

RF TEST REPORT



Report No.: FCC_RF_SL14072101-SLX-013_UNII Rev. 3.2
Supersede Report No.: FCC_RF_SL14072101-SLX-013_UNII Rev. 3.1

Applicant	:	Philips Medical Systems
Product Name	:	SDIO Wireless Module
Model No.	:	PH-SDMAN
Test Standard	:	47 CFR 15.407
Test Method	:	ANSI C63.10: 2013 789033 D02 General UNII Test Procedures New Rules v01
FCC ID	:	PQC-MX40WL3
IC ID	:	3549B-MX40WL3
Dates of test	:	November 13, 2014 to April 24, 2015
Issue Date	:	05/12/2015
Test Result	:	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail
Equipment complied with the specification <input checked="" type="checkbox"/>		
Equipment did not comply with the specification <input type="checkbox"/>		

This Test Report is Issued Under the Authority of:	
Teody Manansala	David Zhang
Test Engineer	Engineer Reviewer
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Issued By:
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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_RF_SL14072101-SLX-013_UNII	None	Original	02/19/2015
FCC_RF_SL14072101-SLX-013_UNII Rev. 1.0	1.0	Change applicant name and address	02/26/2015
		Change trade name	
		Change serial number	
FCC_RF_SL14072101-SLX-013_UNII Rev. 2.0	2.0	Change SW version	03/02/2015
FCC_RF_SL14072101-SLX-013_DTS Rev. 3.0	3.0	Change product name	03/05/2015
		Add antenna photo	
		Provide additional information on the antenna type	
		Change setup photos	
		Change test method	
		Add antenna gain	
FCC_RF_SL14072101-SLX-013_DTS Rev. 3.1	3.1	Change test method	03/09/2015
		Change table height	
		Specify antenna gain for long and short cable	
FCC_RF_SL14072101-SLX-013_DTS Rev. 3.2	3.2	Change test method	05/12/2015

2 Executive Summary

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

Company: Philips Medical Systems
Product: SDIO Wireless Module
Model: PH-SDMAN

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	:	Philips Medical Systems
Applicant Address	:	3000 Minuteman Road, Andover, MA 01810
Manufacturer Name	:	Philips Medical Systems
Manufacturer Address	:	3000 Minuteman Road, Andover, MA 01810

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	: SDIO Wireless Module
Model No.	: PH-SDMAN
Trade Name	: Philips Medical
Serial No.	: 84253F010282
Host Model No.	: N/A
EUT DC Input Power	: 3.3VDC
Adapter Input Power	: N/A
Power Adapter SN	: N/A
Product Hardware version	: rev A
Product Software version	: V3.4.158.35
Radio Hardware version	: rev A
Radio Software version	: V3.4.158.35
Test Software version	: Athtestcmd v3.4
RF power setting in TEST SW	: 802.11b: 2412MHz:13.0dBm; 2437MHz:13.0dBm; 2462MHz: 13.0dBm 802.11g: 2412MHz:8.0dBm; 2437MHz:13.0dBm; 2462MHz: 8.5dBm 802.11n-20: 2412MHz:7.0dBm; 2437MHz:12.0dBm; 2462MHz: 7.5dBm 802.11a: 5180MHz:13.0dBm; 5200-5320MHz: 14.0dBm; 5500-5700MHz:14.0dBm; 5745MHz:13.0dBm; 5785MHz:13.0dBm; 5825MHz: 13.0dBm 802.11n-20: 5180MHz:13.0dBm; 5200-5320MHz: 14.0dBm; 5500-5700MHz:14.0dBm; 5745MHz:13.0dBm; 5785MHz:13.0dBm; 5825MHz: 13.0dBm 802.11n-40: 5190MHz:9.5dBm; 5230-5270MHz:14.0dBm; 5310MHz:11.5dBm; 5510-5670MHz:14.0dBm; 5755MHz:13.0dBm; 5795MHz:13.0dBm
Date of EUT received	: 11/10/2014
Equipment Class/ Category	: DTS, UNII
Port/Connectors	: N/A

