

FCC PART 90 TYPE APPROVAL  
EMI MEASUREMENT AND TEST REPORT  
For  
**Abell Electronics, Inc**

2/F, Bldg. 14, ZhongXing Industrial City, NanShan Dist. ShenZhen, P.R. China

**FCC ID: TEYTH307**

July 6, 2005

<b>This Report Concerns:</b> <input checked="" type="checkbox"/> Original Report	<b>Equipment Type:</b> Handheld two way radio
<b>Test Engineer:</b> <u>Jandy Su</u> 	
<b>Report No.:</b> <u>RSZ05060802</u>	
<b>Test Date:</b> <u>June 11-July 6, 2005</u>	
<b>Reviewed By:</b> <u>Chris Zeng</u> 	
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**Note:** The test report is specially limited to the above company and this particular sample only. It may not be duplicated without prior written consent of Bay Area Compliance Lab Corp. (ShenZhen). This report **must not** be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST or any agency of the US Government.

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## GENERAL INFORMATION

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### Product Description for Equipment Under Test (EUT)

The *Abell Electronics, Inc*'s product, model number: TH-307 or the "EUT" as referred to in this report is a Handheld two way radio. The EUT is measured approximately 6.0 cm L x 4.0cmW x 28.0cmH, rated input voltage: DC 7.2 V Battery.

*\* The test data gathered are from production sample, serial number: 81012666, provided by the manufacturer.*

### Objective

This Type approval report is prepared on behalf of Abell Electronics, Inc in accordance with Part 2, and Part 90 of the Federal Communication Commissions rules.

### Related Submittal(s)/Grant(s)

No related submittal(s).

### Test Methodology

All tests and measurements indicated in this document were performed in accordance with the Code of federal Regulations Title 47 Part 2,Sub-part J as well as the following individual parts:

Part 90 – Private Land Mobile Radio Service

Applicable Standards: TIA EIA 137-A, TIA EIA 98-C, TIA/EIA 603, ANSI 63.4-2003, American National Standard for Method of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

All emissions measurement was performed and Bay Area Compliance Lab Corp. (ShenZhen). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

**Test Facility**

The Test site used by Bay Area Compliance Lab Corp. (ShenZhen) to collect test data is located in the 6/F, the 3rd Phase of WanLi Industrial Building, ShiHua Road, FuTian Free Trade Zone, ShenZhen, Guangdong 518038, P.R.China.

Test site at Bay Area Compliance Lab Corp. (ShenZhen) has been fully described in reports submitted to the Federal Communication Commission (FCC). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on November 04, 2004. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2003.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 382179. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

Additionally, Bay Area Compliance Lab Corp. (ShenZhen) is a National Institute of Standards and Technology (NIST) accredited laboratory, under the National Voluntary Laboratory Accredited Program (Lab Code 200707-0). The current scope of accreditations can be found at

<http://ts.nist.gov/ts/htdocs/210/214/scopes/2007070.htm>

## **SYSTEM TEST CONFIGURATION**

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### **Description of Test Configuration**

The system was configured for testing in a typical fashion (as normally used by a typical user).

### **Equipment Modifications**

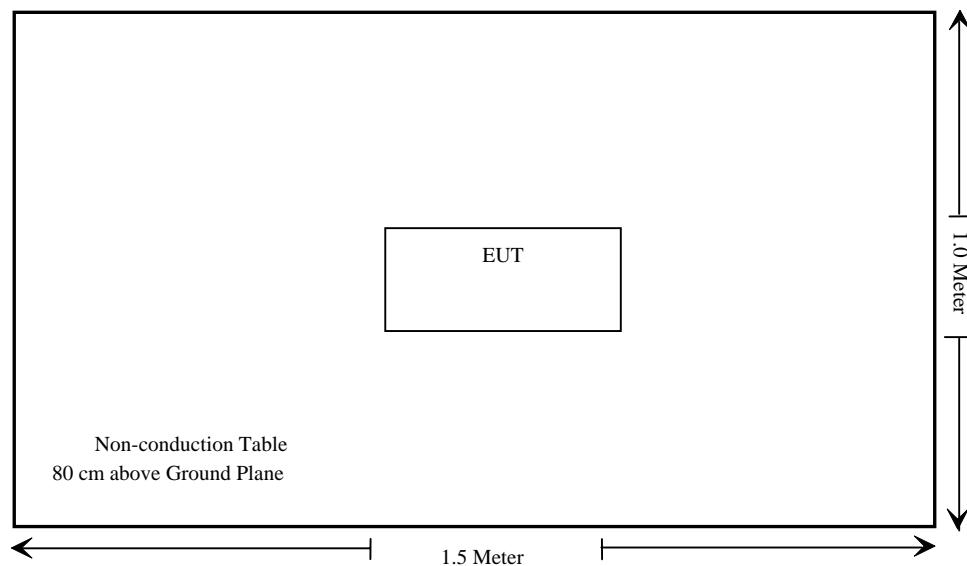
Bay Area Compliance Lab Corp. (ShenZhen) has not done any modification on the EUT.

## Configuration of Test Setup



EUT

## Block Diagram of Test Setup



**SUMMARY OF TEST RESULTS**

FCC RULES	DESCRIPTION OF TEST	RESULT
§2.1046,	Conducted Output Power	Compliant
§1.1310, §2.1093	RF Output Power	Compliant
§2.1047 §90.207	Modulation Characteristic	Compliant
§2.1049, §90.209	Occupied Bandwidth	Compliant
§2.1051, §90.210	Spurious Emissions AT Antenna Terminals	Compliant
§2.1053 §90.210	Spurious Radiated Emissions	Compliant
§ 2.1055 § 90.213	Frequency stability	Compliant
§ 90.214	Transient Frequency Behavior	Compliant

## §2.1046- CONDUCTED OUTPUT POWER

### Applicable Standard

According to FCC §2.1046 and §90.205, maximum ERP is dependent upon the station's antenna HAAT and required service area.

### Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde&Schwarz	Spectrum Analyzer	FSEM30	849720/019	2004-11-10	2005-11-10

\* **Statement of Traceability:** Bay Area Compliance Lab Corp. (ShenZhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

### Test Procedure

The RF output of the transmitter was connected to the input of the spectrum analyzer through sufficient attenuation.

Spectrum Analyzer Setting:

R B/W	Video B/W
100 kHz	100 kHz

### Test Data

#### Environmental Conditions

Temperature:	25 °C
Relative Humidity:	50%
ATM Pressure:	1032mbar

*The testing was performed by Jandy Su on 2005-6-11*

Test Result: Pass

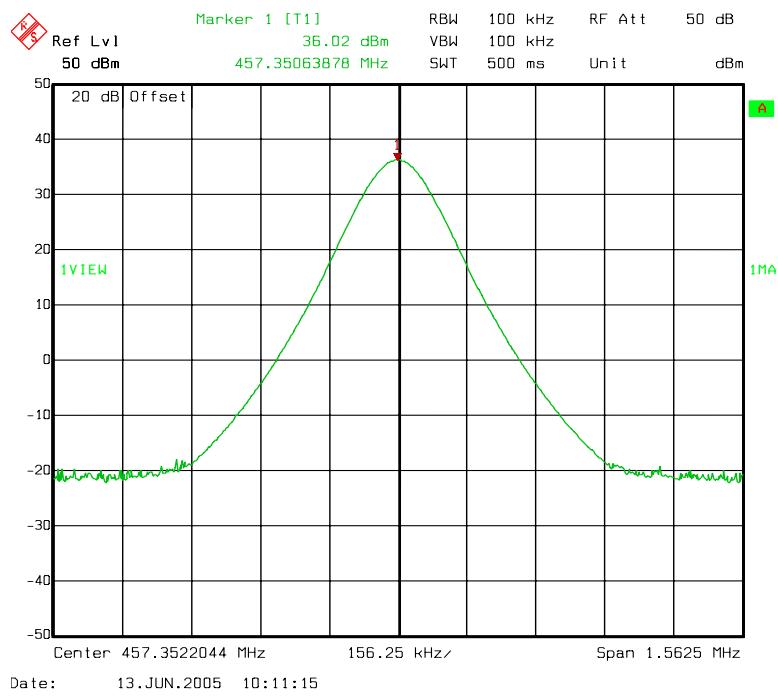
*Test Mode: Transmitting*

CH	Frequency Spacing (kHz)	Frequency (MHz)	Output Power in dBm	Output Power in W
1	12.5	457.35	36.02	3.999
16	12.5	462.82	35.77	3.776
1	25	457.35	36.43	4.395
16	25	462.82	36.33	4.295

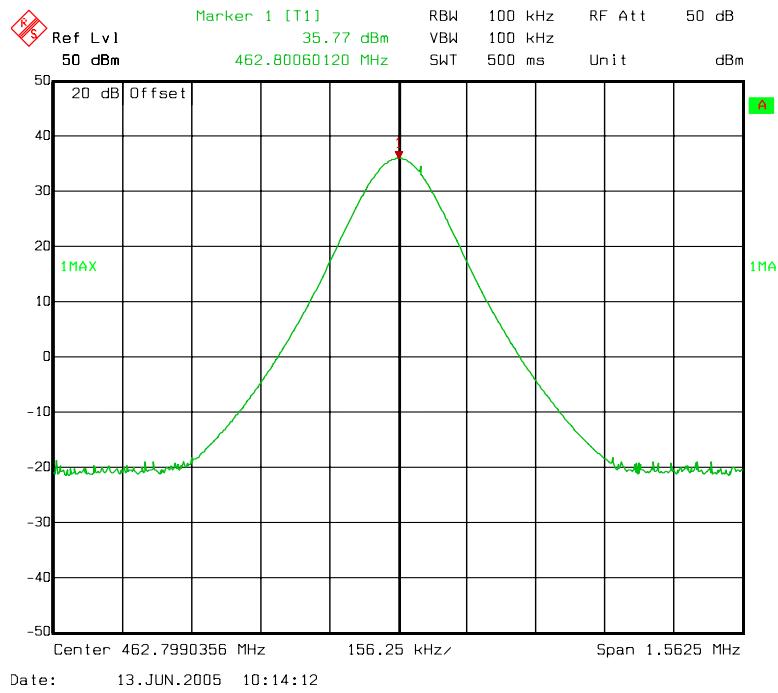
Note: The power output may depend on the intended use of the EUT. For all tests, the EUT was set to maximum conditions.

