



**FCC CFR47 PART 15 SUBPART C
CERTIFICATION
TEST REPORT**

FOR

900 MHz TRANSCEIVER

MODEL NUMBER: M915S

FCC ID: NCYM915S

REPORT NUMBER: 05U3806-1

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Prepared for
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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: TRANGO SYSTEMS, INC
15070 AVENUE OF SCIENCE, SUITE 200
SAN DIEGO, CA 92128, USA

EUT DESCRIPTION: 900 MHz TRANSCEIVER

MODEL: M915S

SERIAL NUMBER: CS 01632

DATE TESTED: NOVEMBER 9-12, 2005

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
FCC PART 15 SUBPART C	NO NON-COMPLIANCE NOTED

Compliance Certification Services, Inc. tested the above equipment in accordance with the requirements set forth in the above standards. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by Compliance Certification Services and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by Compliance Certification Services will constitute fraud and shall nullify the document. No part of this report may be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any government agency.

Approved & Released For CCS By:

Tested By:



THU CHAN
EMC SUPERVISOR
COMPLIANCE CERTIFICATION SERVICES

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EMC ENGINEER
COMPLIANCE CERTIFICATION SERVICES

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.4-2003, FCC CFR 47 Part 2 and FCC CFR 47 Part 15.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 561F Monterey Road, Morgan Hill, California, USA. The sites are constructed in conformance with the requirements of ANSI C63.4, ANSI C63.7 and CISPR Publication 22. All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

CCS is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at <http://www.ccsemc.com>.

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

4.2. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	UNCERTAINTY
Radiated Emission, 30 to 200 MHz	+/- 3.3 dB
Radiated Emission, 200 to 1000 MHz	+4.5 / -2.9 dB
Radiated Emission, 1000 to 2000 MHz	+4.5 / -2.9 dB
Power Line Conducted Emission	+/- 2.9 dB

Uncertainty figures are valid to a confidence level of 95%.

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a 900 MHz transceiver.

The radio module is manufactured by Trango Systems, Inc.

5.2. DESCRIPTION OF MODEL DIFFERENCES

The EUT model M915S covers the following two radio part numbers:

M915S-AP 900 MHz Access Point
M915S-SU 900 MHz Subscriber Unit

The two models are different in firmware only.

5.3. MAXIMUM OUTPUT POWER

The transmitter has a maximum peak conducted output power as follows:

902 - 928 MHz Authorized Band

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)	Notes
906-924	DSSS	26.75	473.15	Used for External Omni & Internal Patch Antennas
906-924	DSSS	21.16	130.62	Used for External Yagi Antenna

5.4. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes the following antennas:

- 1) External Omni Antenna, gain of 8.5 dBi
- 2) External Yagi Antenna, gain of 15 dBi
- 3) Internal Patch Antenna, gain of 9 dBi

5.5. SOFTWARE AND FIRMWARE

The firmware installed in the EUT during testing was 1p0a2.

The test utility software used during testing was telnet.

5.6. WORST-CASE CONFIGURATION AND MODE

The worst-case channel is determined as the channel with the highest output power. The highest measured output powers were at mid channel of 26dBm and high channel of 21dBm from the RF conducted antenna's port.

5.7. DESCRIPTION OF TEST SETUP

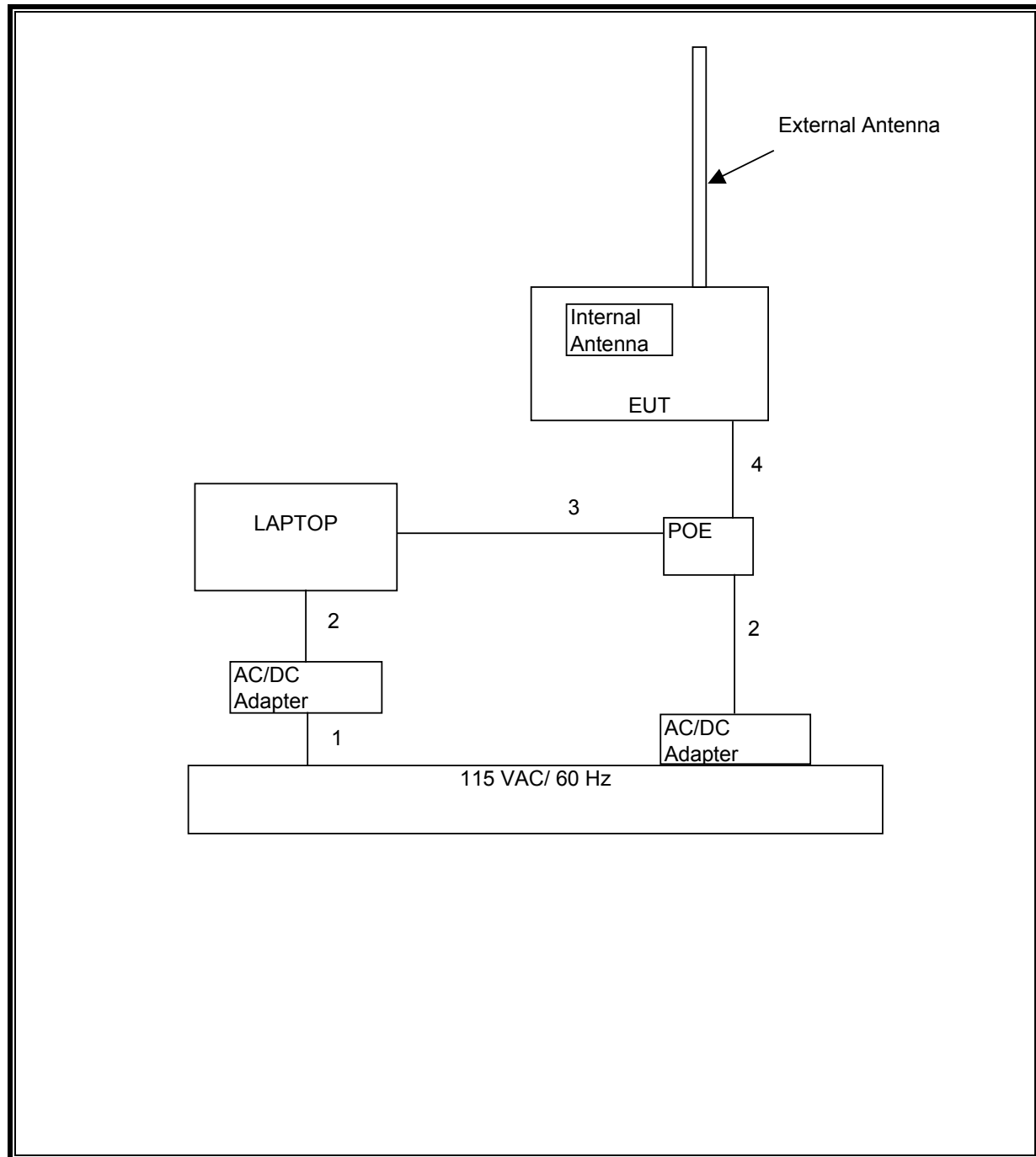
SUPPORT EQUIPMENT

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	Manufacturer	Model	Serial Number	FCC ID
Laptop	Sony	PCG-R505EL	N/A	DoC
AC/DC Adapter	Sony	PCGA-AC19V1	0044D0183529	N/A
POE	Trangobroadband Wireless	N/A	N/A	N/A
AC/DC Adapter	Hon-Kwang	D24-10P	1004C	N/A
Omni Antenna	Maxrad	MFB9157	364981	N/A
Yagi Antenna	Cushcraft	PC9013N	N/A	N/A

I/O CABLES

I/O CABLE LIST						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length	Remarks
1	AC	1	US 115V	Un-shielded	2m	N/A
2	DC	2	DC	Un-shielded	2m	N/A
3	Ethernet	1	RJ45	Un-shielded	2m	N/A
4	Radio	1	RJ45	Un-shielded	3m	N/A

SETUP DIAGRAM FOR TESTS



6. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

TEST EQUIPMENT LIST				
Description	Manufacturer	Model	Serial Number	Cal Due
Antenna, Horn 1 ~ 18 GHz	EMCO	3115	6717	4/22/2006
Spectrum Analyzer 3 Hz ~ 44 GHz	Agilent	E4446A	MY43360112	3/28/2006
Preamplifier, 1 ~ 26 GHz	Miteq	NSP2600-SP	924342	9/2/2006
Antenna, Bilog 30MHz ~ 2Ghz	Solar	JB1	A121003	3/3/2006
EMI Receiver, 9 kHz ~ 2.9 GHz	HP	8542E	3942A00286	3/29/2006
RF Filter Section	HP	85420E	3705A00256	3/29/2006
EMI Test Receiver	R & S	ESHS 20	827129/006	6/3/2006
LISN, 10 kHz ~ 30 MHz	FCC	LISN-50/250-25-2	2023	8/30/2006
Line Filter	Lindgren	LMF-3489	497	CNR
1.5GHz HPF	MicroTronic	HPM13135	1	CNR

7. LIMITS AND RESULTS

7.1. CHANNEL TESTS FOR THE 902 TO 928 MHz BAND

7.1.1. 6 dB BANDWIDTH

LIMIT

§15.247 (a) (2) For direct sequence systems, the minimum 6 dB bandwidth shall be at least 500 kHz.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The RBW is set to 100 kHz and the VBW is set to 300 kHz. The sweep time is coupled.

RESULTS

No non-compliance noted:

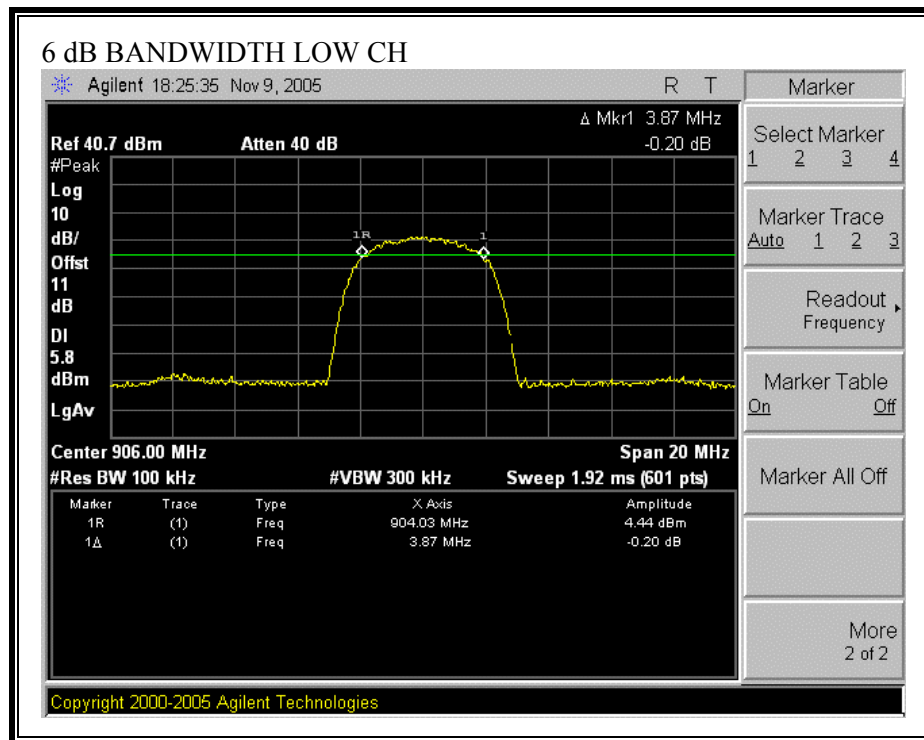
21 dBm power

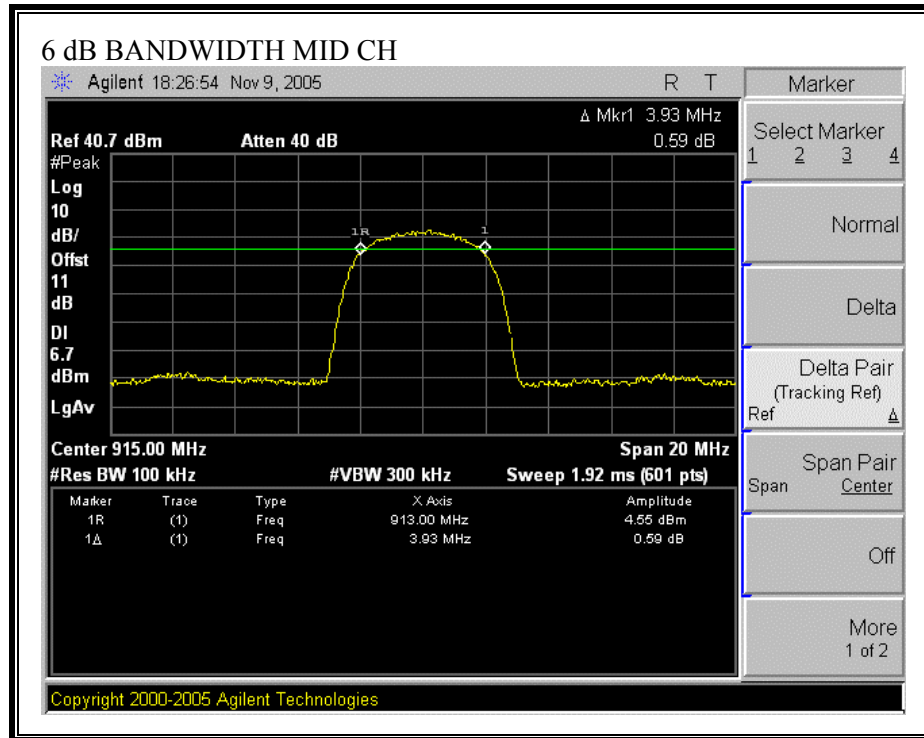
Channel	Frequency (MHz)	6 dB Bandwidth (kHz)	Minimum Limit (kHz)	Margin (kHz)
Low	906	3870	500	3370
Middle	915	3930	500	3430
High	924	3830	500	3330

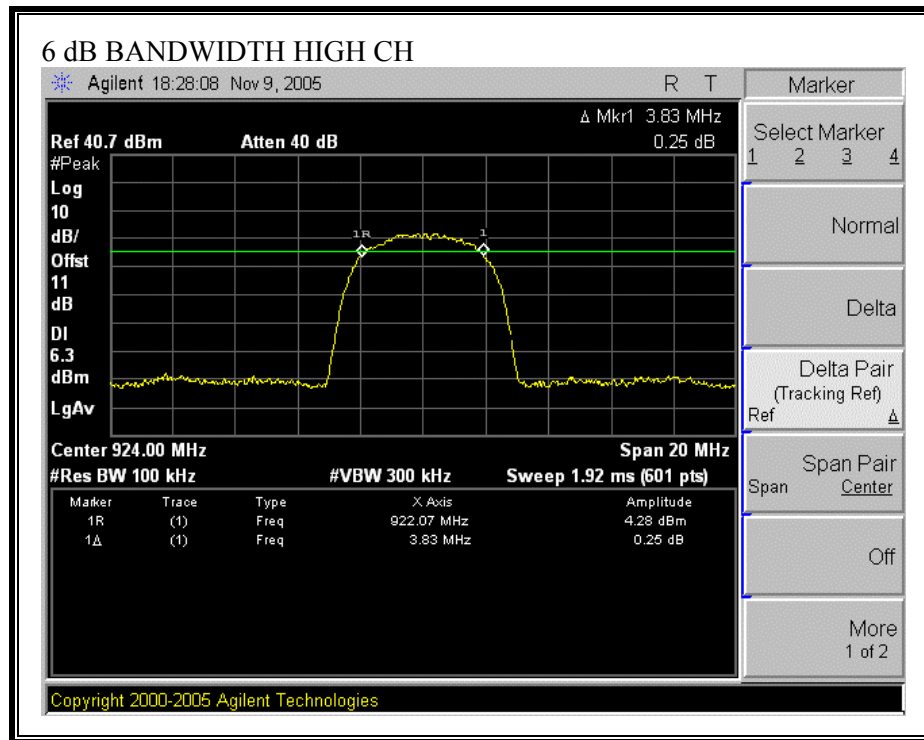
26 dBm power

Channel	Frequency (MHz)	6 dB Bandwidth (kHz)	Minimum Limit (kHz)	Margin (kHz)
Low	906	3870	500	3370
Middle	915	3800	500	3300
High	924	3830	500	3330

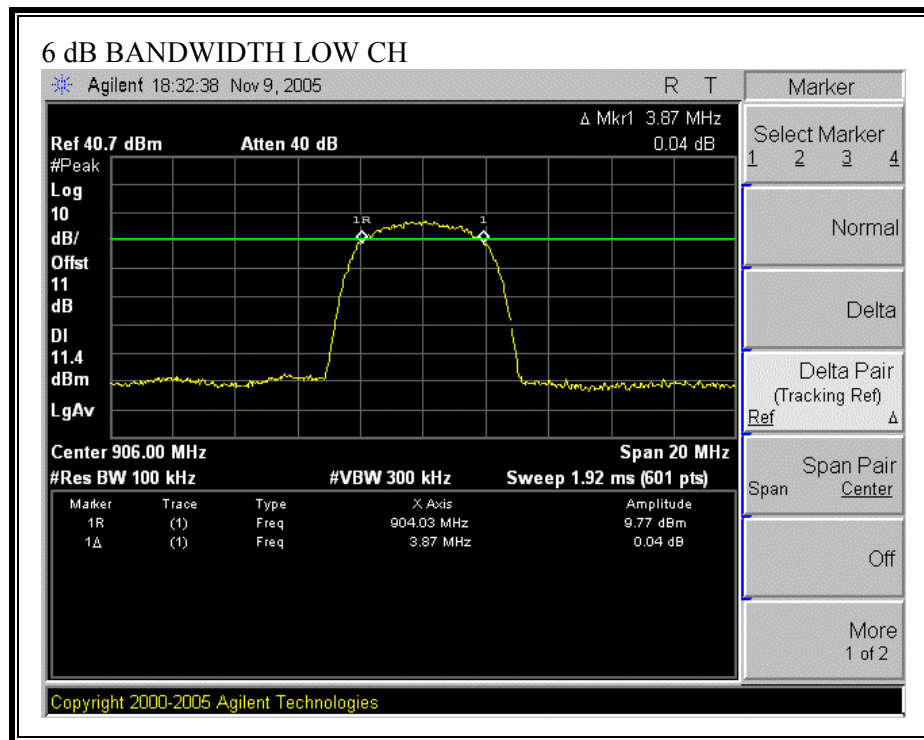
6 dB BANDWIDTH (21 dBm power)

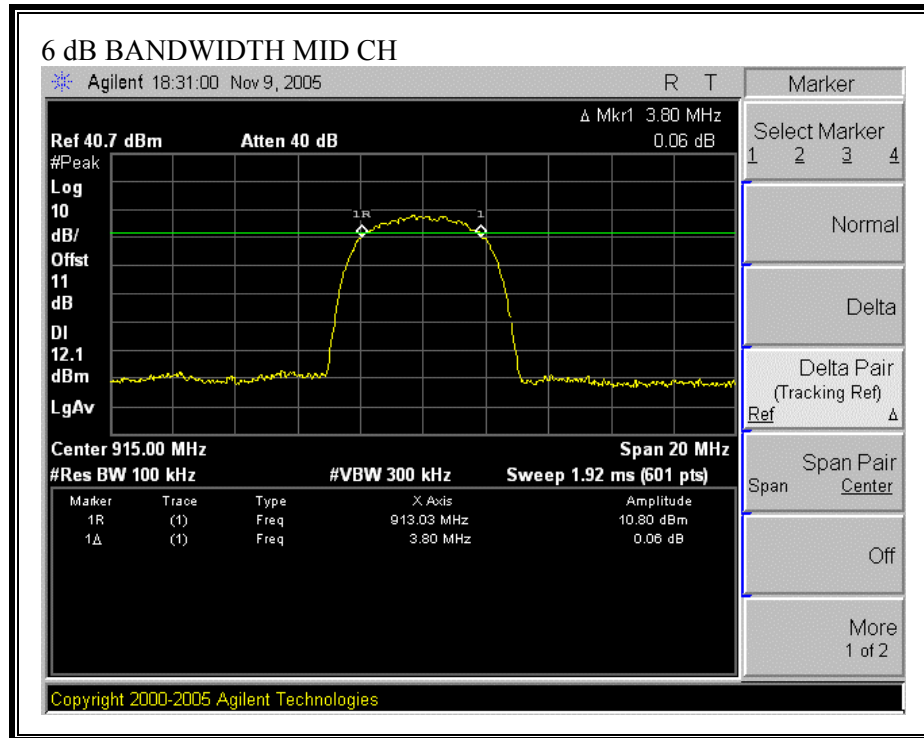


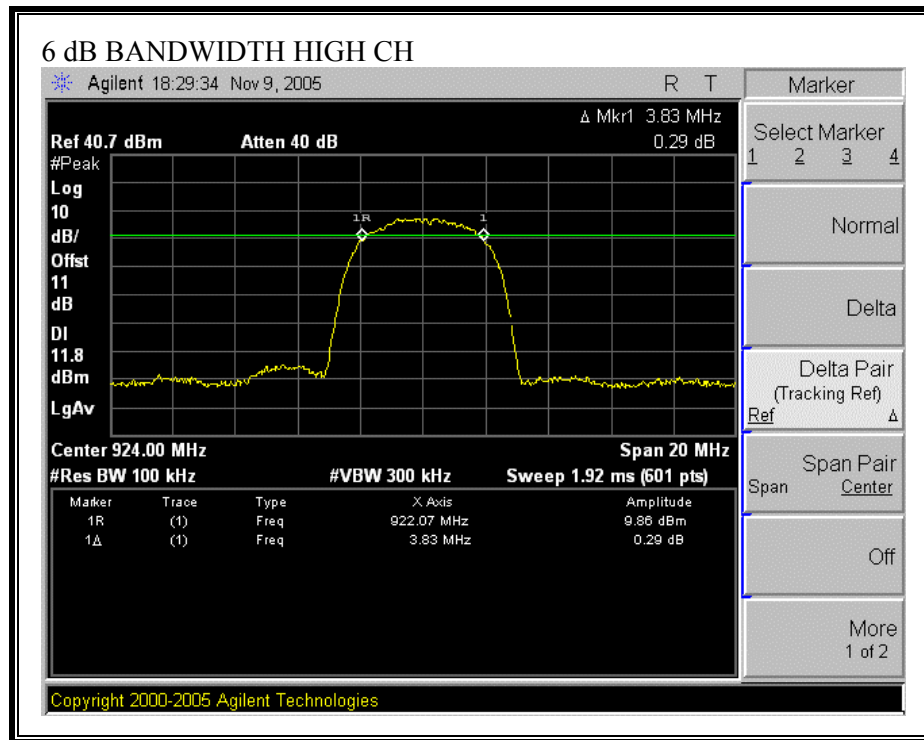




6 dB BANDWIDTH (26 dBm power)







