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-X490**
FCC ID (Requested):	**A3LSGHX490**
Report No:	**FC-141-R1**
Job No:	**FC-141**
Date issued:	**October 24,2005**

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

Prepared By	張又太	**Date**	2005.10.25
	WT JANG – Test Engineer		
Checked By		**Date**	2005.10.25
	SH PARK – Senior Manager		
Authorized By	J.K. Choi	**Date**	2005.10.26
	JK CHOI – General Manager		

© Copyright SAMSUNG Electronics 2005

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 Equivalent Isotropic Radiated Power — **7**
5.2 Radiated Spurious & Harmonic Emission — **8**
5.3 Occupied Bandwidth — **9**
5.4 Spurious and Harmonic Emissions at Antenna Terminal — **9**
5.4.1 Occupied Bandwidth Emission Limits — **9**
5.4.2 Conducted Spurious Emission — **11**
5.5 Frequency Stability / Temperature Variation — **13**

6. TEST DATA — **14**
6.1 Equivalent Isotropic Radiated Power (E.I.R.P.) — **14**
6.2 Radiated Spurious & Harmonic Measurement — **15**
6.3 Radiated Spurious & Harmonic Conversion Table — **16**
6.4 Frequency Stability — **17**
6.4.1 Frequency Stability Table — **17**
6.4.2 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 ELECRONICS CO., LTD.
• Address:	416 Maetan3-Dong, Yeongtong-gu, Suwon City Gyeonggi-Do, Korea 443-742
• Attention:	SungJoo KIM, Engineering Manager (QA Lab)
• FCC ID:	A3LSGHX490
• Quantity:	Quantity production is planned
• Emission Designators:	246KGXW
• Tx Freq. Range:	1850.2MHz -1909.8MHz
• Rx Freq. Range:	1930.2MHz – 1989.8MHz
• Max. Power Rating:	1.762W EIRP GSM1900 (32.46dBm)
• FCC Classification(s):	Licensed Portable Tx Held to Ear (PCE)
• Equipment (EUT) Type:	Single-Band PCS GSM Phone
• Frequency Tolerance:	±0.00025% (2.5ppm)
• FCC Rule Part(s):	§24(E), §2.
• Dates of Test:	October 20 - 21, 2005
• Place of Test:	SAMSUNG Lab,
• Test Report S/N:	FC-141-R1

- End of page -

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.

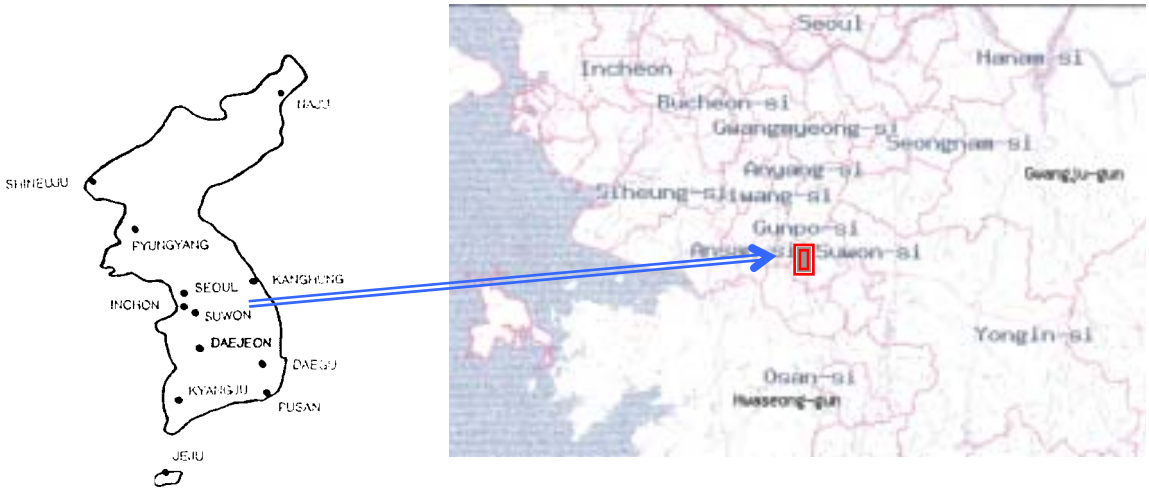


Figure1. Map of the Suwon City area.

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.

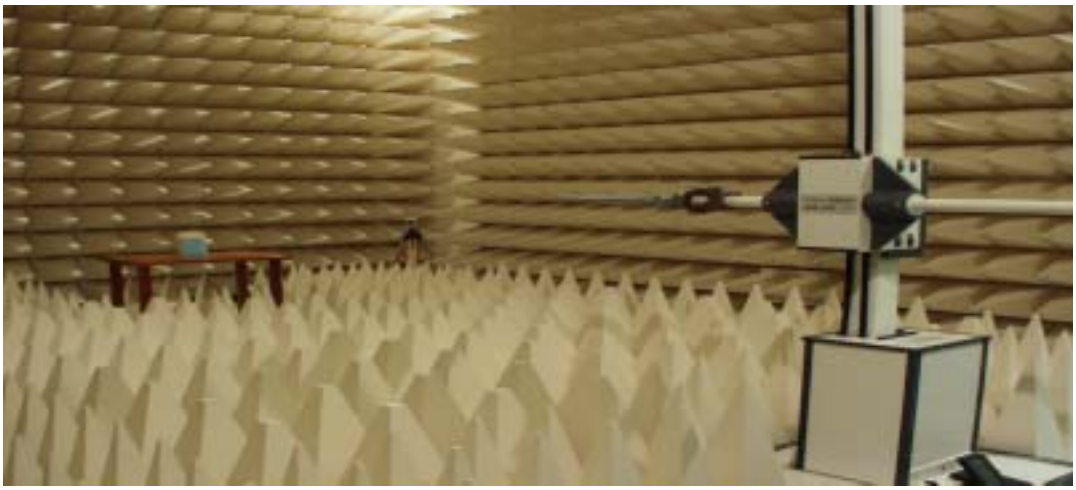


Figure2. Photograph of 3m Fully-Anechoic Chamber

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.

- End of page -

4. TEST EQUIPMENT LIST

Name of Equipment	Model	Serial No.	Due Date
Spectrum Anayzer	ESI26	836119/010	2006-09-26
	E4440A(3Hz~26.5GHz)	MY41000236	2006-10-13
	E4440A(3Hz~26.5GHz)	MY41000233	2005-11-04
Signal Generator	SMIQ03B	83824/021	2005-12-27
	SMR20	835197/030	2006-01-18
Power Meter	E4419B	GB41293846	2006-09-07
Power Sensor	8481B	3318A10325	2006-09-08
	8485A	3318A19924	2006-09-08
Pre-Amplifier	8449B	3008A00691	2006-01-11
Communication test set	8960	GB42230535	2005-11-04
	8960	GB42360886	2006-10-17
Antenna Master	MA0001	ANT0967	Not Required
Controller	HD100	100/756	Not Required
Environmental Chamber	SH-241	92000548	2005-11-22
	SH-241	92000549	2005-11-22
Horn Antenna	HF906	360306/011	2006-03-17
	HF906	100134	2006-04-25
Dipole Antenna	3121C-DB4	9007-587	2005-12-02
Receive Antenna	HL040	353255/020	2006-06-21
Attenuator	8494A	3308A31997	2006-01-03
	8496A	3308A14426	2006-01-04
Divider	11636B	51941	Not Required
	11636B	51942	Not Required
	11636B	51946	Not Required
High Pass Filter	WHK1.0/15G-10SS	1	Not Required
	WHK1.0/15G-10SS	1	Not Required
	WHK/3.5/18G-10SS	3	Not Required
	WHK/3.5/18G-10SS	4	Not Required
Shielded Fully Anechoic Chamber	RF0002	ANT0001	Not Required

5. DESCRIPTION OF TESTS

5.1 Equivalent Isotropic Radiated Power

Test Set-up for the 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:

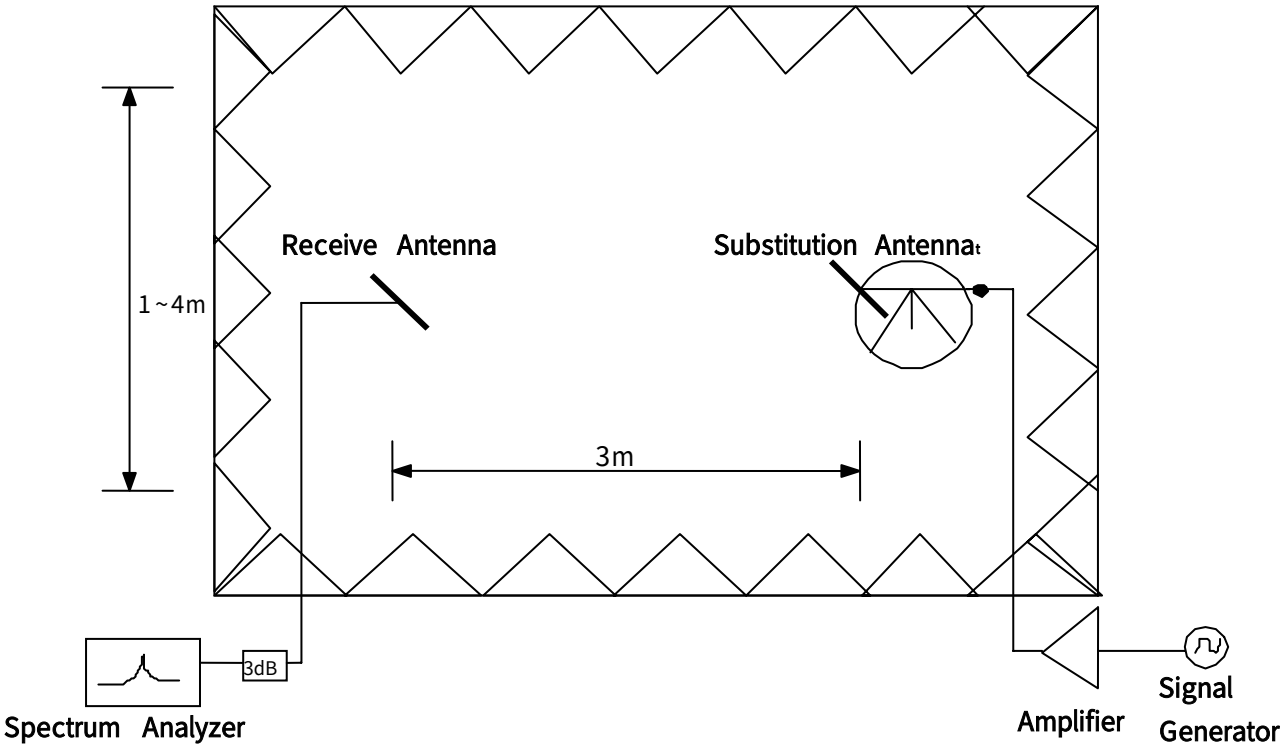


Figure 3. Diagram of ERP/EIRP test Set-up

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 Horn antenna (for readings above 1GHz) was substituted in place of the EUT. This Horn 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 Horn is measured. The EIRP is recorded. 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

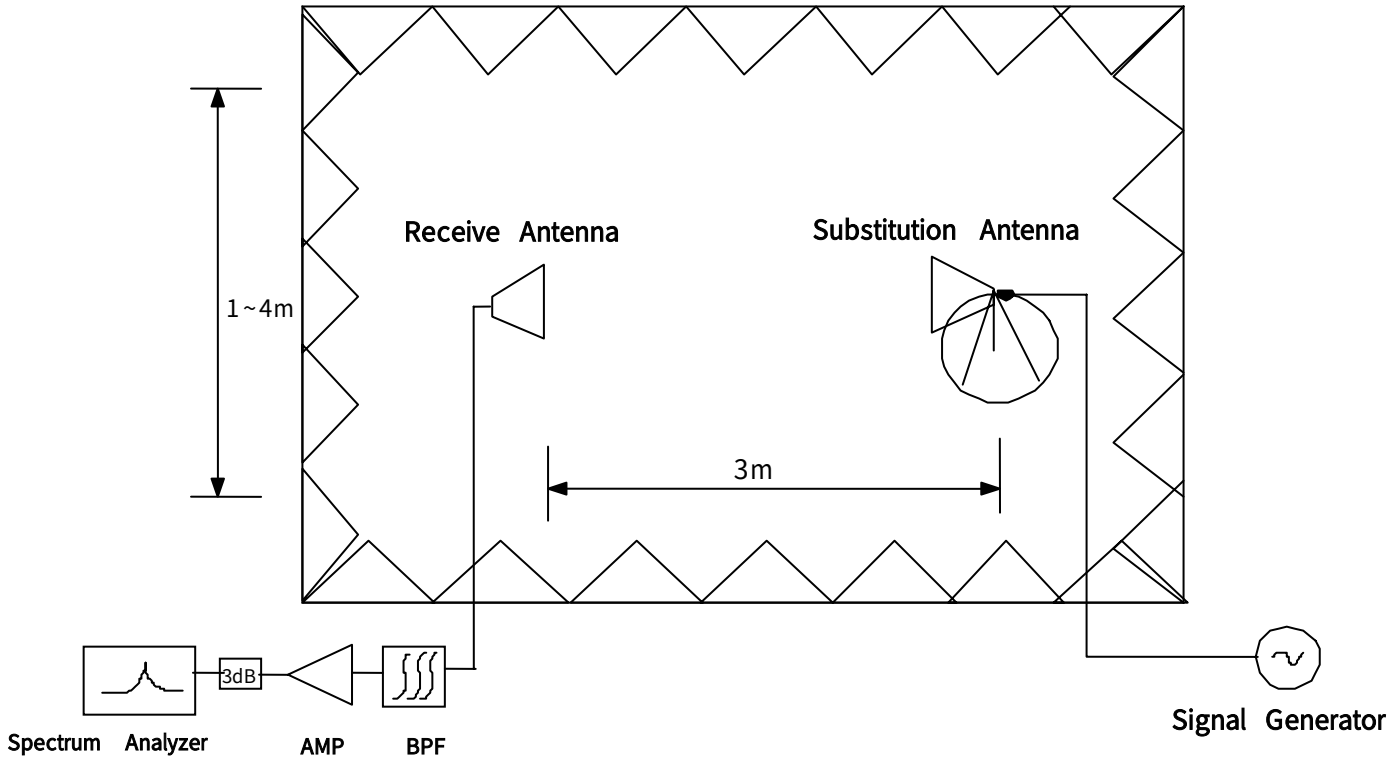


Figure 4. Diagram of Radiated Spurious & Harmonic test Set-up

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 Horn antenna was substituted in place of the EUT. This Horn 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. 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 25.5dBm –(-24.8)= 50.3dBc .

- End of page -

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 Emissions 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.

- End of page -

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+10log (P)dB. Limit equivalent to -13dBm, calculation shown below.

43 + 10log (1.762 W) = 45.46 dB
32.46 dBm – 45.46dB = -13 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 * 273KHz = 2.73KHz
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 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.

- End of page -

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 ±0.00025 (±2.5ppm) of the center frequency.

Time Period and Procedure:

1. The carrier frequency of the transmitter and the individual oscillators is measured at room
2. temperature(25°C to 27°C to provide a reference).
3. The equipment is subjected to an overnight "soak" at -30°C without any power applied.
4. 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.
5. 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.
6. Again the transmitter carrier frequency and the individual oscillators is measured at room temperature to begin measurement of the upper temperature levels.
7. 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.
8. The artificial load is mounted external to the temperature chamber.

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

- End of page -

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	S/A (dBm)	Ant gain (dBi)	Ref level (dBm)
1850.20	27.00	H	-14.00	8.42	-22.42
		V	-14.43	8.42	-22.85
1880.00	27.00	H	-13.97	8.25	-22.22
		V	-14.28	8.25	-22.53
1909.80	27.00	H	-13.76	8.40	-22.16
		V	-14.04	8.40	-22.44

■ Result

Frequency (MHz)	From EUT Tested level (dBm)	Polarization (H/V)	Azimuth (angle)	EIRP (dBm)	EIRP (W)	Battery
1850.20	-18.13	H1	7	32.46	1.762	Standard
1880.00	-19.04	H1	3	32.40	1.738	Standard
1909.80	-19.85	H1	10	31.97	1.574	Standard

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

Radiated measurements at 3 meters by Substitution Method

6.2 Radiated Spurious & Harmonic measurement

Field Strength of SPURIOUS Radiation

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

Measured Output Power : 32.46dBm = 1.762W

Modulation Signal : GSM1900

Limit : 43 + 10log$_{10}$(P) = 45.46dBc

■ **Result**

Channel	Harmonic	Frequency (MHz)	From EUT Tested level (dBm)	POL (H/V)	Result (dBc)
512	2	3700.40	-62.11	V	66.47
	3	5550.60	-64.12	H2	64.73
	4	7400.80	-63.35	H2	58.80
	5	9251.00	-69.41	H2	61.48
	6	11101.20	-	-	-
	7	12951.40	-	-	-
661	2	3760.00	-61.09	V	65.51
	3	5640.00	-63.46	H1	63.94
	4	7520.00	-62.42	H1	57.99
	5	9400.00	-69.12	H1	61.27
	6	11280.00	-	-	-
	7	13160.00	-	-	-
810	2	3819.60	-62.53	V	66.55
	3	5729.40	-63.71	H2	64.23
	4	7639.20	-60.02	H2	55.12
	5	9549.00	-68.98	H2	60.67
	6	11458.80	-	-	-
	7	13368.60	-	-	-

Radiated Spurious Emission measurements at 3 meters by Substitution Method

6.3 Radiated Spurious & Harmonic Conversion Table

Date : 2005 . 10 . 21.