For 12.5 kHz Channel Bandwidth:

Channel 1

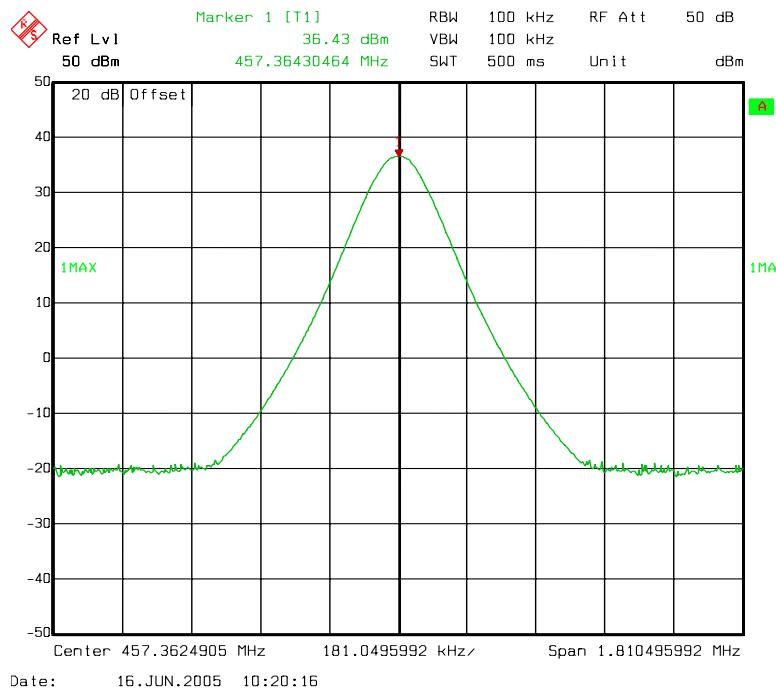


Channel 16

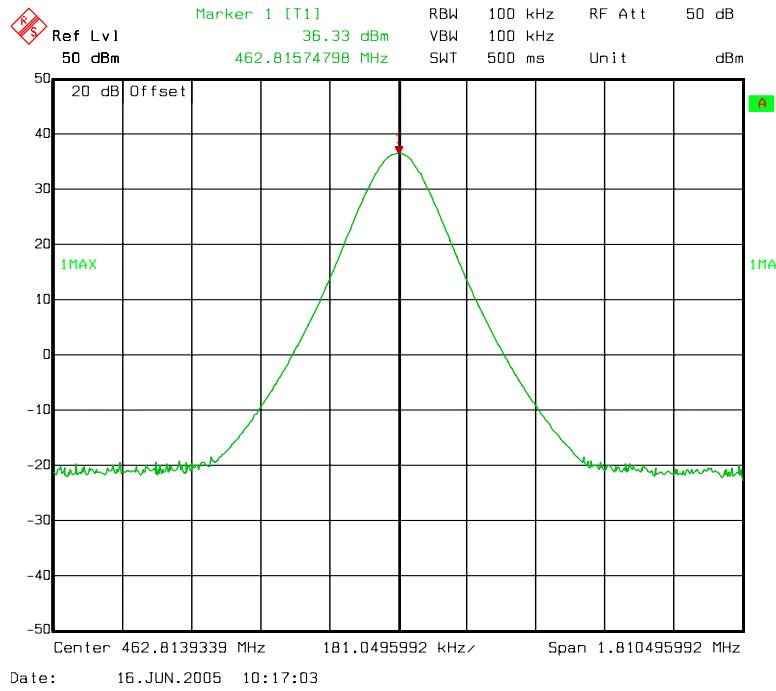


For 25 kHz Channel Bandwidth:

Channel 1



Channel 16



## §2.1046 and §90.205 – RF OUTPUT POWER

### Applicable Standard

Per FCC §2.1046 and §90.205: maximum ERP is dependent upon the station's antenna HAAT and required service area.

### Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde&Schwarz	Spectrum Analyzer	FSEM30	849720/019	2004-11-10	2005-11-10
Sunol Sciences	Bilog Antenna	JB1	A040904-1	2005-4-28	2006-4-28
COM POWER	Dipole Antenna	721027	N/A	N/A	N/A
HP	Signal Generator	8657A	3217A04699	2004-11-19	2005-11-19

\* **Statement of Traceability:** Bay Area Compliance Lab Corp. (ShenZhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

### Test Procedure

1. On a test site, the EUT shall be placed at 1.5m height on a turn table, and in the position closest to normal use as declared by the applicant.
2. The test antenna shall be oriented initially for vertical polarization located 3m from EUT to correspond to the frequency of the transmitter.
3. The output of the test antenna shall be connected to the measuring receiver and the quasi-peak detector is used for the measurement.
4. The transmitter shall be switched on, if possible, without modulation and the measuring receiver shall be tuned to the frequency of the transmitter under test.
5. The test antenna shall be raised and lowered through the specified range of height until a maximum signal level is detected by the measuring receiver.
6. The transmitter shall then be rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver.
7. The test antenna shall be raised and lowered again through the specified range of height until a maximum signal level is detected by the measuring receiver.
8. The maximum signal level detected by the measuring receiver shall be noted.
9. The transmitter shall be replaced by a substitution antenna.
10. The substitution antenna shall be orientated for vertical polarization and the length of the substitution antenna shall be adjusted to correspond to the frequency of the transmitter.
11. The substitution antenna shall be connected to a calibrated signal generator.
12. In necessary, the input attenuator setting of the measuring receiver shall be adjusted in order to increase the sensitivity of the measuring receiver.
13. The test antenna shall be raised and lowered through the specified range of height to ensure that the maximum signal is received.

14. The input signal to the substitution antenna shall be adjusted to the level that produces a level detected by the measuring received, which is equal to the level noted while the transmitter radiated power was measured, corrected for the change of input attenuator setting of the measuring receiver.
15. The input level to the substitution antenna shall be recorded as power level in dBm, corrected for any change of input attenuator setting of the measuring receiver.
16. The measurement shall be repeated with the test antenna and the substitution antenna orientated for horizontal polarization.
17. The measure of the effective radiated power is the large of the two levels recorded, at the input to the substitution antenna, corrected for gain of the substitution antenna if necessary.

## Test Data

### Environmental Conditions

Temperature:	18 °C
Relative Humidity:	53 %
ATM Pressure:	1015 mbar

The testing was performed by Jandy Su on 2005-6-11

Test Result: Pass

Test Mode: Transmitting

For 12.5 kHz Channel Bandwidth:

For 12.5kHz channel bandwidth					
Frequency MHz	S.G. Reading (dBm)	Polar (H/V)	Substitution Antenna Gain (dB)	Substitution Cable loss (dB)	ERP (dBm)
Channel 1					
457.35	29.8	H	0	2.6	27.2
457.35	38.9	V	0	2.6	36.3
Channel 16					
462.82	31.	H	0	2.6	28.4
462.82	39.2	V	0	2.6	36.6

For 25 kHz Channel Bandwidth:

For 25kHz channel bandwidth					
Frequency MHz	S.G. Reading (dBm)	Polar (H/V)	Substitution Antenna Gain (dB)	Substitution Cable loss (dB)	ERP (dBm)
Channel 1					
457.35	29.8	H	0	2.6	27.2
457.35	38.9	V	0	2.6	36.3
Channel 16					
462.85	32.1	H	0	2.6	29.5
462.85	38.4	V	0	2.6	35.8

Sample calculation:

Absolute level = substitution reading + antenna gain - cable loss

For example:

$$29.8 + 0.0 - 2.6 = 27.2$$

## §2.1047, and §90.207 - MODULATION CHARACTERISTIC

### Applicable Standard

§2.1047 & §90.207:

- (a) Equipment which utilizes voice modulated communication shall show the frequency response of the audio modulating circuit over a range of 100 to 5000 Hz. for equipment which is required to have a low pass filter, the frequency response of the filter, or all of the circuitry installed between the modulation limited and the modulated stage shall be supplied.
- (b) Equipment which employs modulation limiting, a curve showing the percentage of modulation versus the modulation input voltage shall be supplied.

### Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde&Schwarz	Spectrum Analyzer	FSEM30	849720/019	2004-11-10	2005-11-10
HP	Modulation Analyzer	8901B	3438A05208	2005-2-28	2006-2-28
NANYAN	Audio Generator	NY2201	019829	2004-12-23	2005-12-23

\* **Statement of Traceability:** Bay Area Compliance Lab Corp. (ShenZhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

### Test Procedure

Test Method: TIA/EIA-603 2.2.3

### Test Data

#### Environmental Conditions

Temperature:	25 °C
Relative Humidity:	50%
ATM Pressure:	1032mbar

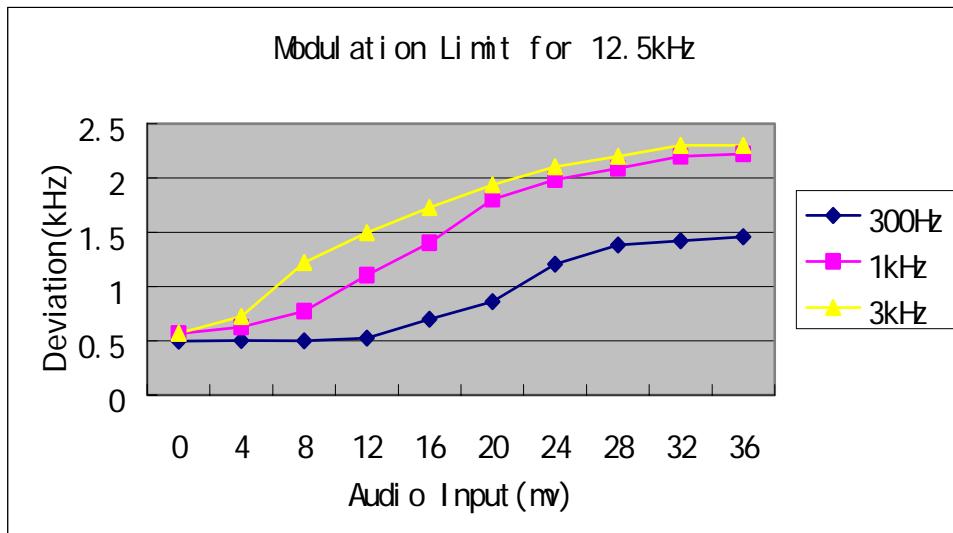
*The testing was performed by Jandy Su on 2005-6-12*

Test Result: Pass

*Test Mode: Transmitting*

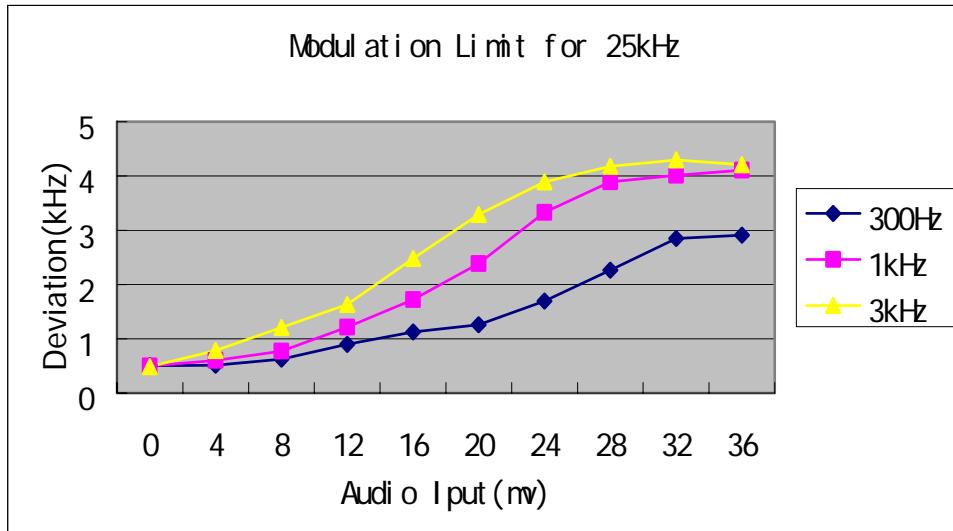
For 12.5 kHz Channel Bandwidth:

Audio Input (mV)	300Hz Deviation (kHz)	1kHz Deviation (kHz)	3kHz Deviation (kHz)
0	0.498	0.565	0.51
4	0.502	0.628	0.724
8	0.5	0.773	1.223
12	0.524	1.105	1.496
16	0.698	1.403	1.729
20	0.725	1.804	1.938
24	1.205	1.984	2.103
28	1.384	2.088	2.2
32	1.422	2.331	2.201
36	1.46	2.32	2.224

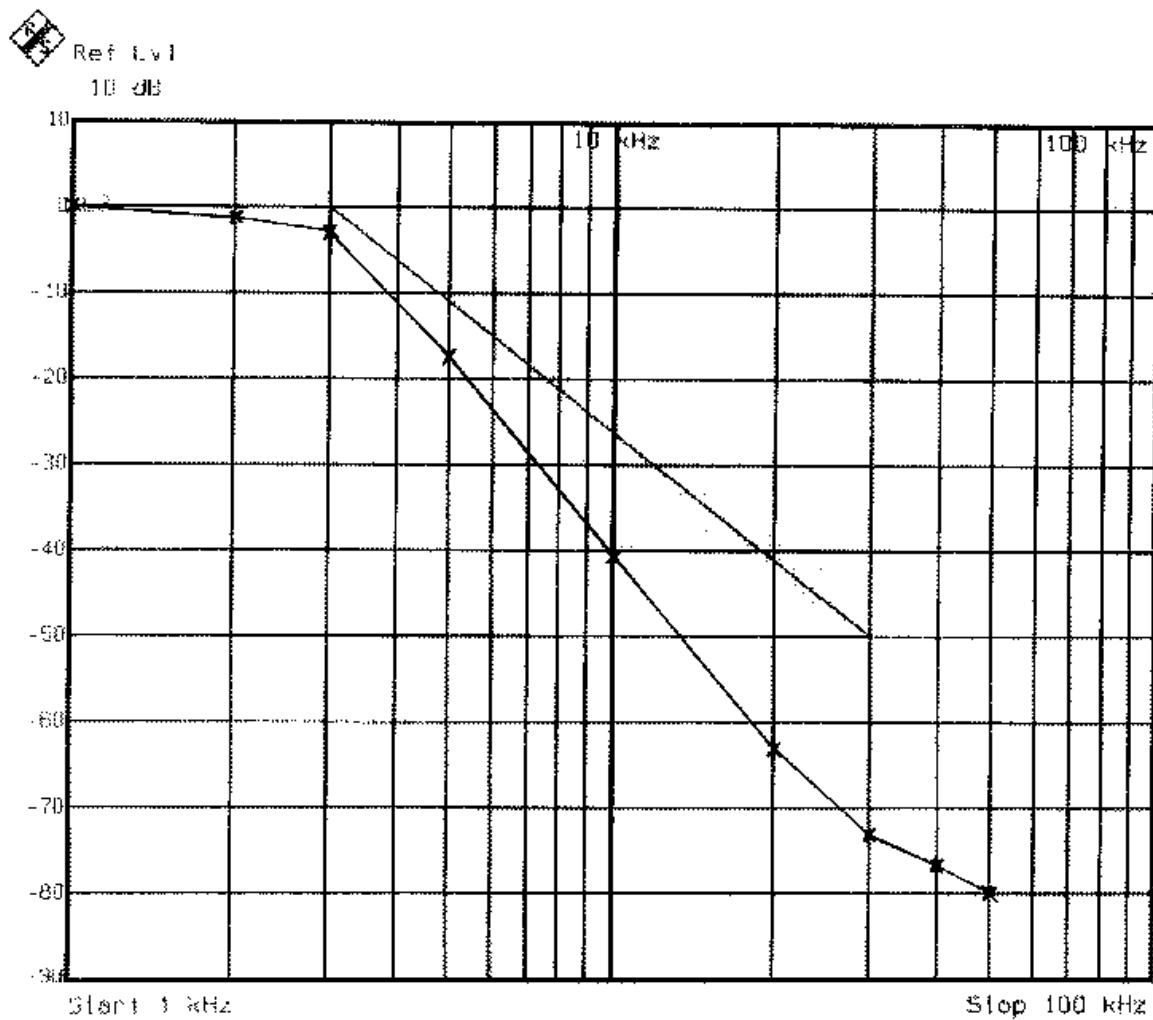
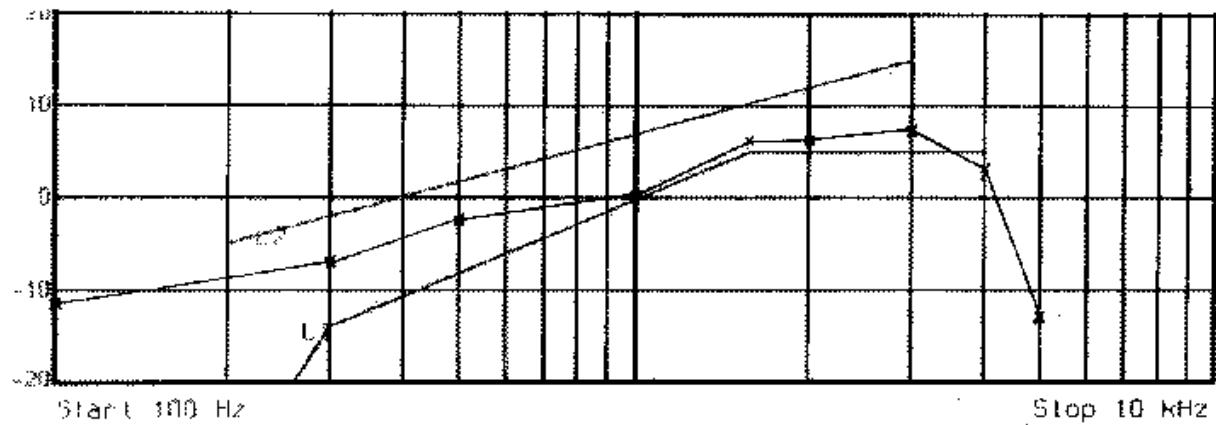


For 25 kHz Channel Bandwidth:

Audio Input (mV)	300Hz Deviation (kHz)	1kHz Deviation (kHz)	3kHz Deviation (kHz)
0	0.504	0.502	0.488
4	0.51	0.602	0.785
8	0.629	0.769	1.212
12	0.898	1.213	1.633
16	1.124	1.724	2.48
20	1.259	2.385	3.288
24	1.698	3.328	3.894
28	2.266	3.894	4.18
32	2.845	4.012	1.214
36	2.91	4.11	4.211



## Audio Low Pass Filter Characteristic



## §2.1049, and § 90.209 – OCCUPIED BANDWIDTH

### Applicable Standard

§2.1049, §90.209 and §90.210

#### *12.5kHz bandwidth:*

For any frequency removed from the center of the authorized bandwidth  $f_0$  to 5.625kHz removed from  $f_0$ , 0dB.

