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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-X105
FCC ID (Requested): A3LSGHX105
Report No: FA-016-R1
Date issued: July 09, 2003

- Abstract -

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

Prepared By		Date	07, 09, 2003
	EH Jung - Test Engineer		
Checked By		Date	July 10, 2003
	CW PARK - Manager		
Authorized By		Date	July 10 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	2004-03-31
Dipole Antenna	3121C-DB4	9007-587	2003-11-08
	3121C-DB4	9007-588	2004-03-21
Log Periodic Dipole Antenna	HO040	353255/020	2004-04-08
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 : A3LSGHX105

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)	Ant gain (dBi)	Ref level (dBm)
1880.00	27.00	H	-12.45	8.18	-20.63
		V	-12.64	8.18	-20.82

■ Result

Frequency (MHz)	From EUT Tested level (dBm)	POL (H/V)	Azimuth (angle)	EIRP (dBm)	EIRP (W)	Battery
1850.20	-16.83	H1	135	30.80	1.202	Standard
1880.00	-16.03	H1	141	31.60	1.445	Standard
1909.80	-15.35	H1	142	32.28	1.690	Standard

FCC ID : A3LSGHX105

Field Stength of SPURIOUS Radiation

Operating Frequency : 1850.2 MHz

Measured Output Power : 32.28 dBm = 1.690 W

Modulation Signal : PCS GSM

Limit : $43+10\log_{10}(W) = 45.28$ dBc

■ Result

Channel	Harmonic	Frequency (MHz)	From EUT Tested level (dBm)	POL (H/V)	Result (dBc)
512	2	3700.40	-48.56	H2	58.14
	3	5550.60	-57.61	H2	62.25
	4	7400.80	-65.48	H2	67.17
	5	9251.00	-79.06	H2	77.26
	6	11101.20	-85.10	V	79.85
	7	12951.40	-	-	-
	8	14801.60	-	-	-
661	2	3760.00	-45.05	H2	54.57
	3	5640.00	-58.18	H2	63.59
	4	7520.00	-79.35	H1	80.57
	5	9400.00	-80.55	V	78.87
	6	11280.00	-	-	-
	7	13160.00	-	-	-
	8	15040.00	-	-	-
810	2	3819.60	-46.08	H2	55.75
	3	5729.40	-61.03	H2	66.41
	4	7639.20	-78.62	H2	80.51
	5	9549.00	-81.77	H2	78.92
	6	11458.80	-	-	-
	7	13368.60	-	-	-
	8	15278.40	-	-	-

Radiated Spurious & Harmonic Conversion Table

FCC ID : A3LSGHX105 Mode : GSM1900 EIRP : 32.28

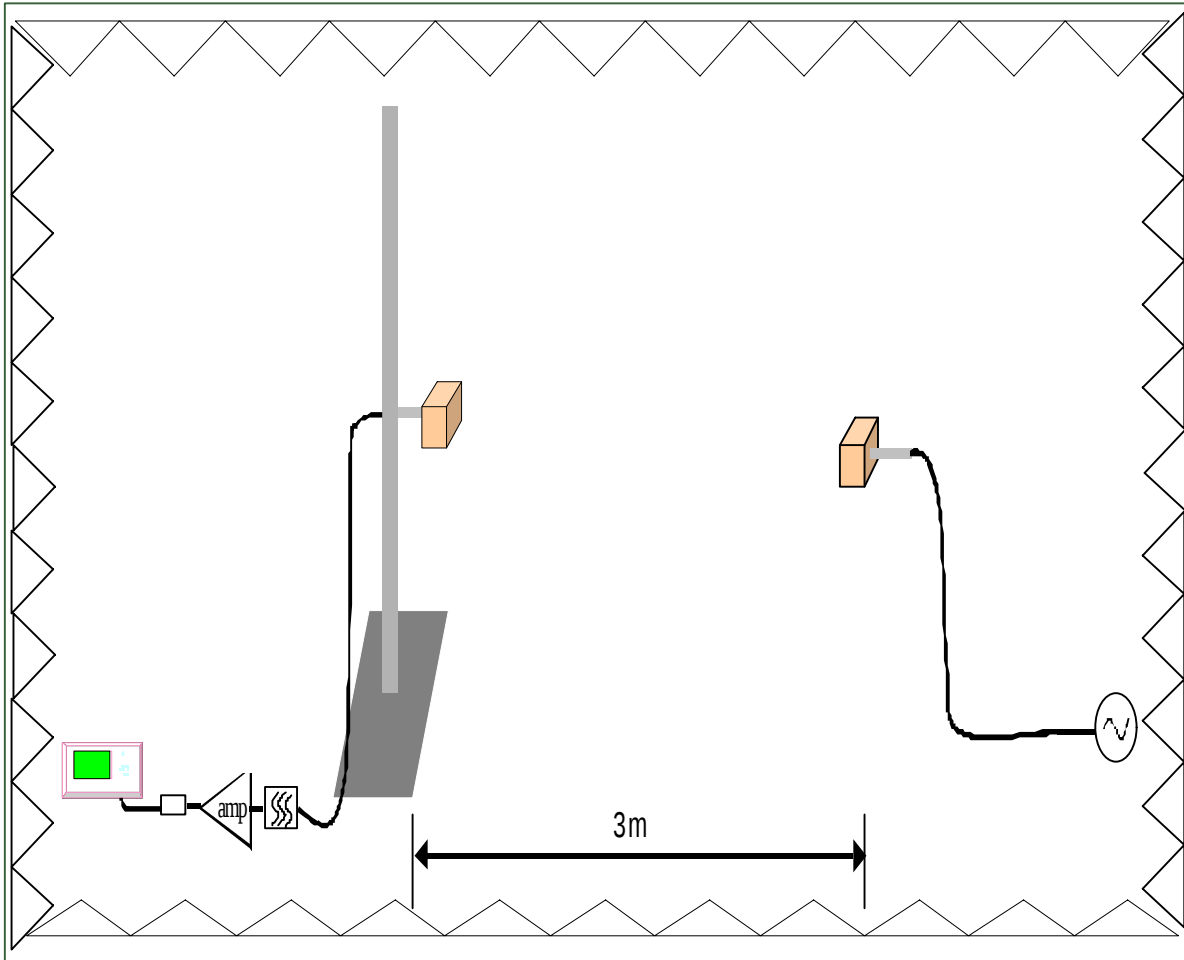
Date ; 2003. 06. 25. ~ 07. 07.

Test Engineer : JH Nam

Tx Cable loss
 Tx Horn Ant Gain
 Rx Cable loss + HPF Insertion loss + Attenuator
 Pre-Amp gain
 Air loss
 Tested Level from EUT
 = + + -
 = EIRP -

CH	Har	Frequency (MHz)	Tx CL (dB)	Horn Gain (dB)	Tx Level @ (S/G 10dBm)	Tested Level EUT : H (dBm)	Tested Level EUT : V (dBm)	Amplitude of Emission EUT : H (dBm)	Amplitude of Emission EUT : V (dBm)	Result EUT : H (dBc)	Result EUT : V (dBc)
512	2	3700.40	14.18	8.87	4.69	-48.56	-49.76	-25.86	-26.53	58.14	58.81
	3	5550.60	19.46	10.60	1.14	-57.61	-59.94	-29.97	-32.63	62.25	64.91
	4	7400.80	23.28	10.83	-2.45	-65.48	-79.02	-34.89	-49.57	67.17	81.85
	5	9251.00	26.97	11.56	-5.41	-79.06	-83.45	-44.98	-49.45	77.26	81.73
	6	11101.20	31.21	12.79	-8.42	-85.65	-85.10	-47.87	-47.57	80.15	79.85
	7	12951.40	36.30	12.66	-13.64	-	-	-	-	-	-
	8	14801.60	40.87	12.69	-18.18	-	-	-	-	-	-
661	2	3760.00	14.47	8.98	4.51	-45.05	-47.31	-22.29	-24.24	54.57	56.52
	3	5640.00	19.27	10.60	1.33	-58.18	-61.20	-31.31	-33.88	63.59	66.16
	4	7520.00	22.94	10.83	-2.11	-79.35	-80.21	-48.29	-50.08	80.57	82.36
	5	9400.00	27.23	11.60	-5.63	-81.55	-80.55	-47.26	-46.59	79.54	78.87
	6	11280.00	31.11	12.93	-8.18	-	-	-	-	-	-
	7	13160.00	38.82	12.64	-16.18	-	-	-	-	-	-
	8	15040.00	42.65	12.70	-19.95	-	-	-	-	-	-
810	2	3819.60	14.54	8.98	4.44	-46.08	-48.57	-23.47	-25.59	55.75	57.87
	3	5729.40	19.81	10.73	0.92	-61.03	-61.74	-34.13	-34.45	66.41	66.73
	4	7639.20	23.92	10.87	-3.05	-78.62	-80.47	-48.23	-50.95	80.51	83.23
	5	9549.00	27.82	11.67	-6.15	-81.77	-82.15	-46.64	-47.74	78.92	80.02
	6	11458.80	31.48	12.90	-8.58	-	-	-	-	-	-
	7	13368.60	43.12	12.65	-20.47	-	-	-	-	-	-
	8	15278.40	43.19	12.73	-20.46	-	-	-	-	-	-

