



**FCC CFR47 PART 95 SUBPART D
CLASS II PERMISSIVE CHANGE
CERTIFICATION TEST REPORT**

FOR

CB RADIO

MODEL NUMBER: JC-216H-51

FCC ID: AX292AJC216H

REPORT NUMBER: 06J10488-1

ISSUE DATE: OCTOBER 10, 2006

Prepared for
CLARION CO. LTD
50 KAMITODA, TODA
SAITAMA, 335-8511, JAPAN

Prepared by
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NVLAP[®]
LAB CODE:200065-0

Revision History

Rev.	Date	Revisions	Revised By
---	10/10/06	Initial Issue	Thu

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: CLARION CO. LTD.
50 KAMITODA, TODA
SAITAMA, 335-8511, JAPAN

EUT DESCRIPTION: CB RADIO

MODEL: JC-216H-51

SERIAL NUMBER: 7

DATE TESTED: AUGUST 7 – 16 & OCTOBER 02, 2006

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
FCC PART 95 SUBPART D	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

CHIN PANG
EMC ENGINEER
COMPLIANCE CERTIFICATION SERVICES

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with TIA/EIA 603A (2001), ANSI C63.4-2003, FCC CFR 47 Part 2, FCC CFR 47 Part 15 and FCC CFR 47 Part 95.

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 CB Radio.

5.2. CLASS II PERMISSIVE CHANGE DESCRIPTION

The major changes filed under this application are:

Change #1 To improve the alternator noise, RF PWB and Audio PWB have been changed.

Change #2 To increase TX oscillation stability, RF PWB has been changed.

Change #3 To minimize squelch sensitivity tolerance, RF PWB has been changed.

Change #4 To minimize standby current at power off mode, RF PWB and Audio PWB have been changed.

Change #5 To minimize TX oscillation distortion, RF PWB has been changed.

Change #6 To minimize RX radiation, RF PWB has been changed.

Change #7 The tentative component codes were replaced with official component codes.

Change #8 Added two EMI gaskets contacted between the gap of PCB metal bar and ground (Marker: Kitagawa_Manufacturing & Product Number: SHSG-020050)

5.3. MAXIMUM OUTPUT POWER

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

Frequency Range (MHz)	Modulation	Output Power (dBm)	Output Power (W)
26.965 - 27.405MHz	A3E	35.92	3.91

5.4. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes a monopole antenna, with a maximum gain of -2.56 dBd.

5.5. SOFTWARE AND FIRMWARE

The EUT driver is manually operating with the Remote Controller.

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 power was at 27.205 MHz.

5.7. DESCRIPTION OF TEST SETUP

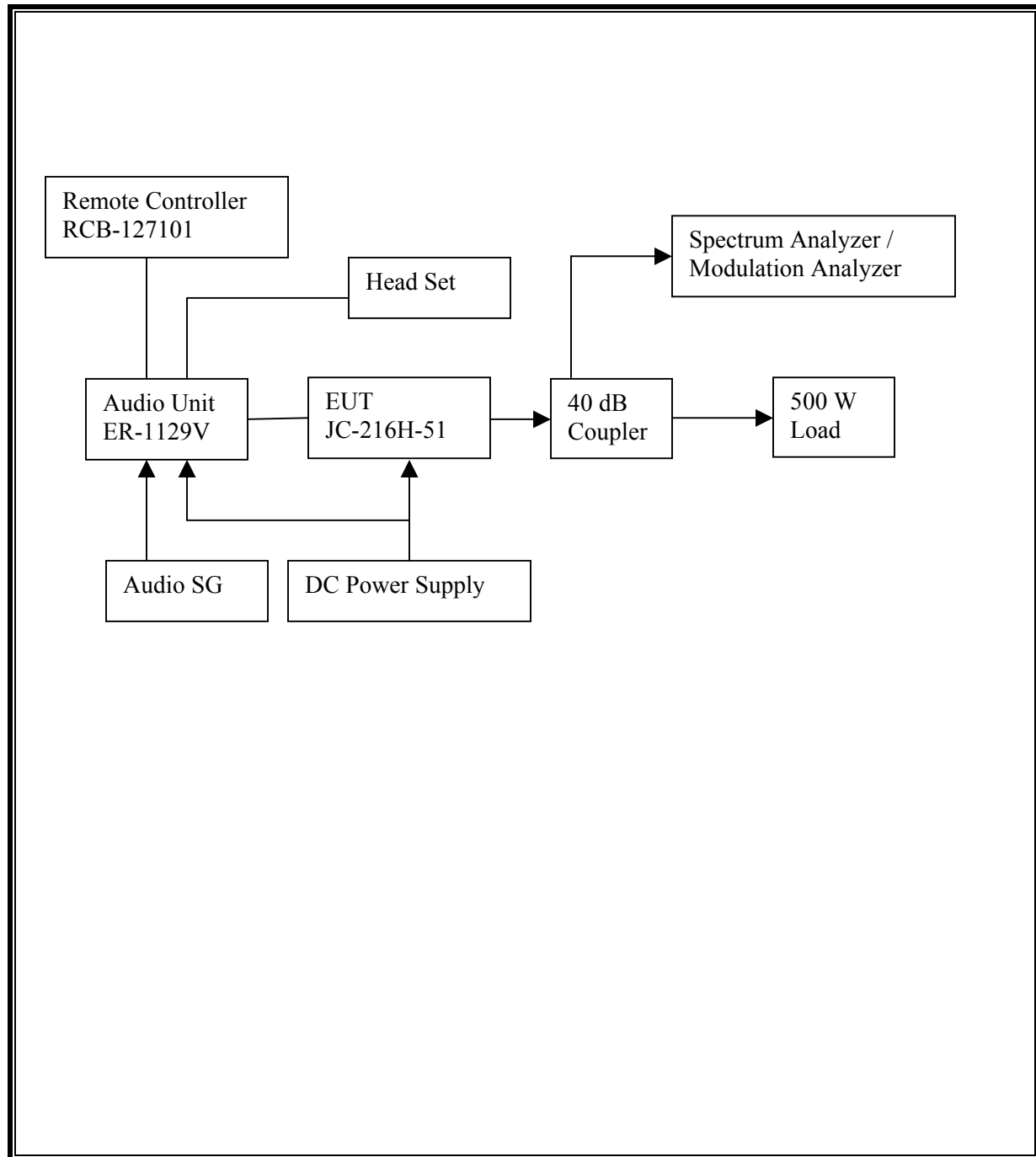
SUPPORT EQUIPMENT

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	Manufacturer	Model	Serial Number	FCC ID
Audio Unit	CLARION	ER-1129V	0004973	N/A
Remote Controller	N/A	RCB-127101	N/A	N/A
Head Set	N/A	N/A	N/A	N/A

TEST SETUP

The EUT is connected to Audio unit, Remote Controller, and all Test Equipment.

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
Spectrum Analyzer 3 Hz ~ 44 GHz	Agilent	E4440A	MY44022875	4/19/2007
Function Generator	HP	3325A	2652A24749	5/10/2007
Modulation Analyzer	HP	8901B	3438A05272	1/2/2007
Temperature / Humidity Chamber	Thermotron	SE 600-10-10	29800	6/12/2007
Antenna, Bilog 30 MHz ~ 2 Ghz	Sunol Sciences	JB1	A121003	9/3/2007
EMI Receiver, 9 kHz ~ 2.9 GHz	HP	8542E	3942A00286	2/4/2007
RF Filter Section	HP	85420E	3705A00256	2/4/2007
500 Watt Load	N/A	N/A	N/A	N/A
DC Power Supply	HP	E3610A	N/A	N/A
Directional Coupler, 500W, 40 dB, 1-1000 MHz	Werlatone	C6021	8576	2/2/2007

7. LIMITS AND RESULTS

7.1. EMISSION BANDWIDTH

LIMIT

§ 95.633(a) the authorized bandwidth for emission type A3E is 8 kHz.

