

FCC Part 22 Test Report
for
Samsung Electronics
on the
CDMA Cellular Telephone
Model: SCH611
FCC ID: A3LSCH611

Test Report: J99017175
Date of Report: July 24, 1999



NVLAP Laboratory Code 200201-0
Accredited for testing to FCC Parts 15

Tested by:	Xi-ming Yang	<i>Xi-ming Yang</i>
Reviewer:	C. K. Li	<i>[Signature]</i>

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1 JOB DESCRIPTION**1.1 Client Information**

The EUT has been tested at the request of

Company: Samsung Electronics
85 West Tasman Drive
San Jose, California 95134

Name of contact: M. Ben Kim
Telephone: (408) 544-5124
Fax: (408) 544-5191

1.2 Equipment under test (EUT)

Equipment type: CDMA Cellular Telephone CDMA Phone
Equipment class: Licensed Portable Transmitter (Held to ear)
Model number(s): SCH611
FCC ID: A3LSCH611
Manufacturer: SAME as above.
Use of Product : Voice communications
Production is planned: ☒ Yes, ☐ No
Technical Specifications:

Type of Emission	1M25F9W
Modulation	CDMA
Range of RF Output	0.320 (Peak EIRP)
Means for variation of operating power	Continuously variable
The dc voltage applied to and current into the several elements of the final RF amplifying device	Collector Voltage: 3.6 Vdc Collector Current: 400 mA
Frequency Range	824.64-848.37
Max. number of Channels	20 FA
Antenna	1/4 λ Helical over 1/4 λ whip
Detachable antenna ?	No
External input	Audio
Frequency Tolerance	< 2.5 ppm

EUT receive date: 7/7/99
EUT received condition: Good condition prototype
Test start date: 7/7/99
Test end date: 7/14/99

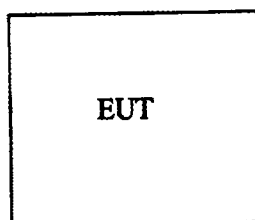
1.3 Test plan reference

FCC Part 2.1033, FCC Part 22

1.4 System test configuration

1.4.1 System block diagram & Support equipment

The diagram shown below details the placement of the equipment under test on the turntable.



1.4.2 Justification

The system was configured for testing in a typical manner in accordance with ANSI C63.4 standard.

1.4.3 Mode(s) of operation

The EUT was powered from fully charged batteries. During tests, EUT was operating at continuous transmitting mode.

1.5 Modifications required for compliance

No modifications were implemented by Intertek Testing Services.

2 TEST SUMMARY

FCC RULE	DESCRIPTION OF TEST	RESULT	PAGE
Transmitter Section			
2.1046 22.913	RF Power Output (Effective Radiated Power)	0.283 W (Peak)	7
2.1047	Modulation Characteristics	N/A	8
2.1049	Occupied Bandwidth	1.26 MHz	9
2.1051	Antenna Conducted of Spurious Radiation	Passes	10
2.1053	Field Strength of Spurious Radiation	Worst case Freq.: 5851.32 MHz Margin: 21.9 dB	11
2.1055	Frequency Stability Vs. Temperature Vs. Voltage	1.02 ppm 0.12 ppm	15
15.107	Line Conducted Emissions	N/A	N/A
Digital Section			
15.109(a)	Radiated Emissions	Worst case Freq.: 2936.25 MHz Margin: 11.8 dB	11

3 EFFECTIVE RADIATED POWER

3.1 Test Description

Parameter:	FCC § 2.1046
Requirement:	FCC § 22.913
Effective Isotropic Radiated Power (EIRP):	< 2 watts peak

3.2 Test Procedure

The EUT was positioned on a non-conductive turntable, 0.8m above the ground plane on an open test site.

The radiated emission at the fundamental frequency was measured at 3m distance with a test antenna and spectrum analyzer. During the measurement, the resolution and video bandwidth of the spectrum analyzer were set to 1 MHz. To maximize emissions, the system was rotated through 360°, the antenna height was varied from 1m to 4m, and the antenna polarization was changed.

The ERP was calculated using equation:

$$E = \frac{\sqrt{30 \cdot P \cdot G}}{D}$$

Where E = Field Strength (V/m),

D = Distance between two antennae(m)

G = Numeric Gain of Antenna (1 for isotropic antenna), P = ERP (W) = EIRP (G=1)

3.3 Test Results

Test Conditions:			Antenna Gain, G = 1.0		Distance, D = 3	
Frequency MHz	Reading dB(μV)	Antenna Factor dB(1/m)	Preamp Gain dB	Cable Loss dB	Field Strength dB(μV/m)	ERP W
824.64	96.0	23.0	0	2.0	121.00	0.283
835.86	96.9	23.0	0	2.0	121.90	0.283
848.37	96.7	23.1	0	2.0	121.80	0.277

Note: Field Strength = Reading + Antenna Factor – preamp + Cable loss

3.4 Modifications made during testing

None

3.5 Test Instrumentation

[x] Hewlett Packard HP8566B Spectrum Analyzer (S.A.)

[x] EMCO 3115 Horn Antenna

[] HP Pre-amp

4 MODULATION CHARACTERISTICS**4.1 Test Description**

Parameter:	FCC § 2.1047
Requirement:	Not Applicable

5 OCCUPIED BANDWIDTH

5.1 Test description

Parameter:	FCC §2.1049
Requirement:	FCC § 22
Emission Bandwidth Limits:	At least 26 dB below the transmitter Power

5.2 Test Procedure

The antenna was disconnected from the transmitter and the short cable was connected to the transmitter RF output.

The RF output was connected to the input of the spectrum analyzer through sufficient attenuation. The resolution bandwidth (RBW) of the spectrum analyzer was set up to at least 1 MHz inside the frequency block. In the 1 MHz bands immediately outside and adjacent to the frequency block, the RBW may be reduced to at least 1% of emission bandwidth of the fundamental emission.

5.3 Test Results

Please see attached plots.

