

Advanced  
Compliance

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**Electromagnetic  
Emission  
Compliance  
Test Report**



**Equipment Under Test  
(EUT)  
Applicant** In Door R-20-930 One Way Paging Repeater  
Shyam Telecom Inc.

**In Accordance With** FCC Part 90, Subpart I

**Test by** Advanced Compliance Laboratory, Inc.  
6 Randolph Way  
Hillsborough, New Jersey 08844

**Authorized by** Wei Li  
Lab Manager

Signature

**Date** May 1, 2007

**AC Lab Report  
Number** 0048-070420-01



Lab Code:200101-0

**The test result in this report is supported and  
covered by the NVLAP accreditation.**

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## Section 1. Summary of Test Results

Manufacturer: Shyam Telecom Inc.  
Model No.: InDoor R-20-930 One Way Paging Repeater  
Sample No.: R20-1PGAG401

General: **All measurements are traceable to national standards**

These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with FCC Part 90, Subpart I.

New Submission                       Production Unit  
 Class II Permissive Change             Pre-Production Unit

THIS TEST REPORT RELATES ONLY TO THE ITEM(S) TESTED.

THE FOLLOWING DEVIATIONS FROM, ADDITIONS TO, OR EXCLUSIONS FROM THE TEST SPECIFICATIONS HAVE BEEN MADE.

“See Summary of Test Data”



**NVLAP LAB CODE: 200101-0**

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**Summary of Test Data**

<b>RF Power Output</b>	2.1046 90.205(a)	500W ERP 100W EIRP	Complies
<b>Occupied Bandwidth (Voice &amp; SAT)</b>	2.1049(i)	Mask	N/A*
<b>Occupies Bandwidth (Wideband Data)</b>	2.1049(i)	Mask	N/A*
<b>Occupied Bandwidth (Digital)</b>	2.1049(i) 90.210	Mask	Complies
<b>Spurious Emissions at Antenna Terminals</b>	2.1051	-20 dBm	Complies
<b>Field Strength of Spurious Emissions</b>	2.1053 90.210	-20 dBm E.I.R.P.	Complies
<b>Frequency Stability</b>	2.1055	1.5 ppm	N/A*

\* These items are NOT applied to the EUT.

The estimated uncertainty of the test result is given as following. The method of uncertainty calculation is provided in Advanced Compliance Lab. Doc. No. 0048-01-01.

	Prob. Dist.	Uncertainty(dB)	Uncertainty(dB)	Uncertainty(dB)
		30-1000MHz	1-6.5GHz	Conducted
Combined Std. Uncertainty $u_c$	norm.	$\pm 2.36$	$\pm 2.99$	$\pm 1.83$



Wei Li  
 Lab Manager  
 Advanced Compliance Lab

Date: May 1, 2007

**Section 2. General Equipment Specification**

<b>Supply Voltage</b>	100-240VAC 50/60Hz to 7.5V/5A DC Adaptor				
<b>Frequency Range</b>	Band I	DL/929-930MHz			
	Modulation	CDMA (F9W) <input type="checkbox"/>	iDEN (GXW) <input checked="" type="checkbox"/>	EDGE (G7W) <input type="checkbox"/>	CDPD (F9W) <input type="checkbox"/>
<b>Rated Power Output</b>	+19dBm DL Tolerance: +1dB & -3dB				
<b>Output Impedance</b>	50ohm				
<b>Frequency Translation</b>	F1-F1 <input checked="" type="checkbox"/>	F1-F2 <input type="checkbox"/>	N/A <input type="checkbox"/>		
	Software <input type="checkbox"/>	Duplexer Change <input type="checkbox"/>	Full Band Coverage <input checked="" type="checkbox"/>		

**DC voltages and DC currents per 2.1033(c)(8)**

The input supply to the transmitter was set at 7.5 Volts DC. The RF power output was measured with the indicated voltage and current applied into the final RF amplifying device(s).

**R-20-930 One Way Paging Repeater**

RF Output, DC Current and RF Input Power are all average values.

Measured Maximum RF output(Rated): 18.61dBm

Measured DC voltage: 7.6V

Measured DC current: 2.2 A

Measured Minimum RF output: -21 dBm

Measured DC voltage: 7.6V

Measured DC current: 2.1 A

**Tune-up procedure per 2.1033(c) (9)**

There are no user accessible adjustments or tuning in this transceiver. All necessary adjustments and tuning are performed during manufacture of the product. Any adjustments or tuning after service or repair are done as part of that process as special equipment is required to perform such adjustments.

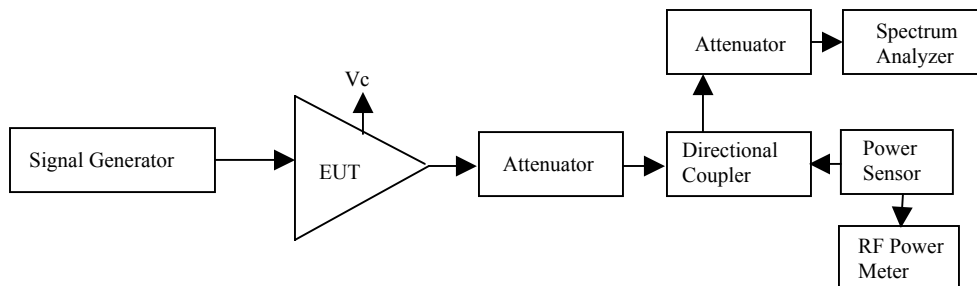
## Description of Operation

This device is a one way paging repeater operating in downlink spectrums: 929-930MHz band.

## System Diagram

See Attachment.

## General EUT Setup



## Testing Frequency/Channel/Port Selection:

Band : M(iddle)of DL band

### Section 3. RF Output Power

<b>Name of Test:</b>	<i>RF Output Power</i>	<b>Test Standard:</b>	<i>2.1046 90.205(a)</i>
<b>Tested By:</b>	WEI LI	<b>Test Date:</b>	04/20/2007-05/01/2007

**Minimum Standard:** Para. No. 90.205& 635. The maximum effective radiated power (ERP) of base station transmitters and repeaters must not exceed 500 Watts (57dBm).

**Method of Measurement:** Detachable Antenna:  
The average/peak power at antenna terminals is measured using power meter. The peak power at antenna terminals can be also measured using spectrum analyzer with proper setting.

Integral Antenna:

If the antenna is not detachable from the circuit then the Peak Power Output is derived from the peak radiated field strength of the fundamental emission by using the plane wave relation

$$\frac{GP}{4\pi R^2} = \frac{E^2}{120\pi}$$

and proceeding as follows:

$$P = \frac{E^2 R^2}{30G} = \frac{E^2 3^2}{30G}$$

where,

P = the equivalent isotropic radiated power in watts

E = the maximum measured field strength in V/m

R = the measurement range (3 meters)

G = the numeric gain of the transmit antenna in relation to an isotropic radiator

**Test Result:**

**Complies**

**Test Data:**

<b>Band I</b>	<b>Channel</b>	<b>Modulation</b>	<b>Power Output (dBm)</b>	<b>Rated Power (dBm)</b>	<b>Margin</b>
<b>Downlink</b>					
	Mid	APCO25	18.61	19	-0.39
	Mid	IDEN	18.93	19	-0.07
<b>Input Power (dBm)</b>	$\geq -55$ (Maximum gain)				
<b>Ref Offset</b>	Ref offset=Cable Factor +Attenuation=10.1dB				



#### Section 4. Occupied Bandwidth

<b>Name of Test:</b>	<i>Occupied Bandwidth</i>	<b>Test Standard:</b>	<i>2.1049(i)</i> <i>90.210</i>
<b>Tested By:</b>	WEI LI	<b>Test Date:</b>	04/20/2007-05/01/2007

**Minimum Standard:** Not defined by FCC. Input vs. Output.

**Method of Measurement:** Spectrum Analyzer Settings:  
RBW: CDMA (30 kHz), GSM (3kHz), EDGE (3KHz),NADC (1 kHz)  
and CDPD (1 kHz), iDEN(QAM) &APCO25(FSK): 300Hz  
VBW:  $\geq$ RBW  
Span: As required  
Sweep: Auto  
Input Signal Characteristics:  
RF level: Maximum recommended by manufacturer

**Test Result:**

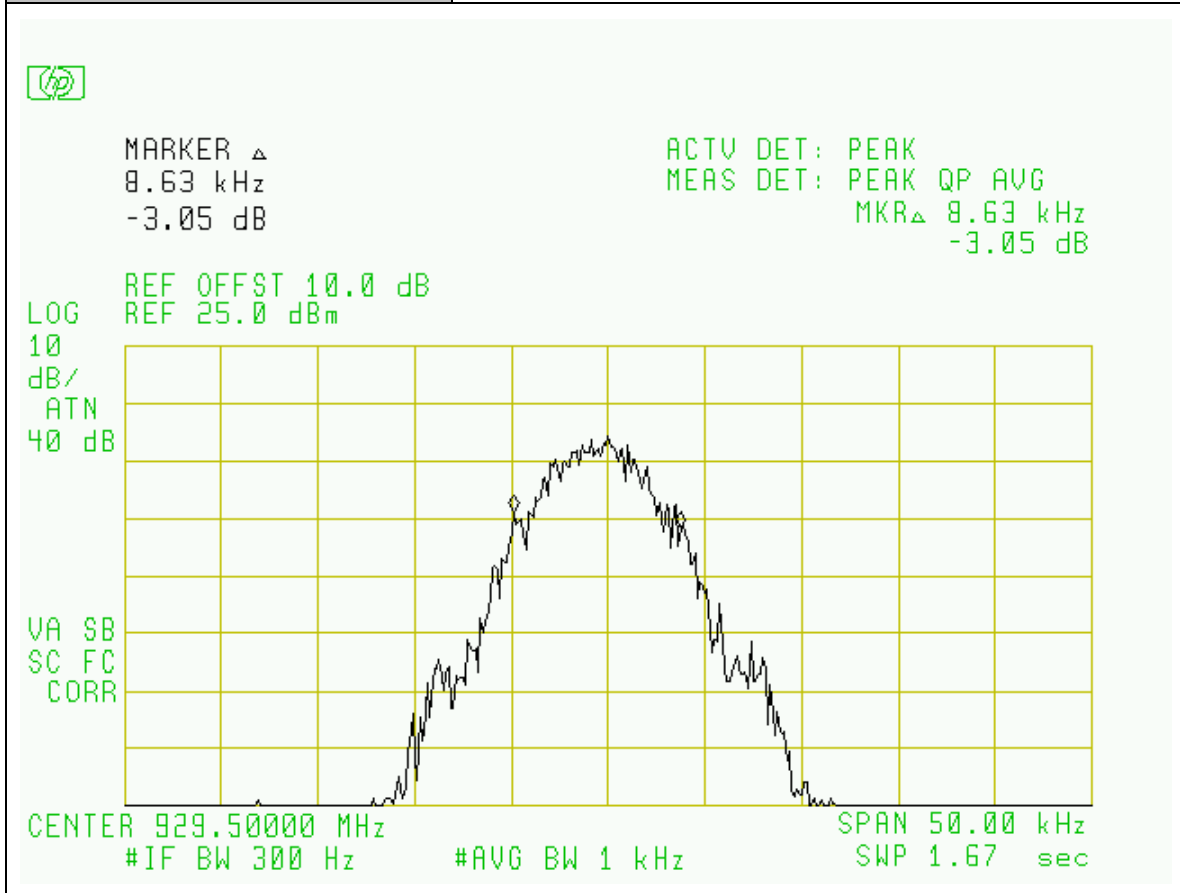
**Complies**

**Test Data:**

Attached Plots

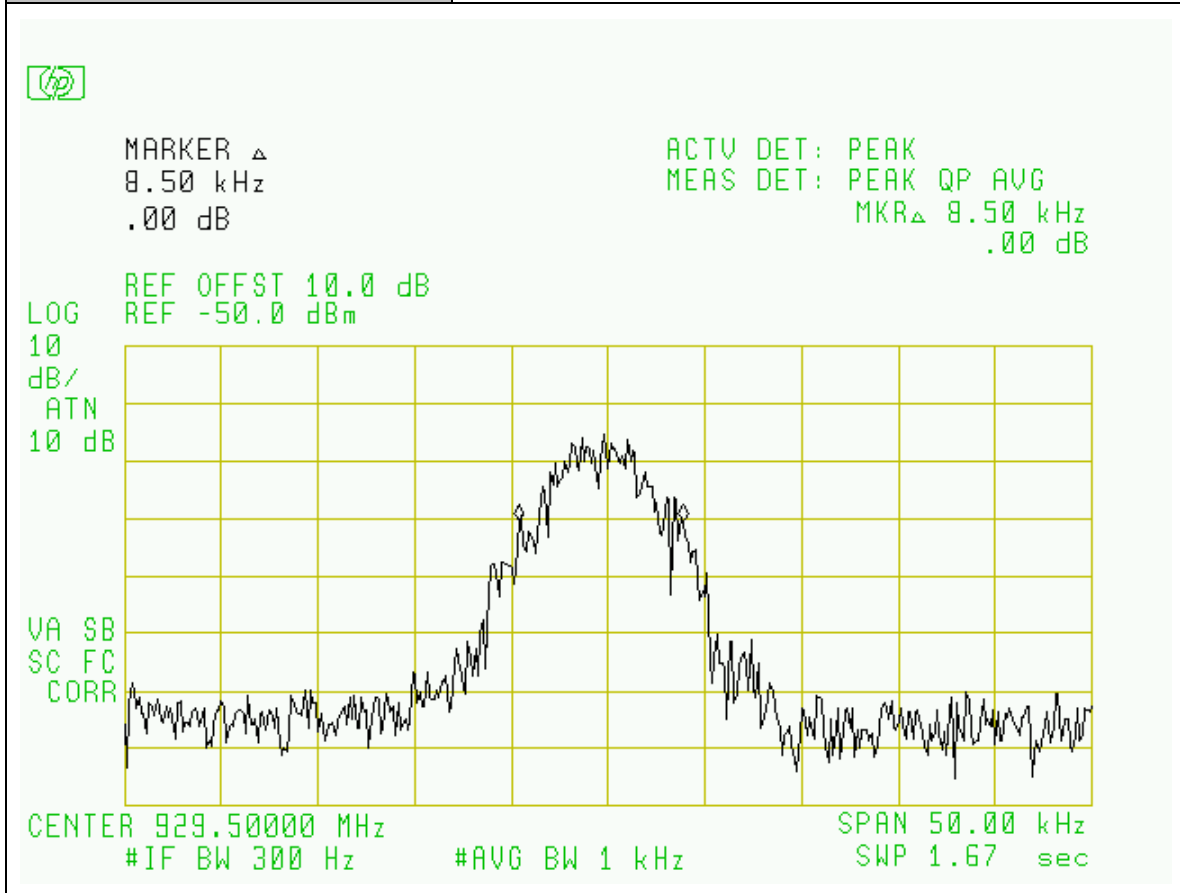
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<b>EUT:</b>	Shyam In Door R-20-930 One Way Paging Repeater
<b>SN:</b>	R20-1PGAG401
<b>Tested By:</b>	Wei Li
<b>Temperature:</b>	70° F
<b>Humidity:</b>	30%

