



Test Report: 4W08175


Applicant: BelAir Networks
603 March Road,
Ottawa Ont.
K2K 2M5

**Equipment Under Test:
(EUT)** B2CC001AA-E
BRM U-NII Band Radio Module

FCC ID: RAR20001002

In Accordance With: **FCC Part 15.401, Subpart E**

Tested By: Nemko Canada Inc.
303 River Road, R.R. 5
Ottawa, Ontario K1V 1H2



Authorized By: Kevin Carr, Wireless/EMC Specialist

Date: 26 August 2004

Total Number of Pages: 45

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EQUIPMENT: B2CC001AA-E

Section 1. Summary of Test Results

General

All measurements are traceable to national standards.

These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 15, Subpart E. Radiated tests were conducted in accordance with ANSI C63.4-1992. Radiated emissions are made on an open area test site. A description of the test facility is on file with the FCC.

THIS TEST REPORT RELATES ONLY TO THE ITEM(S) TESTED.

THE FOLLOWING DEVIATIONS FROM, ADDITIONS TO, OR EXCLUSIONS FROM THE TEST SPECIFICATIONS HAVE BEEN MADE.

See " Summary of Test Data".



TESTED BY: _____
Glen Westwell, Wireless Specialist.

DATE: 20 August 2004

Nemko Canada Inc., a testing laboratory, is accredited by the Standards Council of Canada. The tests included in this report are within the scope of this accreditation. The results apply only to the samples tested.

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This report applies only to the items tested.

EQUIPMENT: B2CC001AA-E

Summary Of Test Data

Name Of Test	Para. No.	Result
Powerline Conducted Emissions	15.207(a)	Complies
Emission Bandwidth	15.403(c)	Complies
Peak Conducted Transmit Power	15.407(a)(3)	Complies
Peak Power Spectral Density	15.407(a)(3)	Complies
Peak Excursion Measurement	15.407(a)(6)	Complies
Undesirable Emissions	15.407(b)(3)(5)	Complies

Note: The power line conducted emissions were performed with the BRM radio module integrated into the BA100 host unit.

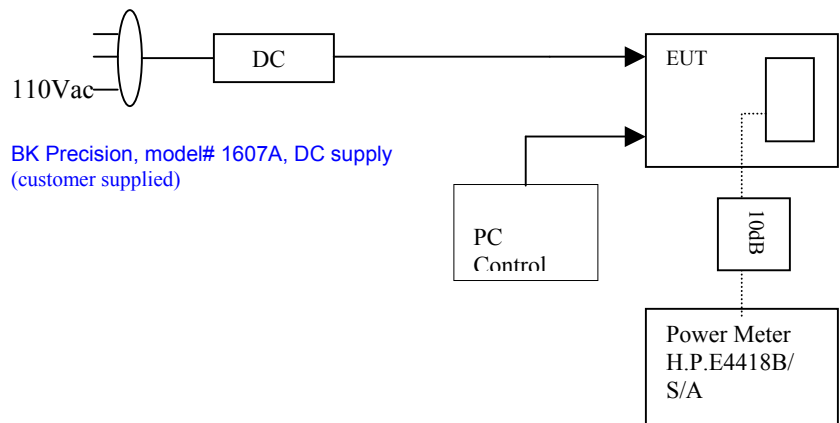
Test Conditions:

Indoor Temperature: 22°C
 Humidity: 36%

Outdoor Temperature: 23°C
 Humidity: 40%

Test Configuration:

The worst case data has been presented, maximum power and data rates.



EQUIPMENT: B2CC001AA-E

Section 2. General Equipment Specification

Manufacturer: BelAir Networks Inc.

Model No.: B2CC001AA-E

Serial No.: K000759584

Date Received In Laboratory: 20 July 2004

Nemko Identification No.: #1

Frequency Band: 5250-5350MHz
5725-5825MHz

Operating Frequency(ies) of DUT: TX: 5265-5335MHz
TX: 5740-5810MHz

Transmit Power (Rated): 5250-5350MHz = +14dBm
5725-5825MHz = +17dBm

Data Rates: 802.11a - 6,9,12,18,24,36,48&54 Mbps

Antenna Gain (integral): 15dBi, 12dBi & 10dBi, panel antenna(s)

EQUIPMENT: B2CC001AA-E

Section 3. RF Exposure Evaluation

- (1) This U-NII Band radio module will be integrated into an enclosure with FCC approved 2.4GHz access radio module FCC ID# RAR20000001. Co-location compliance for multiple frequency exposure criteria to the power density exposure limit is detailed in the table below for the BA100.
- (2) The antenna(s) used with this device and will be installed to provide a minimum separation distance of 20cm from all persons for indoor operation, and will not be co-located or operated in conjunction with any other antenna or transmitter not described in this application. This is a fixed installation device.
- (3) This integrated modular transmitter will only be operated according to the exposure conditions described in this application. End users and installers will be provided with antenna installation and transmitter operating conditions for satisfying RF exposure compliance.

802.11b FCC I.D.# RAR20000001 (mW/cm ²)	802.11a FCC I.D.# RAR20001002 (mW/cm ²)	Sum of Worst Case Power Density at 20cm (mW/cm ²)	General Exposure Limit (mW/cm ²)	
Radio 1	Radio 2			
0.5966	0.3153	0.9119	1.0	PASS

Note:

The 802.11a radio power density was calculated using worst case data of +17dBm conducted power into a 15dBi gain antenna.

EQUIPMENT: B2CC001AA-E

Section 4. Powerline Conducted Emissions

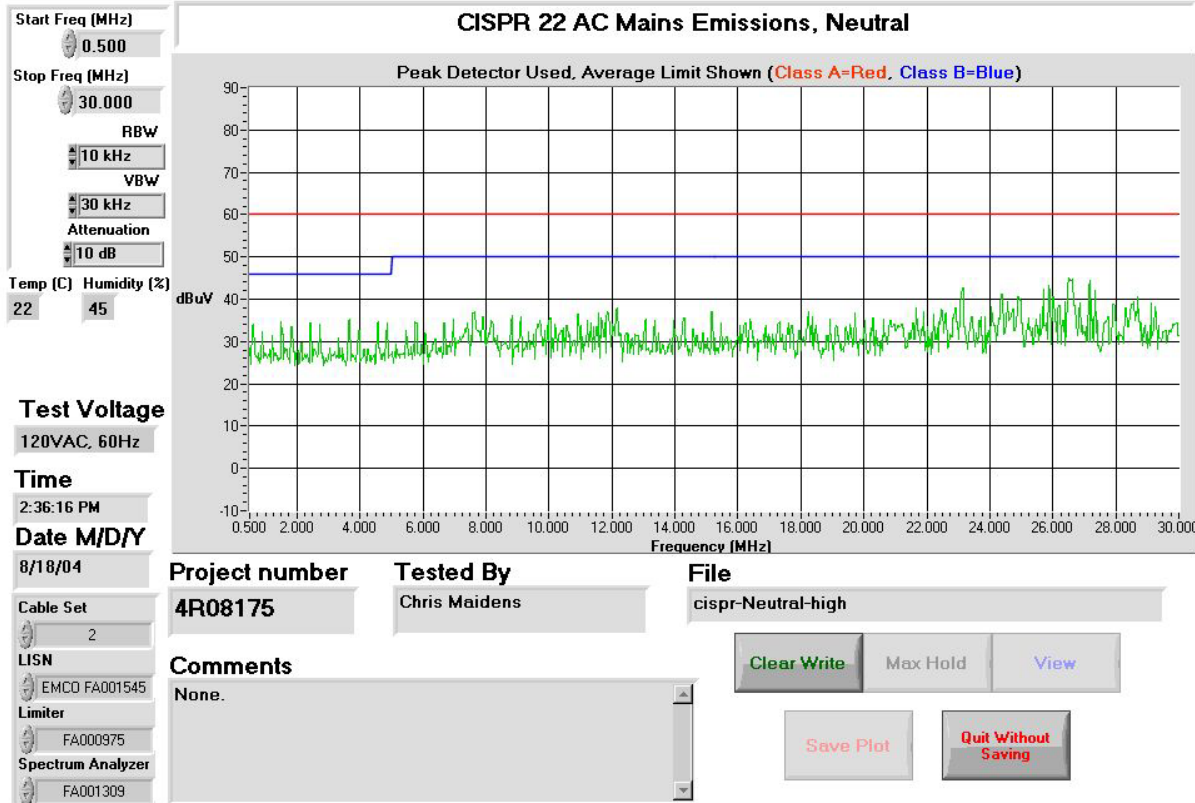
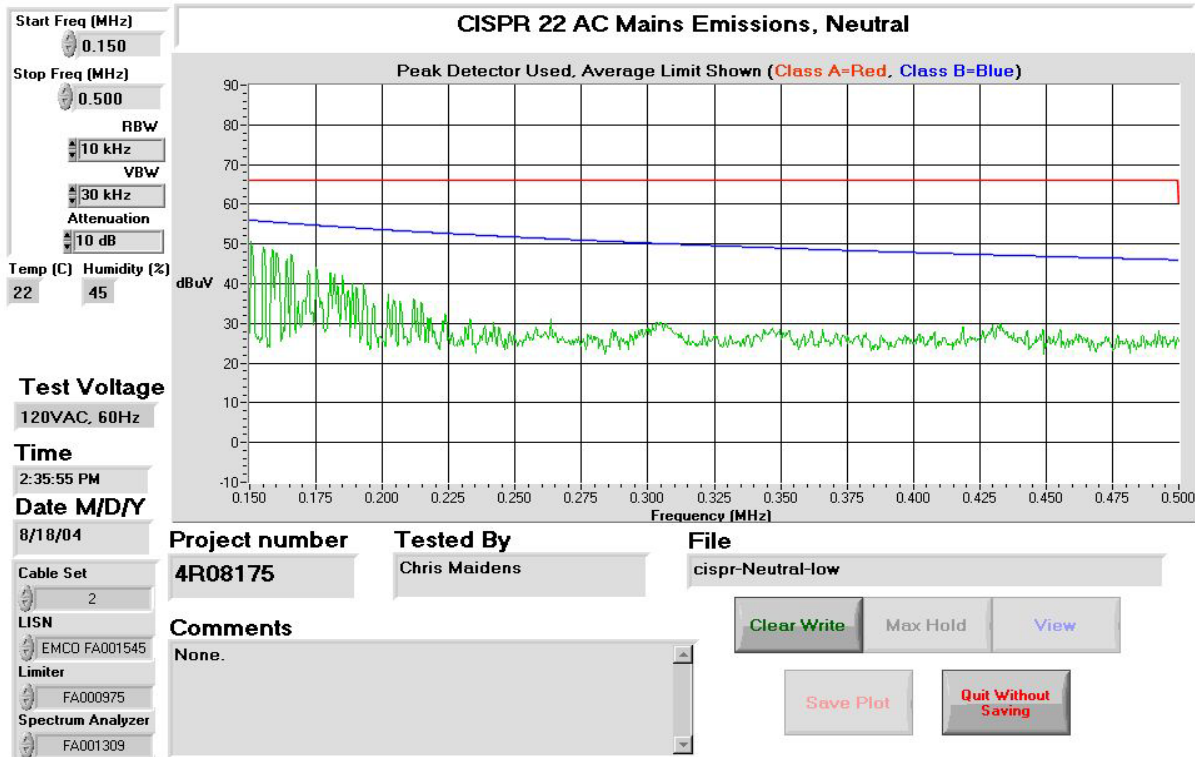
Para. No.: 15.207(a)

Test Performed By: Chris Maidens	Date of Test: 18 Aug. 2004
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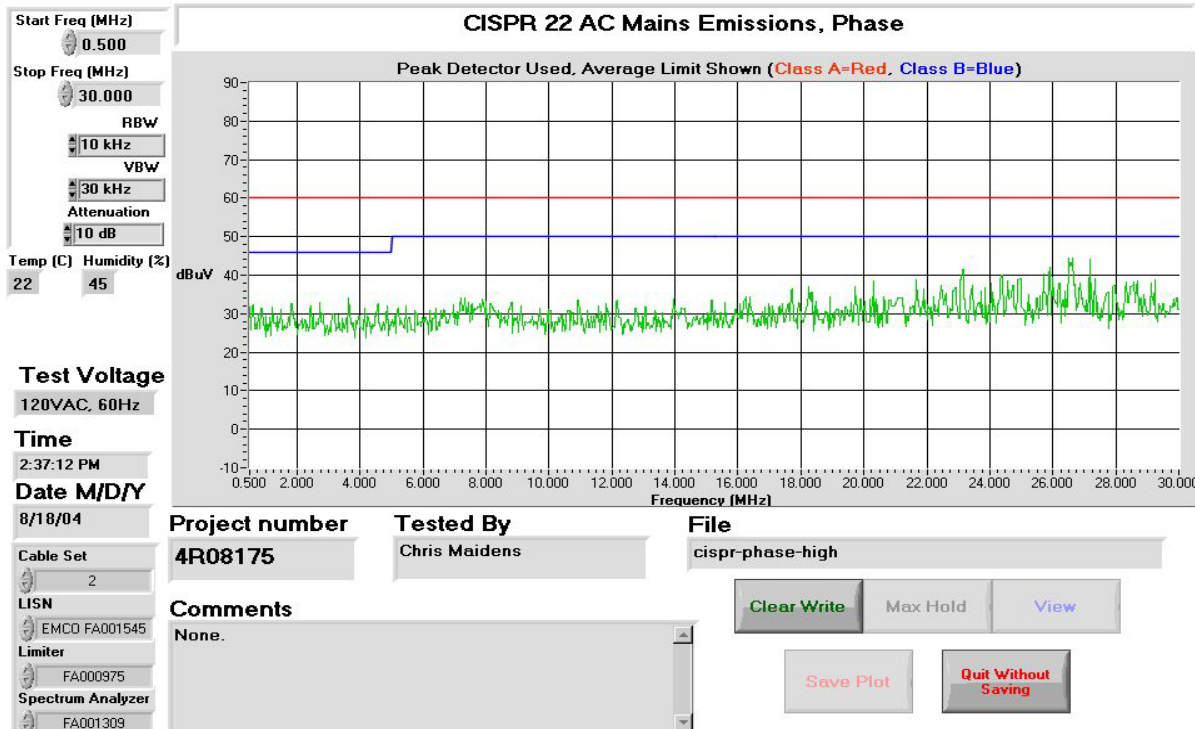
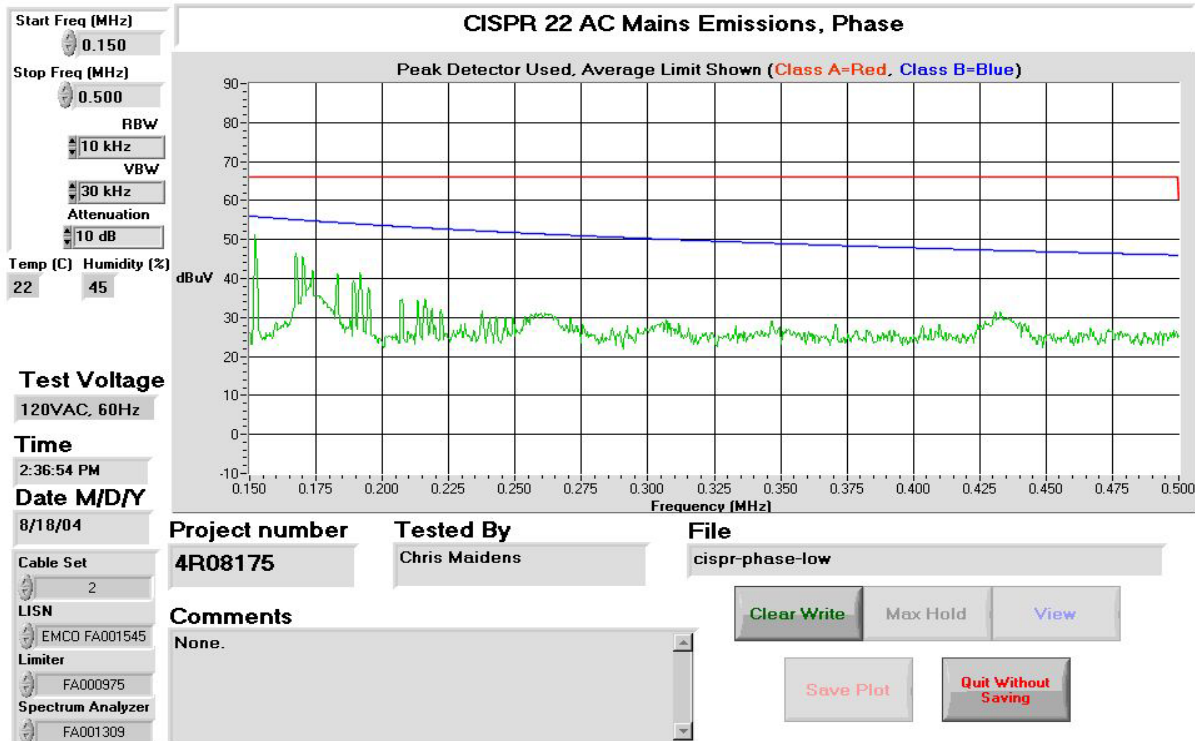
Test Results: Complies.

