

Summit Semiconductor LLC

Summit FS848 Master Module (Wheeler)

Report No. FOCU0081.3

Report Prepared By



www.nwemc.com
1-888-EMI-CERT

© 2010 Northwest EMC, Inc

EMC Test Report

Certificate of Test
Last Date of Test: July 21, 2010
Summit Semiconductor LLC
Model: Summit FS848 Master Module (Wheeler)

Emissions			
Test Description	Specification	Test Method	Pass/Fail
Emission Bandwidth	FCC 15.407:2010	ANSI C63.10:2009	Pass
Peak Power Spectral Density	FCC 15.407:2010	ANSI C63.10:2009	Pass
Peak Excursion	FCC 15.407:2010	ANSI C63.10:2009	Pass
Peak Transmit Power	FCC 15.407:2010	ANSI C63.10:2009	Pass
Frequency Stability	FCC 15.407:2010	ANSI C63.10:2009	Pass
AC Powerline Conducted Emissions	FCC 15.207:2010	ANSI C63.10:2009	Pass
Spurious Radiated Emissions	FCC 15.407:2010	ANSI C63.10:2009	Pass
Spurious Radiated Emissions	FCC 15.209:2010	ANSI C63.10:2009	Pass

Modifications made to the product

See the Modifications section of this report

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).

Approved By:



Don Facticeau, IS Manager



NVLAP Lab Code: 200630-0

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
00	None		

Barometric Pressure

The recorded barometric pressure has been normalized to sea level.



Accreditations and Authorizations

FCC

Accredited by NVLAP for performance of FCC radio, digital, and ISM device testing. Our Open Area Test Sites, certification chambers, and conducted measurement facilities have been fully described in reports filed with the FCC and accepted by the FCC in letters maintained in our files. Northwest EMC has been accredited by ANSI to ISO / IEC Guide 65 as a product certifier. We have been designated by the FCC as a Telecommunications Certification Body (TCB). This allows Northwest EMC to certify transmitters to FCC specifications in accordance with 47 CFR 2.960 and 2.962.



NVLAP

Northwest EMC, Inc. is accredited under the United States Department of Commerce, National Institute of Standards and Technology, and National Voluntary Laboratory Accreditation Program for satisfactory compliance with the requirements of ISO/IEC 17025 for Testing Laboratories. The NVLAP accreditation encompasses Electromagnetic Compatibility Testing in accordance with the European Union EMC Directive 2004/108/EC, and ANSI C63.4. Additionally, Northwest EMC is accredited by NVLAP to perform radio testing in accordance with the European Union R&TTE Directive 1999/5/EEC, the requirements of FCC, and the RSS radio standards for Industry Canada.



NVLAP LAB CODE 200629-0
NVLAP LAB CODE 200630-0
NVLAP LAB CODE 200676-0
NVLAP LAB CODE 200761-0
NVLAP LAB CODE 200881-0

Industry Canada

Accredited by NVLAP for performance of Industry Canada RSS and ICES testing. Our Open Area Test Sites and certification chambers comply with RSS-Gen, Issue 2 and have been filed with Industry Canada and accepted. Northwest EMC has been accredited by ANSI to ISO / IEC Guide 65 as a product certifier. We have been designated by NIST and recognized by Industry Canada as a Certification Body (CB) per the APEC Mutual Recognition Arrangement (MRA). This allows Northwest EMC to certify transmitters to Industry Canada technical requirements. (Site Filing Numbers - Hillsboro: 2834D-1, 2834D-2, Sultan: 2834C-1, Irvine: 2834B-1, 2834B-2, Brooklyn Park: 2834E-1)



CAB

Designated by NIST and validated by the European Commission as a Conformity Assessment Body (CAB) to conduct tests and approve products to the EMC directive and transmitters to the R&TTE directive, as described in the U.S. - EU Mutual Recognition Agreement.



NEMKO

Assessed and accredited by NEMKO (Norwegian testing and certification body) for European emissions and immunity testing. As a result of NEMKO's laboratory assessment, they will accept test results from Northwest EMC, Inc. for product certification (Authorization No. ELA 119).





Accreditations and Authorizations

Australia/New Zealand

The National Association of Testing Authorities (NATA), Australia has been appointed by the ACA as an accreditation body to accredit test laboratories and competent bodies for EMC standards. Accredited test reports or assessments by competent bodies must carry the NATA logo. Test reports made by an overseas laboratory that has been accredited for the relevant standards by an overseas accreditation body that has a Mutual Recognition Agreement (MRA) with NATA are also accepted as technical grounds for product conformity. The report should be endorsed with the respective logo of the accreditation body (NVLAP).



VCCI

Accepted as an Associate Member to the VCCI, Acceptance No. 564. Conducted and radiated measurement facilities have been registered in accordance with Regulations for Voluntary Control Measures, Article 8. (Registration Numbers. - Hillsboro: C-1071, R-1025, G-84, C-2687, T-1658, and R-2318, Irvine: R-1943, G-85, C-2766, and T-1659, Sultan: R-871, G-83, C-1784, and T-1511, Brooklyn Park: R-3125, G-86, G-141, C-3464, and T-1634).



BSMI

Northwest EMC has been designated by NIST and validated by C-Taipei (BSMI) as a CAB to conduct tests as described in the APEC Mutual Recognition Agreement (US0017). License No. SL2-IN-E-1017.



GOST

Northwest EMC, Inc. has been assessed and accredited by the Russian Certification bodies Certinform VNIIINMASH, CERTINFO, SAMTES, and Federal CHEC, to perform EMC and Hygienic testing for Information Technology Products. As a result of their laboratory assessment, they will accept test results from Northwest EMC, Inc. for product certification



KCC

Northwest EMC, Inc is a CAB designated by MRA partners and recognized by Korea. (Assigned Lab Numbers: Hillsboro: US0017, Irvine: US0158, Sultan: US0157)



VIETNAM

Vietnam MIC has approved Northwest EMC as an accredited test lab. Per Decision No. 194/QD-QLCL (dated December 15, 2009), Northwest EMC test reports can be used for Vietnam approval submissions.



SCOPE

For details on the Scopes of our Accreditations, please visit:

<http://www.nwemc.com/accreditations/>



Northwest EMC Locations



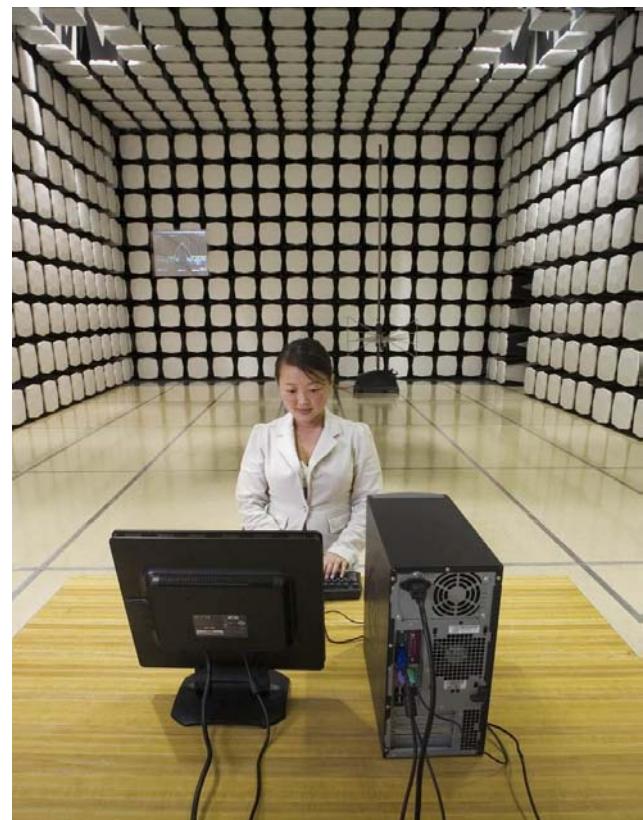
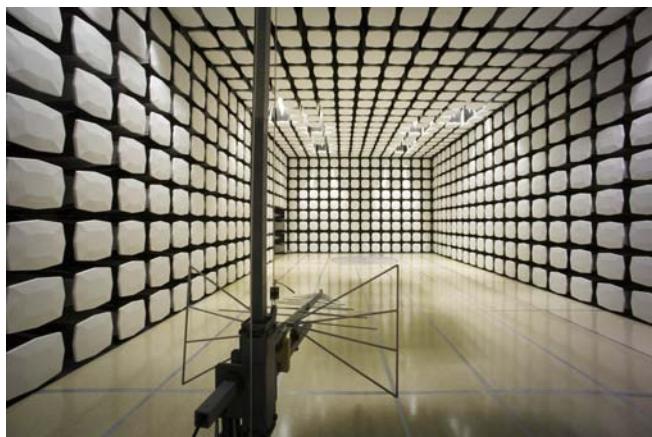
Oregon
Labs EV01-EV12
22975 NW Evergreen Pkwy
Suite 400
Hillsboro, OR 97124
(503) 844-4066

California
Labs OC01-OC13
41 Tesla
Irvine, CA 92618
(949) 861-8918

Minnesota
Labs MN01-MN08
9349 W Broadway Ave.
Brooklyn Park,
MN 55445
(763) 425-2281

Washington
Labs SU01-SU07
14128 339th Ave. SE
Sultan, WA 98294
(360) 793-8675

New York
Labs WA01-WA04
4939 Jordan Rd.
Elbridge, NY 13060
(315) 685-0796



Party Requesting the Test

Company Name:	Summit Semiconductor LLC
Address:	22867 NW Bennett St, Suite 200
City, State, Zip:	Hillsboro, OR 97124
Test Requested By:	Alex Macdonald
Model:	Summit FS848 Master Module (Wheeler)
First Date of Test:	July 14, 2010
Last Date of Test:	July 21, 2010
Receipt Date of Samples:	July 14, 2010
Equipment Design Stage:	Preproduction
Equipment Condition:	No Damage

Information Provided by the Party Requesting the Test**Functional Description of the EUT (Equipment Under Test):**

UNII radio module

Testing Objective:

Seeking limited modular approval of the master under FCC 15.407 for operation in the 5.2, 5.3, and 5.6 GHz bands

CONFIGURATION 1 FOCU0081

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
Summit FS848 Master Module (Wheeler)	Summit Semiconductor LLC	444-2203	0265
Antenna	Aeon Technologies	C6276-510004A	None

Peripherals in test setup boundary			
Description	Manufacturer	Model/Part Number	Serial Number
Power Supply - I/O Board	Summit Semiconductor LLC	Redmond	Linear
AC Adapter	Cincon Electronics	TR20B120X 01E03	20120-0007356

Remote Equipment Outside of Test Setup Boundary			
Description	Manufacturer	Model/Part Number	Serial Number
Remote PC	Compaq	NX9500	CNF4520HP6

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
DC Lead	PA	1.8m	PA	AC Adapter	Power Supply - I/O Board
AC Power	No	1.8m	No	AC Mains	AC Adapter
USB - Serial	Yes	1.9m	No	Summit FS848 Master Module (Wheeler)	Remote PC
Antenna Cable	Yes	0.1m	No	Summit FS848 Master Module (Wheeler)	Antenna

PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.

CONFIGURATION 2 FOCU0081

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
Summit FS848 Master Module (Wheeler)	Summit Semiconductor LLC	444-2203	A146

Peripherals in test setup boundary			
Description	Manufacturer	Model/Part Number	Serial Number
Power Supply - I/O Board	Summit Semiconductor LLC	Redmond	18
AC Adapter	PHIHONG	PSS--45W-120	0706

Remote Equipment Outside of Test Setup Boundary			
Description	Manufacturer	Model/Part Number	Serial Number
Remote PC	Dell	Inspiron 6000	IS386

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
DC Lead	PA	1.8m	PA	AC Adapter	Power Supply - I/O Board
AC Power	No	1.8m	No	AC Mains	AC Adapter
USB - Serial	Yes	1.9m	No	Summit FS848 Master Module (Wheeler)	Remote PC
Audio	Yes	1.8m	No	Remote PC	Summit FS848 Master Module (Wheeler)
Trigger	Yes	1.1m	No	Summit FS848 Master Module (Wheeler)	Measurement analyzer

PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.

CONFIGURATION 3 FOCU0081

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
Summit FS848 Master Module (Wheeler)	Summit Semiconductor LLC	444-2203	A146

Peripherals in test setup boundary			
Description	Manufacturer	Model/Part Number	Serial Number
Power Supply - I/O Board	Summit Semiconductor LLC	Redmond	AC

Remote Equipment Outside of Test Setup Boundary			
Description	Manufacturer	Model/Part Number	Serial Number
DC Power Supply (Test Equipment)	Tektronix	PS280	TPM

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
DC Lead (4x)	No	2.0m	No	DC Power Supply (Test Equipment)	Power Supply - I/O Board
AC Power	No	1.8m	No	AC Mains	DC Power Supply
USB - Serial	Yes	1.9m	No	Summit FS848 Master Module (Wheeler)	Remote PC

PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.

CONFIGURATION 4 FOCU0081

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
Summit FS848 Master Module (Wheeler)	Summit Semiconductor LLC	444-2203	0265
Antenna	Aeon Technologies	C6276-510004A	None

Peripherals in test setup boundary			
Description	Manufacturer	Model/Part Number	Serial Number
Power Supply - I/O Board	Summit Semiconductor LLC	Redmond	AC

Remote Equipment Outside of Test Setup Boundary			
Description	Manufacturer	Model/Part Number	Serial Number
DC Power Supply (Test Equipment)	Tektronix	PS280	TPM

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
DC Lead (4x)	No	1.0m	No	DC Power Supply (Test Equipment)	Power Supply - I/O Board
AC Power	No	1.8m	No	AC Mains	DC Power Supply
USB - Serial	Yes	1.9m	No	Summit FS848 Master Module (Wheeler)	Remote PC
Antenna Cable	Yes	0.1m	No	Summit FS848 Master Module (Wheeler)	Antenna

PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.

Equipment modifications					
Item	Date	Test	Modification	Note	Disposition of EUT
1	7/14/2010	Peak Power Spectral Density	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
2	7/14/2010	Emission Bandwidth	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
3	7/14/2010	Peak Transmit Power	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
4	7/15/2010	Peak Excursion	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
5	7/20/2010	Spurious Radiated Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
6	7/20/2010	Frequency Stability	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
7	7/21/2010	AC Powerline Conducted Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.

EMISSION 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	6/1/2009	24
EV06 Direct Connect Cable	ESM Cable Corp.	TT	ECA	NCR	0
26 GHz DC Block, SMA	Pasternack	PE8210	AME	10/19/2009	13
Attenuator, 6 dB, 'SMA'	N/A	93459 3330A-6	AUF	4/1/2010	13
Attenuator 20 dB, SMA M/F 26GHz	S.M. Electronics	SA26B-20	AUY	7/21/2009	13
Pre-Amplifier (FOR REFERENCE ONLY)	Hewlett-Packard	83017A	APL	NCR	0
Signal Generator	Agilent	E8257D	TGX	12/10/2008	24

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

ANSI C63.10 was followed. The transmit frequency was set to the lowest, a medium, and the highest channels in each band. The transmit power was set to its default maximum. The lowest, a medium, and the highest data rates were measured if available. A direct connection was made between the RF output of the EUT and a spectrum analyzer. Attenuation and a DC block were used. The reference level offset on the spectrum analyzer was adjusted to compensate for cable loss and the external attenuation used between the RF output and the spectrum analyzer input.

The spectrum analyzer settings were as follows:

- Span = approximately 1.5 to 2 times the emission bandwidth, centered on the transmit channel.
- RBW = Approx. 1% of the emission bandwidth (B). This was an iterative process where an exact match of 1% may not be achieved. The largest value of RBW that came close to 1% of the emission bandwidth was used.
- A peak detector was used.

The marker-delta function was then used to measure 26 dB emission bandwidth

EMISSION BANDWIDTH

EUT: Summit FS848 Master Module (Wheeler)	Work Order: FOCU0081
Serial Number: A146	Date: 07/14/10
Customer: Summit Semiconductor LLC	Temperature: 23°C
Attendees: Alex Macdonald	Humidity: 45%
Project: None	Barometric Pres.: 30.16 in
Tested by: Rod Peloquin	Job Site: EV06

TEST SPECIFICATIONS

FCC 15.407:2010	Test Method
	ANSI C63.10:2009

COMMENTS

With External trigger from EUT for 6 Mbps measurements.

DEVIATIONS FROM TEST STANDARD

No Deviations

Configuration #	2	Signature
		<i>Rod Peloquin</i>

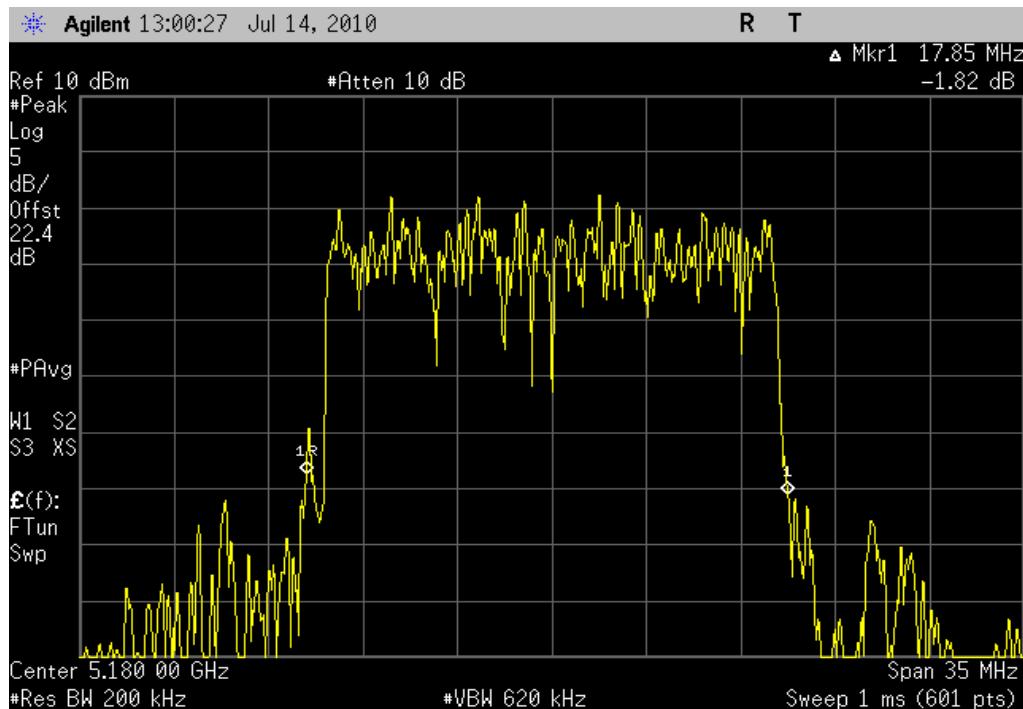
		Value	Limit	Results
802.11(a) 6 Mbps				
5150 - 5250 MHz Band	Channel 36, Low Channel	17.850 MHz	N/A	N/A
	Channel 48, High Channel	17.620 MHz	N/A	N/A
5250 - 5350 MHz Band				
	Channel 52, Low Channel	18.260 MHz	N/A	N/A
	Channel 64, High Channel	18.200 MHz	N/A	N/A
5470 - 5725 MHz Band				
	Channel 100, Low Channel	18.717 MHz	N/A	N/A
	Channel 116, Mid Channel	18.020 MHz	N/A	N/A
	Channel 140, High Channel	18.200 MHz	N/A	N/A
802.11(a) 36 Mbps				
5150 - 5250 MHz Band	Channel 36, Low Channel	18.490 MHz	N/A	N/A
	Channel 48, High Channel	18.200 MHz	N/A	N/A
5250 - 5350 MHz Band				
	Channel 52, Low Channel	18.670 MHz	N/A	N/A
	Channel 64, High Channel	18.020 MHz	N/A	N/A
5470 - 5725 MHz Band				
	Channel 100, Low Channel	18.020 MHz	N/A	N/A
	Channel 116, Mid Channel	17.730 MHz	N/A	N/A
	Channel 140, High Channel	17.910 MHz	N/A	N/A

