RF TEST REPORT

SIEMIC
GLOBAL TESTING & CERTIFICATIONS
YOUR CHOICE FOR- TCB FCB CB NB CAB RCB

Report No.: **SL13071801-LHS-002-RF**
Supersede Report No.: **NONE**

Applicant	:	Legrand Home Systems Division, North America
Product Name	:	TopDog Modular RF Transceiver
Model No.	:	203015
Test Standard	:	FCC 15.247: 2013 RSS 210 Issue8: 2010
Test Method	:	ANSI C63.4:2009 FCC Public Notice DA 00-705
FCC ID	:	YV8-203015
IC ID	:	9922A-203015
Dates of test	:	October 14th - November 7th , 2013
Issue Date	:	11/18/2013
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:	
	
Nima Molaei	David Zhang
Test Engineer	Engineer Reviewer

Issued By:

SIEMIC Laboratories
775 Montague Expressway, Milpitas, 95035 CA

ilac-MRA
ACCREDITED
TESTING CERT # 2742-01

This test report may be reproduced in full only.
Test result presented in this test report is applicable to the representative sample only.

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

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
HongKong	OFTA (US002)	RF , Telecom

CONTENTS

1 REPORT REVISION HISTORY 3
2 EXECUTIVE SUMMARY 4
3 CUSTOMER INFORMATION 4
4 TEST SITE INFORMATION 4
5 MODIFICATION 4
6 EUT INFORMATION 5
6.1 EUT Description 5
6.2 Radio Description 5
6.3 EUT test modes/configuration Description 6
6.4 EUT Photos 7
6.5 EUT Test Setup Photos 8
7 SUPPORTING EQUIPMENT/SOFTWARE AND CABLING DESCRIPTION 9
7.1 Supporting Equipment 9
7.2 Cabling Description 9
7.3 Test Software Description 9
8 TEST SUMMARY 10
9 MEASUREMENT UNCERTAINTY 11
10 MEASUREMENTS, EXAMINATION AND DERIVED RESULTS 12
10.1 Antenna Requirement 12
10.2 Conducted Emission Test Result 13
10.3 Channel Separation 16
10.4 99% Occupied Bandwidth 18
10.5 20dB Bandwidth 20
10.6 Number of Hopping Channel 22
10.7 Time of Occupancy 23
10.8 Peak Spectral Density 25
10.9 Peak Output Power 27
10.10 Radiated Measurement 29
10.10.1 Radiated Measurement below 1GHz 30
10.10.2 Radiated Spurious Emissions > 1GHz 32
10.10.3 Receiver Spurious Emissions 35
ANNEX A. TEST INSTRUMENT 37
ANNEX B. USER MANUAL, BLOCK & CIRCUIT DIAGRAM 38
ANNEX C. SIEMIC ACCREDITATION 39

1 Report Revision History

Report No.	Report Version	Description	Issue Date
SL13071801-LHS-002-RF	Original	-	11/18/2013

2 Executive Summary

The purpose of this test program was to demonstrate compliance of the Legrand Home Systems Division, North America, TopDog Modular RF Transceiver, and model: 203015 against the current Stipulated Standards. The 203015 has demonstrated compliance with the Stipulated Standard listed on 1st page.

3 Customer information

Applicant Name	:	Legrand Home Systems Division, North America
Applicant Address	:	301 Fulling Mill Rd, Suite G, Middletown, PA 17057 USA
Manufacturer Name	:	Legrand Home Systems Division, North America
Manufacturer Address	:	301 Fulling Mill Rd, Suite G, Middletown, PA 17057 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	:	TopDog Modular RF Transceiver
Model No.	:	203015
Trade Name	:	Legrand
Serial No.	:	40J132000083
Input Power	:	5VDC,2A
Power Adapter Manu/Model	:	Powertron Electronics Crop./PA1015-1DU
Power Adapter SN	:	B1001021100500834
Hardware version	:	-
Software version	:	-
Date of EUT received	:	October 14th, 2013
Equipment Class/ Category	:	DTS (This is a Hybrid System device)
Clock Frequencies	:	-
Port/Connectors	:	-

6.2 Radio Description

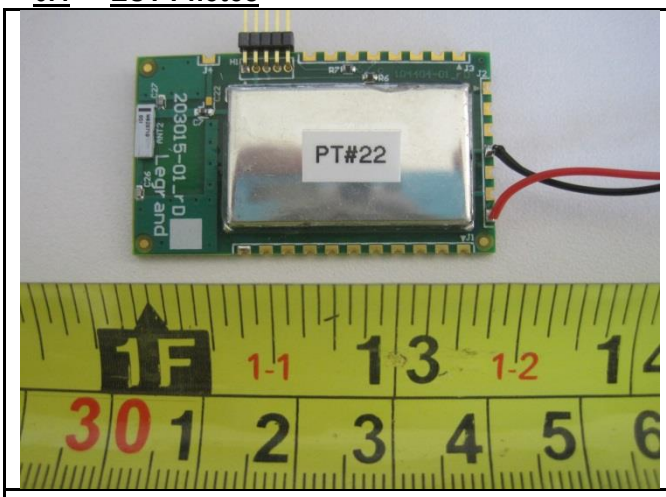
Spec for Radio part -

Radio Type	Description
Operating Frequency	904.86-924.87 MHz
Modulation	FSK
Antenna Type	Ethertronics PN M620710 Chip Antenna
Antenna Gain	2.56 dBi
Channel Separation	N/A
Number of Channels	5

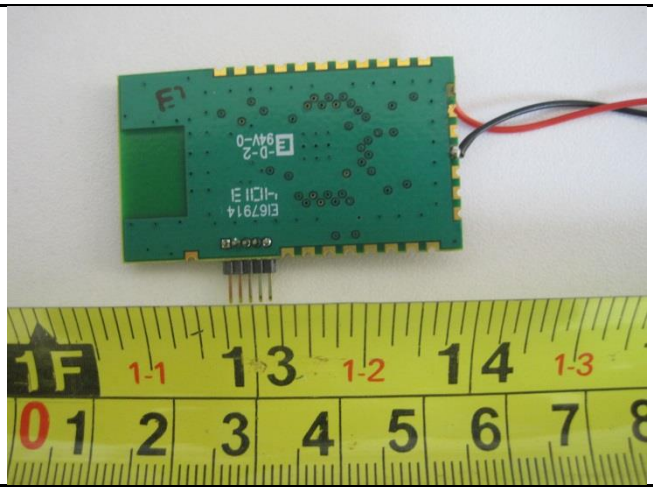
6.3 EUT test modes/configuration Description

Test Item	Operating mode	Tested antenna port	Test frequencies (MHz)
AC Line Conducted Emissions Voltage	Continuous Transmit	-	904.86-924.87
Channel Separation	Continuous Transmit	-	904.86-924.87
Occupied Bandwidth	Continuous Transmit	-	904.86-924.87
20dB Bandwidth	Continuous Transmit	-	904.86-924.87
Peak Spectral Density	Continuous Transmit	-	904.86-924.87
Radiated Spurious Emissions	Continuous Transmit	-	904.86-924.87
Time of Occupancy	Continuous Transmit	-	904.86-924.87
Output Power	Continuous Transmit	-	904.86-924.87
Receiver Spurious Emissions	RX Mode	-	904.86-924.87
100 KHz Bandwidth of Frequency Band Edge	Continuous Transmit	-	904.86-924.87
Maximum Permissible Exposure	Continuous Transmit	-	904.86-924.87
Hopping Capability	Continuous Transmit	-	904.86-924.87

