Cisco Systems, Inc.

TEST REPORT FOR

IR529 915MHz WPAN IP67 Range Extender Single Antenna
Model: IR529WP-915S/K9

Tested To The Following Standards:

FCC Part 15 Subpart C Section(s)
15.207 AND 15.247

Report No.: 96154-8

Date of issue: November 14, 2014

ACCREDITED
Testing Certificates:
803.01, 803.02, 803.05, 803.06

This test report bears the accreditation symbol indicating that the testing performed herein meets the test and reporting requirements of ISO/IEC 17025 under the applicable scope of EMC testing for CKC Laboratories, Inc.

We strive to create long-term, trust based relationships by providing sound, adaptive, customer first testing services. We embrace each of our customers' unique EMC challenges, not as an interruption to set processes, but rather as the reason we are in business.

Testing the Future
CKC LABORATORIES, INC.

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ADMINISTRATIVE INFORMATION

Test Report Information

REPORT PREPARED FOR:

Cisco Systems, Inc.
170 W. Tasman Dr.
San Jose CA 95134-1706

REPRESENTATIVE: Charles Troia
Customer Reference Number: TUS201996780

REPORT PREPARED BY:

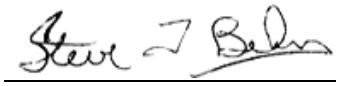
Terri Rayle
CKC Laboratories, Inc.
5046 Sierra Pines Drive
Mariposa, CA 95338

Project Number: 96154

DATE OF EQUIPMENT RECEIPT: October 22, 2014
DATE(S) OF TESTING: October 22-27, 2014

Report Authorization

The test data contained in this report documents the observed testing parameters pertaining to and are relevant for only the sample equipment tested in the agreed upon operational mode(s) and configuration(s) as identified herein. Compliance assessment remains the client's responsibility. This report may not be used to claim product endorsement by A2LA or any government agencies. This test report has been authorized for release under quality control from CKC Laboratories, Inc.



Steve Behm
Director of Quality Assurance & Engineering Services
CKC Laboratories, Inc.

Test Facility Information

Our laboratories are configured to effectively test a wide variety of product types. CKC utilizes first class test equipment, anechoic chambers, data acquisition and information services to create accurate, repeatable and affordable test results.

TEST LOCATION(S):
CKC Laboratories, Inc.
5046 Sierra Pines Drive
Mariposa, CA 95338

Software Versions

CKC Laboratories Proprietary Software	Version
EMITest Emissions	5.00.14
Immunity	5.00.07

Site Registration & Accreditation Information

Location	CB #	TAIWAN	CANADA	FCC	JAPAN
Mariposa A	US0103	SL2-IN-E-1147R	3082A-2	90477	A-0136

SUMMARY OF RESULTS

Standard / Specification: FCC Part 15 Subpart C

Test Procedure/Method	Description	Modifications*	Results
15.205(e) / 15.209	Radiated Spurious Emissions and Band Edge	NA	Pass
15.207	Conducted Emissions	NA	Pass
15.247(a)(1)	Carrier Frequency Separation	NA	Pass
15.247(a)(1)(i)	-20dB Bandwidth	NA	Pass
15.247(a)(1)(i)	Dwell Time	NA	Pass
15.247(a)(1)(i)	Number of Hopping Channels	NA	Pass
15.247(b)(2)	RF Output Power	NA	Pass
15.247(d)	Conducted Spurious Emissions and Band Edge	NA	Pass

Modifications*/Conditions During Testing

This list is a summary of the conditions noted for or modifications made to the equipment during testing.

Summary of Conditions
No modifications were made during testing.

***Modifications listed above must be incorporated into all production units.**

EQUIPMENT UNDER TEST (EUT)

EQUIPMENT UNDER TEST

IR529 915MHz WPAN IP67 Range Extender Single Antenna
Manuf: Cisco Systems, Inc.
Model: IR529WP-915S/K9
Serial: JAD181801BA

PERIPHERAL DEVICES

The EUT was tested with the following peripheral device(s):

Laptop Computer
Manuf: Toshiba
Model: Portege
Serial: G66C0002GC10

FCC PART 15 SUBPART C

This report contains EMC emissions test results under United States Federal Communications Commission (FCC) CFR 47 Section 15 Subpart C requirements for Intentional Radiators.

15.205(e) / 15.209 Radiated Spurious Emissions and Band Edge

Test Data

Test Location: CKC Laboratories, Inc. • 5046 Sierra Pines Dr. • Mariposa, CA 95338 • (209) 966-5240

Customer: **Cisco Systems, Inc.**
Specification: **15.209 Radiated Emissions**
Work Order #: **96154** Date: 10/23/2014
Test Type: **Maximized Emissions** Time: 13:46:59
Equipment: **IR529 915MHz WPAN IP67 Range Extender single antenna** Sequence#: 1
Manufacturer: Cisco Systems, Inc. Tested By: Eddie Mariscal
Model: IR529WP-915S/K9
S/N: JAD181801BA

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN02668	Spectrum Analyzer	E4446A	8/4/2014	8/4/2015
T1	ANP06232	Cable	CXTA04A-35	9/5/2014	9/5/2016
T2	AN00226	Loop Antenna	6502	3/28/2014	3/28/2016

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
IR529 915MHz WPAN IP67 Range Extender single antenna*	Cisco Systems, Inc.	IR529WP-915S/K9	JAD181801BA

Support Devices:

Function	Manufacturer	Model #	S/N
Laptop Computer	Toshiba	Portege	G66C0002GC10

Test Conditions / Notes:

The EUT uses a removable antenna, thus measurements will be gathered via conducted measurements.
The EUT operates on 64 channels and is operating on 120VAC/60Hz.
Radiated emissions measurements were taken while the EUT was operating with frequency-hopping enabled and configured to transmit continuously.

Power level setting: 30
Software used: Tera Term Version 4.76

Frequency Range of Interest: 0.009-30MHz
0.009-0.15MHz: RBW = 200Hz; VBW > RBW;
0.15-30MHz: RBW = 9kHz; VBW > RBW

Environmental Conditions:
Temperature: 21°C
Relative Humidity: 40%
Atmospheric Pressure: 97.7kPa

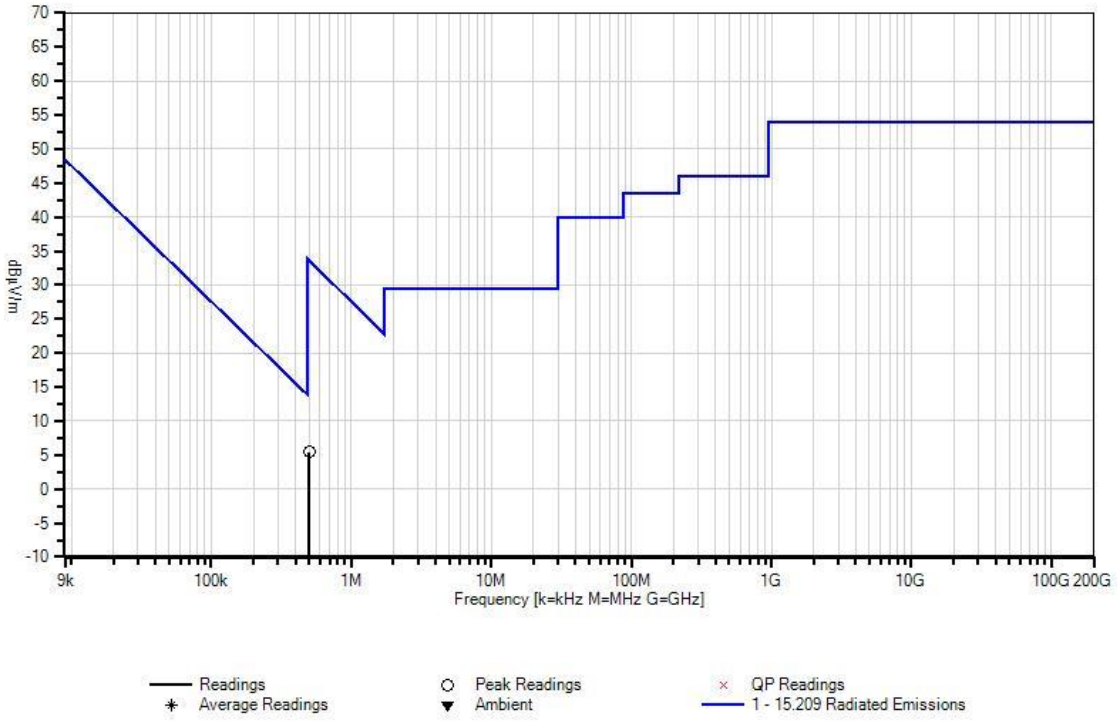
NOTE:
No EUT emissions were detected above the noise floor and within 20dB of the limit. Noise floor readings were taken for reference.

Ext Attn: 0 dB

Measurement Data: Reading listed by margin. Test Distance: 3 Meters

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	dB	dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	500.183k	35.3	+0.0	+10.1			-40.0	5.4	33.6	-28.2	Vert
2	28.575M	20.1	+0.4	+6.8			-40.0	-12.7	29.5	-42.2	Vert
3	9.273k	48.4	+0.0	+17.5			-80.0	-14.1	48.2	-62.3	Vert

CKC Laboratories, Inc. Date: 10/23/2014 Time: 13:46:59 Cisco Systems, Inc. WO#: 96154
15.209 Radiated Emissions Test Distance: 3 Meters Sequence#: 1 Ext ATTN: 0 dB



Test Location: CKC Laboratories, Inc. • 5046 Sierra Pines Dr. • Mariposa, CA 95338 • (209) 966-5240

Customer:	**Cisco Systems, Inc.**		
Specification:	**15.209 Radiated Emissions**		
Work Order #:	**96154**	Date:	10/23/2014
Test Type:	**Maximized Emissions**	Time:	11:21:14
Equipment:	**IR529 915MHz WPAN IP67 Range Extender single antenna**	Sequence#:	1
Manufacturer:	Cisco Systems, Inc.	Tested By:	Eddie Mariscal
Model:	IR529WP-915S/K9		
S/N:	JAD181801BA		

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN01991	Biconilog Antenna	CBL6111C	3/7/2014	3/7/2016
T2	AN03355	Cable	32026-2-29094K-48TC	2/7/2013	2/7/2015
T3	AN03359	Cable		2/4/2013	2/4/2015
T4	ANP05904	Cable	32022-2-29094K-144TC	2/15/2013	2/15/2015
T5	AN02668	Spectrum Analyzer	E4446A	8/4/2014	8/4/2015
T6	AN00449	Preamp-Bottom Amp (dB)	8447F	4/7/2014	4/7/2016
T7	ANP05922	Cable	RG/214	9/5/2014	9/5/2016
T8	AN02138	Attenuator	54-10	2/13/2013	2/13/2015

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
IR529 915MHz WPAN IP67 Range Extender single antenna*	Cisco Systems, Inc.	IR529WP-915S/K9	JAD181801BA

Support Devices:

Function	Manufacturer	Model #	S/N
Laptop Computer	Toshiba	Portege	G66C0002GC10

Test Conditions / Notes:

The EUT uses a removable antenna, thus measurements will be gathered via conducted measurements.
The EUT operates on 64 channels and is operating on 120VAC/60Hz.
Peak Power measurements were taken while the EUT was operating on the lowest, the middle and the highest channels in continuous transmit mode.

