RF TEST REPORT

SIEMIC
A Bureau Veritas Group Company

Report No.: FCC_RF_SL17062101-SEV-039-DTS
Supersede Report No.:

Applicant	:	Continental Automotive Systems, Inc
Product Name	:	FLEX CM
Model No.	:	1819-X
Test Standard	:	47 CFR 15.247
Test Method	:	ANSI C63.10: 2013 558074 D01 DTS Meas Guidance v04
FCC ID	:	2AJW5FLEXCM
Dates of test	:	06/22/2017 – 06/23/2017
Issue Date	:	07/17/2017
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:	
	
Rachana Khanduri	Chen Ge
Test Engineer	Engineer Reviewer

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

ilac-MRA
A2LA ACCREDITED
TESTING CERT # 2742-01

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

CONTENTS

1 REPORT REVISION HISTORY 4
2 EXECUTIVE SUMMARY 5
3 CUSTOMER INFORMATION 5
4 TEST SITE INFORMATION 5
5 MODIFICATION 5
6 EUT INFORMATION 6
6.1 EUT Description 6
6.2 Radio Description 6
6.3 EUT Photos – External 7
6.4 EUT Photos - Internal 8
6.5 EUT Test Setup Photos 9
7 SUPPORTING EQUIPMENT/SOFTWARE AND CABLING DESCRIPTION 10
7.1 Supporting Equipment 10
7.2 Cabling Description 10
7.3 Test Software Description 10
8 TEST SUMMARY 11
9 MEASUREMENT UNCERTAINTY 12
9.1 Conducted Emissions 12
9.2 Radiated Emissions (30MHz to 1GHz) 12
9.3 Radiated Emissions (1GHz to 40GHz) 13
9.4 RF conducted measurement 13
10 MEASUREMENTS, EXAMINATION AND DERIVED RESULTS 14
10.1 Radiated Spurious Emissions below 1GHz 14
10.2 Radiated Spurious Emissions between 1GHz – 25GHz 16
ANNEX A. TEST INSTRUMENT 23
ANNEX B. SIEMIC ACCREDITATION 24

1 Report Revision History

Report No.	Report Version	Description	Issue Date
FCC_RF_SL17062101-SEV-039-DTS	None	Original	07/17/2017

2 Executive Summary

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

Company: Continental Automotive Systems, Inc
Product: FLEX CM
Model: 1819-X

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	:	Continental Automotive Systems, Inc
Applicant Address	:	6755 Snowdrift Road, US
Manufacturer Name	:	Continental Automotive Guadalajara México, S.A. de C.V
Manufacturer Address	:	Camino a la Tijera 3 Municipio de Tlajomulco de Zuniga, Jalisco Mexico

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

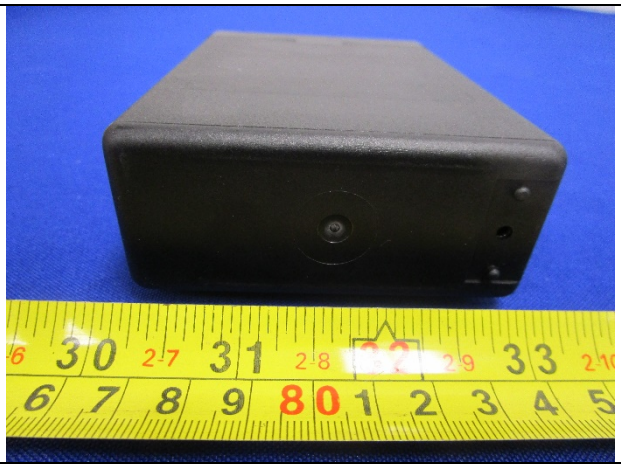
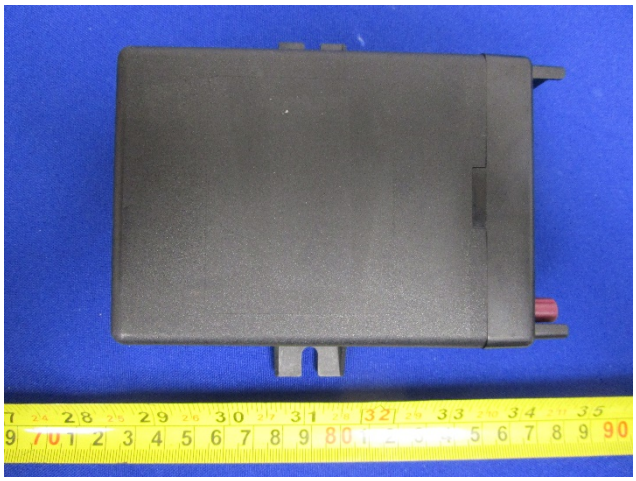
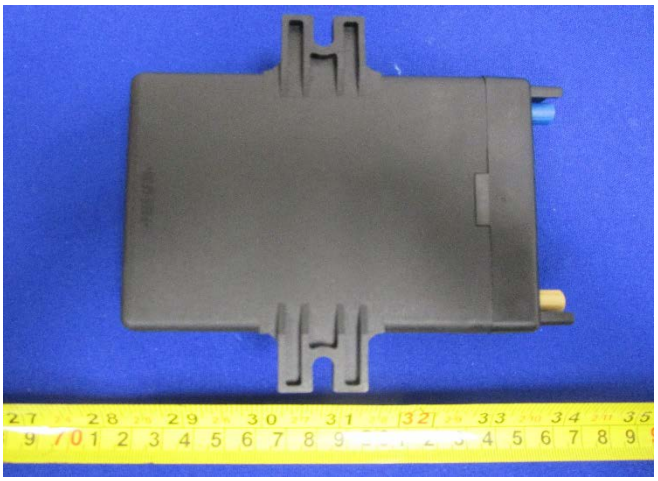
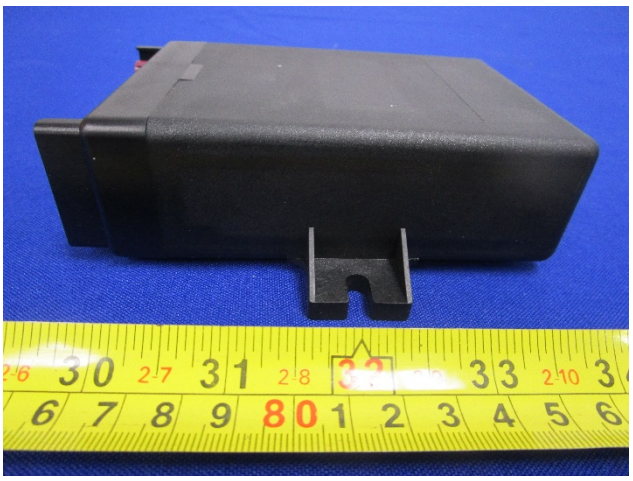
6.1 EUT Description

