

**Advanced  
Compliance Laboratory**

6 Randolph Way  
Hillsborough, NJ 08844  
Tel: (908) 927 9288  
Fax: (908) 927 0728

**Electromagnetic  
Emission  
Compliance  
Test Report**



**Equipment Under Test  
(EUT)  
Applicant**

**HRPM850**  
RF100595/NTN065JA  
Andrew Corporation

**In Accordance With**

FCC Part 22 & Part 2

**Tested by**

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

**Authorized by**

Wei Li  
Lab Manager

Signature

**Date**

February 1, 2007

**AC Lab Report  
Number**

0048-070116-01-FCC



Lab Code:200101-0

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

## Index

<b>Section 1. Summary of Test Results</b> .....	3
<b>Section 2. General Equipment Specification</b> .....	5
<b>Section 3. RF Output Power</b> .....	7
<b>Section 4. Occupied Bandwidth</b> .....	10
<b>Section 5. Spurious Emissions at Antenna Terminals</b> .....	24
<b>Section 6. Field Strength of Spurious</b> .....	54
<b>Section 7. Frequency Stability</b> .....	60
<b>Section 8. Test Equipment List</b> .....	62
<b>Section 9. FCC ID Labeling</b> .....	63
<b>Section 10. Maximum Permissible Exposure</b> .....	64
<b>Section 11. Setup Photos</b> .....	65
<b>Section 12. EUT Photos</b> .....	69

## Section 1. Summary of Test Results

Manufacturer: Andrew Corporation

Product Name: HRP850

Model No.: RF100595/NTN065JA

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 Part 22 & Part 2.

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**

Advance Compliance Laboratory, Inc. authorizes the above named company to reproduce this report provided it is reproduced in its entirety and for use by the company's employees only.

Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. Advance Compliance Laboratory, Inc. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report. This report applies only to the items tested.

**Summary of Test Data**

<b>RF Power Output</b>	22.913(a)	500W ERP	Complies**
	24.232(a)	100W EIRP	N/A*
<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)	Mask	Complies
<b>Spurious Emissions at Antenna Terminals</b>	22.917	-13 dBm	Complies
	24.238	-13 dBm	N/A*
<b>Field Strength of Spurious Emissions</b>	22.917	-13 dBm	Complies
	24.238	-13 dBm E.I.R.P.	N/A*
<b>Frequency Stability</b>	22.355	1.5 ppm	N/A*
	24.235	0.05 ppm	N/A*

\* These items are NOT applied to the EUT.

\*\* See page 10.

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: February 1, 2007

**Section 2. General Equipment Specification**

<b>Supply Voltage</b>	27VDC				
<b>Frequency Range</b>	Cellular	DL/869MHz-894MHz			
	PCS	N/A			
<b>Modulation</b>	<input type="checkbox"/> CDMA 2000	<input type="checkbox"/> WCDMA	<input checked="" type="checkbox"/> GSM	<input checked="" type="checkbox"/> EDGE	<input type="checkbox"/> TDMA
<b>Type of Emissions</b>	F9W	F9W	GXW	G7W	DXW
<b>Rated Power</b>	60 W for GSM/45W for EDGE				
<b>Operating Power</b>	Max. 60W total power for single carrier (GSM)				
<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 27VDC. The RF power output was measured with the indicated voltage and current applied into the final RF amplifying device(s).

**RF100595/NTN065JA Amplifier**

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

Measured Rated RF output: 47.75dBm (GSM 60W) & 46.5dBm (EDGE 45W)

Measured DC voltage: 27.0V

Measured DC current: 5.69A (GSM) & 4.68A(EDGE)

Measured Minimum RF output: 14dBm

Measured DC voltage: 27.0V

Measured DC current: 1.2A

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

There are no user accessible adjustments or tuning in this amplifier. 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.

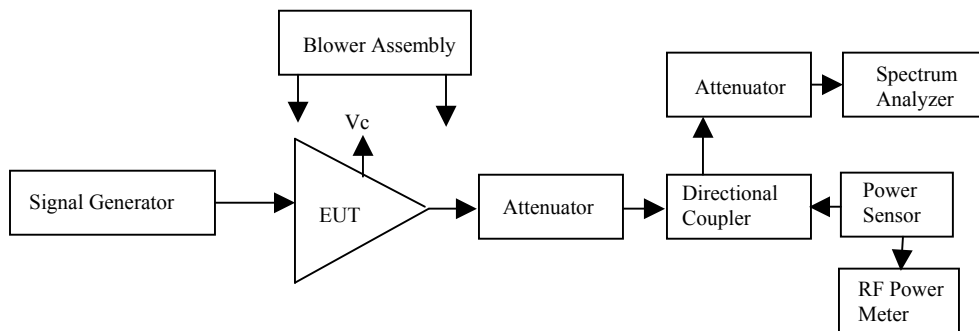
### **Description of Operation**

This device is a single carrier power amplifier used in BTS in downlink spectrum of Cellular band. All measurements shall be made at room temperature and at nominal DC input voltage.

### **System Diagram**

See Attachment.

### **General EUT Setup**



### Section 3. RF Output Power

<b>Name of Test:</b>	<i>RF Output Power</i>	<b>Test Standard:</b>	<i>22.913(a)</i>
<b>Tested By:</b>	WEI LI	<b>Test Date:</b>	01/16/2007-01/30/2007

**Minimum Standard:** Para. No. 22.913(a). The maximum effective radiated power (ERP) of base station transmitters and cellular repeaters must not exceed 500 Watts (57dBm).

**Method of Measurement:** The EUT is a RF amplifier. The manufacturer does not provide an antenna for sale with the product, hence EIRP is not measured nor calculated.

Per 2.1046: The RF Power Output shall be measured at the output connector of the EUT. The output level shall be +47.75dBm(60W) for GSM and +46.50dBm(45W) for EDGE with  $\pm 1$  dB over the Cellular frequency band: 869 to 894 MHz.

Using power meter, power measurements shall be taken at the low band edge, mid, and high band edge frequencies for all modulations listed on Page 5.

**Test Result:**

**Complies**

**Test Data:**



**Rated Output Power – Normal Condition**

The inputs are set to generate rated average output power and crest factor for the multi-carrier signals intended.

<b>Cellular Band</b>	<b>Channel</b>	<b>Modulation</b>	<b>Power Output (dBm)</b>	<b>Rated Power (dBm)</b>	<b>Tolerance</b>
<b>Downlink</b>	Low	GSM	47.52	47.75	-0.58
	Mid	GSM	47.72	47.75	0
	High	GSM	47.58	47.75	-0.21
	Low	EDGE	46.59	46.50	-0.45
	Mid	EDGE	46.53	46.50	0
	High	EDGE	46.21	46.50	-0.14
<b>Total Power at Amplifier RF Input (dBm)</b>	+4.20 (GSM) & +3.18(EDGE) (Maximum gain)				
<b>Ref Offset</b>	Ref offset=Cable&Attenuator&Coupler Attenuation=56.8dB				

#### Section 4. Occupied Bandwidth

<b>Name of Test:</b>	<i>Occupied Bandwidth</i>	<b>Test Standard:</b>	<i>2.1049(i)</i>
<b>Tested By:</b>	WEI LI	<b>Test Date:</b>	01/16/2007-01/30/2007

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

**Method of Measurement:** Spectrum Analyzer Settings:  
RBW: CDMA2000 (30 kHz), WCDMA (100KHz), CDMA(30KHz),  
GSM (3 kHz), EDGE (3KHz), NADC (1 kHz) and CDPD (1 kHz)  
VBW:  $\geq$ RBW  
Span: As required  
Sweep: Auto  
Input Signal Characteristics: Generated from Signal Generator  
RF level: Rated, recommended by manufacturer

**Test Result:**

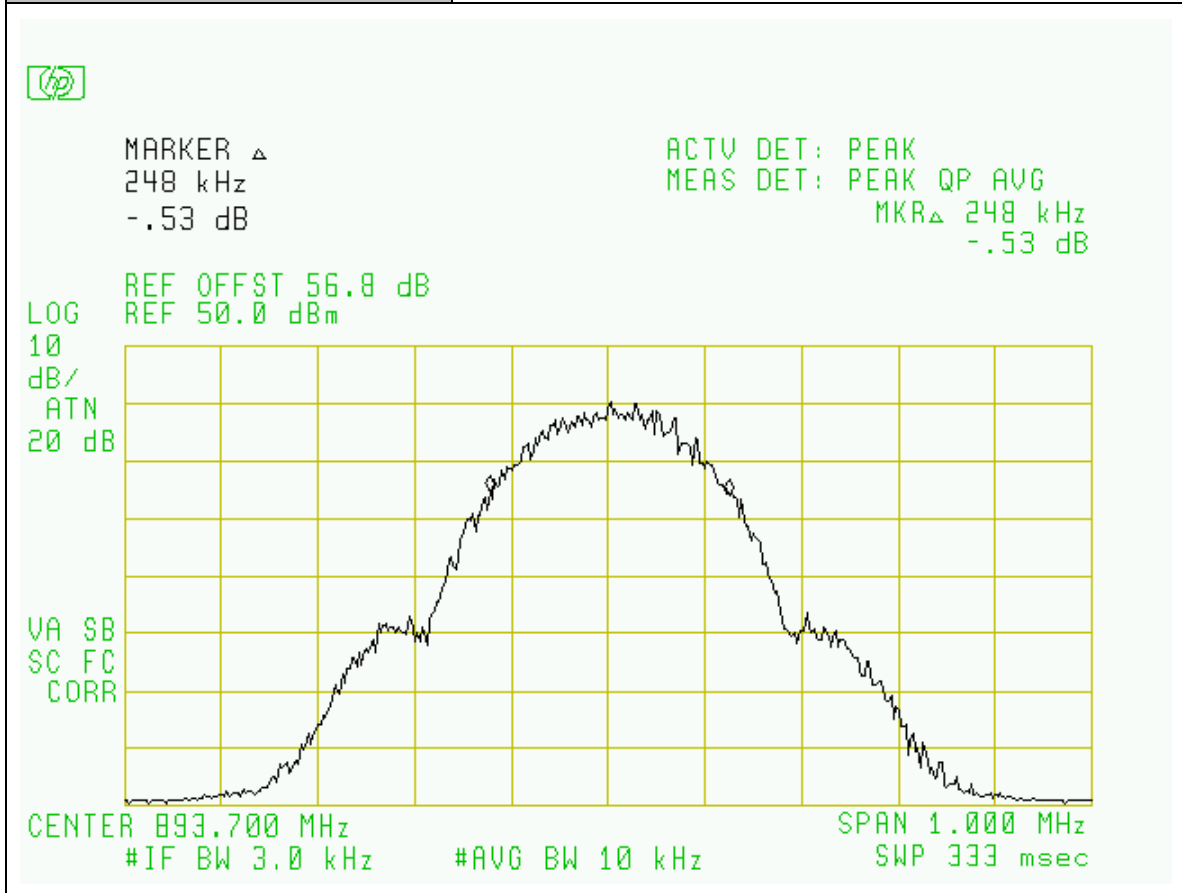
**Complies**

**Test Data:**

Attached Plots

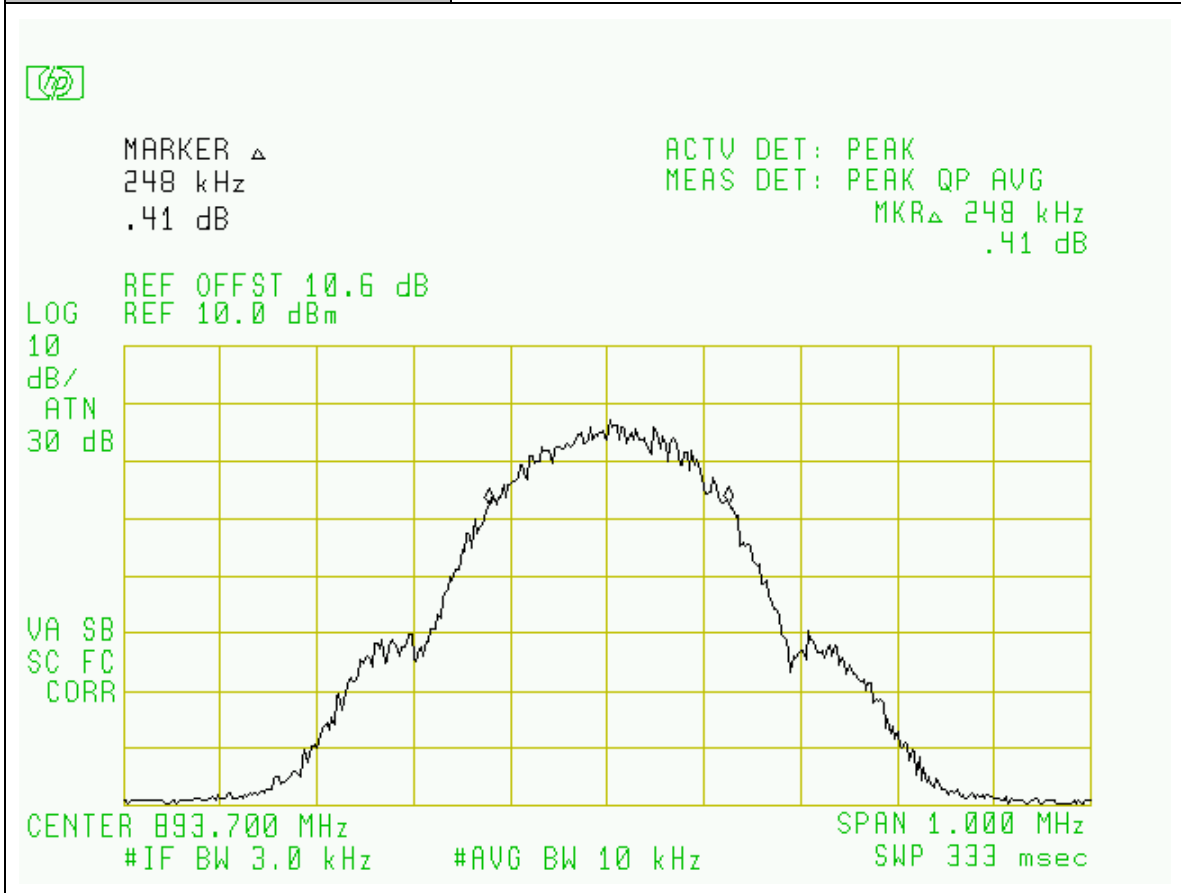
<b>Project Number:</b>	0048-070116-01-FCC
<b>EUT:</b>	ANDREW HRP850 RF100595
<b>S/N:</b>	083
<b>Tested By:</b>	Wei Li
<b>Temperature:</b>	70° F
<b>Humidity:</b>	30%

<b>Section:</b>	Occupied Bandwidth: CELLULAR Bands
<b>Plot Name:</b>	Downlink, Hi-Channel, GSM Modulation
<b>Configuration:</b>	Input: SG, Output Port: EUT RF OUTPUT



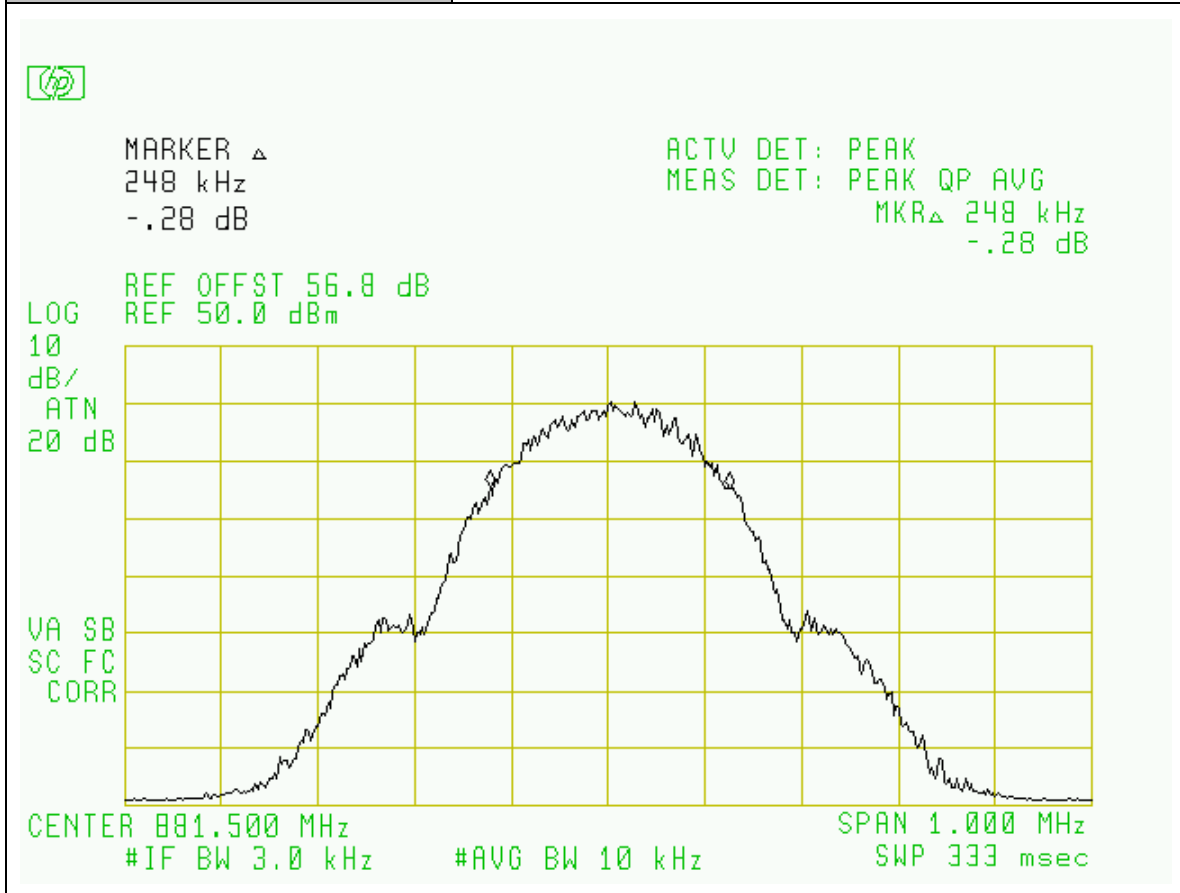
<b>Project Number:</b>	0048-070116-01-FCC
<b>EUT:</b>	ANDREW H RPM850 RF100595
<b>S/N:</b>	083
<b>Tested By:</b>	Wei Li
<b>Temperature:</b>	70° F
<b>Humidity:</b>	30%

<b>Section:</b>	Occupied Bandwidth: CELLULAR Bands
<b>Plot Name:</b>	Downlink, Hi-Channel, GSM Modulation
<b>Configuration:</b>	Input: SG



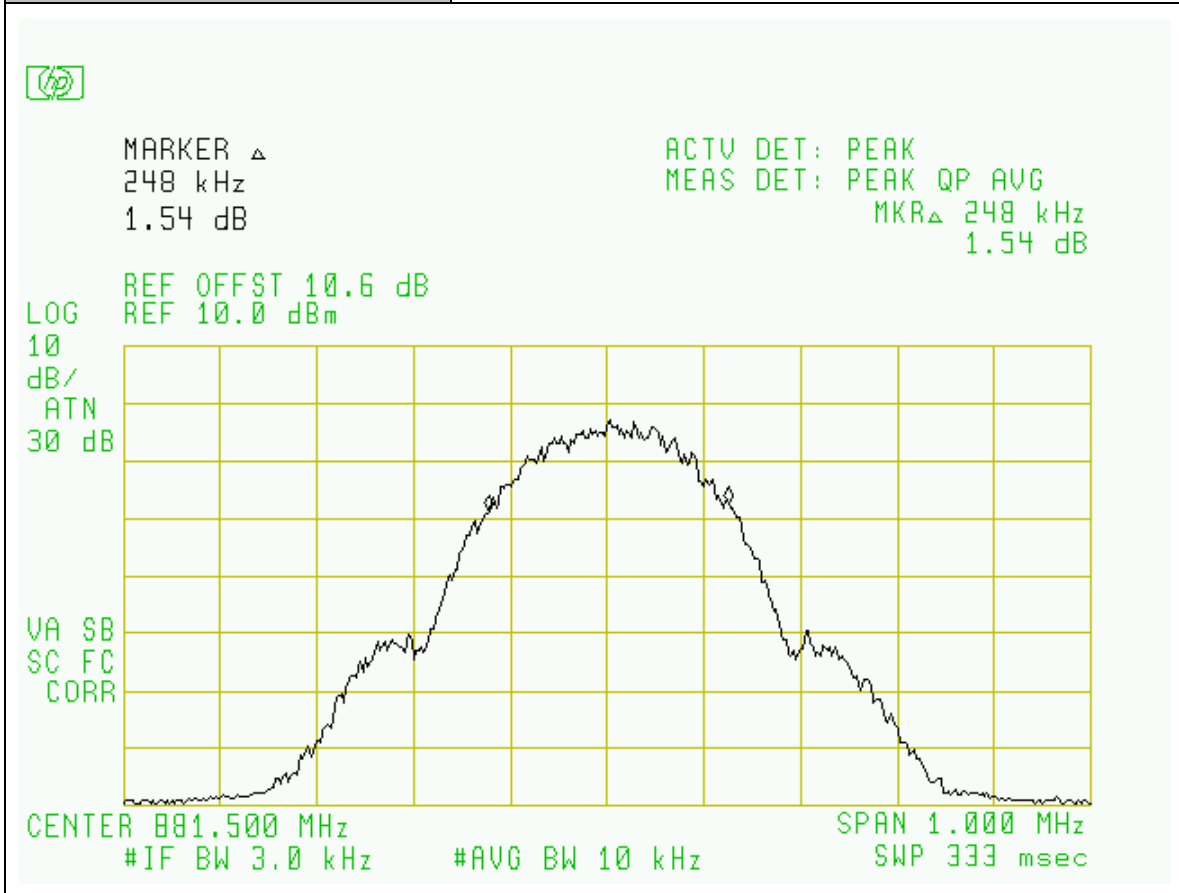
<b>Project Number:</b>	0048-070116-01-FCC
<b>EUT:</b>	ANDREW HRP850 RF100595
<b>S/N:</b>	083
<b>Tested By:</b>	Wei Li
<b>Temperature:</b>	70° F
<b>Humidity:</b>	30%

