EMISSIONS TEST REPORT

(FULL COMPLIANCE)

Report Number: 103104758BOX-005
Project Number: G103104758

Report Issue Date: 09/04/2017

Model(s) Tested:	Lowdown Focus
Model(s) Partially Tested:	None
Model(s) Not Tested but declared equivalent by the client:	None

Standards: CFR47 FCC Part 15.247 Subpart C:2017
CFR47 FCC Part 15 Subpart B:2017
RSS-247 Issue 2: 02/2017
ICES-003 Issue 6: 01/2016
RSS-Gen Issue 4: 11/2014
RSS-102 Issue 5: 03/2015

Tested by:
Intertek Testing Services NA, Inc.
70 Codman Hill Road
Boxborough, MA 01719
USA

Client:
Safilo SpA
via Settima Strada 15
35129 Padova
Italy

Report prepared by

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Report reviewed by

Michael F. Murphy / EMC Supervisor

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1 Introduction and Conclusion

The tests indicated in section 2.0 were performed on the product constructed as described in section 4.0. The remaining test sections are the verbatim text from the actual data sheets used during the investigation. These test sections include the test name, the specified test Method, a list of the actual Test Equipment Used, documentation Photos, Results and raw Data. No additions, deviations, or exclusions have been made from the standard(s) unless specifically noted.

Based on the results of our investigation, we have concluded the product tested **complies** with the requirements of the standard(s) indicated. The results obtained in this test report pertain only to the item(s) tested. Intertek does not make any claims of compliance for samples or variants which were not tested.

2 Test Summary

Section	Test full name	Result
3	Client Information	--
4	Description of Equipment Under Test and Variant Models	--
5	System Setup and Method	--
6	Maximum Peak Output Power and Human RF exposure (CFR47 FCC Part 15 Subpart C:2017, Section 15.247 (b)(3) RSS-247 Issue 2: 02/2017, RSS-102 Issue 5: 03/2015)	Pass
7	6 dB Bandwidth and Occupied Bandwidth (CFR47 FCC Part 15 Subpart C:2017, Section 15.247 (a)(2) RSS-247 Issue 2: 02/2017)	Pass
8	Maximum Power Spectral Density (CFR47 FCC Part 15 Subpart C:2017, Section 15.247 (e) RSS-247 Issue 2: 02/2017)	Pass
9	Band Edge Compliance (CFR47 FCC Part 15 Subpart C:2017, Section 15.247 (d) RSS-247 Issue 2: 02/2017)	Pass
10	Transmitter spurious emissions (CFR47 FCC Part 15 Subpart C:2017, Section 15.247 (d) RSS247 Issue2: 05/2015)	Pass
11	Digital Device Radiated Spurious Emissions (CFR47 FCC Part 15 Subpart B 15.109:2017, ICES-003 Issue 6 January 2016)	Pass
12	AC Mains Conducted Emissions CISPR 11:2009 +A1:2010, FCC 47CFR Part 15.107:2017 ICES-003 Issue 6: 01/2016	Pass
--	Receiver Radiated Spurious Emissions (CFR47 FCC Part 15 Subpart B 15.109, IC RSS-Gen Sections 4.10 & 6.0)	Exempt, above 960 MHz
13	Revision History	--

3 Client Information

This EUT was tested at the request of:

Client: Safilo SpA
via Settima Strada 15
35129 Padova
Italy

Contact: Barbara Pengo / Alessandro Bellati
Telephone: +39 049 6985282 / +39 049 6985252
Email: barbara.pengo@safilo.com / Alessandro.bellati@safilo.com

4 Description of Equipment Under Test and Variant Models

Manufacturer: XIAMEN INTRETECH INC.
NO.588 Jiahe Road, Xiamen
Xiamen Fujian, China

Equipment Under Test			
Description	Manufacturer	Model Number	Serial Number
Brain sensing eyewear	XIAMEN INTRETECH INC.	Lowdown Focus	BOX1707171118 (Intertek Assigned)

Receive Date:	07/17/2017
Received Condition:	Good
Type:	Production

Description of Equipment Under Test (provided by client)
The Lowdown Focus brain sensing eyewear is a device which measure brain activity though EEG (electroencephalography). It features 5 electrodes (3 on the nose and one behind each ear), 3 EEG electrodes, 1 electrodes for common mode rejection (also know as the DRL Circuit), and 1 reference electrode. The signals are fed through an analog front end featuring buffering, filtering and amplification then digitized and processed on a microcontroller to stream over BLE to a device (Smartphone, tablet or computer). The headband also features accelerometer and gyroscope sensors which are streamed over BLE.

Equipment Under Test Power Configuration			
Rated Voltage	Rated Current	Rated Frequency	Number of Phases
3.7 Lithium ion battery	80 mAh	N/A	N/A

Operating modes of the EUT:

No.	Descriptions of EUT Exercising
1	Transmit mode
2	Receive mode

Software used by the EUT:

No.	Descriptions of EUT Exercising
1	None

Radio/Receiver Characteristics	
Frequency Band(s)	2402-2480 MHz
Modulation Type(s)	GFSK
Maximum Output Power	0.00029040226545 W
Test Channels	Low Channel: 2402 MHz Mid Channel: 2442 MHz High Channel: 2480 MHz
Occupied Bandwidth	Low Channel: 1068.93 kHz Mid Channel: 1078.92 kHz High Channel: 1118.88 kHz
Frequency Hopper: Number of Hopping Channels	N/A
Frequency Hopper: Channel Dwell Time	N/A
Frequency Hopper: Max interval between two instances of use of the same channel	N/A
MIMO Information (# of Transmit and Receive antenna ports)	N/A
Equipment Type	Standalone
ETSI LBT/Adaptivity	N/A
ETSI Adaptivity Type	N/A
ETSI Temperature Category (I, II, III)	2
ETSI Receiver Category (1, 2, 3)	3
Antenna Type and Gain	Johanson 2450AT18B100, Average gain -0.5dBi, Peak gain 0.5dBi, Ceramic chip

Variant Models:

The following variant models were not tested as part of this evaluation, but have been identified by the manufacturer as being electrically identical models, depopulated models, or with reasonable similarity to the model(s) tested. Intertek does not make any claims of compliance for samples or variants which were not tested.

None

5 System Setup and Method

Cables					
ID	Description	Length (m)	Shielding	Ferrites	Termination
	None	--	--	--	--

Support Equipment			
Description	Manufacturer	Model Number	Serial Number
Laptop	HP	EliteBook 8470p	CNU244BH36
iPhone Charger*	Apple	A1265	1X3206XZ6G80Z

*Used for line conducted emissions test. Note that in normal operation the BLE can not be operated while it's charging.

5.1 Method:

Configuration as required by ANSI C63.10:2013, ANSI C63.4:2014, CFR47 FCC Part 15.247 Subpart C:2017, CFR47 FCC Part 15 Subpart B:2017, RSS-247 Issue 2: 02/2017,ICES-003 Issue 6: 01/2016, RSS-Gen Issue 4: 11/2014, RSS-102 Issue 5: 03/2015, and KDB 558074 D01 DTS Meas Guidance v03r05: 04/2016.

5.2 EUT Block Diagram:

6 Maximum Peak Output Power and Human RF exposure

6.1 Method

Tests are performed in accordance with CFR47 FCC Part 15.247, RSS-247, RSS-102, and ANSI C63.10.

TEST SITE: 10m ALSE

The 10m ALSE is 13m (Length) x 21m (Depth) x 10m (Height) with the effective size in terms of space from the tips of the absorber is 12m (Length) x 20m (Depth) x 8.5m (Height). This chamber achieves broadband performance using a unique arrangement of hybrid and ferrite tile absorber. This chamber has a built in 3m diameter turntable (Embedded type). The metal structure of the table makes electrical connection around the entire circumference of the turntable to the ground plane with a metal brush type connection. The turntable is located on one end of the chamber and the antennas are mounted 3 and 10 meters away at the other end of the chamber on the adjustable an Antenna Mast. The antenna mast is a non-conductive bore sighted type with remote control of antenna height and polarization. The Antenna Mast and the turntable can be remotely controlled through the controller located in the adjacent Control room. A Styrofoam table 80 cm high is used for table-top equipment.

Measurement Uncertainty

Measurement	Frequency Range	Expanded Uncertainty (k=2)	Ucispr
Radiated Emissions, 10m	30-1000 MHz	4.6 dB	6.3 dB
Radiated Emissions, 3m	30-1000 MHz	5.3 dB	6.3 dB
Radiated Emissions, 3m	1-6 GHz	4.5 dB	5.2 dB
Radiated Emissions, 3m	6-15 GHz	5.2 dB	5.5 dB
Radiated Emissions, 3m	15-18 GHz	5.0 dB	5.5 dB
Radiated Emissions, 3m	18-40 GHz	5.0 dB	5.5 dB

As shown in the table above our radiated emissions U_{lab} is less than the corresponding U_{CISPR} reference value in CISPR 16-4-2 Table 1, hence the compliance of the product is only based on the measured value, and no measurement uncertainty correction is required, based on CISPR 22 and CISPR 11 (for 2006 and later revisions) Clause 11.

Sample Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation with a sample calculation is as follows:

FS = RA + AF + CF - AG

Where FS = Field Strength in dBμV/m
RA = Receiver Amplitude (including preamplifier) in dBμV
CF = Cable Attenuation Factor in dB
AF = Antenna Factor in dB
AG = Amplifier Gain in dB

In the following table(s), the reading shown on the data table reflects the preamplifier gain. An example for the calculations in the following table is as follows.

Assume a receiver reading of 52.0 dBμV is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB is added. The amplifier gain of 29 dB is subtracted, giving a field strength of 32 dBμV/m. This value in dBμV/m was converted to its corresponding level in μV/m.

RA = 52.0 dBμV
AF = 7.4 dB/m
CF = 1.6 dB
AG = 29.0 dB
FS = 32 dBμV/m

To convert from dBμV to μV or mV the following was used:

$UF = 10^{(NF / 20)}$ where UF = Net Reading in μV
NF = Net Reading in dBμV

Example:

FS = RA + AF + CF – AG = 52.0 + 7.4 + 1.6 – 29.0 = 32.0
$UF = 10^{(32\ dB\mu V / 20)}$ = 39.8 μV/m

6.2 Test Equipment Used:

Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due
ROS004'	Vector Signal Generator, 300kHz-3.3GHz	Rohde & Schwartz	SMIQ03B	100338	01/28/2017	01/28/2018
DAV004'	Weather Station	Davis Instruments	7400	PE80529A61A	05/10/2017	05/10/2018
WEI16'	Attenuator, 30dB	Weinschel Corp	47-30-34	BD4327	05/26/2017	05/26/2018
CBLHF2012-2M-1'	2m 9kHz-40GHz Coaxial Cable - SET1	Huber & Suhner	SF102	252675001	02/08/2017	02/08/2018

Software Utilized:

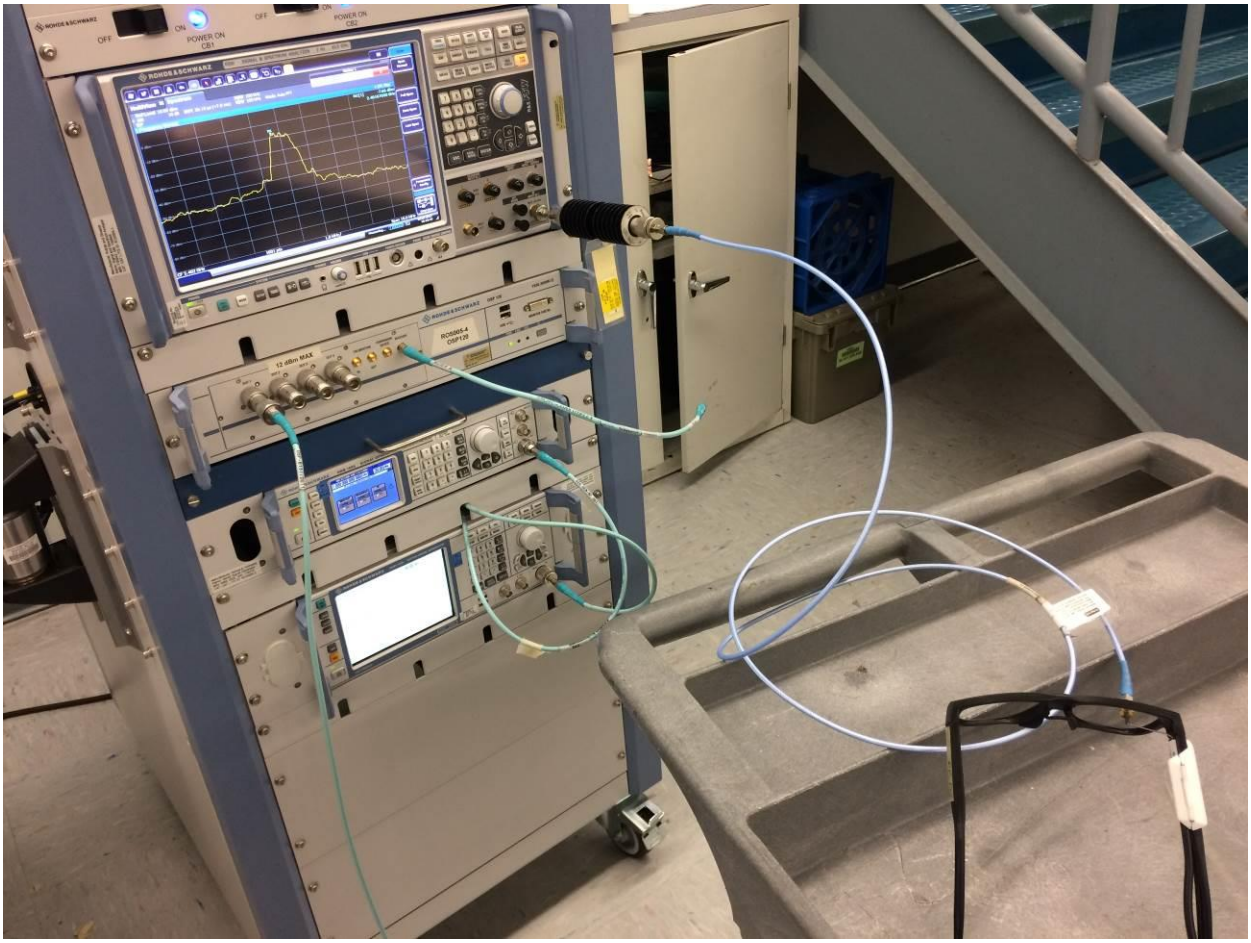
Name	Manufacturer	Version
None	--	--

6.3 Results:

The sample tested was found to Comply.

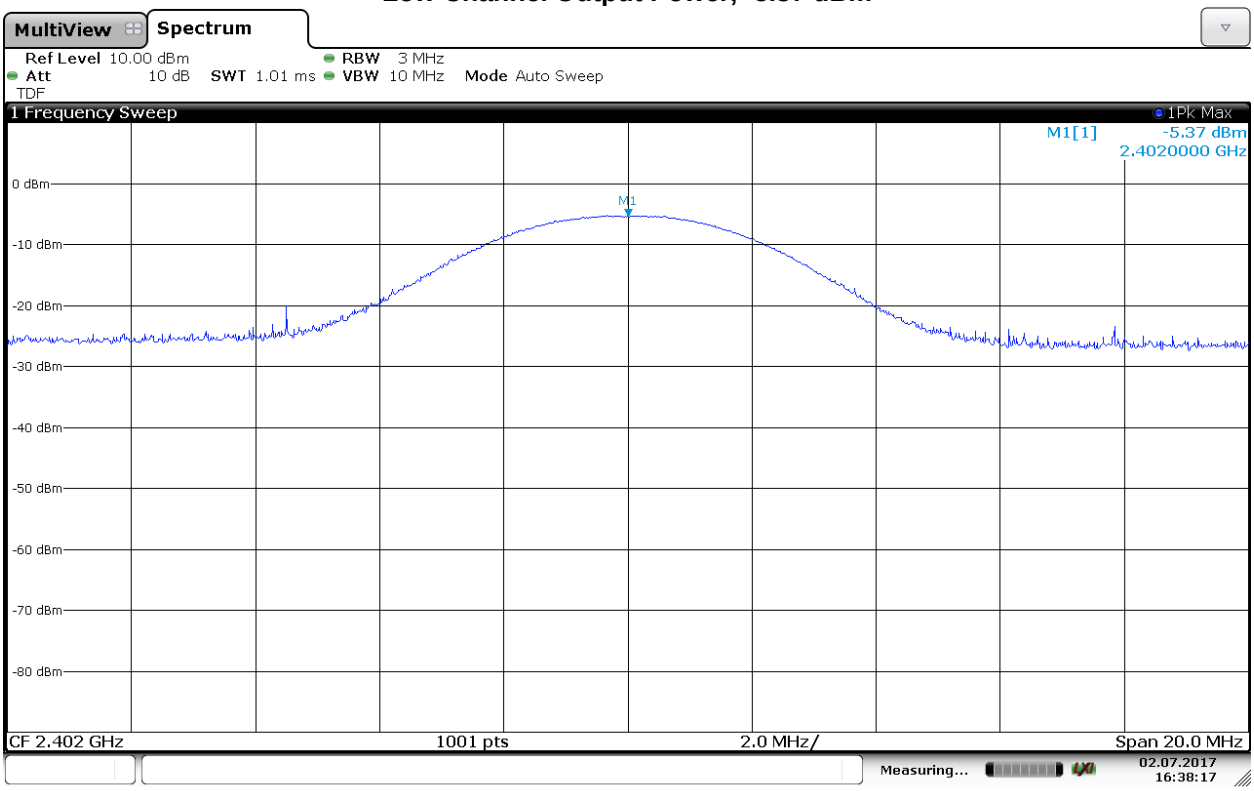
§15.247 (b) (3) For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt or 30 dBm.

6.4 Setup Photograph:



6.5 Plots/Data:

Low Channel Output Power, -5.37 dBm



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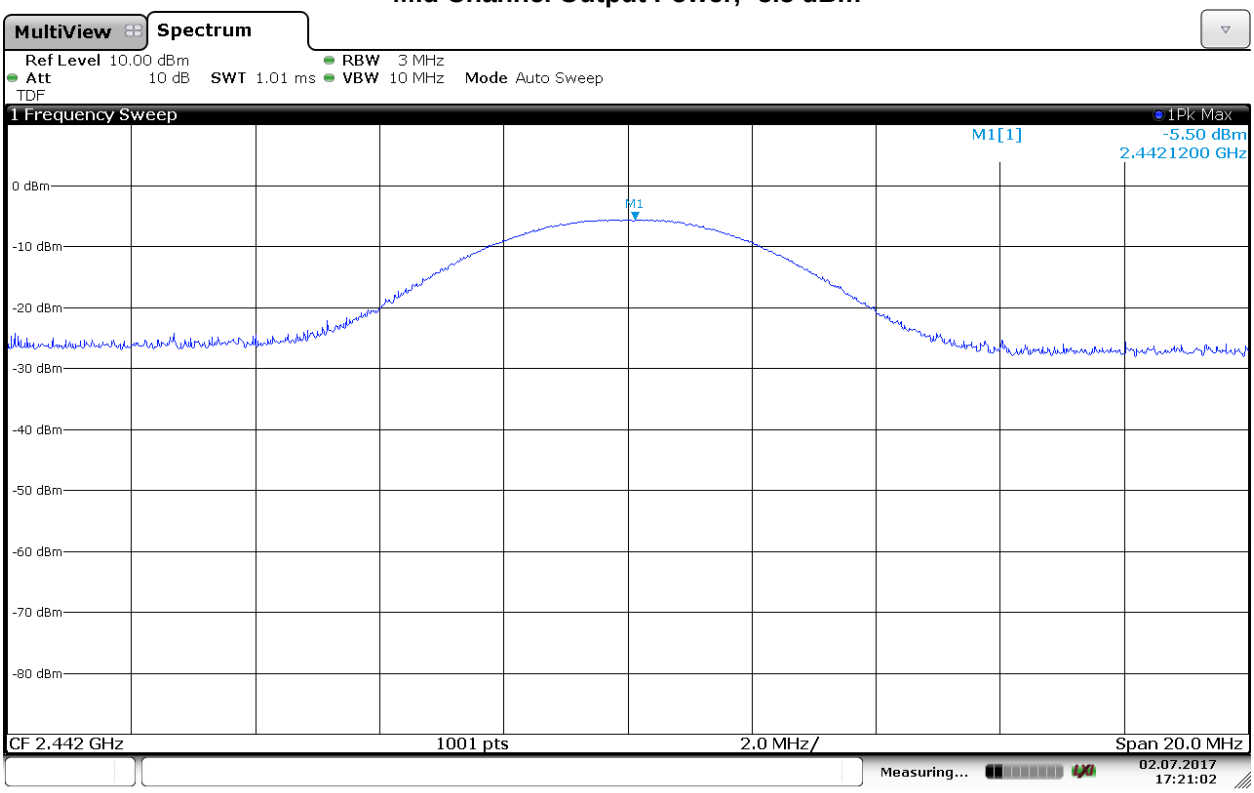
Mid Channel Output Power, -5.5 dBm



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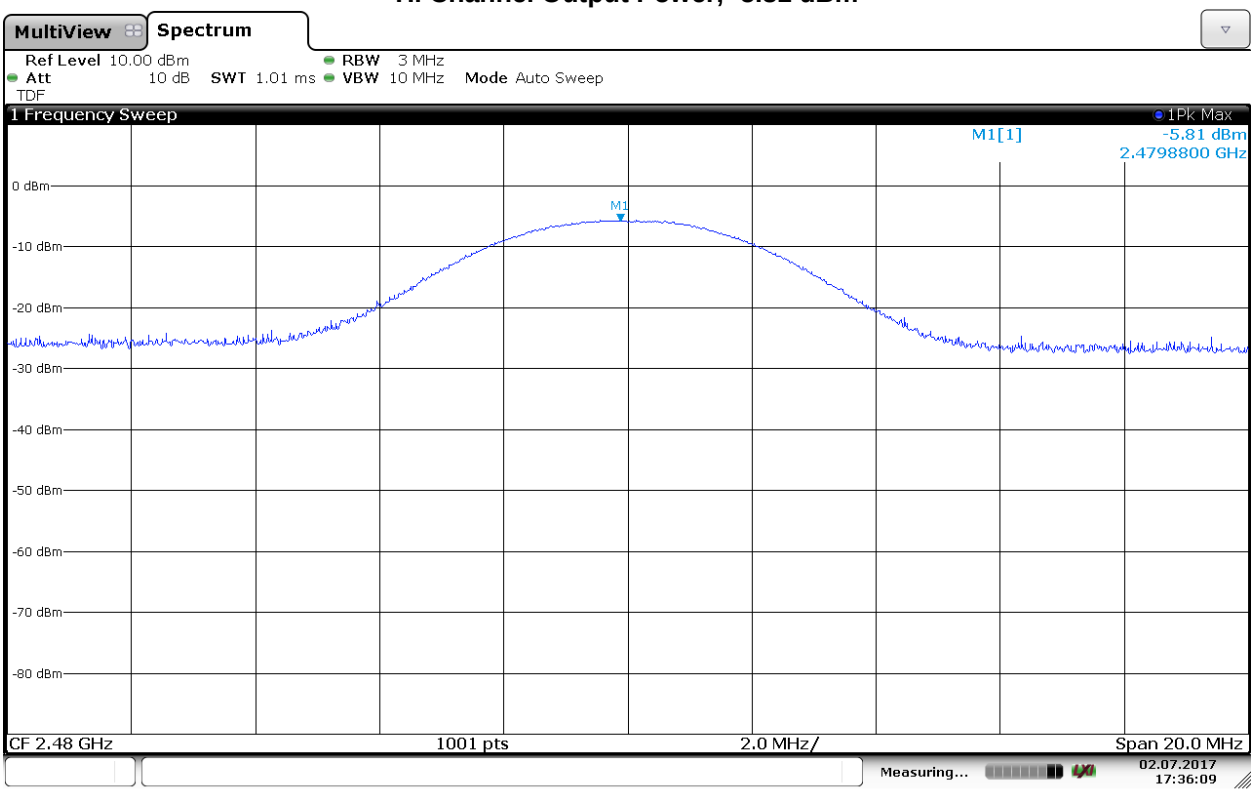
Hi Channel Output Power, -5.81 dBm



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Human RF Exposure

The EUT was measured in a radiated fashion. The RF output power was measured using a resolution bandwidth which encompassed the entire emission bandwidth. The data obtained was adjusted for equipment losses and converted from a field strength reading to a power reading using the provisions of FCC KDB 558074 and RSS-Gen 4.6. .

§1.1310 The criteria listed in table 1 shall be used to evaluate the environmental impact of human exposure to radiofrequency (RF) radiation as specified in §1.1307(b), except in the case of portable devices shall be evaluated according to the provisions of §2.1093 of this chapter.

Part §1.1310 Limits for Maximum Permissible Exposure (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm^2)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposure				
0.3-3.0	614	1.63	*100	6
3.0-30	1842/f	4.89/f	$*900/f^2$	6
30-300	61.4	0.163	1.0	6
300-1,500			f/300	6
1,500-100,000			5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*100	30
1.34-30	824/f	2.19/f	$*180/f^2$	30
30-300	27.5	0.073	0.2	30
300-1,500			f/1500	30
1,500-100,000			1.0	30

f = frequency in MHz * = Plane-wave equivalent power density

(1) Occupational/controlled exposure limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when a person is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure. The phrase *fully aware* in the context of applying these exposure limits means that an exposed person has received written and/or verbal information fully explaining the potential for RF exposure resulting from his or her employment. With the exception of *transient* persons, this phrase also means that an exposed person has received appropriate training regarding work practices relating to controlling or mitigating his or her exposure. Such training is not required for *transient* persons, but they must receive written and/or verbal information and notification (for example, using signs) concerning their exposure potential and appropriate means available to mitigate their exposure. The phrase *exercise control* means that an exposed person is allowed to and knows how to reduce or avoid exposure by administrative or engineering controls and work practices, such as use of personal protective equipment or time averaging of exposure.

(2) General population/uncontrolled exposure limits apply in situations in which the general public may be exposed, or in which persons who are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure.

RSS-102 Issue 5 Exposure Limits:

Table 4: RF Field Strength Limits for Devices Used by the General Public (Uncontrolled Environment)

Frequency Range (MHz)	Electric Field (V/m rms)	Magnetic Field (A/m rms)	Power Density (W/m^2)	Reference Period (minutes)
0.003-10[21]	83	90	-	Instantaneous*
0.1-10	-	$0.73/f$	-	6**
1.1-10	$87/f^{0.5}$	-	-	6**
10-20	27.46	0.0728	2	6
20-48	$58.07/f^{0.25}$	$0.1540/f^{0.25}$	$8.944/f^{0.5}$	6
48-300	22.06	0.05852	1.291	6
300-6000	$3.142 f^{0.3417}$	$0.008335 f^{0.3417}$	$0.02619 f^{0.6834}$	6
6000-15000	61.4	0.163	10	6
15000-150000	61.4	0.163	10	$616000/f^{1.2}$
150000-300000	$0.158 f^{0.5}$	$4.21 \times 10^{-4} f^{0.5}$	$6.67 \times 10^{-5} f$	$616000/f^{1.2}$

Note: f is frequency in MHz.
*Based on nerve stimulation (NS).
** Based on specific absorption rate (SAR).

Test Procedure

An MPE evaluation was performed in order to show that the device was compliant with §2.1091. The maximum power density was calculated for each transmitter at a separation distance of 20 cm.

For each transmitter the maximum power RF exposure at a 20 cm distance using the formula:

Conducted $Power_{mW} = 10^{ConductedPower(dBm)/10}$

Power Density = [Conducted $Power_{mW}$ x Ant.Gain] / [4π x $(20_{cm})^2$] or [EIRP] / [4π x $(20_{cm})^2$]

1.2 Results:

Maximum Output $Power_{mW} = 10^{(-5.37/10)}$ or 0.2904 mW

Antenna gain numeric = 10^(dBi/10) = 1.1220

Power Density = (0.2904*1.122) / 5025.6 or 6.483E-05 mW/cm^2

Limit at 2.4 GHz = 1 mW/cm^2

RSS-102 Issue 5 Exposure Limit at 2.4 GHz = 5.35 W/m^2

Power Density = 0.000648 W/m^2

The calculated maximum power density at 20 cm distance is less than the limit for general population / uncontrolled exposure.

Test Personnel:	Vathana Ven VJV	Test Date:	07/28/2017
Supervising/Reviewing Engineer: (Where Applicable)	N/A		
Product Standard:	FCC Part 15.247, RSS-247 RSS-102	Limit Applied:	See Section 6.3
Input Voltage:	Internal Battery Powered	Ambient Temperature:	23 ºC
Pretest Verification w/ Ambient Signals or BB Source:	**Yes**	Relative Humidity:	48 %
		Atmospheric Pressure:	1009 mbars

Deviations, Additions, or Exclusions: None

7 6 dB Bandwidth and Occupied Bandwidth

7.1 Method

Tests are performed in accordance with CFR47 FCC Part 15.247, RSS-247, and ANSI C63.10.

TEST SITE: EMC Lab

The EMC Lab has one Semi-anechoic Chamber and one Shielded Chamber. AC Mains Power is available at 120, 230, and 277 Single Phase; 208, 400, and 480 3-Phase. Large reference ground-planes are installed in the general lab area to facilitate EMC work not requiring a shielded environment.