Power level setting: 30
Software used: Tera Term Version 4.76

Frequency Range of Interest: 30-1000MHz
RBW = 120kHz; VBW > RBW

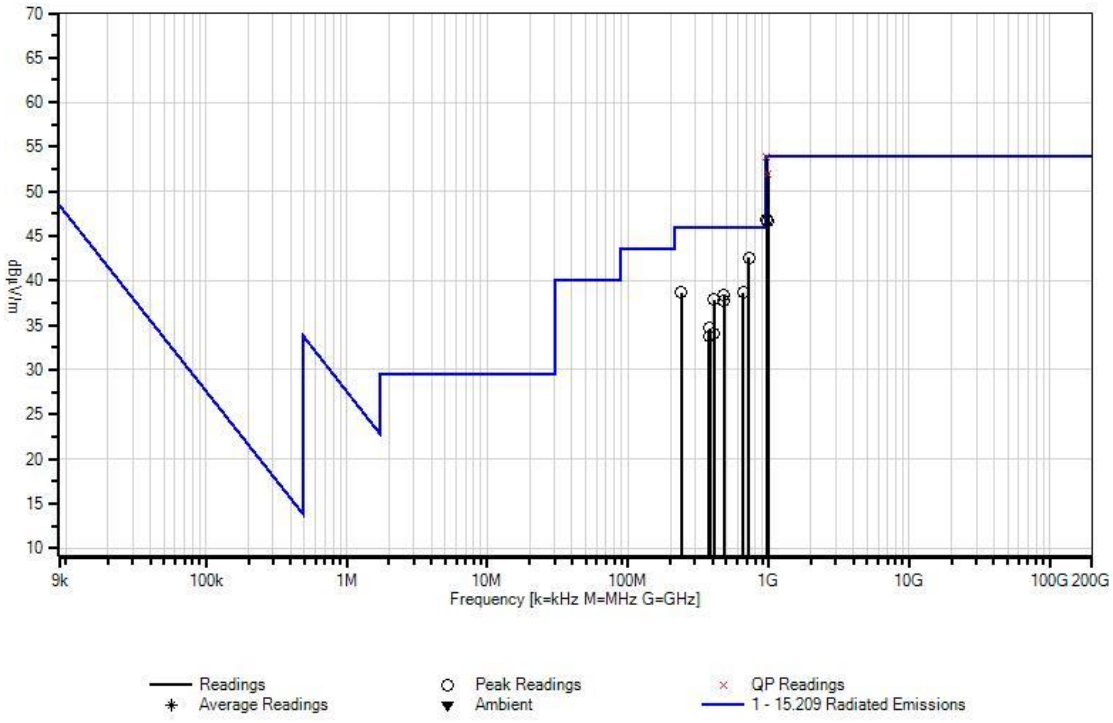
Environmental Conditions:
Temperature: 21°C
Relative Humidity: 40%
Atmospheric Pressure: 97.7kPa

Ext Attn: 0 dB

Measurement Data: Reading listed by margin. Test Distance: 3 Meters

#	Freq	Rdng	T1	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
			T5	T6	T7	T8					
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant
1	966.457M	39.8	+24.2	+0.4	+0.4	+1.5	+0.0	53.9	54.0	-0.1	Vert
	QP		+0.0	-22.4	+0.3	+9.7			Transmit High		
^	966.457M	41.4	+24.2	+0.4	+0.4	+1.5	+0.0	55.5	54.0	+1.5	Vert
			+0.0	-22.4	+0.3	+9.7			Transmit High		
3	992.542M	37.6	+24.6	+0.4	+0.4	+1.5	+0.0	52.0	54.0	-2.0	Vert
	QP		+0.0	-22.5	+0.3	+9.7			Transmit Mid		
^	992.542M	40.1	+24.6	+0.4	+0.4	+1.5	+0.0	54.5	54.0	+0.5	Vert
			+0.0	-22.5	+0.3	+9.7			Transmit Mid		
5	720.000M	33.4	+20.8	+0.4	+0.3	+1.3	+0.0	42.6	46.0	-3.4	Horiz
			+0.0	-23.4	+0.2	+9.6			Radio OFF		
6	966.457M	32.8	+24.2	+0.4	+0.4	+1.5	+0.0	46.9	54.0	-7.1	Horiz
			+0.0	-22.4	+0.3	+9.7			Transmit High		
7	660.010M	30.3	+20.3	+0.3	+0.3	+1.3	+0.0	38.7	46.0	-7.3	Vert
			+0.0	-23.6	+0.2	+9.6			Radio OFF		
8	239.917M	38.4	+12.0	+0.2	+0.2	+0.8	+0.0	38.7	46.0	-7.3	Horiz
			+0.0	-22.5	+0.1	+9.5			Radio OFF		
9	992.537M	32.3	+24.6	+0.4	+0.4	+1.5	+0.0	46.7	54.0	-7.3	Horiz
			+0.0	-22.5	+0.3	+9.7			Transmit Mid		
10	479.772M	32.6	+17.7	+0.3	+0.2	+1.1	+0.0	38.4	46.0	-7.6	Horiz
			+0.0	-23.3	+0.2	+9.6			Radio OFF		
11	406.795M	33.4	+16.3	+0.3	+0.2	+1.0	+0.0	37.9	46.0	-8.1	Horiz
			+0.0	-23.0	+0.1	+9.6			Radio OFF		
12	480.007M	32.0	+17.7	+0.3	+0.2	+1.1	+0.0	37.8	46.0	-8.2	Vert
			+0.0	-23.3	+0.2	+9.6			Radio OFF		
13	381.820M	30.7	+15.7	+0.3	+0.2	+1.0	+0.0	34.7	46.0	-11.3	Vert
			+0.0	-22.9	+0.1	+9.6			Radio OFF		
14	406.820M	29.6	+16.3	+0.3	+0.2	+1.0	+0.0	34.1	46.0	-11.9	Vert
			+0.0	-23.0	+0.1	+9.6			Radio OFF		
15	375.070M	30.0	+15.6	+0.2	+0.2	+1.0	+0.0	33.8	46.0	-12.2	Vert
			+0.0	-22.9	+0.1	+9.6			Radio OFF		

CKC Laboratories, Inc. Date: 10/23/2014 Time: 11:21:14 Cisco Systems, Inc. WO#: 96154
15.209 Radiated Emissions Test Distance: 3 Meters Sequence#: 1 Ext ATTN: 0 dB



Test Location: CKC Laboratories, Inc. • 5046 Sierra Pines Dr. • Mariposa, CA 95338 • (209) 966-5240

Customer:	**Cisco Systems, Inc.**		
Specification:	**15.209 Radiated Emissions**		
Work Order #:	**96154**	Date:	10/24/2014
Test Type:	**Maximized Emissions**	Time:	16:53:29
Equipment:	**IR529 915MHz WPAN IP67 Range Extender single antenna**	Sequence#:	1
Manufacturer:	Cisco Systems, Inc.	Tested By:	Eddie Mariscal
Model:	IR529WP-915S/K9		
S/N:	JAD181801BA		

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN00327	Horn Antenna	3115	3/18/2014	3/18/2016
T2	ANP02271	High Pass Filter	2.6-3.95	6/25/2014	6/25/2016
T3	AN02115	Preamp	83051A	11/12/2012	11/12/2014
T4	AN03360	Cable	32022-2-29094-36TC	2/4/2013	2/4/2015
T5	AN03359	Cable		2/4/2013	2/4/2015
T6	ANP05904	Cable	32022-2-29094K-144TC	2/15/2013	2/15/2015
T7	AN03355	Cable	32026-2-29094K-48TC	2/7/2013	2/7/2015
T8	AN03358	Cable	32022-2-29094K-36TC	2/7/2013	2/7/2015
T9	AN02668	Spectrum Analyzer	E4446A	8/4/2014	8/4/2015
T10	AN03171	High Pass Filter	HM1155-11SS	2/26/2013	2/26/2015
T11	AN02157	Horn Antenna-ANSI C63.5	3115	1/23/2013	1/23/2015

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
IR529 915MHz WPAN IP67 Range Extender single antenna*	Cisco Systems, Inc.	IR529WP-915S/K9	JAD181801BA

Support Devices:

Function	Manufacturer	Model #	S/N
Laptop Computer	Toshiba	Portege	G66C0002GC10

Test Conditions / Notes:

The EUT uses a removable antenna, thus measurements will be gathered via conducted measurements.
The EUT operates on 64 channels and is operating on 120VAC/60Hz.
Radiated Emissions measurements were taken while the EUT was operating on the lowest, the middle and the highest channels in continuous transmit mode.

Power level setting: 30
Software used: Tera Term Version 4.76

Frequency Range of Interest: Restricted bands within the frequency range 1-9.28GHz as defined in 15.205.
RBW = 1MHz; VBW > RBW

Environmental Conditions:
Temperature: 21°C
Relative Humidity: 40%
Atmospheric Pressure: 97.7kPa

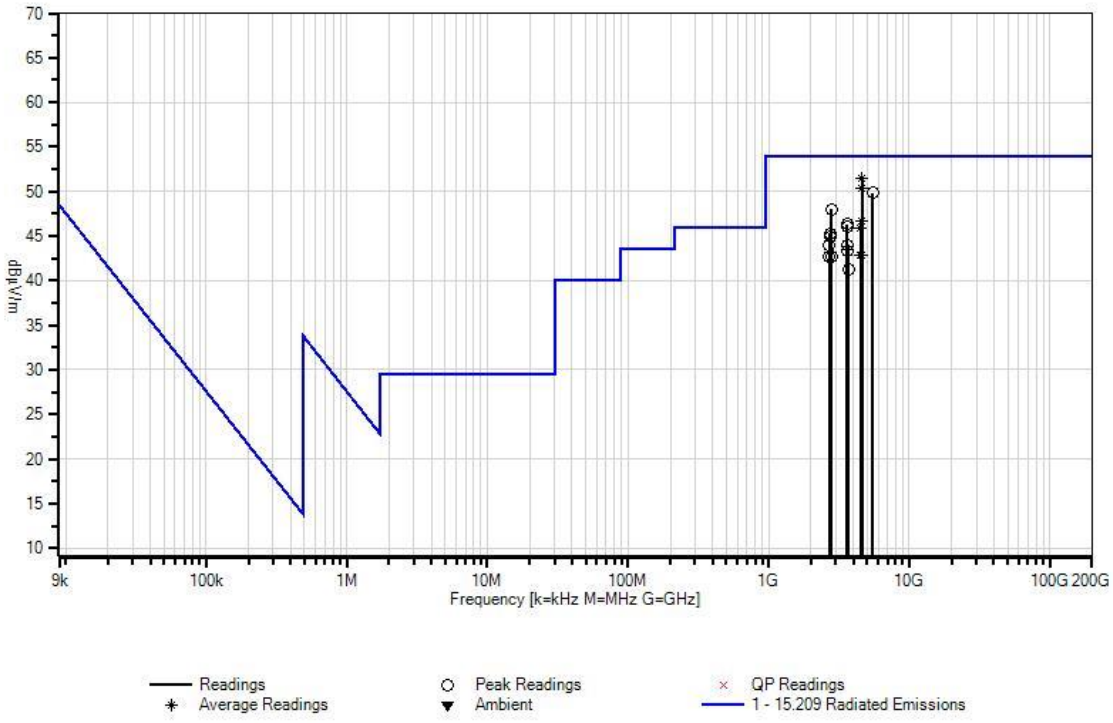
Ext Attn: 0 dB

Measurement Data: Reading listed by margin. Test Distance: 3 Meters

#	Freq	Rdng	T1 T5 T9	T2 T6 T10	T3 T7 T11	T4 T8	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant
1	4637.775M	45.4	+0.0	+0.0	-32.6	+0.9	+0.0	51.5	54.0	-2.5	Vert
	Ave		+0.8	+3.2	+0.8	+0.0			Transmit High		
			+0.0	+0.3	+32.7						
^	4637.775M	49.7	+0.0	+0.0	-32.6	+0.9	+0.0	55.8	54.0	+1.8	Vert
			+0.8	+3.2	+0.8	+0.0			Transmit High		
			+0.0	+0.3	+32.7						
3	4637.900M	44.3	+0.0	+0.0	-32.6	+0.9	+0.0	50.4	54.0	-3.6	Horiz
	Ave		+0.8	+3.2	+0.8	+0.0			Transmit High		
			+0.0	+0.3	+32.7						
^	4637.900M	48.5	+0.0	+0.0	-32.6	+0.9	+0.0	54.6	54.0	+0.6	Horiz
			+0.8	+3.2	+0.8	+0.0			Transmit High		
			+0.0	+0.3	+32.7						
5	5489.380M	40.6	+0.0	+0.0	-32.1	+1.0	+0.0	49.8	54.0	-4.2	Horiz
			+0.9	+3.4	+0.9	+0.0			Transmit Mid		
			+0.0	+0.3	+34.8						
6	2782.817M	48.7	+26.0	+0.9	-32.7	+0.8	+0.0	48.0	54.0	-6.0	Horiz
			+0.6	+2.4	+0.5	+0.8			Transmit High		
			+0.0	+0.0	+0.0						
7	4574.283M	40.9	+0.0	+0.0	-32.7	+0.9	+0.0	46.7	54.0	-7.3	Vert
	Ave		+0.8	+3.1	+0.8	+0.0			Transmit Mid		
			+0.0	+0.3	+32.6						
^	4574.283M	46.6	+0.0	+0.0	-32.7	+0.9	+0.0	52.4	54.0	-1.6	Vert
			+0.8	+3.1	+0.8	+0.0			Transmit Mid		
			+0.0	+0.3	+32.6						