<b>Section:</b>	Occupied Bandwidth: CELLULAR Bands
<b>Plot Name:</b>	Downlink, Mid-Channel, GSM Modulation
<b>Configuration:</b>	Input: SG, Output Port: EUT RF OUTPUT



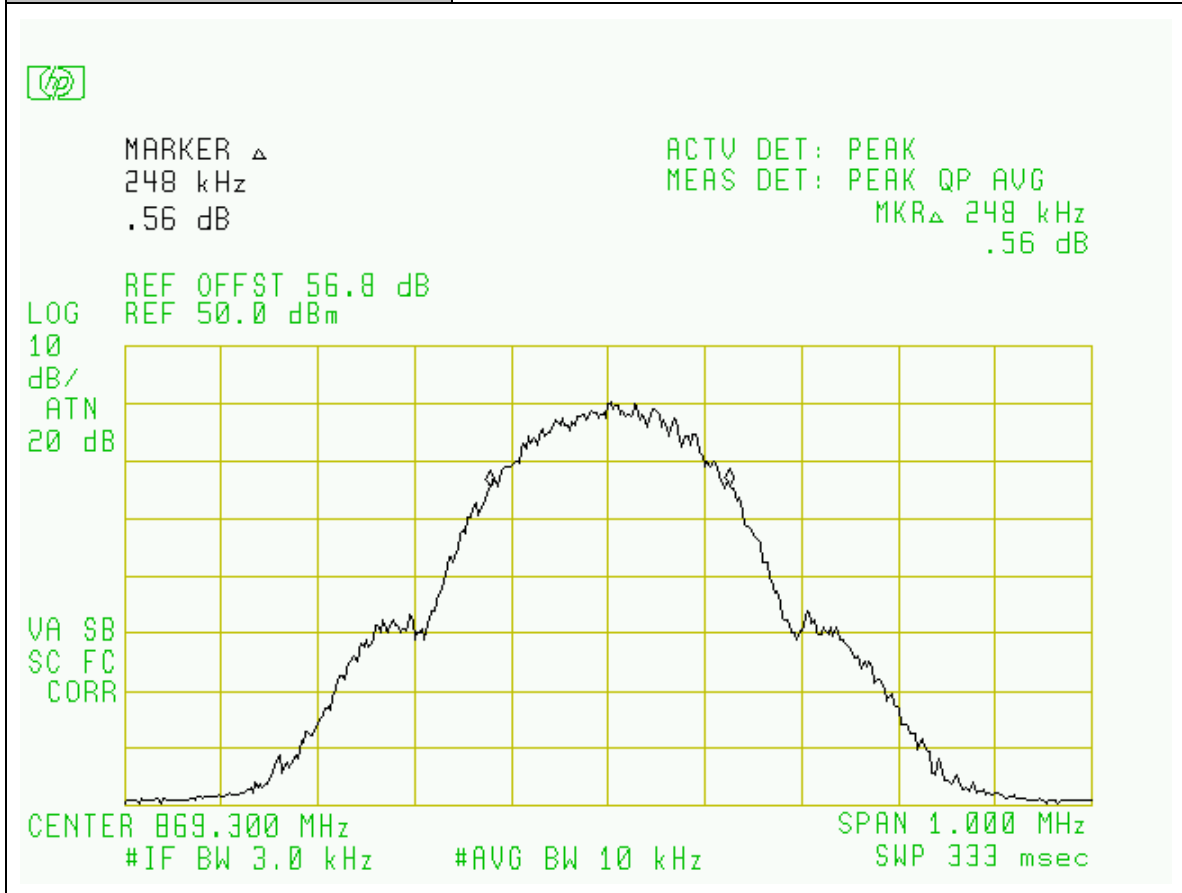
<b>Project Number:</b>	0048-070116-01-FCC
<b>EUT:</b>	ANDREW H RPM850 RF100595
<b>S/N:</b>	083
<b>Tested By:</b>	Wei Li
<b>Temperature:</b>	70° F
<b>Humidity:</b>	30%

<b>Section:</b>	Occupied Bandwidth: CELLULAR Bands
<b>Plot Name:</b>	Downlink, Mid-Channel, GSM Modulation
<b>Configuration:</b>	Input: SG



<b>Project Number:</b>	0048-070116-01-FCC
<b>EUT:</b>	ANDREW HRP850 RF100595
<b>S/N:</b>	083
<b>Tested By:</b>	Wei Li
<b>Temperature:</b>	70° F
<b>Humidity:</b>	30%

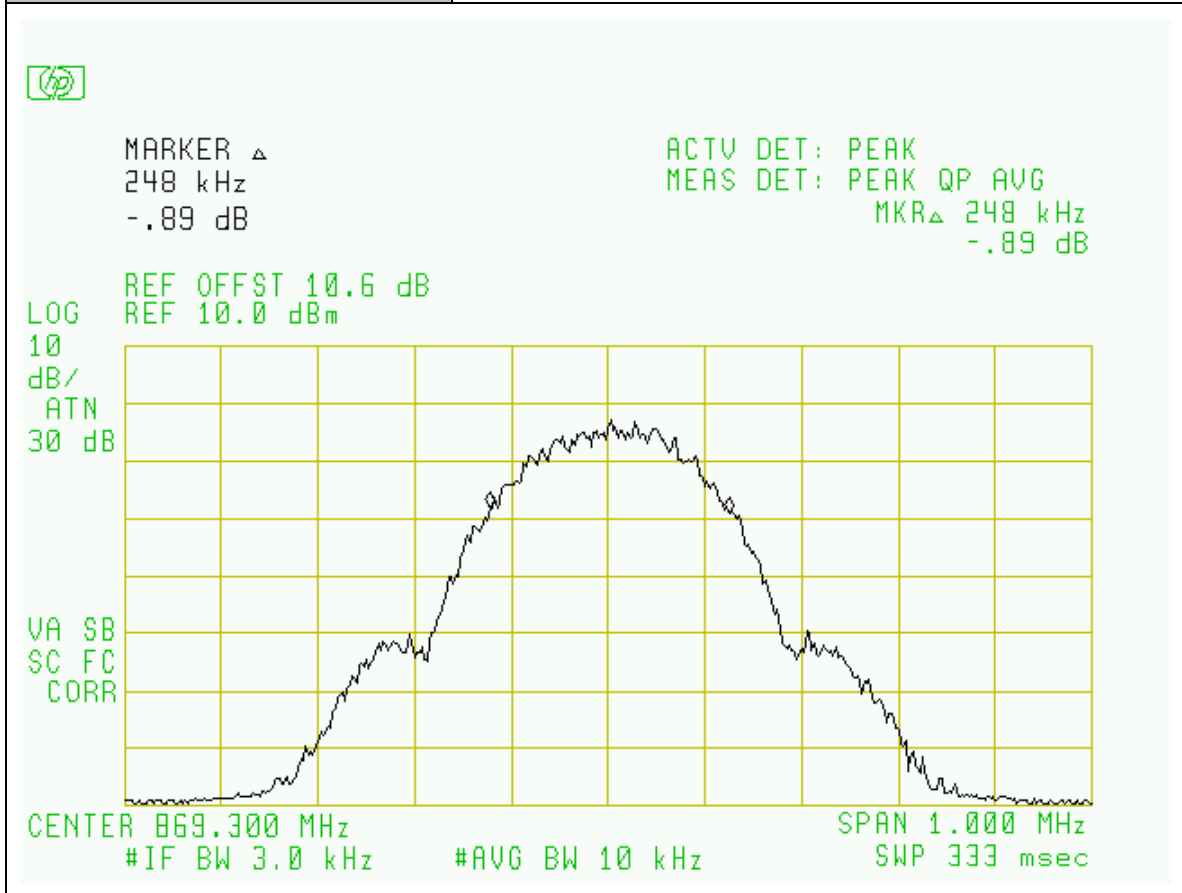
<b>Section:</b>	Occupied Bandwidth: CELLULAR Bands
<b>Plot Name:</b>	Downlink, Low-Channel, GSM Modulation
<b>Configuration:</b>	Input: SG, Output Port: EUT RF OUTPUT





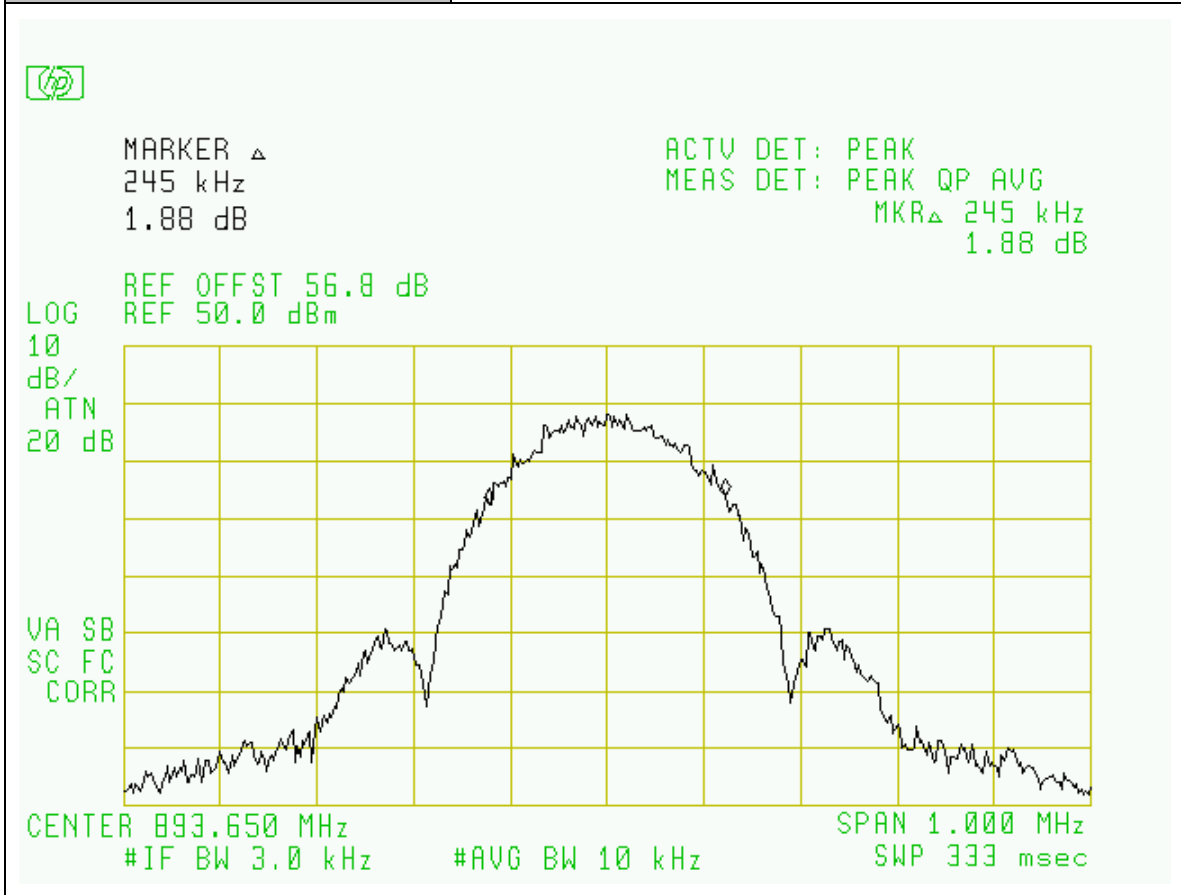
<b>Project Number:</b>	0048-070116-01-FCC
<b>EUT:</b>	ANDREW HRP850 RF100595
<b>S/N:</b>	083
<b>Tested By:</b>	Wei Li
<b>Temperature:</b>	70° F
<b>Humidity:</b>	30%

<b>Section:</b>	Occupied Bandwidth: CELLULAR Bands
<b>Plot Name:</b>	Downlink, Low-Channel, GSM Modulation
<b>Configuration:</b>	Input: SG



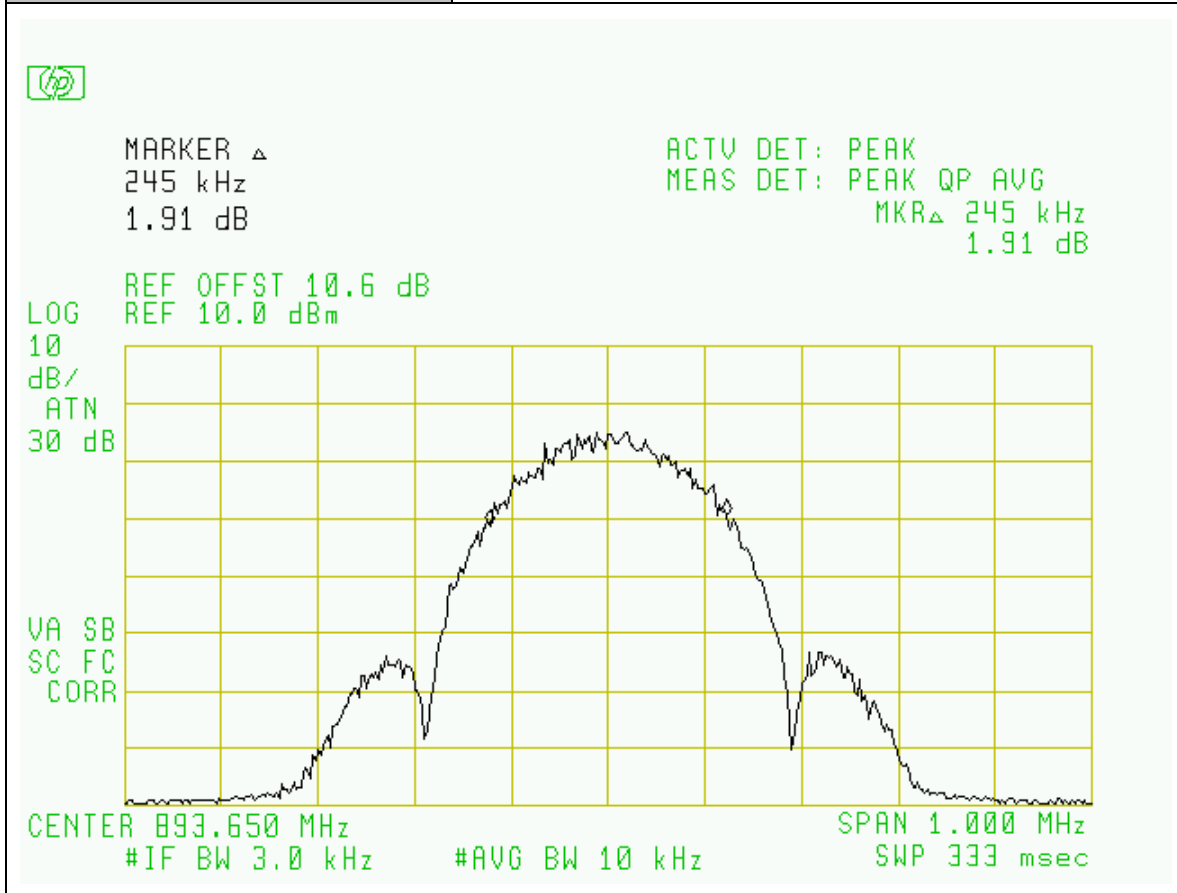
<b>Project Number:</b>	0048-070116-01-FCC
<b>EUT:</b>	ANDREW H RPM850 RF100595
<b>S/N:</b>	083
<b>Tested By:</b>	Wei Li
<b>Temperature:</b>	70° F
<b>Humidity:</b>	30%

<b>Section:</b>	Occupied Bandwidth: CELLULAR Bands
<b>Plot Name:</b>	Downlink, Hi-Channel, EDGE Modulation
<b>Configuration:</b>	Input: SG, Output Port: EUT RF OUTPUT



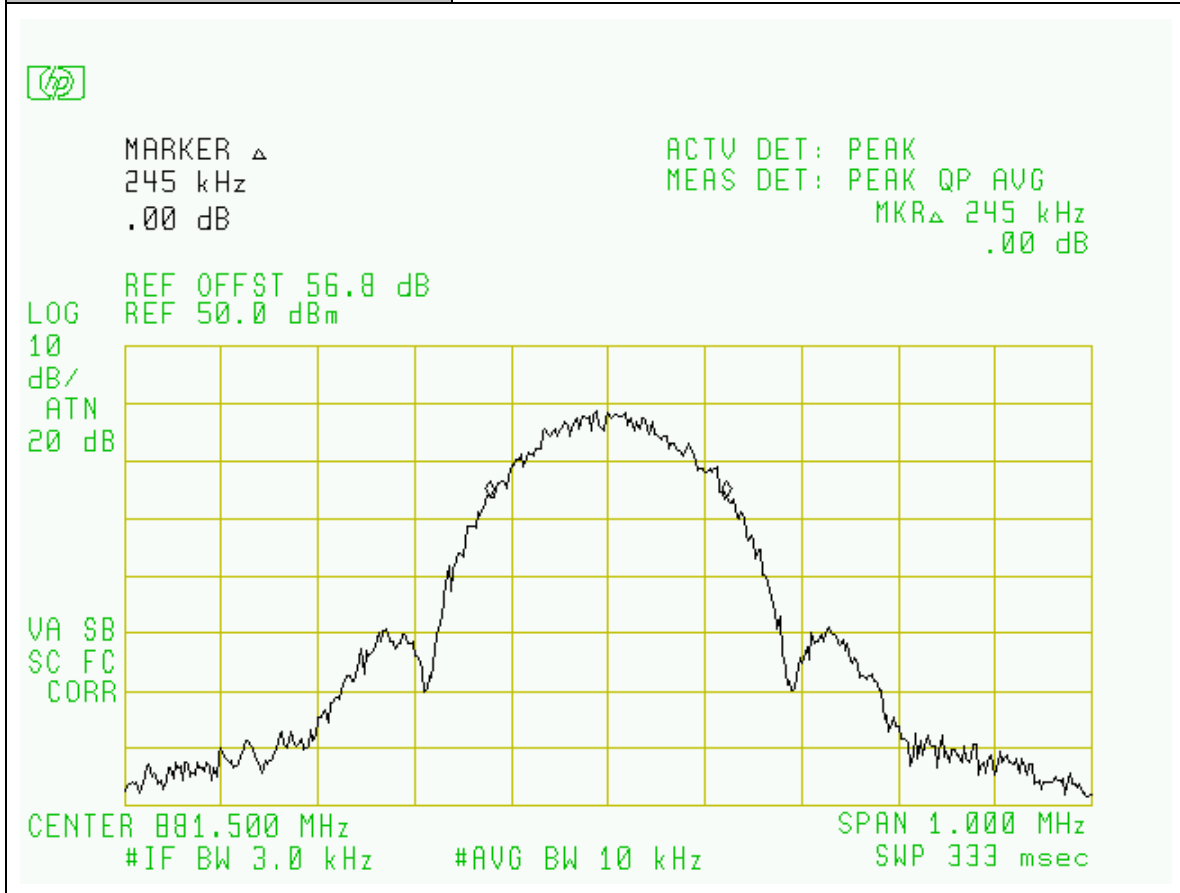
<b>Project Number:</b>	0048-070116-01-FCC
<b>EUT:</b>	ANDREW H RPM850 RF100595
<b>S/N:</b>	083
<b>Tested By:</b>	Wei Li
<b>Temperature:</b>	70° F
<b>Humidity:</b>	30%

<b>Section:</b>	Occupied Bandwidth: CELLULAR Bands
<b>Plot Name:</b>	Downlink, Hi-Channel, EDGE Modulation
<b>Configuration:</b>	Input: SG