7.2 Test Equipment Used:

Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due
ROS004'	Vector Signal Generator, 300kHz-3.3GHz	Rohde & Schwartz	SMIQ03B	100338	01/28/2017	01/28/2018
DAV004'	Weather Station	Davis Instruments	7400	PE80529A61A	05/10/2017	05/10/2018
WEI16'	Attenuator, 30dB	Weinschel Corp	47-30-34	BD4327	05/26/2017	05/26/2018
CBLHF2012-2M-1'	2m 9kHz-40GHz Coaxial Cable - SET1	Huber & Suhner	SF102	252675001	02/08/2017	02/08/2018

Software Utilized:

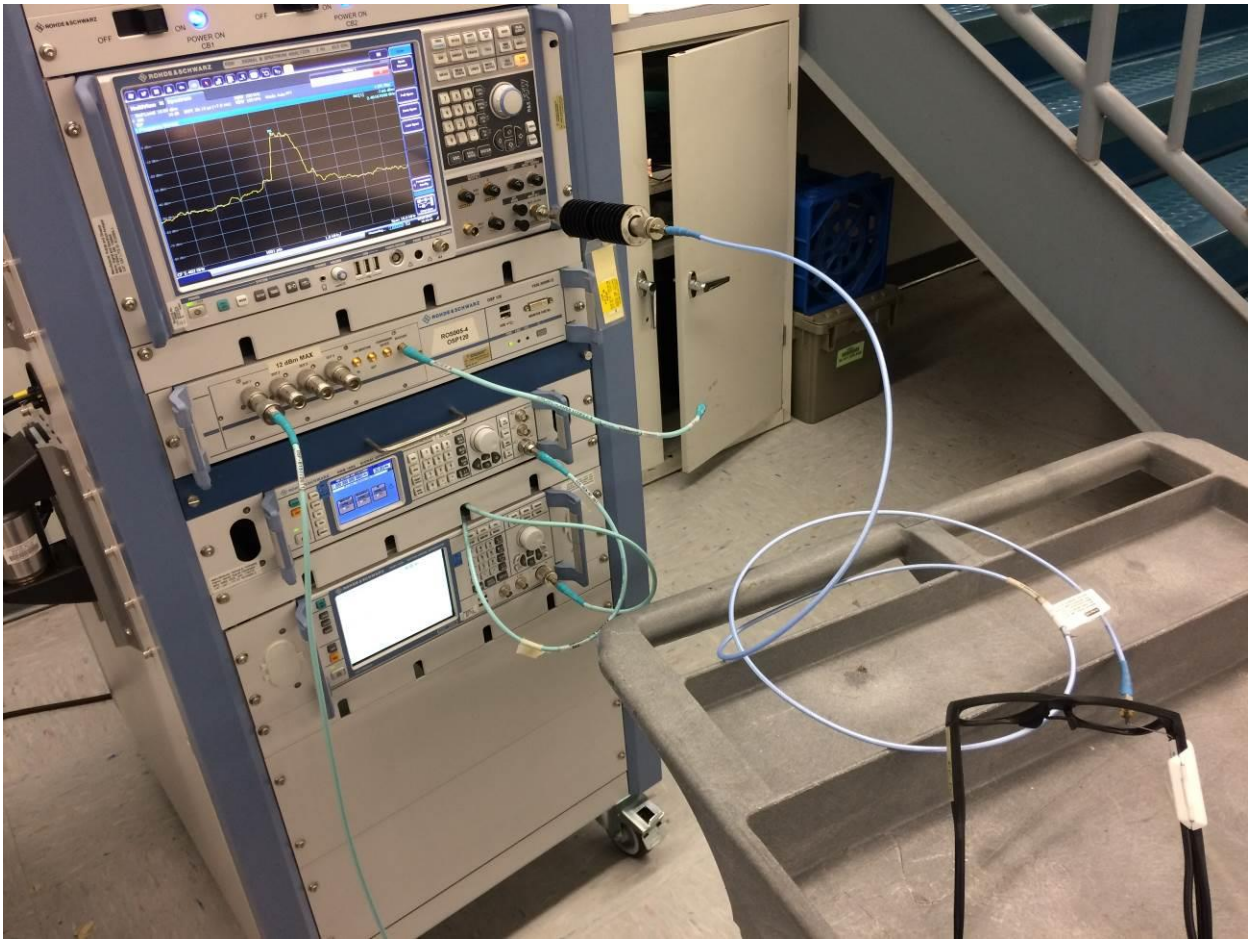
Name	Manufacturer	Version
None	--	--

7.3 Results:

The sample tested was found to Comply.

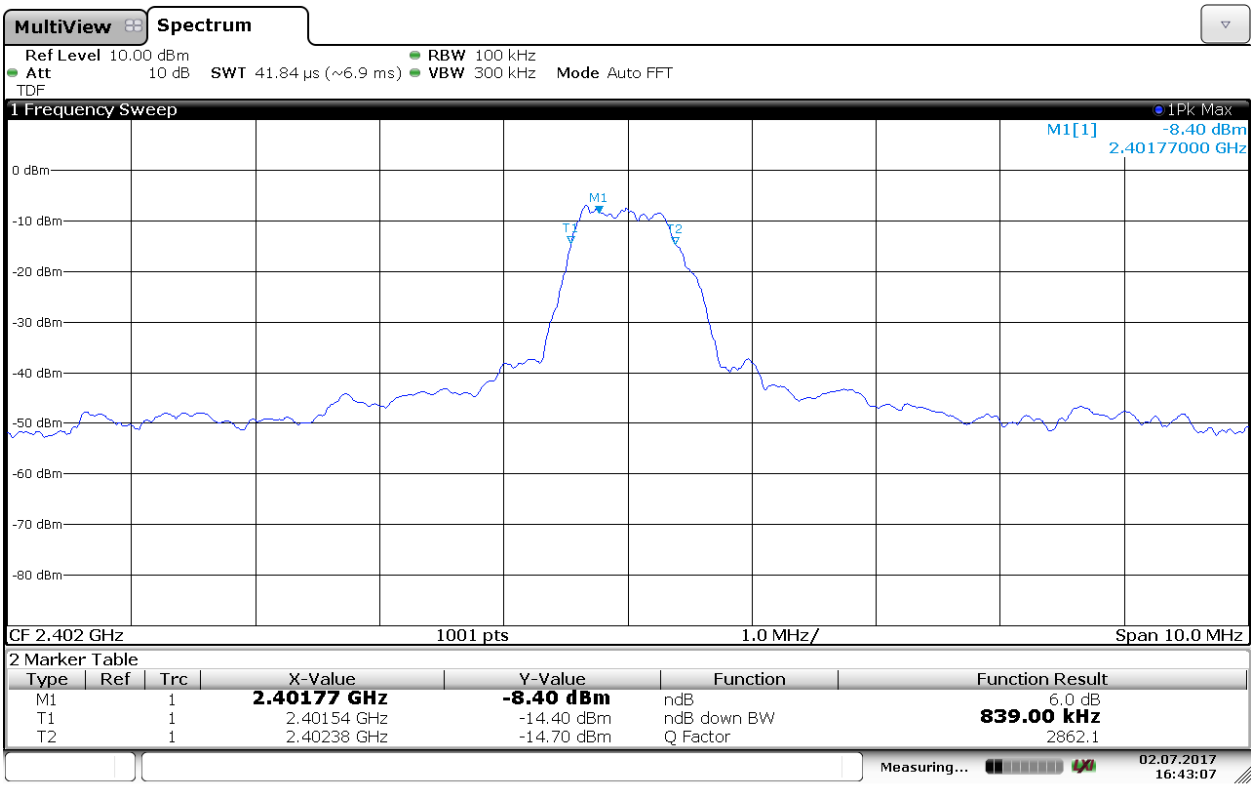
§15.247 (a) (2) Systems using digital modulation techniques may operate in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

7.4 Setup Photograph:



7.5 Plots/Data:

Low Channel 6 dB Bandwidth, 839.00 kHz



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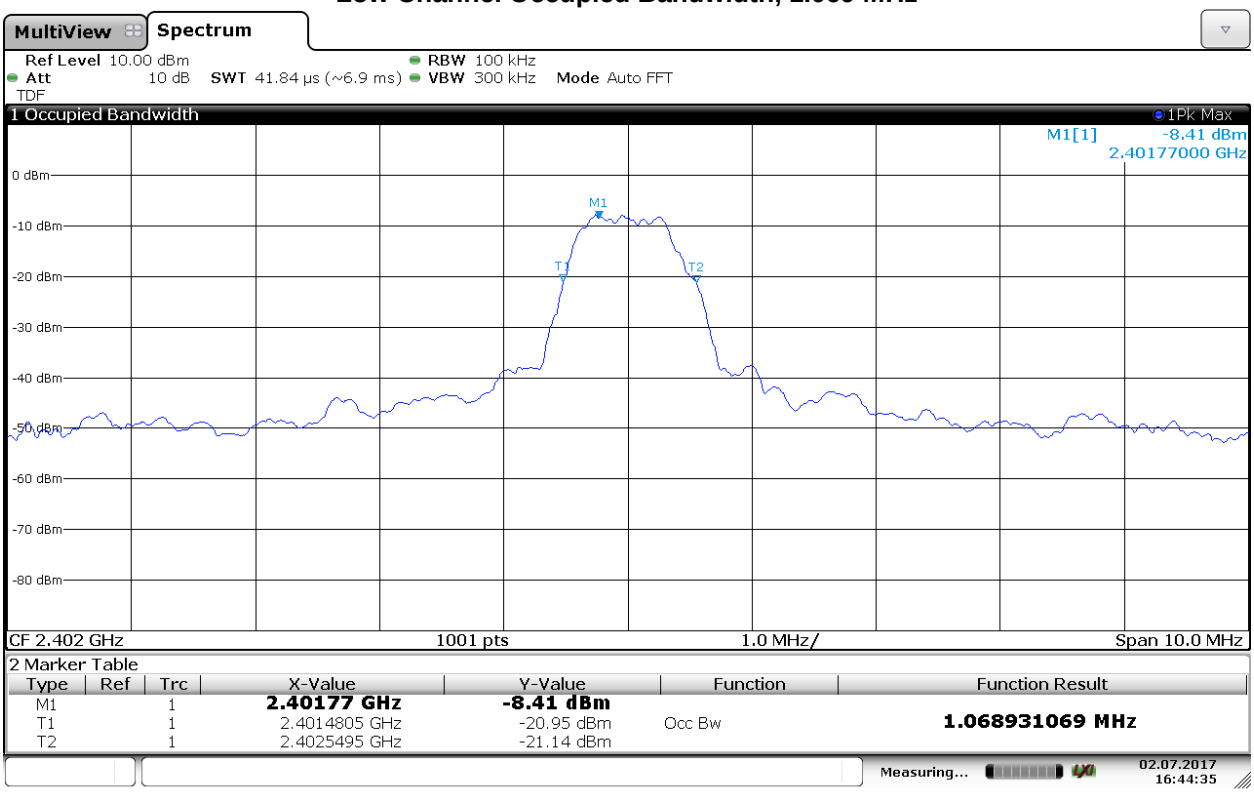
Low Channel Occupied Bandwidth, 1.069 MHz



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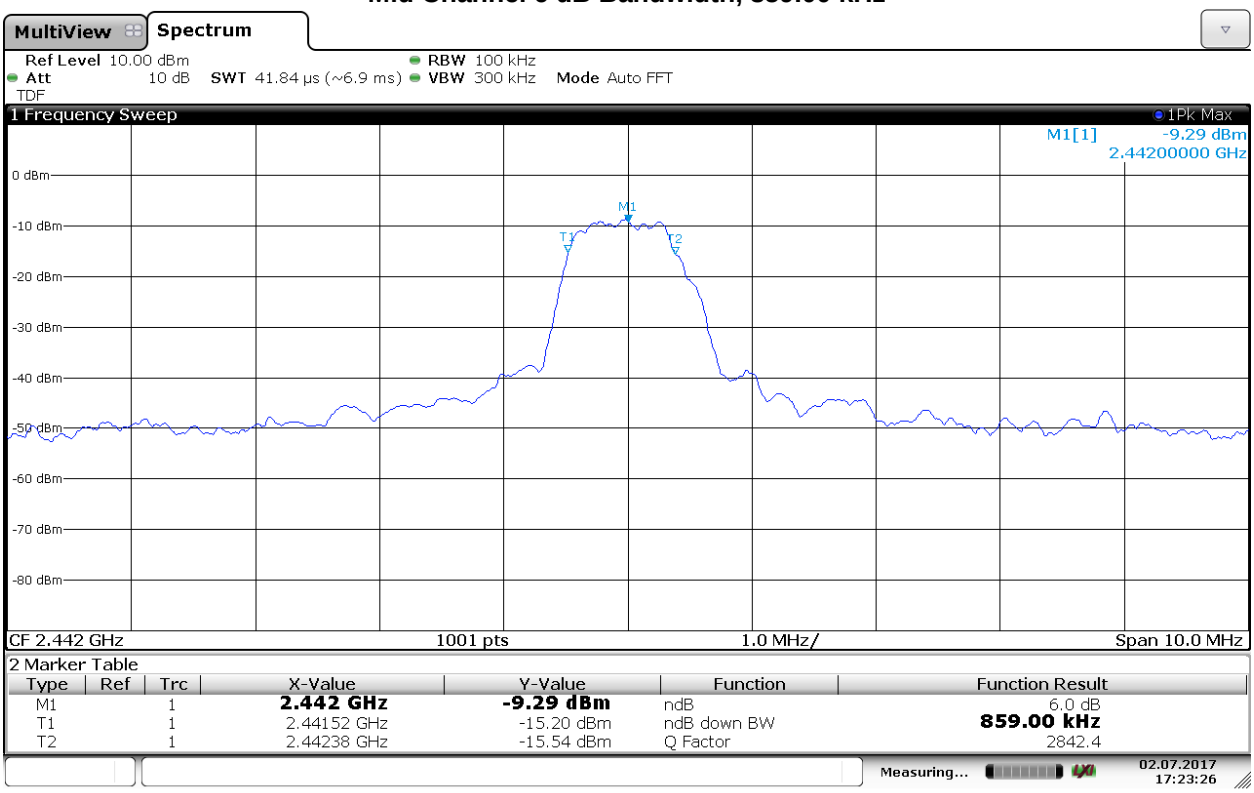
Mid Channel 6 dB Bandwidth, 859.00 kHz



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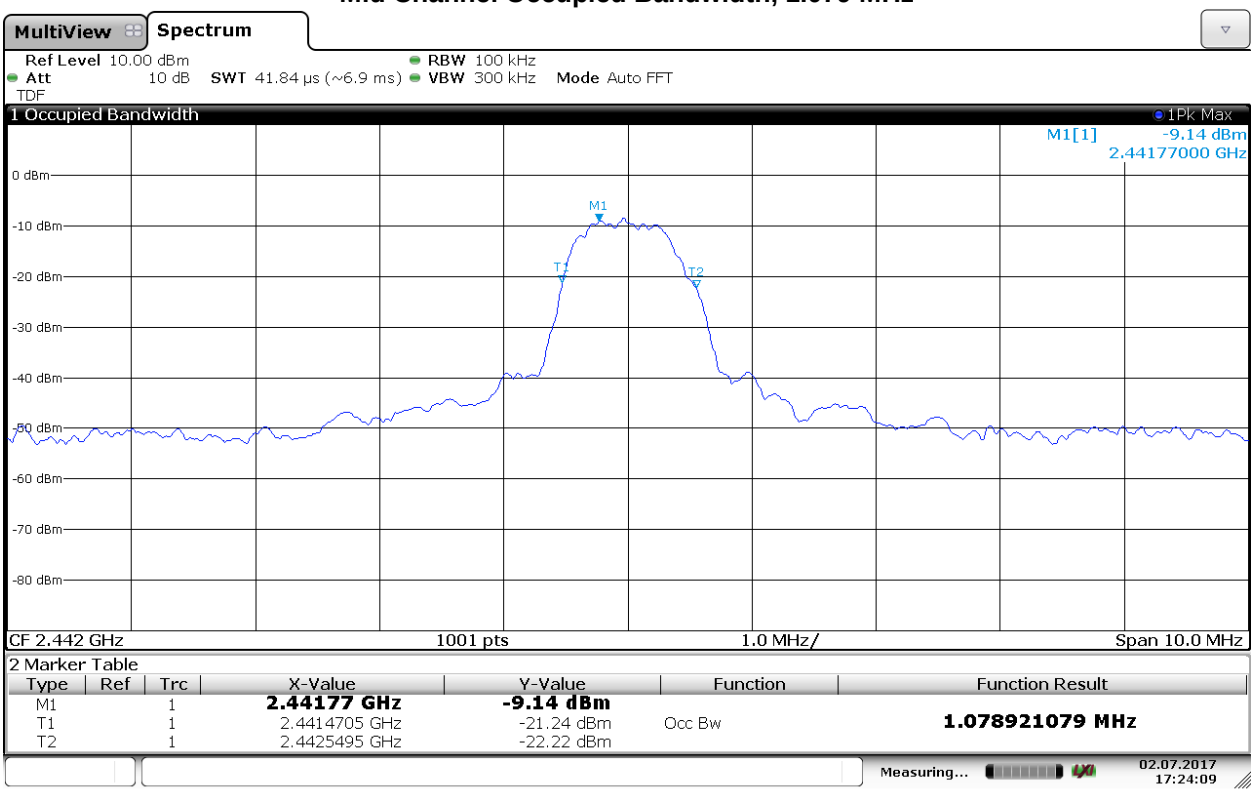
Mid Channel Occupied Bandwidth, 1.079 MHz



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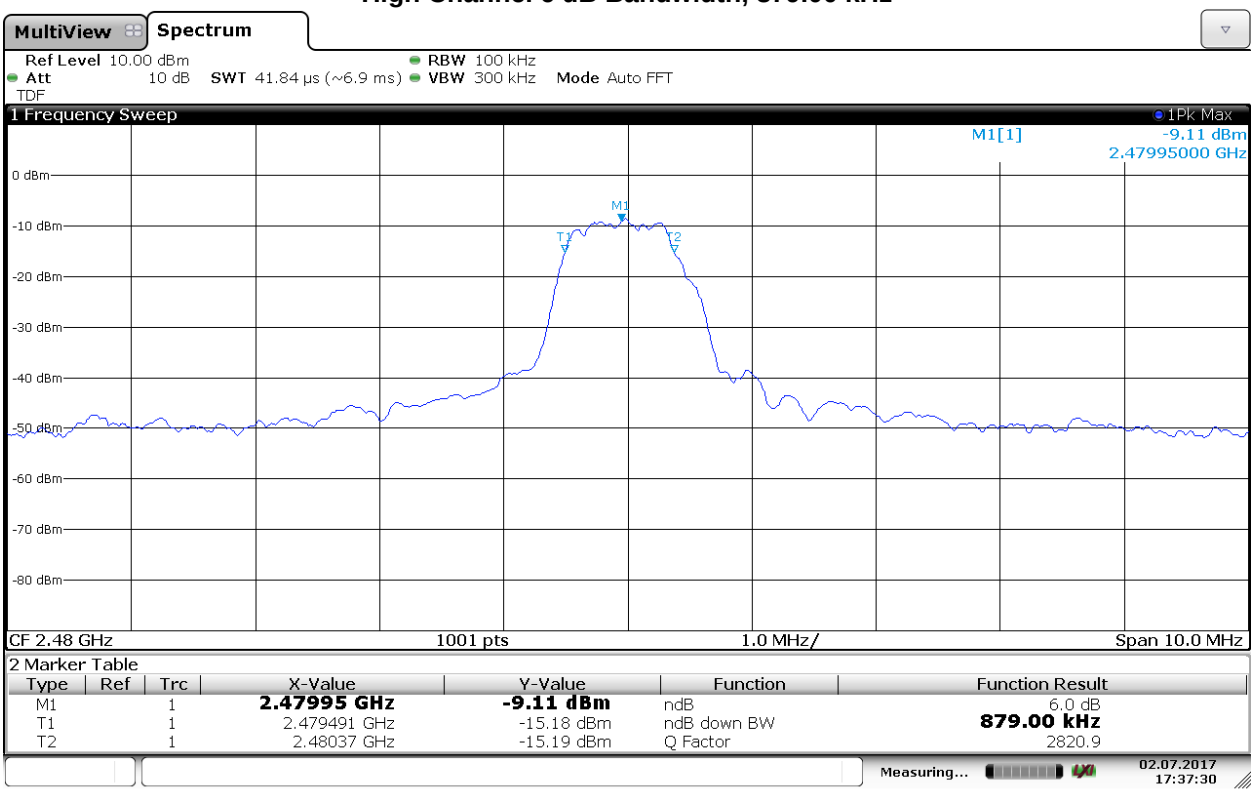
High Channel 6 dB Bandwidth, 879.00 kHz



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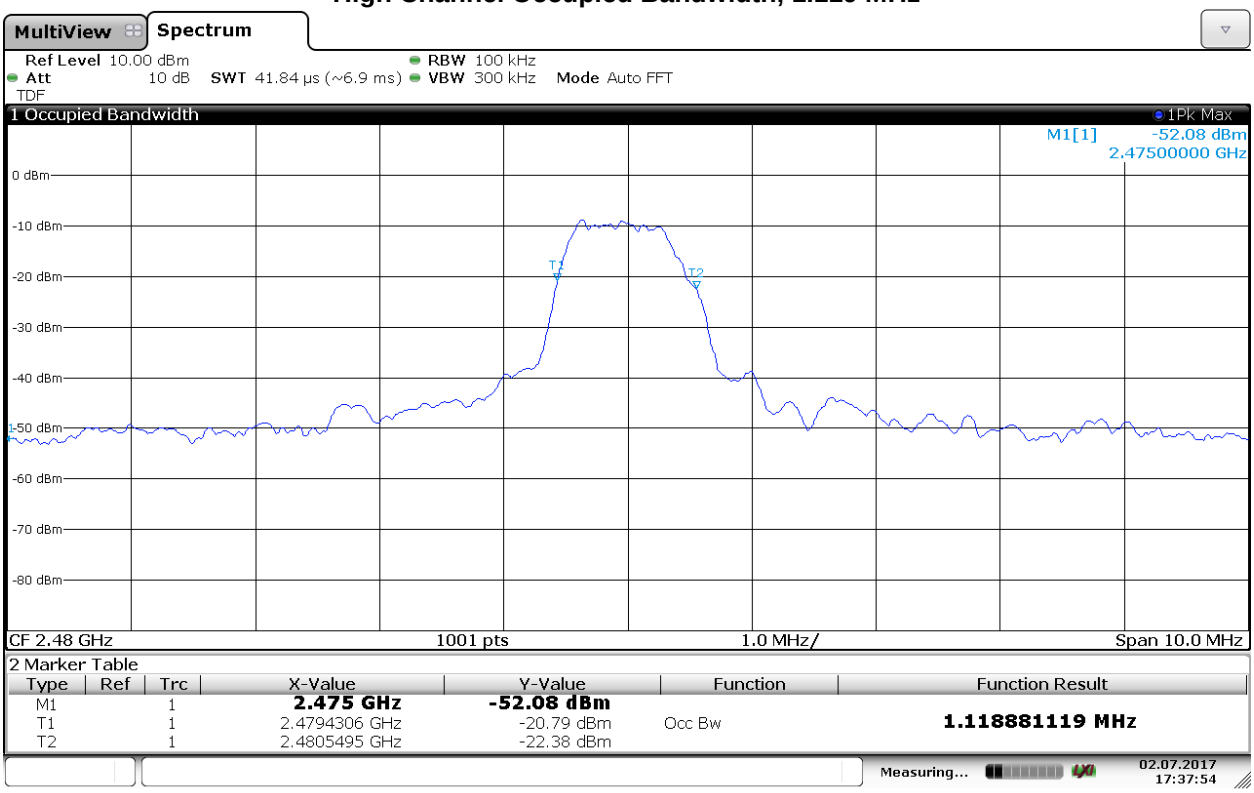
High Channel Occupied Bandwidth, 1.119 MHz



Date: 2.JUL.2017 17:37:53

Test Personnel:	Vathana Ven	Test Date:	07/28/2017
Supervising/Reviewing Engineer: (Where Applicable)	N/A		
Product Standard:	FCC Part 15.247, RSS-247 RSS-102	Limit Applied:	See Section 7.3
Input Voltage:	Internal Battery Powered	Ambient Temperature:	23 ºC
Pretest Verification w/ Ambient Signals or BB Source:	**Yes**	Relative Humidity:	48 %
		Atmospheric Pressure:	1009 mbars

Deviations, Additions, or Exclusions: None

8 Maximum Power Spectral Density

8.1 Method

Tests are performed in accordance with CFR47 FCC Part 15.247, RSS-247, and ANSI C63.10.

TEST SITE: EMC Lab

The EMC Lab has one Semi-anechoic Chamber and one Shielded Chamber. AC Mains Power is available at 120, 230, and 277 Single Phase; 208, 400, and 480 3-Phase. Large reference ground-planes are installed in the general lab area to facilitate EMC work not requiring a shielded environment.

8.2 Test Equipment Used:

Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due
ROS004'	Vector Signal Generator, 300kHz-3.3GHz	Rohde & Schwartz	SMIQ03B	100338	01/28/2017	01/28/2018
DAV004'	Weather Station	Davis Instruments	7400	PE80529A61A	05/10/2017	05/10/2018
WEI16'	Attenuator, 30dB	Weinschel Corp	47-30-34	BD4327	05/26/2017	05/26/2018
CBLHF2012-2M-1'	2m 9kHz-40GHz Coaxial Cable - SET1	Huber & Suhner	SF102	252675001	02/08/2017	02/08/2018

Software Utilized:

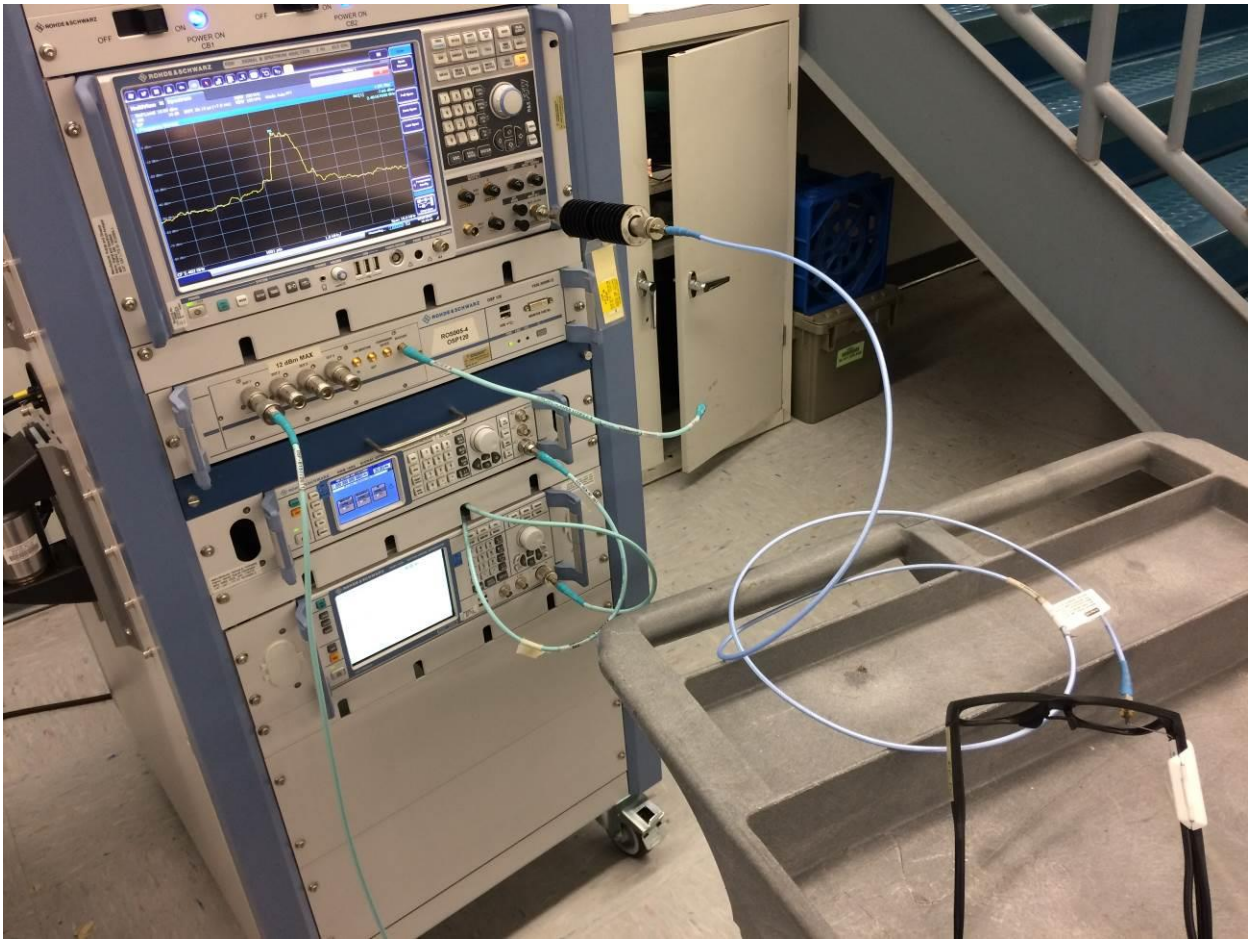
Name	Manufacturer	Version
None		

8.3 Results:

The sample tested was found to Comply.

