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Regulatory Compliance Team
IT R&D Center
416, Maetan-3dong,
Paldal-gu, Suwon-si,
Gyeonggi-do, Korea 442-742

FCC CFR47 PART 24 SUBPART CERTIFICATION TEST DATA

Model Tested: SGH-X400
FCC ID (Requested): A3LSGHX400
Report No: FA-003-R1
Date issued: March 18, 2003

- Abstract -

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

Prepared By

JH CHOI - Test Engineer

Date

March 18, 2003

Checked By

CW PARK - Manager

Date

Mar 19, 2003

Authorized By

JK CHOI - Senior Manager

Date

Mar 21, 2003

Test Equipment

Name of Equipment	Model	Serial No.	Due Date
Spectrum Analyzer	ESI26(20Hz~26.5GHz)	836119/010	2004-02-04
	E4440B(3Hz~26.5GHz)	MY41000236	2003-11-25
	E4440B(3Hz~26.5GHz)	MY41000233	2003-11-25
Signal Generator	SMIQ03B(300KHz~3.3GHz)	83824/021	2004-01-20
	SMR20(1GHz~20GHz)	835197/030	2004-01-20
Power Meter	E4419B	GB41293846	2003-11-26
Power Sensor	8481B(1mW~25W)	3318A10325	2003-09-26
	8485A(1uW~100mW)	3318A19924	2003-09-26
Amplifier	5S1G4(0.8~4.2GHz, 5W)	304866	2003-11-26
Pre-Amplifier	8449B(1~26.5GHz, 30dB)	3008A00691	2004-01-21
Communication test set	8960	GB42230535	2003-12-02
	8960	GB42360886	2004-01-09
Antenna Master	MA0001	ANT0967	Not Required
Controller	HD100	100/756	Not Required
Environmental Chamber	PL-4S(Temperature/Humidity)	13005454	2003-08-20
	SH-241	92000548	2003-12-12
	SH-241	92000549	2003-12-12
Horn Antenna	HF906(1GHz~18GHz)	360306/011	2004-02-10
	HF906(1GHz~18GHz)	100134	2003-09-07
Dipole Antenna	3121C-DB4	9007-587	2003-11-08
	3121C-DB4	1454	2003-05-19
	3121C-DB4	1455	2003-05-19
Attenuator	8494A(0~11dB)	3308A31997	2004-01-20
	8496A(0~110dB)	3308A14426	2004-01-20
Directional Coupler	4278-311-2(0.1~1GHz)	B3679637	2004-01-22
	4278-111-2(1~2GHz)	B103DC8722	2004-01-22
High Pass Filter	WHK1.0/15G-10SS(1~15GHz)	1	Not Required
	WHV1.0/15G-10SS(1~15GHz)	1	Not Required
	WHK/3.5/18G-10SS(3.5~18GHz)	3	Not Required
	WHK/3.5/18G-10SS(3.5~18GHz)	4	Not Required
Shielded Semi-Anechoic Chamber	RF0002	ANT0001	2004-01-21

FCC ID : A3LSGHX400

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

Supply Voltage: 3.7 VDC

Modulation: PCS GSM

■ **Reference level**

Frequency (MHz)	Output (dBm)	Polarization	S/A (dBm)	P/M (dBm)	Ant gain (dBi)	Ref level (dBm)
1880.00	27.00	H	-13.16	-13.15	8.26	-21.41
		V	-13.32	-13.20	8.26	-21.46

■ **Result**

Frequency (MHz)	From EUT Tested level (dBm)	POL (H/V)	Azimuth (angle)	EIRP (dBm)	EIRP (W)	Battery
1850.20	-18.75	H2	29	29.66	0.925	Standard
1880.00	-18.95	H1	125	29.46	0.883	Standard
1909.80	-22.19	H2	27	26.22	0.419	Standard
1850.20	-19.13	H2	18	29.28	0.925	Slim
1880.00	-19.06	H1	126	29.35	0.883	Slim
1909.80	-22.32	H1	124	26.09	0.419	Slim

Effective Radiated Power Output Measurements by Substitution Method □
according to ANSI/TIA/EIA-603-A-2001, Aug. 15, 2001:□

□

The EUT was placed on a wooden turn table 3-meters from the receive antenna. □
The receive antenna height and turntable rotation was adjusted for the highest □
reading on the receive spectrum analyzer. 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 the dipole is □
measured. The ERP is recorded.

FCC ID : A3LSGHX400

Field Strength of SPURIOUS Radiation

Operating Frequency : 1850.2 MHz

Measured Output Power : 29.66 dBm = 0.925 W

Modulation Signal : PCS GSM

Limit : $43+10\log_{10}(W) = 42.66$ dBc

■ Result

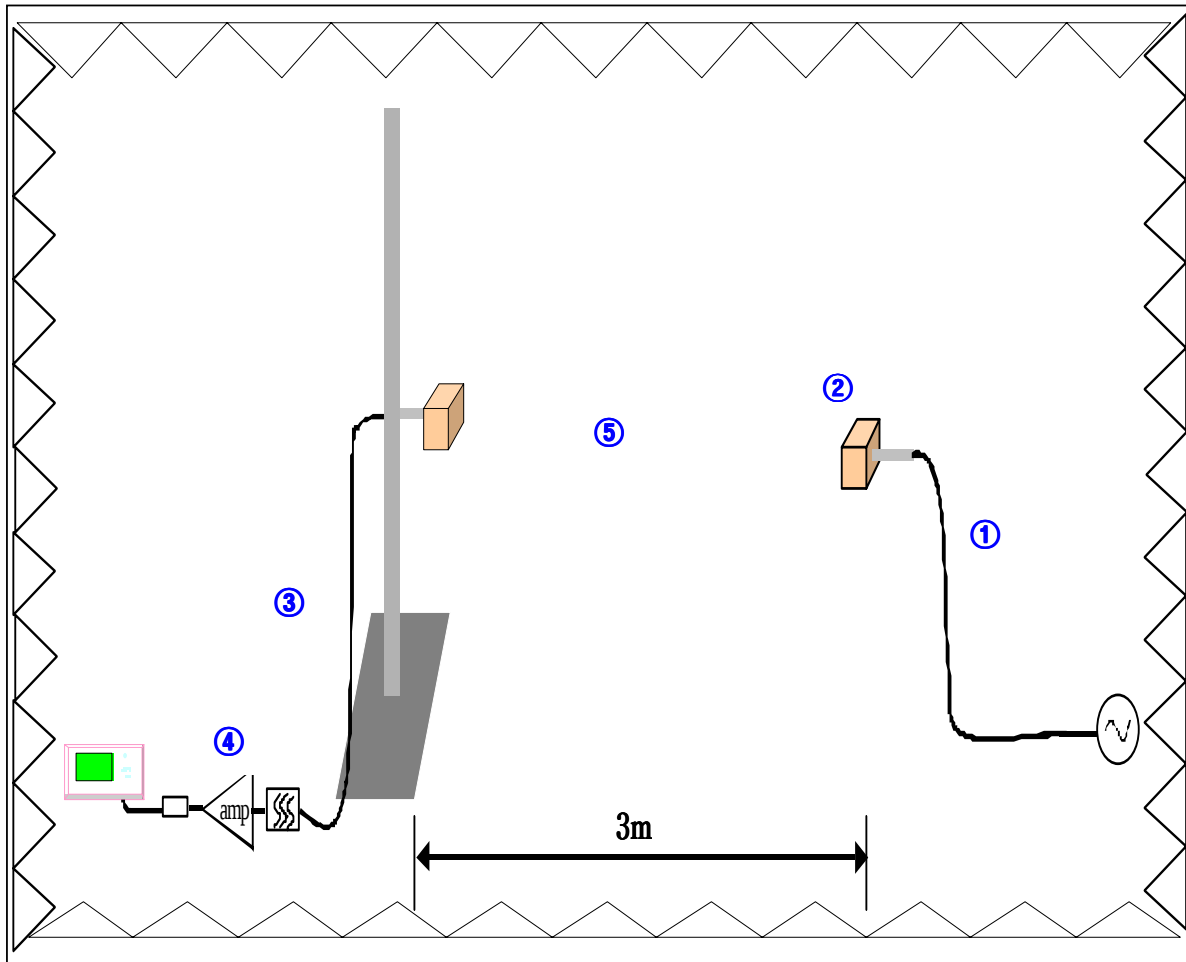
Channel	Harmonic	Frequency (MHz)	From EUT Tested level (dBm)	POL (H/V)	Result (dBc)
512	2	3700.40	-70.40	H2	75.89
	3	5550.60	-66.14	H1	68.17
	4	7400.80	-68.05	H2	66.71
	5	9251.00	-72.09	H2	67.96
	6	11101.20	-67.74	H2	61.10
661	2	3760.00	-69.64	H2	74.87
	3	5640.00	-70.25	H2	72.83
	4	7520.00	-68.32	H2	66.91
	5	9400.00	-73.02	H2	68.57
	6	11280.00	-74.73	H1	67.25
810	2	3819.60	-70.56	H2	76.66
	3	5729.40	-73.46	H2	75.73
	4	7639.20	-72.41	H2	71.30
	5	9549.00	-72.22	H2	67.87
	6	11458.80	-70.99	H2	62.24

Effective Radiated Power Output Measurements by Substitution Method ☐
according to ANSI/TIA/EIA-603-A-2001, Aug. 15, 2001:☐

☐

The EUT was placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. 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 the dipole ☐ is measured. The ERP is recorded.