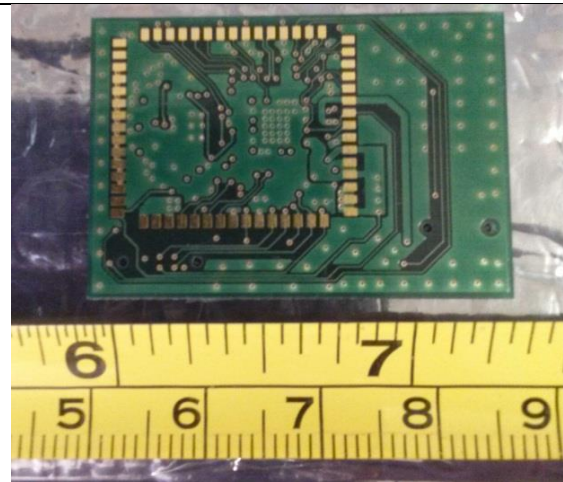
6.2 Radio Description

Radio Type	802.11b	802.11g	802.11a	802.11n-20M	802.11n-40M
Operating Frequency	2412-2462MHz	2412-2462MHz	5180-5240MHz 5260-5320MHz 5500-5700MHz 5725-5825MHz	2412-2462MHz 5180-5240MHz 5240-5320MHz 5500-5700MHz 5725-5825MHz	2422-2452MHz 5190-5230MHz 5270-5310MHz 5510-5670MHz 5755-5795MHz
Modulation	DSSS (CCK, DQPSK, DBPSK)	OFDM-CCK (BPSK, QPSK, 16QAM, 64QAM)	OFDM (BPSK, QPSK, 16QAM, 64QAM)	OFDM (BPSK, QPSK, 16QAM, 64QAM)	OFDM (BPSK, QPSK, 16QAM, 64QAM)
Channel Spacing	5MHz	5MHz	20MHz	5MHz(2.4GHz), 20MHz (5GHz)	40MHz
Number of Channels	11	11	19	11(2.4GH) 19 (5GHz)	7(2.4GH) 9(5GHz)
Antenna Type	Philips P/N (453564553001r1444) Note: Laird antenna (Model: MAP24174 with short cable) Philips P/N (453564252521r1444) Note: Laird antenna (Model: MAP24174 with long cable)				
Antenna Gain (Peak)	3.9dBi (2.4~2.5GHz), 4.1dBi (4.9~5.8GHz) - P/N (453564252521r1444) 4.2dBi (2.4~2.5GHz), 4.4dBi (4.9~5.8GHz) - P/N (453564553001r1444)				
Antenna Connector Type	U. FL connector				

6.3 EUT Photos



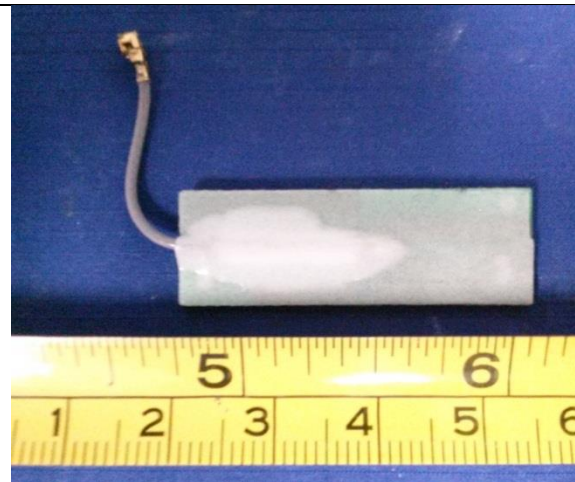
EUT-RF Board Top View



EUT-RF Board Bottom View



Laird antenna - P/N (453564553001r1444) Top View



Laird antenna - P/N (453564553001r1444) Bottom View



Laird antenna - P/N (453564252521r1444) Top View

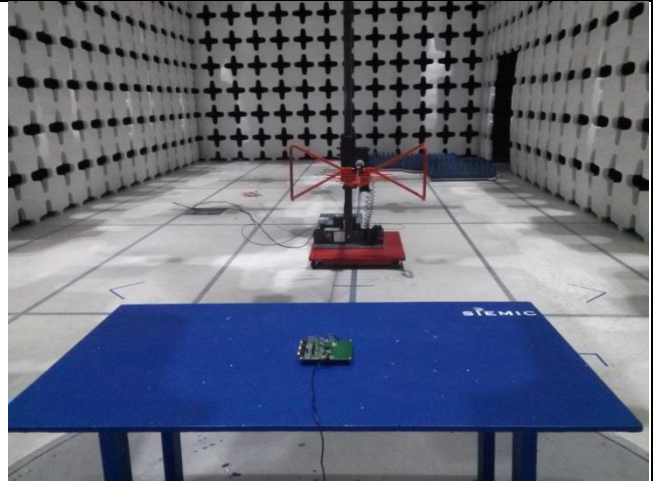


Laird antenna - P/N (453564252521r1444) Bottom View

6.4 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	Development board	-	-	Silex	-

7.2 Cabling Description

Name	Connection Start		Connection Stop		Length / shielding Info		Note
	From	I/O Port	To	I/O Port	Length (m)	Shielding	
-	-	-	-	-	-	-	-

7.3 Test Software Description

Test Item	Software	Description
RF Testing	ProcomPlus	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 789033 D01 General UNII Test Procedures v01r03	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> N/A
AC Conducted Emissions Voltage	FCC	15.207(a)	FCC	ANSI C63.10: 2013	<input type="checkbox"/> Pass <input checked="" type="checkbox"/> N/A