Product Name	:	FLEX CM
Model No.	:	1819-X
Trade Name	:	Continental
Serial No.	:	0027
Input Power	:	12VDC
Power Adapter Manu/Model	:	N/A
Power Adapter SN	:	N/A
Product Hardware version	:	1819-X
Product Software version	:	4.1
Radio Hardware version	:	PDS6 / RBHA-C213B
Radio Software version	:	3.001
Date of EUT received	:	06/21/2017
Equipment Class/ Category	:	Class B
Port/Connectors	:	USB,RS-232,CAN/LIN, Dig I/O, Ana In, Power, Ground, Ignition

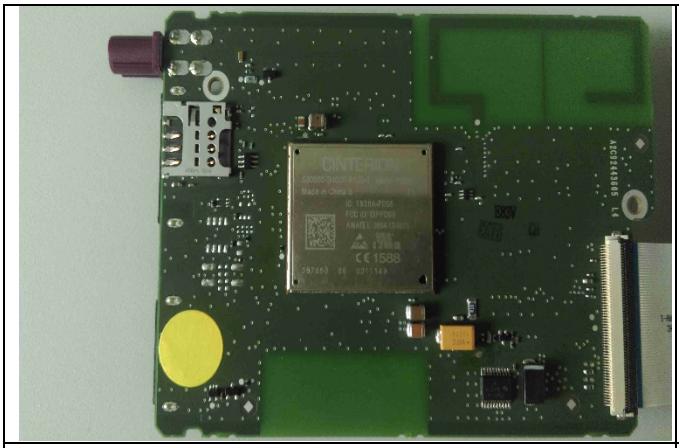
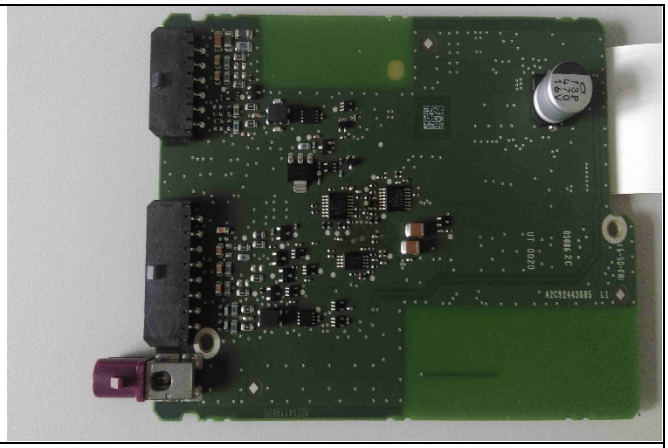
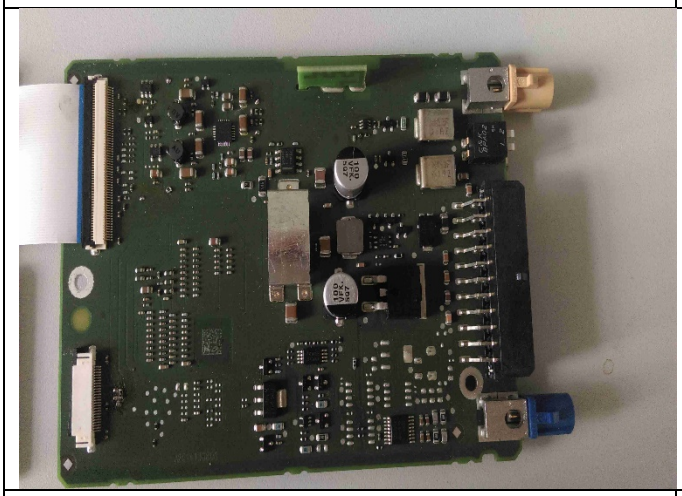
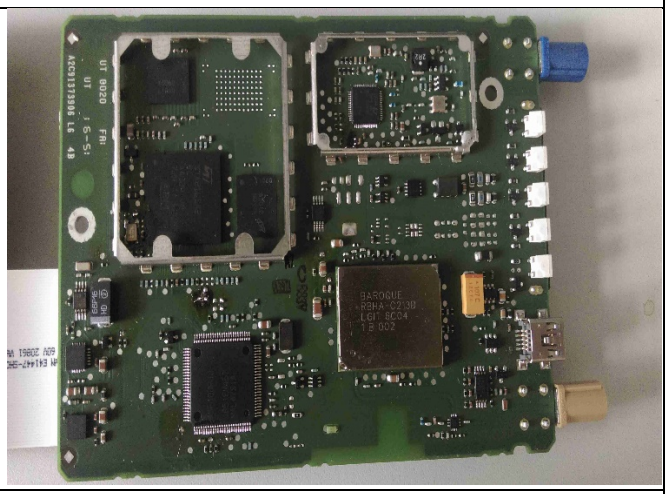
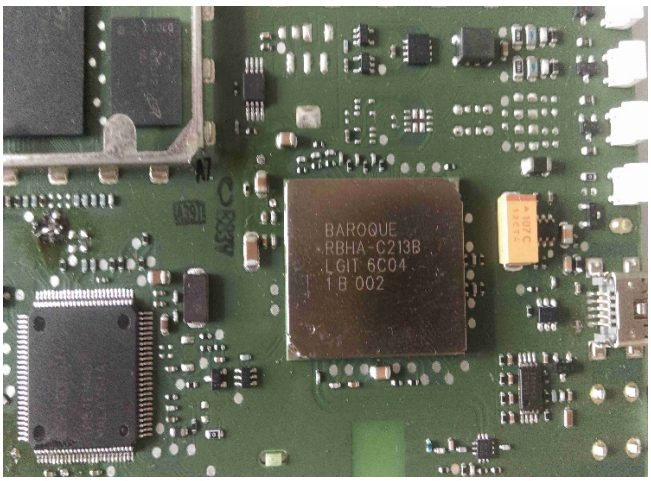
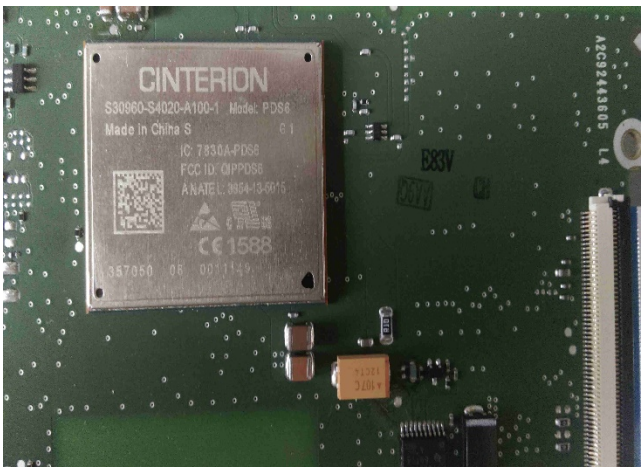
6.2 Radio Description