Plot Number	Description
9-1	Low Channel
9-2	Mid Channel
9-3	High Channel

5.4 Modifications made during testing

None

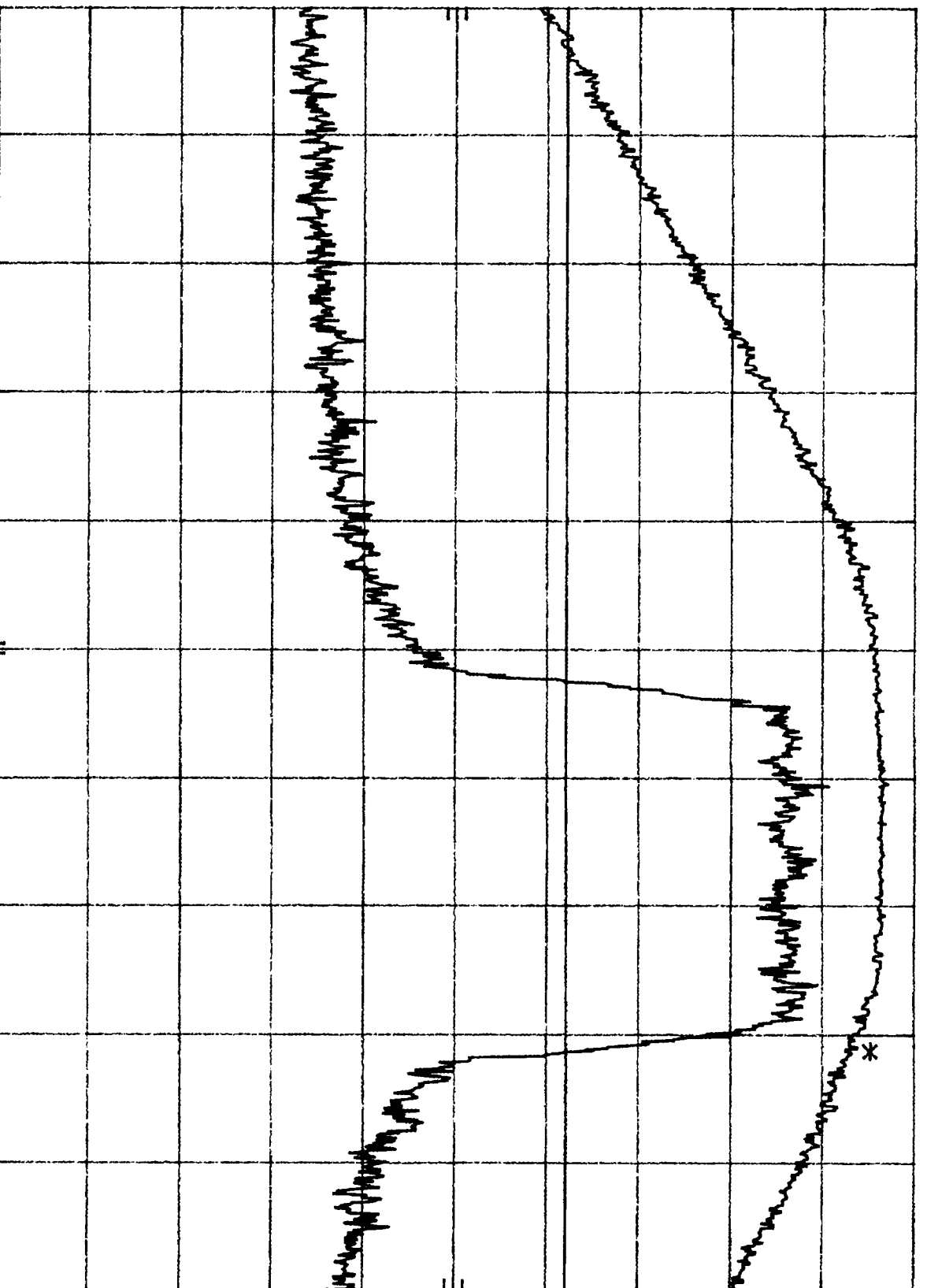
5.5 Test instrumentation

[X] Leader LFG-1300S Function Generator
[X] HP 8566B Spectrum Analyzer
[X] HP 7470A Plotter

HP REF 25.0 dBm ATTEN 40 dB

10 dB/

DL
-13.0
dBm



CENTER 824.04 MHz

RES BW 30 KHZ

VBW 100 KHZ

SPAN 5.00 MHz
SWP 20.0 msec

PILOT 9-2 (MIDDLE CHANNEL)

MKR Δ 1.260 MHz

REF 25.0 dBm

ATTEN 40 dB

0.20 dB

10 dB/

HP

OFFSET

1.8

dB

DL

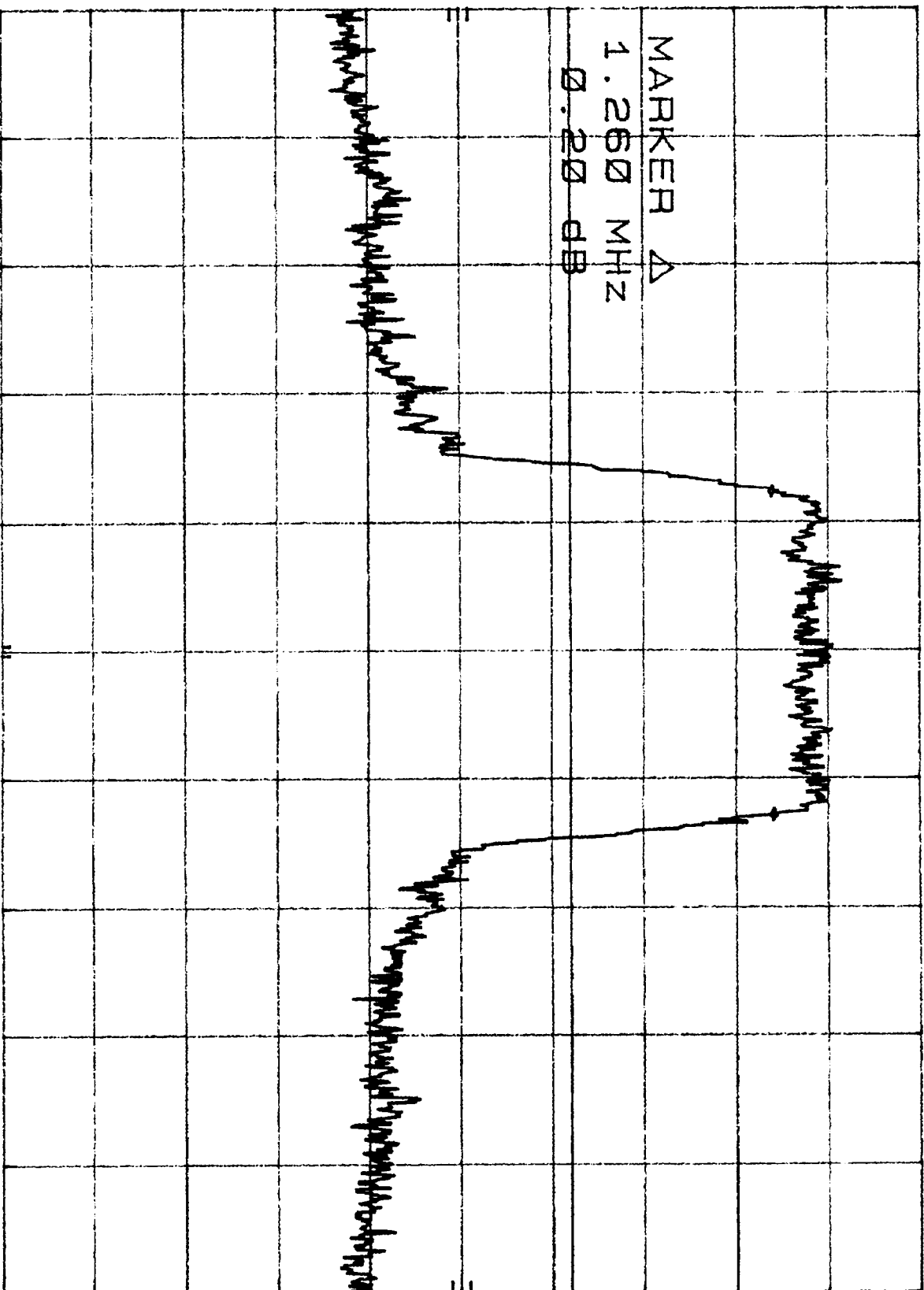
-13.0

dBm

MARKER Δ

1.260 MHz

0.20 dB



CENTER 035.89 MHz

RES BW 30 KHZ

VBW 30 KHZ

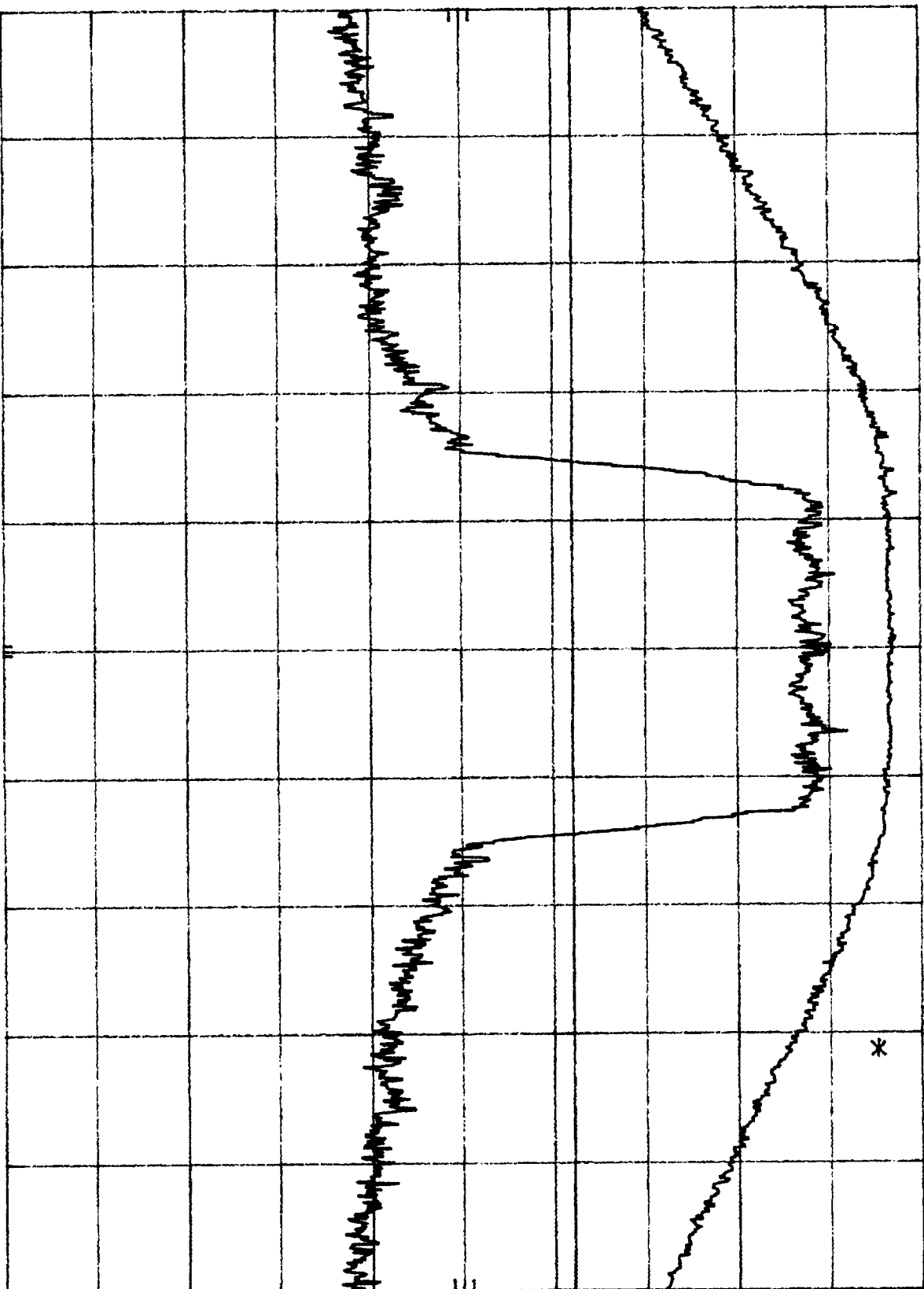
SPAN 5.00 MHz
SWP 20.0 msec

PLOT 9-2(a) (MIDDLE CHANNEL)