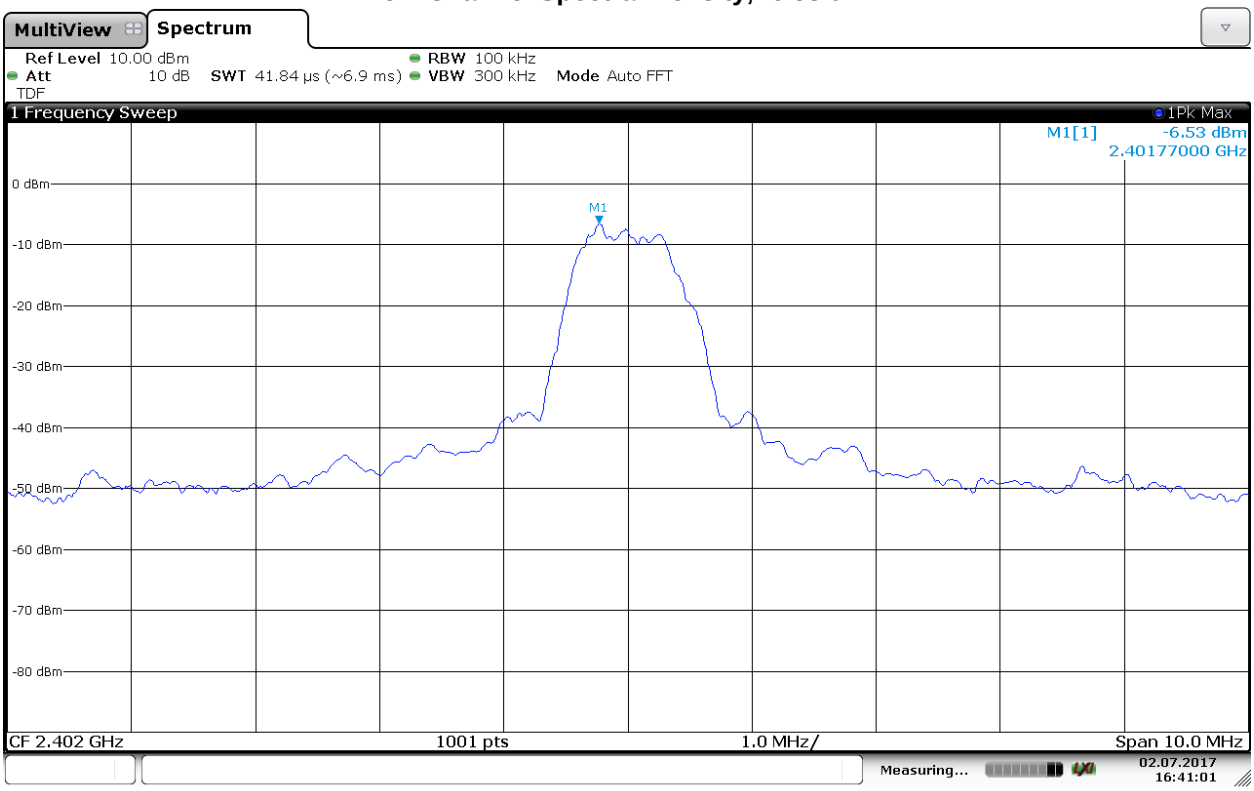
§15.247 (e) For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

8.4 Setup Photograph:

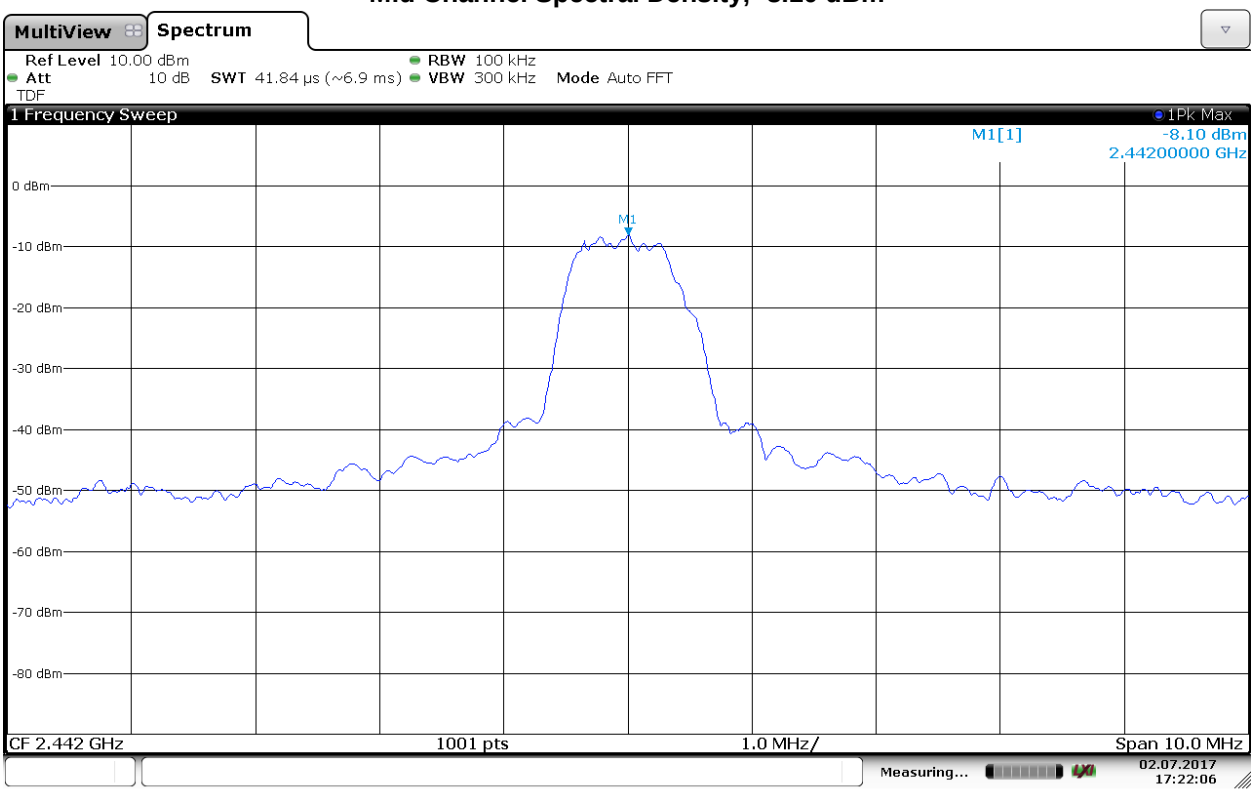


8.5 Plots/Data:

Low Channel Spectral Density, -6.53 dBm

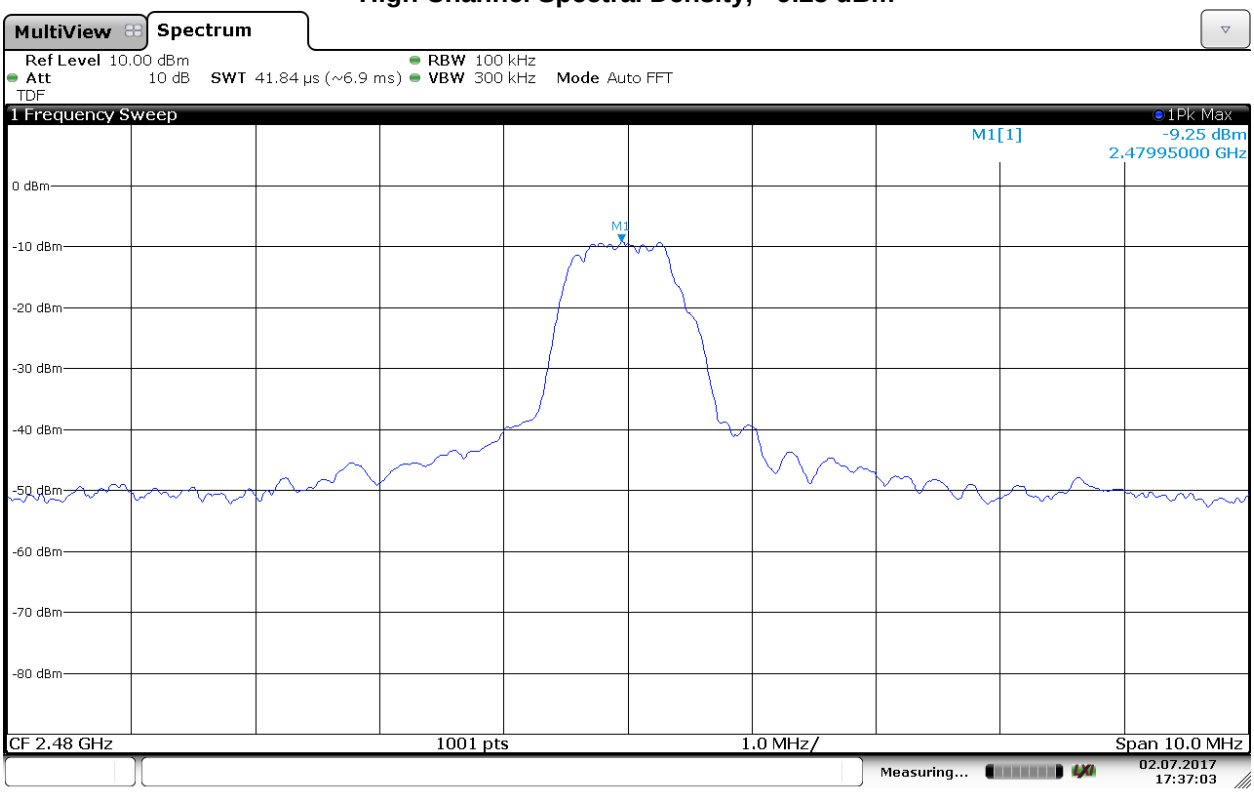


Mid Channel Spectral Density, -8.10 dBm



Date: 2.JUL.2017 17:22:06

High Channel Spectral Density, - 9.25 dBm



Date: 2.JUL.2017 17:37:03

Test Personnel:	Vathana Ven VJV	Test Date:	07/28/2017
Supervising/Reviewing Engineer: (Where Applicable)	N/A		
Product Standard:	FCC Part 15.247, RSS-247 RSS-102	Limit Applied:	See Section 8.3
Input Voltage:	Internal Battery Powered	Ambient Temperature:	23 ºC
Pretest Verification w/ Ambient Signals or BB Source:	**Yes**	Relative Humidity:	48 %
		Atmospheric Pressure:	1009 mbars

Deviations, Additions, or Exclusions: None

9 Band Edge Compliance

9.1 Method

Tests are performed in accordance with CFR47 FCC Part 15.247, RSS-247, and ANSI C63.10.

TEST SITE: EMC Lab & 10m ALSE

The EMC Lab has one Semi-anechoic Chamber and one Shielded Chamber. AC Mains Power is available at 120, 230, and 277 Single Phase; 208, 400, and 480 3-Phase. Large reference ground-planes are installed in the general lab area to facilitate EMC work not requiring a shielded environment.

The 10m ALSE is 13m (Length) x 21m (Depth) x 10m (Height) with the effective size in terms of space from the tips of the absorber is 12m (Length) x 20m (Depth) x 8.5m (Height). This chamber achieves broadband performance using a unique arrangement of hybrid and ferrite tile absorber. This chamber has a built in 3m diameter turntable (Embedded type). The metal structure of the table makes electrical connection around the entire circumference of the turntable to the ground plane with a metal brush type connection. The turntable is located on one end of the chamber and the antennas are mounted 3 and 10 meters away at the other end of the chamber on the adjustable an Antenna Mast. The antenna mast is a non-conductive bore sighted type with remote control of antenna height and polarization. The Antenna Mast and the turntable can be remotely controlled through the controller located in the adjacent Control room. A Styrofoam table 80 cm high is used for table-top equipment.

Measurement Uncertainty

Measurement	Frequency Range	Expanded Uncertainty (k=2)	Ucispr
Radiated Emissions, 10m	30-1000 MHz	4.6 dB	6.3 dB
Radiated Emissions, 3m	30-1000 MHz	5.3 dB	6.3 dB
Radiated Emissions, 3m	1-6 GHz	4.5 dB	5.2 dB
Radiated Emissions, 3m	6-15 GHz	5.2 dB	5.5 dB
Radiated Emissions, 3m	15-18 GHz	5.0 dB	5.5 dB
Radiated Emissions, 3m	18-40 GHz	5.0 dB	5.5 dB

As shown in the table above our radiated emissions U_{lab} is less than the corresponding U_{CISPR} reference value in CISPR 16-4-2 Table 1, hence the compliance of the product is only based on the measured value, and no measurement uncertainty correction is required, based on CISPR 22 and CISPR 11 (for 2006 and later revisions) Clause 11.

Sample Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation with a sample calculation is as follows:

FS = RA + AF + CF - AG

Where FS = Field Strength in dBμV/m
RA = Receiver Amplitude (including preamplifier) in dBμV
CF = Cable Attenuation Factor in dB
AF = Antenna Factor in dB
AG = Amplifier Gain in dB

In the following table(s), the reading shown on the data table reflects the preamplifier gain. An example for the calculations in the following table is as follows.

Assume a receiver reading of 52.0 dBμV is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB is added. The amplifier gain of 29 dB is subtracted, giving a field strength of 32 dBμV/m. This value in dBμV/m was converted to its corresponding level in μV/m.

RA = 52.0 dBμV
AF = 7.4 dB/m
CF = 1.6 dB
AG = 29.0 dB
FS = 32 dBμV/m

To convert from dBμV to μV or mV the following was used:

$UF = 10^{(NF / 20)}$ where UF = Net Reading in μV
NF = Net Reading in dBμV

Example:

FS = RA + AF + CF – AG = 52.0 + 7.4 + 1.6 – 29.0 = 32.0
$UF = 10^{(32\ dB\mu V / 20)}$ = 39.8 μV/m

9.2 Test Equipment Used:

Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due
DAV004'	Weather Station	Davis Instruments	7400	PE80529A61A	10/23/2015	10/23/2017
145128'	EMI Receiver (20 Hz - 40 Ghz)	Rohde & Schwarz	ESIB 40	839283/001	03/15/2017	03/15/2018
145-416'	Cables 145-420 145-423 145-424 145-408	Huber + Suhner	3m Track B cables	multiple	07/30/2016	07/30/2017
ETS001'	1-18GHz DRG Horn Antenna	ETS-Lindgren	3117	00143259	02/13/2017	02/13/2018
WEI16'	Attenuator, 30dB	Weinschel Corp	47-30-34	BD4327	05/26/2017	05/26/2018
ROS004'	Vector Signal Generator, 300kHz-3.3GHz	Rohde & Schwartz	SMIQ03B	100338	01/28/2017	01/28/2018
CBLHF2012-2M-1'	2m 9kHz-40GHz Coaxial Cable - SET1	Huber & Suhner	SF102	252675001	02/08/2017	02/08/2018

Software Utilized:

Name	Manufacturer	Version
EMI Boxborough.xls	Intertek	08/27/2010

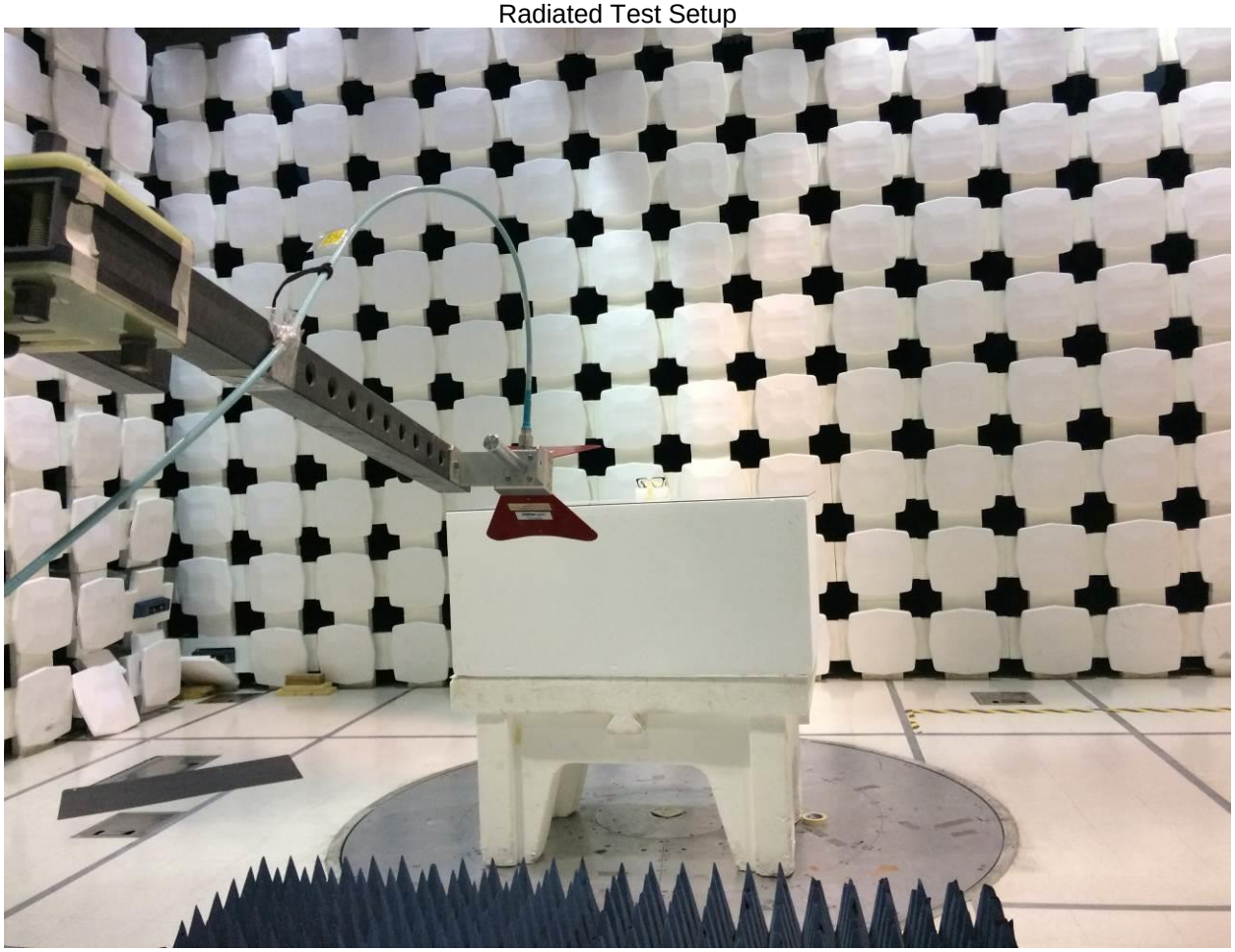
9.3 Results:

The sample tested was found to Comply.

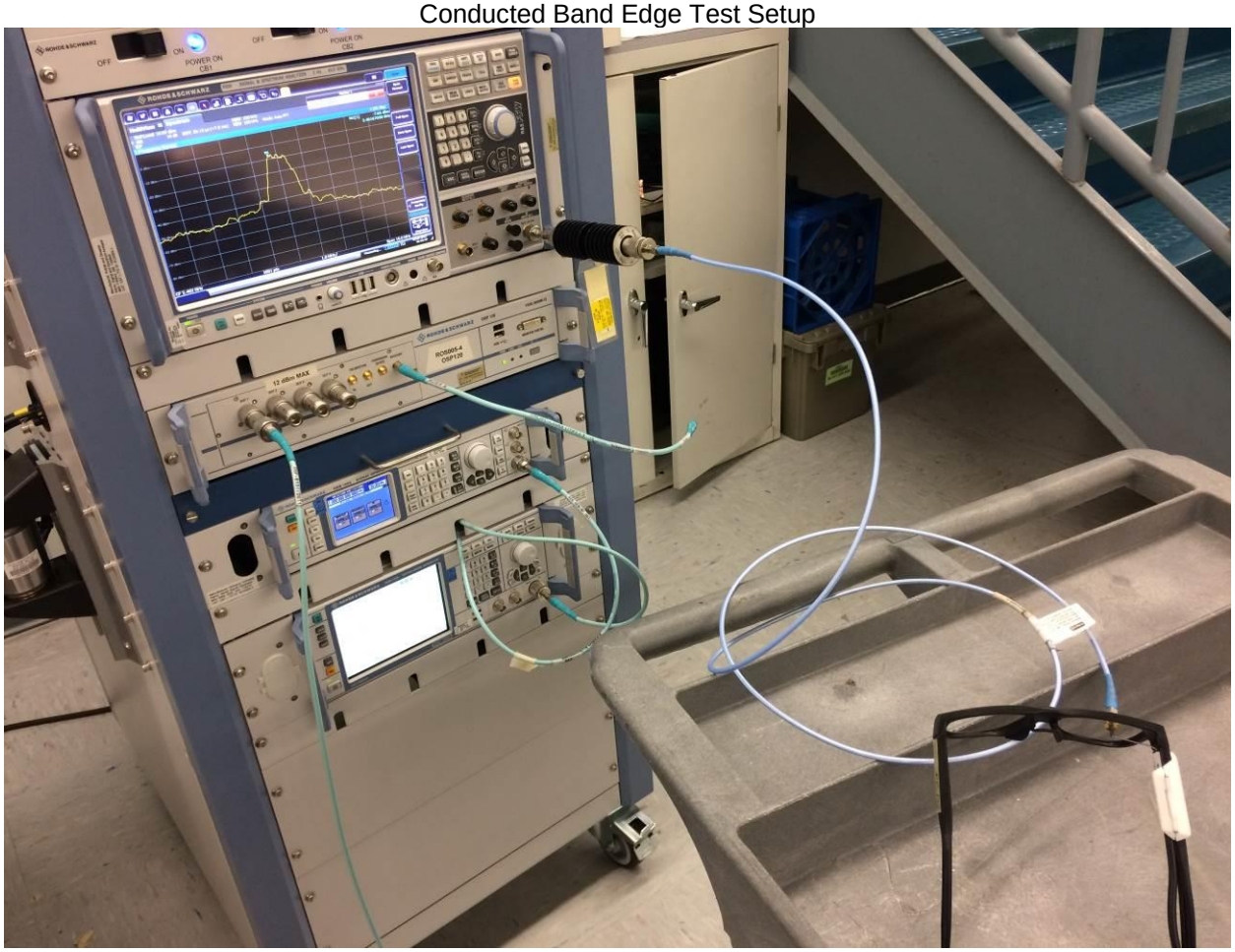
§15.247 (d) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

9.4 Setup Photographs:

Radiated Test Setup

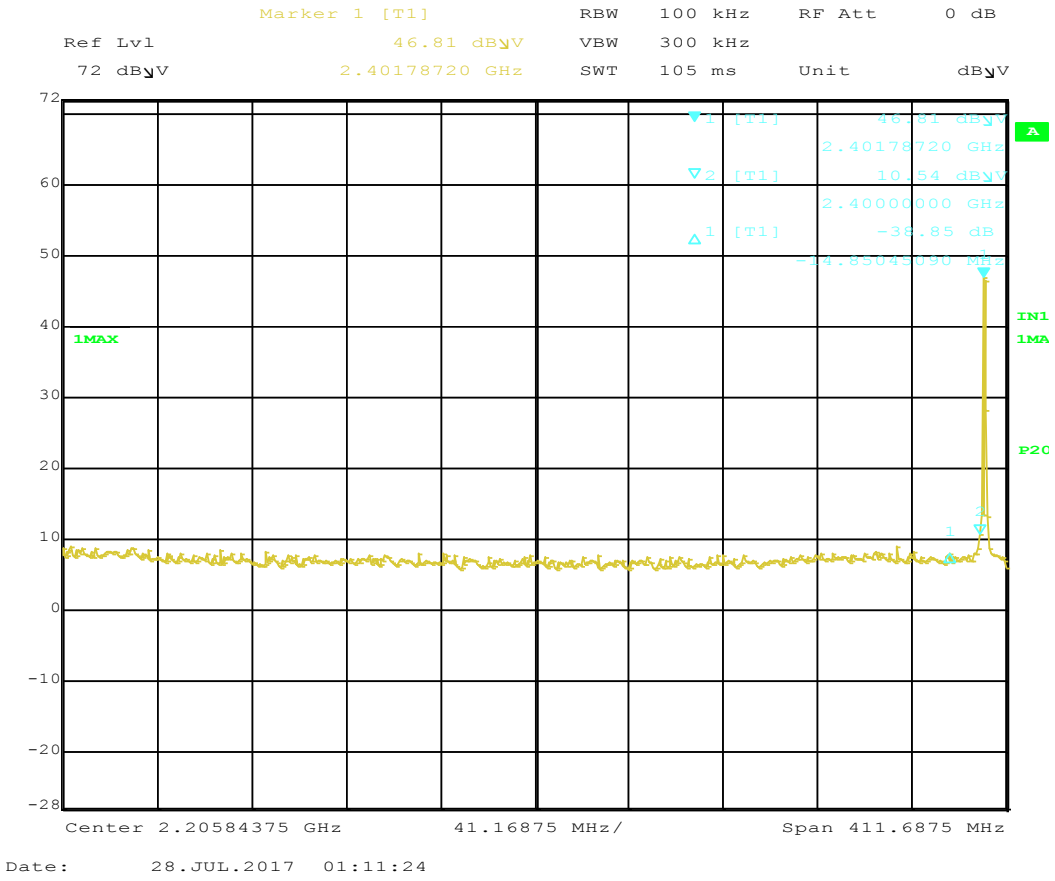


Conducted Band Edge Test Setup

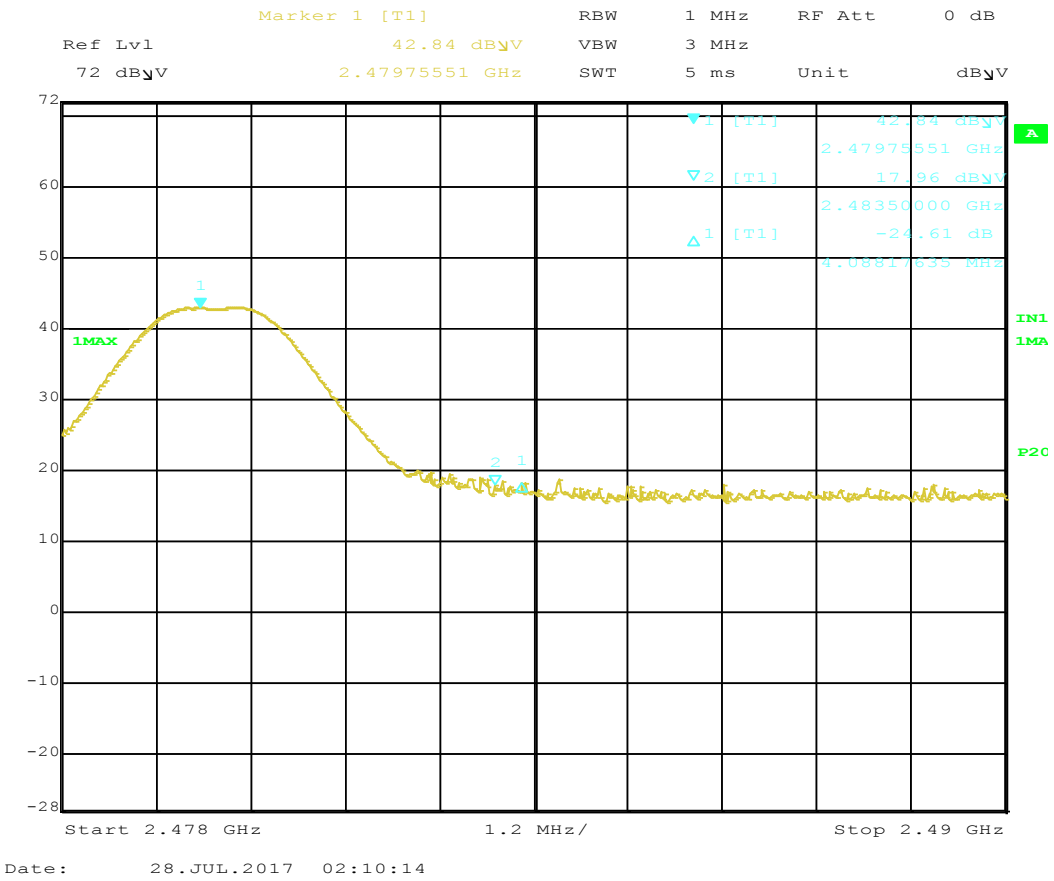


9.5 Plots/Data:

Conducted Lower Band Edge



Conducted Upper Band Edge



Radiated Band Edge

Company: Safilo SpA
Model #: Fitness Tracker Glasses
Serial #: BOX1707171118(Intertek Assigned)
Engineers: Vathana Ven Location: 10M
Project #: G103104758 Date(s): 07/27/17
Standard: FCC Part 15 Subpart C
Receiver: R&S ESI (145-128) 03-15-2018 Limit Distance (m): 3
PreAmp: 145-014_07-01-2017.txt Test Distance (m): 3

Antenna & Cables: HF Bands: N, LF, HF, SHF
Antenna: ETS001_2-13-2018.txt ETS001_2-13-2018.txt
Cable(s): 145-416 3mTrkB 10-03-2014.txt NONE.
Barometer: DAV003 Filter: NONE
Temp/Humidity/Pressure: 22 deg C 52% 1000 mB

PreAmp Used? (Y or N): N Voltage/Frequency: Battery Frequency Range: See frequencies

Net = Reading (dBuV/m) + Antenna Factor (dB1/m) + Cable Loss (dB) - Preamp Factor (dB) - Distance Factor (dB)

Peak: PK Quasi-Peak: QP Average: AVG RMS: RMS; NF = Noise Floor, RB = Restricted Band; Bandwidth denoted as RBW/VBW

Detector Type	Ant. Pol. (V/H)	Frequency MHz	Reading dB(uV)	Antenna Factor dB(1/m)	Cable Loss dB	Pre-amp Factor dB	Distance Factor dB	Net dB(uV/m)	Limit dB(uV/m)	Margin dB	Bandwidth	FCC	IC	Harmonic?
Lower Band Edge, Z-axis														
PK	V	2300.000	15.18	31.58	5.72	0.00	0.00	52.48	74.00	-21.52	1/3 MHz	RB	RB	
AVG	V	2300.000	3.02	31.58	5.72	0.00	0.00	40.32	54.00	-13.68	1/3 MHz	RB	RB	
Lower Band Edge, Y-axis														
PK	V	2300.000	15.29	31.58	5.72	0.00	0.00	52.59	74.00	-21.41	1/3 MHz	RB	RB	
AVG	V	2300.000	2.05	31.58	5.72	0.00	0.00	39.35	54.00	-14.65	1/3 MHz	RB	RB	
Lower Band Edge, X-axis														
PK	V	2300.000	15.01	31.58	5.72	0.00	0.00	52.31	74.00	-21.69	1/3 MHz	RB	RB	
AVG	V	2300.000	2.16	31.58	5.72	0.00	0.00	39.46	54.00	-14.54	1/3 MHz	RB	RB	
Upper Band Edge, Z-axis														
PK	H	2483.500	17.32	32.24	6.07	0.00	0.00	55.63	74.00	-18.37	1/3 MHz	RB	RB	
AVG	H	2483.500	3.32	32.24	6.07	0.00	0.00	41.63	54.00	-12.37	1/3 MHz	RB	RB	
Upper Band Edge, Y-axis														
PK	H	2483.500	20.06	32.24	6.07	0.00	0.00	58.37	74.00	-15.63	1/3 MHz	RB	RB	
AVG	H	2483.500	3.42	32.24	6.07	0.00	0.00	41.73	54.00	-12.27	1/3 MHz	RB	RB	
Upper Band Edge, X-axis														
PK	V	2483.500	16.26	32.24	6.07	0.00	0.00	54.57	74.00	-19.43	1/3 MHz	RB	RB	
AVG	V	2483.500	3.23	32.24	6.07	0.00	0.00	41.54	54.00	-12.46	1/3 MHz	RB	RB	

Test Personnel: Vathana Ven VHV
Supervising/Reviewing Engineer: (Where Applicable) N/A
Product Standard: FCC Part 15.247, RSS-247 RSS-102
Input Voltage: Internal battery power
Pretest Verification w/ Ambient Signals or BB Source: N/A

Test Date: 07/27/2017, 07/28/2017
Limit Applied: See Section 9.3
Ambient Temperature: 22, 23 ºC
Relative Humidity: 52, 48 %
Atmospheric Pressure: 1000, 1009 mbars

Deviations, Additions, or Exclusions: None

10 Transmitter Spurious Emissions

10.1 Method

Tests are performed in accordance with CFR47 FCC Part 15 Subpart C, Section 15.247 Issue 2, and ANSI C63.10.

