

RF TEST REPORT



Report No.: FCC_IC_RF_SL18101502-JPS-003_WIFI_Rev2.0

Supersede Report No.:

Applicant	:	Juniper Systems, Inc.
Product Name	:	Ultra-rugged Handheld computer
Model No.	:	AG3
Test Standard	:	47 CFR 15.247 RSS 247 Iss 2: Feb 2017
Test Method	:	ANSI C63.10: 2013 RSS Gen Iss 5: Apr 2018 558074 D01 DTS Meas Guidance v04
FCC ID	:	VSF-AG3
IC ID	:	7980A-AG3
Dates of test	:	10/19/2018-10/29/2018
Issue Date	:	02/20/2019
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:	
	
Cipher	Chen Ge
Test Engineer	Engineer Reviewer

Issued By:
SIEMIC Laboratories
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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_SL18101502-JPS-003_WIFI	None	Original	10/30/2018
FCC_IC_RF_SL18101502-JPS-003_WIFI_Rev1.0	Rev1.0	Added reference test report no.	02/20/2019

2 Executive Summary

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

Company: Juniper Systems, Inc.
Product: Ultra-rugged Handheld computer
Model: AG3

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	:	Juniper Systems, Inc.
Applicant Address	:	1132 1700 N, Logan, UT 84321
Manufacturer Name	:	Juniper Systems, Inc.
Manufacturer Address	:	1132 1700 N, Logan, UT 84321

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	Ultra-rugged Handheld computer
Model No.	AG3
Trade Name	Juniper Systems, Inc.
Serial No.	AG3E106
Host Model No.	N/A
Input Power	100-240VAC, 50-60Hz 0.5A
Power Adapter Manu/Model	PSAA20R-120L6
Power Adapter SN	N/A
Date of EUT received	10/16/2018
Equipment Class/ Category	DTS
Port/Connectors	USB, Micro-USB, Serial

6.2 Radio Description

Radio Type	802.11b/g/n-20M	802.11n-40M	Bluetooth LE
Operating Frequency	2412-2462MHz	2412-2462MHz	2402MHz-2480MHz
Modulation	DSSS (CCK, DQPSK, DBPSK)	OFDM (BPSK, QPSK, 16QAM, 64QAM)	GFSK
Channel Spacing	5MHz	5MHz	2MHz
Number of Channels	11	7	39
Antenna Type	Printed trace		
Antenna Gain (Peak)	2.28 dBi		
Antenna Connector Type	SMA		
Note	N/A		

7 Supporting Equipment/Software and cabling Description

7.1 Supporting Equipment

Item	Supporting Equipment Description	Model	Serial Number	Manufacturer	Note
1	Laptop	LATITUDE E6530	N/A	Dell	-

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	EUT	Micro USB	Laptop	USB	1	Unshielded	-
USB to Serial	EUT	Serial	Laptop	USB	1	Unshielded	-
USB to Ethernet	EUT	USB	Laptop	Ethernet	1	Unshielded	-

7.3 Test Software Description

Test Item	Software	Description
RF Testing	QRCT	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	☐ Pass
	IC	RSS Gen 8.10	IC	558074 D01 DTS Meas Guidance v04	☒ N/A
AC Conducted Emissions	FCC	15.207(a)	FCC	ANSI C63.10:2013	☐ Pass
	IC	RSS Gen 8.8	IC	RSS Gen Issue 5: 2018	☒ N/A

