Radio Test Report R79188

Japanese Radio Law - Item 19 of Article 12
Category XW (Bands W52 and W53)

MANUFACTURER: Summit Data Communications

MODEL(s): SDC-PE15N (802.11abgn 2x2)

TEST SITE: Elliott Laboratories, LLC
684 W. Maude Avenue
Sunnyvale, CA 94085

SIGNATORY: Mark Briggs

Mark Briggs
Staff Engineer

Revision History

Rev #	Made By	Date	Comments
1.1	Mehran Birgani	May 24,2010	First Issue
2	Mark Briggs	14-Jun-10	Corrected rated power calculations to include measurements at highest data rate. Removed EIRP clauclations using rated power, leaving just the calculations using highest measured power. Changed references to "nominal" output power to "Rated" output power.

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Client:	Summit Data Communications	Job Number:	J78554
Model:	SDC-PE15N (802.11abgn 2x2)	T-Log Number:	T78978
		Account Manager:	Christne Krebill
Standard:	Japanese Radio Law - Item 19 of Article 12	Contact:	Ron Seide

Client:	Summit Data Communications	Job Number:	J78554
Model:	SDC-PE15N (802.11abgn 2x2)	T-Log Number:	T78978
		Account Manager:	Christne Krebill
Standard:	Japanese Radio Law - Item 19 of Article 12	Contact:	Ron Seide

Scope

Testing has been performed on a sample of the product described in the test report against the requirements of the Japanese Radio Law for products operating under category XW.

Product Information

Product Information

The Summit Data Communication model SDC-PE15N is a mini-PCI 802.11abgn module for installation by system integrators.
The serial number of the sample tested was PE15N09082400033E
The hardware version of the sample tested was 200-116575-0000G D as displayed on the rear side of the circuit board.

EUT Software

Summit Client Utility (SCU) - Driver V2.03.47, SCU V2.03.47
Summit Regulatory Utility (SRU) - V2.03.47

Parameter	Mode	Requirement	Measurement	Result
Product may not be easily opened	-	The rf section and modulation section except for the antenna system shall not be capable of being opened easily	See photographs below, rf circuitry is not accessible to the end user.	Pass
Communication Method	-	simplex operation, dusimplex operation, or duplex operation	semi-duplex(for 802.11)	Pass
Modulation	-	(1) OFDM or DSSS (2) Other	OFDM (for 802.11)	Pass
Indoor use, device using W52,W53 and/or W56 band(s)	-	Label on device indicating “For indoor use only”	Module designed for indoor use only. Labeled correctly	Pass
Connector (modular radios only)	-	Modular devices shall use a connector to interface to the host system	Devices uses an mini-PCIe standard edge connector.	Pass

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

Test Environment

Temperature: 15-30 °C
Pressure: 86-106 kPa

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Product Power Supply - Determination of Voltage Regulator

The product is designed to be powered from a nominal power source voltage of: **3.3** Vdc

Option 1: If device contains internal regulation, vary input voltage to the device by +/-10% and measure the variation in output voltage for each regulator that powers the radio circuitry. If variation in regulator output is < 1% then we do not have to test at voltage extremes, just at nominal.

Option 2: If device contains internal regulation, and the manufacturer has specification sheets that show the output voltage from all regulators powering the radio circuitry is better than 1% for an input voltage range of +/- 10% then we do not have to test at voltage extremes, just at nominal. We do need the specification sheets for the regulators and they should be inserted into the final report after this page.

Option 3: Test at voltage extremes, and nominal voltage.

Option 3 was used for this device.

Requirement

The EUT shall be constructed in such a way that sensitive RF parts, (like modulation and oscillator parts) cannot be reached easily by the user. These parts shall be covered by soldered metal caps or glue or by other mechanical covers. If the covers are fixed with screws, these shall be not the common type(s) like a Phillips, but special versions like Torx, so that the user cannot open the device with common tools.

Results

A metal shield, soldered to the circuit board, covers all of the rf sensitive circuitry with the exception of the antenna connectors. The shield is not designed to be removed (see picture below, shield is beneath the label).

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Label Indicating "Indoor Use Only"

The EUT is designed to operate only in the W52 and W53 bands. Use of the W52 and W53 bands is limited to devices designed and intended to be operated indoors and not for devices that may be operated outdoors. The device shall be labeled as follows: "For indoor use only."

Module Connector

Requirement

Modular approval is only permitted for devices with an interface connector. Modular approval is not allowed for modules that are soldered directly into the host system.

Results

The module uses an edge connector as shown in the photograph in the previous section.

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Antenna Gain and Patterns

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Antenna Gain(s)

Antenna	Mode	Requirement	Measurement	Result
Antenna	**Mode**	**Requirement**	**Measurement**	**Result**
Huber+Suhner, SOA 2459/360/5/0/V_C	802.11a 802.11n 20MHz 8021.11n 40MHz	Gain measurements and antenna patterns.	W52 Band: 6.5 dBi W53 Band: 6.5 dBi	Pass
Larsen, R380.500.314			W52 Band: 5 dBi W53 Band: 5 dBi	Pass
Cisco Air-Ant 5135			W52 Band: 3.5 dBi W53 Band: 3.5 dBi	Pass

Antenna Gain

Refer to attached data sheets showing antenna gain and pattern for each antenna.

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Antenna Gain and Patterns

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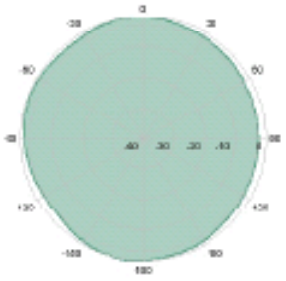
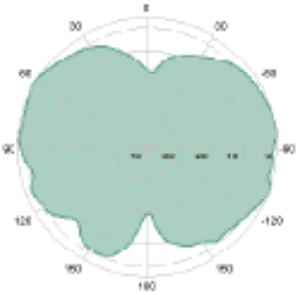
Huber+Suhner, SOA 2459/360/5/0/V_C

HUBER+SUHNER®
SENCITY® ANTENNA
FOR WIRELESS COMMUNICATION

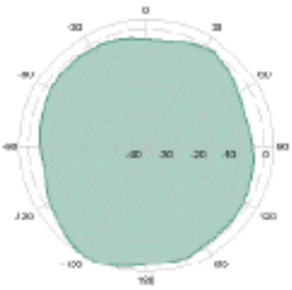
SOA 2459/360/5/0/V_C



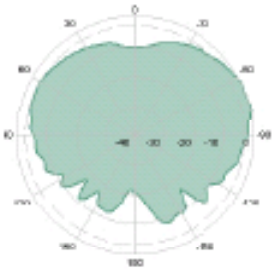
Horizontal 2450MHz



Vertical 2450MHz



Horizontal 5600MHz



Vertical 5600MHz

Technical Data

Electrical Properties		
Frequency range	2400 - 2500MHz	5150 – 5875MHz
Impedance	50 Ω	
VSWR	≤ 2	
Polarization	linear, vertical	
Gain	3 dBi	6.5dB
10 dB beamwidth horizontal	360°	360°
10 dB beamwidth vertical	140°	60°
Max. power	0.1 W (CW) at 25°C	

Mechanical Properties	
Operating temperature range	- 40°C to + 80°C
Storage temperature range	- 40°C to + 80°C

Available Types	Article no.	
1399.99.0020	84038866	Pigtail with UFL connector (0.24m)

Documents	
01.02.0777	security instruction

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HUBER+SUHNER – Excellence in Connectivity Solutions

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Antenna Gain and Patterns

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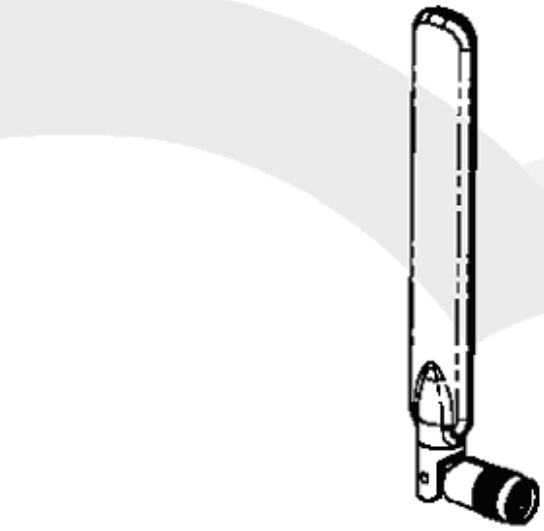
Larsen, R380.500.314

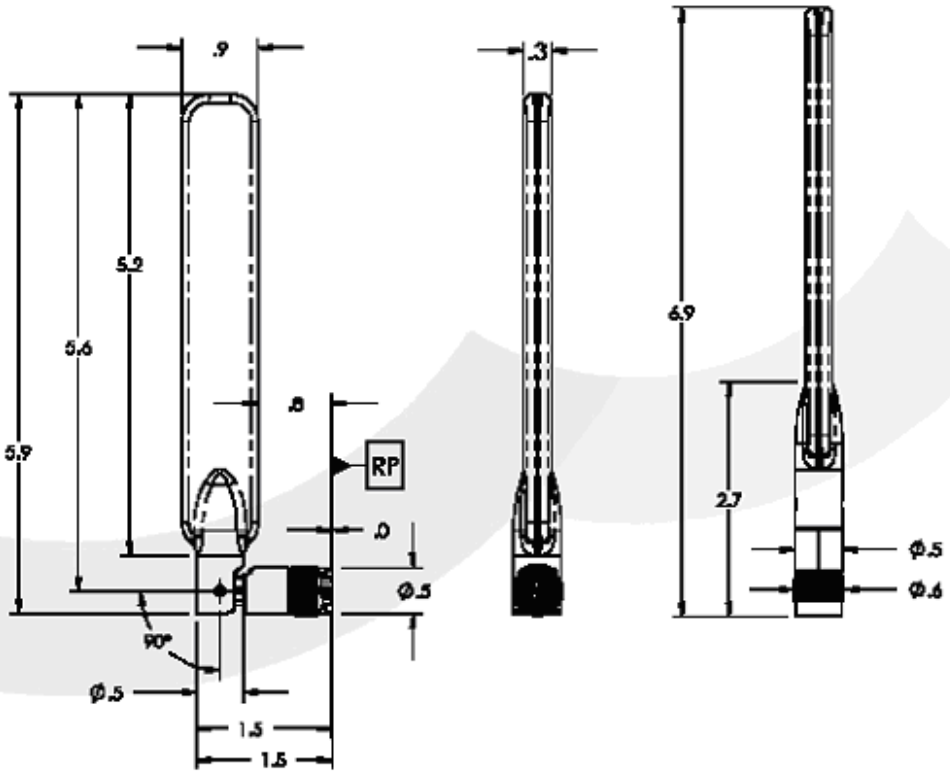
Dual Band Swivel Mount Dipole RP-TNC Blade

2.40-2.50/4.90-5.90 GHz

R380.500.314

Series : **ANTENNA**





All dimensions are inches

Issue : 0717

In the effort to improve our products, we reserve the right to make changes judged to be necessary.

RoHS COMPLIANT

Dual Band Swivel Mount Dipole RP-TNC Blade

2.40-2.50/4.90-5.90 GHz

R380.500.314

Series : **ANTENNA**

ELECTRICAL SPECIFICATIONS

Frequency :	**2.40-2.50/4.90-5.90** GHz
Nominal Impedance :	**50** Ω
VSWR :	**2:1** Max
Gain (Radiating element) :	**1.6/5.0** dBi ± 1 dB
Radiation Pattern	
HPBW in Horizontal Plane :	**360** ° ± 2 °
Ripple level in Horizontal Plane :	**±3** dB Max
HPBW in Elevation	
Low Band :	**85** °
High Band :	**30** °
Polarization :	**Linear Vertical**
Connector type :	**Reverse Polarity TNC**
Cable type :	**RG316**

Dual Band Swivel Mount Dipole RP-TNC Blade

2.40-2.50/4.90-5.90 GHz

R380.500.314

Series : **ANTENNA**

MECHANICAL SPECIFICATIONS

Plastic radome :	**ABS+PC**	
Color :	**Black**	
Flammability Rating :	**V-0**	UL 94
Weight :	**1.2**	oz
Overall length :	**6.9**	Inches
Bent	**5.9**	Inches
Fixing system :		
Azimuth adjustment		° ± 4°
Elevation adjustment		° ± 4°

ENVIRONMENTAL SPECIFICATIONS

Operating temperature :	**-30/+70**	° C
Storage temperature : ……..	**-40/+85**	° C
Humidity :	**95%**	@ 24° C

OTHER SPECIFICATIONS

Dual Band Swivel Mount Dipole RP-TNC Blade

2.40-2.50/4.90-5.90 GHz

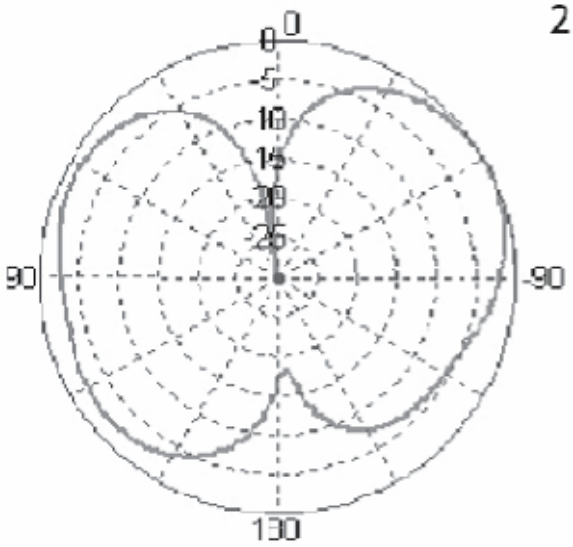
R380.500.314

Series : **ANTENNA**

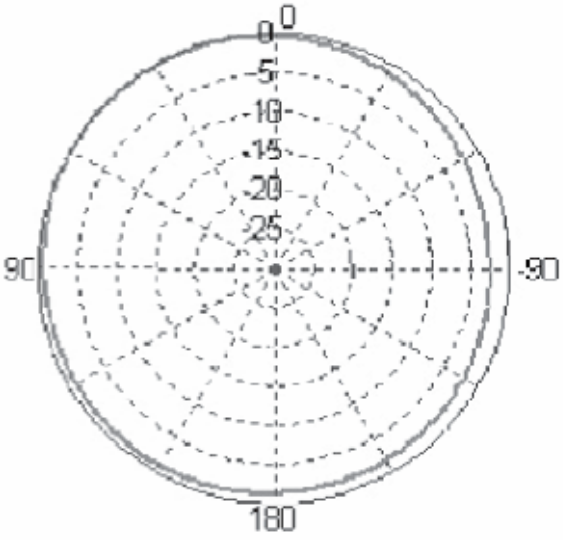
Pattern Data

E-PLANE

2 GHz

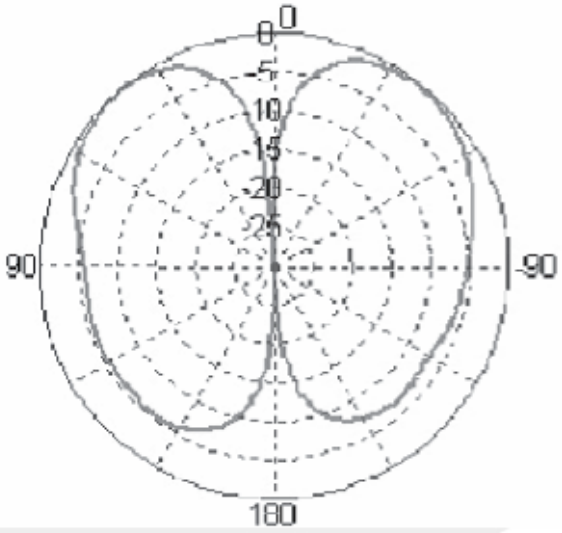


H-PLANE

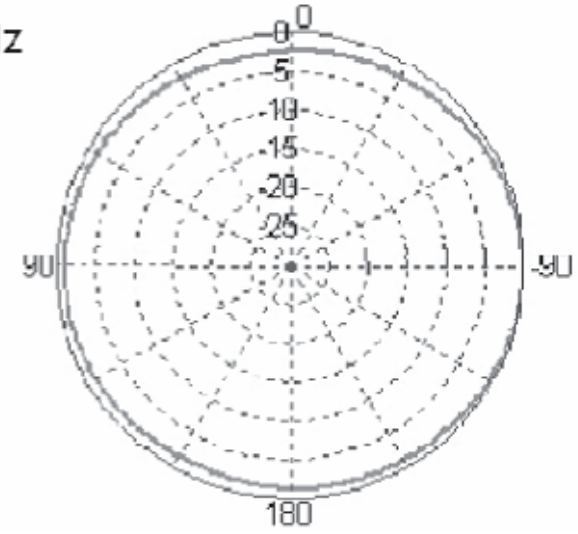


E-PLANE

5 GHz



H-PLANE



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Antenna Gain and Patterns

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Cisco Air-Ant 5135

Cisco Aironet 3.5-dBi Articulated Dipole Antenna (AIR-ANT5135D-R)

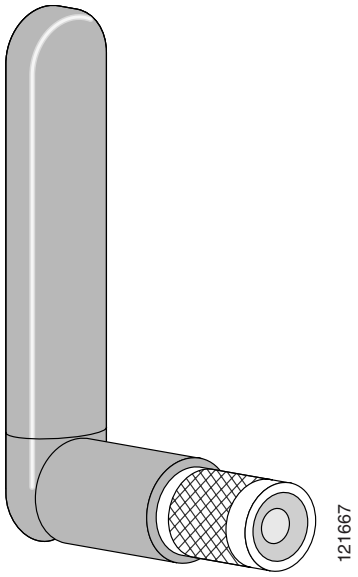
This document outlines the specifications and describes the Cisco Aironet 3.5-dBi Articulated Dipole Antenna. The antenna operates in the 5-GHz frequency band and is designed for use with Cisco Aironet 5-GHz radio products using a reverse-polarity Neil Councilman connector (RP-TNC).

The following information is provided in this document.

