



Elliott Laboratories Inc.
www.elliottlabs.com

684 West Maude Avenue
Sunnyvale, CA 94085-3518

408-245-7800 Phone
408-245-3499 Fax

August 31, 2006

David Boldy
Broadcom Corporation
190 Mathilda Avenue
Sunnyvale, CA 94086

Subject: FCC and Industry Canada Report, model BCM94321MC

Dear Mr. Boldy:

A report has been created detailing the results of the FCC and IC electromagnetic emissions testing performed on the BCM94321MC. This has been submitted to a TCB to obtain the appropriate equipment certifications. Please find this report enclosed.

This application has been granted by the FCC and Industry Canada. Attached you will find the grants.

If you have any questions, please don't hesitate to call us at 408-245-7800.

Sincerely,

A handwritten signature in black ink that reads "Juan Martinez".

Juan Martinez
Senior EMC Engineer

JM/dmg
Enclosure: Copy of Application Package



Elliott Laboratories Inc.
www.elliottlabs.com

684 West Maude Avenue
Sunnyvale, CA 94085-3518

408-245-7800 Phone
408-245-3499 Fax

August 31, 2006

Elliott Laboratories, Inc.
684 West Maude Ave.
Sunnyvale, CA. 94085

Gentlemen:

The enclosed documents constitute a formal submittal and application for a Grant of Equipment Authorization pursuant to the following:

Subpart C of Part 15 of FCC Rules (CFR 47)

RSS-Gen Issue 1, September 2005, "General Requirements and Information for the Certification of Radiocommunication Equipment"

RSS-210, Issue 6, September 2005, "Low-power Licence-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment"

Data within this report demonstrates that the equipment tested complies with the relevant limits for unlicensed wireless devices.

Elliott Laboratories, as duly authorized agent prepared this submittal. A copy of the letter of our appointment as agent is enclosed.

If there are any questions or if further information is needed, please contact Elliott Laboratories for assistance.

Sincerely,

A handwritten signature in black ink that reads "Juan Martinez".

Juan Martinez
Senior EMC Engineer

JM/dmg

Enclosures: Agent Authorization Letter
 Emissions Test Report with Exhibits

***Electromagnetic Emissions Test Report
and
Application for Grant of Equipment Authorization
pursuant to
Industry Canada RSS-Gen Issue 1 / RSS 210 Issue 6
FCC Part 15 Subpart C
on the
Broadcom Corporation
Transmitter
Model: BCM94321MC***

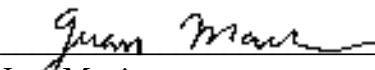
UPN: 4324A-BRCM1022
FCC ID: QDS-BRCM1022

GRANTEE: Broadcom Corporation
190 Mathilda Avenue
Sunnyvale, CA 94086

TEST SITE: Elliott Laboratories, Inc.
41039 Boyce Road
Fremont, CA 94538

REPORT DATE: August 31, 2006

FINAL TEST DATE: August 10, August 11, August 14, August 15,
August 17, August 24 and August 25, 2006

AUTHORIZED SIGNATORY: 
Juan Martinez
Senior EMC Engineer



2016-01

Elliott Laboratories, Inc. is accredited by the A2LA, certificate number 2016-01, to perform the test(s) listed in this report. This report shall not be reproduced, except in its entirety, without the written approval of Elliott Laboratories, Inc.

REVISION HISTORY

Revision #	Date	Comments	Modified By
1	September 21, 2006	Initial Release	David Guidotti

TABLE OF CONTENTS

COVER PAGE.....	1
REVISION HISTORY.....	3
TABLE OF CONTENTS.....	4
SCOPE.....	6
OBJECTIVE.....	7
STATEMENT OF COMPLIANCE.....	8
TEST RESULTS SUMMARY.....	9
DIGITAL TRANSMISSION SYSTEMS (2400 – 2483.5MHZ).....	9
GENERAL REQUIREMENTS APPLICABLE TO ALL BANDS.....	10
MEASUREMENT UNCERTAINTIES	10
EQUIPMENT UNDER TEST (EUT) DETAILS	11
GENERAL.....	11
ANTENNA SYSTEM	11
ENCLOSURE.....	11
MODIFICATIONS.....	11
SUPPORT EQUIPMENT.....	12
EUT INTERFACE PORTS.....	13
EUT OPERATION.....	13
TEST SITE.....	14
GENERAL INFORMATION.....	14
CONDUCTED EMISSIONS CONSIDERATIONS.....	14
RADIATED EMISSIONS CONSIDERATIONS.....	14
MEASUREMENT INSTRUMENTATION.....	15
RECEIVER SYSTEM.....	15
INSTRUMENT CONTROL COMPUTER.....	15
LINE IMPEDANCE STABILIZATION NETWORK (LISN).....	15
FILTERS/ATTENUATORS.....	16
ANTENNAS.....	16
ANTENNA MAST AND EQUIPMENT TURNABLE	16
INSTRUMENT CALIBRATION.....	16
TEST PROCEDURES	17
EUT AND CABLE PLACEMENT.....	17
CONDUCTED EMISSIONS.....	17
RADIATED EMISSIONS.....	17
RADIATED EMISSIONS.....	18
BANDWIDTH MEASUREMENTS.....	20
SPECIFICATION LIMITS AND SAMPLE CALCULATIONS.....	21
GENERAL TRANSMITTER RADIATED EMISSIONS SPECIFICATION LIMITS.....	22
RECEIVER RADIATED SPURIOUS EMISSIONS SPECIFICATION LIMITS.....	22
OUTPUT POWER LIMITS – DIGITAL TRANSMISSION SYSTEMS.....	22
TRANSMIT MODE SPURIOUS RADIATED EMISSIONS LIMITS – FHSS AND DTS SYSTEMS.....	23
SAMPLE CALCULATIONS - CONDUCTED EMISSIONS.....	24
SAMPLE CALCULATIONS - RADIATED EMISSIONS.....	24
SAMPLE CALCULATIONS - FIELD STRENGTH TO EIRP CONVERSION.....	25

TABLE OF CONTENTS (Continued)

EXHIBIT 1: Test Equipment Calibration Data.....	1
EXHIBIT 2: Test Measurement Data.....	2
EXHIBIT 3: Photographs of Test Configurations.....	3
EXHIBIT 4: Proposed FCC ID Label & Label Location	4
EXHIBIT 5: Detailed Photographs.....	5
EXHIBIT 6: Operator's Manual.....	6
EXHIBIT 7: Block Diagram.....	7
EXHIBIT 8: Schematic Diagrams.....	8
EXHIBIT 9: Theory of Operation.....	9
EXHIBIT 10: Advertising Literature.....	10
EXHIBIT 11: RF Exposure Information	11

SCOPE

An electromagnetic emissions test has been performed on the Broadcom Corporation model BCM94321MC pursuant to the following rules:

Industry Canada RSS-Gen Issue 1
RSS 210 Issue 6 "Low-power Licence-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment"
FCC Part 15 Subpart C

Conducted and radiated emissions data has been collected, reduced, and analyzed within this report in accordance with measurement guidelines set forth in the following reference standards and as outlined in Elliott Laboratories test procedures:

ANSI C63.4:2003
RSS-212 Issue 1 Test Facilities and Test Methods for Radio Equipment

The intentional radiator above has been tested in a simulated typical installation to demonstrate compliance with the relevant Industry Canada performance and procedural standards.

Final system data was gathered in a mode that tended to maximize emissions by varying orientation of EUT, orientation of power and I/O cabling, antenna search height, and antenna polarization.

Every practical effort was made to perform an impartial test using appropriate test equipment of known calibration. All pertinent factors have been applied to reach the determination of compliance.

The test results recorded herein are based on a single type test of the Broadcom Corporation model BCM94321MC and therefore apply only to the tested sample. The sample was selected and prepared by David Boldy of Broadcom Corporation

OBJECTIVE

The primary objective of the manufacturer is compliance with the regulations outlined in the previous section.

Prior to marketing in the USA, all unlicensed transmitters and transceivers require certification. Receive-only devices operating between 30 MHz and 960 MHz are subject to either certification or a manufacturer's declaration of conformity, with all other receive-only devices exempt from the technical requirements.

Prior to marketing in Canada, Class I transmitters, receivers and transceivers require certification. Class II devices are required to meet the appropriate technical requirements but are exempt from certification requirements.

Certification is a procedure where the manufacturer submits test data and technical information to a certification body and receives a certificate or grant of equipment authorization upon successful completion of the certification body's review of the submitted documents. Once the equipment authorization has been obtained, the label indicating compliance must be attached to all identical units, which are subsequently manufactured.

Maintenance of compliance is the responsibility of the manufacturer. Any modification of the product which may result in increased emissions should be checked to ensure compliance has been maintained (i.e., printed circuit board layout changes, different line filter, different power supply, harnessing or I/O cable changes, etc.).

STATEMENT OF COMPLIANCE

The tested sample of Broadcom Corporation model BCM94321MC complied with the requirements of the following regulations:

Industry Canada RSS-Gen Issue 1
RSS 210 Issue 6 "Low-power Licence-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment"
FCC Part 15 Subpart C

Maintenance of compliance is the responsibility of the manufacturer. Any modification of the product which may result in increased emissions should be checked to ensure compliance has been maintained (i.e., printed circuit board layout changes, different line filter, different power supply, harnessing or I/O cable changes, etc.).

TEST RESULTS SUMMARY**DIGITAL TRANSMISSION SYSTEMS (2400 – 2483.5MHz)**

FCC Rule Part	RSS Rule Part	Description	Measured Value / Comments	Limit / Requirement	Result
15.247(a)	RSS 210 A8.2	Digital Modulation	Systems uses OFDM / DSSS techniques	-	Complies
15.247 (a) (2)	RSS 210 A8.2 (1)	6dB Bandwidth	N/A – Class II change will have not affect	>500kHz	Complies
	RSP100	99% Bandwidth	N/A – Class II change will have not affect	Information only	Complies
15.247 (b) (3)	RSS 210 A8.2 (4)	Output Power (multipoint systems)	18.8 dBm (.075 Watts) EIRP = 0.251 W ^{Note 1}	1Watt, EIRP limited to 4 Watts.	Complies
15.247(d)	RSS 210 A8.2 (2)	Power Spectral Density	-0.8 dBm/3kHz	8dBm/3kHz	Complies
15.247(c)	RSS 210 A8.5	Antenna Port Spurious Emissions 30MHz – 25 GHz	Refer to plots in test data	< -30dBc ^{Note 2}	Complies
15.247(c) / 15.209	RSS 210 A8.5	Radiated Spurious Emissions 30MHz – 25 GHz	53.6dBμV/m (478.6μV/m) @ 11570.9MHz (-0.4dB)	15.207 in restricted bands, all others <-30dBc ^{Note 2}	Complies

Note 1: EIRP calculated using antenna gain of 2.2 dBi for the highest EIRP multi-point system.

Note 2: Limit of -30dBc used because the power was measured using the UNII test procedure (maximum power averaged over a transmission burst) / RMS averaging over a time interval, as permitted under RSS 210 section A8.4(4).

GENERAL REQUIREMENTS APPLICABLE TO ALL BANDS

FCC Rule Part	RSS Rule part	Description	Measured Value / Comments	Limit / Requirement	Result (margin)
15.203	-	RF Connector	Same as original application		Complies
15.109	RSS GEN 7.2.3 Table 1	Receiver spurious emissions	42.8dB μ V/m (138.0 μ V/m) @ 11510.0MHz (-11.2dB)		Complies (- 0.4 dB)
15.207	RSS GEN Table 2	AC Conducted Emissions	N/A – Class II change will have not affect		Complies
15.247 (b) (5) 15.407 (f)	RSS 102	RF Exposure Requirements	Power stayed the same same exposure information from original application applies	Refer to OET 65, FCC Part 1 and RSS 102	Complies
	RSP 100 RSS GEN 7.1.5	User Manual	Same as original application	Statement required regarding non-interference	
	RSP 100 RSS GEN 7.1.5	User Manual	Same as original application	Statement required regarding detachable antenna	

MEASUREMENT UNCERTAINTIES

ISO Guide 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level and were calculated in accordance with UKAS document LAB 34.

Measurement Type	Frequency Range (MHz)	Calculated Uncertainty (dB)
Conducted Emissions	0.15 to 30	± 2.4
Radiated Emissions	0.015 to 30	± 3.0
Radiated Emissions	30 to 1000	± 3.6
Radiated Emissions	1000 to 40000	± 6.0

EQUIPMENT UNDER TEST (EUT) DETAILS**GENERAL**

The Broadcom Corporation model BCM94321MC is a Broadcom 802.11ag/Draft 802.11n Wireless LAN PCI-E Mini Card that is designed to install in a laptop PC and provide wireless networking capabilities. Since the EUT would be placed on a table top during operation, the EUT was treated as table-top equipment during testing to simulate the end-user environment. The electrical rating of the EUT is 3.3 VDC @ 600mA.

The sample was received on August 10, 2006 and tested on August 10, August 11, August 14, August 15, August 17, August 24 and August 25, 2006. The EUT consisted of the following component(s):

Manufacturer	Model	Description	Serial Number	FCC ID
Broadcom	BCM94321	WLAN module	-	-

ANTENNA SYSTEM

The antenna system used with the Broadcom Corporation model BCM94321MC consists of the original antenna. This is a class II change an antenna information is the same as the original application.

ENCLOSURE

The EUT does not have an enclosure as it is designed to be installed within the enclosure of a host computer or system.

MODIFICATIONS

The EUT did not require modifications during testing in order to comply with emissions specifications.

SUPPORT EQUIPMENT

The following equipment was used as local support equipment for emissions testing:

Config 1

Manufacturer	Model	Description	Serial Number
Dell	Inspiron 0000	Laptop PC	P/R Proto 2 Latitude Config 3
Dell	F9710	60W AC Adapter	CN-0F9710-71615- 56H-5118 Rev A01
FoxConn	-	7.44 dBi PCB Antenna	-
Adexelec	PEX1-MINI Rev 02	Plug-In PCMCIA Adapter Card	-
Agilent	E4416A	Power Meter	MY45100591
Agilent	E9323A	Peak and Avg Power Sensor	MY44420617

Config 2

Manufacturer	Model	Description	Serial Number
Dell	ZRS PT Build Unit Plan Rev 07, Zanzibar A	P/N HAQ00010001	2020537200004 No. 369
Dell	PA-1131-02D D P/N 9Y819	130W AC Adapter	CN-09Y819-71615-57C- 20A9 Rev 04

No equipment was used as remote support equipment for emissions testing:

EUT INTERFACE PORTS

The I/O cabling configuration during emissions testing was as follows:

Config 1

Port	Connected To	Cable(s)		
		Description	Shielded or Unshielded	Length(m)
EUT (Card)	Adexelec Adapter Card	Direct Connection	-	-
EUT Main Port	Antenna #1	Coaxial	Shielded	0.5
EUT Aux Port	Antenna #2	Coaxial	Shielded	0.5
Host Laptop DC Input	AC-DC Adapter	DC Leads	Unshielded	1.0
AC-DC Adapter AC Input	120V/60Hz AC Outlet	AC Power Cord	Unshielded	2.0

Config 2

Port	Connected To	Cable(s)		
		Description	Shielded or Unshielded	Length(m)
EUT (Card)	Installed Internally in Laptop	Direct Connection	-	-
Host Laptop DC Input	AC-DC Adapter	DC Leads	Unshielded	1.0
AC-DC Adapter AC Input	120V/60Hz AC Outlet	AC Power Cord	Unshielded	2.0

EUT OPERATION

During emissions testing the EUT was in continuous transmit mode or receive mode as noted.

TEST SITE**GENERAL INFORMATION**

Final test measurements were taken on August 10, August 11, August 14, August 15, August 17, August 24 and August 25, 2006 at the Elliott Laboratories Anechoic Chambers 3, 4 and 5 located at 41039 Boyce Road, Fremont, California Pursuant to section 2.948 of the FCC's Rules and section 3.3 of RSP-100, construction, calibration, and equipment data has been filed with the Commission.

ANSI C63.4:2003 recommends that ambient noise at the test site be at least 6 dB below the allowable limits. Ambient levels are below this requirement with the exception of predictable local TV, radio, and mobile communications traffic. The test site contains separate areas for radiated and conducted emissions testing. Considerable engineering effort has been expended to ensure that the facilities conform to all pertinent requirements of ANSI C63.4:2003 and RSS 212.

CONDUCTED EMISSIONS CONSIDERATIONS

Conducted emissions testing is performed in conformance with ANSI C63.4:2003 and RSS 212. Measurements are made with the EUT connected to the public power network through a nominal, standardized RF impedance, which is provided by a line impedance stabilization network, known as a LISN. A LISN is inserted in series with each current-carrying conductor in the EUT power cord.

RADIATED EMISSIONS CONSIDERATIONS

The FCC has determined that radiation measurements made in a shielded enclosure are not suitable for determining levels of radiated emissions. Radiated measurements are performed in an open field environment or in a semi-anechoic chamber. The test sites are maintained free of conductive objects within the CISPR defined elliptical area incorporated in ANSI C63.4:2003 guidelines and meet the Normalized Site Attenuation (NSA) requirements of ANSI C63.4:2003 / RSS 212.

MEASUREMENT INSTRUMENTATION**RECEIVER SYSTEM**

An EMI receiver as specified in CISPR 16-1 is used for emissions measurements. The receivers used can measure over the frequency range of 9 kHz up to 2000 MHz. These receivers allow both ease of measurement and high accuracy to be achieved. The receivers have Peak, Average, and CISPR (Quasi-peak) detectors built into their design so no external adapters are necessary. The receiver automatically sets the required bandwidth for the CISPR detector used during measurements. If the repetition frequency of the signal being measured is below 20Hz, peak measurements are made in lieu of Quasi-Peak measurements.

For measurements above the frequency range of the receivers, a spectrum analyzer is utilized because it provides visibility of the entire spectrum along with the precision and versatility required to support engineering analysis. Average measurements above 1000MHz are performed on the spectrum analyzer using the linear-average method with a resolution bandwidth of 1 MHz and a video bandwidth of 10 Hz, unless the signal is pulsed in which case the average (or video) bandwidth of the measuring instrument is reduced to onset of pulse desensitization and then increased.

INSTRUMENT CONTROL COMPUTER

The receivers utilize either a Rohde & Schwarz EZM Spectrum Monitor/Controller or contain an internal Spectrum Monitor/Controller to view and convert the receiver measurements to the field strength at an antenna or voltage developed at the LISN measurement port, which is then compared directly with the appropriate specification limit. This provides faster, more accurate readings by performing the conversions described under Sample Calculations within the Test Procedures section of this report. Results are printed in a graphic and/or tabular format, as appropriate. A personal computer is used to record all measurements made with the receivers.

The Spectrum Monitor provides a visual display of the signal being measured. In addition, the controller or a personal computer run automated data collection programs which control the receivers. This provides added accuracy since all site correction factors, such as cable loss and antenna factors are added automatically.

LINE IMPEDANCE STABILIZATION NETWORK (LISN)

Line conducted measurements utilize a fifty microhenry Line Impedance Stabilization Network as the monitoring point. The LISN used also contains a 250 uH CISPR adapter. This network provides for calibrated radio frequency noise measurements by the design of the internal low pass and high pass filters on the EUT and measurement ports, respectively.

FILTERS/ATTENUATORS

External filters and precision attenuators are often connected between the receiving antenna or LISN and the receiver. This eliminates saturation effects and non-linear operation due to high amplitude transient events.

ANTENNAS

A loop antenna is used below 30 MHz. For the measurement range 30 MHz to 1000 MHz either a combination of a biconical antenna and a log periodic or a bi-log antenna is used. Above 1000 MHz, horn antennas are used. The antenna calibration factors to convert the received voltage to an electric field strength are included with appropriate cable loss and amplifier gain factors to determine an overall site factor, which is then programmed into the test receivers or incorporated into the test software.

ANTENNA MAST AND EQUIPMENT TURNTABLE

The antennas used to measure the radiated electric field strength are mounted on a non-conductive antenna mast equipped with a motor-drive to vary the antenna height. Measurements below 30 MHz are made with the loop antenna at a fixed height of 1m above the ground plane.

ANSI C63.4:2003 and RSS 212 specify that the test height above ground for table mounted devices shall be 80 centimeters. Floor mounted equipment shall be placed on the ground plane if the device is normally used on a conductive floor or separated from the ground plane by insulating material from 3 to 12 mm if the device is normally used on a non-conductive floor. During radiated measurements, the EUT is positioned on a motorized turntable in conformance with this requirement.

INSTRUMENT CALIBRATION

All test equipment is regularly checked to ensure that performance is maintained in accordance with the manufacturer's specifications. All antennas are calibrated at regular intervals with respect to tuned half-wave dipoles. An exhibit of this report contains the list of test equipment used and calibration information.

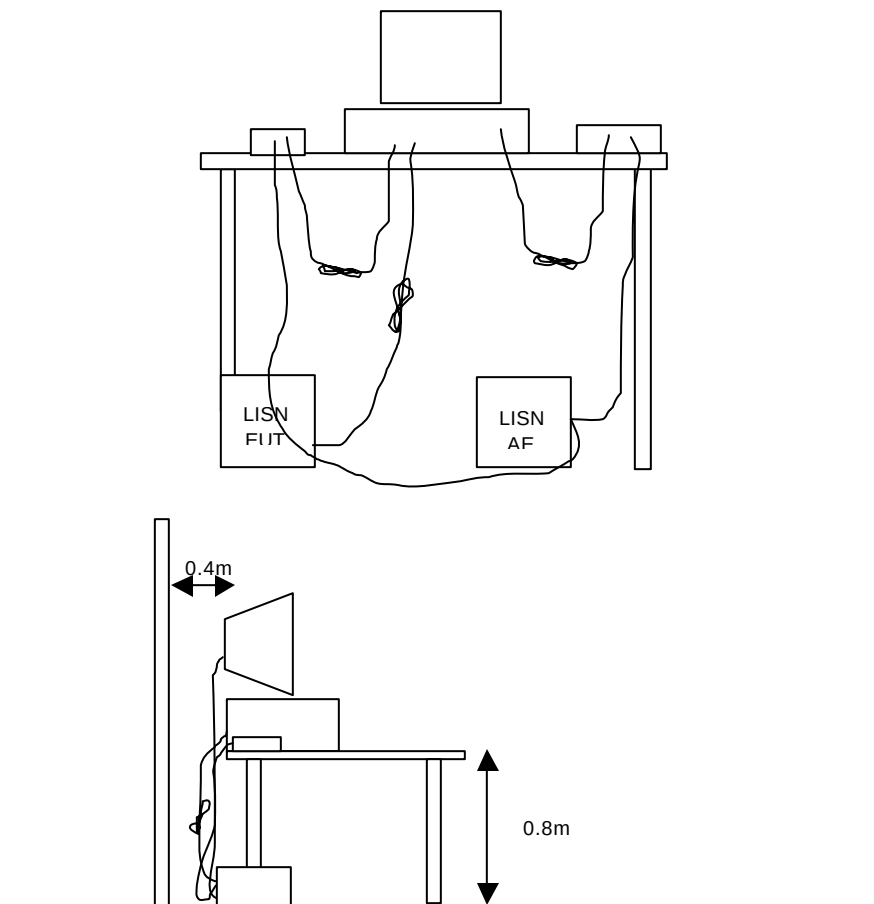
TEST PROCEDURES

EUT AND CABLE PLACEMENT

The regulations require that interconnecting cables be connected to the available ports of the unit and that the placement of the unit and the attached cables simulate the worst case orientation that can be expected from a typical installation, so far as practicable. To this end, the position of the unit and associated cabling is varied within the guidelines of ANSI C63.4:2003, and the worst-case orientation is used for final measurements.

CONDUCTED EMISSIONS

Conducted emissions are measured at the plug end of the power cord supplied with the EUT. Excess power cord length is wrapped in a bundle between 30 and 40 centimeters in length near the center of the cord. Preliminary measurements are made to determine the highest amplitude emission relative to the specification limit for all the modes of operation. Placement of system components and varying of cable positions are performed in each mode. A final peak mode scan is then performed in the position and mode for which the highest emission was noted on all current carrying conductors of the power cord.

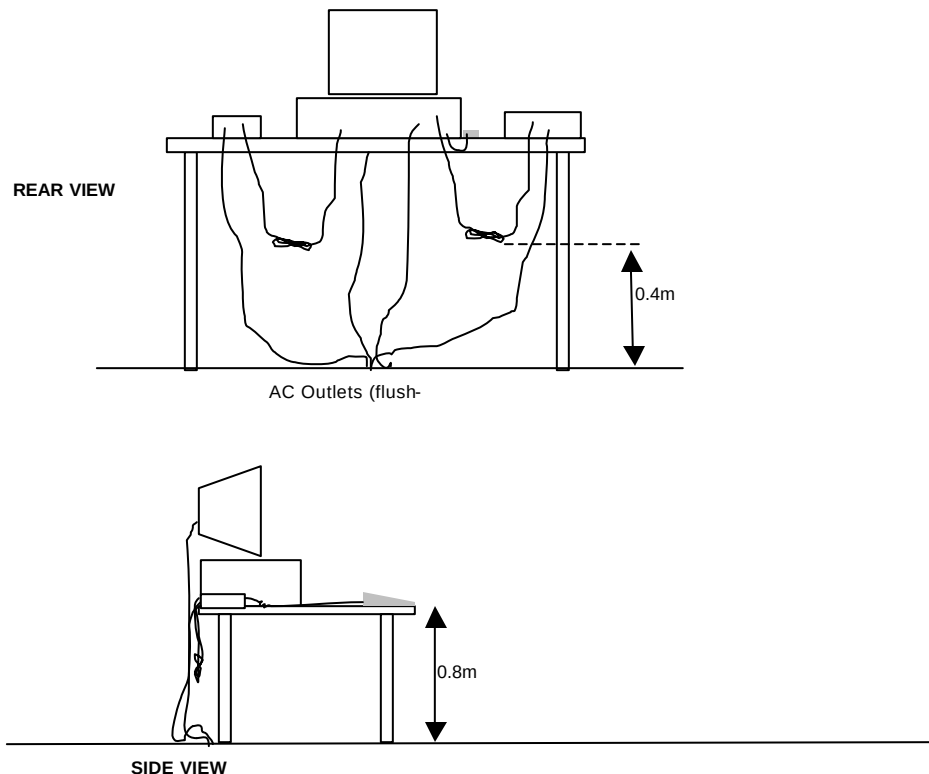


RADIATED EMISSIONS

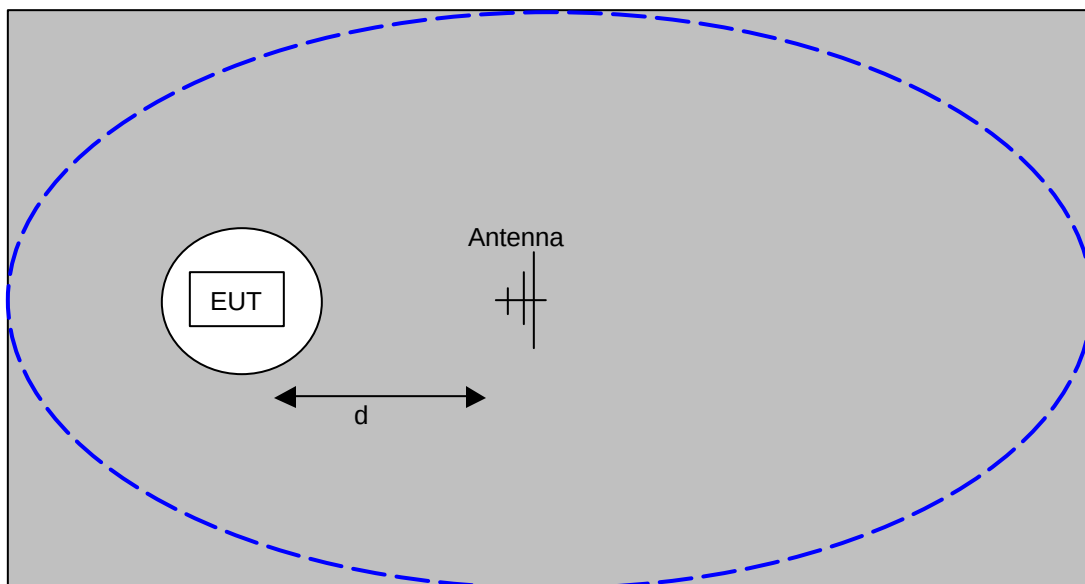
A preliminary scan of the radiated emissions is performed in which all significant EUT frequencies are identified with the system in a nominal configuration. At least two scans are performed, one scan for each antenna polarization (horizontal and vertical; loop parallel and perpendicular to the EUT). During the preliminary scans, the EUT is rotated through 360°, the antenna height is varied (for measurements above 30 MHz) and cable positions are varied to determine the highest emission relative to the limit. Preliminary scans may be performed in a fully anechoic chamber for the purposes of identifying the frequencies of the highest emissions from the EUT.

A speaker is provided in the receiver to aid in discriminating between EUT and ambient emissions. Other methods used during the preliminary scan for EUT emissions involve scanning with near field magnetic loops, monitoring I/O cables with RF current clamps, and cycling power to the EUT.

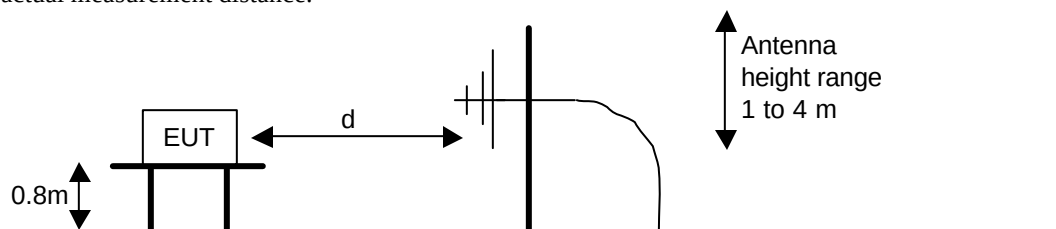
Final maximization is a phase in which the highest amplitude emissions identified in the spectral search are viewed while the EUT azimuth angle is varied from 0 to 360 degrees relative to the receiving antenna. The azimuth, which results in the highest emission is then maintained while varying the antenna height from one to four meters (for measurements above 30 MHz, measurements below 30 MHz are made with the loop antenna at a fixed height of 1m). The result is the identification of the highest amplitude for each of the highest peaks. Each recorded level is corrected in the receiver using appropriate factors for cables, connectors, antennas, and preamplifier gain.



Typical Test Configuration for Radiated Field Strength Measurements



The ground plane extends beyond the ellipse defined in CISPR 16 / CISPR 22 / ANSI C63.4 and is large enough to accommodate test distances (d) of 3m and 10m. Refer to the test data tables for the actual measurement distance.



Test Configuration for Radiated Field Strength Measurements
OATS- Plan and Side Views

BANDWIDTH MEASUREMENTS

The 6dB, 20dB and/or 26dB signal bandwidth is measured in using the bandwidths recommended by ANSI C63.4. When required, the 99% bandwidth is measured using the methods detailed in RSS GEN.

SPECIFICATION LIMITS AND SAMPLE CALCULATIONS

The limits for conducted emissions are given in units of microvolts, and the limits for radiated emissions are given in units of microvolts per meter at a specified test distance. Data is measured in the logarithmic form of decibels relative to one microvolt, or dB microvolts (dBuV). For radiated emissions, the measured data is converted to the field strength at the antenna in dB microvolts per meter (dBuV/m). The results are then converted to the linear forms of uV and uV/m for comparison to published specifications.

For reference, converting the specification limits from linear to decibel form is accomplished by taking the base ten logarithm, then multiplying by 20. These limits in both linear and logarithmic form are as follows:

GENERAL TRANSMITTER RADIATED EMISSIONS SPECIFICATION LIMITS

The table below shows the limits for the spurious emissions from transmitters that fall in restricted bands¹ (with the exception of transmitters operating under FCC Part 15 Subpart D and RSS 210 Annex 9), the limits for all emissions from a low power device operating under the general rules of RSS 310 (tables 3 and 4), RSS 210 (table 2) and FCC Part 15 Subpart C section 15.209.

Frequency Range (MHz)	Limit (uV/m)	Limit (dBuV/m @ 3m)
0.009-0.490	2400/F _{KHz} @ 300m	67.6-20*log ₁₀ (F _{KHz}) @ 300m
0.490-1.705	24000/F _{KHz} @ 30m	87.6-20*log ₁₀ (F _{KHz}) @ 30m
1.705 to 30	30 @ 30m	29.5 @ 30m
30 to 88	100 @ 3m	40 @ 3m
88 to 216	150 @ 3m	43.5 @ 3m
216 to 960	200 @ 3m	46.0 @ 3m
Above 960	500 @ 3m	54.0 @ 3m

RECEIVER RADIATED SPURIOUS EMISSIONS SPECIFICATION LIMITS

The table below shows the limits for the spurious emissions from receivers as detailed in FCC Part 15.109, RSS 210 Table 2, RSS GEN Table 1 and RSS 310 Table 3. Note that receivers operating outside of the frequency range 30 MHz – 960 MHz are exempt from the requirements of 15.109.

Frequency Range (MHz)	Limit (uV/m @ 3m)	Limit (dBuV/m @ 3m)
30 to 88	100	40
88 to 216	150	43.5
216 to 960	200	46.0
Above 960	500	54.0

OUTPUT POWER LIMITS – DIGITAL TRANSMISSION SYSTEMS

The table below shows the limits for output power and output power density. Where the signal bandwidth is less than 20 MHz the maximum output power is reduced to the power spectral density limit plus 10 times the log of the bandwidth (in MHz).

¹ The restricted bands are detailed in FCC 15.203, RSS 210 Table 1 and RSS 310 Table 2

Operating Frequency (MHz)	Output Power	Power Spectral Density
902 – 928	1 Watt (30 dBm)	8 dBm/3kHz
2400 – 2483.5	1 Watt (30 dBm)	8 dBm/3kHz
5725 – 5850	1 Watt (30 dBm)	8 dBm/3kHz

The maximum permitted output power is reduced by 1dB for every dB the antenna gain exceeds 6dBi. Fixed point-to-point applications using the 5725 – 5850 MHz band are not subject to this restriction.

TRANSMIT MODE SPURIOUS RADIATED EMISSIONS LIMITS – FHSS and DTS SYSTEMS

The limits for unwanted (spurious) emissions from the transmitter falling in the restricted bands are those specified in the general limits sections of FCC Part 15 and RSS 210. All other unwanted (spurious) emissions shall be at least 20dB below the level of the highest in-band signal level (30dB if the power is measured using the sample detector/power averaging method).

SAMPLE CALCULATIONS - CONDUCTED EMISSIONS

Receiver readings are compared directly to the conducted emissions specification limit (decibel form) as follows:

$$R_T - S = M$$

where:

R_T = Receiver Reading in dBuV

S = Specification Limit in dBuV

M = Margin to Specification in +/- dB

SAMPLE CALCULATIONS - RADIATED EMISSIONS

Receiver readings are compared directly to the specification limit (decibel form). The receiver internally corrects for cable loss, preamplifier gain, and antenna factor. The calculations are in the reverse direction of the actual signal flow, thus cable loss is added and the amplifier gain is subtracted. The Antenna Factor converts the voltage at the antenna coaxial connector to the field strength at the antenna elements.

A distance factor, when used for electric field measurements above 30MHz, is calculated by using the following formula:

$$F_d = 20 * \text{LOG}_{10} (D_m/D_s)$$

where:

F_d = Distance Factor in dB

D_m = Measurement Distance in meters

D_s = Specification Distance in meters

For electric field measurements below 30MHz the extrapolation factor is either determined by making measurements at multiple distances or a theoretical value is calculated using the formula:

$$F_d = 40 * \text{LOG}_{10} (D_m/D_s)$$

Measurement Distance is the distance at which the measurements were taken and Specification Distance is the distance at which the specification limits are based. The antenna factor converts the voltage at the antenna coaxial connector to the field strength at the antenna elements.

The margin of a given emission peak relative to the limit is calculated as follows:

$$R_C = R_r + F_d$$

and

$$M = R_C - L_S$$

where:

$$R_r = \text{Receiver Reading in dBuV/m}$$

$$F_d = \text{Distance Factor in dB}$$

$$R_C = \text{Corrected Reading in dBuV/m}$$

$$L_S = \text{Specification Limit in dBuV/m}$$

$$M = \text{Margin in dB Relative to Spec}$$

SAMPLE CALCULATIONS - FIELD STRENGTH TO EIRP CONVERSION

Where the radiated electric field strength is expressed in terms of the equivalent isotropic radiated power (eirp), or where a field strength measurement of output power is made in lieu of a direct measurement, the following formula is used to convert between eirp and field strength at a distance of 3m from the equipment under test:

$$E = \frac{1000000 \sqrt{30 P}}{3} \quad \text{microvolts per meter}$$

where P is the eirp (Watts)

EXHIBIT 1: Test Equipment Calibration Data

1 Page

Radio Antenna Port (Power and Spurious Emissions), 25-Aug-06**Engineer: Mark Briggs**

<u>Manufacturer</u>	<u>Description</u>	<u>Model #</u>	<u>Asset #</u>	<u>Cal Due</u>
Hewlett Packard	SpecAn 9 kHz - 40 GHz, Purple (SA40)	8564E (84125C)	1771	04-Nov-06

Radiated Emissions, 30 - 1,000 MHz, 25-Aug-06**Engineer: Mark Briggs**

<u>Manufacturer</u>	<u>Description</u>	<u>Model #</u>	<u>Asset #</u>	<u>Cal Due</u>
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB7	1538	08-Aug-07
Com-Power Corp.	Pre Amplifier, 30-1000 MHz	PA-103	1632	12-Jun-07
Sunol Sciences	Biconilog, 30-3000 MHz	JB3	1657	21-Mar-07

Radiated Spurious Emissions, 1000 - 18,000 MHz, 20-Sep-06**Engineer: Juan Martinez**

<u>Manufacturer</u>	<u>Description</u>	<u>Model #</u>	<u>Asset #</u>	<u>Cal Due</u>
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	785	24-Apr-07
Hewlett Packard	SpecAn 30 Hz -40 GHz, SV (SA40) Red	8564E (84125C)	1148	19-May-07
EMCO	Antenna, Horn, 1-18 GHz	3115	1561	10-May-07

Bandedge, 20-Sep-06**Engineer: Juan Martinez**

<u>Manufacturer</u>	<u>Description</u>	<u>Model #</u>	<u>Asset #</u>	<u>Cal Due</u>
EMCO	Antenna, Horn, 1-18 GHz	3115	1561	10-May-07
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB7	1630	28-Dec-06

Radiated Emissions, 1-18 GHz, 11-Aug-06**Engineer: Conrad Chu**

<u>Manufacturer</u>	<u>Description</u>	<u>Model #</u>	<u>Asset #</u>	<u>Cal Due</u>
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	263	16-Jan-07
Hewlett Packard	High Pass filter, 8.2 GHz	P/N 84300-80039	1392	01-May-07
Hewlett Packard	SpecAn 9 kHz - 40 GHz, FMT (SA40) Blue	8564E (84125C)	1393	10-Nov-06
EMCO	Antenna, Horn, 1-18 GHz	3115	1561	10-May-07
Micro-Tronics	Band Reject Filter, 5725-5875 MHz	BRC50705-02	1728	09-Jun-07
Micro-Tronics	Band Reject Filter, 5150-5350 MHz	BRC50703-02	1729	09-Jun-07
Micro-Tronics	Band Reject Filter, 2400-2500 MHz	BRM50702-02	1731	09-Jun-07

Radiated Emissions, 1,000 - 18,000 MHz, 17-Aug-06**Engineer: Conrad Chu**

<u>Manufacturer</u>	<u>Description</u>	<u>Model #</u>	<u>Asset #</u>	<u>Cal Due</u>
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	263	16-Jan-07
Hewlett Packard	SpecAn 9 kHz - 40 GHz, FMT (SA40) Blue	8564E (84125C)	1393	10-Nov-06
EMCO	Antenna, Horn, 1-18 GHz	3115	1561	10-May-07

Radiated Emissions, 1-18 GHz, 24-Aug-06**Engineer: Conrad Chu**

<u>Manufacturer</u>	<u>Description</u>	<u>Model #</u>	<u>Asset #</u>	<u>Cal Due</u>
EMCO	Antenna, Horn, 1-18 GHz	3115	487	24-May-08
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	785	24-Apr-07
Hewlett Packard	SpecAn 9 kHz - 40 GHz, Purple (SA40)	8564E (84125C)	1771	04-Nov-06

EXHIBIT 2: Test Measurement Data

127 Pages



EMC Test Data

Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	Test-Log Number:	T64985
		Project Manager:	-
Contact:	David Boldy		
Emissions Spec:	FCC 15.247, 15.401, RSS-210	Class:	Radio
Immunity Spec:	-	Environment:	-

EMC Test Data

For The

Broadcom

Model

BCM94321 MC New version

Date of Last Test: 8/28/2006



EMC Test Data

Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	Test-Log Number:	T64985
		Project Manager:	-
Contact:	David Boldy		
Emissions Spec:	FCC 15.247, 15.401, RSS-210	Class:	Radio
Immunity Spec:	-	Environment:	-

EUT INFORMATION

The client agreed provide the following information after the test session(s).

General Description

The EUT is a Broadcom 802.11ag/Draft 802.11n Wireless LAN PCI-E Mini Card that is designed to install in a laptop PC and provide wireless networking capabilities. Since the EUT would be placed on a table top during operation, the EUT was treated as table-top equipment during testing to simulate the end-user environment. The The electrical rating of the EUT is 3.3 VDC @ 600mA.

Equipment Under Test

Manufacturer	Model	Description	Serial Number	FCC ID
Broadcom	BCM94321	WLAN module	-	-

Other EUT Details

None

EUT Antenna (Intentional Radiators Only)

The EUT antenna is a Hirose connector (Antenna is the same as previous original application)

EUT Enclosure

The EUT does not have an enclosure as it is designed to be installed within the enclosure of a host computer or system.

Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
		Project Manager:	-
Contact:	David Boldy		
Emissions Spec:	FCC 15.247, 15.401, RSS-210	Class:	Radio
Immunity Spec:	-	Environment:	-

Test Configuration #1

The following information was collected during the test sessions(s).



Local Support Equipment

Manufacturer	Model	Description	Serial Number	FCC ID
Dell	Inspiron 0000	Laptop PC	P/R Proto 2 Latitude Config 3	-
Dell	F9710	60W AC Adapter	CN-0F9710-71615-56H- 5118 Rev A01	-
FoxConn	-	7.44 dBi PCB Antenna	-	-
Adexelec	PEX1-MINI Rev 02	Plug-In PCMCIA Adapter Card	-	-
Agilent	E4416A	Power Meter	MY45100591	-
Agilent	E9323A	Peak and Avg Power Sensor	MY44420617	-

Remote Support Equipment

Manufacturer	Model	Description	Serial Number	FCC ID
None	-	-	-	-



EMC Test Data

Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
		Project Manager:	-
Contact:	David Boldy		
Emissions Spec:	FCC 15.247, 15.401, RSS-210	Class:	Radio
Immunity Spec:	-	Environment:	-

Cabling and Ports

Port	Connected To	Cable(s)		
		Description	Shielded or Unshielded	Length(m)
EUT (Card)	Adexelec Adapter Card	Direct Connection	-	-
EUT Main Port	Antenna #1	Coaxial	Shielded	0.5
EUT Aux Port	Antenna #2	Coaxial	Shielded	0.5
Host Laptop DC Input	AC-DC Adapter	DC Leads	Unshielded	1.0
AC-DC Adapter AC Input	120V/60Hz AC Outlet	AC Power Cord	Unshielded	2.0

EUT Operation During Emissions Tests

During emissions testing the EUT was in continuous transmit mode or receive mode as noted.

EUT Operation During Immunity Tests

During immunity test the EUT will be exercised by TBD .

Normal operation is indicated by TBD and shall be monitored by TBD .

Performance Criteria for Immunity Tests

Criterion A:

During and after testing the EUT shall continue to TBD .

Criterion B:

During application of the transient test, degradation of performance including TBD is allowed provided that the EUT self-recovers to normal operation after testing without any operator intervention.

Criterion C:

Loss of function is allowed provided that normal operation can be restored by TBD .



EMC Test Data

Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	Radio

RX Radiated Emissions

(Elliott Laboratories Fremont Facility, Semi-Anechoic Chamber)

Test specifics

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

Date of Test: 8/24/2006

Config. Used: **1**

Test Engineer: Conrad Chu

Config Change: **None**

Test Location: Fremont Chamber #3

EUT Voltage: DC powered by host PC

General Test Configuration

The EUT and any local support equipment were located on the turntable for radiated emissions testing. Any remote support equipment was located outside the semi-anechoic chamber. Any cables running to remote support equipment were routed through metal conduit and when possible passed through a ferrite clamp upon exiting the chamber.

The test distance and extrapolation factor (if applicable) are detailed under each run description.

Note, **preliminary** testing indicates that the emissions were maximized by orientation of the EUT and elevation of the measurement antenna. **Maximized** testing indicated that the emissions were maximized by orientation of the EUT, elevation of the measurement antenna, and manipulation of the EUT's interface cables.

Ambient Conditions:

Temperature: **19 °C**

Rel. Humidity: **54 %**



EMC Test Data

Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	Radio

Summary of Results

Run #	Test Performed	Limit	Result	Margin
Card s/n 837 w/ gasket added to laptop coverplate over wireless card				
1	802.11n 40 MHz, Ch 151	RSS-Gen	Pass	42.8dB μ V/m (138.0 μ V/m) @ 11510.0MHz (-11.2dB)
2	802.11n 40 MHz, Ch 118	RSS-Gen	Pass	38.9dB μ V/m (88.1 μ V/m) @ 5590.0MHz (-15.1dB)
3	802.11n 40 MHz, Ch 54	RSS-Gen	Pass	41.9dB μ V/m (124.5 μ V/m) @ 10540.1MHz (-12.1dB)
4	801.11n 40 MHz, Ch 6	RSS-Gen	Pass	34.5dB μ V/m (53.1 μ V/m) @ 4874.0MHz (-19.5dB)
5	802.11n 20 MHz, Ch 120	RSS-Gen	Pass	38.6dB μ V/m (85.1 μ V/m) @ 5600.0MHz (-15.4dB)
6	802.11n 20 MHz, Ch 52	RSS-Gen	Pass	43.2dB μ V/m (144.5 μ V/m) @ 10520.0MHz (-10.8dB)
7	802.11a, Ch 52	RSS-Gen	Pass	42.6dB μ V/m (134.9 μ V/m) @ 10520.0MHz (-11.4dB)

Modifications Made During Testing

Please refer to run for description of modification

Deviations From The Standard

No deviations were made from the requirements of the standard.