7.1.2. 99% BANDWIDTH

LIMIT

None: for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the 99 % bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

RESULTS

No non-compliance noted:

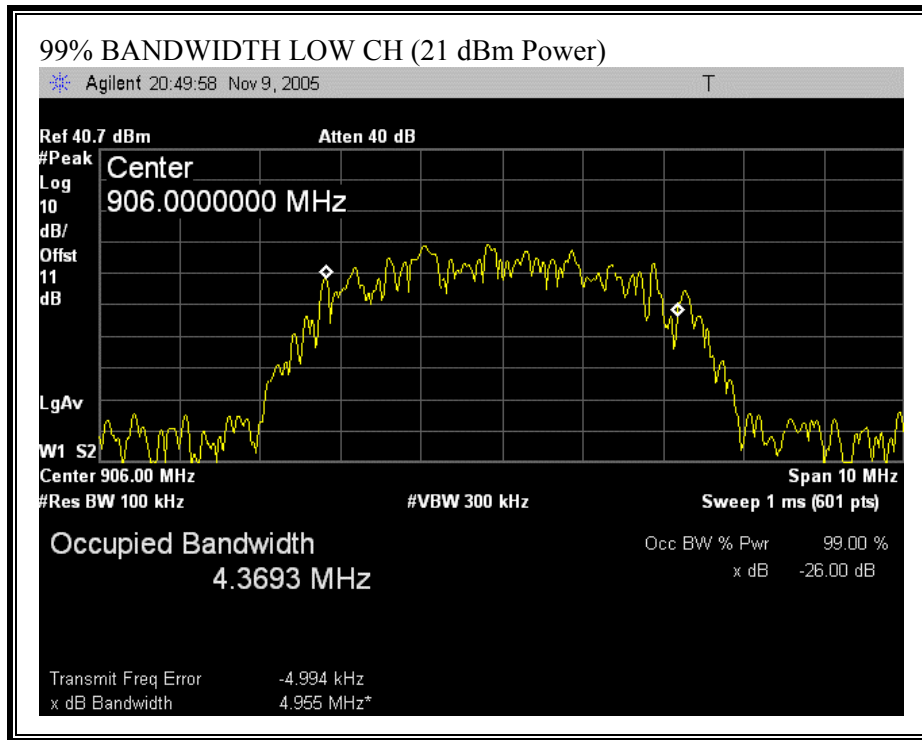
21 dBm Power

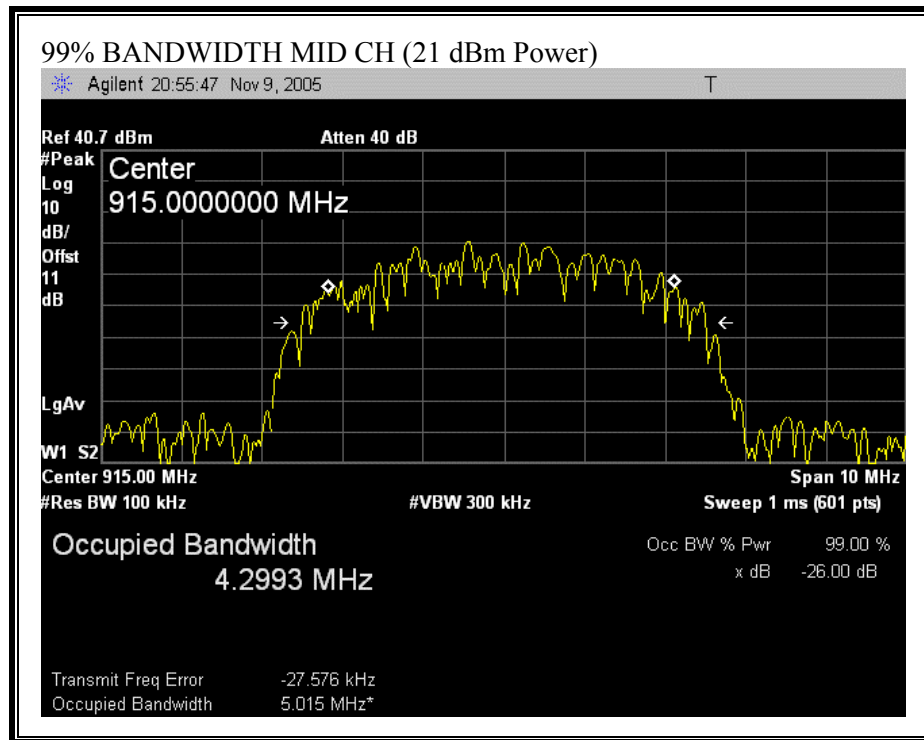
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	906	4.3693
Middle	915	4.2993
High	924	4.3732

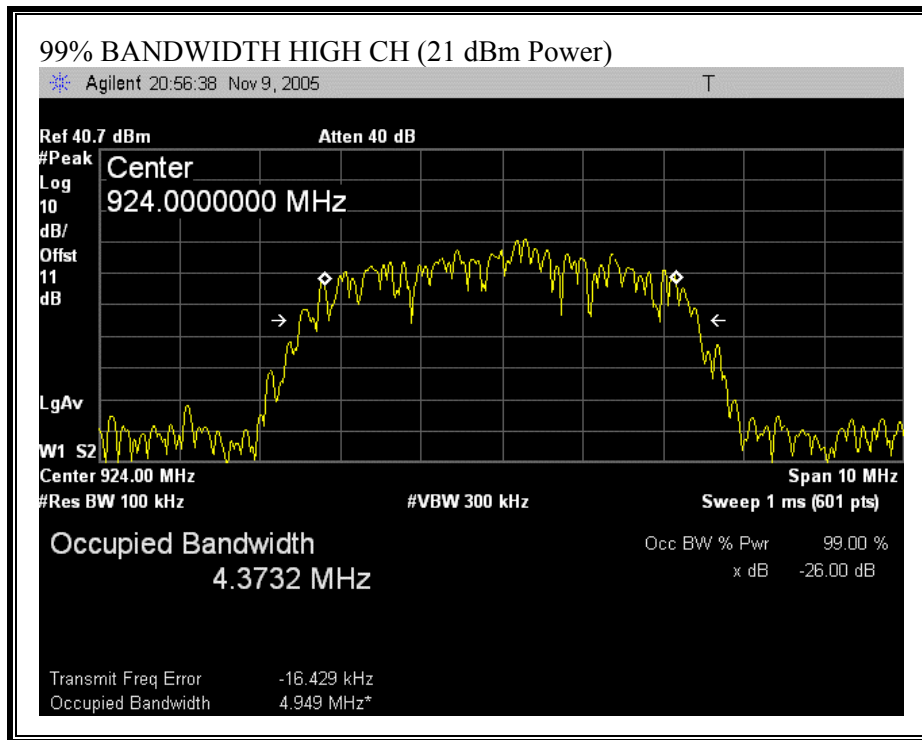
26 dBm Power

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	906	4.2052
Middle	915	4.3835
High	924	4.2291

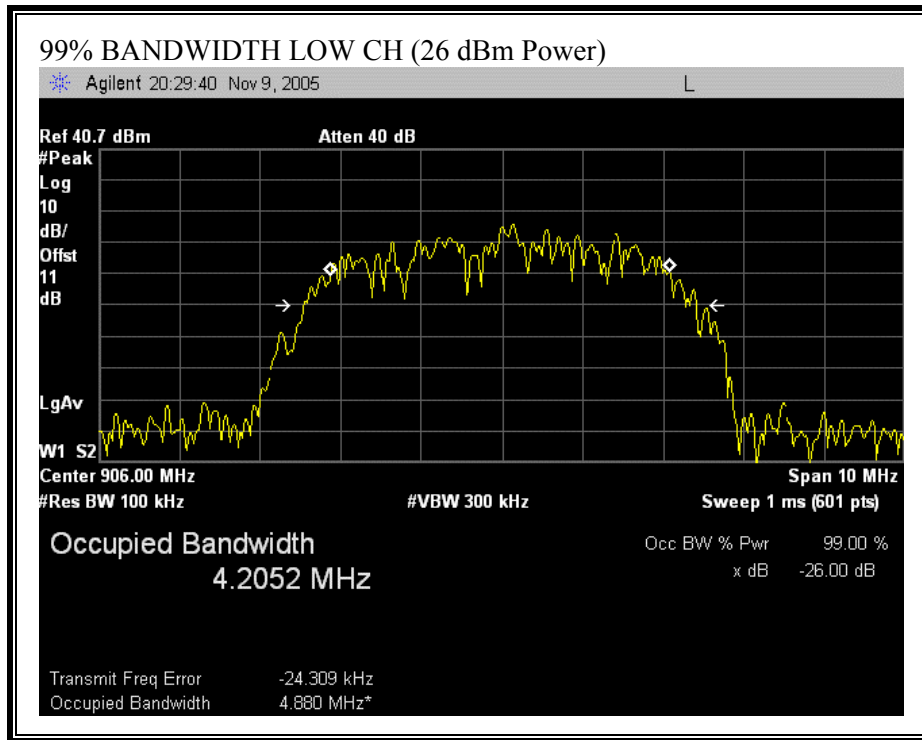
99% BANDWIDTH (21 dBm Power)

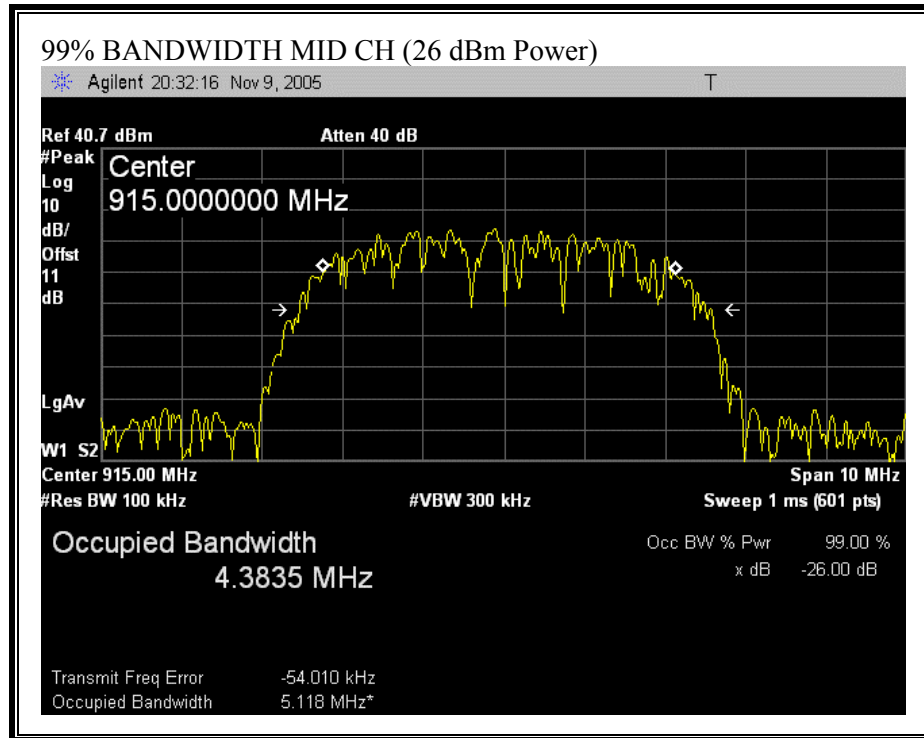


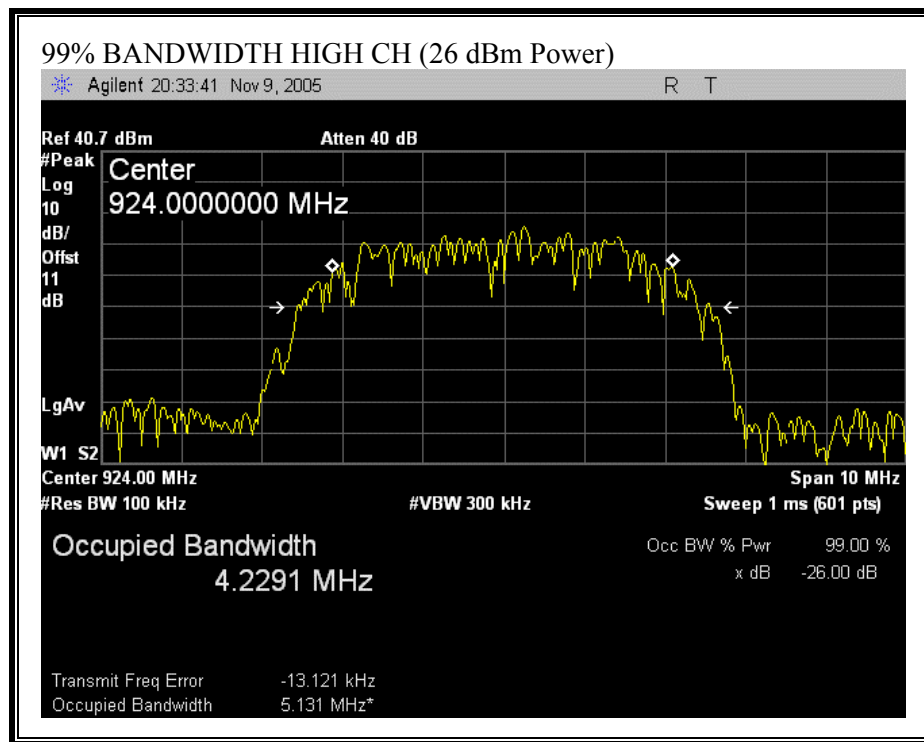




99% BANDWIDTH (26 dBm Power)







7.1.3. PEAK OUTPUT POWER

PEAK POWER LIMIT

§15.247 (b) The maximum peak output power of the intentional radiator shall not exceed the following:

§15.247 (b) (1) For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 hopping channels, all frequency hopping systems in the 5725-5850 MHz band, and all direct sequence systems: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: .125 watts.

§15.247 (b) (3) Except as shown in paragraphs (b)(3) (i), (ii) and (iii) of this section, if transmitting antennas of directional gain greater than 6 dBi are used the peak output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1) or (b)(2) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer, RBW and VBW of the analyzer were set to 8 MHz, MAXHOLD function was used.

RESULTS

No non-compliance noted:

21 dBm Power (with 15 dBi Yagi Antenna)

Channel	Frequency (MHz)	Peak Power (dBm)	Limit (dBm)	Margin (dB)
Low	906	20.74	21.00	-0.26
Middle	915	20.88	21.00	-0.12
High	924	20.96	21.00	-0.04

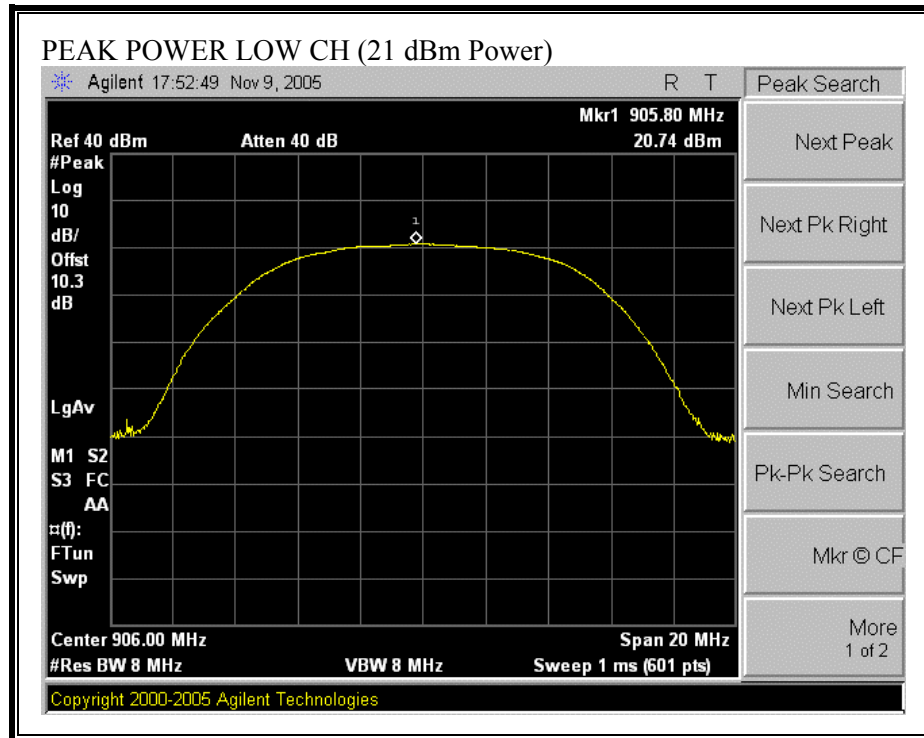
26 dBm Power (with 8.5 dBi Omni Antenna)

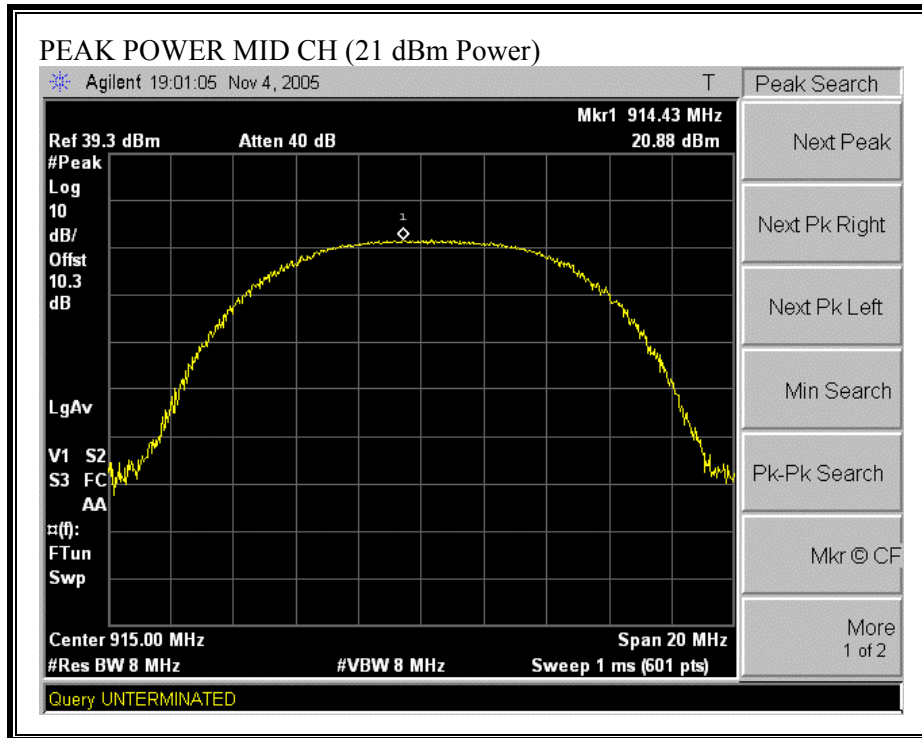
Channel	Frequency (MHz)	Peak Power (dBm)	Limit (dBm)	Margin (dB)
Low	906	26.37	27.50	-1.13
Middle	915	26.75	27.50	-0.75
High	924	26.65	27.50	-0.85

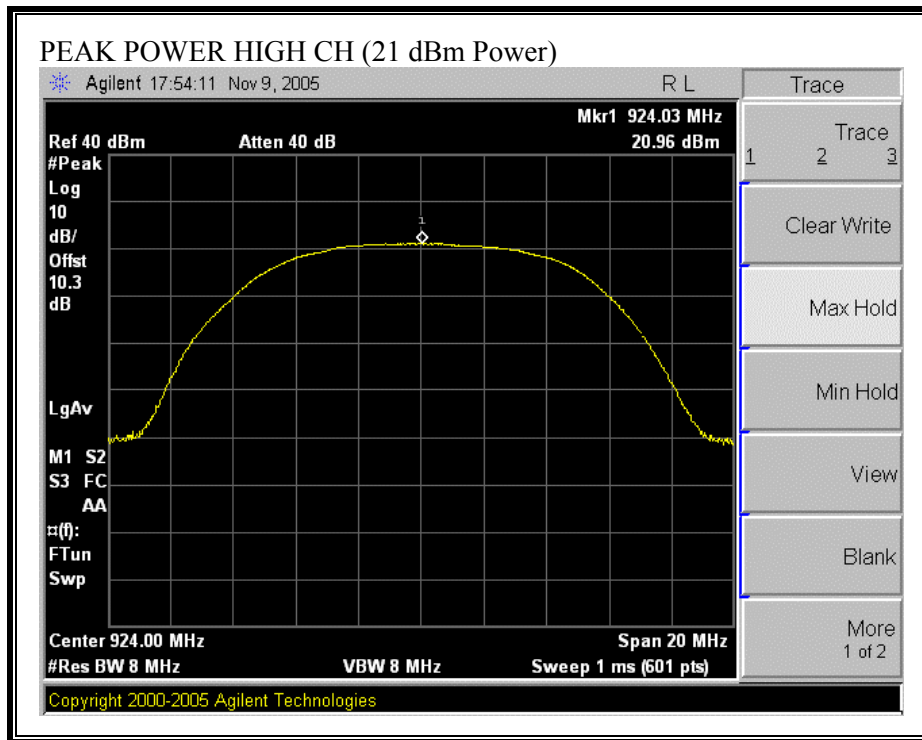
26 dBm Power (with 9 dBi Internal Patch Antenna)