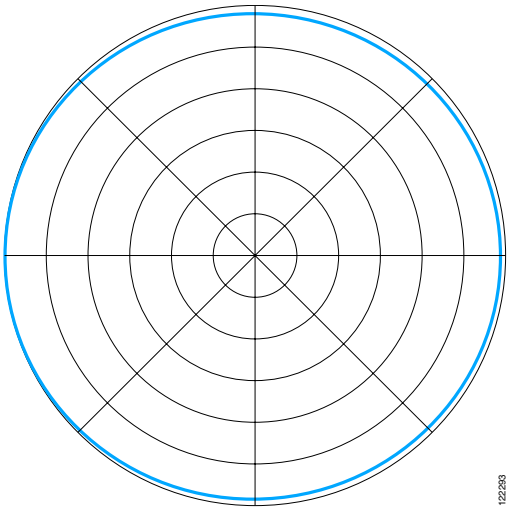
Corporate Headquarters:
Cisco Systems, Inc., 170 West Tasman Drive, San Jose, CA 95134-1706 USA

Technical Specifications

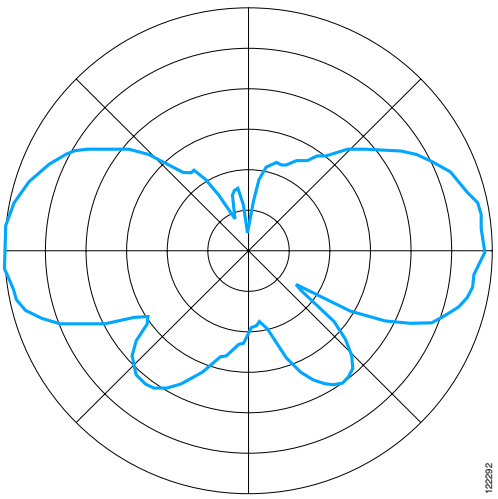
Antenna type	Dipole
Operating frequency range	5150 – 5850 MHz
Nominal input impedance	50Ω
2:1 VSWR bandwidth	5150 – 5850 MHz
Gain	3.5 dBi
Polarization	Linear, vertical
E-plane 3-dB beamwidth	40 degrees
H-plane 3-dB beamwidth	Omnidirectional
Connector type	RP-TNC plug
Length	5.3 in. (13.4 cm)
Radome length	3.4 in. (8.6 cm)
Width	0.62 in. (1.5 cm)
Operating temperature	–22°F – 158°F (–30°C – 70°C)
Storage temperature	–40°F – 185°F (–40°C – 85°C)
Environment	Indoor, office



H-Plane Pattern



E-Plane Pattern

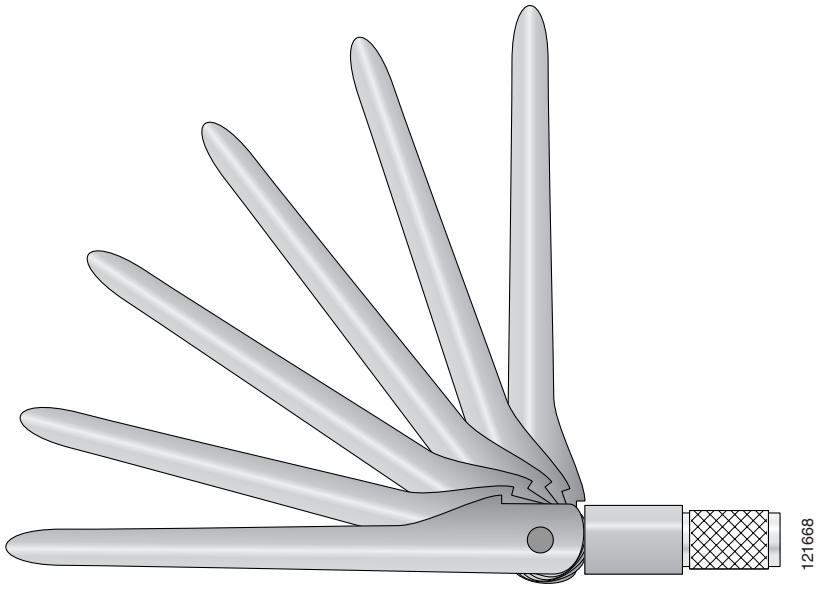


System Requirements

This antenna is designed for use with Cisco Aironet access points and bridges but can be used with any 5-GHz Cisco Aironet radio device that uses RP-TNC connectors.

Features

The antenna has an articulated base that can be rotated 360 degrees at the connection point and from 0 to 90 degrees at its knuckle with detents at 45 and 90 degrees. The articulated base is shown in the following illustration.



Obtaining Documentation

Cisco provides several ways to obtain documentation, technical assistance, and other technical resources. These sections explain how to obtain technical information from Cisco Systems.

Cisco.com

You can access the most current Cisco documentation on the World Wide Web at this URL:

http://www.cisco.com/univercd/home/home.htm

You can access the Cisco website at this URL:

http://www.cisco.com

International Cisco websites can be accessed from this URL:

http://www.cisco.com/public/countries_languages.shtml

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http://www.cisco.com/tac

Accessing all the tools on the Cisco TAC website requires a Cisco.com user ID and password. If you have a valid service contract but do not have a login ID or password, register at this URL:

http://tools.cisco.com/RPF/register/register.do

Opening a TAC Case

Using the online TAC Case Open Tool is the fastest way to open P3 and P4 cases. (P3 and P4 cases are those in which your network is minimally impaired or for which you require product information.) After you describe your situation, the TAC Case Open Tool automatically recommends resources for an immediate solution. If your issue is not resolved using the recommended resources, your case will be assigned to a Cisco TAC engineer. The online TAC Case Open Tool is located at this URL:

http://www.cisco.com/tac/caseopen

For P1 or P2 cases (P1 and P2 cases are those in which your production network is down or severely degraded) or if you do not have Internet access, contact Cisco TAC by telephone. Cisco TAC engineers are assigned immediately to P1 and P2 cases to help keep your business operations running smoothly.

To open a case by telephone, use one of the following numbers:

Asia-Pacific: +61 2 8446 7411 (Australia: 1 800 805 227)
EMEA: +32 2 704 55 55
USA: 1 800 553-2447

For a complete listing of Cisco TAC contacts, go to this URL:

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TAC Case Priority Definitions

To ensure that all cases are reported in a standard format, Cisco has established case priority definitions.

Priority 1 (P1)—Your network is “down” or there is a critical impact to your business operations. You and Cisco will commit all necessary resources around the clock to resolve the situation.

Priority 2 (P2)—Operation of an existing network is severely degraded, or significant aspects of your business operation are negatively affected by inadequate performance of Cisco products. You and Cisco will commit full-time resources during normal business hours to resolve the situation.

Priority 3 (P3)—Operational performance of your network is impaired, but most business operations remain functional. You and Cisco will commit resources during normal business hours to restore service to satisfactory levels.

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- The Cisco Product Catalog describes the networking products offered by Cisco Systems, as well as ordering and customer support services. Access the Cisco Product Catalog at this URL:

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- Cisco Press publishes a wide range of general networking, training and certification titles. Both new and experienced user will benefit from these publications. For current Cisco Press titles and other information, go to Cisco Press online at this URL:

  http://www.ciscopress.com

- Packet magazine is the Cisco quarterly publication that provides the latest networking trends, technology breakthroughs, and Cisco products and solutions to help industry professionals get the most from their networking investment. Included are networking deployment and troubleshooting tips, configuration examples, customer case studies, tutorials and training, certification information, and links to numerous in-depth online resources. You can access Packet magazine at this URL:

  http://www.cisco.com/packet

- iQ Magazine is the Cisco bimonthly publication that delivers the latest information about Internet business strategies for executives. You can access iQ Magazine at this URL:

  http://www.cisco.com/go/iqmagazine

- Internet Protocol Journal is a quarterly journal published by Cisco Systems for engineering professionals involved in designing, developing, and operating public and private internets and intranets. You can access the Internet Protocol Journal at this URL:

  http://www.cisco.com/en/US/about/ac123/ac147/about_cisco_the_internet_protocol_journal.html

- Training—Cisco offers world-class networking training. Current offerings in network training are listed at this URL:

  http://www.cisco.com/en/US/learning/index.html

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Radio Test Data - Transmitter Parameters

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RADIO EQUIPMENT USED FOR 5GHz BANDS W52, W53
WIDE-BAND LOW-POWER DATA COMMUNICATIONS SYSTEM

Summary of Results

Test Performed	Mode	Requirement	Measurement	Result
Frequency Error	802.11a 802.11n 20MHz	20ppm or less	802.11a: 7.75 ppm 802.11n 20MHz: 7.75 ppm	Pass
Occupied bandwidth	802.11a 802.11n 20MHz	19MHz or less	802.11a: 16.78 MHz 802.11n 20MHz: 17.88 MHz	Pass
Spurious Emissions	802.11a 802.11n 20MHz	< 5140MHz : 2.5µW/MHz > 5360MHz : 2.5µW/MHz	0.18 µW/MHz 0.05 µW/MHz	Pass
EIRP in adjacent bands - W52	802.11a 802.11n 20MHz	Refer to masks	Complies with eirp mask	Pass
EIRP in adjacent bands - W53	802.11a 802.11n 20MHz	Refer to masks	Complies with eirp mask	Pass
Antenna power W52 band (OFDM Modulation)	802.11a	20MHz channel: ≤ 10mW/MHz 40MHz channel: ≤ 5mW/MHz Tolerance : +20%,-80%	Rated Power: 2.2 mW/MHz Deviation -55.9 % to -4.1 %	Pass
Antenna power W53 band (OFDM Modulation)				Pass
Antenna power W52 band (OFDM Modulation)	802.11n 20MHz		Rated Power: 1.1 mW/MHz Deviation -60.9 % to +0.9 %	
Antenna power W53 band (OFDM Modulation)				
Equivalent isotropically radiated power W52 band	802.11a 802.11n 20MHz	20MHz channel: ≤ 10mW/MHz	9.37 mW/MHz (Antenna Gain = 6.5dBi)	Pass
Equivalent isotropically radiated power W53 band	802.11a 802.11n 20MHz	20MHz channel: ≤ 10mW/MHz	4.81 mW/MHz (Antenna Gain = 6.5dBi)	Pass
Adjacent channel leakage power W52 Band	802.11a 802.11n 20MHz	±9MHz bandwidth at 20MHz detuning : -25dBc	20MHz detuning: -32.5 dBc 40MHz detuning: -49.4 dBc	Pass
Adjacent channel leakage power W53 Band			20MHz detuning: -31.0 dBc 40MHz detuning: -49.7 dBc	Pass
Transmission burst length	802.11a 802.11n 20MHz	4ms or less	2.08ms	Pass
Carrier separation / number of carriers per MHz	802.11a 802.11n 20MHz	More than 1 carrier per MHz	Carrier spacing is 312.5kHz so at least 2 carriers per MHz	Pass

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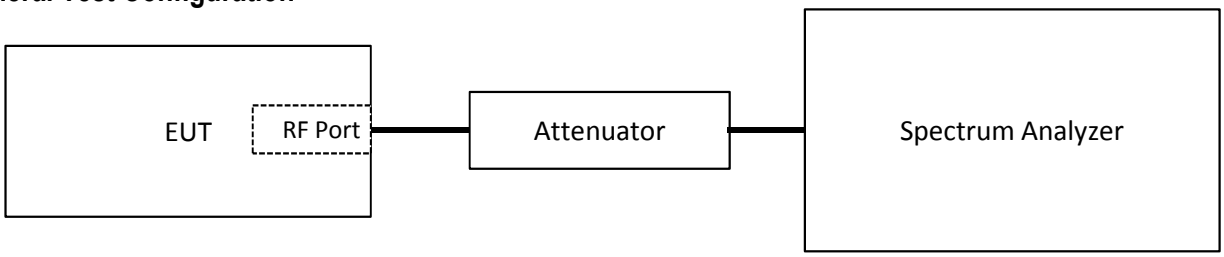
Standard:	Japanese Radio Law - Item 19 of Article 12	Contact:	Ron Seide

General Test Configuration



Test Environment

Temperature:	15-30	°C
Rel. Humidity:	20-75	%
Pressure:	86-106	kPa
Nominal Supply Voltage	3.3	Vdc

Duty Cycle and Transmission Cycle Time

These were the transmission time and duty cycle for measurements made with the device configured using a test utility. They are not the burst times that would occur during normal operation.

Data Rate (Mbps)	Duty Cycle (%)	Transmission cycle time (ms)
6	92.3%	2.1
54	60.9%	0.4
12 (MCS0)	87.6%	1.1
108 (MCS7)	54.6%	0.3

Radio Test Data - Transmitter Parameters

Client:	Summit Data Communications	Job Number:	J78554
Model:	SDC-PE15N (802.11abgn 2x2)	T-Log Number:	T78978
		Account Manager:	Christne Krebill
Standard:	Japanese Radio Law - Item 19 of Article 12	Contact:	Ron Seide

Run #1: Frequency Error

Date of Test: 4/28/2010 Test Engineer: Mehran Birgani
Test Location: Radio Lab

The center frequency was measured at nominal and extreme voltage conditions.
The device supports MIMO operation (plural antennas), but as the individual chains share a common reference clock within the rf chipset only one chain, chain 1, was tested.
For OFDM modulation with no provision for operating with an unmodulated signal measurements were made on a **modulated** signal at the top, center and bottom channels. The operating frequency was determined by dividing the sum of the frequencies for the upper and lower -10dBc points on the modulated signal by 2. The analyzer was configured with RB=VB=100kHz and with video averaging enabled (100 sweeps), unless the device only operated in a burst mode where max hold was employed.

Nominal Frequency (MHz) - 802.11a

Low Channel	5180.0	Center Channel	5240.0	High Channel	5320.0

	Measured Frequency (MHz)			Frequency Error (ppm)		
Voltage	Nominal -10%	Nominal	Nominal + 10%			
	3.0 V	3.3 V	3.6 V	3.0 V	3.3 V	3.6 V
Low Channel	5179.9609	5179.9609	5179.9609	7.55	7.55	7.55
Center Channel	5239.9609	5239.9609	5239.9609	7.46	7.46	7.46
High Channel	5319.9609	5319.9609	5319.9786	7.35	7.35	4.02

Requirement (ppm): 20.0
Max Frequency Error (ppm): 7.55

Notes:
Note - Testing was performed using the peak found in the middle of the modulation envelope with lower res bw.
All testing performed at 6Mb/s - all data rates use the same frequency reference source.
Unless otherwise noted, TX Diversity switch was set to main only. Testing was performed on the Main connector.

Nominal Frequency (MHz) - 802.11n 20MHz

Low Channel	5180.0	Center Channel	5240.0	High Channel	5320.0

	Measured Frequency (MHz)			Frequency Error (ppm)		
Voltage	Nominal -10%	Nominal	Nominal + 10%			
	3.0 V	3.3 V	3.6 V	3.0 V	3.3 V	3.6 V
Low Channel	5179.9869	5179.9609	5180.0072	2.53	7.55	1.39
Center Channel	5239.9882	5239.9609	5239.9823	2.25	7.46	3.38
High Channel	5319.9877	5319.9723	5319.9793	2.31	5.21	3.89

Requirement (ppm): 20.0
Max Frequency Error (ppm): 7.55

Notes:
Note - Testing was performed using the peak found in the middle of the modulation envelope with lower res bw.
All testing performed at 6Mb/s - all data rates use the same frequency reference source.
Unless otherwise noted, TX Diversity switch was set to main only. Testing was performed on the Main connector.

Radio Test Data - Transmitter Parameters

Client:	Summit Data Communications	Job Number:	J78554
Model:	SDC-PE15N (802.11abgn 2x2)	T-Log Number:	T78978
		Account Manager:	Christne Krebill
Standard:	Japanese Radio Law - Item 19 of Article 12	Contact:	Ron Seide

Run #2: Occupied bandwidth

Date of Test: 4/28/2010 Test Engineer: Mehran Birgani
Test Location: Radio Lab

One antenna position was evaluated based on verification that changing the diversity switch position did not affect the occupied bandwidth of the center channel at nominal voltage.

The occupied bandwidth was measured with the spectrum analyzer configured according to the table below. The occupied bandwidth was determined from the 99% power bandwidth by determining the highest and lowest frequencies at which 99.5% of the power was captured and then subtracting the two numbers. the calculation was done by either the analyzer directly or via the software used to capture the plot.

Instrument Settings and Test Requirements

Modulation Type	Analyzer settings				Bandwidth Requirement
	Span	RB	VB	Other	Occupied Bandwidth
OFDM (e.g. 802.11an)	38-66.5 MHz	≤ 570kHz	300kHz	Sample detector, averaging (10 sweeps)[2], sweep time auto[1]	≤ 19.0MHz

Note 1: For burst transmissions sweep time set to ensure dwell time in each bandwidth > transmission cycle time (sweep time = transmit cycle time x span/ measurement bandwidth)
Note 2: For burst transmissions trace set for max hold and detector set to positive peak

Test Results, 802.11a Mode (OFDM: bandwidth ≤ 18MHz) - 99% Bandwidth

Channel	Mode	Port	Chain	Data Rate	Nominal -10% 3.0 V	Nominal 3.3 V	Nominal + 10% 3.6 V
5180	802.11a	Main		6Mb/s	16.75	16.78	16.78
5180	802.11a	Main		54Mb/s	16.75	16.78	16.65

Measurements on top, bottom and center channel in each band using data rate and port with the worst case (widest) bandwidth

Channel	Mode	Port	Chain	Data Rate	Nominal -10% 3.0 V	Nominal 3.3 V	Nominal + 10% 3.6 V
5180	802.11a	Main		6Mb/s	16.75	16.78	16.78
5200	802.11a	Main		6Mb/s	16.78	16.75	16.73
5240	802.11a	Main		6Mb/s	16.73	16.75	16.75
5260	802.11a	Main		6Mb/s	16.75	16.75	16.73
5300	802.11a	Main		6Mb/s	16.75	16.73	16.75
5320	802.11a	Main		6Mb/s	16.75	16.75	16.78

Maximum 99% bandwidth: 16.78 MHz

Radio Test Data - Transmitter Parameters

Client:	Summit Data Communications	Job Number:	J78554
Model:	SDC-PE15N (802.11abgn 2x2)	T-Log Number:	T78978
		Account Manager:	Christne Krebill
Standard:	Japanese Radio Law - Item 19 of Article 12	Contact:	Ron Seide

Test Results, 802.11n 20MHz Mode (OFDM: bandwidth ≤ 18MHz) - 99% Bandwidth

Channel	Mode	Port	Chain	Data Rate	Nominal -10% 3.0 V	Nominal 3.3 V	Nominal + 10% 3.6 V
5180	n,20MHz		2	12Mb/s (MCS0)	17.85	17.85	17.85
5180	n,20MHz		2	108Mb/s (MCS7)	17.78	17.78	17.78

Measurements on top, bottom and center channel in each band using data rate and port with the worst case (widest) bandwidth

Channel	Mode	Port	Chain	Data Rate	Nominal -10% 3.0 V	Nominal 3.3 V	Nominal + 10% 3.6 V
5180	n,20MHz		1	12Mb/s (MCS0)	17.88	17.85	17.85
5200	n,20MHz		1	12Mb/s (MCS0)	17.83	17.85	17.85
5240	n,20MHz		1	12Mb/s (MCS0)	17.85	17.88	17.88
5260	n,20MHz		1	12Mb/s (MCS0)	17.88	17.85	17.88
5300	n,20MHz		1	12Mb/s (MCS0)	17.88	17.85	17.83
5320	n,20MHz		1	12Mb/s (MCS0)	17.85	17.85	17.88
5180	n,20MHz		2	12Mb/s (MCS0)	17.85	17.85	17.85
5200	n,20MHz		2	12Mb/s (MCS0)	17.88	17.83	17.88
5240	n,20MHz		2	12Mb/s (MCS0)	17.88	17.88	17.88
5260	n,20MHz		2	12Mb/s (MCS0)	17.85	17.88	17.85
5300	n,20MHz		2	12Mb/s (MCS0)	17.85	17.80	17.83
5320	n,20MHz		2	12Mb/s (MCS0)	17.83	17.85	17.88

Maximum 99% bandwidth: 17.88 MHz

Radio Test Data - Transmitter Parameters

Client:	Summit Data Communications	Job Number:	J78554
Model:	SDC-PE15N (802.11abgn 2x2)	T-Log Number:	T78978
		Account Manager:	Christne Krebill
Standard:	Japanese Radio Law - Item 19 of Article 12	Contact:	Ron Seide

Run #3: Spurious and unwanted emissions
Run #3a Out of band Emissions

Date of Test: 4/29/2010
Test Location: Radio Lab
Test Engineer: Mehran Birgani

Test Requirements		
Frequency Range (MHz)	Limit (W52/W53)	
	uW/MHz	dBm/MHz
30 - 5140	2.5	-26.0
5360 - 26500	2.5	-26.0

Measurement Summary - Highest emissions in each operating mode
Measurements made at the data rate that produced the highest output power spectral density (refer to antenna power measurements).
All measurements include a 3dB correction factor to account for two transmit chains.