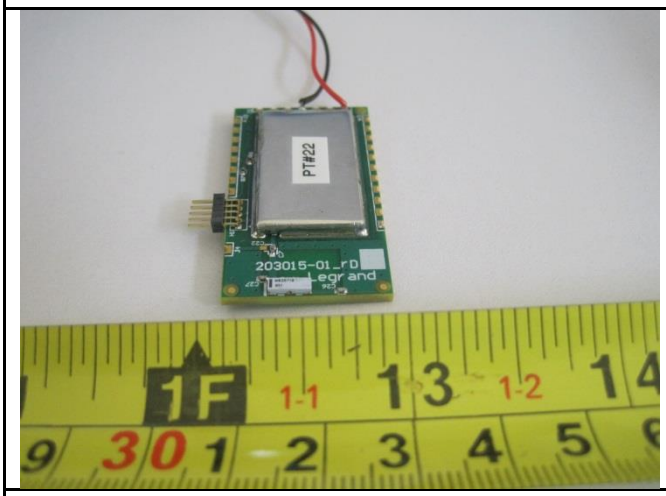
6.4 EUT Photos



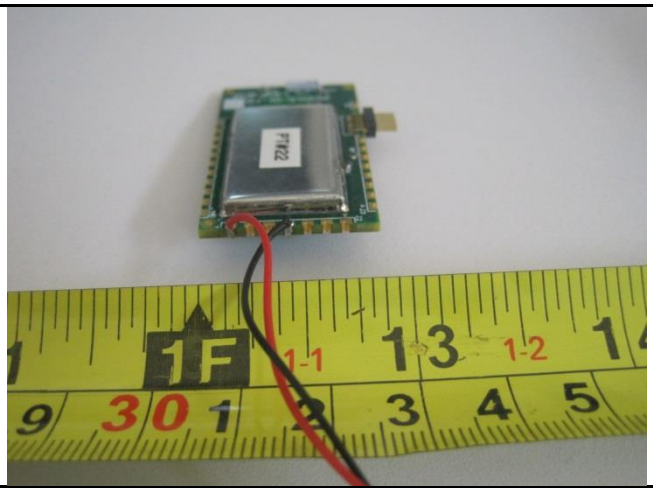
Top



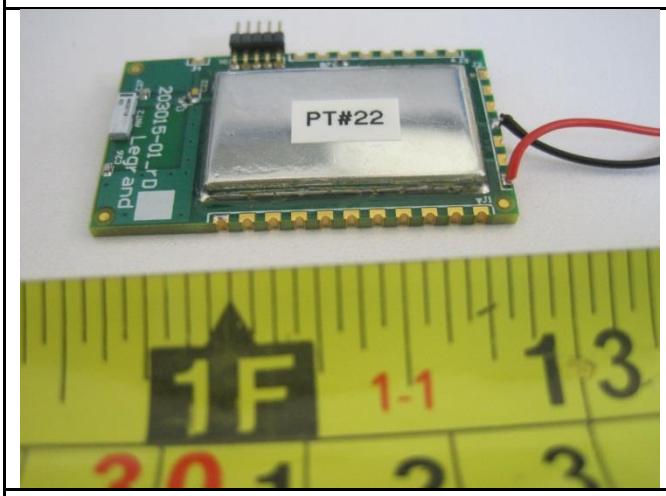
Bottom



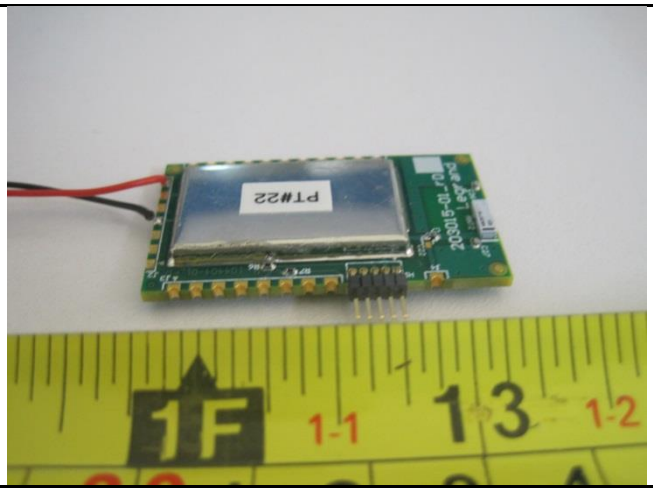
Front



Rear

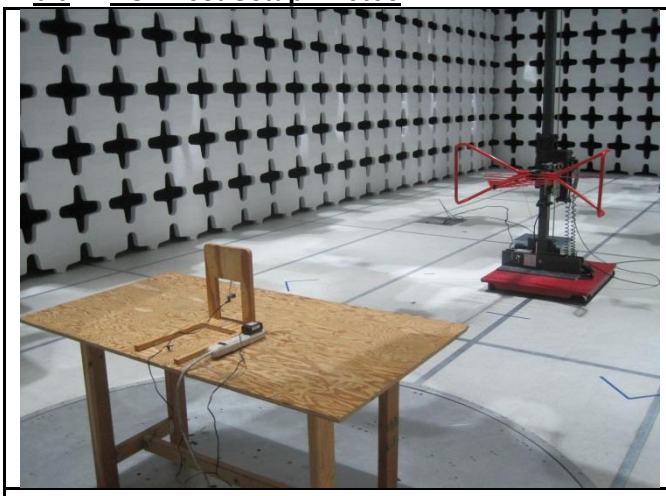


Left Side



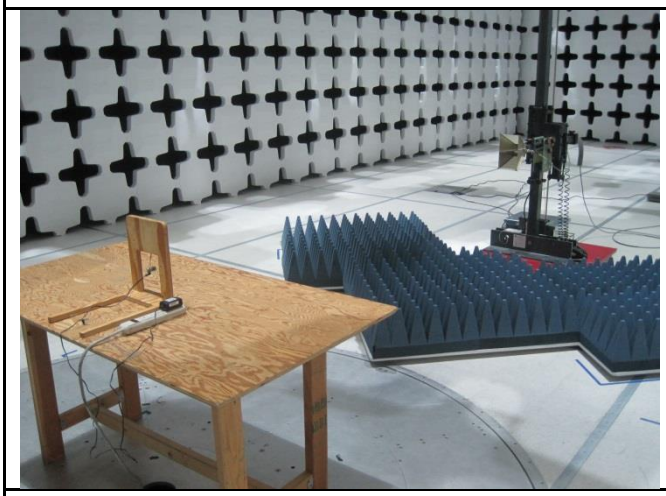
Right Side

6.5 EUT Test Setup Photos

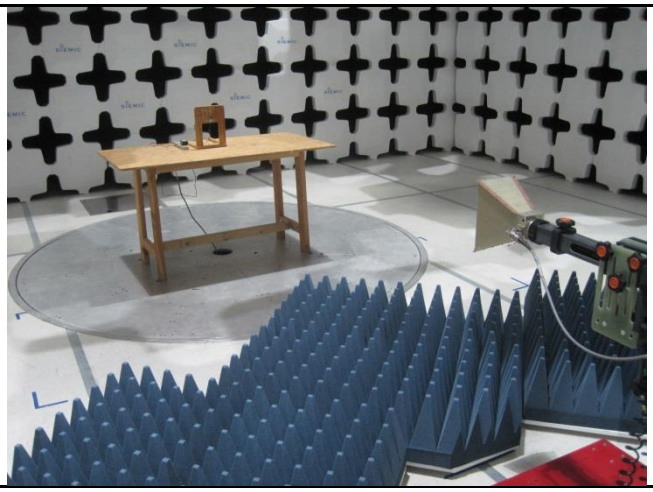


Test setup at 3 meter distance (<1GHz) - Front

Test setup at 3 meter distance (<1GHz) - Rear

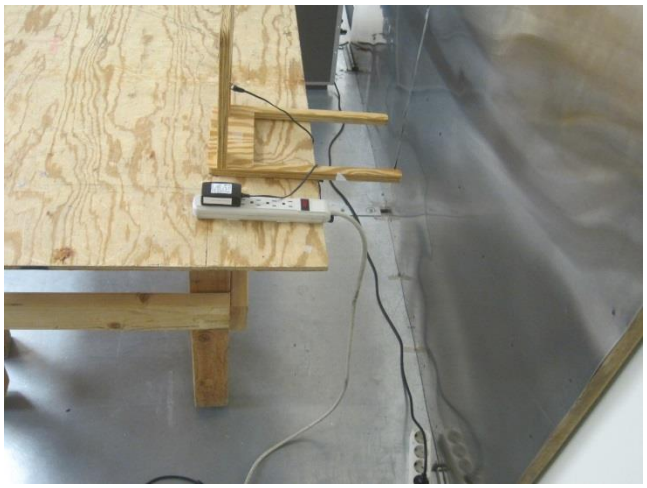


Test setup at 3 meter distance (>1GHz) - Front



Test setup at 3 meter distance (>1GHz) - Rear

Conducted Emission - Front



Conducted Emission - Rear

7 Supporting Equipment/Software and cabling Description

7.1 Supporting Equipment

Index	Supporting Equipment Description	Model	Serial No.	Manu.	Note
1	AC/DC Power Adaptor	PA1015-1DU	PA1015-050DUB	Powertron Electronics Crop.	-

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

8 Test Summary

Test Item	Test standard		Test Method/Procedure		Pass / Fail
Restricted Band of Operation	FCC	15.205	FCC	ANSI C63.4 – 2009 FCC Public Notice DA 00-705	☒ Pass ☐ N/A
	IC	RSS 210 (2.2)	IC	-	
AC Conducted Emissions Voltage	FCC	15.207(a)	FCC	ANSI C63.4 – 2009	☒ Pass ☐ N/A
	IC	RSS Gen (7.2.2)	IC	-	

Test Item	Test standard		Test Method/Procedure		Pass / Fail
Channel Separation	FCC	15.247 (a)(1)	FCC	FCC Public Notice DA 00-705	☒ Pass ☐ N/A
	IC	RSS210 (A8.1)	IC	-	
Occupied Bandwidth	FCC	15.247(a)(1)	FCC	FCC Public Notice DA 00-705	☒ Pass ☐ N/A
	IC	RSS210(A8.1)	IC	-	
Bandwidth	FCC	15.247(a)(2)	FCC	FCC Public Notice DA 00-705	☒ Pass ☐ N/A
	IC	RSS210 (A8.2)	IC	-	
Number of Hopping Channels	FCC	15.247(a)(1)	FCC	-	☐ Pass ☒ N/A
	IC	RSS210(A8.1)	IC	-	
Band Edge and Radiated Spurious Emissions	FCC	15.247(d)	FCC	FCC Public Notice DA 00-705	☒ Pass ☐ N/A
	IC	RSS210(A8.5)	IC	-	
Time of Occupancy	FCC	15.247(a)(1)	FCC	FCC Public Notice DA 00-705	☒ Pass ☐ N/A
	IC	RSS210(A8.1)	IC	-	
Output Power	FCC	15.247(b)	FCC	FCC Public Notice DA 00-705	☒ Pass ☐ N/A
	IC	RSS210 (A8.4)	IC	-	
Receiver Spurious Emissions	FCC	15.247(d)	FCC	FCC Public Notice DA 00-705	☒ Pass ☐ N/A
	IC	RSS Gen (4.8)	IC	-	
Antenna Gain > 6 dBi	FCC	15.247(e)	FCC	-	☐ Pass ☒ N/A
	IC	RSS210(A8.4)	IC	-	
Power Spectral Density	FCC	15.247(e)	FCC	FCC Public Notice DA 00-705	☒ Pass ☐ N/A
	IC	RSS210(A8.3)	IC	-	
Hybrid System Requirement	FCC	15.247(f)	FCC	FCC Public Notice DA 00-705	☒ Pass ☐ N/A
	IC	RSS210(A8.3)	IC	-	
Hopping Capability	FCC	15.247(g)	FCC	-	☐ Pass ☒ N/A
	IC	RSS210(A8.1)	IC	-	
Hopping Coordination Requirement	FCC	15.247(h)	FCC	-	☐ Pass ☒ N/A
	IC	RSS210(A8.1)	IC	-	
RF Exposure requirement	FCC	15.247(i)	FCC	-	☐ Pass ☒ N/A
	IC	RSS Gen(5.5)	IC	-	
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.				

9 Measurement Uncertainty

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 Antenna Requirement

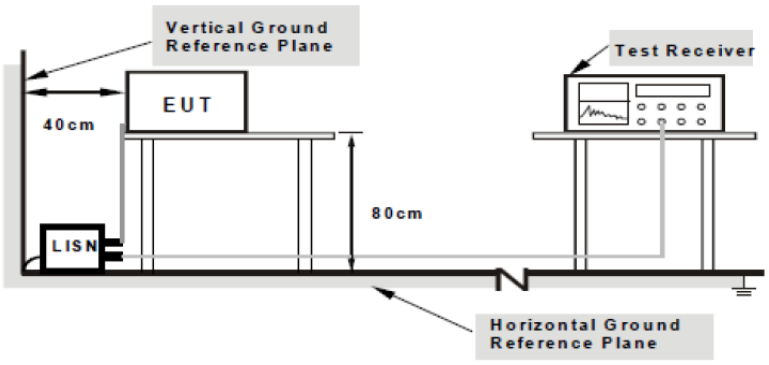
Spec	Requirement	Applicable
§15.203	An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. Antenna requirement must meet at least one of the following: a) Antenna must be permanently attached to the device. b) Antenna must use a unique type of connector to attach to the device. c) Device must be professionally installed. Installer shall be responsible for ensuring that the correct antenna is employed with the device.	☒
Remark	The antenna is integral to the PCB board permanently to the device which meets the requirement (See Internal Photographs submitted as another Exhibit).	
Result	☒ PASS ☐ FAIL	

10.2 Conducted Emission Test Result

Conducted Emission Limit

Section	Frequency ranges (MHz)	Limit (dBuV)	
		QP	Average
Class B devices	0.15 ~ 0.5	66 – 56	56 – 46
	0.5 ~ 5	56	46
	5 ~ 30	60	50

