Radio Test Report R79119

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

MANUFACTURER: Summit Data Communications, Inc

MODEL(s): SDC-MSD30AG

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	M Briggs	27-Apr-10	First release
2	M Briggs	17-May-10	Added photograph of connector on the module. Added hardware revision: MSD30AG Rev G
3	M Briggs	1-Jun-10	Combined antenna power data for W52 and W53 bands to give one value for both bands. Corrected spelling errors.

Table of Contents

Client:	Summit Data Communications, Inc	Job Number:	J78216
Model:	SDC-MSD30AG	T-Log Number:	T78635
		Account Manager:	Pam Tucker
Standard:	Japanese Radio Law - Item 19 of Article 12	Contact:	Jerry Pohmurski

Client:	Summit Data Communications, Inc	Job Number:	J78216
Model:	SDC-MSD30AG	T-Log Number:	T78635
		Account Manager:	Pam Tucker
Standard:	Japanese Radio Law - Item 19 of Article 12	Contact:	Jerry Pohmurski

Scope

Testing has been perfromed 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

The Summit Data Communciation model SDC-MSD30AG is a 802.11abg module for installation by system integrators.
The serial number of the sample tested was 1000FC5
The hardware version of the device tested was MSD30AG Rev G

EUT Software

Summit Client Utility (SCU) - Driver V3.01.13, SCU V2.03.42
Summit Regulatory Utility (SRU) - V3.1.13

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
Rel. Humidity:	20-75 %
Pressure:	86-106 kPa

Product Information

The Summit Data Communications, Inc model SDC-MSD30AG is an 802.11abg module. The module was tested using an HP iPaq PDA with the EUT installed onto an extender card.
The serial number of the sample tested was 1000FC5

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 photogrpahs below, rf circuitry is not accesible 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 bands	-	Label on device indicating “For indoor use only”	Module designed for indoor use only. Labeled correctly	Pass

Client:	Summit Data Communications, Inc	Job Number:	J78216
Model:	SDC-MSD30AG	T-Log Number:	T78635
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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

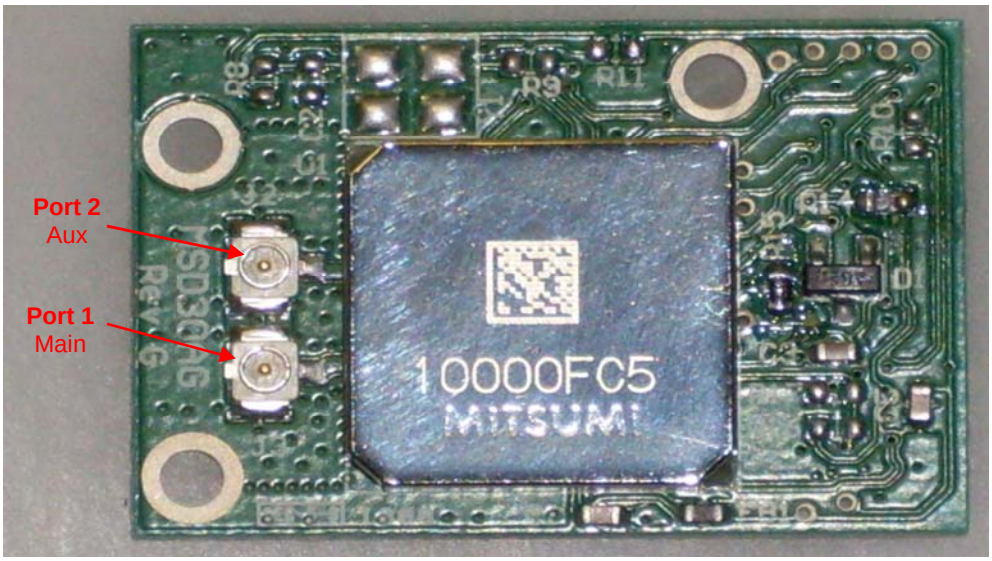
Testing performed at voltage extremes, as the regulator and regulator information is not accessible.

RF Accessibility (Article 2, Item (19) Notice 88 Appendix 43, 44, 45)

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).



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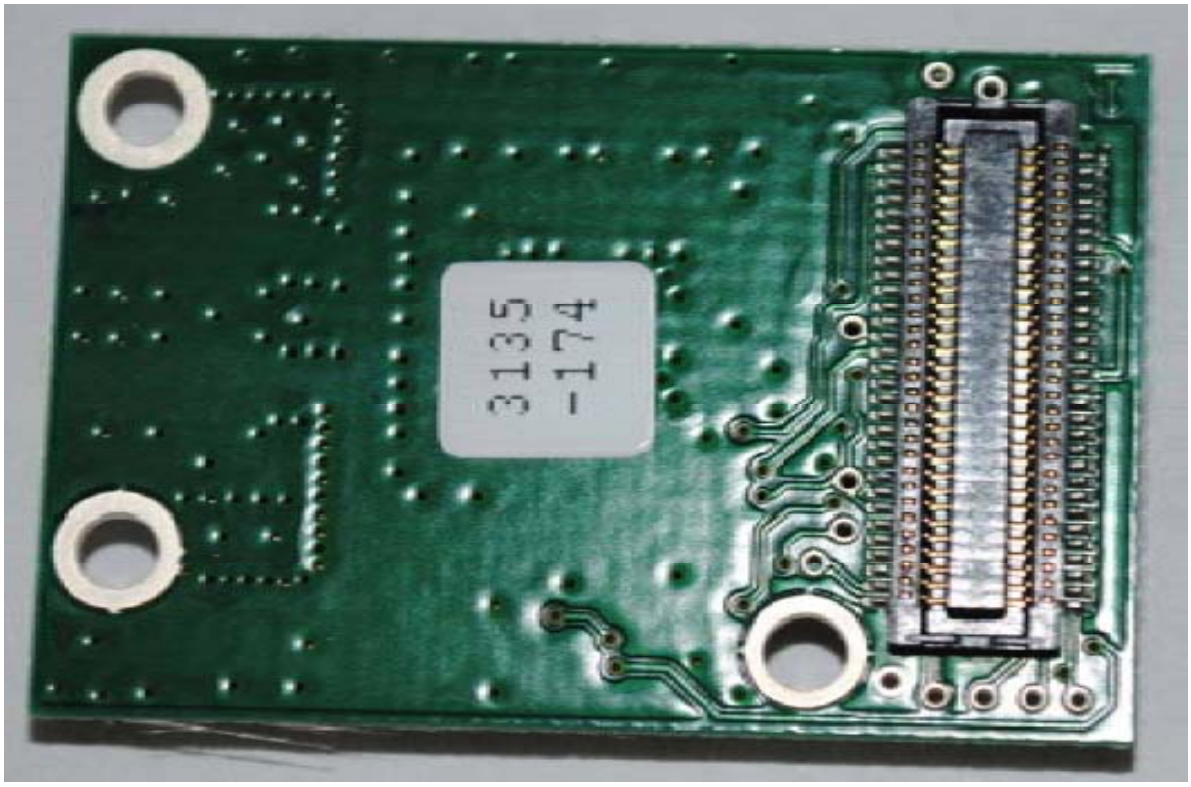
Module Connector

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 a connector found on the back-side of the circuit board, see photograph below.



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."

Elliott An NTS company

Antenna Gain and Patterns

Client:	Summit Data Communications, Inc	Job Number:	J78216
Model:	SDC-MSD30AG	T-Log Number:	T78635
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Antenna Gain(s)

Antenna	Mode	Requirement	Measurement	Result
Huber+Suhner, SOA 2459/360/5/0/V_C	802.11a	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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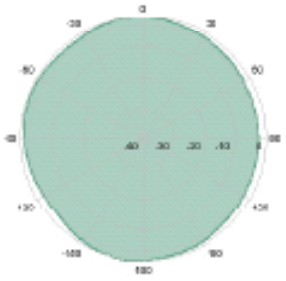
Huber+Suhner, SOA 2459/360/5/0/V_C

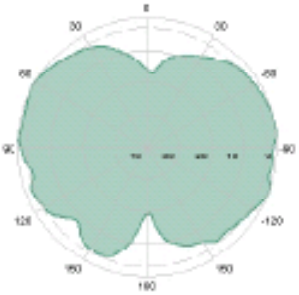
Band	Gain
W52	6.5dBi
W53	6.5dBi

HUBER+SUHNER®
SENCITY® ANTENNA
FOR WIRELESS COMMUNICATION

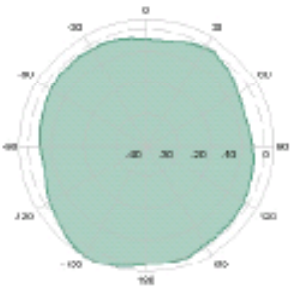
SOA 2459/360/5/0/V_C



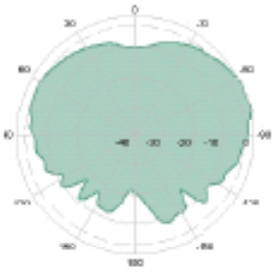
Horizontal 2450MHz



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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RF Technology
9100 Herisau, Switzerland
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Antenna Gain and Patterns

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Larsen, R380.500.314

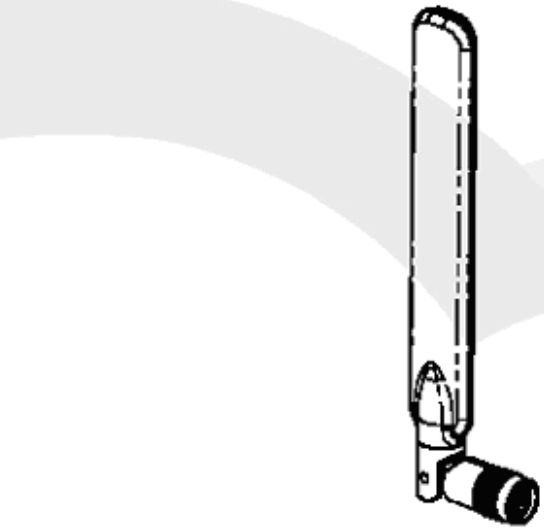
Band	Gain
W52	5.0dBi
W53	5.0dBi

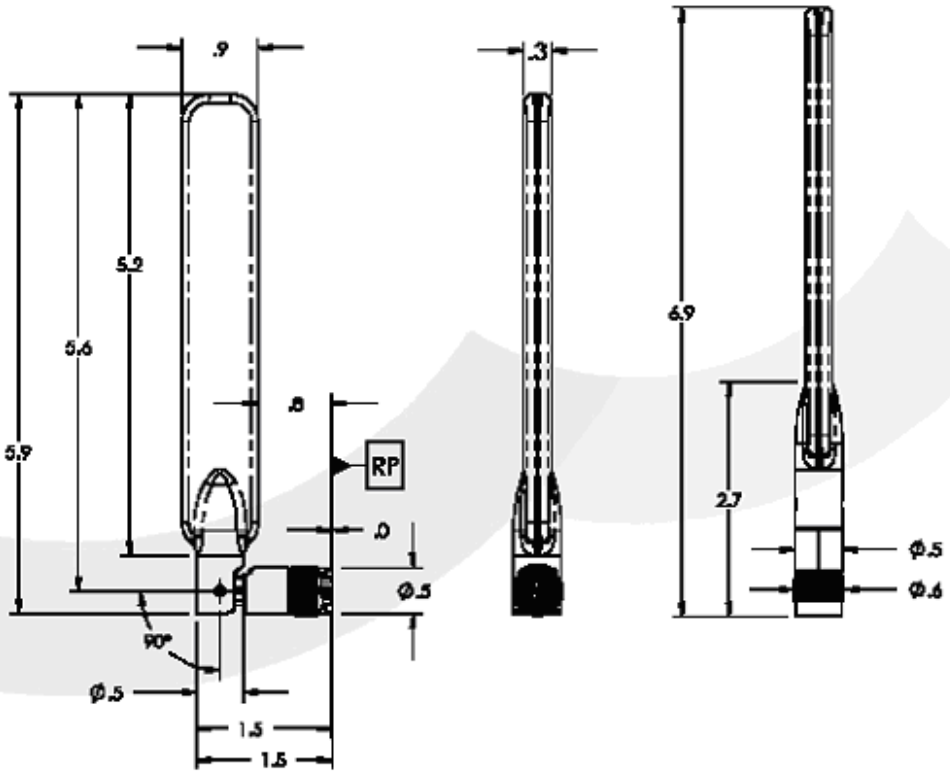
Dual Band Swivel Mount Dipole RP-TNC Blade