EMC Test Data

Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	Radio

Run #1: Maximized Readings, 1000 - 12750 MHz
Operating Mode: Rx Mode, 802.11n 40 MHz, Channel 151
EUT Serial No: 837
Model #BCM94321MC
A23 PA with Apple SROM settings, B1 Silicon

Frequency Range	Test Distance	Limit Distance	Extrapolation Factor
1000-18000	1	3	-9.5

Preliminary peak readings captured during pre-scan

Frequency	Level	Pol	RSS-Gen		Detector	Azimuth	Height	Comments
MHz	dBuV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
No prescan performed. Measured fundamental and 2nd harmonic only								

Final peak and average readings

Frequency	Level	Pol	RSS-Gen		Detector	Azimuth	Height	Comments
MHz	dBuV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
11510.020	42.8	V	54.0	-11.2	AVG	148	1.0	2nd harmonic
11509.970	38.1	H	54.0	-15.9	AVG	126	1.0	2nd harmonic
5755.020	37.5	V	54.0	-16.5	AVG	149	1.0	fundamental
5755.030	35.6	H	54.0	-18.4	AVG	186	1.2	fundamental
11510.020	47.1	V	74.0	-26.9	PK	148	1.0	2nd harmonic
11509.970	44.4	H	74.0	-29.6	PK	126	1.0	2nd harmonic
5755.020	40.7	V	74.0	-33.3	PK	149	1.0	fundamental
5755.030	39.6	H	74.0	-34.4	PK	186	1.2	fundamental



EMC Test Data

Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	Radio

Run #2: Maximized Readings, 1000 - 12750 MHz
Operating Mode: Rx Mode, 802.11n 40 MHz, Channel 118
EUT Serial No: 837
Model #BCM94321MC
A23 PA with Apple SROM settings, B1 Silicon

Frequency Range	Test Distance	Limit Distance	Extrapolation Factor
1000-18000	1	3	-9.5

Preliminary peak readings captured during pre-scan

Frequency	Level	Pol	RSS-Gen		Detector	Azimuth	Height	Comments
MHz	dBuV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
No prescan performed. Measured fundamental and 2nd harmonic only								

Final peak and average readings

Frequency	Level	Pol	RSS-Gen		Detector	Azimuth	Height	Comments
MHz	dBuV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5590.010	38.9	H	54.0	-15.1	AVG	194	1.0	
5589.990	38.1	V	54.0	-15.9	AVG	344	1.0	
5590.010	42.2	H	74.0	-31.8	PK	194	1.0	
5589.990	41.8	V	74.0	-32.2	PK	344	1.0	

Switched to FoxConn A23B1 production sample v5.13, s/n 6F632058LWQXE

11180.020	34.5	V	54.0	-19.5	AVG	196	1.1	
11180.040	30.2	H	54.0	-23.8	AVG	183	1.1	
11180.020	43.3	V	74.0	-30.7	PK	196	1.1	
11180.040	40.7	H	74.0	-33.3	PK	183	1.1	



EMC Test Data

Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	Radio

Run #3: Maximized Readings, 1000 - 12750 MHz
Operating Mode: Rx Mode, 802.11n 40 MHz, Channel 54
EUT Serial No: 837
Model #BCM94321MC
A23 PA with Apple SROM settings, B1 Silicon

Frequency Range	Test Distance	Limit Distance	Extrapolation Factor
1000-18000	1	3	-9.5

Preliminary peak readings captured during pre-scan

Frequency	Level	Pol	RSS-Gen		Detector	Azimuth	Height	Comments
MHz	dBuV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
No prescan performed. Measured fundamental and 2nd harmonic only								

Final peak and average readings

Frequency	Level	Pol	RSS-Gen		Detector	Azimuth	Height	Comments
MHz	dBuV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
10540.050	41.9	H	54.0	-12.1	AVG	217	1.0	2nd harmonic
5270.010	37.6	V	54.0	-16.4	AVG	94	1.1	fundamental
5270.010	33.4	H	54.0	-20.6	AVG	203	1.0	fundamental
10539.990	47.8	V	74.0	-26.2	PK	171	1.0	2nd harmonic
10540.050	46.2	H	74.0	-27.8	PK	217	1.0	2nd harmonic
10539.990	44.8	V	74.0	-29.2	AVG	171	1.0	2nd harmonic
5270.010	41.3	V	74.0	-32.7	PK	94	1.1	fundamental
5270.010	38.1	H	74.0	-35.9	PK	203	1.0	fundamental



EMC Test Data

Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	Radio

Run #4: Maximized Readings, 1000 - 12750 MHz

Operating Mode: Rx Mode, 802.11n 40 MHz, Channel 6

EUT Serial No: 837

Model #BCM94321MC

A23 PA with Apple SROM settings, B1 Silicon

Frequency Range	Test Distance	Limit Distance	Extrapolation Factor
1000-18000	1	3	-9.5

Preliminary peak readings captured during pre-scan

Frequency	Level	Pol	RSS-Gen		Detector	Azimuth	Height	Comments
MHz	dBuV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
No prescan performed. Measured fundamental and 2nd harmonic only								

Final peak and average readings

Frequency	Level	Pol	RSS-Gen		Detector	Azimuth	Height	Comments
MHz	dBuV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
4874.030	34.5	V	54.0	-19.5	AVG	325	1.3	2nd harmonic
4874.010	33.1	H	54.0	-20.9	AVG	140	1.0	2nd harmonic
2437.080	27.4	V	54.0	-26.6	AVG	203	1.0	fundamental
2436.990	27.2	H	54.0	-26.8	AVG	201	1.0	fundamental
4874.030	38.6	V	74.0	-35.4	PK	325	1.3	2nd harmonic
4874.010	37.5	H	74.0	-36.5	PK	140	1.0	2nd harmonic
2436.990	33.5	H	74.0	-40.5	PK	201	1.0	fundamental
2437.080	33.1	V	74.0	-40.9	PK	203	1.0	fundamental



EMC Test Data

Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	Radio

Run #5: Maximized Readings, 1000 - 12750 MHz
Operating Mode: Rx Mode, 802.11n 20 MHz, Channel 120
EUT Serial No: 837
Model #BCM94321MC
A23 PA with Apple SROM settings, B1 Silicon

Frequency Range	Test Distance	Limit Distance	Extrapolation Factor
1000-18000	1	3	-9.5

Preliminary peak readings captured during pre-scan

Frequency	Level	Pol	RSS-Gen		Detector	Azimuth	Height	Comments
MHz	dBuV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
No prescan performed. Measured fundamental and 2nd harmonic only								

Final peak and average readings

Frequency	Level	Pol	RSS-Gen		Detector	Azimuth	Height	Comments
MHz	dBuV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5600.020	38.6	H	54.0	-15.4	AVG	195	1.0	
5600.000	38.0	V	54.0	-16.0	AVG	343	1.0	
5600.020	41.8	H	74.0	-32.2	PK	195	1.0	
5600.000	41.0	V	74.0	-33.0	PK	343	1.0	

Switched to FoxConn A23B1 production sample v5.13, s/n 6F632058LWQXE

11200.030	32.0	V	54.0	-22.0	AVG	194	1.0	
11200.030	29.9	H	54.0	-24.1	AVG	131	1.0	
11200.030	41.5	V	74.0	-32.5	PK	194	1.0	
11200.030	41.0	H	74.0	-33.0	PK	131	1.0	



EMC Test Data

Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	Radio

Run #6: Maximized Readings, 1000 - 12750 MHz
Operating Mode: Rx Mode, 802.11n 20 MHz, Channel 52
EUT Serial No: 837
Model #BCM94321MC
A23 PA with Apple SROM settings, B1 Silicon

Frequency Range	Test Distance	Limit Distance	Extrapolation Factor
1000-18000	1	3	-9.5

Preliminary peak readings captured during pre-scan

Frequency	Level	Pol	RSS-Gen		Detector	Azimuth	Height	Comments
MHz	dBuV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
No prescan performed. Measured fundamental and 2nd harmonic only								

Final peak and average readings

Frequency	Level	Pol	RSS-Gen		Detector	Azimuth	Height	Comments
MHz	dBuV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
10519.950	43.2	V	54.0	-10.8	AVG	17	1.0	
10519.980	39.6	H	54.0	-14.4	AVG	101	1.0	
5259.980	35.9	V	54.0	-18.1	AVG	92	1.0	
5260.020	32.0	H	54.0	-22.0	AVG	203	1.0	
10519.950	46.9	V	74.0	-27.1	PK	17	1.0	
10519.980	44.9	H	74.0	-29.1	PK	101	1.0	
5259.980	40.0	V	74.0	-34.0	PK	92	1.0	
5260.020	37.7	H	74.0	-36.3	PK	203	1.0	



EMC Test Data

Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	Radio

Run #7: Maximized Readings, 1000 - 12750 MHz

Operating Mode: Rx Mode, 802.11a, Channel 52

EUT Serial No: 837

Model #BCM94321MC

A23 PA with Apple SROM settings, B1 Silicon

Frequency Range	Test Distance	Limit Distance	Extrapolation Factor
1000-18000	1	3	-9.5

Preliminary peak readings captured during pre-scan

Frequency	Level	Pol	RSS-Gen		Detector	Azimuth	Height	Comments
MHz	dBuV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
No prescan performed. Measured fundamental and 2nd harmonic only								

Final peak and average readings

Frequency	Level	Pol	RSS-Gen		Detector	Azimuth	Height	Comments
MHz	dBuV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
10519.970	42.6	V	54.0	-11.4	AVG	16	1.0	
10519.970	40.1	H	54.0	-13.9	AVG	143	1.0	
5259.990	36.0	V	54.0	-18.0	AVG	94	1.0	
5260.040	31.9	H	54.0	-22.1	AVG	127	1.0	
10519.970	46.6	V	74.0	-27.4	PK	16	1.0	
10519.970	45.2	H	74.0	-28.8	PK	143	1.0	
5259.990	40.5	V	74.0	-33.5	PK	94	1.0	
5260.040	38.0	H	74.0	-36.0	PK	127	1.0	



EMC Test Data

Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A

Bandedges

Test specifics

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

Date of Test: 8/21/2006 Config. Used: **1**
Test Engineer: Juan Martinez Config Change: **None**
Test Location: Fremont Chamber #3 EUT Voltage: 120V/60Hz

General Test Configuration

The EUT and all local support equipment were located on the turntable for radiated spurious emissions testing.

For radiated emissions testing the measurement antenna was located 3 meters from the EUT.

Ambient Conditions: Temperature: **19** °C
 Rel. Humidity: **41** %

Summary of Results

Run #	Test Performed	Limit	Pass / Fail	Result / Margin
1 - 14	Bandedges	FCC Part 15.209 / 15.247(c)	Pass	Refer to individual runs

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.

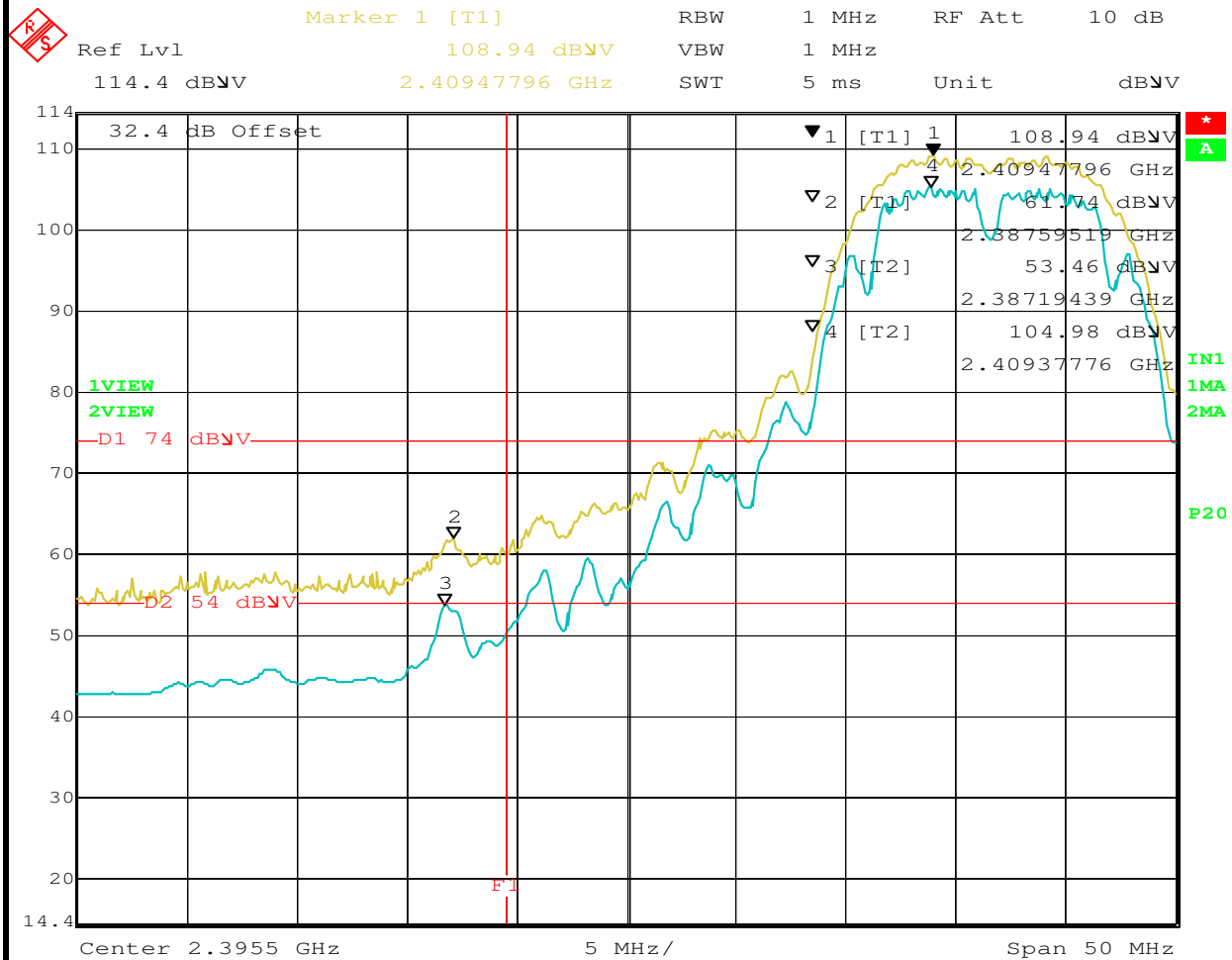


EMC Test Data

Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A

Bandedge Signal Field Strength:

Run #1: Low Channel @ 2412 MHz (802.11b), 18 dBm



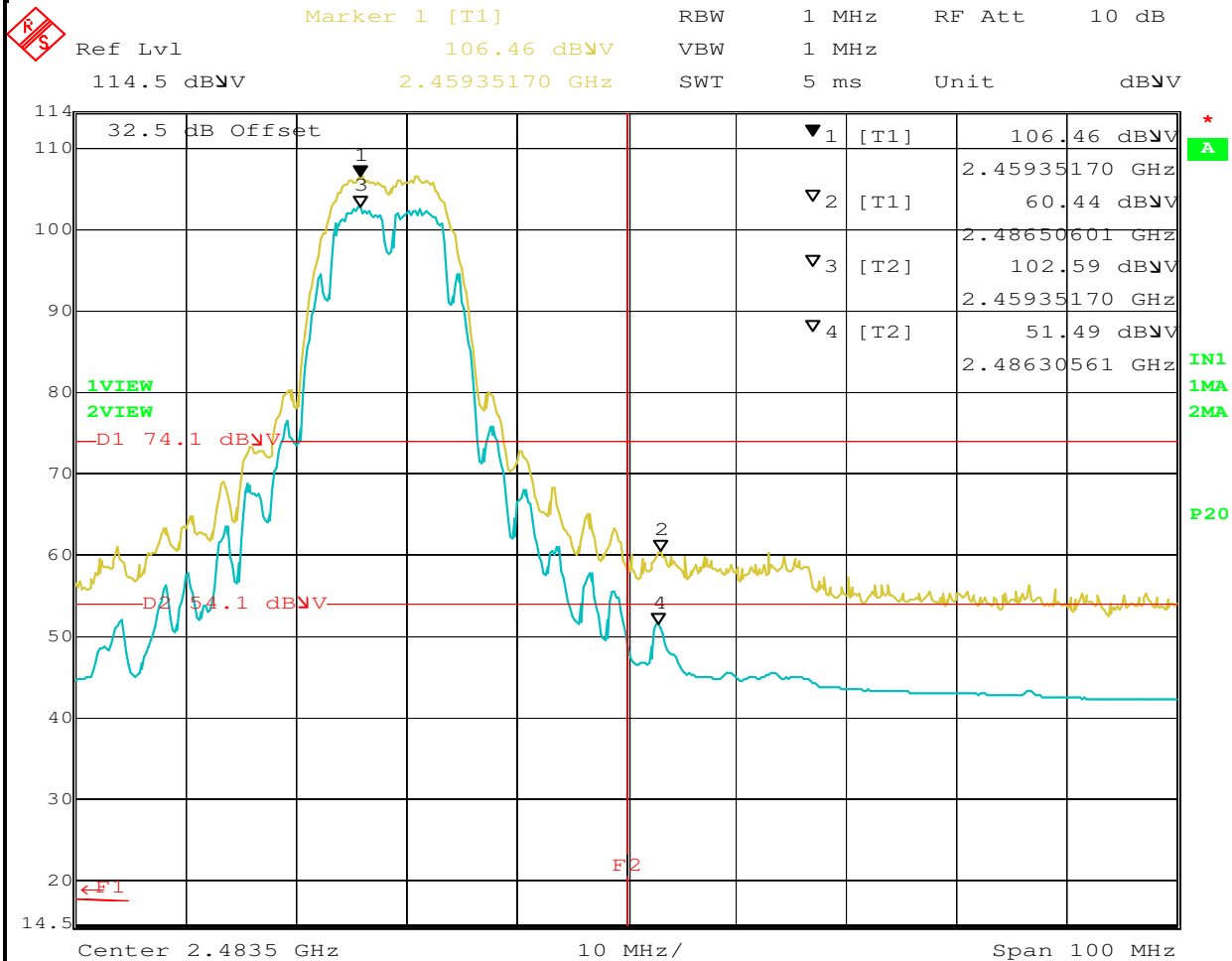
Date: 21.AUG.2006 09:06:45



EMC Test Data

Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A

Run #2: High Channel @ 2462 MHz (802.11b), 16 dBm



Date: 21.AUG.2006 09:47:36



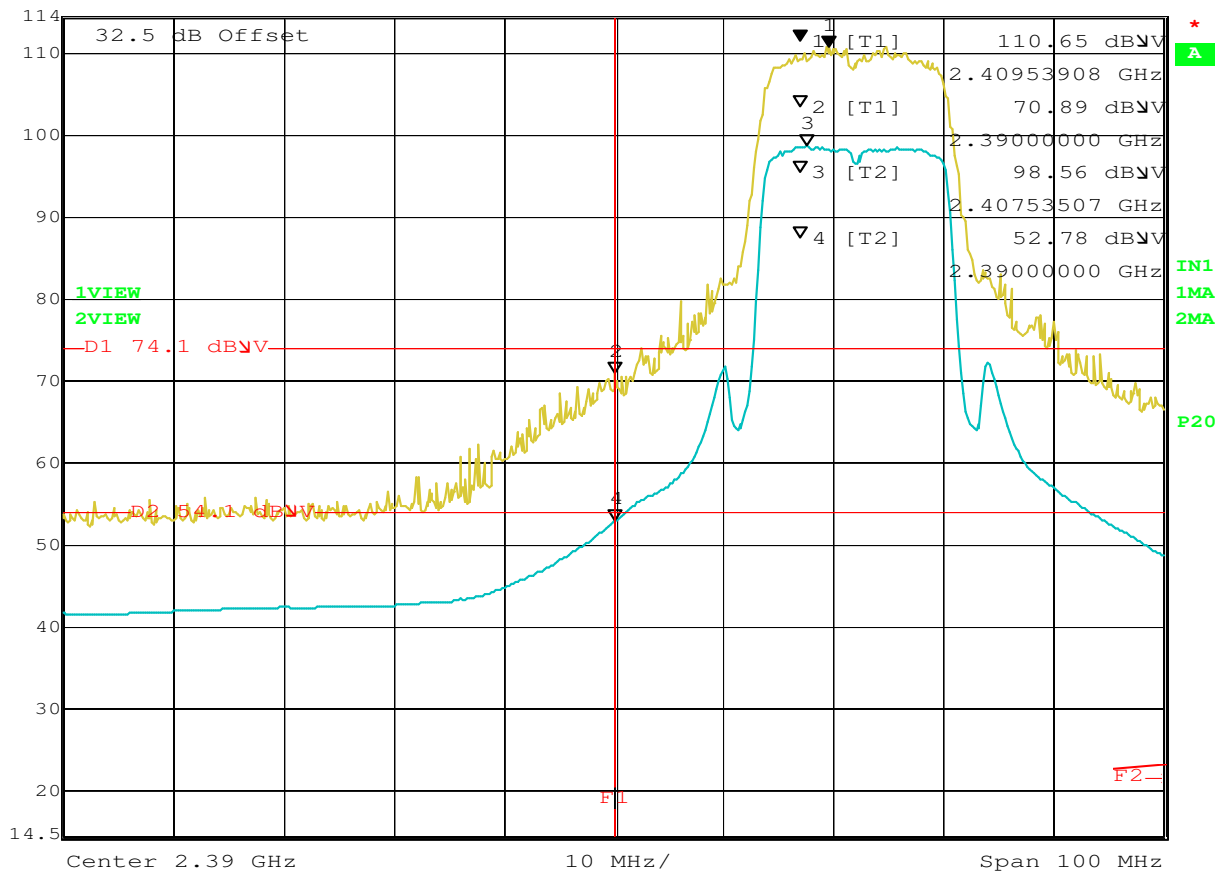
EMC Test Data

Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A

Run #3: Low Channel @ 2412 MHz (802.11g), 16.5 dBm



Marker 1 [T1] RBW 1 MHz RF Att 10 dB
Ref Lvl 110.65 dBμV VBW 1 MHz
114.5 dBμV 2.40953908 GHz SWT 5 ms Unit dBμV



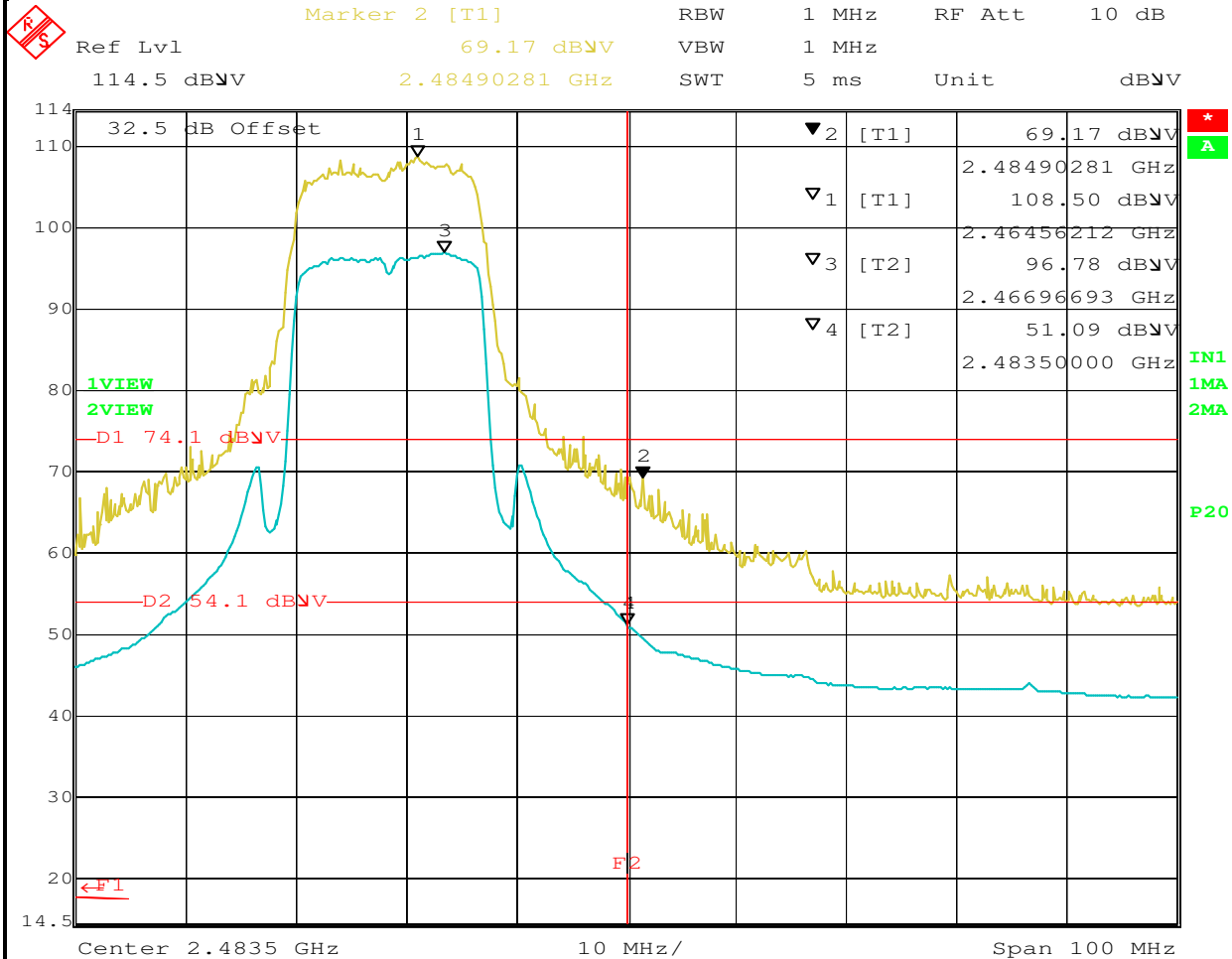
Date: 21.AUG.2006 10:28:13



EMC Test Data

Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A

Run #4: High Channel @ 2462 MHz (802.11g), 15.5 dBm



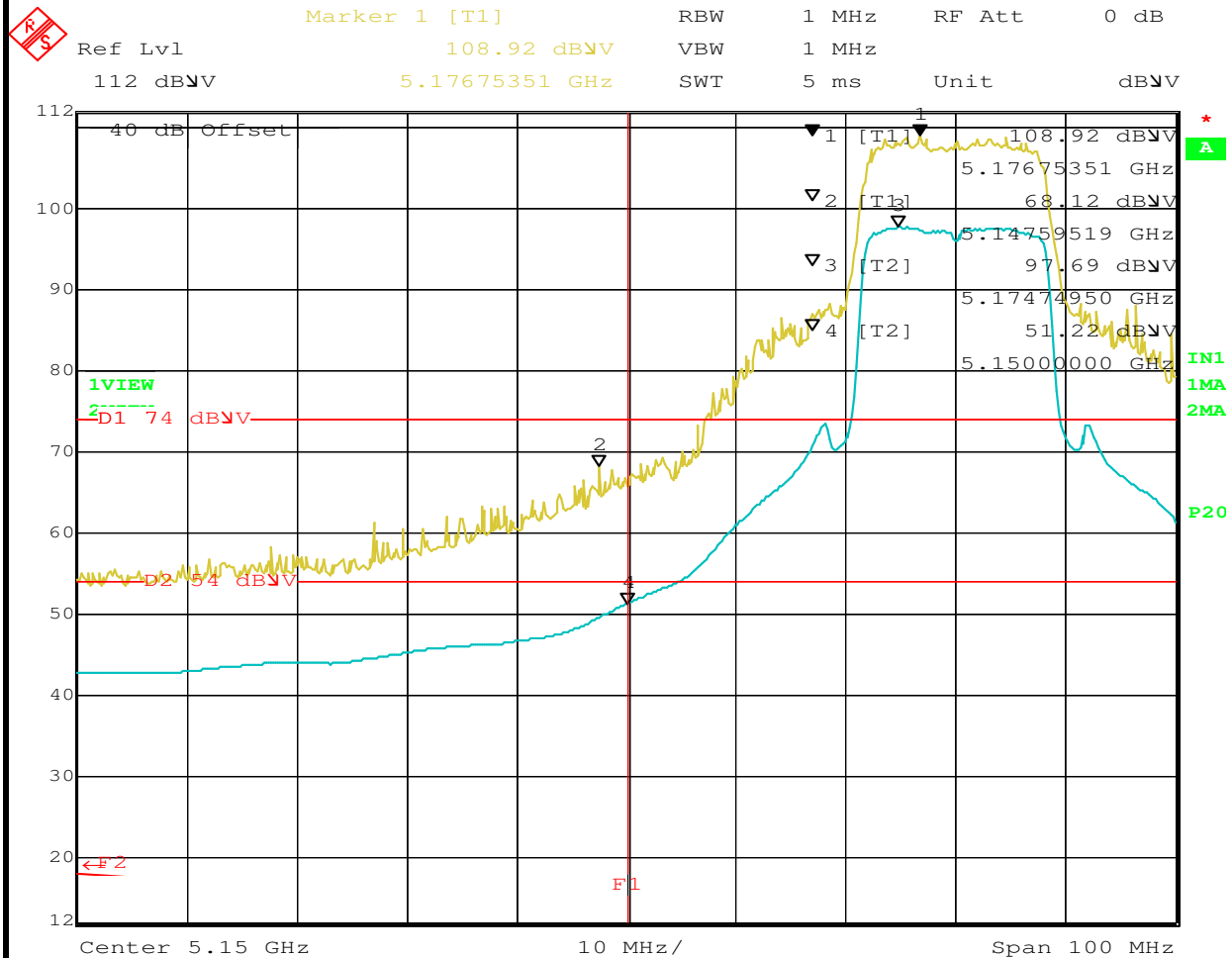
Date: 21.AUG.2006 10:38:59



EMC Test Data

Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A

Run #5: Channel @ 5180 MHz (802.11a), 15.5 dBm



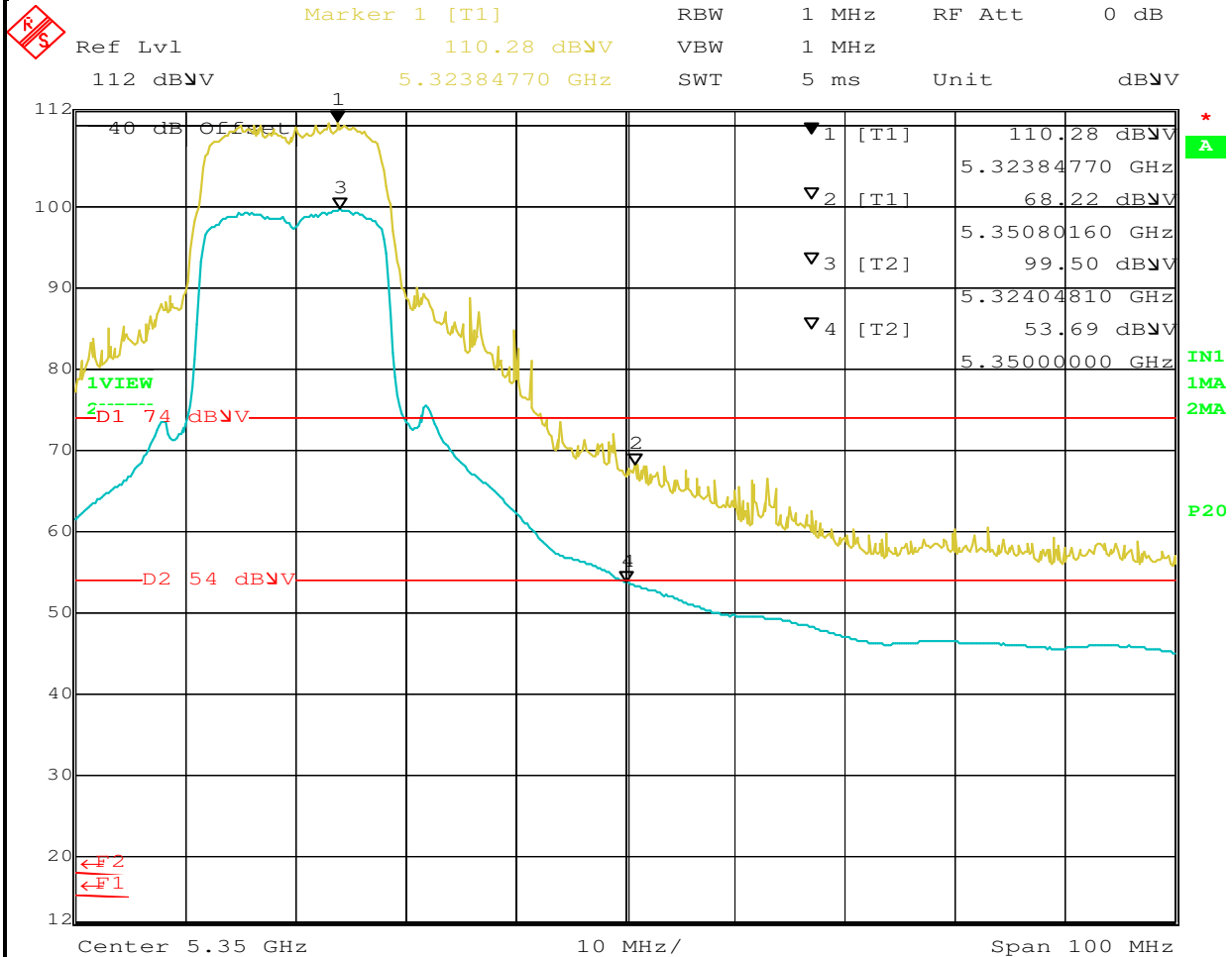
Date: 21.AUG.2006 16:07:07



EMC Test Data

Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A

Run #6: Channel @ 5320 MHz (802.11a), 15.5 dBm



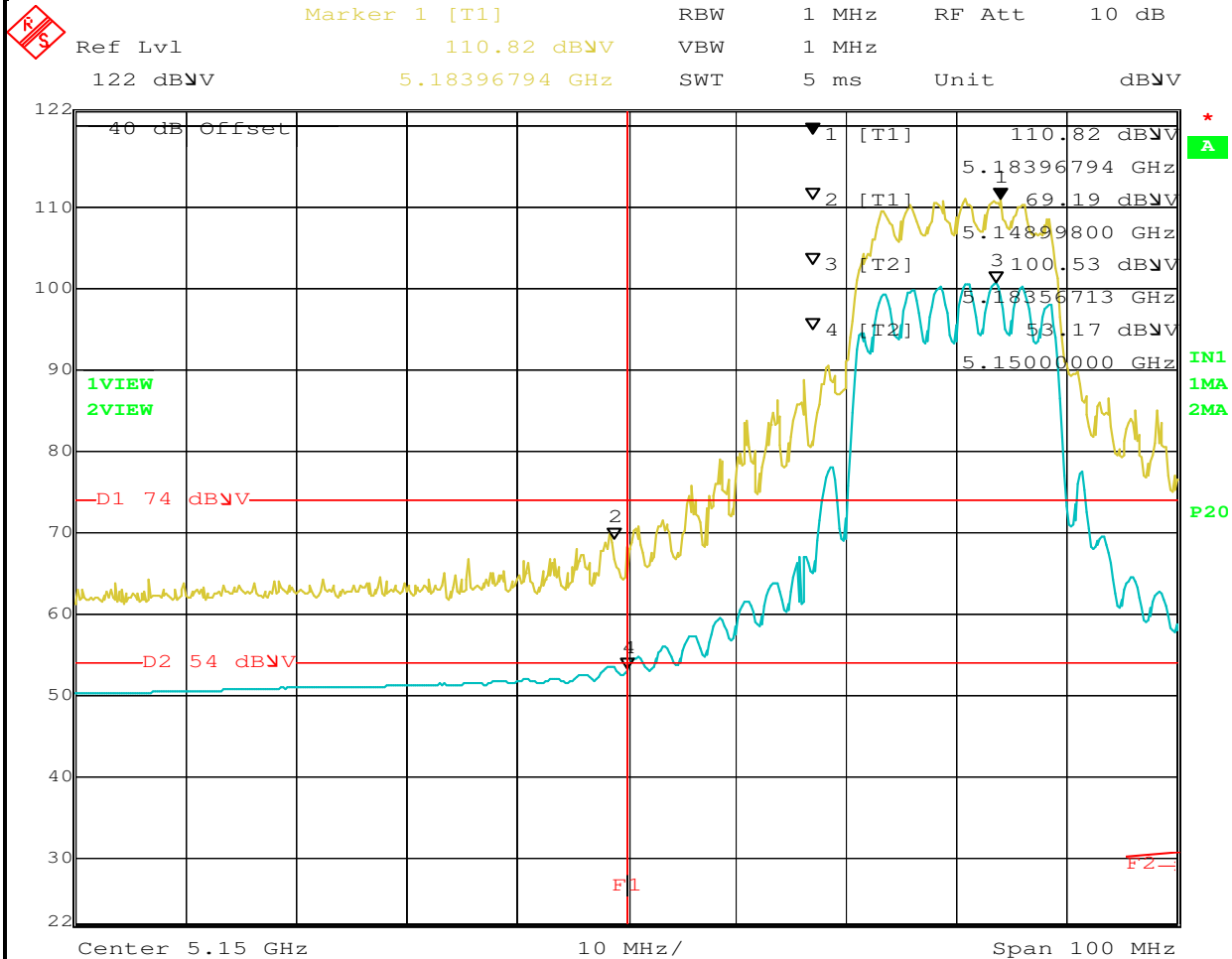
Date: 21.AUG.2006 15:55:31



EMC Test Data

Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A

Run #9: Channel @ 5180 MHz (802.11n 20 MHz), 13.5 dBm



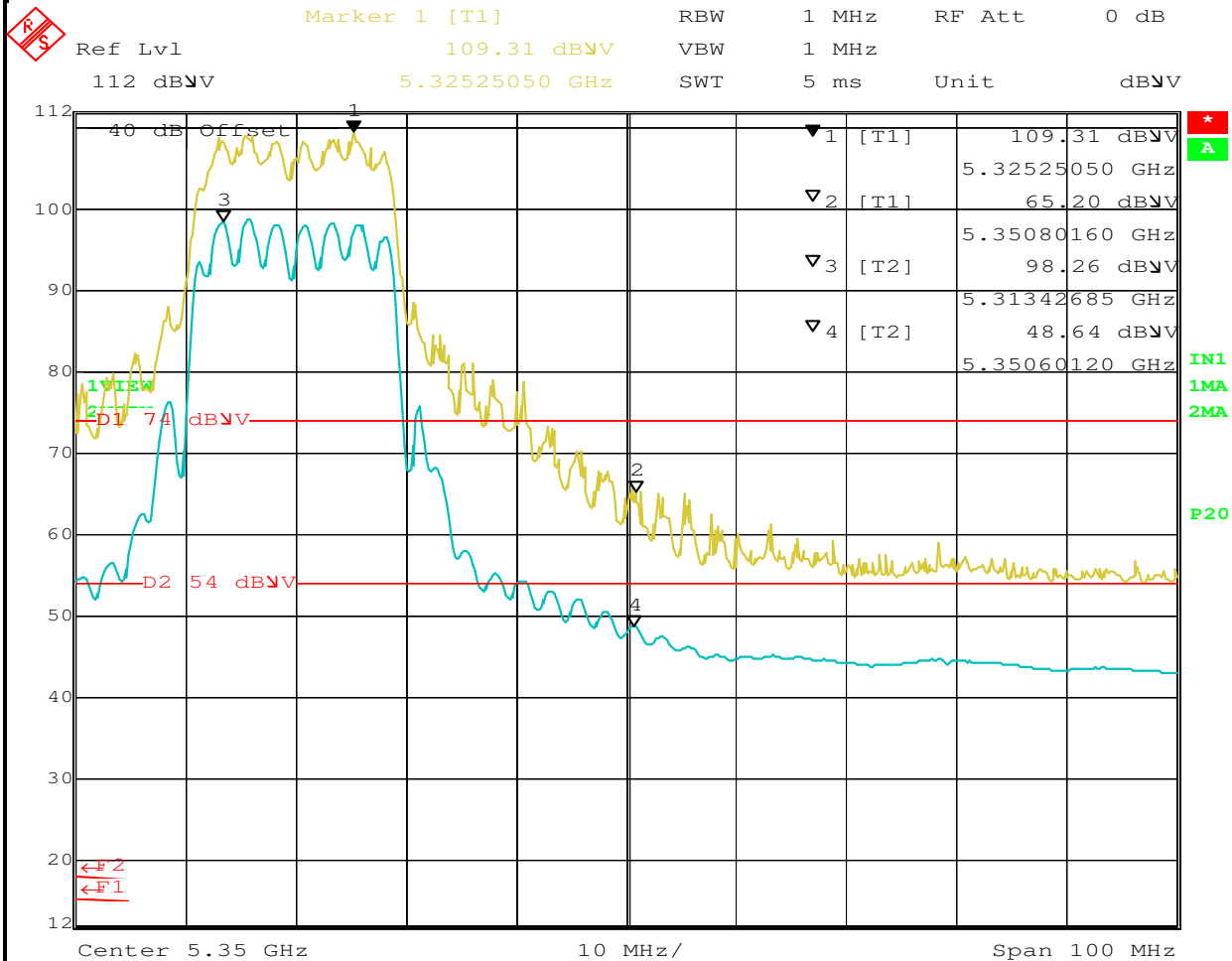
Date: 21.AUG.2006 13:54:19



EMC Test Data

Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A

Run #10: Channel @ 5320 MHz (802.11n 20 MHz), 13 dBm



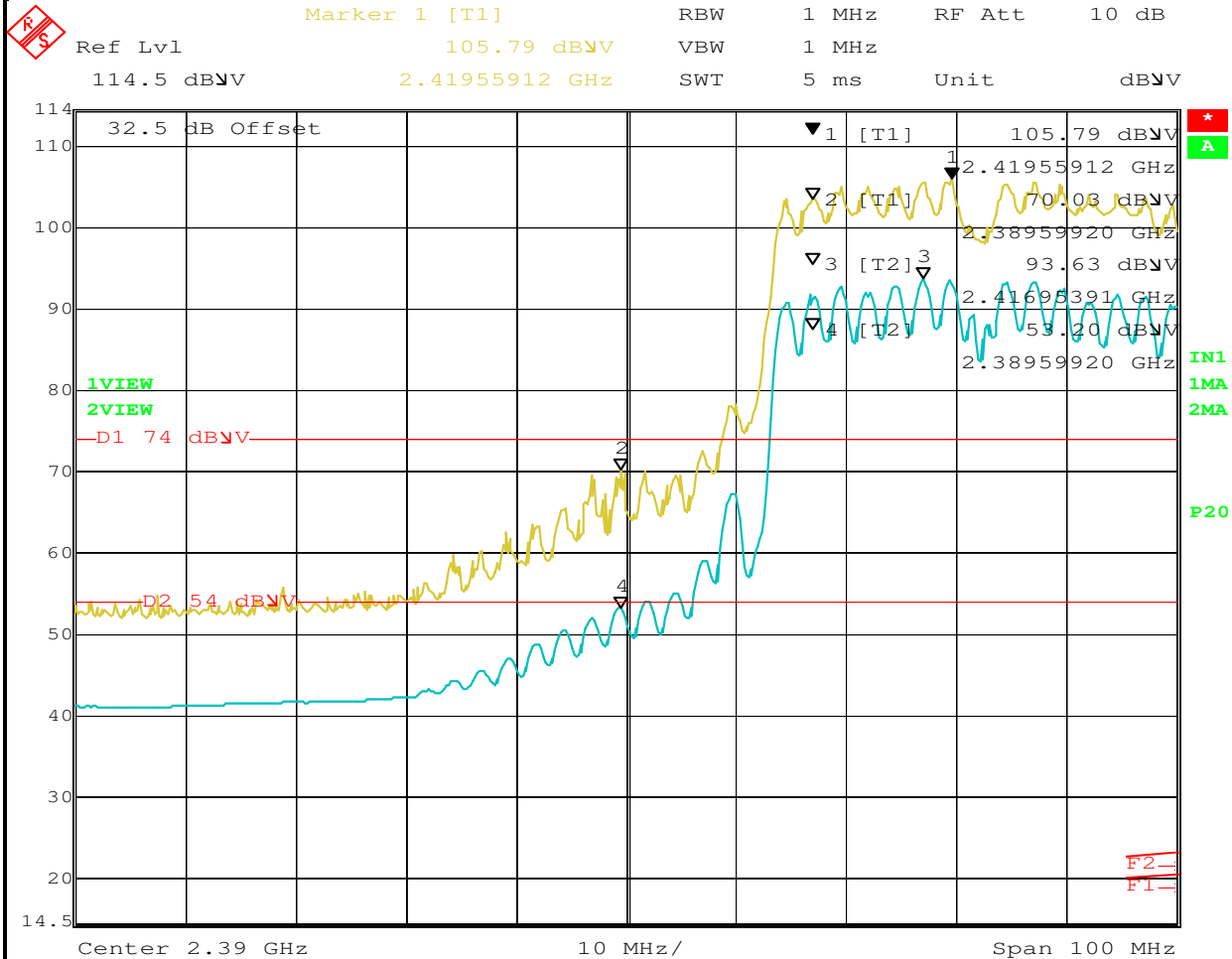
Date: 21.AUG.2006 15:32:59



EMC Test Data

Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A

Run #11: Channel @ 2432 MHz (802.11n 40 MHz), 12.5 dBm



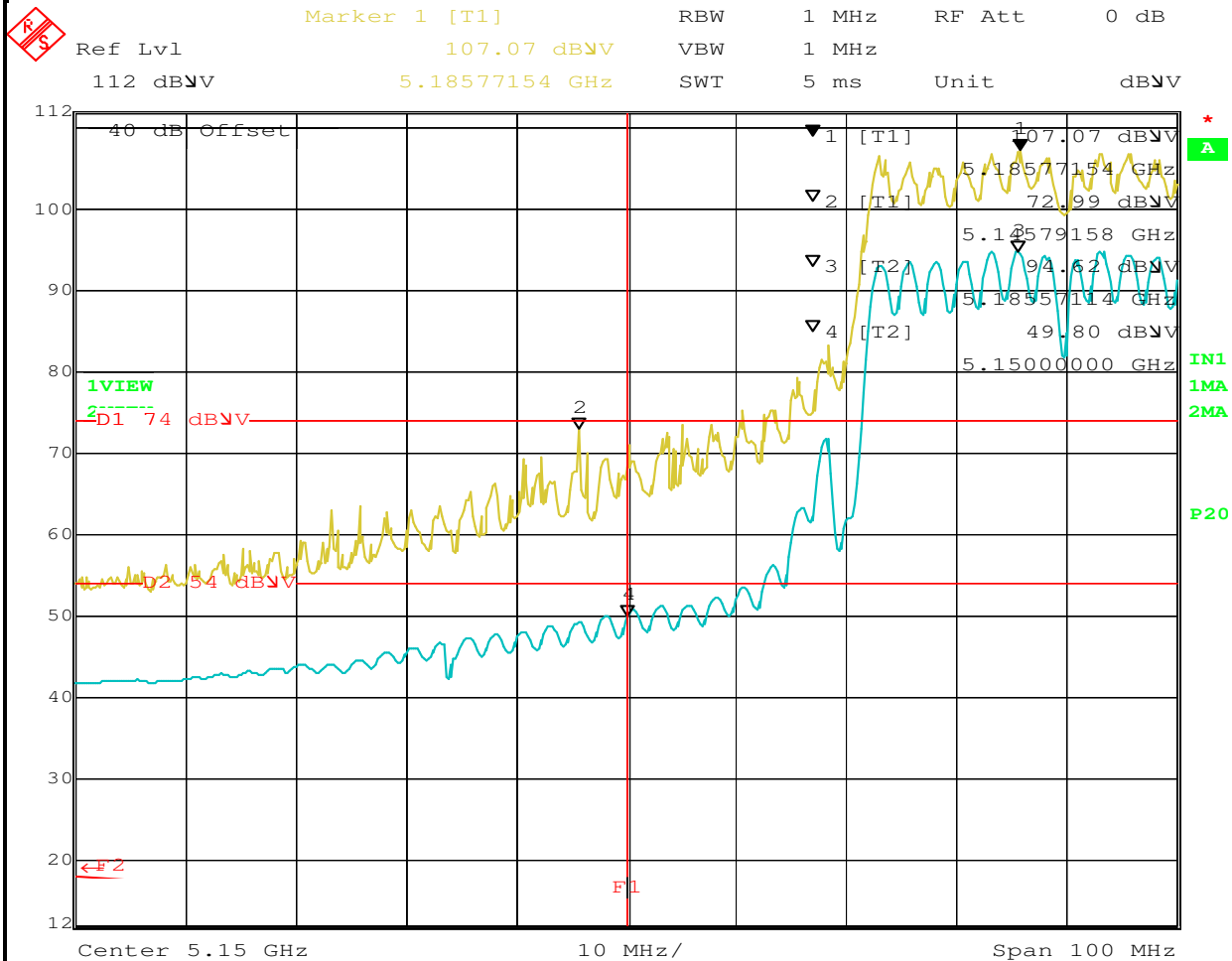
Date: 21.AUG.2006 14:18:07



EMC Test Data

Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A

Run #13: Channel @ 5200 MHz (802.11n 40 MHz), 12 dBm



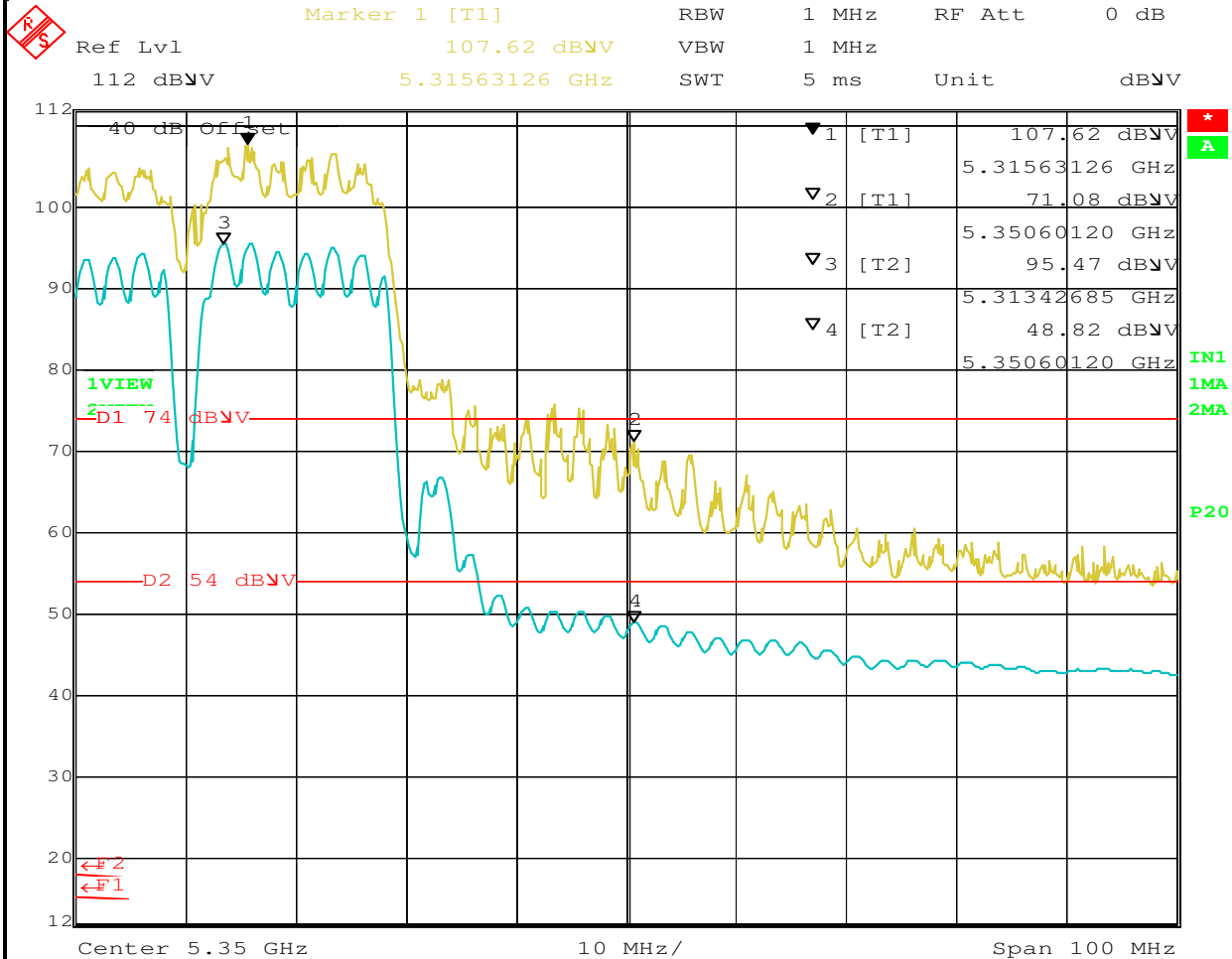
Date: 21.AUG.2006 14:57:45



EMC Test Data

Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A

Run #14: Channel @ 5300 MHz (802.11n 40 MHz), 12 dBm



Date: 21.AUG.2006 15:19:55



EMC Test Data

Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A

RSS 210 and FCC 15.247 Radiated Spurious Emissions

Test specifics

Objective: The objective of this test session is to perform engineering evaluation testing of the EUT with respect to the specification listed above.