TEST SITE: EMC Lab & 10m ALSE

The EMC Lab has one Semi-anechoic Chamber and one Shielded Chamber. AC Mains Power is available at 120, 230, and 277 Single Phase; 208, 400, and 480 3-Phase. Large reference ground-planes are installed in the general lab area to facilitate EMC work not requiring a shielded environment.

The 10m ALSE is 13m (Length) x 21m (Depth) x 10m (Height) with the effective size in terms of space from the tips of the absorber is 12m (Length) x 20m (Depth) x 8.5m (Height). This chamber achieves broadband performance using a unique arrangement of hybrid and ferrite tile absorber. This chamber has a built in 3m diameter turntable (Embedded type). The metal structure of the table makes electrical connection around the entire circumference of the turntable to the ground plane with a metal brush type connection. The turntable is located on one end of the chamber and the antennas are mounted 3 and 10 meters away at the other end of the chamber on the adjustable an Antenna Mast. The antenna mast is a non-conductive bore sighted type with remote control of antenna height and polarization. The Antenna Mast and the turntable can be remotely controlled through the controller located in the adjacent Control room. A Styrofoam table 80 cm high is used for table-top equipment.

Measurement Uncertainty

Measurement	Frequency Range	Expanded Uncertainty (k=2)	Ucispr
Radiated Emissions, 10m	30-1000 MHz	4.6 dB	6.3 dB
Radiated Emissions, 3m	30-1000 MHz	5.3 dB	6.3 dB
Radiated Emissions, 3m	1-6 GHz	4.5 dB	5.2 dB
Radiated Emissions, 3m	6-15 GHz	5.2 dB	5.5 dB
Radiated Emissions, 3m	15-18 GHz	5.0 dB	5.5 dB
Radiated Emissions, 3m	18-40 GHz	5.0 dB	5.5 dB

As shown in the table above our radiated emissions U_{lab} is less than the corresponding U_{CISPR} reference value in CISPR 16-4-2 Table 1, hence the compliance of the product is only based on the measured value, and no measurement uncertainty correction is required, based on CISPR 22 and CISPR 11 (for 2006 and later revisions) Clause 11.

Sample Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation with a sample calculation is as follows:

FS = RA + AF + CF - AG

Where FS = Field Strength in dBμV/m
RA = Receiver Amplitude (including preamplifier) in dBμV
CF = Cable Attenuation Factor in dB
AF = Antenna Factor in dB
AG = Amplifier Gain in dB

In the following table(s), the reading shown on the data table reflects the preamplifier gain. An example for the calculations in the following table is as follows.

Assume a receiver reading of 52.0 dBμV is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB is added. The amplifier gain of 29 dB is subtracted, giving a field strength of 32 dBμV/m. This value in dBμV/m was converted to its corresponding level in μV/m.

RA = 52.0 dBμV
AF = 7.4 dB/m
CF = 1.6 dB
AG = 29.0 dB
FS = 32 dBμV/m

To convert from dBμV to μV or mV the following was used:

$UF = 10^{(NF / 20)}$ where UF = Net Reading in μV
NF = Net Reading in dBμV

Example:

FS = RA + AF + CF – AG = 52.0 + 7.4 + 1.6 – 29.0 = 32.0
$UF = 10^{(32\ dB\mu V / 20)}$ = 39.8 μV/m

Alternately, when BAT-EMC Emission Software is used, the “Level” includes all losses and gains and is compared directly in the “Margin” column to the “Limit”. The “Correction” includes Antenna Factor, Preamp, and Cable Loss. These are already accounted for in the “Level” column.

10.2 Test Equipment Used:

Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due
DAV004'	Weather Station	Davis Instruments	7400	PE80529A61A	05/10/2017	05/10/2018
145128'	EMI Receiver (20 Hz - 40 Ghz)	Rohde & Schwarz	ESIB 40	839283/001	03/15/2017	03/15/2018
145-416'	Cables 145-420 145-423 145-424 145-408	Huber + Suhner	3m Track B cables	multiple	07/30/2016	07/30/2017
PRE10'	30-1000MHz pre-amp	ITS	PRE10	PRE10	12/16/2016	12/16/2017
145145'	Broadband Hybrid Antenna 30 MHz - 3 GHz	Sunol Sciences Corp.	JB3	A122313	05/02/2017	05/02/2018
ETS001'	1-18GHz DRG Horn Antenna	ETS-Lindgren	3117	00143259	02/13/2017	02/13/2018
EMC04'	ANTENNA, RIDGED GUIDE, 18-40 GHZ	EMCO	3116	2090	09/14/2016	09/14/2017
REA004'	3GHz High Pass Filter	Reactel, Inc	7HSX-3G/18G-S11	06-1	02/17/2017	02/17/2018
PRE8'	PREAMPLFIER 1- 40 GHz	MITEQ	NSP4000-NF	507145	09/14/2016	09/14/2017
CBLHF2012-2M-1'	2m 9kHz-40GHz Coaxial Cable - SET1	Huber & Suhner	SF102	252675001	02/08/2017	02/08/2018
CBLHF2012-5M-1'	5m 9kHz-40GHz Coaxial Cable - SET 1	Huber & Suhner	SF102	252676001	02/08/2017	02/08/2018
145014'	Preamplifier (1 GHz to 26.5 GHz)	Hewlett Packard	8449B	3008A00232	06/03/2017	06/03/2018
145-410'	Cables 145-420 145-421 145-422 145-406	Huber + Suhner	10m Track A Cables	multiple	07/30/2016	07/30/2017
ROS004'	Vector Signal Generator, 300kHz-3.3GHz	Rohde & Schwartz	SMIQ03B	100338	01/28/2017	01/28/2018
DAV003'	Weather Station	Davis Instruments	7400	PE80529A39A	11/28/2016	11/28/2017

Software Utilized:

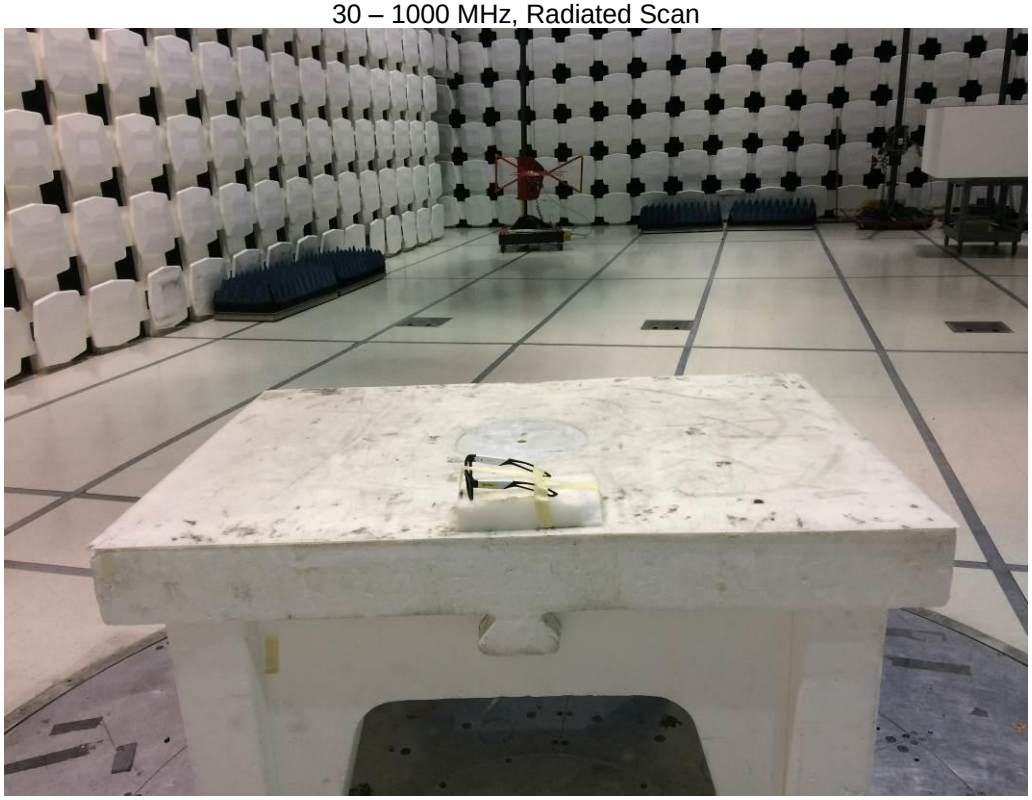
Name	Manufacturer	Version
EMI Boxborough.xls	Intertek	08/27/2010
BAT-EMC	Nexio	3.16.0.69

10.3 Results:

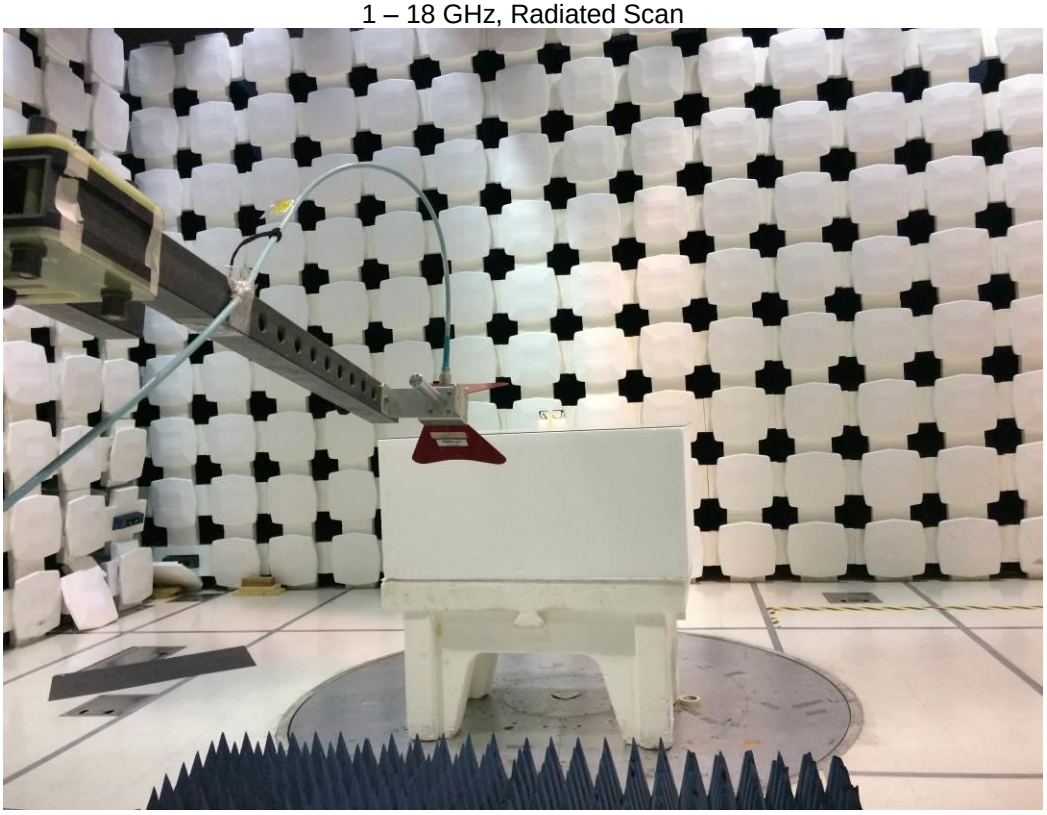
The sample tested was found to Comply.

10.4 Setup Photographs:

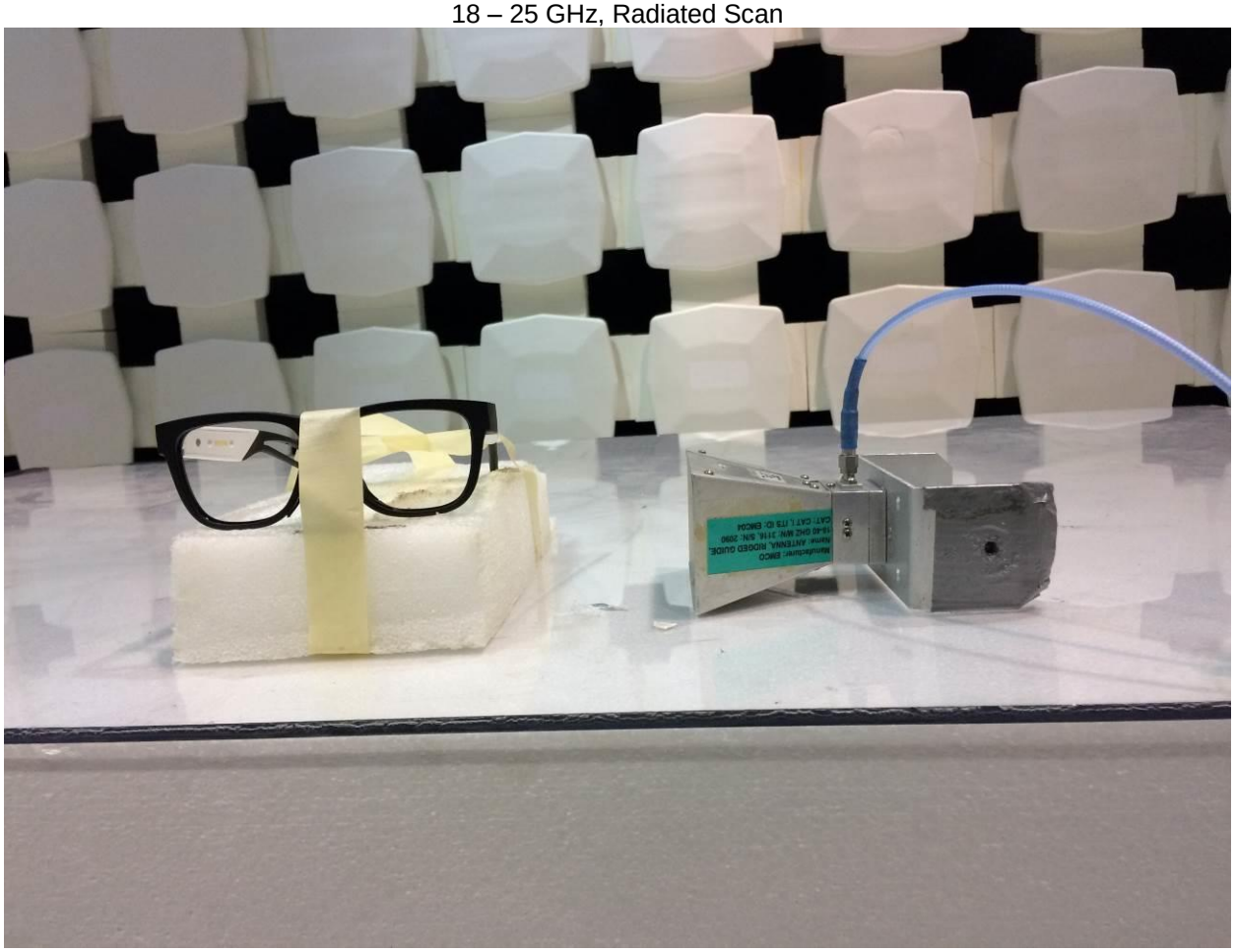
30 – 1000 MHz, Radiated Scan



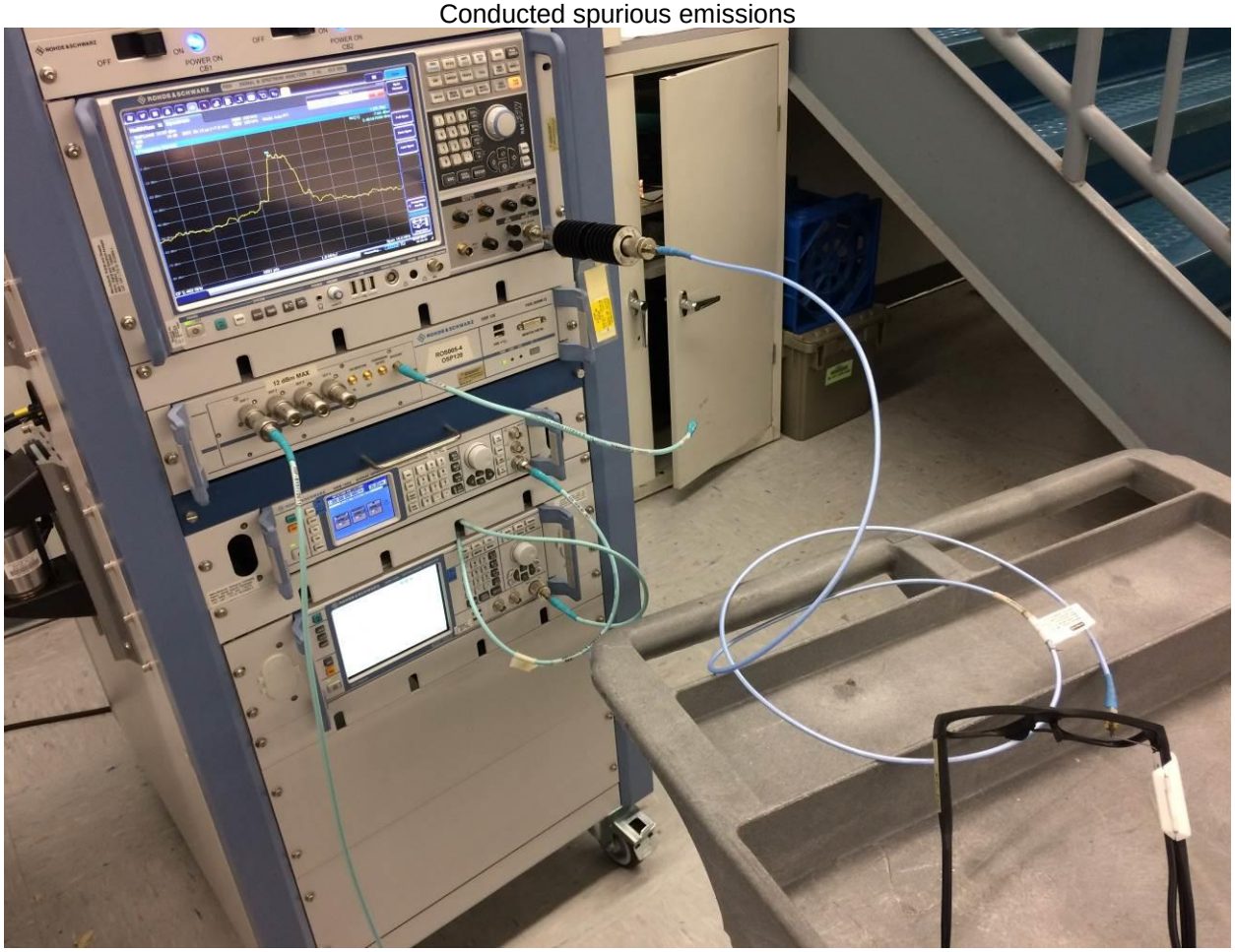
1 – 18 GHz, Radiated Scan



18 – 25 GHz, Radiated Scan

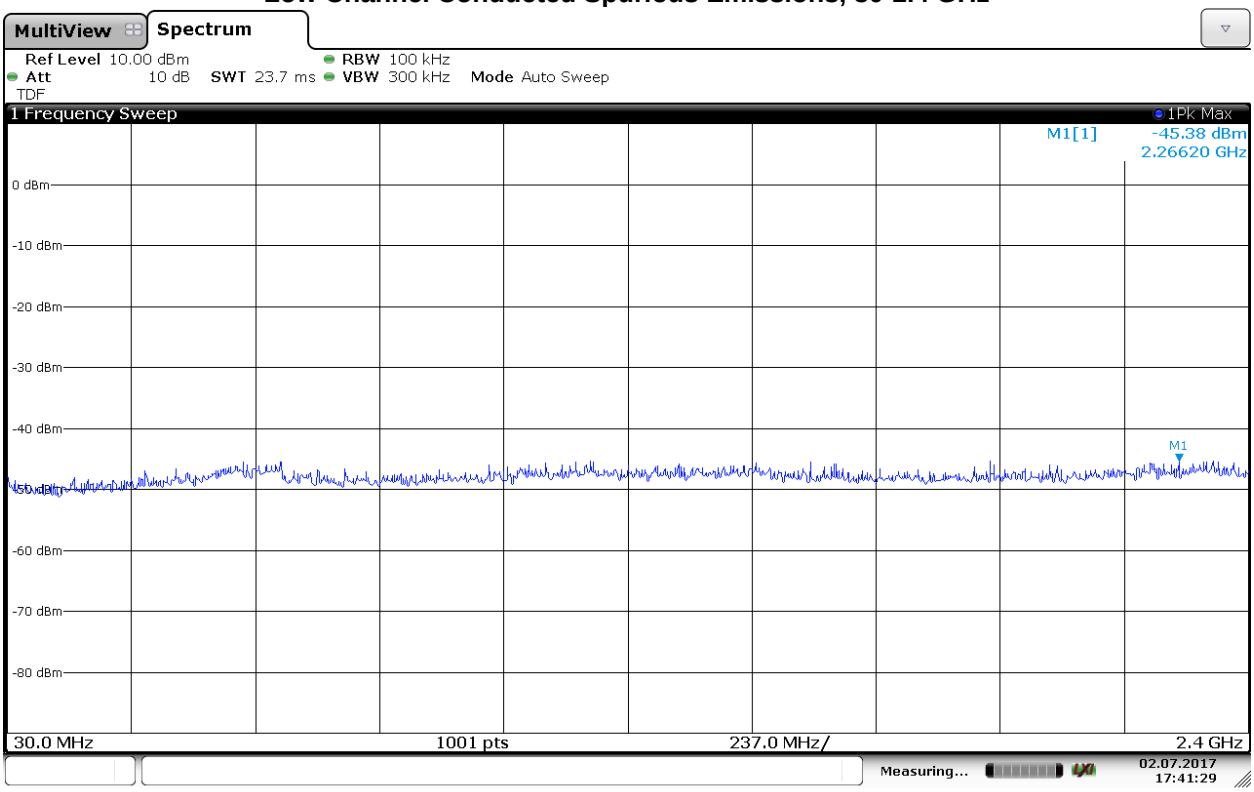


Conducted spurious emissions



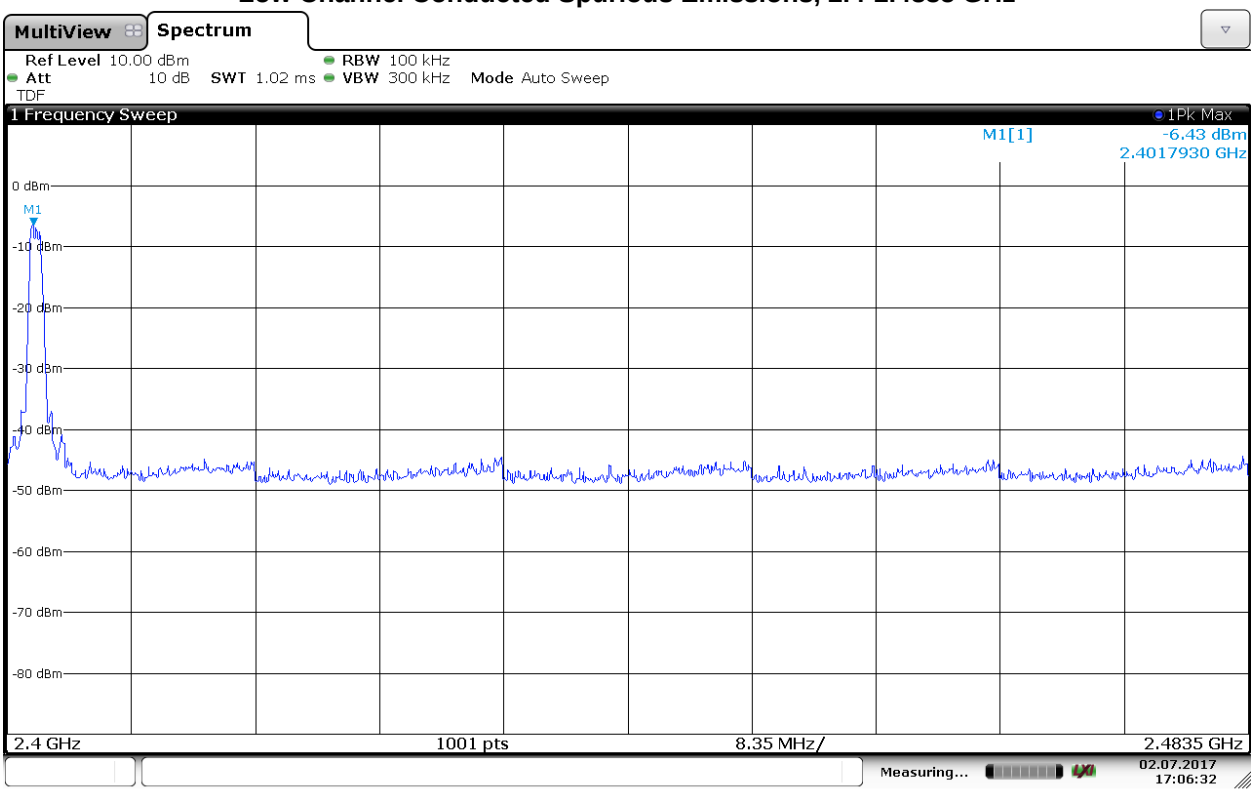
10.5 Plots/Data:

Low Channel Conducted Spurious Emissions, 30-2.4 GHz



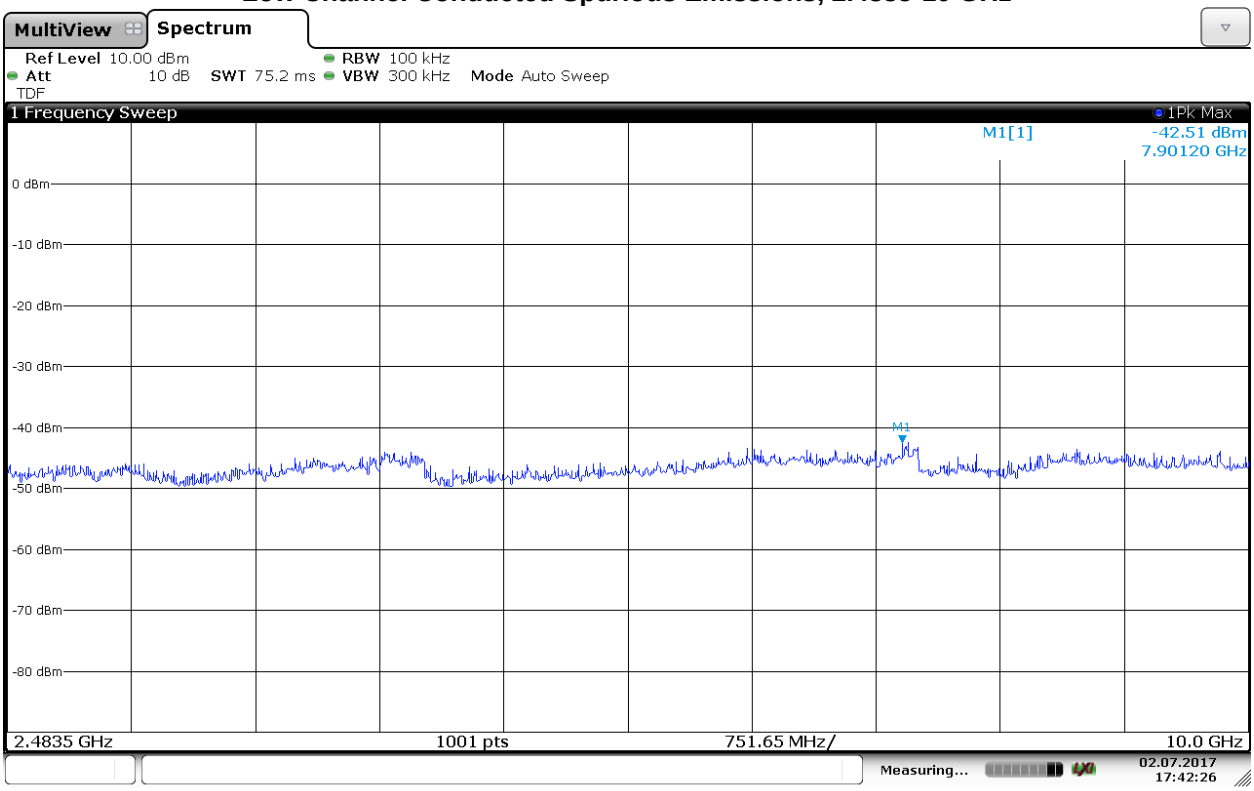
Date: 2.JUL.2017 17:41:29

Low Channel Conducted Spurious Emissions, 2.4-2.4835 GHz



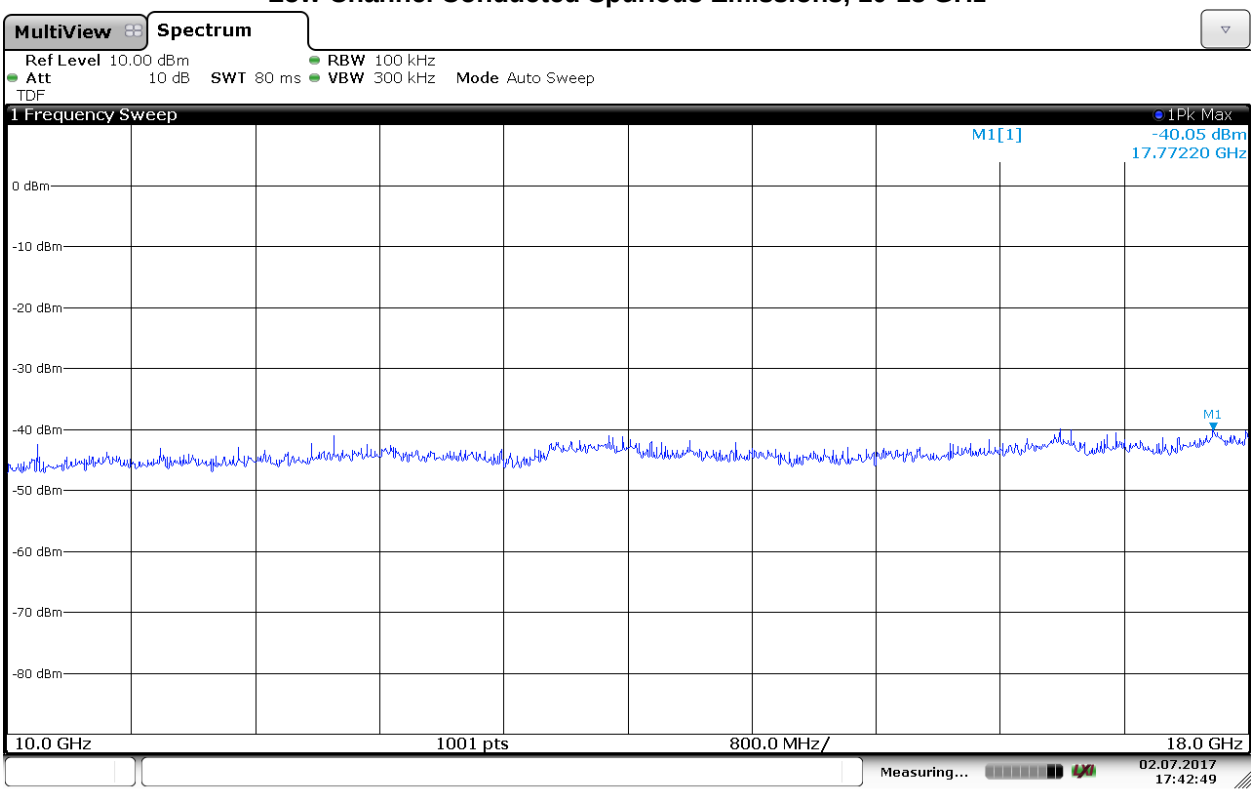
Date: 2.JUL.2017 17:06:32

Low Channel Conducted Spurious Emissions, 2.4835-10 GHz



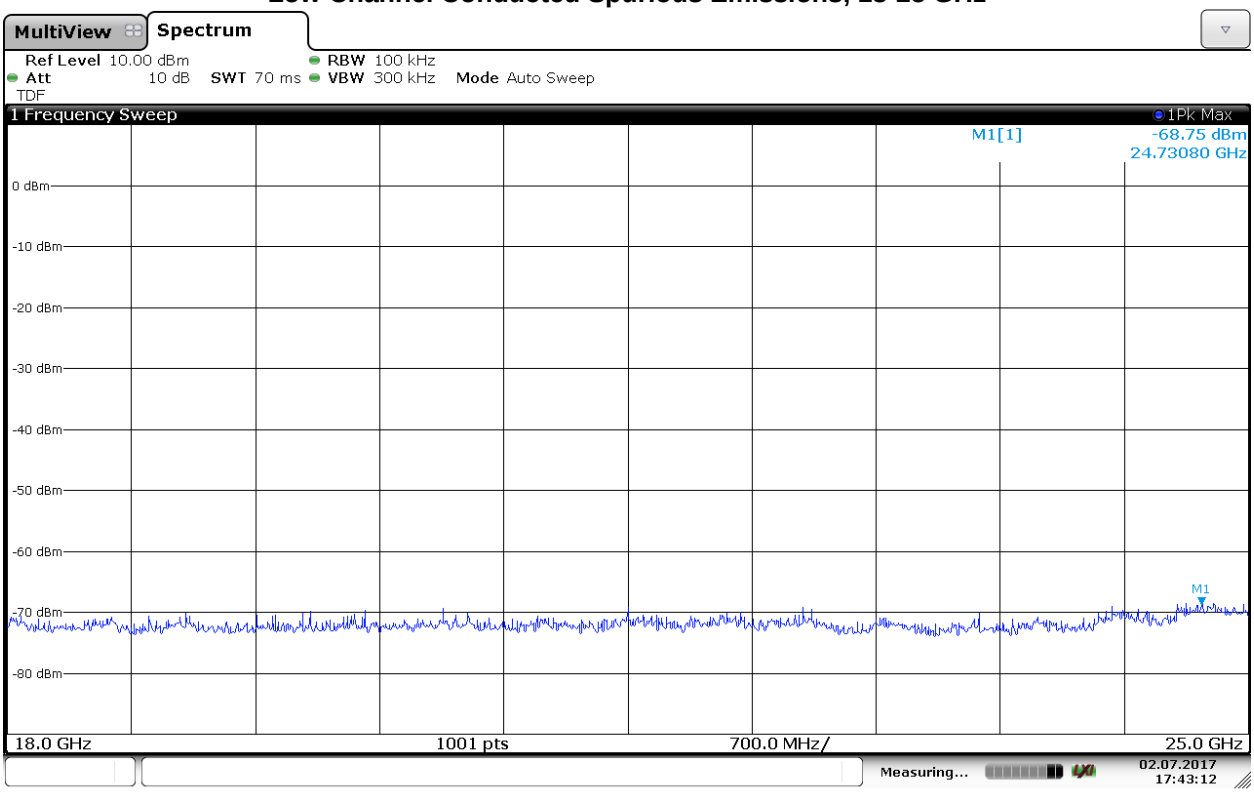
Date: 2.JUL.2017 17:42:25

Low Channel Conducted Spurious Emissions, 10-18 GHz



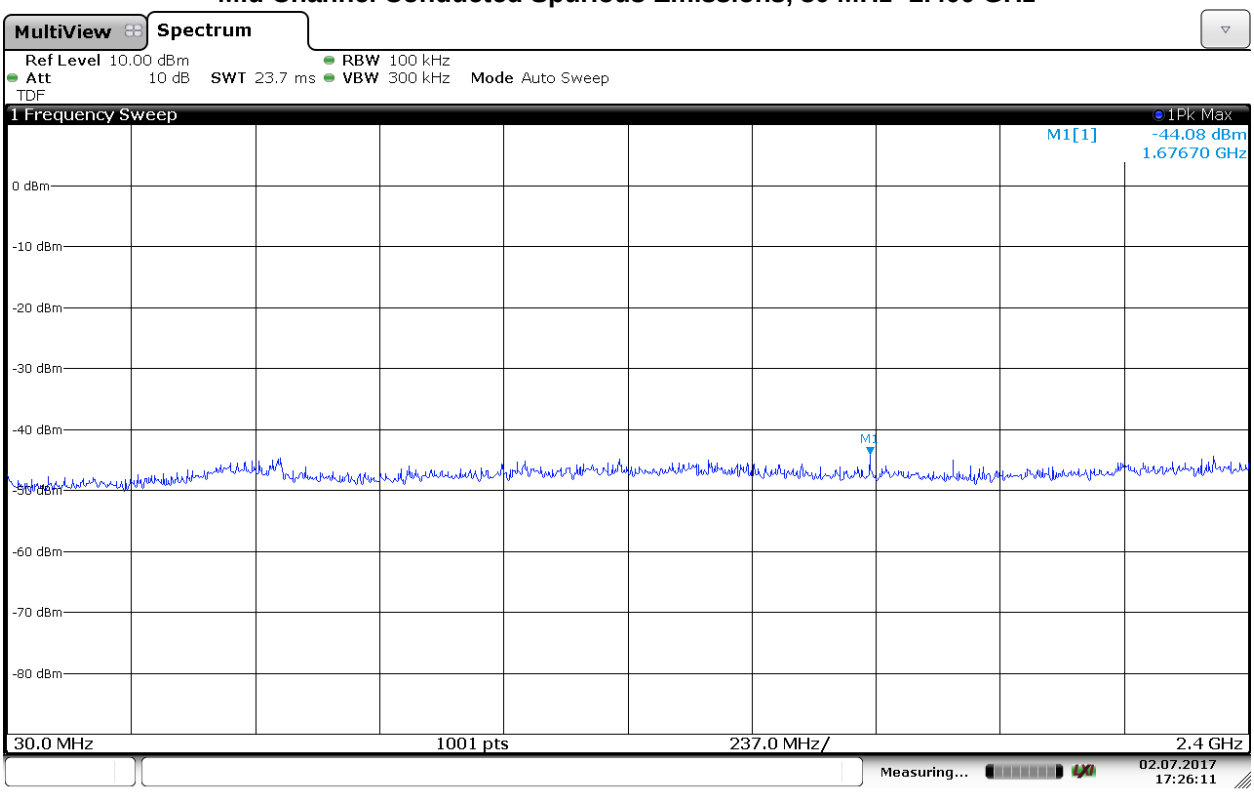
Date: 2.JUL.2017 17:42:49

Low Channel Conducted Spurious Emissions, 18-25 GHz



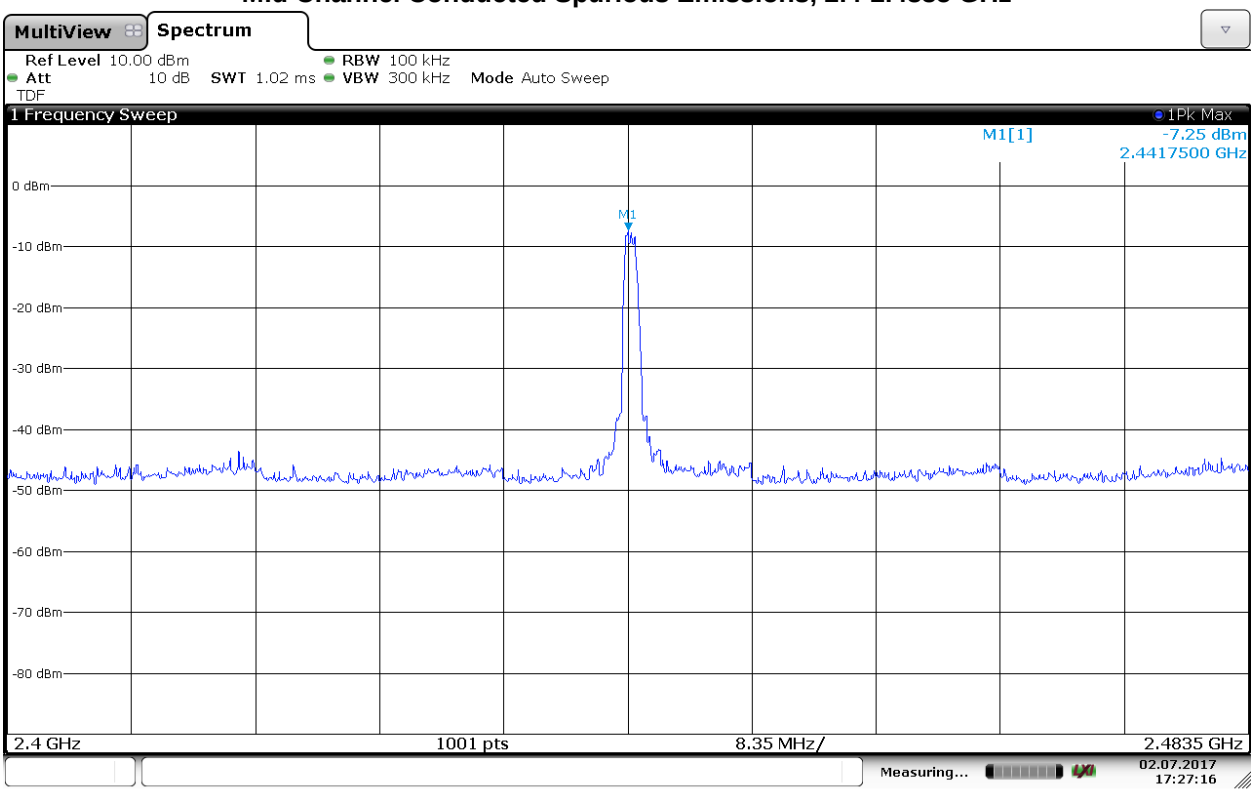
Date: 2.JUL.2017 17:43:12

Mid Channel Conducted Spurious Emissions, 30 MHz- 2.400 GHz



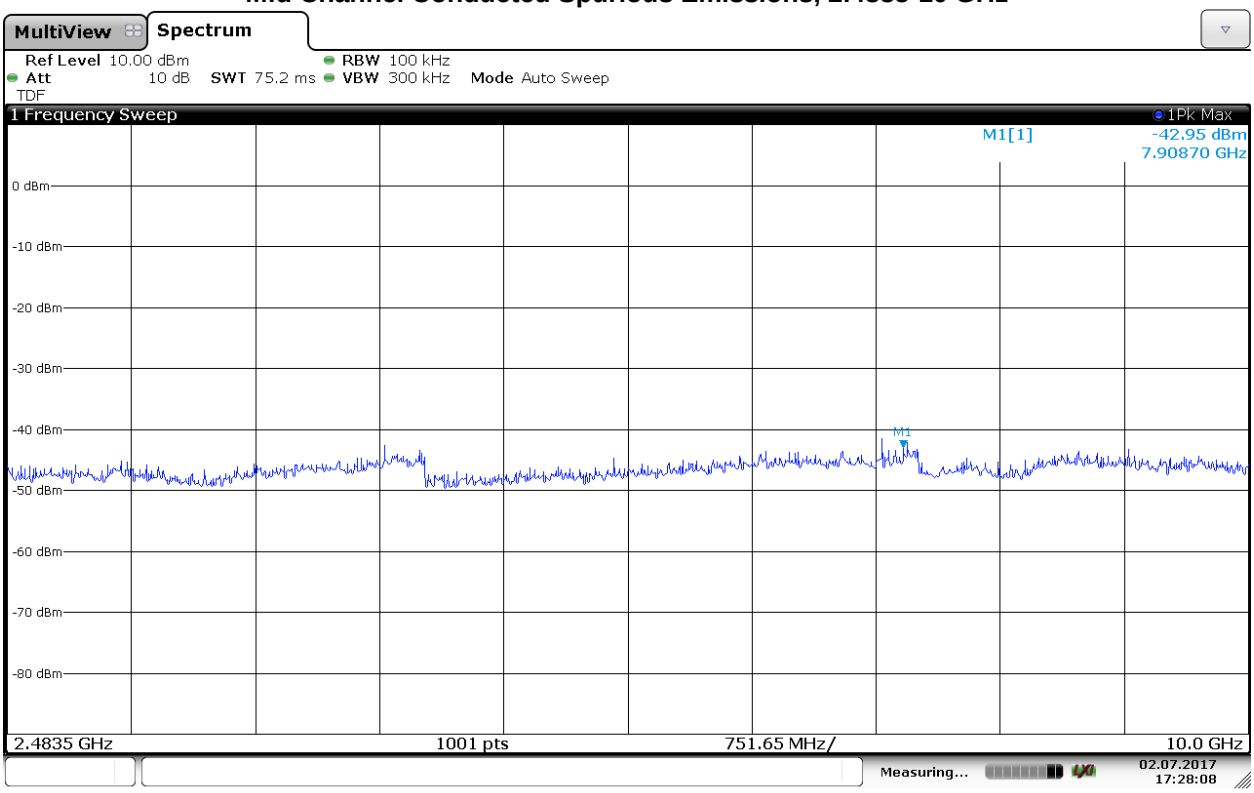
Date: 2.JUL.2017 17:26:11

Mid Channel Conducted Spurious Emissions, 2.4-2.4835 GHz



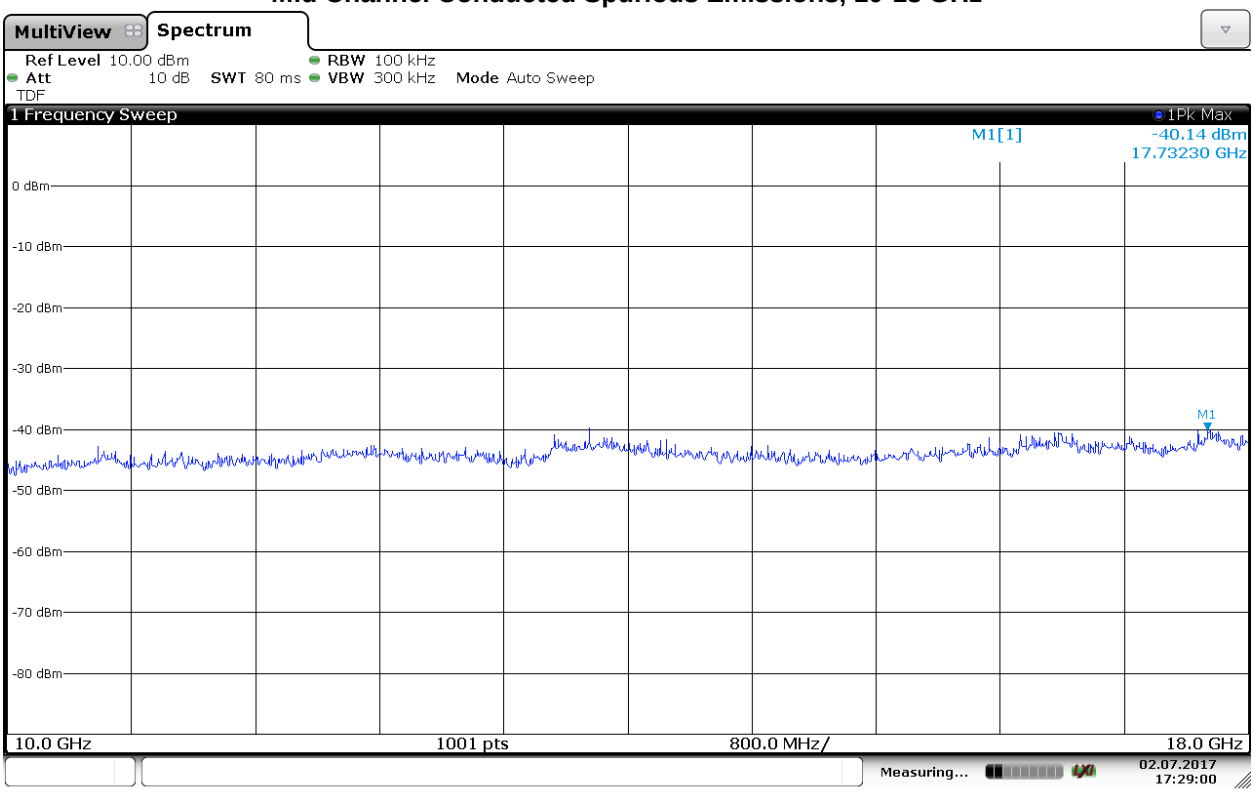
Date: 2.JUL.2017 17:27:16

Mid Channel Conducted Spurious Emissions, 2.4835-10 GHz



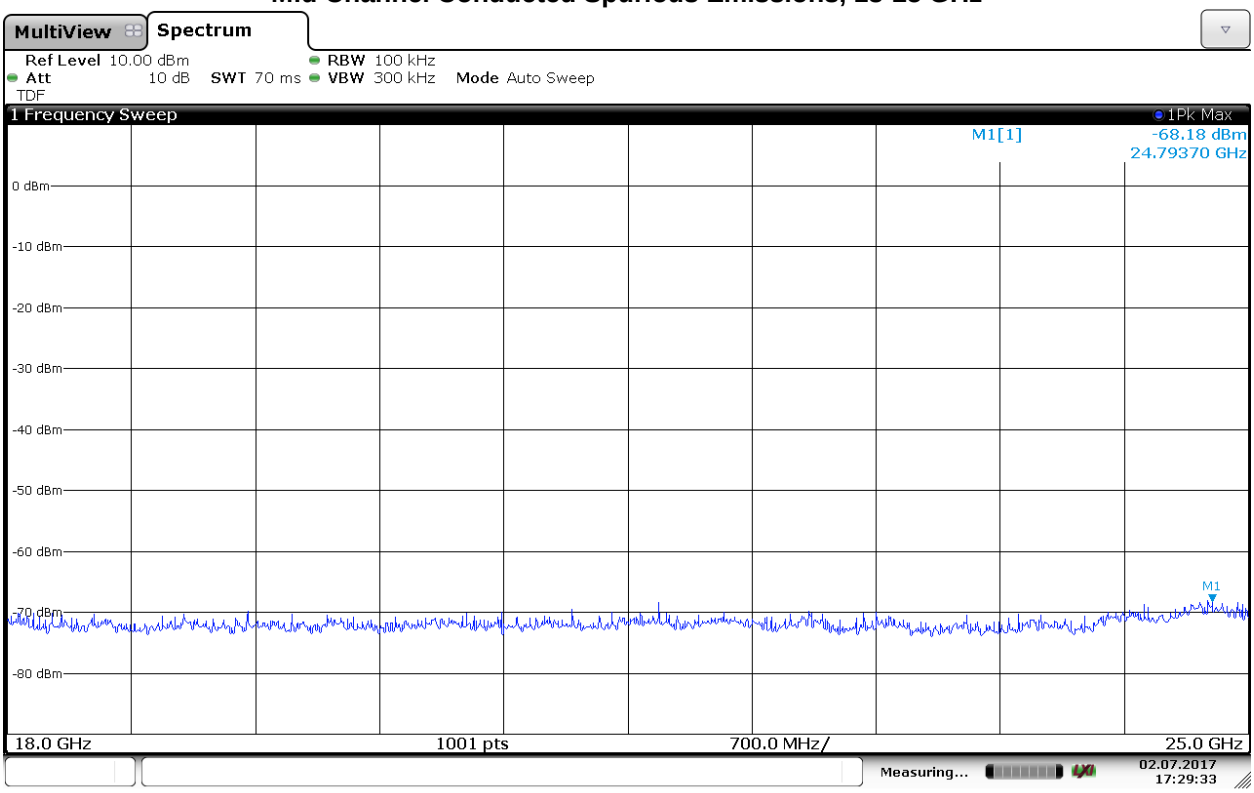
Date: 2.JUL.2017 17:28:09

Mid Channel Conducted Spurious Emissions, 10-18 GHz



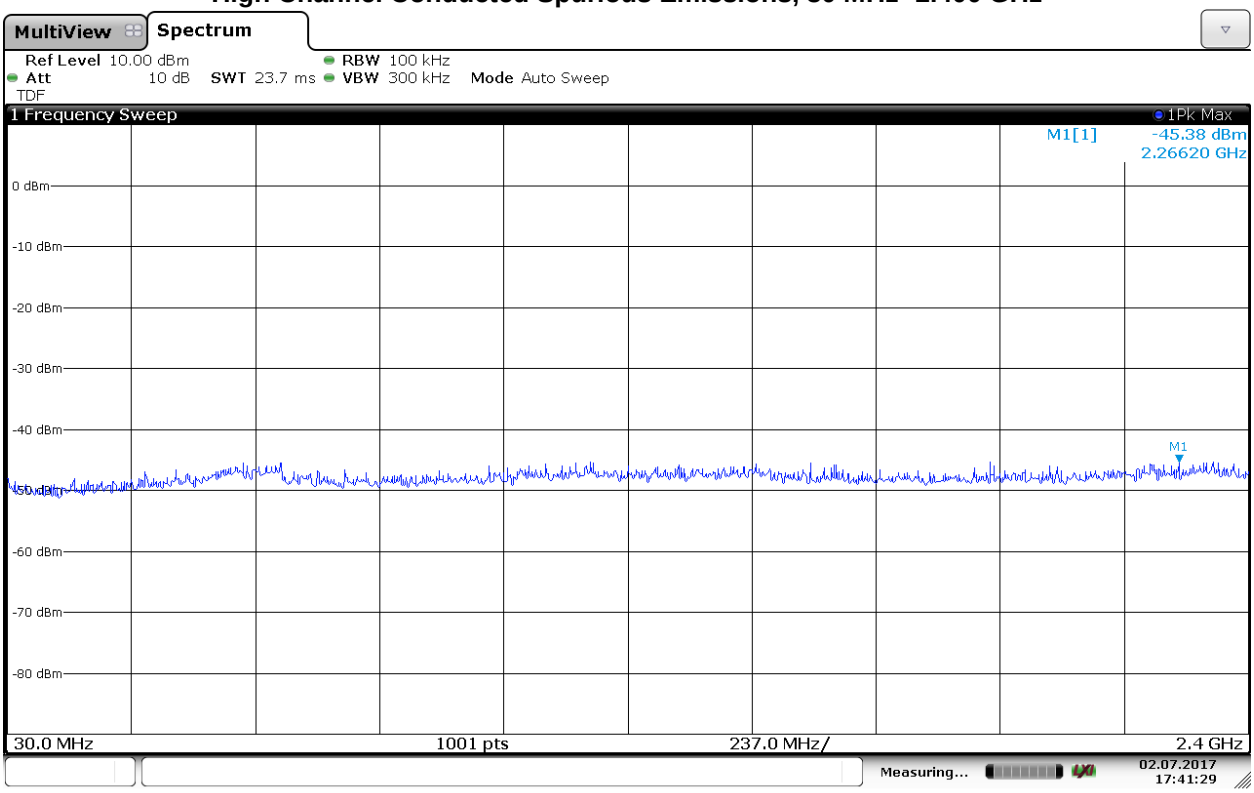
Date: 2.JUL.2017 17:29:00

Mid Channel Conducted Spurious Emissions, 18-25 GHz



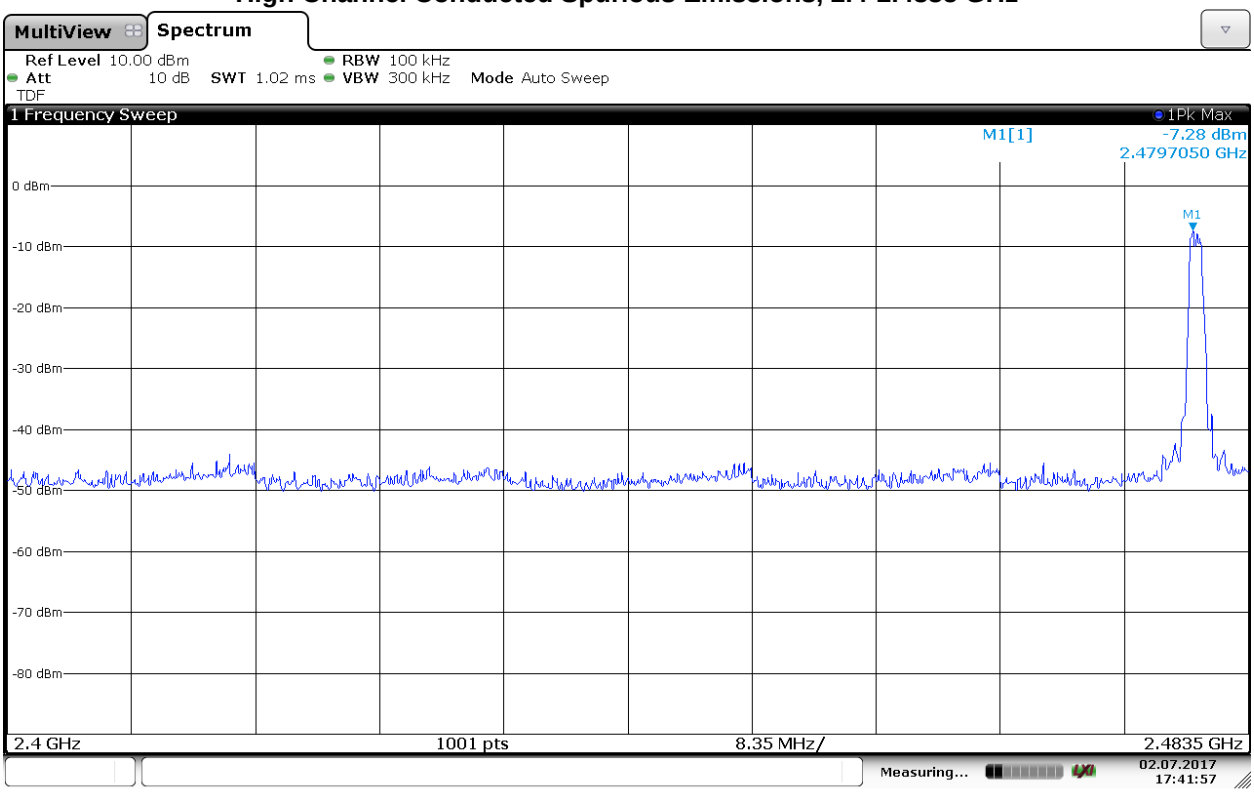
Date: 2.JUL.2017 17:29:33

High Channel Conducted Spurious Emissions, 30 MHz- 2.400 GHz



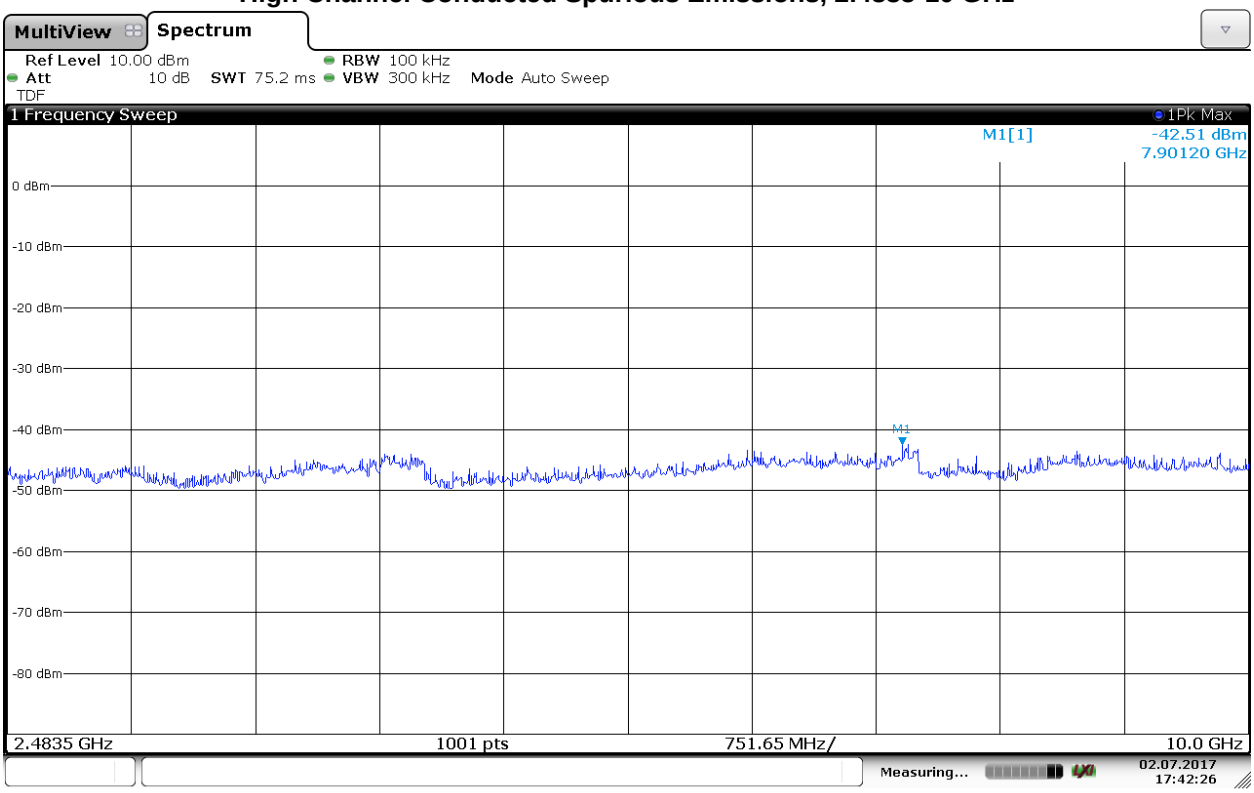
Date: 2.JUL.2017 17:41:29

High Channel Conducted Spurious Emissions, 2.4-2.4835 GHz



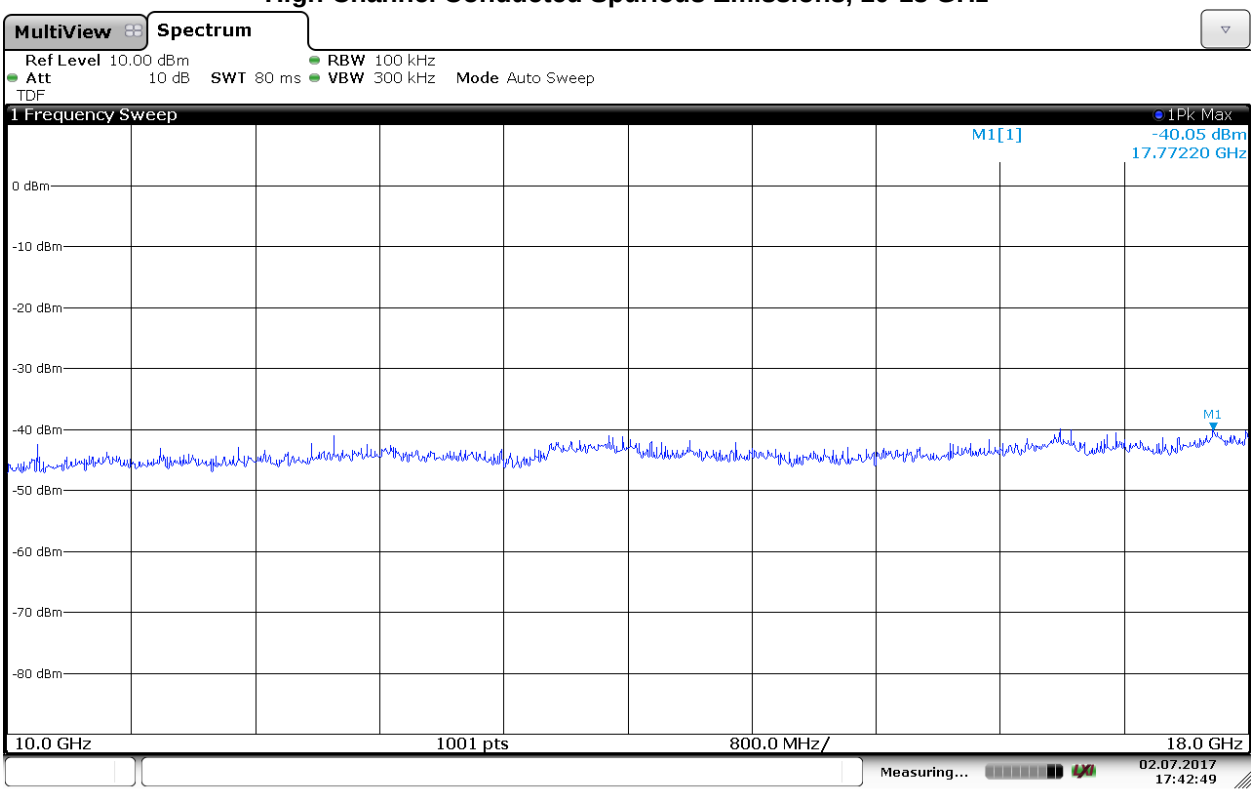
Date: 2.JUL.2017 17:41:56

High Channel Conducted Spurious Emissions, 2.4835-10 GHz



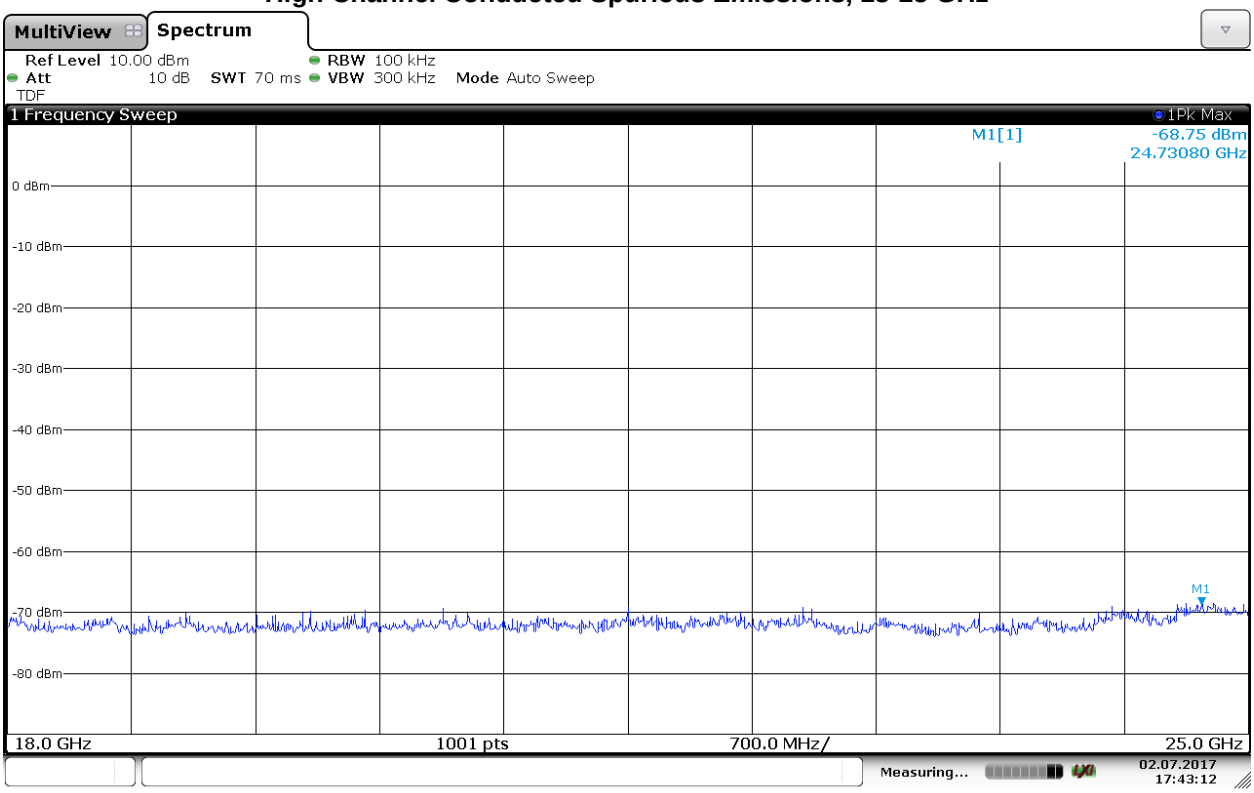
Date: 2.JUL.2017 17:42:25

High Channel Conducted Spurious Emissions, 10-18 GHz



Date: 2.JUL.2017 17:42:49

High Channel Conducted Spurious Emissions, 18-25 GHz



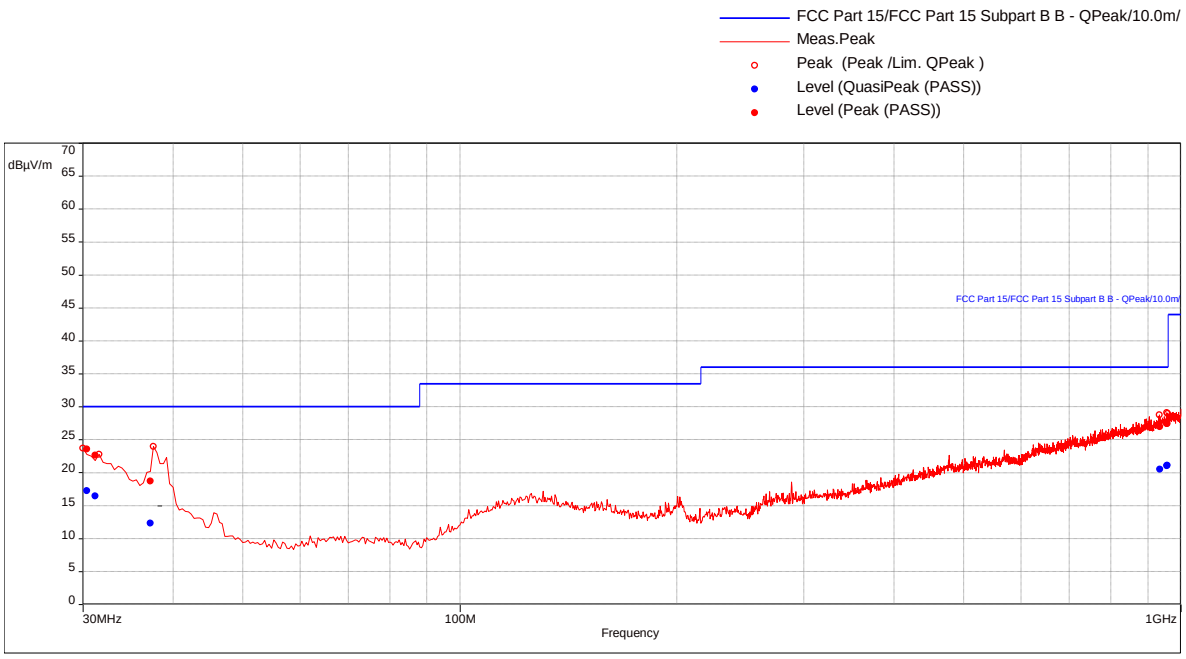
Date: 2.JUL.2017 17:43:12

Mid Channel Radiated Spurious Emission, 30-1000 MHz, X-axis

Test Information:

Date and Time	7/28/2017 5:35:36 PM
Client and Project Number	Safilo_G103104758
Engineer	Vathana Ven
Temperature	22 deg C
Humidity	52%
Atmospheric Pressure	1000 mB
Comments	RE 30-1000MHz_Tx mode_Mid Channel_X-axis

Graph:



Results:

QuasiPeak (PASS) (6)

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	RBW	Correction (dB)
30.25263158	17.21	30.00	-12.79	232.00	2.79	Vertical	120000.00	-12.43
31.28421053	16.45	30.00	-13.55	256.00	2.79	Vertical	120000.00	-13.19
37.12631579	12.32	30.00	-17.68	19.00	3.74	Vertical	120000.00	-17.56
934.7473684	20.52	36.00	-15.48	55.00	2.78	Horizontal	120000.00	-5.99
955.9684211	21.03	36.00	-14.97	247.00	3.09	Vertical	120000.00	-5.62
958.0526316	21.07	36.00	-14.93	203.00	2.92	Vertical	120000.00	-5.51

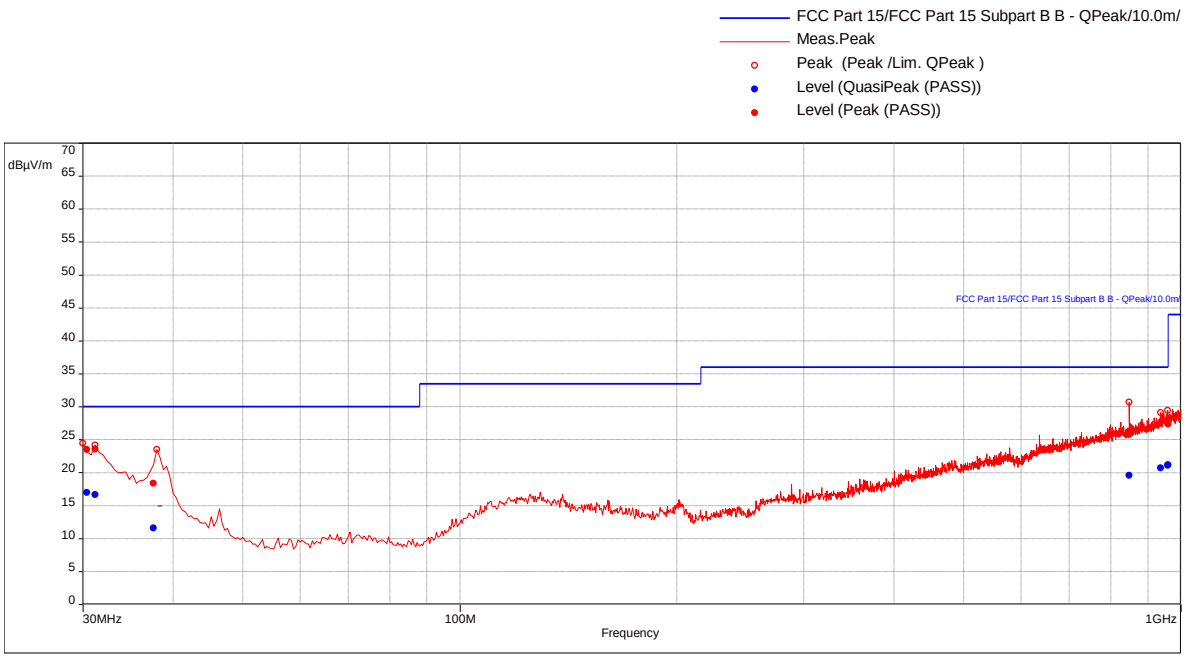
Notes: Only mid channel was tested from 30-1000 MHz.

Mid Channel Radiated Spurious Emission, 30-1000 MHz, Y-axis

Test Information:

Date and Time	7/28/2017 6:22:10 PM
Client and Project Number	Safilo_G103104758
Engineer	Vathana Ven
Temperature	22 deg C
Humidity	52%
Atmospheric Pressure	1000 mB
Comments	RE 30-1000MHz_Tx mode_Mid Channel_Y-axis

Graph:



Results:

QuasiPeak (PASS) (7)

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	RBW	Correction (dB)
30.56842105	16.95	30.00	-13.05	241.00	3.01	Vertical	120000.00	-12.64
31.04210526	16.66	30.00	-13.34	100.00	1.98	Vertical	120000.00	-12.98
37.68421053	11.59	30.00	-18.41	137.00	1.76	Vertical	120000.00	-18.04
848.4631579	19.55	36.00	-16.45	41.00	3.47	Vertical	120000.00	-7.23
937.5368421	20.69	36.00	-15.31	108.00	3.51	Vertical	120000.00	-5.89
959.6842105	21.07	36.00	-14.93	114.00	3.00	Vertical	120000.00	-5.44
960.0736842	21.17	36.00	-14.83	292.00	2.12	Horizontal	120000.00	-5.41

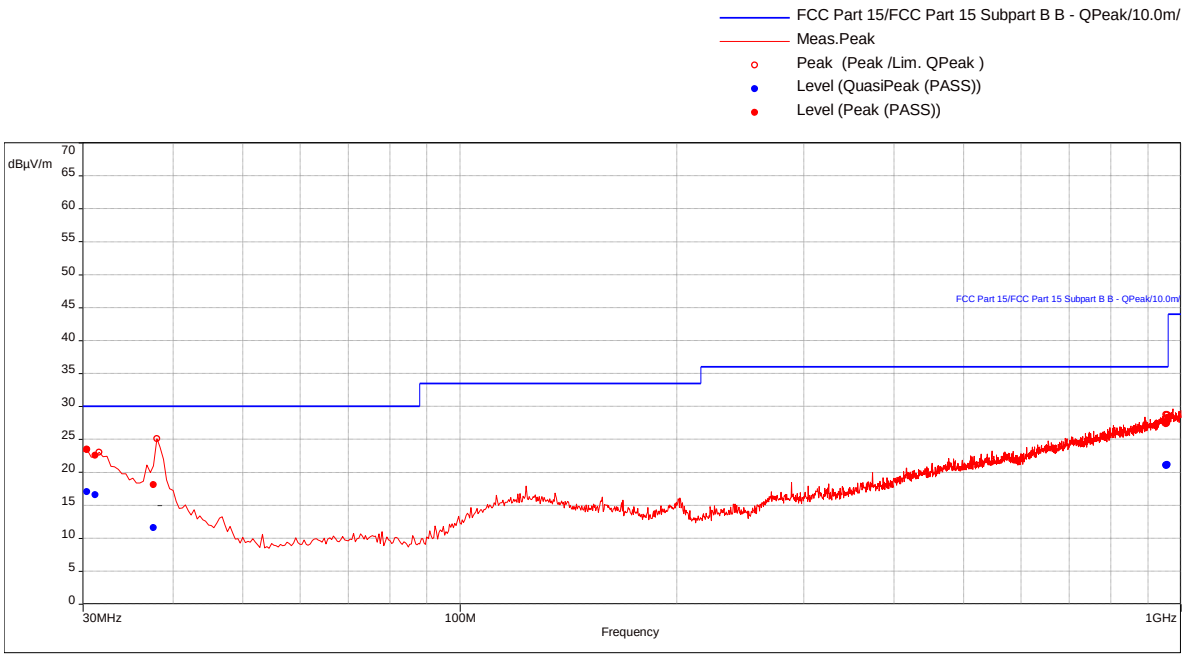
Notes: Only mid channel was tested from 30-1000 MHz.

Mid Channel Radiated Spurious Emission, 30-1000 MHz, Z-axis

Test Information:

Date and Time	7/28/2017 7:12:45 PM
Client and Project Number	Safilo_G103104758
Engineer	Vathana Ven
Temperature	22 deg C
Humidity	52%
Atmospheric Pressure	1000 mB
Comments	RE 30-1000MHz_Tx mode_Mid Channel_Z-axis

Graph:



Results:

QuasiPeak (PASS) (7)

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	RBW	Correction (dB)
30.55789474	17.05	30.00	-12.95	263.00	1.77	Vertical	120000.00	-12.63
31.22105263	16.55	30.00	-13.45	108.00	3.75	Vertical	120000.00	-13.13
37.77894737	11.55	30.00	-18.45	226.00	3.74	Vertical	120000.00	-18.13
953.5578947	21.09	36.00	-14.91	284.00	2.27	Vertical	120000.00	-5.62
953.8210526	21.03	36.00	-14.97	48.00	3.93	Vertical	120000.00	-5.62
956.1578947	21.05	36.00	-14.95	152.00	3.60	Horizontal	120000.00	-5.60
957.5368421	21.13	36.00	-14.87	11.00	3.68	Horizontal	120000.00	-5.51

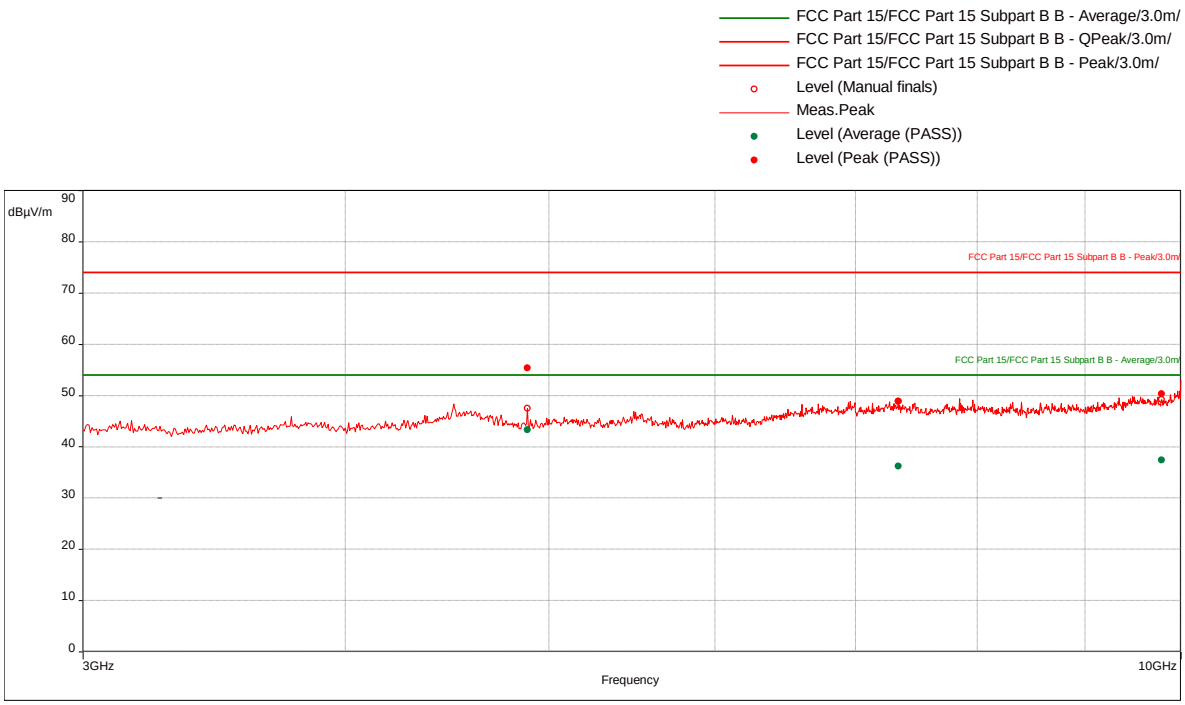
Notes: Only mid channel was tested from 30-1000 MHz.

Mid Channel Radiated Spurious Emission, 1-25 GHz, X-axis

Test Information:

Date and Time	7/27/2017 11:17:00 PM
Client and Project Number	Safilo_G103104758
Engineer	Vathana Ven
Temperature	22 deg C
Humidity	52%
Atmospheric Pressure	1000 mB
Comments	RE 3 to 10 GHz_Tx mode_Mid Channel_X-axis

Graph:



Note: Manual scan was performed from 1-3 GHz and 11-25 GHz. High pass filter was used for scan from 3-25 GHz.

Results:

Peak (PASS) (3)

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	RBW	Correction (dB)
4884.473684	55.33	74.00	-18.67	151.00	2.19	Horizontal	1000000.00	9.25
7335.526316	48.85	74.00	-25.15	306.00	3.11	Horizontal	1000000.00	11.93
9789.210526	50.27	74.00	-23.73	247.00	2.41	Horizontal	1000000.00	13.47

Average (PASS) (3)

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	RBW	Correction (dB)
4884.473684	43.29	54.00	-10.71	151.00	2.19	Horizontal	1000000.00	9.25
7335.526316	36.19	54.00	-17.81	306.00	3.11	Horizontal	1000000.00	11.93
9789.210526	37.37	54.00	-16.63	247.00	2.41	Horizontal	1000000.00	13.47

Mid Channel Radiated Spurious Emission, 1-25 GHz, Y-axis

Test Information:

Date and Time	7/27/2017 9:19:36 PM
Client and Project Number	Safilo_G103104758
Engineer	Vathana Ven
Temperature	22 deg C
Humidity	52%
Atmospheric Pressure	1000 mB
Comments	RE 3 to 10 GHz_Tx mode_Mid Channel_Y-axis

Graph:

Note: Manual scan was performed from 1-3 GHz and 11-25 GHz. High pass filter was used for scan from 3-25 GHz.