802.11(a) 6 Mbps, 5150 - 5250 MHz Band, Channel 36, Low Channel

Result: N/A

Value: 17.850 MHz

Limit: N/A

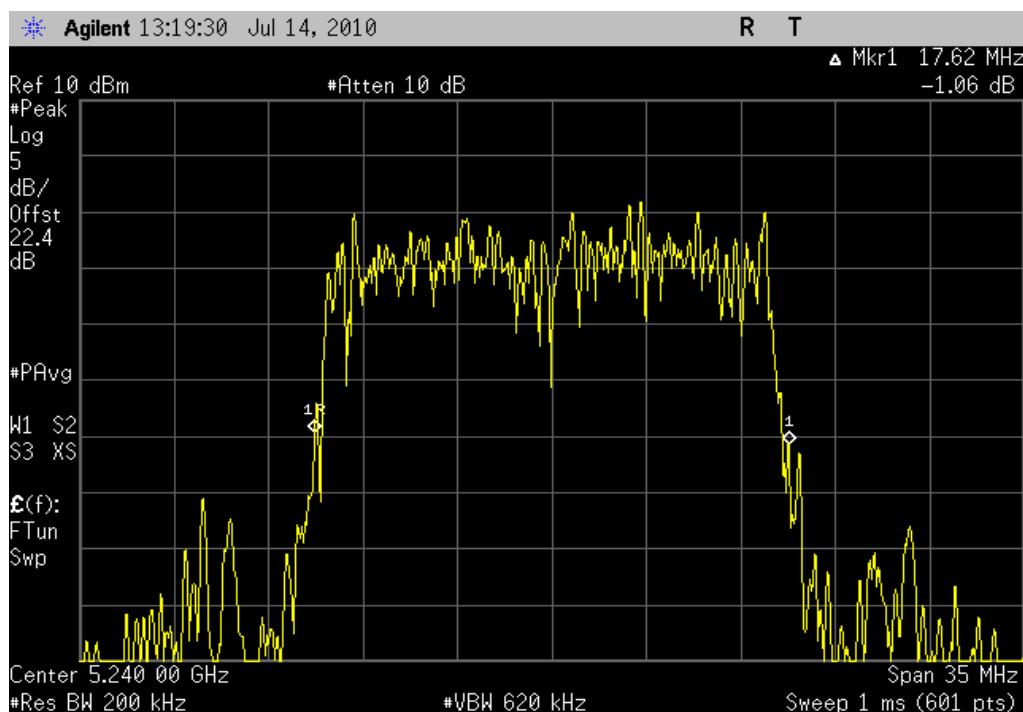


802.11(a) 6 Mbps, 5150 - 5250 MHz Band, Channel 48, High Channel

Result: N/A

Value: 17.620 MHz

Limit: N/A

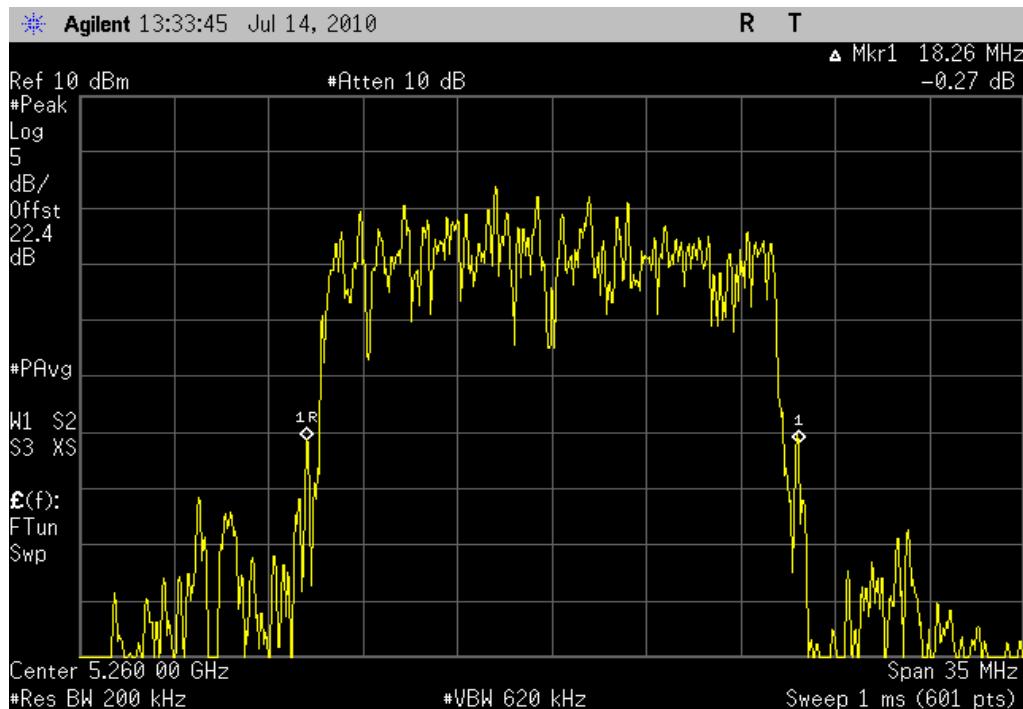


802.11(a) 6 Mbps, 5250 - 5350 MHz Band, Channel 52, Low Channel

Result: N/A

Value: 18.260 MHz

Limit: N/A

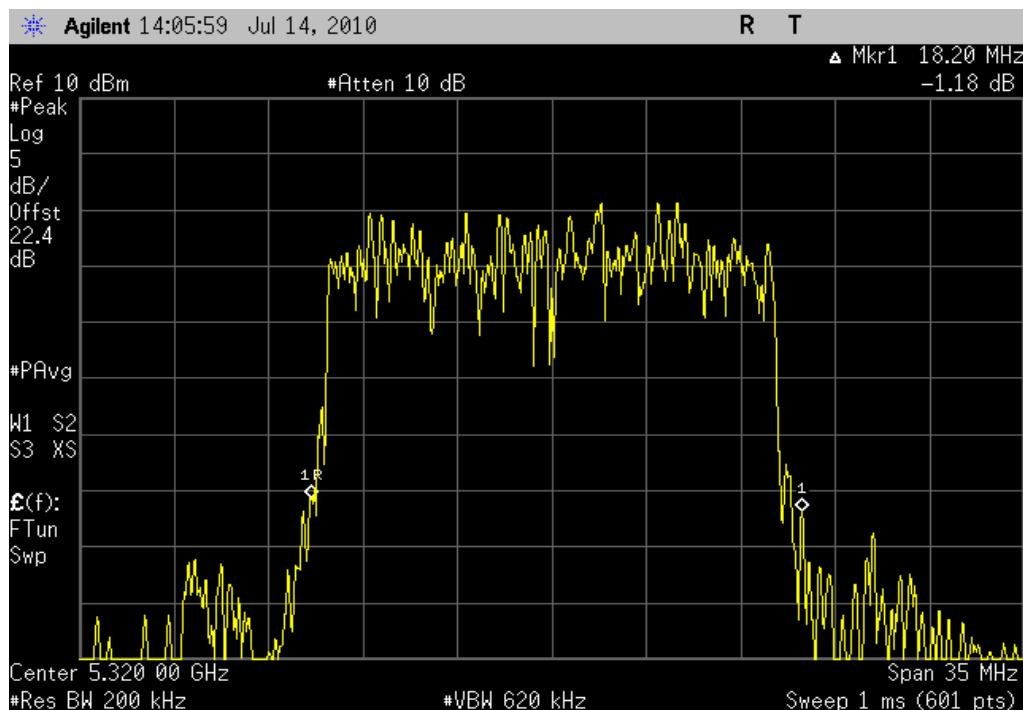


802.11(a) 6 Mbps, 5250 - 5350 MHz Band, Channel 64, High Channel

Result: N/A

Value: 18.200 MHz

Limit: N/A

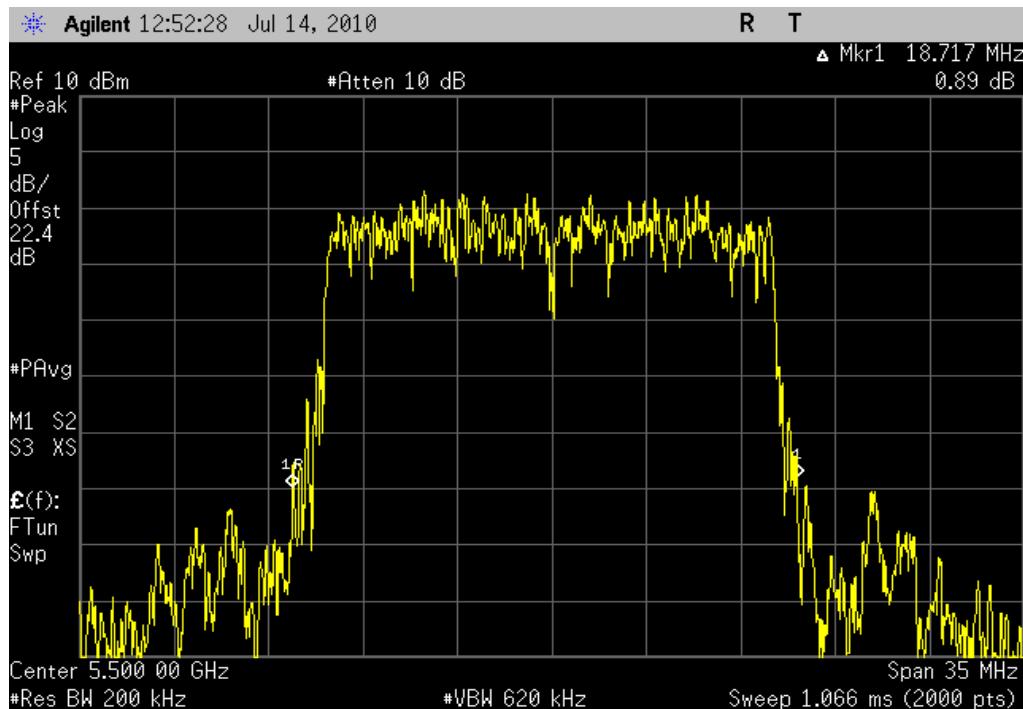


802.11(a) 6 Mbps, 5470 - 5725 MHz Band, Channel 100, Low Channel

Result: N/A

Value: 18.717 MHz

Limit: N/A

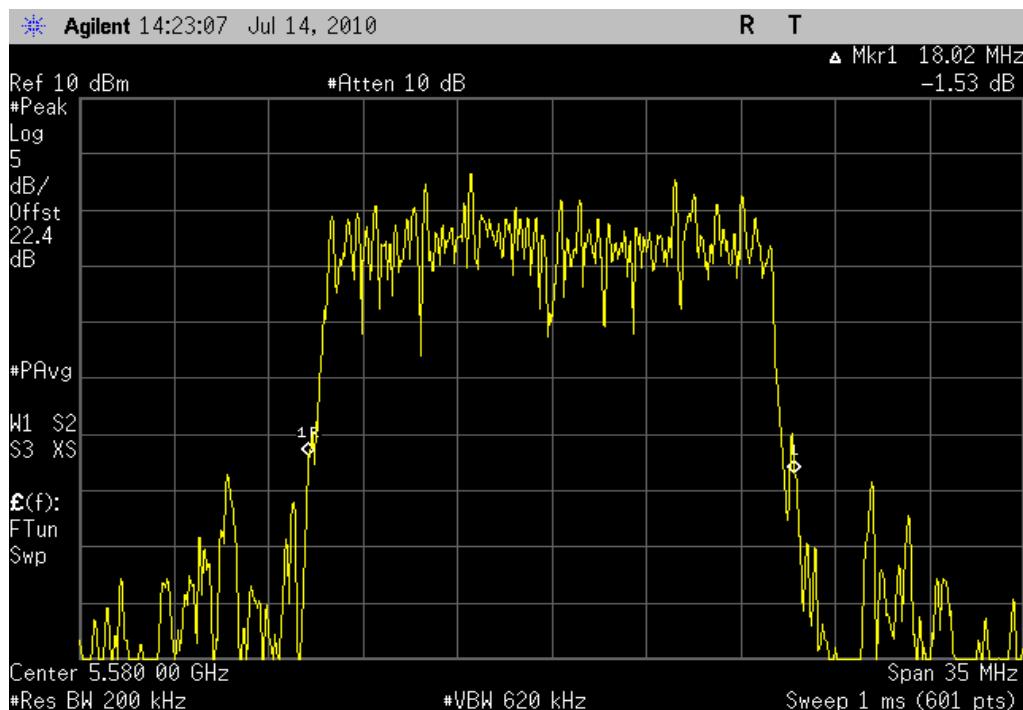


802.11(a) 6 Mbps, 5470 - 5725 MHz Band, Channel 116, Mid Channel

Result: N/A

Value: 18.020 MHz

Limit: N/A

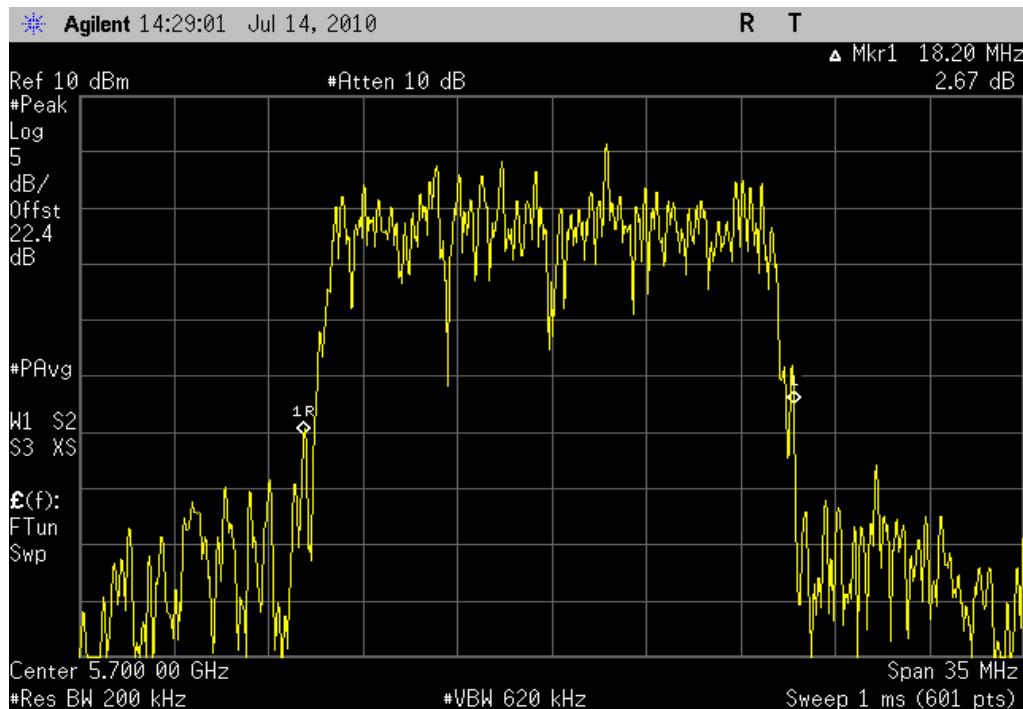


802.11(a) 6 Mbps, 5470 - 5725 MHz Band, Channel 140, High Channel

Result: N/A

Value: 18.200 MHz

Limit: N/A

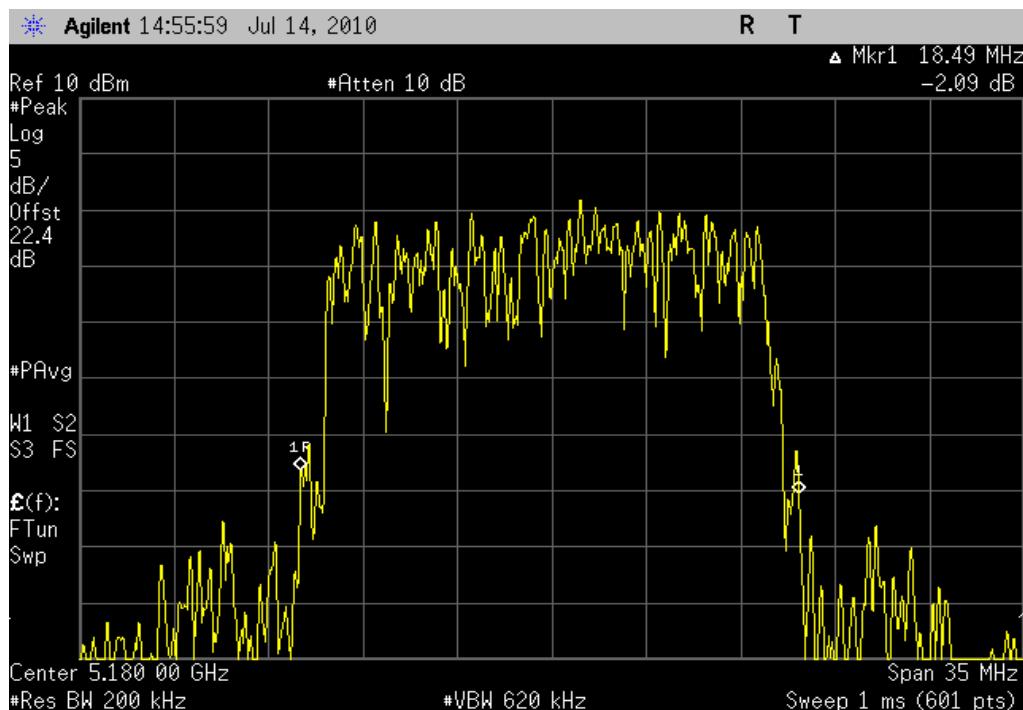


802.11(a) 36 Mbps, 5150 - 5250 MHz Band, Channel 36, Low Channel

Result: N/A

Value: 18.490 MHz

Limit: N/A

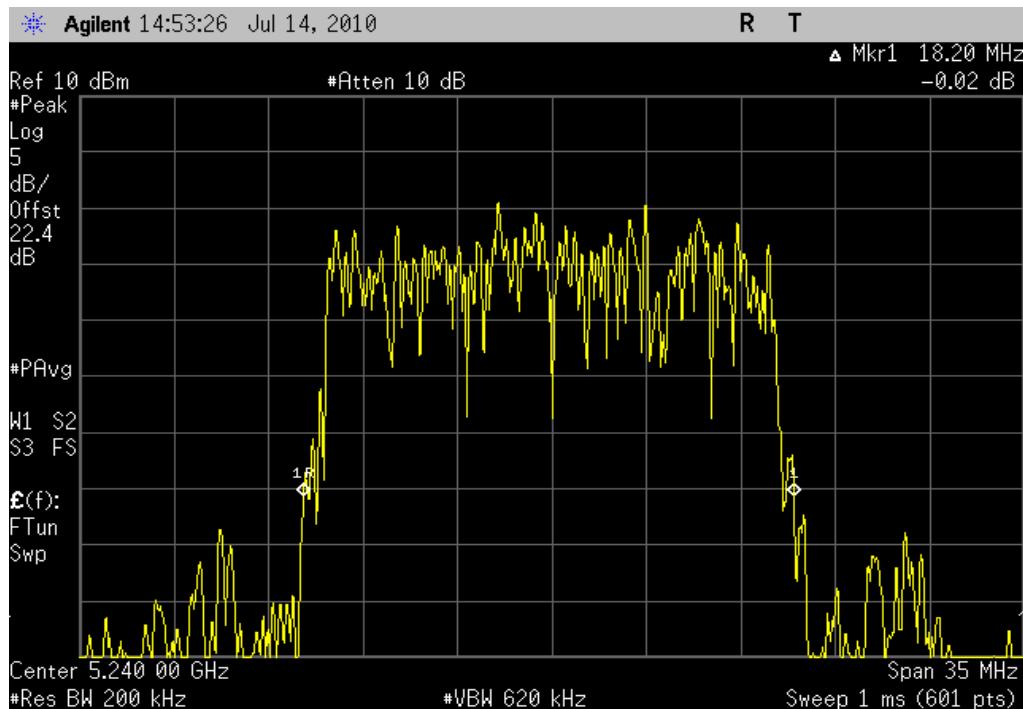


802.11(a) 36 Mbps, 5150 - 5250 MHz Band, Channel 48, High Channel

Result: N/A

Value: 18.200 MHz

Limit: N/A

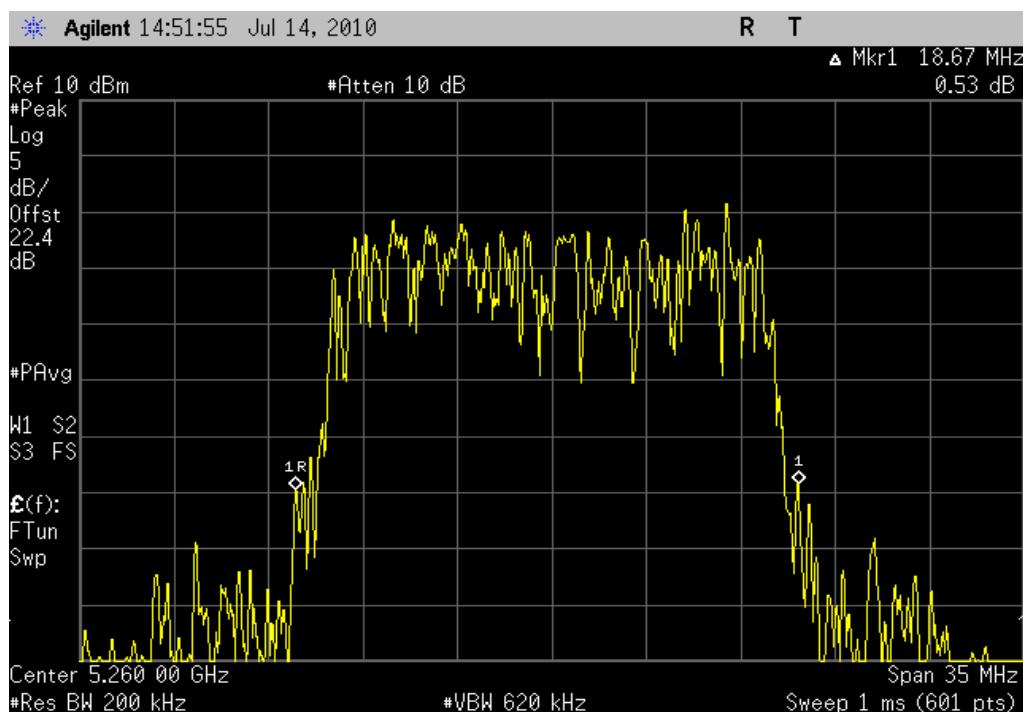


802.11(a) 36 Mbps, 5250 - 5350 MHz Band, Channel 52, Low Channel

Result: N/A

Value: 18.670 MHz

Limit: N/A

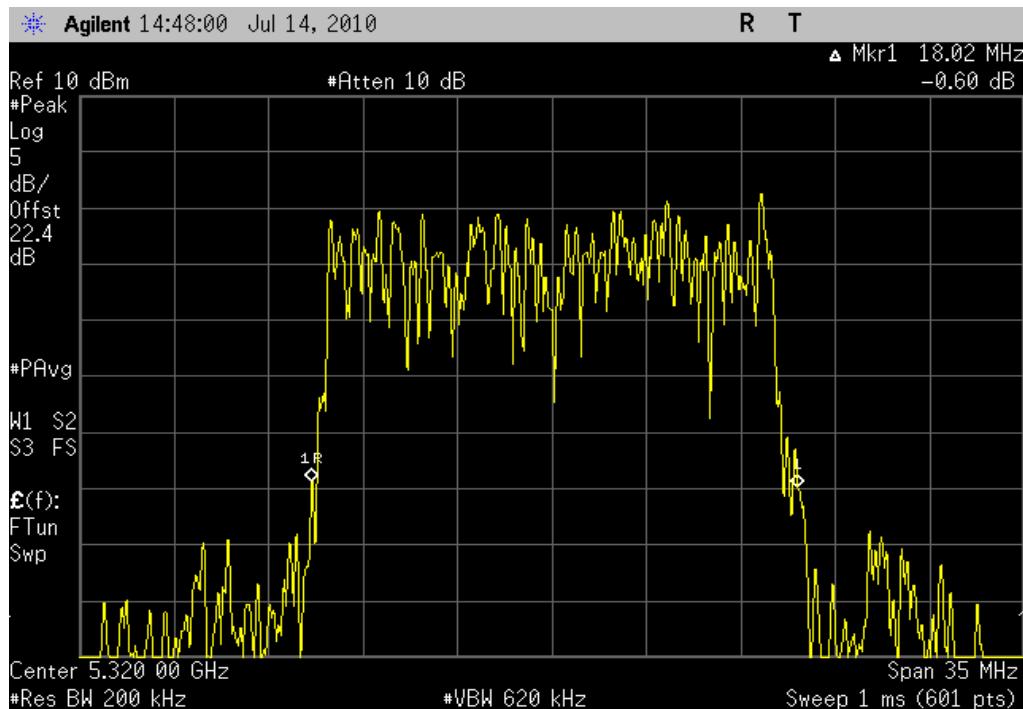


802.11(a) 36 Mbps, 5250 - 5350 MHz Band, Channel 64, High Channel

Result: N/A

Value: 18.020 MHz

Limit: N/A

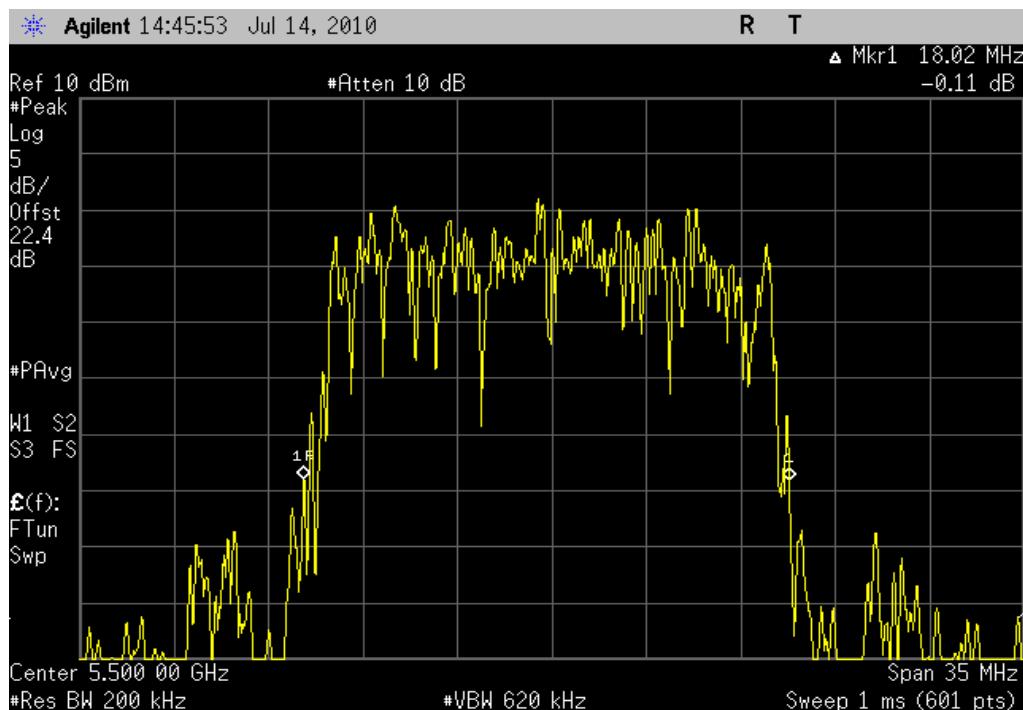


802.11(a) 36 Mbps, 5470 - 5725 MHz Band, Channel 100, Low Channel

Result: N/A

Value: 18.020 MHz

Limit: N/A

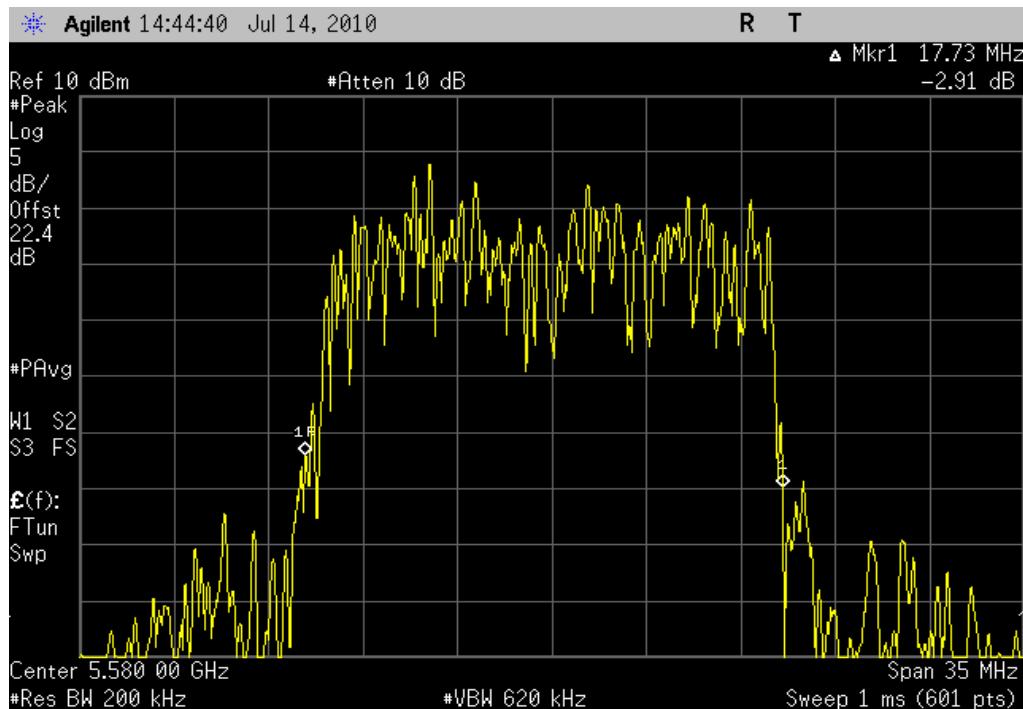


802.11(a) 36 Mbps, 5470 - 5725 MHz Band, Channel 116, Mid Channel

Result: N/A

Value: 17.730 MHz

Limit: N/A

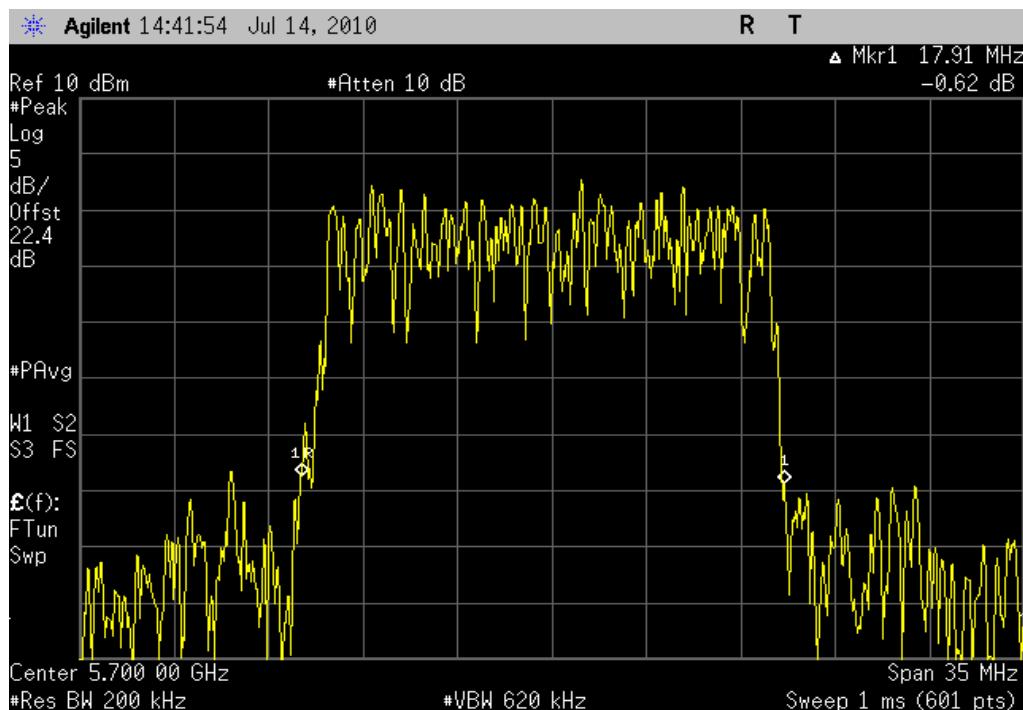


802.11(a) 36 Mbps, 5470 - 5725 MHz Band, Channel 140, High Channel

Result: N/A

Value: 17.910 MHz

Limit: N/A



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	6/1/2009	24	
Attenuator 20 dB, SMA M/F 26GHz	S.M. Electronics	SA26B-20	AUY	7/21/2009	13	
26 GHz DC Block, SMA	Pasternack	PE8210	AME	10/19/2009	13	
EV06 Direct Connect Cable	ESM Cable Corp.	TT	ECA	NCR	0	
Attenuator, 6 dB, 'SMA'	N/A	93459 3330A-6	AUF	4/1/2010	13	
Power Meter	Gigatronics	8651A	SPM	1/7/2010	13	
Power Sensor	Gigatronics	80701A	SPL	1/7/2010	13	
Signal Generator	Agilent	E8257D	TGX	12/10/2008	24	

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

ANSI C63.10 was followed. The transmit frequency was set to the required channels in each band. The transmit power was set to its default maximum. The lowest data rate was measured as it provided the highest output power. A direct connection was made between the RF output of the EUT and a spectrum analyzer. Attenuation and a DC block were used. The reference level offset on the spectrum analyzer was adjusted to compensate for cable loss and the external attenuation used between the RF output and the spectrum analyzer input. The amplitude accuracy of the spectrum analyzer was further enhanced by calibrating the setup using the power meter and synthesized signal generator.

Prior to measuring peak power spectral density, the transmission pulse duration (T) were measured. The transmission pulse duration and the associated data are found elsewhere in this test report.

Method #2 was used because while the pulse duration was short, an external trigger from the EUT was available for the 6 Mbps mode, which was the only mode tested due to having the highest output power of all modes.

The spectrum analyzer settings were as follows:

- The span was set to encompass entire emission bandwidth (B), centered on the transmit channel.
- RBW = 1 MHz, VBW >= 3 MHz because the emission bandwidth (B) is greater than 1 MHz
- Sample detector mode because the bin width (span / number of spectral points) < 0.5 RBW.
- Trace average 100 traces in power averaging mode (not video averaging).

The peak power spectral density (PPSD) was determined to be the highest level found across the emission in any 1 MHz band after 100 sweeps of power averaging (not video averaging).

PEAK POWER SPECTRAL DENSITY

EUT: Summit FS848 Master Module (Wheeler)	Work Order: FOCU0081
Serial Number: A146	Date: 07/14/10
Customer: Summit Semiconductor LLC	Temperature: 23°C
Attendees: Alex Macdonald	Humidity: 45%
Project: None	Barometric Pres.: 30.16 in
Tested by: Rod Peloquin	Job Site: EV06

TEST SPECIFICATIONS

FCC 15.407:2010	Test Method
	ANSI C63.10:2009

COMMENTS

External trigger from EUT. 6 Mbps operation

DEVIATIONS FROM TEST STANDARD

No Deviations

Configuration #	2	<i>Rod Peloquin</i> Signature
-----------------	---	----------------------------------

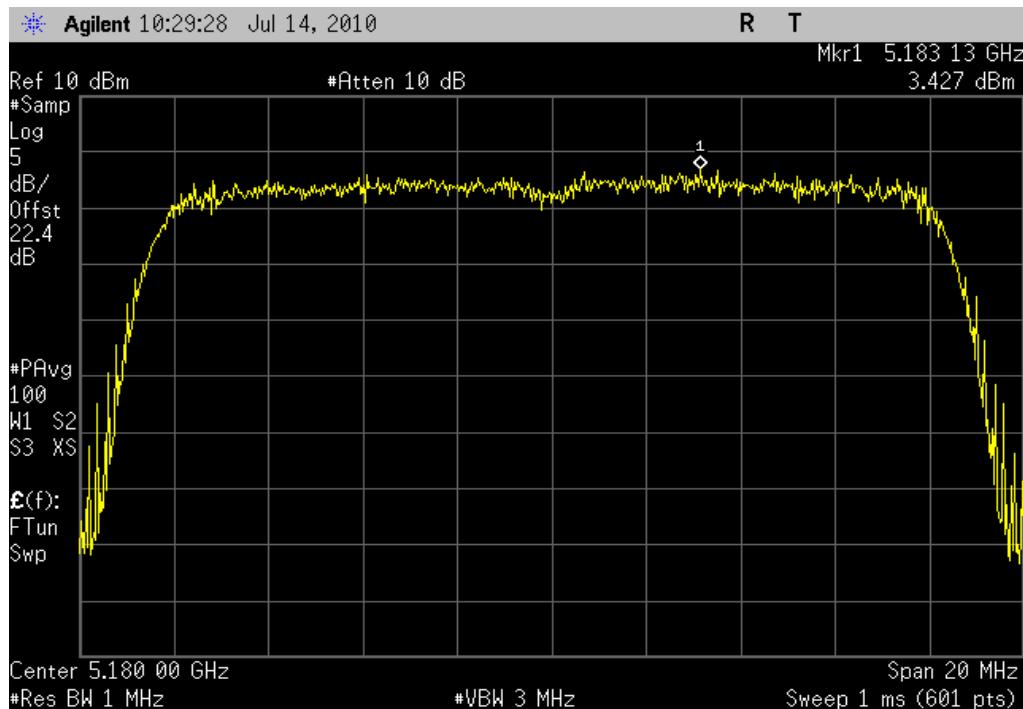
		Value	Limit	Results
802.11(a) 6 Mbps				
5150 - 5250 MHz Band	Channel 36, Low Channel	3.4 dBm	4 dBm	Pass
	Channel 48, High Channel	3.2 dBm	4 dBm	Pass
5250 - 5350 MHz Band				
	Channel 52, Low Channel	3.1 dBm	11 dBm	Pass
	Channel 64, High Channel	3.3 dBm	11 dBm	Pass
5470 - 5725 MHz Band				
	Channel 100, Low Channel	3.5 dBm	11 dBm	Pass
	Channel 116, Mid Channel	5.1 dBm	11 dBm	Pass
	Channel 140, High Channel	6.0 dBm	11 dBm	Pass

