RF TEST REPORT

Report No.: FCC_IC_RF_ SL18061103-ALT-004
Supersede Report No.: None

Applicant	:	Altierre Corporation
Product Name	:	Shoe tag
Model No.	:	ITAG 20S
Model Variant No.		eTAG150E4, eTAG210E4
Test Standard	:	FCC 15.249 RSS210 Issue 9 August 2016
Test Method	:	ANSI C63.10: 2013 RSS-Gen Issue 5, April 2018
FCC ID	:	W22-ITAG
Dates of test	:	09/12/2018-09/13/2018
Issue Date	:	09/13/2018
Test Result	:	☒ Pass ☐ Fail
Equipment complied with the specification [X] Equipment did not comply with the specification [ ]		

This Test Report is Issued Under the Authority of:	
Deon	
Deon Dai	Chen Ge
RF Test Engineer	Engineer Reviewer

Issued By:
SIEMIC Laboratories
775 Montague Expressway, Milpitas, 95035 CA

Laboratory Introduction

SIEMIC, headquartered in the heart of Silicon Valley, with superior facilities in US and Asia, is one of the leading independent testing and certification facilities providing customers with one-stop shop services for Compliance Testing and Global Certifications.

In addition to testing and certification, SIEMIC provides initial design reviews and compliance management throughout a project. Our extensive experience with China, Asia Pacific, North America, European, and International compliance requirements, assures the fastest, most cost effective way to attain regulatory compliance for the global markets.

Accreditations for Conformity Assessment

Country/Region	Accreditation Body	Scope
USA	FCC, A2LA	EMC, RF/Wireless, Telecom
Canada	IC, A2LA, NIST	EMC, RF/Wireless, Telecom
Taiwan	BSMI, NCC, NIST	EMC, RF, Telecom, Safety
Hong Kong	OFTA, NIST	RF/Wireless, Telecom
Australia	NATA, NIST	EMC, RF, Telecom, Safety
Korea	KCC/RRA, NIST	EMI, EMS, RF, Telecom, Safety
Japan	VCCI, JATE, TELEC, RFT	EMI, RF/Wireless, Telecom
Mexico	NOM, COFETEL, Caniety	Safety, EMC, RF/Wireless, Telecom
Europe	A2LA, NIST	EMC, RF, Telecom, Safety
Israel	MOC, NIST	EMC, RF, Telecom, Safety

Accreditations for Product Certifications

Country	Accreditation Body	Scope
USA	FCC TCB, NIST	EMC, RF, Telecom
Canada	IC FCB, NIST	EMC, RF, Telecom
Singapore	iDA, NIST	EMC, RF, Telecom
EU	NB	EMC & R&TTE Directive
Japan	MIC (RCB 208)	RF, Telecom
Hong Kong	OFTA (US002)	RF, Telecom

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1 Report Revision History

Report No.	Report Version	Description	Issue Date
FCC_IC_RF_ SL18061103-ALT-004	None	Original	09/13/2018

2 Executive Summary

The purpose of this test program was to demonstrate compliance of following product

Company: Altierre Corporation
Product: Shoe tag
Model: ITAG 20S

against the current Stipulated Standards. The specified model product stated above has demonstrated compliance with the Stipulated Standard listed on 1st page.

3 Customer information

Applicant Name	:	Altierre Corporation
Applicant Address	:	1980 Concourse Drive San Jose, CA 95131 USA
Manufacturer Name	:	Altierre Corporation
Manufacturer Address	:	1980 Concourse Drive San Jose, CA 95131 USA

4 Test site information

Lab performing tests	SIEMIC Laboratories
Lab Address	775 Montague Expressway, Milpitas, CA 95035
FCC Test Site No.	881796
IC Test Site No.	4842D-2
VCCI Test Site No.	A0133

5 Modification

Index	Item	Description	Note
-	-	-	-

6 EUT Information

6.1 EUT Description

Product Name	Shoe tag
Model No.	ITAG 20S
Trade Name	Altierre Corporation
Serial No.	N/A
Input Power	3.0Vdc
Power Adapter Manu/Model	N/A
Power Adapter SN	N/A
Date of EUT received	09/06/2018
Equipment Class/ Category	FHSS
Clock Frequencies	N/A
Port/Connectors	N/A

6.2 Spec for BT Radio

Radio Type	FHSS
Operating Frequency	2401.5MHz-2479.5MHz
Modulation	FHSS
Channel Spacing	1MHz
Antenna Type	Integrated PCB
Antenna Gain	0 dBi
Antenna Connector Type	-

Channel List

Type	Channel No.	Frequency (MHz)	Power Setting
2401.5-2479.5MHz	0	2401.5	Software default
	39	2440.5	Software default
	78	2479.5	Software default

6.3 EUT test modes/configuration Description

Mode	Note
-	-
-	-

7 Supporting Equipment/Software and cabling Description

7.1 Supporting Equipment

Item	Supporting Equipment Description	Model	Serial Number	Manufacturer	Note
1	Laptop	Z61e	-	Lenoveo	-
2	Altierre Tethered Device	ATD2000	-	Altierre	-
-	-	-	-	-	-
-	-	-	-	-	-

