132 clause 5.4	33.00	1.995	-5.15	-3.00	NA	NA	30.00	1.000	11.5	-10.500	**PASS**
Part 24.232(c) and SRSP-510 clause 5.1.2	29.97	0.993	-3.15	-1.00	NA	NA	28.97	0.789	2.0	-1.211	**PASS**
FCC Part 27.(d)(2) and RSS-139 clause 6.4	23.54	0.226	-2.75	-0.60	NA	NA	22.94	0.197	1.0	-0.803	**PASS**

*Notes: Low Mid and High channels were tested on each band (on file at TUV), worst case data shown above.

[1]The Max Power in dBm is calculated from the power value given Watts. Where; dBm=10log(W)+30.

[2]The Max Power Outputs are referenced in the HE910 Test Reports.

[3]The $ERP_{(Gain)}$ is calculated from the provided EiRP gain of the antenna. Where; $dB_{(Gain)} = dBi_{(Gain)}$ -2.15 .

[4]The EiRP gain in dBi of the antenna is provided by the manufacturer of the antenna.

[5]The ERP and EiRP Output in Watts is calculated. Where; $W=10^{((dBm-30)/10)}$

4.1.2 EiRP Limits Outside the Operating Bands:

(i) In the first 1.0 MHz band immediately outside and adjacent to the equipment's operating frequency block, the power of emissions per any 1% of the occupied bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least $43 + 10 \log_{10} p$ (watts).

(ii) After the first 1.0 MHz immediately outside and adjacent to each of the sub-bands, the power of emissions in any 100 kHz (below 1 GHz) or 1MHz (above 1 GHz) bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least $43 + 10 \log_{10} p$ (watts).

4.1.3 Test Procedure

The measurements are made according to ANSI/TIA-603-C:2004 as follows:

The EUT was placed on a non-conductive table. The radiated emission at the fundamental frequency was measured at 3m with a test antenna and EMI spectrum analyzer.

During the measurement of the EUT, the RBW was set to 1 MHz and VBW set to 3MHz. The highest emissions were recorded with the rotation of the turntable and th .

4.1.4 Deviations

Since all calculated margins are more than 30dB from the limit, the substitution method was not used.

An approximation of the Power outputs in dBi was calculated using the following equation:

$$P=(E*d)^2 / (30*G)$$

Where:

P is the transmitter power (EiRP) in Watts

E is the Field Strength in V/m

G: Is the numeric gain of the transmitting antenna over an isotropic radiator.

d: is the distance at which the measurement is being made. (3m)

