



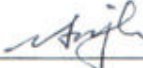
MSUNG ELECTRONICS Co., Ltd.,
Regulatory Compliance Team
IT R&D Center
416, Maetan-3dong,
Paldal-gu, Suwon-si,
Gyeonggi-do, Korea 442-742

FCC CFR47 PART 24 SUBPART CERTIFICATION TEST DATA

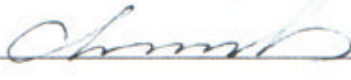
Model Tested: SGH-P408
FCC ID (Requested): A3LSGHP408
Report No: FA-006-R1
Date issued: May 12, 2003

- Abstract -

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

Prepared By  Date May 12, 2003

JH NAM - Test Engineer

Checked By  Date May 14, 2003

CW PARK - Manager

Authorized By  Date May 14, 2003

JK CHOI - Senior Manager

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 : A3LSGHP408

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	-12.83	-12.78	8.26	-21.04
		V	-12.74	-12.72	8.26	-20.98

■ Result

Frequency (MHz)	From EUT Tested level (dBm)	POL (H/V)	Azimuth (angle)	EIRP (dBm)	EIRP (W)	Battery
1850.20	-16.43	H1	111	31.61	1.449	Standard
1880.00	-19.22	H1	113	28.82	0.762	Standard
1909.80	-20.48	H1	116	27.56	0.570	Standard

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 : A3LSGHP408

Field Strength of SPURIOUS Radiation

Operating Frequency : 1850.2 MHz

Measured Output Power : 31.61 dBm = 1.449 W

Modulation Signal : PCS GSM

Limit : $43+10\log_{10}(W) = 44.61$ dBc

■ Result

Channel	Harmonic	Frequency (MHz)	From EUT Tested level (dBm)	POL (H/V)	Result (dBc)
512	2	3700.40	-51.93	H2	61.28
	3	5550.60	-53.85	H1	57.41
	4	7400.80	-56.48	V	58.05
	5	9251.00	-56.81	V	53.58
	6	11101.20	-57.33	H2	49.92
661	2	3760.00	-49.66	H2	57.18
	3	5640.00	-55.96	V	59.81
	4	7520.00	-56.02	H2	56.50
	5	9400.00	-62.45	H1	58.91
	6	11280.00	-57.26	H1	49.80
810	2	3819.60	-47.56	H2	54.76
	3	5729.40	-58.15	V	61.84
	4	7639.20	-56.20	V	58.12
	5	9549.00	-63.41	H1	58.89
	6	11458.80	-60.02	H1	51.21

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 Conversion Table

FCC ID : A3LSGHP408 Mode : GSM1900

EIRP : 31.61 dBm

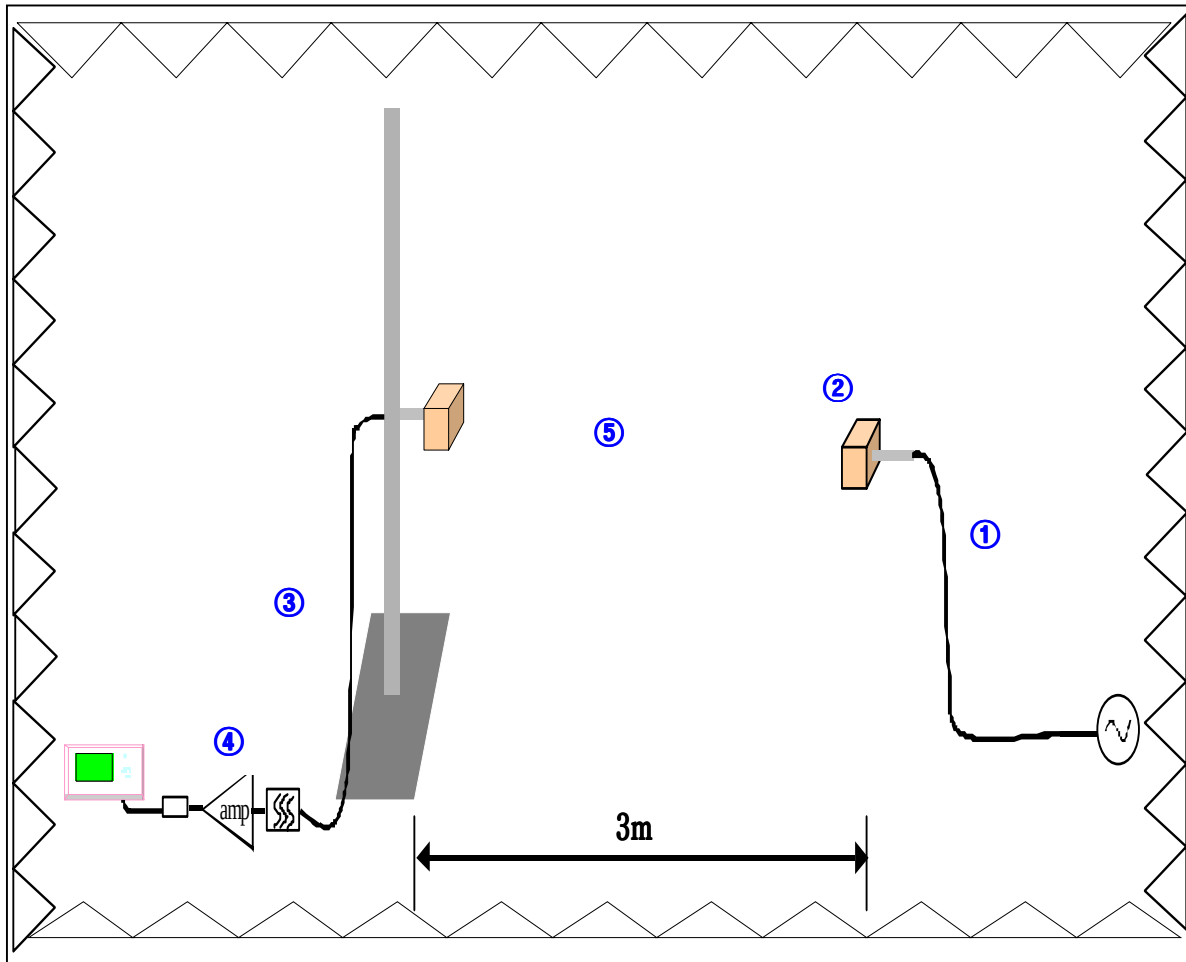
Date : 2003 . 04 . 30 .

Test Engineer : JH Nam

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

CH	채수	Frequency (MHz)	① Tx CL (dB)	② Horn Gain (dB)	Tx Level (Horn) 공탄 S/G 10dBm	⑥ Tested Level Ant : H (dBm)	⑥ Tested Level Ant : V (dBm)	⑦ Actual Value Ant : H (dBm)	⑦ Actual Value Ant : V (dBm)	⑧ Result Ant : H (dBc)	⑧ Result Ant : V (dBc)
512	2	3700.40	15.61	9.98	4.37	-51.93	-54.84	-29.67	-31.91	61.28	63.52
	3	5550.60	18.44	11.18	2.74	-53.85	-56.11	-25.80	-28.23	57.41	59.84
	4	7400.80	22.46	11.48	-0.98	-57.75	-56.48	-26.48	-26.44	58.09	58.05
	5	9251.00	25.71	12.34	-3.37	-61.34	-56.81	-25.96	-21.97	57.57	53.58
	6	11101.20	30.50	13.76	-6.74	-57.33	-61.55	-18.31	-23.79	49.92	55.40
661	2	3760.00	14.24	10.02	5.78	-49.66	-50.23	-25.57	-26.36	57.18	57.97
	3	5640.00	18.60	11.18	2.58	-57.25	-55.96	-29.83	-28.20	61.44	59.81
	4	7520.00	22.56	11.50	-1.06	-56.02	-56.75	-24.89	-26.45	56.50	58.06
	5	9400.00	25.90	12.32	-3.58	-62.45	-62.36	-27.30	-27.74	58.91	59.35
	6	11280.00	30.58	13.68	-6.90	-57.26	-58.30	-18.19	-19.58	49.80	51.19
810	2	3819.60	14.22	10.02	5.80	-47.56	-49.06	-23.15	-25.10	54.76	56.71
	3	5729.40	19.27	11.26	1.99	-60.04	-58.15	-32.60	-30.23	64.21	61.84
	4	7639.20	23.79	11.52	-2.27	-59.85	-56.20	-29.42	-26.51	61.03	58.12
	5	9549.00	26.01	12.30	-3.71	-63.41	-63.02	-27.28	-28.03	58.89	59.64
	6	11458.80	30.14	13.60	-6.54	-60.02	-60.09	-19.60	-20.46	51.21	52.07