HP REF 25.0 dBm ATTEN 40 dB
10 dB/

DL
-13.0
dBm

CENTER 835.89 MHz
RES BW 30 KHz
VBW 100 KHz
SPAN 5.00 MHz
SWP 20.0 msec



PLOT 9-3 (HIGH CHANNEL)

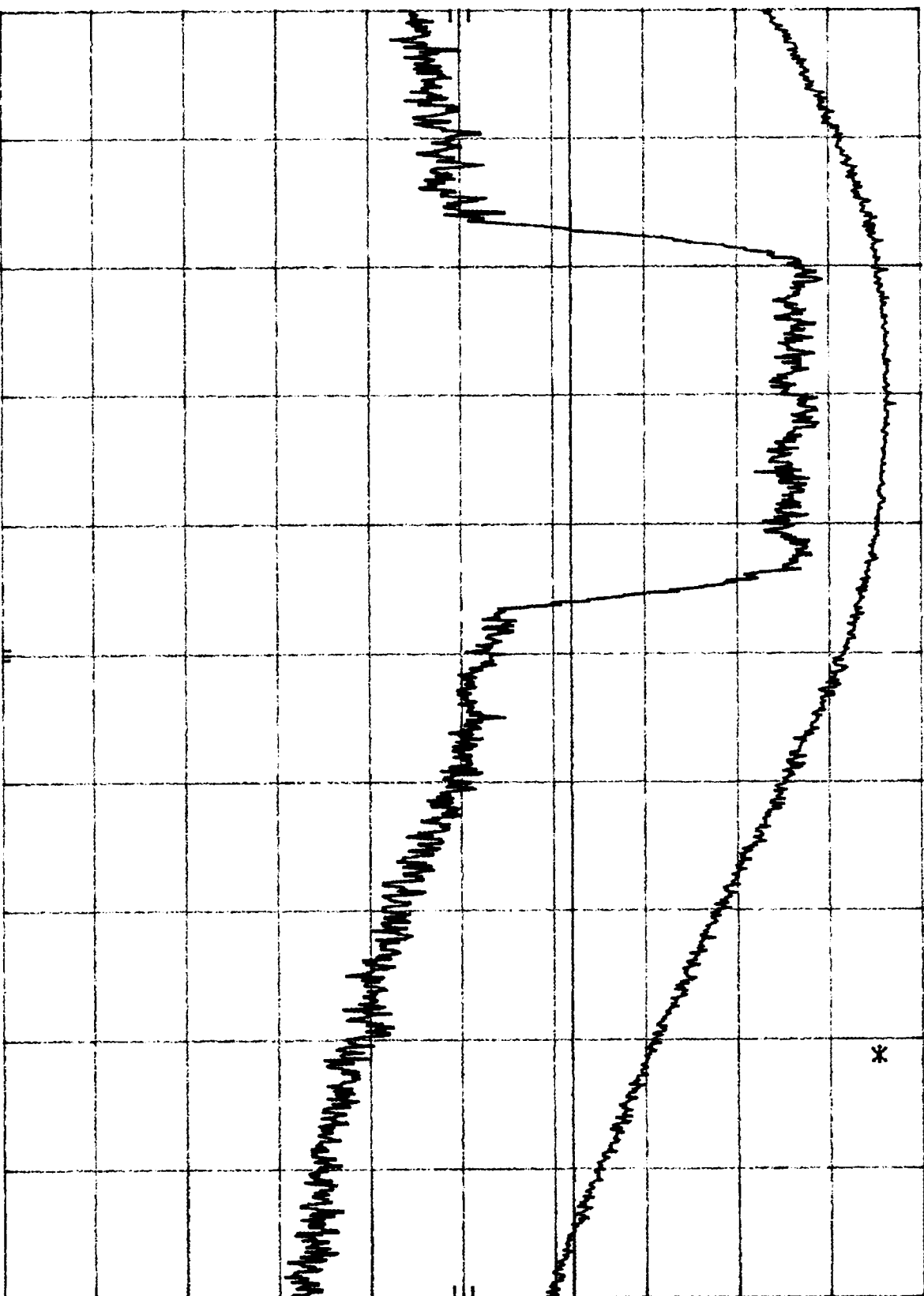
h_p

REF 25.0 dBm

ATTEN 40 dB

10 dB/

DL
-13.0
dBm



CENTER 848.97 MHz

RES BW 30 KHZ

VBW 30 KHZ

SPAN 5.00 MHz
SWP 20.0 msec

6 SPURIOUS EMISSION AT ANTENNA TERMINALS

6.1 Test description

Parameter:	FCC §2.1051
Requirement:	FCC §
Emission Limits:	43 + 10log (P) dB

6.2 Test Procedure

The antenna was disconnected from the transmitter and the short cable was connected to the transmitter RF output.

The RF output was connected to the input of the spectrum analyzer through sufficient attenuation.

6.3 Test Results

Please see Exhibit 10 for the antenna conducted spurious emission plots:

Plot Number	Description
10-1	Low channel, 30 – 1000 MHz
10-2	Low channel, 1 – 2.5 GHz
10-3	Low channel, 2.5 – 10 GHz
10-4	Middle channel, 30 – 1000 MHz
10-5	Middle channel, 1 – 2.5 GHz
10-6	Middle channel, 2.5 – 10 GHz
10-7	High channel, 30 – 1000 MHz
10-8	High channel, 1 – 2.5 GHz
10-9	High channel, 2.5 – 10 GHz

6.4 Modifications made during testing

None

6.5 Test instrumentation

[X] Leader LFG-1300S Function Generator
[X] HP 8566B Spectrum Analyzer
[X] HP 7470A Plotter

PLOT 10-1 (LOW CHANNEL)