DTS Band Requirement

Test Item	Test standard		Test Method/Procedure		Pass / Fail
99% Occupied Bandwidth	-	-	-	-	☐ Pass
	IC	RSS Gen 6.6	IC	RSS Gen Issue 5: 2018	☒ N/A
6dB Bandwidth	FCC	15.247(a)(2)	FCC	558074 D01 DTS Meas Guidance v04	☐ Pass
	IC	RSS247 (5.2.1)	IC		☒ N/A
Radiated Spurious Emissions	FCC	15.247(d)	FCC	ANSI C63.10:2013 558074 D01 DTS Meas Guidance v04	☒ Pass
	IC	RSS247 (5.5)	IC		☐ N/A
Output Power	FCC	15.247(b)	FCC	558074 D01 DTS Meas Guidance v04	☐ Pass
	IC	RSS247 (5.4.4)	IC		☒ N/A
Receiver Spurious Emissions	IC	RSS Gen (4.8)	IC	RSS Gen Issue 5: 2018	☐ Pass ☒ N/A
Antenna Gain > 6 dBi	FCC	15.247(e)	FCC	-	☒ Pass
	IC	-	IC	-	☐ N/A
Power Spectral Density	FCC	15.247(e)	FCC	558074 D01 DTS Meas Guidance v04	☐ Pass
	IC	RSS247 (5.2.2)	IC		☒ N/A
RF Exposure requirement	FCC	15.247(i)	FCC	-	☐ Pass
	IC	RSS Gen(5.5)	IC	RSS Gen Issue 5: 2018	☒ N/A
Remark	- All measurement uncertainties do not take into consideration for all presented test results. - 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. - All the RF testing refer to silex module FCC ID:N6C-PMACS, IC:4908A-PMACS. Test report no. FCC: ER/2017/70041, ER2017/70042 IC: ER/2017/70048-02, ER/2017/70049-02				

9 Measurement Uncertainty

9.1 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.

9.2 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

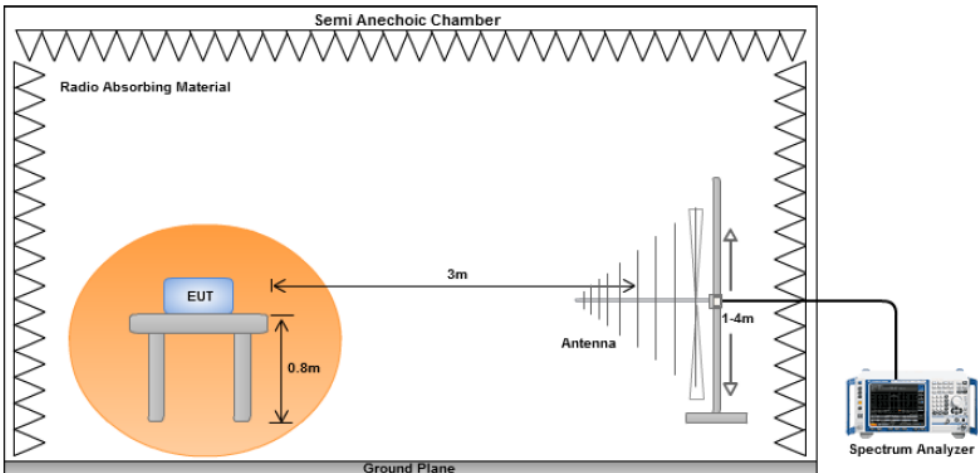
Source of Uncertainty	Value (dB)	Probability Distribution	Division	Sensitivity Coefficient	Expanded Uncertainty
Receiver Reading	0.12	Rectangular	1.732	1	0.0692840
Cable Insertion Loss	0.21	Normal	2	1	0.1050000
Filter Insertion Loss	0.25	Normal	2	1	0.1250000
Antenna Factor	0.65	Normal	2	1	0.3250000
Receiver 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.

10 Measurements, Examination and Derived Results

10.1 Radiated Spurious Emissions below 1GHz

Requirement(s):

Spec	Item	Requirement	Applicable							
47CFR§15.247(d) RSS247 (5.5)	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	☒							
		<table><tr><th>Frequency range (MHz)</th><th>Field Strength (uV/m)</th></tr><tr><td>30 – 88</td><td>100</td></tr><tr><td>88 – 216</td><td>150</td></tr><tr><td>216 960</td><td>200</td></tr><tr><td>Above 960</td><td>500</td></tr></table>		Frequency range (MHz)	Field Strength (uV/m)	30 – 88	100	88 – 216	150	216 960
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									