Channel	Frequency (MHz)	Peak Power (dBm)	Limit (dBm)	Margin (dB)
Low	906	26.37	27.00	-0.63
Middle	915	26.75	27.00	-0.25
High	924	26.65	27.00	-0.35

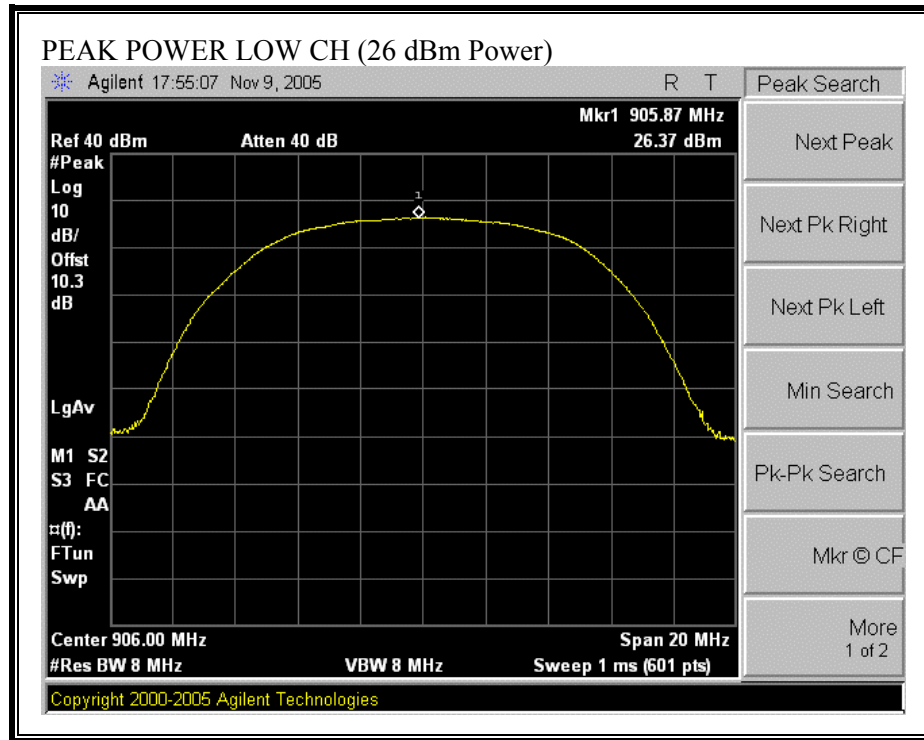
OUTPUT POWER (21 dBm Power)

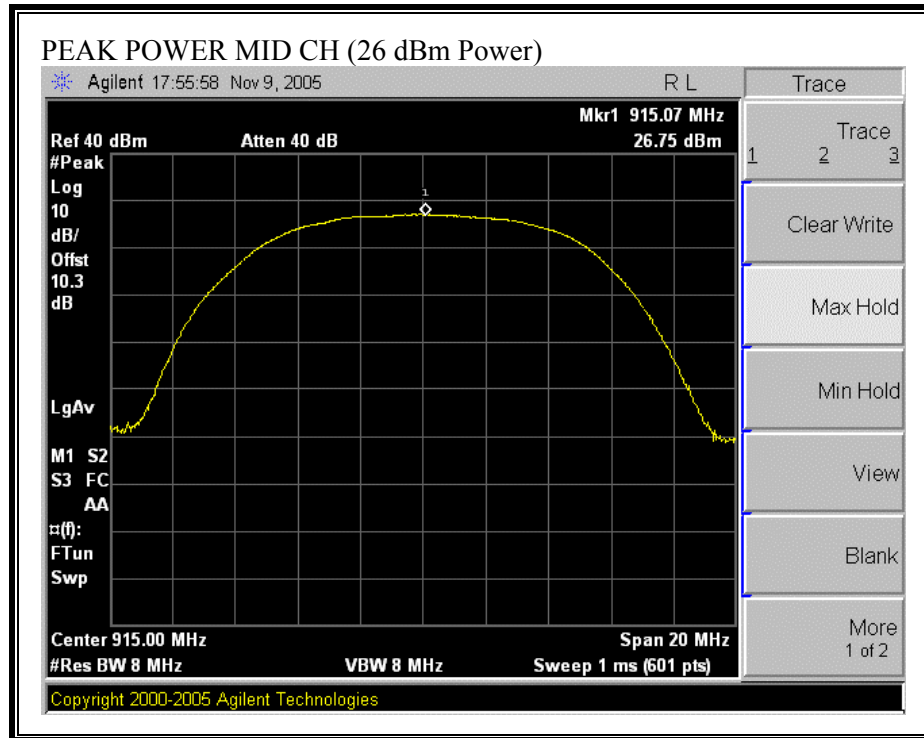


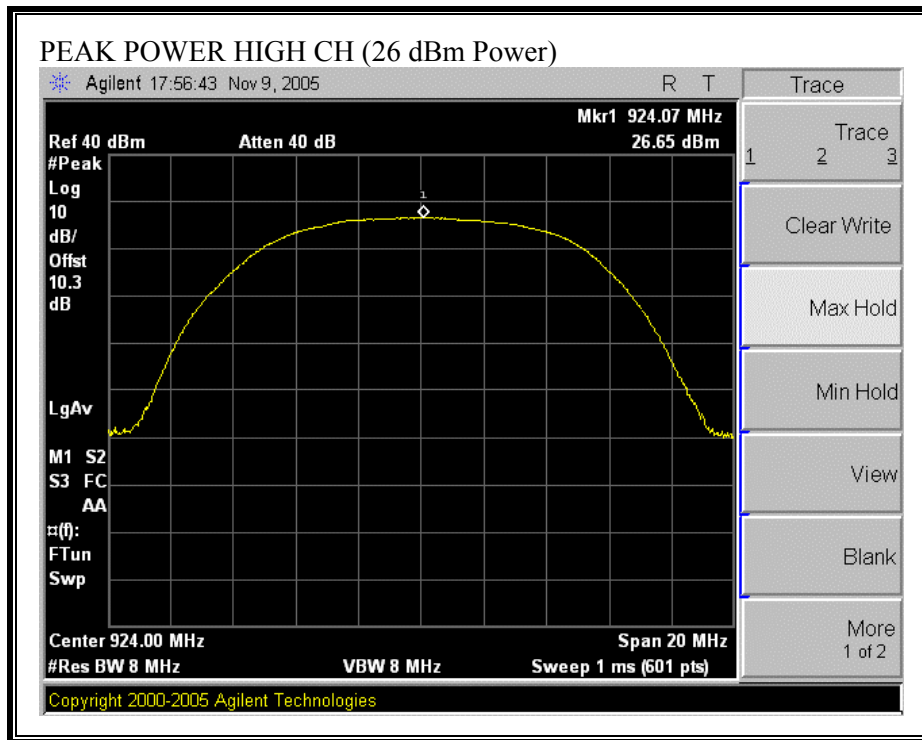




OUTPUT POWER (26 dBm Power)







7.1.4. MAXIMUM PERMISSIBLE EXPOSURE

LIMITS

§1.1310 The criteria listed in Table 1 shall be used to evaluate the environmental impact of human exposure to radio-frequency (RF) radiation as specified in §1.1307(b), except in the case of portable devices which shall be evaluated according to the provisions of §2.1093 of this chapter.

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposures				
0.3–3.0	614	1.63	*(100)	6
3.0–30	1842/f	4.89/f	*(900/f ²)	6
30–300	61.4	0.163	1.0	6
300–1500			f/300	6
1500–100,000			5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3–1.34	614	1.63	*(100)	30
1.34–30	824/f	2.19/f	*(180/f ²)	30

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)—Continued

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
30–300	27.5	0.073	0.2	30
300–1500			f/1500	30
1500–100,000			1.0	30

f = frequency in MHz

* = Plane-wave equivalent power density

NOTE 1 TO TABLE 1: Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure.

NOTE 2 TO TABLE 1: General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or can not exercise control over their exposure.

CALCULATIONS

Given

$$E = \sqrt{(30 * P * G) / d}$$

and

$$S = E^2 / 3770$$

where

E = Field Strength in Volts/meter

P = Power in Watts

G = Numeric antenna gain

d = Distance in meters

S = Power Density in milliwatts/square centimeter

Combining equations and rearranging the terms to express the distance as a function of the remaining variables yields:

$$d = \sqrt{((30 * P * G) / (3770 * S))}$$

Changing to units of Power to mW and Distance to cm, using:

$$P \text{ (mW)} = P \text{ (W)} / 1000 \text{ and}$$

$$d \text{ (cm)} = 100 * d \text{ (m)}$$

yields

$$d = 100 * \sqrt{((30 * (P / 1000) * G) / (3770 * S))}$$

$$d = 0.282 * \sqrt{(P * G / S)}$$

where

d = distance in cm

P = Power in mW

G = Numeric antenna gain

S = Power Density in mW/cm²

Substituting the logarithmic form of power and gain using:

$$P \text{ (mW)} = 10^{(P \text{ (dBm)} / 10)} \text{ and}$$

$$G \text{ (numeric)} = 10^{(G \text{ (dBi)} / 10)}$$

yields

$$d = 0.282 * 10^{((P + G) / 20)} / \sqrt{S}$$

where

d = MPE distance in cm

P = Power in dBm

G = Antenna Gain in dBi

S = Power Density Limit in mW/cm²

Rearranging terms to calculate the power density at a specific distance yields

$$S = 0.0795 * 10^{((P + G) / 10)} / (d^2)$$

LIMITS

From §1.1310 Table 1 (B), the maximum value of $S = 0.6 \text{ mW/cm}^2$

RESULTS

No non-compliance noted: (MPE distance is greater than 20 cm)

Mode	Power Density Limit (mW/cm²)	Output Power (dBm)	Antenna Gain (dBi)	MPE Distance (cm)
Yagi Anenna	0.6	20.96	15.00	22.87
Omni Antenna	0.6	26.75	8.50	21.07
Internal Patch Antenna	0.6	26.75	9.00	22.32

7.1.5. AVERAGE POWER

AVERAGE POWER LIMIT

None: for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

RESULTS

No non-compliance noted:

The cable assembly insertion loss of 11 dB (including 10 dB pad and 1 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

21 dBm Power

Channel	Frequency (MHz)	Power (dBm)
Low	906	18.09
Middle	915	18.96
High	924	18.46

26 dBm Power

Channel	Frequency (MHz)	Power (dBm)
Low	906	23.63
Middle	915	24.49
High	924	24.04

7.1.6. PEAK POWER SPECTRAL DENSITY

LIMIT

§15.247 (d) For direct sequence systems, the peak power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer, the maximum level in a 3 kHz bandwidth is measured with the spectrum analyzer using RBW = 3 kHz and VBW > 3 kHz, sweep time = span / 3 kHz, and video averaging is turned off. The PPSD is the highest level found across the emission in any 3 kHz band.

RESULTS

No non-compliance noted:

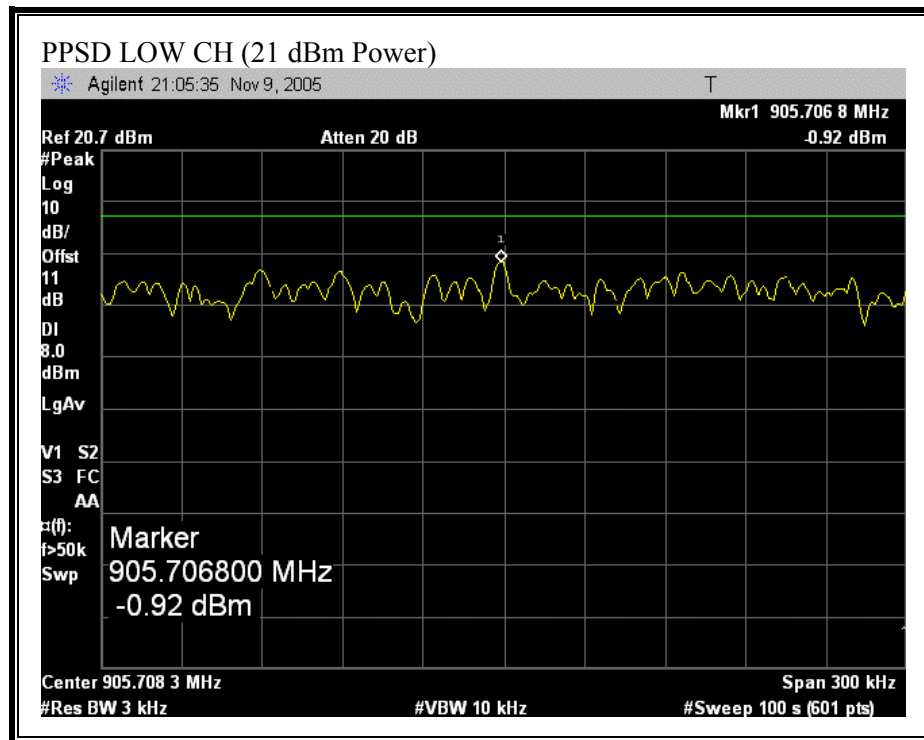
21 dBm Power

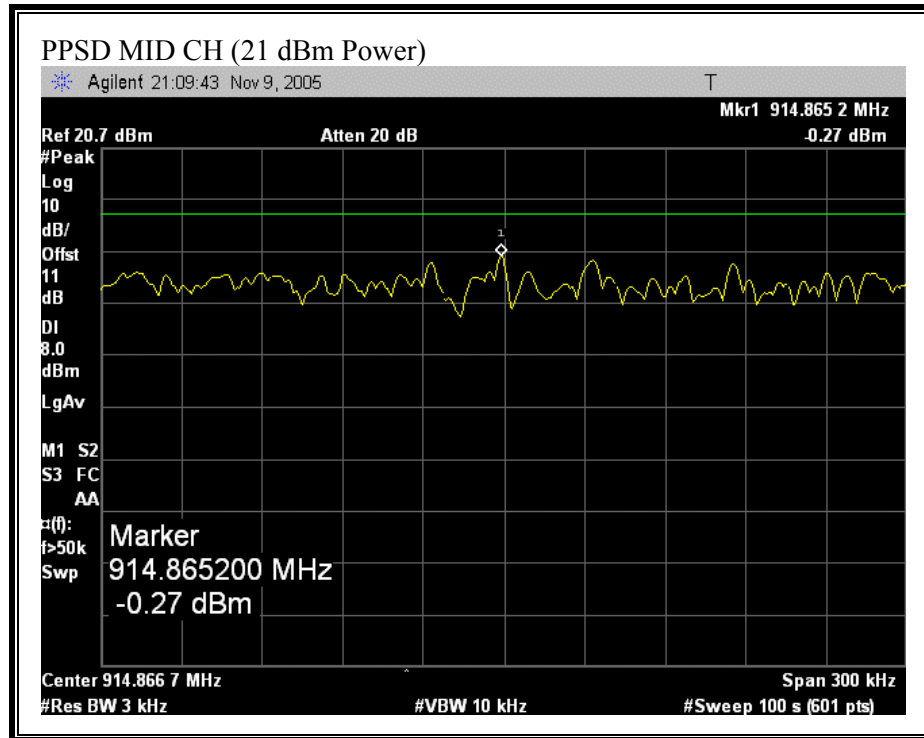
Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dB)
Low	906	-0.92	8	-8.92
Middle	915	-0.27	8	-8.27
High	924	-0.86	8	-8.86

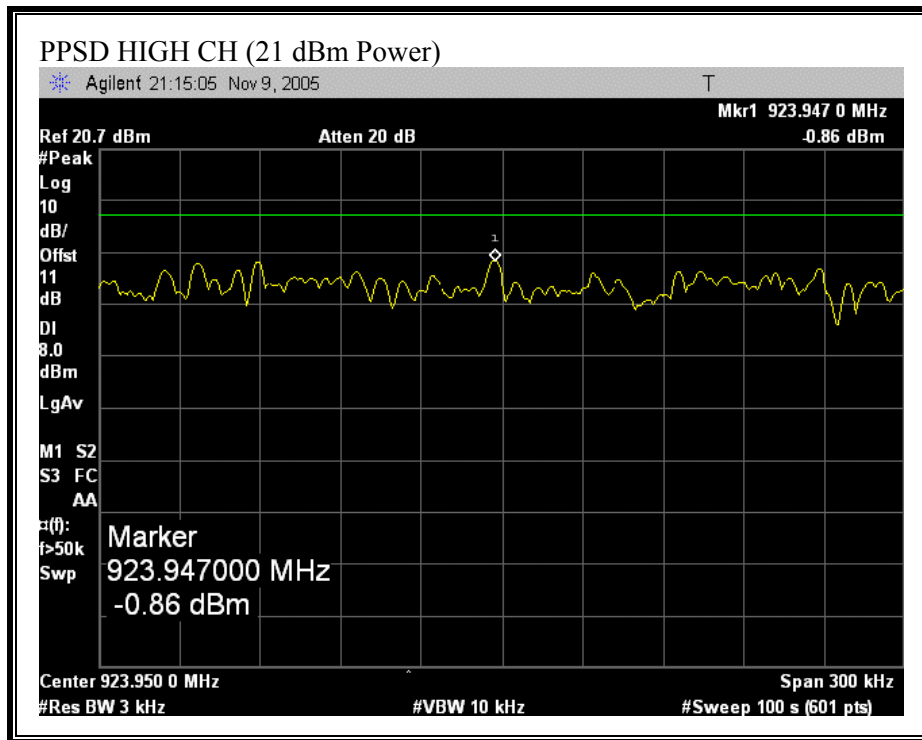
26 dBm Power

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dB)
Low	906	4.38	8	-3.62
Middle	915	4.97	8	-3.03
High	924	4.46	8	-3.54

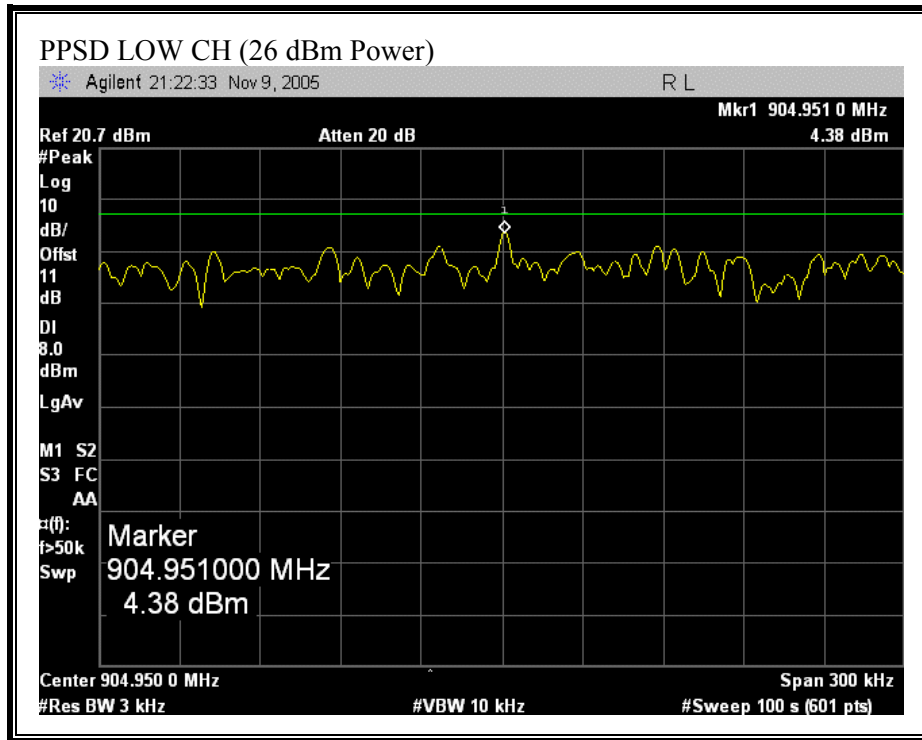
PEAK POWER SPECTRAL DENSITY (21 dBm Power)