Frequency MHz	Level dBm	Antenna Port	Limit	Margin	Detector	Comments	Operating Voltage	Operating Channel	
5480.33	-37.5	Main	-26.0	-11.5	Peak	0.18 uW	3.3	64	54
5459.49	-43.4	Port 1	-26.0	-17.4	Peak	0.05 uW	3.0	60	MCS0

Antenna ports tested were both main and aux ports, worst case result is reported.
Test data rate with the highest output power.

Preliminary Measurements :
Instrument Settings: RB=VB=1MHz, Positive peak detector and maximum hold for a minimum of 10 sweeps, but until the spectrum displayed becomes stable and no new signals are observed. A correction factor for devices that operate on mulitple chains equal to 10log(n), where n is the number of transmit chains, is aplpied to the test data.
Any emissions above the limit from the initial peak scan (RB=VB=1MHz, peak detector) are measured by tuning to that signal, setting RB=VB=1MHz, span=0Hz and using a sample detector. The average power over a transmission burst is calculated if the highest signal level still exceeds the limit. If the system uses burst transmissions during testing the threshold for requiring individual measurements becomes limit -3dB relative to the limit.
The device transmits in a burst mode, sweep time is calculated for each band tested as shown below. The plots are composite plots of the individual frequency bands.

Burst repetition frequency **2.1 ms**

Frequency (MHz)		Bandwidth (MHz)		Sweep Time
Start	Stop	RB	VB	
30	1000	1	1	2037 ms
1000	5140	1	1	8694 ms
5360	10000	1	1	9744 ms
10000	26500	1	1	34650 ms
5340	5360	1	1	42 ms
5140	5360	1	1	462 ms

The device transmits continuously so the analyzer sweep time is auto-coupled.

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Radio Test Data - Transmitter Parameters

Client:	Summit Data Communications	Job Number:	J78554
Model:	SDC-PE15N (802.11abgn 2x2)	T-Log Number:	T78978
		Account Manager:	Christne Krebill
Standard:	Japanese Radio Law - Item 19 of Article 12	Contact:	Ron Seide

802.11a mode

Frequency	Level	Antenna			Detector	Comments	Operating		
MHz	dBm	Port	Limit	Margin			Voltage	Channel	Mb/s
5014.50	-40.1	Main	-26.0	-14.1	Peak		3.0	36	54
10365.46	-45.3	Main	-26.0	-19.3	Peak		3.0	36	54
5014.50	-41.5	Main	-26.0	-15.5	Peak		3.3	36	54
10352.12	-45.9	Main	-26.0	-19.9	Peak		3.3	36	54
5020.01	-39.8	Main	-26.0	-13.8	Peak		3.6	36	54
10352.12	-46.8	Main	-26.0	-20.8	Peak		3.6	36	54
5361.12	-37.7	Main	-26.0	-11.7	Peak		3.0	40	54
10402.80	-45.5	Main	-26.0	-19.5	Peak		3.0	40	54
5361.12	-37.9	Main	-26.0	-11.9	Peak		3.3	40	54
10402.80	-45.2	Main	-26.0	-19.2	Peak		3.3	40	54
5361.12	-38.3	Main	-26.0	-12.3	Peak		3.6	40	54
10405.47	-46.1	Main	-26.0	-20.1	Peak		3.6	40	54
5419.81	-39.6	Main	-26.0	-13.6	Peak		3.0	48	54
10517.51	-46.2	Main	-26.0	-20.2	Peak		3.0	48	54
5403.30	-39.1	Main	-26.0	-13.1	Peak		3.3	48	54
10480.16	-44.7	Main	-26.0	-18.7	Peak		3.3	48	54
5399.63	-38.9	Main	-26.0	-12.9	Peak		3.6	48	54
10482.83	-45.1	Main	-26.0	-19.1	Peak		3.6	48	54
5439.98	-40.0	Main	-26.0	-14.0	Peak		3.0	52	54
10562.85	-46.8	Main	-26.0	-20.8	Peak		3.0	52	54
10562.85	-46.9	Main	-26.0	-20.9	Peak		3.3	52	54
5439.98	-38.4	Main	-26.0	-12.4	Peak		3.6	52	54
10560.19	-45.8	Main	-26.0	-19.8	Peak		3.6	52	54
5460.15	-38.0	Main	-26.0	-12.0	Peak		3.0	60	54
10600.20	-46.2	Main	-26.0	-20.2	Peak		3.0	60	54
5454.65	-38.9	Main	-26.0	-12.9	Peak		3.3	60	54
10600.20	-46.5	Main	-26.0	-20.5	Peak		3.3	60	54
5454.65	-39.0	Main	-26.0	-13.0	Peak		3.6	60	54
10600.20	-46.1	Main	-26.0	-20.1	Peak		3.6	60	54
5480.33	-38.2	Main	-26.0	-12.2	Peak		3.0	64	54
10640.21	-46.5	Main	-26.0	-20.5	Peak		3.0	64	54
5480.33	-37.5	Main	-26.0	**-11.5**	Peak		3.3	64	54
10640.21	-46.3	Main	-26.0	-20.3	Peak		3.3	64	54
5480.33	-38.8	Main	-26.0	-12.8	Peak		3.6	64	54
10640.21	-45.7	Main	-26.0	-19.7	Peak		3.6	64	54

Radio Test Data - Transmitter Parameters

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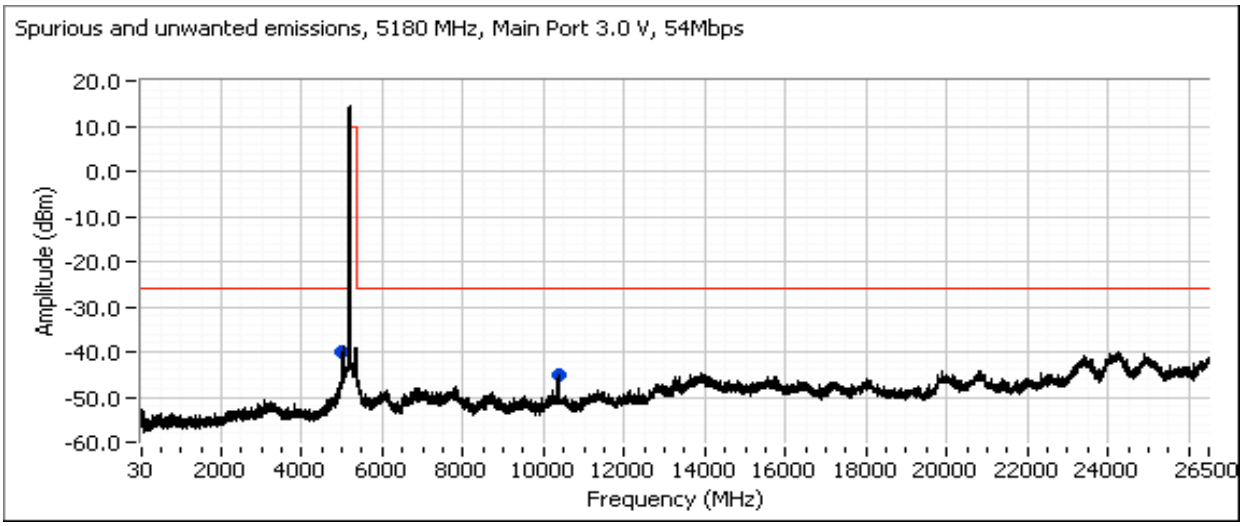
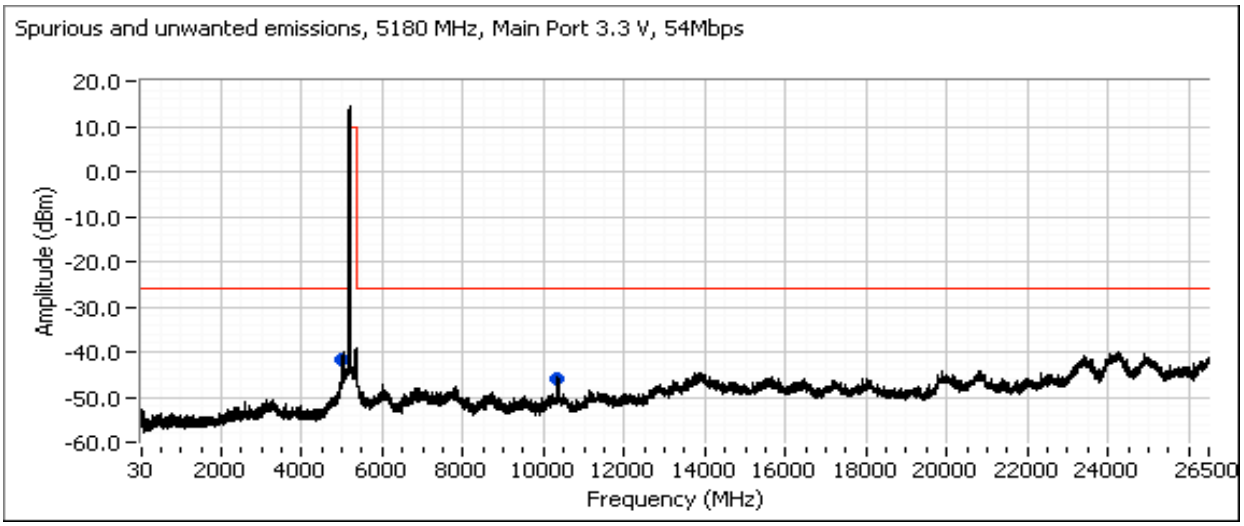
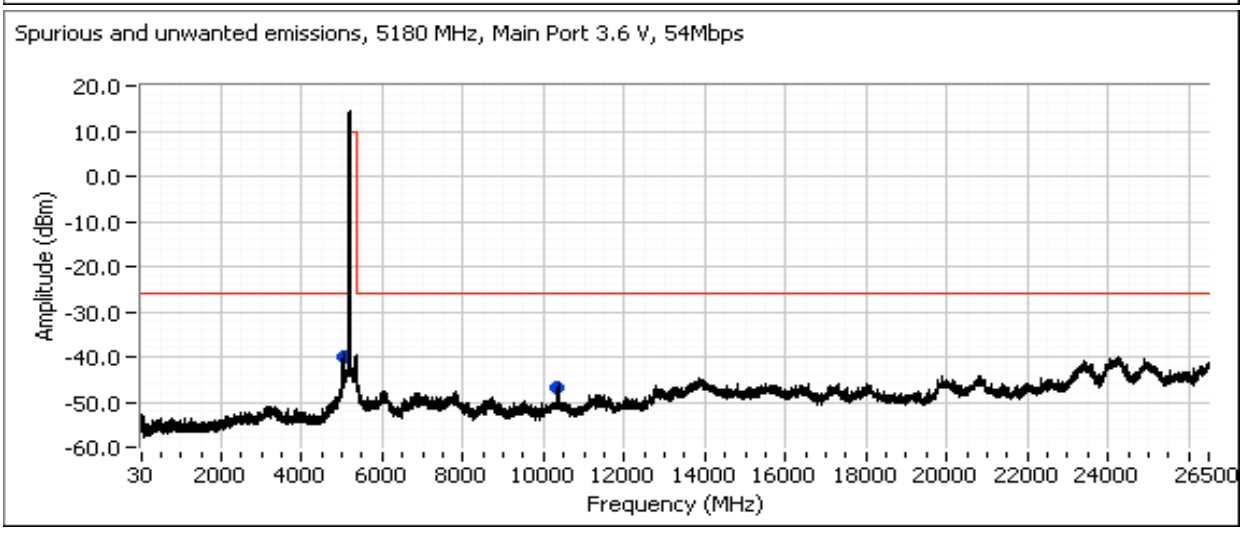
		Account Manager:	Christne Krebill
Standard:	Japanese Radio Law - Item 19 of Article 12	Contact:	Ron Seide







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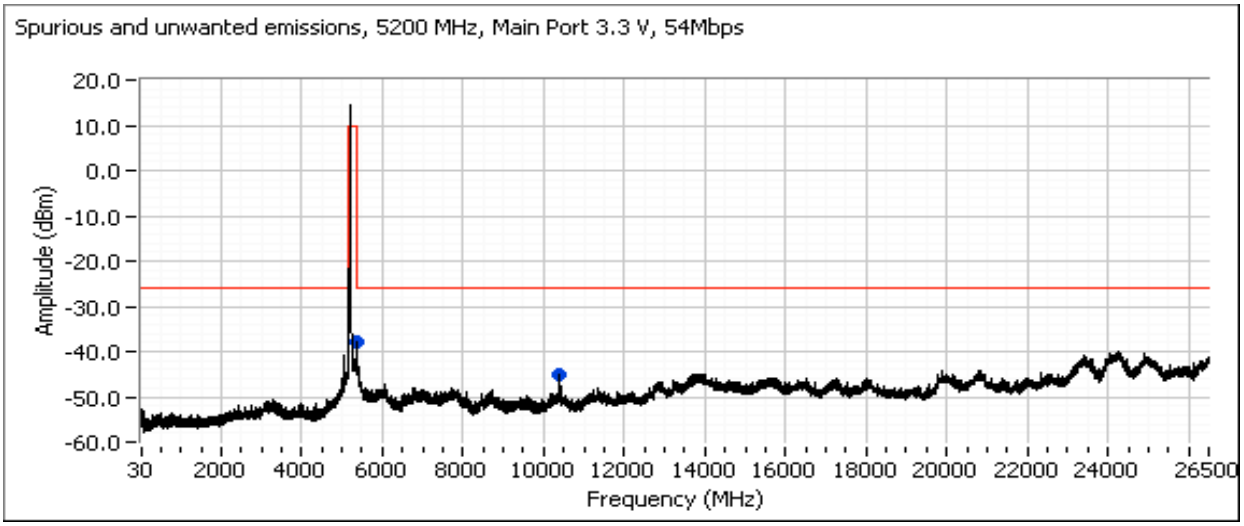

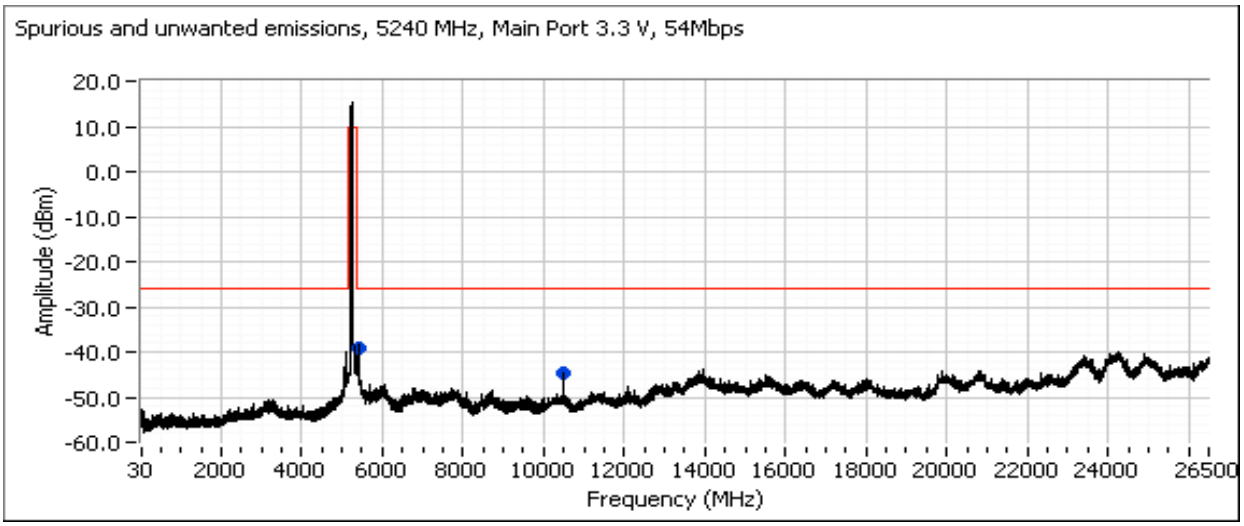

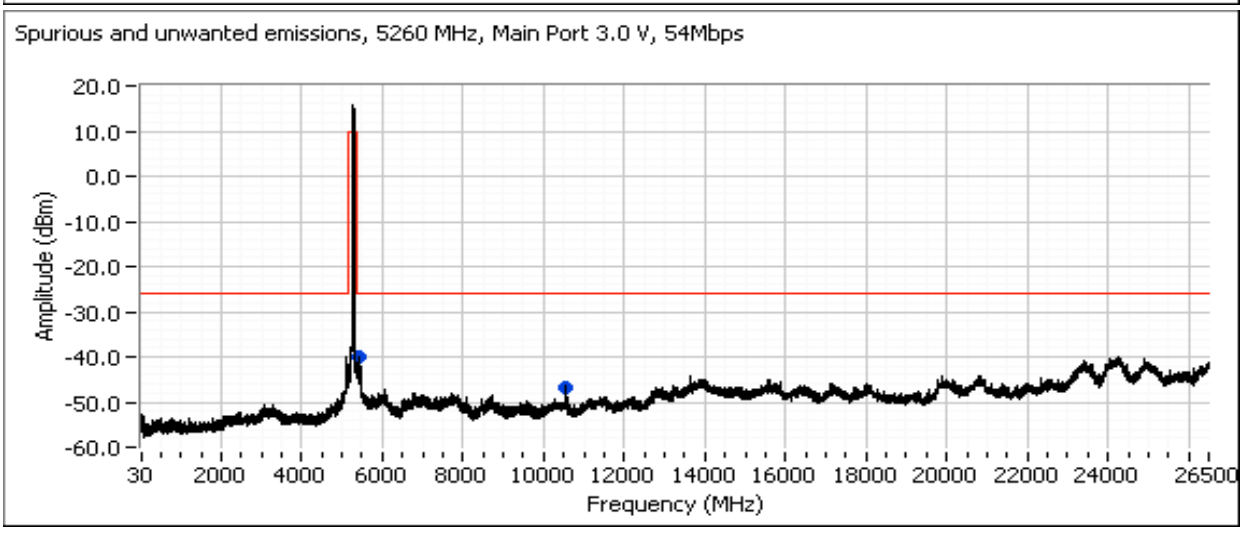

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Radio Test Data - Transmitter Parameters