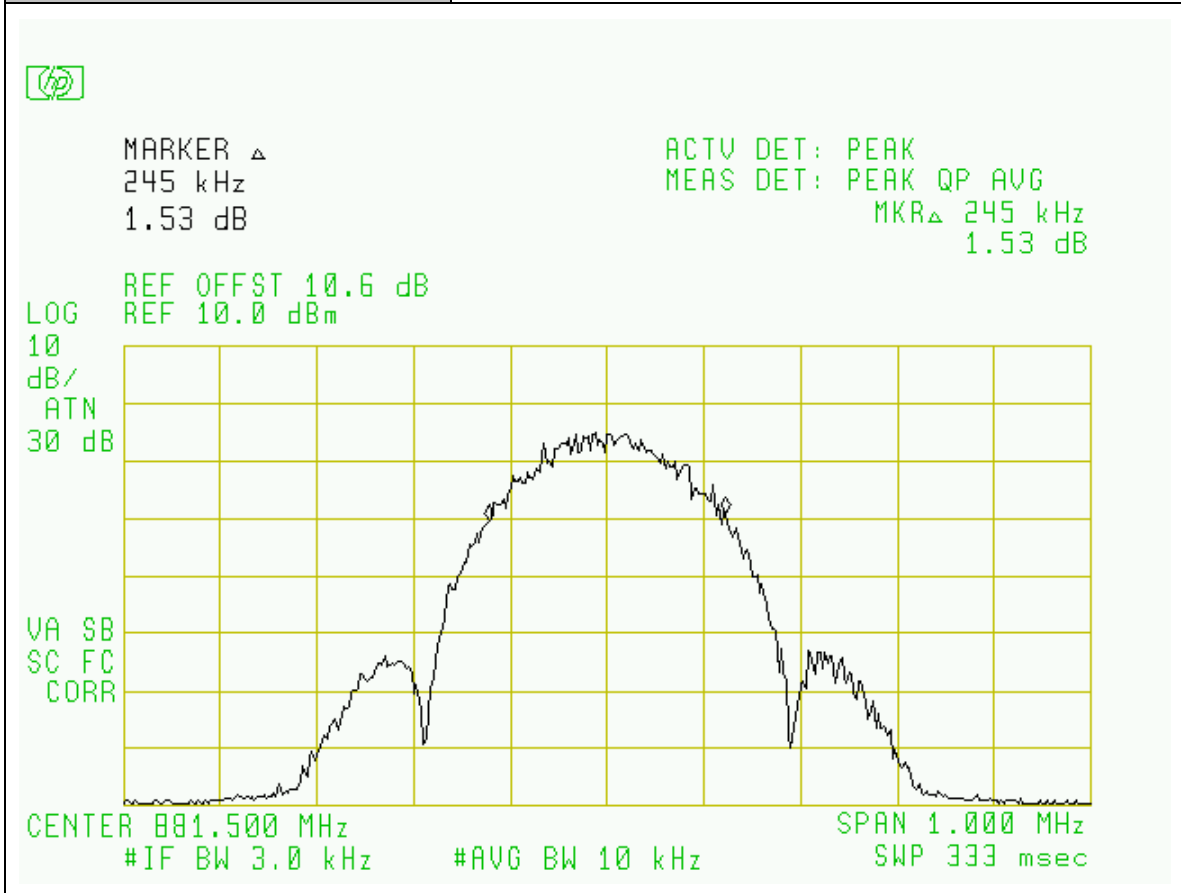
<b>Project Number:</b>	0048-070116-01-FCC
<b>EUT:</b>	ANDREW H RPM850 RF100595
<b>S/N:</b>	083
<b>Tested By:</b>	Wei Li
<b>Temperature:</b>	70° F
<b>Humidity:</b>	30%

<b>Section:</b>	Occupied Bandwidth: CELLULAR Bands
<b>Plot Name:</b>	Downlink, Mid-Channel, EDGE Modulation
<b>Configuration:</b>	Input: SG, Output Port: EUT RF OUTPUT



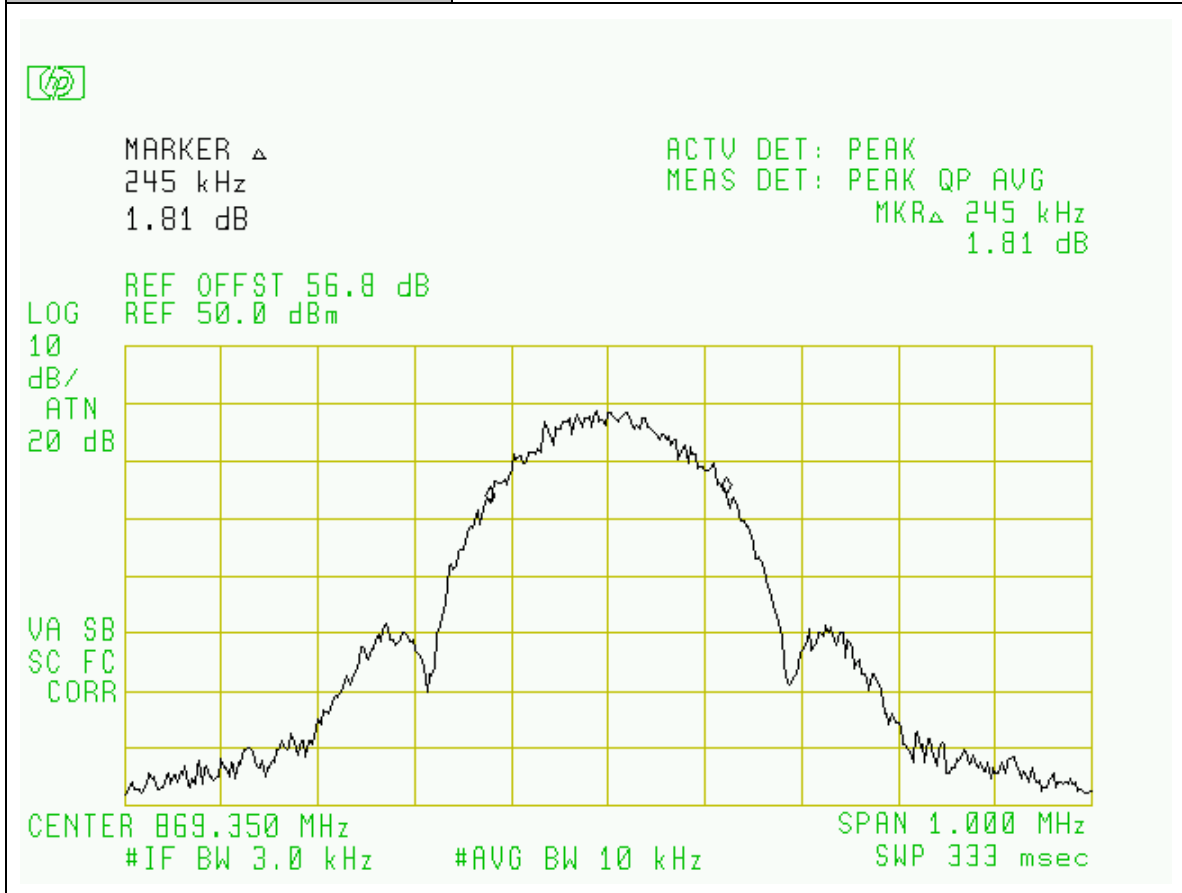
<b>Project Number:</b>	0048-070116-01-FCC
<b>EUT:</b>	ANDREW H RPM850 RF100595
<b>S/N:</b>	083
<b>Tested By:</b>	Wei Li
<b>Temperature:</b>	70° F
<b>Humidity:</b>	30%

<b>Section:</b>	Occupied Bandwidth: CELLULAR Bands
<b>Plot Name:</b>	Downlink, Mid-Channel, EDGE Modulation
<b>Configuration:</b>	Input: SG



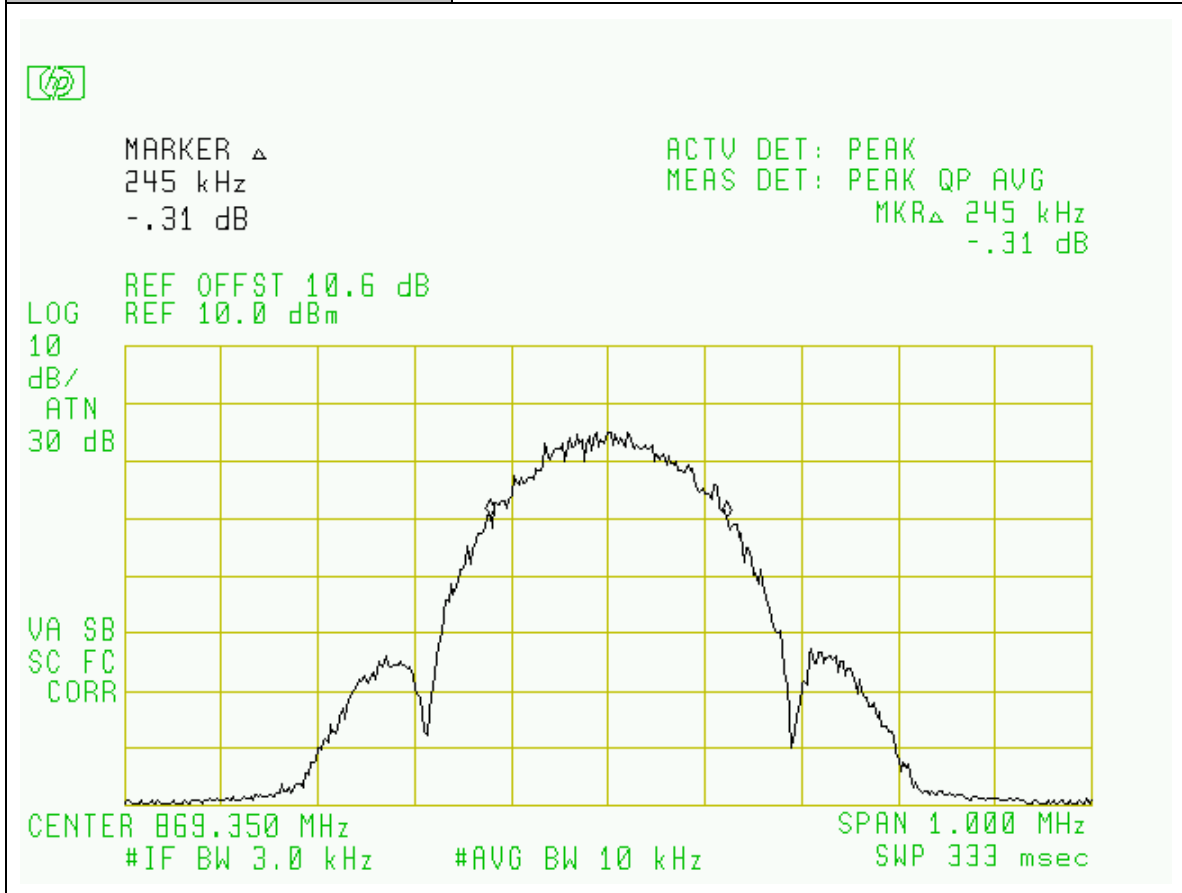
<b>Project Number:</b>	0048-070116-01-FCC
<b>EUT:</b>	ANDREW H RPM850 RF100595
<b>S/N:</b>	083
<b>Tested By:</b>	Wei Li
<b>Temperature:</b>	70° F
<b>Humidity:</b>	30%

<b>Section:</b>	Occupied Bandwidth: CELLULAR Bands
<b>Plot Name:</b>	Downlink, Low-Channel, EDGE Modulation
<b>Configuration:</b>	Input: SG, Output Port: EUT RF OUTPUT



<b>Project Number:</b>	0048-070116-01-FCC
<b>EUT:</b>	ANDREW H RPM850 RF100595
<b>S/N:</b>	083
<b>Tested By:</b>	Wei Li
<b>Temperature:</b>	70° F
<b>Humidity:</b>	30%

<b>Section:</b>	Occupied Bandwidth: CELLULAR Bands
<b>Plot Name:</b>	Downlink, Low-Channel, EDGE Modulation
<b>Configuration:</b>	Input: 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>22.917 &amp; 2.1051(a)</i>
<b>Tested By:</b>	WEI LI EDWARD LEE	<b>Test Date:</b>	01/16/2007-01/30/2007

**Minimum Standard:** Para. No. 22.917(e). The mean power of emissions must be attenuated below the mean power of the unmodulated carrier on any frequency twice or more than twice the fundamental emission by at least  $43 + 10 \log P$ . This is equivalent to -13 dBm absolute power.

**Method of Measurement:** Spectrum Analyzer Settings:  
RBW: 100 kHz for Cellular Tx. As required for digital modulations.  
RBW: 1MHz for PCS Tx.  
VBW:  $\geq$ RBW  
Start Frequency: 9KHz or Lowest Clock Frequency  
Stop Frequency: 10 GHz (Cellular), 20GHz (PCS)  
Sweep: Auto  
Using in-band filter if needed.  
For Inter-modulation measurement if applicable: Three or Two RF signals set as inputs. The frequencies of RF signals shall be within the repeater's operating band: two signals will close to each other at the lower band edge; the third will be close to upper band edge. Or two signals are closed to Low CH, Mid CH and High CH. 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.

\* Out of band plots show nearly identical noise floor readings for the frequency ranges below 20MHz and above 6.5GHz.



**Test Result:**

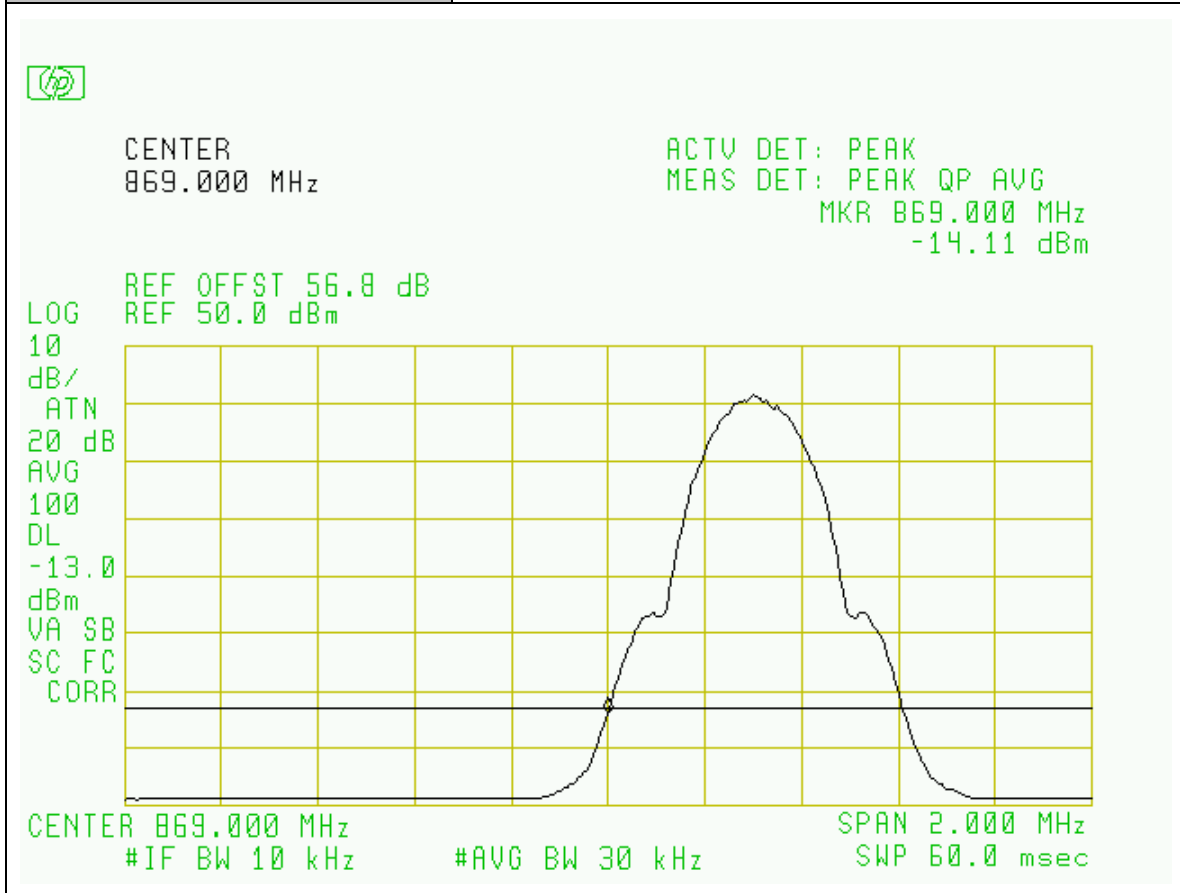
**Complies**

**Test Data:**

Attached Plots

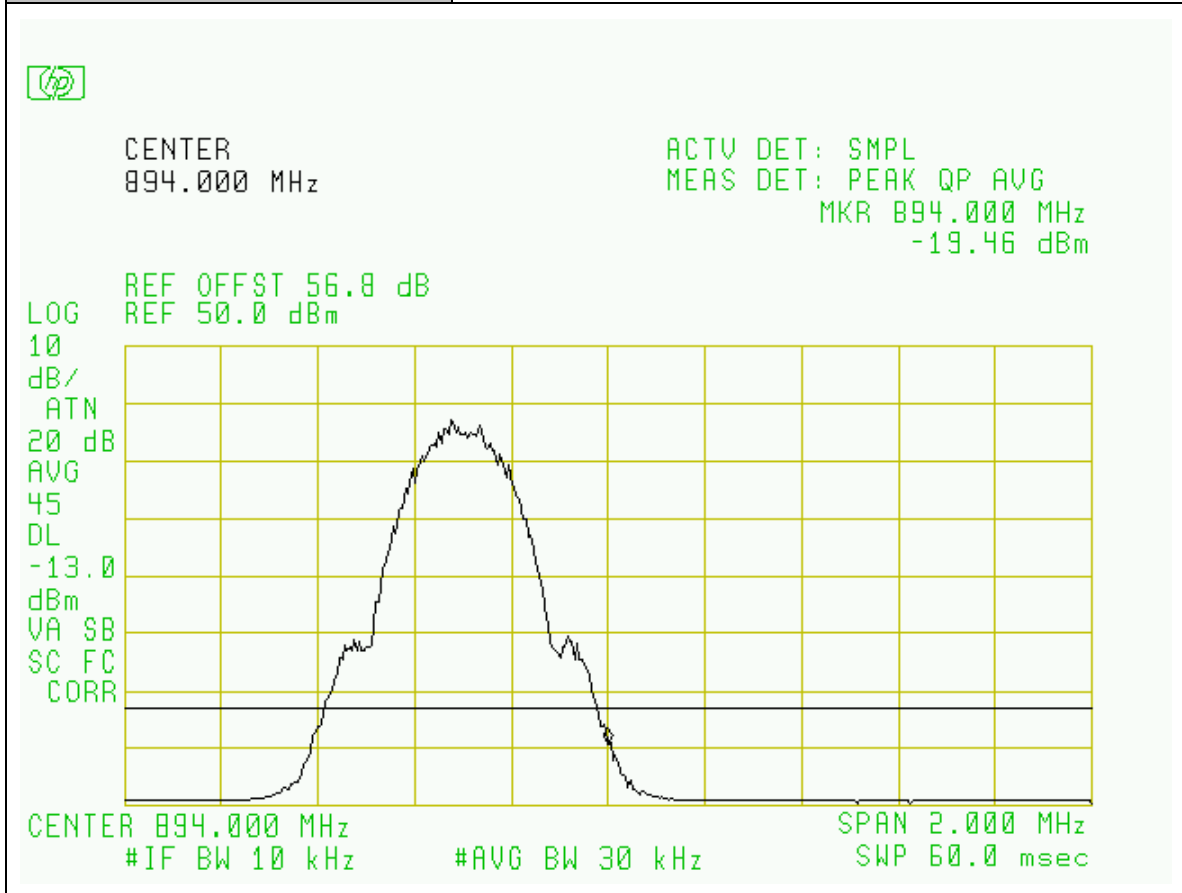
<b>Project Number:</b>	0048-070116-01-FCC
<b>EUT:</b>	ANDREW H RPM850 RF100595
<b>S/N:</b>	083
<b>Tested By:</b>	Edward Lee
<b>Temperature:</b>	70° F
<b>Humidity:</b>	30%

<b>Section:</b>	Spurious Emissions at RF Output Port: Cellular Band / GSM Modulation
<b>Plot Name:</b>	Downlink, Low-Chn, Lower Bandedge
<b>Configuration:</b>	Input: SG, Output Port: EUT RF OUTPUT



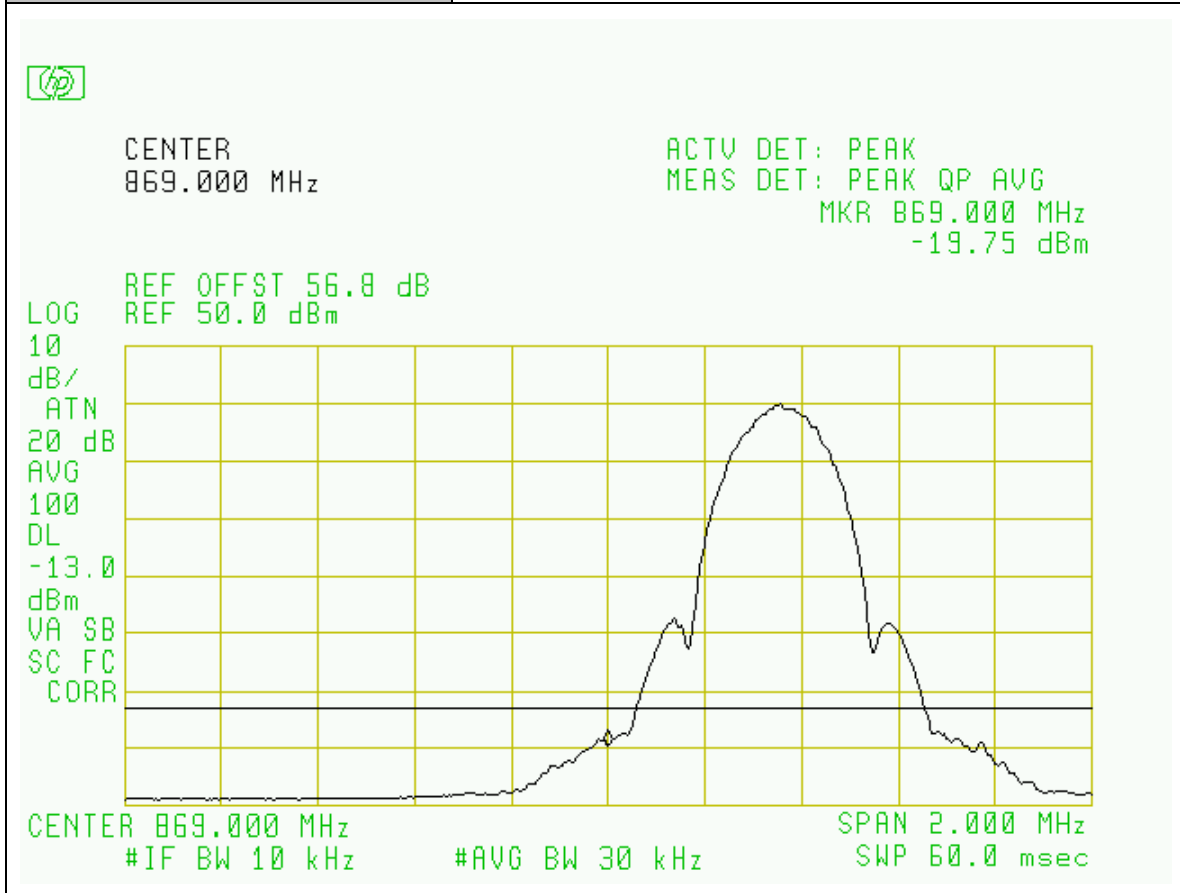
<b>Project Number:</b>	0048-070116-01-FCC
<b>EUT:</b>	ANDREW HRP850 RF100595
<b>S/N:</b>	083
<b>Tested By:</b>	Edward Lee
<b>Temperature:</b>	70° F
<b>Humidity:</b>	30%

