



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-X650
Additional Model : SGH-X658
FCC ID(Requested) : A3LSGHX650
Report No : FD-027-R1
Job No : FD-027
Date issued : March 15, 2006

- Abstract -

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




Prepared By		Date	2006.03.15
	_____ YE PARK – Test Engineer		_____
Checked By		Date	2006.03.15
	_____ WW JANG – Assistant Manager		_____
Authorized By		Date	2006.03.15
	_____ SH PARK - Senior Manager		_____



TABLE OF CONTENT

MEASUREMENT REPORT	Page
1. FCC CERTIFICATION INFORMATION	3
1.1. §2.1033 General Information	3
2. INTRODUCTION	4
2.1. General	4
3. MEASURING INSTRUMENT CALIBRATION	5
4. TEST EQUIPMENT LIST	6
5. DESCRIPTION OF TESTS	7
5.1. Effective Radiated Power / Equivalent Isotropic Radiated Power	7
5.2. Radiated Spurious & Harmonic Emission	8
5.3. Occupied Bandwidth	10
5.4. Spurious and Harmonic Emission at Antenna Terminal	10
5.4.1. Occupied Bandwidth Emission Limits	10
5.4.2. Conducted Spurious Emission	12
5.5. Frequency Stability / Temperature Variation	13
6. TEST DATA	14
6.1. Equivalent Isotropic Radiated Power (E.I.R.P.)	14
6.2. GSM1900 Radiated Spurious & Harmonic measurement	15
6.3. GSM1900 Radiated Spurious & Harmonic Conversion Table	16
6.4. Frequency Stability	17
6.4.1. GSM1900 Frequency Stability Table	17
6.4.2. GSM1900 Frequency Stability Graph	18
7. CONCLUSION	20
8. TEST PLOTS	21



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 : A3LSGHX650
- Additional Model : SGH-X658
- Quantity : Quantity production is planned
- Emission Designators : 241KGXW(GSM1900)
- Tx Freq. Range : 1850.2MHz -1909.8MHz (GSM1900)
- Rx Freq. Range : 1930.2MHz - 1989.8MHz (GSM1900)
- Max. Power Rating : 1.754 W EIRP GSM1900 (32.44dBm)
- FCC Classification(s) : Licensed Portable Tx Held to Ear (PCE)
- Equipment (EUT) Type : Single-Band PCS GSM Phone
- Frequency Tolerance : $\pm 0.00025\%$ (2.5ppm)
- FCC Rule Part(s) : §24(E), §2.
- Dates of Test : March 06-08, 2006
- Place of Test : SAMSUNG Lab,
- Test Report S/N : FD-027-R1

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.

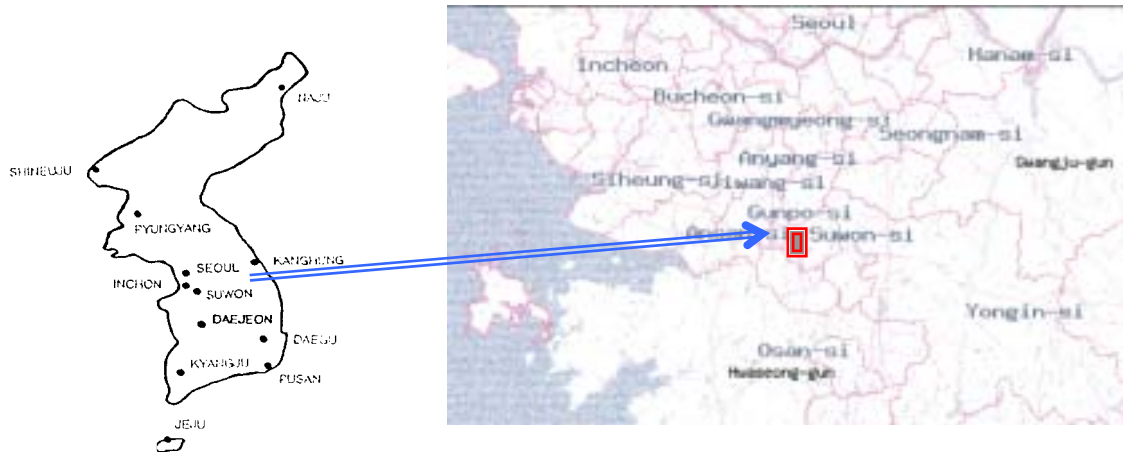


Figure1. Map of the Suwon City area.

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.

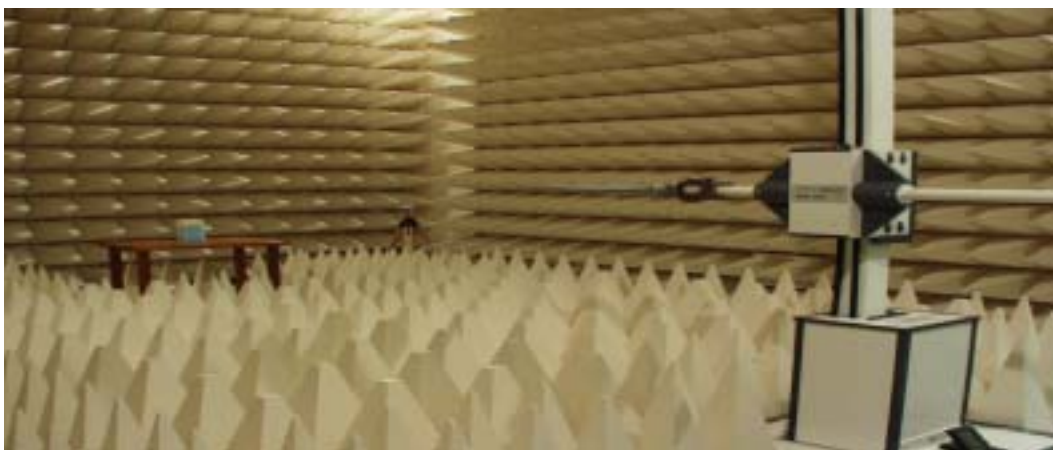


Figure2. Photograph of 3m Fully-Anechoic Chamber



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

Name Of Equipment	Model	Serial No.	Due Date
Spectrum Analyzer	ESI26	836119/010	2006-09-26
	E4440A(3Hz~26.5GHz)	MY41000236	2006-10-13
	E4440A(3Hz~26.5GHz)	MY41000233	2006-12-21
Signal Generator	SMIQ03B	83824/021	2006-12-07
	SMR20	835197/030	2007-01-10
Power Meter	E4419B	GB41293846	2006-09-07
Power Sensor	8481B	3318A10325	2006-09-08
	8485A	3318A19924	2006-09-08
Amplifier	5S1G4	304866	2006-10-18
Pre-Amplifier	8449B	3008A00691	2007-01-02
Communication test set	8960	GB42230535	2007-01-02
	8960	GB42360886	2007-02-28
Antenna Master	MA240	240/618	Not Required
Controller	HD100	100/756	Not Required
Environmental Chamber	SH-241	92000548	2006-11-22
	SH-241	92000549	2006-11-22
Horn Antenna	HF906	100134	2006-04-25
Dipole Antenna	3121C-DB4	9007-587	2006-12-02
	3121C-DB4	9007-588	2006-06-04
Receive Antenna	HL040	353255/019	2006-08-24
	HL040	353255/020	2006-06-21
Divider	11636B	51941	Not Required
	11636B	51942	Not Required
	11636B	51946	Not Required
High Pass Filter	WHK1.0/15G-10SS	1	Not Required
	WHK/3.5/18G-10SS	4	Not Required
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-A-2001, Aug. 15, 2001:

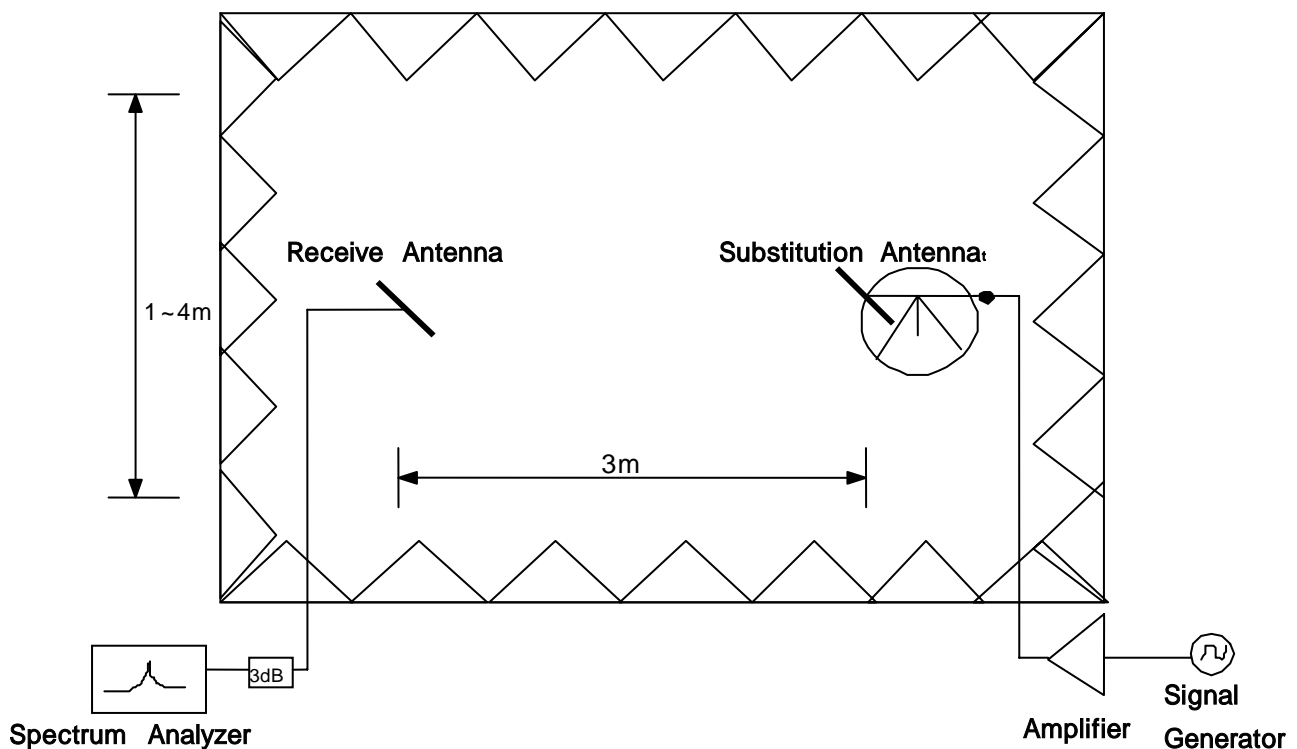


Figure 3. Diagram of ERP/EIRP test Set-up

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-A-2001, Aug. 15, 2001

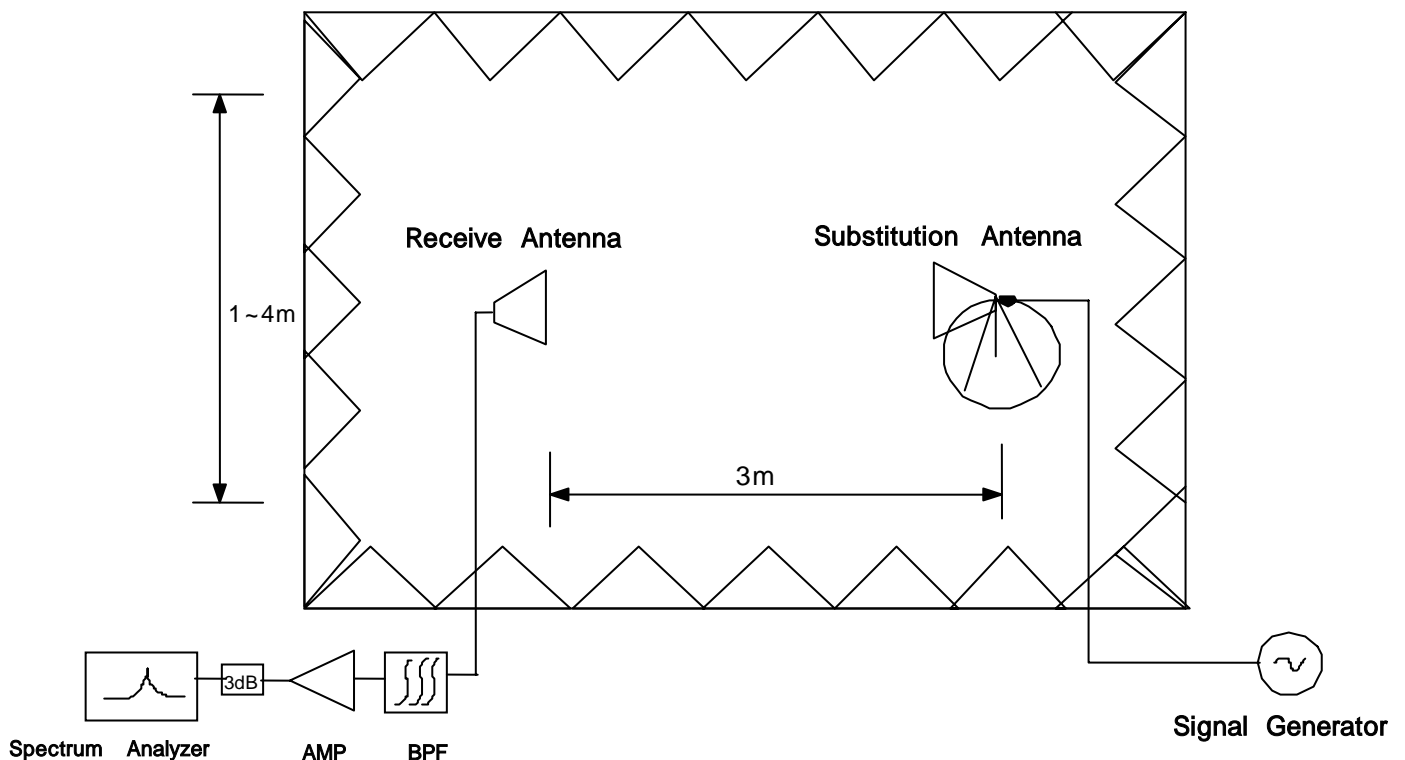


Figure 4. Diagram of Radiated Spurious & Harmonic test Set-up

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 10th 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 -81.0dBm . The gain of the substituted antenna is 8.1dBi . The signal generator connected to the substituted antenna terminals is adjusted to produce a reading of -81.0dBm of the receive analyzer. The loss of the cable between the signal generator and the terminals of the substituted antenna is 2.0dB at 3760.00MHz . So 6.1dB is added to the signal generator reading of -30.9dBm yielding -24.8dBm . The fundamental EIRP was 25.5dBm 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.



BLOCK	Freq. Range (MHz) Transmitter (Tx)	Freq. Range (MHz) Receiver (Rx)
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

BLOCK	Freq. Range (MHz) Transmitter (Tx)	Freq. Range (MHz) Receiver (Rx)
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.

$$43 + 10\log (1.754 \text{ W}) = 45.44 \text{ dB}$$

$$32.44 \text{ dBm} - 45.44 \text{ dB} = -13 \text{ dBm}$$

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 $+60^{\circ}\text{C}$ 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 ± 0.00025 ($\pm 2.5\text{ppm}$) 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 $+60^{\circ}\text{C}$ 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	-14.08	8.42	-22.50
		V	-14.25	8.42	-22.67
1880.00	27.00	H	-14.22	8.25	-22.47
		V	-14.24	8.25	-22.49
1909.80	27.00	H	-13.71	8.40	-22.11
		V	-13.77	8.40	-22.17

Result

Frequency (MHz)	Tested level (dBm)	Polarization (H/V)	Azimuth (angle)	EIRP (dBm)	EIRP (W)	Battery
1850.20	-17.06	H2	29	32.44	1.754	Standard
1880.00	-18.52	H2	32	30.95	1.245	Standard
1909.80	-19.74	H2	31	29.37	0.865	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 : 32.44 dBm = 1.754 W

Modulation Signal : GSM1900

Limit : $43 + 10\log_{10}(P) = 45.44$ dBc

Result

Channel	Harmonic	Frequency (MHz)	From EUT Tested level (dBm)	POL (H/V)	Result (dBc)
512	2	3700.40	-51.73	H1	57.07
	3	5550.60	-54.67	H1	54.82
	4	7400.80	-58.95	H2	56.06
	5	9251.00	-	-	-
	6	11101.20	-	-	-
	7	12951.40	-	-	-
661	2	3760.00	-53.94	H1	59.87
	3	5640.00	-55.99	H1	56.00
	4	7520.00	-58.17	H1	55.04
	5	9400.00	-	-	-
	6	11280.00	-	-	-
	7	13160.00	-	-	-
810	2	3819.60	-54.6	H1	58.78
	3	5729.40	-55.8	H2	54.98
	4	7639.20	-58.63	H1	54.07
	5	9549.00	-	-	-
	6	11458.80	-	-	-
	7	13368.60	-	-	-

Radiated Spurious Emission measurements at 3 meters by Substitution Method



6.3. GSM1900 Radiated Spurious & Harmonic Conversion Table

Date : 2006. 03. 08

Test Engineer : YE PARK

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	11.80	9.47	7.67	-51.73	-54.99	-24.63	-28.12	57.07	60.56
	3	5550.60	15.69	11.11	5.42	-54.67	-55.70	-22.38	-23.82	54.82	56.26
	4	7400.80	19.39	11.43	2.04	-58.95	-59.00	-23.62	-25.04	56.06	57.48
	5	9251.00	22.94	12.69	-0.25	-	-	-	-	-	-
	6	11101.20	26.74	13.67	-3.07	-	-	-	-	-	-
	7	12951.40	32.67	12.74	-9.93	-	-	-	-	-	-
661	2	3760.00	11.64	9.47	7.83	-53.94	-58.13	-27.43	-30.84	59.87	63.28
	3	5640.00	15.68	11.11	5.43	-55.99	-56.98	-23.56	-24.20	56.00	56.64
	4	7520.00	19.81	11.43	1.62	-58.17	-58.79	-22.60	-24.32	55.04	56.76
	5	9400.00	23.42	12.69	-0.73	-	-	-	-	-	-
	6	11280.00	27.01	13.67	-3.34	-	-	-	-	-	-
	7	13160.00	33.49	12.74	-10.75	-	-	-	-	-	-
810	2	3819.60	12.23	9.47	7.24	-54.60	-58.38	-26.34	-29.36	58.78	61.80
	3	5729.40	15.86	11.11	5.25	-55.80	-56.56	-22.54	-23.04	54.98	55.48
	4	7639.20	19.92	11.43	1.51	-58.63	-58.84	-21.63	-22.37	54.07	54.81
	5	9549.00	23.68	12.69	-0.99	-	-	-	-	-	-
	6	11458.80	26.87	13.67	-3.20	-	-	-	-	-	-
	7	13368.60	33.85	12.74	-11.11	-	-	-	-	-	-

6.4. Frequency Stability

6.4.1. GSM1900 Frequency Stability Table

Operating Frequency : 1,880,000,000 Hz

Channel : 661

Reference Voltage : 3.7VDC

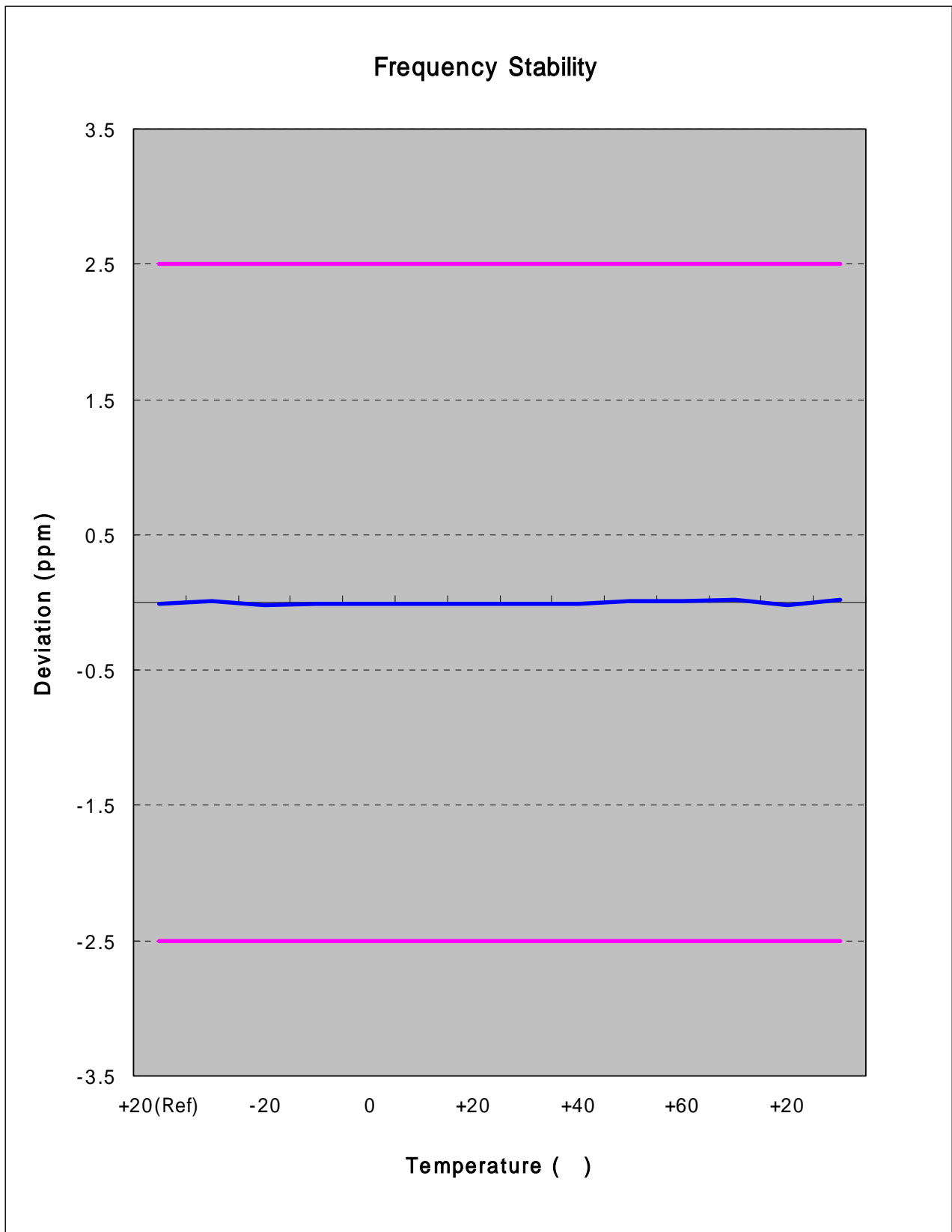
Deviation Limit : ± 0.00025 % or 2.5ppm

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency Error (Hz)	Frequency (Hz)	Deviation (%)	ppm
100%	3.70	+20(Ref)	-23.12	1,879,999,977	-0.000001	-0.012
100%		-30	16.44	1,880,000,016	0.000001	0.009
100%		-20	-45.95	1,879,999,954	-0.000002	-0.024
100%		-10	-25.84	1,879,999,974	-0.000001	-0.014
100%		0	-26.70	1,879,999,973	-0.000001	-0.014
100%		+10	-14.34	1,879,999,986	-0.000001	-0.008
100%		+20	-23.12	1,879,999,977	-0.000001	-0.012
100%		+30	-22.92	1,879,999,977	-0.000001	-0.012
100%		+40	-12.88	1,879,999,987	-0.000001	-0.007
100%		+50	25.93	1,880,000,026	0.000001	0.014
100%		+60	17.47	1,880,000,017	0.000001	0.009
85%		3.40	+20	39.39	1,880,000,039	0.000002
115%	4.26	+20	-36.08	1,879,999,964	-0.000002	-0.019
Batt.Endpoint	3.40	+20	39.39	1,880,000,039	0.000002	0.021