Test Item	Test standard		Test Method/Procedure		Pass / Fail
26 & 6 dB Emission Bandwidth	FCC	15.407 (a) (2)		789033 D02 General UNII Test Procedures New Rules v01	<input type="checkbox"/> Pass <input checked="" type="checkbox"/> N/A
Maximum conducted Output Power	FCC	15.407 (a) (2)		789033 D02 General UNII Test Procedures New Rules v01	<input type="checkbox"/> Pass <input checked="" type="checkbox"/> N/A
Power reduction (Antenna Gain > 6 dBi)	FCC	15.407 (a) (2)		-	<input type="checkbox"/> Pass <input checked="" type="checkbox"/> N/A
Band Edge and Radiated Spurious Emissions	FCC	15.407(b)(2), 15.407(b)(6)		ANSI C63.10: 2013 789033 D02 General UNII Test Procedures New Rules v01	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> N/A
Power Spectral Density	FCC	15.407 (a) (2)		789033 D02 General UNII Test Procedures New Rules v01	<input type="checkbox"/> Pass <input checked="" type="checkbox"/> N/A
Peak Excursion Ratio	FCC	15.407(a)(6)		789033 D02 General UNII Test Procedures New Rules v01	<input type="checkbox"/> Pass <input checked="" type="checkbox"/> N/A
Frequency Stability	FCC	15.407 (g)		-	<input type="checkbox"/> Pass <input checked="" type="checkbox"/> N/A
Transmit Power Control (TPC)	FCC	15.407 (h)(1)		-	<input type="checkbox"/> Pass <input checked="" type="checkbox"/> N/A
User Manual	FCC	-		-	<input type="checkbox"/> Pass <input checked="" type="checkbox"/> N/A

Remark	<ol style="list-style-type: none"> All measurement uncertainties are not taken into consideration for all presented test result. 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.
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9 Measurement Uncertainty

Emissions			
Test Item	Frequency Range	Description	Uncertainty
Band Edge and Radiated Spurious Emissions	30MHz – 1GHz	Confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2 (for EUTs < 0.5m X 0.5m X 0.5m)	+5.6dB/-4.5dB
Band Edge and Radiated Spurious Emissions	1GHz – 40GHz	Confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2 (for EUTs < 0.5m X 0.5m X 0.5m)	+4.3dB/-4.1dB

10 Measurements, Examination and Derived Results

10.1 Radiated Emissions below 1GHz

Requirement(s):

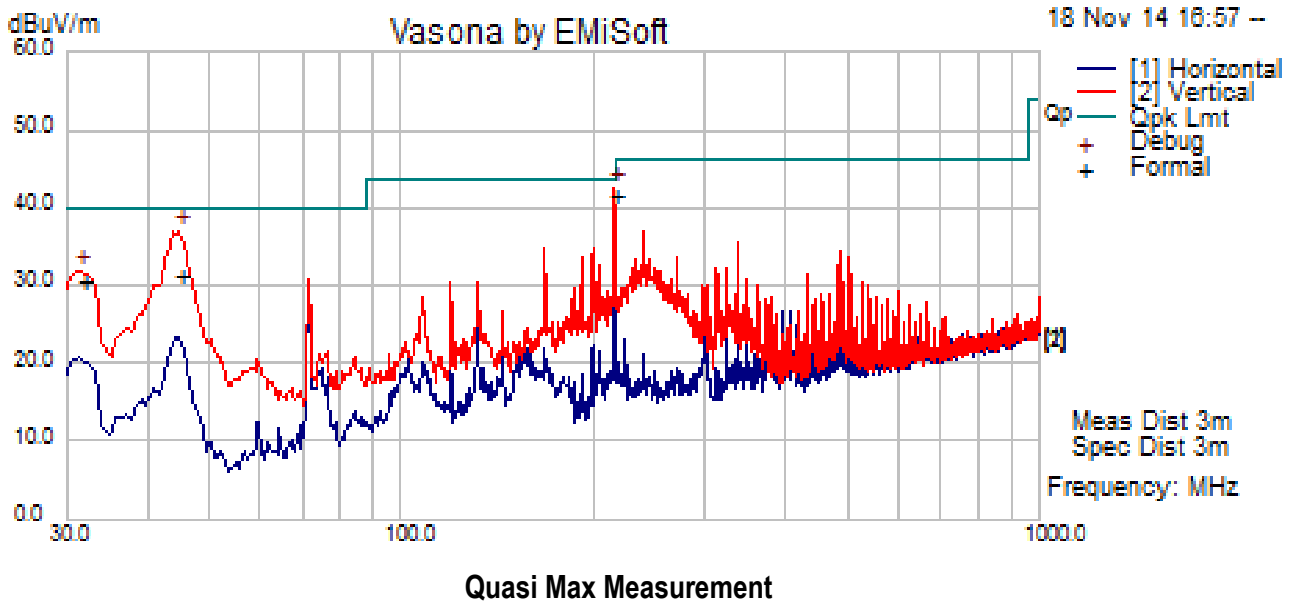
Spec	Requirement	Applicable										
47CFR§ 15.407(b) 15.209 (a)	<p>Except higher limit as specified elsewhere in other section, the emissions from the low-power radio-frequency devices shall not exceed the field strength levels specified in the following table and the level of any unwanted emissions shall not exceed the level of the fundamental emission. The tighter limit applies at the band edges</p> <table border="1"> <thead> <tr> <th>Frequency range (MHz)</th> <th>Field Strength (uV/m)</th> </tr> </thead> <tbody> <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> </tbody> </table>	Frequency range (MHz)	Field Strength (uV/m)	30 – 88	100	88 – 216	150	216 960	200	Above 960	500	☒
Frequency range (MHz)	Field Strength (uV/m)											
30 – 88	100											
88 – 216	150											
216 960	200											
Above 960	500											
Test Setup												
Procedure	<ol style="list-style-type: none"> 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: <ol style="list-style-type: none"> 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

