

# **Exhibit 6**

Test Report

## Exhibit 6

### Test Report

Name of Test: RF Power Output

Rule Part Number: 2.1046, 21.904(b), 74.935(b)  
 EIRP = 33 dBW+10log(X/6) dBW+10log(360/beamwidth) dBW  
 X = 6 for this filing  
 $10\log(360/\text{beamwidth}) \leq 6\text{dB}$   
 beamwidth minimum = 60°  
 EIRP maximum = 39 dBiW = 7,943 W EIRP

Test Procedure: RF power output is measured with the aid of an RF Power Meter that is capable of measuring a Time Division Duplexed (TDD) transmission. Measurements have been recorded for minimum and maximum power settings.

Test Conditions: Frequency = 2557 MHz  
 Temperature = 25°C  
 Supply Voltage = 48 Vdc

Test Equipment:

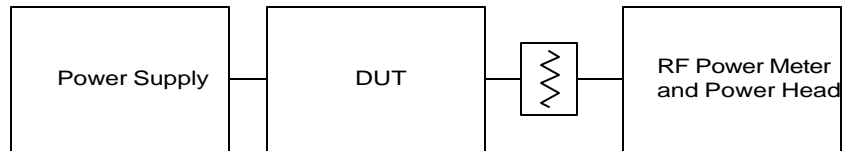
Power Supply	Cherokee International Model: CRP500L1H-1A Calibration not required
Power Meter	Hewlett Packard E4419A S/N: GB38271143 Cal Date: 10-1-1999 Cal Due: 10-1-2001
Power Meter RF Head	Hewlett-Packard HP8481A S/N: US37299502 Cal Date: 10-1-1999 Cal Due: 10-1-2001
Attenuator	Inmet Corporation Model: 12B25W-30dB Calibration not required

## Exhibit 6

### Test Report

Name of Test: RF Power Output

Test Set-Up:



Test Results:

Minimum Power setting	
(dBm)	(Watts)
33.05	2.02

Maximum Power setting	
(dBm)	(Watts)
0.00	0.001

Test Conclusions:

RF Power Output = 33 dBm

Antenna Gain = 20 dBi

Transmitted Power = RF Power + Antenna Gain

Transmitted Power = 33 + 20 = 53.0 dBm

Transmitted Power = 23 dBiW < 39 dBiW

Pass Transmitted Power Output Requirement

## Exhibit 6

### Test Report

Name of Test: Modulation Characteristics

Rule Part Number: 2.1047(d), 21.905(b), 74.936(a), 21.908(d), 74.936(f)

Modulation Characteristics = OFDM

21.908(d) The maximum out-of-band power of an MDS response station using all or part of a 6 MHz channel, employing digital modulation and transmitting with an EIRP greater than -6 dBW per 6 MHz channel shall be attenuated (as measured in accordance with paragraph (e) of this section) at the 6 MHz channel edges at least 25 dB relative to the average 6 MHz channel power level, then attenuated along a linear slope to at least 40 dB at 250 kHz beyond the nearest channel edge, then attenuated along a linear slope from that level to at least 60 dB at 3 MHz above the upper and below the lower licensed channel edges, and attenuated at least 60 dB at all other frequencies.

74.936(f) The maximum out-of-band power of an ITFS response station using all or part of a 6 MHz channel, employing digital modulation and transmitting with an EIRP greater than -6 dBW per 6 MHz channel shall be attenuated (as measured in accordance with § 21.908(e)) at the 6 MHz channel edges at least 25 dB relative to the average 6 MHz channel power level, then attenuated along a linear slope to at least 40 dB at 250 kHz beyond the nearest channel edge, then attenuated along a linear slope from that level to at least 60 dB at 3 MHz above the upper and below the lower licensed channel edges, and attenuated at least 60 dB at all other frequencies.

## Exhibit 6

### Test Report

Name of Test: Modulation Characteristics

Test Procedure: The Orthogonal Frequency Division Multiplexing (OFDM) modulated Time Division Duplex (TDD) RF signal from the test unit is applied to a spectrum analyzer. The emissions of the test unit are recorded for minimum and maximum RF power levels.

Test Conditions: Frequency = 2557 MHz  
 Temperature = 25°C  
 Supply Voltage = 48 Vdc

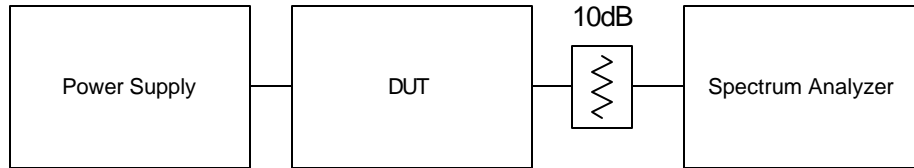
Test Equipment:

Power Supply	Cherokee International Model: CRP500L1H-1A Calibration not required
Spectrum Analyzer	Rohde&Schwarz Model: FSEA S/N: 832247/015 Cal Date: 05-19-2000 Cal Due: 05-19-2001
Attenuator	Pasternack Model PE7016-20 / 20dB Calibration not required
Attenuator	Pasternack Model PE7005-10 / 10dB Calibration not required

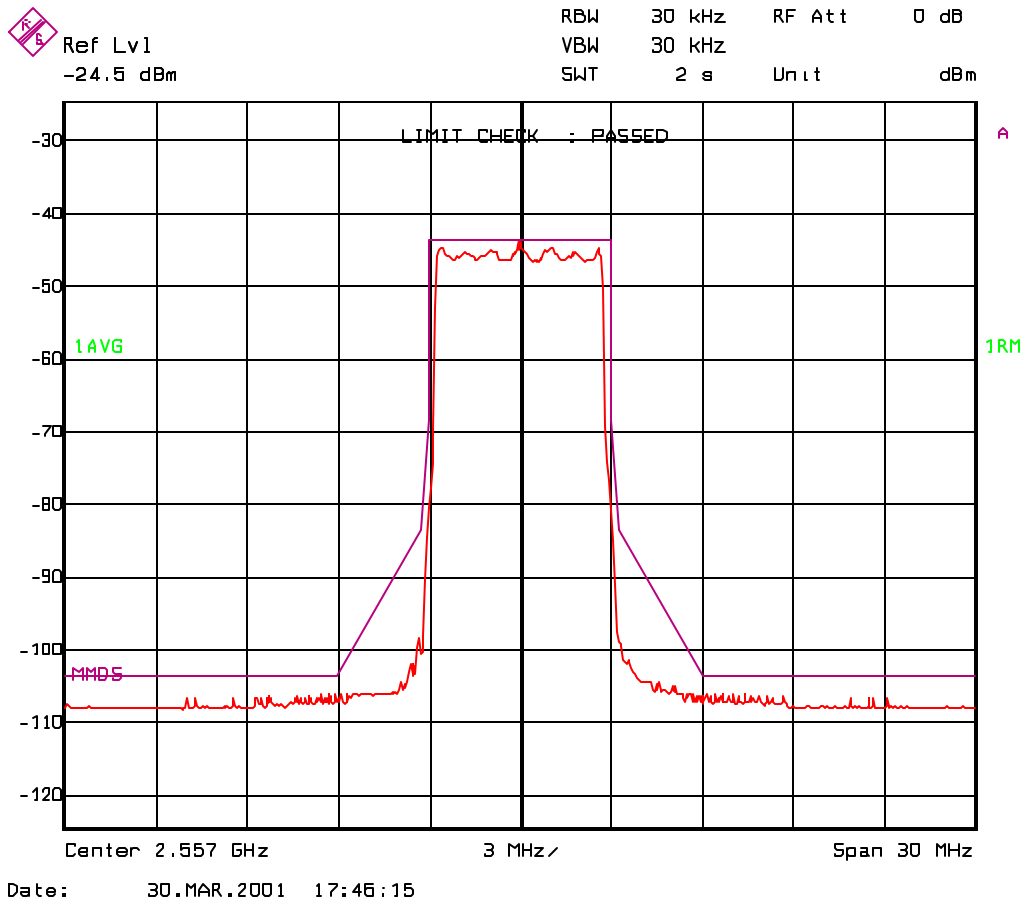
### Exhibit 6 Test Report

Name of Test: Modulation Characteristics

Test Set-Up:



Test Results: Minimum Power Level (0dBm / 1mW)