Date of Test: 8/17/2006
Test Engineer: Juan Martinez
Test Location: Fremont Chamber #3

Config. Used: **1**
Config Change: **None**
EUT Voltage: 120V/60Hz

General Test Configuration

The EUT and all local support equipment were located on the turntable for radiated spurious emissions testing.

For radiated emissions testing the measurement antenna was located 1 meter from the EUT. Readings were extrapolated to 3 meters by subtracting 9.5 dB.

Ambient Conditions:

Temperature: **18 °C**
Rel. Humidity: **45 %**

Summary of Results

Run #	Test Performed	Limit	Pass / Fail	Result / Margin
1 (802.11b/g/a Mode)	RE, 4000 - 10,000 MHz - Spurious Emissions	FCC Part 15.209 / 15.247(c)	Pass	53.6dBμV/m (478.6μV/m) @ 11570.9MHz (-0.4dB)
1 (802.11a/n Mode)	RE, 10,000 - 18,000 MHz - Spurious Emissions	FCC Part 15.209 / 15.401	Pass	52.9dBμV/m (441.6μV/m) @ 10359.8MHz (-1.1dB)

Modifications Made During Testing:

No modifications were made to the EUT during testing.

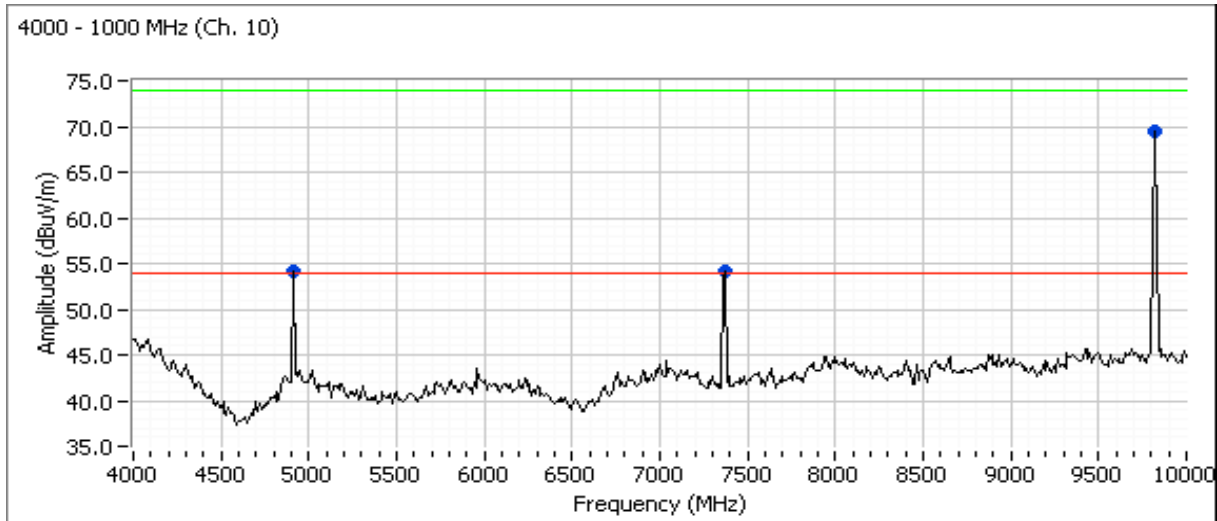
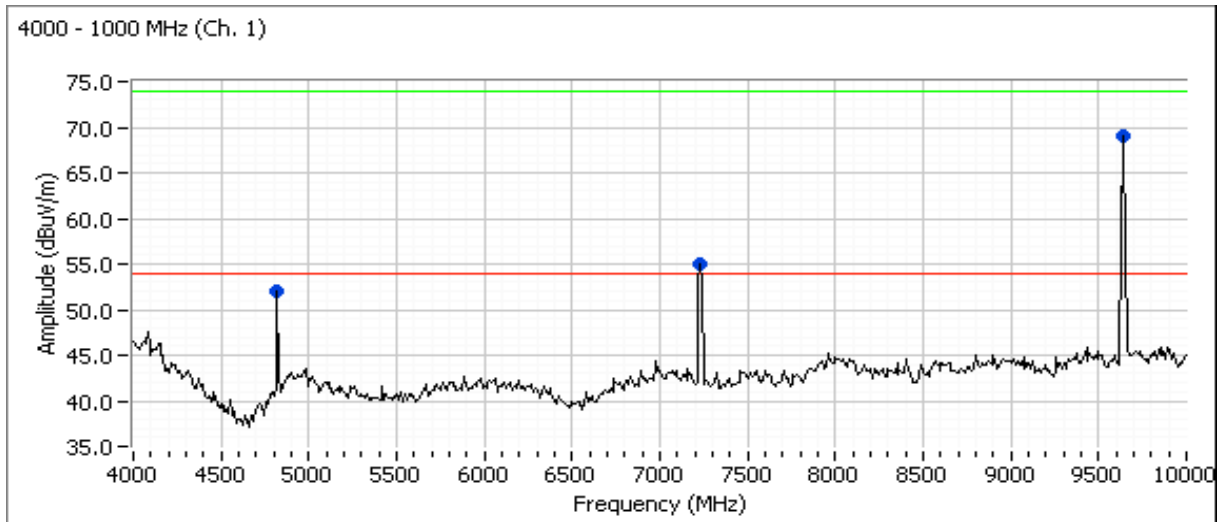
Deviations From The Standard

No deviations were made from the requirements of the standard.

Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A

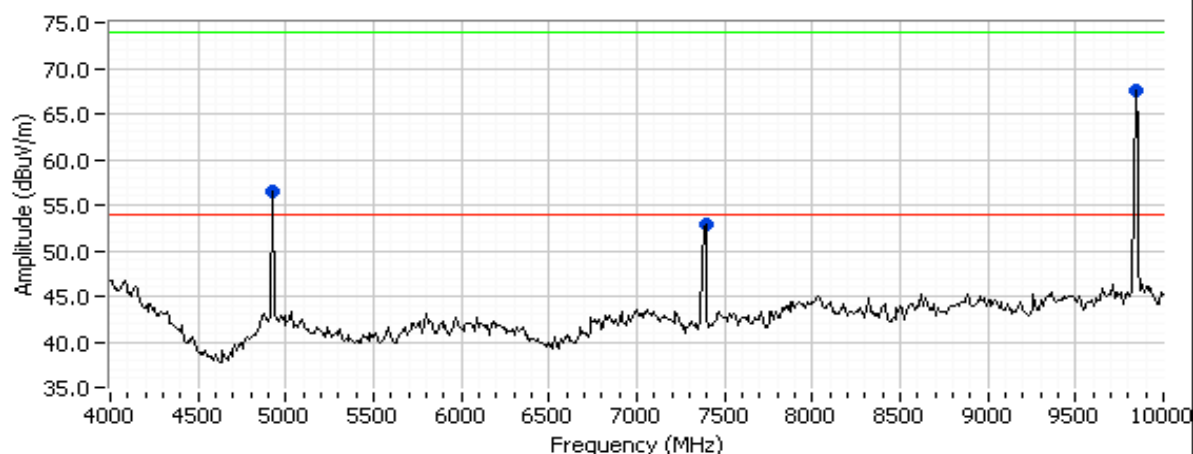
Run #1: Radiated Spurious Emissions, 4000 - 10,000 MHz. Operating Mode: **802.11b**

560 A1/A23 802.11b

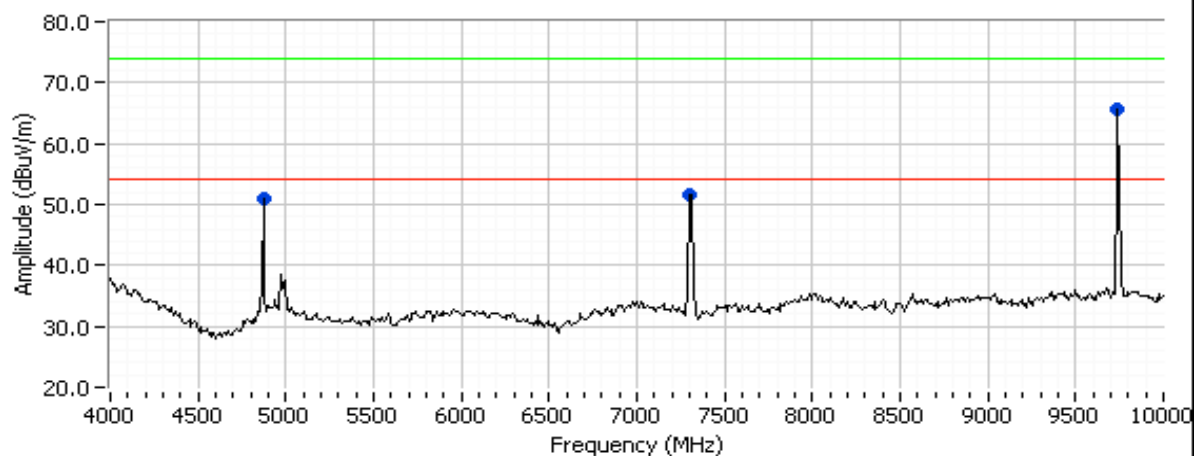


Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A

4000 - 1000 MHz (Ch. 11)

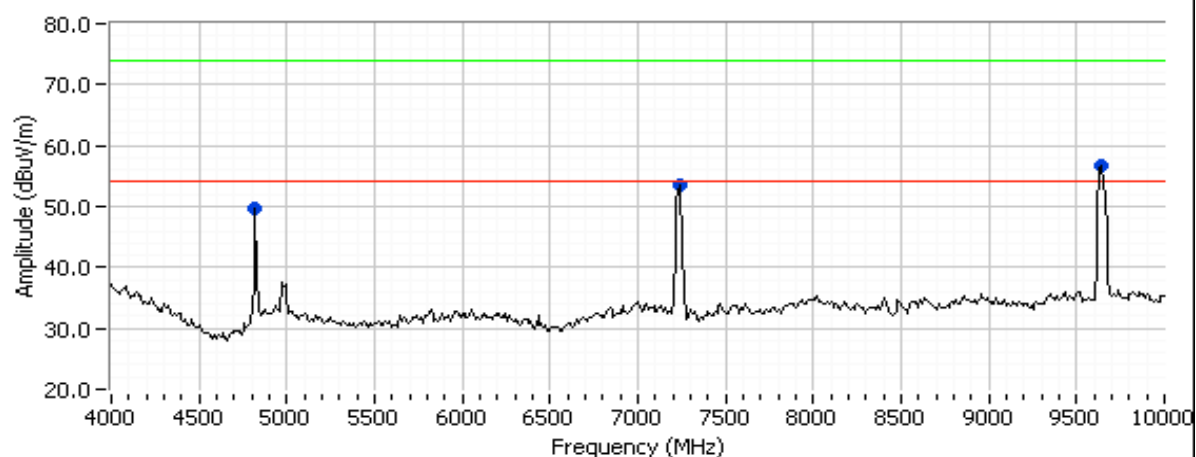


4000 - 1000 MHz (Ch. 6)

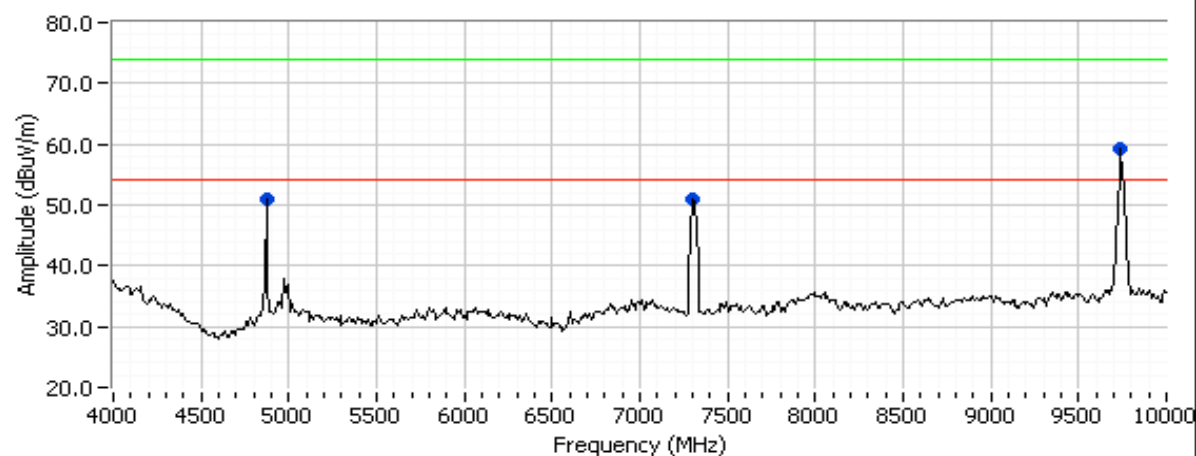


Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A

4000 - 1000 MHz (Ch. 1), 802.11g

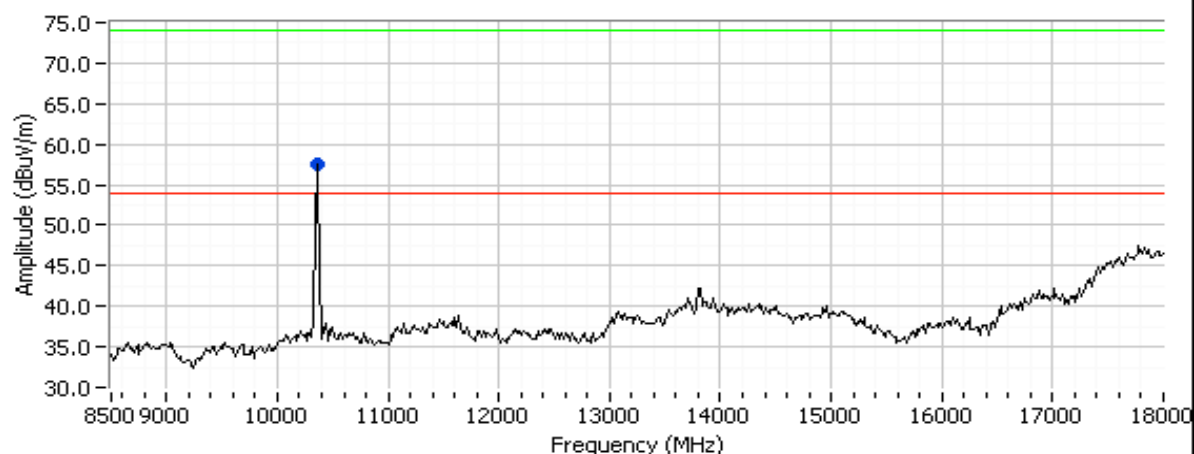


4000 - 1000 MHz (Ch. 6), 802.11g



Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A

8 MHz (Ch. 36), 802.11a (15.4 dBm)

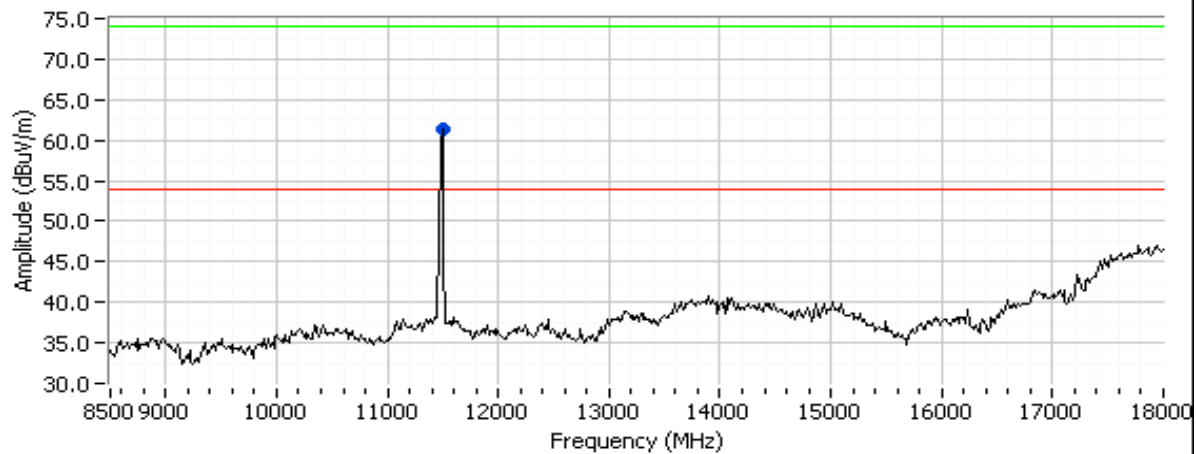


802.11n 20 MHz (Ch. 1, 15 dBm)

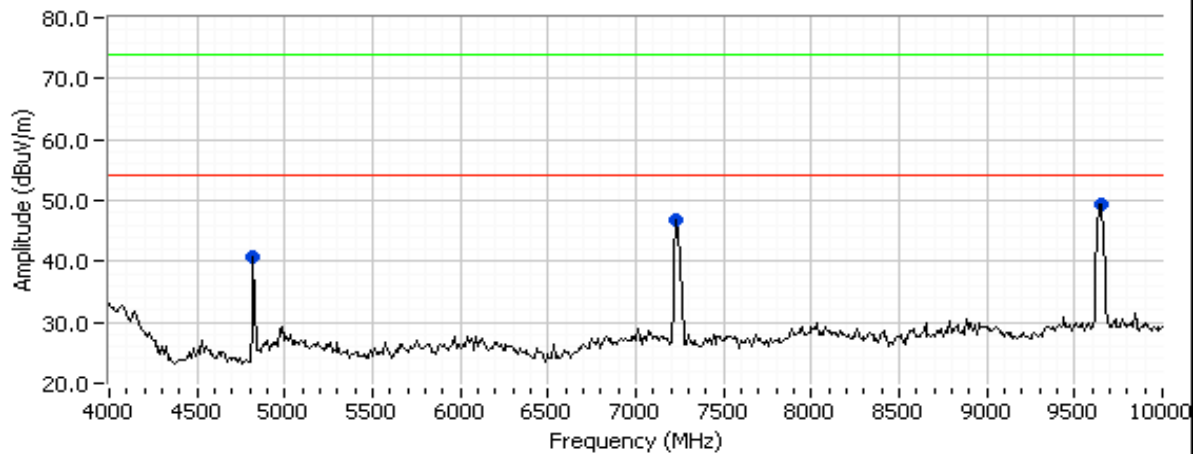


Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A

802.11a (Ch. 149, 17.5 dBm)

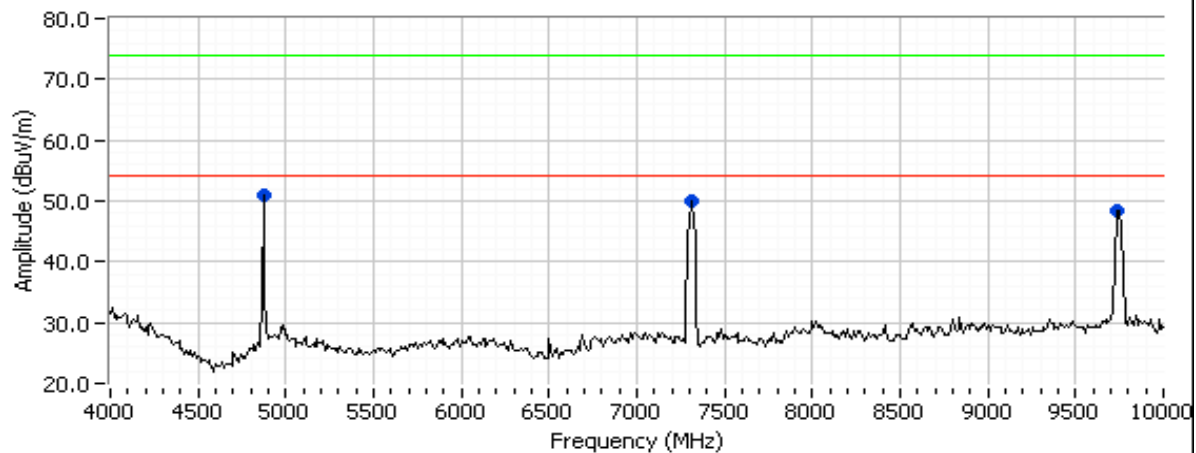


802.11n 20 MHz (Ch. 1, 15 dBm)

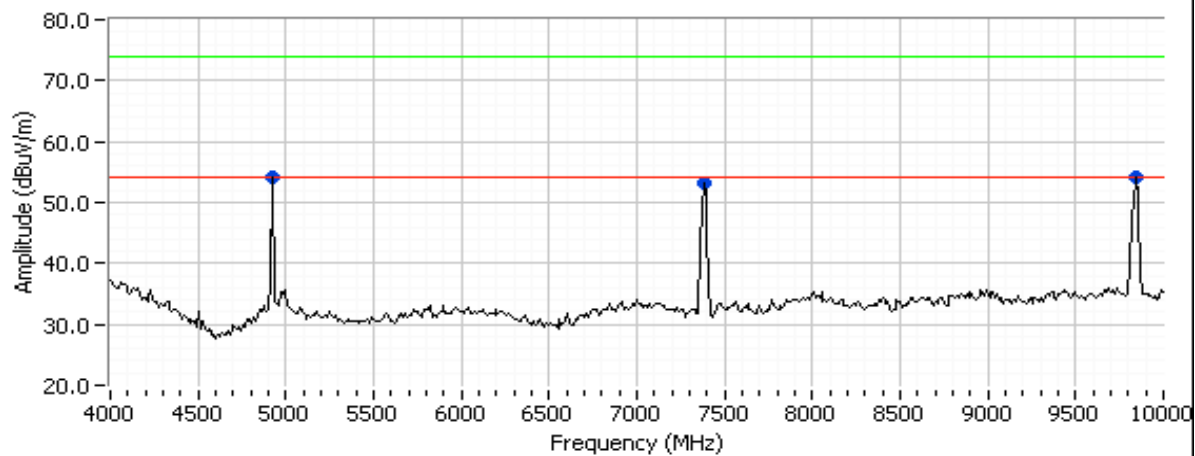


Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A

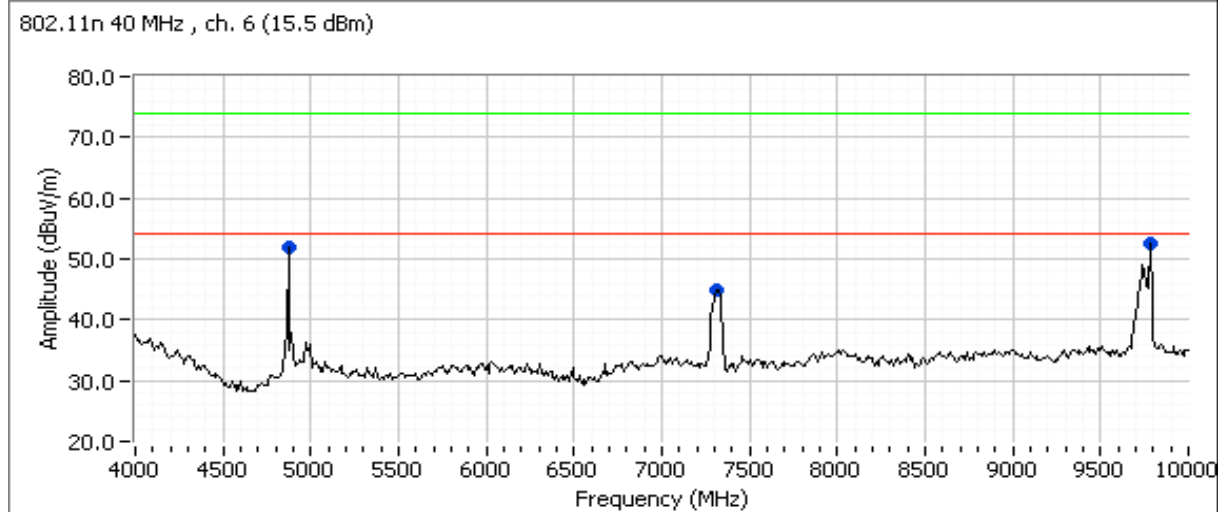
802.11n 20 MHz , ch. 6 (15.5 dBm)



802.11n 20 MHz , ch. 11 (15.5 dBm)



Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A





EMC Test Data

Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A

Other Spurious Emissions

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
560 B1/A23 802.11b (Ch. 1)								
4824.0000	51.4	H	54.0	-2.6	AVG	282	1.4	taken 8/18 19.2 dBm
4824.0000	53.7	H	74.0	-20.3	PK	282	1.4	taken 8/18 19.2 dBm
7232.8100	53.5	V	54.0	-0.5	AVG	277	1.0	taken 8/18 19.2 dBm
7232.8100	58.4	V	74.0	-15.6	PK	277	1.0	taken 8/18 19.2 dBm
9640.000	69.1	V	84.2	-15.1	Peak	269	1.2	
560 B1/A23 802.11b (Ch. 6)								
7307.8400	50.3	V	54.0	-3.7	AVG	233	1.2	
7307.8400	54.0	V	74.0	-20.0	PK	233	1.2	
4873.9600	51.7	H	54.0	-2.3	AVG	280	1.0	
4873.9600	52.7	H	74.0	-21.3	PK	280	1.0	
9740.000	65.6	V	54.0	11.6	Peak	263	1.0	
560 B1/A23 802.11b (Ch. 11)								
7386.780	51.0	V	54.0	-3.0	AVG	251	1.0	19 dBm
7386.780	56.2	V	74.0	-17.8	PK	251	1.0	19 dBm
9840.000	67.6	V	84.2	-16.6	Peak	272	1.6	
4923.970	53.2	H	54.0	-0.8	AVG	277	1.0	Measured at 1 meter (19 dBm)
4923.970	54.0	H	74.0	-20.0	PK	277	1.0	Measured at 1 meter (19 dBm)
560 B1/A23 (802.11g, Ch. 1) 17.6 dBm								
4823.93	49.5	H	54.0	-4.5	AVG	288	1.0	
4823.93	51.1	H	74.0	-22.9	PK	288	1.0	
7231.31	47.0	V	54.0	-7.0	AVG	241	1.0	
7231.31	59.2	V	74.0	-14.8	PK	241	1.0	
9640.00	56.6	V	84.2	-27.6	Peak	263	1.0	
560 B1/A23 (802.11g, Ch. 6) 17.6 dBm								
7313.73	45.2	V	54.0	-8.8	AVG	234	1.2	
7313.73	57.6	V	74.0	-16.4	PK	234	1.2	
4873.99	51.3	H	54.0	-2.7	AVG	279	1.0	
4873.99	52.5	H	74.0	-21.5	PK	279	1.0	
9740.00	59.1	V	82.7	-23.6	Peak	268	1.8	
560 B1/A23 (802.11g, Ch. 11) 17.6 dBm								
4923.97	53.3	H	54.0	-0.7	AVG	278	1.0	
4923.97	54.4	H	74.0	-19.6	PK	278	1.0	
7380.00	49.9	V	54.0	-4.1	Peak	251	1.2	
9840.00	60.4	V	82.7	-22.3	Peak	285	1.4	
560 B1/A23 (802.11a, Ch. 36)								
10359.75	52.9	V	54.0	-1.1	AVG	263	1.0	
10359.75	71.3	V	74.0	-2.7	PK	263	1.0	



EMC Test Data

Client:	Broadcom						Job Number:	J64973
Model:	BCM94321 MC New version						T-Log Number:	T64985
							Account Manager:	-
Contact:	David Boldy							
Standard:	FCC 15.247, 15.401, RSS-210						Class:	N/A
560 B1/A23 (802.11a, Ch. 52)								
10520.15	45.3	V	54.0	-8.7	AVG	257	1.0	
10520.15	62.5	V	74.0	-11.5	PK	257	1.0	
560 B1/A23 (802.11a, Ch. 62)								
10641.83	47.8	V	54.0	-6.2	AVG	252	1.1	
10641.83	64.9	V	74.0	-9.1	PK	252	1.1	
560 B1/A23 (802.11a, Ch.149) 17.5								
11490.25	53.5	V	54.0	-0.5	AVG	254	1.2	
11490.25	68.0	V	74.0	-6.0	PK	254	1.2	
560 B1/A23 (802.11a, Ch.157) 17.5								
11570.92	53.6	V	54.0	-0.4	AVG	313	1.0	
11570.92	67.9	V	74.0	-6.1	PK	313	1.0	
560 B1/A23 (802.11a, Ch.165) 17.5								
11649.38	51.0	V	54.0	-3.0	AVG	255	1.0	
11649.38	65.3	V	74.0	-8.7	PK	255	1.0	
560 B1/A23 (802.11n 20 MHz, Ch.1) 15.5								
4823.99	41.1	V	54.0	-12.9	AVG	43	1.0	
4823.99	46.6	V	74.0	-27.4	PK	43	1.0	
7233.99	44.1	V	54.0	-9.9	AVG	249	1.0	
7233.99	58.6	V	74.0	-15.4	PK	249	1.0	
560 B1/A23 (802.11n 20 MHz, Ch.6) 15.5								
4873.98	51.1	H	54.0	-2.9	AVG	283	1.0	
4873.98	52.8	H	74.0	-21.2	PK	283	1.0	
7308.89	49.0	V	54.0	-5.0	AVG	232	1.0	
7308.89	61.2	V	74.0	-12.8	PK	232	1.0	
9740.00	48.4	V	80.7	-32.3	Peak	270	1.0	
560 B1/A23 (802.11n 20 MHz, Ch.11) 15.5								
4923.96	53.3	H	54.0	-0.7	AVG	276	1.0	
4923.96	54.2	H	74.0	-19.8	PK	276	1.0	
7382.83	45.4	V	54.0	-8.6	AVG	240	1.0	
7382.83	57.8	V	74.0	-16.2	PK	240	1.0	
560 B1/A23 (802.11n 20 MHz, Ch.36) 16								
10360.32	55.1	V	68.2	-13.1	AVG	274	1.0	Non-Restricted
560 B1/A23 (802.11n 20 MHz, Ch.52) 15								
10514.91	48.1	V	54.0	-5.9	AVG	254	1.0	
10514.91	65.6	V	74.0	-8.4	PK	254	1.0	
560 B1/A23 (802.11n 20 MHz, Ch.64) 16								
10639.92	52.3	V	54.0	-1.7	AVG	252	1.0	
10639.92	67.6	V	74.0	-6.4	PK	252	1.0	
560 B1/A23 (802.11n 20 MHz, Ch.149) 15								
11489.84	47.8	V	54.0	-6.2	AVG	310	1.0	



EMC Test Data

Client:	Broadcom						Job Number:	J64973
Model:	BCM94321 MC New version						T-Log Number:	T64985
Contact:	David Boldy						Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210						Class:	N/A
11489.84	61.2	V	74.0	-12.8	PK	310	1.0	
560 B1/A23 (802.11n 20 MHz, Ch.157) 15								
11569.66	47.0	V	54.0	-7.0	AVG	310	1.2	
11569.66	60.7	V	74.0	-13.3	PK	310	1.2	
560 B1/A23 (802.11n 20 MHz, Ch.165) 15								
11650.08	47.6	V	54.0	-6.4	AVG	254	1.0	
11650.08	60.5	V	74.0	-13.5	PK	254	1.0	
560 B1/A23 (802.11n 40 MHz, Ch.38) 15.5								
10384.27	50.2	V	54.0	-3.8	AVG	256	1.0	
10384.27	65.1	V	74.0	-8.9	PK	256	1.0	
560 B1/A23 (802.11n 40 MHz, Ch.54) 15.5								
10539.90	46.5	V	54.0	-7.5	AVG	236	1.2	
10539.90	49.3	V	74.0	-24.7	PK	236	1.2	
560 B1/A23 (802.11n 40 MHz, Ch.62) 15.5								
10620.17	45.5	V	54.0	-8.5	AVG	256	1.6	
10620.17	53.0	V	74.0	-21.0	PK	256	1.6	
560 B1/A23 (802.11n 40 MHz, Ch.3) 13								
4844.00	49.4	H	54.0	-4.6	AVG	277	1.0	
4844.00	50.8	H	74.0	-23.2	PK	277	1.0	
7265.29	38.2	V	54.0	-15.8	AVG	222	1.0	
7265.29	50.9	V	74.0	-23.1	PK	222	1.0	
9720.00	56.2	H	78.2	-22.0	Peak	238	1.2	
560 B1/A23 (802.11n 40 MHz, Ch.6) 13								
7339.61	36.5	V	54.0	-17.5	AVG	310	1.0	
7339.61	48.9	V	74.0	-25.1	PK	310	1.0	
4873.94	51.9	H	54.0	-2.1	AVG	281	1.0	
4873.94	53.1	H	74.0	-20.9	PK	281	1.0	
9780.00	52.5	V	78.2	-25.7	Peak	275	1.4	
560 B1/A23 (802.11n 40 MHz, Ch.9) 13								
7382.53	36.3	H	54.0	-17.7	AVG	170	1.0	
7382.53	48.2	H	74.0	-25.8	PK	170	1.0	
4903.98	51.7	H	54.0	-2.3	AVG	275	1.0	
4903.98	52.8	H	74.0	-21.2	PK	275	1.0	
9840.00	56.4	V	78.2	-21.8	Peak	259	1.4	
560 B1/A23 (802.11n 40 MHz, Ch.151) 15								
11509.94	50.0	H	54.0	-4.0	AVG	215	1.0	
11509.94	57.2	H	74.0	-16.8	PK	215	1.0	
560 B1/A23 (802.11n 40 MHz, Ch.159) 15								
11589.86	44.7	H	54.0	-9.3	AVG	289	1.2	
11589.86	56.4	H	74.0	-17.6	PK	289	1.2	



EMC Test Data

Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A

Note 1:	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit was set 30dB below the level of the fundamental and measured in 100kHz.
Note 2:	Signal is not in a restricted band but the more stringent restricted band limit was used.
Note 3:	No other harmonic emissions detected after the 3rd harmonic for 2.4GHz and after the 2nd harmonic for 5GHz.



EMC Test Data

Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A

RSS 210 and FCC 15.247 (DTS) Antenna Port Measurements Power, Bandwidth and Spurious Emissions (802.11a)

Test specifics

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

Date of Test: 8/15/2006

Config. Used: **1**

Test Engineer: Juan Martinez

Config Change: **None**

Test Location: Fremont Chamber #4

EUT Voltage: 120V/60Hz

General Test Configuration

The EUT was connected to the standard(s) thru analyzer or power meter via a suitable attenuator. All measurements were made on a single chain.

All measurements have been corrected to allow for the external attenuators used.

Ambient Conditions:

Temperature: - °C

Rel. Humidity: - %

Summary of Results

Run #	Test Performed	Limit	Pass / Fail	Result / Margin
1	Output Power	15.247(b)	Pass	17.7 dBm
2	Power standard(s) spectral Density	15.247(d)	Pass	-5.17dBm/3kHz
3	6dB Bandwidth	15.247(a)	Pass	Refer to plots
3	99% Bandwidth	RSS GEN	-	Refer to plots
4	Spurious emissions	15.247(b)	Pass	Refer to plots

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.



EMC Test Data

Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A

Run #1: Output Power

Power Setting ²	Frequency (MHz)	Output Power		Antenna Gain (dBi)	Result	EIRP ^{Note 2}		Output Power	
		(dBm) ¹	mW			dBm	W	(dBm) ³	mW
	5745	17.6	57.5	2.2	Pass	19.8	0.095		
	5785	17.7	58.2	2.2	Pass	19.9	0.097		
	5825	17.5	56.8	2.2	Pass	19.7	0.094		

Note 1:

Output power measured using a spectrum analyzer (see plots below):
RBW=1MHz, VB=3 MHz, sample detector, power averaging on (transmitted signal was not continuous but the ESI analyzer was configured with a gated sweep such that the analyzer was only sweeping when the device was transmitting) and power integration over 30 MHz
The output power limit is 30dBm

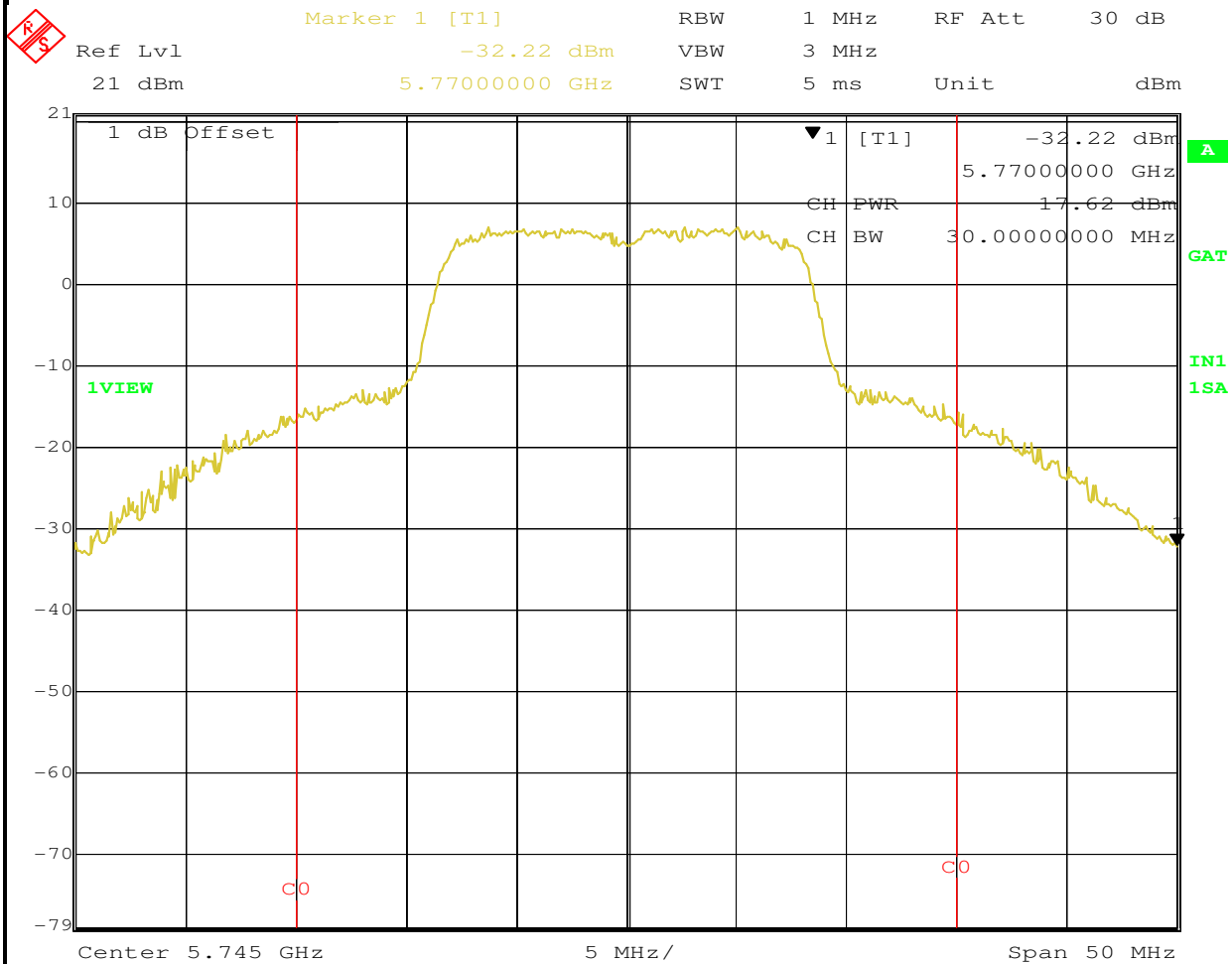
Note 2:

Power setting - the software power setting used during testing, included for reference only.



EMC Test Data

Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A

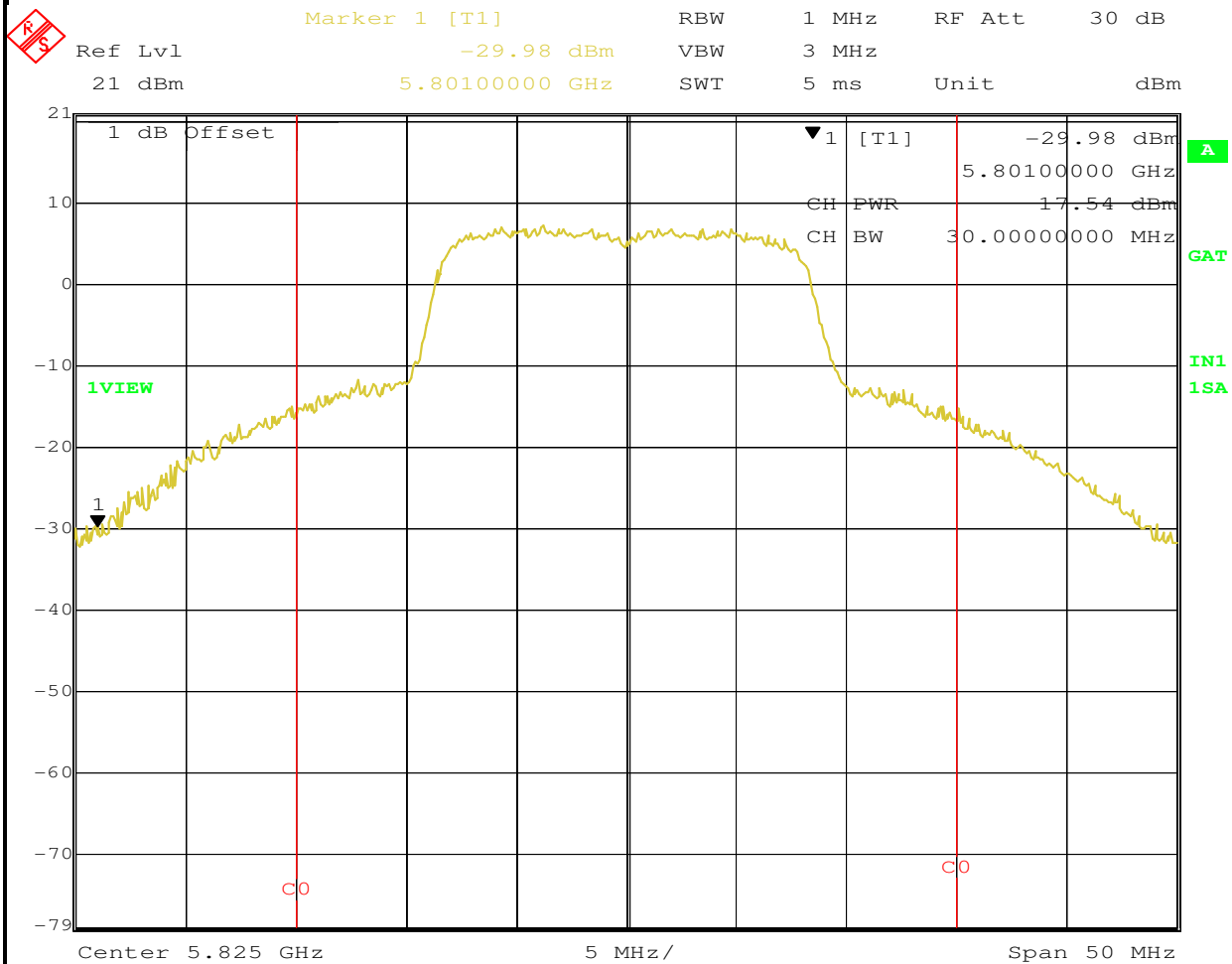


Date: 15.AUG.2006 13:23:33



EMC Test Data

Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A



Date: 15.AUG.2006 12:45:06



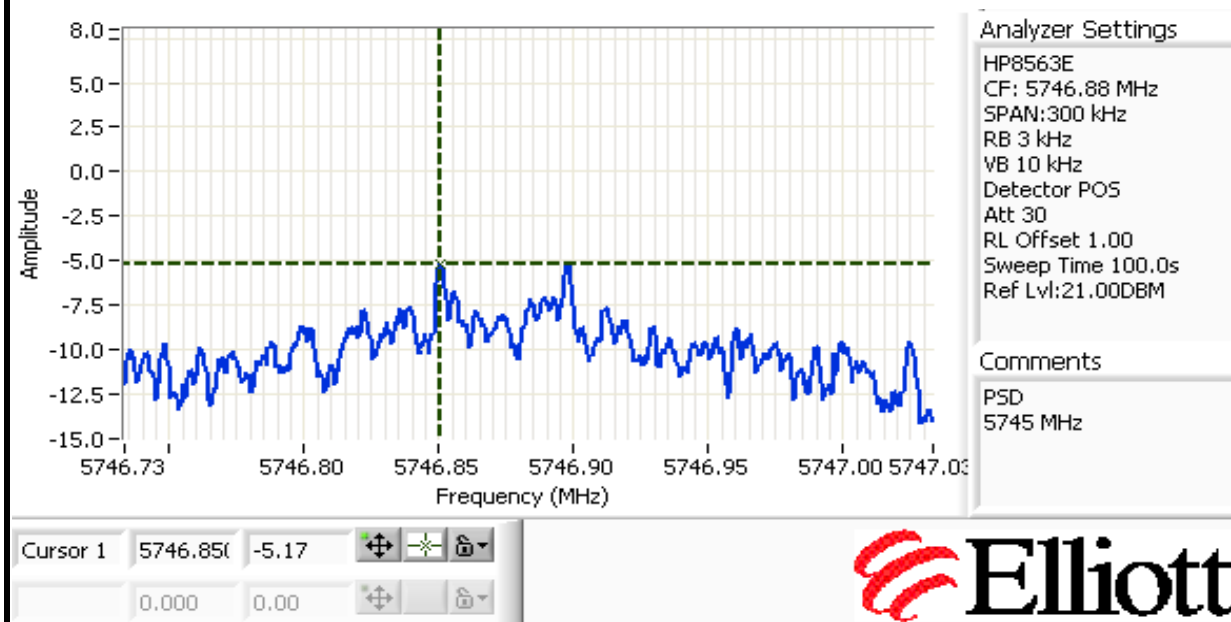
EMC Test Data

Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A

Run #2: Power Spectral Density

Power Setting	Frequency (MHz)	PSD	Limit dBm/3kHz	Result
		(dBm/3kHz) ^{Note 1}		
	5745	-5.2	8.0	Pass
	5785	-5.7	8.0	Pass
	5825	-5.7	8.0	Pass

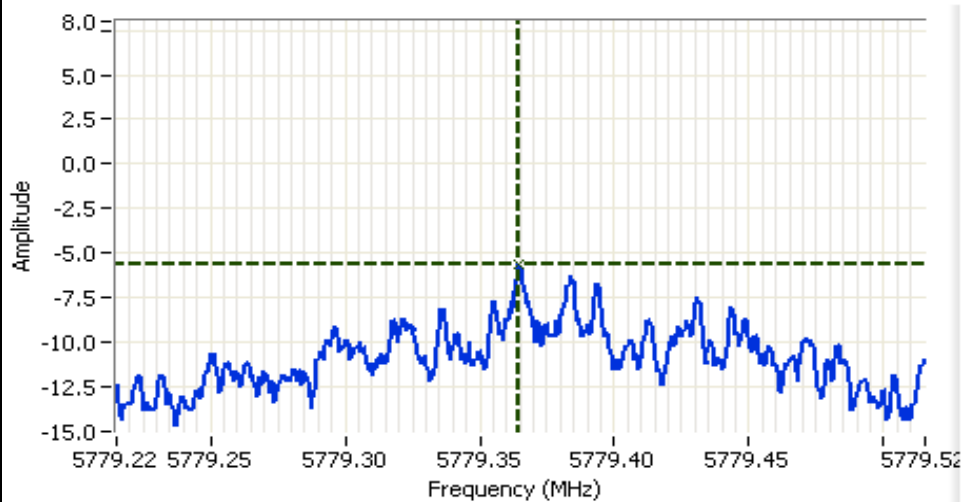
Note 1: Power spectral density measured using RB=3 kHz, VB=10kHz, analyzer with peak detector and with a sweep time set to ensure a dwell time of at least 1 second per 3kHz. The measurement is made at the frequency of PPSD determined from preliminary scans using RB=3kHz using multiple sweeps at a faster rate over the 6dB bandwidth of the signal.