Radiated Spurious & Harmonic Configuration for Calibration



Tx Cable loss
Horn Ant Gain
Rx Cable loss + HPF Insertion loss + Attenuator
Pre-Amp gain
Air loss

FCC ID : A3LSGHX105

Frequency Stability (PCS GSM)

Operating Frequency : 1,880,000,000 Hz

Channel : 661

Reference voltage : 3.7VDC

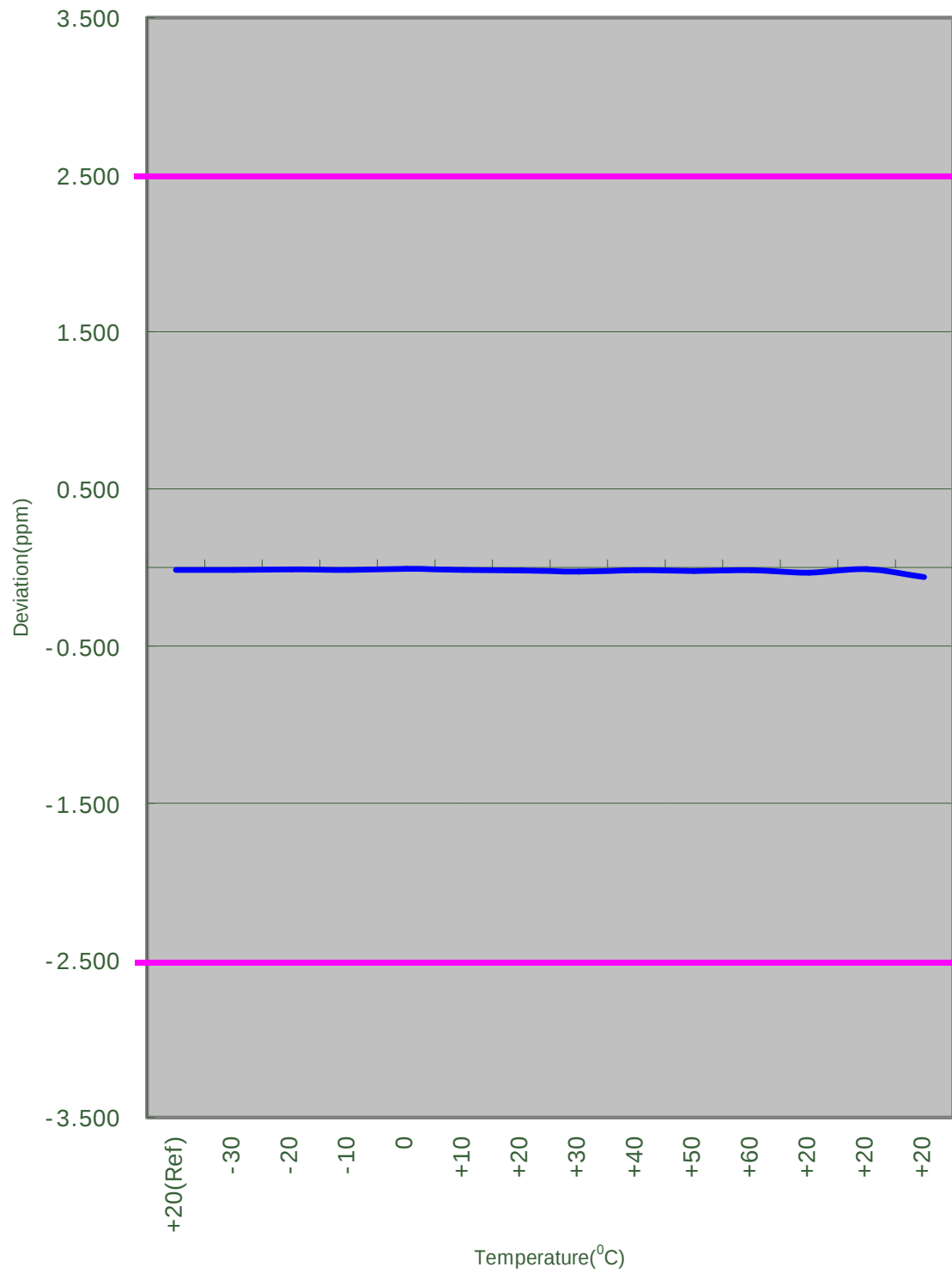
Deviation Limit : $\pm 0.00025\%$ or 2.5ppm

Voltage (%)	Power (V dc)	TEMP (OC)	Frequency error (Hz)	Frequency (Hz)	Deviation (%)	ppm
100%	3.70	+20(Ref)	-31	1,879,999,969	-0.000002	-0.016
100%		-30	-31	1,879,999,969	-0.000002	-0.016
100%		-20	-23	1,879,999,977	-0.000001	-0.012
100%		-10	-29	1,879,999,971	-0.000002	-0.015
100%		0	-17	1,879,999,983	-0.000001	-0.009
100%		+10	-31	1,879,999,969	-0.000002	-0.016
100%		+20	-36	1,879,999,964	-0.000002	-0.019
100%		+30	-48	1,879,999,952	-0.000003	-0.026
100%		+40	-32	1,879,999,968	-0.000002	-0.017
100%		+50	-44	1,879,999,956	-0.000002	-0.023
100%		+60	-33	1,879,999,967	-0.000002	-0.018
85%	3.15	+20	-62	1,879,999,938	-0.000003	-0.033
115%	4.26	+20	-19	1,879,999,981	-0.000001	-0.010
Batt. Endpoint	3.12	+20	-114	1,879,999,886	-0.000006	-0.061

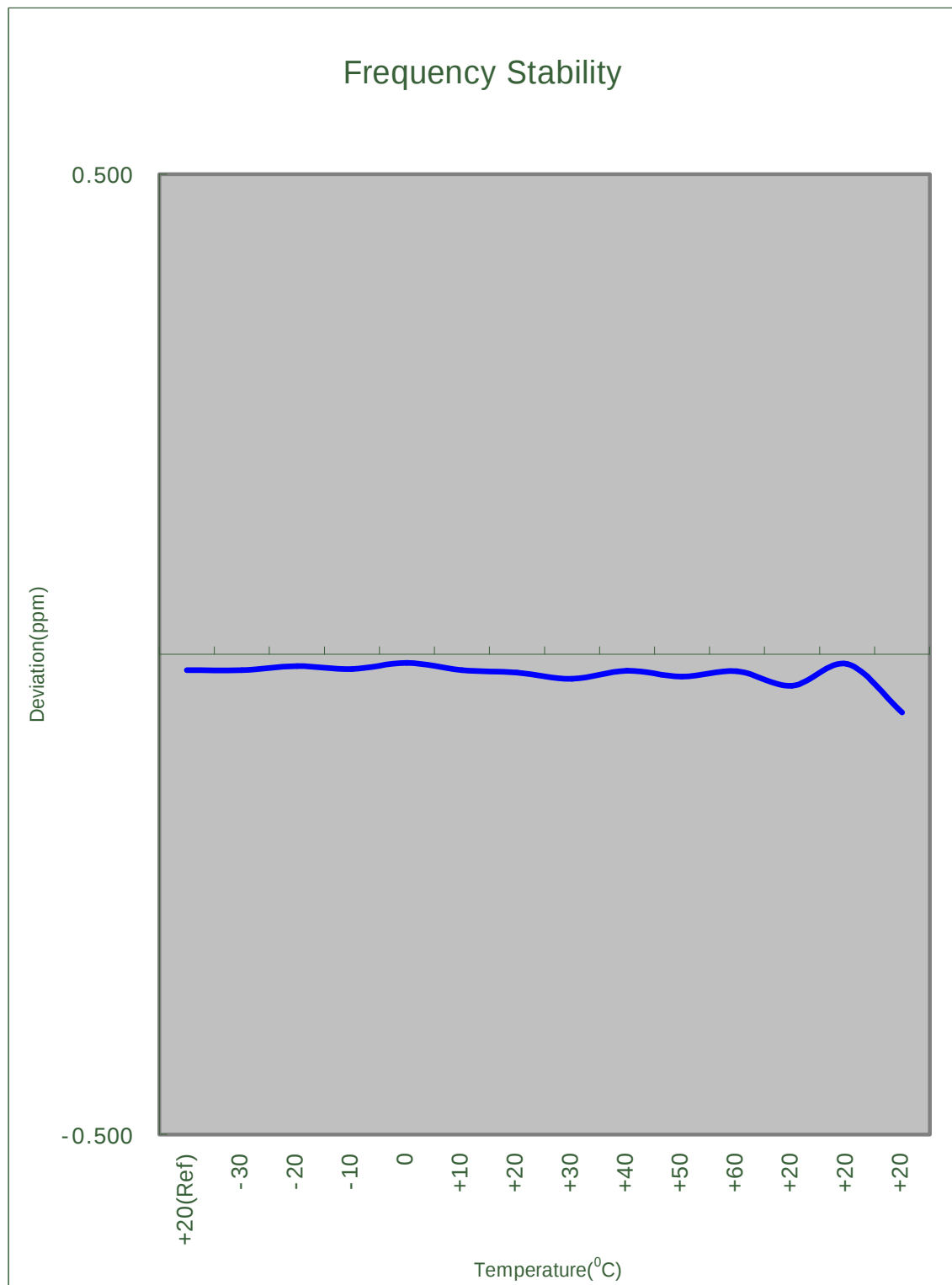
Note : The temperature is varied from -30°C to +60°C using an environmental chamber