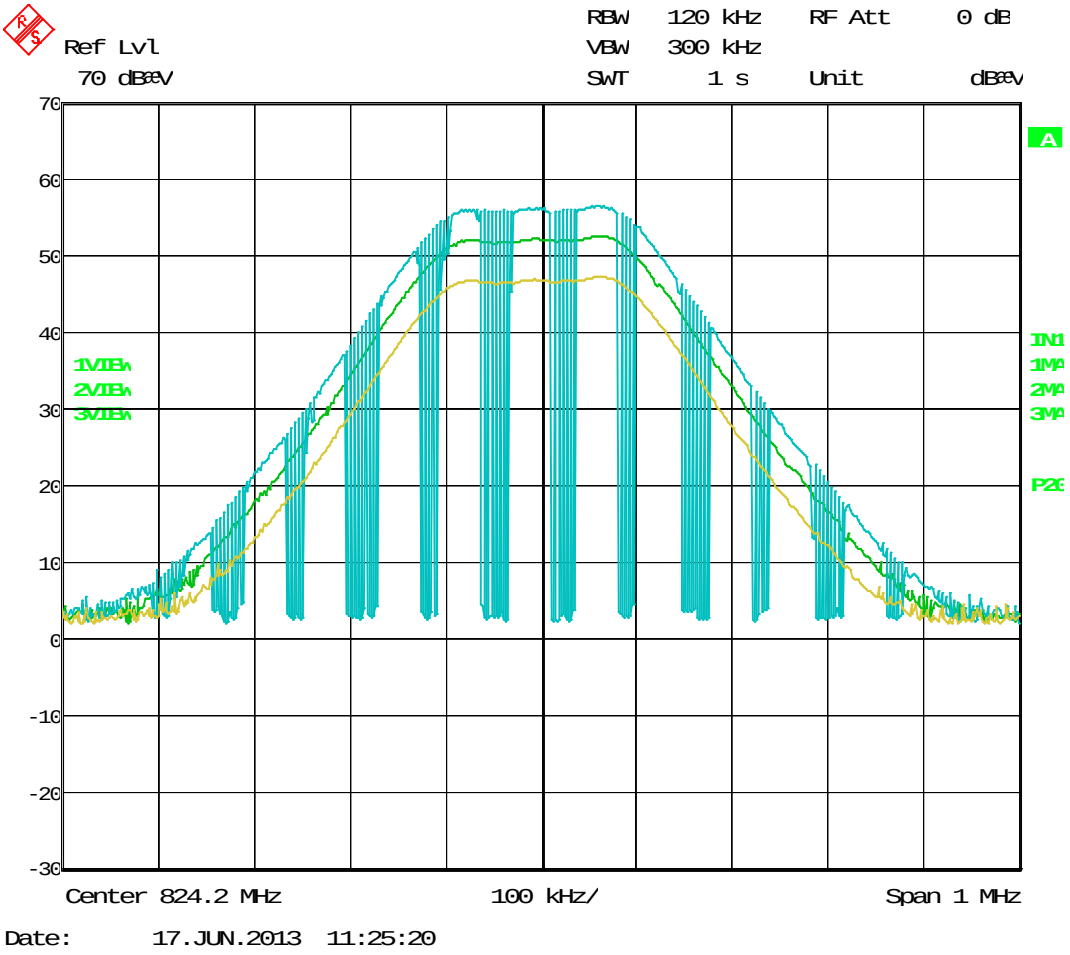
4.1.5 Final Test

All final radiated spurious emissions measurements were below (in compliance) the limits.

The worst –case emissions are shown below. All other emissions are on file at TUV Rheinland.

4.1.5.1 Emissions Outside the Frequency Band

Three orientations of the EUT investigated for highest emissions:



NOTE: Orientation A produced the highest emission

See test set-up photos for orientation evaluation.

Radiated Emissions

30MHz – 1 GHz

Emission Freq (MHz)	ANT Polar (H/V)	FIM Value (dBm)	Corr Factors (dB)	Corrected Value (dBm)	Spec Limit (dBm)	Spec Margin (dB)	Channel (H/M/L)	Remark
GPRS 850:		(Part 22)						
796.38	H	-95.59	24.63	-70.96	-13.00	-57.96	H	Peak
GPRS 1900:		(Part 24)						
68.4	V	-99.55	10.43	-89.12	-13.00	-76.12	L	Peak
844	V	-96.47	25.45	-71.02	-13.00	-58.02	H	Peak
EGPRS 850:		(Part 22)						
66.11	V	-99.71	10.7	-89.01	-13.00	-76.01	L	Peak
262.14	V	-103.28	14.35	-88.93	-13.00	-75.93	M	Peak
88.6	V	-98.13	7.9	-90.23	-13.00	-77.23	H	Peak
325.62	V	-94.98	15.71	-79.27	-13.00	-66.27	H	Peak
796.86	H	-95.85	24.63	-71.22	-13.00	-58.22	H	Peak
EGPRS 1900:		(Part 24)						
68.84	V	-91.74	10.38	-81.36	-13.00	-68.36	H	Peak
839.9	V	-97.88	25.52	-72.36	-13.00	-59.36	H	Peak
WCDMA Band iv		(Part 27)*						
836.48	V	-102.68	37.81	-64.87	-13.00	-51.87	M	Peak