Radiated Emission Test Results (Below 1GHz)

Test specification	below 1GHz			Result	Pass
Environmental Conditions:	Temp (°C):	26.1			
	Humidity (%)	47.5			
	Atmospheric (mbar):	1020			
Mains Power:	120VAC, 60Hz				
Tested by:	Teody Manansala				
Test Date:	November 18, 2014				
Remarks:	5GHz 11n40 5270MHz				



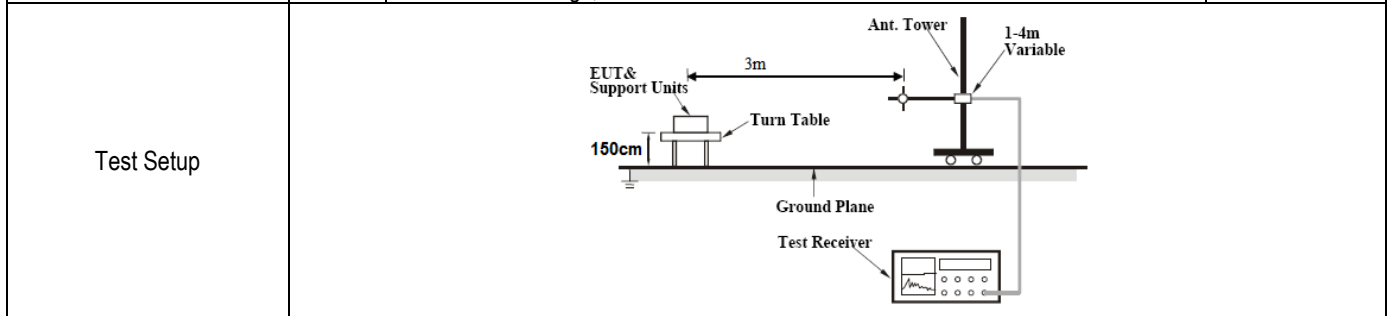
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
61.80	57.17	1.31	-31.34	27.14	Quasi Max	V	270.00	151.00	40.00	-12.86	Pass
53.88	56.09	1.21	-31.33	25.98	Quasi Max	V	166.00	296.00	40.00	-14.02	Pass

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

10.2 Radiated Spurious Emissions above 1GHz

Requirement(s):

Spec	Item	Requirement	Applicable
47CFR§ 15.407(b)(2), 15.407(b)(6)	(1)	For transmitters operating in the 5.15-5.25 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz.	<input checked="" type="checkbox"/>
	(2)	For transmitters operating in the 5.25-5.35 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz. Devices operating in the 5.25-5.35 GHz band that generate emissions in the 5.15-5.25 GHz band must meet all applicable technical requirements for operation in the 5.15-5.25 GHz band (including indoor use) or alternatively meet an out-of-band emission EIRP limit of -27 dBm/MHz in the 5.15-5.25 GHz band.	<input type="checkbox"/>
	(3)	For transmitters operating in the 5.47-5.725 GHz band: all emissions outside of the 5.47-5.725 GHz band shall not exceed an EIRP of -27 dBm/MHz.	<input type="checkbox"/>
	(4)	For transmitters operating in the 5.725-5.825 GHz band: all emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an EIRP of -17 dBm/MHz; for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an EIRP of -27 dBm/MHz.	<input checked="" type="checkbox"/>



Procedure	1.	2.	3.	4.
	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: <ol style="list-style-type: none"> 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.

Test Date	11/13/2014 – 04/24/2015	Environmental condition	Temperature	23°C
			Relative Humidity	42%
			Atmospheric Pressure	1021mbar

Remark	The EUT was scanned up to 40GHz. Both horizontal and vertical polarities were investigated. The results show only the worst case. For spurious emission measurement, if the peak emission is below 54 dBuV/m average limit, the average value is not be measured. Both horizontal and vertical polarization have been verified.
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Result	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail
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Equipment Setting

TEST	RBW	VBW	SPAN	Detector	SWEEP	Trace	NOTES
Radiated Spurious Emission	1MHz	3MHz	1GHz - 25 GHz	Peak	Auto	Max hold	PK Measurement
Radiated Spurious Emission	1MHz	10Hz	1GHz - 25 GHz	Peak	Auto	Max hold	Ave Measurement

Test Data Yes (See below) N/A

Test Plot Yes (See below) N/A

Radiated Restrcted Band Test Results (Above 1GHz)

Restricted Band – Lower band (802.11a-5180MHz)

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
5150.00	43.24	3.64	0.53	47.41	Peak Max	H	293.41	148.70	74.00	-26.59	Pass
5150.00	43.11	3.64	0.53	47.28	Peak Max	V	234.53	96.81	74.00	-26.72	Pass
5150.00	29.97	3.64	0.53	34.14	Average Max	H	293.41	148.70	54.00	-19.86	Pass
5150.00	29.92	3.64	0.53	34.09	Average Max	V	234.53	96.81	54.00	-19.91	Pass