<b>Section:</b>	Spurious Emissions at RF Output Port: Cellular Band / GSM Modulation
<b>Plot Name:</b>	Downlink, Hi-Chn, Upper Bandedge
<b>Configuration:</b>	Input: SG, Output Port: EUT RF OUTPUT



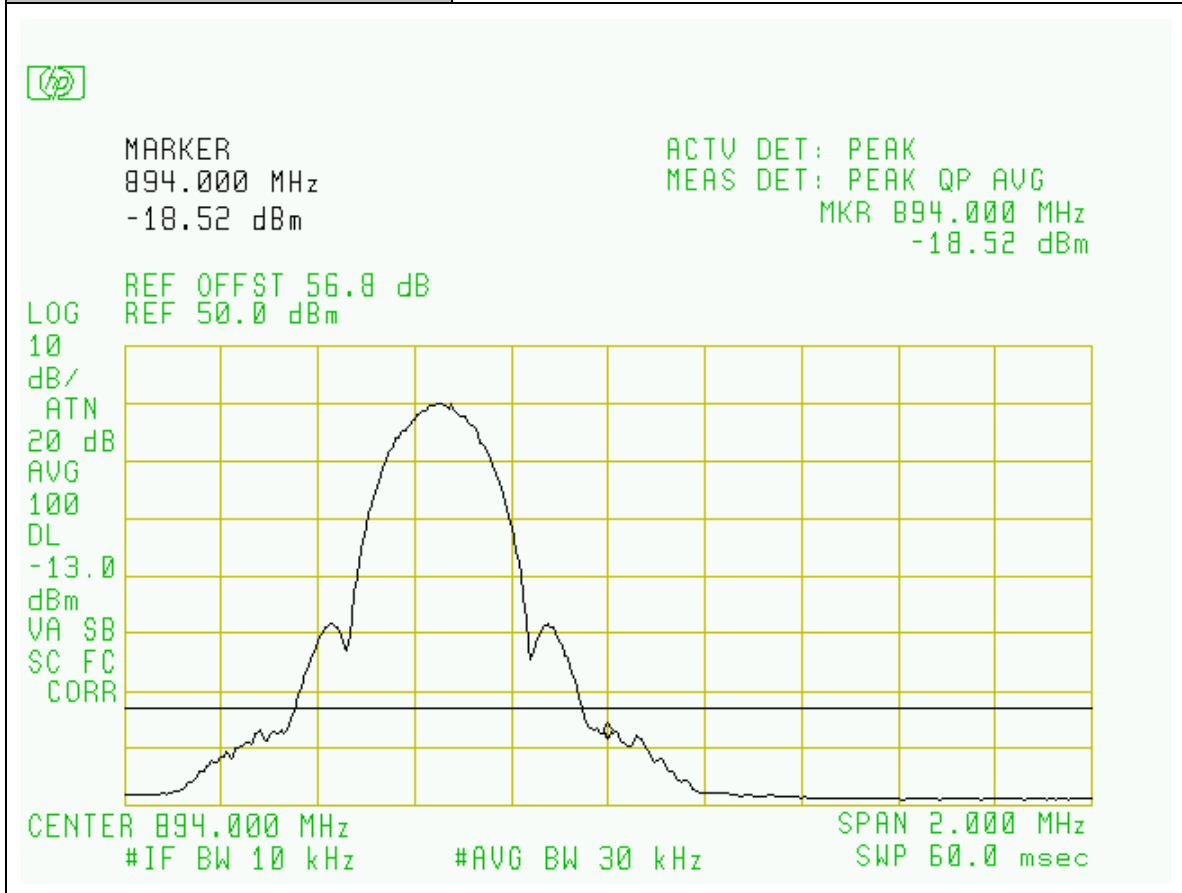
<b>Project Number:</b>	0048-070116-01-FCC
<b>EUT:</b>	ANDREW H RPM850 RF100595
<b>S/N:</b>	083
<b>Tested By:</b>	Edward Lee
<b>Temperature:</b>	70° F
<b>Humidity:</b>	30%

<b>Section:</b>	Spurious Emissions at RF Output Port: Cellular Band / EDGE Modulation
<b>Plot Name:</b>	Downlink, Low-Chn, Lower Bandedge
<b>Configuration:</b>	Input: SG, Output Port: EUT RF OUTPUT



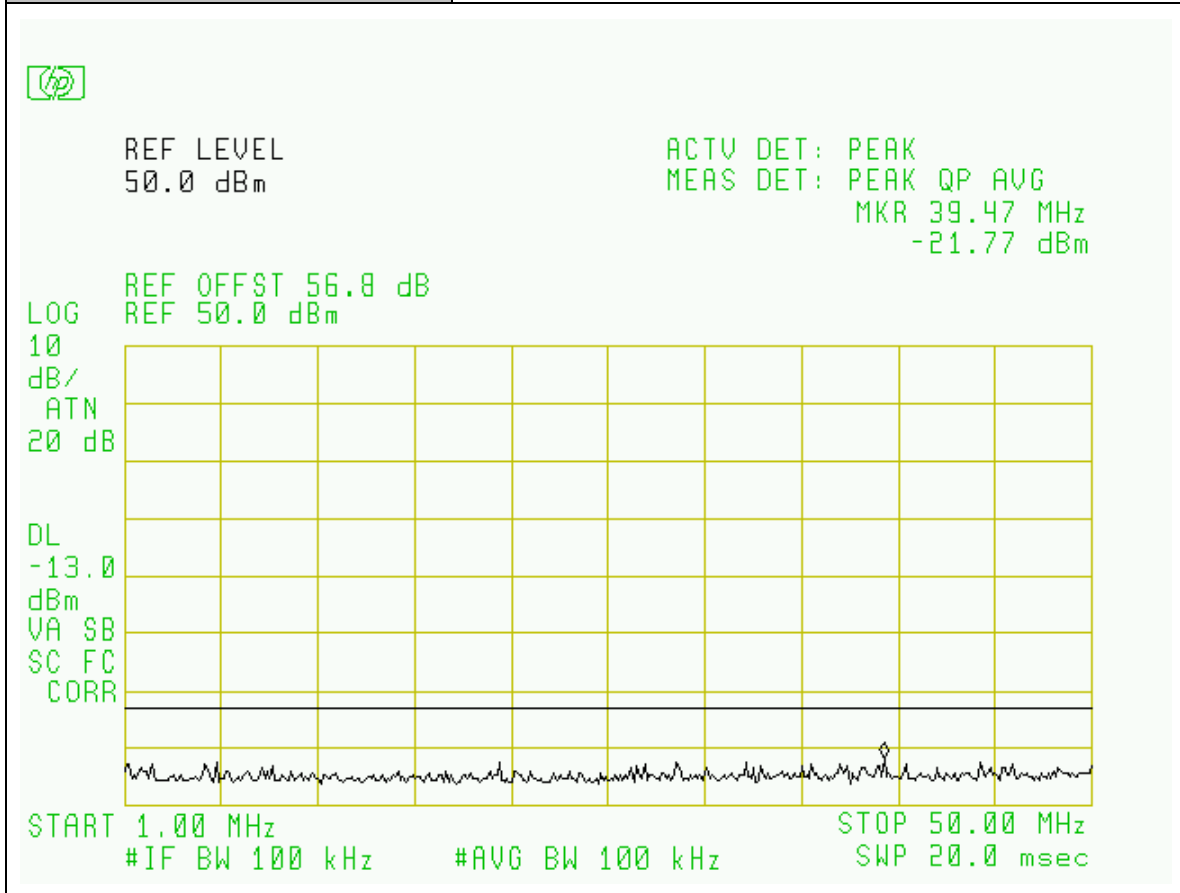
<b>Project Number:</b>	0048-070116-01-FCC
<b>EUT:</b>	ANDREW H RPM850 RF100595
<b>S/N:</b>	083
<b>Tested By:</b>	Edward Lee
<b>Temperature:</b>	70° F
<b>Humidity:</b>	30%

<b>Section:</b>	Spurious Emissions at RF Output Port: Cellular Band / EDGE Modulation
<b>Plot Name:</b>	Downlink, Hi-Chn, Upper Bandedge
<b>Configuration:</b>	Input: SG, Output Port: EUT RF OUTPUT



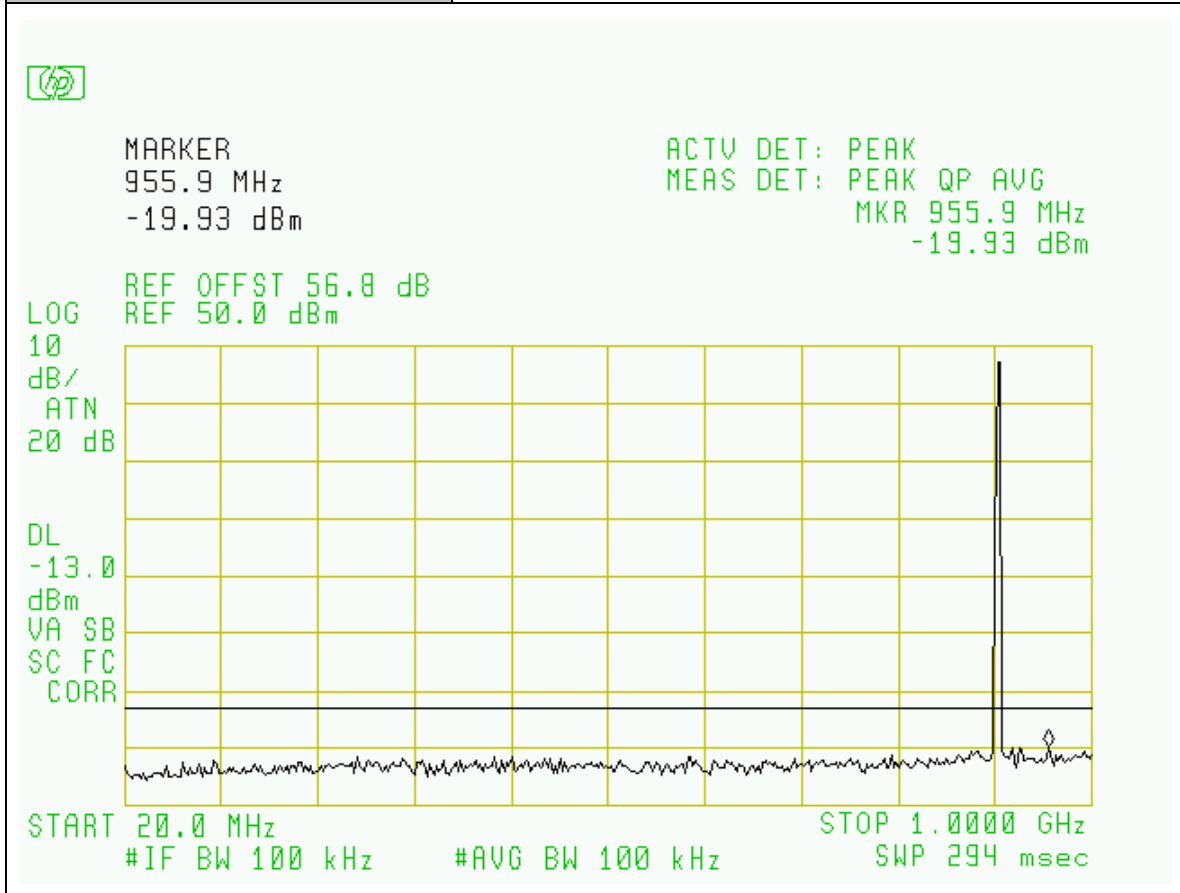
<b>Project Number:</b>	0048-070116-01-FCC
<b>EUT:</b>	ANDREW H RPM850 RF100595
<b>S/N:</b>	083
<b>Tested By:</b>	Edward Lee
<b>Temperature:</b>	70° F
<b>Humidity:</b>	30%

<b>Section:</b>	Spurious Emissions at RF Output Port: Cellular Band / GSM Modulation
<b>Plot Name:</b>	Downlink, Hi-Channel
<b>Configuration:</b>	Input: SG, Output Port: EUT RF OUTPUT



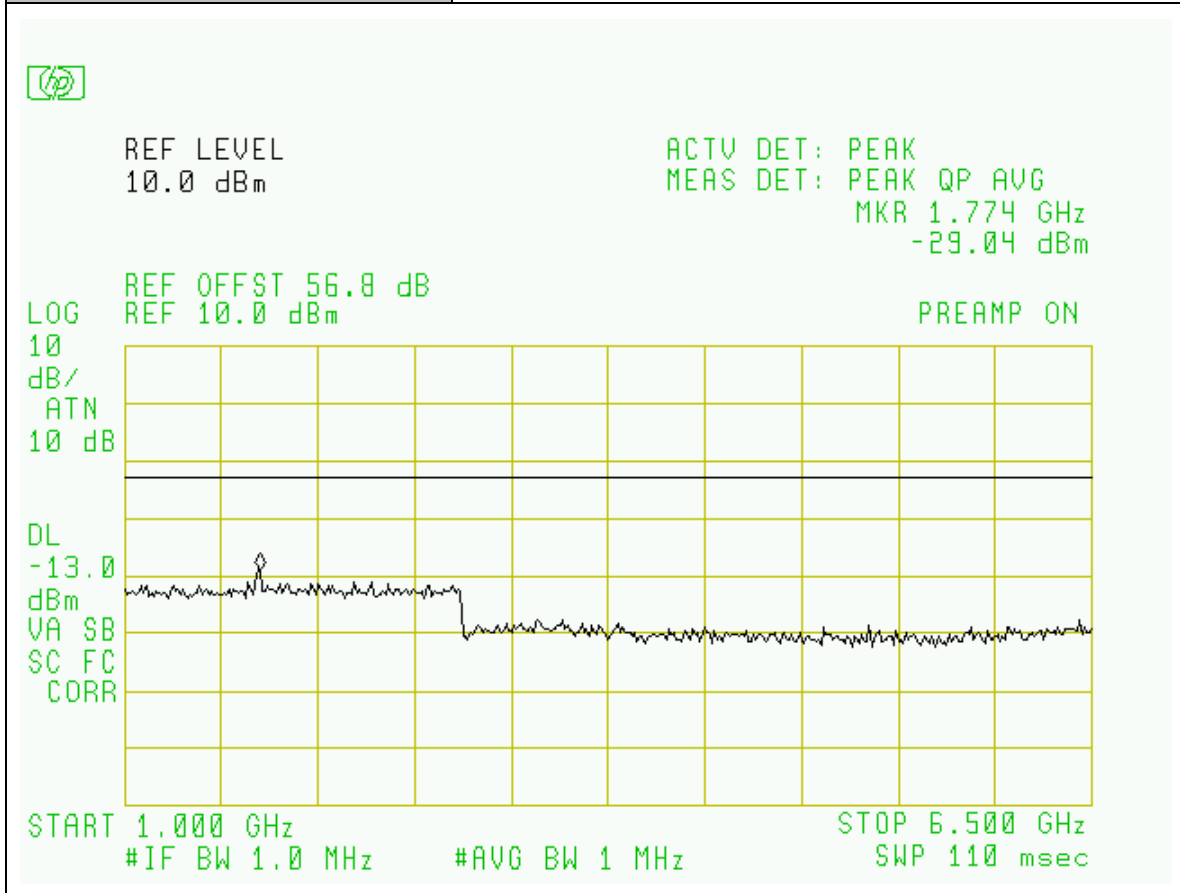
<b>Project Number:</b>	0048-070116-01-FCC
<b>EUT:</b>	ANDREW H RPM850 RF100595
<b>S/N:</b>	083
<b>Tested By:</b>	Edward Lee
<b>Temperature:</b>	70° F
<b>Humidity:</b>	30%

<b>Section:</b>	Spurious Emissions at RF Output Port: Cellular Band / GSM Modulation
<b>Plot Name:</b>	Downlink, Hi-Channel
<b>Configuration:</b>	Input: SG, Output Port: EUT RF OUTPUT



<b>Project Number:</b>	0048-070116-01-FCC
<b>EUT:</b>	ANDREW HRP850 RF100595
<b>S/N:</b>	083
<b>Tested By:</b>	Edward Lee
<b>Temperature:</b>	70°F
<b>Humidity:</b>	30%

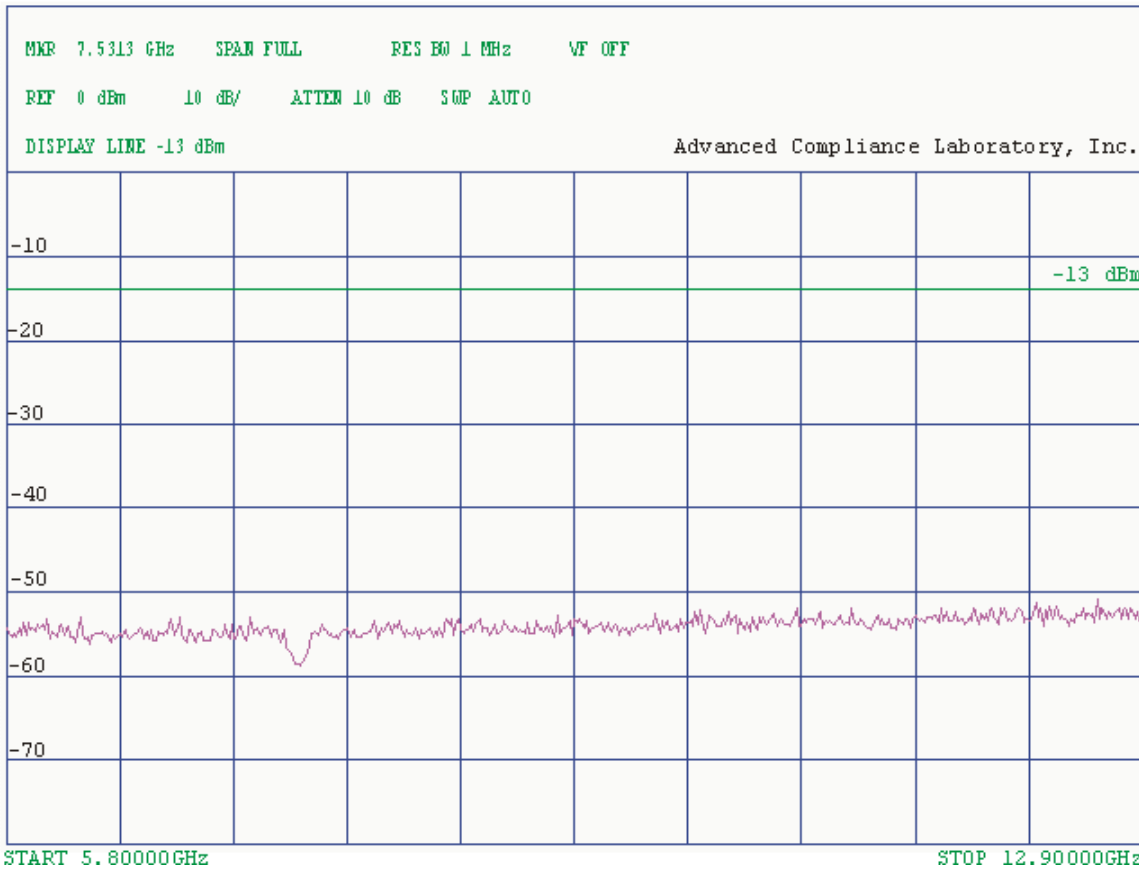
<b>Section:</b>	Spurious Emissions at RF Output Port: Cellular Band / GSM Modulation
<b>Plot Name:</b>	Downlink, Hi-Channel
<b>Configuration:</b>	Input: SG, Output Port: EUT RF OUTPUT





