



SAMSUNG ELECTRONICS Co., Ltd.,  
Regulatory Compliance Group  
IT R&D Center  
416 Maetan3-Dong,  
Yeongtong-gu, Suwon city,  
Gyeonggi-Do, Korea 443-742

## FCC CFR47 PART 24 SUBPART CERTIFICATION REPORT

Model Tested : SGH-D888  
FCC ID(Requested) : A3LSGHD888  
Report No : FE-135-R1/2  
Job No : FE-135  
Date issued : August 06, 2007

This Report supersedes the Report FE-135-R1, dated July 07, 2007.  
The contents contained in this Report supersede those.

- Abstract -

All measurement reported herein accordance with FCC Rules, 47CFR Part2,  
Part24.

Prepared By

JH HAN - Test Engineer

Authorized By

WW JANG - Technical Manager



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# MEASUREMENT REPORT

## 1. FCC Certification Information

The following information is in accordance with FCC Rules, 47CFR Part2, Subpart J, Sections 2.1033 – 2.1055.

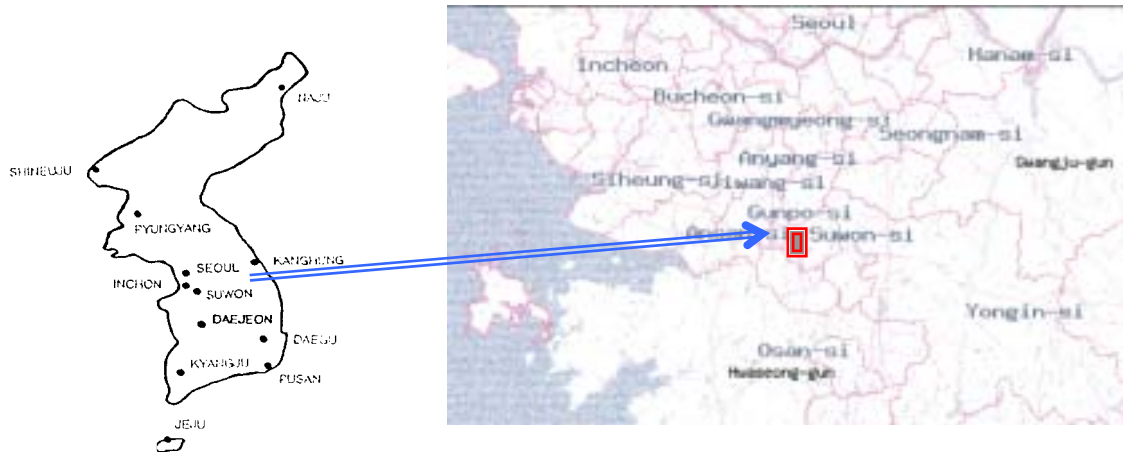
### 1.1. §2.1033 General Information

- Applicant Name : SAMSUNG ELECTRONICS CO., LTD.
- Address : 416 Maetan3-Dong, Yeongtong-gu, Suwon City  
Gyeonggi-Do, Korea 443-742
- Attention : SungJoo KIM, Engineering Manager (QA Lab)
- FCC ID : A3LSGHD888
- Quantity : Quantity production is planned
- Emission Designators : 255KGXW(GSM1900), 249KG7W(GSM1900 EDGE)
- Tx Freq. Range : 1850.2MHz -1909.8MHz (GSM1900)
- Rx Freq. Range : 1930.2MHz - 1989.8MHz (GSM1900)
- Max. Power Rating : 0.839 W EIRP GSM1900 (29.24dBm)  
0.466 W EIRP GSM1900 EDGE(26.68dBm)
- FCC Classification(s) : Licensed Portable Tx Held to Ear (PCE)
- Equipment (EUT) Type : Single-Band PCS GSM/EDGE Phone with Bluetooth
- Frequency Tolerance :  $\pm 0.00025\%$  (2.5ppm)
- FCC Rule Part(s) : §24(E), §2.
- Dates of Test : July 04, 2007
- Place of Test : SAMSUNG Lab,
- Test Report S/N : FE-135-R1/2

## 2. INTRODUCTION

### 2.1. General

These measurement test were conducted at **SAMSUNG ELECTRONICS CO., LTD(SUWON)**. The site address is 416 Maetan3-Dong, Yeongtong-gu, Suwon City, Gyeonggi-Do, Korea 443-742 The site have 1 Fully-anechoic chamber and measurement facility.

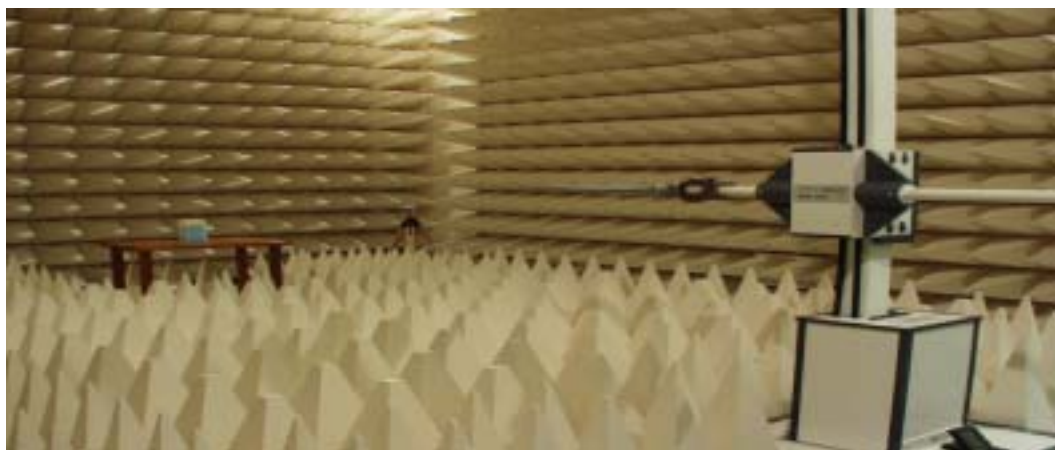


**Figure1. Map of the Suwon City area.**

### **Measurement Procedure**

The radiated and spurious measurements were made Fully-anechoic chamber at a 3-meter test range (see Figure2). The equipment under testing was placed on a Non-conducted turntable 3-meters from the receive antenna. The receive antenna height and turntable rotations were adjusted for the highest reading on the receive spectrum analyzer. The substitution antenna will replace the EUT antenna it the same position and in vertical polarization. The frequency of the signal generator shall be set to the frequencies that were measured on the EUT. The test antenna shall be raised and lowered, if necessary, to ensure that the maximum signal is still being received. The signal generator, output level, shall be adjusted until an equal or a known related level to what was measured from the EUT is obtained in the spectrum analyzer. This level was recorded.

For readings above 1 GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic antenna are taken into consideration.



**Figure2. Photograph of 3m Fully-Anechoic Chamber**



### **3. MEASURING INSTRUMENT CALIBRATION**

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment, which is traceable to recognized national standards.

#### 4. TEST EQUIPMENT LIST

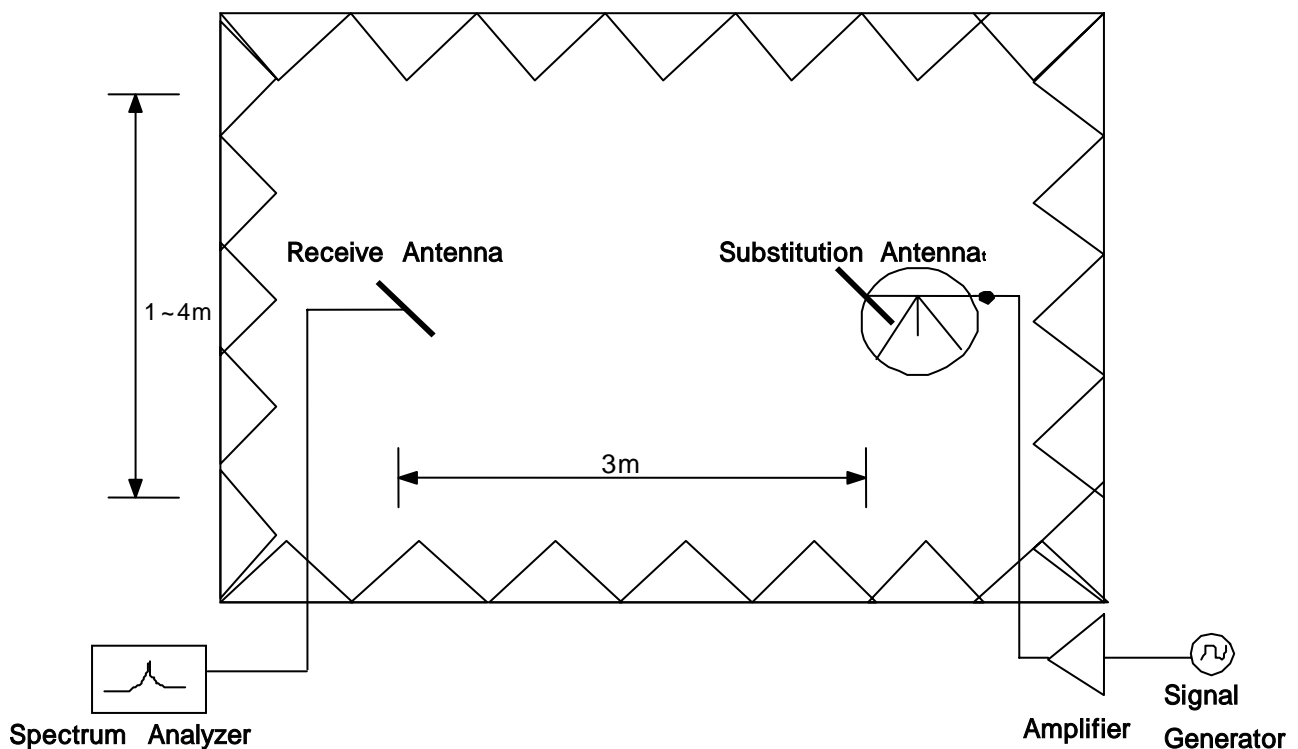
<b>Name Of Equipment</b>	<b>Model</b>	<b>Serial No.</b>	<b>Due Date</b>
Spectrum Analyzer	ESI26	836119/010	2007-10-01
	E4440A(3Hz~26.5GHz)	MY41000236	2008-04-14
	E4440A(3Hz~26.5GHz)	MY41000233	2007-07-21
Signal Generator	SMR20	835197/030	2008-01-11
Amplifier	5S1G4	304866	2007-10-19
Communication test set	8753E	JP38160590	2008-06-26
Power Sensor	8485A	3318A19924	2007-09-24
Power Meter	E4419B	GB41293846	2007-09-06
Pre-Amplifier	8449B	3008A00691	2008-01-02
Communication test set	8960	GB42230535	2008-01-02
	8960	GB42360886	2008-07-03
Antenna Master	MA240	240/618	Not Required
Controller	HD100	100/756	Not Required
Horn Antenna	HF906	100134	2008-05-04
Dipole Antenna	3121C-DB4	9007-588	2008-05-29
Communication test set	CMU200	109162	2007-10-17
Receive Antenna	HL040	353255/019	2007-09-20
	HL040	353255/020	2008-04-25
Spectrum Analyzer	E3640A	MY40003594	2008-06-25
Divider	11636B	51946	Not Required
	11636B	51942	Not Required
High Pass Filter	WHK1.0/15G-10SS	1	Not Required
	WHK/3.5/18G-10SS	4	Not Required
Environmental Chamber	SH-241	92000549	2007-11-16
Shielded Fully Anechoic Chamber	CHAMBER	ANT0001	Not Required

## 5. DESCRIPTION OF TESTS

### 5.1. Effective Radiated Power / Equivalent Isotropic Radiated Power

#### Test Set-up for the ERP/EIRP TEST

Effective Radiated Power Output and Equivalent Isotropic Radiated Power Measurements by Substitution Method according to ANSI/TIA/EIA-603-C-2004:



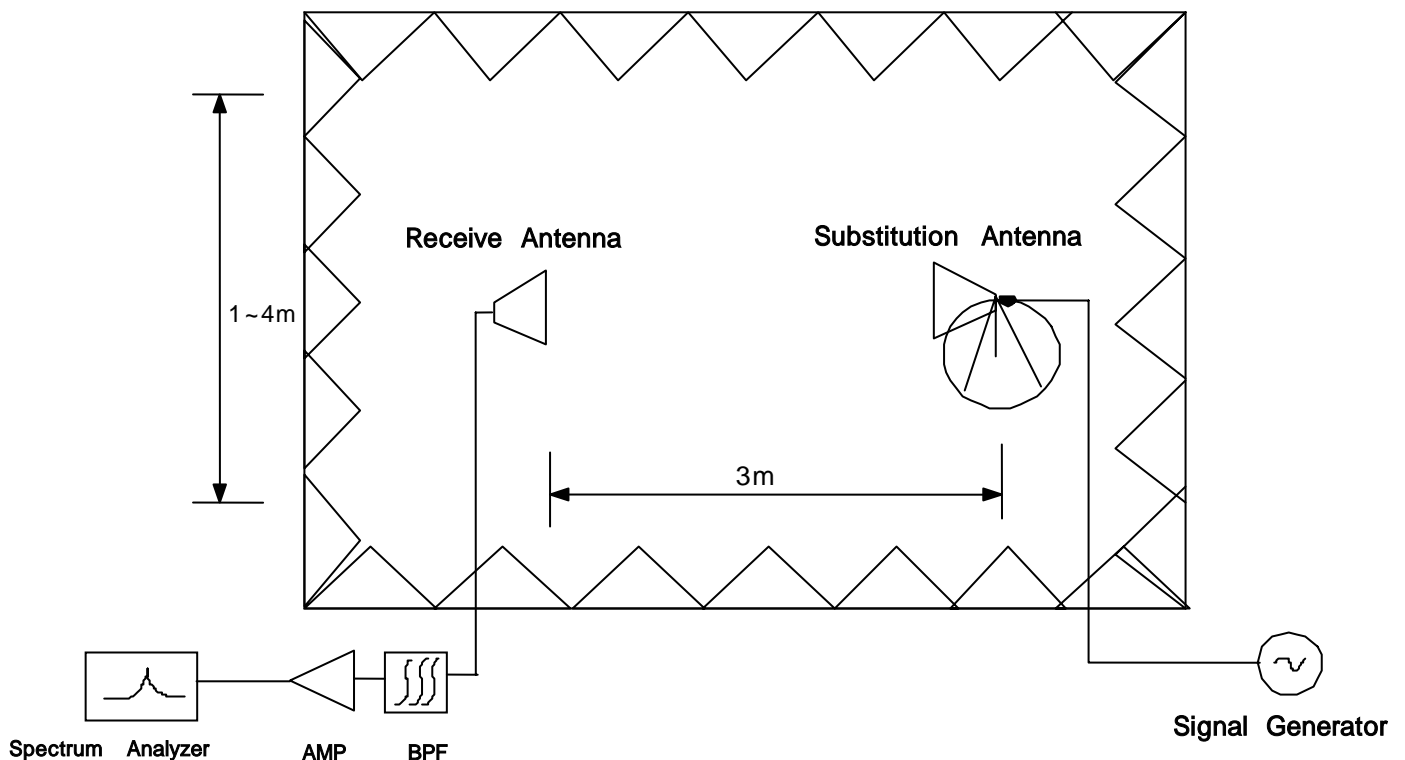
**Figure 3. Diagram of ERP/EIRP test Set-up**

The EUT was placed on a Non-conducted turntable 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. For GSM signals, an average detector is used, with RBW=VBW=3MHz, SPAN=10MHz. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. The conducted power at the terminals of dipole is measured. The ERP and EIRP are recorded. For readings above 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration.