Restricted Band – Lower band (802.11a-5320MHz)

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
5350.00	42.63	3.70	0.76	47.09	Peak Max	H	296.41	13.97	74.00	-26.91	Pass
5350.00	42.26	3.70	0.75	46.71	Peak Max	V	169.66	279.44	74.00	-27.29	Pass
5350.00	29.08	3.70	0.76	33.54	Average Max	H	296.41	13.97	54.00	-20.46	Pass
5350.00	29.05	3.70	0.75	33.50	Average Max	V	169.66	279.44	54.00	-20.50	Pass

Restricted Band – Lower band (802.11a-5500MHz)

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
5460.00	42.64	3.73	0.88	47.25	Peak Max	H	198.60	195.61	74.00	-26.75	Pass
5460.00	41.62	3.73	0.88	46.23	Peak Max	V	130.74	43.91	74.00	-27.77	Pass
5460.00	28.87	3.73	0.88	33.48	Average Max	H	198.60	195.61	54.00	-20.52	Pass
5460.00	28.90	3.73	0.88	33.51	Average Max	V	130.74	43.91	54.00	-20.49	Pass

Restricted Band – Lower band (802.11n20-5180MHz)

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
5146.00	42.97	3.64	0.53	47.14	Peak Max	H	273.45	180.64	74.00	-26.86	Pass
5146.00	43.78	3.64	0.53	47.95	Peak Max	V	232.53	232.53	74.00	-26.05	Pass
5146.00	30.08	3.64	0.53	34.25	Average Max	H	273.45	180.64	54.00	-19.75	Pass
5146.00	30.05	3.64	0.53	34.22	Average Max	V	232.53	232.53	54.00	-19.78	Pass

Restricted Band – Lower band (802.11n20-5320MHz)

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
5350.00	42.75	3.70	0.75	47.20	Peak Max	H	192.61	70.86	74.00	-26.80	Pass
5350.00	42.13	3.70	0.76	46.59	Peak Max	V	253.49	277.44	74.00	-27.41	Pass
5350.00	29.19	3.70	0.75	33.64	Average Max	H	192.61	70.86	54.00	-20.36	Pass
5350.00	29.08	3.70	0.76	33.54	Average Max	V	253.49	277.44	54.00	-20.46	Pass

Restricted Band – Lower band (802.11n20-5500MHz)

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
5460.00	42.27	3.73	0.88	46.88	Peak Max	H	178.64	114.77	74.00	-27.12	Pass
5460.00	42.27	3.73	0.87	46.87	Peak Max	V	182.63	350.30	74.00	-27.13	Pass
5460.00	28.77	3.73	0.88	33.38	Average Max	H	178.64	114.77	54.00	-20.62	Pass
5460.00	28.77	3.73	0.87	33.37	Average Max	V	182.63	350.30	54.00	-20.63	Pass

Restricted Band – Lower band (802.11n40-5190MHz)

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
5150.00	43.38	3.64	0.53	47.55	Peak Max	H	278.44	320.36	74.00	-26.45	Pass
5150.00	42.84	3.64	0.53	47.01	Peak Max	V	159.68	92.81	74.00	-26.99	Pass
5150.00	30.15	3.64	0.53	34.32	Average Max	H	278.44	320.36	54.00	-19.68	Pass
5150.00	30.01	3.64	0.53	34.18	Average Max	V	159.68	92.81	54.00	-19.82	Pass

Restricted Band – Lower band (802.11n40-5310MHz)

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
5350.00	42.50	3.70	0.75	46.95	Peak Max	H	246.51	314.37	74.00	-27.05	Pass
5350.00	42.63	3.70	0.76	47.09	Peak Max	V	222.55	255.49	74.00	-26.91	Pass
5350.00	29.12	3.70	0.75	33.57	Average Max	H	246.51	314.37	54.00	-20.43	Pass
5350.00	29.04	3.70	0.76	33.50	Average Max	V	222.55	255.49	54.00	-20.50	Pass

Restricted Band – Lower band (802.11n40-5510MHz)

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
5460.00	42.40	3.73	0.88	47.01	Peak Max	H	109.78	27.94	74.00	-26.99	Pass
5460.00	42.77	3.73	0.88	47.38	Peak Max	V	107.78	348.30	74.00	-26.62	Pass
5460.00	28.90	3.73	0.88	33.51	Average Max	H	109.78	27.94	54.00	-20.49	Pass
5460.00	28.98	3.73	0.88	33.59	Average Max	V	107.78	348.30	54.00	-20.41	Pass

Radiated Spurious Emission Test Results (Above 1GHz)

Above 1GHz – 802.11a – 5180MHz

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
17735.47	30.27	6.59	13.57	50.43	Peak Max	H	201.60	261.48	54.00(PK)	-3.57	Pass
14118.24	33.08	6.13	10.23	49.44	Peak Max	V	148.70	268.46	54.00(PK)	-4.56	Pass
1008.02	46.34	1.75	-7.17	40.92	Peak Max	V	117.76	198.60	54.00(PK)	-13.08	Pass