Radiated Emissions

1 to 20 GHz

Emission Freq (MHz)	ANT Polar (H/V)	FIM Value (dBm)	Corr Factors (dB)	Corrected Value (dBm)	Spec Limit (dBm)	Spec Margin (dB)	Channel (H/M/L)	Remark
GSM 850:		(Part 22)						
2501	H	-57.35	2.78	-54.57	-13.00	-41.57	M	Peak
2945.9	H	-68.68	4.59	-64.09	-13.00	-51.09	M	Peak
GPRS1900:		(Part 24)						
5551.1	V	-65.97	13.03	-52.94	-13.00	-39.94	L	Peak
5729.2	H	-63.33	12.83	-50.5	-13.00	-37.5	L	Peak
WCDMA Band iv:		(Part 27)*						
3506.8	H	-59.01	19.37	-39.64	-13.00	-26.64	H	Peak

*Notes:

For the Part 27 Band, a correction factor of 12.36 dB was added to include the Site attenuation (11.76 dB at 3m) minus the maximum antenna gain (-0.6 dBi for 1700MHz)

5 Unintentional Emissions

5.1 Radiated Emissions FCC Part 15.109(a) and ICES-003

This test measures the electromagnetic levels of spurious signals generated by the EUT that radiated from the EUT and may affect the performance of other nearby electronic equipment.

5.1.1 Over View of Test

Results	**Complies** (as tested per this report)					**Date**	June 18, 2013
Standard	FCC Part 15.109(a) and ICES-003						
Product Model	EF0001			**Serial#**	PROTOTYPE		
Configuration	See test plan for details						
Test Set-up	Tested in a 5m Semi Anechoic chamber, placed on a 1.0m x 1.5m non-conductive table 80cm above the ground plane on a turn-table. See test plans for details.						
EUT Powered By	120VAC / 60 Hz	**Temp**	76º F	**Humidity**	40%	**Pressure**	998mbar
Frequency Range	30 MHz to 1000 MHz@ 3m						
Perf. Criteria	(Below Limit)			**Perf. Verification**	Readings Under Limit		
Mod. to EUT	None			**Test Performed By**	Mark Ryan		

5.1.2 Test Procedure

Radiated and FCC emissions tests were performed using the procedures of ANSI C63.4:2009 including methods for signal maximizations and EUT configuration. The photos included with the report show the EUT in its maximized configuration.

Other than the transmitter module, none of the clocks or crystals frequencies are above 108 MHz, As such, the frequency range from 30 MHz to 1 GHz was investigated for radiated emissions.

Radiated emission testing was performed at a distance of 3 meters in a 5 meter semi-anechoic chamber.