7.2 Cabling Description

Name	Connection Start		Connection Stop		Length / shielding Info		Note
	From	I/O Port	To	I/O Port	Length (m)	Shielding	
USB Cable	Laptop	USB	ATD2000	USB	1.8	-	-

7.3 Test Software Description

Test Item	Software	Description
RF Testing	CC tag GUI	Set the EUT to transmit continuously in diferent test mode
-	-	-

8 Test Summary

Test Item	Test standard		Test Method/Procedure		Pass / Fail
Antenna Requirement	FCC	15.203	FCC	ANSI C63.10 – 2013	☒ Pass ☐ N/A
	IC	-	IC		
AC Conducted Emissions Voltage	FCC	15.207(a)	FCC	ANSI C63.10: 2013	☐ Pass ☒ N/A*
	IC	RSS Gen 8.8	IC	RSS-Gen Issue 5, April 2018	
Radiated Emissions	FCC	15.249(a) / 15.209	FCC	ANSI C63.10 – 2013	☒ Pass ☐ N/A
	IC	RSS-Gen (8.9,8.10)	IC	RSS-Gen Issue 5, April 2018	
Fundamental Field Strength	FCC	15.249(a)	FCC	ANSI C63.10 – 2013	☒ Pass ☐ N/A
	IC	RSS210 B10 RSS-Gen (8.9,8.10)	IC	RSS-Gen Issue 5, April 2018	
20dB Bandwidth	FCC	15.215(c)	FCC	ANSI C63.10 – 2013	☒ Pass ☐ N/A
	IC	RSS Gen (4.6.1)	IC	RSS-Gen Issue 5, April 2018	
Remark	1. All measurement uncertainties are not taken into consideration for all presented test result. 2. The applicant shall ensure frequency stability by showing that an emission is maintained within the band of operation under all normal operating conditions as specified in the user's manual. 3. N/A* EUT is battery powered only.				

9 Measurement Uncertainty

9.1 Conducted Emissions

The test is to measure the conducted emissions to the mains port of the EUT.

Some error sources that can contribute to the total uncertainty:

- Uncertainty of the receiver
- Uncertainty of the LISN
- Uncertainty of cables
- Uncertainty due to the mismatches
- Etc, see the below table for details

Source of Uncertainty	Value (dB)	Probability Distribution	Division	Sensitivity Coefficient	Expanded Uncertainty
Receiver Reading	0.12	Rectangular	1.732	1	0.069284
Cable Insertion Loss	0.21	Normal	2	1	0.105
Filter Insertion Loss	0.25	Normal	2	1	0.125
LISN Insertion Loss	0.40	Normal	2	1	0.20
Receiver CW accuracy	0.5	Rectangular	1.732	1	0.2886836
Pulse Amplitude Response	1.5	Rectangular	1.732	1	0.86605081
PRF Response	1.5	Rectangular	1.732	1	0.86605081
Mismatch LISN - Receiver	0.25	U-Shape	1.414	1	0.1768033
LISN Impedance	2.5	Triangular	2.449	1	1.0208248
Combined Standard Uncertainty					1.928133
Expanded Uncertainty (K=2)					3.856266

The total derived measurement uncertainty is +/- 3.86 dB.

9.2 Radiated Emissions (30MHz to 1GHz)

The test is to measure the radiated emissions of the EUT.

Some error sources that can contribute to the total uncertainty:

- Uncertainty of the receiver
- Uncertainty of the antenna
- Uncertainty of cables
- Uncertainty due to the mismatches
- NSA Calibration
- Etc., details see the below table

Source of Uncertainty	Value (dB)	Probability Distribution	Division	Sensitivity Coefficient	Expanded Uncertainty
Receiver Reading	0.12	Rectangular	1.732	1	0.069284
Cable Insertion Loss	0.21	Normal	2	1	0.105
Filter Insertion Loss	0.25	Normal	2	1	0.125
Antenna Factor	0.65	Normal	2	1	0.325
Receiver CW accuracy	0.5	Rectangular	1.732	1	0.2886836
Pulse Amplitude Response	1.5	Rectangular	1.732	1	0.86605081
PRF Response	1.5	Rectangular	1.732	1	0.86605081
Mismatch Filter - Receiver	0.25	U-Shape	1.414	1	0.1768033
NSA Calibration	4.0	U-Shape	1.414	1	2.8288543
Combined Standard Uncertainty					3.0059131
Expanded Uncertainty (K=2)					6.0118262

The total derived measurement uncertainty is +/- 6.00 dB.

9.3 Radiated Emissions (1GHz to 40GHz)

The test is to measure the radiated emissions of the EUT.