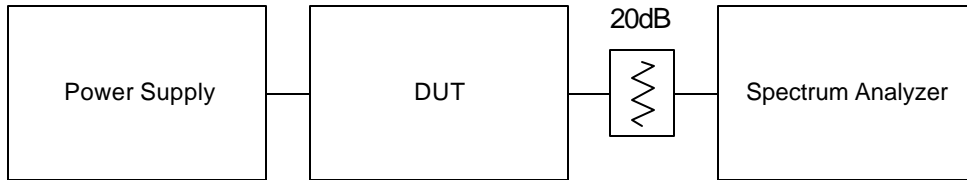


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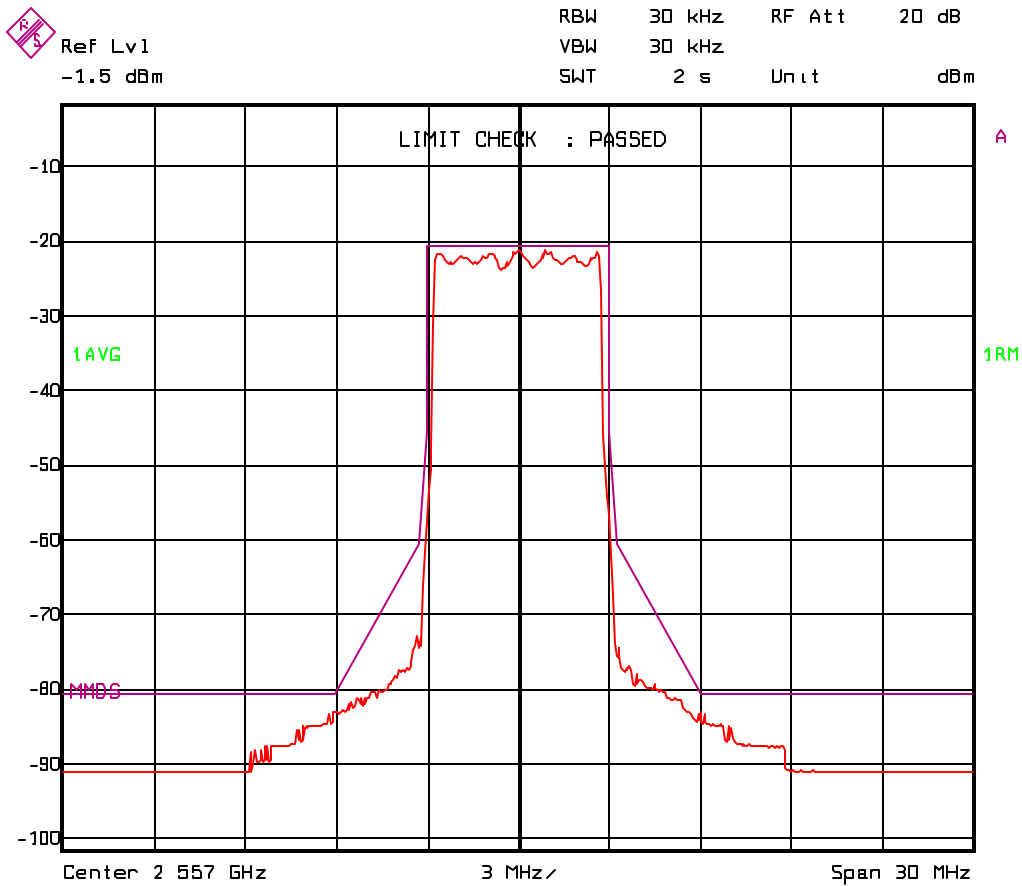
### Exhibit 6 Test Report

Name of Test: Modulation Characteristics

Test Set-Up:



Test Results: Maximum Power Level (33dBm / 2W)



Date: 30.MAR.2001 18:14:37

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## Exhibit 6

### Test Report

Name of Test: Occupied Bandwidth

Rule Part Number: 2.1049(h), 21.105

Each authorization issued pursuant to these rules will show, as the emission designator, a symbol representing the class of emission which shall be prefixed by a number specifying the necessary bandwidth. This figure does not necessarily indicate the bandwidth actually occupied by the emission at any instant. In those cases where part 2 of this chapter does not provide a formula for the computation of the necessary bandwidth, the occupied bandwidth may be used in the emission designator.

Test Procedure: The Orthogonal Frequency Division Multiplexing (OFDM) modulated Time Division Duplex (TDD) RF signal from the test unit is applied to a spectrum analyzer. The occupied bandwidth of the test unit is recorded by measuring the modulation bandwidth at the 25 dB points.

Test Conditions: Frequency = 2557 MHz  
 Temperature = 25°C  
 Supply Voltage = 48 Vdc

Test Equipment:

Power Supply	Cherokee International Model: CRP500L1H-1A Calibration not required
Spectrum Analyzer	Rohde&Schwarz Model: FSEA S/N: 832247/015 Cal Date: 05-19-2000 Cal Due: 05-19-2001
Attenuator	Pasternack Model PE7016-20 / 20dB Calibration not required
Attenuator	Pasternack Model PE7005-10 / 10dB Calibration not required



**Exhibit 6**  
Test Report

Name of Test: Occupied Bandwidth

Test Results Summary:

0dBm / 1mW level

Occupied Bandwidth = 2.5598492 GHz – 2.5541518 GHz

Occupied Bandwidth = 5.6974 MHz

33dBm / 2W level

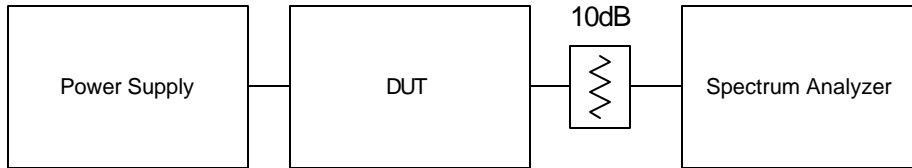
Occupied Bandwidth = 2.5598492 GHz – 2.55416683 GHz

Occupied Bandwidth = 5.68237 MHz

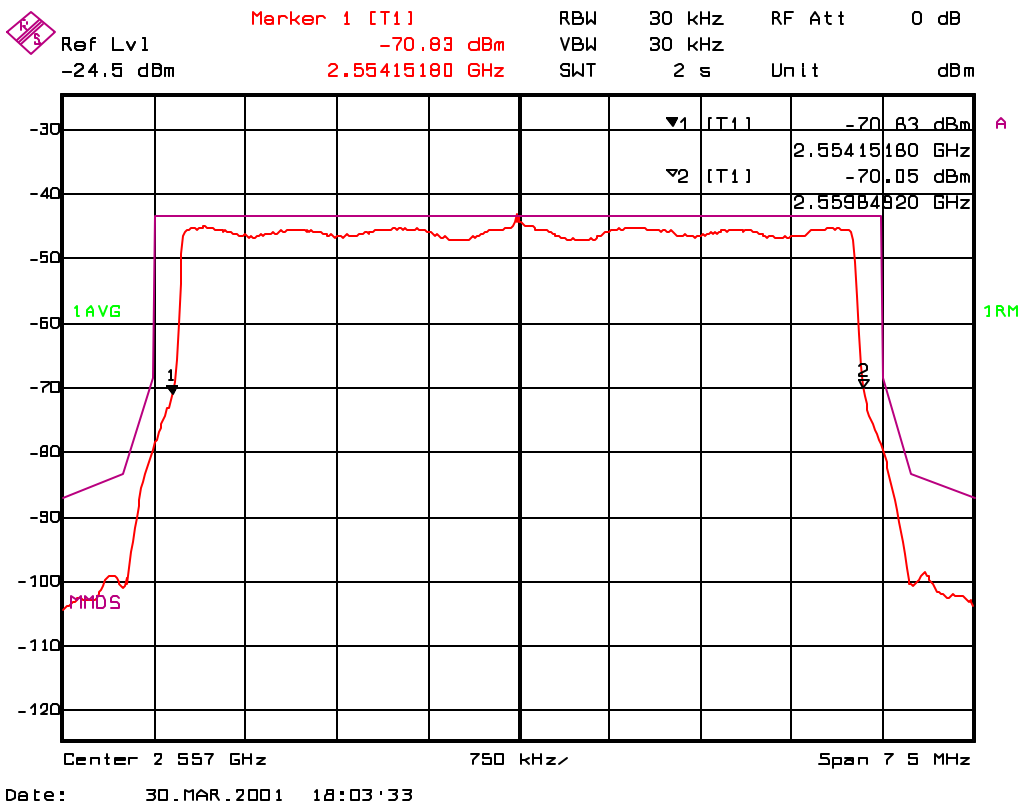
### Exhibit 6 Test Report

Name of Test: Occupied Bandwidth

Test Set-Up:



Test Results: Minimum Power Level (0dBm / 1mW)



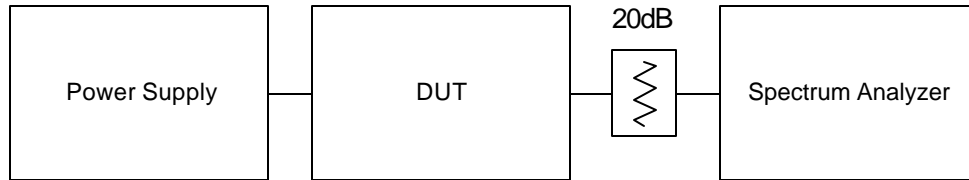
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### Exhibit 6

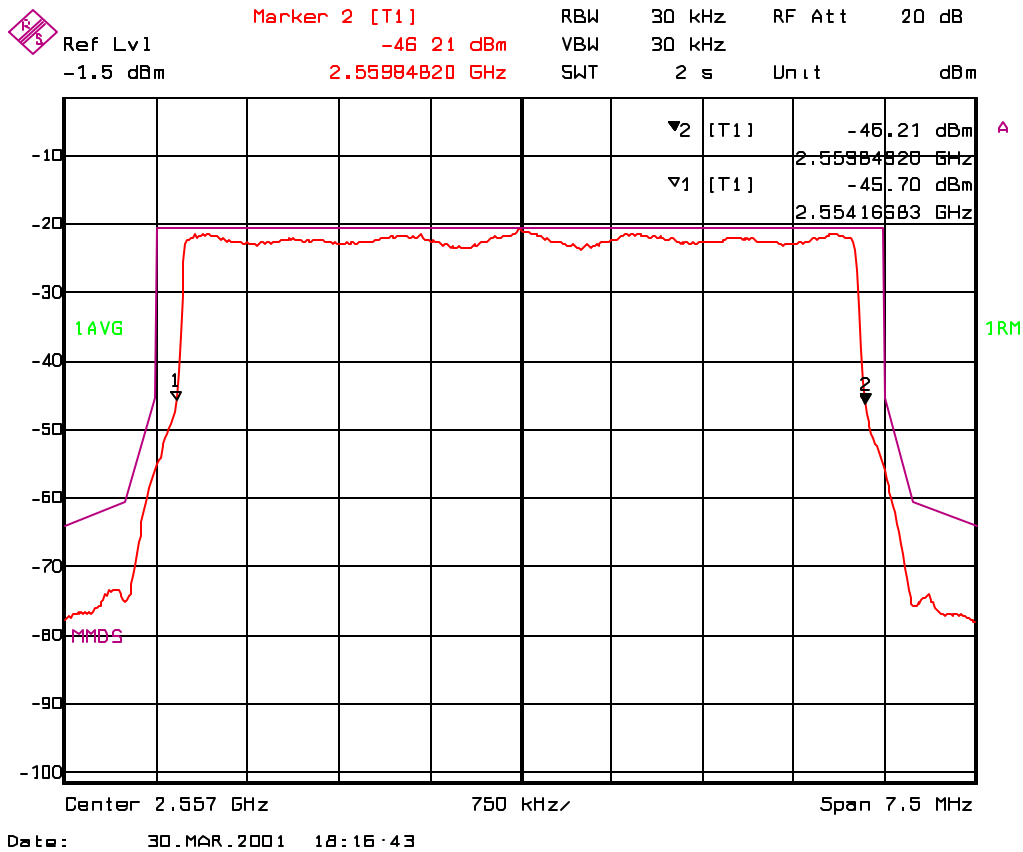
### Test Report

Name of Test: Occupied Bandwidth

Test Set-Up:



Test Results: Minimum Power Level (33dBm / 2W)



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## Exhibit 6

### Test Report

Name of Test: Spurious emissions at antenna terminals

Rule Part Number: 2.1051, 2.1049, 2.1057

Frequency Range = 9 kHz to 26.86 GHz

Attenuation (dB) below the power (W) supplied to the antenna transmission line

Attenuation =  $43 + 10 \log P$ , or 70 dBc, whichever is less stringent

Attenuation =  $43 + 10 \log 2 = 46 \text{ dB}$      2 watt transmit level  
Attenuation =  $43 + 10 \log .001 = 13 \text{ dB}$      0.001 watt transmit level

Test Procedure: The Orthogonal Frequency Division Multiplexing (OFDM) modulated Time Division Duplex (TDD) RF signal from the test unit is applied to a spectrum analyzer. The transmission is recorded from 9 kHz to 26.5 GHz.

Test Conditions: Frequency = 2557 MHz  
Temperature = 25°C  
Supply Voltage = 48 Vdc

## Exhibit 6

### Test Report

Name of Test: Spurious emissions at antenna terminals

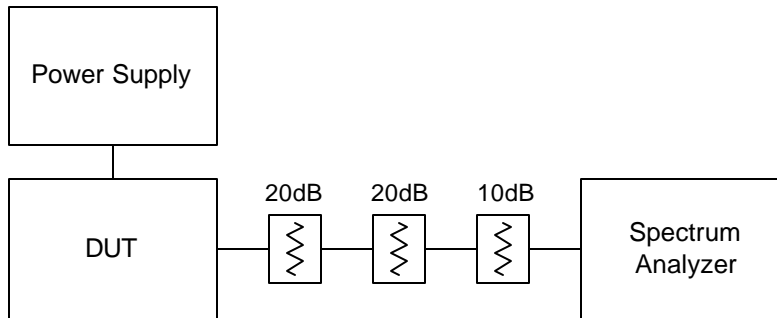
Test Equipment:

Power Supply	Cherokee International Model: CRP500L1H-1A Calibration not required
Spectrum Analyzer	Hewlett Packard HP8563E S/N: 3221A00143 Cal Date: 08-01-1999 Cal Due: 08-01-2001
Network Analyzer	Hewlett Packard HP8753C S/N: 3025A00263 Calibration not required
S-Parameter Test Set	Hewlett Packard HP85047A S/N: 3033A02955 Calibration not required
Attenuator	Inmet Corporation Model: 12B25W-20dB 25 watt / 20 dB Calibration not required
Attenuator	Pasternack Model PE7017-6 25 watt / 6 dB Calibration not required
Attenuator	Inmet Corporation Model: 12B - 3 dB Calibration not required
Attenuator	Inmet Corporation Model: 12B - 6 dB Calibration not required
Attenuator	Inmet Corporation Model: 12B - 10 dB Calibration not required
Attenuator	Inmet Corporation Model: 12B - 20 dB Calibration not required