<b>Section:</b>	Occupied Bandwidth: Band I Bands
<b>Plot Name:</b>	Downlink, Mid-Channel, APCO25 Modulation
<b>Configuration:</b>	SG Input: -60dBm, Output Port: EUT MOBILE



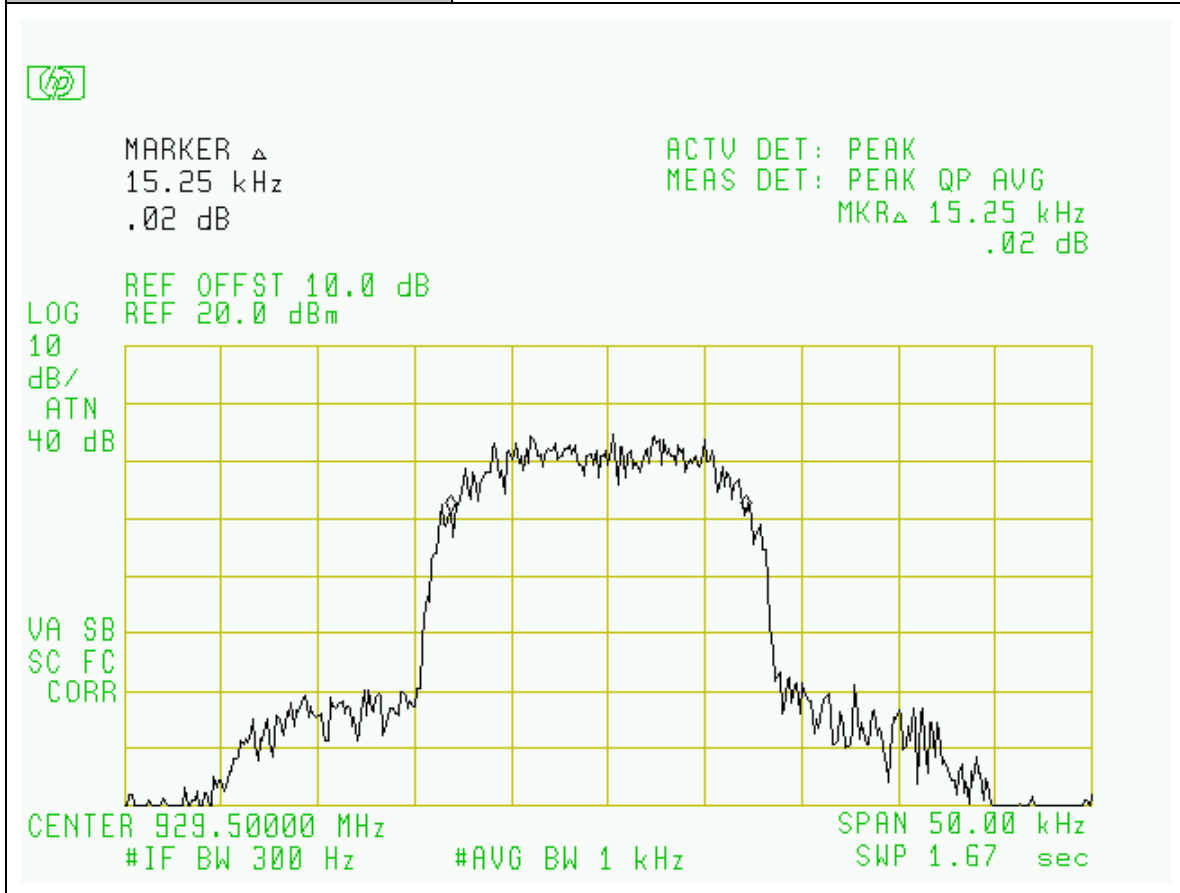
<b>Project Number:</b>	0048-070420-01
<b>EUT:</b>	Shyam In Door R-20-930 One Way Paging Repeater
<b>SN:</b>	R20-1PGAG401
<b>Tested By:</b>	Wei Li
<b>Temperature:</b>	70° F
<b>Humidity:</b>	30%

<b>Section:</b>	Occupied Bandwidth: Band I Bands
<b>Plot Name:</b>	Downlink, Mid-Channel, APCO25 Modulation
<b>Configuration:</b>	SG Input: -60dBm, Output Port: SG



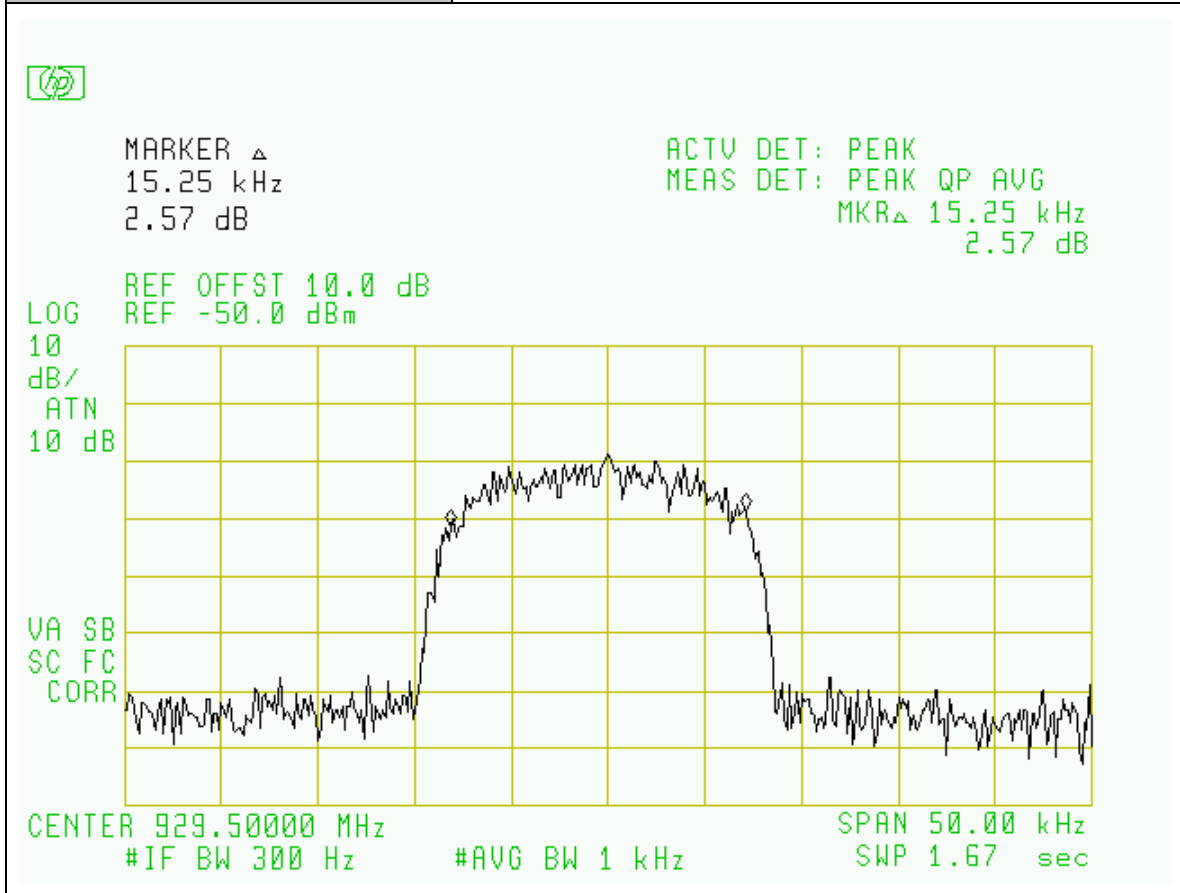
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<b>EUT:</b>	Shyam In Door R-20-930 One Way Paging Repeater
<b>SN:</b>	R20-1PGAG401
<b>Tested By:</b>	Wei Li
<b>Temperature:</b>	70° F
<b>Humidity:</b>	30%

<b>Section:</b>	Occupied Bandwidth: Band I Bands
<b>Plot Name:</b>	Downlink, Mid-Channel, IDEN Modulation
<b>Configuration:</b>	SG Input: -60dBm, Output Port: EUT MOBILE



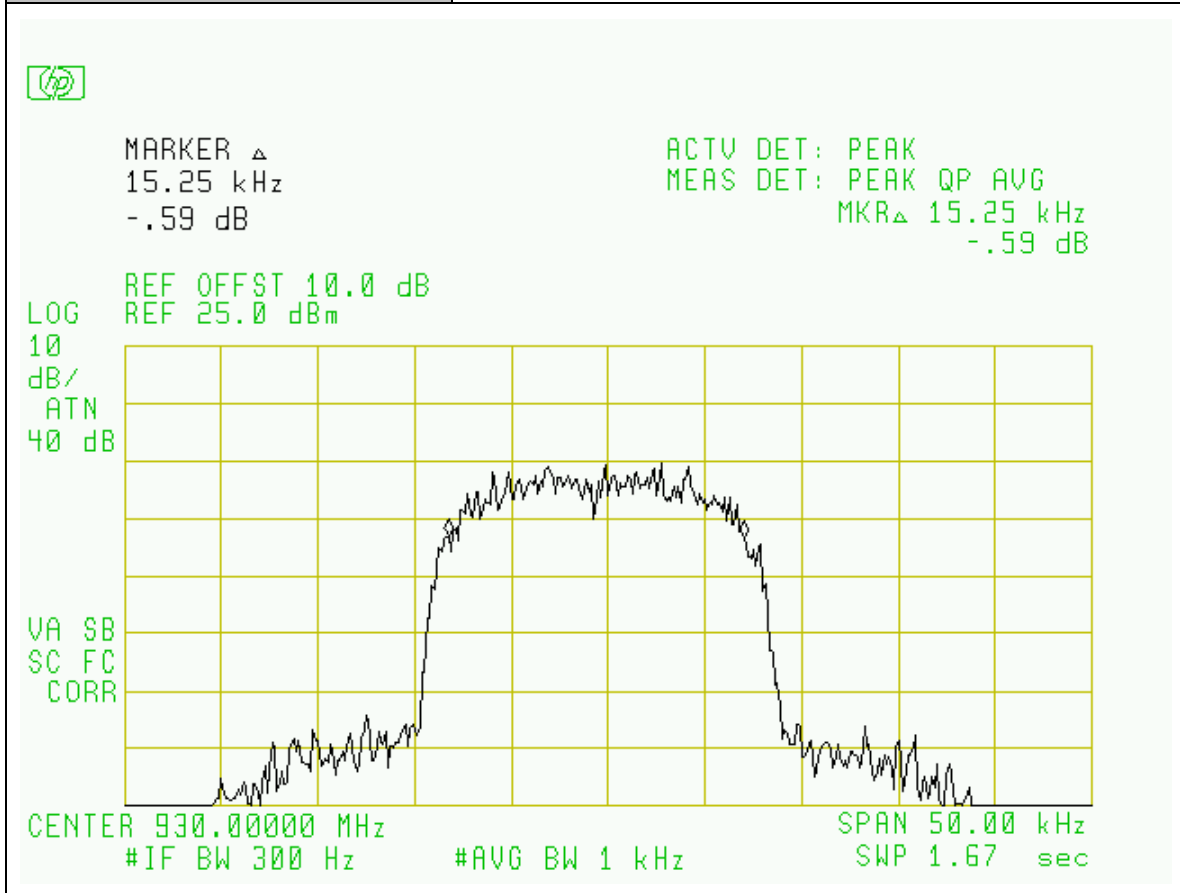
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<b>EUT:</b>	Shyam In Door R-20-930 One Way Paging Repeater
<b>SN:</b>	R20-1PGAG401
<b>Tested By:</b>	Wei Li
<b>Temperature:</b>	70° F
<b>Humidity:</b>	30%

<b>Section:</b>	Occupied Bandwidth: Band I Bands
<b>Plot Name:</b>	Downlink, Mid-Channel, IDEN Modulation
<b>Configuration:</b>	SG Input: -60dBm, Output Port: SG