EMC Test Data

Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A



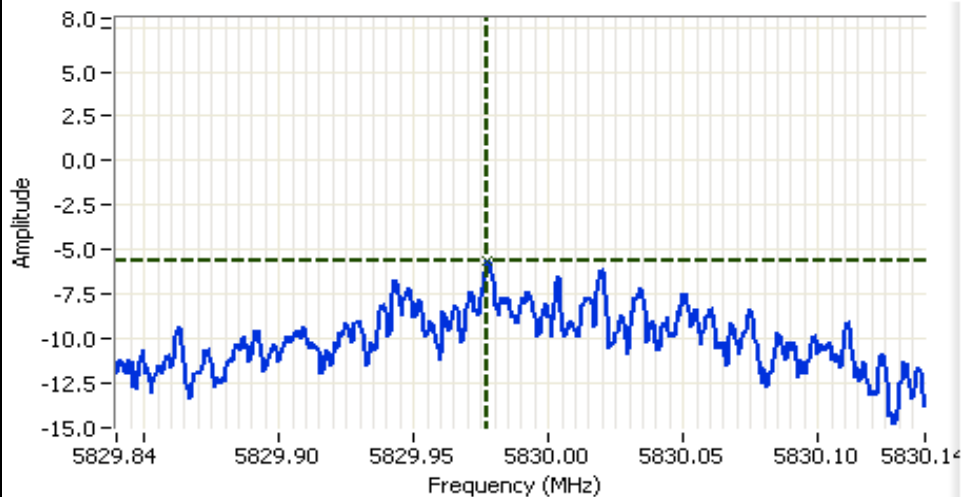
Analyzer Settings

HP8563E
CF: 5779.37 MHz
SPAN:300 kHz
RB 3 kHz
VB 10 kHz
Detector POS
Att 30
RL Offset 1.00
Sweep Time 100.0s
Ref Lvl:21.00DBM

Comments

PSD
5785 MHz

Cursor 1 5779.365 -5.67
0.000 0.00



Analyzer Settings

HP8563E
CF: 5829.99 MHz
SPAN:300 kHz
RB 3 kHz
VB 10 kHz
Detector POS
Att 30
RL Offset 1.00
Sweep Time 100.0s
Ref Lvl:21.00DBM

Comments

PSD
5825 MHz

Cursor 1 5829.97 -5.67
0.000 0.00





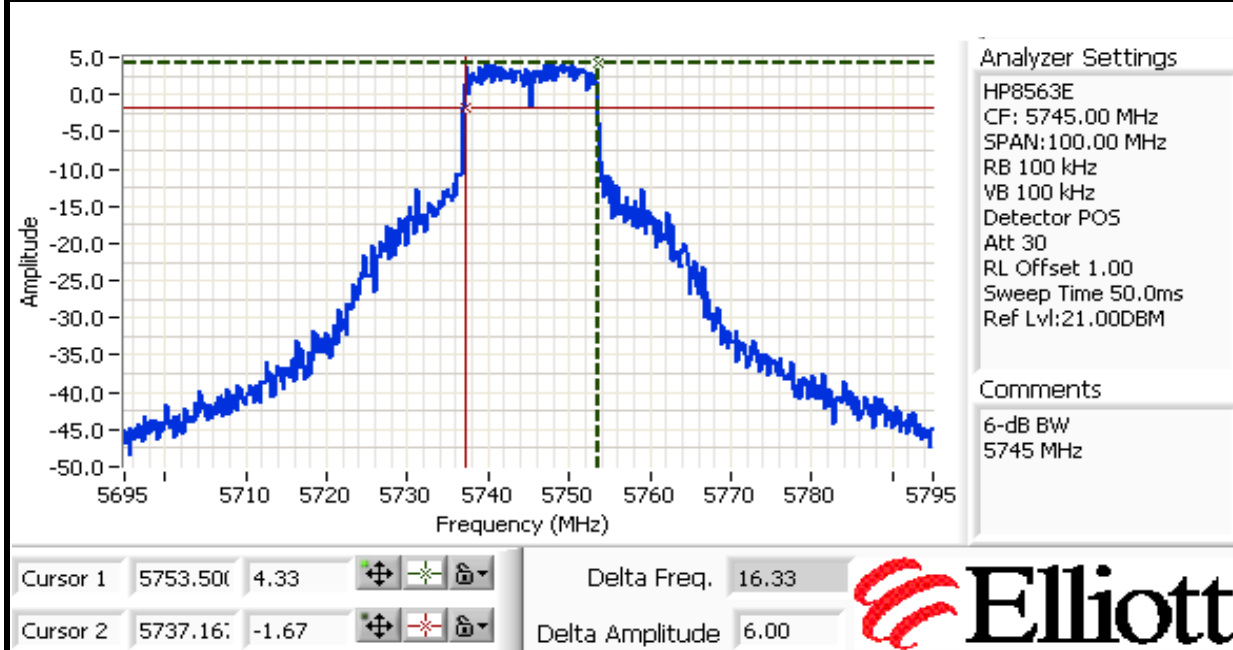
EMC Test Data

Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A

Run #3: Signal Bandwidth

Power Setting	Frequency (MHz)	Resolution Bandwidth	Bandwidth (MHz)	
			6dB	99%
	5745	100 kHz	16.3	41.5
	5785	100 kHz	16.3	39.0
	5825	100 kHz	16.0	41.0

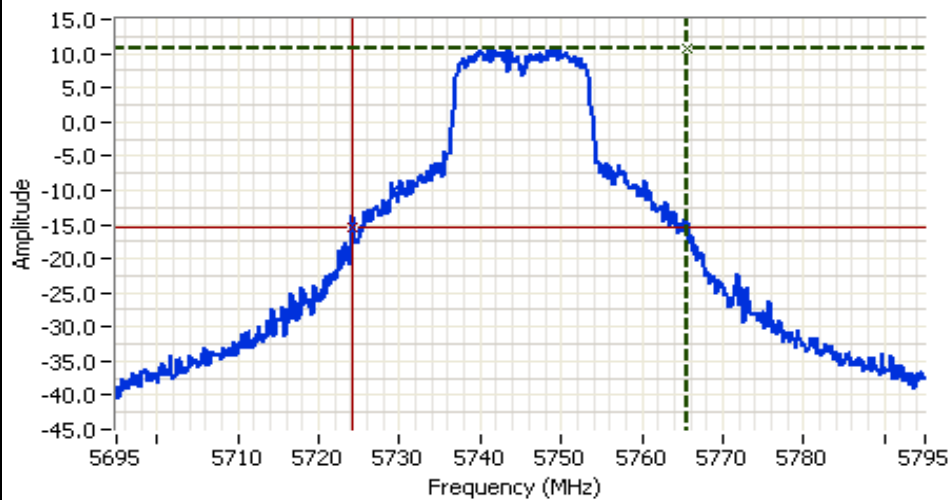
Note 1: 99% bandwidth measured in accordance with RSS GEN, with RB > 1% of the span and VB > 3xRB





EMC Test Data

Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A



Analyzer Settings

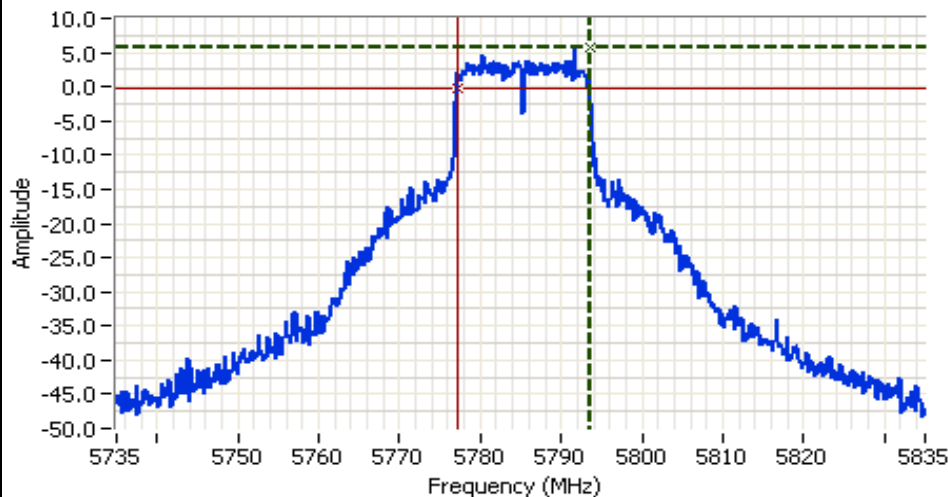
HP8563E
CF: 5745.00 MHz
SPAN: 100.00 MHz
RB 300 kHz
VB 1.000 MHz
Detector POS
Att 30
RL Offset 1.00
Sweep Time 50.0ms
Ref Lvl: 21.00DBM

Comments

99% BW
5745 MHz

Cursor 1 5765.66; 10.67
Cursor 2 5724.16; -15.33

Delta Freq. 41.50
Delta Amplitude 26.00



Analyzer Settings

HP8563E
CF: 5785.00 MHz
SPAN: 100.00 MHz
RB 100 kHz
VB 100 kHz
Detector POS
Att 30
RL Offset 1.00
Sweep Time 50.0ms
Ref Lvl: 21.00DBM

Comments

6-dB BW
5785 MHz

Cursor 1 5793.50; 5.67
Cursor 2 5777.16; -0.33

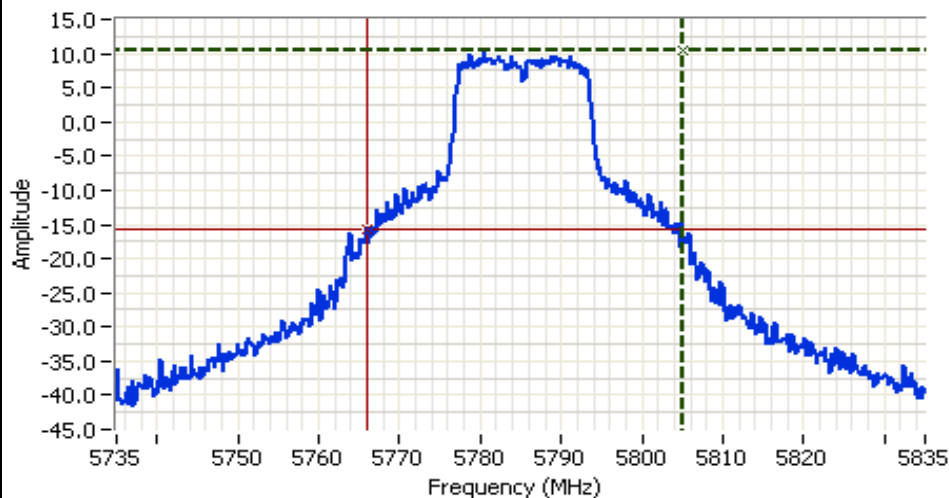
Delta Freq. 16.33
Delta Amplitude 6.00





EMC Test Data

Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A



Analyzer Settings

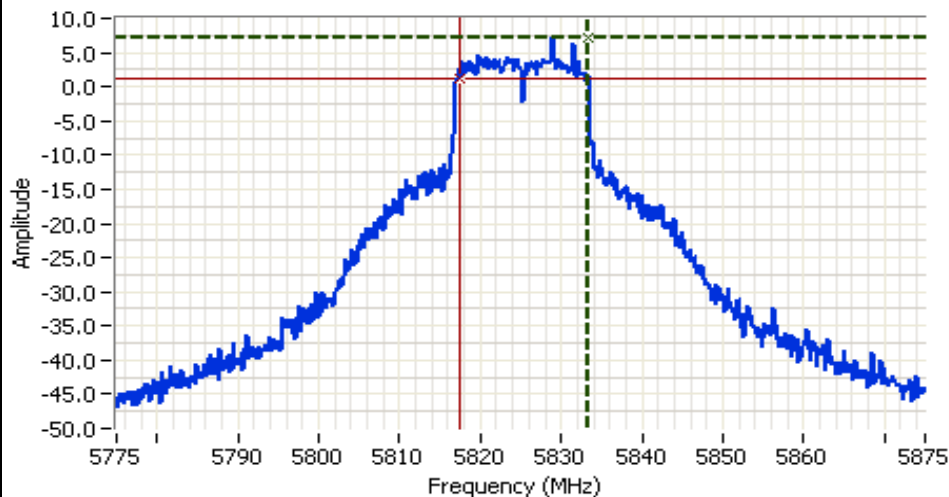
HP8563E
CF: 5785.00 MHz
SPAN: 100.00 MHz
RB 300 kHz
VB 1.000 MHz
Detector POS
Att 30
RL Offset 1.00
Sweep Time 50.0ms
Ref Lvl: 21.00DBM

Comments

99% BW
5785 MHz

Cursor 1 5805.00 10.33
Cursor 2 5766.00 -15.67

Delta Freq. 39.00
Delta Amplitude 26.00



Analyzer Settings

HP8563E
CF: 5825.00 MHz
SPAN: 100.00 MHz
RB 100 kHz
VB 100 kHz
Detector POS
Att 30
RL Offset 1.00
Sweep Time 50.0ms
Ref Lvl: 21.00DBM

Comments

6-dB BW
5825 MHz

Cursor 1 5833.33 7.17
Cursor 2 5817.33 1.17

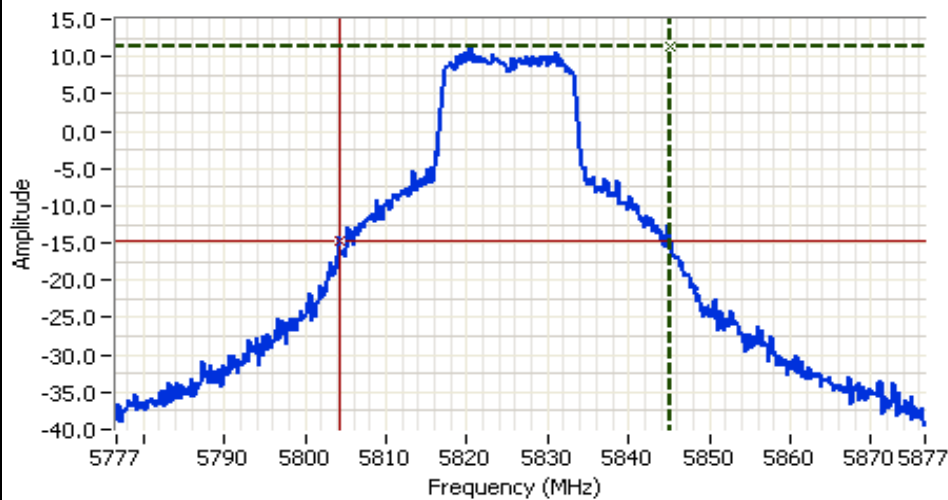
Delta Freq. 16.00
Delta Amplitude 6.00





EMC Test Data

Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A



Analyzer Settings

HP8563E
CF: 5826.67 MHz
SPAN: 100.00 MHz
RB 300 kHz
VB 1.000 MHz
Detector POS
Att 30
RL Offset 1.00
Sweep Time 50.0ms
Ref Lvl: 21.00DBM

Comments

99% BW
5825 MHz

Cursor 1 5845.16; 11.33

Cursor 2 5804.16; -14.67

Delta Freq. 41.00

Delta Amplitude 26.00





EMC Test Data

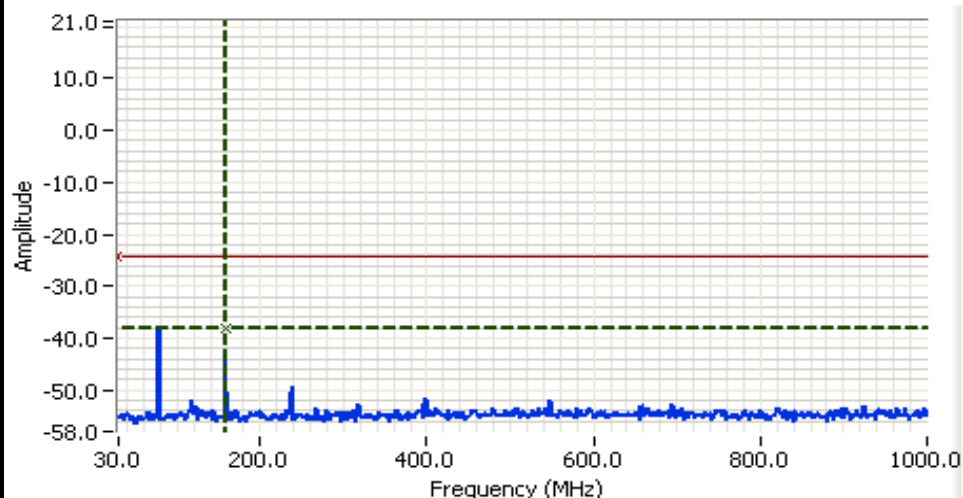
Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A

Run #4: Out of Band Spurious Emissions

Frequency (MHz)	Limit	Result
5745	-30dBc	Refer to plots
5785	-30dBc	Refer to plots
5825	-30dBc	Refer to plots

Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A

Plots for low channel



Analyzer Settings

HP8563E
CF: 515.00 MHz
SPAN: 970.00 MHz
RB 100 kHz
VB 100 kHz
Detector POS
Att 30
RL Offset 1.00
Sweep Time 250.0ms
Ref Lvl: 21.00DBM

Comments

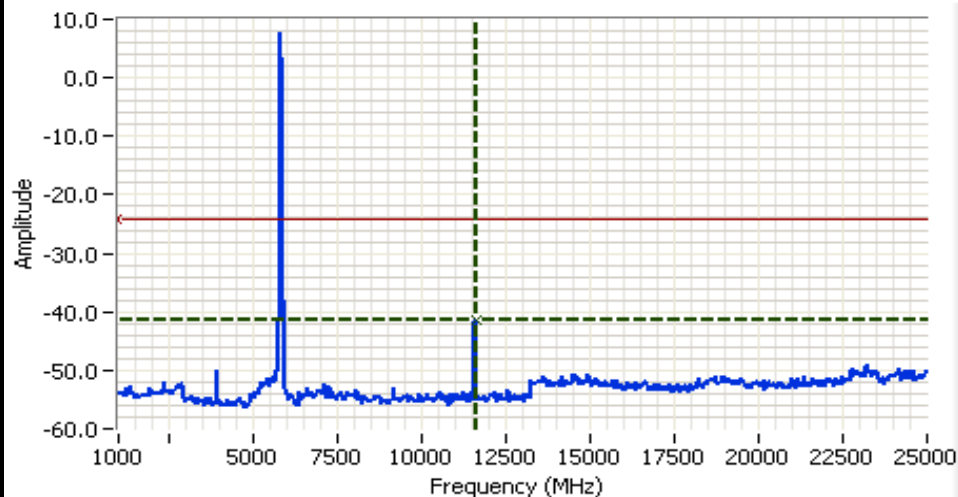
Out of Band
5745 MHz

Cursor 1 157.717 -38.33

Delta Freq. 130.24

Cursor 2 27.474 -24.17

Delta Amplitude 14.16



Analyzer Settings

HP8563E
CF: 13000.00 MHz
SPAN: 24000.00 MHz
RB 100 kHz
VB 100 kHz
Detector POS
Att 30
RL Offset 1.00
Sweep Time 6.0s
Ref Lvl: 21.00DBM

Comments

Out of Band
5745 MHz

Cursor 1 11600.0 -41.50

Delta Freq. 10662.50

Cursor 2 937.500 -24.17

Delta Amplitude 17.33

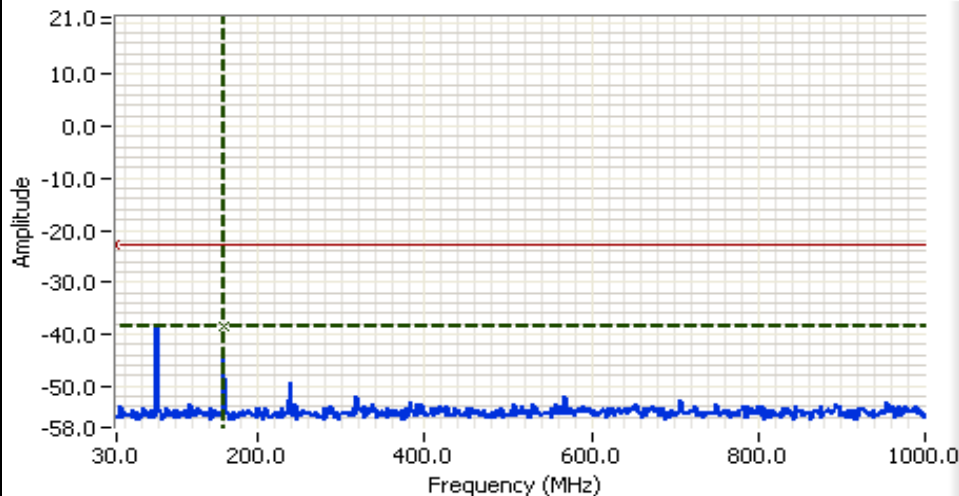




EMC Test Data

Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A

Plots for center channel



Analyzer Settings

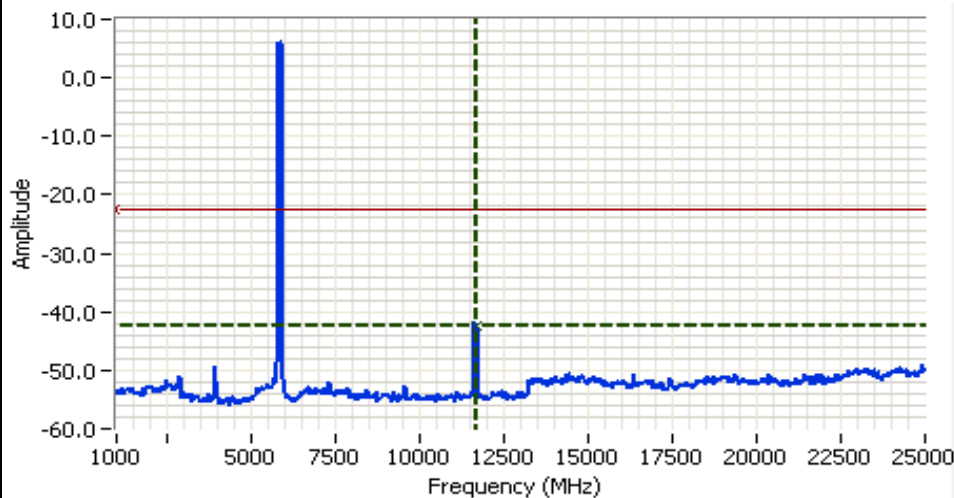
HP8563E
CF: 515.00 MHz
SPAN: 970.00 MHz
RB 100 kHz
VB 100 kHz
Detector POS
Att 30
RL Offset 1.00
Sweep Time 250.0ms
Ref Lvl: 21.00DBM

Comments

Out of Band
5785 MHz

Cursor 1 157.717 -38.67
Cursor 2 27.474 -22.67

Delta Freq. 130.24
Delta Amplitude 16.00



Analyzer Settings

HP8563E
CF: 13000.00 MHz
SPAN: 24000.00 MHz
RB 100 kHz
VB 100 kHz
Detector POS
Att 30
RL Offset 1.00
Sweep Time 6.0s
Ref Lvl: 21.00DBM

Comments

Out of Band
5785 MHz

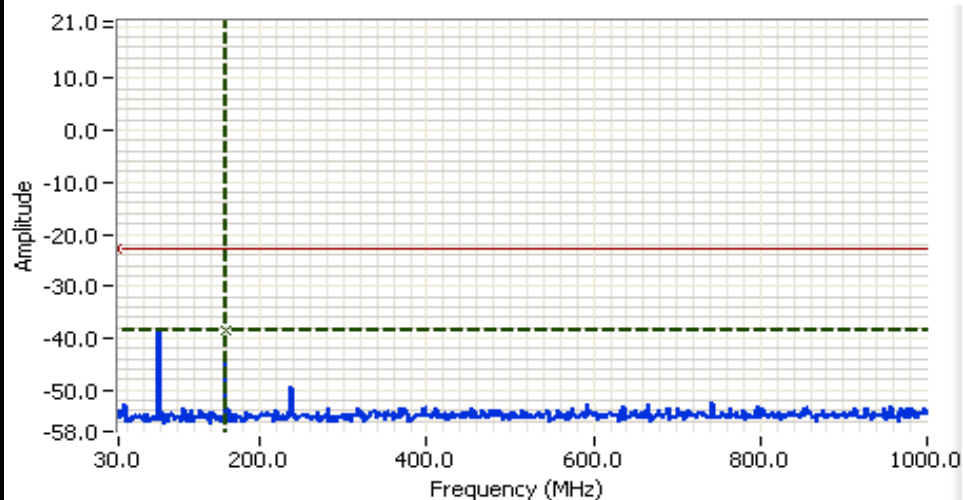
Cursor 1 11680.0 -42.33
Cursor 2 937.500 -22.67

Delta Freq. 10742.50
Delta Amplitude 19.66



Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A

Plots for high channel



Analyzer Settings

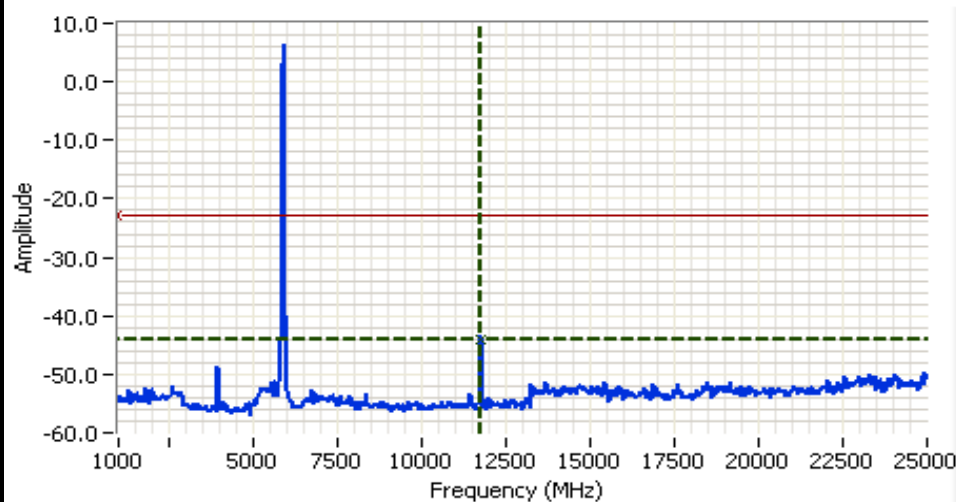
HP8563E
CF: 515.00 MHz
SPAN: 970.00 MHz
RB 100 kHz
VB 100 kHz
Detector POS
Att 30
RL Offset 1.00
Sweep Time 250.0ms
Ref Lvl: 21.00DBM

Comments

Out of Band
5825 MHz

Cursor 1 157.717 -38.67
Cursor 2 27.474 -22.83

Delta Freq. 130.24
Delta Amplitude 15.84



Analyzer Settings

HP8563E
CF: 13000.00 MHz
SPAN: 24000.00 MHz
RB 100 kHz
VB 100 kHz
Detector POS
Att 30
RL Offset 1.00
Sweep Time 6.0s
Ref Lvl: 21.00DBM

Comments

Out of Band
5825 MHz

Cursor 1 11720.0 -44.17
Cursor 2 937.500 -22.83

Delta Freq. 10782.50
Delta Amplitude 21.34





EMC Test Data

Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A

RSS 210 and FCC 15.247 (DTS) Antenna Port Measurements MIMO and Smart Antenna Systems (802.11n 20 MHz) (5GHz) Power, Bandwidth and Spurious Emissions

Test specifics

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

Date of Test: 8/16/2006
Test Engineer: Juan Martinez
Test Location: Fremont Chamber #3

Config. Used: **1**
Config Change: **None**
EUT Voltage: 120V/60Hz

General Test Configuration

The EUT was connected to the standard(s) trum analyzer or power meter via a suitable attenuator. All measurements were made on a single chain.

All measurements have been corrected to allow for the external attenuators used.

Ambient Conditions:

Temperature: - °C
Rel. Humidity: - %

Summary of Results

Run #	Test Performed	Limit	Pass / Fail	Result / Margin
1	Output Power	15.247(b)	Pass	18.2 dBm
2	Power spectral Density (PSD)	15.247(d)	Pass	0.2 dBm/3kHz
3	6dB Bandwidth	15.247(a)	Pass	Not Applicable
3	99% Bandwidth	RSS GEN	-	Not Applicable
4	Spurious emissions	15.247(b)	Pass	Refer to plots

Output power measurements to confirm output power for each channel was at the previously certified level +/- 0.5dB. Power measurements were made prior to each set of conducted and radiated spurious emissions test to verify output power was within +/-0.5dB of the previously certified level

PSD measurements to confirm the PSD with the alternate PA remained compliant. Tests were performed on three channels in 20MHz mode and center channel in 40MHz mode (to demonstrate that 20MHz mode was worst case).

6dB and 99% bandwidth measurements performed on at least the center channel in both 20Mhz and 40Mhz to verify bandwidths. Changing the PA should have no significant effect on signal bandwidth unless the PA was overloaded.

Spurious emissions on the antenna port were measured on the top, bottom and center channels in 20MHz mode and repeated on 40MHz mode, center channel to demonstrate that the 20 MHz mode was the worst case.



EMC Test Data

Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A

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.

Run #1: Output Power

Transmitted signal on chain is coherent ? y

Regulatory Power Measurements:

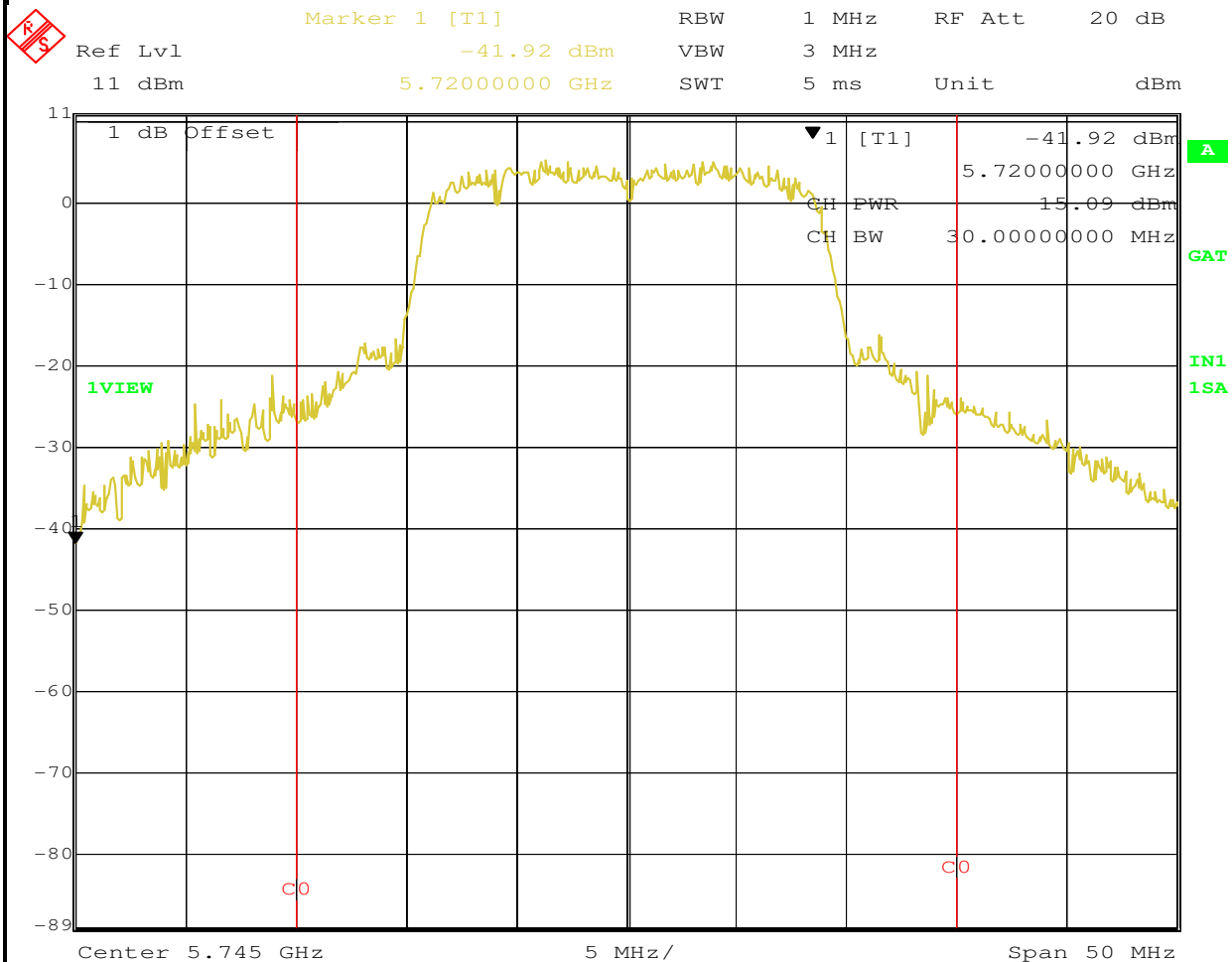
Mode	Frequency (MHz)	Output Power (dBm) ^{Note 1}			Antenna Gain (dBi) ^{Note 3}			EIRP ^{Note 2}	
		Chain 1	Chain 2	Total	Chain 1	Chain 2	Total	dBm	W
20MHz n	5745	15.2	15.2	18.2	7.4	7.4	10.5	28.7	0.735
20MHz n	5785	15.0	15.1	18.1	7.4	7.4	10.5	28.5	0.710
20MHz n	5825	15.2	15.0	18.1	7.4	7.4	10.5	28.6	0.718
40MHz n	5755	15.1	15.0	18.1	7.4	7.4	10.5	28.5	0.710

Note 1:	Output power measured using a spectrum analyzer to verify power was within 0.5dB of originally reported power. RBW=1MHz, VB=3 MHz, sample detector, power averaging on (transmitted signal was not continuous but the ESI analyzer was configured with a gated sweep such that the analyzer was only sweeping when the device was transmitting) and power integration over 50 MHz
Note 2:	EIRP - if transmit chains are coherent then the EIRP is calculated from the sum of the antenna gains plus the total power (i.e. beam-forming is assumed because of coherency on the chains). If the individual chains are incoherent then the EIRP is calculated from the sum of the individual EIRPs for each chain.
Note 3:	If the transmit chains are coherent then the total system antenna gain is the sum of the numeric gains for each antenna. If the transmit chains are incoherent then the system antenna gain is not applicable as each transmit chain can be treated independently.



EMC Test Data

Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A



Date: 16.AUG.2006 16:25:30



EMC Test Data

Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A

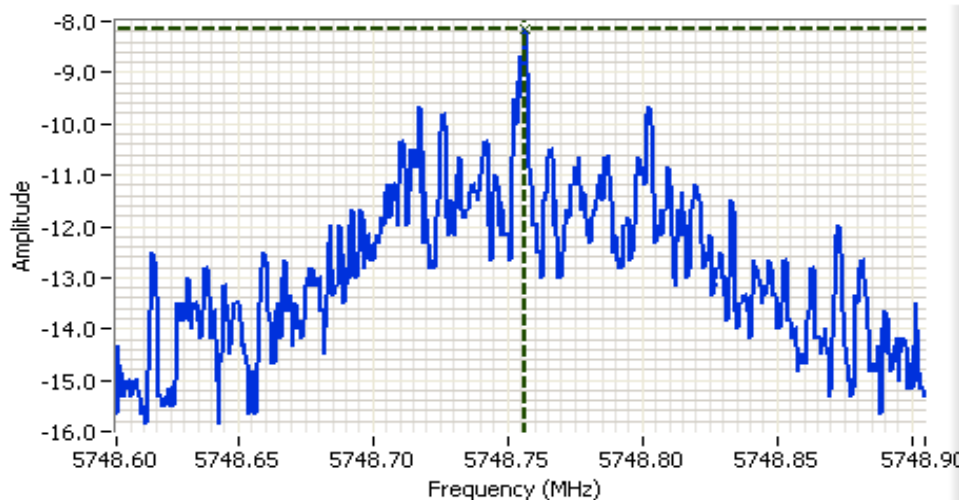
Run #4: Power Spectral Density

Mode	Power Setting	Frequency (MHz)	PSD (dBm/3kHz) ^{Note 1}			Limit dBm/3kHz	Result
			Chain 1	Chain 2	Total		
n 20MHz	18.2	5745	-8.2	-8.3	0.2	8.0	Pass
n 20MHz	18.1	5785	-6.0	-5.3	-0.7	8.0	Pass
n 20MHz	18.1	5825	-6.0	-5.3	-0.7	8.0	Pass
n 40MHz	18.1	5755	-12.2	-11.2	-1.0	8.0	Pass

Note 1:	Power standard(s)tral density measured using RB=3 kHz, VB=10kHz, analyzer with peak detector and with a sweep time set to ensure a dwell time of at least 1 second per 3kHz. The measurement is made at the frequency of PPSD determined from preliminary scans using RB=3kHz using multiple sweeps at a faster rate over the 6dB bandwidth of the signal.
---------	--

Client: Broadcom	Job Number: J64973
Model: BCM94321 MC New version	T-Log Number: T64985
Contact: David Boldy	Account Manager: -
Standard: FCC 15.247, 15.401, RSS-210	Class: N/A

Low Channel - 5745 MHz



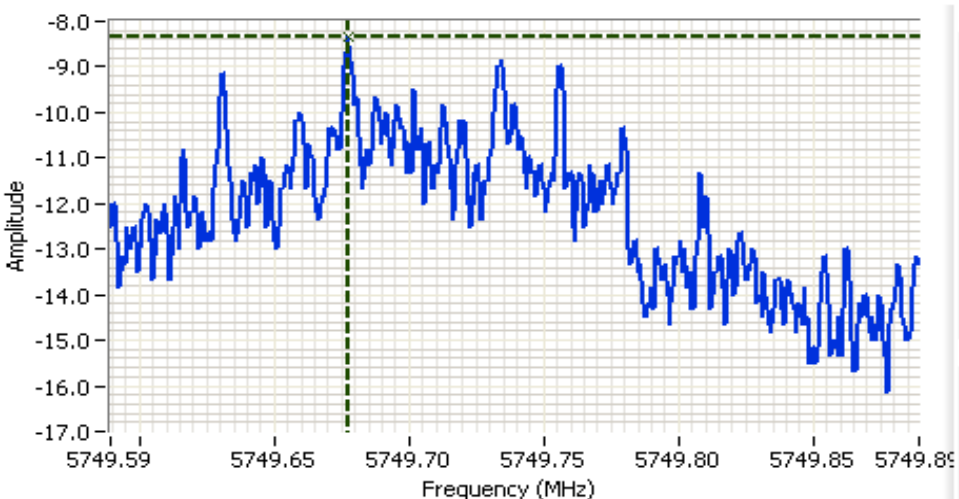
Analyzer Settings

HP8564E,EMI
CF: 5748.75 MHz
SPAN:300 kHz
RB 3 kHz
VB 10 kHz
Detector POS
Att 30
RL Offset 1.00
Sweep Time 100.0s
Ref Lvl:19.00DBM

Comments

PSD
802.11n 20 MHz
5745 MHz
Main Port

Cursor 1 5748.75 -8.17
0.000 0.00



Analyzer Settings

HP8564E,EMI
CF: 5749.74 MHz
SPAN:300 kHz
RB 3 kHz
VB 10 kHz
Detector POS
Att 30
RL Offset 1.00
Sweep Time 100.0s
Ref Lvl:19.00DBM

Comments

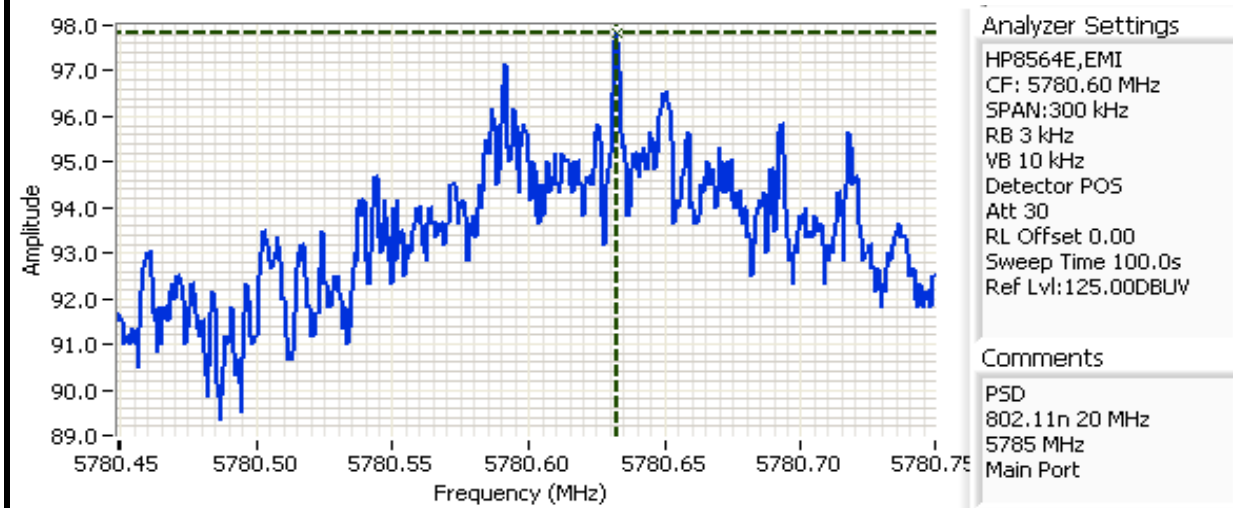
PSD
802.11n 20 MHz
5745 MHz
Aux Port

Cursor 1 5749.67 -8.33
0.000 0.00



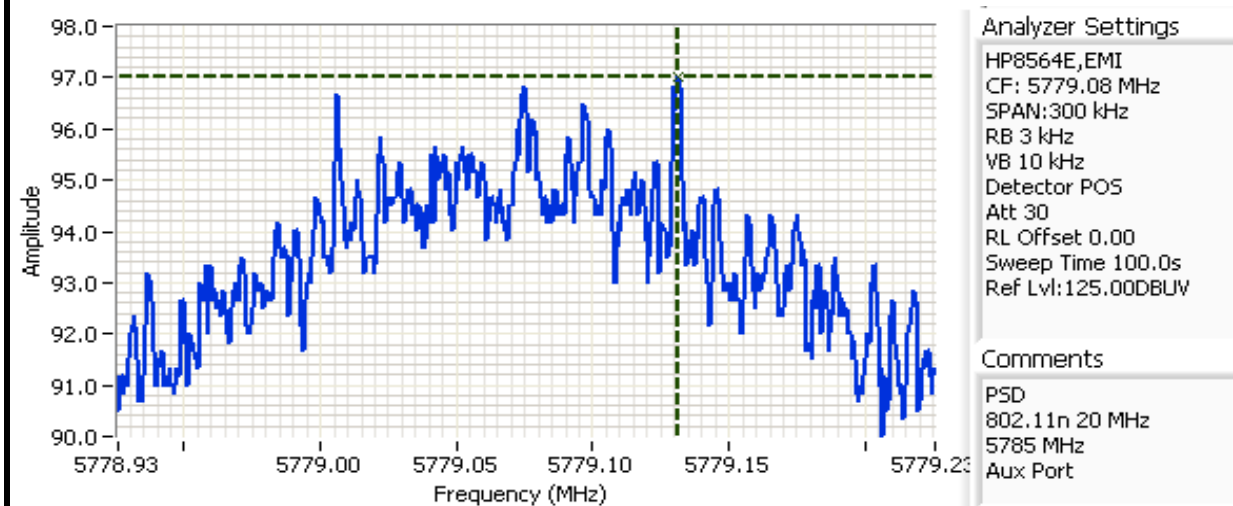
Client: Broadcom	Job Number: J64973
Model: BCM94321 MC New version	T-Log Number: T64985
Contact: David Boldy	Account Manager: -
Standard: FCC 15.247, 15.401, RSS-210	Class: N/A

Middle Channel - 5785 MHz



Cursor 1 5780.63: 97.83

0.000 0.00



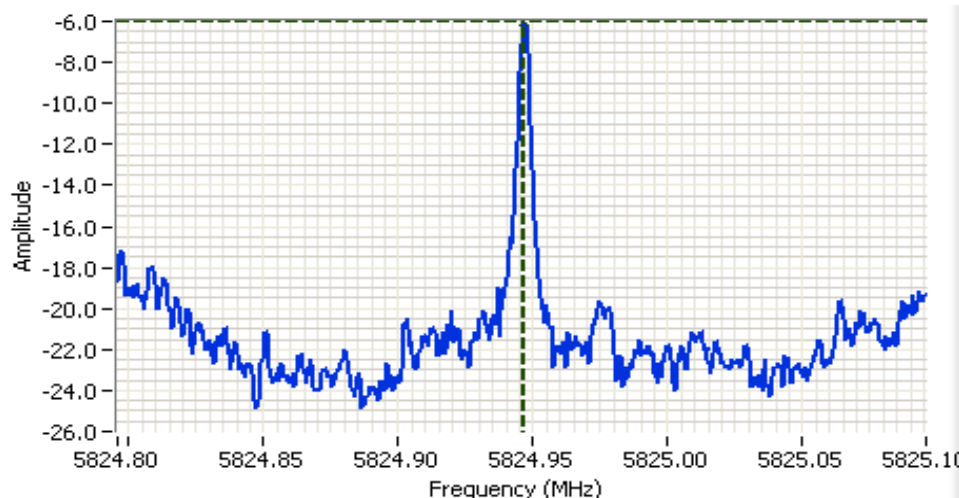
Cursor 1 5779.13: 97.00

0.000 0.00



Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A

High Channel - 5825 MHz



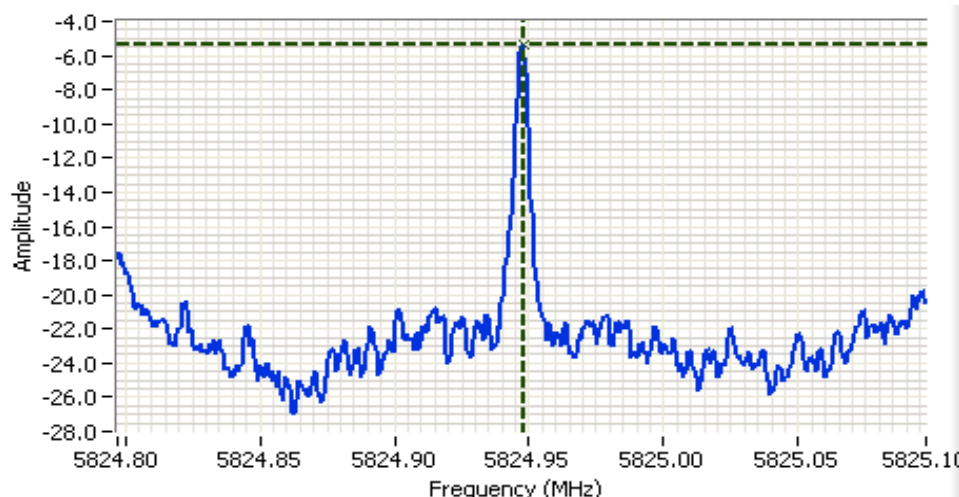
Analyzer Settings

HP8564E,EMI
CF: 5824.95 MHz
SPAN:300 kHz
RB 3 kHz
VB 10 kHz
Detector POS
Att 30
RL Offset 1.00
Sweep Time 100.0s
Ref Lvl:19.00DBM

Comments

PSD
802.11n 20 MHz
5825 MHz
Main Port

Cursor 1 5824.94: -6.00
0.000 0.00



Analyzer Settings

HP8564E,EMI
CF: 5824.95 MHz
SPAN:300 kHz
RB 3 kHz
VB 10 kHz
Detector POS
Att 30
RL Offset 1.00
Sweep Time 100.0s
Ref Lvl:19.00DBM

Comments

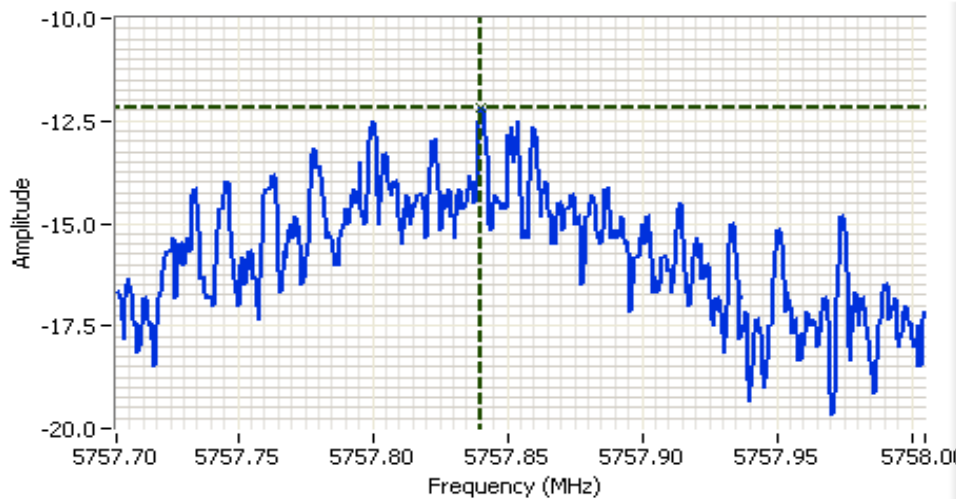
PSD
802.11n 20 MHz
5825 MHz
Aux Port

Cursor 1 5824.94: -5.33
0.000 0.00



Client: Broadcom	Job Number: J64973
Model: BCM94321 MC New version	T-Log Number: T64985
Contact: David Boldy	Account Manager: -
Standard: FCC 15.247, 15.401, RSS-210	Class: N/A

802.11n 40 MHz - Channel 151



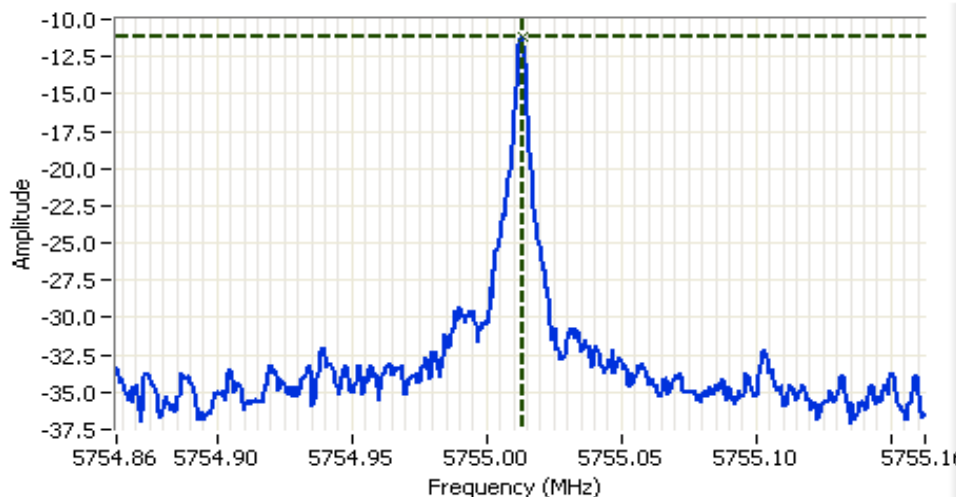
Analyzer Settings

HP8564E,EMI
CF: 5757.85 MHz
SPAN:300 kHz
RB 3 kHz
VB 10 kHz
Detector POS
Att 30
RL Offset 1.00
Sweep Time 100.0s
Ref Lvl:19.00DBM

Comments

PSD
802.11n 40 MHz
Channel 151
Main Port

Cursor 1 5757.84 -12.17
0.000 0.00



Analyzer Settings

HP8564E,EMI
CF: 5755.01 MHz
SPAN:300 kHz
RB 3 kHz
VB 10 kHz
Detector POS
Att 30
RL Offset 1.00
Sweep Time 100.0s
Ref Lvl:19.00DBM

Comments

PSD
802.11n 40 MHz
Channel 151
Aux Port

Cursor 1 5755.01 -11.17
0.000 0.00





EMC Test Data

Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A

Run #3: Signal Bandwidth

Note 1: Proposed changes would not affect signal bandwidths previously reported.



