

# Synapse Strategic Product Development LLC MB-R1G1

FCC 15.247:2012

Report #: SYNA0080 Rev 01



Report Prepared By Northwest EMC Inc.

NORTHWEST EMC - (888) 364-2378 - www.nwemc.com

California – Minnesota – Oregon – New York – Washington



**CERTIFICATE OF TEST** 

## Last Date of Test: June 14, 2012 Synapse Strategic Product Development LLC Model: MB-R1G1

Emissions						
Test Description	Specification	Test Method	Pass/Fail			
Duty Cycle – Direct Connect	FCC 15.247:2012	ANSI C63.10:2009	Pass			
Occupied Bandwidth	FCC 15.247:2012	ANSI C63.10:2009	Pass			
Output Power	FCC 15.247:2012	ANSI C63.10:2009	Pass			
Band Edge Compliance	FCC 15.247:2012	ANSI C63.10:2009	Pass			
Spurious Conducted Emissions	FCC 15.247:2012	ANSI C63.10:2009	Pass			
Power Spectral Density	FCC 15.247:2012	ANSI C63.10:2009	Pass			
Spurious Radiated Emissions	FCC 15.247:2012	ANSI C63.10:2009	Pass			

### **Deviations From Test Standards**

None

### Approved By:

Tim O'Shea, Operations Manager

NVLAP Lab Code: 200630-0

### **Test Facility**

The measurement facility used to collect the data is located at:

Northwest EMC, Inc. 22975 NW Evergreen Parkway, Suite 400 Hillsboro, OR 97124

Phone: (503) 844-4066 Fax: 844-3826

This site has been fully described in a report filed with and accepted by the FCC (Federal Communications Commission) and Industry Canada (Site filing #2834D-1).

This report must not be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government of the United States of America.

Product compliance is the responsibility of the client, therefore the tests and equipment modes of operation represented in this report were agreed upon by the client, prior to testing. This Report may only be duplicated in its entirety. The results of this test pertain only to the sample(s) tested. The specific description is noted in each of the individual sections of the test report supporting this certificate of test.



Revision Number	Description	Date	Page Number
01	Correct model name of Base Station	10/1/12	7



### **United States**

FCC - Designated by the FCC as a Telecommunications Certification Body (TCB). Certification chambers, Open Area Test Sites, and conducted measurement facilities are listed with the FCC.

**A2LA** - Accredited by A2LA to ISO / IEC Guide 65 as a product certifier. This allows Northwest EMC to certify transmitters to FCC and IC specifications.

NVLAP - Each laboratory is accredited by NVLAP to ISO 17025

### Canada

IC - Recognized by Industry Canada as a Certification Body (CB). Certification chambers and Open Area Test Sites are filed with IC.

### **European Union**

**European Commission** – Validated by the European Commission as a Conformity Assessment Body (CAB) under the EMC directive and as a Notified Body under the R&TTE Directive.

### Australia/New Zealand

ACMA - Recognized by ACMA as a CAB for the acceptance of test data.

### Korea

KCC / RRA - Recognized by KCC's RRA as a CAB for the acceptance of test data.

### Japan

VCCI - Associate Member of the VCCI. Conducted and radiated measurement facilities are registered.

### Taiwan

BSMI – Recognized by BSMI as a CAB for the acceptance of test data.

NCC - Recognized by NCC as a CAB for the acceptance of test data.

### Singapore

**IDA** – Recognized by IDA as a CAB for the acceptance of test data.

### Hong Kong

OFTA - Recognized by OFTA as a CAB for the acceptance of test data.

### Vietnam

MIC – Recognized by MIC as a CAB for the acceptance of test data.

### Russia

**GOST** – Accredited by Certinform VNIINMASH, CERTINFO, SAMTES, and Federal CHEC to perform EMC and Hygienic testing for Information Technology products to GOST standards.

# SCOPE

For details on the Scopes of our Accreditations, please visit: http://www.nwemc.com/accreditations/



# LOCATIONS



<b>Oregon</b> Labs EV01-EV12 22975 NW Evergreen Pkwy, #400 Hillsboro, OR 97124 (503) 844-4066	Evergreen Pkwy, #40041 Tesla4939 JordDR 97124Irvine, CA 9261813060		Minnesota Labs MN01-MN08 9349 W Broadway Ave. Brooklyn Park, MN 55445 (763) 425-2281	Washington Labs SU01-SU07 14128 339 <sup>th</sup> Ave. SE Sultan, WA 98294 (360) 793-8675	
VCCI					
EV01: C-1071, R-1025, G-84 EV07: C-2687, T-1658 EV11: R-2318 OC06: C-2766, T-1659 OC07: G-548 OC08: R-1943, G-85 OC10: A-0029			MN03: C-3464, T-1634 MN04: R-3125 MN05: G-141	SU01: C-3265, T-1511 SU02: R-871, G-83	
Industry Canada					
2834D-1, 2834D-2	2834B-1, 2834B-2, 2834B-3		2834E-1	2834C-1	









# **PRODUCT DESCRIPTION**

## **Client and Equipment Under Test (EUT) Information**

Company Name:	Synapse Strategic Product Development LLC
Address:	1511 6th Ave. 4th Floor
City, State, Zip:	Seattle, WA 98101
Test Requested By:	Bert Buxton
Model:	MB-R1G1
First Date of Test:	June 13, 2012
Last Date of Test:	June 14, 2012
Receipt Date of Samples:	June 13, 2012
Equipment Design Stage:	Preproduction
Equipment Condition:	No Damage

## Information Provided by the Party Requesting the Test

### Functional Description of the EUT (Equipment Under Test):

2.4 GHz ISM Radio

# **Testing Objective:**

To demonstrate compliance to FCC 15.247 requirements.



# CONFIGURATIONS

# Configuration 1 SYNA0080

Software/Firmware Running during test			
Description	Version		
Band	0.60P		
Base Station	mfg.12		

EUT					
Description		Model/Part Number	Serial Number		
Identity Band - direct connect	Synapse Strategic Product Development LLC	MB-R1G1	2501L1 / 00 00 1f 40 78		

Remote Equipment Outside of Test Setup Boundary				
Description	Manufacturer	Model/Part Number	Serial Number	
Base Station	Synapse Strategic Product Development LLC	tx100	SN08	

# Configuration 2 SYNA0080

Software/Firmware Running during test			
Description	Version		
Band	0.60P		
Base Station	mfg.12		

EUT					
Description	Manufacturer	Model/Part Number	Serial Number		
Identity Band - radiated	Synapse Strategic Product Development LLC	MB-R1G1	2503Q0 / 00 00 1f 42 7e		

Remote Equipment Outside of Test Setup Boundary				
Description	Manufacturer	Model/Part Number	Serial Number	
Base Station	Synapse Strategic Product Development LLC	tx100	SN08	



# **MODIFICATIONS**

# **Equipment Modifications**

Item	Date	Test	Modification	Note	Disposition of EUT
		Occupied	Tested as	No EMI suppression	EUT remained at
1	6/13/2012	Bandwidth	delivered to	devices were added or	Northwest EMC
		Banawiaan	Test Station.	modified during this test.	following the test.
		Output	Tested as	No EMI suppression	EUT remained at
2	6/13/2012	Power	delivered to	devices were added or	Northwest EMC
		TOWER	Test Station.	modified during this test.	following the test.
		Spurious	Tested as	No EMI suppression	EUT remained at
3	6/13/2012	Conducted	delivered to	devices were added or	Northwest EMC
		Emissions	Test Station.	modified during this test.	following the test.
		Power	Tested as	No EMI suppression	EUT remained at
4	6/13/2012	Spectral	delivered to	devices were added or	Northwest EMC
		Density	Test Station.	modified during this test.	following the test.
		Band Edge	Tested as	No EMI suppression	EUT remained at
5	6/13/2012	Compliance	delivered to	devices were added or	Northwest EMC
		Compliance	Test Station.	modified during this test.	following the test.
		Duty Cycle –	Tested as	No EMI suppression	EUT remained at
6	6/13/2012	Direct	delivered to	devices were added or	Northwest EMC
		Connect	Test Station.	modified during this test.	following the test.
		Spurious	Tested as	No EMI suppression	Schodulod testing
7	6/14/2012	Radiated	delivered to	devices were added or	Scheduled testing
		Emissions	Test Station.	modified during this test.	was completed.