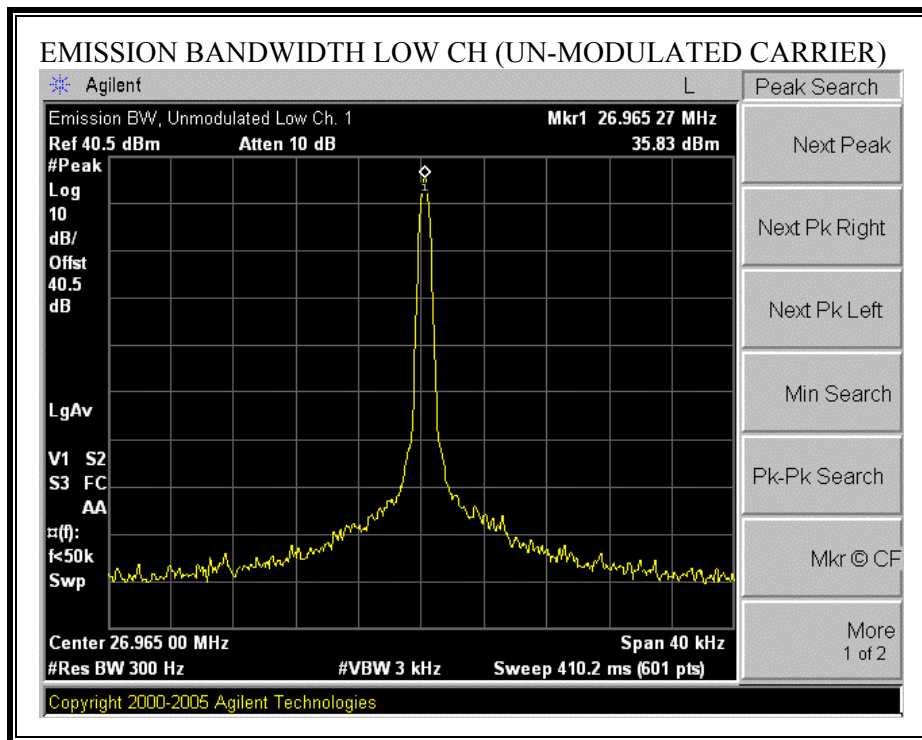
TEST PROCEDURE

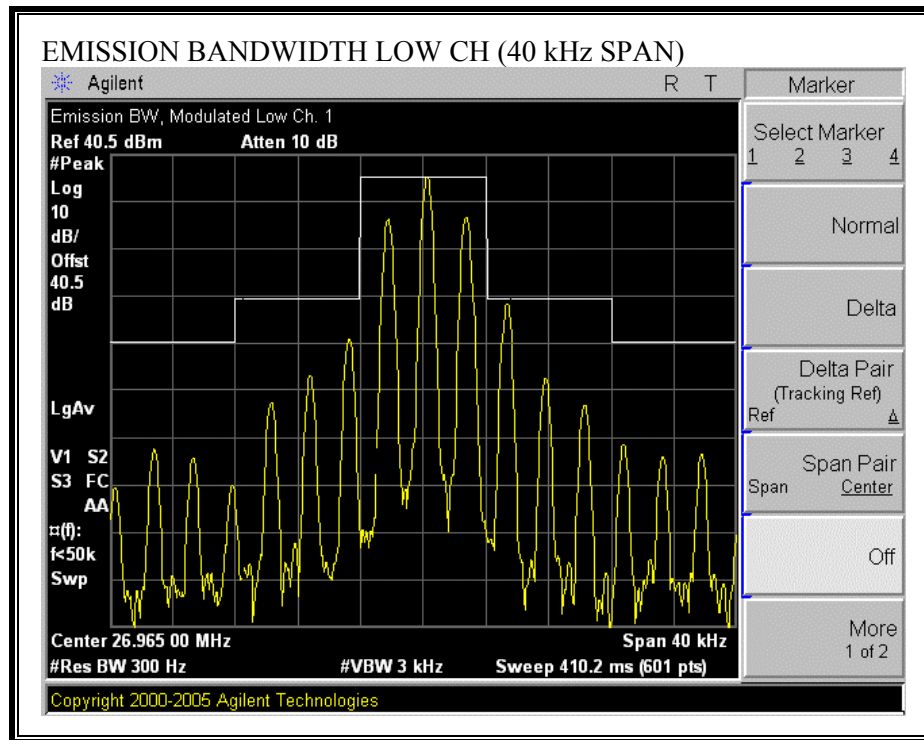
The level of the un-modulated carrier was set to the full-scale reference line of the spectrum analyzer. This is used as a 0dB reference for emission mask measurements. The transmitter was then modulated with a 2500 Hz tone at an input level 20 dB greater than the necessary to produce 50% of rated system deviation. The resolution bandwidth of the spectrum analyzer was set up to 300 Hz and the spectrum of the transmitting signal was recorded. This spectrum was compared to the required emission mask.

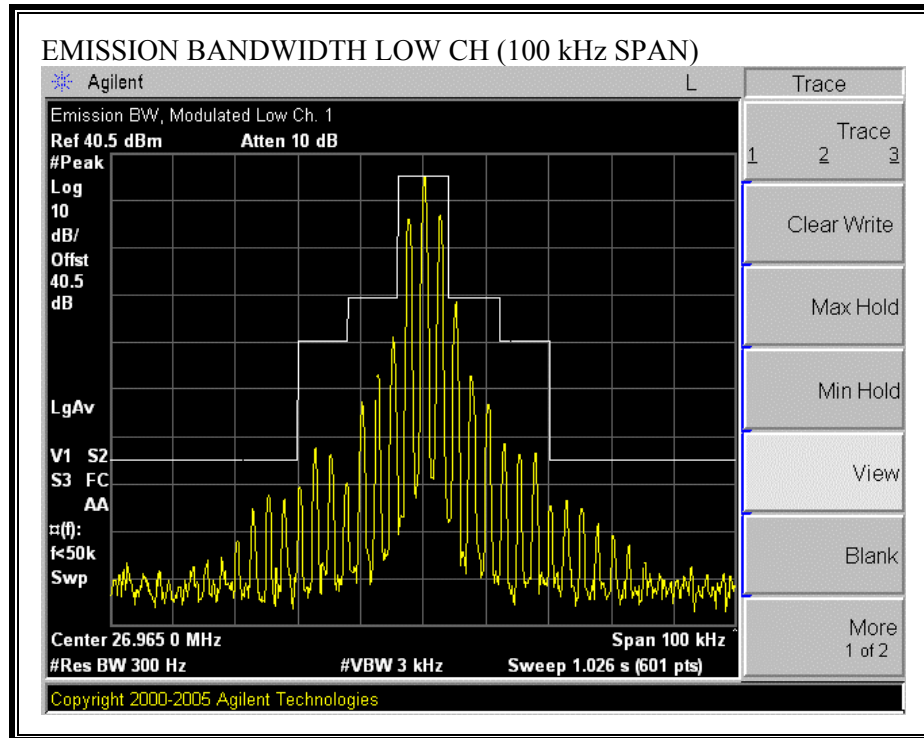
RESULTS

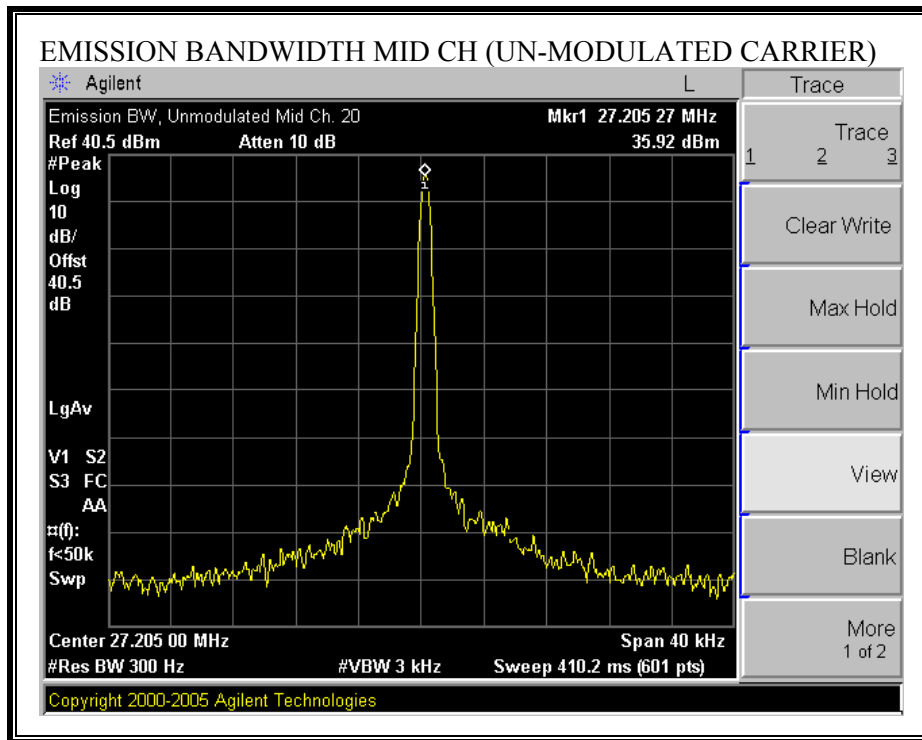
No non-compliance noted:

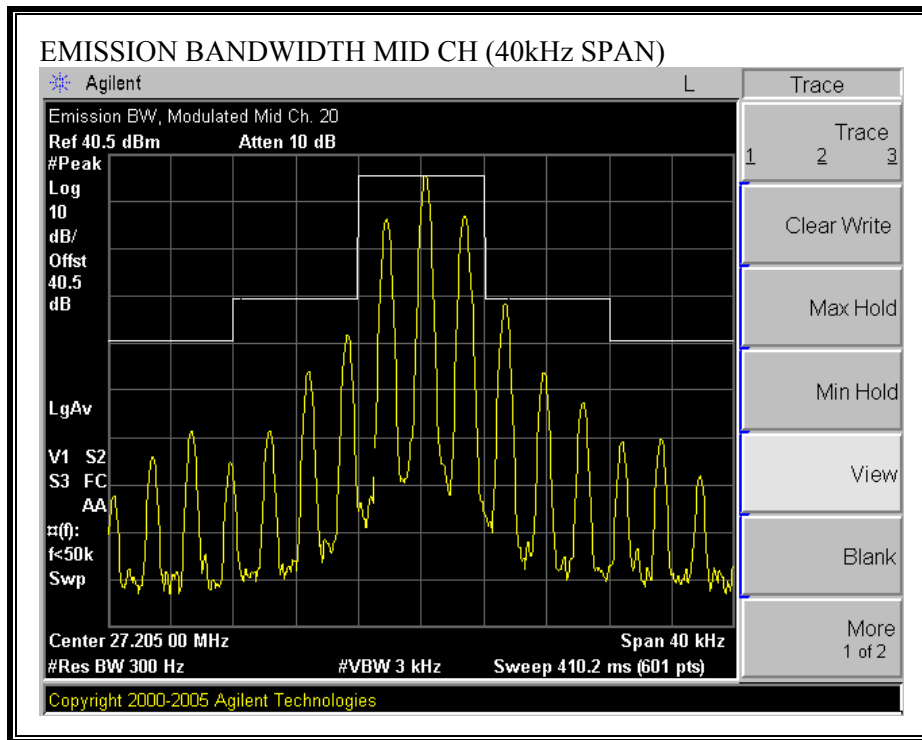
EMISSION BANDWIDTH

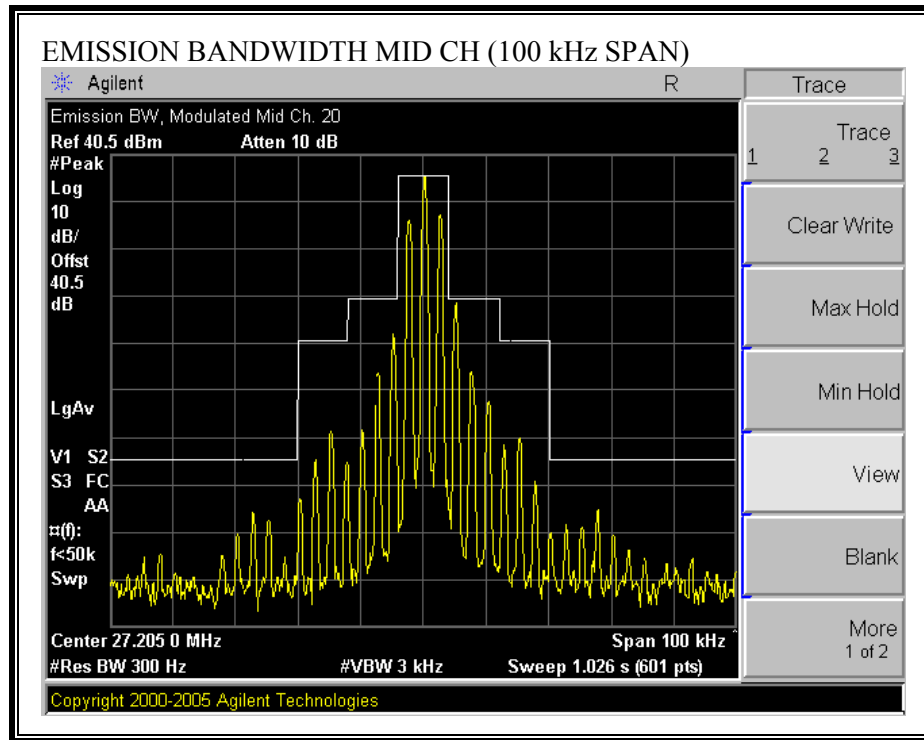


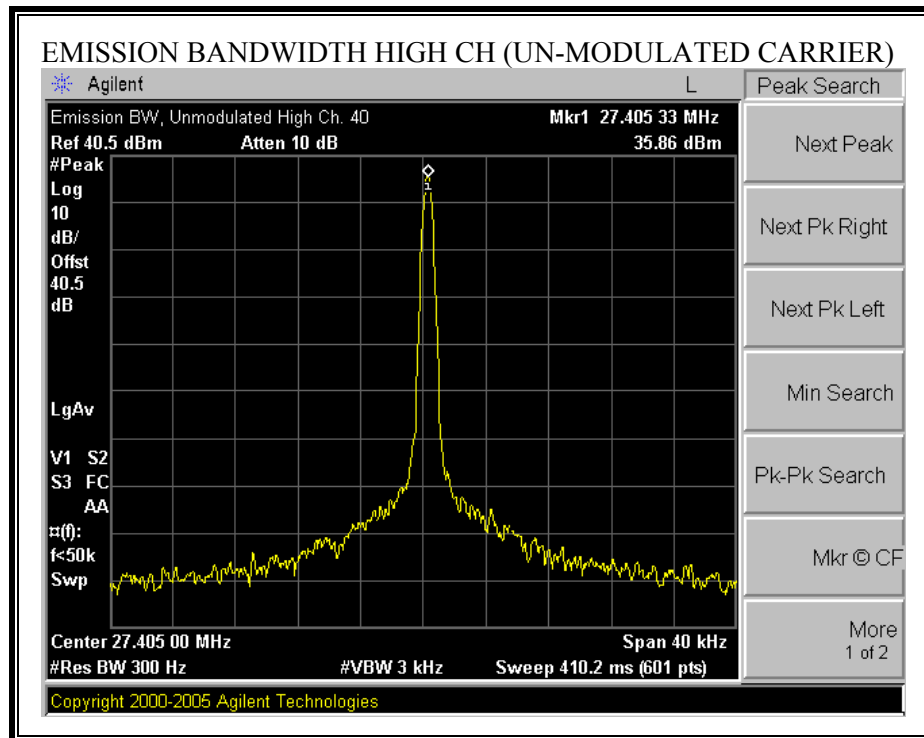


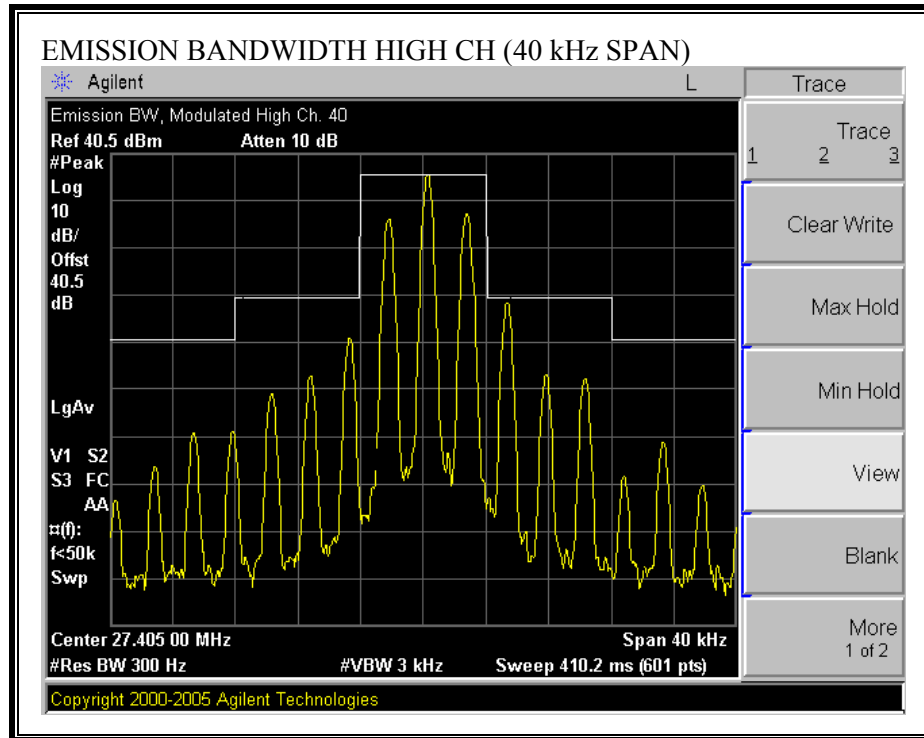


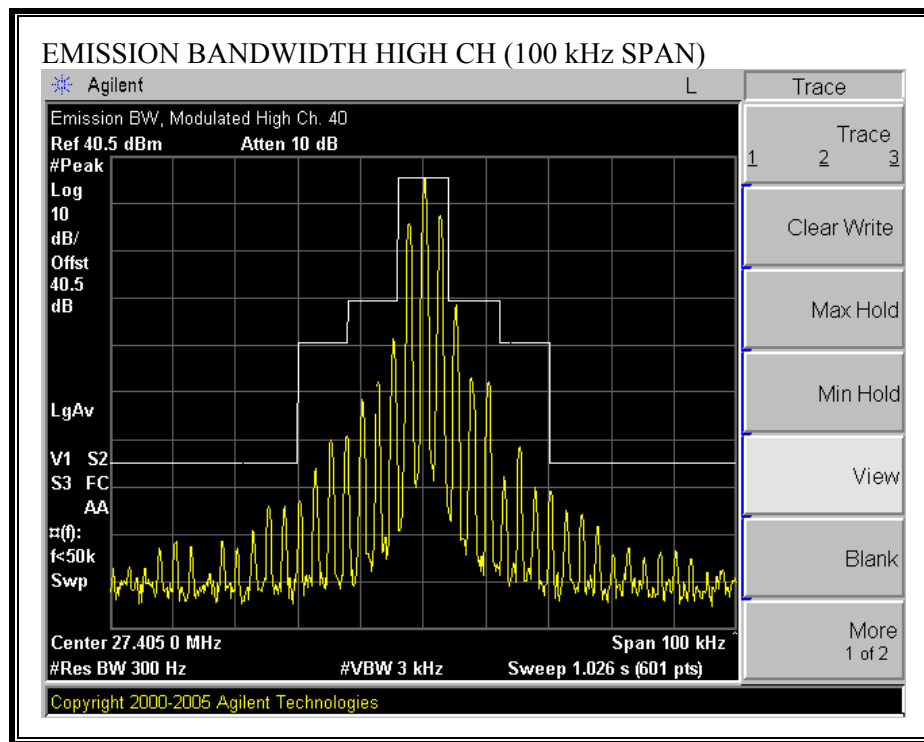












7.2. MODULATION CHARACTERISTICS

LIMIT

§95.637 (c) When emission type A3E is transmitted, the modulation must be greater than 85% but must not exceed 100%. Simultaneous amplitude modulation and frequency or phase modulation of a transmitter is not permitted.

