



Test Report: 4W07803

Applicant: VCom Inc.
150 Cardinal Place
Saskatoon, SK
Canada
S7L 6H7

**Equipment Under Test:
(EUT)** BTR5857

FCC ID: OPPBTR5857

In Accordance With: **FCC Part 15, Subpart E
U-NII Devices**

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



Authorized By: Sim Jagpal, Resource Manager

Date: 11 March 2004

Total Number of Pages: 41

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EQUIPMENT: BTR5857

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, for U-NII devices. 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: 11 March 2004



TESTED BY: _____
Kevin Carr, EMC/EMI/Wireless Specialist

DATE: 11 March 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: BTR5857

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

Test Conditions:**Indoor**

Temperature: 22°C

Humidity: 27%

Outdoor

Temperature: 10°C

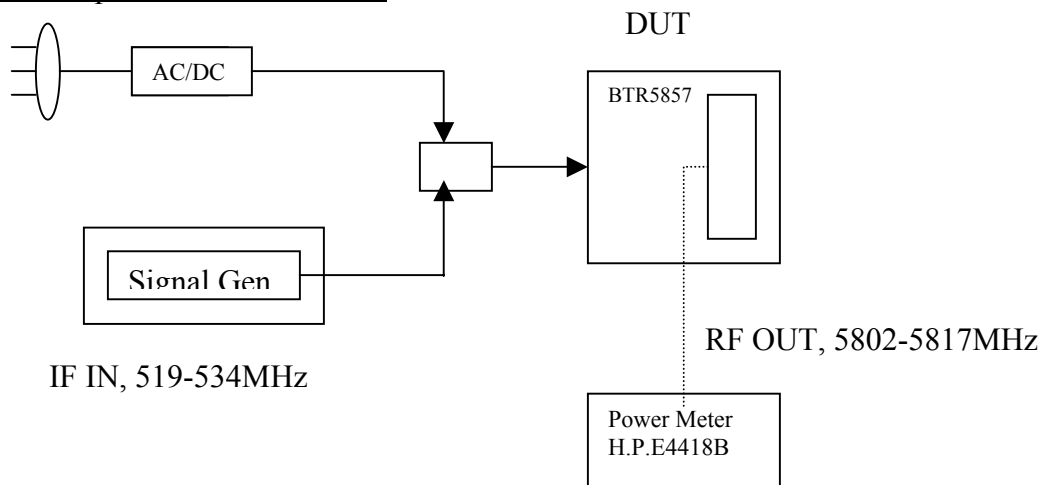
Humidity: 49%

EQUIPMENT: BTR5857

Section 2. General Equipment Specification

Manufacturer:	VCom Inc.
Model No.:	BTR5857
Serial No.:	304061
Date Received In Laboratory:	Sept 5, 2003
Nemko Identification No.:	1
Frequency Band:	5725-5825MHz
Operating Frequency(ies) of DUT:	5802-5817MHz MHz
Transmit Power (Rated):	64QAM: +15.0dBm QPSK: +20dBm
Modulation:	64 QAM @ 5.056941Msym/Sec QPSK @ 5.213043Msym/Sec
Antenna Gain(s):	5204-14-90V = 16dBi 5705H-14-90 = 16.5dBi

EUT Set Up for Conducted Tests.



EQUIPMENT: BTR5857

Section 3. Powerline Conducted Emissions

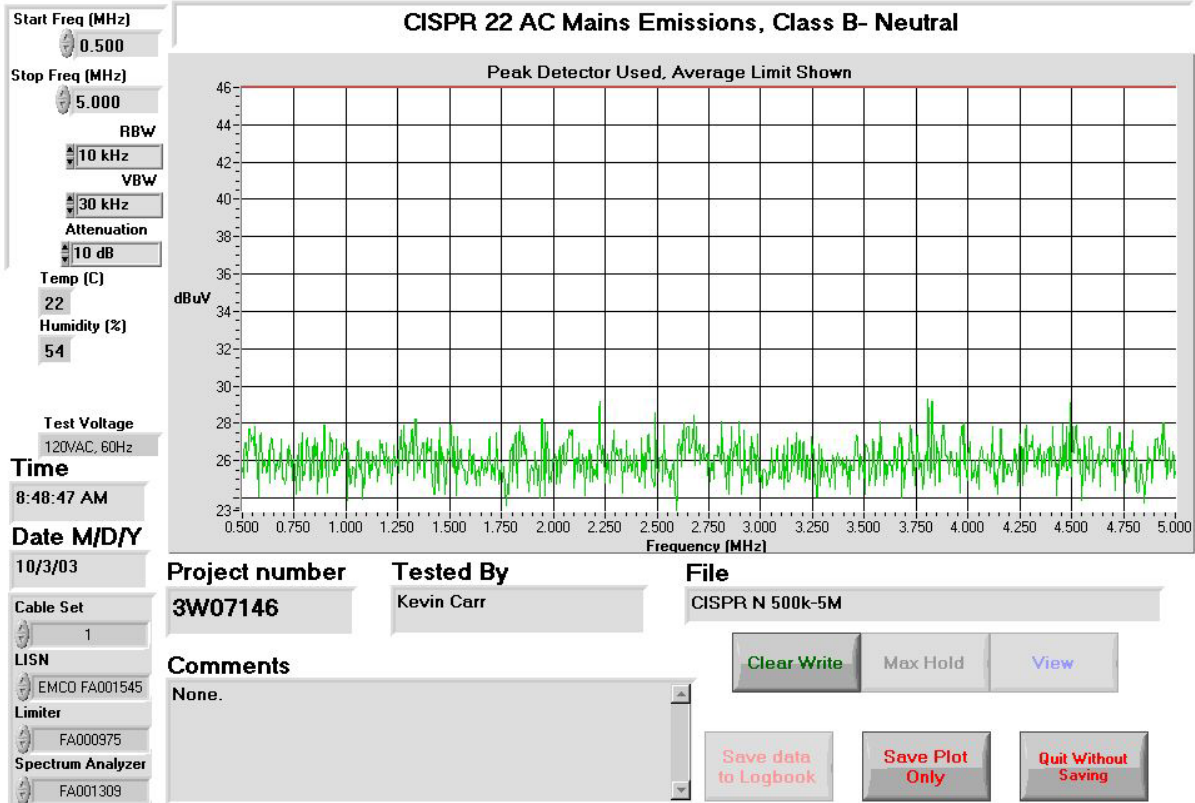
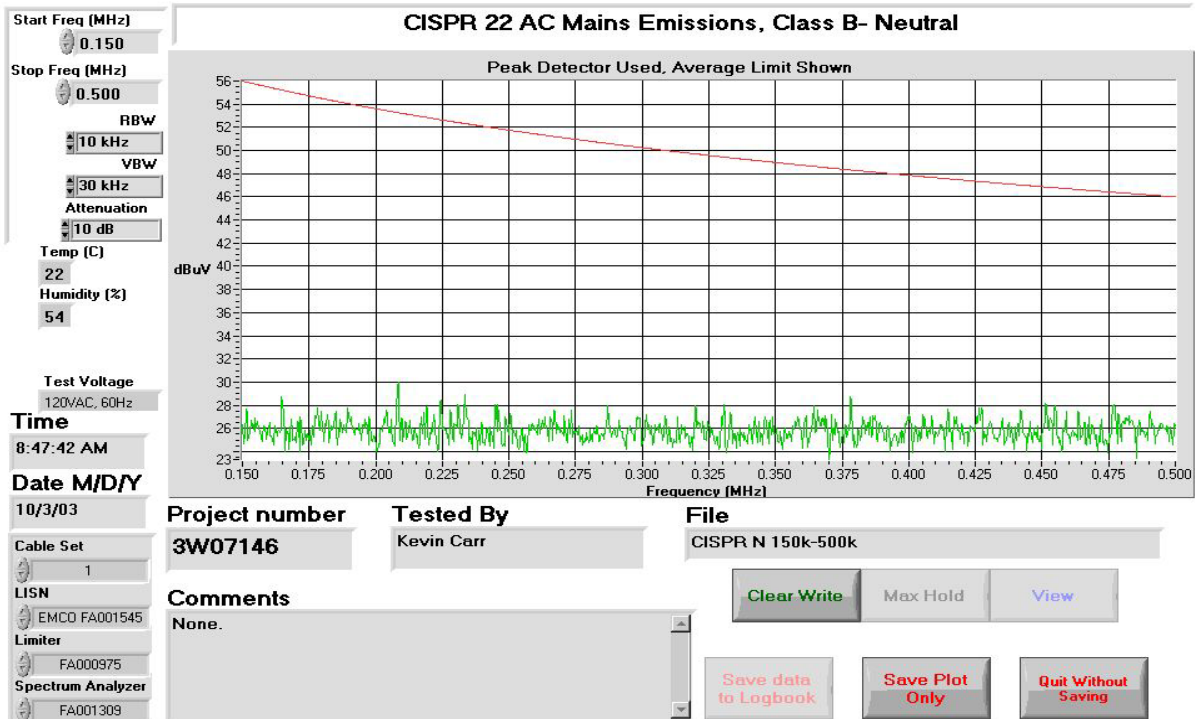
Para. No.: 15.207 (a)

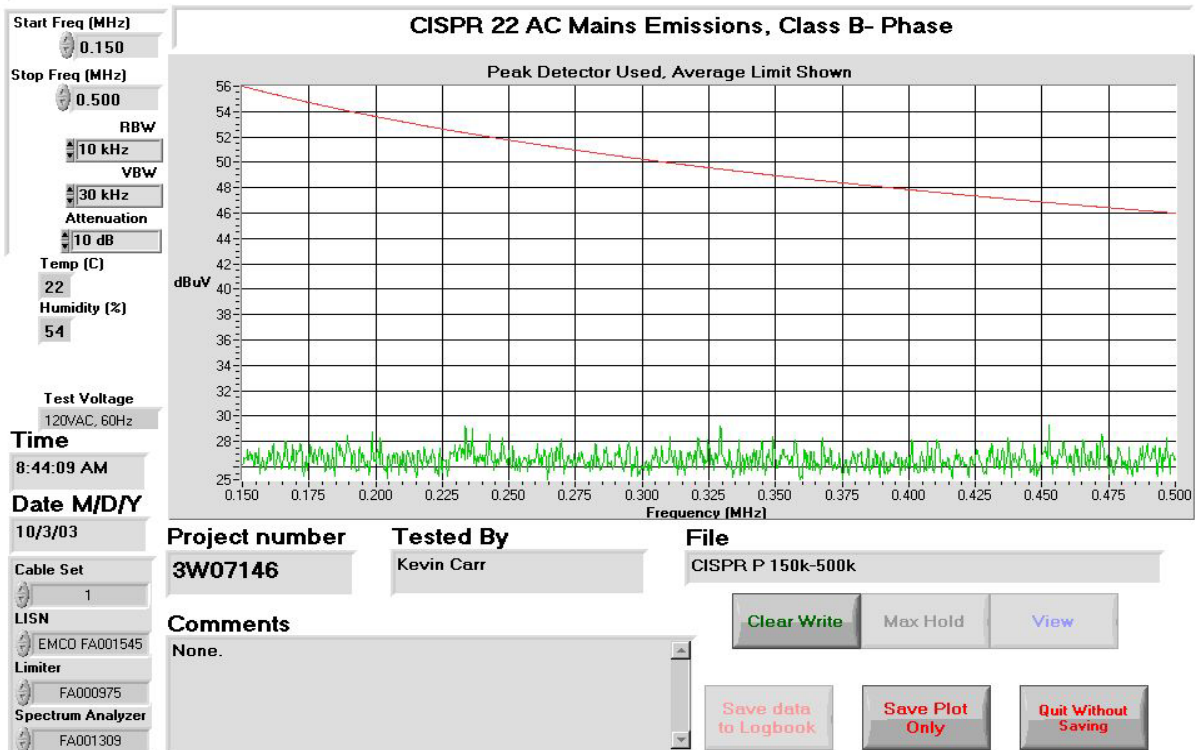
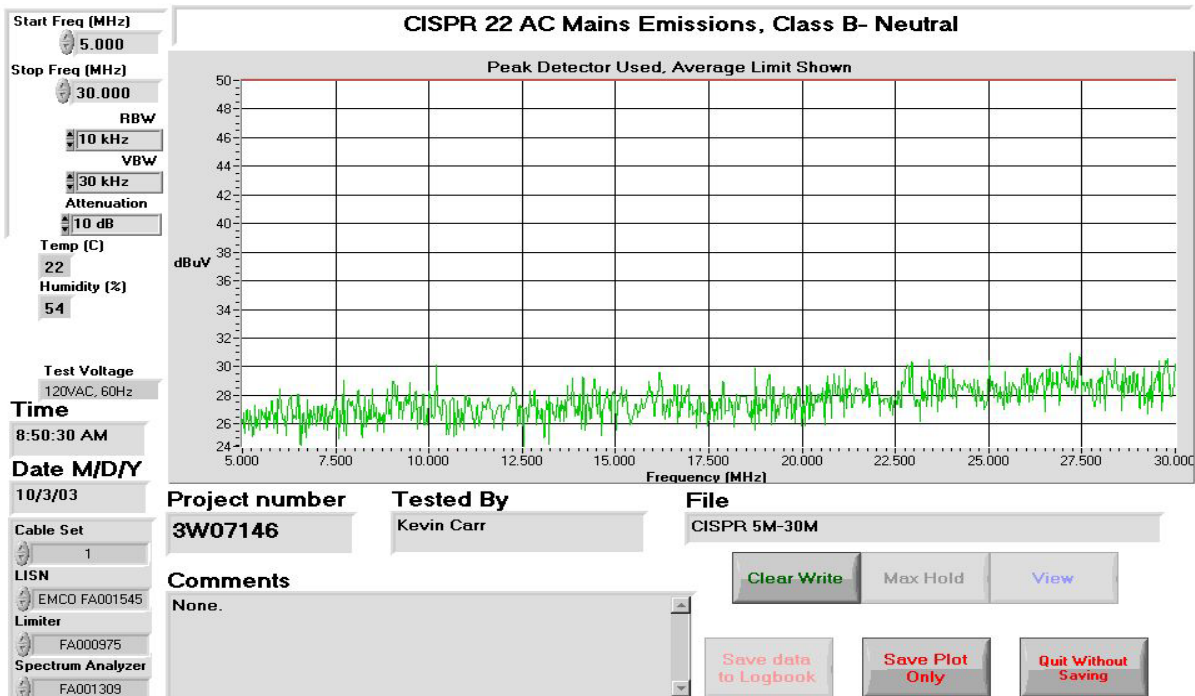
Test Performed By: Kevin Carr	Date of Test: 3 Oct. 2003
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Test Results: Complies