Measurement Data: See Attached Graphs.

EQUIPMENT: B2CC001AA-E



EQUIPMENT: B2CC001AA-E



EQUIPMENT: B2CC001AA-E

Set Up Photo.



EQUIPMENT: B2CC001AA-E

Section 5. Emission Bandwidth

Para. No.: 15.403(c)

Test Performed By: Glen Westwell	Date of Test: 17 Aug. 2004
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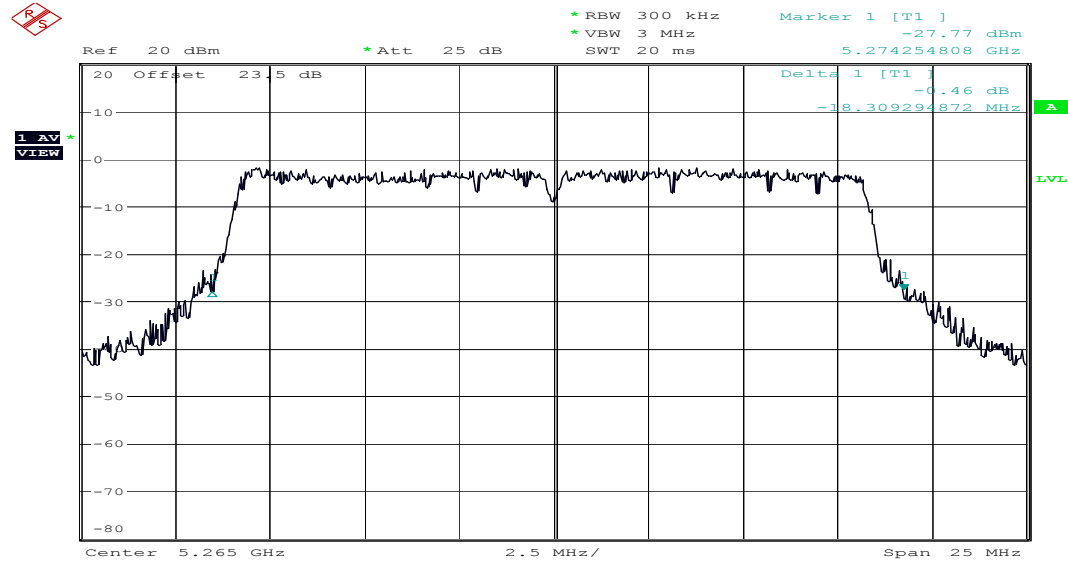
Test Results: Complies

Measurement Data: See Attached Plots.

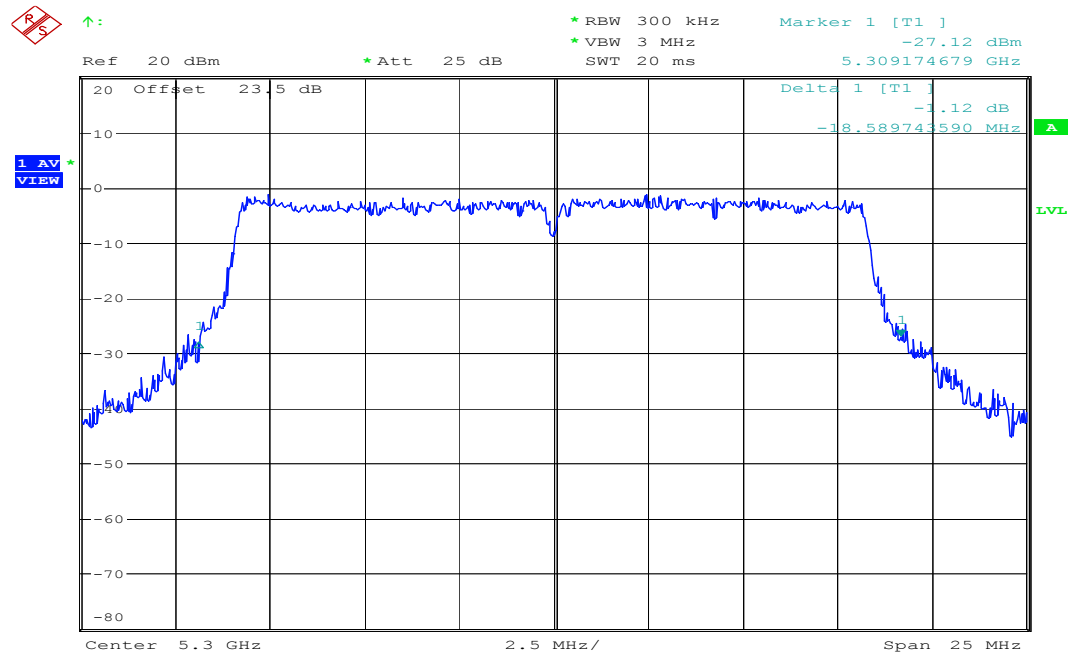
Emission Bandwidth (EBW)			
Frequency (U-NII 2)	5265MHz	5300MHz	5335MHz
	18.3MHz	18.6MHz	18.2MHz
Frequency (U-NII 3)	5740MHz	5775MHz	5810MHz
	18.3MHz	18.3MHz	18.4MHz