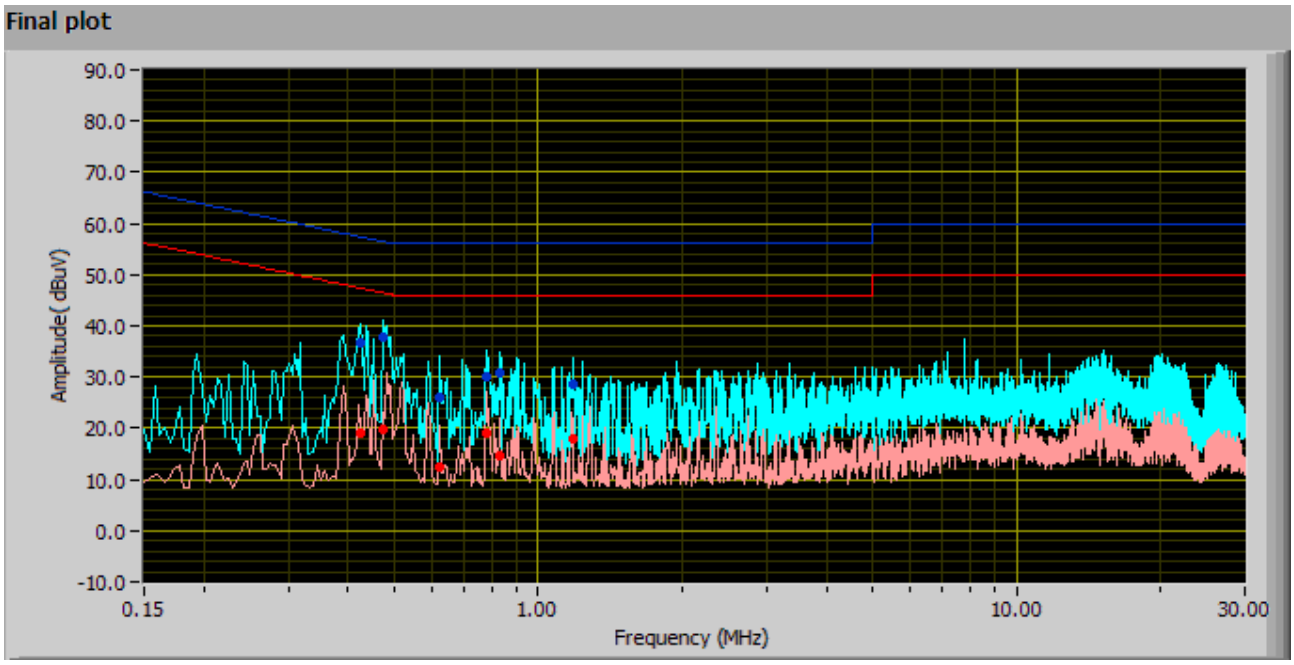
Spec	Item	Requirement	Applicable
§ 15.207, RSS210(A8.1)	a)	For an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits set in § 15.207, as measured using a 50 μH/50 ohms line impedance stabilization network (LISN). AC Line conducted emission within the band 150KHz to 30MHz	☒

Test Setup	 Note: 1.Support units were connected to second LISN. 2.Both of LISNs (AMN) are 80cm from EUT and at least 80cm from other units and other metal planes support units.
Procedure	- The EUT and supporting equipment was set up in accordance with the requirements of the standard on top of a 1.5m x 1m x 0.8m high, non-metallic ta+6ble, as shown in Annex B. - The power supply for the EUT was fed through a 50Ω/50μH EUT LISN, connected to filtered mains. - The RF OUT of the EUT LISN was connected to the EMI test receiver via a low-loss coaxial cable. - All other supporting equipments were powered separately from another main supply.

Test Date	10/17/2013	Environmental condition	Temperature Relative Humidity Atmospheric Pressure	24°C 47% 1019mbar
Remark	-			
Result	☒ Pass ☐ Fail			

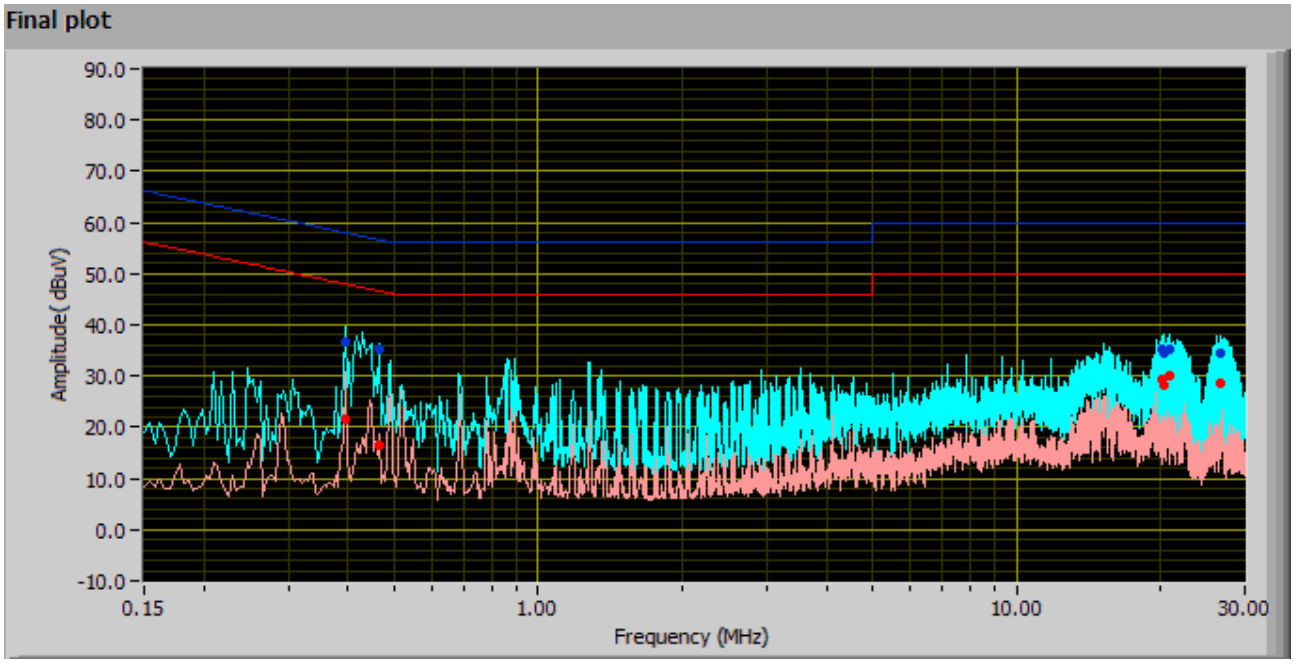
Test Data ☒ Yes ☐ N/A

Test Plot ☒ Yes ☐ N/A



Phase Line Plot at 110Vac, 60Hz

Frequency (MHz)	Quasi Peak (dBuV)	Limit (dBuV)	Margin (dB)	Average (dBuV)	Limit (dBuV)	Margin (dB)	Factors (dB)	Line
0.47	37.69	56.45	-18.75	19.75	46.45	-26.70	12.11	Phase
0.43	36.55	57.35	-20.81	18.90	47.35	-28.46	12.09	Phase
0.78	30.07	56.00	-25.93	19.16	46.00	-26.84	12.35	Phase
0.83	30.92	56.00	-25.08	14.79	46.00	-31.21	12.38	Phase
0.62	26.05	56.00	-29.95	12.25	46.00	-33.75	12.25	Phase
1.18	28.46	56.00	-27.54	18.10	46.00	-27.90	12.46	Phase



Quasi-Peak Limit Average Limit

Neutral Line Plot at 110Vac, 60Hz

Frequency (MHz)	Quasi Peak (dBuV)	Limit (dBuV)	Margin (dB)	Average (dBuV)	Limit (dBuV)	Margin (dB)	Factors (dB)	Line
0.39	36.57	58.01	-21.45	21.76	48.01	-26.26	10.73	Natural
0.47	35.27	56.59	-21.32	16.60	46.59	-29.99	10.73	Natural
20.38	34.57	60.00	-25.43	28.37	50.00	-21.63	12.27	Natural
20.84	35.33	60.00	-24.67	30.04	50.00	-19.96	12.27	Natural
20.14	35.15	60.00	-24.85	29.17	50.00	-20.83	12.27	Natural
26.72	34.61	60.00	-25.39	28.43	50.00	-21.57	12.27	Natural

10.3 Channel Separation

Requirement(s):

Spec	Requirement	Applicable
47 CFR §15.247 (a)(1) RSS-210 (A8.1)	Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.	☒

Test Setup				
Procedure	Channel Separation procedure 1. The EUT must have its hopping function enabled. 2. Span = wide enough to capture the peaks of two adjacent channels 3. Resolution (or IF) Bandwidth (RBW) >= 1% of the span 4. Video (or Average) Bandwidth (VBW) >= RBW. 5. Detector = Peak. 6. Trace mode = max hold. 7. Use the marker-delta function to determine the separation between the peaks of the adjacent channels.			
Test Date	10/17/2013	Environmental condition	Temperature Relative Humidity Atmospheric Pressure	23°C 45% 1019mbar
Remark	-			
Result	☒ Pass ☐ Fail			

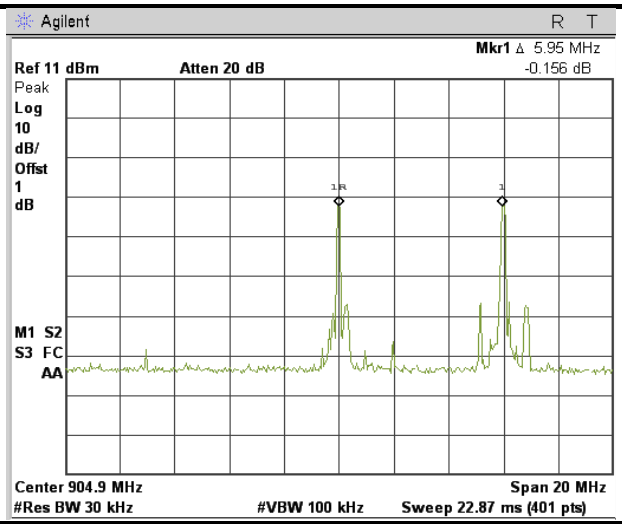
Equipment Setting

TEST	RBW	VBW	SPAN	Detector	SWEEP	Trace	NOTES
Channel Separation	≥1% Span	≥ RBW	-	PK	Auto	Maxhold	-