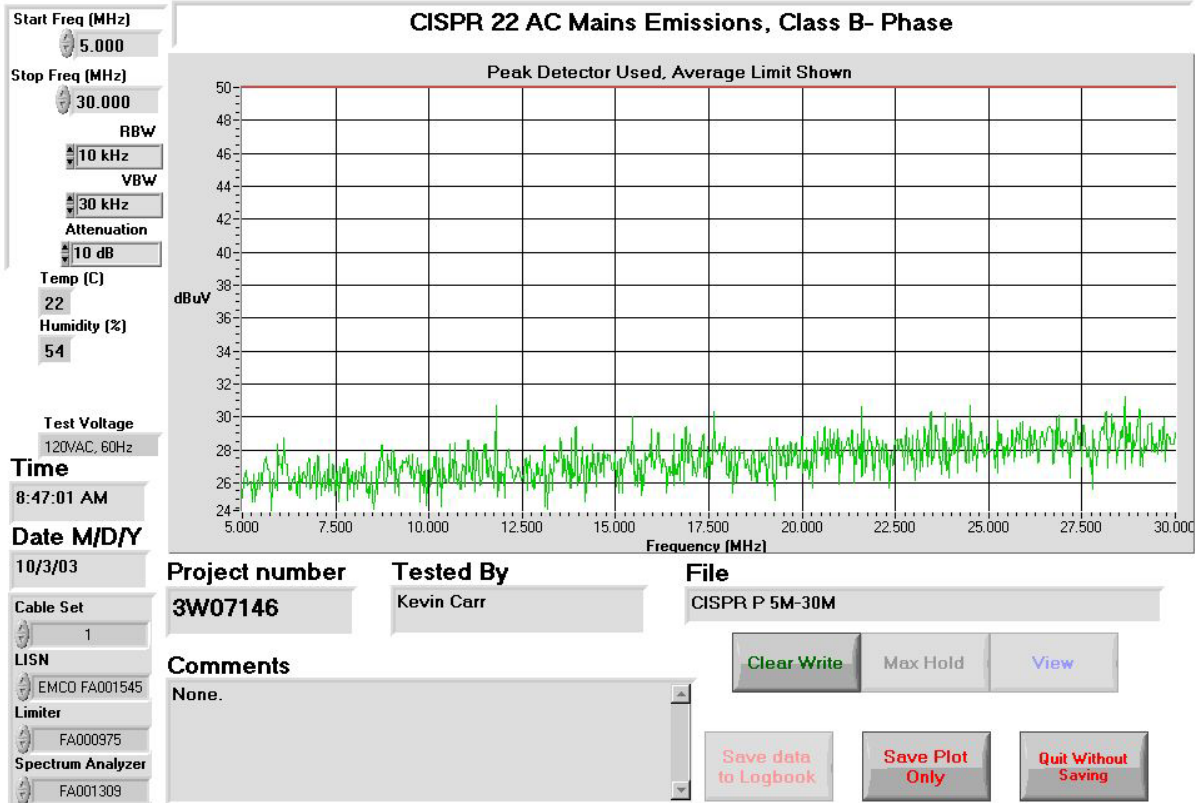
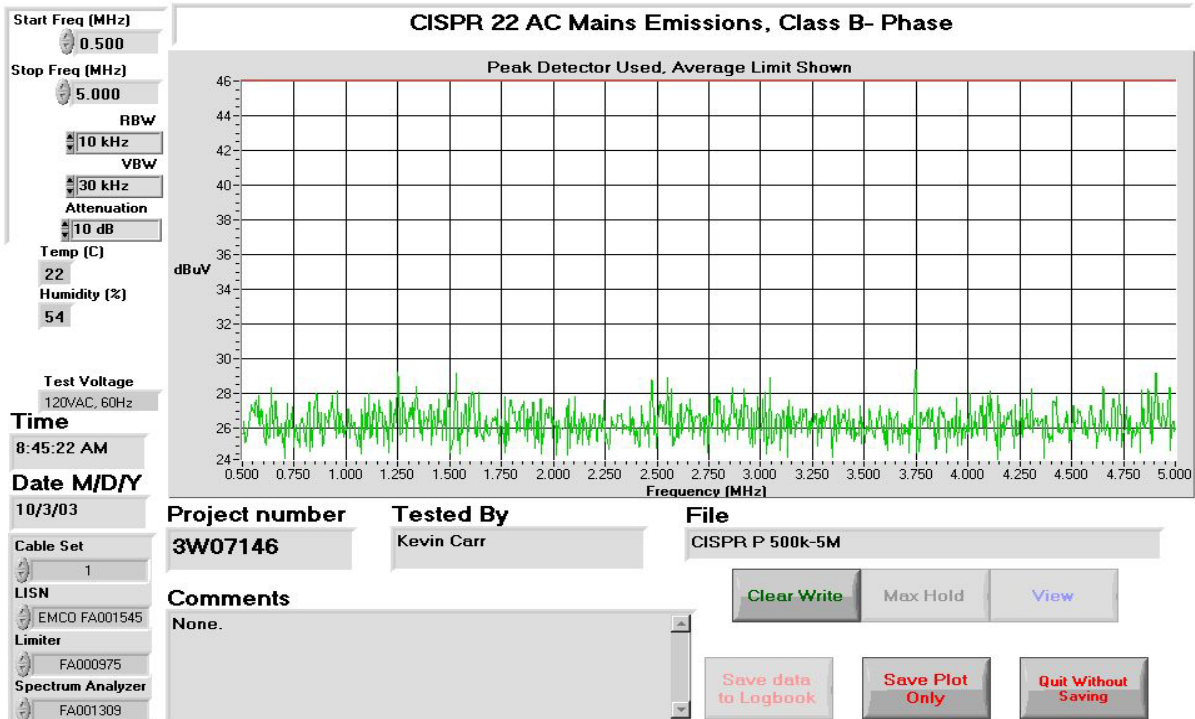
Measurement Data: See attached graph(s).

EQUIPMENT: BTR5857



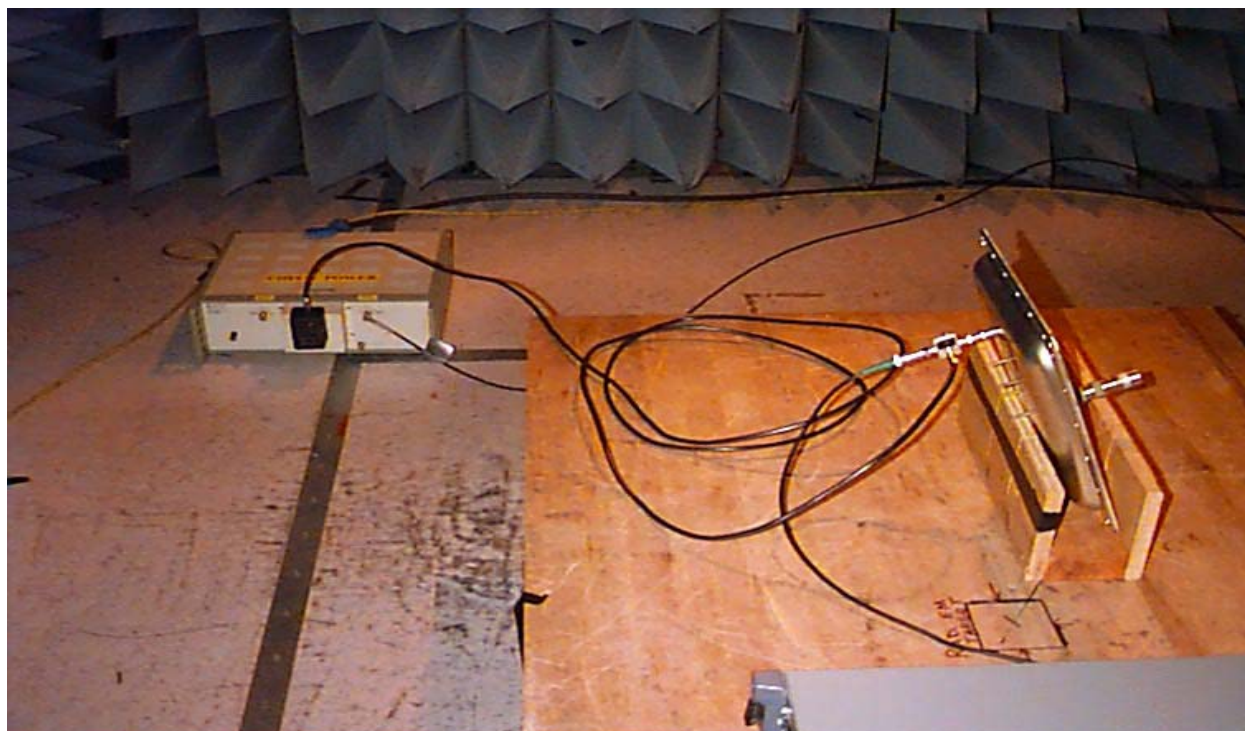
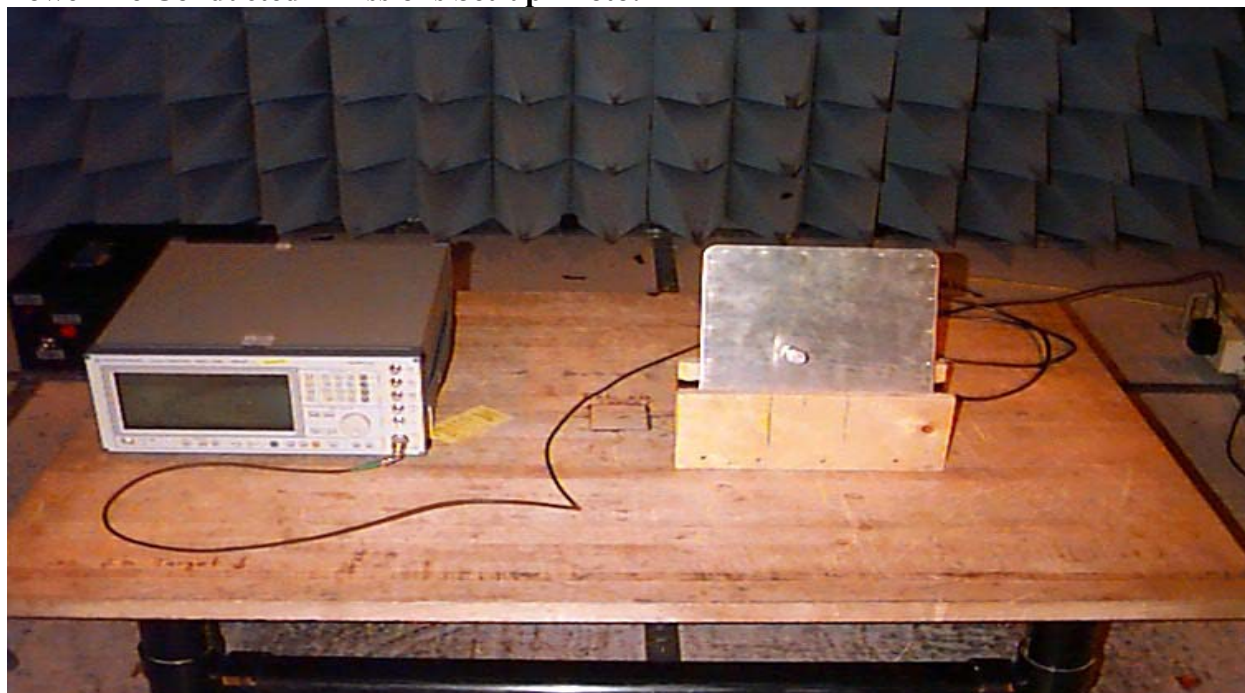
EQUIPMENT: BTR5857

EQUIPMENT: BTR5857



EQUIPMENT: BTR5857

Powerline Conducted Emissions Set-up Photo:



EQUIPMENT: BTR5857

Section 4. Emission Bandwidth

Para. No.: 15.403(c)

