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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-I9020A
FCC ID (Requested) : A3LGTI9020A
Report No : FI-004-R1
Job No : FI-004
Date issued : January 26, 2011

- Abstract -

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

Prepared By

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Authorized By

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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 : A3LGTI9020A
- Model : GT-I9020A
- Quantity : Quantity production is planned
- Emission Designators : 249KGXW(GSM850), 248KG7W(GSM850 EDGE)
245KGXW(GSM1900), 246KG7W(GSM1900 EDGE)
- 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 : 0.668 W ERP GSM850 (28.25 dBm)
1.054 W EIRP GSM1900 (30.23 dBm)
0.187 W ERP GSM850 EDGE(22.71dBm)
0.516 W EIRP GSM1900 EDGE(27.13dBm)
- FCC Classification(s) : PCS Licensed Portable Tx Held to Ear (PCE)
- Equipment (EUT) Type : 850/1900 GSM/EDGE/GPRS/WCDMA Phone with
Bluetooth, WLAN and HSDPA, RFID
- Frequency Tolerance : $\pm 0.00025\%$ (2.5ppm)
- FCC Rule Part(s) : §24(E), §22(H), §2.
- Dates of Test : January 13-14, 2011
- Place of Test : SAMSUNG Lab,
- Test Report S/N : FI-004-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	2011-10-21
	E4440A(3Hz~26.5GHz)	MY46187454	2011-03-08
	E4440A(3Hz~26.5GHz)	MY41000236	2011-04-13
Network Analyzer	8753E	JP38160590	2011-06-18
Pre-Amplifier	8449B	3008A00691	2011-12-15
Communication test set	8960	MY47510060	2011-03-08
	8960	GB42360886	2011-08-06
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	100134	2011-09-23
	HF906	360306/011	2012-06-13
Dipole Antenna	UHA 9105	9105-2412	2011-10-06
	3121C-DB4	9007-587	2011-04-15
Receive Antenna	HL040	353255/019	2011-10-26
Power Supply	E3640A	MY40003594	2011-06-17
	E3640A	MY40003595	2011-05-17
	E3632A	MY40022438	2011-03-05
Divider	11636B	51946	2011-06-25
	11636B	51942	2011-07-09
	11636B	56918	2011-08-31
High Pass Filter	WHK/3.0/18G-10SS	492	Not Required
	WHK/3.5/18G-10SS	4	Not Required
Environmental Chamber	SH-241	92000549	2011-11-15
	SH-241	92000548	2011-11-15
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

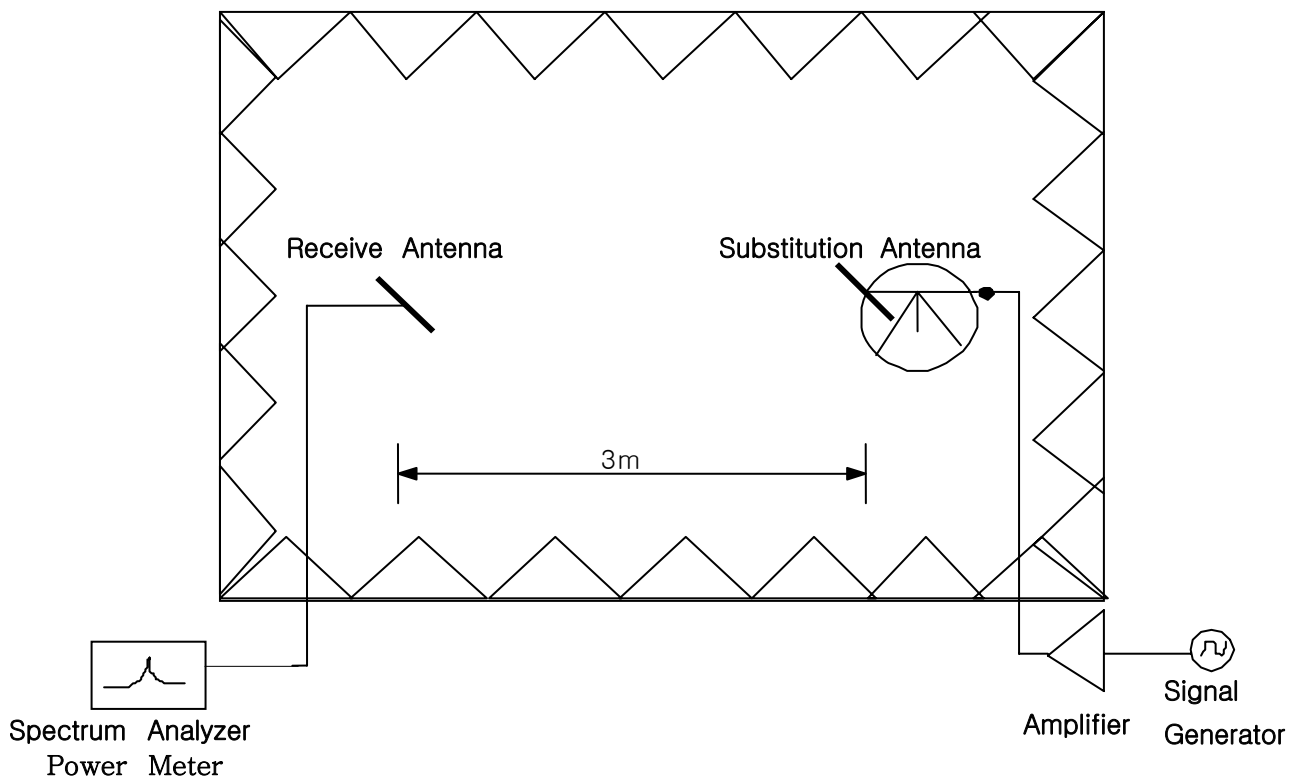


Figure 3. Diagram of ERP/EIRP test Set-up

The EUT was placed on the rotating device at 3-meters from the receive antenna and tested in 3 orthogonal planes. 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

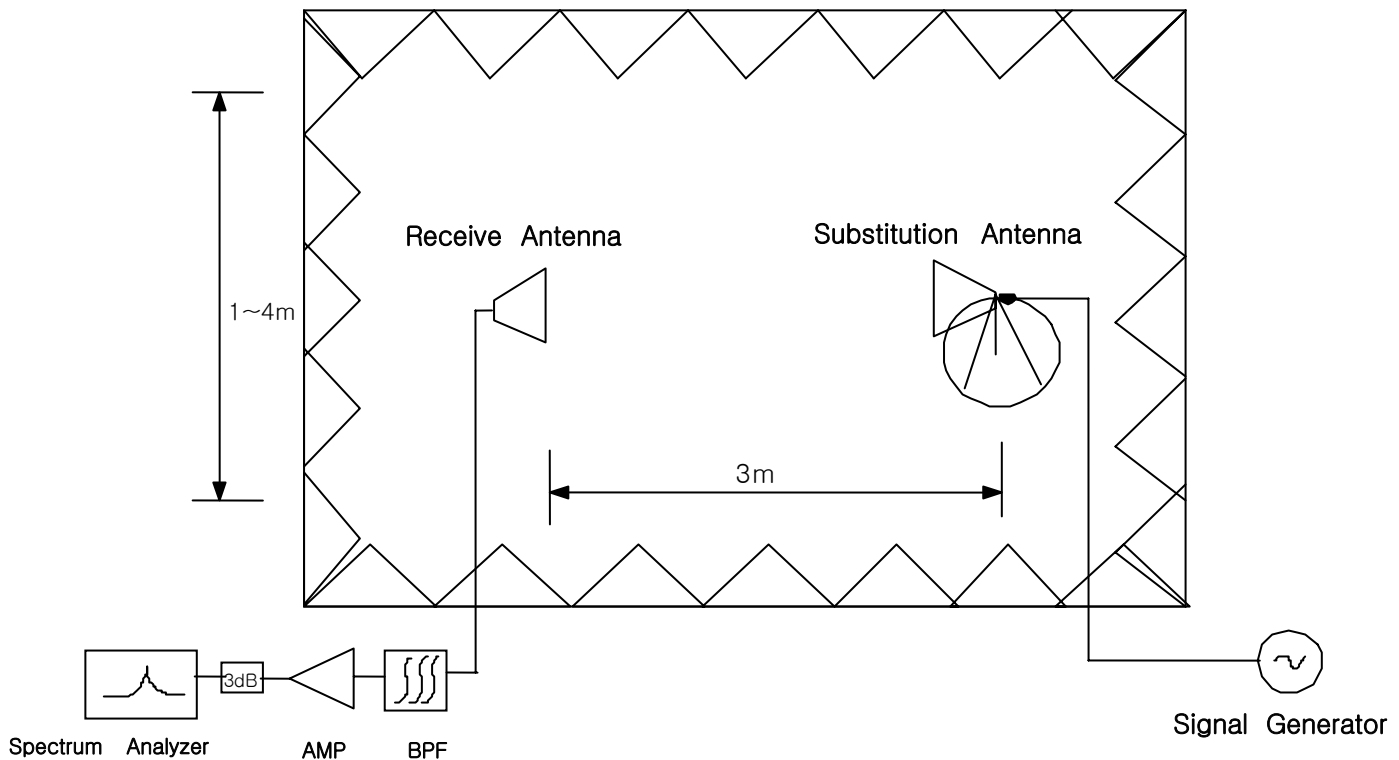


Figure 4. Diagram of Radiated Spurious & Harmonic test Set-up

The EUT was placed on the rotating device at 3-meters from the receive antenna and tested in 3 orthogonal planes. 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.

$$43 + 10\log (0.668 \text{ W}) = 41.25 \text{ dB}$$

$$28.25 \text{ dBm} - 41.25 \text{ dB} = -13 \text{ dBm}$$

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 $+50^{\circ}\text{C}$ 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 $+50^{\circ}\text{C}$ 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. 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	28.00	H	-8.48	-0.67	-7.81
		V	-9.30	-0.67	-8.63
836.60	28.00	H	-8.97	-0.73	-8.24
		V	-9.24	-0.73	-8.51
848.80	28.00	H	-11.12	-0.79	-10.33
		V	-10.31	-0.79	-9.52

Result

Frequency (MHz)	Tested level (dBm)	Polarization (H/V)	Azimuth (angle)	ERP (dBm)	ERP (W)	Battery
824.20	-7.56	H	289/115	28.25	0.668	Standard
836.60	-8.33	H	286/80	27.91	0.618	Standard
848.80	-10.62	H	282/70	27.71	0.590	Standard

EDGE Result

Frequency (MHz)	Tested level (dBm)	Polarization (H/V)	Azimuth (angle)	ERP (dBm)	ERP (W)	Battery
824.20	-13.10	H	289/115	22.71	0.187	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



6.2. 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	-10.32	9.60	-19.92
		V	-9.91	9.60	-19.51
1880.00	30.00	H	-8.95	9.60	-18.55
		V	-9.32	9.60	-18.92
1909.80	29.00	H	-10.49	9.60	-20.09
		V	-10.17	9.60	-19.77

Result

Frequency (MHz)	Tested level (dBm)	Polarization (H/V)	Azimuth (angle)	EIRP (dBm)	EIRP (W)	Battery
1850.20	-19.16	V	317/80	29.35	0.861	Standard
1880.00	-18.69	V	216/90	30.23	1.054	Standard
1909.80	-19.73	V	320/90	29.04	0.802	Standard

EDGE Result

Frequency (MHz)	Tested level (dBm)	Polarization (H/V)	Azimuth (angle)	EIRP (dBm)	EIRP (W)	Battery
1880.00	-21.79	V	216/90	27.13	0.516	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. GSM850 Radiated Spurious & Harmonic measurement

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

Measured Output Power : 28.25 dBm = 0.668 W

Modulation Signal : GSM850

Limit : $43 + 10\log_{10}(P) = 41.25$ dBc

■ Result

Channel	Harmonic	Frequency (MHz)	From EUT Tested level (dBm)	POL (H/V)	Result (dBc)
128	2	1648.40	-63.17	H	78.96
	3	2472.60	-53.31	H	64.20
	4	3296.80	-57.78	H	65.16
	5	4121.00	-	-	-
	6	4945.20	-	-	-
	7	5769.40	-	-	-
190	2	1673.20	-64.55	V	79.67
	3	2509.80	-53.73	H	64.45
	4	3346.40	-59.27	V	65.96
	5	4183.00	-	-	-
	6	5019.60	-	-	-
	7	5856.20	-	-	-
251	2	1697.60	-67.25	V	82.25
	3	2546.40	-53.54	H	64.27
	4	3395.20	-65.08	H	72.16
	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

6.4. GSM1900 Radiated Spurious & Harmonic measurement

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

Measured Output Power : 30.23 dBm = 1.054 W

Modulation Signal : GSM1900

Limit : $43 + 10\log_{10}(P) = 43.23$ dBc

Result

Channel	Harmonic	Frequency (MHz)	From EUT Tested level (dBm)	POL (H/V)	Result (dBc)
512	2	3700.40	-68.09	V	74.03
	3	5550.60	-65.41	V	66.13
	4	7400.80	-68.89	V	64.80
	5	9251.00	-	-	-
	6	11101.20	-	-	-
	7	12951.40	-	-	-
661	2	3760.00	-64.99	H	70.29
	3	5640.00	-67.06	H	67.71
	4	7520.00	-68.35	V	64.36
	5	9400.00	-	-	-
	6	11280.00	-	-	-
	7	13160.00	-	-	-
810	2	3819.60	-64.49	V	69.54
	3	5729.40	-66.11	V	66.45
	4	7639.20	-67.93	V	63.63
	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



6.5. GSM850 Radiated Spurious & Harmonic Conversion Table

Date : January 14, 2011

Test Engineer : KJ KWON

- ① Tx Cable loss
- ② Tx Horn Ant Gain
- ③ Tx Level to radiate -13dBm
- ④ ESI Level received from Tx with-13dBm
- ⑤ Tested Level from EUT
- ⑥ = ERP+ 2.15 - (-13 + ⑤ - ④)

CH	Har	Frequency (MHz)	① Tx C/L dB	②Tx Horn Gain dBi	③Tx Level dBm	④ ESI Level : H dBm	④ ESI Level : V dBm	⑤Tested EUT Level : H dBm	⑤Tested EUT Level : V dBm	⑥ Result EUT : H (dBc)	⑥ Result EUT : V (dBc)
128	2	1648.40	-9.34	9.50	-13.20	-27.60	-27.25	-63.17	-63.58	78.96	79.72
	3	2472.60	-11.66	10.70	-12.00	-32.50	-32.00	-53.31	-60.56	64.20	71.95
	4	3296.80	-13.53	12.30	-11.80	-36.01	-35.61	-57.78	-57.90	65.16	65.68
	5	4121.00	-15.09	12.50	-10.40	-38.76	-38.44	-	-	-	-
	6	4945.20	-16.89	12.70	-8.80	-41.87	-40.99	-	-	-	-
	7	5769.40	-18.42	12.90	-7.50	-43.37	-43.42	-	-	-	-
190	2	1673.20	-9.39	9.50	-13.10	-28.11	-28.27	-65.65	-64.55	80.93	79.67
	3	2509.80	-11.68	10.70	-12.00	-32.67	-32.25	-53.73	-55.02	64.45	66.16
	4	3346.40	-13.62	12.30	-11.70	-36.28	-36.70	-60.09	-59.27	67.20	65.96
	5	4183.00	-15.33	12.50	-10.20	-38.60	-38.48	-	-	-	-
	6	5019.60	-17.17	12.70	-8.50	-42.15	-41.72	-	-	-	-
	7	5856.20	-18.51	12.90	-7.40	-44.68	-44.47	-	-	-	-
251	2	1697.60	-9.42	9.50	-13.10	-29.20	-28.39	-68.97	-67.25	83.16	82.25
	3	2546.40	-11.69	10.70	-12.00	-32.66	-32.59	-53.54	-55.14	64.27	65.94
	4	3395.20	-13.58	12.30	-11.70	-36.31	-35.95	-65.08	-65.22	72.16	72.66
	5	4244.00	-15.43	12.50	-10.10	-39.14	-39.12	-	-	-	-
	6	5092.80	-17.20	12.70	-8.50	-42.76	-42.76	-	-	-	-
	7	5941.60	-18.66	12.90	-7.20	-44.34	-44.02	-	-	-	-

6.6. GSM1900 Radiated Spurious & Harmonic Conversion Table

Date : January 14, 2011

Test Engineer : KJ KWON

- ① Tx Cable loss
- ② Tx Horn Ant Gain
- ③ Tx Level to radiate -13dBm
- ④ ESI Level received from Tx with-13dBm
- ⑤ Tested Level from EUT
- ⑥ = EIRP - (-13 + ⑤ - ④)

CH	Har	Frequency (MHz)	① Tx C/L dB	②Tx Horn Gain dBi	③Tx Level dBm	④ ESI Level : H dBm	④ ESI Level : V dBm	⑤Tested EUT Level : H dBm	⑤Tested EUT Level : V dBm	⑥ Result EUT : H (dBc)	⑥ Result EUT : V (dBc)
512	2	3700.40	-14.27	12.40	-11.10	-37.42	-37.29	-68.42	-68.09	74.23	74.03
	3	5550.60	-17.89	12.90	-8.00	-42.43	-42.51	-66.51	-65.41	67.31	66.13
	4	7400.80	-20.68	10.50	-2.80	-47.70	-47.31	-69.27	-68.89	64.80	64.81
	5	9251.00	-24.00	11.20	-0.20	-51.55	-50.34	-	-	-	-
	6	11101.20	-27.10	11.60	2.50	-55.14	-55.44	-	-	-	-
	7	12951.40	-29.17	12.90	3.30	-58.61	-58.58	-	-	-	-
661	2	3760.00	-14.42	12.40	-11.00	-37.93	-37.89	-64.99	-68.48	70.29	73.82
	3	5640.00	-18.03	12.90	-7.90	-42.58	-42.73	-67.06	-67.64	67.71	68.14
	4	7520.00	-20.87	10.60	-2.70	-47.19	-47.22	-68.55	-68.35	64.59	64.36
	5	9400.00	-23.58	11.60	-1.00	-51.70	-51.98	-	-	-	-
	6	11280.00	-26.58	12.10	1.50	-55.95	-56.35	-	-	-	-
	7	13160.00	-28.58	12.80	2.80	-58.92	-59.14	-	-	-	-
810	2	3819.60	-14.46	12.40	-10.90	-38.24	-38.04	-64.55	-64.49	69.54	69.68
	3	5729.40	-18.26	13.00	-7.70	-43.05	-42.89	-67.97	-66.11	68.15	66.45
	4	7639.20	-21.26	11.20	-2.90	-47.42	-47.53	-69.34	-67.93	65.15	63.63
	5	9549.00	-23.84	11.70	-0.90	-52.67	-51.88	-	-	-	-
	6	11458.80	-27.12	11.70	2.40	-56.20	-55.97	-	-	-	-
	7	13368.60	-28.83	12.30	3.50	-60.16	-59.86	-	-	-	-

6.7. Frequency Stability

6.7.1. GSM850 Frequency Stability Table

Operating Frequency : 836,600,000 Hz

Channel : 190

Reference Voltage : 3.7VDC

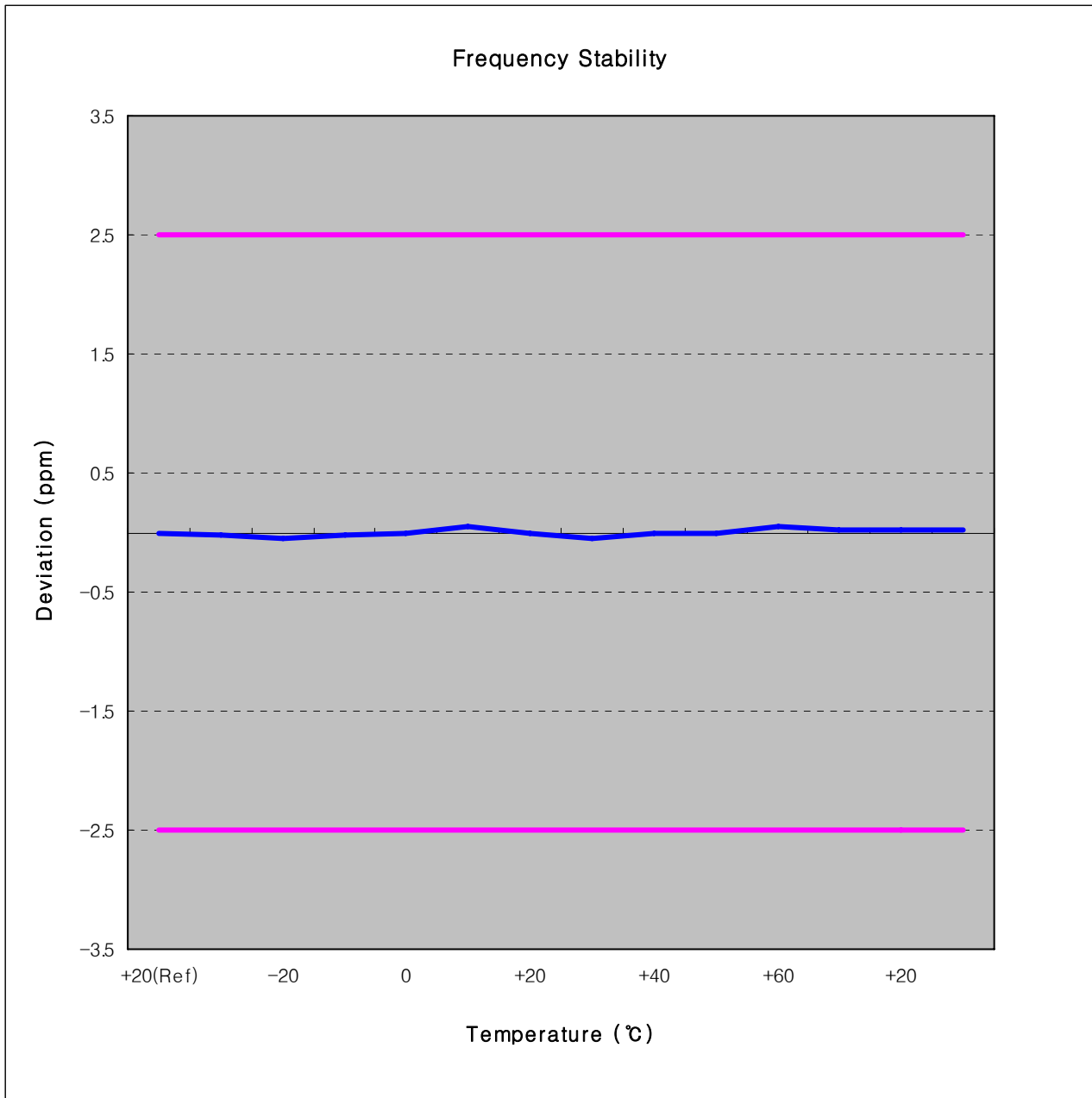
Deviation Limit : $\pm 0.00025\%$ or 2.5ppm

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency Error (Hz)	Frequency (Hz)	Deviation (%)	ppm
100%	3.70	+20(Ref)	-0.60	836,599,999	0.000000	-0.001
100%		-30	7.90	836,600,008	0.000001	0.009
100%		-20	10.20	836,600,010	0.000001	0.012
100%		-10	-16.90	836,599,983	-0.000002	-0.020
100%		0	-8.70	836,599,991	-0.000001	-0.010
100%		+10	-24.20	836,599,976	-0.000003	-0.029
100%		+20	-0.60	836,599,999	0.000000	-0.001
100%		+30	-21.70	836,599,978	-0.000003	-0.026
100%		+40	9.70	836,600,010	0.000001	0.012
100%		+50	11.40	836,600,011	0.000001	0.014
85%		3.35	+20	-12.70	836,599,987	-0.000002
115%	4.26	+20	8.70	836,600,009	0.000001	0.010
Batt.Endpoint	3.35	+20	-12.70	836,599,987	-0.000002	-0.015

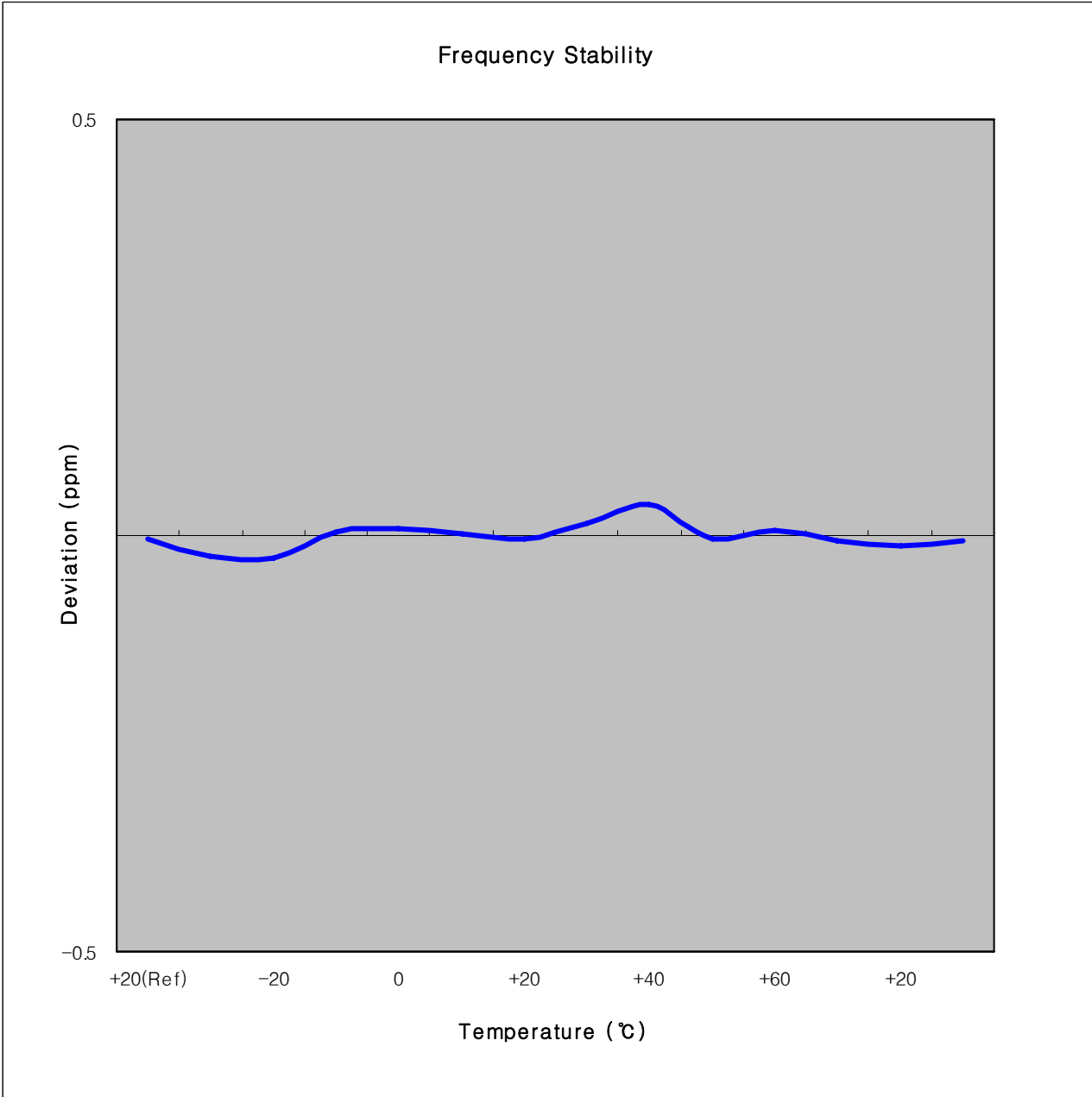
Note : The temperature is varied from -30 °C to +50 °C using an environmental chamber.