Test Engineer : W. T. Jang

① Tx Cable loss
② Tx Horn Ant Gain
③ Rx Cable loss + HPF Insertion loss + Attenuator
④ Pre-Amp gain
⑤ Air loss
⑥ Tested Level from EUT
⑦ = ⑥ + ⑤ + ③ - ④
⑧ = EIRP - ⑦

CH	Har	Frequency (MHz)	① Tx CL (dB)	② Horn Gain (dB)	Tx Level @ (S/G 10dBm)	⑥ Tested Level EUT : H (dBm)	⑥ Tested Level EUT : V (dBm)	⑦ Amplitude of Emission EUT : H (dBm)	⑦ Amplitude of Emission EUT : V (dBm)	⑧ Result EUT : H (dBc)	⑧ Result EUT : V (dBc)
512	2	3700.40	12.45	9.73	7.28	-63.62	-62.11	-35.77	-34.01	68.23	66.47
	3	5550.60	16.63	11.55	4.92	-64.12	-64.78	-32.27	-32.92	64.73	65.38
	4	7400.80	19.87	11.44	1.57	-63.35	-62.53	-26.34	-27.28	58.80	59.74
	5	9251.00	23.58	12.17	-1.41	-69.41	-69.15	-29.02	-29.21	61.48	61.67
	6	11101.20	27.13	13.66	-3.47	-	-	-	-	-	-
	7	12951.40	32.55	13.27	-9.28	-	-	-	-	-	-
661	2	3760.00	12.76	9.73	6.97	-62.95	-61.09	-35.81	-33.05	68.27	65.51
	3	5640.00	16.65	11.55	4.90	-63.46	-64.53	-31.48	-32.56	63.94	65.02
	4	7520.00	20.05	11.44	1.39	-62.42	-60.20	-26.08	-25.53	58.54	57.99
	5	9400.00	23.87	12.17	-1.70	-69.12	-69.08	-28.81	-29.84	61.27	62.30
	6	11280.00	27.29	13.66	-3.63	-	-	-	-	-	-
	7	13160.00	33.40	13.27	-10.13	-	-	-	-	-	-
810	2	3819.60	13.04	9.73	6.69	-62.10	-62.53	-34.53	-34.09	66.99	66.55
	3	5729.40	16.68	11.55	4.87	-63.71	-64.94	-31.77	-33.10	64.23	65.56
	4	7639.20	20.53	11.44	0.91	-60.02	-59.83	-22.66	-23.57	55.12	56.03
	5	9549.00	24.50	12.17	-2.33	-68.98	-69.43	-28.21	-28.99	60.67	61.45
	6	11458.80	27.74	13.66	-4.08	-	-	-	-	-	-
	7	13368.60	33.77	13.27	-10.50	-	-	-	-	-	-

6.4 Frequency Stability

6.4.1 Frequency Stability Table

Operating Frequency : 1,880,000,000 Hz

Channel : 661

Reference Voltage : 3.7VDC

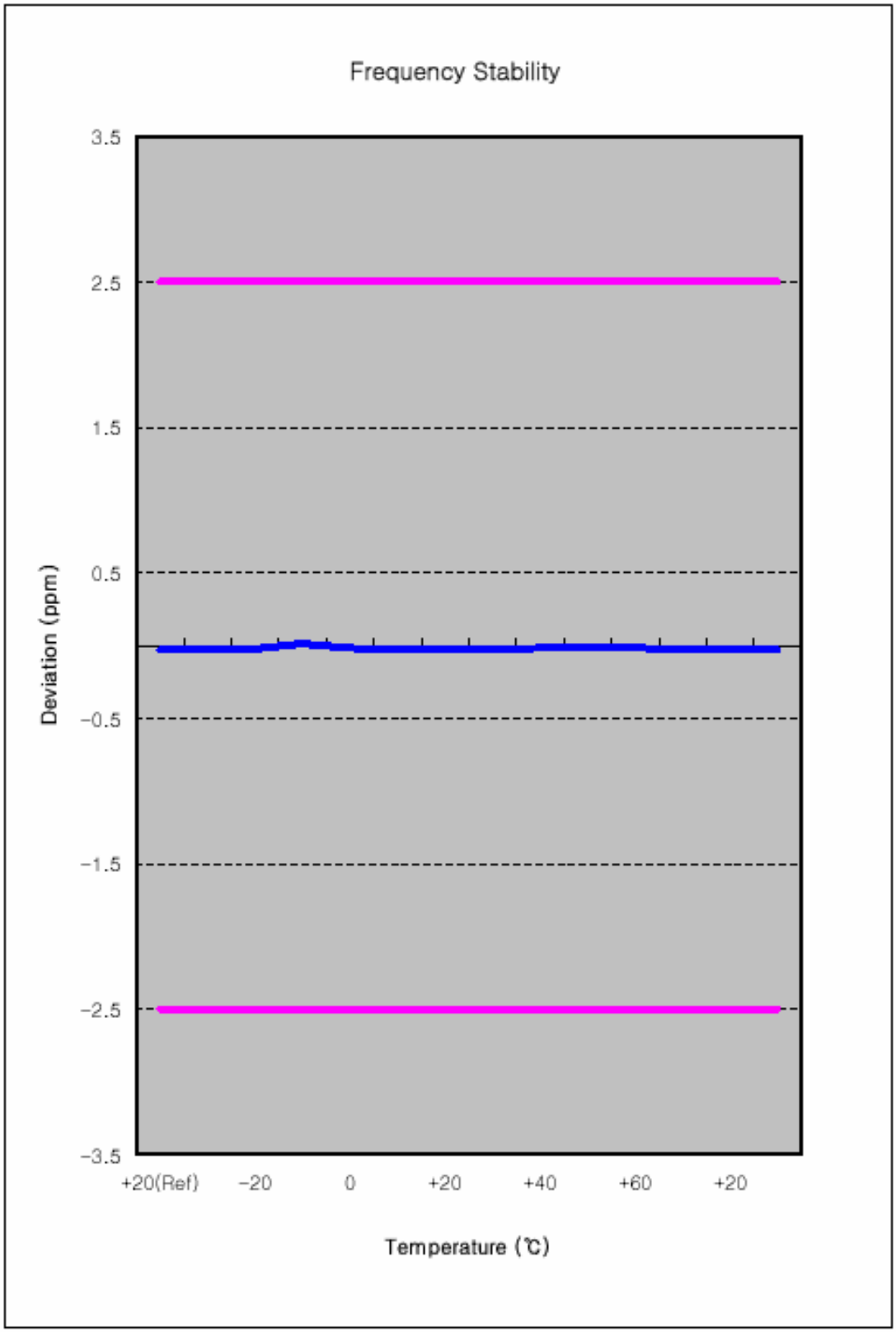
Deviation Limit : ±0.00025 % or 2.5ppm

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency Error (Hz)	Frequency (Hz)	Deviation (%)	ppm
100%	3.70	+20(Ref)	-56.82	1,879,999,943	-0.000003	-0.030
100%		-30	-58.26	1,879,999,942	-0.000003	-0.031
100%		-20	-43.03	1,879,999,957	-0.000002	-0.023
100%		-10	22.75	1,880,000,023	0.000001	0.012
100%		0	-33.56	1,879,999,966	-0.000002	-0.018
100%		+10	-48.75	1,879,999,951	-0.000003	-0.026
100%		+20	-56.82	1,879,999,943	-0.000003	-0.030
100%		+30	-43.75	1,879,999,956	-0.000002	-0.023
100%		+40	-33.26	1,879,999,967	-0.000002	-0.018
100%		+50	-23.74	1,879,999,976	-0.000001	-0.013
100%		+60	-30.96	1,879,999,969	-0.000002	-0.016
85%	3.40	+20	-48.76	1,879,999,951	-0.000003	-0.026
115%	4.26	+20	-50.16	1,879,999,950	-0.000003	-0.027
Batt.Endpoint	3.40	+20	-48.76	1,879,999,951	-0.000003	-0.026

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

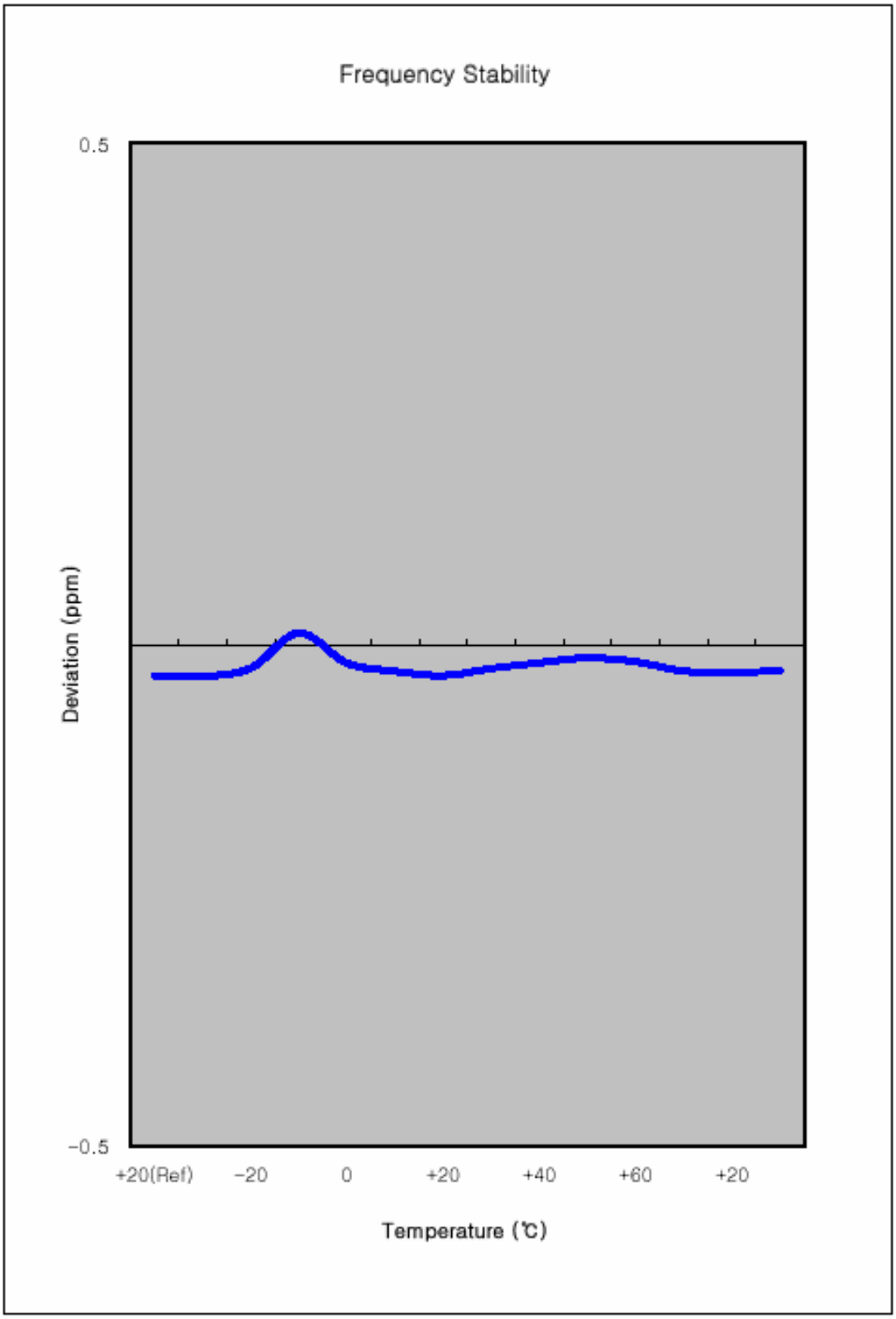
The EUT is tested down to the battery end point.

6.4.2 Frequency Stability Graph



- End of page –

Zoom In



- End of page -

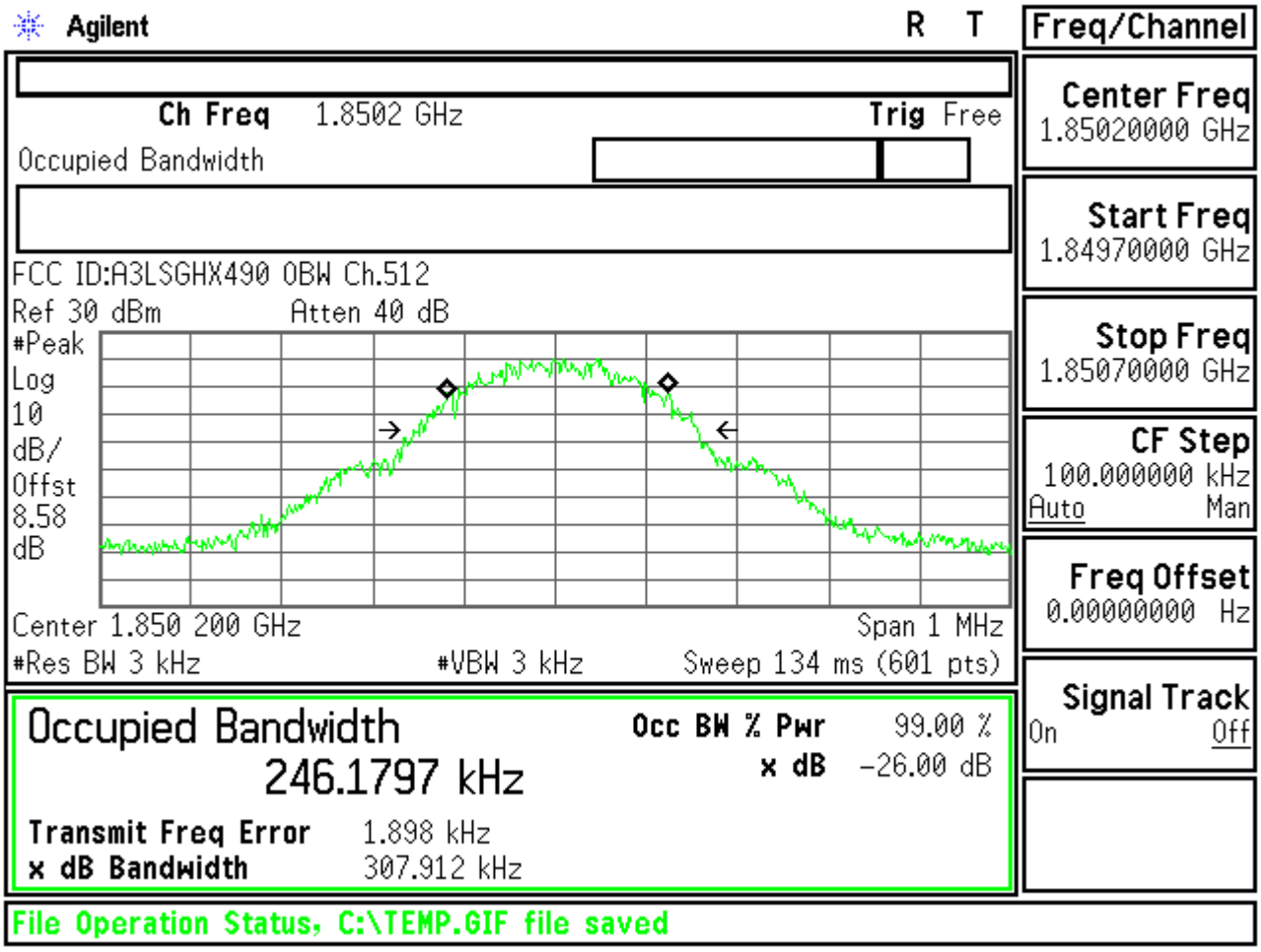
7. CONCLUSION

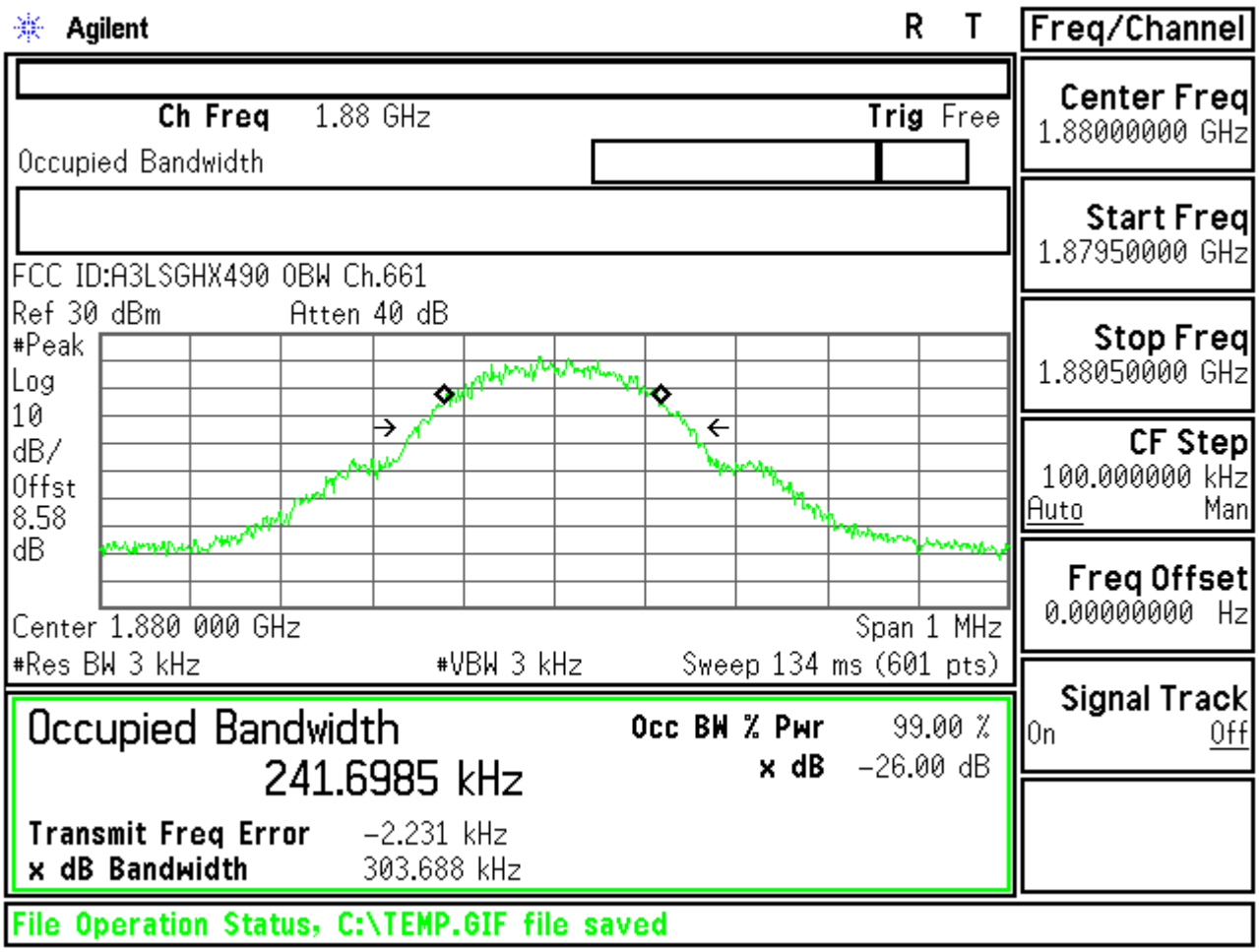
The data collected shows that the SAMSUNG Single-Band PCS GSM Phone.
FCC ID : A3LSGHX490 complies with all the requirements of Parts 2,24 of the FCC Rules.