(d) When emission type A3E is transmitted by a CB transmitter having a TP of greater than 2.5 W, the CB transmitter must automatically prevent the modulation from exceeding 100%. The transients must have duration of less than 100 milliseconds & be attenuated by at least 26dB.

TEST PROCEDURE

Modulation Limiting

With the same setup as section 5.2.1 above, at three different modulating frequencies, the output level of the audio generator was varied and the FM deviation level was recorded.

Audio Frequency Response

The RF output of the transceiver was connected to the input of a FM deviation meter through sufficient attenuation so as not to overload the meter or distort the reading. An audio signal generator was coupled into the external microphone jack of the transceiver, or alternatively, the microphone element was removed the generator output was connected to the microphone connectors. The audio signal input level was adjusted to obtain 20% of the maximum rated system deviation at 1 kHz, and recorded as DEVREF. With the audio signal generator level unchanged, set the generator frequency between 100 Hz to 5000 Hz. The transmitter deviations (DEVFREQ) were measured and the audio frequency response was calculated as $20\log_{10} [DEV_{FREQ} / DEV_{REF}]$

Audio Low-Pass Filter Response

An audio signal generator and an audio spectrum analyzer were connected to the input and output of the post limiter low pass filter respectively. The audio signal generator frequency was set between 1000 Hz and the upper low pass filter limit. The audio frequency response at test frequency was calculated as $LEV_{FREQ} - LEV_{REF}$

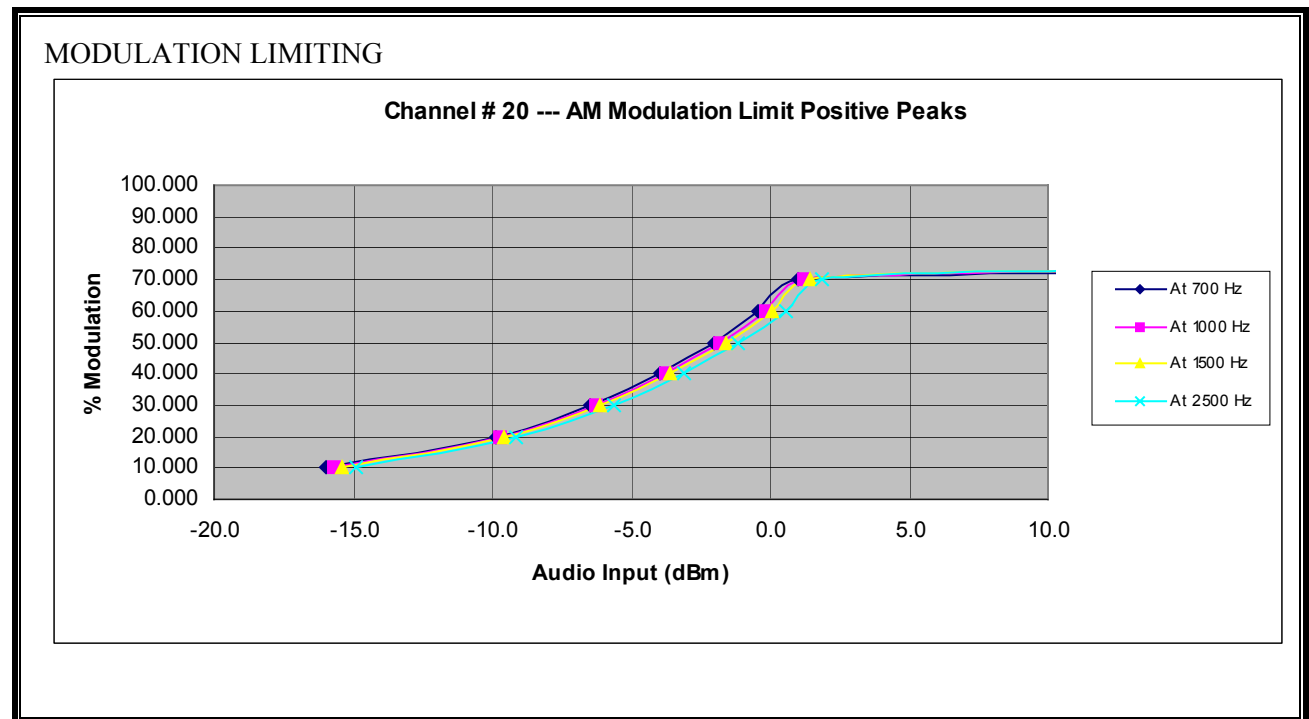
Over Modulation Transient Response

1. Set the frequency of the audio signal generator to 2.5kHz at level 16dB greater than required for 50% modulation.
2. Use the other audio signal generator pulse the previous signal at on P.P.S. with pulse width of 0.5 second.
3. Tune the spectrum analyzer to the channel on which the transmitter is set and adjust the setting as for the measurement of occupied bandwidth.
4. And then tune the spectrum analyzer to adjacent channel (+/-10kHz) and use "Zero-scan" to observe the transients caused by the amplitude modulation.
5. The transient must have a duration of less than 100ms and attenuated by at least 26dB.

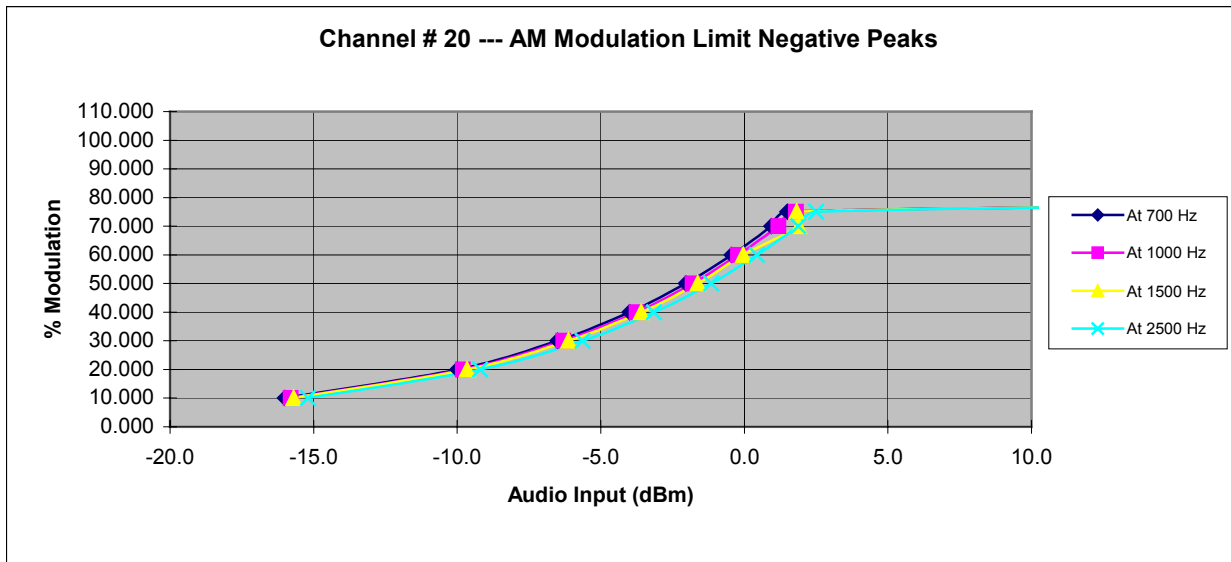
RESULTS

No non-compliance noted.