## 5.2. Radiated Spurious & Harmonic Emission

### Test Set-up for the Radiated Emission TEST

Radiated Spurious Emission Measurements by Substitution Method according to ANSI/TIA/EIA-603-C-2004



**Figure 4. Diagram of Radiated Spurious & Harmonic test Set-up**

The EUT was placed on a Non-conducted turntable 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. The Spectrum was investigated from 30MHz to the 10<sup>th</sup> Harmonic of the fundamental. A peak detector is used, with RBW=VBW=1MHz. The value that we could measure was only reported. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. This spurious level is recorded. For readings above 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration.



## SAMPLE CALCULATION

### **Example: Channel 661 , Second Harmonic(3760.00MHz)**

The receive analyzer reading at 3meters with the EUT on the turntable was  $-81.0\text{dBm}$ . The gain of the substituted antenna is  $8.1\text{dBi}$ . The signal generator connected to the substituted antenna terminals is adjusted to produce a reading of  $-81.0\text{dBm}$  of the receive analyzer. The loss of the cable between the signal generator and the terminals of the substituted antenna is  $2.0\text{dB}$  at  $3760.00\text{MHz}$ . So  $6.1\text{dB}$  is added to the signal generator reading of  $-30.9\text{dBm}$  yielding  $-24.8\text{dBm}$ . The fundamental EIRP was  $25.5\text{dBm}$  so this harmonic was  $25.5\text{dBm} - (-24.8) = 50.3\text{dBc}$  .

### 5.3. Occupied Bandwidth

#### **Test Procedure**

The EUT was setup to maximum output power at its lowest channel. The occupied bandwidth was measured using a spectrum analyzer. The measurements are repeated for the highest and a middle channel. The EUT's occupied bandwidth is measured as the width of the signal between two points, one below the carrier center frequency and one above the carrier frequency, outside of which all emissions are attenuated at least 26dB below the transmitter power.

Plots of the EUT's occupied bandwidth are shown herein.

### 5.4. Spurious and Harmonic Emission at Antenna Terminal

#### 5.4.1. Occupied Bandwidth Emission Limits

- (a) On any frequency outside a licensee's frequency block, the power of any emission shall be attenuated below the transmitter power (P) by at least  $43 + 10 \log(P)$  dB.
- (b) Compliance with these provisions is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 1MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emission are attenuated at least 26 dB below the transmitter power.
- (c) When measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the licensee's frequency block edges, both upper and lower, as the design permits.
- (d) The measurement of emission power can be expressed in peak or average values, provided they are expressed in the same parameters as the transmitter power.



<b>BLOCK</b>	<b>Freq. Range (MHz) Transmitter (Tx)</b>	<b>Freq. Range (MHz) Receiver (Rx)</b>
A	1850 – 1865	1930 – 1945
B	1870 – 1885	1950 – 1965
C	1895 – 1910	1975 – 1990
D	1865 – 1870	1945 – 1950
E	1885 – 1890	1965 – 1970
F	1890 – 1895	1970 – 1975

**Table 1. Broadband PCS Service Frequency Blocks**

<b>BLOCK</b>	<b>Freq. Range (MHz) Transmitter (Tx)</b>	<b>Freq. Range (MHz) Receiver (Rx)</b>
A* Low + A	824 ~ 835	869 ~ 880
B	835 ~ 845	880 ~ 890
A* High	845 ~ 846.5	890 ~ 891.5
B*	846.5 ~ 849	891.5 ~ 894

**Table 2. Cellular Service Frequency Blocks**

## 5.4.2. Conducted Spurious Emission

### **Minimum standard:**

On any frequency outside a license frequency block, the power of any emission shall be attenuated below the transmitter power(P) by at least  $43+10\log(P)$ dB. Limit equivalent to -13dBm, calculation shown below.

$$43 + 10\log ( 0.839 \text{ W} ) = 42.24 \text{ dB}$$

$$29.24 \text{ dBm} - 42.24 \text{ dB} = -13 \text{ dBm}$$

Compliance with the out-of-band emissions requirement is based on test being performed with an analyzer resolution bandwidth of 1MHz. However in the 1MHz band immediately outside and adjacent to the frequency block a resolution bandwidth of at least 1% of the fundamental emissions bandwidth may be employed.

In case of GSM :  $0.01 * 273\text{KHz} = 2.73\text{KHz}$   
A Resolution BW of 3KHz was used for measurement at the band edges.

### **Test Procedure:**

The EUT was setup to maximum output power at its lowest channel. The Resolution BW of the analyzer is set to 1% of the emission bandwidth to show compliance with the -13dBm limit, in the 1MHz bands immediately outside and adjacent to the edge of the frequency block. The measurements are repeated for the EUT's highest channel. For the Out-of-Band measurements a 1MHz RBW was used to scan from 10MHz to 10GHz. (GSM1900 Mode : 10MHz to 20GHz). A display line was placed at -13dBm to show compliance. The high, lowest and a middle channel were tested for out of band measurements.

Plots are shown herein.

## 5.5. Frequency Stability / Temperature Variation

The frequency stability of the transmitter is measured by:

- a.) Temperature: The temperature is carried from -30°C to +60°C using an environmental chamber.
- b.) Primary Supply Voltage: The primary supply voltage is varied from 85% to 115% of the voltage normally at the input to the device or at the power supply terminals if cables are not normally supplied.

Specification- The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. The frequency stability of the transmitter shall be maintained within  $\pm 0.00025$  ( $\pm 2.5$ ppm) of the center frequency.

Time Period and Procedure:

1. The carrier frequency of the transmitter and the individual oscillators is measured at room temperature (25°C to 27°C to provide a reference).
2. The equipment is subjected to an overnight "soak" at -30°C without any power applied.
3. After the overnight "soak" at -30°C (Usually 14~16 hours), the equipment is turned on in a "standby" condition for one minute before applying power to the transmitter. Measurement of the carrier frequency of the transmitter and the individual oscillators is made within a three minute interval after applying to the transmitter.
4. Frequency measurements are made at 10°C interval up to room temperature. At least a period of one and one half-hour is provided to allow stabilization of the equipment at each temperature level.
5. Again the transmitter carrier frequency and the individual oscillators is measured at room temperature to begin measurement of the upper temperature levels.
6. Frequency measurements are at 10 intervals starting at -30°C up to +60°C allowing at least two hours at each temperature for stabilization. In all measurements the frequency is measured within three minutes after re-applying power to the transmitter.
7. The artificial load is mounted external to the temperature chamber.

NOTE : The EUT is tested down to the battery endpoint.



## 6. TEST DATA

### 6.1. Equivalent Isotropic Radiated Power (E.I.R.P.)

Supply Voltage : 3.7VDC

Modulation : PCS 1900

#### Reference level

Frequency (MHz)	Output (dBm)	Polarization (H/V)	S/A (dBm)	Ant gain (dBi)	Ref level (dBm)
1850.20	27.00	H	-12.32	8.13	-20.45
		V	-12.64	8.13	-20.77
1880.00	27.00	H	-12.36	8.11	-20.47
		V	-12.32	8.11	-20.43
1909.80	27.00	H	-12.29	8.33	-20.62
		V	-11.89	8.33	-20.22

#### Result

Frequency (MHz)	Tested level (dBm)	Polarization (H/V)	Azimuth (angle)	EIRP (dBm)	EIRP (W)	Battery
1850.20	-18.21	H1	294	29.24	0.839	Standard
1880.00	-19.55	H1	287	27.92	0.619	Standard
1909.80	-19.95	H1	283	27.67	0.585	Standard

#### EDGE Result

Frequency (MHz)	Tested level (dBm)	Polarization (H/V)	Azimuth (angle)	EIRP (dBm)	EIRP (W)	Battery
1850.20	-20.77	H1	324	26.68	0.466	Standard

**NOTE :** Standard batteries are the only battery options for this phone

**Radiated measurements at 3 meters by Substitution Method**



## 6.2. GSM1900 Radiated Spurious & Harmonic measurement

Operating Frequency : 1850.2 MHz(Low), 1880.00 MHz(Middle), 1909.80 MHz(High)

Measured Output Power : 29.24 dBm = 0.839 W

Modulation Signal : GSM1900

Limit :  $43 + 10\log_{10}(P) = 42.24$  dBc

### Result

Channel	Harmonic	Frequency (MHz)	From EUT Tested level (dBm)	POL (H/V)	Result (dBc)
512	2	3700.40	-55.23	H2	61.61
	3	5550.60	-65.64	H1	66.54
	4	7400.80	-68.15	H2	64.93
	5	9251.00	-62.83	H2	56.11
	6	11101.20	-58.61	H2	46.34
	7	12951.40	-64.47	H2	50.74
	8	14801.60	-	-	-
661	2	3760.00	-57.34	H2	63.60
	3	5640.00	-65.43	H2	66.84
	4	7520.00	-66.28	H2	63.55
	5	9400.00	-61.63	H1	54.54
	6	11280.00	-57.81	H2	46.18
	7	13160.00	-66.23	H2	52.26
	8	15040.00	-	-	-
810	2	3819.60	-58.75	H1	64.38
	3	5729.40	-66.29	H2	66.73
	4	7639.20	-65.6	V	63.62
	5	9549.00	-56.22	H2	49.53
	6	11458.80	-56.96	H2	44.66
	7	13368.60	-65.36	H2	50.74
	8	15278.40	-	-	-

### NOTE :

1. "-" Indicates the spurious emission could not be detected due to noise limitations or ambients.
2. The spectrum is measured from 30MHz to the 10<sup>th</sup> harmonic and the worst-case emissions and reported.

### Radiated Spurious Emission measurements at 3 meters by Substitution Method



### 6.3. GSM1900 Radiated Spurious & Harmonic Conversion Table

Date : 2007. 07. 04

Test Engineer : JH HAN

Tx Cable loss  
 Tx Horn Ant Gain  
 Rx Cable loss + HPF Insertion loss + Attenuator  
 Pre- Amp gain  
 Air loss  
 Tested Level from EUT  
 = + + -  
 = EIRP -

CH	Har	Frequency (MHz)	Tx CL (dB)	Horn Gain (dB)	Tx Level @ (S/G 10dBm)	Tested Level EUT : H (dBm)	Tested Level EUT : V (dBm)	Amplitude of Emission EUT : H (dBm)	Amplitude of Emission EUT : V (dBm)	Result EUT : H (dBc)	Result EUT : V (dBc)
512	2	3700.40	11.17	9.62	8.45	-55.23	-58.50	-32.37	-34.64	61.61	63.88
	3	5550.60	14.55	11.05	6.50	-65.64	-66.11	-37.30	-37.73	66.54	66.97
	4	7400.80	17.49	11.70	4.21	-68.15	-67.96	-35.69	-36.27	64.93	65.51
	5	9251.00	19.93	12.38	2.45	-62.83	-63.83	-26.87	-27.31	56.11	56.55
	6	11101.20	22.22	13.52	1.30	-58.61	-63.49	-17.10	-22.09	46.34	51.33
	7	12951.40	24.19	13.03	-1.16	-64.47	-66.29	-21.50	-22.74	50.74	51.98
661	2	3760.00	11.48	9.62	8.14	-57.34	-60.62	-34.36	-36.82	63.60	66.06
	3	5640.00	14.82	11.05	6.23	-65.43	-66.96	-37.60	-38.90	66.84	68.14
	4	7520.00	17.84	11.70	3.86	-66.28	-66.14	-34.31	-34.57	63.55	63.81
	5	9400.00	20.38	12.38	2.00	-61.63	-61.95	-25.30	-25.85	54.54	55.09
	6	11280.00	22.52	13.52	1.00	-57.81	-61.42	-16.94	-20.24	46.18	49.48
	7	13160.00	24.62	13.03	-1.59	-66.23	-66.43	-23.02	-23.22	52.26	52.46
810	2	3819.60	11.70	9.62	7.92	-58.75	-62.69	-35.14	-39.05	64.38	68.29
	3	5729.40	15.14	11.05	5.91	-66.29	-67.07	-37.49	-38.87	66.73	68.11
	4	7639.20	18.12	11.70	3.58	-68.40	-65.60	-36.55	-34.38	65.79	63.62
	5	9549.00	20.87	12.38	1.51	-56.22	-59.44	-20.29	-23.35	49.53	52.59
	6	11458.80	22.42	13.52	1.10	-56.96	-60.52	-15.42	-18.79	44.66	48.03
	7	13368.60	24.37	13.03	-1.34	-65.36	-67.09	-21.50	-23.65	50.74	52.89

## 6.4. Frequency Stability

### 6.4.1. GSM1900 Frequency Stability Table

Operating Frequency : 1,880,000,000 Hz

Channel : 661

Reference Voltage : 3.7VDC

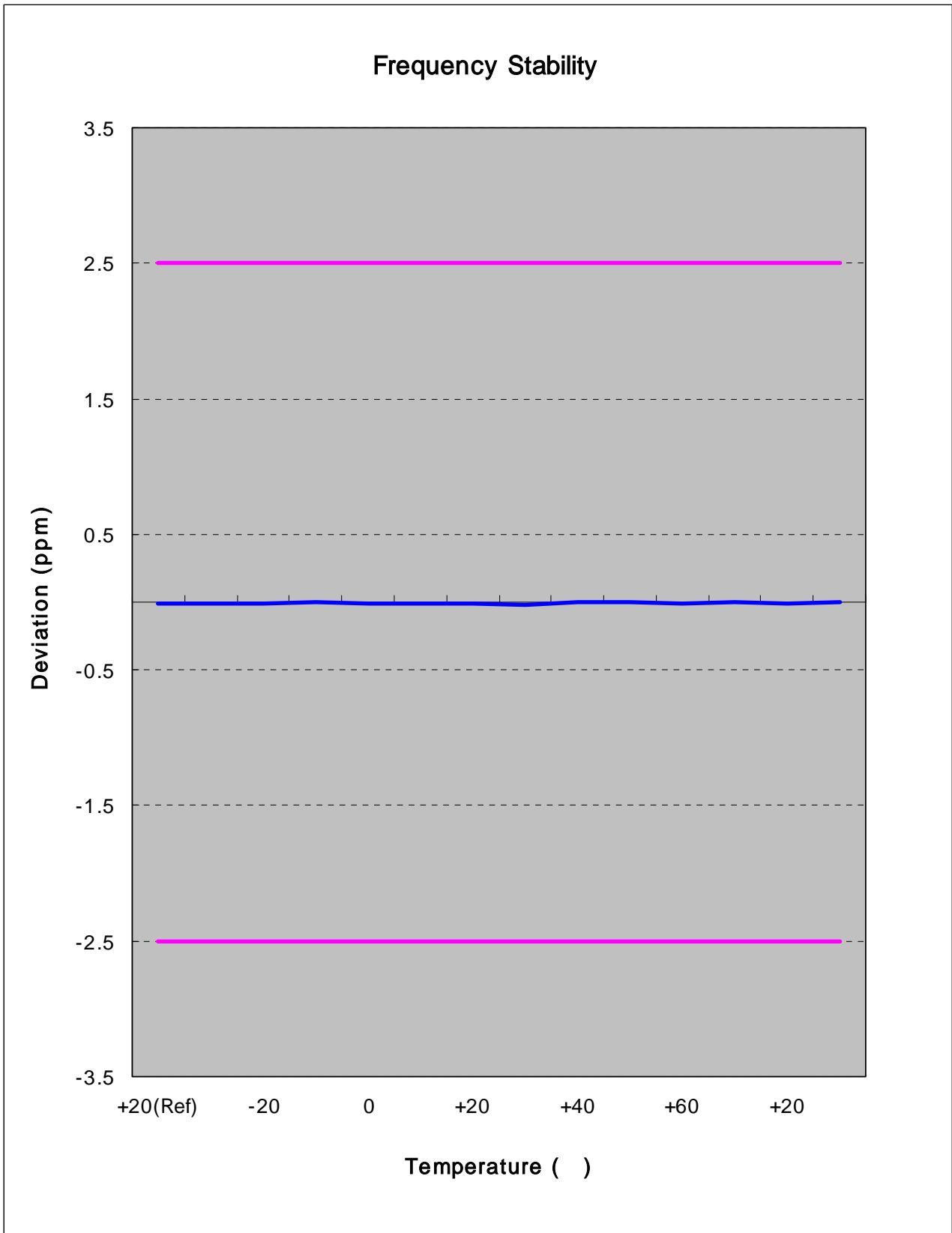
Deviation Limit :  $\pm 0.00025\%$  or 2.5ppm