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

FCC ID : A3LSGHP408

Frequency Stability (PCS GSM)

Operating Frequency : 1,880,000,000 Hz

Channel : 661

Reference voltage : 3.7VDC

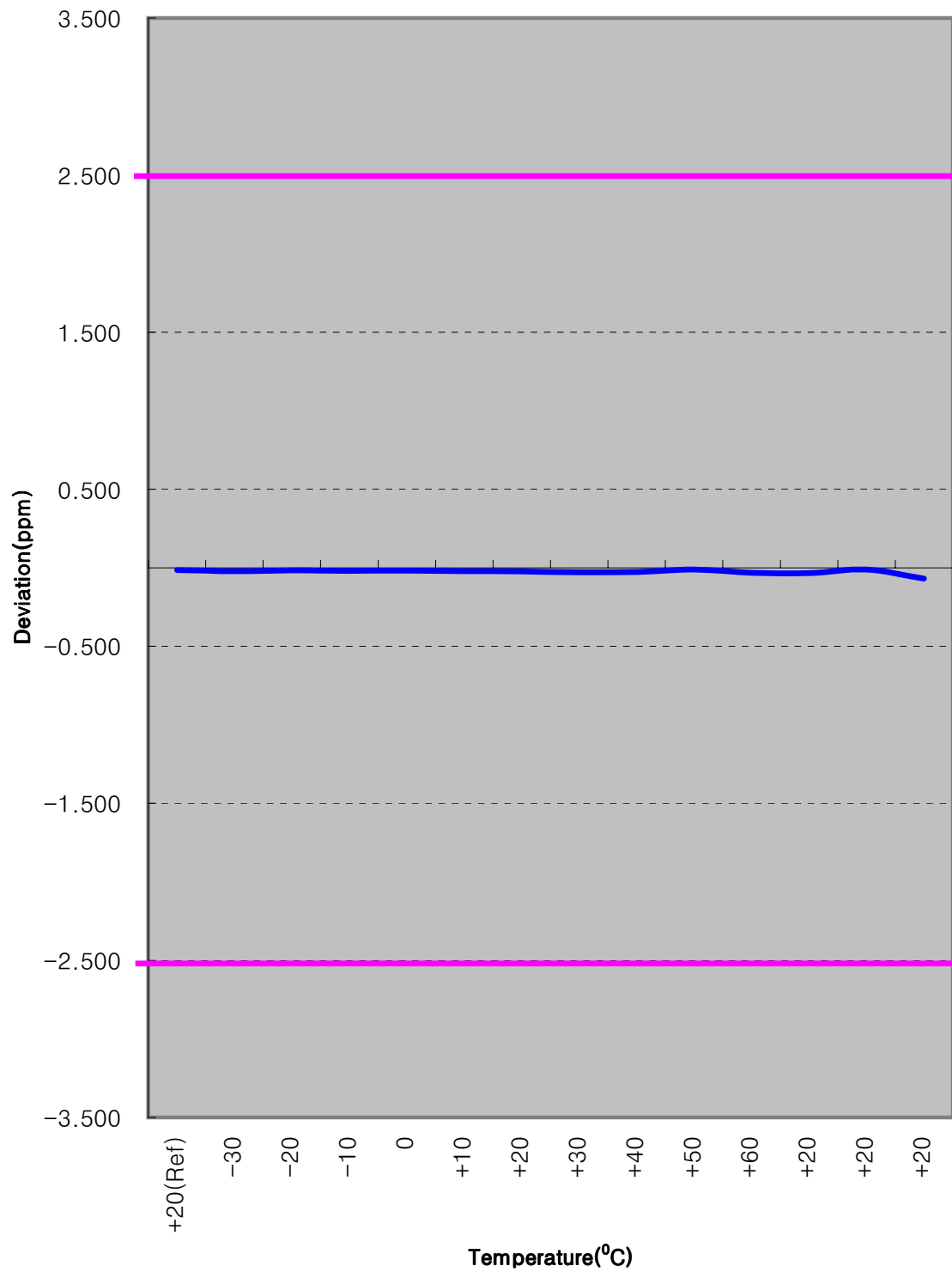
Deviation Limit : $\pm 0.00025\%$ or 2.5ppm

Voltage (%)	Power (V dc)	TEMP (OC)	Frequency error (Hz)	Frequency (Hz)	Deviation (%)	ppm
100%	3.70	+20(Ref)	-26.94	1,879,999,973	-0.000001	-0.014
100%		-30	-42.17	1,879,999,958	-0.000002	-0.022
100%		-20	-30.68	1,879,999,969	-0.000002	-0.016
100%		-10	-37.49	1,879,999,963	-0.000002	-0.020
100%		0	-34.96	1,879,999,965	-0.000002	-0.019
100%		+10	-41.00	1,879,999,959	-0.000002	-0.022
100%		+20	-43.37	1,879,999,957	-0.000002	-0.023
100%		+30	-52.79	1,879,999,947	-0.000003	-0.028
100%		+40	-50.14	1,879,999,950	-0.000003	-0.027
100%		+50	-20.78	1,879,999,979	-0.000001	-0.011
100%		+60	-61.47	1,879,999,939	-0.000003	-0.033
85%	3.15	+20	-63.12	1,879,999,937	-0.000003	-0.034
115%	4.26	+20	-21.47	1,879,999,979	-0.000001	-0.011
Batt. Endpoint	3.12	+20	-130.32	1,879,999,870	-0.000007	-0.069