MODULATION LIMITING

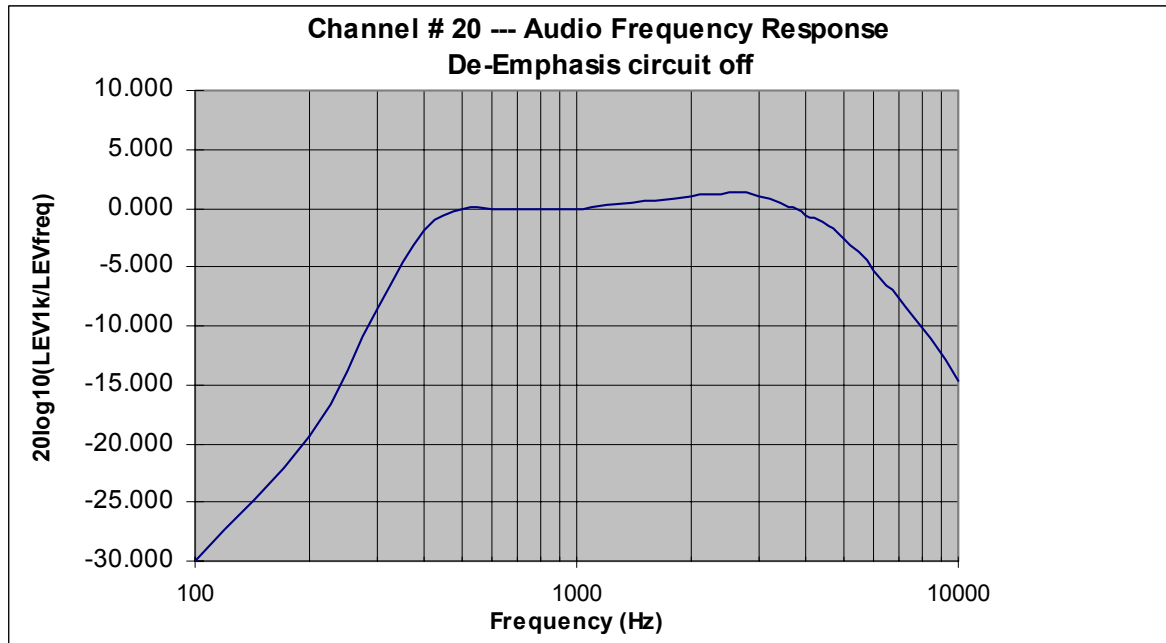


MODULATION LIMITING



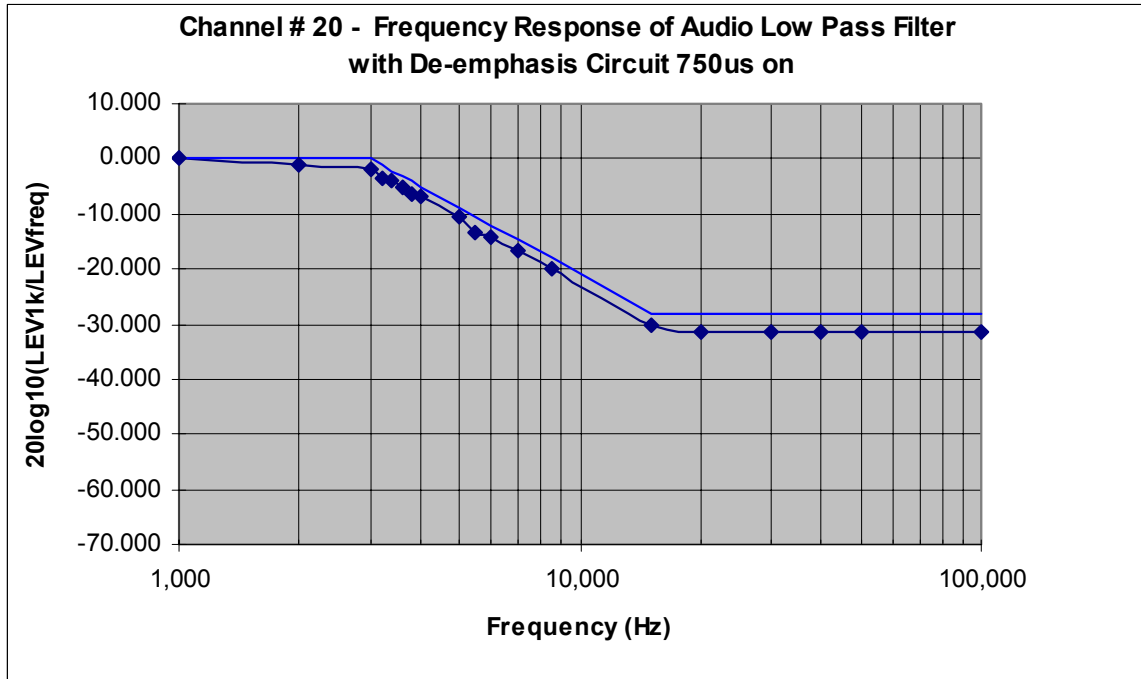
AUDIO FREQUENCY RESPONSE

AUDIO FREQUENCY RESPONSE

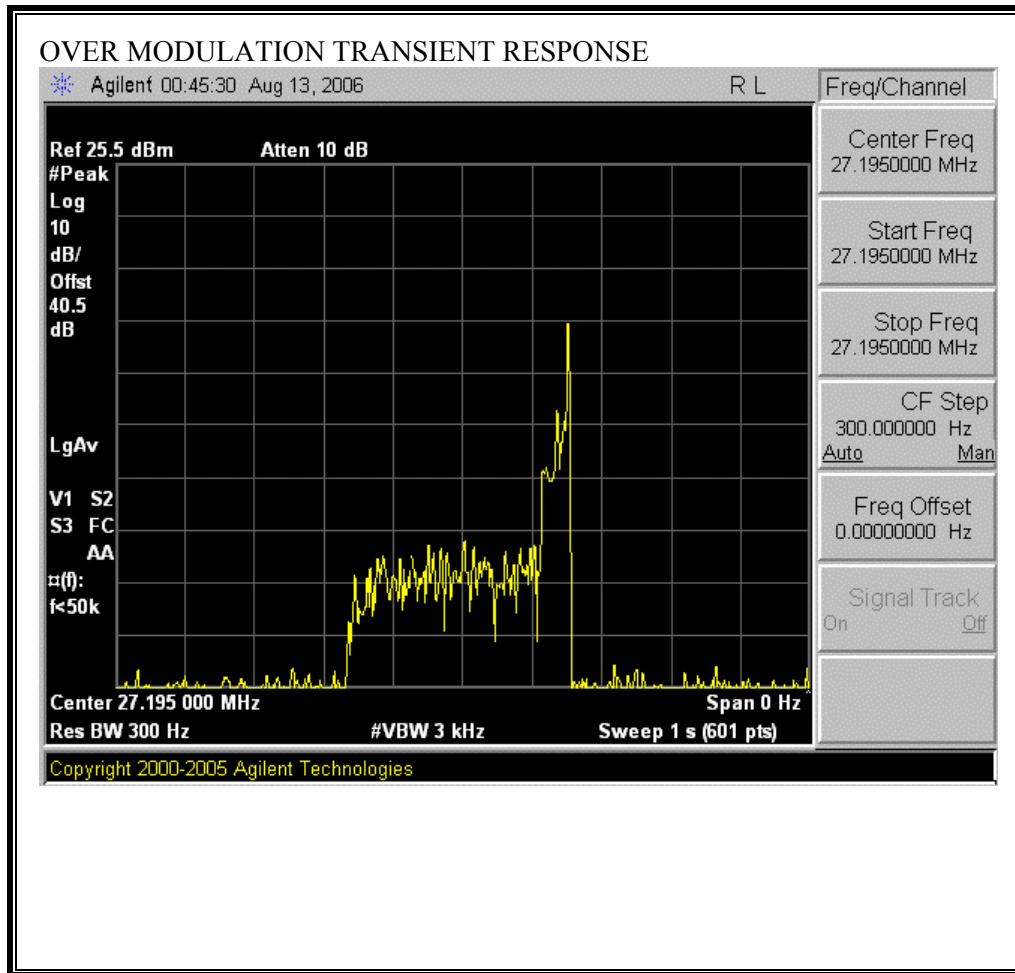


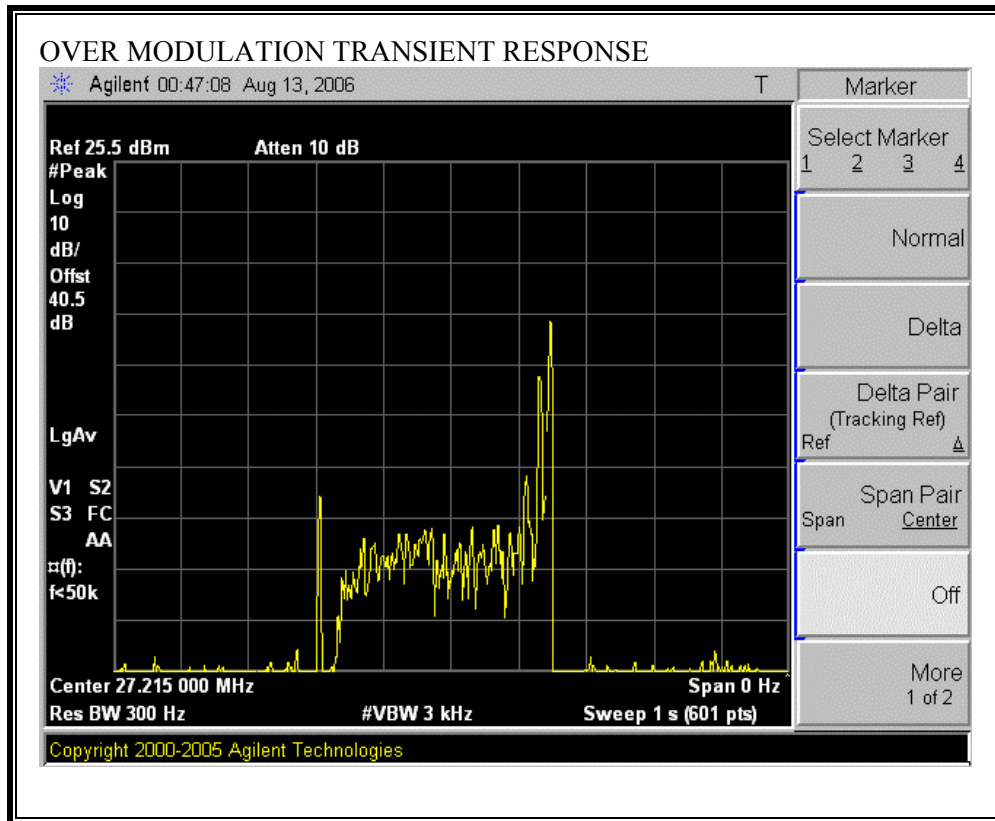
AUDIO LOW-PASS FILTER RESPONSE

AUDIO LOW-PASS FILTER RESPONSE



OVER MODULATION TRANSIENT RESPONSE





7.3. RF POWER OUTPUT

LIMIT

§ 95.639 (c) no CB transmitter under any condition of modulation shall exceed:
(1) 4 W Carrier power when transmitting emission type A1D or A3E.

TEST PROCEDURE

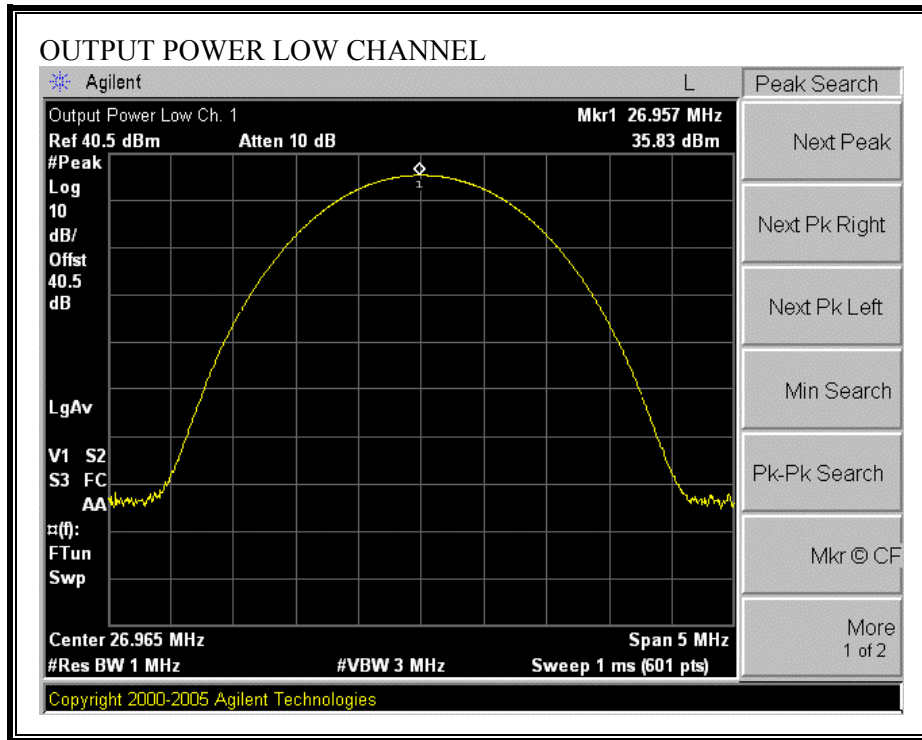
1. Place the EUT on a bench and set it in transmitting mode.
2. Connect a low loss RF cable from the antenna port to an attenuator.
3. Connect a low loss RF cable from the attenuator to a spectrum analyzer.