# **Duty Cycle - Direct Connect**

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

### **TEST EQUIPMENT**

Description	Manufacturer	Model	ID	Last Cal.	Interval
Spectrum Analyzer	Agilent	E4440A	AFD	7/5/2011	12
40GHz DC Block	Miteq	DCB4000	AMD	8/12/2011	12
Attenuator 20 dB, SMA M/F 26GHz	S.M. Electronics	SA26B-20	AUY	8/2/2011	12
EV06 Direct Connect Cable	ESM Cable Corp.	ТТ	ECA	NCR	0
Power Meter	Gigatronics	8651A	SPM	1/9/2012	24
Power Sensor	Gigatronics	80701A	SPL	7/8/2011	24
MXG Vector Signal Generator	Agilent	N5182A	TIF	NCR	0

### **MEASUREMENT UNCERTAINTY**

A measurement uncertainty estimation has been performed for each test per our internal quality document WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty for radiated emissions measurements is less than +/- 4 dB, and for conducted emissions measurements is less than +/- 2.7 dB. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for measurement uncertainty are available upon request.

### **TEST DESCRIPTION**

The Duty Cycle (x) were measured for each of the EUT operating modes. The measurements were made using a zero span on the spectrum analyzer to see the pulses in the time domain. The transmit power was set to its default maximum. A direct connection was made between the RF output of the EUT and a spectrum analyzer. Attenuation and a DC block were used

The duty cycle was calculated by dividing the transmission pulse duration (T) by the total period of a single on and total off time.

If the transmit duty cycle < 98 percent, burst gating may have been used during some of the other tests in this report to only measure during the burst duration.



EUT: MB-R1G1			Work Order:	SYNA0080
Serial Number: 2501L1 / 00 00 1F 40 78			Date:	06/13/12
Customer: Synapse Strategic Product Development LLC			Temperature:	23°C
Attendees: Skip Kaczynski			Humidity:	
Project: None			Barometric Pres.:	1021.8
Tested by: Rod Peloquin	Power:	Battery	Job Site:	EV06
TEST SPECIFICATIONS		Test Method		
FCC 15.247:2012		ANSI C63.10:2009		
COMMENTS				
Transmitting in 4ms bursts in duty cycle for direct connect testing				

### DEVIATIONS FROM TEST STANDARD

None									
Configuration #	1	Signature	Roly to	Reling					
				Pulse Width	Period	Number of Pulses	Value (%)	Limit	Result
FSK Modulation									
	Low Channel, 2401 MHz			4.168 mS	8.833 mS	1	47.2	N/A	N/A
	Low Channel, 2401 MHz			N/A	N/A	5	N/A	N/A	N/A
	Mid Channel, 2450 MHz			4.168 mS	8.833 mS	1	47.2	N/A	N/A
	Mid Channel, 2450 MHz			N/A	N/A	5	N/A	N/A	N/A
	High Channel, 2476 MHz			4.168 mS	8.833 mS	1	47.2	N/A	N/A
	High Channel, 2476 MHz			N/A	N/A	5	N/A	N/A	N/A



# Duty Cycle - Direct Connect

			ation, Low Channel, Number of	Value		
	Pulse Width	Period	Pulses	(%)	Limit	Result
	4.168 mS	8.833 mS	1	47.2	N/A	N/A
🔆 Agilent 10	0:05:42 Jun 13	, 2012			RT	
Northwest EMC	, Inc					Mkr3 9.826 r
Ref 2 dBm		#Atten 10 d	ΙB			–11.78 dBi
#Peak			2			
Log 1			Ŷ			
5 🔶 🔶	•				<mark>_</mark>	
dB/					•	
Offst						
21.8						
dB						
#LgAv						
W1 S2 /						
Center 2.401						Span 0 H
Res BW 1 MHz			#VBW 30 kHz_		Sweep 13.0	)6 ms (2000 pts
	race Туре		Axis		litude	
	(1) Time (1) Time		93.1 μs .161 ms		18 dBm 11 dBm	
	(1) Time		.161 ms .826 ms		'8 dBm	
	,					

		FSK Modula	tion, Low Chanr				
	Desta a Milatel	Device 4	Number of	Value	1 June 14	Desult	
	Pulse Width N/A	Period N/A	Pulses 5	(%) N/A	Limit N/A	Result N/A	
			5	IN/A		IN/A	
	10:05:56 Jun 13,	2012			RT		
Northwest EM	1C, Inc						
Ref 2 dBm		#Atten 10 d	B				
#Peak							
Log 5							
dB/							1
057 0ffet							
0ffst 21.8 dB							
dB							
#LgAv							4
W1 S2			<b>├</b>				
S3 VS							
<b>£</b> (f):							
FTun							
Center 2.401	. 000 GHz					Span 0 Hz	z
Res BW 1 MH			#VBW 30 kH;	2	Sweep 39.85	ms (2000 pts)	ļ



# Duty Cycle - Direct Connect

		1 Ort Module	ation, Mid Channel Number of	Value			
	Pulse Width	Period	Pulses	(%)	Limit	Result	
	4.168 mS	8.833 mS	1	47.2	N/A	N/A	
🔆 Agilent 10:	40:07 Jun 13	, 2012			RT		
Northwest EMC,	Inc					Mkr3 9.	.826 m
Ref 3 dBm		#Atten 10 d	зB				5 dBm
#Peak			2 Ø				
Log 1 5 Ø			<b>^</b>				·······
					<sup>3</sup>		
dB/							
Offst							
21.8 dB							
αD							
#LgAv							
#L9HV							
W1 S2							
Center 2.450 00	00 GHz	I	<u> </u>	I		Spa	n 0 Hz
Res BW 1 MHz			₩VBW 30 kHz		Sweep 13.	06 ms (200	
Marker Tra	се Туре		Axis	Amp	olitude		-   /
1 (1			93 <b>.</b> 1 µs		15 dBm		
2 (1 3 (1			.161 ms .826 ms		34 dBm 45 dBm		
3 (1	/ 11111/2		.020 ms				

		FSK Modula	tion, Mid Chanr Number of	el, 2450 M Val				
	Pulse Width	Period	Pulses	(%	6)	Limit		Result
	N/A	N/A	5	N/	/A	N/A		N/A
🔆 Agilent 10		2012				RΤ		
Northwest EMC,		~ · · ·	_					
Ref3dBm #Peak [	#	Atten 10 d	B					
5								
dB/								
0ffst								
21.8 dB								
				_			_	
#L @Out								
#LgAv								
W1 S2						1		
W1 S2 S3 VS								
<b>A</b> (D)								
£(f): F⊤un								
Center 2.450 0	00 GHz							Span 0 Hz
Res BW 1 MHz_			⊭VBW 30 kH:	Z		_Sweep 3	9.85 ms	(2000 pts)