802.11(a) 6 Mbps, 5150 - 5250 MHz Band, Channel 36, Low Channel

Result: Pass

Value: 3.4 dBm

Limit: 4 dBm

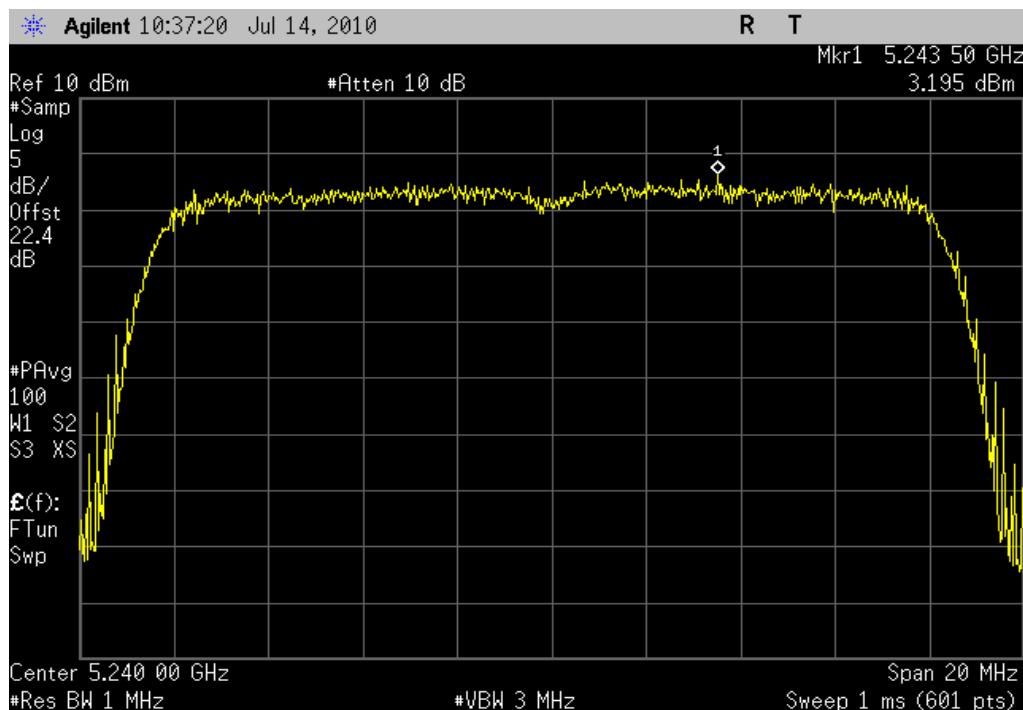


802.11(a) 6 Mbps, 5150 - 5250 MHz Band, Channel 48, High Channel

Result: Pass

Value: 3.2 dBm

Limit: 4 dBm

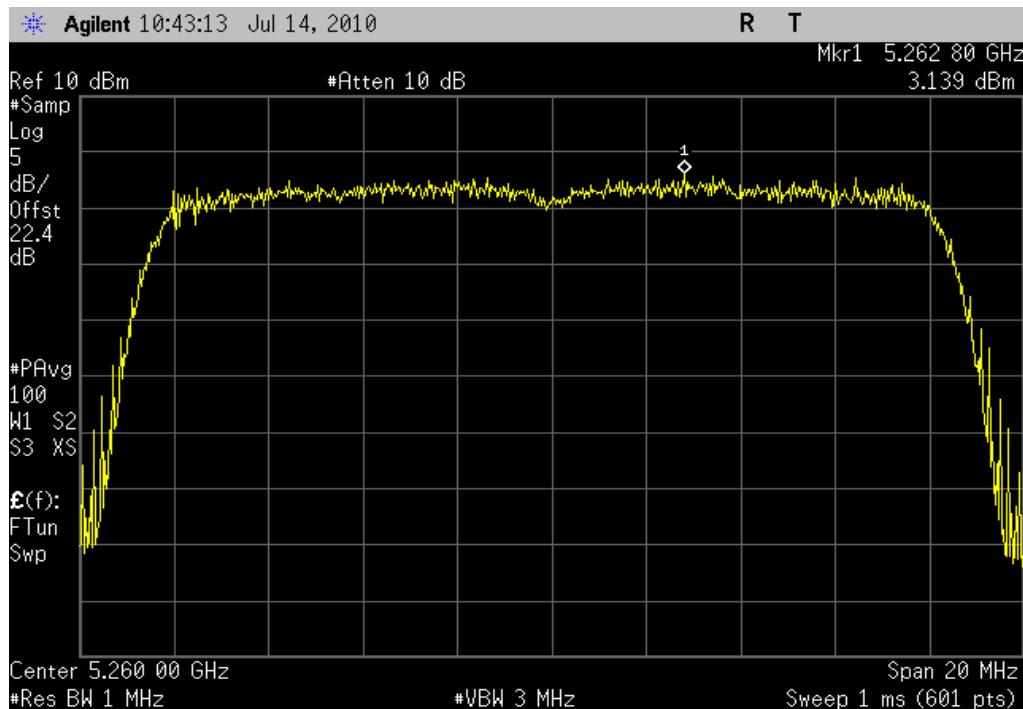


802.11(a) 6 Mbps, 5250 - 5350 MHz Band, Channel 52, Low Channel

Result: Pass

Value: 3.1 dBm

Limit: 11 dBm

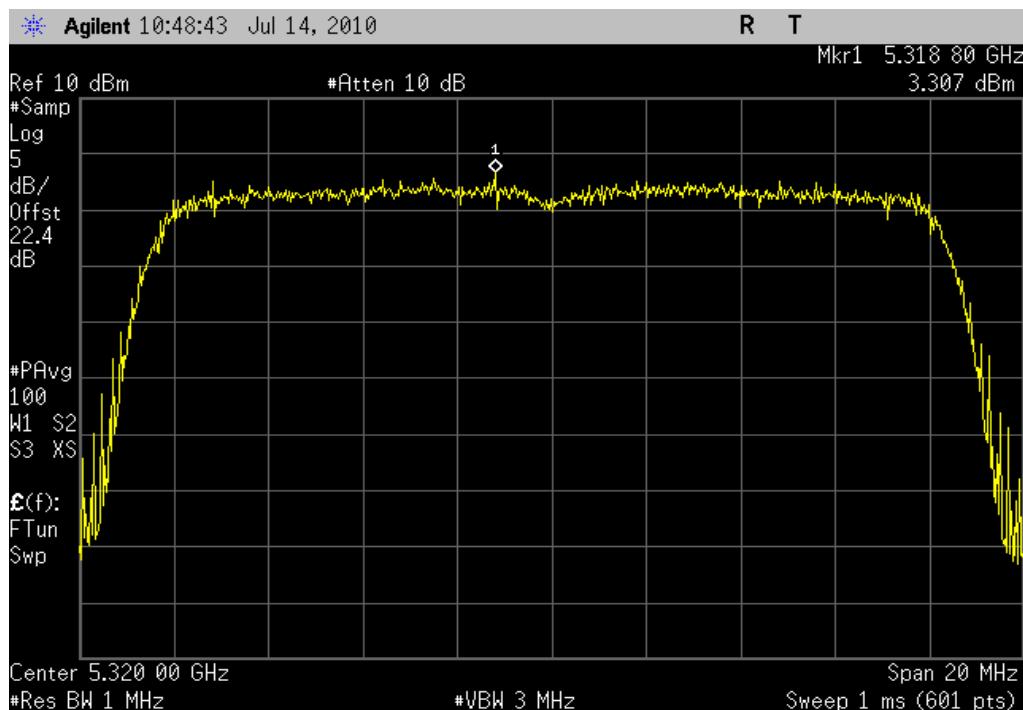


802.11(a) 6 Mbps, 5250 - 5350 MHz Band, Channel 64, High Channel

Result: Pass

Value: 3.3 dBm

Limit: 11 dBm

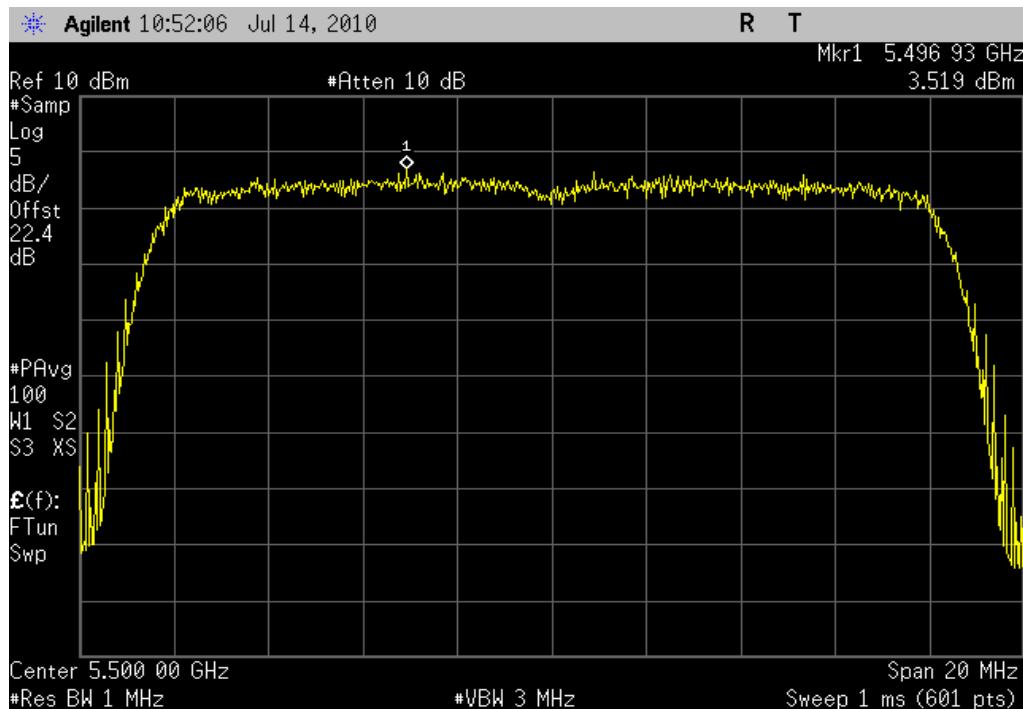


802.11(a) 6 Mbps, 5470 - 5725 MHz Band, Channel 100, Low Channel

Result: Pass

Value: 3.5 dBm

Limit: 11 dBm



802.11(a) 6 Mbps, 5470 - 5725 MHz Band, Channel 116, Mid Channel

Result: Pass

Value: 5.1 dBm

Limit: 11 dBm

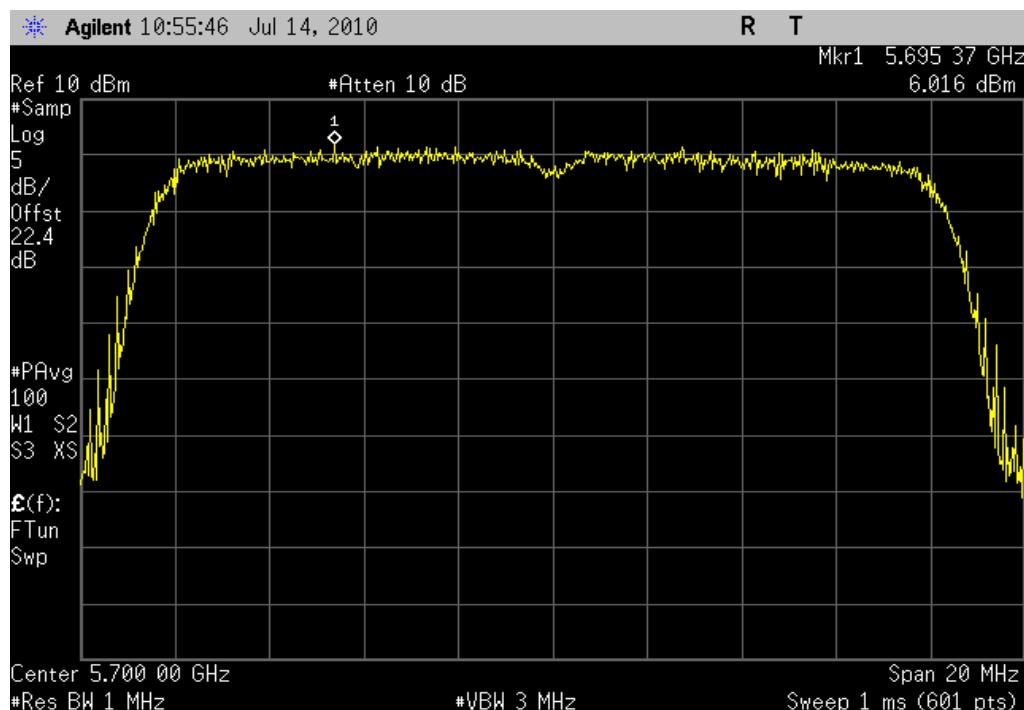


802.11(a) 6 Mbps, 5470 - 5725 MHz Band, Channel 140, High Channel

Result: Pass

Value: 6.0 dBm

Limit: 11 dBm



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	6/1/2009	24	
EV06 Direct Connect Cable	ESM Cable Corp.	TT	ECA	NCR	0	
Attenuator 20 dB, SMA M/F 26GHz	S.M. Electronics	SA26B-20	AUY	7/21/2009	13	
26 GHz DC Block, SMA	Pasternack	PE8210	AME	10/19/2009	13	
Attenuator, 6 dB, 'SMA'	N/A	93459 3330A-6	AUF	4/1/2010	13	
Power Meter	Gigatronics	8651A	SPM	1/7/2010	13	
Power Sensor	Gigatronics	80701A	SPL	1/7/2010	13	
Signal Generator	Agilent	E8257D	TGX	12/10/2008	24	

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 transmit frequency was set to the required channels in each band. The transmit power was set to its default maximum. The lowest, a medium, and the highest data rates were measured. A direct connection was made between the RF output of the EUT and a spectrum analyzer. Attenuation and a DC block were used. The reference level offset on the spectrum analyzer was adjusted to compensate for cable loss and the external attenuation used between the RF output and the spectrum analyzer input.

The spectrum analyzer settings were as follows:

- Span set to encompass the entire emission bandwidth (B), centered on the transmit channel.
- Using the marker delta function, the largest difference between the following two traces was measured:
 - 1st Trace: RBW = 1 MHz, VBW >= 3 MHz with peak detector and max-hold settings.
 - 2nd Trace: Use same settings as were used for peak conducted transmit power. The sample detector was used as well as the VBW being matched to that used on the peak conducted transmit power.

PEAK EXCURSION

EUT: Summit FS848 Master Module (Wheeler)	Work Order: FOCU0081
Serial Number: A146	Date: 07/15/10
Customer: Summit Semiconductor LLC	Temperature: 23°C
Attendees: Alex Macdonald	Humidity: 45%
Project: None	Barometric Pres.: 30.16 in
Tested by: Rod Peloquin	Job Site: EV06

TEST SPECIFICATIONS

FCC 15.407:2010	Test Method
	ANSI C63.10:2009

COMMENTS

External trigger from EUT.

DEVIATIONS FROM TEST STANDARD

No Deviations

Configuration #	2	Signature	
		<i>Rod Peloquin</i>	

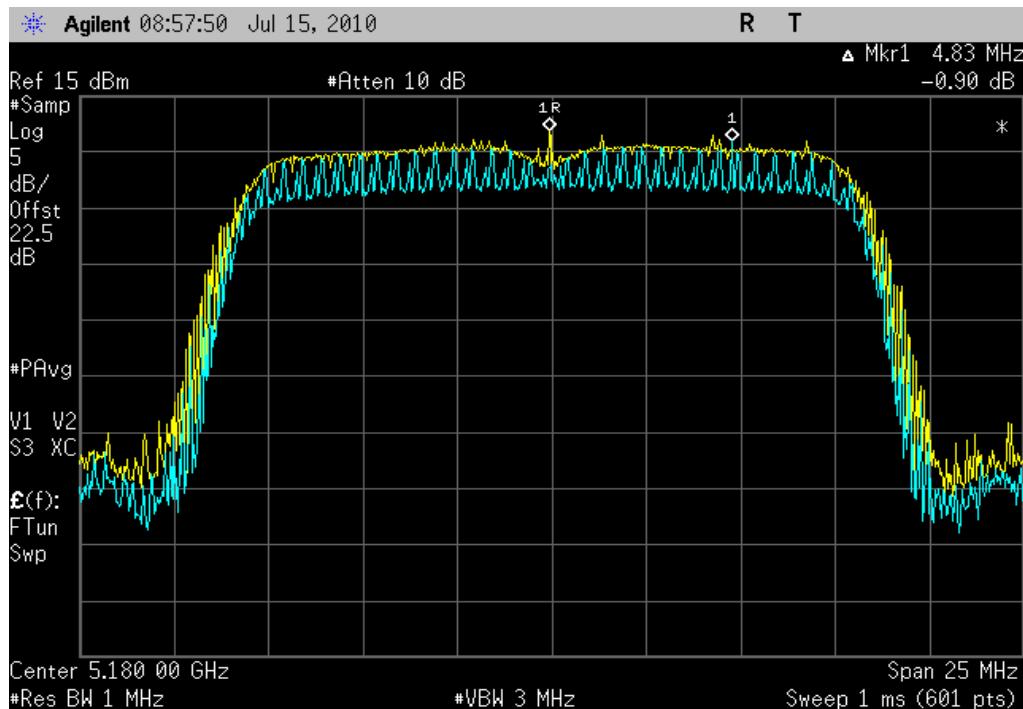
		Value	Limit	Results
802.11(a) 6 Mbps				
5150 - 5250 MHz Band	Channel 36, Low Channel	-0.90 dB	≤ 13 dB	Pass
	Channel 48, High Channel	-1.03 dB	≤ 13 dB	Pass
5250 - 5350 MHz Band				
	Channel 52, Low Channel	-1.11 dB	≤ 13 dB	Pass
	Channel 64, High Channel	-1.09 dB	≤ 13 dB	Pass
5470 - 5725 MHz Band				
	Channel 100, Low Channel	-0.73 dB	≤ 13 dB	Pass
	Channel 116, Mid Channel	-0.71 dB	≤ 13 dB	Pass
	Channel 140, High Channel	-0.55 dB	≤ 13 dB	Pass
802.11(a) 36 Mbps				
5150 - 5250 MHz Band	Channel 36, Low Channel	-1.24 dB	≤ 13 dB	Pass
	Channel 48, High Channel	-0.64 dB	≤ 13 dB	Pass
5250 - 5350 MHz Band				
	Channel 52, Low Channel	-1.13 dB	≤ 13 dB	Pass
	Channel 64, High Channel	-1.50 dB	≤ 13 dB	Pass
5470 - 5725 MHz Band				
	Channel 100, Low Channel	-0.76 dB	≤ 13 dB	Pass
	Channel 116, Mid Channel	-0.40 dB	≤ 13 dB	Pass
	Channel 140, High Channel	-0.82 dB	≤ 13 dB	Pass