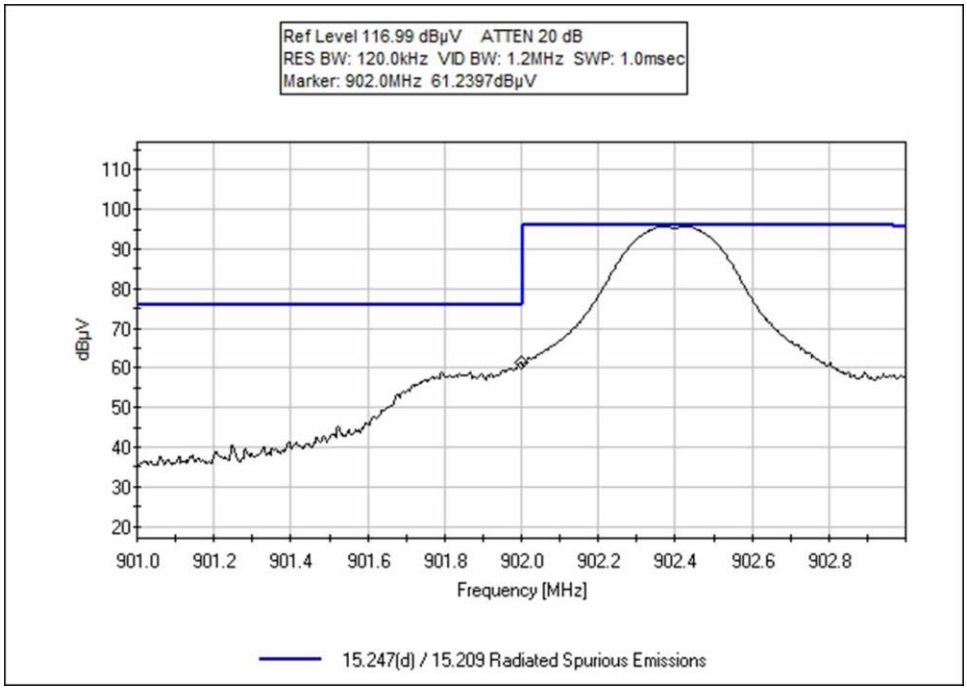
9	3609.583M	44.2	+28.3 +0.6 +0.0	+1.2 +2.7 +0.0	-33.3 +0.7 +0.0	+0.8 +1.1	+0.0	46.3	54.0 Transmit Low	-7.7	Vert
10	3609.367M	44.0	+28.3 +0.6 +0.0	+1.2 +2.7 +0.0	-33.3 +0.7 +0.0	+0.8 +1.1	+0.0	46.1	54.0 Transmit Low	-7.9	Horiz
11	4512.110M Ave	40.4	+0.0 +0.7 +0.0	+0.0 +3.1 +0.3	-32.8 +0.8 +32.5	+0.9 +0.0	+0.0	45.9	54.0 Transmit Low	-8.1	Horiz
^	4512.110M	46.1	+0.0 +0.7 +0.0	+0.0 +3.1 +0.3	-32.8 +0.8 +32.5	+0.9 +0.0	+0.0	51.6	54.0 Transmit Low	-2.4	Horiz
13	2744.383M	46.0	+25.9 +0.6 +0.0	+1.1 +2.3 +0.0	-32.7 +0.5 +0.0	+0.8 +0.8	+0.0	45.3	54.0 Transmit Mid	-8.7	Vert
14	2744.383M	45.7	+25.9 +0.6 +0.0	+1.1 +2.3 +0.0	-32.7 +0.5 +0.0	+0.8 +0.8	+0.0	45.0	54.0 Transmit Mid	-9.0	Horiz
15	2707.367M	44.8	+25.7 +0.6 +0.0	+1.4 +2.3 +0.0	-32.7 +0.5 +0.0	+0.7 +0.7	+0.0	44.0	54.0 Transmit Low	-10.0	Horiz
16	3659.183M	42.2	+28.3 +0.7 +0.0	+0.8 +2.7 +0.0	-33.3 +0.7 +0.0	+0.8 +1.1	+0.0	44.0	54.0 Transmit Mid	-10.0	Horiz
17	3659.183M	41.6	+28.3 +0.7 +0.0	+0.8 +2.7 +0.0	-33.3 +0.7 +0.0	+0.8 +1.1	+0.0	43.4	54.0 Transmit Mid	-10.6	Vert
18	4574.443M Ave	37.1	+0.0 +0.8 +0.0	+0.0 +3.1 +0.3	-32.7 +0.8 +32.6	+0.9 +0.0	+0.0	42.9	54.0 Transmit Mid	-11.1	Horiz
^	4574.443M	46.5	+0.0 +0.8 +0.0	+0.0 +3.1 +0.3	-32.7 +0.8 +32.6	+0.9 +0.0	+0.0	52.3	54.0 Transmit Mid	-1.7	Horiz
20	4511.833M Ave	37.4	+0.0 +0.7 +0.0	+0.0 +3.1 +0.3	-32.8 +0.8 +32.5	+0.9 +0.0	+0.0	42.9	54.0 Transmit Low	-11.1	Vert
^	4511.830M	46.5	+0.0 +0.7 +0.0	+0.0 +3.1 +0.3	-32.8 +0.8 +32.5	+0.9 +0.0	+0.0	52.0	54.0 Transmit Low	-2.0	Vert
22	2782.610M	43.4	+26.0 +0.6 +0.0	+0.9 +2.4 +0.0	-32.7 +0.5 +0.0	+0.8 +0.8	+0.0	42.7	54.0 Transmit High	-11.3	Vert
23	2707.183M	43.5	+25.7 +0.6 +0.0	+1.4 +2.3 +0.0	-32.7 +0.5 +0.0	+0.7 +0.7	+0.0	42.7	54.0 Transmit Low	-11.3	Vert
24	3710.417M	39.6	+28.3 +0.7 +0.0	+0.4 +2.8 +0.0	-33.2 +0.7 +0.0	+0.8 +1.1	+0.0	41.2	54.0 Transmit High	-12.8	Vert

CKC Laboratories, Inc. Date: 10/24/2014 Time: 16:53:29 Cisco Systems, Inc. WO#: 96154
15.209 Radiated Emissions Test Distance: 3 Meters Sequence#: 1 Ext ATTN: 0 dB

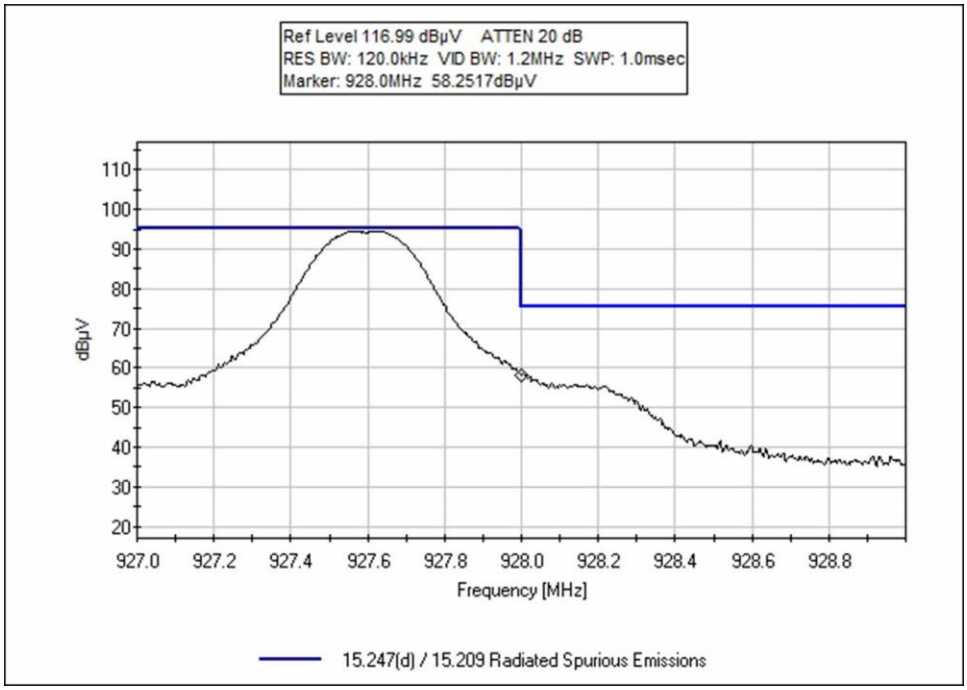


Test Data

Band Edge

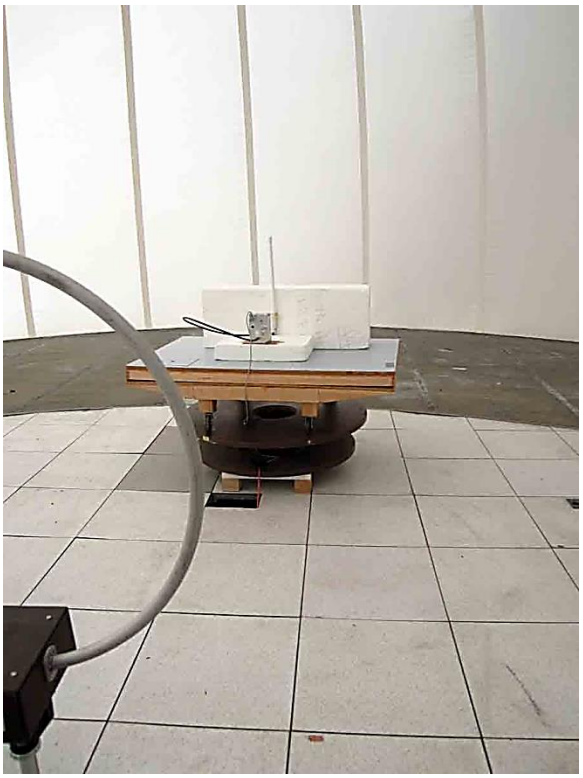


Low Channel, 902.0MHz



High Channel, 928.0MHz

Test Setup Photos



.009 – 30MHz

30MHz - 1GHz

1 – 9.28GHz

15.207 AC Conducted Emissions

Test Data

Test Location: CKC Laboratories, Inc. • 5046 Sierra Pines Dr. • Mariposa, CA 95338 • (209) 966-5240

Customer:	**Cisco Systems, Inc.**		
Specification:	**15.207 AC Mains - Average**		
Work Order #:	**96154**	Date:	10/27/2014
Test Type:	**Conducted Emissions**	Time:	10:06:55
Equipment:	**IR529 915MHz WPAN IP67 Range Extender single antenna**	Sequence#:	1
Manufacturer:	Cisco Systems, Inc.	Tested By:	Eddie Mariscal
Model:	IR529WP-915S/K9		120V 60Hz
S/N:	JAD181801BA		

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN02668	Spectrum Analyzer	E4446A	8/4/2014	8/4/2015
T1	AN02608	High Pass Filter	HE9615-150K-50-720B	3/25/2014	3/25/2016
T2	ANMACOND	Cable		8/26/2014	8/26/2016
T3	ANP02229	Attenuator	PE7010-10	2/13/2013	2/13/2015
T4	AN00374	50uH LISN-Black (dB)	8028-TS-50-BNC	3/15/2014	3/15/2015
	AN00374	50uH LISN-White (dB)	8028-TS-50-BNC	3/15/2014	3/15/2015

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
IR529 915MHz WPAN IP67 Range Extender single antenna*	Cisco Systems, Inc.	IR529WP-915S/K9	JAD181801BA

Support Devices:

Function	Manufacturer	Model #	S/N
Laptop Computer	Toshiba	Portege	G66C0002GC10

Test Conditions / Notes:

The EUT uses a removable antenna, thus measurements will be gathered via conducted measurements.
The EUT operates on 64 channels and is operating on 120VAC/60Hz.
Conducted emissions measurements were taken while the EUT was operating with frequency-hopping enabled and configured to transmit continuously.