Above 1GHz – 802.11a – 5260MHz

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
17963.93	29.06	6.61	14.34	50.01	Peak Max	H	156.69	333.33	54.00(PK)	-3.99	Pass
14022.04	33.00	6.09	10.04	49.13	Peak Max	V	125.75	205.59	54.00(PK)	-4.87	Pass
6975.95	38.80	4.66	2.68	46.14	Peak Max	H	179.64	233.53	54.00(PK)	-7.86	Pass

Above 1GHz – 802.11a – 5320MHz

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
17993.99	29.12	6.61	14.44	50.17	Peak Max	H	240.52	191.62	54.00(PK)	-3.83	Pass
14583.17	32.01	6.32	10.61	48.94	Peak Max	V	187.62	0.00	54.00(PK)	-5.06	Pass
1008.02	46.40	1.75	-7.17	40.98	Peak Max	V	236.53	249.50	54.00(PK)	-13.02	Pass

Above 1GHz – 802.11a – 5500MHz

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
17975.95	29.06	6.61	14.38	50.05	Peak Max	V	225.55	339.32	54.00(PK)	-3.95	Pass
14551.10	31.55	6.31	10.75	48.61	Peak Max	V	108.78	132.73	54.00(PK)	-5.39	Pass
1008.02	46.12	1.75	-7.17	40.70	Peak Max	H	271.46	17.96	54.00(PK)	-13.30	Pass

Above 1GHz – 802.11a – 5580MHz

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
17915.83	29.80	6.60	14.18	50.58	Peak Max	V	137.72	23.95	54.00(PK)	-3.42	Pass
7000.00	39.60	4.68	2.71	46.99	Peak Max	V	172.65	0.00	54.00(PK)	-7.01	Pass
14503.01	31.29	6.29	10.96	48.54	Peak Max	V	146.71	261.48	54.00(PK)	-5.46	Pass

Above 1GHz – 802.11a – 5700MHz

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
17873.75	29.08	6.60	14.04	49.72	Peak Max	H	264.47	342.31	54.00(PK)	-4.28	Pass
14551.10	31.68	6.31	10.75	48.74	Peak Max	V	291.42	172.65	54.00(PK)	-5.26	Pass
1028.06	45.72	1.77	-7.13	40.36	Peak Max	H	105.79	46.91	54.00(PK)	-13.64	Pass

Above 1GHz – 802.11a – 5745MHz

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
17921.84	28.90	6.60	14.20	49.70	Peak Max	V	216.57	330.34	54.00(PK)	-4.30	Pass
14150.30	32.15	6.14	10.29	48.58	Peak Max	V	157.68	262.47	54.00(PK)	-5.42	Pass
1016.03	46.04	1.76	-7.15	40.65	Peak Max	H	343.31	222.55	54.00(PK)	-13.35	Pass

Above 1GHz – 802.11a – 5785MHz

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
17819.64	29.50	6.59	13.86	49.95	Peak Max	V	200.60	167.66	54.00(PK)	-4.05	Pass
14567.13	32.44	6.32	10.68	49.44	Peak Max	H	160.68	291.42	54.00(PK)	-4.57	Pass
1024.05	46.89	1.76	-7.14	41.51	Peak Max	V	136.73	41.92	54.00(PK)	-12.49	Pass

Above 1GHz – 802.11a – 5825MHz

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
17987.98	28.91	6.61	14.42	49.94	Peak Max	H	213.57	59.88	54.00(PK)	-4.06	Pass
14519.04	31.52	6.30	10.89	48.71	Peak Max	H	262.47	72.85	54.00(PK)	-5.29	Pass
4234.47	41.29	3.38	-0.23	44.44	Peak Max	V	244.51	310.38	54.00(PK)	-9.56	Pass

Above 1GHz – 802.11n – 5180MHz

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
17987.98	29.38	6.61	14.42	50.41	Peak Max	H	222.55	186.63	54.00(PK)	-3.59	Pass
14535.07	31.93	6.30	10.82	49.05	Peak Max	V	197.60	324.35	54.00(PK)	-4.95	Pass
1008.02	46.89	1.75	-7.17	41.47	Peak Max	V	212.57	359.28	54.00(PK)	-12.53	Pass

Above 1GHz – 802.11n – 5260MHz

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
17987.98	29.14	6.61	14.42	50.17	Peak Max	V	208.58	6.99	54.00(PK)	-3.83	Pass
14583.17	31.90	6.32	10.61	48.83	Peak Max	H	300.40	187.62	54.00(PK)	-5.17	Pass
3200.40	42.25	2.91	-1.68	43.48	Peak Max	H	169.66	100.80	54.00(PK)	-10.52	Pass

Above 1GHz – 802.11n – 5320MHz

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
17711.42	29.97	6.58	13.49	50.04	Peak Max	H	251.50	284.43	54.00(PK)	-3.96	Pass
14102.20	32.50	6.12	10.20	48.82	Peak Max	H	99.80	319.36	54.00(PK)	-5.18	Pass
4186.37	41.35	3.37	-0.22	44.50	Peak Max	V	173.65	77.84	54.00(PK)	-9.50	Pass