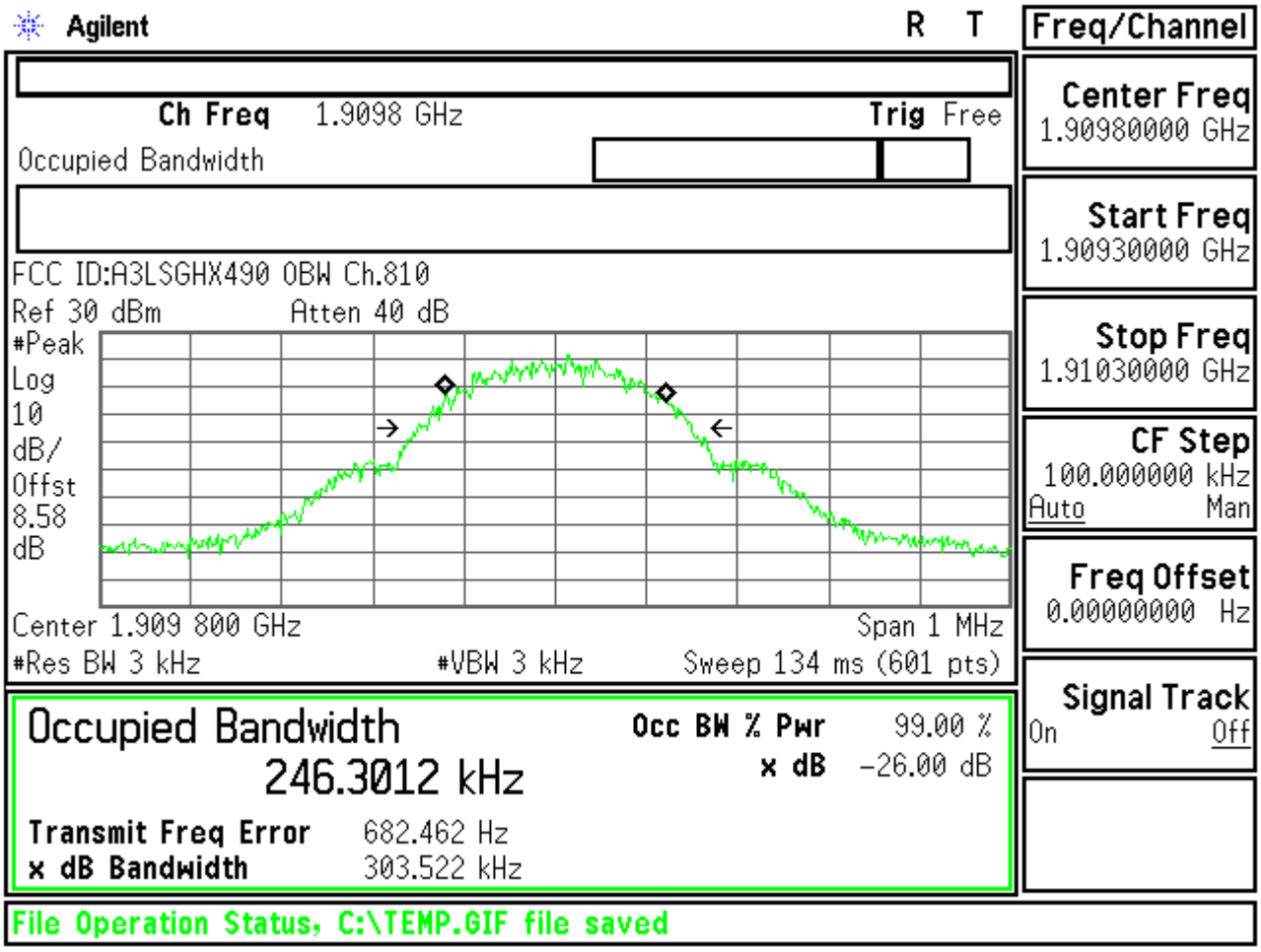
- End of page -

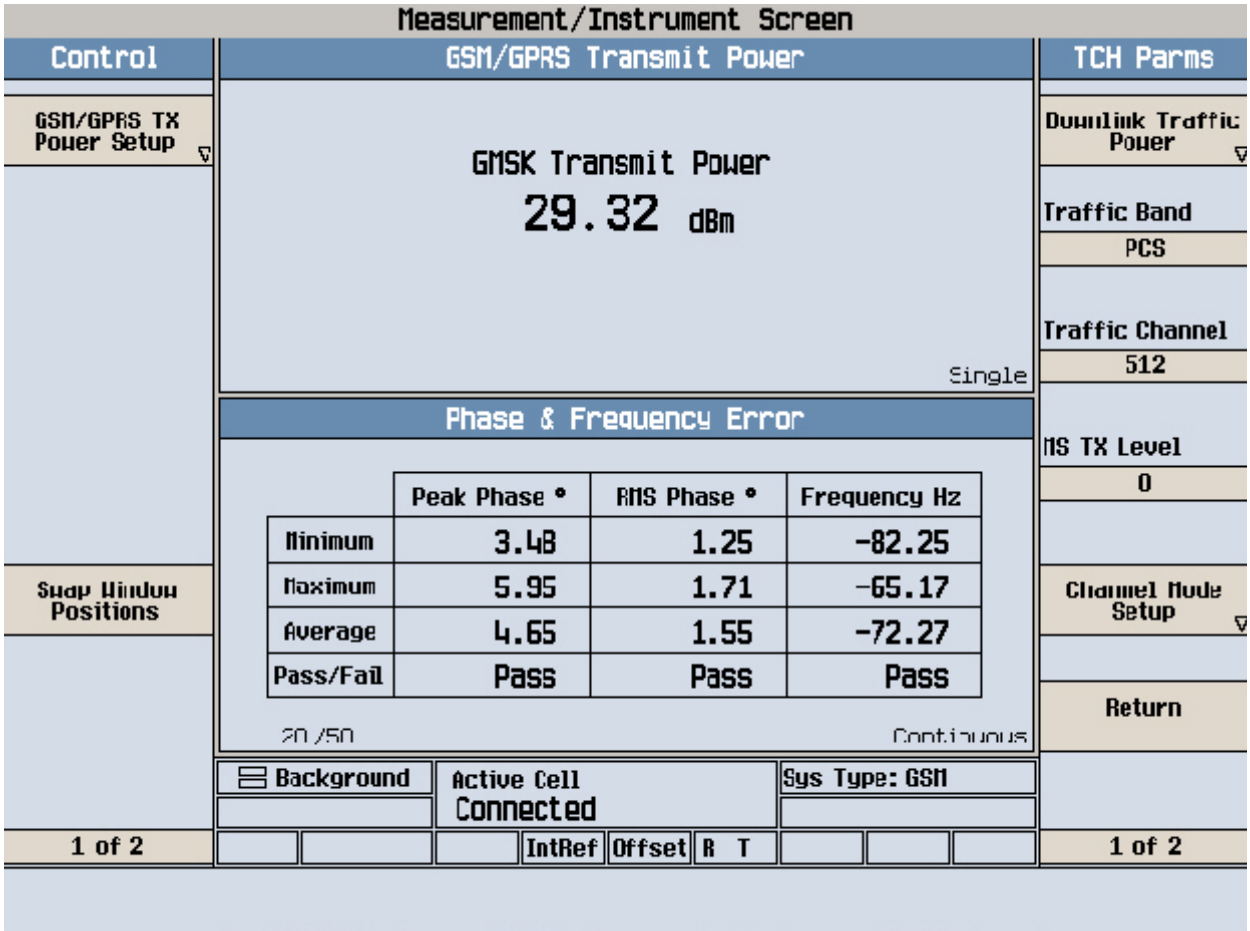
8. TEST PLOTS

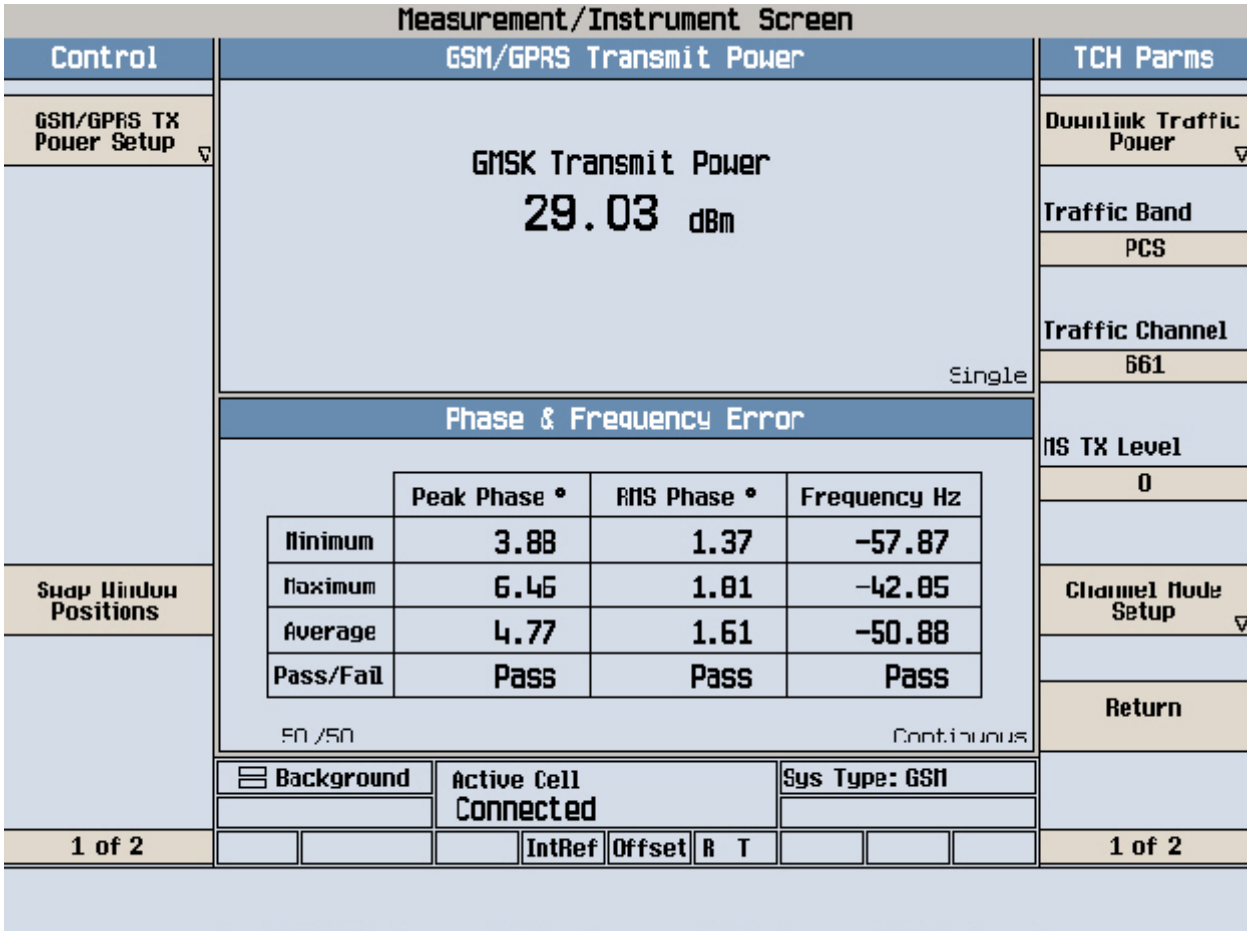
- End of page -

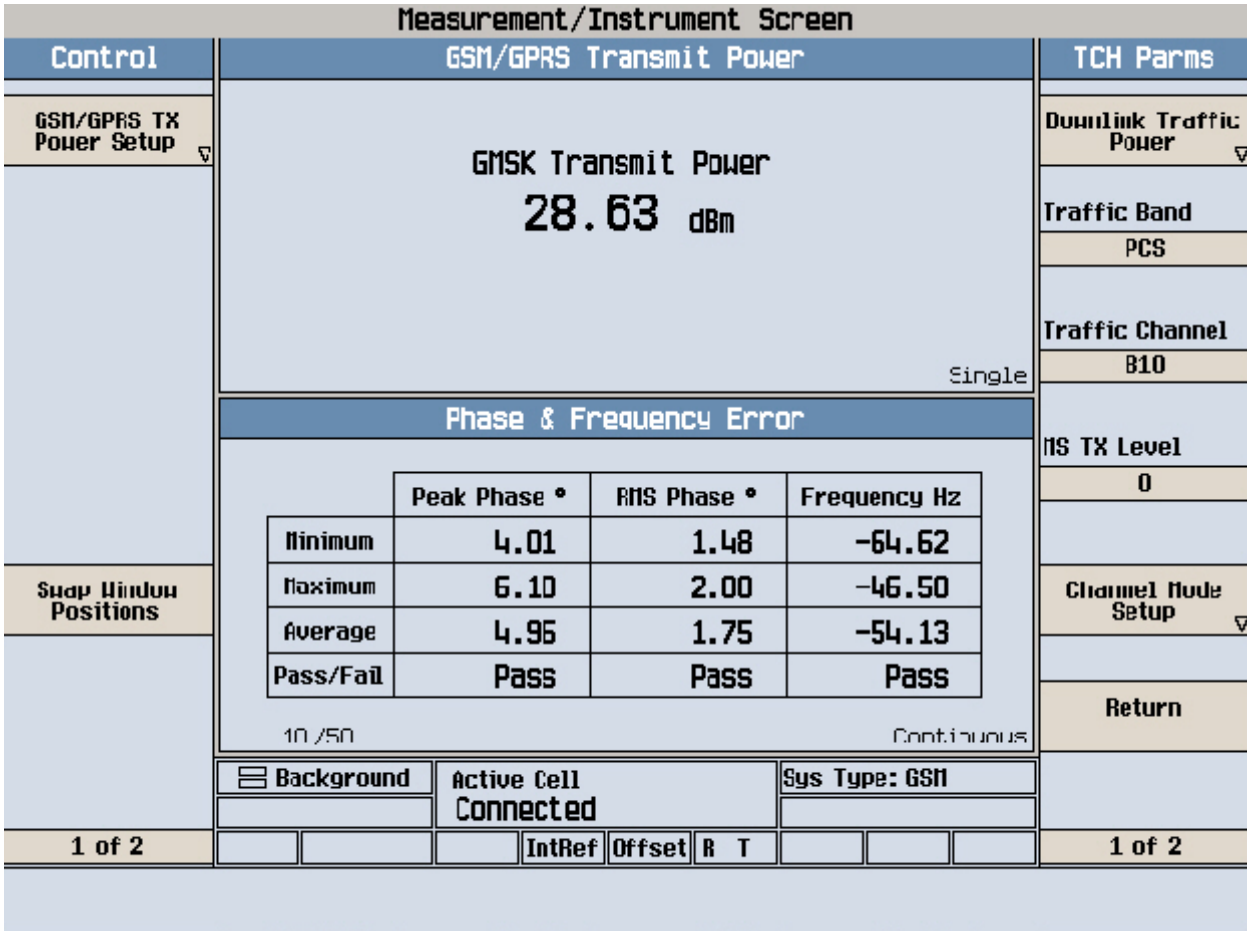

Agilent
R T
Freq/Channel
Ch Freq 1.8502 GHz
Trig Free
Occupied Bandwidth
FCC ID:A3LSGHX490 OBW Ch.512
Ref 30 dBm
Atten 40 dB
#Peak
Log
10
dB/
Offst
8.58
dB
Center 1.850 200 GHz
Span 1 MHz
#Res BW 3 kHz
#VBW 3 kHz
Sweep 134 ms (601 pts)
Occupied Bandwidth
246.1797 kHz
Occ BW % Pwr 99.00 %
x dB -26.00 dB
Transmit Freq Error 1.898 kHz
x dB Bandwidth 307.912 kHz
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
Freq/Channel
Ch Freq 1.88 GHz
Trig Free
Occupied Bandwidth
FCC ID:A3LSGHX490 OBW Ch.661
Ref 30 dBm
Atten 40 dB
#Peak
Log
10
dB/
Offst
8.58
dB
Center 1.880 000 GHz
Span 1 MHz
#Res BW 3 kHz
#VBW 3 kHz
Sweep 134 ms (601 pts)
Occupied Bandwidth
241.6985 kHz
Occ BW % Pwr 99.00 %
x dB -26.00 dB
Transmit Freq Error -2.231 kHz
x dB Bandwidth 303.688 kHz
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