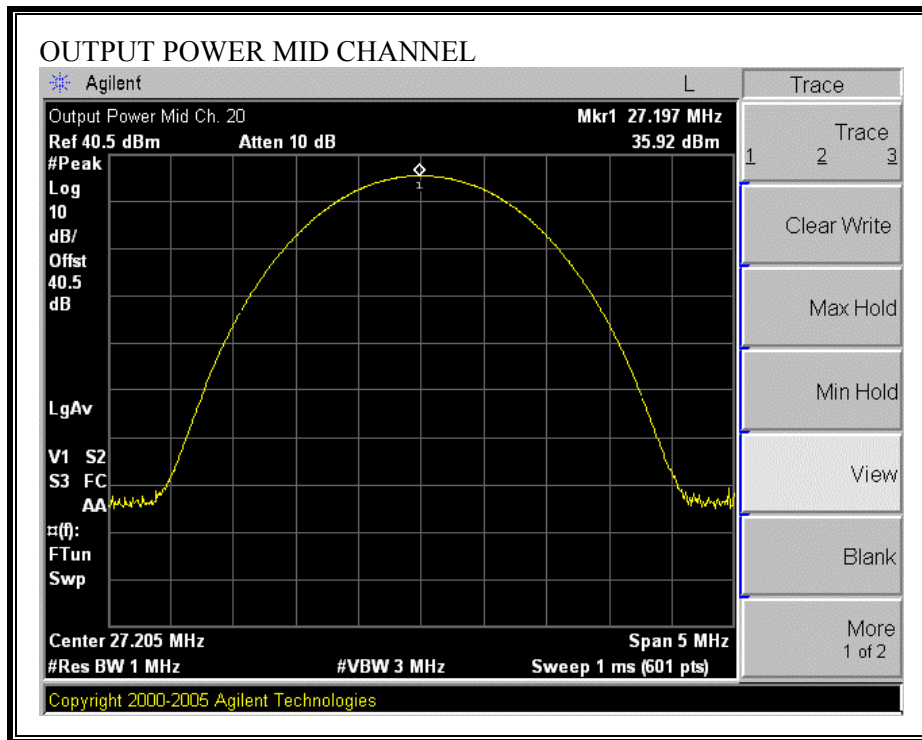
RESULTS

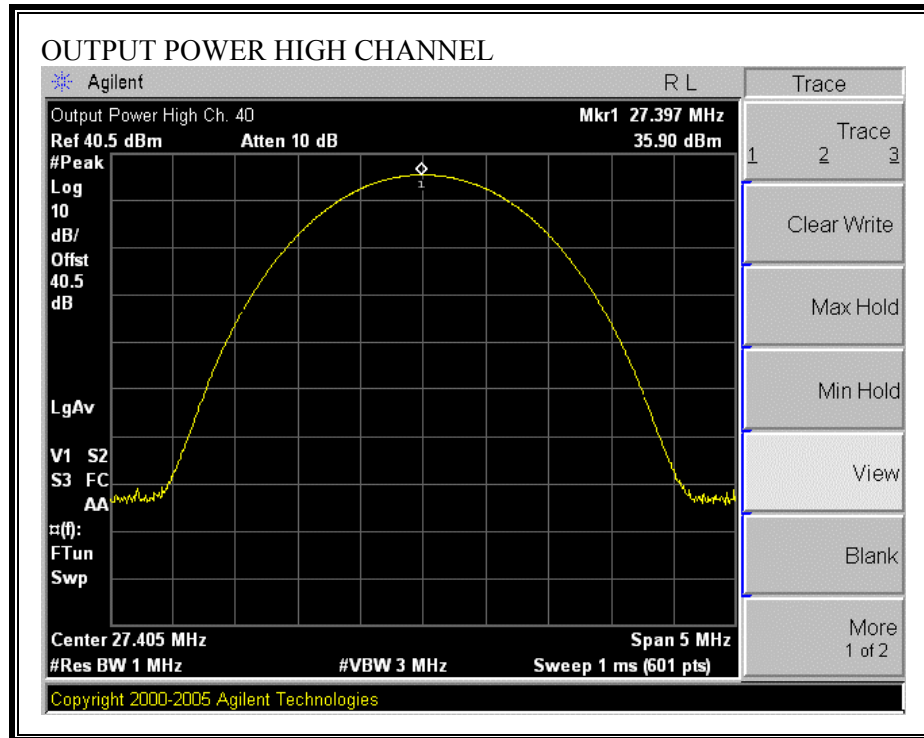
No non-compliance noted.

Channel Number	Frequency (MHz)	Conducted Output Power (dBm)	Conducted Output Power (mW)
1	26.965MHz	35.83	3828.25
20	27.205MHz	35.92	3908.41
40	27.405MHz	35.90	3890.45

RF OUTPUT POWER







7.4. FREQUENCY STABILITY

LIMIT

§95.625 (b) Each CB transmitter must be maintained within a frequency tolerance of 0.005%.

TEST PROCEDURE

Frequency stability versus environmental temperature

The equipment under test was connected to an external DC power supply and the RF output was connected to a frequency counter via feed through attenuators. The EUT was placed inside the temperature chamber. After the temperature stabilized for approximately 20 minutes, the frequency of the output signal was recorded from the counter.