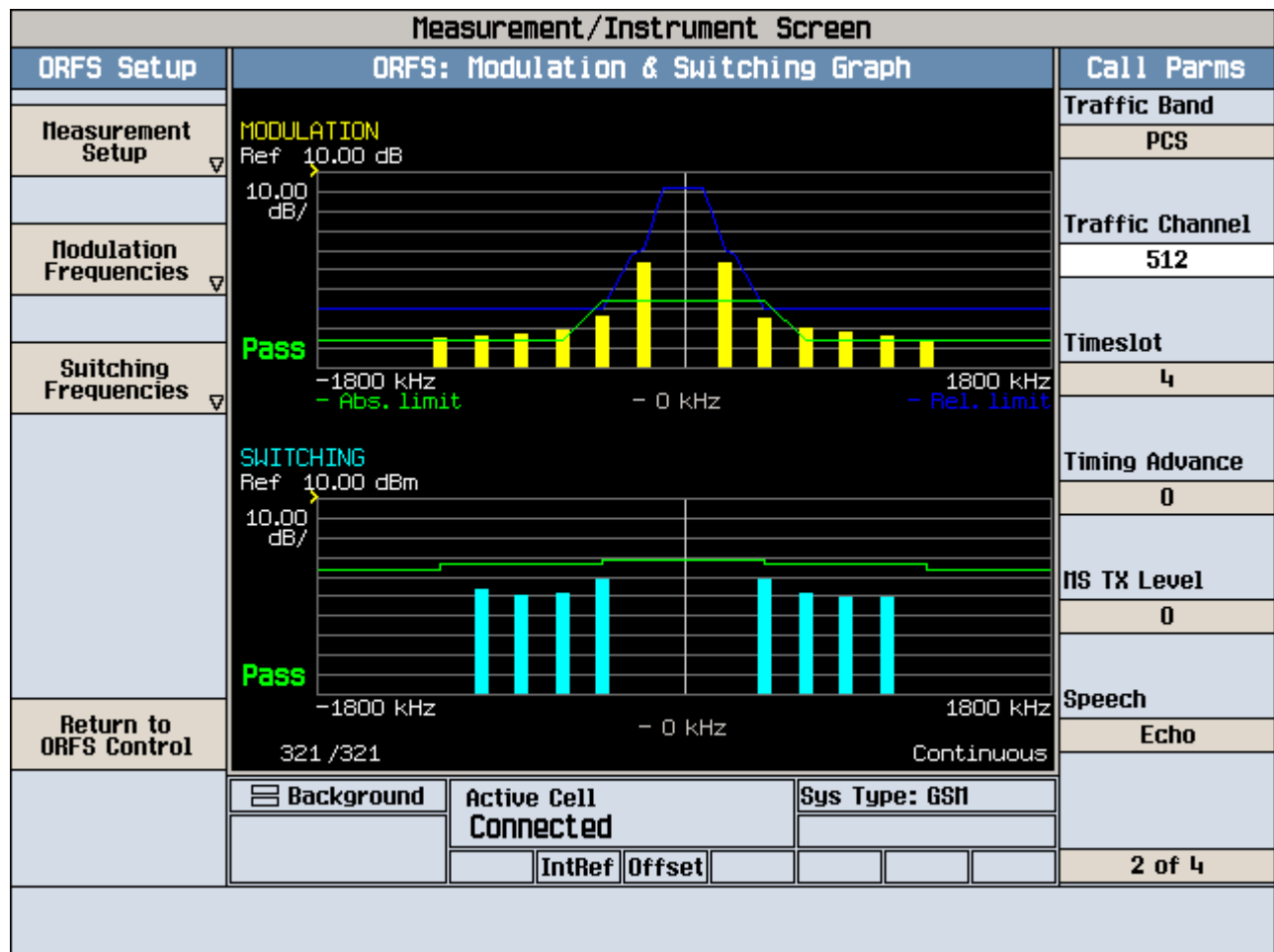
The EUT is tested down to the battery end point.