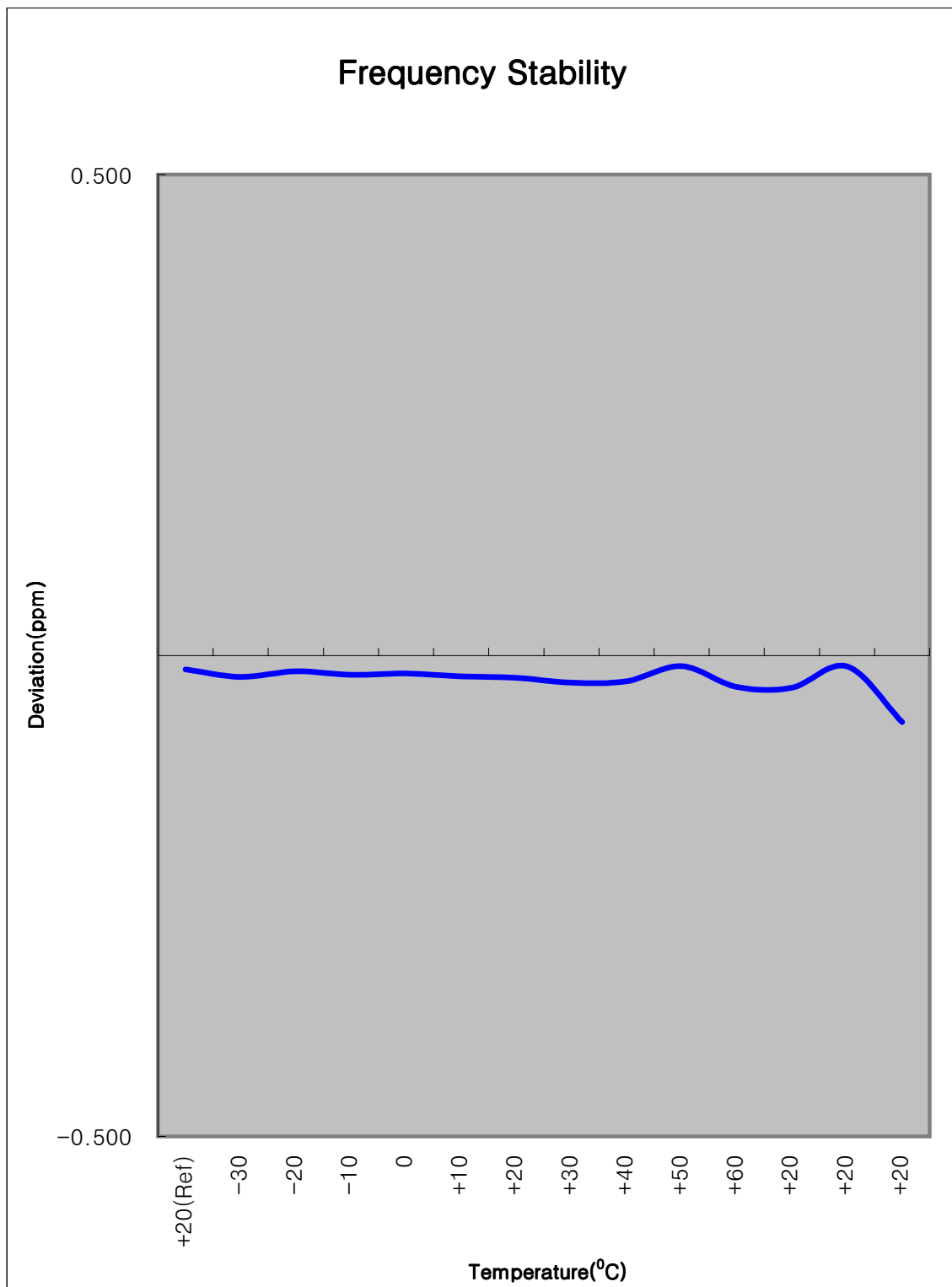
Note : The temperature is varied from -30°C to +60°C using an environmental chamber

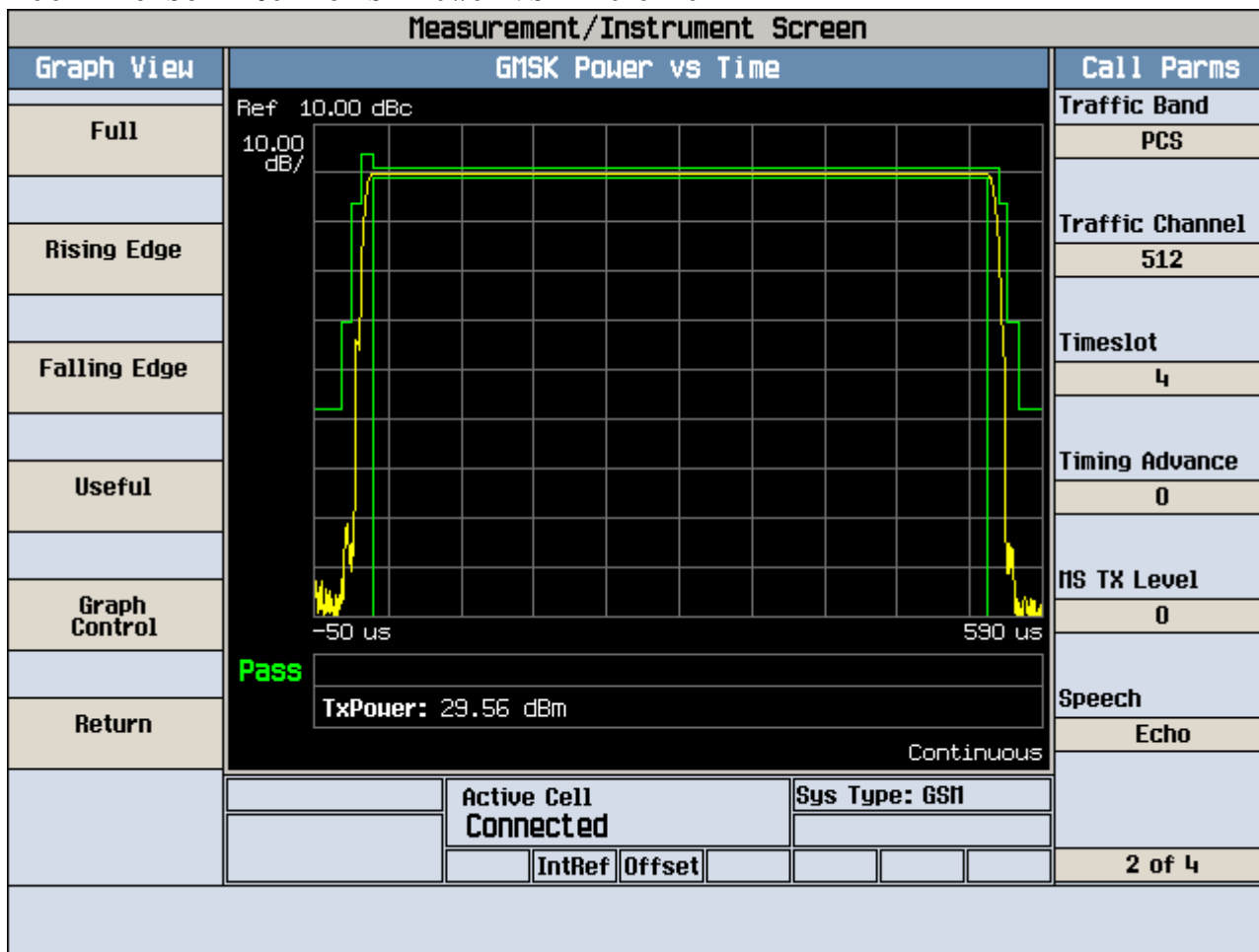
The EUT is tested down to the battery end point.