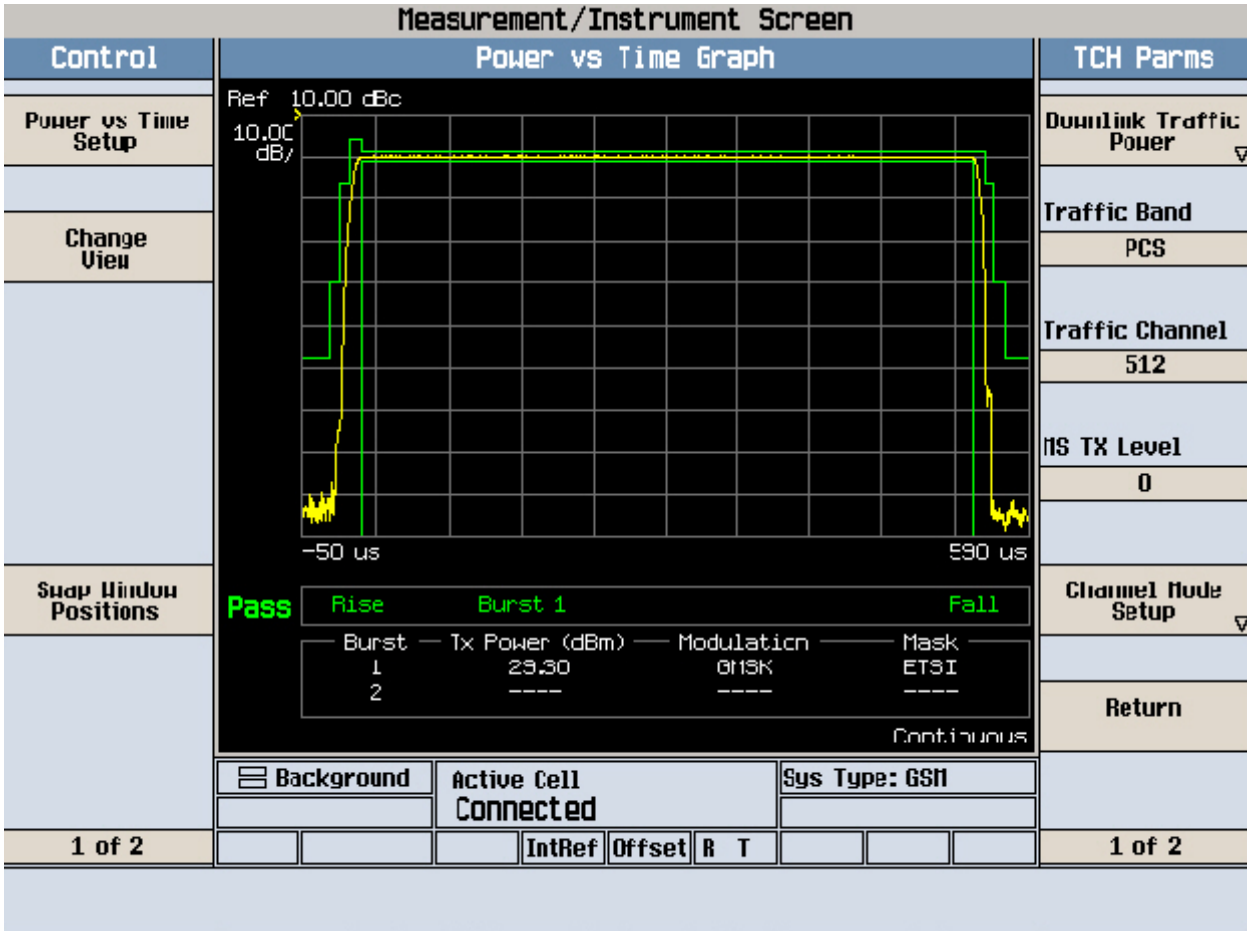

Agilent
R T
Freq/Channel
Ch Freq 1.9098 GHz
Trig Free
Occupied Bandwidth
FCC ID:A3LSGHX490 OBW Ch.810
Ref 30 dBm
Atten 40 dB
#Peak
Log
10
dB/
Offst
8.58
dB
Center 1.909 800 GHz
Span 1 MHz
#Res BW 3 kHz
#VBW 3 kHz
Sweep 134 ms (601 pts)
Occupied Bandwidth
246.3012 kHz
Occ BW % Pwr 99.00 %
x dB -26.00 dB
Transmit Freq Error 682.462 Hz
x dB Bandwidth 303.522 kHz
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
File Operation Status, C:\TEMP.GIF file saved


Measurement/Instrument Screen
Control
GSM/GPRS Transmit Power
TCH Parms
GSM/GPRS TX Power Setup
GMSK Transmit Power
29.32 dBm
Single
Downlink Traffic Power
Traffic Band
PCS
Traffic Channel
512
Phase & Frequency Error
MS TX Level
0
Peak Phase °
RMS Phase °
Frequency Hz
Minimum 3.48 1.25 -82.25
Maximum 5.95 1.71 -65.17
Average 4.65 1.55 -72.27
Pass/Fail Pass Pass Pass
Swap Window Positions
Channel Mode Setup
Return
20/50
Continuous
Background
Active Cell
Connected
Sys Type: GSM
1 of 2
IntRef
Offset
R T
1 of 2

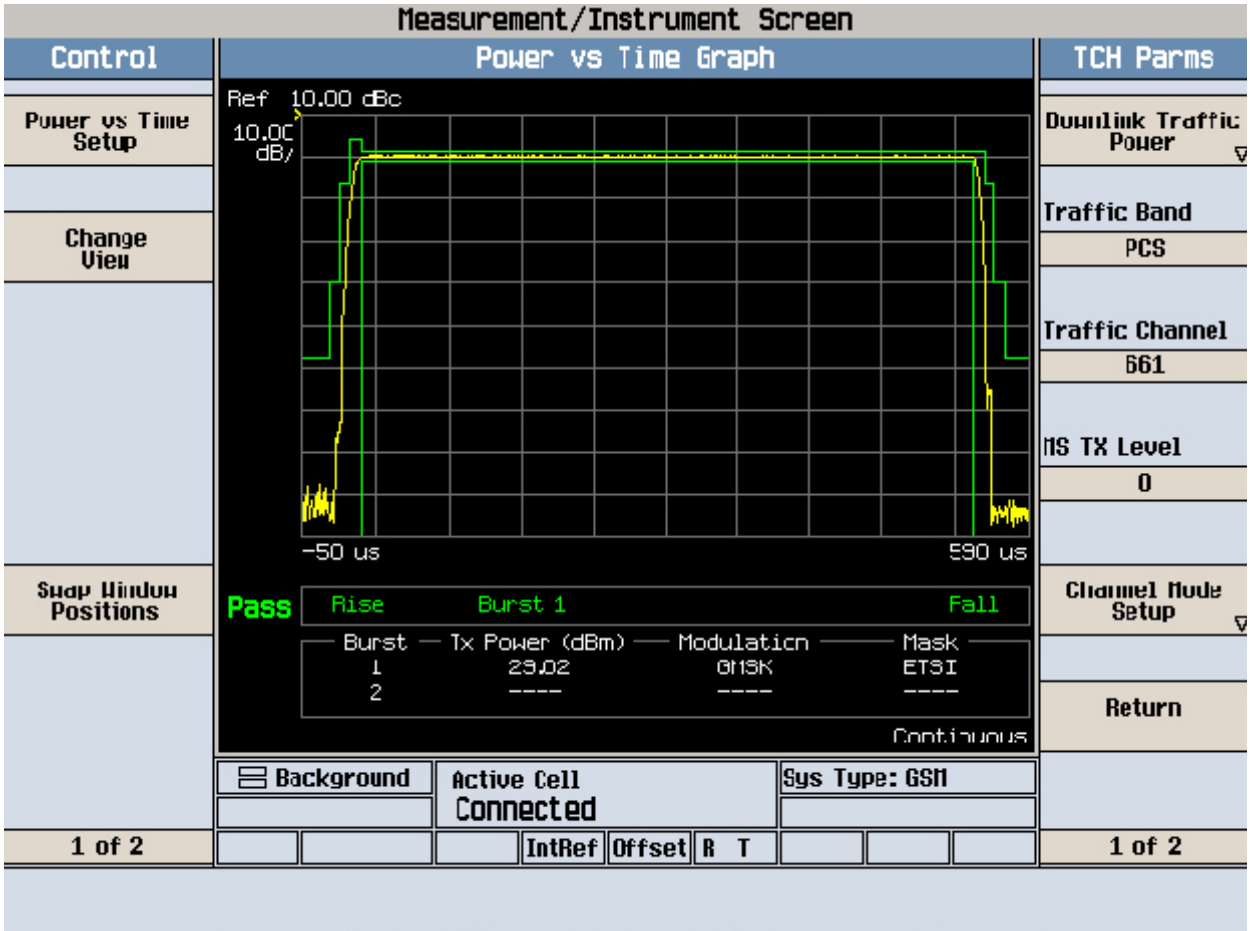

Measurement/Instrument Screen
Control
GSM/GPRS Transmit Power
TCH Parms
GSM/GPRS TX Power Setup
GMSK Transmit Power
29.03 dBm
Single
Downlink Traffic Power
Traffic Band
PCS
Traffic Channel
661
Phase & Frequency Error
MS TX Level
0
Peak Phase °
RMS Phase °
Frequency Hz
Minimum 3.88 1.37 -57.87
Maximum 6.46 1.81 -42.85
Average 4.77 1.61 -50.88
Pass/Fail Pass Pass Pass
Swap Window Positions
Channel Mode Setup
Return
50/50
Continuous
Background
Active Cell
Connected
Sys Type: GSM
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
GMSK Transmit Power
28.63 dBm
Single
Downlink Traffic Power
Traffic Band
PCS
Traffic Channel
810
Phase & Frequency Error
MS TX Level
0
Peak Phase °
RMS Phase °
Frequency Hz
Minimum 4.01 1.48 -64.62
Maximum 6.10 2.00 -46.50
Average 4.96 1.75 -54.13
Pass/Fail Pass Pass Pass
Swap Window Positions
Channel Mode Setup
Return
10 /50
Continuous
Background
Active Cell
Connected
Sys Type: GSM
1 of 2
IntRef
Offset
R T
1 of 2

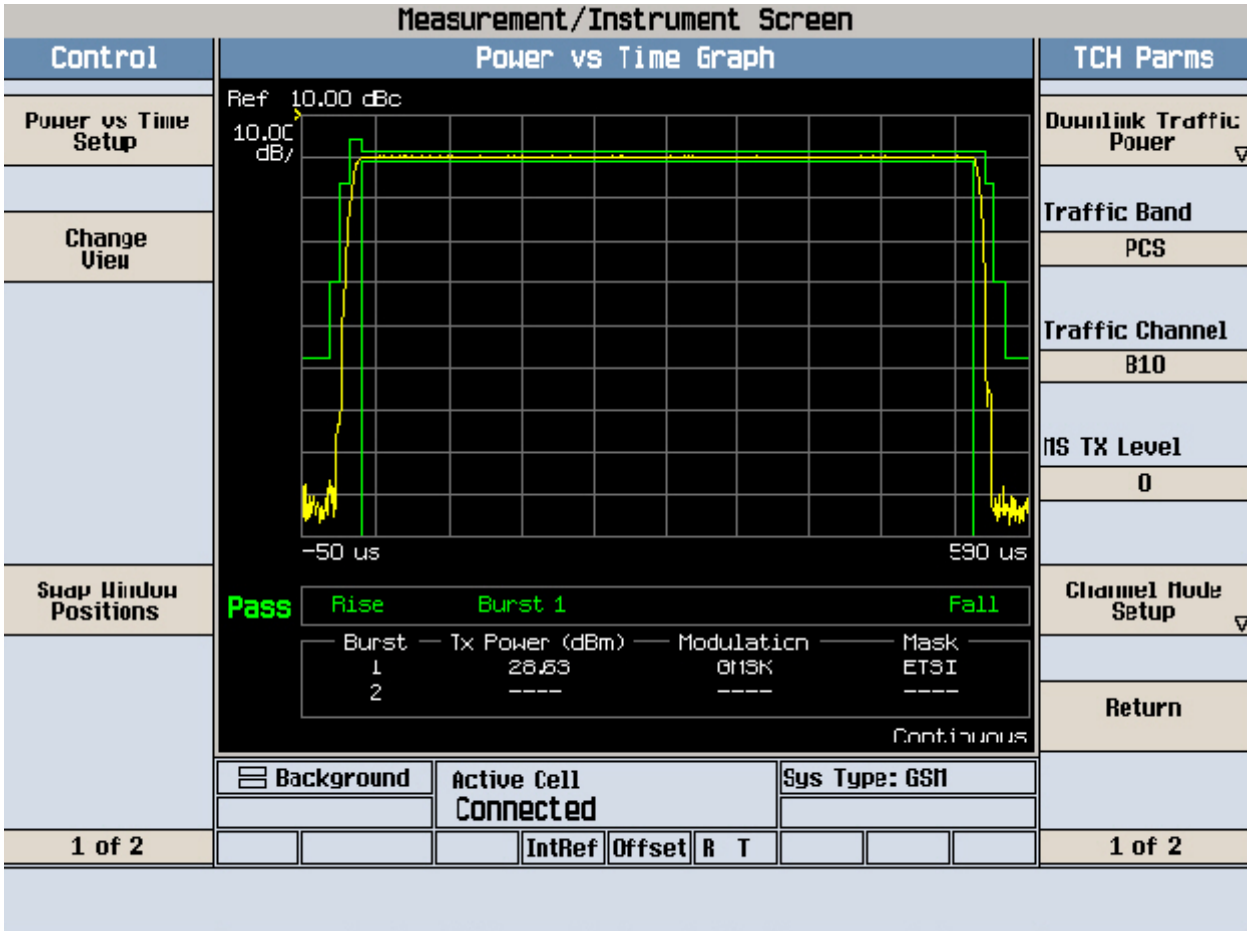
FCC ID : A3LSGHX490 GMSK Power vs Time 512CH

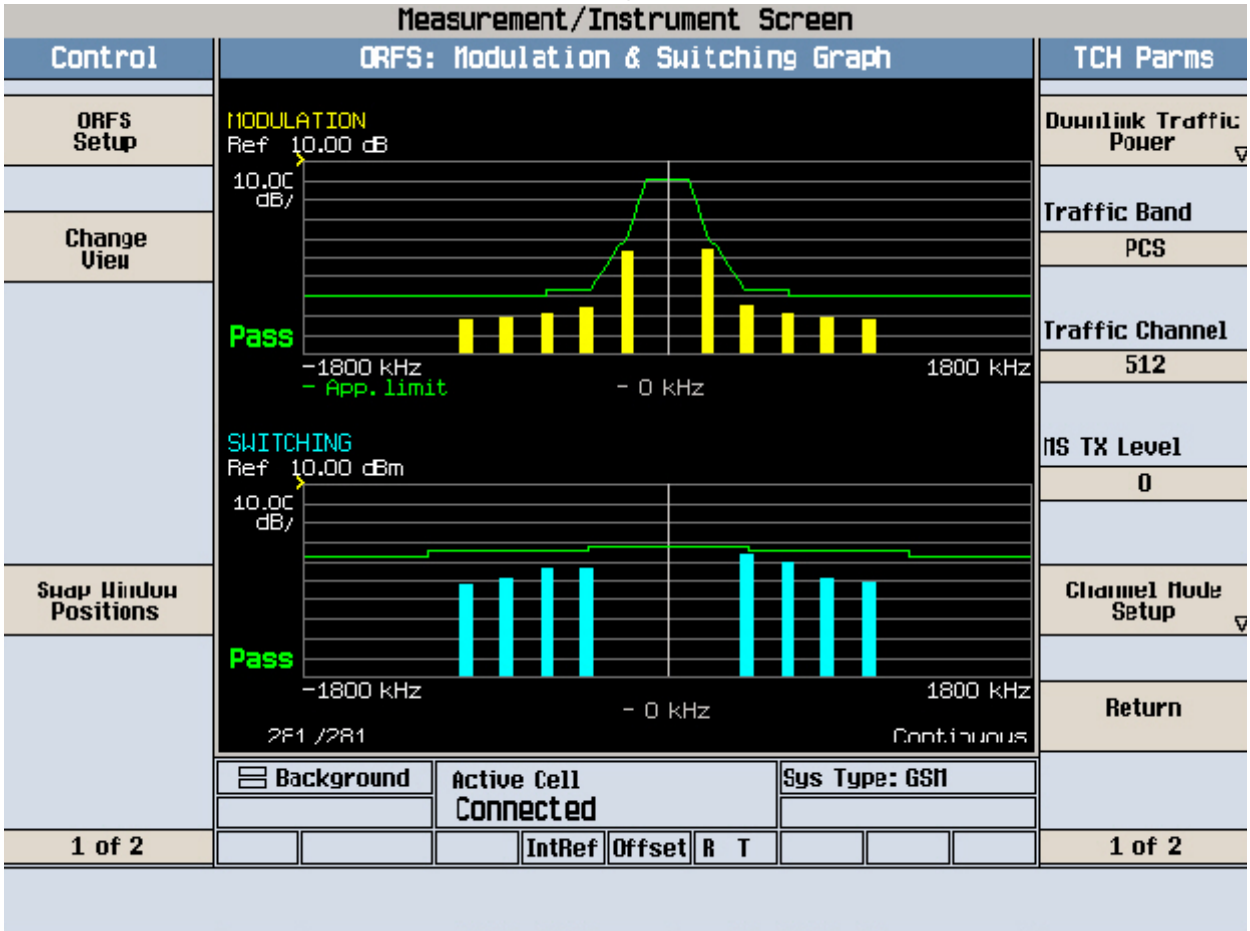


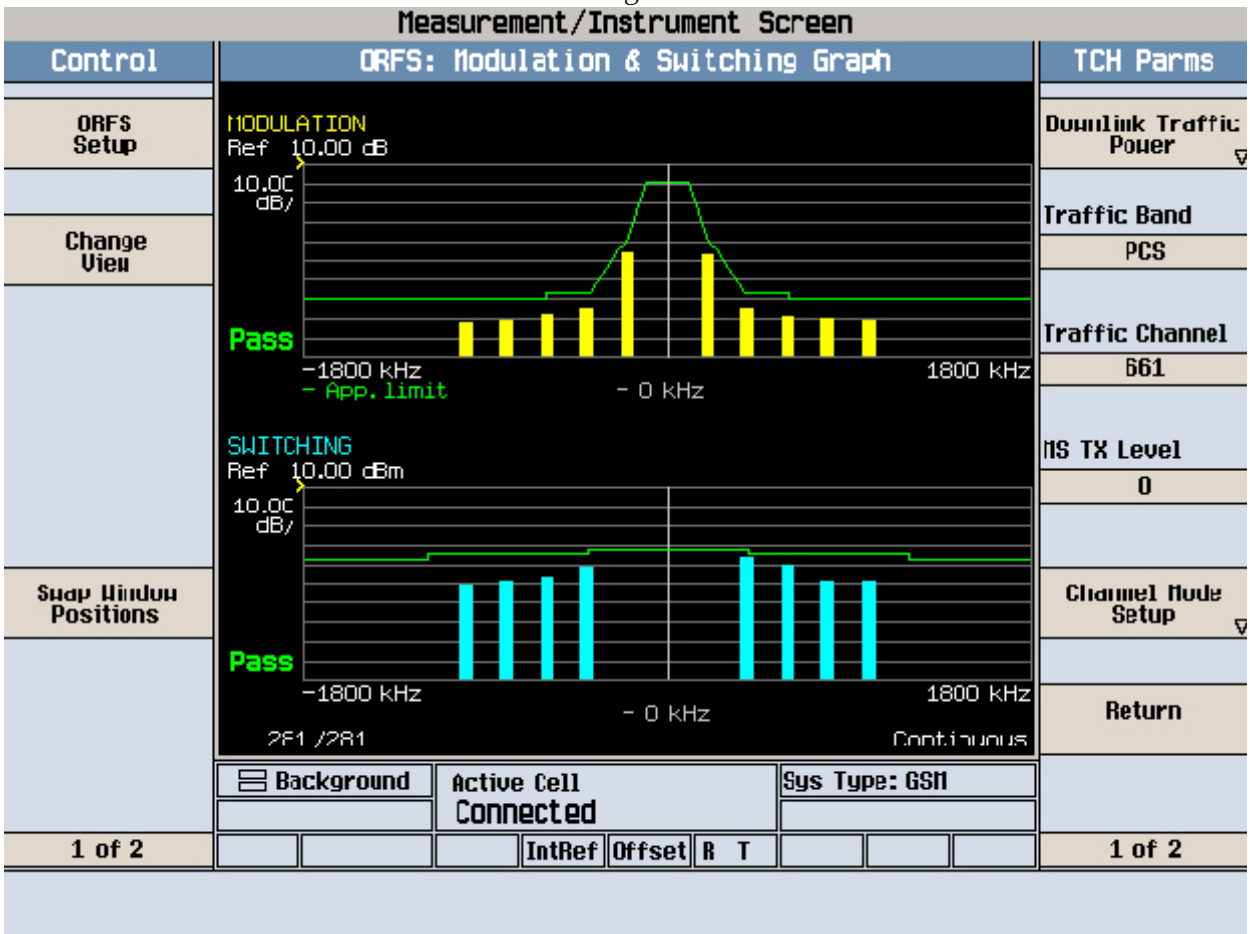
FCC ID : A3LSGHX490 GMSK Power vs Time 661CH