Results:

Peak (PASS) (3)

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	RBW	Correction (dB)
4884.473684	54.68	74.00	-19.32	172.00	1.42	Horizontal	1000000.00	9.25
7367.894737	49.73	74.00	-24.27	195.00	3.58	Horizontal	1000000.00	11.87
9719.210526	50.66	74.00	-23.34	1.00	2.19	Horizontal	1000000.00	13.20

Average (PASS) (3)

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	RBW	Correction (dB)
4884.473684	42.78	54.00	-11.22	172.00	1.42	Horizontal	1000000.00	9.25
7367.894737	37.37	54.00	-16.63	195.00	3.58	Horizontal	1000000.00	11.87
9719.210526	37.37	54.00	-16.63	1.00	2.19	Horizontal	1000000.00	13.20

Mid Channel Radiated Spurious Emission, 1-25 GHz, Z-axis

Test Information:

Date and Time	7/27/2017 9:00:06 PM
Client and Project Number	Safilo_G103104758
Engineer	Vathana Ven
Temperature	22 deg C
Humidity	52%
Atmospheric Pressure	1000 mB
Comments	RE 3 to 10 GHz_Tx mode_Mid Channel_Z-axis

Graph:

Note: Manual scan was performed from 1-3 GHz and 11-25 GHz. High pass filter was used for scan from 3-25 GHz.

Results:

Peak (PASS) (3)

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	RBW	Correction (dB)
4884.473684	55.84	74.00	-18.16	253.00	1.00	Vertical	1000000.00	9.25
7252.105263	50.54	74.00	-23.46	284.00	2.11	Horizontal	1000000.00	12.00
9777.631579	51.55	74.00	-22.45	349.00	1.70	Horizontal	1000000.00	13.42

Average (PASS) (3)

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	RBW	Correction (dB)
4884.473684	43.87	54.00	-10.13	253.00	1.00	Vertical	1000000.00	9.25
7252.105263	36.44	54.00	-17.56	284.00	2.11	Horizontal	1000000.00	12.00
9777.631579	37.50	54.00	-16.50	349.00	1.70	Horizontal	1000000.00	13.42

Low Channel Radiated Spurious Emission, 1-25 GHz, X-axis

Company: Safilo SpA
Model #: Fitness Tracker Glasses
Serial #: BOX1707171118(Intertek Assigned)
Engineers: Vathana Ven Location: 10M
Project #: G103104758 Date(s): 07/27/17
Standard: FCC Part 15 Subpart C
Receiver: R&S ESI (145-128) 03-15-2018 Limit Distance (m): 3
PreAmp: 145-014_06-03-2018.txt Test Distance (m): 3

Antenna & Cables: HF Bands: N, LF, HF, SHF
Antenna: ETS001_2-13-2018.txt ETS001_2-13-2018.txt
Cable(s): 145-416 3mTrkB 07-30-2017.txt NONE.
Barometer: DAV003 Filter: REA004
Temp/Humidity/Pressure: 22 deg C 52% 1000 mB

PreAmp Used? (Y or N): Y Voltage/Frequency: Battery Frequency Range: 1-25 GHz

Net = Reading (dBuV/m) + Antenna Factor (dB1/m) + Cable Loss (dB) - Preamp Factor (dB) - Distance Factor (dB)

Peak: PK Quasi-Peak: QP Average: AVG RMS: RMS; NF = Noise Floor, RB = Restricted Band; Bandwidth denoted as RBW/VBW

Detector Type	Ant. Pol. (V/H)	Frequency MHz	Reading dB(uV)	Antenna Factor dB(1/m)	Cable Loss dB	Pre-amp Factor dB	Distance Factor dB	Net dB(uV/m)	Limit dB(uV/m)	Margin dB	Bandwidth	FCC	IC	Harmonic?
Tx mode, Lo Channel, 2402 MHz, Power setting 0dB(m), X-axis (EUT flat)														
PK	V	4804.000	44.68	34.21	8.64	33.88	0.00	53.65	74.00	-20.35	1/3 MHz	RB	RB	
AVG	V	4804.000	33.70	34.21	8.64	33.88	0.00	42.67	54.00	-11.33	1/3 MHz	RB	RB	
PK	V	7206.000	37.00	35.70	11.02	34.63	0.00	49.09	74.00	-24.91	1/3 MHz			Noise Floor
AVG	V	7206.000	24.50	35.70	11.02	34.63	0.00	36.59	54.00	-17.41	1/3 MHz			Noise Floor
PK	V	9608.000	36.50	36.72	12.75	35.06	0.00	50.91	74.00	-23.09	1/3 MHz			Noise Floor
AVG	V	9608.000	24.20	36.72	12.75	35.06	0.00	38.61	54.00	-15.39	1/3 MHz			Noise Floor
PK	V	12010.000	34.80	38.80	14.94	33.36	0.00	55.19	74.00	-18.81	1/3 MHz	RB	RB	Noise Floor
AVG	V	12010.000	22.27	38.80	14.94	33.36	0.00	42.66	54.00	-11.34	1/3 MHz	RB	RB	Noise Floor

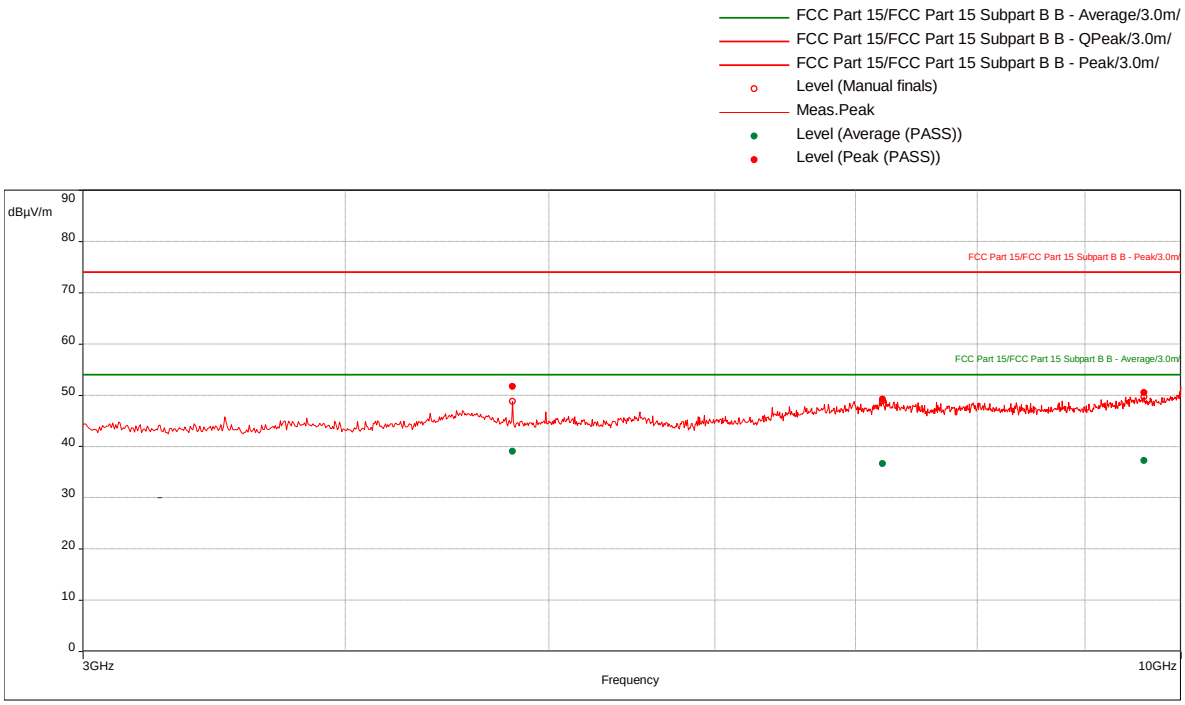
Notes: Hand scan was performed from 18 – 25 GHz at a distance of 10 cm, no emissions were detected above the equipment measuring noise floor.

Low Channel Radiated Spurious Emission, 1-25 GHz, Y-axis

Test Information:

Date and Time	7/27/2017 8:01:28 PM
Client and Project Number	Safilo_G103104758
Engineer	Vathana Ven
Temperature	22 deg C
Humidity	52%
Atmospheric Pressure	1000 mB
Comments	RE 3 to 10 GHz_Safilo_Tx mode_Lo Channel_Y-axis

Graph:



Note: Manual scan was performed from 1-3 GHz and 11-25 GHz. High pass filter was used for scan from 3-25 GHz.

Results:

Peak (PASS) (3)

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	RBW	Correction (dB)
4803.421053	51.67	74.00	-22.33	159.00	1.27	Horizontal	1000000.00	9.18
7208.947368	49.16	74.00	-24.84	4.00	1.23	Horizontal	1000000.00	11.98
9604.736842	50.46	74.00	-23.54	0.00	2.80	Horizontal	1000000.00	13.00

Average (PASS) (3)

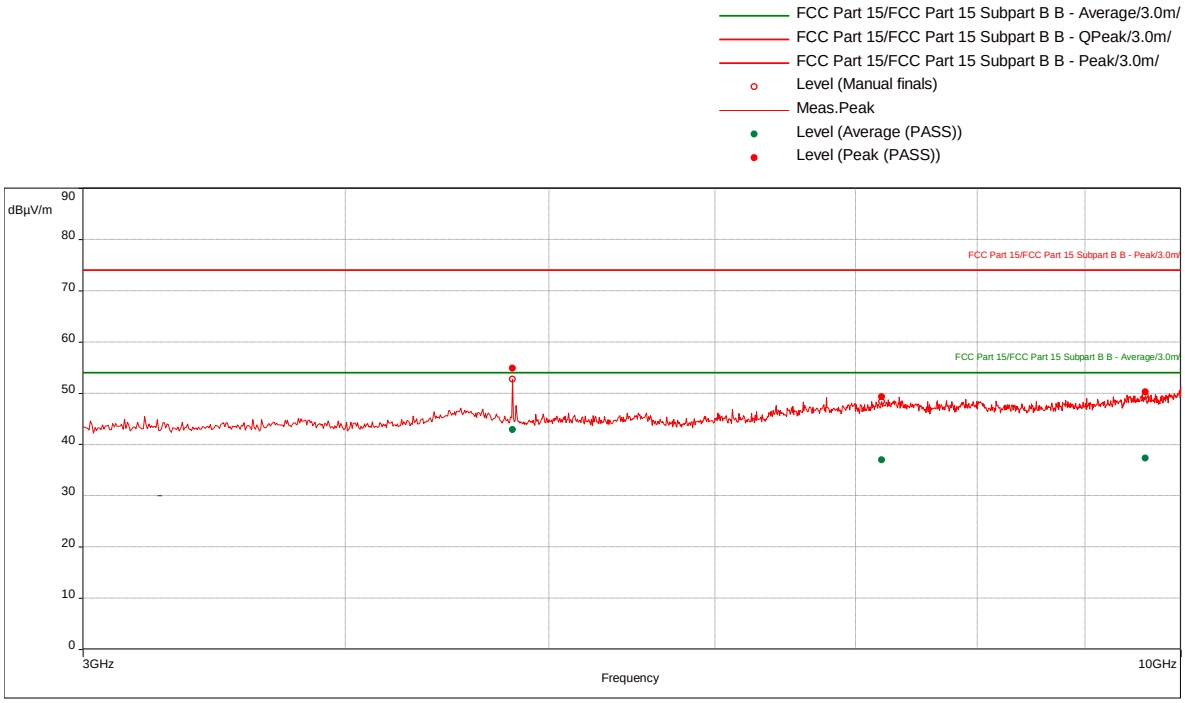
Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	RBW	Correction (dB)
4803.421053	39.05	54.00	-14.95	159.00	1.27	Horizontal	1000000.00	9.18
7208.947368	36.59	54.00	-17.41	4.00	1.23	Horizontal	1000000.00	11.98
9604.736842	37.26	54.00	-16.74	0.00	2.80	Horizontal	1000000.00	13.00

Low Channel Radiated Spurious Emission, 1-25 GHz, Z-axis

Test Information:

Date and Time	7/27/2017 8:30:43 PM
Client and Project Number	Safilo_G103104758
Engineer	Vathana Ven
Temperature	22 deg C
Humidity	52%
Atmospheric Pressure	1000 mB
Comments	RE 3 to 10 GHz_Safilo_Tx mode_Lo Channel_Z-axis

Graph:



Note : Manual scan was performed from 1-3 GHz and 11-25 GHz. High pass filter was used for scan from 3-25 GHz.

Results:

Peak (PASS) (3)

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	RBW	Correction (dB)
4804.473684	54.87	74.00	-19.13	254.00	1.00	Vertical	1000000.00	9.18
7206.842105	49.30	74.00	-24.70	136.00	1.69	Vertical	1000000.00	11.98
9619.473684	50.21	74.00	-23.79	27.00	3.33	Horizontal	1000000.00	13.02

Average (PASS) (3)

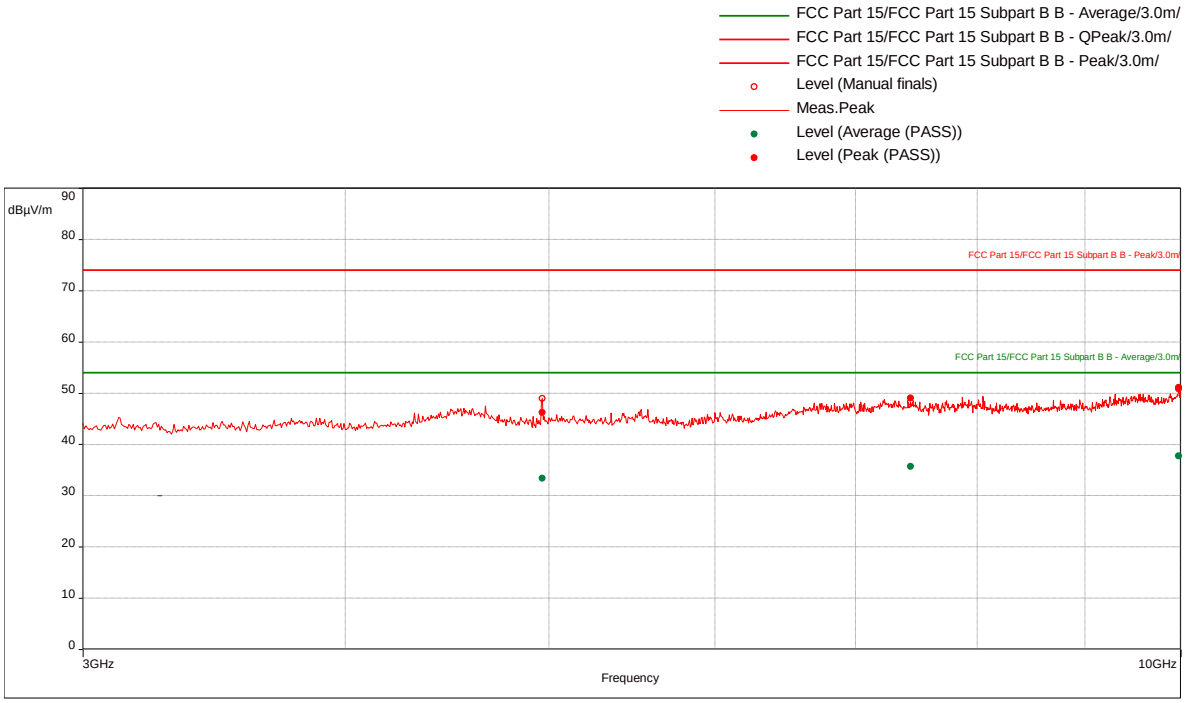
Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	RBW	Correction (dB)
4804.473684	42.86	54.00	-11.14	254.00	1.00	Vertical	1000000.00	9.18
7206.842105	37.00	54.00	-17.00	136.00	1.69	Vertical	1000000.00	11.98
9619.473684	37.28	54.00	-16.72	27.00	3.33	Horizontal	1000000.00	13.02

High Channel Radiated Spurious Emission, 1-25 GHz, X-axis

Test Information:

Date and Time	7/27/2017 11:40:28 PM
Client and Project Number	Safilo_G103104758
Engineer	Vathana Ven
Temperature	22 deg C
Humidity	52%
Atmospheric Pressure	1000 mB
Comments	RE 3 to 10 GHz_Tx mode_Hi Channel_X-axis

Graph:



Note: Manual scan was performed from 1-3 GHz and 11-25 GHz. High pass filter was used for scan from 3-25 GHz.

Results:

Peak (PASS) (3)

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	RBW	Correction (dB)
4963.684211	46.20	74.00	-27.80	33.00	3.74	Horizontal	1000000.00	9.40
7432.631579	49.02	74.00	-24.98	299.00	2.66	Vertical	1000000.00	11.84
9972.631579	51.09	74.00	-22.91	306.00	3.30	Horizontal	1000000.00	14.03

Average (PASS) (3)

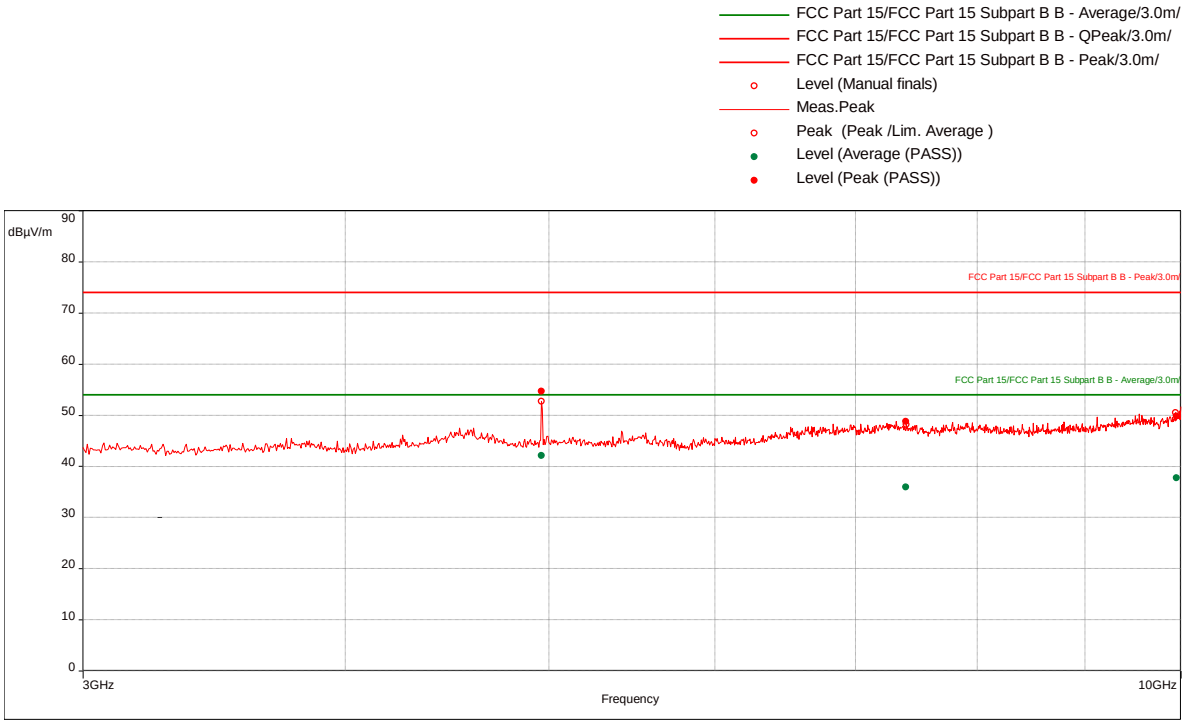
Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	RBW	Correction (dB)
4963.684211	33.39	54.00	-20.61	33.00	3.74	Horizontal	1000000.00	9.40
7432.631579	35.64	54.00	-18.36	299.00	2.66	Vertical	1000000.00	11.84
9972.631579	37.74	54.00	-16.26	306.00	3.30	Horizontal	1000000.00	14.03

High Channel Radiated Spurious Emission, 1-25 GHz, Y-axis

Test Information:

Date and Time	7/27/2017 11:58:38 PM
Client and Project Number	Safilo_G103104758
Engineer	Vathana Ven
Temperature	22 deg C
Humidity	52%
Atmospheric Pressure	1000 mB
Comments	RE 3 to 10 GHz_Tx mode_Hi Channel_Y-axis

Graph:



Note: Manual scan was performed from 1-3 GHz and 11-25 GHz. High pass filter was used for scan from 3-25 GHz.

Results:

Peak (PASS) (3)

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	RBW	Correction (dB)
4960.526316	54.69	74.00	-19.31	166.00	1.39	Horizontal	1000000.00	9.39
7397.368421	48.74	74.00	-25.26	334.00	1.61	Vertical	1000000.00	11.82
9948.157895	49.79	74.00	-24.21	359.00	2.20	Horizontal	1000000.00	13.94

Average (PASS) (3)

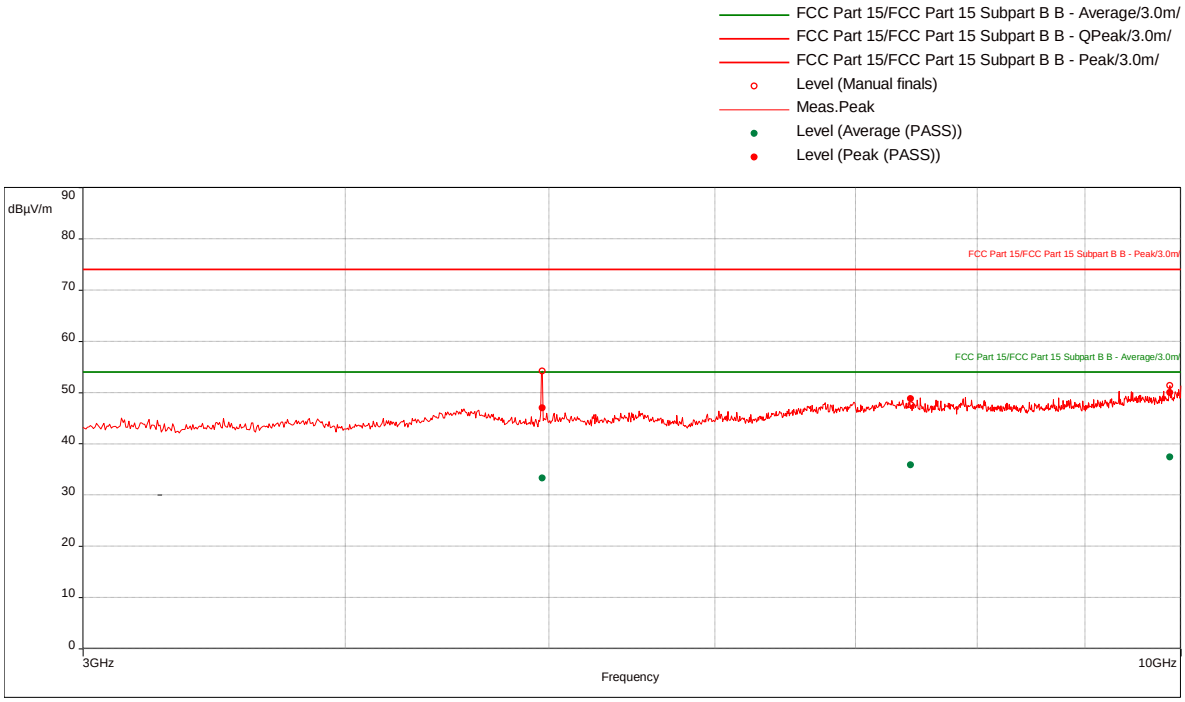
Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	RBW	Correction (dB)
4960.526316	42.13	54.00	-11.87	166.00	1.39	Horizontal	1000000.00	9.39
7397.368421	35.90	54.00	-18.10	334.00	1.61	Vertical	1000000.00	11.82
9948.157895	37.75	54.00	-16.25	359.00	2.20	Horizontal	1000000.00	13.94

High Channel Radiated Spurious Emission, 1-25 GHz, Z-axis

Test Information:

Date and Time	7/28/2017 12:18:45 AM
Client and Project Number	Safilo_G103104758
Engineer	Vathana Ven
Temperature	22 deg C
Humidity	52%
Atmospheric Pressure	1000 mB
Comments	RE 3 to 10 GHz_Tx mode_Hi Channel_Z-axis

Graph:



Note: Manual scan was performed from 1-3 GHz and 11-25 GHz. High pass filter was used for scan from 3-25 GHz.

Results:

Peak (PASS) (3)

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	RBW	Correction (dB)
4965.263158	47.00	74.00	-27.00	197.00	1.31	Vertical	1000000.00	9.40
7437.105263	48.76	74.00	-25.24	107.00	1.93	Vertical	1000000.00	11.84
9878.157895	49.97	74.00	-24.03	313.00	1.80	Horizontal	1000000.00	13.71

Average (PASS) (3)

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	RBW	Correction (dB)
4965.263158	33.30	54.00	-20.70	197.00	1.31	Vertical	1000000.00	9.40
7437.105263	35.83	54.00	-18.17	107.00	1.93	Vertical	1000000.00	11.84
9878.157895	37.43	54.00	-16.57	313.00	1.80	Horizontal	1000000.00	13.71

Test Personnel:	Vathana Ven VV	Test Date:	07/28/2017
Supervising/Reviewing Engineer: (Where Applicable)	N/A		
Product Standard:	15.247, RSS-247	Limit Applied:	Below specified limits
Input Voltage:	Internal battery	Ambient Temperature:	22 ºC
Pretest Verification w/ Ambient Signals or BB Source:	**Yes**	Relative Humidity:	52 %
		Atmospheric Pressure:	1000 mbars

Deviations, Additions, or Exclusions: None

11 Digital Device Radiated Spurious Emissions

11.1 Method

Tests are performed in accordance with CFR47 FCC Part 15 Subpart C, ICES-003, and ANSI C63.4.

TEST SITE: 10m ALSE

The 10m ALSE is 13m (Length) x 21m (Depth) x 10m (Height) with the effective size in terms of space from the tips of the absorber is 12m (Length) x 20m (Depth) x 8.5m (Height). This chamber achieves broadband performance using a unique arrangement of hybrid and ferrite tile absorber. This chamber has a built in 3m diameter turntable (Embedded type). The metal structure of the table makes electrical connection around the entire circumference of the turntable to the ground plane with a metal brush type connection. The turntable is located on one end of the chamber and the antennas are mounted 3 and 10 meters away at the other end of the chamber on the adjustable an Antenna Mast. The antenna mast is a non-conductive bore sighted type with remote control of antenna height and polarization. The Antenna Mast and the turntable can be remotely controlled through the controller located in the adjacent Control room. A Styrofoam table 80 cm high is used for table-top equipment.

Measurement Uncertainty

Measurement	Frequency Range	Expanded Uncertainty (k=2)	Ucispr
Radiated Emissions, 10m	30-1000 MHz	4.6 dB	6.3 dB
Radiated Emissions, 3m	30-1000 MHz	5.3 dB	6.3 dB
Radiated Emissions, 3m	1-6 GHz	4.5 dB	5.2 dB
Radiated Emissions, 3m	6-15 GHz	5.2 dB	5.5 dB
Radiated Emissions, 3m	15-18 GHz	5.0 dB	5.5 dB
Radiated Emissions, 3m	18-40 GHz	5.0 dB	5.5 dB

As shown in the table above our radiated emissions U_{lab} is less than the corresponding U_{CISPR} reference value in CISPR 16-4-2 Table 1, hence the compliance of the product is only based on the measured value, and no measurement uncertainty correction is required, based on CISPR 22 and CISPR 11 (for 2006 and later revisions) Clause 11.

Sample Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation with a sample calculation is as follows:

FS = RA + AF + CF - AG

Where FS = Field Strength in dBμV/m
RA = Receiver Amplitude (including preamplifier) in dBμV
CF = Cable Attenuation Factor in dB
AF = Antenna Factor in dB
AG = Amplifier Gain in dB

In the following table(s), the reading shown on the data table reflects the preamplifier gain. An example for the calculations in the following table is as follows.

Assume a receiver reading of 52.0 dBμV is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB is added. The amplifier gain of 29 dB is subtracted, giving a field strength of 32 dBμV/m. This value in dBμV/m was converted to its corresponding level in μV/m.

RA = 52.0 dBμV
AF = 7.4 dB/m
CF = 1.6 dB
AG = 29.0 dB
FS = 32 dBμV/m

To convert from dBμV to μV or mV the following was used:

$UF = 10^{(NF / 20)}$ where UF = Net Reading in μV
NF = Net Reading in dBμV

Example:

FS = RA + AF + CF – AG = 52.0 + 7.4 + 1.6 – 29.0 = 32.0
$UF = 10^{(32\ dB\mu V / 20)}$ = 39.8 μV/m

Alternately, when BAT-EMC Emission Software is used, the “Level” includes all losses and gains and is compared directly in the “Margin” column to the “Limit”. The “Correction” includes Antenna Factor, Preamp, and Cable Loss. These are already accounted for in the “Level” column.