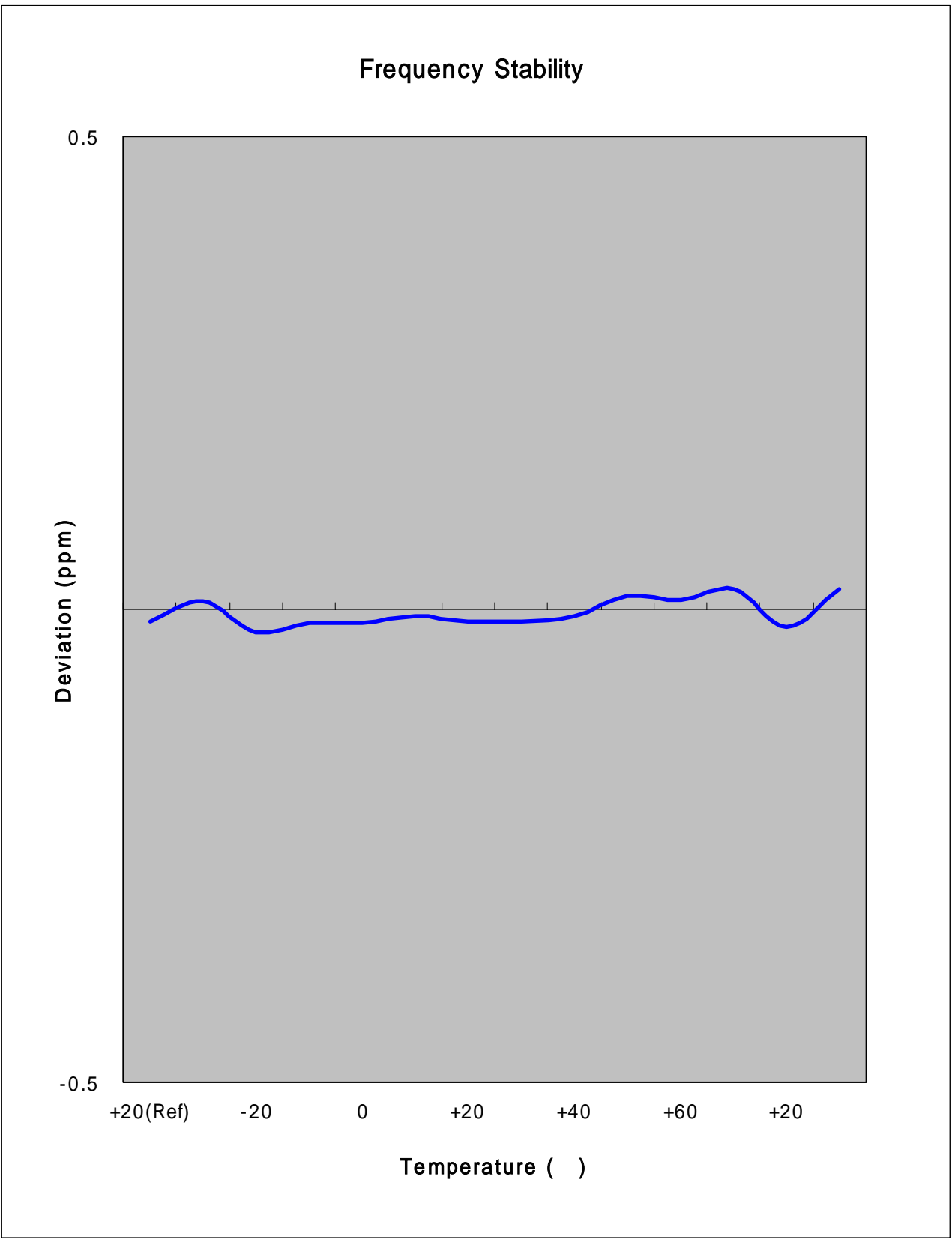
Note : The temperature is varied from -30 °C to +60 °C using an environmental chamber.

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 Phone.

FCC ID : A3LSGHX650 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:A3LSGHX650 0BW Ch.512
Ref 30 dBm Atten 40 dB

#Peak
Log
10
dB/
Offst
8.61
dB

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

Occupied Bandwidth	Occ BW % Pwr	99.00 %
240.0159 kHz	x dB	-26.00 dB
Transmit Freq Error	154.881 Hz	
x dB Bandwidth	306.896 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:A3LSGHX650 0BW Ch.661
Ref 30 dBm Atten 40 dB

#Peak
Log
10
dB/
Offst
8.61
dB

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

Occupied Bandwidth	Occ BW % Pwr	99.00 %
237.3264 kHz	x dB	-26.00 dB
Transmit Freq Error	-464.701 Hz	
x dB Bandwidth	301.304 kHz	

Freq/Channel

Center Freq
1.88000000 GHz

Start Freq
1.87950000 GHz

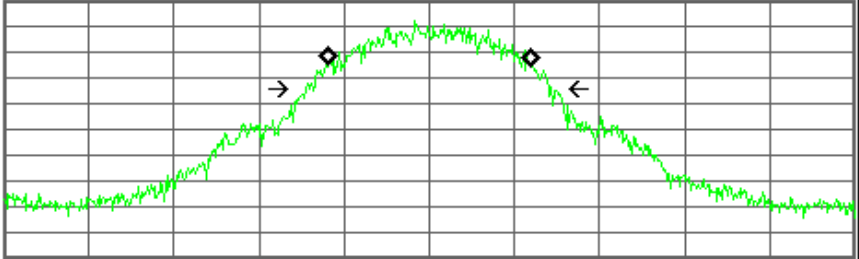
Stop Freq
1.88050000 GHz

CF Step
100.000000 kHz
Auto Man

Freq Offset
0.00000000 Hz

Signal Track
On Off

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

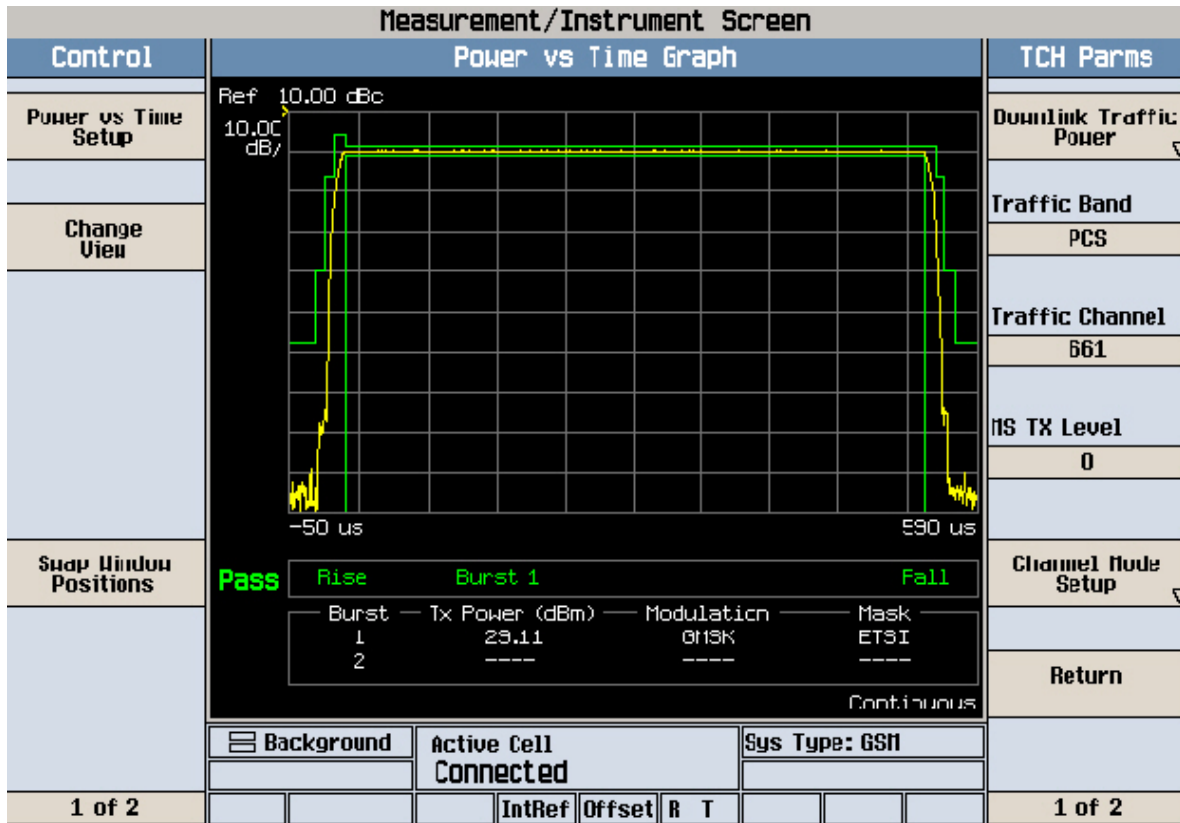
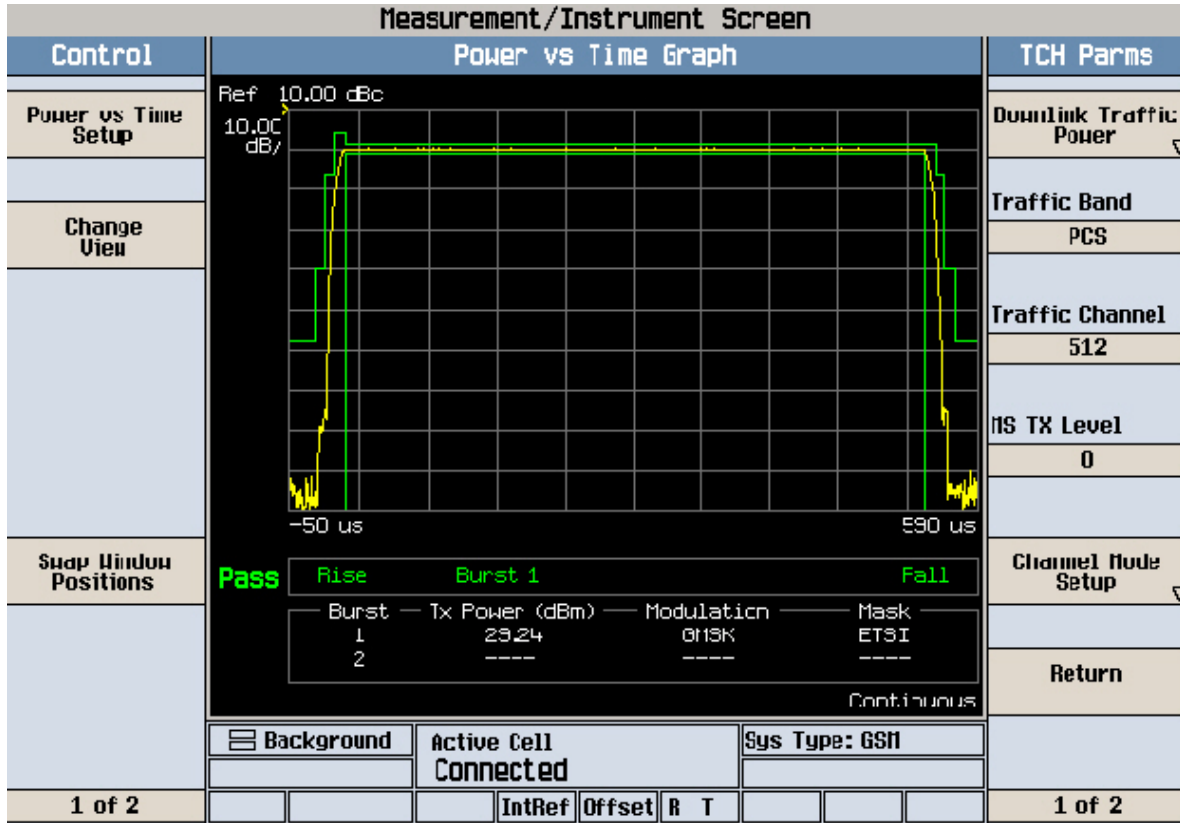
Ch Freq 1.9098 GHz Trig Free Occupied Bandwidth [] []	Freq/Channel Center Freq 1.90980000 GHz Start Freq 1.90930000 GHz Stop Freq 1.91030000 GHz CF Step 100.000000 kHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off								
FCC ID:A3LSGHX650 0BW Ch.810 Ref 30 dBm Atten 40 dB #Peak Log 10 dB/ Offst 8.61 dB 									
Center 1.909 800 GHz Span 1 MHz #Res BW 3 kHz #VBW 3 kHz #Sweep 1 s (601 pts)									
<table style="width:100%; border-collapse: collapse;"> <tr> <td style="width:50%;">Occupied Bandwidth</td> <td style="width:50%;">Occ BW % Pwr 99.00 %</td> </tr> <tr> <td style="text-align: center;">240.9277 kHz</td> <td style="text-align: center;">x dB -26.00 dB</td> </tr> <tr> <td>Transmit Freq Error -70.960 Hz</td> <td></td> </tr> <tr> <td>x dB Bandwidth 292.682 kHz</td> <td></td> </tr> </table>		Occupied Bandwidth	Occ BW % Pwr 99.00 %	240.9277 kHz	x dB -26.00 dB	Transmit Freq Error -70.960 Hz		x dB Bandwidth 292.682 kHz	
Occupied Bandwidth	Occ BW % Pwr 99.00 %								
240.9277 kHz	x dB -26.00 dB								
Transmit Freq Error -70.960 Hz									
x dB Bandwidth 292.682 kHz									
File Operation Status, C:\TEMP.GIF file saved									