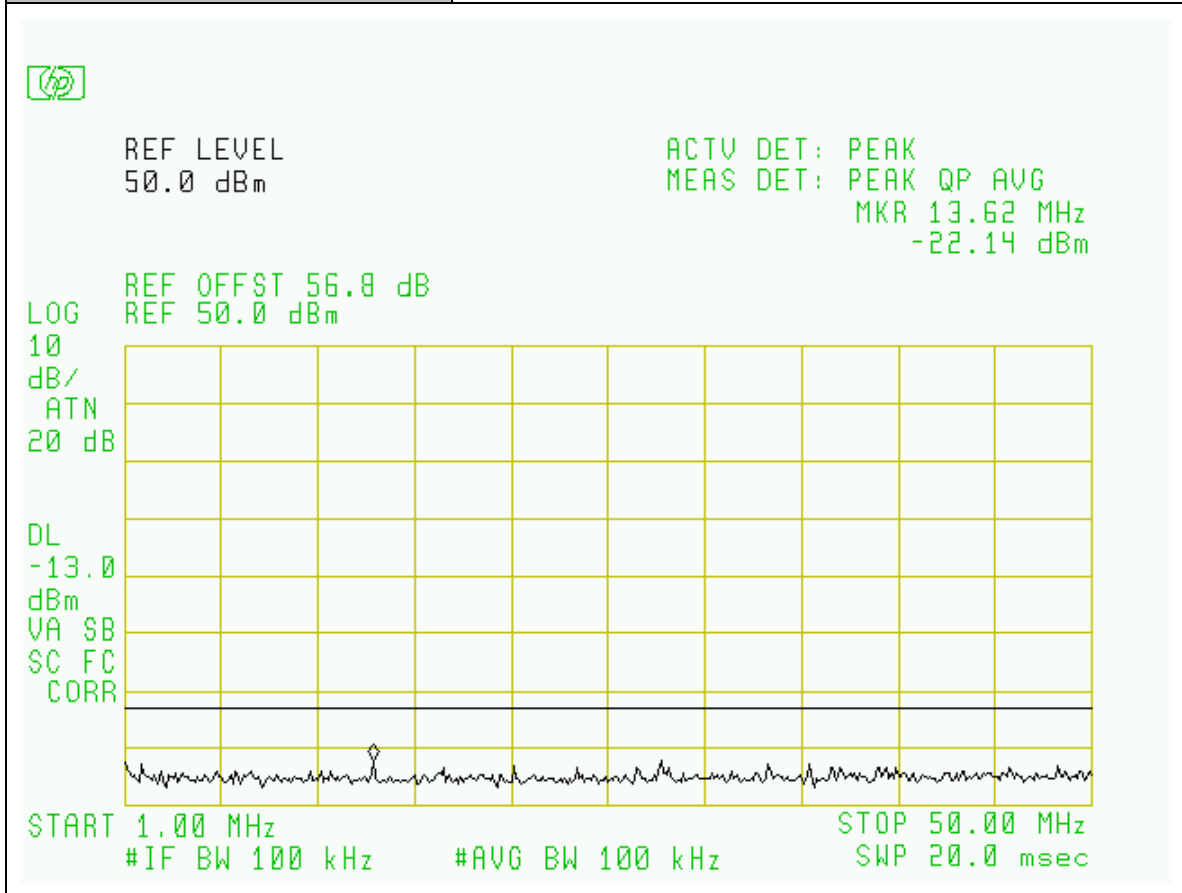
<b>Project Number:</b>	0048-070116-01-FCC
<b>EUT:</b>	ANDREW H RPM850 RF100595
<b>S/N:</b>	083
<b>Tested By:</b>	Edward Lee
<b>Temperature:</b>	70° F
<b>Humidity:</b>	30%

<b>Section:</b>	Spurious Emissions at RF Output Port: Cellular Band / GSM Modulation
<b>Plot Name:</b>	Downlink, Hi-Channel
<b>Configuration:</b>	Input: SG, Output Port: EUT RF OUTPUT



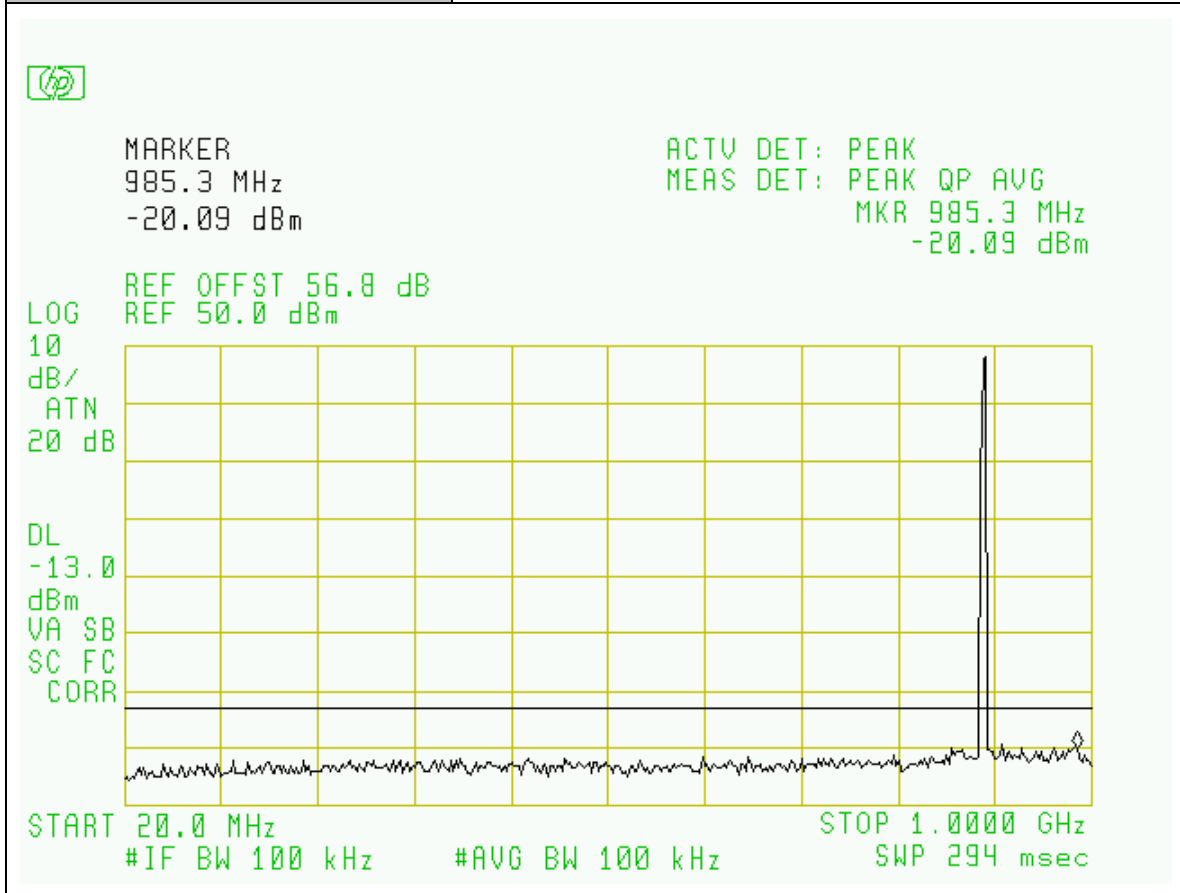
<b>Project Number:</b>	0048-070116-01-FCC
<b>EUT:</b>	ANDREW HRP850 RF100595
<b>S/N:</b>	083
<b>Tested By:</b>	Edward Lee
<b>Temperature:</b>	70° F
<b>Humidity:</b>	30%

<b>Section:</b>	Spurious Emissions at RF Output Port: Cellular Band / GSM Modulation
<b>Plot Name:</b>	Downlink, Mid-Channel
<b>Configuration:</b>	Input: SG, Output Port: EUT RF OUTPUT



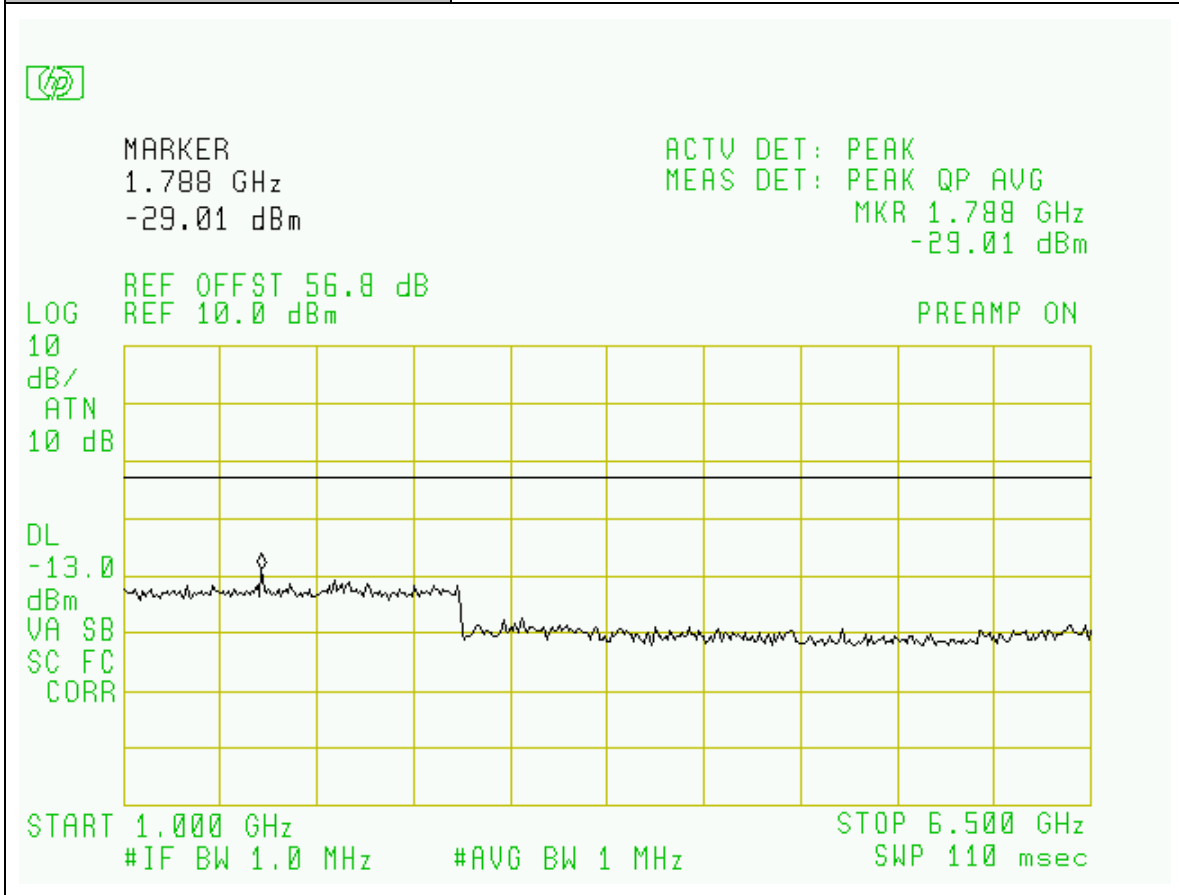
<b>Project Number:</b>	0048-070116-01-FCC
<b>EUT:</b>	ANDREW H RPM850 RF100595
<b>S/N:</b>	083
<b>Tested By:</b>	Edward Lee
<b>Temperature:</b>	70° F
<b>Humidity:</b>	30%

<b>Section:</b>	Spurious Emissions at RF Output Port: Cellular Band / GSM Modulation
<b>Plot Name:</b>	Downlink, Mid-Channel
<b>Configuration:</b>	Input: SG, Output Port: EUT RF OUTPUT



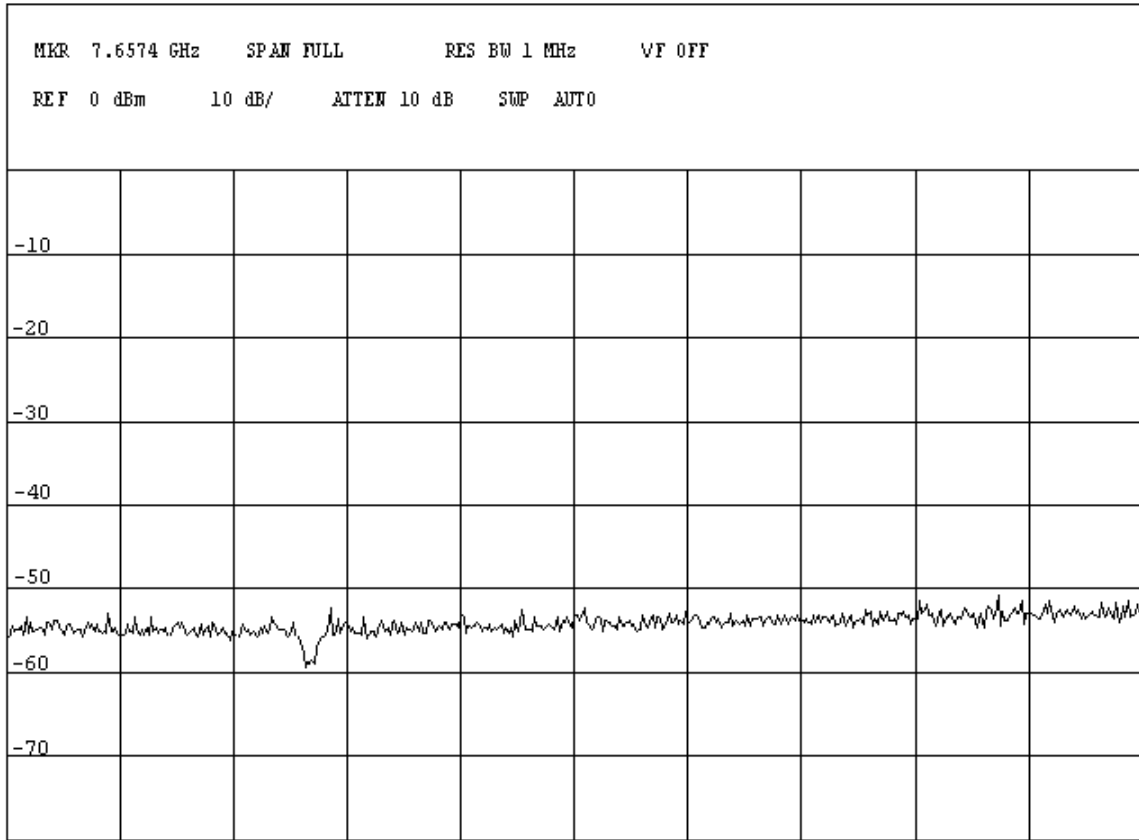
<b>Project Number:</b>	0048-070116-01-FCC
<b>EUT:</b>	ANDREW H RPM850 RF100595
<b>S/N:</b>	083
<b>Tested By:</b>	Edward Lee
<b>Temperature:</b>	70° F
<b>Humidity:</b>	30%

<b>Section:</b>	Spurious Emissions at RF Output Port: Cellular Band / GSM Modulation
<b>Plot Name:</b>	Downlink, Mid-Channel
<b>Configuration:</b>	Input: SG, Output Port: EUT RF OUTPUT



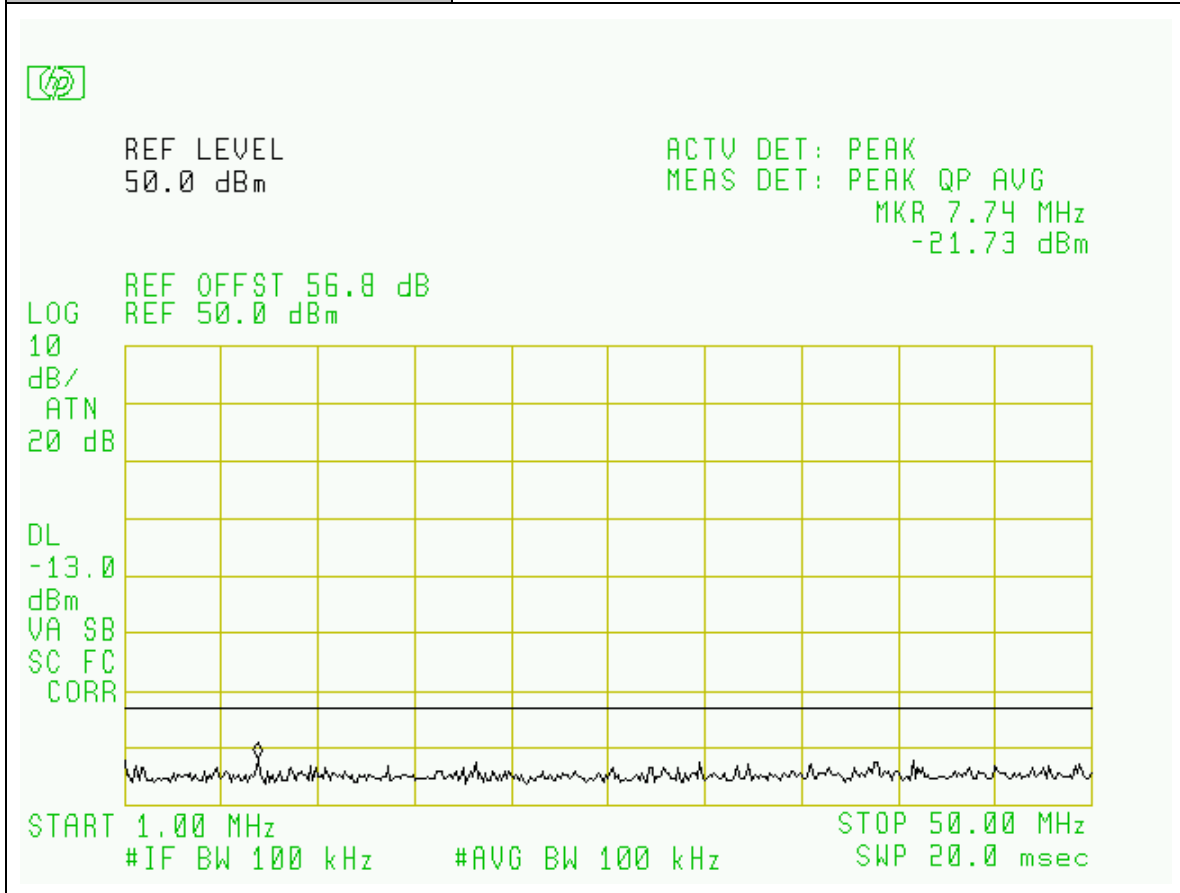
<b>Project Number:</b>	0048-070116-01-FCC
<b>EUT:</b>	ANDREW H RPM850 RF100595
<b>S/N:</b>	083
<b>Tested By:</b>	Edward Lee
<b>Temperature:</b>	70° F
<b>Humidity:</b>	30%

<b>Section:</b>	Spurious Emissions at RF Output Port: Cellular Band / GSM Modulation
<b>Plot Name:</b>	Downlink, Mid-Channel
<b>Configuration:</b>	Input: SG, Output Port: EUT RF OUTPUT



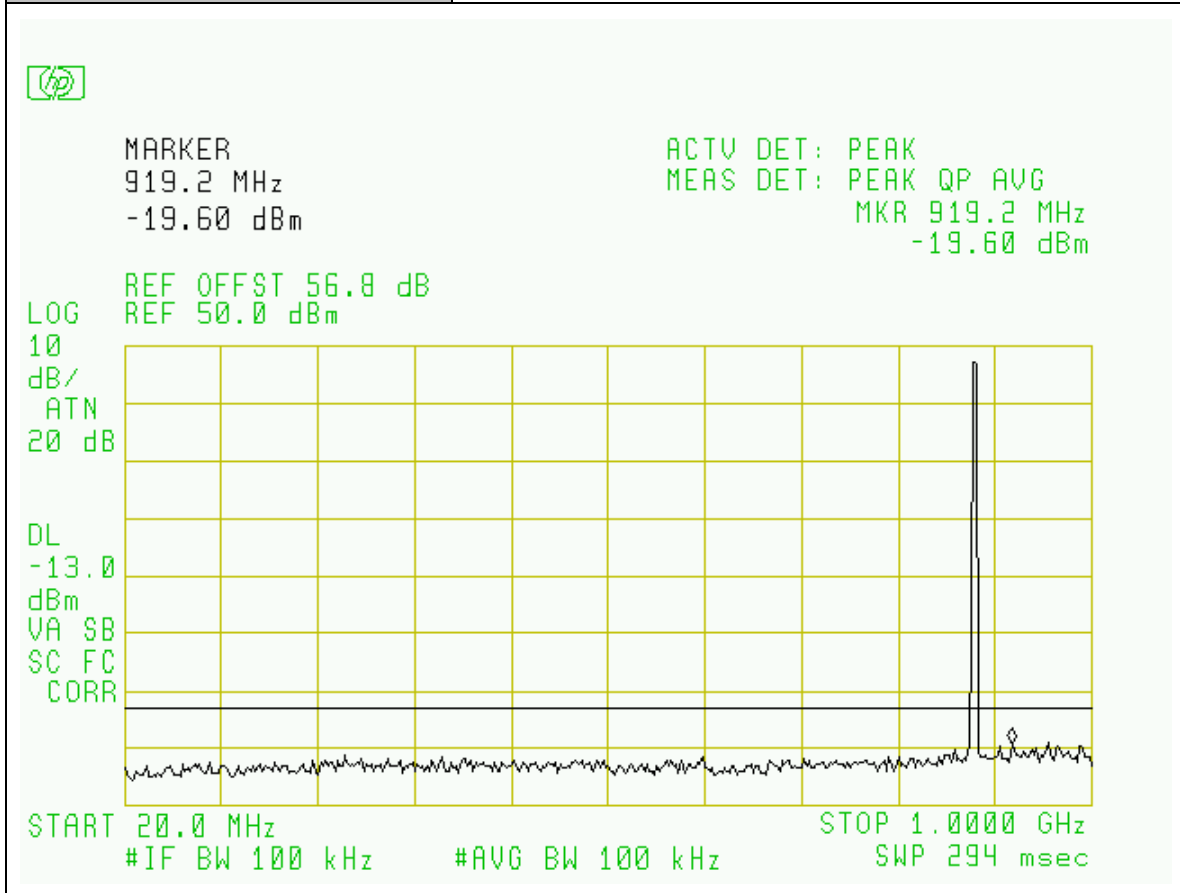
<b>Project Number:</b>	0048-070116-01-FCC
<b>EUT:</b>	ANDREW H RPM850 RF100595
<b>S/N:</b>	083
<b>Tested By:</b>	Edward Lee
<b>Temperature:</b>	70° F
<b>Humidity:</b>	30%