hp

10 dB/

REF 25.0 dBm ATTEN 40 dB CH. Low. Cond. *spurious*

OFFSET

1.8

dB

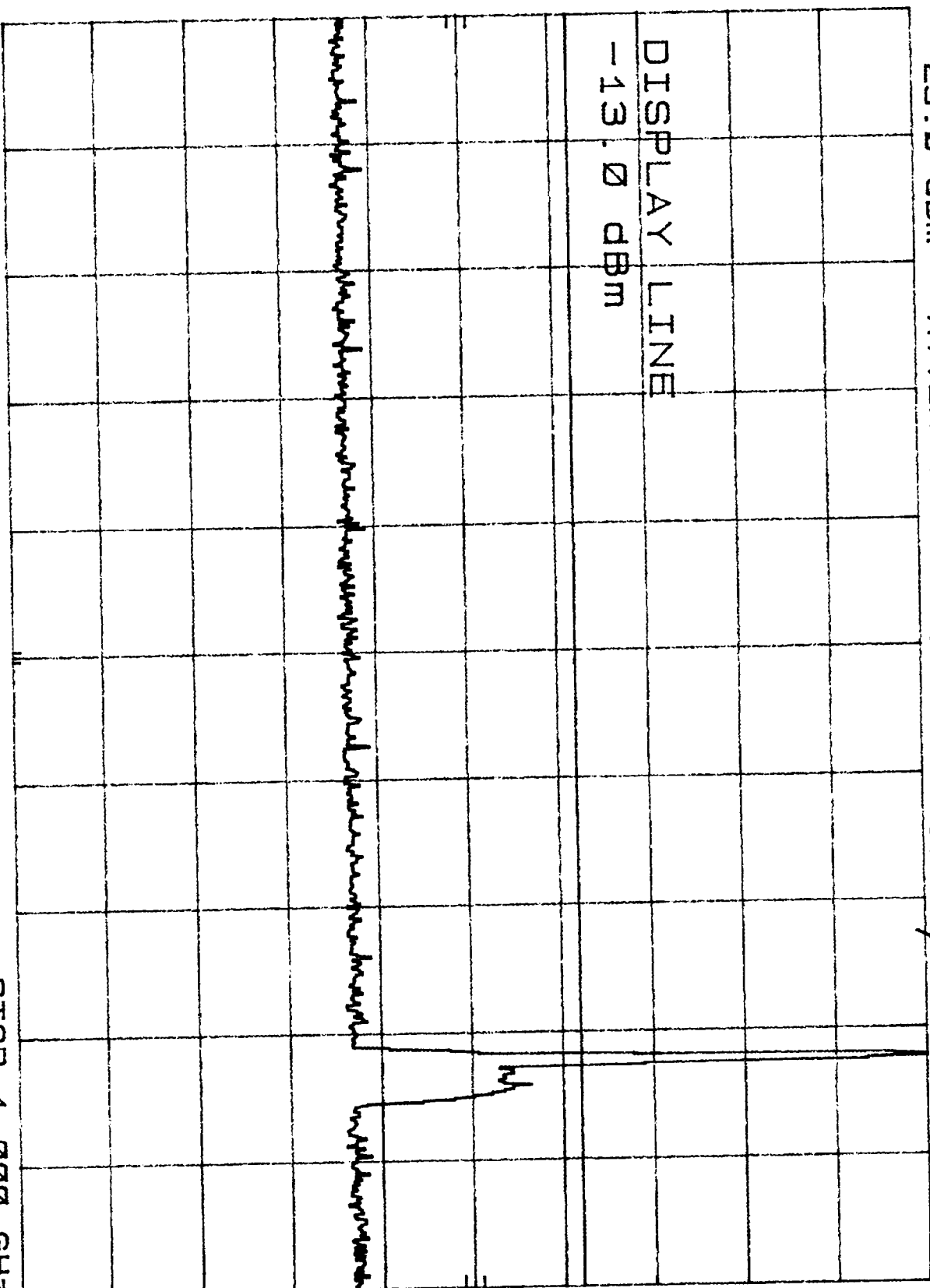
DL

-13.0

dBm

DISPLAY LINE

-13.0 dBm



START 30 MHz

RES BW 1 MHz

VBW 1 MHz

STOP 1.000 GHz

SWP 24.3 msec

PILOT 10-2 (LOW CHANNEL)