Above 1GHz – 802.11n – 5500MHz

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
17969.94	29.16	6.61	14.36	50.13	Peak Max	H	212.57	312.37	54.00(PK)	-3.87	Pass
14182.37	32.53	6.16	10.36	49.05	Peak Max	H	149.70	83.83	54.00(PK)	-4.95	Pass
2054.11	43.61	2.55	-4.39	41.77	Peak Max	V	156.69	113.77	54.00(PK)	-12.23	Pass

Above 1GHz – 802.11n – 5580MHz

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
14150.30	33.63	6.14	10.29	50.06	Peak Max	V	134.73	284.43	54.00(PK)	-3.94	Pass
18000.00	28.74	6.61	14.46	49.81	Peak Max	H	110.78	298.40	54.00(PK)	-4.19	Pass
6927.86	38.56	4.63	2.63	45.82	Peak Max	H	148.70	83.83	54.00(PK)	-8.18	Pass

Above 1GHz – 802.11n – 5700MHz

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
17921.84	29.25	6.60	14.20	50.05	Peak Max	V	280.44	173.65	54.00(PK)	-3.95	Pass
14567.13	32.13	6.32	10.68	49.13	Peak Max	H	146.71	122.75	54.00(PK)	-4.87	Pass
2078.16	43.47	2.56	-4.32	41.71	Peak Max	H	188.62	173.65	54.00(PK)	-12.29	Pass

Above 1GHz – 802.11n – 5745MHz

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
17927.86	29.33	6.61	14.22	50.16	Peak Max	H	152.69	292.41	54.00(PK)	-3.84	Pass
14567.13	32.09	6.32	10.68	49.09	Peak Max	H	164.67	95.81	54.00(PK)	-4.91	Pass
7208.42	39.00	4.57	3.10	46.67	Peak Max	V	186.63	171.66	54.00(PK)	-7.33	Pass

Above 1GHz – 802.11n – 5785MHz

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
17981.96	28.91	6.61	14.40	49.92	Peak Max	V	255.49	25.95	54.00(PK)	-4.08	Pass
14006.01	32.69	6.08	10.01	48.78	Peak Max	V	287.42	19.96	54.00(PK)	-5.22	Pass
1008.02	46.94	1.75	-7.17	41.52	Peak Max	V	121.76	257.48	54.00(PK)	-12.48	Pass

Above 1GHz – 802.11n – 5825MHz

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
17855.71	29.51	6.60	13.98	50.09	Peak Max	H	179.64	359.28	54.00(PK)	-3.91	Pass
4178.36	42.51	3.36	-0.22	45.65	Peak Max	H	140.72	210.58	54.00(PK)	-8.35	Pass
14599.20	31.94	6.33	10.54	48.81	Peak Max	H	170.66	223.55	54.00(PK)	-5.19	Pass

Above 1GHz – 802.11n40 – 5190MHz

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
17957.92	29.25	6.61	14.32	50.18	Peak Max	H	321.00	184.00	54.00(PK)	-3.82	Pass
14519.04	32.14	6.30	10.89	49.32	Peak Max	V	344.00	256.00	54.00(PK)	-4.68	Pass
7000.00	39.54	4.68	2.71	46.93	Peak Max	V	324.00	356.00	54.00(PK)	-7.07	Pass

Above 1GHz – 802.11n40 – 5270MHz

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
17879.76	29.58	6.60	14.06	50.24	Peak Max	H	193.00	306.00	54.00(PK)	-3.76	Pass
14054.11	32.21	6.10	10.11	48.42	Peak Max	V	125.00	64.00	54.00(PK)	-5.58	Pass
7000.00	39.33	4.68	2.71	46.72	Peak Max	V	180.00	77.00	54.00(PK)	-7.28	Pass

Above 1GHz – 802.11n40 – 5310MHz

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
17723.45	30.45	6.58	13.53	50.57	Peak Max	H	126.00	140.00	54.00(PK)	-3.43	Pass
14567.13	32.20	6.32	10.68	49.20	Peak Max	V	138.00	53.00	54.00(PK)	-4.80	Pass
1012.02	46.91	1.75	-7.16	41.50	Peak Max	V	196.00	29.00	54.00(PK)	-12.50	Pass

Above 1GHz – 802.11n40 – 5510MHz

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
17873.75	30.25	6.60	14.04	50.89	Peak Max	H	131.00	205.00	54.00(PK)	-3.11	Pass
14695.39	33.12	6.37	10.12	49.61	Peak Max	H	206.00	63.00	54.00(PK)	-4.39	Pass
1028.06	47.40	1.77	-7.13	42.04	Peak Max	H	167.00	87.00	54.00(PK)	-11.96	Pass

Above 1GHz – 802.11n40 – 5550MHz

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
17933.87	29.47	6.61	14.24	50.32	Peak Max	V	158.00	152.00	54.00(PK)	-3.68	Pass
14583.17	32.10	6.32	10.61	49.03	Peak Max	V	140.00	351.00	54.00(PK)	-4.97	Pass
1012.02	47.23	1.75	-7.16	41.82	Peak Max	V	126.00	243.00	54.00(PK)	-12.18	Pass