Radiated Spurious & Harmonic Configuration for Calibration



- ① Tx Cable loss
- ② Horn Ant Gain
- ③ Rx Cable loss + HPF Insertion loss + Attenuator
- ④ Pre-Amp gain
- ⑤ Air loss

Radiated Spurious & Harmonic Conversion Table

FCC ID : A3L8GHX400 Mode : GSM1900

EIRP : 29.66 dBm

Date : 2003 . 03 . 11 .

Test Engineer : JH Choi

㉑ Tx Cable loss
 ㉒ Tx Horn Ant Gain
 ㉓ Rx Cable loss + IIPF Insertion loss + Attenuator
 ㉔ Pre-Amp gain
 ㉕ Air loss
 ㉖ Tested Level from EUT
 ㉗ = ㉑ + ㉒ + ㉓ + ㉔
 ㉘ = FRP - ㉕

CH	차수	Frequency (MHz)	㉑ Tx CL (dB)	㉒ Horn Gain (dB)	Tx Level (Horn 출력) S/G 15dBm	㉖ Tested Level Ant : H (dBm)	㉖ Tested Level Ant : V (dBm)	㉑ Actual Value Ant : H (dBm)	㉑ Actual Value Ant : V (dBm)	㉗ Result Ant : H (dBc)	㉗ Result Ant : V (dBc)
512	2	3700.40	13.99	9.96	10.97	-70.40	-72.91	-46.23	-49.36	75.89	79.02
	3	5550.60	18.96	11.06	7.10	-66.14	-70.43	-38.51	-42.78	68.17	72.44
	4	7400.80	22.73	11.08	3.35	-68.05	-72.39	-37.05	-42.60	66.71	72.26
	5	9251.00	26.54	12.20	0.66	-72.09	-72.64	-38.30	-39.08	67.96	68.74
	6	11101.20	30.50	13.34	-2.16	-67.74	-71.38	-31.44	-34.94	61.10	64.60
881	2	3760.00	14.40	9.95	10.55	-69.64	-70.54	-45.21	-47.07	74.87	76.73
	3	5640.00	19.02	11.12	7.10	-70.25	-72.37	-43.17	-45.19	72.83	74.85
	4	7520.00	22.74	11.10	3.36	-68.32	-69.33	-37.25	-39.11	68.91	68.77
	5	9400.00	26.52	12.14	0.62	-73.02	-75.66	-38.91	-42.41	68.57	72.07
	6	11280.00	30.53	13.40	-2.13	-74.73	-74.72	-37.59	-37.97	67.25	67.63
810	2	3819.60	14.37	9.94	10.57	-70.56	-72.73	-47.00	-48.69	76.66	78.35
	3	5729.40	19.54	11.14	6.60	-73.46	-76.23	-46.07	-48.70	75.73	78.36
	4	7639.20	23.37	11.15	2.78	-72.41	-72.02	-41.64	-41.96	71.30	71.62
	5	9549.00	27.03	12.16	0.13	-72.22	-74.75	-38.21	-41.47	67.87	71.13
	6	11458.80	30.23	13.50	-1.73	-70.99	-70.93	-32.58	-32.90	62.24	62.56

FCC ID : A3LSGHX400

Frequency Stability (PCS GSM)

Operating Frequency : 1,880,000,000 Hz

Channel : 661

Reference voltage : 3.7VDC

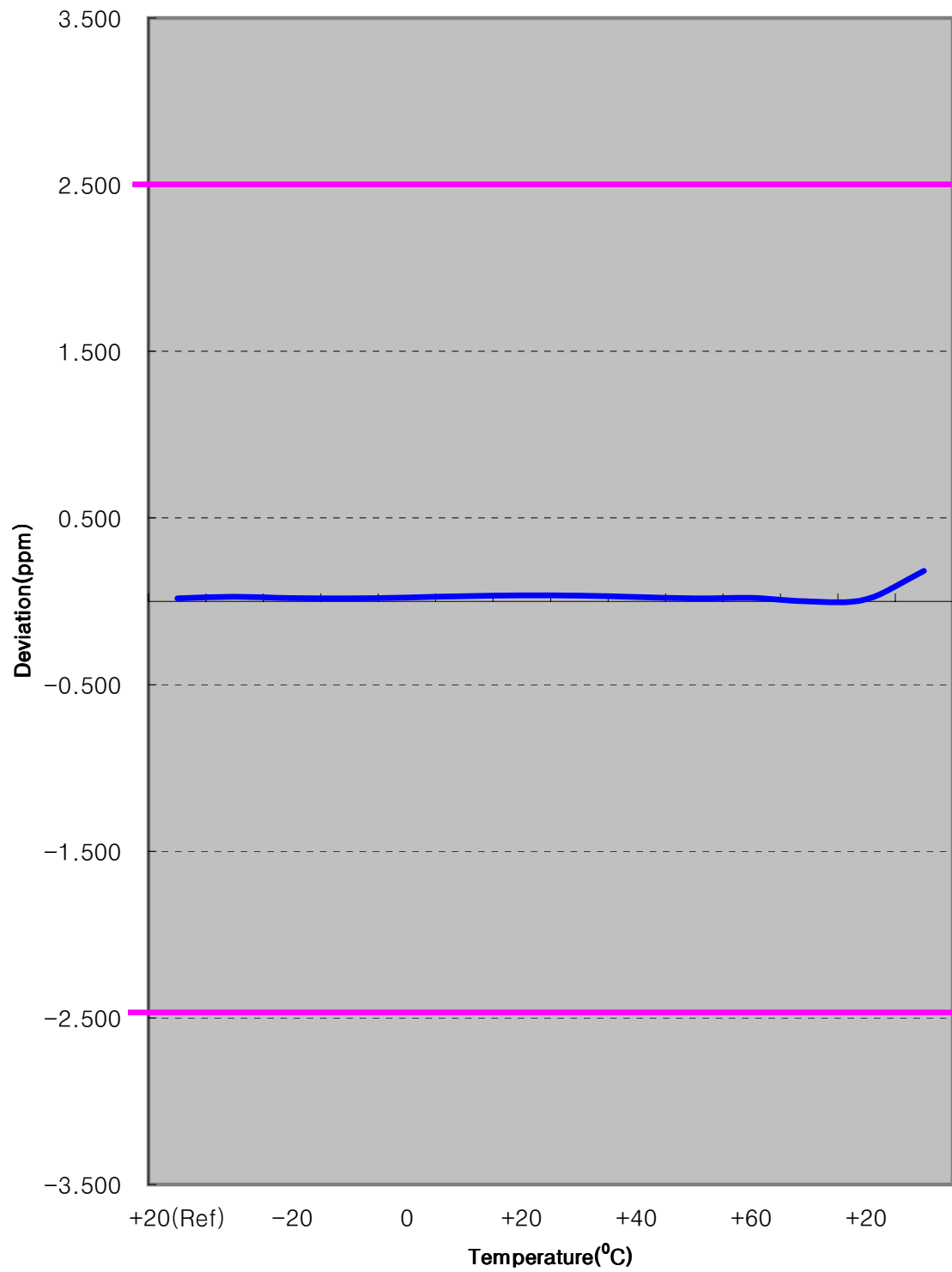
Deviation Limit : $\pm 0.00025\%$ or 2.5ppm

Voltage (%)	Power (V dc)	TEMP (OC)	Frequency error (Hz)	Frequency (Hz)	Deviation (%)	ppm
100%	3.70	+20(Ref)	-32.43	1,879,999,968	0.000002	0.017
100%		-30	-50.23	1,879,999,950	0.000003	0.027
100%		-20	-35.63	1,879,999,964	0.000002	0.019
100%		-10	-32.72	1,879,999,967	0.000002	0.017
100%		0	41.14	1,880,000,041	0.000002	0.022
100%		+10	-55.92	1,879,999,944	0.000003	0.030
100%		+20	-66.35	1,879,999,934	0.000004	0.035
100%		+30	-63.27	1,879,999,937	0.000003	0.034
100%		+40	-47.42	1,879,999,953	0.000003	0.025
100%		+50	-31.97	1,879,999,968	0.000002	0.017
100%		+60	-38.49	1,879,999,962	0.000002	0.020
85%	3.15	+20	-	-	-	-
115%	4.26	+20	24.77	1,880,000,025	0.000001	0.013
Batt. Endpoint		+20	-342.89	1,879,999,657	0.000018	0.182