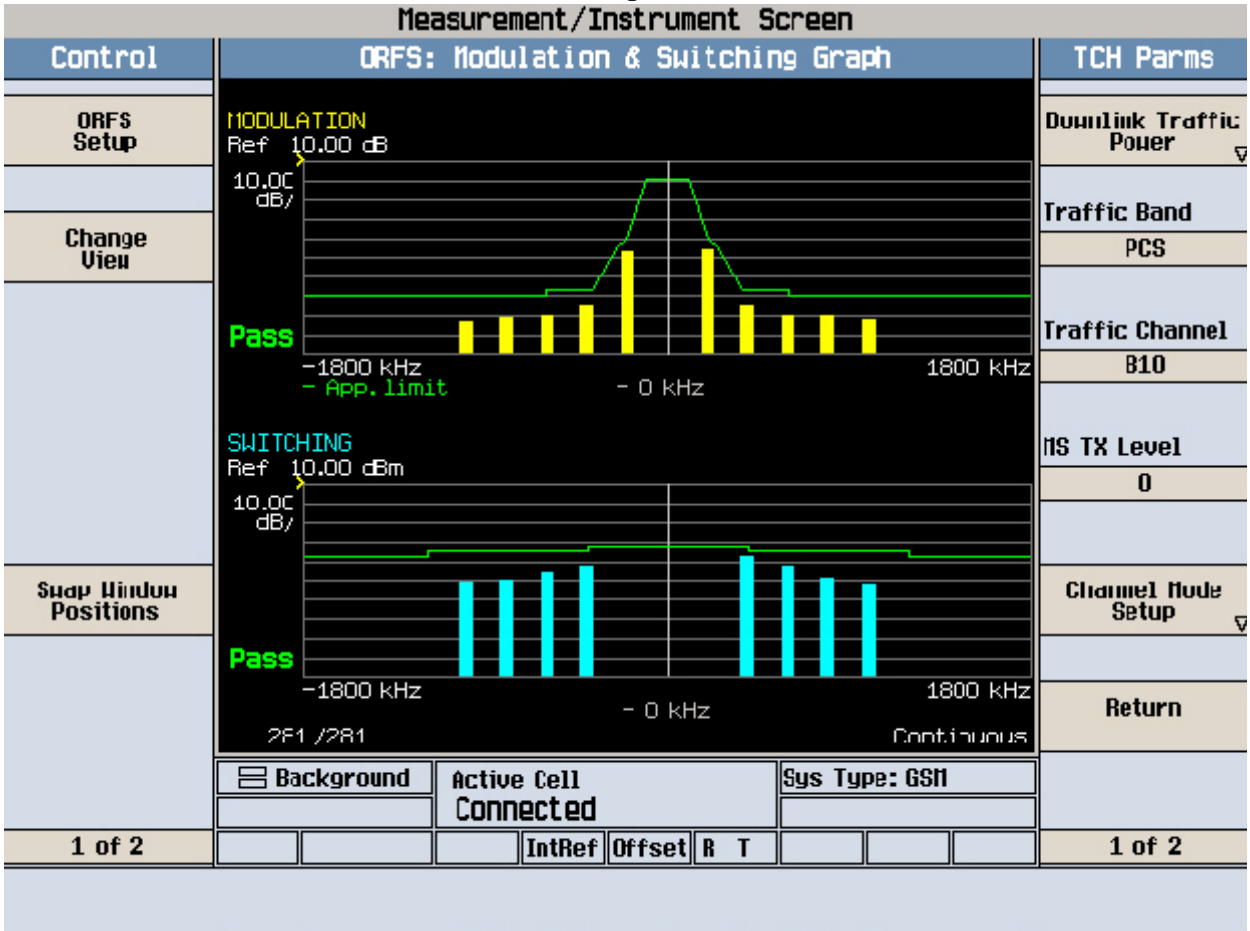


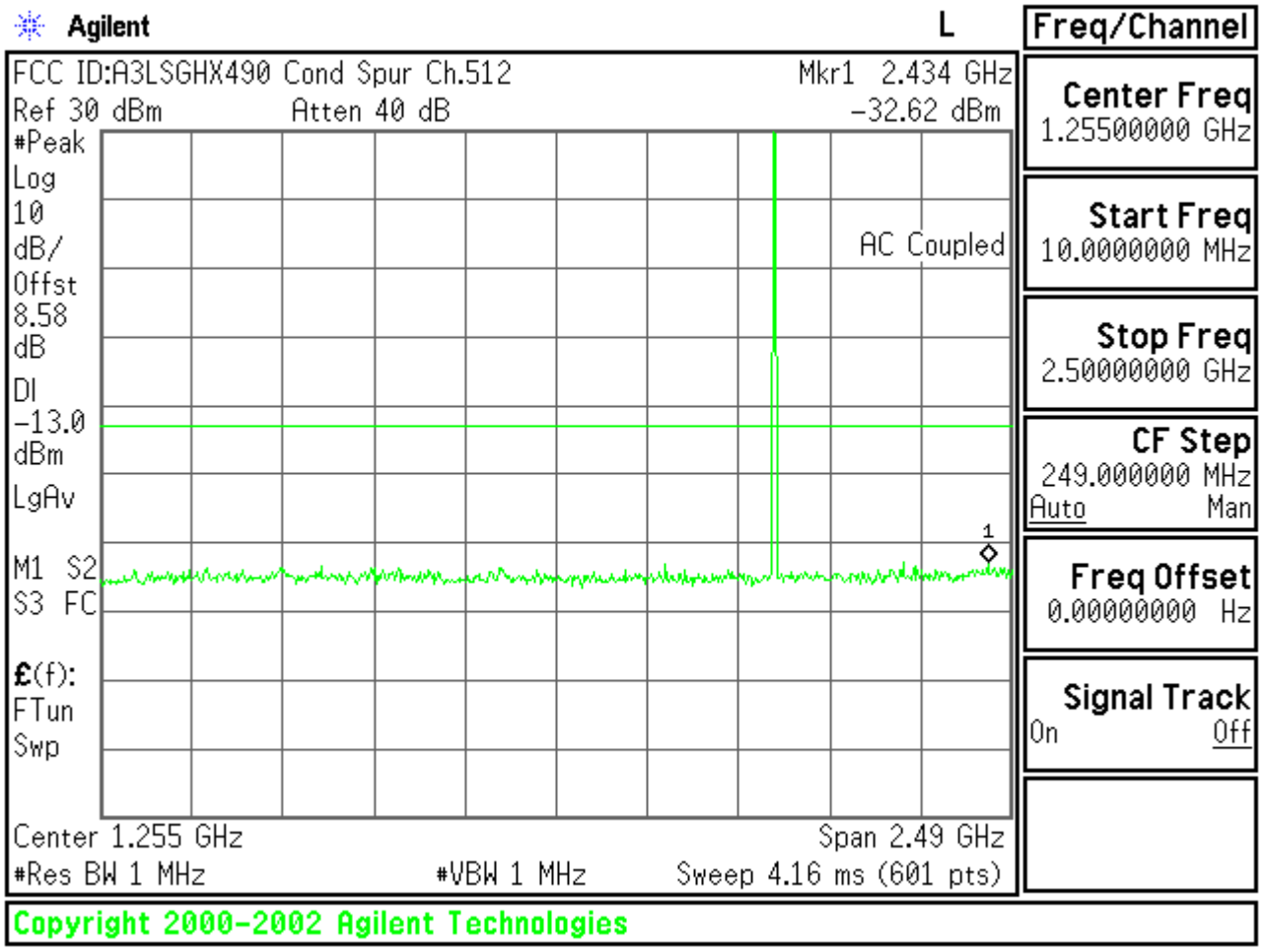
FCC ID : A3LSGHX490 GMSK Power vs Time 810CH

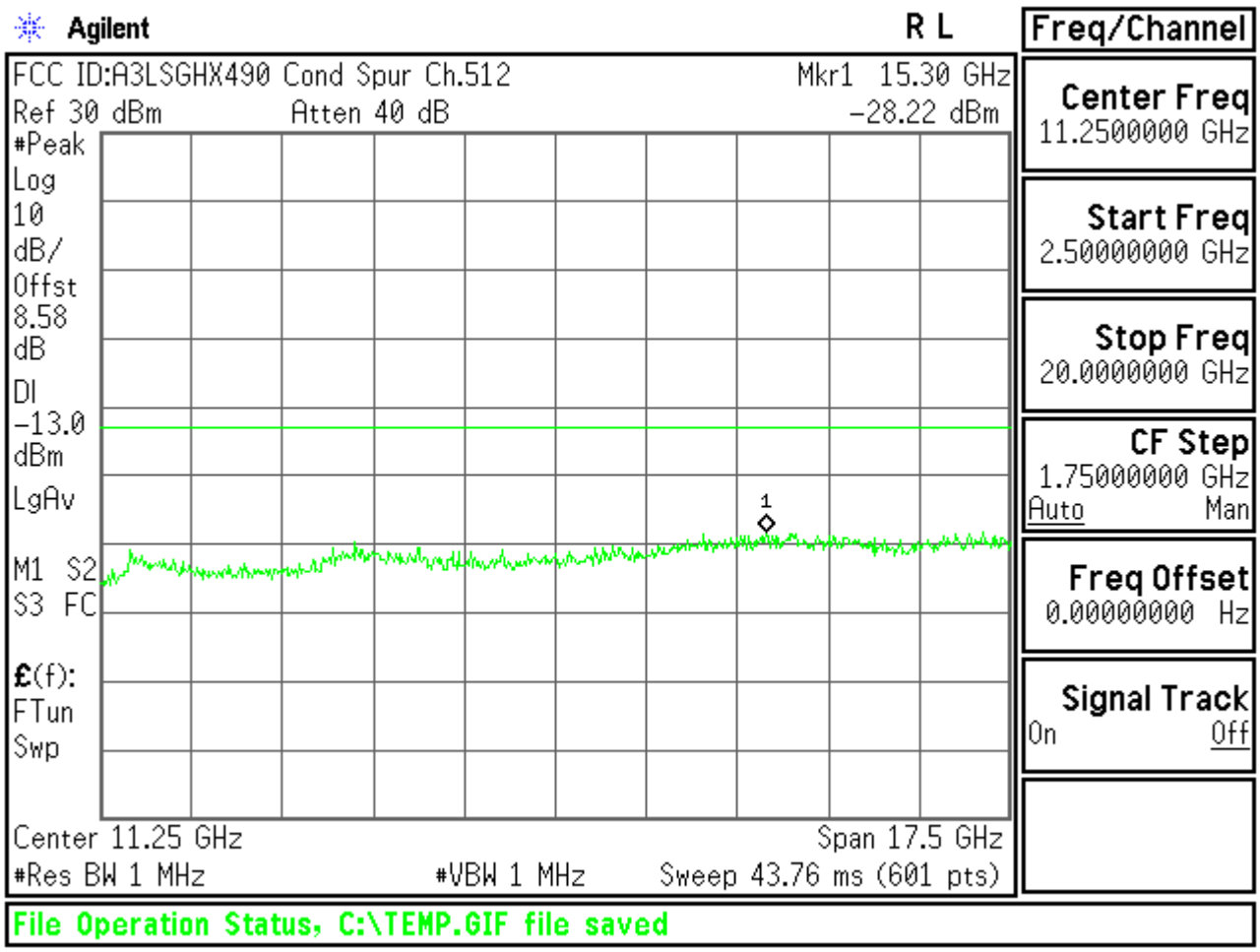


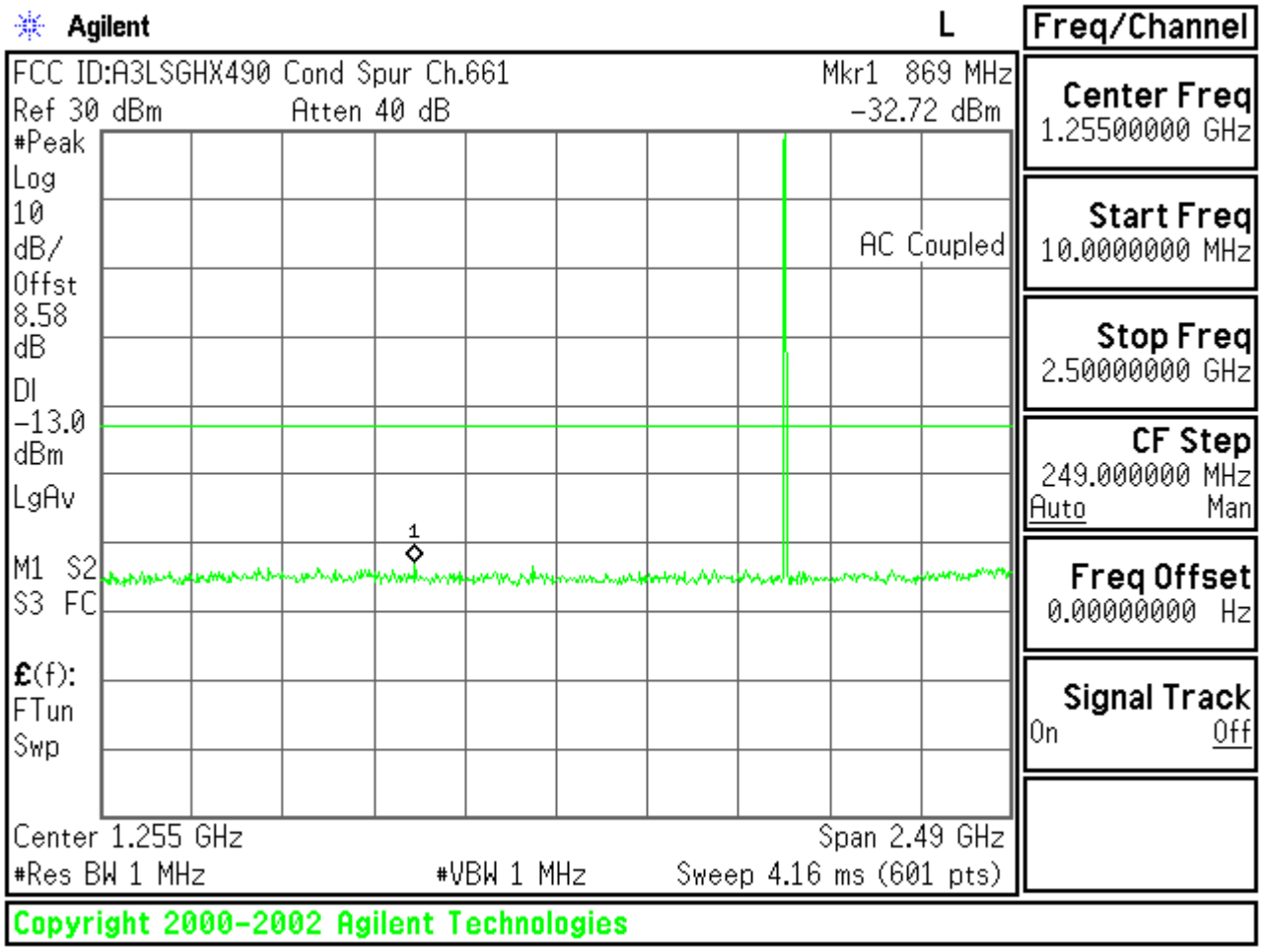

Measurement/Instrument Screen
Control
ORFS: Modulation & Switching Graph
TCH Parms
ORFS Setup
Change View
Swap Window Positions
1 of 2
MODULATION
Ref 10.00 dB
10.00 dB/
Pass
-1800 kHz
1800 kHz
- App. limit
- 0 kHz
SWITCHING
Ref 10.00 dBm
10.00 dB/
Pass
-1800 kHz
1800 kHz
- 0 kHz
Continuous
Background
Active Cell
Connected
Sys Type: GSM
IntRef
Offset
R T
Downlink Traffic Power
Traffic Band
PCS
Traffic Channel
512
MS TX Level
0
Channel Mode Setup
Return
1 of 2