EMC Test Data

Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A

Run #4: Out of Band Spurious Emissions

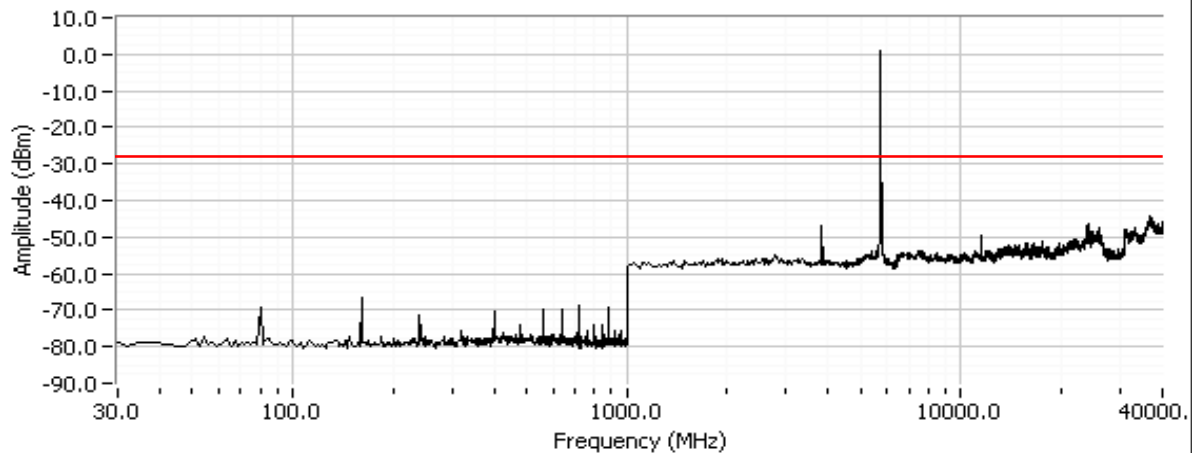
Frequency (MHz)	Limit	Result
5745	-30dBc	Refer to plots
5785	-30dBc	Refer to plots
5825	-30dBc	Refer to plots
5785	-30dBc	Refer to plots

Note 1: Measured on each chain individually. 40Mhz spurious measured on one channel and one chain to demonstrate that the emissions were lower than the 20Mhz emissions.

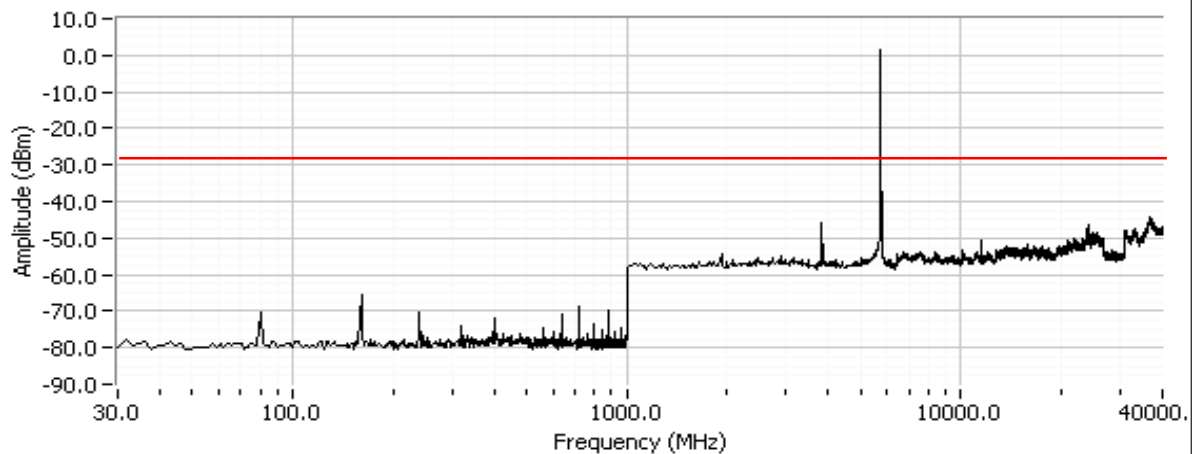
Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A

Plots for low channel, power setting(s) = 15.2 dBm on Main, 15.2 dBm on Aux

Main Port Conducted Emissions, 802.11n 20MHz mode, Channel 149 (5745 MHz)



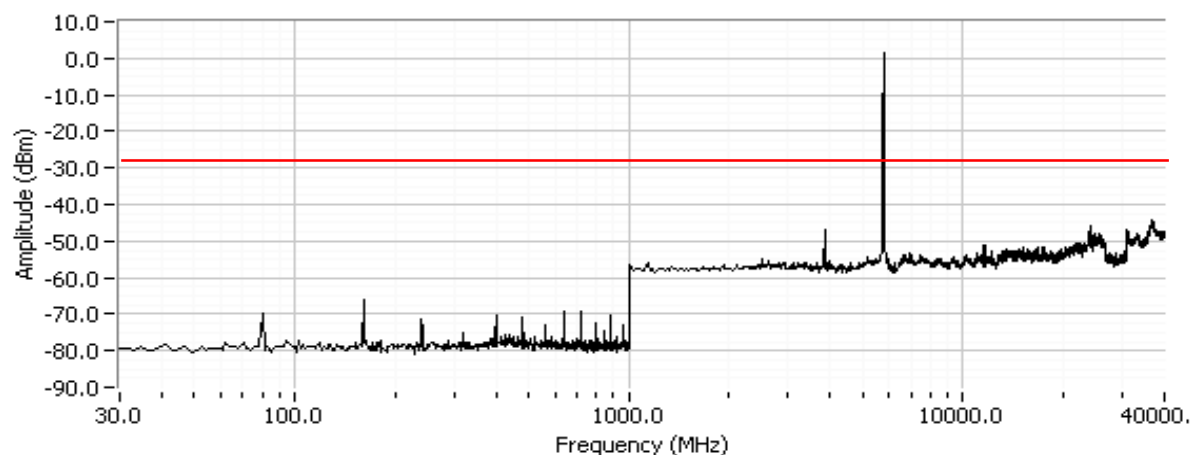
Aux Port Conducted Emissions, 802.11n 20MHz mode, Channel 149 (5745 MHz)



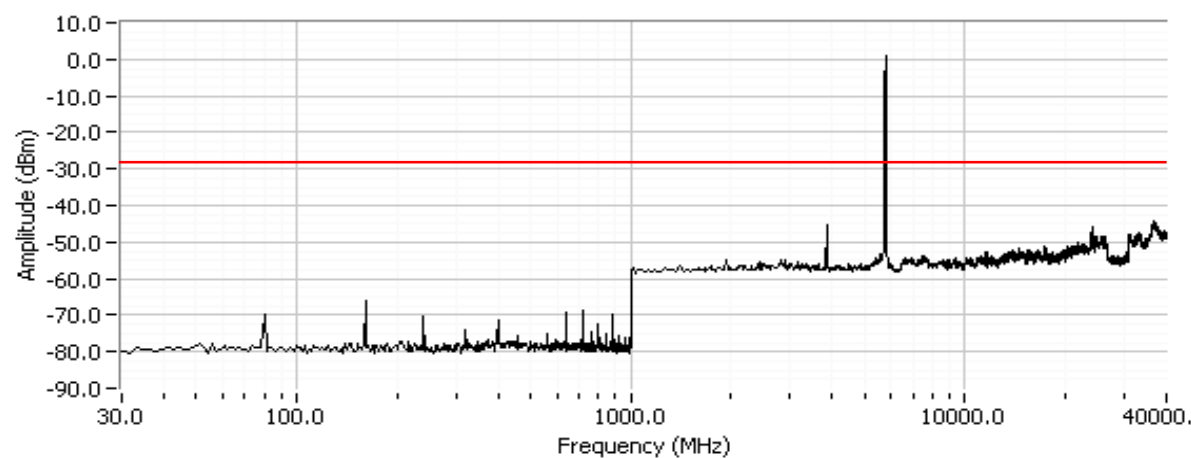
Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A

Plots for center channel, power setting(s) = 15.0 dBm on Main, 15.1 dBm on Aux

Main Port Conducted Emissions, 802.11n 20MHz mode, Channel 157 (5785 MHz)



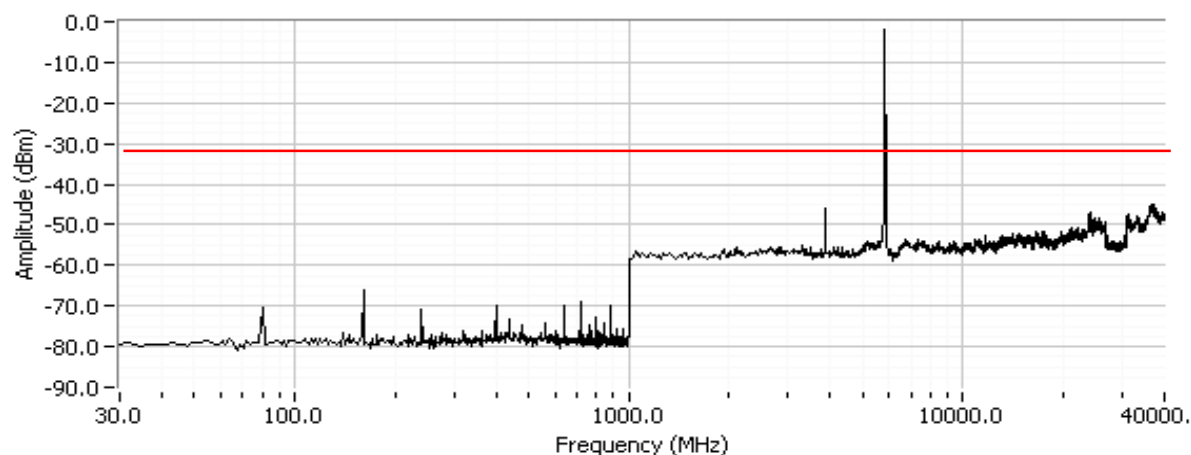
Aux Port Conducted Emissions, 802.11n 20MHz mode, Channel 157 (5785 MHz)



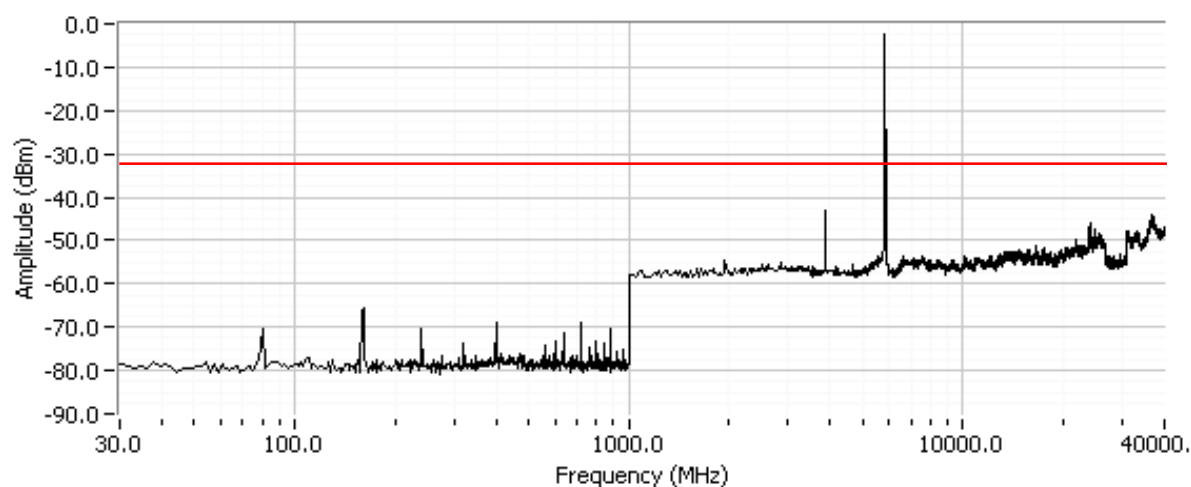
Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A

Plots for high channel, power setting(s) = 15.2 dBm on Main, 15.0 dBm on Aux

Main Port Conducted Emissions, 802.11n 20MHz mode, Channel 165 (5825 MHz)

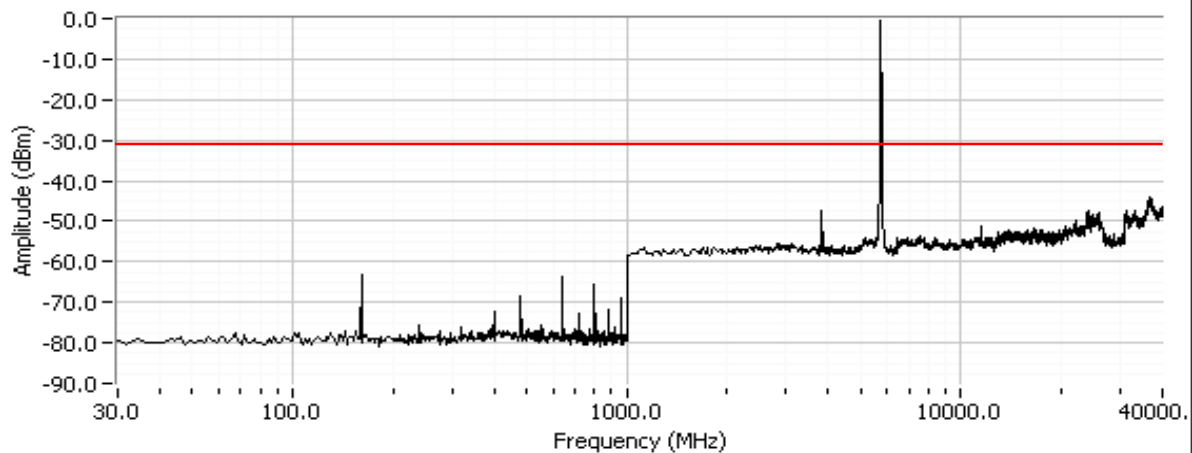


Aux Port Conducted Emissions, 802.11n 20MHz mode, Channel 165 (5825 MHz)

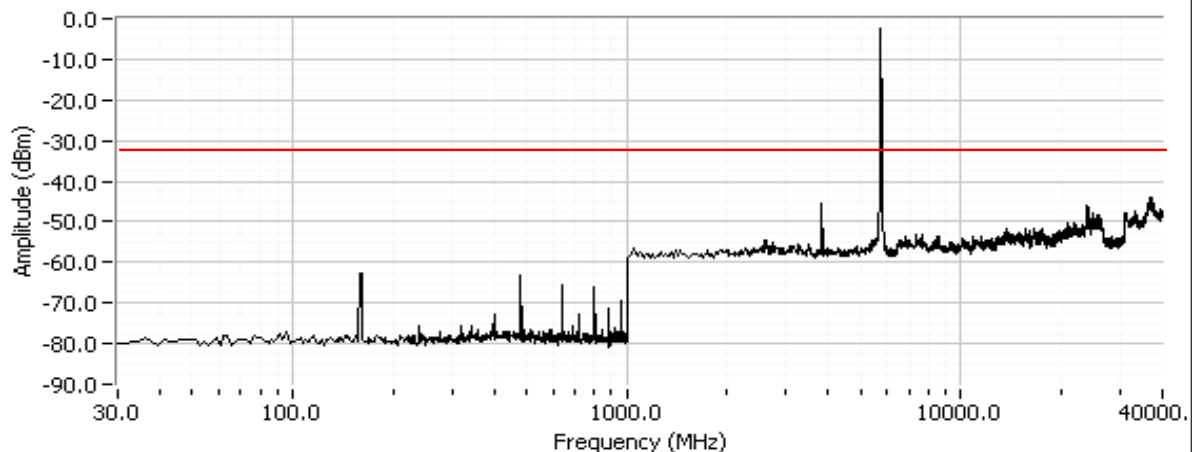


Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A

Main Port Conducted Emissions, 802.11n 40MHz mode, Channel 151



Aux Port Conducted Emissions, 802.11n 40MHz mode, Channel 151





EMC Test Data

Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A

RSS 210 and FCC 15.247 (DTS) Antenna Port Measurements Power, Bandwidth and Spurious Emissions (802.11g)

Test specifics

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

Date of Test: 8/14/2006

Config. Used: **1**

Test Engineer: Juan Martinez

Config Change: **None**

Test Location: Fremont Chamber #5

EUT Voltage: 120V/60Hz

General Test Configuration

The EUT was connected to the standard(s) thru analyzer or power meter via a suitable attenuator. All measurements were made on a single chain.

All measurements have been corrected to allow for the external attenuators used.

Ambient Conditions:

Temperature: - °C

Rel. Humidity: - %

Summary of Results

Run #	Test Performed	Limit	Pass / Fail	Result / Margin
1	Output Power	15.247(b)	Pass	17.5 dBm
2	Power standard(s) spectral Density	15.247(d)	Pass	-0.8 dBm/3kHz
3	6dB Bandwidth	15.247(a)	Pass	Refer to plots
3	99% Bandwidth	RSS GEN	-	Refer to plots
4	Spurious emissions	15.247(b)	Pass	Refer to plots

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.



EMC Test Data

Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A

Run #1: Output Power

Power Setting ²	Frequency (MHz)	Output Power		Antenna Gain (dBi)	Result	EIRP ^{Note 2}		Output Power	
		(dBm) ¹	mW			dBm	W	(dBm) ³	mW
0x3e00	2412	16.6	45.7	2.2	Pass	18.8	0.075		
ox3	2437	17.5	56.4	2.2	Pass	19.7	0.094		
	2462	15.7	36.7	2.2	Pass	17.9	0.061		

Note 1: Output power measured using a spectrum analyzer (see plots below):
RBW=1MHz, VB=3 MHz, sample detector, power averaging on (transmitted signal was not continuous but the ESI analyzer was configured with a gated sweep such that the analyzer was only sweeping when the device was transmitting) and power integration over 30 MHz
The output power limit is 30dBm

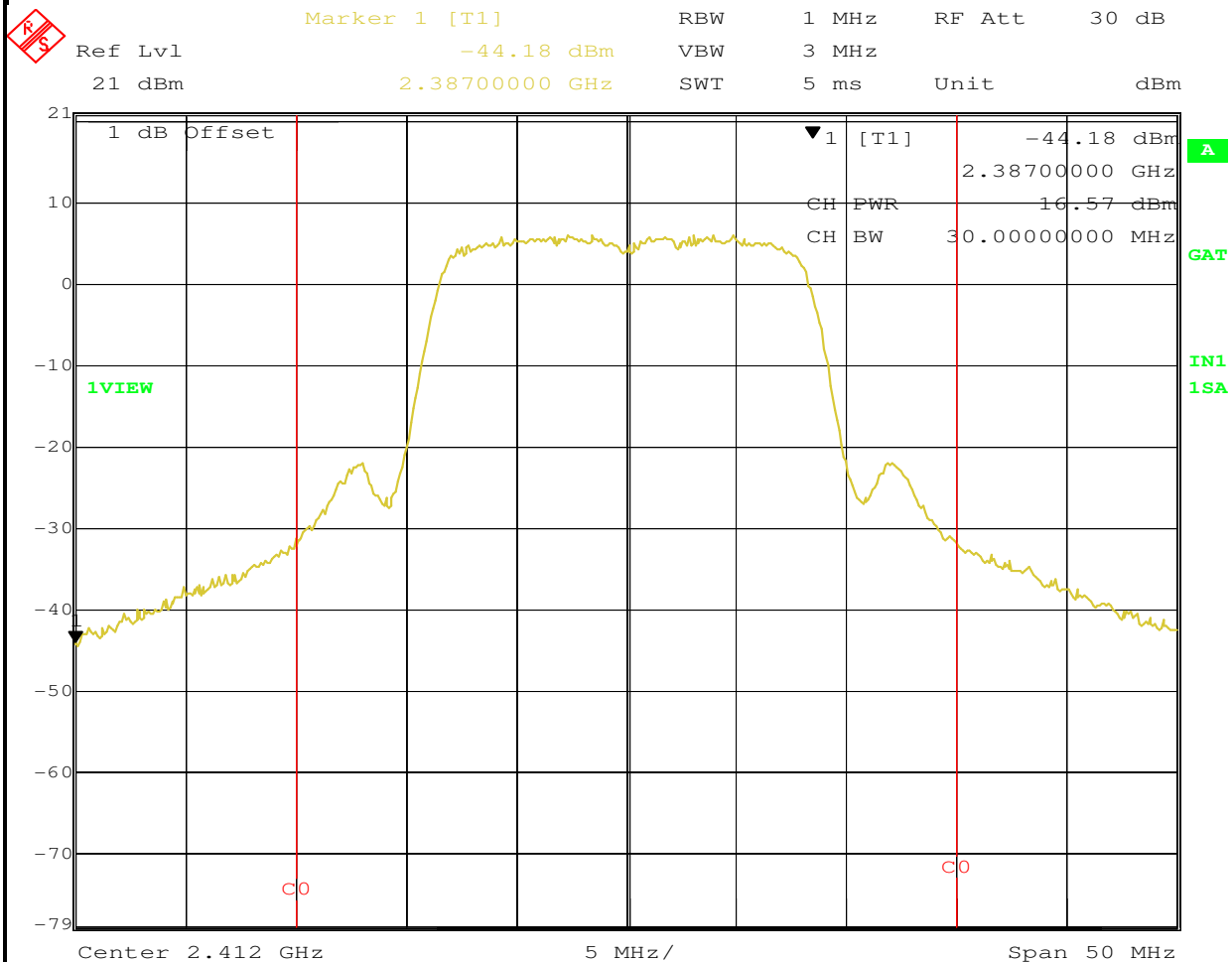
Note 2: Power setting - the software power setting used during testing, included for reference only.

Note 3: Power measured using ??? and is included for reference only.



EMC Test Data

Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A

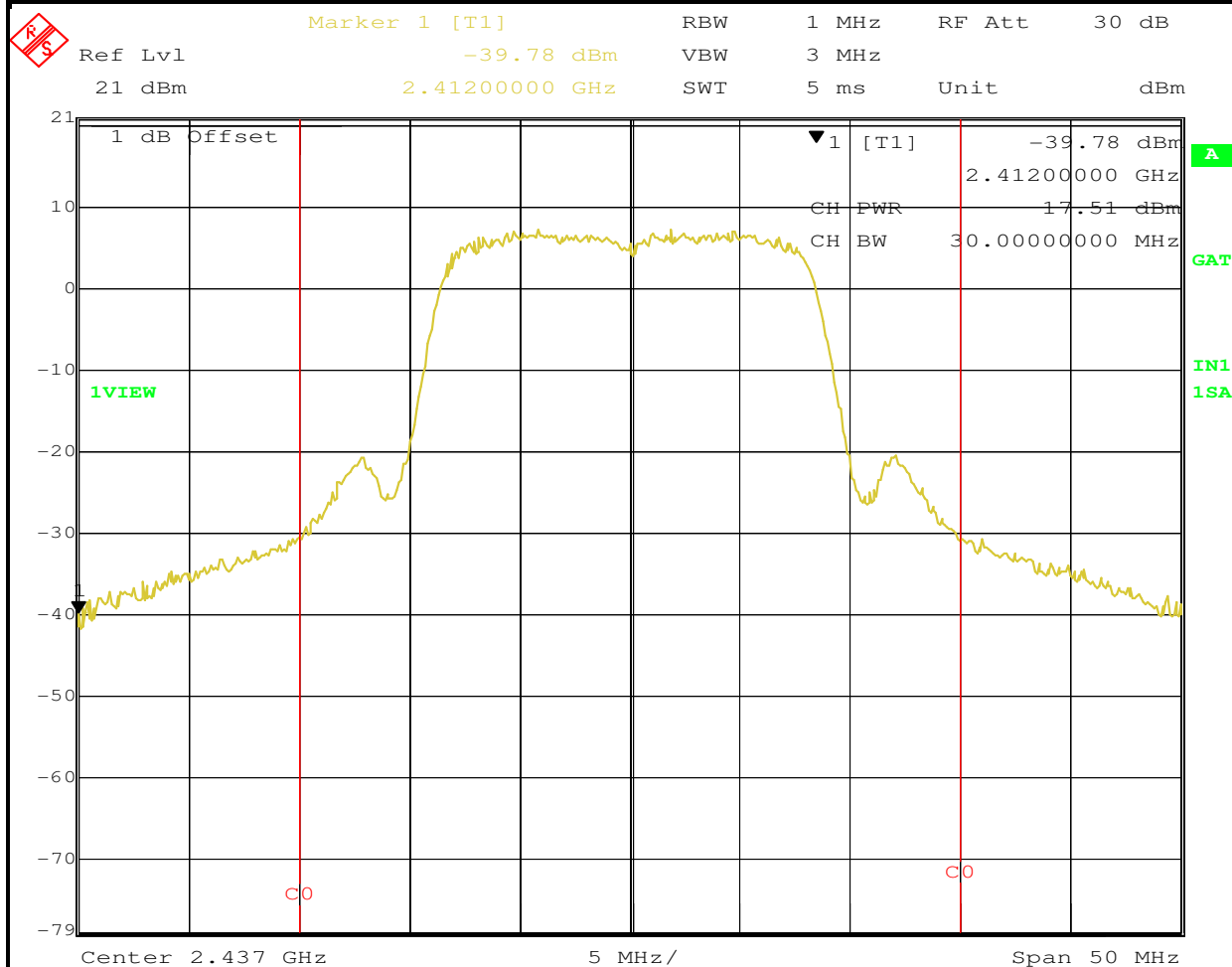


Date: 14.AUG.2006 10:12:06



EMC Test Data

Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A

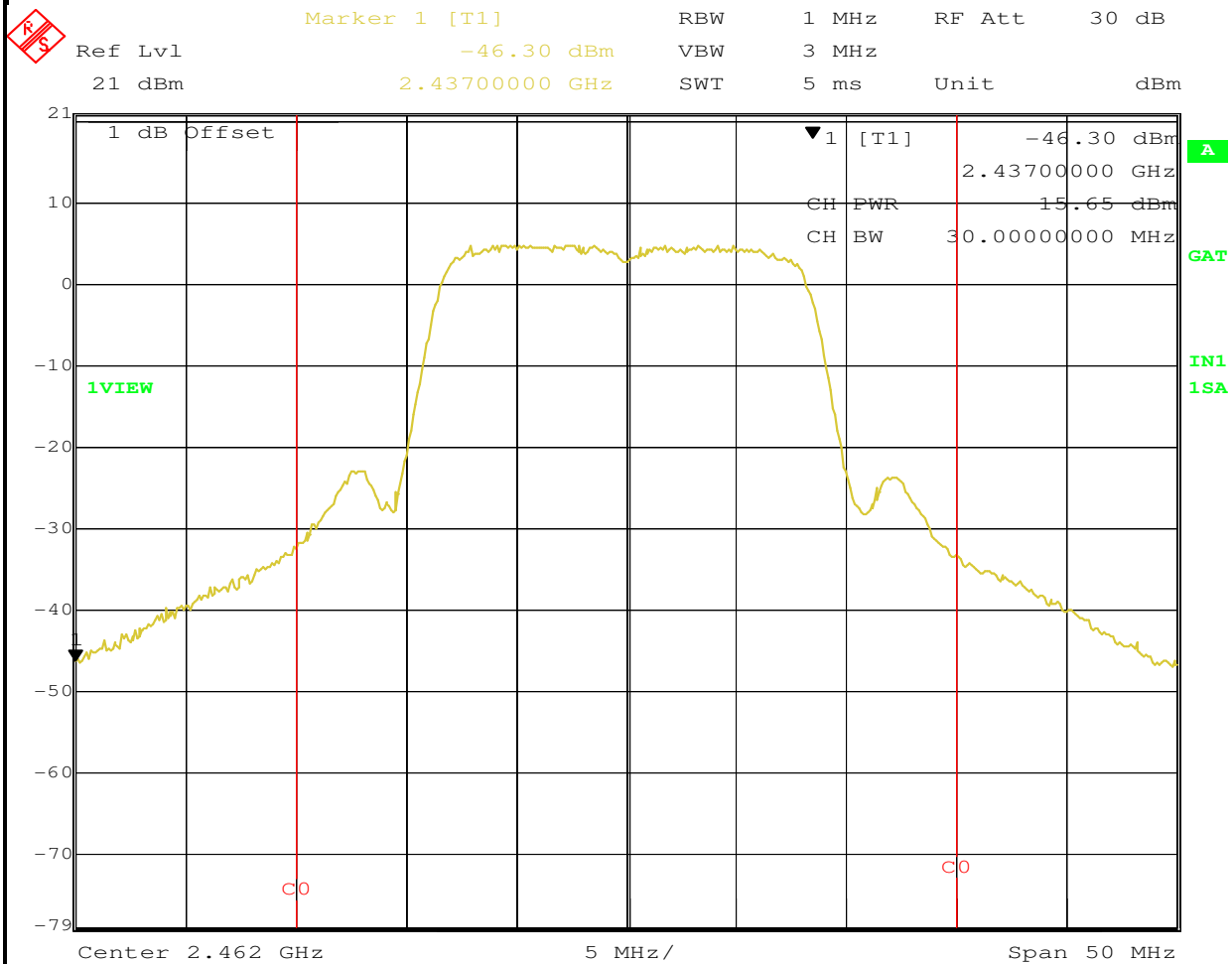


Date: 14.AUG.2006 11:10:37



EMC Test Data

Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A



Date: 14.AUG.2006 11:56:40



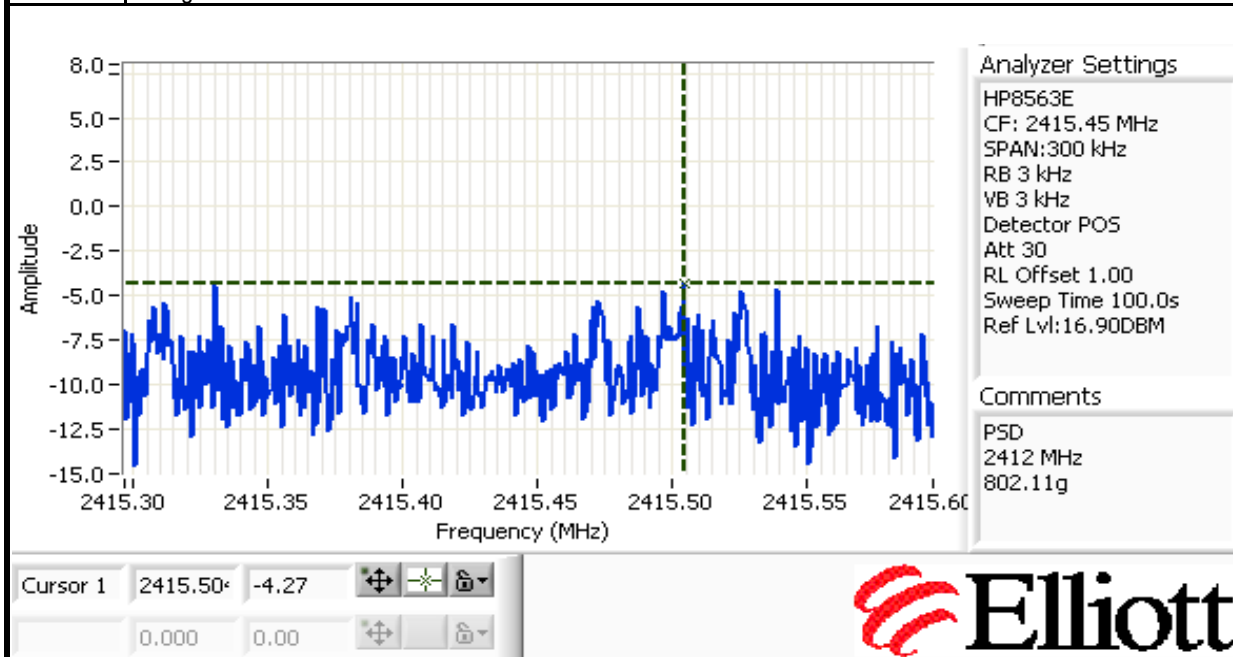
EMC Test Data

Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A

Run #2: Power standard(s) Power Density

Power Setting	Frequency (MHz)	PSD (dBm/3kHz) ^{Note 1}	Limit dBm/3kHz	Result
0x3e00	2412	-4.3	8.0	Pass
	2437	-0.8	8.0	Pass
	2462	-5.7	8.0	Pass

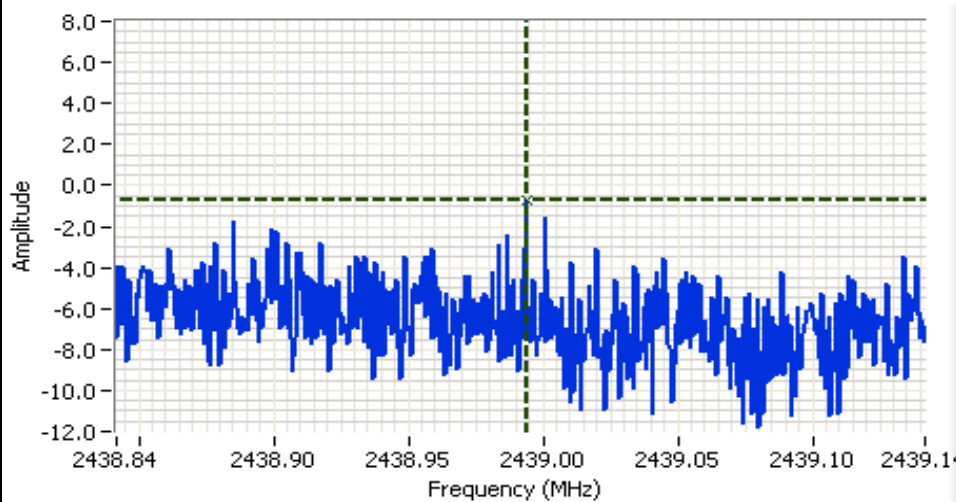
Note 1: Power standard(s) Power density measured using RB=3 kHz, VB=10kHz, analyzer with peak detector and with a sweep time set to ensure a dwell time of at least 1 second per 3kHz. The measurement is made at the frequency of PPSD determined from preliminary scans using RB=3kHz using multiple sweeps at a faster rate over the 6dB bandwidth of the signal.





EMC Test Data

Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A



Analyzer Settings

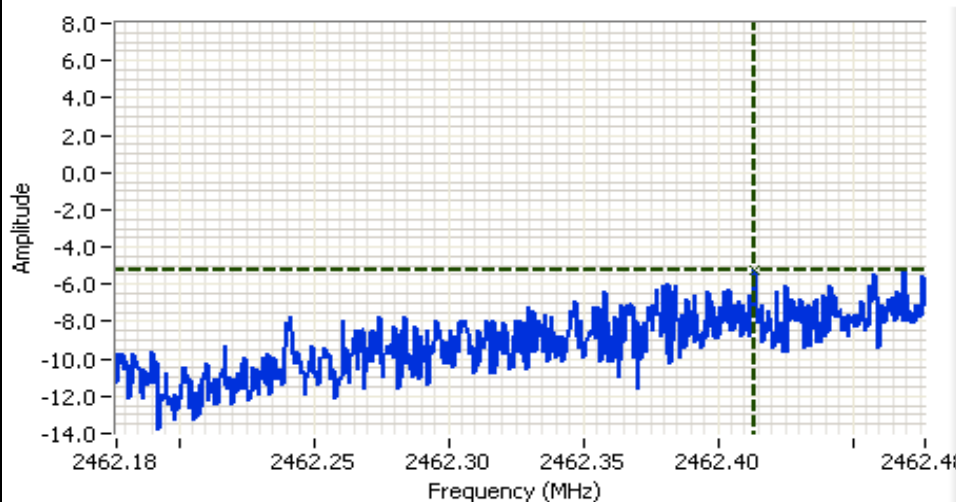
HP8563E
CF: 2438.99 MHz
SPAN:300 kHz
RB 3 kHz
VB 10 kHz
Detector POS
Att 30
RL Offset 1.00
Sweep Time 100.0s
Ref Lvl:16.90DBM

Comments

PSD
2437 MHz

Cursor 1 2438.99 -0.77

0.000 0.00



Analyzer Settings

HP8563E
CF: 2462.33 MHz
SPAN:300 kHz
RB 3 kHz
VB 10 kHz
Detector POS
Att 30
RL Offset 1.00
Sweep Time 100.0s
Ref Lvl:16.90DBM

Comments

PSD
2462 MHz

Cursor 1 2462.41 -5.27

0.000 0.00





EMC Test Data

Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A

Run #3: Signal Bandwidth

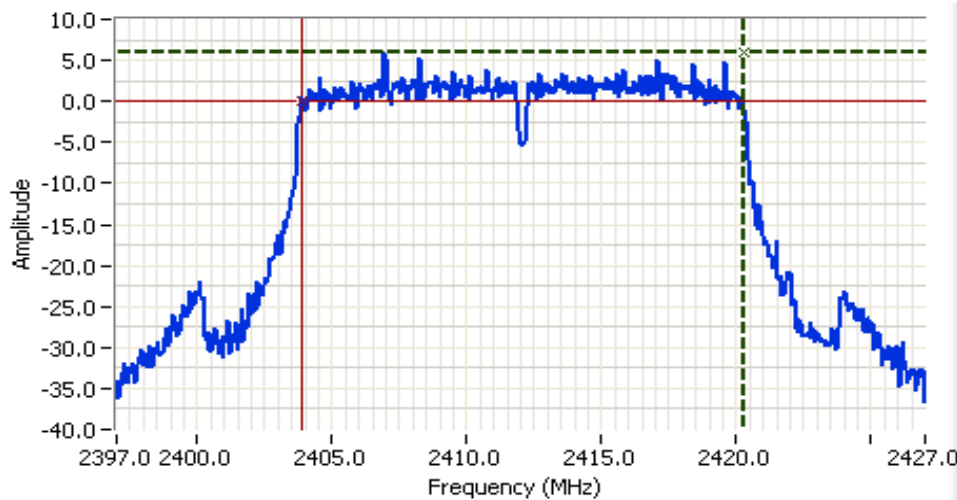
Power Setting	Frequency (MHz)	Resolution Bandwidth	Bandwidth (MHz)	
			6dB	99%
	2412	100 kHz	16.4	20
	2437	100 kHz	16.5	19.83
	2462	100 kHz	16.42	20

Note 1: 99% bandwidth measured in accordance with RSS GEN, with RB > 1% of the span and VB > 3xRB



EMC Test Data

Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A



Analyzer Settings

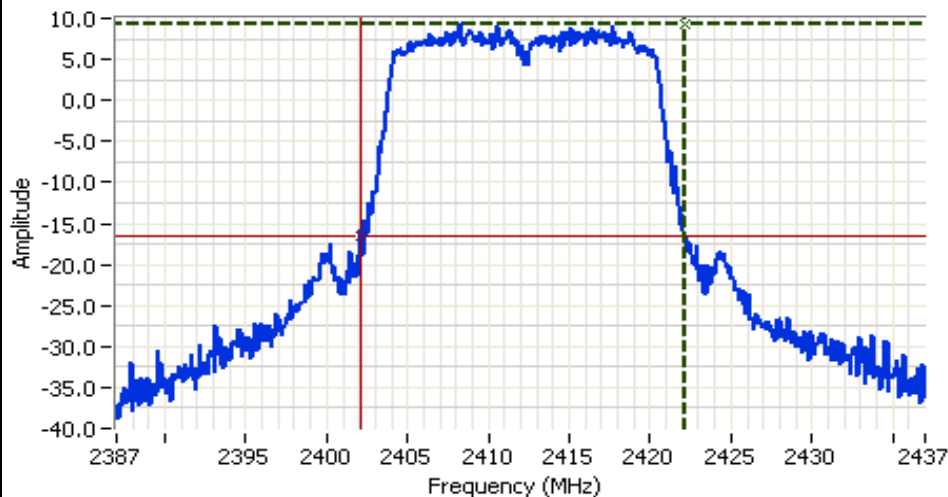
HP8563E
CF: 2412.00 MHz
SPAN:30.00 MHz
RB 100 kHz
VB 100 kHz
Detector POS
Att 30
RL Offset 1.00
Sweep Time 200.0ms
Ref Lvl:14.60DBM

Comments

6-dB BW
2412 MHz
802.11g

Cursor 1 2420.25 5.93
Cursor 2 2403.85 -0.07

Delta Freq. 16.40
Delta Amplitude 6.00



Analyzer Settings

HP8563E
CF: 2412.00 MHz
SPAN:50.00 MHz
RB 300 kHz
VB 1.000 MHz
Detector POS
Att 30
RL Offset 1.00
Sweep Time 50.0ms
Ref Lvl:16.90DBM

Comments

99% power bandwidth:
20 MHz

Cursor 1 2422.16 9.40
Cursor 2 2402.16 -16.60

Delta Freq. 20.00
Delta Amplitude 26.00





EMC Test Data

Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A



Analyzer Settings

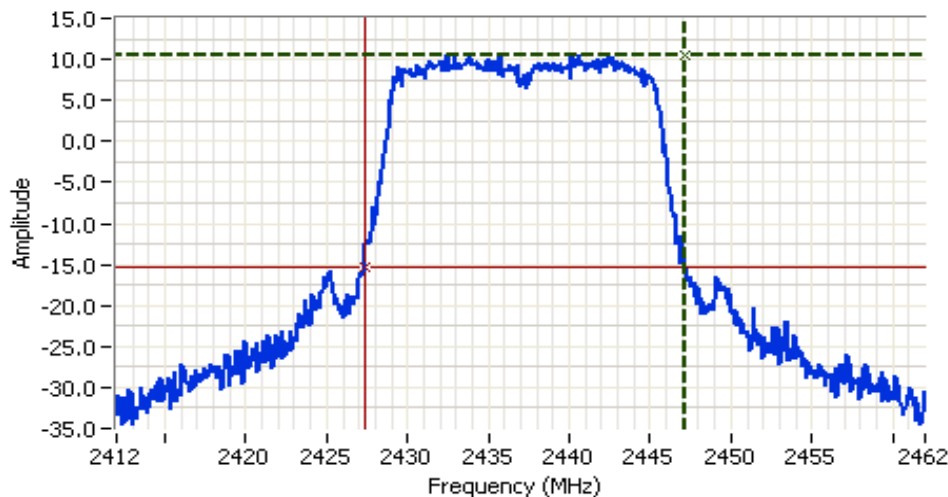
HP8563E
CF: 2437.00 MHz
SPAN:50.00 MHz
RB 100 kHz
VB 100 kHz
Detector POS
Att 30
RL Offset 1.00
Sweep Time 50.0ms
Ref Lvl:16.90DBM