11.2 Test Equipment Used:

Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due
145128'	EMI Receiver (20 Hz - 40 Ghz)	Rohde & Schwarz	ESIB 40	839283/001	03/15/2017	03/15/2018
145-416'	Cables 145-420 145-423 145-424 145-408	Huber + Suhner	3m Track B cables	multiple	07/30/2016	07/30/2017
PRE10'	30-1000MHz pre-amp	ITS	PRE10	PRE10	12/16/2016	12/16/2017
145145'	Broadband Hybrid Antenna 30 MHz - 3 GHz	Sunol Sciences Corp.	JB3	A122313	05/02/2017	05/02/2018
ETS001'	1-18GHz DRG Horn Antenna	ETS-Lindgren	3117	00143259	02/13/2017	02/13/2018
145014'	Preamplifier (1 GHz to 26.5 GHz)	Hewlett Packard	8449B	3008A00232	06/03/2017	06/03/2018
145-410'	Cables 145-420 145-421 145-422 145-406	Huber + Suhner	10m Track A Cables	multiple	07/30/2016	07/30/2017
DAV003'	Weather Station	Davis Instruments	7400	PE80529A39A	11/28/2016	11/28/2017

Software Utilized:

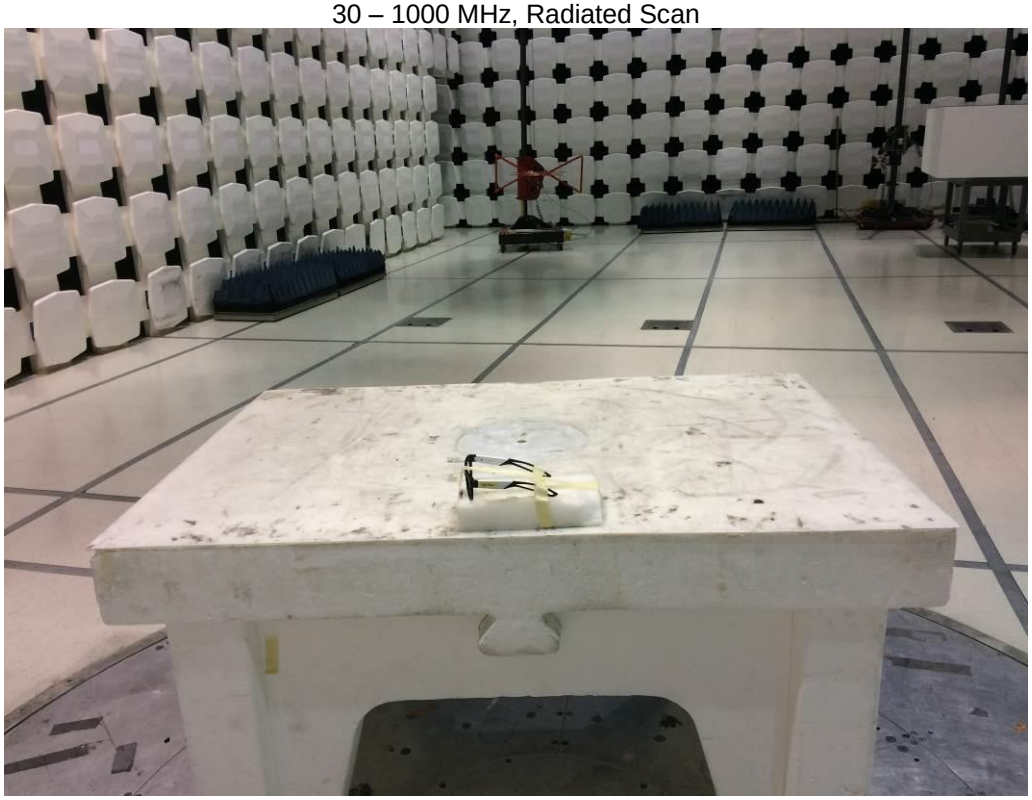
Name	Manufacturer	Version
BAT-EMC	Nexio	3.16.0.69

11.3 Results:

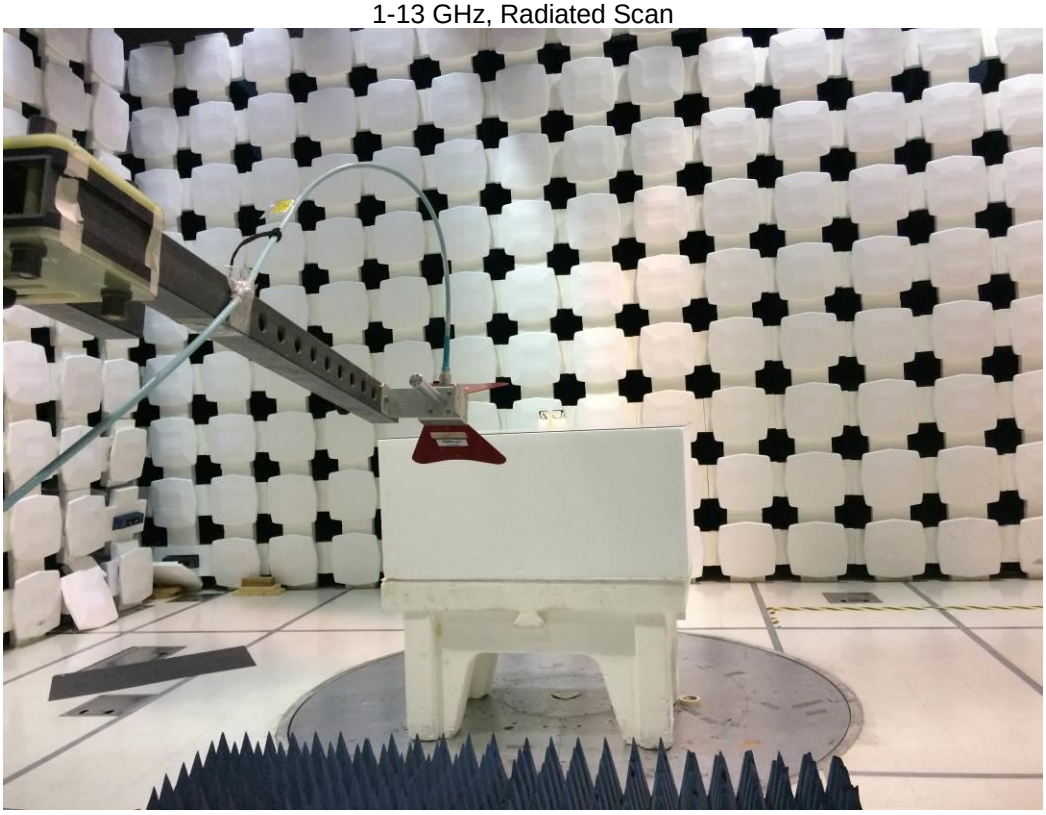
The sample tested was found to Comply.

11.4 Setup Photographs:

30 – 1000 MHz, Radiated Scan



1-13 GHz, Radiated Scan



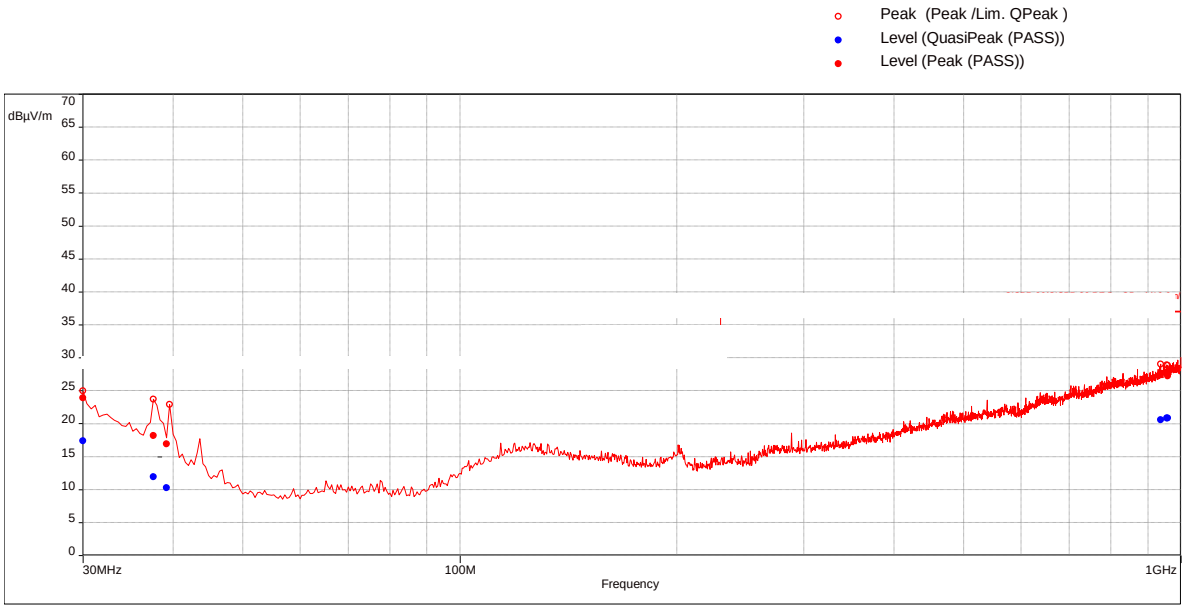
11.5 Test Data:

Radiated Spurious Emissions, 30-1000 MHz, Idle/Receive mode

Test Information:

Date and Time	7/20/2017 11:42:59 AM
Client and Project Number	Safilo
Engineer	Kouma Sinn
Temperature	23C
Humidity	46%
Atmospheric Pressure	1003mbar
Comments	Safilo 30-1000 MHz, Receive Mode Laptop below groundplane

Graph:



Results:

QuasiPeak (PASS) (6)

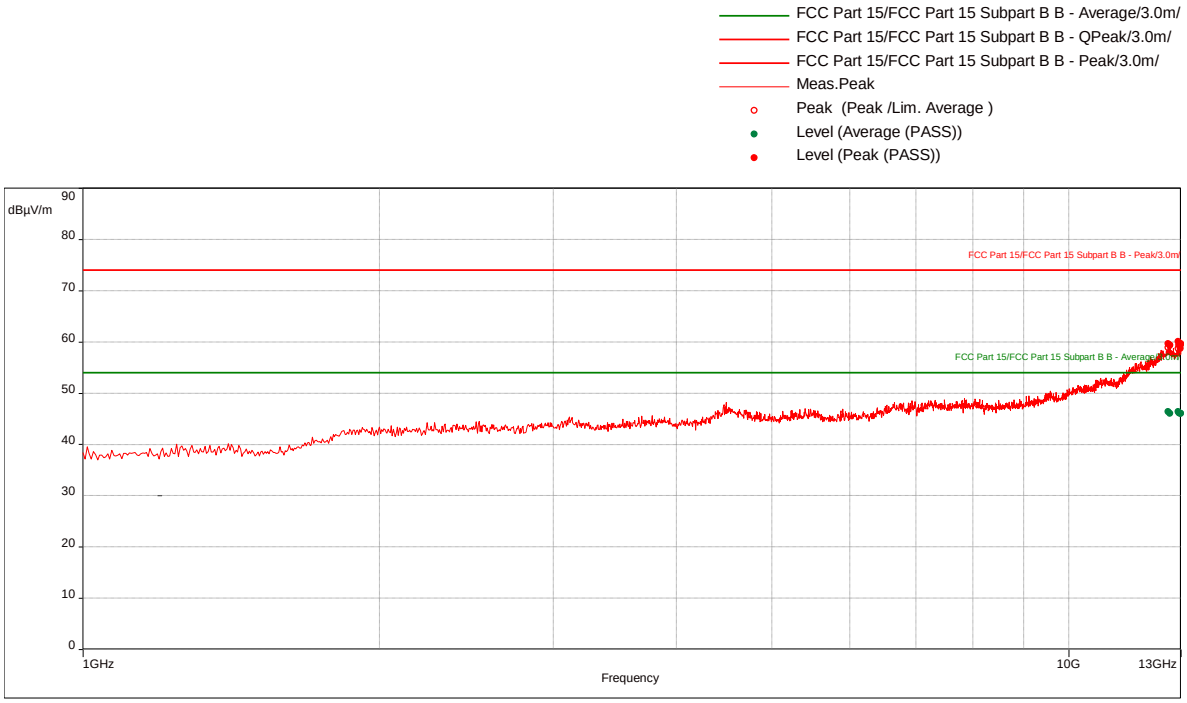
Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	RBW	Correction (dB)
30.12631579	17.35	29.54	-12.19	234.00	2.45	Vertical	120000.00	-12.56
37.66315789	11.92	29.54	-17.62	18.00	2.37	Vertical	120000.00	-18.23
39.37894737	10.26	29.54	-19.28	235.00	2.02	Vertical	120000.00	-19.47
937.5473684	20.60	35.56	-14.96	248.00	1.80	Horizontal	120000.00	-6.25
956.4315789	20.83	35.56	-14.73	161.00	3.17	Horizontal	120000.00	-5.95
959.3473684	20.86	35.56	-14.7	40.00	3.67	Vertical	120000.00	-5.85

Radiated Spurious Emissions, 1-13 GHz, Idle/Receive mode

Test Information:

Date and Time	7/28/2017 2:54:46 AM
Client and Project Number	Safilo_G103104758
Engineer	Vathana Ven
Temperature	22 deg C
Humidity	52%
Atmospheric Pressure	1000 mB
Comments	RE 1 to 13 GHz_Rx mode

Graph:



Results:

Peak (PASS) (6)

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	RBW	Correction (dB)
12612.89474	59.66	74.00	-14.34	217.00	2.11	Vertical	1000000.00	23.27
12674.47368	59.32	74.00	-14.68	49.00	1.66	Horizontal	1000000.00	23.34
12919.47368	60.06	74.00	-13.94	151.00	2.89	Vertical	1000000.00	23.92
12945.26316	59.39	74.00	-14.61	291.00	3.16	Vertical	1000000.00	23.95
12985	58.72	74.00	-15.28	204.00	3.79	Horizontal	1000000.00	23.99
12997.5	59.57	74.00	-14.43	18.00	1.54	Vertical	1000000.00	24.01

Average (PASS) (6)

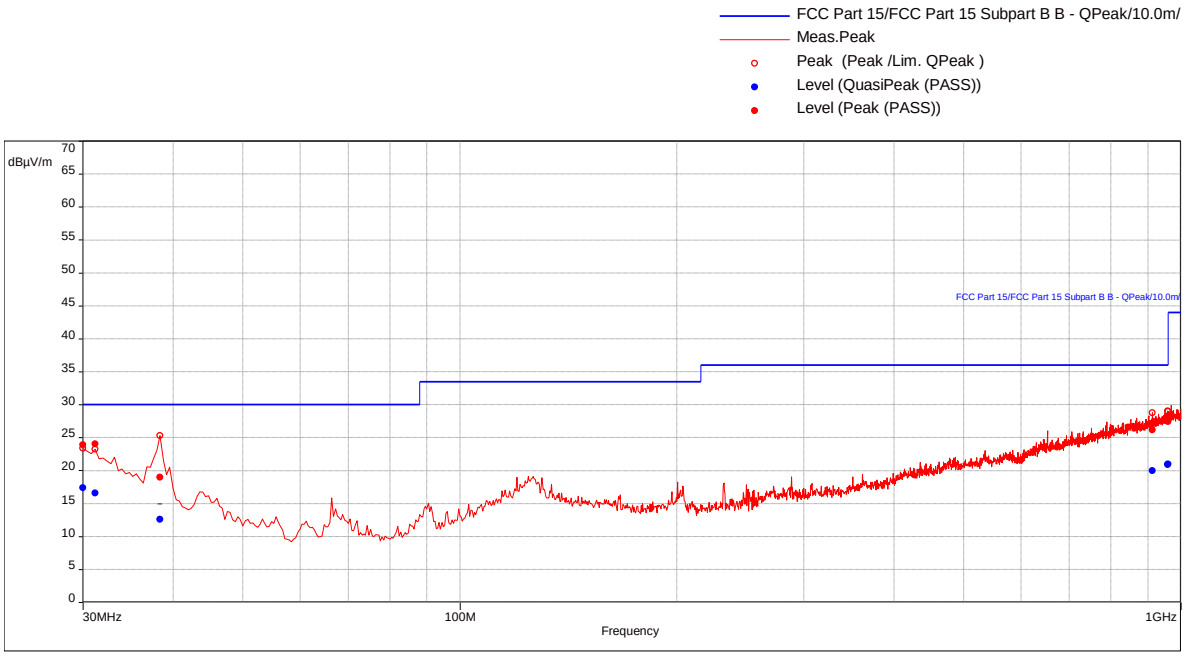
Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	RBW	Correction (dB)
12612.89474	46.40	54.00	-7.60	217.00	2.11	Vertical	1000000.00	23.27
12674.47368	46.05	54.00	-7.95	49.00	1.66	Horizontal	1000000.00	23.34
12919.47368	46.42	54.00	-7.58	151.00	2.89	Vertical	1000000.00	23.92
12945.26316	46.11	54.00	-7.89	291.00	3.16	Vertical	1000000.00	23.95
12985	46.05	54.00	-7.95	204.00	3.79	Horizontal	1000000.00	23.99
12997.5	46.06	54.00	-7.94	18.00	1.54	Vertical	1000000.00	24.01

Radiated Spurious Emissions, 30-1000 MHz, Charging Mode

Test Information:

Date and Time	7/20/2017 10:47:29 AM
Client and Project Number	Safilo
Engineer	Kouma Sinn
Temperature	23C
Humidity	46%
Atmospheric Pressure	1003mbar
Comments	Copy Safilo 30-1000 MHz, 120VAC 60Hz, Charging Mode, Laptop below groundplane

Graph:



Results:

QuasiPeak (PASS) (6)

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	RBW	Correction (dB)
30.17368421	17.37	30.00	-12.63	235.00	2.09	Vertical	120000.00	-12.59
31.2	16.59	30.00	-13.41	76.00	2.46	Vertical	120000.00	-13.33
38.43157895	12.58	30.00	-17.42	132.00	3.32	Vertical	120000.00	-18.82
912.7578947	19.98	36.00	-16.02	175.00	2.52	Horizontal	120000.00	-6.73
959.3578947	20.93	36.00	-15.07	68.00	1.73	Vertical	120000.00	-5.85
959.8105263	20.97	36.00	-15.03	110.00	2.39	Horizontal	120000.00	-5.81

Test Personnel:	Kouma Sinn KPS	Test Date:	07/20/2017
	Vathana Ven VHV		07/28/2017
Supervising/Reviewing Engineer: (Where Applicable)	N/A		
Product Standard:	FCC Part 15 Subpart B ICES-003	Limit Applied:	All Class B
Input Voltage:	Internal battery		
		Ambient Temperature:	22, 23 ºC
Pretest Verification w/ Ambient Signals or BB Source:	**Yes**	Relative Humidity:	52, 46 %
		Atmospheric Pressure:	1000, 1003 mbars

Deviations, Additions, or Exclusions: None

12 AC Mains Line conducted Emissions

12.1 Method

Tests are performed in accordance with FCC 47CFR Part 15 Subpart B, ICES-003, and ANSI C63.4.

TEST SITE: EMC Lab

The EMC Lab has one Semi-anechoic Chamber and one Shielded Chamber. AC Mains Power is available at 120, 230, and 277 Single Phase; 208, 400, and 480 3-Phase. Large reference ground-planes are installed in the general lab area to facilitate EMC work not requiring a shielded environment.

Measurement Uncertainty

Measurement	Frequency Range	Expanded Uncertainty (k=2)	Ucispr
AC Line Conducted Emissions	150 kHz - 30 MHz	2.8dB	3.4dB
Telco Port Emissions	150 kHz - 30 MHz	3.2dB	5.0dB

As shown in the table above our conducted emissions U_{lab} is less than the corresponding U_{CISPR} reference value in CISPR 16-4-2 Table 1, hence the compliance of the product is only based on the measured value, and no measurement uncertainty correction is required, based on CISPR 22 and CISPR 11 (for 2006 and later revisions) Clause 11.

Sample Calculations

The following is how net line-conducted readings were determined:

NF = RF + LF + CF + AF
Where NF = Net Reading in dBμV
RF = Reading from receiver in dBμV
LF = LISN or ISN Correction Factor in dB
CF = Cable Correction Factor in dB
AF = Attenuator Loss Factor in dB

To convert from dBμV to μV or mV the following was used:

$UF = 10^{(NF / 20)}$ where UF = Net Reading in μV
NF = Net Reading in dBμV

Example:

NF = RF + LF + CF + AF = 28.5 + 0.2 + 0.4 + 20.0 = 49.1 dBμV
$UF = 10^{(49.1\ dB\mu V / 20)}$ = 285.1 μV/m

Alternately, when C5 Software is used, the “Level” includes all losses and gains and is compared directly in the “Margin” column to the “Limit”. “TF” is the Transducer Factor; in this case LISN or ISN loss.

12.2 Test Equipment Used:

Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due
DAV004'	Weather Station	Davis Instruments	7400	PE80529A61A	05/10/2017	05/10/2018
ROS002'	9kHz to 3GHz EMI Test Receiver	Rohde & Schwartz	ESCI 1166.5950K03	100067	08/03/2017	08/03/2018
LISN31'	LISN – CISPR16 Compliant 9kHz-30MHz	Com-Power	LI-215A	191957	04/05/2017	04/05/2018
CBLBNC7'	30 ft 50 ohm coax, BNC – BNC	ITT Pomona	RG 58 C/U	CBLBNC7	01/10/2017	01/10/2018
DS22A'	Attenuator, 20dB	Mini Circuits	20dB, 50 ohm	DS22A	09/17/2009	Verified
147238'	Digital Multimeter (Full Color)	Fluke	187	89300560	04/07/2017	04/07/2018

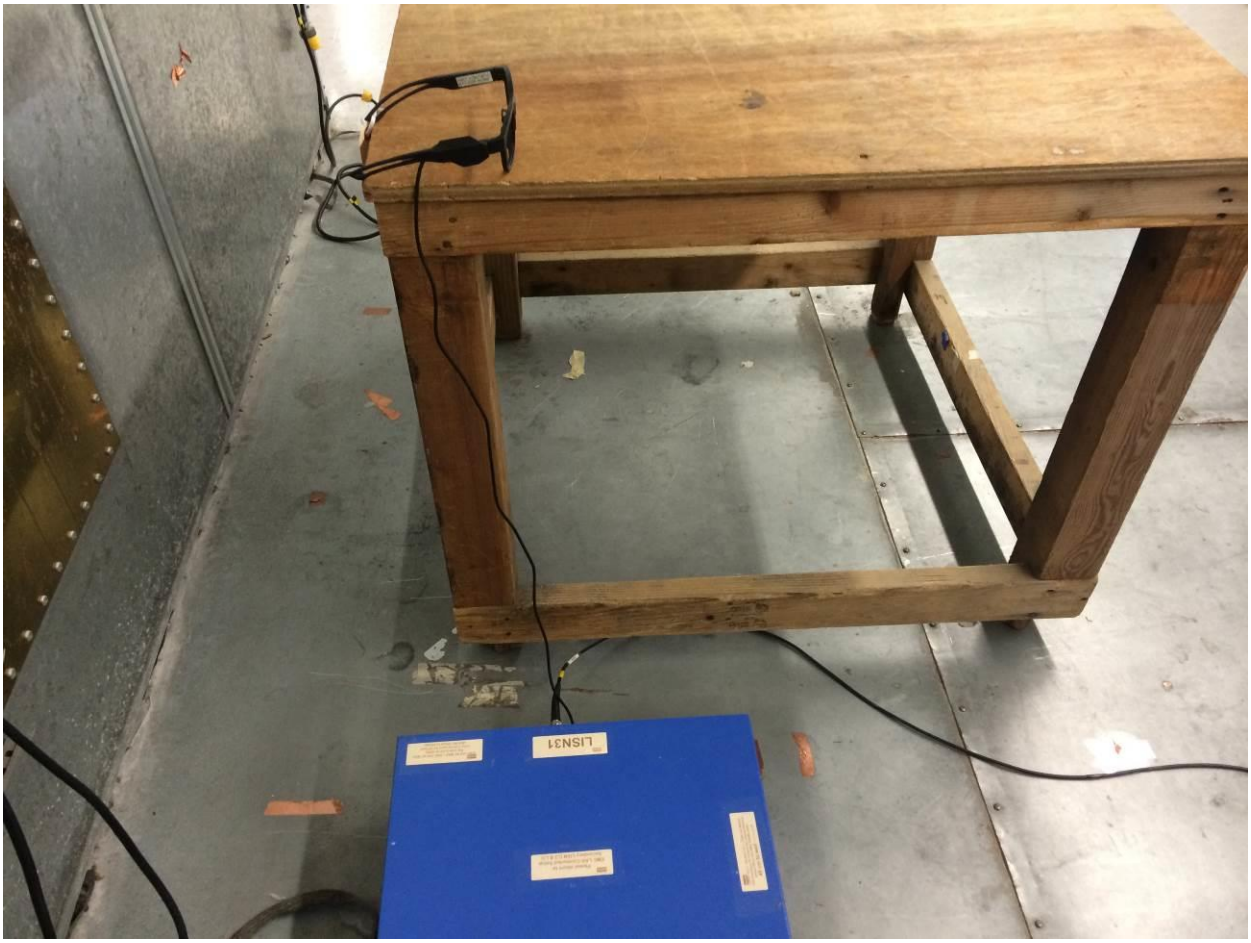
Software Utilized:

Name	Manufacturer	Version
Compliance 5	Teseq	5.26.46.46

12.3 Results:

The sample tested was found to Comply.

12.4 Setup Photograph:



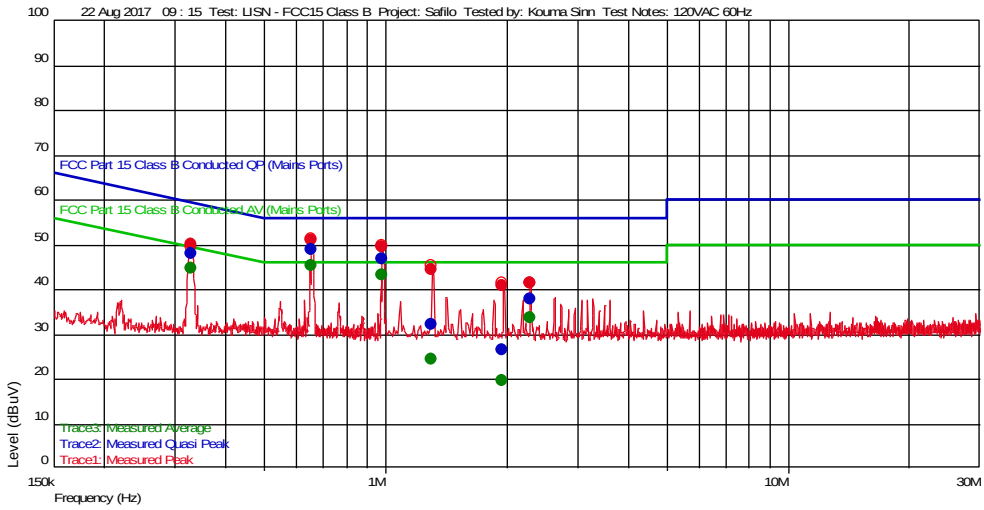
12.5 Plots/Data:

Charging Mode

Test Information

Test Details	User Entry	Additional Information
Test:	LISN - FCC15 Class B	
Project:	Safilo	
Test Notes:	120VAC 60Hz	
Temperature:	21C	
Humidity:	67%, 1001mbar	
Tested by:	Kouma Sinn	
Test Started:	22 Aug 2017 09 : 15	

Prescan Emission Graph



- Measured Peak Value
- Measured Quasi Peak Value
- Measured Average Value
- Maximum Value of Mast and Turntable

- Swept Peak Data
- Swept Quasi Peak Data
- Swept Average Data

Emissions Test Data

Trace2: Measured Quasi Peak

Frequency(Hz)	Level(dBuV)	TF	PA+CL	Limit(dBuV)	Margin(dBuV)	RBW(Hz)	Comment	LINE
1.963 M	26.52	0.260	20.132	56.000	-29.48	9 k		L1
1.306 M	32.03	0.260	20.104	56.000	-23.97	9 k		L1
2.296 M	37.89	0.262	20.146	56.000	-18.11	9 k		L1
330.2 k	47.92	0.622	20.052	59.446	-11.53	9 k		L1
983.0 k	46.83	0.265	20.089	56.000	-9.17	9 k		L1
654.9 k	48.66	0.355	20.068	56.000	-7.34	9 k		L1

Trace3: Measured Average

Frequency(Hz)	Level(dBuV)	TF	PA+CL	Limit(dBuV)	Margin(dBuV)	RBW(Hz)	Comment	LINE
1.963 M	19.68	0.260	20.132	46.000	-26.32	9 k		L1
1.306 M	24.37	0.260	20.104	46.000	-21.63	9 k		L1
2.296 M	33.48	0.262	20.146	46.000	-12.52	9 k		L1
330.2 k	44.62	0.622	20.052	49.446	-4.83	9 k		L1
983.0 k	43.14	0.265	20.089	46.000	-2.86	9 k		L1
654.9 k	45.24	0.355	20.068	46.000	-0.76	9 k		L1

Test Personnel:	Kouma Sinn KPS	Test Date:	09/04/2017
Supervising/Reviewing Engineer: (Where Applicable)	N/A		
Product Standard:	ICES-003, FCC 47CFR Part 15 Subpart B	Limit Applied:	All Class B
Input Voltage:	120VAC 60Hz	Ambient Temperature:	21 ºC
Pretest Verification w/ Ambient Signals or BB Source:	Signal Generator Source	Relative Humidity:	67 %
		Atmospheric Pressure:	1001 mbars

Deviations, Additions, or Exclusions: None

13 Revision History

Revision Level	Date	Report Number	Prepared By	Reviewed By	Notes
0	09/04/2017	103104758BOX-005	KPS KPS	MFM MFM	Original Issue