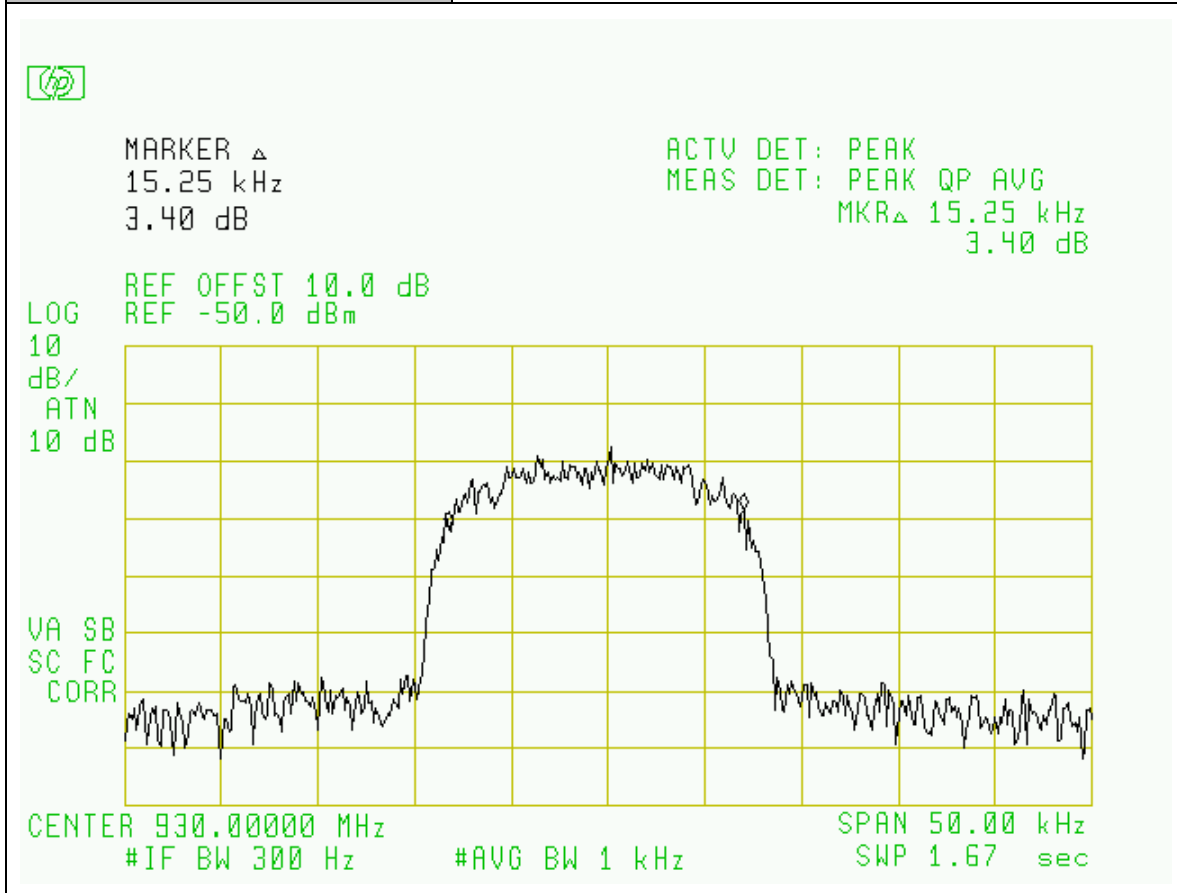
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<b>EUT:</b>	Shyam In Door R-20-930 One Way Paging Repeater
<b>SN:</b>	R20-1PGAG401
<b>Tested By:</b>	Wei Li
<b>Temperature:</b>	70° F
<b>Humidity:</b>	30%

<b>Section:</b>	Occupied Bandwidth: Band I Bands
<b>Plot Name:</b>	Downlink, High-Channel, IDEN Modulation
<b>Configuration:</b>	SG Input: -60dBm, Output Port: EUT MOBILE



<b>Project Number:</b>	0048-070420-01
<b>EUT:</b>	Shyam In Door R-20-930 One Way Paging Repeater
<b>SN:</b>	R20-1PGAG401
<b>Tested By:</b>	Wei Li
<b>Temperature:</b>	70° F
<b>Humidity:</b>	30%

<b>Section:</b>	Occupied Bandwidth: Band I Bands
<b>Plot Name:</b>	Downlink, High-Channel, IDEN Modulation
<b>Configuration:</b>	SG Input: -60dBm, Output Port: SG





## Section 5. Spurious Emissions at Antenna Terminals

<b>Name of Test:</b>	<i>Spurious Emissions at Antenna Terminals</i>	<b>Test Standard:</b>	<i>2.1051</i>
<b>Tested By:</b>	WEI LI EDWARD LEE	<b>Test Date:</b>	04/20/2007-05/01/2007

**Minimum Standard:** -20dBm

**Method of Measurement:** Spectrum Analyzer Settings:  
RBW: 100 kHz&1MHz. As required for digital modulations.  
VBW:>=RBW  
Start Frequency: 0 MHz or lowest EUT clock frequency.  
Stop Frequency: 13 GHz  
Sweep: Auto

For Inter-modulation measurement: Two RF signals set as inputs. The frequencies of both RF signals shall be within the repeater's operating band. The spacing between both RF signals shall be the minimum possible spacing applied in a network. The level of both RF input signals shall be increased, until the maximum rated output power per channel, as declared by the manufacturer, is reached.

Frequencies:  $f1=F_{(Low\ CH/Mid\ CH/High\ CH)}$ ,  $f2=f1\pm\Delta$   
Min. spacing  $\Delta=2.5MHz$  for APCO25 and 600KHz for IDEN&EDGE (including iDEN&APCO25)  
Each RF Input Level:  
about -3dB comparing to the max. input level of single RF Input test

**Test Result:**

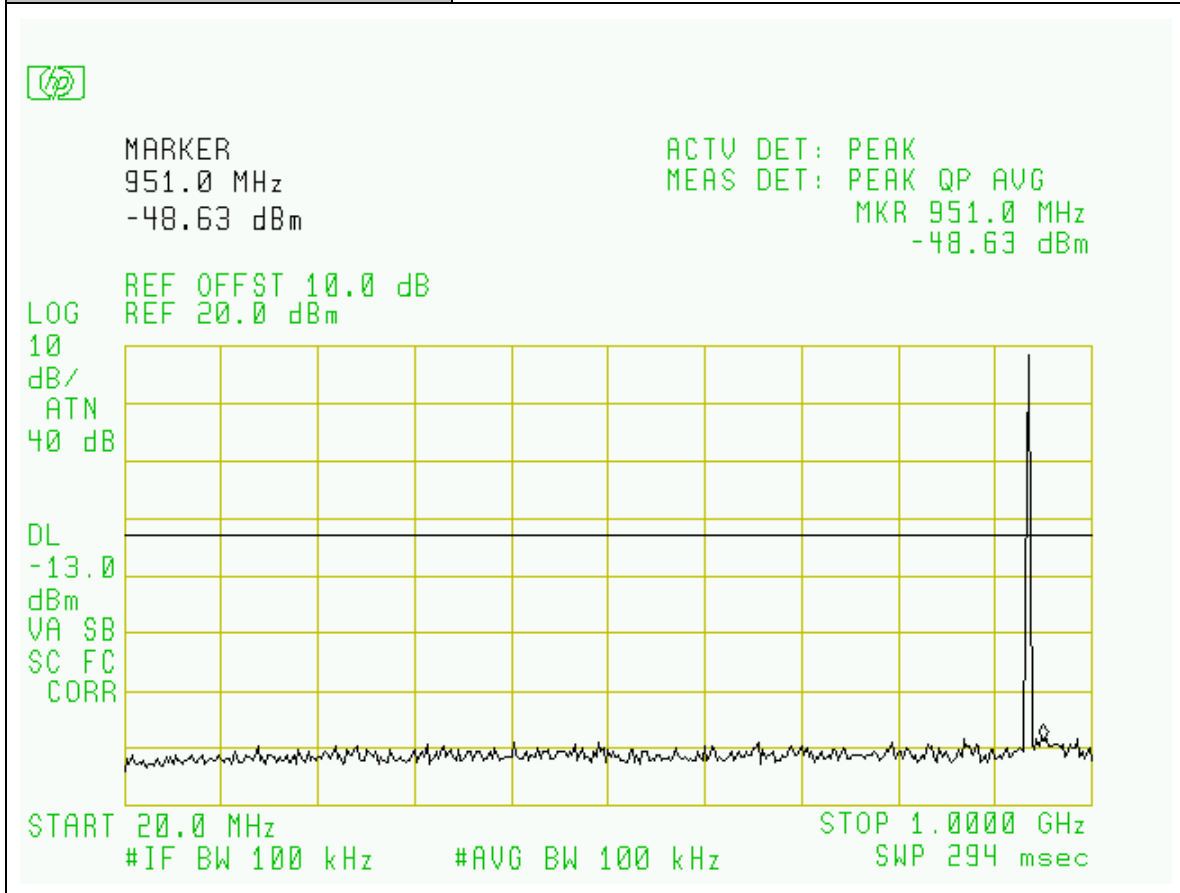
**Complies**

**Test Data:**

Attached Plots

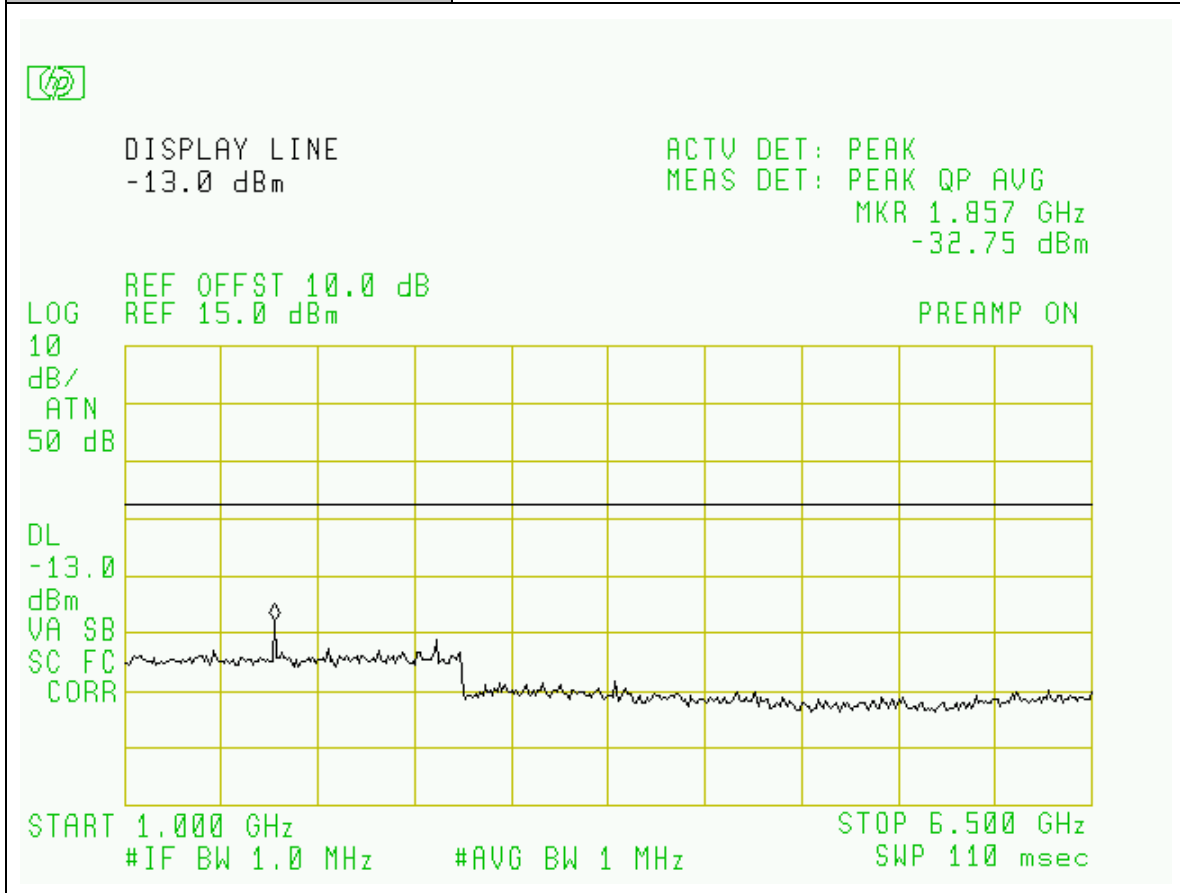
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<b>EUT:</b>	Shyam In Door R-20-930 One Way Paging Repeater
<b>SN:</b>	R20-1PGAG401
<b>Tested By:</b>	Wei Li
<b>Temperature:</b>	70° F
<b>Humidity:</b>	30%

<b>Section:</b>	Spurious Emissions at Antenna Terminals: Band I Bands / APCO25 Modulation
<b>Plot Name:</b>	Downlink, Hi-Channel
<b>Configuration:</b>	SG Input: -52dBm, Output Port: EUT MOBILE