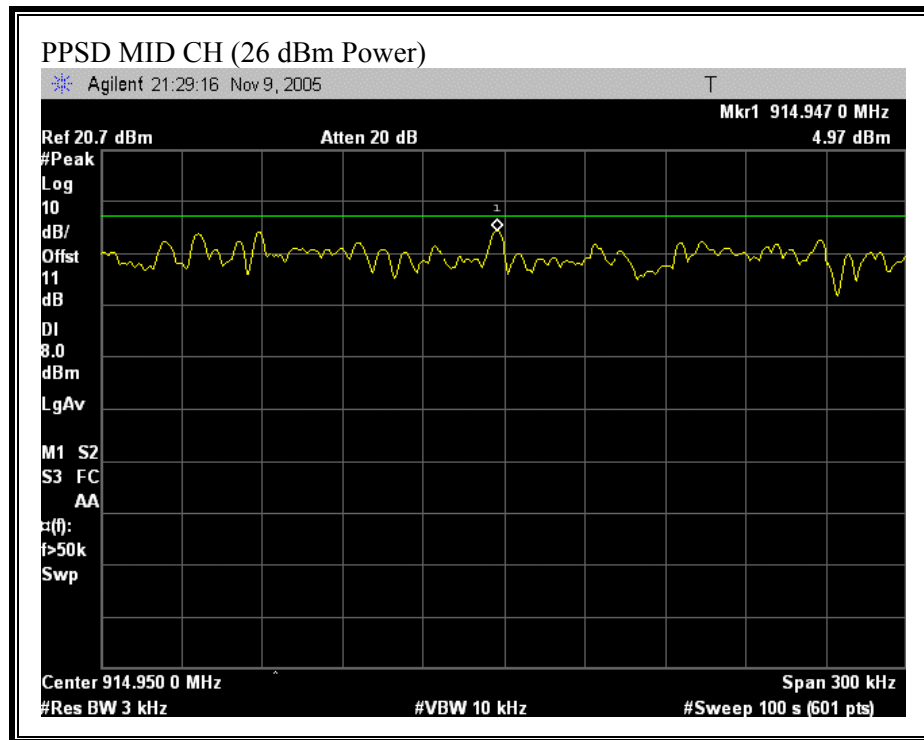


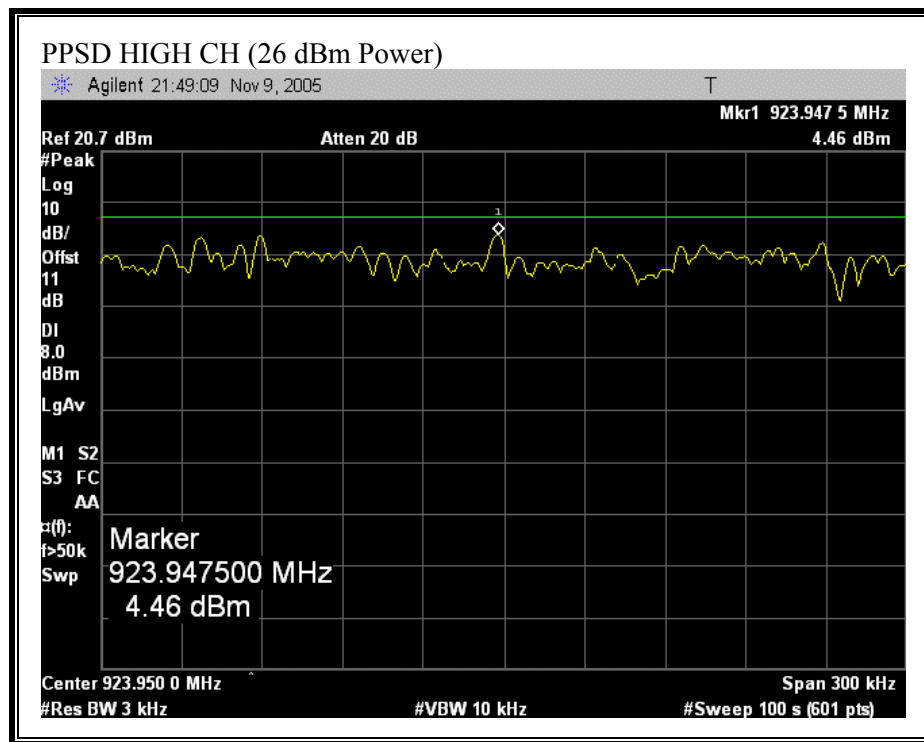




PEAK POWER SPECTRAL DENSITY (26 dBm Power)







7.1.7. CONDUCTED SPURIOUS EMISSIONS

LIMITS

§15.247 (c) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions, which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

TEST PROCEDURE

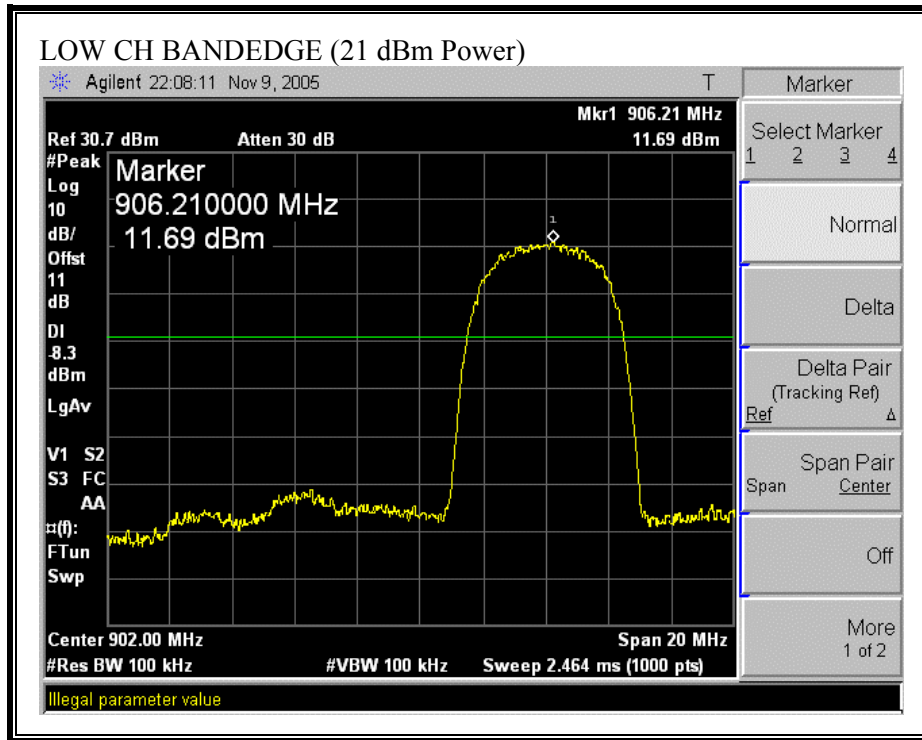
The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

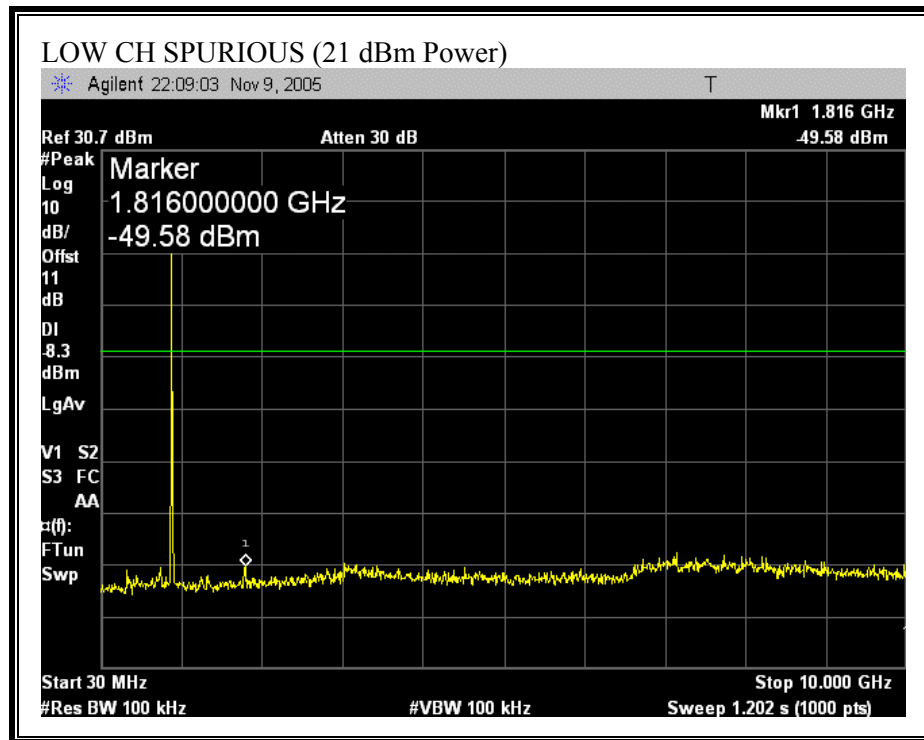
The spectrum from 30 MHz to 10 GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

RESULTS

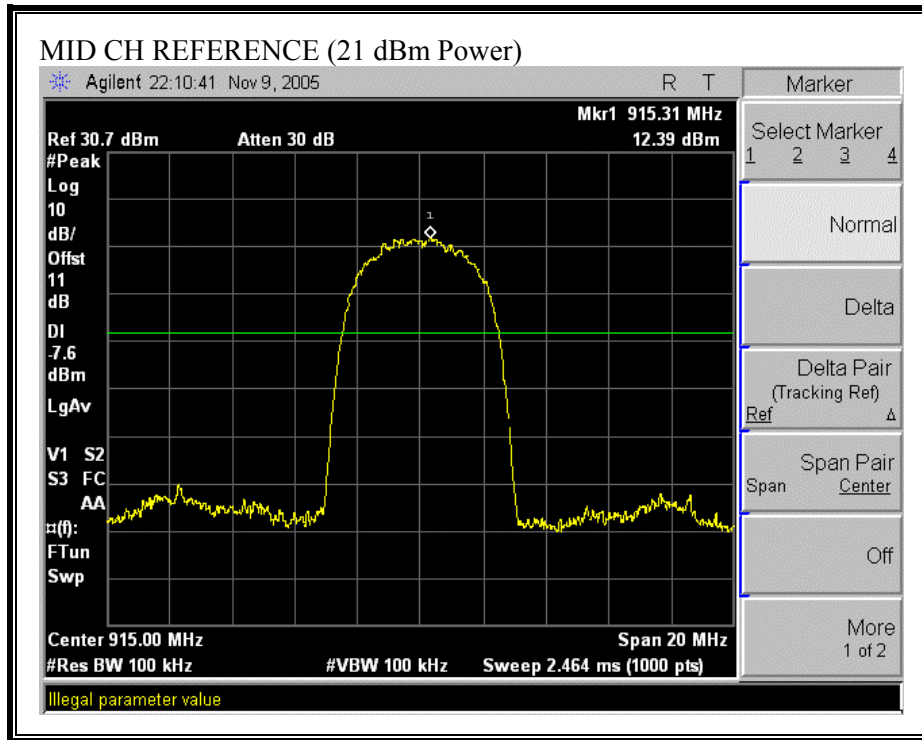
No non-compliance noted:

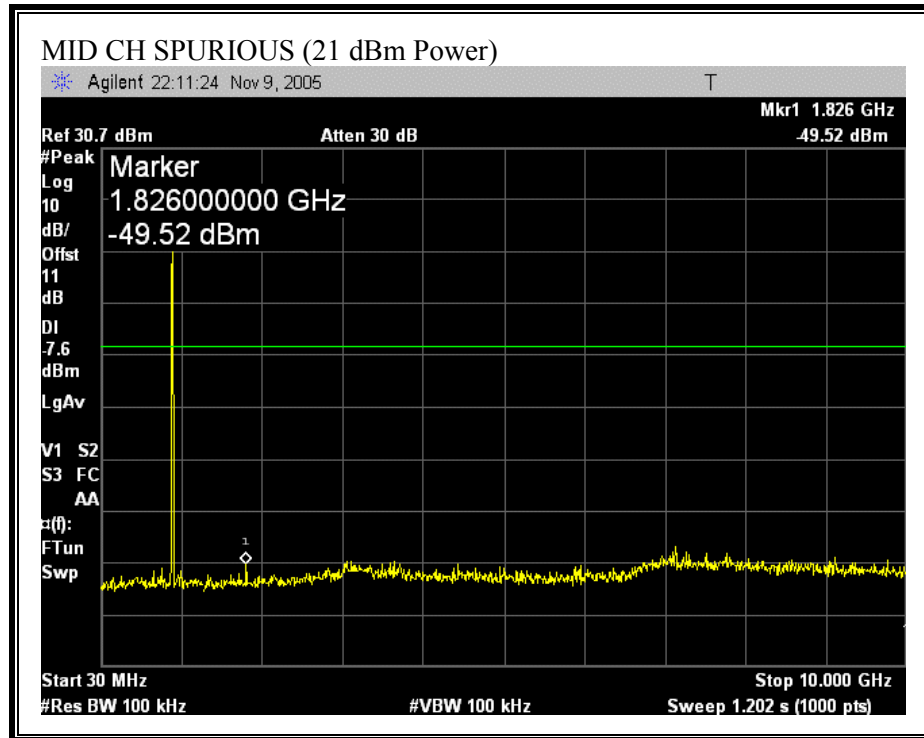
SPURIOUS EMISSIONS, LOW CHANNEL (21 dBm Power)



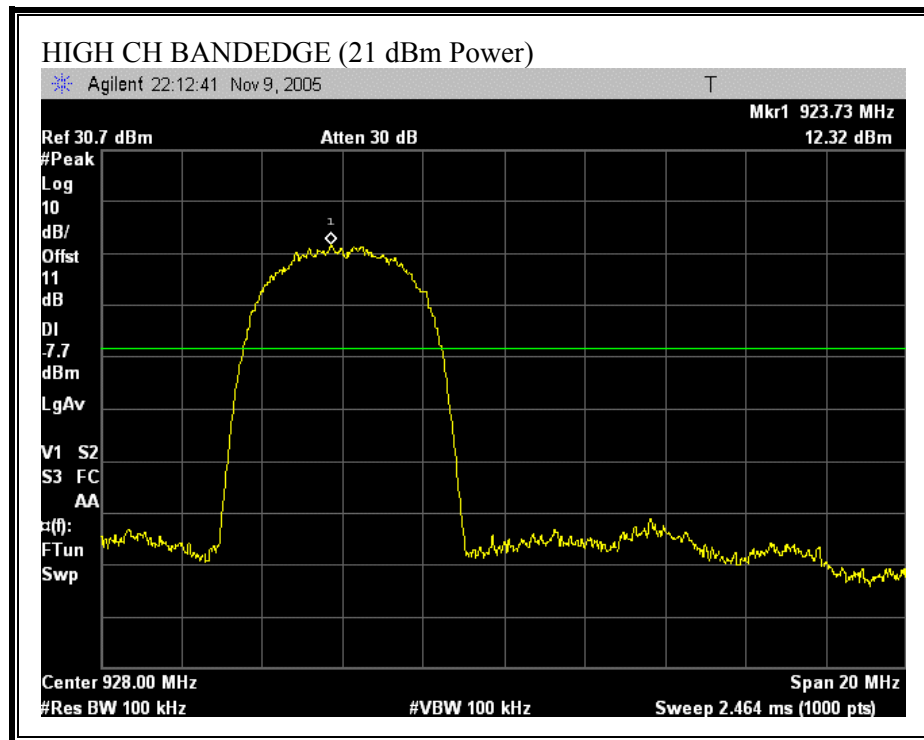


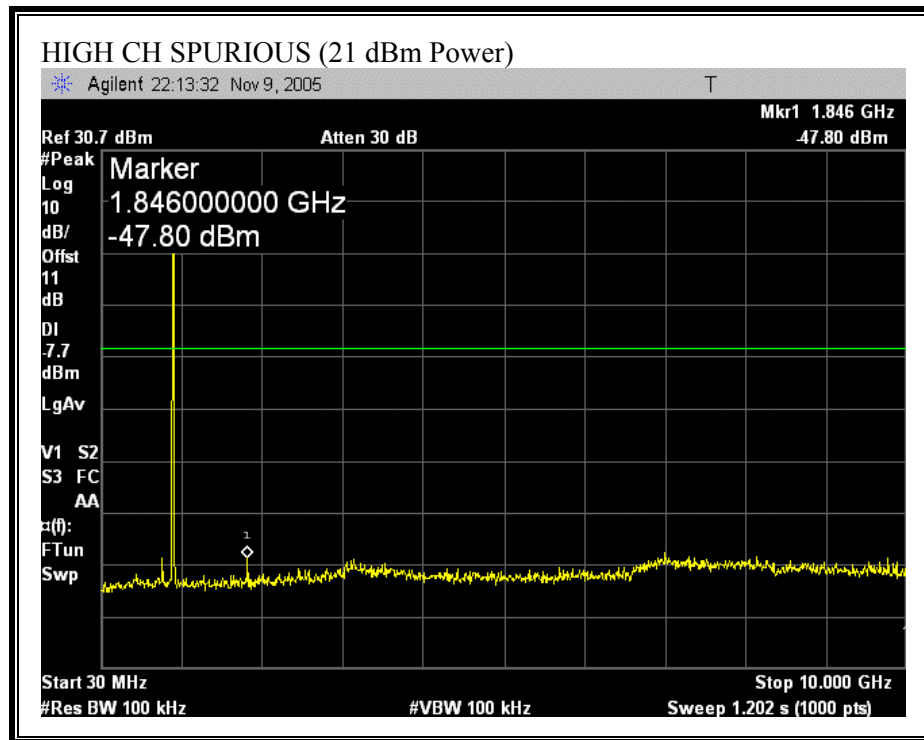
SPURIOUS EMISSIONS, MID CHANNEL (21 dBm Power)



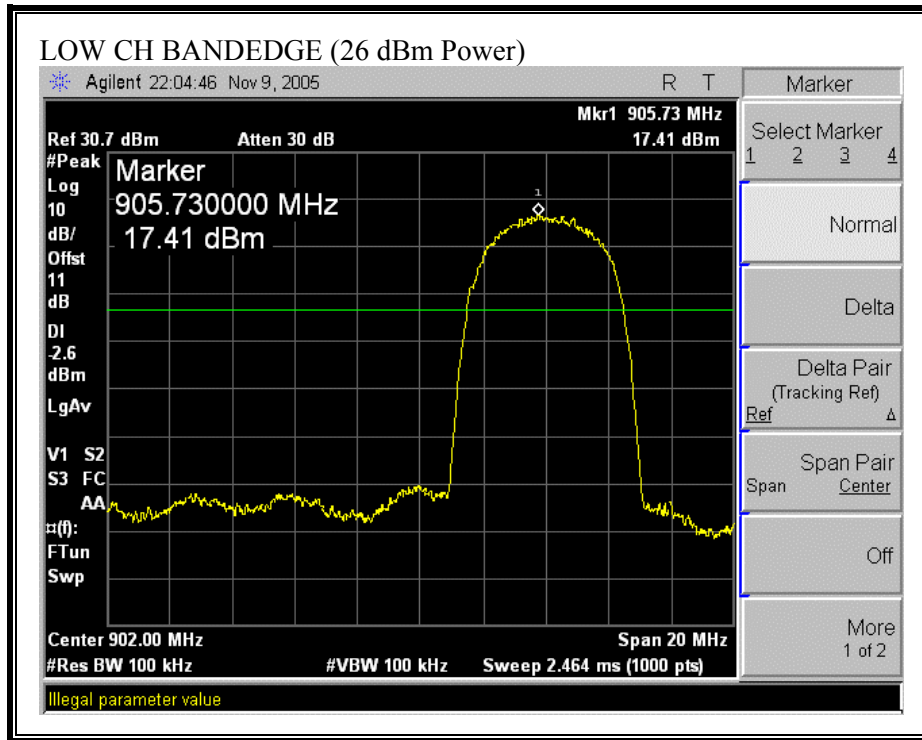


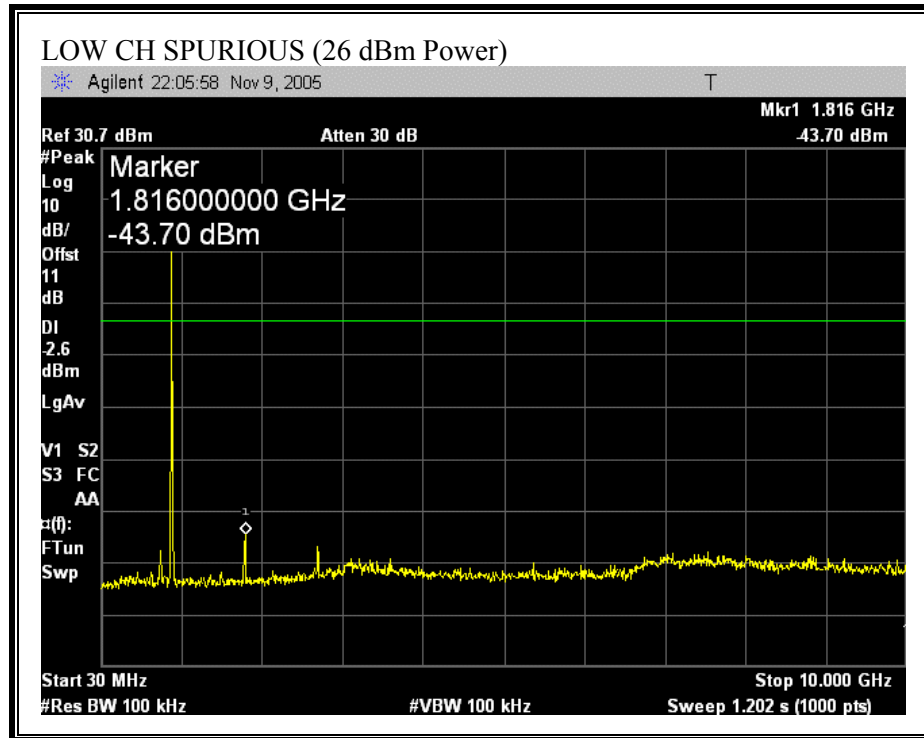
SPURIOUS EMISSIONS, HIGH CHANNEL (21 dBm Power)