Test Performed By: Glen Westwell	Date of Test: 3 Mar. 2004
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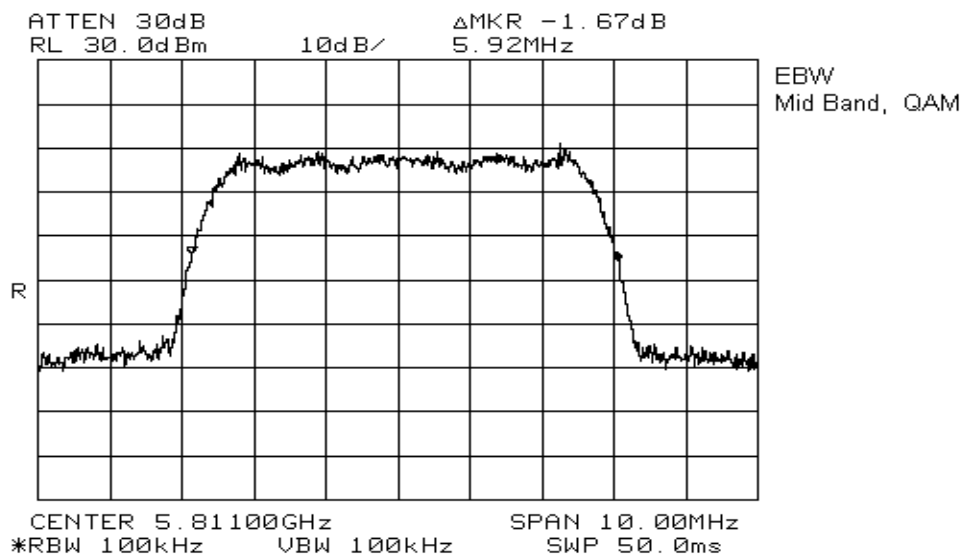
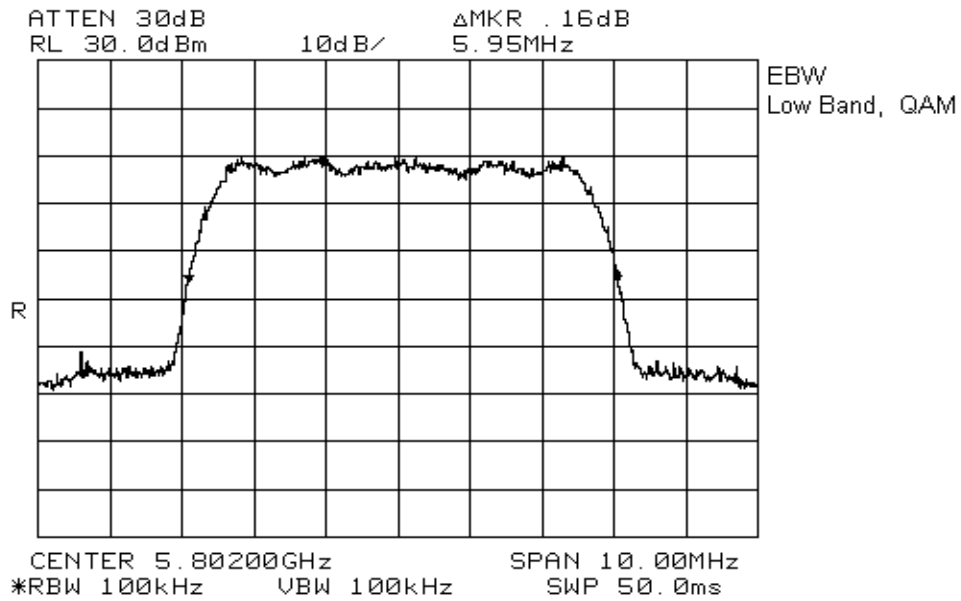
Test Results: Complied

Measurement Data: See Attached Plots.

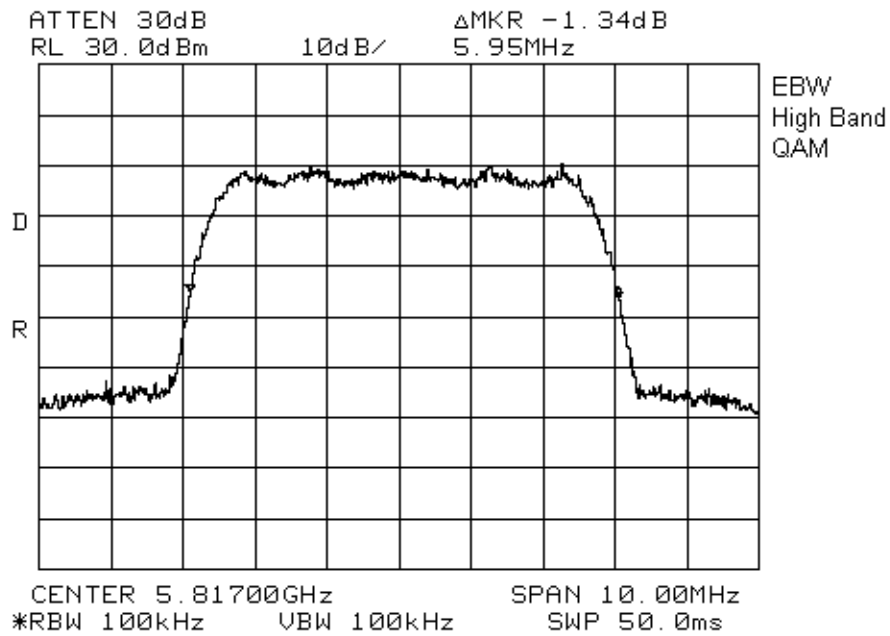
Emission Bandwidth (EBW)			
Frequency	5802MHz	5811MHz	5817MHz
QPSK	6.13MHz	6.13MHz	6.17MHz
QAM	5.95MHz	5.92MHz	5.95MHz

EQUIPMENT: BTR5857

QAM

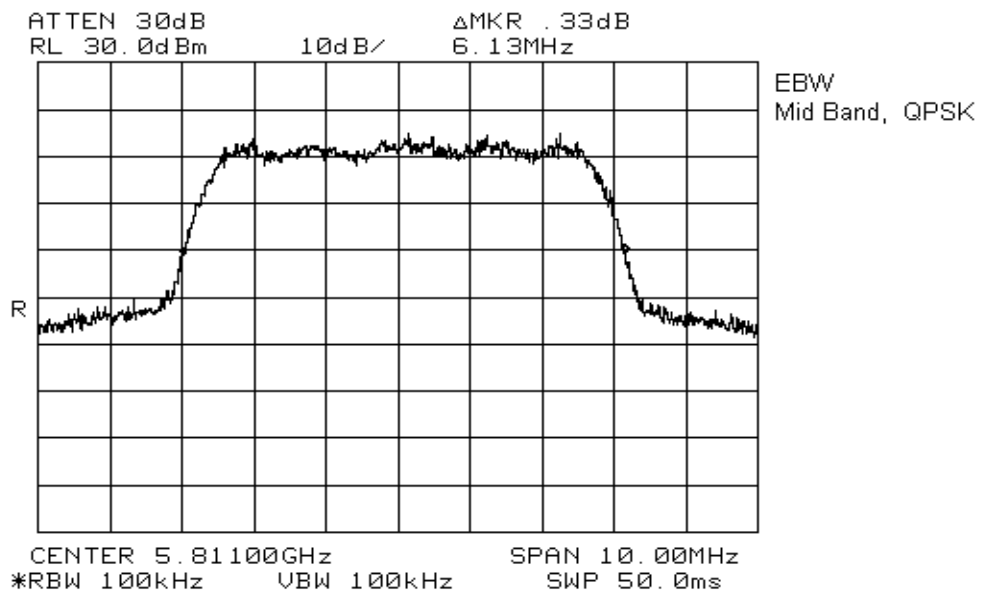
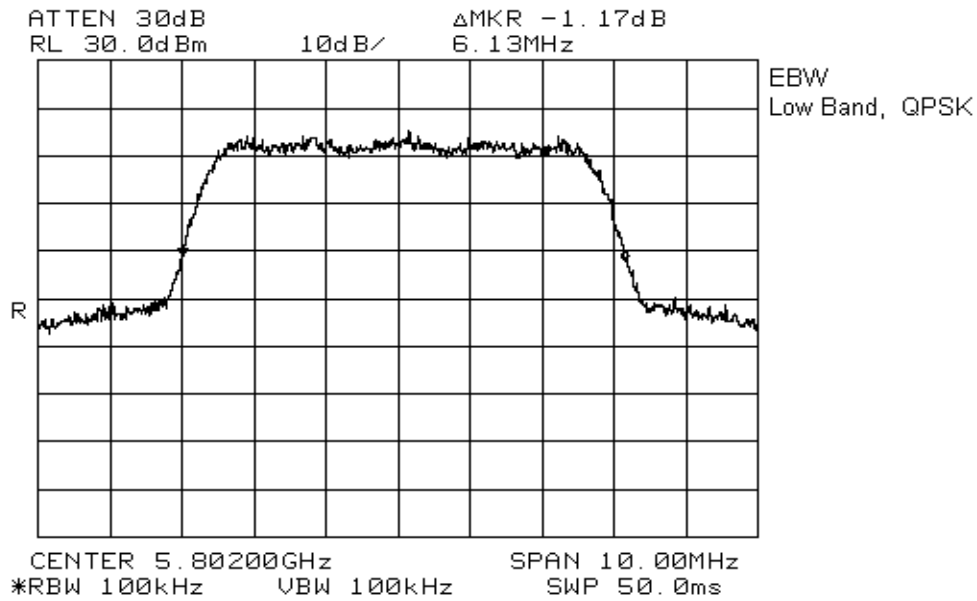


EQUIPMENT: BTR5857

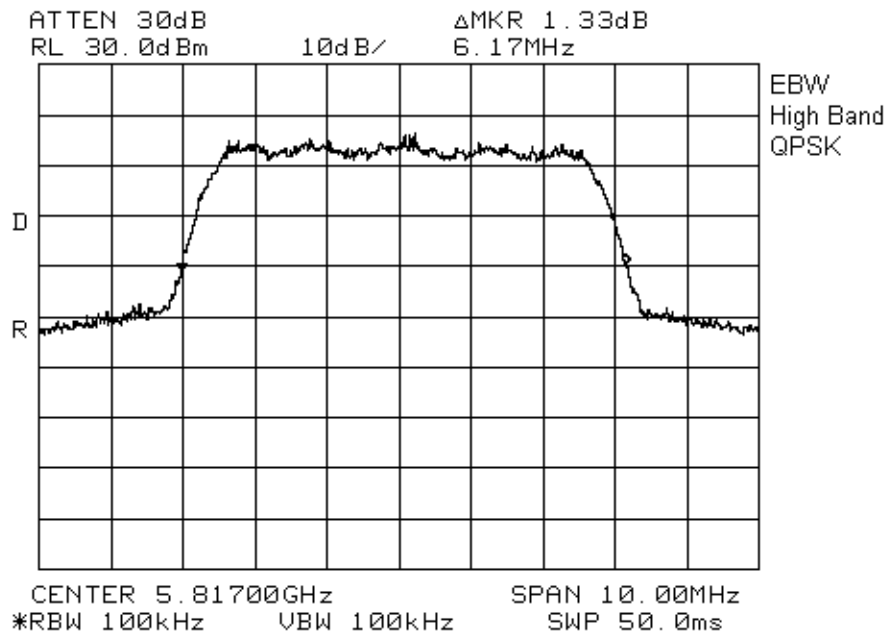


EQUIPMENT: BTR5857

QPSK



EQUIPMENT: BTR5857



EQUIPMENT: BTR5857

Section 5. Peak Conducted Transmit Power

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

Test Performed By: Glen Westwell	Date of Test: 3 Mar. 2004
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Test Results: Complies**Measurement Data:** See Table/Plots

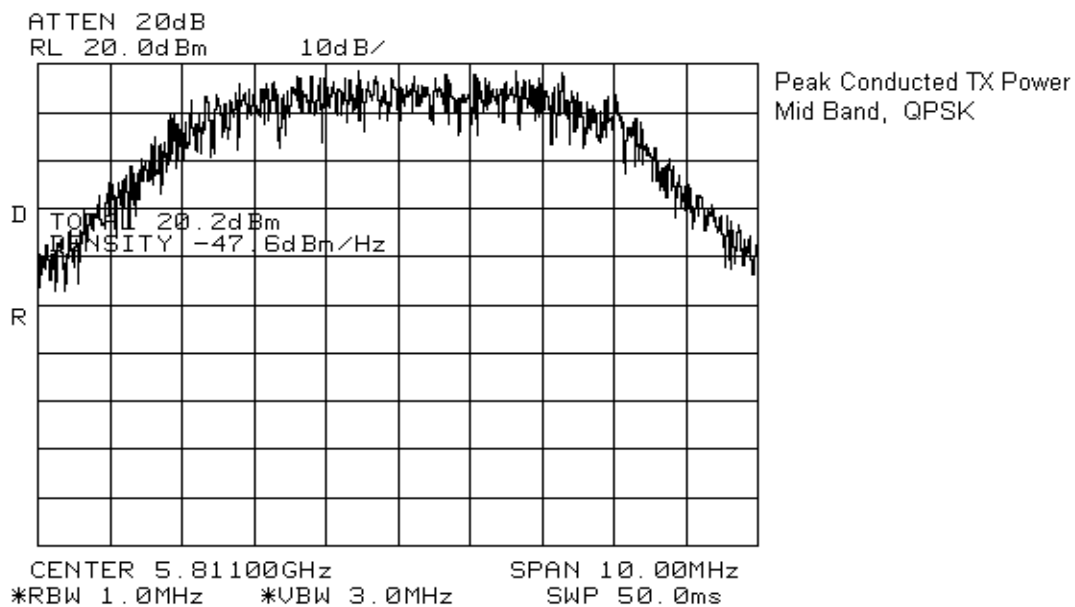
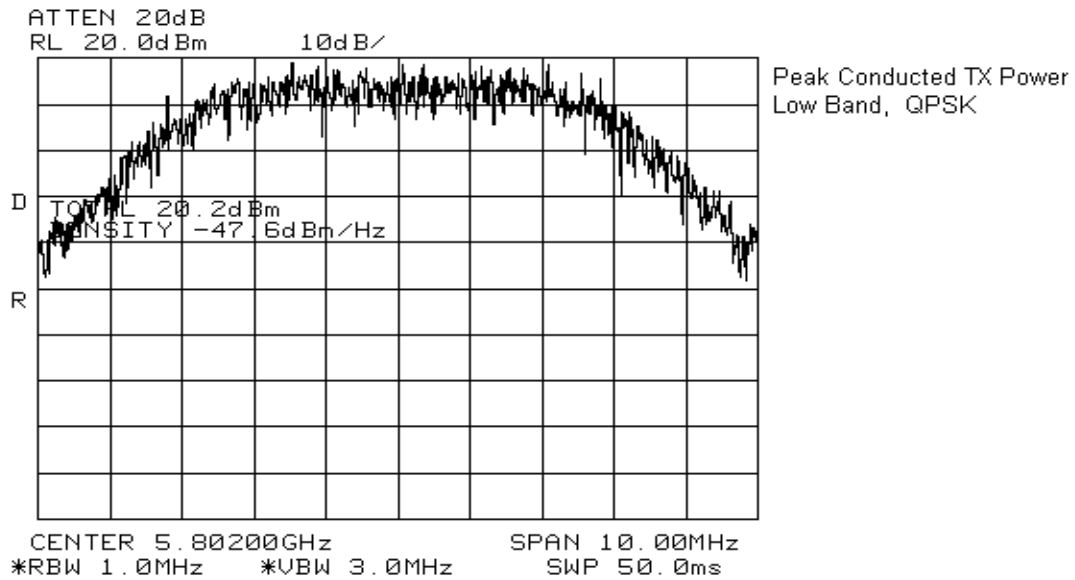
Ref. DA 02-2138, 30 Aug. 2002, Method 1