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency Error (Hz)	Frequency (Hz)	Deviation (%)	ppm
100%	3.70	+20(Ref)	-13.51	1,879,999,986	-0.000001	-0.007
100%		-30	-22.47	1,879,999,978	-0.000001	-0.012
100%		-20	-10.10	1,879,999,990	-0.000001	-0.005
100%		-10	6.87	1,880,000,007	0.000000	0.004
100%		0	-14.24	1,879,999,986	-0.000001	-0.008
100%		+10	-20.98	1,879,999,979	-0.000001	-0.011
100%		+20	-13.51	1,879,999,986	-0.000001	-0.007
100%		+30	-31.44	1,879,999,969	-0.000002	-0.017
100%		+40	-8.95	1,879,999,991	0.000000	-0.005
100%		+50	9.12	1,880,000,009	0.000000	0.005
100%		+60	-11.64	1,879,999,988	-0.000001	-0.006
85%		3.35	+20	7.26	1,880,000,007	0.000000
115%	4.26	+20	-20.37	1,879,999,980	-0.000001	-0.011
Batt.Endpoint	3.35	+20	7.26	1,880,000,007	0.000000	0.004

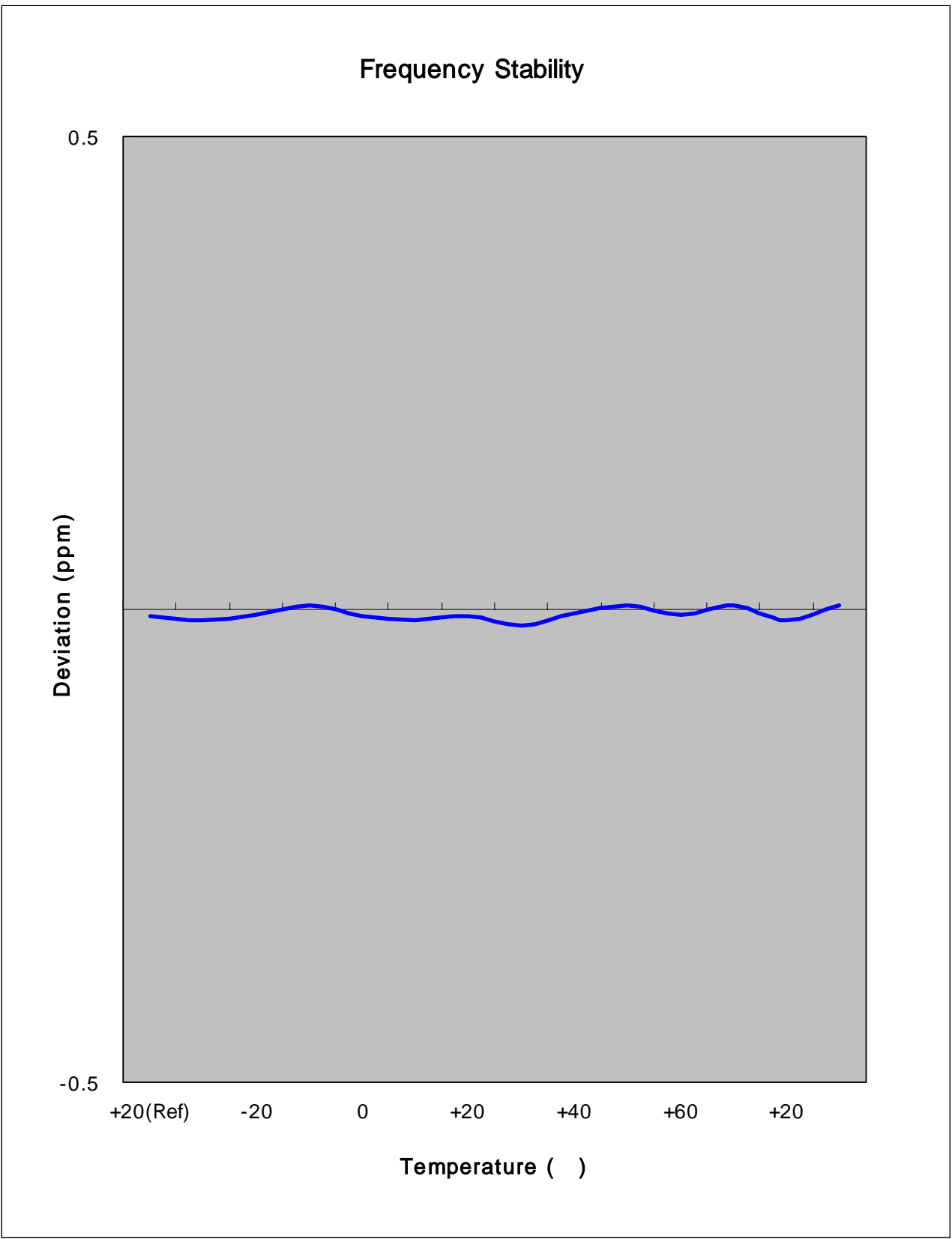
**Note :** The temperature is varied from -30 °C to +60 °C using an environmental chamber.

**The EUT is tested down to the battery end point.**

### 6.4.2. GSM1900 Frequency Stability Graph



**Zoom IN**





## 7. CONCLUSION

The data collected shows that the SAMSUNG Single-Band PCS GSM/EDGE Phone with Bluetooth. FCC ID : A3LSGHD888 complies with all the requirements of Parts 2,24 of the FCC Rules.

## 8. TEST PLOTS

GSM1900

Agilent

R T

**Ch Freq** 1.8502 GHz **Trig** Free

Occupied Bandwidth

FCC ID:A3LSGHD888 0BW Ch.512  
Ref 30 dBm Atten 40 dB

#Peak  
Log  
10  
dB/  
Offst  
8.74  
dB

Center 1.850 200 GHz Span 1 MHz  
#Res BW 3 kHz #VBW 3 kHz #Sweep 1 s (601 pts)

<b>Occupied Bandwidth</b>	<b>Occ BW % Pwr</b>	99.00 %
252.8992 kHz	<b>x dB</b>	-26.00 dB
<b>Transmit Freq Error</b>	713.618 Hz	
<b>x dB Bandwidth</b>	314.650 kHz	

**Freq/Channel**

**Center Freq**  
1.85020000 GHz

**Start Freq**  
1.84970000 GHz

**Stop Freq**  
1.85070000 GHz

**CF Step**  
100.000000 kHz  
Auto Man

**Freq Offset**  
0.00000000 Hz

**Signal Track**  
On Off

File Operation Status, C:\TEMP.GIF file saved

Agilent

R T

**Ch Freq** 1.88 GHz **Trig** Free

Occupied Bandwidth

FCC ID:A3LSGHD888 0BW Ch.661  
Ref 30 dBm Atten 40 dB

#Peak  
Log  
10  
dB/  
Offst  
8.74  
dB

Center 1.880 000 GHz Span 1 MHz  
#Res BW 3 kHz #VBW 3 kHz #Sweep 1 s (601 pts)

<b>Occupied Bandwidth</b>	<b>Occ BW % Pwr</b>	99.00 %
255.0070 kHz	<b>x dB</b>	-26.00 dB
<b>Transmit Freq Error</b>	-202.746 Hz	
<b>x dB Bandwidth</b>	312.096 kHz	

**Freq/Channel**

**Center Freq**  
1.88000000 GHz

**Start Freq**  
1.87950000 GHz

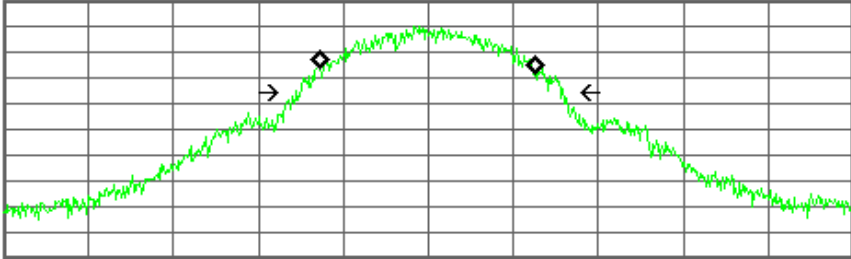
**Stop Freq**  
1.88050000 GHz

**CF Step**  
100.000000 kHz  
Auto Man

**Freq Offset**  
0.00000000 Hz

**Signal Track**  
On Off

File Operation Status, C:\TEMP.GIF file saved

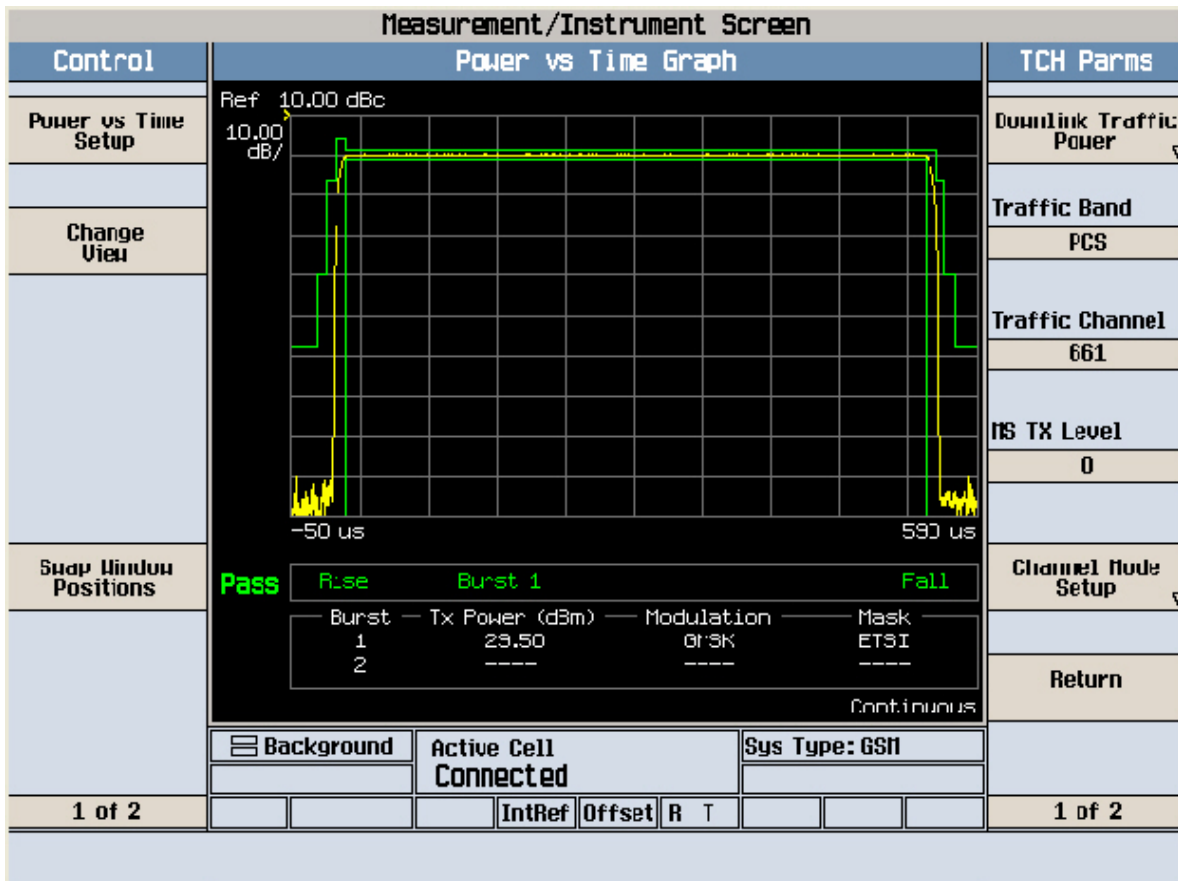
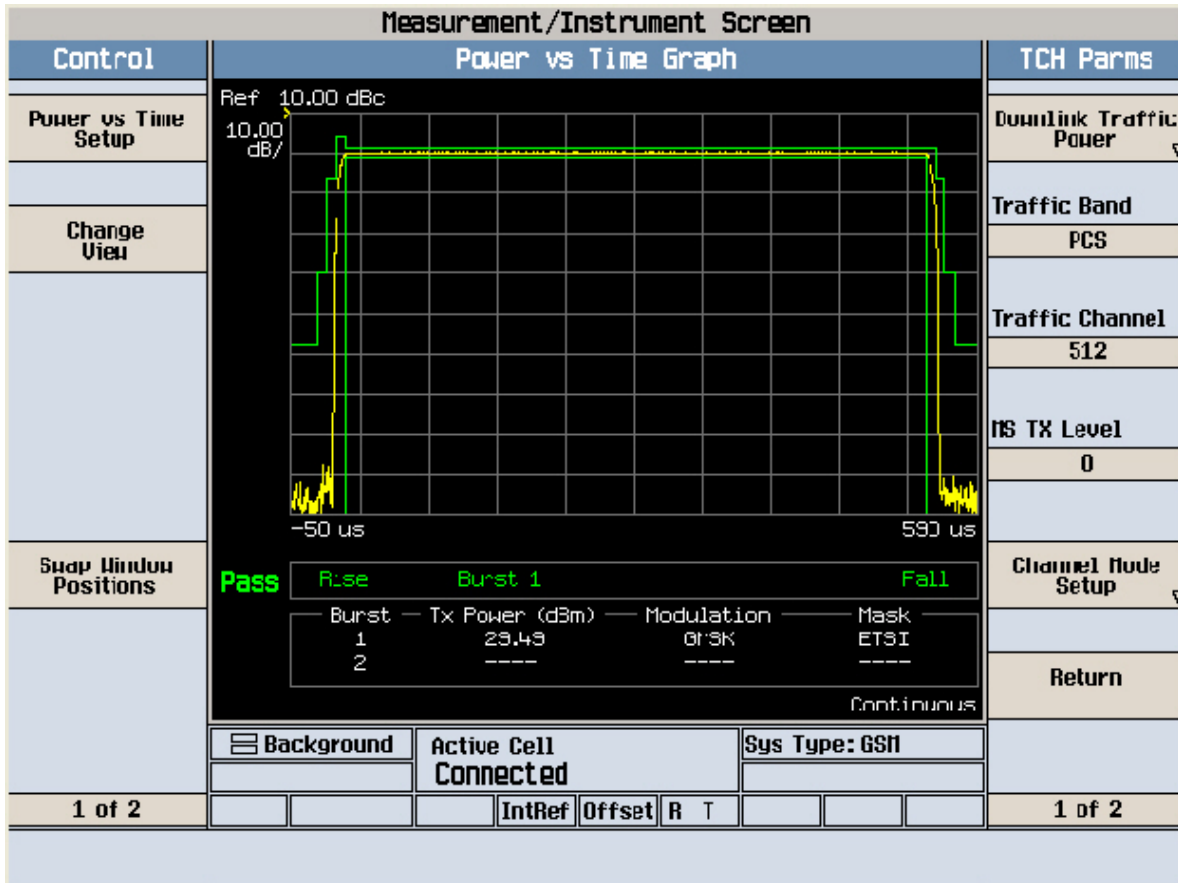
<p style="text-align: center;"><b>Ch Freq</b> 1.9098 GHz <span style="float: right;"><b>Trig</b> Free</span></p> <p>Occupied Bandwidth <span style="float: right;">[ ] [ ]</span></p> <hr/> <p>FCC ID:A3LSGHD888 0BW Ch.810                  Ref 30 dBm Atten 40 dB</p> <div style="border: 1px solid black; padding: 5px;"> <p>#Peak Log 10 dB/Offst 8.74 dB</p>  <p style="font-size: small;">Center 1.909 800 GHz Span 1 MHz                      #Res BW 3 kHz #VBW 3 kHz #Sweep 1 s (601 pts)</p> </div>	<p><b>Freq/Channel</b></p> <p><b>Center Freq</b> 1.90980000 GHz</p> <p><b>Start Freq</b> 1.90930000 GHz</p> <p><b>Stop Freq</b> 1.91030000 GHz</p> <p><b>CF Step</b> 100.000000 kHz Auto Man</p> <p><b>Freq Offset</b> 0.00000000 Hz</p> <p><b>Signal Track</b> On Off</p>								
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;"><b>Occupied Bandwidth</b></td> <td style="width: 50%;"><b>Occ BW % Pwr</b> 99.00 %</td> </tr> <tr> <td style="text-align: center;">254.7578 kHz</td> <td style="text-align: center;"><b>x dB</b> -26.00 dB</td> </tr> <tr> <td><b>Transmit Freq Error</b></td> <td>-389.618 Hz</td> </tr> <tr> <td><b>x dB Bandwidth</b></td> <td>318.747 kHz</td> </tr> </table>		<b>Occupied Bandwidth</b>	<b>Occ BW % Pwr</b> 99.00 %	254.7578 kHz	<b>x dB</b> -26.00 dB	<b>Transmit Freq Error</b>	-389.618 Hz	<b>x dB Bandwidth</b>	318.747 kHz
<b>Occupied Bandwidth</b>	<b>Occ BW % Pwr</b> 99.00 %								
254.7578 kHz	<b>x dB</b> -26.00 dB								
<b>Transmit Freq Error</b>	-389.618 Hz								
<b>x dB Bandwidth</b>	318.747 kHz								
<p style="color: green;">File Operation Status, C:\TEMP.GIF file saved</p>									