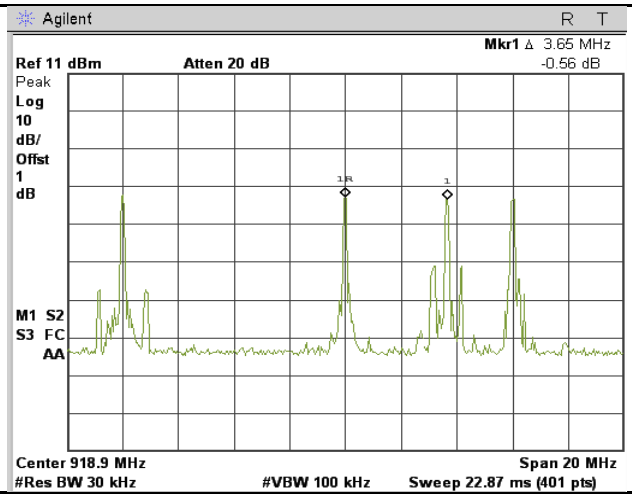
Test Data ☒ Yes (See below) ☐ N/A

Channel	Channel Frequency (MHz)	Channel Separation (MHz)	20 dB Bandwidth (MHz)	Pass/Fail
Low	904.86	5.95	0.0929	Pass
Mid	918.86	3.65	0.0926	Pass
High	924.87	2.35	0.0929	Pass

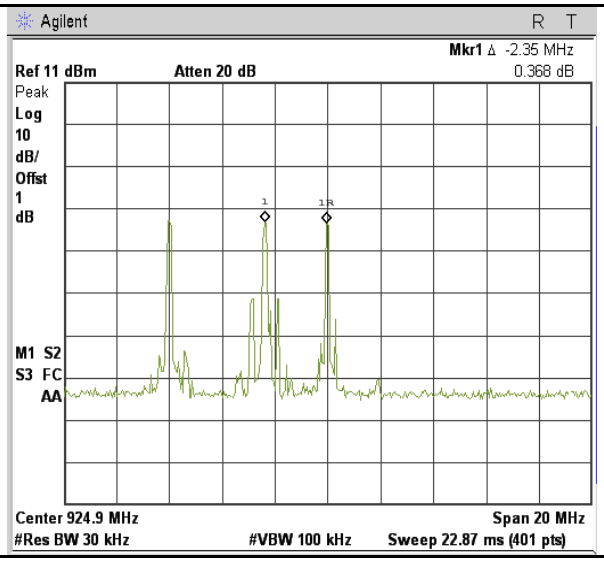
Test Plot ☒ Yes (See below) ☐ N/A



Channel Separation-Low Channel



Channel Separation-Mid Channel



Channel Separation-High Channel

10.4 99% Occupied Bandwidth

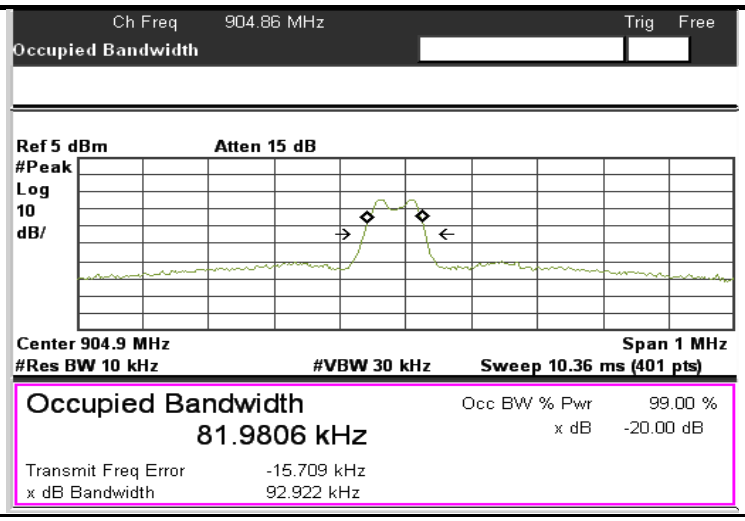
Requirement(s):

Spec	Requirement	Applicable
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	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	10/17/2013	Environmental condition: Temperature 23°C; Relative Humidity 45%; Atmospheric Pressure 1019mbar
Remark	-	
Result	☒ Pass ☐ Fail	

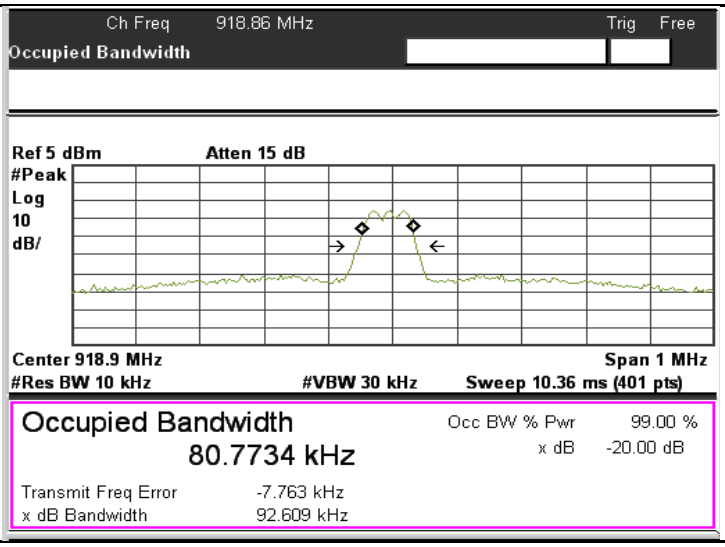
Test Data ☒ Yes (See below) ☐ N/A

Channel	Channel Frequency (MHz)	99% Occupied Bandwidth (KHz)
Low	904.86	81.98
Mid	918.86	80.77
High	924.87	80.04

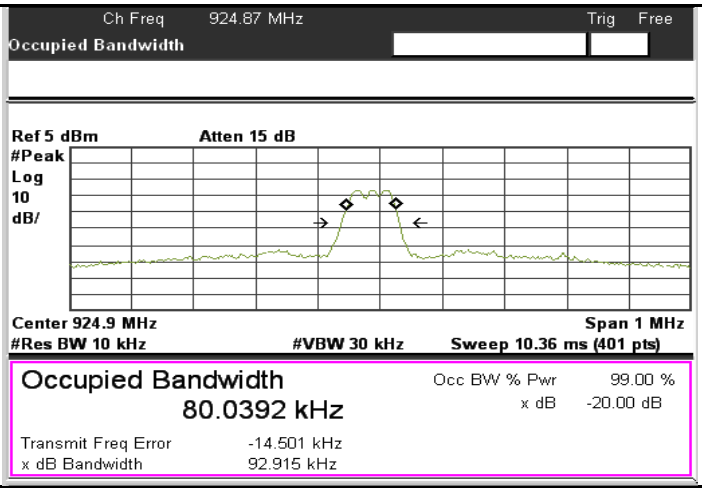
Test Plot ☒ Yes (See below) ☐ N/A



99% Occupied Bandwidth -Low Channel



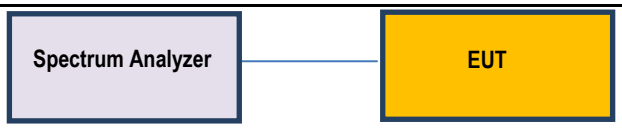
99% Occupied Bandwidth -Mid Channel



99% Occupied Bandwidth -High Channel

10.5 20dB Bandwidth

Requirement(s):

Spec	Requirement	Applicable
47 CFR §15.247 (a) RSS-210 (A8.2)	Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or 20 dB bandwidth of the hopping channel, whichever is greater.	☒
Test Setup		
Procedure	20dB Emission bandwidth measurement procedure 1. Set RBW ⩾ 1% 20dB Bandwidth 2. Set the video bandwidth (VBW) ⩾ RBW. 3. Detector = Peak. 4. Trace mode = max hold. 5. Sweep = auto couple. 6. Allow the trace to stabilize. 7. 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.	
Test Date	10/17/2013	Environmental condition: Temperature 23°C; Relative Humidity 45%; Atmospheric Pressure 1019mbar
Remark	-	
Result	☒ Pass ☐ Fail	

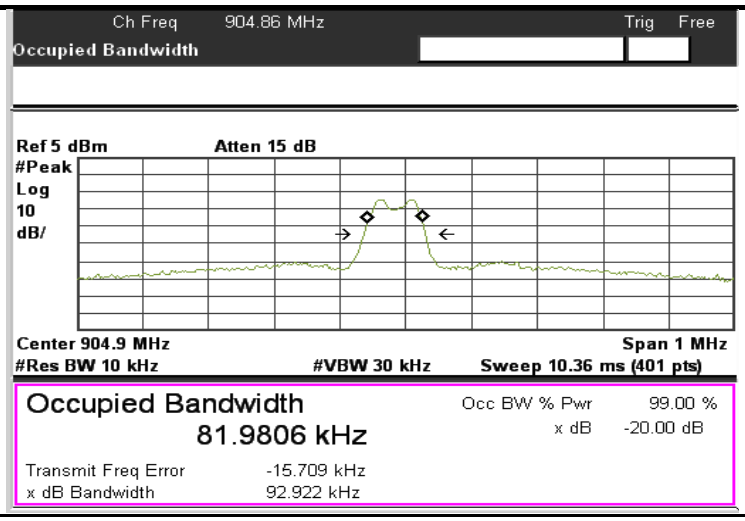
Equipment Setting

TEST	RBW	VBW	SPAN	Detector	SWEEP	Trace	NOTES
20dB Bandwidth	≥1% 20dB bandwidth	≥ RBW	~2 – 3 times 20dBbandwidth	PK	Auto	Maxhold	-

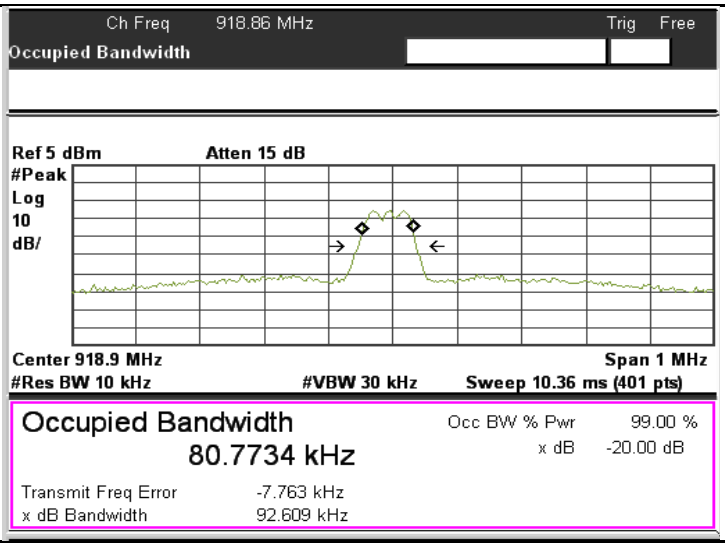
Test Data ☒ Yes (See below) ☐ N/A

Channel	Channel Frequency (MHz)	20 dB Bandwidth (MHz)
Low	904.86	0.0929
Mid	918.86	0.0926
High	924.87	0.0929