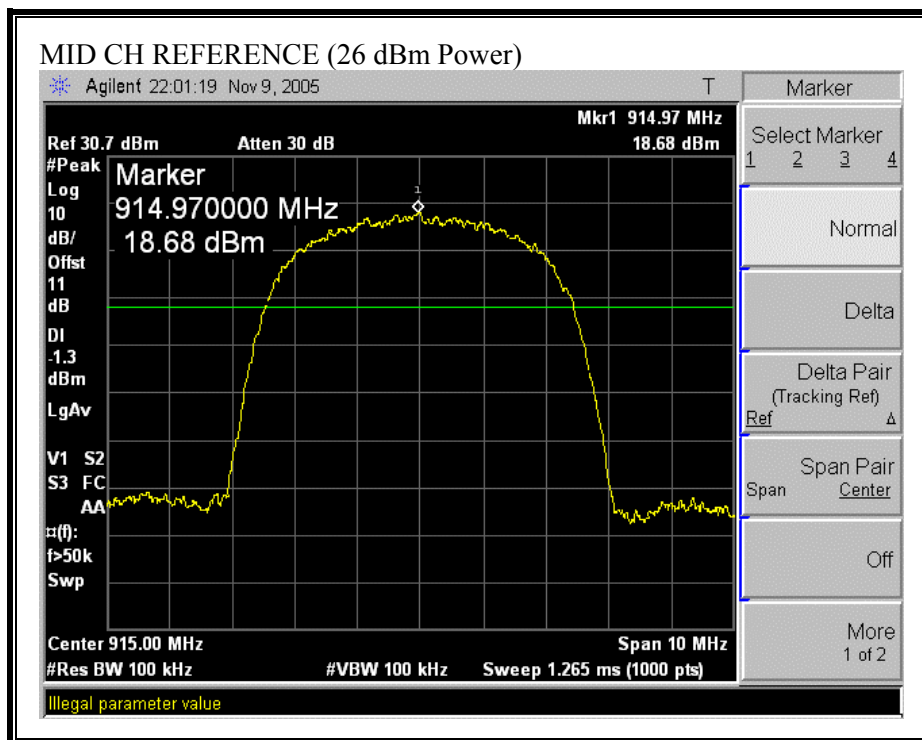


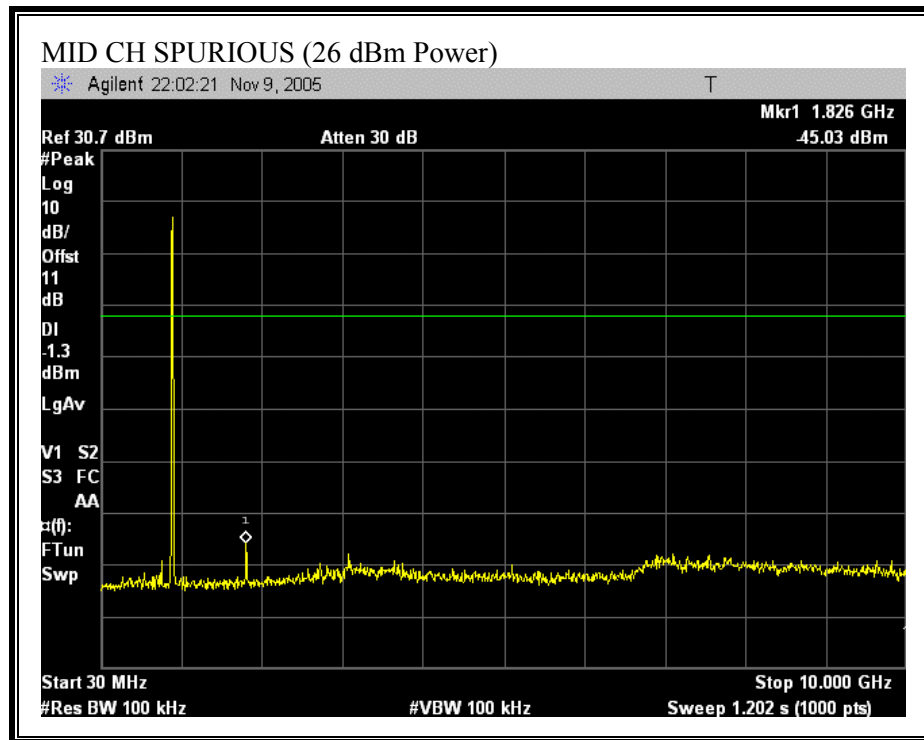
SPURIOUS EMISSIONS, LOW CHANNEL (26 dBm Power)



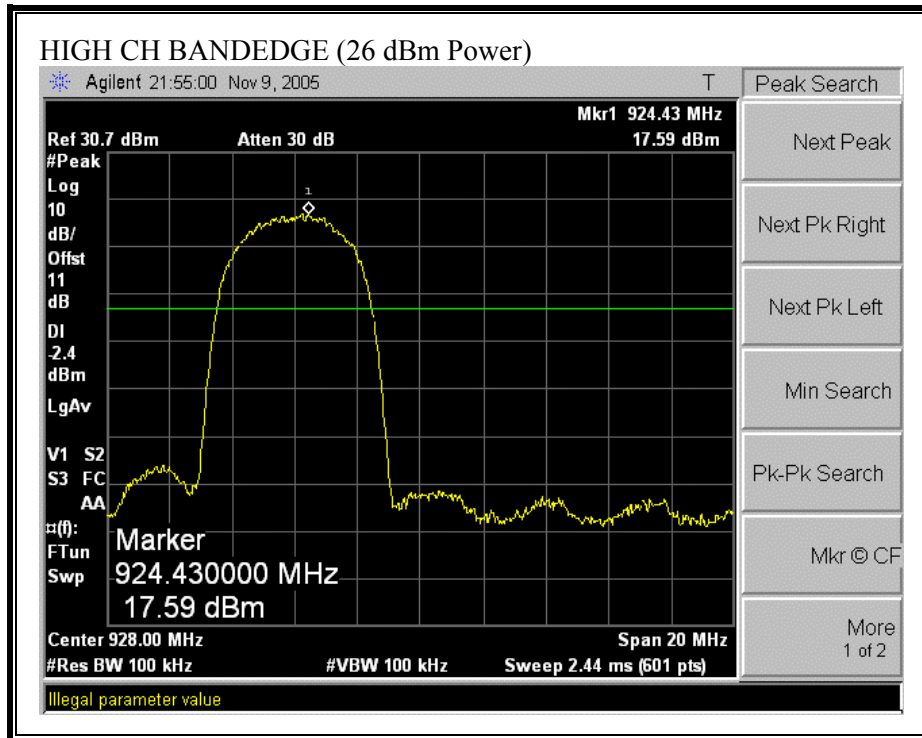


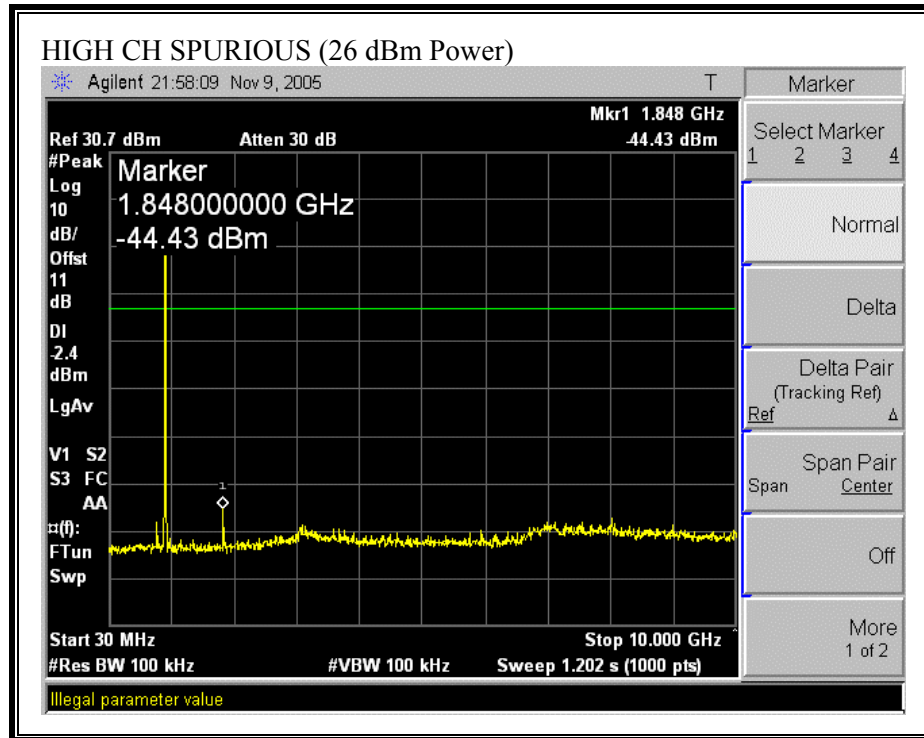
SPURIOUS EMISSIONS, MID CHANNEL (26 dBm Power)





SPURIOUS EMISSIONS, HIGH CHANNEL (26 dBm Power)





7.2. RADIATED EMISSIONS

7.2.1. TRANSMITTER RADIATED SPURIOUS EMISSIONS

LIMITS

§15.205 (a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
¹ 0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	(²)
13.36 - 13.41			

¹ Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

² Above 38.6

§15.205 (b) Except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

§15.209 (a) Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
30 - 88	100 **	3
88 - 216	150 **	3
216 - 960	200 **	3
Above 960	500	3

** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

§15.209 (b) In the emission table above, the tighter limit applies at the band edges.

TEST PROCEDURE

The EUT is placed on a non-conducting table 80 cm above the ground plane. The antenna to EUT distance is 3 meters. The EUT is configured in accordance with ANSI C63.4. The EUT is set to transmit in a continuous mode.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 1 MHz for peak measurements and 10 Hz for average measurements.

The spectrum from 30 MHz to 10 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in the 900 MHz band.

The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized in both the vertical and the horizontal positions.

7.2.2. TRANSMITTER ABOVE 1 GHz FOR 902 TO 928 MHz BAND

HARMONICS AND SPURIOUS EMISSIONS (WITH INTERNAL PATCH ANTENNA)

11/11/05 High Frequency Measurement Compliance Certification Services, Morgan Hill Open Field Site																			
Test Engr:		Frank Ibrahim																	
Project #:		05U3806																	
Company:		Trango Systems																	
EUT Descrip.:		900 MHz Transceiver, with Internal Patch Antenna																	
EUT M/N:		M915S																	
Test Target:		FCC 15.247																	
Mode Oper:		TX ON at 26 dBm power																	
Test Equipment:																			
Horn 1-18GHz				Pre-amplifier 1-26GHz				Pre-amplifier 26-40GHz				Horn > 18GHz							
T73; S/N: 6717 @3m				T87 Miteq 924342															
Hi Frequency Cables																			
2 foot cable				3 foot cable				12 foot cable				HPF				Reject Filter			
				Frank 177080001				Frank 187209001				HPF_1.5GHz							
Peak Measurements RBW=VBW=1MHz Average Measurements RBW=1MHz, VBW=10Hz																			
f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Filtr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)				
Low Channel (906 MHz)																			
2.718	3.0	71.0	60.9	29.3	3.0	-44.5	0.0	0.6	59.5	49.3	74	54	-14.5	-4.7	V, (internal ant V- polarized)				
3.624	3.0	53.5	43.2	31.8	3.4	-44.6	0.0	0.6	44.7	34.4	74	54	-29.3	-19.6	V, (internal ant V- polarized)				
2.718	3.0	84.5	65.2	29.3	3.0	-44.5	0.0	0.6	72.9	53.6	74	54	-1.1	-0.4	H, (internal ant H- polarized)				
3.624	3.0	57.1	49.2	31.8	3.4	-44.6	0.0	0.6	48.3	40.4	74	54	-25.7	-13.6	H, (internal ant H- polarized)				
4.530	3.0	61.6	51.0	33.4	3.8	-45.1	0.0	0.6	54.3	43.7	74	54	-19.7	-10.3	H, (internal ant H- polarized)				
Mid Channel (915 MHz)																			
2.745	3.0	72.2	64.1	29.4	3.0	-44.4	0.0	0.6	60.8	52.7	74	54	-13.2	-1.3	V, (internal ant V- polarized)				
3.660	3.0	55.7	45.1	31.9	3.5	-44.6	0.0	0.6	47.0	36.4	74	54	-27.0	-17.6	V, (internal ant V- polarized)				
2.745	3.0	81.2	65.2	29.4	3.0	-44.4	0.0	0.6	69.8	53.8	74	54	-4.2	-0.2	H, (internal ant H- polarized)				
3.660	3.0	60.7	54.5	31.9	3.5	-44.6	0.0	0.6	52.0	45.8	74	54	-22.0	-8.2	H, (internal ant H- polarized)				
4.575	3.0	58.0	46.3	33.4	3.9	-45.2	0.0	0.6	50.7	39.0	74	54	-23.3	-15.0	H, (internal ant H- polarized)				
High Channel (924 MHz)																			
2.772	3.0	71.0	61.8	29.5	3.1	-44.4	0.0	0.6	59.7	50.5	74	54	-14.3	-3.5	V, (internal ant V- polarized)				
4.620	3.0	70.0	60.4	33.5	3.9	-45.2	0.0	0.6	62.8	53.2	74	54	-11.2	-0.8	V, (internal ant V- polarized)				
2.772	3.0	71.7	61.9	29.5	3.1	-44.4	0.0	0.6	60.4	50.6	74	54	-13.6	-3.4	H, (internal ant H- polarized)				
3.696	3.0	63.2	57.7	32.0	3.5	-44.6	0.0	0.6	54.6	49.1	74	54	-19.4	-4.9	H, (internal ant H- polarized)				
4.620	3.0	60.9	49.2	33.5	3.9	-45.2	0.0	0.6	53.6	42.0	74	54	-20.4	-12.0	H, (internal ant H- polarized)				
f	Measurement Frequency					Amp	Preamp Gain					Avg Lim	Average Field Strength Limit						
Dist	Distance to Antenna					D Corr	Distance Correct to 3 meters					Pk Lim	Peak Field Strength Limit						
Read	Analyzer Reading					Avg	Average Field Strength @ 3 m					Avg Mar	Margin vs. Average Limit						
AF	Antenna Factor					Peak	Calculated Peak Field Strength					Pk Mar	Margin vs. Peak Limit						
CL	Cable Loss					HPF	High Pass Filter												

HARMONICS AND SPURIOUS EMISSIONS (WITH EXTERNAL OMNI ANTENNA)

11/11/05 High Frequency Measurement Compliance Certification Services, Morgan Hill Open Field Site																
Test Engr:		Frank Ibrahim														
Project #:		05U3806														
Company:		Trango Systems														
EUT Descrip.:		900 MHz Transceiver, with Omni Antenna														
EUT M/N:		M915S														
Test Target:		FCC 15.247														
Mode Oper:		TX ON at 26 dBm power														
Test Equipment:																
Horn 1-18GHz				Pre-amplifier 1-26GHz				Pre-amplifier 26-40GHz				Horn > 18GHz				
T73; S/N: 6717 @3m				T87 Miteq 924342												
Hi Frequency Cables																
2 foot cable				3 foot cable				12 foot cable				HPF		Reject Filter		<u>Peak Measurements</u> RBW=VBW=1MHz <u>Average Measurements</u> RBW=1MHz ; VBW=10Hz
				Frank 177080001				Frank 187209001				HPF_1.5GHz				
f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)	
Low Channel (906 MHz)																
2.718	3.0	75.2	65.5	29.3	3.0	-44.5	0.0	0.6	63.6	53.9	74	54	-10.4	-0.1	V	
3.624	3.0	56.8	49.4	31.8	3.4	-44.6	0.0	0.6	48.1	40.7	74	54	-25.9	-13.3	V	
Mid Channel (915 MHz)																
2.718	3.0	68.3	57.9	29.3	3.0	-44.5	0.0	0.6	56.7	46.3	74	54	-17.3	-7.7	H	
3.624	3.0	52.6	43.2	31.8	3.4	-44.6	0.0	0.6	43.8	34.4	74	54	-30.2	-19.6	H	
High Channel (924 MHz)																
2.745	3.0	59.6	48.0	29.4	3.0	-44.4	0.0	0.6	48.1	36.6	74	54	-25.9	-17.4	V	
3.660	3.0	59.1	52.9	31.9	3.5	-44.6	0.0	0.6	50.4	44.2	74	54	-23.6	-9.8	V	
4.575	3.0	55.8	44.0	33.4	3.9	-45.2	0.0	0.6	48.5	36.7	74	54	-25.5	-17.3	V	
2.745	3.0	54.0	41.2	29.4	3.0	-44.4	0.0	0.6	42.5	29.7	74	54	-31.5	-24.3	H	
3.660	3.0	54.7	45.5	31.9	3.5	-44.6	0.0	0.6	46.0	36.8	74	54	-28.0	-17.2	H	
High Channel (924 MHz)																
2.772	3.0	58.7	47.1	29.5	3.1	-44.4	0.0	0.6	47.4	35.8	74	54	-26.6	-18.2	V	
3.696	3.0	59.5	53.9	32.0	3.5	-44.6	0.0	0.6	50.9	45.3	74	54	-23.1	-8.7	V	
4.620	3.0	56.9	45.2	33.5	3.9	-45.2	0.0	0.6	49.7	37.9	74	54	-24.3	-16.1	V	
3.696	3.0	56.8	49.5	32.0	3.5	-44.6	0.0	0.6	48.2	40.9	74	54	-25.8	-13.1	H	
4.620	3.0	55.8	42.6	33.5	3.9	-45.2	0.0	0.6	48.6	35.4	74	54	-25.4	-18.6	H	
f	Measurement Frequency					Amp	Preamp Gain					Avg Lim	Average Field Strength Limit			
Dist	Distance to Antenna					D Corr	Distance Correct to 3 meters					Pk Lim	Peak Field Strength Limit			
Read	Analyzer Reading					Avg	Average Field Strength @ 3 m					Avg Mar	Margin vs. Average Limit			
AF	Antenna Factor					Peak	Calculated Peak Field Strength					Pk Mar	Margin vs. Peak Limit			
CL	Cable Loss					HPF	High Pass Filter									

HARMONICS AND SPURIOUS EMISSIONS (WITH EXTERNAL YAGI ANTENNA)

11/11/05 High Frequency Measurement Compliance Certification Services, Morgan Hill Open Field Site															
Test Engr:		Frank Ibrahim													
Project #:		05U3806													
Company:		Trango Systems													
EUT Descrip.:		900 MHz Transceiver, with Sector Antenna													
EUT M/N:		M915S													
Test Target:		FCC 15.247													
Mode Oper:		TX ON at 21 dBm power													
Test Equipment:															
Horn 1-18GHz				Pre-amplifier 1-26GHz				Pre-amplifier 26-40GHz				Horn > 18GHz			
T73; S/N: 6717 @3m				T87 Miteq 924342											
Hi Frequency Cables															
2 foot cable				3 foot cable				12 foot cable				HPF			
				Frank 177080001				Frank 187209001				HPF_1.5GHz			
												Reject Filter			
Peak Measurements RBW=VBW=1MHz Average Measurements RBW=1MHz ; VBW=10Hz															
f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Ftr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
Low Channel (906 MHz)															
1.580	3.0	64.9	51.1	25.8	2.4	-44.9	0.0	0.2	48.6	34.7	74	54	-25.4	-19.3	V
3.624	3.0	59.4	53.1	31.8	3.4	-44.6	0.0	0.6	50.6	44.3	74	54	-23.4	-9.7	V
Mid Channel (915 MHz)															
1.580	3.0	63.9	42.5	25.8	2.4	-44.9	0.0	0.2	47.5	26.2	74	54	-26.5	-27.8	H
2.718	3.0	56.4	44.3	29.3	3.0	-44.5	0.0	0.6	44.8	32.8	74	54	-29.2	-21.2	H
3.624	3.0	54.9	45.9	31.8	3.4	-44.6	0.0	0.6	46.2	37.2	74	54	-27.8	-16.8	H
High Channel (924 MHz)															
2.200	3.0	64.0	42.3	27.8	2.8	-44.8	0.0	0.5	50.2	28.5	74	54	-23.8	-25.5	V
3.660	3.0	56.6	45.8	31.9	3.5	-44.6	0.0	0.6	47.9	37.1	74	54	-26.1	-16.9	V
1.580	3.0	63.5	42.1	25.8	2.4	-44.9	0.0	0.2	47.1	25.7	74	54	-26.9	-28.3	H
2.745	3.0	55.9	43.3	29.4	3.0	-44.4	0.0	0.6	44.4	31.8	74	54	-29.6	-22.2	H
3.660	3.0	56.1	48.5	31.9	3.5	-44.6	0.0	0.6	47.4	39.8	74	54	-26.6	-14.2	H
High Channel (924 MHz)															
3.696	3.0	56.8	49.1	32.0	3.5	-44.6	0.0	0.6	48.2	40.5	74	54	-25.8	-13.5	V
3.696	3.0	57.4	50.8	32.0	3.5	-44.6	0.0	0.6	48.8	42.2	74	54	-25.2	-11.8	H
f	Measurement Frequency					Amp	Preamp Gain					Avg Lim	Average Field Strength Limit		
Dist	Distance to Antenna					D Corr	Distance Correct to 3 meters					Pk Lim	Peak Field Strength Limit		
Read	Analyzer Reading					Avg	Average Field Strength @ 3 m					Avg Mar	Margin vs. Average Limit		
AF	Antenna Factor					Peak	Calculated Peak Field Strength					Pk Mar	Margin vs. Peak Limit		
CL	Cable Loss					HPF	High Pass Filter								