EQUIPMENT: B2CC001AA-E

U-NII Band 5.25-5.35GHz

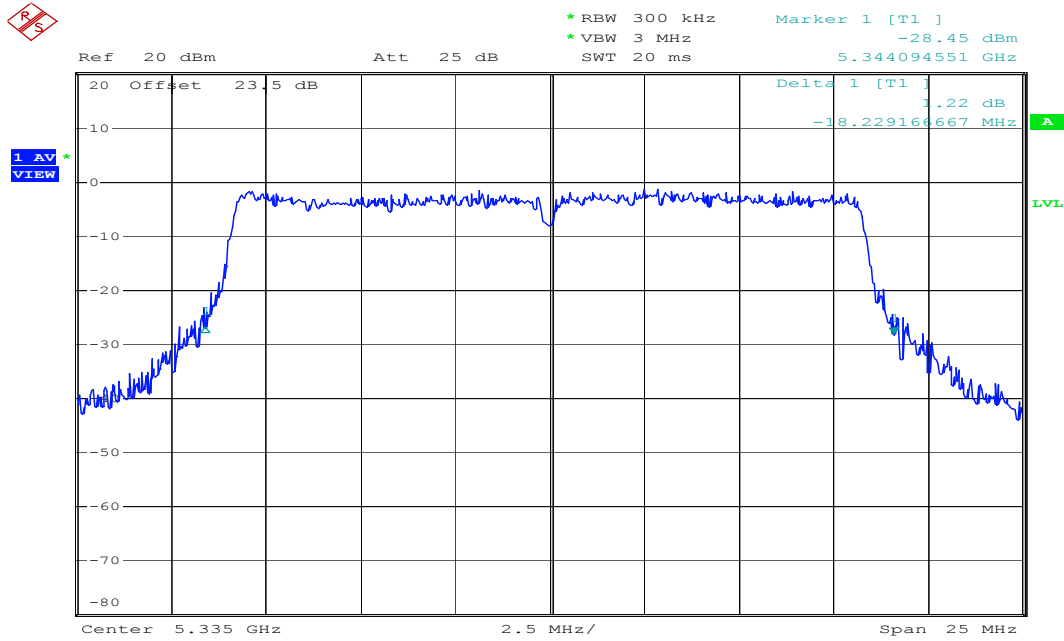


OCC BW
Date: 17.AUG.2004 21:58:39



OCC BW
Date: 17.AUG.2004 22:23:00

EQUIPMENT: B2CC001AA-E

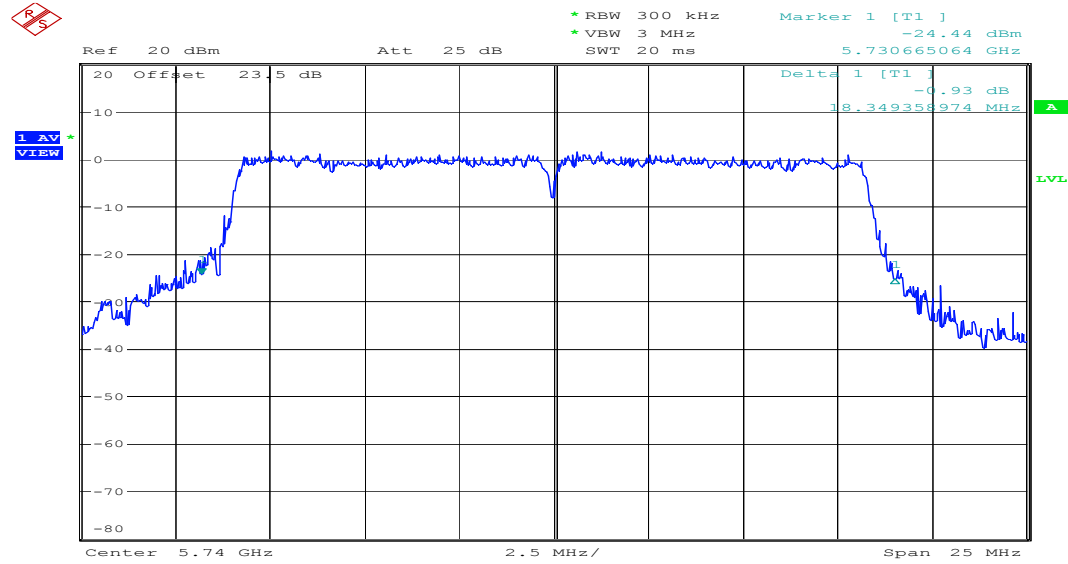


OCC BW

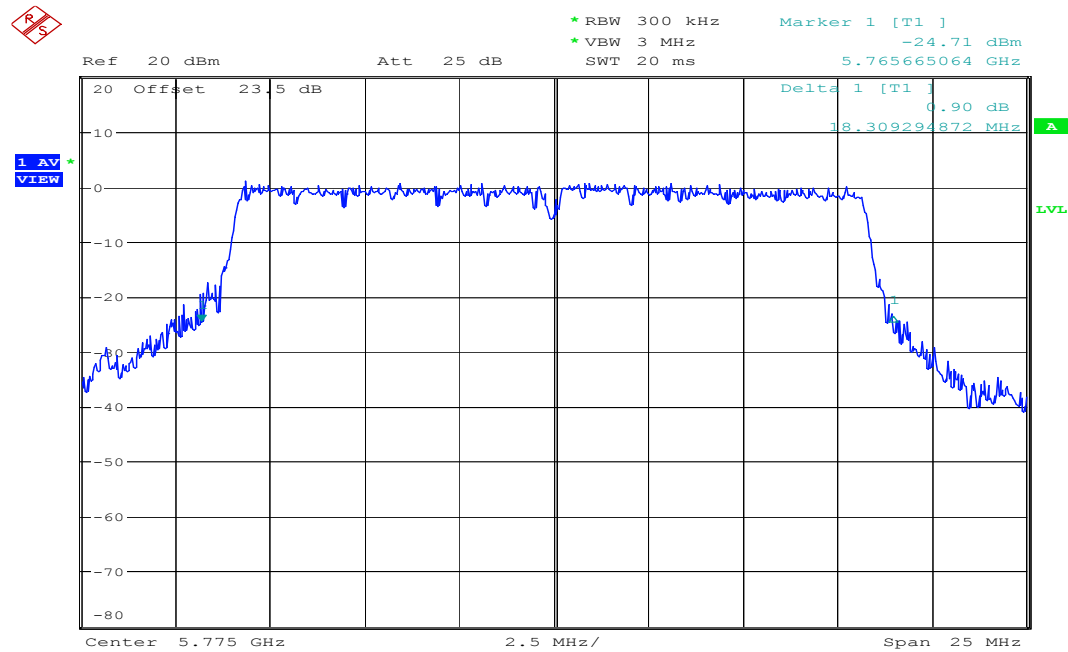
Date: 17.AUG.2004 22:30:00

EQUIPMENT: B2CC001AA-E

U-NII Band 5.725-5.825GHz

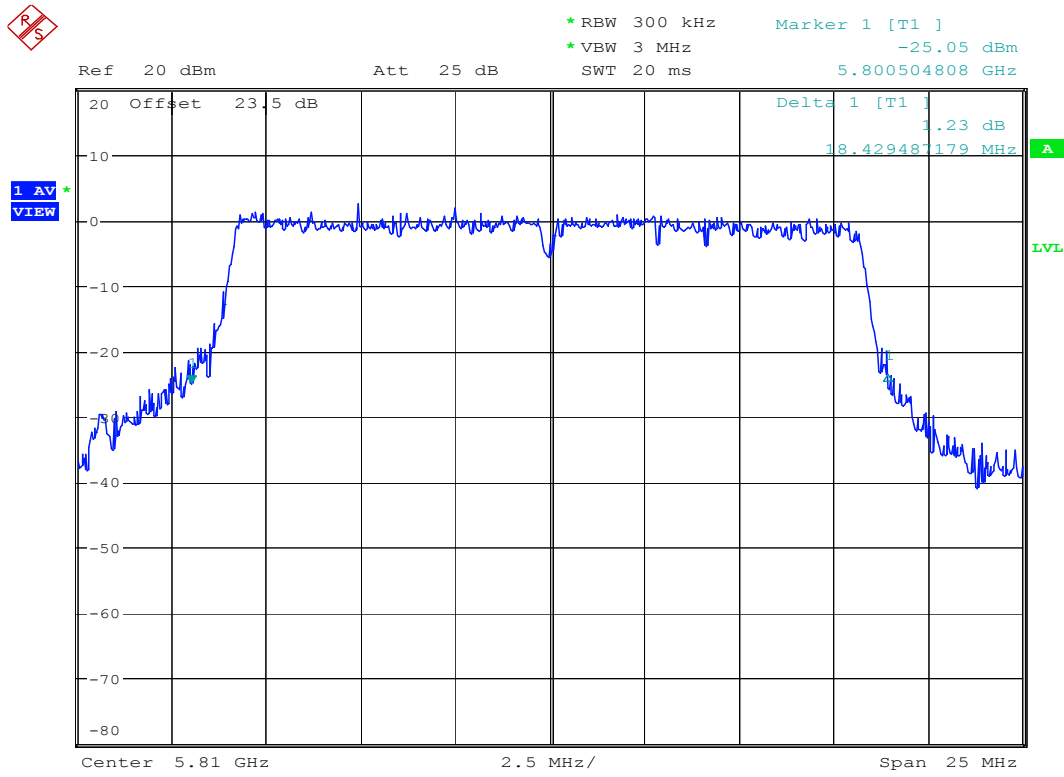


OCC BW
Date: 17.AUG.2004 22:32:35



OCC BW
Date: 17.AUG.2004 22:35:26

EQUIPMENT: B2CC001AA-E



OCC BW

Date: 17.AUG.2004 22:37:22

EQUIPMENT: B2CC001AA-E

Section 6. Peak Conducted Transmit Power

Para. No.: 15.407(a)(2)(3),

Test Performed By: Glen Westwell	Date of Test: 17 Aug. 2004
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Test Results: Complies.

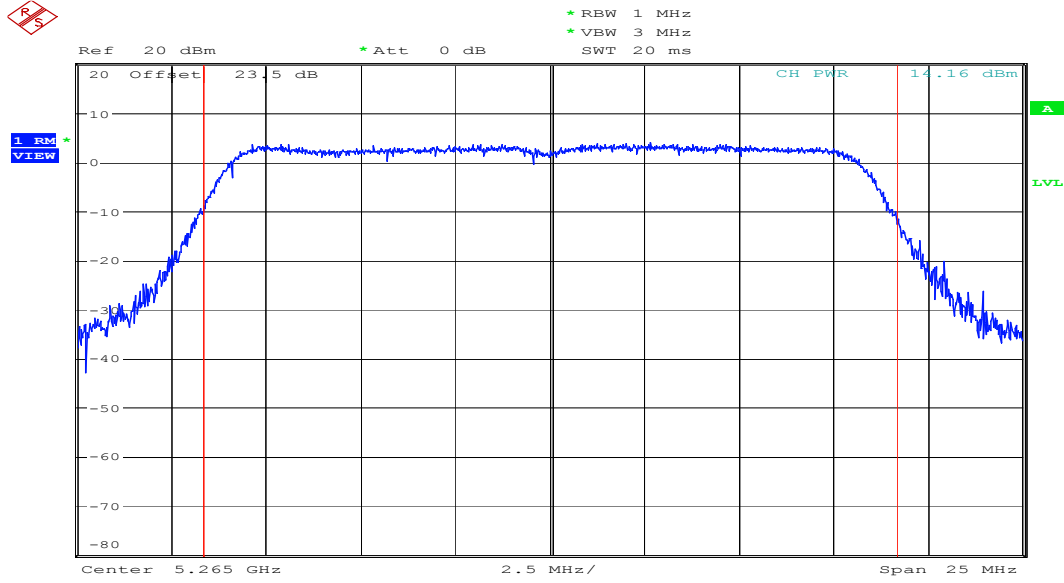
Measurement Data: See Attached Data
Worst case data has been presented for maximum power vs data rate.

Ref: DA 02-2138 Method 1.

15.407 General Technical Requirements – Peak Transmit Power		
U-NII Band 2 (MHz)	Measured Across EBW (dBm)	Limit (dBm)
5265	14.2	24
5300	14.3	24
5335	14.3	24
U-NII Band 3 (MHz)	Measured Across EBW (dBm)	Limit (dBm)
5740	16.9	30
5775	16.7	30
5810	16.6	30