Power level setting: 30
Software used: Tera Term Version 4.76

Frequency Range of Interest: 0.15-30MHz
RBW = 9kHz; VBW > RBW

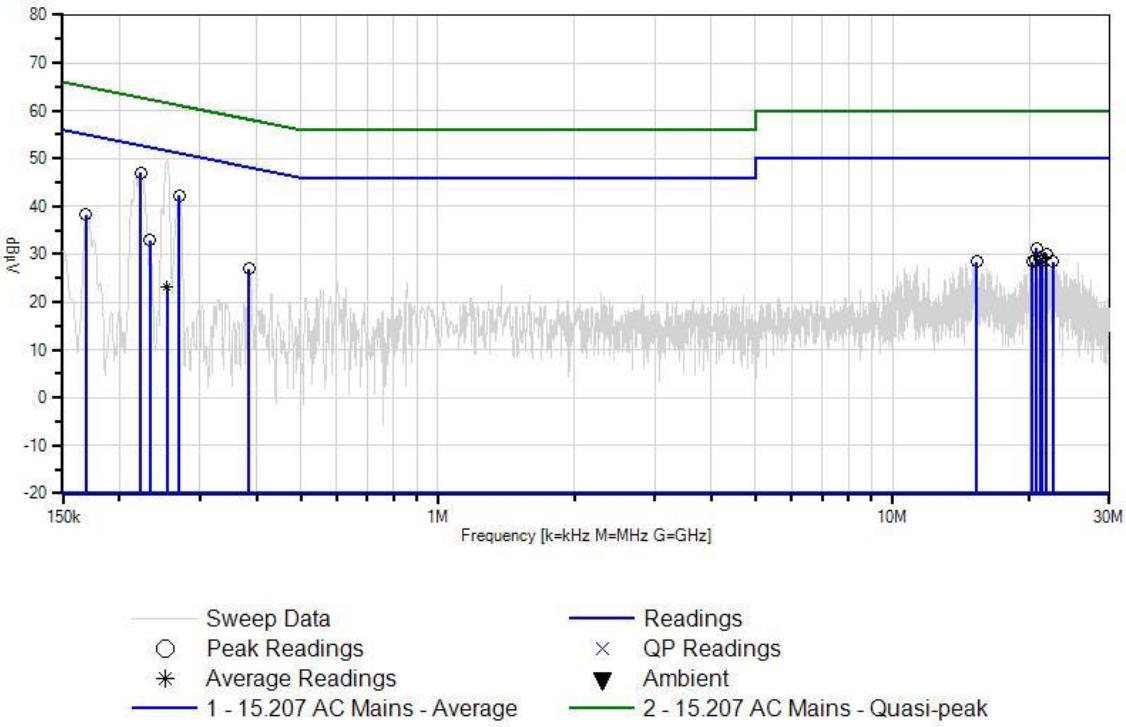
Environmental Conditions:
Temperature: 21°C
Relative Humidity: 40%
Atmospheric Pressure: 97.7kPa

Ext Attn: 0 dB

Measurement Data: Reading listed by margin. Test Lead: Black

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1	222.721k	36.9	+0.2	+0.1	+9.7	+0.1	+0.0	47.0	52.7	-5.7	Black
2	269.989k	32.2	+0.2	+0.1	+9.7	+0.1	+0.0	42.3	51.1	-8.8	Black
3	168.907k	28.0	+0.4	+0.0	+9.7	+0.1	+0.0	38.2	55.0	-16.8	Black
4	20.715M	20.4	+0.2	+0.7	+9.9	+0.1	+0.0	31.3	50.0	-18.7	Black
5	233.629k	22.8	+0.2	+0.1	+9.7	+0.1	+0.0	32.9	52.3	-19.4	Black
6	21.797M	19.2	+0.2	+0.7	+9.9	+0.1	+0.0	30.1	50.0	-19.9	Black
7	21.283M	18.4	+0.2	+0.7	+9.9	+0.1	+0.0	29.3	50.0	-20.7	Black
8	21.121M	18.3	+0.2	+0.7	+9.9	+0.1	+0.0	29.2	50.0	-20.8	Black
9	20.679M	18.0	+0.2	+0.7	+9.9	+0.1	+0.0	28.9	50.0	-21.1	Black
10	384.888k	16.8	+0.2	+0.1	+9.7	+0.1	+0.0	26.9	48.2	-21.3	Black
11	20.283M	17.6	+0.2	+0.7	+9.9	+0.1	+0.0	28.5	50.0	-21.5	Black
12	21.238M	17.6	+0.2	+0.7	+9.9	+0.1	+0.0	28.5	50.0	-21.5	Black
13	15.319M	17.6	+0.1	+0.6	+9.9	+0.2	+0.0	28.4	50.0	-21.6	Black
14	22.490M	17.5	+0.2	+0.7	+9.9	+0.1	+0.0	28.4	50.0	-21.6	Black
15 Ave	253.990k	13.2	+0.2	+0.1	+9.7	+0.1	+0.0	23.3	51.6	-28.3	Black
^	253.990k	39.5	+0.2	+0.1	+9.7	+0.1	+0.0	49.6	51.6	-2.0	Black

CKC Laboratories, Inc. Date: 10/27/2014 Time: 10:06:55 Cisco Systems, Inc. WO#: 96154
15.207 AC Mains - Average Test Lead: Black 120V 60Hz Sequence#: 1 Ext ATTN: 0 dB



Test Location: CKC Laboratories, Inc. • 5046 Sierra Pines Dr. • Mariposa, CA 95338 • (209) 966-5240

Customer:	**Cisco Systems, Inc.**		
Specification:	**15.207 AC Mains - Average**		
Work Order #:	**96154**	Date:	10/27/2014
Test Type:	**Conducted Emissions**	Time:	10:08:35 AM
Equipment:	**IR529 915MHz WPAN IP67 Range Extender single antenna**	Sequence#:	2
Manufacturer:	Cisco Systems, Inc.	Tested By:	Eddie Mariscal
Model:	IR529WP-915S/K9		120V 60Hz
S/N:	JAD181801BA		

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN02668	Spectrum Analyzer	E4446A	8/4/2014	8/4/2015
T1	AN02608	High Pass Filter	HE9615-150K-50-720B	3/25/2014	3/25/2016
T2	ANMACOND	Cable		8/26/2014	8/26/2016
T3	ANP02229	Attenuator	PE7010-10	2/13/2013	2/13/2015
	AN00374	50uH LISN-Black (dB)	8028-TS-50-BNC	3/15/2014	3/15/2015
T4	AN00374	50uH LISN-White (dB)	8028-TS-50-BNC	3/15/2014	3/15/2015

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
IR529 915MHz WPAN IP67 Range Extender single antenna*	Cisco Systems, Inc.	IR529WP-915S/K9	JAD181801BA

Support Devices:

Function	Manufacturer	Model #	S/N
Laptop Computer	Toshiba	Portege	G66C0002GC10

Test Conditions / Notes:

The EUT uses a removable antenna, thus measurements will be gathered via conducted measurements.
The EUT operates on 64 channels and is operating on 120VAC/60Hz.
Conducted emissions measurements were taken while the EUT was operating with frequency-hopping enabled and configured to transmit continuously.

Power level setting: 30
Software used: Tera Term Version 4.76

Frequency Range of Interest: 0.15-30MHz
RBW = 9kHz; VBW > RBW

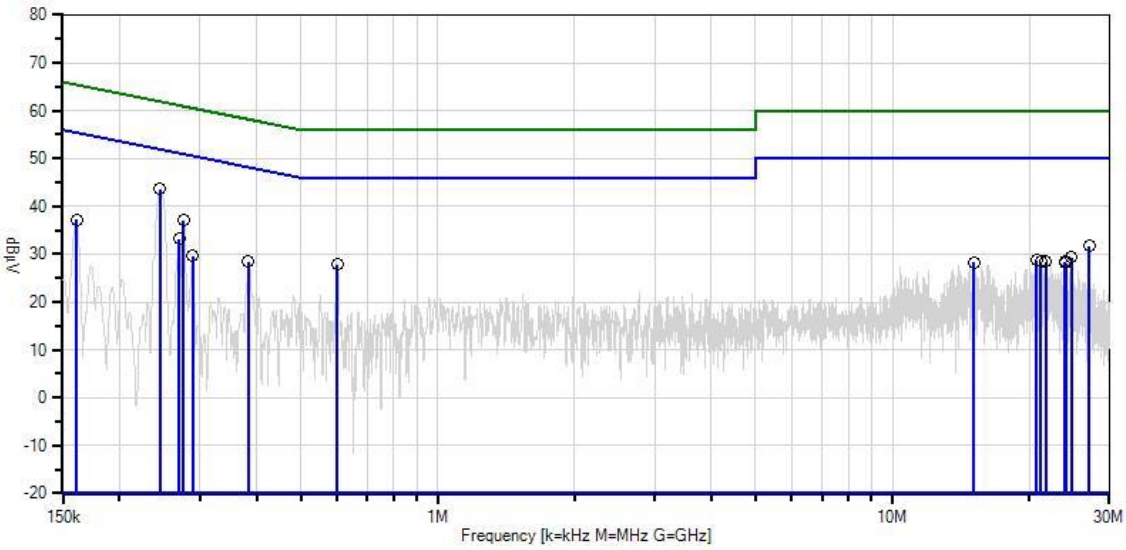
Environmental Conditions:
Temperature: 21°C
Relative Humidity: 40%
Atmospheric Pressure: 97.7kPa

Ext Attn: 0 dB

Measurement Data: Reading listed by margin. Test Lead: White

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1	245.264k	33.5	+0.2	+0.1	+9.7	+0.1	+0.0	43.6	51.9	-8.3	White
2	276.534k	26.9	+0.2	+0.1	+9.7	+0.1	+0.0	37.0	50.9	-13.9	White
3	269.989k	23.1	+0.2	+0.1	+9.7	+0.1	+0.0	33.2	51.1	-17.9	White
4	602.322k	17.8	+0.2	+0.1	+9.7	+0.1	+0.0	27.9	46.0	-18.1	White
5	160.908k	26.8	+0.6	+0.0	+9.7	+0.1	+0.0	37.2	55.4	-18.2	White
6	27.026M	20.8	+0.2	+0.8	+9.8	+0.1	+0.0	31.7	50.0	-18.3	White
7	384.160k	18.4	+0.2	+0.1	+9.7	+0.1	+0.0	28.5	48.2	-19.7	White
8	24.751M	18.4	+0.2	+0.7	+9.8	+0.2	+0.0	29.3	50.0	-20.7	White
9	289.624k	19.6	+0.1	+0.1	+9.7	+0.1	+0.0	29.6	50.5	-20.9	White
10	20.715M	17.7	+0.2	+0.7	+9.9	+0.2	+0.0	28.7	50.0	-21.3	White
11	21.157M	17.4	+0.2	+0.7	+9.9	+0.2	+0.0	28.4	50.0	-21.6	White
12	21.761M	17.4	+0.2	+0.7	+9.9	+0.2	+0.0	28.4	50.0	-21.6	White
13	23.984M	17.5	+0.2	+0.7	+9.8	+0.2	+0.0	28.4	50.0	-21.6	White
14	15.085M	17.5	+0.1	+0.6	+9.9	+0.2	+0.0	28.3	50.0	-21.7	White
15	24.011M	17.3	+0.2	+0.7	+9.8	+0.2	+0.0	28.2	50.0	-21.8	White

CKC Laboratories, Inc. Date: 10/27/2014 Time: 10:08:35 AM Cisco Systems, Inc. WO#: 96154
15.207 AC Mains - Average Test Lead: White 120V 60Hz Sequence#: 2 Ext ATTN: 0 dB



Sweep Data
Peak Readings
Average Readings
1 - 15.207 AC Mains - Average
Readings
QP Readings
Ambient
2 - 15.207 AC Mains - Quasi-peak

Test Setup Photos

15.247(a)(1) Carrier Frequency Separation

Test Conditions / Setup

Test Location: CKC Laboratories, Inc. • 5046 Sierra Pines Dr. • Mariposa, CA 95338 • (209) 966-5240

Customer:	**Cisco Systems, Inc.**		
Specification:	**15.247(a)(1) Carrier Frequency Separation**		
Work Order #:	**96154**	Date:	10/22/2014
Test Type:	**Conducted Emissions**	Time:	11:25:04
Equipment:	**IR529 915MHz WPAN IP67 Range Extender single antenna**	Sequence#:	1
Manufacturer:	Cisco Systems, Inc.	Tested By:	Eddie Mariscal
Model:	IR529UWP-915D/K9		120V 60Hz
S/N:	JAD181801BA		