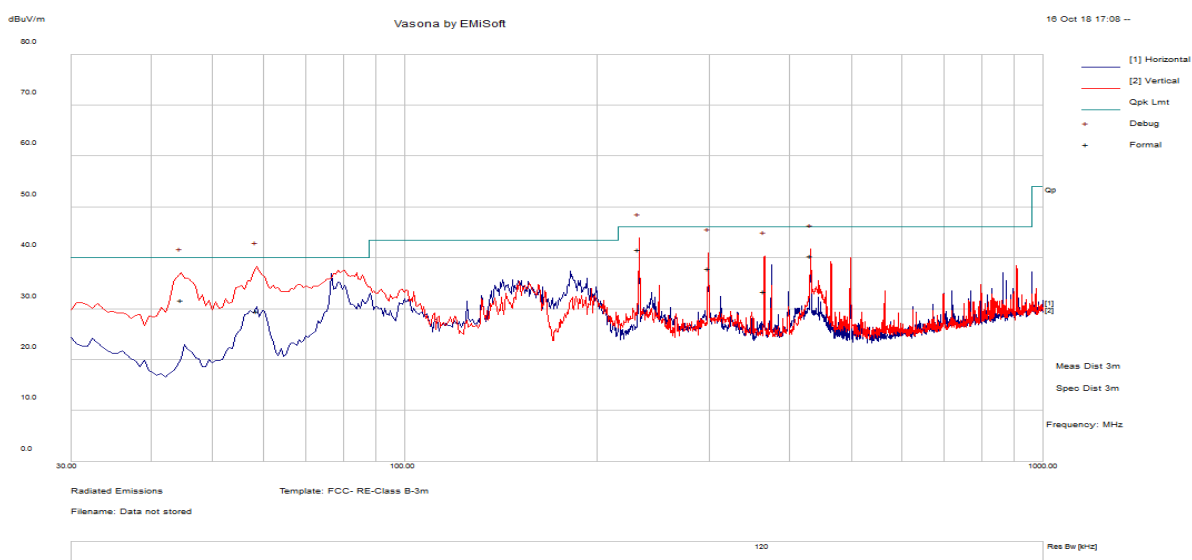
Test Data ☒ Yes (See below) ☐ N/A

Test Plot ☒ Yes (See below) ☐ N/A

Test was done by Cipher at 10m chamber.

Radiated Emission Test Results (Below 1GHz)

Test specification	below 1GHz				
Environmental Conditions:	Temp (°C):	26	Result	Pass	
	Humidity (%)	47			
	Atmospheric (mbar):	1020			
Mains Power:	120VAC, 60Hz				
Tested by:	Cipher				
Test Date:	10/19/2018-10/29/2018				
Remarks:	802.11b, 2437MHz				