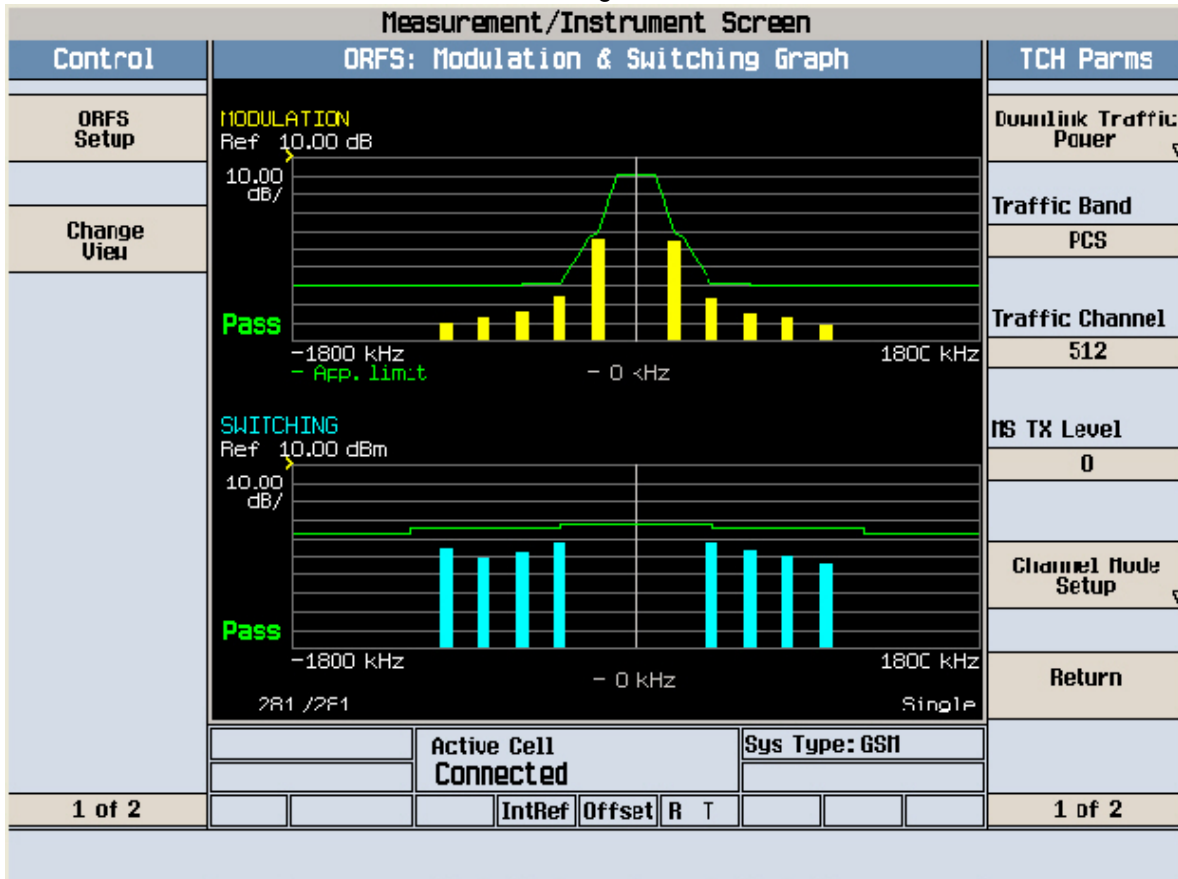
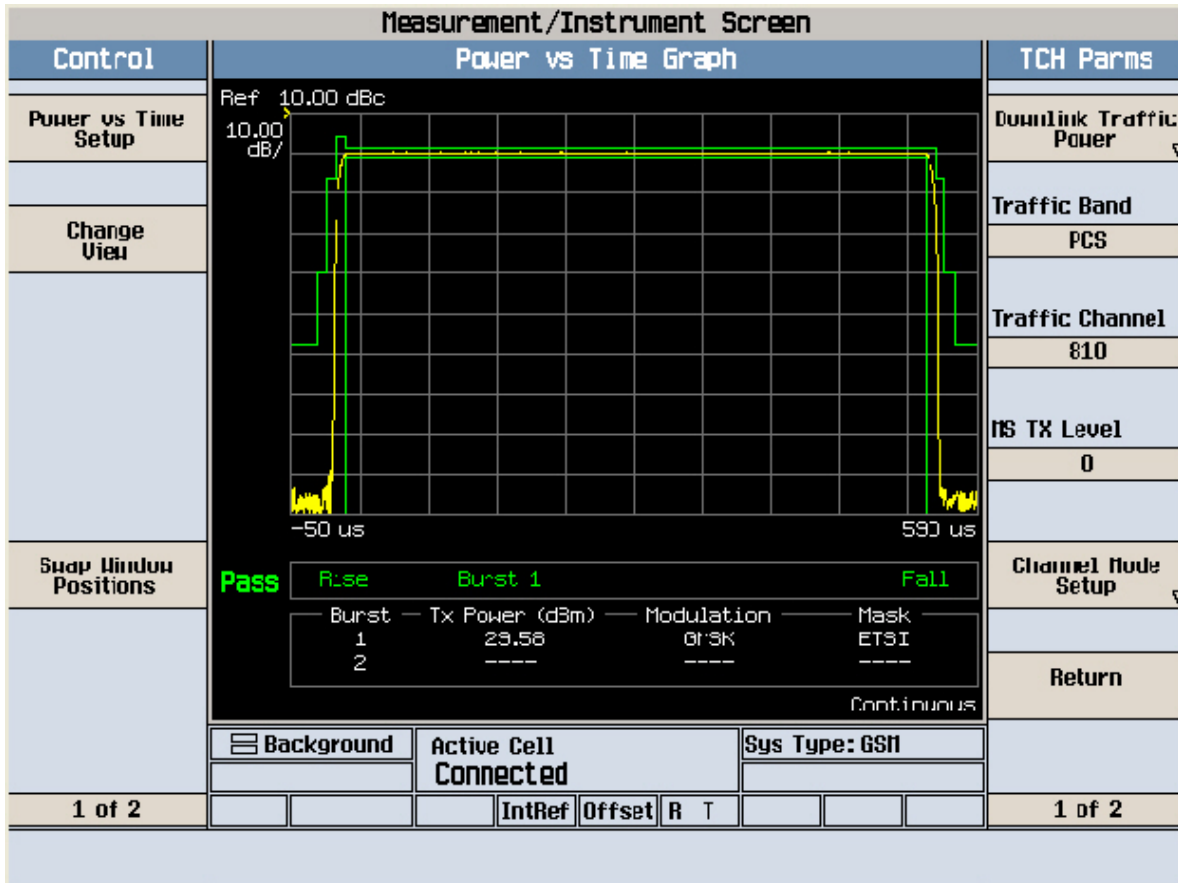
FCC ID : A3LSGHD888 Transmit Power 512CH

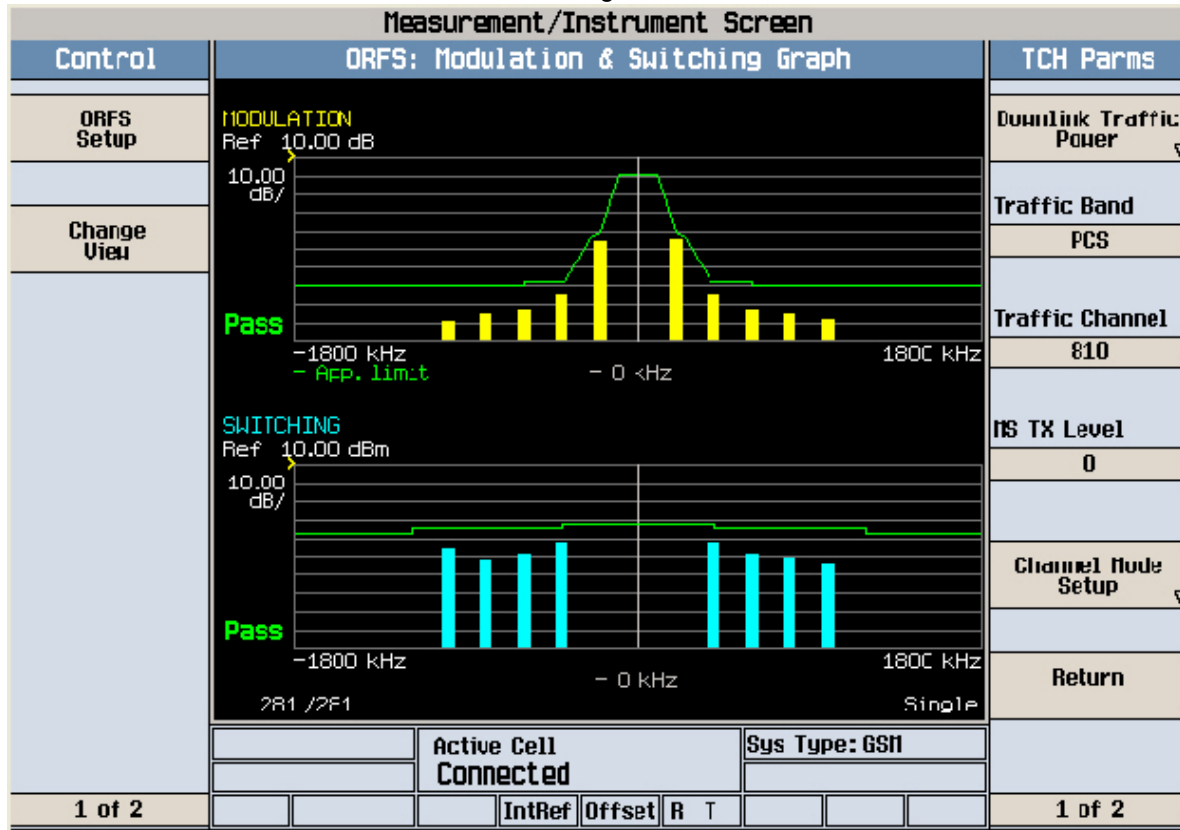
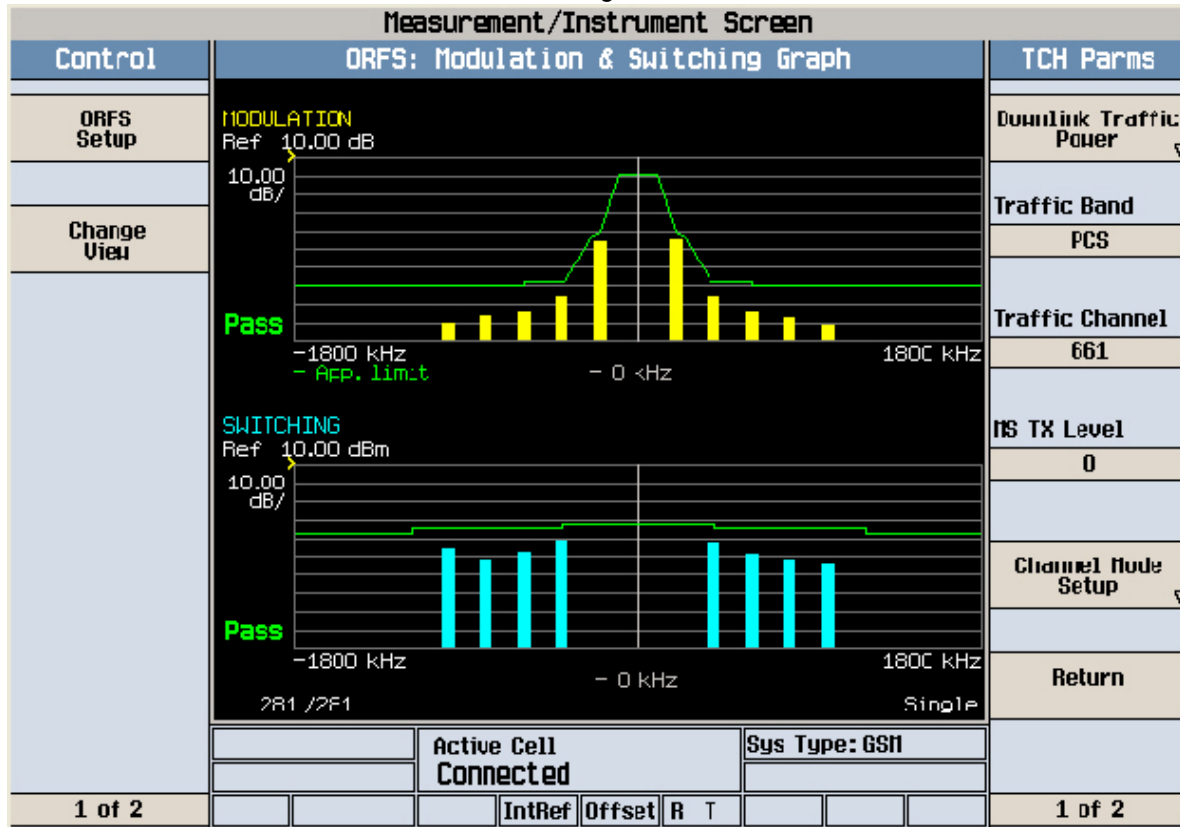
Measurement/Instrument Screen																										
Control	GSM/GPRS Transmit Power				TCH Parms																					
<p>GSM/GPRS TX Power Setup ▾</p> <hr/> <p>Swap Window Positions</p> <hr/> <p>1 of 2</p>	<p><b>GMSK Transmit Power</b></p> <p style="font-size: 2em;"><b>29.46 dBm</b></p> <p style="text-align: right; font-size: small;">Single</p>				<p><b>Downlink Traffic Power</b> ▾</p> <hr/> <p><b>Traffic Band</b> PCS</p> <hr/> <p><b>Traffic Channel</b> 512</p> <hr/> <p><b>RIS TX Level</b> 0</p> <hr/> <p><b>Channel Mode Setup</b> ▾</p> <hr/> <p style="text-align: center;">Return</p>																					
<p><b>Phase &amp; Frequency Error</b></p>																										
<table border="1" style="width: 100%; border-collapse: collapse; font-size: small;"> <thead> <tr> <th></th> <th>Peak Phase °</th> <th>RMS Phase °</th> <th>Frequency Hz</th> </tr> </thead> <tbody> <tr> <td>Minimum</td> <td style="text-align: center;">4.58</td> <td style="text-align: center;">1.94</td> <td style="text-align: center;">-112.22</td> </tr> <tr> <td>Maximum</td> <td style="text-align: center;">6.78</td> <td style="text-align: center;">2.56</td> <td style="text-align: center;">217.83</td> </tr> <tr> <td>Average</td> <td style="text-align: center;">5.73</td> <td style="text-align: center;">2.35</td> <td style="text-align: center;">44.75</td> </tr> <tr> <td>Pass/Fail</td> <td style="text-align: center;">Pass</td> <td style="text-align: center;">Pass</td> <td style="text-align: center;">Fail</td> </tr> </tbody> </table>								Peak Phase °	RMS Phase °	Frequency Hz	Minimum	4.58	1.94	-112.22	Maximum	6.78	2.56	217.83	Average	5.73	2.35	44.75	Pass/Fail	Pass	Pass	Fail
	Peak Phase °	RMS Phase °	Frequency Hz																							
Minimum	4.58	1.94	-112.22																							
Maximum	6.78	2.56	217.83																							
Average	5.73	2.35	44.75																							
Pass/Fail	Pass	Pass	Fail																							
50 / 50 Single																										
<p>Background</p>		<p>Active Cell Connected</p>			<p>Sys Type: GSM</p>																					
IntRef Offset R T																										
1 of 2																										