7.2.3. RADIATED EMISSIONS BELOW 1 GHz

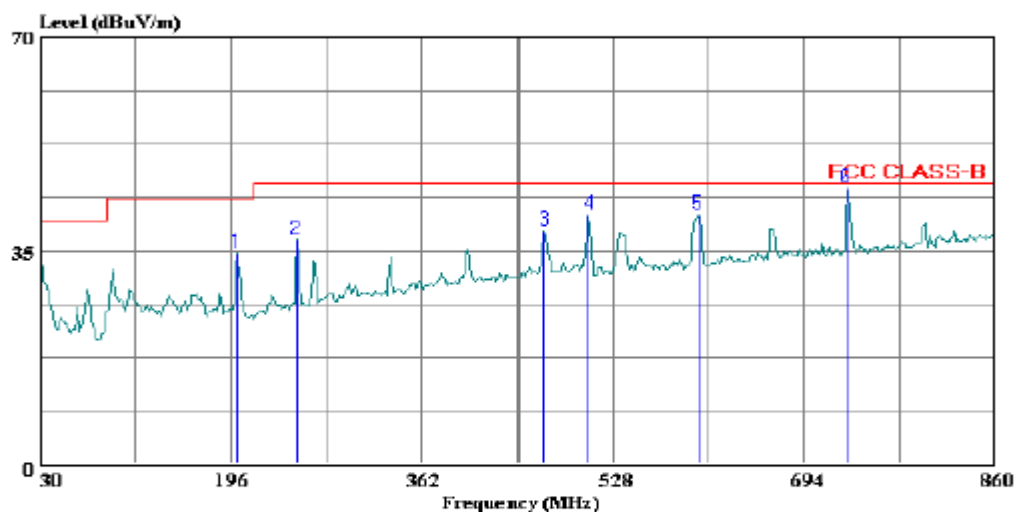
SPURIOUS EMISSIONS 30 TO 860 MHz (WITH INTERNAL ANTENNA, HORIZONTAL)

HORIZONTAL PLOT 30-860 MHz



561F Monterey Road
Morgan Hill, CA 95037
Tel: (408) 463-0888
Fax: (408) 463-0885

Data#: 10 File#: RAD1110.EMI Date: 11-10-2005 Time: 19:13:07



(Auxiliary ATC)

Trace: 9

Ref Trace:

Condition: FCC CLASS-B HORIZONTAL
Test Operator: : Frank Ibrahim
Project #: : 05U3806
Company: : Trango System
EUT: : 900 MHz Transceiver
Model No. : M915S
Configuration : Stand alone EUT
Target of Test : FCC Class B
Mode of Operation: TX ON at mid channel (915 MHz)

HORIZONTAL DATA

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	201.810	20.23	14.32	34.55	43.50	-8.95	Peak
2	253.270	22.78	14.00	36.78	46.00	-9.22	Peak
3	467.410	18.58	19.58	38.16	46.00	-7.84	Peak
4	506.420	20.53	20.29	40.82	46.00	-5.18	Peak
5	601.870	19.38	21.53	40.91	46.00	-5.09	Peak
6	730.520	21.84	23.56	45.40	46.00	-0.60	Peak

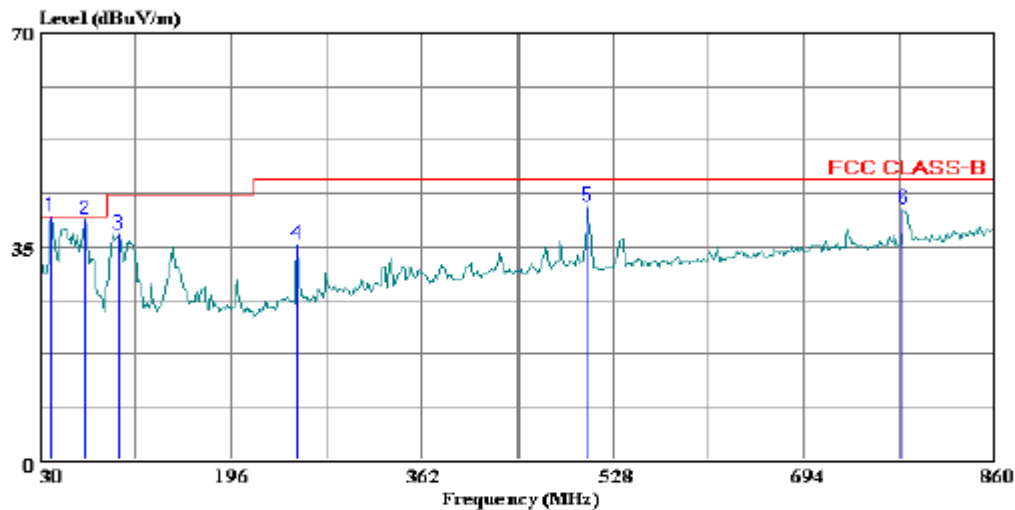
SPURIOUS EMISSIONS 30 TO 860 MHz (WITH INTERNAL ANTENNA, VERTICAL)

VERTICAL PLOT 30-860 MHz



561F Monterey Road
Morgan Hill, CA 95037
Tel: (408) 463-0888
Fax: (408) 463-0885

Data#: 14 File#: RAD1110.EMI Date: 11-10-2005 Time: 19:24:56



(Auxiliary ATC)

Trace: 13

Ref Trace:

Condition: FCC CLASS-B VERTICAL
Test Operator: : Frank Ibrahim
Project #: : 05U3806
Company: : Trango System
EUT: : 900 MHz Transceiver
Model No.: : M915S
Configuration : Stand alone EUT
Target of Test : FCC Class B
Mode of Operation: TX ON at mid channel (915 MHz)

VERTICAL DATA

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	39.960	24.13	15.77	39.91	40.00	-0.09	Peak
2	69.010	30.28	9.22	39.49	40.00	-0.51	Peak
3	98.060	26.34	10.67	37.01	43.50	-6.50	Peak
4	253.270	21.31	14.00	35.31	46.00	-10.69	Peak
5	504.760	21.35	20.26	41.61	46.00	-4.39	Peak
6	780.320	16.78	24.29	41.07	46.00	-4.93	Peak

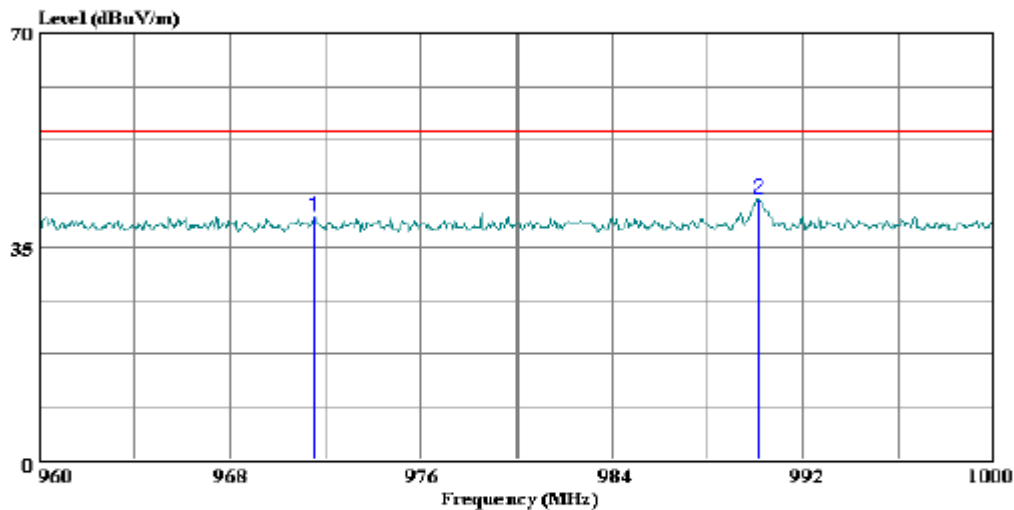
SPURIOUS EMISSIONS 960 TO 1000 MHz (WITH INTERNAL ANTENNA, HORIZONTAL)

HORIZONTAL PLOT 960-1000 MHz



561F Monterey Road
Morgan Hill, CA 95037
Tel: (408) 463-0888
Fax: (408) 463-0885

Data#: 12 File#: RAD1110.EMI Date: 11-10-2005 Time: 19:18:42



(Auxiliary ATC)

Trace: 11

Ref Trace:

Condition: FCC CLASS-B HORIZONTAL
Test Operator: : Frank Ibrahim
Project #: : 05U3806
Company: : Trango System
EUT: : 900 MHz Transceiver
Model No. : M915S
Configuration : Stand alone EUT
Target of Test : FCC Class B
Mode of Operation: TX ON at mid channel (915 MHz)

HORIZONTAL DATA

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	971.560	13.34	26.68	40.02	54.00	-13.98	Peak
2	990.120	15.90	26.89	42.79	54.00	-11.21	Peak

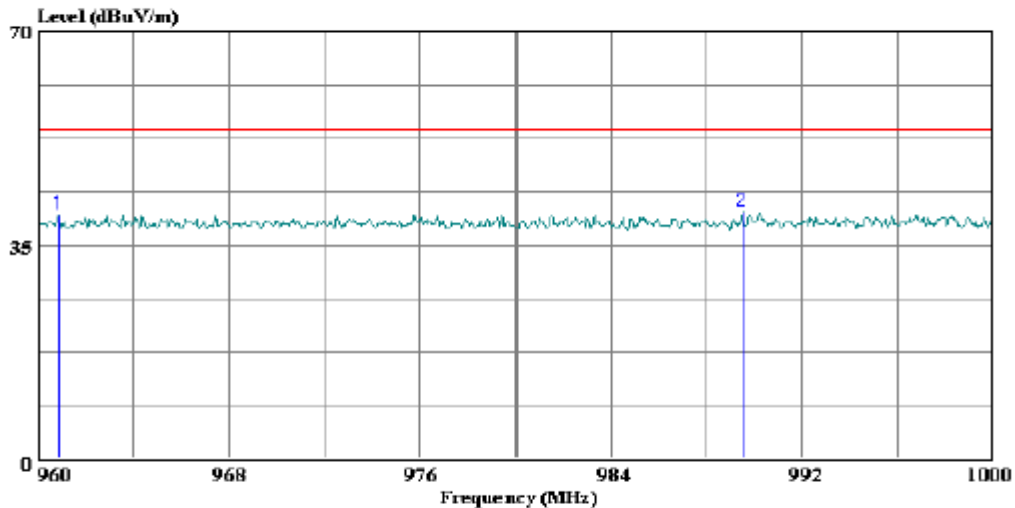
SPURIOUS EMISSIONS 960 TO 1000 MHz (WITH INTERNAL ANTENNA, VERTICAL)

VERTICAL PLOT 960-1000 MHz



561F Monterey Road
Morgan Hill, CA 95037
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Fax: (408) 463-0885

Data#: 16 File#: RAD1110.EMI Date: 11-10-2005 Time: 19:28:36



(Auxiliary ATC)

Trace: 15

Ref Trace:

Condition: FCC CLASS-B VERTICAL
Test Operator: : Frank Ibrahim
Project #: : 05U3806
Company: : Trango System
EUT: : 900 MHz Transceiver
Model No. : M915S
Configuration : Stand alone EUT
Target of Test : FCC Class B
Mode of Operation: TX ON at mid channel (915 MHz)

VERTICAL DATA

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	960.880	13.46	26.58	40.04	54.00	-13.96	Peak
2	989.480	13.66	26.87	40.53	54.00	-13.47	Peak

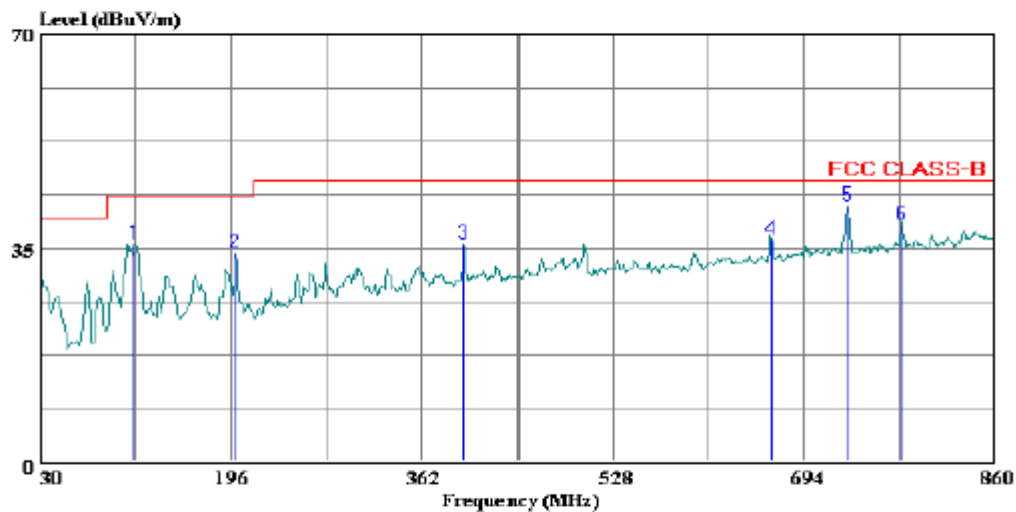
SPURIOUS EMISSIONS 30 TO 860 MHz (WITH OMNI ANTENNA, HORIZONTAL)

HORIZONTAL PLOT 30-860 MHz



561F Monterey Road
Morgan Hill, CA 95037
Tel: (408) 463-0888
Fax: (408) 463-0885

Data#: 51 File#: Rad1110.emi Date: 11-12-2005 Time: 15:23:18



(Auxiliary ATC)

Trace: 50

Ref Trace:

Condition: FCC CLASS-B HORIZONTAL
Test Operator: : Chin pang
Project #: : 05U3806
Company: : Trango System
EUT: : 900 MHz Transceiver
Model No.: : M915S
Configuration : EUT with external Omni antenna
Target of Test : FCC Class B
Mode of Operation: TX at Mid Ch (915MHz)

HORIZONTAL DATA

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	112.170	21.67	13.98	35.65	43.50	-7.85	Peak
2	199.320	19.77	14.50	34.27	43.50	-9.23	Peak
3	398.520	17.66	17.99	35.64	46.00	-10.36	Peak
4	664.950	13.82	22.62	36.44	46.00	-9.56	Peak
5	732.180	18.16	23.64	41.80	46.00	-4.20	Peak
6	779.490	14.43	24.26	38.69	46.00	-7.31	Peak

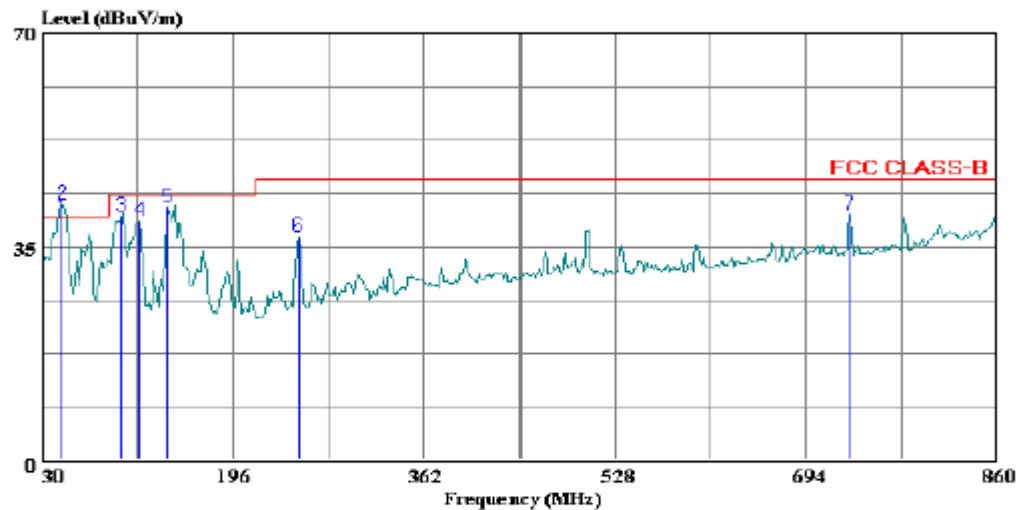
SPURIOUS EMISSIONS 30 TO 860 MHz (WITH OMNI ANTENNA, VERTICAL)

VERTICAL PLOT 30-860 MHz



561F Monterey Road
Morgan Hill, CA 95037
Tel: (408) 463-0888
Fax: (408) 463-0885

Data#: 59 File#: Rad1110.emi Date: 11-12-2005 Time: 15:42:37



(Auxiliary ATC)

Trace: 48

Ref Trace:

Condition: FCC CLASS-B VERTICAL
Test Operator: : Chin pang
Project #: : 05U3806
Company: : Trango System
EUT: : 900 MHz Transceiver
Model No. : M915S
Configuration : EUT with external Omni antenna
Target of Test : FCC Class B
Mode of Operation: TX at Mid Ch (915MHz)

VERTICAL DATA

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	47.430	29.00	10.70	39.70	40.00	-0.30	QP
2 *	47.430	31.20	10.70	41.90	40.00	1.90	Peak
3	98.890	28.77	11.11	39.88	43.50	-3.62	Peak
4	114.660	24.68	14.46	39.14	43.50	-4.36	Peak
5	139.560	26.49	14.83	41.32	43.50	-2.18	Peak
6	253.270	22.60	14.00	36.60	46.00	-9.40	Peak
7	732.180	16.59	23.64	40.23	46.00	-5.77	Peak

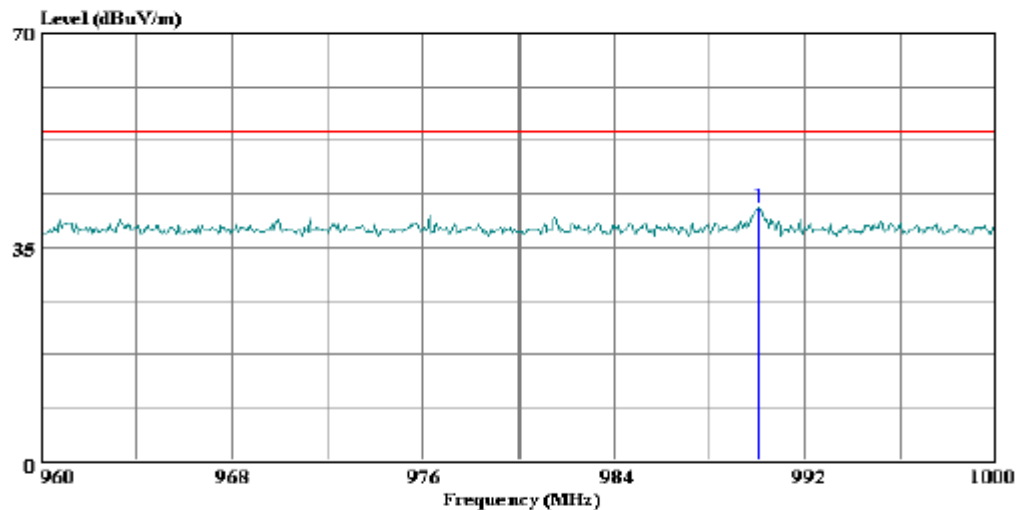
SPURIOUS EMISSIONS 960 TO 1000 MHz (WITH OMNI ANTENNA, HORIZONTAL)

HORIZONTAL PLOT 960-1000 MHz



561F Monterey Road
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Data#: 53 File#: Rad1110.emi Date: 11-12-2005 Time: 15:25:36



(Auxiliary ATC)

Trace: 52

Ref Trace:

Condition: FCC CLASS-B HORIZONTAL
Test Operator: : Chin pang
Project #: : 05U3806
Company: : Trango System
EUT: : 900 MHz Transceiver
Model No. : M915S
Configuration : EUT with external Omni antenna
Target of Test : FCC Class B
Mode of Operation: TX at Mid Ch (915MHz)

HORIZONTAL DATA

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	990.080	14.52	26.89	41.41	54.00	-12.59	Peak

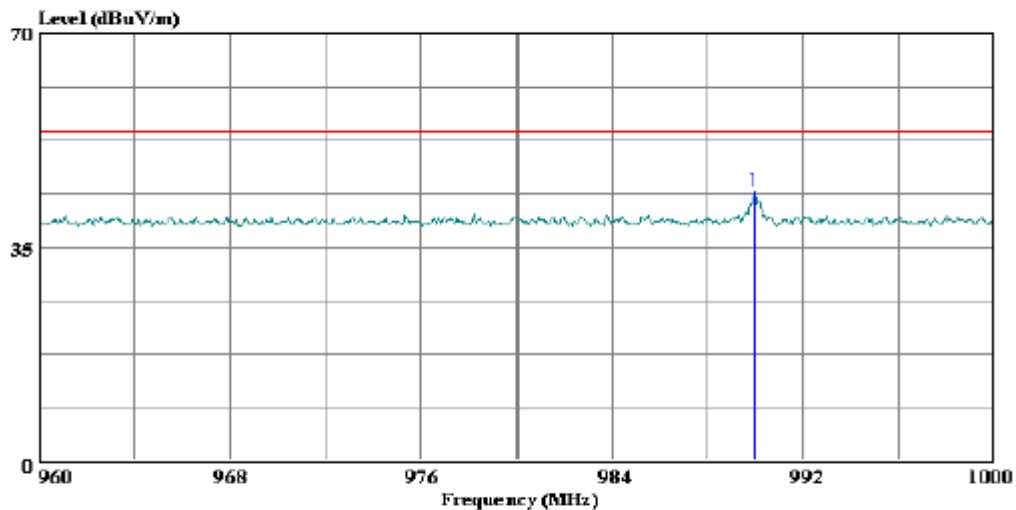
SPURIOUS EMISSIONS 960 TO 1000 MHz (WITH OMNI ANTENNA, VERTICAL)