5.1.3 Deviations

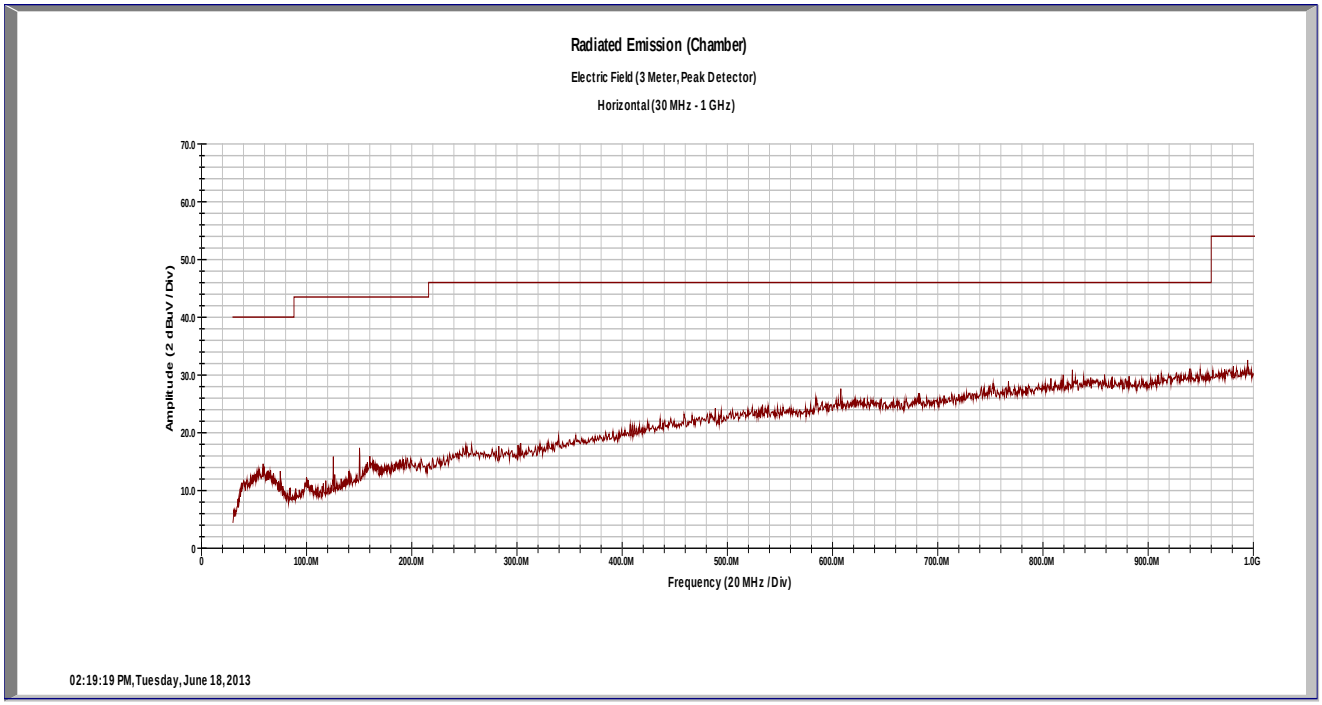
There were no deviations from the test methodology listed in the test plan for the radiated emission test.

5.1.4 Final Test

All final radiated emissions measurements were below (in compliance) the limits.

5.1.5 Final Data and Graphs

Radiated Emissions
Horizontal



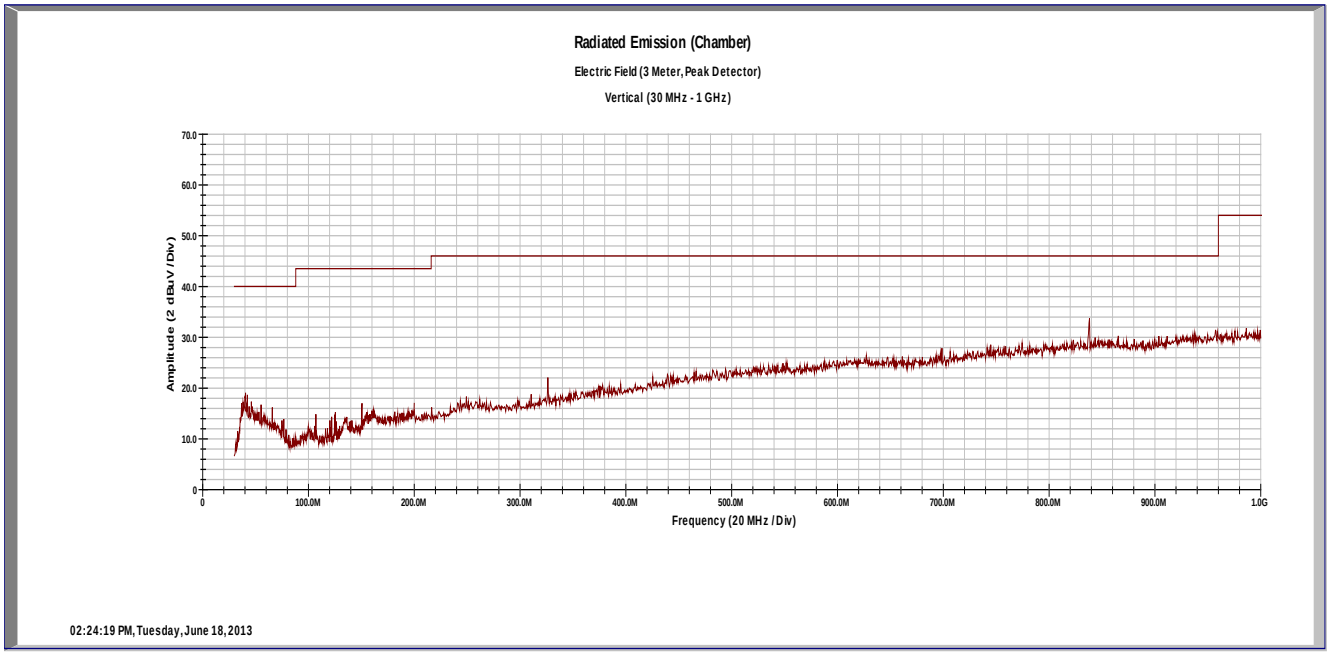
Emission Freq (MHz)	ANT Polar (H/V)	ANT Pos (m)	Table Pos (deg)	FIM Value (dBµV)	Amp Gain (dB)	Cable Loss (dB)	ANT Factor (dB/m)	E-Field Value (dBµV/m)	Spec Limit (dBµV/m)	Spec Margin (dB)