Frequency Stability versus Input Voltage

At room temperature ($25 \pm 5^\circ\text{C}$), an external variable DC power supply was connected to the EUT. The frequency of the transmitter was measured for 115%, 100% and 85% of the nominal operating input voltage.

RESULTS

No non-compliance noted.

Reference Frequency: Mid Channel 27.2057MHz @ 25°C				
Limit: +- 50 ppm = 1360.284 Hz				
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
13.80	50	27.205752	-1.382	+- 50
13.80	40	27.205733	-1.347	+- 50
13.80	30	27.205727	-1.336	+- 50
13.80	25	27.20568	-1.244	+- 50
13.80	20	27.205775	-1.424	+- 50
13.80	10	27.205729	-1.340	+- 50
13.80	0	27.205715	-1.314	+- 50
13.80	-10	27.205625	-1.149	+- 50
13.80	-20	27.205528	-0.970	+- 50
13.80	-30	27.205538	-0.989	+- 50
11.73	25	27.20567	-1.239	+- 50
15.87	25	27.20567	-1.226	+- 50

7.5. SPURIOUS EMISSION AT ANTENNA TERMINAL

LIMIT

§95.635 (b)(1), at least 25 dB (decibels) on any frequency removed from the center of the authorized bandwidth by more than 50% up to and including 100% of the authorized bandwidth.

(b)(3), at least 35 dB on any frequency removed from the center of the authorized bandwidth by more than 100% up to and including 250% of the authorized bandwidth.

(b)(8), at least $53 + 10 \log_{10}(T)$ dB on any frequency removed from the center of the authorized bandwidth by more than 250%.

(b)(9), at least 60dB on any frequency twice or greater than twice the fundamental frequency.

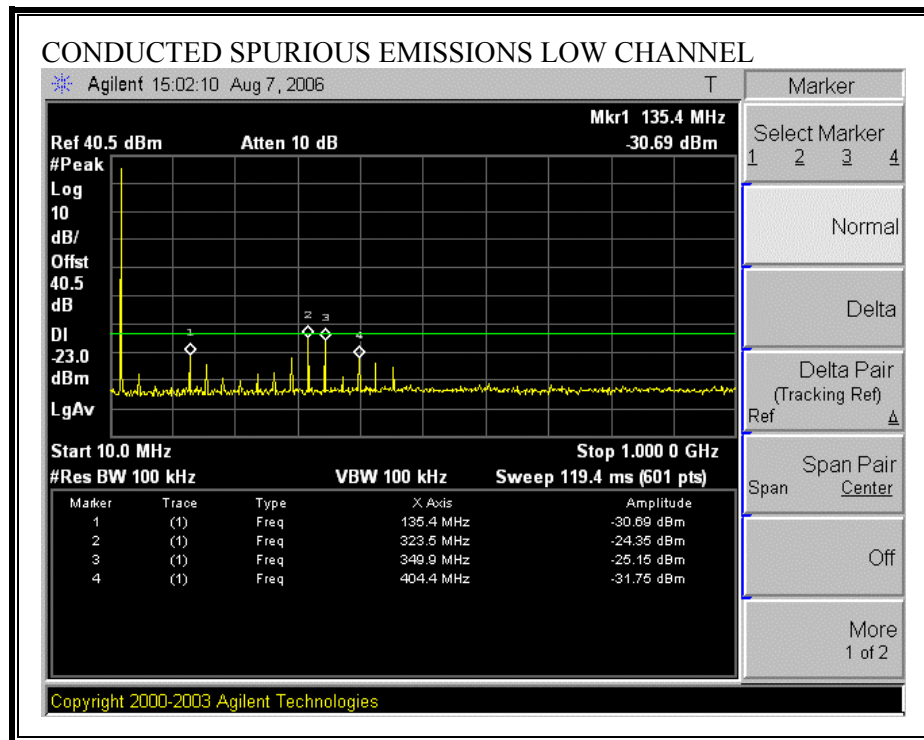
TEST PROCEDURE

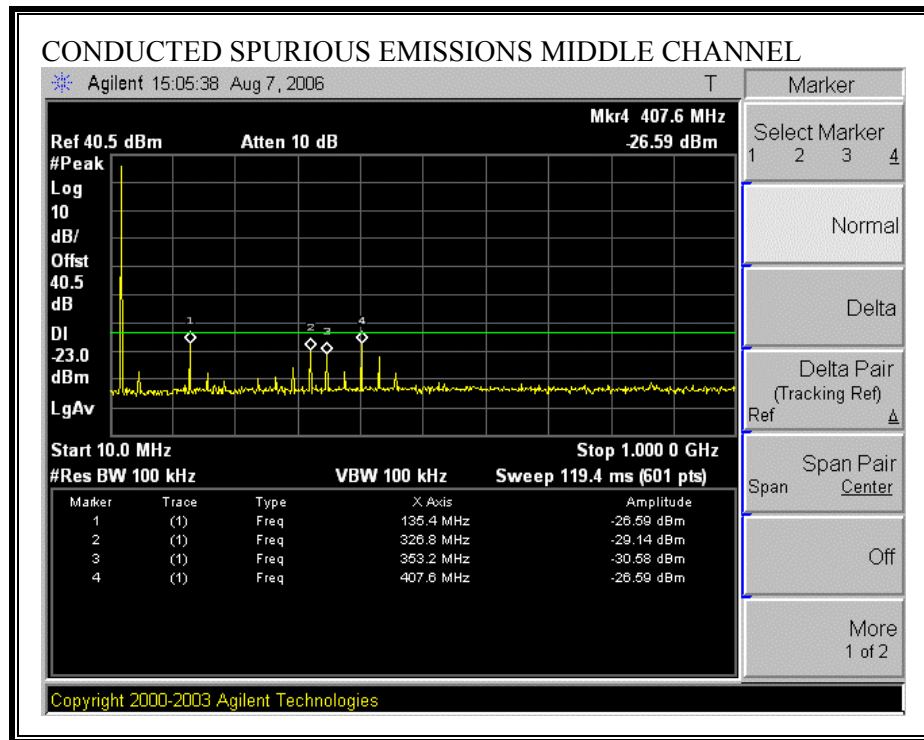
ANSI / TIA / EIA 603 Clause 3.2.13

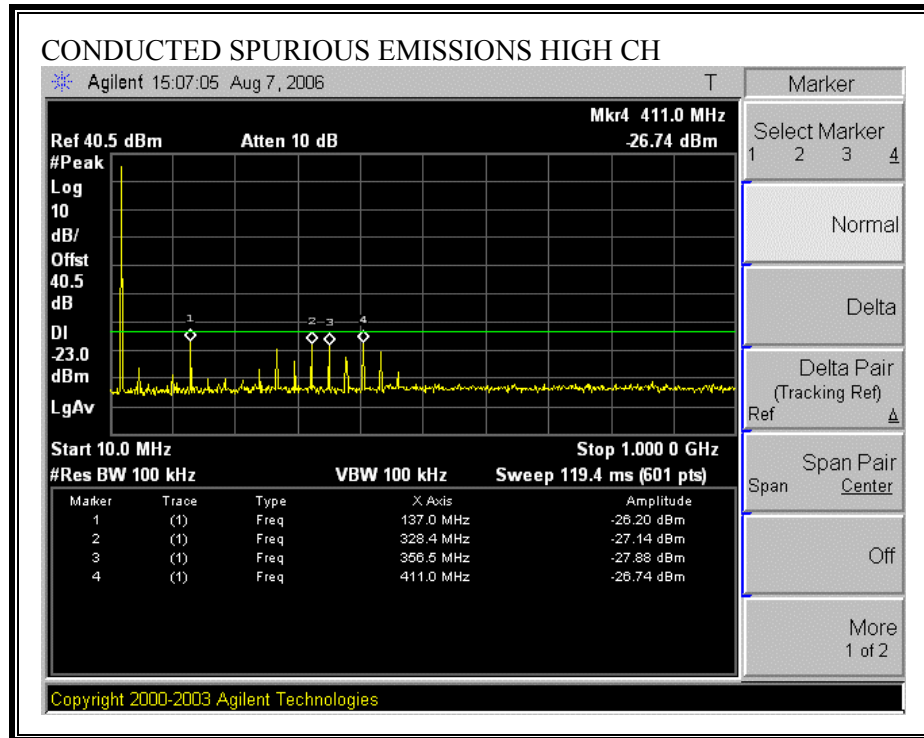
RESULTS

No non-compliance noted.

CONDUCTED SPURIOUS EMISSIONS







7.6. RADIATED SPURIOUS EMISSION

LIMIT

§95.635 (b)(1) at least 25 dB (decibels) on any frequency removed from the center of the authorized bandwidth by more than 50% up to and including 100% of the authorized bandwidth.

(b)(3), at least 35 dB on any frequency removed from the center of the authorized bandwidth by more than 100% up to and including 250% of the authorized bandwidth.

(b)(8), at least $53 + 10 \log_{10}(T)$ dB on any frequency removed from the center of the authorized bandwidth by more than 250%.

(b)(9), at least 60dB on any frequency twice or greater than twice the fundamental frequency.