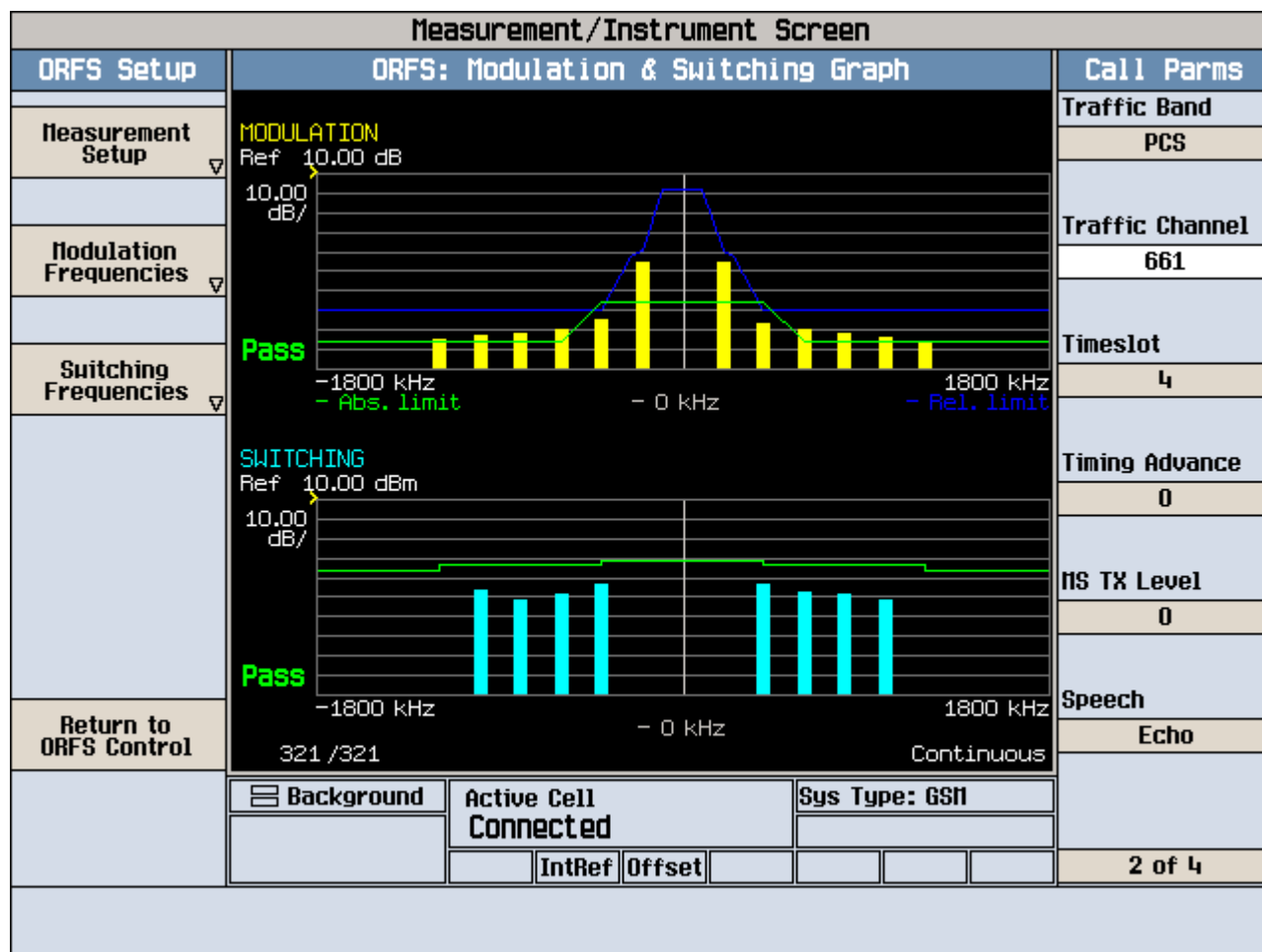
Frequency Stability

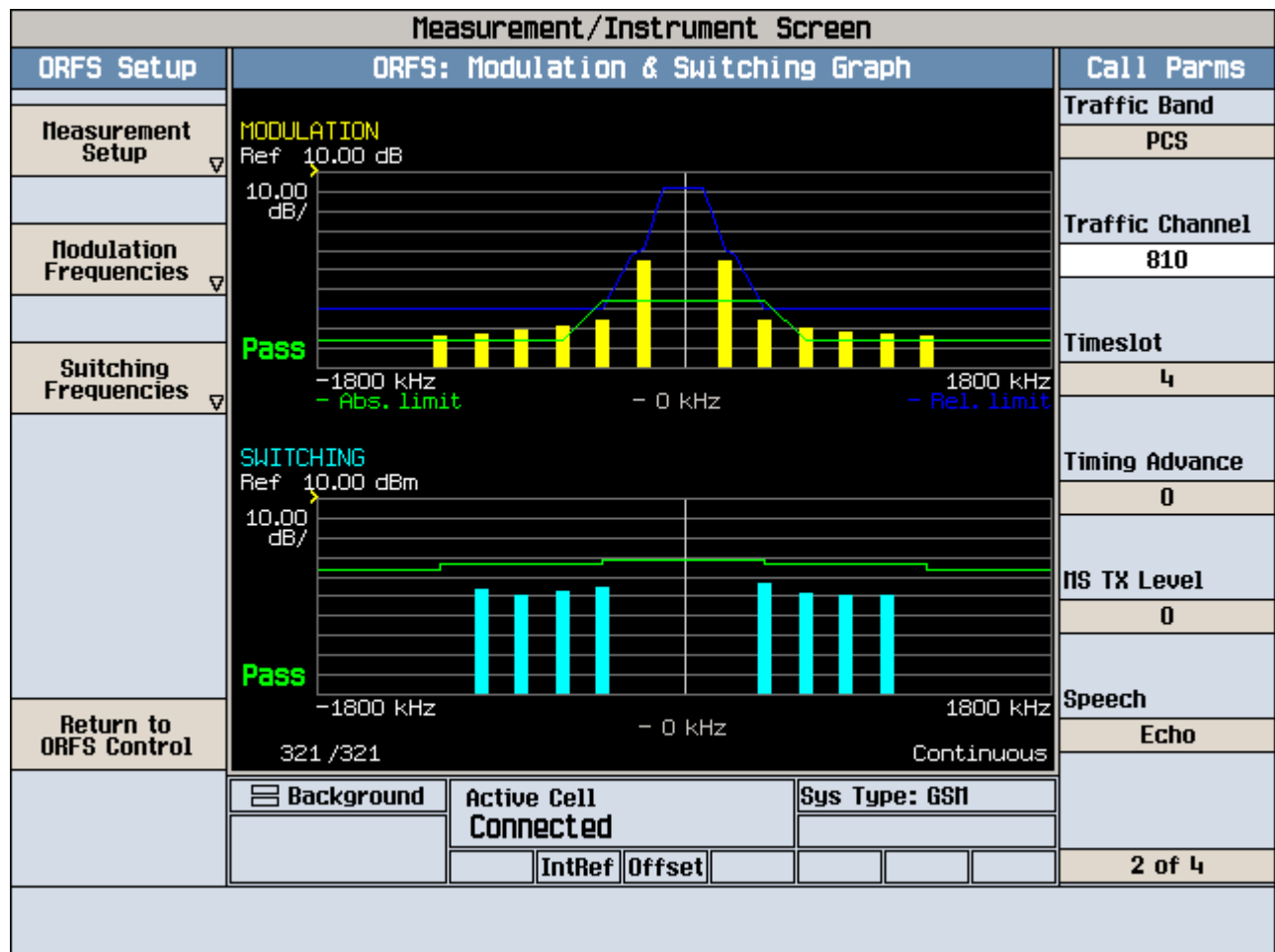


Zoom In









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Freq/Channel

FCC ID:A3LSGHX105 Cond Spurs 512CH

Mkr1 2.396 GHz

Ref 30 dBm

Atten 40 dB

-36.02 dBm

#Peak

Log

10

dB/

Offst

5.74

dB

DI

-13.0

dBm

LgAv

M1 S2

S3 FC

AA

$\mathcal{E}(f)$:

FTun

Swp

AC Coupled

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

Start 10 MHz

Stop 2.500 GHz

#Res BW 1 MHz

#VBW 1 MHz

Sweep 4.16 ms (601 pts)

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Freq/Channel

FCC ID:A3LSGHX105 Cond Spurs 512CH

Mkr1 17.64 GHz

Ref 30 dBm

Atten 40 dB

-30.88 dBm

#Peak

Log

10

dB/

Offst

5.74

dB

DI

-13.0

dBm

LgAv

M1 S2

S3 FC

AA

$\mathcal{E}(f)$:

FTun

Swp

1

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

Start 2.50 GHz

Stop 20.00 GHz

#Res BW 1 MHz

#VBW 1 MHz

Sweep 43.76 ms (601 pts)

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Freq/Channel

FCC ID:A3LSGHX105 Cond Spurs 661CH

Mkr1 2.085 GHz

Ref 30 dBm

Atten 40 dB

-35.31 dBm

#Peak

Log

10

dB/

Offst

5.74

dB

DI

-13.0

dBm

LgAv

M1 S2

S3 FC

AA

$\mathcal{E}(f)$:

FTun

Swp

AC Coupled

Center Freq

1.25500000 GHz

Start Freq

10.0000000 MHz

Stop Freq

2.50000000 GHz

CF Step

249.0000000 MHz

Auto

Man

Freq Offset

0.00000000 Hz

Signal Track

On

Off

Start 10 MHz

Stop 2.500 GHz

#Res BW 1 MHz

#VBW 1 MHz

Sweep 4.16 ms (601 pts)

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Freq/Channel

FCC ID:A3LSGHX105 Cond Spurs 661CH

Mkr1 19.42 GHz

Ref 30 dBm

Atten 40 dB

-29.88 dBm

#Peak

Log

10

dB/

Offst

5.74

dB

DI

-13.0

dBm

LgAv

M1 S2

S3 FC

AA

$\mathcal{E}(f)$:

FTun

Swp

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

Start 2.50 GHz

Stop 20.00 GHz

#Res BW 1 MHz

#VBW 1 MHz

Sweep 43.76 ms (601 pts)

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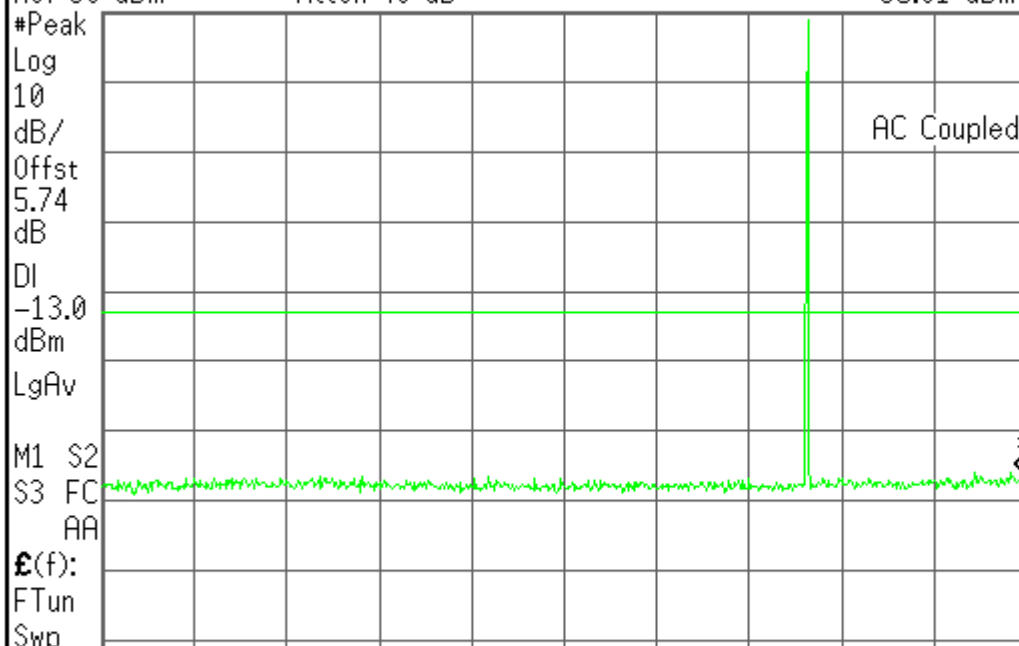
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Freq/Channel

FCC ID:A3LSGHX105 Cond Spurs 810CH Mkr1 2.492 GHz
Ref 30 dBm Atten 40 dB -35.81 dBm

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

Start 10 MHz Stop 2.500 GHz
#Res BW 1 MHz #VBW 1 MHz Sweep 4.16 ms (601 pts)

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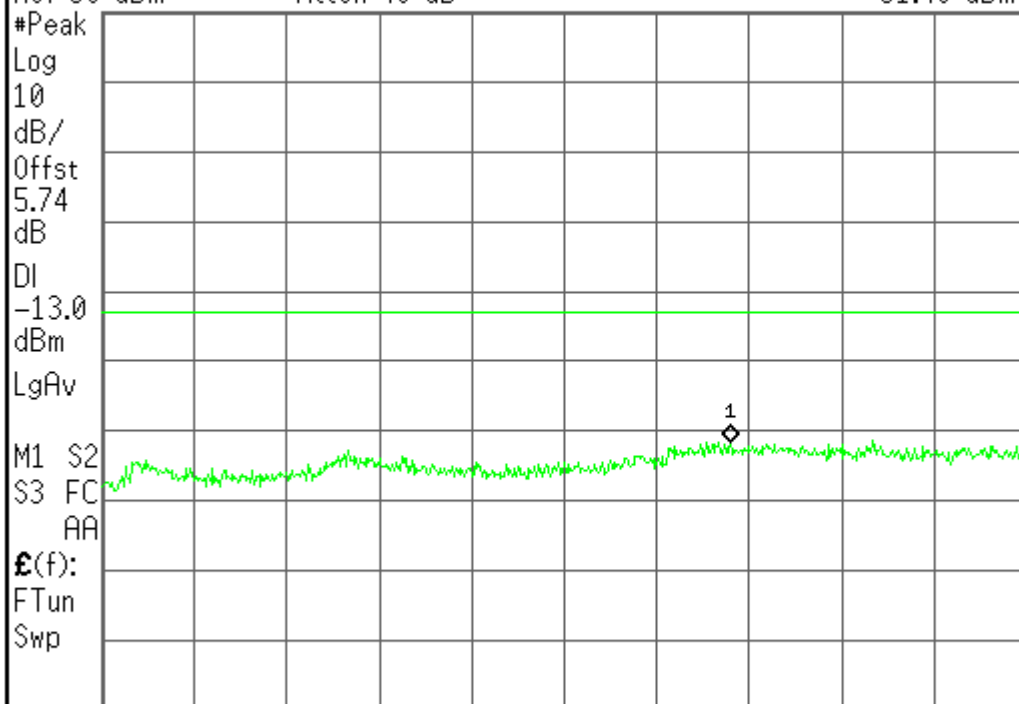
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Freq/Channel