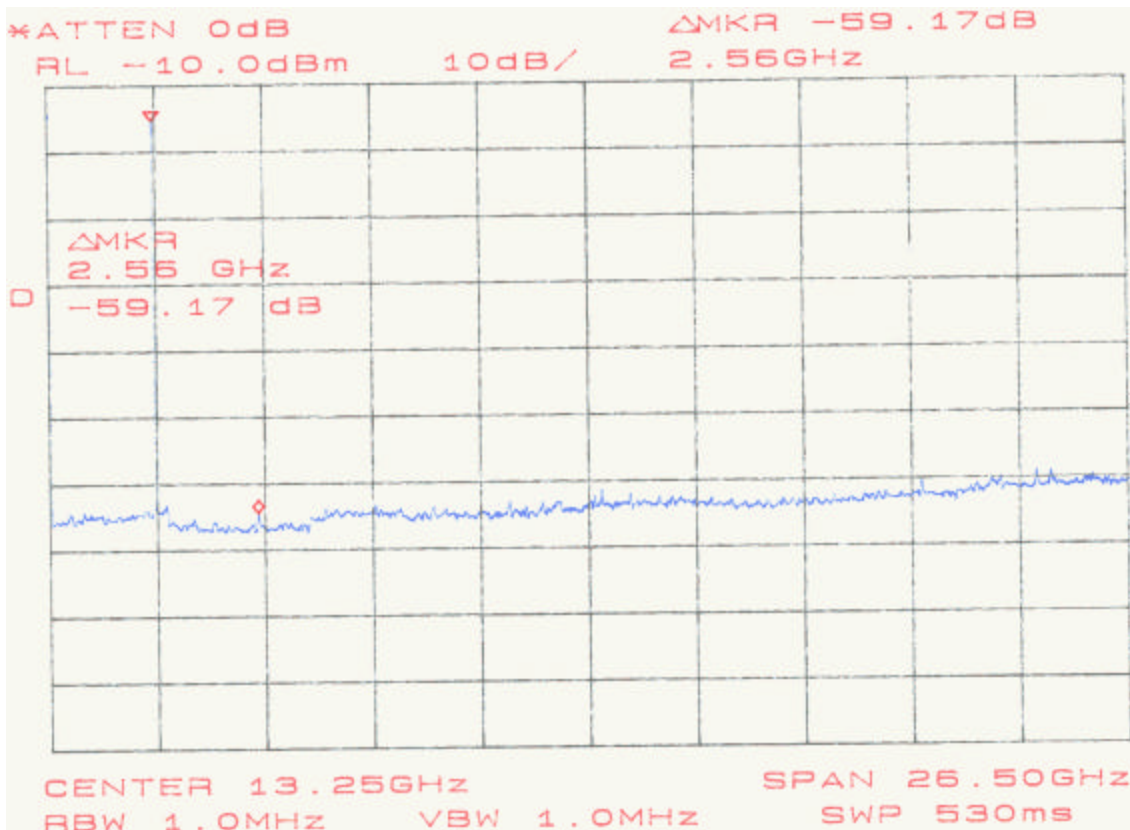
### Exhibit 6 Test Report

Name of Test: Spurious emissions at antenna terminals

Test Setup:



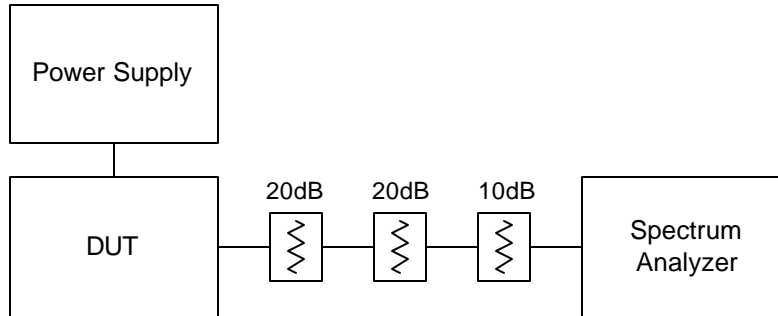
Test Results: The second harmonic is barely visible at the 2 watt transmit level. This signal is 13 dB below the specification in this test measurement setup. Note that there are no other observed emissions.



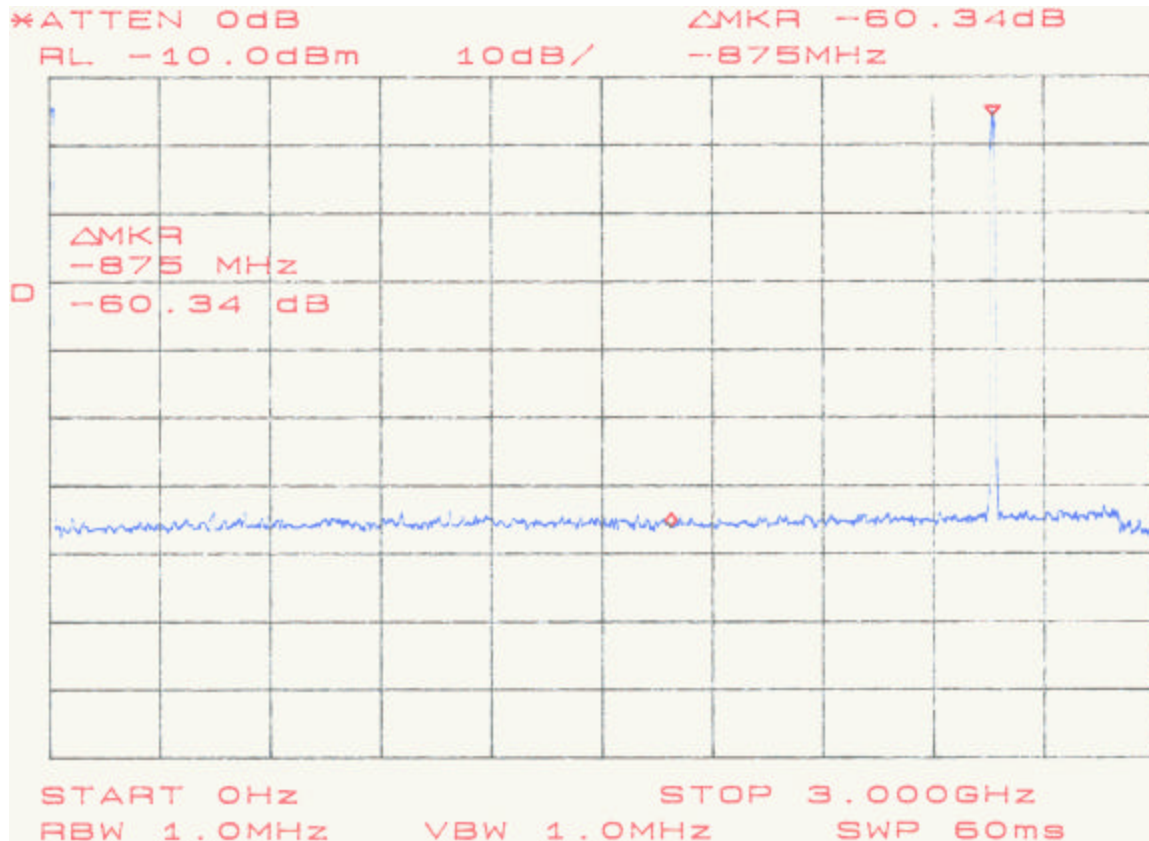
### Exhibit 6 Test Report

Name of Test: Spurious emissions at antenna terminals

Test Setup:



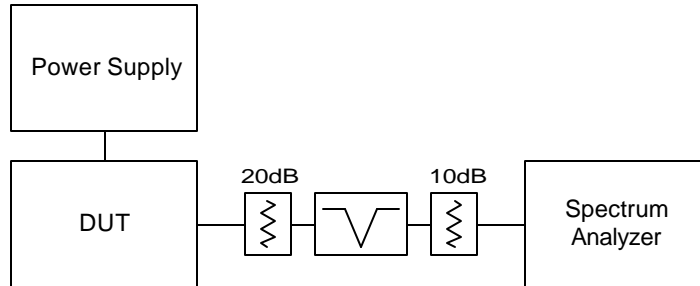
Test Results: No emissions were observed below the carrier at the 2 watt transmit level.



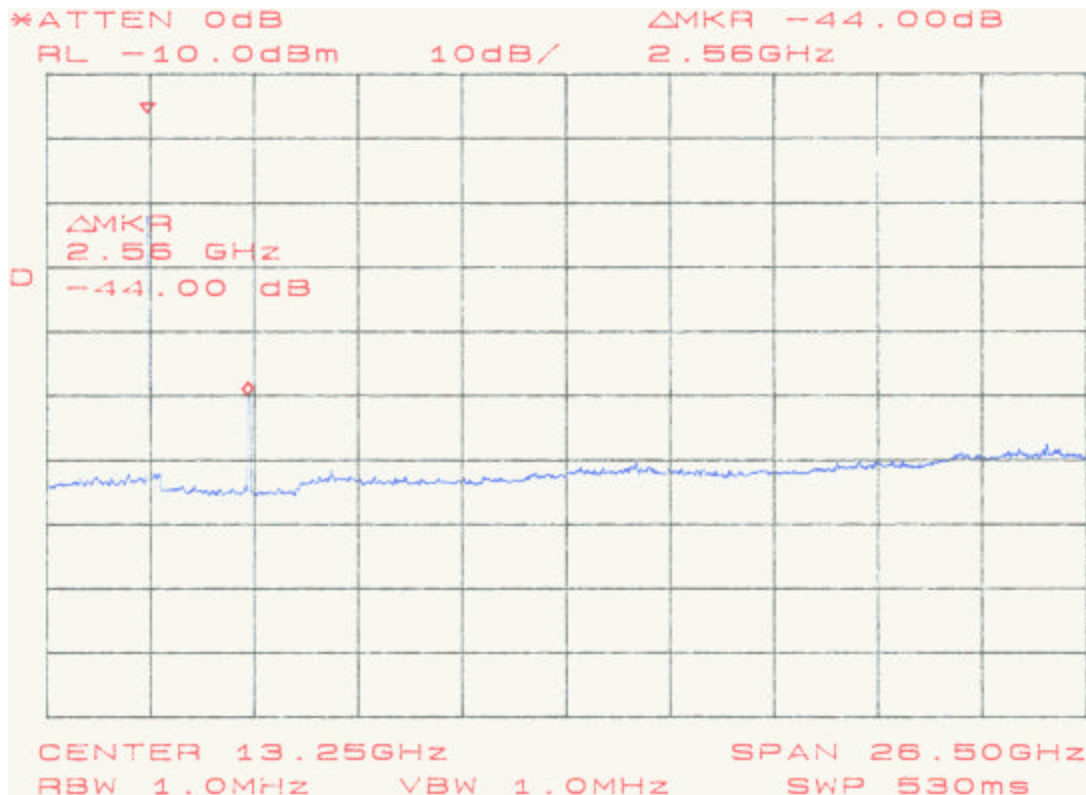
### Exhibit 6 Test Report

Name of Test: Spurious emissions at antenna terminals

Test Setup:



Test Results: At the 2 watt level, the center 20 dB attenuator was removed and replaced with a carrier frequency notch. This technique was performed to improve the measurement system noise floor and ensure that the signal incident upon the spectrum analyzer was not producing harmonics in the measurement system. From the first graph, about 5 dB of second harmonic was being produced by the spectrum analyzer. The highest spurious emission was measured to be 64 dB below the carrier (44 dB + 20 dB).

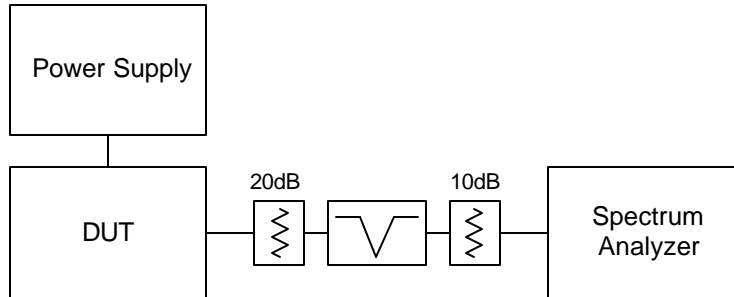




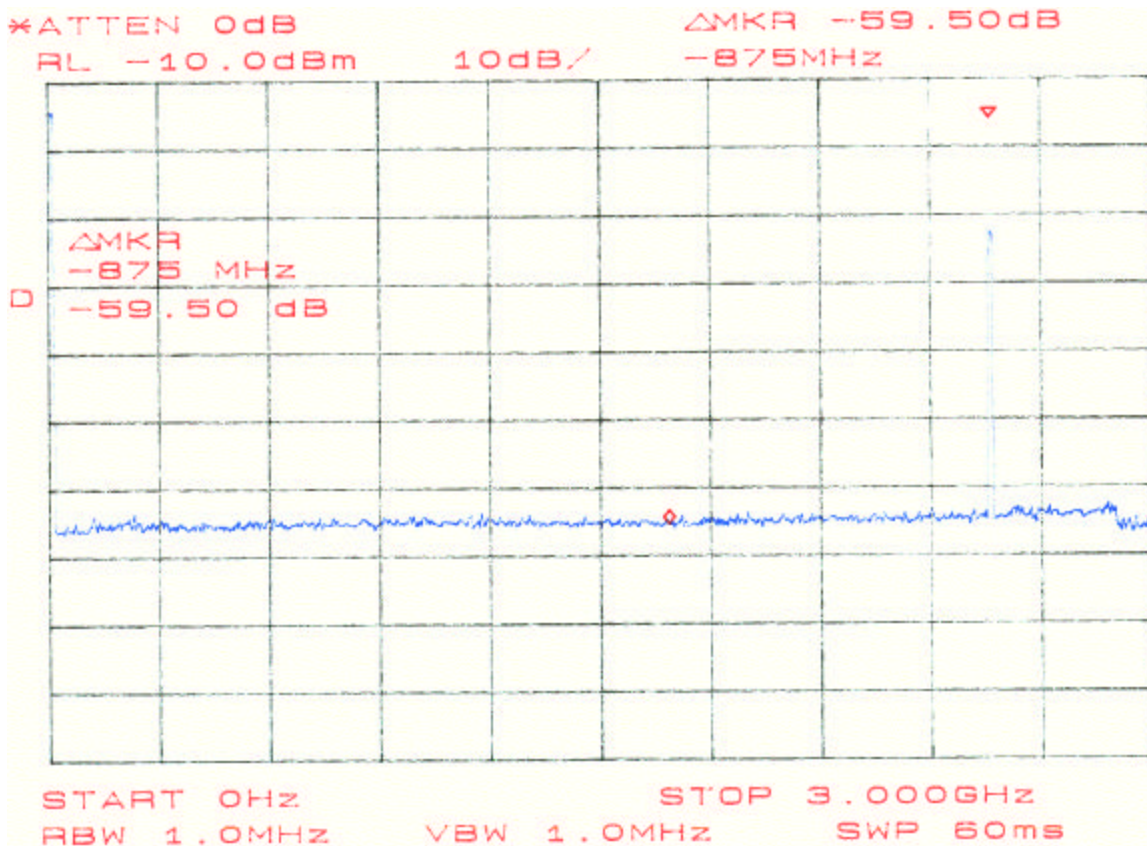
### Exhibit 6 Test Report

Name of Test: Spurious emissions at antenna terminals

Test Setup:

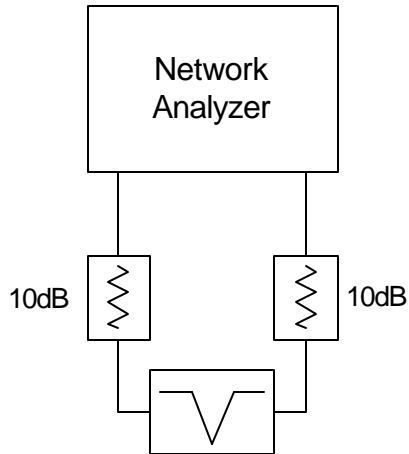


Test Results: At the 2 watt level, the center 20 dB attenuator was removed and replaced with a carrier frequency notch. This improved the measurement setup noise floor to display any lower level signals. No emissions were observed below the carrier frequency.

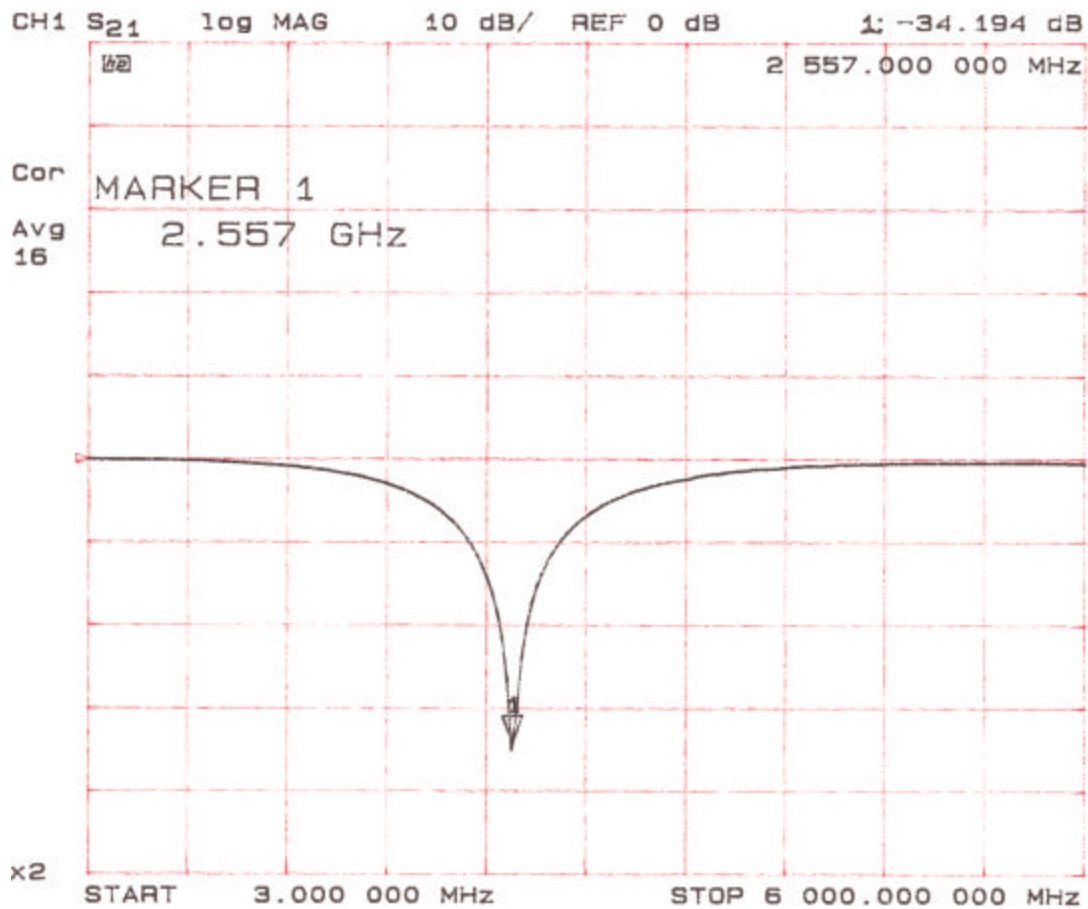


### Exhibit 6 Test Report

Test Set-Up Measurements for 2557 MHz Trap:

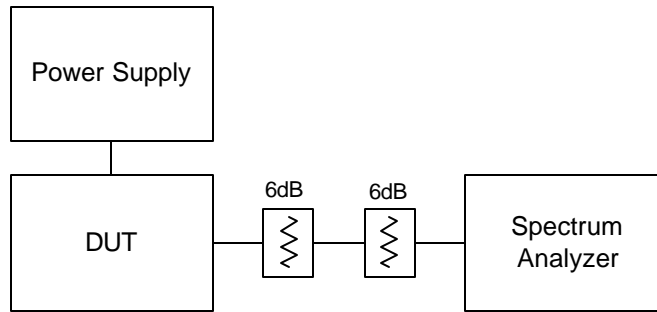


#### Measurement Results



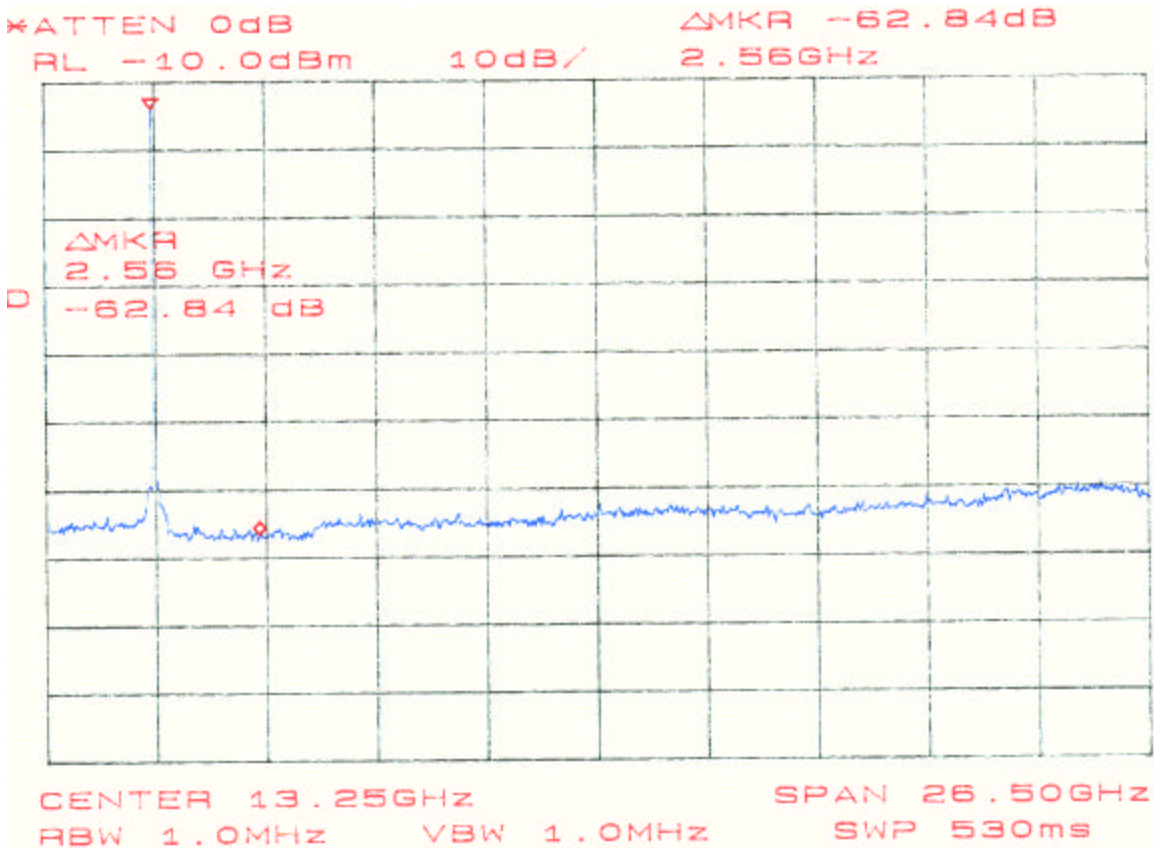
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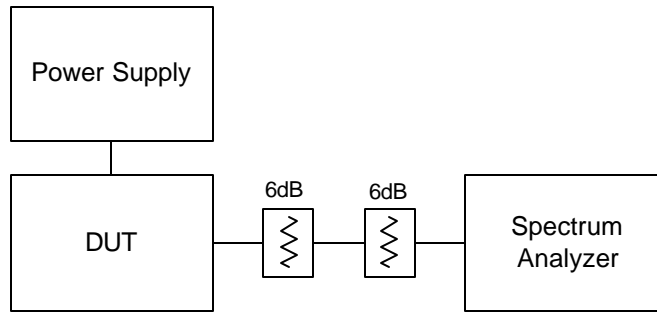


Name of Test: Spurious emissions at antenna terminals

Test Results: No emissions were observed at the .001 watt transmit level.

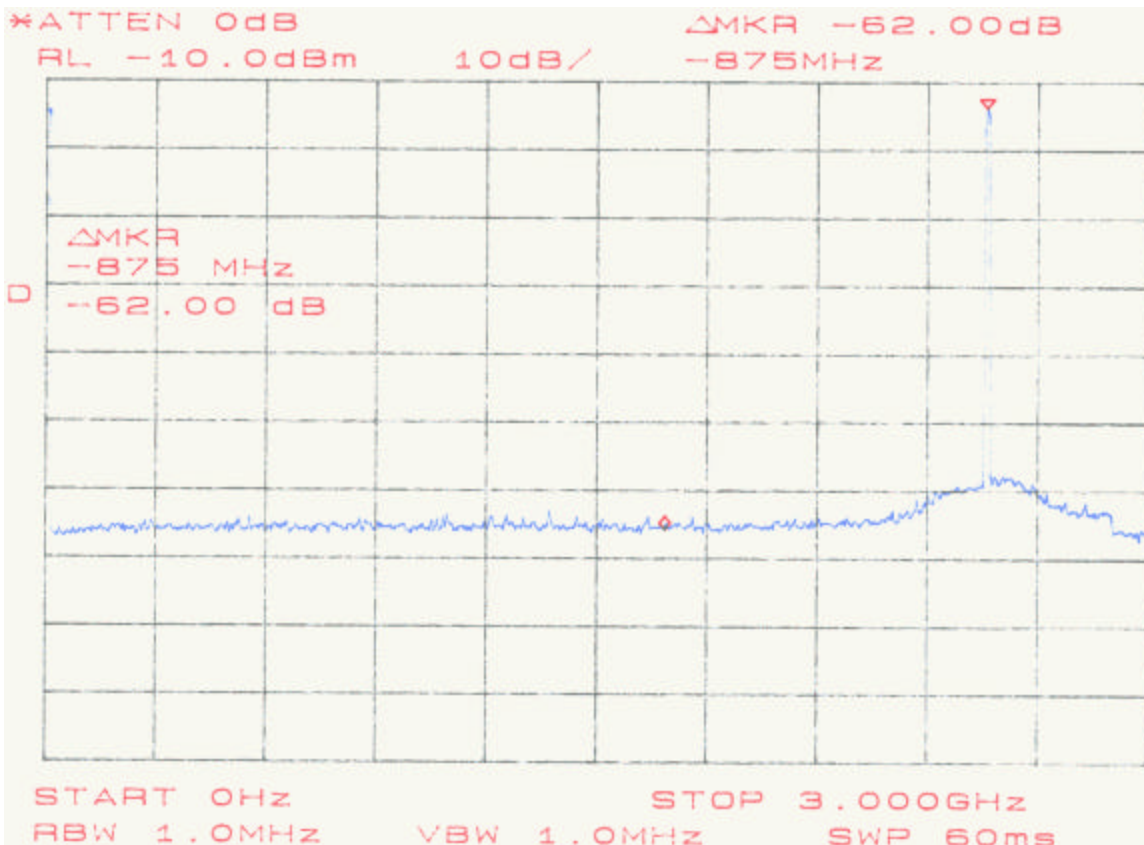


### Exhibit 6 Test Report



Name of Test: Spurious emissions at antenna terminals

Test Results: No emissions were observed below the carrier at the .001 watt transmit level.