Some error sources that can contribute to the total uncertainty:
- Uncertainty of the receiver
- Uncertainty of the antenna
- Uncertainty of cables
- Uncertainty due to the mismatches
- VSWR Calibration
- Etc., details see the below table

Source of Uncertainty	Value (dB)	Probability Distribution	Division	Sensitivity Coefficient	Expanded Uncertainty
Receiver Reading	0.12	Rectangular	1.732	1	0.0692840
Cable Insertion Loss	0.21	Normal	2	1	0.1050000
Filter Insertion Loss	0.25	Normal	2	1	0.1250000
Antenna Factor	0.65	Normal	2	1	0.3250000
Receiver CW accuracy	0.5	Rectangular	1.732	1	0.2886836
Pulse Amplitude Response	1.5	Rectangular	1.732	1	0.8660508
PRF Response	1.5	Rectangular	1.732	1	0.8660508
Mismatch Filter - Receiver	0.25	U-Shape	1.414	1	0.1768033
VSWR Calibration	2.0	U-Shape	1.414	1	1.4144272
Combined Standard Uncertainty					4.2363
Expanded Uncertainty (K=2)					8.4726

The total derived measurement uncertainty is +/- 8.47 dB.

9.4 RF conducted measurement

The test is to measure the RF output power from the EUT.

Some error sources that can contribute to the total uncertainty:

- Uncertainty of the Reference Level Uncertainty
- Uncertainty of variable attenuators
- Uncertainty of cables
- Uncertainty due to the mismatches

Source of Uncertainty	Value (dB)	Probability Distribution	Division	Sensitivity Coefficient	Expanded Uncertainty
Reference Level	0.12	Rectangular	1.732	1	0.069284
Cable Insertion Loss	0.21	Normal	2	1	0.105
Attenuator	0.25	Normal	2	1	0.125
Mismatch	0.25	U-Shape	1.414	1	0.1768033
Combined Standard Uncertainty					0.476087
Expanded Uncertainty (K=2)					0.952174

The total derived measurement uncertainty is +/- 0.95 dB.

10 Measurements, Examination and Derived Results

10.1 Antenna Requirement

Applicable Standard

According to § 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the user of a standard antenna jack or electrical connector is prohibited.

The structure and application of the EUT were analyzed to determine compliance with section §15.203 of the rules. §15.203 state that the subject device must meet the following criteria:

a. Antenna must be permanently attached to the unit.

b. Antenna must use a unique type of connector to attach to the EUT.

c. Unit must be professionally installed, and installer shall be responsible for verifying that the correct antenna is employed with the unit.

Antenna Connector Construction

The EUT has 1 antenna:

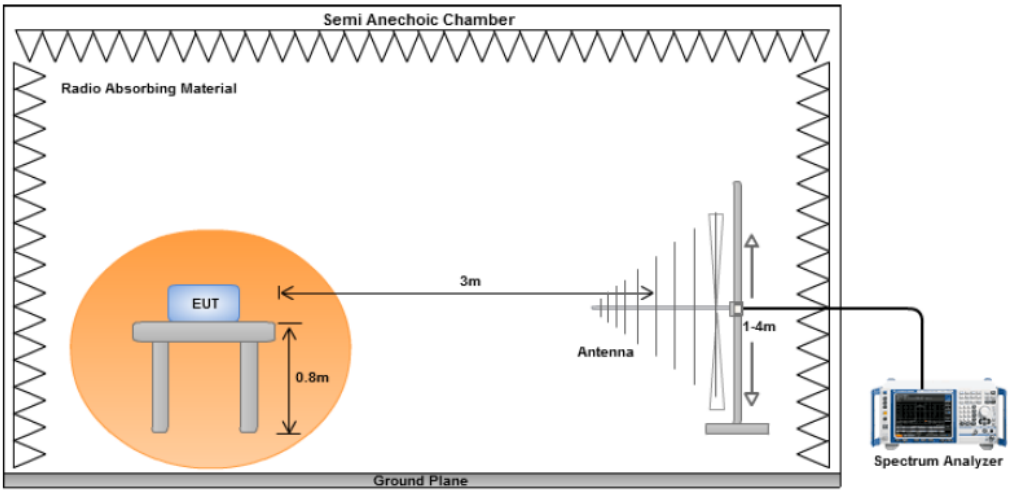
A permanently attached Integrated PCB antenna for FHSS , the gain is 0 dBi.

The antenna meets up with the ANTENNA REQUIREMENT.

Result: Compliance.

10.2 Radiated Spurious Emissions Below 1GHz

Requirement(s):

Spec	Item	Requirement	Applicable
47CFR§15.209, 47CFR§15.249(a), RSS-210 B10 RSS-Gen(8.9 8.10)	1	Except higher limit as specified elsewhere in other section, the emissions from the low-power radio-frequency devices shall not exceed the field strength levels specified in the following table and the level of any unwanted emissions shall not exceed the level of the fundamental emission. The tighter limit applies at the band edges Frequency range (MHz) / Field Strength (uV/m) 30 – 88 / 100 88 – 216 / 150 216 960 / 200 Above 960 / 500	☒
Test Setup			
Procedure		1. The EUT was switched on and allowed to warm up to its normal operating condition. 2. The test was carried out at the selected frequency points obtained from the EUT characterisation. Maximization of the emissions, was carried out by rotating the EUT, changing the antenna polarization, and adjusting the antenna height in the following manner: a. Vertical or horizontal polarisation (whichever gave the higher emission level over a full rotation of the EUT) was chosen. b. The EUT was then rotated to the direction that gave the maximum emission. c. Finally, the antenna height was adjusted to the height that gave the maximum emission. 3. A Quasi-peak measurement was then made for that frequency point. 4. Steps 2 and 3 were repeated for the next frequency point, until all selected frequency points were measured.	
Remark		The EUT was scanned up to 1GHz. Both horizontal and vertical polarities were investigated. The results show only the worst case.	
Result		☒ Pass ☐ Fail	