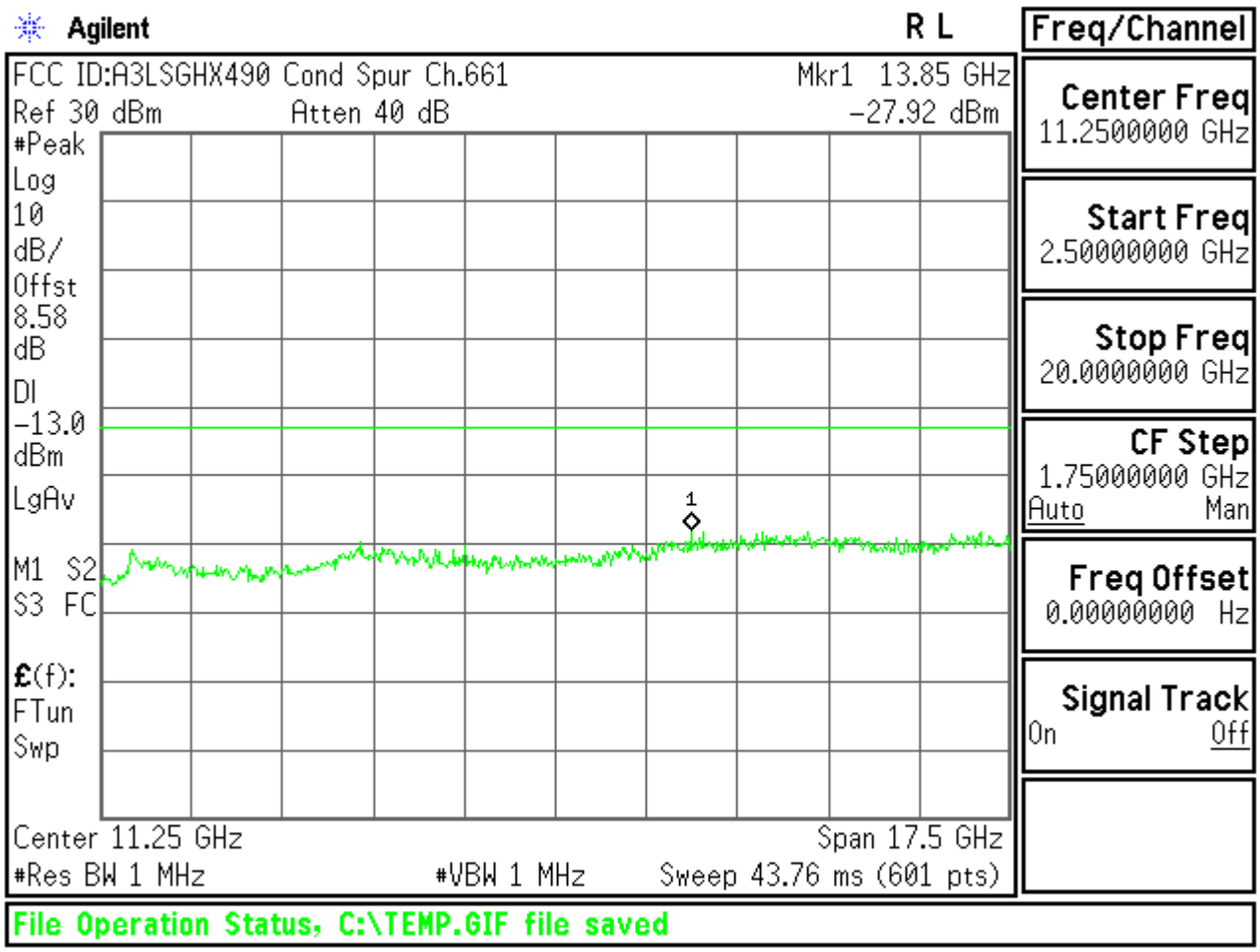

Measurement/Instrument Screen
Control
ORFS: Modulation & Switching Graph
TCH Parms
ORFS Setup
Change View
Swap Window Positions
1 of 2
MODULATION
Ref 10.00 dB
10.0C dB/
Pass
-1800 kHz
1800 kHz
- App. limit
- 0 kHz
SWITCHING
Ref 10.00 dBm
10.0C dB/
Pass
-1800 kHz
1800 kHz
- 0 kHz
Continuous
Background
Active Cell
Connected
Sys Type: GSM
IntRef
Offset
R T
Downlink Traffic Power
Traffic Band
PCS
Traffic Channel
661
MS TX Level
0
Channel Mode Setup
Return
1 of 2

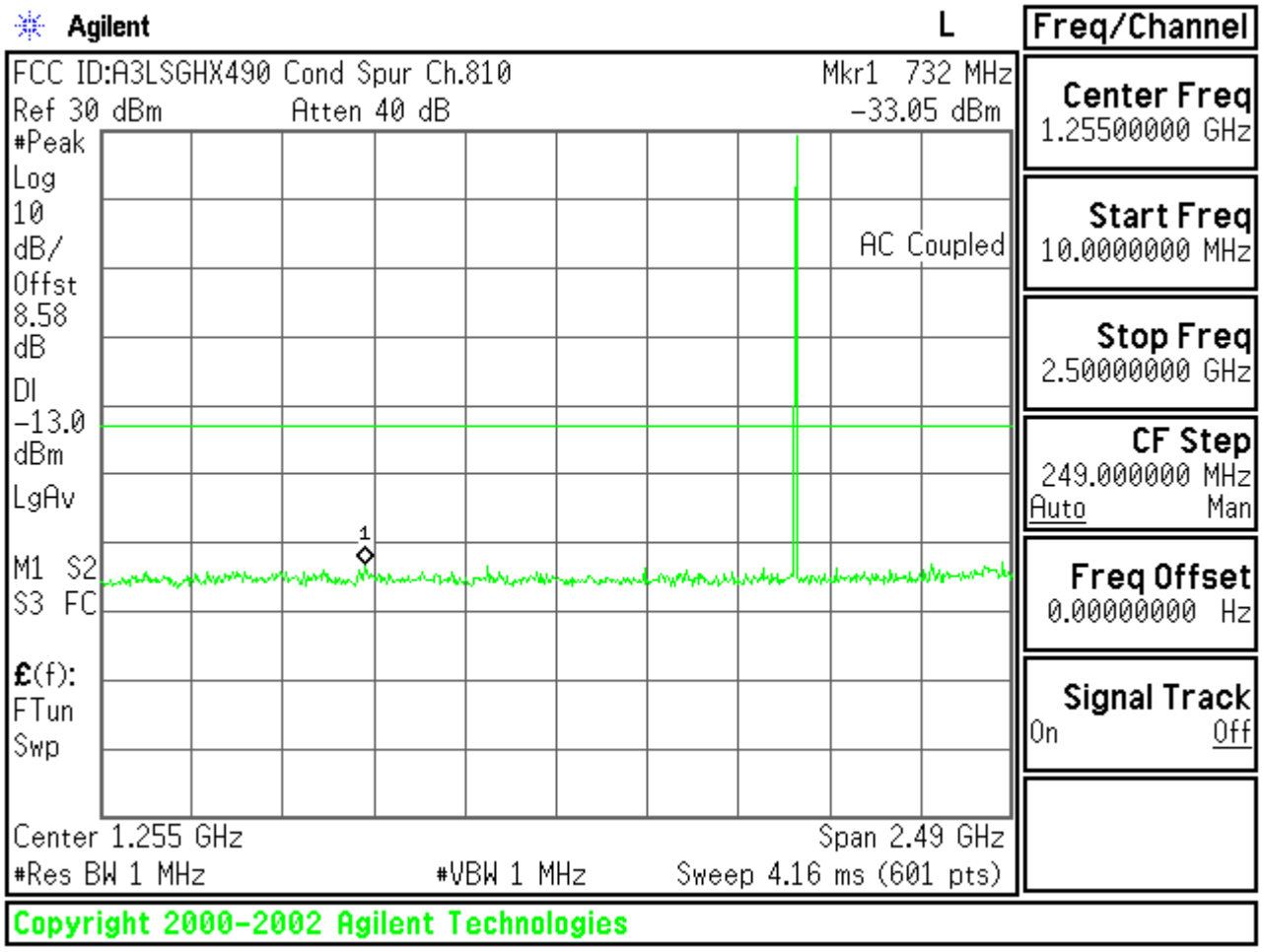

Measurement/Instrument Screen
Control
ORFS: Modulation & Switching Graph
TCH Parms
ORFS Setup
Change View
Swap Window Positions
1 of 2
MODULATION
Ref 10.00 dB
10.0C dB/
Pass
-1800 kHz
1800 kHz
- App. limit
- 0 kHz
SWITCHING
Ref 10.00 dBm
10.0C dB/
Pass
-1800 kHz
1800 kHz
- 0 kHz
Continuous
Background
Active Cell
Connected
Sys Type: GSM
IntRef
Offset
R T
Downlink Traffic Power
Traffic Band
PCS
Traffic Channel
810
MS TX Level
0
Channel Mode Setup
Return
1 of 2

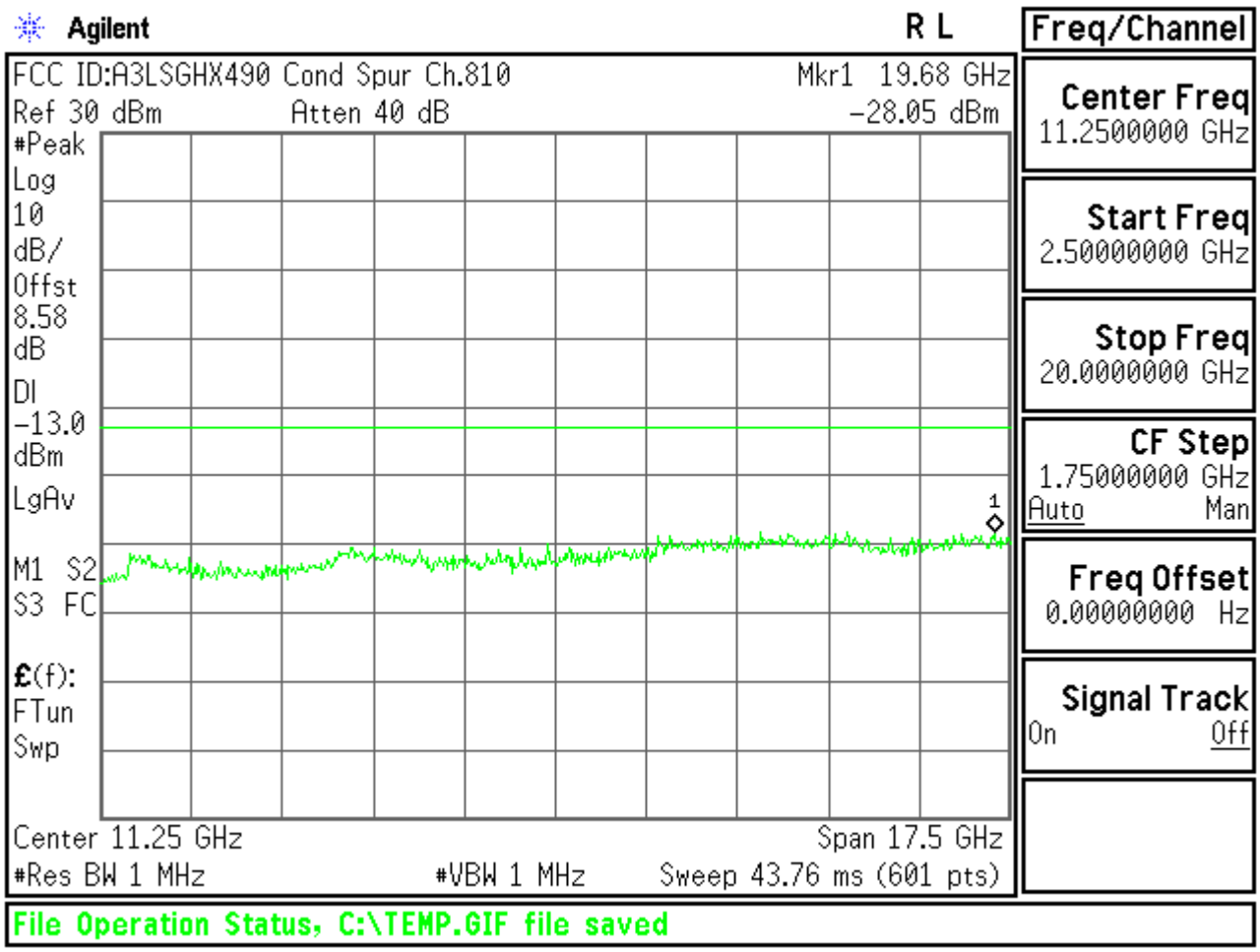

Agilent
L
Freq/Channel
FCC ID:A3LSGHX490 Cond Spur Ch.512
Mkr1 2.434 GHz
Ref 30 dBm
Atten 40 dB
-32.62 dBm
#Peak
Log
10
dB/
Offst
8.58
dB
Dl
-13.0
dBm
LgAv
AC Coupled
M1 S2
S3 FC
£(f):
FTun
Swp
Center 1.255 GHz
Span 2.49 GHz
#Res BW 1 MHz
#VBW 1 MHz
Sweep 4.16 ms (601 pts)
Center Freq
1.25500000 GHz
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
Copyright 2000-2002 Agilent Technologies

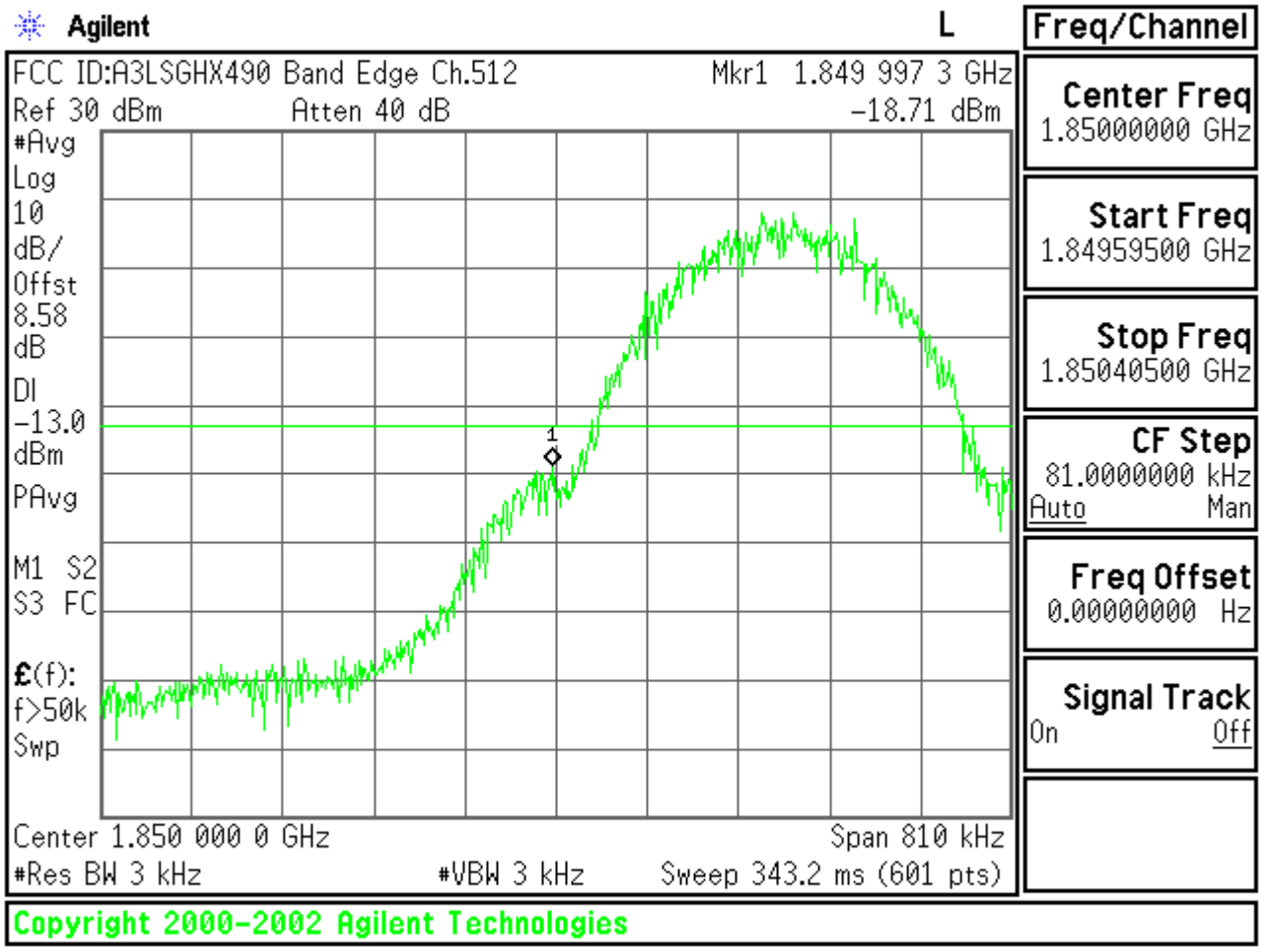

Agilent
R L
Freq/Channel
FCC ID:A3LSGHX490 Cond Spur Ch.512
Mkr1 15.30 GHz
Ref 30 dBm
Atten 40 dB
-28.22 dBm
#Peak
Log
10
dB/
Offst
8.58
dB
Dl
-13.0
dBm
LgAv
M1 S2
S3 FC
£(f):
FTun
Swp
Center 11.25 GHz
Span 17.5 GHz
#Res BW 1 MHz
#VBW 1 MHz
Sweep 43.76 ms (601 pts)
Center Freq
11.2500000 GHz
Start Freq
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