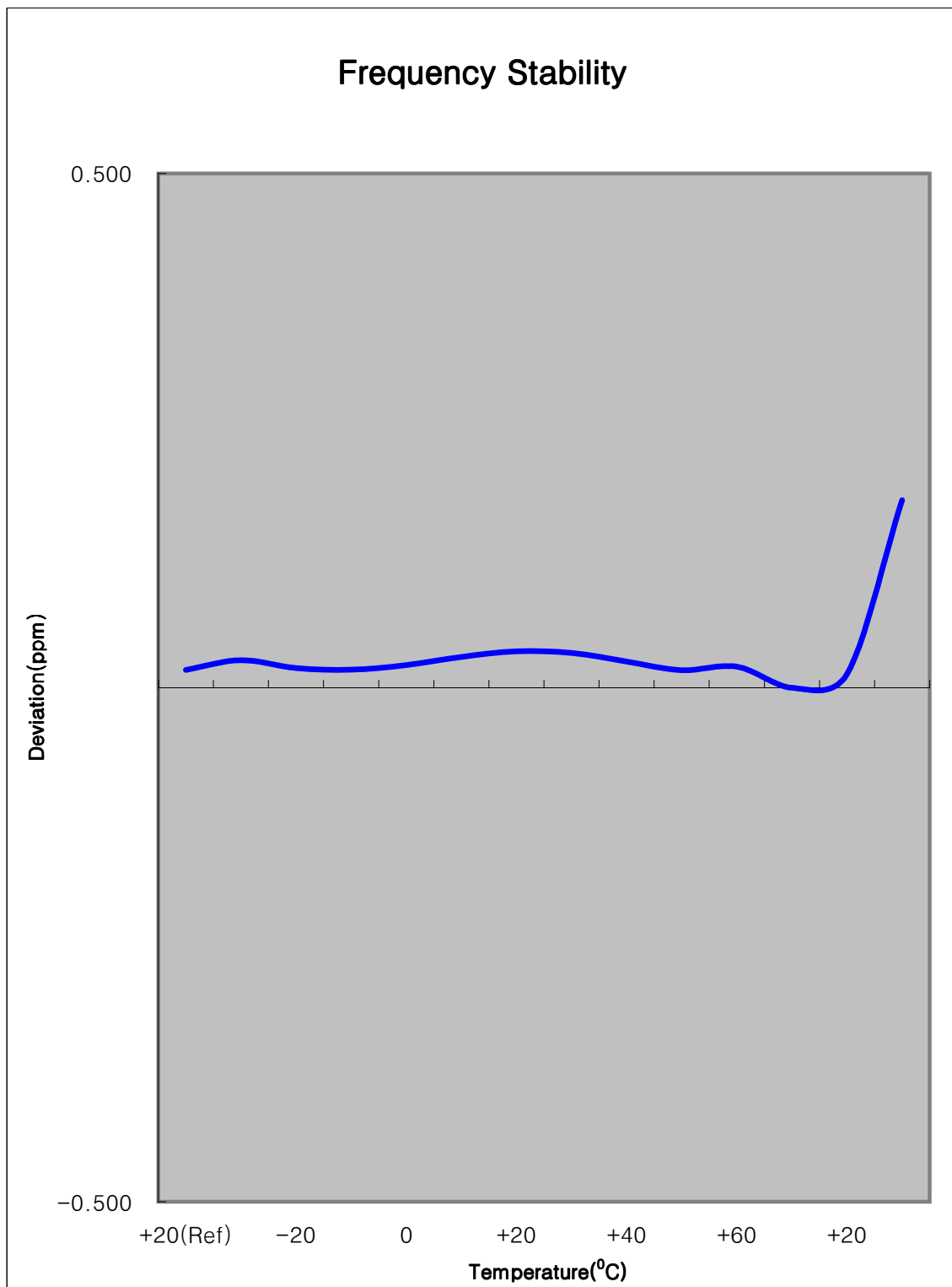
Note : The temperature is varied from -30°C to +60°C using an environmental chamber

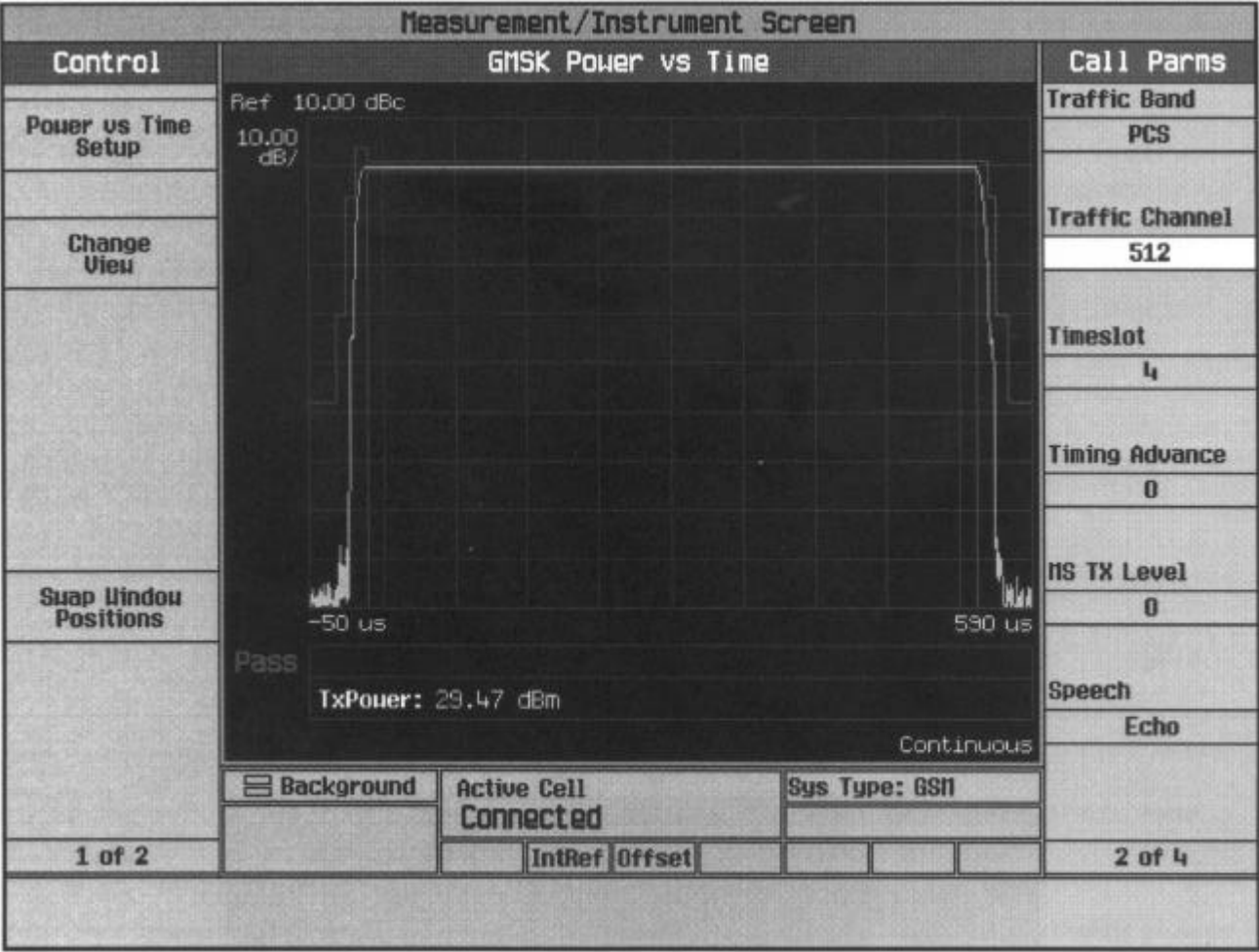
The EUT is tested down to the battery end point.