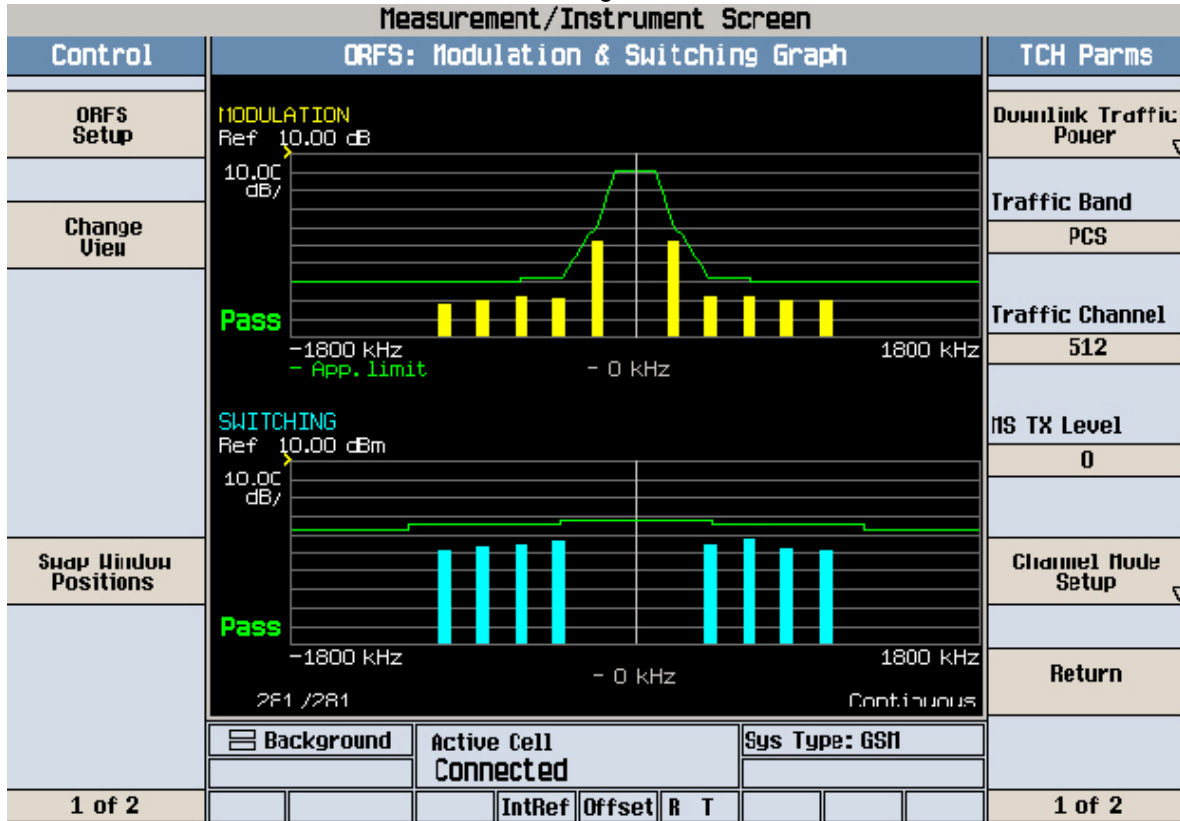
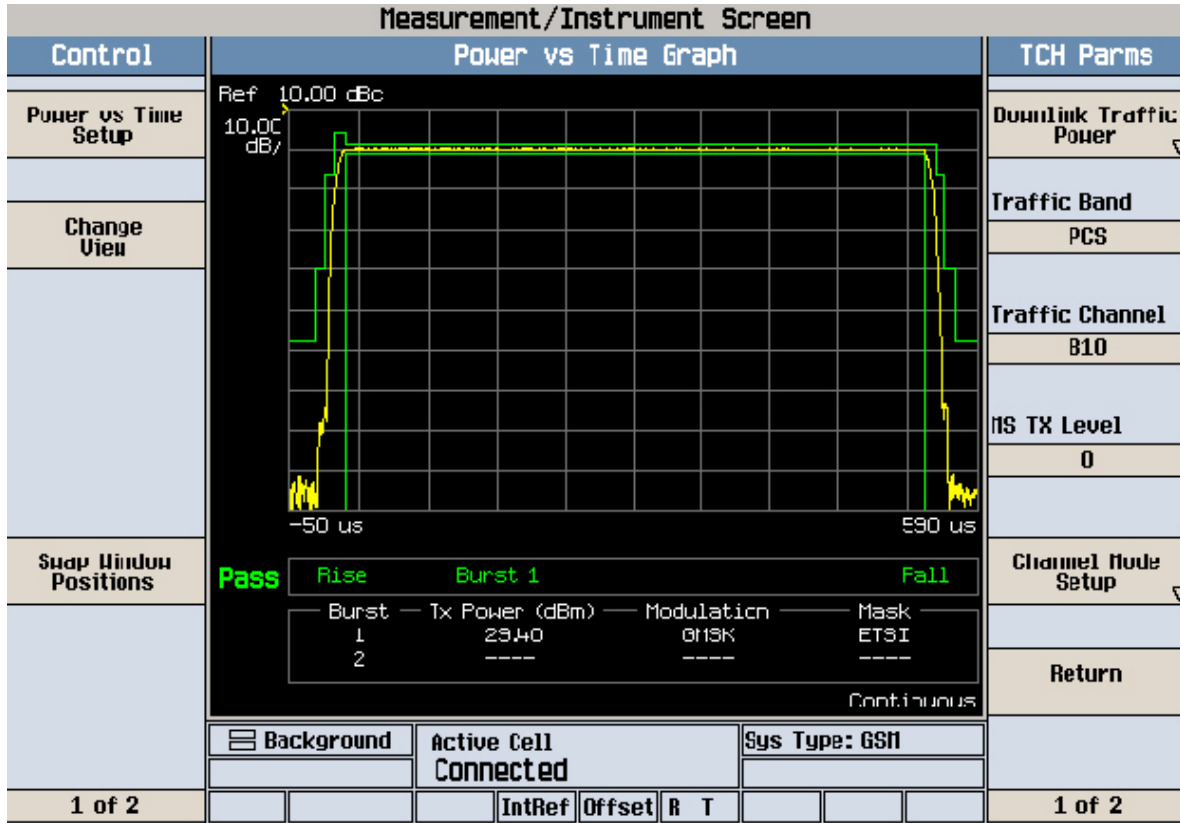
FCC ID : A3LSGHX650 Transmit Power 512CH