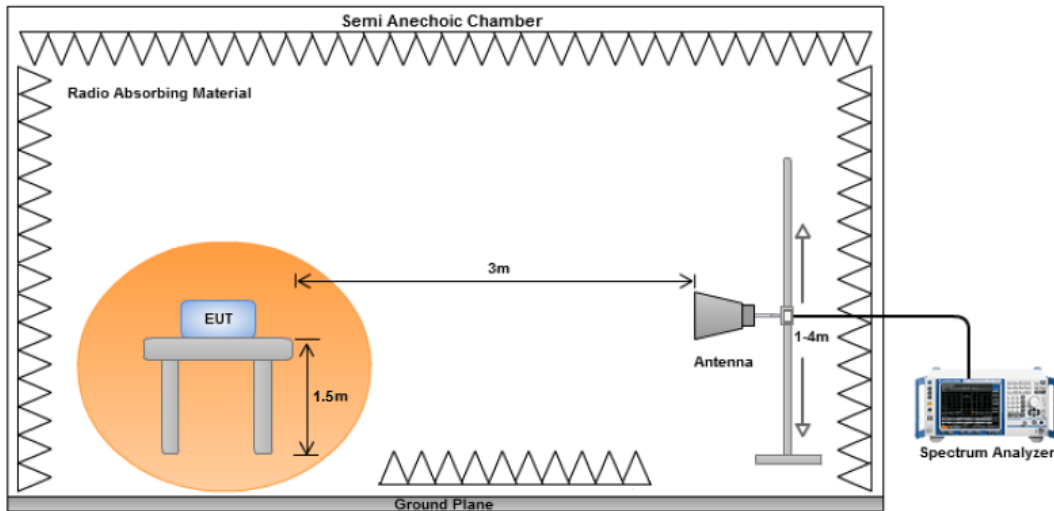


Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Po l	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
58.61	45.34	11.5	-27.23	29.6	Quasi Max	V	144	317	40	-10.4	Pass
232.36	53.4	12.86	-24.54	41.72	Quasi Max	V	203	196	46	-4.28	Pass
44.70	43.8	11.39	-23.44	31.76	Quasi Max	V	104	137	40	-8.24	Pass
432.36	45.67	14.03	-19.23	40.46	Quasi Max	V	118	203	46	-5.54	Pass
299.32	46.65	13.24	-21.86	38.04	Quasi Max	V	165	94	46	-7.96	Pass
365.75	40.48	13.6	-20.56	33.53	Quasi Max	V	111	130	46	-12.47	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), RSS247(A8.5)	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	- The EUT was switched on and allowed to warm up to its normal operating condition. - 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: - Vertical or horizontal polarisation (whichever gave the higher emission level over a full rotation of the EUT) was chosen. - The EUT was then rotated to the direction that gave the maximum emission. - Finally, the antenna height was adjusted to the height that gave the maximum emission. - An average measurement was then made for that frequency point. - 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 40GHz. Both horizontal and vertical polarities were investigated. The results show only the worst case. There isn't outstanding emission found at the edge of restricted frequency.		
Result	☒ Pass ☐ Fail		

Test Data ☒ Yes (See below) ☐ N/A

Test Plot ☐ Yes (See below) ☒ N/A

Test was done by Cipher at 3m chamber.

Radiated Emission Test Results (Above 1GHz)

BLE - 2402MHz

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
3674.73	49.66	3.57	-13.31	39.92	Peak Max	H	271	304	74	-34.08	Pass
4804.10	51.2	4.1	-10.91	44.39	Peak Max	H	234	50	74	-29.61	Pass
7623.44	41.41	5.17	-7.39	39.19	Peak Max	V	162	154	74	-34.81	Pass
3674.73	40.1	3.57	-13.31	30.36	Average Max	V	271	304	54	-23.64	Pass
4804.10	41.87	4.1	-10.91	35.06	Average Max	H	234	50	54	-18.94	Pass
7623.44	31.77	5.17	-7.39	29.55	Average Max	H	162	154	54	-24.45	Pass

BLE - 2440MHz

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
3511.04	49.3	3.58	-13.71	39.17	Peak Max	V	268	301	74	-34.83	Pass
4879.66	50.26	4.17	-11.03	43.4	Peak Max	H	231	45	74	-30.6	Pass
7703.56	42.32	5.2	-7.28	40.24	Peak Max	V	168	162	74	-33.76	Pass
3511.04	39.88	3.58	-13.71	29.75	Average Max	V	268	301	54	-24.25	Pass
4879.66	40.39	4.17	-11.03	33.53	Average Max	H	231	45	54	-20.47	Pass
7703.56	32.67	5.2	-7.28	30.59	Average Max	H	168	162	54	-23.41	Pass

BLE - 2480MHz

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
3088.22	49.22	3.34	-13.87	38.69	Peak Max	H	264	299	74	-35.31	Pass
4960.74	50.25	4.25	-11.16	43.34	Peak Max	H	230	50	74	-30.66	Pass
7991.59	42.31	5.42	-7.04	40.69	Peak Max	V	163	162	74	-33.31	Pass
3088.22	39.98	3.34	-13.87	29.45	Average Max	V	264	299	54	-24.55	Pass
4960.74	40.75	4.25	-11.16	33.84	Average Max	H	230	50	54	-20.16	Pass
7991.59	33.27	5.42	-7.04	31.65	Average Max	H	163	162	54	-22.35	Pass

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
3024.81	49.87	3.29	-14.09	39.07	Peak Max	V	266	304	74	-34.93	Pass
4824.35	60.66	4.12	-10.92	53.86	Peak Max	H	227	47	74	-20.14	Pass
8494.46	41.14	5.53	-6.86	39.81	Peak Max	V	168	159	74	-34.19	Pass
3024.81	40.01	3.29	-14.09	29.21	Average Max	H	266	304	54	-24.79	Pass
4824.35	51.58	4.12	-10.92	44.78	Average Max	V	227	47	54	-9.22	Pass
8494.46	32.03	5.53	-6.86	30.7	Average Max	V	168	159	54	-23.3	Pass