Radio Type	802.11b	802.11g	802.11n-20M
Operating Frequency	2412-2462MHz	2412-2462MHz	2412-2462MHz
Modulation	DSSS (CCK, DQPSK, DBPSK)	OFDM-CCK (BPSK, QPSK, 16QAM, 64QAM)	OFDM (BPSK, QPSK, 16QAM, 64QAM)
Channel Spacing	5MHz	5MHz	5MHz
Number of Channels	11	11	11
Antenna Type	PCB		
Antenna Gain (Peak)	4.5dBi		
Antenna Connector Type	intern. microstrip line / ext. FAKRA		

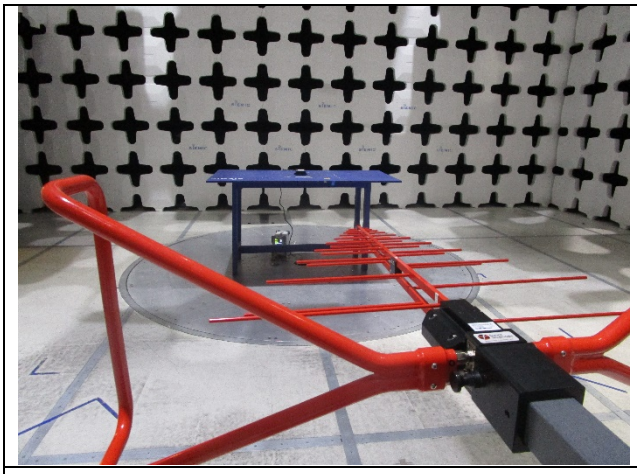
6.3 EUT Photos – External

	
EUT – Front View	EUT – Rear View
	
EUT – Top View	EUT – Bottom View
	
EUT – Left Side View	EUT – Right Side View

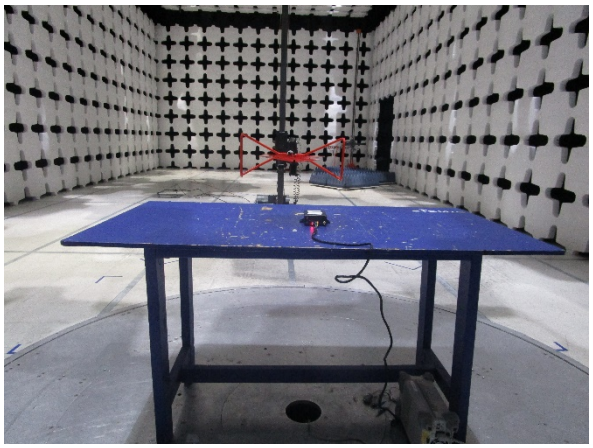
6.4 EUT Photos - Internal

	
FLEXCM- External Board- Top View	FLEXCM-External Board- Bottom View
	
FLEXCM- Main Board- Top View	FLEXCM-Main Board- Bottom View
	
FLEXCM-WLAN and BT Module	FLEXCM-Cellular Module

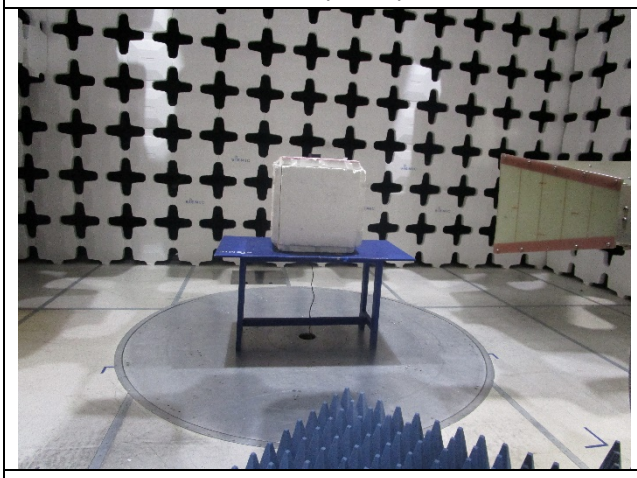
6.5 EUT Test Setup Photos



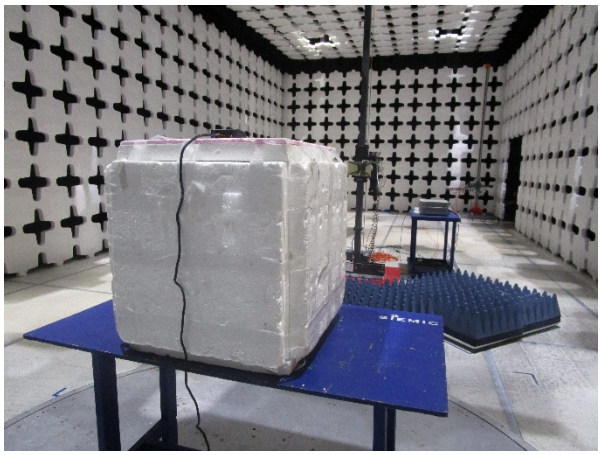
Radiated Emissions (<1GHz) – Front View



Radiated Emissions (<1GHz) – Rear View



Radiated Emissions (>1GHz) – Front View



Radiated Emissions (>1GHz) – Rear View

7 Supporting Equipment/Software and cabling Description

7.1 Supporting Equipment

Item	Supporting Equipment Description	Model	Serial Number	Manufacturer	Note
1	Laptop	Lattitude 3550	N/A	Dell	-
2	DC Power Supply	DP712	DP7B190700020	RIGOL	-