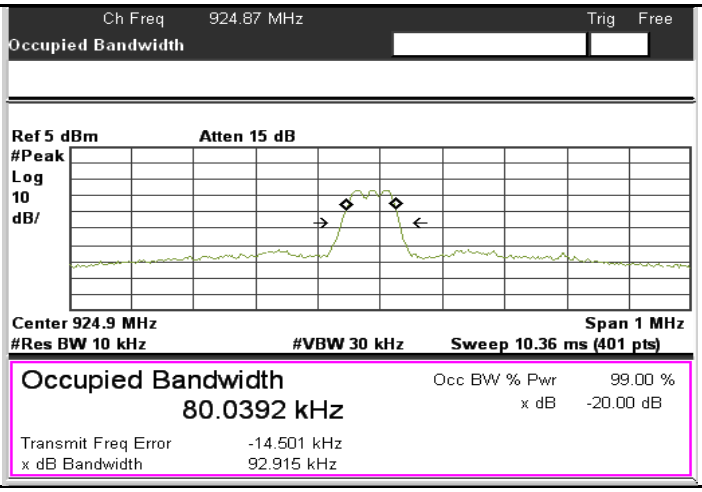
Test Plot ☒ Yes (See below) ☐ N/A



20dB Occupied Bandwidth -Low Channel



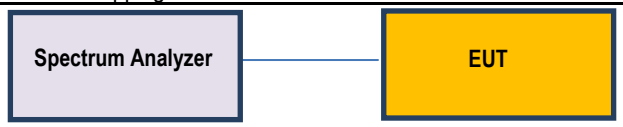
20dB Occupied Bandwidth -Mid Channel



20dB Occupied Bandwidth -High Channel

10.6 Number of Hopping Channel

Requirement(s):

Spec	Requirement	Applicable
47 CFR §15.247 RSS-210 (A8.1)	For frequency hopping systems operating in the 902–928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period; if the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period. The maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz	☐
Test Setup		
Procedure	Number of hopping frequencies procedure 1. The EUT must have its hopping function enabled 2. Span = the frequency band of operation. 3. Resolution (or IF) Bandwidth (RBW) >= 1% of the span. 4. Video (or Average) Bandwidth (VBW) >= RBW. 5. Detector = peak. 6. Sweep time = auto couple. 7. Trace mode = max hold. 8. Allow trace to fully stabilize. 9. Save the plot	

Test Date	N/A	Environmental condition	Temperature N/A Relative Humidity N/A Atmospheric Pressure N/A
Remark	-		
Result	☐ Pass ☐ Fail		

Equipment Setting

TEST	RBW	VBW	SPAN	Detector	SWEEP	Trace	NOTES
Hopping Channel Number	≥1% Span	≥ RBW	-	PK	Auto	Maxhold	-

Test Data ☐ Yes (See below) ☒ N/A

Test Plot ☐ Yes (See below) ☒ N/A

10.7 Time of Occupancy

Requirement(s):

Spec	Requirement	Applicable
47 CFR §15.247 RSS-210 (A8.4)	For frequency hopping systems operating in the 902–928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 2 second period; if the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period.	☒
Test Setup		
Procedure	Channel Separation procedure 1. The EUT must have its hopping function enabled. 2. Span = zero span 3. centered on a hopping channel 4. RBW = 1 MHz; VBW >= RBW 5. Sweep = as necessary to capture the entire dwell time per hopping channel. 6. Detector = Peak. 7. Trace mode = max hold. 8. If possible, use the marker-delta function to determine the dwell time. If this value varies with different modes of operation (e.g., data rate, modulation format, etc.), repeat this test for each variation.	
Test Date	10/17/2013	Environmental condition: Temperature 23°C; Relative Humidity 45%; Atmospheric Pressure 1019mbar
Remark	-	
Result	☒ Pass ☐ Fail	

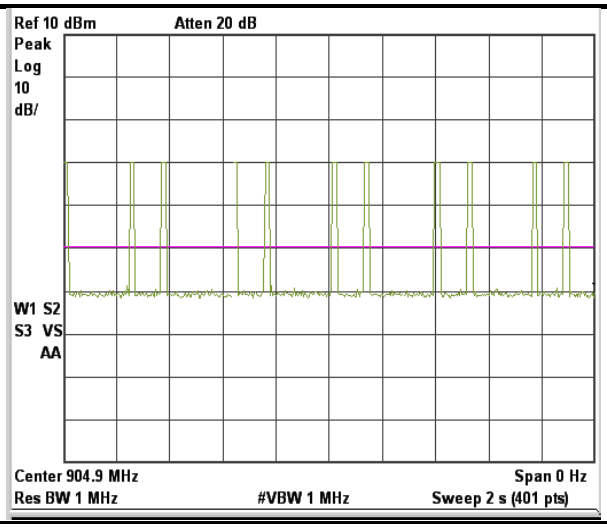
Equipment Setting

TEST	RBW	VBW	SPAN	Detector	SWEEP	Trace	NOTES
Occupied Time	1MHz	≥ RBW	0Hz	PK	-	Maxhold	-

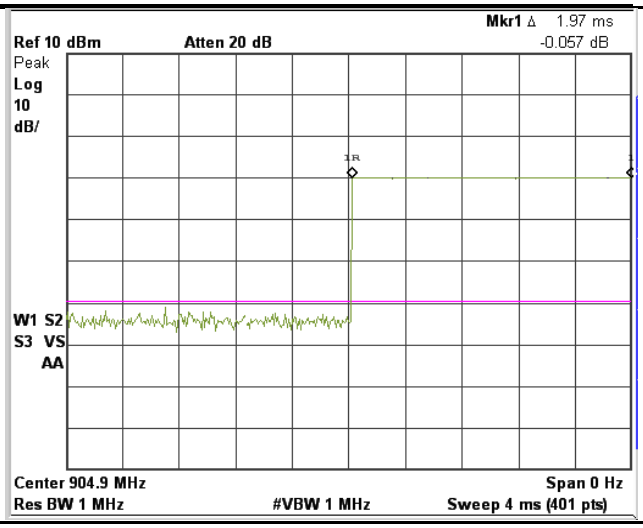
Test Data ☒ Yes (See below) ☐ N/A

Channel	Channel Frequency (MHz)	Dwell Time (Sec)	Limit (Sec)	Pass/Fail
Low	904.86	0.022	0.4	Pass
Mid	918.86	0.022	0.4	Pass
High	924.87	0.022	0.4	Pass

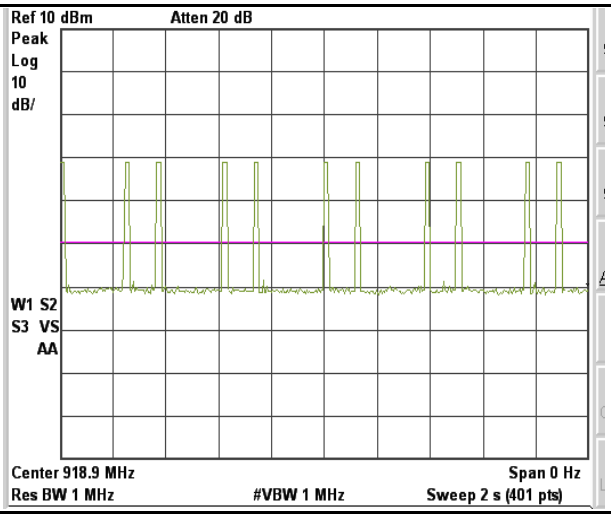
Test Plot ☒ Yes (See below) ☐ N/A



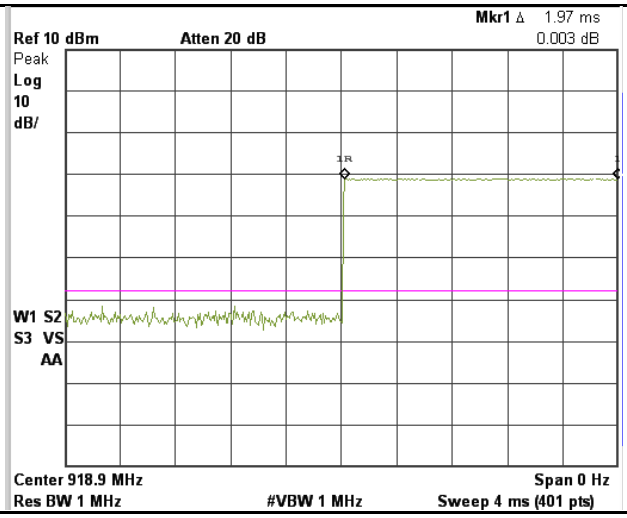
Low Channel (Sweep in 2sec)



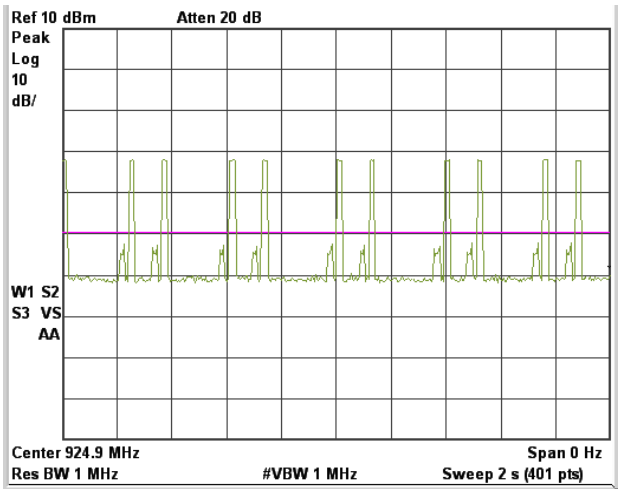
Low Channel (Sweep in 4msec)



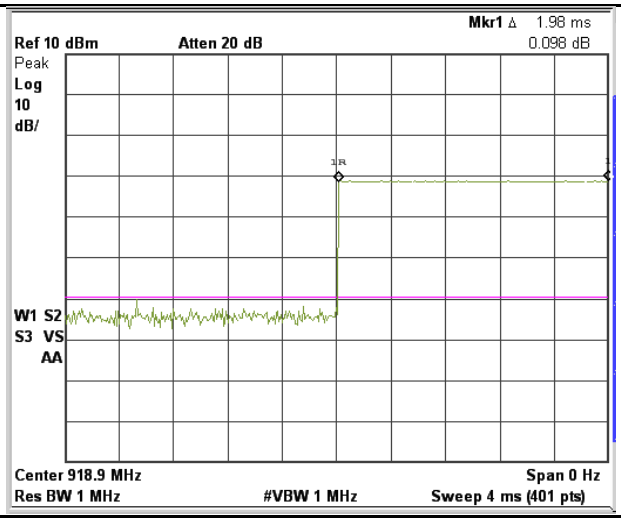
Middle Channel (Sweep in 2sec)