Comments

6-BW
2437 MHz

Cursor 1 2445.50 4.57
Cursor 2 2429.00 -1.43

Delta Freq. 16.50
Delta Amplitude 6.00



Analyzer Settings

HP8563E
CF: 2437.00 MHz
SPAN:50.00 MHz
RB 300 kHz
VB 1.000 MHz
Detector POS
Att 30
RL Offset 1.00
Sweep Time 50.0ms
Ref Lvl:16.90DBM

Comments

99% power bandwidth:
19.83 MHz

Cursor 1 2447.16 10.57
Cursor 2 2427.33 -15.43

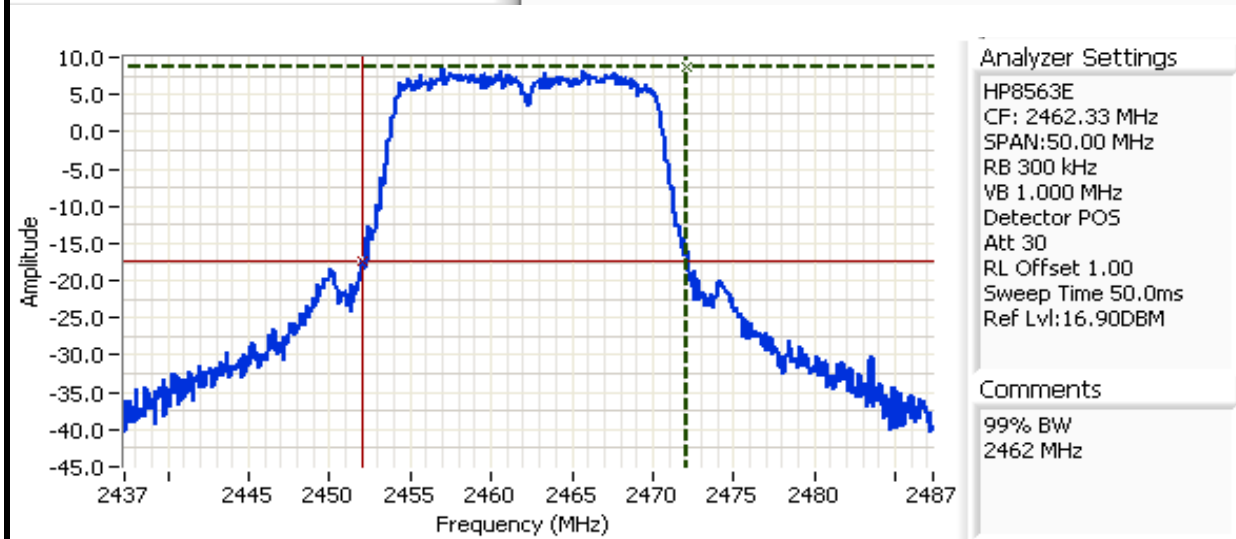
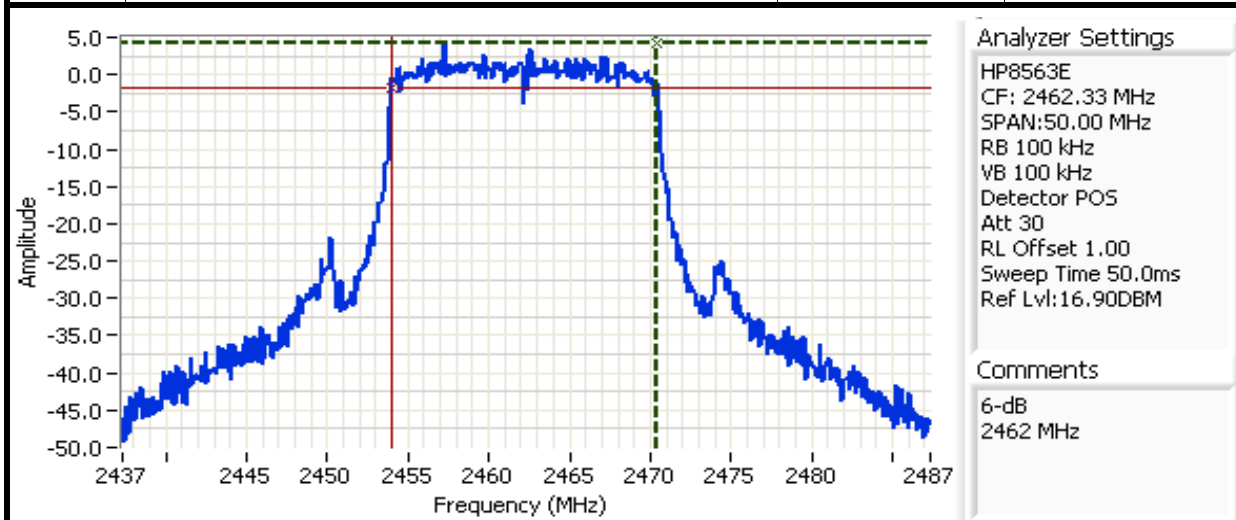
Delta Freq. 19.83
Delta Amplitude 26.00





EMC Test Data

Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A





EMC Test Data

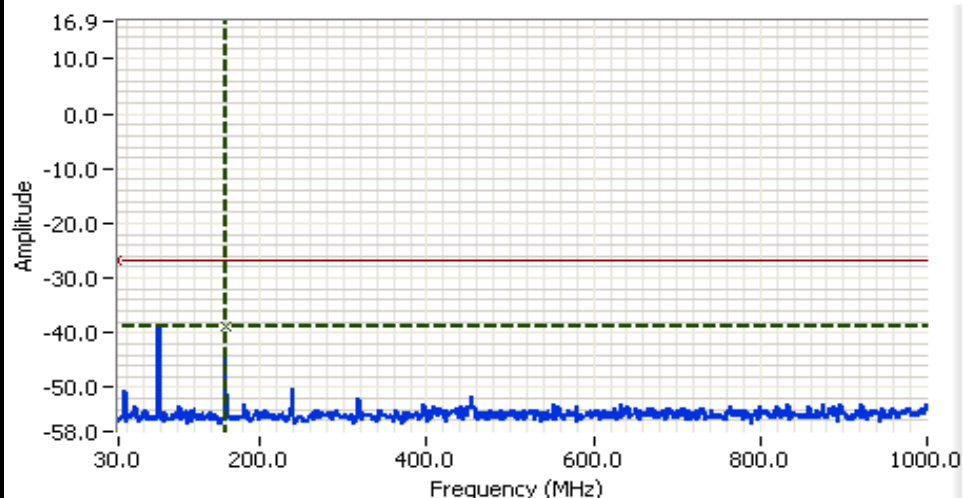
Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A

Run #4: Out of Band Spurious Emissions

Frequency (MHz)	Limit	Result
2412	-30dBc	Refer to plots
2437	-30dBc	Refer to plots
2462	-30dBc	Refer to plots

Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A

Plots for low channel



Analyzer Settings

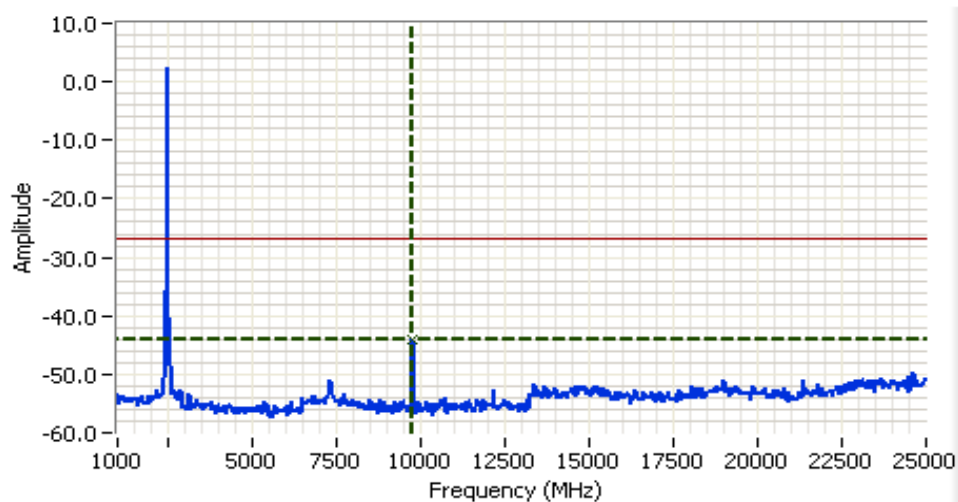
HP8563E
CF: 515.00 MHz
SPAN: 970.00 MHz
RB 100 kHz
VB 100 kHz
Detector POS
Att 30
RL Offset 1.00
Sweep Time 250.0ms
Ref Lvl: 16.90DBM

Comments

out-of-band
2412 MHz
802.11g

Cursor 1 157.717 -38.77
Cursor 2 27.474 -26.93

Delta Freq. 130.24
Delta Amplitude 11.84



Analyzer Settings

HP8563E
CF: 13000.00 MHz
SPAN: 24000.00 MHz
RB 100 kHz
VB 100 kHz
Detector POS
Att 30
RL Offset 1.00
Sweep Time 6.0s
Ref Lvl: 16.90DBM

Comments

out-of-band
2412 MHz
802.11g

Cursor 1 9760.000 -44.10
Cursor 2 875.000 -26.93

Delta Freq. 8885.00
Delta Amplitude 17.17

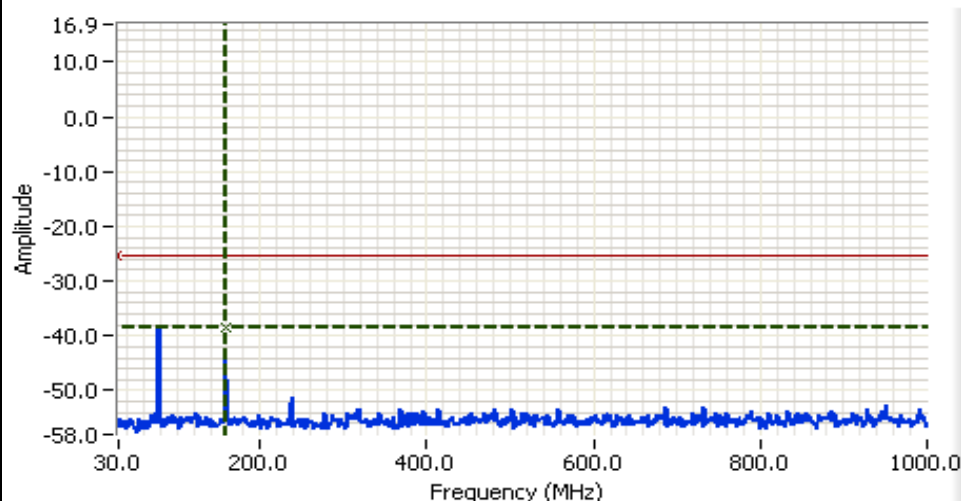




EMC Test Data

Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A

Plots for center channel



Analyzer Settings

HP8563E
CF: 515.00 MHz
SPAN: 970.00 MHz
RB 100 kHz
VB 100 kHz
Detector POS
Att 30
RL Offset 1.00
Sweep Time 250.0ms
Ref Lvl: 16.90dBm

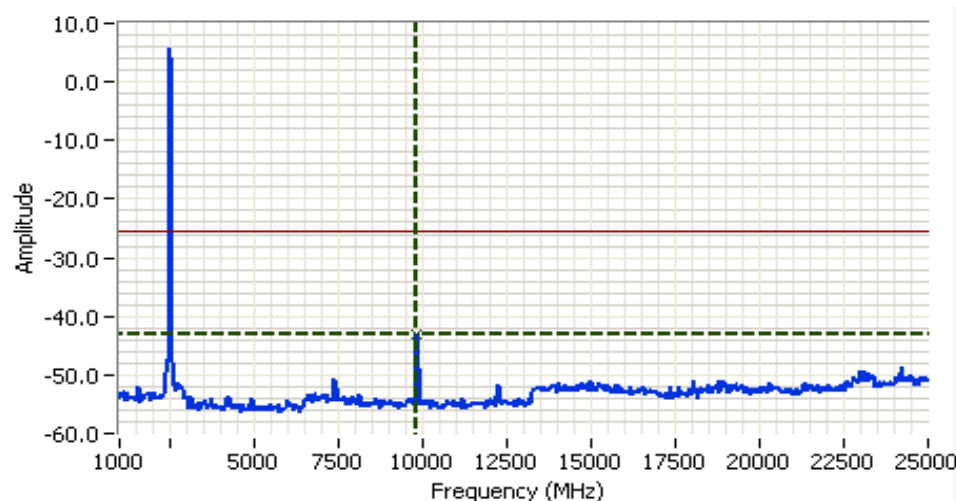
Comments

out of band
2437 MHz

Cursor 1	157.717	-38.43	
Cursor 2	27.474	-25.43	

Delta Freq. 130.24

Delta Amplitude 13.00



Analyzer Settings

HP8563E
CF: 13000.00 MHz
SPAN: 24000.00 MHz
RB 100 kHz
VB 100 kHz
Detector POS
Att 30
RL Offset 1.00
Sweep Time 6.0s
Ref Lvl: 16.90dBm

Comments

out of band
2437 MHz

Cursor 1	9840.000	-42.93	
Cursor 2	875.000	-25.43	

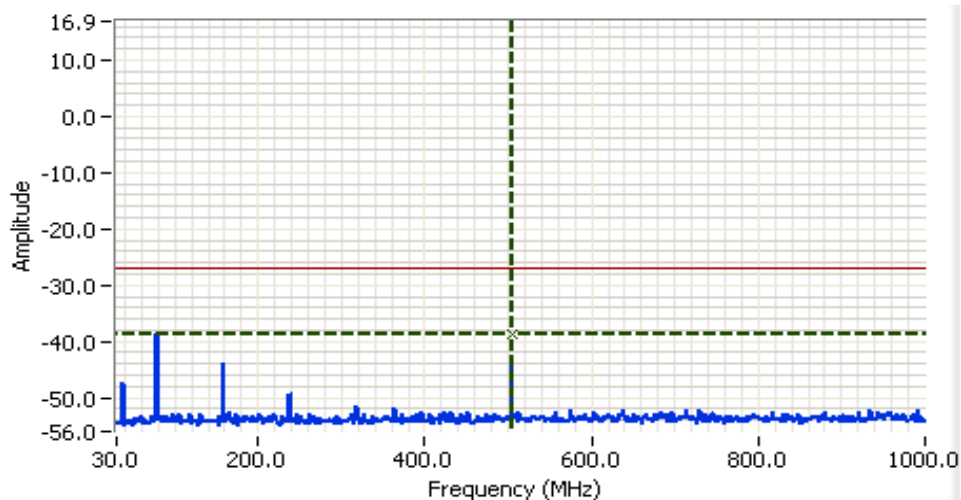
Delta Freq. 8965.00

Delta Amplitude 17.50



Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A

Plots for high channel



Analyzer Settings

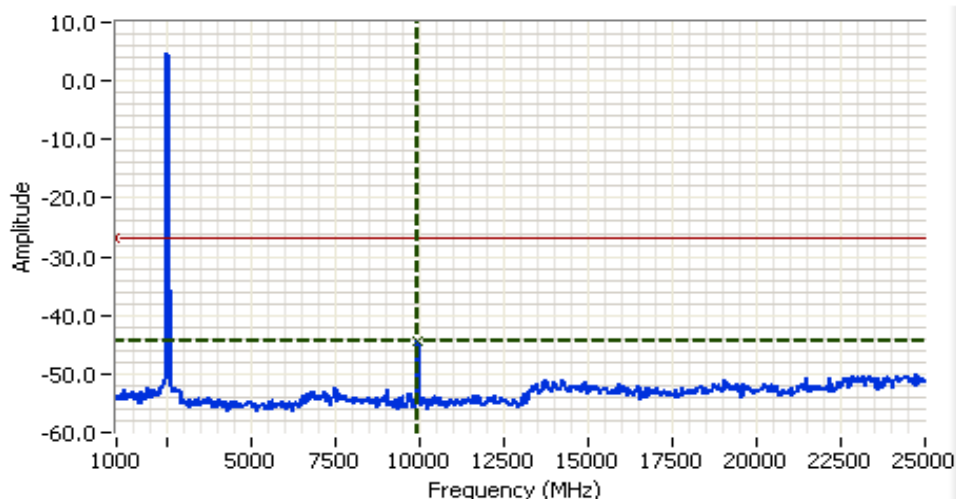
HP8563E
CF: 515.00 MHz
SPAN: 970.00 MHz
RB 100 kHz
VB 100 kHz
Detector POS
Att 30
RL Offset 1.00
Sweep Time 250.0ms
Ref Lvl: 16.90DBM

Comments

out of band
2462 MHz

Cursor 1	503.683	-38.60			
Cursor 2	24.948	-26.93			

Delta Freq. 478.74
Delta Amplitude 11.67



Analyzer Settings

HP8563E
CF: 13000.00 MHz
SPAN: 24000.00 MHz
RB 100 kHz
VB 100 kHz
Detector POS
Att 30
RL Offset 1.00
Sweep Time 6.0s
Ref Lvl: 16.90DBM

Comments

out of band
2462 MHz

Cursor 1	9960.000	-44.27			
Cursor 2	937.500	-26.93			

Delta Freq. 9022.50
Delta Amplitude 17.34





EMC Test Data

Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A

RSS 210 and FCC 15.247 (DTS) Antenna Port Measurements Power, Bandwidth and Spurious Emissions (802.11b)

Test specifics

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

Date of Test: 8/14/2006
Test Engineer: Juan Martinez
Test Location: Fremont Chamber #5

Config. Used: 1
Config Change: None
EUT Voltage: 120V/60Hz

General Test Configuration

The EUT was connected to the standard(s) thru analyzer or power meter via a suitable attenuator. All measurements were made on a single chain.

All measurements have been corrected to allow for the external attenuators used.

Ambient Conditions:

Temperature: - °C
Rel. Humidity: - %

Summary of Results

Run #	Test Performed	Limit	Pass / Fail	Result / Margin
1	Output Power	15.247(b)	Pass	19.4 dBm
2	Power standard(s) spectral Density	15.247(d)	Pass	-1.1 dBm/3kHz
3	6dB Bandwidth	15.247(a)	Pass	Refer to plots
3	99% Bandwidth	RSS GEN	-	Refer to plots
4	Spurious emissions	15.247(b)	Pass	Refer to plots

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.



EMC Test Data

Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A

Run #1: Output Power

Power Setting ²	Frequency (MHz)	Output Power		Antenna Gain (dBi)	Result	EIRP ^{Note 2}		Output Power	
		(dBm) ¹	mW			dBm	W	(dBm) ³	mW
	2412	18.4	69.7	2.2	Pass	20.6	0.116		
	2437	19.4	87.7	2.2	Pass	21.6	0.146		
	2462	16.6	45.8	2.2	Pass	18.8	0.076		

Note 1:

Output power measured using a spectrum analyzer (see plots below):
RBW=1MHz, VB=3 MHz, sample detector, power averaging on (transmitted signal was not continuous but the ESI analyzer was configured with a gated sweep such that the analyzer was only sweeping when the device was transmitting) and power integration over 30 MHz
The output power limit is 30dBm

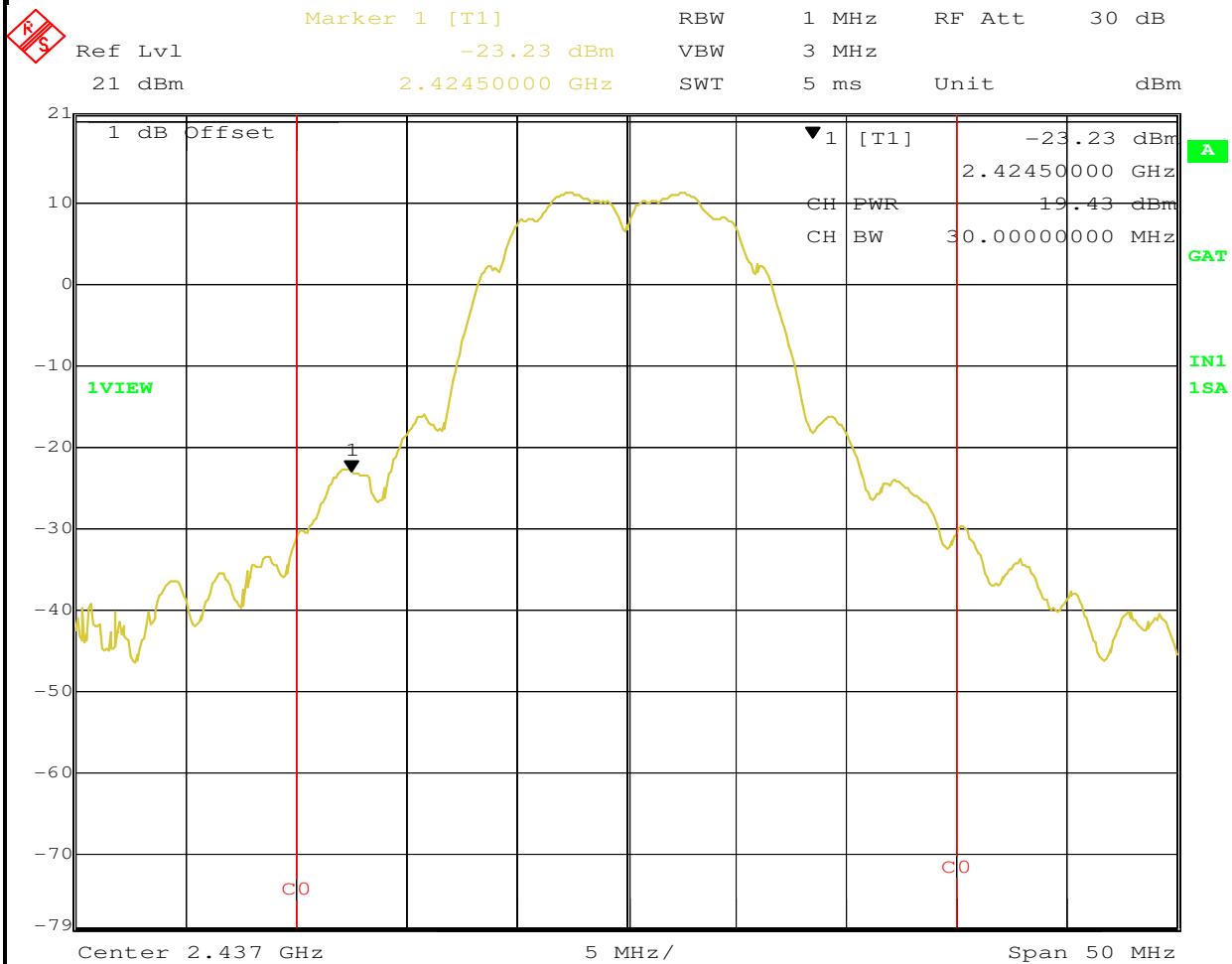
Note 2:

Power setting - the software power setting used during testing, included for reference only.



EMC Test Data

Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A

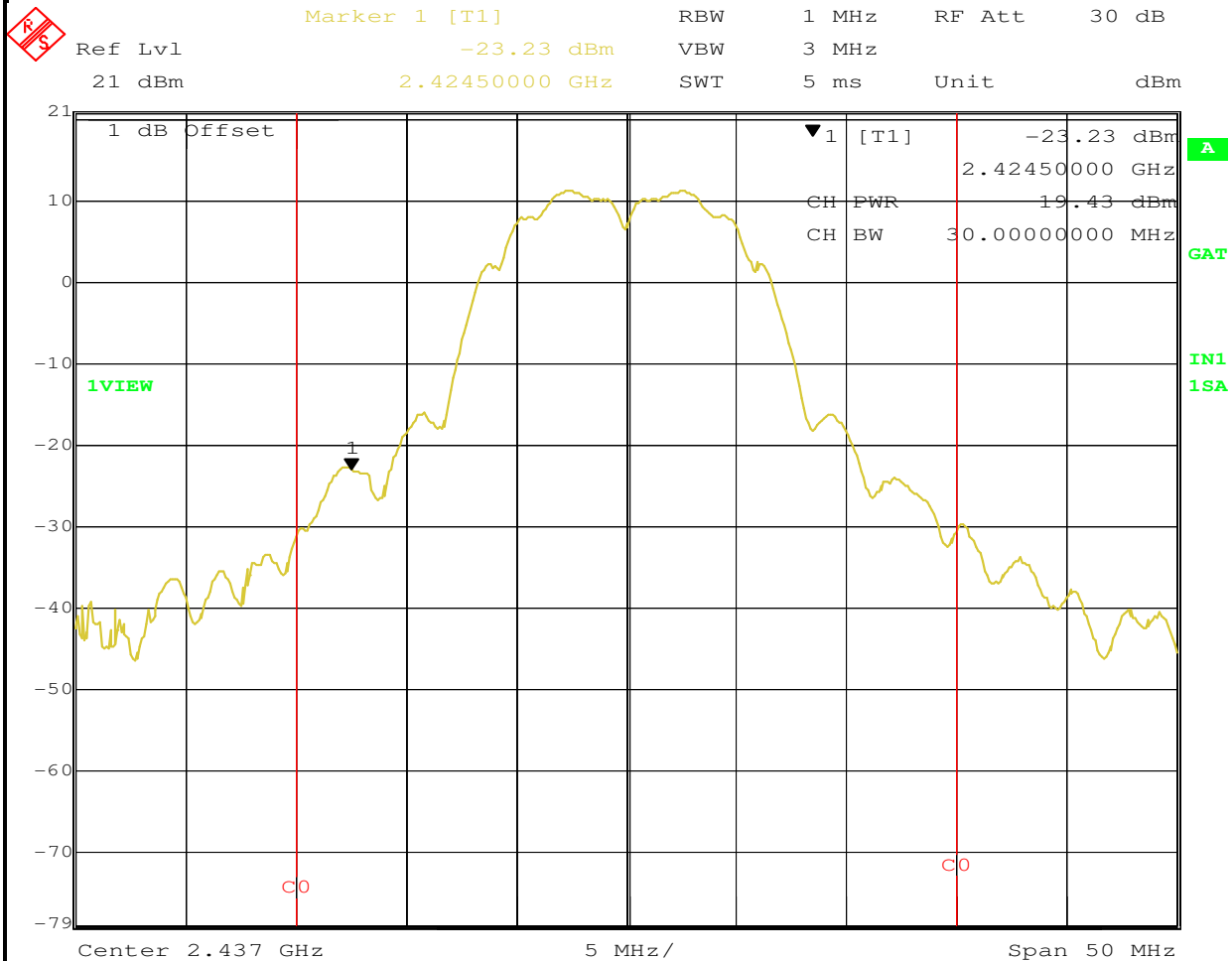


Date: 14.AUG.2006 14:53:54



EMC Test Data

Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A



Date: 14.AUG.2006 14:53:54



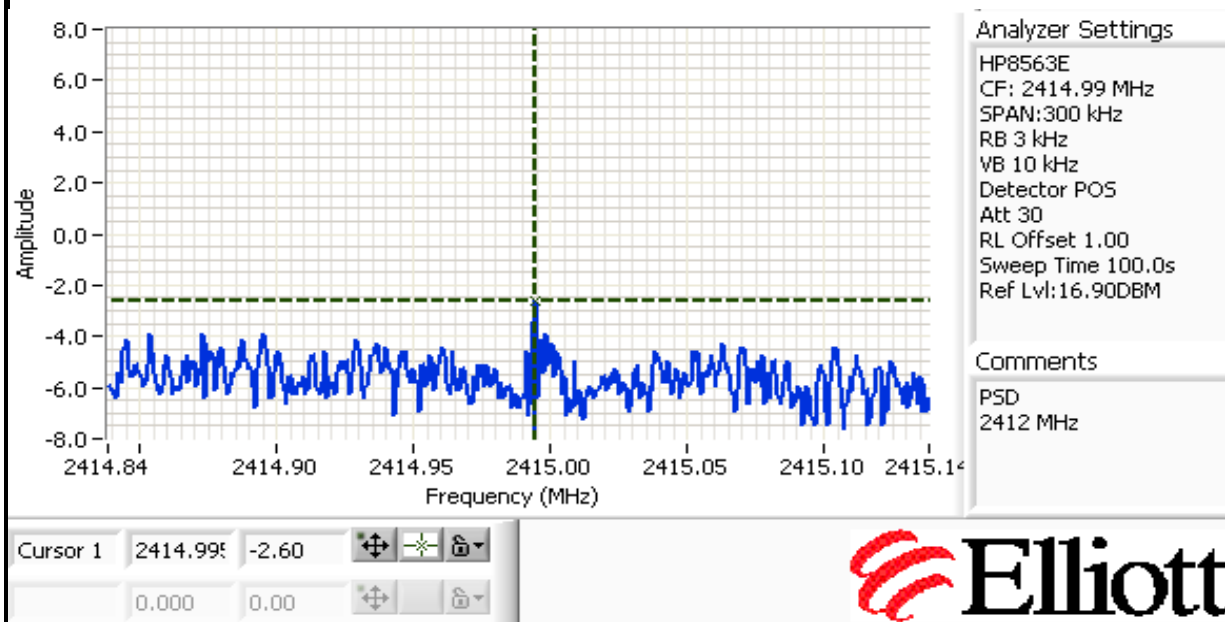
EMC Test Data

Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A

Run #2: Power spectral Density

Power Setting	Frequency (MHz)	PSD	Limit dBm/3kHz	Result
		(dBm/3kHz) ^{Note 1}		
	2412	-2.2	8.0	Pass
	2437	-1.1	8.0	Pass
	2462	-4.8	8.0	Pass

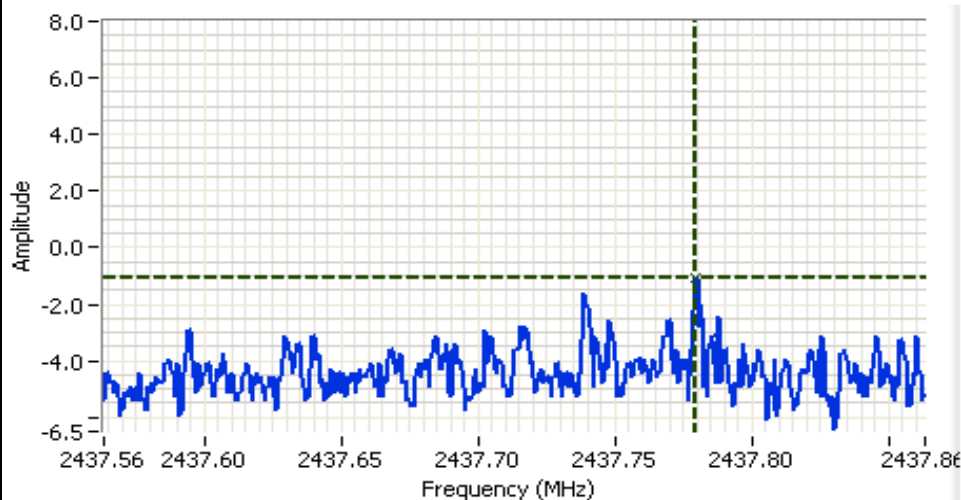
Note 1: Power spectral density measured using RB=3 kHz, VB=10kHz, analyzer with peak detector and with a sweep time set to ensure a dwell time of at least 1 second per 3kHz. The measurement is made at the frequency of PPSD determined from preliminary scans using RB=3kHz using multiple sweeps at a faster rate over the 6dB bandwidth of the signal.





EMC Test Data

Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A



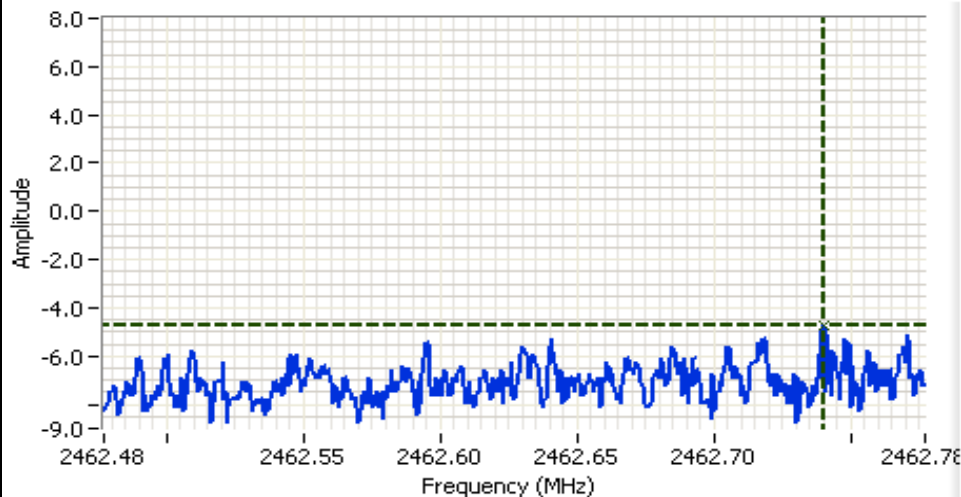
Analyzer Settings

HP8563E
CF: 2437.71 MHz
SPAN:300 kHz
RB 3 kHz
VB 10 kHz
Detector POS
Att 30
RL Offset 1.00
Sweep Time 100.0s
Ref Lvl:16.90DBM

Comments

PSD
2437 MHz

Cursor 1 2437.78 -1.10
0.000 0.00



Analyzer Settings

HP8563E
CF: 2462.63 MHz
SPAN:300 kHz
RB 3 kHz
VB 10 kHz
Detector POS
Att 30
RL Offset 1.00
Sweep Time 100.0s
Ref Lvl:16.90DBM

Comments

Out of Band
2462 MHz

Cursor 1 2462.74 -4.77
0.000 0.00





EMC Test Data

Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A

Run #3: Signal Bandwidth

Power Setting	Frequency (MHz)	Resolution Bandwidth	Bandwidth (MHz)	
			6dB	99%
	2412	100 kHz	10.2	15.3
	2437	100 kHz	10.0	15.2
	2462	100 kHz	10.2	16.8

Note 1: 99% bandwidth measured in accordance with RSS GEN, with RB > 1% of the span and VB > 3xRB



EMC Test Data

Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A



Analyzer Settings

HP8563E
CF: 2412.00 MHz
SPAN: 50.00 MHz
RB 100 kHz
VB 100 kHz
Detector POS
Att 30
RL Offset 1.00
Sweep Time 50.0ms
Ref Lvl: 16.90DBM

Comments

6-dB BW
2412 MHz

Cursor 1 2417.33 9.07
Cursor 2 2407.16 3.07

Delta Freq. 10.167
Delta Amplitude 6.00



Analyzer Settings

HP8563E
CF: 2412.00 MHz
SPAN: 50.00 MHz
RB 100 kHz
VB 300 kHz
Detector POS
Att 30
RL Offset 1.00
Sweep Time 50.0ms
Ref Lvl: 16.90DBM

Comments

99% BW
2412 MHz

Cursor 1 2419.91 9.57
Cursor 2 2404.58 -16.43

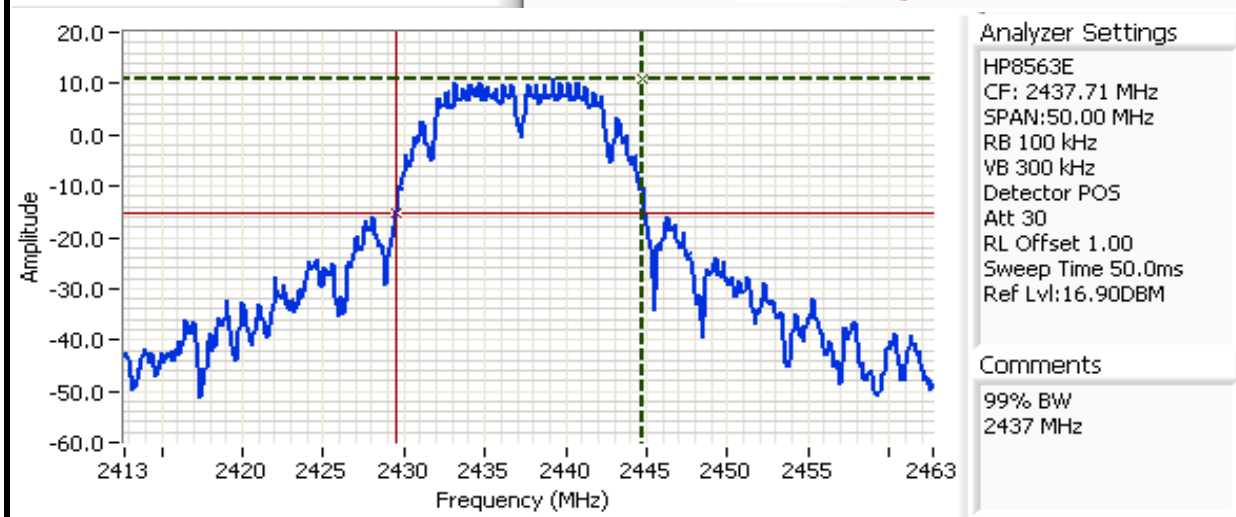
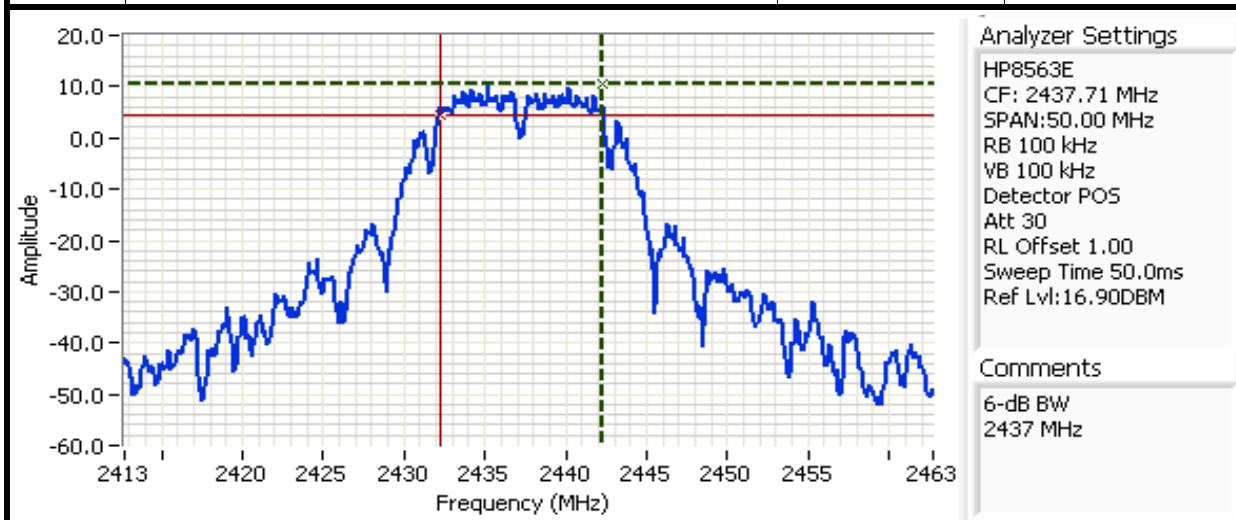
Delta Freq. 15.33
Delta Amplitude 26.00





EMC Test Data

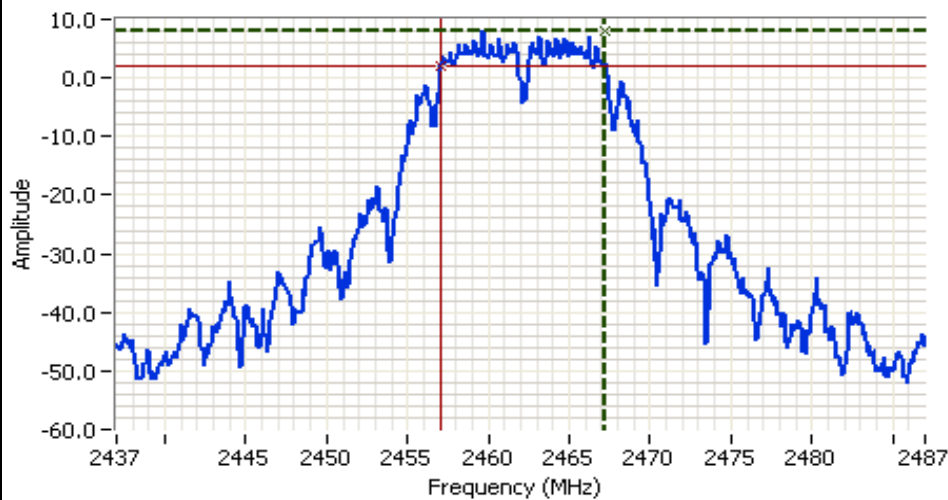
Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A





EMC Test Data

Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A



Analyzer Settings

HP8563E
CF: 2462.00 MHz
SPAN: 50.00 MHz
RB 100 kHz
VB 100 kHz
Detector POS
Att 30
RL Offset 1.00
Sweep Time 50.0ms
Ref Lvl: 16.90DBM

Comments

6-dB BW
2462 MHz

Cursor 1 2467.25 7.90
Cursor 2 2457.08 1.90

Delta Freq. 10.167

Delta Amplitude 6.00



Analyzer Settings

HP8563E
CF: 2462.00 MHz
SPAN: 50.00 MHz
RB 100 kHz
VB 300 kHz
Detector POS
Att 30
RL Offset 1.00
Sweep Time 50.0ms
Ref Lvl: 16.90DBM

Comments

99% BW
2462 MHz

Cursor 1 2469.83 7.40
Cursor 2 2453.08 -18.60

Delta Freq. 16.75

Delta Amplitude 26.00





EMC Test Data

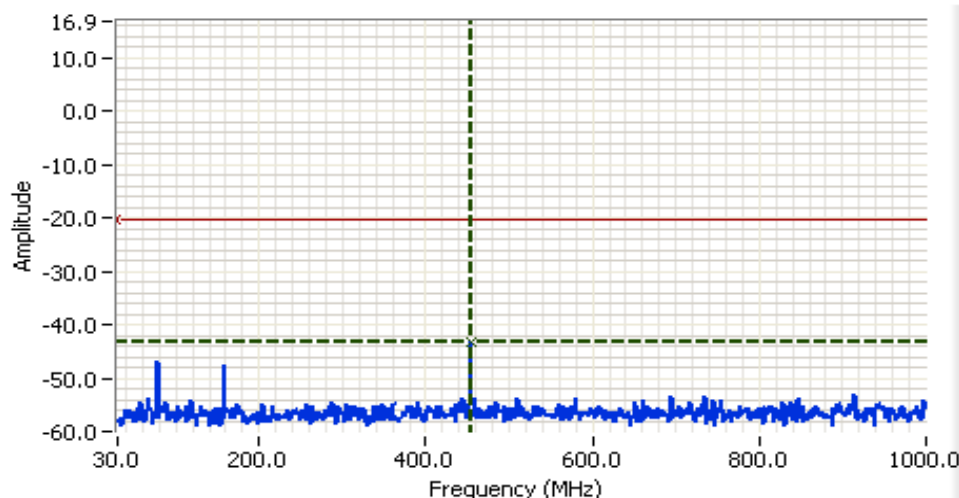
Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A

Run #4: Out of Band Spurious Emissions

Frequency (MHz)	Limit	Result
2412	-30dBc	Refer to plot
2437	-30dBc	Refer to plot
2462	-30dBc	Refer to plot

Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A

Plots for low channel



Analyzer Settings

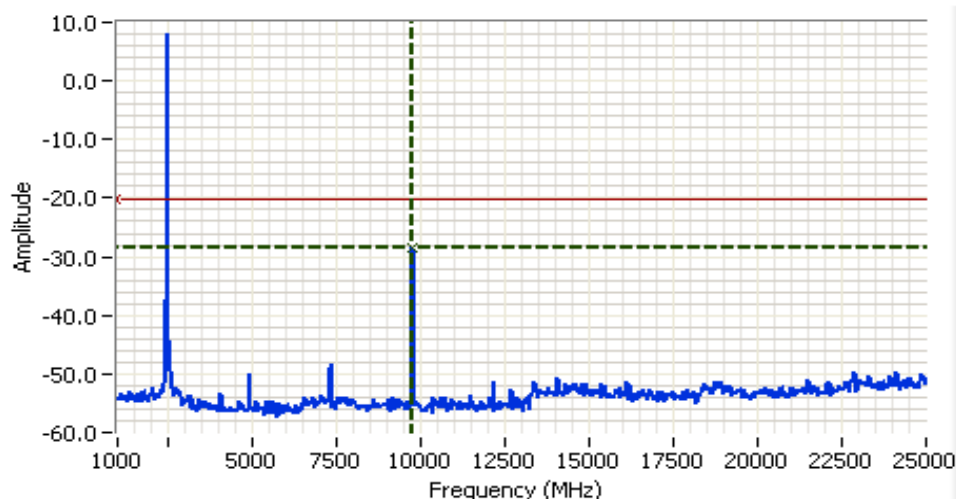
HP8563E
CF: 515.00 MHz
SPAN: 970.00 MHz
RB 100 kHz
VB 100 kHz
Detector POS
Att 30
RL Offset 1.00
Sweep Time 250.0ms
Ref Lvl: 16.90DBM

Comments

out of band
2412 MHz

Cursor 1 453.567 -43.27
Cursor 2 27.474 -20.27

Delta Freq. 426.09
Delta Amplitude 23.00



Analyzer Settings

HP8563E
CF: 13000.00 MHz
SPAN: 24000.00 MHz
RB 100 kHz
VB 100 kHz
Detector POS
Att 30
RL Offset 1.00
Sweep Time 6.0s
Ref Lvl: 16.90DBM

Comments

out of band
2412 MHz

Cursor 1 9760.00 -28.43
Cursor 2 937.500 -20.27

Delta Freq. 8822.50
Delta Amplitude 8.16

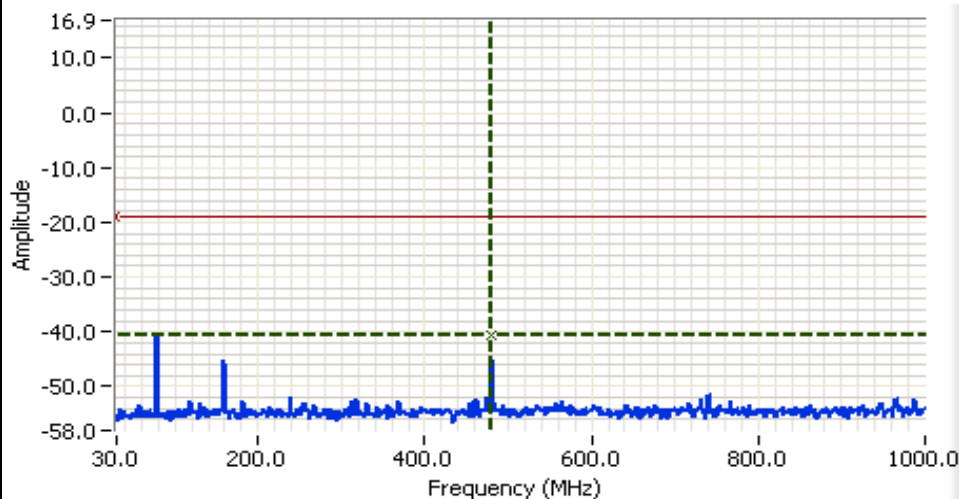




EMC Test Data

Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A

Plots for center channel



Analyzer Settings

HP8563E
CF: 515.00 MHz
SPAN: 970.00 MHz
RB 100 kHz
VB 100 kHz
Detector POS
Att 30
RL Offset 1.00
Sweep Time 250.0ms
Ref Lvl: 16.90DBM

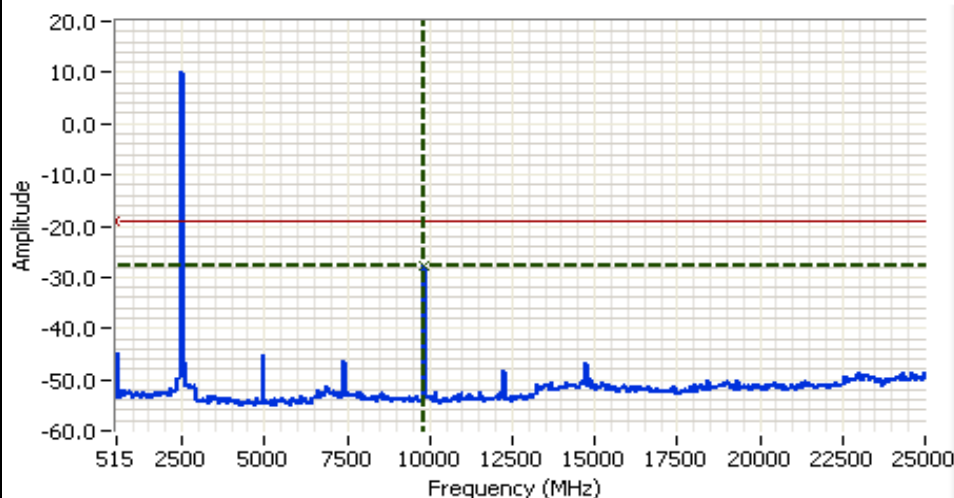
Comments

Out of Band
2437 MHz

Cursor 1	479.433	-40.43	
Cursor 2	27.474	-19.10	

Delta Freq. 451.96

Delta Amplitude 21.33



Analyzer Settings

HP8563E
CF: 12757.50 MHz
SPAN: 24485.00 MHz
RB 100 kHz
VB 100 kHz
Detector POS
Att 30
RL Offset 1.00
Sweep Time 6.2s
Ref Lvl: 16.90DBM

Comments

Out of Band
2437 MHz

Cursor 1	9819.30	-27.77	
Cursor 2	451.237	-19.10	

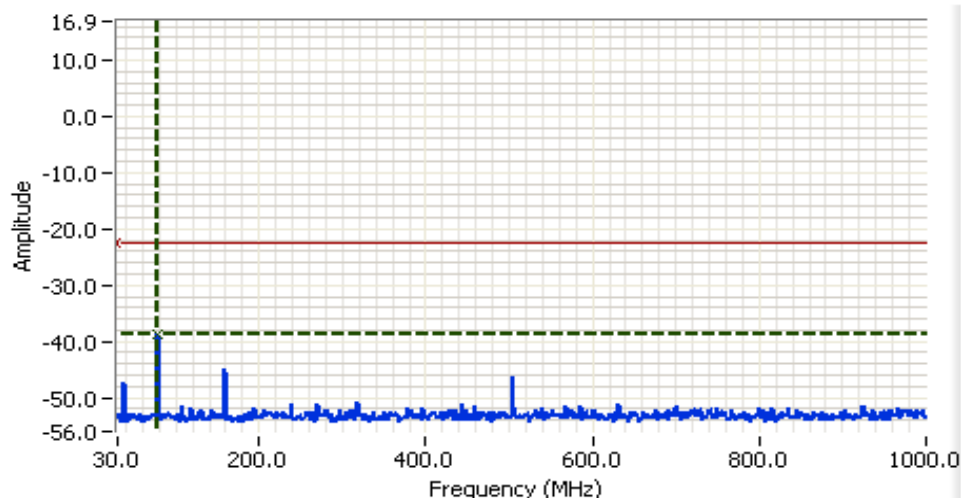
Delta Freq. 9368.06

Delta Amplitude 8.67



Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A

Plots for high channel



Analyzer Settings

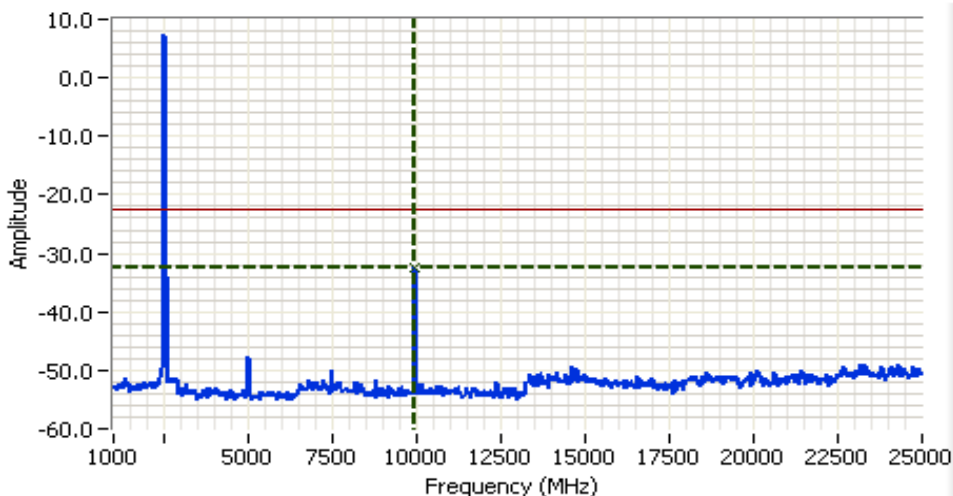
HP8563E
CF: 515.00 MHz
SPAN: 970.00 MHz
RB 100 kHz
VB 300 kHz
Detector POS
Att 30
RL Offset 1.00
Sweep Time 250.0ms
Ref Lvl: 16.90DBM

Comments

Out of Band
2462 MHz

Cursor 1 77.995 -38.77
Cursor 2 27.474 -22.60

Delta Freq. 50.52
Delta Amplitude 16.17



Analyzer Settings

HP8563E
CF: 13000.00 MHz
SPAN: 24000.00 MHz
RB 100 kHz
VB 300 kHz
Detector POS
Att 30
RL Offset 1.00
Sweep Time 6.0s
Ref Lvl: 16.90DBM

Comments

Out of Band
2462 MHz

Cursor 1 9960.00 -32.60
Cursor 2 625.000 -22.60

Delta Freq. 9335.00
Delta Amplitude 10.00





EMC Test Data

Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A

RSS 210 and FCC 15.247 (DTS) Antenna Port Measurements MIMO (802.11n 20 MHz), 2.4GHz Power, Bandwidth and Spurious Emissions

Test specifics

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

Date of Test: 8/16/2006

Test Engineer: Juan Martinez

Test Location: Fremont Chamber #3

Config. Used: **1**

Config Change: **None**

EUT Voltage: 120V/60Hz

General Test Configuration

The EUT was connected to the standard(s) trum analyzer or power meter via a suitable attenuator. All measurements were made on a single chain.