802.11(a) 6 Mbps, 5150 - 5250 MHz Band, Channel 36, Low Channel

Result: Pass

Value: -0.90 dB

Limit: ≤ 13 dB

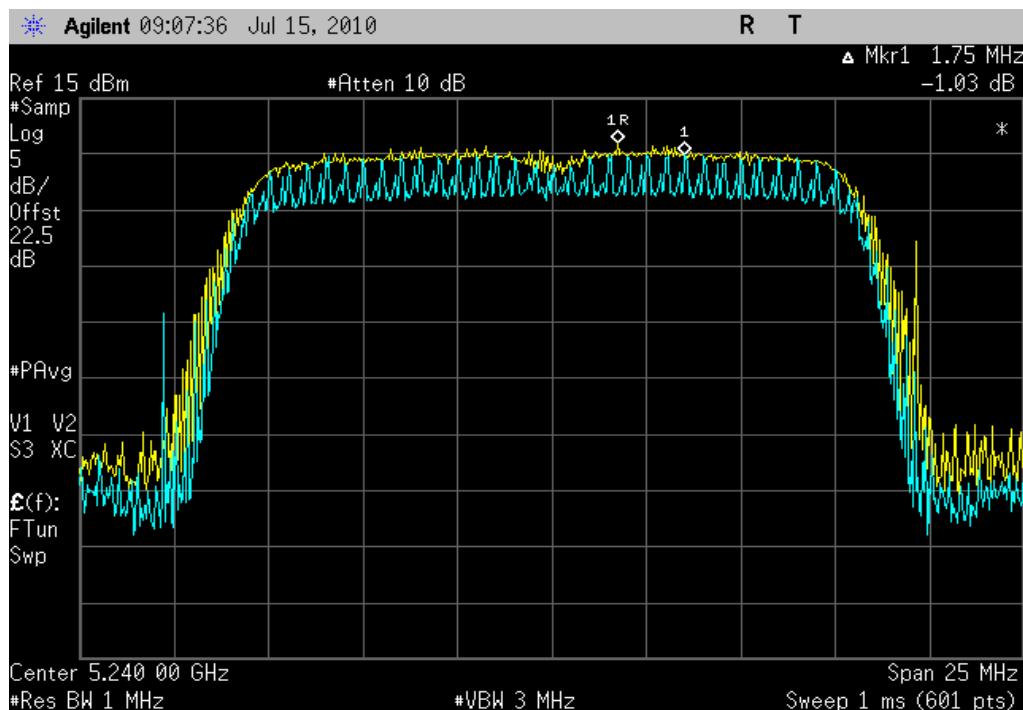


802.11(a) 6 Mbps, 5150 - 5250 MHz Band, Channel 48, High Channel

Result: Pass

Value: -1.03 dB

Limit: ≤ 13 dB

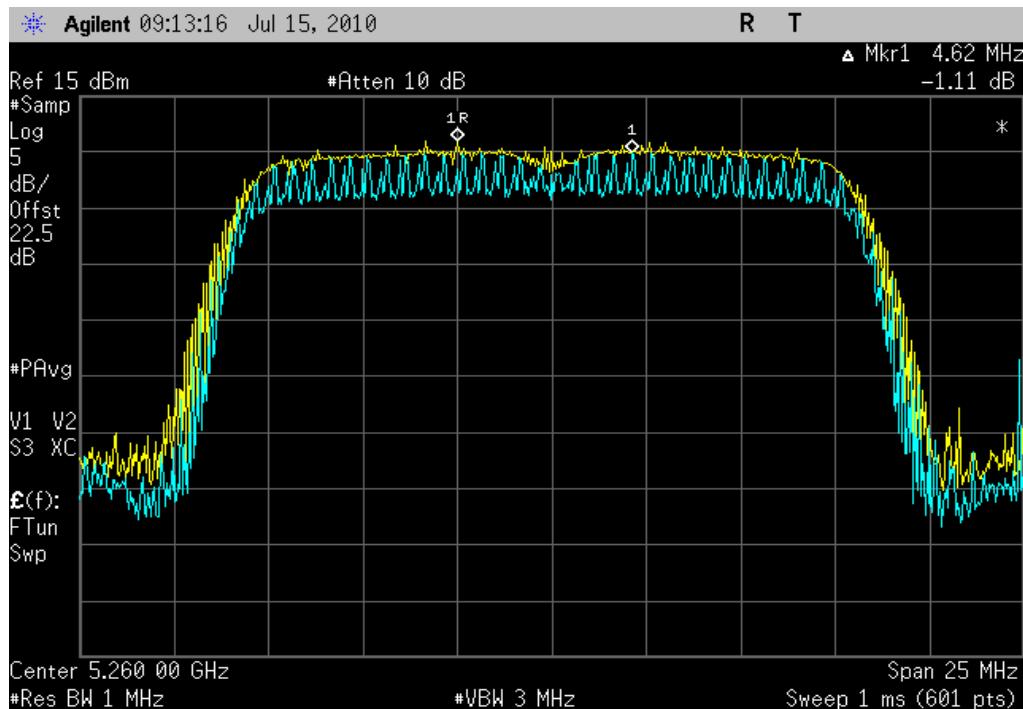


802.11(a) 6 Mbps, 5250 - 5350 MHz Band, Channel 52, Low Channel

Result: Pass

Value: -1.11 dB

Limit: ≤ 13 dB

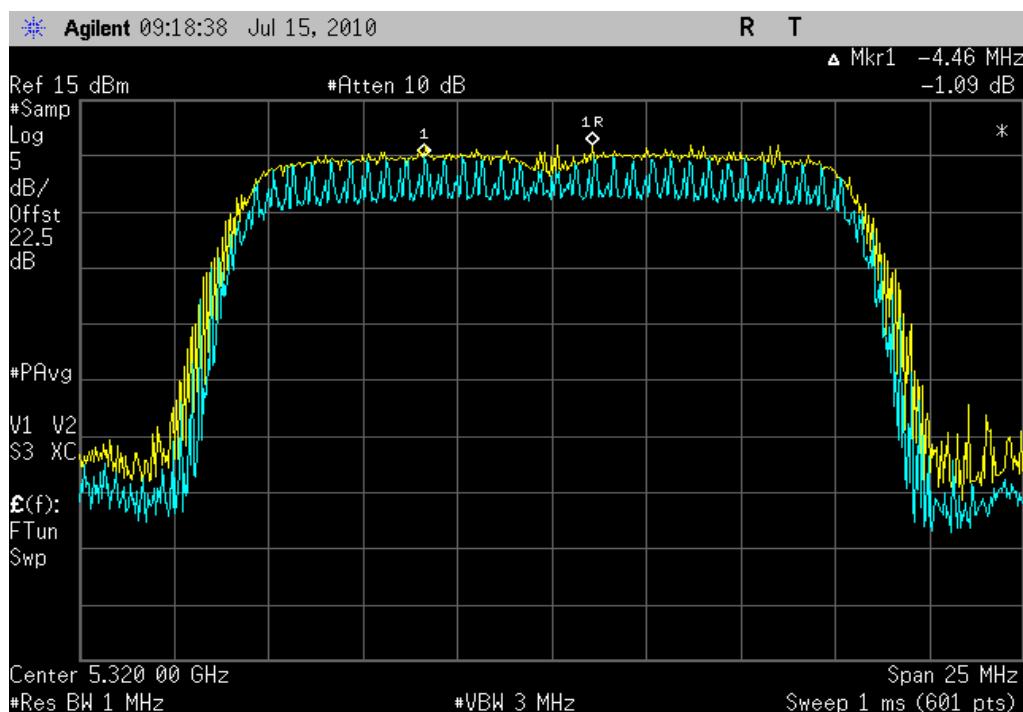


802.11(a) 6 Mbps, 5250 - 5350 MHz Band, Channel 64, High Channel

Result: Pass

Value: -1.09 db

Limit: ≤ 13 dB

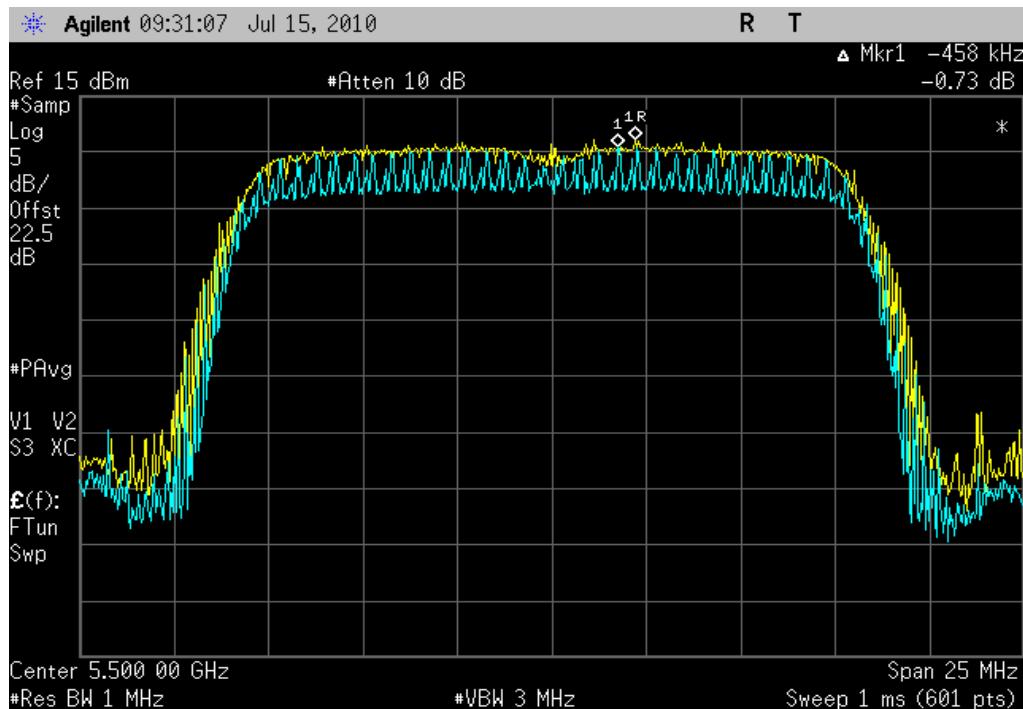


802.11(a) 6 Mbps, 5470 - 5725 MHz Band, Channel 100, Low Channel

Result: Pass

Value: -0.73 dB

Limit: ≤ 13 dB

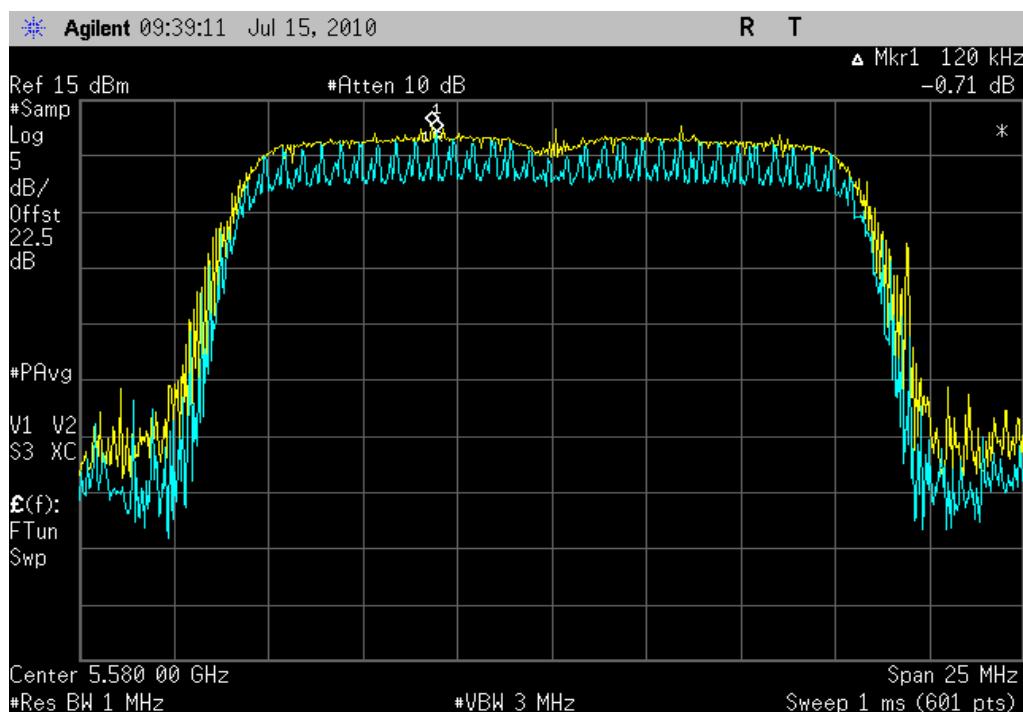


802.11(a) 6 Mbps, 5470 - 5725 MHz Band, Channel 116, Mid Channel

Result: Pass

Value: -0.71 dB

Limit: ≤ 13 dB

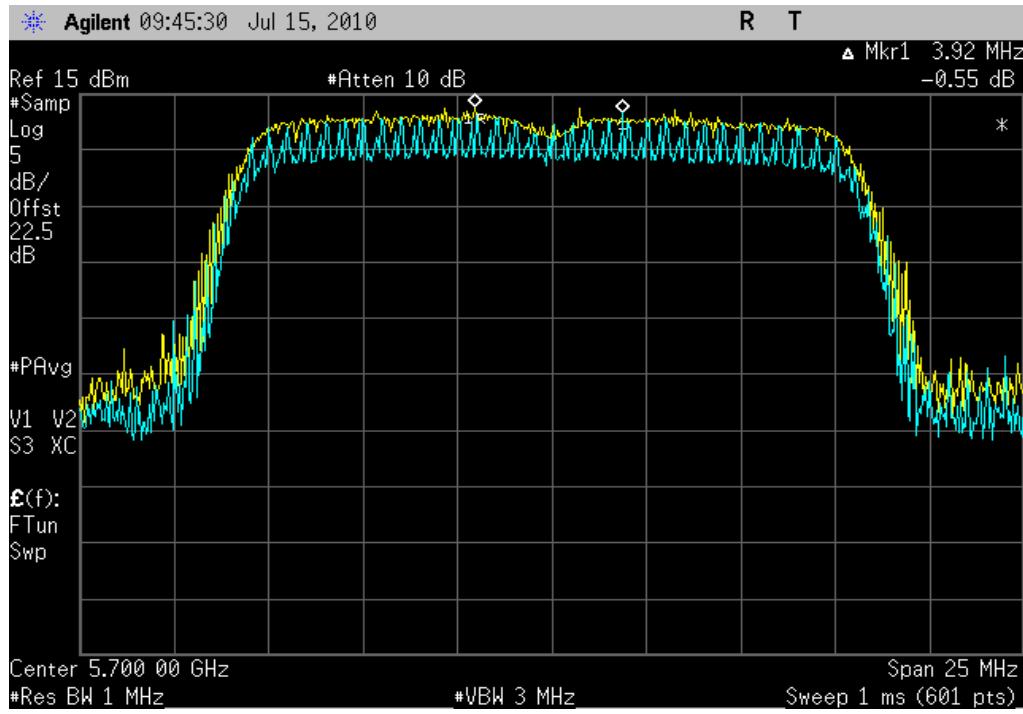


802.11(a) 6 Mbps, 5470 - 5725 MHz Band, Channel 140, High Channel

Result: Pass

Value: -0.55 dB

Limit: ≤ 13 dB

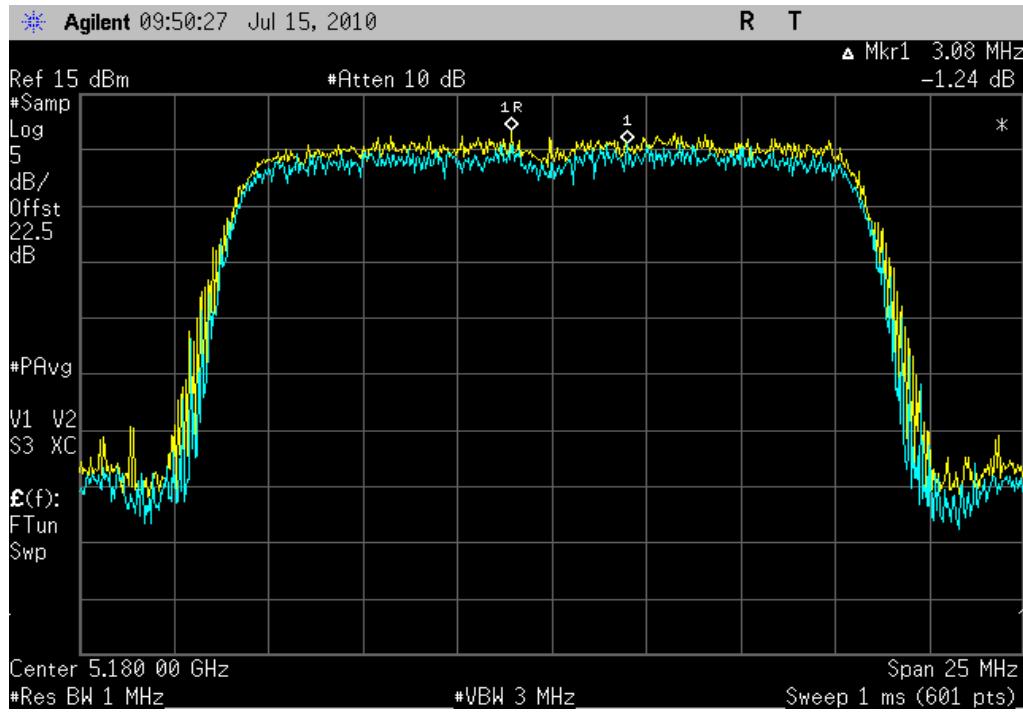


802.11(a) 36 Mbps, 5150 - 5250 MHz Band, Channel 36, Low Channel

Result: Pass

Value: -1.24 dB

Limit: ≤ 13 dB

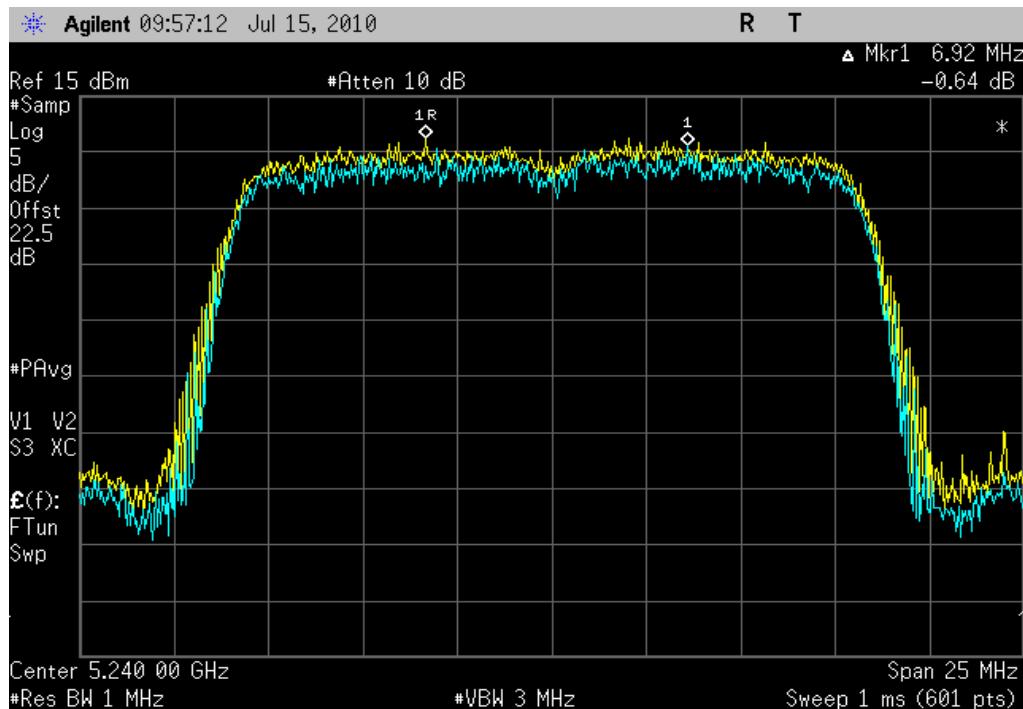


802.11(a) 36 Mbps, 5150 - 5250 MHz Band, Channel 48, High Channel

Result: Pass

Value: -0.64 dB

Limit: ≤ 13 dB

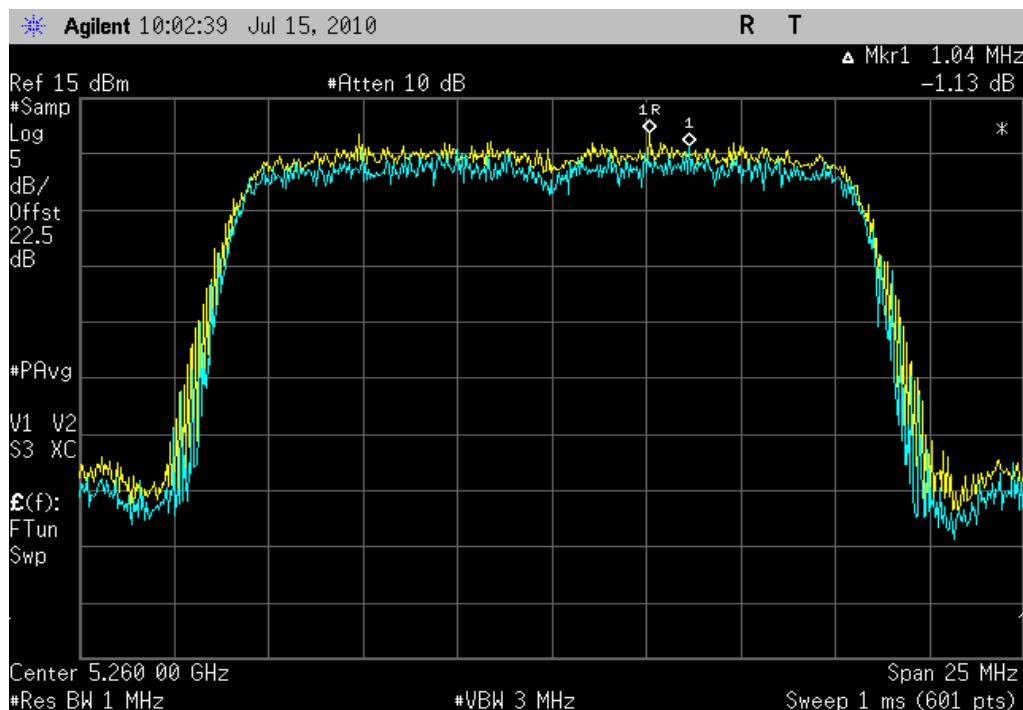


802.11(a) 36 Mbps, 5250 - 5350 MHz Band, Channel 52, Low Channel

Result: Pass

Value: -1.13 dB

Limit: ≤ 13 dB

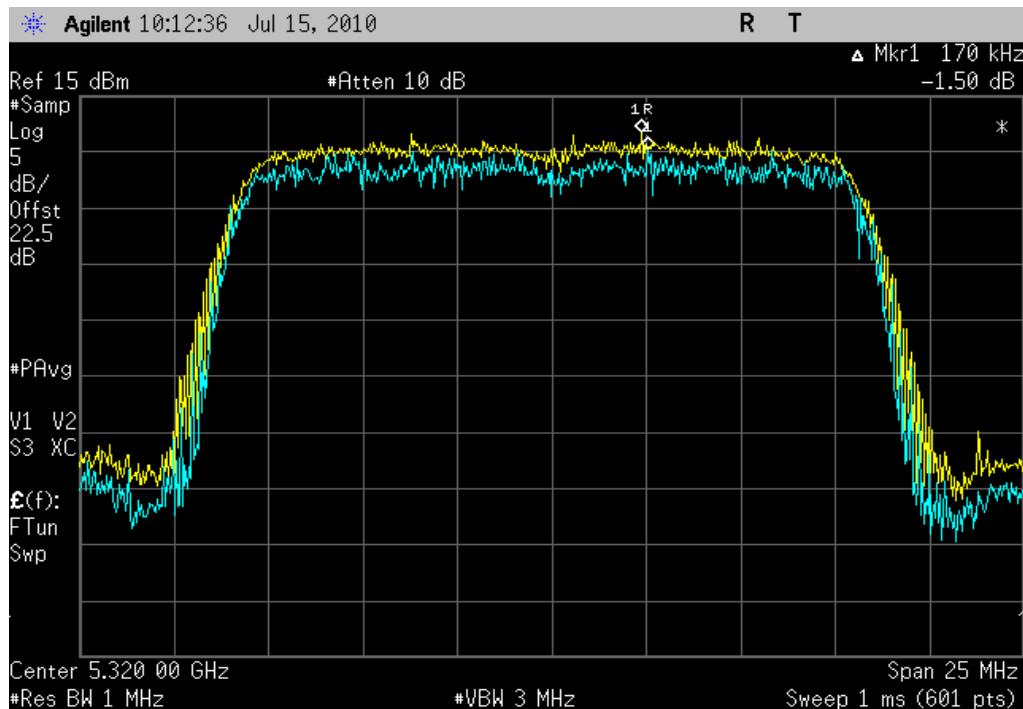


802.11(a) 36 Mbps, 5250 - 5350 MHz Band, Channel 64, High Channel

Result: Pass

Value: -1.50 dB

Limit: ≤ 13 dB

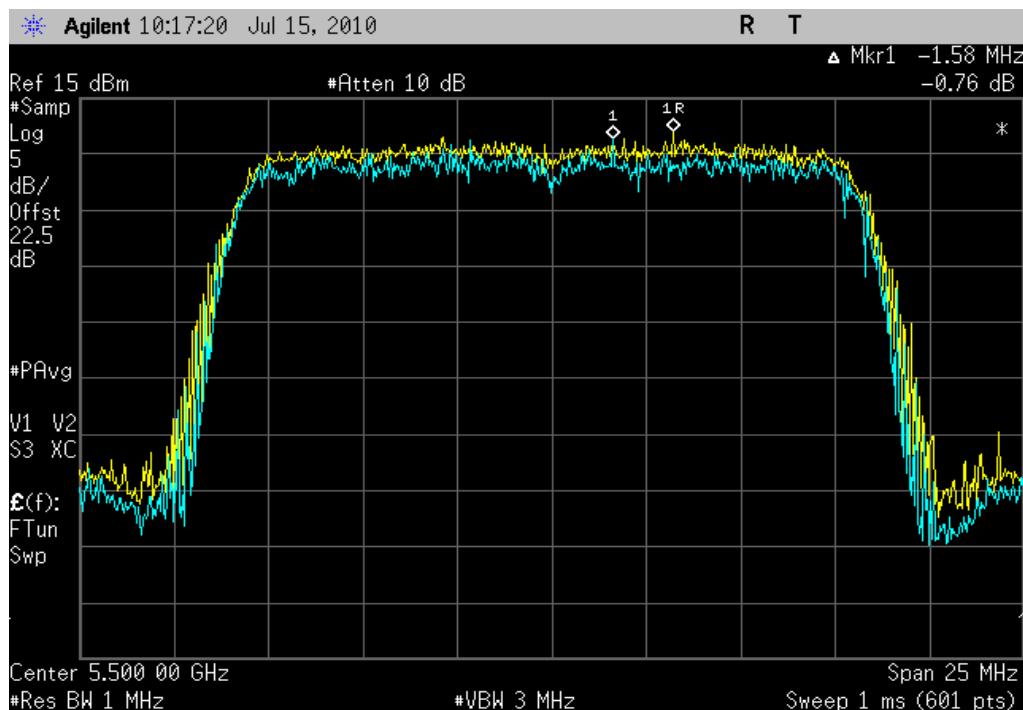


802.11(a) 36 Mbps, 5470 - 5725 MHz Band, Channel 100, Low Channel

Result: Pass

Value: -0.76 dB

Limit: ≤ 13 dB

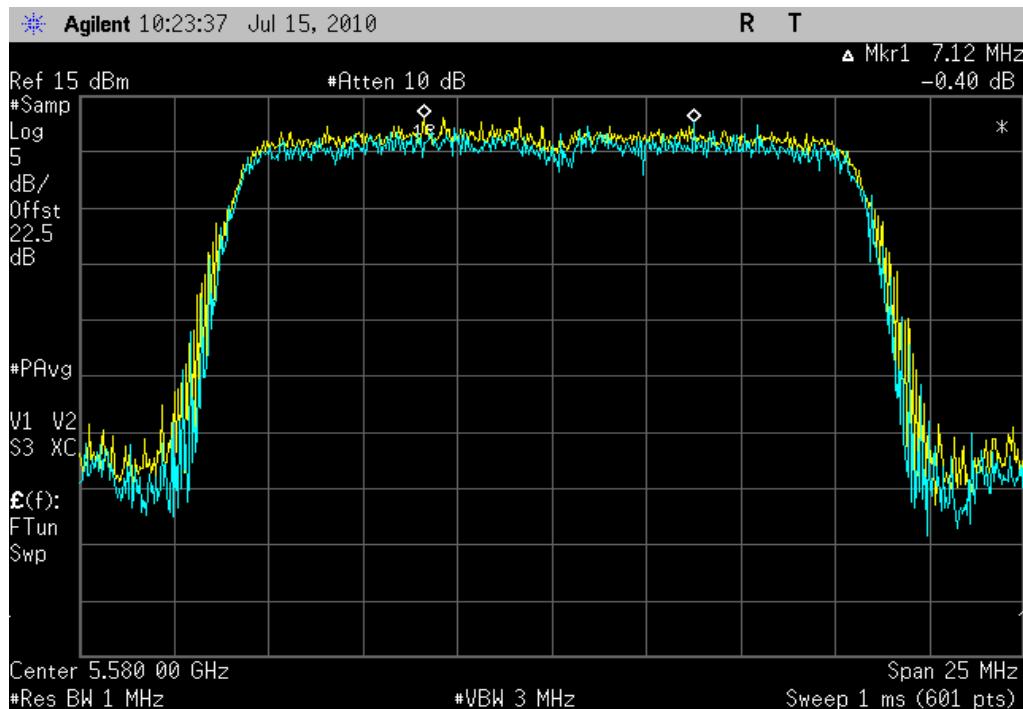


802.11(a) 36 Mbps, 5470 - 5725 MHz Band, Channel 116, Mid Channel

Result: Pass

Value: -0.40 dB

Limit: ≤ 13 dB

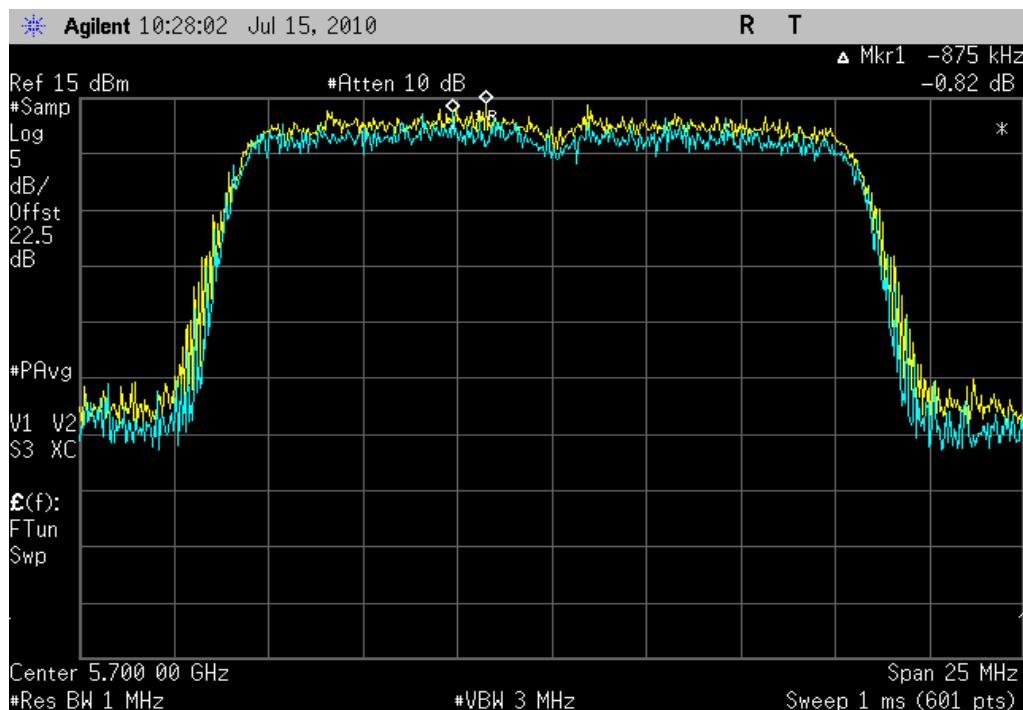


802.11(a) 36 Mbps, 5470 - 5725 MHz Band, Channel 140, High Channel

Result: Pass

Value: -0.82 dB

Limit: ≤ 13 dB



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	6/1/2009	24	
Attenuator 20 dB, SMA M/F 26GHz	S.M. Electronics	SA26B-20	AUY	7/21/2009	13	
26 GHz DC Block, SMA	Pasternack	PE8210	AME	10/19/2009	13	
EV06 Direct Connect Cable	ESM Cable Corp.	TT	ECA	NCR	0	
Attenuator, 6 dB, 'SMA'	N/A	93459 3330A-6	AUF	4/1/2010	13	
e-Amplifier (FOR REFERENCE ONLY)	Hewlett-Packard	83017A	APL	NCR	0	
Signal Generator	Agilent	E8257D	TGX	12/10/2008	24	

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

ANSI C63.10 was followed. The transmit frequency was set to the required channels in each band. 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 reference level offset on the spectrum analyzer was adjusted to compensate for cable loss and the external attenuation used between the RF output and the spectrum analyzer input. The amplitude accuracy of the spectrum analyzer was further enhanced by calibrating the setup using the power meter and synthesized signal generator.

Prior to measuring peak transmit power; the emission bandwidth (B) and the transmission pulse duration (T) were measured. Both are required to determine the method of measuring Peak Transmit Power. The method of measuring the emission bandwidth and the associated data are found elsewhere in this test report. The transmission pulse duration (T) was measured using a zero span on the spectrum analyzer to see the pulses in the time domain.

Method #3 was used because the analyzer sweep time was greater than T for the operating mode which has the shortest transmission pulse duration and the Emission Bandwidth was greater than the largest RBW on the analyzer.

An external trigger to the analyzer was used in conjunction with the sweep gating function to ensure the measurement was made only during the high time of the pulse duration.

The spectrum analyzer settings were as follows:

- The span was set to encompass entire emission bandwidth (B), centered on the transmit channel.
- The RBW = 1 MHz, VBW > / = 1/T
- Sample detector mode because the bin width (span / number of spectral points) < 0.5 RBW.
- Power was integrated across "B", by using the channel power function of the analyzer.

PEAK TRANSMIT POWER

EUT: Summit FS848 Master Module (Wheeler)	Work Order: FOCU0081
Serial Number: A146	Date: 07/14/10
Customer: Summit Semiconductor LLC	Temperature: 23°C
Attendees: Alex Macdonald	Humidity: 45%
Project: None	Barometric Pres.: 30.16 in
Tested by: Rod Peloquin	Job Site: EV06

TEST SPECIFICATIONS

FCC 15.407:2010	Test Method
	ANSI C63.10:2009

COMMENTS

With External trigger from EUT for 6 Mbps measurements.

DEVIATIONS FROM TEST STANDARD

No Deviations

Configuration #	2	
		Signature

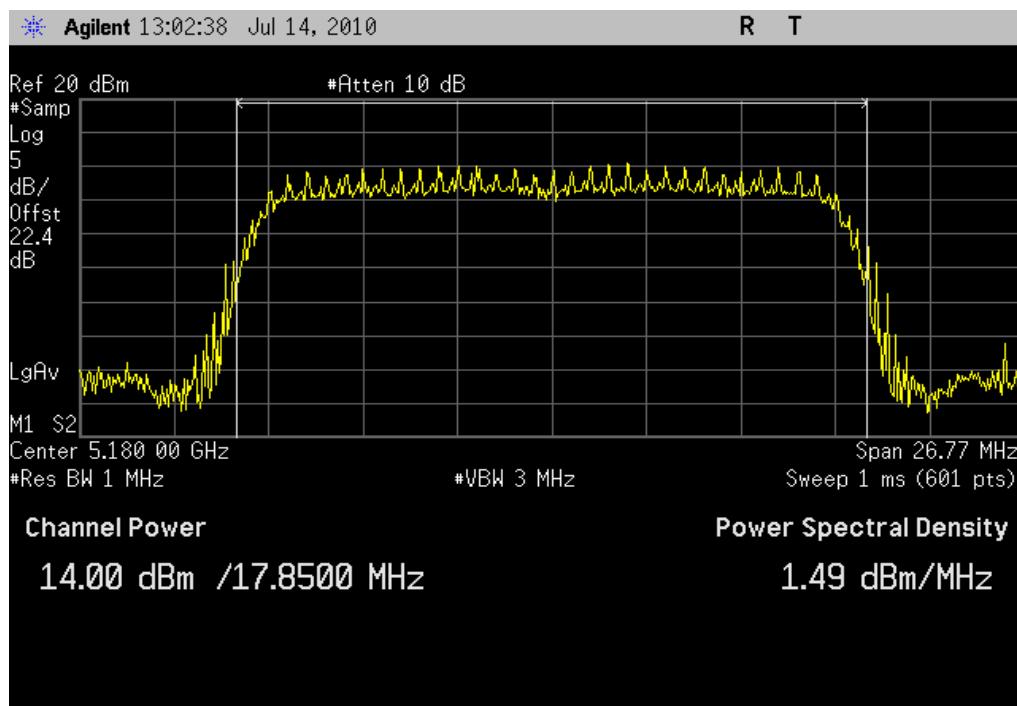
		Value	Limit	Results
802.11(a) 6 Mbps				
5150 - 5250 MHz Band	Channel 36, Low Channel	14.0 dBm	17 dBm	Pass
	Channel 48, High Channel	13.6 dBm	17 dBm	Pass
5250 - 5350 MHz Band				
	Channel 52, Low Channel	13.5 dBm	24 dBm	Pass
	Channel 64, High Channel	13.6 dBm	24 dBm	Pass
5470 - 5725 MHz Band				
	Channel 100, Low Channel	14.1 dBm	24 dBm	Pass
	Channel 116, Mid Channel	15.6 dBm	24 dBm	Pass
	Channel 140, High Channel	16.6 dBm	24 dBm	Pass
802.11(a) 36 Mbps				
5150 - 5250 MHz Band	Channel 36, Low Channel	13.6 dBm	17 dBm	Pass
	Channel 48, High Channel	13.3 dBm	17 dBm	Pass
5250 - 5350 MHz Band				
	Channel 52, Low Channel	13.4 dBm	24 dBm	Pass
	Channel 64, High Channel	13.1 dBm	24 dBm	Pass
5470 - 5725 MHz Band				
	Channel 100, Low Channel	13.6 dBm	24 dBm	Pass
	Channel 116, Mid Channel	14.9 dBm	24 dBm	Pass
	Channel 140, High Channel	16.4 dBm	24 dBm	Pass

802.11(a) 6 Mbps, 5150 - 5250 MHz Band, Channel 36, Low Channel

Result: Pass

Value: 14.0 dBm

Limit: 17 dBm

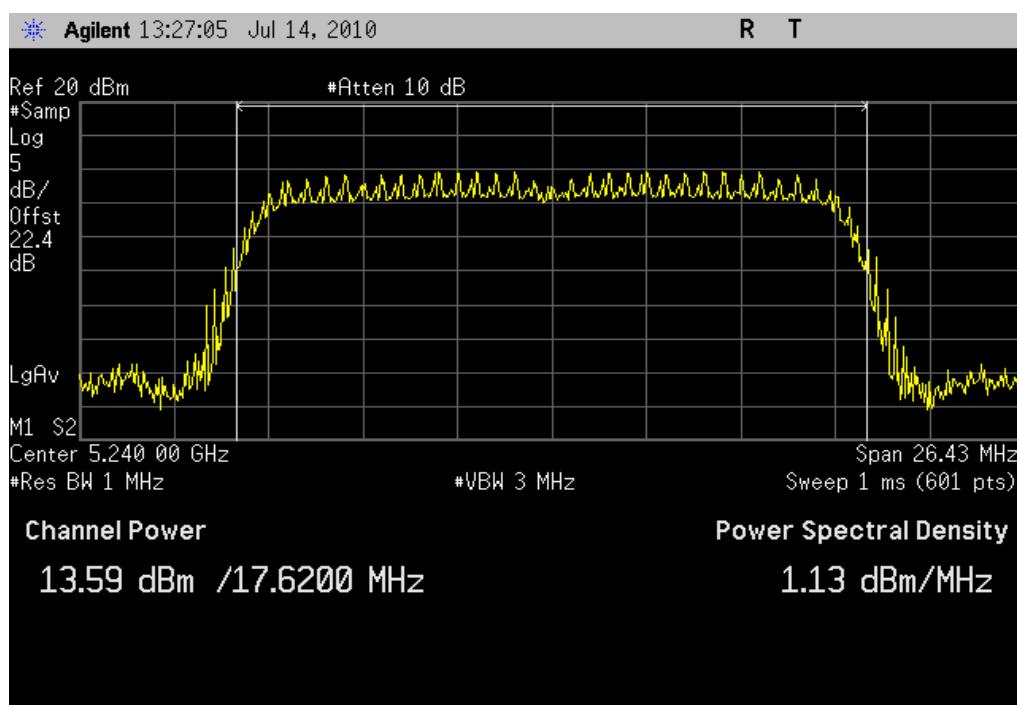


802.11(a) 6 Mbps, 5150 - 5250 MHz Band, Channel 48, High Channel

Result: Pass

Value: 13.6 dBm

Limit: 17 dBm

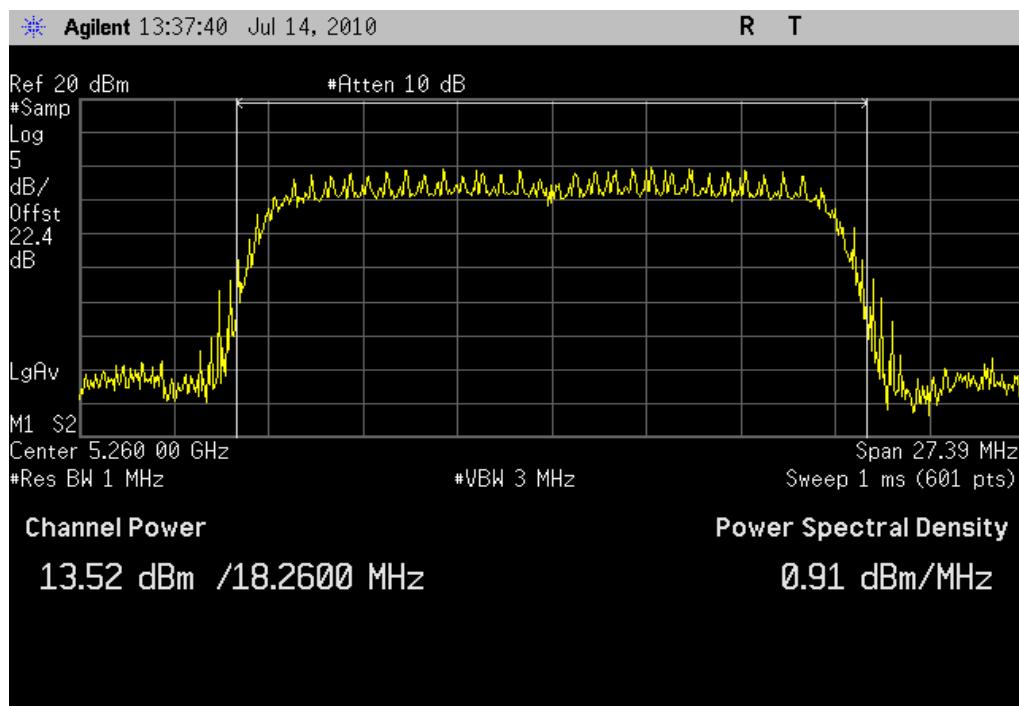


802.11(a) 6 Mbps, 5250 - 5350 MHz Band, Channel 52, Low Channel

Result: Pass

Value: 13.5 dBm

Limit: 24 dBm

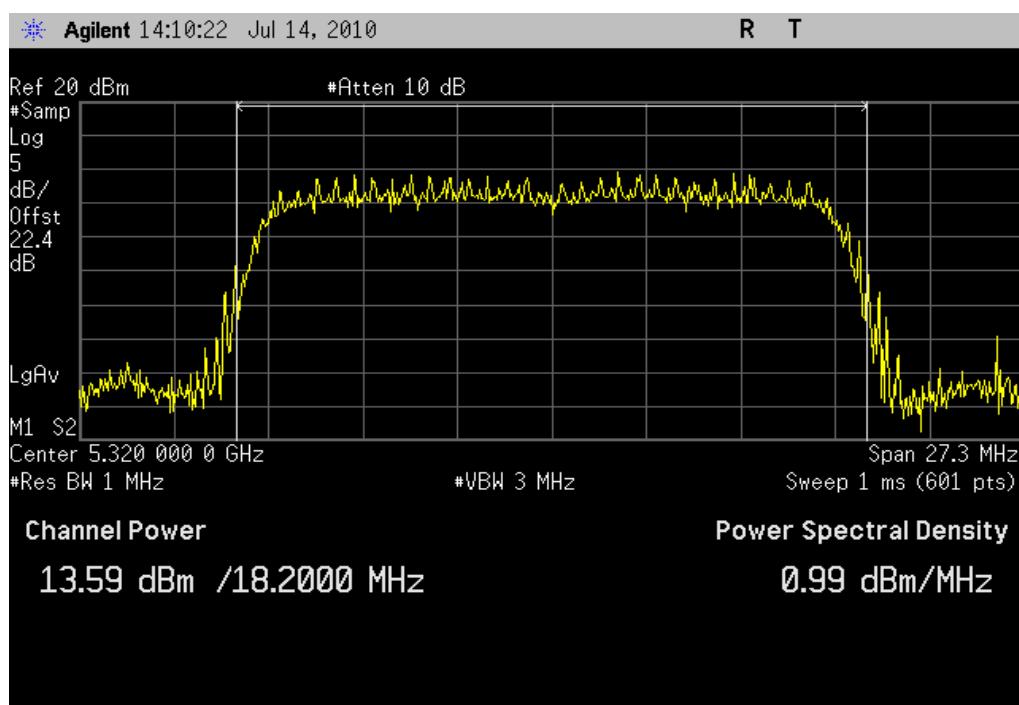


802.11(a) 6 Mbps, 5250 - 5350 MHz Band, Channel 64, High Channel

Result:

Value: 13.6 dBm

Limit: 24 dBm

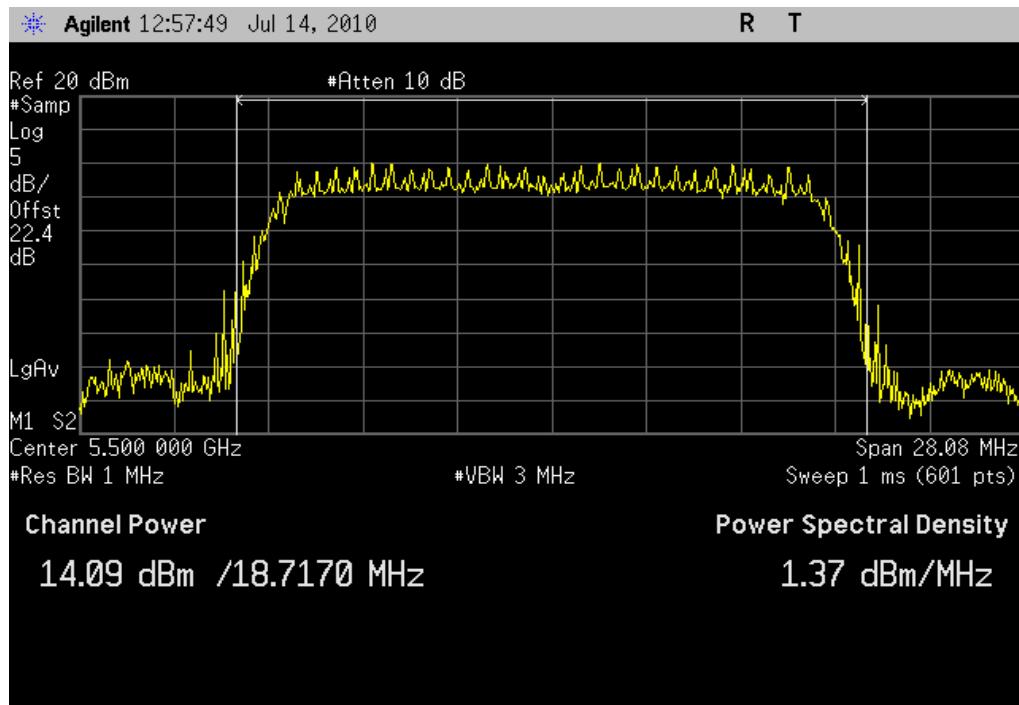


802.11(a) 6 Mbps, 5470 - 5725 MHz Band, Channel 100, Low Channel

Result: Pass

Value: 14.1 dBm

Limit: 24 dBm

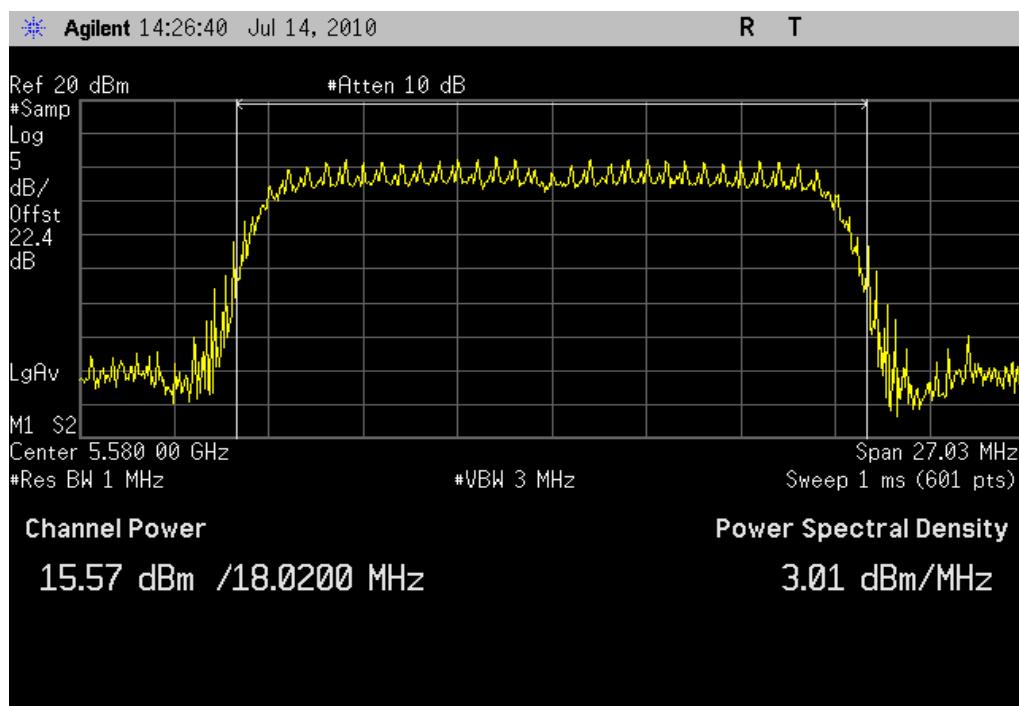


802.11(a) 6 Mbps, 5470 - 5725 MHz Band, Channel 116, Mid Channel

Result: Pass

Value: 15.6 dBm

Limit: 24 dBm

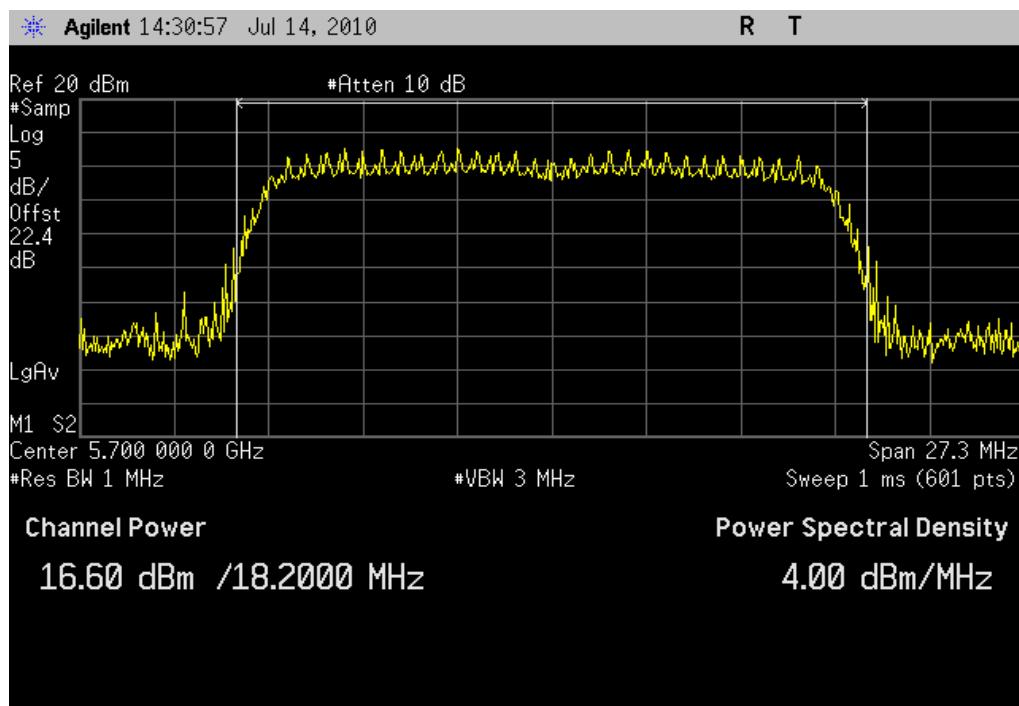


802.11(a) 6 Mbps, 5470 - 5725 MHz Band, Channel 140, High Channel

Result: Pass

Value: 16.6 dBm

Limit: 24 dBm

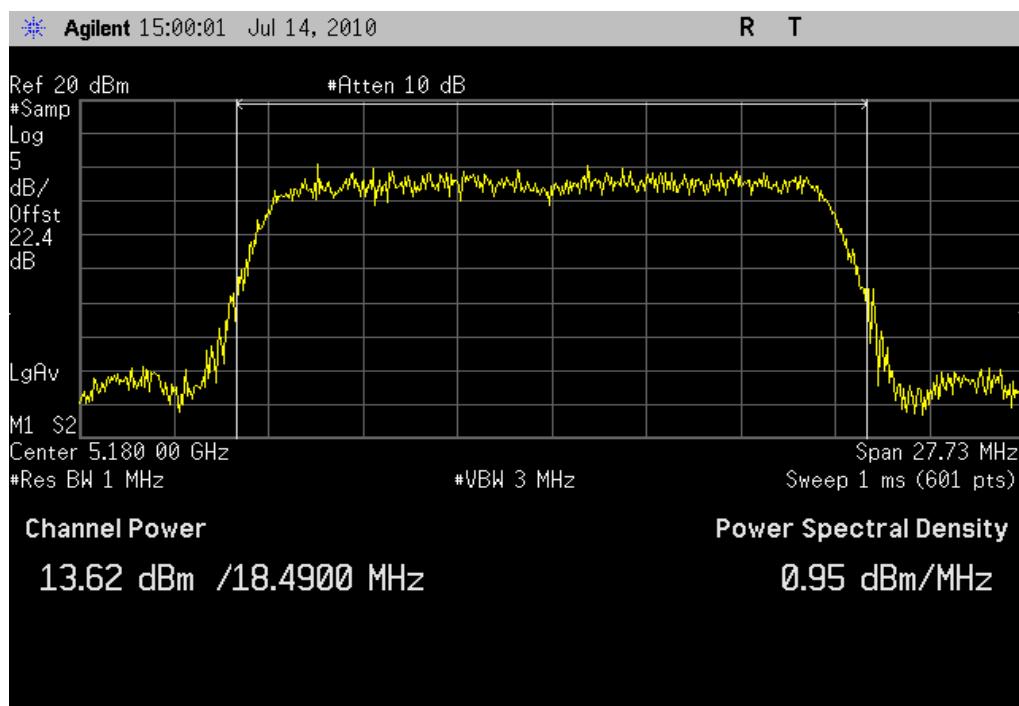


802.11(a) 36 Mbps, 5150 - 5250 MHz Band, Channel 36, Low Channel

Result: Pass

Value: 13.6 dBm

Limit: 17 dBm

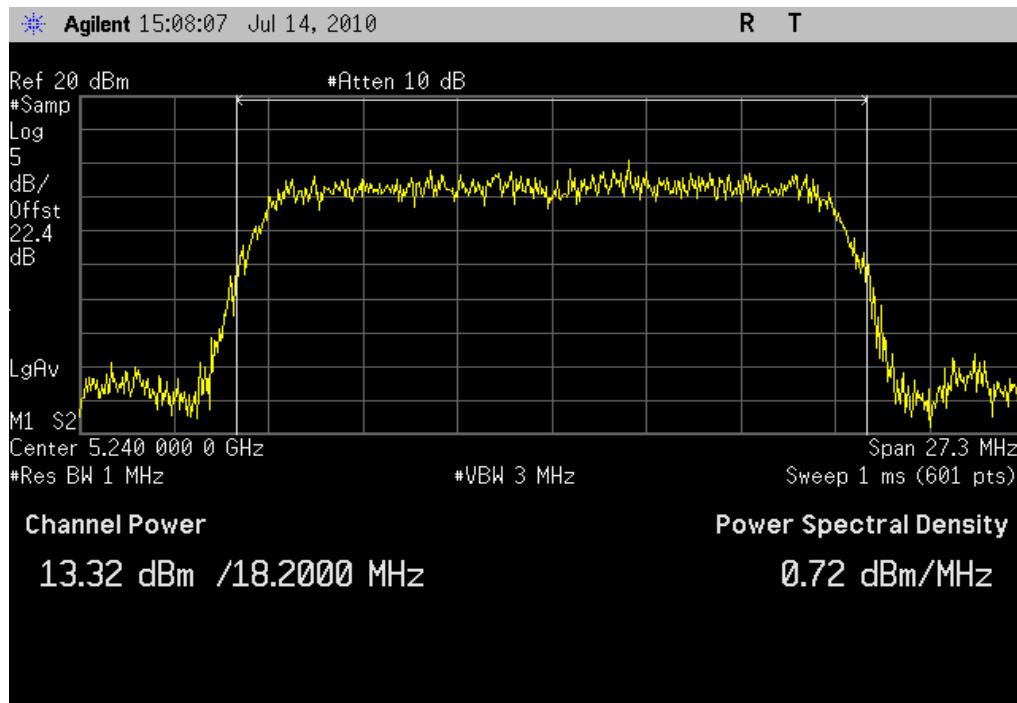


802.11(a) 36 Mbps, 5150 - 5250 MHz Band, Channel 48, High Channel

Result: Pass

Value: 13.3 dBm

Limit: 17 dBm

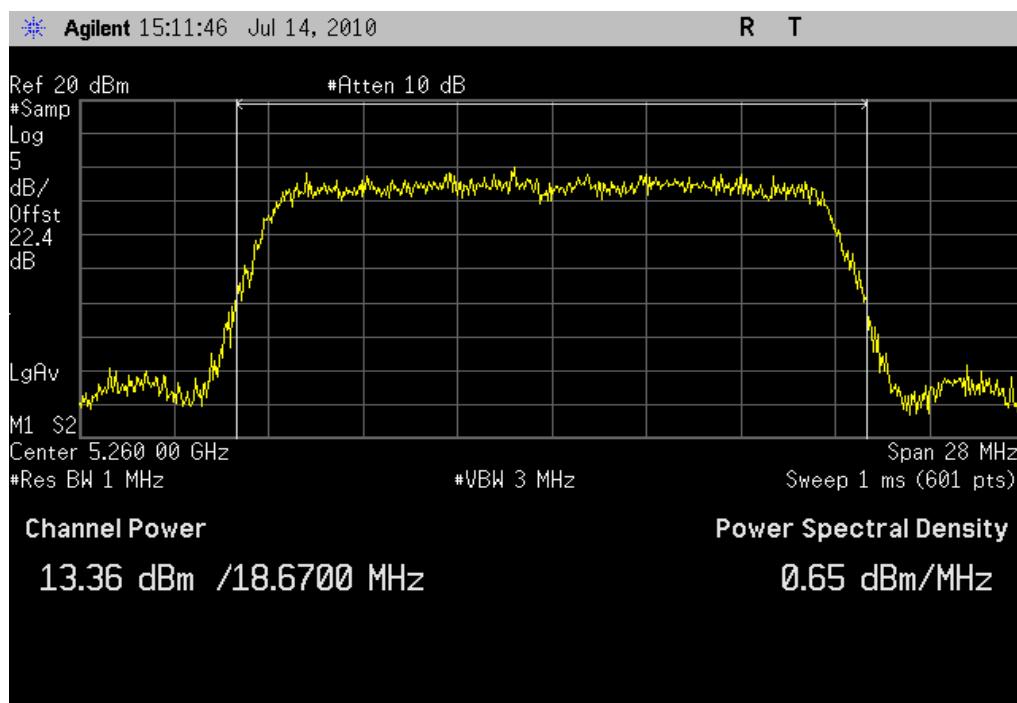


802.11(a) 36 Mbps, 5250 - 5350 MHz Band, Channel 52, Low Channel

Result: Pass

Value: 13.4 dBm

Limit: 24 dBm

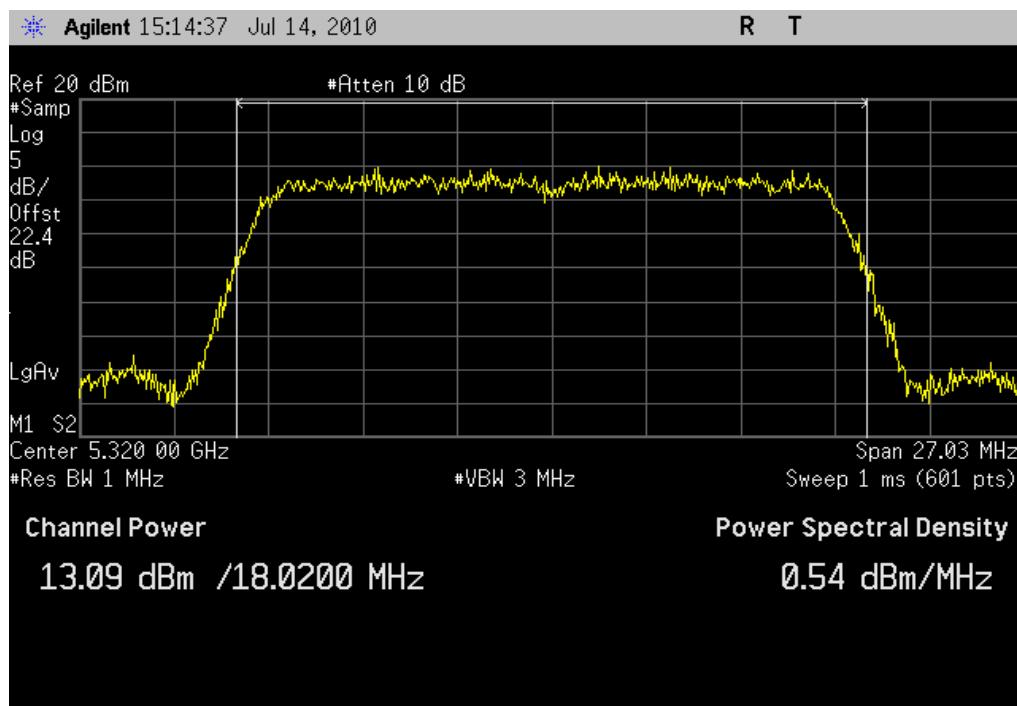


802.11(a) 36 Mbps, 5250 - 5350 MHz Band, Channel 64, High Channel

Result: Pass

Value: 13.1 dBm

Limit: 24 dBm

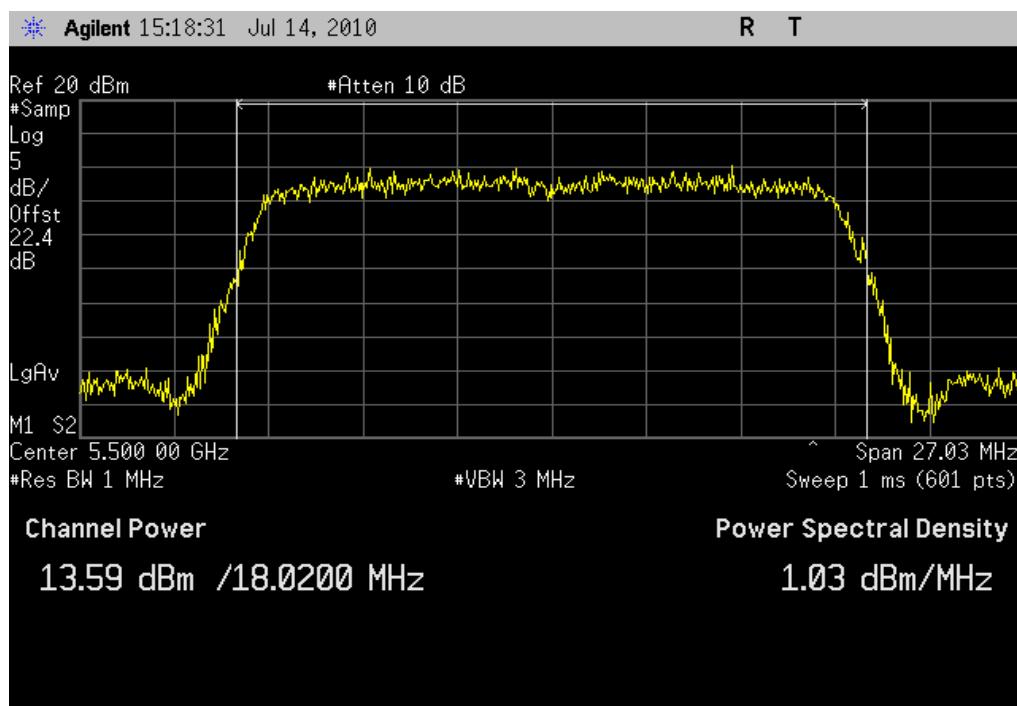


802.11(a) 36 Mbps, 5470 - 5725 MHz Band, Channel 100, Low Channel

Result: Pass

Value: 13.6 dBm

Limit: 24 dBm

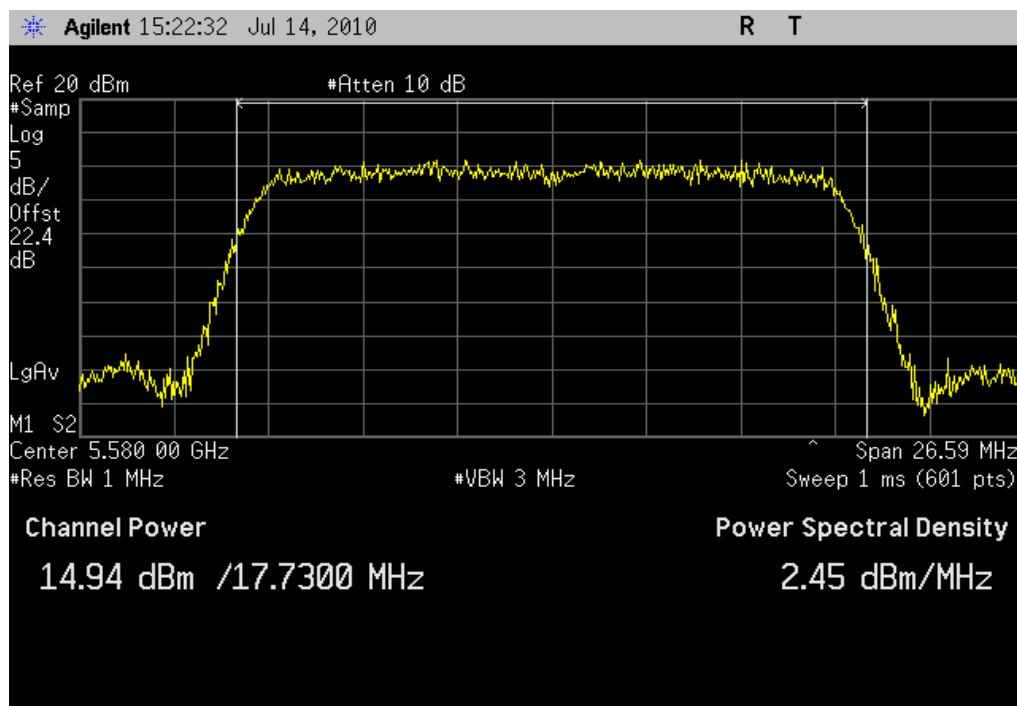


802.11(a) 36 Mbps, 5470 - 5725 MHz Band, Channel 116, Mid Channel

Result: Pass

Value: 14.9 dBm

Limit: 24 dBm

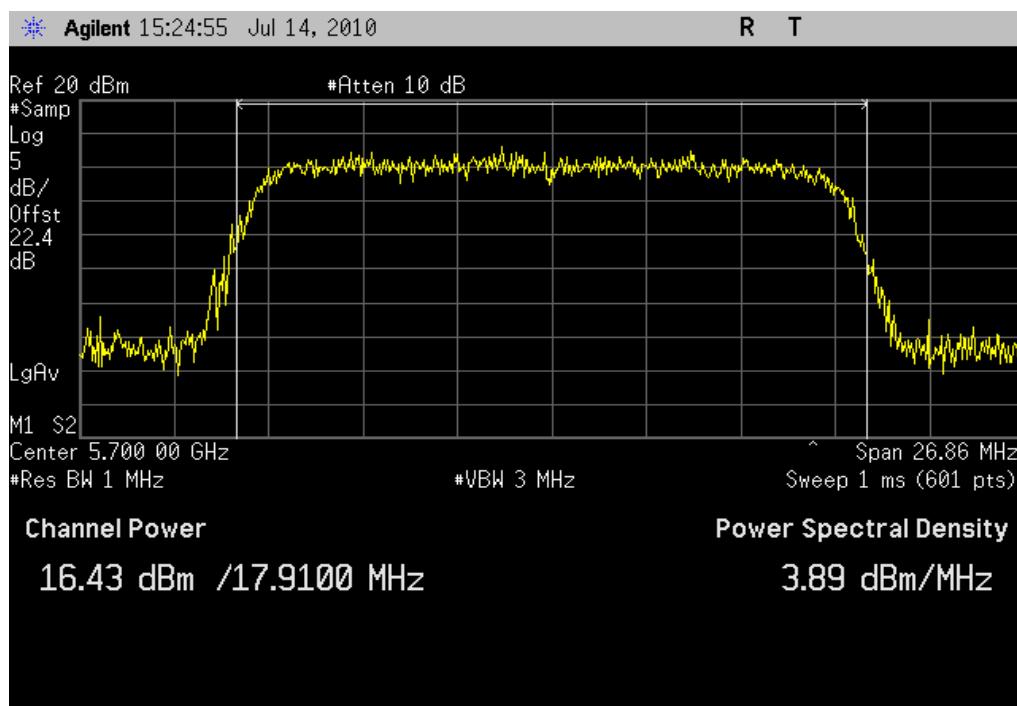


802.11(a) 36 Mbps, 5470 - 5725 MHz Band, Channel 140, High Channel

Result: Pass

Value: 16.4 dBm

Limit: 24 dBm



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	6/1/2009	24	
26 GHz DC Block, SMA	Pasternack	PE8210	AME	10/19/2009	13	
Attenuator 20 dB, SMA M/F 26GHz	S.M. Electronics	SA26B-20	AUY	7/21/2009	13	
EV06 Cable Direct Connect Cable	ESM Cable Corp.	TTBJ-141 KMKM-132	ECB	NCR	0	
Multimeter	Tektronix	DMM912	MMH	12/10/2008	24	
DC Power Supply	Tektronix	PS280	TPM	NCR	0	
Chamber, Temp./Humidity Chamber	Cincinnati Sub Zero (CSZ)	ZH-32-2-2-H/AC	TBA	7/23/2008	24	
Chamber Temp. & Humidity Controller	ESZ / Eurotherm	Dimension II	TBC	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

Variation of Supply Voltage

The primary supply voltage was varied over the range specified by the client. Per the client, the chip only works over this voltage range; it will shut off if the voltage is outside the specified range.

Variation of Ambient Temperature

Using a temperature chamber, the transmit frequency was recorded at the extremes of the specified temperature range (-30 ° to +50° C) and at 10°C intervals.

A direct connect measurement was made between the EUT's antenna cable and a spectrum analyzer. The spectrum analyzer is equipped with a precision frequency reference that exceeds the stability requirement of the EUT. Measurements were made at the mid channel of each band to determine frequency stability. If the frequency variation is less than 100 ppm, the EUT will meet the requirement of 15.407(g), that the emissions are maintained within the band of operation.

FREQUENCY STABILITY			XMit 2010.01.14	
EUT: Summit FS848 Master Module (Wheeler)		Work Order: FOCU0081		
Serial Number: A146		Date: 07/20/10		
Customer: Summit Semiconductor LLC		Temperature: 23°C		
Attendees: Alex Macdonald		Humidity: 45%		
Project: None		Barometric Pres.: 30.16 in		
Tested by: Rod Peloquin	Power: 3.3 VDC & 5.0 VDC	Job Site: EV06 / EV09		
TEST SPECIFICATIONS		Test Method		
FCC 15.407:2010		ANSI C63.10:2009		
COMMENTS				
Both 3.3 VDC and 5.0 VDC were altered concurrently.				
DEVIATIONS FROM TEST STANDARD				
No Deviations				
Configuration #	3	 Signature		
		Value	Limit	Results
Mid Channel 5150 - 5250 MHz Band				
Frequency Stability with Variation of DC Voltage (Ambient Temperature = 20°C)				
Voltage (VDC)	Assigned Frequency (MHz)	Measured Frequency (MHz)	Tolerance (ppm)	Specification (ppm)
3.6 & 5.5 (110%)	5200.000000	5199.974025	5.00	n/a
3.3 & 5.0 (100%)	5200.000000	5199.966100	6.52	n/a
3.0 & 4.5 (90%)	5200.000000	5199.960025	7.69	n/a
Frequency Stability with Variation of Ambient Temperature (Primary Supply = 3.3 VDC & 5.0 VDC)				
Temp (°C)	Assigned Frequency (MHz)	Measured Frequency (MHz)	Tolerance (ppm)	Specification (ppm)
50	5200.000000	5199.961145	7.47	n/a
40	5200.000000	5199.966483	6.45	n/a
30	5200.000000	5199.961600	7.38	n/a
20	5200.000000	5199.966100	6.52	n/a
10	5200.000000	5199.963749	6.97	n/a
0	5200.000000	5199.970608	5.65	n/a
-10	5200.000000	5199.975908	4.63	n/a
-20	5200.000000	5199.976967	4.43	n/a
-30	5200.000000	5199.970265	5.72	n/a
Mid Channel 5250 - 5350 MHz Band				
Frequency Stability with Variation of DC Voltage (Ambient Temperature = 20°C)				
Voltage (VDC)	Assigned Frequency (MHz)	Measured Frequency (MHz)	Tolerance (ppm)	Specification (ppm)
3.6 & 5.5 (110%)	5300.000000	5299.972950	5.10	n/a
3.3 & 5.0 (100%)	5300.000000	5299.964800	6.64	n/a
3.0 & 4.5 (90%)	5300.000000	5299.958825	7.77	n/a
Frequency Stability with Variation of Ambient Temperature (Primary Supply = 3.3 VDC & 5.0 VDC)				
Temp (°C)	Assigned Frequency (MHz)	Measured Frequency (MHz)	Tolerance (ppm)	Specification (ppm)
50	5300.000000	5299.959775	7.59	n/a
40	5300.000000	5299.965250	6.56	n/a
30	5300.000000	5299.960325	7.49	n/a
20	5300.000000	5299.964800	6.64	n/a
10	5300.000000	5299.962432	7.09	n/a
0	5300.000000	5299.969342	5.78	n/a
-10	5300.000000	5299.974873	4.74	n/a
-20	5300.000000	5299.975892	4.55	n/a
-30	5300.000000	5299.968985	5.85	n/a
Mid Channel 5470 - 5725 MHz Band				
Frequency Stability with Variation of DC Voltage (Ambient Temperature = 20°C)				
Voltage (VDC)	Assigned Frequency (MHz)	Measured Frequency (MHz)	Tolerance (ppm)	Specification (ppm)
3.6 & 5.5 (110%)	5600.000000	5599.971600	5.07	n/a
3.3 & 5.0 (100%)	5600.000000	5599.962825	6.64	n/a
3.0 & 4.5 (90%)	5600.000000	5599.956550	7.76	n/a
Frequency Stability with Variation of Ambient Temperature (Primary Supply = 3.3 VDC & 5.0 VDC)				
Temp (°C)	Assigned Frequency (MHz)	Measured Frequency (MHz)	Tolerance (ppm)	Specification (ppm)
50	5600.000000	5599.957495	7.59	n/a
40	5600.000000	5599.963345	6.55	n/a
30	5600.000000	5599.958216	7.46	n/a
20	5600.000000	5599.962825	6.64	n/a
10	5600.000000	5599.960292	7.09	n/a
0	5600.000000	5599.967592	5.79	n/a
-10	5600.000000	5599.973625	4.71	n/a
-20	5600.000000	5599.974526	4.55	n/a
-30	5600.000000	5599.967453	5.81	n/a

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.

MODES OF OPERATION

Continuous Tx 5700MHz, (Ch.140)
Continuous Tx 5580MHz, (Ch.116)
Continuous Tx 5500MHz, (Ch.100)
Continuous Tx 5320MHz, (Ch.64)
Continuous Tx 5260MHz, (Ch.52)
Continuous Tx 5240MHz, (Ch.48)
Continuous Tx 5180MHz, (Ch.36)

POWER SETTINGS INVESTIGATED

120VAC/60Hz

CONFIGURATIONS INVESTIGATED

FOCU0081 - 4

SAMPLE CALCULATIONS

Conducted Emissions: Adjusted Level = Measured Level + Transducer Factor + Cable Attenuation Factor + External Attenuator

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Receiver	Rohde & Schwarz	ESCI	ARE	4/29/2010	12 mo
High Pass Filter	TTE	H97-100K-50-720B	HFX	2/16/2010	13 mo
Attenuator	Coaxicom	66702 2910-20	ATO	7/21/2009	13 mo
EV07 Cables	N/A	Conducted Cables	EVG	6/21/2010	13 mo
LISN	Solar	9252-50-R-24-BNC	LIN	5/27/2010	12 mo

MEASUREMENT BANDWIDTHS

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

Measurements were made using the bandwidths and detectors specified. No video filter was used.

MEASUREMENT UNCERTAINTY

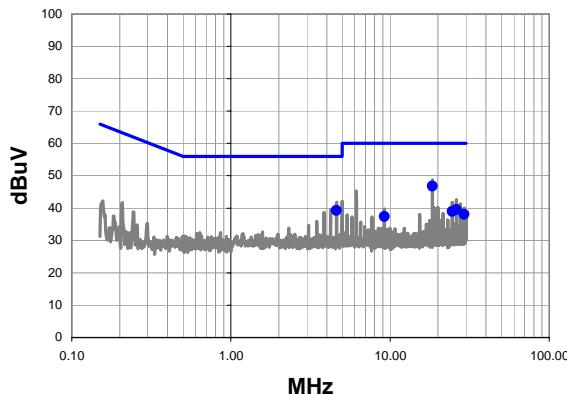
A measurement uncertainty estimation has been performed for each test per our internal quality document WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty for radiated emissions measurements is less than +/- 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

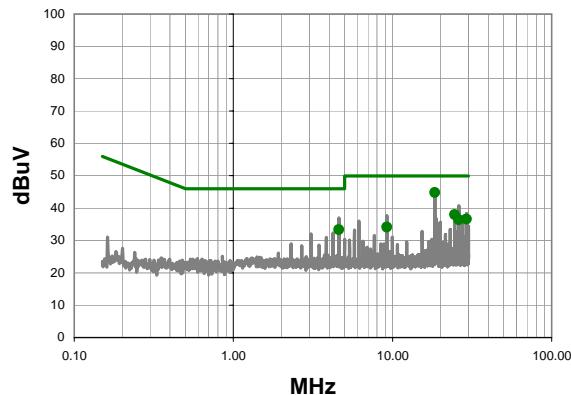
Using the mode of operation and configuration noted within this report, conducted emissions tests were performed. The frequency range investigated (scanned), is also noted in this report. Conducted power line measurements are made, unless otherwise specified, over the frequency range from 150 kHz to 30 MHz to determine the line-to-ground radio-noise voltage that is conducted from the EUT power-input terminals that are directly (or indirectly via separate transformer or power supplies) connected to a public power network. Equipment is tested with power cords that are normally used or that have electrical or shielding characteristics that are the same as those cords normally used. Typically those measurements are made using a LISN (Line Impedance Stabilization Network), the 50ohm measuring port is terminated by a 50ohm EMI meter or a 50ohm resistive load. All 50ohm measuring ports of the LISN are terminated by 50ohm.