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
3821.31	49.8	3.65	-12.93	40.52	Peak Max	H	268	304	74	-33.48	Pass
4873.36	60.36	4.17	-11.01	53.52	Peak Max	H	232	49	74	-20.48	Pass
8096.01	42.32	5.4	-7.07	40.65	Peak Max	H	164	160	74	-33.35	Pass
3821.31	40.67	3.65	-12.93	31.39	Average Max	V	268	304	54	-22.61	Pass
4873.36	51.33	4.17	-11.01	44.49	Average Max	V	232	49	54	-9.51	Pass
8096.01	32.41	5.4	-7.07	30.74	Average Max	H	164	160	54	-23.26	Pass

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
3040.75	49.39	3.3	-14.02	38.67	Peak Max	H	269	304	74	-35.33	Pass
4924.33	60.24	4.22	-11.11	53.35	Peak Max	V	234	45	74	-20.65	Pass
8338.02	42.01	5.41	-7.03	40.39	Peak Max	H	169	153	74	-33.61	Pass
3040.75	39.45	3.3	-14.02	28.73	Average Max	V	269	304	54	-25.27	Pass
4924.33	51.11	4.22	-11.11	44.22	Average Max	V	234	45	54	-9.78	Pass
8338.02	32.03	5.41	-7.03	30.41	Average Max	V	169	153	54	-23.59	Pass

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
3154.74	49.74	3.39	-13.81	39.32	Peak Max	V	265	295	74	-34.68	Pass
4825.00	48.6	4.12	-10.92	41.8	Peak Max	H	225	49	74	-32.2	Pass
8617.57	43.32	5.58	-6.67	42.23	Peak Max	H	169	159	74	-31.77	Pass
3154.74	39.85	3.39	-13.81	29.43	Average Max	V	265	295	54	-24.57	Pass
4825.00	39.52	4.12	-10.92	32.72	Average Max	H	225	49	54	-21.28	Pass
8617.57	33.97	5.58	-6.67	32.88	Average Max	V	169	159	54	-21.12	Pass

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
3735.19	50.66	3.57	-13.13	41.1	Peak Max	H	271	304	74	-32.9	Pass
4873.76	48.35	4.17	-11.01	41.51	Peak Max	H	226	47	74	-32.49	Pass
8011.44	42.3	5.43	-7.03	40.7	Peak Max	V	167	158	74	-33.3	Pass
3735.19	40.86	3.57	-13.13	31.3	Average Max	V	271	304	54	-22.7	Pass
4873.76	39.08	4.17	-11.01	32.24	Average Max	H	226	47	54	-21.76	Pass
8011.44	32.64	5.43	-7.03	31.04	Average Max	V	167	158	54	-22.96	Pass

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
3091.64	49.8	3.34	-13.87	39.27	Peak Max	H	269	302	74	-34.73	Pass
4924.08	48.27	4.22	-11.11	41.38	Peak Max	H	233	43	74	-32.62	Pass
8371.97	42.28	5.44	-6.99	40.73	Peak Max	H	168	160	74	-33.27	Pass
3091.64	40.61	3.34	-13.87	30.08	Average Max	H	269	302	54	-23.92	Pass
4924.08	38.71	4.22	-11.11	31.82	Average Max	H	233	43	54	-22.18	Pass
8371.97	32.88	5.44	-6.99	31.33	Average Max	V	168	160	54	-22.67	Pass

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
3876.64	49.23	3.71	-12.8	40.14	Peak Max	V	266	296	74	-33.86	Pass
4824.86	60.61	4.12	-10.92	53.81	Peak Max	V	230	45	74	-20.19	Pass
8872.45	41.81	5.63	-6.18	41.26	Peak Max	V	163	155	74	-32.74	Pass
3876.64	39.98	3.71	-12.8	30.89	Average Max	H	266	296	54	-23.11	Pass
4824.86	50.7	4.12	-10.92	43.9	Average Max	V	230	45	54	-10.1	Pass
8872.45	32.76	5.63	-6.18	32.21	Average Max	V	163	155	54	-21.79	Pass