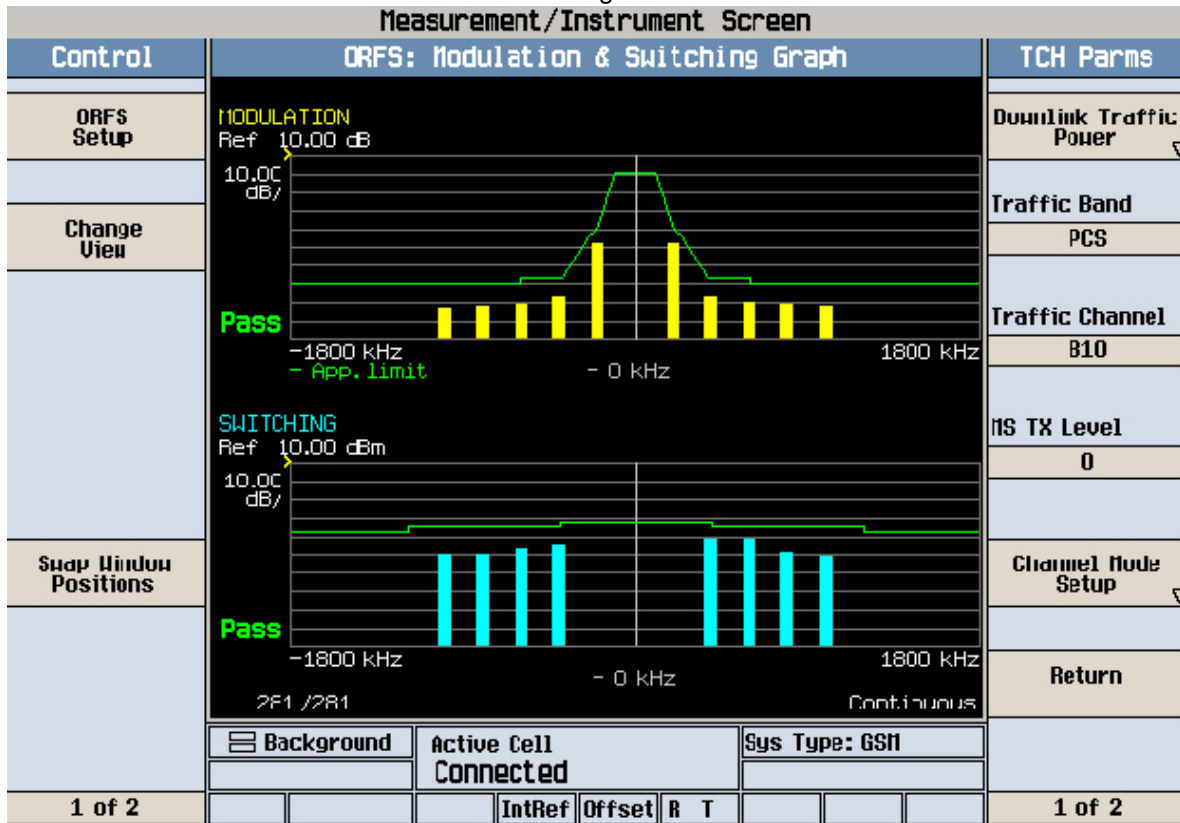
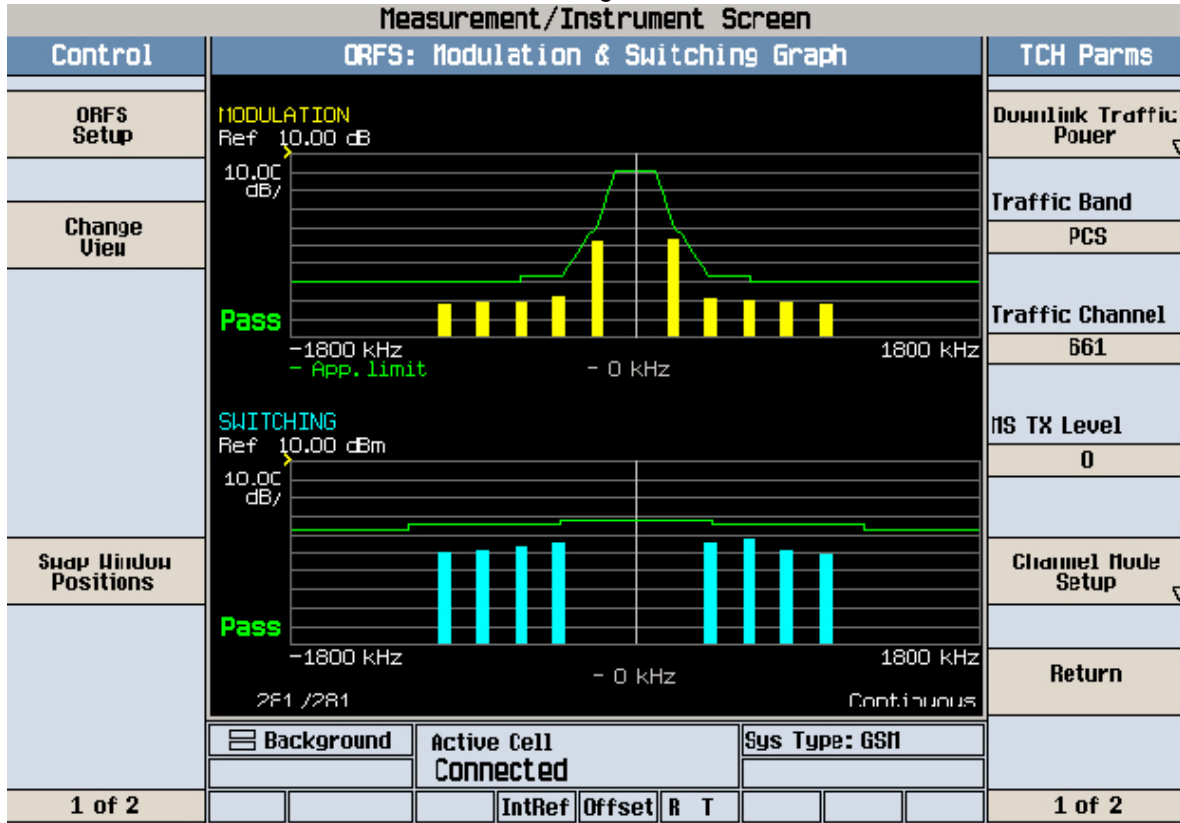
Measurement/Instrument Screen						
Control	GSM/GPRS Transmit Power				TCH Parms	
GSM/GPRS TX Power Setup	GMSK Transmit Power 29.25 dBm				Downlink Traffic Power	
Supp Hindou Positions	Single				Traffic Band	
					PCS	
					Traffic Channel	
					512	
					MS TX Level	
					0	
					Channel Mode Setup	
					Return	
	Background		Active Cell		Sys Type: GSM	
			Connected			
1 of 2	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;">GMSK Transmit Power 29.11 dBm</p> <p style="text-align: right;">Single</p>						Downlink Traffic Power ▾																					
Swap Window Positions								Traffic Band		PCS		Traffic Channel		661															
		Phase & Frequency Error		RIS TX Level		0		Channel Mode Setup ▾																					
		<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th>Peak Phase °</th> <th>RMS Phase °</th> <th>Frequency Hz</th> </tr> </thead> <tbody> <tr> <td>Minimum</td> <td>4.46</td> <td>1.64</td> <td>-50.85</td> </tr> <tr> <td>Maximum</td> <td>6.39</td> <td>2.02</td> <td>-42.97</td> </tr> <tr> <td>Average</td> <td>5.13</td> <td>1.84</td> <td>-46.28</td> </tr> <tr> <td>Pass/Fail</td> <td>Pass</td> <td>Pass</td> <td>Pass</td> </tr> </tbody> </table>			Peak Phase °	RMS Phase °	Frequency Hz	Minimum	4.46	1.64	-50.85	Maximum	6.39	2.02	-42.97	Average	5.13	1.84	-46.28	Pass/Fail	Pass	Pass	Pass	Return					
			Peak Phase °	RMS Phase °	Frequency Hz																								
Minimum	4.46	1.64	-50.85																										
Maximum	6.39	2.02	-42.97																										
Average	5.13	1.84	-46.28																										
Pass/Fail	Pass	Pass	Pass																										
1 of 2		50 / 50		Continuous				1 of 2																					
		Background		Active Cell Connected		Sys Type: GSM																							
				IntRef		Offset		R T																					

Measurement/Instrument Screen																													
Control		GSM/GPRS Transmit Power						TCH Parms																					
GSM/GPRS TX Power Setup ▾		<p style="text-align: center;">GMSK Transmit Power 29.39 dBm</p> <p style="text-align: right;">Single</p>						Downlink Traffic Power ▾																					
Swap Window Positions								Traffic Band		PCS		Traffic Channel		810															
		Phase & Frequency Error		RIS TX Level		0		Channel Mode Setup ▾																					
		<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th>Peak Phase °</th> <th>RMS Phase °</th> <th>Frequency Hz</th> </tr> </thead> <tbody> <tr> <td>Minimum</td> <td>4.38</td> <td>1.60</td> <td>-57.37</td> </tr> <tr> <td>Maximum</td> <td>6.32</td> <td>1.96</td> <td>-49.40</td> </tr> <tr> <td>Average</td> <td>5.13</td> <td>1.80</td> <td>-52.41</td> </tr> <tr> <td>Pass/Fail</td> <td>Pass</td> <td>Pass</td> <td>Pass</td> </tr> </tbody> </table>			Peak Phase °	RMS Phase °	Frequency Hz	Minimum	4.38	1.60	-57.37	Maximum	6.32	1.96	-49.40	Average	5.13	1.80	-52.41	Pass/Fail	Pass	Pass	Pass	Return					
			Peak Phase °	RMS Phase °	Frequency Hz																								
Minimum	4.38	1.60	-57.37																										
Maximum	6.32	1.96	-49.40																										
Average	5.13	1.80	-52.41																										
Pass/Fail	Pass	Pass	Pass																										
1 of 2		10 / 50		Continuous				1 of 2																					
		Background		Active Cell Connected		Sys Type: GSM																							
				IntRef		Offset		R T																					







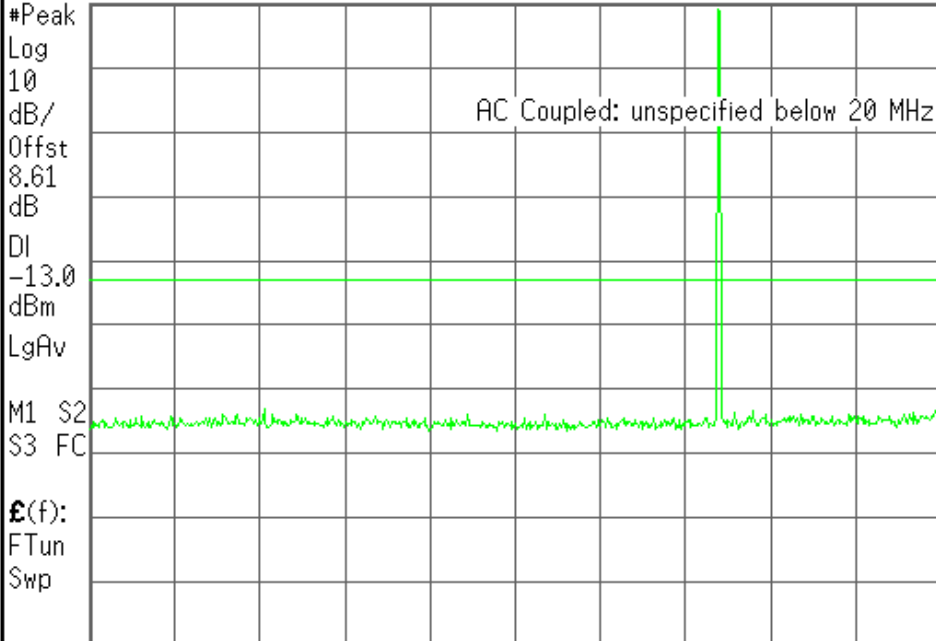
Agilent

R L

Freq/Channel

FCC ID:A3LSGHX650 Cond Spur Ch.512

Ref 30 dBm Atten 40 dB



Center Freq
1.25500000 GHz

Start Freq
10.0000000 MHz

Stop Freq
2.50000000 GHz

CF Step
249.000000 MHz
Auto Man

Freq Offset
0.00000000 Hz

Signal Track
On Off

Center 1.255 GHz Span 2.49 GHz
#Res BW 1 MHz #VBW 1 MHz Sweep 4.16 ms (601 pts)