## Exhibit 6

### Test Report

Name of Test: Field strength of spurious radiation

Rule Part Number: 2.1053, 2.1049, 2.1057

Frequency Range = 9 kHz to 26.86 GHz

Case Radiation Attenuation =  $43+10\log P = -13$  dBm maximum

Test Procedure: The field strength of spurious radiation was measured at an open area test site with applicable measurement antennas, low noise amplifiers, and spectrum analyzers. Measurements were performed by TUV Product Service Inc – Taylors Falls. Spurious signals were maximized for peak level by rotation of the test unit and elevation of the measurement antenna. Antenna substitution was performed to verify compliance with the regulations.

Test Conditions: Frequency = 2557 MHz  
 Temperature = 25°C  
 Supply Voltage = 48 Vdc

Test Equipment: NextNet Wireless, Inc.

Power Supply	Cherokee International Model: CRP500L1H-1A Calibration not required
Transmitter Load	Telewave Inc. TWL-35 Calibration not required

## Exhibit 6

### Test Report

Name of Test: Field strength of spurious radiation

Test Equipment: TUV Product Services

#### Emissions Test Conditions: RADIATED EMISSIONS (Electric Field)

The *RADIATED EMISSIONS (ELECTRIC FIELD)* measurements, in the frequency range of 30 MHz-1000 MHz, were tested in a horizontal and vertical polarization at the following test location :

- Wild River Lab Large Test Site (Open Area Test Site) – NSA measurements made 7-00, due 7-01
- Wild River Lab Small Test Site (Open Area Test Site)
- Oakwood Lab (Open Area Test Site)

#### at a test distance of :

- 3 meters
- 10 meters
- 30 meters

#### Test equipment used :

	TUV ID	Model Number	Manufacturer	Description	Serial Number	Cal Due
■ -	2543	ZHL-1042J	Mini-Circuits	Preamplifier	H072294-11	3-12-02
■ -	3202	EM-6917B	Electro-Metrics	Biconicalog Periodic	101	9-21-01
■ -	2690	8566B	Hewlett-Packard	Spectrum Analyzer (Unit F)	2430A00930	5-16-01
■ -	2678	85662A	Hewlett-Packard	Analyzer Display (Unit F)	2403A08134	5-16-01
■ -	2684	85650A	Hewlett-Packard	Quasi-Peak Adapter (Unit F)	2521A01006	5-24-01

## Exhibit 6

### Test Report

Name of Test: Field strength of spurious radiation

Test Equipment: TUV Product Services

#### Emissions Test Conditions: RADIATED EMISSIONS (Electric Field)

**The *EQUIVALENT RADIATED EMISSIONS* measurements in the frequency range 1 GHz - 26 GHz were performed in a horizontal and vertical polarization at the following test location :**

- Wild River Lab Large Test Site (Open Area Test Site)
- Wild River Lab Small Test Site (Open Area Test Site)
- Oakwood Lab (Open Area Test Site)
- Wild River Lab Screen Room

#### at a test distance of:

- 1 meters
- 3 meters
- 10 meters

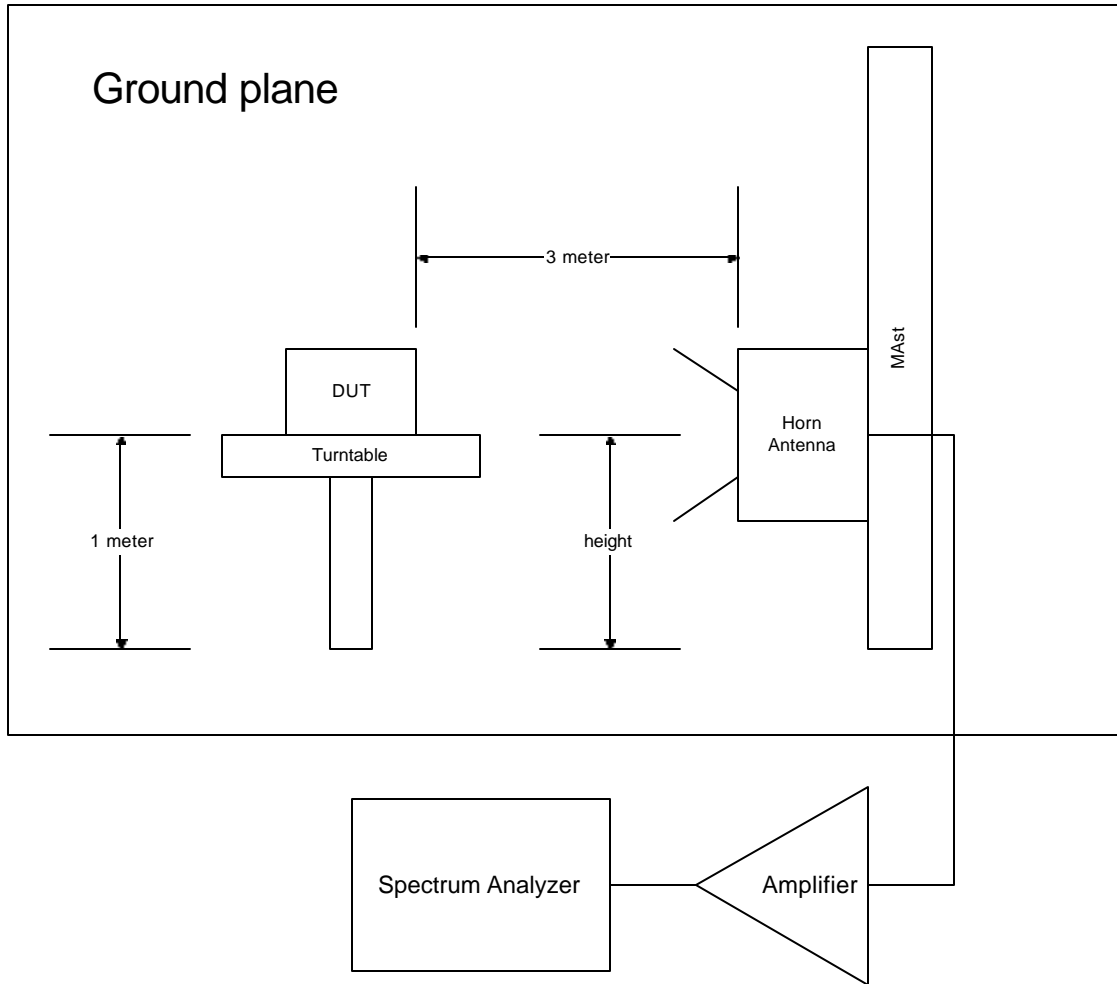
#### Test equipment used :

TUV ID	Model Number	Manufacturer	Description	Serial Number	Cal Due
<input checked="" type="checkbox"/> - 2543	ZHL-1042J	Mini-Circuits	Preamplifier	H072294-11	3-12-02
<input checked="" type="checkbox"/> - 3202	EM-6917B	Electro-Metrics	Biconicalog Periodic	101	9-21-01
<input checked="" type="checkbox"/> - 2690	8566B	Hewlett-Packard	Spectrum Analyzer (Unit F)	2430A00930	5-16-01
<input checked="" type="checkbox"/> - 2678	85662A	Hewlett-Packard	Analyzer Display (Unit F)	2403A08134	5-16-01
<input checked="" type="checkbox"/> - 2684	85650A	Hewlett-Packard	Quasi-Peak Adapter (Unit F)	2521A01006	5-24-01
<input checked="" type="checkbox"/> - 2075	3115	Electro-Mechanics (EMCO)	Ridge Guide Ant. 1-18 GHz	9001-3275	10-20-01
<input checked="" type="checkbox"/> - 3010	6769B	Wiltron	Signal Generator	159003	5-10-01
<input checked="" type="checkbox"/> - 2478	AWT-18037	Avantek	Preamplifier 8- 18 GHz	1001-9226	3-16-02
<input checked="" type="checkbox"/> - 2477	AFT-8434	Avantek	Preamplifier 4-8 GHz	2613A92801	3-16-02
<input checked="" type="checkbox"/> - 2788	3116	Electro-Mechanics (EMCO)	Ridge Guide Ant 18-40 GHz	2005	1-18-02
<input checked="" type="checkbox"/> - 3229	3115	Electro-Mechanics	Ridge Guide	2483	1-24-02