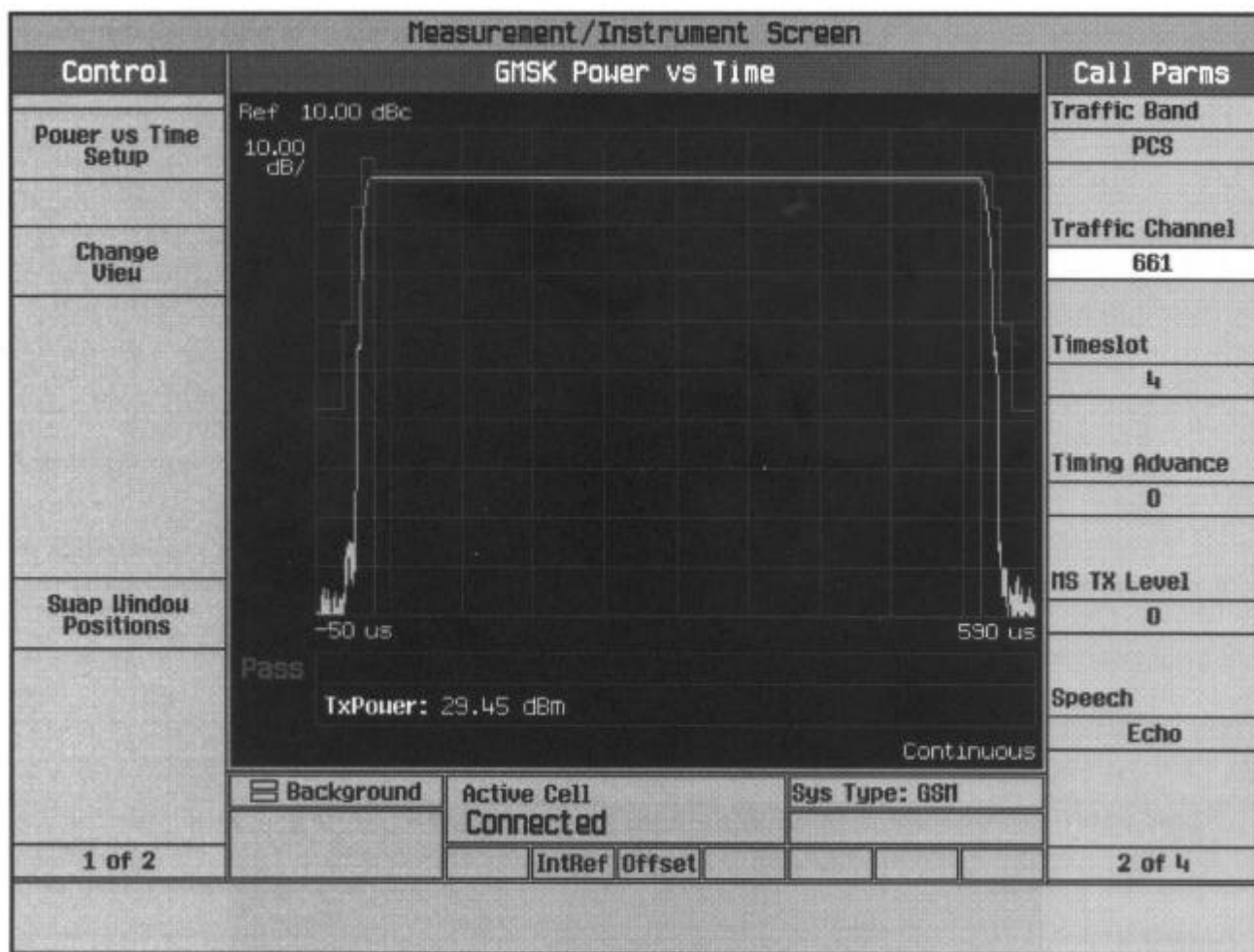
Frequency Stability

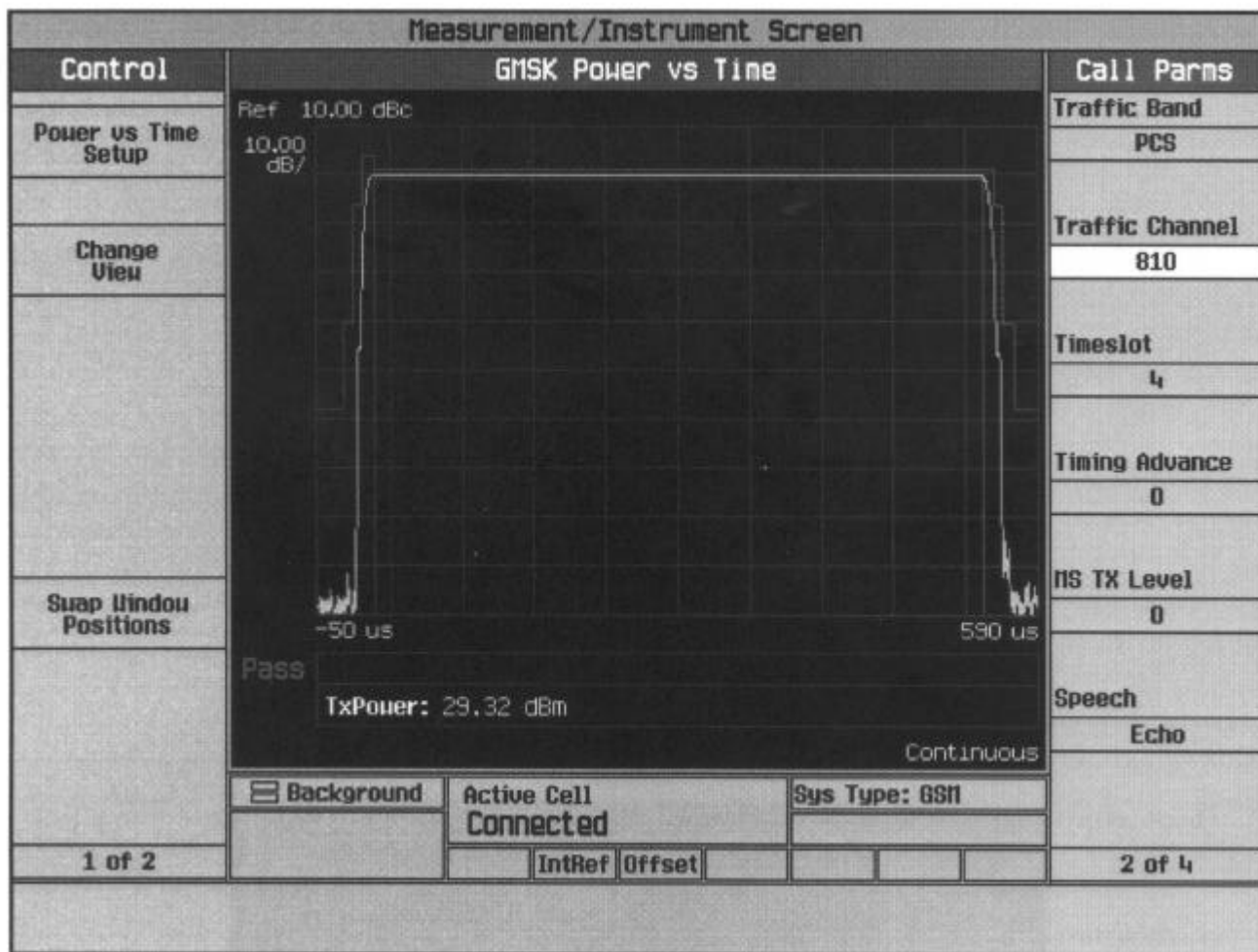


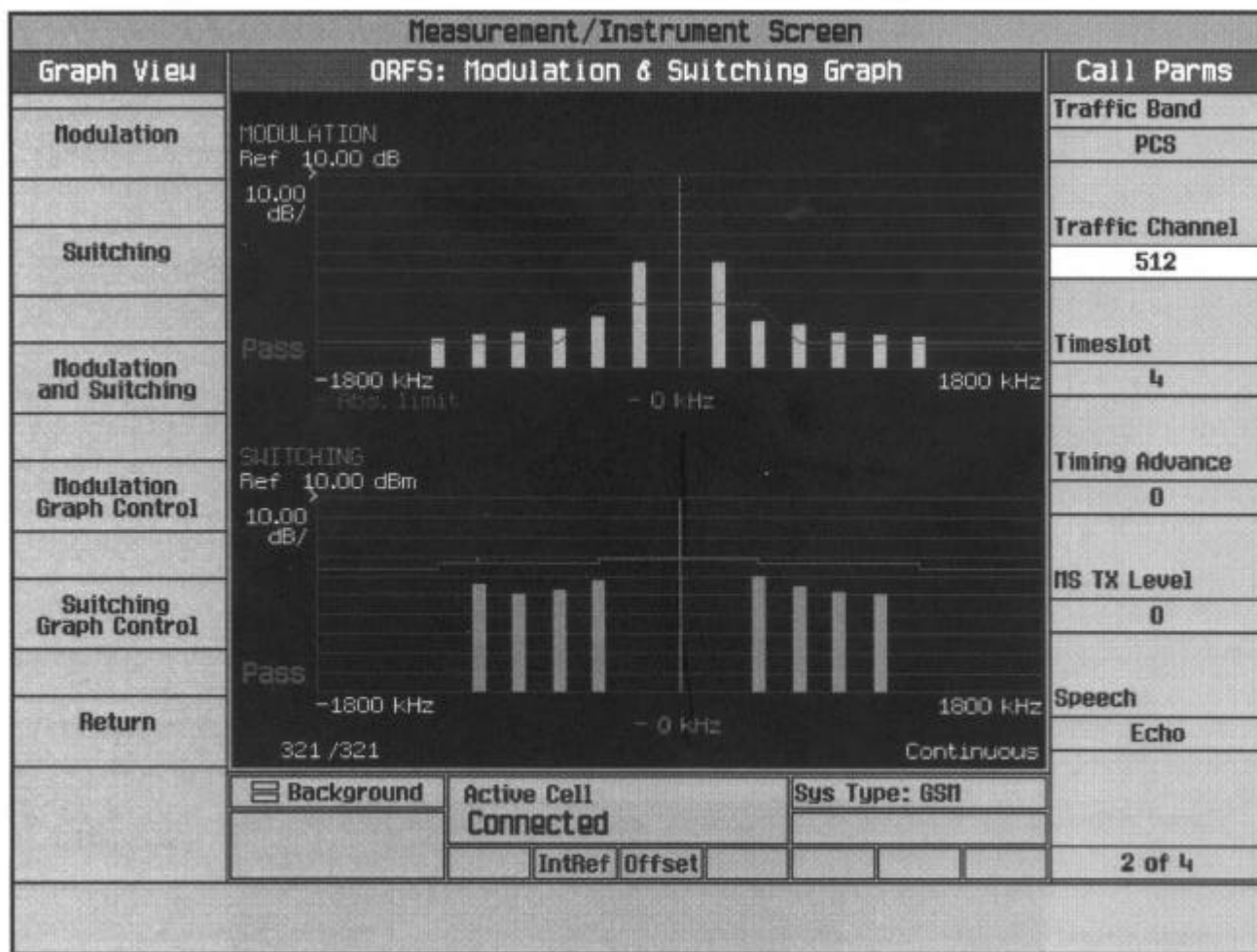
Zoom In

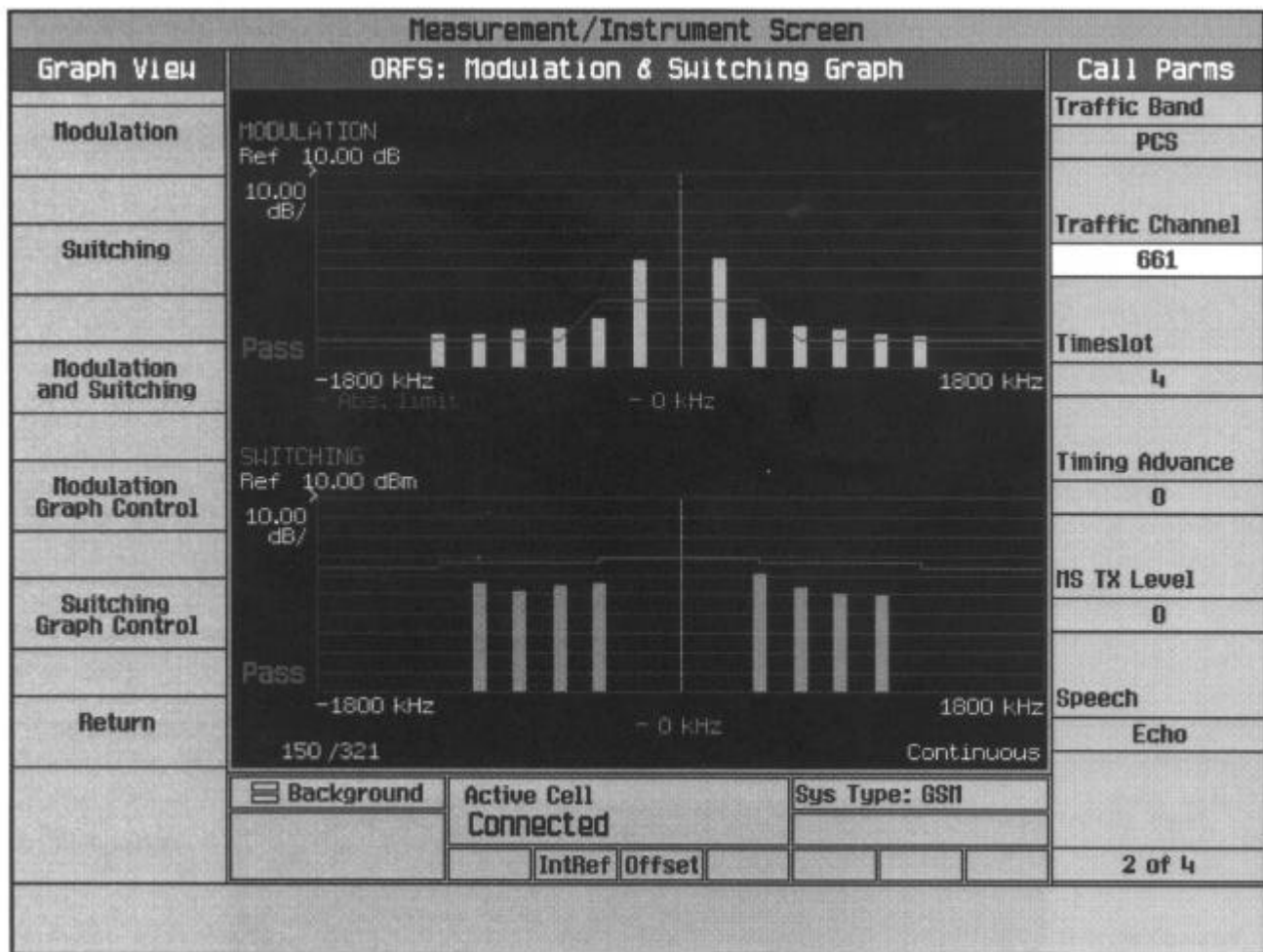


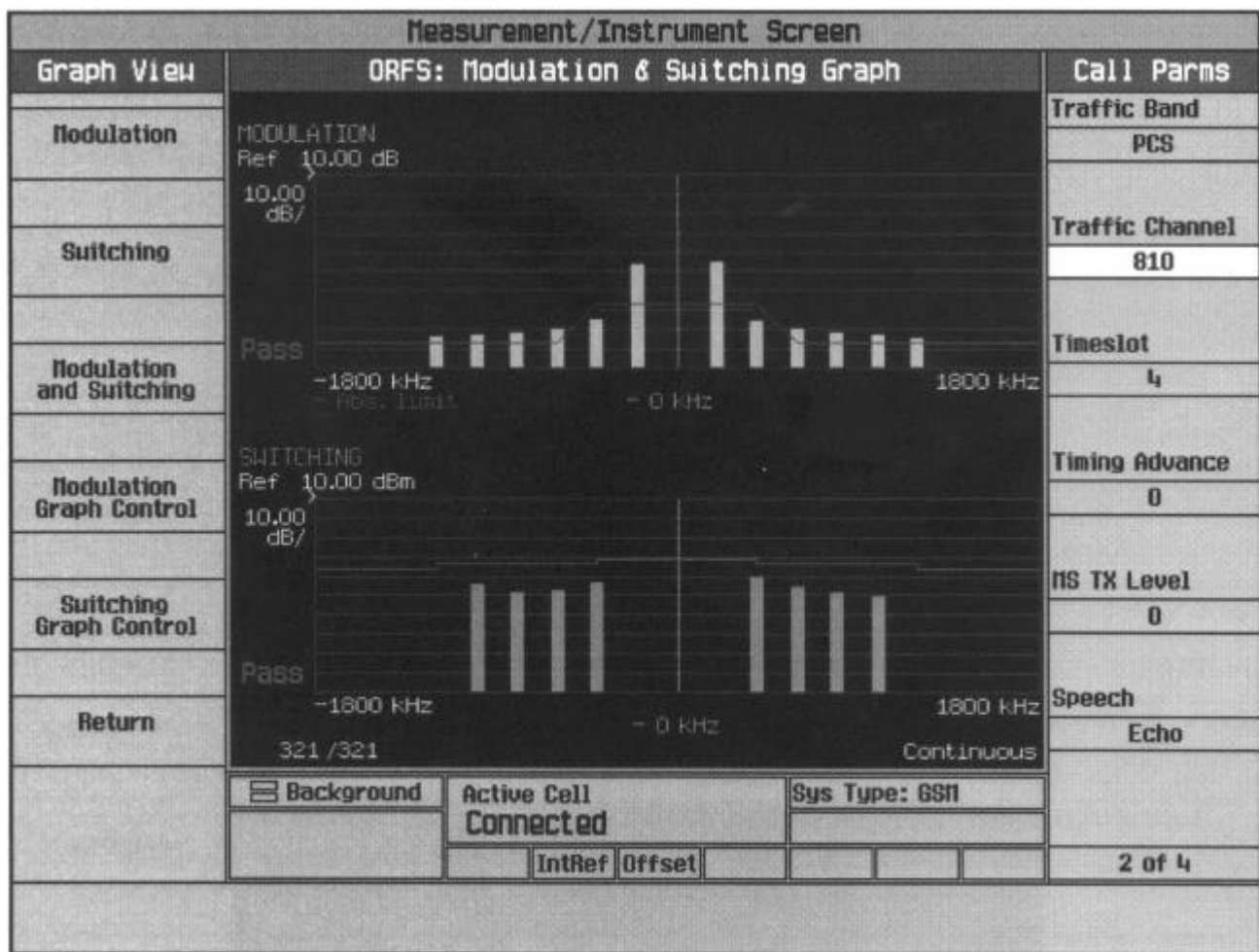






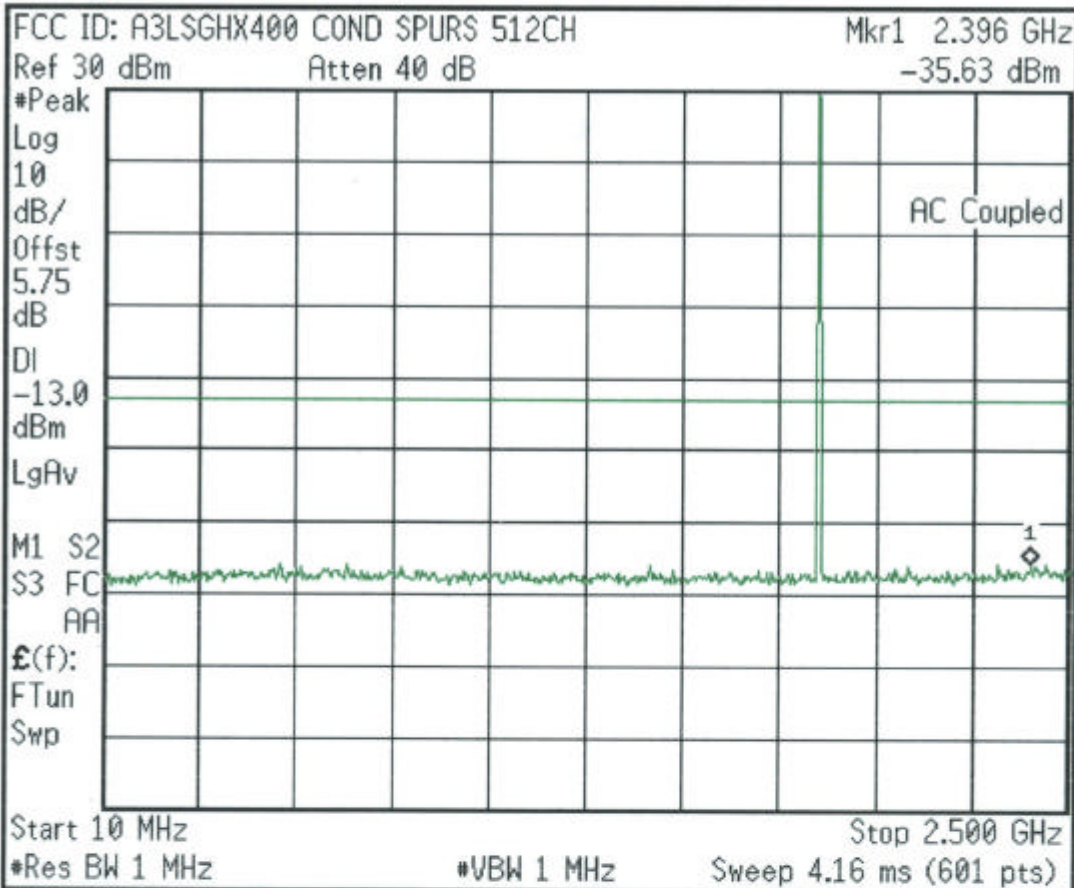






Agilent 12:58:50 Mar 10, 2003

Freq/Channel



Center Freq