Copyright 2000-2004 Agilent Technologies

Agilent

R L

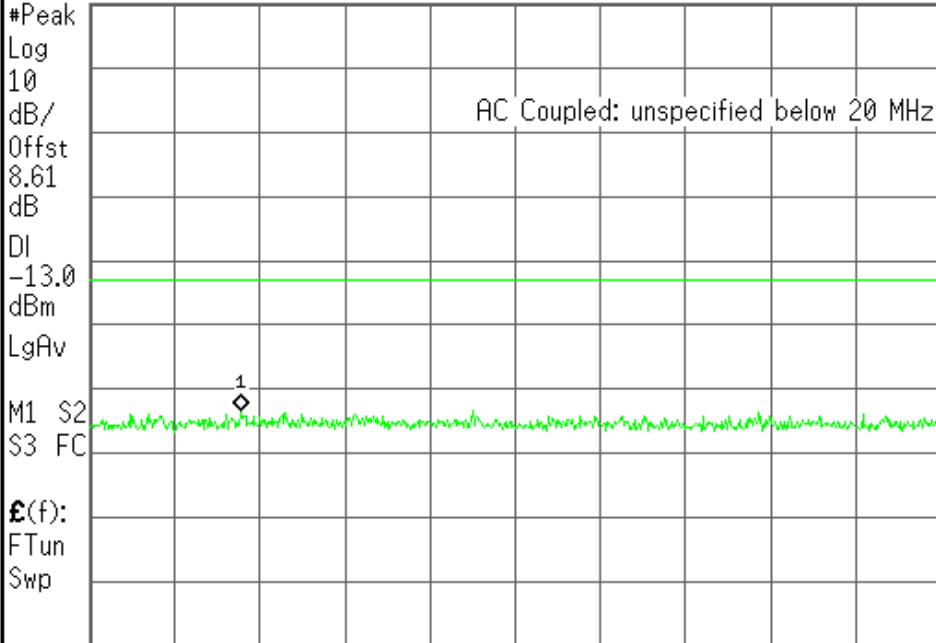
Freq/Channel

FCC ID:A3LSGHX650 Cond Spur Ch.512

Ref 30 dBm Atten 40 dB

Mkr1 334 MHz

-33.25 dBm



Center Freq
926.350000 MHz

Start Freq
10.0000000 MHz

Stop Freq
1.84270000 GHz

CF Step
183.270000 MHz
Auto Man

Freq Offset
0.00000000 Hz

Signal Track
On Off

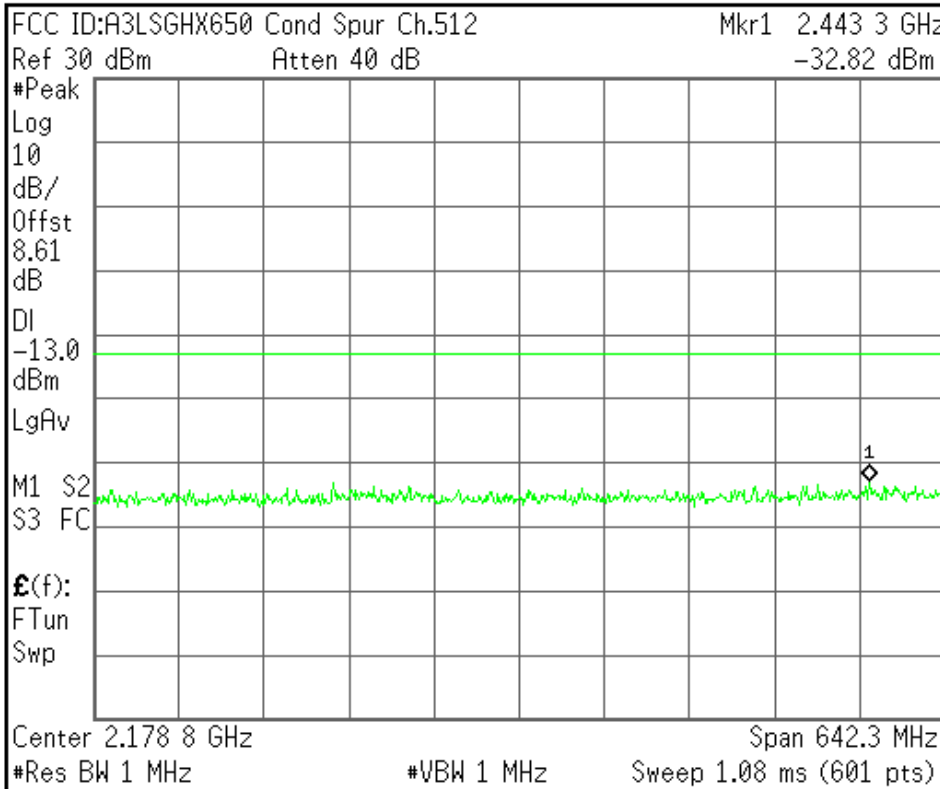
Center 926 MHz Span 1.833 GHz
#Res BW 1 MHz #VBW 1 MHz Sweep 3.08 ms (601 pts)

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

Agilent

R T

Freq/Channel



Center Freq
2.17885000 GHz

Start Freq
1.85770000 GHz

Stop Freq
2.50000000 GHz

CF Step
64.2300000 MHz
Auto Man

Freq Offset
0.00000000 Hz

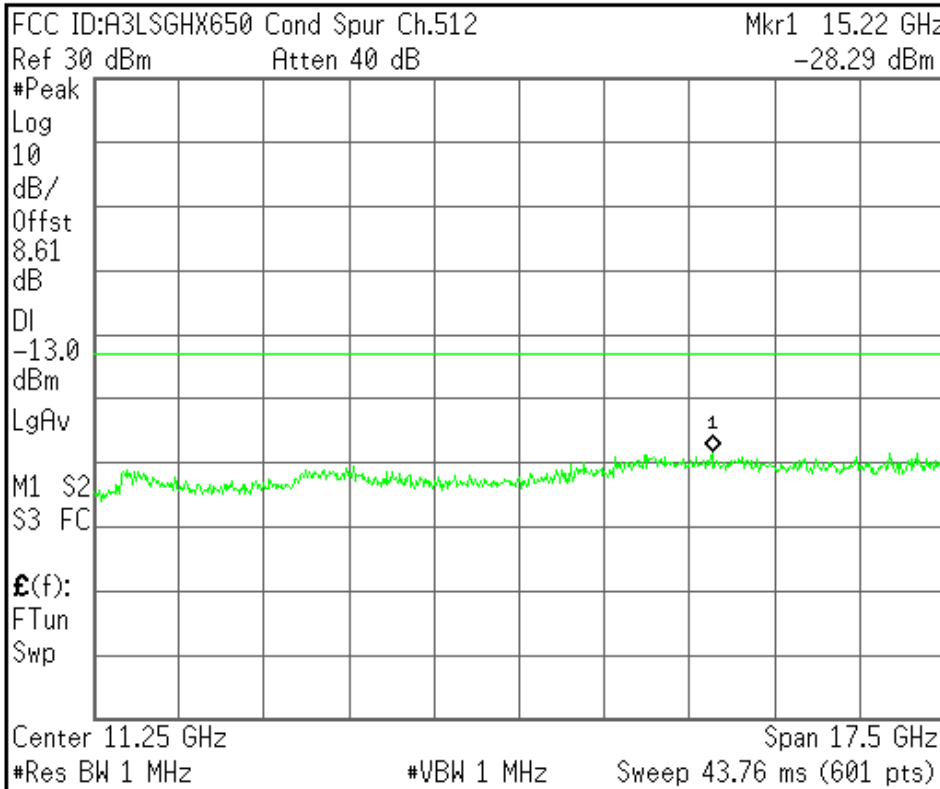
Signal Track
On Off

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

Agilent

R L

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 L

Freq/Channel

FCC ID:A3LSGHX650 Cond Spur Ch.661

Ref 30 dBm

Atten 40 dB

#Peak

Log

10

dB/

Offst

8.61

dB

DI

-13.0

dBm

LgAv

M1 S2

S3 FC

$\mathcal{E}(f)$:

FTun

Swp

AC Coupled: unspecified below 20 MHz

Center 1.255 GHz

Span 2.49 GHz

#Res BW 1 MHz

#VBW 1 MHz

Sweep 4.16 ms (601 pts)

Center Freq
1.25500000 GHz

Start Freq
10.00000000 MHz

Stop Freq
2.50000000 GHz

CF Step
249.0000000 MHz
Auto Man

Freq Offset
0.00000000 Hz

Signal Track
On Off

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

Agilent

R L

Freq/Channel

FCC ID:A3LSGHX650 Cond Spur Ch.661

Mkr1 1.332 GHz

Ref 30 dBm

Atten 40 dB

-33.01 dBm

#Peak

Log

10

dB/

Offst

8.61

dB

DI

-13.0

dBm

LgAv

M1 S2

S3 FC

$\mathcal{E}(f)$:

FTun

Swp

AC Coupled: unspecified below 20 MHz

Center 941 MHz

Span 1.863 GHz

#Res BW 1 MHz

#VBW 1 MHz

Sweep 3.12 ms (601 pts)