Work Order:	FOCU0081	Date:	07/21/10	
Project:	None	Temperature:	24.4 °C	
Job Site:	EV07	Humidity:	44.7	
Serial Number:	0265	Barometric Pres.:	1015.9 mb	Tested by: Dan Haas
EUT:	Summit FS848 Master Module (Wheeler)			
Configuration:	4 - AC powerline conducted emissions			
Customer:	Summit Semiconductor LLC			
Attendees:	None			
EUT Power:	120VAC/60Hz			
Operating Mode:	Continuous Tx 5180MHz, (Ch.36)			
Deviations:	No deviations.			
Comments:	Aeon C627-510004A antennas with 4 inch antenna cables. 12 inch ribbon cable: small donut ferrites on Antenna cables with two turns.			
Test Specifications		Test Method		
FCC 15.207:2010		ANSI C63.10:2009		
Run #	4	Line:	High Line	Ext. Attenuation:
			20	Results
				Pass

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



Quasi Peak Data - vs - Quasi Peak Limit

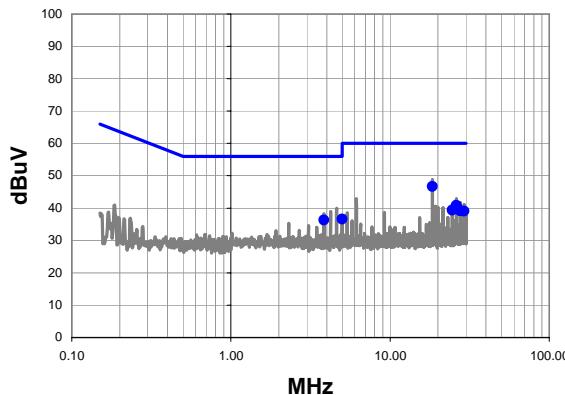
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
18.432	26.0	20.8	46.8	60.0	-13.2
4.608	19.0	20.3	39.3	56.0	-16.8
26.114	18.3	21.2	39.5	60.0	-20.5
24.576	17.8	21.1	38.9	60.0	-21.1
29.186	16.6	21.4	38.0	60.0	-22.0
9.216	17.0	20.4	37.4	60.0	-22.6

Average Data - vs - Average Limit

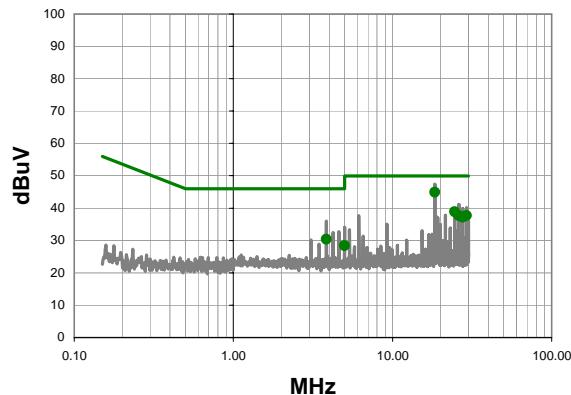
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
18.432	24.0	20.8	44.8	50.0	-5.2
24.576	16.8	21.1	37.9	50.0	-12.1
4.608	13.1	20.3	33.4	46.0	-12.7
29.186	15.2	21.4	36.6	50.0	-13.4
26.114	15.2	21.2	36.4	50.0	-13.6
9.216	13.7	20.4	34.1	50.0	-15.9

Work Order:	FOCU0081	Date:	07/21/10	
Project:	None	Temperature:	24.4 °C	
Job Site:	EV07	Humidity:	44.7	
Serial Number:	0265	Barometric Pres.:	1015.9 mb	Tested by: Dan Haas
EUT:	Summit FS848 Master Module (Wheeler)			
Configuration:	4 - AC powerline conducted emissions			
Customer:	Summit Semiconductor LLC			
Attendees:	None			
EUT Power:	120VAC/60Hz			
Operating Mode:	Continuous Tx 5180MHz, (Ch.36)			
Deviations:	No deviations.			
Comments:	Aeon C627-510004A antennas with 4 inch antenna cables. 12 inch ribbon cable: small donut ferrites on Antenna cables with two turns.			
Test Specifications		Test Method		
FCC 15.207:2010		ANSI C63.10:2009		
Run #	5	Line:	Neutral	Ext. Attenuation:
			20	Results
				Pass

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



Quasi Peak Data - vs - Quasi Peak Limit

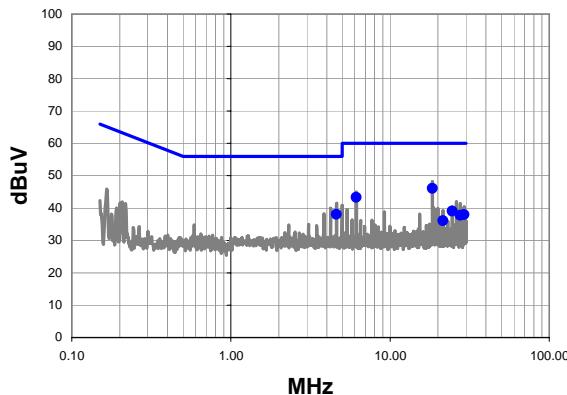
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
18.434	25.9	20.8	46.7	60.0	-13.3
26.114	19.6	21.2	40.8	60.0	-19.2
4.992	16.3	20.3	36.6	56.0	-19.4
3.840	16.1	20.2	36.3	56.0	-19.7
24.576	18.2	21.1	39.3	60.0	-20.7
27.650	17.9	21.3	39.2	60.0	-20.8
29.186	17.6	21.4	39.0	60.0	-21.0

Average Data - vs - Average Limit

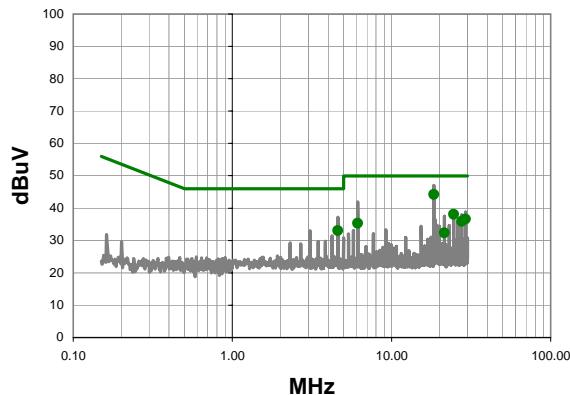
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
18.434	24.1	20.8	44.9	50.0	-5.1
24.576	17.7	21.1	38.8	50.0	-11.2
26.114	16.5	21.2	37.7	50.0	-12.3
29.186	16.2	21.4	37.6	50.0	-12.4
27.650	15.9	21.3	37.2	50.0	-12.8
3.840	10.1	20.2	30.3	46.0	-15.7
4.992	8.1	20.3	28.4	46.0	-17.6

Work Order:	FOCU0081	Date:	07/21/10	
Project:	None	Temperature:	24.4 °C	
Job Site:	EV07	Humidity:	44.7	
Serial Number:	0265	Barometric Pres.:	1015.9 mb	Tested by: Dan Haas
EUT:	Summit FS848 Master Module (Wheeler)			
Configuration:	4 - AC powerline conducted emissions			
Customer:	Summit Semiconductor LLC			
Attendees:	None			
EUT Power:	120VAC/60Hz			
Operating Mode:	Continuous Tx 5240MHz, (Ch.48)			
Deviations:	No deviations.			
Comments:	Aeon C627-510004A antennas with 4 inch antenna cables. 12 inch ribbon cable: small donut ferrites on Antenna cables with two turns.			
Test Specifications		Test Method		
FCC 15.207:2010		ANSI C63.10:2009		
Run #	6	Line:	High Line	Ext. Attenuation:
			20	Results
				Pass

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



Quasi Peak Data - vs - Quasi Peak Limit

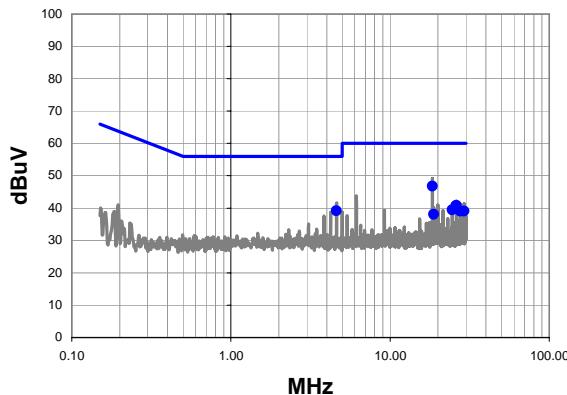
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
18.434	25.3	20.8	46.1	60.0	-13.9
6.144	23.0	20.3	43.3	60.0	-16.7
4.608	17.8	20.3	38.1	56.0	-18.0
24.576	17.9	21.1	39.0	60.0	-21.0
29.186	16.5	21.4	37.9	60.0	-22.1
27.650	16.5	21.3	37.8	60.0	-22.2
21.504	15.1	21.0	36.1	60.0	-23.9

Average Data - vs - Average Limit

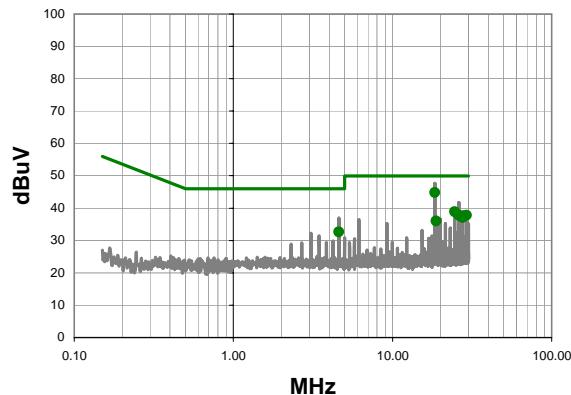
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
18.434	23.4	20.8	44.2	50.0	-5.8
24.576	16.9	21.1	38.0	50.0	-12.0
4.608	12.8	20.3	33.1	46.0	-13.0
29.186	15.2	21.4	36.6	50.0	-13.4
27.650	14.6	21.3	35.9	50.0	-14.1
6.144	15.0	20.3	35.3	50.0	-14.7
21.504	11.3	21.0	32.3	50.0	-17.7

Work Order:	FOCU0081	Date:	07/21/10	
Project:	None	Temperature:	24.4 °C	
Job Site:	EV07	Humidity:	44.7	
Serial Number:	0265	Barometric Pres.:	1015.9 mb	Tested by: Dan Haas
EUT:	Summit FS848 Master Module (Wheeler)			
Configuration:	4 - AC powerline conducted emissions			
Customer:	Summit Semiconductor LLC			
Attendees:	None			
EUT Power:	120VAC/60Hz			
Operating Mode:	Continuous Tx 5240MHz, (Ch.48)			
Deviations:	No deviations.			
Comments:	Aeon C627-510004A antennas with 4 inch antenna cables. 12 inch ribbon cable: small donut ferrites on Antenna cables with two turns.			
Test Specifications		Test Method		
FCC 15.207:2010		ANSI C63.10:2009		
Run #	7	Line:	Neutral	Ext. Attenuation:
			20	Results
				Pass

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



Quasi Peak Data - vs - Quasi Peak Limit

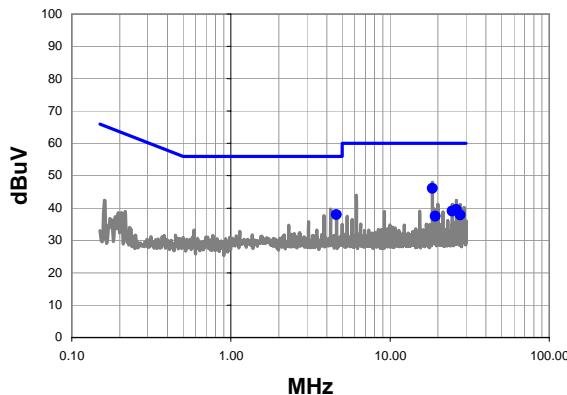
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
18.434	26.0	20.8	46.8	60.0	-13.2
4.608	18.9	20.3	39.2	56.0	-16.9
26.114	19.6	21.2	40.8	60.0	-19.2
24.576	18.3	21.1	39.4	60.0	-20.6
27.650	17.8	21.3	39.1	60.0	-20.9
29.186	17.6	21.4	39.0	60.0	-21.0
18.816	17.2	20.9	38.1	60.0	-21.9

Average Data - vs - Average Limit

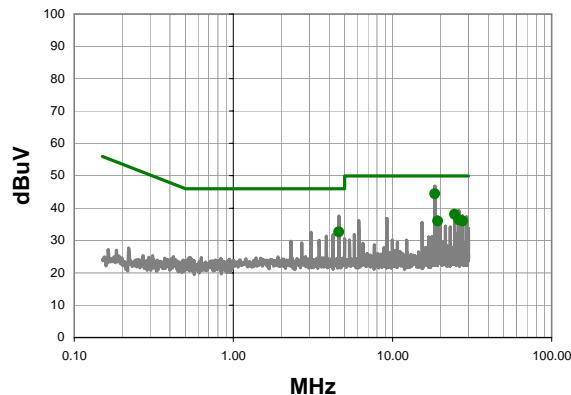
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
18.434	24.0	20.8	44.8	50.0	-5.2
24.576	17.7	21.1	38.8	50.0	-11.2
26.114	16.6	21.2	37.8	50.0	-12.2
29.186	16.3	21.4	37.7	50.0	-12.3
27.650	15.8	21.3	37.1	50.0	-12.9
4.608	12.4	20.3	32.7	46.0	-13.4
18.816	15.2	20.9	36.1	50.0	-13.9

Work Order:	FOCU0081	Date:	07/21/10	
Project:	None	Temperature:	24.4 °C	
Job Site:	EV07	Humidity:	44.7	
Serial Number:	0265	Barometric Pres.:	1015.9 mb	Tested by: Dan Haas
EUT:	Summit FS848 Master Module (Wheeler)			
Configuration:	4 - AC powerline conducted emissions			
Customer:	Summit Semiconductor LLC			
Attendees:	None			
EUT Power:	120VAC/60Hz			
Operating Mode:	Continuous Tx 5260MHz, (Ch.52)			
Deviations:	No deviations.			
Comments:	Aeon C627-510004A antennas with 4 inch antenna cables. 12 inch ribbon cable: small donut ferrites on Antenna cables with two turns.			
Test Specifications		Test Method		
FCC 15.207:2010		ANSI C63.10:2009		
Run #	8	Line:	High Line	Ext. Attenuation:
			20	Results
				Pass

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



Quasi Peak Data - vs - Quasi Peak Limit

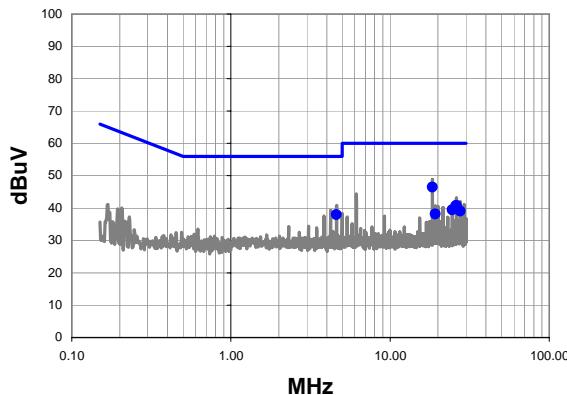
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
18.434	25.3	20.8	46.1	60.0	-13.9
4.608	17.7	20.3	38.0	56.0	-18.1
26.114	18.3	21.2	39.5	60.0	-20.5
24.576	17.9	21.1	39.0	60.0	-21.0
27.650	16.6	21.3	37.9	60.0	-22.1
19.200	16.6	20.9	37.5	60.0	-22.5

Average Data - vs - Average Limit

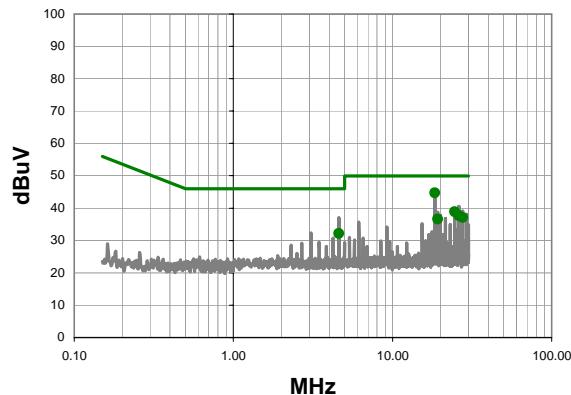
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
18.434	23.6	20.8	44.4	50.0	-5.6
24.576	16.9	21.1	38.0	50.0	-12.0
4.608	12.4	20.3	32.7	46.0	-13.4
26.114	15.2	21.2	36.4	50.0	-13.6
27.650	14.7	21.3	36.0	50.0	-14.0
19.200	15.1	20.9	36.0	50.0	-14.0

Work Order:	FOCU0081	Date:	07/21/10	
Project:	None	Temperature:	24.4 °C	
Job Site:	EV07	Humidity:	44.7	
Serial Number:	0265	Barometric Pres.:	1015.9 mb	Tested by: Dan Haas
EUT:	Summit FS848 Master Module (Wheeler)			
Configuration:	4 - AC powerline conducted emissions			
Customer:	Summit Semiconductor LLC			
Attendees:	None			
EUT Power:	120VAC/60Hz			
Operating Mode:	Continuous Tx 5260MHz, (Ch.52)			
Deviations:	No deviations.			
Comments:	Aeon C627-510004A antennas with 4 inch antenna cables. 12 inch ribbon cable: small donut ferrites on Antenna cables with two turns.			
Test Specifications		Test Method		
FCC 15.207:2010		ANSI C63.10:2009		
Run #	9	Line:	Neutral	Ext. Attenuation:
			20	Results
				Pass

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



Quasi Peak Data - vs - Quasi Peak Limit

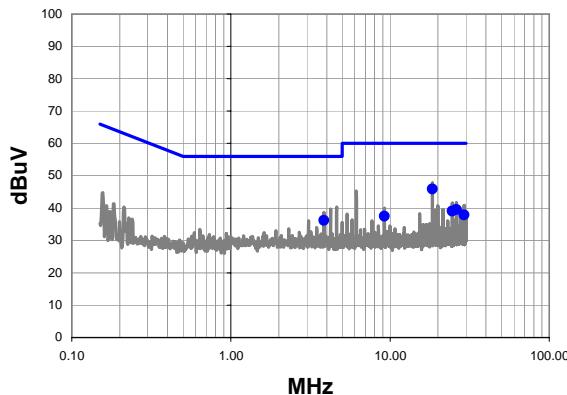
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
18.434	25.7	20.8	46.5	60.0	-13.5
4.608	17.7	20.3	38.0	56.0	-18.1
26.114	19.6	21.2	40.8	60.0	-19.2
24.576	18.3	21.1	39.4	60.0	-20.6
27.650	17.8	21.3	39.1	60.0	-20.9
19.200	17.3	20.9	38.2	60.0	-21.8

Average Data - vs - Average Limit

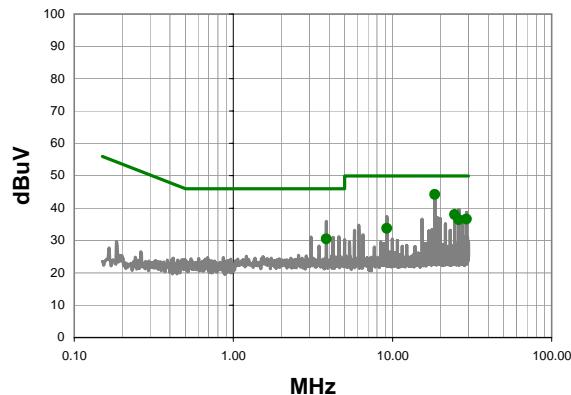
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
18.434	23.9	20.8	44.7	50.0	-5.3
24.576	17.7	21.1	38.8	50.0	-11.2
26.114	16.5	21.2	37.7	50.0	-12.3
27.650	15.8	21.3	37.1	50.0	-12.9
19.200	15.7	20.9	36.6	50.0	-13.4
4.608	11.9	20.3	32.2	46.0	-13.9

Work Order:	FOCU0081	Date:	07/21/10	
Project:	None	Temperature:	24.4 °C	
Job Site:	EV07	Humidity:	44.7	
Serial Number:	0265	Barometric Pres.:	1015.9 mb	Tested by: Dan Haas
EUT:	Summit FS848 Master Module (Wheeler)			
Configuration:	4 - AC powerline conducted emissions			
Customer:	Summit Semiconductor LLC			
Attendees:	None			
EUT Power:	120VAC/60Hz			
Operating Mode:	Continuous Tx 5320MHz, (Ch.64)			
Deviations:	No deviations.			
Comments:	Aeon C627-510004A antennas with 4 inch antenna cables. 12 inch ribbon cable: small donut ferrites on Antenna cables with two turns.			
Test Specifications		Test Method		
FCC 15.207:2010		ANSI C63.10:2009		
Run #	10	Line:	High Line	Ext. Attenuation:
			20	Results
				Pass

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



Quasi Peak Data - vs - Quasi Peak Limit

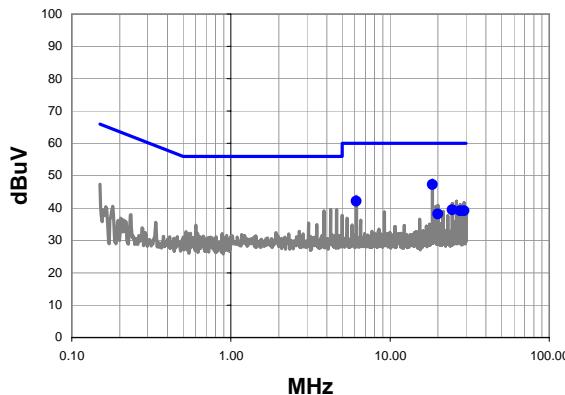
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
18.434	25.1	20.8	45.9	60.0	-14.1
3.840	16.0	20.2	36.2	56.0	-19.8
26.114	18.3	21.2	39.5	60.0	-20.5
24.576	17.9	21.1	39.0	60.0	-21.0
29.186	16.4	21.4	37.8	60.0	-22.2
9.216	17.1	20.4	37.5	60.0	-22.5

Average Data - vs - Average Limit

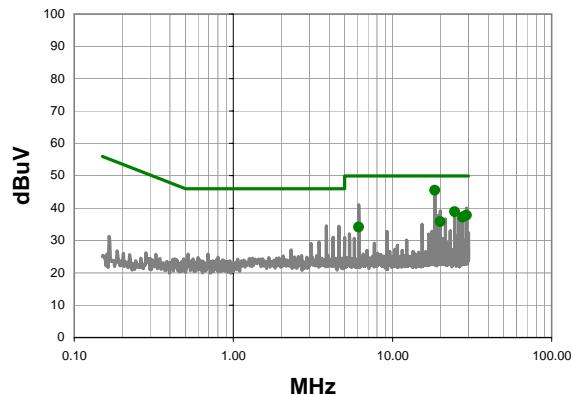
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
18.434	23.4	20.8	44.2	50.0	-5.8
24.576	16.8	21.1	37.9	50.0	-12.1
29.186	15.2	21.4	36.6	50.0	-13.4
26.114	15.2	21.2	36.4	50.0	-13.6
3.840	10.2	20.2	30.4	46.0	-15.6
9.216	13.3	20.4	33.7	50.0	-16.3

Work Order:	FOCU0081	Date:	07/21/10	
Project:	None	Temperature:	24.4 °C	
Job Site:	EV07	Humidity:	44.7	
Serial Number:	0265	Barometric Pres.:	1015.9 mb	Tested by: Dan Haas
EUT:	Summit FS848 Master Module (Wheeler)			
Configuration:	4 - AC powerline conducted emissions			
Customer:	Summit Semiconductor LLC			
Attendees:	None			
EUT Power:	120VAC/60Hz			
Operating Mode:	Continuous Tx 5320MHz, (Ch.64)			
Deviations:	No deviations.			
Comments:	Aeon C627-510004A antennas with 4 inch antenna cables. 12 inch ribbon cable: small donut ferrites on Antenna cables with two turns.			
Test Specifications		Test Method		
FCC 15.207:2010		ANSI C63.10:2009		
Run #	11	Line:	Neutral	Ext. Attenuation:
			20	Results
				Pass

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



Quasi Peak Data - vs - Quasi Peak Limit

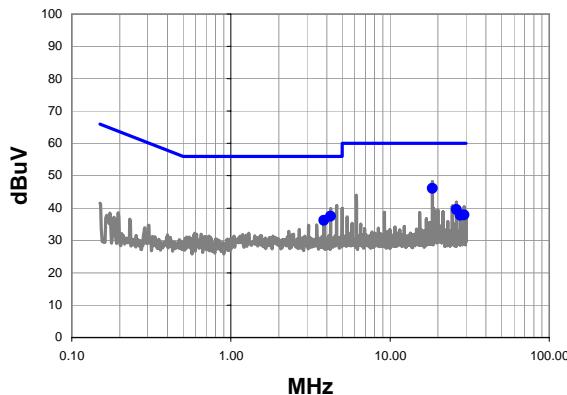
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
18.432	26.5	20.8	47.3	60.0	-12.7
6.144	21.9	20.3	42.2	60.0	-17.8
24.576	18.3	21.1	39.4	60.0	-20.6
27.650	17.9	21.3	39.2	60.0	-20.8
29.186	17.7	21.4	39.1	60.0	-20.9
19.970	17.2	20.9	38.1	60.0	-21.9

Average Data - vs - Average Limit

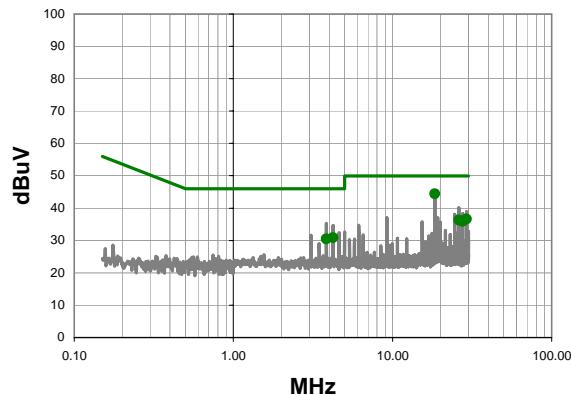
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
18.432	24.7	20.8	45.5	50.0	-4.5
24.576	17.7	21.1	38.8	50.0	-11.2
29.186	16.3	21.4	37.7	50.0	-12.3
27.650	15.9	21.3	37.2	50.0	-12.8
19.970	14.9	20.9	35.8	50.0	-14.2
6.144	13.8	20.3	34.1	50.0	-15.9

Work Order:	FOCU0081	Date:	07/21/10	
Project:	None	Temperature:	24.4 °C	
Job Site:	EV07	Humidity:	44.7	
Serial Number:	0265	Barometric Pres.:	1015.9 mb	 Tested by: Dan Haas
EUT:	Summit FS848 Master Module (Wheeler)			
Configuration:	4 - AC powerline conducted emissions			
Customer:	Summit Semiconductor LLC			
Attendees:	None			
EUT Power:	120VAC/60Hz			
Operating Mode:	Continuous Tx 5500MHz, (Ch.100)			
Deviations:	No deviations.			
Comments:	Aeon C627-510004A antennas with 4 inch antenna cables. 12 inch ribbon cable: small donut ferrites on Antenna cables with two turns.			
Test Specifications		Test Method		
FCC 15.207:2010		ANSI C63.10:2009		
Run #	12	Line:	High Line	Ext. Attenuation:
			20	Results
				Pass

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



Quasi Peak Data - vs - Quasi Peak Limit

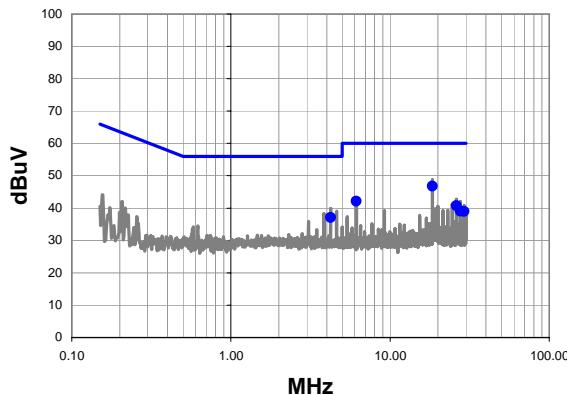
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
18.434	25.3	20.8	46.1	60.0	-13.9
4.224	17.2	20.2	37.4	56.0	-18.6
3.840	16.0	20.2	36.2	56.0	-19.8
26.114	18.3	21.2	39.5	60.0	-20.5
29.186	16.4	21.4	37.8	60.0	-22.2
27.650	16.5	21.3	37.8	60.0	-22.2

Average Data - vs - Average Limit

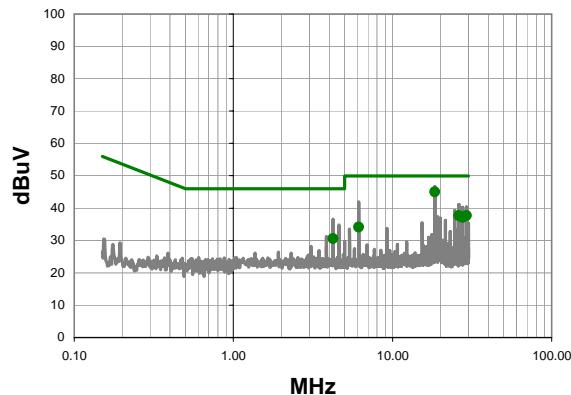
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
18.434	23.6	20.8	44.4	50.0	-5.6
29.186	15.2	21.4	36.6	50.0	-13.4
26.114	15.1	21.2	36.3	50.0	-13.7
27.650	14.6	21.3	35.9	50.0	-14.1
4.224	10.6	20.2	30.8	46.0	-15.2
3.840	10.2	20.2	30.4	46.0	-15.6

Work Order:	FOCU0081	Date:	07/21/10	
Project:	None	Temperature:	24.4 °C	
Job Site:	EV07	Humidity:	44.7	
Serial Number:	0265	Barometric Pres.:	1015.9 mb	Tested by: Dan Haas
EUT:	Summit FS848 Master Module (Wheeler)			
Configuration:	4 - AC powerline conducted emissions			
Customer:	Summit Semiconductor LLC			
Attendees:	None			
EUT Power:	120VAC/60Hz			
Operating Mode:	Continuous Tx 5500MHz, (Ch.100)			
Deviations:	No deviations.			
Comments:	Aeon C627-510004A antennas with 4 inch antenna cables. 12 inch ribbon cable: small donut ferrites on Antenna cables with two turns.			
Test Specifications		Test Method		
FCC 15.207:2010		ANSI C63.10:2009		
Run #	13	Line:	Neutral	Ext. Attenuation:
			20	Results
				Pass

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



Quasi Peak Data - vs - Quasi Peak Limit

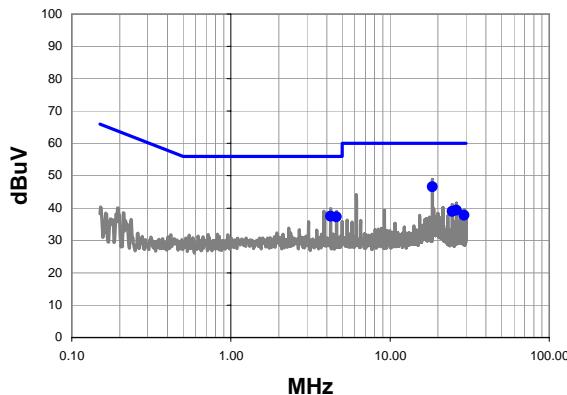
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
18.434	26.0	20.8	46.8	60.0	-13.2
6.144	21.9	20.3	42.2	60.0	-17.8
4.224	16.9	20.2	37.1	56.0	-18.9
26.114	19.5	21.2	40.7	60.0	-19.3
27.650	17.8	21.3	39.1	60.0	-20.9
29.186	17.5	21.4	38.9	60.0	-21.1

Average Data - vs - Average Limit

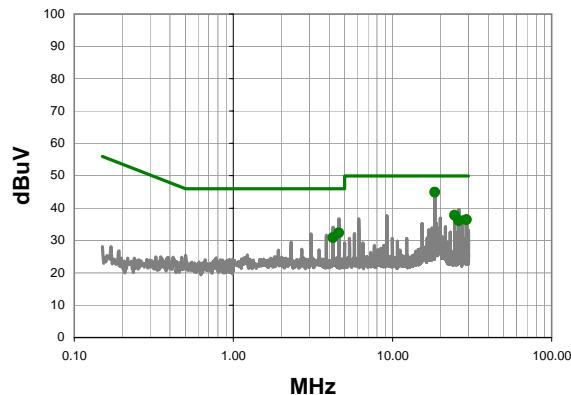
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
18.434	24.2	20.8	45.0	50.0	-5.0
26.114	16.5	21.2	37.7	50.0	-12.3
29.186	16.2	21.4	37.6	50.0	-12.4
27.650	15.8	21.3	37.1	50.0	-12.9
4.224	10.3	20.2	30.5	46.0	-15.5
6.144	13.8	20.3	34.1	50.0	-15.9

Work Order:	FOCU0081	Date:	07/21/10	
Project:	None	Temperature:	24.4 °C	
Job Site:	EV07	Humidity:	44.7	
Serial Number:	0265	Barometric Pres.:	1015.9 mb	<i>Dan Haas</i>
Tested by: Dan Haas				
EUT:	Summit FS848 Master Module (Wheeler)			
Configuration:	4 - AC powerline conducted emissions			
Customer:	Summit Semiconductor LLC			
Attendees:	None			
EUT Power:	120VAC/60Hz			
Operating Mode:	Continuous Tx 5580MHz, (Ch.116)			
Deviations:	No deviations.			
Comments:	Aeon C627-510004A antennas with 4 inch antenna cables. 12 inch ribbon cable: small donut ferrites on Antenna cables with two turns.			
Test Specifications		Test Method		
FCC 15.207:2010		ANSI C63.10:2009		
Run #	15	Line:	High Line	Ext. Attenuation:
			20	Results
				Pass