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

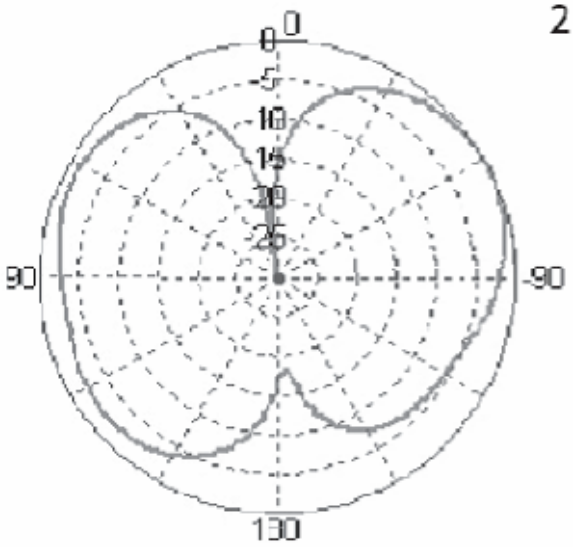
R380.500.314

Series : **ANTENNA**

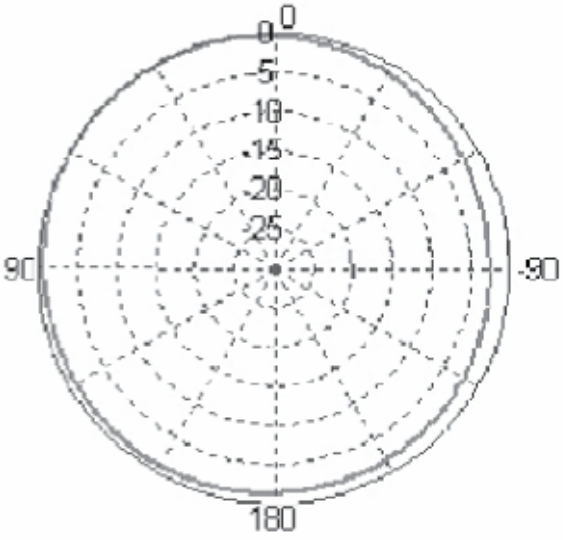
Pattern Data

E-PLANE

2 GHz

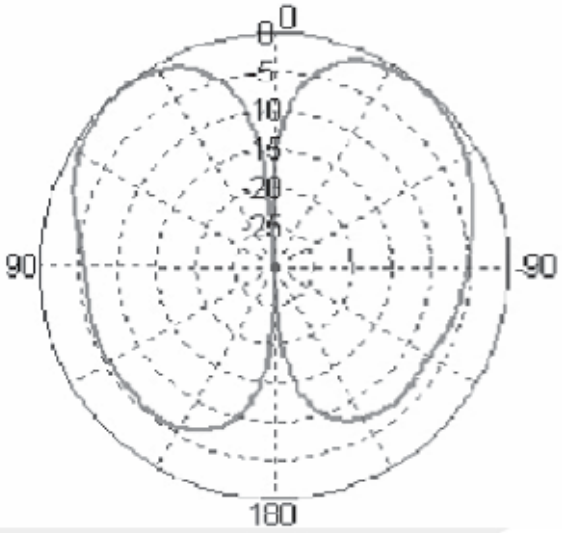


H-PLANE

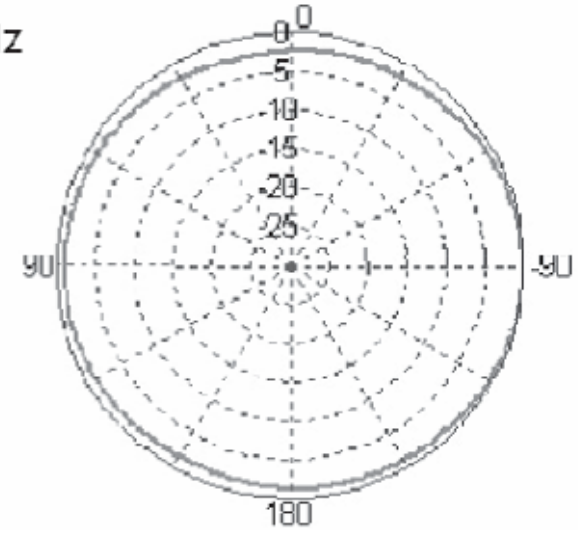


E-PLANE

5 GHz



H-PLANE



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Antenna Gain and Patterns

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Cisco Air-Ant 5135

Band	Gain
W52	3.5dBi
W53	3.5dBi

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

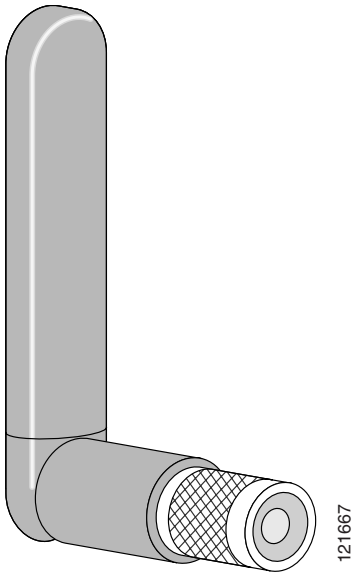
This document outlines the specifications and describes the Cisco Aironet 3.5-dBi Articulated Dipole Antenna. The antenna operates in the 5-GHz frequency band and is designed for use with Cisco Aironet 5-GHz radio products using a reverse-polarity Neil Councilman connector (RP-TNC).

The following information is provided in this document.

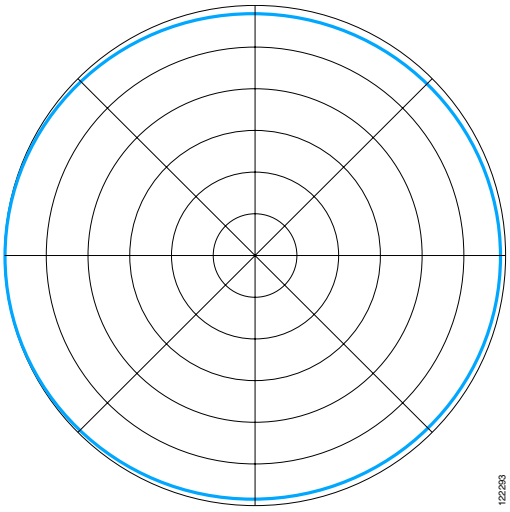
Corporate Headquarters:
Cisco Systems, Inc., 170 West Tasman Drive, San Jose, CA 95134-1706 USA

Technical Specifications

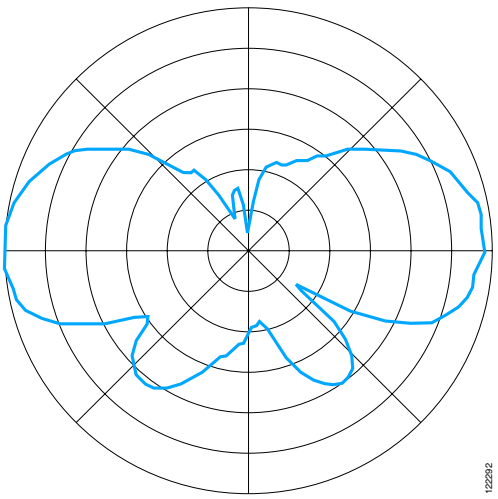
Antenna type	Dipole
Operating frequency range	5150 – 5850 MHz
Nominal input impedance	50Ω
2:1 VSWR bandwidth	5150 – 5850 MHz
Gain	3.5 dBi
Polarization	Linear, vertical
E-plane 3-dB beamwidth	40 degrees
H-plane 3-dB beamwidth	Omnidirectional
Connector type	RP-TNC plug
Length	5.3 in. (13.4 cm)
Radome length	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

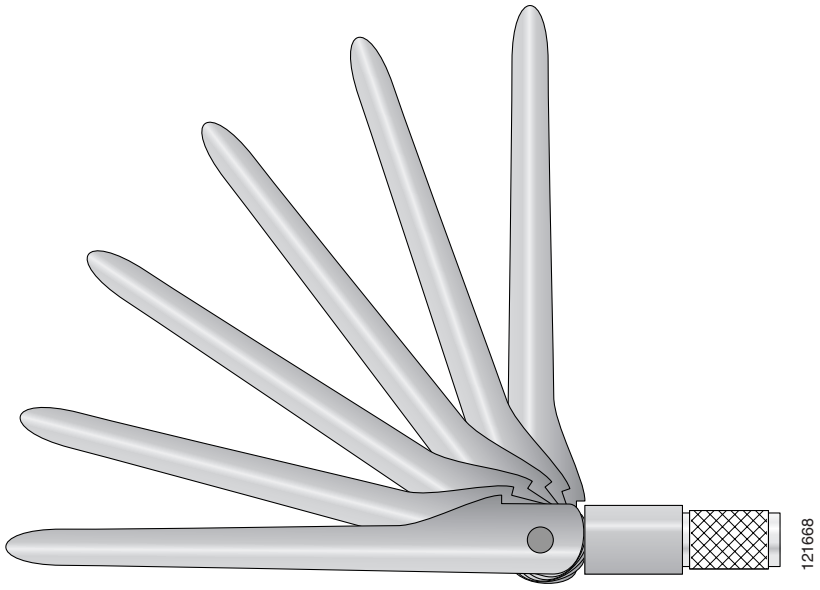


System Requirements

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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San Jose, CA 95134-9883

We appreciate your comments.

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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

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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:

http://www.cisco.com/warp/public/687/Directory/DirTAC.shtml

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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.

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  http://www.cisco.com/en/US/products/products_catalog_links_launch.html

- 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

Elliott An NTS company

Radio Test Data - Transmitter Parameters

Client:	Summit Data Communications, Inc	Job Number:	J78216
Model:	SDC-MSD30AG	T-Log Number:	T78635
		Account Manager:	Pam Tucker
Standard:	Japanese Radio Law - Item 19 of Article 12	Contact:	Jerry Pohmurski

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	-	20ppm or better	5.36 ppm	Pass
Occupied bandwidth	802.11a	18MHz or less	16.80 MHz	Pass
Spurious Emissions	802.11a	< 5140MHz : 2.5µW / MHz > 5360MHz : 2.5µW / MHz	0.014 uW/MHz (-48.4 dBm/MHz)	Pass
EIRP in adjacent bands - W52	802.11a	Refer to masks	Complies with eirp mask	Pass
EIRP in adjacent bands - W53	802.11a	Refer to masks	Complies with eirp mask	Pass
Antenna power W52 and W53 bands (OFDM Modulation)	802.11a	20MHz channel: ≤ 10mW/MHz 40MHz channel: ≤ 5mW/MHz	Rated Power: 1.52 mW/MHz Deviation -43.5 % to -16.5 %	Pass
Equivalent isotropically radiated power W52 band	802.11a	20MHz channel: ≤ 10mW/MHz 40MHz channel: ≤ 5mW/MHz	5.7mW/MHz (Antenna Gain = 6.5dBi)	Pass
Equivalent isotropically radiated power W53 band	802.11a	20MHz channel: ≤ 10mW/MHz 40MHz channel: ≤ 5mW/MHz TPC required if EIRP>5mW/MHz	5.2mW/MHz (Antenna Gain = 6.5dBi)	Pass
Adjacent channel leakage power - W52 Band	802.11a, HT20 and HT40	±9MHz bandwidth at 20MHz detuning : -25dB ±9MHz bandwidth at 40MHz detuning: -40dBc	20MHz detuning: -28.5dBc 40MHz detuning: -53.6dBc	Pass
Adjacent channel leakage power - W53 Band			20MHz detuning: -29.1 dBc 40MHz detuning: -52.5 dBc	Pass
Transmission burst length	802.11a, HT20 and HT40	4ms or less	2.08ms	Pass
Carrier separation / number of carriers per MHz	802.11a, HT20 and HT40	More than 1 carrier per MHz	Carrier spacing is 312.5kHz so at least 2 carriers per MHz	Pass

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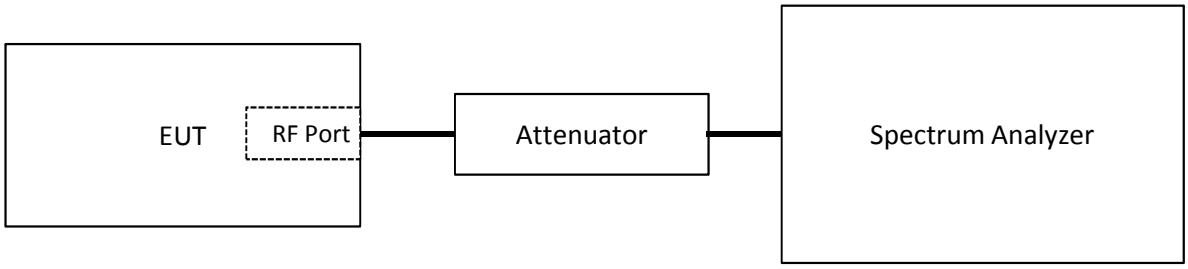
		Account Manager:	Pam Tucker
Standard:	Japanese Radio Law - Item 19 of Article 12	Contact:	Jerry Pohmurski

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	Duty Cycle	Transmission cycle
Mb/s	%	ms
6	99.3	2.06
54	94.5	0.254

Radio Test Data - Transmitter Parameters

Client:	Summit Data Communications, Inc	Job Number:	J78216
Model:	SDC-MSD30AG	T-Log Number:	T78635
		Account Manager:	Pam Tucker
Standard:	Japanese Radio Law - Item 19 of Article 12	Contact:	Jerry Pohmurski

Run #1: Frequency Error

Date of Test: 3/31/2010 Test Engineer: Mehran Birgani

Test Location: Radio Lab

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 measuring the frequency of the suppressed carrier at the center of the modulation envelope, observed by reducing the resolution bandwidth.