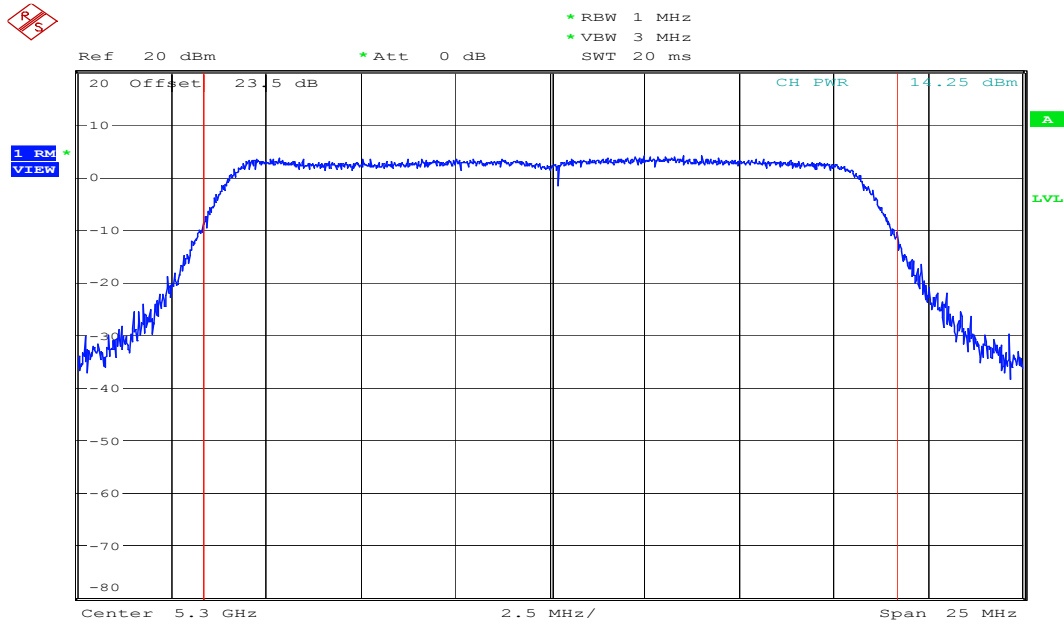
EQUIPMENT: B2CC001AA-E

U-NII 2



OCC BW

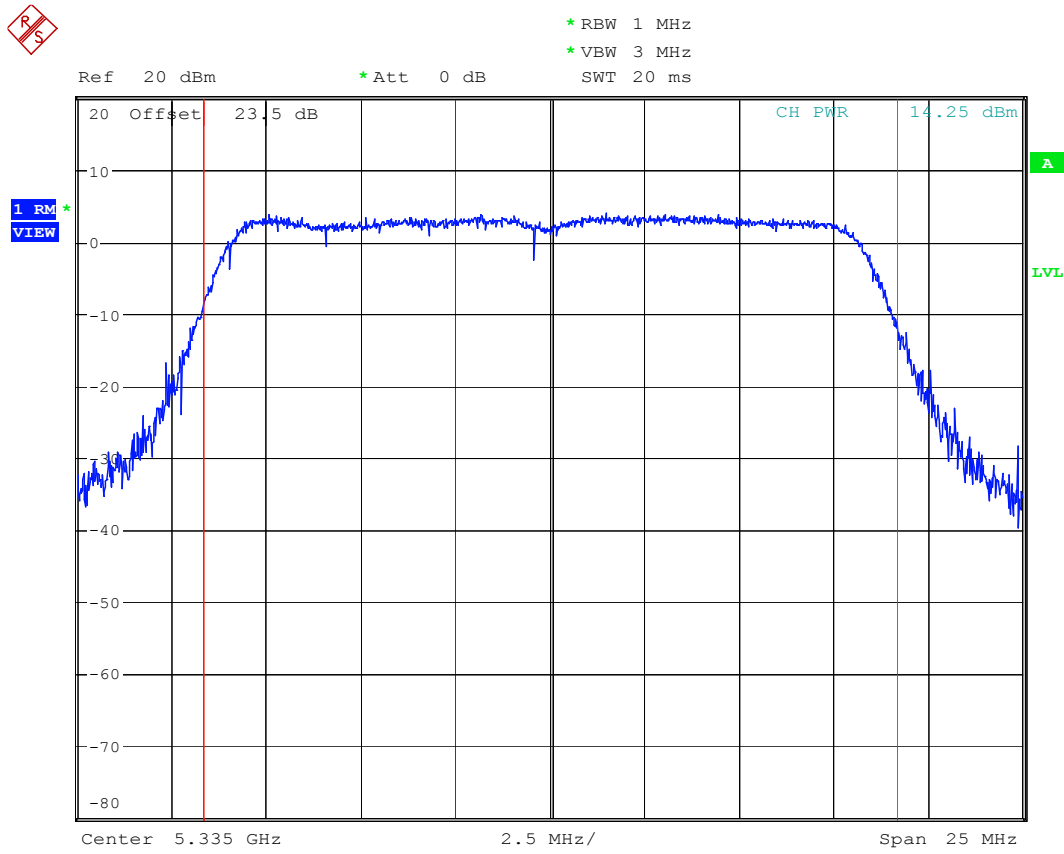
Date: 17.AUG.2004 23:04:35



OCC BW

Date: 17.AUG.2004 23:06:56

EQUIPMENT: B2CC001AA-E

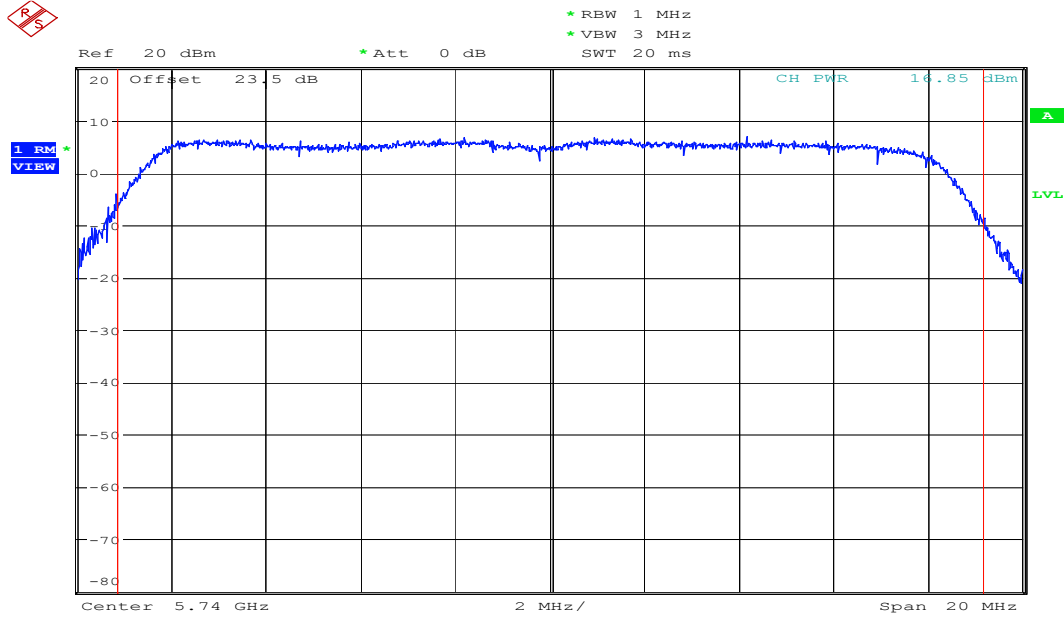


OCC BW

Date: 17.AUG.2004 23:09:08

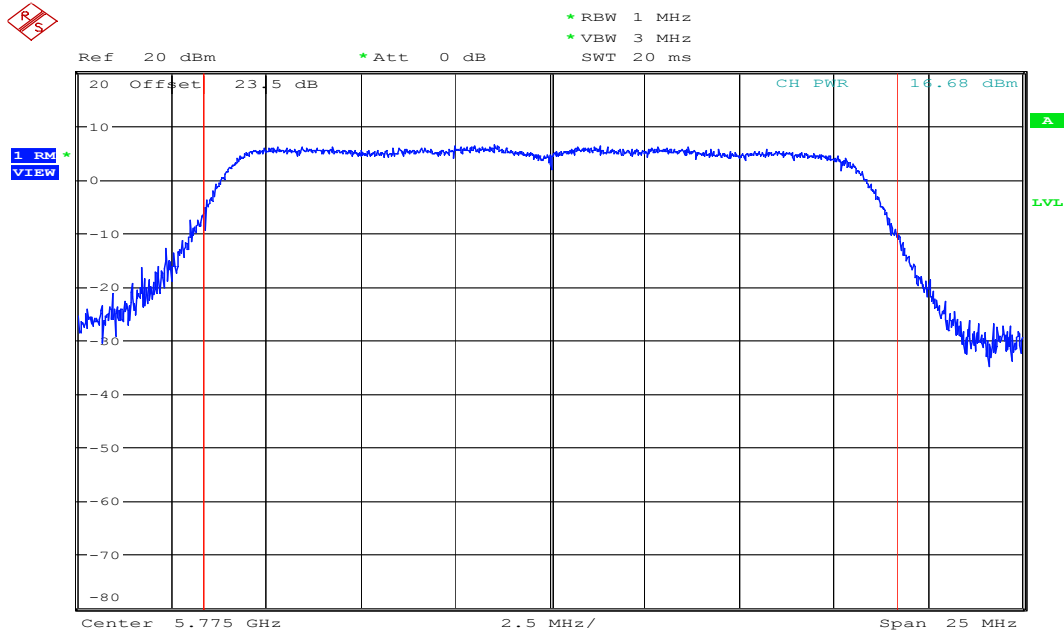
EQUIPMENT: B2CC001AA-E

U-NII 3



OCC BW

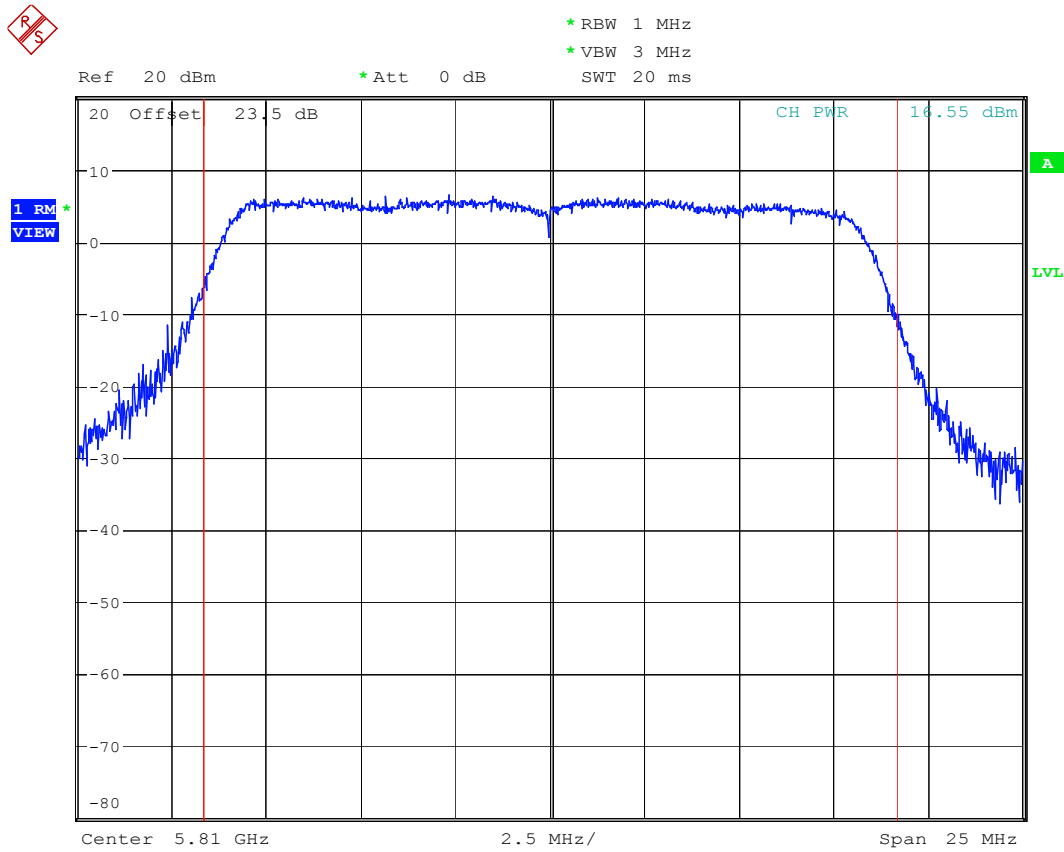
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OCC BW

Date: 17.AUG.2004 23:18:21

EQUIPMENT: B2CC001AA-E



OCC BW

Date: 17.AUG.2004 23:19:26

EQUIPMENT: B2CC001AA-E

Section 7. Peak Power spectral density

Para. No.: 15.407(a)(2)(3)

Test Performed By: Glen Westwell	Date of Test: 18 Aug. 2004
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Limit: 5.25-5.35GHz, U-NII 2 = +11dBm/MHz
5.725-5.825GHz, U-NII 3 = +17dBm/MHz

Test Results: Complies.

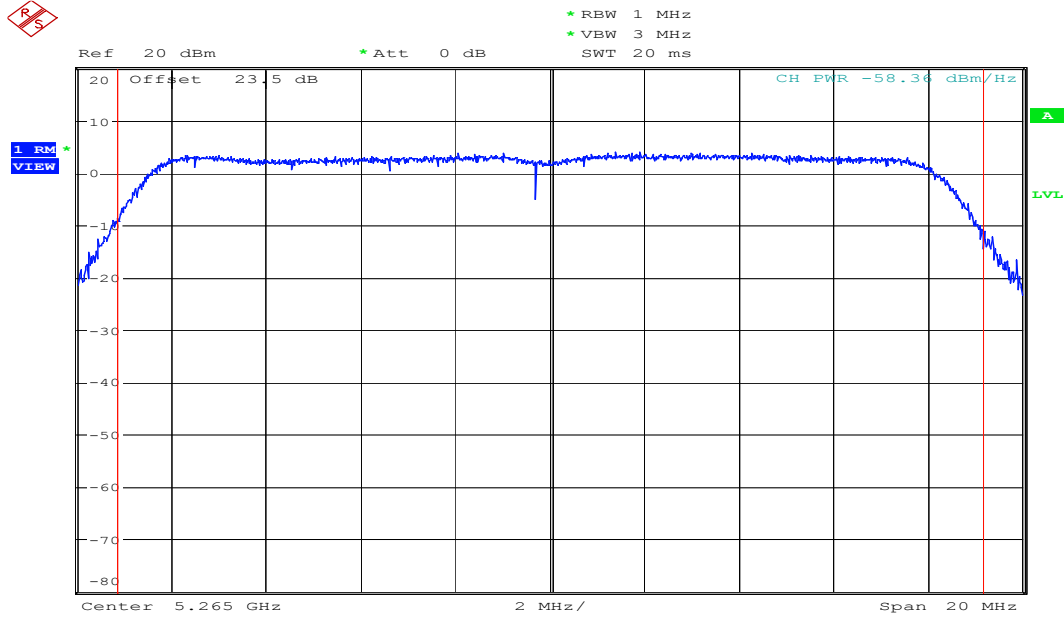
Measurement Data: See attached plots.

Ref: DA 02-2138 Method 2.

PPSD Measurements		
Frequency (MHz)	Density (dBm/Hz)	Density (dBm/MHz)
5265	-58.4	1.6
5300	-58.1	1.9
5335	-58.3	1.7
5740	-55.6	4.4
5775	-56.0	4.0
5810	-56.1	3.9

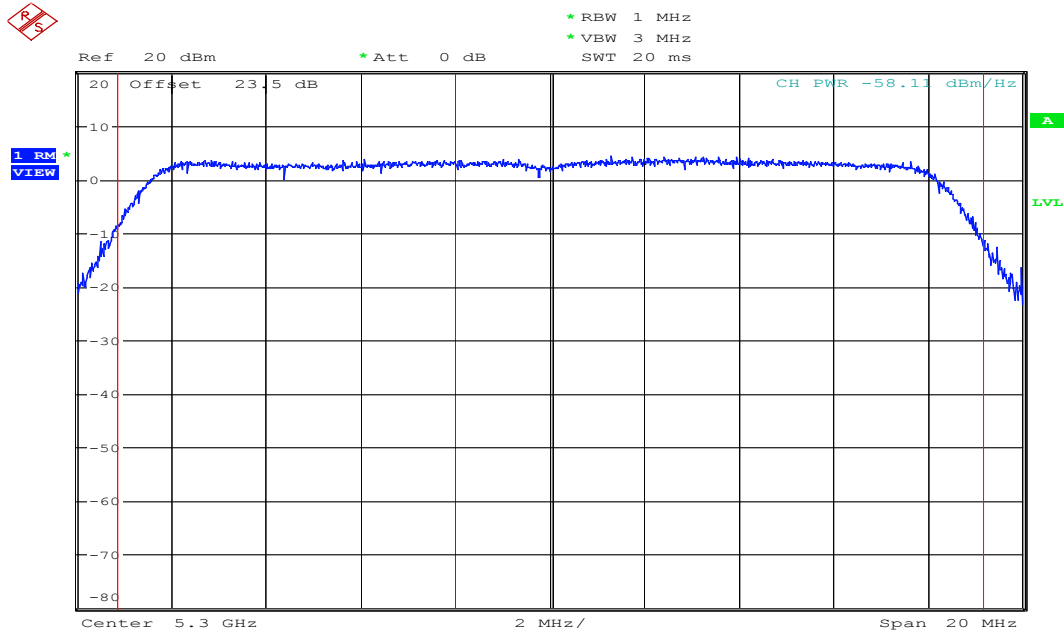
EQUIPMENT: B2CC001AA-E

U-NII 2



OCC BW

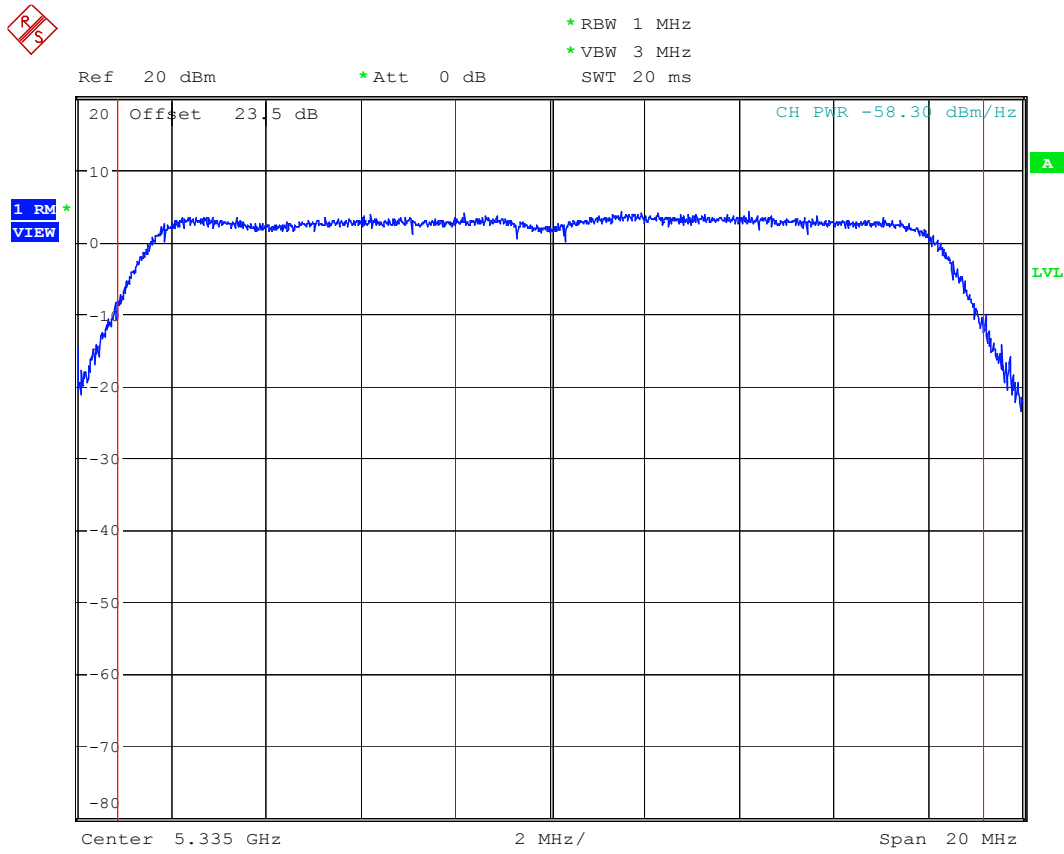
Date: 17.AUG.2004 23:25:21



OCC BW

Date: 17.AUG.2004 23:26:40

EQUIPMENT: B2CC001AA-E

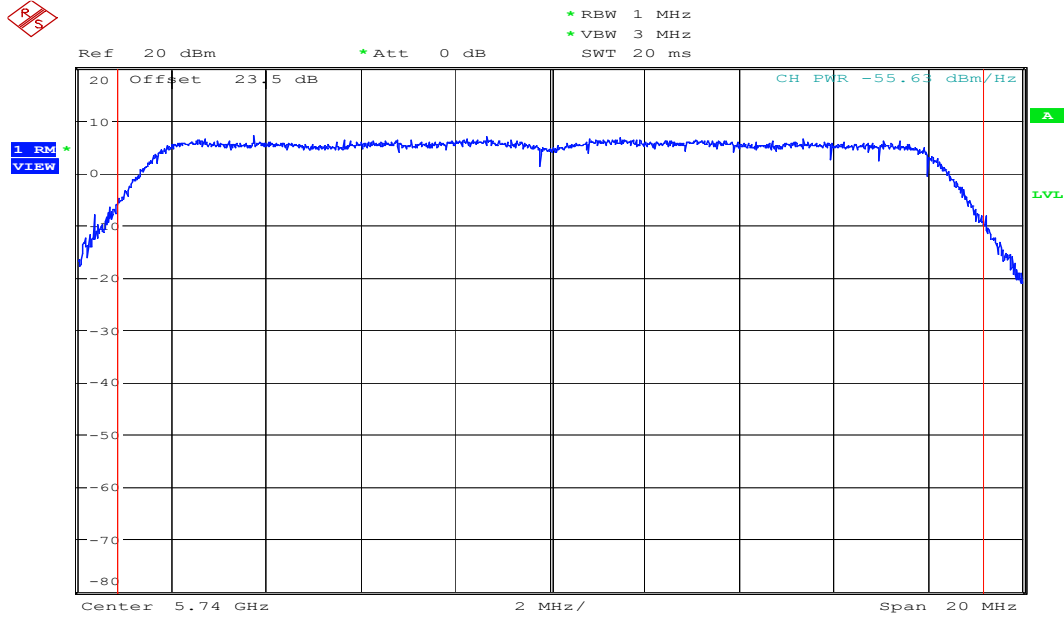


OCC BW

Date: 17.AUG.2004 23:28:12

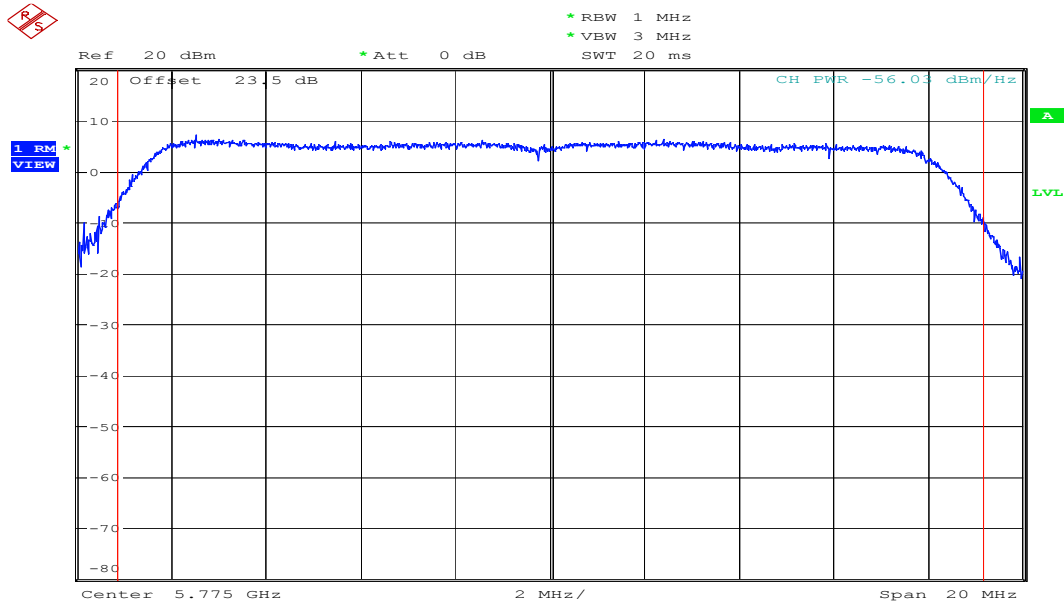
EQUIPMENT: B2CC001AA-E

U-NII 3



OCC BW

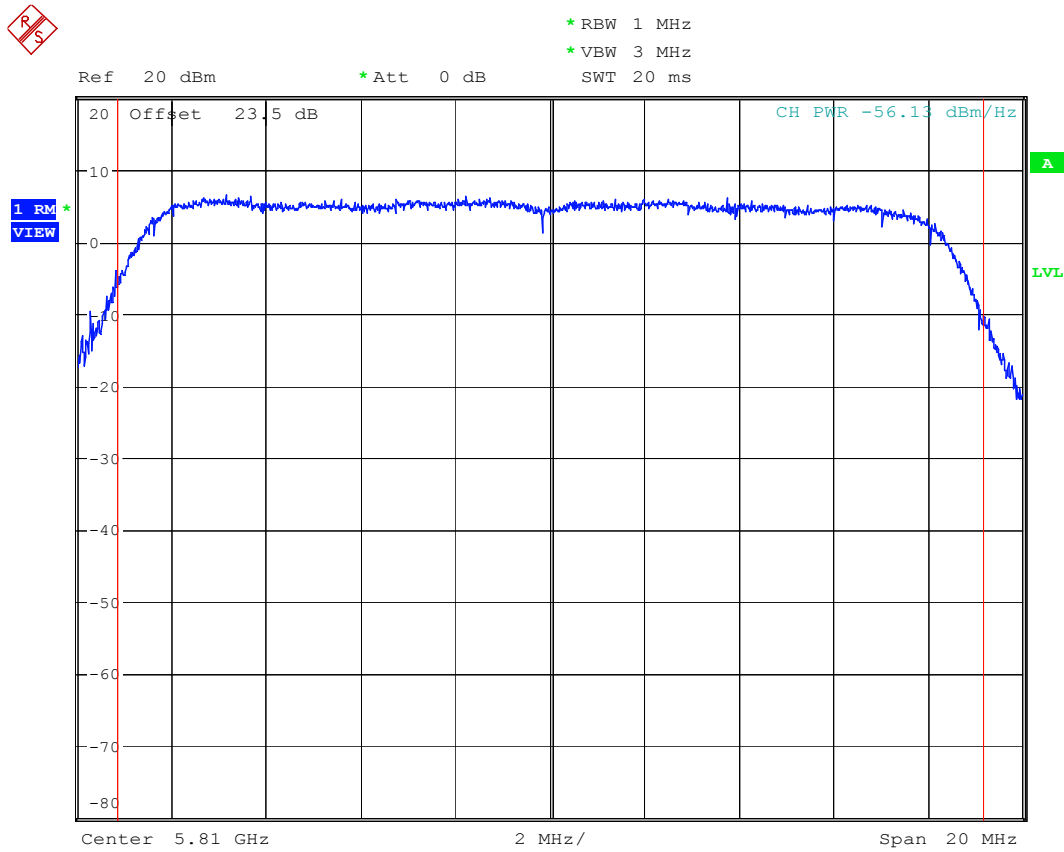
Date: 17.AUG.2004 23:30:07



OCC BW

Date: 17.AUG.2004 23:31:38

EQUIPMENT: B2CC001AA-E



OCC BW

Date: 17.AUG.2004 23:37:18

EQUIPMENT: B2CC001AA-E

Section 8. Peak Excursion Measurement

Para. No.: 15.407(a)(6)

Test Performed By: Glen Westwell	Date of Test: 18 Aug.2004
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Limit: ≤+13dB

Test Results: Complies

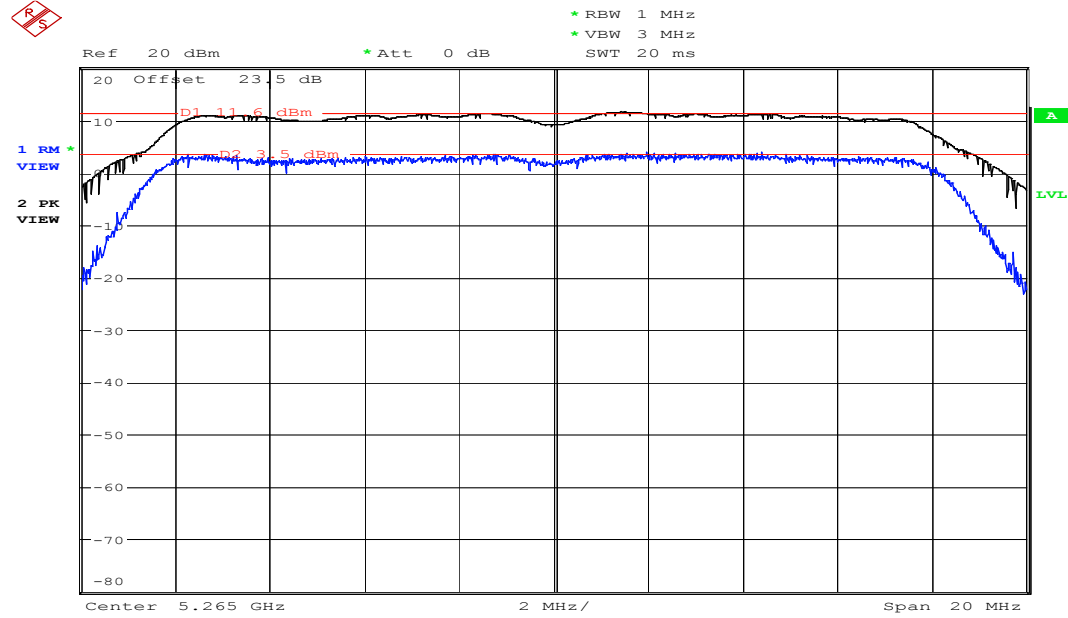
Measurement Data: See attached plots.

Ref: DA 02-2138.

Frequency (MHz)	Modulation Envelope Peak Excursion Ratio (dB)	Limit (dB)
5265	8.1	13
5300	8.2	13
5335	8.6	13
5740	8.1	13
5775	8.0	13
5810	7.9	13

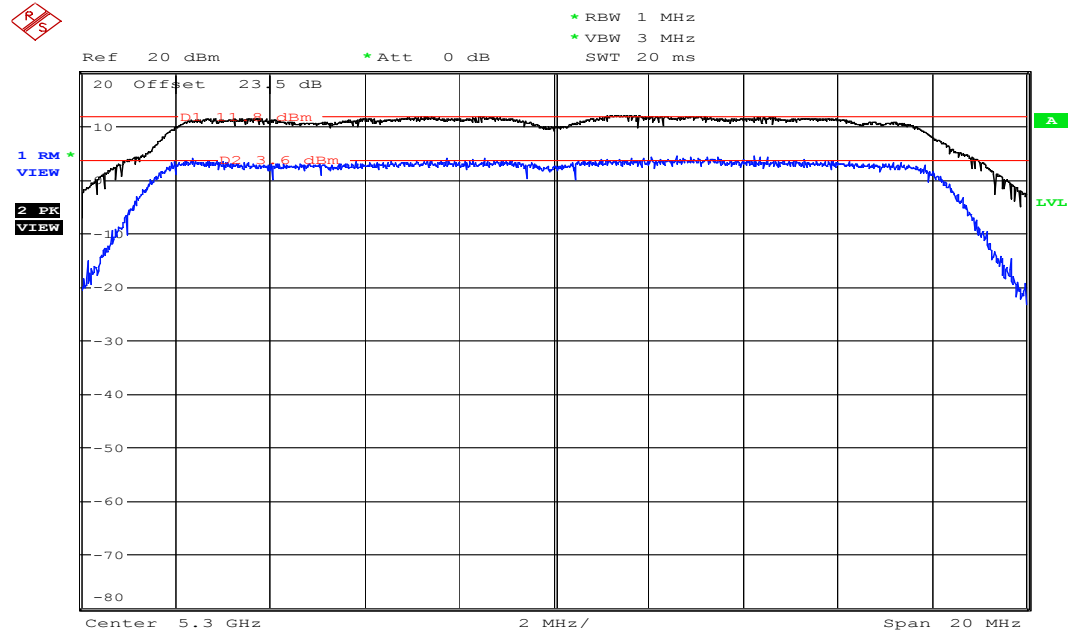
EQUIPMENT: B2CC001AA-E

U-NII 2



OCC BW

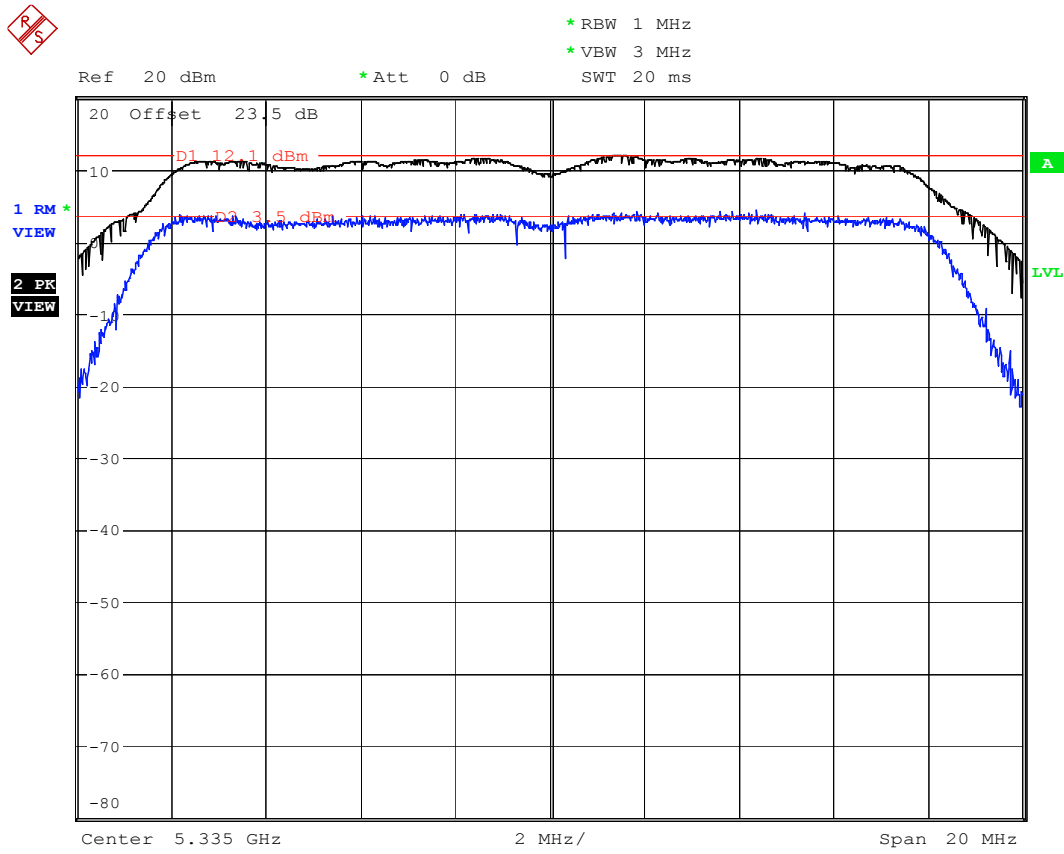
Date: 18.AUG.2004 00:08:55



OCC BW

Date: 18.AUG.2004 00:10:55

EQUIPMENT: B2CC001AA-E

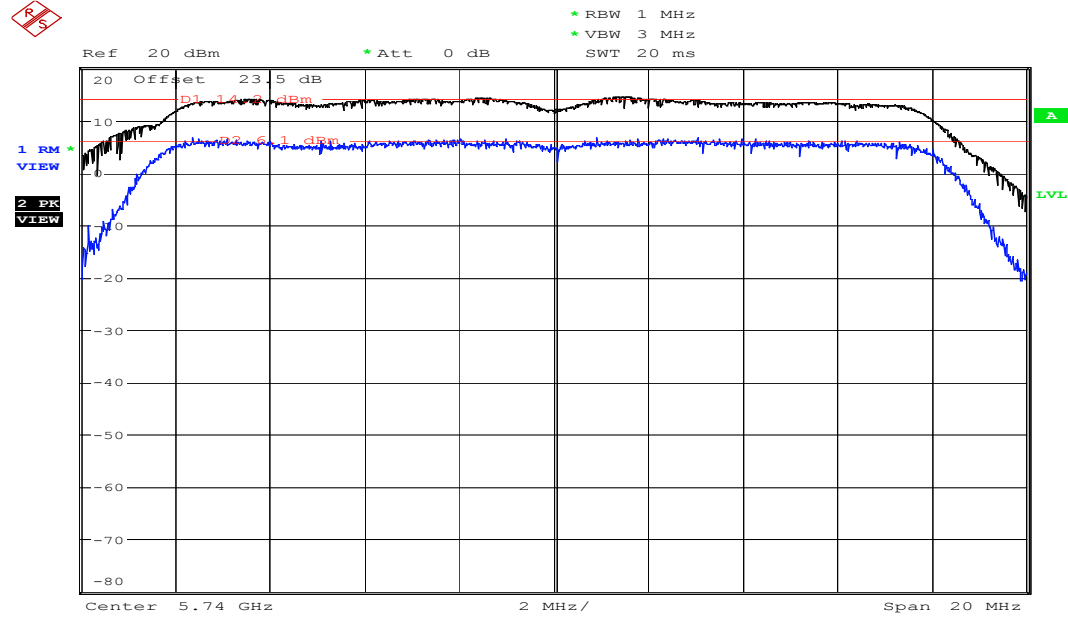


OCC BW

Date: 18.AUG.2004 00:13:25

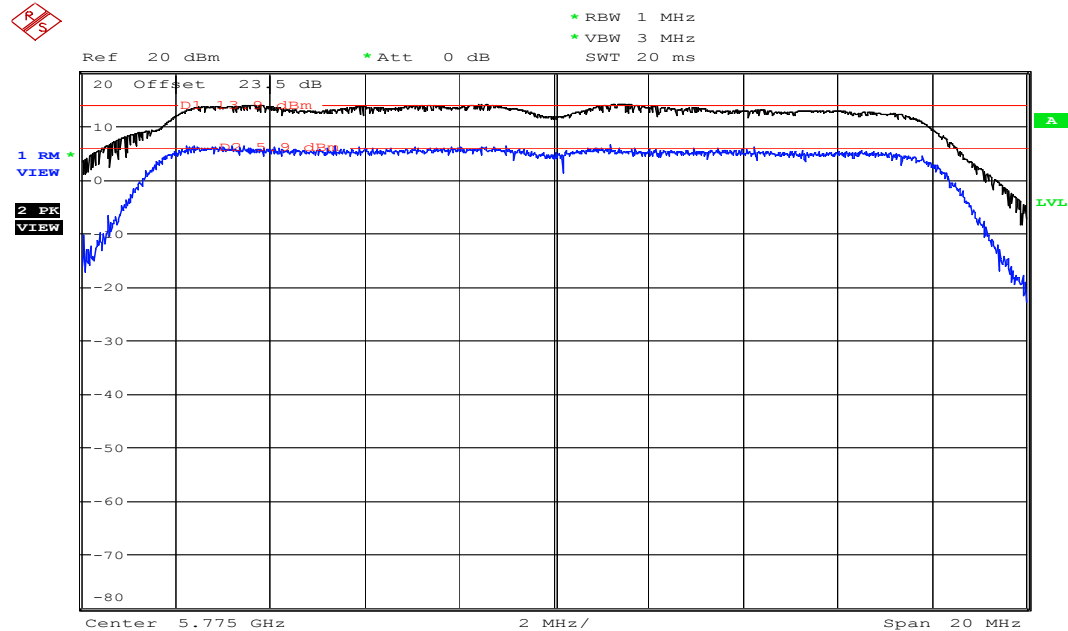
EQUIPMENT: B2CC001AA-E

U-NII 3



OCC BW

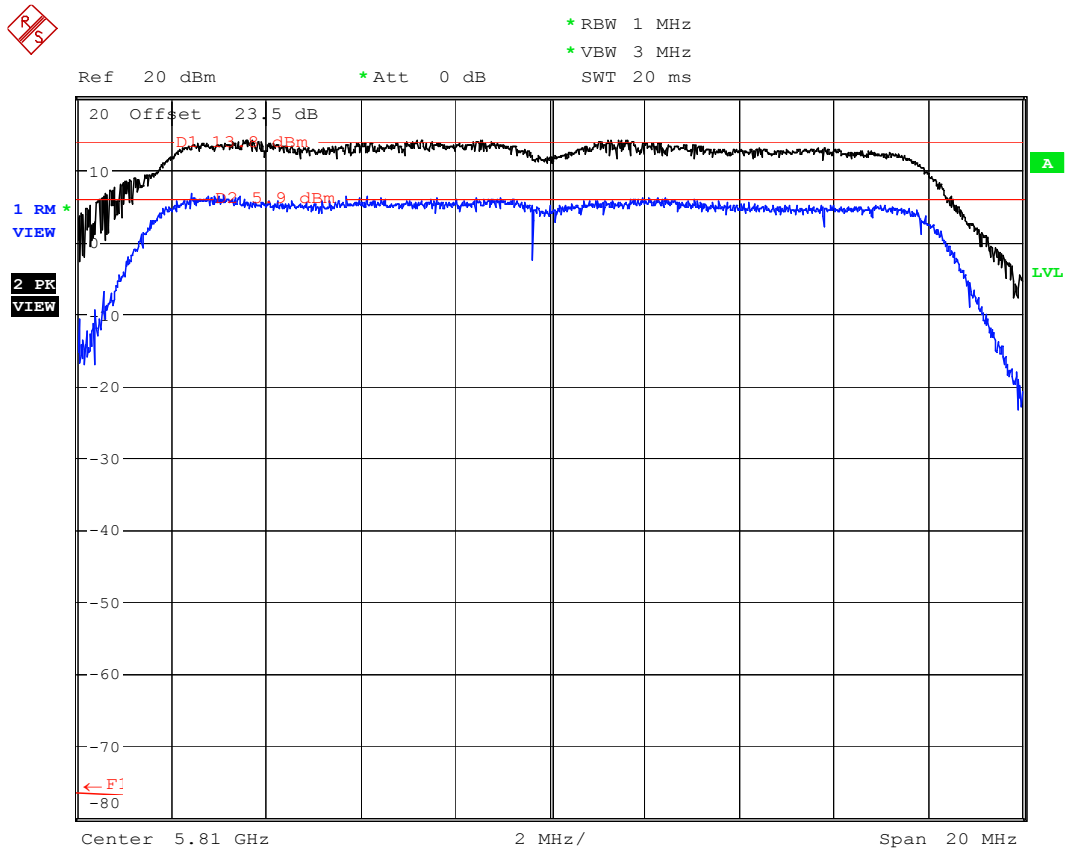
Date: 18.AUG.2004 00:15:20



OCC BW

Date: 18.AUG.2004 00:16:45

EQUIPMENT: B2CC001AA-E



OCC BW

Date: 18.AUG.2004 00:19:08

EQUIPMENT: B2CC001AA-E

Section 9. Undesirable Emissions

Para. No.: 15.407(b)(2)

Test Performed By: Glen Westwell	Date of Test: 28 Jul. 2004
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Test Results: Complies

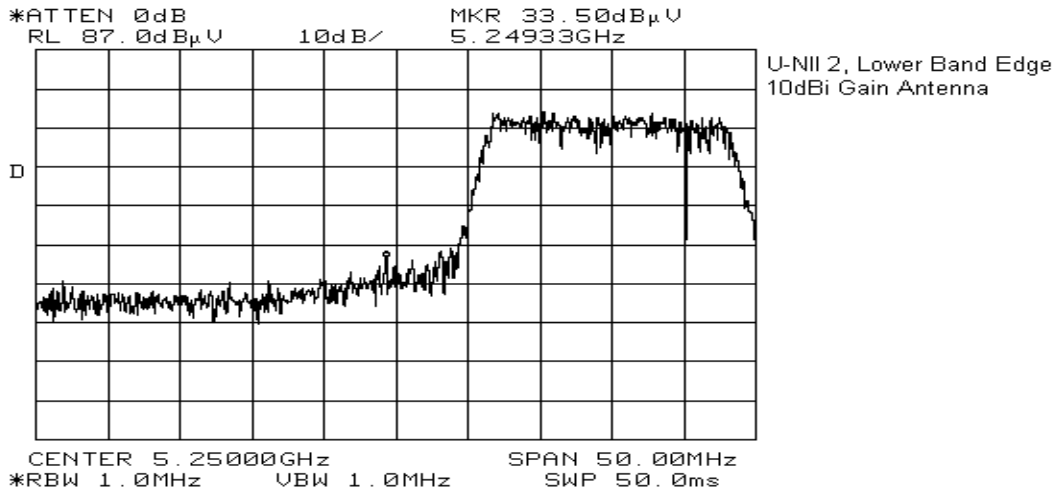
Measurement Data: See attached plots and table.

- Emissions were searched for all possible configurations. Worst case data has been presented.
- The DUT was searched from 30MHz to the 10th harmonic. Only those emissions within 20dB of the limit were reported.
- Bandedge emissions were measured at the lowest and highest operating frequencies.
- The power supply source was varied +/-15% to verify worst case emissions.

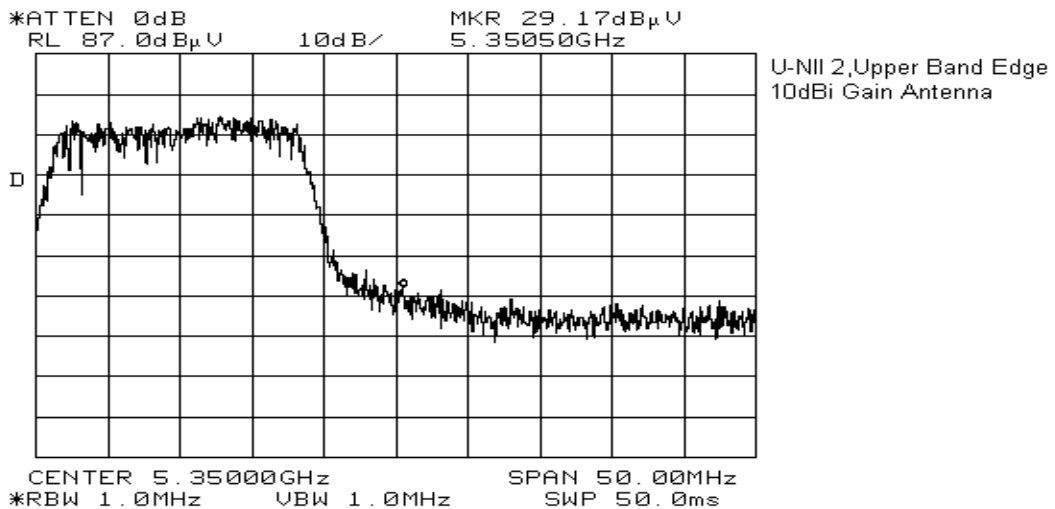
EQUIPMENT: B2CC001AA-E

5250-5350MHz

Band Edge Level (dBuV)	Signal Substitution Level (dBm)	Antenna Gain (dBi)	Emission Power Level (dBm)	Limit (dBm)
33.5dBuV	-40.0	10.8	-28.2	-27.0

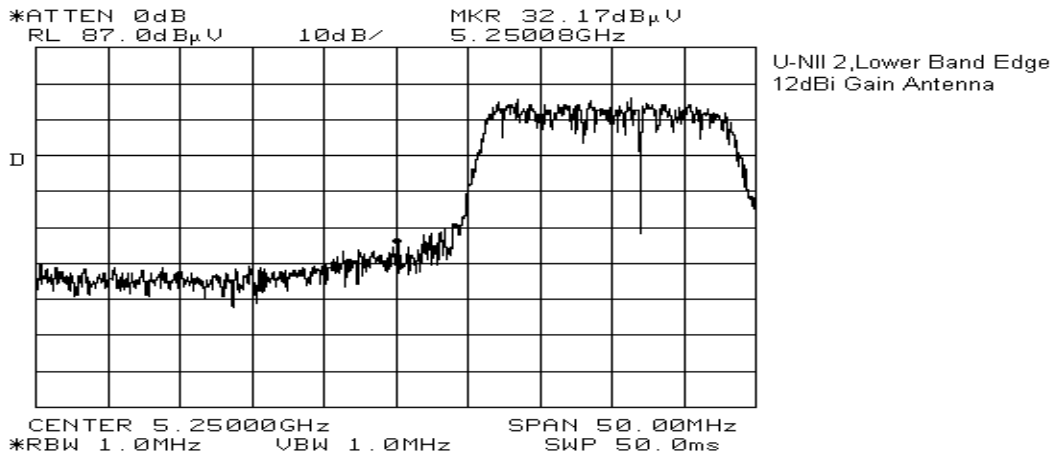


Band Edge Level (dBuV)	Signal Substitution Level (dBm)	Antenna Gain (dBi)	Emission Power Level (dBm)	Limit (dBm)
29.2dBuV	-43.2	10.8	-32.4	-27.0

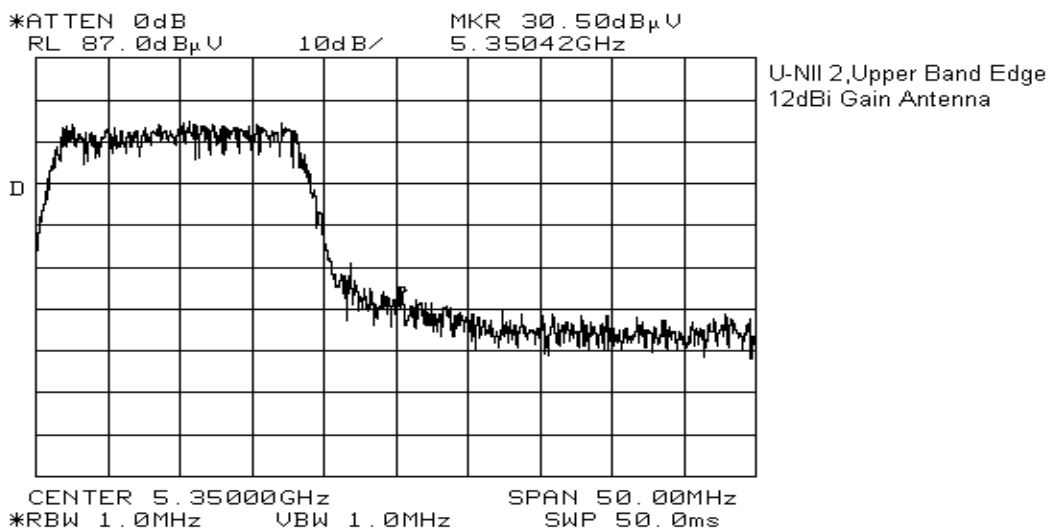


EQUIPMENT: B2CC001AA-E

Band Edge Level (dBuV)	Signal Substitution Level (dBm)	Antenna Gain (dBi)	Emission Power Level (dBm)	Limit (dBm)
32.2dBuV	-40.0	10.8	-29.2	-27.0



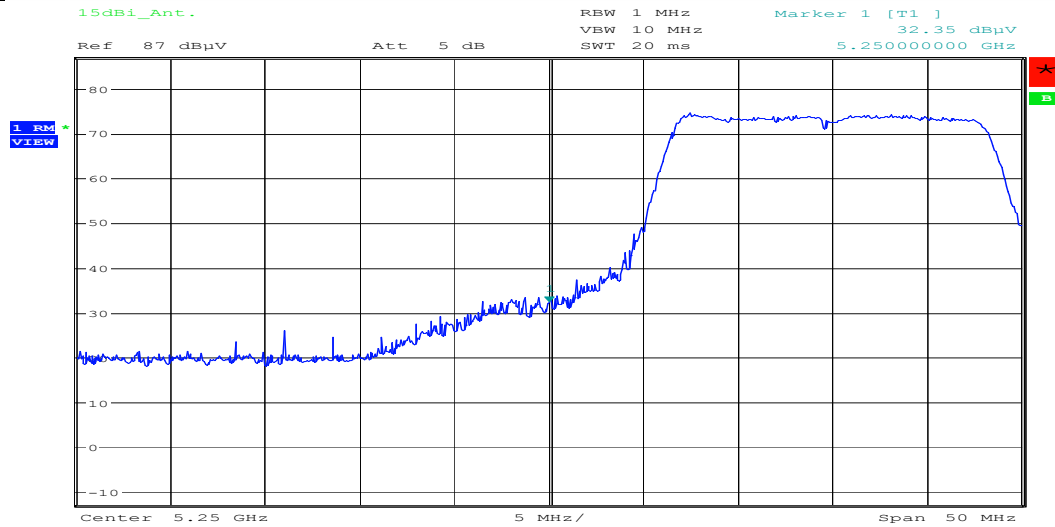
Band Edge Level (dBuV)	Signal Substitution Level (dBm)	Antenna Gain (dBi)	Emission Power Level (dBm)	Limit (dBm)
30.5dBuV	-41.8	10.8	-31.0	-27.0



EQUIPMENT: B2CC001AA-E

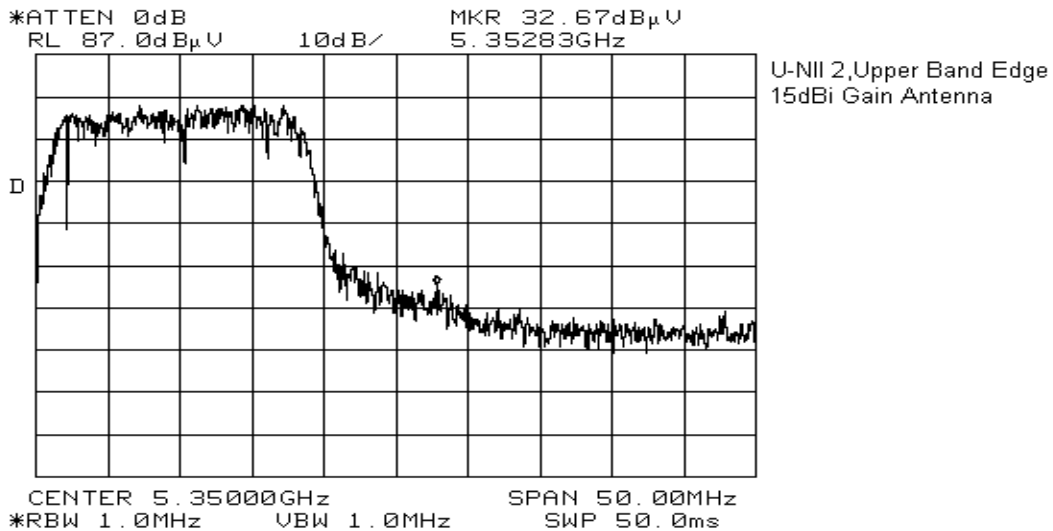
U-NII 2 Lower Bandedge, 15dBi gain antenna.

Band Edge Level (dBuV)	Signal Substitution Level (dBm)	Antenna Gain (dBi)	Emission Power Level (dBm)	Limit (dBm)
32.4dBuV	-40.0	10.8	-29.2	-27.0



Date: 23.JUL.2004 02:04:42

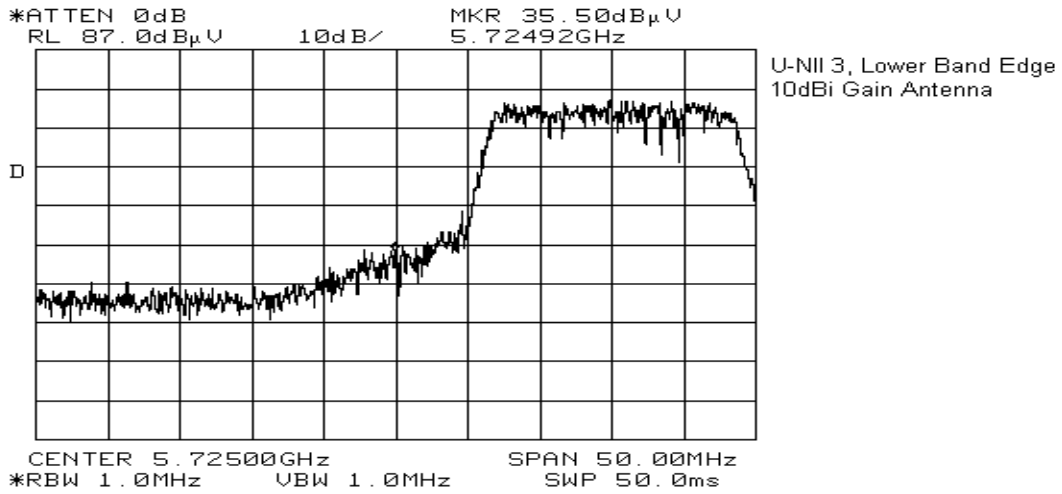
Band Edge Level (dBuV)	Signal Substitution Level (dBm)	Antenna Gain (dBi)	Emission Power Level (dBm)	Limit (dBm)
32.7dBuV	-40.5	10.8	-29.7	-27.0



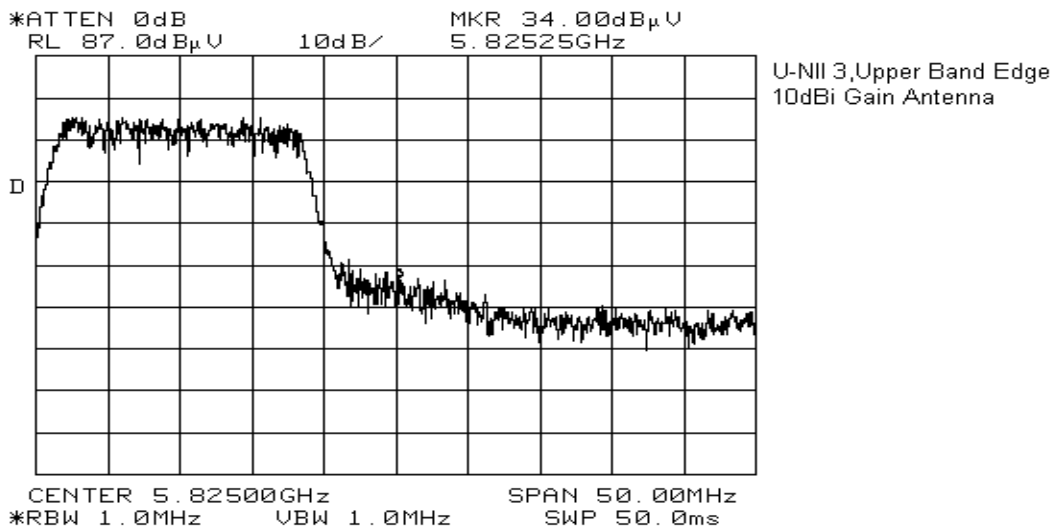
EQUIPMENT: B2CC001AA-E

5725-5825MHz

Band Edge Level (dBuV)	Signal Substitution Level (dBm)	Antenna Gain (dBi)	Emission Power Level (dBm)	Limit (dBm)
35.5dBuV	-43.3	10.8	-32.5	-17.0

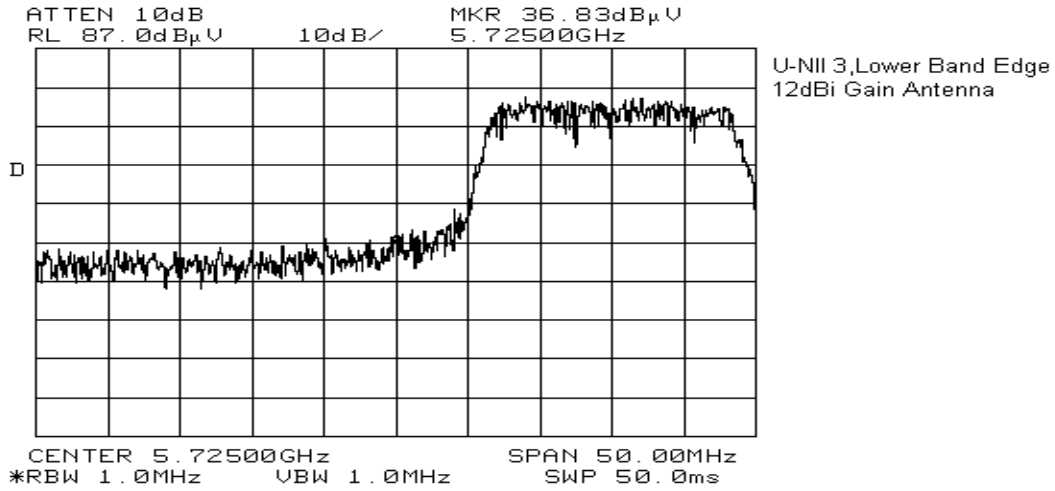


Band Edge Level (dBuV)	Signal Substitution Level (dBm)	Antenna Gain (dBi)	Emission Power Level (dBm)	Limit (dBm)
34.0dBuV	-42.2	10.8	-31.4	-17.0

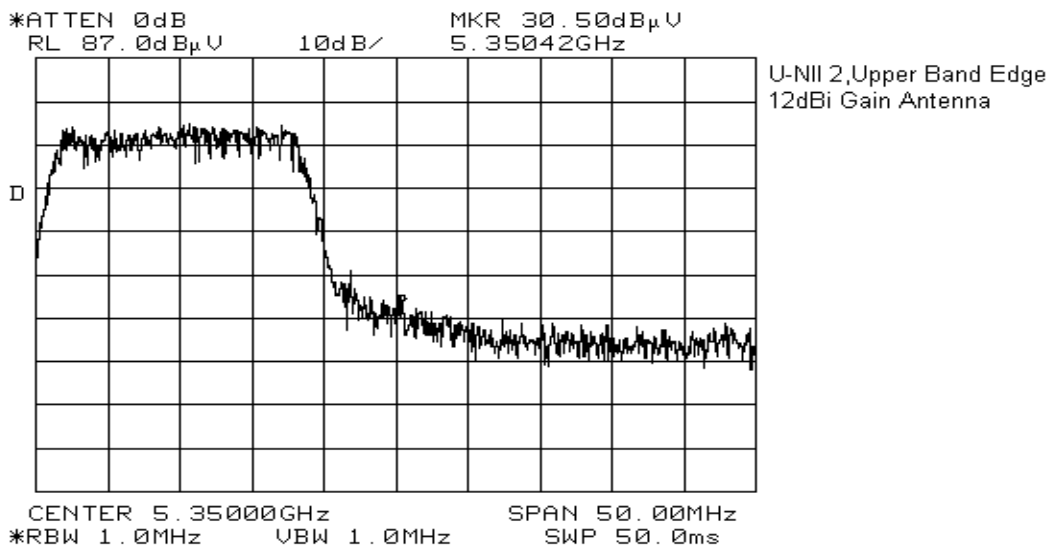


EQUIPMENT: B2CC001AA-E

Band Edge Level (dBuV)	Signal Substitution Level (dBm)	Antenna Gain (dBi)	Emission Power Level (dBm)	Limit (dBm)
36.8dBuV	-43.8	10.8	-33.0	-17.0

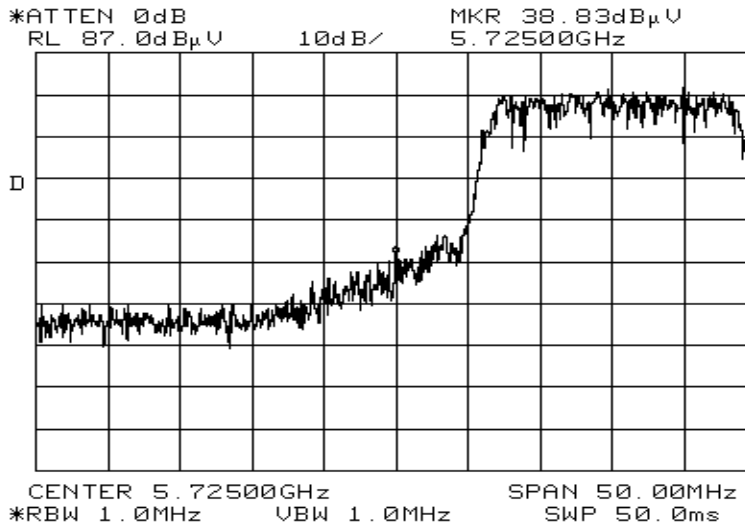


Band Edge Level (dBuV)	Signal Substitution Level (dBm)	Antenna Gain (dBi)	Emission Power Level (dBm)	Limit (dBm)
30.5dBuV	-41.5	10.8	-30.7	-17.0



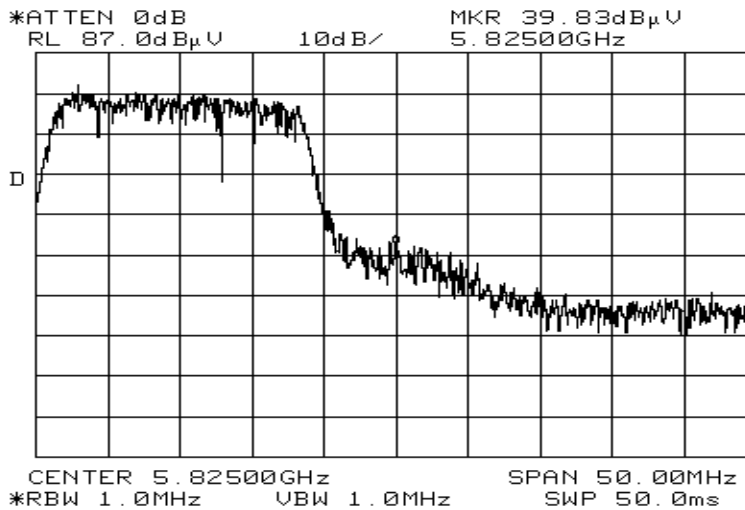
EQUIPMENT: B2CC001AA-E

Band Edge Level (dBuV)	Signal Substitution Level (dBm)	Antenna Gain (dBi)	Emission Power Level (dBm)	Limit (dBm)
38.8dBuV	-45.7	10.8	-34.9	-17.0



U-NII 3, Lower Band Edge
15dBi Gain Antenna

Band Edge Level (dBuV)	Signal Substitution Level (dBm)	Antenna Gain (dBi)	Emission Power Level (dBm)	Limit (dBm)
39.8dBuV	-46.8	10.8	-36.0	-17.0