On any frequency removed from the center of the authorized bandwidth by a displacement frequency ( $f_d$  in kHz) of more than 5.626kHz but no more than 12.5kHz, at least 7.27 ( $f_d - 2.88$ kHz) dB.

On any frequency removed from the center of the authorized bandwidth by a displacement frequency ( $f_d$  in kHz) of more than 12.5kHz at least:

$$50 + 10 \log P = 50 + 10 \log(4.295) = 56.6 \text{ dB}$$

#### *25kHz bandwidth:*

For any frequency removed from the center of the assigned channel by more than 50 percent up to and including 100 percent of the authorized bandwidth, at least 25 dB.

On any frequency removed from the center of the assigned channel by more than 100 percent up to and including 250 percent, at least 35 dB.

On any frequency removed from the center of the assigned channel by more than 250 percent at least:

$$43 + 10 \log P = 43 + 10 \log(4.266) = 56.3 \text{ dB}$$

The resolution bandwidth was 300Hz or greater for measuring up to 250kHz from the edge of the authorized frequency segment, and 30kHz or greater for measuring more than 250kHz from the authorized frequency segment.

### Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde&Schwarz	Spectrum Analyzer	FSEM30	849720/019	2004-11-10	2005-11-10
HP	Modulation Analyzer	8901B	3438A05208	2005-2-28	2006-2-28
NANYAN	Audio Generator	NY2201	019829	2004-12-23	2005-12-23

\* **Statement of Traceability:** Bay Area Compliance Lab Corp. (ShenZhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

### Test Procedure

The RF output of the transmitter was connected to the input of the spectrum analyzer through sufficient attenuation.

The resolution bandwidth of the spectrum analyzer was set at 300 Hz and the spectrum was recorded in the frequency band  $\pm 50$  KHz from the carrier frequency.

**Test Data****Environmental Conditions**

Temperature:	25 ° C
Relative Humidity:	50%
ATM Pressure:	1032mbar

*The testing was performed by Jandy Su on 2005-7-6*

Test Result: Pass

*Test Mode: Transmitting*

Please refer to the hereinafter plots.

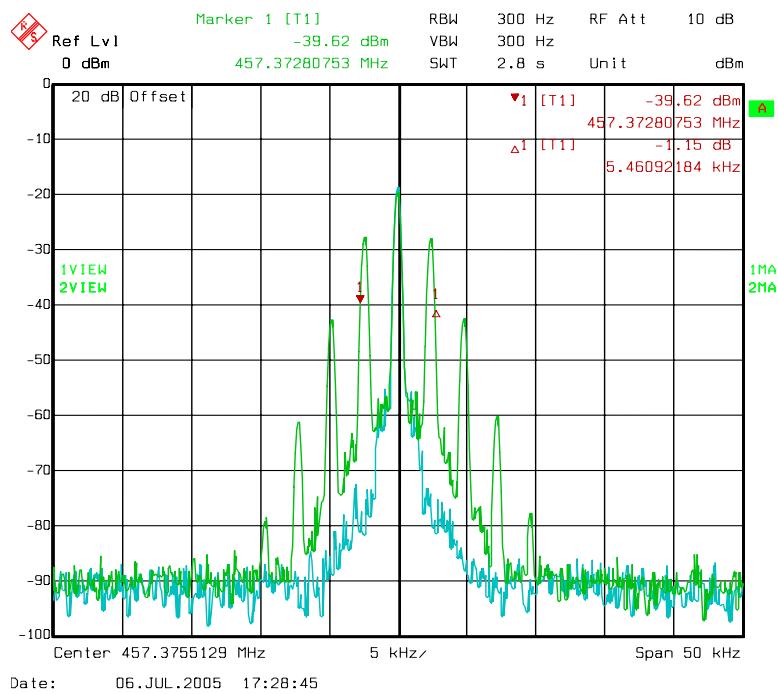
Emission Designator:

For 12.5KHz Channel Spacing:  $2M+2D = 2 \times 3 + 2 \times 2.5 = 11K0F3E$

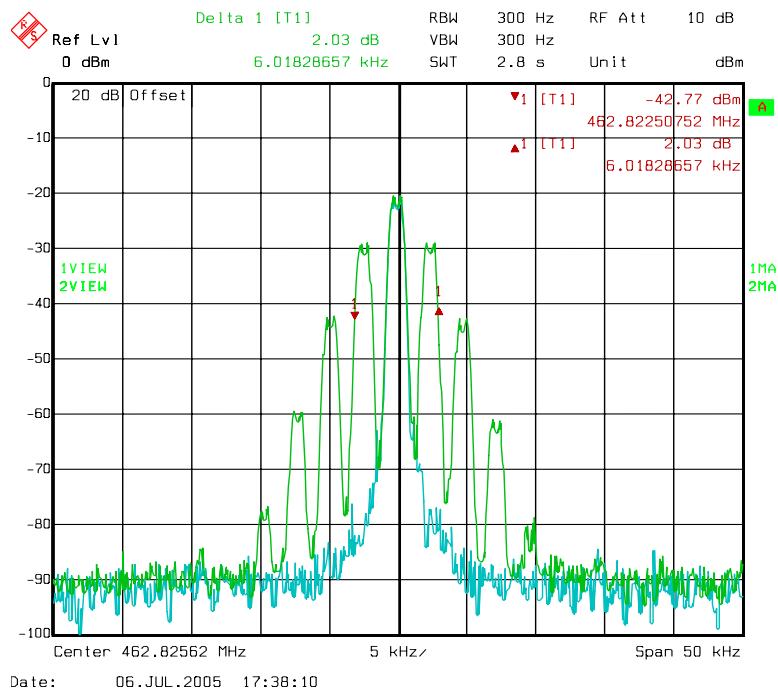
For 25 KHz Channel Spacing:  $2M+2D = 2 \times 3 + 2 \times 5 = 16K0F3E$

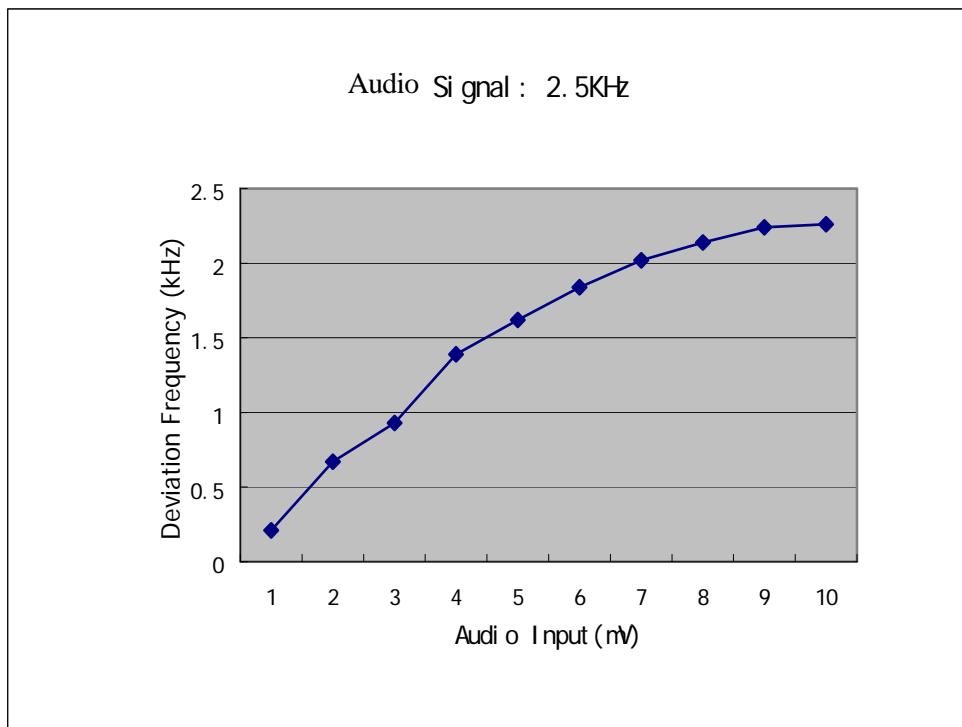
For 12.5 kHz Channel Bandwidth:

Channel 1



Channel 16

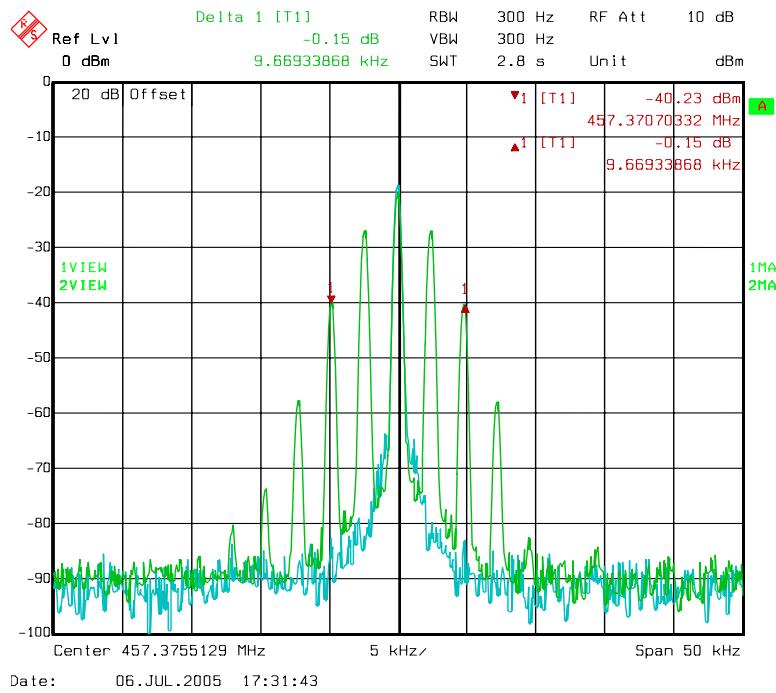




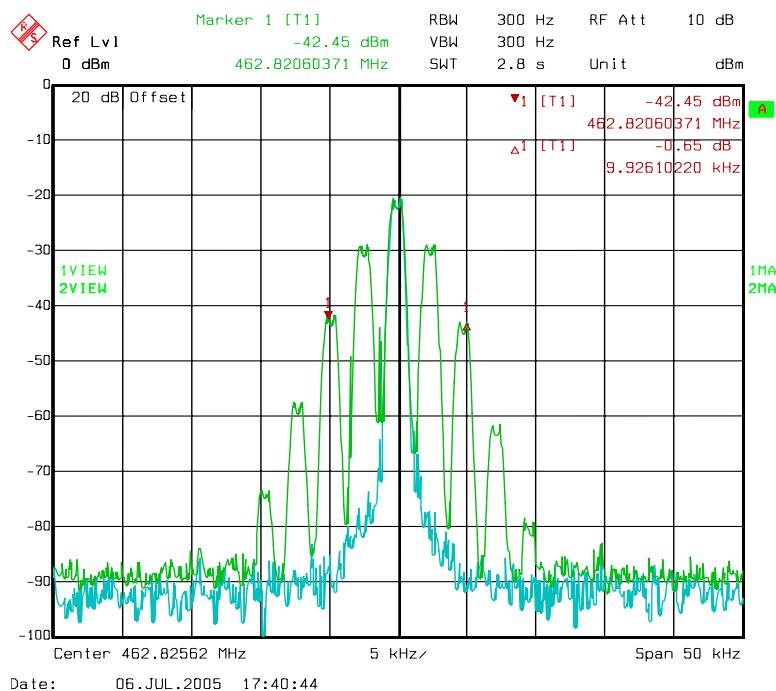
Audio Input (mV)	Frequency Deviation (KHz)
0	0.21
4	0.67
8	1.03
12	1.39
16	1.62
20	1.84
24	2.02
28	2.14
32	2.24
36	2.26

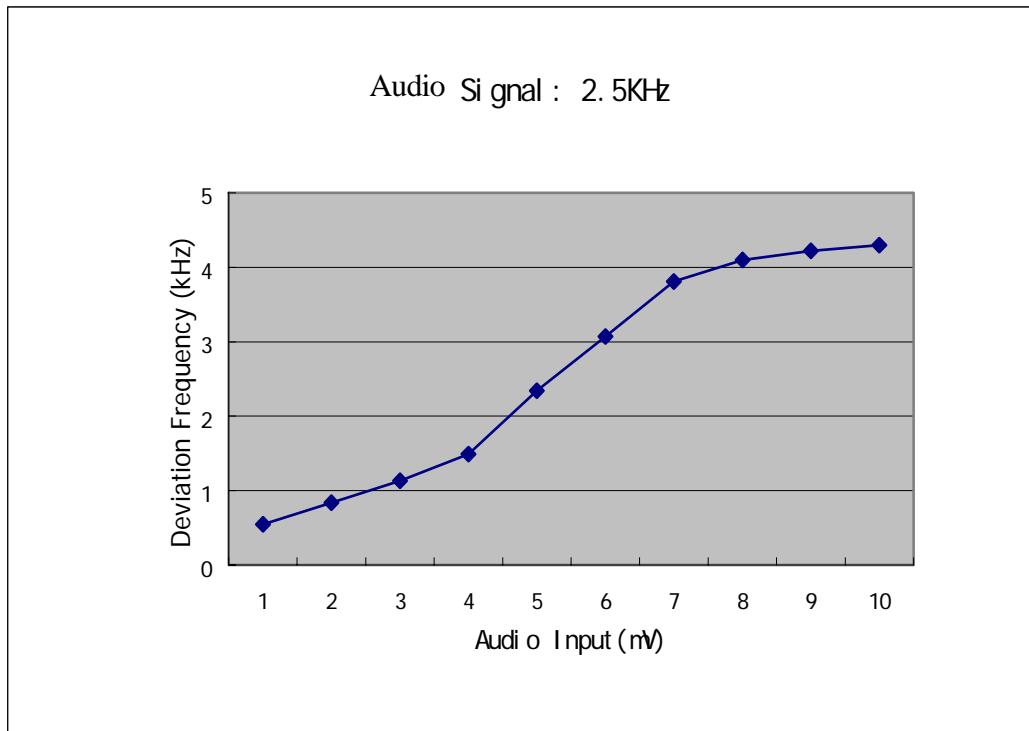
For 25 kHz Channel Bandwidth:

### Channel 1



### Channel 16





Audio Input (mV)	Frequency Deviation (KHz)
0	0.55
4	0.84
8	1.13
12	1.49
16	2.34
20	3.07
24	3.81
28	4.1
32	4.22
36	4.30

## §2.1051 and §90.210 - SPURIOUS EMISSIONS AT ANTENNA TERMINALS

### Applicable Standard

§2.1051 and §90.210 (25kHz bandwidth only)

On any frequency removed from the center of the assigned channel by more than 250 percent at least:

$$43+10\log P=43+10\log(4.295)=49.43\text{dB}$$

§90.210 (12.5kHz bandwidth only)

On any frequency removed from the center of the authorized bandwidth by a displacement frequency ( $f_d$  in kHz) of more than 12.5kHz at least:

$$50+10\log P=50+10\log(3.999)=56.02\text{dB}$$

### Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	Spectrum Analyzer	FSEM30	849720/019	2004-11-10	2005-11-10

\* **Statement of Traceability:** Bay Area Compliance Lab Corp. (ShenZhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

### Test Procedure

The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation. The resolution bandwidth of the spectrum analyzer was set at 100 kHz. Sufficient scans were taken to show any out of band emissions up to 10<sup>th</sup> harmonic.

### Test Data

#### Environmental Conditions

Temperature:	25 °C
Relative Humidity:	50%
ATM Pressure:	1032mbar

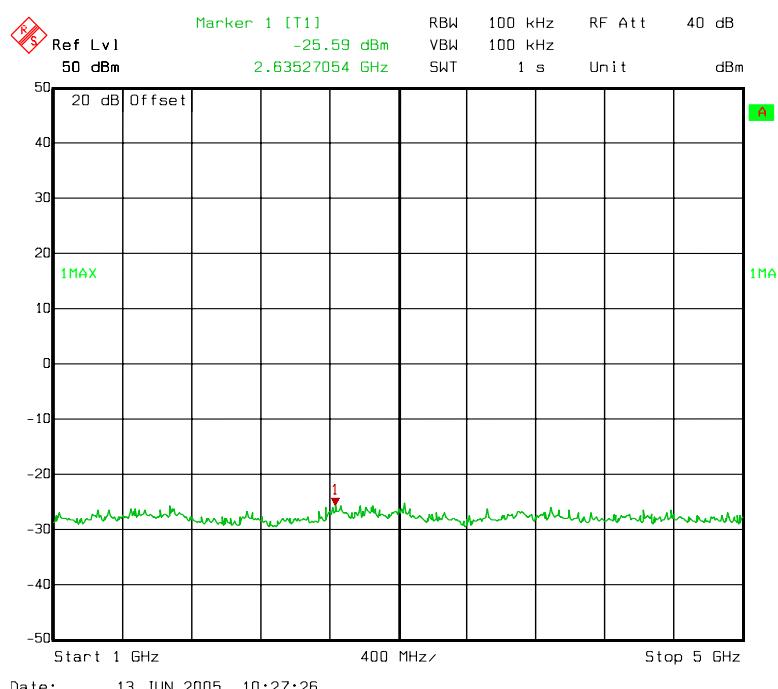
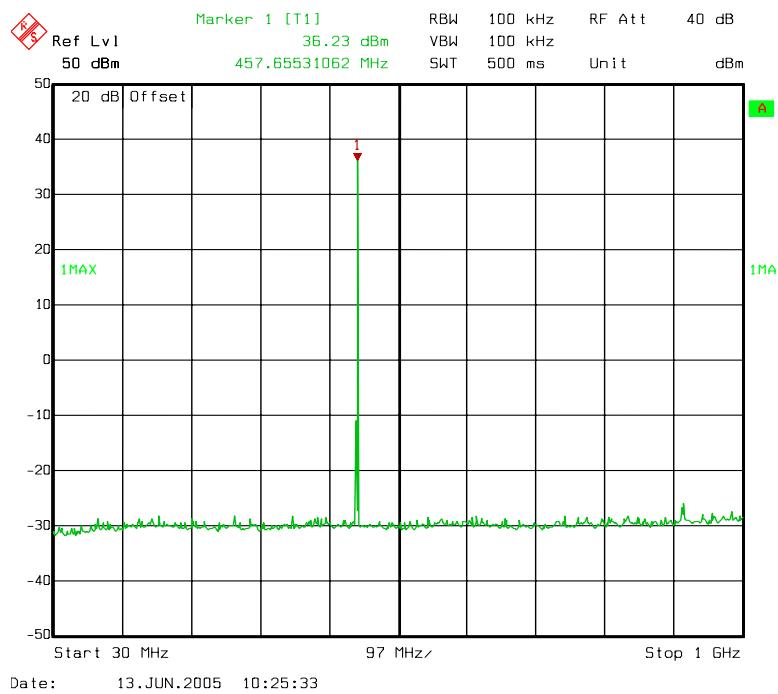
*The testing was performed by Jandy Su on 2005-6-13*