HP REF 25.0 dBm ATTEN 40 dB CH. Low. *Cond. Spurious*

10 dB/

OFFSET

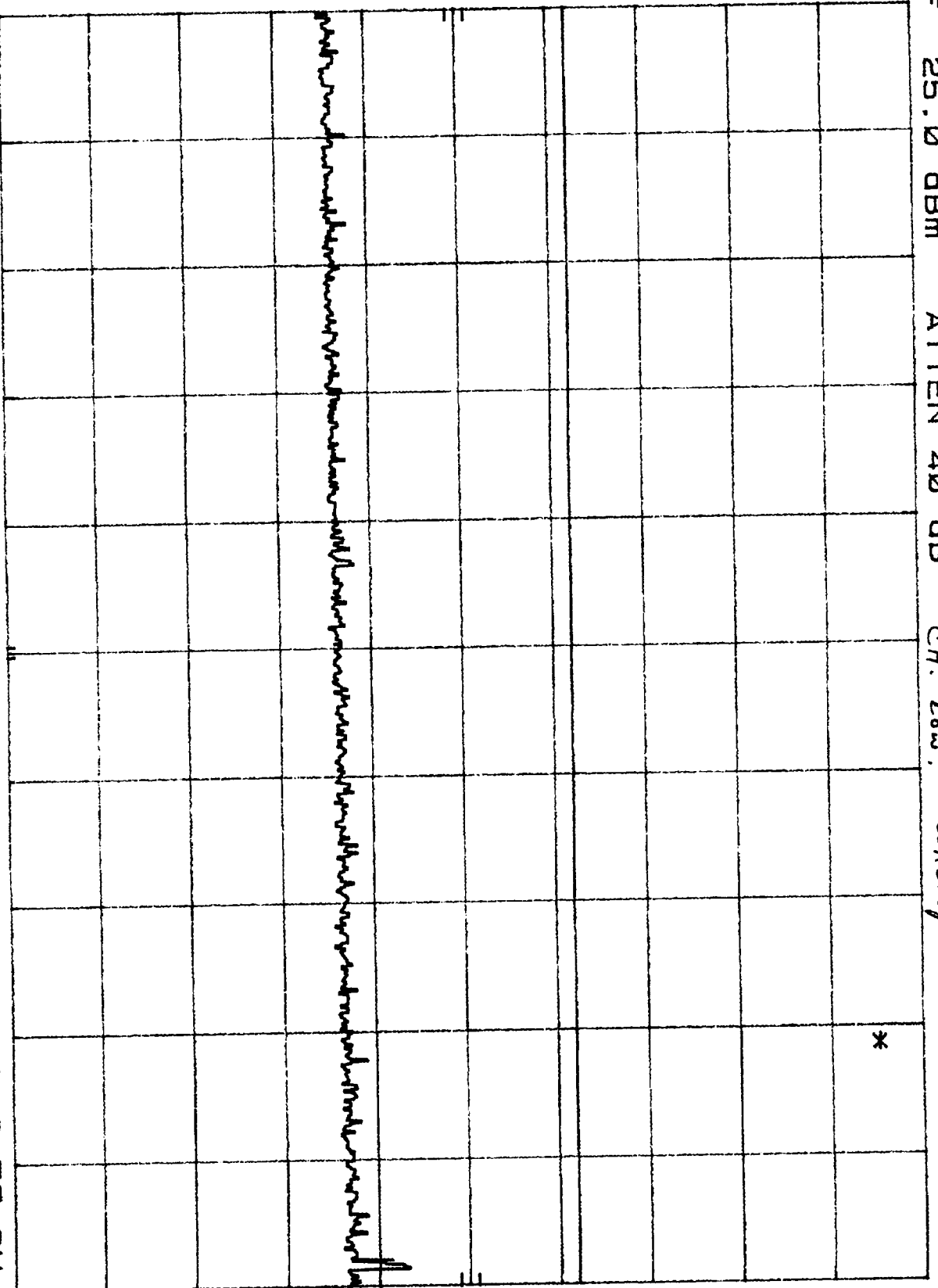
1.8

dB

DL

-13.0

dBm



START 1.00 GHz

RES BW 1 MHz

VBW 1 MHz

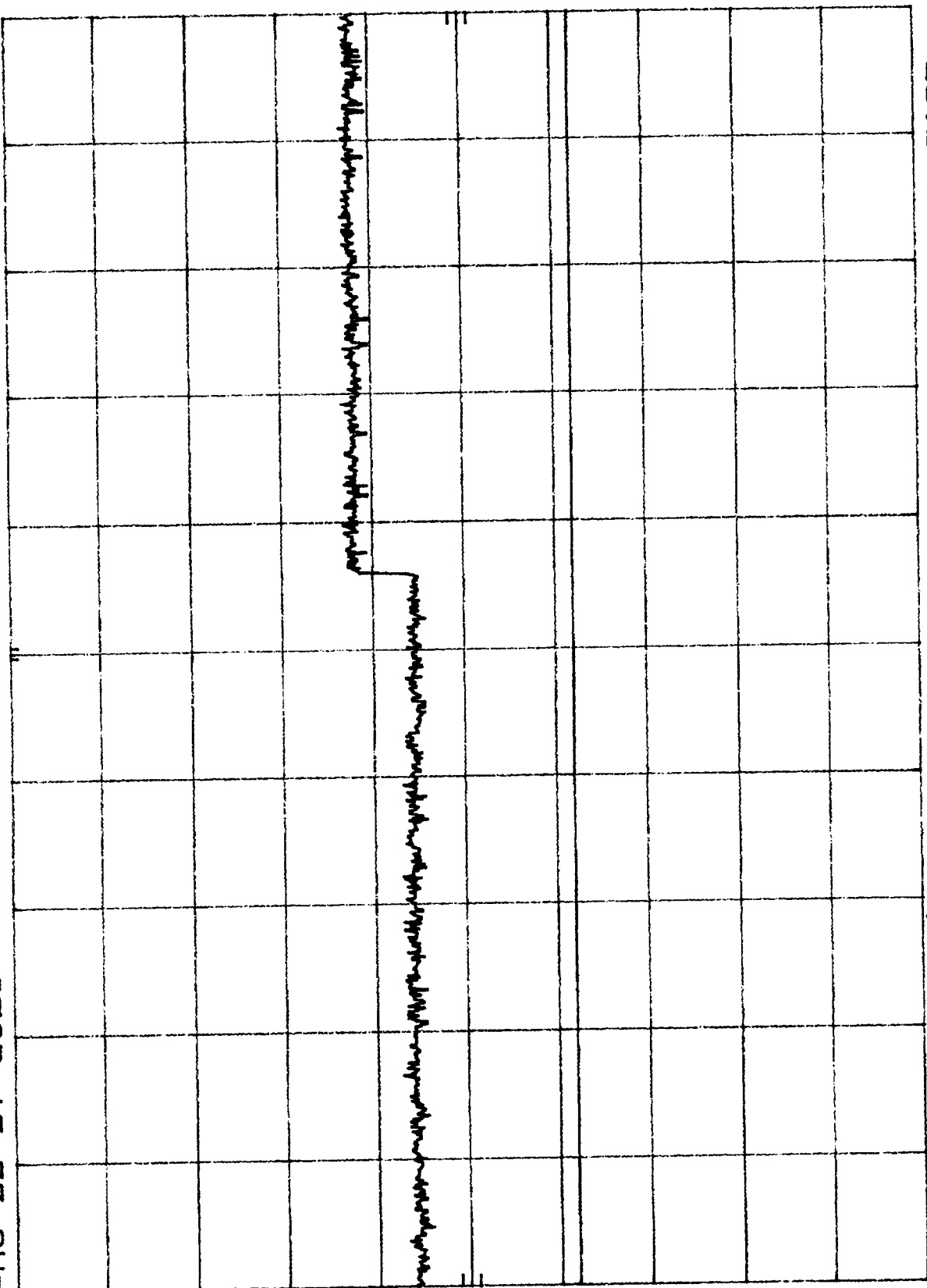
STOP 2.50 GHz

SWP 37.5 msec

hp REF 25.0 dBm ATTN 40 dB CH. Low, Cond. Spurious
10 dB/

OFFSET
1.8
dB

DL
-13.0
dBm

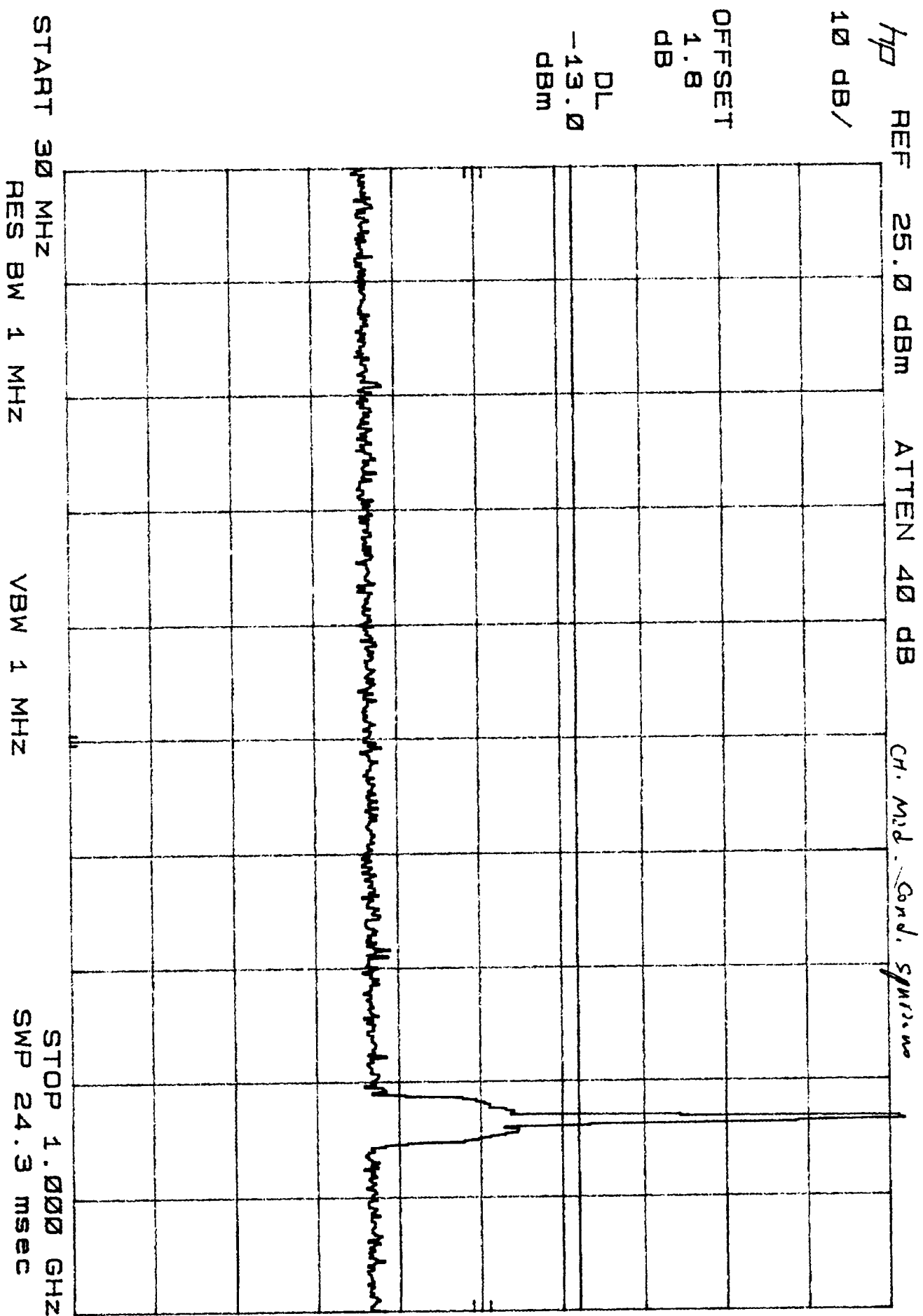


START 2.50 GHz
RES BW 1 MHz

VBW 1 MHz

STOP 10.00 GHz
SWP 100 msec

PLOT 10-4 (MIDDLE CHANNEL)

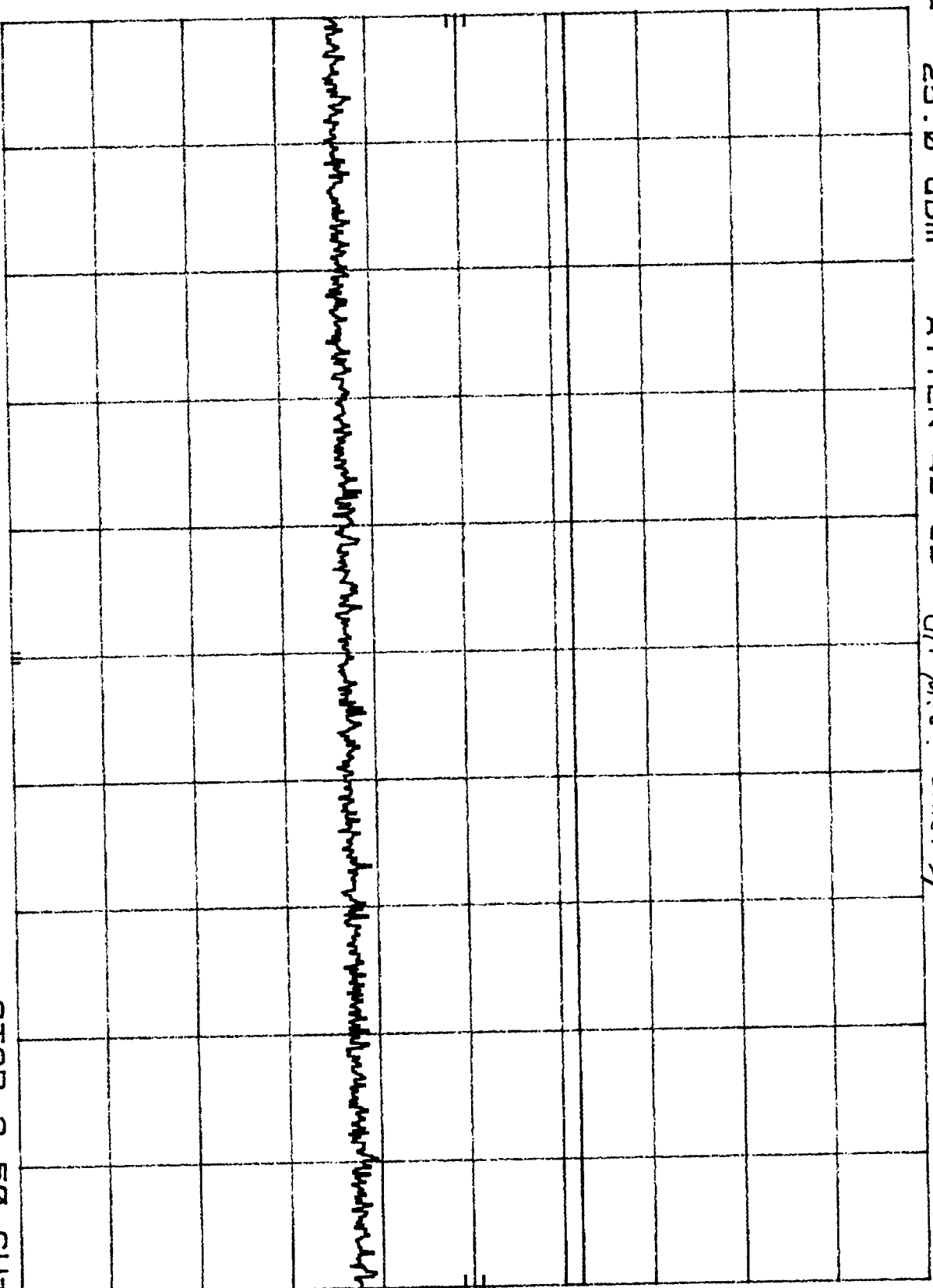


PLOT 10-5 (MIDDLE CHANNEL)