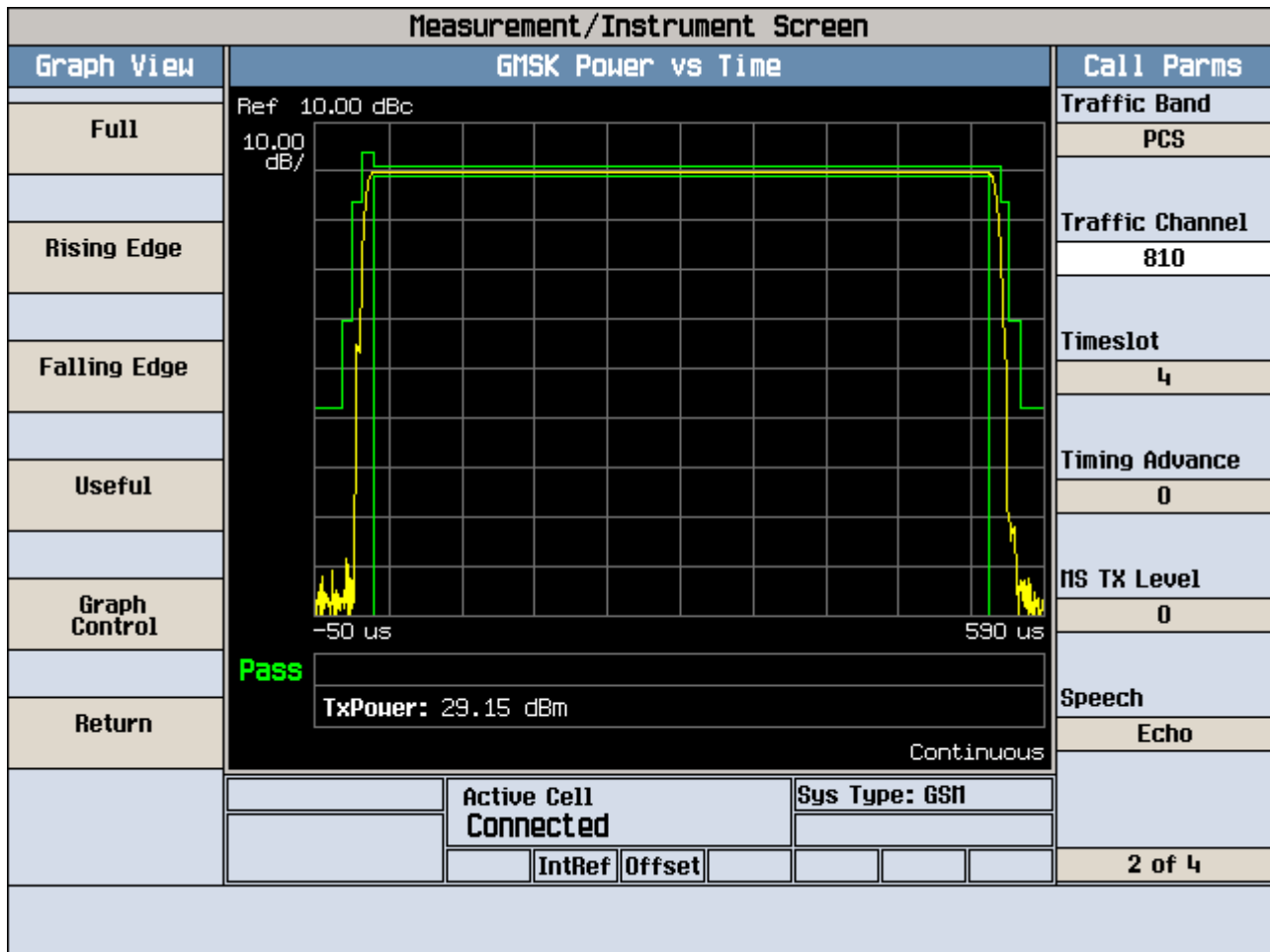
Frequency Stability

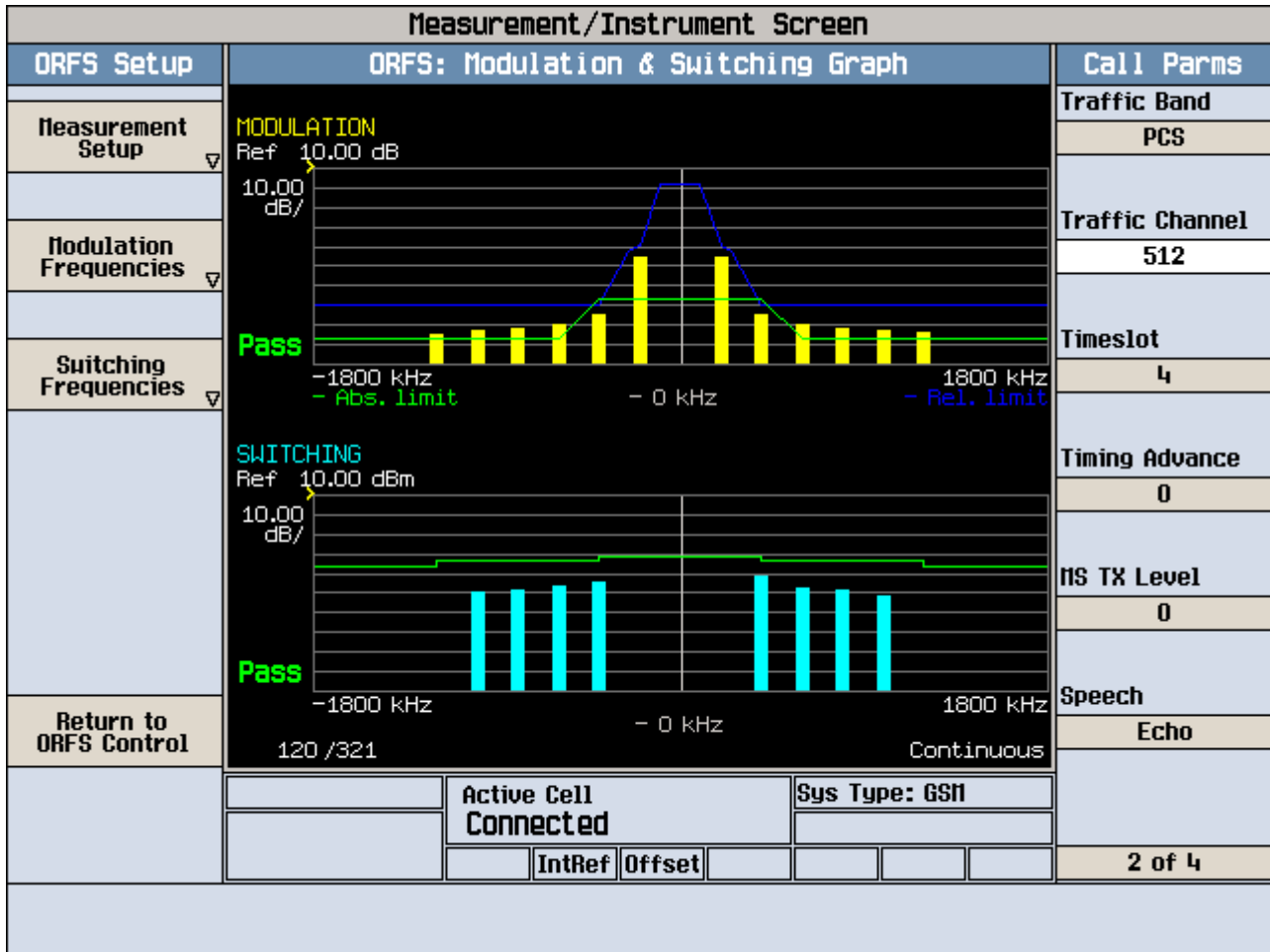


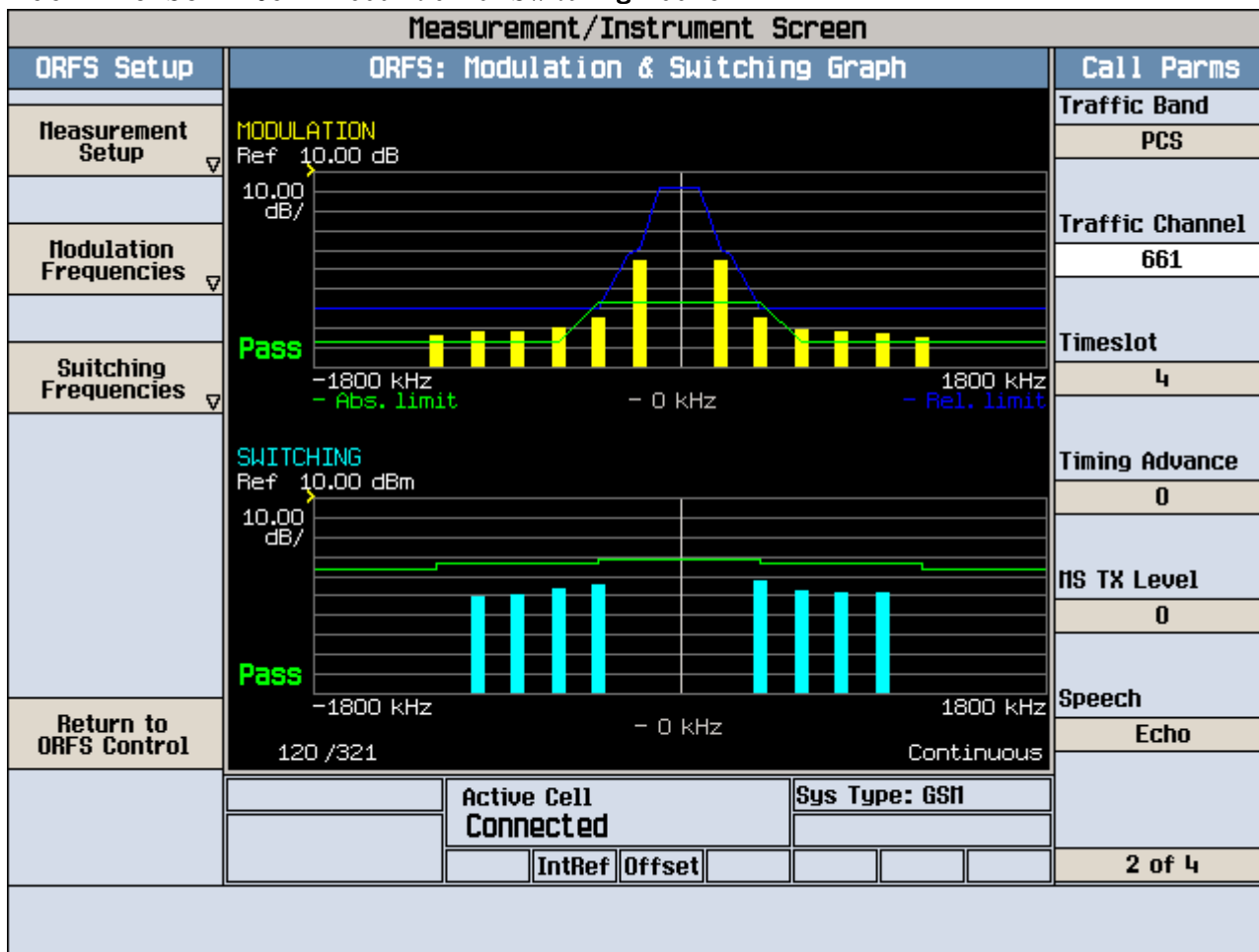
Zoom In

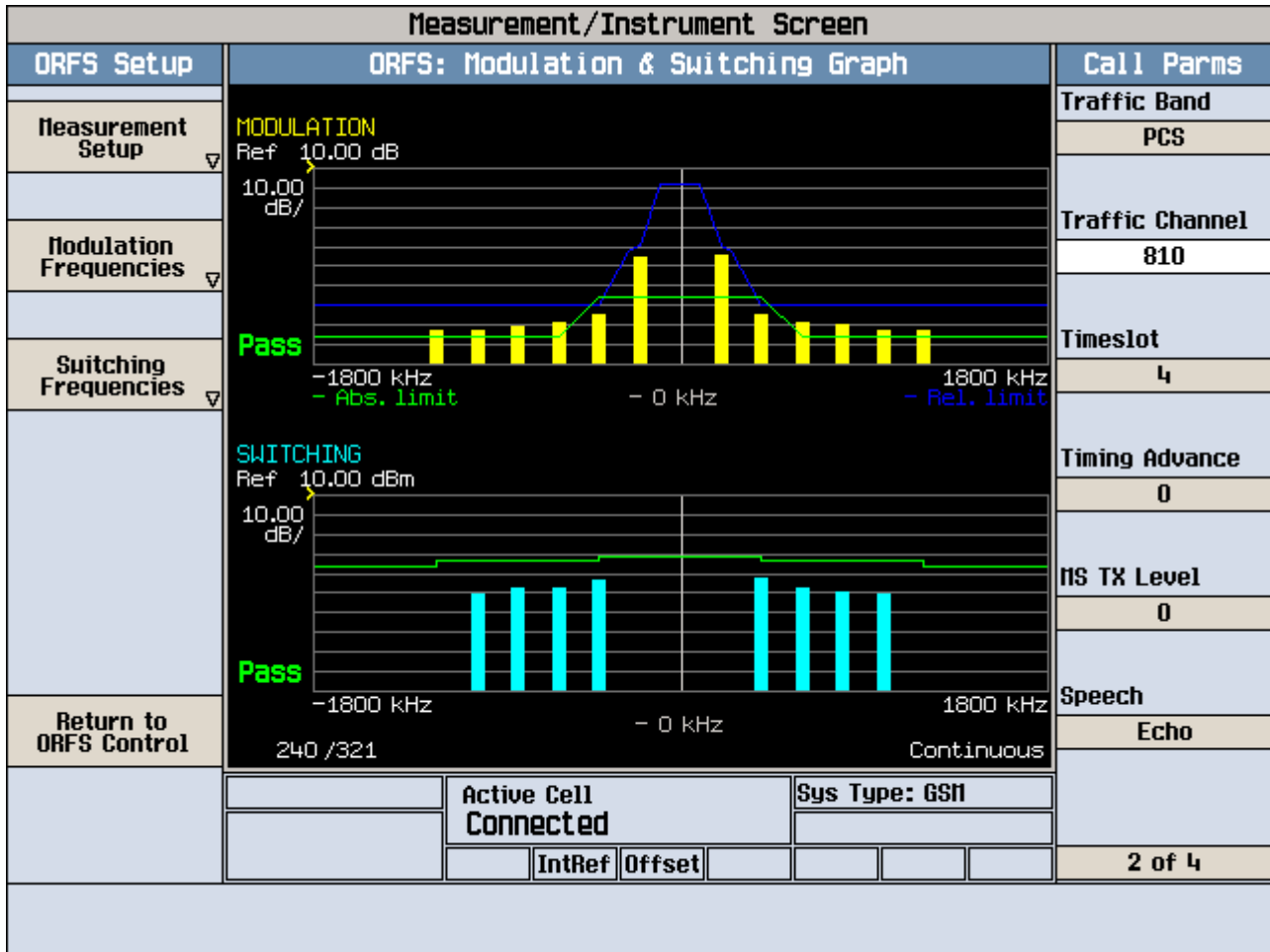




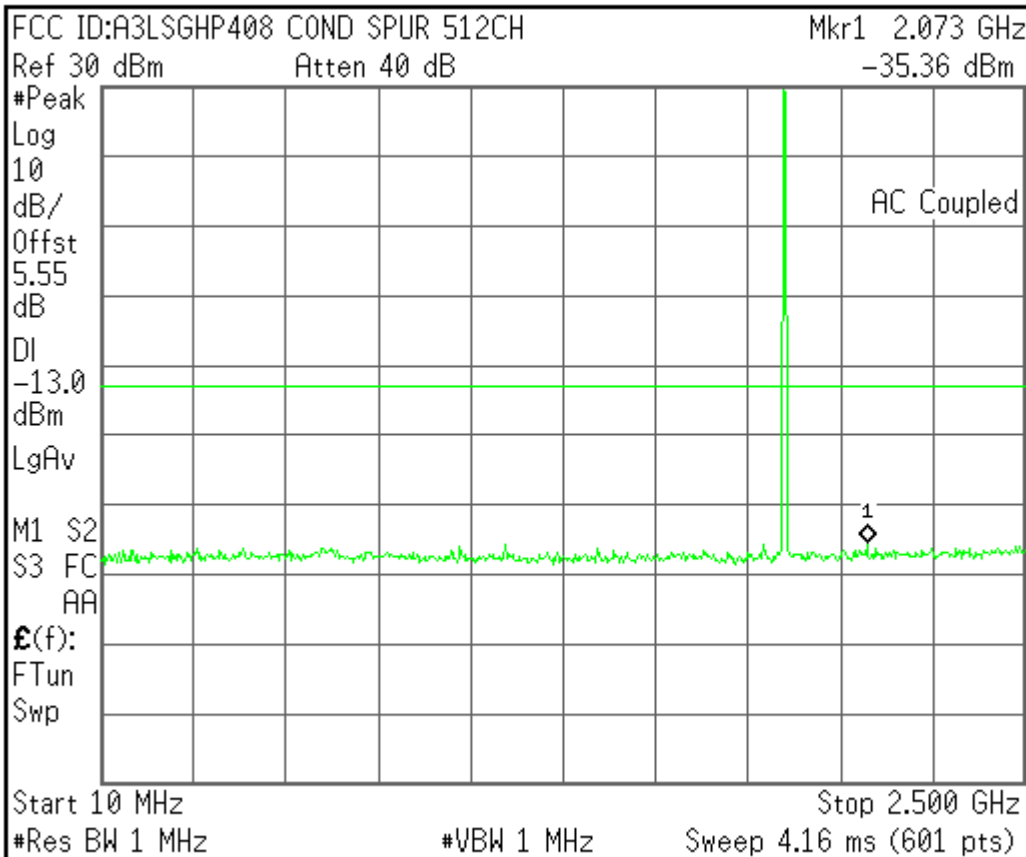








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Freq/Channel