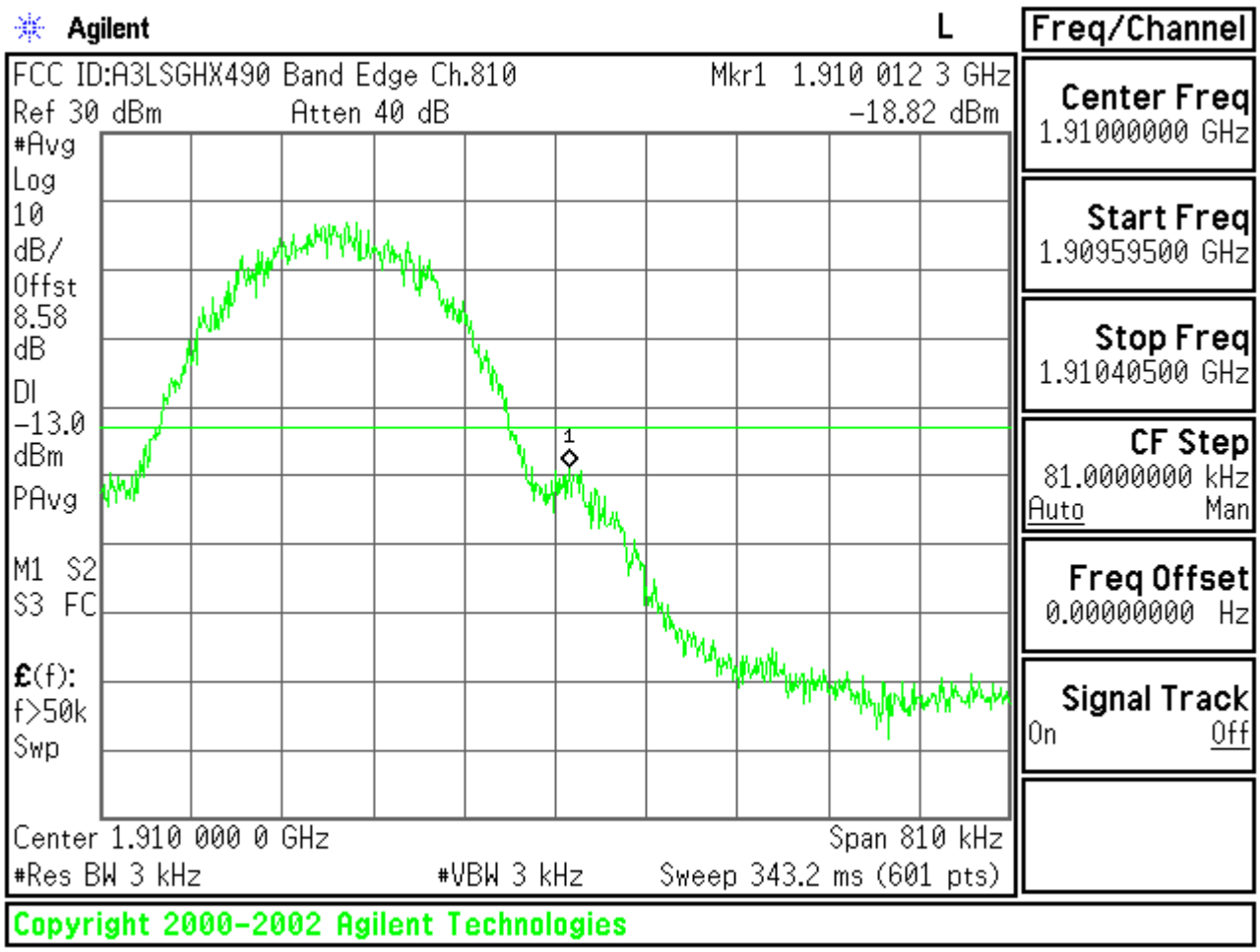

Agilent
L
Freq/Channel
FCC ID:A3LSGHX490 Cond Spur Ch.661
Mkr1 869 MHz
Ref 30 dBm
Atten 40 dB
-32.72 dBm
#Peak
Log
10
dB/
Offst
8.58
dB
Dl
-13.0
dBm
LgAv
AC Coupled
M1 S2
S3 FC
£(f):
FTun
Swp
Center 1.25500000 GHz
Start Freq
10.0000000 MHz
Stop Freq
2.50000000 GHz
CF Step
249.000000 MHz
Auto Man
Freq 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 2000-2002 Agilent Technologies

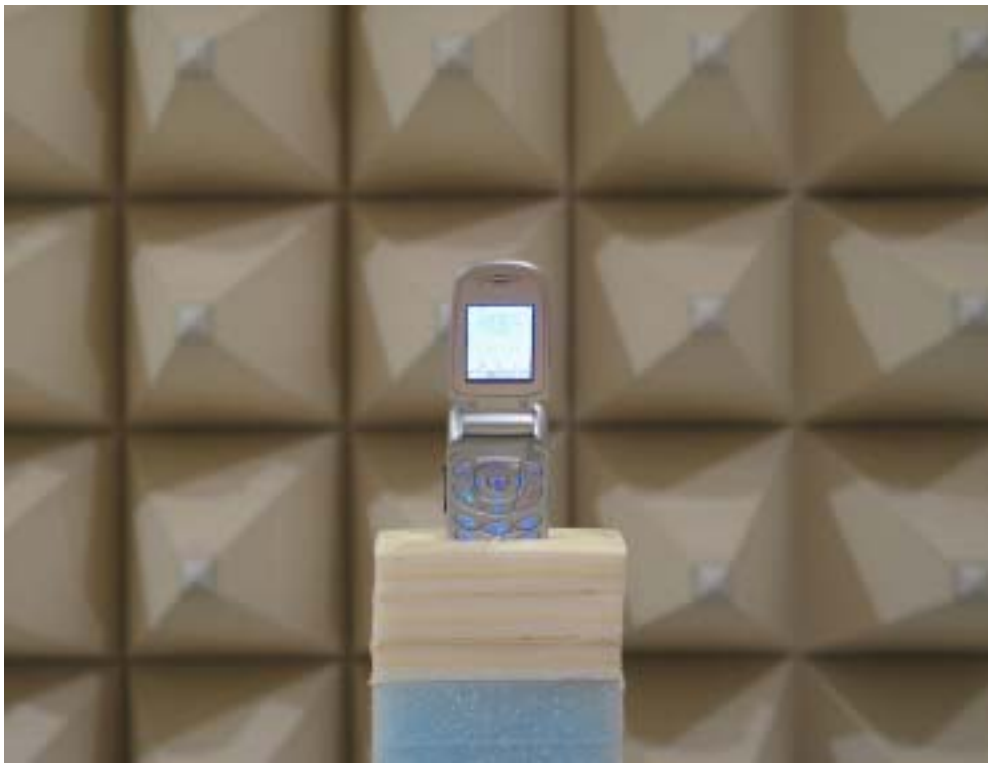

Agilent
R L
Freq/Channel
FCC ID:A3LSGHX490 Cond Spur Ch.661
Mkr1 13.85 GHz
Ref 30 dBm
Atten 40 dB
-27.92 dBm
#Peak
Log
10
dB/
Offst
8.58
dB
Dl
-13.0
dBm
LgAv
M1 S2
S3 FC
£(f):
FTun
Swp
Center 11.25500000 GHz
Start Freq
2.50000000 GHz
Stop Freq
20.0000000 GHz
CF Step
1.75000000 GHz
Auto Man
Freq Offset
0.00000000 Hz
Signal Track
On Off
Center 11.25 GHz
Span 17.5 GHz
#Res BW 1 MHz
#VBW 1 MHz
Sweep 43.76 ms (601 pts)
File Operation Status, C:\TEMP.GIF file saved

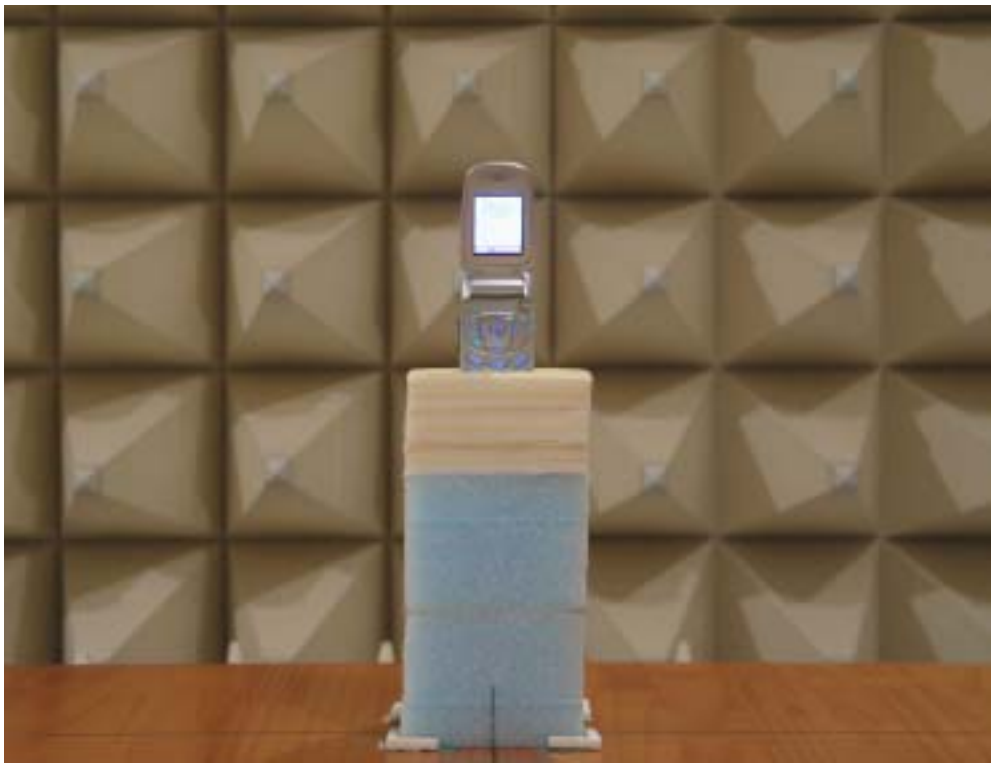

Agilent
L
FCC ID:A3LSGHX490 Cond Spur Ch.810
Mkr1 732 MHz
Ref 30 dBm
Atten 40 dB
-33.05 dBm
#Peak
Log
10
dB/
Offst
8.58
dB
Dl
-13.0
dBm
LgAv
AC Coupled
M1 S2
S3 FC
£(f):
FTun
Swp
Center 1.255 GHz
Span 2.49 GHz
#Res BW 1 MHz
#VBW 1 MHz
Sweep 4.16 ms (601 pts)
Freq/Channel
Center Freq
1.25500000 GHz
Start 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
Copyright 2000-2002 Agilent Technologies


Agilent
R L
FCC ID:A3LSGHX490 Cond Spur Ch.810
Mkr1 19.68 GHz
Ref 30 dBm
Atten 40 dB
-28.05 dBm
#Peak
Log
10
dB/
Offst
8.58
dB
Dl
-13.0
dBm
LgAv
M1 S2
S3 FC
£(f):
FTun
Swp
Center 11.25 GHz
Span 17.5 GHz
#Res BW 1 MHz
#VBW 1 MHz
Sweep 43.76 ms (601 pts)
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

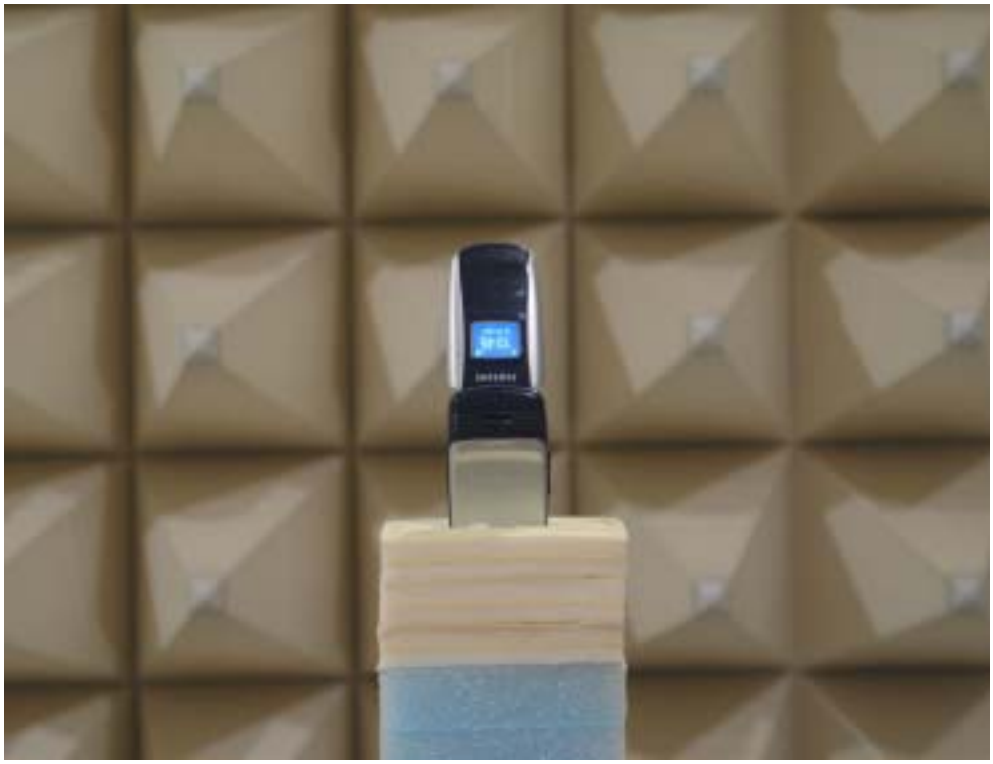

Agilent
L
Freq/Channel
FCC ID:A3LSGHX490 Band Edge Ch.512
Mkr1 1.849 997 3 GHz
Ref 30 dBm
Atten 40 dB
-18.71 dBm
#Avg
Log
10
dB/
Offst
8.58
dB
Dl
-13.0
dBm
PAvg
M1 S2
S3 FC
£(f):
f>50k
Swp
Center 1.850 000 0 GHz
Span 810 kHz
#Res BW 3 kHz
#VBW 3 kHz
Sweep 343.2 ms (601 pts)
Center Freq
1.85000000 GHz
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
Copyright 2000-2002 Agilent Technologies

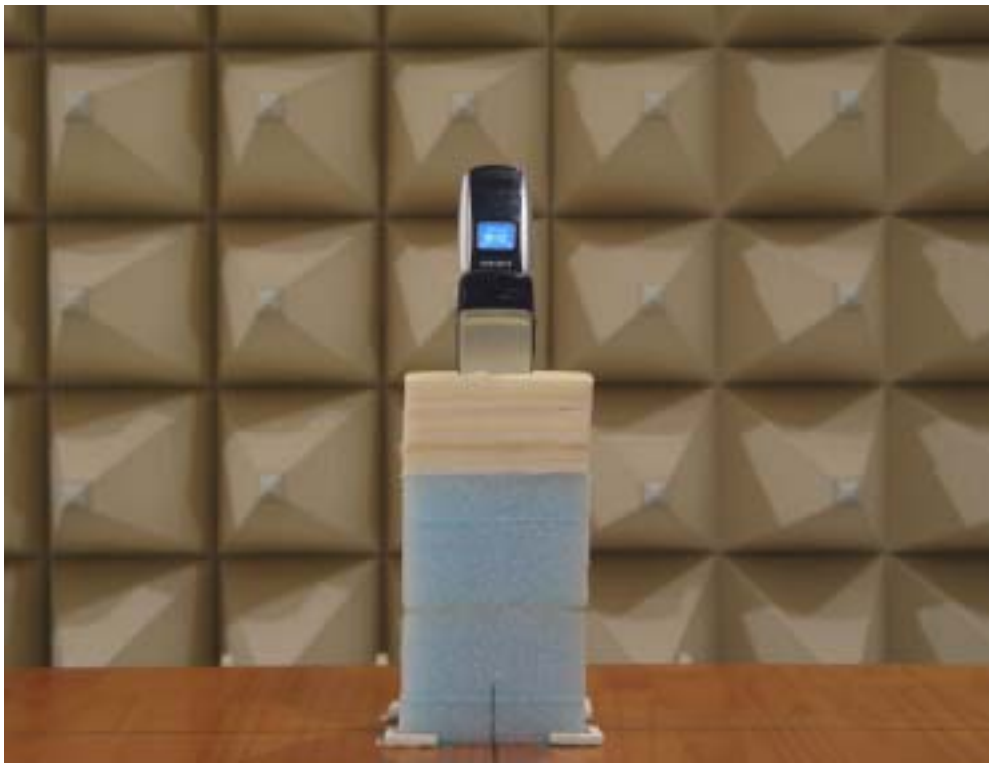

Agilent
L
Freq/Channel
FCC ID:A3LSGHX490 Band Edge Ch.810
Mkr1 1.910 012 3 GHz
Ref 30 dBm
Atten 40 dB
-18.82 dBm
#Avg
Log
10
dB/
Offst
8.58
dB
Dl
-13.0
dBm
PAvg
M1 S2
S3 FC
£(f):
f>50k
Swp
Center 1.910 000 0 GHz
Span 810 kHz
#Res BW 3 kHz
#VBW 3 kHz
Sweep 343.2 ms (601 pts)
Center Freq
1.91000000 GHz
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
Copyright 2000-2002 Agilent Technologies