Measurement/Instrument Screen											
Control		GSM/GPRS Transmit Power						TCH Parms			
GSM/GPRS TX Power Setup ▾		<p style="text-align: center;"><b>GMSK Transmit Power</b> <b>29.48</b> dBm</p> <p style="text-align: right;">Single</p>						Downlink Traffic Power ▾			
Swap Window Positions								Traffic Band		PCS	
		Phase & Frequency Error		MS TX Level		0		Channel Mode Setup ▾			
		Return		1 of 2		Background		Active Cell Connected		Sys Type: GSM	
		1 of 2		IntRef		Offset		R T		1 of 2	
		Minimum		4.89		1.98		-4.32			
		Maximum		6.97		2.43		28.89			
		Average		5.74		2.24		9.58			
		Pass/Fail		Pass		Pass		Pass			
		50 / 50		Single							

Measurement/Instrument Screen											
Control		GSM/GPRS Transmit Power						TCH Parms			
GSM/GPRS TX Power Setup ▾		<p style="text-align: center;"><b>GMSK Transmit Power</b> <b>29.60</b> dBm</p> <p style="text-align: right;">Single</p>						Downlink Traffic Power ▾			
Swap Window Positions								Traffic Band		PCS	
		Phase & Frequency Error		MS TX Level		0		Channel Mode Setup ▾			
		Return		1 of 2		Background		Active Cell Connected		Sys Type: GSM	
		1 of 2		IntRef		Offset		R T		1 of 2	
		Minimum		4.43		1.92		-14.24			
		Maximum		7.99		2.50		243.41			
		Average		5.68		2.17		63.70			
		Pass/Fail		Pass		Pass		Fail			
		50 / 50		Single							



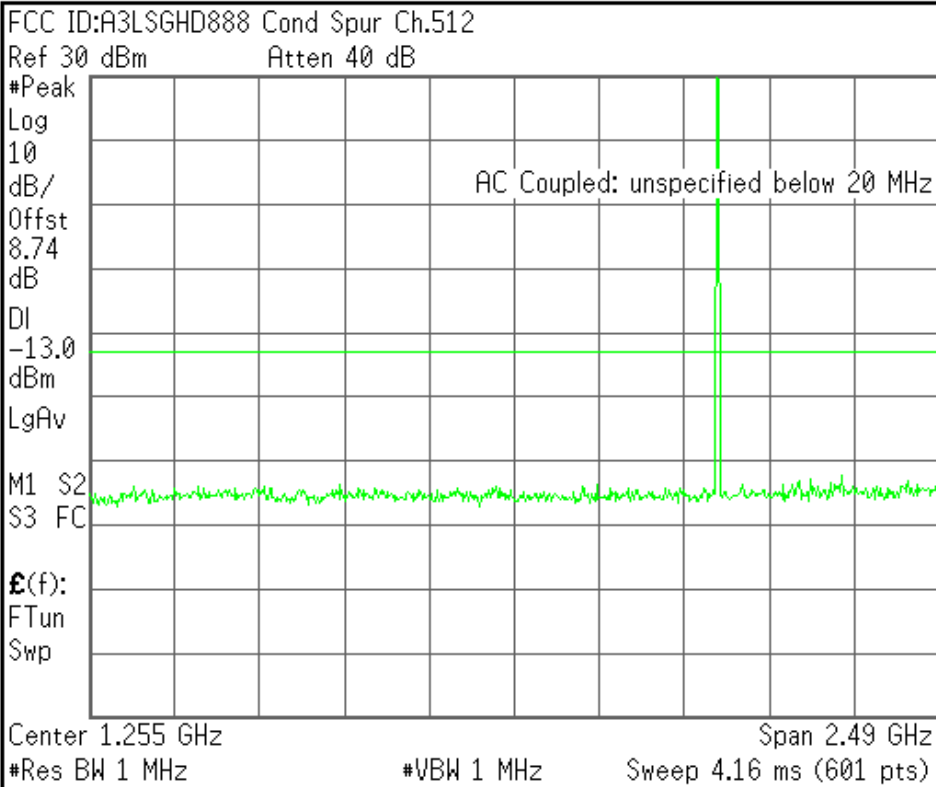




Agilent

R T

Freq/Channel



<b>Center Freq</b> 1.25500000 GHz
<b>Start Freq</b> 10.00000000 MHz
<b>Stop Freq</b> 2.50000000 GHz
<b>CF Step</b> 249.0000000 MHz Auto Man
<b>Freq Offset</b> 0.00000000 Hz
<b>Signal Track</b> On Off

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Agilent

R T

Freq/Channel



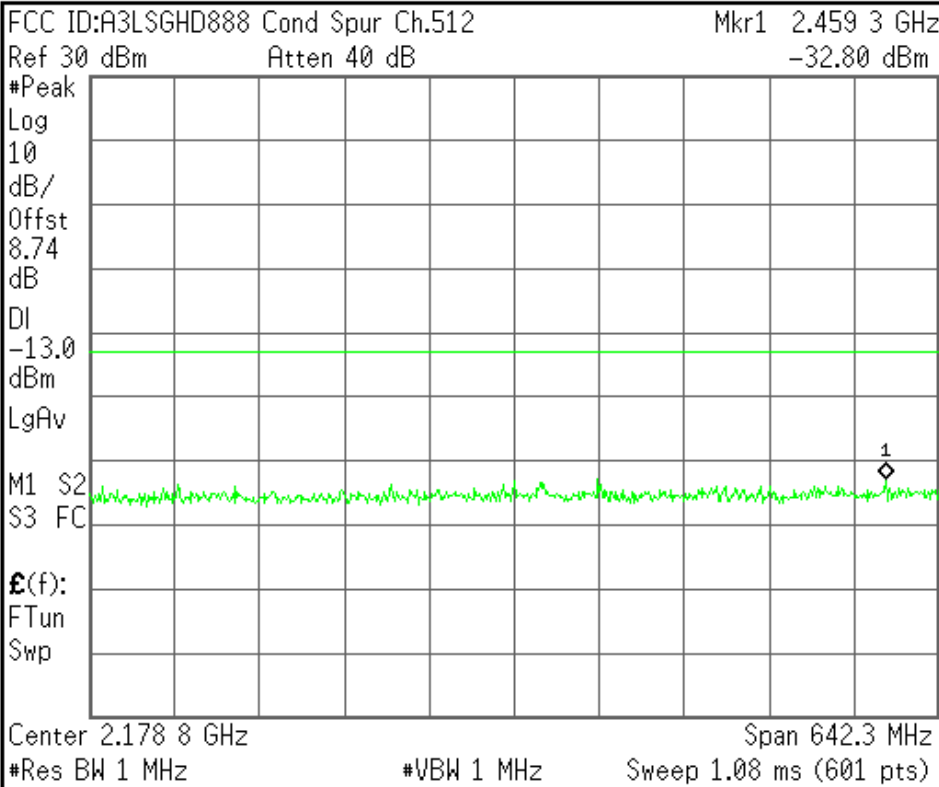
<b>Center Freq</b> 926.350000 MHz
<b>Start Freq</b> 10.00000000 MHz
<b>Stop Freq</b> 1.84270000 GHz
<b>CF Step</b> 183.270000 MHz Auto Man
<b>Freq Offset</b> 0.00000000 Hz
<b>Signal Track</b> On Off

File Operation Status, C:\TEMP.GIF file saved

Agilent

R T

Freq/Channel



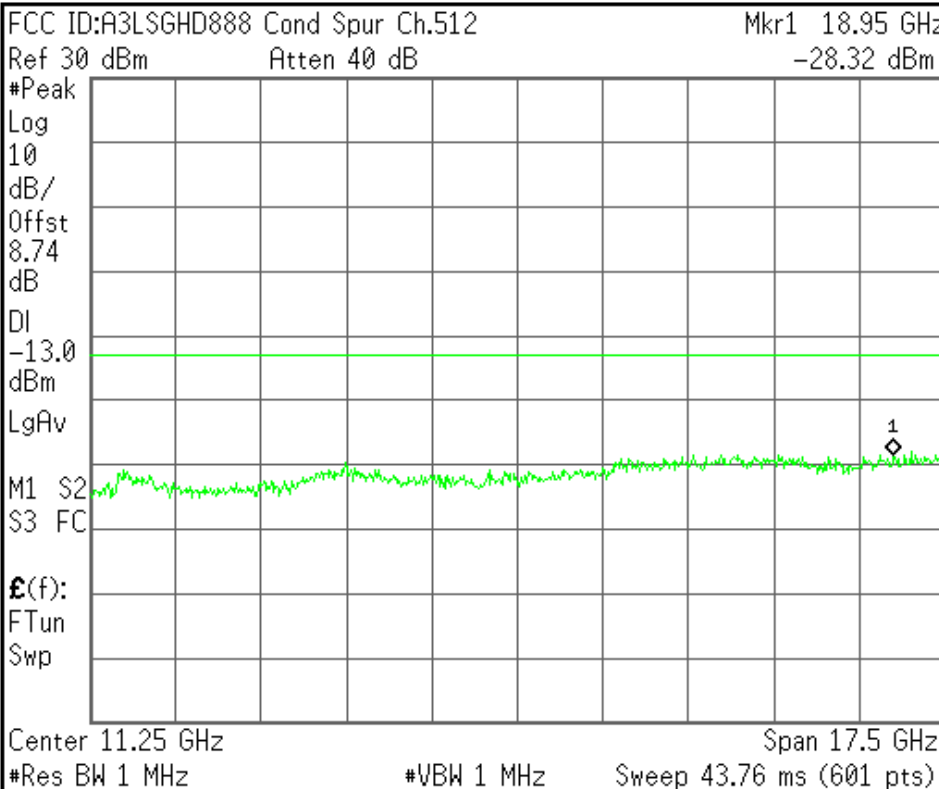
<b>Center Freq</b> 2.17885000 GHz
<b>Start Freq</b> 1.85770000 GHz
<b>Stop Freq</b> 2.50000000 GHz
<b>CF Step</b> 64.2300000 MHz Auto Man
<b>Freq Offset</b> 0.00000000 Hz
<b>Signal Track</b> On Off

File Operation Status, C:\TEMP.GIF file saved

Agilent

R T

Freq/Channel



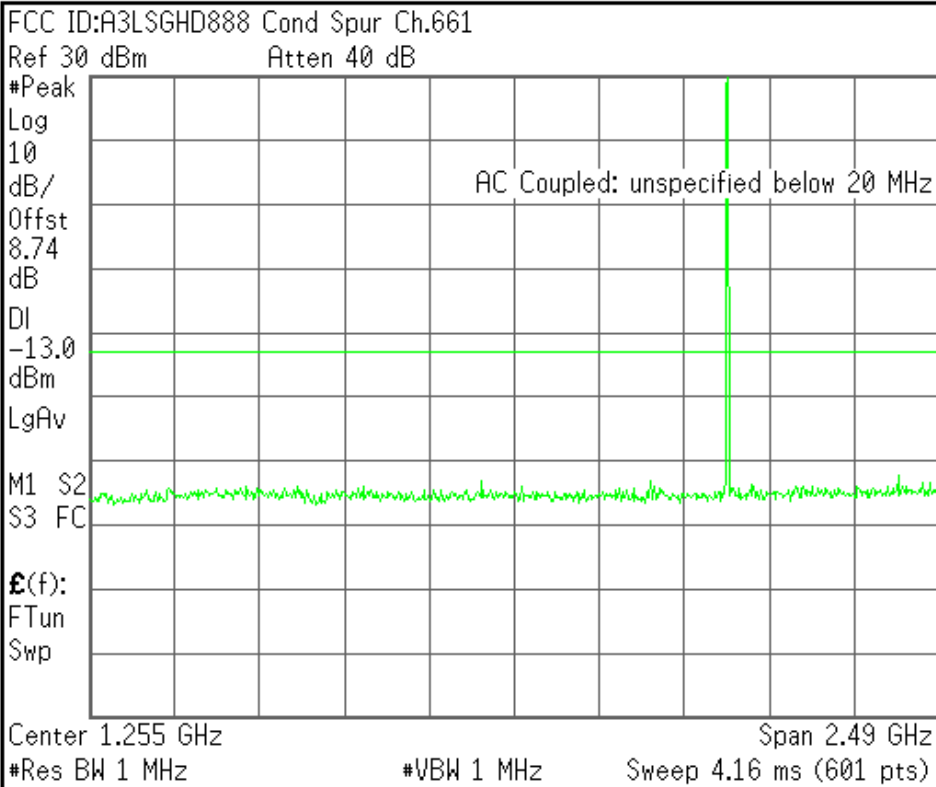
<b>Center Freq</b> 11.2500000 GHz
<b>Start Freq</b> 2.50000000 GHz
<b>Stop Freq</b> 20.0000000 GHz
<b>CF Step</b> 1.75000000 GHz Auto Man
<b>Freq Offset</b> 0.00000000 Hz
<b>Signal Track</b> On Off

File Operation Status, C:\TEMP.GIF file saved

Agilent

R T

Freq/Channel



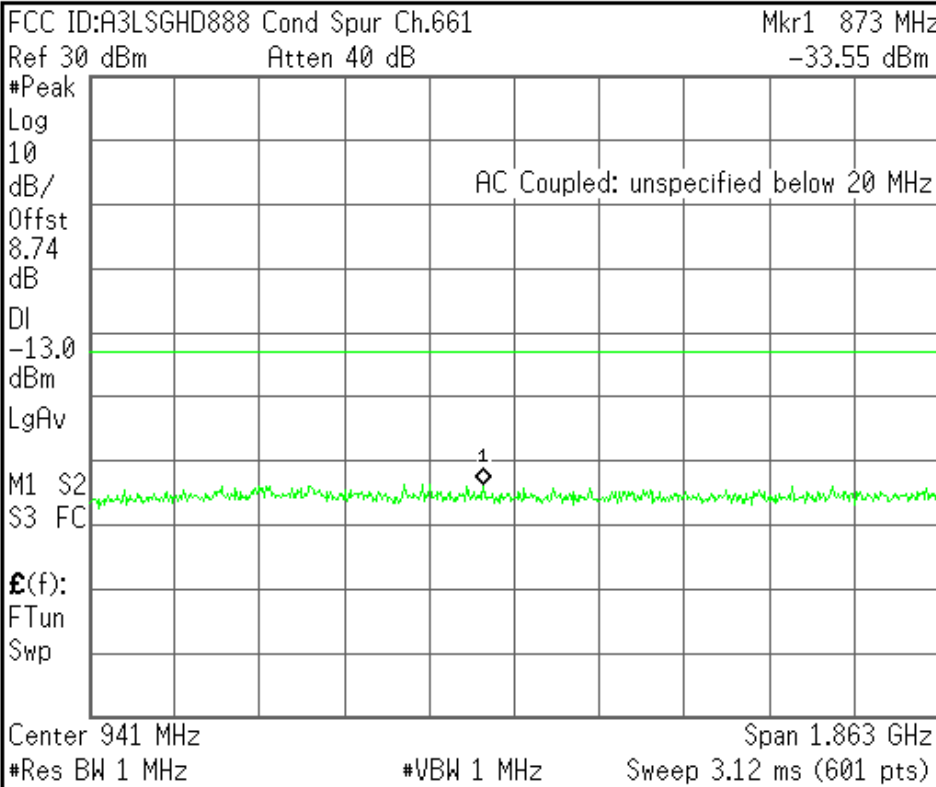
<b>Center Freq</b>	1.25500000 GHz
<b>Start Freq</b>	10.00000000 MHz
<b>Stop Freq</b>	2.50000000 GHz
<b>CF Step</b>	249.0000000 MHz Auto Man
<b>Freq Offset</b>	0.00000000 Hz
<b>Signal Track</b>	On Off