Center Freq
 1.25500000 GHz

Start Freq
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Stop Freq
 2.50000000 GHz

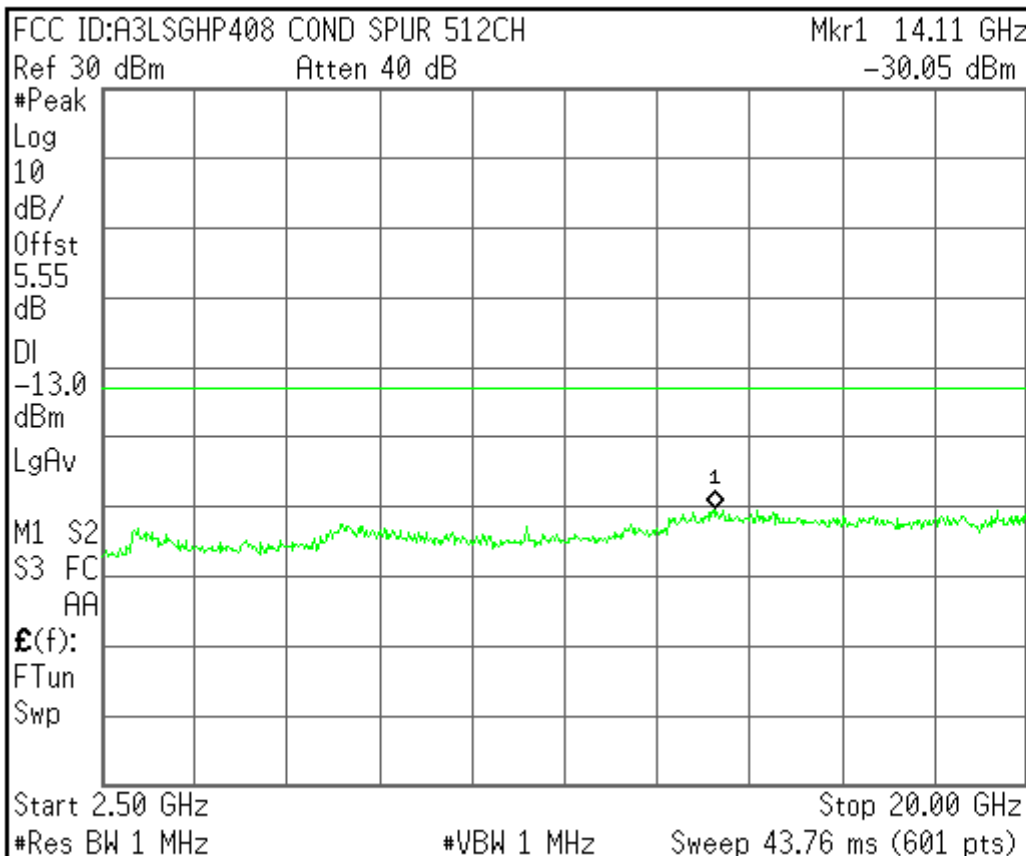
CF Step
 249.0000000 MHz
 Auto Man

Freq Offset
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Signal Track