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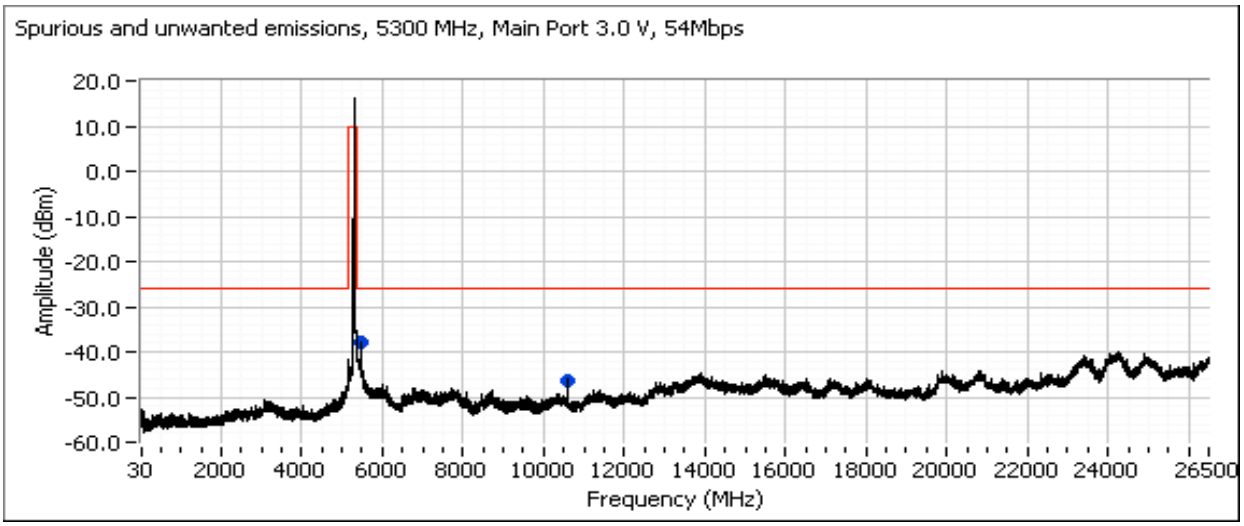

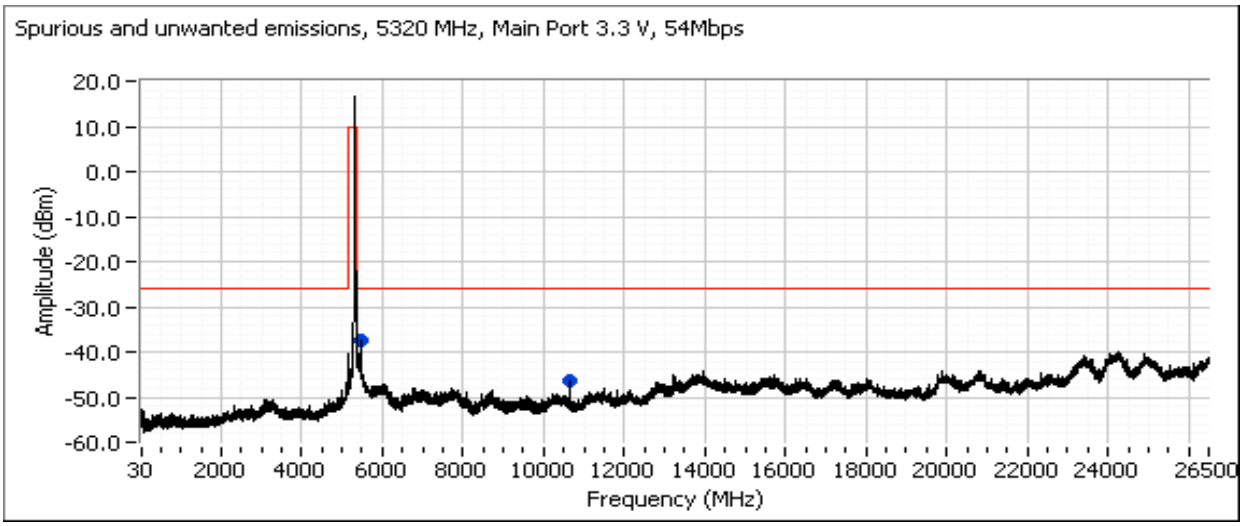

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Radio Test Data - Transmitter Parameters

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802.11n 20MHz mode

For MIMO systems the limit has been adjusted for measurements on individual antenna ports by 10log(n), where n is the number of antenna ports capable of transmitting simultaneously. Individual chain measurements are made for all frequencies except those close to the operating frequency, where a combiner is used to couple all of the antenna ports together. Individual port measurements are indicated by single entry in the Antenna port column (e.g. **A** or **B** individually), combiner measurements are indicated by multiple entries (e.g. **A+B**).

Frequency	Level	Antenna			Detector	Comments	Operating		
MHz	dBm	Port	Limit	Margin			Voltage	Channel	Port
5021.34	-49.6	Port 1	-26.0	-23.6	Peak		3.0	36	MCS0
5021.34	-45.1	Port 1	-26.0	**-19.1**	Peak		3.3	36	MCS0
5018.34	-50.1	Port 1	-26.0	-24.1	Peak		3.6	36	MCS0
5018.34	-49.5	Port 1	-26.0	-23.5	Peak		3.0	36	MCS7
5018.34	-46.3	Port 1	-26.0	-20.3	Peak		3.3	36	MCS7
5018.34	-49.7	Port 1	-26.0	-23.7	Peak		3.6	36	MCS7
5024.34	-49.7	Port 2	-26.0	-23.7	Peak		3.0	36	MCS0
5018.34	-50.2	Port 2	-26.0	-24.2	Peak		3.3	36	MCS0
5018.34	-50.4	Port 2	-26.0	-24.4	Peak		3.6	36	MCS0
5045.35	-46.8	Port 1	-26.0	-20.8	Peak		3.0	40	MCS0
5039.35	-48.9	Port 1	-26.0	-22.9	Peak		3.3	40	MCS0
5363.45	-48.0	Port 1	-26.0	-22.0	Peak		3.3	40	MCS0
5360.45	-43.6	Port 1	-26.0	**-17.6**	Peak		3.6	40	MCS0
5042.35	-44.9	Port 1	-26.0	-18.9	Peak		3.6	40	MCS0
5081.36	-44.6	Port 1	-26.0	-18.6	Peak		3.0	48	MCS0
5396.47	-43.8	Port 1	-26.0	**-17.8**	Peak		3.0	48	MCS0
5402.47	-44.9	Port 1	-26.0	-18.9	Peak		3.3	48	MCS0
5087.36	-45.4	Port 1	-26.0	-19.4	Peak		3.3	48	MCS0
5081.36	-44.7	Port 1	-26.0	-18.7	Peak		3.6	48	MCS0
5402.47	-44.3	Port 1	-26.0	-18.3	Peak		3.6	48	MCS0
5096.37	-44.9	Port 1	-26.0	**-18.9**	Peak		3.0	52	MCS0
5420.47	-45.0	Port 1	-26.0	-19.0	Peak		3.0	52	MCS0
5414.47	-45.5	Port 1	-26.0	-19.5	Peak		3.3	52	MCS0
5102.37	-45.5	Port 1	-26.0	-19.5	Peak		3.3	52	MCS0
5102.37	-45.6	Port 1	-26.0	-19.6	Peak		3.6	52	MCS0
5423.47	-45.3	Port 1	-26.0	-19.3	Peak		3.6	52	MCS0
5459.49	-43.4	Port 1	-26.0	**-17.4**	Peak		3.0	60	MCS0
5459.49	-44.4	Port 1	-26.0	-18.4	Peak		3.3	60	MCS0
5465.49	-43.6	Port 1	-26.0	-17.6	Peak		3.6	60	MCS0
5477.49	-43.5	Port 1	-26.0	**-17.5**	Peak		3.0	64	MCS0
5486.50	-44.0	Port 1	-26.0	-18.0	Peak		3.3	64	MCS0
5477.49	-43.6	Port 1	-26.0	-17.6	Peak		3.6	64	MCS0

Final (Zero-Span) measurement - 802.11n 20MHz mode

No measurement necessary, all frequencies in the preliminary scan are below the limit.

Radio Test Data - Transmitter Parameters

Client:	Summit Data Communications	Job Number:	J78554
Model:	SDC-PE15N (802.11abgn 2x2)	T-Log Number:	T78978
		Account Manager:	Christne Krebill
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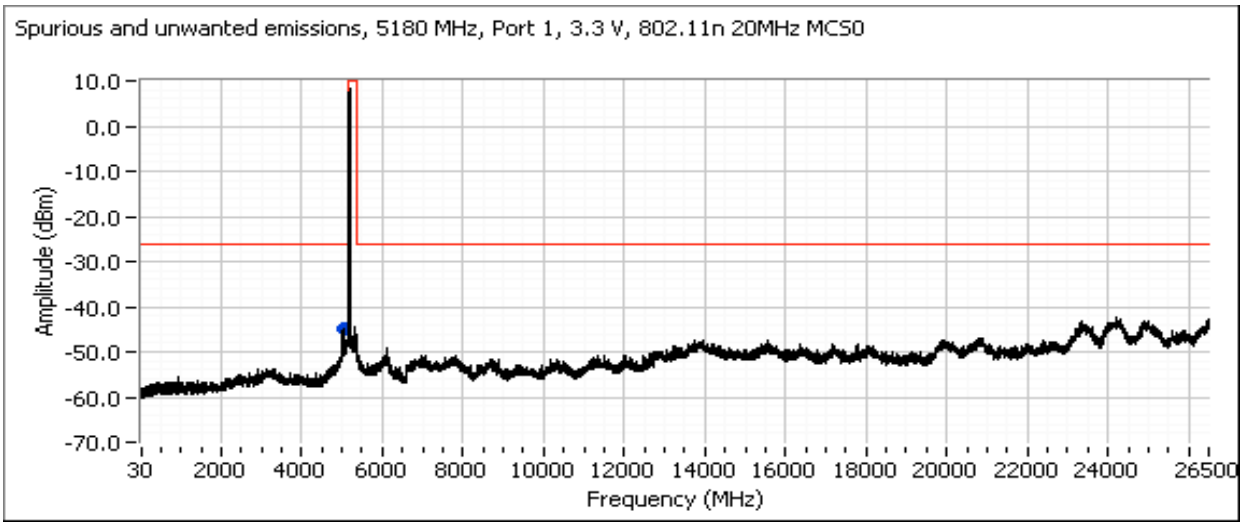
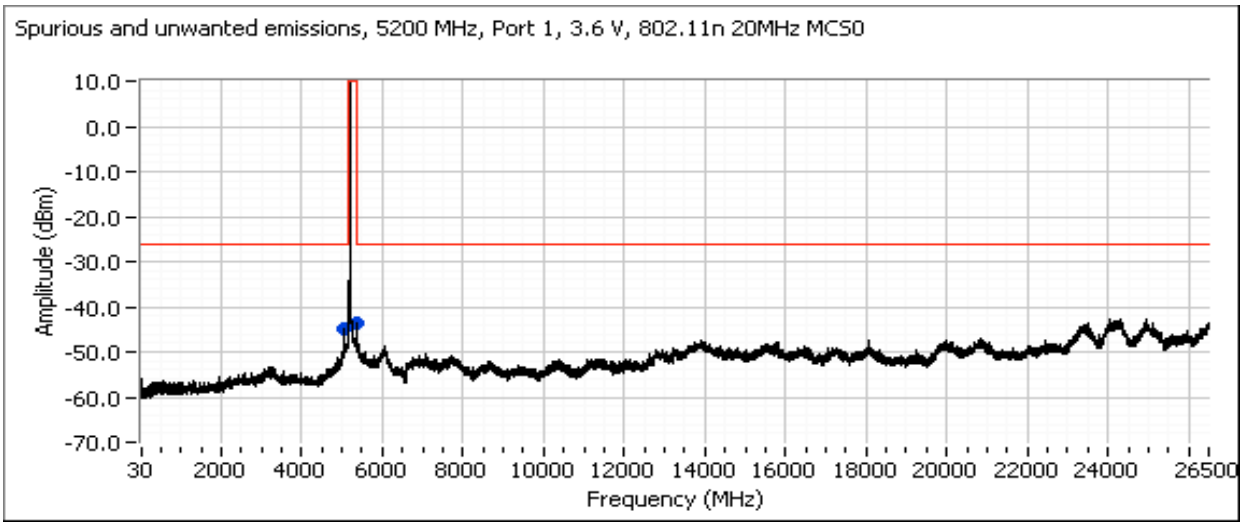
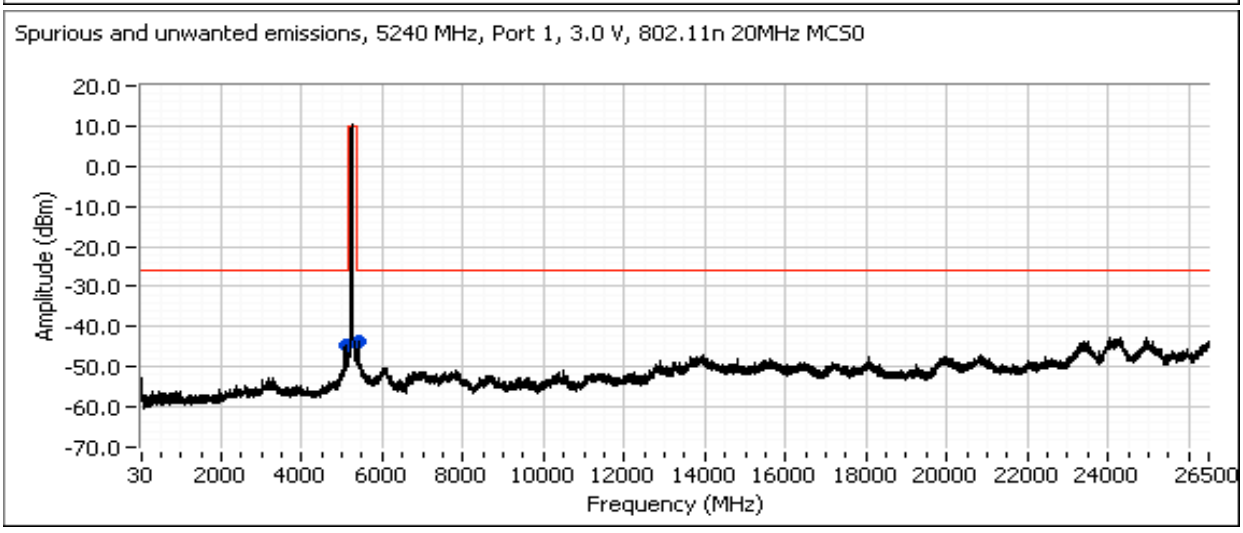
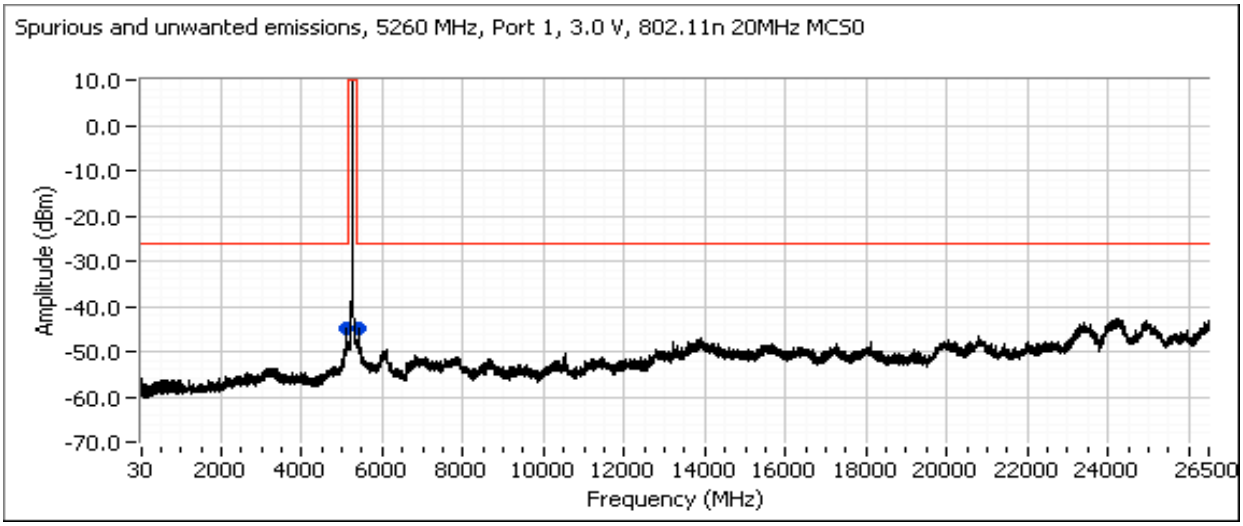


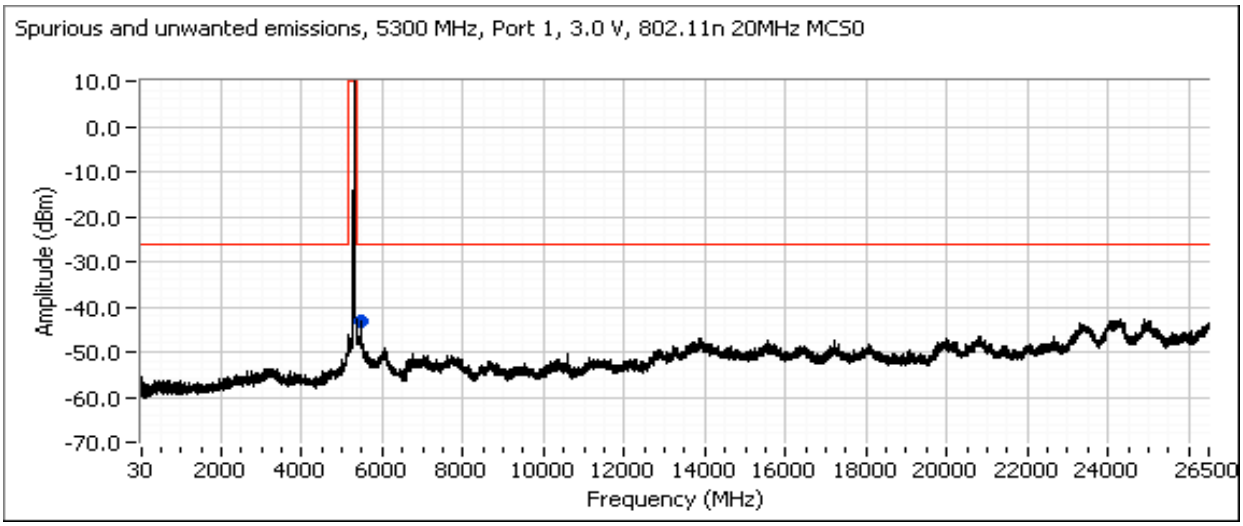


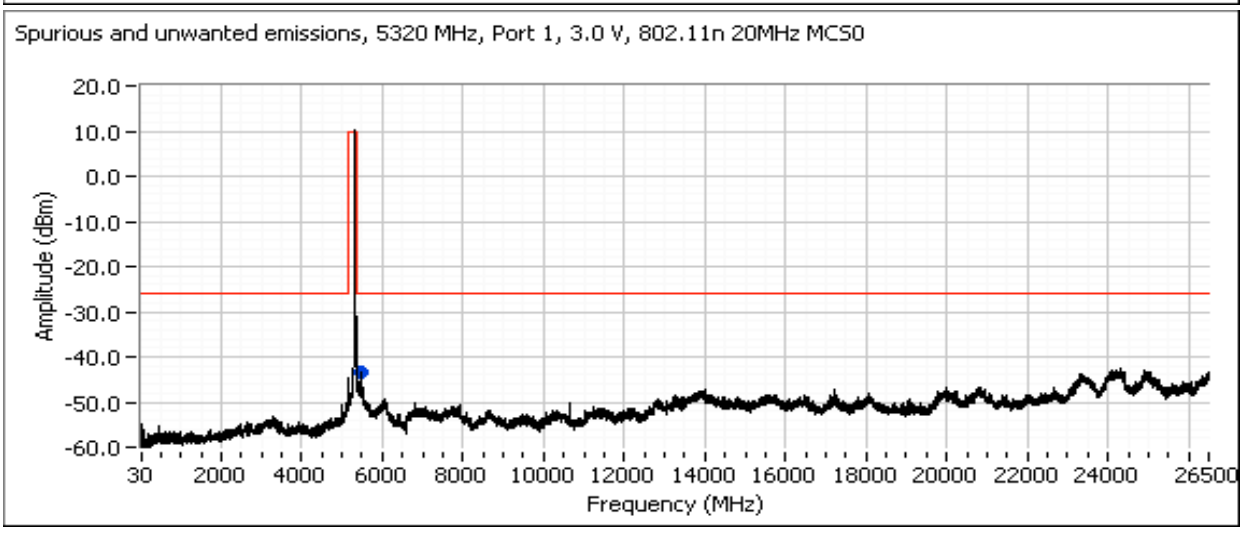


Radio Test Data - Transmitter Parameters

Client:	Summit Data Communications	Job Number:	J78554
Model:	SDC-PE15N (802.11abgn 2x2)	T-Log Number:	T78978
		Account Manager:	Christne Krebill
Standard:	Japanese Radio Law - Item 19 of Article 12	Contact:	Ron Seide