Test Result: Pass

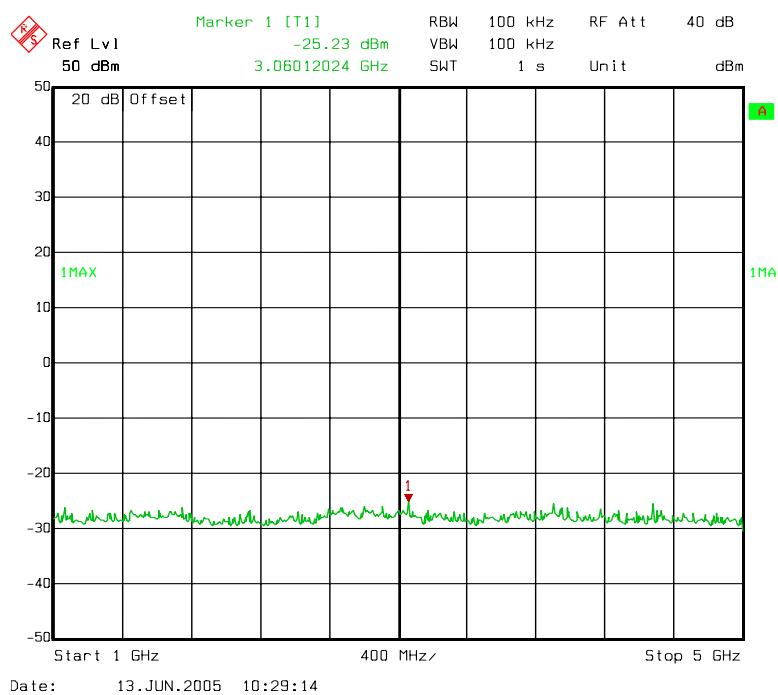
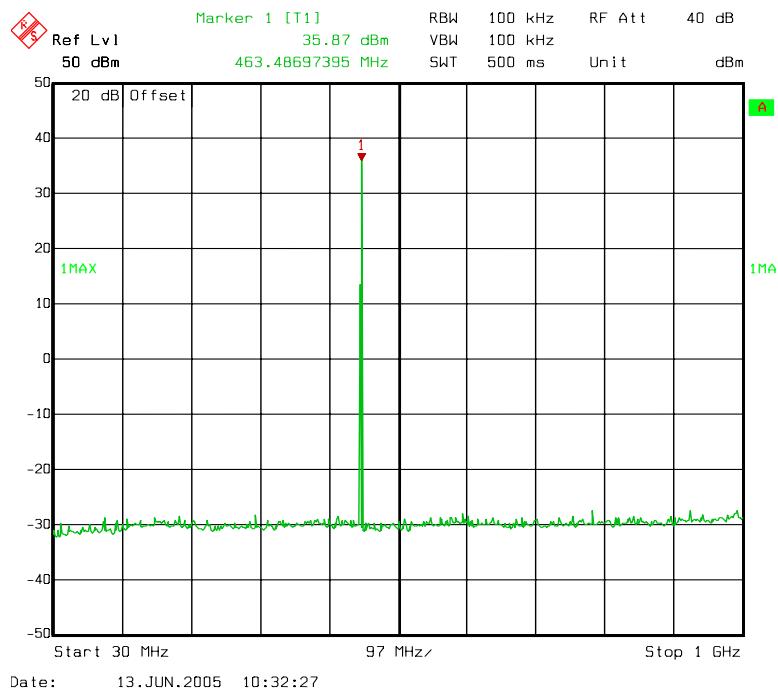
*Test Mode: Transmitting*

For 12.5 kHz Channel Bandwidth:

Channel 1

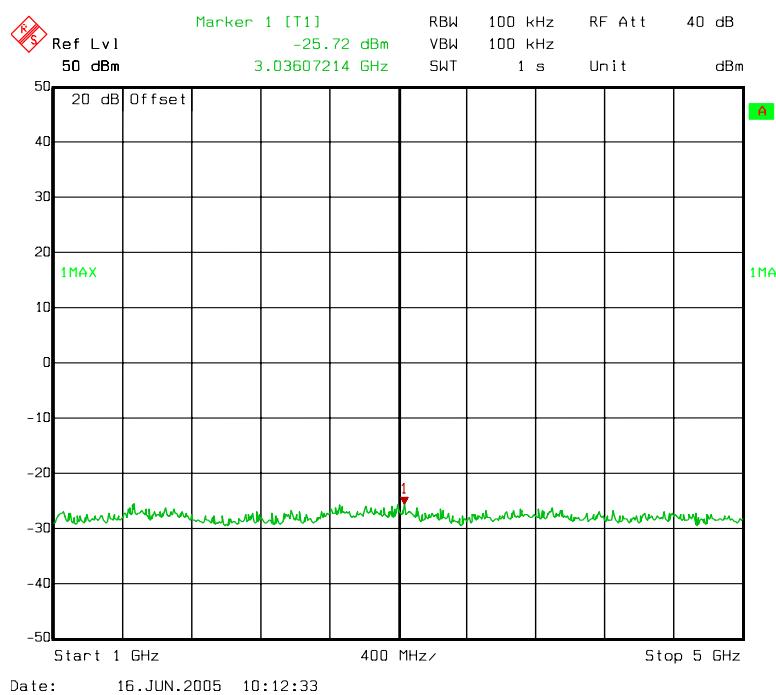
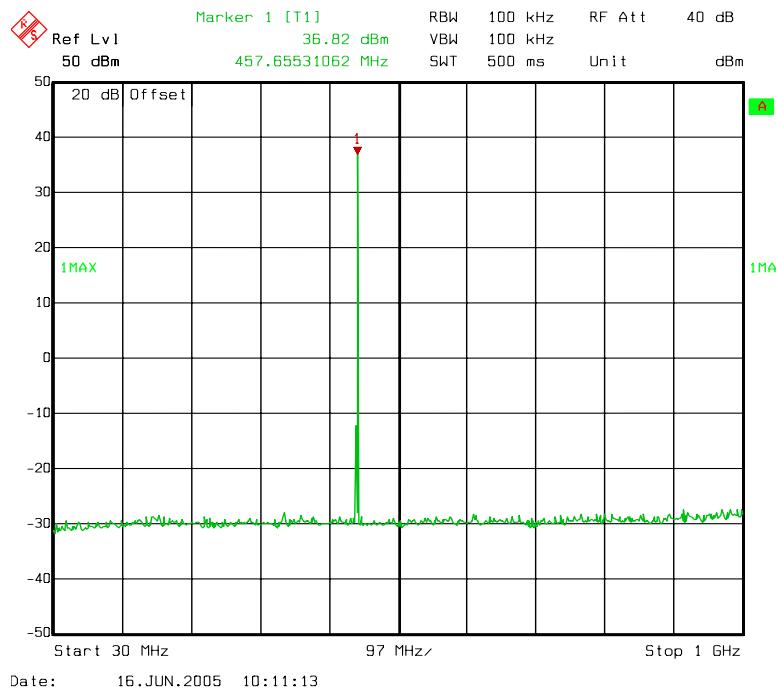