FCC ID:A3LSGHX105 Cond Spurs 810CH Mkr1 14.40 GHz
Ref 30 dBm Atten 40 dB -31.48 dBm

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

Start 2.50 GHz Stop 20.00 GHz
#Res BW 1 MHz #VBW 1 MHz Sweep 43.76 ms (601 pts)

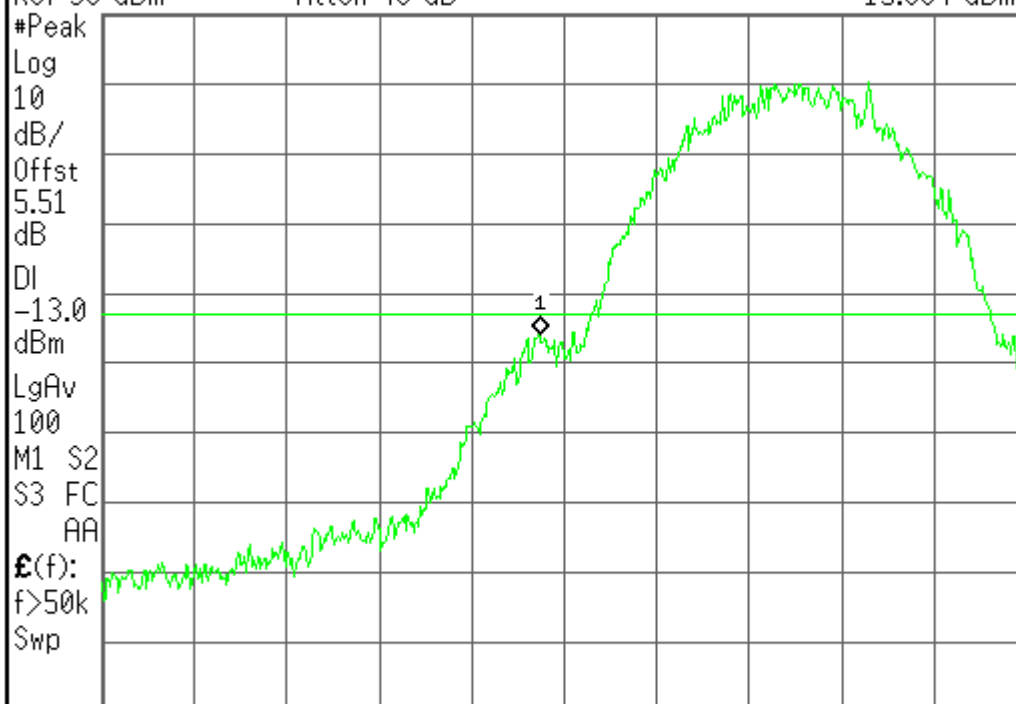
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Freq/Channel

FCC ID:A3LSGHX105 Band Edge Block A Mkr1 1.849 978 2 GHz
Ref 30 dBm Atten 40 dB -15.894 dBm



Center Freq
1.85000000 GHz

Start Freq
1.84959500 GHz

Stop Freq
1.85040500 GHz

CF Step
81.00000000 kHz
Auto Man

Freq Offset
0.00000000 Hz

Signal Track
On Off

Center 1.850 000 0 GHz Span 810 kHz
#Res BW 3 kHz #VBW 3 kHz Sweep 108.5 ms (601 pts)

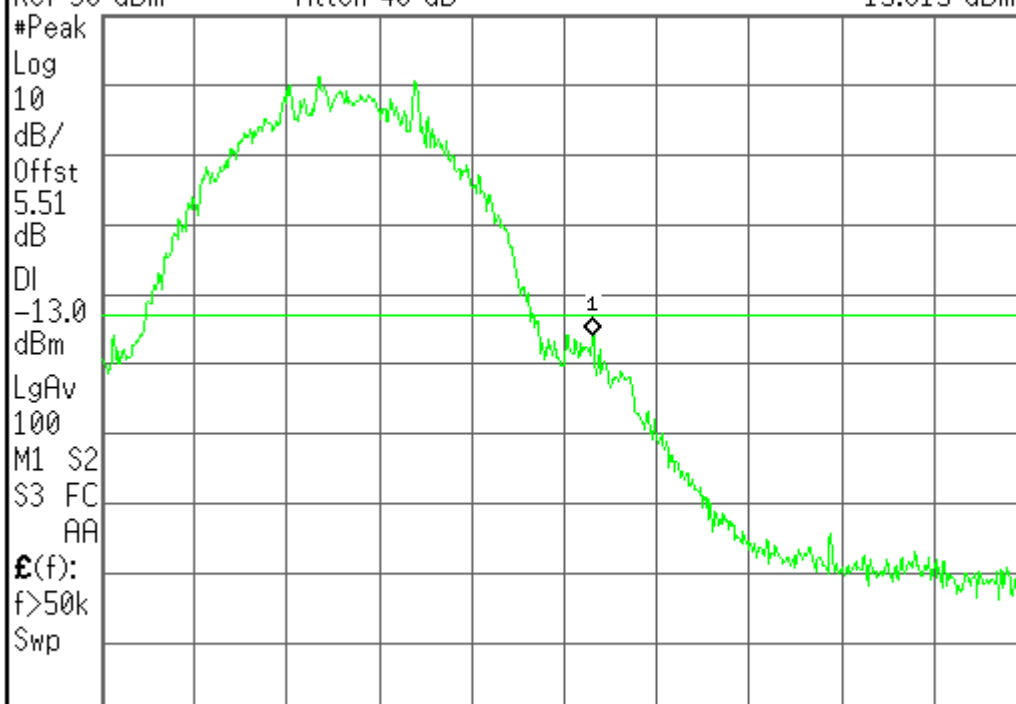
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Freq/Channel

FCC ID:A3LSGHX105 Band Edge Block A Mkr1 1.865 024 5 GHz
Ref 30 dBm Atten 40 dB -15.815 dBm



Center Freq
1.86500000 GHz

Start Freq
1.86459500 GHz

Stop Freq
1.86540500 GHz

CF Step
81.00000000 kHz
Auto Man

Freq Offset
0.00000000 Hz

Signal Track
On Off

Center 1.865 000 0 GHz Span 810 kHz
#Res BW 3 kHz #VBW 3 kHz Sweep 108.5 ms (601 pts)

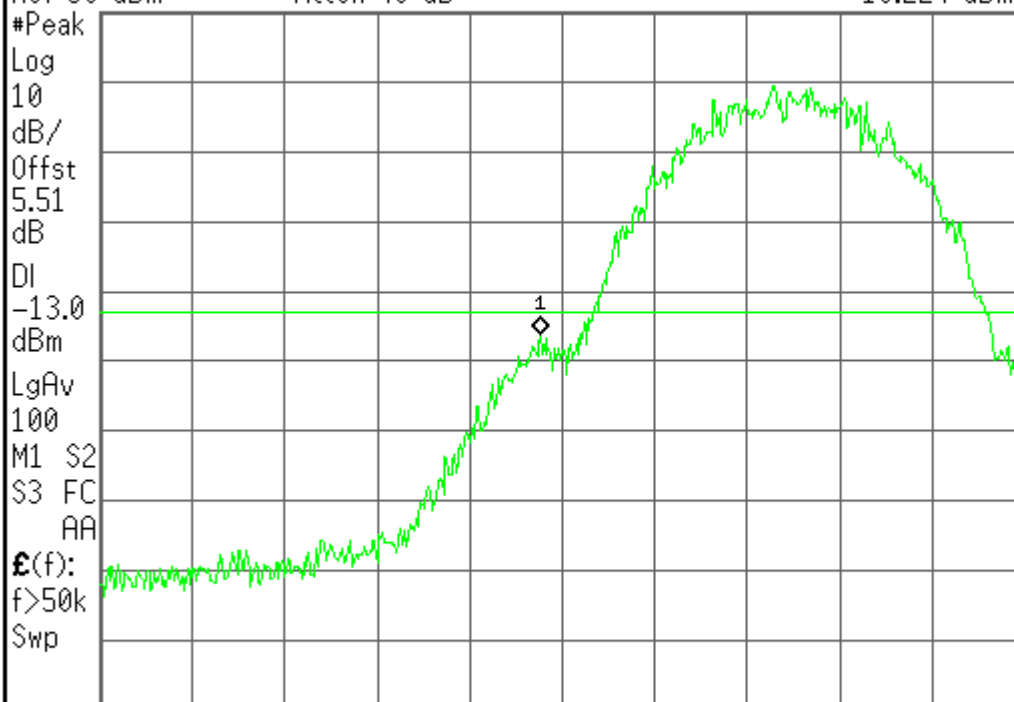
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Freq/Channel