 On Off

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Freq/Channel

Center Freq
 11.2500000 GHz

Start Freq
 2.50000000 GHz

Stop Freq
 20.0000000 GHz

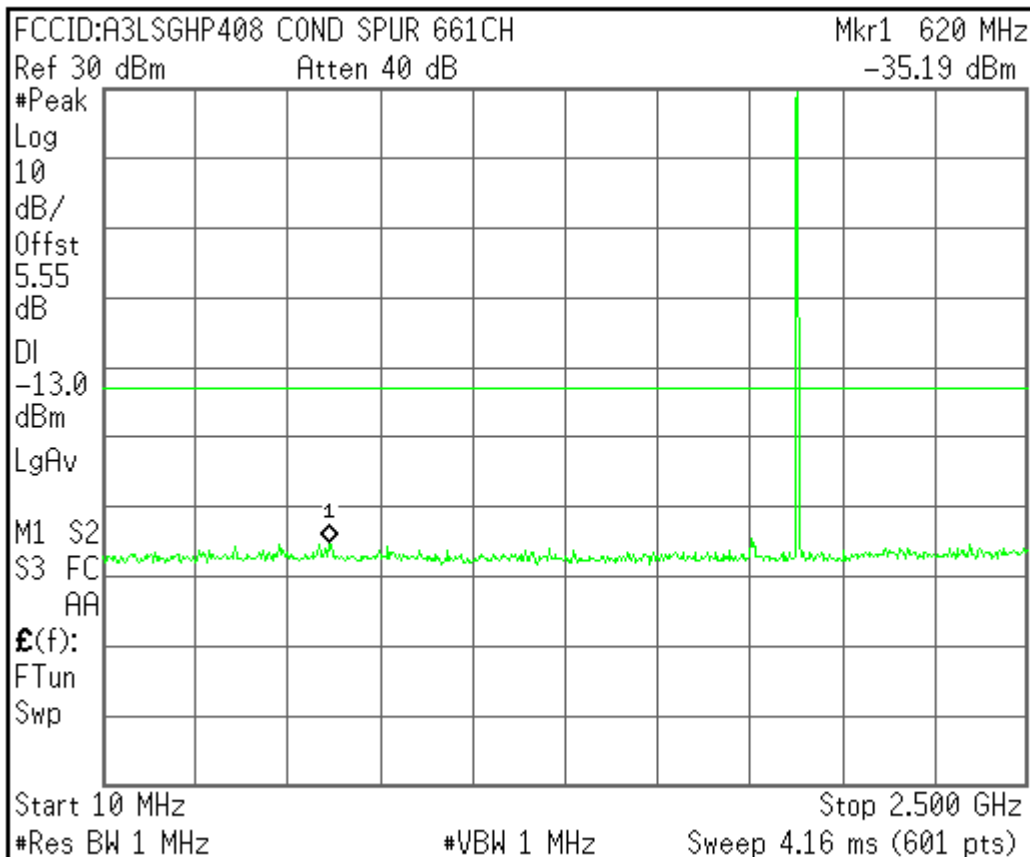
CF Step
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 Auto Man