Spec Margin = E-Field Value - Limit, E-Field Value = FIM Value - Amp Gain + Cable Loss + ANT Factor

Notes: The spikes shown below 200 MHz in the above graph are anomalies form the internal pre-amp of the EMC Receiver.

No measureable signals were observed.

Radiated Emissions
Vertical



Emission Freq (MHz)	ANT Polar (H/V)	ANT Pos (m)	Table Pos (deg)	FIM Value (dBµV)	Amp Gain (dB)	Cable Loss (dB)	ANT Factor (dB/m)	E-Field Value (dBµV/m)	Spec Limit (dBµV/m)	Spec Margin (dB)

Spec Margin = E-Field Value - Limit, E-Field Value = FIM Value - Amp Gain + Cable Loss + ANT Factor

Notes: The spikes shown below 200 MHz in the above graph are anomalies form the internal pre-amp of the EMC Receiver. The spikes show above 300 MHz were transients and not measureable.

No measureable signals were observed.

5.2 Conducted Emissions FCC Part 15.107(a) and ICES-003

This test measures the electromagnet levels of spurious signals generated by the EUT on the AC power line that may affect the performance of other nearby electronic equipment.

5.2.1 Over View of Test

Results	**Complies** (as tested per this report)					**Date**	21 June 2013
Standard	FCC Part 15.107(a) and ICES-003						
Product Model	EF0001			**Serial#**	PROTOTYPE		
Configuration	See test plan for details						
Test Set-up	EUT placed on a 1.0m x 1.5m non-conductive table 80cm above the ground plane, 40cm from a vertical ground plane. See test plans for details.						
EUT Powered By	120VAC / 60 Hz	**Temp**	75º F	**Humidity**	47%	**Pressure**	1009mbar
Frequency Range	150 kHz to 30 MHz						
Perf. Criteria	(Below Limit)	**Perf. Verification**	Readings Under Limit for L1 & Neutral				
Mod. to EUT	None	**Test Performed By**	Mark Ryan				

5.2.2 Test Procedure

Conducted and FCC emissions tests were performed using the procedures of ANSI C63.4:2009 including methods for signal maximizations and EUT configuration. The photos included with the report show the EUT in its maximized configuration.

The frequency range from 150 kHz to 30 MHz was investigated for conducted emissions.