FCC ID:A3LSGHX105 Band Edge Block B Mkr1 1.869 980 9 GHz
Ref 30 dBm Atten 40 dB -16.224 dBm



Center Freq
1.87000000 GHz

Start Freq
1.86959500 GHz

Stop Freq
1.87040500 GHz

CF Step
81.00000000 kHz
Auto Man

Freq Offset
0.00000000 Hz

Signal Track
On Off

Center 1.870 000 0 GHz Span 810 kHz
#Res BW 3 kHz #VBW 3 kHz Sweep 108.5 ms (601 pts)

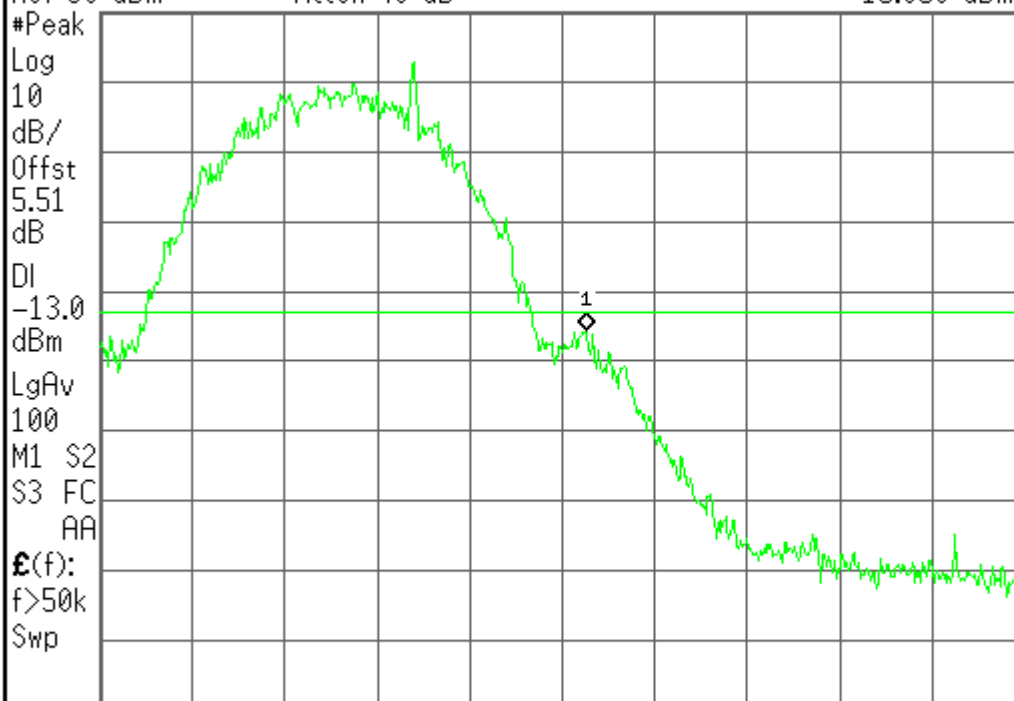
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Freq/Channel

FCC ID:A3LSGHX105 Band Edge Block B Mkr1 1.885 020 4 GHz
Ref 30 dBm Atten 40 dB -15.659 dBm



Center Freq
1.88500000 GHz

Start Freq
1.88459500 GHz

Stop Freq
1.88540500 GHz

CF Step
81.00000000 kHz
Auto Man

Freq Offset
0.00000000 Hz

Signal Track
On Off

Center 1.885 000 0 GHz Span 810 kHz
#Res BW 3 kHz #VBW 3 kHz Sweep 108.5 ms (601 pts)

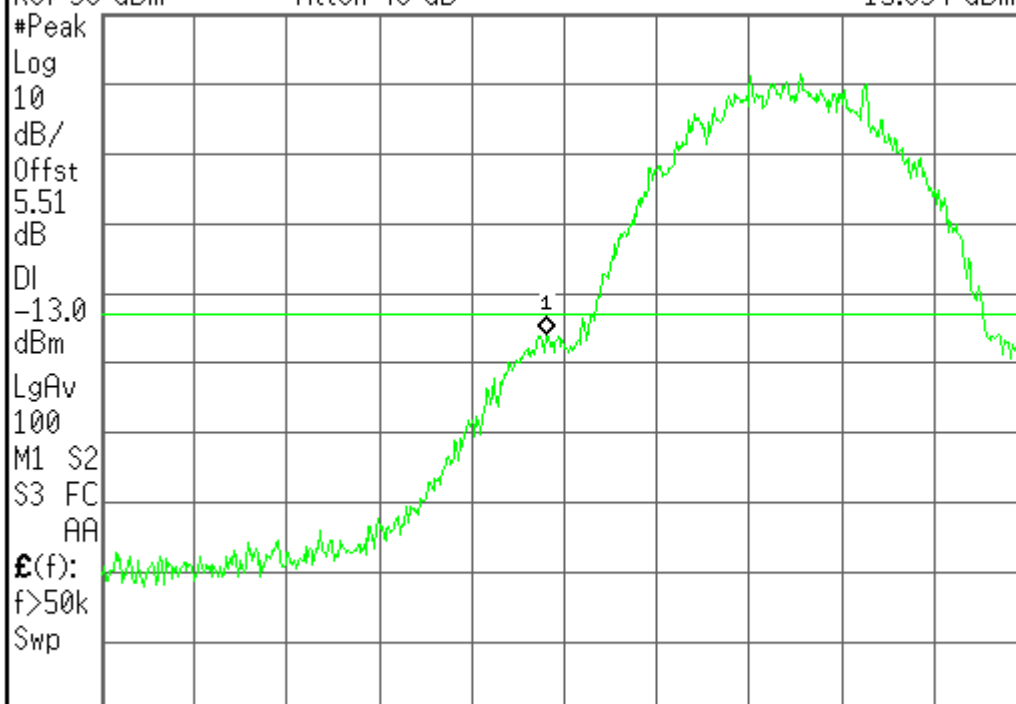
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Freq/Channel

FCC ID:A3LSGHX105 Band Edge Block C Mkr1 1.894 983 6 GHz
Ref 30 dBm Atten 40 dB -15.834 dBm



Center Freq
1.89500000 GHz

Start Freq
1.89459500 GHz

Stop Freq
1.89540500 GHz

CF Step
81.00000000 kHz
Auto Man

Freq Offset
0.00000000 Hz

Signal Track
On Off

Center 1.895 000 0 GHz Span 810 kHz
#Res BW 3 kHz #VBW 3 kHz Sweep 108.5 ms (601 pts)

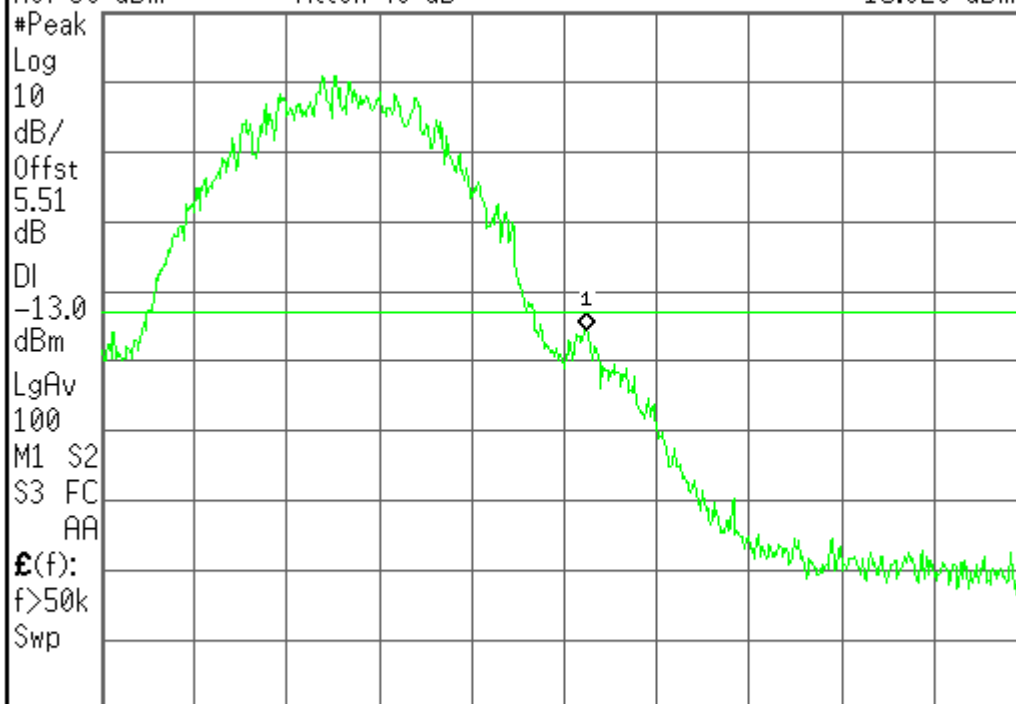
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Freq/Channel

FCC ID:A3LSGHX105 Band Edge Block C Mkr1 1.910 019 1 GHz
Ref 30 dBm Atten 40 dB -15.626 dBm



Center Freq
1.91000000 GHz

Start Freq
1.90959500 GHz

Stop Freq
1.91040500 GHz

CF Step
81.00000000 kHz
Auto Man

Freq Offset
0.00000000 Hz

Signal Track
On Off

Center 1.910 000 0 GHz Span 810 kHz
#Res BW 3 kHz #VBW 3 kHz Sweep 108.5 ms (601 pts)

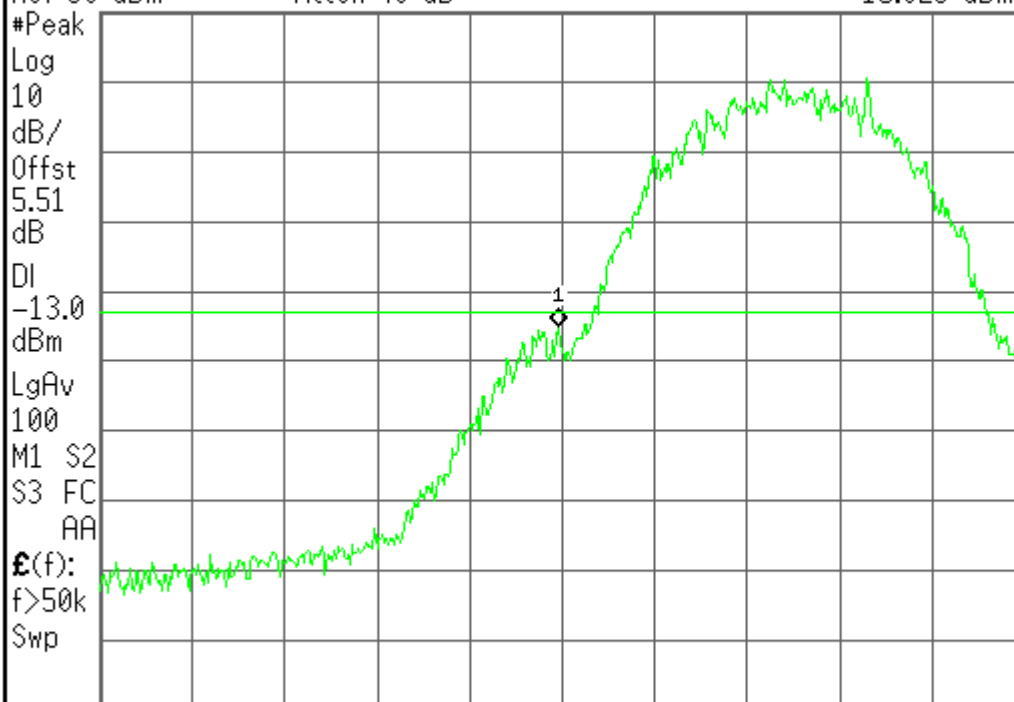
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Freq/Channel

FCC ID:A3LSGHX105 Band Edge Block D Mkr1 1.864 997 3 GHz
Ref 30 dBm Atten 40 dB -15.023 dBm



Center Freq
1.86500000 GHz

Start Freq
1.86459500 GHz

Stop Freq
1.86540500 GHz

CF Step
81.00000000 kHz
Auto Man

Freq Offset
0.00000000 Hz

Signal Track
On Off

Center 1.865 000 0 GHz Span 810 kHz
#Res BW 3 kHz #VBW 3 kHz Sweep 108.5 ms (601 pts)

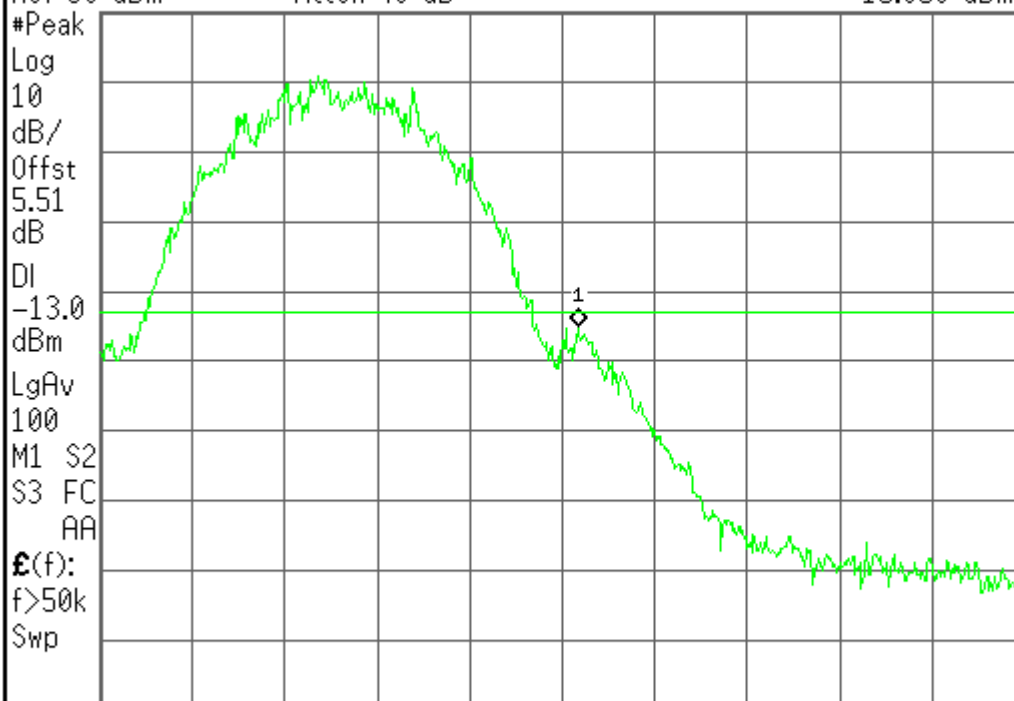
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Freq/Channel

FCC ID:A3LSGHX105 Band Edge Block D Mkr1 1.870 013 6 GHz
Ref 30 dBm Atten 40 dB -15.050 dBm



Center Freq
1.87000000 GHz

Start Freq
1.86959500 GHz

Stop Freq
1.87040500 GHz

CF Step
81.00000000 kHz
Auto Man

Freq Offset
0.00000000 Hz

Signal Track
On Off

Center 1.870 000 0 GHz Span 810 kHz
#Res BW 3 kHz #VBW 3 kHz Sweep 108.5 ms (601 pts)

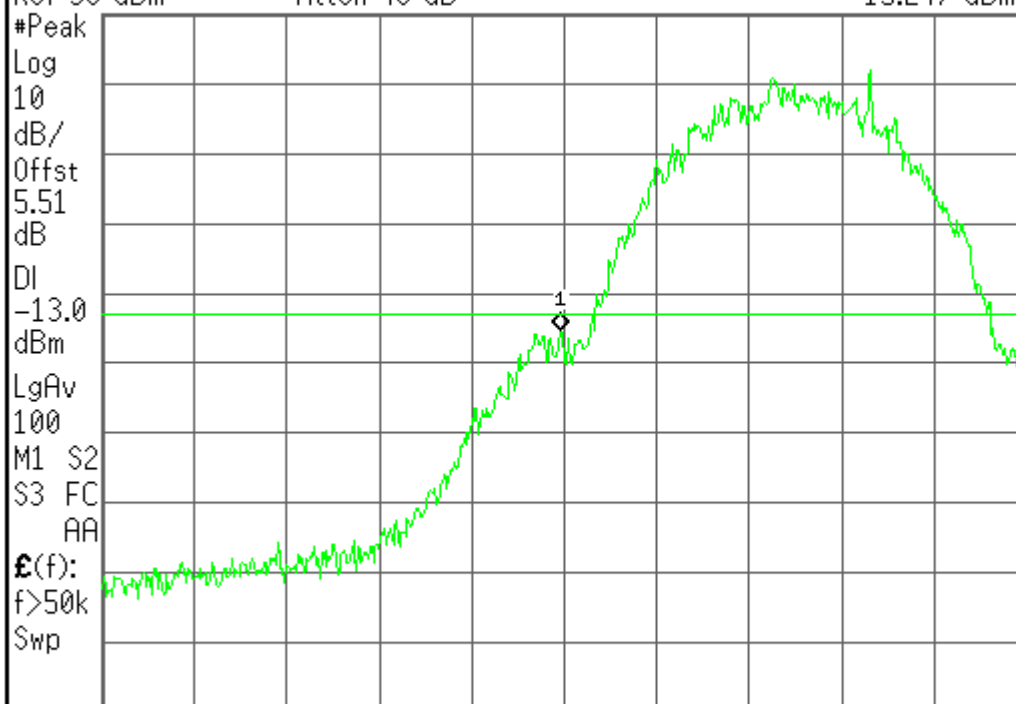
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Freq/Channel

FCC ID:A3LSGHX105 Band Edge Block E Mkr1 1.884 995 9 GHz
Ref 30 dBm Atten 40 dB -15.247 dBm