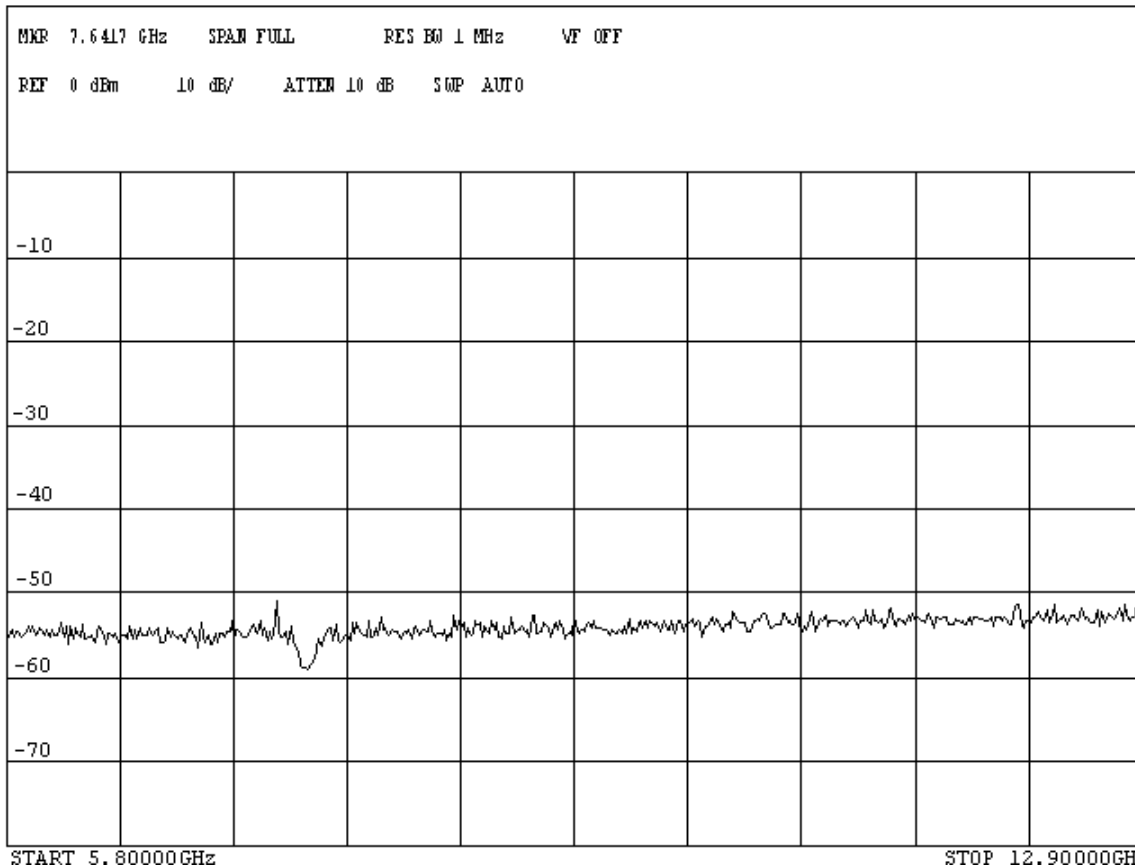
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<b>EUT:</b>	Shyam In Door R-20-930 One Way Paging Repeater
<b>SN:</b>	R20-1PGAG401
<b>Tested By:</b>	Wei Li
<b>Temperature:</b>	70°F
<b>Humidity:</b>	30%

<b>Section:</b>	Spurious Emissions at Antenna Terminals: Band I Bands / APCO25 Modulation
<b>Plot Name:</b>	Downlink, Hi-Channel
<b>Configuration:</b>	SG Input: -52dBm, Output Port: EUT MOBILE



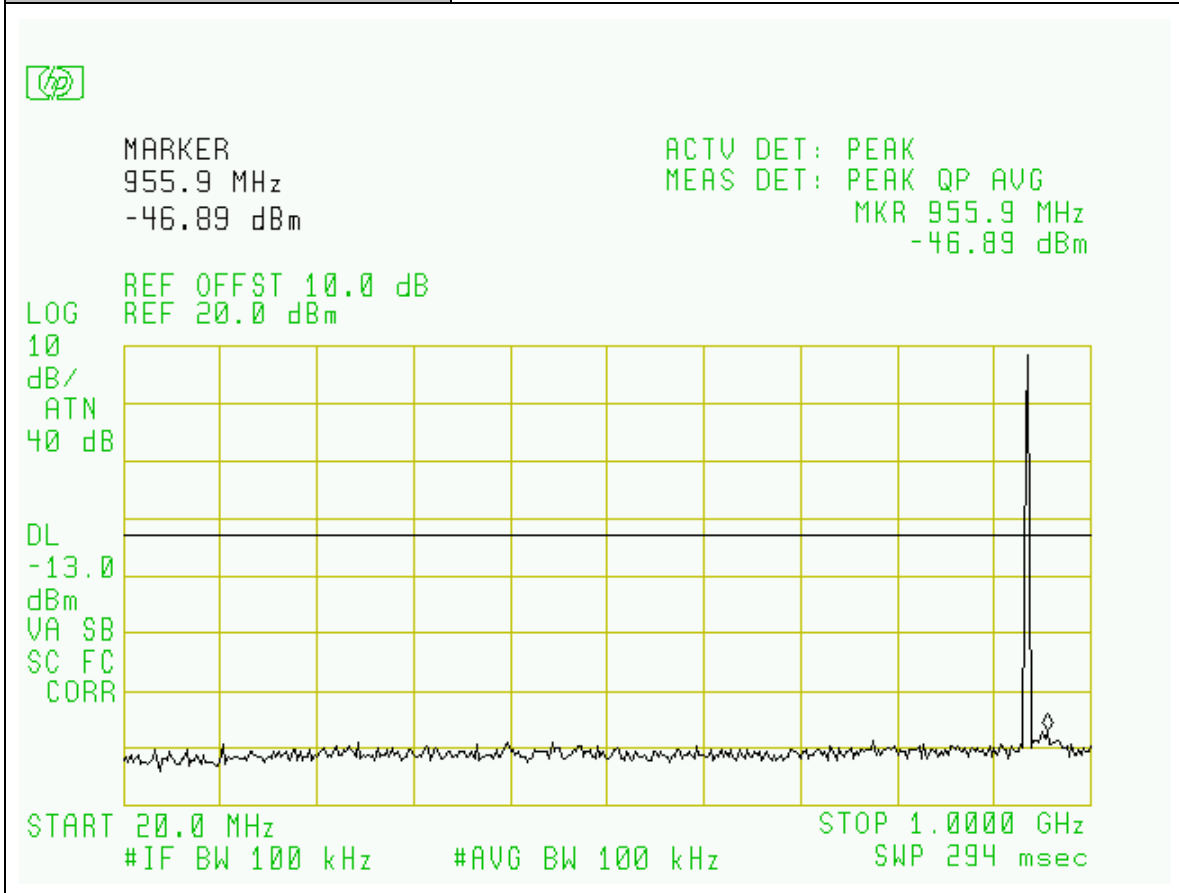
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<b>EUT:</b>	Shyam In Door R-20-930 One Way Paging Repeater
<b>SN:</b>	R20-1PGAG401
<b>Tested By:</b>	Wei Li
<b>Temperature:</b>	70° F
<b>Humidity:</b>	30%

<b>Section:</b>	Spurious Emissions at Antenna Terminals: Band I Bands / APCO25 Modulation
<b>Plot Name:</b>	Downlink, Hi-Channel
<b>Configuration:</b>	SG Input: -52dBm, Output Port: EUT MOBILE



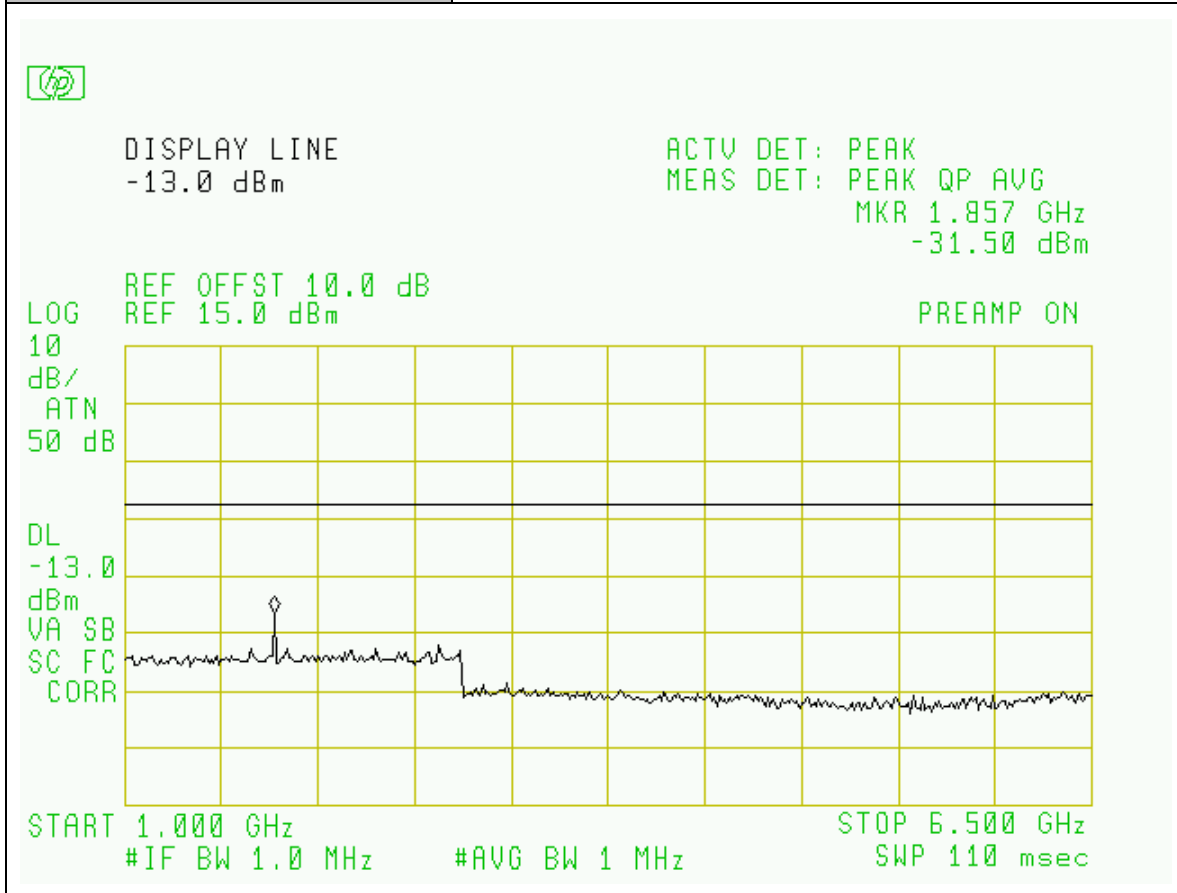
<b>Project Number:</b>	0048-070420-01
<b>EUT:</b>	Shyam In Door R-20-930 One Way Paging Repeater
<b>SN:</b>	R20-1PGAG401
<b>Tested By:</b>	Wei Li
<b>Temperature:</b>	70°F
<b>Humidity:</b>	30%

<b>Section:</b>	Spurious Emissions at Antenna Terminals: Band I Bands / APCO25 Modulation
<b>Plot Name:</b>	Downlink, Mid-Channel
<b>Configuration:</b>	SG Input: -52dBm, Output Port: EUT MOBILE



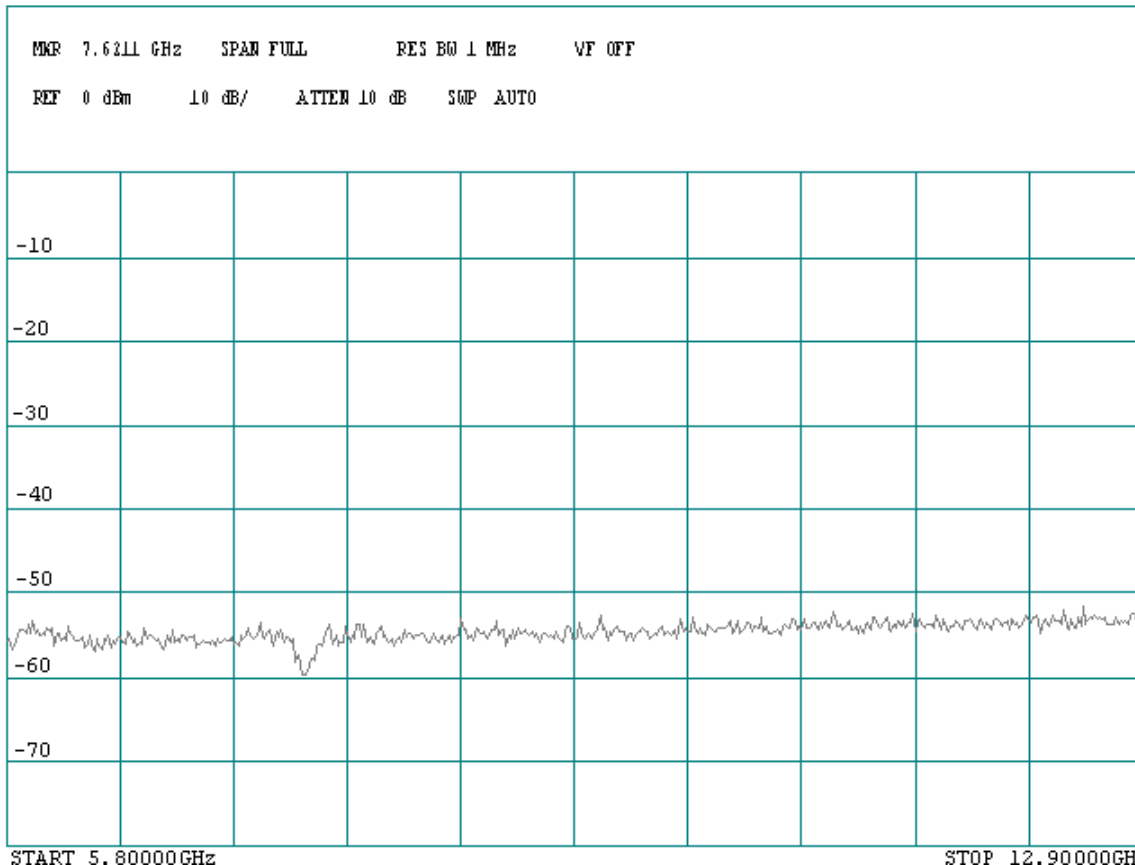
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<b>EUT:</b>	Shyam In Door R-20-930 One Way Paging Repeater
<b>SN:</b>	R20-1PGAG401
<b>Tested By:</b>	Wei Li
<b>Temperature:</b>	70°F
<b>Humidity:</b>	30%

<b>Section:</b>	Spurious Emissions at Antenna Terminals: Band I Bands / APCO25 Modulation
<b>Plot Name:</b>	Downlink, Mid-Channel
<b>Configuration:</b>	SG Input: -52dBm, Output Port: EUT MOBILE