# Duty Cycle - Direct Connect

			Number of	Value			
	Pulse Width	Period	Pulses	(%)	Limit	t I	Result
	4.168 mS	8.833 mS	1	47.2	N/A		N/A
🔆 Agilent 10:	:52:55 Jun 13	3,2012			RT		
Northwest EMC,	Inc					Mkr	3 9.826 m
Ref 3 dBm		#Atten 10 🛛	dB				-7.60 dBm
#Peak			2 0				
Log 1			Î –		3		
5							
dB/							
Offst							
21.8 dB							
#LgAv							
*L'GITO							
W1 S2							
Center 2.476 0	00 GHz						Span 0 Hz
Res BW 1 MHz			₩VBW 30 kHz		Sweep :	13.06 ms	(2000 pts)
Marker Tra			Axis		olitude		
			193.1 µs .161 ms		33 dBm 37 dBm		
			.161 ms 1.826 ms		or abm 50 dBm		

				ition, High Chani Number of	Value		
		Pulse Width N/A	Period N/A	Pulses 5	(%)	Limit N/A	Result N/A
siz a				5	IN/A	R T	N/A
	<mark>gilent</mark> 10:5 est EMC, I		2012			RI	
Ref 3 d			Atten 10 d	1R			
#Peak							
Log							
5							
dB/ Offst							
21.8 dB							
dB							
#LgAv							
"Lgriv							
W1 S2 S3 VS							
S3 VS							
<b>6</b> /(0)							
€(f): FTun							
i i un							
	2.476 00	0 GHz					Span 0 Hz
Res BW	1 MHz			#VBW 30 kH:			5 ms (2000 pts)

# **OCCUPIED BANDWIDTH**

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

### **TEST EQUIPMENT**

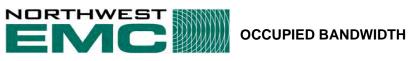
Description	Manufacturer	Model	ID	Last Cal.	Interval
Spectrum Analyzer	Agilent	E4440A	AFD	7/5/2011	12
40GHz DC Block	Miteq	DCB4000	AMD	8/12/2011	12
Attenuator 20 dB, SMA M/F 26GHz	S.M. Electronics	SA26B-20	AUY	8/2/2011	12
EV06 Direct Connect Cable	ESM Cable Corp.	ТТ	ECA	NCR	0
Power Meter	Gigatronics	8651A	SPM	1/9/2012	24
Power Sensor	Gigatronics	80701A	SPL	7/8/2011	24
MXG Vector Signal Generator	Agilent	N5182A	TIF	NCR	0

### **MEASUREMENT UNCERTAINTY**

A measurement uncertainty estimation has been performed for each test per our internal quality document WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty for radiated emissions measurements is less than +/- 4 dB, and for conducted emissions measurements is less than +/- 2.7 dB. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for measurement uncertainty are available upon request.

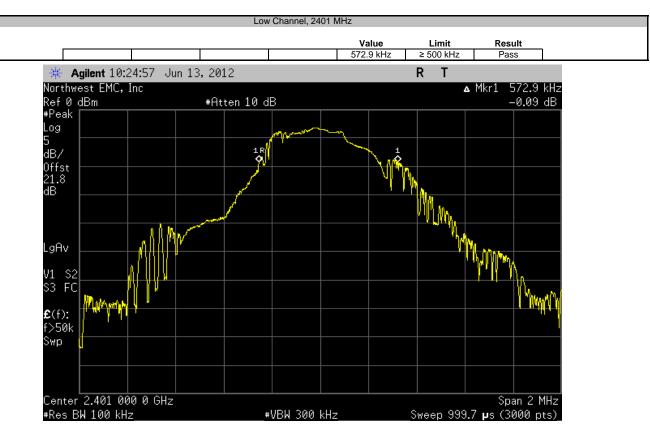
### **TEST DESCRIPTION**

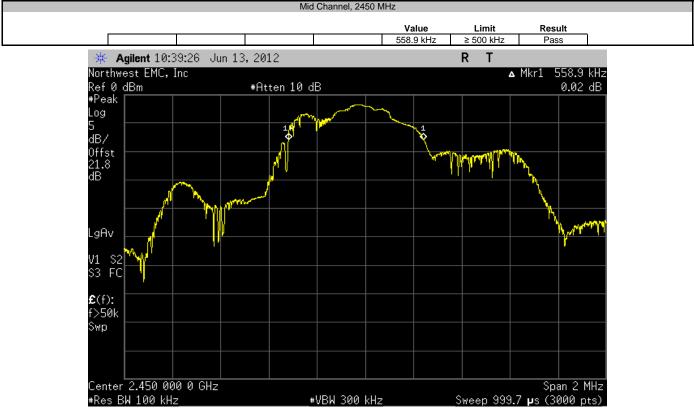
The occupied bandwidth was measured with the EUT set to low, medium and high transmit frequencies. The measurement was made using a direct connection between the RF output of the EUT and the spectrum analyzer. The EUT was transmitting at the data rate(s) listed in the datasheet.



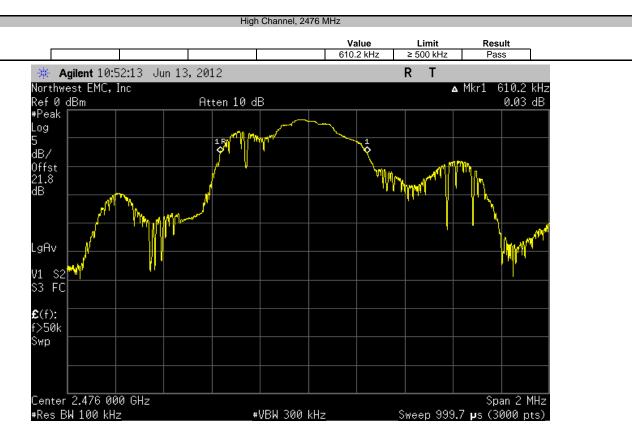
EUT:	MB-R1G1		Work Order:	SYNA0080	
Serial Number:	2501L1 / 00 00 1F 40 78		Date:	06/13/12	
Customer:	Synapse Strategic Product Development LLC		Temperature:	23°C	
Attendees:	Skip Kaczynski		Humidity:	41%	
Project:	None		Barometric Pres.:	1021.8	
Tested by:	Rod Peloquin	Power: Battery	Job Site:	EV06	
TEST SPECIFICATI	ONS	Test Method	•		
FCC 15.247:2012		ANSI C63.10:2009			
COMMENTS					
,	s bursts at 47.2 % duty cycle. See Duty Cycle module elsewhere				
None					
Configuration #	1 Signature	chy te Reling			
			Value	Limit	Result
Low Channel, 2401	MHz		572.9 kHz	≥ 500 kHz	Pass
Mid Channel, 2450 M	MHz		558.9 kHz	≥ 500 kHz	Pass
High Channel, 2476	MHz		610.2 kHz	≥ 500 kHz	Pass











# **Output Power**

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

### **TEST EQUIPMENT**

Description	Manufacturer	Model	ID	Last Cal.	Interval
Spectrum Analyzer	Agilent	E4440A	AFD	7/5/2011	12
40GHz DC Block	Miteq	DCB4000	AMD	8/12/2011	12
Attenuator 20 dB, SMA M/F 26GHz	S.M. Electronics	SA26B-20	AUY	8/2/2011	12
EV06 Direct Connect Cable	ESM Cable Corp.	TT	ECA	NCR	0
Power Meter	Gigatronics	8651A	SPM	1/9/2012	24
Power Sensor	Gigatronics	80701A	SPL	7/8/2011	24
MXG Vector Signal Generator	Agilent	N5182A	TIF	NCR	0

### **MEASUREMENT UNCERTAINTY**

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### **TEST DESCRIPTION**

The peak output power was measured with the EUT set to low, medium and high transmit frequencies. The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer.

The EUT was transmitting at its only data rate.