1.25500000 GHz

Start Freq
10.0000000 MHz

Stop Freq
2.50000000 GHz

CF Step
249.000000 MHz
Auto Man

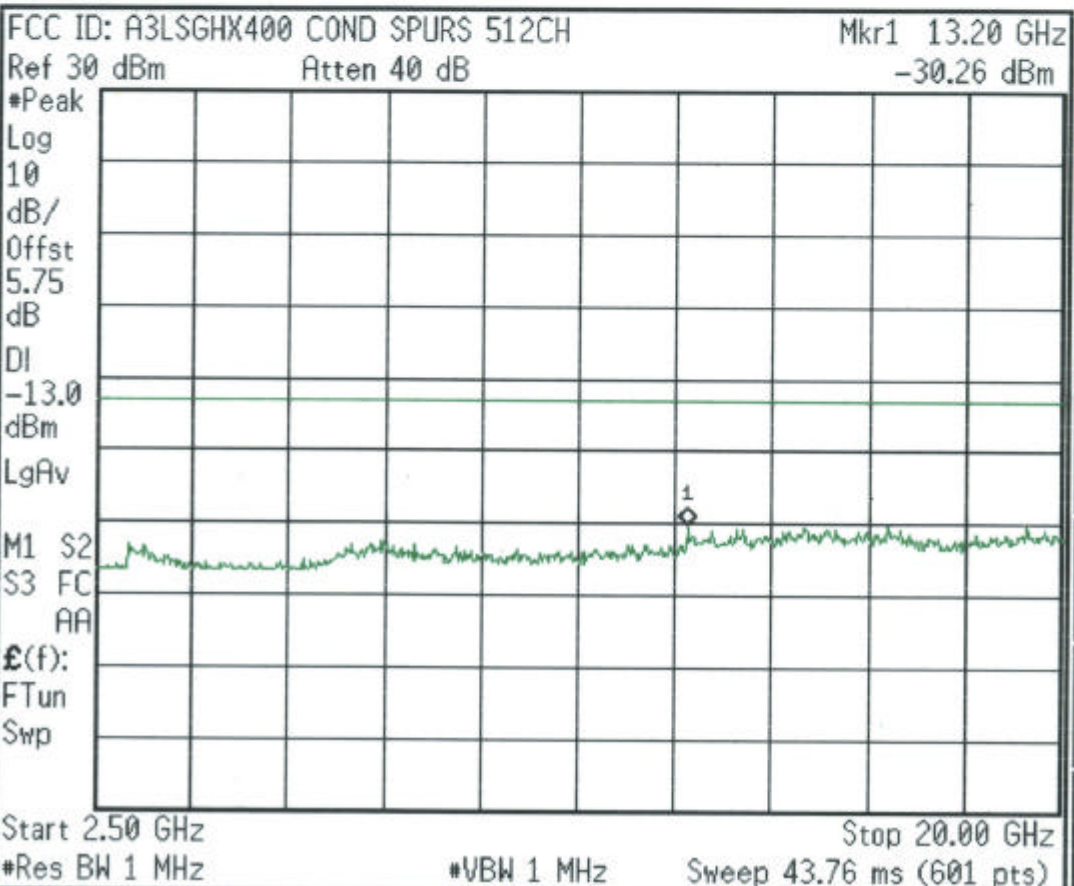
Freq Offset
0.00000000 Hz

Signal Track
On Off

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Peak Search



Next Peak

Next Pk Right

Next Pk Left

Min Search

Pk-Pk Search

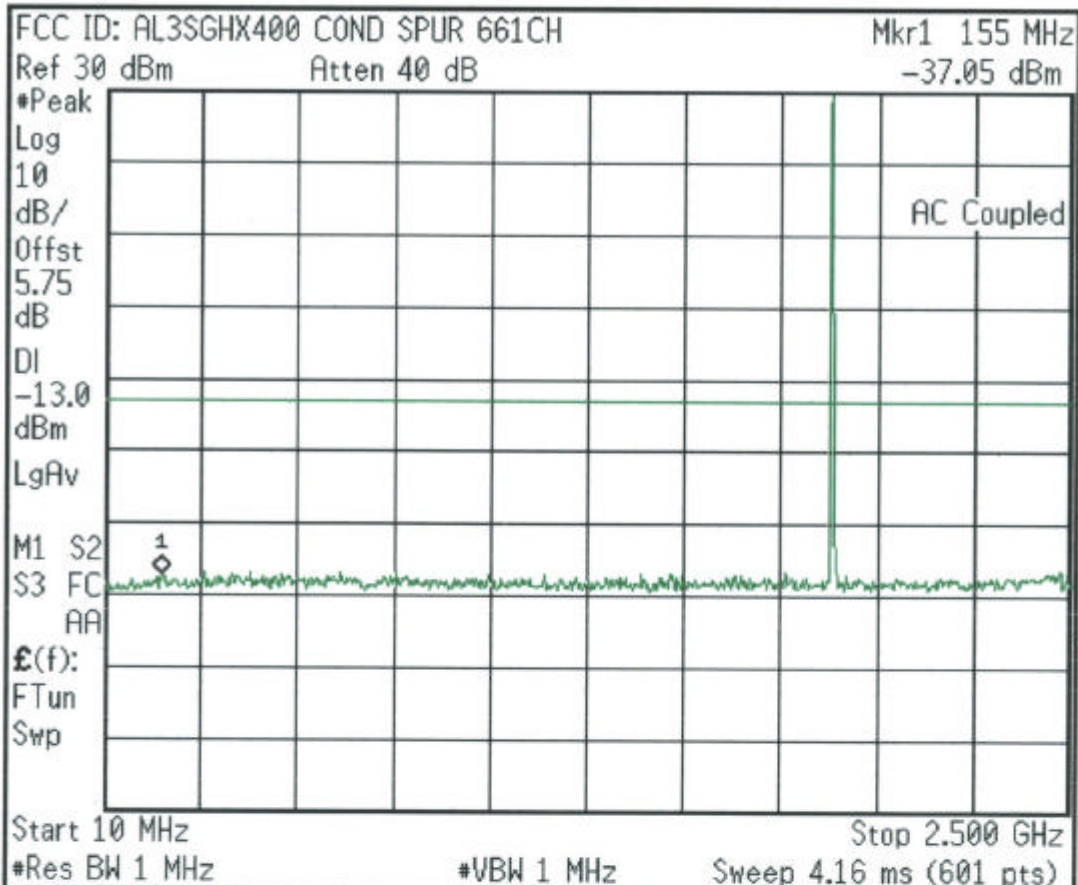