<b>Project Number:</b>	0048-070420-01
<b>EUT:</b>	Shyam In Door R-20-930 One Way Paging Repeater
<b>SN:</b>	R20-1PGAG401
<b>Tested By:</b>	Wei Li
<b>Temperature:</b>	70° F
<b>Humidity:</b>	30%

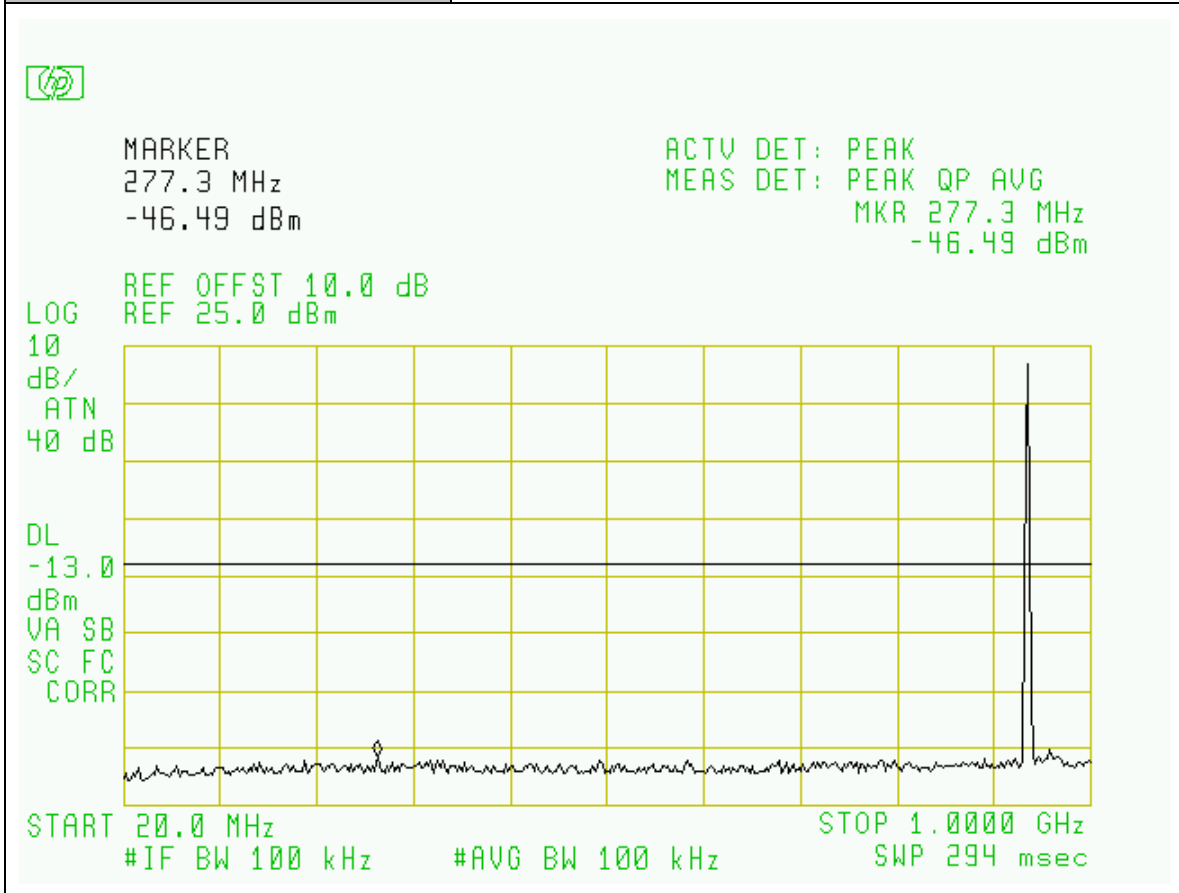
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<b>Plot Name:</b>	<b>Downlink, Mid-Channel</b>
<b>Configuration:</b>	SG Input: -50dBm, Output Port: EUT MOBILE





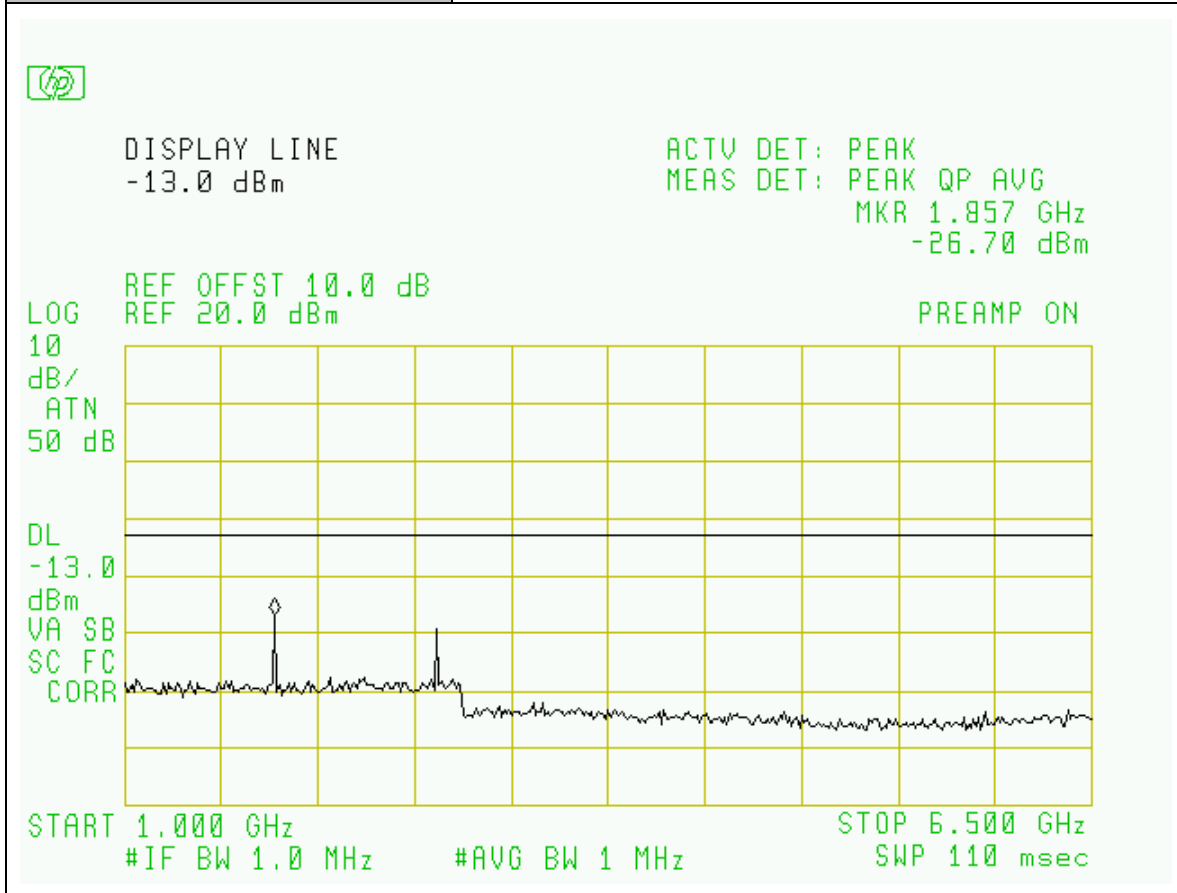
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<b>EUT:</b>	Shyam In Door R-20-930 One Way Paging Repeater
<b>SN:</b>	R20-1PGAG401
<b>Tested By:</b>	Edward Lee
<b>Temperature:</b>	70° F
<b>Humidity:</b>	30%

<b>Section:</b>	Spurious Emissions at Antenna Terminals: Band I Bands / IDEN Modulation
<b>Plot Name:</b>	Downlink, Hi-Channel
<b>Configuration:</b>	SG Input: -52dBm, Output Port: EUT MOBILE



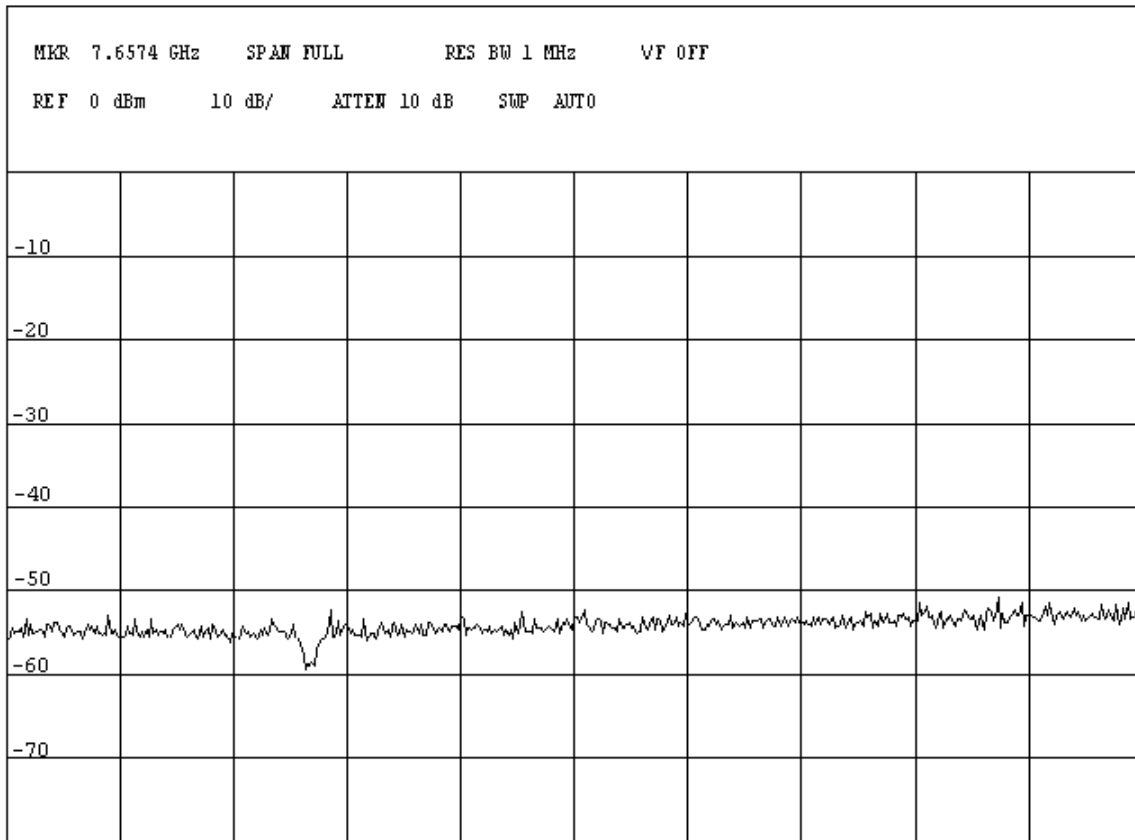
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<b>EUT:</b>	Shyam In Door R-20-930 One Way Paging Repeater
<b>SN:</b>	R20-1PGAG401
<b>Tested By:</b>	Edward Lee
<b>Temperature:</b>	70° F
<b>Humidity:</b>	30%

<b>Section:</b>	Spurious Emissions at Antenna Terminals: Band I Bands / IDEN Modulation
<b>Plot Name:</b>	Downlink, Hi-Channel
<b>Configuration:</b>	SG Input: -52dBm, Output Port: EUT MOBILE



<b>Project Number:</b>	0048-070420-01
<b>EUT:</b>	Shyam In Door R-20-930 One Way Paging Repeater
<b>SN:</b>	R20-1PGAG401
<b>Tested By:</b>	Edward Lee
<b>Temperature:</b>	70° F
<b>Humidity:</b>	30%

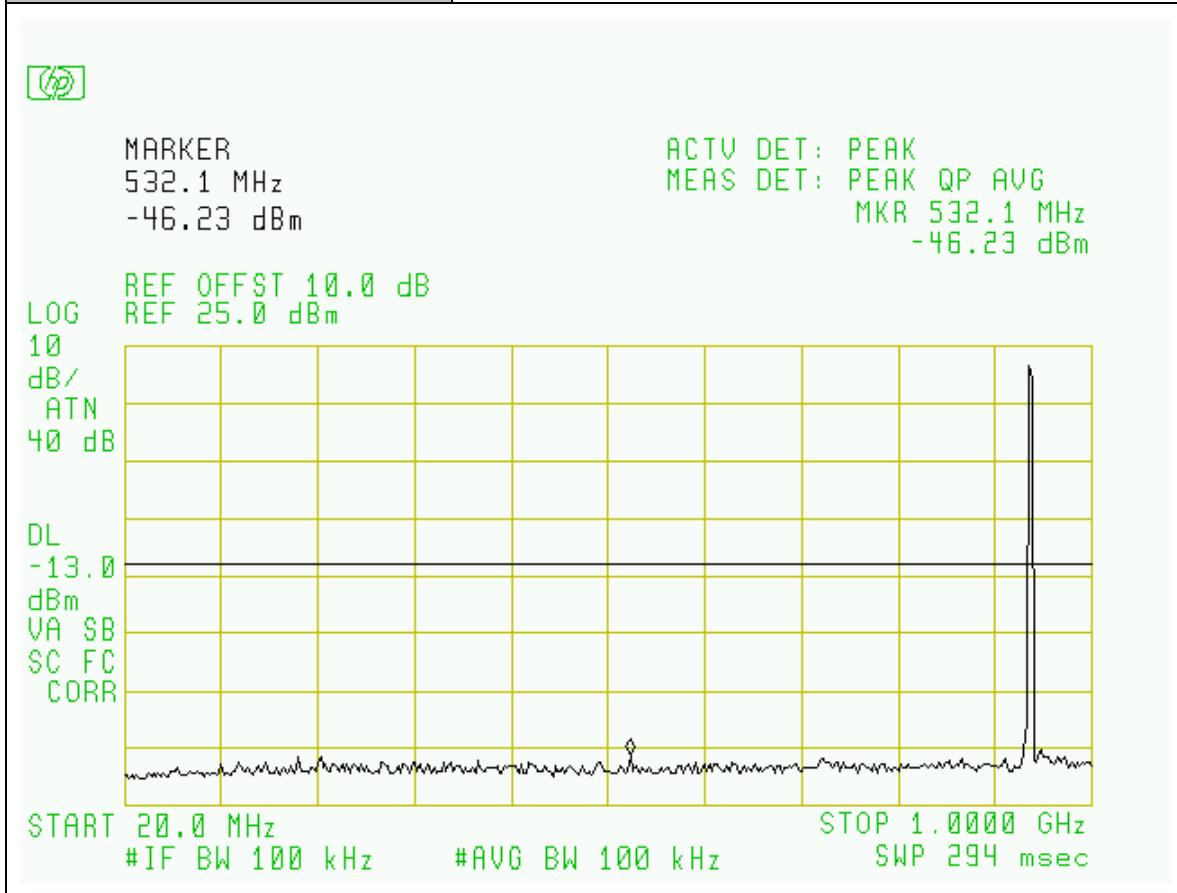
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<b>Plot Name:</b>	Downlink, Hi-Channel
<b>Configuration:</b>	SG Input: -52dBm, Output Port: EUT MOBILE