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	5180.023050	5180.026420	5180.027780	4.45	5.10	**5.36**
Center Channel	5240.021350	5240.021680	5240.025580	4.07	4.14	4.88
High Channel	5320.023810	5320.027250	5320.027780	4.48	5.12	5.22
				Requirement (ppm):		**20.0**

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, Inc	Job Number:	J78216
Model:	SDC-MSD30AG	T-Log Number:	T78635
		Account Manager:	Pam Tucker
Standard:	Japanese Radio Law - Item 19 of Article 12	Contact:	Jerry Pohmurski

Run #2: Occupied bandwidth

Date of Test: 3/31/2010 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)	36-63 MHz	≤ 540kHz	300kHz	Sample detector, averaging (10 sweeps)[2], sweep time auto[1]	≤ 18.0MHz

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% Pwr 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		16.78	
5180	802.11a	Main		54Mb/s		16.78	
5180	802.11a	Aux		6 Mb/s		16.78	

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	802.11a	Main		6 Mb/s	16.80	16.78	16.75
5200	802.11a	Main		6 Mb/s	16.78	**16.80**	16.75
5240	802.11a	Main		6 Mb/s	16.80	16.78	16.75
5260	802.11a	Main		6 Mb/s	16.78	16.78	16.78
5300	802.11a	Main		6 Mb/s	16.78	16.78	16.78
5320	802.11a	Main		6 Mb/s	16.78	16.78	16.78

Maximum 99% bandwidth: 16.80 MHz

Radio Test Data - Transmitter Parameters

Client:	Summit Data Communications, Inc	Job Number:	J78216
Model:	SDC-MSD30AG	T-Log Number:	T78635
		Account Manager:	Pam Tucker
Standard:	Japanese Radio Law - Item 19 of Article 12	Contact:	Jerry Pohmurski

Run #3: Spurious and unwanted emissions

Run #3a Out of band Emissions

Date of Test: 4/7/2010 Test Engineer: Mehran Birgani

Test Location: Radio Lab

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).

Frequency MHz	Level dBm	Antenna Port	Limit	Margin	Detector	Comments	Operating Voltage	Operating Channel	
6905.97	**-48.4**	Main	-26.0	**-22.4**	Peak	0.014 uW	3.3	36	

Antenna ports tested were both main and aux ports, worst case result is reported.

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 multiple chains equal to 10log(n), where n is the number of transmit chains, is applied 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 **0.05 ms**

Frequency (MHz)		Bandwidth (MHz)		Sweep Time
Start	Stop	RB	VB	(Minimum)
30	1000	1	1	49 ms
1000	5140	1	1	207 ms
5360	10000	1	1	232 ms
10000	26500	1	1	825 ms
5340	5360	1	1	1 ms
5140	5360	1	1	11 ms

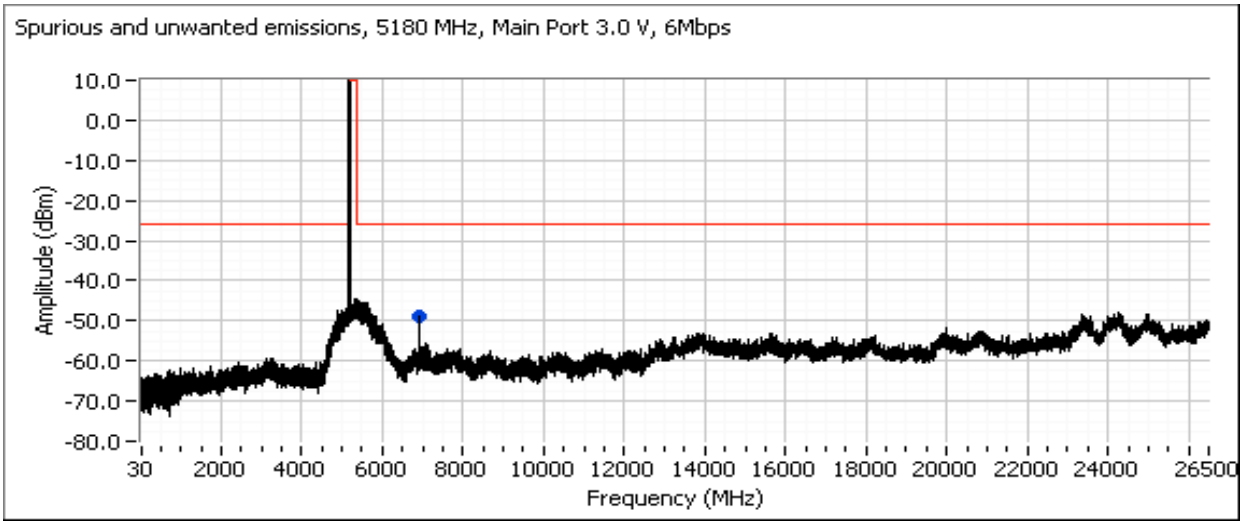
The device transmits continuously so the analyzer sweep time is auto-coupled.

Radio Test Data - Transmitter Parameters

Client:	Summit Data Communications, Inc	Job Number:	J78216
Model:	SDC-MSD30AG	T-Log Number:	T78635
		Account Manager:	Pam Tucker
Standard:	Japanese Radio Law - Item 19 of Article 12	Contact:	Jerry Pohmurski

802.11a mode

Frequency MHz	Level dBm	Antenna Port	Limit	Margin	Detector	Comments	Operating Voltage	Operating Channel	
6905.97	**-48.4**	Main	-26.0	**-22.4**	Peak		3.3	36	6Mbps
6905.97	-48.5	Aux	-26.0	-22.5	Peak		3.3	36	54Mbps
6905.97	-48.7	Main	-26.0	-22.7	Peak		3.0	36	6Mbps
6905.97	-48.7	Main	-26.0	-22.7	Peak		3.3	36	54Mbps
6905.97	-49.0	Main	-26.0	-23.0	Peak		3.6	36	6Mbps
6905.97	-49.1	Main	-26.0	-23.1	Peak		3.0	36	54Mbps
6905.97	-49.1	Aux	-26.0	-23.1	Peak		3.3	36	6Mbps
6934.14	-49.1	Main	-26.0	-23.1	Peak		3.3	48	6Mbps
6905.97	-49.2	Main	-26.0	-23.2	Peak		3.6	36	54Mbps
6934.14	-49.3	Main	-26.0	-23.3	Peak		3.3	40	6Mbps
10362.95	-50.0	Aux	-26.0	-24.0	Peak		3.3	36	6Mbps
7014.34	-51.4	Main	-26.0	-25.4	Peak		3.3	52	6Mbps
10357.45	-52.9	Aux	-26.0	-26.9	Peak		3.3	36	54Mbps
7092.36	-53.0	Main	-26.0	-27.0	Peak		3.3	64	6Mbps
7066.36	-53.1	Main	-26.0	-27.1	Peak		3.3	60	6Mbps
10356.45	-54.1	Aux	-26.0	-28.1	Peak		3.3	36	54Mbps



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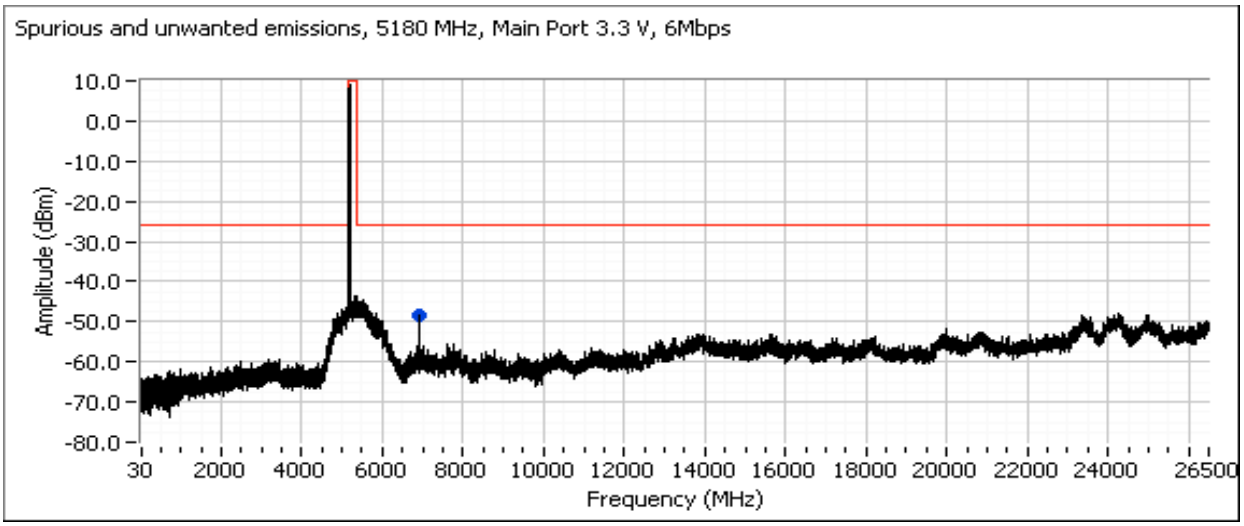
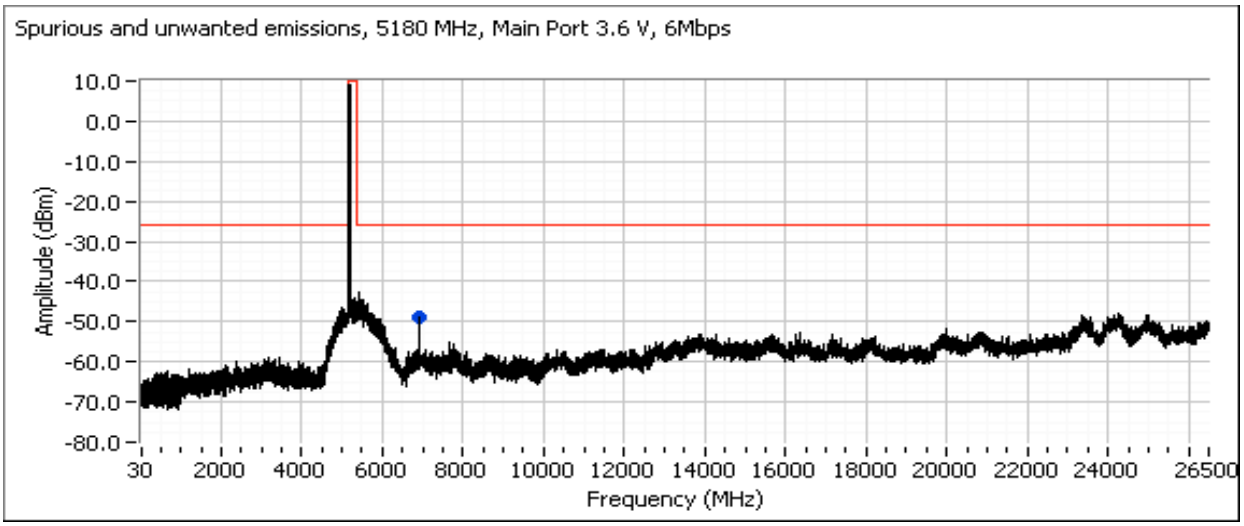
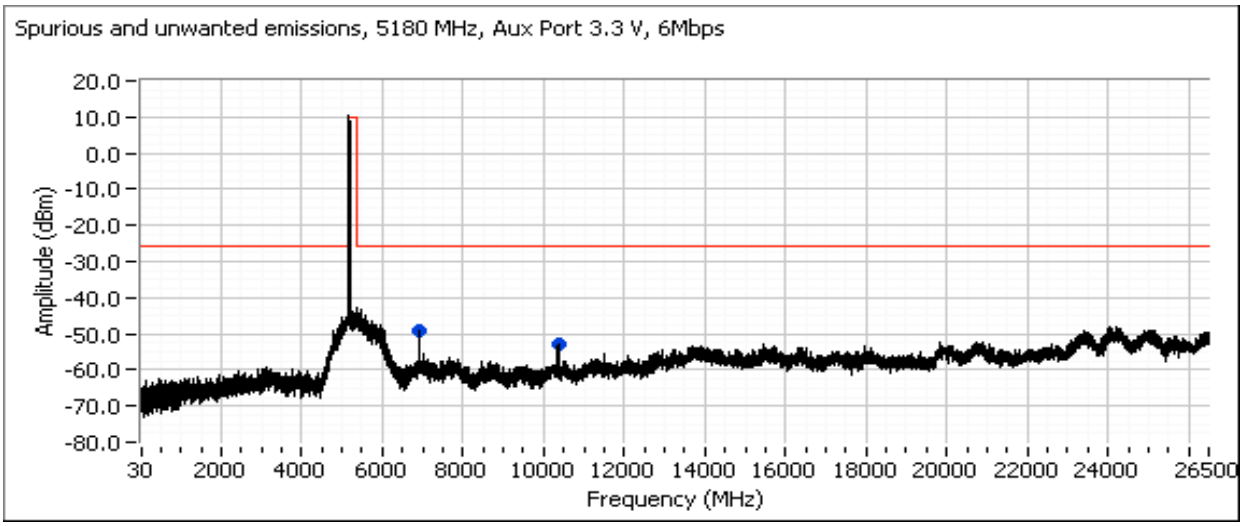
Radio Test Data - Transmitter Parameters