VERTICAL PLOT 960-1000 MHz



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Morgan Hill, CA 95037
Tel: (408) 463-0888
Fax: (408) 463-0885

Data#: 61 File#: Rad1110.emi Date: 11-12-2005 Time: 16:21:55



(Auxiliary ATC)

Trace: 60

Ref Trace:

Condition: FCC CLASS-B VERTICAL
Test Operator: : Chin pang
Project #: : 05U3806
Company: : Trango System
EUT: : 900 MHz Transceiver
Model No. : M915S
Configuration : EUT with external Omni antenna
Target of Test : FCC Class B
Mode of Operation: TX at Mid Ch (915MHz)

VERTICAL DATA

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	989.960	17.22	26.89	44.11	54.00	-9.89	Peak

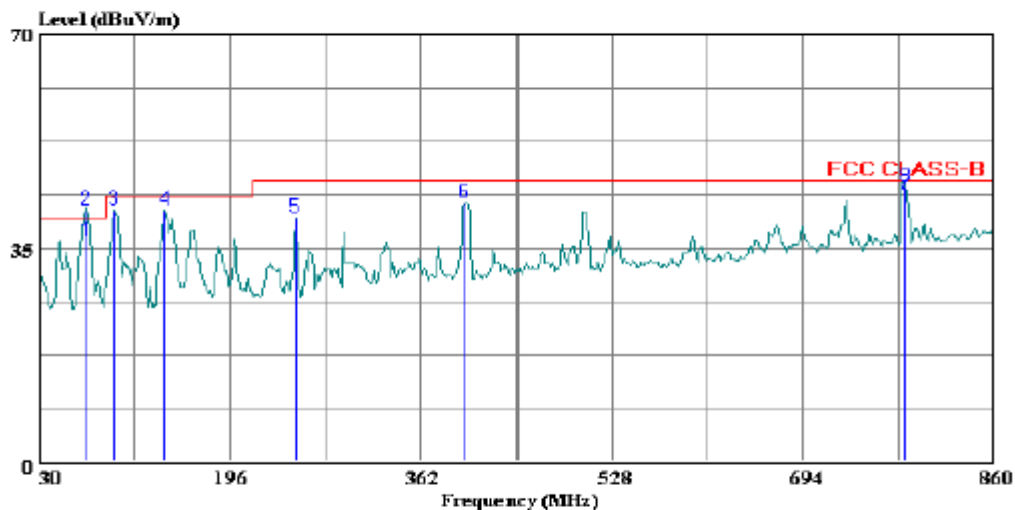
SPURIOUS EMISSIONS 30 TO 860 MHz (WITH YAGI ANTENNA, HORIZONTAL)

HORIZONTAL PLOT 30-860 MHz



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Tel: (408) 463-0888
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Data#: 32 File#: Rad1110.emi Date: 11-12-2005 Time: 12:38:39



(Auxiliary)

Trace: 29

Ref Trace:

Condition: FCC CLASS-B HORIZONTAL
Test Operator: : Chin pang
Project #: : 05U3806
Company: : Trango System
EUT: : 900 MHz Transceiver
Model No. : M915S
Configuration : EUT with external Sector antenna
Target of Test : FCC Class B
Mode of Operation: TX at Mid Ch (915MHz)

HORIZONTAL DATA

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	71.500	26.84	9.30	36.14	40.00	-3.86	QP
2 *	71.500	31.82	9.30	41.12	40.00	1.12	Peak
3	95.570	31.04	10.22	41.26	43.50	-2.24	Peak
4	139.560	26.27	14.83	41.10	43.50	-2.40	Peak
5	253.270	26.01	14.00	40.01	46.00	-5.99	Peak
6	401.010	24.37	18.04	42.41	46.00	-3.59	Peak
7	782.810	19.61	24.32	43.93	46.00	-2.07	QP
8	782.810	20.74	24.33	45.07	46.00	-0.93	Peak

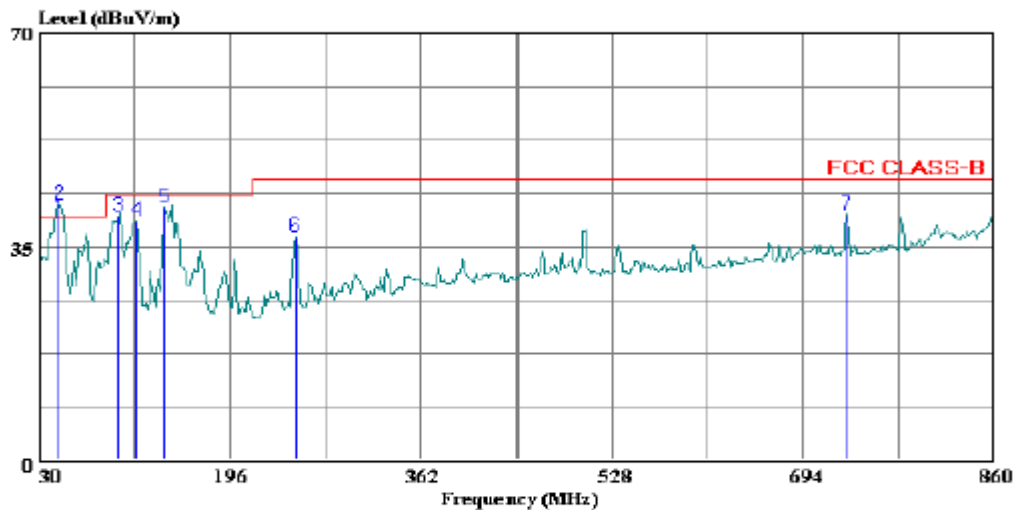
SPURIOUS EMISSIONS 30 TO 860 MHz (WITH YAGI ANTENNA, VERTICAL)

VERTICAL PLOT 30-860 MHz



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Tel: (408) 463-0888
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Data#: 59 File#: Rad1110.emi Date: 11-12-2005 Time: 15:42:37



(Auxiliary ATC)

Trace: 48

Ref Trace:

Condition: FCC CLASS-B VERTICAL
Test Operator: : Chin pang
Project #: : 05U3806
Company: : Trango System
EUT: : 900 MHz Transceiver
Model No. : M915S
Configuration : EUT with external Omni antenna
Target of Test : FCC Class B
Mode of Operation: TX at Mid Ch (915MHz)

VERTICAL DATA

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	47.430	29.00	10.70	39.70	40.00	-0.30	QP
2 *	47.430	31.20	10.70	41.90	40.00	1.90	Peak
3	98.890	28.77	11.11	39.88	43.50	-3.62	Peak
4	114.660	24.68	14.46	39.14	43.50	-4.36	Peak
5	139.560	26.49	14.83	41.32	43.50	-2.18	Peak
6	253.270	22.60	14.00	36.60	46.00	-9.40	Peak
7	732.180	16.59	23.64	40.23	46.00	-5.77	Peak

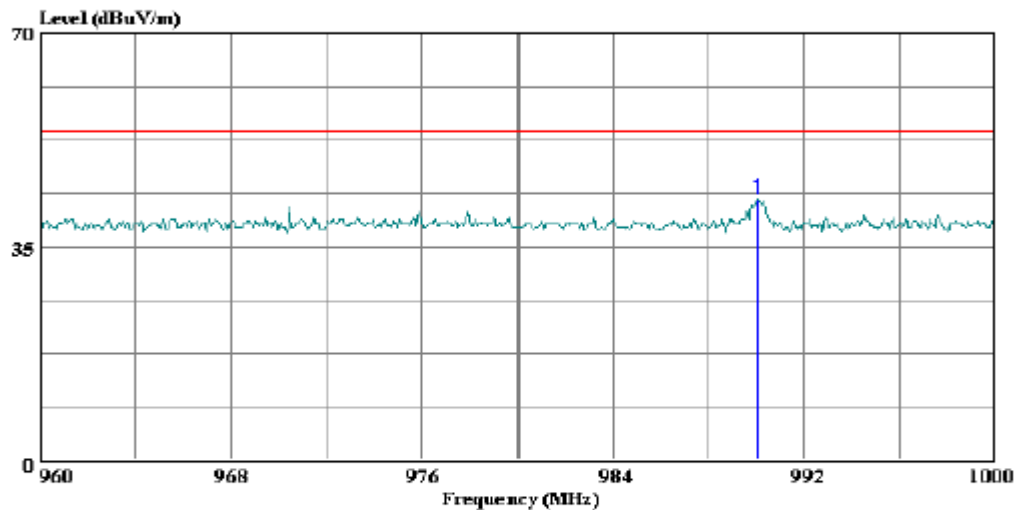
SPURIOUS EMISSIONS 960 TO 1000 MHz (WITH YAGI ANTENNA, HORIZONTAL)

HORIZONTAL PLOT 960-1000 MHz



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Morgan Hill, CA 95037
Tel: (408) 463-0888
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Data#: 34 File#: Rad1110.emi Date: 11-12-2005 Time: 12:42:44



(Auxiliary ATC)

Trace: 33

Ref Trace:

Condition: FCC CLASS-B HORIZONTAL
Test Operator: : Chin pang
Project #: : 05U3806
Company: : Trango System
EUT: : 900 MHz Transceiver
Model No. : M915S
Configuration : EUT with external Sector antenna
Target of Test : FCC Class B
Mode of Operation: TX at Mid Ch (915MHz)

HORIZONTAL DATA

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	990.080	15.89	26.89	42.78	54.00	-11.22	Peak

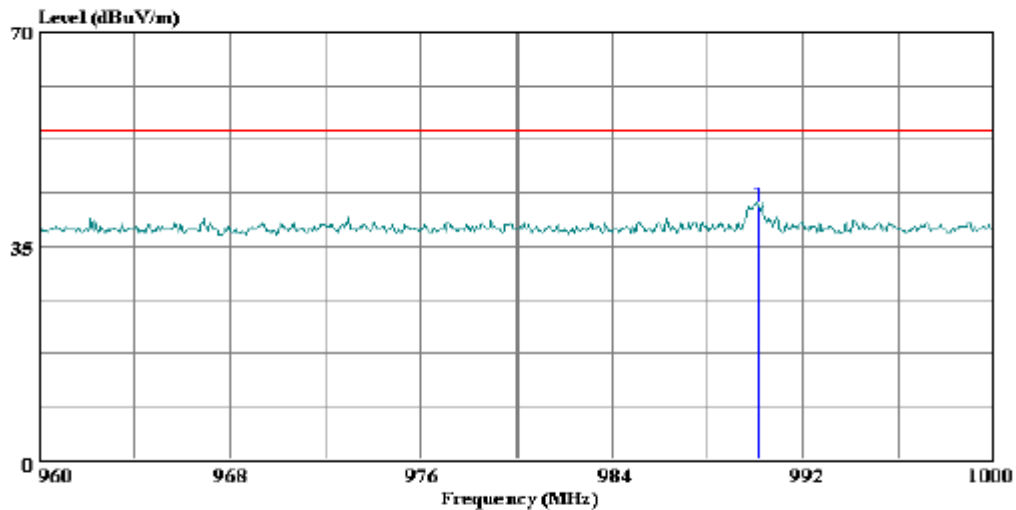
SPURIOUS EMISSIONS 960 TO 1000 MHz (WITH YAGI ANTENNA, VERTICAL)

VERTICAL PLOT 960-1000 MHz



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Data#: 47 File#: Rad1110.emi Date: 11-12-2005 Time: 14:52:45



(Auxiliary ATC)

Trace: 46

Ref Trace:

Condition: FCC CLASS-B VERTICAL
Test Operator: : Chin pang
Project #: : 05U3806
Company: : Trango System
EUT: : 900 MHz Transceiver
Model No. : M915S
Configuration : EUT with external Sector antenna
Target of Test : FCC Class B
Mode of Operation: TX at Mid Ch (915MHz)

VERTICAL DATA

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	990.120	14.50	26.89	41.39	54.00	-12.61	Peak

7.3. POWERLINE CONDUCTED EMISSIONS

LIMIT

§15.207 (a) Except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50 μ H/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal.

The lower limit applies at the boundary between the frequency ranges.

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56 *	56 to 46 *
0.5-5	56	46
5-30	60	50

* Decreases with the logarithm of the frequency.

TEST PROCEDURE

The EUT is placed on a non-conducting table 40 cm from the vertical ground plane and 80 cm above the horizontal ground plane. The EUT is configured in accordance with ANSI C63.4.

The resolution bandwidth is set to 9 kHz for both peak detection and quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

Line conducted data is recorded for both NEUTRAL and HOT lines.

RESULTS

No non-compliance noted:

6 WORST EMISSIONS

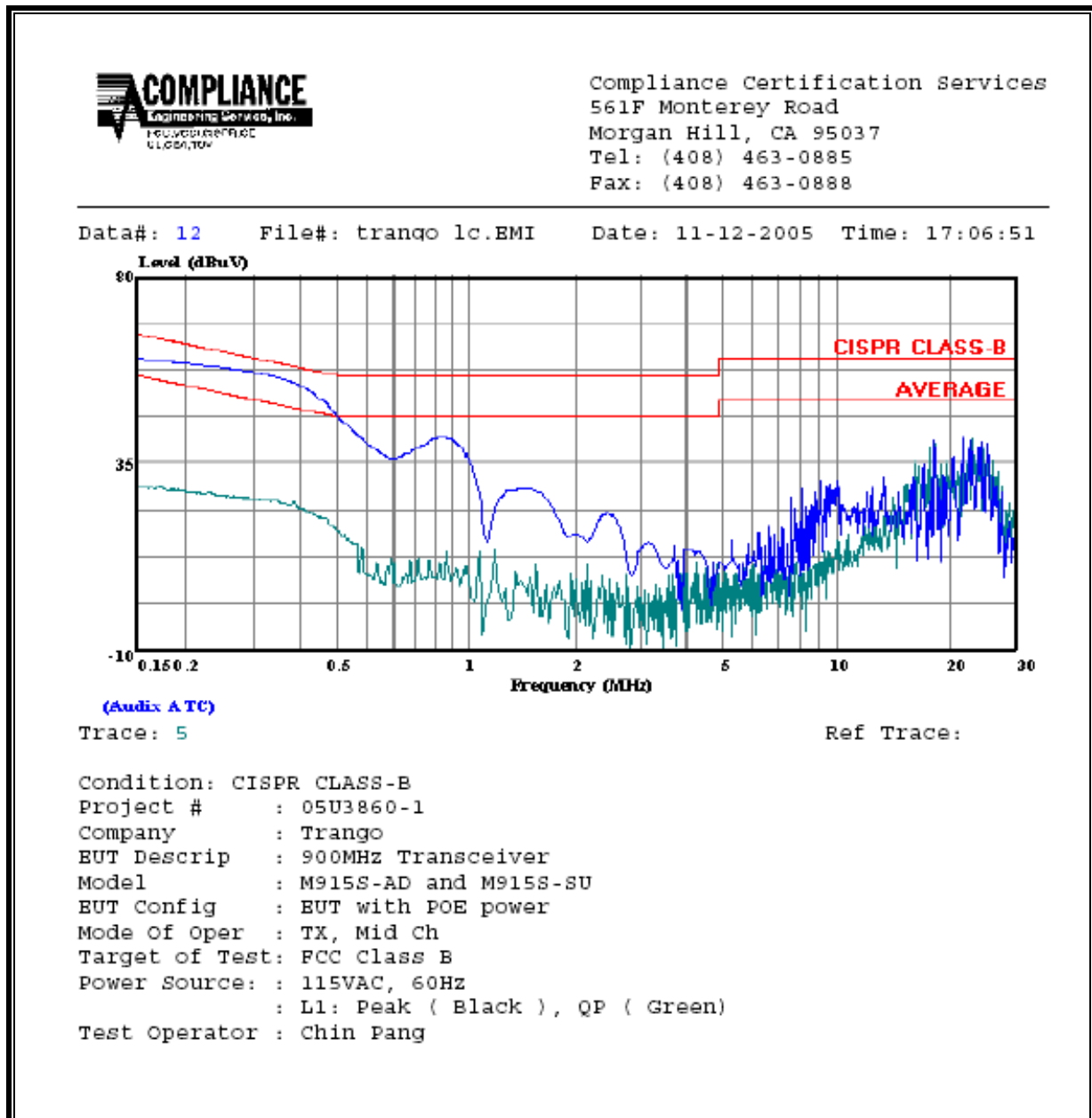
CONDUCTED EMISSIONS DATA (115VAC 60Hz)									
Freq.	Reading			Closs	Limit	EN B	Margin		Remark
(MHz)	PK (dBuV)	QP (dBuV)	AV (dBuV)	(dB)	QP	AV	QP (dB)	AV (dB)	L1 / L2
0.20	66.80	58.92	28.43	0.00	63.61	53.61	-4.69	-25.18	L1
0.41	60.82	53.34	25.92	0.00	57.73	47.73	-4.39	-21.81	L1
18.23	41.00	40.08	39.44	0.00	60.00	50.00	-19.92	-10.56	L1
0.18	66.32	57.98	26.88	0.00	64.44	54.44	-6.46	-27.56	L2
0.33	61.02	52.36	22.64	0.00	59.35	49.35	-6.99	-26.71	L2
21.71	47.32	46.28	24.73	0.00	60.00	50.00	-13.72	-25.27	L2
6 Worst Data									

POE

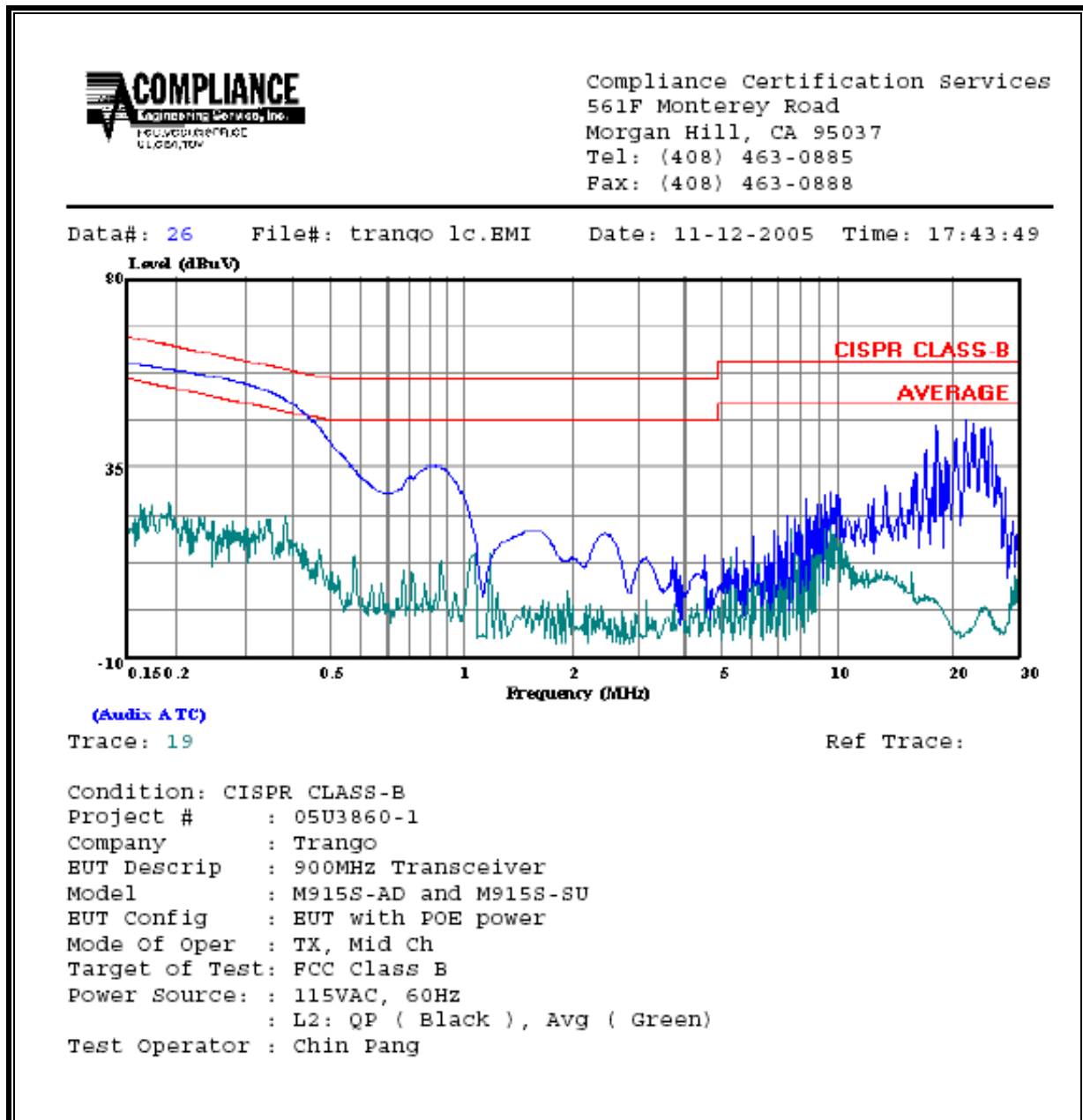
CONDUCTED EMISSIONS DATA (115VAC 60Hz)									
Freq.	Reading			Closs	Limit	EN B	Margin		Remark
(MHz)	PK (dBuV)	QP (dBuV)	AV (dBuV)	(dB)	QP	AV	QP (dB)	AV (dB)	L1 / L2
0.17	51.28	--	38.09	0.00	64.77	54.77	-13.49	-16.68	L1
0.23	42.84	--	30.00	0.00	62.31	52.31	-19.47	-22.31	L1
23.14	45.54	--	41.12	0.00	60.00	50.00	-14.46	-8.88	L1
0.18	52.00	--	38.92	0.00	64.72	54.72	-12.72	-15.80	L2
0.23	43.98	--	31.67	0.00	62.38	52.38	-18.40	-20.71	L2
23.14	47.38	--	43.58	0.00	60.00	50.00	-12.62	-6.42	L2
6 Worst Data									