EUT was placed on a 1.0m x 1.5m non-conductive table 80cm above the ground plane, 40cm from a vertical ground plane, using procedures specified in the test plan and standard.

5.2.3 Deviations

There were no deviations from the test methodology listed in the test plan for the conducted emission test.

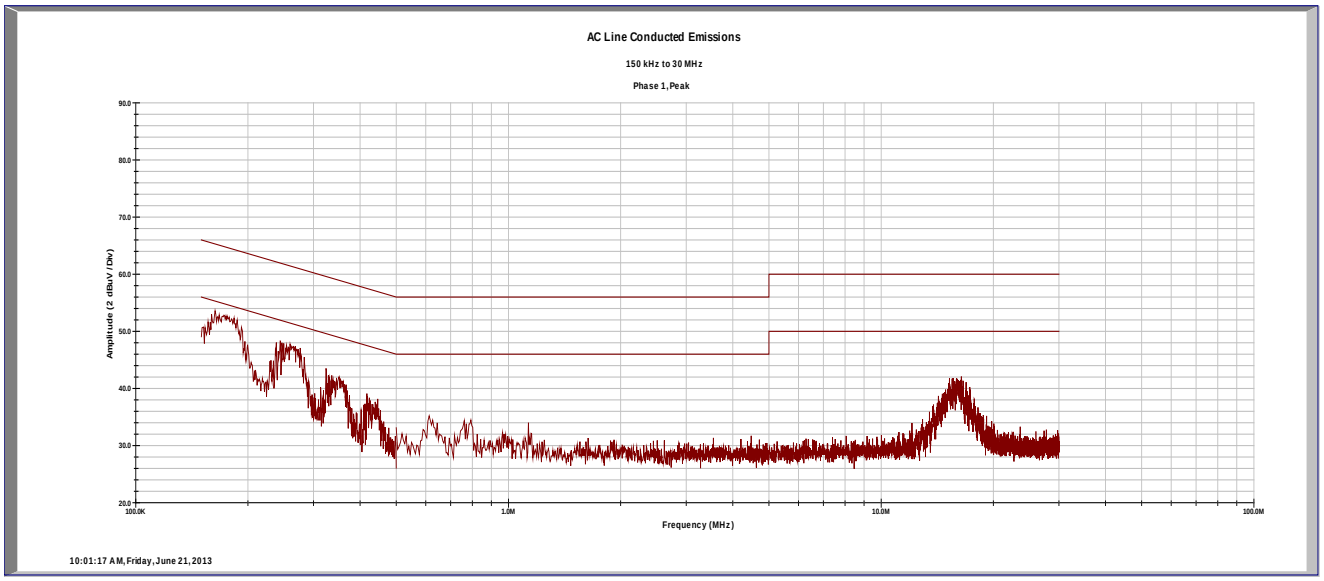
5.2.4 Final Test

All final conducted emissions measurements were below (in compliance) the limits.

5.2.5 Final data and Graphs

Conducted Emissions @ 120V/60Hz

Line 1



Freq (MHz)	ID (1,2,3,N)	Quasi FIM (dBµV)	Ave FIM (dBµV)	Cable Loss (dB)	TL/LISN (dB)	Limit QP (dBµV)	Limit AVE (dBµV)	Margin QP (dB)	Margin AVE (dB)
0.16	1	34.14	13.04	0.03	9.98	65.46	55.46	-21.31	-32.41
0.25	1	27.89	9.92	0.03	9.99	61.76	51.76	-23.85	-31.82
0.41	1	15.93	6.71	0.03	10.00	57.65	47.65	-31.68	-30.90
1.11	1	9.43	5.77	0.06	10.02	56.00	46.00	-36.49	-30.15
16.40	1	23.07	10.57	0.28	10.51	60.00	50.00	-26.14	-28.64