Client:	Summit Data Communications, Inc	Job Number:	J78216
Model:	SDC-MSD30AG	T-Log Number:	T78635
		Account Manager:	Pam Tucker
Standard:	Japanese Radio Law - Item 19 of Article 12	Contact:	Jerry Pohmurski

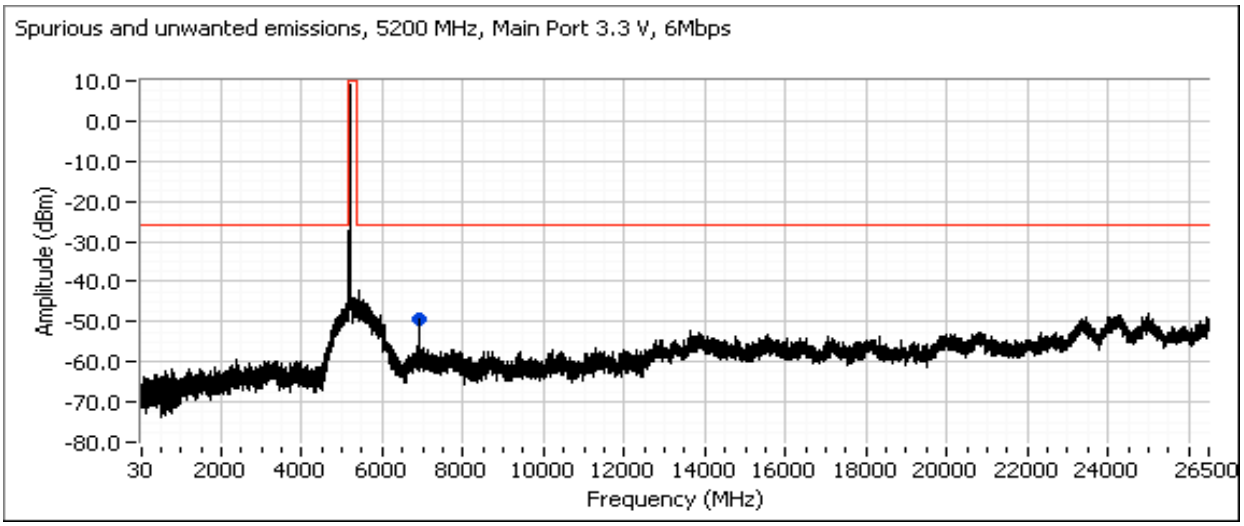


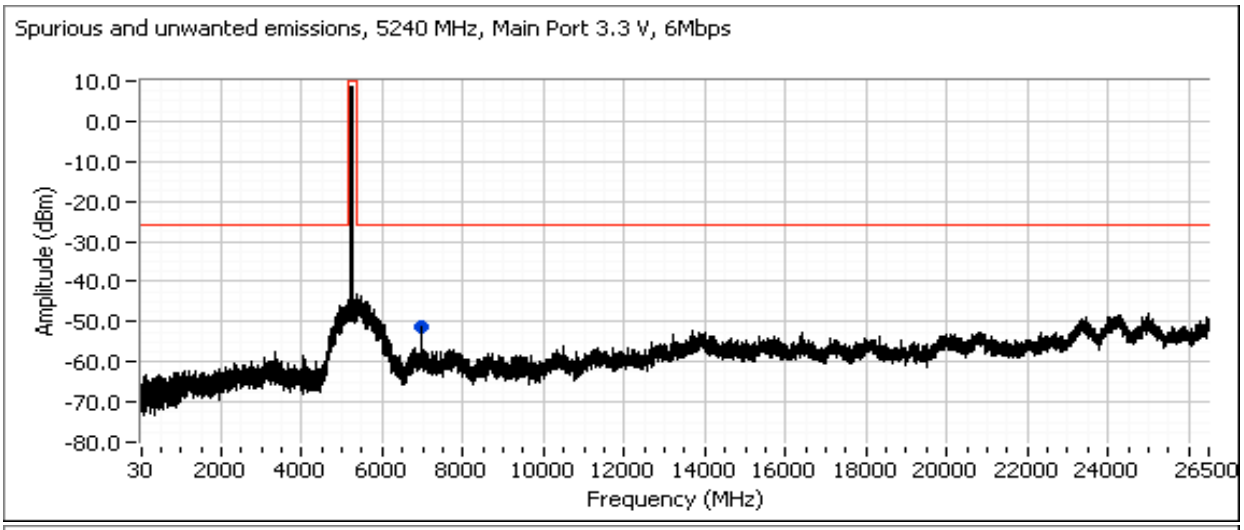


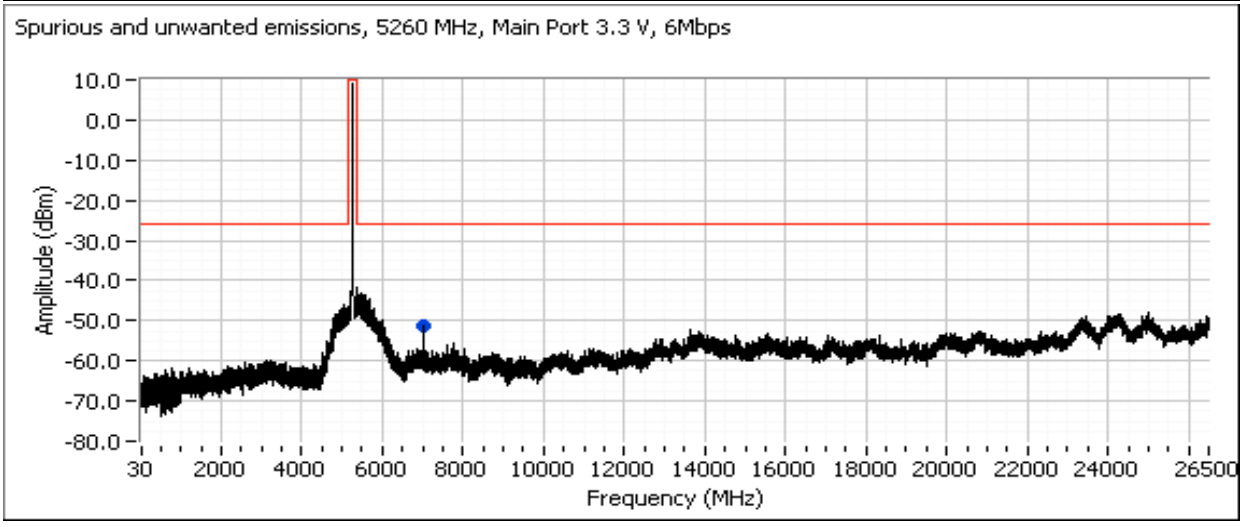


Radio Test Data - Transmitter Parameters

Client:	Summit Data Communications, Inc	Job Number:	J78216
Model:	SDC-MSD30AG	T-Log Number:	T78635
		Account Manager:	Pam Tucker
Standard:	Japanese Radio Law - Item 19 of Article 12	Contact:	Jerry Pohmurski

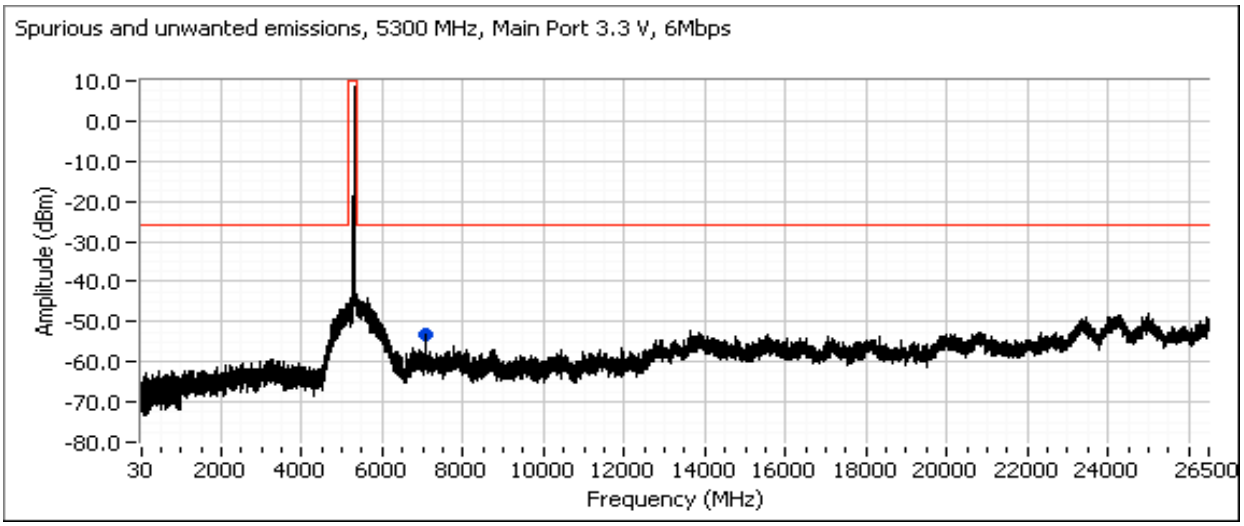


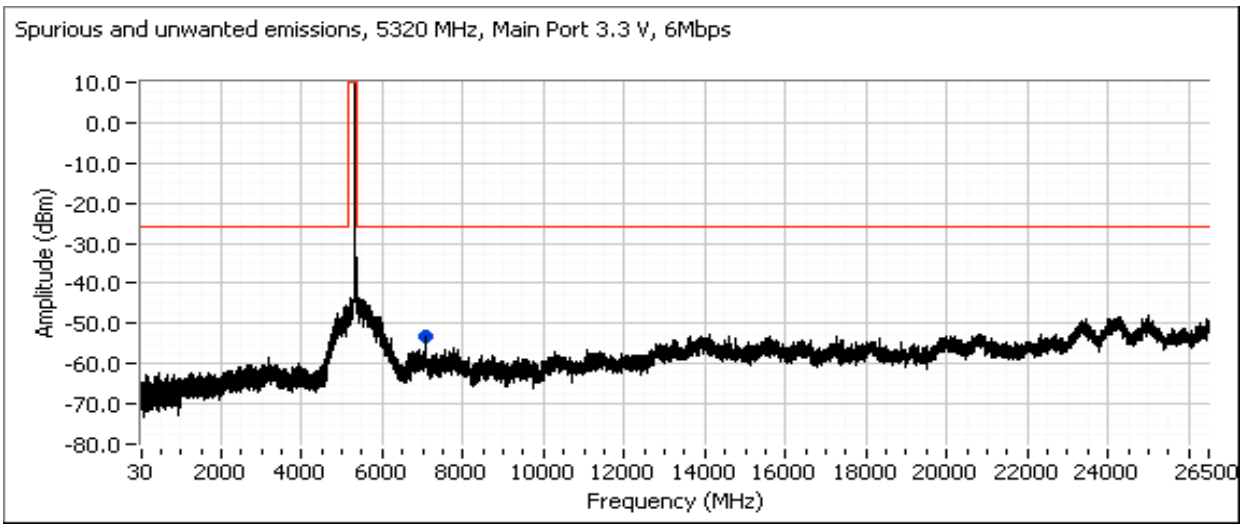




Radio Test Data - Transmitter Parameters

Client:	Summit Data Communications, Inc	Job Number:	J78216
Model:	SDC-MSD30AG	T-Log Number:	T78635
		Account Manager:	Pam Tucker
Standard:	Japanese Radio Law - Item 19 of Article 12	Contact:	Jerry Pohmurski





Final (Zero-Span) measurement

Measurements are made only on those frequencies that exceed the limit during the preliminary measurements and at the operating voltage that produced the highest emission level. As there were no emissions above the limit during the preliminary (peak) scan, no final measurements were required.

Radio Test Data - Transmitter Parameters

Client:	Summit Data Communications, Inc	Job Number:	J78216
Model:	SDC-MSD30AG	T-Log Number:	T78635
		Account Manager:	Pam Tucker
Standard:	Japanese Radio Law - Item 19 of Article 12	Contact:	Jerry Pohmurski

Run #3b Adjacent Band EIRP

Date of Test: 4/7/2010 Test Engineer: Mehran Birgani

Test Location: Radio Lab

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 detector.

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 multiple chains equal to 10log(n), where n is the number of transmit chains, is applied to the test data for modes that support MIMO.