START 5.80000GHz STOP 12.90000GHz

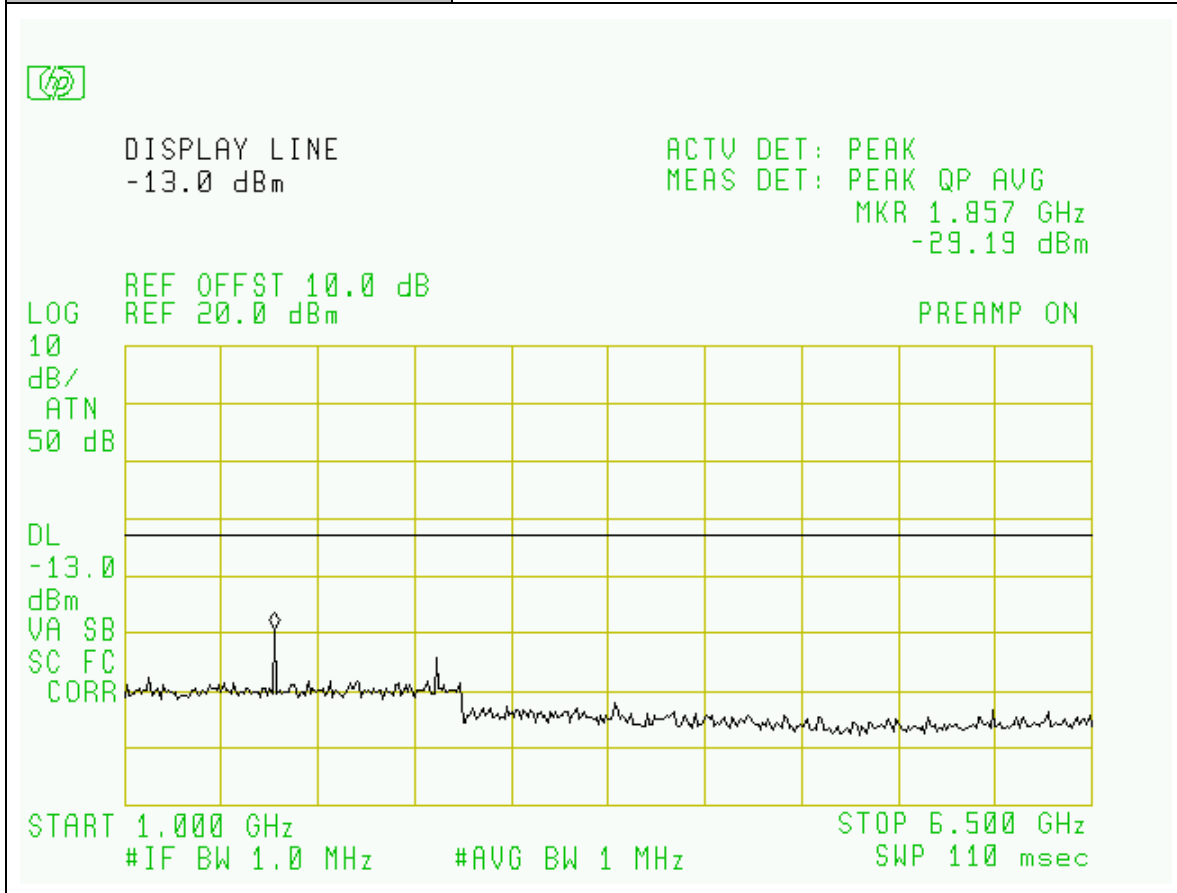
<b>Project Number:</b>	0048-070420-01
<b>EUT:</b>	Shyam In Door R-20-930 One Way Paging Repeater
<b>SN:</b>	R20-1PGAG401
<b>Tested By:</b>	Edward Lee
<b>Temperature:</b>	70° F
<b>Humidity:</b>	30%

<b>Section:</b>	Spurious Emissions at Antenna Terminals: Band I Bands / IDEN Modulation
<b>Plot Name:</b>	Downlink, Mid-Channel
<b>Configuration:</b>	SG Input: -52dBm, Output Port: EUT MOBILE



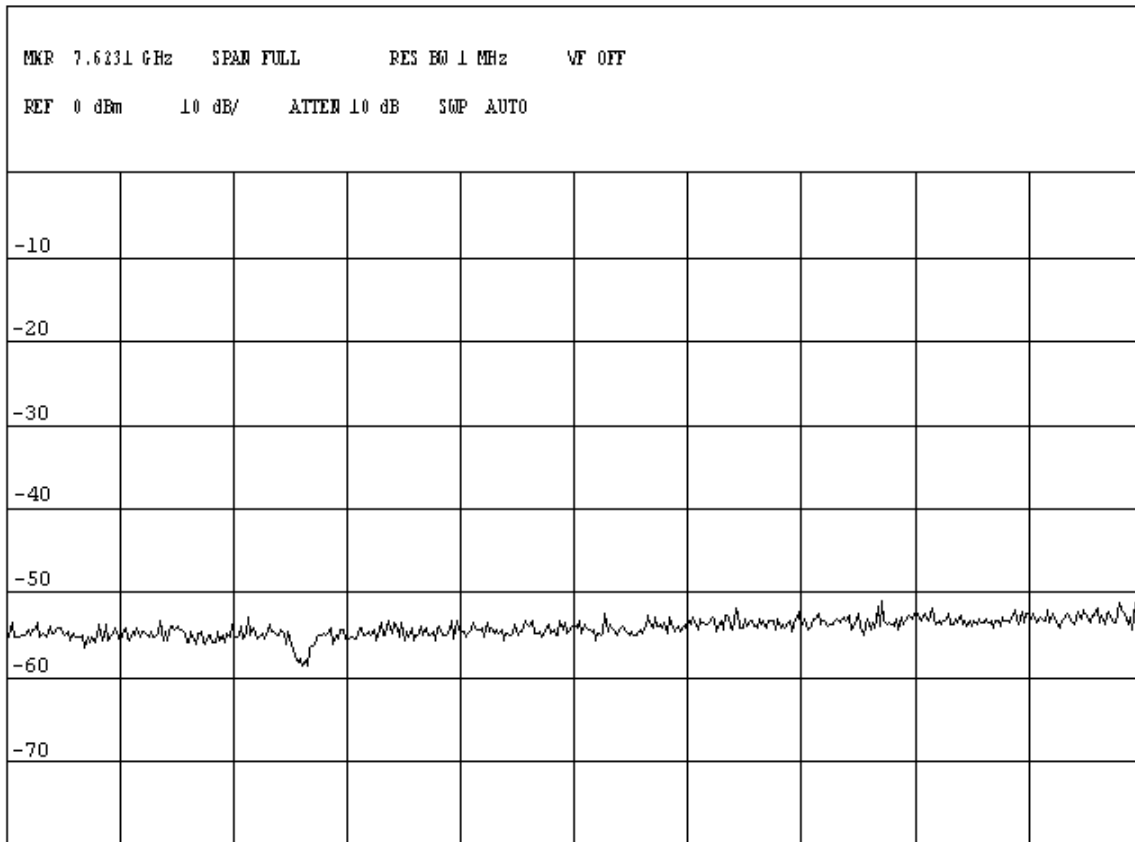
<b>Project Number:</b>	0048-070420-01
<b>EUT:</b>	Shyam In Door R-20-930 One Way Paging Repeater
<b>SN:</b>	R20-1PGAG401
<b>Tested By:</b>	Edward Lee
<b>Temperature:</b>	70° F
<b>Humidity:</b>	30%

<b>Section:</b>	Spurious Emissions at Antenna Terminals: Band I Bands / IDEN Modulation
<b>Plot Name:</b>	Downlink, Mid-Channel
<b>Configuration:</b>	SG Input: -52dBm, Output Port: EUT MOBILE



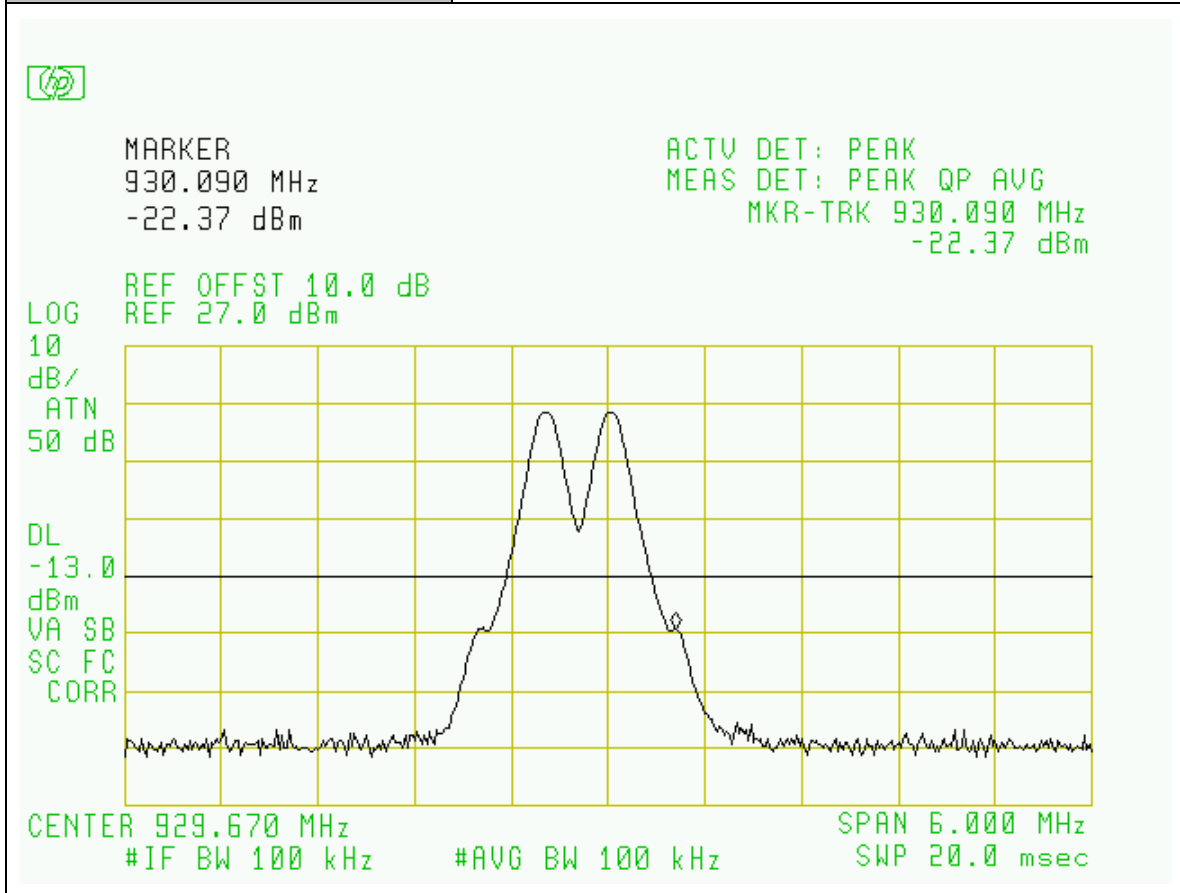
<b>Project Number:</b>	0048-070420-01
<b>EUT:</b>	Shyam In Door R-20-930 One Way Paging Repeater
<b>SN:</b>	R20-1PGAG401
<b>Tested By:</b>	Edward Lee
<b>Temperature:</b>	70° F
<b>Humidity:</b>	30%

<b>Section:</b>	Spurious Emissions at Antenna Terminals: Band I Bands / IDEN Modulation
<b>Plot Name:</b>	Downlink, Mid-Channel
<b>Configuration:</b>	SG Input: -52dBm, Output Port: EUT MOBILE