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	USB	EUT	USB	Laptop	USB	2	Unshielded

7.3 Test Software Description

Test Item	Software	Description
RF Testing	Putty	Set the EUT to transmit continuously in diferent test mode

8 Test Summary

Test Item	Test standard		Test Method/Procedure		Pass / Fail
Restricted Band of Operation	FCC	15.205	FCC	ANSI C63.10:2013 558074 D01 DTS Meas Guidance v04	☒ Pass ☐ N/A
AC Conducted Emissions	FCC	15.207(a)	FCC	ANSI C63.10:2013	☐ Pass ☒ N/A

DTS Band Requirement

Test Item	Test standard		Test Method/Procedure		Pass / Fail
6dB Bandwidth	FCC	15.247(a)(2)	FCC	558074 D01 DTS Meas Guidance v04	☒ Pass* ☐ N/A
Band Edge and Radiated Spurious Emissions	FCC	15.247(d)	FCC	ANSI C63.10:2013 558074 D01 DTS Meas Guidance v04	☒ Pass ☐ N/A
Output Power	FCC	15.247(b)	FCC	558074 D01 DTS Meas Guidance v04	☒ Pass* ☐ N/A
Antenna Gain > 6 dBi	FCC	15.247(e)	FCC	-	☐ Pass ☒ N/A
Power Spectral Density	FCC	15.247(e)	FCC	558074 D01 DTS Meas Guidance v04	☒ Pass * ☐ N/A
RF Exposure requirement	FCC	15.247(i)	FCC	-	☐ Pass ☒ N/A
Remark	1. All measurement uncertainties do not take into consideration for all presented test results. 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. Pass * : Please refer to test report no. FCC(WLAN 2G)_A163A-367_LG Innotek_RBHA-C213B.				

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.

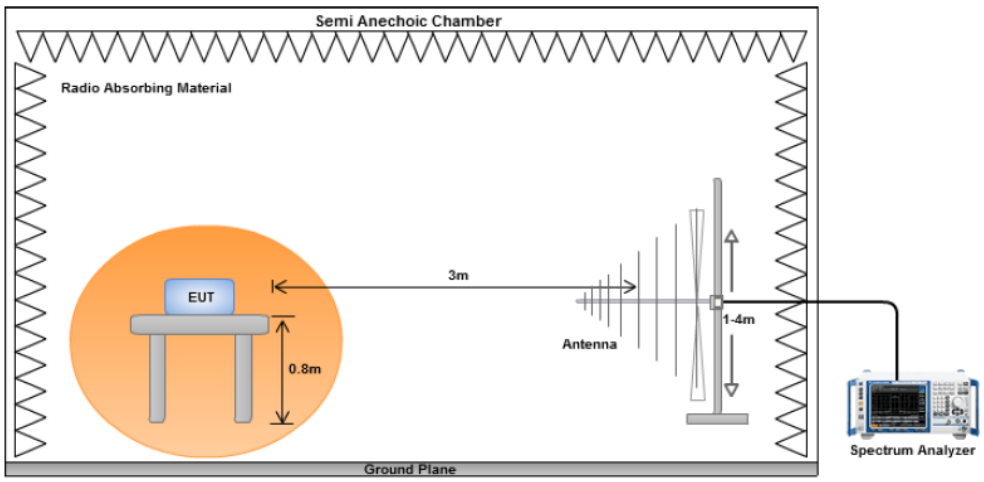
10 Measurements, Examination and Derived Results

10.1 Radiated Spurious Emissions below 1GHz

Requirement(s):

Spec	Item	Requirement	Applicable
47CFR§15.247(d)	a)	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

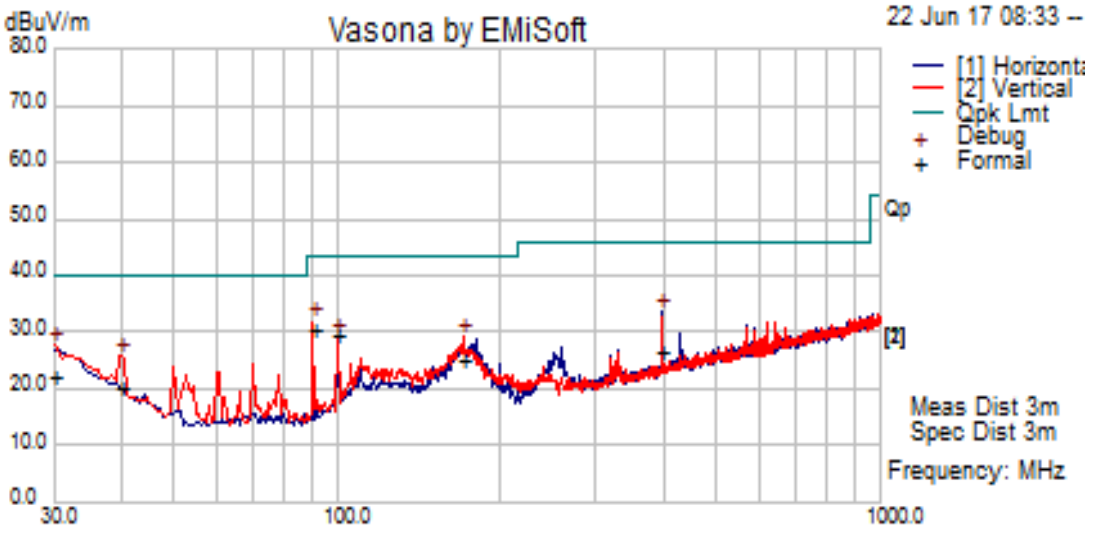
Test Data ☒ Yes (See below) ☐ N/A

Test Plot ☒ Yes (See below) ☐ N/A

Test was done by Rachana Khanduri at 10m chamber.