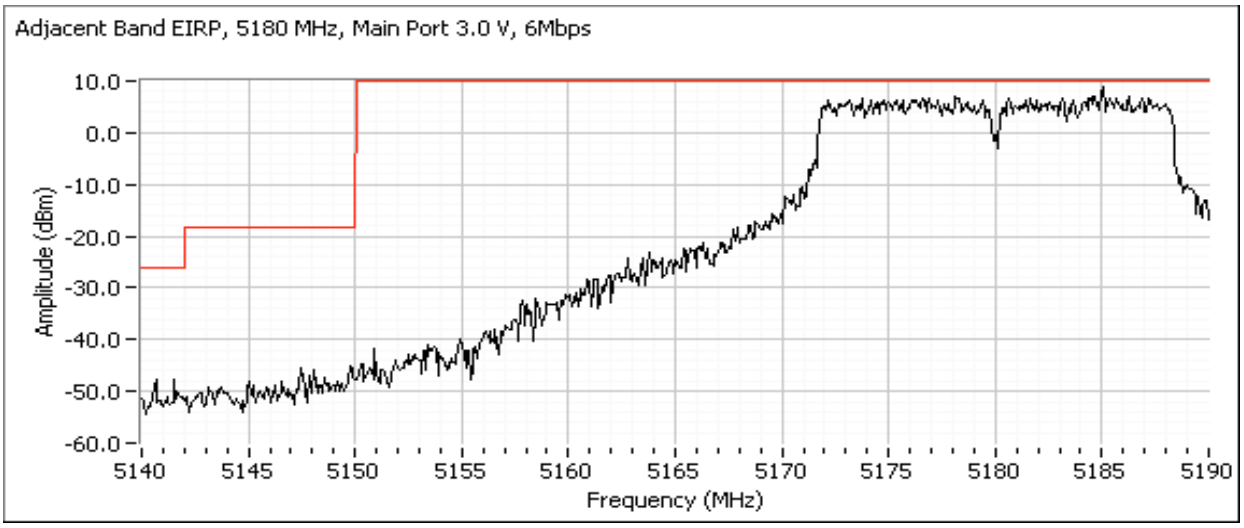
Correction factor applied as an offset to the test data

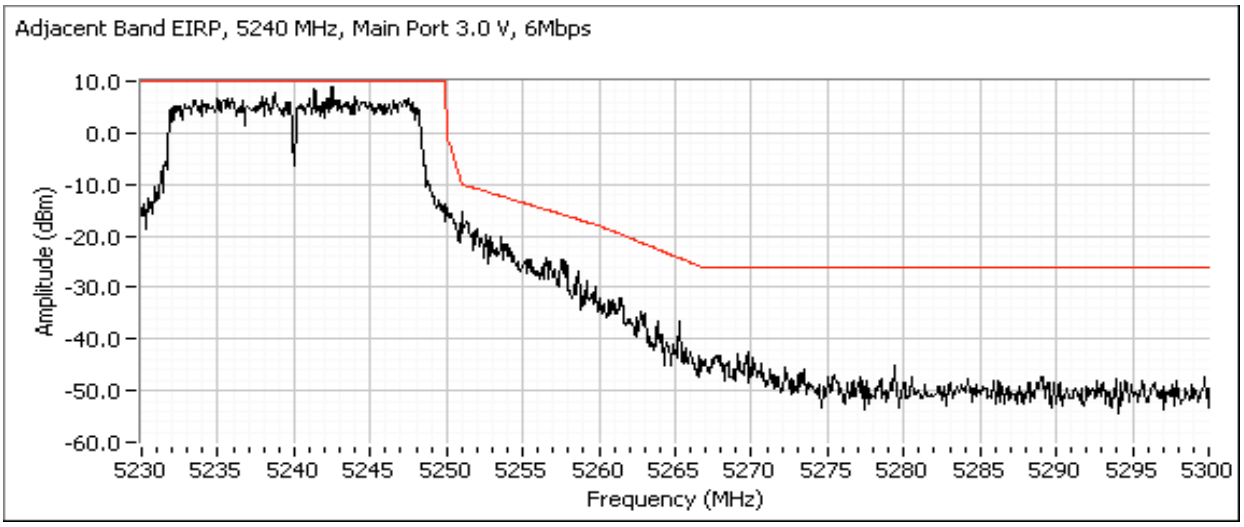
Mode	Band	Antenna Gain (max)	# of Chains	Total Offset (dB)
802.11a	W52	6.5 dBi	1	6.5
802.11a	W53	6.5 dBi	1	6.5

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.

Radio Test Data - Transmitter Parameters

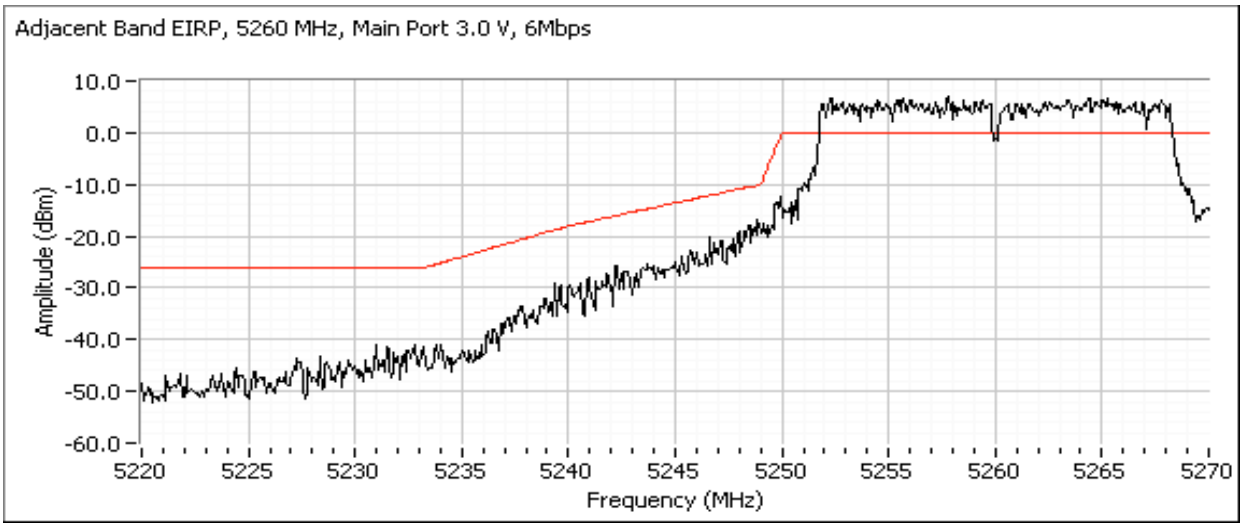
Client:	Summit Data Communications, Inc	Job Number:	J78216
Model:	SDC-MSD30AG	T-Log Number:	T78635
		Account Manager:	Pam Tucker
Standard:	Japanese Radio Law - Item 19 of Article 12	Contact:	Jerry Pohmurski

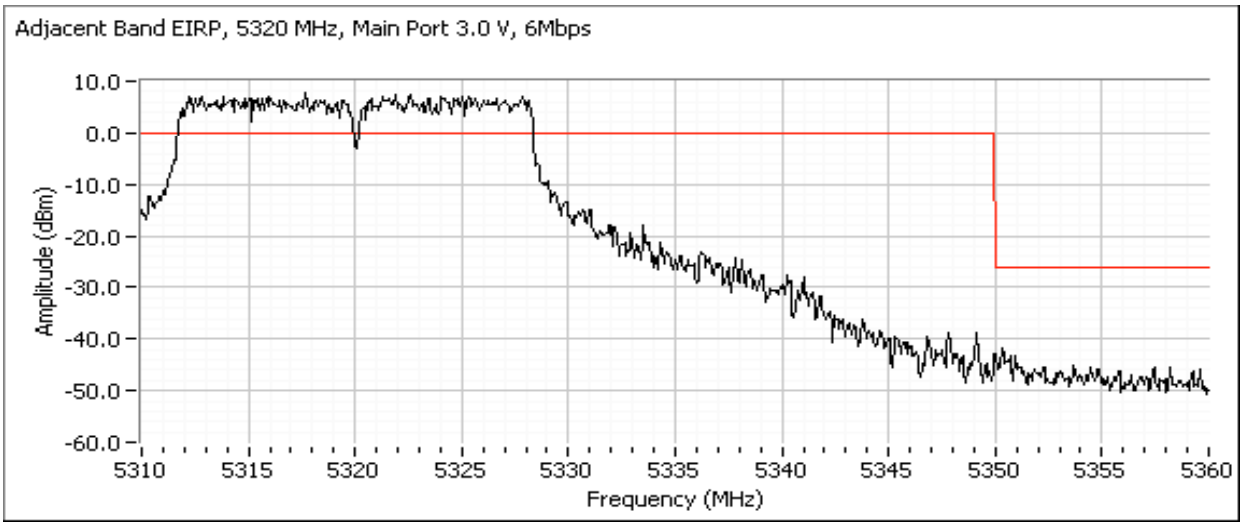




Radio Test Data - Transmitter Parameters

Client:	Summit Data Communications, Inc	Job Number:	J78216
Model:	SDC-MSD30AG	T-Log Number:	T78635
		Account Manager:	Pam Tucker
Standard:	Japanese Radio Law - Item 19 of Article 12	Contact:	Jerry Pohmurski





Final Measurements :

Instrument Settings: RB=VB=1MHz, Zero Span (Span = 0Hz), sample detector, single sweep and sweep time set to auto, or, if the device is not transmitting continuously, the sweep time is set to be at least 3 times the burst repetition frequency.

Measurements are made only on those frequencies that exceed the limit during the preliminary measurements and at the operating voltage that produced the highest emission level.

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

Radio Test Data - Transmitter Parameters

Client:	Summit Data Communications, Inc	Job Number:	J78216
Model:	SDC-MSD30AG	T-Log Number:	T78635
		Account Manager:	Pam Tucker
Standard:	Japanese Radio Law - Item 19 of Article 12	Contact:	Jerry Pohmurski

Run #4: Antenna Power

Date of Test: 4/7/2010 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	1.27 mw/MHz	1.01 mw/MHz	1.01 mw/MHz
5240	802.11a	Aux	-	6Mb/s	1.18 mw/MHz	1.03 mw/MHz	0.94 mw/MHz
5240	802.11a	Main	-	54Mb/s	1.16 mw/MHz	0.88 mw/MHz	0.86 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	-	6Mb/s	1.183 mw/MHz	0.877 mw/MHz	0.857 mw/MHz
5200	802.11a	Main	-	6Mb/s	1.156 mw/MHz	0.898 mw/MHz	0.877 mw/MHz
5240	802.11a	Main	-	6Mb/s	1.268 mw/MHz	1.007 mw/MHz	1.007 mw/MHz
5260	802.11a	Main	-	6Mb/s	1.104 mw/MHz	0.877 mw/MHz	0.857 mw/MHz
5280	802.11a	Main	-	6Mb/s	1.130 mw/MHz	0.877 mw/MHz	0.857 mw/MHz
5320	802.11a	Main	-	6Mb/s	1.156 mw/MHz	0.918 mw/MHz	0.898 mw/MHz

Nominal Output Power: **1.52 mw/MHz**
Lowest Output Power: **0.857 mw/MHz**
Highest Output Power: **1.268 mw/MHz** *Limit is 10mW/MHz*
Tolerance: **-43.5%** **to** **-16.5%**

Antenna Gain: **6.5 dBi**
EIRP: **5.7 mw/MHz** *Limit is 10mW/MHz* Using highest measured output power
6.8 mw/MHz Using nominal output power

Radio Test Data - Transmitter Parameters

Client:	Summit Data Communications, Inc	Job Number:	J78216
Model:	SDC-MSD30AG	T-Log Number:	T78635
		Account Manager:	Pam Tucker
Standard:	Japanese Radio Law - Item 19 of Article 12	Contact:	Jerry Pohmurski

Run #5: Adjacent Channel Leakage Power

Date of Test: 3/8/2010
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 Leakage ratio (CLR) shall be at least 25dB for the adjacent channels and at least 40dB for the alternate channels.