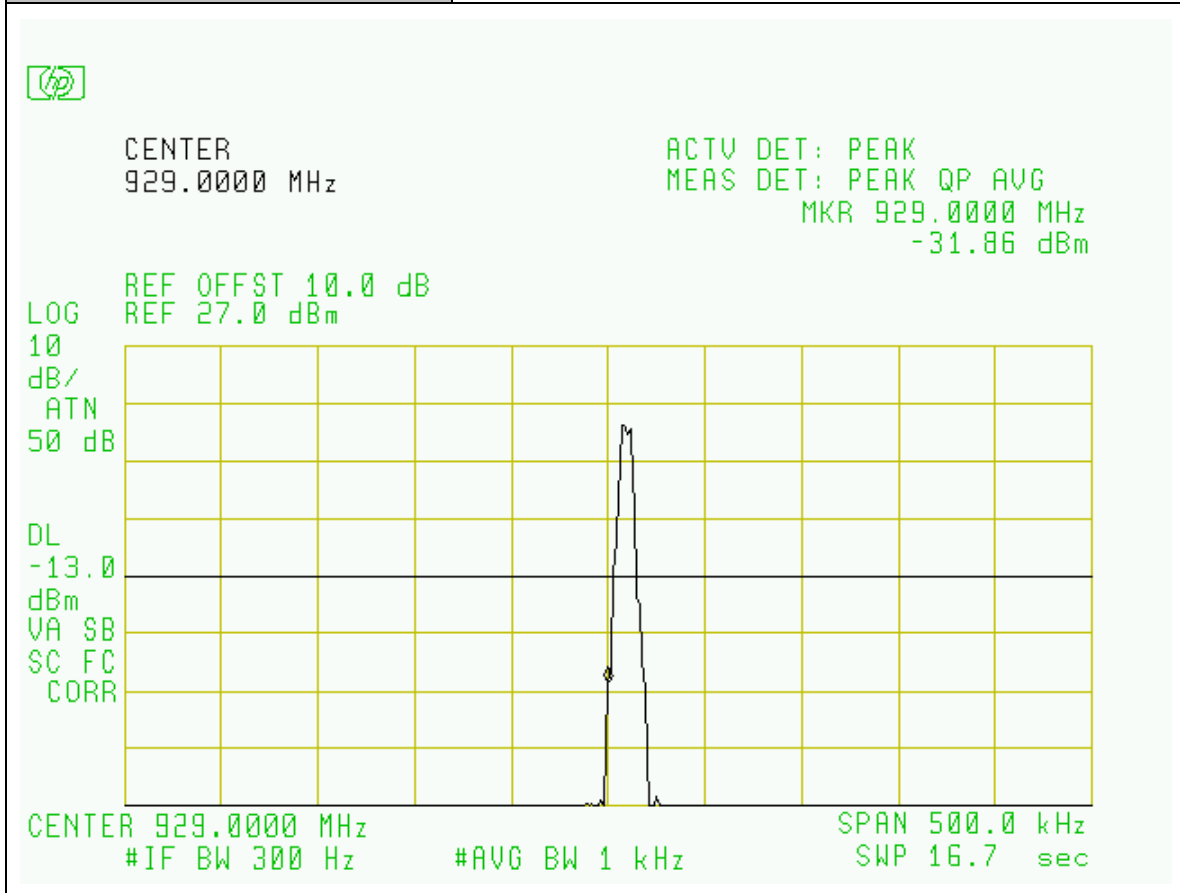
<b>Project Number:</b>	0048-070420-01
<b>EUT:</b>	Shyam In Door R-20-930 One Way Paging Repeater
<b>SN:</b>	R20-1PGAG401
<b>Tested By:</b>	Wei Li
<b>Temperature:</b>	70° F
<b>Humidity:</b>	30%

<b>Section:</b>	Spurious Emissions at Antenna Terminals: Band I Bands / APCO25 Modulation
<b>Plot Name:</b>	DL, Intermodulation
<b>Configuration:</b>	SG Input: -50dBm, Output Port: EUT BTS



<b>Project Number:</b>	0048-070420-01
<b>EUT:</b>	Shyam In Door R-20-930 One Way Paging Repeater
<b>SN:</b>	R20-1PGAG401
<b>Tested By:</b>	Wei Li
<b>Temperature:</b>	70° F
<b>Humidity:</b>	30%

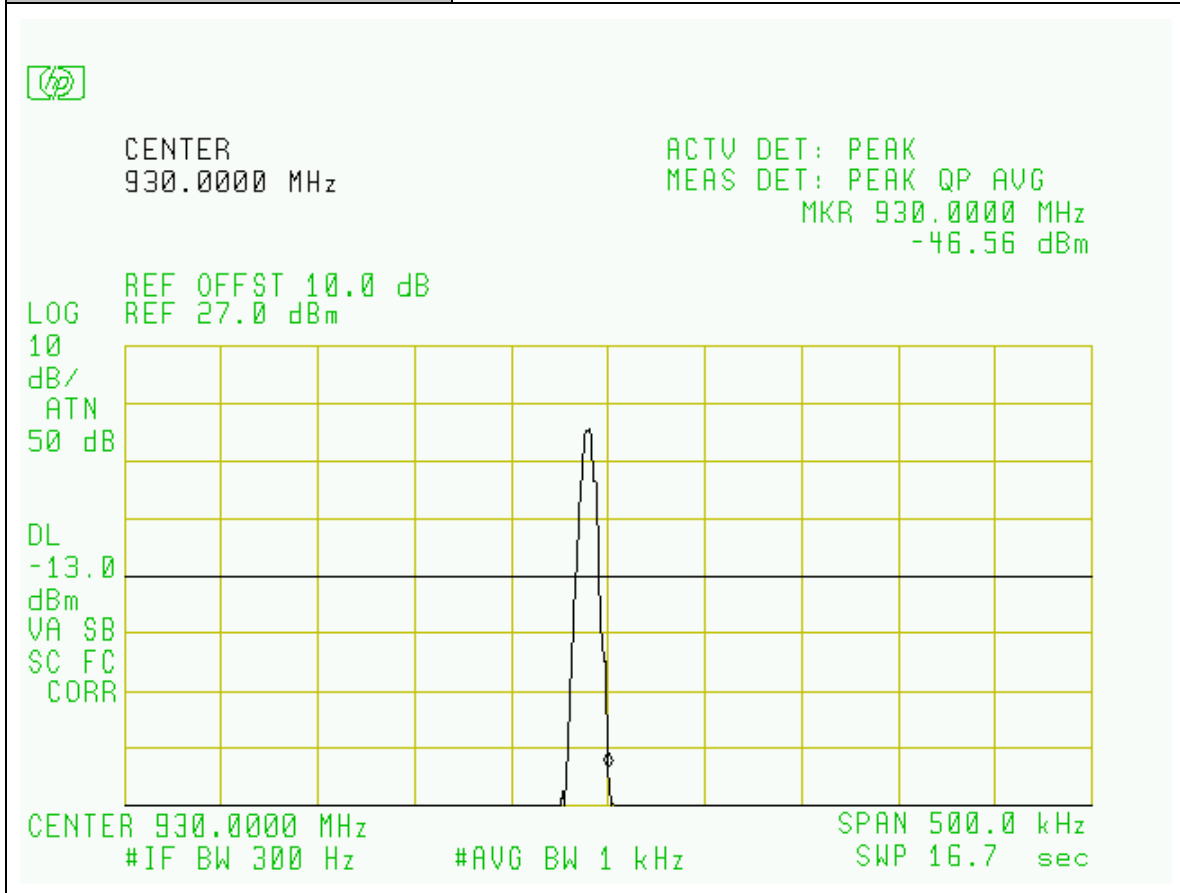
<b>Section:</b>	Spurious Emissions at Antenna Terminals: Band I Bands / APCO25 Modulation
<b>Plot Name:</b>	DL, Lower Bandedge
<b>Configuration:</b>	SG Input: -52dBm, Output Port: EUT MOBILE





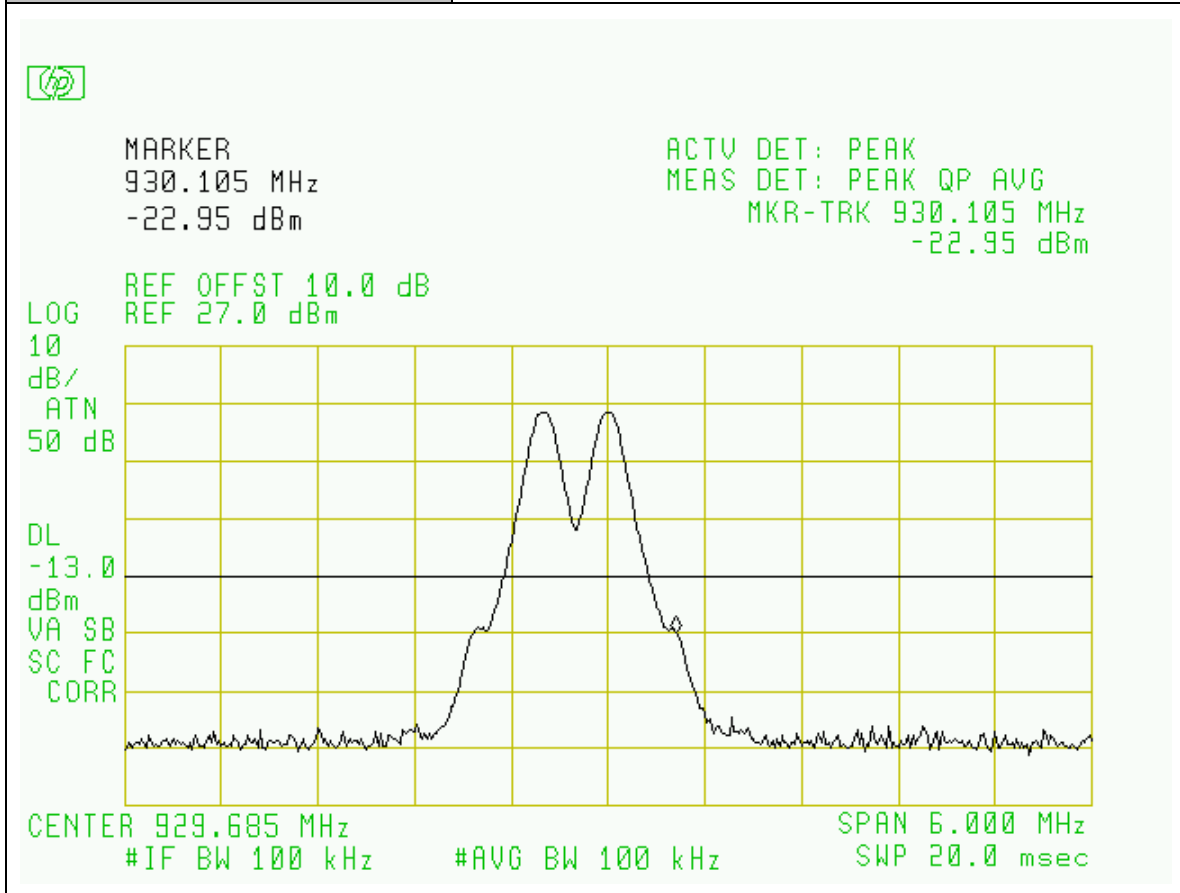
<b>Project Number:</b>	0048-070420-01
<b>EUT:</b>	Shyam In Door R-20-930 One Way Paging Repeater
<b>SN:</b>	R20-1PGAG401
<b>Tested By:</b>	Edward Lee
<b>Temperature:</b>	70° F
<b>Humidity:</b>	30%

<b>Section:</b>	Spurious Emissions at Antenna Terminals: Band I Bands / APCO25 Modulation
<b>Plot Name:</b>	DL, Upper Bandedge
<b>Configuration:</b>	SG Input: -52dBm, Output Port: EUT BTS



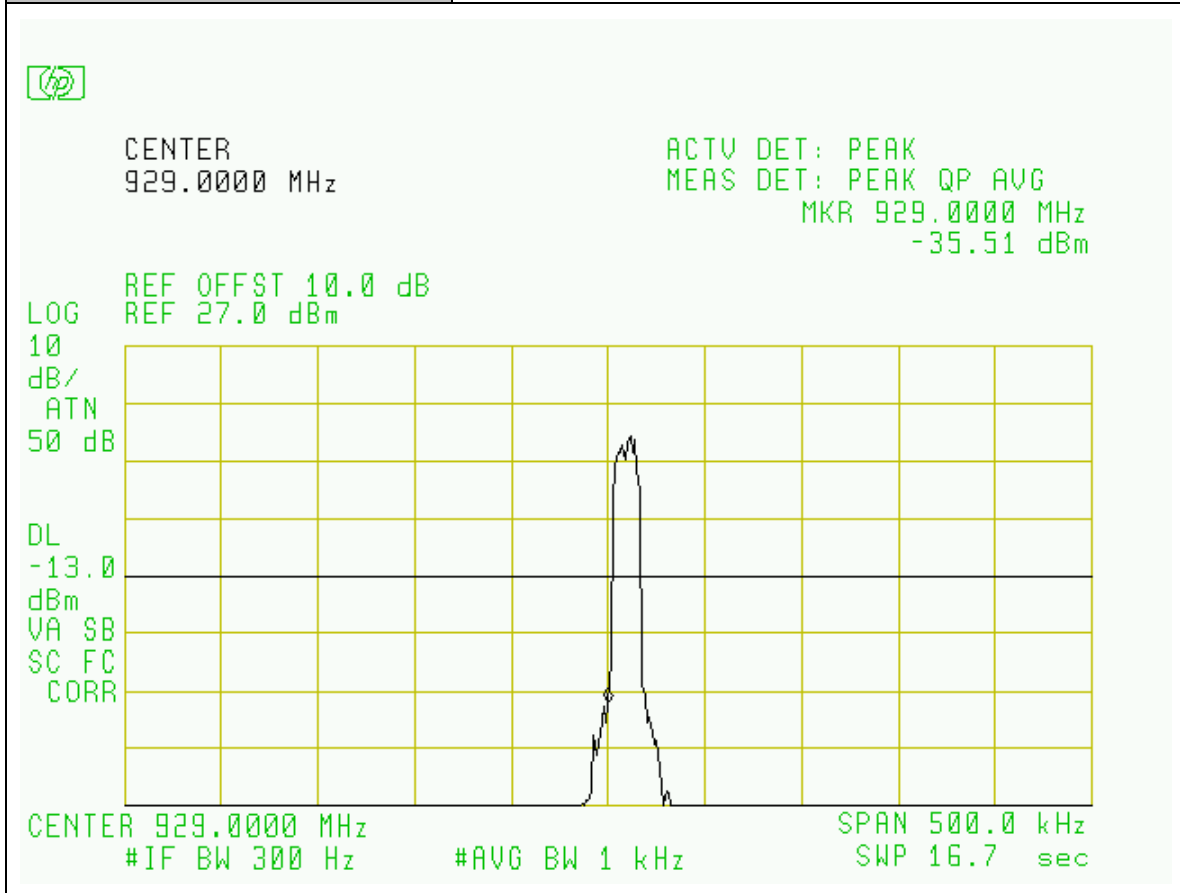
<b>Project Number:</b>	0048-070420-01
<b>EUT:</b>	Shyam In Door R-20-930 One Way Paging Repeater
<b>SN:</b>	R20-1PGAG401
<b>Tested By:</b>	Wei Li
<b>Temperature:</b>	70° F
<b>Humidity:</b>	30%