Mid Channel (Sweep in 4msec)



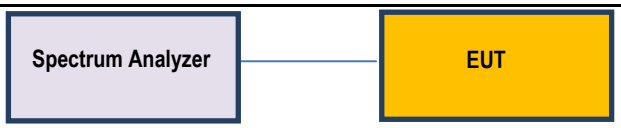
High Channel (Sweep in 2sec)



High Channel (Sweep in 4msec)

10.8 Peak Spectral Density

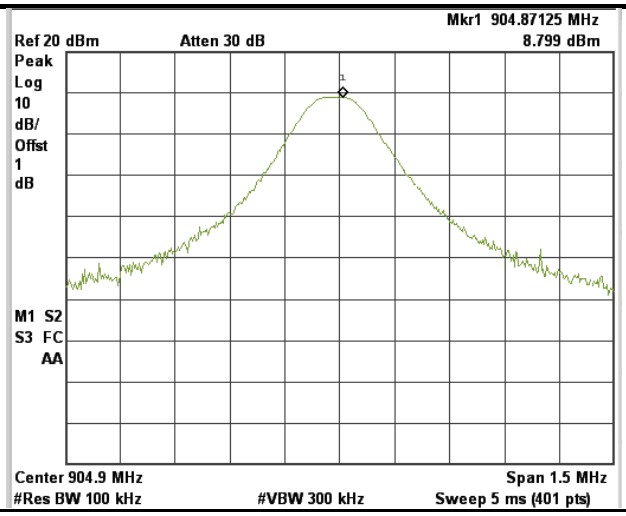
Requirement(s):

Spec	Requirement	Applicable
47 CFR §15.247 RSS-210 (A8.3)	For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission	☒
Test Setup		
Procedure	Peak spectral density measurement procedure - Set analyzer center frequency to DTS channel center frequency. - Set the span to 1.5 times the DTS bandwidth. - Set the RBW to: 3 kHz ≤ RBW ≤ 100 kHz. - Set the VBW ≥ 3 x RBW. - Detector = peak. - Sweep time = auto couple. - Trace mode = max hold. - Allow trace to fully stabilize. - Use the peak marker function to determine the maximum amplitude level within the RBW. - If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.	
Test Date	11/07/2013	Environmental condition: Temperature 23°C; Relative Humidity 45%; Atmospheric Pressure 1019mbar
Remark	-	
Result	☒ Pass ☐ Fail	

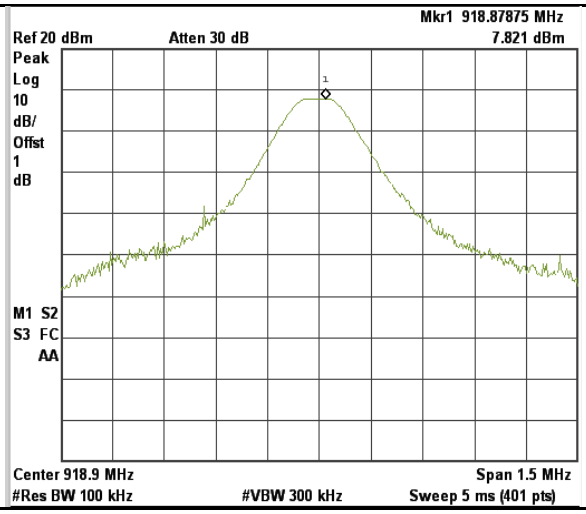
Test Data ☒ Yes (See below) ☐ N/A

Type	Freq (MHz)	CH	Conducted PSD (dBm/100KHz)	Correction Factor	Conducted PSD (dBm/3KHz)	Limit (dBm/100KHz)	Result
Maximum PSD	904.86	Low	8.799	-15.2	-6.401	8	Pass
Maximum PSD	918.86	Mid	7.821	-15.2	-7.379	8	Pass
Maximum PSD	924.87	High	7.362	-15.2	-7.838	8	Pass

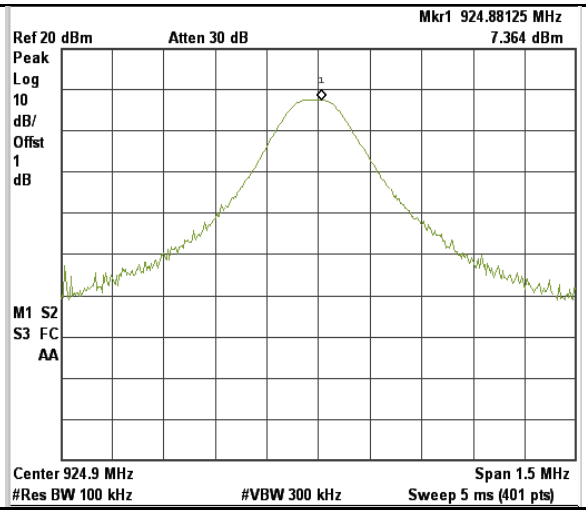
Test Plot ☒ Yes (See below) ☐ N/A



Peak Spectral Density-Low Channel



Peak Spectral Density -Mid Channel



Peak Spectral Density -High Channel

10.9 Peak Output Power

Requirement(s):

Spec	Requirement	Applicable
47 CFR §15.247 (b) RSS-210 (A8.4)	For all other frequency hopping systems in the 902-928 MHz band: 1 Watt. The power is converted from watt to dBm, therefore, 1 watt = 30 dBm.	☒
Test Setup		
Procedure	Maximum output power measurement procedure - Span = approximately 5 times the 20 dB bandwidth, centered on a hopping channel. - RBW > 1% of the 20 dB bandwidth of the emission being measured; - VBW >= RBW. - Detector = peak. - Sweep time = auto couple. - Trace mode = max hold. - Allow trace to fully stabilize. - Use the marker-to-peak function to set the marker to the peak of the emission. The indicated level is the peak output power.	
Test Date	10/17/2013	Environmental condition: Temperature 23°C; Relative Humidity 45%; Atmospheric Pressure 1019mbar
Remark	-	
Result	☒ Pass ☐ Fail	

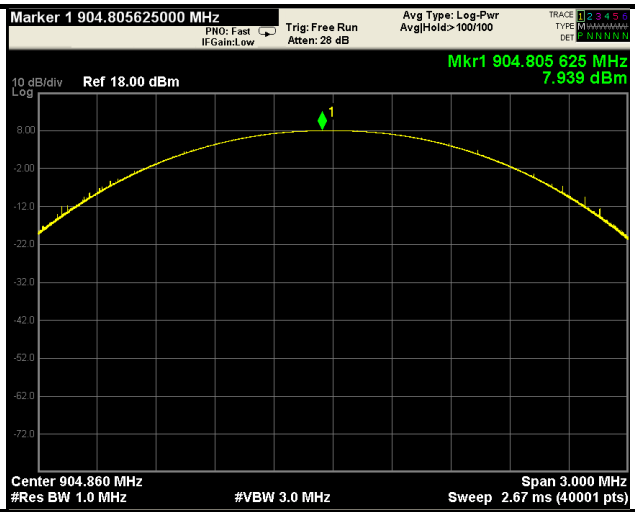
Equipment Setting

TEST	RBW	VBW	SPAN	Detector	SWEEP	Trace	NOTES
PK output power	≥1% 20dB bandwidth	≥ RBW	~ 5 times 20dB bandwidth	Peak	Auto	Maxhold	Including Cable loss and Attenuation

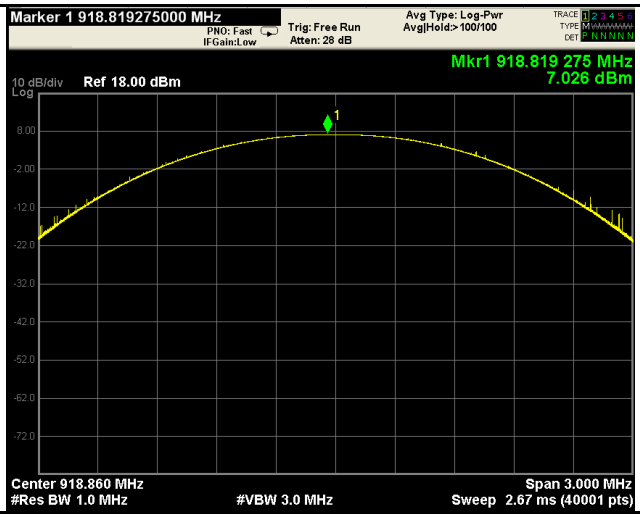
Test Data ☒ Yes (See below) ☐ N/A

Channel	Channel Frequency (MHz)	Measured Output Power (dBm)	Peak Output Power Limit (dBm)
Low	904.86	7.939	30
Mid	918.86	7.026	30
High	924.87	6.584	30

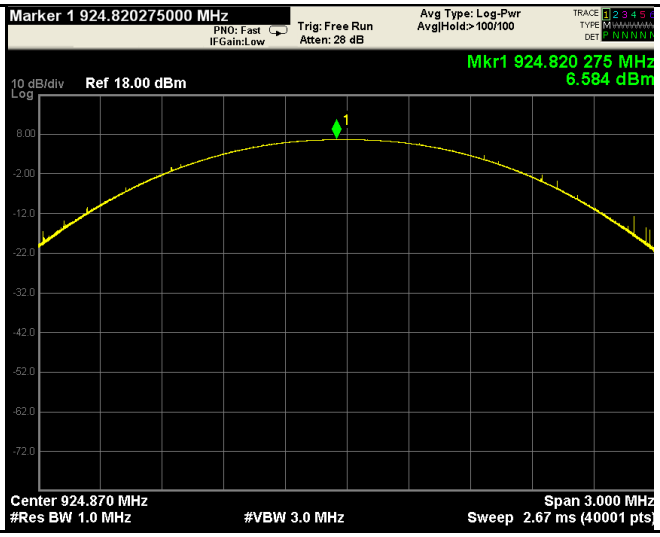
Test Plot ☒ Yes (See below) ☐ N/A



Peak Output Power-Low Channel



Peak Output Power-Mid Channel



Peak Output Power-High Channel

10.10 Radiated Measurement

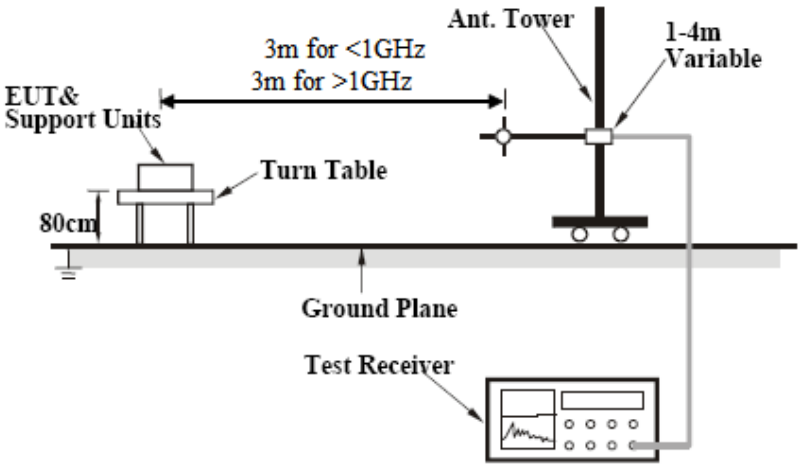
Receiver/Spectrum analyzer setting

TEST	Detector	RBW	VBW	Test Distance	NOTES
Radiated Emission < 1GHz (30MHz – 1GHz)	PK/QP	100 KHz	300 KHz	3m	-
Radiated Emission > 1GHz (1GHz – 40GHz)	PK/AV	1 MHz	3 MHz / 10 Hz	3m	-
Band Edge	PK/AV	1 MHz	3 MHz	3m	-