Radio Test Data - Transmitter Parameters

Client:	Summit Data Communications	Job Number:	J78554
Model:	SDC-PE15N (802.11abgn 2x2)	T-Log Number:	T78978
		Account Manager:	Christne Krebill
Standard:	Japanese Radio Law - Item 19 of Article 12	Contact:	Ron Seide

Run #3b Adjacent Band EIRP

Date of Test: 4/30/2010
Test Location: Radio Lab

Test Engineer: Mehran Birgani

Test Requirements (W52 Band, 5180 - 5240MHz)		
Frequency Range (MHz)	Limit	
	mW/MHz	dBm/MHz
5140-5142	0.0025	-26.0
5142-5150	0.0150	-18.2
5150 - 5250	-	-
5250 - 5251	$10^{1-(f-9)}$	0 to -10
5251 - 5260	$10^{-1-(8/90)(f-11)}$	-10 to -18
5260 - 5266.7	$10^{-1.8-(6/50)(f-20)}$	-18 to -26
5266.7 - 5360	0.0025	-26.0

Test Requirements (W53 Band, 5260 - 5320MHz)		
Frequency Range (MHz)	Limit	
	mW/MHz	dBm/MHz
5140 - 5233.3	0.0025	-26.0
5233.3 - 5240	$10^{-1.8-(6/50)(f-20)}$	-26 to -18
5240 - 5249	$10^{-1-(8/90)(f-11)}$	-18 to -10
5249 - 5250	$10^{1-(f-9)}$	-10 to 0
5250 - 5350	-	-
5350 - 5360	0.0025	-26.0

The limits in the table above are an eirp limit. The **f** in the limit formulae is the deviation in MHz from 5240MHz for the W52 band and from 5260MHz for the W53 band.

Measurement Summary - Highest emissions in each operating mode

Measurements made at the data rate that produced the highest output power spectral density (refer to antenna power measurements).
All plots show the emissions outside of the band to below the average limits when measured with a peak detcteor.
Worst case antenna chain, chain 1 (port 1) results are reported below.

Preliminary Measurements :

Instrument Settings: RB=VB=1MHz, Positive peak detector and maximum hold for a minimum of 10 sweeps, but until the spectrum displayed becomes stable and no new signals are observed. An offset equal to the antenna gain is applied to the test data so that the displayed level is the eirp of the signal. An additional correction factor for devices that operate on mulitple chains equal to 10log(n), where n is the number of transmit chains, is applied to the test data for modes that support MIMO.

Correction factor applied as an offset to the test data

Mode	Band	Antenna Gain (max)	# of Chains	Total Offset (dB)
802.11a	W52	6.5 dBi	1	6.5
802.11a	W53	6.5 dBi	1	6.5
802.11n	W52	6.5 dBi	2	9.5
802.11n	W53	6.5 dBi	2	9.5

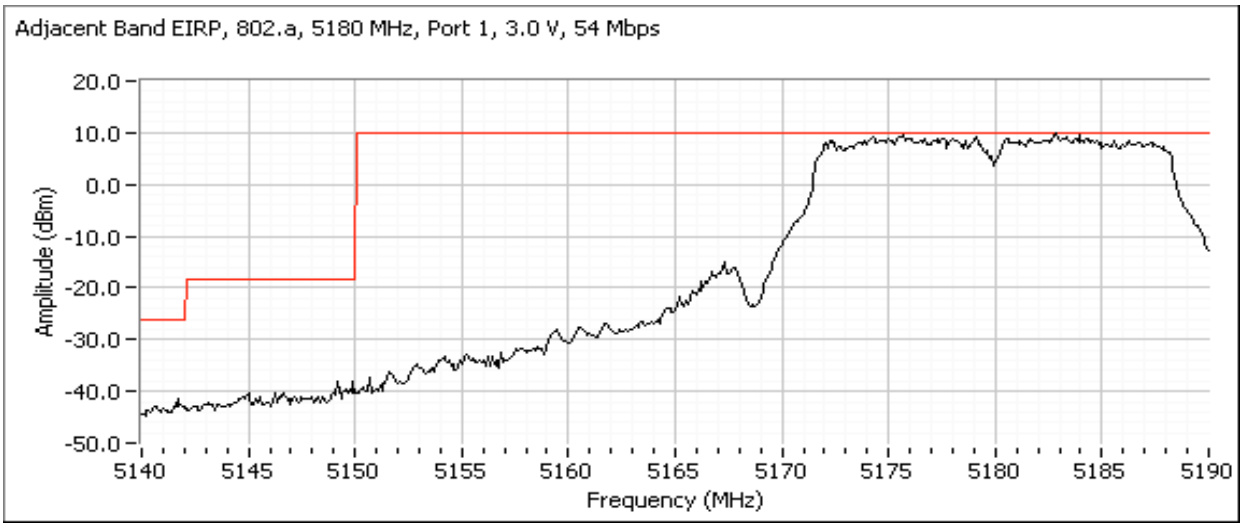
Any emissions above the limit from the initial peak scan (RB=VB=1MHz, peak detector) are measured by tuning to that signal, setting RB=VB=1MHz, span=0Hz and using a sample detector. The average power over a transmission burst is calculated if the highest signal level still exceeds the limit. If the system uses burst transmissions during testing the threshold for requiring individual measurements becomes limit -3dB relative to the limit.

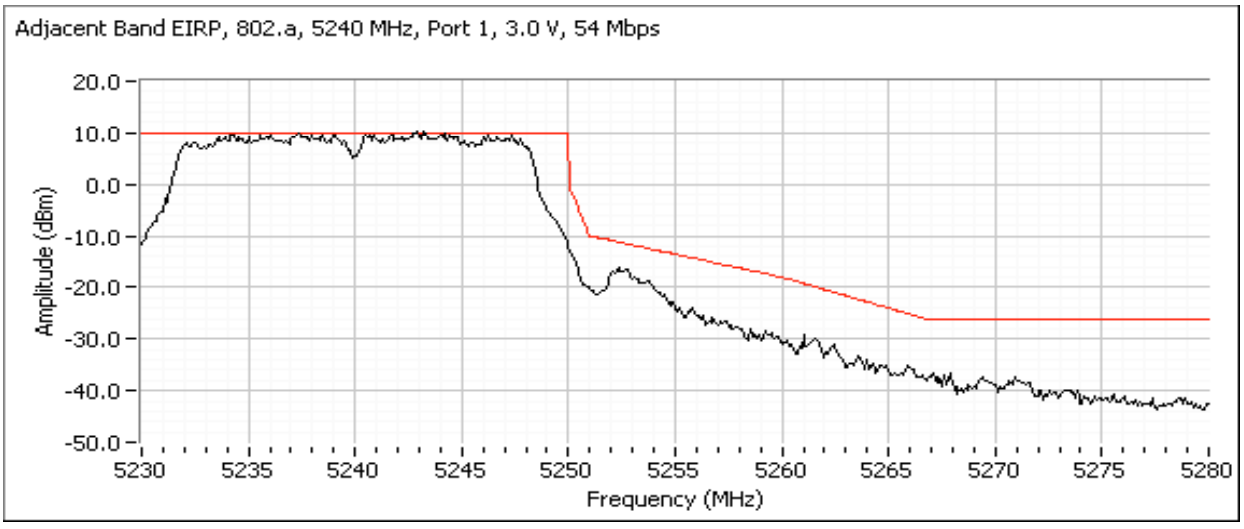
Final Measurements :

No measurements were necessary in zero-span mode as the peak measuremetns showed compliance with the average eirp limits..

Radio Test Data - Transmitter Parameters

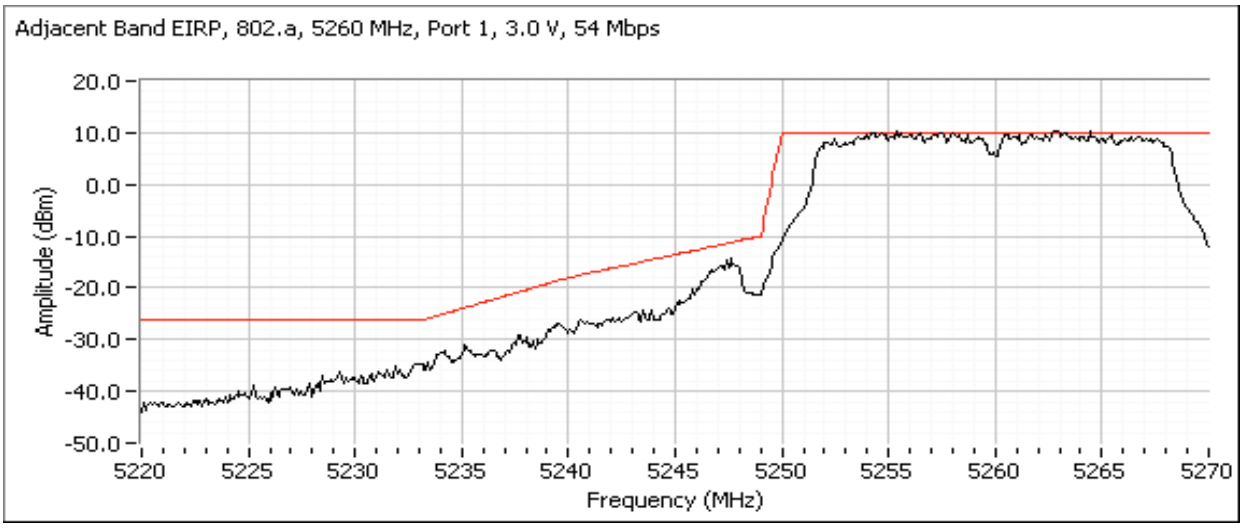
Client:	Summit Data Communications	Job Number:	J78554
Model:	SDC-PE15N (802.11abgn 2x2)	T-Log Number:	T78978
		Account Manager:	Christne Krebill
Standard:	Japanese Radio Law - Item 19 of Article 12	Contact:	Ron Seide

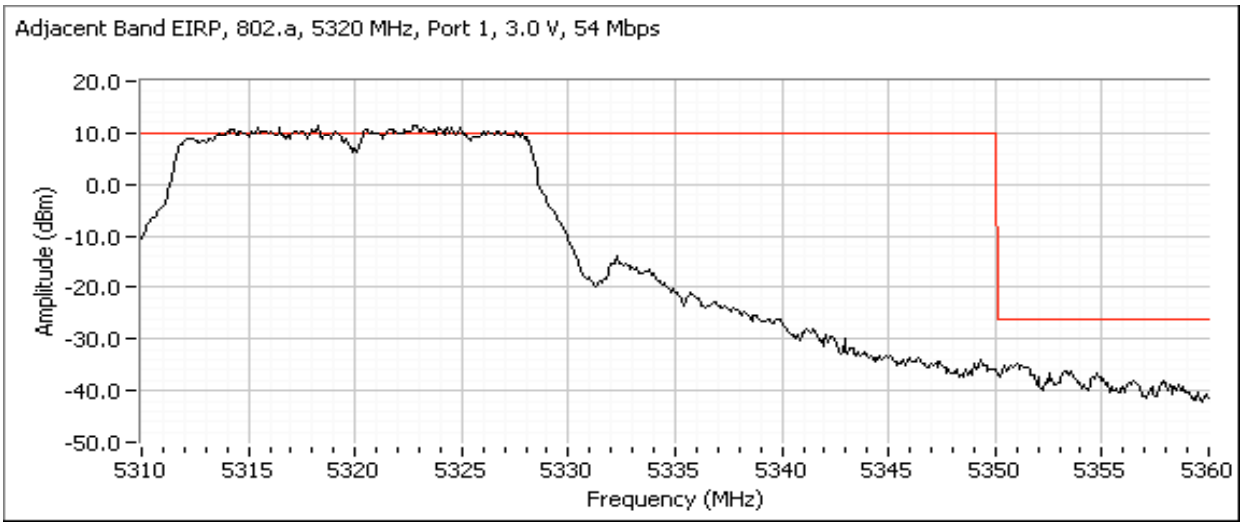




Radio Test Data - Transmitter Parameters

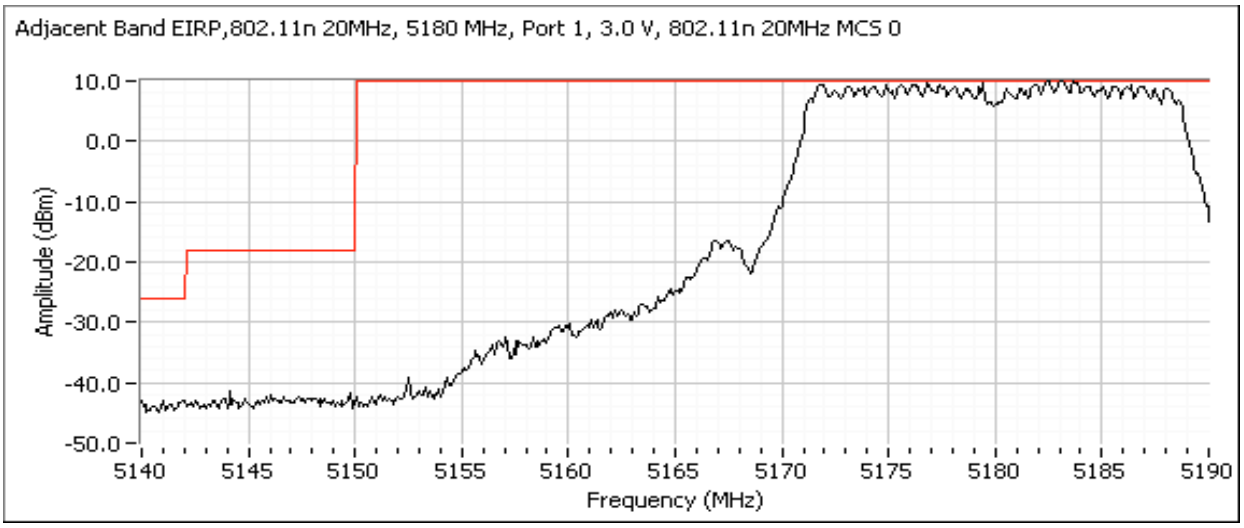
Client:	Summit Data Communications	Job Number:	J78554
Model:	SDC-PE15N (802.11abgn 2x2)	T-Log Number:	T78978
		Account Manager:	Christne Krebill
Standard:	Japanese Radio Law - Item 19 of Article 12	Contact:	Ron Seide

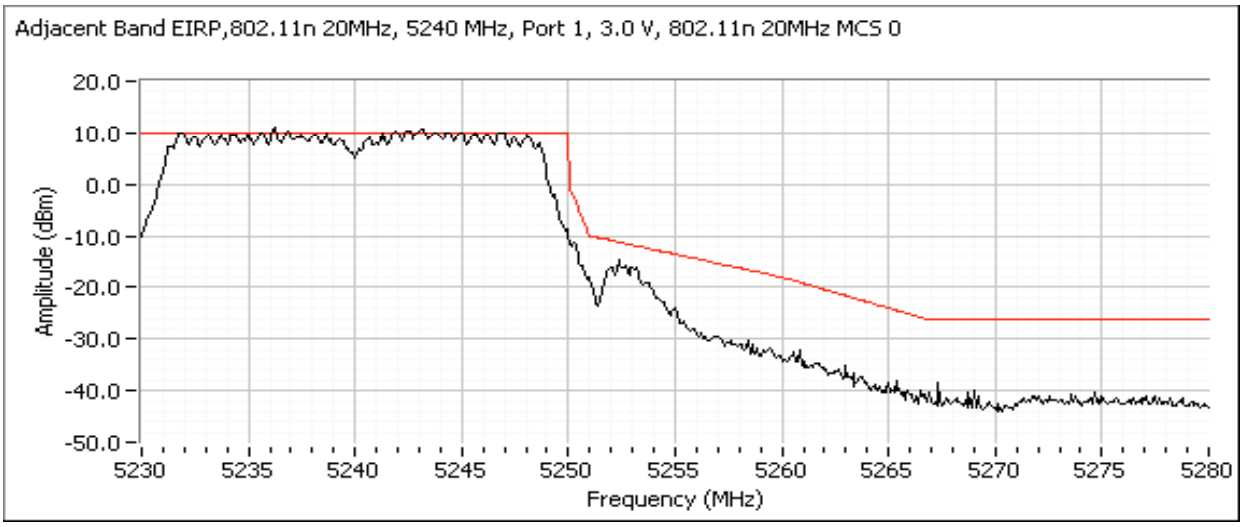




Radio Test Data - Transmitter Parameters

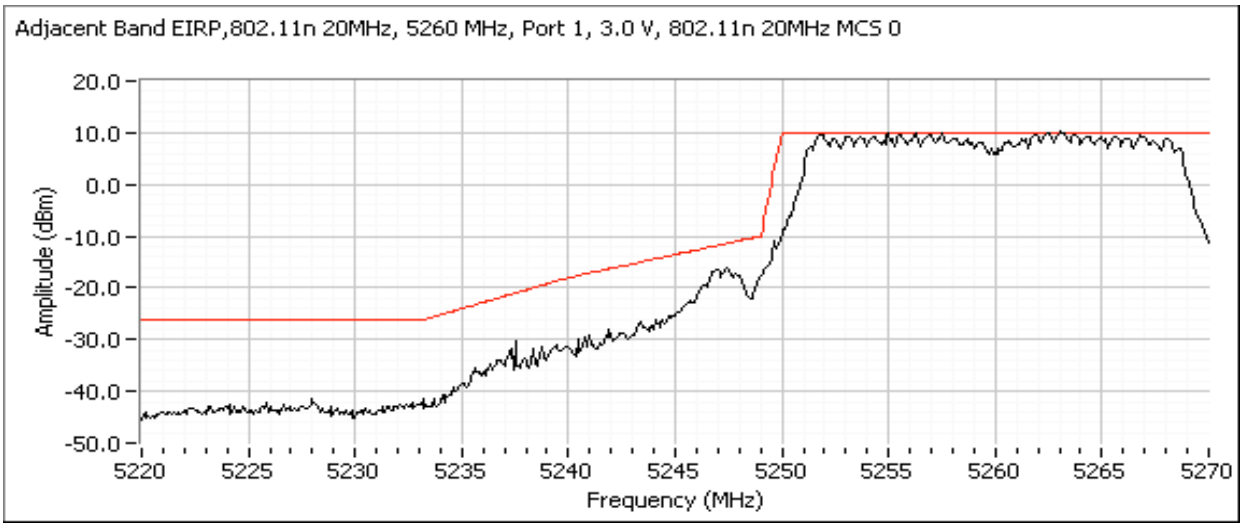
Client:	Summit Data Communications	Job Number:	J78554
Model:	SDC-PE15N (802.11abgn 2x2)	T-Log Number:	T78978
		Account Manager:	Christne Krebill
Standard:	Japanese Radio Law - Item 19 of Article 12	Contact:	Ron Seide