Peak Conducted Transmit Power			
	Low band (dBm)	Mid Band (dBm)	High Band (dBm)
QPSK	20.2	20.2	20.0
QAM	14.9	14.9	14.7

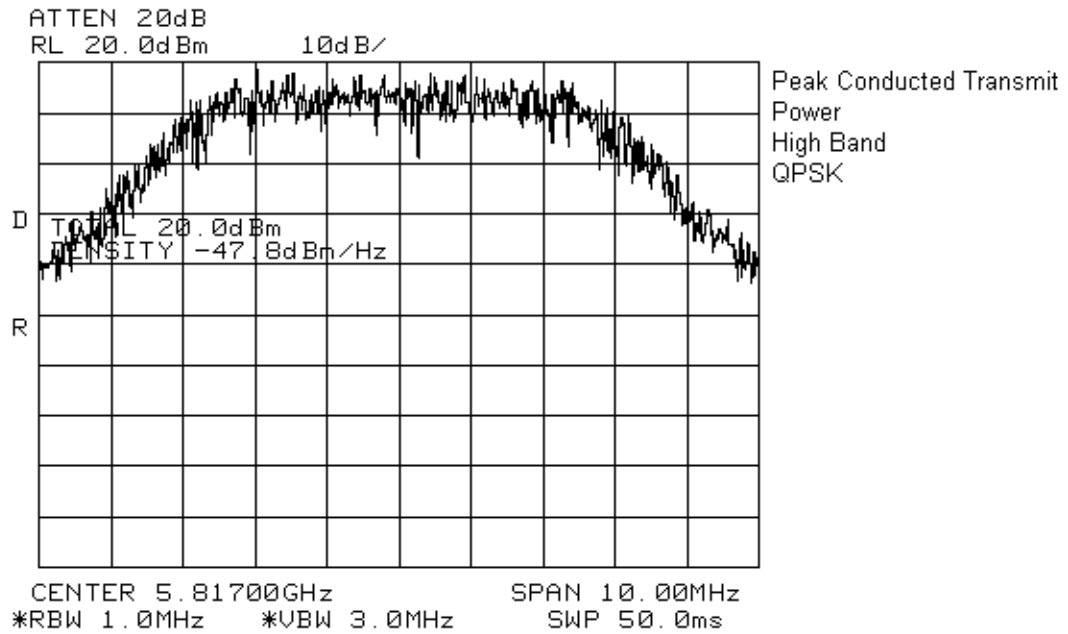
Limit = $17 + 10 \log(26 \text{ dB, BMHz})$ QPSK: $17 + 10 \log(6.17) = 24.9 \text{ dB}$ 64QAM: $17 + 10 \log(5.95) = 24.7 \text{ dB}$

EQUIPMENT: BTR5857

QPSK

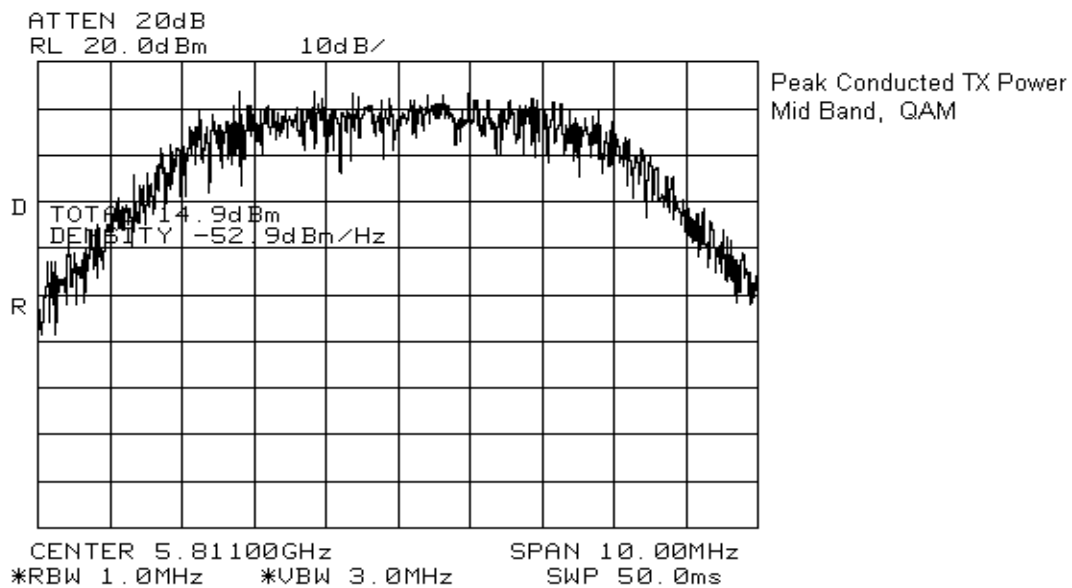
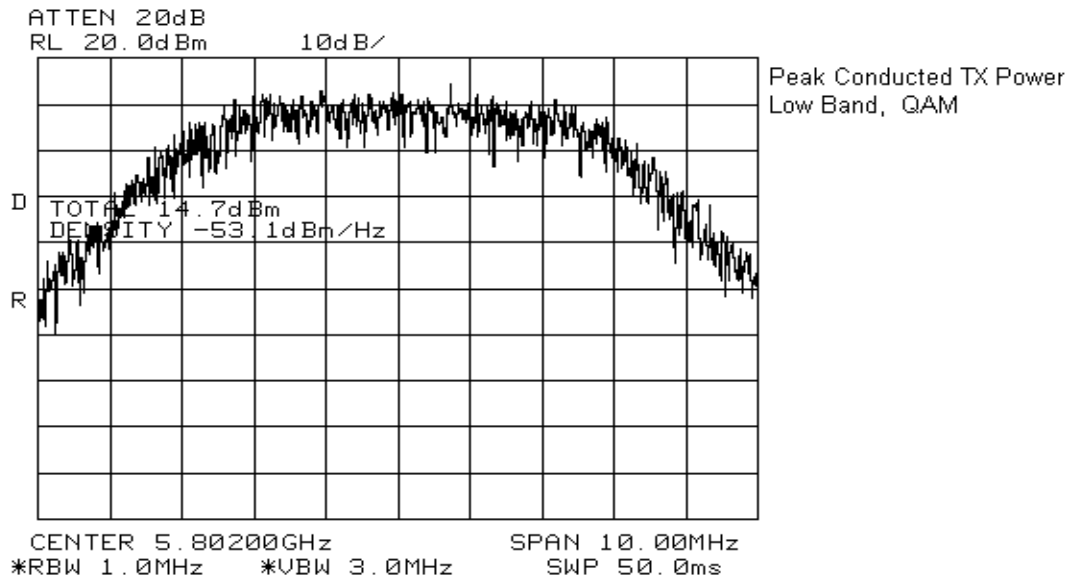


EQUIPMENT: BTR5857

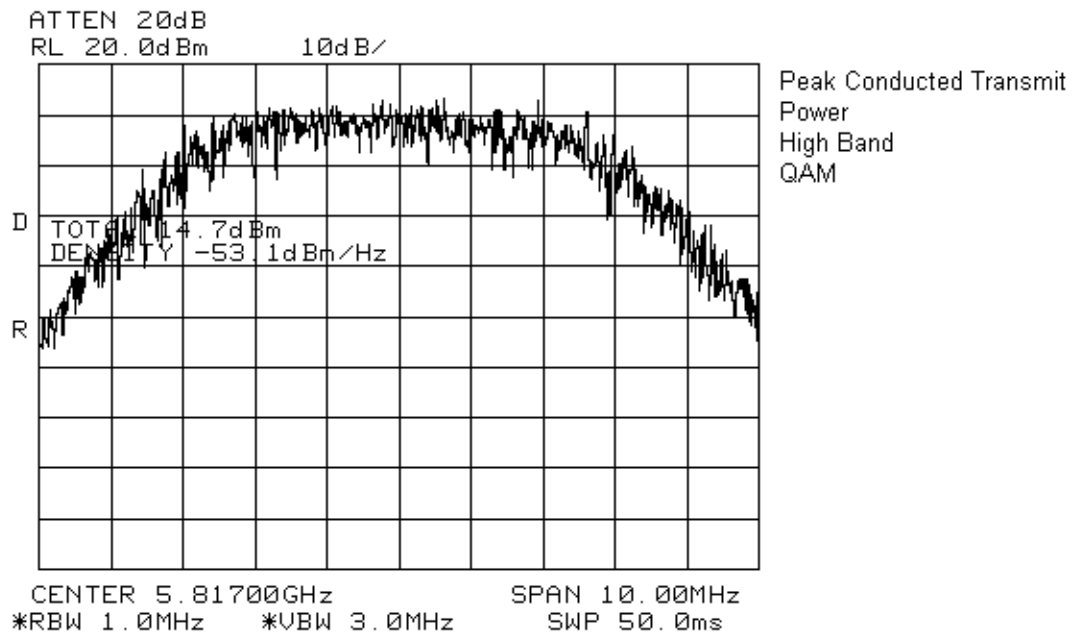


EQUIPMENT: BTR5857

QAM



EQUIPMENT: BTR5857



EQUIPMENT: BTR5857

Section 6. Peak Power Spectral Density

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

Test Performed By: Glen Westwell	Date of Test: 3 Mar. 2004
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Test Results: Complies

Measurement Data: See Table/Plots

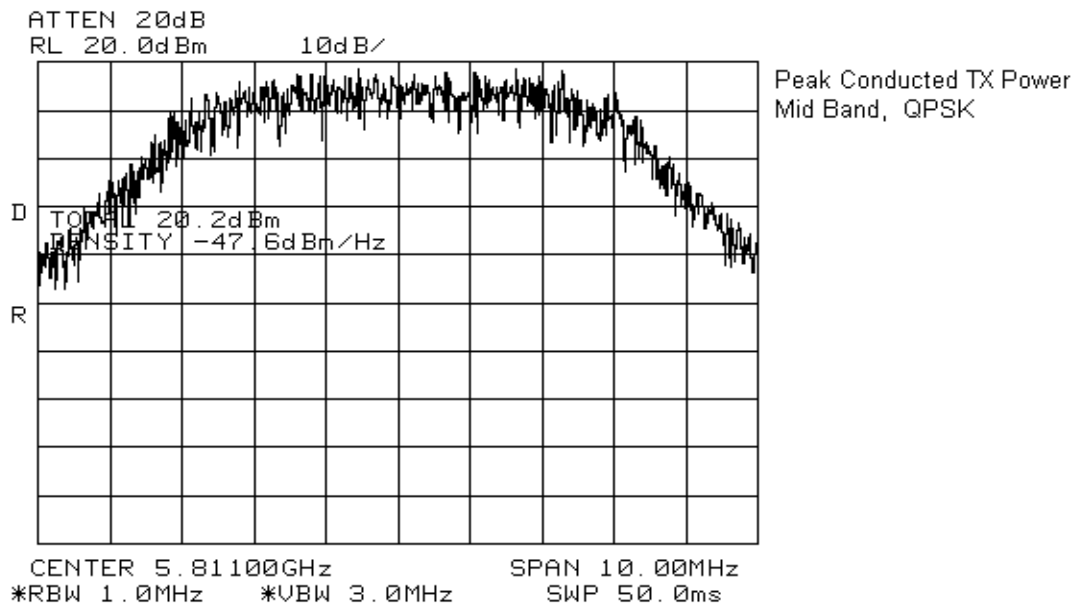
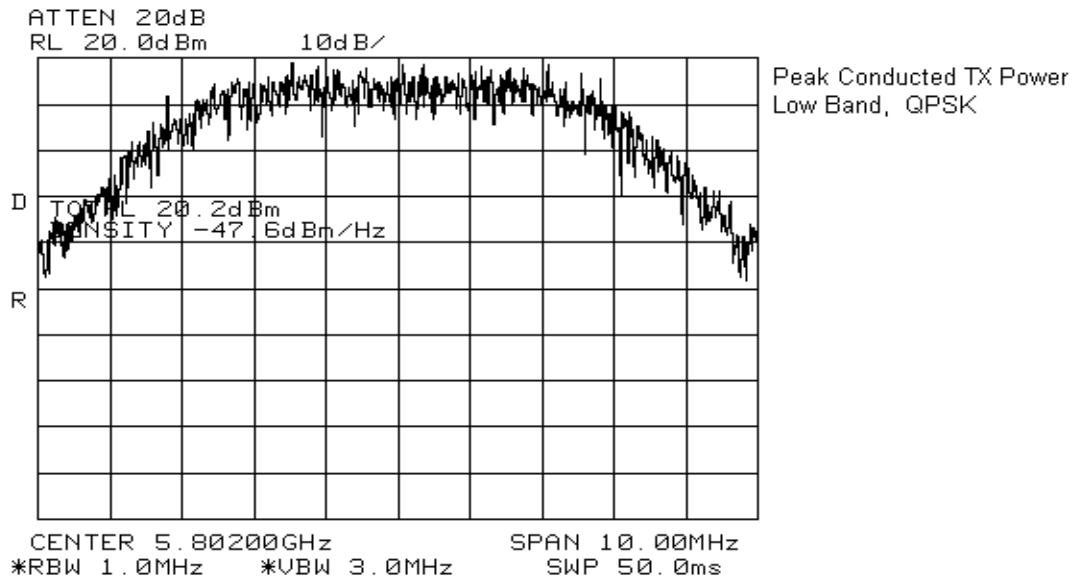
Ref. DA 02-2138, 30 Aug. 2002, Method 2