Above 1GHz – 802.11n40 – 5670MHz

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
17993.99	29.52	6.61	14.44	50.58	Peak Max	H	156.00	316.00	54.00(PK)	-3.42	Pass
14519.04	31.39	6.30	10.89	48.58	Peak Max	V	148.00	80.00	54.00(PK)	-5.42	Pass
1016.03	47.06	1.76	-7.15	41.66	Peak Max	H	142.00	116.00	54.00(PK)	-12.34	Pass

Above 1GHz – 802.11n40 – 5755MHz

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
17813.63	30.22	6.59	13.84	50.65	Peak Max	V	131.00	205.00	54.00(PK)	-3.35	Pass
14390.78	31.95	6.24	10.76	48.95	Peak Max	V	206.00	63.00	54.00(PK)	-5.05	Pass
1020.04	46.44	1.76	-7.15	41.05	Peak Max	V	167.00	87.00	54.00(PK)	-12.95	Pass

Above 1GHz – 802.11n40 – 5795MHz

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
17969.94	29.47	6.61	14.36	50.45	Peak Max	H	256.00	26.00	54.00(PK)	-3.55	Pass
14519.04	32.43	6.30	10.89	49.61	Peak Max	H	288.00	20.00	54.00(PK)	-4.39	Pass
1004.01	46.97	1.74	-7.18	41.53	Peak Max	V	122.00	258.00	54.00(PK)	-12.47	Pass

















Annex A. TEST INSTRUMENT








Instrument	Model	Serial #	Cal Date	Cal Cycle	Cal Due	In use
Conducted Emissions						
R & S Receiver	ESHS10	830223/0009	04/08/2014	1 Year	04/08/2015	<input type="checkbox"/>
Spectrum Analyzer	FSIQ7	825555/013	05/31/2014	1 Year	04/08/2015	<input type="checkbox"/>
Schwarzbeck LISN	NNLK 8129	8129-190	08/11/2014	1 Year	08/11/2015	<input type="checkbox"/>
CHASE LISN	MN2050B	1018	07/31/2014	1 Year	07/31/2015	<input type="checkbox"/>
Sekonic Hygro Hermograph	ST-50	HE01-000092	05/25/2014	1 Year	05/25/2015	<input type="checkbox"/>
Radiated Emissions						
R & S Receiver	ESL6	100178	03/01/2014	1 Year	03/04/2015	<input checked="" type="checkbox"/>
R & S Receiver	ESIB 40	100179	05/24/2014	1 Year	05/24/2015	<input checked="" type="checkbox"/>
Bi-Log antenna (30MHz~2GHz)	JB1	A030702	08/12/2014	1 Year	08/12/2015	<input checked="" type="checkbox"/>
Horn Antenna (1-26.5GHz)	3115	10SL0059	08/11/2014	1 Year	08/11/2015	<input checked="" type="checkbox"/>
Horn Antenna (18-40 GHz)	AH-840	101013	08/11/2014	1 Year	08/11/2015	<input checked="" type="checkbox"/>
Pre-Amplifier (100KHz-7GHz)	LPA-6-30	11140711	02/18/2014	1 Year	02/18/2015	<input checked="" type="checkbox"/>
Microwave Preamplifier (18-40 GHz)	PA-840	181251	02/12/2014	1 Year	02/12/2015	<input checked="" type="checkbox"/>
3 Meters SAC	3M	N/A	03/04/2014	1 Year	03/04/2015	<input checked="" type="checkbox"/>
10 Meters SAC	10M	N/A	09/05/2014	1 Year	09/05/2015	<input checked="" type="checkbox"/>
Sekonic Hygro Hermograph	ST-50	HE01-000092	05/25/2014	1 Year	05/25/2015	<input checked="" type="checkbox"/>
RF Conducted Measurement						
Spectrum Analyzer	N9010A	MY50210206	05/30/2014	1 Year	05/30/2015	<input type="checkbox"/>
Spectrum Analyzer	E4407B	US88441016	05/31/2014	1 Year	05/31/2015	<input type="checkbox"/>
R & S Receiver	ESIB 40	100179	04/20/2014	1 Year	04/20/2015	<input type="checkbox"/>

Test Software Version

Test Item	Vendor	Software	Version
Radiated Emission	EMISoft	EMISoft Vasona	V5.0

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		<p>Radio: A1. Terminal equipment for purpose of calling</p> <p>Telecom: B1. Specified radio equipment specified in Article 38-2, Paragraph 1, Item 1 of the Radio Law</p>
Korea CAB Accreditation		<p>EMI: KCC Notice 2008-39, RRL Notice 2008-3: CA Procedures for EMI KN22: Test Method for EMI</p> <p>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</p>
		<p>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</p>
		<p>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</p>
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		<p>EMC: AS/NZS CISPR 11, AS/NZS CISPR 14.1, AS/NZS CISPR22, AS/NZS 61000.6.3, AS/NZS 61000.6.4</p>
		<p>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</p>
		<p>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</p>
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