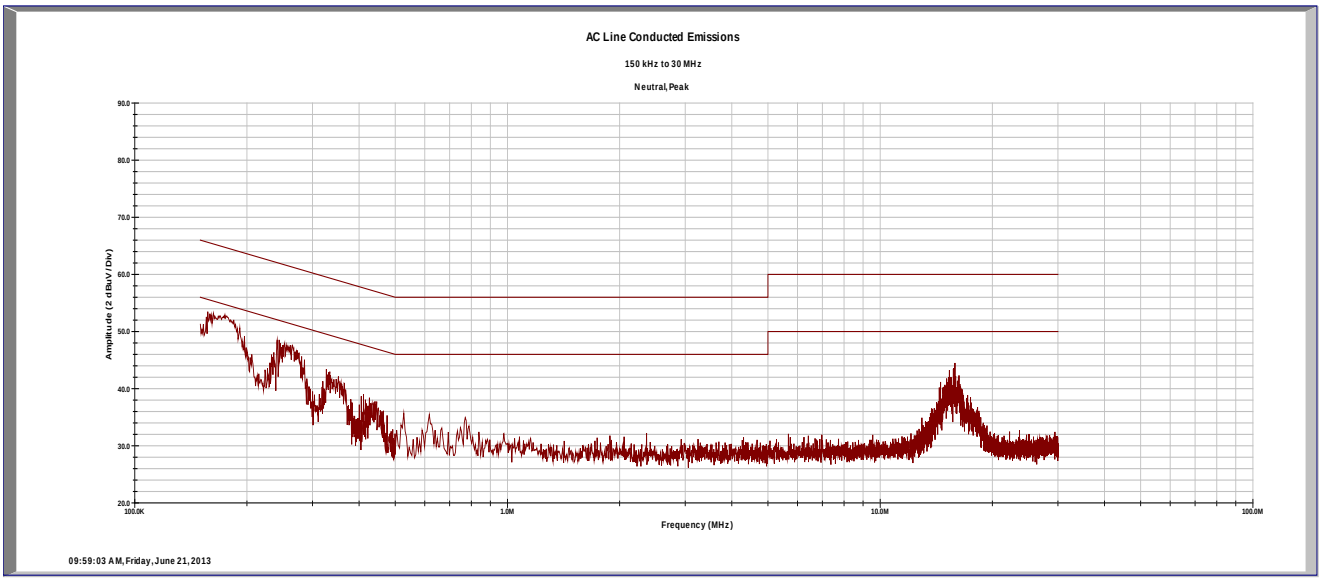
Quasi Spec Margin = Quasi FIM + Cable Loss + LISN CF - Quasi Limit ± Uncertainty
Ave Spec Margin = Ave FIM + Cable Loss + LISN CF - Ave Limit ± Uncertainty

Combined Standard Uncertainty $u_c(y)$ = ± 1.66dB Expanded Uncertainty $U = ku_c(y)$ k = 2 for 95% confidence

Notes:

Conducted Emissions @ 120V/60Hz

Neutral



Freq (MHz)	ID (1,2,3,N)	Quasi FIM (dBµV)	Ave FIM (dBµV)	Cable Loss (dB)	TL/LISN (dB)	Limit QP (dBµV)	Limit AVE (dBµV)	Margin QP (dB)	Margin AVE (dB)
0.17	N	33.66	12.53	0.03	9.97	64.96	54.96	-21.30	-32.43
0.25	N	27.62	9.66	0.03	9.98	61.76	51.76	-24.13	-32.09
0.40	N	14.73	6.46	0.03	9.98	57.85	47.85	-33.11	-31.38
0.74	N	14.11	7.52	0.05	9.99	56.00	46.00	-31.85	-28.44
15.87	N	21.53	8.76	0.28	10.41	60.00	50.00	-27.78	-30.55

Quasi Spec Margin = Quasi FIM + Cable Loss + LISN CF - Quasi Limit ± Uncertainty
Ave Spec Margin = Ave FIM + Cable Loss + LISN CF - Ave Limit ± Uncertainty

Combined Standard Uncertainty $u_c(y) = \pm 1.66$dB Expanded Uncertainty $U = ku_c(y)$ $k = 2$ for 95% confidence

Notes:

6 RF Exposure Evaluation

6.1 Exposure Requirements – FCC Part 2.1093 and RSS-102 Issue 4

If the antenna is located > 20cm from the user, then an MPE calculation is acceptable.