PPSD Measurements (dBm/MHz)			
	Low	Mid	High
QPSK	12.4	12.4	12.2
QAM	6.9	7.1	6.9

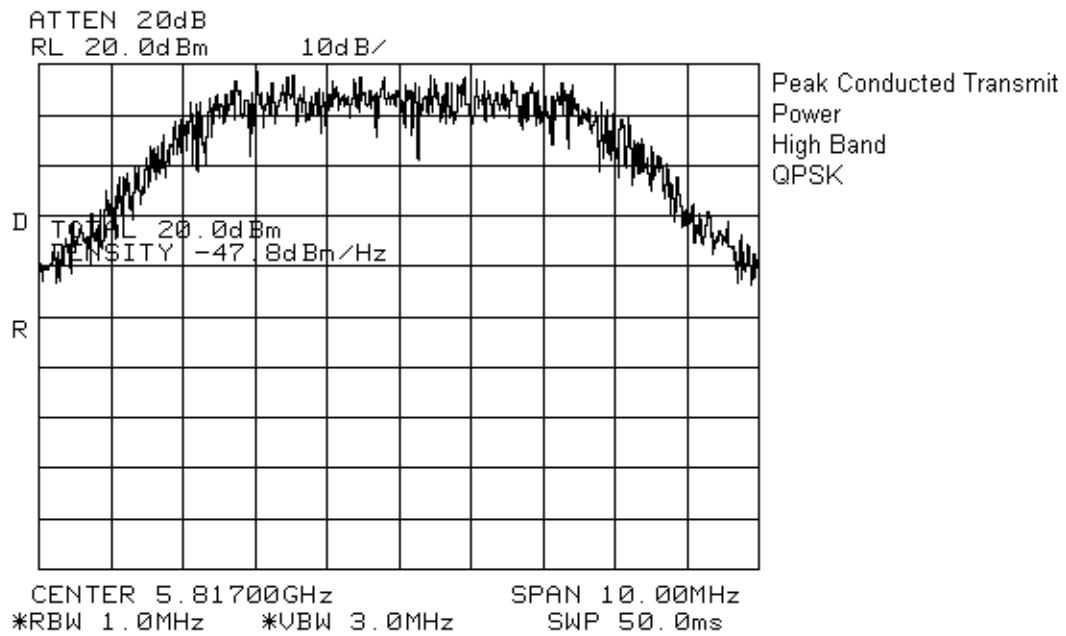
Limit: 5.725-5.825GHz, U-NII 3 = +17dBm/MHz

EQUIPMENT: BTR5857

QPSK

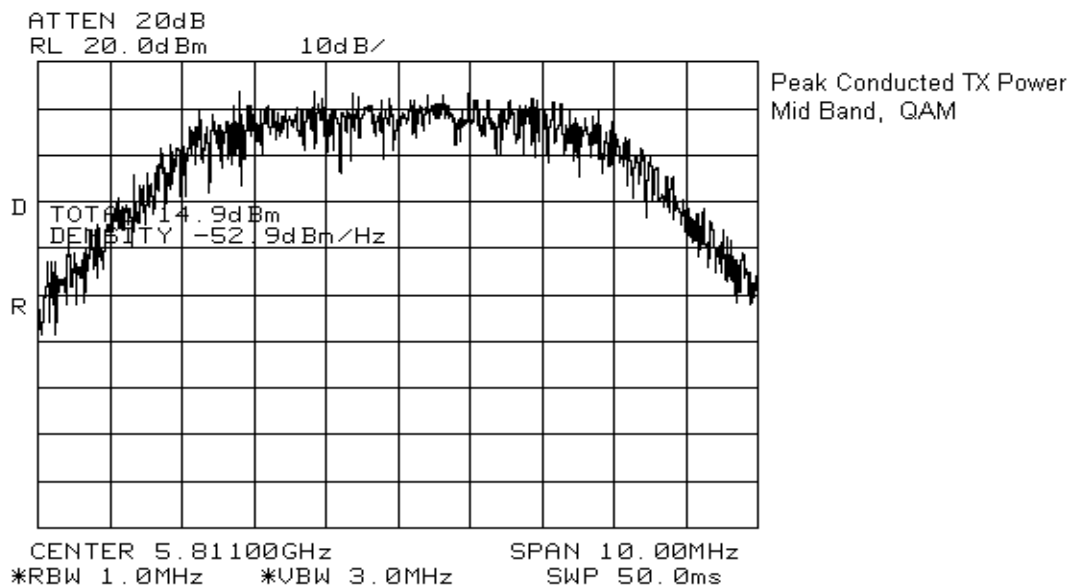
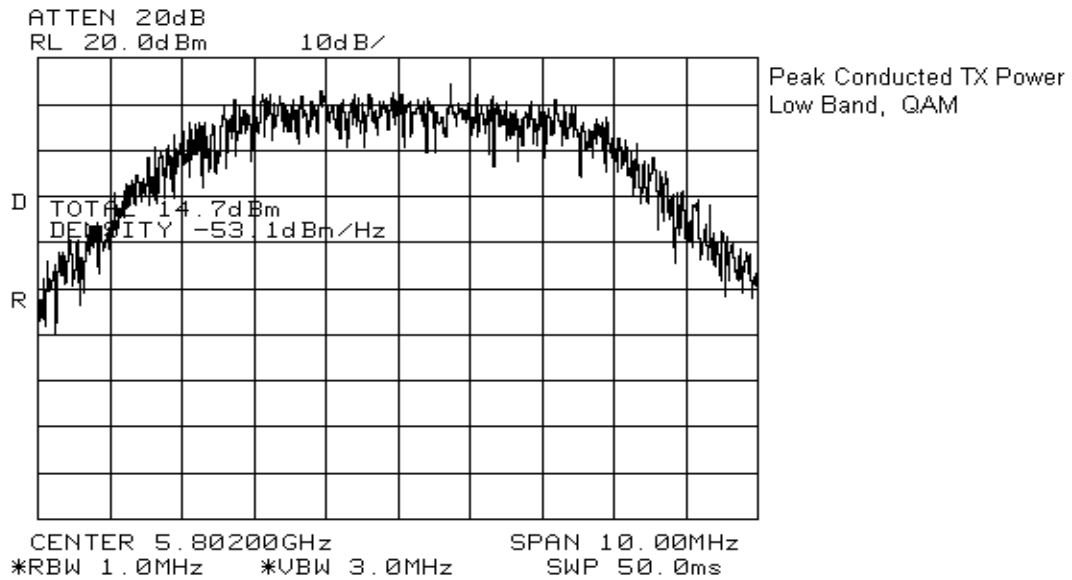


EQUIPMENT: BTR5857

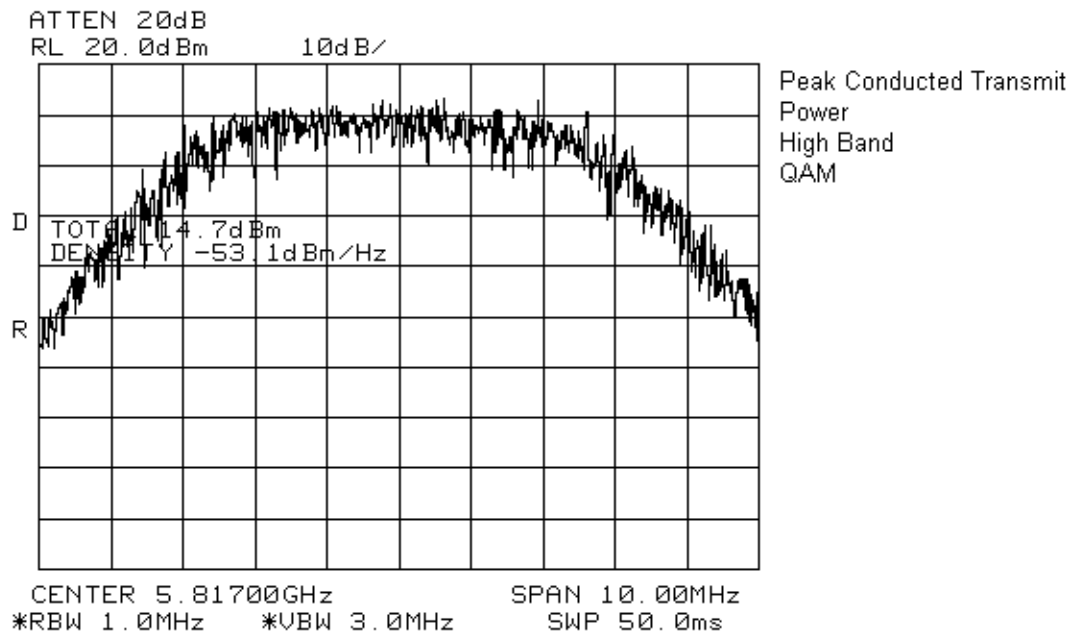


EQUIPMENT: BTR5857

QAM



EQUIPMENT: BTR5857



EQUIPMENT: BTR5857

Section 7. Peak Excursion Measurement

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

Test Performed By: Glen Westwell	Date of Test: 4 Mar. 2004
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Test Results: Complies.

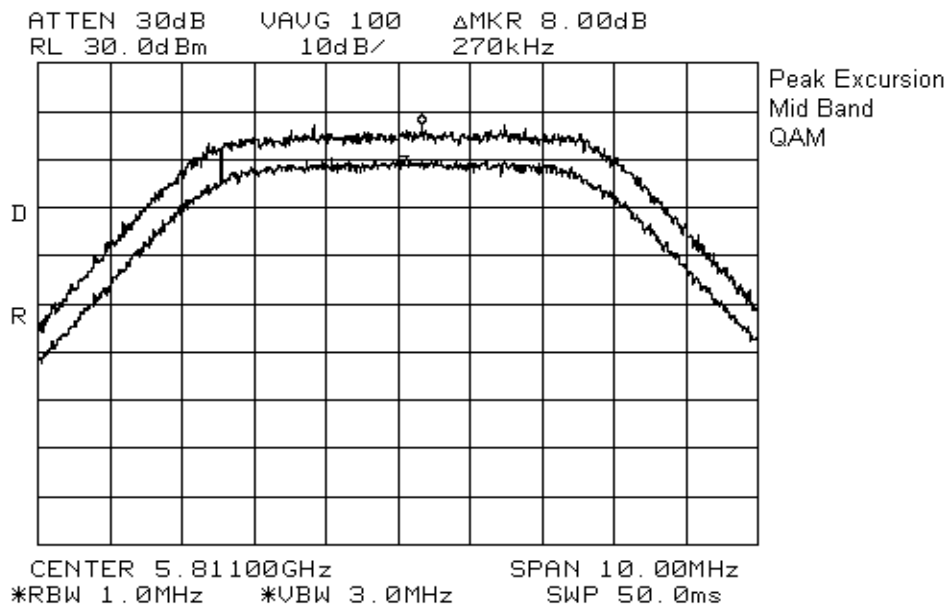
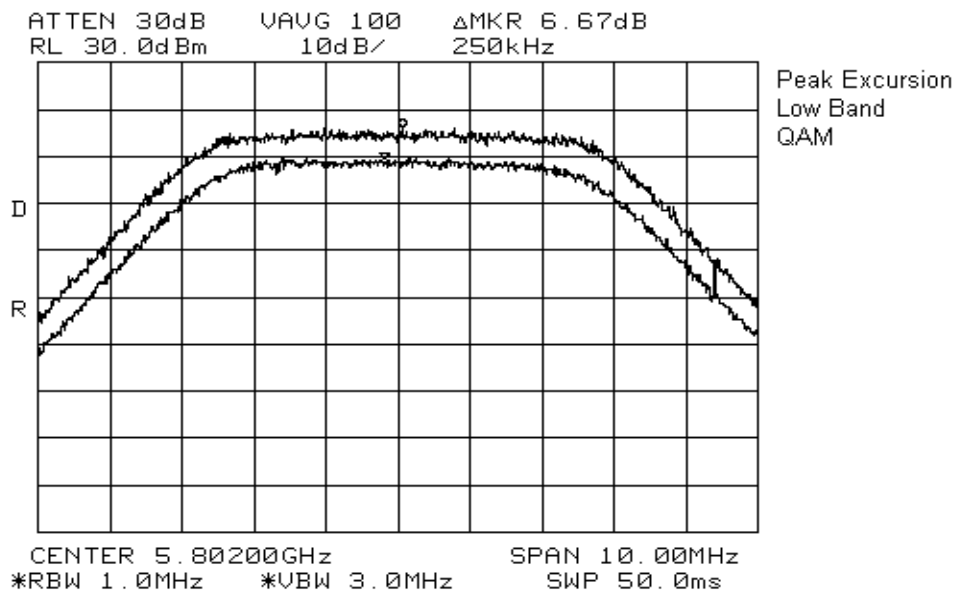
Measurement Data: See attached data.

Ref: DA 02-2138.