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■ -	11970K	(EMCO) Hewlett-Packard	Antenna Ext. mixer 18- 26.5 GHz	2332A01170	1-03
■ -	11975A	Hewlett-Packard	Amplifier	2738A01200	3-01

Test Set-Up:





## Exhibit 6

### Test Report

Name of Test: Field strength of spurious radiation

Test Results: Pass

Frequency (MHz)	Emission		Height (m)	Azimuth (degrees)	Generator Substitution
	Level (dBuV)	Polarity			Level (dBm)
42.68	26.3	V	1.0	90	-46.9
63.48	27.6	V	1.0	270	-45.6
79.38	28.2	V	1.0	270	-45.0
85.56	24.9	V	1.0	270	-48.3
126.54	31.5	V	1.0	0	-41.7
156.34	24.1	V	1.0	270	-49.1
173.74	28.3	H	1.0	180	-44.9
176.59	29.0	H	1.0	180	-44.2
207.88	22.2	H	2.0	180	-51.0
261.92	21.1	V	1.0	0	-52.1
350.00	36.9	H	1.0	270	-36.3
353.06	32.1	H	1.0	270	-41.1
364.00	40.7	H	1.1	262	-32.5
378.01	37.9	H	1.0	270	-35.3
392.00	36.5	H	2.0	0	-36.7
420.00	43.7	H	1.0	260	-29.5
675.00	33.4	V	1.0	0	-39.8
765.01	30.9	V	1.0	270	-42.3
798.00	34.4	V	1.0	270	-38.8

No other significant emissions detected to 26GHz.

Calculations: Generator Substitution  
 At 420 MHz  
 Generator Level = -36.05 dBm  
 Equivalent level = GenLevel + cable loss + antenna gain  
 + 2.15 (dBi conversion)  
 Equivalent Level = -36.05 - 2.3 + 11 - 2.15 = -29.5 dBm

## Exhibit 6

### Test Report

Name of Test: Frequency stability

Rule Part Number: 2.1055, 21.101(a), 74.961(a)

Stability Requirements: 0.001% or 10ppm

Test Procedure: The local oscillator signal that drives the transmit modulator was lightly coupled onto an RF probe and applied to a spectrum analyzer. The frequency of the local oscillator was monitored and recorded for changes due to temperature and input voltage.

Test Conditions: Standard Test Conditions

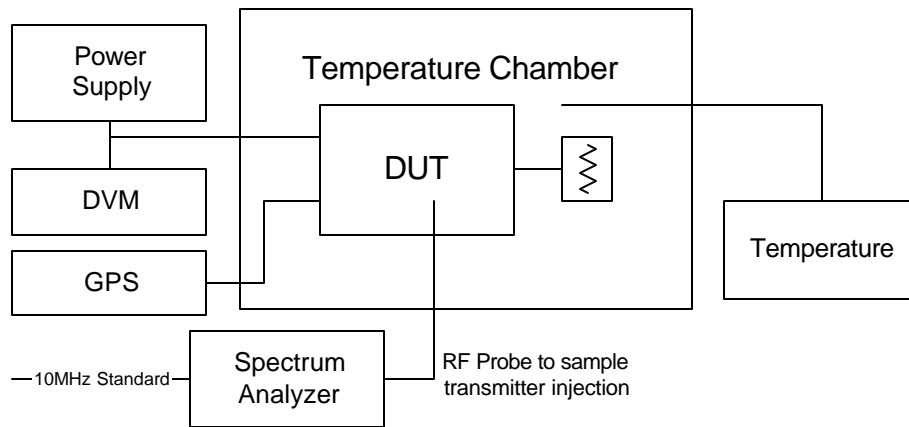
Test Equipment:

DVM	Fluke 87 III Calibration not required
Spectrum Analyzer	Rohde&Schwarz Model: FSEA S/N: 832247/015 Cal Date: 05-19-2000 Cal Due: 05-19-2001
Temperature Chamber	Test Equity 1000 Series Calibration not required
Temperature Sensor	Fluke 89 IV True RMS Multimeter K-Type thermocouple Calibration not required
Transmitter Load	Telewave Inc. TWL-35 Calibration not required
Power Supply	Agilent 6544A S/N: US36390304 Cal Date: 07-27-2000 Cal Due: 07-27-2002

### Exhibit 6 Test Report

Name of Test: Frequency stability

Test Set-Up:



## Exhibit 6

### Test Report

Name of Test: Frequency Stability

Test Conditions: Frequency = 2557 MHz  
Supply Voltage = 48 Vdc

2.1055(a) The frequency stability shall be measured with variation of ambient temperature as follows:

(1) From -30° to +50° centigrade for all equipment except that specified in paragraphs (a) (2) and (3) of this section.

2.1055(b) Frequency measurements shall be made at the extremes of the specified temperature range and at intervals of not more than 10° centigrade through the range.

Test Results: Temperature Variation

Without GPS				
Temperature (°C)	Frequency (Hz)	Frequency Error (Hz)	Frequency Error (%)	Frequency Error (ppm)
-30	2557001141	1141	0.000045	0.45
-20	2556998475	-1525	-0.000060	-0.60
-10	2556997958	-2042	-0.000080	-0.80
0	2556998333	-1667	-0.000065	-0.65
10	2556999242	-758	-0.000030	-0.30
20	2557000358	358	0.000014	0.14
25	2557001375	1375	0.000054	0.54
30	2557001300	1300	0.000051	0.51
40	2557001725	1725	0.000067	0.67
50	2557000617	617	0.000024	0.24

With GPS				
Temperature (°C)	Frequency (Hz)	Frequency Error (Hz)	Frequency Error (%)	Frequency Error (ppm)
-30	2557000006	6	0.000002	0.002
-20	2557000009	9	0.000004	0.004
-10	2557000002	2	0.000001	0.001
0	2557000006	6	0.000002	0.002
10	2557000009	9	0.000004	0.004
20	2556999998	-2	-0.000001	-0.001
25	2557000018	18	0.000007	0.007
30	2557000013	13	0.000005	0.005
40	2557000002	2	0.000001	0.001
50	2557000011	11	0.000004	0.004

## Exhibit 6

### Test Report

Name of Test: Frequency stability

Test Conditions: Frequency = 2557 MHz  
Temperature = 25°C

(d) The frequency stability shall be measured with variation of primary supply voltage as follows:

(1) Vary primary supply voltage from 85 to 115 percent of the nominal value for other than hand carried battery equipment.

Test Results: Supply Voltage Variation

Source Input  
Voltage Specification: 48 VDC

		Without GPS		
Source Voltage (VDC)	Frequency (Hz)	Frequency Error	Frequency Error	Frequency Error
		(Hz)	(%)	(ppm)
40.8	2557000899	899	0.000035	0.35
42.6	2557000908	908	0.000036	0.36
44.4	2557000908	908	0.000036	0.36
46.2	2557000908	908	0.000036	0.36
48.0	2557000908	908	0.000036	0.36
49.8	2557000899	899	0.000035	0.35
51.6	2557000899	899	0.000035	0.35
53.4	2557000899	899	0.000035	0.35
55.2	2557000899	899	0.000035	0.35

		With GPS		
Source Voltage (VDC)	Frequency (Hz)	Frequency Error	Frequency Error	Frequency Error
		(Hz)	(%)	(ppm)
40.8	2556999989	-11	-0.0000004	-0.004
42.6	2556999985	-15	-0.0000006	-0.006
44.4	2556999989	-11	-0.0000004	-0.004
46.2	2556999999	-1	0.0000000	0.000
48.0	2556999994	-6	-0.0000002	-0.002
49.8	2556999994	-6	-0.0000002	-0.002
51.6	2556999989	-11	-0.0000004	-0.004
53.4	2556999989	-11	-0.0000004	-0.004
55.2	2556999994	-6	-0.0000002	-0.002