All measurements have been corrected to allow for the external attenuators used.

Ambient Conditions:

Temperature: - °C

Rel. Humidity: - %

Summary of Results

Run #	Test Performed	Limit	Pass / Fail	Result / Margin
1	Output Power	15.247(b)	Pass	24dBm combined
2	Power standard(s)tral Density	15.247(d)	Pass	-2.2dBm/kHz
3	6dB Bandwidth	15.247(a)	Pass	Refer to plots
3	99% Bandwidth	RSS GEN	-	Refer to plots
4	Spurious emissions	15.247(b)	Pass	Refer to plots

Output power measurements to confirm output power for each channel was at the previously certified level +/- 0.5dB. Power measurements were made prior to each set of conducted and radiated spurious emissions test to verify output power was within +/-0.5dB of the previously certified level

PSD measurements to confirm the PSD with the alternate PA remained compliant. Tests were performed on three channels in 20MHz mode and center channel in 40MHz mode (to demonstrate that 20MHz mode was worst case).

6dB and 99% bandwidth measurements performed on at least the center channel in both 20Mhz and 40Mhz to verify bandwidths. Changing the PA should have no significant effect on signal bandwidth unless the PA was overloaded.

Spurious emissions on the antenna port were measured on the top, bottom and center channels in 20MHz mode and repeated on 40MHz mode, center channel to demonstrate that the 20 MHz mode was the worst case.



EMC Test Data

Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A

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.

Run #1: Output Power

Transmitted signal on chain is coherent ? Y

Regulatory Power Measurements:

Mode	Frequency (MHz)	Output Power (dBm) ^{Note 1}			Antenna Gain (dBi) ^{Note 3}			EIRP ^{Note 2}	
		Chain 1	Chain 2	Total	Chain 1	Chain 2	Total	dBm	W
20MHz n	2412	14.1	14.1	17.1	2.2	2.2	5.2	22.3	0.169
20MHz n	2437	15.9	15.7	18.8	2.2	2.2	5.2	24.0	0.251
20MHz n	2462	13.6	13.8	16.7	2.2	2.0	5.1	21.8	0.151
40MHz n	2437	13.2	13.0	16.1	2.2	2.2	5.2	21.3	0.135

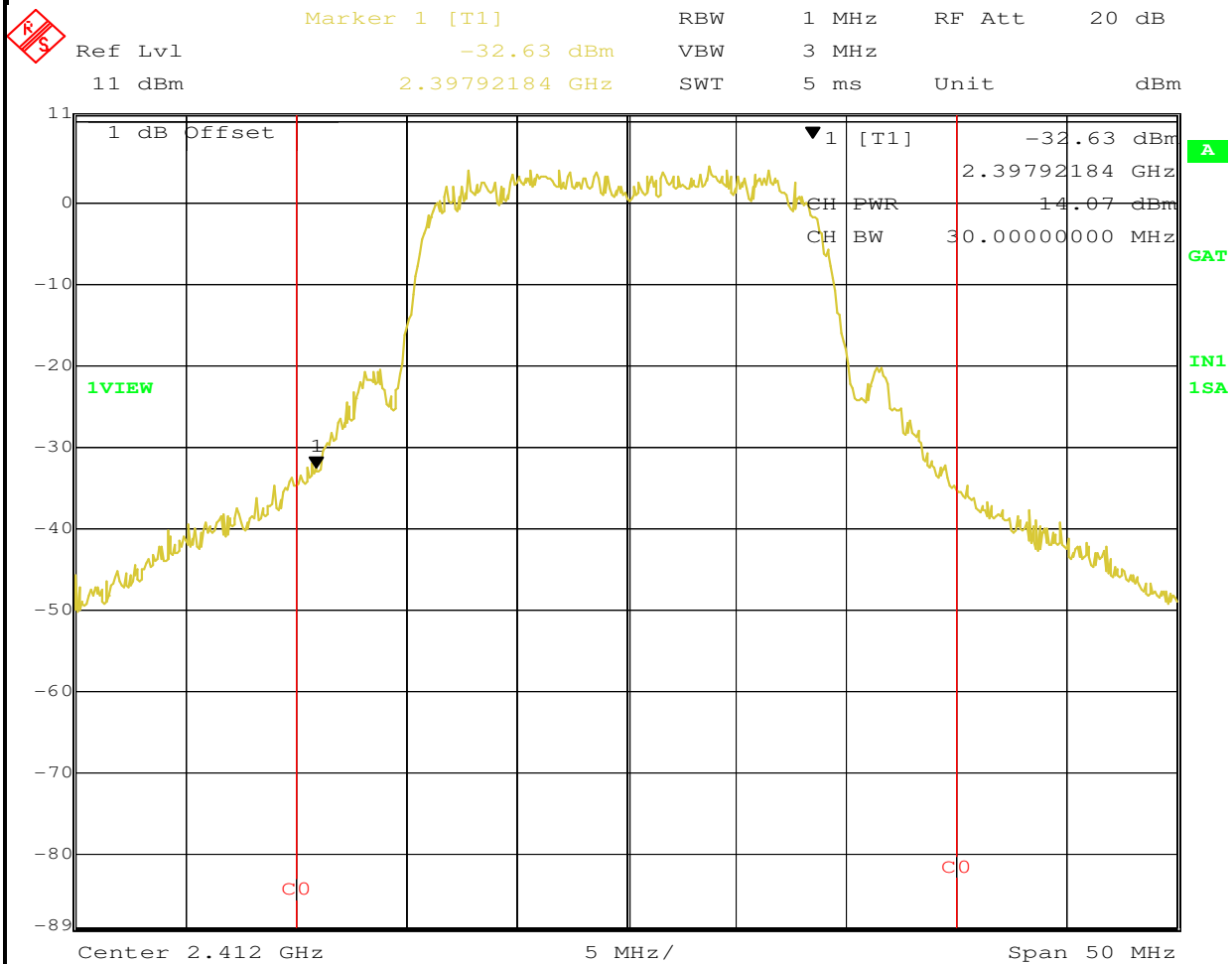
(No plots for 40MHz mode)

Note 1:	Output power measured using a spectrum analyzer (see plots below): RBW=1MHz, VB=3 MHz, sample detector, power averaging on (transmitted signal was not continuous but the ESI analyzer was configured with a gated sweep such that the analyzer was only sweeping when the device was transmitting) and power integration over 30 MHz The output power limit is 30dBm
Note 2:	EIRP - if transmit chains are coherent then the EIRP is calculated from the sum of the antenna gains plus the total power (i.e. beam-forming is assumed because of coherency on the chains). If the individual chains are incoherent then the EIRP is calculated from the sum of the individual EIRPs for each chain.
Note 3:	If the transmit chains are coherent then the total system antenna gain is the sum of the numeric gains for each antenna. If the transmit chains are incoherent then the system antenna gain is not applicable as each transmit chain can be treated independently.
Note 4:	Power setting - if a single number the same power setting was used for each chain. If multiple numbers the power setting for each chain is separated by a comma (e.g. x,y would indicate power setting x for chain 1, power setting y for chain 2.



EMC Test Data

Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A

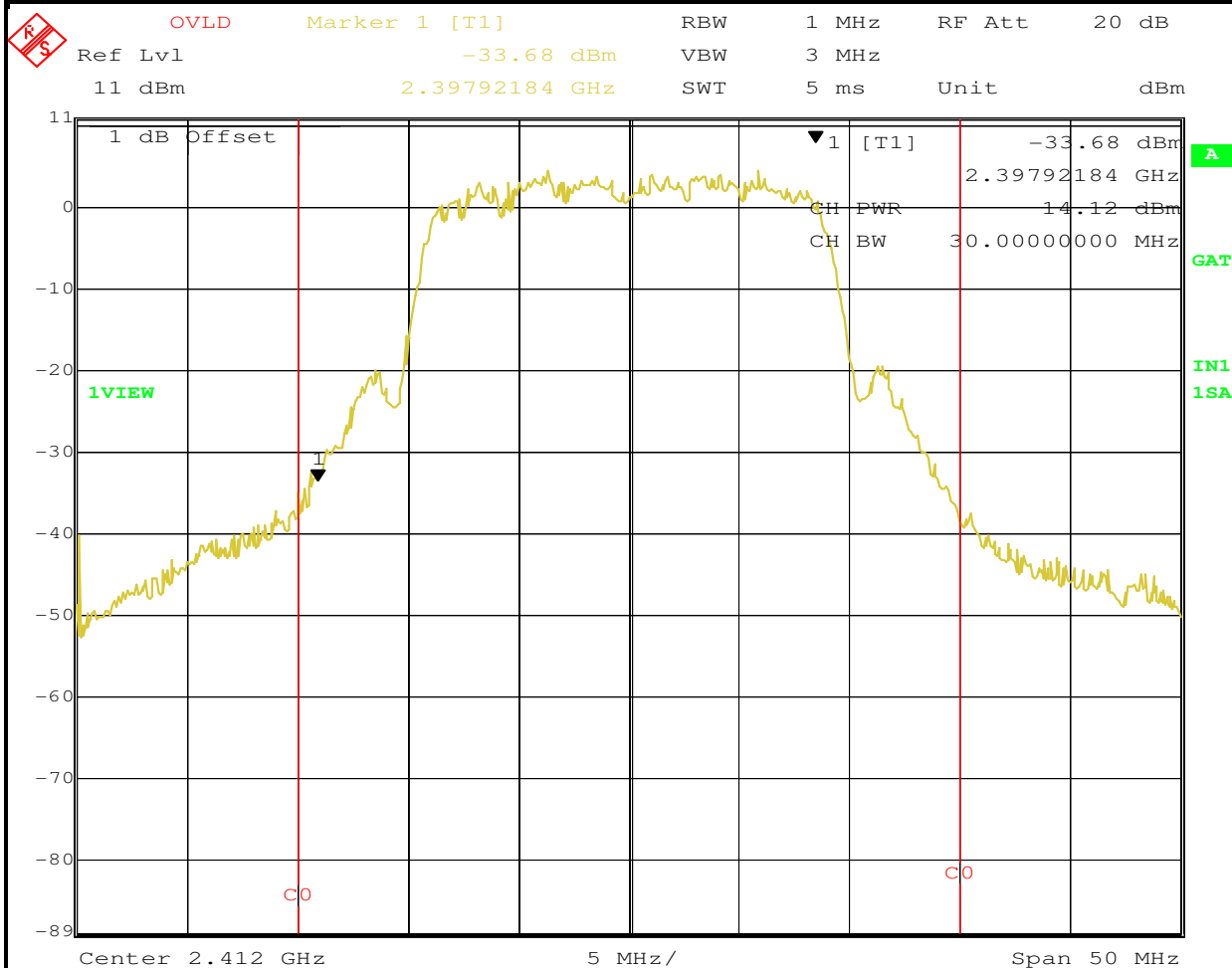


Date: 16.AUG.2006 10:03:59



EMC Test Data

Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A

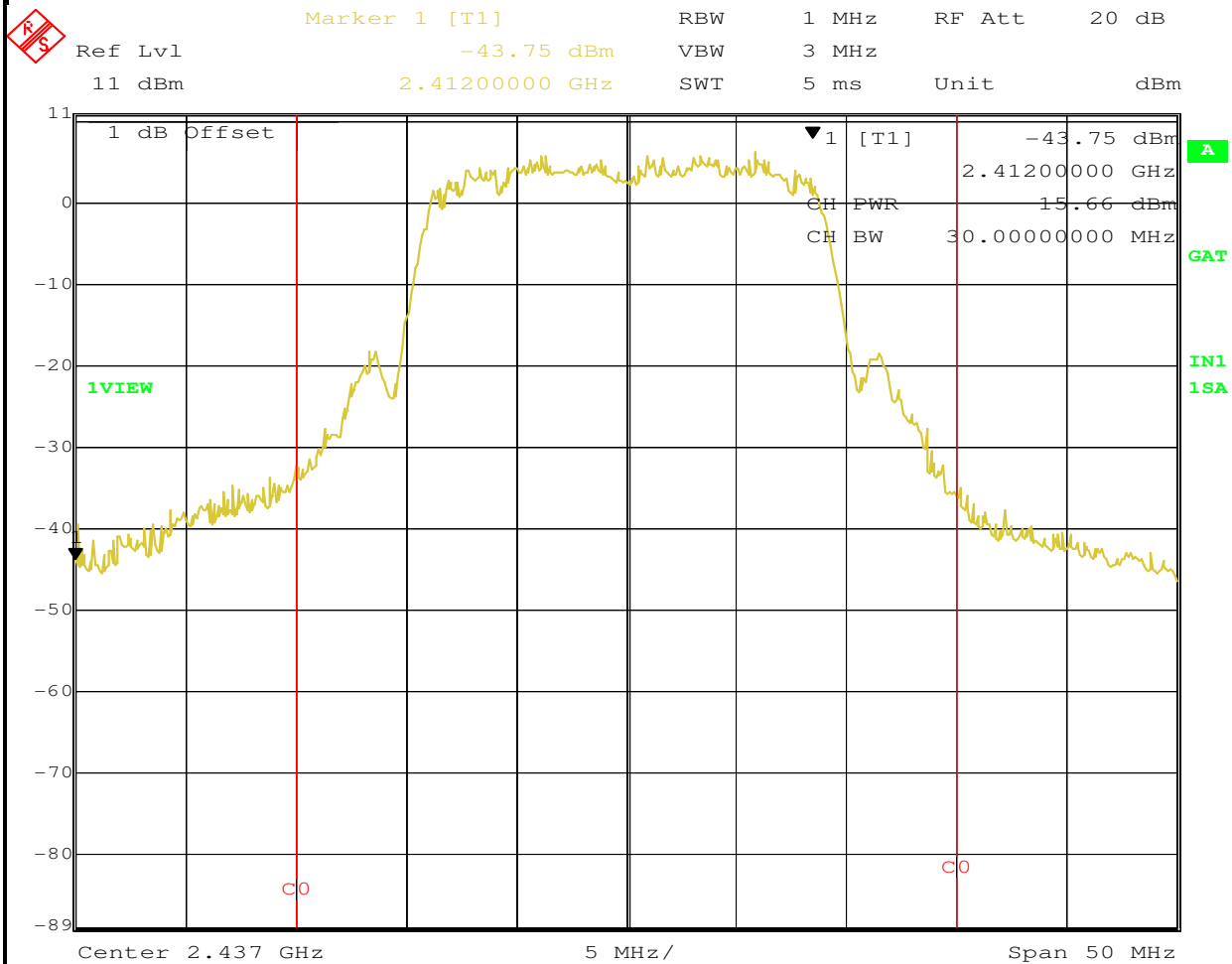


Date: 16.AUG.2006 10:16:58



EMC Test Data

Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A

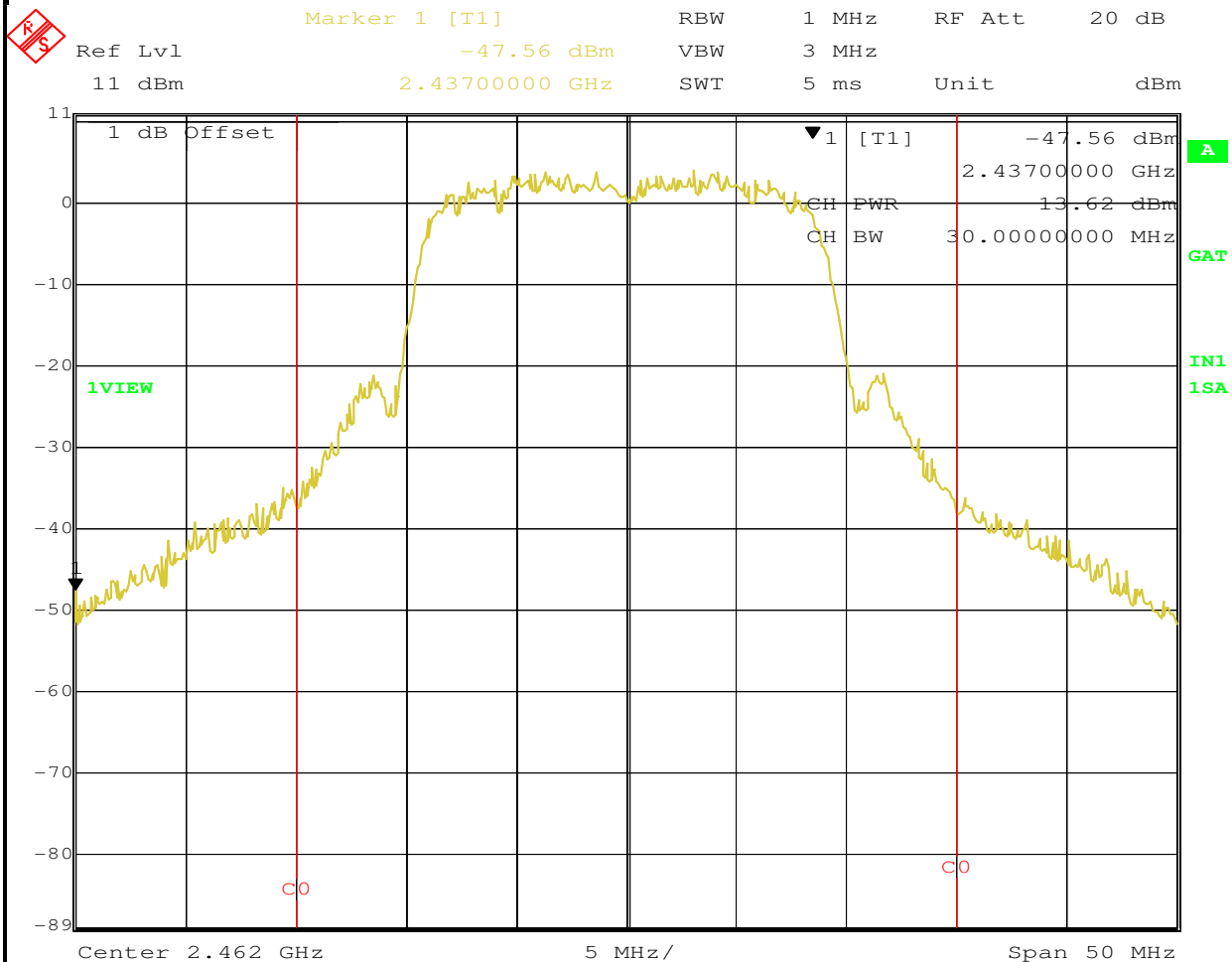


Date: 16.AUG.2006 10:46:50



EMC Test Data

Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A

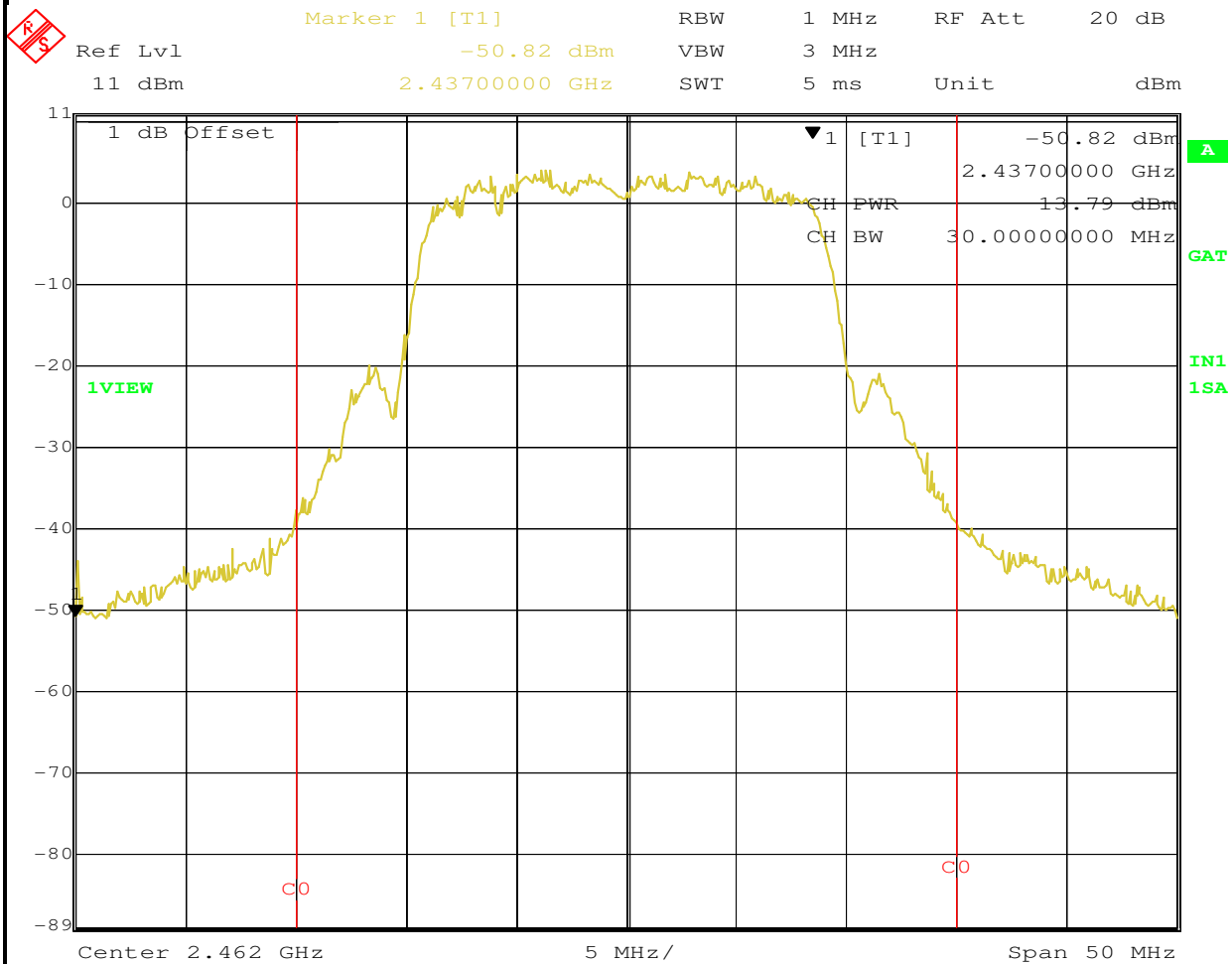


Date: 16.AUG.2006 11:57:00



EMC Test Data

Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A



Date: 16.AUG.2006 13:25:37



EMC Test Data

Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A

Run #4: Power Spectral Density

Mode	Frequency (MHz)	PSD (dBm/3kHz) ^{Note 1}			Limit dBm/3kHz	Result
		Chain 1	Chain 2	Total		
20MHz n	2412	-5.5	-7.7	-3.4	8.0	Pass
20 MHz n	2437	-3.7	-7.7	-2.2	8.0	Pass
20 MHz n	2462	-5.5	-6.2	-2.8	8.0	Pass
40MHz n	2437	-12.8	-12.5	-9.6	8.0	Pass

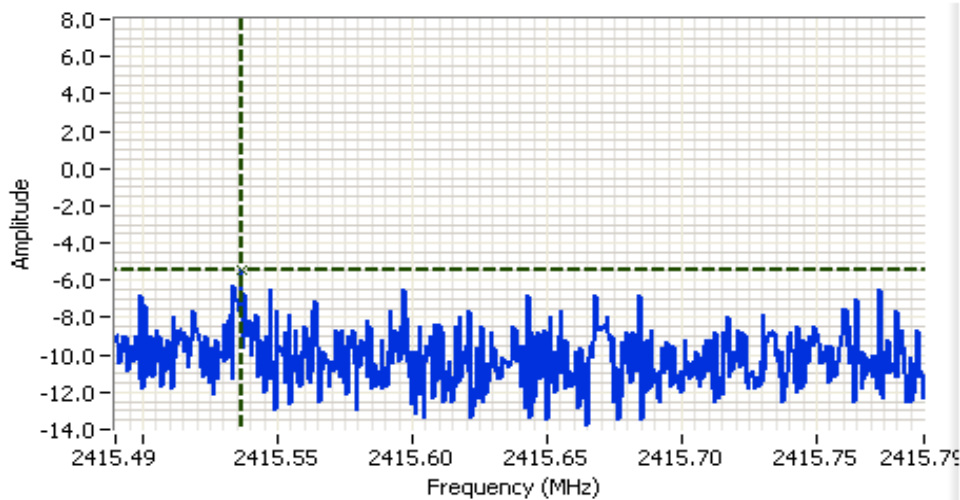
Note 1:

Power standard(s) spectral density measured using RB=3 kHz, VB=10kHz, analyzer with peak detector and with a sweep time set to ensure a dwell time of at least 1 second per 3kHz. The measurement is made at the frequency of PPSD determined from preliminary scans using RB=3kHz using multiple sweeps at a faster rate over the 6dB bandwidth of the signal.



EMC Test Data

Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A



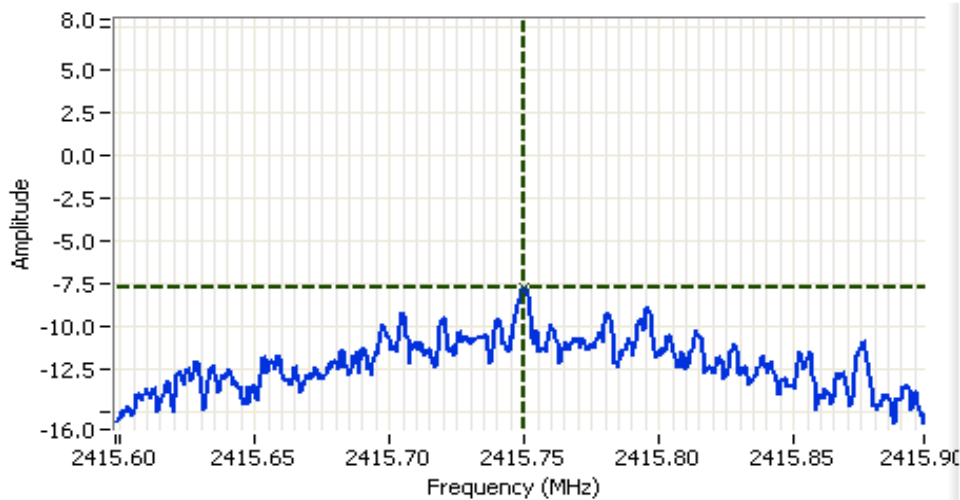
Analyzer Settings

HP8563E
CF: 2415.64 MHz
SPAN:300 kHz
RB 3 kHz
VB 10 kHz
Detector POS
Att 30
RL Offset 1.00
Sweep Time 100.0s
Ref Lvl:16.50DBM

Comments

PSD
2412 MHz Main

Cursor 1 2415.53 MHz -5.50 dBm
0.000 0.00



Analyzer Settings

HP8563E
CF: 2415.75 MHz
SPAN:300 kHz
RB 3 kHz
VB 10 kHz
Detector POS
Att 30
RL Offset 1.00
Sweep Time 100.0s
Ref Lvl:16.50DBM

Comments

PSD
2412 MHz Aux

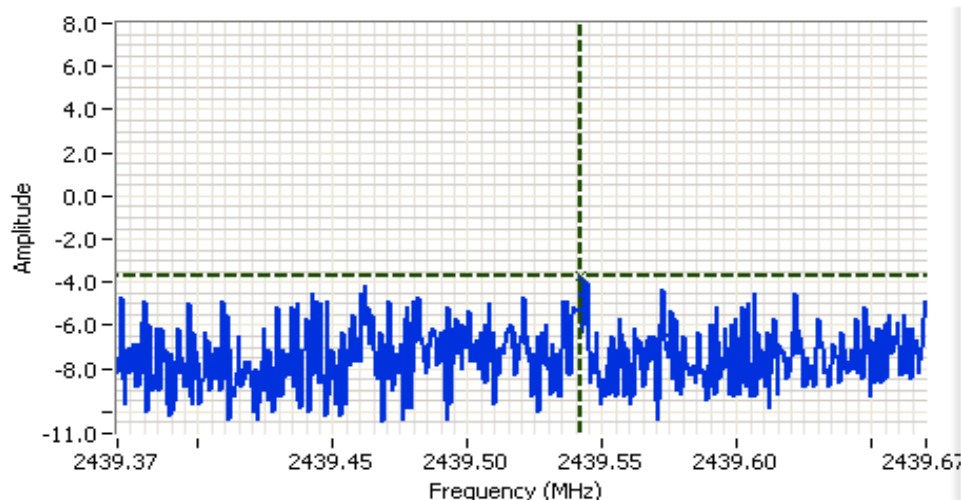
Cursor 1 2415.75 MHz -7.67 dBm
0.000 0.00





EMC Test Data

Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A

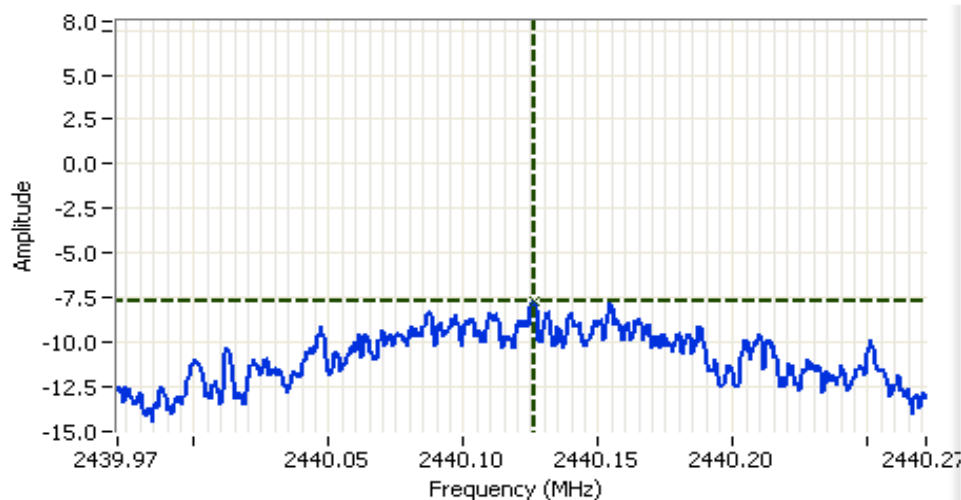
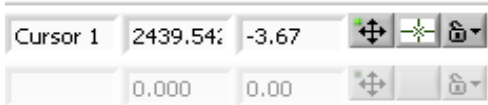


Analyzer Settings

HP8563E
CF: 2439.52 MHz
SPAN:300 kHz
RB 3 kHz
VB 10 kHz
Detector POS
Att 30
RL Offset 1.00
Sweep Time 100.0s
Ref Lvl:16.50DBM

Comments

PSD
2437 MHz Main

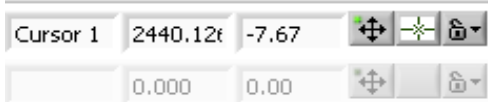


Analyzer Settings

HP8563E
CF: 2440.12 MHz
SPAN:300 kHz
RB 3 kHz
VB 10 kHz
Detector POS
Att 30
RL Offset 1.00
Sweep Time 100.0s
Ref Lvl:16.50DBM

Comments

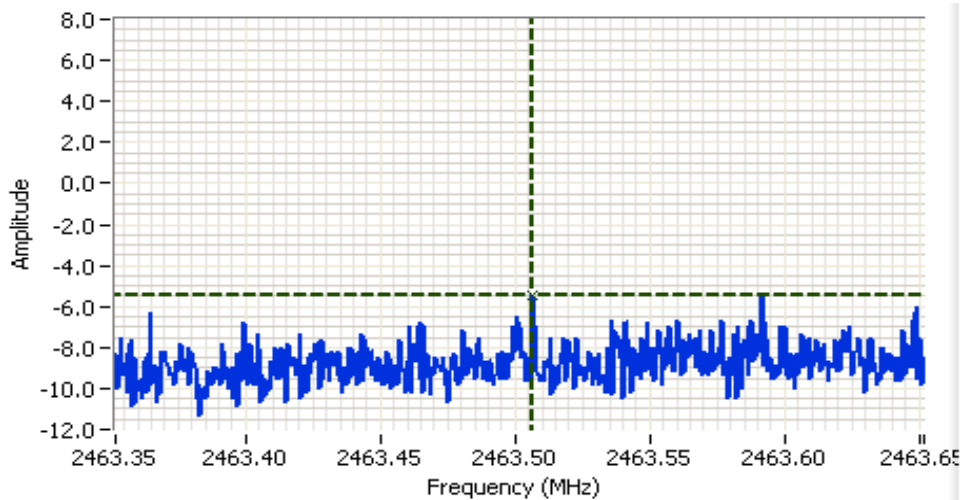
PSD
2437 MHz Aux





EMC Test Data

Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A

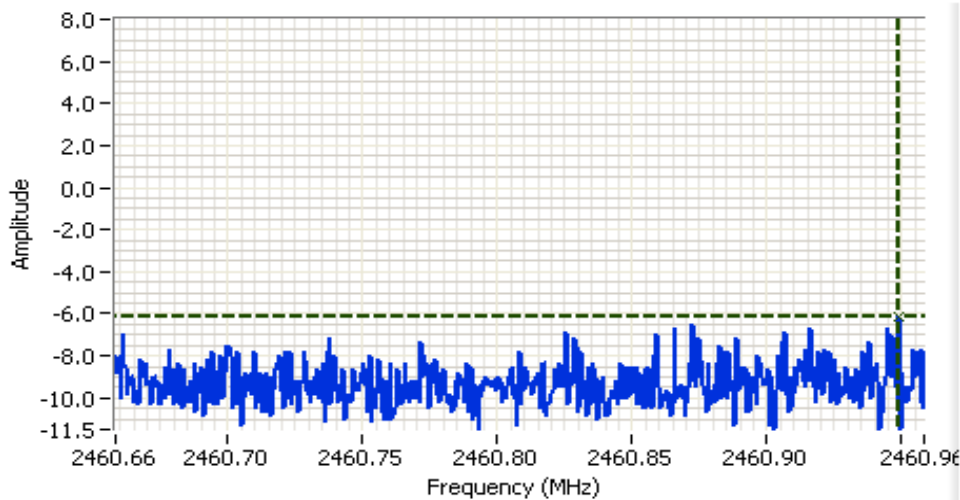
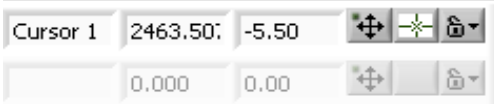


Analyzer Settings

HP8563E
CF: 2463.50 MHz
SPAN:300 kHz
RB 3 kHz
VB 10 kHz
Detector POS
Att 30
RL Offset 1.00
Sweep Time 100.0s
Ref Lvl:16.50DBM

Comments

PSD
2462 MHz Main

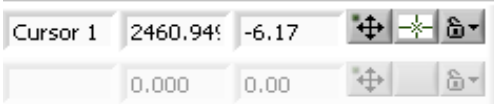


Analyzer Settings

HP8563E
CF: 2460.81 MHz
SPAN:300 kHz
RB 3 kHz
VB 10 kHz
Detector POS
Att 30
RL Offset 1.00
Sweep Time 100.0s
Ref Lvl:16.50DBM

Comments

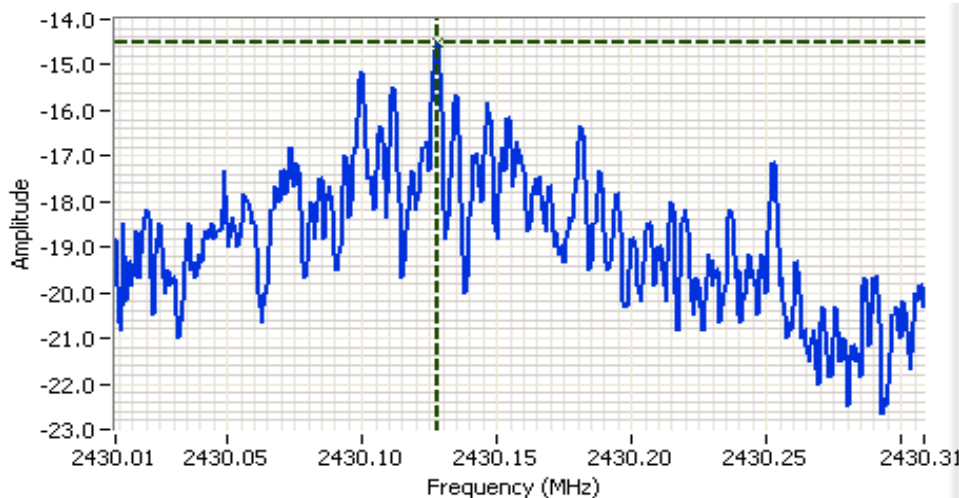
PSD
2462 MHz Aux





EMC Test Data

Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A

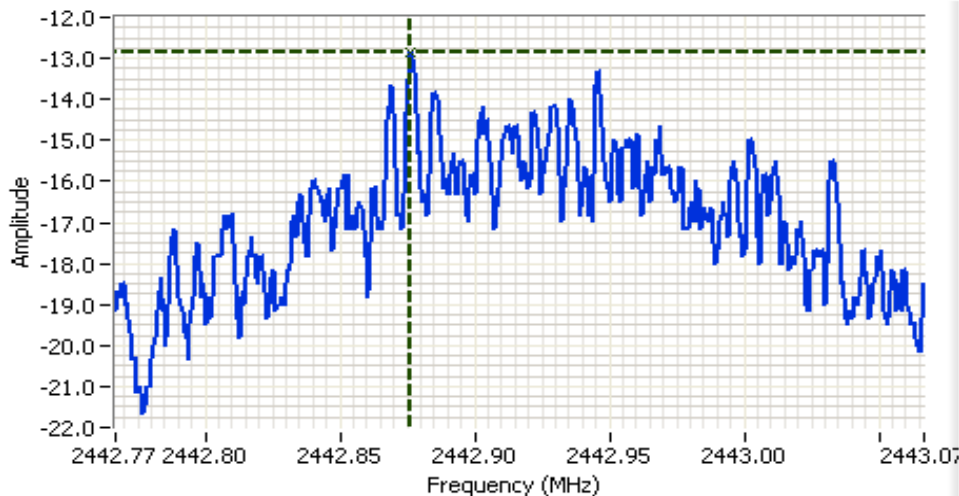
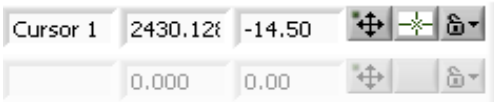


Analyzer Settings

HP8564E,EMI
CF: 2430.16 MHz
SPAN:300 kHz
RB 3 kHz
VB 10 kHz
Detector POS
Att 20
RL Offset 0.00
Sweep Time 100.0s
Ref Lvl:10.00DBM

Comments

Aux Port, 40MHz Mode,
PSD -13.5dBm/3kHz
(including cable loss)

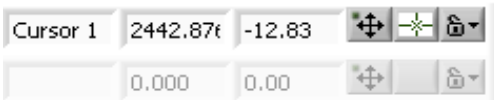


Analyzer Settings

HP8564E,EMI
CF: 2442.92 MHz
SPAN:300 kHz
RB 3 kHz
VB 10 kHz
Detector POS
Att 20
RL Offset 1.00
Sweep Time 100.0s
Ref Lvl:11.00DBM

Comments

Main Port, 40MHz
Mode, PSD -12.8dBm/
3kHz (cable loss
accounted using ref lvl
offset)





EMC Test Data

Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A

Run #3: Signal Bandwidth

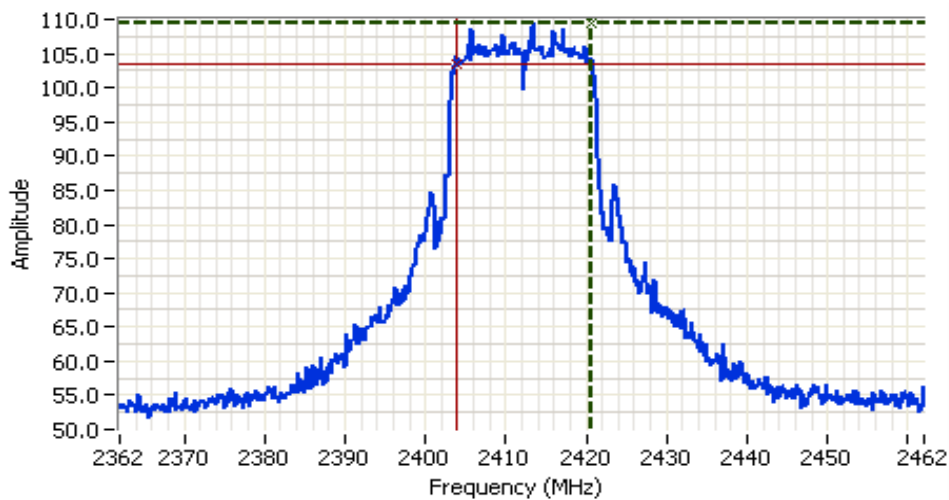
Mode	Frequency (MHz)	Resolution Bandwidth	Main		Aux	
			Bandwidth (MHz)		Bandwidth (MHz)	
			6dB	99%	6dB	99%
20MHz n	2412	100 kHz	16.83	23.7	16.83	23.5
20MHz n	2437	100 kHz	15.17	21.3	16.17	23.0
20MHz n	2462	100 kHz	17.33	21.2	17.17	23.3

Note 1:	Measured on a single chain
Note 2:	99% bandwidth measured in accordance with RSS GEN, with RB > 1% of the span and VB > 3xRB



EMC Test Data

Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A

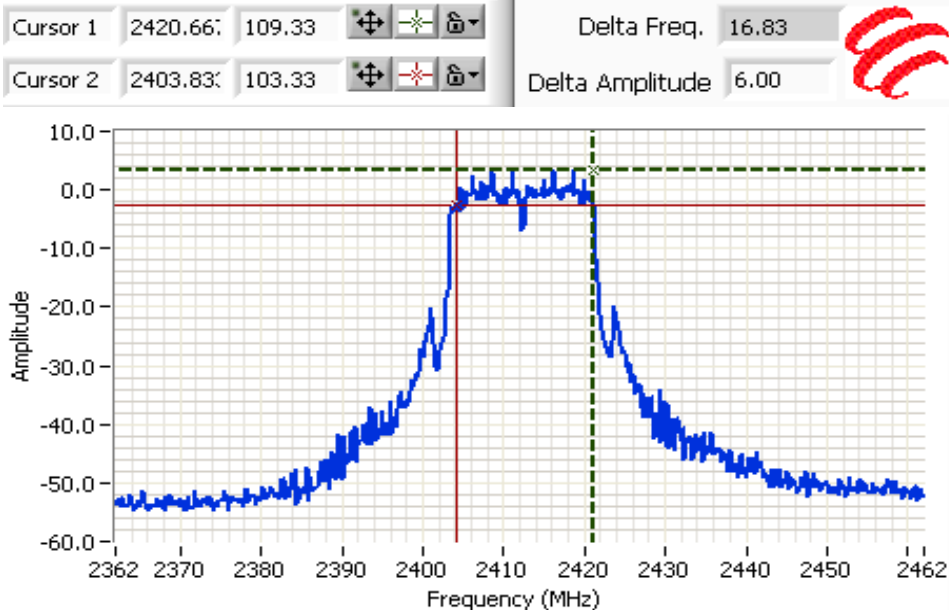


Analyzer Settings

HP8563E
CF: 2412.00 MHz
SPAN: 100.00 MHz
RB 100 kHz
VB 100 kHz
Detector POS
Att 30
RL Offset 0.00
Sweep Time 200.0ms
Ref Lvl: 122.50 DBUV