## Channel 16

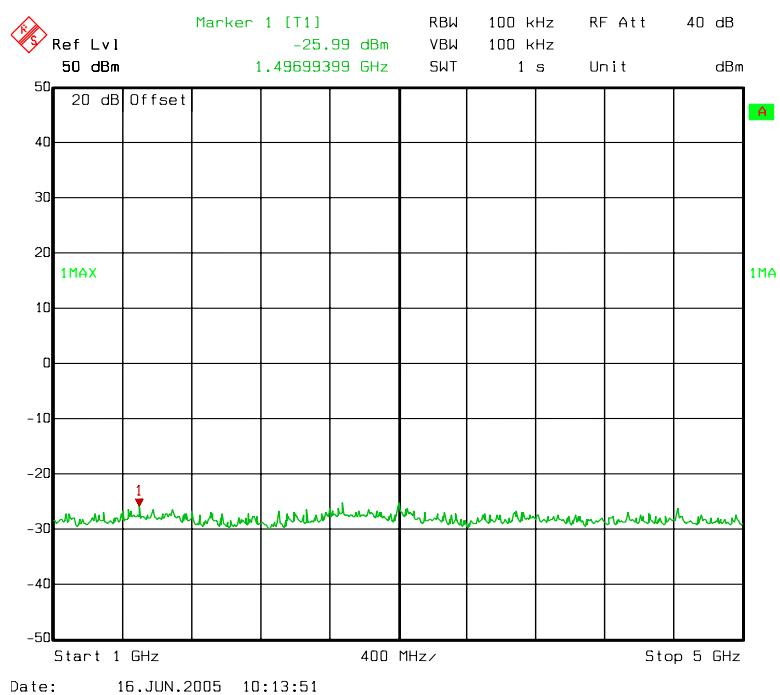
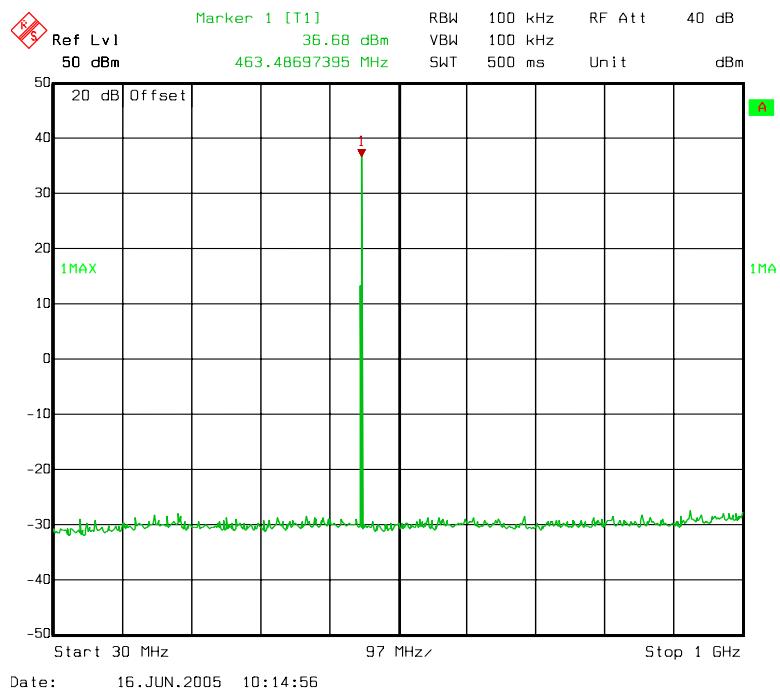


For 25 kHz Channel Bandwidth:

Channel 1



## Channel 16



## §2.1053 and §90.210 - RADIATED SPURIOUS EMISSION

### Applicable Standard

§2.1053 and §90.210

### Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
HP	Signal Generator	HP8657A	2849U00982	2005-2-28	2006-2-28
Rohde & Schwarz	Spectrum Analyzer	FSEM30	849720/019	2004-11-10	2005-11-10
SUNOL SCIENCES	Horn Antenna	DRH-118	A052604	2005-6-2	2006-6-2
A.H. System	Horn Antenna	SAS-200/571	135	2005-4-28	2006-4-28
Giga-tronics	Signal Generator	1026	270801	2005-2-28	2006-2-28

\* **Statement of Traceability:** Bay Area Compliance Lab Corp. (ShenZhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

### Test Procedure

The transmitter was placed on a wooden turntable, and it was transmitting into a non-radiating load, which was also placed on the turntable.

The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis.

The frequency range up to teeth harmonic of the fundamental frequency was investigated.

Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution.

Spurious emissions in dB =  $10 \log_{10}(\text{TXpwr in Watts}/0.001)$  - the absolute level

Spurious attenuation limit in dB =  $43 + 10 \log_{10}(\text{power out in Watts})$

Spurious attenuation limit in dB =  $50 + 10 \log_{10}(\text{power out in Watts})$  for EUT with a 12.5KHz channel bandwidth.

### Test Results Summary

*For 12.5 kHz Channel Bandwidth:*

Channel 1: -2.1 dB at 1373.74 MHz  
Channel 16: -2.2 dB at 1391.00 MHz

*For 25 kHz Channel Bandwidth:*

Channel 1: -14.6 dB at 1007.20 MHz  
Channel 16: -5.2 dB at 1391.00 MHz

## Test Data

### Environmental Conditions

Temperature:	25 ° C
Relative Humidity:	50%
ATM Pressure:	1032mbar

The testing was performed by Jandy Su on 2005-6-13

Test Mode: Transmitting

For 12.5 kHz Channel Bandwidth:

Indicated Frequency MHz	Meter Reading dBuV/m	Table	Test Antenna			Substituted			Antenna	Cable	Absolute Level dBm	Limit dBm	Margin dB
			Angle Degree	Height Meter	Polar H/V	Frequency MHz	Level dBm	Polar H/V					
Channel 1													
457.35	103.41	30	1.6	h	457.35	29.80	h	0	2.6	27.2			
457.35	112.72	30	1.6	v	457.35	38.90	v	0	2.6	36.3			
1373.74	40.37	0	1.5	v	1373.74	-26.30	v	8.4	4.2	-22.1	-20	-2.1	
1373.33	33.11	0	1.5	h	1373.33	-27.30	h	8.4	4.2	-23.1	-20	-3.1	
913.76	43.51	60	1.6	v	913.76	-20.40	v	0	3.4	-23.8	-20	-3.8	
1007.09	30.35	30	1.7	v	1007.09	-26.60	v	6.3	4.2	-24.5	-20	-4.5	
913.76	40.40	60	1.6	h	913.76	-27.40	h	0	3.4	-30.8	-20	-10.8	
192.02	30.13	180	1.8	v	192.02	-48.20	v	0	1.7	-49.9	-20	-29.9	
418.86	30.50	180	1.8	h	418.86	-47.50	h	0	2.5	-50.0	-20	-30.0	
192.02	29.74	30	1.7	h	192.02	-49.20	h	0	1.7	-50.9	-20	-30.9	
Channel 16													
462.82	104.88	30	1.6	h	462.82	31.0	h	0	2.6	28.4			
462.82	111.19	30	1.6	v	462.82	39.2	v	0	2.6	36.6			
1391.00	30.50	30	1.7	h	1391.00	-26.40	h	8.4	4.2	-22.2	-20	-2.2	
1391.00	30.42	30	1.7	v	1391.00	-26.70	v	8.4	4.2	-22.5	-20	-2.5	
925.55	44.38	180	1.5	v	925.55	-19.80	v	0	3.6	-23.4	-20	-3.4	
925.55	40.23	180	1.5	h	925.55	-27.00	h	0	3.6	-30.6	-20	-10.6	
1389.78	21.40	60	1.8	v	1389.78	-39.64	v	8.4	4.2	-35.4	-20	-15.4	
365.83	30.09	0	1.6	h	365.83	-42.80	h	0	2.6	-45.4	-20	-25.4	
1251.50	29.91	0	1.6	v	1251.50	-49.30	v	6.3	4.2	-47.2	-20	-27.2	
866.63	28.49	60	1.8	h	866.63	-44.60	h	0	3.3	-47.9	-20	-27.9	

For 25 kHz Channel Bandwidth:

Indicated Frequency MHz	Meter Reading dBuV/m	Table	Test Antenna			Substituted			Antenna Gain Correction	Cable Loss dB	Absolute Level dBm	Limit dBm	Margin dB
			Angle Degree	Height Meter	Polar H/V	Frequency MHz	Level dBm	Polar H/V					
Channel 1													
457.35	104.34	30	1.6	h	457.35	29.80	h	0	2.6	27.2			
457.35	112.04	30	1.6	v	457.35	38.90	v	0	2.6	36.3			
1007.20	29.73	30	1.7	v	1007.20	-29.73	v	6.3	4.2	-27.6	-13	-14.6	
1373.38	32.36	0	1.5	h	1373.38	-32.36	h	8.4	4.2	-28.2	-13	-15.2	
192.14	28.52	30	1.7	h	192.14	-28.52	h	0	1.7	-30.2	-13	-17.2	
192.14	29.87	180	1.8	v	192.14	-29.87	v	0	1.7	-31.6	-13	-18.6	
418.86	31.08	180	1.8	h	418.86	-31.08	h	0	2.5	-33.6	-13	-20.6	
1373.75	39.37	0	1.5	v	1373.75	-39.37	v	8.4	4.2	-35.2	-13	-22.2	
913.77	41.25	60	1.6	h	913.77	-41.25	h	0	3.4	-44.7	-13	-31.7	
913.77	42.18	60	1.6	v	913.77	-42.18	v	0	3.4	-45.6	-13	-32.6	
Channel 16													
462.85	105.86	30	1.6	h	462.85	32.1	h	0	2.6	29.5			
462.85	110.12	30	1.6	v	462.85	38.40	v	0	2.6	35.8			
1391.00	32.32	30	1.7	v	1391.00	-22.40	v	8.4	4.2	-18.2	-13	-5.2	
1391.00	32.76	30	1.7	h	1391.00	-23.30	h	8.4	4.2	-19.1	-13	-6.1	
925.55	44.32	180	1.5	v	925.55	-19.10	v	0	3.6	-22.7	-13	-9.7	
925.55	40.12	180	1.5	h	925.55	-27.10	h	0	3.6	-30.7	-13	-17.7	
1389.74	21.20	60	1.8	v	1389.74	-40.50	v	8.4	4.2	-36.3	-13	-23.3	
365.46	30.04	0	1.6	h	365.46	-43.20	h	0	2.6	-45.8	-13	-32.8	
866.63	28.59	60	1.8	h	866.63	-43.22	h	0	3.3	-46.5	-13	-33.5	
1251.10	28.64	0	1.6	v	1251.10	-50.50	v	6.3	4.2	-48.4	-13	-35.4	

### Compliance Statement:

According to FCC part 15, at 3-meter distance the emission from an intentional radiator shall not exceed the field strength level 40 dBuV/m within 30-88 MHz, 43.5 dBuV/m within 88-216 MHz, 46 dBuV/m within 226-960 MHz, 54 dBuV/m above 960 MHz. The level of any unwanted emissions shall not exceed the level of the fundamental frequency.