Mkr → CF

More
1 of 2

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Freq/Channel



Center Freq
 1.25500000 GHz

Start Freq
 10.0000000 MHz

Stop Freq
 2.50000000 GHz

CF Step
 249.000000 MHz
 Auto Man

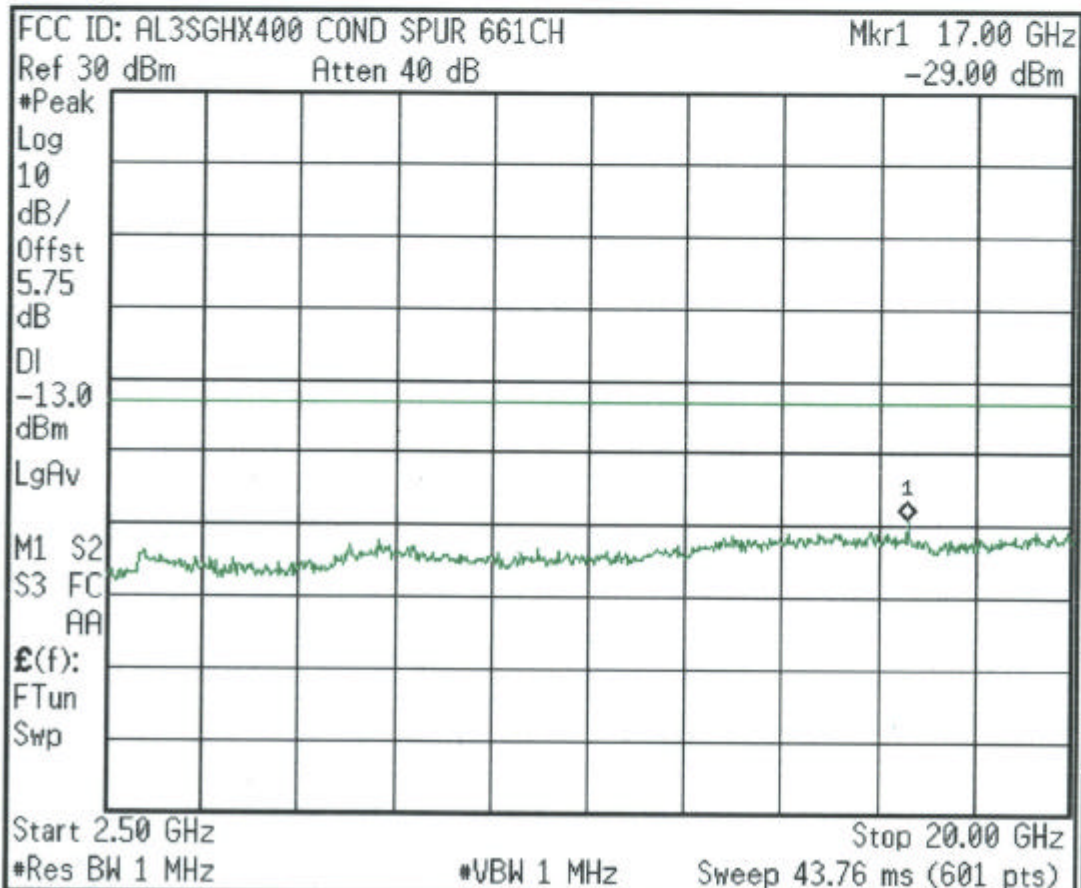
Freq Offset
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Signal Track
 On Off