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	ANP02229	Attenuator	PE7010-10	2/13/2013	2/13/2015
	AN03360	Cable	32022-2-29094-36TC	2/4/2013	2/4/2015
	AN02668	Spectrum Analyzer	E4446A	8/4/2014	8/4/2015

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
IR529 915MHz WPAN IP67 Range Extender single antenna*	Cisco Systems, Inc.	IR529WP-915S/K9	JAD181801BA

Support Devices:

Function	Manufacturer	Model #	S/N
Laptop Computer	Toshiba	Portege	G66C0002GC10

Test Conditions / Notes:

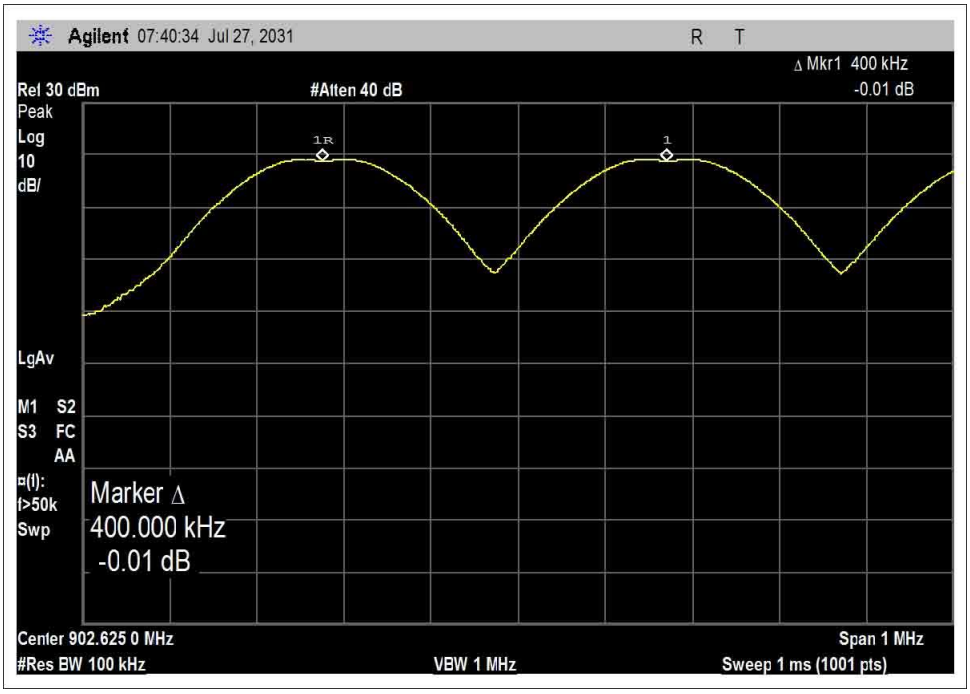
The EUT uses a removable antenna, thus measurements will be gathered via conducted measurements.
The EUT operates on 64 channels and is operating on 120VAC/60Hz.
Channel Separation measurements were taken while the EUT was operating with frequency hopping enabled in continuous transmit mode.

Power level setting: 30
Software used: Tera Term Version 4.76

Environmental Conditions:
Temperature: 21°C
Relative Humidity: 40%
Atmospheric Pressure: 97.7kPa

Test Data

	Measured Frequency Separation (kHz)	Limit (kHz)	Test Result
Carrier Frequency Separation	400	>159.48	PASS



Channel Separation

Test Setup Photo

15.247(a)(1)(i) -20dB Bandwidth

Test Conditions / Setup

Test Location: CKC Laboratories, Inc. • 5046 Sierra Pines Dr. • Mariposa, CA 95338 • (209) 966-5240

Customer:	**Cisco Systems, Inc.**		
Specification:	**15.247(a)(1)(i) -20dB Bandwidth**		
Work Order #:	**96154**	Date:	10/22/2014
Test Type:	**Conducted Emissions**	Time:	11:25:04
Equipment:	**IR529 915MHz WPAN IP67 Range Extender single antenna**	Sequence#:	1
Manufacturer:	Cisco Systems, Inc.	Tested By:	Eddie Mariscal
Model:	IR529UWP-915D/K9		120V 60Hz
S/N:	JAD181801BA		

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	ANP02229	Attenuator	PE7010-10	2/13/2013	2/13/2015
	AN03360	Cable	32022-2-29094-36TC	2/4/2013	2/4/2015
	AN02668	Spectrum Analyzer	E4446A	8/4/2014	8/4/2015

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
IR529 915MHz WPAN IP67 Range Extender single antenna*	Cisco Systems, Inc.	IR529WP-915S/K9	JAD181801BA

Support Devices:

Function	Manufacturer	Model #	S/N
Laptop Computer	Toshiba	Portege	G66C0002GC10

Test Conditions / Notes:

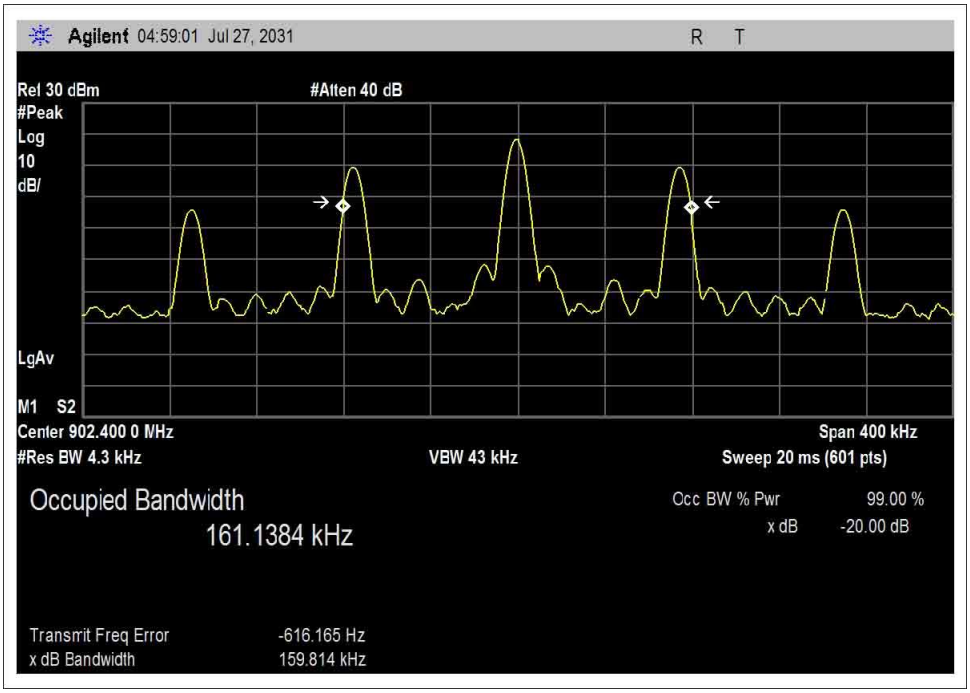
The EUT uses a removable antenna, thus measurements will be gathered via conducted measurements.
The EUT operates on 64 channels and is operating on 120VAC/60Hz.
Occupied Bandwidth measurements were taken while the EUT was operating on the lowest, the middle and the highest channels in continuous transmit mode.

Power level setting: 30
Software used: Tera Term Version 4.76

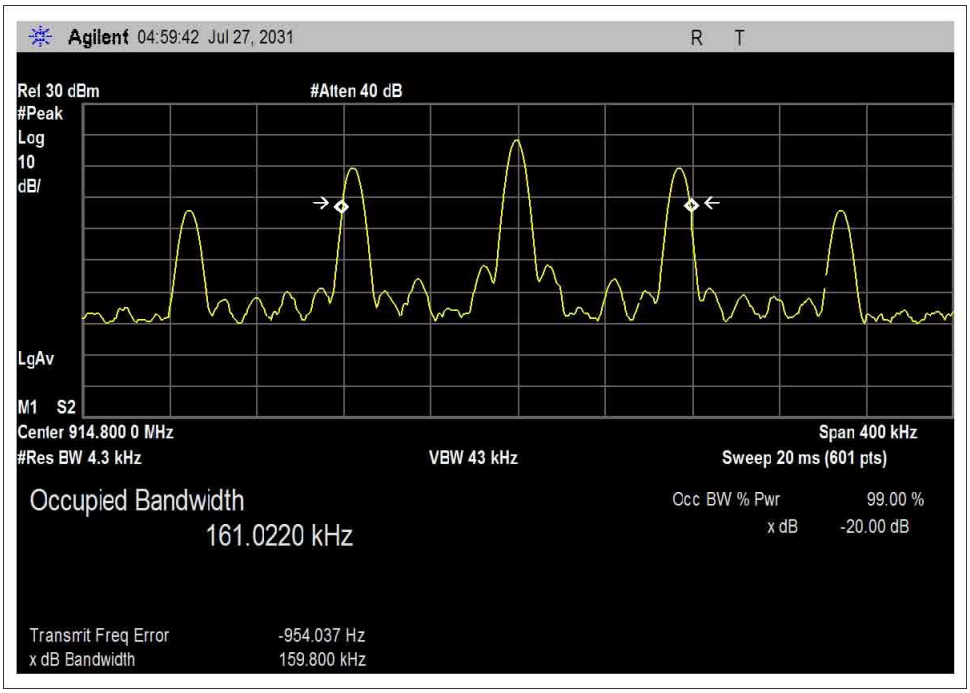
Environmental Conditions:
Temperature: 21°C
Relative Humidity: 40%
Atmospheric Pressure: 97.7kPa

Test Data

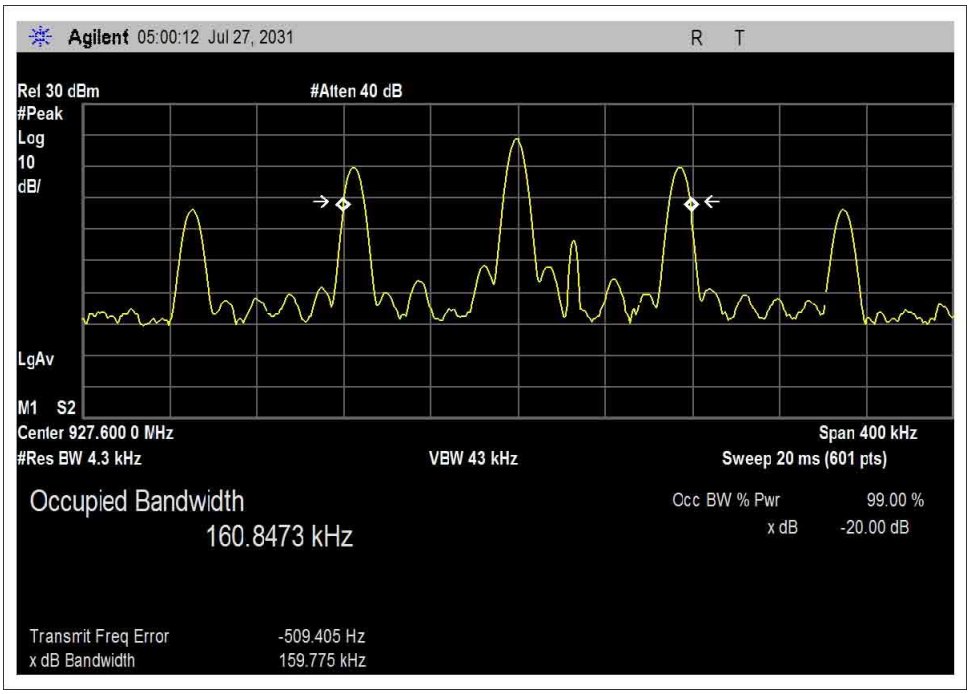
	Measured -20dB Bandwidth (kHz)	Limit (kHz)	Test Result
Low Channel (902.4MHz)	159.814	< 250	PASS
Mid Channel (914.8MHz)	159.800	< 250	PASS
High Channel (927.6MHz)	159.775	< 250	PASS



Low Channel, 902.4MHz



Mid Channel, 914.8MHz



High Channel, 927.6MHz

Test Setup Photos

15.247(a)(1)(i) Dwell Time

Test Conditions / Setup

Test Location: CKC Laboratories, Inc. • 5046 Sierra Pines Dr. • Mariposa, CA 95338 • (209) 966-5240