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
3423.88	49.58	3.55	-13.73	39.4	Peak Max	H	269	297	74	-34.6	Pass
4873.81	60.35	4.17	-11.01	53.51	Peak Max	V	230	43	74	-20.49	Pass
8918.49	41.4	5.62	-6.11	40.91	Peak Max	H	168	160	74	-33.09	Pass
3423.88	39.99	3.55	-13.73	29.81	Average Max	V	269	297	54	-24.19	Pass
4873.81	50.67	4.17	-11.01	43.83	Average Max	H	230	43	54	-10.17	Pass
8918.49	31.52	5.62	-6.11	31.03	Average Max	H	168	160	54	-22.97	Pass

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
3894.65	49.24	3.73	-12.76	40.21	Peak Max	H	264	296	74	-33.79	Pass
4924.39	60.24	4.22	-11.11	53.35	Peak Max	V	225	45	74	-20.65	Pass
8938.38	42.06	5.62	-6.07	41.61	Peak Max	H	161	159	74	-32.39	Pass
3894.65	40.24	3.73	-12.76	31.21	Average Max	H	264	296	54	-22.79	Pass
4924.39	50.3	4.22	-11.11	43.41	Average Max	H	225	45	54	-10.59	Pass
8938.38	32.84	5.62	-6.07	32.39	Average Max	H	161	159	54	-21.61	Pass

802.11n40 - 2422MHz

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
3517.92	49.74	3.58	-13.7	39.62	Peak Max	V	271	295	74	-34.38	Pass
4843.31	61.36	4.14	-10.94	54.56	Peak Max	H	229	50	74	-19.44	Pass
8827.41	42.01	5.63	-6.26	41.38	Peak Max	H	165	156	74	-32.62	Pass
3517.92	40.34	3.58	-13.7	30.22	Average Max	V	271	295	54	-23.78	Pass
4843.31	51.89	4.14	-10.94	45.09	Average Max	H	229	50	54	-8.91	Pass
8827.41	32.52	5.63	-6.26	31.89	Average Max	H	165	156	54	-22.11	Pass

802.11n40 - 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
3561.91	49.24	3.58	-13.64	39.18	Peak Max	V	268	295	74	-34.82	Pass
4873.14	60.36	4.17	-11.01	53.52	Peak Max	V	231	46	74	-20.48	Pass
8596.46	42.25	5.57	-6.7	41.12	Peak Max	H	169	155	74	-32.88	Pass
3561.91	39.51	3.58	-13.64	29.45	Average Max	H	268	295	54	-24.55	Pass
4873.14	50.43	4.17	-11.01	43.59	Average Max	H	231	46	54	-10.41	Pass
8596.46	32.28	5.57	-6.7	31.15	Average Max	H	169	155	54	-22.85	Pass

802.11n40 - 2452MHz

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
3685.83	49.33	3.57	-13.28	39.62	Peak Max	V	265	298	74	-34.38	Pass
4904.67	60.64	4.2	-11.09	53.75	Peak Max	H	231	41	74	-20.25	Pass
8536.95	42.07	5.54	-6.83	40.78	Peak Max	V	165	154	74	-33.22	Pass
3685.83	40.26	3.57	-13.28	30.55	Average Max	V	265	298	54	-23.45	Pass
4904.67	50.87	4.2	-11.09	43.98	Average Max	V	231	41	54	-10.02	Pass
8536.95	32.26	5.54	-6.83	30.97	Average Max	V	165	154	54	-23.03	Pass

Annex A. TEST INSTRUMENT

Instrument	Model	Serial #	Cal Date	Cal Cycle	Cal Due	In use
Radiated Emissions						
Keysight EXA 44GHz Spectrum Analyzer	N9010A	MY51440112	11/16/2017	1 Year	11/16/2018	☒
Bi-Log antenna (30MHz~2GHz)	JB1	A030702	03/09/2018	2 Year	03/09/2020	☒
Horn Antenna (1GHz~26GHz)	3115	100059	11/09/2017	1 Year	11/09/2018	☒
Horn Antenna (26GHz~40GHz)	AH-840	101013	08/27/2018	1 Year	08/28/2019	☒
Pre-Amp (30MHz~40GHz)	LPA-6-30	11140711	02/09/2018	1 Year	02/10/2019	☒

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