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Freq/Channel



Center Freq
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Start Freq
 2.50000000 GHz

Stop Freq
 20.0000000 GHz

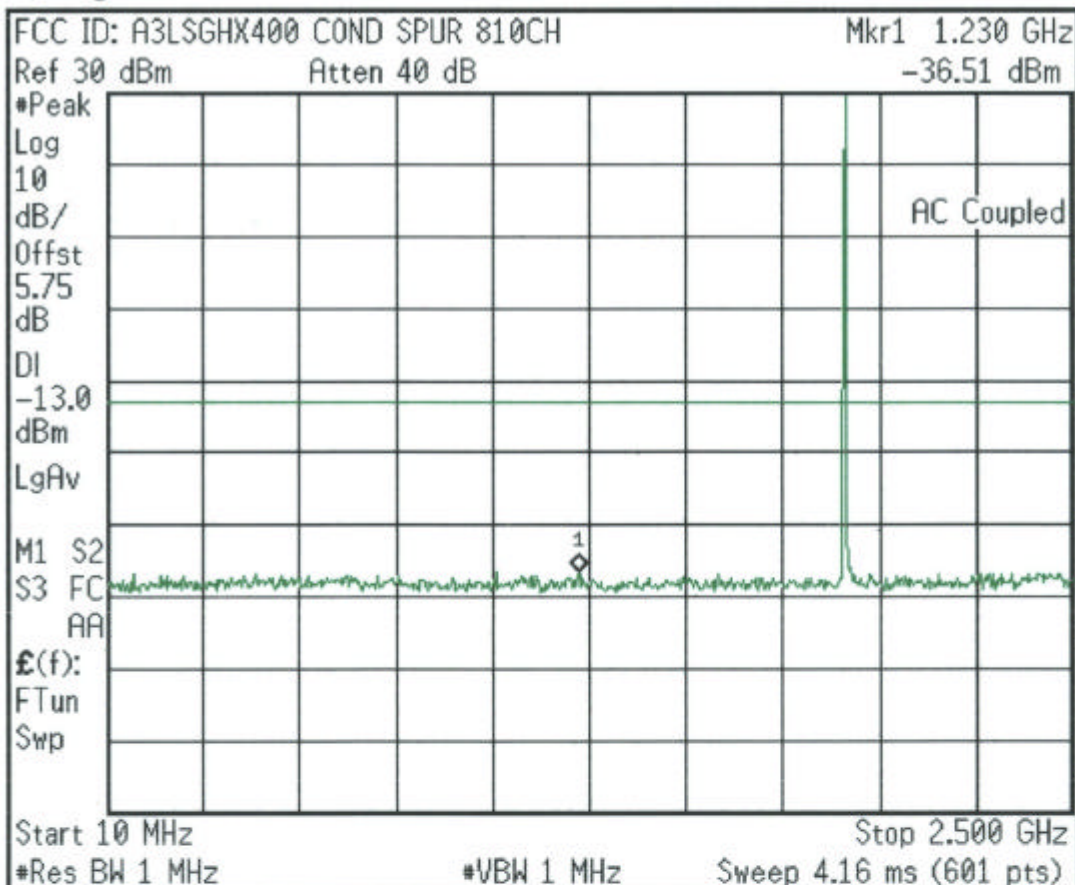
CF Step
 1.75000000 GHz
 Auto Man

Freq Offset
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Signal Track
 On Off