Freq Offset
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Signal Track
 On Off

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Freq/Channel

Center Freq
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Start Freq
 10.0000000 MHz

Stop Freq
 2.50000000 GHz

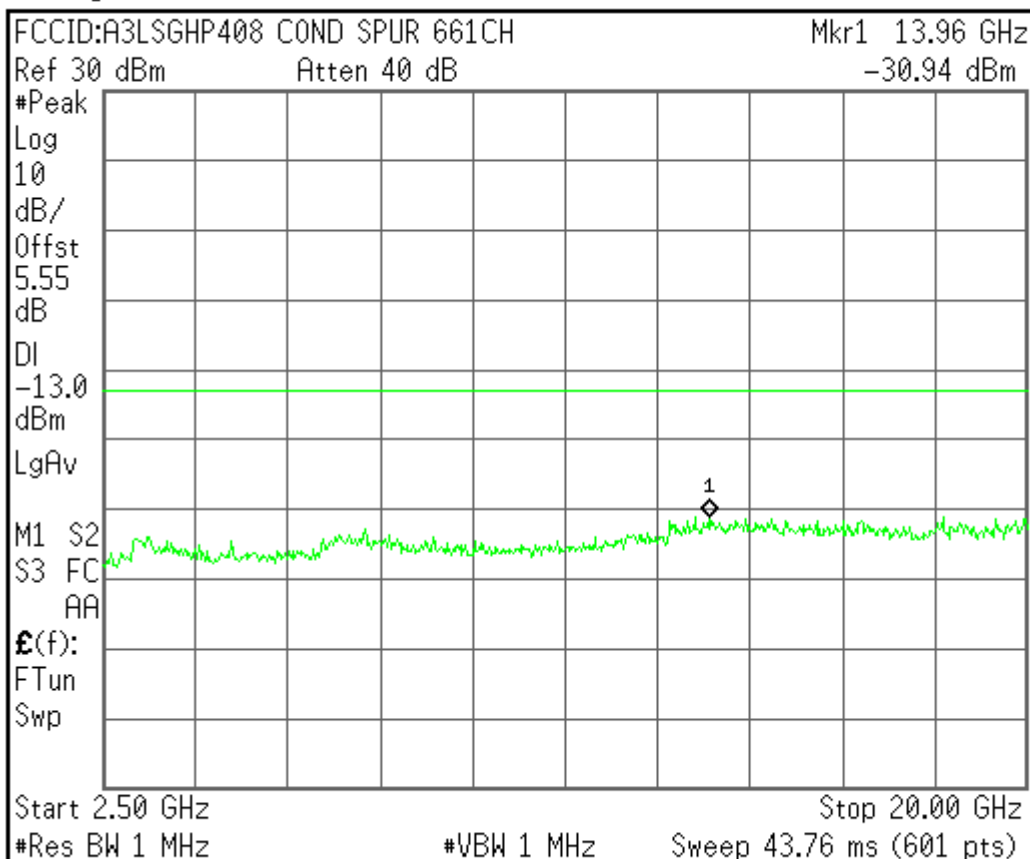
CF Step
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 Auto Man

Freq Offset
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Signal Track
 On Off

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Freq/Channel

Center Freq
 11.2500000 GHz

Start Freq
 2.50000000 GHz

Stop Freq
 20.0000000 GHz

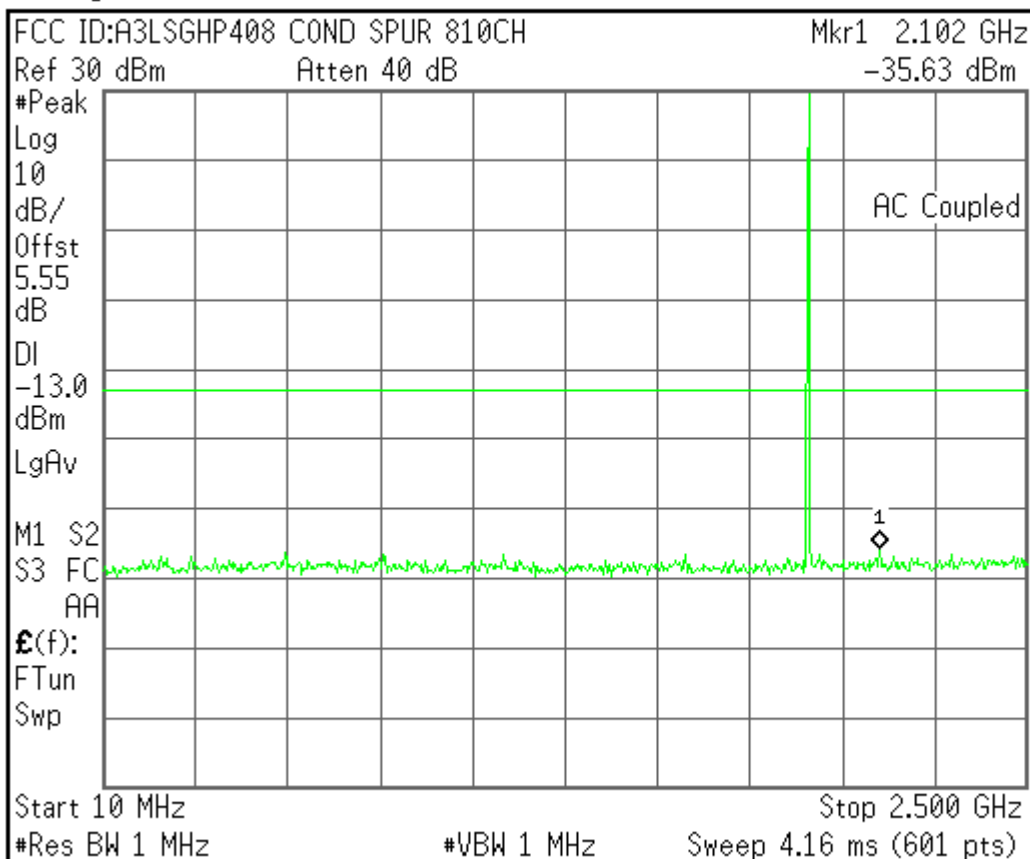
CF Step
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Freq Offset
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Signal Track
 On Off