Center Freq
941.250000 MHz

Start Freq
10.00000000 MHz

Stop Freq
1.87250000 GHz

CF Step
186.250000 MHz
Auto Man

Freq Offset
0.00000000 Hz

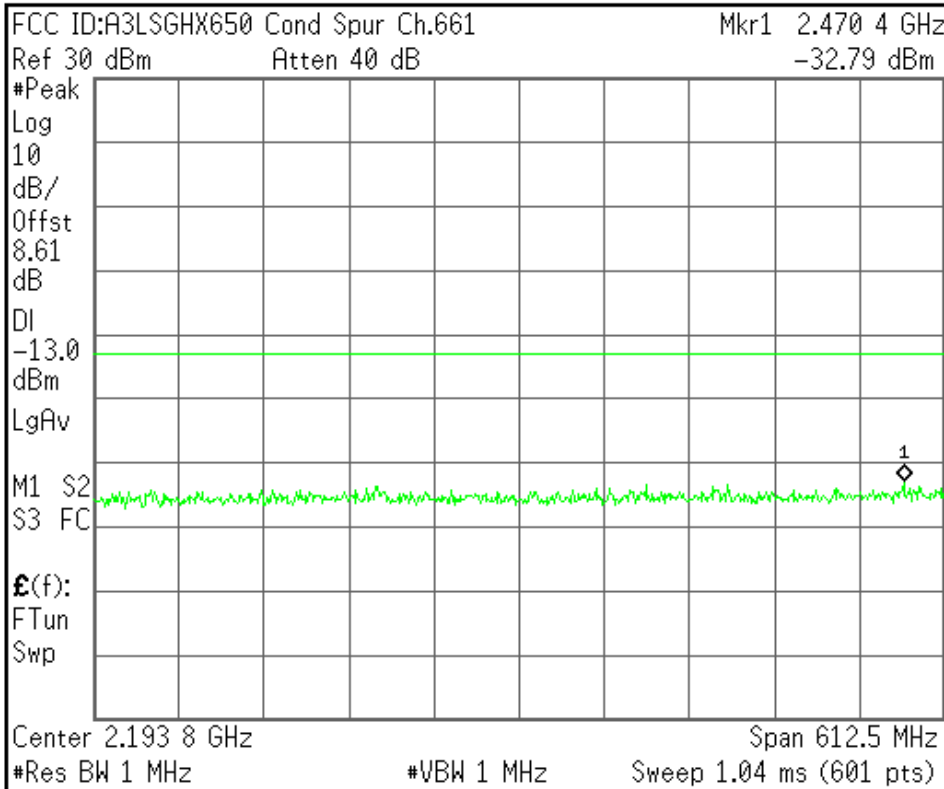
Signal Track
On Off

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

Agilent

R L

Freq/Channel



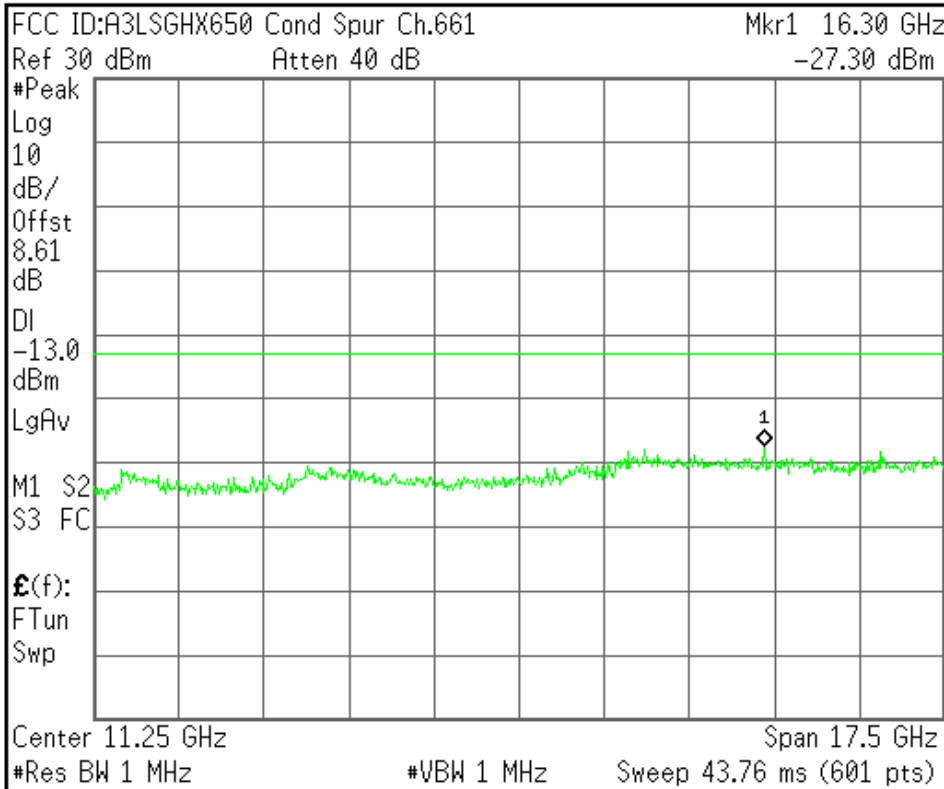
Center Freq 2.19375000 GHz
Start Freq 1.88750000 GHz
Stop Freq 2.50000000 GHz
CF Step 61.2500000 MHz Auto Man
Freq Offset 0.00000000 Hz
Signal Track On Off

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

Agilent

R L

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 L

Freq/Channel

FCC ID:A3LSGHX650 Cond Spur Ch.810

Ref 30 dBm

Atten 40 dB

#Peak

Log

10

dB/

Offst

8.61

dB

DI

-13.0

dBm

LgAv

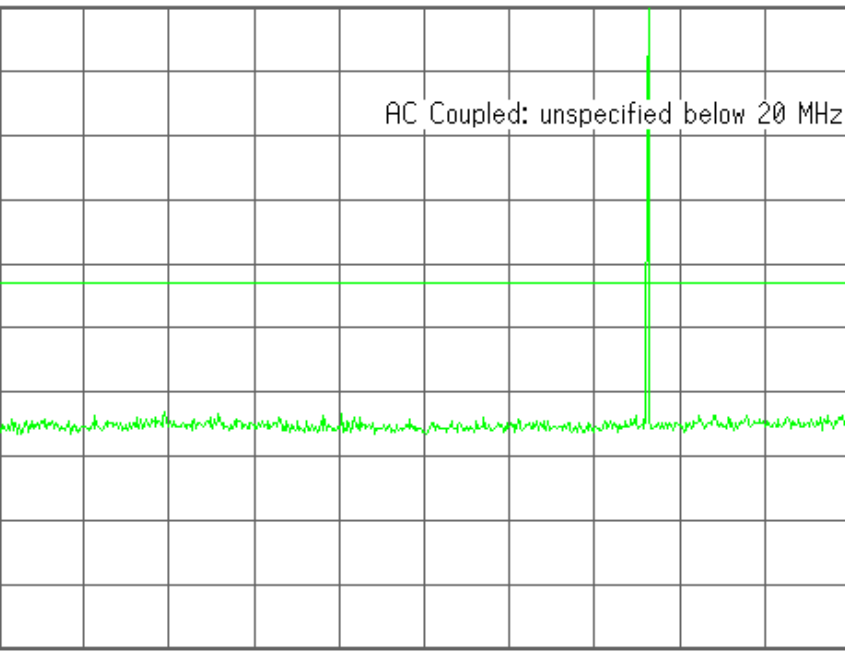
M1 S2

S3 FC

$\mathcal{E}(f)$:

FTun

Swp



Center 1.255 GHz

Span 2.49 GHz

#Res BW 1 MHz

#VBW 1 MHz

Sweep 4.16 ms (601 pts)

Center Freq
1.25500000 GHz

Start Freq
10.0000000 MHz

Stop Freq
2.50000000 GHz

CF Step
249.000000 MHz
Auto Man

Freq Offset
0.00000000 Hz

Signal Track
On Off

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

Agilent

R L

Freq/Channel

FCC ID:A3LSGHX650 Cond Spur Ch.810

Mkr1 647 MHz

Ref 30 dBm

Atten 40 dB

-33.34 dBm

#Peak

Log

10

dB/

Offst

8.61

dB

DI

-13.0

dBm

LgAv

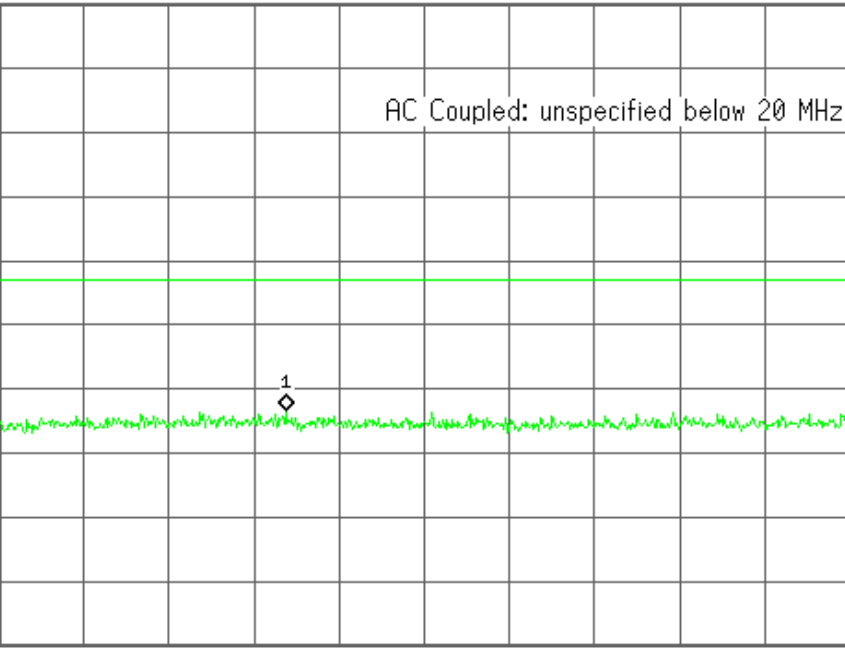
M1 S2

S3 FC

$\mathcal{E}(f)$:

FTun

Swp



Center 956 MHz

Span 1.892 GHz

#Res BW 1 MHz

#VBW 1 MHz

Sweep 3.16 ms (601 pts)