File Operation Status, C:\TEMP.GIF file saved

Agilent

R T

Freq/Channel



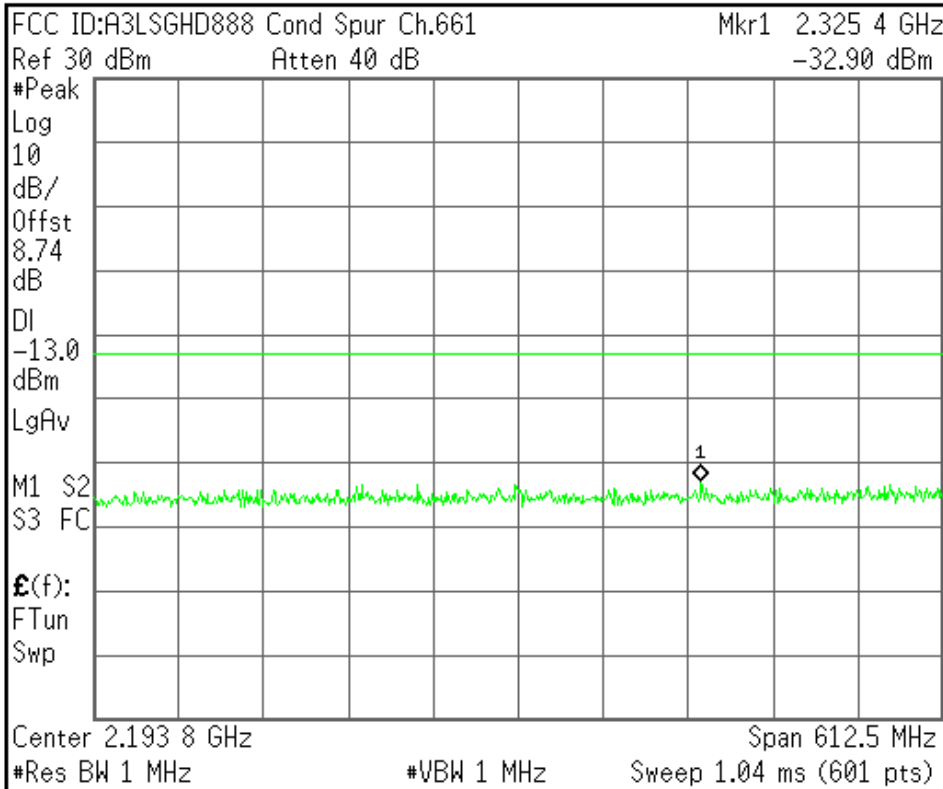
<b>Center Freq</b>	941.250000 MHz
<b>Start Freq</b>	10.00000000 MHz
<b>Stop Freq</b>	1.87250000 GHz
<b>CF Step</b>	186.250000 MHz Auto Man
<b>Freq Offset</b>	0.00000000 Hz
<b>Signal Track</b>	On Off

File Operation Status, C:\TEMP.GIF file saved

Agilent

R T

Freq/Channel



Center Freq  
2.19375000 GHz

Start Freq  
1.88750000 GHz

Stop Freq  
2.50000000 GHz

CF Step  
61.2500000 MHz  
Auto Man

Freq Offset  
0.00000000 Hz

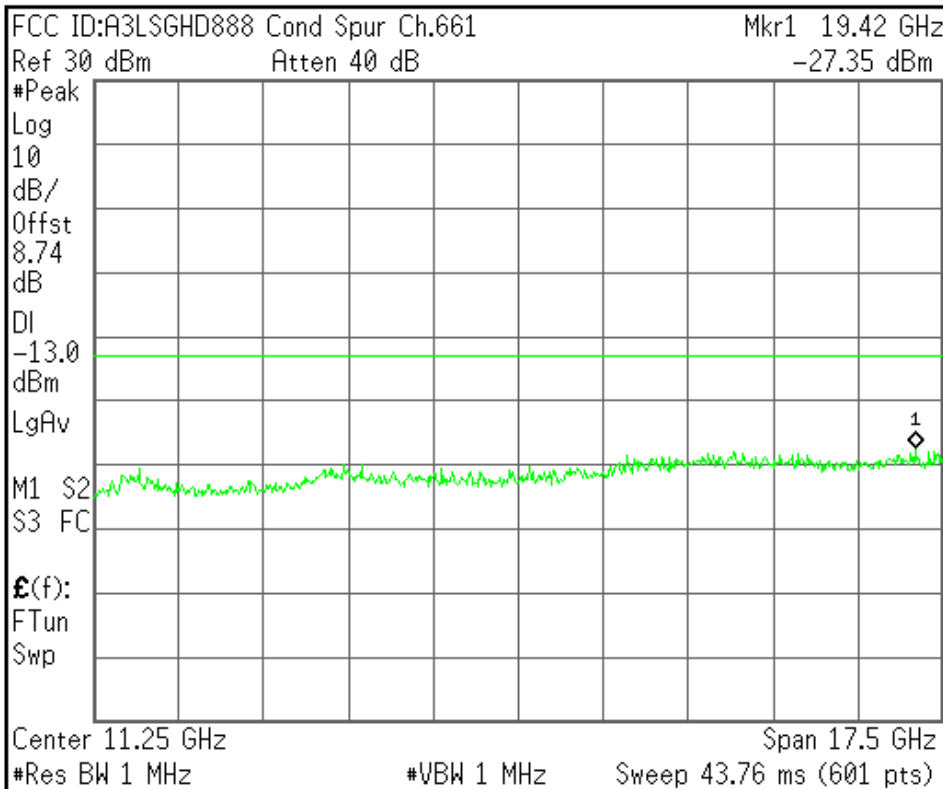
Signal Track  
On Off

File Operation Status, C:\TEMP.GIF file saved

Agilent

R T

Freq/Channel



Center Freq  
11.2500000 GHz

Start Freq  
2.50000000 GHz

Stop Freq  
20.0000000 GHz

CF Step  
1.75000000 GHz  
Auto Man

Freq Offset  
0.00000000 Hz

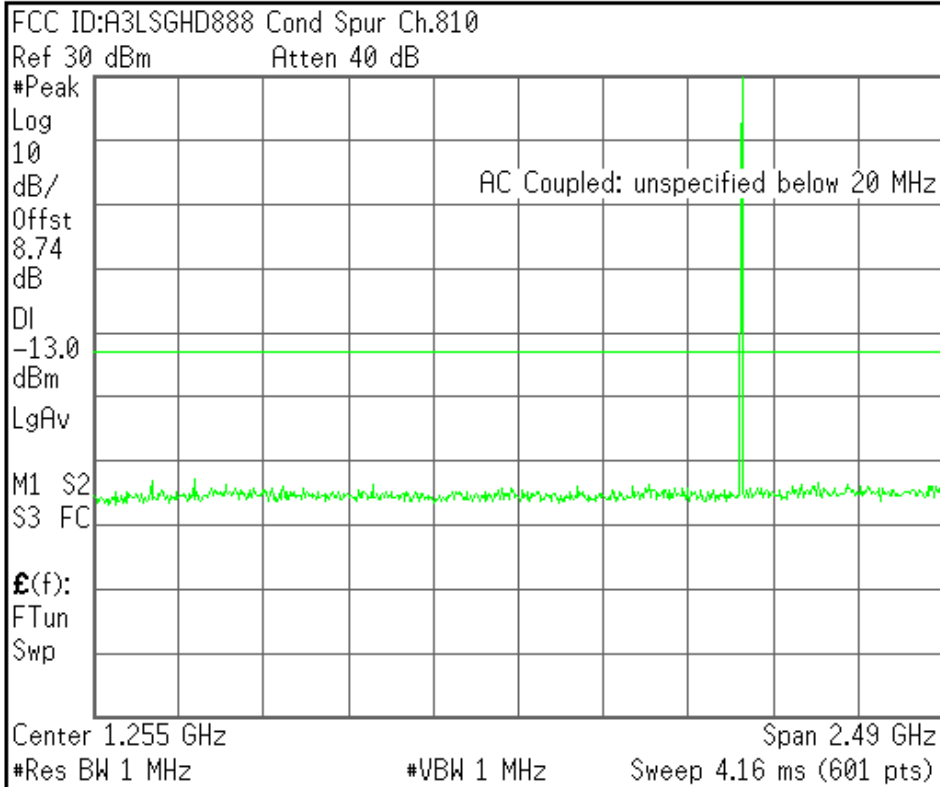
Signal Track  
On Off

File Operation Status, C:\TEMP.GIF file saved

Agilent

R T

Freq/Channel



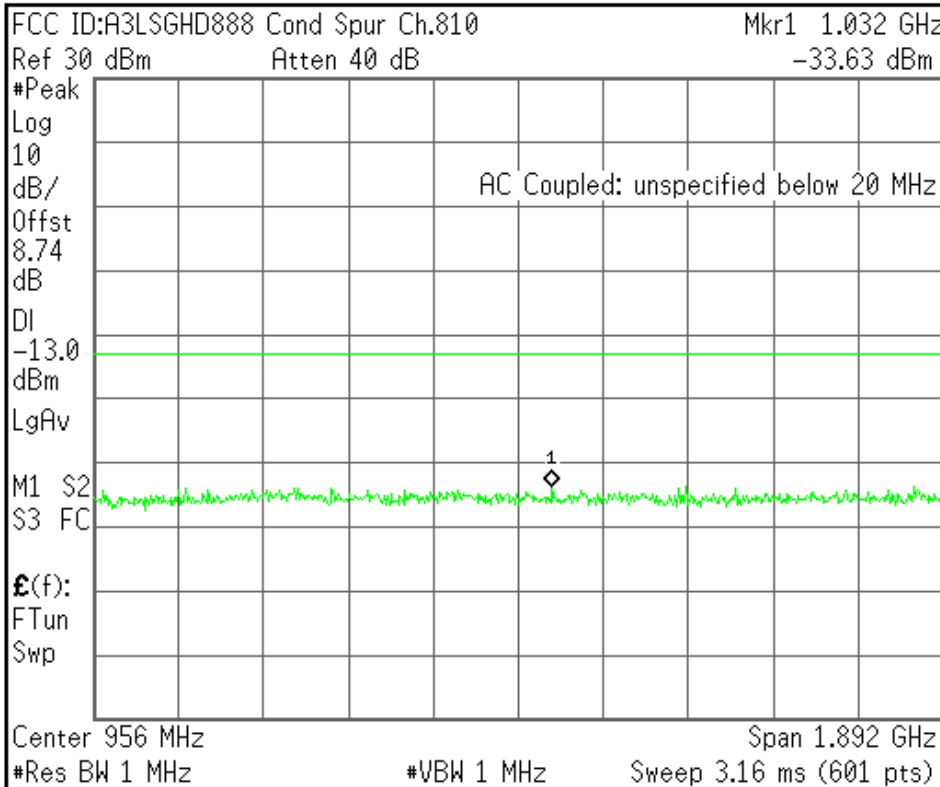
<b>Center Freq</b> 1.25500000 GHz
<b>Start Freq</b> 10.00000000 MHz
<b>Stop Freq</b> 2.50000000 GHz
<b>CF Step</b> 249.0000000 MHz Auto Man
<b>Freq Offset</b> 0.00000000 Hz
<b>Signal Track</b> On Off

File Operation Status, C:\TEMP.GIF file saved

Agilent

R T

Freq/Channel



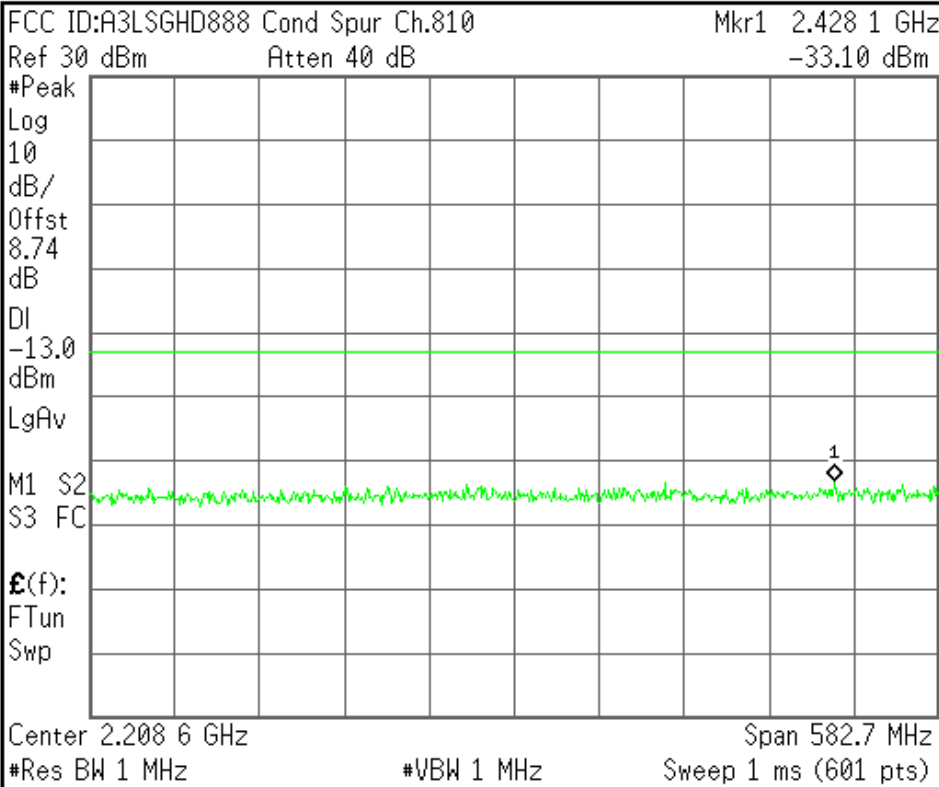
<b>Center Freq</b> 956.150000 MHz
<b>Start Freq</b> 10.00000000 MHz
<b>Stop Freq</b> 1.90230000 GHz
<b>CF Step</b> 189.2300000 MHz Auto Man
<b>Freq Offset</b> 0.00000000 Hz
<b>Signal Track</b> On Off