Radiated Emission Test Results (Below 1GHz)

Test specification	below 1GHz			
Environmental Conditions:	Temp (°C):	26.1	Result	Pass
	Humidity (%)	47.5		
	Atmospheric (mbar):	1020		
Mains Power:	120VAC, 60Hz			
Tested by:	Rachana Khanduri			
Test Date:	06/22/2017			
Remarks:	802.11n HT20-2437			

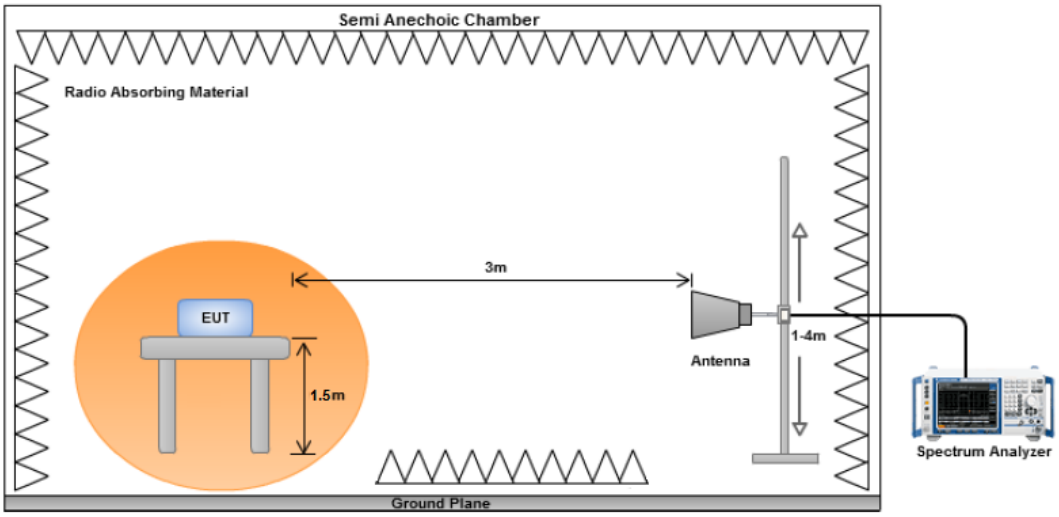


Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
89.99	47.04	11.59	-27.99	30.64	Quasi Max	V	126	157	43.50	-12.87	Pass
30.00	25.14	10.99	-13.82	22.31	Quasi Max	V	292	267	40.00	-17.69	Pass
395.07	34.25	13.22	-20.76	26.72	Quasi Max	H	103	266	46.00	-19.28	Pass
99.97	43.79	11.65	-26.14	29.30	Quasi Max	V	98	148	43.50	-14.20	Pass
170.00	37.44	12.11	-24.76	24.78	Quasi Max	V	105	72	43.50	-18.72	Pass
39.95	31.00	11.16	-21.86	20.30	Quasi Max	V	108	146	40.00	-19.70	Pass

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

10.2 Radiated Spurious Emissions between 1GHz – 25GHz

Requirement(s):

Spec	Item	Requirement	Applicable
47CFR§15.247(d)	a)	For non-restricted band, 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 or 30dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, determined by the measurement method on output power to be used. Attenuation below the general limits specified in § 15.209(a) is not required ☐ 20 dB down ☒ 30 dB down	☒
	b)	or restricted band, emission must also comply with the radiated emission limits specified in 15.209	☒
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	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 Rachana Khanduri at 10m chamber.

Radiated Emission Test Results (Above 1GHz)

Above 1GHz-25GHz – 802.11b – 2412MHz

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
17428.21	36.29	0.98	7.70	44.98	Peak Max	V	127	50	74	-29.03	Pass
7238.87	34.64	4.11	0.02	38.78	Peak Max	H	150	205	74	-35.22	Pass
4021.12	33.63	5.33	-5.8	33.16	Peak Max	V	109	233	74	-40.84	Pass
17428.21	23.78	0.98	7.70	32.47	Average Max	V	127	50	54	-21.53	Pass
7238.87	23.33	4.11	0.02	27.47	Average Max	H	150	205	54	-26.53	Pass
4021.12	21.80	5.33	-5.80	21.33	Average Max	V	109	233	54	-32.67	Pass

Above 1GHz-25GHz- 802.11b - 2437MHz

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
17938.24	36.72	0.86	8.42	46.00	Peak Max	V	121	65	74	-28.00	Pass
7351.67	33.48	4.06	-0.14	37.40	Peak Max	H	113	210	74	-36.60	Pass
4826.57	34.76	5.32	-5.00	35.08	Peak Max	V	110	165	74	-38.92	Pass
17938.24	24.56	0.86	8.42	33.84	Average Max	V	121	65	54	-20.16	Pass
7351.67	22.54	4.06	-0.14	26.46	Average Max	H	113	210	54	-27.54	Pass
4826.57	22.45	5.32	-5.00	22.77	Average Max	V	110	165	54	-31.23	Pass

Above 1GHz-25GHz – 802.11b – 2462MHz

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
16688.25	36.80	1.17	6.09	44.07	Peak Max	V	173	222	74	-29.94	Pass
7387.39	34.76	4.05	-0.25	38.56	Peak Max	H	105	231	74	-35.44	Pass
4802.53	34.02	5.29	-4.97	34.35	Peak Max	V	190	194	74	-39.65	Pass
16688.25	24.59	1.17	6.09	31.85	Average Max	V	173	222	54	-22.15	Pass
7387.39	23.88	4.05	-0.25	27.68	Average Max	H	105	231	54	-26.32	Pass
4802.53	21.60	5.29	-4.97	21.93	Average Max	V	190	194	54	-32.07	Pass