<b>Section:</b>	Spurious Emissions at Antenna Terminals: Band I Bands / APCO25 Modulation
<b>Plot Name:</b>	DL, Intermodulation
<b>Configuration:</b>	SG Input: -50dBm, Output Port: EUT BTS



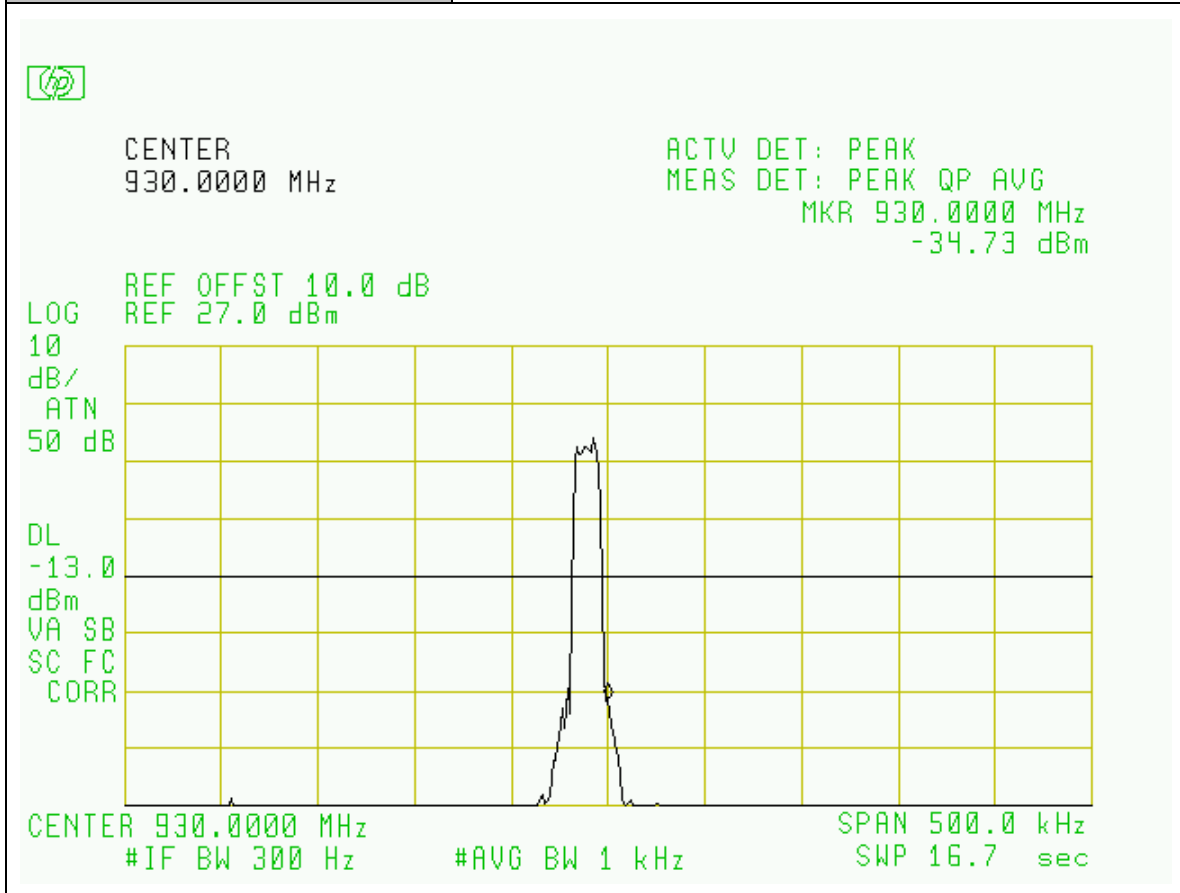
<b>Project Number:</b>	0048-070420-01
<b>EUT:</b>	Shyam In Door R-20-930 One Way Paging Repeater
<b>SN:</b>	R20-1PGAG401
<b>Tested By:</b>	Wei Li
<b>Temperature:</b>	70° F
<b>Humidity:</b>	30%

<b>Section:</b>	Spurious Emissions at Antenna Terminals: Band I Bands / APCO25 Modulation
<b>Plot Name:</b>	DL, Lower Bandedge
<b>Configuration:</b>	SG Input: -52dBm, Output Port: EUT MOBILE



<b>Project Number:</b>	0048-070420-01
<b>EUT:</b>	Shyam In Door R-20-930 One Way Paging Repeater
<b>SN:</b>	R20-1PGAG401
<b>Tested By:</b>	Edward Lee
<b>Temperature:</b>	70° F
<b>Humidity:</b>	30%

<b>Section:</b>	Spurious Emissions at Antenna Terminals: Band I Bands / APCO25 Modulation
<b>Plot Name:</b>	DL, Upper Bandedge
<b>Configuration:</b>	SG Input: -52dBm, Output Port: EUT BTS



## Section 6. Field Strength of Spurious

<b>Name of Test:</b>	<i>Field Strength of Spurious</i>	<b>Test Standard:</b>	<i>2.1053 90.210</i>
<b>Tested By:</b>	EDWARD LEE	<b>Test Date:</b>	04/20/2007-05/01/2007

**Minimum Standard:** -20dBm

**Method of Measurement:** TIA/EIA-603-1992, Section 2.2.12  
The antenna substitution method was used to determine the equivalent radiated power at spurious frequencies. The spurious emissions were measured at a distance of 3 meters. The EUT was then replaced with a reference substitution antenna with a known gain referenced to a dipole. This antenna was fed with a signal at the spurious frequency. The level of the signal was adjusted to repeat the previously measured level. The resulting ERP is the signal level fed to the reference antenna corrected for gain referenced to a dipole.

Emissions at middle channel of DL band were investigated and the worst cases were recorded.

Two RF signals set as inputs. The frequencies of both RF signals shall be within the repeater's operating band. The spacing between both RF signals shall be the minimum possible spacing applied in a network. The level of both RF input signals shall be increased, until the maximum rated output power per channel, as declared by the manufacturer, is reached.

Per FCC Requirements, the antenna substitution method can be replaced by using following calculation to yield the required limit criteria WHEN the max. level of measured spurious emissions is 30dB below the limit.

**Test Result:**

**Complies**

**Test Data:**

See Attached Table(s)

Calculation for Required Emission Limit Per 2.1053

With the EUT output level set to rated power, Radiated Emissions between 10 MHz and 10 GHz (Cellular) or 20GHz (PCS) shall be observed. The “Low, Mid, and High”( if applicable) frequencies shall be used for this test.

The Emission Limits and measuring instrumentation settings established in FCC Part 2.1053 shall be followed. Emissions shall be less than  $43 + 10 \log (P)$  dBc. Per FCC Part 2.1053(a), “Information submitted shall include the relative radiated power of each spurious emission with reference to the rated power output of the transmitter (*amplifier*), assuming all emissions are radiated from half-wave dipole antennas.” The following relationships yield the required limit criteria.

For a half-wave dipole antenna in free space:

$$E = (49.2 * P)^{1/2}/R$$

Where:

E = Field intensity in Volts/meter of carrier

P = transmitted power in Watts

R = Distance from antenna to EUT in meters (3 meters)

Conversion of E, Volts/meter to dBuV/m:

$$20 \log (E * 10^6)$$

Attenuation requirement (Atten):  $43 + 10 \log P$

Thus, the required limit:

$$E_{lim} = E - \text{Atten} \quad \text{dBuV/m}$$

Then,  $E_{lim} = 84.38 \text{ dBuV/m}$

Note: Emissions less than 64.38 dBuV/m (84.38 - 20 dB) may not be reported.

<b>Configuration</b>	Band I
<b>Band</b>	Downlink
<b>Channel</b>	Mid

Freq. (MHz)	H,V	SA Reading (dBuV)	Height (m)	Angle (degree)	Calculated 3m Limit (dBuV)	Margin (dB)	Absolute Limit (dBm)	Margin (dB)
1859.0	V	43.1	1.1	10	84.38	-41.28	-20	-43.9
2788.5	V	42.5	1.2	0	84.38	-41.88	-20	-44.5
827.5	V	46.0	1.1	10	84.38	-38.38	-20	-41
1655.0	V	40.8	1.1	10	84.38	-43.58	-20	-46.2
999.5	V	53.8	1.1	10	84.38	-30.58	-20	-33.2
1999.0	V	53.2	1.2	10	84.38	-31.18	-20	-33.8
2998.5	V	54.0	1.2	0	84.38	-30.38	-20	-33
3998.0	V	52.1	1.2	0	84.38	-32.28	-20	-34.9

**NOTE:**

\* Measured noise floor  
 SA: Spectrum Analyzer

H=horizontal and V=vertical  
 SA Reading: Average Reading ( worst case)

**Section 7. Frequency Stability**

<b>Name of Test:</b>	<i>Frequency Stability</i>	<b>Test Standard:</b>	<i>2.1055 22.355&amp;24.235</i>
<b>Tested By:</b>	WEI LI	<b>Test Date:</b>	04/20/2007-05/01/2007

**Minimum Standard:** Para. No. 22.355. The transmitter carrier frequency shall remain within the tolerances given in Table C-1.

TABLE C-1.—FREQUENCY TOLERANCE FOR TRANSMITTERS IN THE PUBLIC MOBILE SERVICES

Frequency range (MHz)	Base, fixed (ppm)	Mobile ≤3 watts (ppm)	Mobile ≤3 watts (ppm)
25 to 50 .....	20.0	20.0	50.0
50 to 450 .....	5.0	5.0	50.0
450 to 512 .....	2.5	5.0	5.0
821 to 896 .....	1.5	2.5	2.5
928 to 929 .....	5.0	n/a	n/a
929 to 960 .....	1.5	n/a	n/a
2110 to 2220 .....	10.0	n/a	n/a

Para No. 24.235. The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

**Method of Measurement:** Frequency Stability With Voltage Variation:  
 The E.U.T. is placed in an environmental chamber and allowed to stabilize at +20 degrees Celsius for at least 15 minutes. Set SA resolution bandwidth low enough (30Hz) to obtain the desired frequency resolution. (Using frequency counter method: The frequency counter and signal generator are phase locked with the same 10 MHz reference frequency by connecting the 10 MHz ref. out of the counter to the 10MHz ref, in of the signal generator). With the voltage input to the E.U.T. set to 85% S.T.V., the frequency is measured in 30 second intervals for a period of 5 minutes. This procedure is repeated at 100% S.T.V. and 115% S.T.V.

Frequency Stability With Temperature Variation:  
 The input voltage to the E.U.T. is set to S.T.V. and the temperature of the environmental chamber is varied in 10 degree steps from -30 degrees C to +50 degrees C. The E.U.T. is allowed to stabilize at each temperature and the frequency is measured in 30 second intervals for a period of 5 minutes.



**Test Result:**

**Complies**

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**Test Data:**

See Attached Table(s)

***Not Applicable***

## Section 8. Test Equipment List

Manufacture	Model	Serial No.	Description	Cal Due dd/mm/ yy
HP	HP8546A	3448A00290	EMI Receiver	01/12/07
HP	E4432B	US38220355	250K-3GHz Signal Generator	15/07/07
EMCO	3104C	9307-4396	20-300MHz Biconical Antenna	15/09/07
EMCO	3146	9008-2860	200-1000MHz Log-Periodic Antenna	09/02/08
Fischer Custom	LIPARTS NO.-2	900-4-0008	Line Impedance Stabilization Networks	15/09/07
Fischer Custom	LIPARTS NO.-2	900-4-0009	Line Impedance Stabilization Networks	23/08/07
EMCO	6502	2665	10KHz-30MHz Active Loop Antenna	27/02/08
EMCO	3115	4945	Double Ridge Guide Horn Antenna	13/09/07
HP	8569B	2607A02802	1GHz-22GHz Spectrum Analyzer	10/02/08
Delta Design	5900C	0-67-26	Temperature Chamber	24/03/08
HP	E8254A	US42110367	Signal Generator	23/03/08
Electro-Metrics	RGA-15	8-95	Double Ridge Guide Horn Antenna	10/02/08
EMCO	3116	4943	Double Ridge Guide Horn Antenna	11/01/08
Scientific-Atlanta	12A-18	441	Wave Guide Horn Antenna	04/08/07
HP	4419A	US37292112	RF Power Meter w/ Sensor Probe	20/07/07
Chamber	GD-32-33	LN2	Temperature Chamber	28/07/07
HP	6032A	3323A-09526	System Power Supply	01/07/07
Agilent	E4438C	US41460731	ESG Vector Signal Generator	01/07/07
Agilent	E4438C	US41460771	ESG Vector Signal Generator	01/07/07
Agilent	E4438C	US41460400	ESG Vector Signal Generator	01/07/07
Lorch Microwave	5NF- 800/1000-S	AC3	Notch Filter	
Lorch Microwave	5NF- 1800/2200-S	AE10	Notch Filter	
RES-NET	RFA500NFF 30	0108	30dB in-line Power Attenuator	
Narda	3022	80986	Directional Coupler	
General Purpose			0-60V, 50A DC Power Supply	