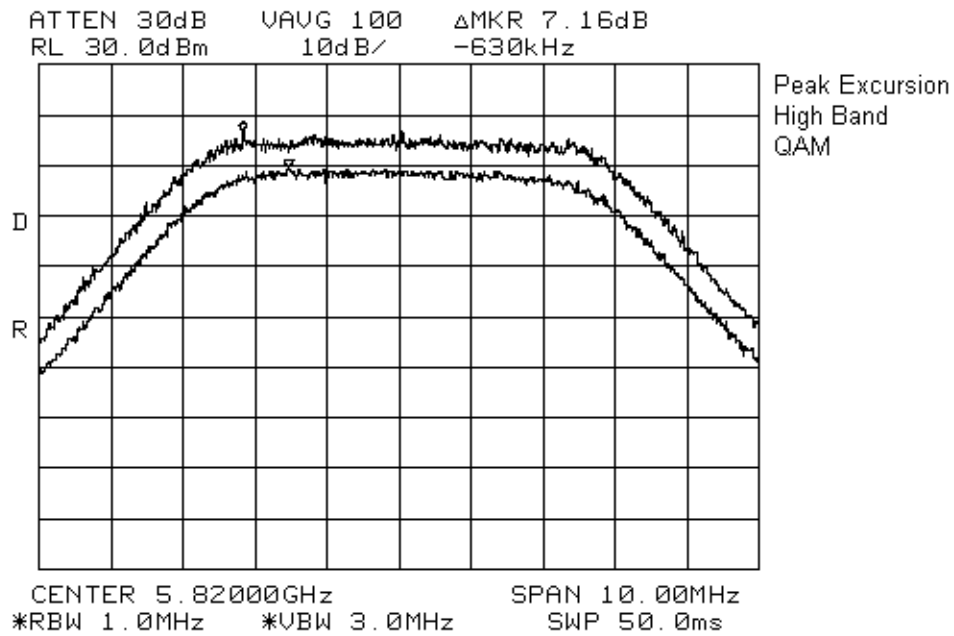
Modulation Envelope Peak Excursion Ratio (dB)			
	Low	Mid	High
QPSK	7.5	6.7	6.7
QAM	6.7	8.0	7.2

Limit = <13dB

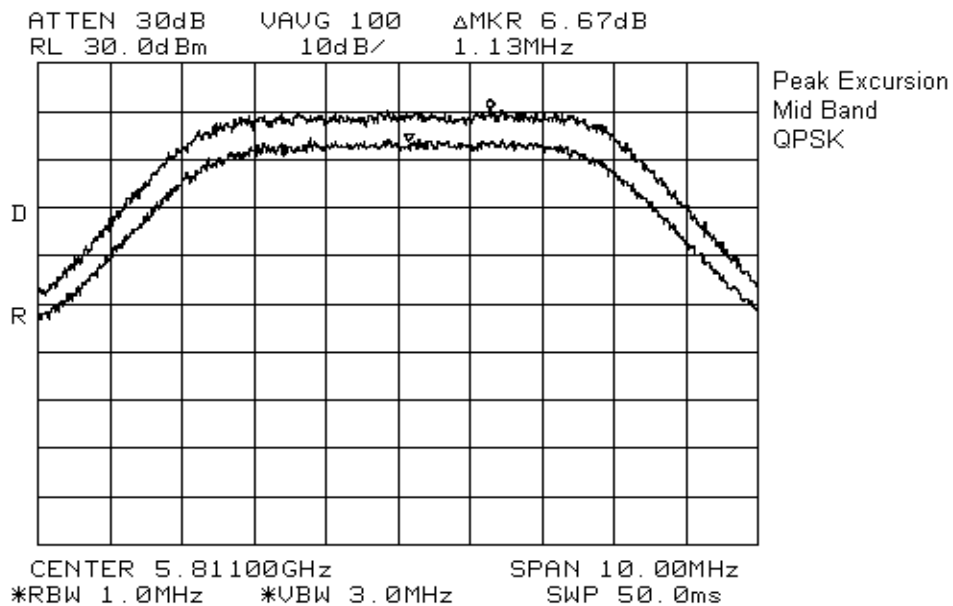
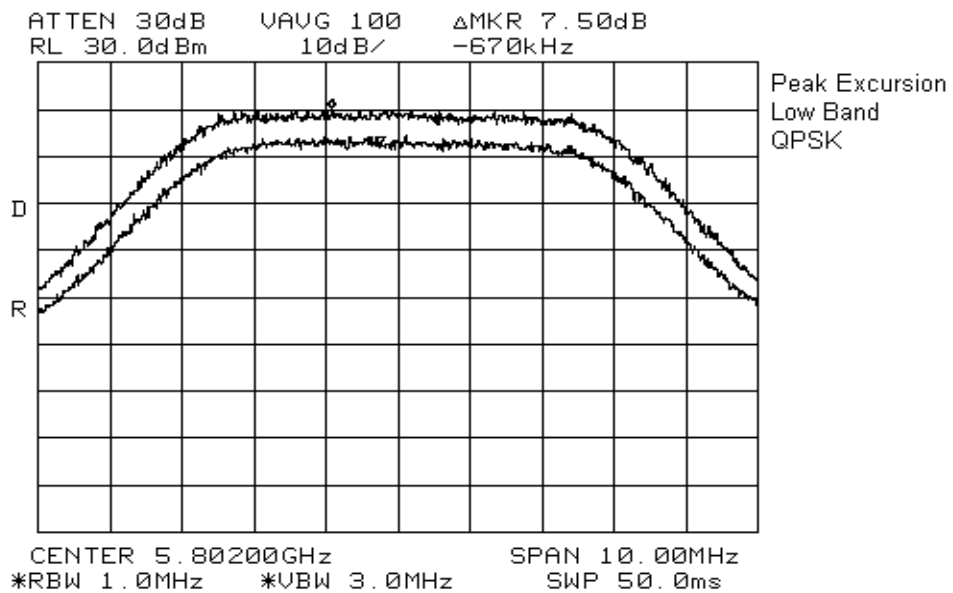
EQUIPMENT: BTR5857



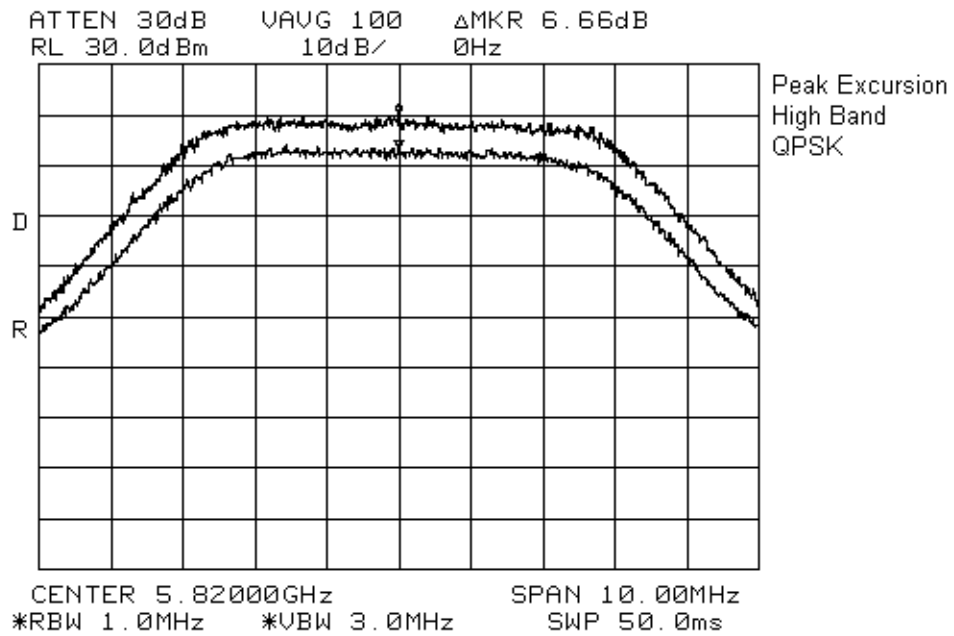
EQUIPMENT: BTR5857



EQUIPMENT: BTR5857



EQUIPMENT: BTR5857



*EQUIPMENT: BTR5857***Section 8. Undesirable Emissions****Para. No.: 15.407(b)(3)(5)**

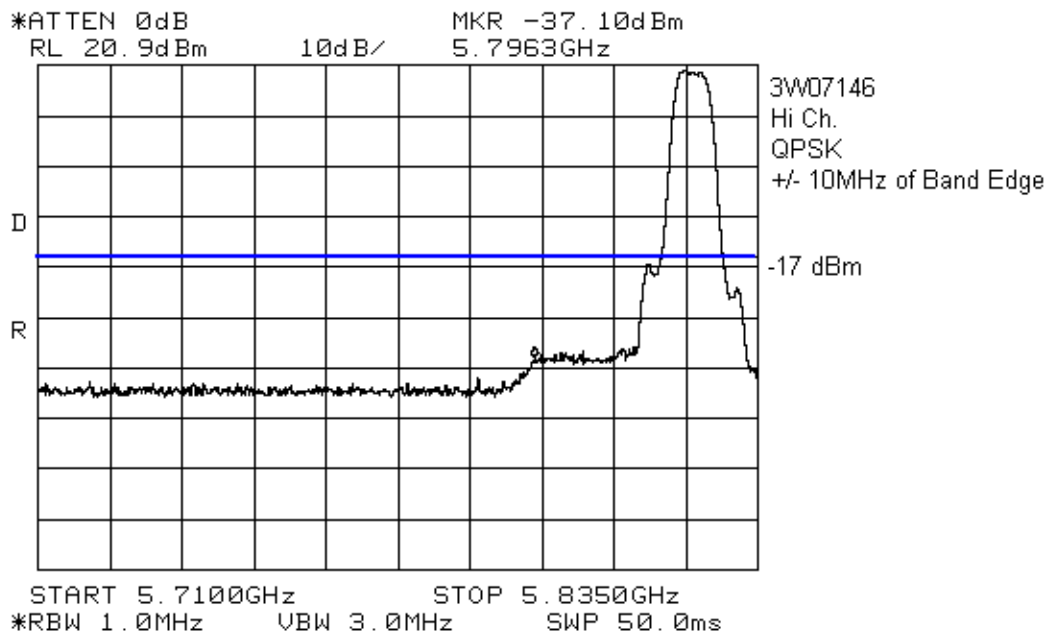
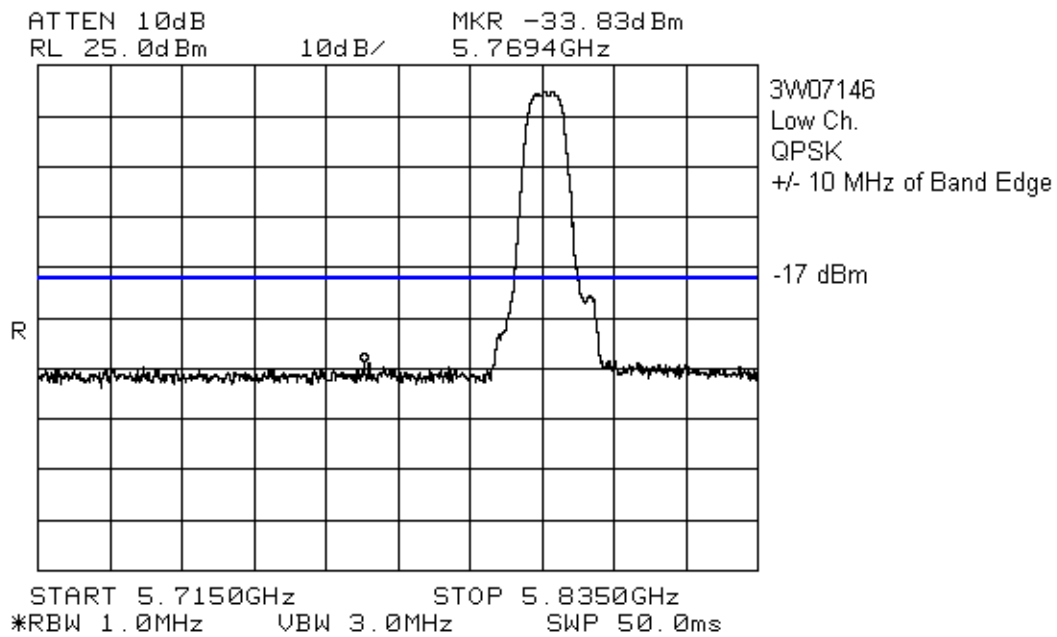
Test Performed By: Kevin Carr	Date of Test: 3 Oct. 2003
Test Performed By: Glen Westwell	Date of Test: 5 Mar. 2004

Test Results: Complies.**Measurement Data:** See attached data.