If the antenna is located < 20cm (portable / mobile / hand-held device) from the user, then SAR evaluation is required.

6.2 Evaluation for FCC

The EUT is indented to be a wrist worn device. Therefore the transmitter antennas are located in close proximity (< 20cm) to humans. A SAR evaluation is required for this device.

6.2.1 SAR Testing

SAR testing was performed at RF Exposure Lab, in San Marcos, CA. See the SAR Reports in exhibits list. The SAR levels are compliant with the FCC rules

6.2.2 Worst Case SAR Data Summary – Extremity Measurements:

This device was tested for bodyworn operation. The maximum SAR value reported is 1.15 W/kg.

The device was tested for operation against the head. The maximum SAR value reported is 0.23 W/kg”

6.3 Evaluation for Industry Canada

RSS-102, Issue 4, section 1.1 states that a SAR evaluation is the method used to evaluate the SAR levels from a device by physical measurement or computational modeling techniques. SAR evaluation is required if the separation distance between the user or bystanders and the device is less than or equal to 20 cm.

6.3.1 Evaluation

The EUT is indented to be a hand held device. Therefore the transmitter antennas are located in close proximity (< 20cm) to humans. A SAR evaluation is required for this device.

6.3.2 SAR Testing

SAR testing was performed at RF Exposure Lab, in San Marcos, CA. See the SAR Report in exhibits list. The SAR levels are compliant with the Industry Canada rules.

6.3.3 Worst Case SAR Data Summary – Extremity Measurements:

This device was tested for bodyworn operation. The maximum SAR value reported is 1.15 mW/g.

The device was tested for operation against the head. The maximum SAR value reported is 0.23 mW/g”

Appendix A

7 Test Plan

This test report is intended to follow this test plan outlined here in unless otherwise stated in this here report. The following test plan will give details on product information, standards to be used, test set ups and refer to TUV test procedures. The test procedures will give the steps to be taken when performing the stated test. The product information below came via client, product manual, product itself and or the internet.

7.1 General Information

Client	Evado Filip US Ltd.
Address 1	100 Glenspring Way
Address 2	Morrisville, NC 27560 USA
Contact Person	Paal Selnaes
Telephone	919-807-9281
e-mail	pal.selnes@evadofilip.com

7.1.1 Model(s) Name

Smart Watch

7.1.2 Type of Product

EF0001

7.1.3 Equipment Under Test (EUT) Description

This is a wrist worn personal Tracking Device that is worn by children to allow their parents to keep track of their location via *WiFi, Cellular and GPS technology. The device supports voice to allow two way communications.

*Please note that the WiFi section is RECEIVE ONLY. It only listens for WiFi activity. (See technical Description)

7.1.4 Modifications

No modifications were necessary to meet the requirements.

7.1.5 Product Environment

☒	**Residential**	☐	**Hospital**
☐	**Light Industrial**	☐	**Small Clinic**
☐	**Industrial**	☐	**Doctor's office**
☐	**Other**		

*Check all that apply

7.1.6 Countries

☒	**USA**
☒	**Canada**

*Check all that apply

7.2 Applicable Documents

Standards	Description
FCC Parts 22H, 24E, 27L, RSS-132 Issue 2, RSS-133 Issue 5, RSS-139 Issue 2	Licensed Cellular Telephone Sysems Operating in the 824-849 MHz Band , 2 GHz Personal Communications Services, and Advanced QWireless Services Equipment Operating in the 1710-1755MHz Band