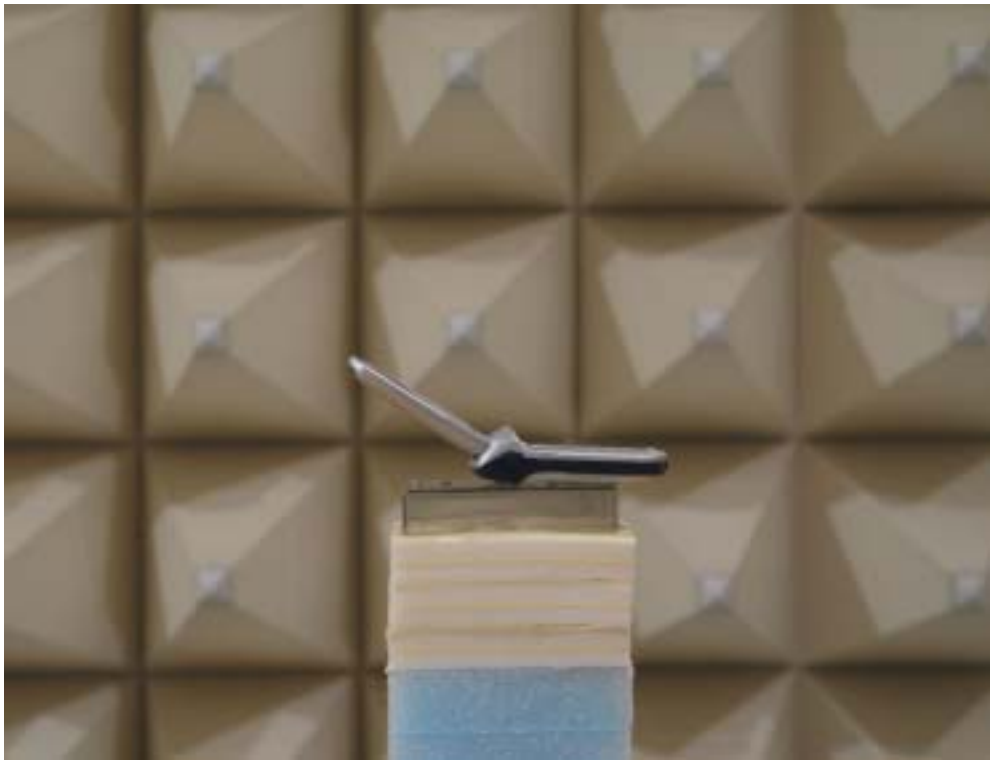


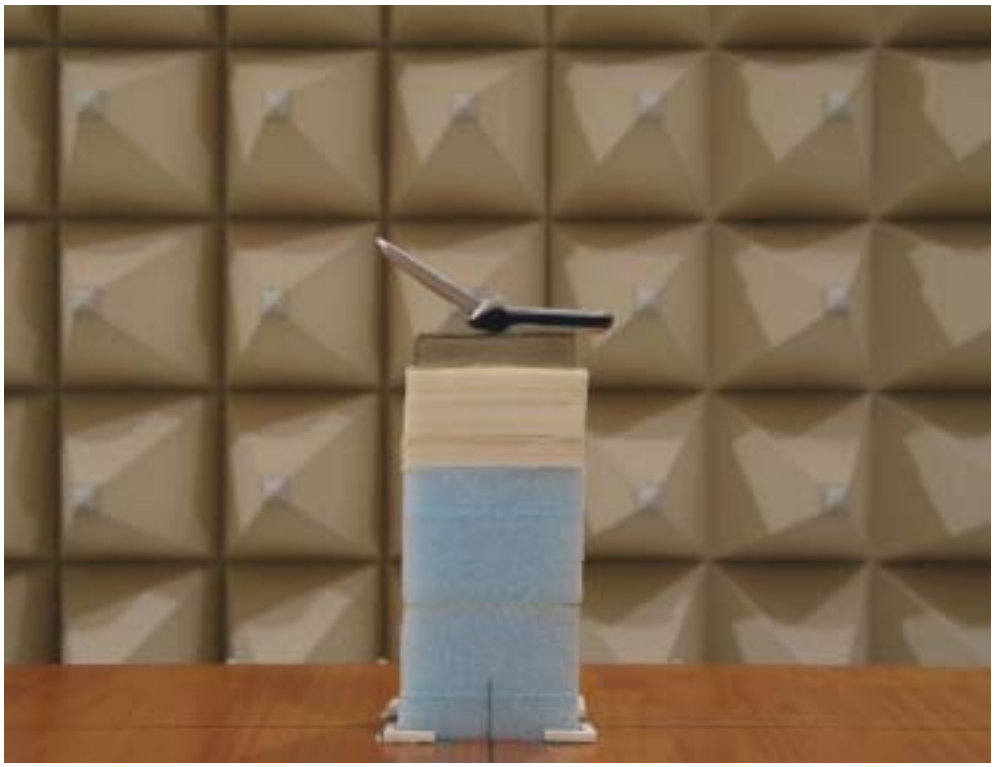
© 2005 SAMSUNG ELECTRONICS Co., Ltd.



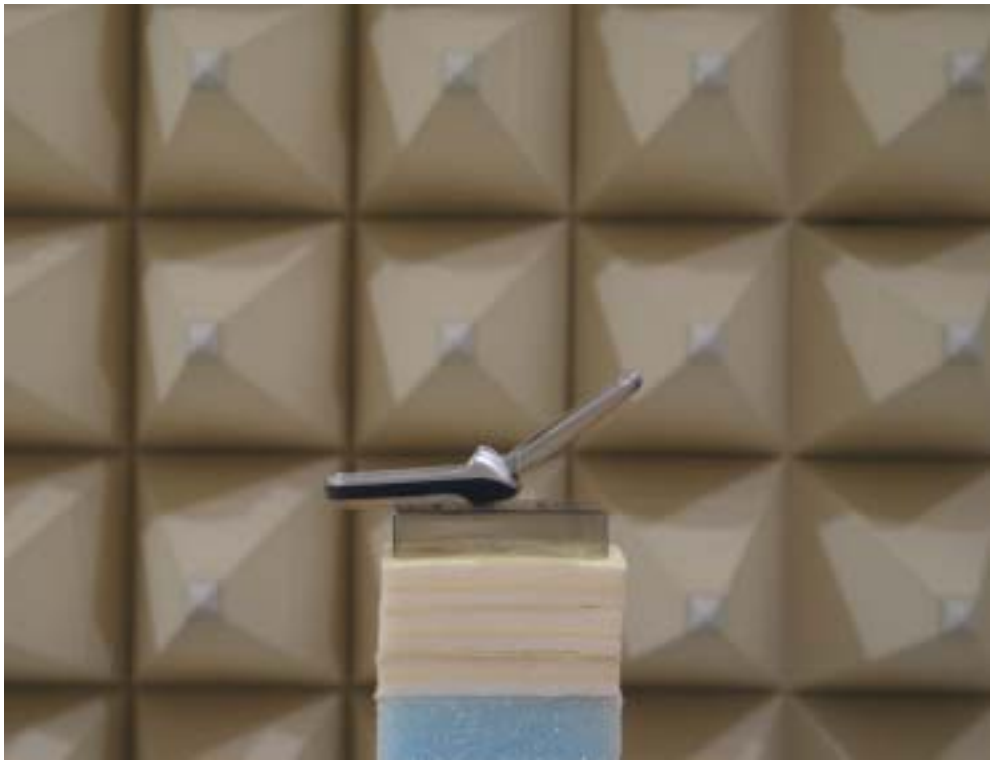


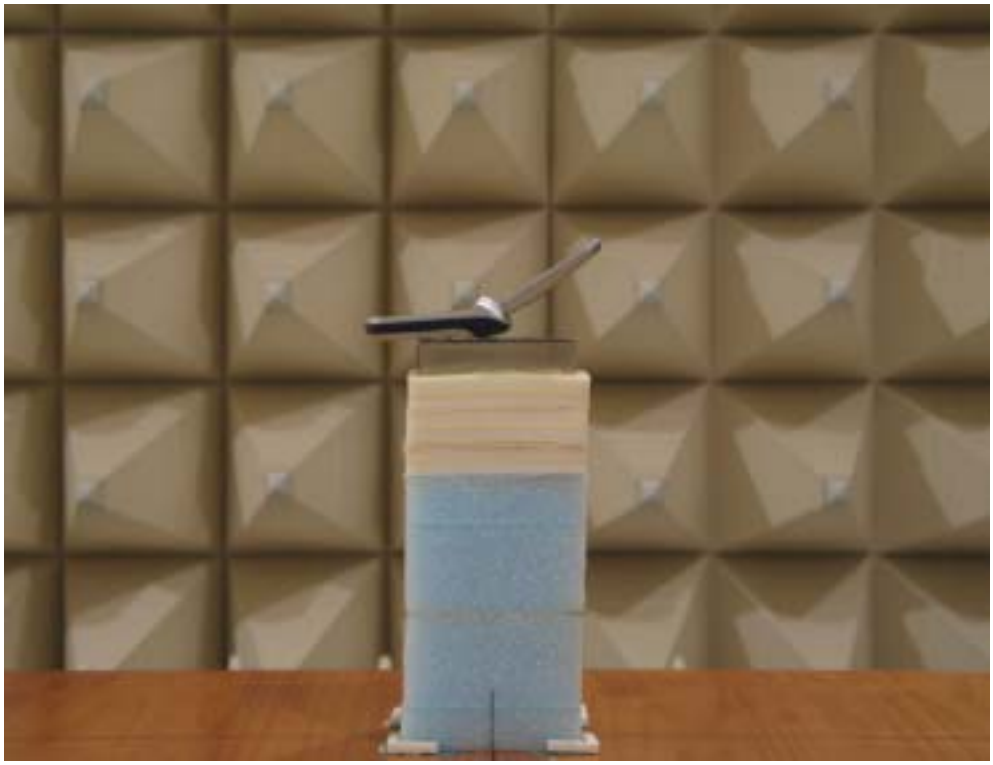
© 2005 SAMSUNG ELECTRONICS Co., Ltd.



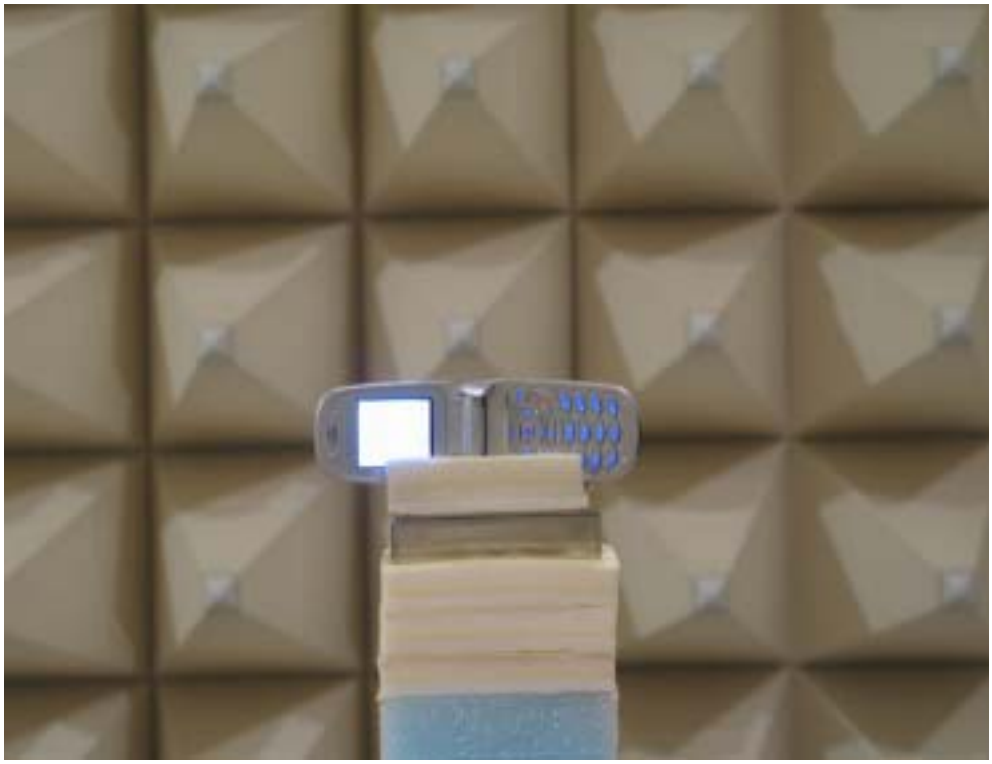


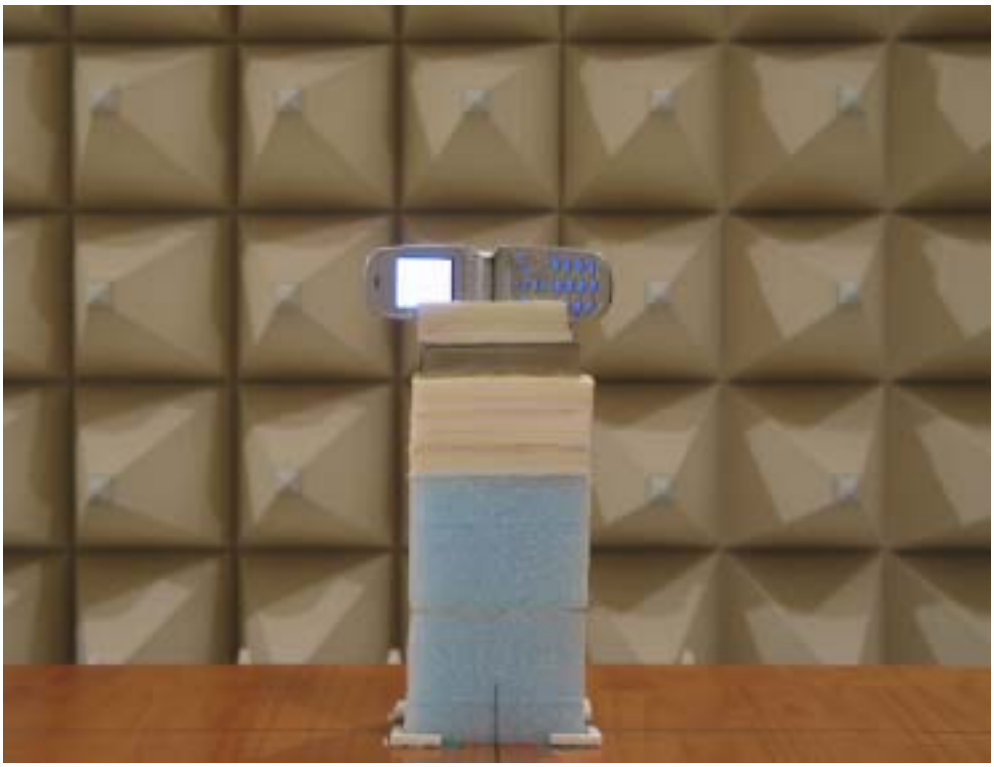
© 2005 SAMSUNG ELECTRONICS Co., Ltd.



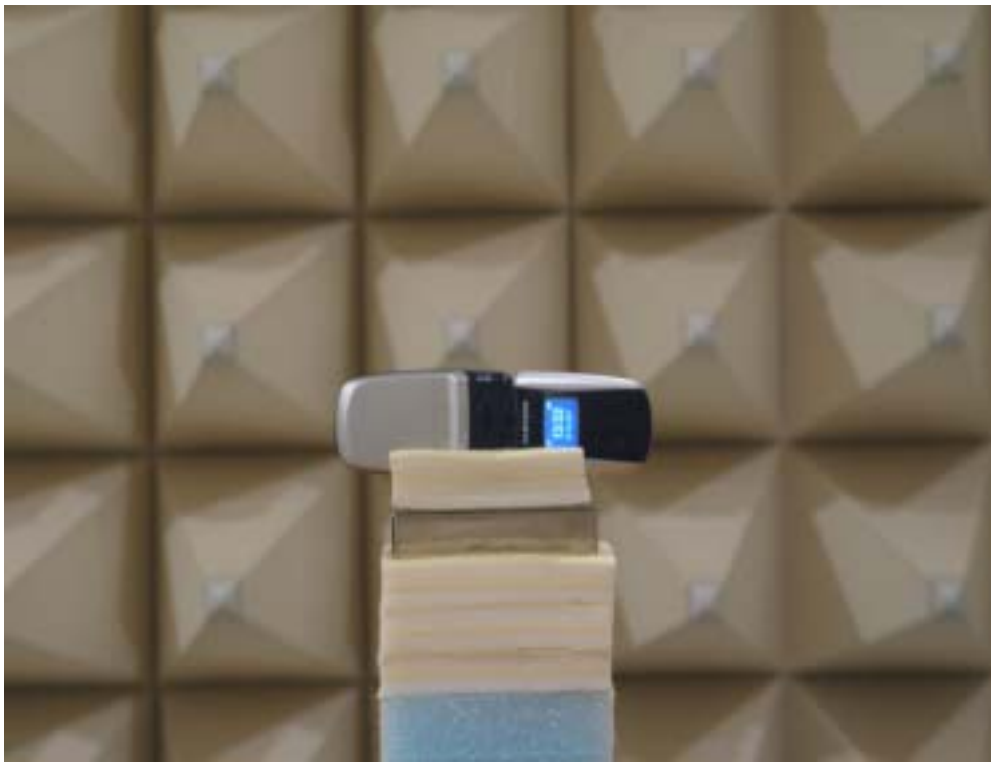


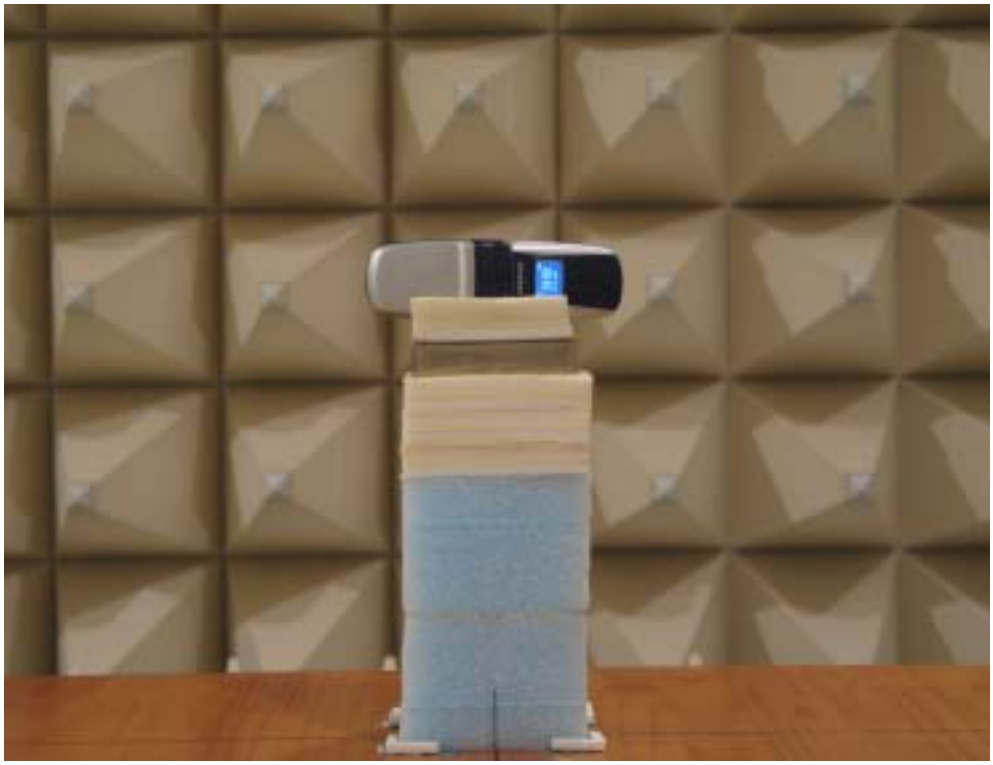
© 2005 SAMSUNG ELECTRONICS Co., Ltd.





© 2005 SAMSUNG ELECTRONICS Co., Ltd.





© 2005 SAMSUNG ELECTRONICS Co., Ltd.