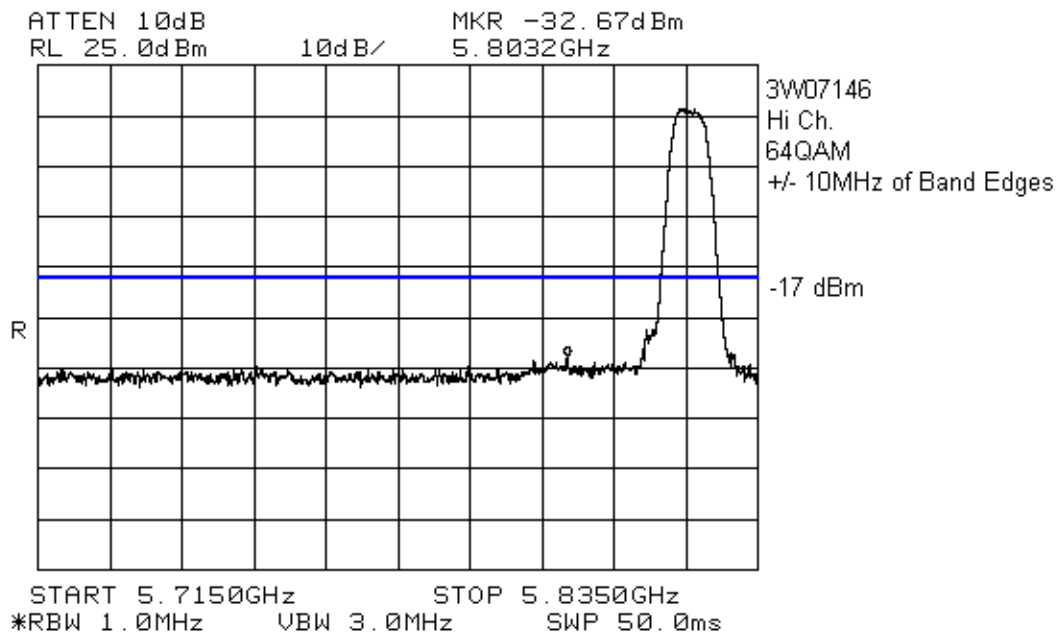
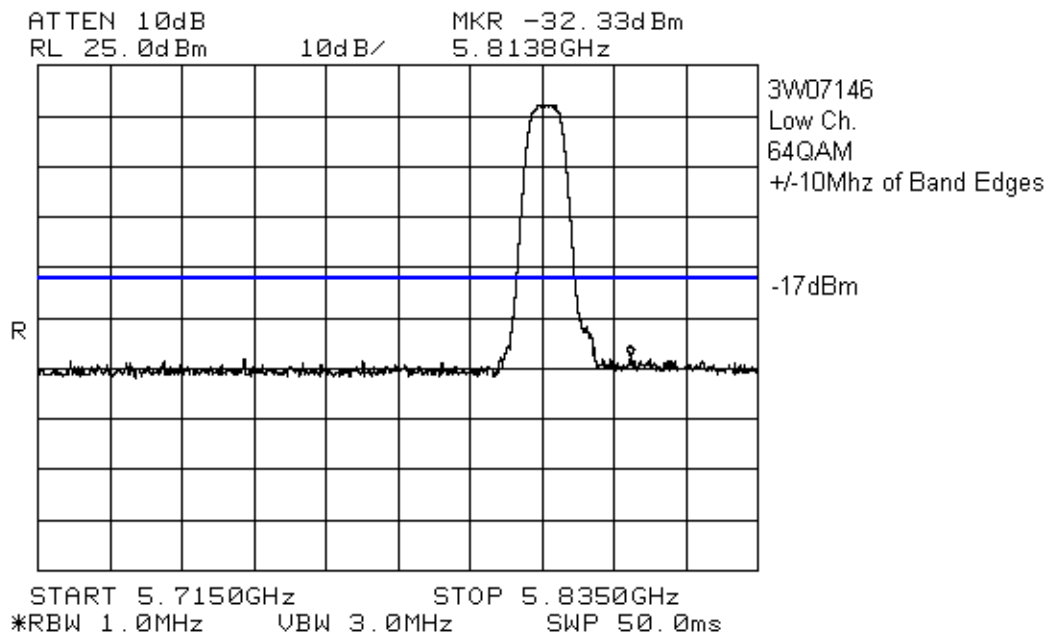
- All emissions were searched from 30MHz to 60GHz.
- Emissions were searched 1m with an in-line amplifier.
- All emissions within 20dB of the limit were reported.
- The DUT was searched on 3 orthogonal axis.
- The supply voltage was varied +/- 15% to verify maximum emission level(s).
- This device operates in the high end of this U-NII band and as such, bandedge compliance has been presented for the upper band edge only.

Radiated Emissions – Signal Substitution. RBW=1MHz					
Frequency (GHz)	Antenna	Polarity	Emission Level (dBm)	Limit (dBm)	Margin (dB)
11.622	H2	V	-50.4	-27	23.4
11.622	H2	H	-50	-27	23.0
17.433	H2	V	-50.9	-27	23.9
17.433	H2	H	-50.7	-27	23.7
23.244	H5	V	-48.2	-27	21.2
23.244	H5	H	-48.2	-27	21.2
29.055	H5	V	-56.9	-27	29.9
29.055	H5	H	-56.9	-27	-29.9
34.866	H5	V	-62.4	-27	35.4
34.866	H5	H	-62.4	-27	35.4

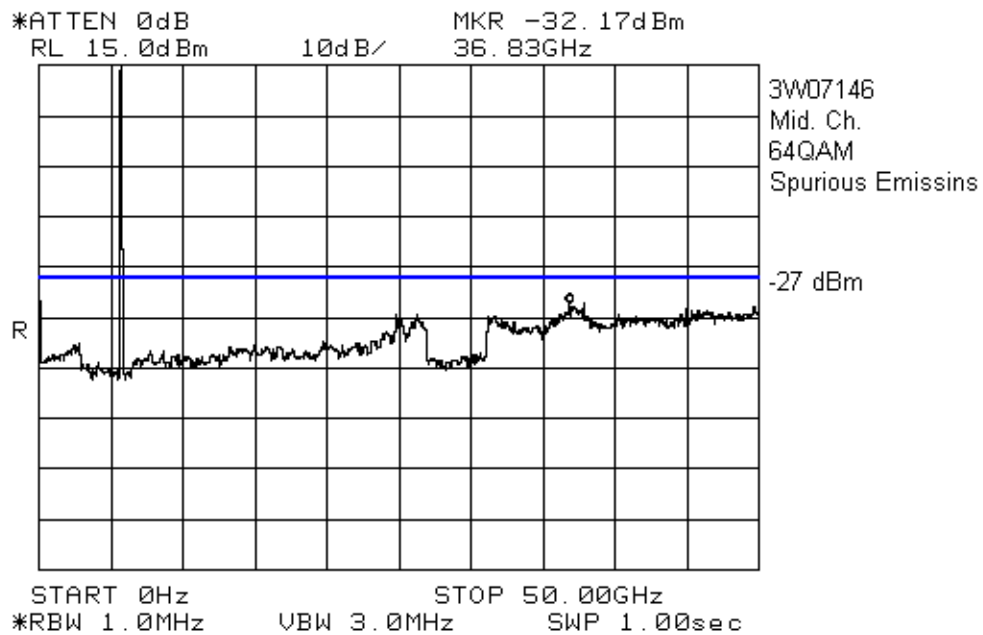
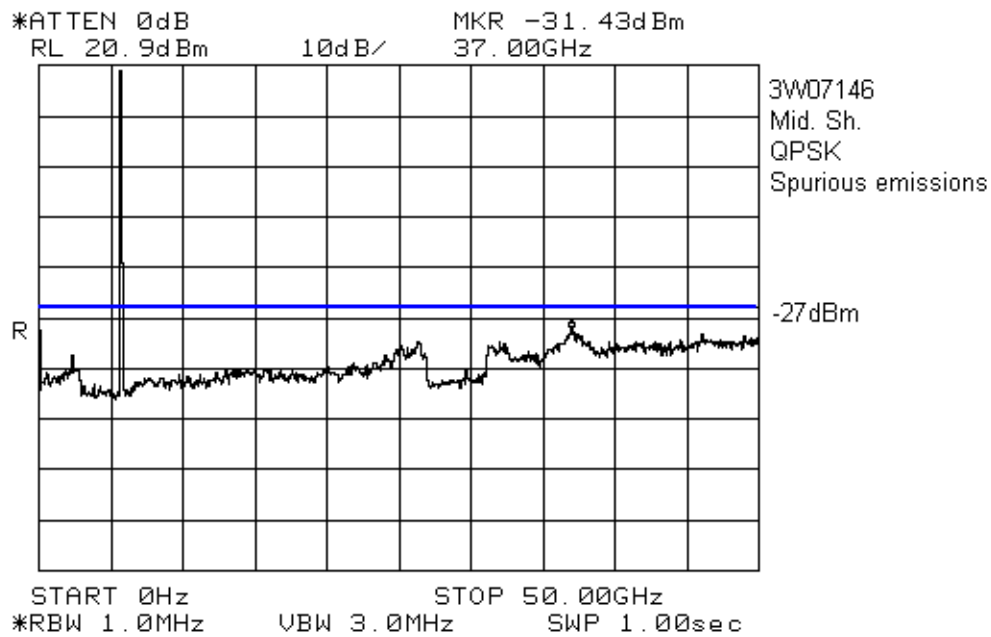
EQUIPMENT: BTR5857



EQUIPMENT: BTR5857

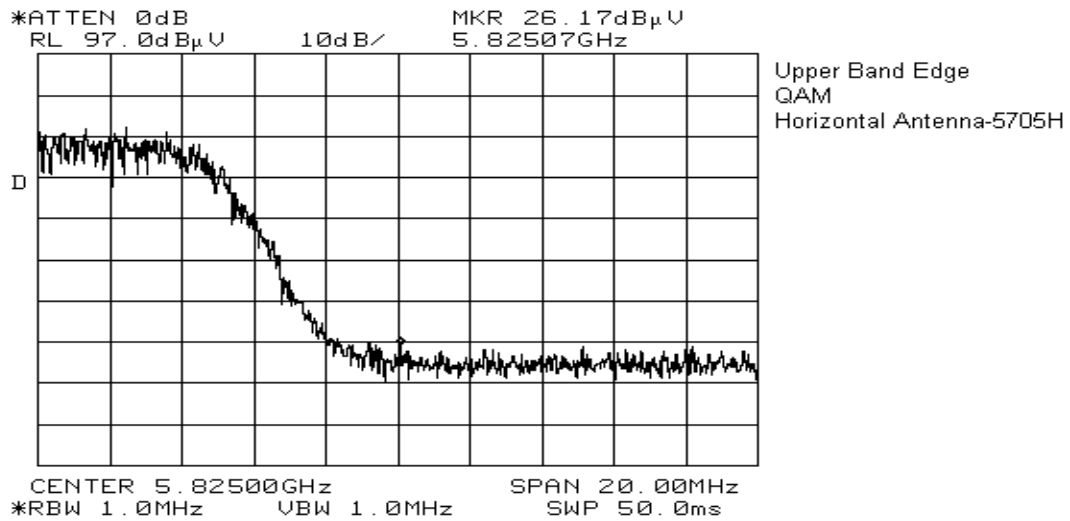


EQUIPMENT: BTR5857

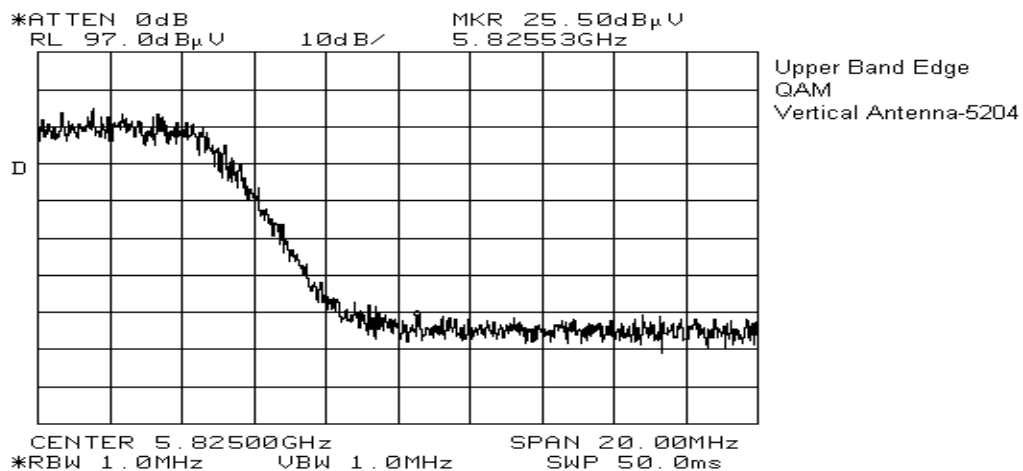


EQUIPMENT: BTR5857

Band Edge Level (dBuV)	Signal Substitution Level (dBm)	Antenna Gain (dBi)	Emission Power Level (dBm)	Limit (dBm)
26.2dBuV	-46.0	10.8	-35.2	-17.0

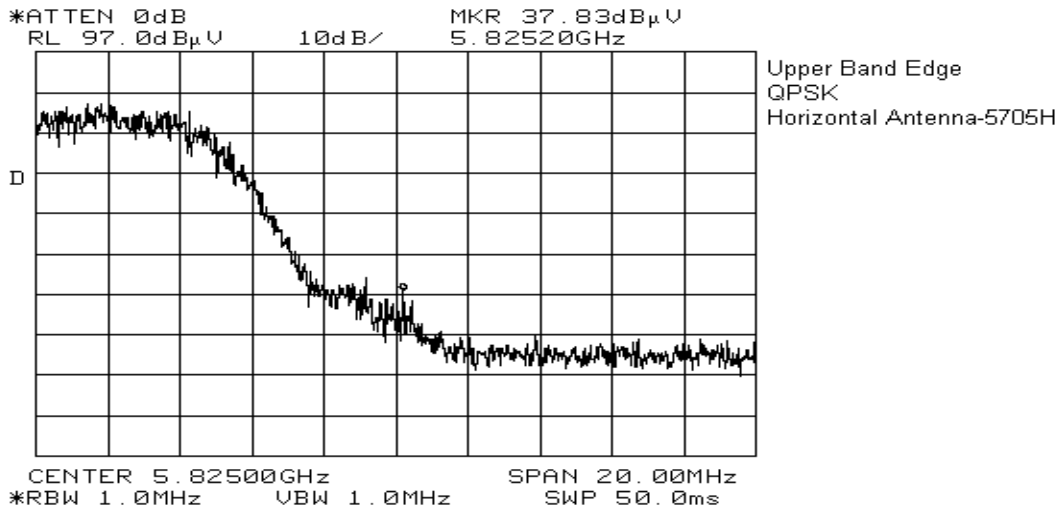


Band Edge Level (dBuV)	Signal Substitution Level (dBm)	Antenna Gain (dBi)	Emission Power Level (dBm)	Limit (dBm)
25.5dBuV	-47.5	10.8	-36.7	-17.0