The EUT is tested down to the battery end point.

6.7.2. GSM850 Frequency Stability Graph



Zoom IN





6.7.3. GSM1900 Frequency Stability Table

Operating Frequency : 1,880,000,000 Hz

Channel : 661

Reference Voltage : 3.7VDC

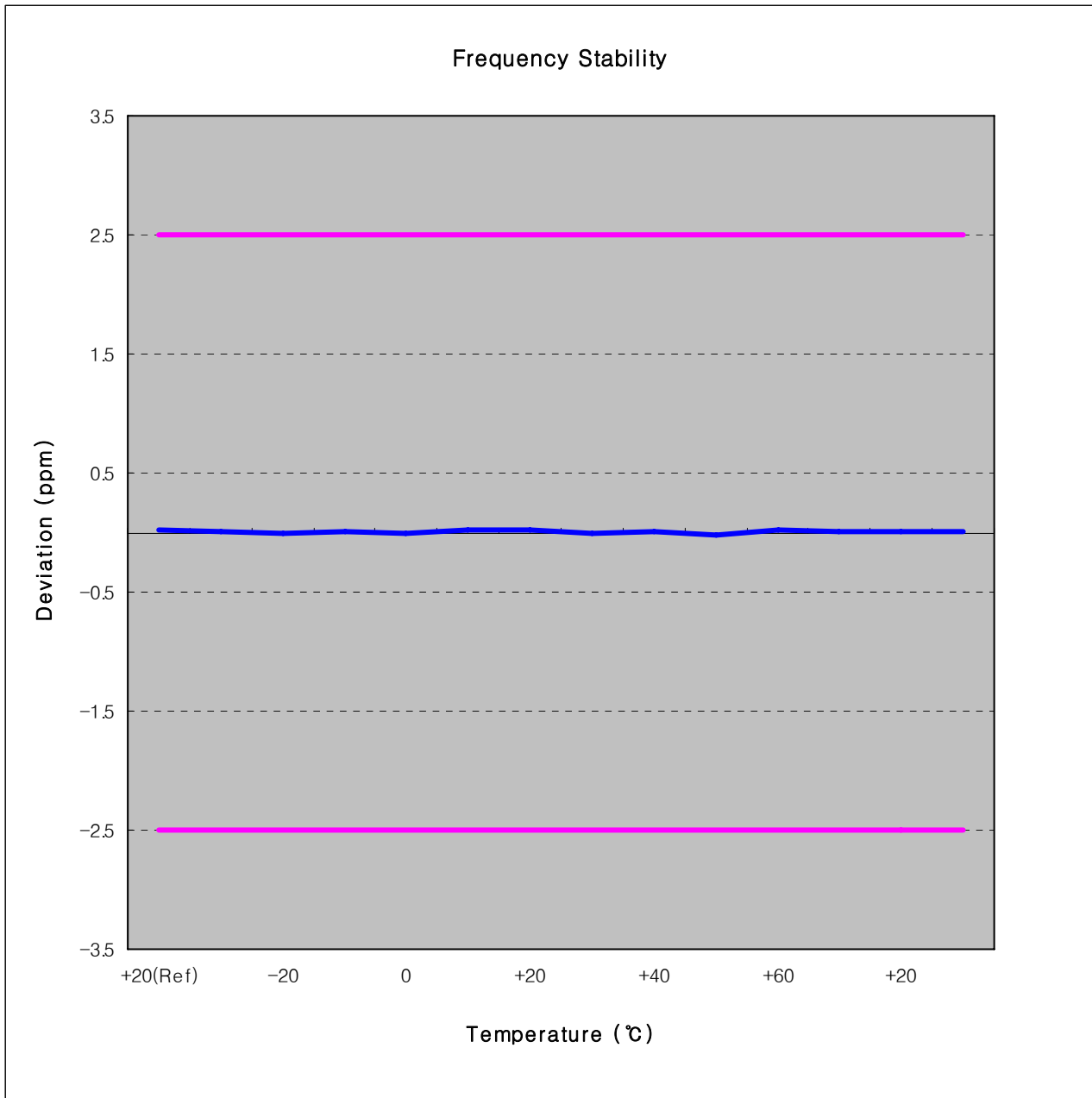
Deviation Limit : ± 0.00025 % or 2.5ppm

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency Error (Hz)	Frequency (Hz)	Deviation (%)	ppm
100%	3.70	+20(Ref)	8.60	1,880,000,009	0.000000	0.005
100%		-30	26.40	1,880,000,026	0.000001	0.014
100%		-20	19.30	1,880,000,019	0.000001	0.010
100%		-10	-8.40	1,879,999,992	0.000000	-0.004
100%		0	22.40	1,880,000,022	0.000001	0.012
100%		+10	1.60	1,880,000,002	0.000000	0.001
100%		+20	8.60	1,880,000,009	0.000000	0.005
100%		+30	-19.30	1,879,999,981	-0.000001	-0.010
100%		+40	-12.30	1,879,999,988	-0.000001	-0.007
100%		+50	-16.70	1,879,999,983	-0.000001	-0.009
85%		3.35	+20	34.60	1,880,000,035	0.000002
115%	4.26	+20	2.30	1,880,000,002	0.000000	0.001
Batt.Endpoint	3.35	+20	34.60	1,880,000,035	0.000002	0.018

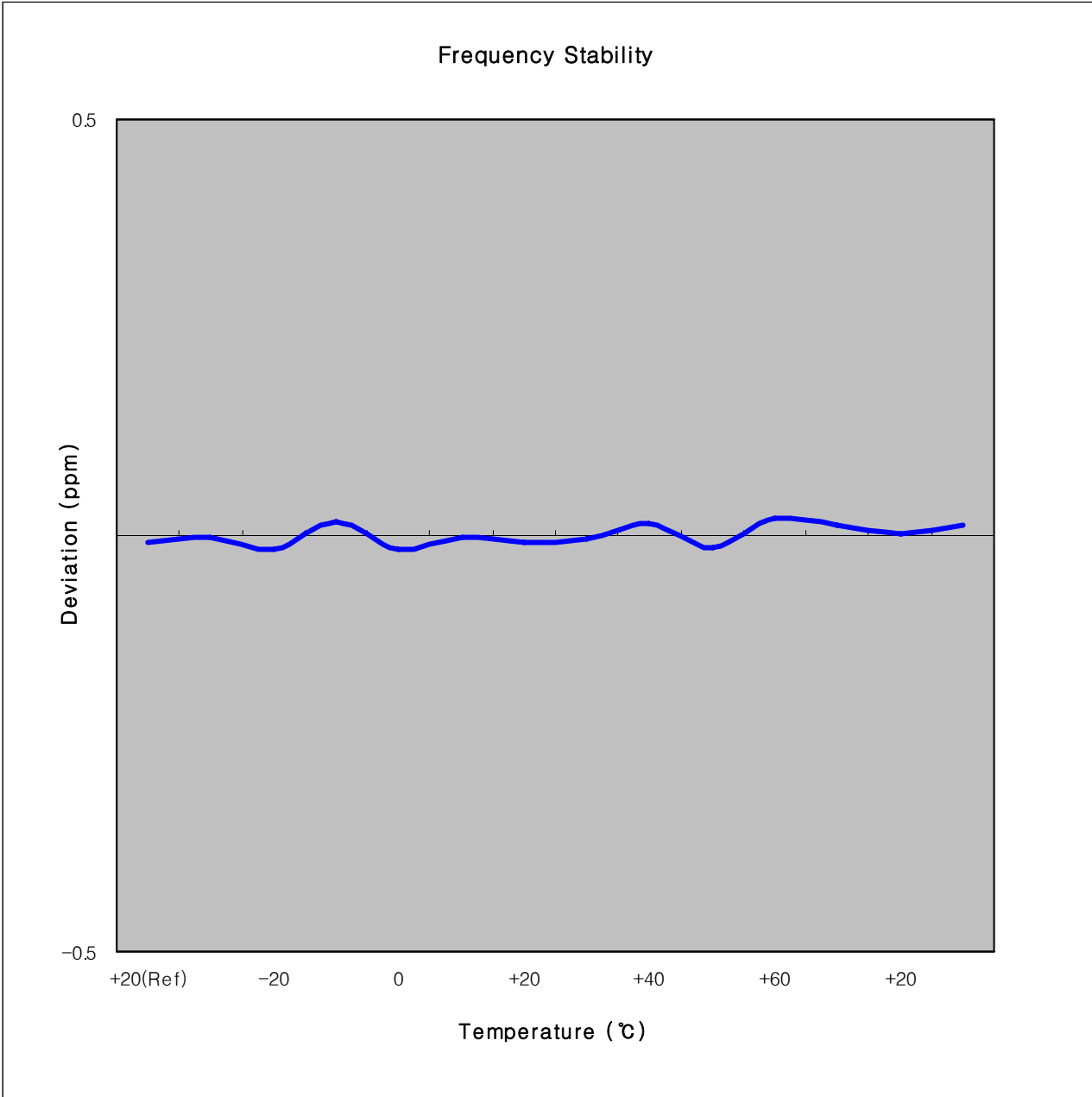
Note : The temperature is varied from -30 °C to +50 °C using an environmental chamber.

The EUT is tested down to the battery end point.

6.7.4. GSM1900 Frequency Stability Graph



Zoom IN





7. CONCLUSION

The data collected shows that the SAMSUNG 850/1900 GSM/EDGE/GPRS/WCDMA Phone with Bluetooth, WLAN and HSDPA, RFID.

FCC ID : A3LGTI9020A complies with all the requirements of Parts 2,22,24 of the FCC Rules.

8. TEST PLOTS

Agilent

R T

Ch Freq 824.2 MHz		Trig Free	
Occupied Bandwidth			
FCC ID:A3LGTI9020A 0BW Ch.128 Ref 33 dBm Atten 40 dB			
#Peak			
Center	824.200 MHz	Span	1 MHz
#Res BW	3 kHz	#VBW	3 kHz
#Sweep	1 s (601 pts)		
Occupied Bandwidth		Occ BW % Pwr	99.00 %
248.5246 kHz		x dB	-26.00 dB
Transmit Freq Error	-399.231 Hz		
x dB Bandwidth	307.835 kHz		

Center Freq	824.200000 MHz
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

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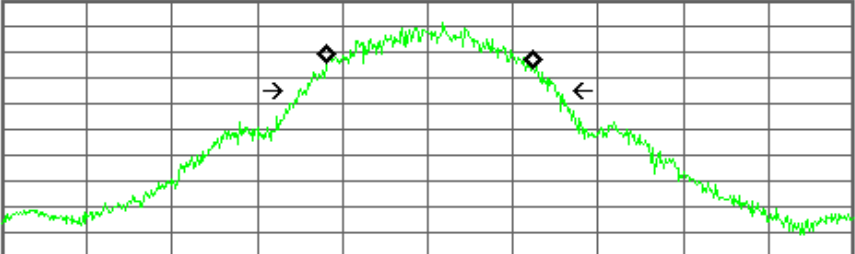
Agilent

R T

Ch Freq 836.6 MHz		Trig Free	
Occupied Bandwidth			
FCC ID:A3LGTI9020A 0BW Ch.190 Ref 33 dBm Atten 40 dB			
#Peak			
Center	836.600 MHz	Span	1 MHz
#Res BW	3 kHz	#VBW	3 kHz
#Sweep	1 s (601 pts)		
Occupied Bandwidth		Occ BW % Pwr	99.00 %
244.1577 kHz		x dB	-26.00 dB
Transmit Freq Error	874.980 Hz		
x dB Bandwidth	304.986 kHz		

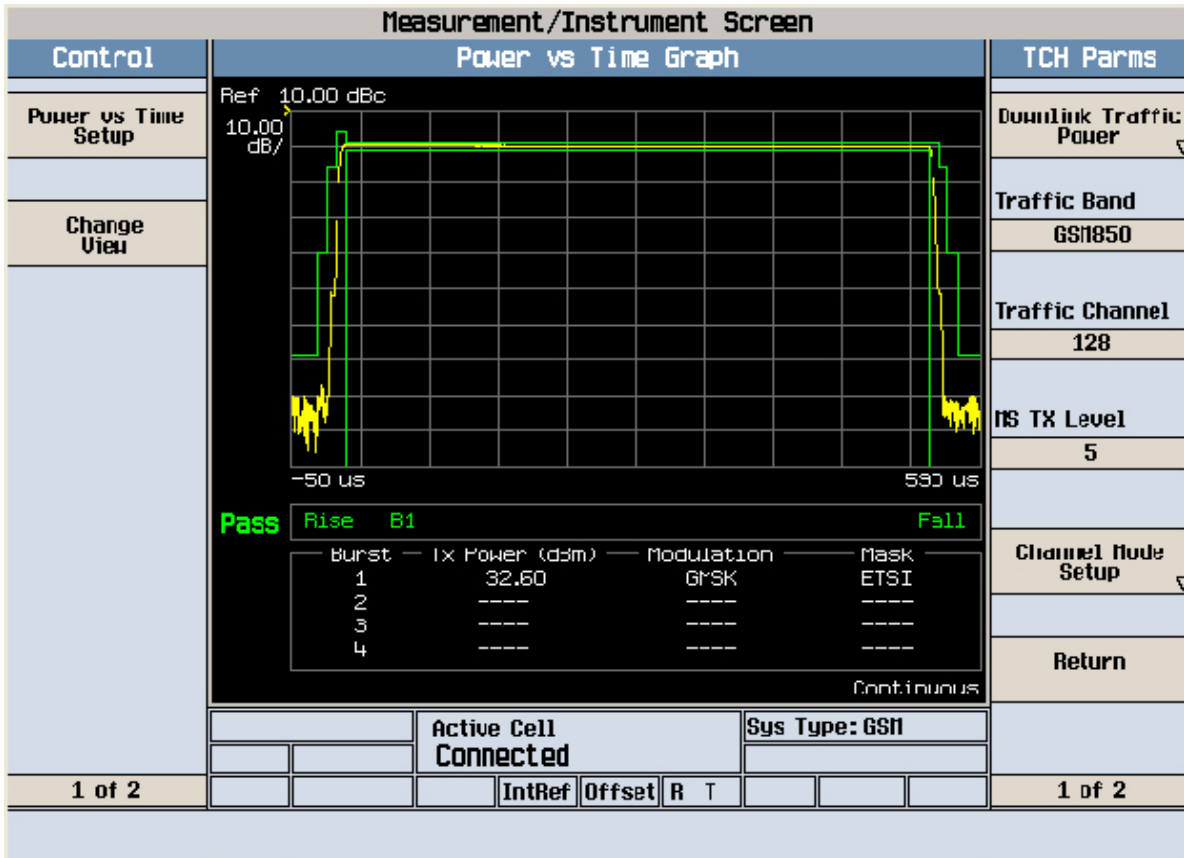
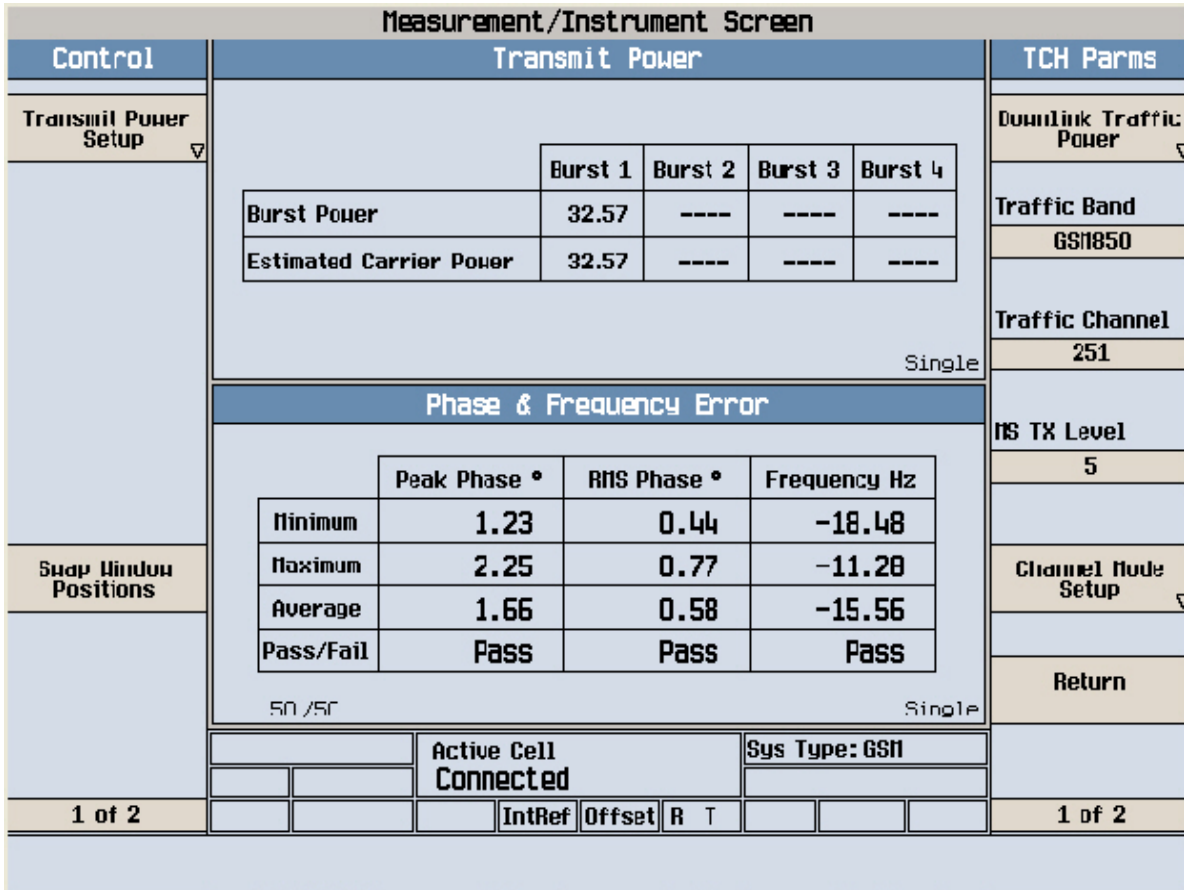
Center Freq	836.600000 MHz
Start Freq	836.100000 MHz
Stop Freq	837.100000 MHz
CF Step	100.000000 kHz
	Auto Man
Freq Offset	0.00000000 Hz
Signal Track	On Off

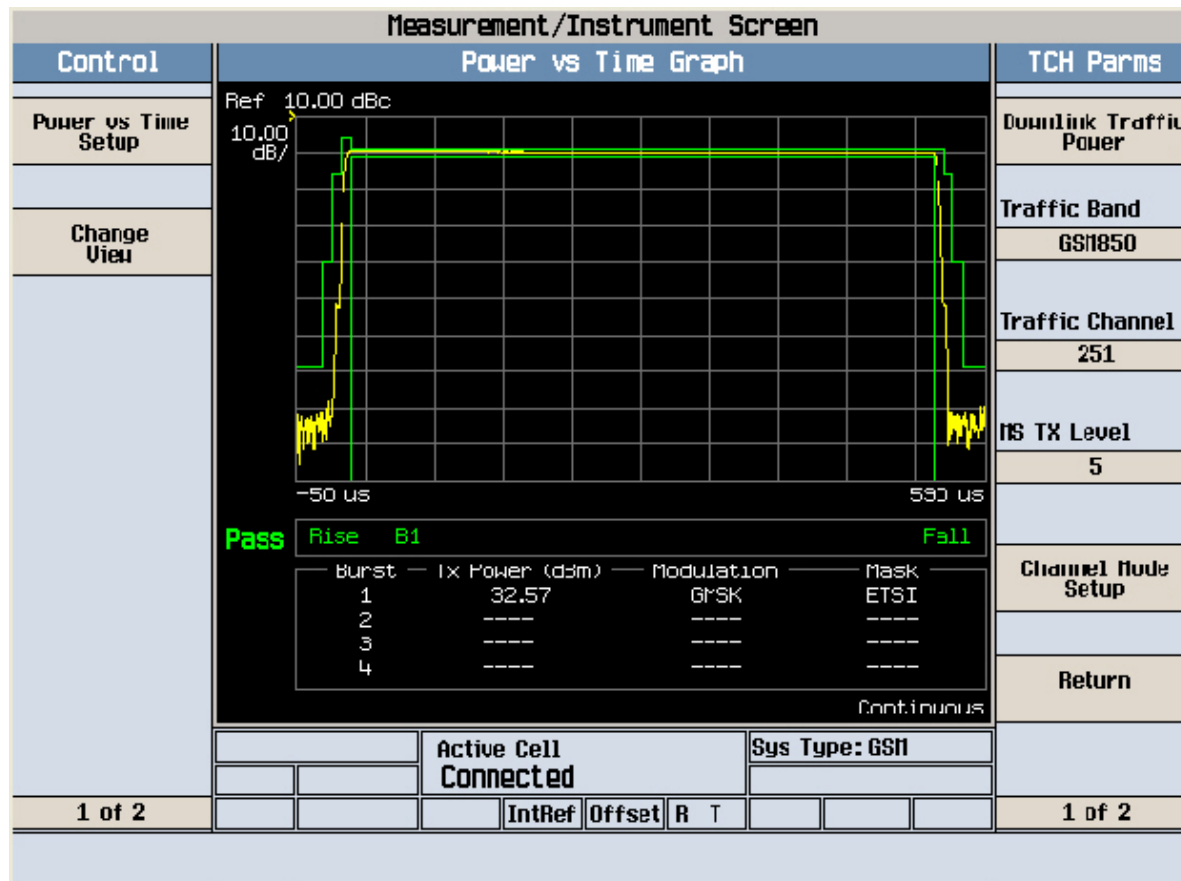
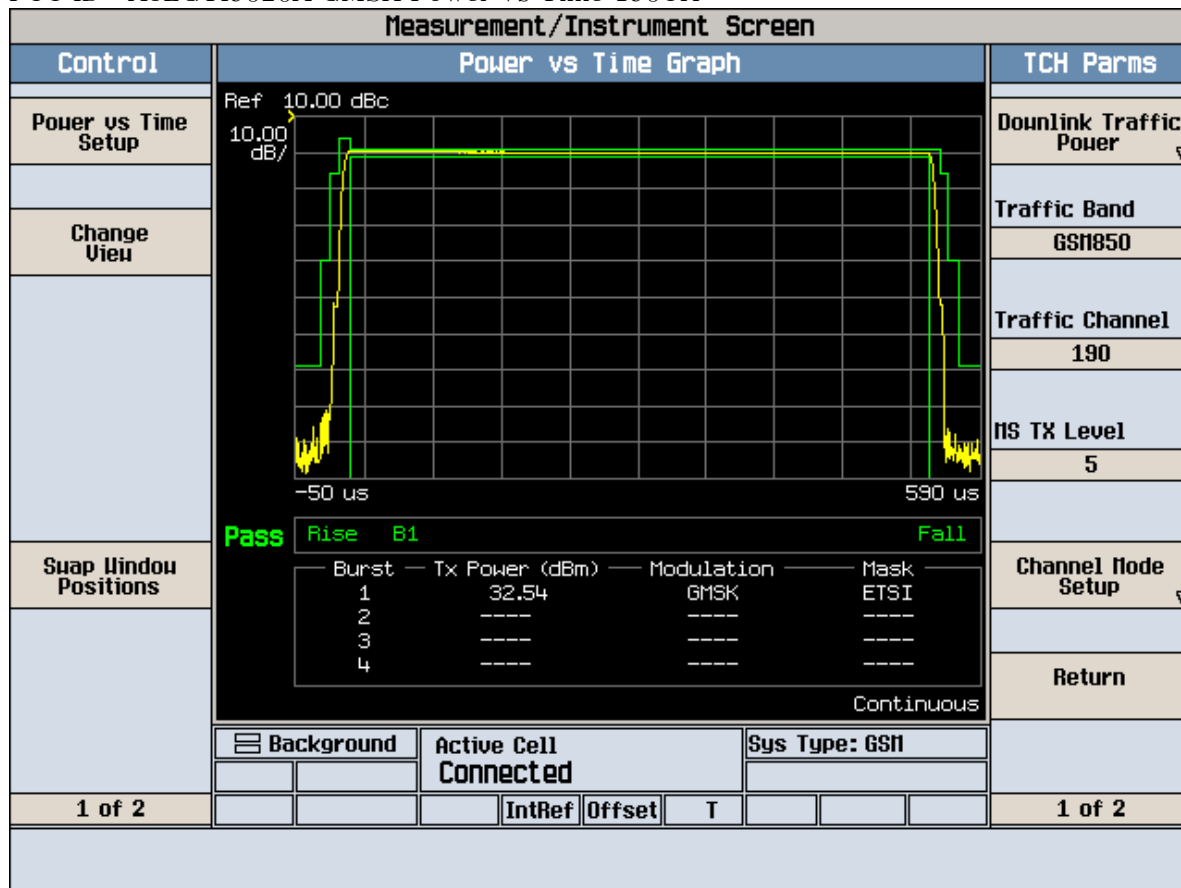
File Operation Status, C:\TEMP.GIF file saved

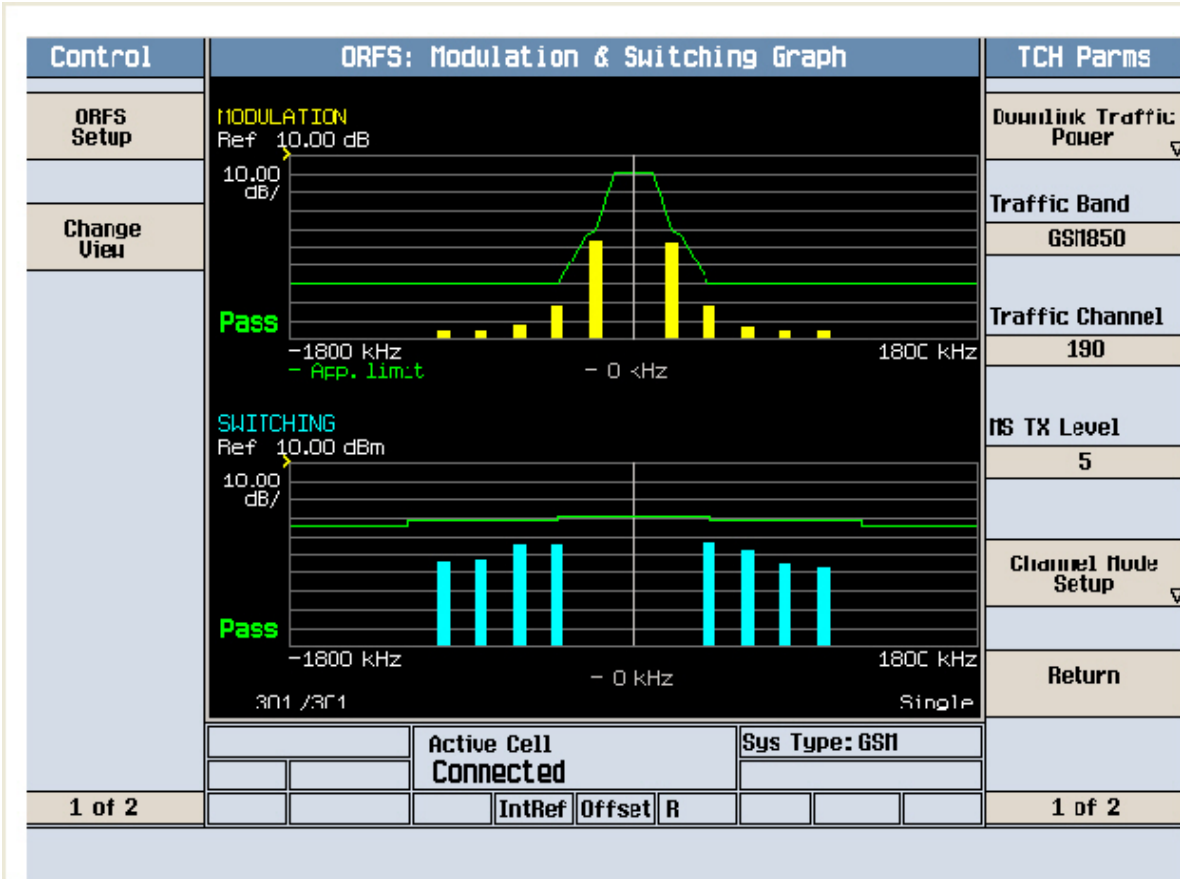
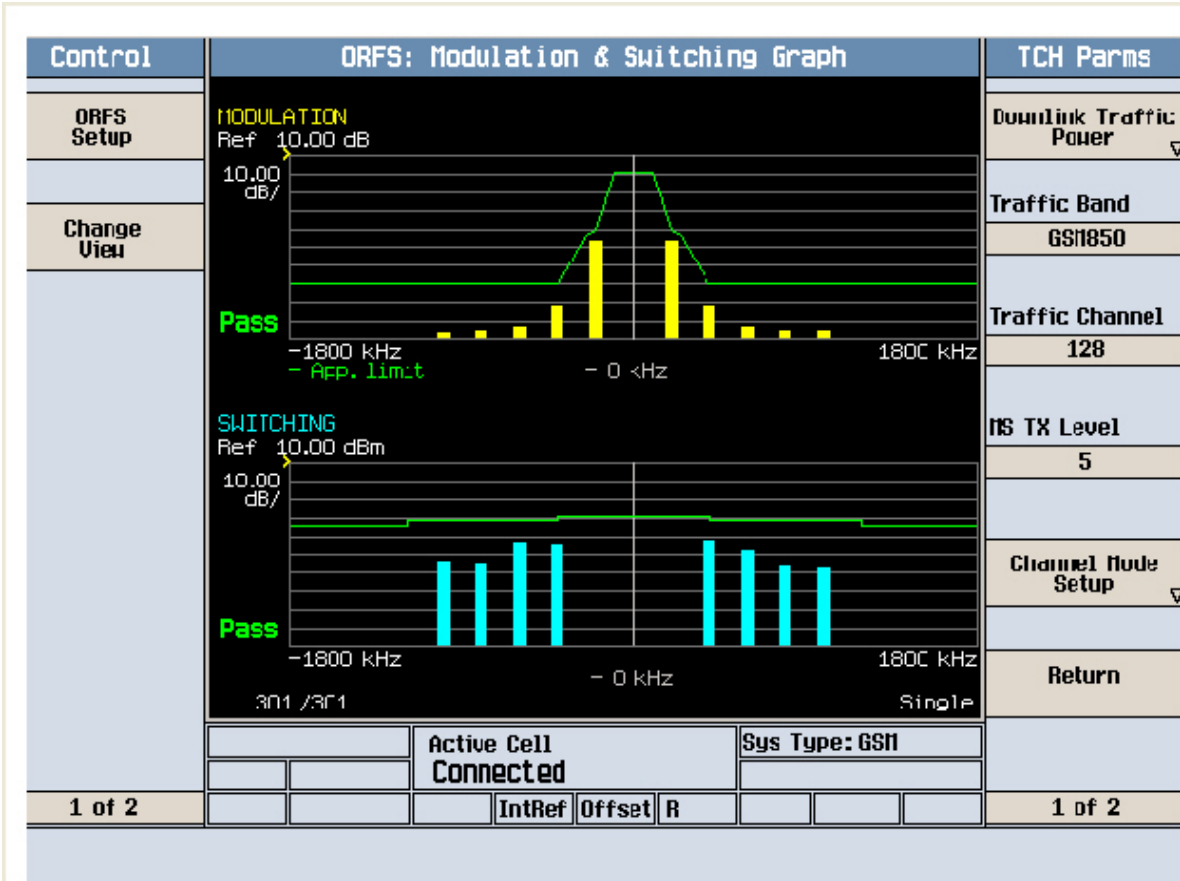
Ch Freq 848.8 MHz Trig Free		Freq/Channel	
Occupied Bandwidth [] []		Center Freq 848.800000 MHz	
FCC ID:A3LGTI9020A 0BW Ch.251 Ref 33 dBm Atten 40 dB		Start Freq 848.300000 MHz	
<div style="display: flex; align-items: center;"> <div style="writing-mode: vertical-rl; transform: rotate(180deg); font-size: small; margin-right: 5px;"> #Peak Log 10 dB/ Offst 7.77 dB </div>  </div>		Stop Freq 848.300000 MHz	
		CF Step 100.000000 kHz Auto Man	
Center 848.800 MHz Span 1 MHz #Res BW 3 kHz #VBW 3 kHz #Sweep 1 s (601 pts)		Freq Offset 0.00000000 Hz	
Occupied Bandwidth Occ BW % Pwr 99.00 % 245.5591 kHz x dB -26.00 dB		Signal Track On Off	
Transmit Freq Error 1.869 kHz x dB Bandwidth 304.415 kHz			
File Operation Status, C:\TEMP.GIF file saved			

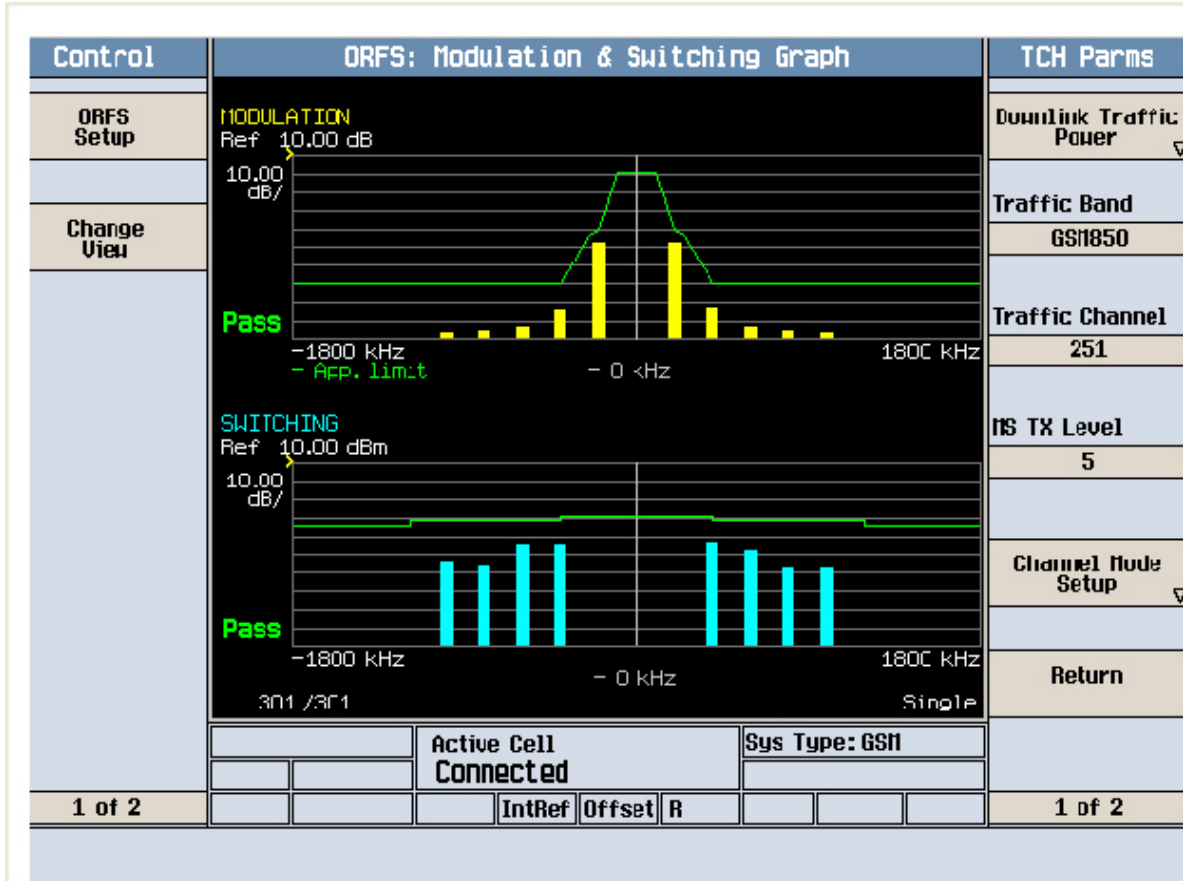
Measurement/Instrument Screen										
Control	Transmit Power							TCH Parms		
Transmit Power Setup ▾					Burst 1	Burst 2	Burst 3	Burst 4	Downlink Traffic Power ▾	
	Burst Power				32.59	----	----	----	Traffic Band	
Snap Window Positions	Estimated Carrier Power				32.59	----	----	----	GS1850	
								Traffic Channel		
								128		
								MS TX Level		
							5		Channel Mode Setup ▾	
							Return			
							50 / 50		Single	
			Active Cell Connected				Sys Type: GSM			
1 of 2				IntRef	Offset	R	T	1 of 2		

Measurement/Instrument Screen										
Control	Transmit Power							TCH Parms		
Transmit Power Setup ▾					Burst 1	Burst 2	Burst 3	Burst 4	Downlink Traffic Power ▾	
	Burst Power				32.56	----	----	----	Traffic Band	
Snap Window Positions	Estimated Carrier Power				32.56	----	----	----	GS1850	
								Traffic Channel		
								190		
								MS TX Level		
							5		Channel Mode Setup ▾	
							Return			
							50 / 50		Single	
			Active Cell Connected				Sys Type: GSM			
1 of 2				IntRef	Offset	R	T	1 of 2		









Agilent

R

Freq/Channel

FCC ID:A3LGTI9020A Cond Spur Ch.128

Ref 33 dBm

Atten 40 dB

#Peak

Log

10

dB/

Offst

7.77

dB

DI

-13.0

dBm

#LgAv

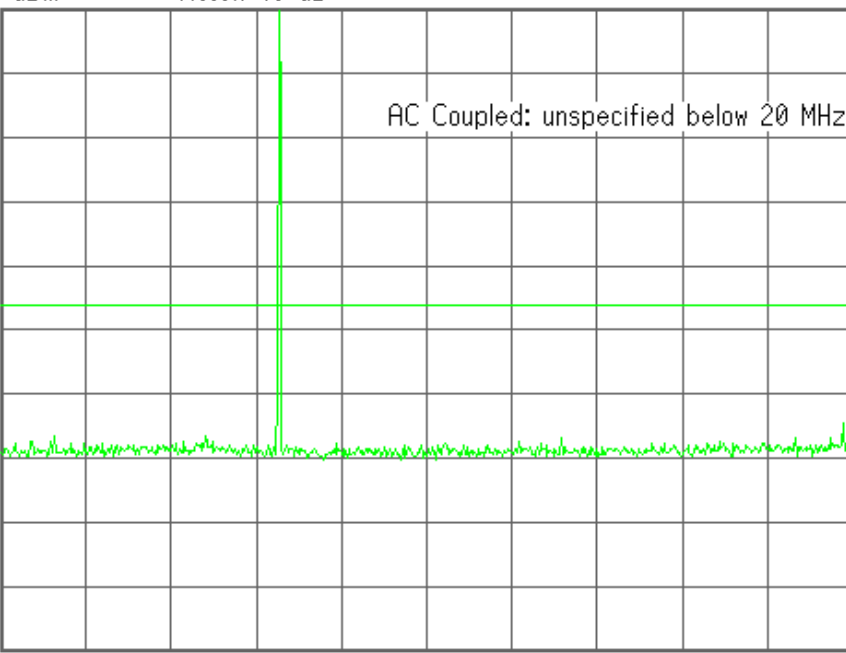
M1 S2

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

Freq/Channel

FCC ID:A3LGTI9020A Cond Spur Ch.128

Mkr1 488.8 MHz

Ref 33 dBm

Atten 40 dB

-33.79 dBm

#Peak

Log

10

dB/

Offst

7.77

dB

DI

-13.0

dBm

#LgAv

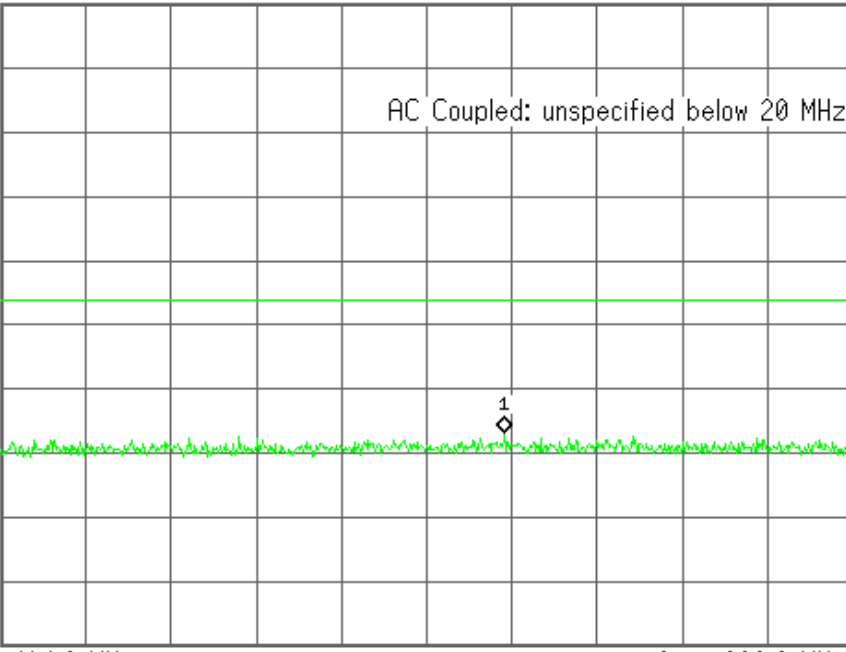
V1 S2

S3 FC

$\mathcal{E}(f)$:

FTun

Swp



Center 414.6 MHz

Span 809.2 MHz

#Res BW 1 MHz

#VBW 1 MHz

Sweep 1.36 ms (601 pts)

Center Freq
414.600000 MHz

Start Freq
10.0000000 MHz

Stop Freq
819.200000 MHz

CF Step
80.9200000 MHz
Auto Man

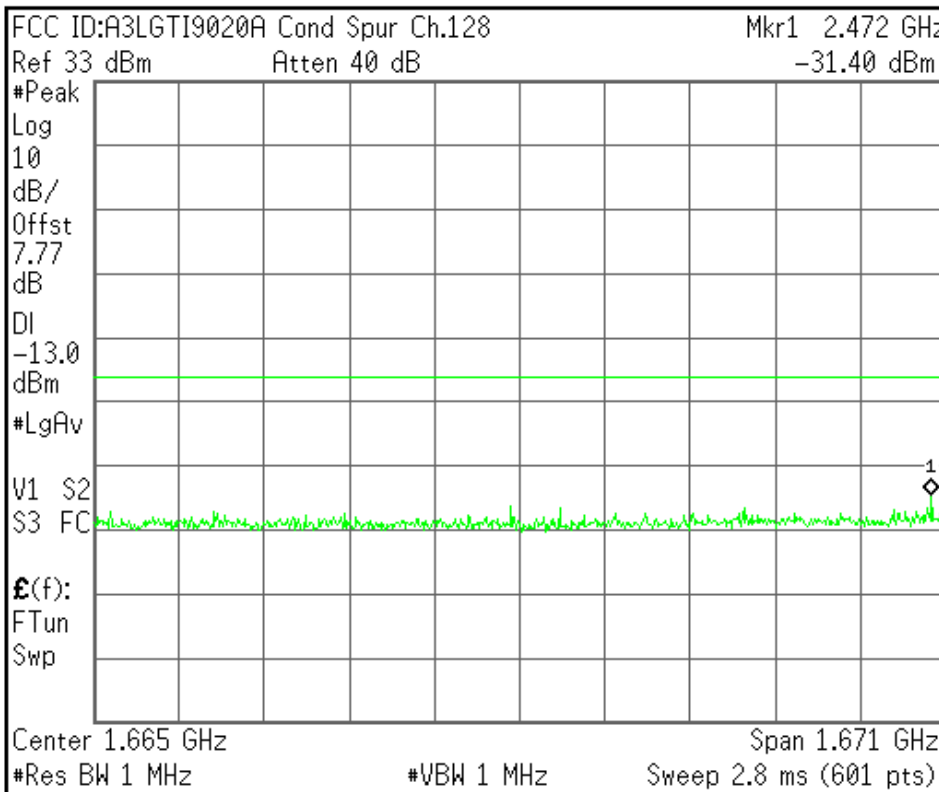
Freq Offset
0.00000000 Hz

Signal Track
On Off

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

Agilent

R



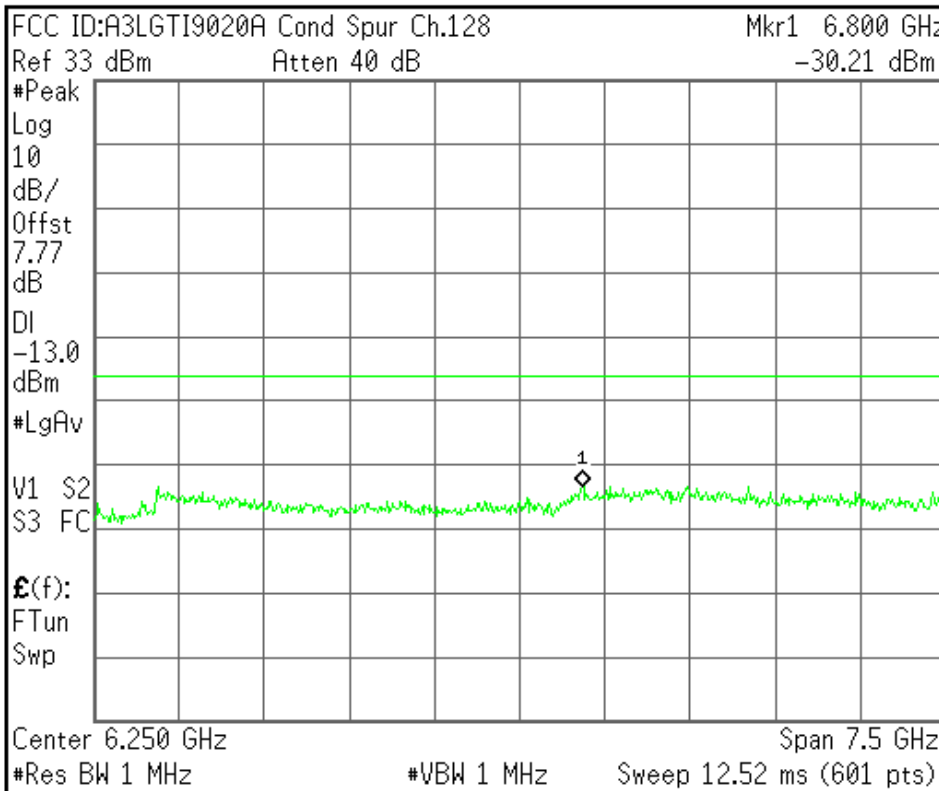
Freq/Channel

Center Freq 1.66460000 GHz
Start Freq 829.200000 MHz
Stop Freq 2.50000000 GHz
CF Step 167.080000 MHz Auto Man
Freq Offset 0.00000000 Hz
Signal Track On Off

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

Agilent

R T



Freq/Channel

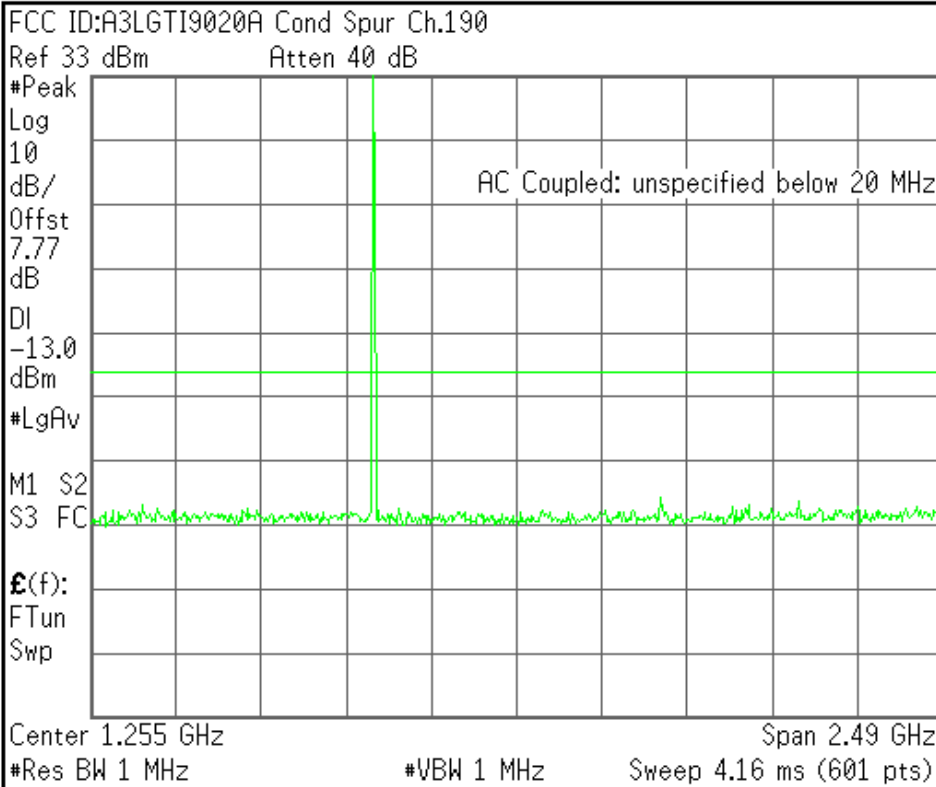
Center Freq 6.25000000 GHz
Start Freq 2.50000000 GHz
Stop Freq 10.00000000 GHz
CF Step 750.000000 MHz Auto Man
Freq Offset 0.00000000 Hz
Signal Track On Off

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

Agilent

R L

Freq/Channel



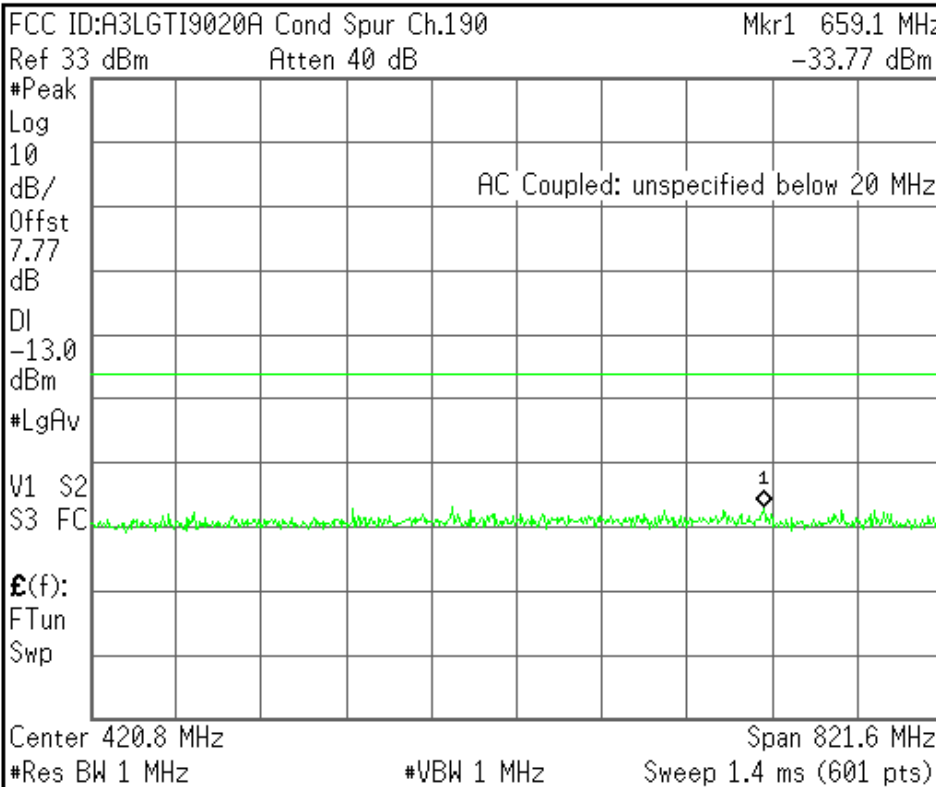
Center Freq 1.25500000 GHz
Start Freq 10.0000000 MHz
Stop Freq 2.50000000 GHz
CF Step 249.000000 MHz Auto Man
Freq Offset 0.00000000 Hz
Signal Track On Off

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

Agilent

R L

Freq/Channel



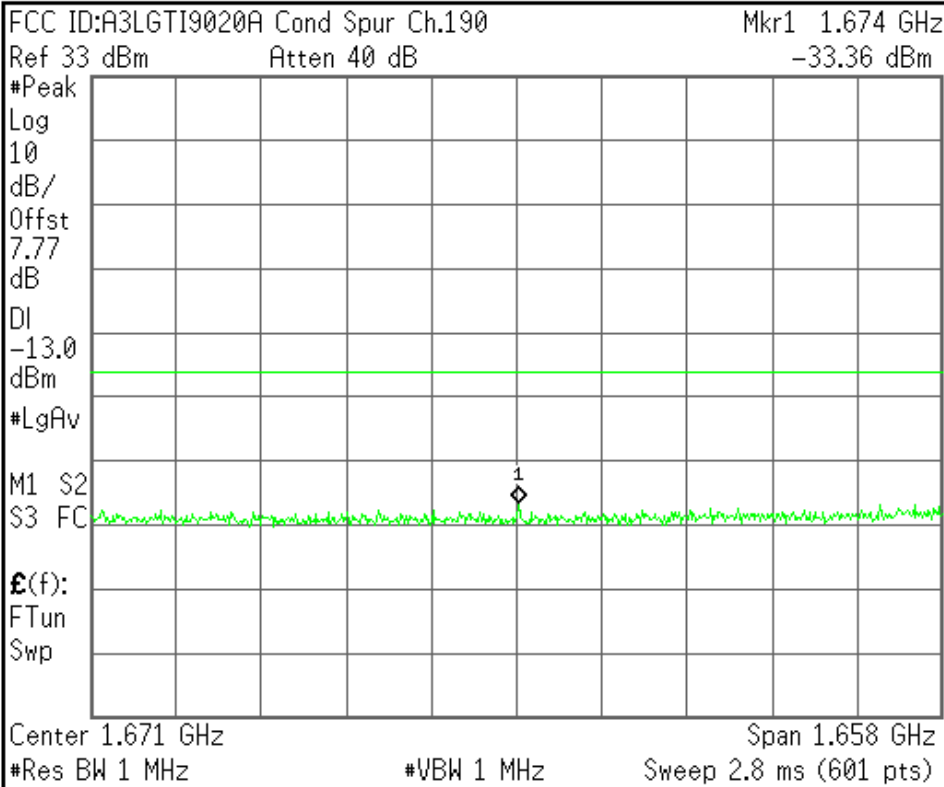
Center Freq 420.800000 MHz
Start Freq 10.0000000 MHz
Stop Freq 831.600000 MHz
CF Step 82.1600000 MHz Auto Man
Freq Offset 0.00000000 Hz
Signal Track On Off

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

Agilent

R L

Freq/Channel



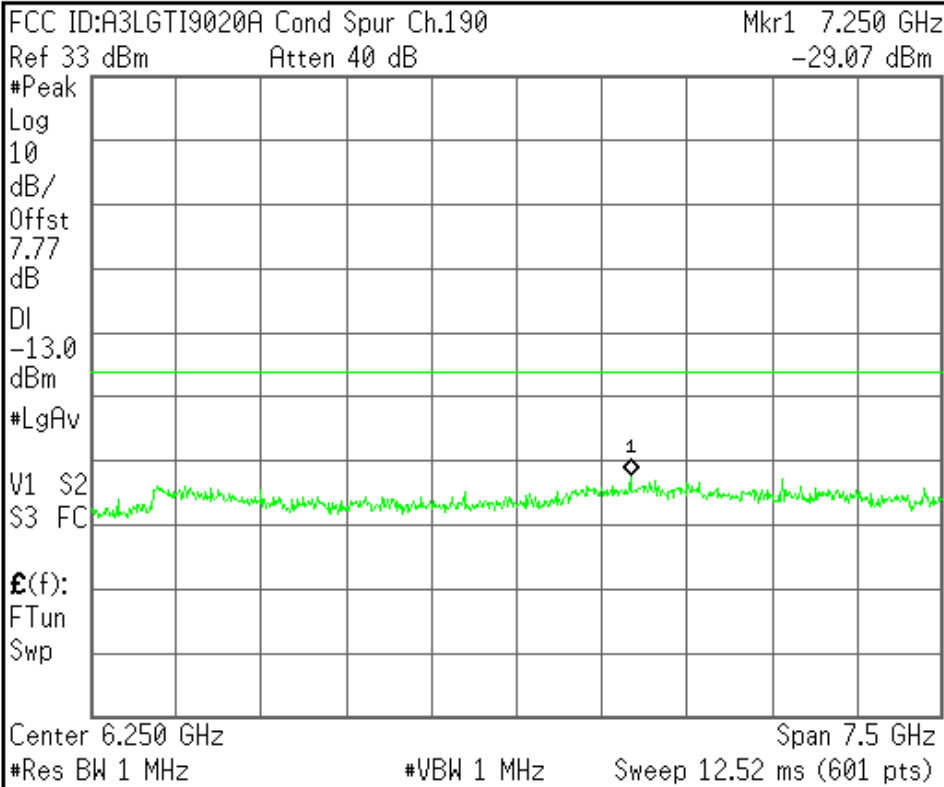
Center Freq 1.67080000 GHz
Start Freq 841.600000 MHz
Stop Freq 2.50000000 GHz
CF Step 165.840000 MHz Auto Man
Freq Offset 0.00000000 Hz
Signal Track On Off

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

Agilent

R L

Freq/Channel



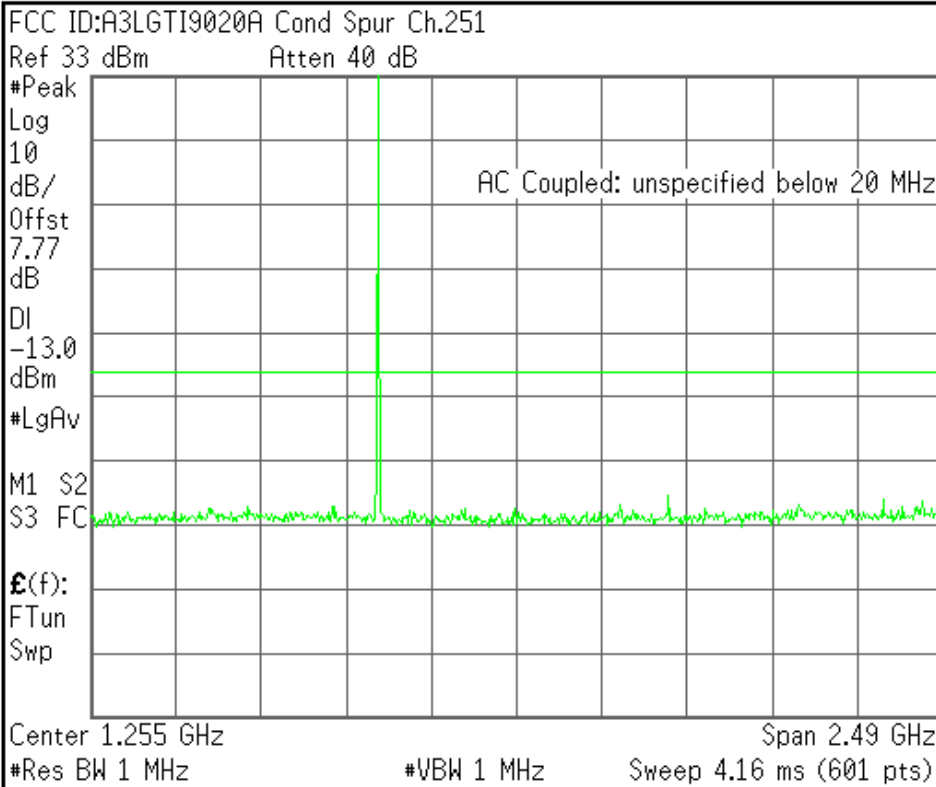
Center Freq 6.25000000 GHz
Start Freq 2.50000000 GHz
Stop Freq 10.00000000 GHz
CF Step 750.000000 MHz Auto Man
Freq Offset 0.00000000 Hz
Signal Track On Off

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

Agilent

R L

Freq/Channel



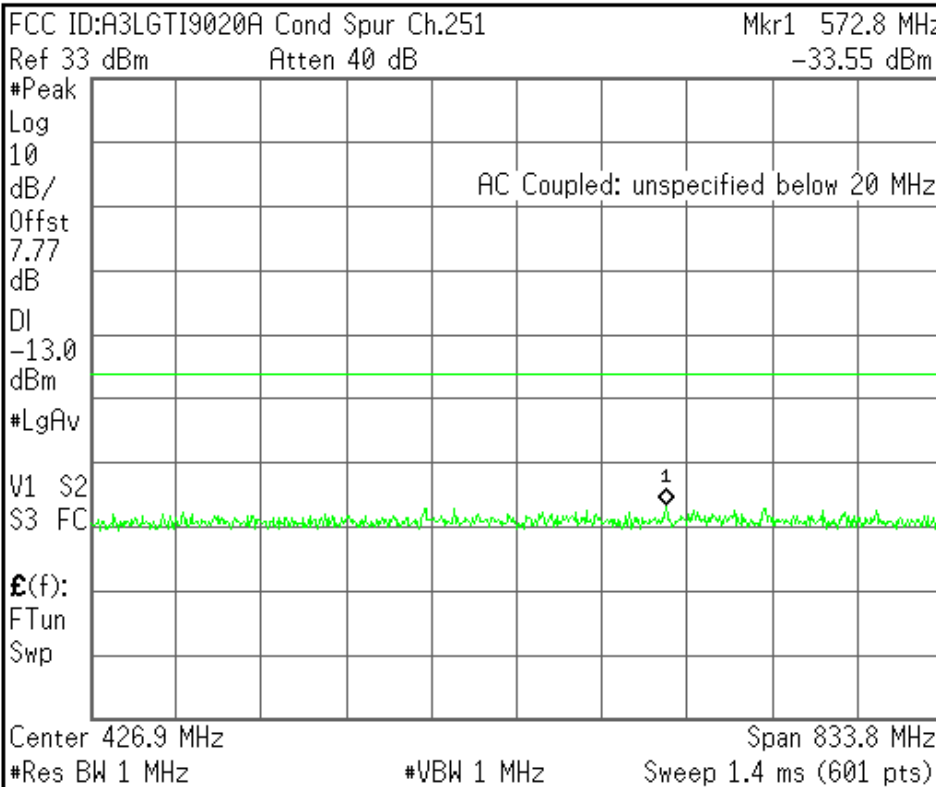
Center Freq 1.25500000 GHz
Start Freq 10.0000000 MHz
Stop Freq 2.50000000 GHz
CF Step 249.000000 MHz Auto Man
Freq Offset 0.00000000 Hz
Signal Track On Off

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

Agilent

R L

Freq/Channel



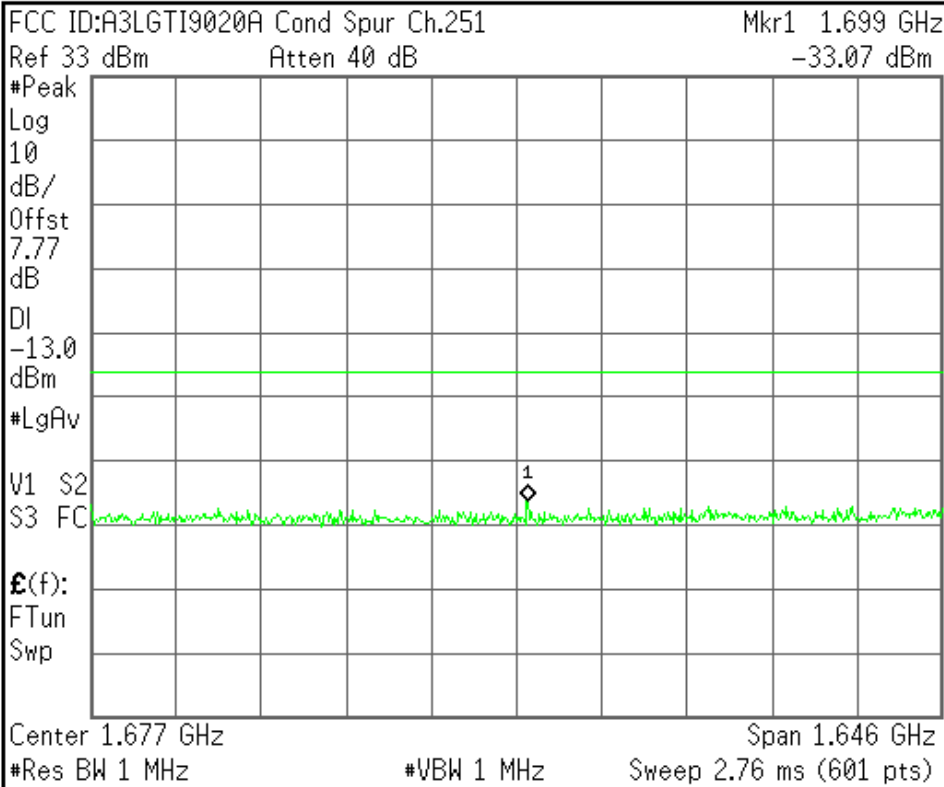
Center Freq 426.900000 MHz
Start Freq 10.0000000 MHz
Stop Freq 843.800000 MHz
CF Step 83.3800000 MHz Auto Man
Freq Offset 0.00000000 Hz
Signal Track On Off

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

Agilent

R L

Freq/Channel



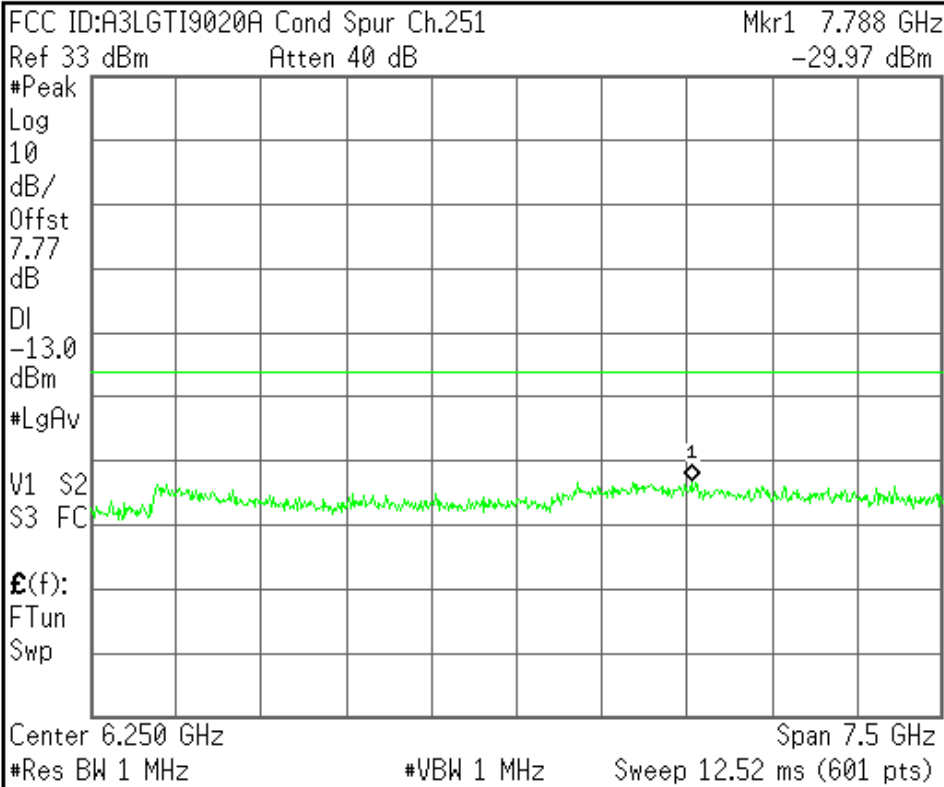
Center Freq 1.67690000 GHz
Start Freq 853.800000 MHz
Stop Freq 2.50000000 GHz
CF Step 164.620000 MHz Auto Man
Freq Offset 0.00000000 Hz
Signal Track On Off

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

Agilent

R T

Freq/Channel



Center Freq 6.25000000 GHz
Start Freq 2.50000000 GHz
Stop Freq 10.00000000 GHz
CF Step 750.000000 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:A3LGTI9020A Band Edge Ch.128

Ref 33 dBm

Atten 40 dB

#Avg

Log

10

dB/

Offst

7.77

dB

DI

-13.0

dBm

#LgAv

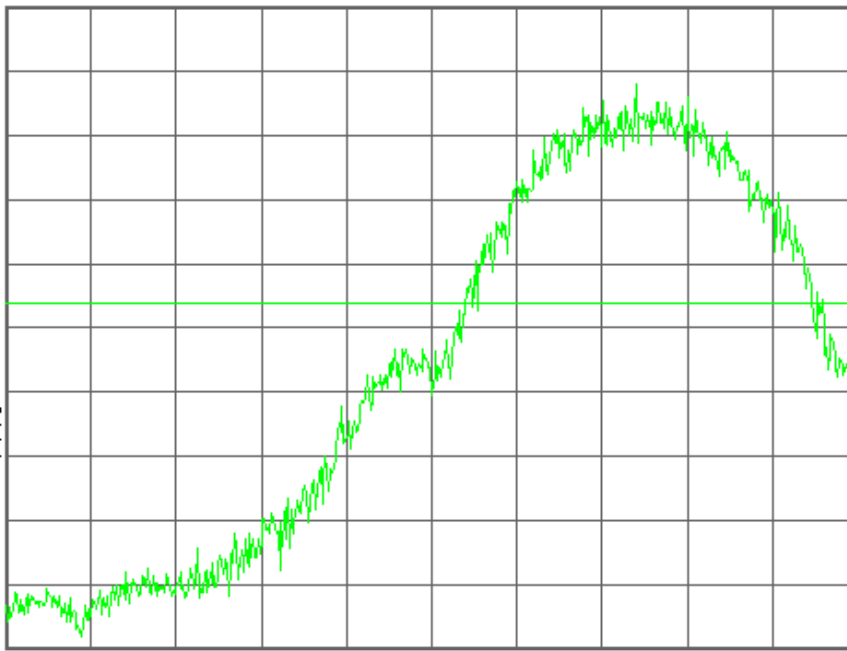
M1 S2

S3 FC

$\mathcal{E}(f)$:

f>50k

Swp



Center 824.000 0 MHz

Span 810 kHz

#Res BW 3 kHz

#VBW 3 kHz

Sweep 343.2 ms (601 pts)

Center Freq
824.000000 MHz

Start Freq
823.595000 MHz

Stop Freq
824.405000 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:A3LGTI9020A Band Edge Ch.128

Mkr1 823.975 9 MHz

Ref 33 dBm

Atten 40 dB

-17.60 dBm

#Avg

Log

10

dB/

Offst

7.77

dB

DI

-13.0

dBm

#LgAv

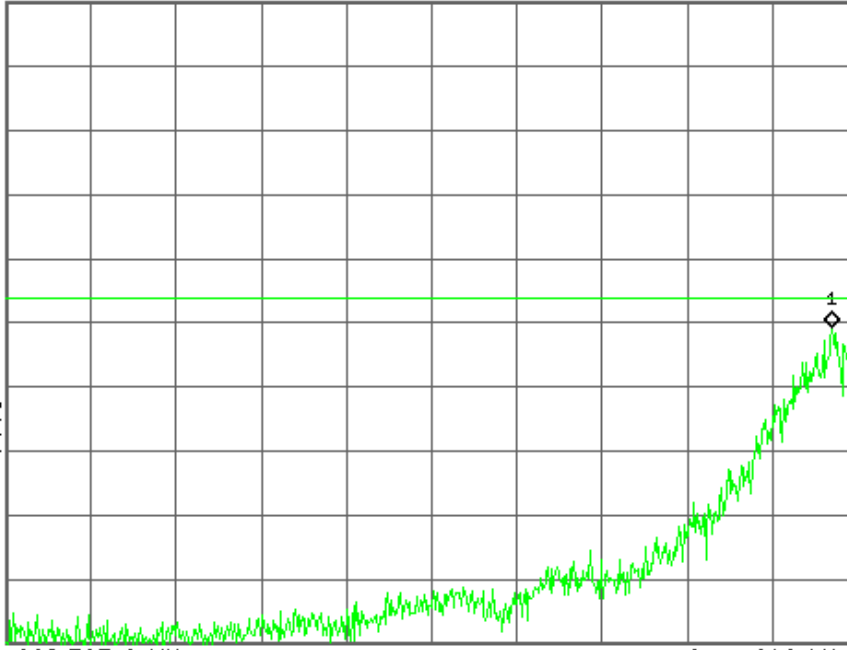
M1 S2

S3 FC

$\mathcal{E}(f)$:

f>50k

Swp



Center 823.595 0 MHz

Span 810 kHz

#Res BW 3 kHz

#VBW 3 kHz

Sweep 343.2 ms (601 pts)

Center Freq
823.595000 MHz

Start Freq
823.190000 MHz

Stop Freq
824.000000 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

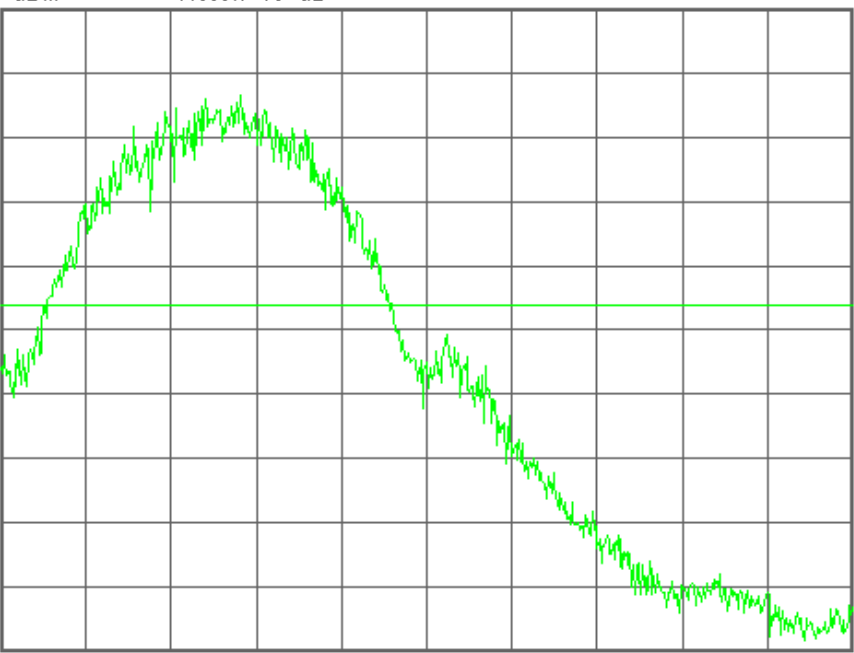
R L

Freq/Channel

FCC ID:A3LGTI9020A Band Edge Ch.251

Ref 33 dBm Atten 40 dB

#Avg
Log
10
dB/
Offst
7.77
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

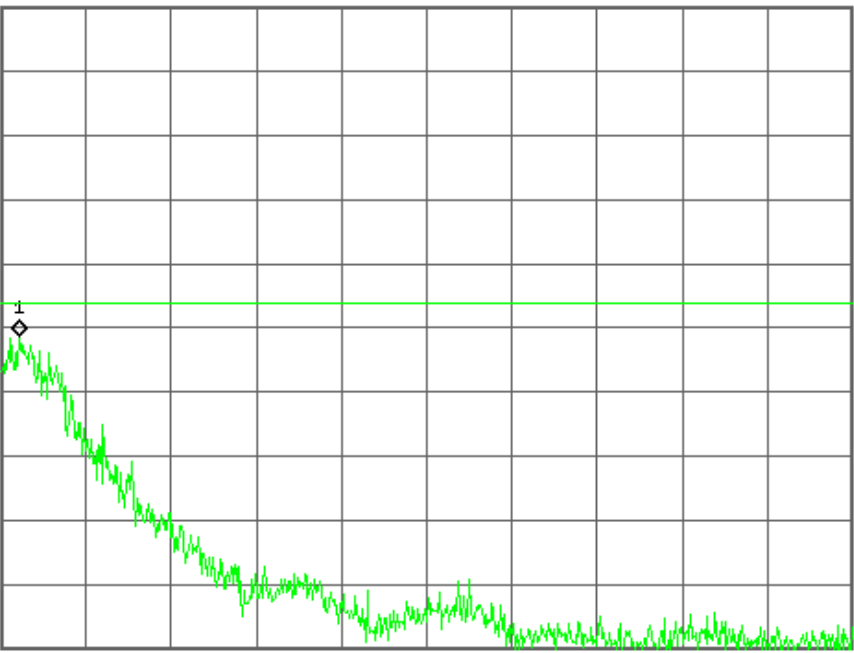
FCC ID:A3LGTI9020A Band Edge Ch.251

Mkr1 849.017 4 MHz

Ref 33 dBm Atten 40 dB

-18.19 dBm

#Avg
Log
10
dB/
Offst
7.77
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

Ch Freq 1.8502 GHz **Trig** Free

Occupied Bandwidth

FCC ID:A3LGTI9020A 0BW Ch.512
Ref 30 dBm Atten 40 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 %
242.0036 kHz	x dB	-26.00 dB
Transmit Freq Error		-390.639 Hz
x dB Bandwidth		305.087 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:A3LGTI9020A 0BW Ch.661
Ref 30 dBm Atten 40 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 %
244.8048 kHz	x dB	-26.00 dB
Transmit Freq Error		373.382 Hz
x dB Bandwidth		307.746 kHz

Freq/Channel

Center Freq
1.88000000 GHz

Start Freq
1.87950000 GHz

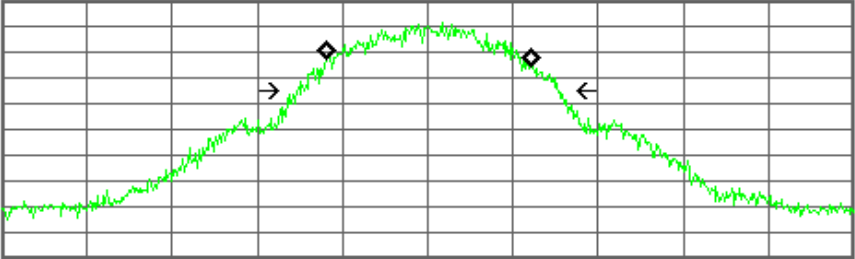
Stop Freq
1.88050000 GHz

CF Step
100.000000 kHz
Auto Man

Freq Offset
0.00000000 Hz

Signal Track
On Off

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

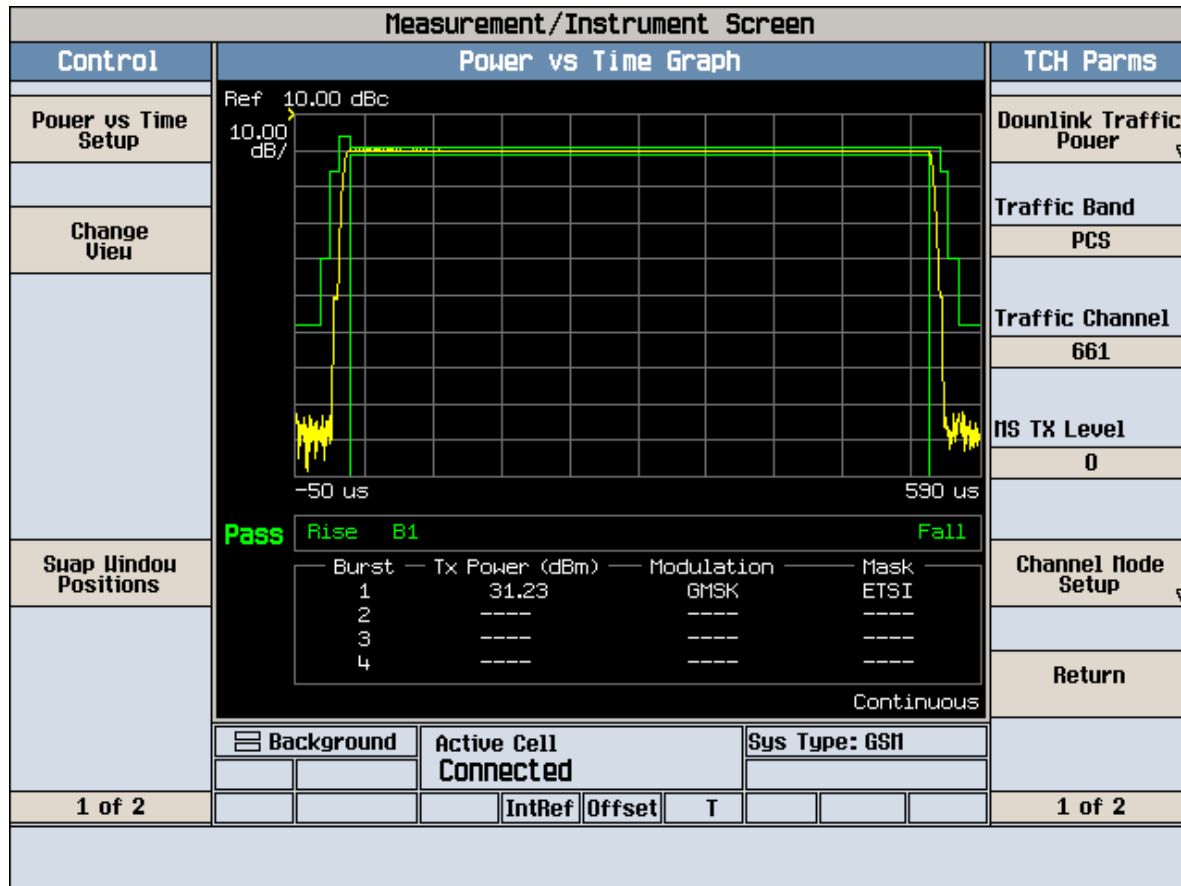
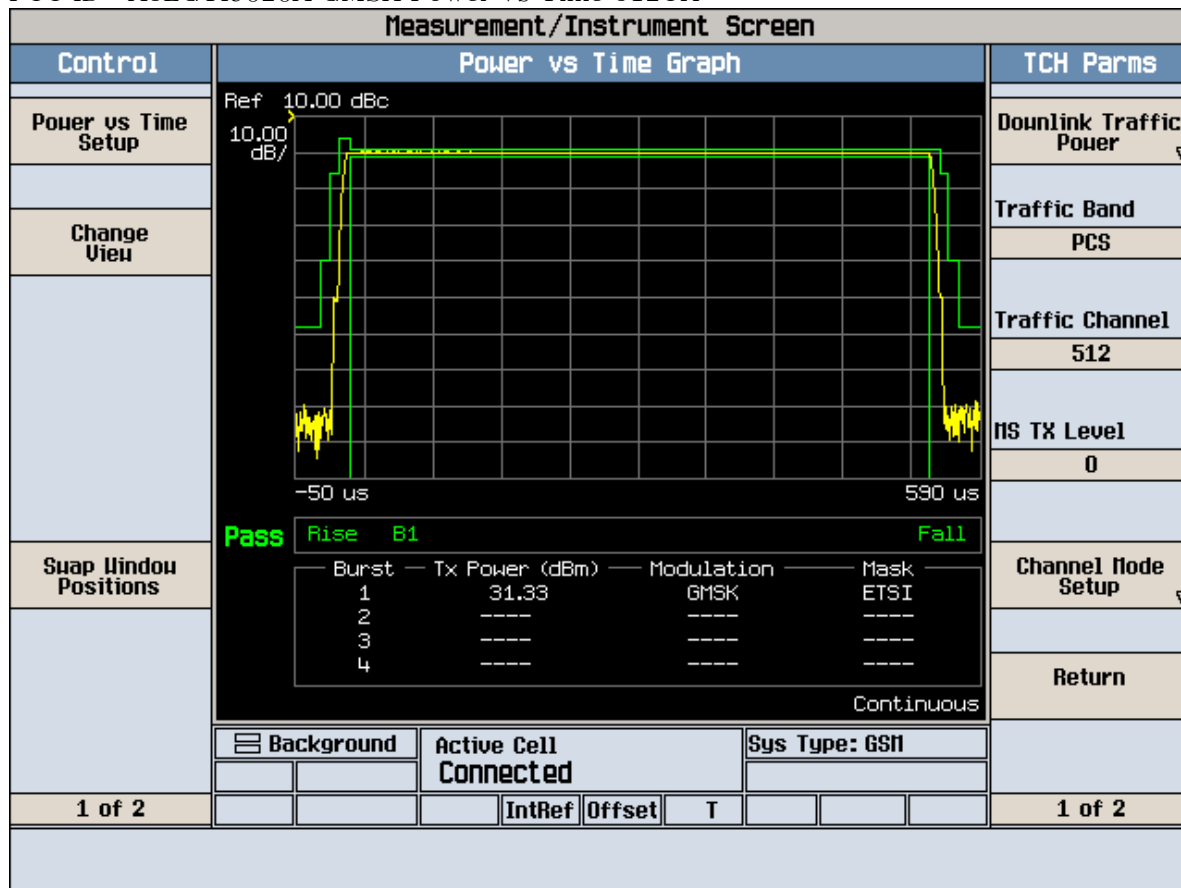
<p>Ch Freq 1.9098 GHz Trig Free</p> <p>Occupied Bandwidth [] []</p> <hr/> <p>FCC ID:A3LGTI9020A 0BW Ch.810 Ref 30 dBm Atten 40 dB</p> <div style="display: flex; align-items: center;"> <div style="font-size: small; margin-right: 10px;"> #Peak Log 10 dB/ Offst 8.75 dB </div>  </div> <p style="font-size: x-small; margin-top: 5px;">Center 1.909 800 GHz Span 1 MHz #Res BW 3 kHz #VBW 3 kHz #Sweep 1 s (601 pts)</p>	<p>Freq/Channel</p> <p>Center Freq 1.90980000 GHz</p> <hr/> <p>Start Freq 1.90930000 GHz</p> <hr/> <p>Stop Freq 1.91030000 GHz</p> <hr/> <p>CF Step 100.000000 kHz Auto Man</p> <hr/> <p>Freq Offset 0.00000000 Hz</p> <hr/> <p>Signal Track On Off</p>
<p>Occupied Bandwidth Occ BW % Pwr 99.00 %</p> <p style="font-size: large; text-align: center;">244.8598 kHz x dB -26.00 dB</p> <p>Transmit Freq Error 291.254 Hz</p> <p>x dB Bandwidth 310.326 kHz</p>	
<p>File Operation Status, C:\TEMP.GIF file saved</p>	

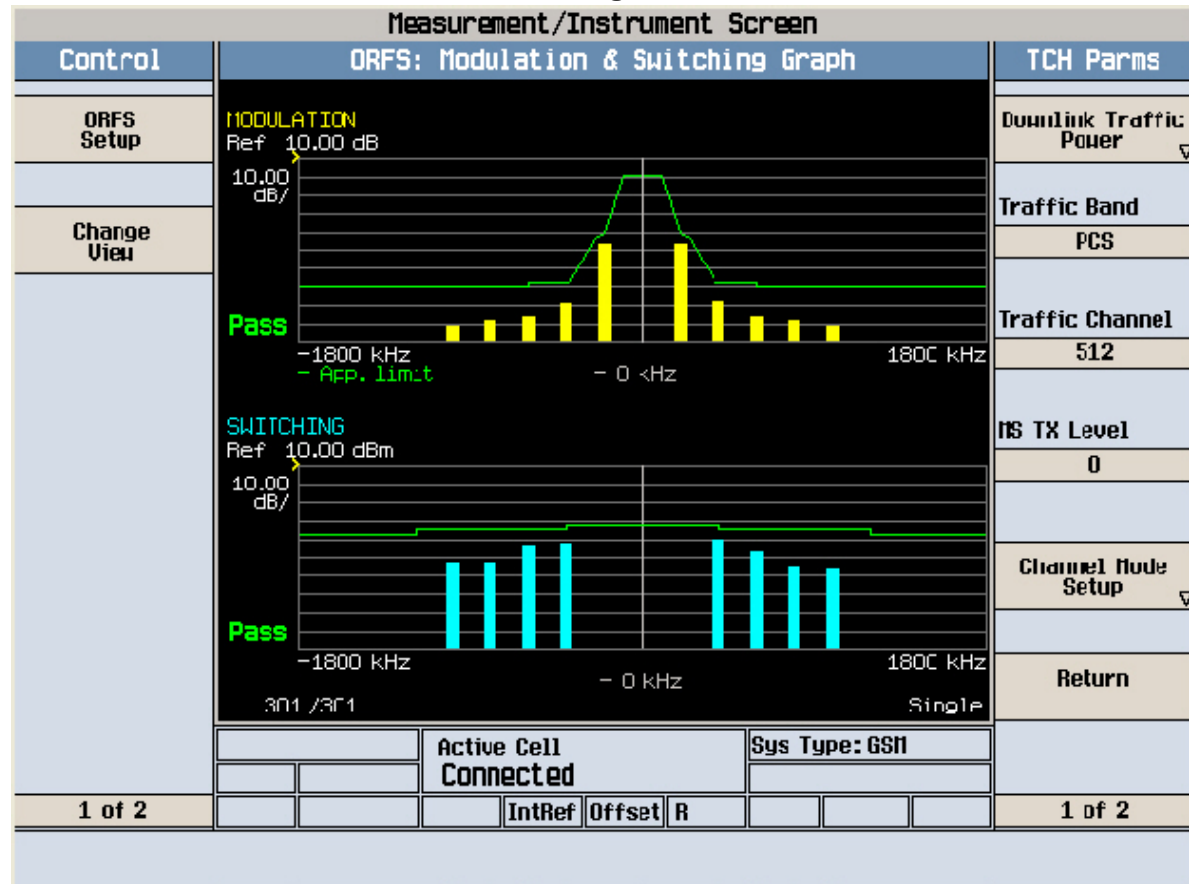
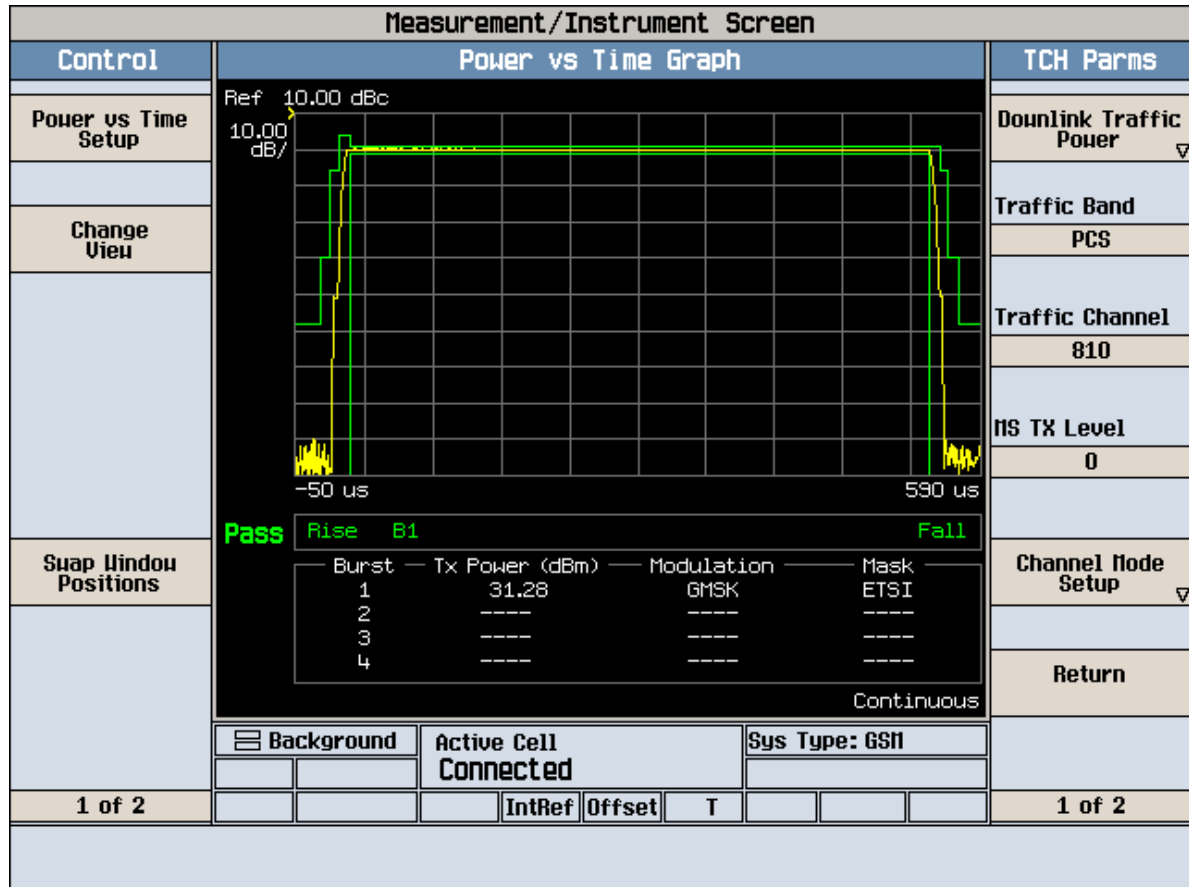
FCC ID : A3LGTI9020A Transmit Power 512CH

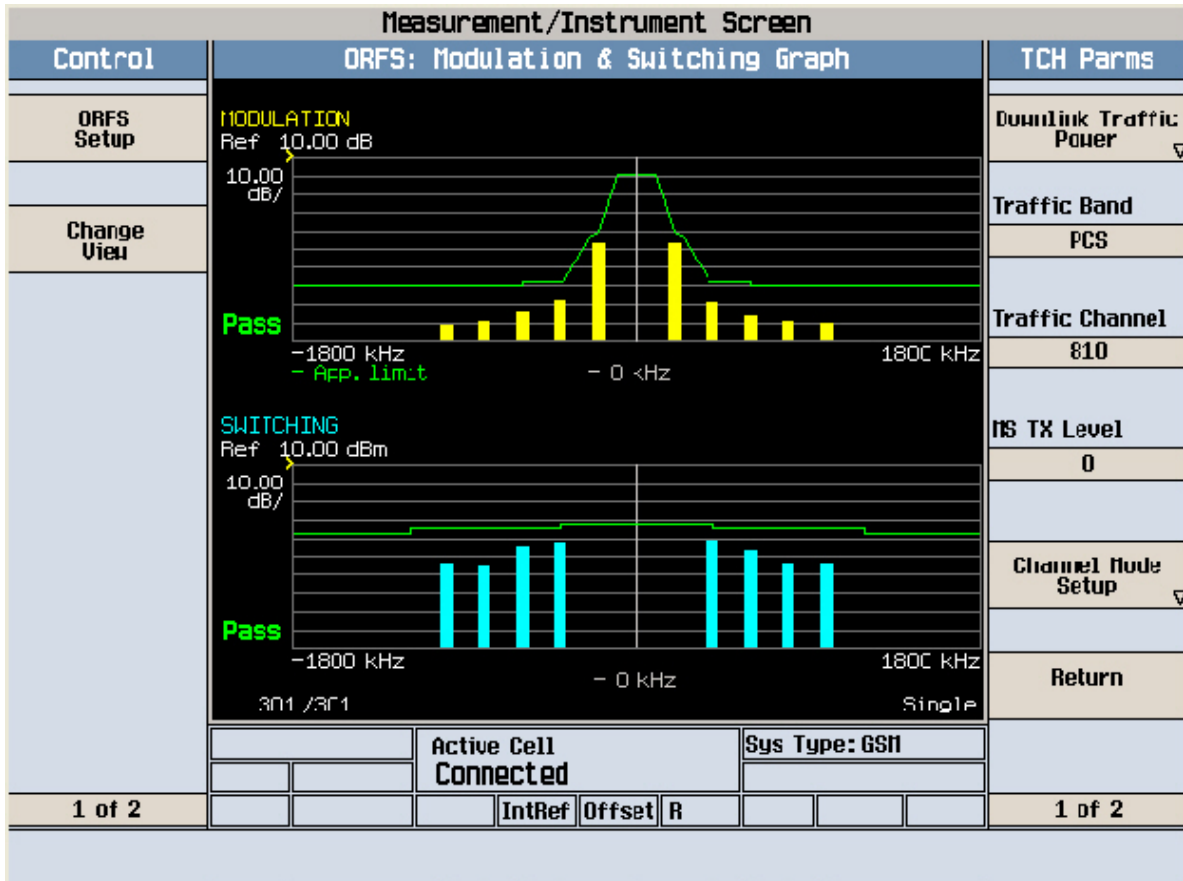
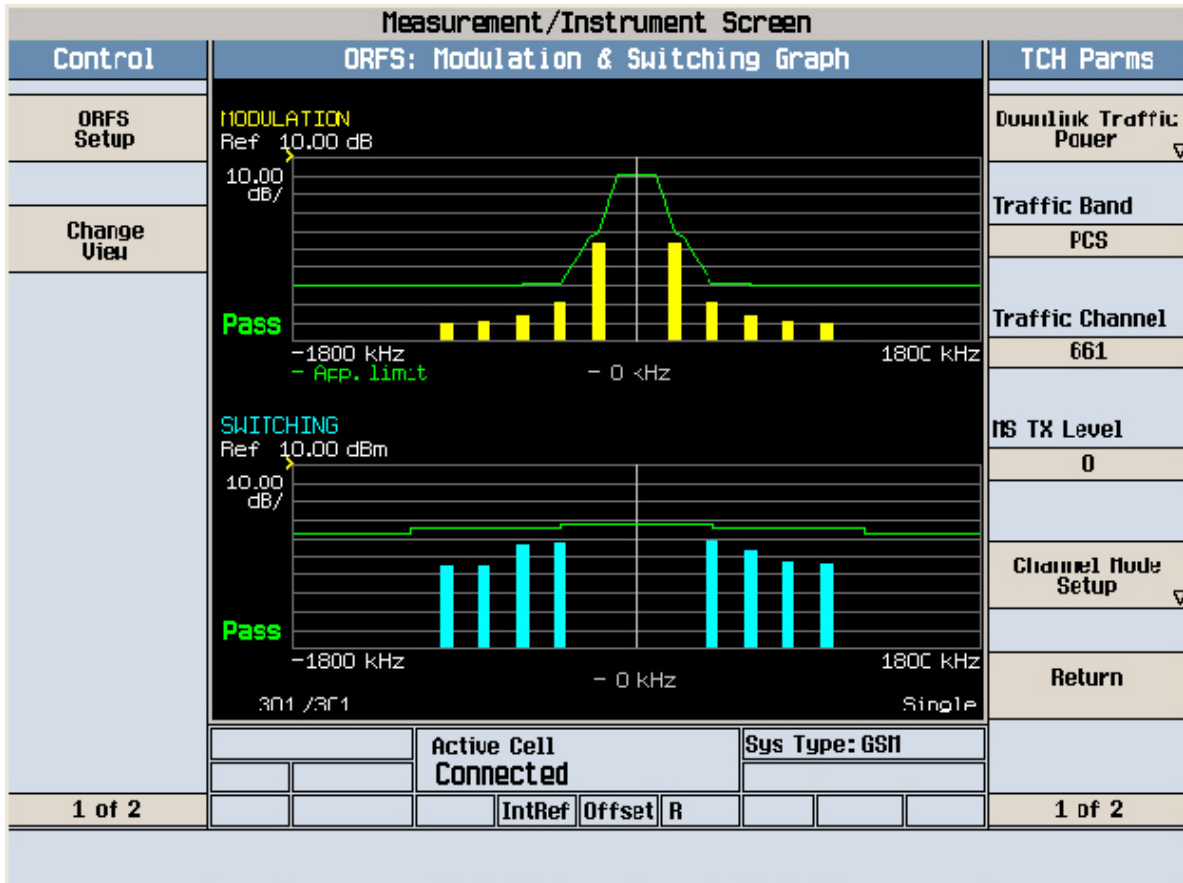
Measurement/Instrument Screen																								
Control	Transmit Power						TCH Parms																	
<p>Transmit Power Setup ▾</p>	<table border="1" style="width: 100%; border-collapse: collapse; font-size: x-small;"> <thead> <tr> <th></th> <th>Burst 1</th> <th>Burst 2</th> <th>Burst 3</th> <th>Burst 4</th> </tr> </thead> <tbody> <tr> <td>Burst Power</td> <td>31.34</td> <td>----</td> <td>----</td> <td>----</td> </tr> <tr> <td>Estimated Carrier Power</td> <td>31.34</td> <td>----</td> <td>----</td> <td>----</td> </tr> </tbody> </table>							Burst 1	Burst 2	Burst 3	Burst 4	Burst Power	31.34	----	----	----	Estimated Carrier Power	31.34	----	----	----	<p>Downlink Traffic Power ▾</p> <hr/> <p>Traffic Band PCS</p> <hr/> <p>Traffic Channel 512</p> <hr/> <p>MS TX Level 0</p> <hr/> <p>Channel Mode Setup ▾</p> <hr/> <p style="text-align: center;">Return</p>		
	Burst 1	Burst 2	Burst 3	Burst 4																				
Burst Power	31.34	----	----	----																				
Estimated Carrier Power	31.34	----	----	----																				
	Active Cell Connected			Sys Type: GSM																				
1 of 2									1 of 2															

Measurement/Instrument Screen																							
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>31.25</td> <td>----</td> <td>----</td> <td>----</td> </tr> <tr> <td>Estimated Carrier Power</td> <td>31.25</td> <td>----</td> <td>----</td> <td>----</td> </tr> </tbody> </table>								Burst 1	Burst 2	Burst 3	Burst 4	Burst Power	31.25	----	----	----	Estimated Carrier Power	31.25	----	----	----	Downlink Traffic Power ▾
									Burst 1	Burst 2	Burst 3	Burst 4											
								Burst Power	31.25	----	----	----											
	Estimated Carrier Power	31.25	----	----	----																		
	Traffic Band																						
	PCS																						
	Traffic Channel																						
	661																						
	MS TX Level																						
	0																						
Channel Mode Setup ▾																							
Return																							
		Active Cell Connected			Sys Type: GSM																		
1 of 2				IntRef	Offset	T			1 of 2														

Measurement/Instrument Screen																							
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>31.28</td> <td>----</td> <td>----</td> <td>----</td> </tr> <tr> <td>Estimated Carrier Power</td> <td>31.28</td> <td>----</td> <td>----</td> <td>----</td> </tr> </tbody> </table>								Burst 1	Burst 2	Burst 3	Burst 4	Burst Power	31.28	----	----	----	Estimated Carrier Power	31.28	----	----	----	Downlink Traffic Power ▾
									Burst 1	Burst 2	Burst 3	Burst 4											
								Burst Power	31.28	----	----	----											
	Estimated Carrier Power	31.28	----	----	----																		
	Traffic Band																						
	PCS																						
	Traffic Channel																						
	810																						
	MS TX Level																						
	0																						
Channel Mode Setup ▾																							
Return																							
		Active Cell Connected			Sys Type: GSM																		
1 of 2				IntRef	Offset	T			1 of 2														



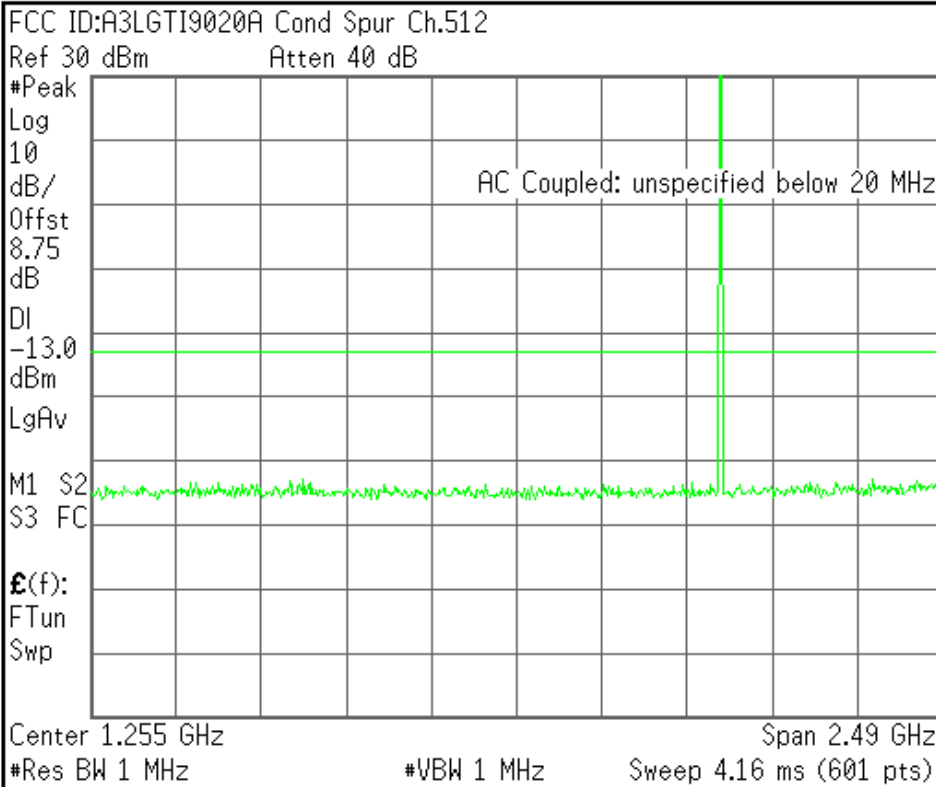




Agilent

R

Freq/Channel



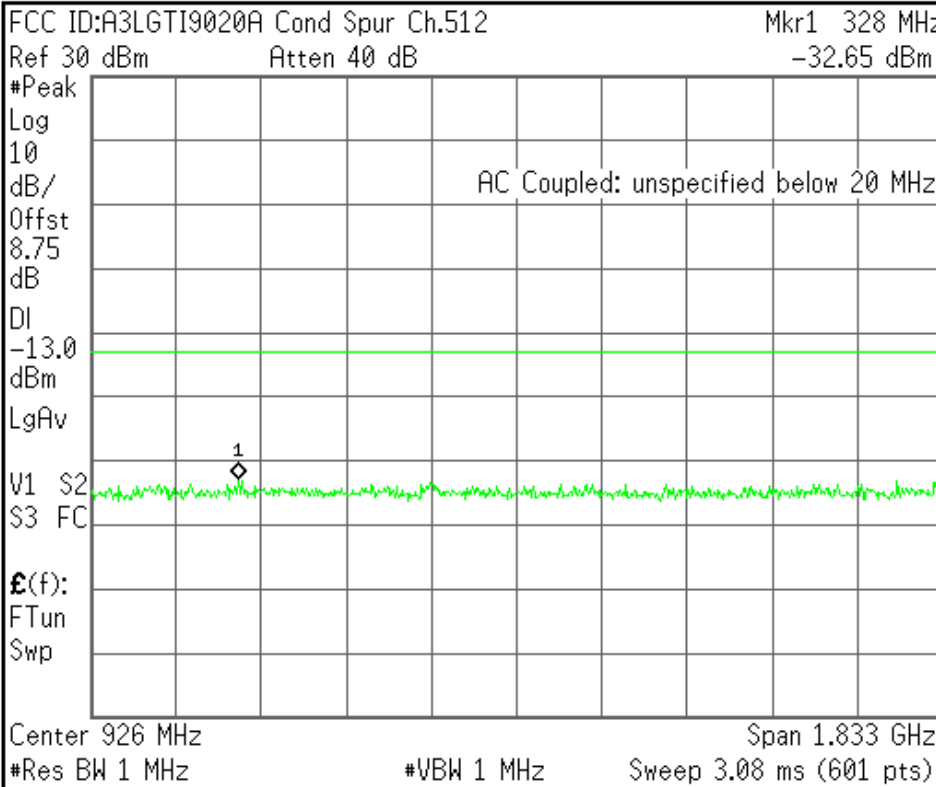
Center Freq 1.25500000 GHz
Start Freq 10.0000000 MHz
Stop Freq 2.50000000 GHz
CF Step 249.000000 MHz Auto Man
Freq Offset 0.00000000 Hz
Signal Track On Off

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Agilent

R T

Freq/Channel



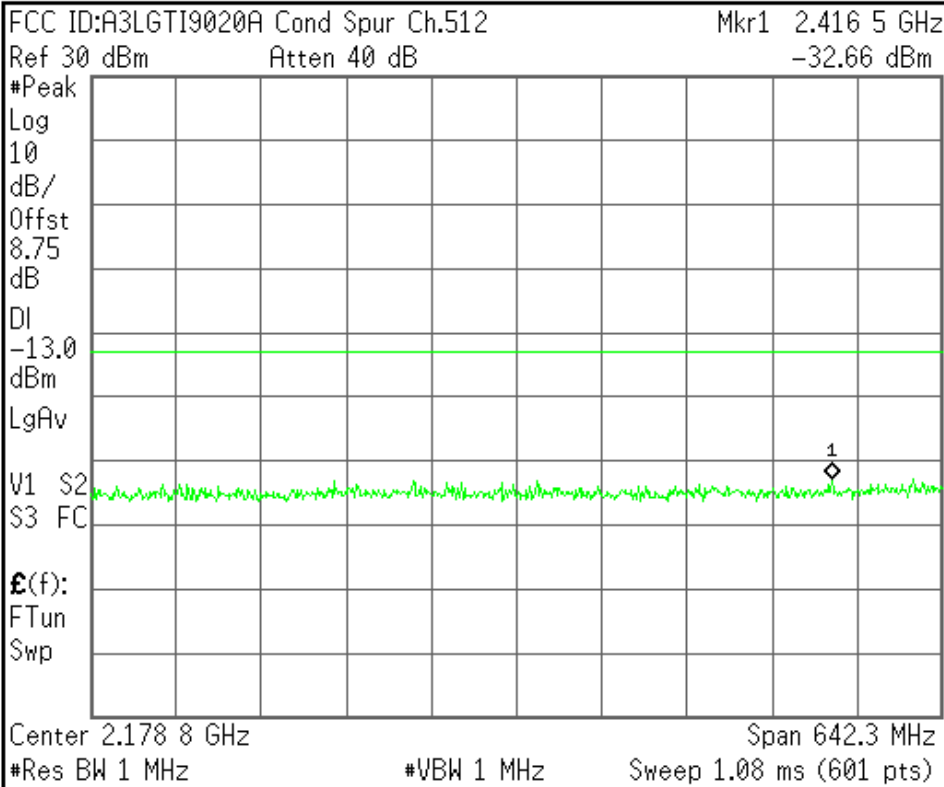
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Start Freq 10.0000000 MHz
Stop Freq 1.84270000 GHz
CF Step 183.270000 MHz Auto Man
Freq Offset 0.00000000 Hz
Signal Track On Off

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

Agilent

R T

Freq/Channel



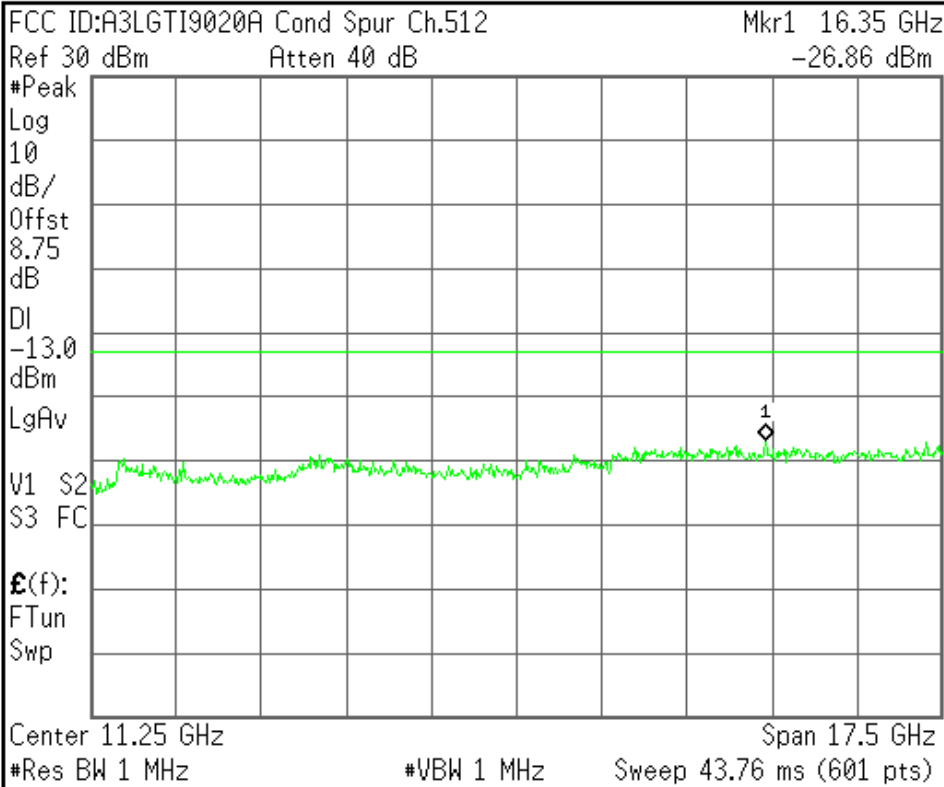
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Start Freq 1.85770000 GHz
Stop Freq 2.50000000 GHz
CF Step Auto Man 64.23000000 MHz
Freq Offset 0.00000000 Hz
Signal Track On Off

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

Agilent

R T

Freq/Channel



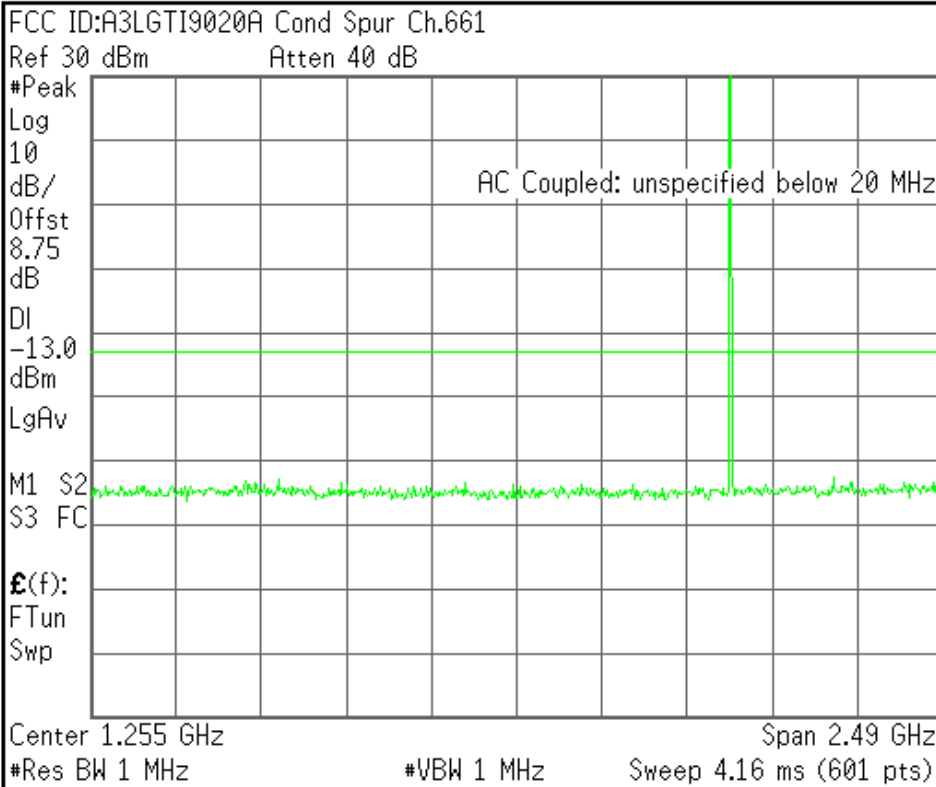
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Start Freq 2.50000000 GHz
Stop Freq 20.00000000 GHz
CF Step Auto Man 1.75000000 GHz
Freq Offset 0.00000000 Hz
Signal Track On Off

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

Agilent

R

Freq/Channel



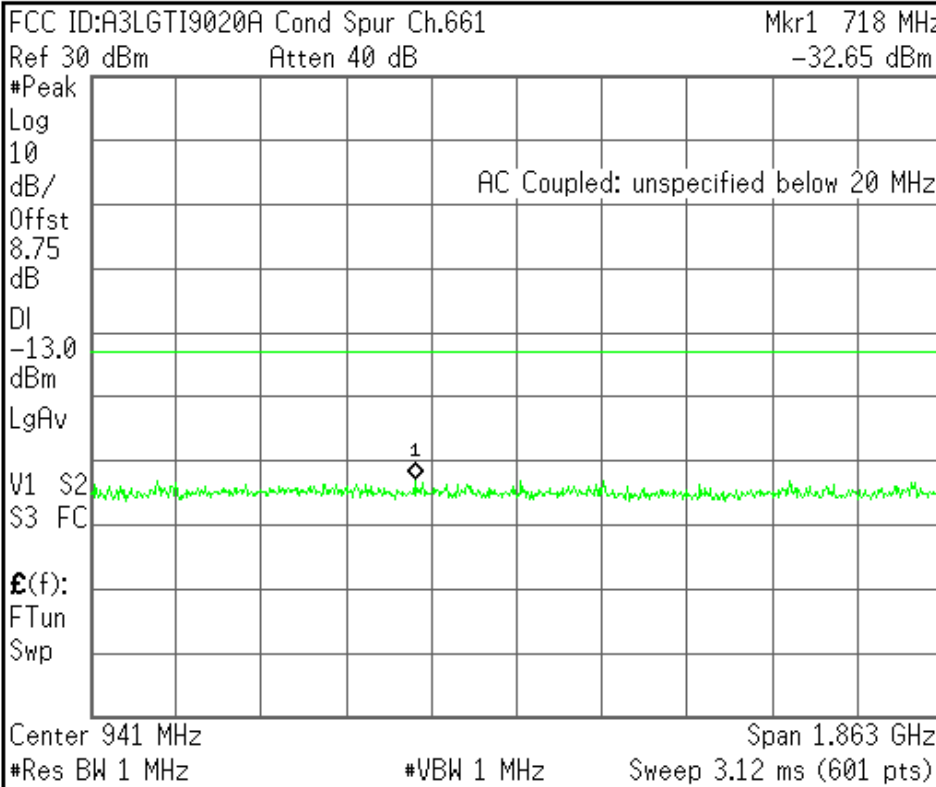
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Start Freq 10.0000000 MHz
Stop Freq 2.50000000 GHz
CF Step 249.000000 MHz Auto Man
Freq Offset 0.00000000 Hz
Signal Track On Off

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

Agilent

R T

Freq/Channel

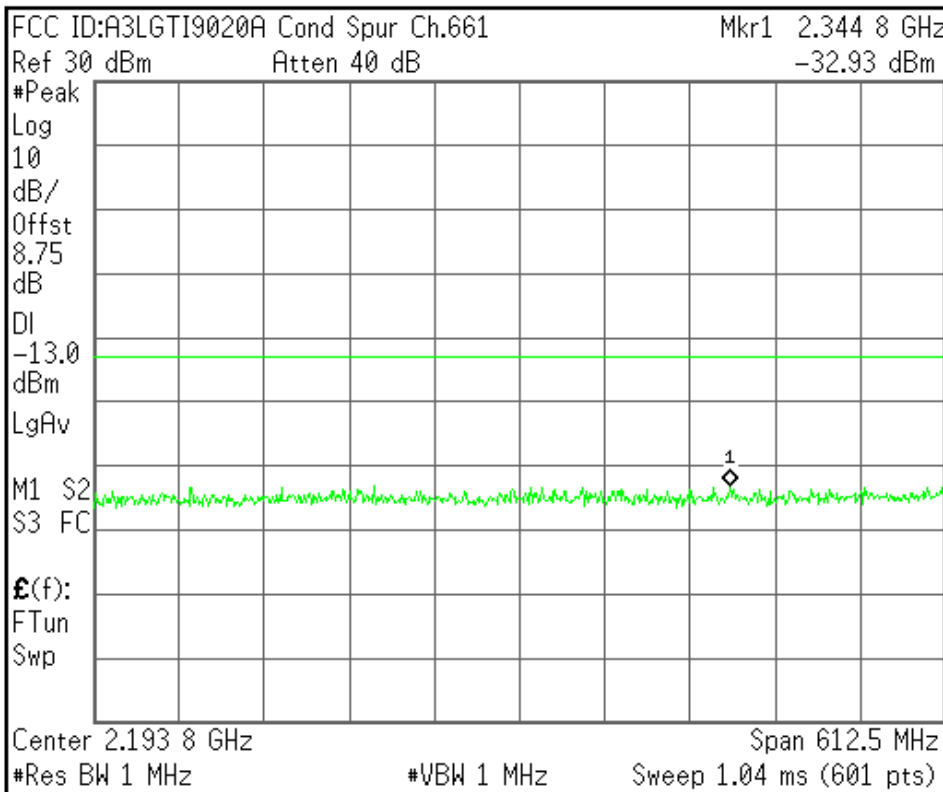


Center Freq 941.250000 MHz
Start Freq 10.0000000 MHz
Stop Freq 1.87250000 GHz
CF Step 186.250000 MHz Auto Man
Freq Offset 0.00000000 Hz
Signal Track On Off

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

Agilent

R



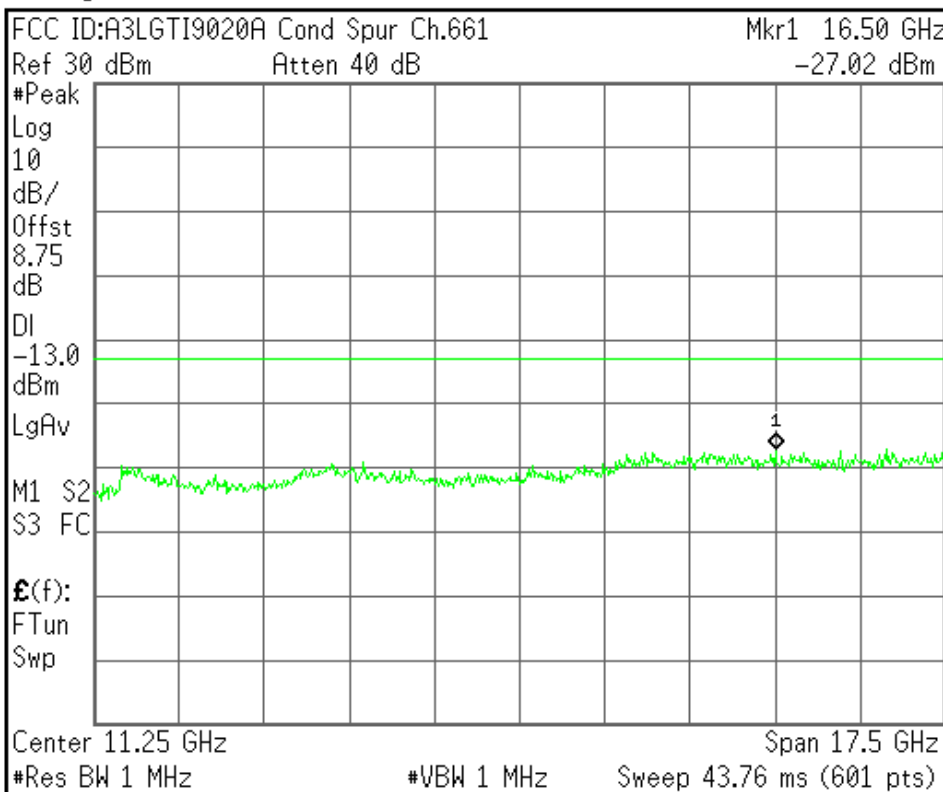
Freq/Channel

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

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

Agilent

R



Freq/Channel

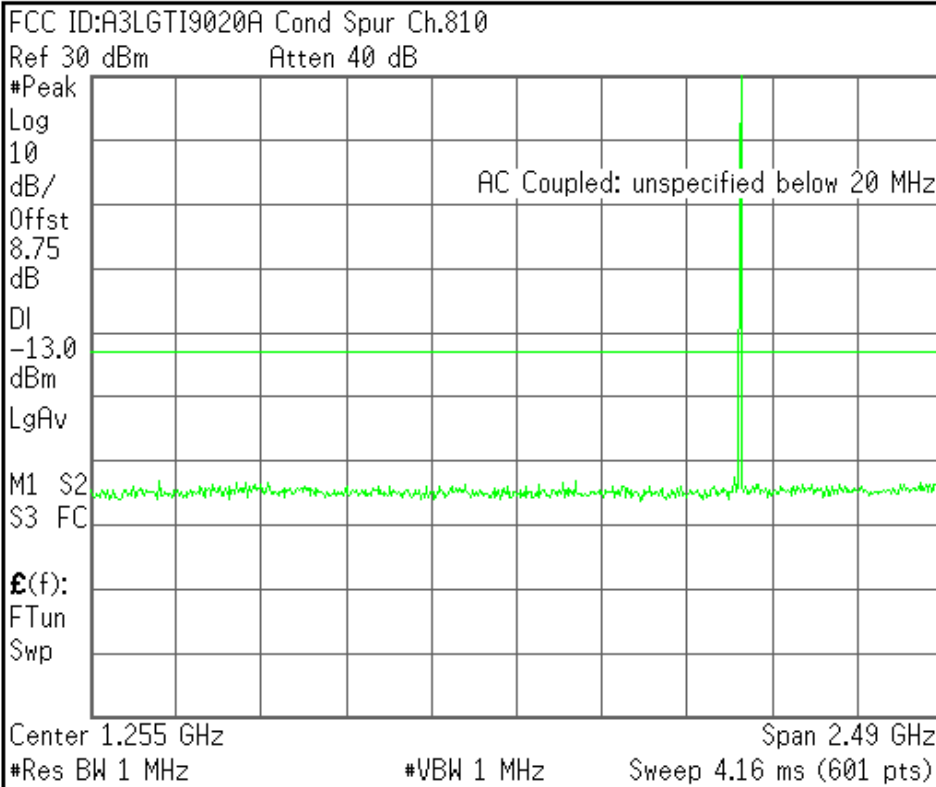
Center Freq 11.2500000 GHz
Start Freq 2.50000000 GHz
Stop Freq 20.0000000 GHz
CF Step Auto Man 1.75000000 GHz
Freq Offset 0.00000000 Hz
Signal Track On Off

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

Agilent

R

Freq/Channel



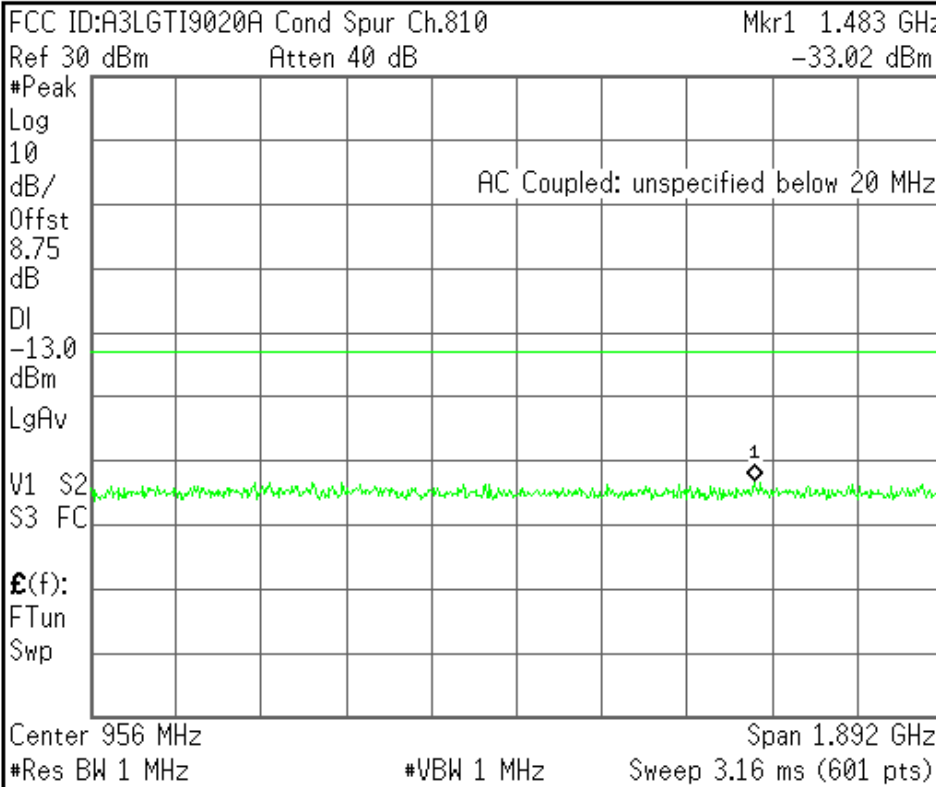
Center Freq 1.25500000 GHz
Start Freq 10.0000000 MHz
Stop Freq 2.50000000 GHz
CF Step 249.000000 MHz Auto Man
Freq Offset 0.00000000 Hz
Signal Track On Off

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

Agilent

R

Freq/Channel

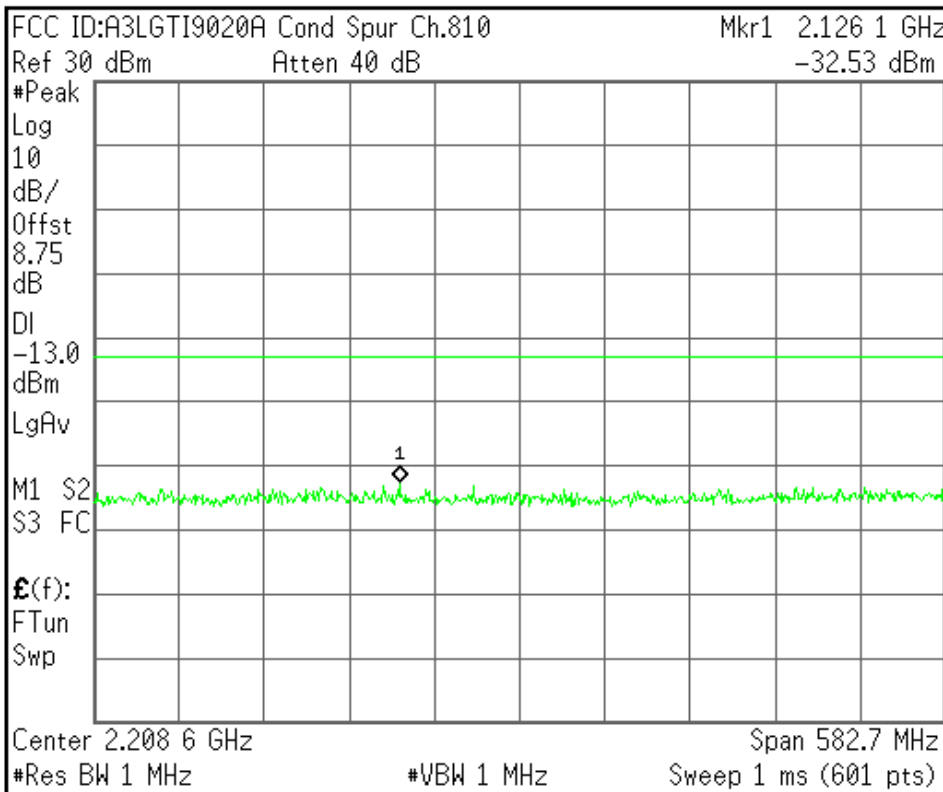


Center Freq 956.150000 MHz
Start Freq 10.0000000 MHz
Stop Freq 1.90230000 GHz
CF Step 189.230000 MHz Auto Man
Freq Offset 0.00000000 Hz
Signal Track On Off

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

Agilent

R



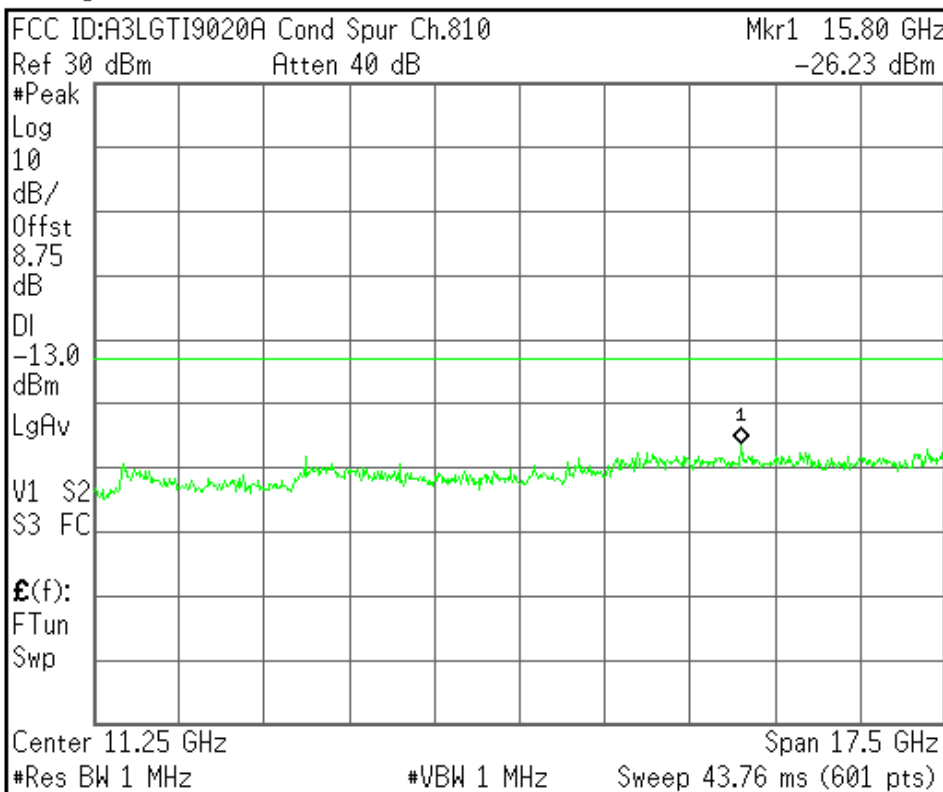
Freq/Channel

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

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

Agilent

R



Freq/Channel

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

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

Agilent

R

Freq/Channel

FCC ID:A3LGTI9020A Band Edge Ch.512

Ref 30 dBm

Atten 40 dB

#Avg

Log

10

dB/

Offst

8.75

dB

DI

-13.0

dBm

PAvg

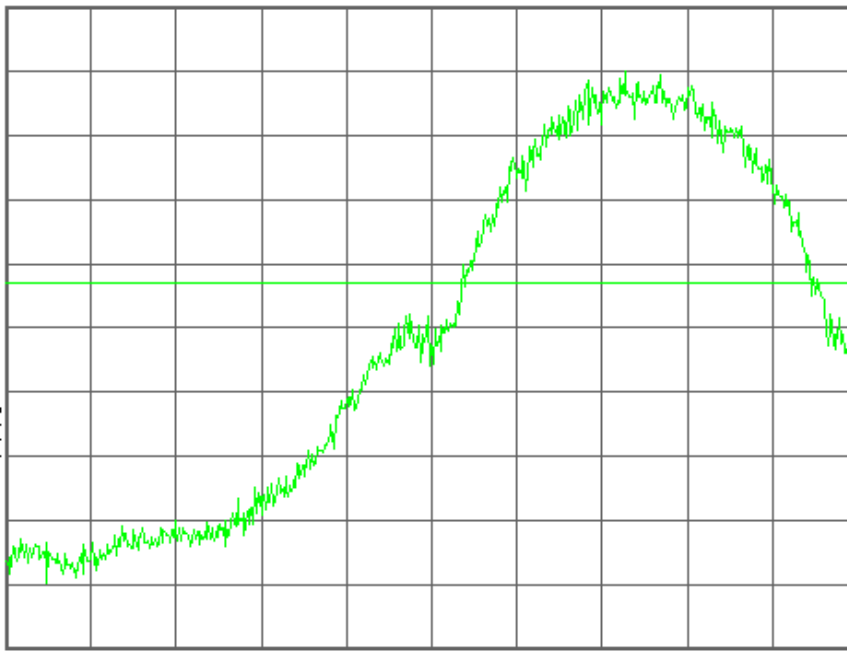
M1 S2

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 T

Freq/Channel

FCC ID:A3LGTI9020A Band Edge Ch.512

Mkr1 1.849 975 9 GHz

Ref 30 dBm

Atten 40 dB

-18.85 dBm

#Avg

Log

10

dB/

Offst

8.75

dB

DI

-13.0

dBm

PAvg

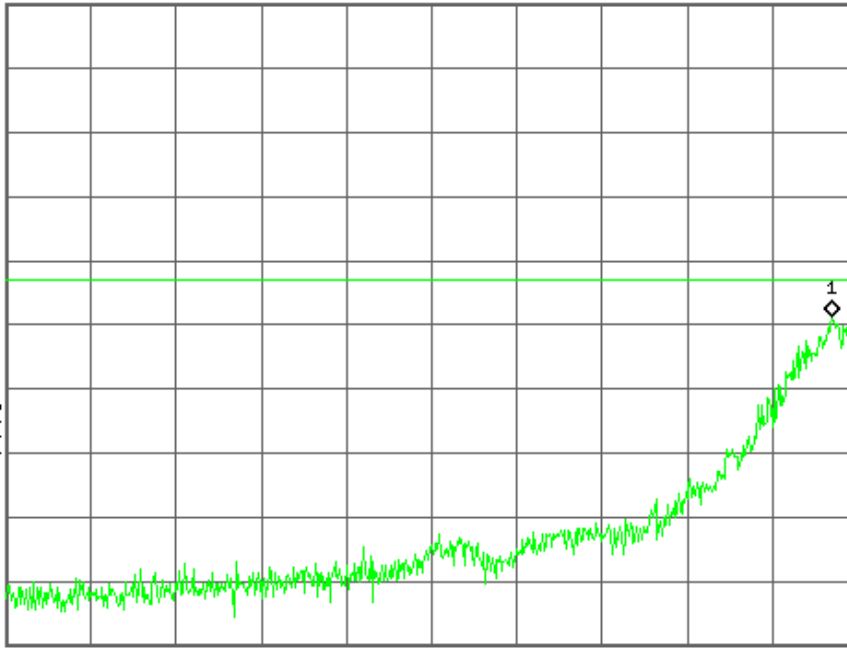
M1 S2

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

Freq/Channel

FCC ID:A3LGTI9020A Band Edge Ch.810

Ref 30 dBm Atten 40 dB

#Avg

Log

10

dB/

Offst

8.75

dB

DI

-13.0

dBm

PAvg

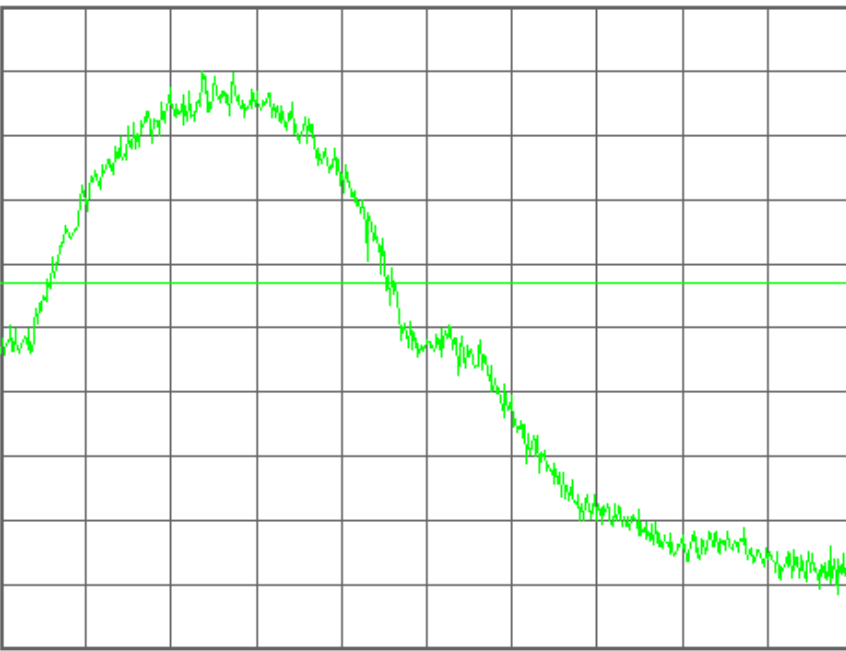
M1 S2

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:A3LGTI9020A Band Edge Ch.810

Mkr1 1.910 020 4 GHz

Ref 30 dBm Atten 40 dB

-19.12 dBm

#Avg

Log

10

dB/

Offst

8.75

dB

DI

-13.0

dBm

PAvg

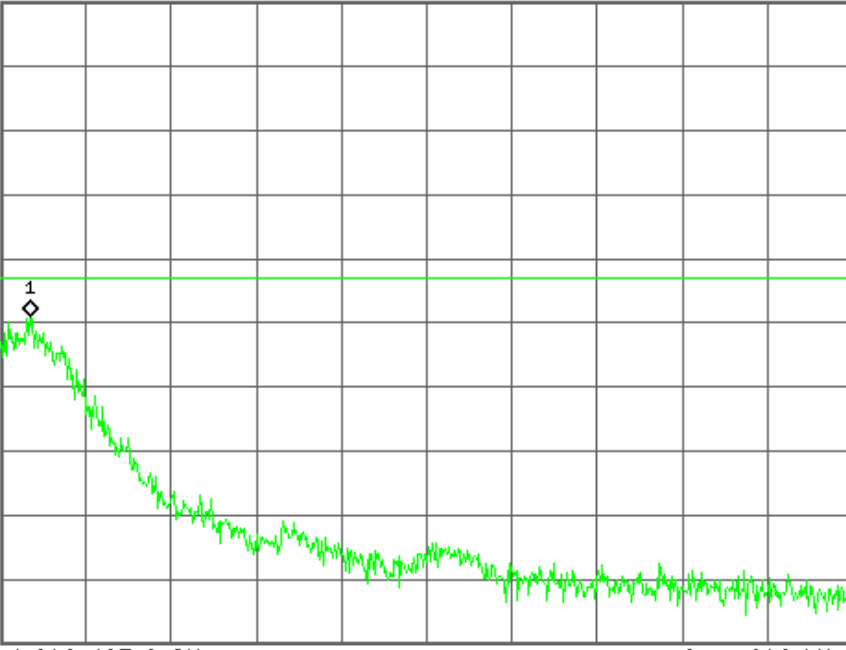
M1 S2

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

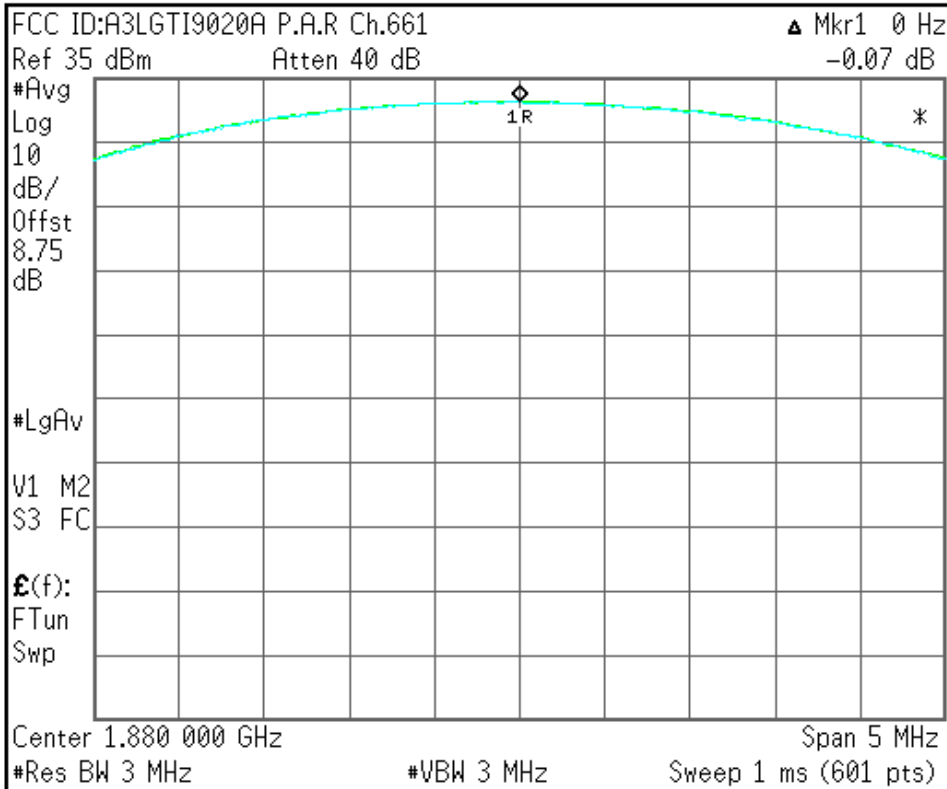
Freq Offset
0.00000000 Hz

Signal Track
On Off

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

Agilent

R



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

Agilent

R T

Ch Freq 824.2 MHz Trig Free		Freq/Channel	
Occupied Bandwidth		Center Freq 824.200000 MHz	
FCC ID:A3LGTI9020A 0BW Ch.128 EDGE Ref 27 dBm Atten 30 dB		Start Freq 823.700000 MHz	
		Stop Freq 824.700000 MHz	
Center 824.200 MHz Span 1 MHz #Res BW 3 kHz #VBW 3 kHz #Sweep 1 s (601 pts)		CF Step 100.000000 kHz Auto Man	
Occupied Bandwidth 248.0335 kHz		Freq Offset 0.00000000 Hz	
Transmit Freq Error 1.053 kHz		Signal Track On Off	
x dB Bandwidth 313.548 kHz			
File Operation Status, C:\TEMP.GIF file saved			

Agilent

R T

Ch Freq 836.6 MHz Trig Free		Freq/Channel	
Occupied Bandwidth		Center Freq 836.600000 MHz	
FCC ID:A3LGTI9020A 0BW Ch.190 EDGE Ref 27 dBm Atten 30 dB		Start Freq 836.100000 MHz	
		Stop Freq 837.100000 MHz	
Center 836.600 MHz Span 1 MHz #Res BW 3 kHz #VBW 3 kHz #Sweep 1 s (601 pts)		CF Step 100.000000 kHz Auto Man	
Occupied Bandwidth 243.8811 kHz		Freq Offset 0.00000000 Hz	
Transmit Freq Error 409.784 Hz		Signal Track On Off	
x dB Bandwidth 313.584 kHz			
File Operation Status, C:\TEMP.GIF file saved			

Ch Freq 848.8 MHz		Trig Free	
Occupied Bandwidth			
FCC ID:A3LGTI9020A 0BW Ch.251 EDGE			
Ref 27 dBm		Atten 30 dB	
Center 848.800 MHz		Span 1 MHz	
#Res BW 3 kHz		#Sweep 1 s (601 pts)	
Occupied Bandwidth		Occ BW % Pwr 99.00 %	
242.0814 kHz		x dB -26.00 dB	
Transmit Freq Error 445.314 Hz			
x dB Bandwidth 308.337 kHz			
File Operation Status, C:\TEMP.GIF file saved			

Freq/Channel
Center Freq 848.800000 MHz
Start Freq 848.300000 MHz
Stop Freq 849.300000 MHz
CF Step 100.000000 kHz Auto Man
Freq Offset 0.00000000 Hz
Signal Track On Off

FCC ID : A3LGTI9020A Transmit Power 128CH EDGE

Measurement/Instrument Screen						
Control	EGPRS Transmit Power				PDCH Parms	
EGPRS Transmit Power Setup	EPK Burst Power		EPK Est Carrier Power		Downlink Traffic Power	
	Minimum	Maximum	Minimum	Maximum	Traffic Band	
	26.11 dBm	27.35 dBm	26.65 dBm	26.79 dBm	GSM850	
	Average	Std Dev	Average	Std Dev	Traffic Channel	
26.67 dBm	0.22 dBm	26.72 dBm	0.03 dBm	128		
	200 /200		Single		HS TX Level	
					Modulation Coding Scheme	
					Return	
	Active Cell Transferring			Sys Type: EGPRS		
1 of 2			IntRef	Offset	R T	1 of 2

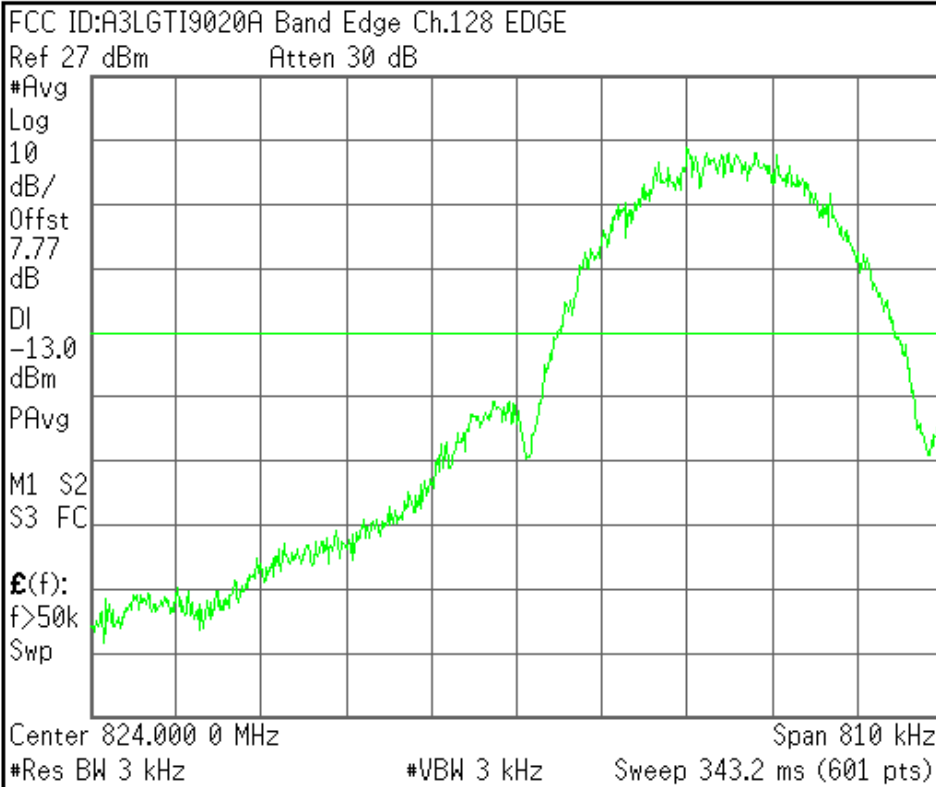
Measurement/Instrument Screen															
Control	EGPRS Transmit Power							PDCH Parms							
EGPRS Transmit Power Setup ▾	EPSK Burst Power			EPSK Est Carrier Power				Downlink Traffic Power ▾							
	Minimum	Maximum		Minimum	Maximum			Traffic Band							
	26.01 dBm	27.33 dBm		26.66 dBm	26.79 dBm			GS1850							
	Average	Std Dev		Average	Std Dev			Traffic Channel							
26.67 dBm	0.22 dBm		26.73 dBm	0.03 dBm			190								
	200 /200							Single							
	Active Cell Transferring							Sys Type: EGPRS							
								IntRef		Offset	R	T		Return	
1 of 2														1 of 2	

Measurement/Instrument Screen															
Control	EGPRS Transmit Power							PDCH Parms							
EGPRS Transmit Power Setup ▾	EPSK Burst Power			EPSK Est Carrier Power				Downlink Traffic Power ▾							
	Minimum	Maximum		Minimum	Maximum			Traffic Band							
	26.07 dBm	27.32 dBm		26.65 dBm	26.79 dBm			GS1850							
	Average	Std Dev		Average	Std Dev			Traffic Channel							
26.68 dBm	0.22 dBm		26.72 dBm	0.03 dBm			251								
	200 /200							Single							
	Active Cell Transferring							Sys Type: EGPRS							
								IntRef		Offset	R	T		Return	
1 of 2														1 of 2	

Agilent

R L

Freq/Channel



Center Freq 824.000000 MHz
Start Freq 823.595000 MHz
Stop Freq 824.405000 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



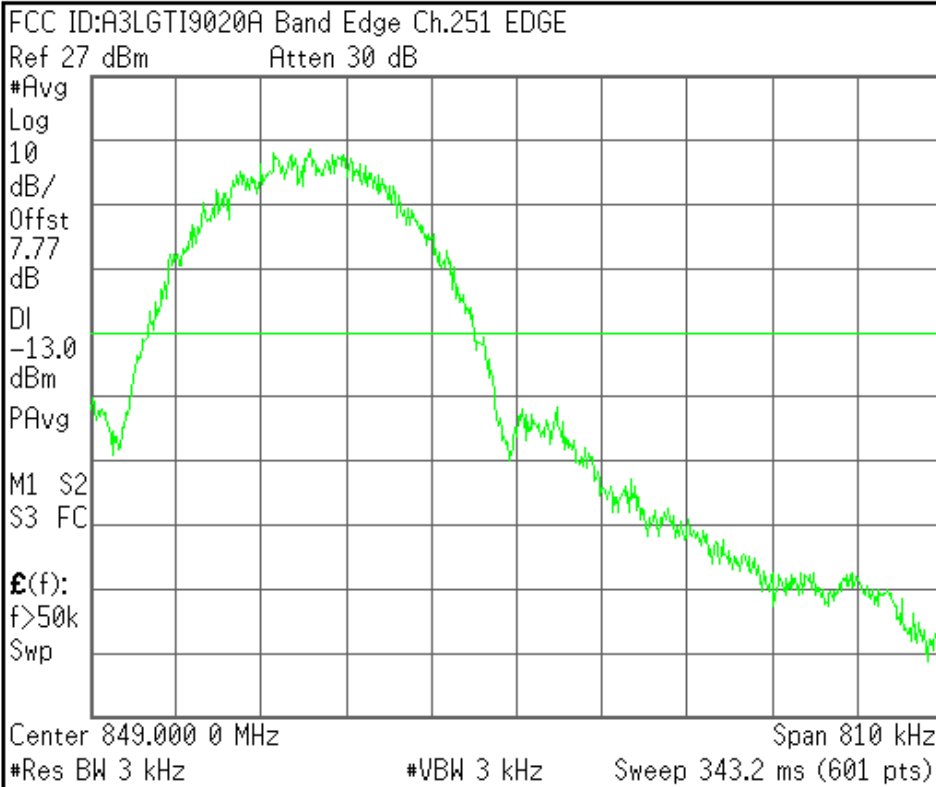
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Start Freq 823.190000 MHz
Stop Freq 824.000000 MHz
CF Step 81.0000000 kHz Auto Man
Freq Offset 0.00000000 Hz
Signal Track On Off

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

Agilent

R L

Freq/Channel



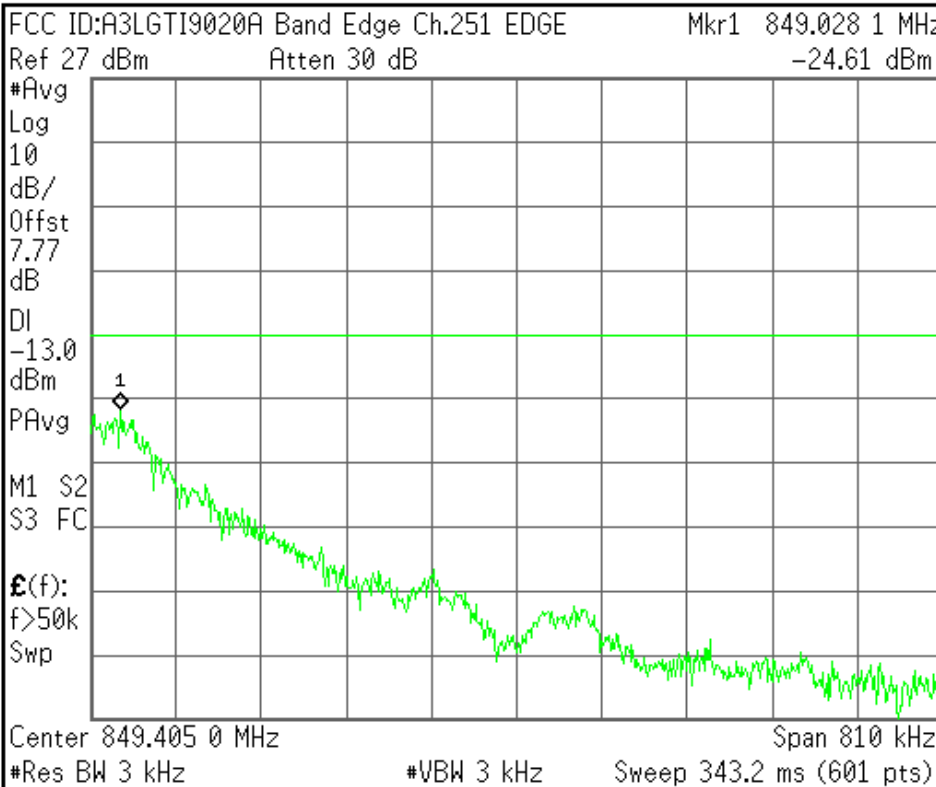
Center Freq 849.000000 MHz
Start Freq 848.595000 MHz
Stop Freq 849.405000 MHz
CF Step 81.0000000 kHz Auto Man
Freq Offset 0.00000000 Hz
Signal Track On Off

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

Agilent

R T

Freq/Channel



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

Ch Freq 1.9098 GHz		Trig Free	
Occupied Bandwidth			
FCC ID:A3LGTI9020A 0BW Ch.810 EDGE			
Ref 26 dBm		Atten 30 dB	
#Res BW 3 kHz		#Sweep 1 s (601 pts)	
Occupied Bandwidth		Occ BW % Pwr 99.00 %	
241.1765 kHz		x dB -26.00 dB	
Transmit Freq Error -1.137 kHz			
x dB Bandwidth 310.703 kHz			
File Operation Status, C:\TEMP.GIF file saved			

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 : A3LGTI9020A Transmit Power 512CH EDGE

Measurement/Instrument Screen						
Control	EGPRS Transmit Power				PDTCB Parms	
EGPRS Transmit Power Setup	EPK Burst Power		EPK Est Carrier Power		Downlink Traffic Power	
	Minimum	Maximum	Minimum	Maximum	Traffic Band	
	26.45 dBm	27.67 dBm	27.22 dBm	27.35 dBm	PCS	
	Average	Std Dev	Average	Std Dev	Traffic Channel	
27.21 dBm	0.23 dBm	27.27 dBm	0.03 dBm	512		
	200 /200		Single		HS TX Level	
					Modulation Coding Scheme	
					Return	
	Active Cell Transferring			Sys Type: EGPRS		
1 of 2			IntRef	Offset	R T	1 of 2

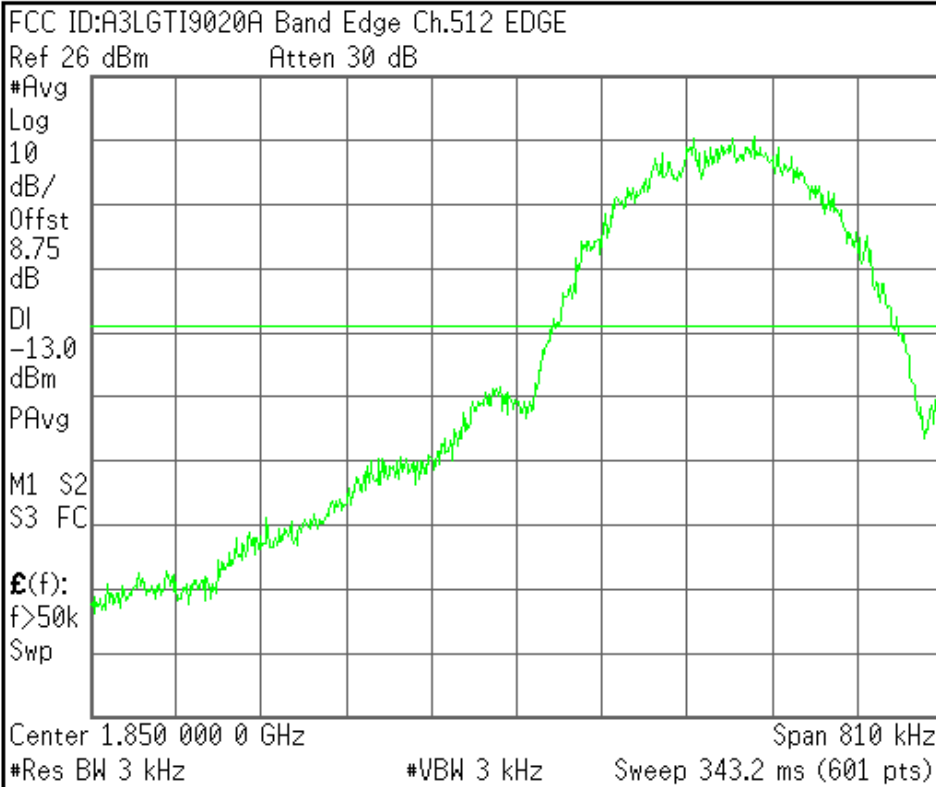
Measurement/Instrument Screen														
Control	EGPRS Transmit Power							PDCH Parms						
EGPRS Transmit Power Setup ▾	EPSK Burst Power			EPSK Est Carrier Power				Downlink Traffic Power ▾						
	Minimum	Maximum		Minimum	Maximum			Traffic Band						
	26.85 dBm	27.77 dBm		27.28 dBm	27.40 dBm			PCS						
	Average	Std Dev		Average	Std Dev			Traffic Channel						
27.30 dBm	0.19 dBm		27.33 dBm	0.03 dBm			661							
	200 /200						Single							
	Active Cell Transferring							Sys Type: EGPRS						
								IntRef		Offset	R	T		
1 of 2														1 of 2
	Return													

Measurement/Instrument Screen														
Control	EGPRS Transmit Power							PDCH Parms						
EGPRS Transmit Power Setup ▾	EPSK Burst Power			EPSK Est Carrier Power				Downlink Traffic Power ▾						
	Minimum	Maximum		Minimum	Maximum			Traffic Band						
	26.28 dBm	27.68 dBm		27.03 dBm	27.15 dBm			PCS						
	Average	Std Dev		Average	Std Dev			Traffic Channel						
27.02 dBm	0.23 dBm		27.09 dBm	0.03 dBm			810							
	200 /200						Single							
	Active Cell Transferring							Sys Type: EGPRS						
								IntRef		Offset	R	T		
1 of 2														1 of 2
	Return													

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R L

Freq/Channel



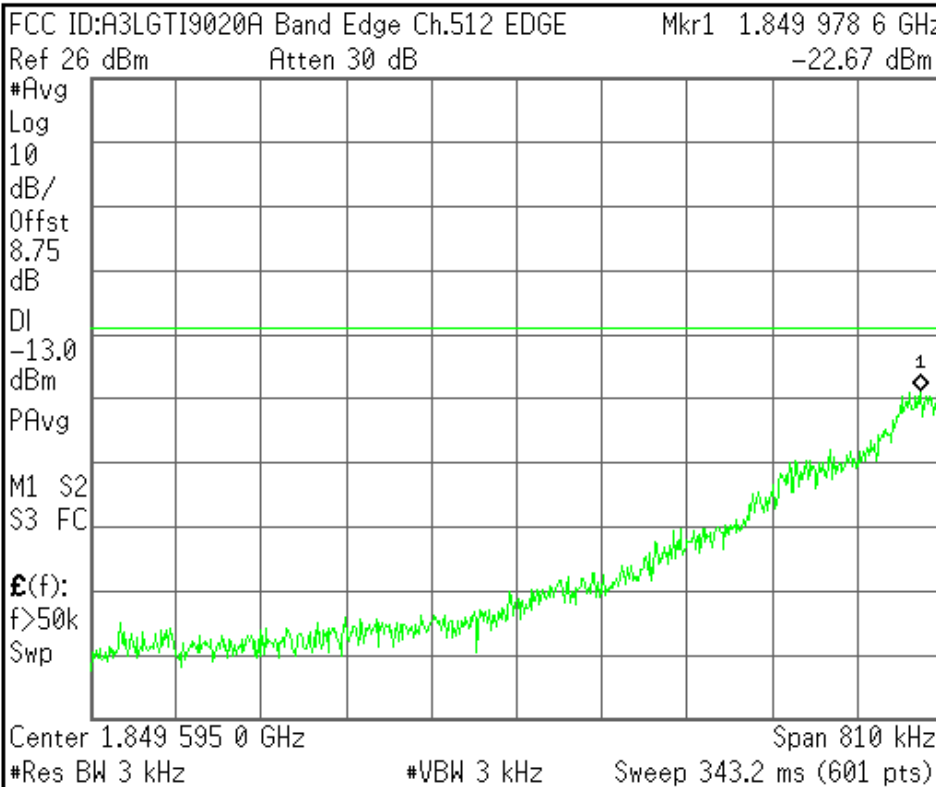
Center Freq 1.85000000 GHz
Start Freq 1.84959500 GHz
Stop Freq 1.85040500 GHz
CF Step 81.0000000 kHz Auto Man
Freq Offset 0.00000000 Hz
Signal Track On Off

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R T

Freq/Channel



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

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

Agilent

R L

Freq/Channel

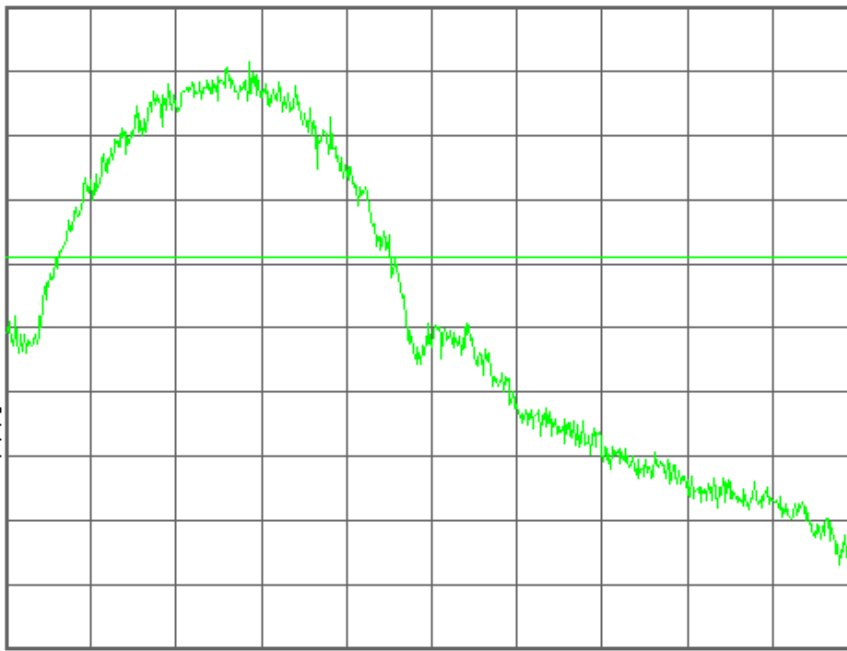
FCC ID:A3LGTI9020A Band Edge Ch.810 EDGE

Ref 26 dBm Atten 30 dB

#Avg
Log
10
dB/
Offst
8.75
dB
DI
-13.0
dBm
PAvg

M1 S2
S3 FC

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:A3LGTI9020A Band Edge Ch.810 EDGE

Mkr1 1.909 998 1 GHz

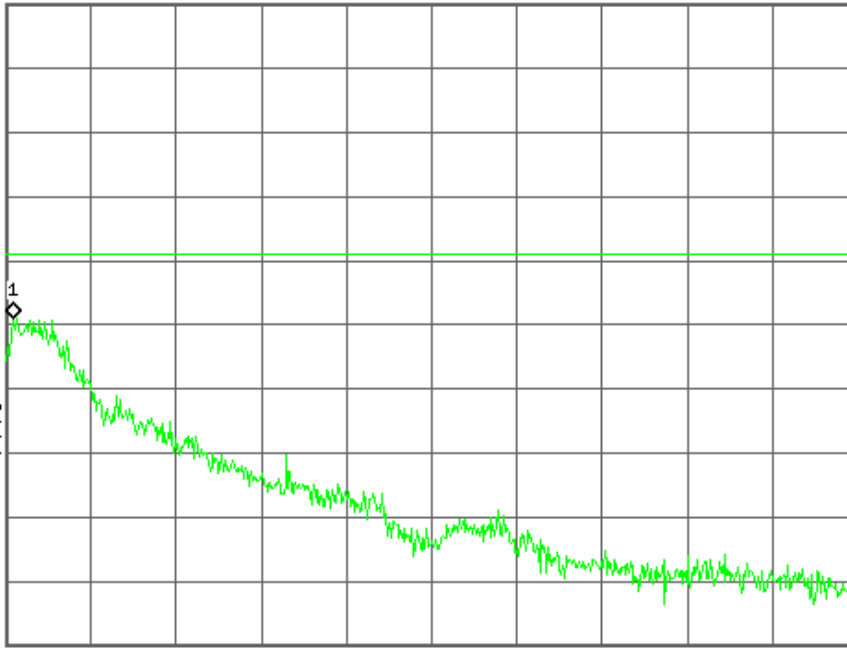
Ref 26 dBm Atten 30 dB

-23.04 dBm

#Avg
Log
10
dB/
Offst
8.75
dB
DI
-13.0
dBm
PAvg

M1 S2
S3 FC

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

Agilent

R L

Freq/Channel

FCC ID:A3LGTI9020A P.A.R Ch.661 EDGE

Mkr1 0 Hz

Ref 35 dBm

Atten 40 dB

0.08 dB

#Avg

Log

10

dB/

Offst

8.75

dB

PAvg

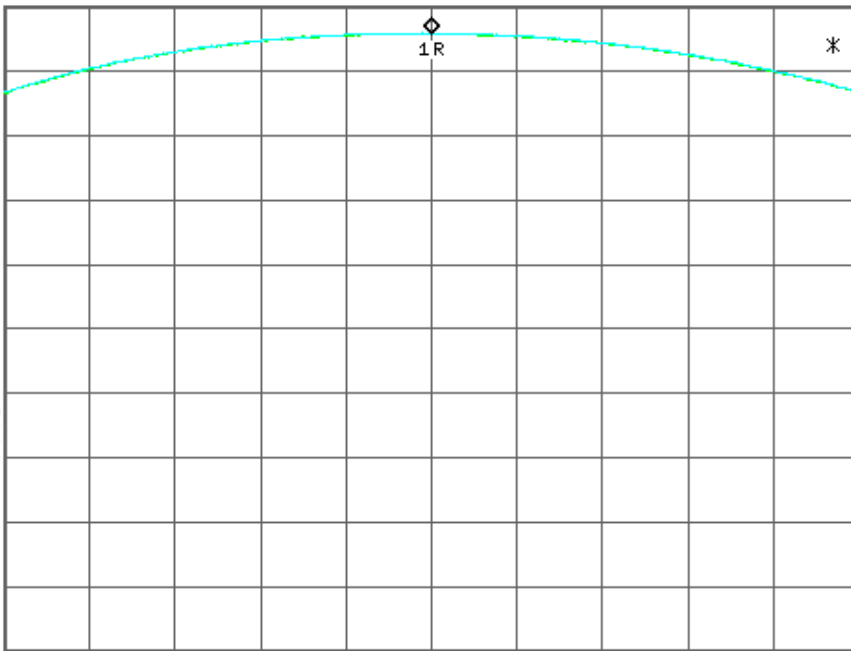
V1 M2

S3 FC

$\mathcal{E}(f)$:

FTun

Swp



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

Center 1.880 000 GHz

Span 5 MHz

*Res BW 3 MHz

VBW 3 MHz

*Sweep 1 ms (601 pts)

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