<b>Section:</b>	Spurious Emissions at RF Output Port: Cellular Band / GSM Modulation
<b>Plot Name:</b>	Downlink, Low-Channel
<b>Configuration:</b>	Input: SG, Output Port: EUT RF OUTPUT



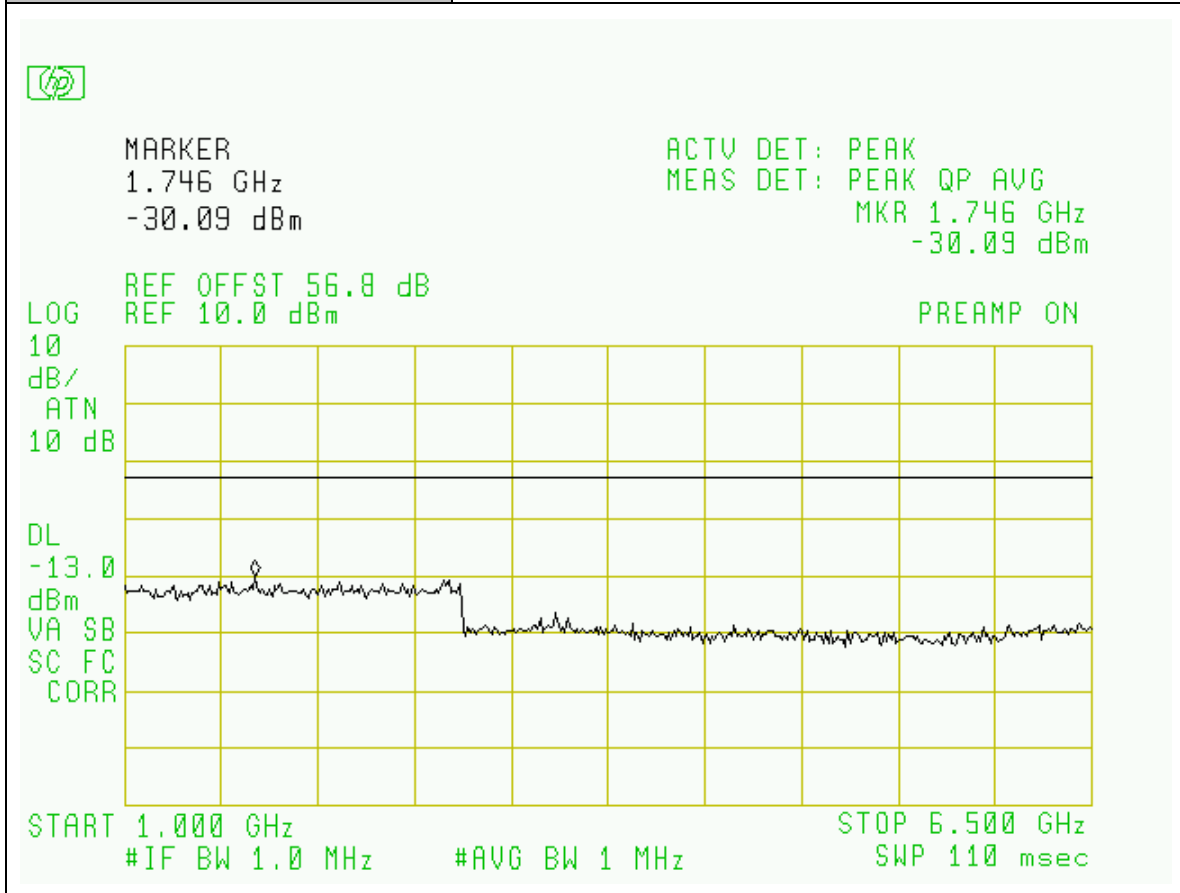
<b>Project Number:</b>	0048-070116-01-FCC
<b>EUT:</b>	ANDREW H RPM850 RF100595
<b>S/N:</b>	083
<b>Tested By:</b>	Edward Lee
<b>Temperature:</b>	70° F
<b>Humidity:</b>	30%

<b>Section:</b>	Spurious Emissions at RF Output Port: Cellular Band / GSM Modulation
<b>Plot Name:</b>	Downlink, Low-Channel
<b>Configuration:</b>	Input: SG, Output Port: EUT RF OUTPUT



<b>Project Number:</b>	0048-070116-01-FCC
<b>EUT:</b>	ANDREW HRP850 RF100595
<b>S/N:</b>	083
<b>Tested By:</b>	Edward Lee
<b>Temperature:</b>	70° F
<b>Humidity:</b>	30%

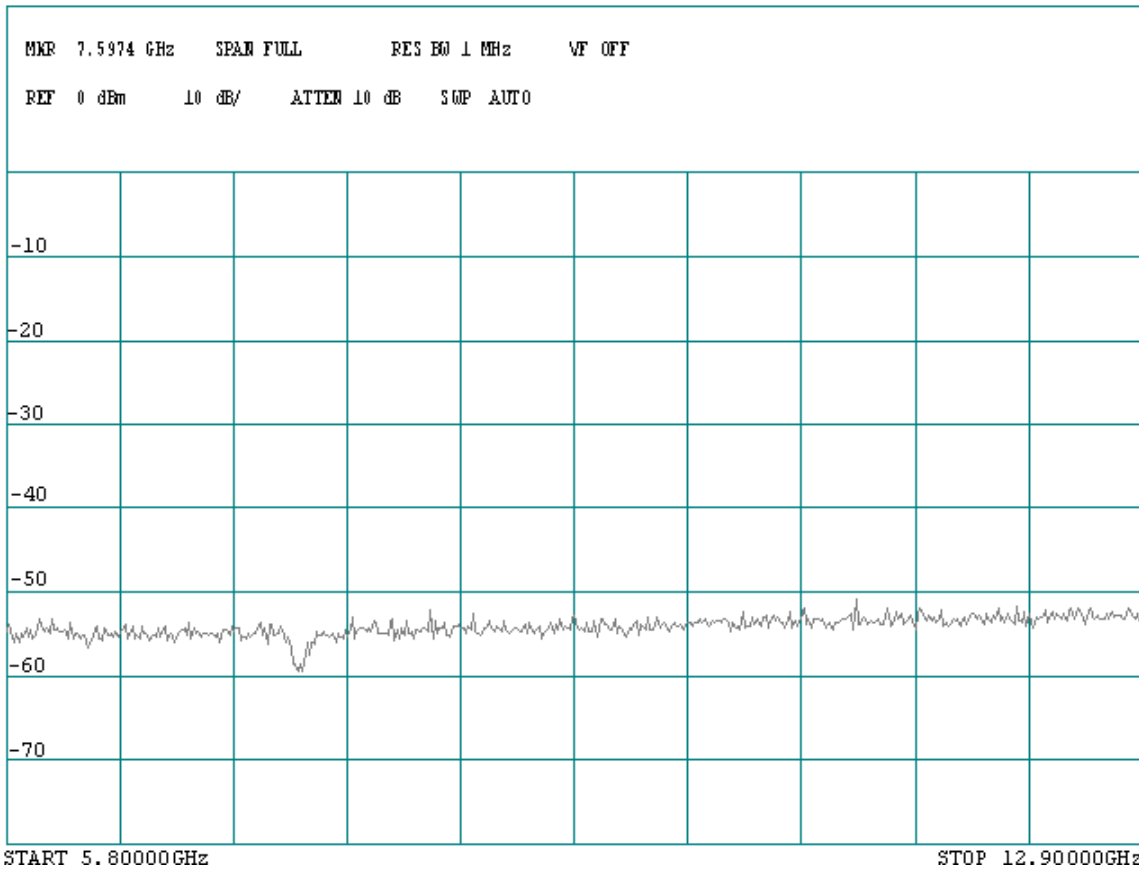
<b>Section:</b>	Spurious Emissions at RF Output Port: Cellular Band / GSM Modulation
<b>Plot Name:</b>	Downlink, Low-Channel
<b>Configuration:</b>	Input: SG, Output Port: EUT RF OUTPUT





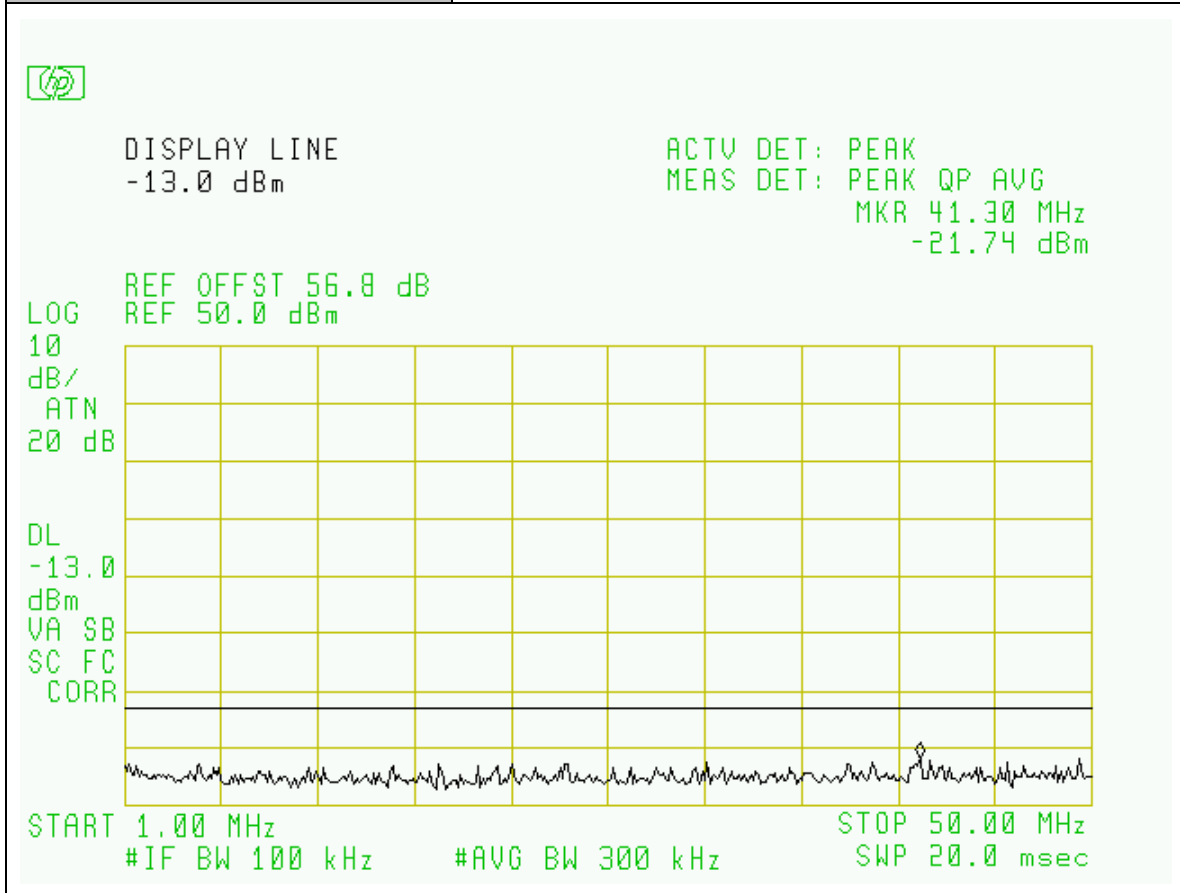
<b>Project Number:</b>	0048-070116-01-FCC
<b>EUT:</b>	ANDREW HRP850 RF100595
<b>S/N:</b>	083
<b>Tested By:</b>	Edward Lee
<b>Temperature:</b>	70° F
<b>Humidity:</b>	30%

<b>Section:</b>	Spurious Emissions at RF Output Port: Cellular Band / GSM Modulation
<b>Plot Name:</b>	Downlink, Low-Channel
<b>Configuration:</b>	Input: SG, Output Port: EUT RF OUTPUT



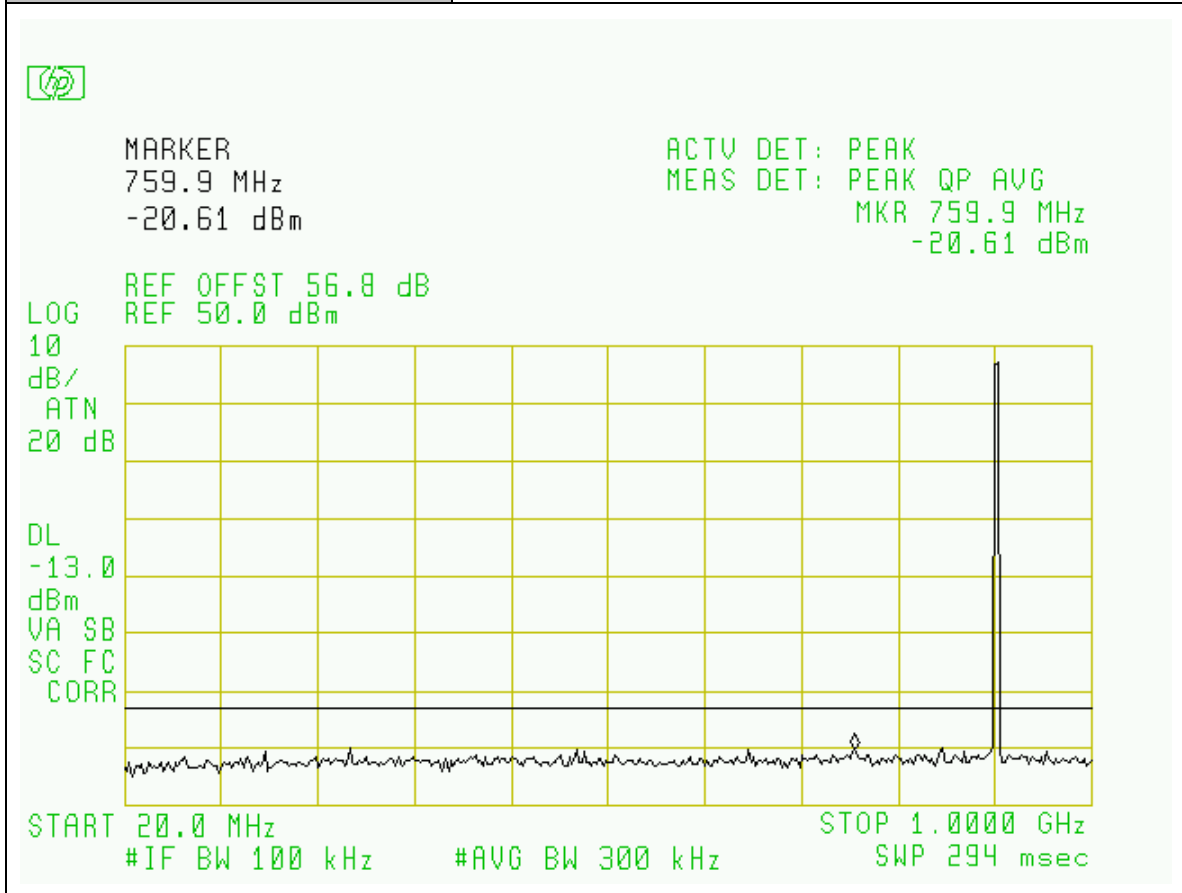
<b>Project Number:</b>	0048-070116-01-FCC
<b>EUT:</b>	ANDREW H RPM850 RF100595
<b>S/N:</b>	083
<b>Tested By:</b>	Edward Lee
<b>Temperature:</b>	70° F
<b>Humidity:</b>	30%

<b>Section:</b>	Spurious Emissions at RF Output Port: Cellular Band / EDGE Modulation
<b>Plot Name:</b>	Downlink, Hi-Channel
<b>Configuration:</b>	Input: SG, Output Port: EUT RF OUTPUT



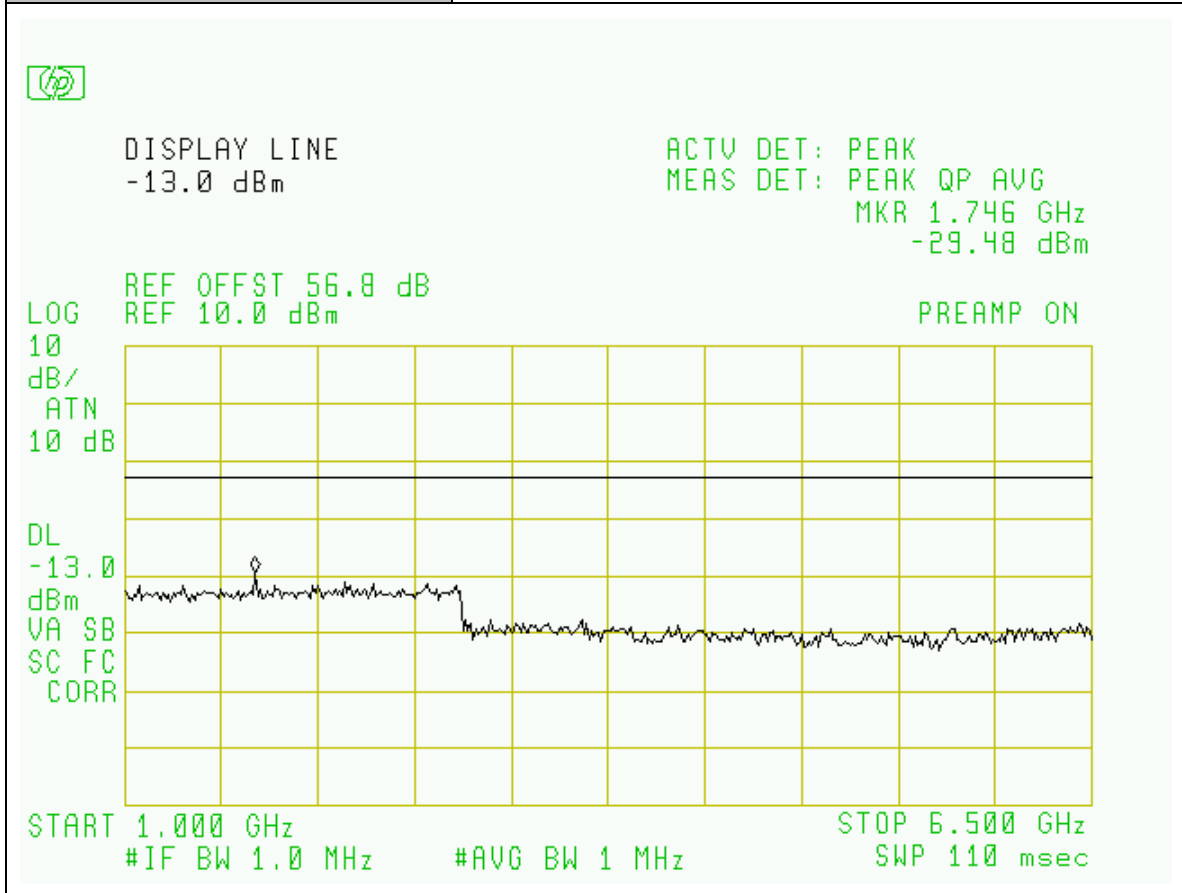
<b>Project Number:</b>	0048-070116-01-FCC
<b>EUT:</b>	ANDREW H RPM850 RF100595
<b>S/N:</b>	083
<b>Tested By:</b>	Edward Lee
<b>Temperature:</b>	70° F
<b>Humidity:</b>	30%

<b>Section:</b>	Spurious Emissions at RF Output Port: Cellular Band / EDGE Modulation
<b>Plot Name:</b>	Downlink, Hi-Channel
<b>Configuration:</b>	Input: SG, Output Port: EUT RF OUTPUT