Laptop

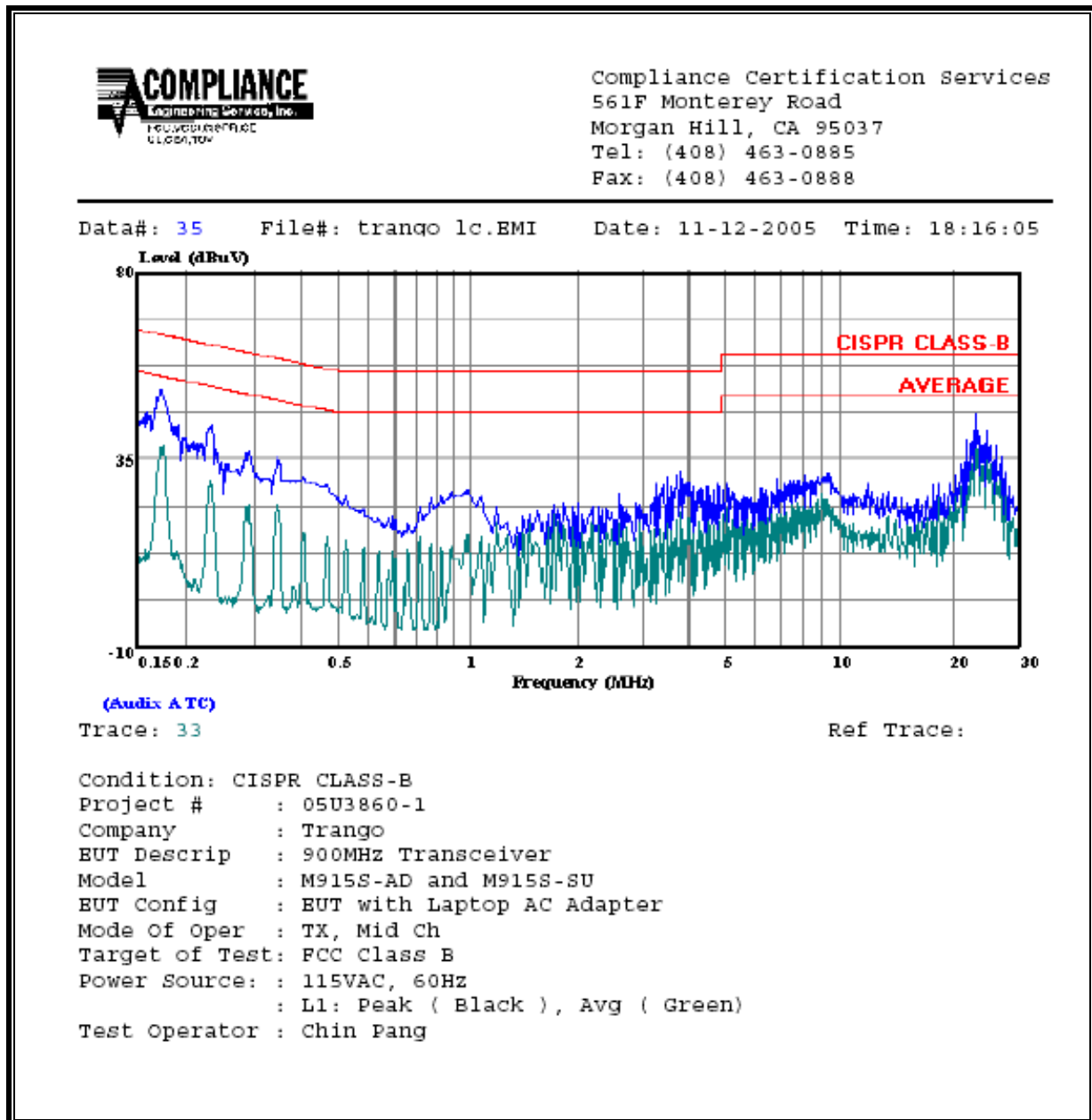
LINE 1 RESULTS (POE)



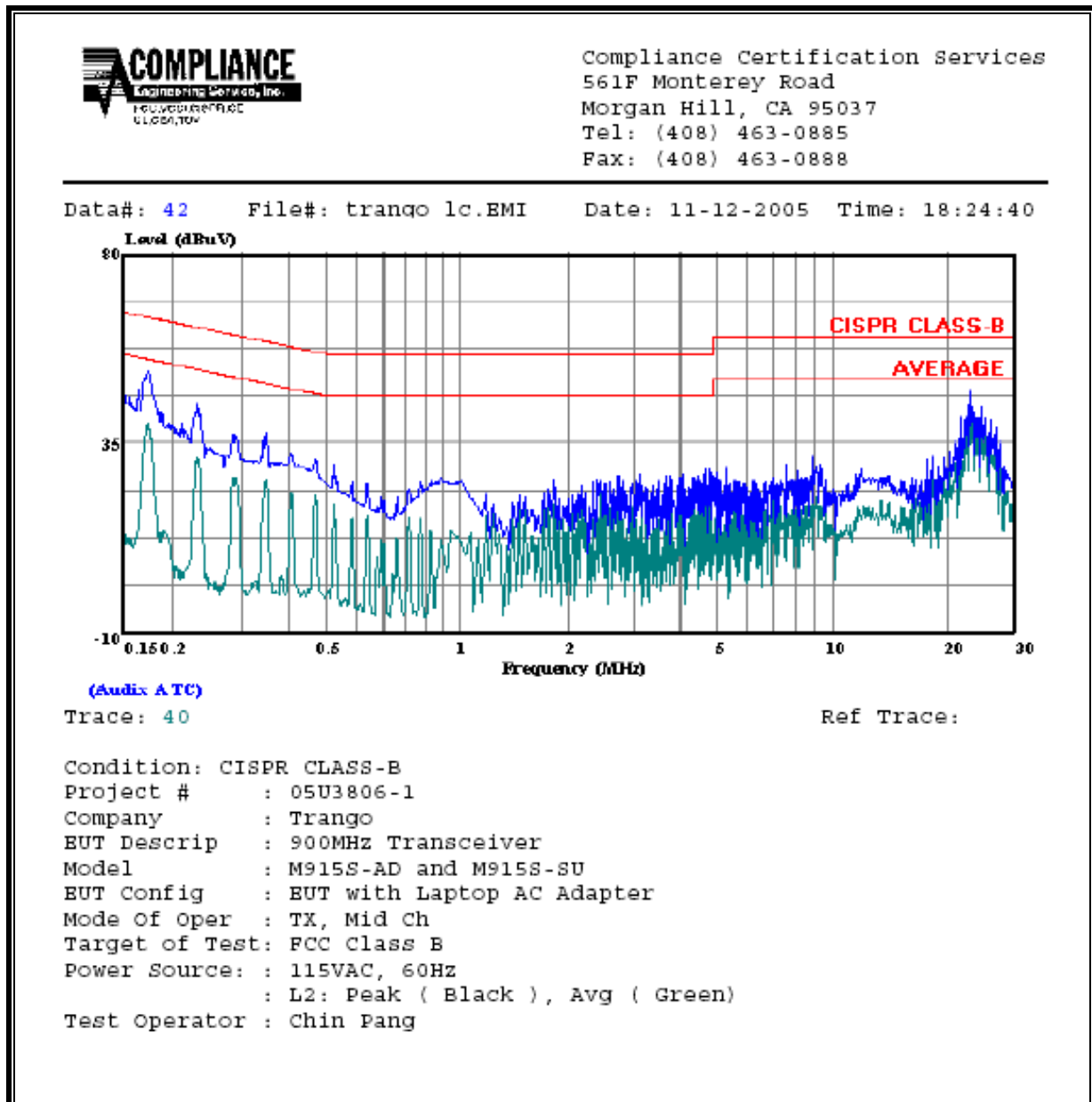
LINE 2 RESULTS (POE)



LINE 1 RESULTS (LAPTOP)

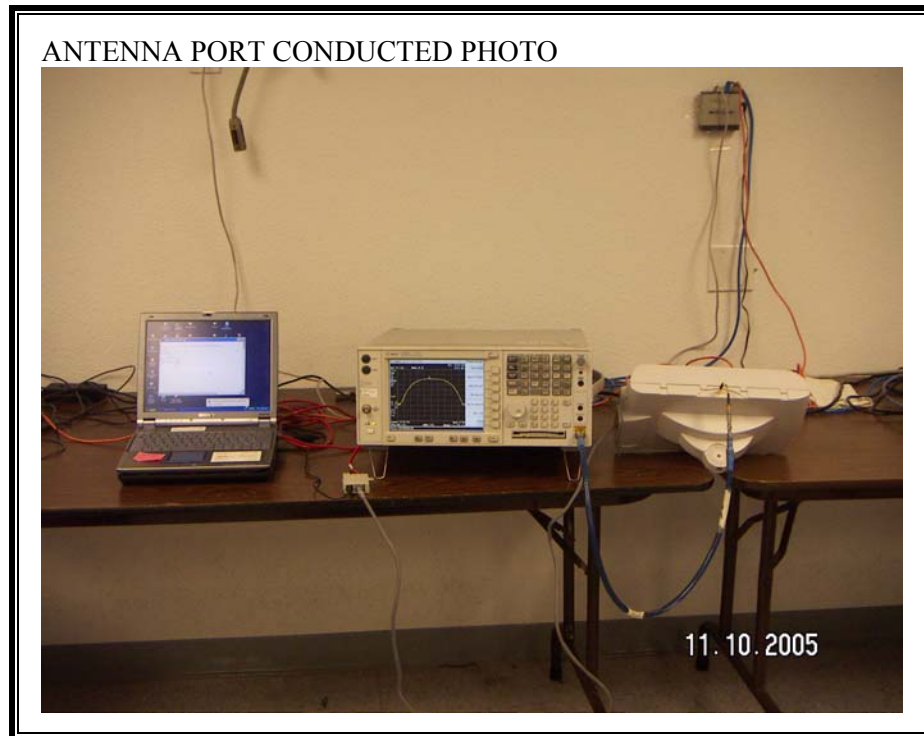


LINE 2 RESULTS (LAPTOP)

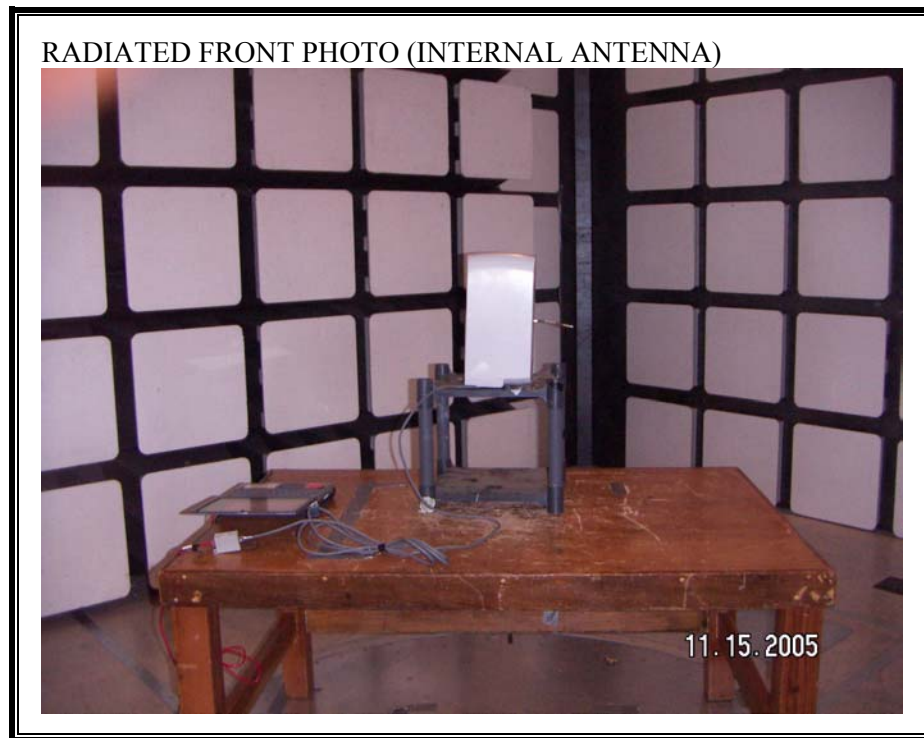


8. SETUP PHOTOS

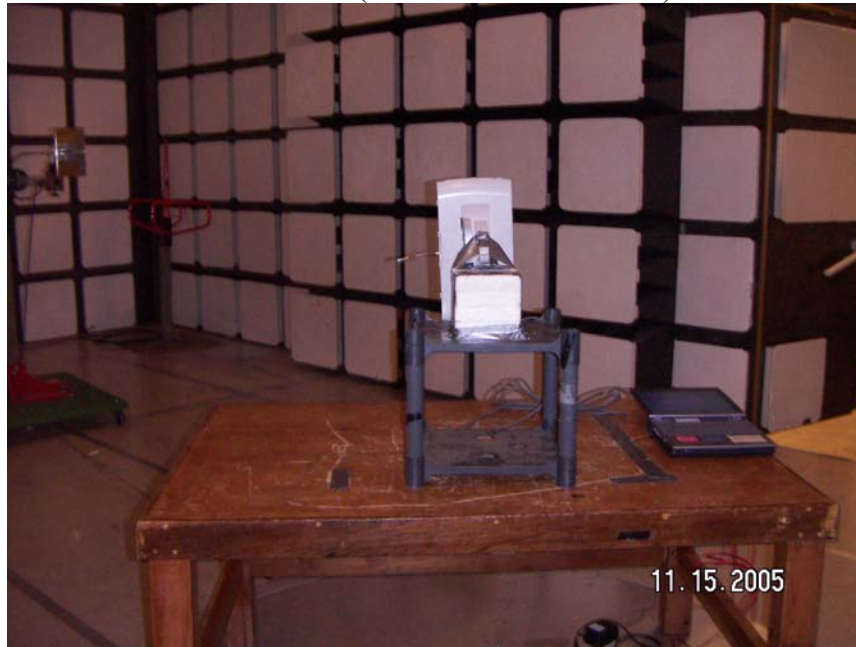
ANTENNA PORT CONDUCTED RF MEASUREMENT SETUP



RADIATED RF MEASUREMENT SETUP

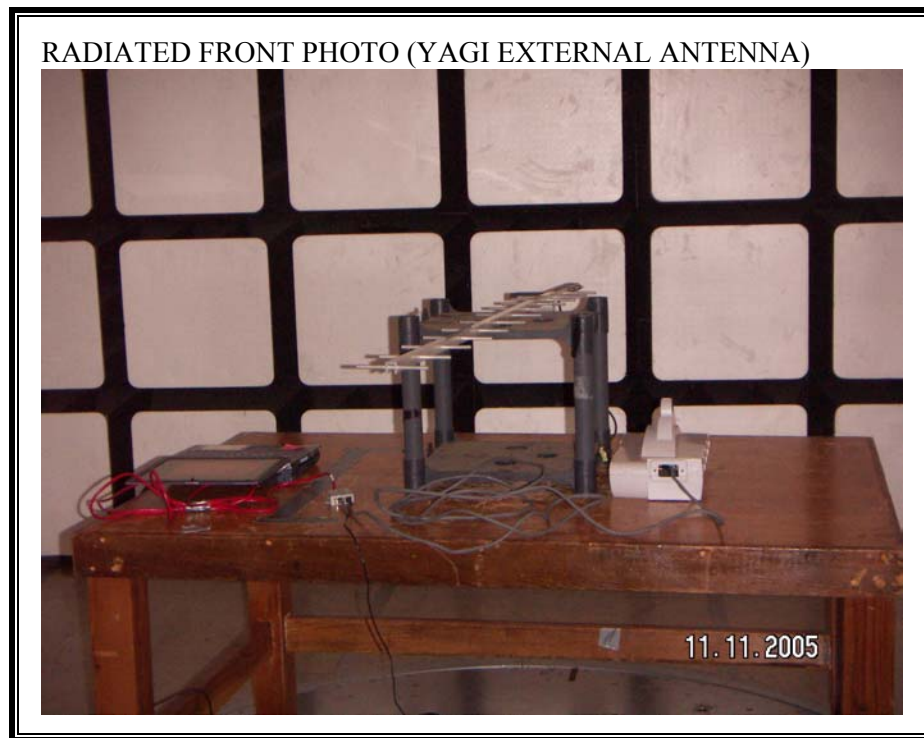


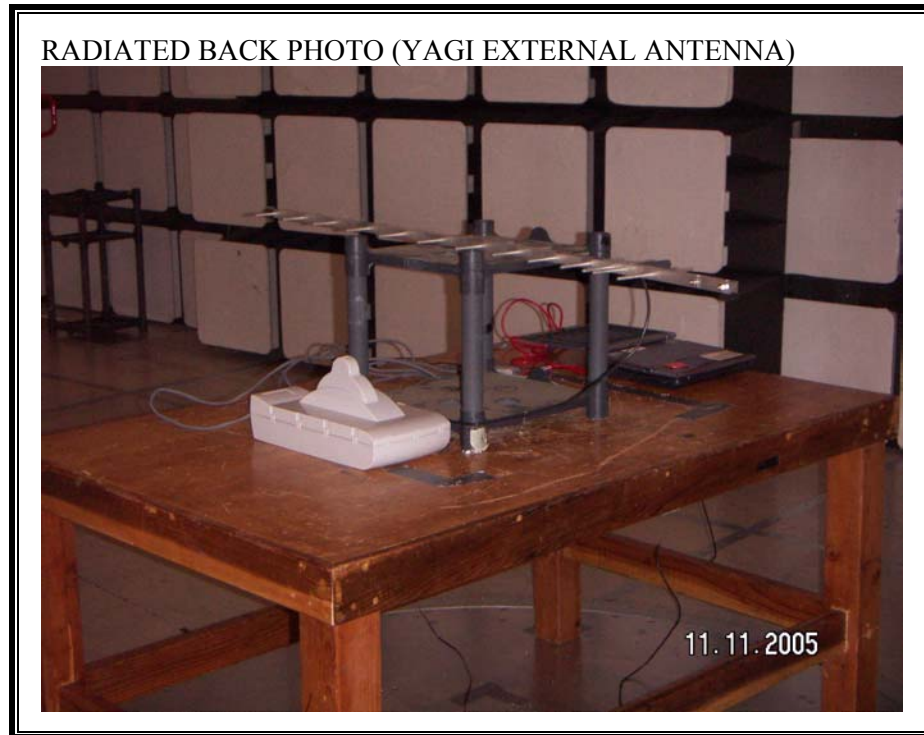
RADIATED BACK PHOTO (INTERNAL ANTENNA)



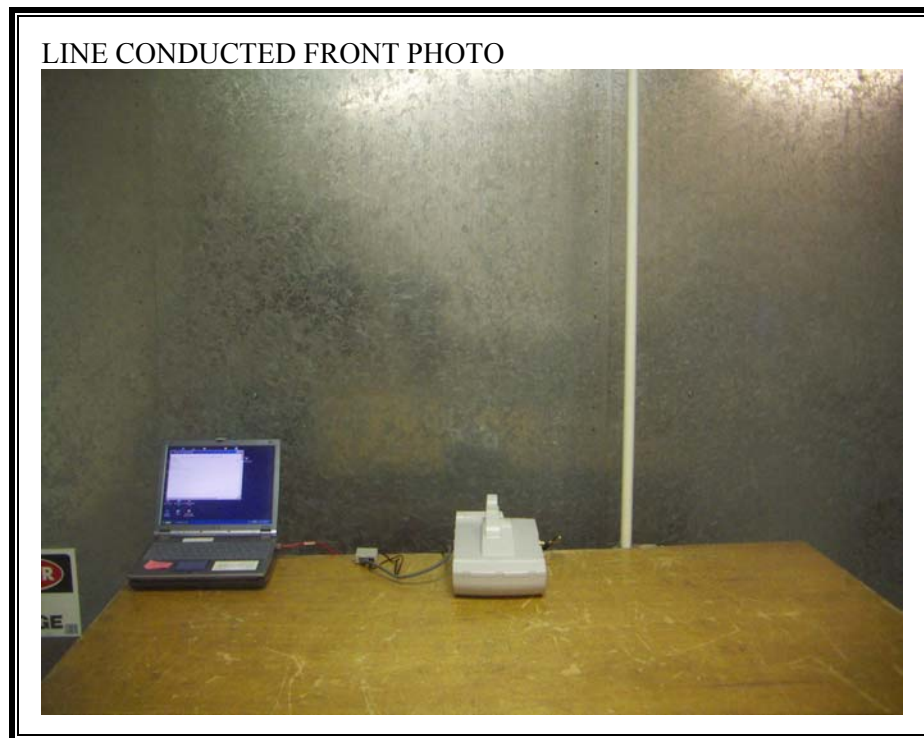








POWERLINE CONDUCTED EMISSIONS MEASUREMENT SETUP



LINE CONDUCTED BACK PHOTO



END OF REPORT