The level of unwanted emission of this device were below the above limits. This device was compliant with the FCC Part 15.

## §2.1055 (d) and §90.213- FREQUENCY STABILITY

### Applicable Standard

§2.1055 (d)

§90.213

For output power > 2 watts, the limit is 2.5ppm.

### Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
NANYAN	Audio Generator	NY2201	019829	2004-12-23	2005-12-23
Hewlett-Packard	Frequency Counter	5342A	2317A08289	2005-1-26	2006-1-26

\* **Statement of Traceability:** Bay Area Compliance Lab Corp. (ShenZhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

### Test Procedure

Frequency Stability vs. Temperature: The equipment under test was connected to an external DC power supply and the RF output was connected to a f Spectrum Analyzer via feed-through attenuators. The EUT was placed inside the temperature chamber. The DC leads and RF output cable exited the chamber through an opening made for the purpose.

After the temperature stabilized for approximately 20 minutes, the frequency output was recorded from the Spectrum Analyzer.

Frequency Stability vs. Voltage: An external variable DC power supply Source. The voltage was set to 115% of the nominal value and was then decreased until the transmitter light no longer illuminated; i.e., the end point. The output frequency was recorded for each voltage.

### Test Data

#### Environmental Conditions

Temperature:	25 °C
Relative Humidity:	50%
ATM Pressure:	1032mbar

*The testing was performed by Jandy Su on 2005-6-17.*

Test Result: Pass

*Test Mode: Transmitting*

Reference Frequency: 457.3750 MHz, Limit: 2.5 ppm			
Environment Temperature (°C)	Power Supplied (Vdc)	Frequency Measure with Time Elapsed	
		MCF (MHz)	PPM Error
50	7.2	457.3754	0.87
40	7.2	457.3754	0.87
30	7.2	457.3755	1.10
20	7.2	457.3755	1.10
10	7.2	457.3759	1.97
0	7.2	457.3759	1.97
-10	7.2	457.3759	1.97
-20	7.2	457.3760	2.19
-30	7.2	457.3760	2.19

*Frequency Stability Versus Input Voltage*

Reference Frequency: 457.3750 MHz, Limit: 2.5 ppm		
Power Supplied (Vdc)	Frequency Measure with Time Elapsed	
	Frequency (MHz)	Error (ppm)
6.2	457.3754	0.87

Note: 1) Limit 2.5ppm is for EUT operating with 12.5 kHz channel bandwidth.

2) The end point is 6.2Vdc.

Reference Frequency: 457.3750 MHz, Limit: 2.5 ppm			
Environment Temperature (°C)	Power Supplied (Vdc)	Frequency Measure with Time Elapsed	
		MCF (MHz)	PPM Error
50	7.2	457.3751	0.22
40	7.2	457.3752	0.44
30	7.2	457.3752	0.44
20	7.2	457.3754	0.88
10	7.2	457.3754	0.88
0	7.2	457.3752	0.44
-10	7.2	457.3754	0.88
-20	7.2	457.3757	1.54
-30	7.2	457.3756	1.32

*Frequency Stability Versus Input Voltage*

Reference Frequency: 457.3750 MHz, Limit: 2.5 ppm		
Power Supplied (Vdc)	Frequency Measure with Time Elapsed	
	Frequency (MHz)	Error (ppm)
6.2	457.3754	0.88

Note: 1) Limit 2.5ppm is for EUT operating with 25 kHz channel bandwidth.

2) The end point is 6.2Vdc.

## §90.214 - TRANSIENT FREQUENCY BEHAVIOR

### Applicable Standard

§90.214

### Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
TEKTRONIX	Digital Phosphor Oscilloscope	TDS 7104	B020518	2005-1-24	2006-1-24
HP	Modulation Analyzer	8901B	3438A05208	2005-2-28	2006-2-28
HP	Signal Generator	HP8657A	2849U00982	2005-2-28	2006-2-28

\* **Statement of Traceability:** Bay Area Compliance Lab Corp. (ShenZhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

### Test Procedure

TIA/EIA-603 2.2.19

### Test Data

#### Environmental Conditions

Temperature:	25 °C
Relative Humidity:	50%
ATM Pressure:	1032mbar

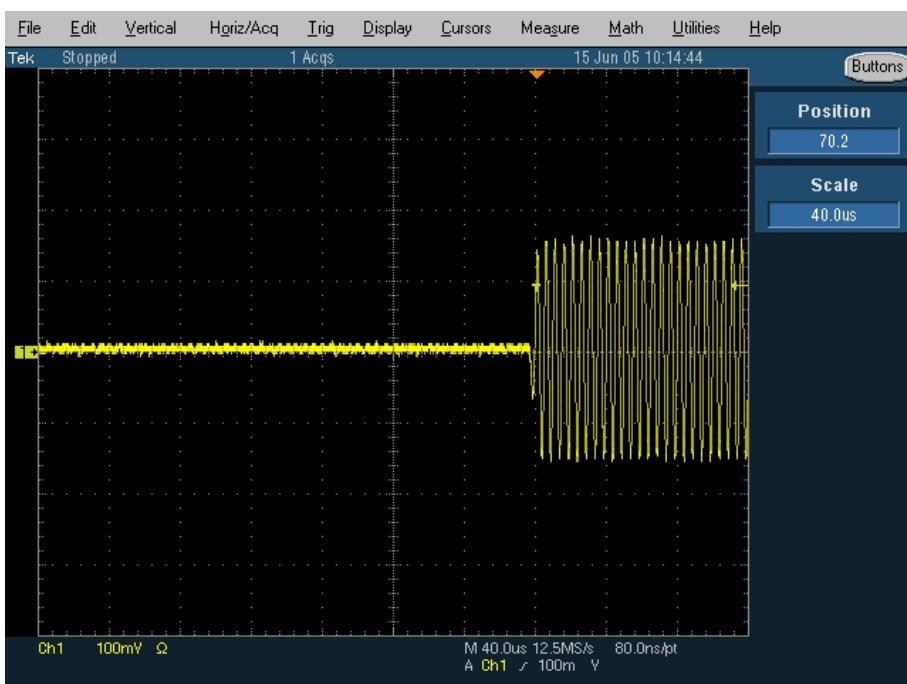
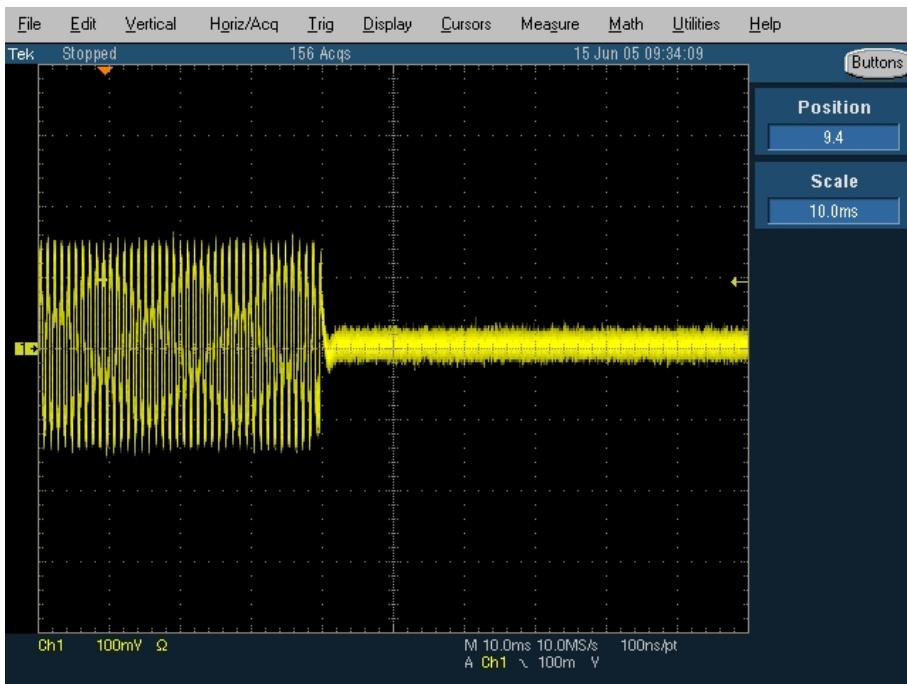
The testing was performed by Jandy Su on 2005-6-17.

Test Result: Pass

Test Mode: Transmitting

Operation Frequency	Channel Separation	Transient Period	Transient Frequency	Result
455.25 MHz	12.5 kHz	t1=10 ms	<+-12.5 kHz	Pass
		t2=25 ms	<+-6.25 kHz	
		t3=10 ms	<+-12.5 kHz	
	25 kHz	t1=10 ms	<+-25 kHz	Pass
		t2=25 ms	<+-12.5 kHz	
		t3=10 ms	<+-25 kHz	

For 12.5 kHz Channel Bandwidth:



For 25 kHz Channel Bandwidth:

