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

FCC CFR47 PART 22 & 24 SUBPART CERTIFICATION REPORT

Model Tested : **GT-S3550**
FCC ID(Requested) : **A3LGTS3550**
Report No : **FG-356-R1**
Job No : **FG-356**
Date issued : **February 4, 2010**

- Abstract -

All measurement reported herein accordance with FCC Rules, 47CFR Part2,
Part22, Part24.

Prepared By

HJ AN- Test Engineer

Authorized By

WT 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
- FCC ID : A3LGTS3550
- Model ID : GT-S3550
- Quantity : Quantity production is planned
- Emission Designators : 250KGXW(GSM850)
249KGXW(GSM1900)
- Tx Freq. Range : 824.2 - 848.8MHz (GSM850)
1850.2MHz - 1909.8MHz (GSM1900)
- Rx Freq. Range : 869.2 - 893.8 MHz (GSM850)
1930.2MHz - 1989.8MHz (GSM1900)
- Max. Power Rating : 0.571 W ERP GSM850 (27.57 dBm)
0.853 W EIRP GSM1900 (29.31 dBm)
- FCC Classification(s) : PCS Licensed Portable Tx Held to Ear (PCE)
- Equipment (EUT) Type : 850/1900 GSM/GPRS Phone with Bluetooth and EDGE Rx
Only
- Frequency Tolerance : $\pm 0.00025\%$ (2.5ppm)
- FCC Rule Part(s) : §24(E), §22(H), §2.
- Dates of Test : January 29-30, 2010
- Place of Test : SAMSUNG Lab,
- Test Report S/N : FG-356-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.

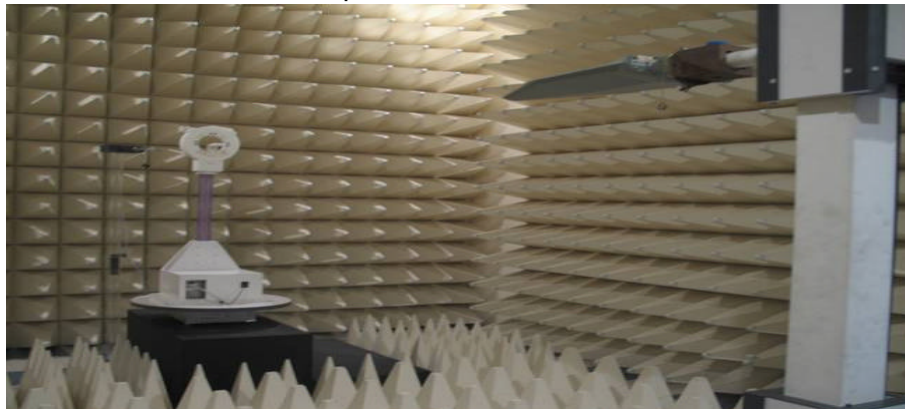


Figure2. Photograph of 3m Fully-Anechoic Chamber

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	2010-10-20
	E4440A(3Hz~26.5GHz)	MY46187454	2010-03-06
	E4440A(3Hz~26.5GHz)	MY41000236	2010-04-14
Network Analyzer	8753E	JP38160590	2010-06-19
Pre-Amplifier	8449B	3008A00691	2010-12-15
Communication test set	8960	MY47510060	2010-03-06
	8960	GB42230535	2010-12-18
Controller	CO2000	CO2000/424	Not Required
Turn Unit	CT0800	CT0800/057	Not Required
Rotating Device	DE3600-RH-PR	DE3600-RH-PR/050	Not Required
Antenna Master	MA4000	MA4000/204	Not Required
Horn Antenna	HF906	360306/011	2010-06-13
Dipole Antenna	UHA 9105	9105-2412	2011-10-06
	UHA 9105	9105-2413	2010-06-13
Power Supply	E3640A	MY40003594	2010-06-19
	E3640A	MY40003595	2010-06-19
	E3632A	MY40022438	2010-03-06
Divider	11636B	51946	Not Required
	11636B	56913	Not Required
	11636B	56918	Not Required
High Pass Filter	WHK/3.0/18G-10SS	492	Not Required
	WHK/3.5/18G-10SS	4	Not Required
Environmental Chamber	SH-241	92000549	2010-11-11
	SH-241	92000548	2010-11-11
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 output Measurements by Substitution Method according to ANSI/TIA/EIA-603-C-2004

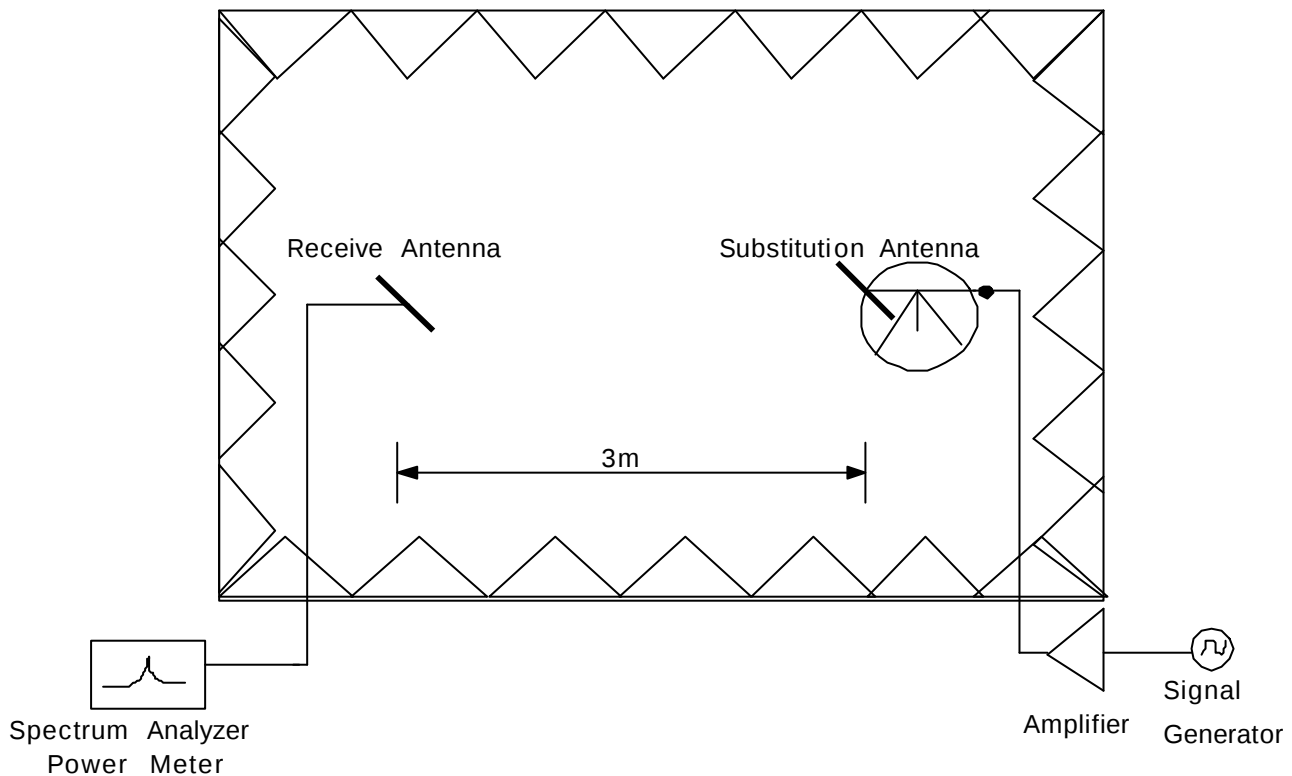


Figure 3. Diagram of ERP/EIRP test Set-up

The EUT was placed on the rotating device at 3-meters from the receive antenna. The turn unit and rotating device 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

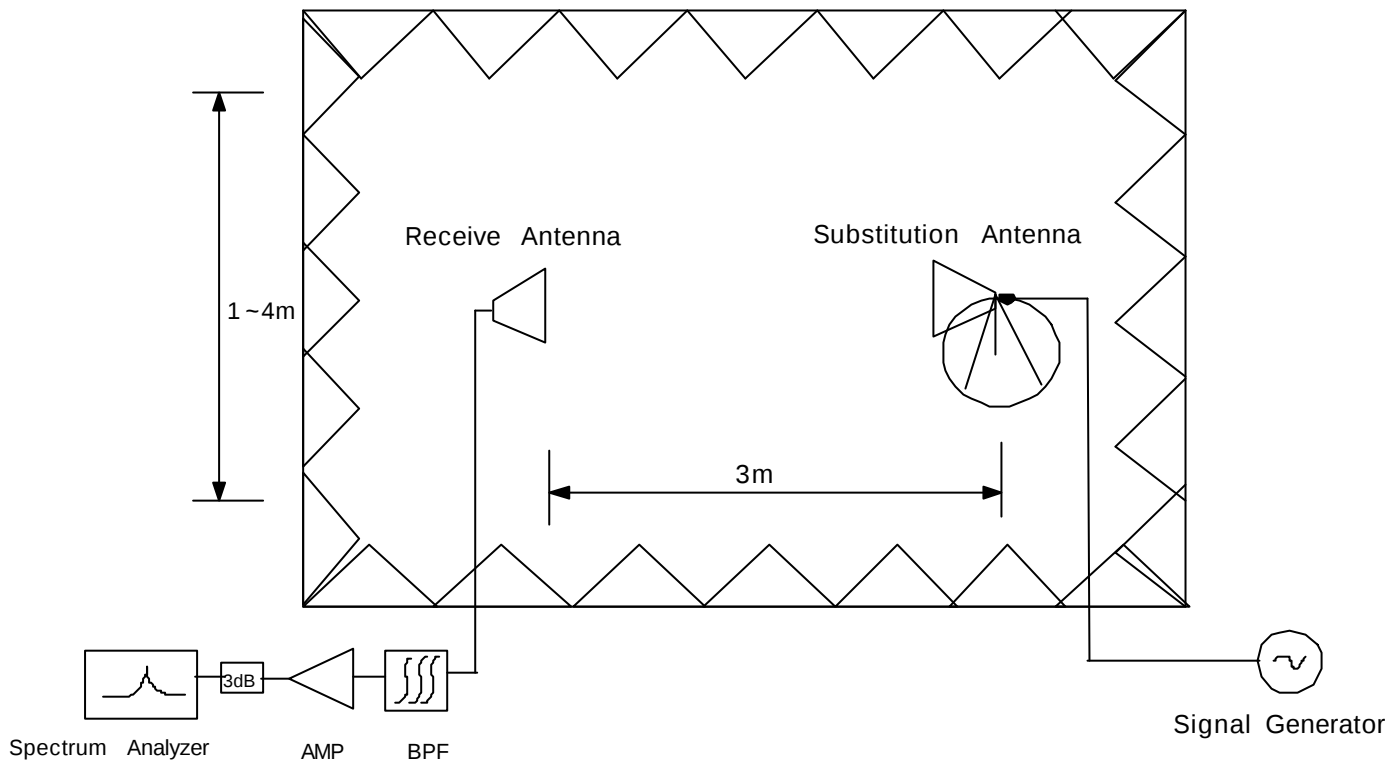


Figure 4. Diagram of Radiated Spurious & Harmonic test Set-up

The EUT was placed on the rotating device at 3-meters from the receive antenna. The turn unit and rotating device 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. Peak-Average Ratio

A peak to average ratio measurement is performed at the conducted port of the EUT. An average and a peak trace are used on a spectrum analyzer to determine the largest deviation between the average and the peak power of the EUT in a given bandwidth.

5.4. 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.

5.5. Spurious and Harmonic Emission at Antenna Terminal

5.5.1. 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

5.5.2. 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.

$$43 + 10\log(0.571 \text{ W}) = 40.57 \text{ dB}$$

$$27.57 \text{ dBm} - 40.57 \text{ dB} = -13 \text{ dBm}$$

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.

5.6. 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 (± 2.5 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. Conducted Output Power

A base station simulator was used to establish communication with the Samsung 850/1900 GSM/GPRS Phone with Bluetooth and EDGE Rx Only FCC ID: A3LGTS3550. The base station simulator parameters were set to produce the maximum power from the EUT. This device was tested under all configurations and the highest power is reported in GSM mode and using a Power Control Level of “0” in the PCS BAND and “5” in the Cellular Band. The GSM conducted powers are reported below, respectively.

BAND	Channel	RF Conducted Power Table				
		Voice	GPRS Data			
			1 Tx Slot	2 Tx Slot	3 Tx Slot	4 Tx Slot
PCS	512	30.16	30.14	30.17	28.13	26.1
	661	30.08	30.06	30.08	28.03	26.01
	810	29.92	29.9	29.91	27.89	25.92
Cellular	128	32.26	32.28	32.28	30.26	28.22
	190	32.55	32.57	32.57	30.53	28.48
	251	32.6	32.62	32.62	30.59	28.54

Table 6-1 GSM Conducted Output Powers

6.2. Effective Radiated Power (E.R.P.)

Supply Voltage : 3.7VDC

Modulation : GSM850

■ Reference level

Frequency (MHz)	Output (dBm)	Polarization (H/V)	S/A (dBm)	Ant gain (dBd)	Ref level (dBm)
824.20	25.00	H	-11.46	-0.67	-10.79
		V	-11.67	-0.67	-11.00
836.60	27.00	H	-10.90	-0.73	-10.17
		V	-10.42	-0.73	-9.69
848.80	28.00	H	-12.55	-0.79	-11.76
		V	-11.22	-0.79	-10.43

■ Result

Frequency (MHz)	Tested level (dBm)	Polarization (H/V)	Azimuth (angle)	ERP (dBm)	ERP (W)	Battery
824.20	-10.51	H	287/100	25.28	0.337	Standard
836.60	-10.56	H	291/100	26.61	0.458	Standard
848.80	-12.19	H	281/100	27.57	0.571	Standard

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

- All modes of operation were investigated, and the worst-case results are reported.

Radiated measurements at 3 meters by Substitution Method

6.3. 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	29.00	H	-9.75	9.70	-19.45
		V	-9.38	9.70	-19.08
1880.00	29.00	H	-10.11	9.70	-19.81
		V	-10.11	9.70	-19.81
1909.80	29.00	H	-10.11	9.70	-19.81
		V	-9.80	9.70	-19.50

■ Result

Frequency (MHz)	Tested level (dBm)	Polarization (H/V)	Azimuth (angle)	EIRP (dBm)	EIRP (W)	Battery
1850.20	-19.14	H	53/10	29.31	0.853	Standard
1880.00	-19.97	H	129/0	28.84	0.766	Standard
1909.80	-19.51	H	227/170	29.30	0.851	Standard

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

- All modes of operation were investigated, and the worst-case results are reported.

Radiated measurements at 3 meters by Substitution Method

6.4. GSM850 Radiated Spurious & Harmonic measurement

Operating Frequency : 824.20 MHz(Low), 836.60MHz(Middle), 848.80MHz(High)

Measured Output Power : 27.57 dBm = 0.571 W

Modulation Signal : GSM850

Limit : $43 + 10\log_{10}(P) = 40.57 \text{ dBc}$

■ Result

Channel	Harmonic	Frequency (MHz)	From EUT Tested level (dBm)	POL (H/V)	Result (dBc)
128	2	1648.40	-47.36	H	62.83
	3	2472.60	-62.61	V	73.87
	4	3296.80	-60.66	V	67.94
	5	4121.00	-	-	-
	6	4945.20	-	-	-
	7	5769.40	-	-	-
190	2	1673.20	-50.97	H	65.94
	3	2509.80	-64.69	H	75.71
	4	3346.40	-60.78	V	67.89
	5	4183.00	-	-	-
	6	5019.60	-	-	-
	7	5856.20	-	-	-
251	2	1697.60	-57.09	H	71.85
	3	2546.40	-61.38	V	71.15
	4	3395.20	-59.73	V	66.98
	5	4244.00	-	-	-
	6	5092.80	-	-	-
	7	5941.60	-	-	-

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 10th harmonic and All modes of operation were investigated, and the worst-case results are reported..

Radiated Spurious Emission measurements at 3 meters by Substitution Method

6.5. GSM1900 Radiated Spurious & Harmonic measurement

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

Measured Output Power : 29.31 dBm = 0.853 W

Modulation Signal : GSM1900

Limit : $43 + 10\log_{10}(P) = 42.31 \text{ dBc}$

■ Result

Channel	Harmonic	Frequency (MHz)	From EUT Tested level (dBm)	POL (H/V)	Result (dBc)
512	2	3700.40	-63.41	H	68.78
	3	5550.60	-64.44	H	64.07
	4	7400.80	-68.56	V	63.57
	5	9251.00	-	-	-
	6	11101.20	-	-	-
	7	12951.40	-	-	-
661	2	3760.00	-64.52	V	69.78
	3	5640.00	-64.40	H	63.98
	4	7520.00	-67.93	V	63.20
	5	9400.00	-	-	-
	6	11280.00	-	-	-
	7	13160.00	-	-	-
810	2	3819.60	-64.14	V	67.77
	3	5729.40	-64.42	H	63.25
	4	7639.20	-68.26	V	63.13
	5	9549.00	-	-	-
	6	11458.80	-	-	-
	7	13368.60	-	-	-

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 10th harmonic and All modes of operation were investigated, and the worst-case results are reported.

Radiated Spurious Emission measurements at 3 meters by Substitution Method

6.6. GSM850 Radiated Spurious & Harmonic Conversion Table

Date : January 30, 2010

Test Engineer : HJ AN

Tx Cable loss

Tx Horn Ant Gain

Tx Level to radiate -13dBm

ESI Level received from Tx with -13dBm

Tested Level from EUT

= ERP+2.15 - (-13 + -)

CH	Har	Frequency (MHz)	Tx C/L dB	Tx Horn Gain dBd	Tx Level dBm	ESI Level : H dBm	ESI Level : V dBm	Tested EUT Level : H dBm	Tested EUT Level : V dBm	Result EUT : H (dBc)	Result EUT : V (dBc)
128	2	1648.40	-9.02	9.50	-13.50	-27.24	-27.10	-47.36	-52.51	62.83	68.12
	3	2472.60	-11.41	10.70	-12.30	-31.70	-31.45	-64.22	-62.61	75.23	73.87
	4	3296.80	-13.59	12.30	-11.70	-34.96	-35.43	-61.61	-60.66	69.36	67.94
	5	4121.00	-15.15	12.50	-10.30	-38.60	-38.90	-	-	-	-
	6	4945.20	-16.71	12.70	-9.00	-40.65	-40.69	-	-	-	-
	7	5769.40	-18.17	12.90	-7.70	-43.29	-43.30	-	-	-	-
190	2	1673.20	-9.07	9.50	-13.40	-27.74	-28.63	-50.97	-59.17	65.94	73.25
	3	2509.80	-11.43	10.70	-12.30	-31.69	-31.64	-64.69	-66.88	75.71	77.95
	4	3346.40	-13.78	12.30	-11.50	-35.46	-35.60	-62.30	-60.78	69.55	67.89
	5	4183.00	-15.26	12.50	-10.20	-38.67	-39.11	-	-	-	-
	6	5019.60	-16.94	12.70	-8.80	-41.28	-41.32	-	-	-	-
	7	5856.20	-18.23	12.90	-7.70	-43.94	-43.84	-	-	-	-
251	2	1697.60	-9.08	9.50	-13.40	-27.95	-27.75	-57.09	-60.41	71.85	75.37
	3	2546.40	-11.41	10.70	-12.30	-31.58	-32.94	-64.71	-61.38	75.84	71.15
	4	3395.20	-13.82	12.30	-11.50	-35.17	-35.46	-64.34	-59.73	71.88	66.98
	5	4244.00	-15.38	12.50	-10.10	-38.81	-39.07	-	-	-	-
	6	5092.80	-17.06	12.70	-8.60	-41.51	-41.42	-	-	-	-
	7	5941.60	-18.41	12.90	-7.50	-43.83	-43.32	-	-	-	-

6.7. GSM1900 Radiated Spurious & Harmonic Conversion Table

Date : January 30, 2010

Test Engineer : HJ AN

Tx Cable loss
Tx Horn Ant Gain
Tx Level to radiate -13dBm
ESI Level received from Tx with -13dBm
Tested Level from EUT
= EIRP - (-13 + -)

CH	Har	Frequency (MHz)	Tx C/L dB	Tx Horn Gain dBi	Tx Level dBm	ESI Level : H dBm	ESI Level : V dBm	Tested EUT Level : H dBm	Tested EUT Level : V dBm	Result EUT : H (dBc)	Result EUT : V (dBc)
512	2	3700.40	-14.91	12.40	-10.50	-36.94	-36.57	-63.41	-64.17	68.78	69.91
	3	5550.60	-17.69	12.90	-8.20	-42.68	-42.80	-64.44	-65.35	64.07	64.86
	4	7400.80	-20.43	10.50	-3.10	-47.33	-46.96	-68.59	-68.56	63.57	63.91
	5	9251.00	-23.63	11.20	-0.60	-51.79	-50.45	-	-	-	-
	6	11101.20	-26.86	11.60	2.30	-54.95	-55.26	-	-	-	-
	7	12951.40	-28.80	12.90	2.90	-58.88	-58.56	-	-	-	-
661	2	3760.00	-15.19	12.40	-10.20	-37.08	-37.05	-65.61	-64.52	70.84	69.78
	3	5640.00	-17.78	12.90	-8.10	-42.73	-43.08	-64.40	-65.78	63.98	65.01
	4	7520.00	-20.67	10.60	-2.90	-47.12	-46.95	-68.01	-67.93	63.20	63.29
	5	9400.00	-23.23	11.60	-1.40	-51.75	-52.22	-	-	-	-
	6	11280.00	-26.34	12.10	1.20	-55.98	-56.30	-	-	-	-
	7	13160.00	-28.12	12.80	2.30	-59.32	-58.91	-	-	-	-
810	2	3819.60	-14.23	12.40	-11.20	-38.02	-38.68	-64.75	-64.14	69.04	67.77
	3	5729.40	-18.11	13.00	-7.90	-43.48	-43.49	-64.42	-66.56	63.25	65.38
	4	7639.20	-21.16	11.20	-3.00	-47.29	-47.44	-68.54	-68.26	63.56	63.13
	5	9549.00	-23.54	11.70	-1.20	-52.60	-52.08	-	-	-	-
	6	11458.80	-26.84	11.70	2.10	-56.26	-56.23	-	-	-	-
	7	13368.60	-28.23	12.30	2.90	-60.44	-59.84	-	-	-	-

6.8. Frequency Stability

6.8.1. GSM850 Frequency Stability Table

Operating Frequency : 836,600,000 Hz

Channel : 190

Reference Voltage : 3.7VDC

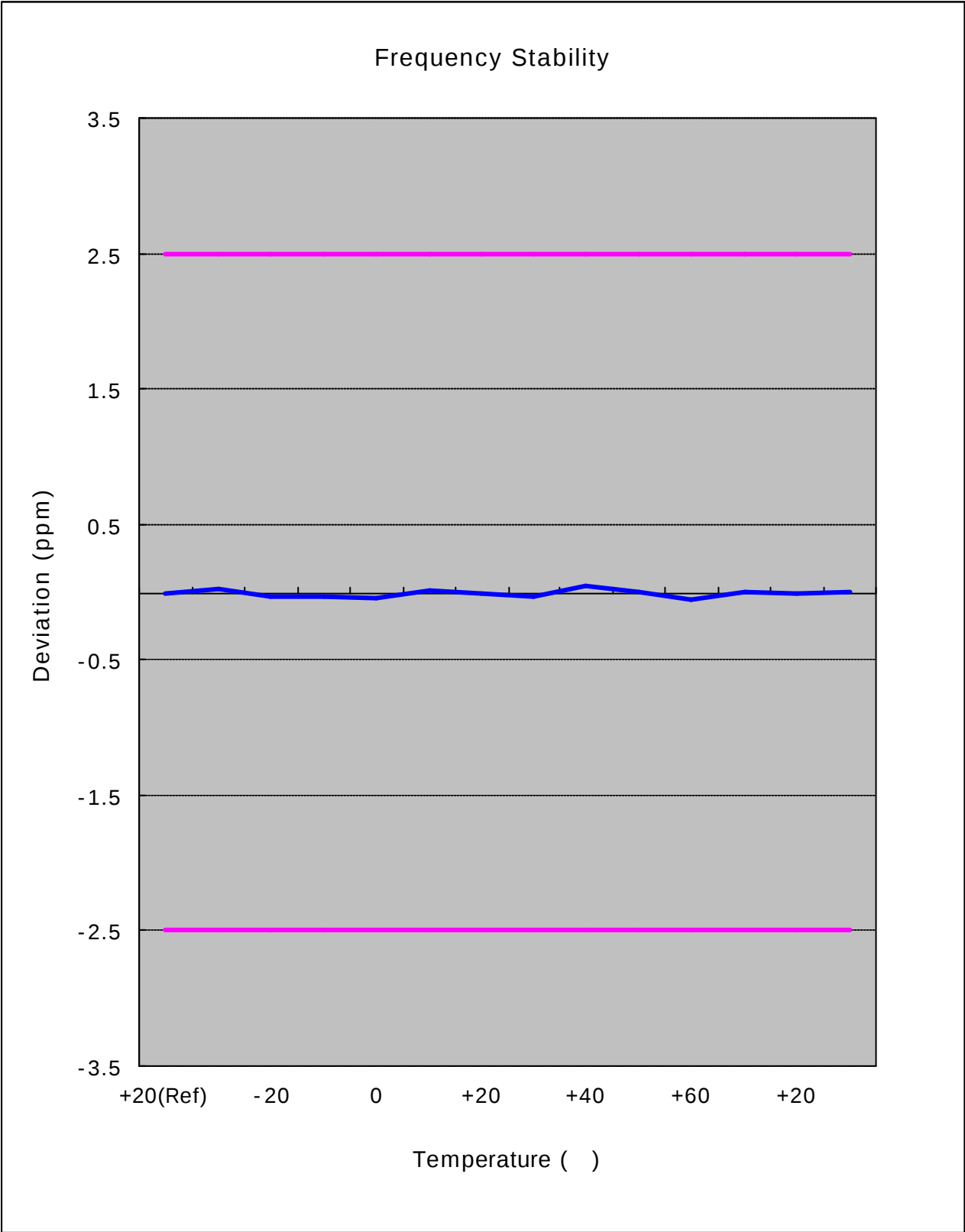
Deviation Limit : ± 0.00025 % or 2.5ppm

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency Error (Hz)	Frequency (Hz)	Deviation (%)	ppm
100%	3.70	+20(Ref)	-2.80	836,599,997	0.000000	-0.003
100%		-30	-2.00	836,599,998	0.000000	-0.002
100%		-20	-1.40	836,599,999	0.000000	-0.002
100%		-10	7.70	836,600,008	0.000001	0.009
100%		0	7.50	836,600,008	0.000001	0.009
100%		+10	35.80	836,600,036	0.000004	0.043
100%		+20	-2.80	836,599,997	0.000000	-0.003
100%		+30	-34.70	836,599,965	-0.000004	-0.041
100%		+40	23.40	836,600,023	0.000003	0.028
100%		+50	-25.20	836,599,975	-0.000003	-0.030
100%		+60	14.60	836,600,015	0.000002	0.017
85%	3.35	+20	-21.10	836,599,979	-0.000003	-0.025
115%	4.26	+20	-25.70	836,599,974	-0.000003	-0.031
Batt.Endpoint	3.35	+20	-21.10	836,599,979	-0.000003	-0.025

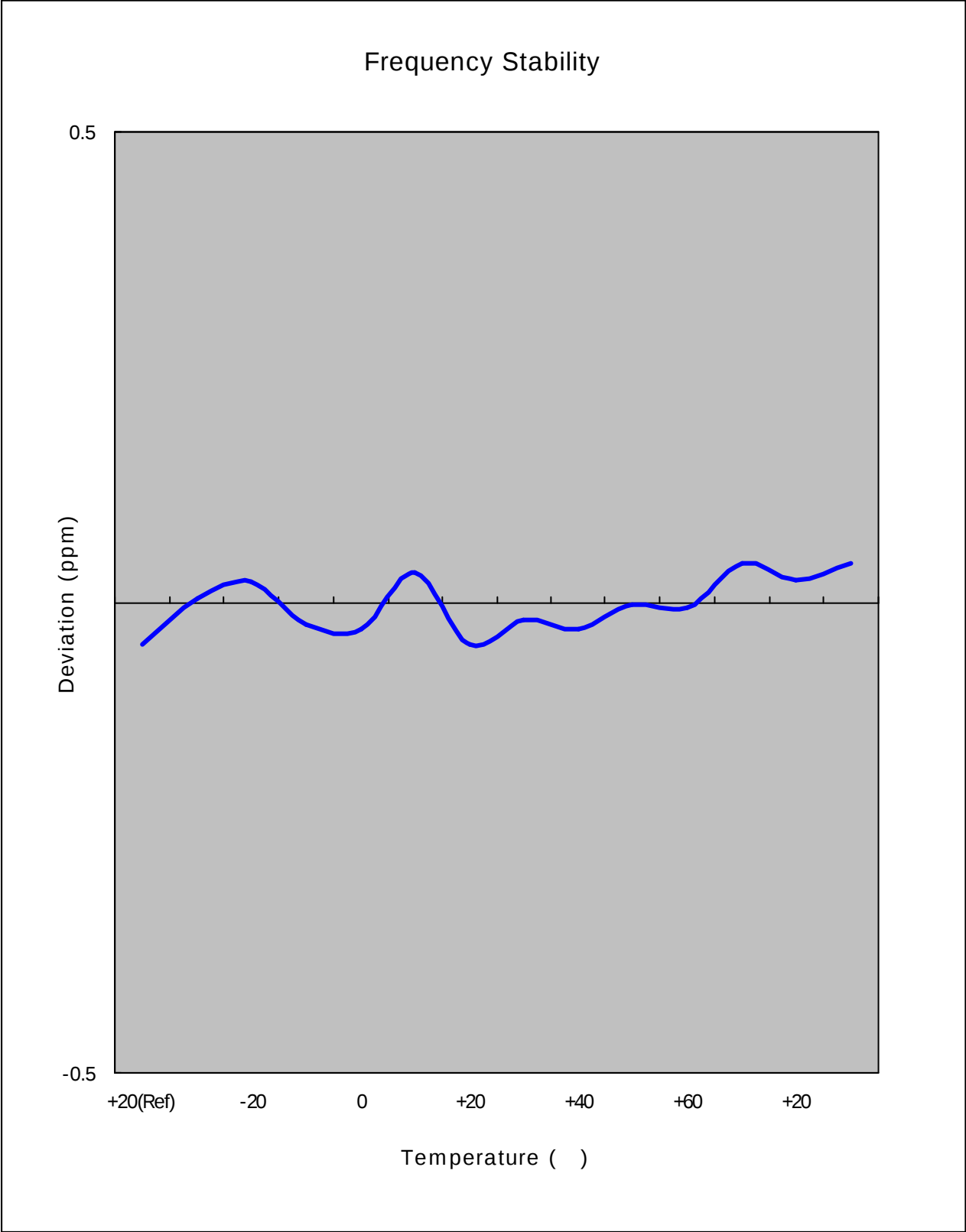
Note : The temperature is varied from -30 °C to +60 °C using an environmental chamber.

The EUT is tested down to the battery end point.

6.8.2. GSM850 Frequency Stability Graph



Zoom IN



6.8.3. GSM1900 Frequency Stability Table

Operating Frequency : 1,880,000,000 Hz

Channel : 661

Reference Voltage : 3.7VDC

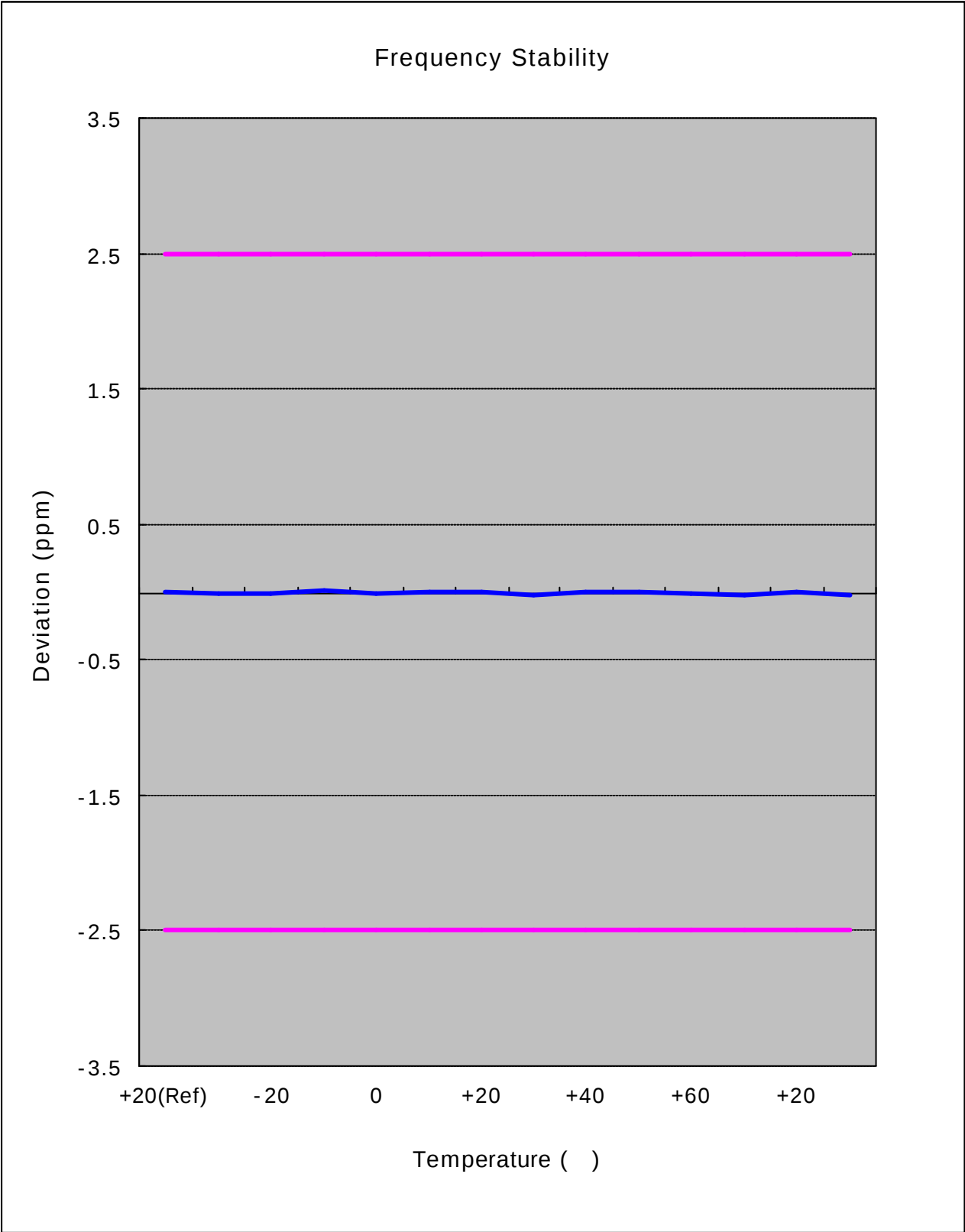
Deviation Limit : ± 0.00025 % or 2.5ppm

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency Error (Hz)	Frequency (Hz)	Deviation (%)	ppm
100%	3.70	+20(Ref)	-17.00	1,879,999,983	-0.000001	-0.009
100%		-30	36.10	1,880,000,036	0.000002	0.019
100%		-20	7.00	1,880,000,007	0.000000	0.004
100%		-10	-21.60	1,879,999,978	-0.000001	-0.011
100%		0	-28.30	1,879,999,972	-0.000002	-0.015
100%		+10	-9.00	1,879,999,991	0.000000	-0.005
100%		+20	-17.00	1,879,999,983	-0.000001	-0.009
100%		+30	-35.40	1,879,999,965	-0.000002	-0.019
100%		+40	15.00	1,880,000,015	0.000001	0.008
100%		+50	-21.50	1,879,999,979	-0.000001	-0.011
100%		+60	20.30	1,880,000,020	0.000001	0.011
85%	3.35	+20	38.20	1,880,000,038	0.000002	0.020
115%	4.26	+20	18.80	1,880,000,019	0.000001	0.010
Batt.Endpoint	3.35	+20	38.20	1,880,000,038	0.000002	0.020

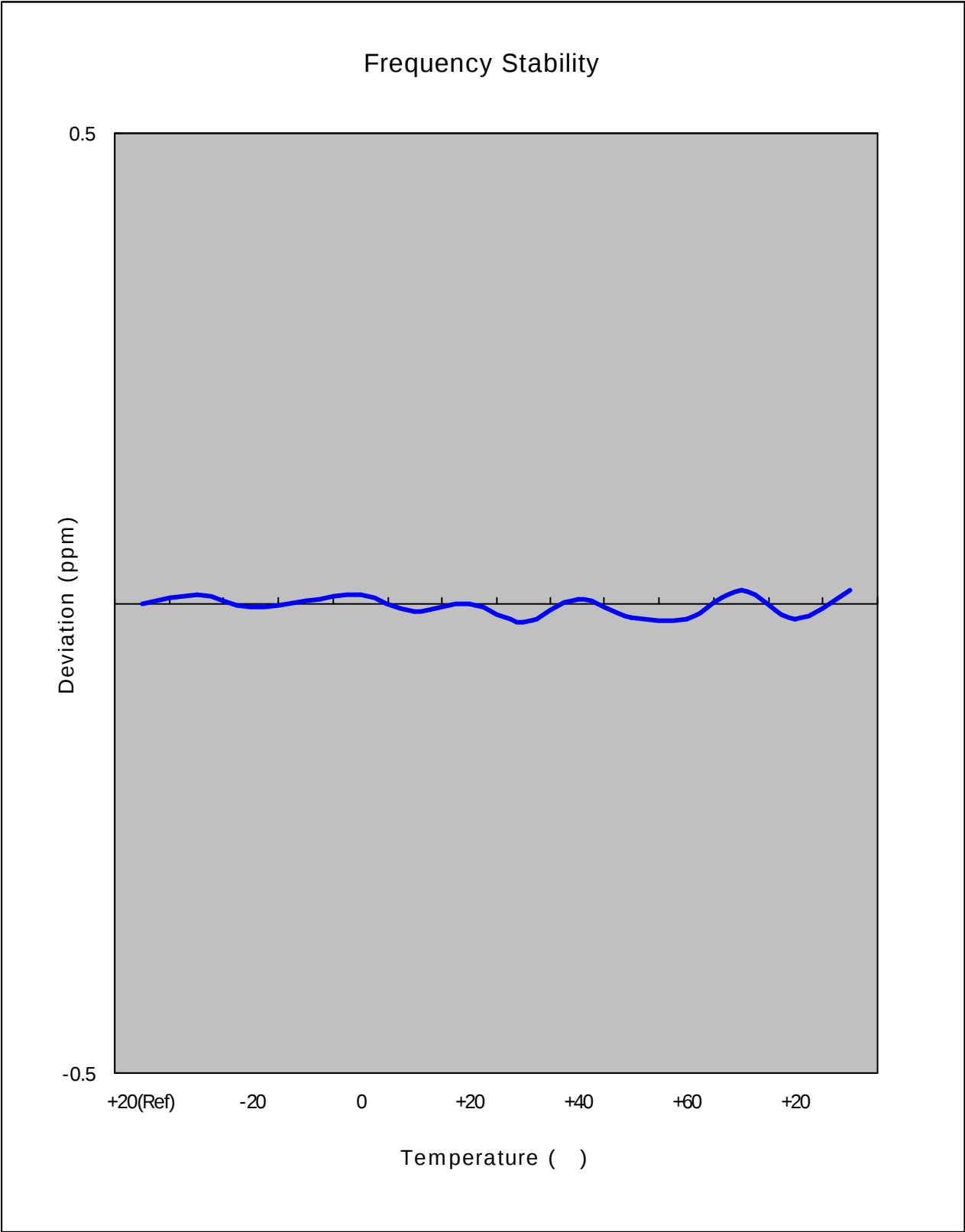
Note : The temperature is varied from -30 °C to +60 °C using an environmental chamber.

The EUT is tested down to the battery end point.

6.8.4. GSM1900 Frequency Stability Graph



Zoom IN





7. CONCLUSION

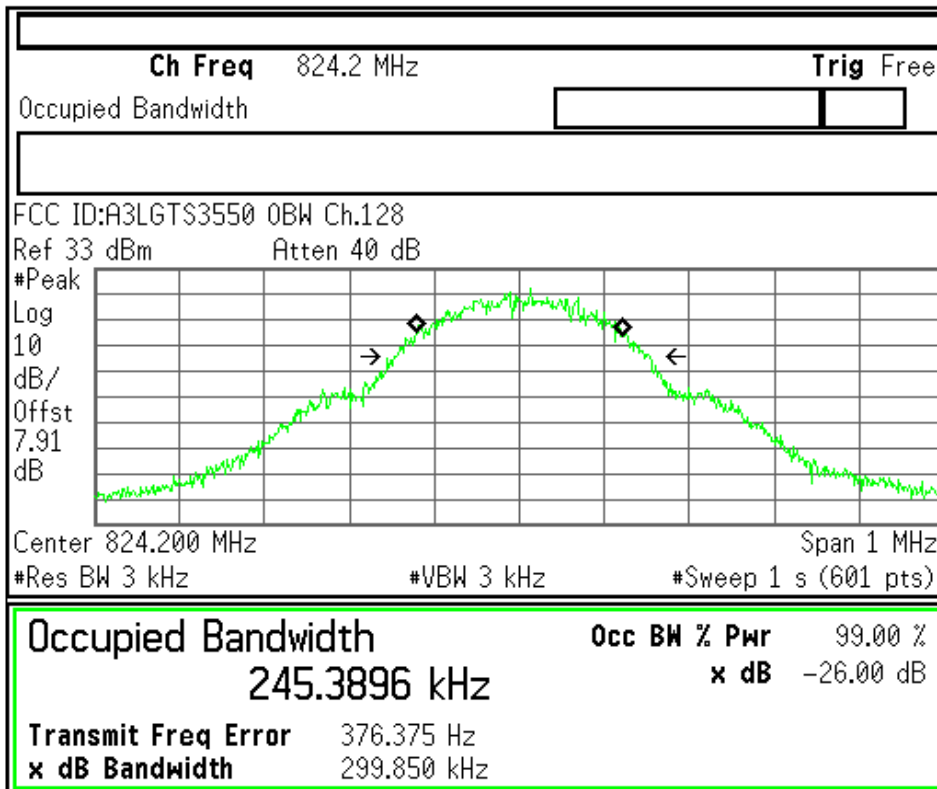
The data collected shows that the 850/1900 GSM/GPRS Phone with Bluetooth and EDGE Rx Only.
FCC ID : A3LGTS3550 complies with all the requirements of Parts 2,22,24 of the FCC Rules.

8. TEST PLOTS

GSM850

 Agilent

R T

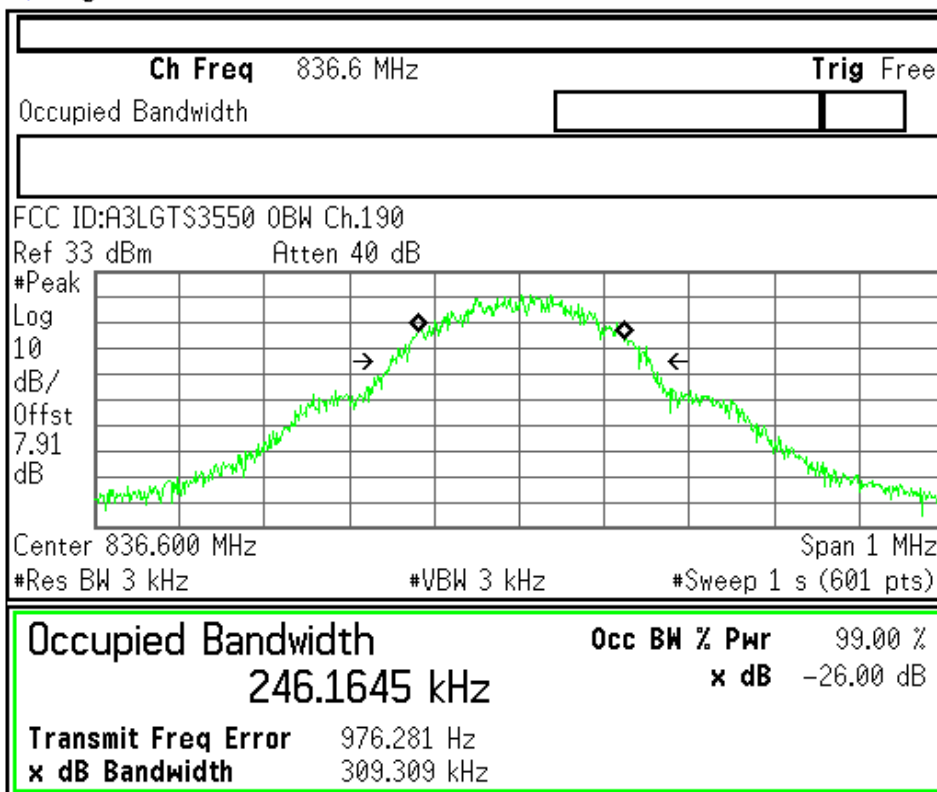


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Start Freq 823.700000 MHz
Stop Freq 824.700000 MHz
CF Step 100.000000 kHz Auto Man
Freq Offset 0.00000000 Hz
Signal Track On Off

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

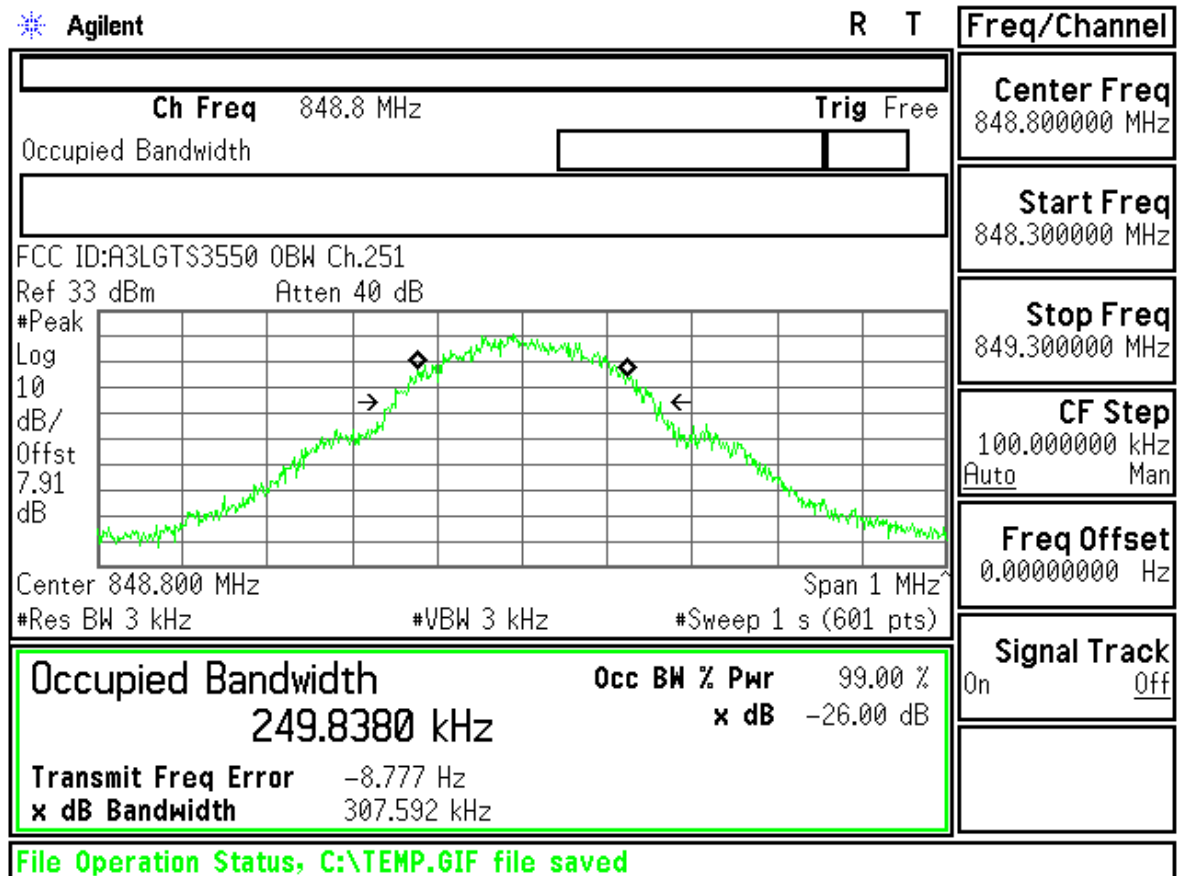
 Agilent

R T



Freq/Channel
Center Freq 836.600000 MHz
Start Freq 836.100000 MHz
Stop Freq 837.100000 MHz
CF Step 100.000000 kHz Auto Man
Freq Offset 0.00000000 Hz
Signal Track On Off

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

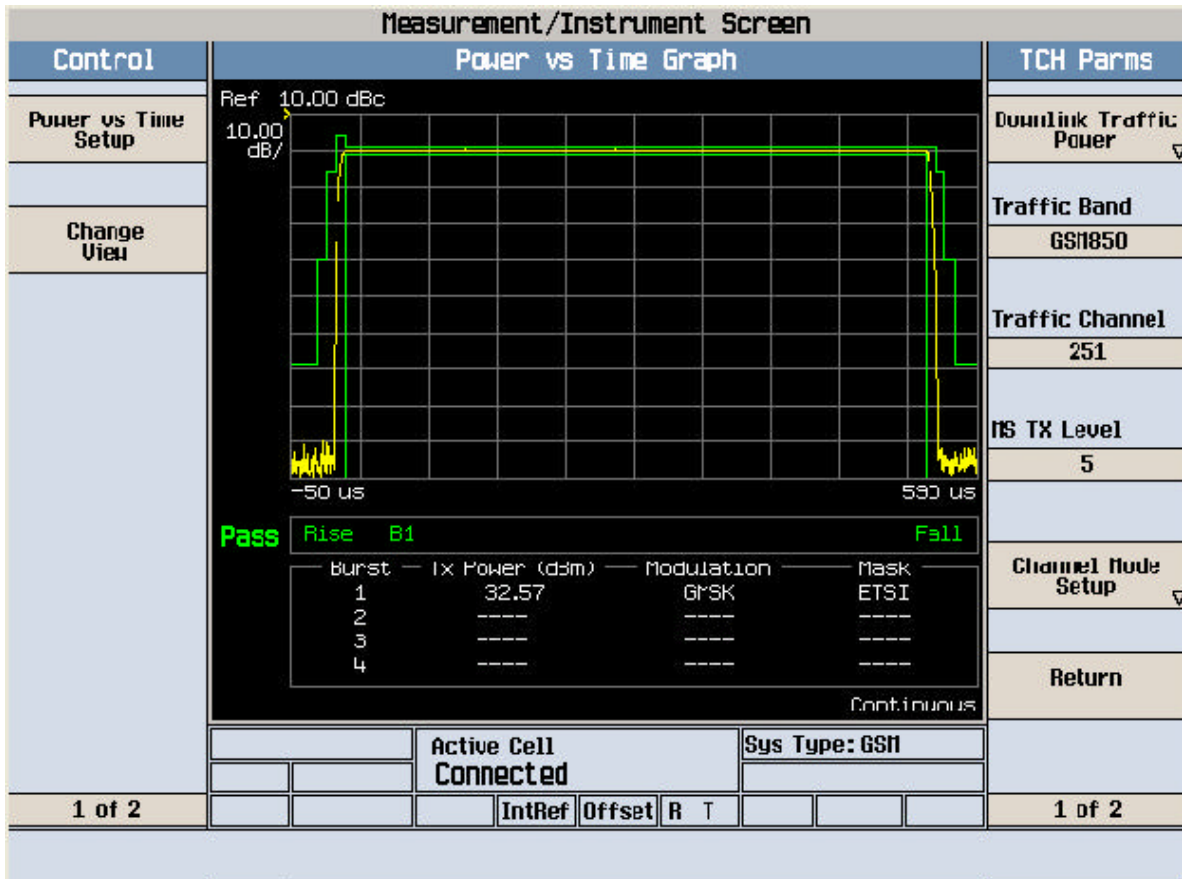
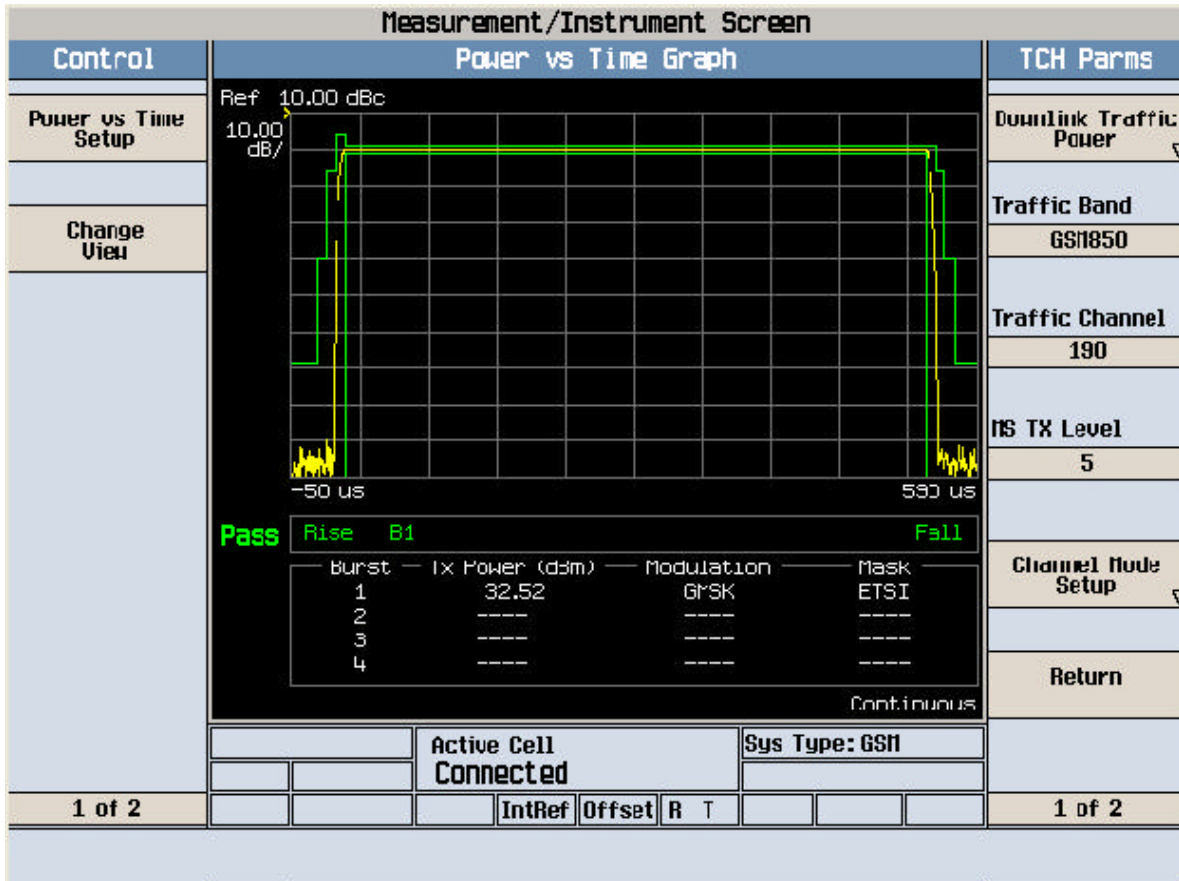


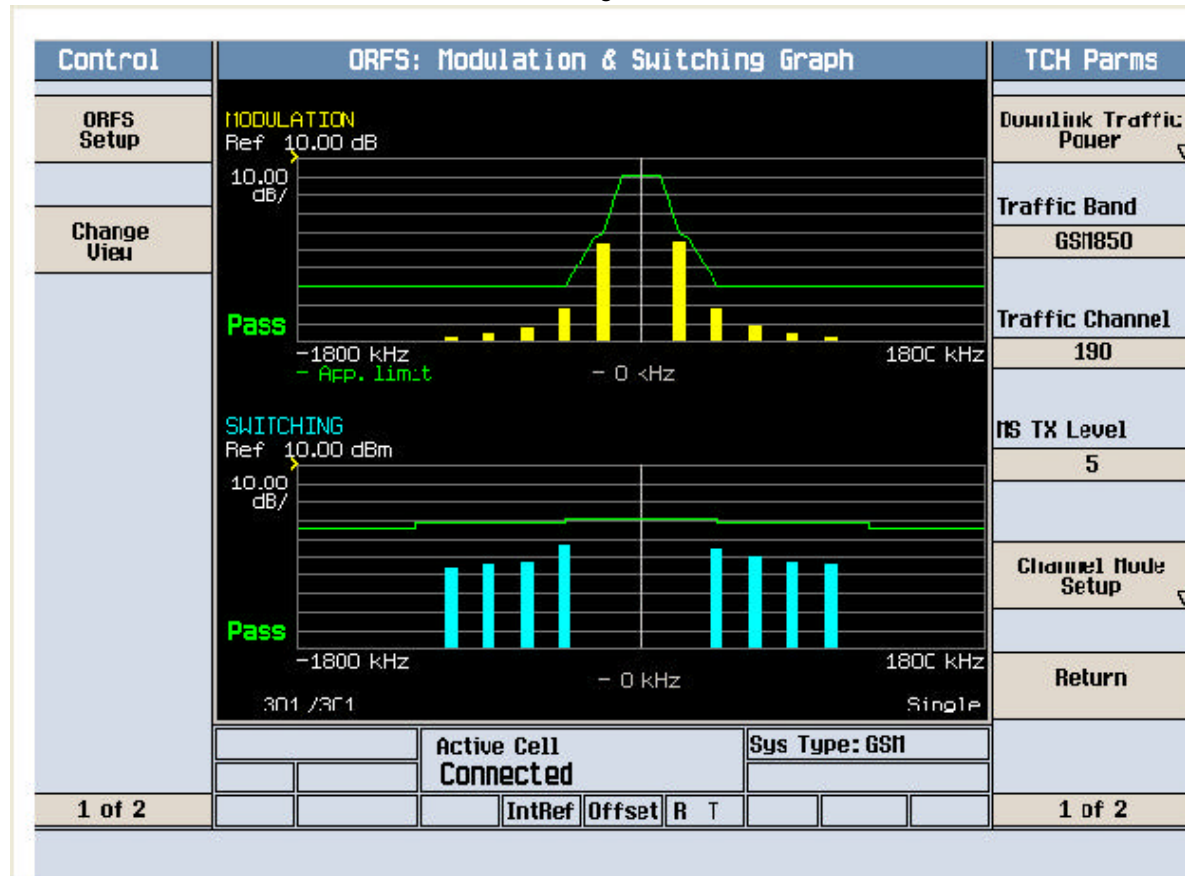
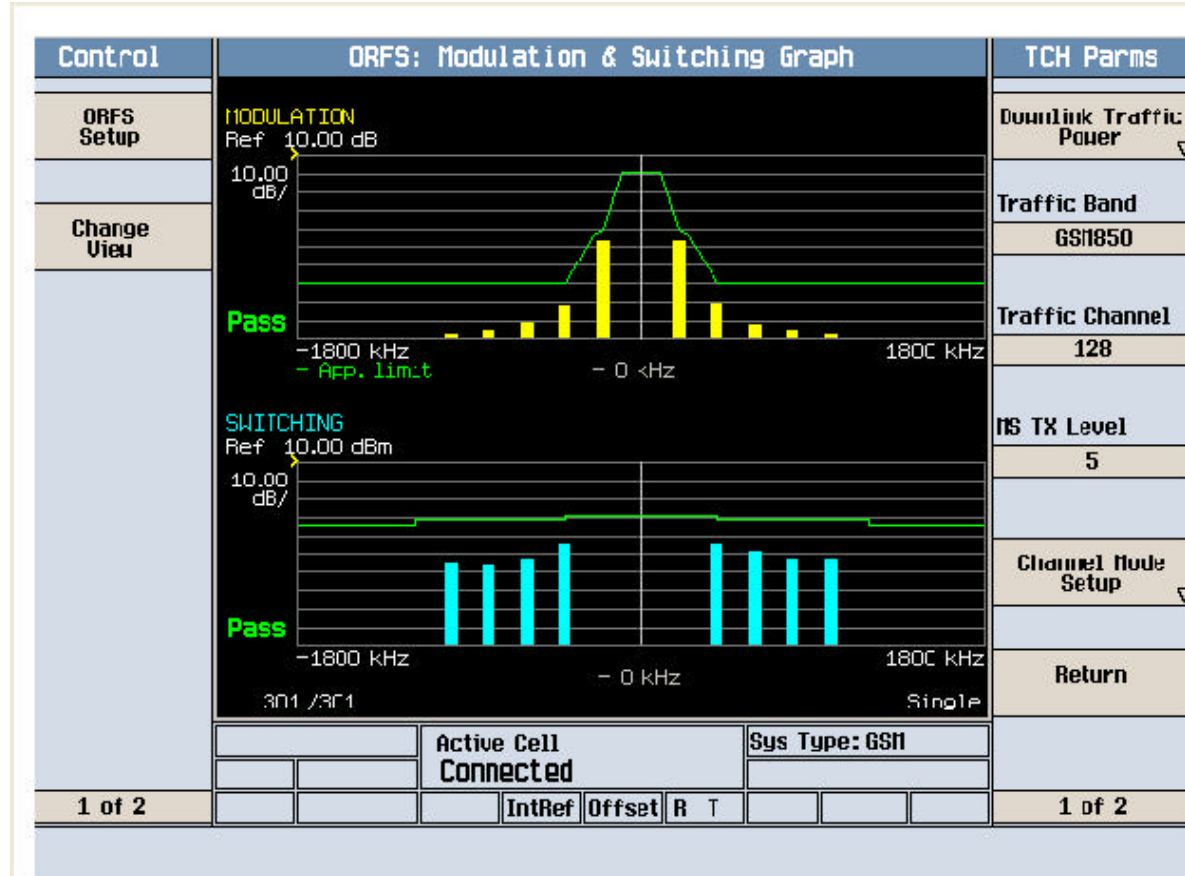
Measurement/Instrument Screen																										
Control		Transmit Power								TCH Parms																
Transmit Power Setup ▾		<table><tr><td></td><td>Burst 1</td><td>Burst 2</td><td>Burst 3</td><td>Burst 4</td></tr><tr><td>Burst Power</td><td>32.26</td><td>----</td><td>----</td><td>----</td></tr><tr><td>Estimated Carrier Power</td><td>32.26</td><td>----</td><td>----</td><td>----</td></tr></table>									Burst 1	Burst 2	Burst 3	Burst 4	Burst Power	32.26	----	----	----	Estimated Carrier Power	32.26	----	----	----	Downlink Traffic Power ▾	
	Burst 1									Burst 2	Burst 3	Burst 4														
Burst Power	32.26									----	----	----														
Estimated Carrier Power	32.26									----	----	----														
Swap Window Positions		Traffic Band																								
		GS1850																								
		Traffic Channel																								
		128																								
		MS TX Level																								
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										Channel Mode Setup ▾																
										Return																
		50 / 50								Single																
						Active Cell Connected				Sys Type: GSM																
1 of 2						IntRef Offset R T																				
										1 of 2																

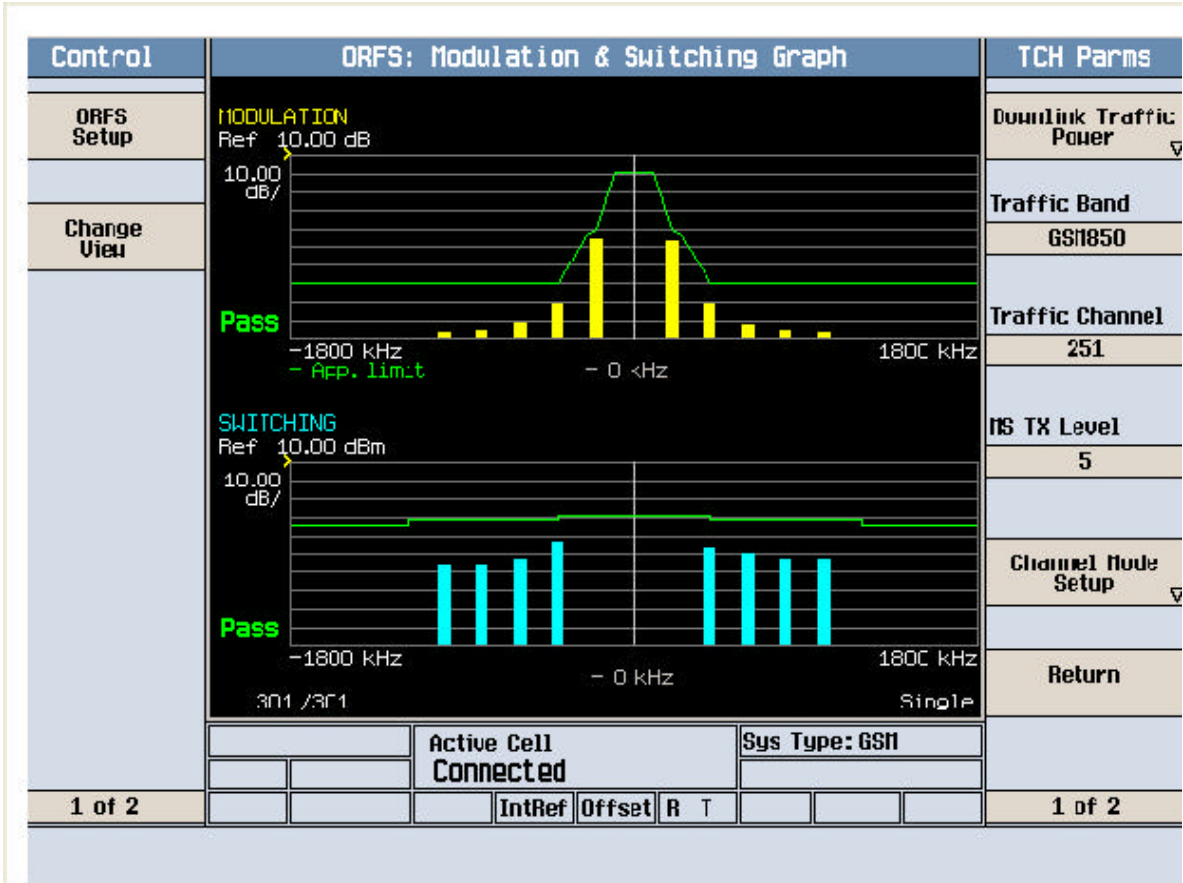
Control		Transmit Power										TCH Parms																																
Transmit Power Setup ▾		<table><tr><td></td><td>Burst 1</td><td>Burst 2</td><td>Burst 3</td><td>Burst 4</td></tr><tr><td>Burst Power</td><td>32.55</td><td>----</td><td>----</td><td>----</td></tr><tr><td>Estimated Carrier Power</td><td>32.55</td><td>----</td><td>----</td><td>----</td></tr></table>											Burst 1	Burst 2	Burst 3	Burst 4	Burst Power	32.55	----	----	----	Estimated Carrier Power	32.55	----	----	----	Downlink Traffic Power ▾																	
	Burst 1											Burst 2	Burst 3	Burst 4																														
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Traffic Band																																												
Swap Window Positions		Single										GS1850																																
		Phase & Frequency Error										Traffic Channel																																
		<table><tr><td></td><td>Peak Phase °</td><td>RMS Phase °</td><td>Frequency Hz</td></tr><tr><td>Minimum</td><td>1.64</td><td>0.62</td><td>14.64</td></tr><tr><td>Maximum</td><td>2.79</td><td>0.85</td><td>23.14</td></tr><tr><td>Average</td><td>2.10</td><td>0.75</td><td>20.03</td></tr><tr><td>Pass/Fail</td><td>Pass</td><td>Pass</td><td>Pass</td></tr></table>											Peak Phase °	RMS Phase °	Frequency Hz	Minimum	1.64	0.62	14.64	Maximum	2.79	0.85	23.14	Average	2.10	0.75	20.03	Pass/Fail	Pass	Pass	Pass	190												
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Pass/Fail	Pass	Pass	Pass																																									
MS TX Level																																												
5																																												
		50 / 50										Channel Mode Setup ▾																																
		Single										Return																																
1 of 2		<table><tr><td colspan="2"></td><td colspan="4">Active Cell Connected</td><td colspan="4">Sys Type: GSM</td></tr><tr><td></td><td></td><td colspan="4"></td><td colspan="4"></td></tr><tr><td></td><td></td><td></td><td>IntRef</td><td>Offset</td><td>R</td><td>T</td><td></td><td></td><td></td></tr></table>												Active Cell Connected				Sys Type: GSM																	IntRef	Offset	R	T				1 of 2		
		Active Cell Connected				Sys Type: GSM																																						
			IntRef	Offset	R	T																																						

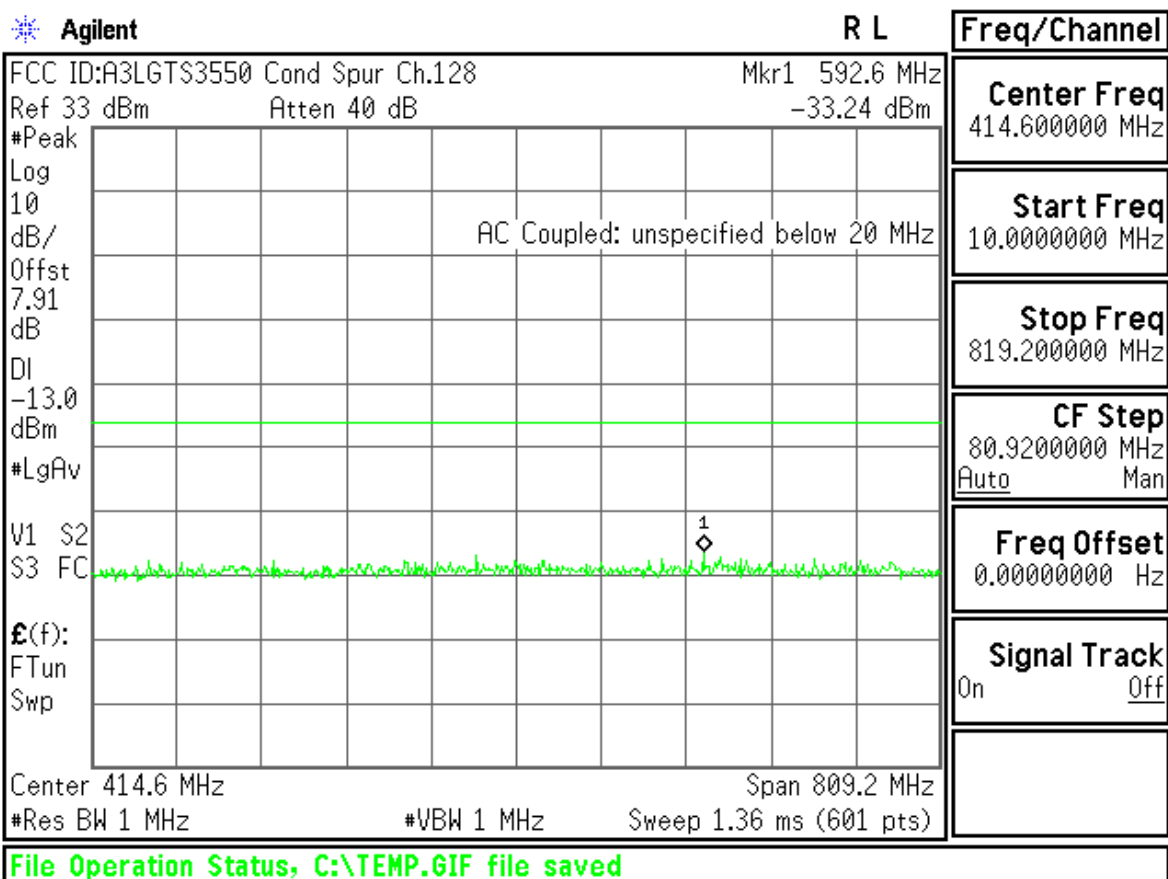
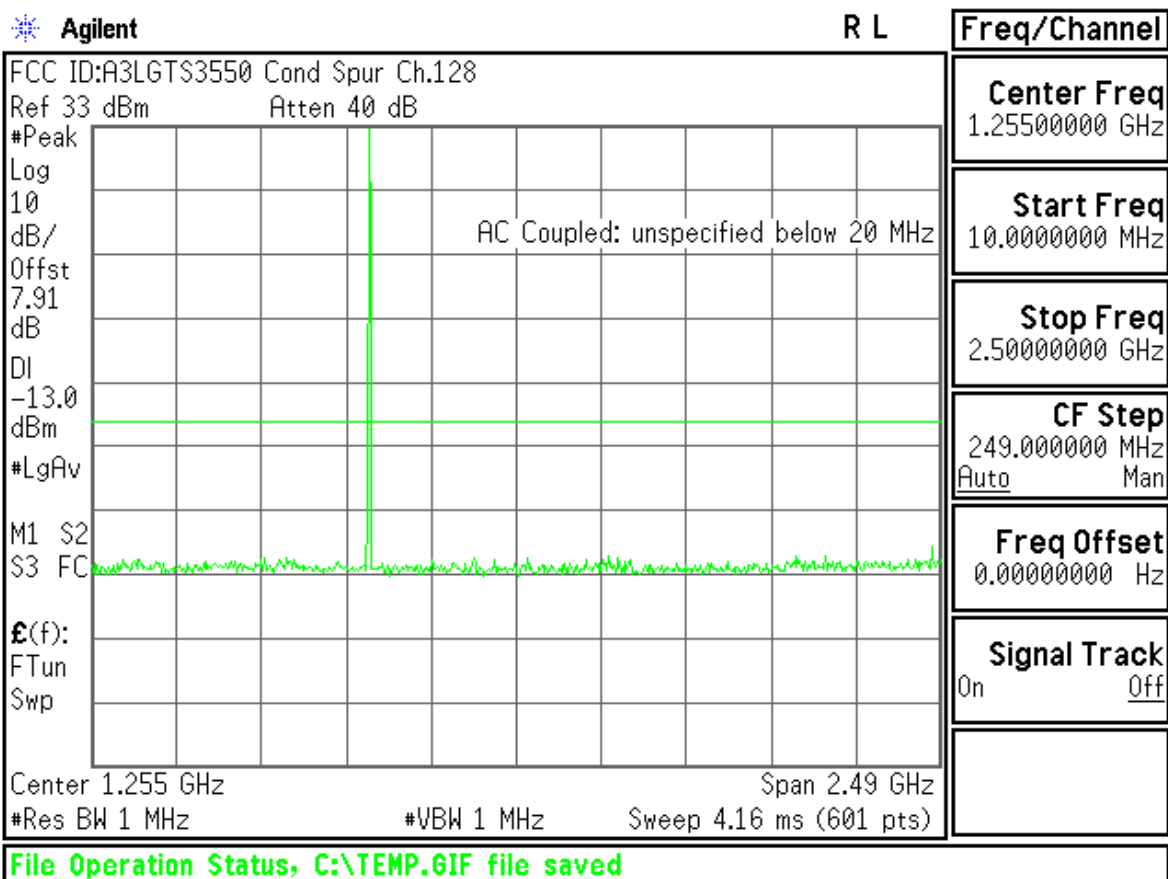
Control	Transmit Power								TCH Parms																									
Transmit Power Setup	<table border="1"> <thead> <tr> <th></th> <th>Burst 1</th> <th>Burst 2</th> <th>Burst 3</th> <th>Burst 4</th> </tr> </thead> <tbody> <tr> <td>Burst Power</td> <td>32.60</td> <td>----</td> <td>----</td> <td>----</td> </tr> <tr> <td>Estimated Carrier Power</td> <td>32.60</td> <td>----</td> <td>----</td> <td>----</td> </tr> </tbody> </table>									Burst 1	Burst 2	Burst 3	Burst 4	Burst Power	32.60	----	----	----	Estimated Carrier Power	32.60	----	----	----	Downlink Traffic Power										
									Burst 1	Burst 2	Burst 3	Burst 4																						
Burst Power									32.60	----	----	----																						
Estimated Carrier Power									32.60	----	----	----																						
	Traffic Band																																	
	GS1850																																	
	Traffic Channel																																	
	251																																	
	MS TX Level																																	
	5																																	
Swap Window Positions	<table border="1"> <thead> <tr> <th colspan="4">Phase & Frequency Error</th> </tr> <tr> <th></th> <th>Peak Phase °</th> <th>RMS Phase °</th> <th>Frequency Hz</th> </tr> </thead> <tbody> <tr> <td>Minimum</td> <td>1.58</td> <td>0.65</td> <td>22.84</td> </tr> <tr> <td>Maximum</td> <td>2.74</td> <td>0.88</td> <td>31.75</td> </tr> <tr> <td>Average</td> <td>2.07</td> <td>0.77</td> <td>27.31</td> </tr> <tr> <td>Pass/Fail</td> <td>Pass</td> <td>Pass</td> <td>Pass</td> </tr> </tbody> </table>								Phase & Frequency Error					Peak Phase °	RMS Phase °	Frequency Hz	Minimum	1.58	0.65	22.84	Maximum	2.74	0.88	31.75	Average	2.07	0.77	27.31	Pass/Fail	Pass	Pass	Pass	Channel Mode Setup	
Phase & Frequency Error																																		
									Peak Phase °	RMS Phase °	Frequency Hz																							
Minimum									1.58	0.65	22.84																							
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Pass/Fail	Pass	Pass	Pass																															
	Return																																	
	1 of 2																																	
	50 / 50 Active Cell Connected Sys Type: GSM																																	
1 of 2				IntRef	Offset	R	T			1 of 2																								

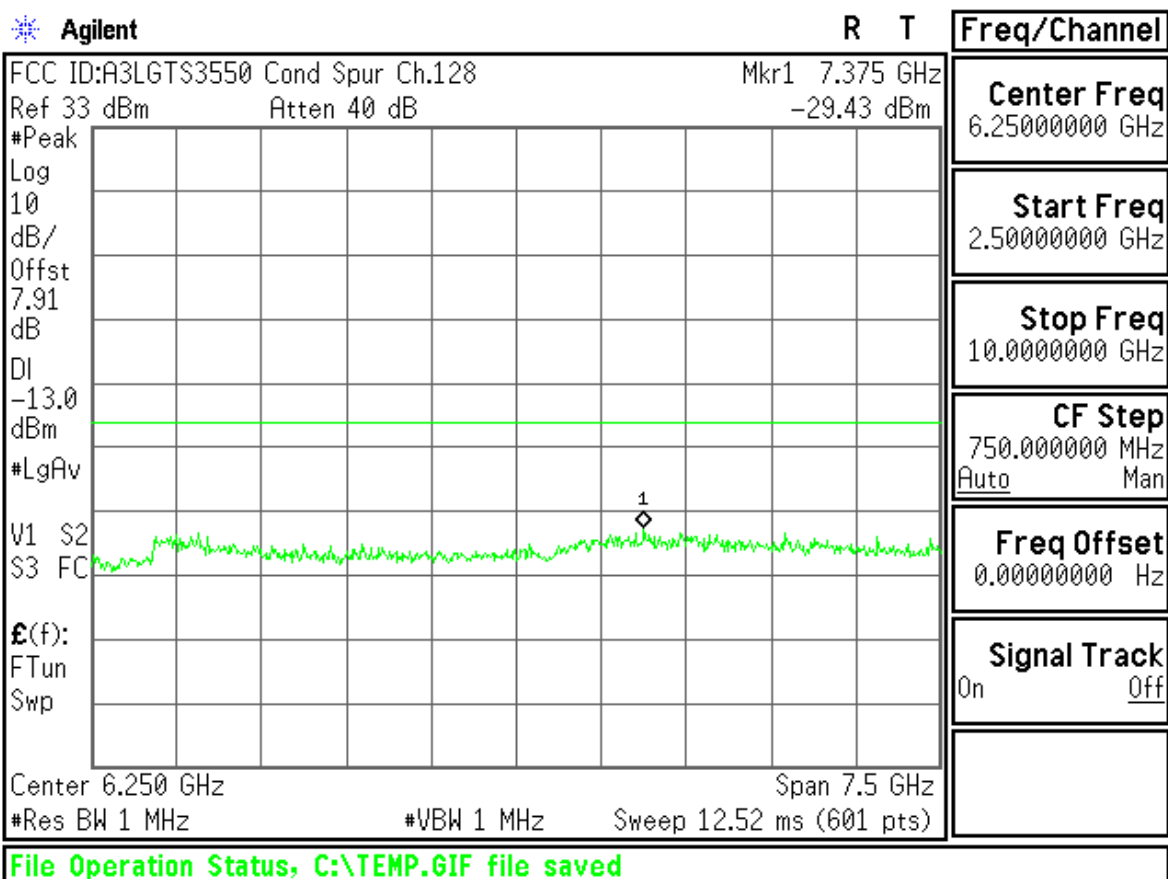
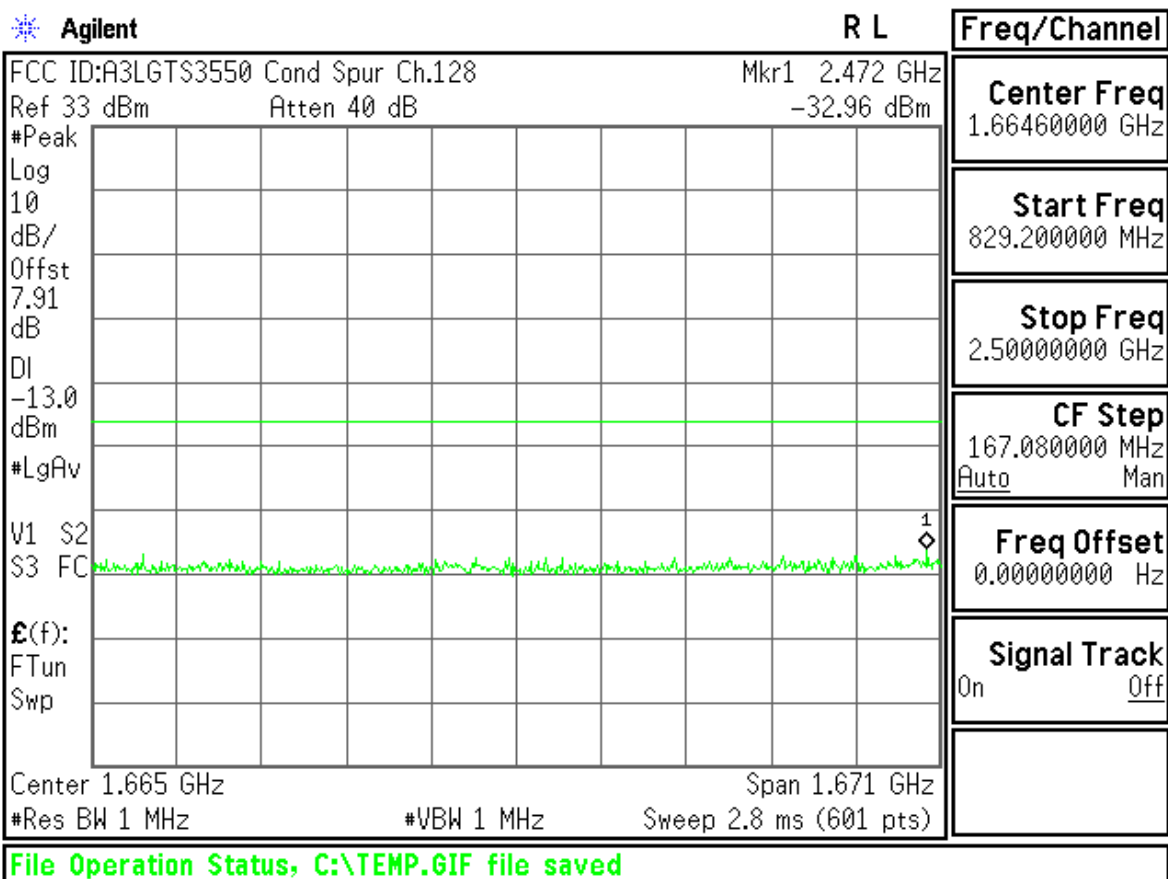
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Burst									TX Power (dBm)	Modulation	Mask																			
1									32.25	GMSK	ETSI																			
2									----	----	----																			
3	----	----	----																											
4	----	----	----																											
	Traffic Band																													
	GS1850																													
Change View	Traffic Channel																													
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1 of 2				IntRef	Offset	R	T			1 of 2																				

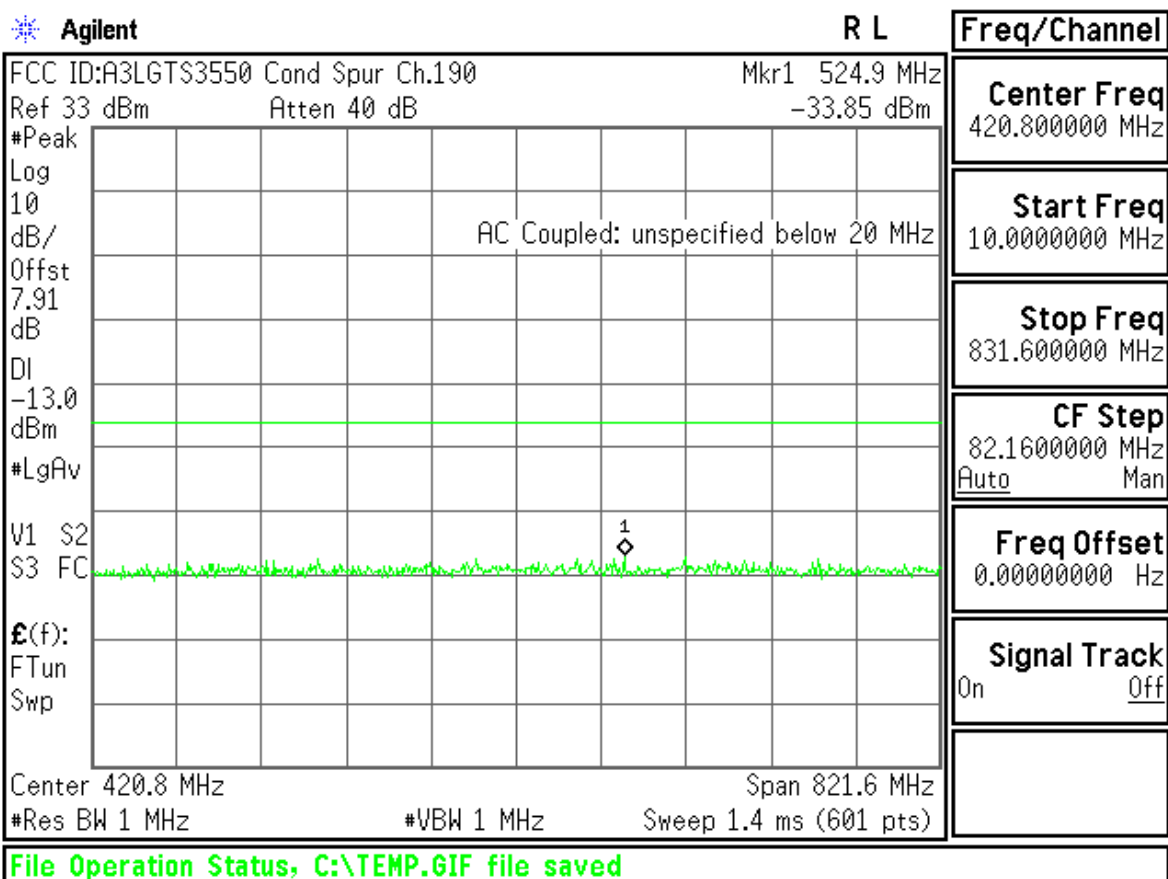
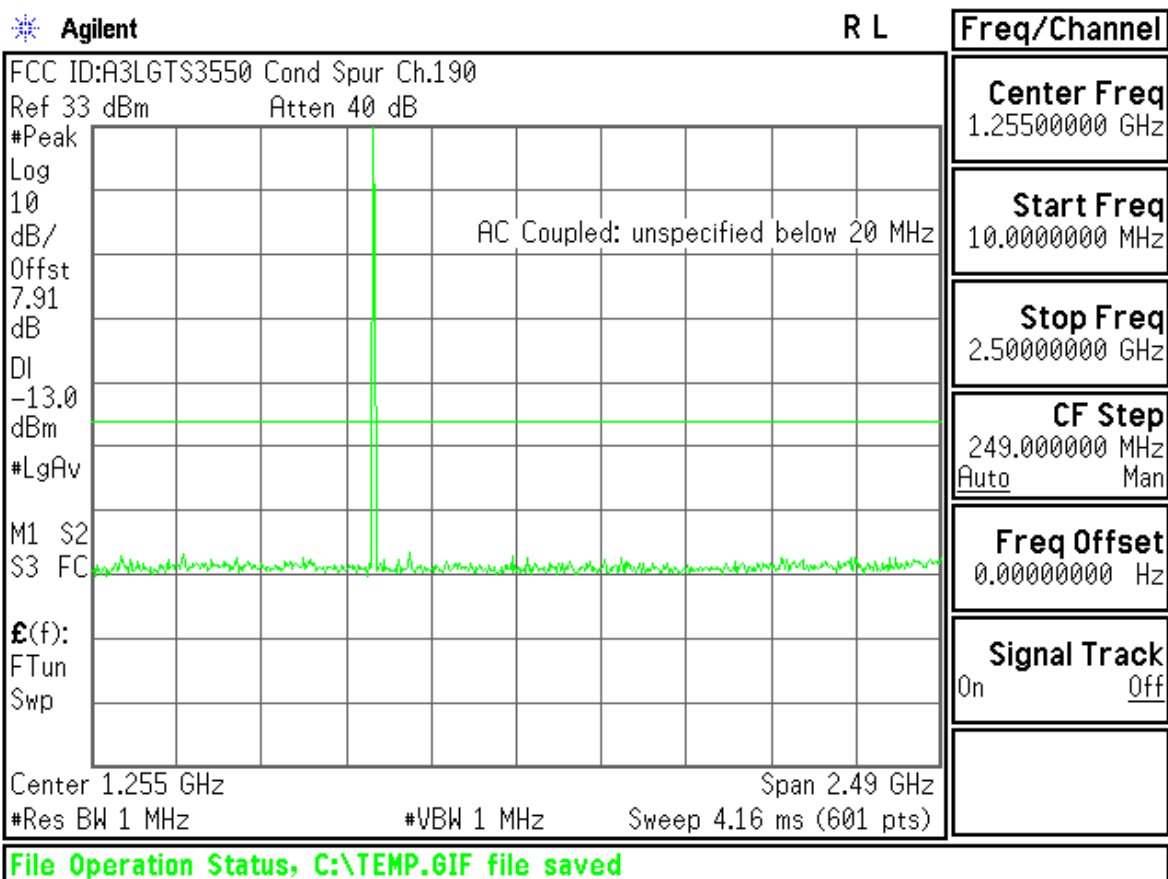


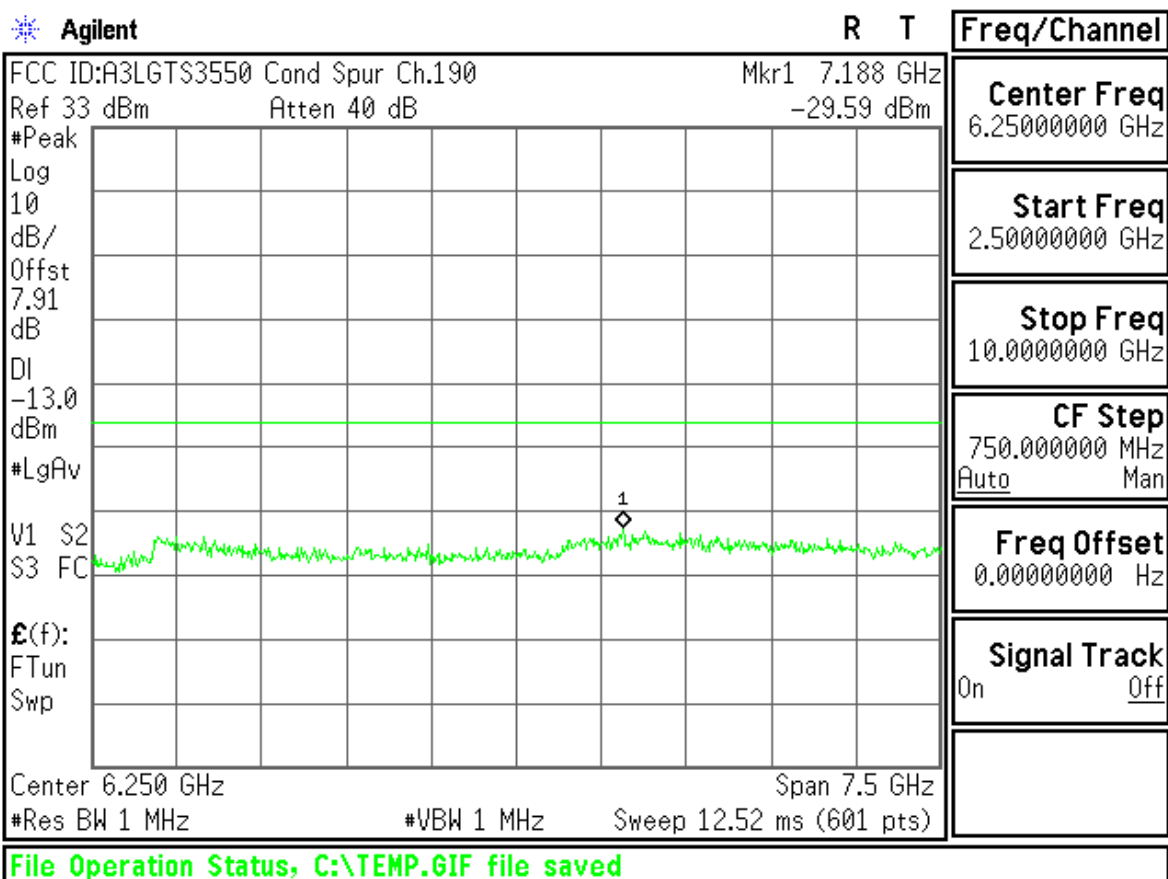
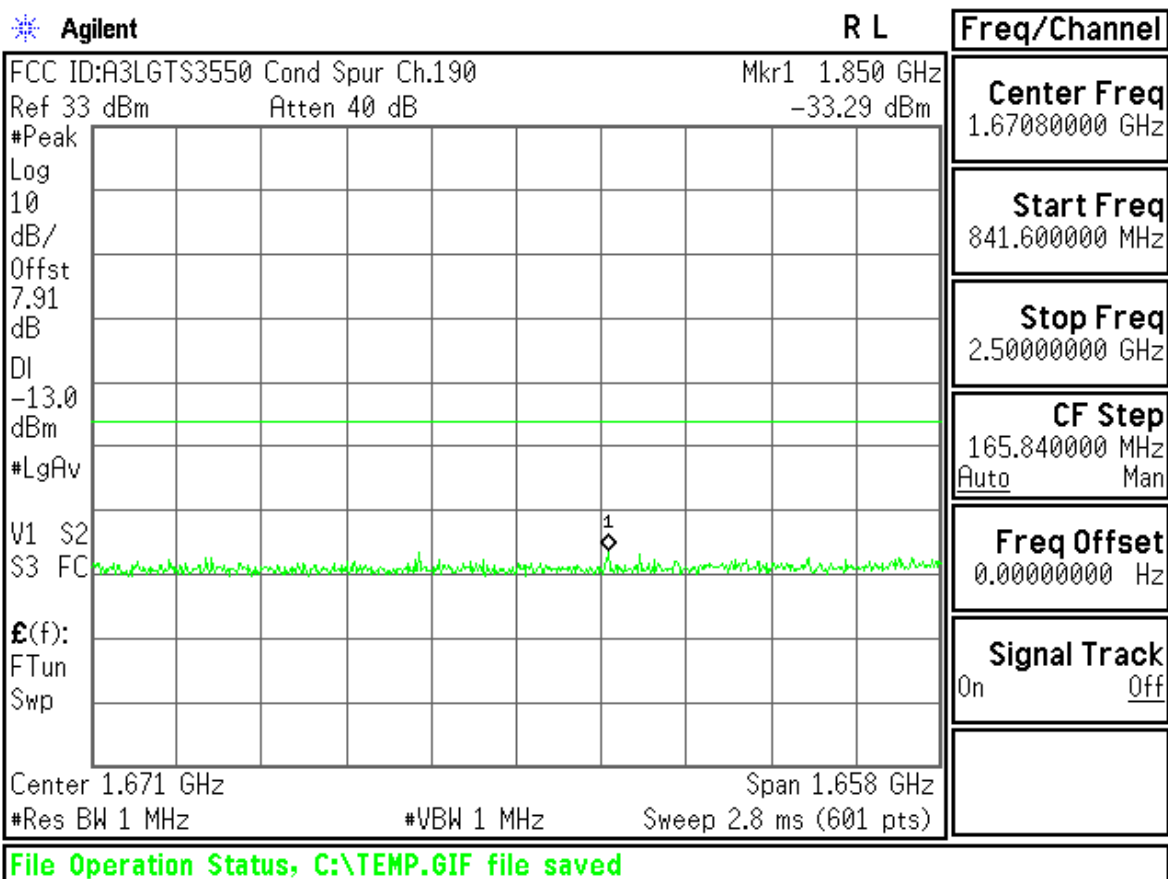


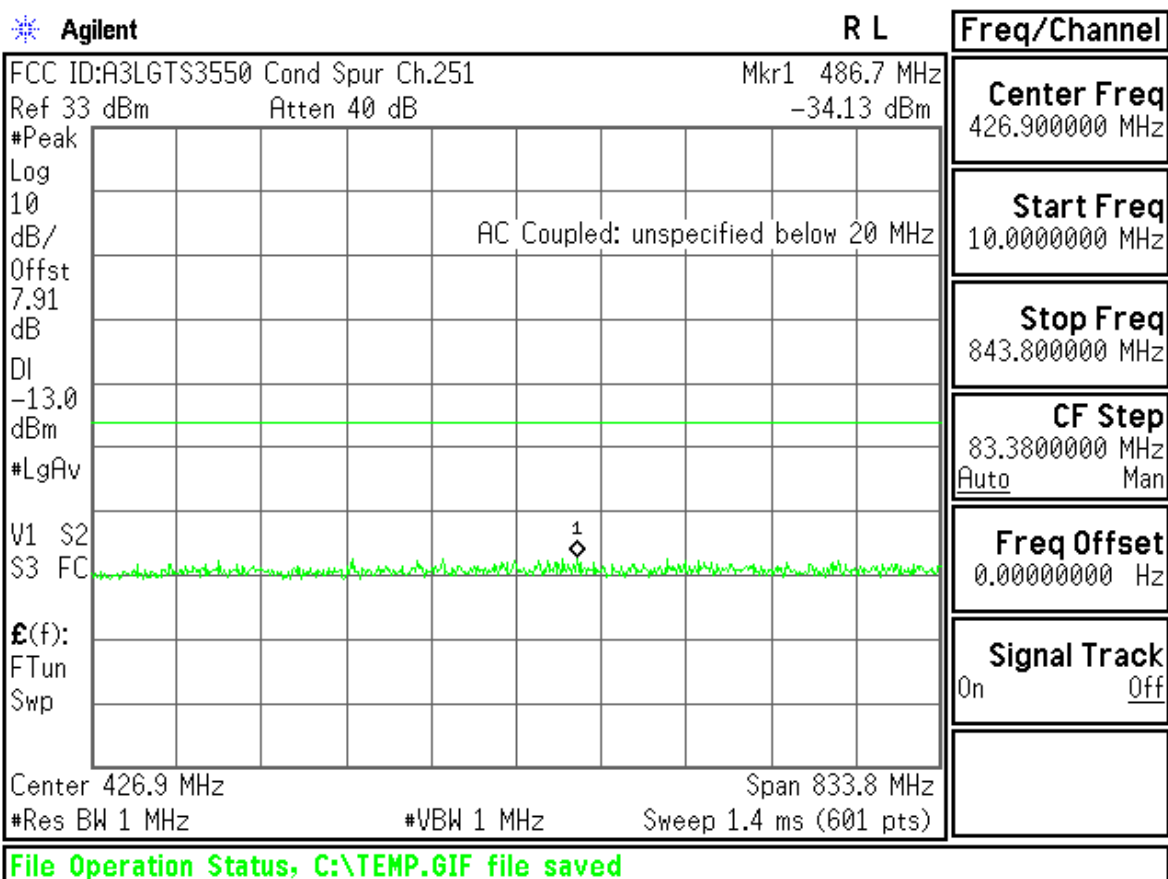
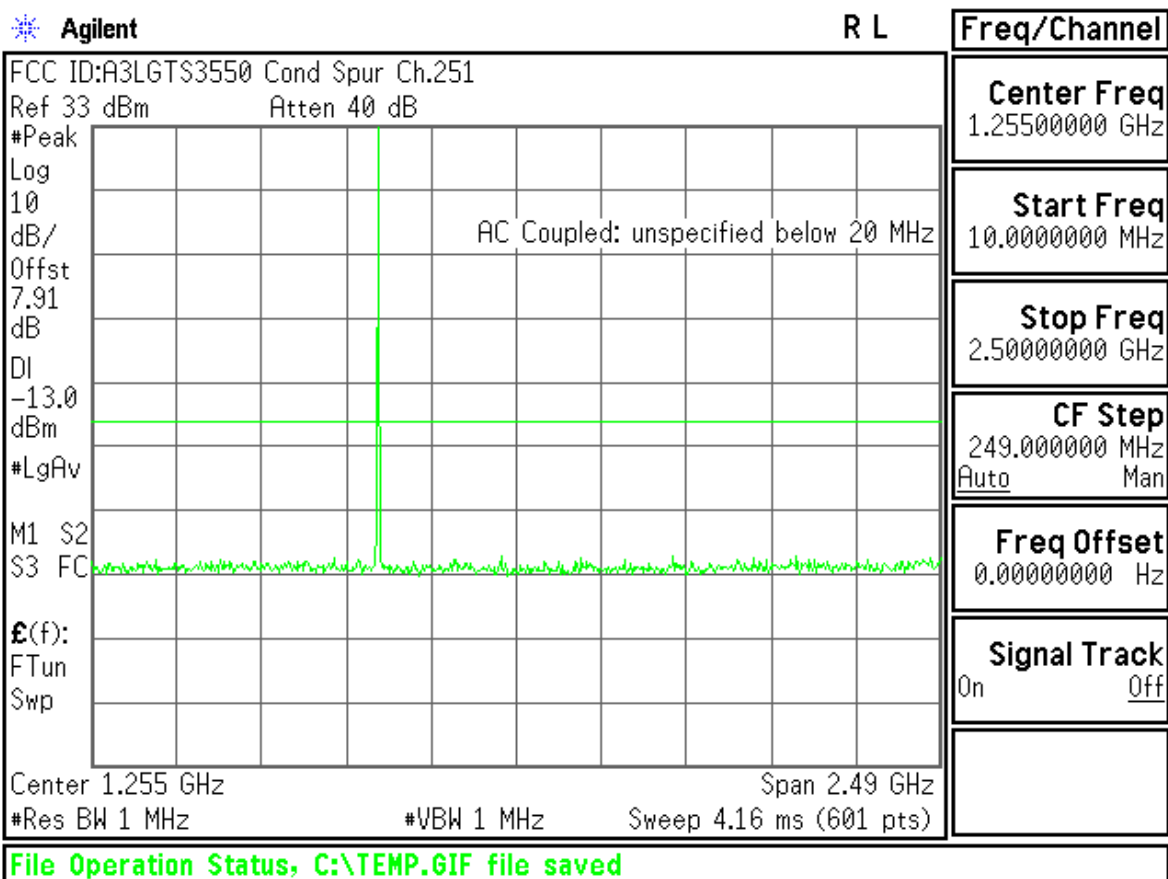


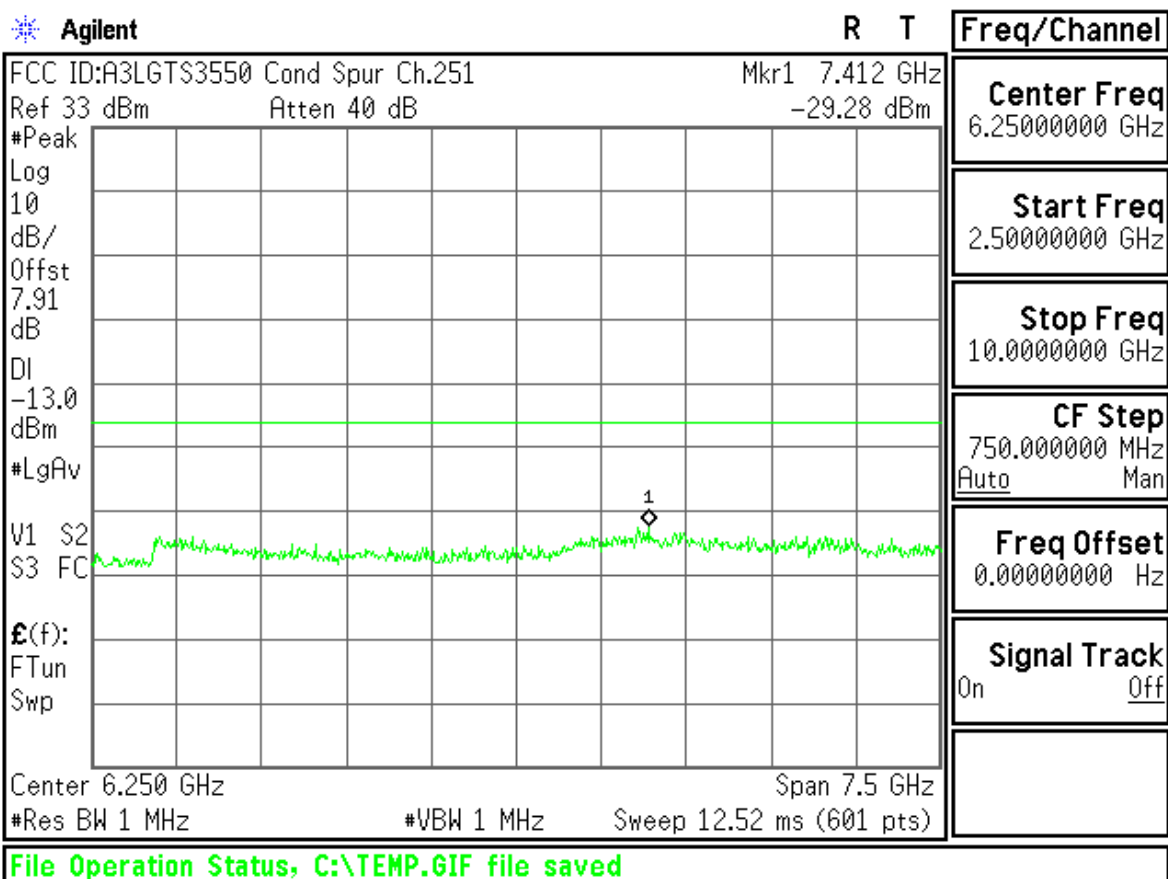
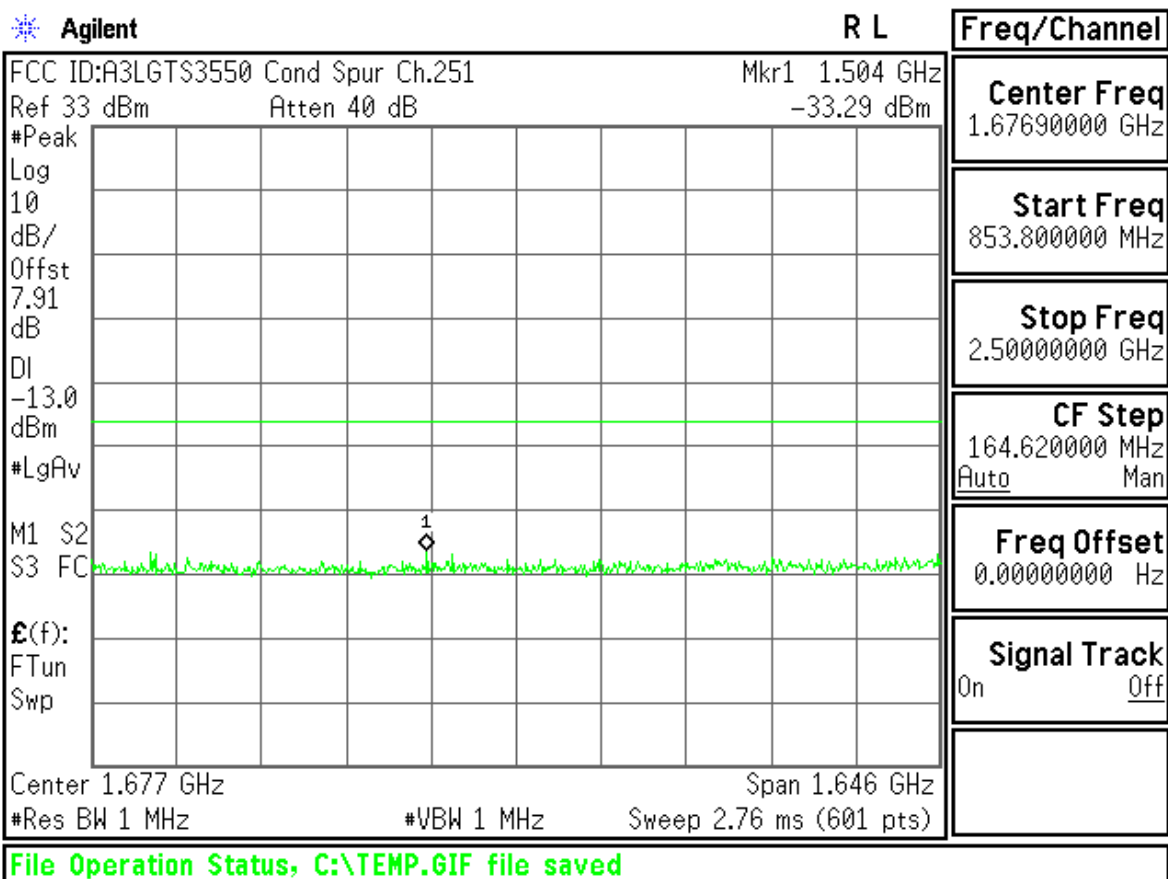


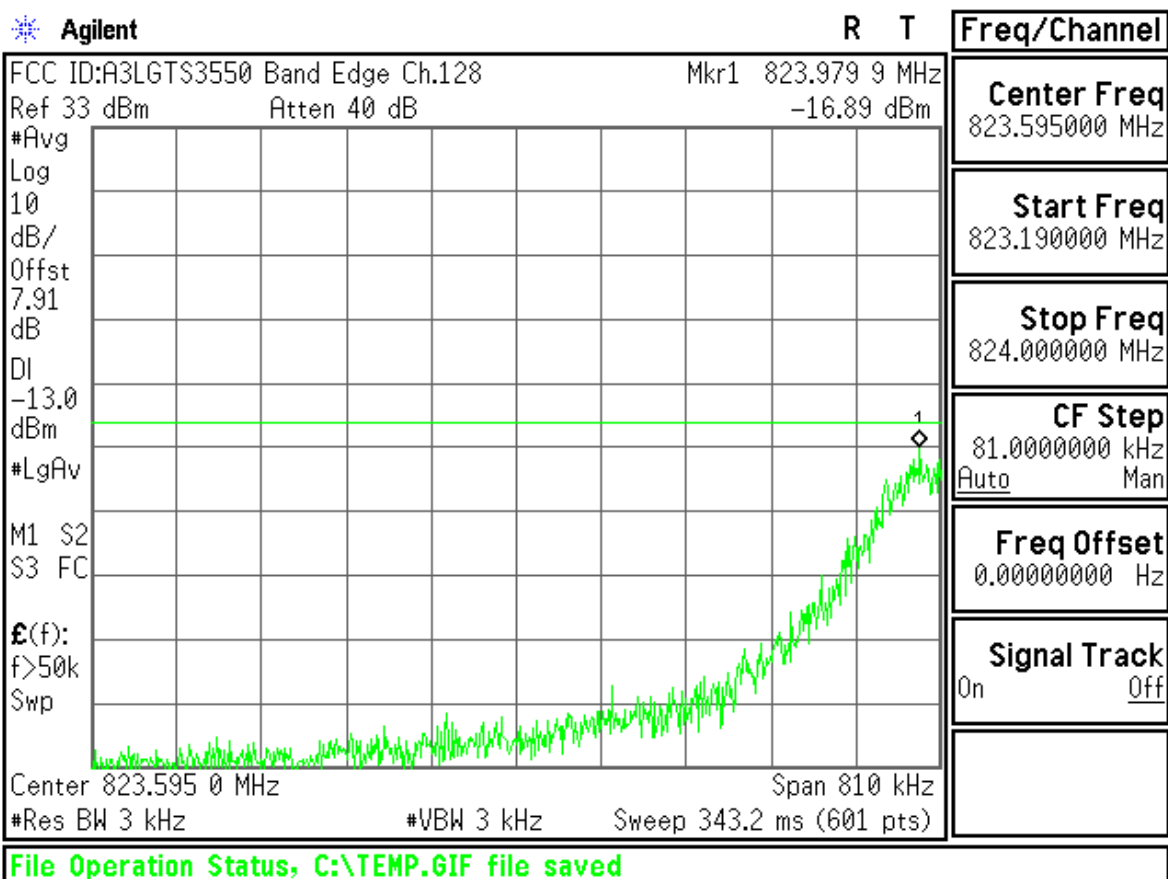
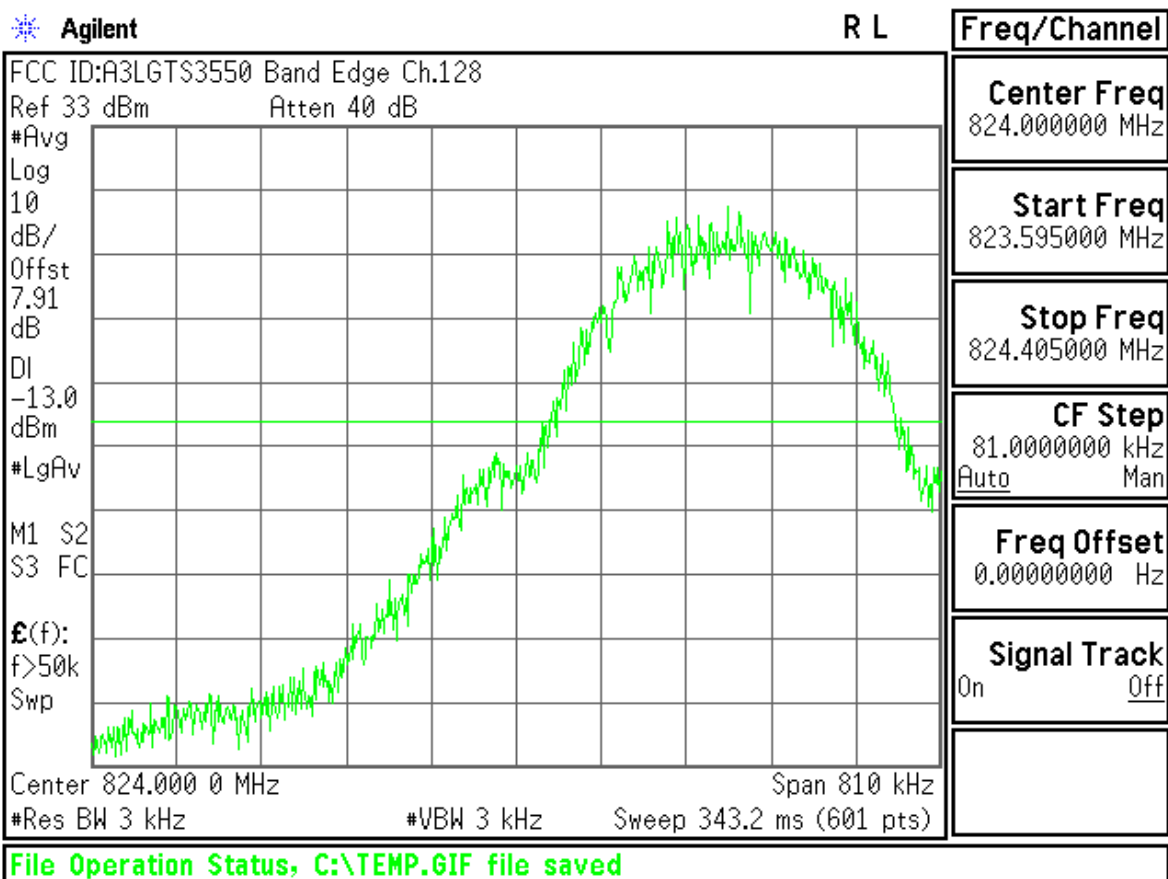












Agilent

R L

Freq/Channel

FCC ID:A3LGT3550 Band Edge Ch.251

Ref 33 dBm

Atten 40 dB

#Avg

Log

10

dB/

Offst

7.91

dB

DI

-13.0

dBm

#LgAv

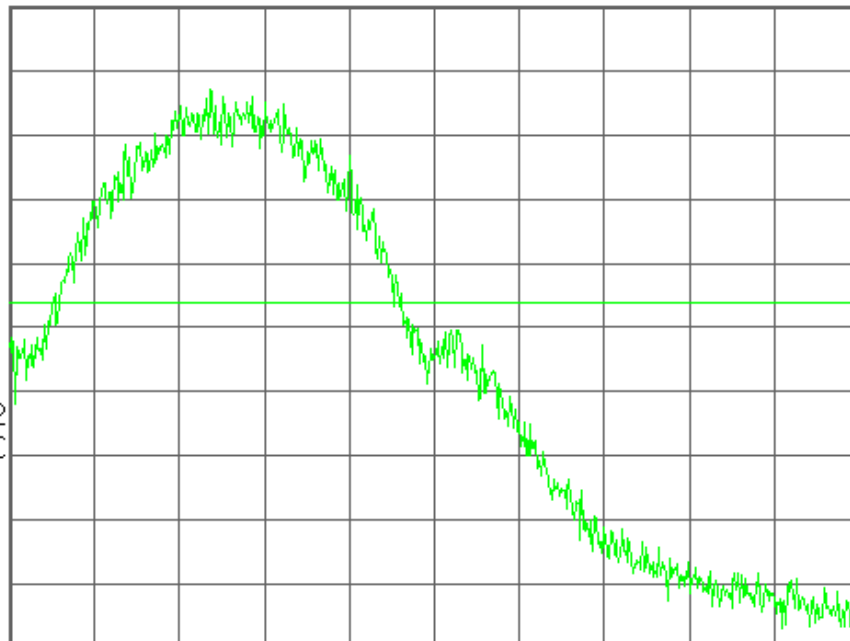
M1 S2

S3 FC

£(f):

f>50k

Swp



Center 849.000 0 MHz

Span 810 kHz

#Res BW 3 kHz

#VBW 3 kHz

Sweep 343.2 ms (601 pts)

Center Freq
849.000000 MHz

Start Freq
848.595000 MHz

Stop Freq
849.405000 MHz

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:A3LGT3550 Band Edge Ch.251

Mkr1 849.014 7 MHz

Ref 33 dBm

Atten 40 dB

-17.15 dBm

#Avg

Log

10

dB/

Offst

7.91

dB

DI

-13.0

dBm

#LgAv

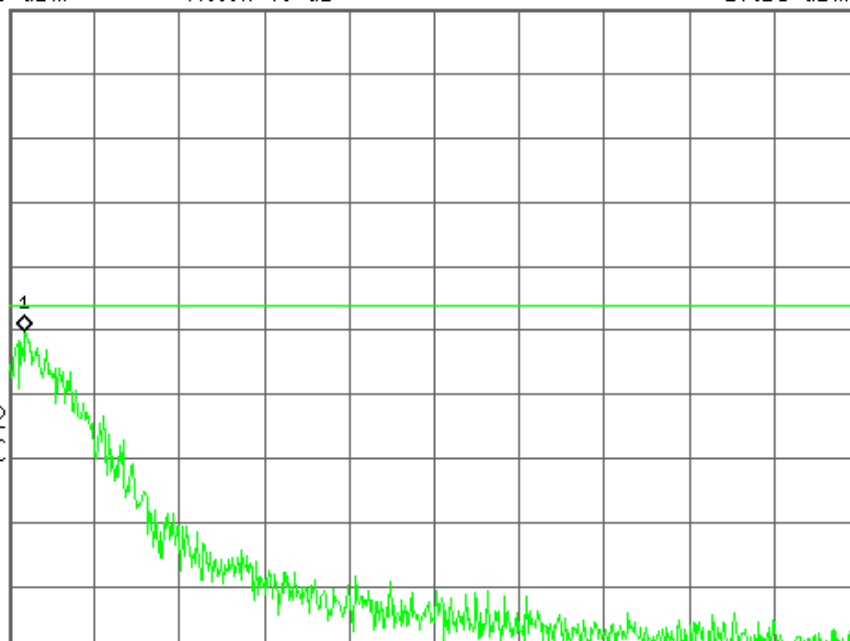
M1 S2

S3 FC

£(f):

f>50k

Swp



Center 849.405 0 MHz

Span 810 kHz

#Res BW 3 kHz

#VBW 3 kHz

Sweep 343.2 ms (601 pts)

Center Freq
849.405000 MHz

Start Freq
849.000000 MHz

Stop Freq
849.810000 MHz

CF Step
81.0000000 kHz
Auto Man

Freq Offset
0.00000000 Hz

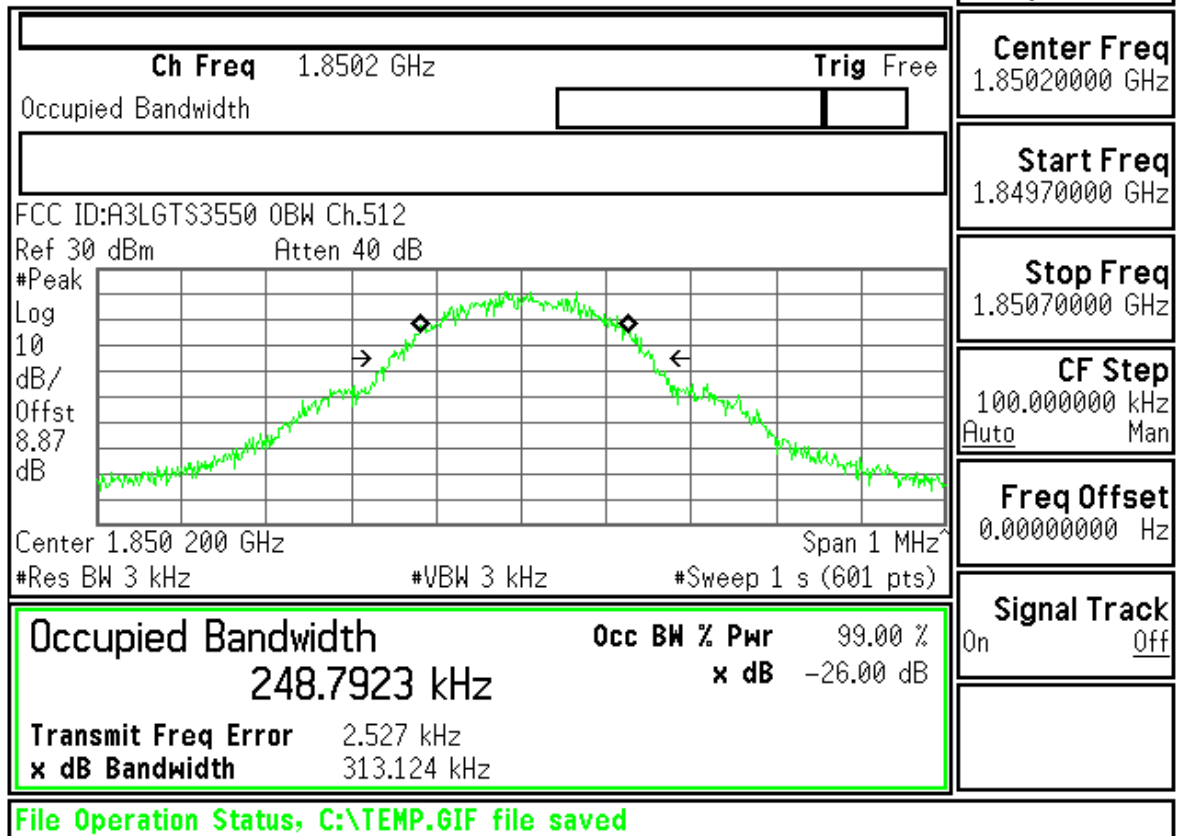
Signal Track
On Off

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

GSM1900

 Agilent

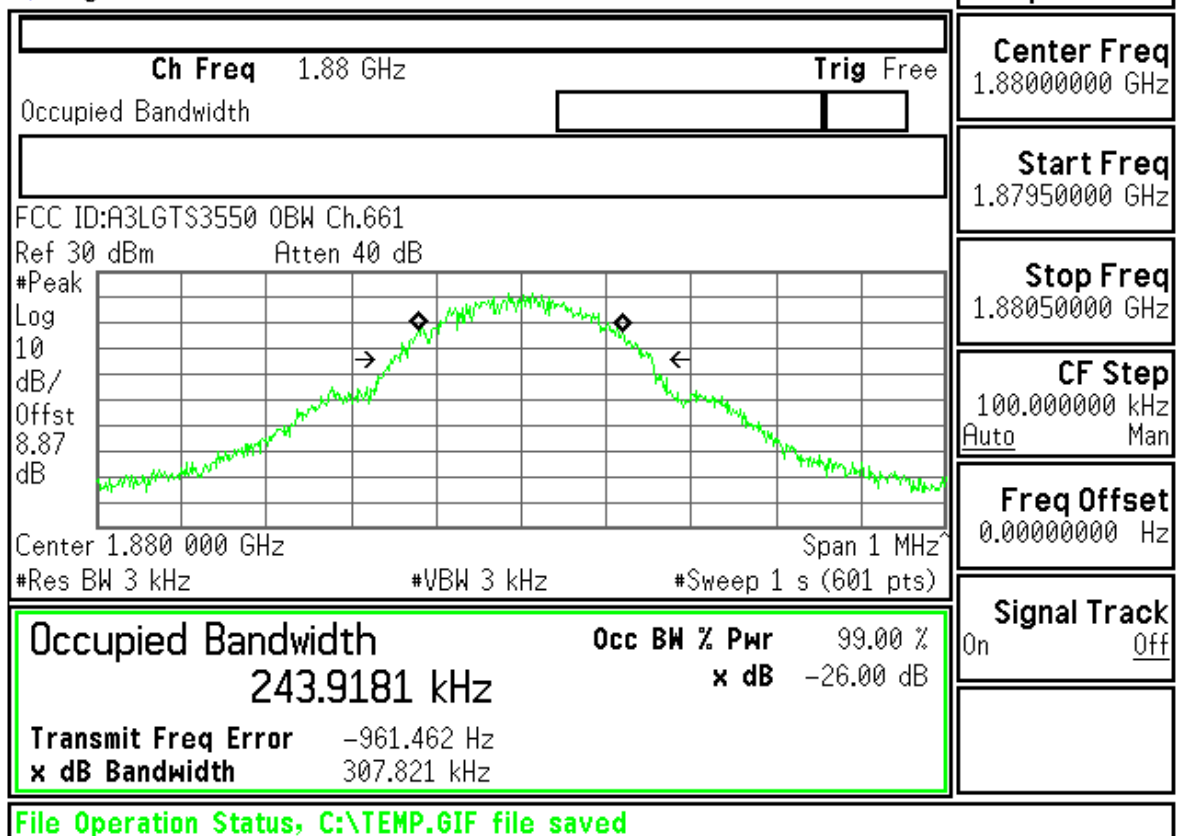
R T



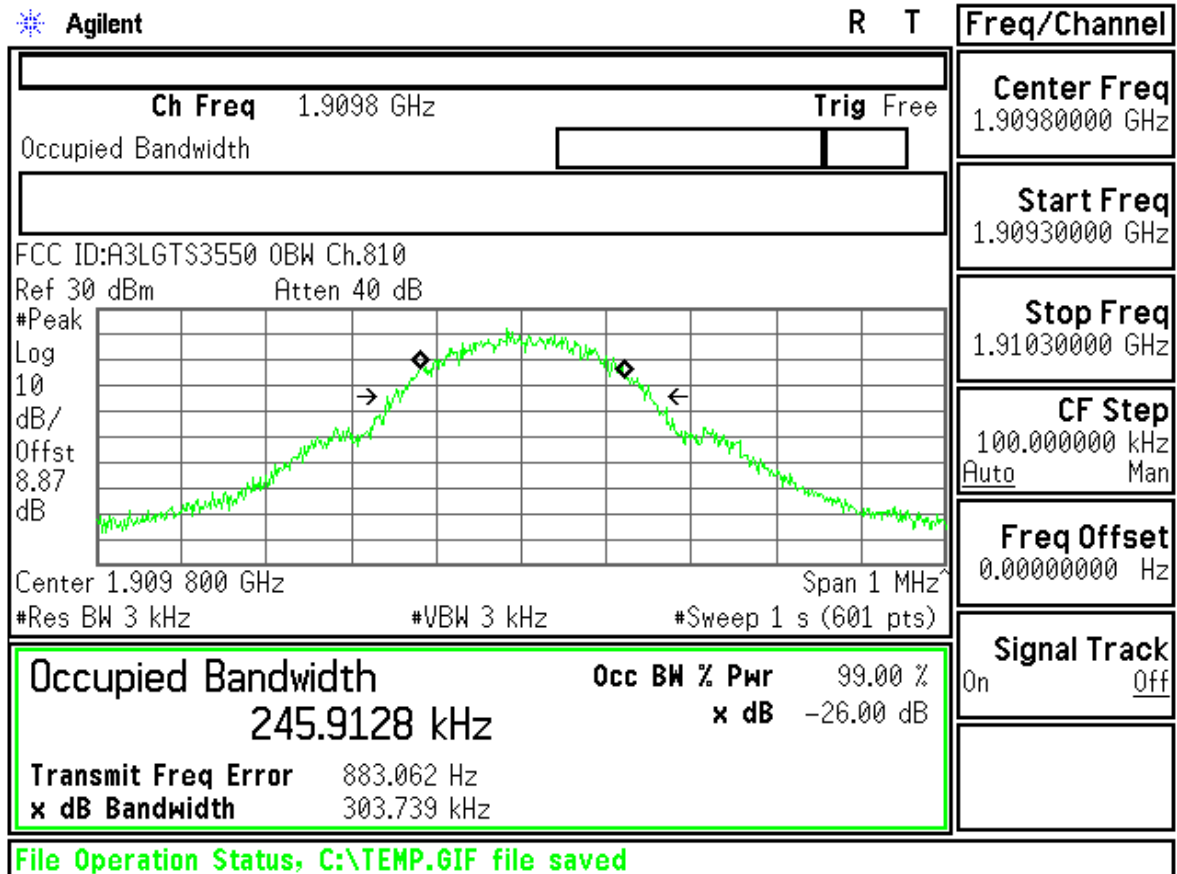
Freq/Channel
Center Freq 1.85020000 GHz
Start Freq 1.84970000 GHz
Stop Freq 1.85070000 GHz
CF Step 100.000000 kHz Auto Man
Freq Offset 0.00000000 Hz
Signal Track On Off

 Agilent

R T



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



FCC ID : A3LGTS3550 Transmit Power 512CH

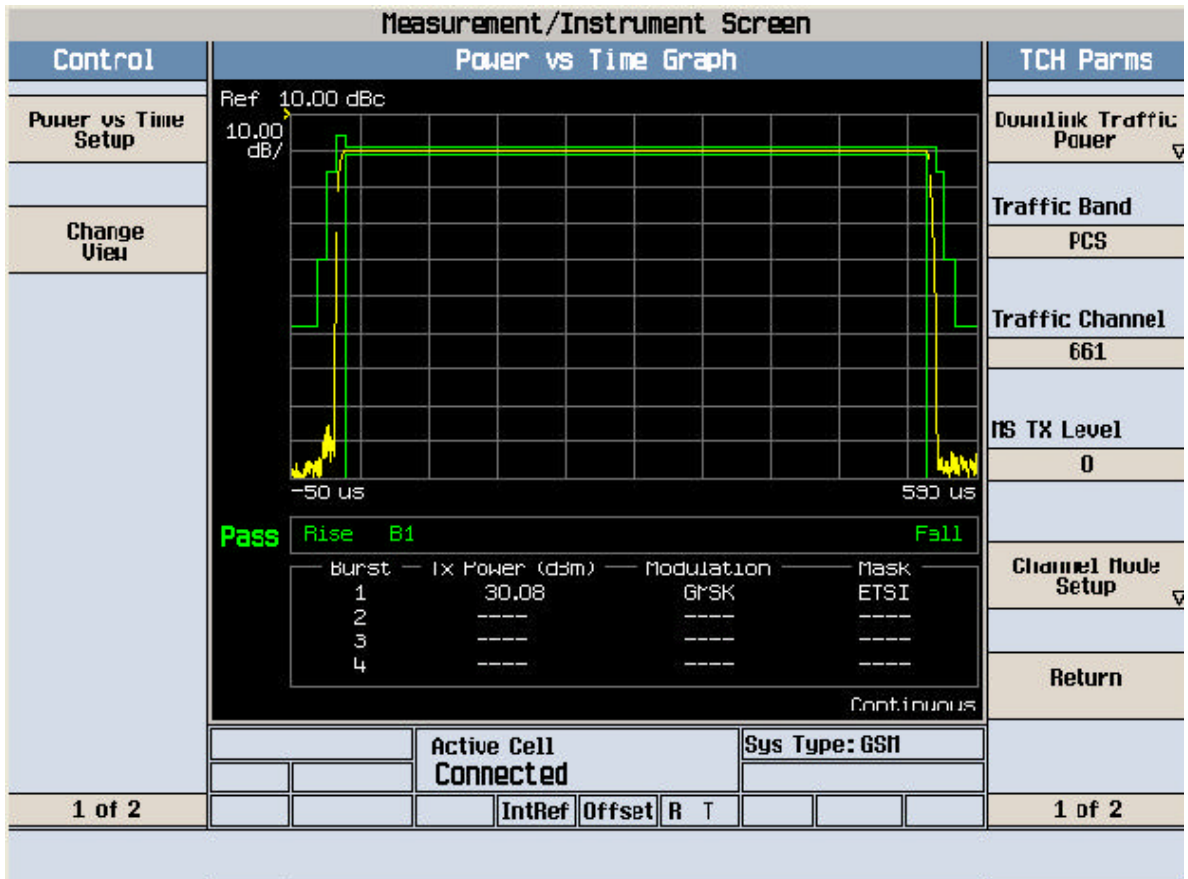
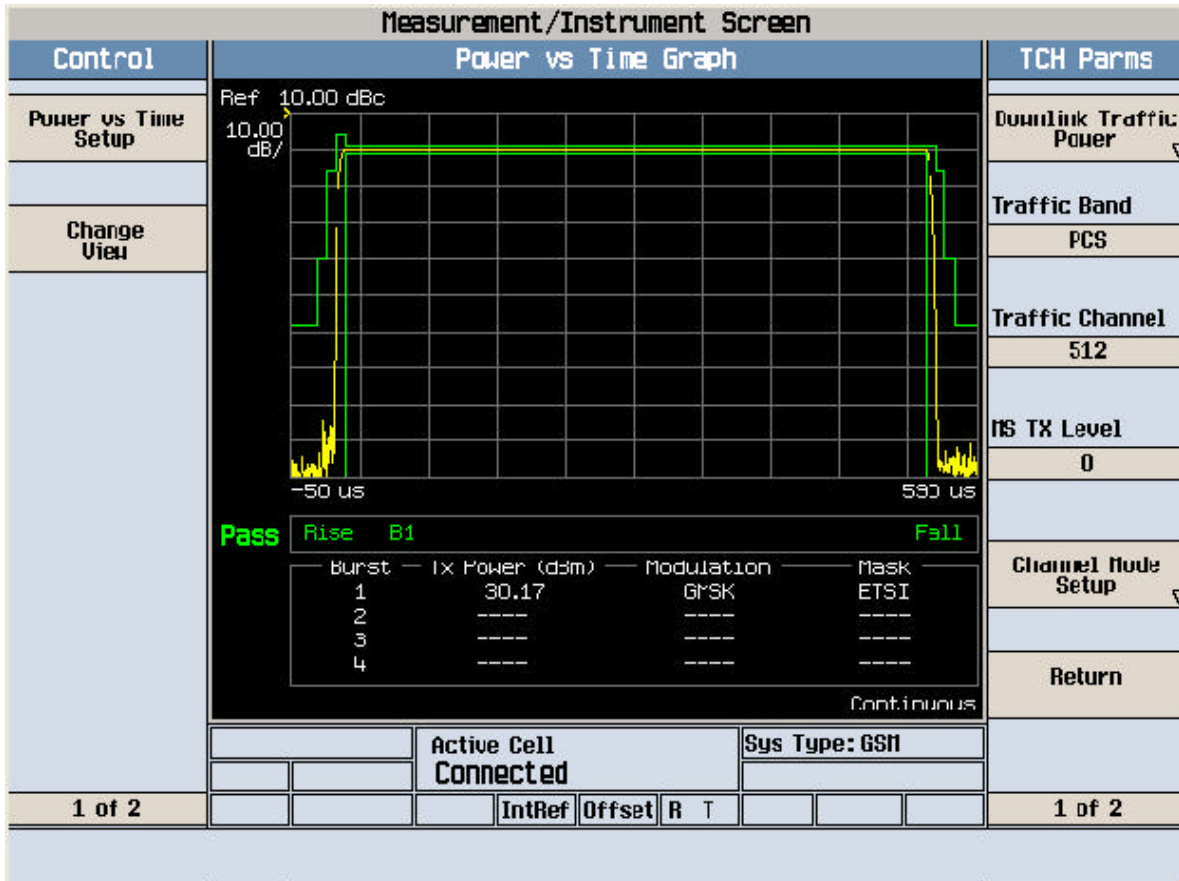
Measurement/Instrument Screen																										
Control		Transmit Power								TCH Parms																
Transmit Power Setup	<table><tr><td></td><td>Burst 1</td><td>Burst 2</td><td>Burst 3</td><td>Burst 4</td></tr><tr><td>Burst Power</td><td>30.16</td><td>----</td><td>----</td><td>----</td></tr><tr><td>Estimated Carrier Power</td><td>30.16</td><td>----</td><td>----</td><td>----</td></tr></table>									Burst 1	Burst 2	Burst 3	Burst 4	Burst Power	30.16	----	----	----	Estimated Carrier Power	30.16	----	----	----	Downlink Traffic Power		
										Burst 1	Burst 2	Burst 3	Burst 4													
									Burst Power	30.16	----	----	----													
									Estimated Carrier Power	30.16	----	----	----													
	Traffic Band																									
PCS																										
Single								Traffic Channel																		
								512																		
Phase & Frequency Error											MS TX Level															
Swap Window Positions						Peak Phase °		RMS Phase °		Frequency Hz		0														
		Minimum		2.63		0.94		27.22		Channel Mode Setup																
		Maximum		4.70		1.30		44.99																		
		Average		3.31		1.09		38.20																		
		Pass/Fail		Pass		Pass		Pass																		
50 / 50								Single		Return																
1 of 2				Active Cell Connected				Sys Type: GSM			1 of 2															
				IntRef		Offset		R T																		

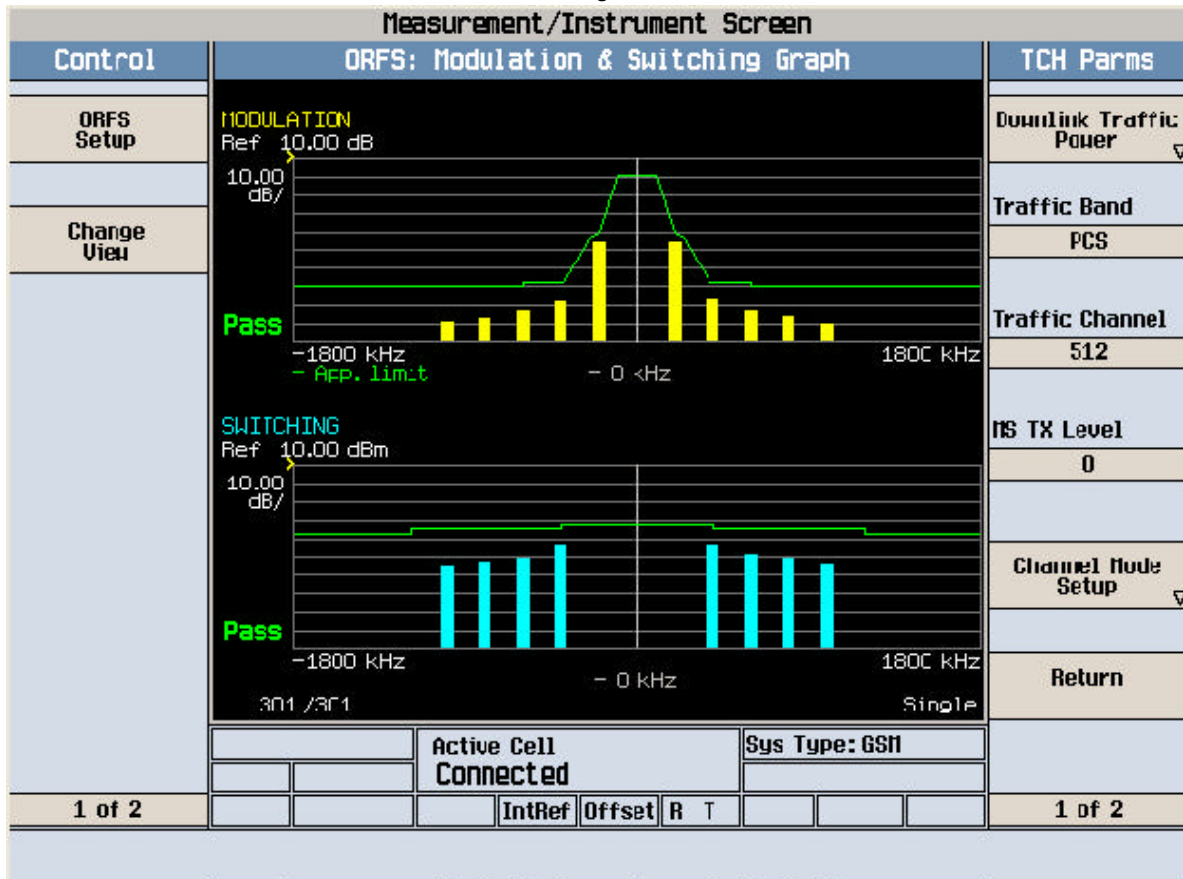
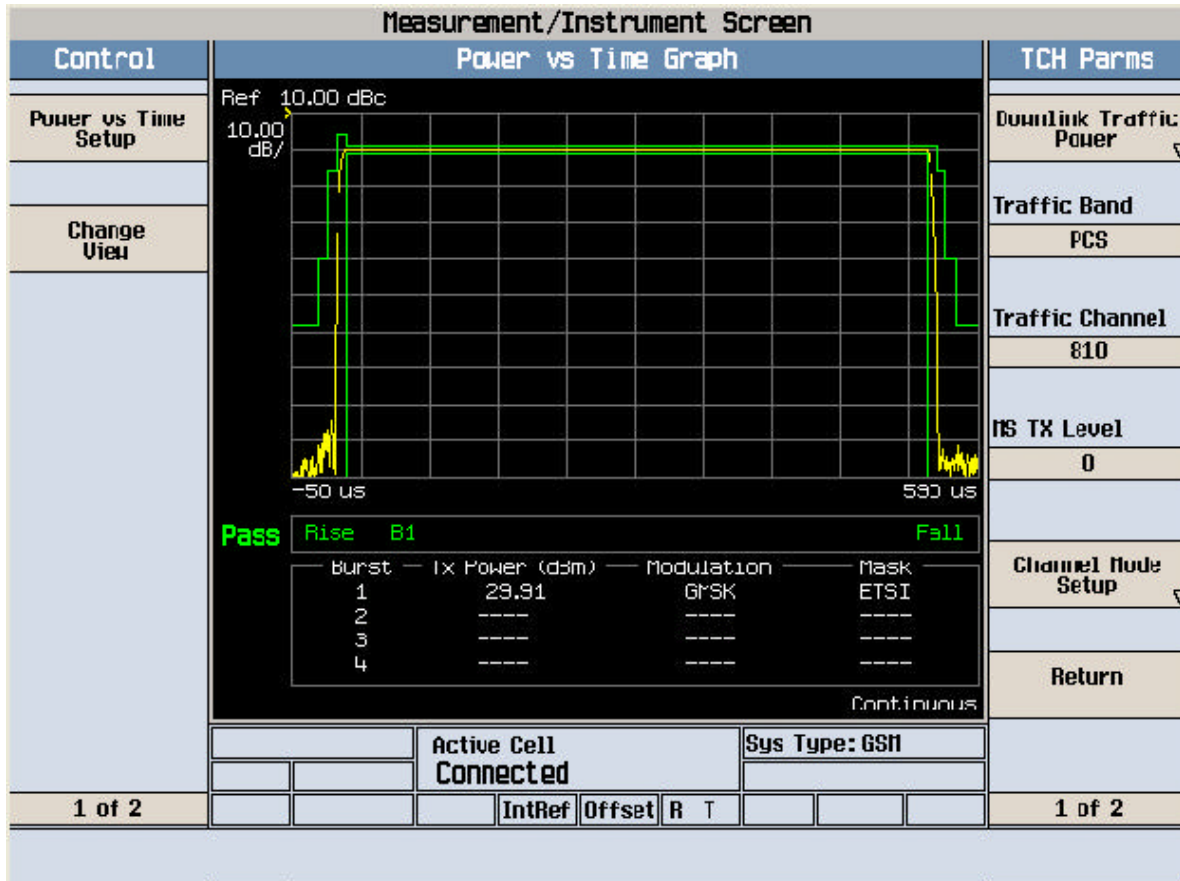
Measurement/Instrument Screen											
Control		Transmit Power							TCH Parms		
Transmit Power Setup ▾									Downlink Traffic Power ▾		
									Traffic Band		
									PCS		
									Traffic Channel		
Swap Window Positions									661		
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1 of 2									Return		
									1 of 2		

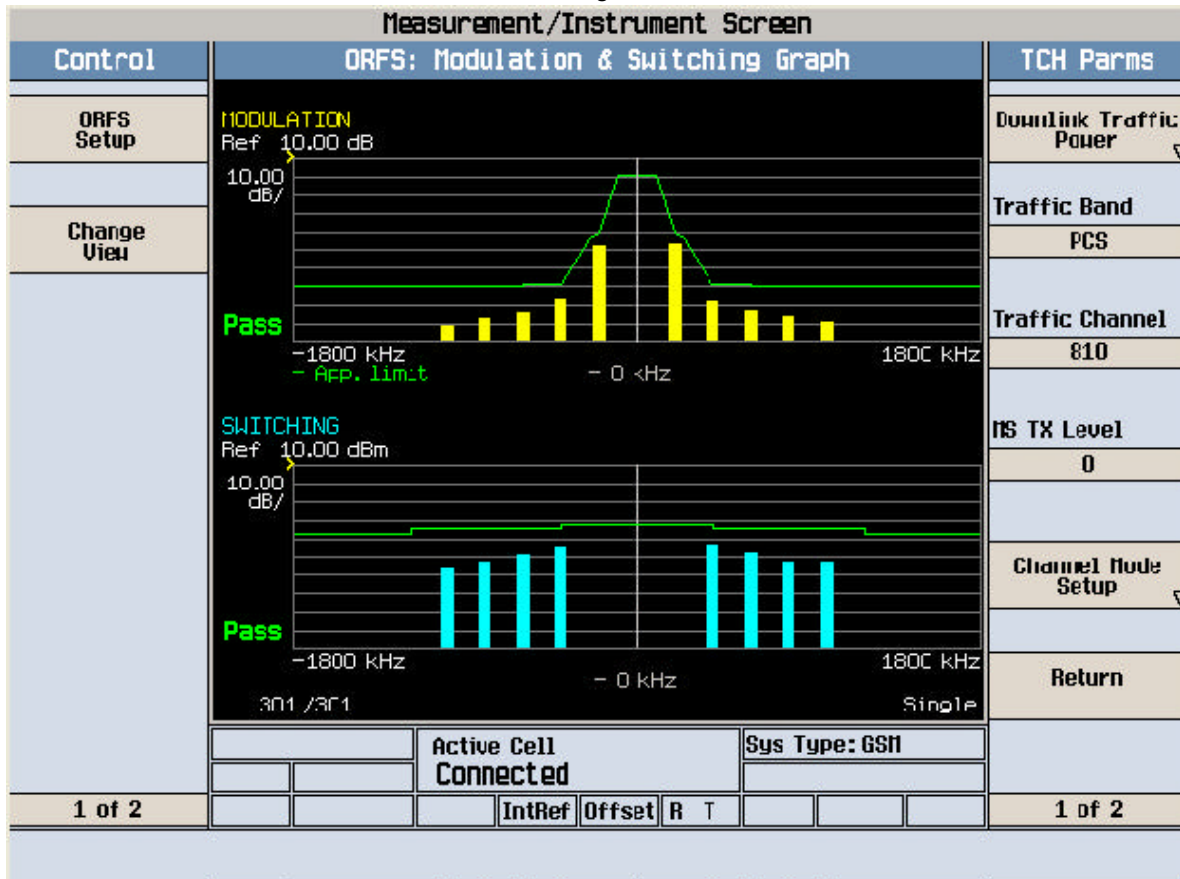
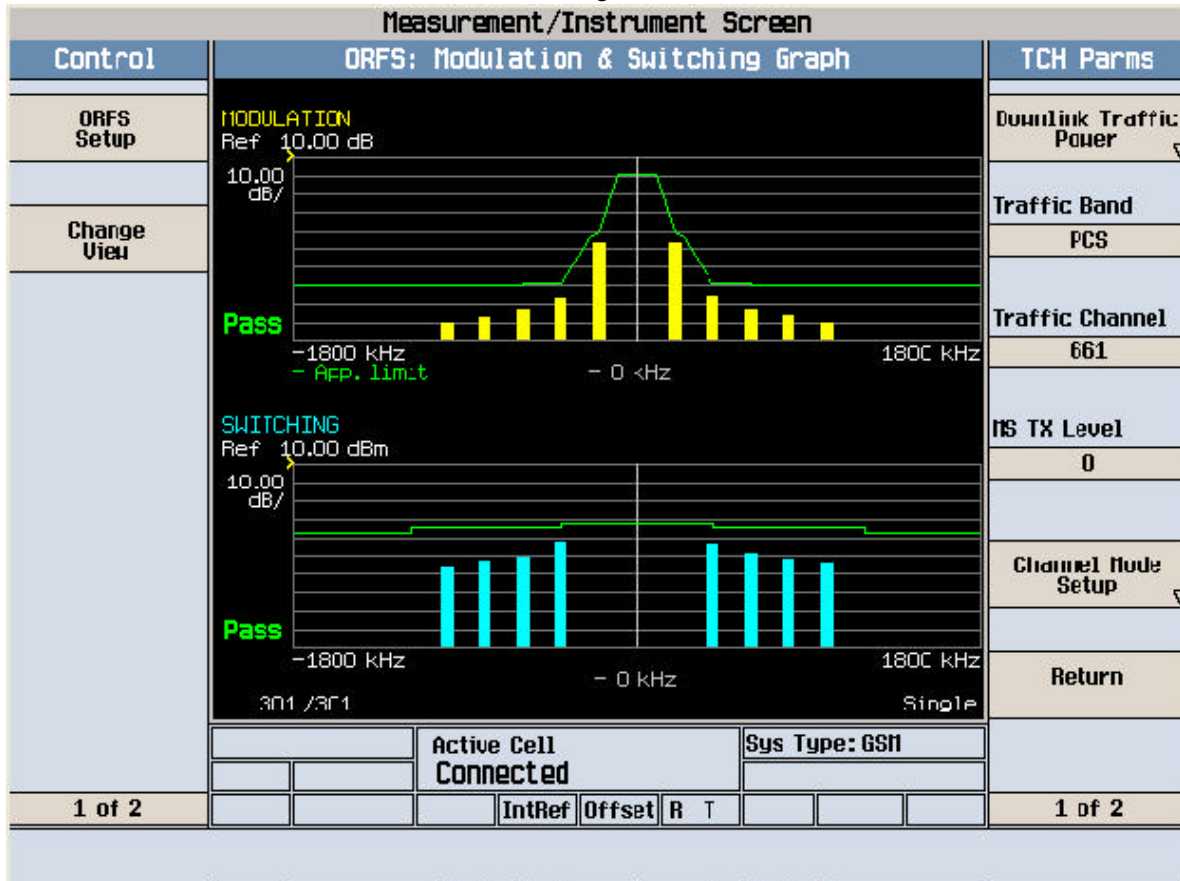
Measurement/Instrument Screen											
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Transmit Power Setup ▾									Downlink Traffic Power ▾		
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Swap Window Positions									810		
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1 of 2									Return		
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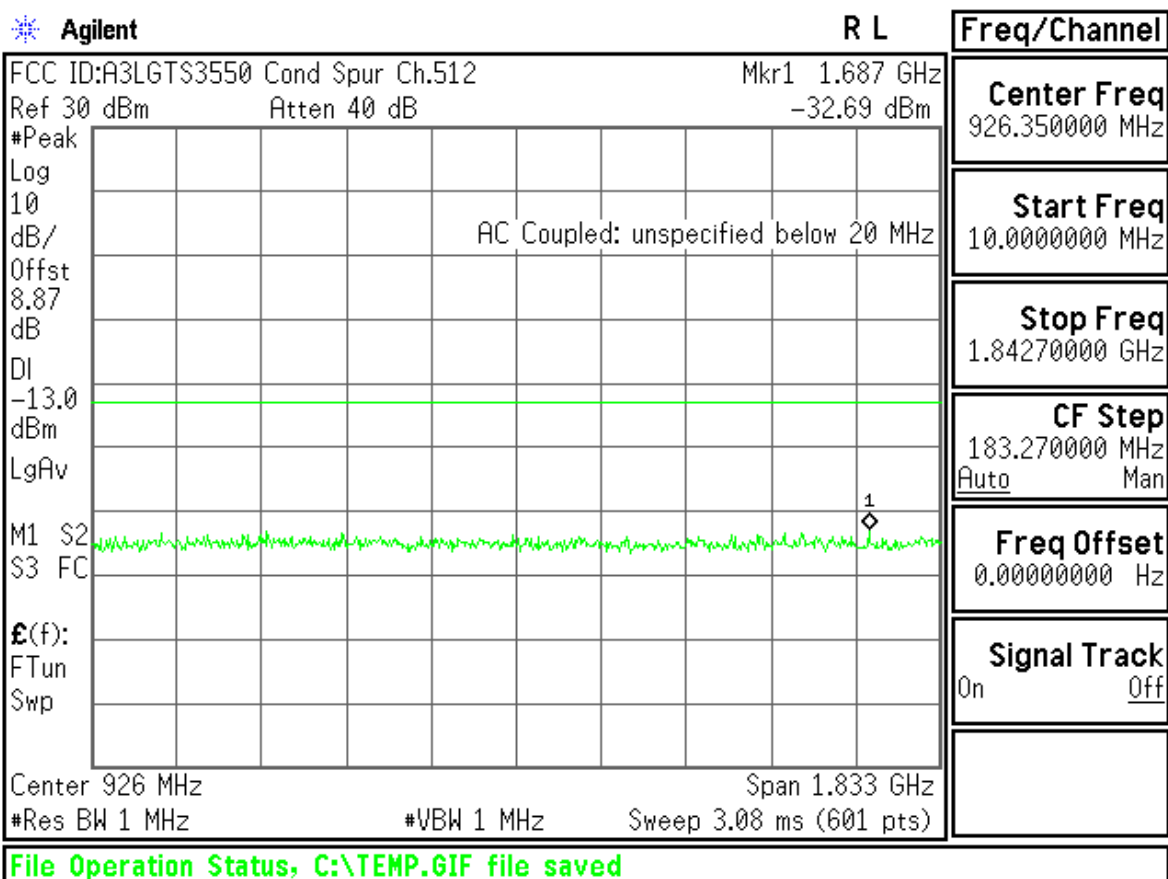
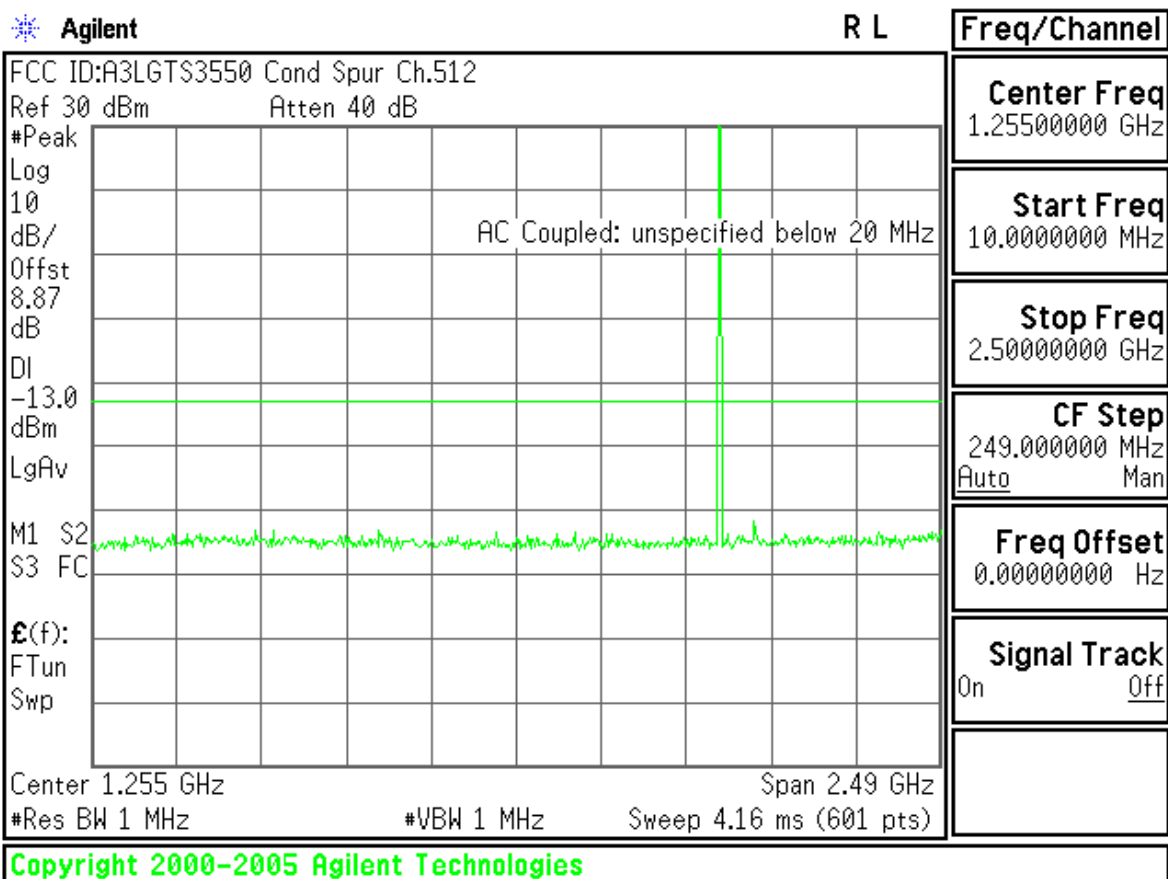
Measurement/Instrument Screen											
Control		Transmit Power							TCH Parms		
Transmit Power Setup ▾									Downlink Traffic Power ▾		
									Traffic Band		
									PCS		
									Traffic Channel		
Swap Window Positions									810		
									MS TX Level		
									0		
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1 of 2									Return		
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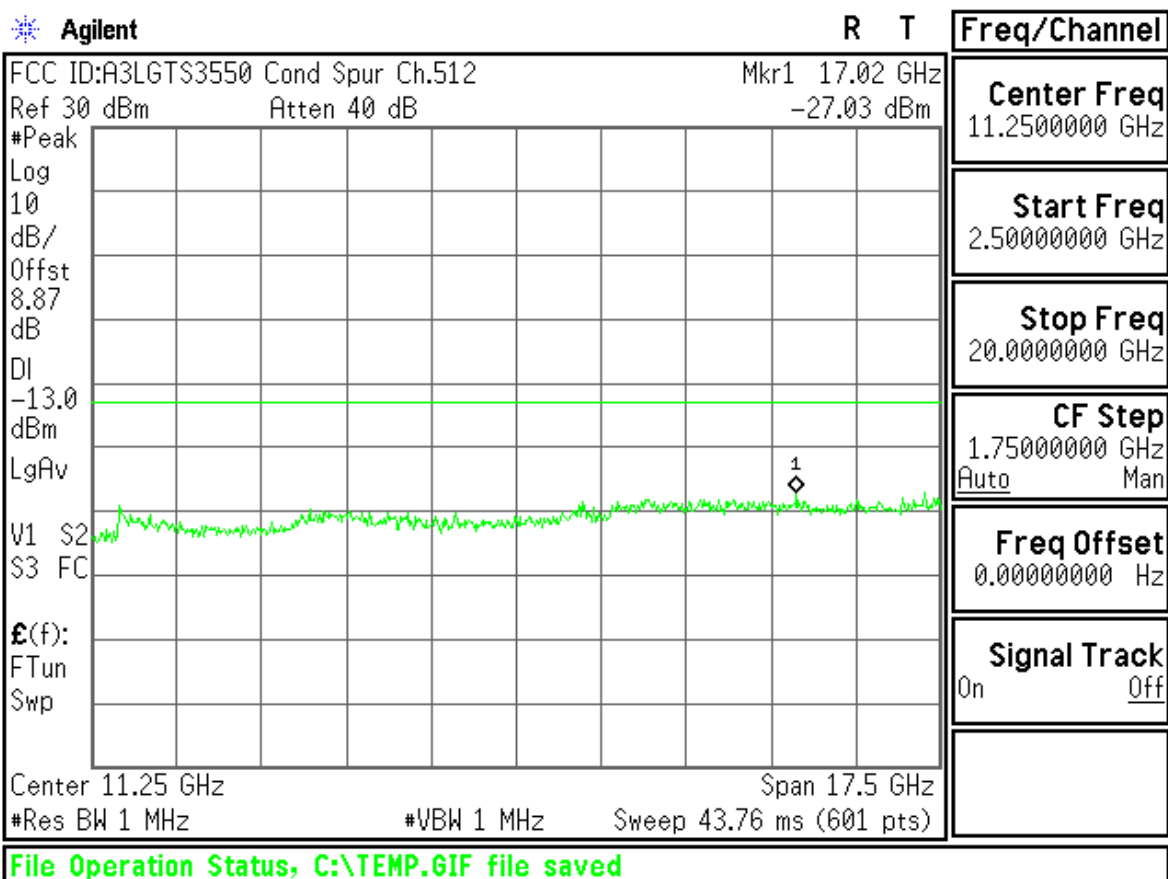
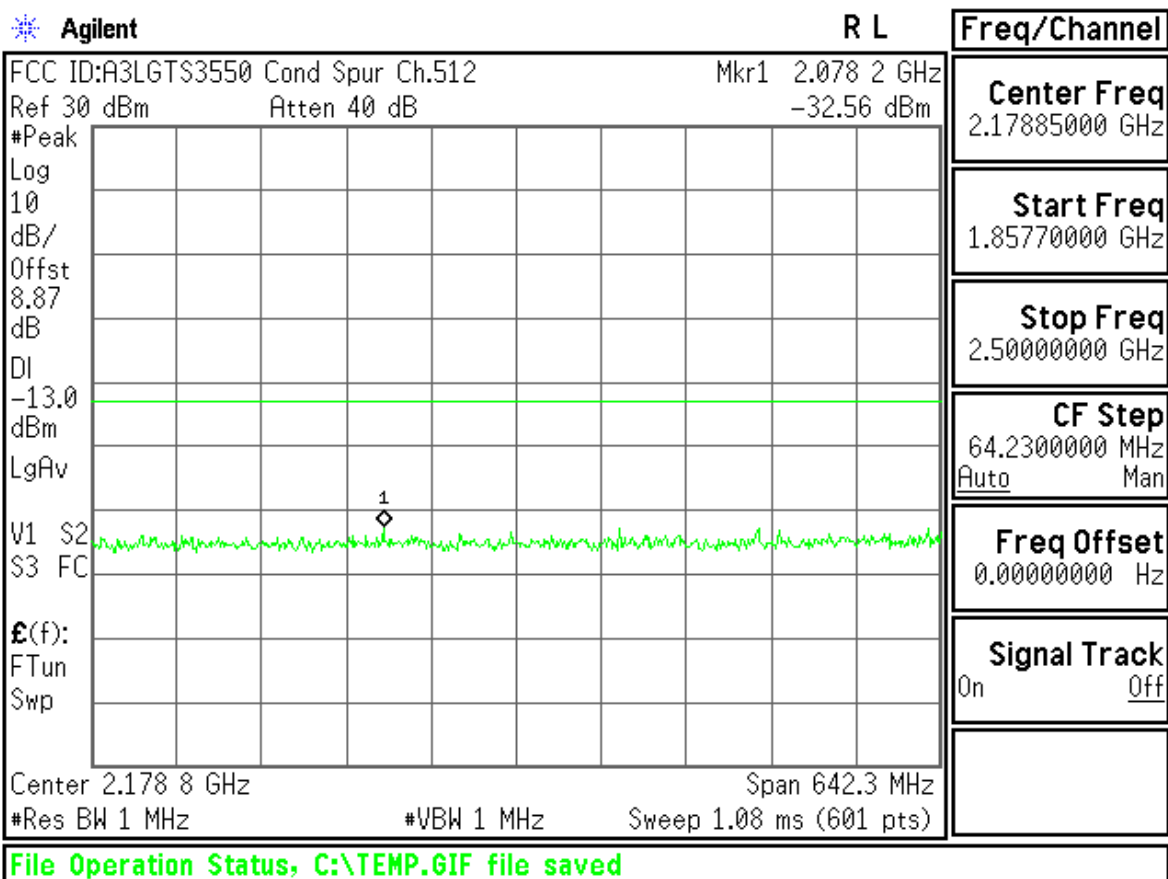
Measurement/Instrument Screen											
Control		Transmit Power							TCH Parms		
Transmit Power Setup ▾									Downlink Traffic Power ▾		
									Traffic Band		
									PCS		
									Traffic Channel		
Swap Window Positions									810		
									MS TX Level		
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1 of 2									Return		
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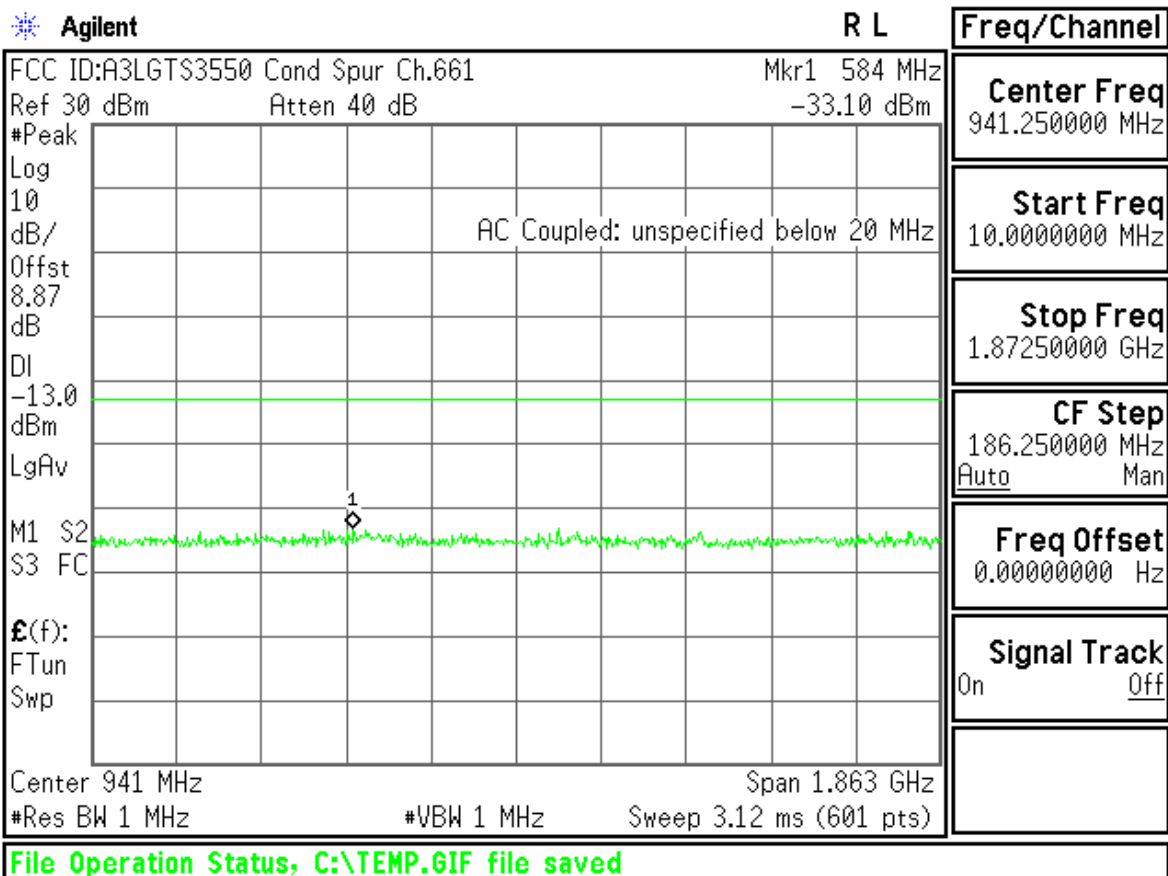
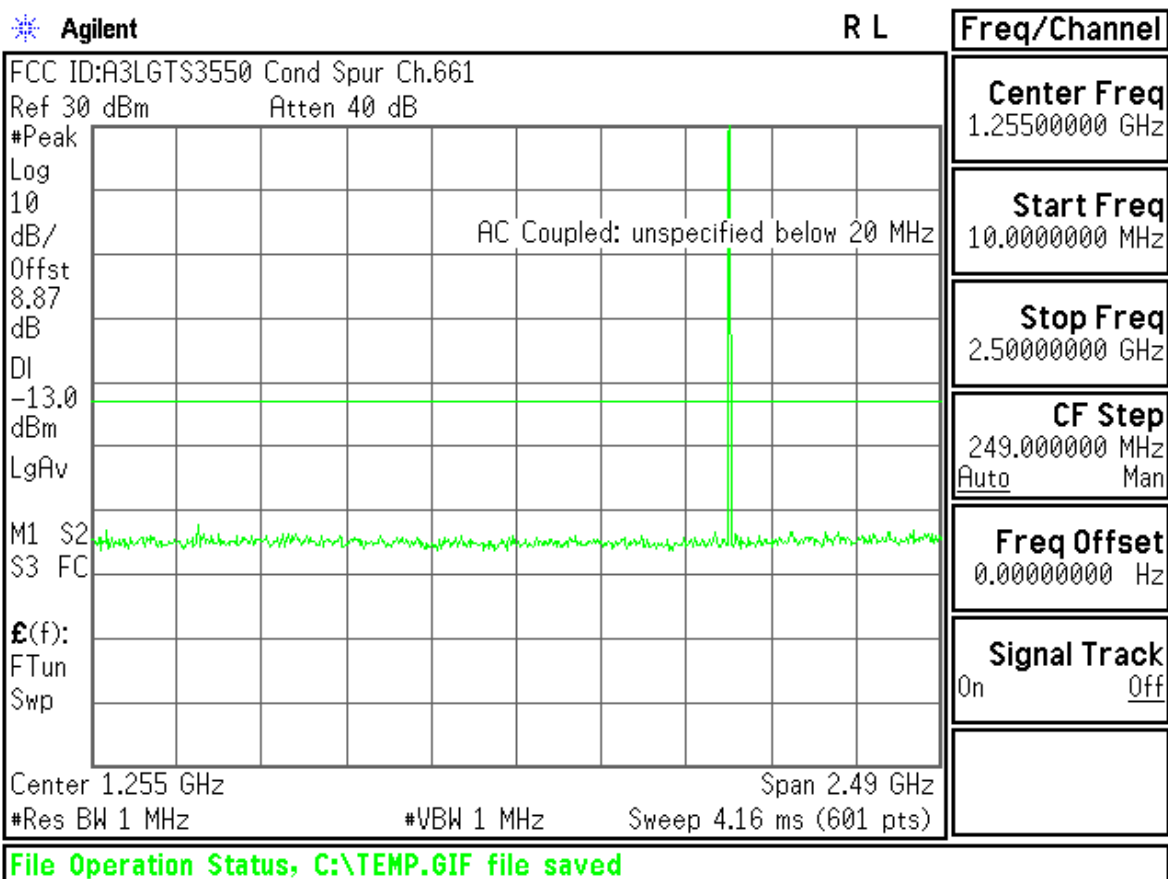


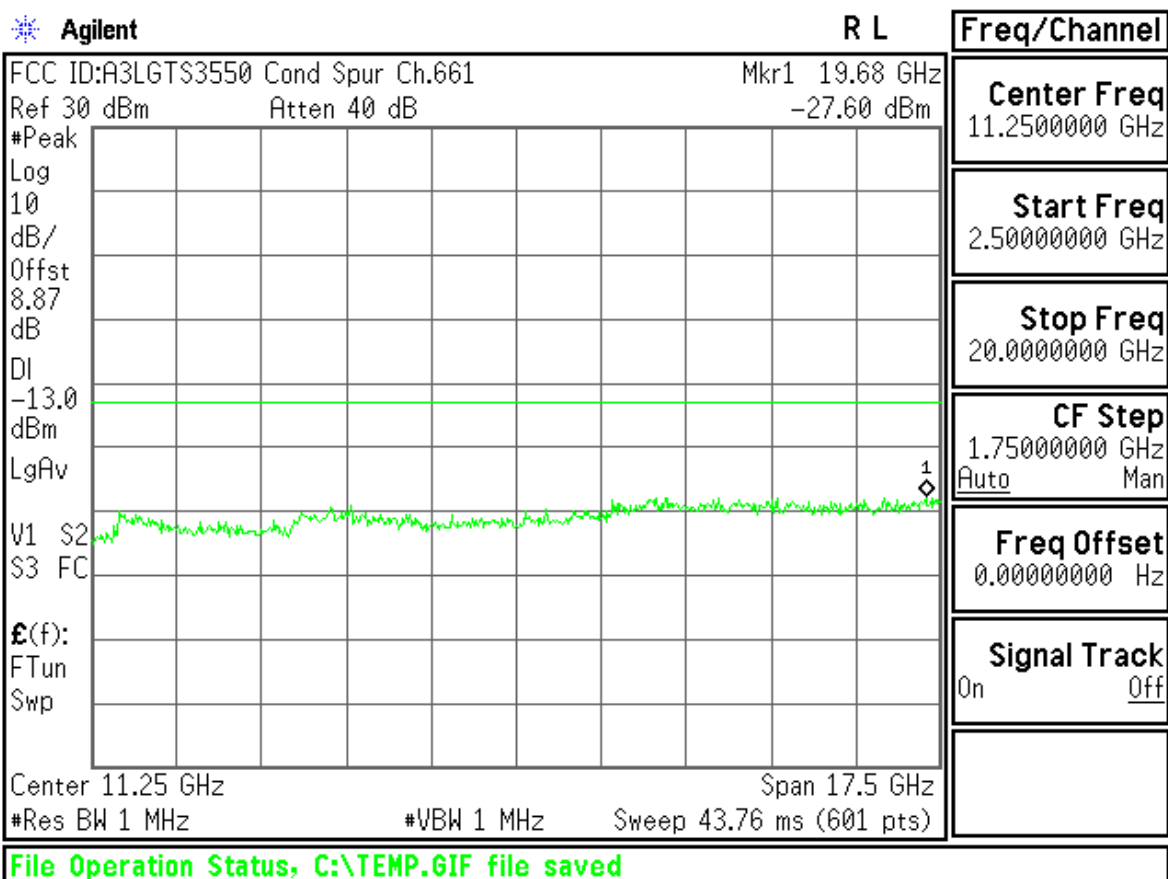
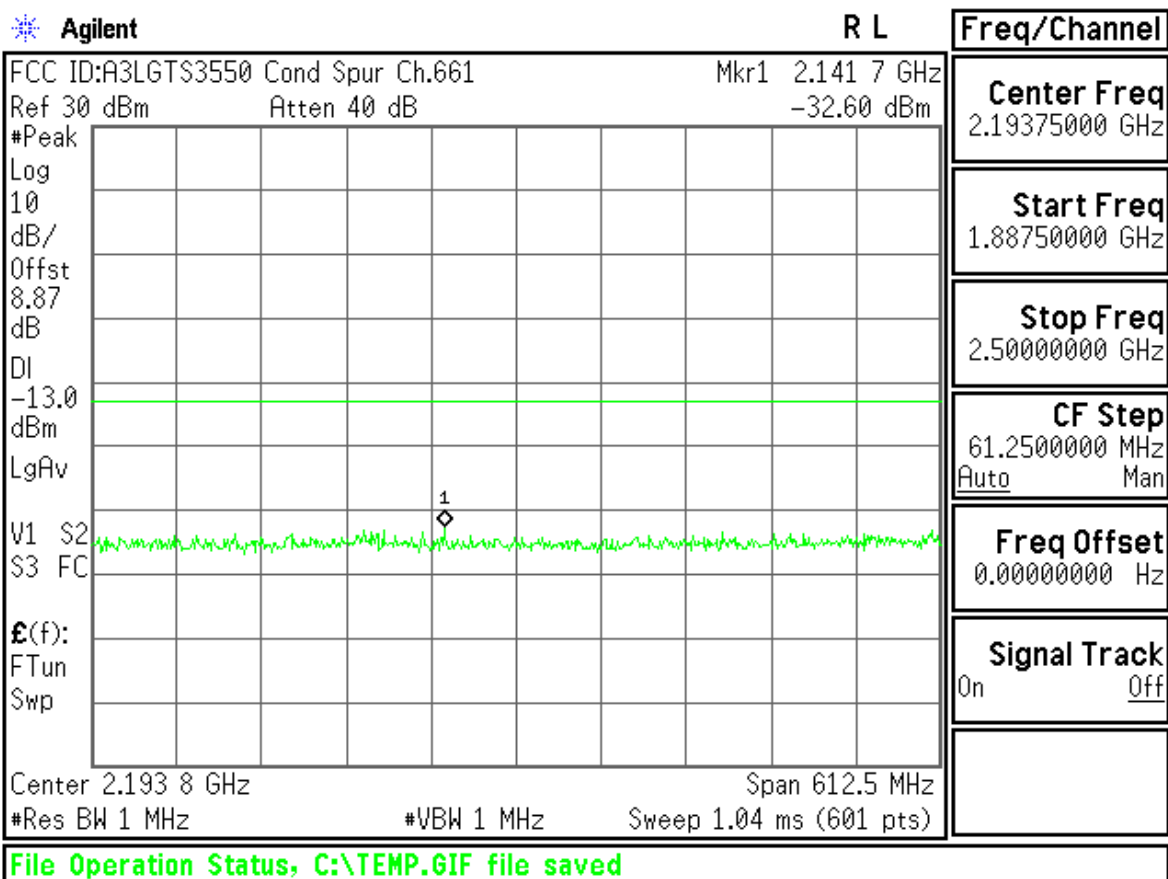