EUT: MB	B-R1G1					Work Order:	SYNA0080	
	01L1 / 00 00 1F 40 78						06/13/12	
	napse Strategic Product De	velopment LLC				Temperature:		
Attendees: Ski						Humidity:		
Project: Nor						Barometric Pres.:	1021.8	
Tested by: Roo	od Peloquin			Powe	er: Battery	Job Site:	EV06	
<b>TEST SPECIFICATIONS</b>	IS				Test Method			
CC 15.247:2012					ANSI C63.10:2009			
COMMENTS								
ransmitting in 4ms bu	oursts at 47.2 % duty cycle. S	ee Duty Cycle module	elsewhere i	n this report.				
DEVIATIONS FROM TE		ee Duty Cycle module	elsewhere in	n this report.				
Ū.		ee Duty Cycle module			Relay			
DEVIATIONS FROM TE lone					Reling	 Value	Limit	Result
EVIATIONS FROM TE lone onfiguration #	EST STANDARD				Relegy			
DEVIATIONS FROM TE lone Configuration #	EST STANDARD				Relay	492.947 uW	< 1 W	Pass
DEVIATIONS FROM TE lone Configuration #	EST STANDARD				Reling			



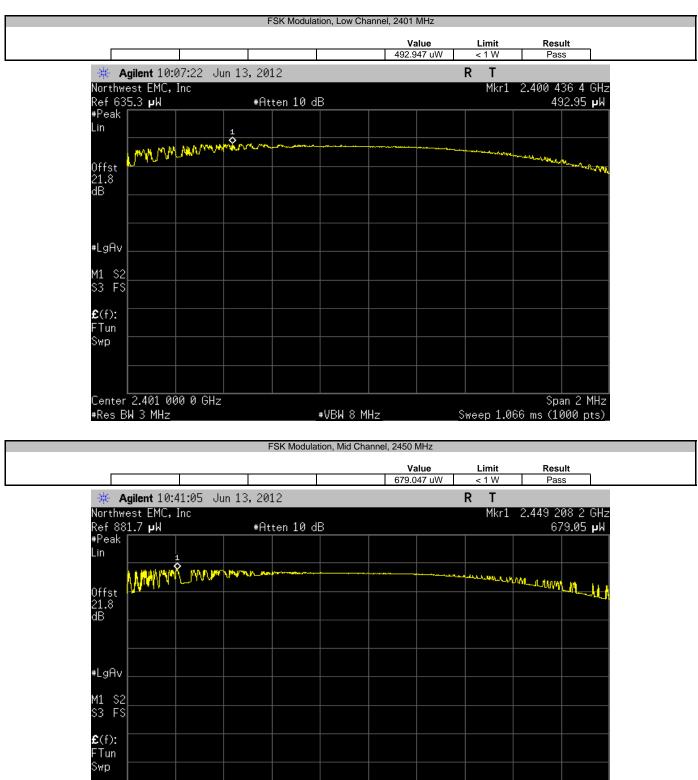
Center 2.450 000 0 GHz #Res BW 3 MHz

### **Output Power**



Span 2 MHz

Sweep 1.066 ms (1000 pts)



#VBW 8 MHz



## **Output Power**

	Value 686.91 uW	Limit < 1 W	Result Pass
	000.91 UW		Pass
🔆 Agilent 10:53:47 Jun 13, 2012		RT	
Northwest EMC, Inc		Mkr1	2.475 066 1 GHz
Ref 888.4 µW #Atten 10 dB			686.91 <b>µ</b> W
#Peak			
Lin <u>1</u>			
arra MMMM management		-non my p	ware marked
Offst			were were with the particular of the particular
0ffst 21.8 dB			
dB			
#LgAv			
**L9110			
M1 S2			
M1 \$2 \$3 F\$			
£(f):			
FTun			
Swp			
Center 2.476 000 0 GHz			Spop 2 MU
#Res BW 3 MHz #VBW 8 №	11.1	A 4 AA	Span 2 MHz 6 ms (1000 pts)_

# **Band Edge Compliance**

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

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EV06 Direct Connect Cable	ESM Cable Corp.	ТТ	ECA	NCR	0
Power Meter	Gigatronics	8651A	SPM	1/9/2012	24
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### **TEST DESCRIPTION**

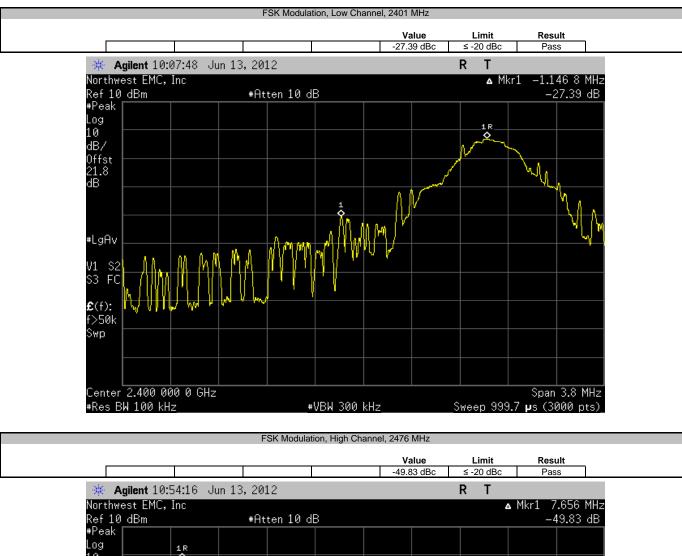
The spurious RF conducted emissions at the edges of the authorized bands were measured with the EUT set to low and high transmit frequencies in each available band. The channels closest to the band edges were selected. The measurement was made using a direct connection between the RF output of the EUT and the spectrum analyzer. The EUT was transmitting at the data rate(s) listed in the datasheet.

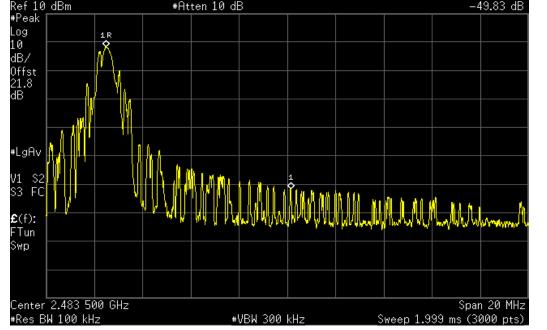
The spectrum was scanned below the lower band edge and above the higher band edge.



EUT	MB-R1G1		Work Order:	SYNA0080	
Serial Number	r: 2501L1 / 00 00 1F 40 78		Date:	06/13/12	
Customer	: Synapse Strategic Product Development LLC		Temperature:	23°C	
Attendees	Skip Kaczynski		Humidity:	41%	
	t: None		Barometric Pres.:		
Tested by	/: Rod Peloguin	Power: Battery	Job Site:	EV06	
TEST SPECIFICAT	TIONS	Test Method			
FCC 15.247:2012		ANSI C63.10:2009			
COMMENTS					
5	ns bursts at 47.2 % duty cycle. See Duty Cycle module elsewher	e in this report.			
DEVIATIONS FRO	M TEST STANDARD				
None					
Configuration #	1 Signature	aling he Reling			
			Value	Limit	Result
FSK Modulation					
	Low Channel, 2401 MHz		-27.39 dBc	≤ -20 dBc	Pass
	High Channel, 2476 MHz		-49.83 dBc	≤ -20 dBc	Pass







# Spurious Conducted Emissions

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

### **TEST EQUIPMENT**

Description	Manufacturer	Model	ID	Last Cal.	Interval
Spectrum Analyzer	Agilent	E4440A	AFD	7/5/2011	12
40GHz DC Block	Miteq	DCB4000	AMD	8/12/2011	12
Attenuator 20 dB, SMA M/F 26GHz	S.M. Electronics	SA26B-20	AUY	8/2/2011	12
EV06 Direct Connect Cable	ESM Cable Corp.	TT	ECA	NCR	0
Power Meter	Gigatronics	8651A	SPM	1/9/2012	24
Power Sensor	Gigatronics	80701A	SPL	7/8/2011	24
MXG Vector Signal Generator	Agilent	N5182A	TIF	NCR	0

### **MEASUREMENT UNCERTAINTY**

A measurement uncertainty estimation has been performed for each test per our internal quality document WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty for radiated emissions measurements is less than +/- 4 dB, and for conducted emissions measurements is less than +/- 2.7 dB. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for measurement uncertainty are available upon request.