hp REF 25.0 dBm ATTEN 40 dB *CH. Mid. Cond. spurious*
10 dB/

OFFSET
1.8
dB

DL
-13.0
dBm



START 1.00 GHz
RES BW 1 MHz

VBW 1 MHz

STOP 2.50 GHz
SWP 37.5 msec

PLOT 10-6 (MIDDLE CHANNEL)

hp

REF 25.0 dBm

ATTEN 40 dB

CH. Mid. Cond. spurious

10 dB/

OFFSET

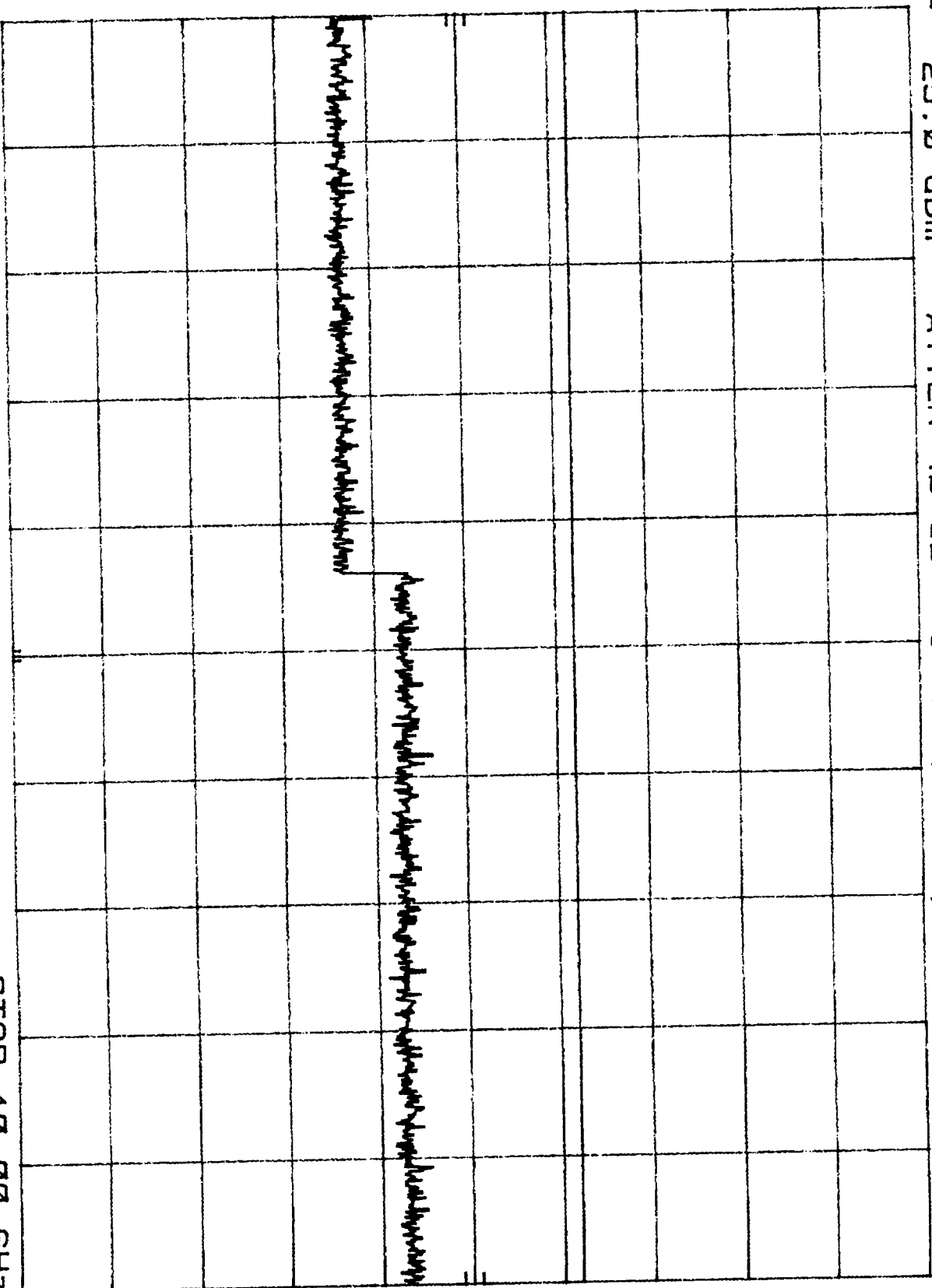
1.8

dB

DL

-13.0

dBm



START 2.50 GHz

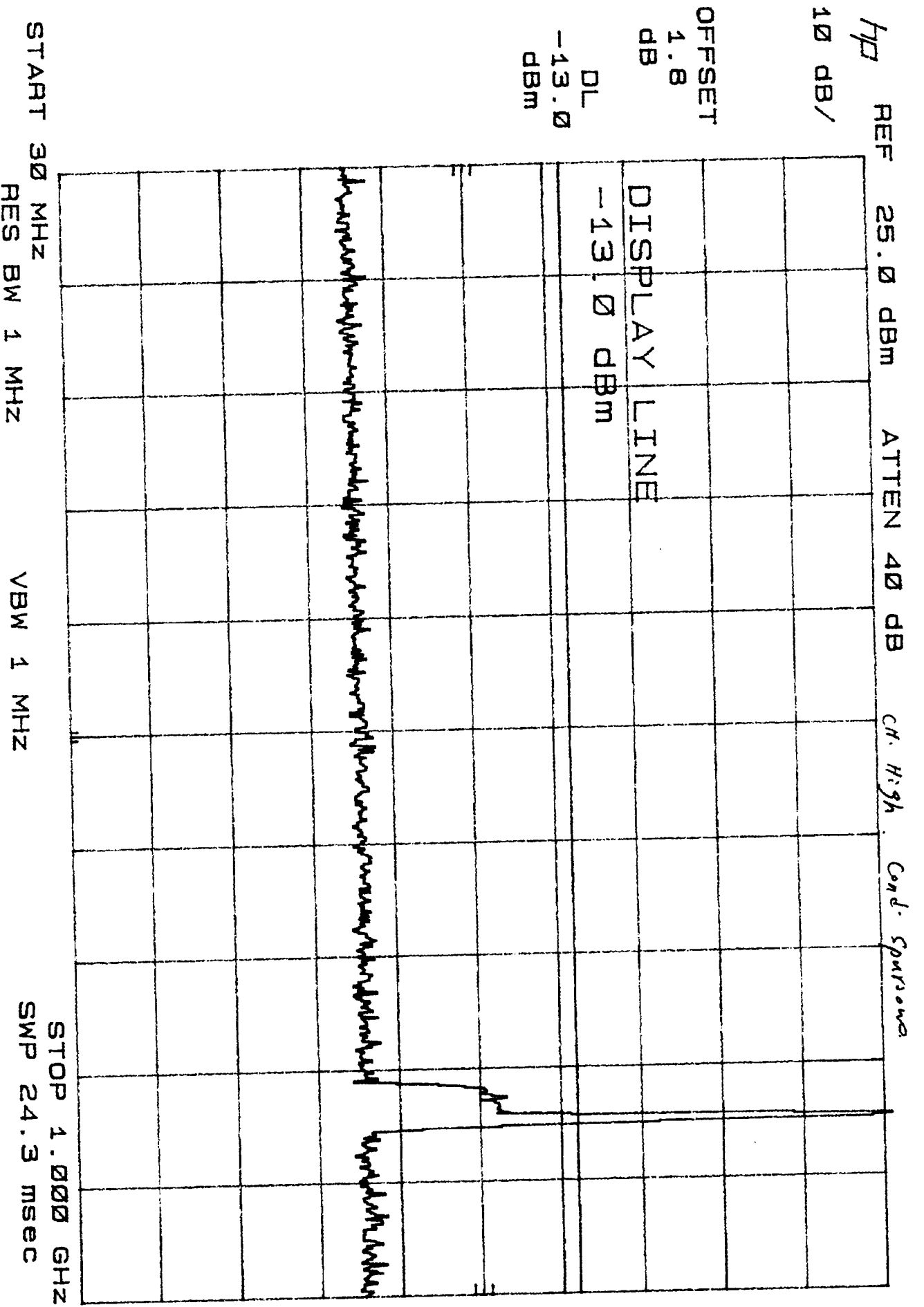
RES BW 1 MHz

VBW 1 MHz

STOP 10.00 GHz

SWP 100 msec

PILOT 10-7 (HIGH CHANNEL)