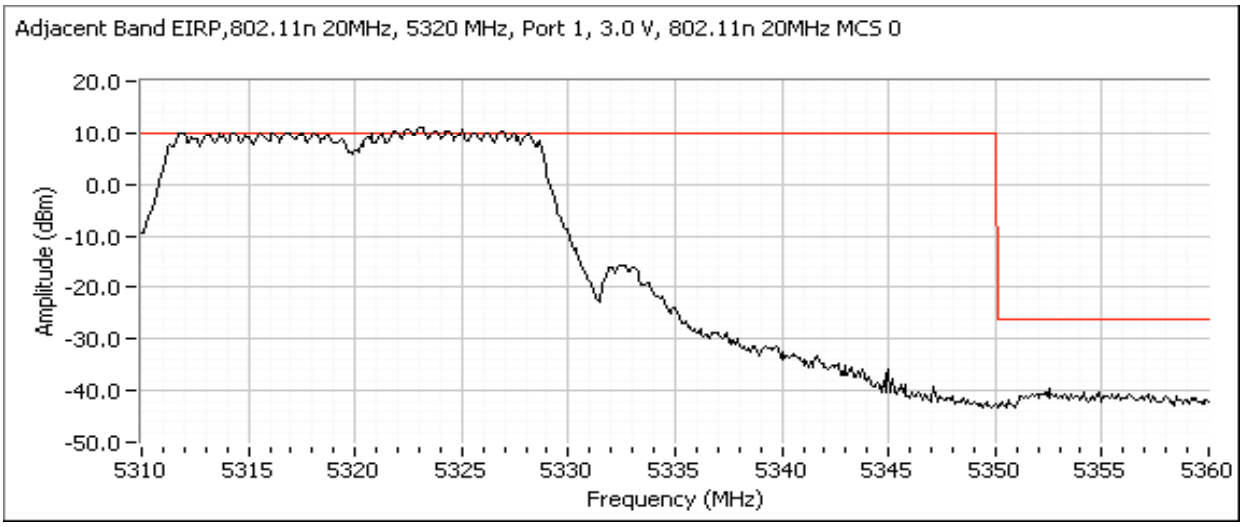




Radio Test Data - Transmitter Parameters

Client:	Summit Data Communications	Job Number:	J78554
Model:	SDC-PE15N (802.11abgn 2x2)	T-Log Number:	T78978
		Account Manager:	Christne Krebill
Standard:	Japanese Radio Law - Item 19 of Article 12	Contact:	Ron Seide





Radio Test Data - Transmitter Parameters

Client:	Summit Data Communications	Job Number:	J78554
Model:	SDC-PE15N (802.11abgn 2x2)	T-Log Number:	T78978
		Account Manager:	Christne Krebill
Standard:	Japanese Radio Law - Item 19 of Article 12	Contact:	Ron Seide

Run #4: Antenna Power

Date of Test: 4/29/2010 Test Engineer: Mehran Birgani
Test Location: Radio Lab

One antenna position was evaluated based on verification that changing the diversity switch position did not affect the output power at the center channel at nominal voltage.

Test Procedure:

Step 1:Determine the frequency of the signal with the highest power spectral density

Instrument Settings: RB=1MHz, VB=3MHz, Span > Occupied bandwidth, peak detector, max hold, sampling points > 400.
Once the display has settled (no more peaks added) the marker is paced at the peak of the signal.
The spectrum analyzer center frequency is adjusted to the marker frequency (Mkr -> CF feature), the span is then set to zero span.

Step 2:Measure the output power

Instrument Settings: RB=VB=1MHz, continuous sweep, trace clear-write

The output power is the power measured by the average power meter connected to the IF output of the analyzer, corrected for the IF path loss, the value of the external attenuator (if used) and the duty cycle of the transmission sequence if the product is not transmitting continuously.

802.11a mode - initial measurements on center channel to determine worst-case mode/antenna:

Channel	Mode	Port	Chain	Data Rate	Nominal -10%	Nominal	Nominal + 10%
					3.0 V	3.3 V	3.6 V
5240	802.11a	Main	-	6Mb/s	0.97 mw/MHz	0.97 mw/MHz	0.97 mw/MHz
5240	802.11a	Main	-	54Mb/s	1.14 mw/MHz	1.08 mw/MHz	1.08 mw/MHz

802.11a mode - final measurements, 5180 - 5240 MHz (W52 Band)

Channel	Mode	Port	Chain	Data Rate	Nominal -10%	Nominal	Nominal + 10%
					3.0 V	3.3 V	3.6 V
5180	802.11a	Main	-	54Mb/s	1.14 mw/MHz	1.08 mw/MHz	1.08 mw/MHz
5200	802.11a	Main	-	54Mb/s	1.01 mw/MHz	1.01 mw/MHz	0.99 mw/MHz
5240	802.11a	Main	-	54Mb/s	1.30 mw/MHz	1.27 mw/MHz	1.27 mw/MHz

802.11a mode - final measurements, 5260 - 5320 MHz (W53 band)

Channel	Mode	Port	Chain	Data Rate	Nominal -10%	Nominal	Nominal + 10%
					3.0 V	3.3 V	3.6 V
5260	802.11a	Main	-	54Mb/s	1.83 mw/MHz	1.74 mw/MHz	1.74 mw/MHz
5280	802.11a	Main	-	54Mb/s	2.00 mw/MHz	1.96 mw/MHz	1.91 mw/MHz
5320	802.11a	Main	-	54Mb/s	2.10 mw/MHz	2.05 mw/MHz	2.00 mw/MHz

Rated Output Power: 2.2 mw/MHz
Lowest Output Power: 0.97 mw/MHz
Highest Output Power: 2.10 mw/MHz *Limit is 10mW/MHz*
Tolerance: -55.9% to -4.1%

Antenna Gain: 6.5 dBi
EIRP: 9.37 mw/MHz *Limit is 10mW/MHz* Using highest measured output power

Radio Test Data - Transmitter Parameters

Client:	Summit Data Communications	Job Number:	J78554
Model:	SDC-PE15N (802.11abgn 2x2)	T-Log Number:	T78978
		Account Manager:	Christne Krebill
Standard:	Japanese Radio Law - Item 19 of Article 12	Contact:	Ron Seide

802.11n 20MHz mode (Total power is the sum of powers on each transmit chain)

Channel	Mode	Port	Chain	Data Rate	Nominal -10% 3.0 V	Nominal 3.3 V	Nominal + 10% 3.6 V
802.11n 20MHz mode - initial measurements on center channel to determine worst-case data rate:							
36	802.11n 20	-	1	12Mb/s (MCS0)	0.47 mw/MHz	0.42 mw/MHz	0.41 mw/MHz
36	802.11n 20	-	2	12Mb/s (MCS0)	0.12 mw/MHz	0.11 mw/MHz	0.11 mw/MHz
				Total Power:	0.59 mw/MHz	0.54 mw/MHz	0.53 mw/MHz
36	802.11n 20	-	1	108Mb/s (MCS7)	0.31 mw/MHz	0.30 mw/MHz	0.28 mw/MHz
36	802.11n 20	-	2	108Mb/s (MCS7)	0.15 mw/MHz	0.14 mw/MHz	0.13 mw/MHz
				Total Power:	0.46 mw/MHz	0.44 mw/MHz	0.42 mw/MHz
				802.11n 20MHz mode - final measurements			
36	802.11n 20	-	1	12Mb/s (MCS0)	0.47 mw/MHz	0.42 mw/MHz	0.41 mw/MHz
36	802.11n 20	-	2	12Mb/s (MCS0)	0.12 mw/MHz	0.11 mw/MHz	0.11 mw/MHz
				Total Power:	0.59 mw/MHz	0.54 mw/MHz	0.53 mw/MHz
40	802.11n 20	-	1	12Mb/s (MCS0)	0.51 mw/MHz	0.47 mw/MHz	0.47 mw/MHz
40	802.11n 20	-	2	12Mb/s (MCS0)	0.35 mw/MHz	0.32 mw/MHz	0.31 mw/MHz
				Total Power:	0.86 mw/MHz	0.79 mw/MHz	0.78 mw/MHz
48	802.11n 20	-	1	12Mb/s (MCS0)	0.56 mw/MHz	0.53 mw/MHz	0.52 mw/MHz
48	802.11n 20	-	2	12Mb/s (MCS0)	0.41 mw/MHz	0.38 mw/MHz	0.38 mw/MHz
				Total Power:	0.97 mw/MHz	0.91 mw/MHz	0.90 mw/MHz
52	802.11n 20	-	1	12Mb/s (MCS0)	0.52 mw/MHz	0.49 mw/MHz	0.48 mw/MHz
52	802.11n 20	-	2	12Mb/s (MCS0)	0.42 mw/MHz	0.38 mw/MHz	0.37 mw/MHz
				Total Power:	0.95 mw/MHz	0.86 mw/MHz	0.85 mw/MHz
60	802.11n 20	-	1	12Mb/s (MCS0)	0.56 mw/MHz	0.51 mw/MHz	0.50 mw/MHz
60	802.11n 20	-	2	12Mb/s (MCS0)	0.42 mw/MHz	0.39 mw/MHz	0.37 mw/MHz
				Total Power:	0.98 mw/MHz	0.90 mw/MHz	0.87 mw/MHz
64	802.11n 20	-	1	12Mb/s (MCS0)	0.64 mw/MHz	0.56 mw/MHz	0.56 mw/MHz
64	802.11n 20	-	2	12Mb/s (MCS0)	0.43 mw/MHz	0.40 mw/MHz	0.39 mw/MHz
				Total Power:	1.08 mw/MHz	0.95 mw/MHz	0.95 mw/MHz

Rated Output Power: 1.1 mw/MHz
Lowest Output Power: 0.42 mw/MHz
Highest Output Power: 1.08 mw/MHz

Deviation In Output Power: -60.9% to 0.9%

EIRP Calculation

Antenna Gain: 6.5 dBi
EIRP: 4.81 mw/MHz *Limit is 10mW/MHz* Using highest measured output power

Radio Test Data - Transmitter Parameters

Client:	Summit Data Communications	Job Number:	J78554
Model:	SDC-PE15N (802.11abgn 2x2)	T-Log Number:	T78978
		Account Manager:	Christne Krebill
Standard:	Japanese Radio Law - Item 19 of Article 12	Contact:	Ron Seide

Run #5: Adjacent Channel Leakage Power

Date of Test: 5/4/2010
Test Location: Radio Lab

Test Engineer: Mehran Birgani

Measurement method

The power in a +/- 9MHz band centered on the operating frequency is measured and used as a reference value. The powers in the +/-9MHz band on the adjacent channels (+/-20MHz from the operating channel) and alternate channels (+/-40MHz from the operating channel) are also measured. The Channel Leakgae ratio (CLR) shall be at least 25dB for the adjacent channels and at least 40dB for the alternate channels.

802.11a

Operating Voltage: 3.0 V

Channel	Port / Chain	Channel power dBm	Adjacent Channel Low dBm	Adjacent Channel High dBm	Adjacent Channel CLR dB	Alternate Channel Low dBm	Alternate Channel High dBm	Alternate Channel CLR dB
5180	Main	18.0	-15.5	-17.0	33.5	-36.5	-35.2	53.2
5200	Main	18.0	-15.7	-16.2	33.7	-35.5	-35.0	53.0
5240	Main	18.9	-15.3	-15.3	34.2	-35.0	-33.8	52.7
5260	Main	19.0	-17.5	-15.6	34.6	-34.7	-33.0	51.9
5300	Main	19.7	-14.5	-15.0	34.2	-34.2	-32.2	51.9
5320	Main	20.0	-11.3	-11.0	31.0	-31.1	-29.8	49.7
				Worst case:	**31.0**			**49.7**

Operating Voltage: 3.3 V

Channel	Port / Chain	Channel power dBm	Adjacent Channel Low dBm	Adjacent Channel High dBm	Adjacent Channel CLR dB	Alternate Channel Low dBm	Alternate Channel High dBm	Alternate Channel CLR dB
5180	Main	18.1	-16.1	-16.3	34.2	-35.0	-35.8	53.1
5200	Main	17.8	-17.1	-17.0	34.7	-36.3	-34.4	52.2
5240	Main	18.5	-15.9	-15.3	33.8	-35.7	-34.2	52.7
5260	Main	19.5	-15.4	-14.9	34.4	-35.3	-32.7	52.2
5300	Main	19.6	-14.6	-14.0	33.6	-33.9	-32.4	52.0
5320	Main	20.0	-12.5	-12.3	32.3	-31.9	-30.4	50.3
				Worst case:	**32.3**			**50.3**

Operating Voltage: 3.6 V

Channel	Port / Chain	Channel power dBm	Adjacent Channel Low dBm	Adjacent Channel High dBm	Adjacent Channel CLR dB	Alternate Channel Low dBm	Alternate Channel High dBm	Alternate Channel CLR dB
5180	Main	18.0	-16.2	-16.4	34.2	-35.1	-35.6	53.1
5200	Main	17.7	-17.0	-17.0	34.7	-36.3	-34.2	51.9
5240	Main	18.4	-16.0	-15.1	33.5	-35.9	-34.0	52.4
5260	Main	18.8	-15.5	-14.8	33.6	-35.1	-32.6	51.4
5300	Main	19.7	-14.7	-13.7	33.4	-33.7	-32.6	52.3
5320	Main	19.7	-13.5	-13.2	32.9	-32.3	-31.4	51.1
				Worst case:	**32.9**			**51.1**

Radio Test Data - Transmitter Parameters

Client:	Summit Data Communications	Job Number:	J78554
Model:	SDC-PE15N (802.11abgn 2x2)	T-Log Number:	T78978
		Account Manager:	Christne Krebill
Standard:	Japanese Radio Law - Item 19 of Article 12	Contact:	Ron Seide

802.11n 20MHz

Operating Voltage: 3.0 V **Operating Port:** 1

Channel	Port / Chain	Channel power dBm	Adjacent Channel Low dBm	Adjacent Channel High dBm	Adjacent Channel CLR dB	Alternate Channel Low dBm	Alternate Channel High dBm	Alternate Channel CLR dB
5180	1	13.9	-18.7	-19.2	32.6	-35.5	-35.8	49.4
5200	1	14.9	-18.8	-18.7	33.6	-35.8	-35.0	49.9
5240	1	14.0	-18.7	-18.5	32.5	-35.9	-35.6	49.6
5260	1	15.1	-18.5	-18.6	33.6	-35.5	-34.9	50.0
5300	1	17.0	-17.1	-16.4	33.4	-35.2	-33.2	50.2
5320	1	16.9	-17.0	-16.6	33.5	-35.7	-34.5	51.4
				Worst case:	**32.5**			**49.4**

Operating Voltage: 3.0 V **Operating Port:** 2

Channel	Port / Chain	Channel power dBm	Adjacent Channel Low dBm	Adjacent Channel High dBm	Adjacent Channel CLR dB	Alternate Channel Low dBm	Alternate Channel High dBm	Alternate Channel CLR dB
5180	2	16.3	-16.9	-17.9	33.2	-34.6	-34.2	50.4
5200	2	15.3	-18.0	-18.0	33.2	-34.6	-34.2	49.5
5240	2	16.2	-18.0	-17.8	34.0	-34.7	-34.5	50.8
5260	2	16.2	-17.3	-18.1	33.5	-34.6	-34.0	50.2
5300	2	16.6	-17.0	-16.9	33.5	-37.3	-33.6	50.2
5320	2	16.9	-16.7	-16.9	33.6	-34.6	-33.7	50.6
				Worst case:	**33.2**			**49.5**

Operating Voltage: 3.3 V **Operating Port:** 1

Channel	Port / Chain	Channel power dBm	Adjacent Channel Low dBm	Adjacent Channel High dBm	Adjacent Channel CLR dB	Alternate Channel Low dBm	Alternate Channel High dBm	Alternate Channel CLR dB
5180	1	14.2	-19.2	-19.4	33.4	-36.0	-36.0	50.2
5200	1	14.5	-19.5	-18.9	33.4	-37.8	-35.7	50.2
5240	1	14.8	-19.3	-19.0	33.7	-35.9	-35.2	50.0
5260	1	14.9	-19.0	-18.9	33.7	-35.7	-35.3	50.1
5300	1	16.5	-17.9	-16.8	33.3	-35.3	-33.5	50.0
5320	1	16.4	-17.8	-17.0	33.4	-35.6	-34.5	50.9
				Worst case:	**33.3**			**50.0**

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Radio Test Data - Transmitter Parameters

Client:	Summit Data Communications	Job Number:	J78554
Model:	SDC-PE15N (802.11abgn 2x2)	T-Log Number:	T78978
		Account Manager:	Christne Krebill
Standard:	Japanese Radio Law - Item 19 of Article 12	Contact:	Ron Seide

Operating Voltage: 3.3 V **Operating Port:** 2

Channel	Port / Chain	Channel power dBm	Adjacent Channel Low dBm	Adjacent Channel High dBm	Adjacent Channel CLR dB	Alternate Channel Low dBm	Alternate Channel High dBm	Alternate Channel CLR dB
5180	2	15.8	-17.9	-18.3	33.6	-34.9	-34.5	50.3
5200	2	15.2	-18.7	-18.5	33.7	-34.9	-34.5	49.7
5240	2	15.7	-18.1	-18.1	33.8	-34.6	-34.5	50.2
5260	2	15.6	-18.0	-18.5	33.6	-34.3	-34.8	50.0
5300	2	16.1	-17.8	-17.5	33.6	-37.4	-33.9	50.1
5320	2	16.5	-17.4	-17.4	33.9	-34.9	-33.7	50.2
				Worst case:	**33.6**			**49.7**

Operating Voltage: 3.6 V **Operating Port:** 1

Channel	Port / Chain	Channel power dBm	Adjacent Channel Low dBm	Adjacent Channel High dBm	Adjacent Channel CLR dB	Alternate Channel Low dBm	Alternate Channel High dBm	Alternate Channel CLR dB
5180	1	14.2	-19.5	-19.5	33.7	-35.7	-35.5	49.7
5200	1	14.5	-19.4	-19.0	33.5	-35.9	-35.4	49.9
5240	1	14.7	-19.4	-19.0	33.6	-35.8	-35.1	49.8
5260	1	14.8	-19.2	-19.1	34.0	-35.6	-35.1	50.0
5300	1	16.5	-18.0	-16.8	33.2	-35.3	-33.4	49.8
5320	1	16.5	-17.7	-17.2	33.7	-35.9	-34.7	51.2
				Worst case:	**33.2**			**49.7**