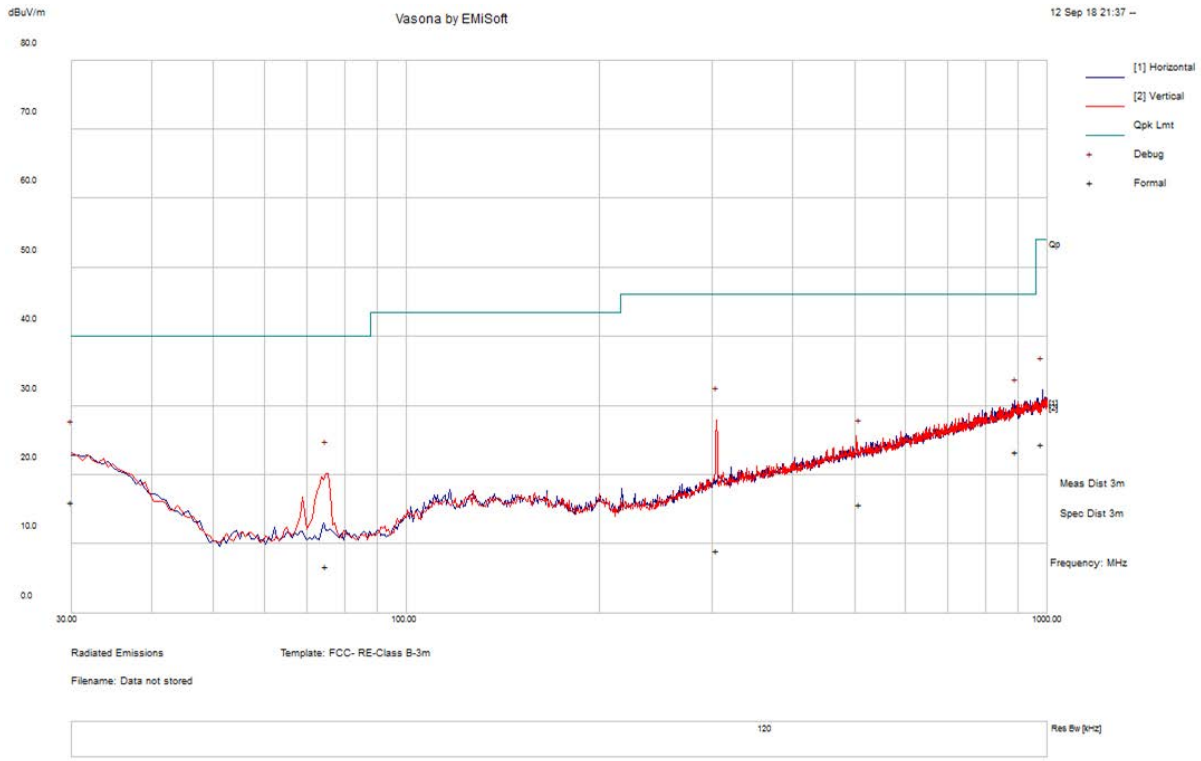
Test Data ☒ Yes (See below) ☐ N/A

Test Plot ☒ Yes (See below) ☐ N/A

Test was done by Deon Dai at *10m Chamber.*

Radiated Emission Test Results (Below 1GHz)

Test specification:	Radiated Spurious Emissions (30MHz – 1000MHz)			
Environmental Conditions:	Temp(°C):	22	Result :	☒ Pass ☐ Fail
	Humidity (%):	42		
	Atmospheric(mbar):	1021		
Mains Power:	DC3.0V			
Tested by:	Deon Dai			
Test Date:	09/12/2018			
Remarks:	Transmit Mid CH			