TEST PROCEDURE

ANSI / TIA / EIA 603 Clause 3.2.13

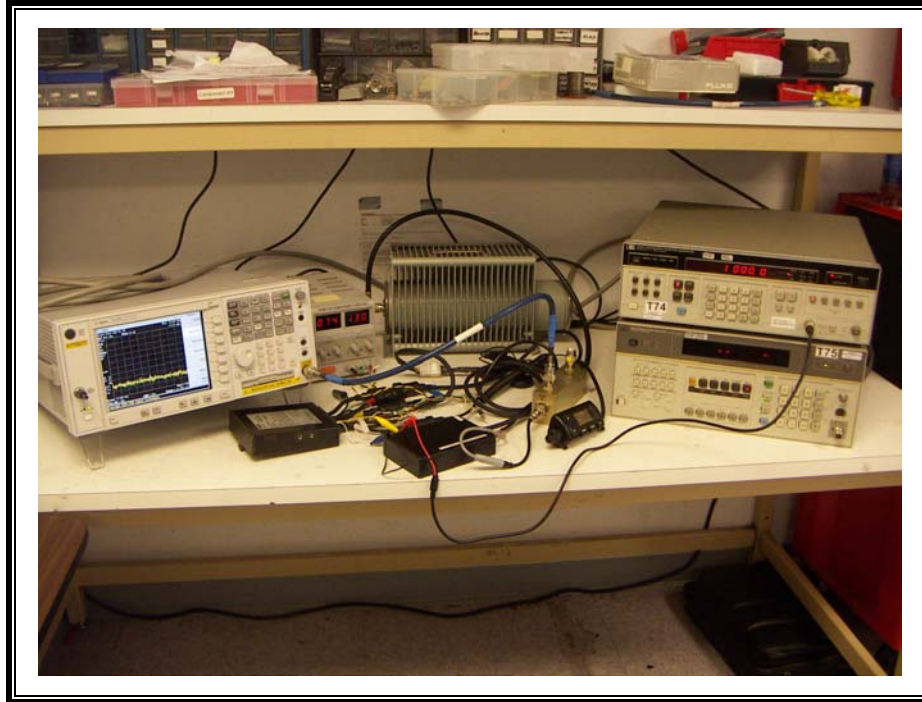
RESULTS

No non-compliance noted.

30 - 1000MHz Substitution Measurement										
Compliance Certification Services, Morgan Hill 5m Chamber Site										
Test Engr: Chin Pang										
Company: Clarion										
Project #: 06J10488										
Date: 10/2/2006										
Configuration: EUT / Load / DC Power Supply										
Test Equipment:										
Bilog Antenna		Cable		Pre-amplifier 8447D		Limit				
5m Chamber Sunol Bilog		5m Chamber Cable				ERP				
f MHz	SA reading (dBuV/m)	Ant. Pol. (H/V)	SG reading (dBm)	CL (dB)	Gain (dBi)	Gain (dBd)	ERP	Limit (dBm)	Margin (dB)	Notes
Low Channel										
164.83	48.9	H	-32.7	1.6	1.7	-0.4	-34.8	-23.0	-11.8	
271.53	40.6	H	-40.4	2.0	6.0	3.9	-38.5	-23.0	-15.5	
324.88	48.0	H	-30.7	2.2	6.0	3.9	-29.0	-23.0	-6.0	
352.00	44.5	H	-33.5	2.2	6.0	3.9	-31.8	-23.0	-8.8	
405.40	42.6	H	-34.5	2.4	6.0	3.9	-33.0	-23.0	-10.0	
434.50	44.0	H	-32.5	2.5	6.1	3.9	-31.1	-23.0	-8.1	
164.80	47.0	V	-35.4	1.6	1.7	-0.4	-37.4	-23.0	-14.4	
298.70	40.0	V	-40.5	2.1	6.0	3.9	-38.7	-23.0	-15.7	
324.90	50.2	V	-29.5	2.2	6.0	3.9	-27.7	-23.0	-4.7	
352.00	45.0	V	-33.9	2.2	6.0	3.9	-32.3	-22.0	-10.3	
405.40	48.5	V	-28.5	2.4	6.0	3.9	-27.0	-23.0	-4.0	
434.50	48.6	V	-27.8	2.5	6.1	3.9	-26.3	-23.0	-3.3	
Mid Channel										
163.90	40.0	H	-41.6	1.6	1.6	-0.5	-43.7	-23.0	-20.7	
300.60	42.0	H	-37.4	2.1	6.0	3.9	-35.6	-23.0	-12.6	
328.00	52.2	H	-26.4	2.2	6.0	3.9	-24.7	-23.0	-1.7	
410.20	51.4	H	-25.7	2.4	6.1	3.9	-24.2	-23.0	-1.2	
436.40	44.5	H	-32.0	2.5	6.1	3.9	-30.5	-23.0	-7.5	
164.80	40.0	V	-42.4	1.6	1.7	-0.4	-44.4	-23.0	-21.4	
327.80	48.5	V	-31.1	2.2	6.0	3.9	-29.4	-23.0	-6.4	
354.00	41.0	V	-37.8	2.2	6.0	3.9	-36.2	-23.0	-13.2	
410.20	45.0	V	-31.9	2.4	6.1	3.9	-30.4	-23.0	-7.4	
436.40	43.0	V	-33.4	2.5	6.1	3.9	-31.9	-22.0	-9.9	
463.59	35.1	V	-40.7	2.6	6.1	4.0	-39.3	-22.0	-17.3	
High Channel										
167.70	47.0	H	-34.7	1.6	2.0	-0.2	-36.5	-23.0	-13.5	
275.40	36.4	H	-44.5	2.0	6.0	3.9	-42.6	-23.0	-19.6	
329.70	51.0	H	-27.6	2.2	6.0	3.9	-25.9	-23.0	-2.9	
358.80	43.0	H	-34.8	2.3	6.0	3.9	-33.2	-23.0	-10.2	
412.20	50.6	H	-26.4	2.4	6.1	3.9	-24.9	-23.0	-1.9	
439.40	43.2	H	-33.2	2.5	6.1	3.9	-31.8	-23.0	-8.8	
167.70	41.0	V	-41.5	1.6	2.0	-0.2	-43.3	-23.0	-20.3	
329.70	47.2	V	-32.3	2.2	6.0	3.9	-30.6	-23.0	-7.6	
358.80	42.6	V	-36.1	2.3	6.0	3.9	-34.5	-23.0	-11.5	
412.20	48.0	V	-28.9	2.4	6.1	3.9	-27.4	-23.0	-4.4	
439.30	48.8	V	-27.5	2.5	6.1	3.9	-26.0	-22.0	-4.0	
494.60	40.3	V	-34.8	2.7	6.2	4.0	-33.5	-23.0	-10.5	
Rev. 5.1.6										

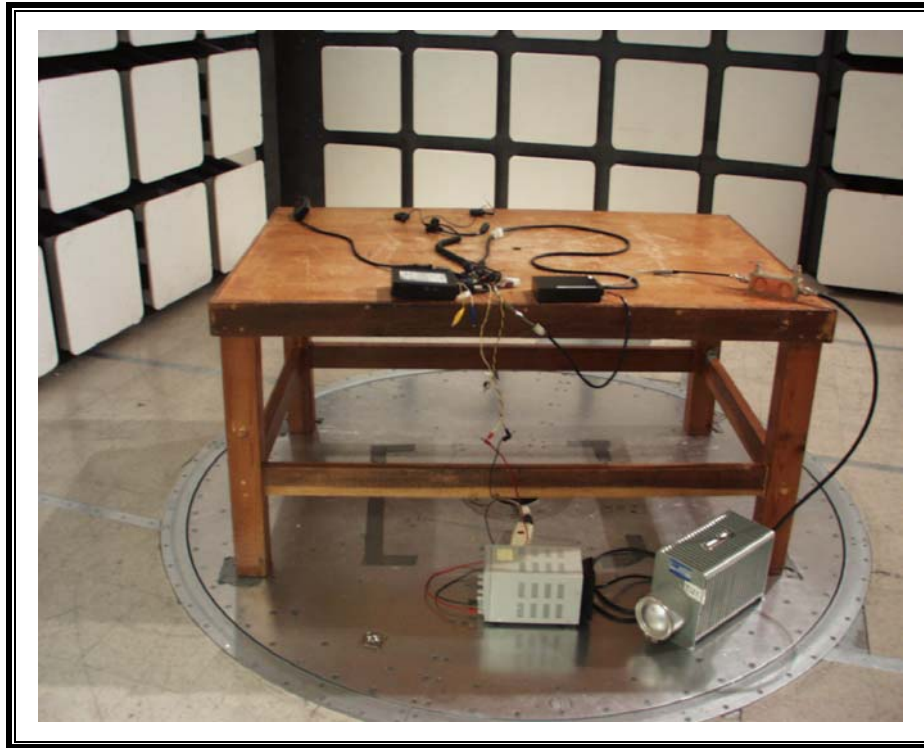
8. SETUP PHOTOS

ANTENNA PORT CONDUCTED RF MEASUREMENT SETUP



RADIATED RF MEASUREMENT SETUP





FREQUENCY STABILITY SETUP



END OF REPORT