Above 1GHz-25GHz- 802.11g - 2412MHz

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
16878.96	36.74	1.09	5.82	43.65	Peak Max	V	156	264	74	-30.35	Pass
7239.80	33.28	4.11	0.02	37.42	Peak Max	H	388	215	74	-36.59	Pass
4826.21	33.90	5.32	-5.01	34.21	Peak Max	V	171	332	74	-39.79	Pass
16878.96	24.58	1.09	5.82	31.49	Average Max	V	156	264	54	-22.51	Pass
7239.80	21.41	4.11	0.02	25.55	Average Max	H	388	215	54	-28.45	Pass
4826.21	21.71	5.32	-5.01	22.02	Average Max	V	171	332	54	-31.98	Pass

Above 1GHz-25GHz – 802.11g – 2437MHz

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
17951.92	35.13	0.86	8.34	44.32	Peak Max	H	265	272	74	-29.68	Pass
7306.52	34.99	4.09	0.08	39.16	Peak Max	H	139	304	74	-34.84	Pass
1345.26	36.07	7.45	-14.89	28.64	Peak Max	V	389	115	74	-45.37	Pass
17951.92	23.45	0.86	8.34	32.64	Average Max	H	265	272	54	-21.36	Pass
7306.52	22.14	4.09	0.08	26.31	Average Max	H	139	304	54	-27.69	Pass
1345.26	23.69	7.45	-14.89	16.25	Average Max	V	389	115	54	-37.75	Pass

Above 1GHz-25GHz- 802.11g - 2462MHz

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
16572.54	36.94	1.22	6.42	44.58	Peak Max	V	120	356	74	-29.42	Pass
7392.83	34.87	4.05	-0.27	38.64	Peak Max	H	150	218	74	-35.36	Pass
4199.41	34.23	5.17	-5.83	33.58	Peak Max	V	180	149	74	-40.42	Pass
16572.54	24.52	1.22	6.42	32.17	Average Max	V	120	356	54	-21.83	Pass
7392.83	22.01	4.05	-0.27	25.79	Average Max	H	150	218	54	-28.21	Pass
4199.41	21.75	5.17	-5.83	21.10	Average Max	V	180	149	54	-32.90	Pass

Above 1GHz-25GHz- 802.11n20 - 2412MHz

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
17405.77	35.70	0.99	7.88	44.56	Peak Max	V	197	238	74	-29.44	Pass
7231.53	33.27	4.12	0.01	37.40	Peak Max	H	344	191	74	-36.60	Pass
4851.50	33.80	5.35	-5.05	34.10	Peak Max	V	226	185	74	-39.90	Pass
17405.77	23.63	0.99	7.88	32.49	Average Max	V	197	238	54	-21.51	Pass
7231.53	21.56	4.12	0.01	25.69	Average Max	H	344	191	54	-28.32	Pass
4851.50	21.72	5.35	-5.05	22.02	Average Max	V	226	185	54	-31.99	Pass

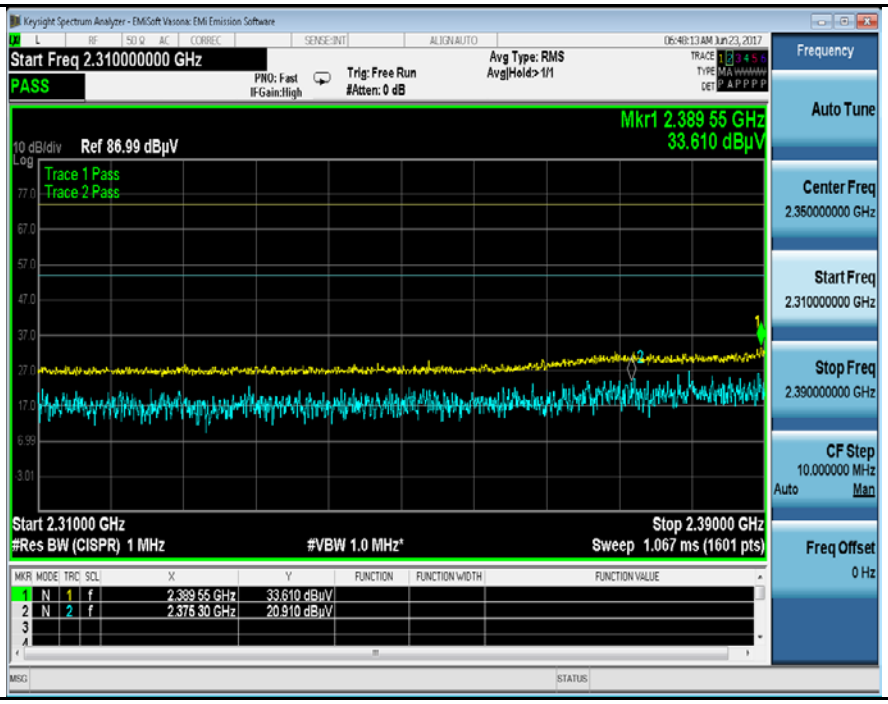
Above 1GHz-25GHz – 802.11n20 – 2437MHz

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
17988.16	35.39	0.85	8.14	44.38	Peak Max	H	335	136	74	-29.62	Pass
16530.03	36.71	1.24	6.10	44.05	Peak Max	H	200	317	74	-29.95	Pass
7315.20	35.82	4.08	0.05	39.95	Peak Max	H	139	328	74	-34.05	Pass
17988.16	23.74	0.85	8.14	32.73	Average Max	H	335	136	54	-21.27	Pass
16530.03	24.31	1.24	6.10	31.65	Average Max	H	200	317	54	-22.35	Pass
7315.20	22.00	4.08	0.05	26.13	Average Max	H	139	328	54	-27.87	Pass