File Operation Status, C:\TEMP.GIF file saved

Agilent

R T

Freq/Channel



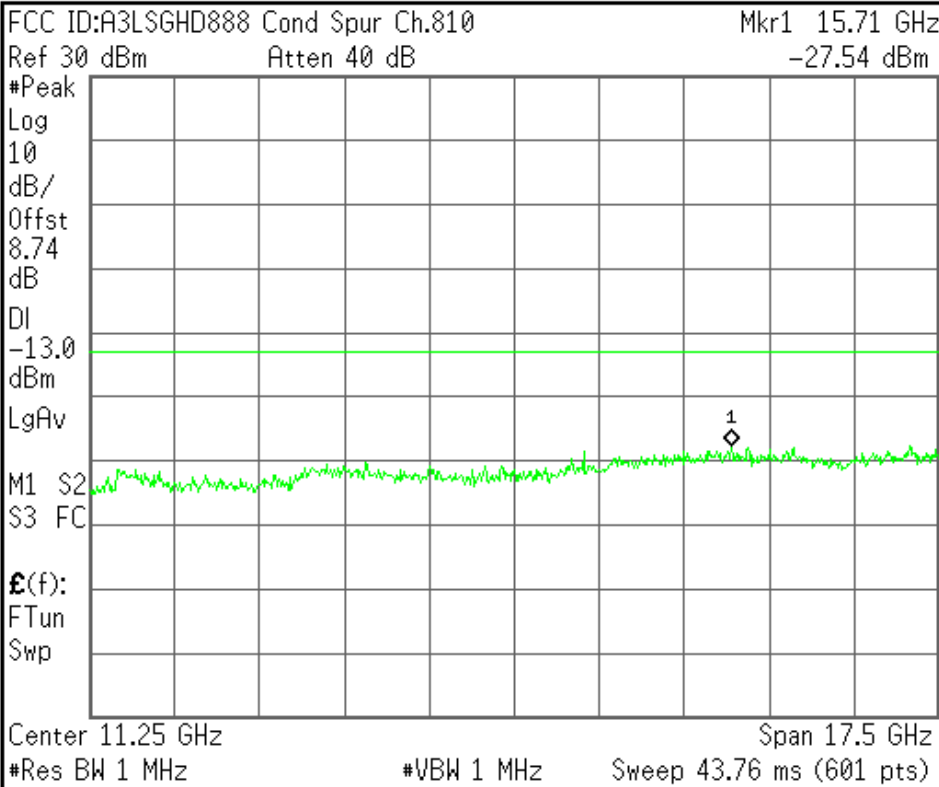
<b>Center Freq</b> 2.20865000 GHz
<b>Start Freq</b> 1.91730000 GHz
<b>Stop Freq</b> 2.50000000 GHz
<b>CF Step</b> 58.2700000 MHz Auto Man
<b>Freq Offset</b> 0.00000000 Hz
<b>Signal Track</b> On Off

File Operation Status, C:\TEMP.GIF file saved

Agilent

R T

Freq/Channel



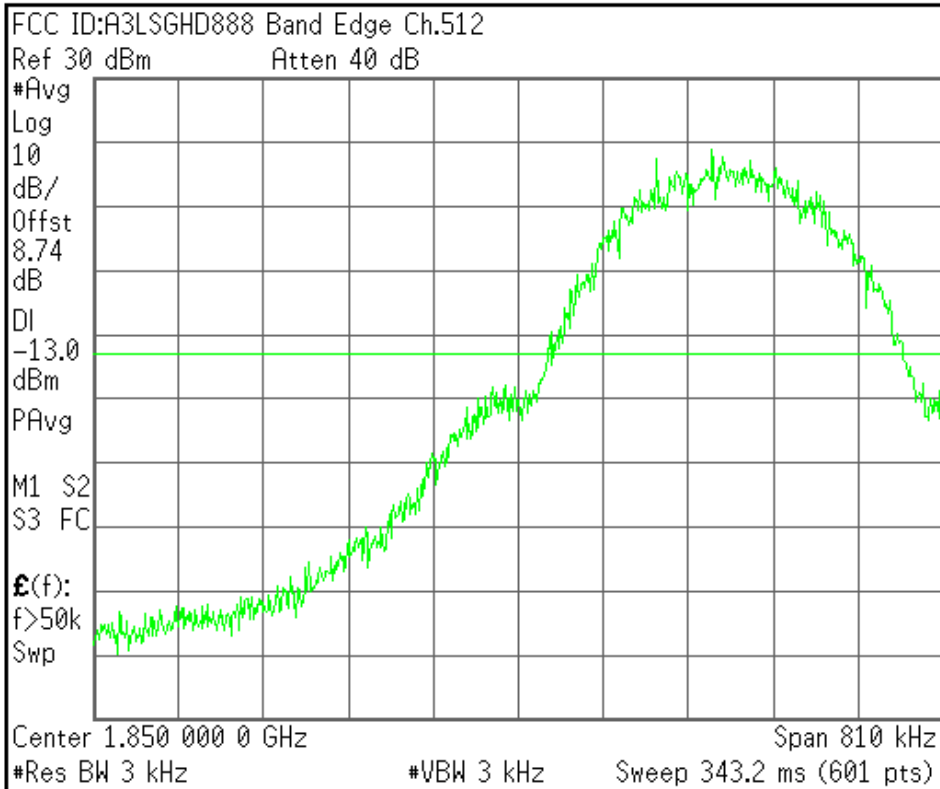
<b>Center Freq</b> 11.2500000 GHz
<b>Start Freq</b> 2.50000000 GHz
<b>Stop Freq</b> 20.0000000 GHz
<b>CF Step</b> 1.75000000 GHz Auto Man
<b>Freq Offset</b> 0.00000000 Hz
<b>Signal Track</b> On Off

File Operation Status, C:\TEMP.GIF file saved

Agilent

R T

Freq/Channel



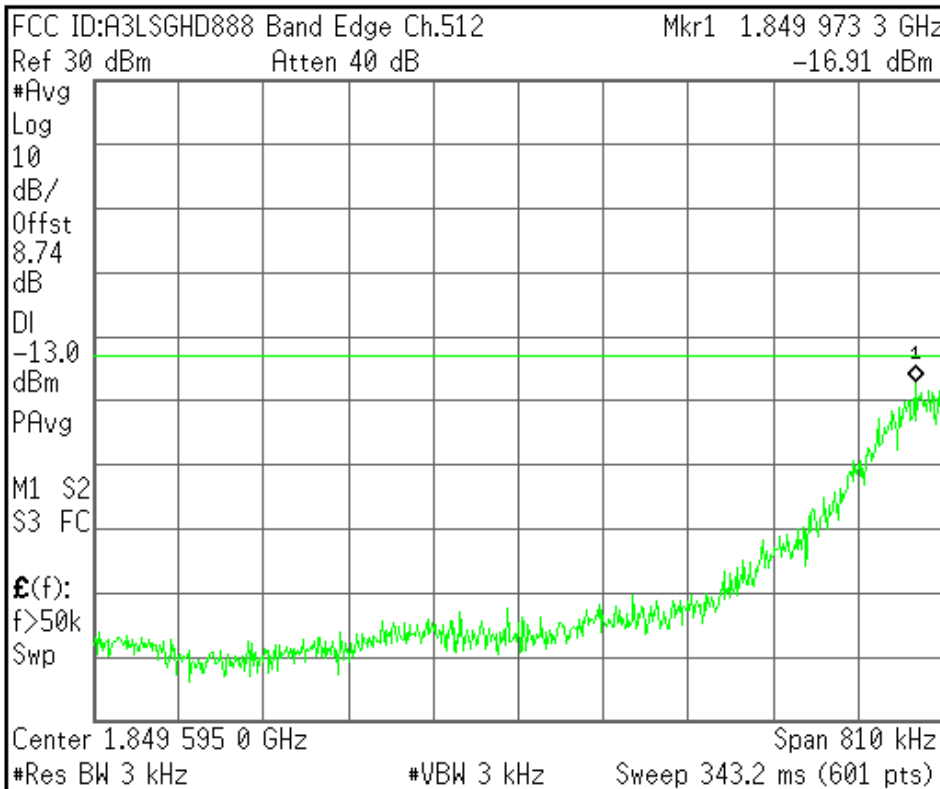
<b>Center Freq</b>	1.85000000 GHz
<b>Start Freq</b>	1.84959500 GHz
<b>Stop Freq</b>	1.85040500 GHz
<b>CF Step</b>	81.0000000 kHz Auto Man
<b>Freq Offset</b>	0.00000000 Hz
<b>Signal Track</b>	On Off

File Operation Status, C:\TEMP.GIF file saved

Agilent

R T

Freq/Channel



<b>Center Freq</b>	1.84959500 GHz
<b>Start Freq</b>	1.84919000 GHz
<b>Stop Freq</b>	1.85000000 GHz
<b>CF Step</b>	81.0000000 kHz Auto Man
<b>Freq Offset</b>	0.00000000 Hz
<b>Signal Track</b>	On Off

File Operation Status, C:\TEMP.GIF file saved

Agilent

R T

Freq/Channel

FCC ID:A3LSGHD888 Band Edge Ch.810

Ref 30 dBm

Atten 40 dB

#Avg

Log

10

dB/

Offst

8.74

dB

DI

-13.0

dBm

PAvg

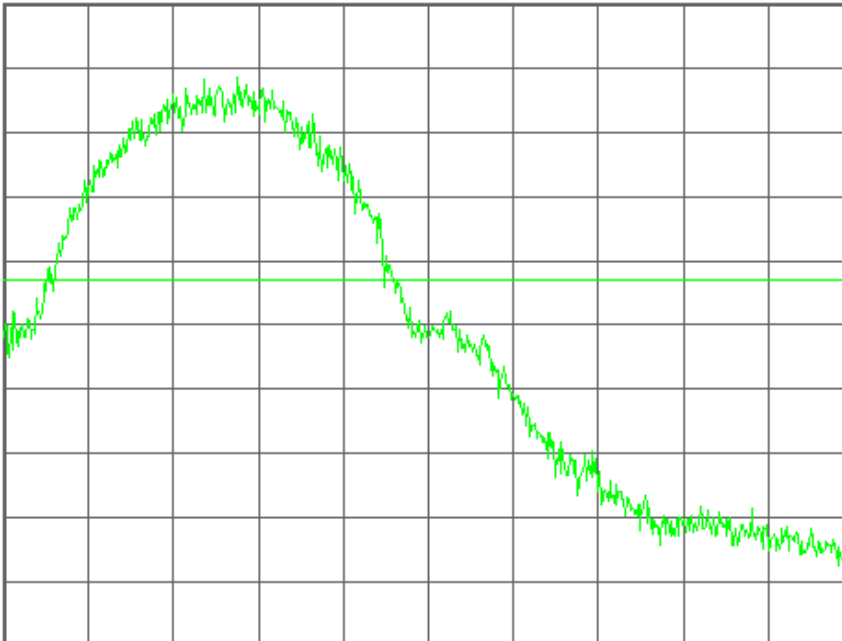
M1 S2

S3 FC

$\mathcal{E}(f)$ :

f>50k

Swp



Center 1.910 000 0 GHz

Span 810 kHz

#Res BW 3 kHz

#VBW 3 kHz

Sweep 343.2 ms (601 pts)

Center Freq  
1.91000000 GHz

Start Freq  
1.90959500 GHz

Stop Freq  
1.91040500 GHz

CF Step  
81.0000000 kHz  
Auto Man

Freq Offset  
0.00000000 Hz

Signal Track  
On Off

File Operation Status, C:\TEMP.GIF file saved

Agilent

R T

Freq/Channel

FCC ID:A3LSGHD888 Band Edge Ch.810

Mkr1 1.910 023 2 GHz

Ref 30 dBm

Atten 40 dB

-17.06 dBm

#Avg

Log

10

dB/

Offst

8.74

dB

DI

-13.0

dBm

PAvg

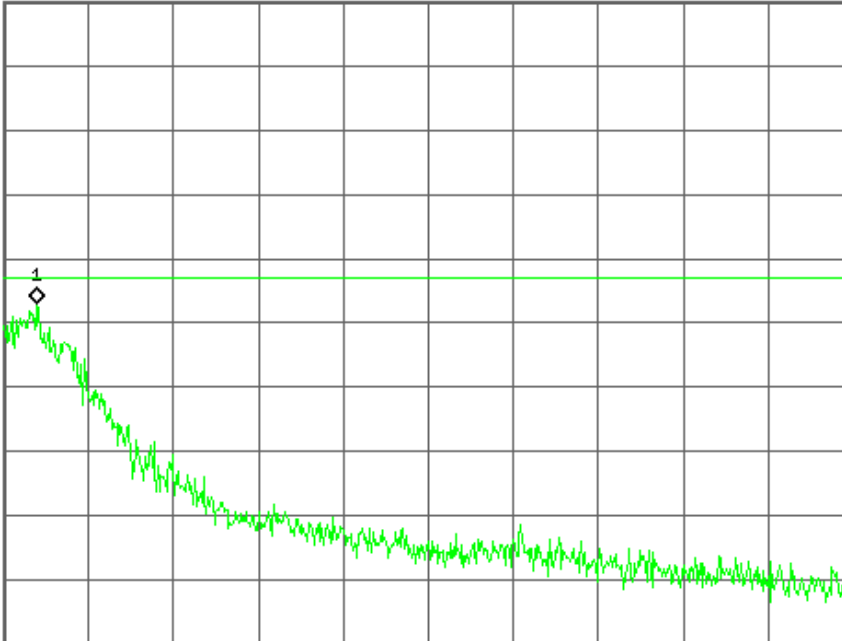
M1 S2

S3 FC

$\mathcal{E}(f)$ :

f>50k

Swp



Center 1.910 405 0 GHz

Span 810 kHz

#Res BW 3 kHz

#VBW 3 kHz

Sweep 343.2 ms (601 pts)

Center Freq  
1.91040500 GHz

Start Freq  
1.91000000 GHz

Stop Freq  
1.91081000 GHz

CF Step  
81.0000000 kHz  
Auto Man

Freq Offset  
0.00000000 Hz

Signal Track  
On Off

File Operation Status, C:\TEMP.GIF file saved

EDGE1900

Agilent

R T

**Ch Freq** 1.8502 GHz **Trig** Free

Occupied Bandwidth

FCC ID:A3LSGHD888 0BW Ch.512 EDGE  
Ref 26 dBm Atten 30 dB

Center 1.850 200 GHz Span 1 MHz  
#Res BW 3 kHz #VBW 3 kHz #Sweep 1 s (601 pts)

<b>Occupied Bandwidth</b>	<b>Occ BW % Pwr</b>	99.00 %
249.2380 kHz	<b>x dB</b>	-26.00 dB
<b>Transmit Freq Error</b>	340.034 Hz	
<b>x dB Bandwidth</b>	315.147 kHz	

**Freq/Channel**

**Center Freq**  
1.85020000 GHz

**Start Freq**  
1.84970000 GHz

**Stop Freq**  
1.85070000 GHz

**CF Step**  
100.000000 kHz  
Auto Man

**Freq Offset**  
0.00000000 Hz

**Signal Track**  
On Off

File Operation Status, C:\TEMP.GIF file saved

Agilent

R T

**Ch Freq** 1.88 GHz **Trig** Free

Occupied Bandwidth

FCC ID:A3LSGHD888 0BW Ch.661 EDGE  
Ref 26 dBm Atten 30 dB

Center 1.880 000 GHz Span 1 MHz  
#Res BW 3 kHz #VBW 3 kHz #Sweep 1 s (601 pts)

<b>Occupied Bandwidth</b>	<b>Occ BW % Pwr</b>	99.00 %
243.0484 kHz	<b>x dB</b>	-26.00 dB
<b>Transmit Freq Error</b>	-3.440 kHz	
<b>x dB Bandwidth</b>	308.364 kHz	