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



Quasi Peak Data - vs - Quasi Peak Limit

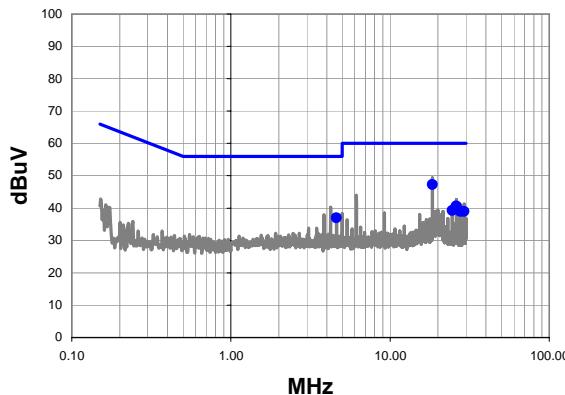
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
18.434	25.8	20.8	46.6	60.0	-13.4
4.224	17.2	20.2	37.4	56.0	-18.6
4.608	17.0	20.3	37.3	56.0	-18.8
26.114	18.1	21.2	39.3	60.0	-20.7
24.576	17.8	21.1	38.9	60.0	-21.1
29.186	16.3	21.4	37.7	60.0	-22.3

Average Data - vs - Average Limit

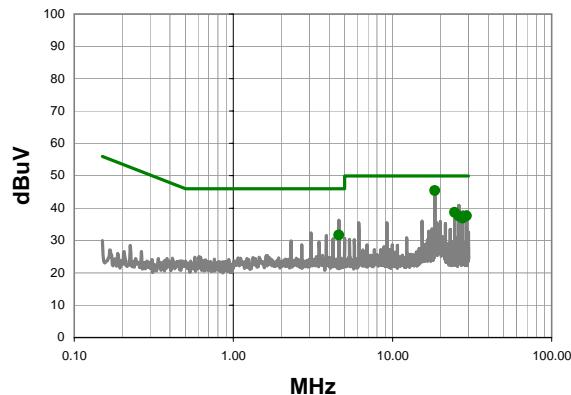
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
18.434	24.1	20.8	44.9	50.0	-5.1
24.576	16.6	21.1	37.7	50.0	-12.3
29.186	15.0	21.4	36.4	50.0	-13.6
4.608	12.1	20.3	32.4	46.0	-13.7
26.114	14.9	21.2	36.1	50.0	-13.9
4.224	10.6	20.2	30.8	46.0	-15.2

Work Order:	FOCU0081	Date:	07/21/10	
Project:	None	Temperature:	24.4 °C	
Job Site:	EV07	Humidity:	44.7	
Serial Number:	0265	Barometric Pres.:	1015.9 mb	Tested by: Dan Haas
EUT:	Summit FS848 Master Module (Wheeler)			
Configuration:	4 - AC powerline conducted emissions			
Customer:	Summit Semiconductor LLC			
Attendees:	None			
EUT Power:	120VAC/60Hz			
Operating Mode:	Continuous Tx 5580MHz, (Ch.116)			
Deviations:	No deviations.			
Comments:	Aeon C627-510004A antennas with 4 inch antenna cables. 12 inch ribbon cable: small donut ferrites on Antenna cables with two turns.			
Test Specifications		Test Method		
FCC 15.207:2010		ANSI C63.10:2009		
Run #	16	Line:	Neutral	Ext. Attenuation:
				20
				Results
				Pass

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



Quasi Peak Data - vs - Quasi Peak Limit

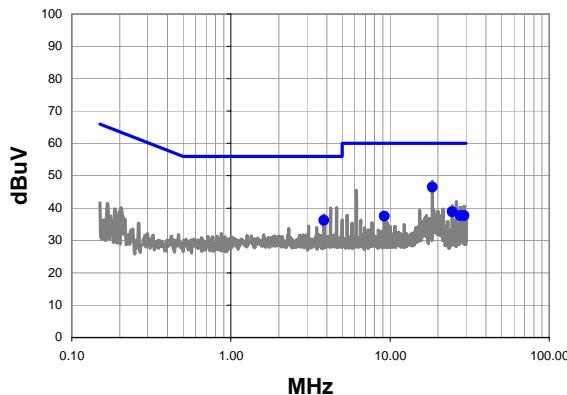
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
18.434	26.5	20.8	47.3	60.0	-12.7
4.608	16.7	20.3	37.0	56.0	-19.1
26.114	19.4	21.2	40.6	60.0	-19.4
24.576	18.1	21.1	39.2	60.0	-20.8
27.650	17.7	21.3	39.0	60.0	-21.0
29.186	17.5	21.4	38.9	60.0	-21.1

Average Data - vs - Average Limit

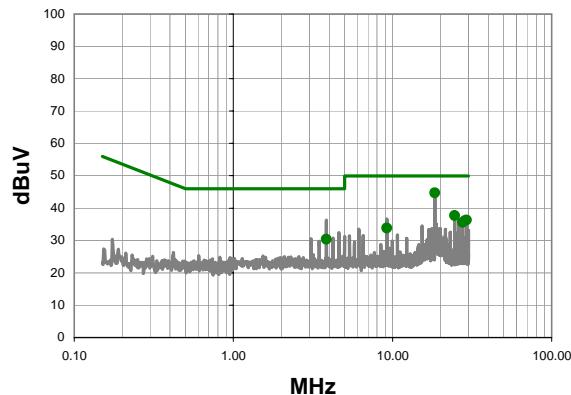
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
18.434	24.6	20.8	45.4	50.0	-4.6
24.576	17.5	21.1	38.6	50.0	-11.4
26.114	16.4	21.2	37.6	50.0	-12.4
29.186	16.1	21.4	37.5	50.0	-12.5
27.650	15.6	21.3	36.9	50.0	-13.1
4.608	11.4	20.3	31.7	46.0	-14.4

Work Order:	FOCU0081	Date:	07/21/10	
Project:	None	Temperature:	24.4 °C	
Job Site:	EV07	Humidity:	44.7	
Serial Number:	0265	Barometric Pres.:	1015.9 mb	Tested by: Dan Haas
EUT:	Summit FS848 Master Module (Wheeler)			
Configuration:	4 - AC powerline conducted emissions			
Customer:	Summit Semiconductor LLC			
Attendees:	None			
EUT Power:	120VAC/60Hz			
Operating Mode:	Continuous Tx 5580MHz, (Ch.116)			
Deviations:	No deviations.			
Comments:	Aeon C627-510004A antennas with 4 inch antenna cables. 12 inch ribbon cable: small donut ferrites on Antenna cables with two turns.			
Test Specifications		Test Method		
FCC 15.207:2010		ANSI C63.10:2009		
Run #	17	Line:	High Line	Ext. Attenuation:
			20	Results
				Pass

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



Quasi Peak Data - vs - Quasi Peak Limit

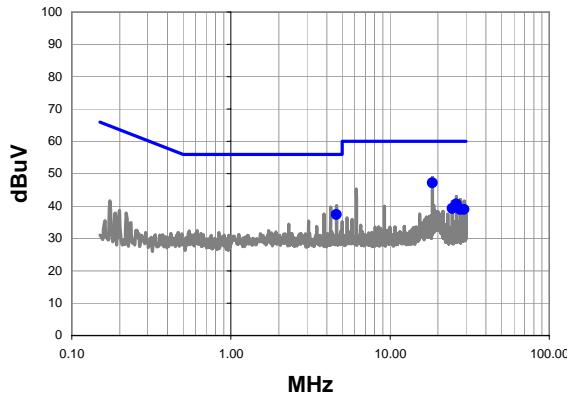
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
18.434	25.7	20.8	46.5	60.0	-13.5
3.840	16.0	20.2	36.2	56.0	-19.8
24.576	17.7	21.1	38.8	60.0	-21.2
27.650	16.4	21.3	37.7	60.0	-22.3
29.186	16.2	21.4	37.6	60.0	-22.4
9.216	17.1	20.4	37.5	60.0	-22.5

Average Data - vs - Average Limit

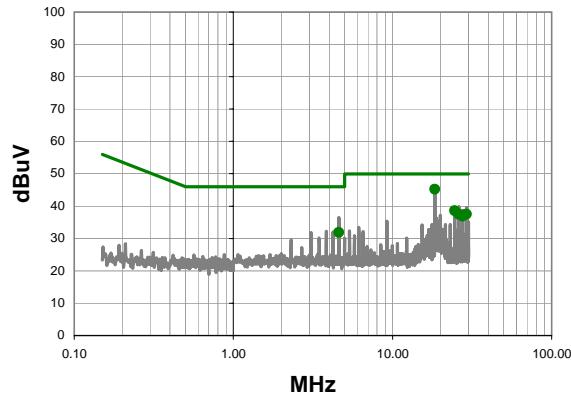
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
18.434	23.9	20.8	44.7	50.0	-5.3
24.576	16.5	21.1	37.6	50.0	-12.4
29.186	14.9	21.4	36.3	50.0	-13.7
27.650	14.3	21.3	35.6	50.0	-14.4
3.840	10.1	20.2	30.3	46.0	-15.7
9.216	13.4	20.4	33.8	50.0	-16.2

Work Order:	FOCU0081	Date:	07/21/10	
Project:	None	Temperature:	24.4 °C	
Job Site:	EV07	Humidity:	44.7	
Serial Number:	0265	Barometric Pres.:	1015.9 mb	Tested by: Dan Haas
EUT:	Summit FS848 Master Module (Wheeler)			
Configuration:	4 - AC powerline conducted emissions			
Customer:	Summit Semiconductor LLC			
Attendees:	None			
EUT Power:	120VAC/60Hz			
Operating Mode:	Continuous Tx 5700MHz, (Ch.140)			
Deviations:	No deviations.			
Comments:	Aeon C627-510004A antennas with 4 inch antenna cables. 12 inch ribbon cable: small donut ferrites on Antenna cables with two turns.			
Test Specifications		Test Method		
FCC 15.207:2010		ANSI C63.10:2009		
Run #	18	Line:	Neutral	Ext. Attenuation:
			20	Results
				Pass

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
18.434	26.4	20.8	47.2	60.0	-12.8
4.608	17.1	20.3	37.4	56.0	-18.7
26.114	19.4	21.2	40.6	60.0	-19.4
24.576	18.1	21.1	39.2	60.0	-20.8
27.650	17.7	21.3	39.0	60.0	-21.0
29.186	17.5	21.4	38.9	60.0	-21.1

Average Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
18.434	24.4	20.8	45.2	50.0	-4.8
24.576	17.4	21.1	38.5	50.0	-11.5
26.114	16.3	21.2	37.5	50.0	-12.5
29.186	16.0	21.4	37.4	50.0	-12.6
27.650	15.6	21.3	36.9	50.0	-13.1
4.608	11.6	20.3	31.9	46.0	-14.2

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.

MODES OF OPERATION

Transmitting at 5260 MHz
Transmitting at 5320 MHz
Transmitting at 5180 MHz

POWER SETTINGS INVESTIGATED

120VAC/60Hz

FREQUENCY RANGE INVESTIGATED

Start Frequency	30MHz	Stop Frequency	40GHz
-----------------	-------	----------------	-------

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	1/6/2010	12
OC Cable	ESM Cable Corp.	KMKM-72	OCV	11/3/2009	13
Pre-Amplifier	Miteq	JSW45-26004000-40-5P	AVR	6/22/2010	13
Antenna, Horn	ETS	3160-10	AIC	NCR	0
Cable	ESM Cable Corp.	KMKM-72	EVY	11/3/2009	13
Pre-Amplifier	Miteq	AMF-6F-18002650-25-10P	AVU	5/19/2009	16
Antenna, Horn	ETS Lindgren	3160-09	AIV	NCR	0
Pre-Amplifier	Miteq	AMF-6F-12001800-30-10P	AVD	7/10/2009	13
Antenna, Horn	ETS	3160-08	AHV	NCR	0
EV01 Cables	N/A	Standard Gain Horns Cables	EVF	4/2/2010	13
Pre-Amplifier	Miteq	AMF-6F-08001200-30-10P	AVC	7/10/2009	13
Antenna, Horn	ETS	3160-07	AHU	NCR	0
High Pass Filter	Micro-Tronics	HPM50112	HGA	10/1/2009	13
5.725-5.875 Notch Filter	Micro-Tronics	BRC50705	HGJ	7/31/2009	13
5.47-5.725 Notch Filter	Micro-Tronics	BRC50704	HGI	10/1/2009	13
5.25 GHz Notch Filter	K&L Microwave	8N50-5250/X200-0/0	HKF	4/2/2010	13
EV01 Cables	N/A	Double Ridge Horn Cables	EVB	7/9/2010	13
Pre-Amplifier	Miteq	AMF-4D-010100-24-10P	APW	7/9/2010	13
Antenna, Horn	EMCO	3115	AHC	7/8/2010	24
EV01 Cables	N/A	Bilog Cables	EVA	7/9/2010	13
Pre-Amplifier	Miteq	AM-1616-1000	AOL	7/9/2010	13
Antenna, Biconilog	EMCO	3141	AXE	1/14/2010	13

MEASUREMENT BANDWIDTHS

	Frequency Range	Peak Data	Quasi-Peak Data	Average Data
	(MHz)	(kHz)	(kHz)	(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

Measurements were made using the bandwidths and detectors specified. No video filter was used.

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. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4. The measurement uncertainty estimation is available upon request.

TEST DESCRIPTION

The highest gain antenna of each type to be used with the EUT were tested. The EUT was configured for the lowest, a middle, and the highest transmit frequency in each operational band. For each configuration, the spectrum was scanned throughout the specified range. Measurements were made to satisfy the three requirements of 47 CFR 15.407: Field strength under 1GHz, Restricted Bands of 47 CFR 15.205, and EIRP of 47 CFR 15.407. While scanning, emissions from the EUT were maximized by rotating the EUT on a turntable, adjusting the position of the EUT and EUT antenna in three orthogonal axis, and adjusting the measurement antenna height and polarization (per ANSI C63.10:2009). A preamp and high pass filter (and notch filter) were used for this test in order to provide sufficient measurement sensitivity.

The amplitude and frequency of the highest emissions were noted. The EUT was then replaced with a 1/2 wave dipole that was successively tuned to each of the highest spurious emissions. A signal generator was connected to the dipole (horn antenna for frequencies above 1GHz), and its output was adjusted to match the level previously noted for each frequency. The output of the signal generator was recorded, and by factoring in the cable loss to the dipole antenna (or horn) and its gain (dBi); the effective radiated power for each radiated spurious emission was determined.

SPURIOUS RADIATED EMISSIONS

EUT: Summit FS848 Master Module (Wheeler)	Work Order: FOCU0081
Serial Number: 0265	Date: 07/15/10
Customer: Summit Semiconductor LLC	Temperature: 24.3°C
Attendees: Alex Macdonald	Humidity: 41%
Project: None	Barometric Pres.: 1020.3 mb
Tested by: Rod Peloquin	Job Site: EV06

TEST SPECIFICATIONS

FCC 15.407:2010 | ANSI C63.10:2009

TEST PARAMETERS

Antenna Height(s) (m) | 1 - 2 | Test Distance (m) | 1

COMMENTS

Aeon C627-510004A antennas with 4 inch antenna cables. 12 inch ribbon cable: small donut ferrites on Antenna cables with two turns:

EUT OPERATING MODES

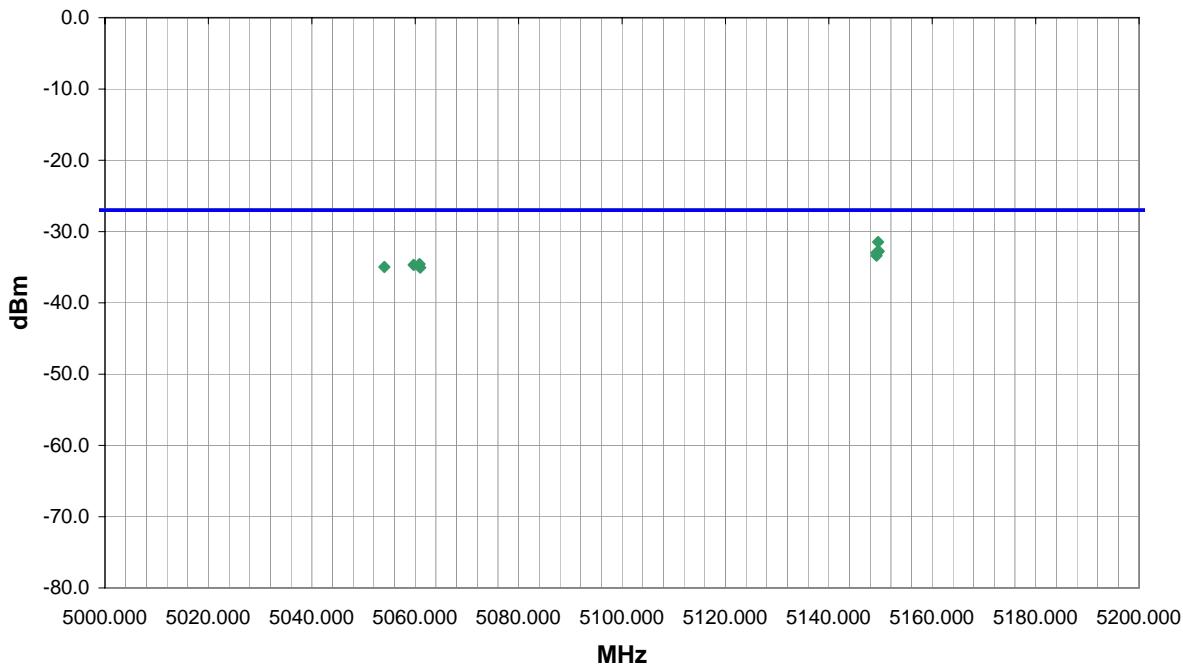
Transmitting at 5180 MHz

DEVIATIONS FROM TEST STANDARD

No deviations.

Run #	1
Configuration #	1
Results	Pass

Signature

Roddy L. Peloquin

Freq (MHz)			Azimuth (degrees)	Height (meters)			Polarity	Detector	EIRP (Watts)	EIRP (dBm)	Spec. Limit (dBm)	Compared to Spec. (dB)
5149.533			130.0	1.4			V-Horn	PK	7.13E-07	-31.5	-27.0	-4.5
5149.663			-1.0	1.0			H-Horn	PK	5.28E-07	-32.8	-27.0	-5.8
5149.217			188.0	1.3			V-Horn	PK	5.05E-07	-33.0	-27.0	-6.0
5149.213			-1.0	1.0			H-Horn	PK	4.60E-07	-33.4	-27.0	-6.4
5060.840			183.0	1.3			V-Horn	PK	3.49E-07	-34.6	-27.0	-7.6
5059.700			360.0	1.2			H-Horn	PK	3.41E-07	-34.7	-27.0	-7.7
5054.030			130.0	1.4			V-Horn	PK	3.18E-07	-35.0	-27.0	-8.0
5060.960			352.0	1.0			H-Horn	PK	3.11E-07	-35.1	-27.0	-8.1

SPURIOUS RADIATED EMISSIONS

EUT: Summit FS848 Master Module (Wheeler)	Work Order: FOCU0081
Serial Number: 0265	Date: 07/15/10
Customer: Summit Semiconductor LLC	Temperature: 24.3°C
Attendees: Alex Macdonald	Humidity: 41%
Project: None	Barometric Pres.: 1020.3 mb
Tested by: Rod Peloquin	Job Site: EV06

TEST SPECIFICATIONS		Test Method
FCC 15.209:2010		ANSI C63.10:2009

TEST PARAMETERS

Antenna Height(s) (m)	1 - 2	Test Distance (m)	1
-----------------------	-------	-------------------	---

COMMENTS

Aeon C627-510004A antennas with 4 inch antenna cables. 12 inch ribbon cable: small donut ferrites on Antenna cables with two turns:

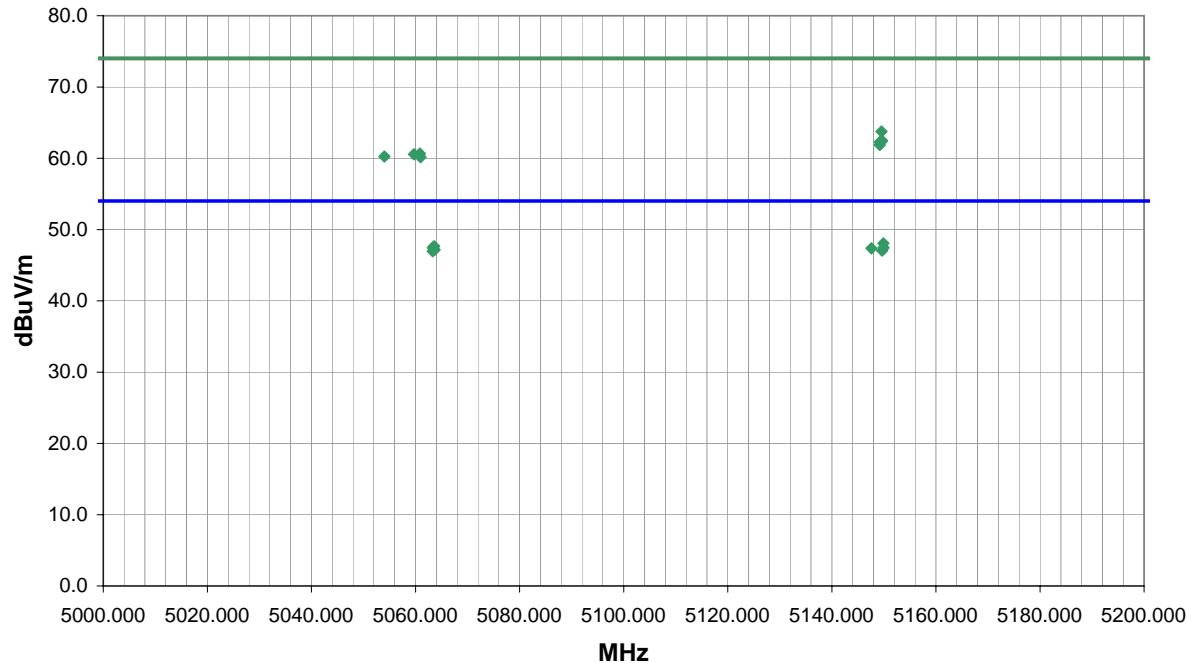
EUT OPERATING MODES

Transmitting at 5180 MHz

DEVIATIONS FROM TEST STANDARD

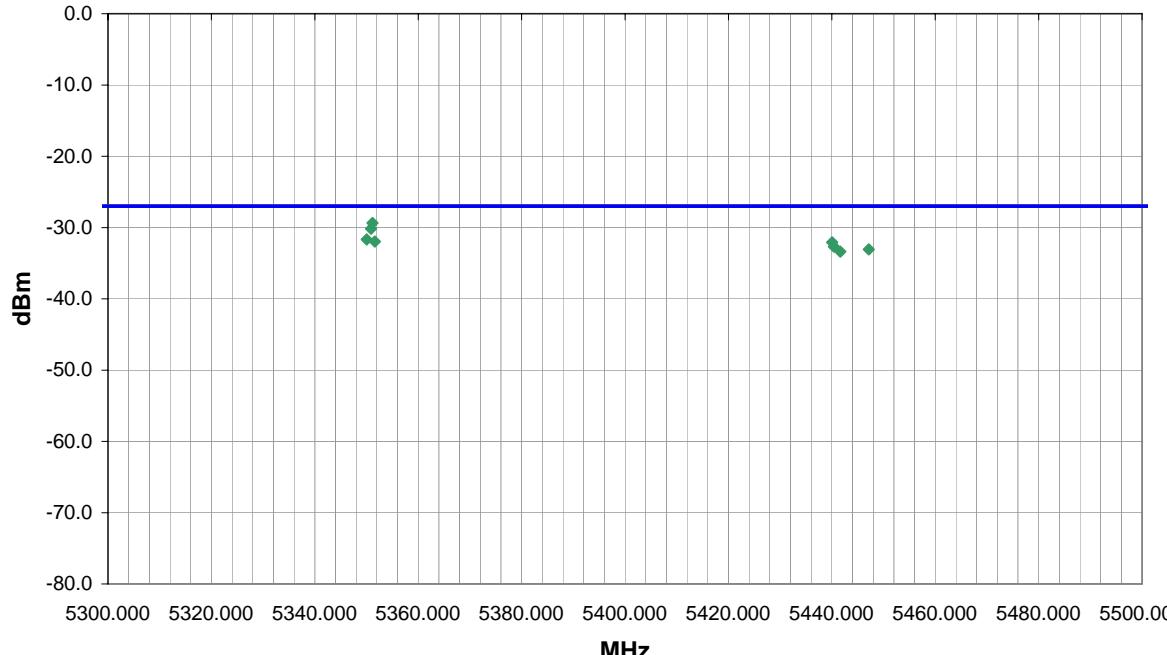
No deviations.

Run #	1	Signature
Configuration #	1	
Results	Pass	



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Distance (meters)	External Attenuation (dB)	Polarity	Detector	Distance Adjustment (dB)	Adjusted dBuV/m	Spec. Limit dBuV/m	Compared to Spec. (dB)
5149.907	21.0	36.6	188.0	1.3	1.0	0.0	V-Horn	AV	-9.5	48.1	54.0	-5.9
5063.570	20.7	36.5	352.0	1.0	1.0	0.0	H-Horn	AV	-9.5	47.7	54.0	-6.3
5149.947	20.4	36.6	-1.0	1.0	1.0	0.0	H-Horn	AV	-9.5	47.5	54.0	-6.5
5063.340	20.5	36.5	183.0	1.3	1.0	0.0	V-Horn	AV	-9.5	47.5	54.0	-6.5
5147.613	20.3	36.6	-1.0	1.0	1.0	0.0	H-Horn	AV	-9.5	47.4	54.0	-6.6
5063.670	20.2	36.5	360.0	1.2	1.0	0.0	H-Horn	AV	-9.5	47.2	54.0	-6.8
5149.683	20.0	36.6	134.0	1.4	1.0	0.0	V-Horn	AV	-9.5	47.1	54.0	-6.9
5063.300	20.0	36.5	130.0	1.4	1.0	0.0	V-Horn	AV	-9.5	47.0	54.0	-7.0
5149.533	36.7	36.6	130.0	1.4	1.0	0.0	V-Horn	PK	-9.5	63.8	74.0	-10.2
5149.663	35.4	36.6	-1.0	1.0	1.0	0.0	H-Horn	PK	-9.5	62.5	74.0	-11.5
5149.217	35.2	36.6	188.0	1.3	1.0	0.0	V-Horn	PK	-9.5	62.3	74.0	-11.7
5149.213	34.8	36.6	-1.0	1.0	1.0	0.0	H-Horn	PK	-9.5	61.9	74.0	-12.1
5060.840	33.7	36.5	183.0	1.3	1.0	0.0	V-Horn	PK	-9.5	60.7	74.0	-13.3
5059.700	33.6	36.5	360.0	1.2	1.0	0.0	H-Horn	PK	-9.5	60.6	74.0	-13.4
5054.030	33.3	36.5	130.0	1.4	1.0	0.0	V-Horn	PK	-9.5	60.3	74.0	-13.7
5060.960	33.2	36.5	352.0	1.0	1.0	0.0	H-Horn	PK	-9.5	60.2	74.0	-13.8

SPURIOUS RADIATED EMISSIONS

EUT: Summit FS848 Master Module (Wheeler)	Work Order: FOCU0081
Serial Number: 0265	Date: 07/16/10
Customer: Summit Semiconductor LLC	Temperature: 24.3°C
Attendees: Alex Macdonald	Humidity: 41%
Project: None	Barometric Pres.: 1020.3 mb
Tested by: Dan Haas	Job Site: EV06
TEST SPECIFICATIONS	
FCC 15.407:2010	Test Method: ANSI C63.10:2009
TEST PARAMETERS	
Antenna Height(s) (m) 1 - 2	Test Distance (m) 1
COMMENTS	
Aeon C627-510004A antennas with 4 inch antenna cables. 12 inch ribbon cable: small donut ferrites on Antenna cables with two turns:	
EUT OPERATING MODES	
Transmitting at 5320 MHz	
DEVIATIONS FROM TEST STANDARD	
No deviations.	
Run # 2	Signature 
Configuration # 1	
Results Pass	
	

Freq (MHz)			Azimuth (degrees)	Height (meters)			Polarity	Detector	EIRP (Watts)	EIRP (dBm)	Spec. Limit (dBm)	Compared to Spec. (dB)
5351.140			171.0	1.4			V-Horn	PK	1.16E-06	-29.4	-27.0	-2.4
5350.867			348.0	1.0			H-Horn	PK	9.61E-07	-30.2	-27.0	-3.2
5350.053			181.0	1.5			V-Horn	PK	6.81E-07	-31.7	-27.0	-4.7
5351.610			338.0	1.0			H-Horn	PK	6.35E-07	-32.0	-27.0	-5.0
5440.070			178.0	1.5			V-Horn	PK	6.21E-07	-32.1	-27.0	-5.1
5440.400			341.0	1.0			H-Horn	PK	5.41E-07	-32.7	-27.0	-5.7
5447.130			344.0	1.0			H-Horn	PK	4.93E-07	-33.1	-27.0	-6.1
5441.630			177.0	1.5			V-Horn	PK	4.60E-07	-33.4	-27.0	-6.4

SPURIOUS RADIATED EMISSIONS										PSA 2008.07.21		EMI 2008.1.9	
NORTHWEST EMC EUT: Summit FS848 Master Module (Wheeler) Serial Number: 0265 Customer: Summit Semiconductor LLC Attendees: Alex Macdonald Project: None Tested by: Dan Haas										Work Order:	FOCU0081	Date:	07/16/10
										Temperature:	24.3°C	Humidity:	41%
										Barometric Pres.:	1020.3 mb	Job Site:	EV06
TEST SPECIFICATIONS										Test Method			
FCC 15.209:2010										ANSI C63.10:2009			
TEST PARAMETERS													
Antenna Height(s) (m)		1 - 2		Test Distance (m)		1							
COMMENTS										Aeon C627-510004A antennas with 4 inch antenna cables. 12 inch ribbon cable: small donut ferrites on Antenna cables with two turns:			
EUT OPERATING MODES													
Transmitting at 5320 MHz													
DEVIATIONS FROM TEST STANDARD													
No deviations.													
Run #	2		Signature										
Configuration #	1												
Results	Pass												

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Distance (meters)	External Attenuation (dB)	Polarity	Detector	Distance Adjustment (dB)	Adjusted dBuV/m	Spec. Limit dBuV/m	Compared to Spec. (dB)
5439.970	23.4	37.0	177.0	1.5	1.0	0.0	V-Horn	AV	-9.5	50.9	54.0	-3.1
5440.000	22.9	37.0	341.0	1.0	1.0	0.0	H-Horn	AV	-9.5	50.4	54.0	-3.6
5439.930	22.6	37.0	178.0	1.5	1.0	0.0	V-Horn	AV	-9.5	50.1	54.0	-3.9
5439.970	22.3	37.0	344.0	1.0	1.0	0.0	H-Horn	AV	-9.5	49.8	54.0	-4.2
5350.037	21.6	36.9	181.0	1.5	1.0	0.0	V-Horn	AV	-9.5	49.0	54.0	-5.0
5350.033	21.4	36.9	171.0	1.4	1.0	0.0	V-Horn	AV	-9.5	48.8	54.0	-5.2
5351.000	21.4	36.9	338.0	1.0	1.0	0.0	H-Horn	AV	-9.5	48.8	54.0	-5.2
5350.040	21.2	36.9	348.0	1.0	1.0	0.0	H-Horn	AV	-9.5	48.6	54.0	-5.4
5351.140	38.5	36.9	171.0	1.4	1.0	0.0	V-Horn	PK	-9.5	65.9	74.0	-8.1
5350.867	37.7	36.9	348.0	1.0	1.0	0.0	H-Horn	PK	-9.5	65.1	74.0	-8.9
5350.053	36.2	36.9	181.0	1.5	1.0	0.0	V-Horn	PK	-9.5	63.6	74.0	-10.4
5351.610	35.9	36.9	338.0	1.0	1.0	0.0	H-Horn	PK	-9.5	63.3	74.0	-10.7
5440.070	35.7	37.0	178.0	1.5	1.0	0.0	V-Horn	PK	-9.5	63.2	74.0	-10.8
5440.400	35.1	37.0	341.0	1.0	1.0	0.0	H-Horn	PK	-9.5	62.6	74.0	-11.4
5447.130	34.7	37.0	344.0	1.0	1.0	0.0	H-Horn	PK	-9.5	62.2	74.0	-11.8
5441.630	34.4	37.0	177.0	1.5	1.0	0.0	V-Horn	PK	-9.5	61.9	74.0	-12.1

SPURIOUS RADIATED EMISSIONS

EUT: Summit FS848 Master Module (Wheeler)	Work Order: FOCU0081
Serial Number: 0265	Date: 07/16/10
Customer: Summit Semiconductor LLC	Temperature: 24.3°C
Attendees: Alex Macdonald	Humidity: 41%
Project: None	Barometric Pres.: 1020.3 mb
Tested by: Dan Haas	Job Site: EV06

TEST SPECIFICATIONS

FCC 15.407:2010

Test Method

ANSI C63.10:2009

TEST PARAMETERS

Antenna Height(s) (m)

1 - 2

Test Distance (m)

1

COMMENTS

Aeon C627-510004A antennas with 4 inch antenna cables. 12 inch ribbon cable: small donut ferrites on Antenna cables with two turns:

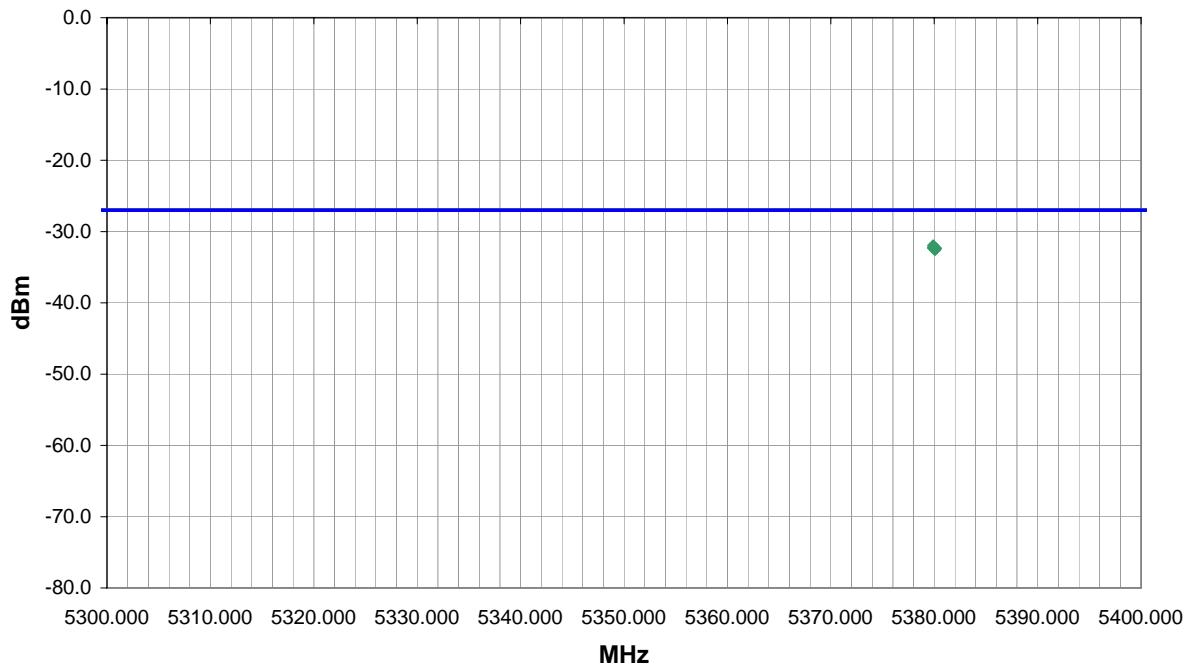
EUT OPERATING MODES

Transmitting at 5260 MHz

DEVIATIONS FROM TEST STANDARD

No deviations.