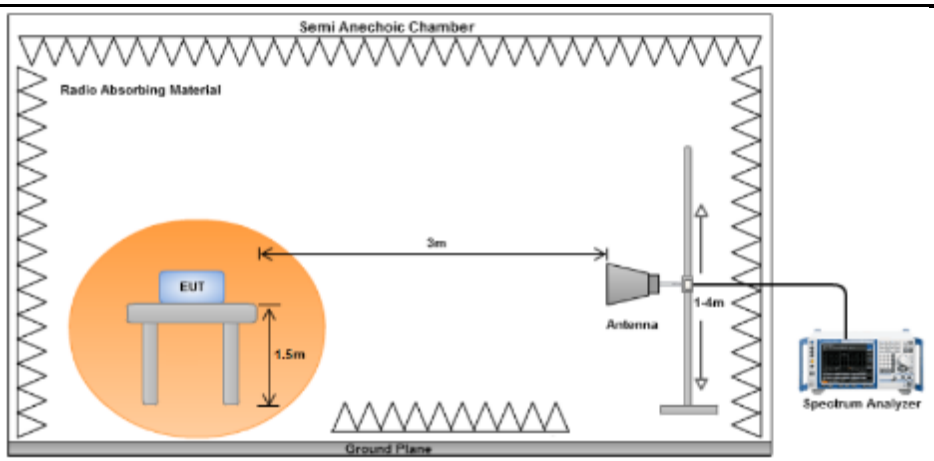
Frequency (MHz)	Raw (dBuV)	Cable Loss (dB)	AF (dB)	Level (dBuV/m)	Measurement Type	Pol (V/H)	Hgt (cm)	Azt (Deg)	Limit (dBuV/m)	Margin (dB)	Pass /Fail
895.30	20.84	15.95	-13.47	23.32	Quasi Max	H	345	6	46	-22.68	Pass
30.00	17.09	11.12	-12.08	16.12	Quasi Max	V	190	133	40	-23.88	Pass
304.47	17.71	13.26	-21.84	9.12	Quasi Max	V	244	14	46	-36.88	Pass
75.00	23.42	11.63	-27.49	7.56	Quasi Max	V	178	317	40	-32.44	Pass
981.38	20.16	16.01	-11.63	24.53	Quasi Max	H	312	256	54	-29.47	Pass
509.16	19.45	14.26	-17.98	15.73	Quasi Max	H	173	142	46	-30.28	Pass

Note: Both horizontal and vertical polarities were investigated. The results above show only the worst case.

10.3 Radiated Spurious Emissions > 1GHz & Fundamental Field Strength

Requirement(s):

<table>
<tr><th>Spec</th><th>Item</th><th>Requirement</th><th>Applicable</th></tr>
<tr><td rowspan="2">47CFR§15.209,
47CFR§15.249(a),
RSS-210 B10
RSS-Gen(8.9 8.10)</td><td>a)</td><td>Emissions radiated outside of the specified bands, shall be according to the general radiated limits in 15.209 as following:
<table>
<tr><th>FREQUENCIES (MHz)</th><th>FIELD STRENGTH (microvolts/meter)</th><th>MEASUREMENT DISTANCE (meters)</th></tr>
<tr><td>0.009 ~ 0.490</td><td>2400/F(kHz)</td><td>300</td></tr>
<tr><td>0.490 ~ 1.705</td><td>24000/F(kHz)</td><td>30</td></tr>
<tr><td>1.705 ~ 30.0</td><td>30</td><td>30</td></tr>
<tr><td>30 ~ 88</td><td>100</td><td>3</td></tr>
<tr><td>88 ~ 216</td><td>150</td><td>3</td></tr>
<tr><td>216 ~ 960</td><td>200</td><td>3</td></tr>
<tr><td>Above 960</td><td>500</td><td>3</td></tr>
</table>
According to §15.249(a), the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:
<table>
<tr><th>FREQUENCIES</th><th>Field strength of fundamental (milli-volts/meter)</th><th>Field strength of harmonics (micro-volts/meter)</th></tr>
<tr><td>902-928 MHz</td><td>50</td><td>500</td></tr>
<tr><td>2400-2483.5 MHz</td><td>50</td><td>500</td></tr>
<tr><td>5725-5875 MHz</td><td>50</td><td>500</td></tr>
<tr><td>24.0-24.25 GHz</td><td>250</td><td>2500</td></tr>
</table>
The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in §15.35 for limiting peak emissions apply.</td><td>☒</td></tr>
<tr><td>b)</td><td>Devices shall comply with the following requirements:
a. The field strength of fundamental and harmonic emissions, measured at 3 m, shall not exceed 50 mV/m and 0.5 mV/m respectively.
The field strength limits shall be measured using an average detector, except for the fundamental emission in the frequency band 902-928 MHz, which is based on measurements using an International Special Committee on Radio Interference (CISPR) quasi-peak detector.
b. Emissions radiated outside of the specified frequency bands, except for harmonic emissions, shall be attenuated by at least 50 dB below the level of the fundamental emissions or to the general field strength limits listed in RSS-Gen, whichever is less stringent.</td><td>☒</td></tr>
</table>

Test Setup	
Procedure	1. The EUT was switched on and allowed to warm up to its normal operating condition. 2. The test was carried out at the selected frequency points obtained from the EUT characterisation. Maximization of the emissions, was carried out by rotating the EUT, changing the antenna polarization, and adjusting the antenna height in the following manner: a. Vertical or horizontal polarisation (whichever gave the higher emission level over a full rotation of the EUT) was chosen. b. The EUT was then rotated to the direction that gave the maximum emission. c. Finally, the antenna height was adjusted to the height that gave the maximum emission. 3. An average measurement was then made for that frequency point. 4. Steps 2 and 3 were repeated for the next frequency point, until all selected frequency points were measured.
Remark	The EUT was scanned up to 26GHz. Both horizontal and vertical polarities were investigated. The results show only the worst case.
Result	☒ Pass ☐ Fail