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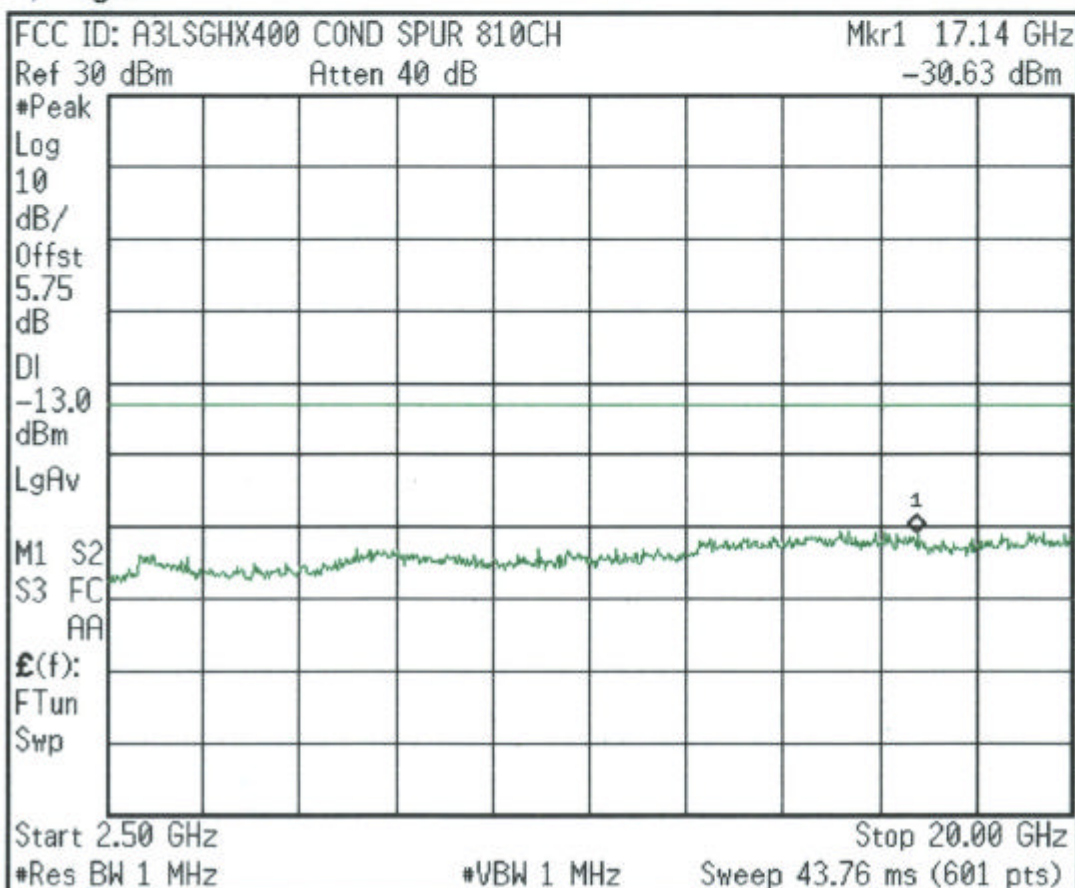
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Freq/Channel
Center Freq 1.25500000 GHz
Start Freq 10.0000000 MHz
Stop Freq 2.50000000 GHz
CF Step 249.000000 MHz Auto Man
Freq Offset 0.00000000 Hz
Signal Track On Off

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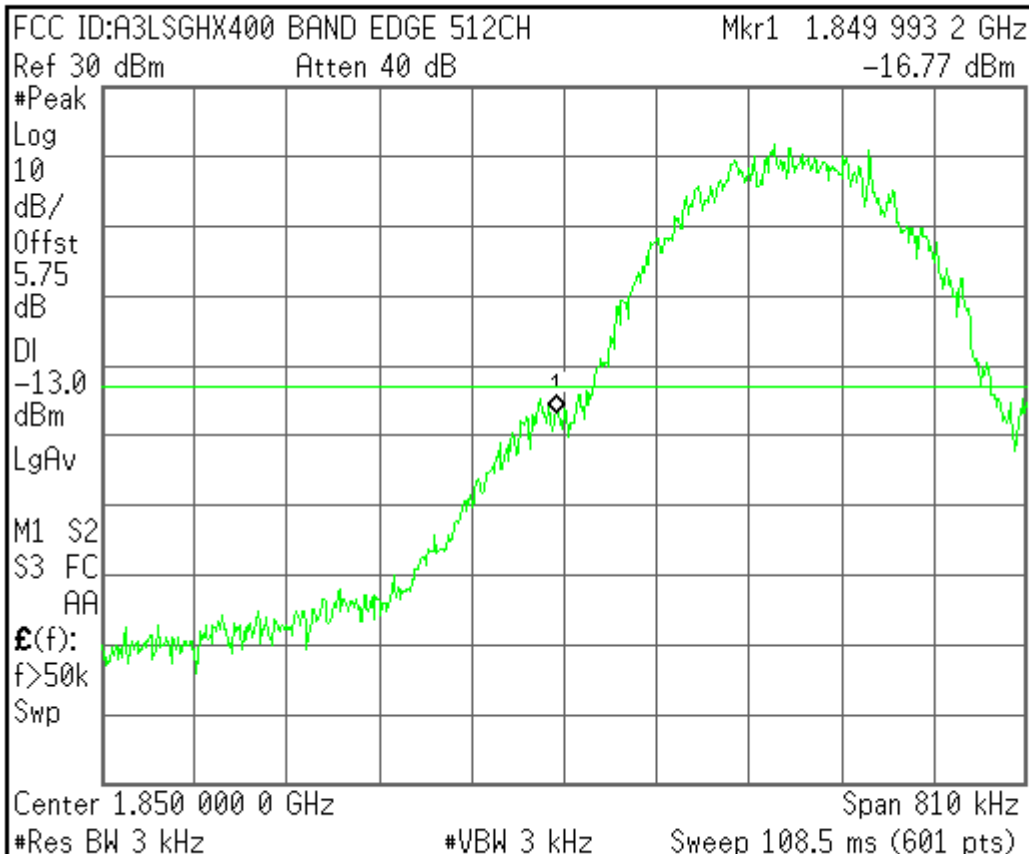
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Freq/Channel
Center Freq 11.2500000 GHz
Start Freq 2.50000000 GHz
Stop Freq 20.0000000 GHz
CF Step 1.75000000 GHz Auto Man
Freq Offset 0.00000000 Hz
Signal Track On Off

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Freq/Channel

Center Freq
1.85000000 GHz

Start Freq
1.84959500 GHz

Stop Freq
1.85040500 GHz

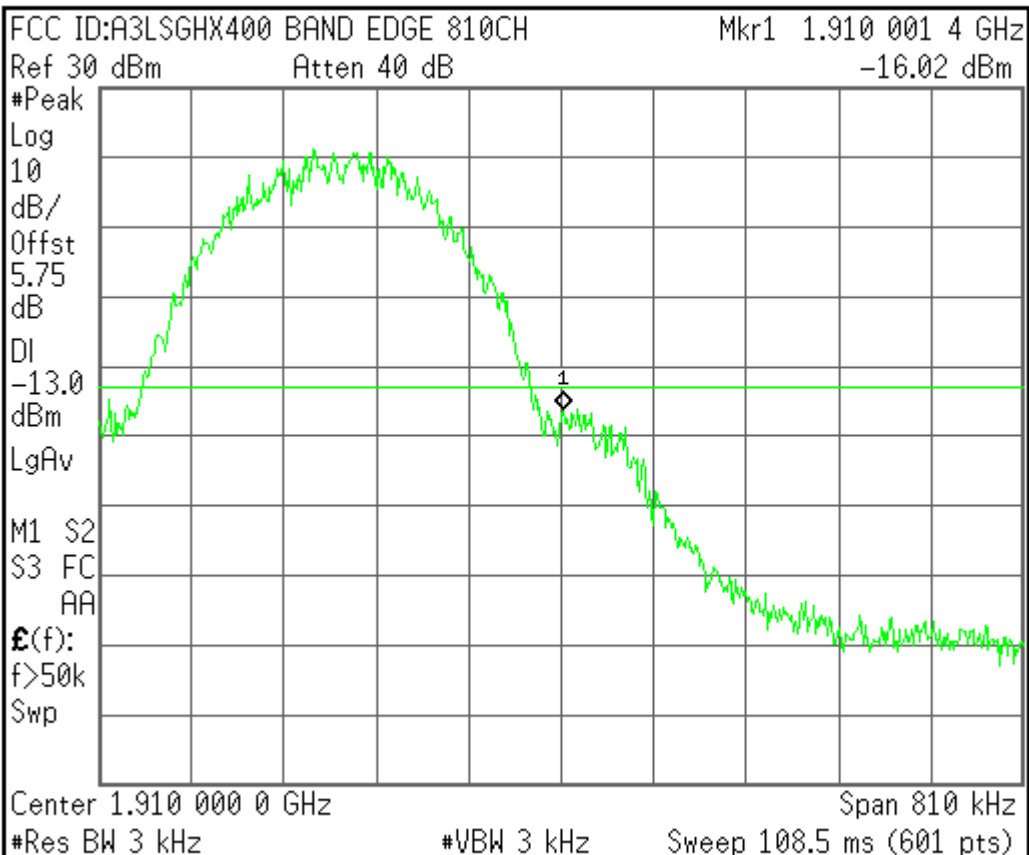
CF Step
81.0000000 kHz
Auto Man

Freq Offset
0.00000000 Hz

Signal Track
On Off

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Freq/Channel

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

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