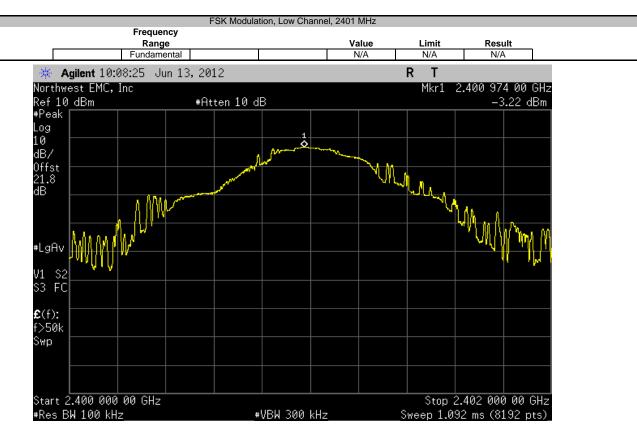
### **TEST DESCRIPTION**

The spurious RF conducted emissions were measured with the EUT set to low, medium and high transmit frequencies. The measurements were made using a direct connection between the RF output of the EUT and the spectrum analyzer. The EUT was transmitting at the data rate(s) listed in the datasheet. For each transmit frequency, the spectrum was scanned throughout the specified frequency range.



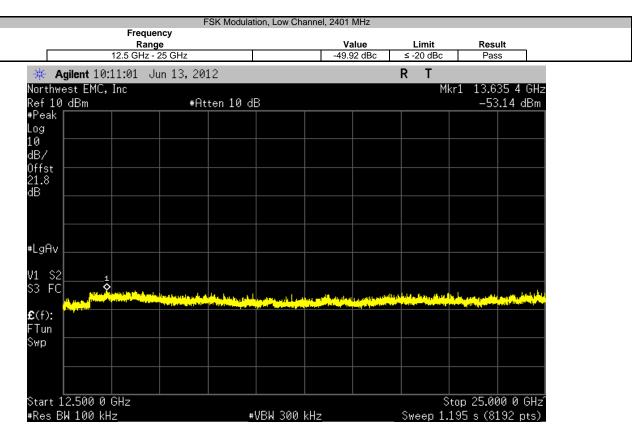
	MB-R1G1			Work Order:		
	2501L1 / 00 00 1F 40 78				06/13/12	
	Synapse Strategic Product De	velopment LLC		Temperature:		
	Skip Kaczynski			Humidity:		
Project:				Barometric Pres.:		
	Rod Peloquin		Power: Battery	Job Site:	EV06	
EST SPECIFICATI	ONS		Test Method			
CC 15.247:2012			ANSI C63.10:2009			
COMMENTS						
ransmitting in 4ms	s bursts at 47.2 % duty cycle. S	ee Duty Cycle module else	ewhere in this report.			
			·			
DEVIATIONS FROM	I TEST STANDARD					
lone						
			10120			
Configuration #	1		Rocking to Relings			
		Signature				
			Frequency			
			Frequency Range	Value	Limit	Result
			Range			
	Low Channel, 2401 MHz		Range Fundamental	N/A	Limit N/A	Result N/A
	Low Channel, 2401 MHz Low Channel, 2401 MHz		Range			
			Range Fundamental	N/A	N/A	N/A
	Low Channel, 2401 MHz		Range Fundamental 30 MHz - 12.5 GHz	N/A -36.41 dBc	N/A ≤ -20 dBc	N/A Pass
	Low Channel, 2401 MHz Low Channel, 2401 MHz		Range Fundamental 30 MHz - 12.5 GHz 12.5 GHz - 25 GHz	N/A -36.41 dBc -49.92 dBc	N/A ≤ -20 dBc ≤ -20 dBc	N/A Pass Pass
	Low Channel, 2401 MHz Low Channel, 2401 MHz Mid Channel, 2450 MHz Mid Channel, 2450 MHz		Range Fundamental 30 MHz - 12.5 GHz 12.5 GHz - 25 GHz Fundamental	N/A -36.41 dBc -49.92 dBc N/A	N/A ≤ -20 dBc ≤ -20 dBc N/A	N/A Pass Pass N/A
	Low Channel, 2401 MHz Low Channel, 2401 MHz Mid Channel, 2450 MHz Mid Channel, 2450 MHz Mid Channel, 2450 MHz		Range Fundamental 30 MHz - 12.5 GHz 12.5 GHz - 25 GHz Fundamental 30 MHz - 12.5 GHz	N/A -36.41 dBc -49.92 dBc N/A -43.94 dBc	N/A ≤ -20 dBc ≤ -20 dBc N/A ≤ -20 dBc	N/A Pass Pass N/A Pass Pass
	Low Channel, 2401 MHz Low Channel, 2401 MHz Mid Channel, 2450 MHz Mid Channel, 2450 MHz		Fundamental           30 MHz - 12.5 GHz           12.5 GHz - 25 GHz           Fundamental           30 MHz - 12.5 GHz           Fundamental           30 HZ - 12.5 GHz           12.5 GHz - 25 GHz           12.5 GHz - 25 GHz	N/A -36.41 dBc -49.92 dBc N/A -43.94 dBc -50.68 dBc	N/A ≤ -20 dBc ≤ -20 dBc N/A ≤ -20 dBc ≤ -20 dBc	N/A Pass Pass N/A Pass