Operating Voltage: 3.6 V **Operating Port:** 2

Channel	Port / Chain	Channel power dBm	Adjacent Channel Low dBm	Adjacent Channel High dBm	Adjacent Channel CLR dB	Alternate Channel Low dBm	Alternate Channel High dBm	Alternate Channel CLR dB
5180	2	15.6	-18.1	-18.3	33.8	-34.8	-35.3	50.4
5200	2	15.3	-18.8	-18.7	33.9	-34.8	-34.4	49.7
5240	2	15.6	-18.3	-18.3	33.9	-34.7	-34.4	50.0
5260	2	15.6	-18.1	-18.6	33.7	-34.3	-34.6	50.0
5300	2	16.2	-18.1	-17.6	33.8	-37.3	-33.8	50.0
5320	2	16.3	-17.9	-17.5	33.8	-34.6	-33.9	50.2
				Worst case:	**33.7**			**49.7**

Radio Test Data - Transmitter Parameters

Client:	Summit Data Communications	Job Number:	J78554
Model:	SDC-PE15N (802.11abgn 2x2)	T-Log Number:	T78978
		Account Manager:	Christne Krebill
Standard:	Japanese Radio Law - Item 19 of Article 12	Contact:	Ron Seide

Run #6: Burst Transmission Duration

Date of Test: 4/29/2010
Test Location: Radio Lab

Test Engineer: Mehran Birgani

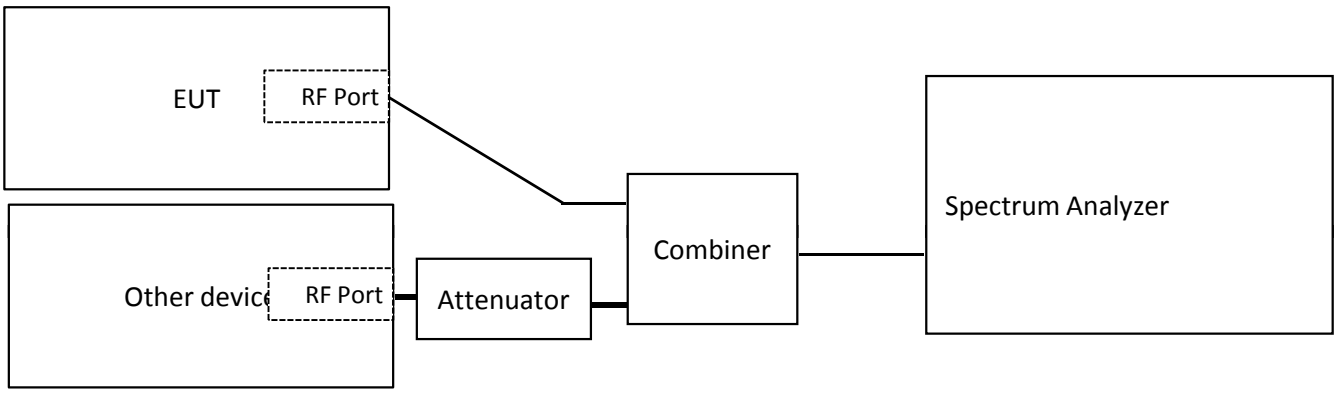
Requirement

The maximum transmission burst length is limited to 4ms.

Measurement method

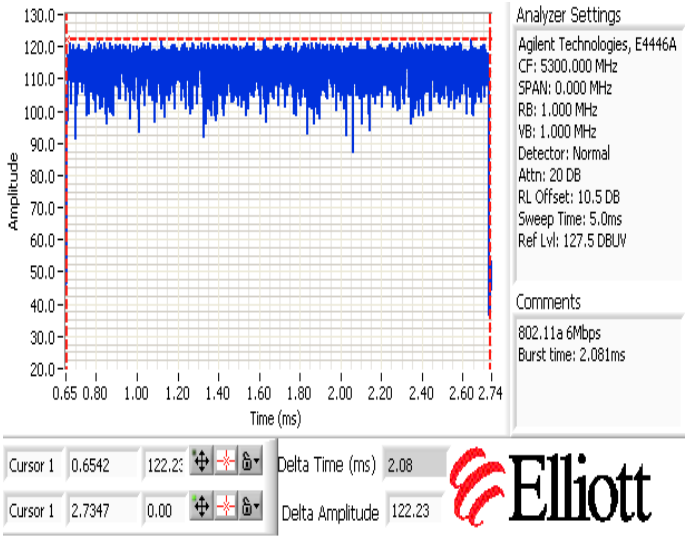
The device is configured to communicate with another device as shown below. Once the communications link is established at the slowest data rate the EUT is set to send a large file or other data to the second device. A spectrum analyzer is connected to the rf output of the EUT as shown and tunes with zero span to the operating frequency of the communications link. The spectrum analyzer (or an oscilloscope connected to the analyzers IF output) is used to measure the duration of the longest burst.

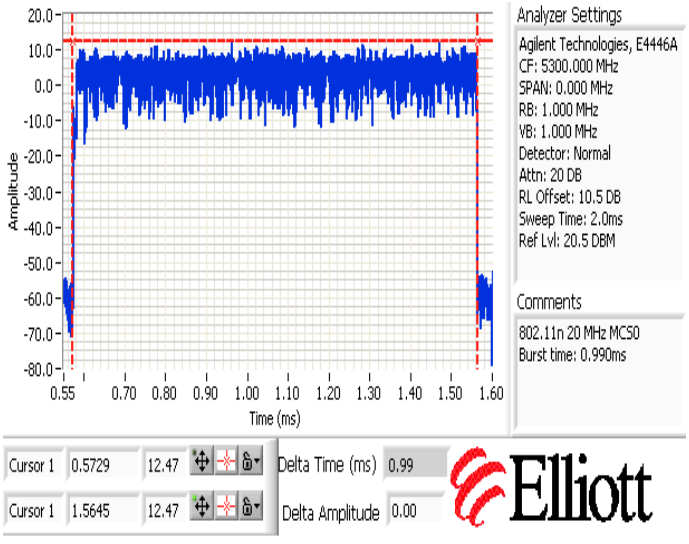
The measurement is repeated for all different modes at the slowest data rate in each mode.



Result

The maximum transmission burst length was 2.08ms, 0.99ms.





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Radio Test Data - Receiver

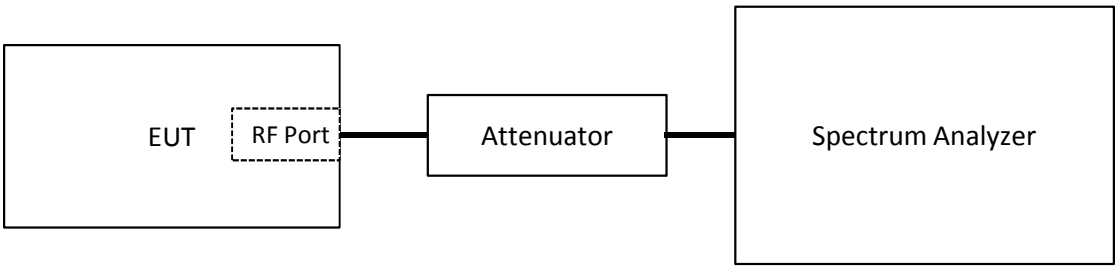
Client:	Summit Data Communications	Job Number:	J78554
Model:	SDC-PE15N (802.11abgn 2x2)	T-Log Number:	T78978
		Account Manager:	Christne Krebill
Standard:	Japanese Radio Law - Item 19 of Article 12	Contact:	Ron Seide

RADIO EQUIPMENT USED FOR 5GHz BAND(S) WIDE-BAND LOW-POWER DATA COMMUNICATIONS SYSTEM (W52, W53)

Summary of Results

Test Performed	Mode	Requirement	Measurement	Result
Secondary Radiated Emissions (Receiver Spurious Emissions)	-	< 1GHz : 4nW 1GHz - 26.50GHz : 20nW	< 1GHz: 0.03nW > 1GHz: 0.2nW	Pass
Interference prevention function	-	Shall have the function of automatic transmission or reception of identification code.	802.11a protocol uses Carrier Sense Multiple Access With Collision Avoidance (CSMA/CA)	Pass
Carrier sensing function (Carrier sense)	-	Shall not transmit radio wave when receiving over 100mV/m	Threshold < 95.5 mV/m	Pass
Carrier sensing function (DFS)		Threshold: -62dBm (eirp < 0.2W) -64dBm (eirp > 0.2W)	only required for master device	N/A

Test Configuration



Test Environment

Temperature:	15-30	°C
Rel. Humidity:	20-75	%
Pressure:	86-106	kPa
Nominal Supply Voltage	3.3	Vdc

Elliott An NAT company

Radio Test Data - Receiver

Client:	Summit Data Communications	Job Number:	J78554
Model:	SDC-PE15N (802.11abgn 2x2)	T-Log Number:	T78978
		Account Manager:	Christne Krebill
Standard:	Japanese Radio Law - Item 19 of Article 12	Contact:	Ron Seide

Run #1 Secondary Radiated Emissions

Date of Test: 5/11/2010
Test Location: Radio Lab

Test Engineer: Mehran Birgani

Test Requirements		
Frequency Range (MHz)	Limit	
	nW	dBm/MHz
30 - 1000	4.0	-54.0
1000 - 26500	20.0	-47.0

Note - as the device operates on two transmit/receive chains the data for each chain includes a 10log(2), i.e. 3dB. Offset to account for two sources of noise.

Measurement Summary - Emission with the least margin from all measurements

Frequency MHz	Level nW	Antenna Port	Limit nW	Margin dB	Detector	Comments	Voltage	Channel	
30 - 1000	0.033	RF Port	4.0	-20.8	Peak	Highest level below 1GHz	3.3	40	
1000-26500	0.200	RF Port	20.0	-20.0	Peak	Highest level above 1GHz	3.3	100	

Preliminary Measurements :

Instrument Settings: RB and VB as detailed below, Positive peak detector and maximum hold for a minimum of 10 sweeps, but until the spectrum displayed becomes stable and no new signals are observed.

Sweep Settings

Frequency (MHz)		Bandwidth (MHz)		Sweep Time
Start	Stop	RB	VB	
30	1000	0.1	0.1	AUTO ms
1000	26500	1.0	1.0	AUTO ms

Frequency MHz	Level dBm	Antenna Port	Limit	Margin	Detector	Comments	Operating Voltage	Operating Channel
870.43	-70.7	Port 1	-54.0	-16.7	Peak	36,3.0,1	3.0	36
1948.32	-63.4	Port 1	-47.0	-16.4	Peak	36,3.0,1	3.0	36
873.94	-69.9	Port 1	-54.0	-15.9	Peak	36,3.3,1	3.3	36
1948.32	-62.9	Port 1	-47.0	-15.9	Peak	36,3.3,1	3.3	36
871.43	-71.8	Port 1	-54.0	-17.8	Peak	36,3.6,1	3.6	36
1948.32	-63.0	Port 1	-47.0	-16.0	Peak	36,3.6,1	3.6	36
870.43	-69.6	Port 2	-54.0	-15.6	Peak	36,3.0,2	3.0	36
1948.32	-62.4	Port 2	-47.0	-15.4	Peak	36,3.0,2	3.0	36
10512.17	-64.9	Port 2	-47.0	-17.9	Peak	36,3.0,2	3.0	36
870.93	-69.4	Port 2	-54.0	-15.4	Peak	36,3.3,2	3.3	36
1948.32	**-62.2**	**Port 2**	**-47.0**	**-15.2**	**Peak**	**36,3.3,2**	**3.3**	**36**
10512.17	-64.3	Port 2	-47.0	-17.3	Peak	36,3.3,2	3.3	36
869.93	-70.7	Port 2	-54.0	-16.7	Peak	36,3.6,2	3.6	36
1948.32	-62.5	Port 2	-47.0	-15.5	Peak	36,3.6,2	3.6	36
10512.17	-62.2	Port 2	-47.0	-15.2	Peak	36,3.6,2	3.6	36

Elliott An NTS company

Radio Test Data - Receiver

Client:	Summit Data Communications	Job Number:	J78554
Model:	SDC-PE15N (802.11abgn 2x2)	T-Log Number:	T78978
		Account Manager:	Christne Krebill
Standard:	Japanese Radio Law - Item 19 of Article 12	Contact:	Ron Seide

Frequency	Level	Antenna			Detector	Comments	Operating	
MHz	dBm	Port	Limit	Margin			Voltage	Channel
870.93	-69.0	Port 2	-54.0	-15.0	Peak	40,3.0,2	3.0	40
1948.32	-63.1	Port 2	-47.0	-16.1	Peak	40,3.0,2	3.0	40
874.44	-70.0	Port 2	-54.0	-16.0	Peak	40,3.3,2	3.3	40
2449.48	**-59.7**	**Port 2**	**-47.0**	**-12.7**	**Peak**	**40,3.3,2**	**3.3**	**40**
870.93	-69.8	Port 2	-54.0	-15.8	Peak	40,3.6,2	3.6	40
1948.32	-62.9	Port 2	-47.0	-15.9	Peak	40,3.6,2	3.6	40
10512.17	-62.4	Port 2	-47.0	-15.4	Peak	40,3.6,2	3.6	40
873.94	-68.8	Port 2	-54.0	-14.8	Peak	48,3.0,2	3.0	48
1948.32	-63.2	Port 2	-47.0	-16.2	Peak	48,3.0,2	3.0	48
870.93	-68.0	Port 2	-54.0	-14.0	Peak	48,3.3,2	3.3	48
1948.32	-62.9	Port 2	-47.0	-15.9	Peak	48,3.3,2	3.3	48
10514.84	-62.7	Port 2	-47.0	-15.7	Peak	48,3.3,2	3.3	48
870.93	-69.6	Port 2	-54.0	-15.6	Peak	48,3.6,2	3.6	48
2473.49	**-59.8**	**Port 2**	**-47.0**	**-12.8**	**Peak**	**48,3.6,2**	**3.6**	**48**
10514.84	-63.1	Port 2	-47.0	-16.1	Peak	48,3.6,2	3.6	48
873.94	-70.1	Port 2	-54.0	-16.1	Peak	52,3.0,2	3.0	52
2479.49	**-60.1**	**Port 2**	**-47.0**	**-13.1**	**Peak**	**52,3.0,2**	**3.0**	**52**
10512.17	-63.7	Port 2	-47.0	-16.7	Peak	52,3.0,2	3.0	52
869.93	-69.9	Port 2	-54.0	-15.9	Peak	52,3.3,2	3.3	52
1948.32	-62.8	Port 2	-47.0	-15.8	Peak	52,3.3,2	3.3	52
10512.17	-62.2	Port 2	-47.0	-15.2	Peak	52,3.3,2	3.3	52
869.93	-68.9	Port 2	-54.0	-14.9	Peak	52,3.6,2	3.6	52
1948.32	-62.5	Port 2	-47.0	-15.5	Peak	52,3.6,2	3.6	52
10512.17	-63.7	Port 2	-47.0	-16.7	Peak	52,3.6,2	3.6	52
870.93	-69.5	Port 2	-54.0	-15.5	Peak	60,3.0,2	3.0	60
1948.32	-63.1	Port 2	-47.0	-16.1	Peak	60,3.0,2	3.0	60
10512.17	-63.3	Port 2	-47.0	-16.3	Peak	60,3.0,2	3.0	60
870.93	-69.5	Port 2	-54.0	-15.5	Peak	60,3.3,2	3.3	60
1948.32	-63.0	Port 2	-47.0	-16.0	Peak	60,3.3,2	3.3	60
10512.17	-63.5	Port 2	-47.0	-16.5	Peak	60,3.3,2	3.3	60
870.93	**-69.4**	**Port 2**	**-54.0**	**-15.4**	**Peak**	**60,3.6,2**	**3.6**	**60**
1948.32	-62.9	Port 2	-47.0	-15.9	Peak	60,3.6,2	3.6	60
10512.17	-65.2	Port 2	-47.0	-18.2	Peak	60,3.6,2	3.6	60
870.93	**-69.1**	**Port 2**	**-54.0**	**-15.1**	**Peak**	**64,3.0,2**	**3.0**	**64**
1948.32	-62.9	Port 2	-47.0	-15.9	Peak	64,3.0,2	3.0	64
10512.17	-63.7	Port 2	-47.0	-16.7	Peak	64,3.0,2	3.0	64
870.93	-69.7	Port 2	-54.0	-15.7	Peak	64,3.3,2	3.3	64
1948.32	-62.4	Port 2	-47.0	-15.4	Peak	64,3.3,2	3.3	64
10512.17	-63.1	Port 2	-47.0	-16.1	Peak	64,3.3,2	3.3	64
870.93	-69.3	Port 2	-54.0	-15.3	Peak	64,3.6,2	3.6	64
1948.32	-62.4	Port 2	-47.0	-15.4	Peak	64,3.6,2	3.6	64
10512.17	-64.3	Port 2	-47.0	-17.3	Peak	64,3.6,2	3.6	64

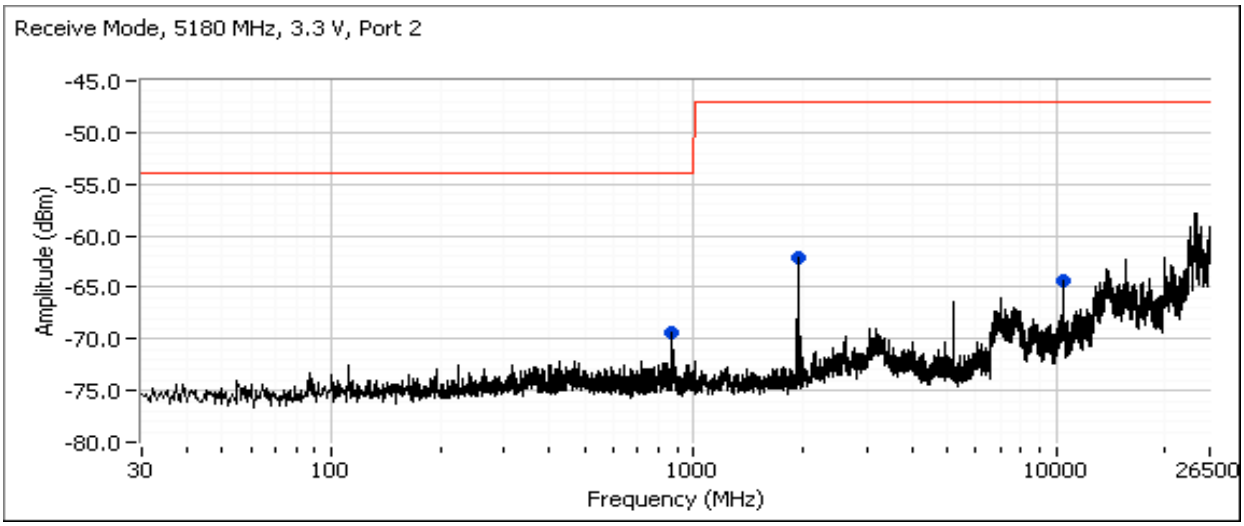
All scans showed measured value to be below -70dBm (0.1nW) below 1GHz and below -57dBm (2nW) above 1GHz.