U-NII 3, Upper Band Edge
15dBi Gain Antenna

EQUIPMENT: B2CC001AA-E

Radiated Disturbance Test Data: BA100 Fully Integrated Unit

Test Date: 18 Aug. 2004											
Engineer's Name: Chris Maidens											
Temperature (C°): +22						Humidity %: 49					
Test Distance (meters): 3						Dome: 1					
Freq. (MHz)	Ant.	Pol. V/H	RCVD Signal (dBµV)	Ant. Factor (dB)	Amp. Gain (dB)	Cable Loss (dB)	Field Strength (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Amp.
30.6393	BC1	V	27.0	12.0	N/A	0.7	39.7	40.0	0.3	Q-Peak	N/A
31.4332	BC1	V	26.0	11.8	N/A	0.7	38.5	40.0	1.5	Q-Peak	N/A
40.1498	BC1	V	19.8	10.2	N/A	0.8	30.8	40.0	9.2	Q-Peak	N/A
77.2006	BC1	V	25.7	7.0	N/A	1.0	33.7	40.0	6.3	Q-Peak	N/A
99.9986	BC1	V	25.4	8.8	N/A	1.2	35.4	43.5	8.1	Q-Peak	N/A
124.9991	BC1	V	26.4	12.1	N/A	1.4	39.9	43.5	3.6	Q-Peak	N/A
149.9981	BC1	V	20.1	12.3	N/A	1.5	33.9	43.5	9.6	Q-Peak	N/A
199.9986	BC1	V	24.3	13.6	N/A	1.7	39.6	43.5	3.9	Q-Peak	N/A
249.9980	BC1	V	23.1	16.1	N/A	2.0	41.2	46.0	4.8	Q-Peak	N/A
299.9968	BC1	V	15.8	17.6	N/A	2.3	35.7	46.0	10.3	Q-Peak	N/A
224.9967	BC1	V	11.7	15.1	N/A	1.8	28.6	46.0	17.4	Q-Peak	N/A
260.6157	BC1	V	22.9	16.3	N/A	2.1	41.3	46.0	4.7	Q-Peak	N/A
274.9980	BC1	V	18.4	16.1	N/A	2.0	36.5	46.0	9.5	Q-Peak	N/A
59.9956	BC1	V	17.3	8.1	N/A	0.9	26.3	40.0	13.7	Q-Peak	N/A
30.6393	BC1	H	10.8	13.0	N/A	0.7	24.5	40.0	15.5	Q-Peak	N/A
31.4332	BC1	H	10.0	12.8	N/A	0.7	23.6	40.0	16.4	Q-Peak	N/A
40.1498	BC1	H	6.5	11.5	N/A	0.8	18.8	40.0	21.2	Q-Peak	N/A
77.2006	BC1	H	21.8	7.1	N/A	1.0	29.9	40.0	10.1	Q-Peak	N/A
99.9986	BC1	H	19.6	8.4	N/A	1.2	29.2	43.5	14.3	Q-Peak	N/A
124.9991	BC1	H	18.2	11.4	N/A	1.4	31.0	43.5	12.5	Q-Peak	N/A
149.9981	BC1	H	14.3	12.0	N/A	1.5	27.8	43.5	15.7	Q-Peak	N/A
199.9986	BC1	H	0.0	13.4	N/A	1.7	15.1	43.5	28.4	Q-Peak	N/A
249.9980	BC1	H	16.0	15.3	N/A	2.0	33.3	46.0	12.7	Q-Peak	N/A
299.9968	BC1	H	15.3	18.5	N/A	2.3	36.1	46.0	9.9	Q-Peak	N/A
224.9967	BC1	H	11.4	14.3	N/A	1.8	27.6	46.0	18.4	Q-Peak	N/A
260.6157	BC1	H	12.3	15.7	N/A	2.1	30.1	46.0	15.9	Q-Peak	N/A
274.9980	BC1	H	10.6	16.6	N/A	2.0	29.2	46.0	16.8	Q-Peak	N/A
59.9956	BC1	H	10.6	8.6	N/A	0.9	20.1	40.0	19.9	Q-Peak	N/A
349.9947	LP2	V	21.1	15.4	N/A	2.4	38.9	46.0	7.1	Q-Peak	N/A
375.0171	LP2	V	21.0	15.9	N/A	2.5	39.4	46.0	6.6	Q-Peak	N/A
399.9971	LP2	V	21.2	16.7	N/A	2.6	40.5	46.0	5.5	Q-Peak	N/A
449.9966	LP2	V	14.1	17.2	N/A	2.7	34.0	46.0	12.0	Q-Peak	N/A
499.9960	LP2	V	20.1	18.0	N/A	2.9	41.0	46.0	5.0	Q-Peak	N/A
599.9956	LP2	V	17.4	19.4	N/A	3.2	40.0	46.0	6.0	Q-Peak	N/A
549.9960	LP2	V	13.5	18.8	N/A	3.1	35.4	46.0	10.6	Q-Peak	N/A
625.0285	LP2	V	10.8	20.3	N/A	3.2	34.2	46.0	11.8	Q-Peak	N/A
699.9948	LP2	V	16.6	21.6	N/A	3.5	41.7	46.0	4.3	Q-Peak	N/A
<p>Note 1: Antenna Legend: BC = Biconical, BL = Bilog, LP = Log-Periodic, Horn = Horn, ED = EMCO Dipole</p> <p>Note 2: Detector Legend: Q-Peak = 120 kHz RBW, Average = 1.0 MHz RBW</p>											

EQUIPMENT: B2CC001AA-E

Radiated Disturbance Detailed Setup Photos:



EQUIPMENT: B2CC001AA-E

Radiated Emissions Setup Photos:

10dBi Antenna



12dBi Antenna



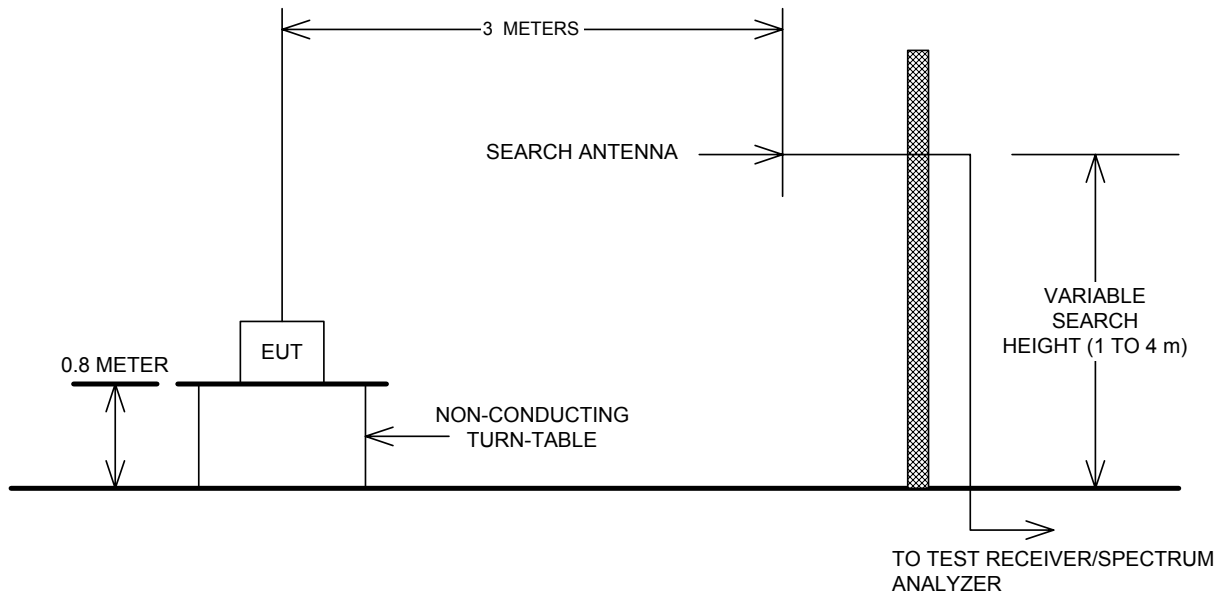
EQUIPMENT: B2CC001AA-E

15dBi Antenna

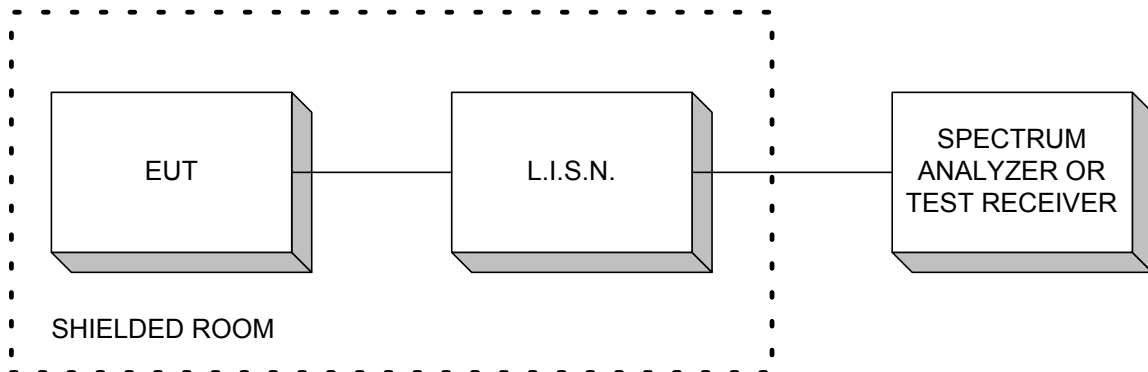


Section 10. Block Diagrams

Test Site For Radiated Emissions

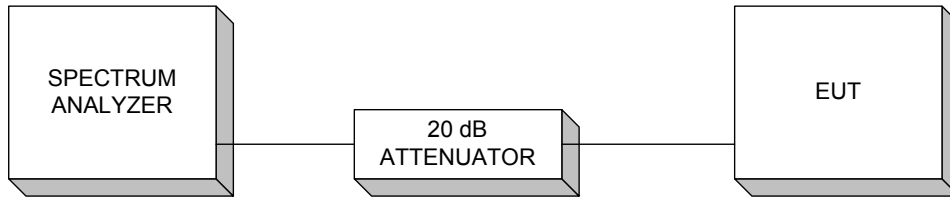


Conducted Emissions

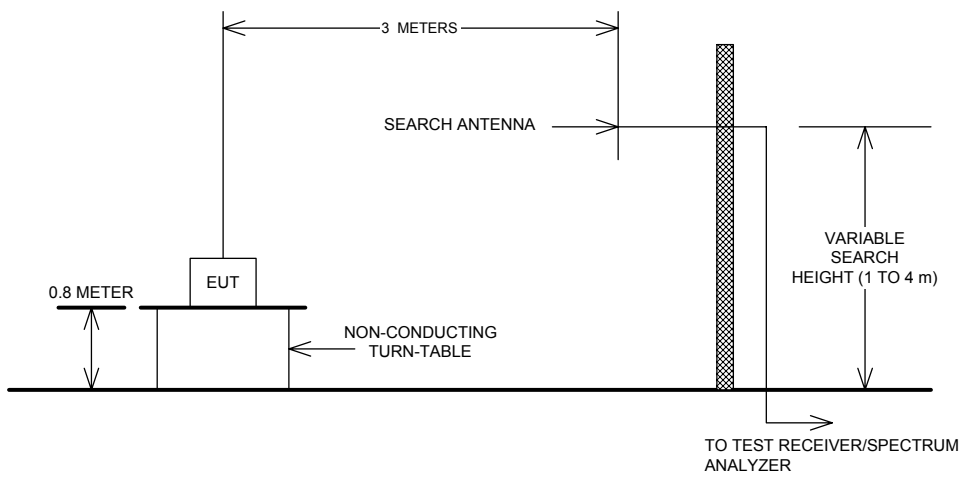


EQUIPMENT: B2CC001AA-E

Transmitter Power Density & Peak Power At Antenna Terminals Conducted Measurements



TIA/EIA 603, Signal Substitution Method



EQUIPMENT: B2CC001AA-E

Section 11. Test Equipment List

CAL Cycle	Equipment	Manufacturer	Model No.	Asset/Serial No.	Last Cal.	Next Cal.
1 Year	Spectrum Analyzer	Rhode & Schwarz	FSU46	FA001877	26 May 04	26 May 05
1 Year	Spectrum Analyzer	Hewlett Packard	8564E	FA001367	13 May 04	28 Jun 05
1 Year	Signal Generator	Rohde & Schwarz	SMIQ06B	FA001878	18 May 04	18 May 05
1 Year	Power Meter	Hewlett Packard	E4418B	FA001413	26 May 04	26 May 05
1 Year	Power Sensor	Hewlett Packard	8487A	FA001419	02 Feb 04	02 Feb 05
1 Year	RF AMP	JCA	4-8 GHz	FA001497	18 June 04	18 June 05
1 Year	RF AMP	Narda	5 - 18GHz	FA001409	COU	COU
1 Year	High Pass Filter (6.7GHz)	Dorado	WR90	20.806	COU	COU
1 Year	Horn Antenna	EMCO #2	3115	FA000825	10 Dec 03	10 Dec 04
1 Year	Horn Antenna	EMCO #1	3115	FA000649	18 Dec 03	18 Dec 04
1 Year	Horn Antenna	EMCO #5	3116	FA001847	19 Jan 04	19 Jan 05
1 Year	Diplexer	Olsen - OML	DPL.26 (H.P)		COU	COU
1 Year	Mixer/Antenna 40-60Ghz	Olsen - OML	M19HWA (H.P.)		COU	COU
1 Year	Receiver	Rohde & Schwarz	ESVS-30	FA001437	July 26/04	July 26/05
1 Year	Biconical (1) Antenna	EMCO	3109	FA000805	April 23/04	April 23/05
1 Year	Log Periodic Antenna #2	EMCO	3148	FA001355	May 05/04	May 05/05
NCR	0.1 - 1300 MHz Amplifier	Hewlett Packard	8447D	FA001748	NCR	NCR
1 Year	1.0 - 2.0 GHz Amplifier	JCA	12-400	FA001498	June 18/04	June 18/05
1 Year	LISN	EMCO	4825/2	FA001545	Oct. 30/03	Oct. 30/04
1 Year	LISN (peripheral)	Tegam	95300-50	FA000986	Jan. 27/04	Jan. 27/05
1 Year	LISN (peripheral)	Tegam	95300-50	FA000987	Jan. 27/04	Jan. 27/05
1 Year	Spectrum Analyzer	Hewlett-Packard	8566B	FA001309	May 28/04	May 28/05
1 Year	Spectrum Analyzer Display	Hewlett-Packard	85662A	FA001309	May 28/04	May 28/05
1 Year	Transient Limiter	Hewlett-Packard	1194 7A	FA000975	June 10/04	June 10/05
NCR	Bilog	Schaffner	CBL6112B	FA001504	NCR	NCR

NA: Not Applicable
NCR: No Cal Required
COU: CAL On Use