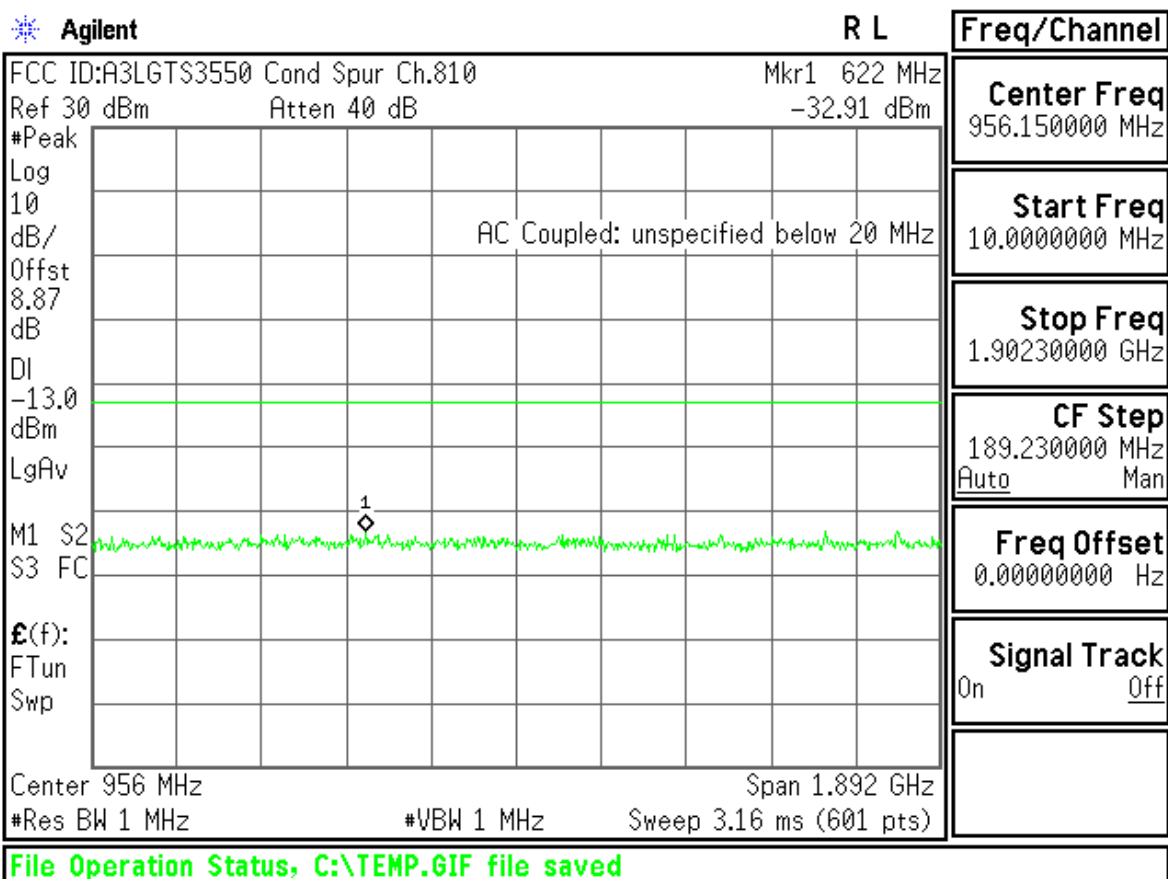
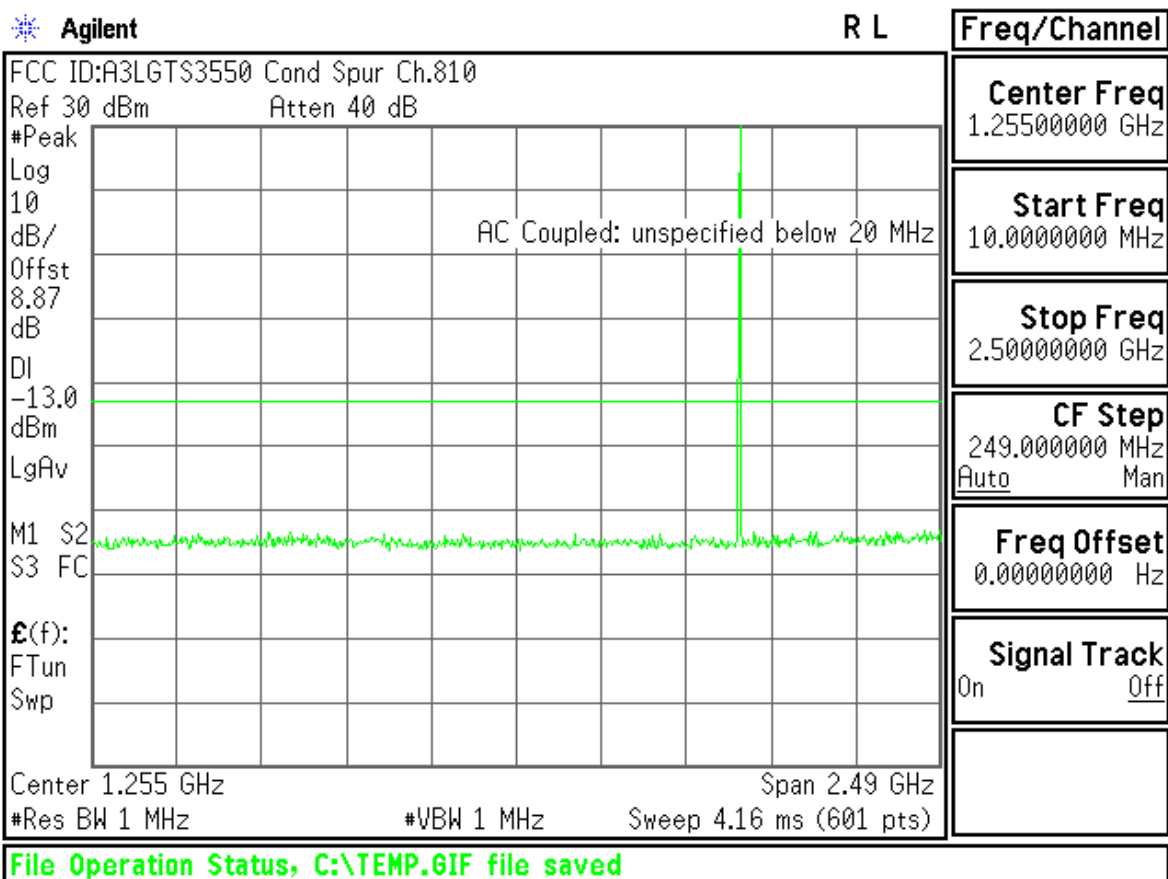


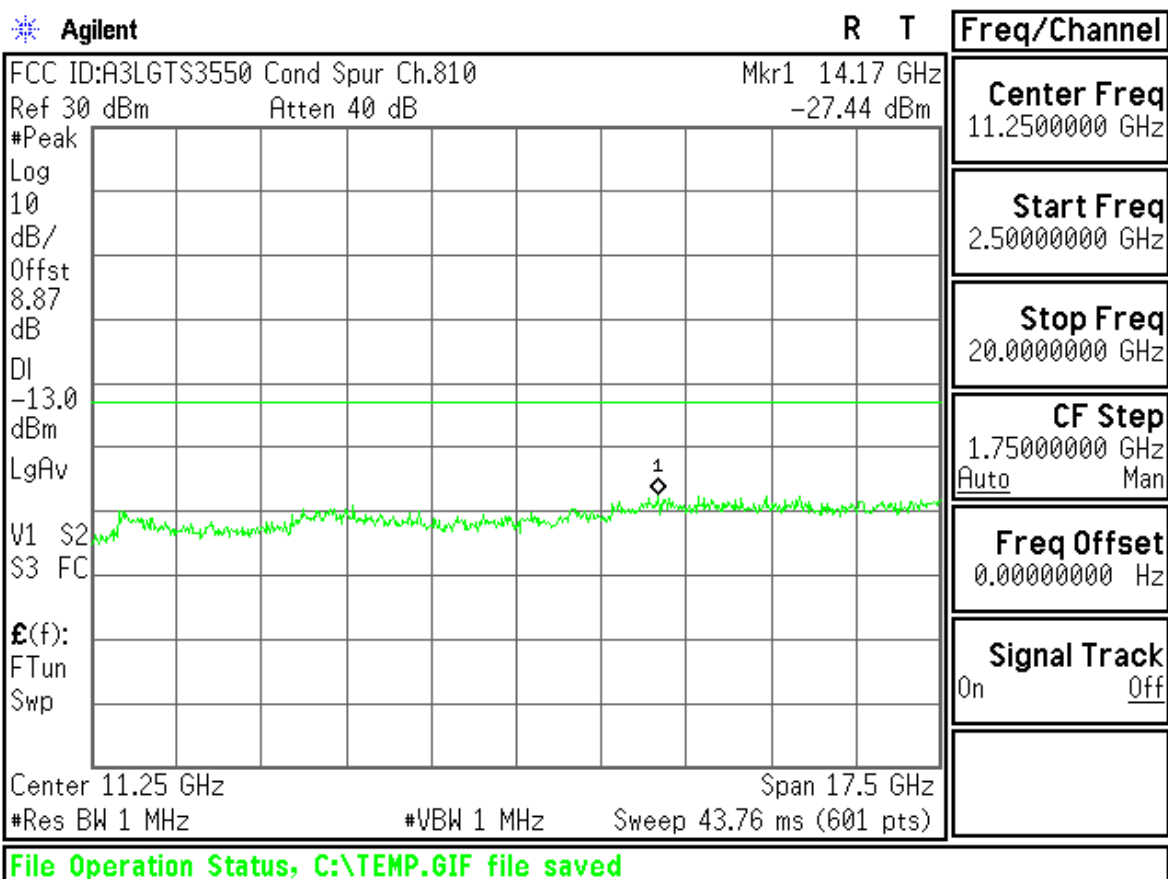
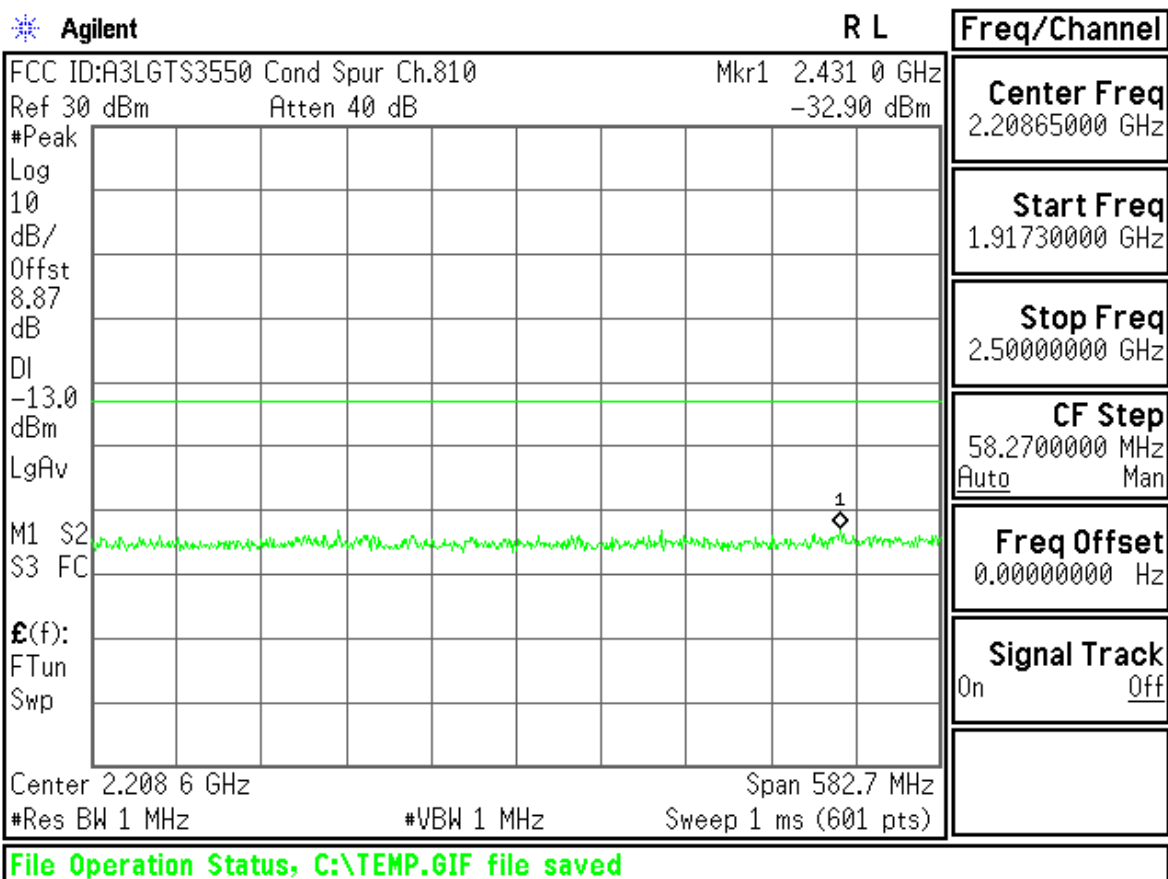


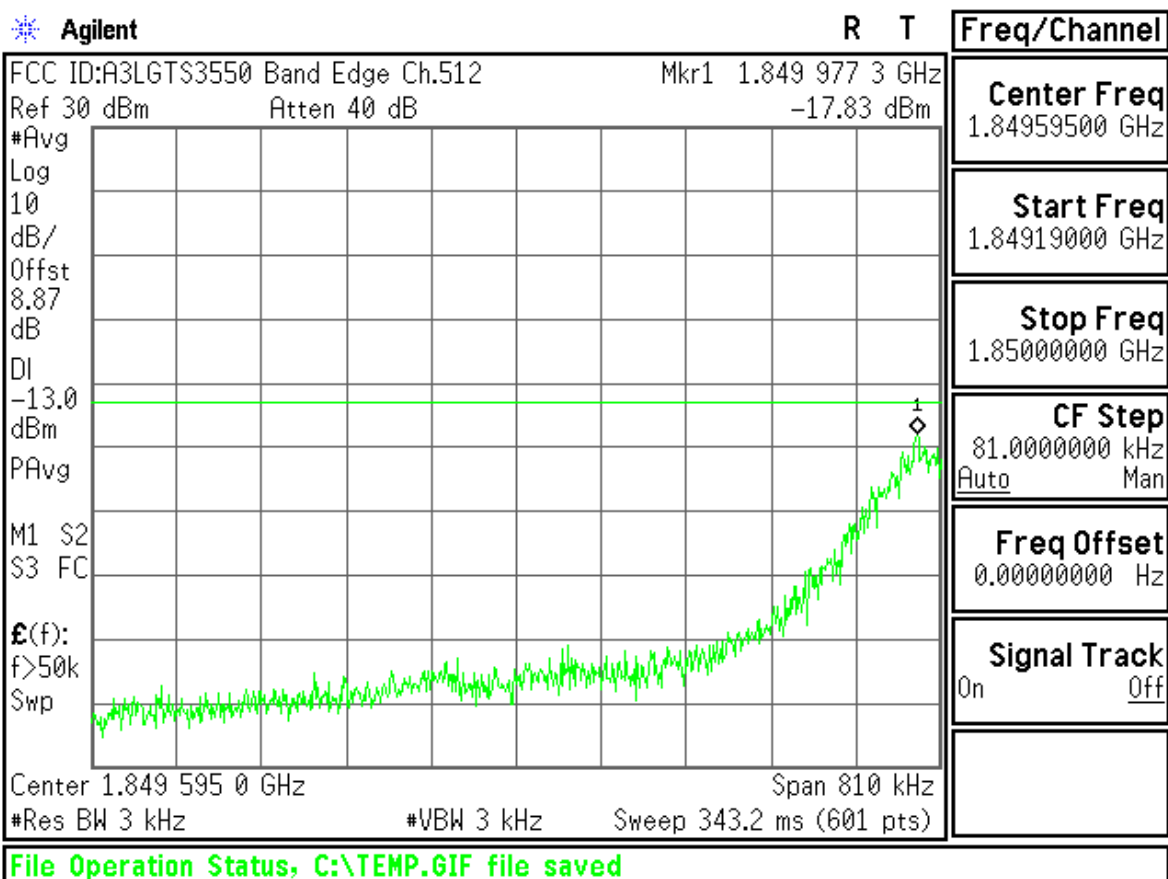
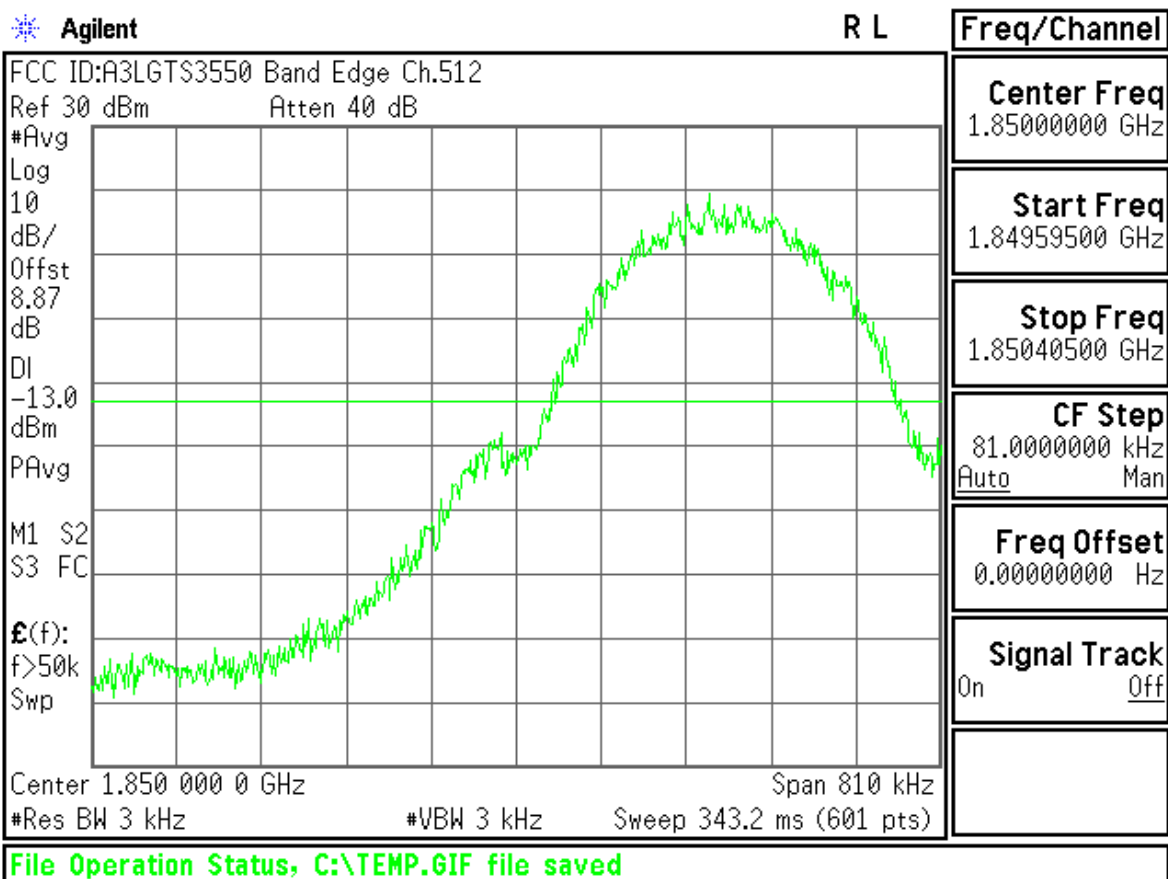












Agilent

R L

Freq/Channel

FCC ID:A3LGT3550 Band Edge Ch.810

Ref 30 dBm

Atten 40 dB

#Avg

Log

10

dB/

Offst

8.87

dB

DI

-13.0

dBm

PAvg

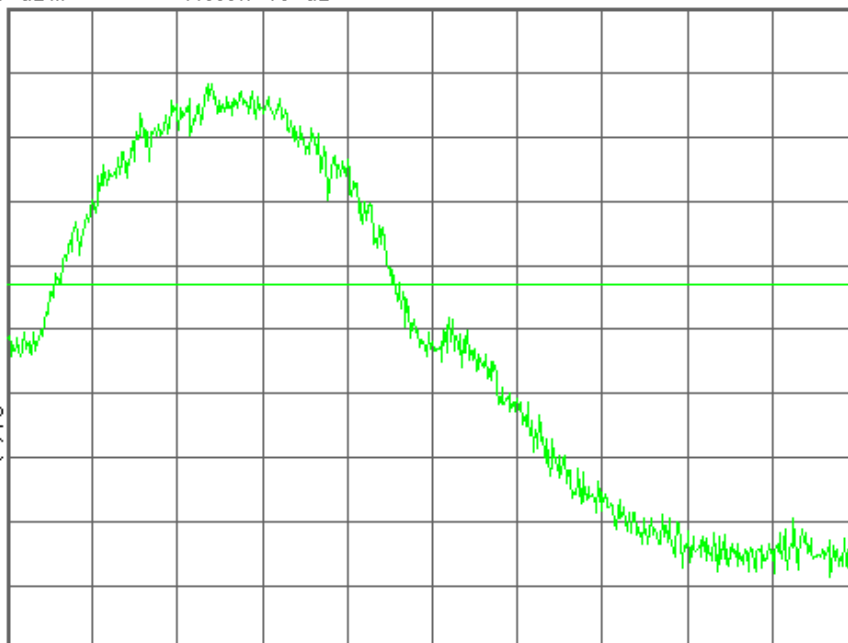
M1 S2

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:A3LGT3550 Band Edge Ch.810

Mkr1 1.910 024 6 GHz

Ref 30 dBm

Atten 40 dB

-18.84 dBm

#Avg

Log

10

dB/

Offst

8.87

dB

DI

-13.0

dBm

PAvg

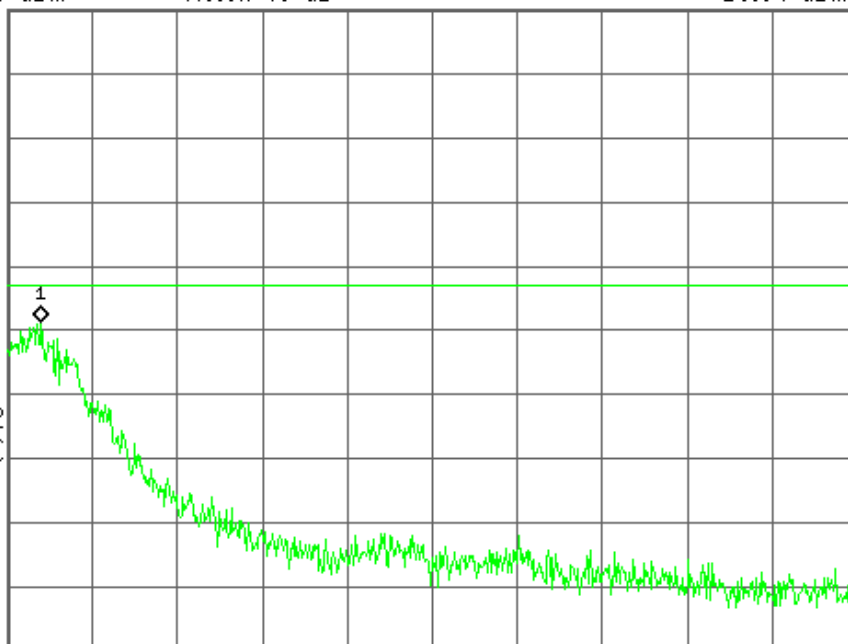
M1 S2

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

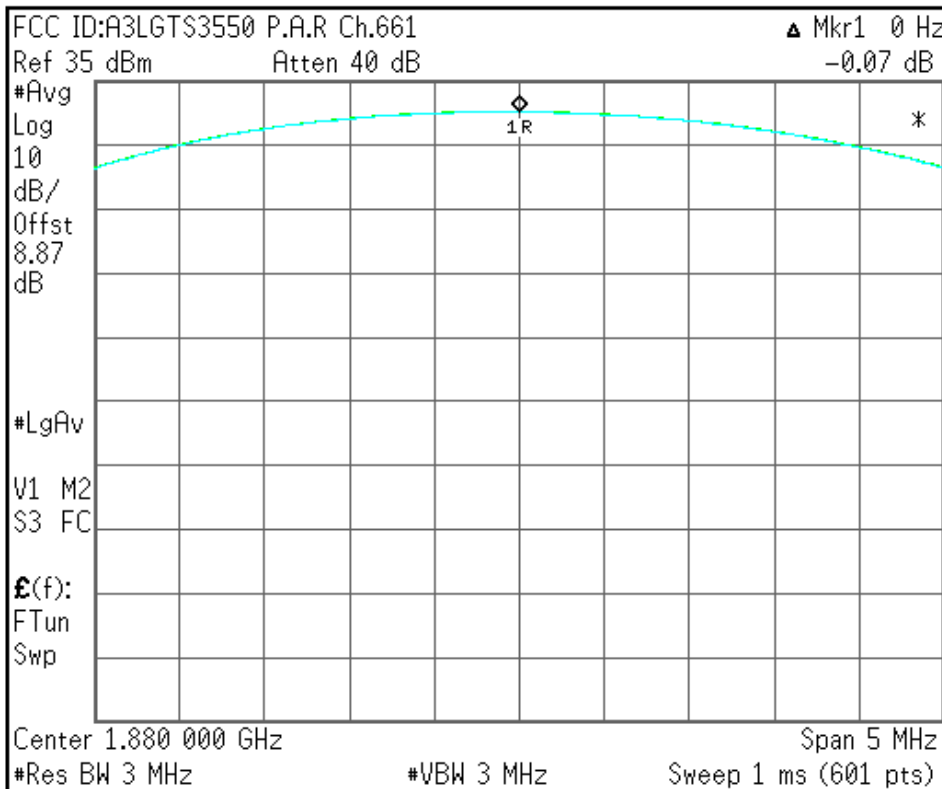
Stop Freq
1.91081000 GHz

CF Step
81.0000000 kHz
Auto Man

Freq Offset
0.00000000 Hz

Signal Track
On Off

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



Freq/Channel

Center Freq
 1.88000000 GHz

Start Freq
 1.87750000 GHz

Stop Freq
 1.88250000 GHz

CF Step
 500.000000 kHz
 Auto Man

Freq Offset
 0.00000000 Hz

Signal Track
 On Off

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