PLOT 10-8 (HIGH CHANNEL)

hp

REF 25.0 dBm

ATTEN 40 dB

CH. High Cond. Spurious

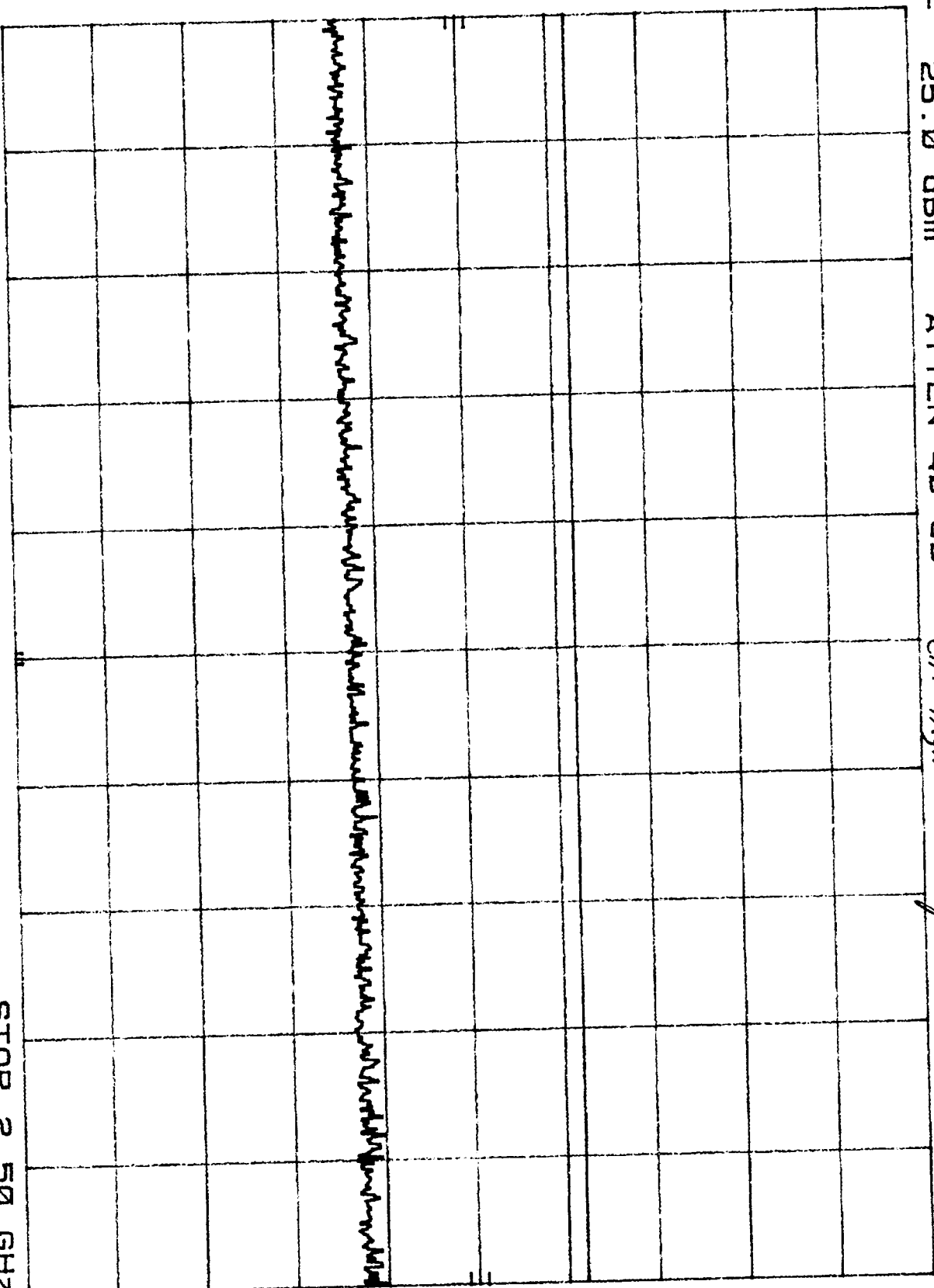
10 dB/

OFFSET
1.8

dB

DL

-13.0
dBm



START 1.00 GHz

RES BW 1 MHz

VBW 1 MHz

STOP 2.50 GHz
SWP 37.5 msec

Plot 10-9 (HIGH CHANNEL)

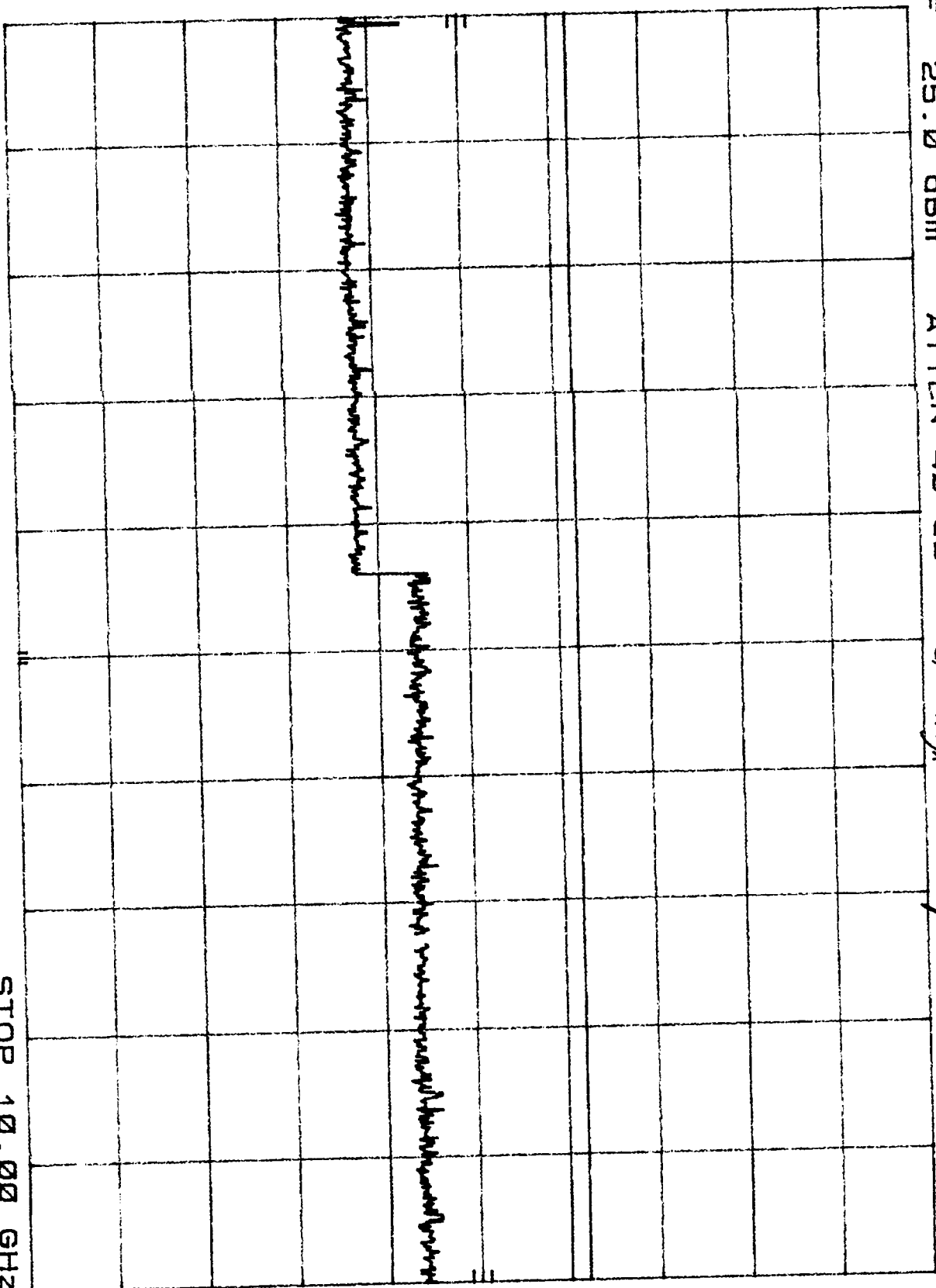
HP REF 25.0 dBm ATTEN 40 dB *CR. High Cond. Spurious.*

10 dB/

OFFSET
1.8

dB

DL
-13.0
dBm



START 2.50 GHz
RES BW 1 MHz

VBW 1 MHz

STOP 10.00 GHz
SWP 100 msec

7 RADIATED SPURIOUS EMISSIONS

7.1 Test description

Parameter:	FCC §2.1053
Requirement:	FCC § 22
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7.2 Test Procedure

The transmitter was placed on a wooden turntable.