Test Data ☒ Yes (See below) ☐ N/A

Test Plot ☐ Yes (See below) ☒ N/A

Test was done by *Deon Dai* at 10*m Chamber.*

Fundamental Field Strength Measurement Result

Low channel – 2401.5MHz

Frequency (MHz)	Raw (dBuV)	Cable Loss (dB)	AF (dB)	Amp (dB)	Level (dBuV/m)	Measurement Type	Pol (V/H)	Hgt (cm)	Azt (Deg)	Limit (dBuV/m)	Margin (dB)	Pass /Fail
2401.5	83.25	2.96	31.91	46.38	71.74	Peak Max	V	155	214	114	-42.26	Pass
2401.5	79.54	2.96	31.91	46.38	68.03	Peak Max	H	149	45	114	-45.97	Pass
2401.5	70.56	2.96	31.91	46.38	59.05	Average Max	V	155	214	94	-34.95	Pass
2401.5	70.12	2.96	31.91	46.38	58.61	Average Max	H	149	45	94	-35.39	Pass

Mid channel – 2440.5MHz

Frequency (MHz)	Raw (dBuV)	Cable Loss (dB)	AF (dB)	Amp (dB)	Level (dBuV/m)	Measurement Type	Pol (V/H)	Hgt (cm)	Azt (Deg)	Limit (dBuV/m)	Margin (dB)	Pass /Fail
2440.5	80.24	2.97	32.14	46.39	68.96	Peak Max	V	150	211	114	-45.04	Pass
2440.5	78.48	2.97	32.14	46.39	67.2	Peak Max	H	156	128	114	-46.8	Pass
2440.5	69.58	2.97	32.14	46.39	58.3	Average Max	V	150	211	94	-35.7	Pass
2440.5	69.11	2.97	32.14	46.39	57.83	Average Max	H	156	128	94	-36.17	Pass

High channel – 2479.5MHz

Frequency (MHz)	Raw (dBuV)	Cable Loss (dB)	AF (dB)	Amp (dB)	Level (dBuV/m)	Measurement Type	Pol (V/H)	Hgt (cm)	Azt (Deg)	Limit (dBuV/m)	Margin (dB)	Pass /Fail
2479.5	81.24	2.99	32.2	46.4	70.03	Peak Max	V	156	214	114	-43.97	Pass
2479.5	77.41	2.99	32.2	46.4	66.2	Peak Max	H	180	155	114	-47.8	Pass
2479.5	70.86	2.99	32.2	46.4	59.65	Average Max	V	156	214	94	-34.35	Pass
2479.5	68.49	2.99	32.2	46.4	57.28	Average Max	H	180	155	94	-36.72	Pass

Note: Level (dBuV/m)=Raw(dBuV)+Cable Loss(dB)+AF(dB)-Amp(dBuV/m)

Radiated Spurious Emission Test Results

Low channel - 2401.5MHz

Frequency (MHz)	Raw (dBuV)	Cable Loss (dB)	AF (dB)	Amp (dB)	Level (dBuV/m)	Measurement Type	Pol (V/H)	Hgt (cm)	Azt (Deg)	Limit (dBuV/m)	Margin (dB)	Pass /Fail
4803	49.58	4.1	34.5	45.4	42.78	Peak Max	V	159	219	74	-31.22	Pass
4803	47.41	4.1	34.5	45.4	40.61	Peak Max	H	148	358	74	-33.39	Pass
4803	38.13	4.1	34.5	45.4	31.33	Average Max	V	159	219	54	-22.67	Pass
4803	35.99	4.1	34.5	45.4	29.19	Average Max	H	148	358	54	-24.81	Pass

Mid channel - 2440.5MHz

Frequency (MHz)	Raw (dBuV)	Cable Loss (dB)	AF (dB)	Amp (dB)	Level (dBuV/m)	Measurement Type	Pol (V/H)	Hgt (cm)	Azt (Deg)	Limit (dBuV/m)	Margin (dB)	Pass /Fail
4881	50.58	4.18	34.44	45.57	43.63	Peak Max	V	155	147	74	-30.37	Pass
4881	49.14	4.18	34.44	45.57	42.19	Peak Max	H	164	299	74	-31.81	Pass
4881	39.58	4.18	34.44	45.57	32.63	Average Max	V	155	147	54	-21.37	Pass
4881	37.93	4.18	34.44	45.57	30.98	Average Max	H	164	299	54	-23.02	Pass