Comments

6-dB BW
2412 MHz Main



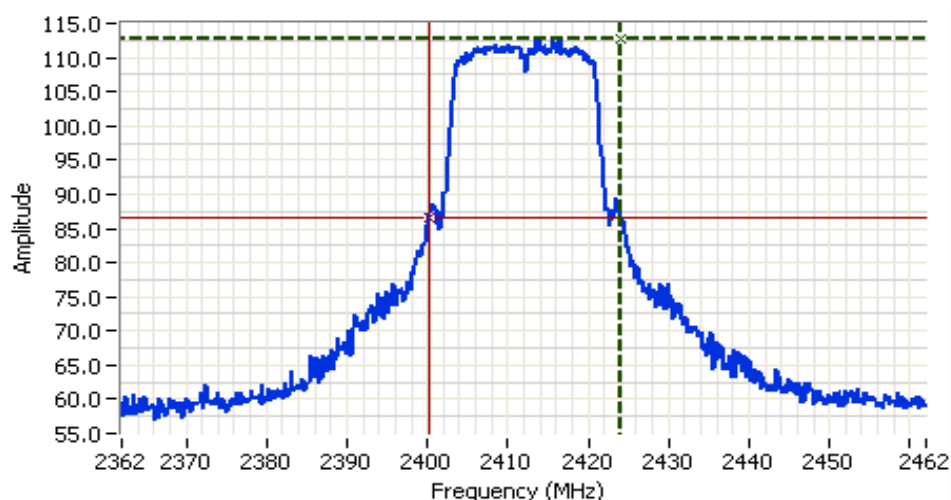
Analyzer Settings

HP8563E
CF: 2412.00 MHz
SPAN: 100.00 MHz
RB 100 kHz
VB 100 kHz
Detector POS
Att 30
RL Offset 1.00
Sweep Time 50.0ms
Ref Lvl: 16.50 DBM

Comments

6-dB BW
2412 MHz Aux

Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A



Analyzer Settings

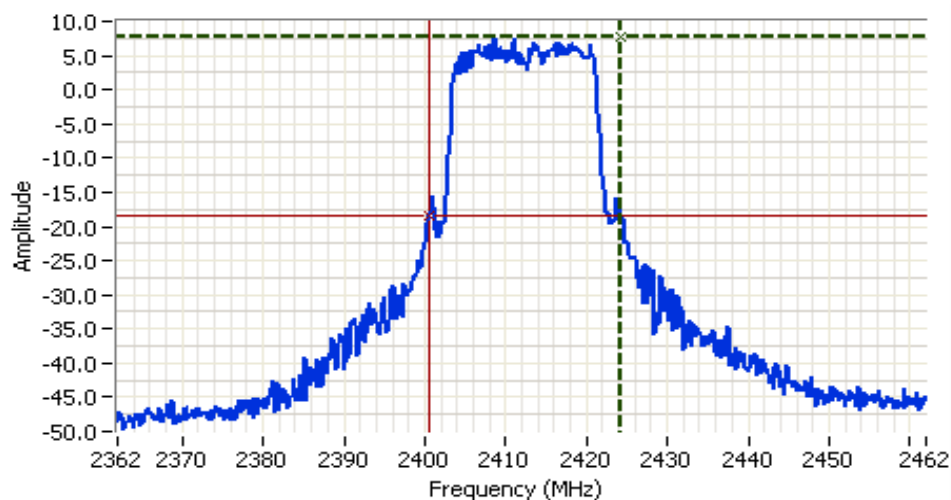
HP8563E
 CF: 2412.00 MHz
 SPAN: 100.00 MHz
 RB 300 kHz
 VB 1.000 MHz
 Detector POS
 Att 30
 RL Offset 0.00
 Sweep Time 200.0ms
 Ref Lvl: 122.50 DBU

Comments

99% BW
 2412 MHz Main

Cursor 1 2424.00 112.67
 Cursor 2 2400.33 86.67

Delta Freq. 23.67
 Delta Amplitude 26.00



Analyzer Settings

HP8563E
 CF: 2412.00 MHz
 SPAN: 100.00 MHz
 RB 300 kHz
 VB 1.000 MHz
 Detector POS
 Att 30
 RL Offset 1.00
 Sweep Time 50.0ms
 Ref Lvl: 16.50 DBM

Comments

99%
 2412 MHz Aux

Cursor 1 2424.16 7.67
 Cursor 2 2400.66 -18.33

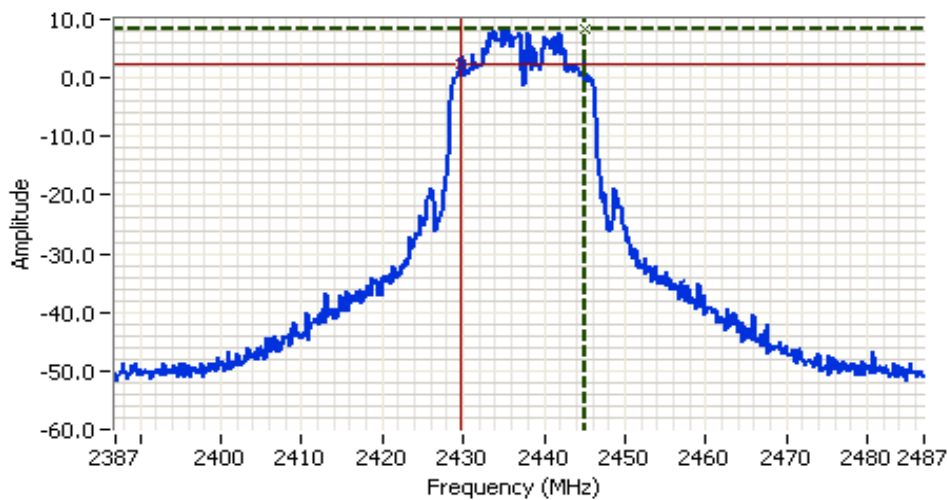
Delta Freq. 23.50
 Delta Amplitude 26.00





EMC Test Data

Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A



Analyzer Settings

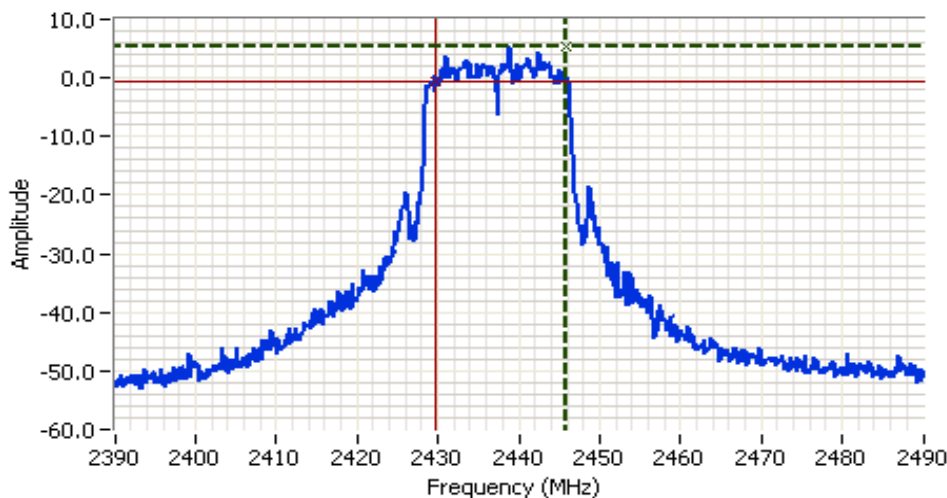
HP8563E
CF: 2437.00 MHz
SPAN: 100.00 MHz
RB 100 kHz
VB 100 kHz
Detector POS
Att 30
RL Offset 1.00
Sweep Time 50.0ms
Ref Lvl: 16.50DBM

Comments

6-dB BW
2437 MHz Main

Cursor 1 2445.00 8.50
Cursor 2 2429.83 2.50

Delta Freq. 15.17
Delta Amplitude 6.00



Analyzer Settings

HP8563E
CF: 2440.12 MHz
SPAN: 100.00 MHz
RB 100 kHz
VB 100 kHz
Detector POS
Att 30
RL Offset 1.00
Sweep Time 50.0ms
Ref Lvl: 16.50DBM

Comments

6-dB BW
2437 MHz Aux

Cursor 1 2445.95 5.50
Cursor 2 2429.78 -0.50

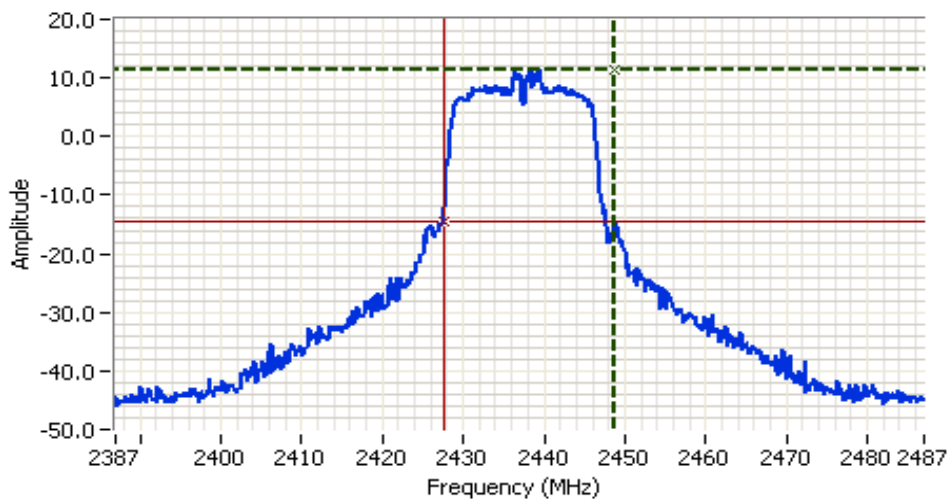
Delta Freq. 16.17
Delta Amplitude 6.00





EMC Test Data

Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A



Analyzer Settings

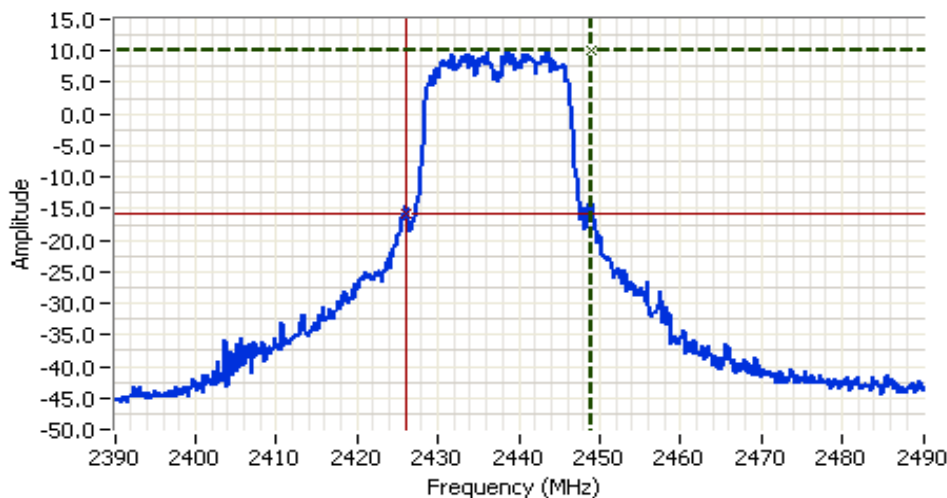
HP8563E
CF: 2437.00 MHz
SPAN: 100.00 MHz
RB 300 kHz
VB 1.000 MHz
Detector POS
Att 30
RL Offset 1.00
Sweep Time 50.0ms
Ref Lvl: 16.50DBM

Comments

99%
2437 MHz Main

Cursor 1 2448.83 11.33
Cursor 2 2427.50 -14.67

Delta Freq. 21.33
Delta Amplitude 26.00



Analyzer Settings

HP8563E
CF: 2440.12 MHz
SPAN: 100.00 MHz
RB 300 kHz
VB 1.000 MHz
Detector POS
Att 30
RL Offset 1.00
Sweep Time 50.0ms
Ref Lvl: 16.50DBM

Comments

99%
2437 MHz Aux

Cursor 1 2448.95 10.17
Cursor 2 2425.95 -15.83

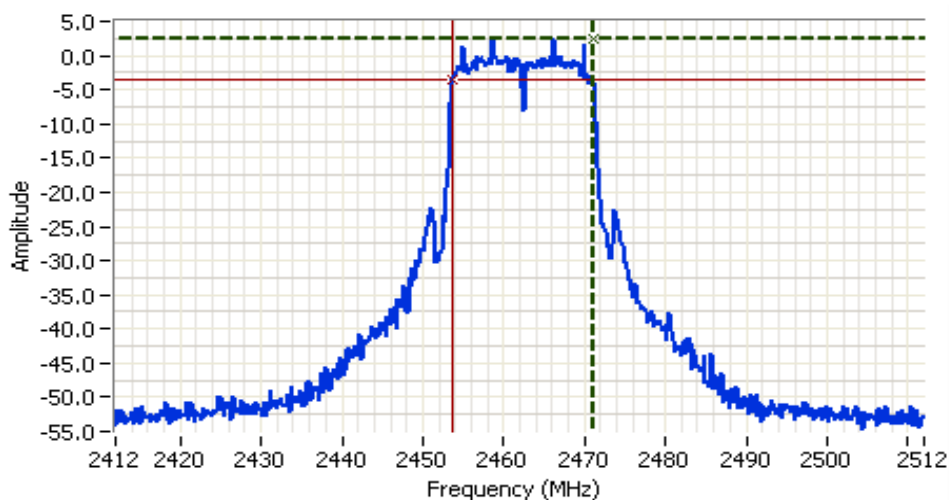
Delta Freq. 23.00
Delta Amplitude 26.00





EMC Test Data

Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A



Analyzer Settings

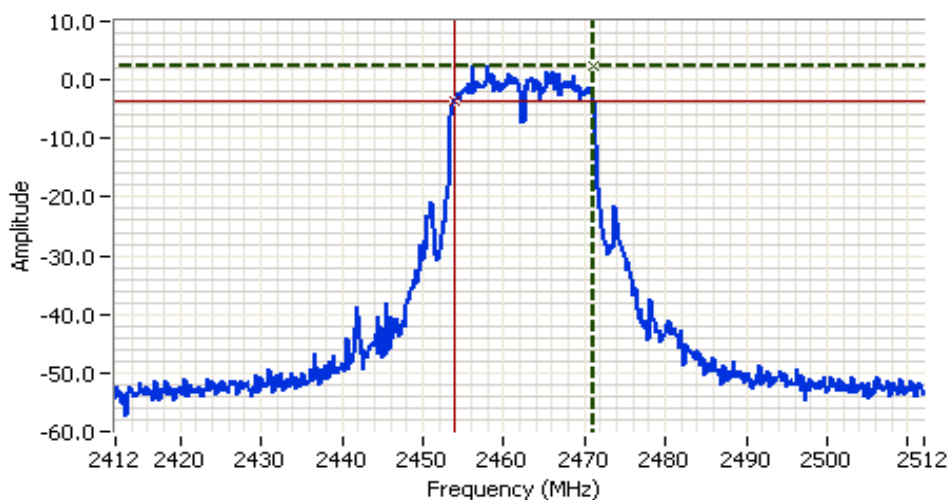
HP8563E
CF: 2462.00 MHz
SPAN: 100.00 MHz
RB 100 kHz
VB 100 kHz
Detector POS
Att 30
RL Offset 1.00
Sweep Time 50.0ms
Ref Lvl: 16.50 dBm

Comments

6-dB BW
2462 MHz Main

Cursor 1 2471.00 2.33
Cursor 2 2453.66 -3.67

Delta Freq. 17.33
Delta Amplitude 6.00



Analyzer Settings

HP8563E
CF: 2462.00 MHz
SPAN: 100.00 MHz
RB 100 kHz
VB 100 kHz
Detector POS
Att 30
RL Offset 1.00
Sweep Time 50.0ms
Ref Lvl: 16.50 dBm

Comments

6-dB BW
2462 MHz Aux

Cursor 1 2471.00 2.50
Cursor 2 2453.83 -3.50

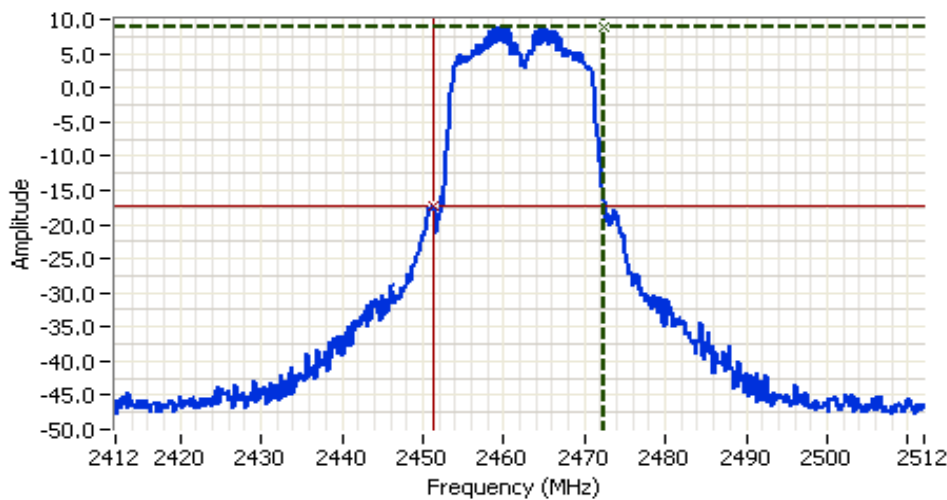
Delta Freq. 17.17
Delta Amplitude 6.00





EMC Test Data

Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A



Analyzer Settings

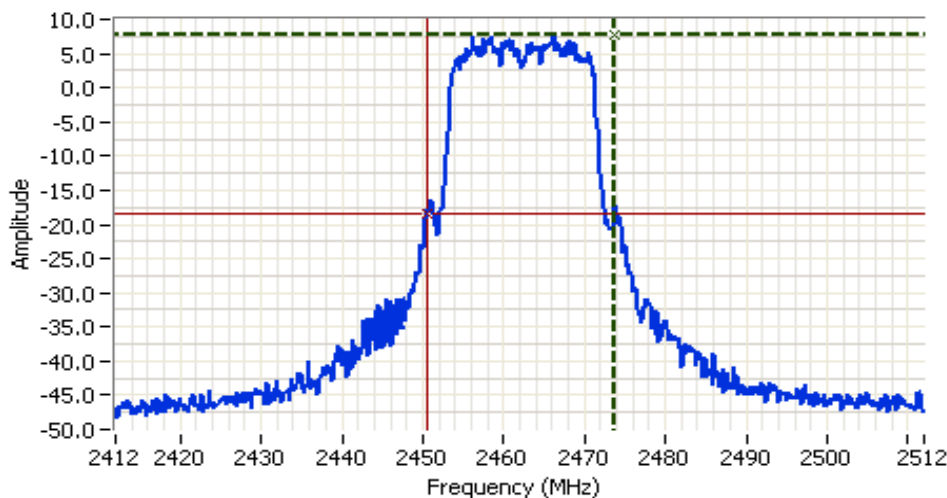
HP8563E
CF: 2462.00 MHz
SPAN: 100.00 MHz
RB 300 kHz
VB 1.000 MHz
Detector POS
Att 30
RL Offset 1.00
Sweep Time 50.0ms
Ref Lvl: 16.50DBM

Comments

99%
2462 MHz Main

Cursor 1 2472.50 8.83
Cursor 2 2451.33 -17.17

Delta Freq. 21.17
Delta Amplitude 26.00



Analyzer Settings

HP8563E
CF: 2462.00 MHz
SPAN: 100.00 MHz
RB 300 kHz
VB 1.000 MHz
Detector POS
Att 30
RL Offset 1.00
Sweep Time 50.0ms
Ref Lvl: 16.50DBM

Comments

99%
2462 MHz Aux

Cursor 1 2473.83 7.67
Cursor 2 2450.50 -18.33

Delta Freq. 23.33
Delta Amplitude 26.00





EMC Test Data

Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A

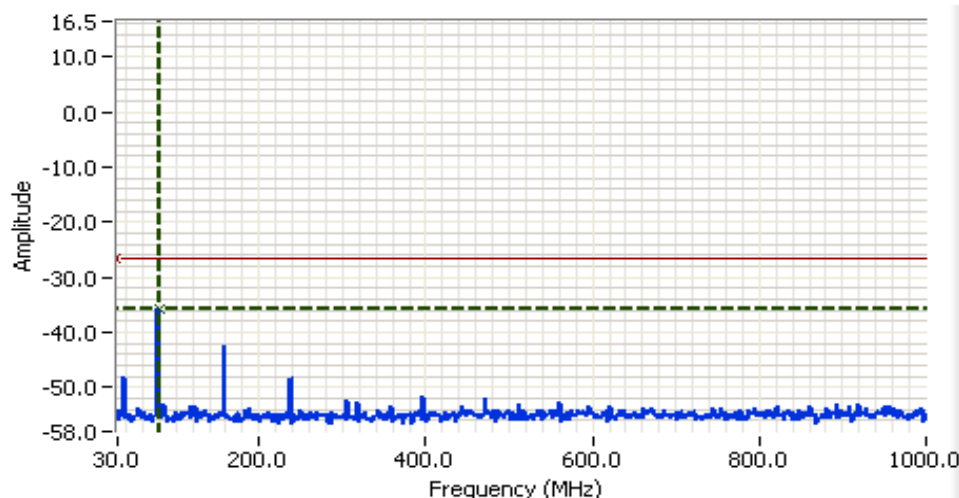
Run #4: Out of Band Spurious Emissions

Power Setting Per Chain			Frequency (MHz)	Limit	Mode	Result
#1	#2	#3				
			2412	-30dBc	20MHz	All spurs below -30dBc
			2437	-30dBc	20MHz	All spurs below -30dBc
			2437	-30dBc	40MHz	All spurs below -30dBc
			2462	-30dBc	20MHz	All spurs below -30dBc

Note 1: Measured on each chain individually

Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A

Plots for low channel, power setting(s) = 15.5dBm per chain (maximum in-band power setting)



Analyzer Settings

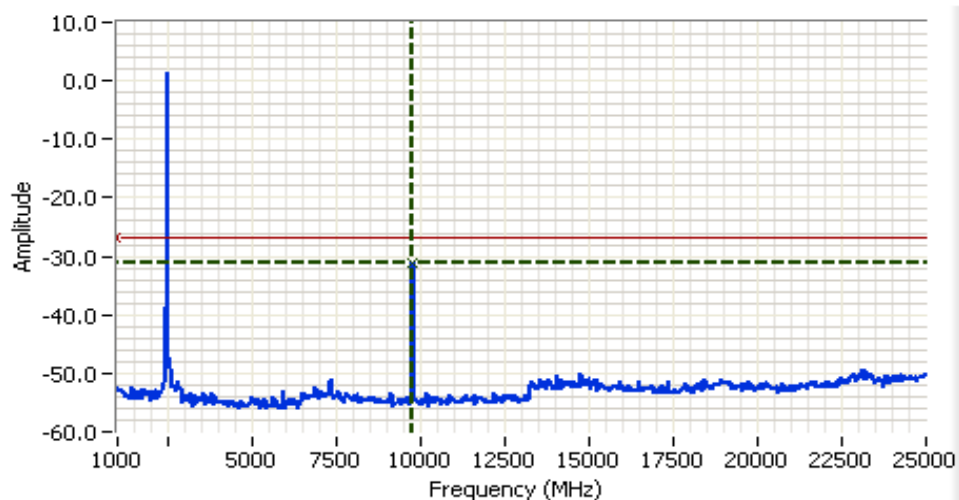
HP8563E
CF: 515.00 MHz
SPAN: 970.00 MHz
RB 100 kHz
VB 100 kHz
Detector POS
Att 30
RL Offset 1.00
Sweep Time 250.0ms
Ref Lvl: 16.50DBM

Comments

Out of band
2412 MHz Main

Cursor 1 80.521 -35.67
Cursor 2 27.474 -26.70

Delta Freq. 53.05
Delta Amplitude 8.97



Analyzer Settings

HP8563E
CF: 13000.00 MHz
SPAN: 24000.00 MHz
RB 100 kHz
VB 100 kHz
Detector POS
Att 30
RL Offset 1.00
Sweep Time 6.0s
Ref Lvl: 16.50DBM

Comments

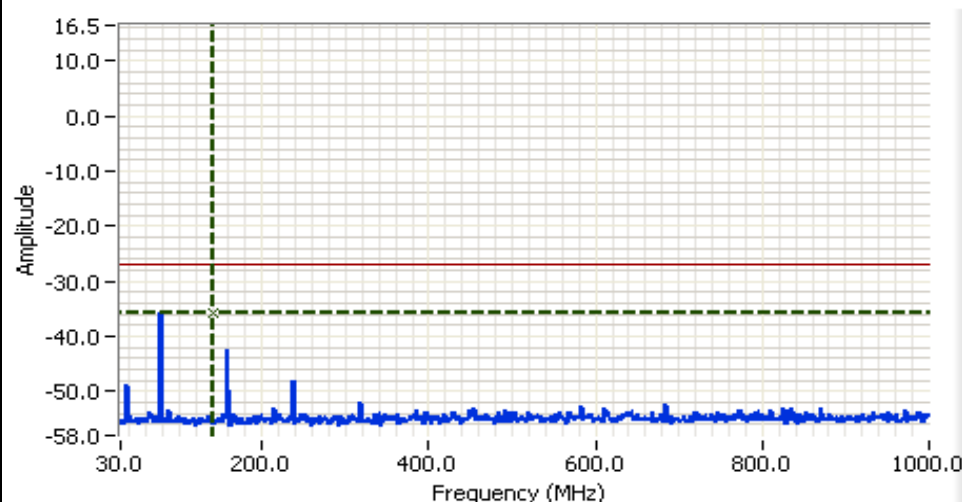
Out of band
2412 MHz Main

Cursor 1 9760.00 -31.00
Cursor 2 937.500 -26.70

Delta Freq. 8822.50
Delta Amplitude 4.30



Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A



Analyzer Settings

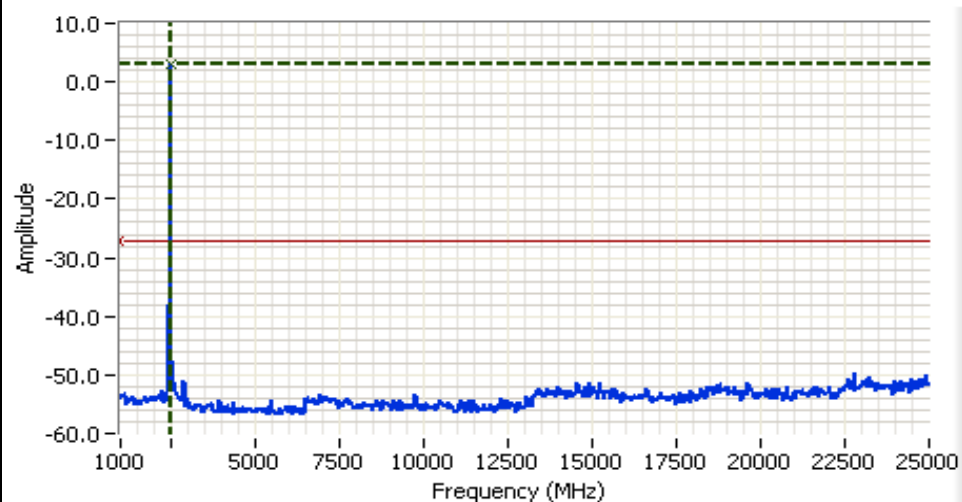
HP8563E
CF: 515.00 MHz
SPAN: 970.00 MHz
RB 100 kHz
VB 100 kHz
Detector POS
Att 30
RL Offset 1.00
Sweep Time 250.0ms
Ref Lvl: 16.50DBM

Comments

out of band
2412 MHz Aux

Cursor 1 141.146 -35.67
Cursor 2 24.948 -27.00

Delta Freq. 116.20
Delta Amplitude 8.67



Analyzer Settings

HP8563E
CF: 13000.00 MHz
SPAN: 24000.00 MHz
RB 100 kHz
VB 100 kHz
Detector POS
Att 30
RL Offset 1.00
Sweep Time 6.0s
Ref Lvl: 16.50DBM

Comments

out of band
2412 MHz Aux

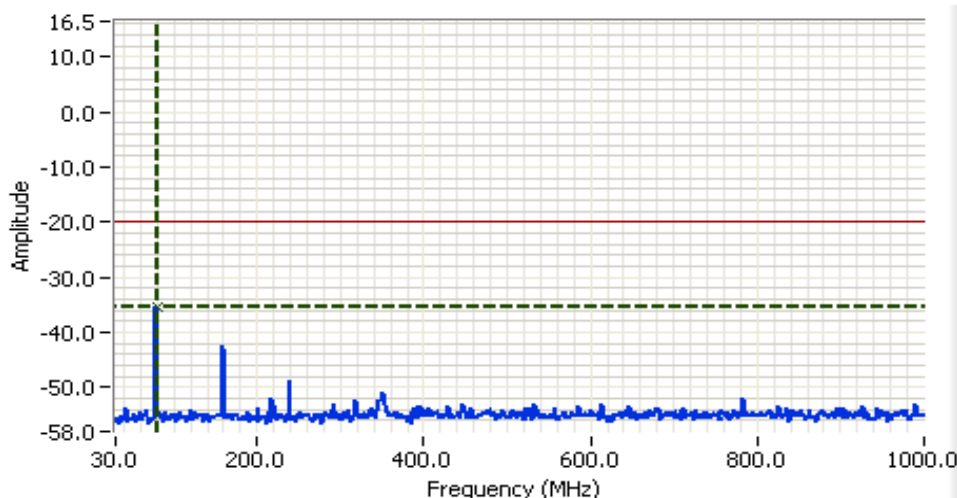
Cursor 1 2500.00 3.00
Cursor 2 937.500 -27.00

Delta Freq. 1562.50
Delta Amplitude 30.00



Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A

Plots for center channel, power setting(s) = 15.5dBm per chain (maximum in-band power setting)



Analyzer Settings

HP8563E
CF: 515.00 MHz
SPAN: 970.00 MHz
RB 100 kHz
VB 100 kHz
Detector POS
Att 30
RL Offset 1.00
Sweep Time 250.0ms
Ref Lvl: 16.50DBM

Comments

Out of Band
2437 MHz Main

Cursor 1 80.521 -35.50
Cursor 2 4.740 -20.00

Delta Freq. 75.78
Delta Amplitude 15.50



Analyzer Settings

HP8563E
CF: 13000.00 MHz
SPAN: 24000.00 MHz
RB 100 kHz
VB 100 kHz
Detector POS
Att 30
RL Offset 1.00
Sweep Time 6.0s
Ref Lvl: 16.50DBM

Comments

Out of Band
2437 MHz Main

Cursor 1 9840.00 -45.50
Cursor 2 937.500 -20.00

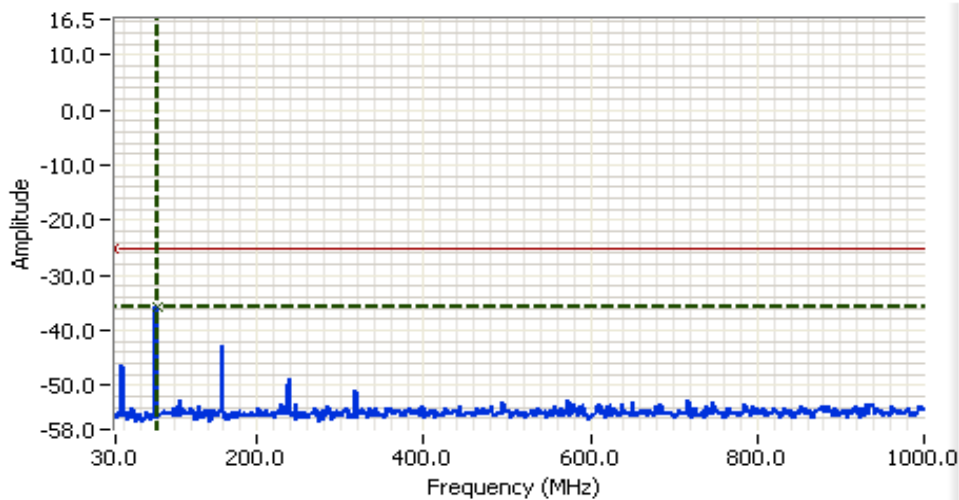
Delta Freq. 8902.50
Delta Amplitude 25.50





EMC Test Data

Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A



Analyzer Settings

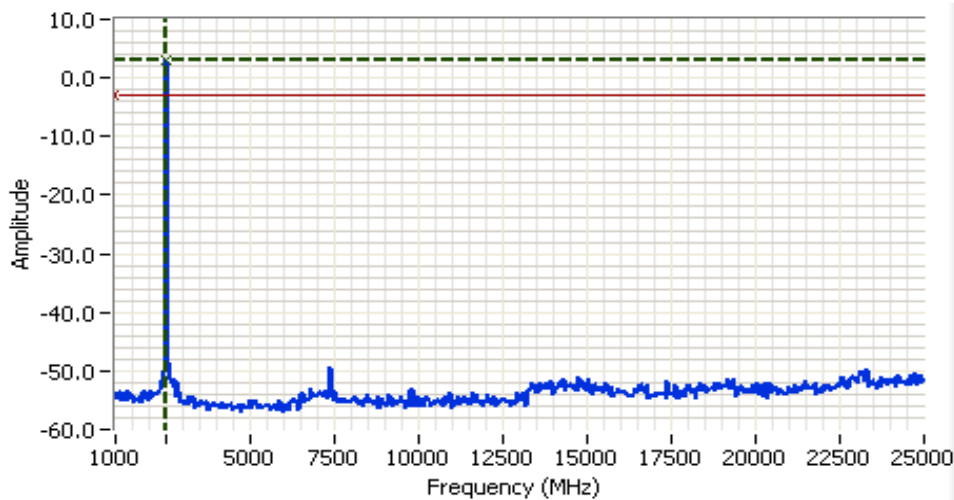
HP8563E
CF: 515.00 MHz
SPAN: 970.00 MHz
RB 100 kHz
VB 100 kHz
Detector POS
Att 30
RL Offset 1.00
Sweep Time 250.0ms
Ref Lvl: 16.50DBM

Comments

out of band
2437 MHz Aux

Cursor 1 80.521 -35.67
Cursor 2 27.474 -25.00

Delta Freq. 53.05
Delta Amplitude 10.67



Analyzer Settings

HP8563E
CF: 13000.00 MHz
SPAN: 24000.00 MHz
RB 100 kHz
VB 100 kHz
Detector POS
Att 30
RL Offset 1.00
Sweep Time 6.0s
Ref Lvl: 16.50DBM

Comments

out of band
2437 MHz Aux

Cursor 1 2500.000 3.00
Cursor 2 937.500 -3.00

Delta Freq. 1562.50
Delta Amplitude 6.00

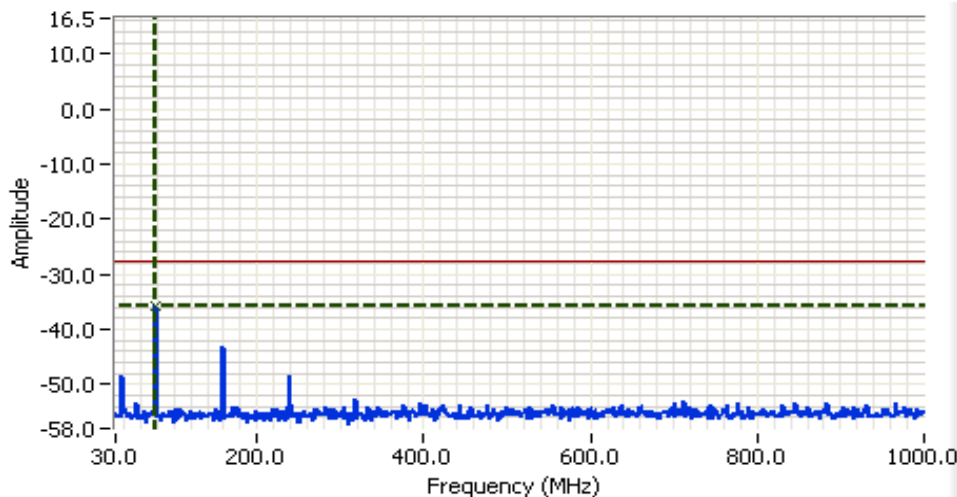




EMC Test Data

Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A

Plots for high channel, power setting(s) = 15.5dBm per chain (maximum in-band power setting)



Analyzer Settings

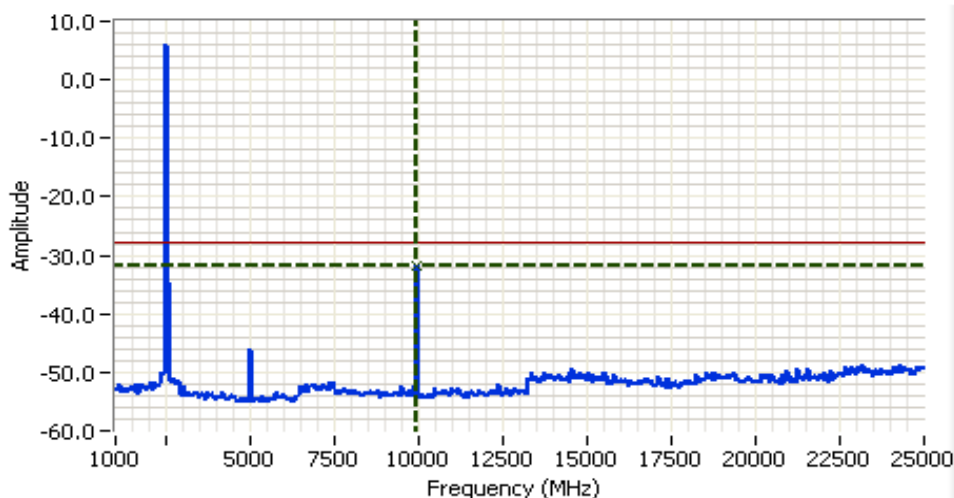
HP8563E
CF: 515.00 MHz
SPAN: 970.00 MHz
RB 100 kHz
VB 100 kHz
Detector POS
Att 30
RL Offset 1.00
Sweep Time 250.0ms
Ref Lvl: 16.50DBM

Comments

out of band
2462 MHz Main

Cursor 1 77.995 -35.67
Cursor 2 24.948 -27.67

Delta Freq. 53.05
Delta Amplitude 8.00



Analyzer Settings

HP8563E
CF: 13000.00 MHz
SPAN: 24000.00 MHz
RB 100 kHz
VB 100 kHz
Detector POS
Att 30
RL Offset 1.00
Sweep Time 6.0s
Ref Lvl: 16.50DBM

Comments

out of band
2462 MHz Main

Cursor 1 9960.00 -31.67
Cursor 2 875.000 -27.67

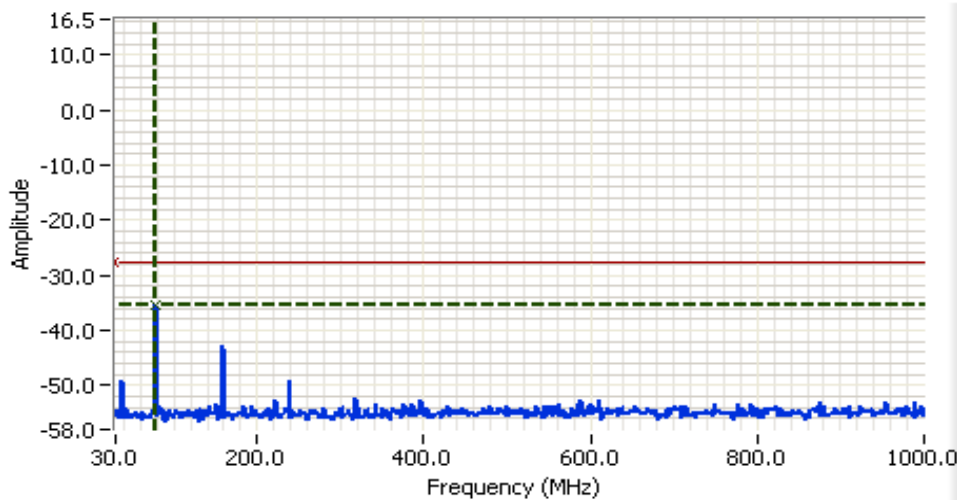
Delta Freq. 9085.00
Delta Amplitude 4.00





EMC Test Data

Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A



Analyzer Settings

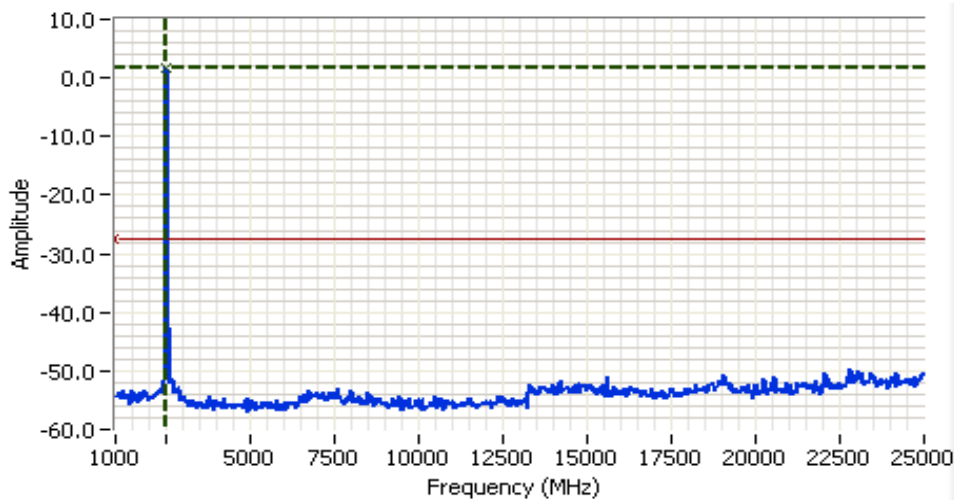
HP8563E
CF: 515.00 MHz
SPAN: 970.00 MHz
RB 100 kHz
VB 100 kHz
Detector POS
Att 30
RL Offset 1.00
Sweep Time 250.0ms
Ref Lvl: 16.50DBM

Comments

Out of Band
2462 MHz Aux

Cursor 1 77.995 -35.33
Cursor 2 27.474 -27.50

Delta Freq. 50.52
Delta Amplitude 7.83



Analyzer Settings

HP8563E
CF: 13000.00 MHz
SPAN: 24000.00 MHz
RB 100 kHz
VB 100 kHz
Detector POS
Att 30
RL Offset 1.00
Sweep Time 6.0s
Ref Lvl: 16.50DBM

Comments

Out of Band
2462 MHz Aux

Cursor 1 2520.00 1.67
Cursor 2 937.500 -27.50

Delta Freq. 1582.50
Delta Amplitude 29.17



Client:	Broadcom	Job Number:	J64973
Model:	BCM94321 MC New version	T-Log Number:	T64985
Contact:	David Boldy	Account Manager:	-
Standard:	FCC 15.247, 15.401, RSS-210	Class:	N/A

Plot for 40 MHz mode, center channel, confirming 20MHz mode is worst case. Power setting = 13dBm per chain

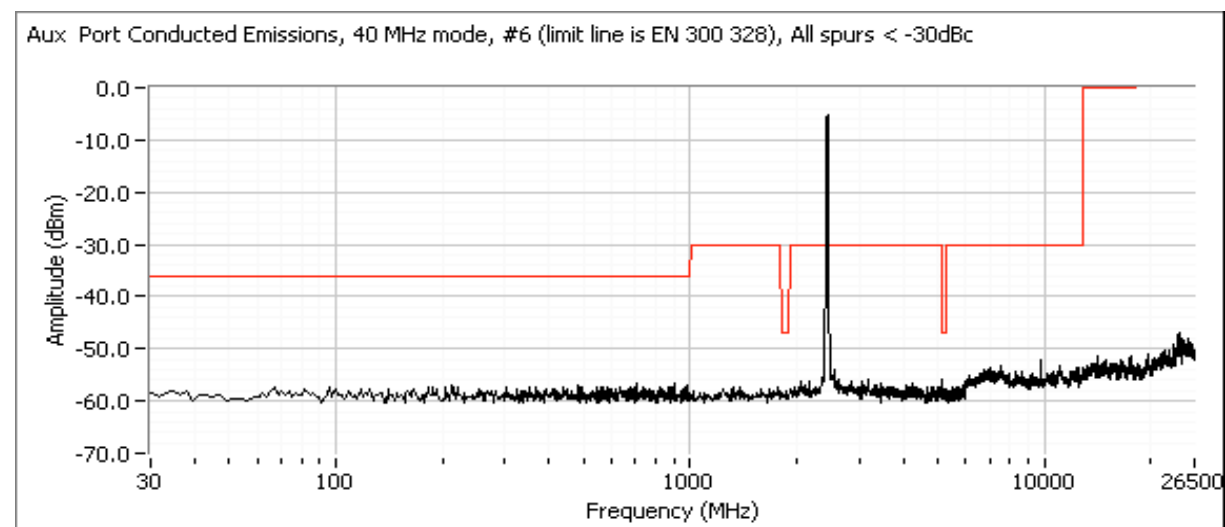
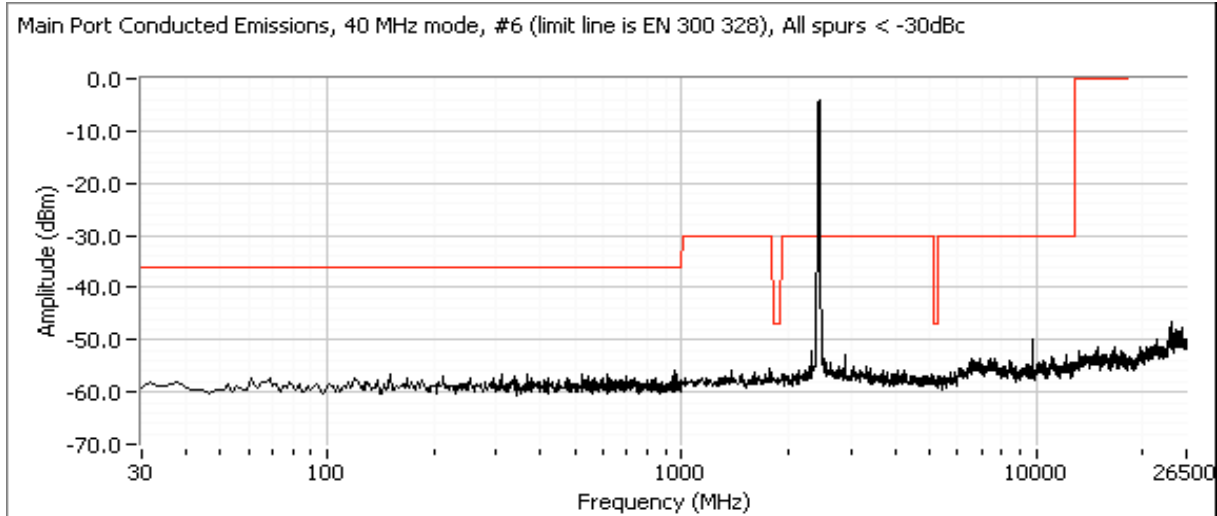


EXHIBIT 3: Photographs of Test Configurations

Pages

EXHIBIT 4: Proposed FCC ID Label & Label Location

Unchanged from previous application

**EXHIBIT 5: Detailed Photographs
of Broadcom Corporation Model BCM94321MCConstruction**

Unchanged from previous application

**EXHIBIT 6: Operator's Manual
for Broadcom Corporation Model BCM94321MC**

Unchanged from previous application

**EXHIBIT 7: Block Diagram
of Broadcom Corporation Model BCM94321MC**

Unchanged from previous application

**EXHIBIT 8: Schematic Diagrams
for Broadcom Corporation Model BCM94321MC**

Unchanged from previous application

**EXHIBIT 9: Theory of Operation
for Broadcom Corporation Model BCM94321MC**

Unchanged from previous application

EXHIBIT 10: Advertising Literature

Unchanged from previous application

EXHIBIT 11: RF Exposure Information

Unchanged from previous application