Operating Voltage: 3.0 V

Channel	Port / Chain	Channel power dBm	Adjacent Channel			Alternate Channel		
			Low dBm	High dBm	CLR dB	Low dBm	High dBm	CLR dB
5180	Main	20.7	-8.5	-7.8	**28.5**	-35.16	-34.3	55.0
5200	Main	20.4	-9.4	-8.8	29.2	-35.0	-34.6	55.0
5240	Main	20.3	-9.2	-8.7	29.0	-33.9	-33.5	**53.8**
5260	Main	20.1	-9.1	-9.1	29.2	-33.4	-32.5	52.6
5280	Main	20.0	-9.4	-9.0	**29.1**	-33.2	-32.5	**52.5**
5320	Main	20.4	-9.5	-9.5	29.9	-33.8	-32.3	52.7

Operating Voltage: 3.3 V

Channel	Port / Chain	Channel power dBm	Adjacent Channel			Alternate Channel		
			Low dBm	High dBm	CLR dB	Low dBm	High dBm	CLR dB
5180	Main	19.3	-11.2	-11.0	30.3	-35.2	-34.5	53.8
5200	Main	19.2	-11.5	-11.0	**30.2**	-34.6	-34.5	**53.7**
5240	Main	19.2	-11.2	-11.3	30.4	-34.7	-34.6	53.7
5260	Main	19.4	-11.7	-11.7	31.1	-33.9	-33.8	53.1
5280	Main	19.5	-11.4	-11.2	**30.7**	-34.3	-33.3	**52.9**
5320	Main	19.7	-11.8	-11.8	31.4	-34.3	-33.4	53.0

Operating Voltage: 3.6 V

Channel	Port / Chain	Channel power dBm	Adjacent Channel			Alternate Channel		
			Low dBm	High dBm	CLR dB	Low dBm	High dBm	CLR dB
5180	Main	19.5	-10.6	-11.0	30.1	-35.6	-34.8	54.3
5200	Main	19.2	-11.7	-11.3	30.5	-35.2	-34.4	**53.6**
5240	Main	18.8	-11.3	-11.8	**30.1**	-34.8	-34.8	53.6
5260	Main	19.2	-11.6	-11.9	30.8	-34.4	-33.7	52.9
5280	Main	19.2	-11.6	-11.3	**30.5**	-34.4	-33.6	**52.8**
5320	Main	19.7	-11.9	-11.4	31.1	-34.6	-33.6	53.3

Radio Test Data - Transmitter Parameters

Client:	Summit Data Communications, Inc	Job Number:	J78216
Model:	SDC-MSD30AG	T-Log Number:	T78635
		Account Manager:	Pam Tucker
Standard:	Japanese Radio Law - Item 19 of Article 12	Contact:	Jerry Pohmurski

Run #6: Burst Transmission Duration

Date of Test: 3/8/2010
Test Location: Radio Lab

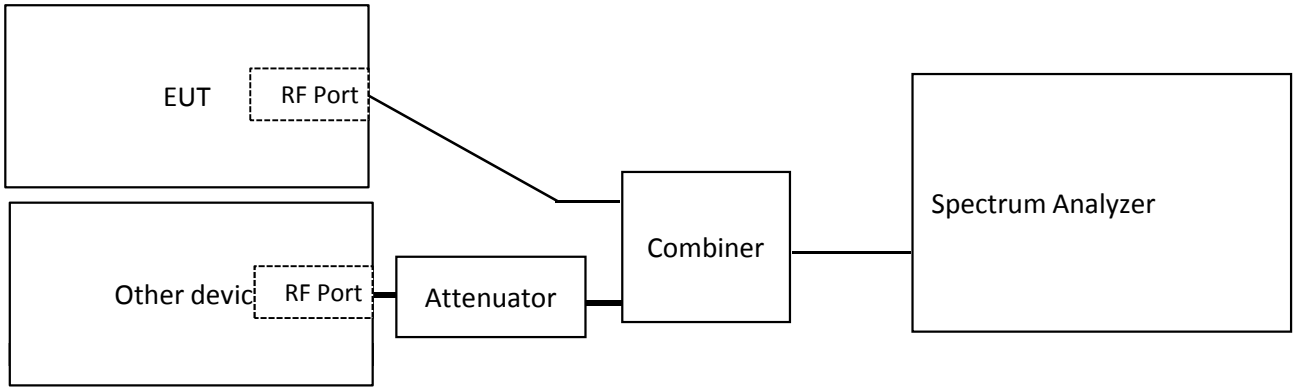
Test Engineer: Mehran Birgani

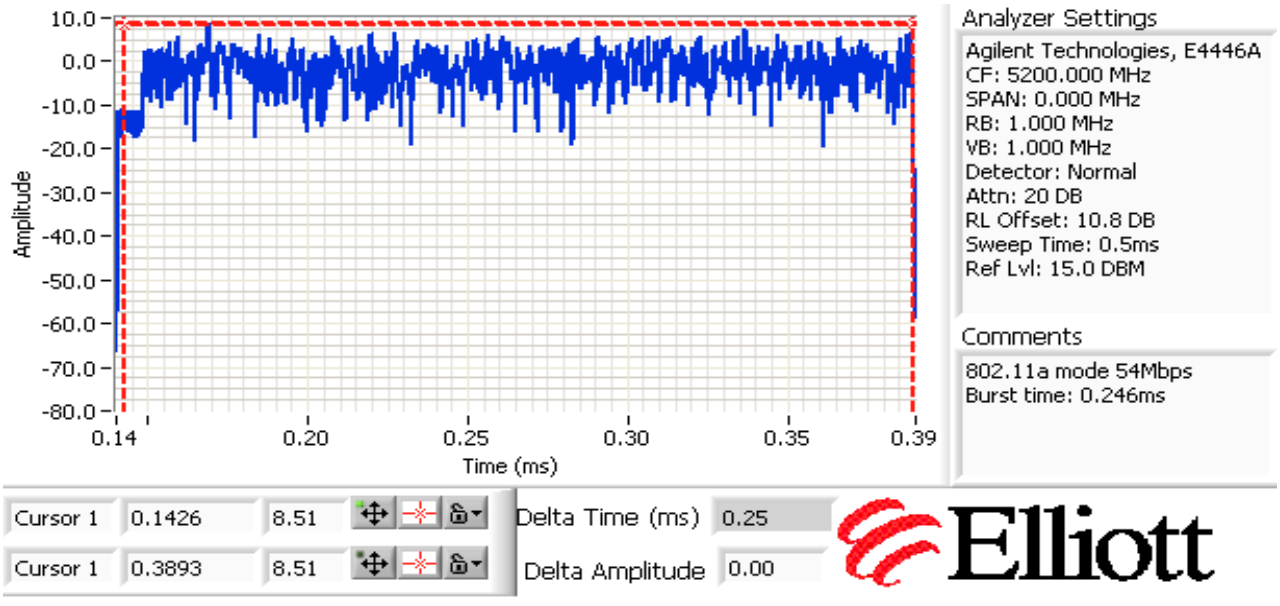
Requirement

The maximum transmission burst length is limited to 4ms.

Measurement method

The device was configured to transmit maximum length packets at the fastest and slowest data rates (54Mb/s and 6Mb/s).
The longest transmitted burst was at 6Mb/s and was 2.07ms in duration.

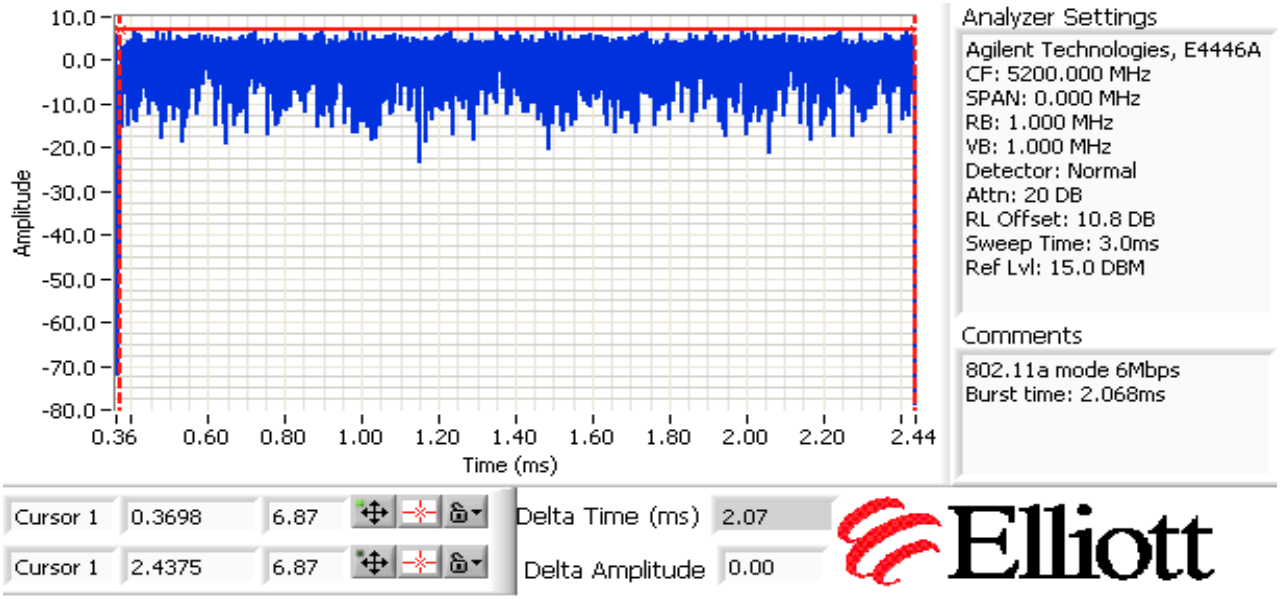




Maximum burst time, data rate = 54Mb/s

Radio Test Data - Transmitter Parameters

Client:	Summit Data Communications, Inc	Job Number:	J78216
Model:	SDC-MSD30AG	T-Log Number:	T78635
		Account Manager:	Pam Tucker
Standard:	Japanese Radio Law - Item 19 of Article 12	Contact:	Jerry Pohmurski



Maximum burst time, data rate = 6Mb/s

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Radio Test Data - Receiver

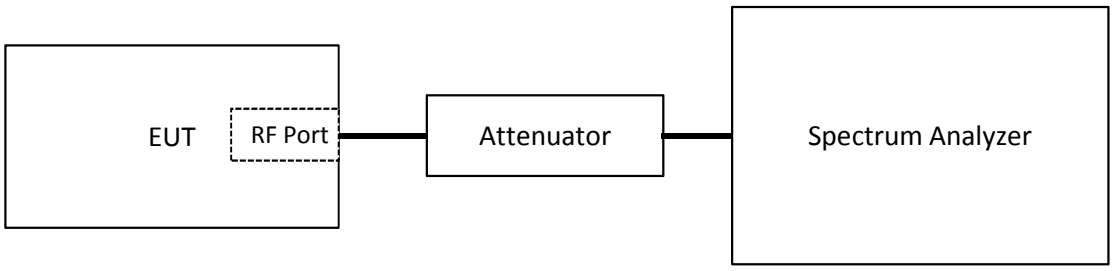
Client:	Summit Data Communications, Inc	Job Number:	J78216
Model:	SDC-MSD30AG	T-Log Number:	T78635
		Account Manager:	Pam Tucker
Standard:	Japanese Radio Law - Item 19 of Article 12	Contact:	Jerry Pohmurski

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)	802.11a	< 1GHz : 4nW 1GHz - 26.50GHz : 20nW	< 1GHz: 0.03nW > 1GHz: 0.2nW	Pass
Interference prevention function	802.11a	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)	802.11a	Shall not transmit radio wave when receiving over 100mV/m	Threshold > 96.9 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

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Radio Test Data - Receiver

Client:	Summit Data Communications, Inc	Job Number:	J78216
Model:	SDC-MSD30AG	T-Log Number:	T78635
		Account Manager:	Pam Tucker
Standard:	Japanese Radio Law - Item 19 of Article 12	Contact:	Jerry Pohmurski

Run #1 Secondary Radiated Emissions

Date of Test: 4/1/2010
Test Location: Radio Lab

Test Engineer: Mehran Birgani

Test Requirements						
Frequency Range (MHz)	Limit					
	Single Chain		2x2 MIMO, per Chain		3x3 MIMO, per Chain	
	nW	dBm/MHz	uW/MHz	dBm/MHz	uW/MHz	dBm/MHz
30 - 1000	4.0	-54.0	2.0	-57.0	1.3	-58.8
1000 - 26500	20.0	-47.0	10.0	-50.0	6.7	-51.8

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	0.03	RF Port	4.0	-20.8	Peak	Highest level below 1GHz	3.3	40	
1000-26500	0.20	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

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Radio Test Data - Receiver

Client:	Summit Data Communications, Inc	Job Number:	J78216
Model:	SDC-MSD30AG	T-Log Number:	T78635
		Account Manager:	Pam Tucker
Standard:	Japanese Radio Law - Item 19 of Article 12	Contact:	Jerry Pohmurski

Frequency MHz	Level dBm	Antenna Port	Limit	Margin	Detector	Comments	Operating Voltage	Operating Channel
3453.820	-67.0	RF Port	-47.0	**-20.0**	Peak	0.20 nW	3.3	36
3466.660	-67.3	RF Port	-47.0	-20.3	Peak		3.3	40
3547.350	-67.3	RF Port	-47.0	-20.3	Peak		3.3	64
3507.000	-67.6	RF Port	-47.0	-20.6	Peak		3.3	52
3532.680	-67.6	RF Port	-47.0	-20.6	Peak		3.3	60
214.361	**-74.7**	RF Port	-54.0	**-20.7**	Peak	0.03 nW	3.3	40
1977.490	-67.7	RF Port	-47.0	-20.7	Peak		3.3	48
1977.490	-67.7	RF Port	-47.0	-20.7	Peak		3.3	52
2153.550	-67.7	RF Port	-47.0	-20.7	Peak		3.3	52
2151.720	-67.9	RF Port	-47.0	-20.9	Peak		3.3	64
214.361	-75.1	RF Port	-54.0	-21.1	Peak		3.3	48
3494.160	-68.2	RF Port	-47.0	-21.2	Peak		3.3	48
214.361	-75.2	RF Port	-54.0	-21.2	Peak		3.3	60
214.361	-75.6	RF Port	-54.0	-21.6	Peak		3.3	52
214.361	-75.6	RF Port	-54.0	-21.6	Peak		3.3	64
1977.490	-69.2	RF Port	-47.0	-22.2	Peak		3.3	36
2151.720	-69.3	RF Port	-47.0	-22.3	Peak		3.3	48
2151.720	-69.3	RF Port	-47.0	-22.3	Peak		3.3	60
1977.490	-70.0	RF Port	-47.0	-23.0	Peak		3.3	40
1977.490	-70.7	RF Port	-47.0	-23.7	Peak		3.3	60
1977.490	-71.4	RF Port	-47.0	-24.4	Peak		3.3	64
870.947	-79.3	RF Port	-54.0	-25.3	Peak		3.3	36