10.10.1 Radiated Measurement below 1GHz

Requirement(s):

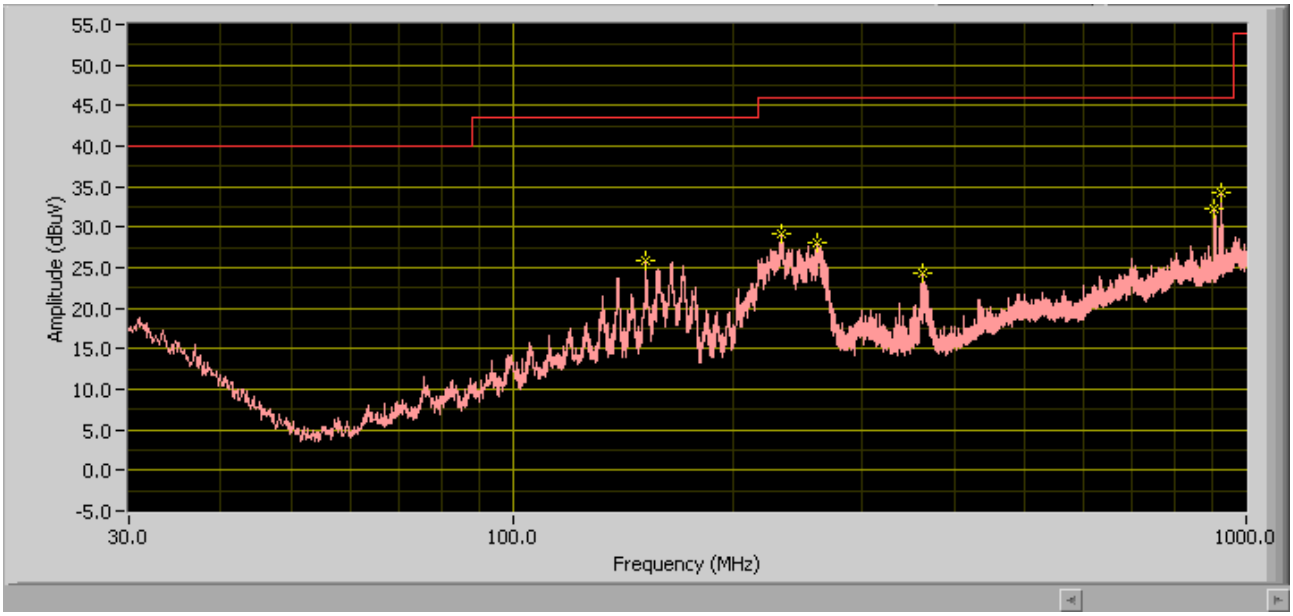
Spec	Item	Requirement	Applicable
§ 15.247(d), RSS210(A8.5)	a)	For non-restricted band, In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall 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(a)	☒

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 characterization. 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 polarization (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.			
Test Date	10/17/2013	Environmental condition	Temperature Relative Humidity Atmospheric Pressure	23°C 45% 1019mbar
Remark	-			
Result	☒ Pass ☐ Fail			

Test Data ☒ Yes (See below) ☐ N/A

Test Plot ☒ Yes (See below) ☐ N/A

Graph-



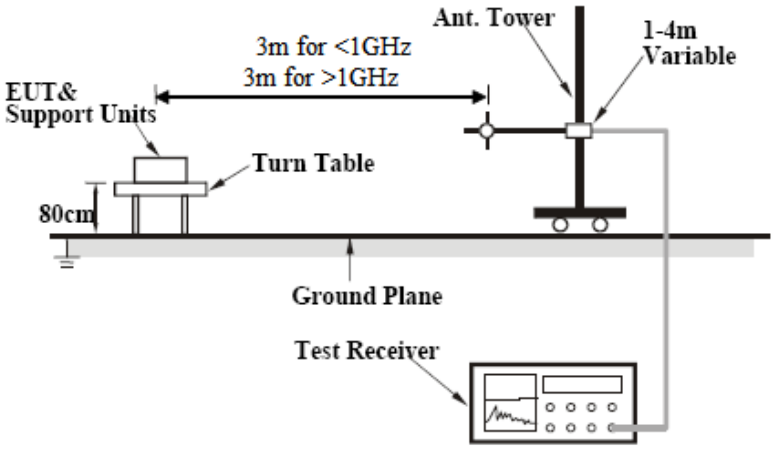
Test Data

Frequency (MHz)	Reading (dBuV)	Azimuth	Polarity (H/V)	Height (cm)	Cable Loss(dB)	Antenna Factor (dB)	Amplifier (dB)	Corrected (dBuV/m)	Limit (dBuV/m)	Margin (dB)
926.27	31.87	137	V	135	5.6	21.7	31.1	27.87	46	-18.12
904.20	31.56	34	V	400	5.5	21.5	31.3	27.26	46	-18.73
362.20	31.068	333	H	395	3.1	14.8	31.7	17.27	46	-28.73
259.38	39.93	267	H	110	2.6	12.0	31.8	24.27	46	-23.27
232.01	43.25	236	H	137	2.5	10.9	31.8	24.81	46	-21.18
152.20	38.89	208	H	208	1.9	12.2	31.9	21.09	43.52	-22.43

10.10.2 Radiated Spurious Emissions > 1GHz

Requirement(s):

Spec	Item	Requirement	Applicable
§ 15.247(d), RSS210(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(a)	☒

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 characterization. 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 polarization (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.			
Test Date	10/17/2013	Environmental condition	Temperature Relative Humidity Atmospheric Pressure	23°C 45% 1019mbar
Remark	-			
Result	☒ Pass ☐ Fail			

Test Data ☒ Yes (See below) ☐ N/A

Test Plot ☐ Yes (See below) ☒ N/A

Radiated Spurious Emissions

Low Channel Continus TX @ 904.86MHz @ 3 Meter

Frequency (MHz)	Direction (degree)	Height (cm)	Polarity (H/V)	Antenna Loss (dB)	Cable Loss (dB)	Amplifier (dB)	Corrected Reading @ 3m (dBuV/m)	15.247 AV Limit @ 3m (dBuV/m)	Margin (dB)	Detector (pk/avg)
1809.77	0	100	V	26.8	1.4	32	49.568	74	-24.432	PK
2706.62	0	100	V	29.4	1.8	32.2	52.624	74	-21.376	PK
3619.45	0	200	H	31.4	2.1	32.4	49.279	74	-24.721	PK
7165.22	0	200	H	35.4	3.6	32.4	58.616	74	-15.384	PK
8531.2	0	300	H	37.8	3.2	32.4	60.117	74	-13.883	PK
8753.27	0	200	H	37.9	3.3	32.4	59.016	74	-14.984	PK
1809.77	265	131	V	26.8	1.4	32	38.555	54	-15.445	AVE
2706.62	283	384	V	29.4	1.8	32.2	41.644	54	-12.356	AVE
3619.45	190	210	H	31.4	2.1	32.4	41.774	54	-12.226	AVE
7165.22	25	281	H	32.2	2.5	32.5	40.283	54	-13.717	AVE
8531.2	81	106	H	37.8	3.2	32.4	50.384	54	-3.616	AVE
8753.27	317	239	H	37.9	3.3	32.4	49.933	54	-4.067	AVE
Remark	Emission was scanned up to 25GHz; no emissions were detected above the noise floor which was at least 20dB below the specification limit. If the emission PK level is within Average limit, then the maximization and average measurement are not performed; both horizontal and vertical polarization had been verified.									

Mid Channel Continus TX @ 918.86MHz @ 3 Meter

Frequency (MHz)	Direction (degree)	Height (cm)	Polarity (H/V)	Antenna Loss (dB)	Cable Loss (dB)	Amplifier (dB)	Corrected Reading @ 3m (dBuV/m)	15.247 AV Limit @ 3m (dBuV/m)	Margin (dB)	Detector (pk/avg)
1837.67	0	200	V	26.9	1.4	32	35.071	74	-38.929	PK
2756.57	0	200	H	29.6	1.8	32.2	51.295	74	-22.705	PK
3675.475	0	100	V	31.6	2.1	32.4	49.563	74	-24.437	PK
7170.62	0	300	H	35.4	3.6	32.4	58.077	74	-15.923	PK
8527.6	0	300	V	37.8	3.2	32.4	58.03	74	-15.97	PK
8779.15	0	100	H	37.9	3.3	32.4	57.878	74	-16.122	PK
1837.67	254	215	V	26.9	1.4	32	33.699	54	-20.301	AVE
2756.57	156	149	H	29.6	1.8	32.2	40.519	54	-13.481	AVE
3675.47	160	286	V	31.6	2.1	32.4	41.684	54	-12.316	AVE
7170.625	99	167	H	35.4	3.6	32.4	48.433	54	-5.567	AVE
8527.6	303	335	V	37.8	3.2	32.4	50.19	54	-3.81	AVE
8779.15	117	400	H	37.9	3.3	32.4	49.878	54	-4.122	AVE
Remark	Emission was scanned up to 25GHz; no emissions were detected above the noise floor which was at least 20dB below the specification limit. If the emission PK level is within Average limit, then the maximization and average measurement are not performed; both horizontal and vertical polarization had been verified.									