Customer:	**Cisco Systems, Inc.**		
Specification:	**15.247(a)(1) Dwell Time**		
Work Order #:	**96154**	Date:	10/22/2014
Test Type:	**Conducted Emissions**	Time:	11:25:04
Equipment:	**IR529 915MHz WPAN IP67 Range Extender single antenna**	Sequence#:	1
Manufacturer:	Cisco Systems, Inc.	Tested By:	Eddie Mariscal
Model:	IR529UWP-915D/K9		120V 60Hz
S/N:	JAD181801BA		

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	ANP02229	Attenuator	PE7010-10	2/13/2013	2/13/2015
	AN03360	Cable	32022-2-29094-36TC	2/4/2013	2/4/2015
	AN02668	Spectrum Analyzer	E4446A	8/4/2014	8/4/2015

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
IR529 915MHz WPAN IP67 Range Extender single antenna*	Cisco Systems, Inc.	IR529WP-915S/K9	JAD181801BA

Support Devices:

Function	Manufacturer	Model #	S/N
Laptop Computer	Toshiba	Portege	G66C0002GC10

Test Conditions / Notes:

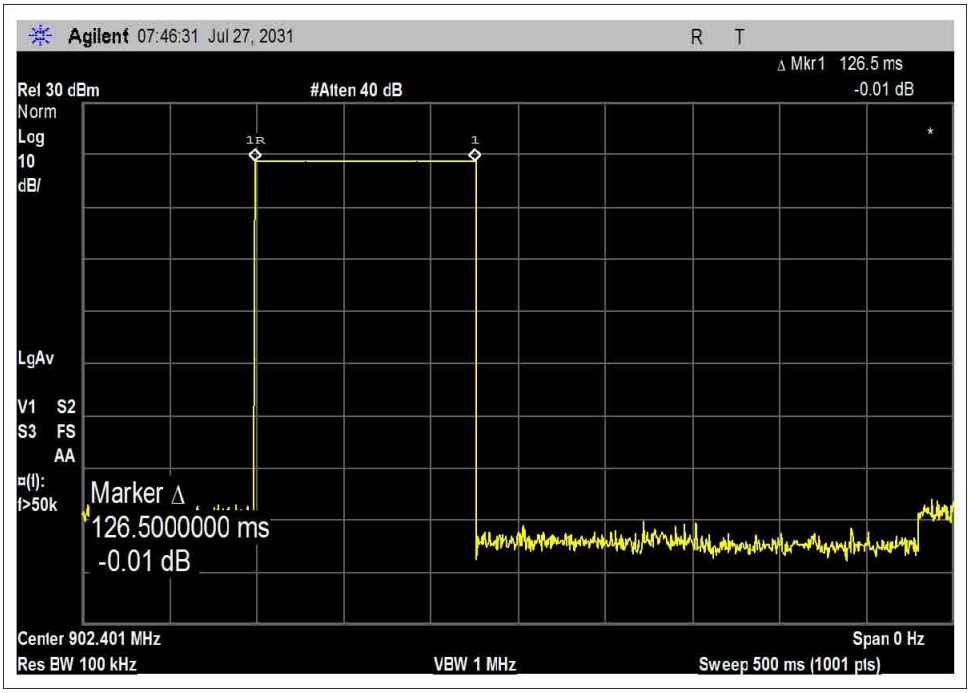
The EUT uses a removable antenna, thus measurements will be gathered via conducted measurements.
The EUT operates on 64 channels and is operating on 120VAC/60Hz.
Dwell time measurements were taken while the EUT was operating with frequency hopping enabled in continuous transmit mode.

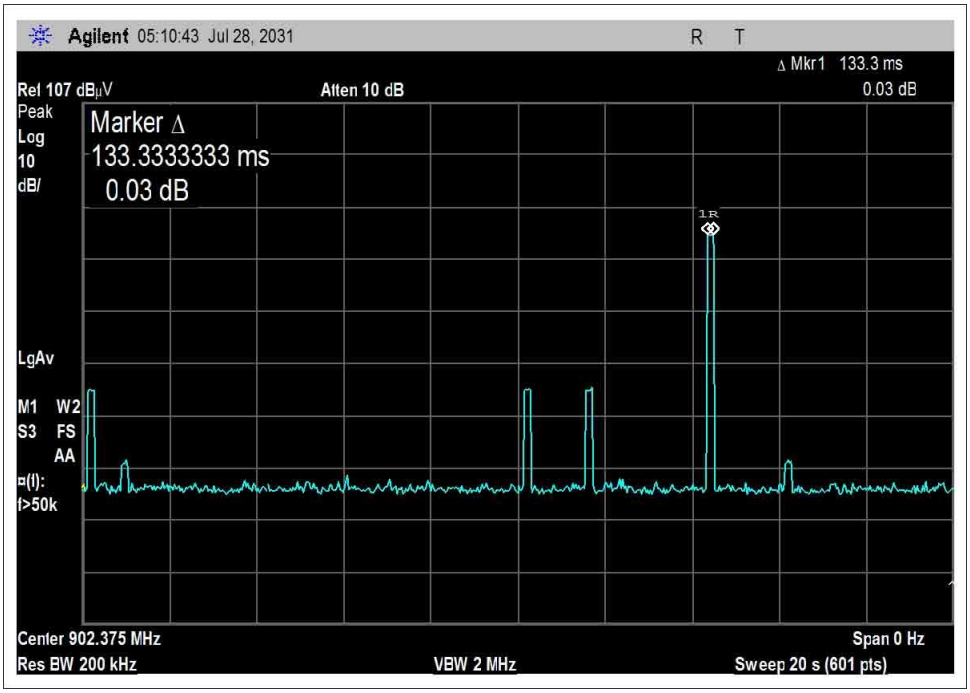
Power level setting: 30
Software used: Tera Term Version 4.76

Environmental Conditions:
Temperature: 21°C
Relative Humidity: 40%
Atmospheric Pressure: 97.7kPa

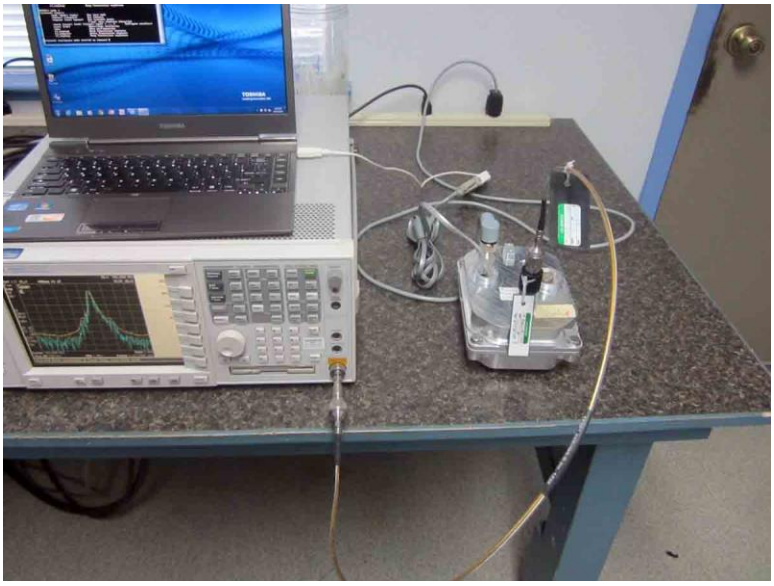
Test Data

	Measured Dwell Time (ms)	Limit (ms)	Test Result
Dwell Time	126.5	400	PASS





Test Setup Photo



15.247(a)(1)(i) Number of Hopping Channels

Test Conditions / Setup

Test Location: CKC Laboratories, Inc. • 5046 Sierra Pines Dr. • Mariposa, CA 95338 • (209) 966-5240

Customer:	**Cisco Systems, Inc.**		
Specification:	**15.247(a)(1) (i) Number of Hopping Channels**		
Work Order #:	**96154**	Date:	10/22/2014
Test Type:	**Conducted Emissions**	Time:	11:25:04
Equipment:	**IR529 915MHz WPAN IP67 Range Extender single antenna**	Sequence#:	1
Manufacturer:	Cisco Systems, Inc.	Tested By:	Eddie Mariscal
Model:	IR529UWP-915D/K9		120V 60Hz
S/N:	JAD181801BA		

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	ANP02229	Attenuator	PE7010-10	2/13/2013	2/13/2015
	AN03360	Cable	32022-2-29094-36TC	2/4/2013	2/4/2015
	AN02668	Spectrum Analyzer	E4446A	8/4/2014	8/4/2015

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
IR529 915MHz WPAN IP67 Range Extender single antenna*	Cisco Systems, Inc.	IR529WP-915S/K9	JAD181801BA

Support Devices:

Function	Manufacturer	Model #	S/N
Laptop Computer	Toshiba	Portege	G66C0002GC10

Test Conditions / Notes:

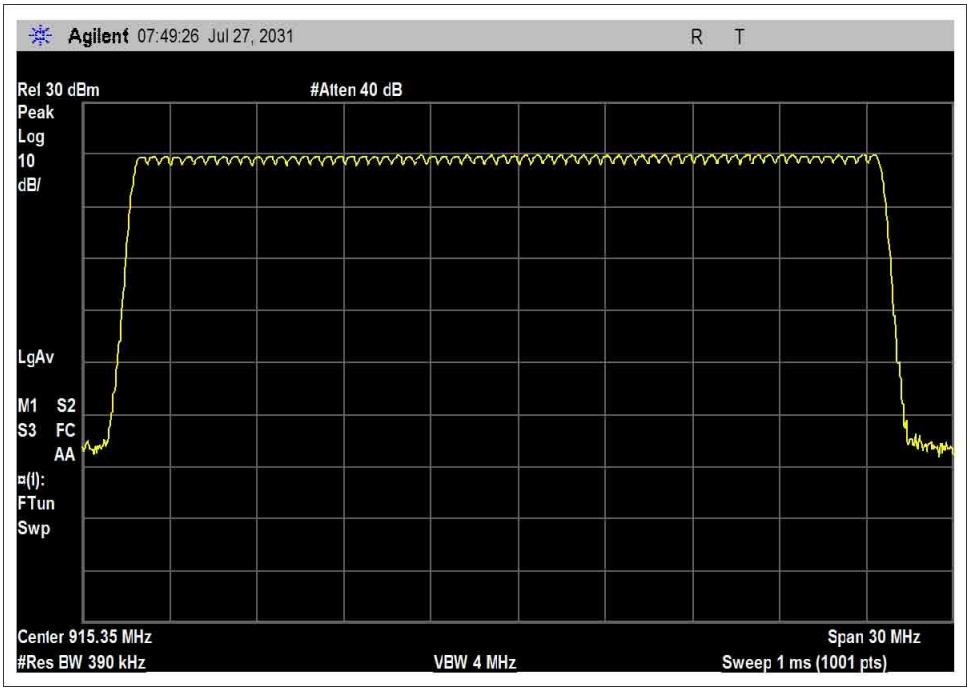
The EUT uses a removable antenna, thus measurements will be gathered via conducted measurements.
The EUT operates on 64 channels and is operating on 120VAC/60Hz.
Number of channels measurements were taken while the EUT was operating with frequency hopping enabled in continuous transmit mode.

Power level setting: 30
Software used: Tera Term Version 4.76

Environmental Conditions:
Temperature: 21°C
Relative Humidity: 40%
Atmospheric Pressure: 97.7kPa

Test Data

	Measured Number of channels	Limit	Test Result
Number of Channels	64	50	PASS



Number of Channels

Test Setup Photo

15.247(b)(2) RF Output Power

Test Conditions / Setup

Test Location: CKC Laboratories, Inc. • 5046 Sierra Pines Dr. • Mariposa, CA 95338 • (209) 966-5240

Customer:	**Cisco Systems, Inc.**		
Specification:	**15.247(b) Power Output (902-928 MHz DTS)**		
Work Order #:	**96154**	Date:	10/22/2014
Test Type:	**Conducted Emissions**	Time:	13:57:35
Equipment:	**IR529 915MHz WPAN IP67 Range Extender single antenna**	Sequence#:	1
Manufacturer:	Cisco Systems, Inc.	Tested By:	Eddie Mariscal
Model:	IR529WP-915S/K9		120V 60Hz
S/N:	JAD181801BA		

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	ANP02229	Attenuator	PE7010-10	2/13/2013	2/13/2015
T2	AN03360	Cable	32022-2-29094-36TC	2/4/2013	2/4/2015
T3	AN02668	Spectrum Analyzer	E4446A	8/4/2014	8/4/2015

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
IR529 915MHz WPAN IP67 Range Extender single antenna*	Cisco Systems, Inc.	IR529WP-915S/K9	JAD181801BA

Support Devices:

Function	Manufacturer	Model #	S/N
Laptop Computer	Toshiba	Portege	G66C0002GC10

Test Conditions / Notes:

The EUT uses a removable antenna, thus measurements will be gathered via conducted measurements.
The EUT operates on 64 channels and is operating on 120VAC/60Hz.
Peak Power measurements were taken while the EUT was operating on the lowest, the middle and the highest channels in continuous transmit mode.