Run #	3
Configuration #	1
Results	Pass

Signature 

Freq (MHz)			Azimuth (degrees)	Height (meters)			Polarity	Detector	EIRP (Watts)	EIRP (dBm)	Spec. Limit (dBm)	Compared to Spec. (dB)
5379.900			182.0	1.4			V-Horn	PK	6.35E-07	-32.0	-27.0	-5.0
5379.870			343.0	1.3			H-Horn	PK	5.93E-07	-32.3	-27.0	-5.3
5380.170			348.0	1.3			H-Horn	PK	5.79E-07	-32.4	-27.0	-5.4
5380.070			173.0	1.4			V-Horn	PK	5.53E-07	-32.6	-27.0	-5.6

SPURIOUS RADIATED EMISSIONS

EUT: Summit FS848 Master Module (Wheeler)	Work Order: FOCU0081
Serial Number: 0265	Date: 07/16/10
Customer: Summit Semiconductor LLC	Temperature: 24.3°C
Attendees: Alex Macdonald	Humidity: 41%
Project: None	Barometric Pres.: 1020.3 mb
Tested by: Dan Haas	Job Site: EV06

TEST SPECIFICATIONS

FCC 15.209:2010 | ANSI C63.10:2009

TEST PARAMETERS

Antenna Height(s) (m) | 1 - 2 | Test Distance (m) | 1

COMMENTS

Aeon C627-510004A antennas with 4 inch antenna cables. 12 inch ribbon cable: small donut ferrites on Antenna cables with two turns:

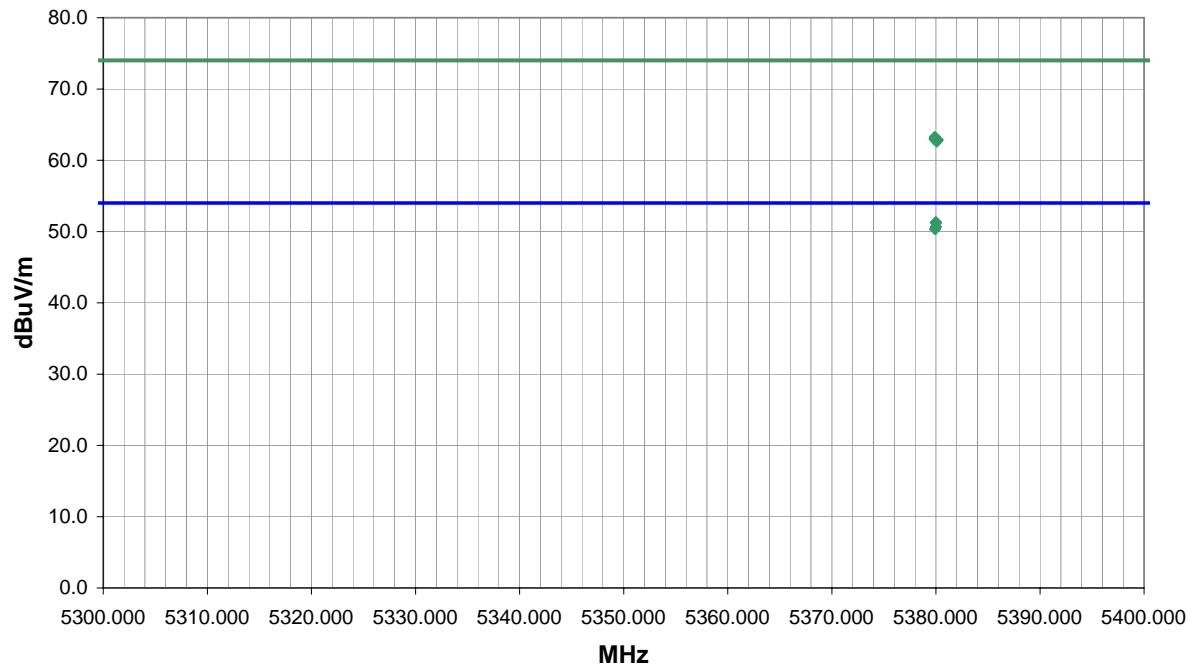
EUT OPERATING MODES

Transmitting at 5260 MHz

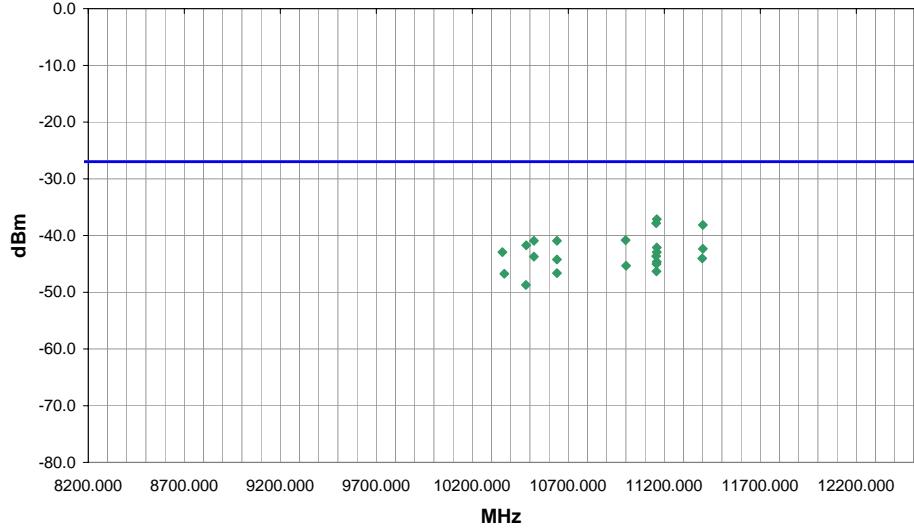
DEVIATIONS FROM TEST STANDARD

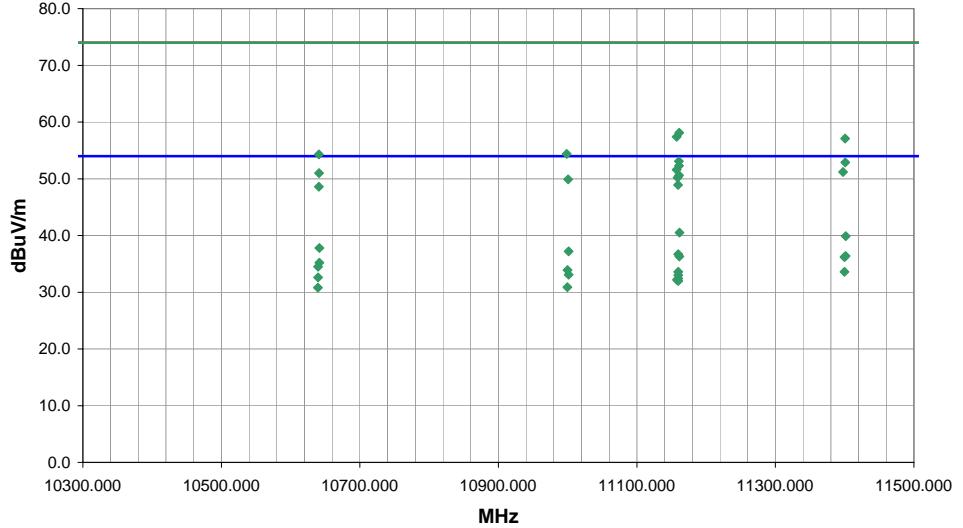
No deviations.

Run #	3	Signature
Configuration #	1	
Results	Pass	



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Distance (meters)	External Attenuation (dB)	Polarity	Detector	Distance Adjustment (dB)	Adjusted dBuV/m	Spec. Limit dBuV/m	Compared to Spec. (dB)
5380.000	23.9	36.9	182.0	1.4	1.0	0.0	V-Horn	AV	-9.5	51.3	54.0	-2.7
5380.000	23.9	36.9	343.0	1.3	1.0	0.0	H-Horn	AV	-9.5	51.3	54.0	-2.7
5380.000	23.3	36.9	348.0	1.3	1.0	0.0	H-Horn	AV	-9.5	50.7	54.0	-3.3
5379.930	23.0	36.9	173.0	1.4	1.0	0.0	V-Horn	AV	-9.5	50.4	54.0	-3.6
5379.900	35.9	36.9	182.0	1.4	1.0	0.0	V-Horn	PK	-9.5	63.3	74.0	-10.7
5379.870	35.6	36.9	343.0	1.3	1.0	0.0	H-Horn	PK	-9.5	63.0	74.0	-11.0
5380.170	35.5	36.9	348.0	1.3	1.0	0.0	H-Horn	PK	-9.5	62.9	74.0	-11.1
5380.070	35.3	36.9	173.0	1.4	1.0	0.0	V-Horn	PK	-9.5	62.7	74.0	-11.3

SPURIOUS RADIATED EMISSIONS												PSA 2008.07.21	
												EMI 2008.1.9	
EUT: Summit FS848 Master Module (Wheeler)						Work Order: FOCU0081							
Serial Number: 0265						Date: 07/19/10							
Customer: Summit Semiconductor LLC						Temperature: 22.1 °C							
Attendees: None						Humidity: 45%							
Project: None						Barometric Pres.: 1018.3 mb							
Tested by: Dan Haas			Power: 120VAC/60Hz			Job Site: EV01							
TEST SPECIFICATIONS												Test Method	
FCC 15.407:2010						ANSI C63.10:2009							
TEST PARAMETERS													
Antenna Height(s) (m)			1 - 4			Test Distance (m)			3				
COMMENTS													
Aeon C627-510004A antennas with 4 inch antenna cables. 12 inch ribbon cable: small donut ferrites on Antenna cables with two turns:													
EUT OPERATING MODES													
Continuous Transmitting.													
DEVIATIONS FROM TEST STANDARD													
No deviations.													
Run #	5					Signature							
Configuration #	1												
Results	Pass												
													
Freq (MHz)			Azimuth (degrees)	Height (meters)			Polarity	Detector	EIRP (Watts)	EIRP (dBm)	Spec. Limit (dBm)	Compared to Spec. (dB)	Comments
11161.000			206.0	1.4			H-Horn	PK	1.94E-07	-37.1	-27.0	-10.1	CH:116, 6Mbps, EUT Vertical.
11157.300			208.0	1.4			H-Horn	PK	1.65E-07	-37.8	-27.0	-10.8	CH:116, 36Mbps, EUT Vertical.
11400.730			208.0	1.3			H-Horn	PK	1.54E-07	-38.1	-27.0	-11.1	CH:140, 6Mbps, EUT Vertical.
10998.570			216.0	1.1			H-Horn	PK	8.26E-08	-40.8	-27.0	-13.8	CH:100, 6Mbps, EUT Vertical.
10520.670			257.0	1.1			H-Horn	PK	8.07E-08	-40.9	-27.0	-13.9	CH:52, 6Mbps, EUT Vertical.
10640.770			260.0	1.0			H-Horn	PK	8.07E-08	-40.9	-27.0	-13.9	CH:64, 6Mbps, EUT Vertical.
10480.800			260.0	1.2			H-Horn	PK	6.72E-08	-41.7	-27.0	-14.7	CH:48, 6Mbps, EUT Vertical.
11160.600			353.0	1.2			V-Horn	PK	6.13E-08	-42.1	-27.0	-15.1	CH:116, 6Mbps, EUT Horizontal.
11400.830			5.0	1.3			V-Horn	PK	5.85E-08	-42.3	-27.0	-15.3	CH:140, 6Mbps, EUT Horizontal.
11160.800			166.0	1.2			V-Horn	PK	5.09E-08	-42.9	-27.0	-15.9	CH:116, 6Mbps, EUT on side.
10356.930			226.0	1.3			H-Horn	PK	5.09E-08	-42.9	-27.0	-15.9	CH:36, 6Mbps, EUT Vertical.
11157.300			349.0	1.3			V-Horn	PK	4.34E-08	-43.6	-27.0	-16.6	CH:116, 36Mbps, EUT Horizontal.
10520.930			199.0	1.0			V-Horn	PK	4.24E-08	-43.7	-27.0	-16.7	CH:52, 6Mbps, EUT Horizontal.
11397.670			7.0	1.2			V-Horn	PK	3.95E-08	-44.0	-27.0	-17.0	CH:140, 36Mbps, EUT Horizontal.
10640.900			198.0	1.0			V-Horn	PK	3.78E-08	-44.2	-27.0	-17.2	CH:64, 6Mbps, EUT Horizontal.
11160.830			238.0	1.2			V-Horn	PK	3.44E-08	-44.6	-27.0	-17.6	CH:116, 6Mbps, EUT Vertical.
11158.800			144.0	1.0			H-Horn	PK	3.14E-08	-45.0	-27.0	-18.0	CH:116, 6Mbps, EUT on side.
11000.800			138.0	1.1			V-Horn	PK	2.93E-08	-45.3	-27.0	-18.3	CH:100, 6Mbps, EUT Horizontal.
11159.370			231.0	1.1			H-Horn	PK	2.33E-08	-46.3	-27.0	-19.3	CH:116, 6Mbps, EUT Horizontal.
10640.730			255.0	1.1			V-Horn	PK	2.17E-08	-46.6	-27.0	-19.6	CH:64, 6Mbps, EUT Horizontal.

SPURIOUS RADIATED EMISSIONS												PSA 2008.07.21	EMI 2008.1.9	
EUT: Summit FS848 Master Module (Wheeler)							Work Order: FOCU0081							
Serial Number: 0265							Date: 07/19/10							
Customer: Summit Semiconductor LLC							Temperature: 22.1 °C							
Attendees: None							Humidity: 45%							
Project: None							Barometric Pres.: 1018.3 mb							
Tested by: Dan Haas			Power: 120VAC/60Hz				Job Site: EV01							
TEST SPECIFICATIONS												Test Method		
FCC 15.209:2010							ANSI C63.10:2009							
TEST PARAMETERS														
Antenna Height(s) (m)			1 - 4		Test Distance (m)			3						
COMMENTS														
Aeon C627-510004A antennas with 4 inch antenna cables. 12 inch ribbon cable: small donut ferrites on Antenna cables with two turns:														
EUT OPERATING MODES														
Continuous Transmitting.														
DEVIATIONS FROM TEST STANDARD														
No deviations.														
Run #	5					Signature								
Configuration #	1													
Results	Pass													
														
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Distance (meters)	External Attenuation (dB)	Polarity	Detector	Distance Adjustment (dB)	Adjusted dBuV/m	Spec. Limit dBuV/m	Compared to Spec. (dB)	Comments	
11161.470	49.4	-8.9	208.0	1.4	3.0	0.0	H-Horn	AV	0.0	40.5	54.0	-13.5	CH:116, 36Mbps, EUT Vertical.	
11401.470	47.2	-7.3	208.0	1.3	3.0	0.0	H-Horn	AV	0.0	39.9	54.0	-14.1	CH:140, 36Mbps, EUT Vertical.	
11161.000	67.0	-8.9	206.0	1.4	3.0	0.0	H-Horn	PK	0.0	58.1	74.0	-15.9	CH:116, 6Mbps, EUT Vertical.	
10641.430	49.3	-11.5	260.0	1.0	3.0	0.0	H-Horn	AV	0.0	37.8	54.0	-16.2	CH:64, 36Mbps, EUT Vertical.	
11157.300	66.3	-8.9	208.0	1.4	3.0	0.0	H-Horn	PK	0.0	57.4	74.0	-16.6	CH:116, 36Mbps, EUT Vertical.	
11001.400	47.2	-10.0	216.0	1.1	3.0	0.0	H-Horn	AV	0.0	37.2	54.0	-16.8	CH:100, 36Mbps, EUT Vertical.	
11400.730	64.4	-7.3	208.0	1.3	3.0	0.0	H-Horn	PK	0.0	57.1	74.0	-16.9	CH:140, 6Mbps, EUT Vertical.	
11159.700	45.6	-8.9	206.0	1.4	3.0	0.0	H-Horn	AV	0.0	36.7	54.0	-17.3	CH:116, 6Mbps, EUT Vertical.	
11401.430	43.7	-7.3	7.0	1.2	3.0	0.0	V-Horn	AV	0.0	36.4	54.0	-17.6	CH:140, 36Mbps, EUT Horizontal.	
11161.400	45.2	-8.9	349.0	1.3	3.0	0.0	V-Horn	AV	0.0	36.3	54.0	-17.7	CH:116, 36Mbps, EUT Horizontal.	
11399.700	43.5	-7.3	208.0	1.3	3.0	0.0	H-Horn	AV	0.0	36.2	54.0	-17.8	CH:140, 6Mbps, EUT Vertical.	
10641.500	46.7	-11.5	198.0	1.0	3.0	0.0	V-Horn	AV	0.0	35.2	54.0	-18.8	CH:64, 36Mbps, EUT Horizontal.	
10639.670	46.0	-11.5	260.0	1.0	3.0	0.0	H-Horn	AV	0.0	34.5	54.0	-19.5	CH:64, 6Mbps, EUT Vertical.	
10998.570	64.4	-10.0	216.0	1.1	3.0	0.0	H-Horn	PK	0.0	54.4	74.0	-19.6	CH:100, 6Mbps, EUT Vertical.	
10640.770	65.8	-11.5	260.0	1.0	3.0	0.0	H-Horn	PK	0.0	54.3	74.0	-19.7	CH:64, 6Mbps, EUT Vertical.	
10999.700	43.9	-10.0	216.0	1.1	3.0	0.0	H-Horn	AV	0.0	33.9	54.0	-20.1	CH:100, 6Mbps, EUT Vertical.	
11159.670	42.5	-8.9	353.0	1.2	3.0	0.0	V-Horn	AV	0.0	33.6	54.0	-20.4	CH:116, 6Mbps, EUT Horizontal.	
11399.730	40.9	-7.3	5.0	1.3	3.0	0.0	V-Horn	AV	0.0	33.6	54.0	-20.4	CH:140, 6Mbps, EUT Horizontal.	
11001.500	43.1	-10.0	138.0	1.1	3.0	0.0	V-Horn	AV	0.0	33.1	54.0	-20.9	CH:100, 36Mbps, EUT Horizontal.	
11160.600	62.0	-8.9	353.0	1.2	3.0	0.0	V-Horn	PK	0.0	53.1	74.0	-20.9	CH:116, 6Mbps, EUT Horizontal.	

SPURIOUS RADIATED EMISSIONS

EUT: Summit FS848 Master Module (Wheeler)	Work Order: FOCU0081
Serial Number: 0265	Date: 07/20/10
Customer: Summit Semiconductor LLC	Temperature: 22.9 °C
Attendees: None	Humidity: 45%
Project: None	Barometric Pres.: 1018.1 mb
Tested by: Dan Haas	Job Site: EV01

TEST SPECIFICATIONS

FCC 15.407:2010 | ANSI C63.10:2009

TEST PARAMETERS

Antenna Height(s) (m) | 1 - 4 | Test Distance (m) | 3

COMMENTS

Aeon C627-510004A antennas with 4 inch antenna cables. 12 inch ribbon cable: small donut ferrites on Antenna cables with two turns:

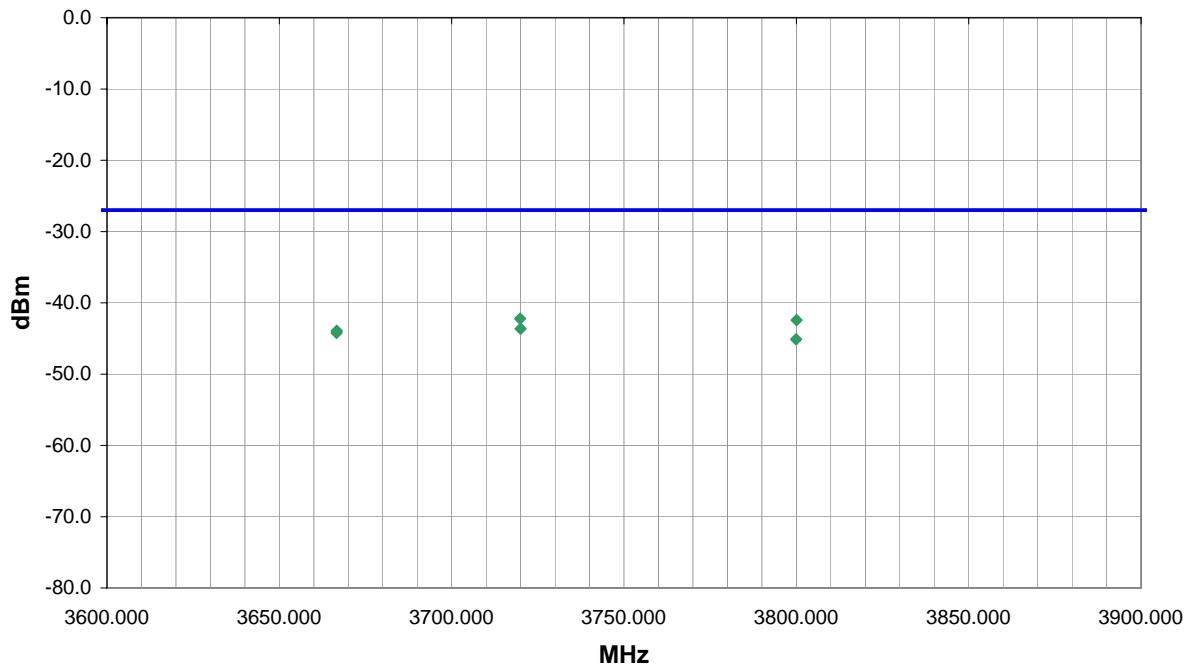
EUT OPERATING MODES

Continuous Transmitting.

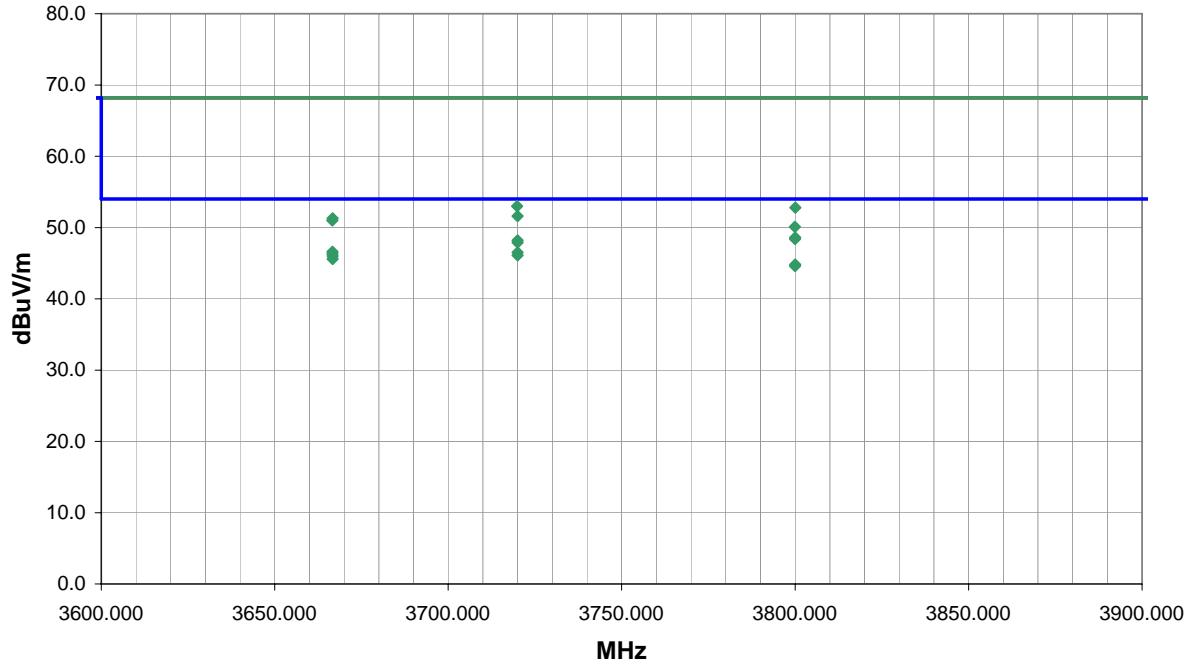
DEVIATIONS FROM TEST STANDARD

No deviations.

Run #	7	Signature
Configuration #	1	
Results	Pass	



Freq (MHz)			Azimuth (degrees)	Height (meters)			Polarity	Detector	EIRP (Watts)	EIRP (dBm)	Spec. Limit (dBm)	Compared to Spec. (dB)
3719.873			236.0	1.2			H-Horn	PK	5.99E-08	-42.2	-27.0	-15.2
3800.070			234.0	1.0			H-Horn	PK	5.72E-08	-42.4	-27.0	-15.4
3720.013			198.0	1.0			V-Horn	PK	4.34E-08	-43.6	-27.0	-16.6
3666.670			240.0	1.2			H-Horn	PK	4.05E-08	-43.9	-27.0	-16.9
3666.617			196.0	1.0			V-Horn	PK	3.78E-08	-44.2	-27.0	-17.2
3799.920			183.0	1.1			V-Horn	PK	3.07E-08	-45.1	-27.0	-18.1

SPURIOUS RADIATED EMISSIONS											
NORTHWEST EMC											PSA 2008.07.21
Serial Number: 0265											EMI 2008.1.9
Customer: Summit Semiconductor LLC						Work Order: FOCU0081					
Attendees: None						Date: 07/20/10					
Project: None						Temperature: 22.9 °C					
Tested by: Dan Haas						Humidity: 45%					
						Barometric Pres.: 1018.1 mb					
						Job Site: EV01					
TEST SPECIFICATIONS											
FCC 15.209:2010						Test Method: ANSI C63.10:2009					
TEST PARAMETERS											
Antenna Height(s) (m)			1 - 4			Test Distance (m)			3		
COMMENTS											
Aeon C627-510004A antennas with 4 inch antenna cables. 12 inch ribbon cable: small donut ferrites on Antenna cables with two turns:											
EUT OPERATING MODES											
Continuous Transmitting.											
DEVIATIONS FROM TEST STANDARD											
No deviations.											
Run #	7										
Configuration #	1										
Results	Pass		Signature								
											

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Distance (meters)	External Attenuation (dB)	Polarity	Detector	Distance Adjustment (dB)	Adjusted dBuV/m	Spec. Limit dBuV/m	Compared to Spec. (dB)
3800.003	40.4	8.2	234.0	1.0	3.0	0.0	H-Horn	AV	0.0	48.6	54.0	-5.4
3799.990	40.2	8.2	234.0	1.0	3.0	0.0	H-Horn	AV	0.0	48.4	54.0	-5.6
3719.987	40.7	7.5	236.0	1.2	3.0	0.0	H-Horn	AV	0.0	48.2	54.0	-5.8
3719.980	40.4	7.5	236.0	1.2	3.0	0.0	H-Horn	AV	0.0	47.9	54.0	-6.1
3666.633	39.4	7.2	240.0	1.2	3.0	0.0	H-Horn	AV	0.0	46.6	54.0	-7.4
3720.000	39.0	7.5	198.0	1.0	3.0	0.0	V-Horn	AV	0.0	46.5	54.0	-7.5
3666.653	39.1	7.2	240.0	1.2	3.0	0.0	H-Horn	AV	0.0	46.3	54.0	-7.7
3720.003	38.6	7.5	198.0	1.0	3.0	0.0	V-Horn	AV	0.0	46.1	54.0	-7.9
3666.700	38.8	7.2	196.0	1.0	3.0	0.0	V-Horn	AV	0.0	46.0	54.0	-8.0
3666.700	38.4	7.2	196.0	1.0	3.0	0.0	V-Horn	AV	0.0	45.6	54.0	-8.4
3800.003	36.6	8.2	183.0	1.1	3.0	0.0	V-Horn	AV	0.0	44.8	54.0	-9.2
3799.983	36.4	8.2	183.0	1.1	3.0	0.0	V-Horn	AV	0.0	44.6	54.0	-9.4
3719.873	45.5	7.5	236.0	1.2	3.0	0.0	H-Horn	PK	0.0	53.0	68.2	-15.2
3800.070	44.6	8.2	234.0	1.0	3.0	0.0	H-Horn	PK	0.0	52.8	68.2	-15.4
3720.013	44.1	7.5	198.0	1.0	3.0	0.0	V-Horn	PK	0.0	51.6	68.2	-16.6
3666.670	44.1	7.2	240.0	1.2	3.0	0.0	H-Horn	PK	0.0	51.3	68.2	-16.9
3666.617	43.8	7.2	196.0	1.0	3.0	0.0	V-Horn	PK	0.0	51.0	68.2	-17.2
3799.920	41.9	8.2	183.0	1.1	3.0	0.0	V-Horn	PK	0.0	50.1	68.2	-18.1