Center Freq
1.88500000 GHz

Start Freq
1.88459500 GHz

Stop Freq
1.88540500 GHz

CF Step
81.00000000 kHz
Auto Man

Freq Offset
0.00000000 Hz

Signal Track
On Off

Center 1.885 000 0 GHz Span 810 kHz
#Res BW 3 kHz #VBW 3 kHz Sweep 108.5 ms (601 pts)

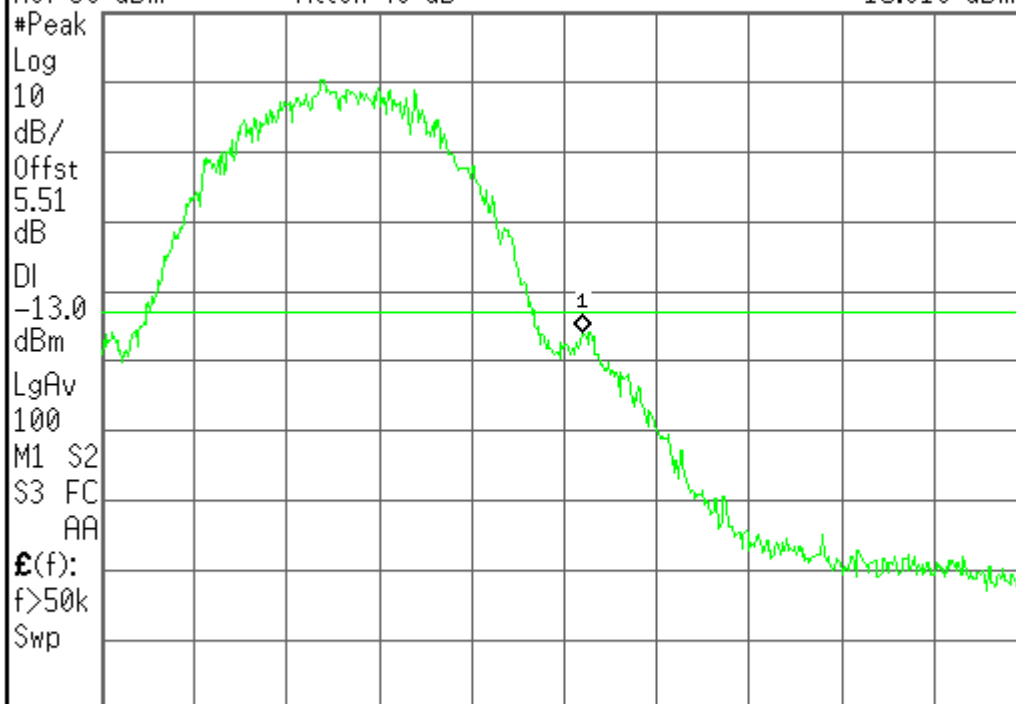
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Freq/Channel

FCC ID:A3LSGHX105 Band Edge Block E Mkr1 1.890 016 4 GHz
Ref 30 dBm Atten 40 dB -15.810 dBm



Center Freq
1.89000000 GHz

Start Freq
1.88959500 GHz

Stop Freq
1.89040500 GHz

CF Step
81.00000000 kHz
Auto Man

Freq Offset
0.00000000 Hz

Signal Track
On Off

Center 1.890 000 0 GHz Span 810 kHz
#Res BW 3 kHz #VBW 3 kHz Sweep 108.5 ms (601 pts)

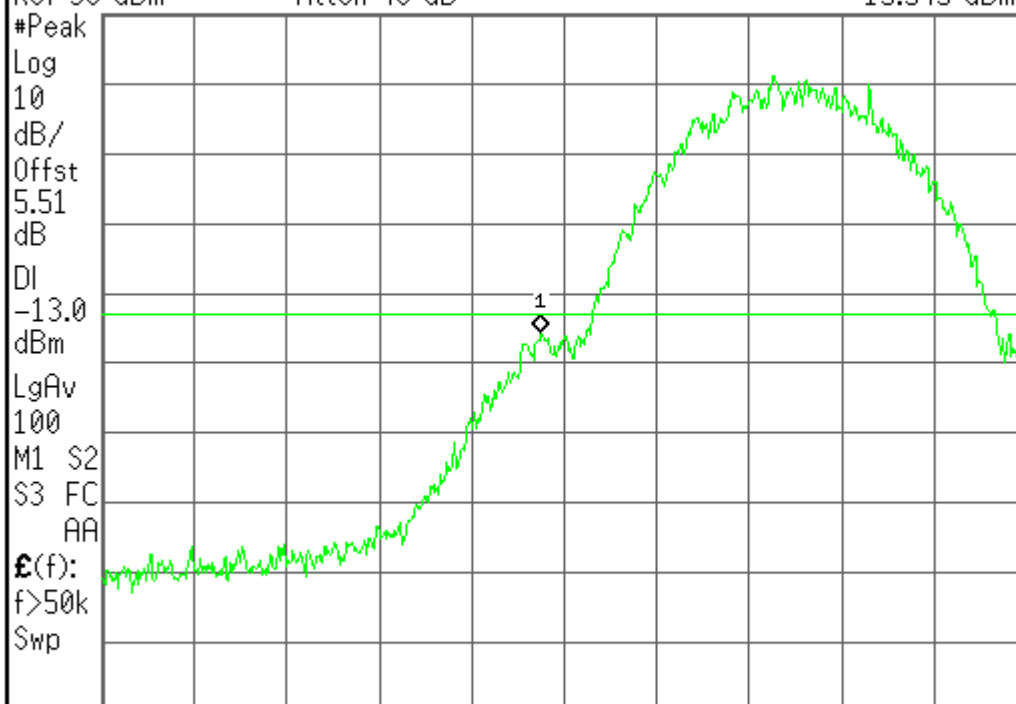
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Freq/Channel

FCC ID:A3LSGHX105 Band Edge Block F Mkr1 1.889 979 5 GHz
Ref 30 dBm Atten 40 dB -15.545 dBm



Center 1.890 000 0 GHz Span 810 kHz
#Res BW 3 kHz #VBW 3 kHz Sweep 108.5 ms (601 pts)

Center Freq
1.89000000 GHz

Start Freq
1.88959500 GHz

Stop Freq
1.89040500 GHz

CF Step
81.00000000 kHz
Auto Man

Freq Offset
0.00000000 Hz

Signal Track
On Off

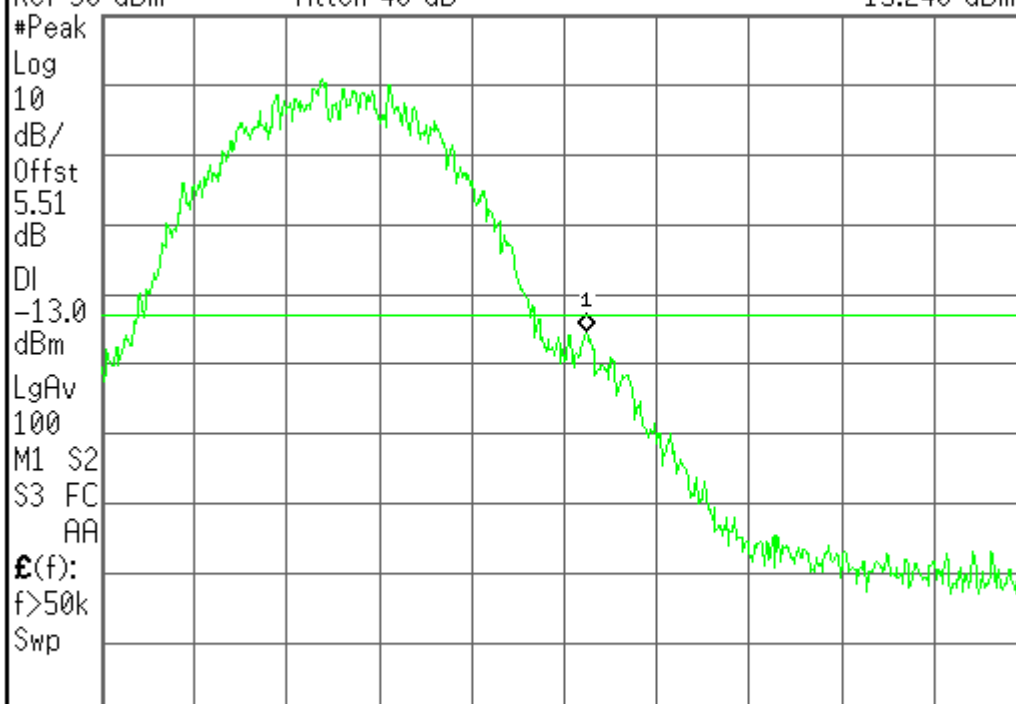
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Freq/Channel

FCC ID:A3LSGHX105 Band Edge Block F Mkr1 1.895 019 1 GHz
Ref 30 dBm Atten 40 dB -15.240 dBm



Center 1.895 000 0 GHz Span 810 kHz
#Res BW 3 kHz #VBW 3 kHz Sweep 108.5 ms (601 pts)

Center Freq
1.89500000 GHz

Start Freq
1.89459500 GHz

Stop Freq
1.89540500 GHz

CF Step
81.00000000 kHz
Auto Man

Freq Offset
0.00000000 Hz

Signal Track
On Off

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