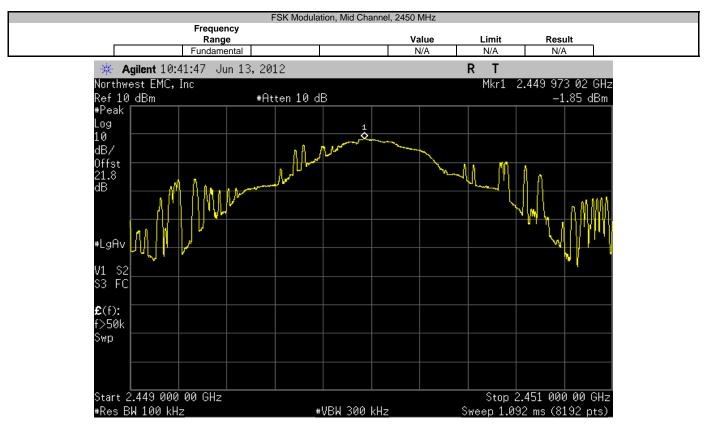




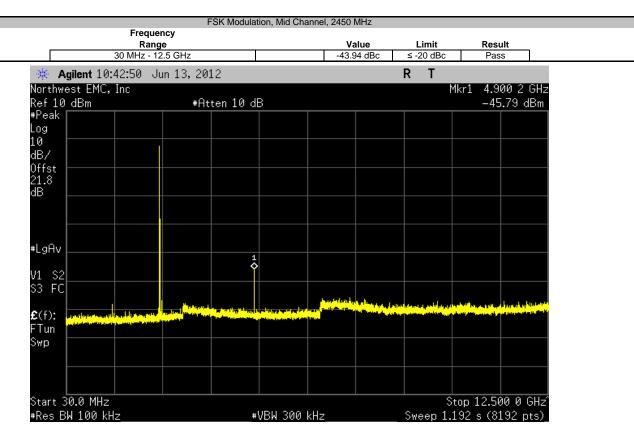
	FSK	K Modulation, Low Ch	annel, 2401 MHz			
	Frequency				5 1	
30	Range MHz - 12.5 GHz		-36.41 dBc	Limit ≤ -20 dBc	Result Pass	
	51 Jun 13, 2012			RT		
Northwest EMC, Ind				Mk	r1 4.801 2 GHz	
Ref 10 dBm		n 10 dB			-39.63 dBm	
#Peak						
Log						
10 dB/						
057 Offst						
0ffst 21.8 dB						
dB						
#LgAv						
*E9110						
V1 S2 S3 FC						
\$3 FC						
	A state of the state of the base of the		And the state of the	وم بالأفار فقر ورمان أوريه	a di a la sa di sa sa la li a da bata	
€(f): <mark>to table tille addere</mark> FTun		and the second				
Swp						
Start 30.0 MHz				Sto	p 12.500 0 GHz	
#Res BW 100 kHz		#VBW 300	kHz	Sweep 1.1%	92 s (8192 pts)_	





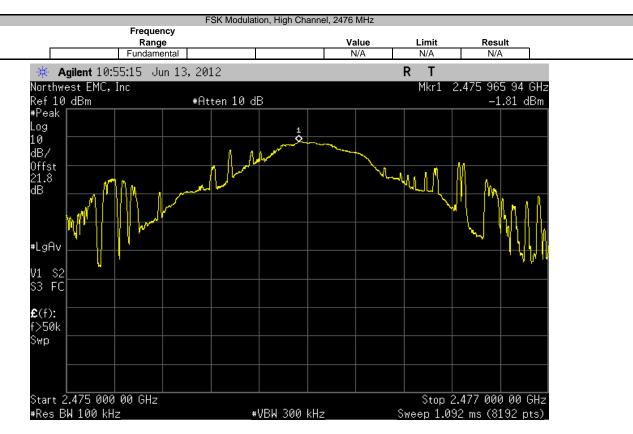






		_		SK Modulat	ion, Mid Cha	annel, 2450	MHz				
		Frequen Range				Va	alue	Limit	Res	ult	
		12.5 GHz - 2				-50.6	68 dBc	≤ -20 dBc	Pas	S	
	Agilent 10:		n 13,200	12							
	Northwest EMC, Inc Ref 10 dBm #Atten						Mkr1 13.607 9 dB −52.53 <				
#Peak											
Log 10											
dB/											
Offst 21.8											
dB											
#LgAv	' <b></b>										
V1 S2	2 1										
V1 S2 S3 F0		åk det förstad och		and a land a land a	ور الافرى	وراط فأطلبا وروا	والمرابع والمراجع والمراجع		ter for the barry of the	والمقار المحمل المحمل	
<b>£</b> (f):			أنفد لنماعة وأفا	and the second	and the second	and a state of the second s	IL CONTRACTOR		ant the contract of the	Nichold Control of Con	
FTun											
Ѕพр											
	12.500 0 BW 100 kH			#	VBW 300	kHz		S Sweep 1.		00 0 GHzî 192 pts)_	





		SK Modulation, High Cl	hannel, 2476 MHz		
	Frequency Range		Value	Limit	Result
	30 MHz - 12.5 GHz		-42.96 dBc	≤ -20 dBc	Pass
Acilent 1	0:56:34 Jun 13, 201	2		RT	
Northwest EM					1 4.951 9 GHz
Ref 10 dBm		ten 10 dB		1 1131 -	-44.77 dBm
#Peak					
Log					
10					
dB/					
0ffst 21.8 dB					
dB					
#LgAv		1			
114		Ŷ			
V1 S2 S3 FC					
SS FC					and the second
£(f): dependent	A A DE LA DE				
FTun	A COLOR OF A				
Swp					
Start 3 <b>0.0</b> MH				Stop	12.500 0 GHz <sup>^</sup>
#Res BW 100	kHz	#VBW 300	kHz	Sweep 1.192	2 s (8192 pts)_



			K Modulati	ion, High Ch	annel, 2476	MHz			
	Freque	•					Linde	<b>D</b> -1	
	Rang 12.5 GHz -					alue )1 dBc	Limit ≤ -20 dBc		sult ass
<u>.</u>			~		0110	T GD 0		1	
		un 13, 201	Z				RT		
Northwest EN	1L, Inc		4.0 1	_			M		627 8 GHz
Ref 10 dBm #Peak		#Htt	en 10 di	5	1			-5	2.82 dBm
Fean Log									
10									
dB/									
Offst 🗕 🚽									
21.8 dB									
ав ——									
#LgAv									
V1 S2	1								
S3 FC _		المرادية المراجع المراجع					alk on horse starte	եստի նեւ ո	العارفين ويترار
and self									and the subscript
<b>£</b> (f):									
FTun									
Ѕพр									
L Start 12.500									
Start 12.500 #Res BW 100				VBW 300	LU-3				000 0 GHz 3192 pts)
es dm I00			#	000 M 200	кпи		Sweep I.	193 2 (0	ρισζ μτει

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

### **TEST EQUIPMENT**

Description	Manufacturer	Model	ID	Last Cal.	Interval
Spectrum Analyzer	ectrum Analyzer Agilent E4440A		AFD	7/5/2011	12
Attenuator 20 dB, SMA M/F 26GHz	S.M. Electronics	SA26B-20	AUY	8/2/2011	12
EV06 Direct Connect Cable	ESM Cable Corp.	TT	ECA	NCR	0
Power Meter	Gigatronics	8651A	SPM	1/9/2012	24
Power Sensor	Gigatronics	80701A	SPL	7/8/2011	24
MXG Vector Signal Generator	Agilent	N5182A	TIF	NCR	0

### **MEASUREMENT UNCERTAINTY**

A measurement uncertainty estimation has been performed for each test per our internal quality document WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty for radiated emissions measurements is less than +/- 4 dB, and for conducted emissions measurements is less than +/- 2.7 dB. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for measurement uncertainty are available upon request.

### **TEST DESCRIPTION**

The peak power spectral density measurements were measured with the EUT set to low, mid, and high transmit frequencies. The measurement was made using a direct connection between the RF output of the EUT and the spectrum analyzer. The EUT was transmitting at its maximum data rate for each modulation type available. Per the procedure outlined in FCC KDB 558074, March 23, 2005, the spectrum analyzer was used as follows:

The emission peak(s) were located and zoom in on within the passband. The resolution bandwidth was set to 3 kHz, the video bandwidth was set to greater than or equal to the resolution bandwidth. The sweep speed was set equal to the span divided by 3 kHz (sweep = (SPAN/3 kHz)). For example, given a span of 1.5 MHz, the sweep should be  $1.5 \times 106 \div 3 \times 103 = 500$  seconds. External attenuation was used and added to the reading. The following FCC procedure was used for modifying the power spectral density measurements:

"If the spectrum line spacing cannot be resolved on the available spectrum analyzer, the noise density function on most modern conventional spectrum analyzers will directly measure the noise power density normalized to a 1 Hz noise power bandwidth. Add 35 dB for correction to 3 kHz."