High Channel Continus TX @ 9.87MHz @ 3 Meter

Frequency (MHz)	Direction (degree)	Height (cm)	Polarity (H/V)	Antenna Loss (dB)	Cable Loss (dB)	Amplifier (dB)	Corrected Reading @ 3m (dBuV/m)	15.247 AV Limit @ 3m (dBuV/m)	Margin (dB)	Detector (pk/avg)
1849.82	0	100	V	27	1.4	32	42.054	74	-31.946	PK
2774.56	0	300	V	29.6	1.8	32.2	47.799	74	-26.201	PK
3699.53	0	200	H	31.6	2.2	32.4	49.76	74	-24.24	PK
5549.21	0	100	V	33.4	2.7	32.5	58.279	74	-15.721	PK
8536.12	0	300	H	37.8	3.2	32.4	58.78	74	-15.22	PK
8779.12	0	100	H	37.9	3.3	32.4	58.354	74	-15.646	PK
1849.82	252	103	V	27	1.4	32	35.557	54	-18.443	AVE
2774.56	278	211	V	29.6	1.8	32.2	40.046	54	-13.954	AVE
3699.53	237	114	H	31.6	2.2	32.4	42.232	54	-11.768	AVE
5549.21	54	103	V	33.4	2.7	32.5	47.838	54	-6.162	AVE
8536.12	175	117	H	37.8	3.2	32.4	50.317	54	-3.683	AVE
8779.12	163	104	H	37.9	3.3	32.4	50.031	54	-3.969	AVE
Remark	Emission was scanned up to 25GHz; no emissions were detected above the noise floor which was at least 20dB below the specification limit. If the emission PK level is within Average limit, then the maximization and average measurement are not performed.; both horizontal and vertical polarization had been verified.									

Band Edge – Hopping Mode

902MHz-928MHz @ 3 Meter

Frequency (MHz)	Direction (degree)	Height (cm)	Polarity (H/V)	Antenna Loss (dB)	Cable Loss (dB)	Amplifier (dB)	Corrected Reading @ 3m (dBuV/m)	15.247 Limit @ 3m (dBuV/m)	Margin (dBuV/m)	Detector (pk/avg)
904.86 (Fundamental)	0	200	H	21.5	4.7	25.5	84.97	-	-	PK
902	0	400	V	21.5	4.7	25.5	28.773	-	-	PK
902	139	351	V	21.5	4.7	25.5	28.35	46	-17.65	QP
924.87 (Fundamental)	0	200	H	21.7	4.7	25.4	89.043	-	-	PK
928	0	200	H	21.7	4.8	25.4	33.34	-	-	PK
928	329	400	H	21.7	4.8	25.4	26.977	46	-19.02	QP
Remark	Both horizontal and vertical polarization had been verified. Both hopping mode and single channel continuous transmit mode had been verified.									

Band Edge – Continus TX at Low & High Channel

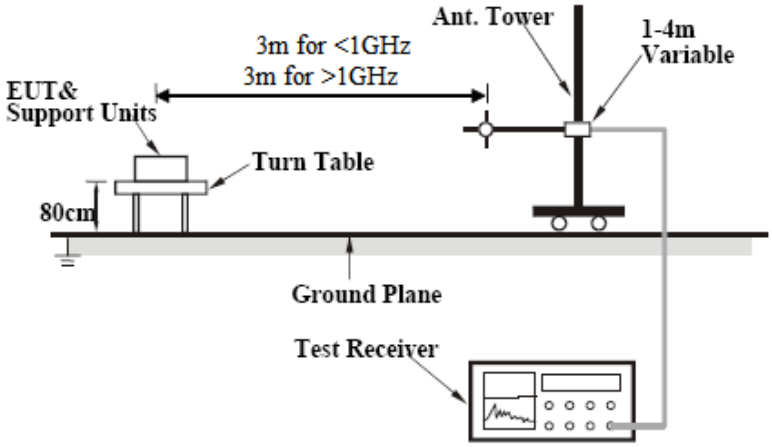
902MHz-928MHz @ 3 Meter

Frequency (MHz)	Direction (degree)	Height (cm)	Polarity (H/V)	Antenna Loss (dB)	Cable Loss (dB)	Amplifier (dB)	Corrected Reading @ 3m (dBuV/m)	15.247 Limit @ 3m (dBuV/m)	Margin (dBuV/m)	Detector (pk/avg)
904.86 (Fundamental)	0	100	V	21.5	4.7	25.5	67.59	-	-	PK
902	0	100	H	21.5	4.7	25.5	27.87	-	-	PK
902	296	356	H	21.5	4.7	25.5	26.28	46	-19.72	QP
924.87 (Fundamental)	0	200	V	21.7	4.7	25.4	61.87	-	-	PK
928	0	200	V	21.7	4.8	25.4	27.54	-	-	PK
928	90	208	V	21.7	4.8	25.4	24.85	46	-21.15	QP
Remark	Both horizontal and vertical polarization had been verified. Both hopping mode and single channel continuous transmit mode had been verified.									

10.10.3 Receiver Spurious Emissions

Requirement(s):

Spec	Item	Requirement	Applicable
§ 15.247(d), RSS210(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(a)	☒

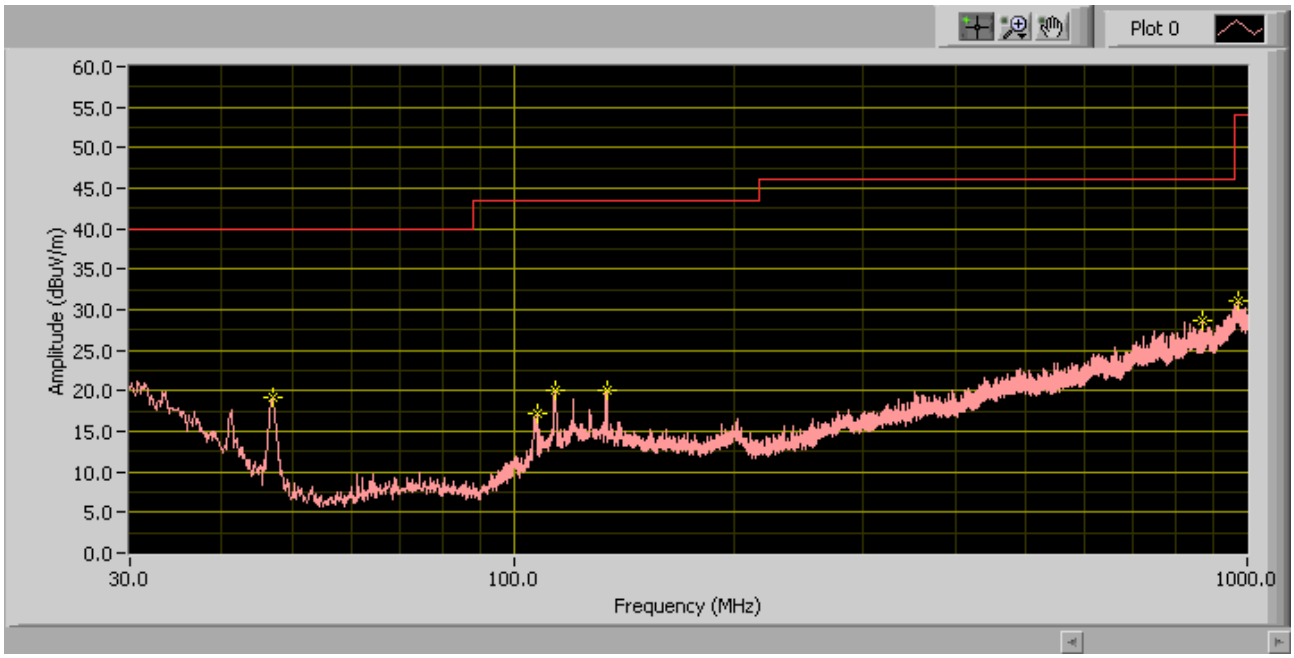
Test Setup				
Procedure	1. The EUT was switched on and allowed to warm up to its normal operating condition. 2. The test was carried out at the selected frequency points obtained from the EUT characterisation. Maximization of the emissions, was carried out by rotating the EUT, changing the antenna polarization, 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.			
Test Date	10/17/2013	Environmental condition	Temperature Relative Humidity Atmospheric Pressure	23°C 45% 1019mbar
Remark	-			
Result	☒ Pass ☐ Fail			

Test Data ☒ Yes (See below) ☐ N/A

Test Plot ☒ Yes (See below) ☐ N/A

Note: For above 1 GHz only noise floor was detected.

Receiver Spurious Emissions Below 1 GHz



Test Data

Frequency (MHz)	Reading (dBuV)	Azimuth (degree)	Polarity	Height (cm)	Antenna Factor	Cable Loss	Amplifier	Corrected (dBuV/m)	Limit (dBuV/m)	Margin (dB)
972.1626	31.54603	297	H	400	22.9	5.7	27.5	32.64603	54	-21.354
133.9635	30.63072	170	V	111	13.8	1.8	28.8	17.43072	43.52	-26.0893
107.8047	30.52524	95	V	111	12.2	1.5	29	15.22524	43.52	-28.2948
47.00348	33.14809	241	V	160	9.2	0.8	29.2	13.94809	40	-26.0519
869.4367	31.92584	0	H	257	21.2	5.4	28.7	29.82584	46	-16.1742
114.1176	30.73905	190	V	100	13.3	1.6	29	16.63905	43.52	-26.8809

Annex A. TEST INSTRUMENT

Instrument	Model	Serial #	Cal Date	Cal Cycle	Cal Due	In use
Conducted Emissions						
R & S Receiver	ESIB 40	100179	04/20/2013	1 Year	04/20/2014	☑
R&S LISN	ESH2-Z5	861741/013	05/18/2013	1 Year	05/18/2014	☑
CHASE LISN	MN2050B	1018	07/24/2013	1 Year	07/24/2014	☑
Sekonic Hygro Hermograph	ST-50	HE01-000092	05/25/2013	1 Year	05/25/2014	☑
Radiated Emissions						
R & S Receiver	ESL6	100178	03/01/2013	1 Year	03/01/2014	☑
R & S Receiver	ESIB 40	100179	04/20/2013	1 Year	04/20/2014	☐
Bi-Log antenna (30MHz~2GHz)	JB1	A030702	02/09/2013	1 Year	02/09/2014	☑
Horn Antenna (1-26.5GHz)	3115	10SL0059	04/26/2013	1 Year	04/26/2014	☑
Horn Antenna (18-40 GHz)	AH-840	101013	04/23/2013	1 Year	04/23/2014	☐
Pre-Amplifier (1-26.5GHz)	8449B	3008A00715	05/30/2013	1 Year	05/30/2014	☑
Microwave Preamplifier (18-40 GHz)	PA-840	181251	05/30/2013	1 Year	05/30/2014	☑
10 Meters SAC	10M	N/A	06/05/2013	1 Year	06/05/2014	☑
Power Analyzer	PACS-1	72394	5/19/2013	1 Year	05/19/2014	☐
Sekonic Hygro Hermograph	ST-50	HE01-000092	05/25/2013	1 Year	05/25/2014	☑
Spectrum Analyzer	N9010A	MY50210206	05/30/2013	1 Year	05/30/2014	☑

Annex B. USER MANUAL, BLOCK & CIRCUIT DIAGRAM

Please see attachment

Annex C. 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
HongKong 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

This page has been left blank intentionally.