**Freq/Channel**

**Center Freq**  
1.88000000 GHz

**Start Freq**  
1.87950000 GHz

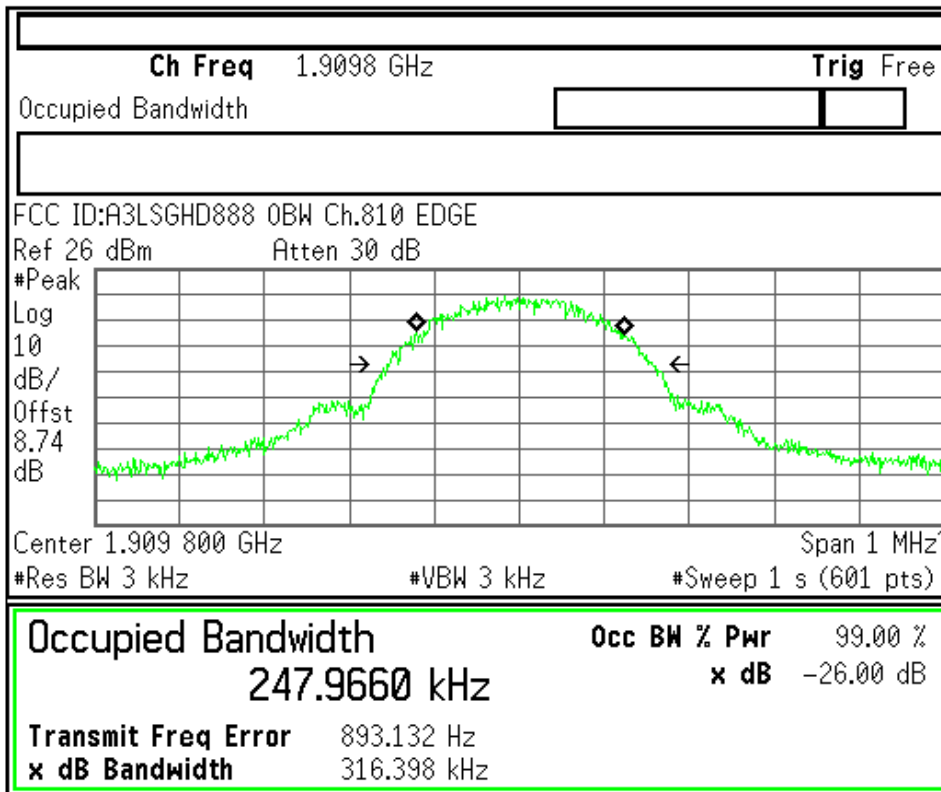
**Stop Freq**  
1.88050000 GHz

**CF Step**  
100.000000 kHz  
Auto Man

**Freq Offset**  
0.00000000 Hz

**Signal Track**  
On Off

File Operation Status, C:\TEMP.GIF file saved



<b>Freq/Channel</b>
<b>Center Freq</b> 1.90980000 GHz
<b>Start Freq</b> 1.90930000 GHz
<b>Stop Freq</b> 1.91030000 GHz
<b>CF Step</b> 100.000000 kHz Auto Man
<b>Freq Offset</b> 0.00000000 Hz
<b>Signal Track</b> On Off

File Operation Status, C:\TEMP.GIF file saved

ID : A3LSGHD888 Transmit Power 512CH EDGE

Control	EGPRS Transmit Power				PDCH Parms	
EGPRS Transmit Power Setup	EPK Burst Power		EPK Est Carrier Power		Downlink Traffic Power	
	Minimum	Maximum	Minimum	Maximum	Traffic Band	
	24.55 dBm	26.09 dBm	25.17 dBm	25.70 dBm	PCS	
	Average	Std Dev	Average	Std Dev	Traffic Channel	
	25.35 dBm	0.29 dBm	25.44 dBm	0.16 dBm	512	
	200 /200		Single		HS TX Level	
					Modulation Coding Scheme	
					Return	
	Active Cell Transferring			Sys Type: EGPRS		
1 of 2			IntRef	Offset	R T	1 of 2

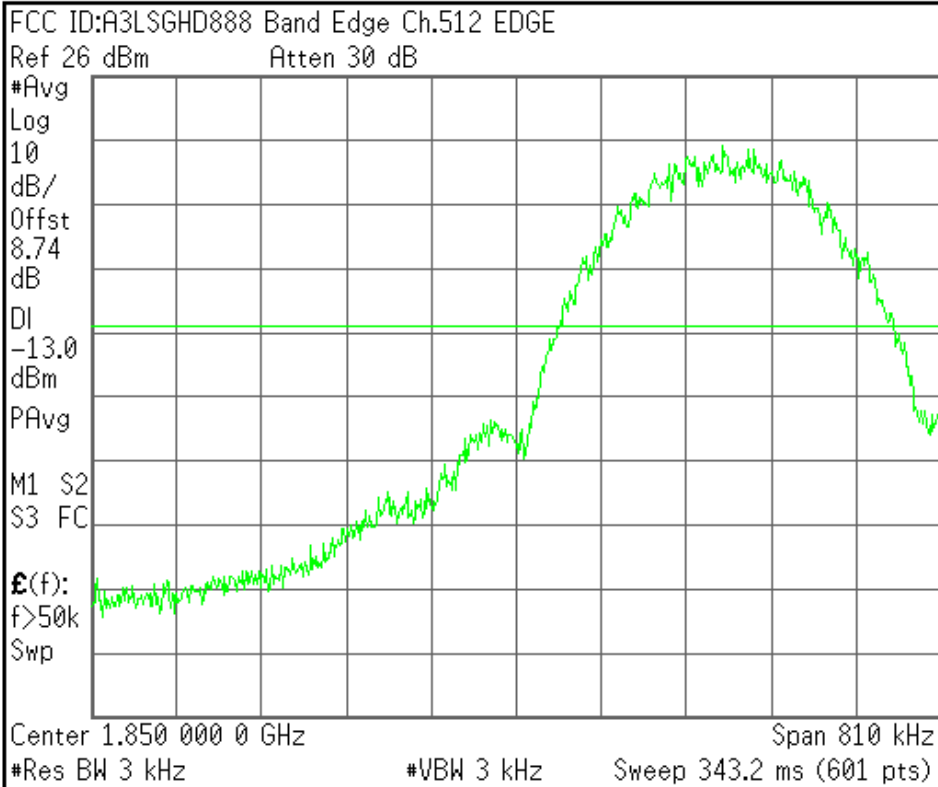
Measurement/Instrument Screen														
Control	EGPRS Transmit Power							PDCH Parms						
EGPRS Transmit Power Setup ▾	EP SK Burst Power			EP SK Est Carrier Power				Downlink Traffic Power ▾						
	Minimum	Maximum		Minimum	Maximum			Traffic Band						
	25.19 dBm	26.40 dBm		25.78 dBm	25.97 dBm			PCS						
	Average	Std Dev		Average	Std Dev			Traffic Channel						
25.85 dBm	0.22 dBm		25.90 dBm	0.04 dBm			661							
	200 /200							Single						
	Active Cell Transferring							Sys Type: EGPRS						
								IntRef		Offset	R	T		
1 of 2														

Measurement/Instrument Screen														
Control	EGPRS Transmit Power							PDCH Parms						
EGPRS Transmit Power Setup ▾	EP SK Burst Power			EP SK Est Carrier Power				Downlink Traffic Power ▾						
	Minimum	Maximum		Minimum	Maximum			Traffic Band						
	24.21 dBm	25.59 dBm		24.78 dBm	25.00 dBm			PCS						
	Average	Std Dev		Average	Std Dev			Traffic Channel						
24.84 dBm	0.26 dBm		24.91 dBm	0.05 dBm			810							
	200 /200							Single						
	Active Cell Transferring							Sys Type: EGPRS						
								IntRef		Offset	R	T		
1 of 2														

Agilent

R T

Freq/Channel



Center Freq  
1.85000000 GHz

Start Freq  
1.84959500 GHz

Stop Freq  
1.85040500 GHz

CF Step  
81.0000000 kHz  
Auto Man

Freq Offset  
0.00000000 Hz

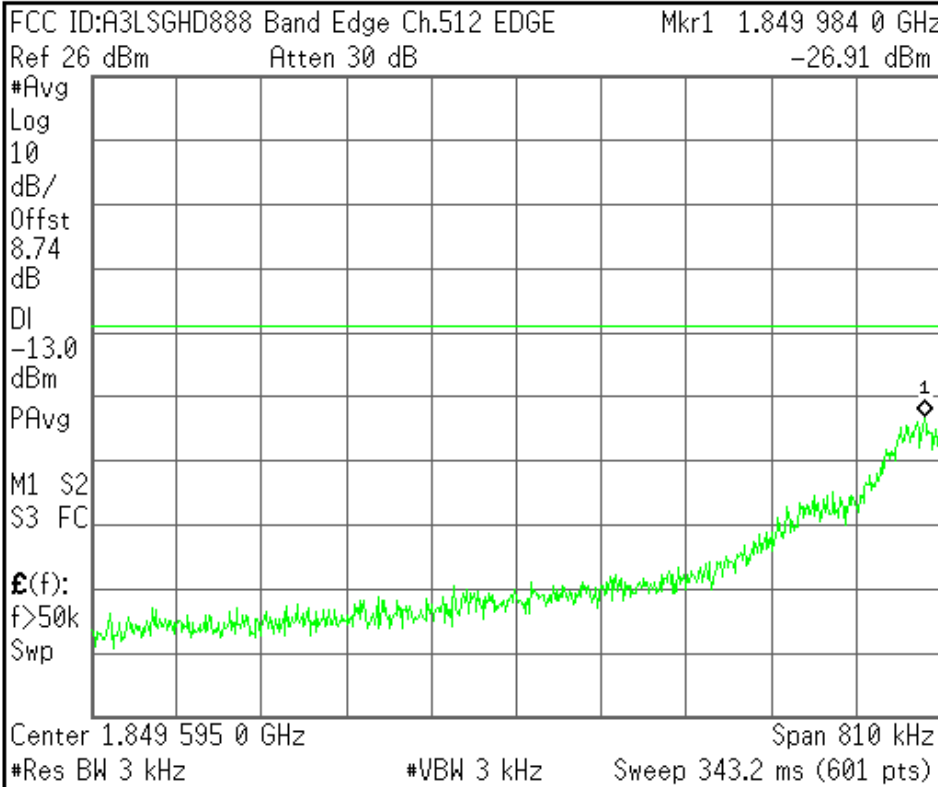
Signal Track  
On Off

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R T

Freq/Channel



Center Freq  
1.84959500 GHz

Start Freq  
1.84919000 GHz

Stop Freq  
1.85000000 GHz

CF Step  
81.0000000 kHz  
Auto Man

Freq Offset  
0.00000000 Hz

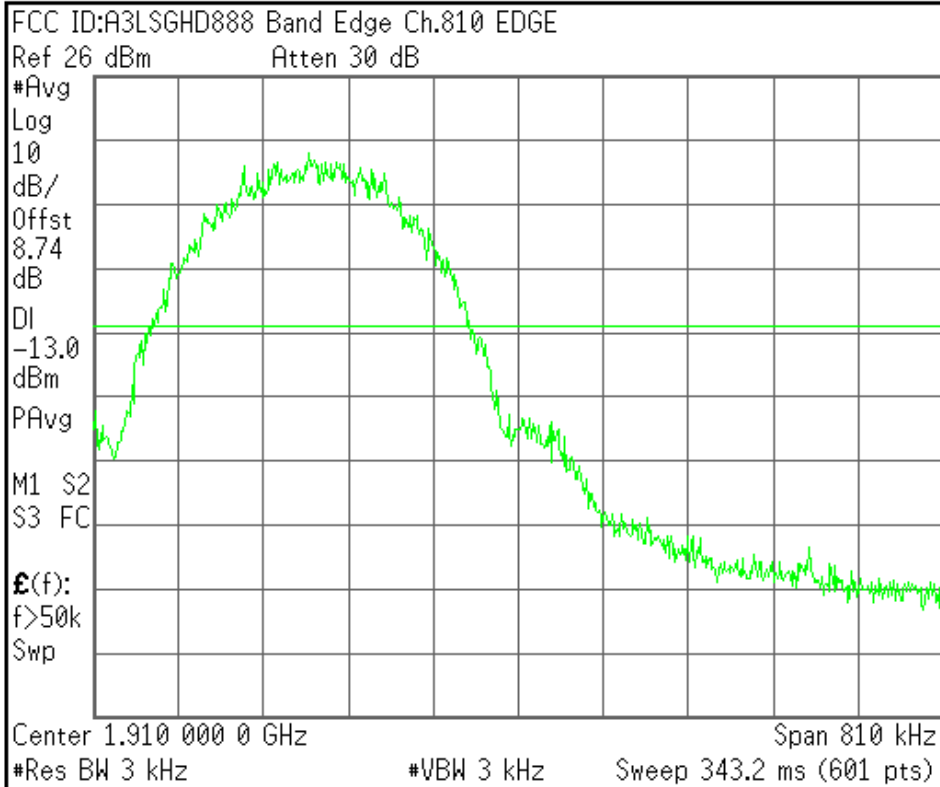
Signal Track  
On Off

File Operation Status, C:\TEMP.GIF file saved

Agilent

R T

Freq/Channel



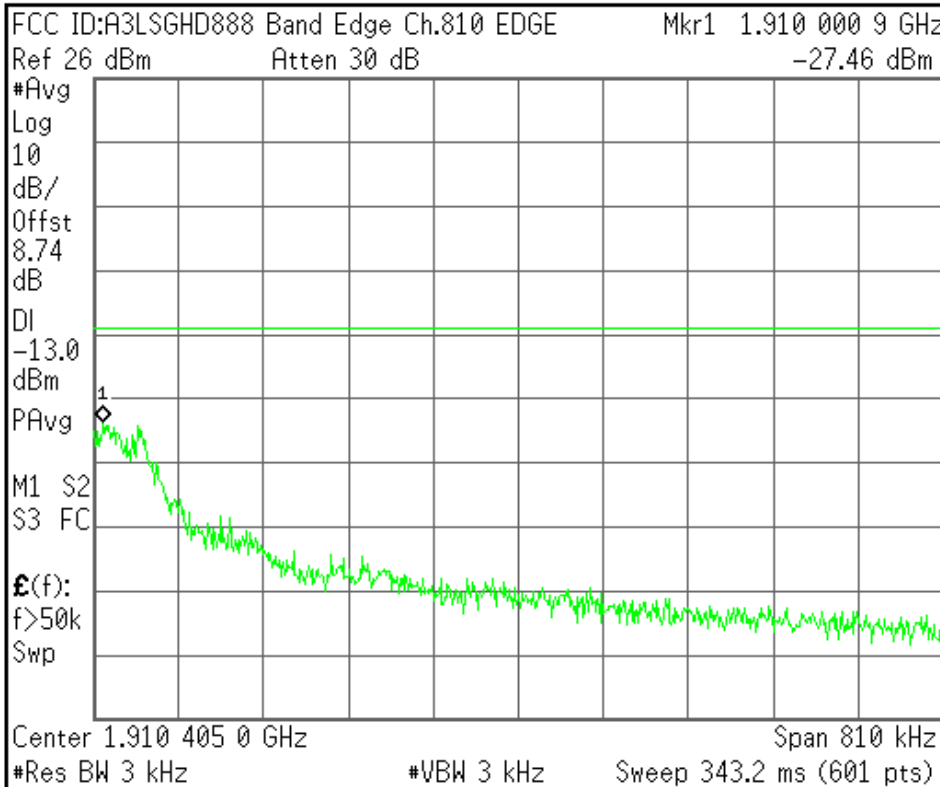
<b>Center Freq</b> 1.91000000 GHz
<b>Start Freq</b> 1.90959500 GHz
<b>Stop Freq</b> 1.91040500 GHz
<b>CF Step</b> 81.0000000 kHz Auto Man
<b>Freq Offset</b> 0.00000000 Hz
<b>Signal Track</b> On Off

File Operation Status, C:\TEMP.GIF file saved

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R T

Freq/Channel



<b>Center Freq</b> 1.91040500 GHz
<b>Start Freq</b> 1.91000000 GHz
<b>Stop Freq</b> 1.91081000 GHz
<b>CF Step</b> 81.0000000 kHz Auto Man
<b>Freq Offset</b> 0.00000000 Hz
<b>Signal Track</b> On Off

File Operation Status, C:\TEMP.GIF file saved