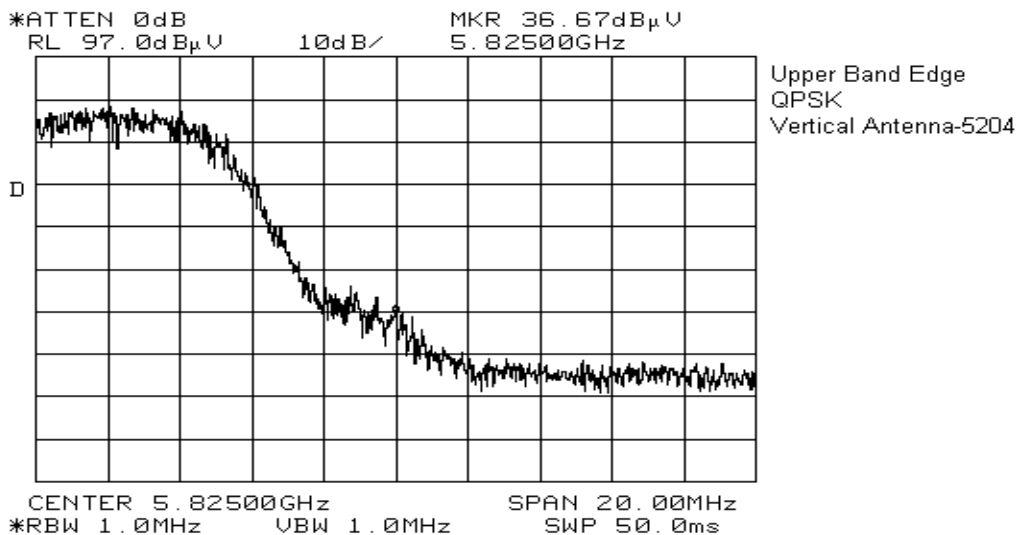


EQUIPMENT: BTR5857

Band Edge Level (dBuV)	Signal Substitution Level (dBm)	Antenna Gain (dBi)	Emission Power Level (dBm)	Limit (dBm)
37.8dBuV	-35.0	10.8	-24.2	-17.0



Band Edge Level (dBuV)	Signal Substitution Level (dBm)	Antenna Gain (dBi)	Emission Power Level (dBm)	Limit (dBm)
36.7dBuV	-36.3	10.8	-25.5	-17.0



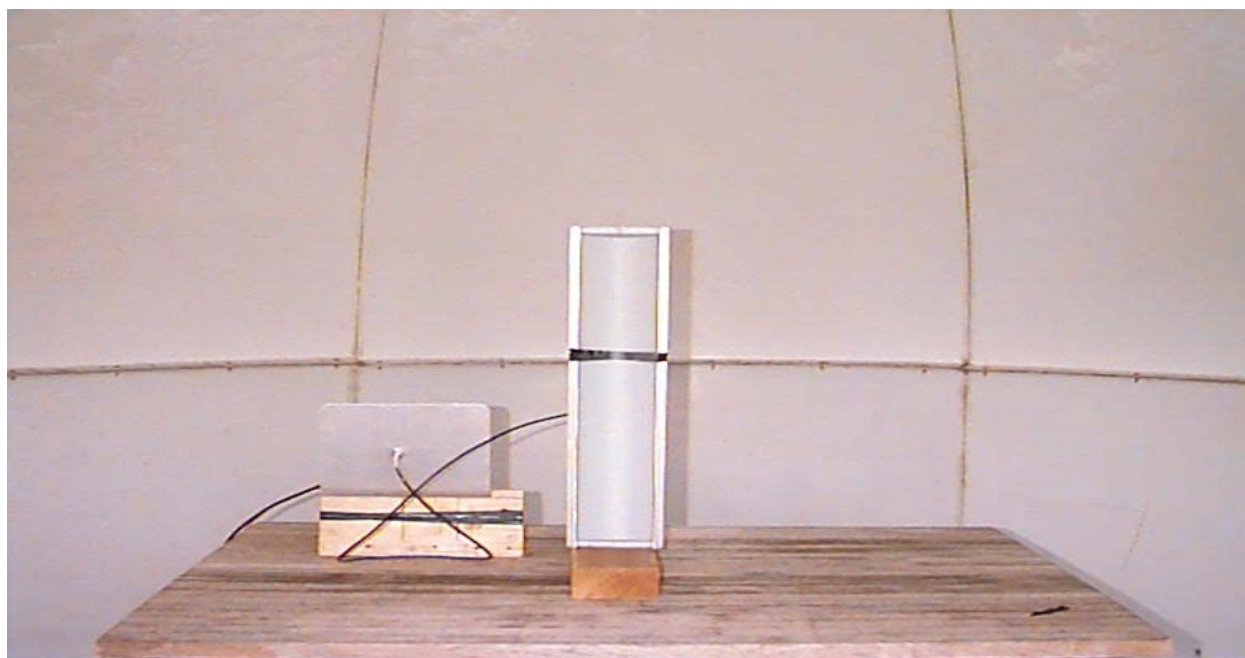
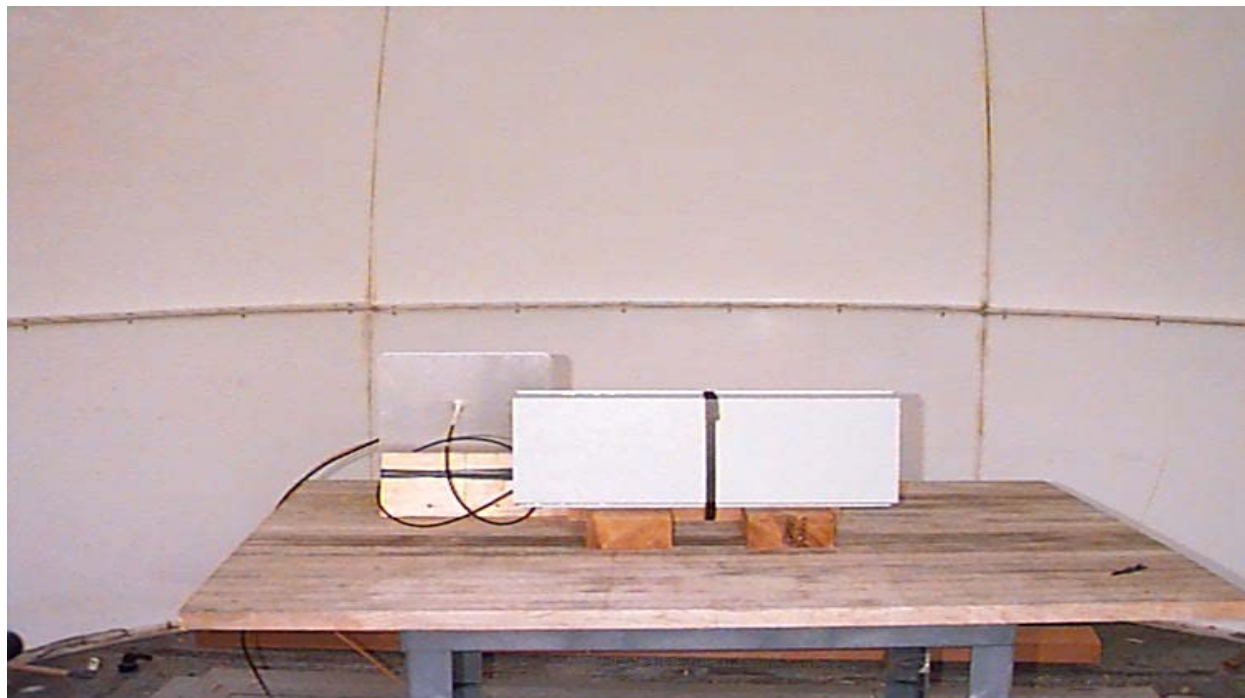
EQUIPMENT: BTR5857

Radiated Test Set-Up, Pre-Scan



EQUIPMENT: BTR5857

Radiated Emissions, OATS



EQUIPMENT: BTR5857

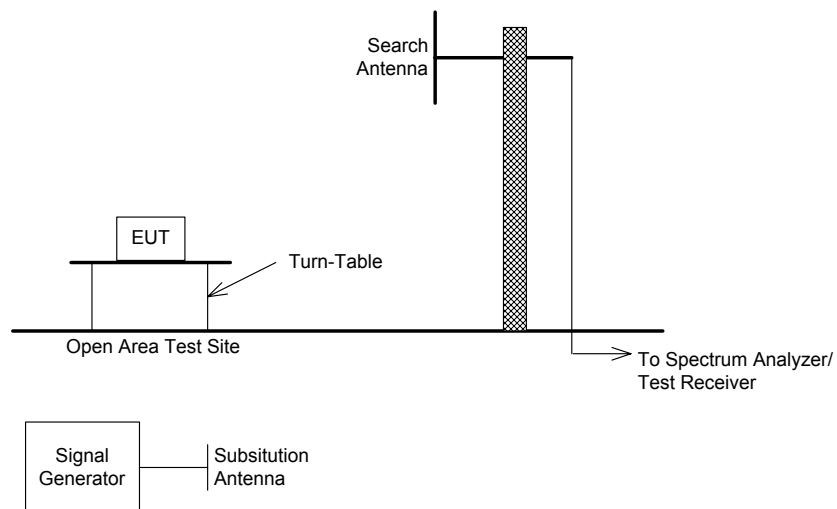
Section 9. Block Diagrams

Test Site For Radiated Emissions

TIA/EIA 603

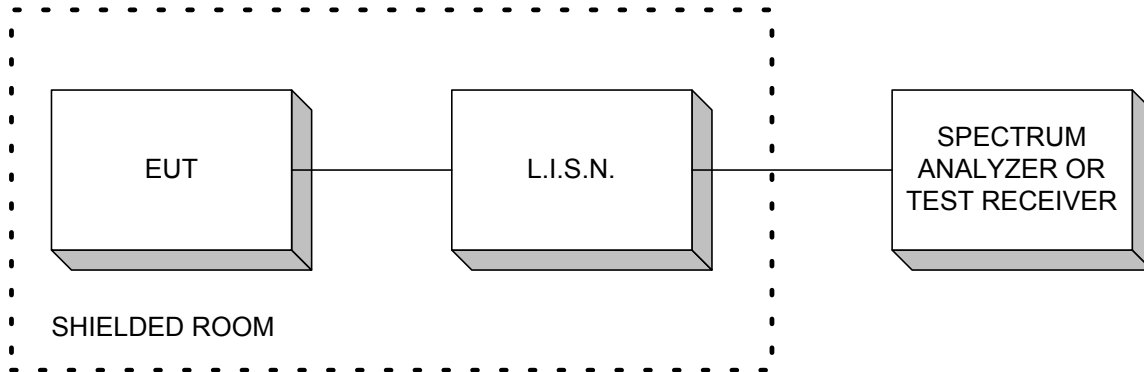
Effective Radiated Power

Spurious Emissions



EQUIPMENT: BTR5857

Conducted Emissions



Peak Power At Antenna Terminals

Conducted Transmitted Power at Antenna Terminals

Peak Power Spectral Density



*EQUIPMENT: BTR5857***Section 10. Test Equipment List****Oct. 2003****Equipment List – Conducted Emissions**

CAL Cycle	Equipment	Manufacturer	Model No.	Asset/Serial No.	Last Cal.	Next Cal.
1 Year	LISN	EMCO	4825/2	FA001545	Oct. 25/02	Oct. 25/03
1 Year	Spectrum Analyzer	Hewlett-Packard	8566B	FA001309	June. 05/03	June. 05/04
1 Year	Spectrum Analyzer Display	Hewlett-Packard	85662A	FA001309	June. 05/03	June. 05/04
1 Year	Transient Limiter	Hewlett-Packard	1194 7A	FA001855	May. 06/03	May. 06/04

Note: N/A = Not Applicable, NCR = No Cal Required, COU = CAL On Use, OUT = Out For CAL/Repair

Equipment List - Radiated Emissions

CAL Cycle	Equipment	Manufacturer	Model No.	Asset/Serial No.	Last Cal.	Next Cal.
1 Year	Spectrum Analyzer	Hewlett-Packard	8565E	FA000981	July. 03/03	July. 03/04
1 Year	Horn Antenna #2	EMCO	3115	FA000825	Dec. 09/02	Dec. 09/03
1 Year	Horn Antenna	EMCO #5	3116	FA001847	13 Feb 03	13 Feb 04
COU	5.0 – 18.0 GHz Amplifier	NARDA	DWT-186N23U40	FA001409	COU	COU
COU	18.0 – 26.0 GHz Amplifier	NARDA	BBS-1826N612	FA001550	COU	COU
COU	26 – 40.0 GHz Amplifier	NARDA	DBL-2640N610	FA001556	COU	COU

Note: N/A = Not Applicable, NCR = No Cal Required, COU = CAL On Use, OUT = Out For CAL/Repair

Mar. 2004**RF Conducted and Radiated Emissions**

CAL Cycle	Equipment	Manufacturer	Model No.	Asset/Serial No.	Last Cal.	Next Cal.
1 Year	Spectrum Analyzer	Hewlett Packard	8565E	FA000981	03 Jul 03	03 Jul 04
3 Year	Signal Generator	Rhode & Schwarz	SM1Q03E	FA001269	06 Dec 02	06 Dec 05
1 Year	Power Meter	Hewlett Packard	E4418B	FA001413	08 May 03	08 May 04
1 Year	Power Sensor	Hewlett Packard	8487A	FA001419	15 May 03	15 May 04
1 Year	RF AMP	JCA	4-8 GHz	FA001497	18 June 03	18 June 04
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 Feb 04	19 Feb 05
1 Year	Signal Generator	Hewlett Packard	8673B	FA001134	COU	COU
1 Year	Diplexer	Olsen - OML	DPL.26 (H.P)		COU	COU
1 Year	Mixer/Antenna 40-60Ghz	Olsen – OML	M19HWA (H.P.)		COU	COU

Note: N/A = Not Applicable, NCR = No Cal Required, COU = CAL On Use, OUT = Out For CAL/Repair