Power level setting: 30
Software used: Tera Term Version 4.76

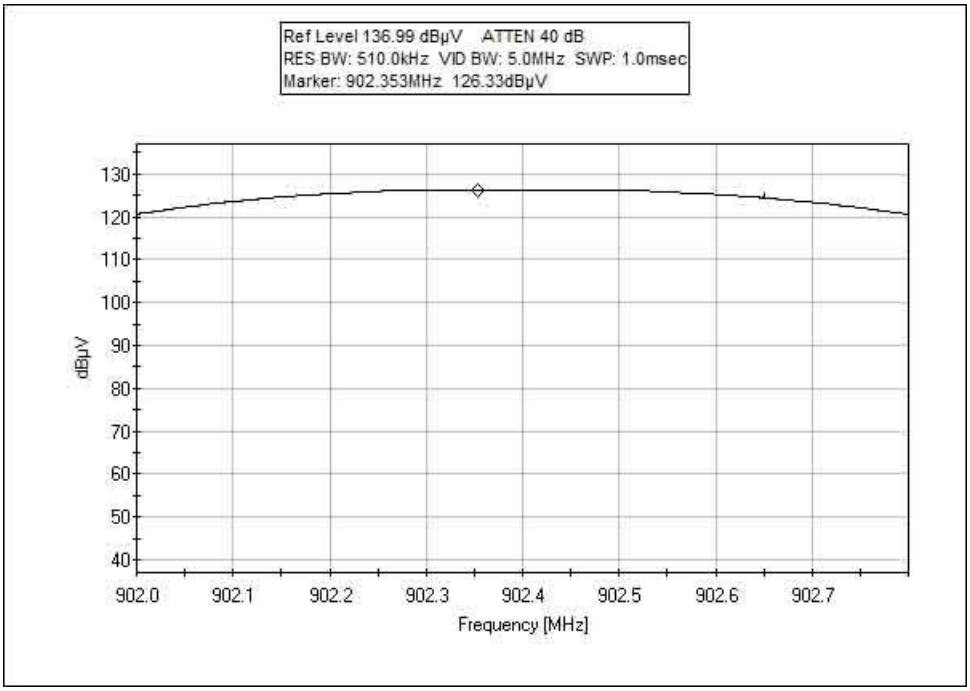
Environmental Conditions:
Temperature: 21°C
Relative Humidity: 40%
Atmospheric Pressure: 97.7kPa

Ext Attn: 0 dB

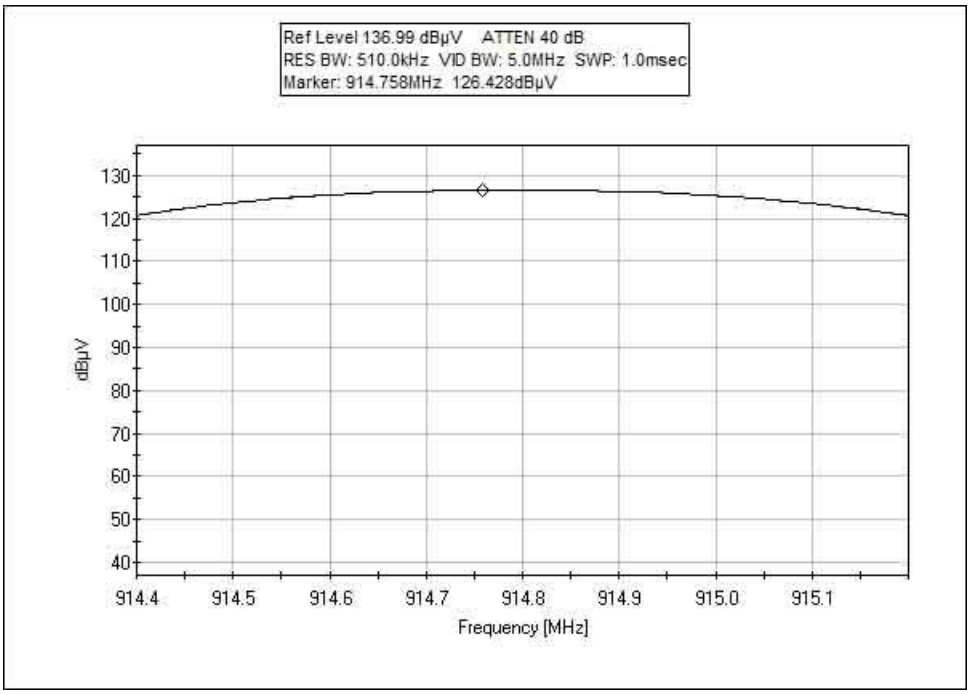
Measurement Data: Reading listed by margin. Test Lead: Black

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	dB	Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1	927.550M	126.6	+9.9	+0.4	+0.0		+0.0	136.9	137.0	-0.1	RF Ou
2	914.758M	126.4	+9.9	+0.4	+0.0		+0.0	136.7	137.0	-0.3	RF Ou
3	902.350M	126.3	+9.9	+0.4	+0.0		+0.0	136.6	137.0	-0.4	RF Ou

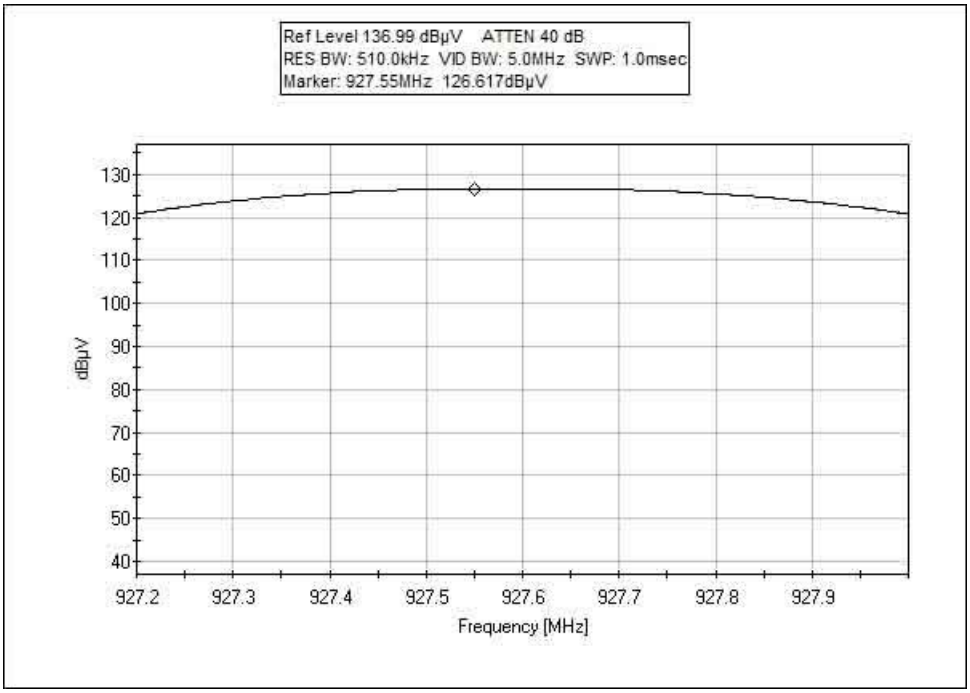
Test Data



Low Channel, 902.353MHz



Mid Channel, 914.758MHz



High Channel, 927.55MHz

Test Setup Photo

15.247(d) Conducted Spurious Emissions and Band Edge

Test Conditions / Setup

Test Location: CKC Laboratories, Inc. • 5046 Sierra Pines Dr. • Mariposa, CA 95338 • (209) 966-5240

Customer:	**Cisco Systems, Inc.**		
Specification:	**15.247(d) / 15.209 Spurious Emissions**		
Work Order #:	**96154**	Date:	10/22/2014
Test Type:	**Conducted Emissions**	Time:	14:38:19
Equipment:	**IR529 915MHz WPAN IP67 Range Extender single antenna**	Sequence#:	1
Manufacturer:	Cisco Systems, Inc.	Tested By:	Eddie Mariscal
Model:	IR529WP-915S/K9		120V 60Hz
S/N:	JAD181801BA		

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN03360	Cable	32022-2-29094-36TC	2/4/2013	2/4/2015
T2	AN02668	Spectrum Analyzer	E4446A	8/4/2014	8/4/2015
T3	AN02138	Attenuator	54-10	2/13/2013	2/13/2015
	ANP05922	Cable	RG/214	9/5/2014	9/5/2016

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
IR529 915MHz WPAN IP67 Range Extender single antenna*	Cisco Systems, Inc.	IR529WP-915S/K9	JAD181801BA

Support Devices:

Function	Manufacturer	Model #	S/N
Laptop Computer	Toshiba	Portege	G66C0002GC10

Test Conditions / Notes:

The EUT uses a removable antenna, thus measurements will be gathered via conducted measurements.
The EUT operates on 64 channels and is operating on 120VAC/60Hz.
Peak Power measurements were taken while the EUT was operating on the lowest, the middle and the highest channels in continuous transmit mode.

Power level setting: 30
Software used: Tera Term Version 4.76

Frequency Range of Interest: 9kHz - 9.28GHz excluding restricted bands as defined in 15.205.
RBW = 100kHz; VBW > RBW;

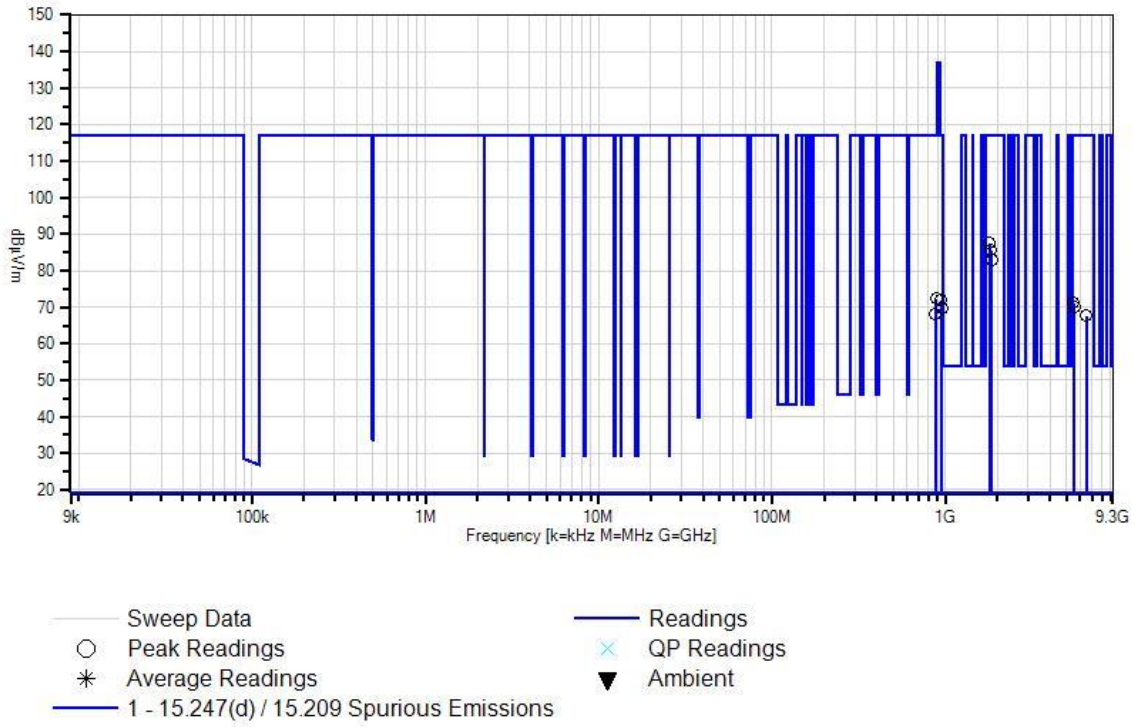
Environmental Conditions:
Temperature: 21°C
Relative Humidity: 40%
Atmospheric Pressure: 97.7kPa