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

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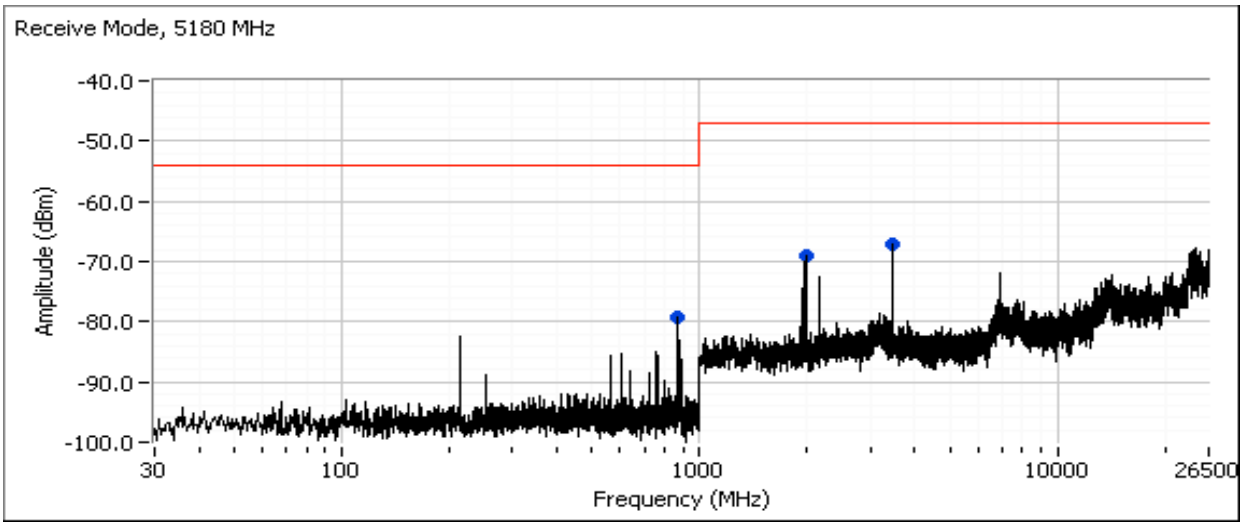
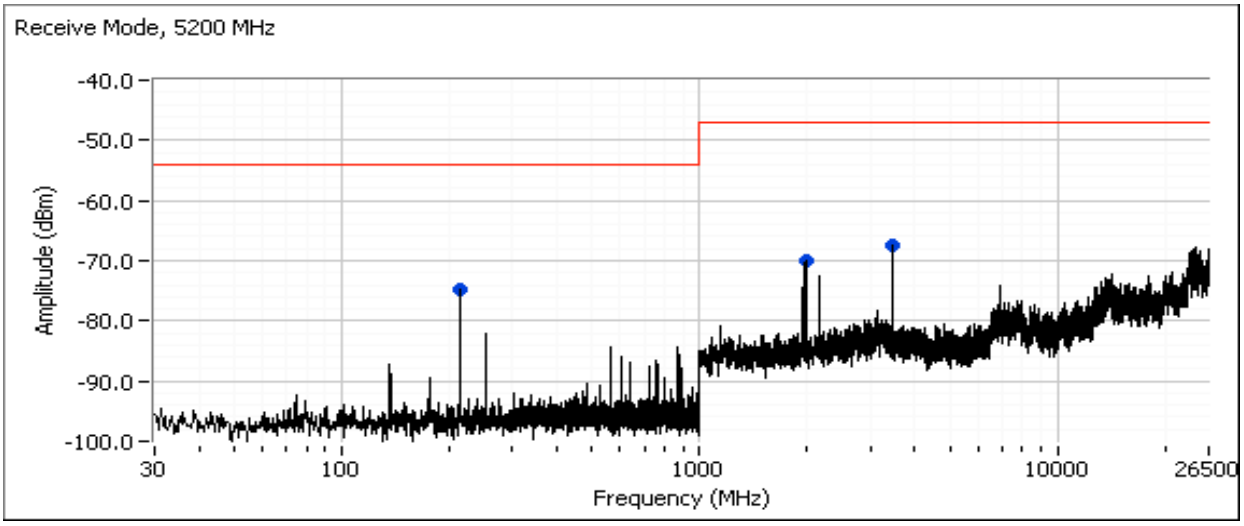
Radio Test Data - Receiver

Client:	Summit Data Communications, Inc	Job Number:	J78216
Model:	SDC-MSD30AG	T-Log Number:	T78635
		Account Manager:	Pam Tucker
Standard:	Japanese Radio Law - Item 19 of Article 12	Contact:	Jerry Pohmurski

Broadband plots from 30MHz to 26.5GHz, 5180 MHz



Broadband plots from 30MHz to 26.5GHz, 5200 MHz



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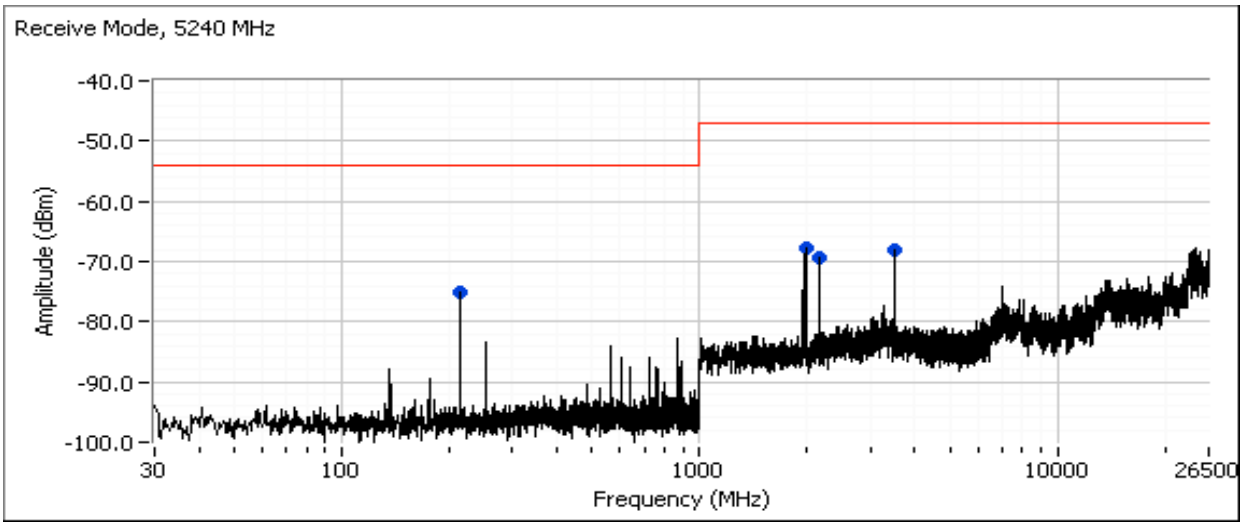
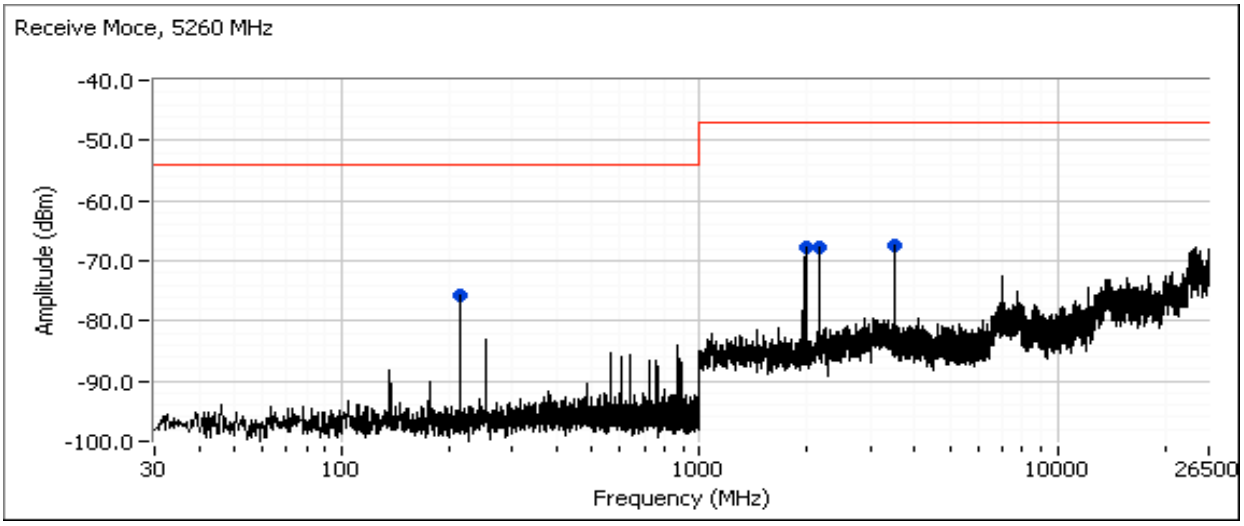
Radio Test Data - Receiver

Client:	Summit Data Communications, Inc	Job Number:	J78216
Model:	SDC-MSD30AG	T-Log Number:	T78635
		Account Manager:	Pam Tucker
Standard:	Japanese Radio Law - Item 19 of Article 12	Contact:	Jerry Pohmurski

Broadband plots from 30MHz to 26.5GHz, 5240 MHz



Broadband plots from 30MHz to 26.5GHz, 5260 MHz

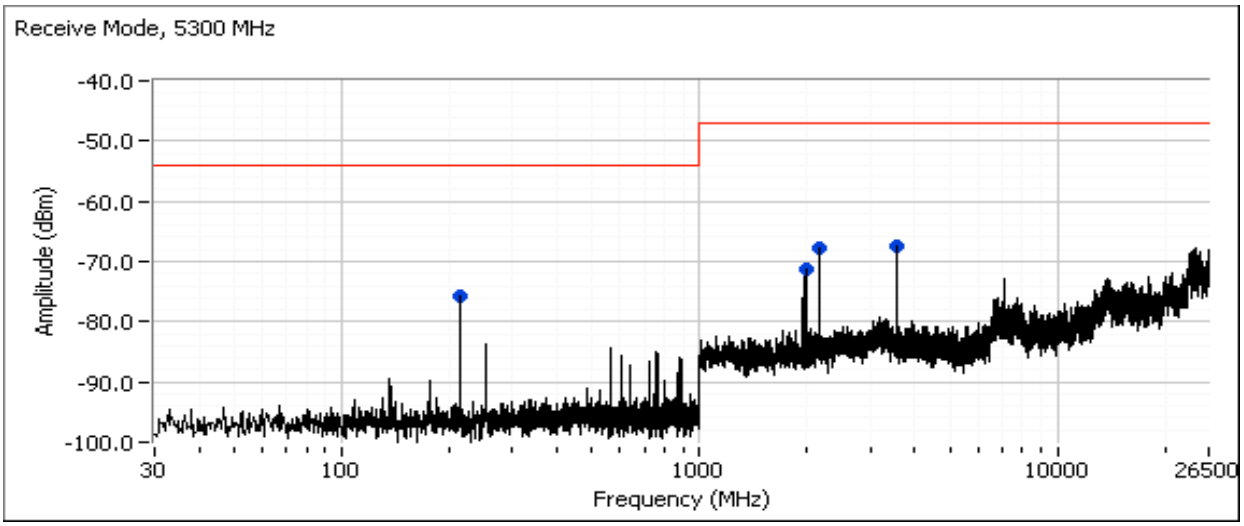


Elliott An NTS company

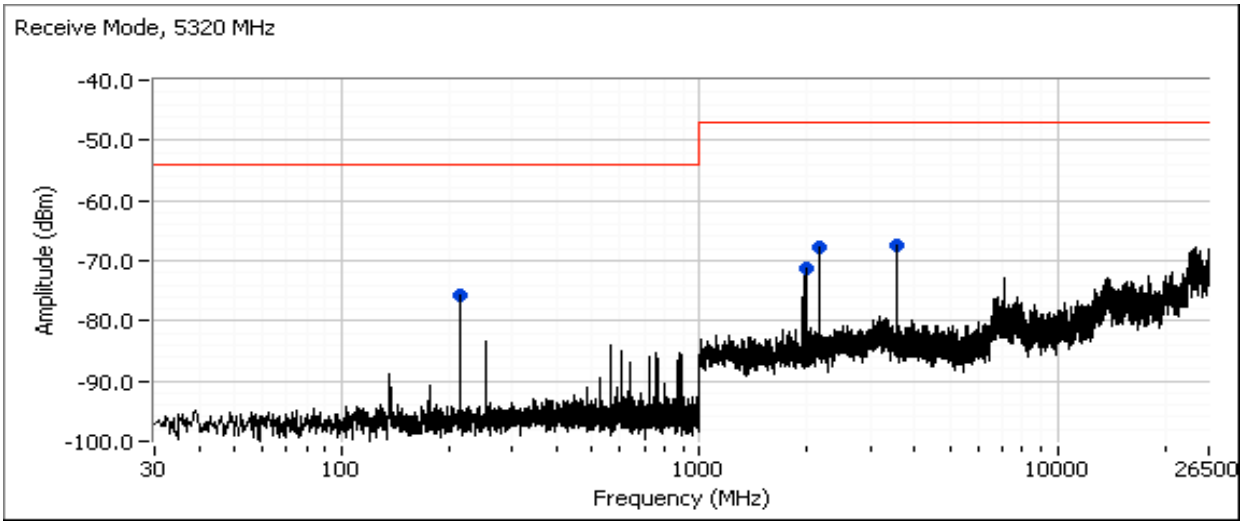
Radio Test Data - Receiver

Client:	Summit Data Communications, Inc	Job Number:	J78216
Model:	SDC-MSD30AG	T-Log Number:	T78635
		Account Manager:	Pam Tucker
Standard:	Japanese Radio Law - Item 19 of Article 12	Contact:	Jerry Pohmurski