Center Freq
956.150000 MHz

Start Freq
10.0000000 MHz

Stop Freq
1.90230000 GHz

CF Step
189.230000 MHz
Auto Man

Freq Offset
0.00000000 Hz

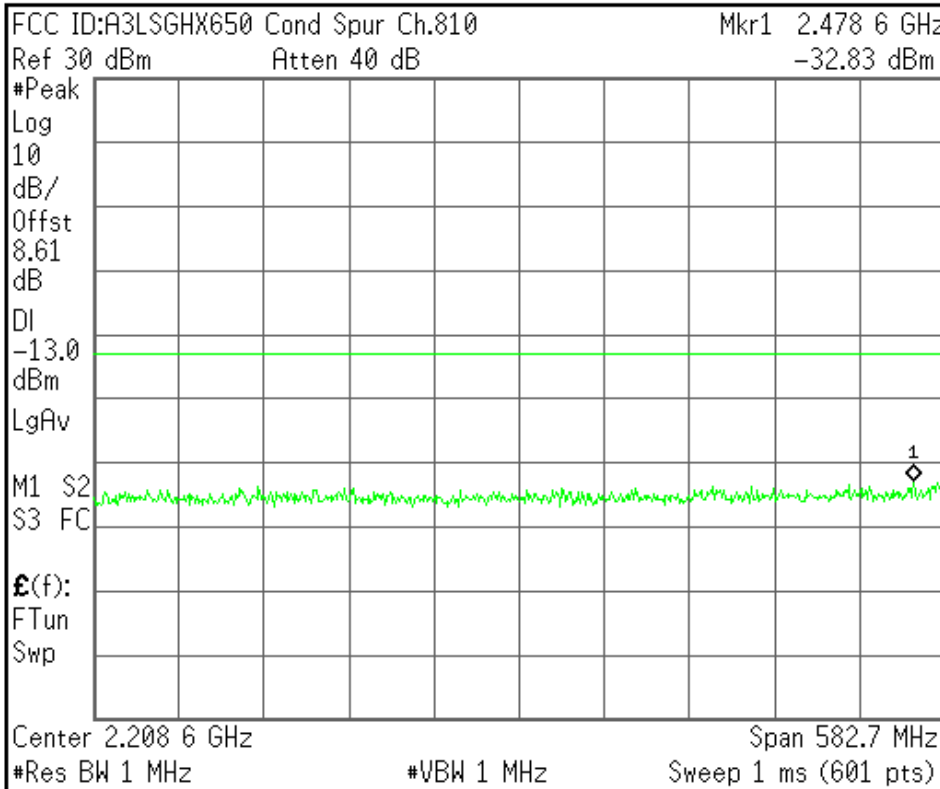
Signal Track
On Off

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

Agilent

R L

Freq/Channel



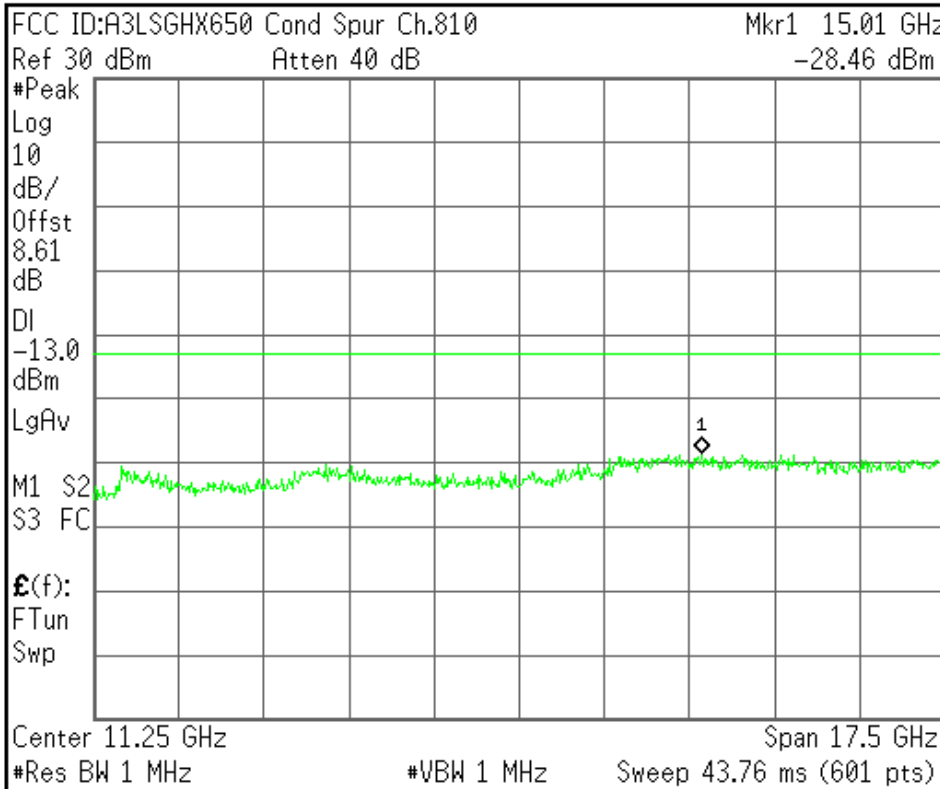
Center Freq 2.20865000 GHz
Start Freq 1.91730000 GHz
Stop Freq 2.50000000 GHz
CF Step 58.2700000 MHz Auto Man
Freq Offset 0.00000000 Hz
Signal Track On Off

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

Agilent

R L

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 L

Freq/Channel

FCC ID:A3LSGHX650 Band Edge Ch.512

Ref 30 dBm Atten 40 dB

#Avg

Log

10

dB/

Offst

8.61

dB

DI

-13.0

dBm

PAvg

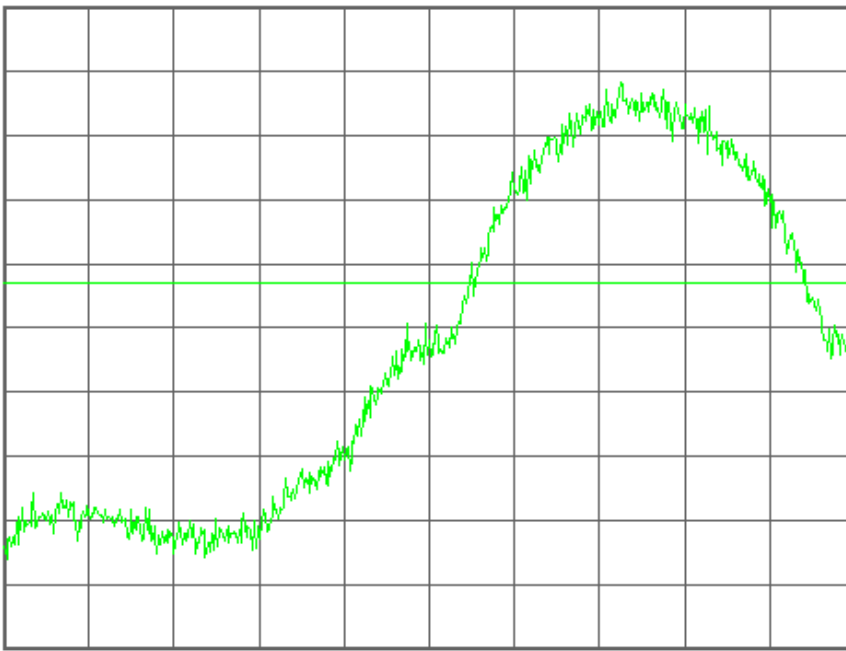
M1 S2

S3 FC

$\mathcal{E}(f)$:

f>50k

Swp



Center 1.850 000 0 GHz

Span 810 kHz

#Res BW 3 kHz

#VBW 3 kHz

Sweep 343.2 ms (601 pts)

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

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

Agilent

R L

Freq/Channel

FCC ID:A3LSGHX650 Band Edge Ch.512

Mkr1 1.849 998 7 GHz

Ref 30 dBm Atten 40 dB

-20.56 dBm

#Avg

Log

10

dB/

Offst

8.61

dB

DI

-13.0

dBm

PAvg

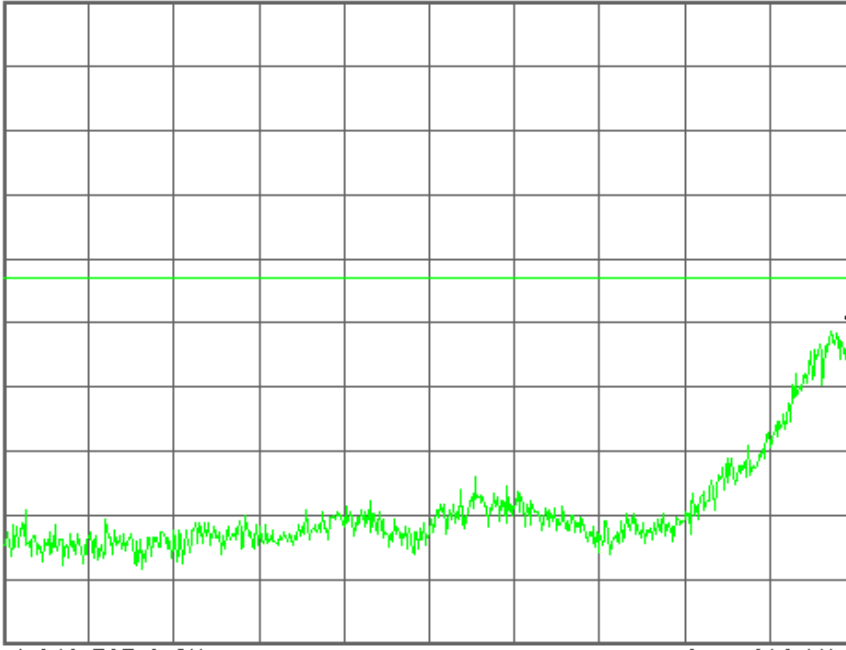
M1 S2

S3 FC

$\mathcal{E}(f)$:

f>50k

Swp



Center 1.849 595 0 GHz

Span 810 kHz

#Res BW 3 kHz

#VBW 3 kHz

Sweep 343.2 ms (601 pts)

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 L

Freq/Channel

FCC ID:A3LSGHX650 Band Edge Ch.810

Ref 30 dBm Atten 40 dB

#Avg

Log

10

dB/

Offst

8.61

dB

DI

-13.0

dBm

PAvg

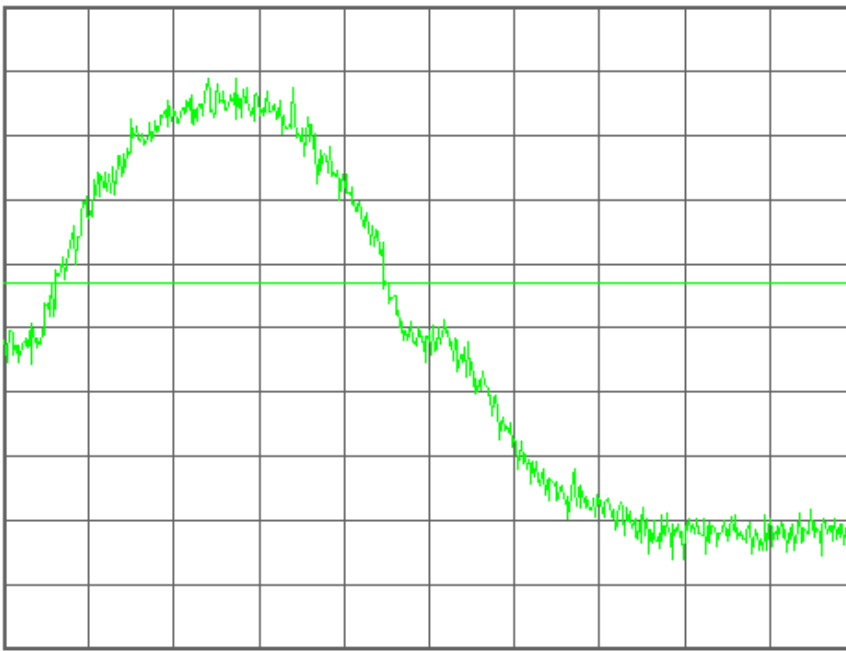
M1 S2

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 L

Freq/Channel

FCC ID:A3LSGHX650 Band Edge Ch.810

Mkr1 1.910 003 7 GHz

Ref 30 dBm

Atten 40 dB

-18.70 dBm

#Avg

Log

10

dB/

Offst

8.61

dB

DI

-13.0

dBm

PAvg

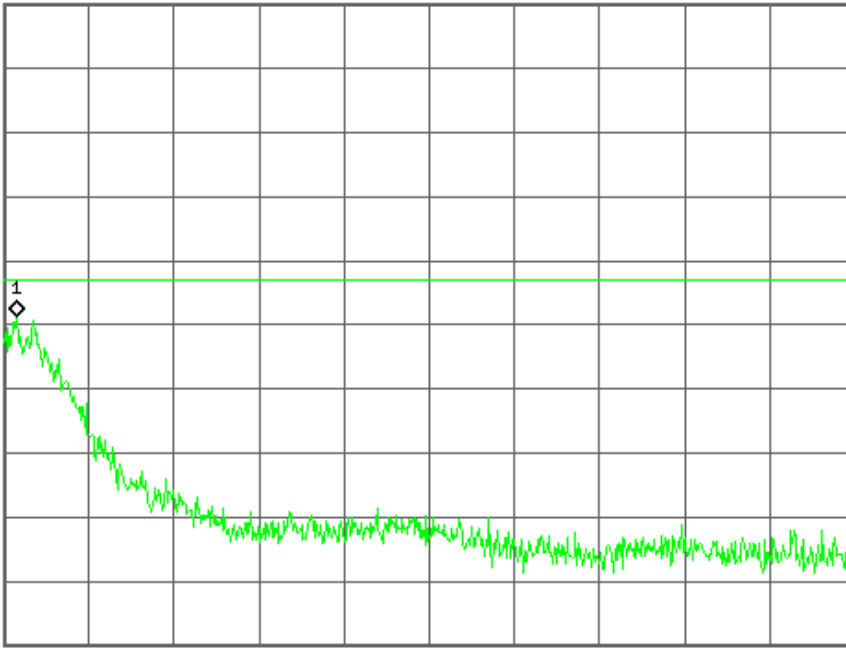
M1 S2

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