Ext Attn: 0 dB

Measurement Data: Reading listed by margin. Test Lead: RF Output Port

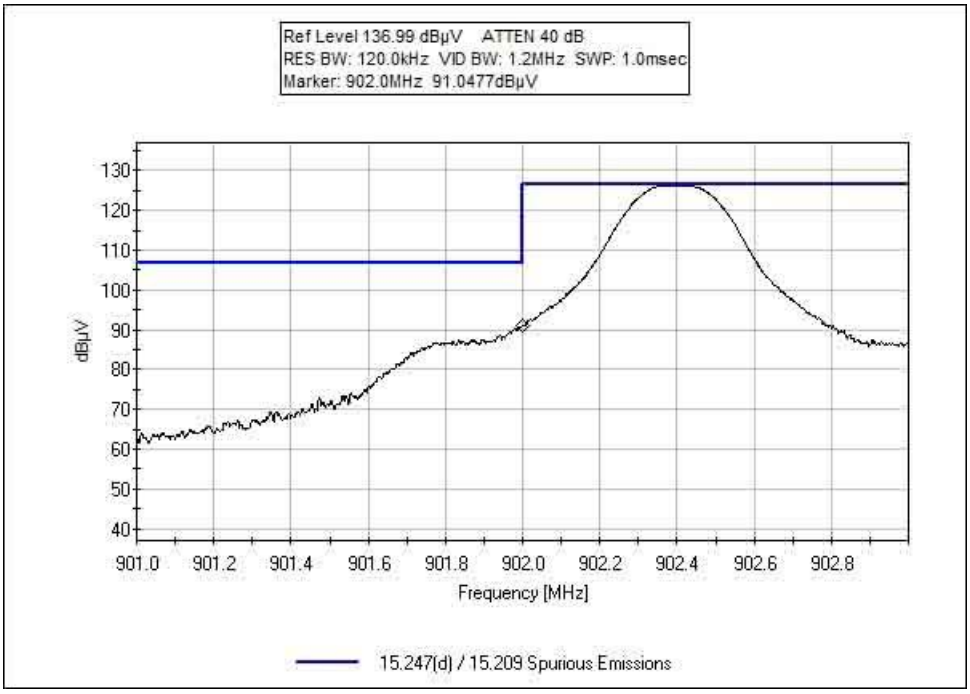
#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	1804.870M	77.2	+0.6	+0.0	+9.8		+0.0	87.6	116.9 Low Channel	-29.3	RF Ou
2	1829.645M	75.1	+0.6	+0.0	+9.8		+0.0	85.5	116.9 Mid Channel	-31.4	RF Ou
3	1855.140M	72.6	+0.6	+0.0	+9.9		+0.0	83.1	116.9 High Channel	-33.8	RF Ou
4	888.720M	62.3	+0.4	+0.0	+9.6		+0.0	72.3	116.9 High Channel	-44.6	RF Ou
5	941.300M	61.9	+0.4	+0.0	+9.7		+0.0	72.0	116.9 Low Channel	-44.9	RF Ou
6	5489.010M	59.9	+1.0	+0.0	+10.2		+0.0	71.1	116.9 Mid Channel	-45.8	RF Ou
7	5565.350M	58.9	+1.0	+0.0	+10.1		+0.0	70.0	116.9 High Channel	-46.9	RF Ou
8	953.660M	59.7	+0.4	+0.0	+9.7		+0.0	69.8	116.9 Mid Channel	-47.1	RF Ou
9	875.920M	58.0	+0.4	+0.0	+9.6		+0.0	68.0	116.9 Mid Channel	-48.9	RF Ou
10	6492.950M	56.6	+1.0	+0.0	+10.1		+0.0	67.7	116.9 High Channel	-49.2	RF Ou

CKC Laboratories, Inc. Date: 10/22/2014 Time: 14:38:19 Cisco Systems, Inc. WO#: 96154
15.247(d) / 15.209 Spurious Emissions Test Lead: RF Output Port 120V 60Hz Sequence#: 1 Ext ATTN: 0 dB

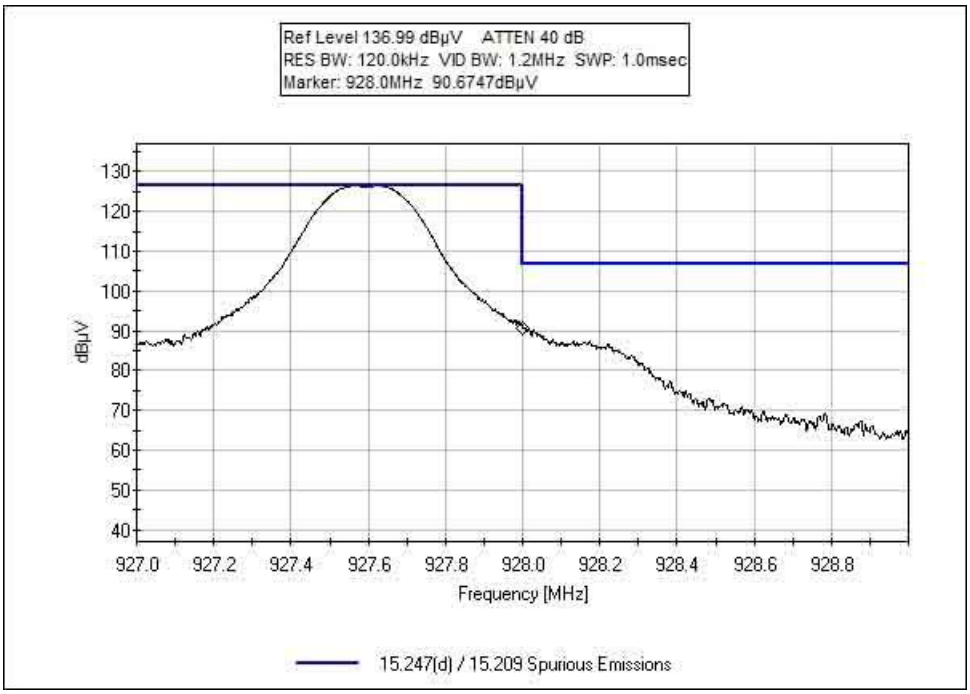


Test Data

Band Edge

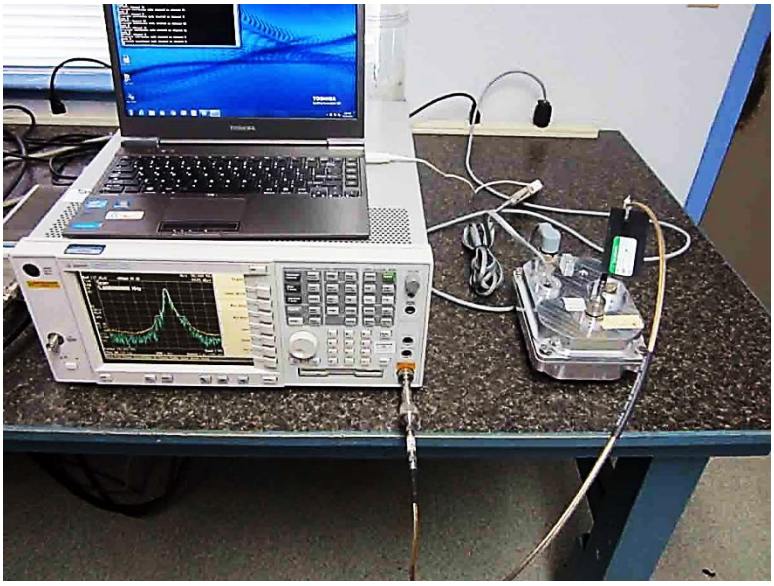


Low Channel, 902.0MHz



High Channel, 928.0MHz

Test Setup Photo



SUPPLEMENTAL INFORMATION

Measurement Uncertainty

Uncertainty Value	Parameter
4.73 dB	Radiated Emissions
3.34 dB	Mains Conducted Emissions
3.30 dB	Disturbance Power

The reported measurement uncertainties are calculated based on the worst case of all laboratory environments from CKC Laboratories, Inc. test sites. Only those parameters which require estimation of measurement uncertainty are reported. The reported worst case measurement uncertainty is less than the maximum values derived in CISPR 16-4-2. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k=2. Compliance is deemed to occur provided measurements are below the specified limits.

Emissions Test Details

TESTING PARAMETERS

Unless otherwise indicated, the following configuration parameters are used for equipment setup: The cables were routed consistent with the typical application by varying the configuration of the test sample. Interface cables were connected to the available ports of the test unit. The effect of varying the position of the cables was investigated to find the configuration that produced maximum emissions. Cables were of the type and length specified in the individual requirements. The length of cable that produced maximum emissions was selected.

The equipment under test (EUT) was set up in a manner that represented its normal use, as shown in the setup photographs. Any special conditions required for the EUT to operate normally are identified in the comments that accompany the emissions tables.

The emissions data was taken with a spectrum analyzer or receiver. Incorporating the applicable correction factors for distance, antenna, cable loss and amplifier gain, the data was reduced as shown in the table below. The corrected data was then compared to the applicable emission limits. Preliminary and final measurements were taken in order to ensure that all emissions from the EUT were found and maximized.

CORRECTION FACTORS

The basic spectrum analyzer reading was converted using correction factors as shown in the highest emissions readings in the tables. For radiated emissions in dBµV/m, the spectrum analyzer reading in dBµV was corrected by using the following formula. This reading was then compared to the applicable specification limit.

SAMPLE CALCULATIONS		
	Meter reading	(dBµV)
+	Antenna Factor	(dB)
+	Cable Loss	(dB)
-	Distance Correction	(dB)
-	Preamplifier Gain	(dB)
=	Corrected Reading	(dBµV/m)

TEST INSTRUMENTATION AND ANALYZER SETTINGS

The test instrumentation and equipment listed were used to collect the emissions data. A spectrum analyzer or receiver was used for all measurements. Unless otherwise specified, the following table shows the measuring equipment bandwidth settings that were used in designated frequency bands. For testing emissions, an appropriate reference level and a vertical scale size of 10 dB per division were used.

MEASURING EQUIPMENT BANDWIDTH SETTINGS PER FREQUENCY RANGE			
TEST	BEGINNING FREQUENCY	ENDING FREQUENCY	BANDWIDTH SETTING
CONDUCTED EMISSIONS	150 kHz	30 MHz	9 kHz
RADIATED EMISSIONS	9 kHz	150 kHz	200 Hz
RADIATED EMISSIONS	150 kHz	30 MHz	9 kHz
RADIATED EMISSIONS	30 MHz	1000 MHz	120 kHz
RADIATED EMISSIONS	1000 MHz	>1 GHz	1 MHz

SPECTRUM ANALYZER/RECEIVER DETECTOR FUNCTIONS

The notes that accompany the measurements contained in the emissions tables indicate the type of detector function used to obtain the given readings. Unless otherwise noted, all readings were made in the "positive peak" detector mode. Whenever a "quasi-peak" or "average" reading was recorded, the measurement was annotated with a "QP" or an "Ave" on the appropriate rows of the data sheets. In cases where quasi-peak or average limits were employed and data exists for multiple measurement types for the same frequency then the peak measurement was retained in the report for reference, however the numbering for the affected row was removed and an arrow or carrot ("^") was placed in the far left-hand column indicating that the row above takes precedence for comparison to the limit. The following paragraphs describe in more detail the detector functions and when they were used to obtain the emissions data.

Peak

In this mode, the spectrum analyzer or receiver recorded all emissions at their peak value as the frequency band selected was scanned. By combining this function with another feature called "peak hold," the measurement device had the ability to measure intermittent or low duty cycle transient emission peak levels. In this mode the measuring device made a slow scan across the frequency band selected and measured the peak emission value found at each frequency across the band.

Quasi-Peak

Quasi-peak measurements were taken using the quasi-peak detector when the true peak values exceeded or were within 2 dB of a quasi-peak specification limit. Additional QP measurements may have been taken at the discretion of the operator.

Average

Average measurements were taken using the average detector when the true peak values exceeded or were within 2 dB of an average specification limit. Additional average measurements may have been taken at the discretion of the operator. If the specification or test procedure requires trace averaging, then the averaging was performed using 100 samples or as required by the specification. All other average measurements are performed using video bandwidth averaging. To make these measurements, the test engineer reduces the video bandwidth on the measuring device until the modulation of the signal is filtered out. At this point the measuring device is set into the linear mode and the scan time is reduced.