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Freq/Channel

Center Freq
 1.25500000 GHz

Start Freq
 10.0000000 MHz

Stop Freq
 2.50000000 GHz

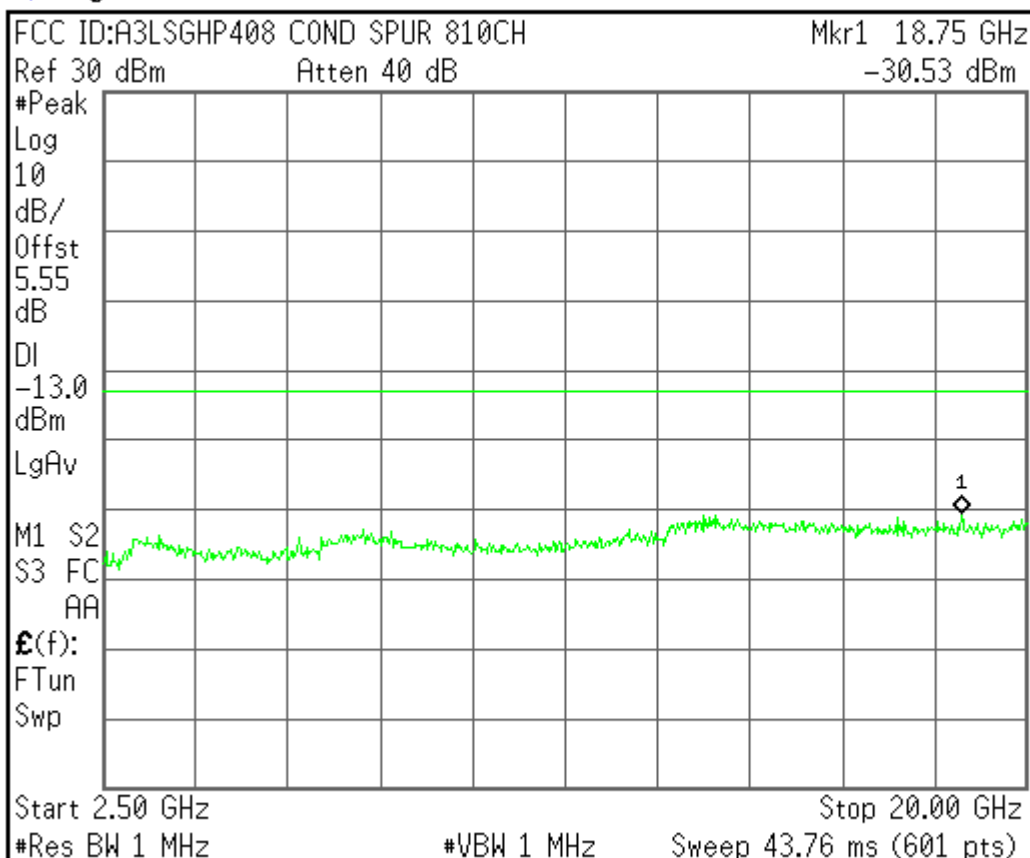
CF Step
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 Auto Man

Freq Offset
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Signal Track
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Freq/Channel

Center Freq
 11.2500000 GHz

Start Freq
 2.50000000 GHz

Stop Freq
 20.0000000 GHz

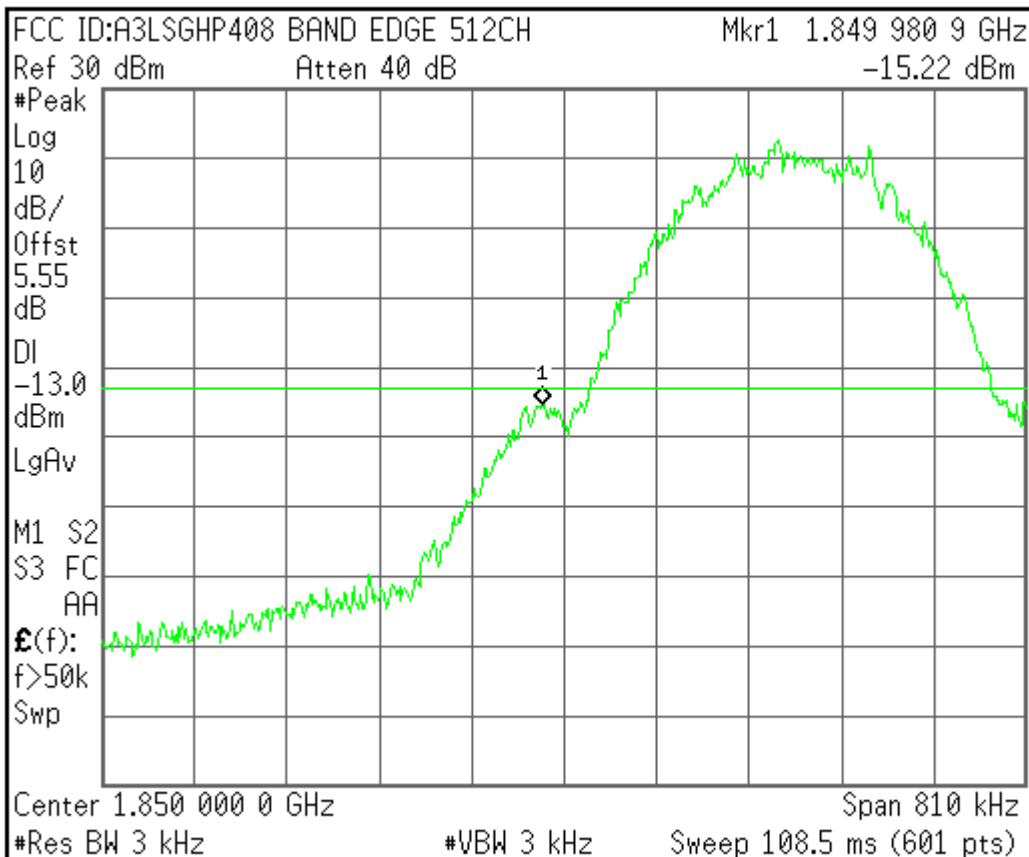
CF Step
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 Auto Man

Freq Offset
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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

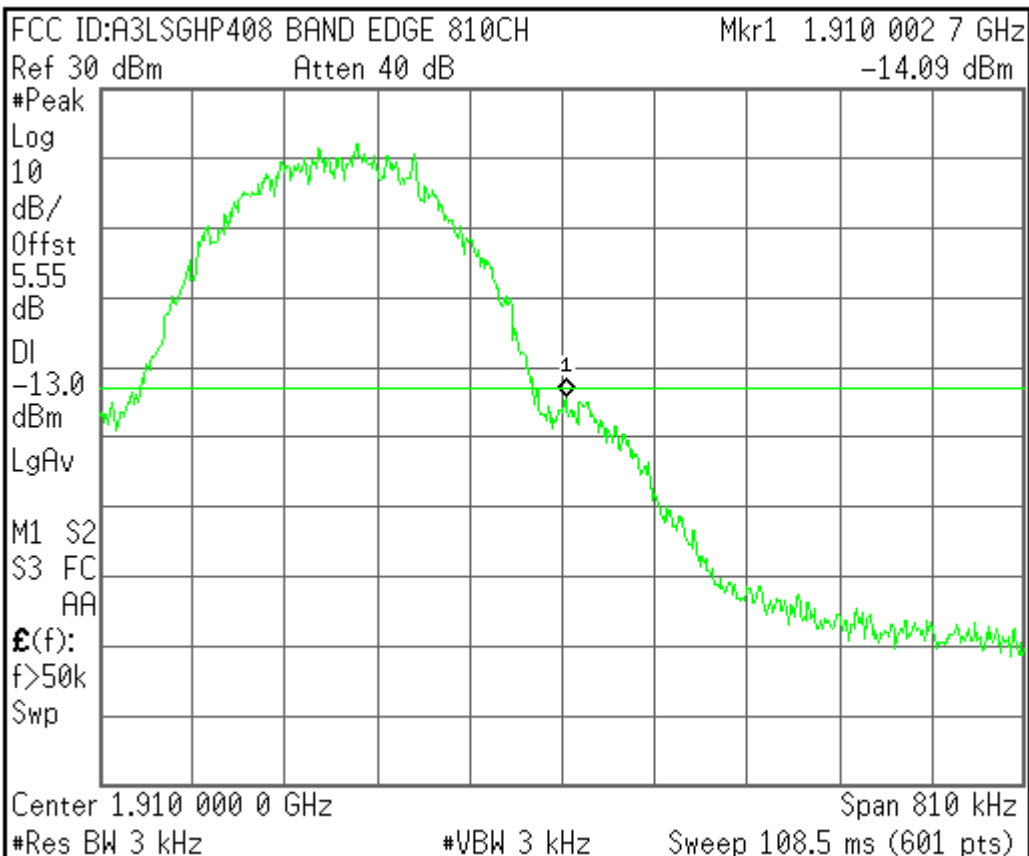
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 Auto Man

Freq Offset
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Signal Track
 On Off

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Freq/Channel

Center Freq
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Start Freq
 1.90959500 GHz

Stop Freq
 1.91040500 GHz

CF Step
 81.00000000 kHz
 Auto Man

Freq Offset
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Signal Track
 On Off

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