Elliott An NTS company

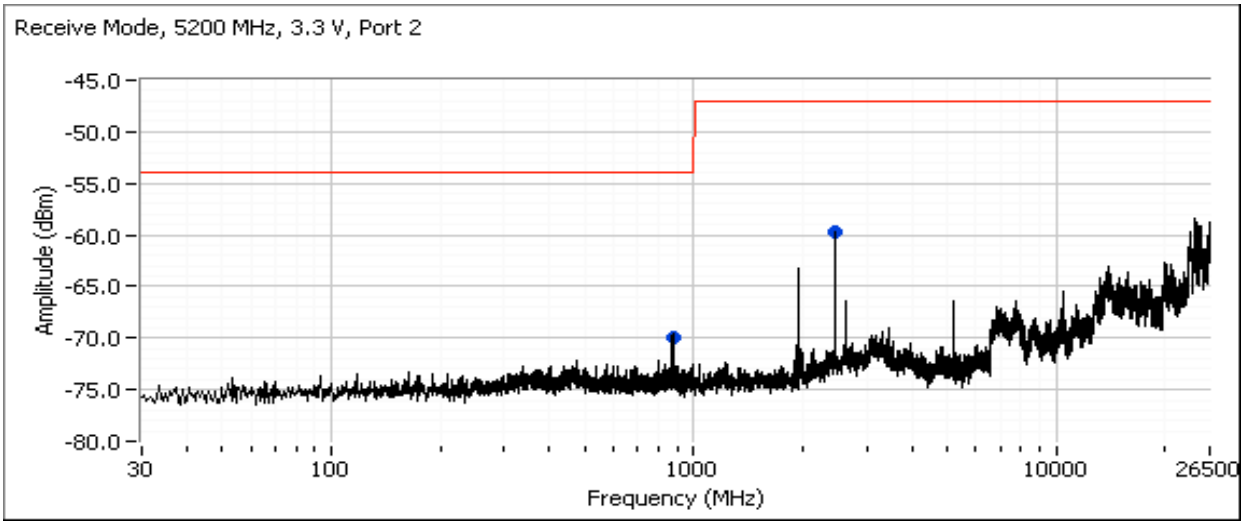
Radio Test Data - Receiver

Client:	Summit Data Communications	Job Number:	J78554
Model:	SDC-PE15N (802.11abgn 2x2)	T-Log Number:	T78978
		Account Manager:	Christne Krebill
Standard:	Japanese Radio Law - Item 19 of Article 12	Contact:	Ron Seide

Broadband plots from 30MHz to 26.5GHz, 5180 MHz



Broadband plots from 30MHz to 26.5GHz, 5200 MHz

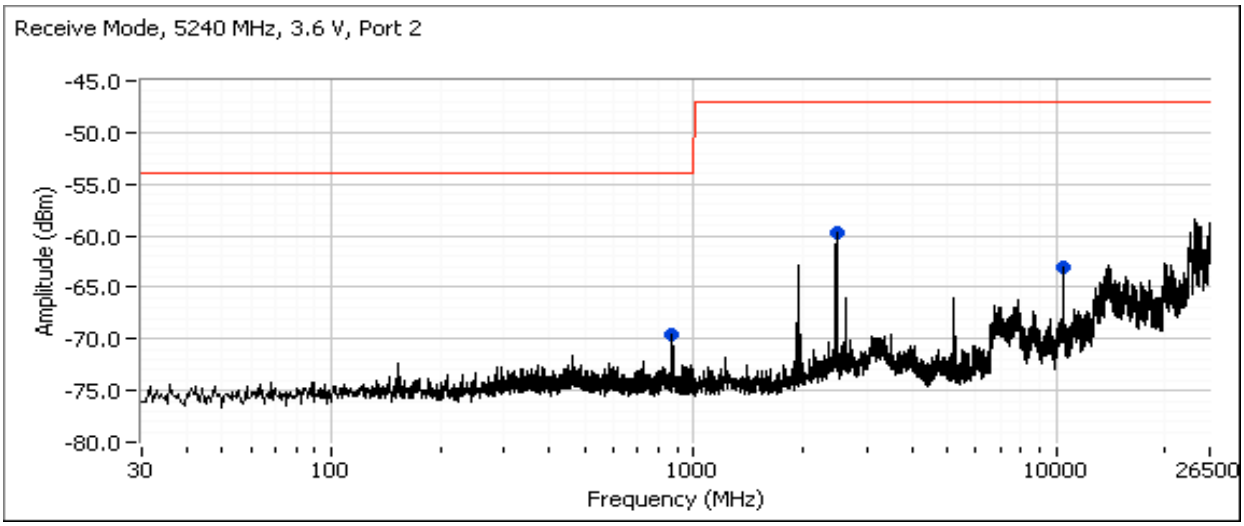


Elliott An NTS company

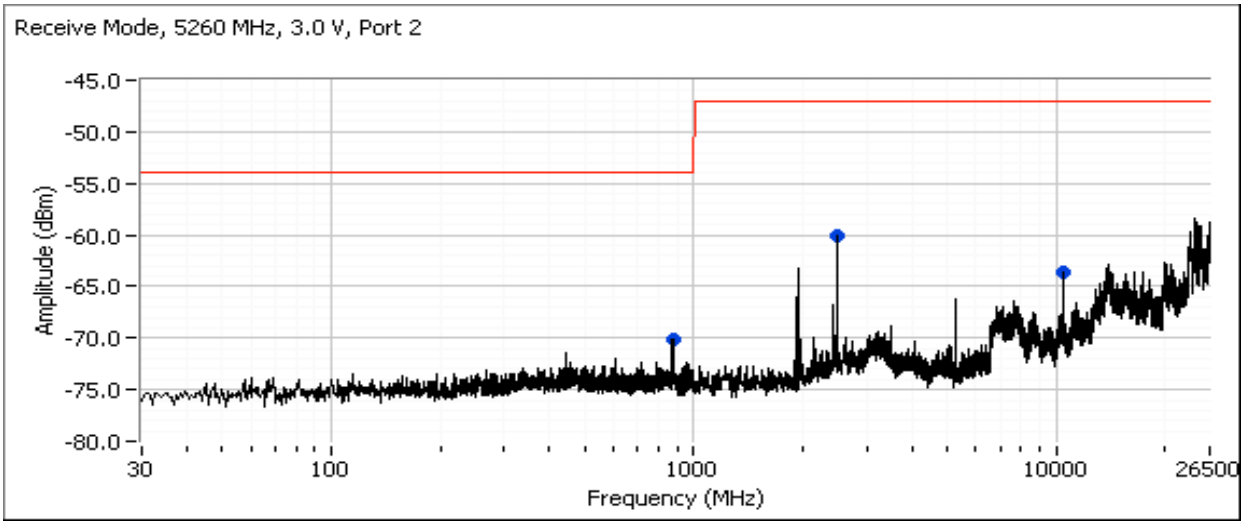
Radio Test Data - Receiver

Client:	Summit Data Communications	Job Number:	J78554
Model:	SDC-PE15N (802.11abgn 2x2)	T-Log Number:	T78978
		Account Manager:	Christne Krebill
Standard:	Japanese Radio Law - Item 19 of Article 12	Contact:	Ron Seide

Broadband plots from 30MHz to 26.5GHz, 5240 MHz



Broadband plots from 30MHz to 26.5GHz, 5260 MHz

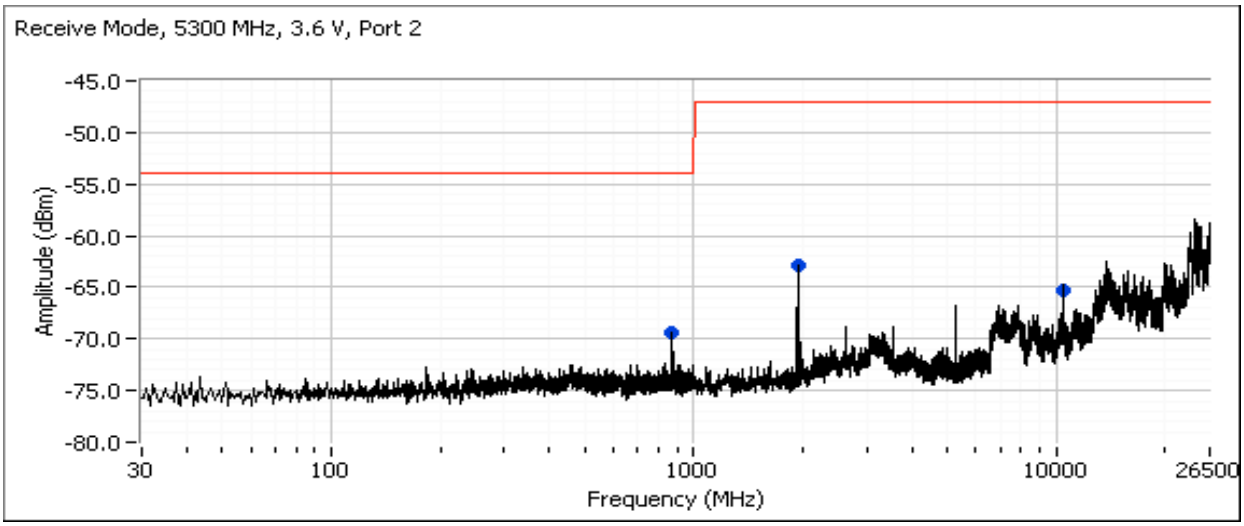


Elliott An NTS company

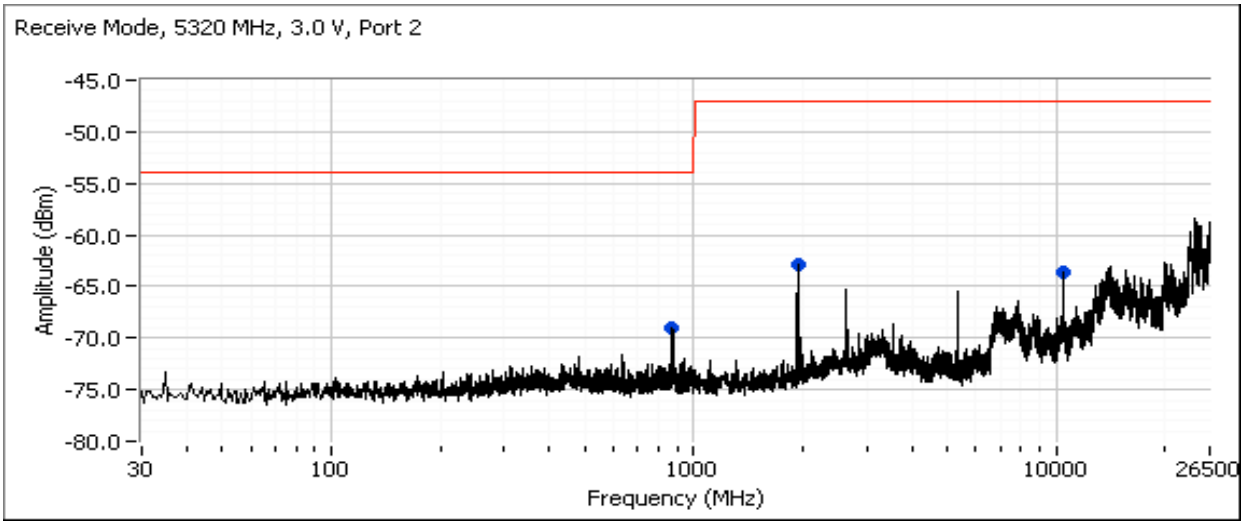
Radio Test Data - Receiver

Client:	Summit Data Communications	Job Number:	J78554
Model:	SDC-PE15N (802.11abgn 2x2)	T-Log Number:	T78978
		Account Manager:	Christne Krebill
Standard:	Japanese Radio Law - Item 19 of Article 12	Contact:	Ron Seide

Broadband plots from 30MHz to 26.5GHz, 5300 MHz



Broadband plots from 30MHz to 26.5GHz, 5320 MHz



Final Measurements :

No measurement necessary, all frequencies in the preliminary scan are below the limit.

Elliott An NTS company

Radio Test Data - Receiver

Client:	Summit Data Communications	Job Number:	J78554
Model:	SDC-PE15N (802.11abgn 2x2)	T-Log Number:	T78978
		Account Manager:	Christne Krebill
Standard:	Japanese Radio Law - Item 19 of Article 12	Contact:	Ron Seide

Run #2: Carrier Sense

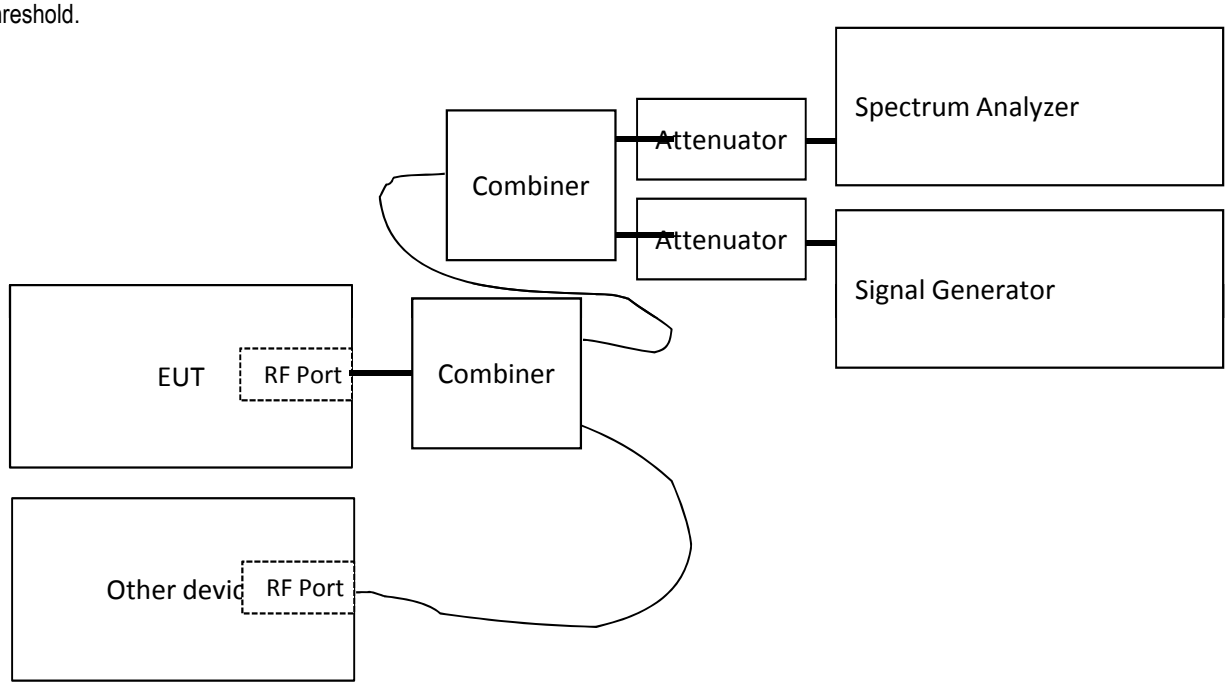
Date of Test: 5/11/2010 Test Engineer: Mehran Birgani
Test Location: SV Chamber #2

Requirement

The device shall not transmit radio wave when receiving over 100mV/m

Measurement method

The device is configured to communicate with another device as shown below. Once the communications link is established the signal generator is configured to produce a CW signal at the center frequency of the operating channel. The level of the signal generator is increased from a level approximately 30dB lower then the required carrier sense detection threshold (calculated based on the **lowest** antenna gain to be used with the device) until the device stops transmitting. This level is recorded as the carrier sense detection threshold.



The formula to calculate the voltage at the antenna input (Vrx, dBuV/m) for a field strength of E dBuV/m is related to the antenna factor (AF, dB/m) of the receive antenna.

Vrx = E - AF dBuV/m

The relationship between the antenna gain (G, dBi) and Antenna factor is dependent on the frequency (F, MHz):

AF = 20Log(F) - Gain - 29.79

So for a field strength of EdBuV/m the voltage,Vrx (dBuV) received at the rf port is:

Vrx = E - 20Log(F) + G + 29.79

Assuming a 50ohm system the power, Prx (dBm) at the input can be calculated by subtracting 107dB from the voltage in dBuV, so the power at the rf port is:

Prx = E - 20Log(F) + G + 29.79 - 107

So, for a signal level of 100mV/m at the antenna (100dBuV/m), the power at the receiver input would be:

Prx = [100 - 20Log(F) + G + 29.79 - 107] dBm

Elliott An NAT company

Radio Test Data - Receiver

Client:	Summit Data Communications	Job Number:	J78554
Model:	SDC-PE15N (802.11abgn 2x2)	T-Log Number:	T78978
		Account Manager:	Christne Krebill
Standard:	Japanese Radio Law - Item 19 of Article 12	Contact:	Ron Seide

Frequency	Antenna	Signal generator	Path loss	Threshold			Result
MHz	Gain (dBi)	threshold	dB	dBm	dBuV/m	mV/m	
5180	3.5	-27.1	21.3	-48.4	99.6	**95.5**	Pass
5200	3.5	-27.8	21.7	-49.5	98.5	84.4	Pass
5240	3.5	-27.8	21.6	-49.4	98.7	86.1	Pass
5260	3.5	-27.5	21.7	-49.2	98.9	88.4	Pass
5300	3.5	-27.8	21.7	-49.5	98.7	86.1	Pass
5320	3.5	-27.0	21.9	-48.9	99.3	92.6	Pass

Antenna Gain - The minimum antenna gain used by the EUT
Threshold - Power at the EUT rf port equivalent to a field strength of 100mV/m at the EUT's antenna
Signal generator threshold - Power level of the signal generator output at which Carrier Sense function detects the signal and stops tranmsitting
Path loss - Total loss between signal generator output and the rf input port of the EUT
Threhsold dBm - power at the EUT's rf port when CS function is enabled
Threhsold dBuV/m - equivalent field strength at the EUT antenna at the CS threshold in dBuV/m
Threhsold mV/m - equivalent field strength at the EUT antenna at the CS threshold in mV/m

Path loss table

Frequency	Signal generator	Level at EUT	Path loss
MHz	Level (dBm)	dBm	dB
5180	0.0	-21.3	21.3
5200	0.0	-21.7	21.7
5240	0.0	-21.6	21.6
5260	0.0	-21.7	21.7
5300	0.0	-21.7	21.7
5320	0.0	-21.9	21.9

Elliott An NTS company

Test Equipment Used

Client: Summit Data Communications	Job Number:	J78554
Model: SDC-PE15N (802.11abgn 2x2)	T-Log Number:	T78978
	Account Manager:	Christne Krebill
Standard: Japanese Radio Law - Item 19 of Article 12	Contact:	Ron Seide

Manufacturer	Description	Model #	Asset #	Cal Due
Rohde & Schwarz	Power Meter, Dual Channel	NRVD	1071	09-Jun-10
Hewlett Packard	EMC Spectrum Analyzer, 9 KHz - 22 GHz	8593EM	1319	19-Aug-10
Rohde & Schwarz	Attenuator, 20 dB, 10W, DC-18 GHz	20dB, 10W, Type N	1795	03-Jun-10
Rohde & Schwarz	Power Sensor 100 uW - 10 Watts	NRV-Z53	1796	03-Jun-10
Agilent	PSG Vector Signal Generator (250kHz - 20GHz)	E8267C	1877	24-Mar-12
Rohde & Schwarz	Power Sensor, 1 nW-20 mW, 10 MHz-18 GHz, 50ohms	NRV-Z1	2114	10-Nov-10
Agilent	PSA, Spectrum Analyzer, (installed options, 111, 115, 123, 1DS, B7J, HYX,	E4446A	2139	06-Jan-11
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB7	1756	16-Mar-11
Hewlett Packard	EMC Spectrum Analyzer, 9 kHz - 6.5 GHz	8595EM	780	05-Jan-11