High channel - 2479.5MHz

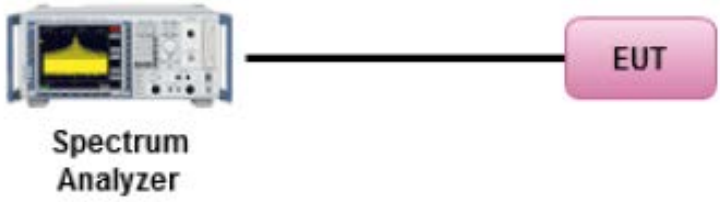
Frequency (MHz)	Raw (dBuV)	Cable Loss (dB)	AF (dB)	Amp (dB)	Level (dBuV/m)	Measurement Type	Pol (V/H)	Hgt (cm)	Azt (Deg)	Limit (dBuV/m)	Margin (dB)	Pass /Fail
4959	48.88	4.25	34.38	45.53	41.98	Peak Max	V	149	149	74	-32.02	Pass
4959	46.82	4.25	34.38	45.53	39.92	Peak Max	H	158	244	74	-34.08	Pass
4959	39.21	4.25	34.38	45.53	32.31	Average Max	V	149	149	54	-21.69	Pass
4959	34.59	4.25	34.38	45.53	27.69	Average Max	H	158	244	54	-26.31	Pass

Note: Both horizontal and vertical polarities were investigated. The results above show only the worst case.

Level (dBuV/m)=Raw(dBuV)+Cable Loss(dB)+AF(dB)-Amp(dBuV/m)

10.4 20dB Bandwidth

Requirement(s):

Spec	Requirement	Applicable
47 CFR §15.215	According to FCC 15.215(c), must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.	☒
RSS Gen 4.6.1	The transmitter shall be operated at its maximum carrier power measured under normal test conditions. The span of the analyzer shall be set to capture all products of the modulation process, including the emission skirts. The resolution bandwidth shall be set to as close to 1% of the selected span as is possible without being below 1%. The video bandwidth shall be set to 3 times the resolution bandwidth. Video averaging is not permitted. Where practical, a sampling detector shall be used given that a peak or peak hold may produce a wider bandwidth than actual. The trace data points are recovered and directly summed in linear terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5% of the total is reached and that frequency recorded. The process is repeated for the highest frequency data points. This frequency is recorded. The span between the two recorded frequencies is the occupied bandwidth	☒
Test Setup		
Procedure	20dB Emission bandwidth measurement procedure - Set RBW ≥ 1% of 20dB Bandwidth - Set the video bandwidth (VBW) ≥ RBW. - Detector = Peak. - Trace mode = max hold. - Sweep = auto couple. - Allow the trace to stabilize. - Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission. 99% bandwidth measurement procedure 1. EUT was set for low , mid, high channel with modulated mode and highest RF output power. 2. The spectrum analyzer was connected to the antenna terminal.	

Test Date	09/12/2018	Environmental condition	Temperature 23oC Relative Humidity 47% Atmospheric Pressure 1019mbar
Remark	The result of 20dB BW measurement is for reference only.		
Result	☐ Pass ☐ Fail		

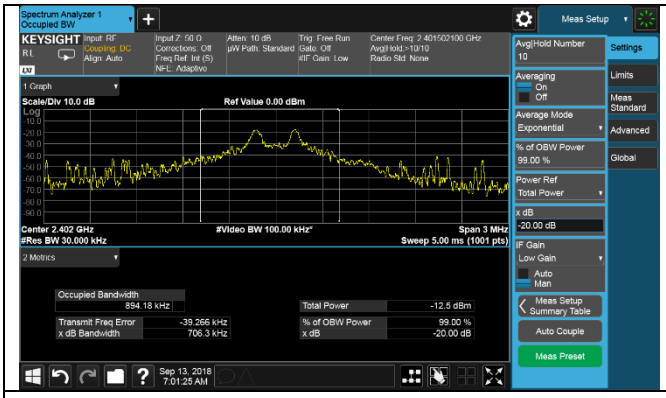
Test Data ☒ Yes (See below) ☐ N/A

Test Plot ☒ Yes (See below) ☐ N/A

Test was done by Deon Dai at *RF Test Site*.

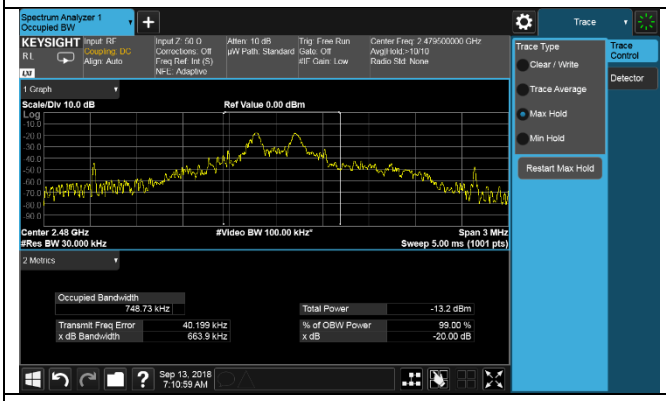
Channel	Channel Frequency (MHz)	OBW	
		99% (KHz)	20dB(KHz)
Low	2401.5	894.18	706.3
Mid	2440.5	1419.1	628.5
High	2479.5	748.73	663.9