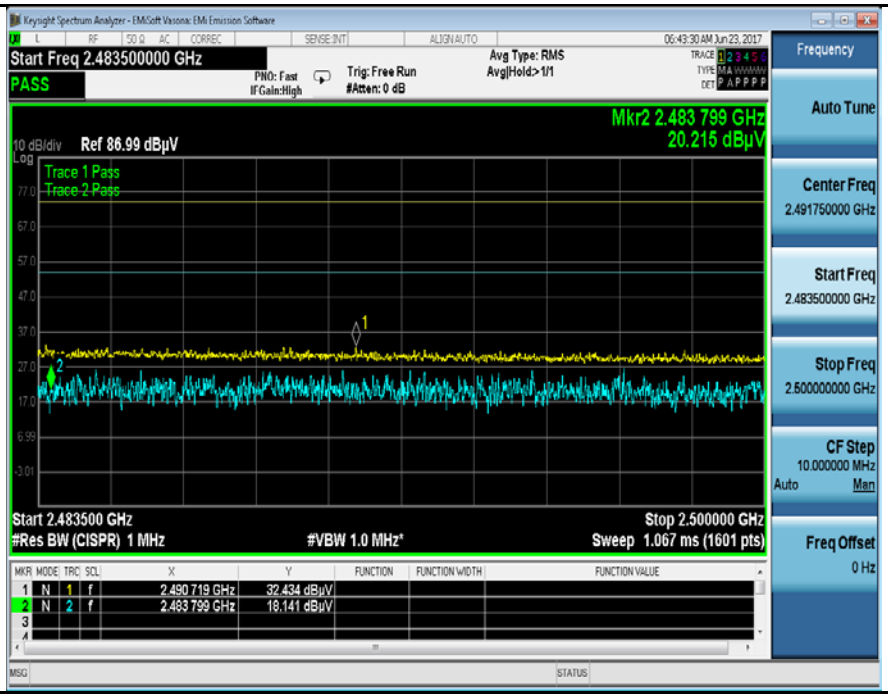
Above 1GHz-25GHz- 802.11n20 - 2462MHz

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
16661.13	36.89	1.18	6.26	44.33	Peak Max	V	339	4	74	-29.67	Pass
7381.45	36.11	4.05	-0.23	39.93	Peak Max	H	136	220	74	-34.07	Pass
4853.45	33.62	5.35	-5.06	33.91	Peak Max	V	338	258	74	-40.09	Pass
16661.13	24.72	1.18	6.26	32.16	Average Max	V	339	4	54	-21.84	Pass
7381.45	22.27	4.05	-0.23	26.10	Average Max	H	136	220	54	-27.90	Pass
4853.45	21.75	5.35	-5.06	22.05	Average Max	V	338	258	54	-31.95	Pass

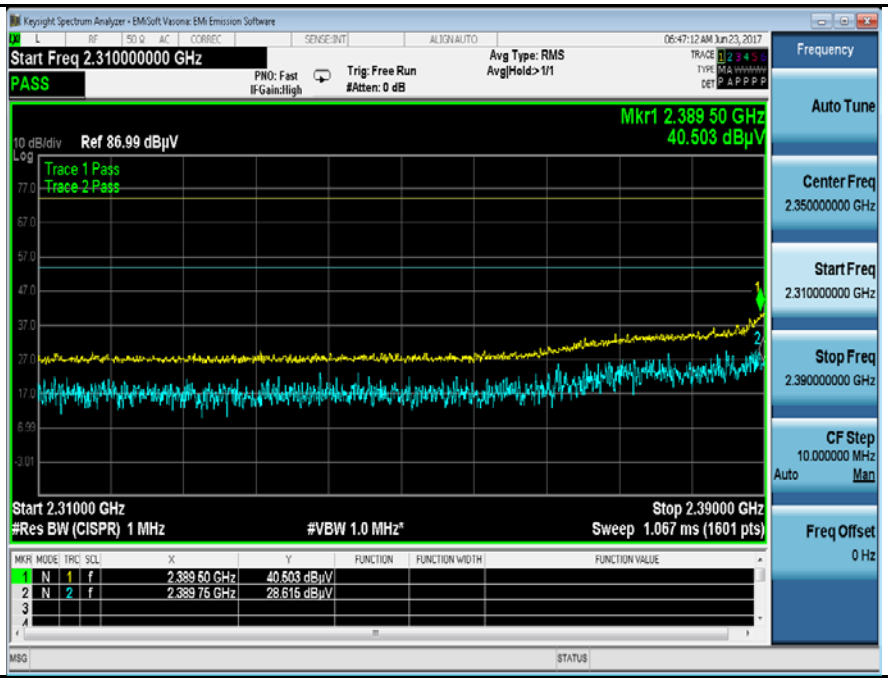
Restricted Band Measurement Plots:



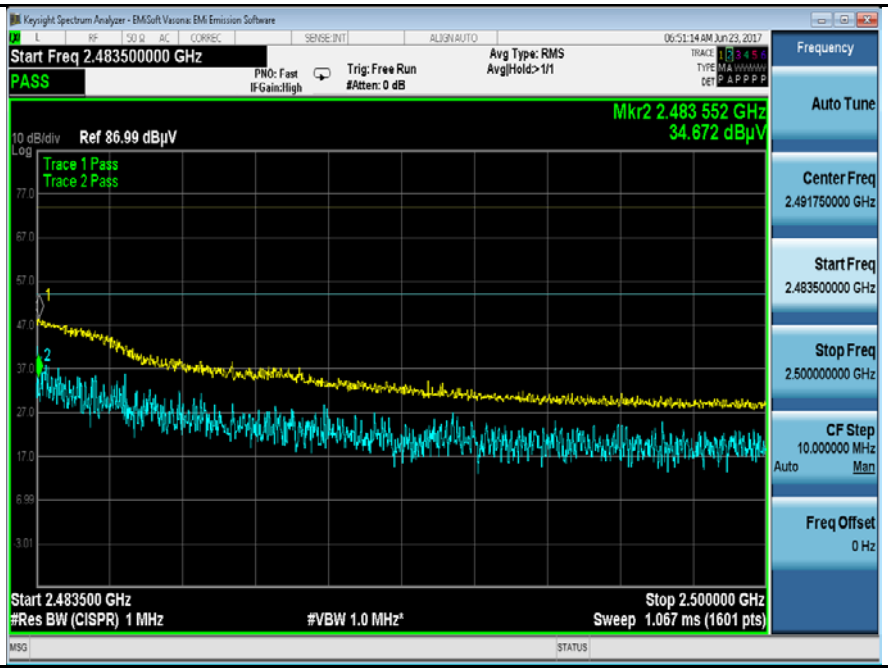
802.11b-2412MHz



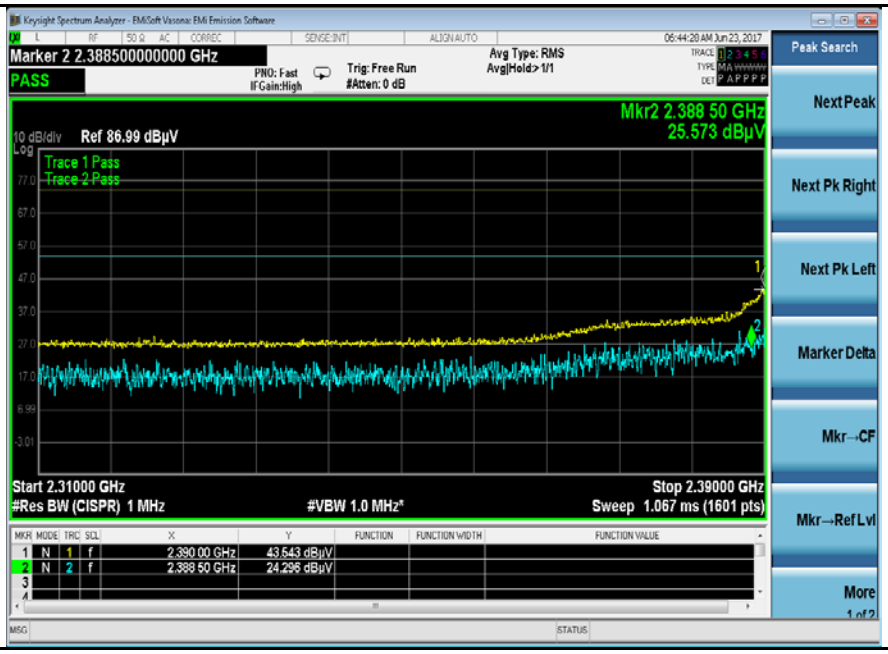
802.11b-2462MHz



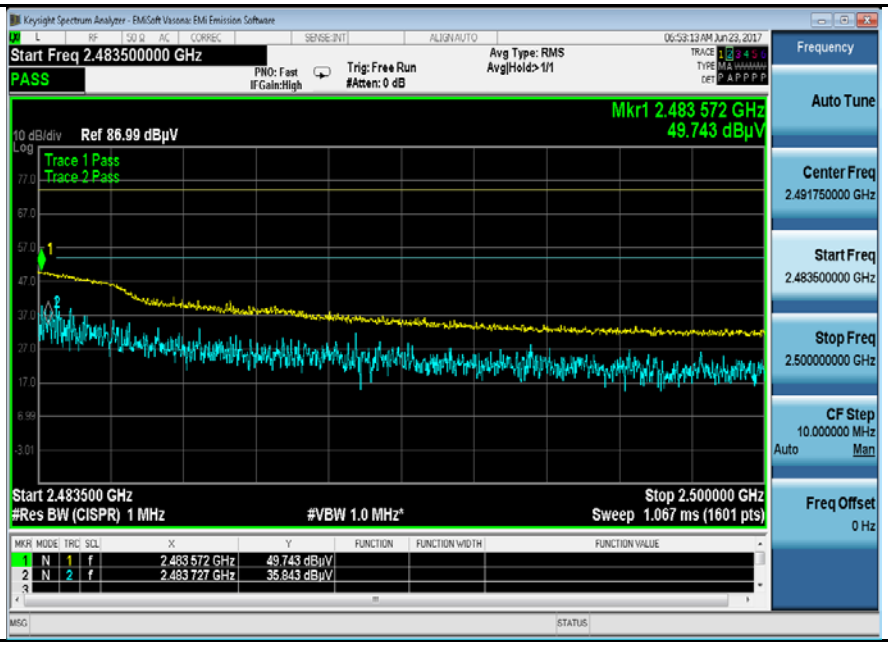
802.11g-2412MHz



802.11g-2462MHz



802.11n-HT20-2412MHz



802.11n-HT20-2462MHz

Annex A. TEST INSTRUMENT

Instrument	Model	Serial #	Cal Date	Cal Cycle	Cal Due	In use
Radiated Emissions						
Keysight EXA 44GHz Spectrum Analyzer	N9010A	MY51440112	08/02/2016	1 Year	08/02/2017	☑
R & S Wideband Communication Tester	CMW500	108852	07/28/2016	1 Year	07/28/2017	☐
R & S Universal Radio Communication Tester	CMU200	111078	N/A	N/A	N/A	☐
Bi-Log antenna (30MHz~2GHz)	JB1	A030702	01/13/2017	1 Year	01/13/2018	☑
Horn Antenna (1GHz~26GHz)	3115	100059	08/11/2016	1 Year	08/11/2017	☑
Pre-Amplifier (1-40GHz)	SAS-474	579	04/04/2017	1 Year	05/04/2018	☑
Preamplifier (100KHz-7GHz)	LPA-6-30	11140711	02/09/2017	1 Year	02/09/2018	☑
3 Meters SAC	3M	N/A	06/09/2016	1 Year	09/09/2017	☐
10 Meters SAC	10M	N/A	07/06/2016	1 Year	07/06/2017	☑
RF Conducted Measurement						
Spectrum Analyzer	N9010A	10SL0219	11/16/2016	1 Year	11/16/2017	☑

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 & Telecommunications Terminal Equipment: EN45001 – EN ISO/IEC 17025
		Electromagnetic Compatibility: EN45001 – EN ISO/IEC 17025
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 Measurement
Australia CAB Recognition		EMC: AS/NZS CISPR 11, AS/NZS CISPR 14.1, AS/NZS CISPR22, AS/NZS 61000.6.3, AS/NZS 61000.6.4
		Radio communications: 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