Broadband plots from 30MHz to 26.5GHz, 5300 MHz



Broadband plots from 30MHz to 26.5GHz, 5320 MHz



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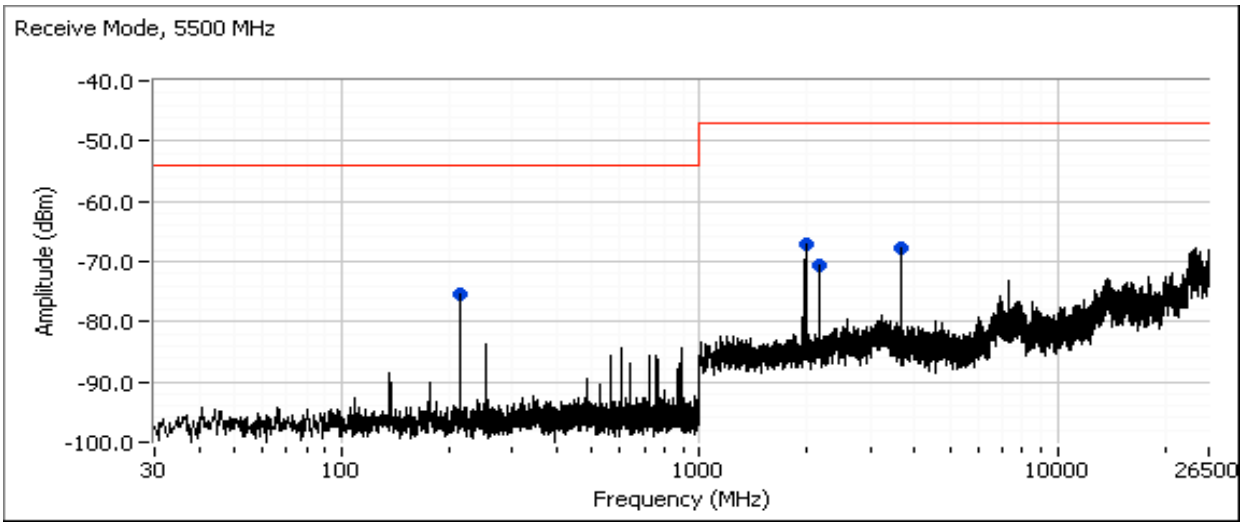
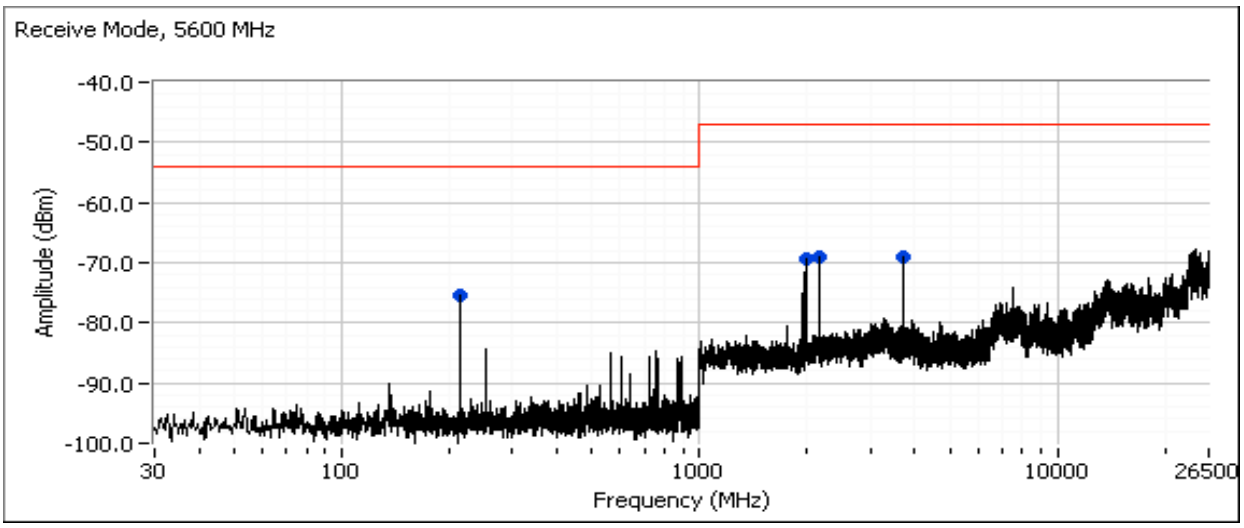
Radio Test Data - Receiver

Client:	Summit Data Communications, Inc	Job Number:	J78216
Model:	SDC-MSD30AG	T-Log Number:	T78635
		Account Manager:	Pam Tucker
Standard:	Japanese Radio Law - Item 19 of Article 12	Contact:	Jerry Pohmurski

Broadband plots from 30MHz to 26.5GHz, 5500 MHz



Broadband plots from 30MHz to 26.5GHz, 5600 MHz



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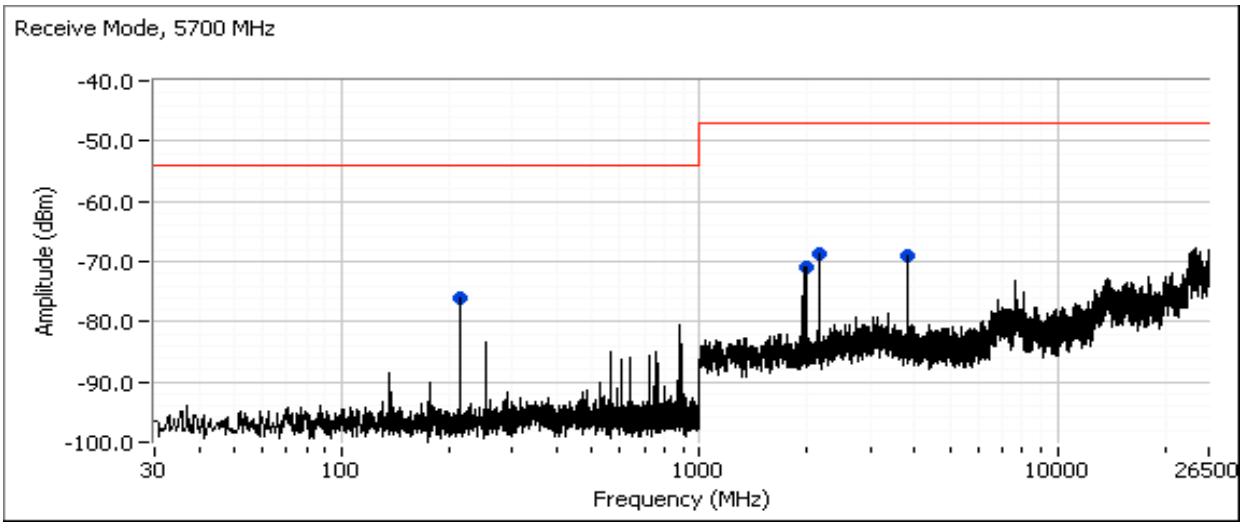
Radio Test Data - Receiver

Client:	Summit Data Communications, Inc	Job Number:	J78216
Model:	SDC-MSD30AG	T-Log Number:	T78635
		Account Manager:	Pam Tucker
Standard:	Japanese Radio Law - Item 19 of Article 12	Contact:	Jerry Pohmurski

Broadband plots from 30MHz to 26.5GHz, 5700 MHz



Final Measurements :

Instrument Settings: RB=VB=100kHz (below 1GHz) or RB=VB=1MHz (above 1GHz), Zero Span (Span = 0Hz), sample detector, single sweep and sweep time set to auto.

Measurements are made only on those frequencies that exceed the limit during the preliminary measurements and at the operating voltage that produced the highest emission level.

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, Inc	Job Number:	J78216
Model:	SDC-MSD30AG	T-Log Number:	T78635
		Account Manager:	Pam Tucker
Standard:	Japanese Radio Law - Item 19 of Article 12	Contact:	Jerry Pohmurski

Run #2: Carrier Sense

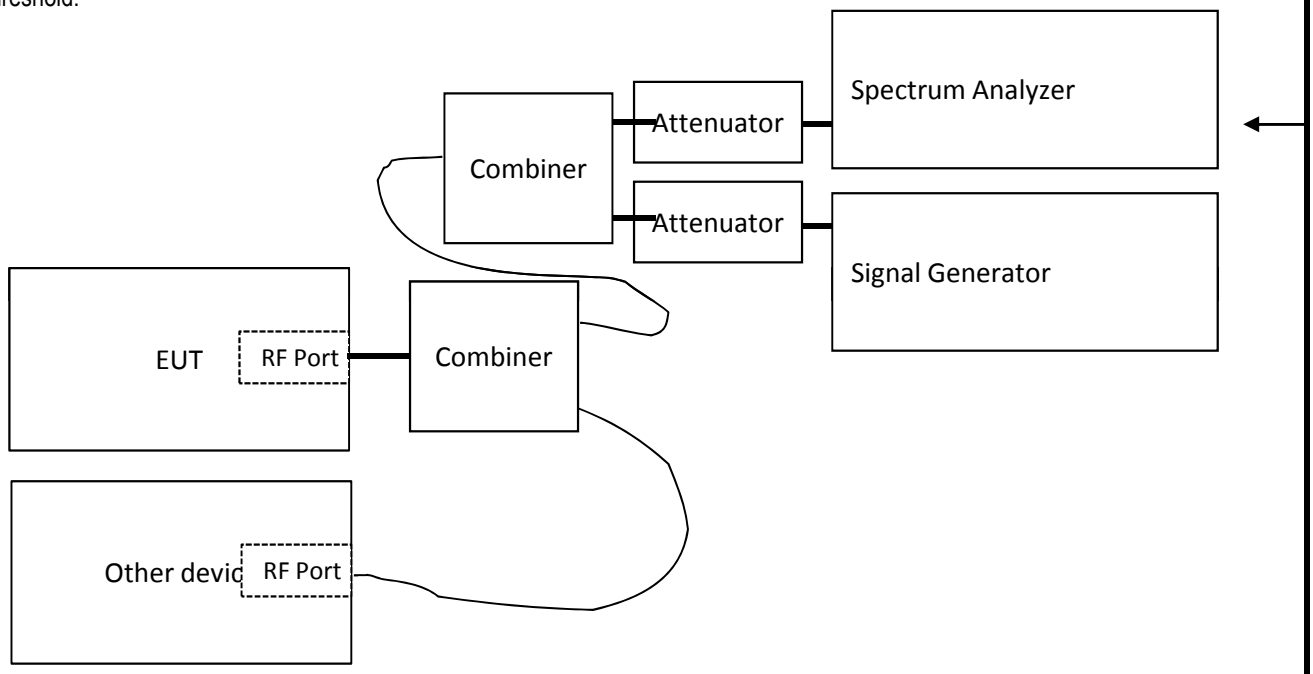
Date of Test: 6/8/2010 Test Engineer: Mehran Birgani
Test Location: SV Chamber #2

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 NTS company

Radio Test Data - Receiver

Client:	Summit Data Communications, Inc	Job Number:	J78216
Model:	SDC-MSD30AG	T-Log Number:	T78635
		Account Manager:	Pam Tucker
Standard:	Japanese Radio Law - Item 19 of Article 12	Contact:	Jerry Pohmurski

Frequency	Antenna	Signal generator	Path loss	Threshold			Result
MHz	Gain (dBi)	threshold	dB	dBm	dBuV/m	mV/m	
5180	3.5	-15.7	37.6	-53.3	94.7	54.3	Pass
5200	3.5	-21.5	37.7	-59.2	88.8	27.6	Pass
5240	3.5	-25.4	37.8	-63.2	84.9	17.6	Pass
5260	3.5	-20.4	37.9	-58.3	89.8	31.0	Pass
5300	3.5	-18.2	38.0	-56.2	92.0	39.8	Pass
5320	3.5	-10.5	38.0	-48.5	99.7	**96.9**	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	-37.6	37.6
5200	0.0	-37.7	37.7
5240	0.0	-37.8	37.8
5260	0.0	-37.9	37.9
5300	0.0	-38.0	38.0
5320	0.0	-38.0	38.0
5500	0.0	-38.3	38.3
5600	0.0	-38.4	38.4
5700	0.0	-38.6	38.6

Elliott An NTS company

Test Equipment Used

Client: Summit Data Communications, Inc	Job Number:	J78216
Model: SDC-MSD30AG	T-Log Number:	T78635
	Account Manager:	Pam Tucker
Standard: Japanese Radio Law - Item 19 of Article 12	Contact:	Jerry Pohmurski

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