99% & 20dB Bandwidth Test Plots



99% and 20dB BW – 2401.5MHz

99% and 20dB BW –2440.5MHz



99% and 20dB BW – 2479.5MHz

Annex A. TEST INSTRUMENT

Instrument	Model	Serial #	Cal Date	Cal Cycle	Cal Due	In use
Conducted Emissions						
R & S Receiver	ESIB 40	100179	04/21/2018	1 Year	04/21/2019	☐
CHASE LISN	MN2050B	1018	08/16/2018	1 Year	08/16/2019	☐
Radiated Emissions						
Keysight EXA 44GHz Spectrum Analyzer	N9010A	MY51440112	11/02/2017	1 Year	11/02/2018	☑
Bi-Log antenna (30MHz~2GHz)	JB1	A030702	01/13/2018	1 Year	01/13/2019	☑
Horn Antenna (1GHz~26GHz)	3115	100059	08/11/2018	1 Year	08/11/2019	☑
Pre-Amplifier (1-40GHz)	SAS-574	579	05/04/2018	1 Year	05/04/2019	☑
Preamplifier (100KHz-7GHz)	LPA-6-30	11140711	02/09/2018	1 Year	02/09/2019	☑
RF Conducted Measurement						
Spectrum Analyzer	N9010A	10SL0219	11/16/2017	1 Year	11/16/2018	☑

Annex B. SIEMIC Accreditation

Accreditations	Document	Scope / Remark
ISO 17025 (A2LA)		Please see the documents for the detailed scope
ISO Guide 65 (A2LA)		Please see the documents for the detailed scope
TCB Designation		A1, A2, A3, A4, B1, B2, B3, B4, C
FCC DoC Accreditation		FCC Declaration of Conformity Accreditation
FCC Site Registration		3 meter site
FCC Site Registration		10 meter site
IC Site Registration		3 meter site
IC Site Registration		10 meter site
EU NB		Radio Equipment: EN45011: EN ISO/IEC 17065
		Electromagnetic Compatibility: EN45011 – EN ISO/IEC 17065
Singapore iDA CB(Certification Body)		Phase I, Phase II
Vietnam MIC CAB Accreditation		Please see the document for the detailed scope
Hong Kong OFCA		(Phase II) OFCA Foreign Certification Body for Radio and Telecom
		(Phase I) Conformity Assessment Body for Radio and Telecom
Industry Canada CAB		Radio: Scope A – All Radio Standard Specification in Category I
		Telecom: CS-03 Part I, II, V, VI, VII, VIII

Japan Recognized Certification Body Designation		Radio: A1. Terminal equipment for purpose of calling Telecom: B1. Specified radio equipment specified in Article 38-2, Paragraph 1, Item 1 of the Radio Law
Korea CAB Accreditation		EMI: KCC Notice 2008-39, RRL Notice 2008-3: CA Procedures for EMI KN22: Test Method for EMI EMS: KCC Notice 2008-38, RRL Notice 2008-4: CA Procedures for EMS KN24, KN61000-4-2, -4-3, -4-4, -4-5, -4-6, -4-8, -4-11: Test Method for EMS
		Radio: RRL Notice 2008-26, RRL Notice 2008-2, RRL Notice 2008-10, RRL Notice 2007-49, RRL Notice 2007-20, RRL Notice 2007-21, RRL Notice 2007-80, RRL Notice 2004-68
		Telecom: President Notice 20664, RRL Notice 2007-30, RRL Notice 2008-7 with attachments 1, 3, 5, 6; President Notice 20664, RRL Notice 2008-7 with attachment 4
Taiwan NCC CAB Recognition		LP0002, PSTN01, ADSL01, ID0002, IS6100, CNS14336, PLMN07, PLMN01, PLMN08
Taiwan BSMI CAB Recognition		CNS 13438
Japan VCCI		R-3083: Radiation 3 meter site C-3421: Main Ports Conducted Interference Measurement T-1597: Telecommunication Ports Conducted Interference Measuremet
Australia CAB Regocnition		EMC: AS/NZS CISPR 11, AS/NZS CISPR 14.1, AS/NZS CISPR22, AS/NZS 61000.6.3, AS/NZS 61000.6.4
		Radiocommunications: AS/NZS 4281, AS/NZS 4268, AS/NZS 4280.1, AS/NZS 4280.2, AS/NZS 4295, AS/NZS 4582, AS/NZS 4583, AS/NZS 4769.1, AS/NZS 4769.2, AS/NZS 4770, AS/NZS 4771
		Telecommunications: AS/ACIF S002:05, AS/ACIF S003:06, AS/ACIF S004:06 AS/ACIF S006:01, AS/ACIF S016:01, AS/ACIF S031:01, AS/ACIF S038:01, AS/ACIF S040:01, AS/ACIF S041:05, AS/ACIF S043.2:06, AS/ACIF S60950.1
Australia NATA Recognition		AS/ACIF S002, AS/ACIF S003, AS/ACIF S004, AS/ACIF S006, AS/ACIF S016,AS/ACIF S031, AS/ACIF S038, AS/ACIF S040, AS/ACIF S041, AS/ACIF S043.2