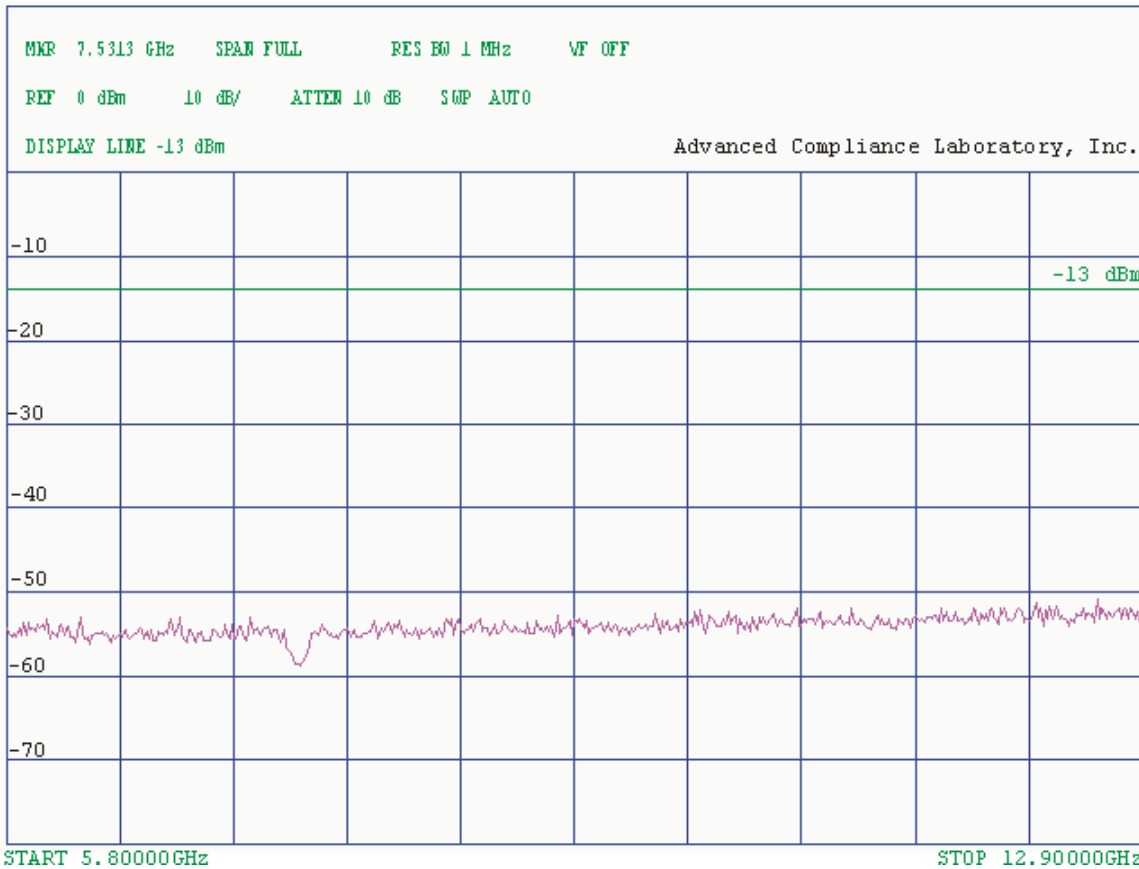
<b>Project Number:</b>	0048-070116-01-FCC
<b>EUT:</b>	ANDREW HRP850 RF100595
<b>S/N:</b>	083
<b>Tested By:</b>	Edward Lee
<b>Temperature:</b>	70° F
<b>Humidity:</b>	30%

<b>Section:</b>	Spurious Emissions at RF Output Port: Cellular Band / EDGE Modulation
<b>Plot Name:</b>	Downlink, Hi-Channel
<b>Configuration:</b>	Input: SG, Output Port: EUT RF OUTPUT



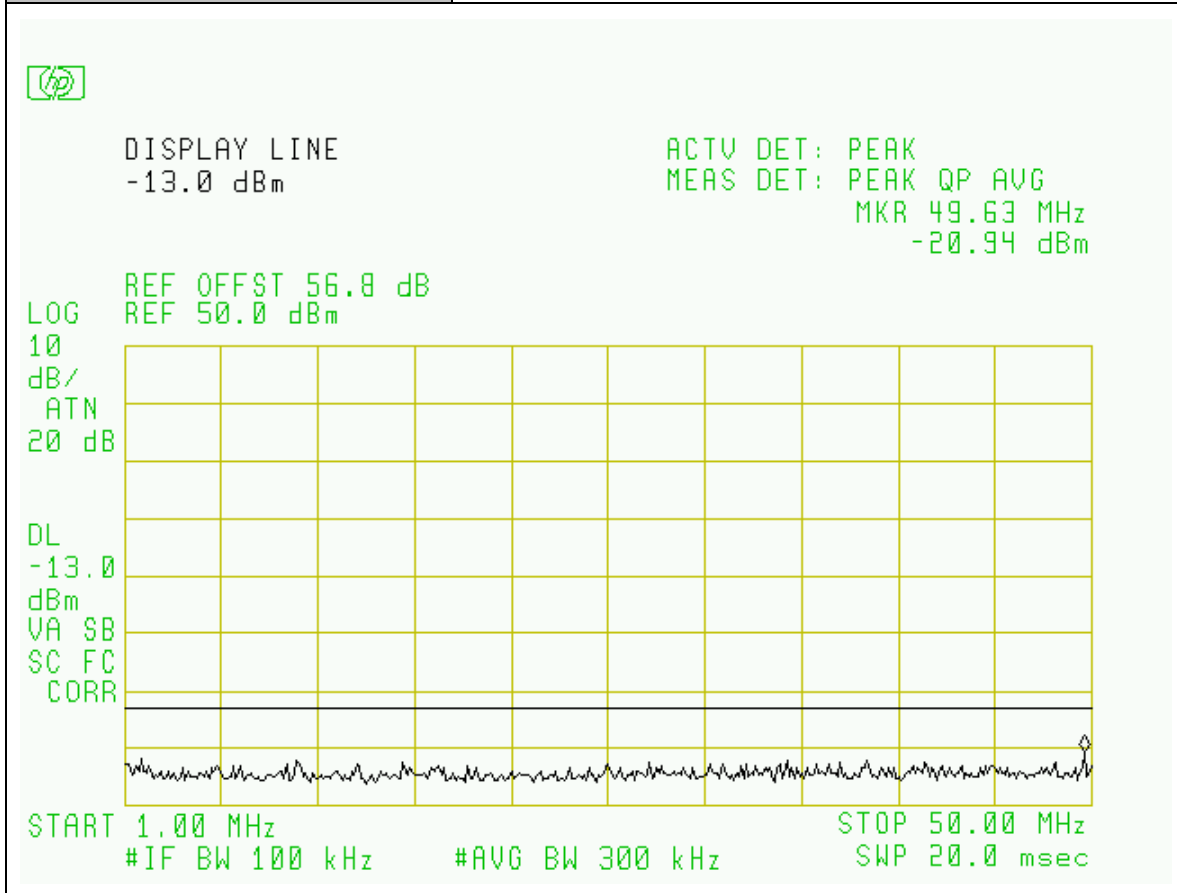
<b>Project Number:</b>	0048-070116-01-FCC
<b>EUT:</b>	ANDREW H RPM850 RF100595
<b>S/N:</b>	083
<b>Tested By:</b>	Edward Lee
<b>Temperature:</b>	70° F
<b>Humidity:</b>	30%

<b>Section:</b>	Spurious Emissions at RF Output Port: Cellular Band / EDGE Modulation
<b>Plot Name:</b>	Downlink, Hi-Channel
<b>Configuration:</b>	Input: SG, Output Port: EUT RF OUTPUT



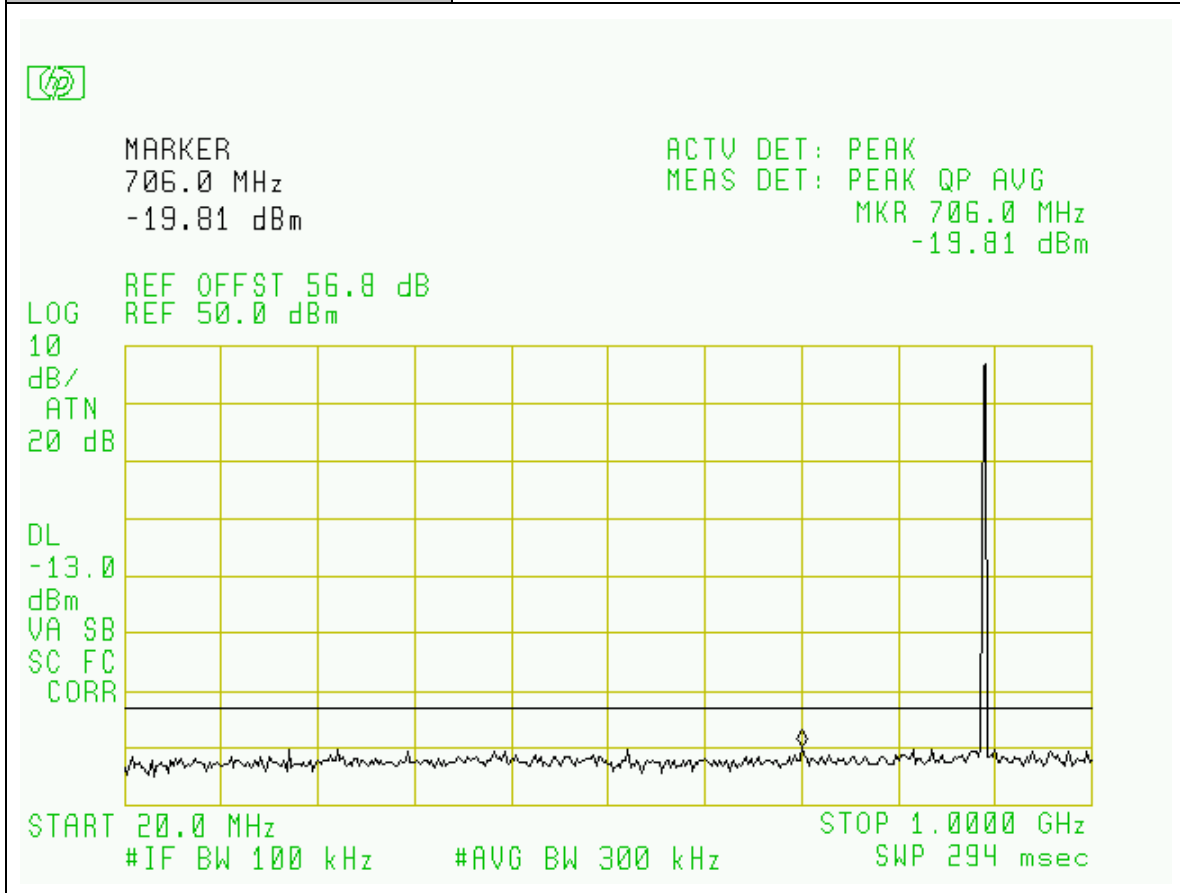
<b>Project Number:</b>	0048-070116-01-FCC
<b>EUT:</b>	ANDREW H RPM850 RF100595
<b>S/N:</b>	083
<b>Tested By:</b>	Edward Lee
<b>Temperature:</b>	70° F
<b>Humidity:</b>	30%

<b>Section:</b>	Spurious Emissions at RF Output Port: Cellular Band / EDGE Modulation
<b>Plot Name:</b>	Downlink, Mid-Channel
<b>Configuration:</b>	Input: SG, Output Port: EUT RF OUTPUT



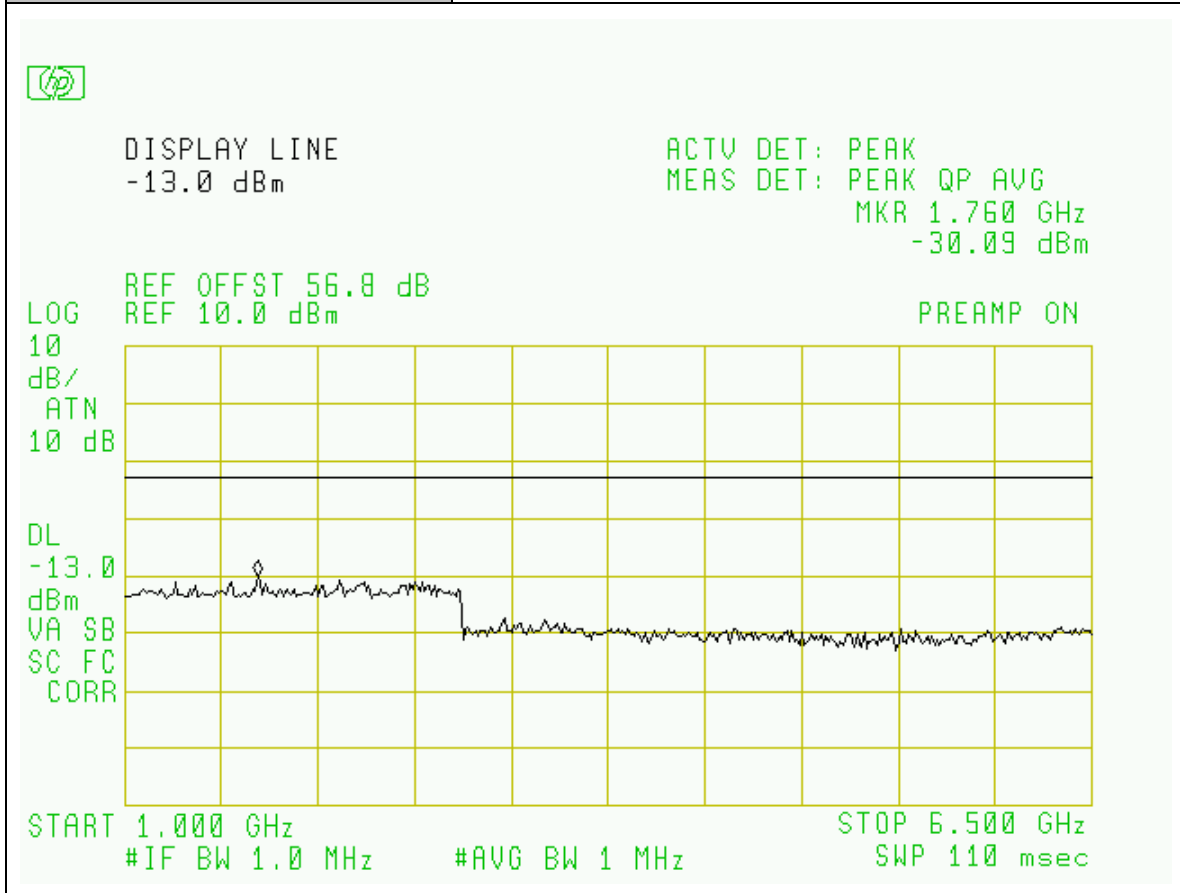
<b>Project Number:</b>	0048-070116-01-FCC
<b>EUT:</b>	ANDREW H RPM850 RF100595
<b>S/N:</b>	083
<b>Tested By:</b>	Edward Lee
<b>Temperature:</b>	70° F
<b>Humidity:</b>	30%

<b>Section:</b>	Spurious Emissions at RF Output Port: Cellular Band / EDGE Modulation
<b>Plot Name:</b>	Downlink, Mid-Channel
<b>Configuration:</b>	Input: SG, Output Port: EUT RF OUTPUT



<b>Project Number:</b>	0048-070116-01-FCC
<b>EUT:</b>	ANDREW H RPM850 RF100595
<b>S/N:</b>	083
<b>Tested By:</b>	Edward Lee
<b>Temperature:</b>	70° F
<b>Humidity:</b>	30%

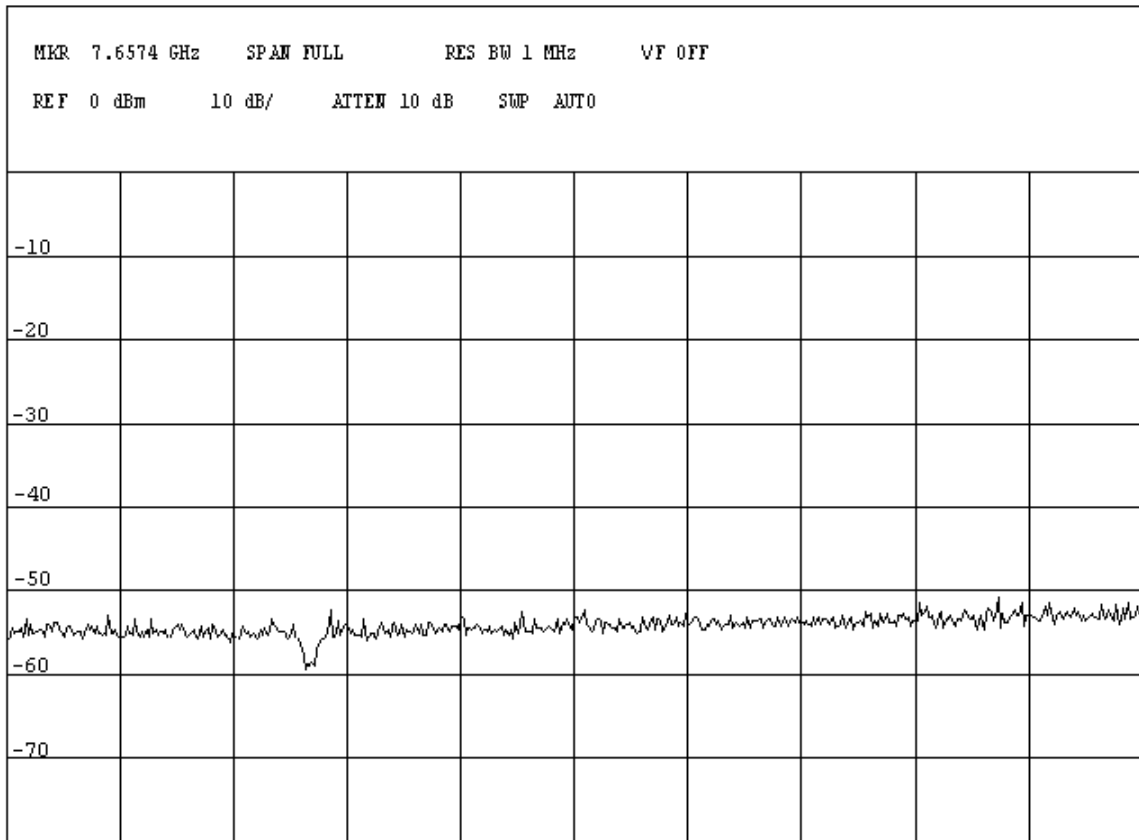
<b>Section:</b>	Spurious Emissions at RF Output Port: Cellular Band / EDGE Modulation
<b>Plot Name:</b>	Downlink, Mid-Channel
<b>Configuration:</b>	Input: SG, Output Port: EUT RF OUTPUT





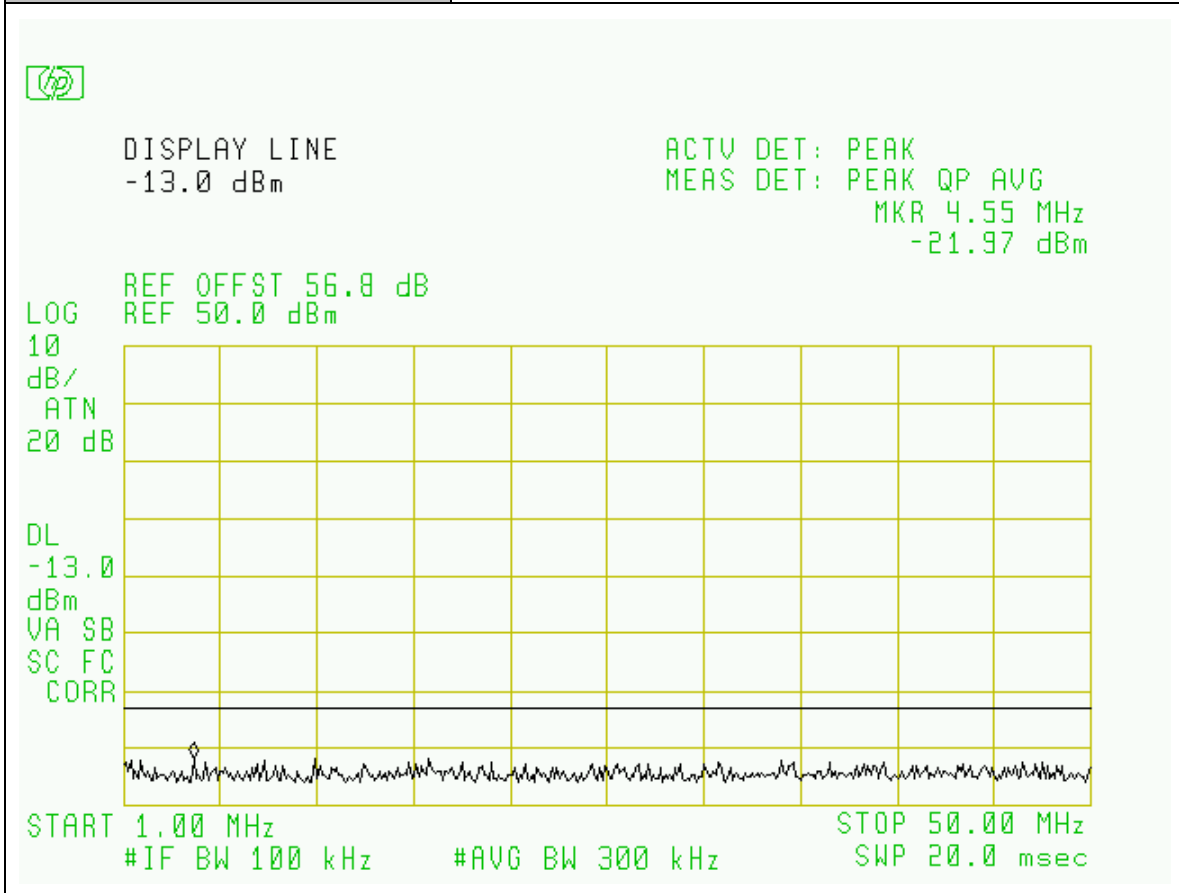
<b>Project Number:</b>	0048-070116-01-FCC
<b>EUT:</b>	ANDREW HRP850 RF100595
<b>S/N:</b>	083
<b>Tested By:</b>	Edward Lee
<b>Temperature:</b>	70° F
<b>Humidity:</b>	30%

<b>Section:</b>	<b>Spurious Emissions at RF Output Port: Cellular Band / EDGE Modulation</b>
<b>Plot Name:</b>	<b>Downlink, Mid-Channel</b>
<b>Configuration:</b>	<b>Input: SG, Output Port: EUT RF OUTPUT</b>