EUT:	: MB-R1G1							Work Order:	SYNA0080	
Serial Number:	2501L1 / 00 00 1F 40 78							Date:	06/13/12	
Customer:	Synapse Strategic Product	Development LLC						Temperature:	23°C	
	Skip Kaczynski							Humidity:		
Project:								Barometric Pres.:	es.: 1021.8	
Tested by:	: Rod Peloguin			Power: Ba	attery			Job Site:	EV06	
EST SPECIFICAT	IONS			Te	est Method					
CC 15.247:2012				A	NSI C63.10:2009					
OMMENTS										
ransmitting in 4m	ns bursts at 47.2% duty cycle	e. See Duty Cycle module	elsewhere in this	s report.						
ransmitting in 4m	ns bursts at 47.2% duty cycle	e. See Duty Cycle module	elsewhere in this	s report.						
ransmitting in 4m	ns bursts at 47.2% duty cycle	e. See Duty Cycle module	elsewhere in this	s report.						
U U	ns bursts at 47.2% duty cycle M TEST STANDARD	See Duty Cycle module	elsewhere in this	s report.						
U U		<ol> <li>See Duty Cycle module (</li> </ol>	elsewhere in this	s report.						
DEVIATIONS FROM		<ol> <li>See Duty Cycle module of the second se</li></ol>			Pl					
EVIATIONS FROM		2. See Duty Cycle module			Relig					
EVIATIONS FROM		<ol> <li>See Duty Cycle module of Signature</li> </ol>			Releg					
EVIATIONS FROM					Relig	Value	(dBm / Hz) To	Value	Limit	
EVIATIONS FROM					Releg	Value (dBm / Hz)	(dBm / Hz) To (dBm / 3 KHz)	Value (dBm / 3 kHz)	Limit (dBm / 3 kHz)	Result
EVIATIONS FROM one					Relegy					Result
EVIATIONS FROM one					Relig					Result Pass
EVIATIONS FROM	M TEST STANDARD				Robing	(dBm / Hz)	(dBm / 3 kHz)	(dBm / 3 kHz)	(dBm / 3 kHz)	



V1 S2 S3 FC

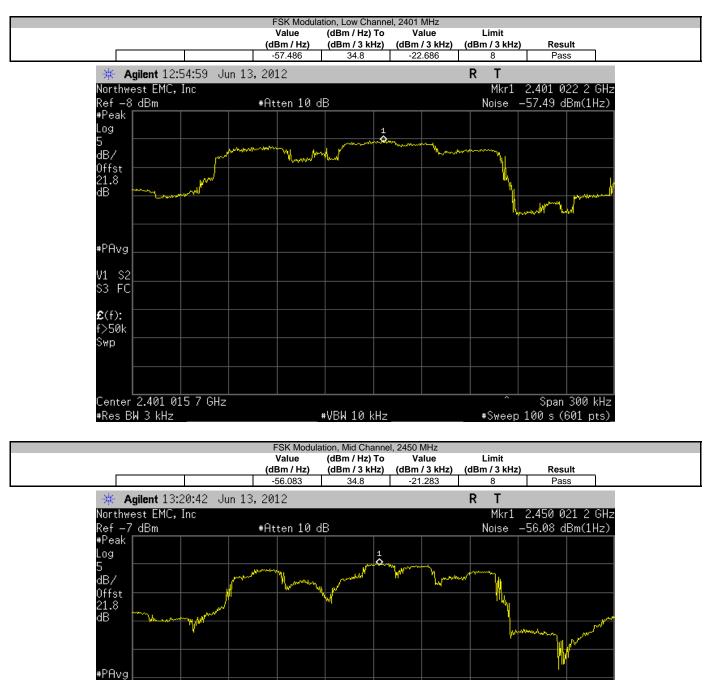
€(f): f>50k Swp

Center 2.450 017 2 GHz #Res BW 3 kHz



Span 300 kHz

#Sweep 100 s (601 pts)\_



₩VBW 10 kHz







### SPURIOUS RADIATED EMISSIONS

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data. The test data represents the configuration / operating mode/ model that produced the highest emission levels as compared to the specification limit.

### MODES OF OPERATION

Transmitting 5% duty cycle

### POWER SETTINGS INVESTIGATED

Battery

### CONFIGURATIONS INVESTIGATED

SYNA0080 - 2

### FREQUENCY RANGE INVESTIGATED

Start Frequency 30 MHz

Stop Frequency 25 GHz

### SAMPLE CALCULATIONS

Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation

### TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Spectrum Analyzer	Agilent	E4446A	AAQ	2/7/2012	12 mo
Antenna, Biconilog	EMCO	3141	AXG	4/10/2012	12 mo
Pre-Amplifier	Miteq	AM-1616-1000	AOL	6/28/2011	12 mo
EV01 Cables	N/A	Bilog Cables	EVA	6/28/2011	12 mo
High Pass Filter	Micro-Tronics	HPM50111	HFO	8/9/2010	24 mo
Pre-Amplifier	Miteq	AMF-4D-010100-24-10P	APW	6/28/2011	12 mo
Antenna, Horn	ETS	3115	AIZ	1/24/2011	24 mo
EV01 Cables	N/A	Double Ridge Horn Cables	EVB	6/28/2011	12 mo
EV01 Cables	N/A	Standard Gain Horns Cables	EVF	2/28/2012	12 mo
Antenna, Horn	ETS	3160-08	AHV	NCR	0 mo
Antenna, Horn	ETS	3160-07	AHU	NCR	0 mo
Pre-Amplifier	Miteq	AMF-6F-12001800-30-10P	AVD	2/28/2012	12 mo
Pre-Amplifier	Miteq	AMF-6F-08001200-30-10P	AVC	2/28/2012	12 mo
Antenna, Horn	ETS Lindgren	3160-09	AIV	NCR	0 mo
Pre-Amplifier	Miteq	AMF-6F-18002650-25-10P	AVU	9/12/2011	12 mo
Cable	ESM Cable Corp.	KMKM-72	EVY	9/12/2011	12 mo

### MEASUREMENT BANDWIDTHS

Frequency Range (MHz)	Peak Data (kHz)	Quasi-Peak Data (kHz)	Average Data (kHz)
0.01 - 0.15	1.0	0.2	0.2
0.15 - 30.0	10.0	9.0	9.0
30.0 - 1000	100.0	120.0	120.0
Above 1000	1000.0	N/A	1000.0

### MEASUREMENT UNCERTAINTY

A measurement uncertainty estimation has been performed for each test per our internal quality document WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty for radiated emissions measurements is less than +/- 4 dB, and for conducted emissions measurements is less than +/- 2.7 dB. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for measurement uncertainty are available upon request.

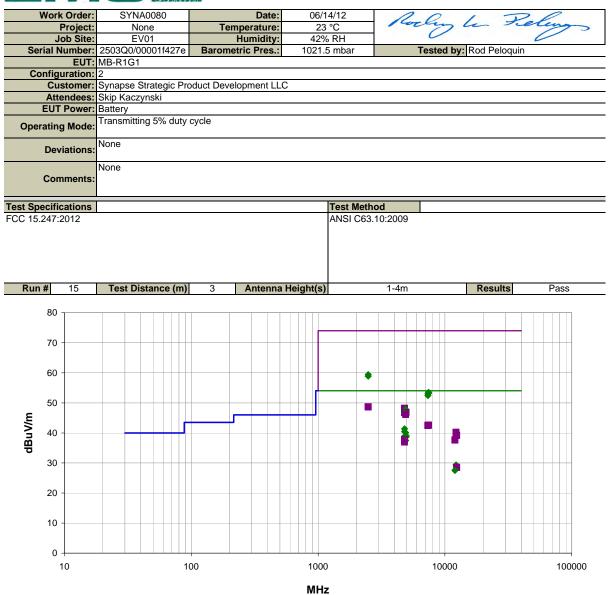
### TEST DESCRIPTION

The highest gain of each type of antenna to be used with the EUT was tested. The EUT was configured for low, mid, and high band transmit frequencies. For each configuration, the spectrum was scanned throughout the specified range. In addition, measurements were made in the restricted bands to verify compliance. While scanning, emissions from the EUT were maximized by rotating the EUT on a turntable, adjusting the position of the EUT and the EUT antenna in three orthogonal axis, and adjusting measurement antenna height and polarization, and manipulating the EUT antenna in 3 orthogonal planes (per ANSI C63.10:2009). A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.



PSA-ESCI 2012.05.07 PSA-ESCI Version 2011.12.21

# SPURIOUS RADIATED EMISSIONS



PK + AV • QP

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
2484.430	26.4	2.3	1.0	284.0	3.0	20.0	Vert	AV	0.0	48.7	54.0	-5.3	High Channel, EUT horizontal
2484.100	26.3	2.3	1.0	159.0	3.0	20.0	Horz	AV	0.0	48.6	54.0	-5.4	High Channel, EUT vertical
7426.825	25.9	16.7	1.9	192.0	3.0	0.0	Horz	AV	0.0	42.6	54.0	-11.4	High Channel, EUT vertical
7426.908	25.9	16.7	1.0	170.0	3.0	0.0	Vert	AV	0.0	42.6	54.0	-11.4	High Channel, EUT on side
7349.058	25.9	16.6	1.0	237.0	3.0	0.0	Vert	AV	0.0	42.5	54.0	-11.5	Mid Channel, EUT on side
7348.946	25.8	16.6	1.0	126.0	3.0	0.0	Horz	AV	0.0	42.4	54.0	-11.6	Mid Channel, EUT vertical
4802.000	32.0	9.3	1.0	26.0	3.0	0.0	Vert	AV	0.0	41.3	54.0	-12.7	Low Channel, EUT on side
4802.021	31.1	9.3	1.0	173.0	3.0	0.0	Horz	AV	0.0	40.4	54.0	-13.6	Low Channel, EUT vertical
4900.004	30.6	9.5	1.9	178.0	3.0	0.0	Horz	AV	0.0	40.1	54.0	-13.9	Mid Channel, EUT vertical
2483.647	37.1	2.3	1.0	159.0	3.0	20.0	Horz	PK	0.0	59.4	74.0	-14.6	High Channel, EUT vertical
4952.100	29.5	9.6	1.0	238.0	3.0	0.0	Vert	AV	0.0	39.1	54.0	-14.9	High Channel, EUT on side
2484.285	36.6	2.3	1.0	284.0	3.0	20.0	Vert	PK	0.0	58.9	74.0	-15.1	High Channel, EUT horizontal
4802.054	29.5	9.3	1.3	94.0	3.0	0.0	Horz	AV	0.0	38.8	54.0	-15.2	Low Channel, EUT on side
4951.938	29.1	9.6	1.0	359.0	3.0	0.0	Horz	AV	0.0	38.7	54.0	-15.3	High Channel, EUT vertical
4802.033	28.8	9.3	1.0	164.0	3.0	0.0	Vert	AV	0.0	38.1	54.0	-15.9	Low Channel, EUT horizontal
4801.896	28.5	9.3	1.0	333.0	3.0	0.0	Vert	AV	0.0	37.8	54.0	-16.2	Low Channel, EUT vertical
4899.908	28.0	9.5	1.6	210.0	3.0	0.0	Vert	AV	0.0	37.5	54.0	-16.5	Mid Channel, EUT on side
4801.950	27.6	9.3	1.3	73.0	3.0	0.0	Horz	AV	0.0	36.9	54.0	-17.1	Low Channel, EUT horizontal
7428.308	36.8	16.7	1.0	170.0	3.0	0.0	Vert	PK	0.0	53.5	74.0	-20.5	High Channel, EUT on side
7429.004	36.5	16.7	1.9	192.0	3.0	0.0	Horz	PK	0.0	53.2	74.0	-20.8	High Channel, EUT vertical
7350.367	36.4	16.6	1.0	237.0	3.0	0.0	Vert	PK	0.0	53.0	74.0	-21.0	Mid Channel, EUT on side
7350.800	35.8	16.6	1.0	126.0	3.0	0.0	Horz	PK	0.0	52.4	74.0	-21.6	Mid Channel, EUT vertical

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
12248.510	33.2	-3.9	1.0	32.0	3.0	0.0	Vert	AV	0.0	29.3	54.0	-24.7	Mid Channel, EUT on side
12248.410	33.2	-3.9	1.0	205.0	3.0	0.0	Horz	AV	0.0	29.3	54.0	-24.7	Mid Channel, EUT vertical
12378.030	31.6	-3.0	1.0	329.0	3.0	0.0	Vert	AV	0.0	28.6	54.0	-25.4	High Channel, EUT on side
12378.130	31.5	-3.0	1.0	149.0	3.0	0.0	Horz	AV	0.0	28.5	54.0	-25.5	High Channel, EUT vertical
4802.000	38.9	9.3	1.0	173.0	3.0	0.0	Horz	PK	0.0	48.2	74.0	-25.8	Low Channel, EUT vertical
4801.840	38.6	9.3	1.0	26.0	3.0	0.0	Vert	PK	0.0	47.9	74.0	-26.1	Low Channel, EUT on side
4899.675	38.4	9.5	1.9	178.0	3.0	0.0	Horz	PK	0.0	47.9	74.0	-26.1	Mid Channel, EUT vertical
12003.960	33.1	-5.5	1.0	347.0	3.0	0.0	Vert	AV	0.0	27.6	54.0	-26.4	Low Channel, EUT on side
12006.850	33.0	-5.5	1.0	205.0	3.0	0.0	Horz	AV	0.0	27.5	54.0	-26.5	Low Channel, EUT vertical
4801.550	38.0	9.3	1.3	94.0	3.0	0.0	Horz	PK	0.0	47.3	74.0	-26.7	Low Channel, EUT on side
4952.042	37.2	9.6	1.0	359.0	3.0	0.0	Horz	PK	0.0	46.8	74.0	-27.2	High Channel, EUT vertical
4802.383	37.4	9.3	1.0	333.0	3.0	0.0	Vert	PK	0.0	46.7	74.0	-27.3	Low Channel, EUT vertical
4802.192	37.4	9.3	1.0	164.0	3.0	0.0	Vert	PK	0.0	46.7	74.0	-27.3	Low Channel, EUT horizontal
4802.492	37.3	9.3	1.3	73.0	3.0	0.0	Horz	PK	0.0	46.6	74.0	-27.4	Low Channel, EUT horizontal
4951.808	36.7	9.6	1.0	238.0	3.0	0.0	Vert	PK	0.0	46.3	74.0	-27.7	High Channel, EUT on side
4900.238	36.6	9.5	1.6	210.0	3.0	0.0	Vert	PK	0.0	46.1	74.0	-27.9	Mid Channel, EUT on side
12250.220	44.1	-3.9	1.0	32.0	3.0	0.0	Vert	PK	0.0	40.2	74.0	-33.8	Mid Channel, EUT on side
12249.620	43.5	-3.9	1.0	205.0	3.0	0.0	Horz	PK	0.0	39.6	74.0	-34.4	Mid Channel, EUT vertical
12378.770	42.2	-3.0	1.0	329.0	3.0	0.0	Vert	PK	0.0	39.2	74.0	-34.8	High Channel, EUT on side
12378.220	42.2	-3.0	1.0	149.0	3.0	0.0	Horz	PK	0.0	39.2	74.0	-34.8	High Channel, EUT vertical
12003.430	43.2	-5.5	1.0	347.0	3.0	0.0	Vert	PK	0.0	37.7	74.0	-36.3	Low Channel, EUT on side
12005.140	43.1	-5.5	1.0	205.0	3.0	0.0	Horz	PK	0.0	37.6	74.0	-36.4	Low Channel, EUT vertical