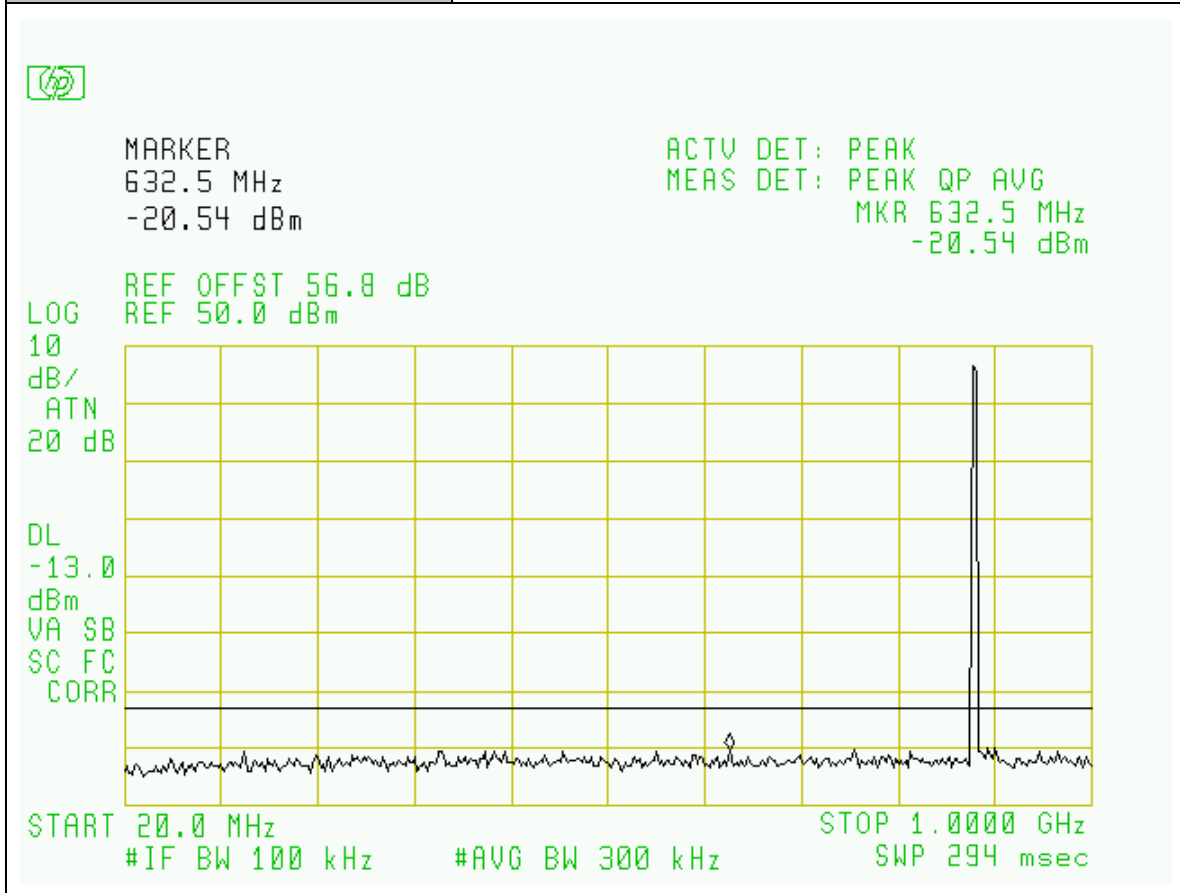
<b>Project Number:</b>	0048-070116-01-FCC
<b>EUT:</b>	ANDREW H RPM850 RF100595
<b>S/N:</b>	083
<b>Tested By:</b>	Edward Lee
<b>Temperature:</b>	70° F
<b>Humidity:</b>	30%

<b>Section:</b>	Spurious Emissions at RF Output Port: Cellular Band / EDGE Modulation
<b>Plot Name:</b>	Downlink, Low-Channel
<b>Configuration:</b>	Input: SG, Output Port: EUT RF OUTPUT



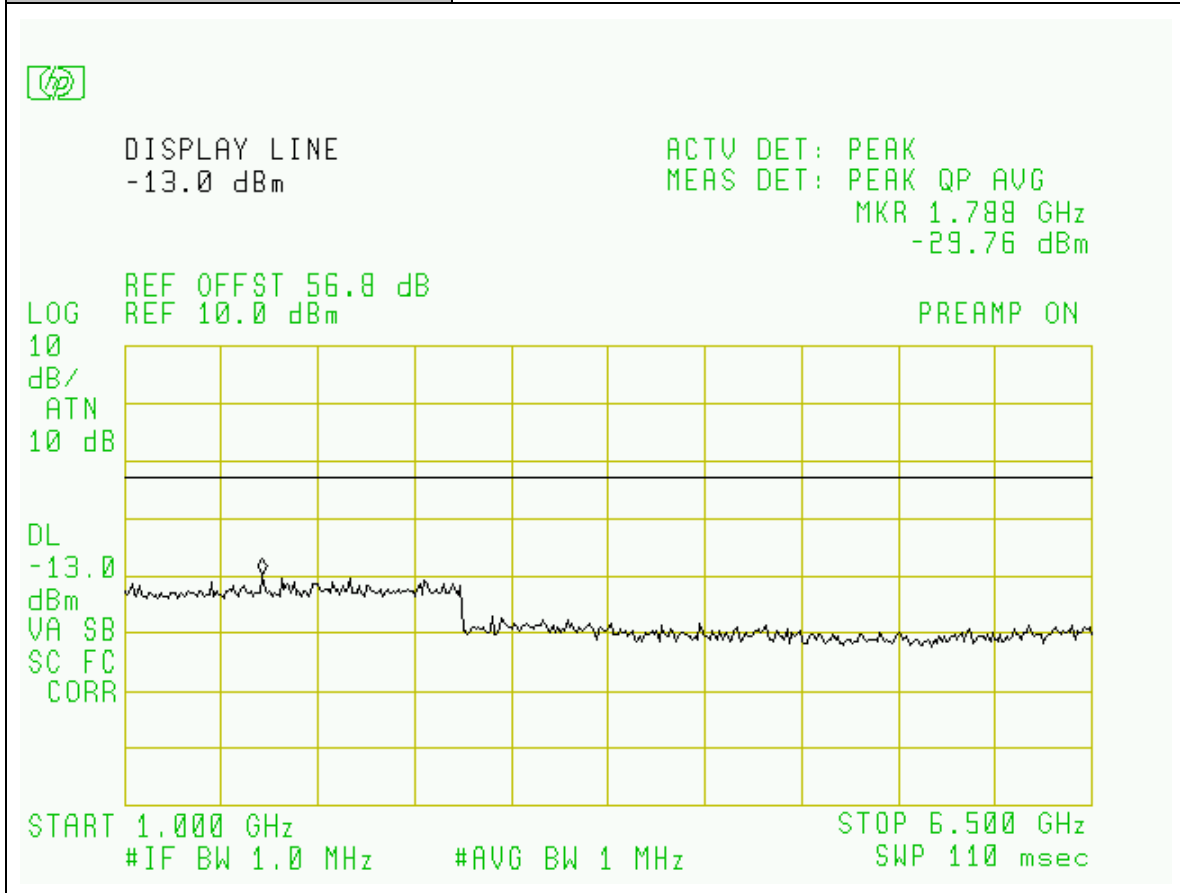
<b>Project Number:</b>	0048-070116-01-FCC
<b>EUT:</b>	ANDREW H RPM850 RF100595
<b>S/N:</b>	083
<b>Tested By:</b>	Edward Lee
<b>Temperature:</b>	70° F
<b>Humidity:</b>	30%

<b>Section:</b>	Spurious Emissions at RF Output Port: Cellular Band / EDGE Modulation
<b>Plot Name:</b>	Downlink, Low-Channel
<b>Configuration:</b>	Input: SG, Output Port: EUT RF OUTPUT



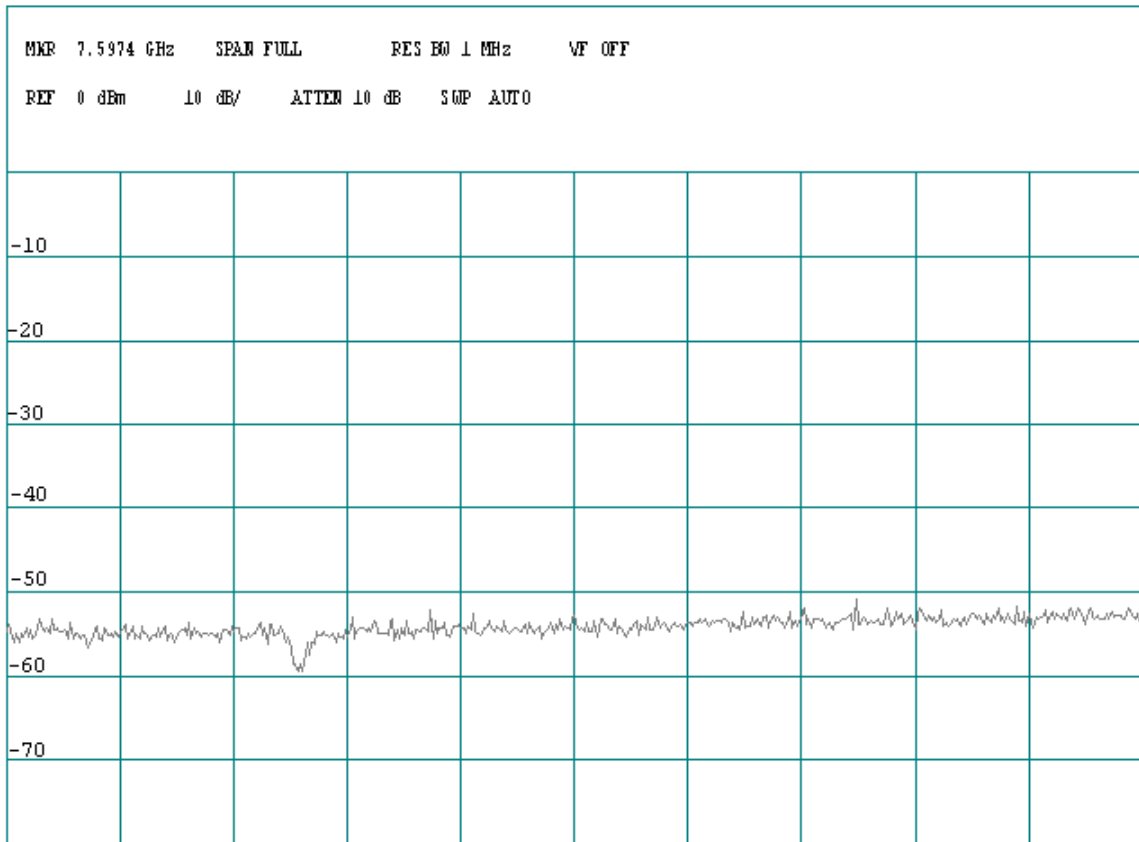
<b>Project Number:</b>	0048-070116-01-FCC
<b>EUT:</b>	ANDREW H RPM850 RF100595
<b>S/N:</b>	083
<b>Tested By:</b>	Edward Lee
<b>Temperature:</b>	70° F
<b>Humidity:</b>	30%

<b>Section:</b>	Spurious Emissions at RF Output Port: Cellular Band / EDGE Modulation
<b>Plot Name:</b>	Downlink, Low-Channel
<b>Configuration:</b>	Input: SG, Output Port: EUT RF OUTPUT



<b>Project Number:</b>	0048-070116-01-FCC
<b>EUT:</b>	ANDREW HRP850 RF100595
<b>S/N:</b>	083
<b>Tested By:</b>	Edward Lee
<b>Temperature:</b>	70° F
<b>Humidity:</b>	30%

<b>Section:</b>	Spurious Emissions at RF Output Port: Cellular Band / EDGE Modulation
<b>Plot Name:</b>	Downlink, Low-Channel
<b>Configuration:</b>	Input: SG, Output Port: EUT RF OUTPUT



## Section 6. Field Strength of Spurious

<b>Name of Test:</b>	<i>Field Strength of Spurious</i>	<b>Test Standard:</b>	<i>22.917</i> <i>2.1053</i>
<b>Tested By:</b>	EDWARD LEE	<b>Test Date:</b>	01/16/2007-01/30/2007

**Minimum Standard:** Para. No. 22.917(e). The mean power of emissions must be attenuated below the mean power of the unmodulated carrier on any frequency twice or more than twice the fundamental emission by at least  $43 + 10 \log P$ . This is equivalent to -13 dBm absolute power. Para. No. 2.1053(a). The magnitude of each spurious and harmonic emission that can be detected when the equipment is operated under conditions specified in the instruction manual and/or alignment procedure, shall not less than  $43+10 \log$  (mean output power in watts) dBc below the mean power output outside a licensee's frequency block (-13dBm).

**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.

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.

### Calculation for Required Emission Limit Per 2.1053

With the MCPA RF output level set to 45 watts (46.50 dBm), Radiated Emissions between 10 MHz and 10 GHz (Cellular) or 20GHz (PCS) shall be observed. The “Low, Mid, and High” 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:

$$E = (49.2 * P)^{1/2} / R \quad [15.684 \text{ V/m}]$$

Where:

E = Field intensity in Volts/meter of carrier

P = transmitted power in Watts (45 W)

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

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

$$20 \log (E * 10^6) \quad [143.91]$$

Attenuation requirement (Atten):  $43 + 10 \log P$  [59.53dBc]

Thus, the required limit:

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

For MCPA:

E = 143.91 dBuV/m (at 3 meters)

Atten = 59.53 dBc

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

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

**Test Result:**

**Complies**

**Test Data:**

See Attached Table(s)



<b>Configuration</b>	CELLULAR w/ RF Output Port Terminated
<b>Band</b>	CELLULAR Downlink
<b>Channel</b>	Low

Freq. (MHz)	H,V	SA Reading (dBuV)	Height (m)	Angle (degree)	Calculated 3m Limit (dBuV)	Margin (dB)	Absolute Limit (dBm)	Margin (dB)
GSM 60W								
1738.4	H	40.1	1.6	280	84.38	-44.28	-13	-53.9
2607.6	H				84.38		-13	
3476.8	H	38.0	1.4	100	84.38	-46.38	-13	-56
4346.0	H				84.38		-13	
5215.2	H	42.0	1.4	80	84.38	-42.38	-13	-52
1738.4	V	49.6	1.5	45	84.38	-34.78	-13	-44.4
2607.6	V				84.38		-13	
3476.8	V	40.4	1.2	20	84.38	-43.98	-13	-53.6
4346.0	V				84.38		-13	
5215.2	V	44.9	1.3	30	84.38	-39.48	-13	-49.1
6085.0	V	43.4	1.2	40	84.38	-40.98	-13	-50.6
EDGE 45W								
1738.4	H	44.5	1.5	80	84.38	-39.88	-13	-49.5
2607.6	H	38.5	1.4	100	84.38	-45.88	-13	-55.5
3476.8	H	38.8	1.5	0	84.38	-45.58	-13	-55.2
4346.0	H				84.38		-13	
5215.2	H				84.38		-13	
6085.0	H	42.3	1.4	45	84.38	-42.08	-13	-51.7
1738.4	V	45.8	1.5	100	84.38	-38.58	-13	-48.2
2607.6	V	40.0	1.3	50	84.38	-44.38	-13	-54
3476.8	V	43.9	1.3	45	84.38	-40.48	-13	-50.1
4346.0	V				84.38		-13	
5215.2	V	39.6	1.3	90	84.38	-44.78	-13	-54.4
6085.0	V	48.1	1.3	45	84.38	-36.28	-13	-45.9

**NOTE:**

\* Measured with Average Detector  
 SA: Spectrum Analyzer  
 EUT's input.: GSM & EDGE with rated P

H=horizontal and V=vertical  
 SA Reading: Peak Reading unless otherwise specified

<b>Configuration</b>	CELLULAR w/ RF Output Port Terminated
<b>Band</b>	CELLULAR 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)
GSM 60W								
1763.0	H	41.0	1.4	40	84.38	-43.38	-13	-53
2644.5	H				84.38		-13	
3526.0	H	39.1	1.3	60	84.38	-45.28	-13	-54.9
4407.5	H				84.38		-13	
5289.0	H	37.8	1.5	30	84.38	-46.58	-13	-56.2
1763.0	V	49.0	1.4	90	84.38	-35.38	-13	-45
2644.5	V				84.38		-13	
3526.0	V	40.0	1.4	70	84.38	-44.38	-13	-54
4407.5	V				84.38		-13	
5289.0	V	43.5	1.5	80	84.38	-40.88	-13	-50.5
EDGE 45W								
1763.0	H	42.6	1.4	80	84.38	-41.78	-13	-51.4
2644.5	H				84.38		-13	
3526.0	H	37.8	1.3	70	84.38	-46.58	-13	-56.2
4407.5	H				84.38		-13	
5289.0	H	40.2	1.3	20	84.38	-44.18	-13	-53.8
1763.0	V	50.5	1.5	100	84.38	-33.88	-13	-43.5
2644.5	V	41.5	1.3	90	84.38	-42.88	-13	-52.5
3526.0	V	41.4	1.3	80	84.38	-42.98	-13	-52.6
4407.5	V	36.0	1.4	80	84.38	-48.38	-13	-58
5289.0	V	44.1	1.4	90	84.38	-40.28	-13	-49.9

**NOTE:**

\* Measured with Average Detector  
 SA: Spectrum Analyzer  
 EUT's input.: GSM & EDGE with rated P

H=horizontal and V=vertical  
 SA Reading: Peak Reading unless otherwise specified

<b>Configuration</b>	CELLULAR w/ RF Output Port Terminated
<b>Band</b>	CELLULAR Downlink
<b>Channel</b>	High

Freq. (MHz)	H,V	SA Reading (dBuV)	Height (m)	Angle (degree)	Calculated 3m Limit (dBuV)	Margin (dB)	Absolute Limit (dBm)	Margin (dB)
GSM 60W								
1787.6	H	41.0	1.5	10	84.38	-43.38	-13	-53
2681.4	H				84.38		-13	
3575.2	H				84.38		-13	
4469.0	H				84.38		-13	
5362.8	H	38.2	1.2	40	84.38	-46.18	-13	-55.8
1787.6	V	48.4	1.2	90	84.38	-35.98	-13	-45.6
2681.4	V				84.38		-13	
3575.2	V	38.0	1.3	70	84.38	-46.38	-13	-56
4469.0	V				84.38		-13	
5362.8	V	40.1	1.3	50	84.38	-44.28	-13	-53.9
EDGE 45W								
1787.6	H	43.8	1.5	40	84.38	-40.58	-13	-50.2
2681.4	H				84.38		-13	
3575.2	H				84.38		-13	
4469.0	H	40.0	1.5	40	84.38	-44.38	-13	-54
5362.8	H				84.38		-13	
1787.6	V	48.5	1.5	100	84.38	-35.88	-13	-45.5
2681.4	V	41.6	1.5	90	84.38	-42.78	-13	-52.4
3575.2	V	40.9	1.5	80	84.38	-43.48	-13	-53.1
4469.0	V				84.38		-13	
5362.8	V	44.3	1.4	90	84.38	-40.08	-13	-49.7

**NOTE:**

\* Measured with Average Detector  
 SA: Spectrum Analyzer  
 EUT's input.: GSM & EDGE with rated P

H=horizontal and V=vertical  
 SA Reading: Peak Reading unless otherwise specified

**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>	

**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 +25 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**

---

**Test Data:**

See Attached Table(s)

***Not Applicable***

**Section 8. Test Equipment List**

<b>Manufacture</b>	<b>Model</b>	<b>Serial No.</b>	<b>Description</b>	<b>Last Cal dd/mm/ yy</b>	<b>Cal Due dd/mm/ yy</b>
HP	HP8546A	3448A00290	EMI Receiver	01/12/06	01/12/07
HP	E4432B	US38220355	250K-3GHz Signal Generator	17/09/06	17/09/07
EMCO	3104C	9307-4396	20-300MHz Biconical Antenna	12/02/06	12/02/07
EMCO	3146	9008-2860	200-1000MHz Log-Periodic Antenna	09/02/06	09/02/07
Fischer Custom	LISN-2	900-4-0008	Line Impedance Stabilization Networks	23/08/06	23/08/07
Fischer Custom	LISN-2	900-4-0009	Line Impedance Stabilization Networks	23/08/06	23/08/07
EMCO	6502	2665	10KHz-30MHz Active Loop Antenna	27/02/06	27/02/07
EMCO	3115	4945	Double Ridge Guide Horn Antenna	11/08/06	11/08/07
HP	8569B	2607A02802	1GHz-22GHz Spectrum Analyzer	10/02/06	10/02/07
Advantest	R3271	5003583	100Hz-26.5GHz Spectrum Analyzer	30/04/06	30/04/07
Delta Design	5900C	0-67-26	Temperature Chamber	24/03/06	24/03/07
HP	E8254A	US42110367	Signal Generator	23/03/06	23/03/07
Electro-Metrics	RGA-50	8-95	Double Ridge Guide Horn Antenna	10/02/06	10/02/07
EMCO	3116	4943	Double Ridge Guide Horn Antenna	11/01/06	11/01/07
Scientific-Atlanta	12A-18	441	Wave Guide Horn Antenna	04/08/06	04/08/07
HP	4419A	US37292112	RF Power Meter w/ Sensor Probe	20/07/06	20/07/07
Agilent	E4438C	US41460731	ESG Vector Signal Generator	01/07/05	01/07/07
Agilent	E4438C	US41460771	ESG Vector Signal Generator	01/07/05	01/07/07
Agilent	E4438C	US41460400	ESG Vector Signal Generator	01/07/05	01/07/07
Lorch Microwave	5NF-800/1000-S	AC3	Notch Filter		
RES-NET	RFA500NFF30	0108	30dB in-line Power Attenuator		
Narda	3022	80986	Directional Coupler		
General Purpose			0-60V, 50A DC Power Supply		