The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3 orthogonal axis.

The frequency range up to tenth harmonic of the fundamental frequency was investigated, with measurement equipment RBW setting at 1 MHz.

The spurious harmonic attenuation was calculated as the difference between E in dB(uV/m) at the fundamental frequency and at the spurious emission frequency.

Spurious attenuation in dB = $43 + 10\log_{10}(\text{power out in Watts})$

7.3 Test Results

Please see attached pages.

- ☒ Spurious harmonic attenuation
- ☒ FCC Part 15.109 Radiated Emission

7.4 Modifications made during testing

None

7.5 Test instrumentation

- ☒ CDI B100/200/300 Biconical Antennas
- ☒ EMCO Bi-logcon Antenna
- ☒ EMCO 3115 Horn Antenna
- ☒ HP 8566B Spectrum Analyzer
- ☒ Preamplifiers

Radiated Emissions Test Data

Company:	SAMSUNG ELECTRONICS AMERICA	Model #:	SCH611	Req	FCC 2:993
EUT:		S/N or FCC #:	A3LSCH611	Test Dist	3 meters
Project #:	J99017175	Test Date:	July 7, 1999	TP	0.28 Watt
Test Mode:	Tx	Engineer:	Xi-Ming Y.	Max Attn	37.47 dBc

	Antenna Used			Pre-Amp Used			Cable Used			Transducer Used
Number:	1	8	13	8	4	11	0	0	12	0
Model:	EMCO 3143	EMCO 3115	EMCO 3301	CDL F100 0	None	ALM100	None	None	Gen. MFL	None

Frequency	Reading	Detector	Ant	Amp	Ant. Pol	Ant. Factor	Pre-Amp	Insert. Loss	Net	ERP	Attn	Margin
MHz	(dBm)	Pk/C	#	#	HPV	(dB/m)	dB	dB	(dB(μV/m)	mW	dBc	dB
848.37	96.7	Peak	1	0	H	23.1	0.0	2.0	121.8	2.77E+02	0.0	N/A
1696.78	42.7	Peak	8	8	V	27.2	29.5	3.0	43.4	4.00E-06	78.4	-40.9
2545.13	44.3	Peak	8	8	V	30.6	28.5	2.3	48.7	1.36E-05	73.1	-35.6
3393.48	35.2	Peak	8	8	H	31.7	27.9	2.5	41.5	2.55E-06	80.4	-42.9
4241.83	36.3	Peak	8	8	H	32.9	27.9	2.9	44.2	4.76E-06	77.7	-40.2
5090.26	36.7	Peak	8	8	H	34.9	28.3	3.5	46.8	8.76E-06	75.0	-37.5
5938.61	41.5	Peak	8	8	V	36.2	28.3	3.7	53.1	3.75E-05	68.7	-31.2
5938.61	41.7	Peak	8	8	H	37.7	28.3	3.7	54.8	5.55E-05	67.0	-29.5
6786.96	38.2	Peak	8	8	V	37.6	28.0	4.2	52.0	2.87E-05	69.8	-32.4
7635.31	37.0	Peak	8	8	H	38.0	27.8	4.6	51.8	2.74E-05	70.1	-32.6
8483.66	37.5	Peak	8	8	H	35.7	27.1	4.8	50.9	2.24E-05	70.9	-33.4

- Notes:**
- a) O.C.F.: Other Correction Factor
 - b) Insert. Loss = Cable A + Cable B + Cable C + Transducer.
 - c) Net = Reading + Antenna Factor - Pre-Amp + Insert. Loss.
 - d) Attn. = Field Strength (Fundamental) - Field Strength (Harmonics).
 - e) Negative signs (-) in Margin column signify levels below the limits.

Radiated Emissions Test Data

Company:	SAMSUNG ELECTRONICS AMERICA	Model #:	SCH611	FCC 2:993
EUT:		S/N or FCC #:	A3LSCH611	3
Project #:	J99017175	Test Date:	July 7, 1999	0.28
Test Mode:	Tx	Engineer:	Xi-Ming Y.	3/47

Antenna Used	Pre-Amp Used	Cable Used	Transducer Used
1	8	13	8
4	11	0	0
12	0		

Frequency	Reading	Detector	Ant. Amp	Ant. Pol.	Ant. Factor	Pre-Amp	Insert. Loss	Net	ERP	Attn.	Margin	
MHz	dBm	P/A/O	#	#	H/V	dB(1m)	dB	dB(dBm)	mW	dBc	dB	
835.86	96.9	Peak	1	0	H	23.0	0.0	2.0	121.9	2.83E+02	0.0	N/A
1671.72	55.7	Peak	8	8	V	27.2	29.5	3.0	56.4	7.99E-05	65.5	-28.0
2507.72	45.8	Peak	8	8	V	30.6	28.5	2.3	50.2	1.92E-05	71.7	-34.2
3343.72	36.2	Peak	8	8	H	31.7	27.9	2.5	42.5	3.22E-06	79.5	-42.0
4179.72	45.1	Peak	8	8	H	32.9	27.9	2.9	53.0	3.61E-05	69.0	-31.5
5012.52	42.0	Peak	8	8	H	34.9	28.3	3.5	52.1	2.97E-05	69.8	-32.3
5851.32	49.4	Peak	8	8	H	37.7	28.3	3.7	62.5	3.27E-04	59.4	-21.9
6687.12	39.1	Peak	8	8	V	37.6	28.0	4.2	52.9	3.53E-05	69.0	-31.6
7523.12	36.8	Peak	8	8	H	38.0	28.0	4.6	51.4	2.50E-05	70.6	-33.1
8359.08	38.2	Peak	8	8	H	35.7	27.2	4.8	51.5	2.57E-05	70.4	-32.9

- Notes:
- a) O.C.F.: Other Correction Factor
 - b) Insert. Loss = Cable A + Cable B + Cable C + Transducer.
 - c) Net = Reading + Antenna Factor - Pre-Amp + Insert. Loss.
 - d) Attn. = Field Strength (Fundamental) - Field Strength (Harmonics).
 - e) Negative signs (-) in Margin column signify levels below the limits.

Radiated Emissions Test Data

Company:	SAMSUNG ELECTRONICS AMERICA	Model #:	SCH611	Reg:	FCC 2,993
EUT:		S/N or FCC #:	A3LSCH611	Test Dist:	3 meters
Project #:	J99017175	Test Date:	July 7, 1999	TP:	0.28
Test Mode:	Tx	Engineer:	Xi-Ming Y.	Min. Adj:	37.47 dBc

Antenna Used			Pre-Amp Used			Cable Used			Transducer Used	
Number:	1	8	13	8	4	11	0	0	12	0
Model:	EMCO 3-AS	EMCO 3-15	EMCO 3-30	CDL P100 2	None	A3M100	None	None	Gr. M-L	None

Frequency	Read	Detector	Ant. Amp		Ant. Pol	Ant. Factor	Pre-Amp	Insert. Loss	Net	ERP	Attn.	Margin
MHz	dB(μV)	P/A/G	F	F	H/V	dB(1m)	dB	dB	dB(μV/m)	mW	dBc	dB
824.64	96.9	Peak	1	0	H	23.0	0.0	2.0	121.9	2.83E+02	0.0	N/A
1649.24	45.8	Peak	8	8	V	27.2	29.5	3.0	46.5	8.17E-06	75.4	-37
2473.98	42.5	Peak	8	8	V	29.6	28.5	2.3	45.9	7.12E-06	76.0	-38
3298.60	35.1	Peak	8	8	H	31.7	27.9	2.5	41.4	2.50E-06	80.6	-43
4123.22	34.0	Peak	8	8	H	32.9	27.9	2.9	41.9	2.80E-06	80.1	-42
4947.78	35.2	Peak	8	8	H	34.0	28.1	3.2	44.3	4.92E-06	77.6	-40
5772.50	36.8	Peak	8	8	H	37.7	28.3	3.7	49.9	1.80E-05	72.0	-34
6597.12	37.9	Peak	8	8	H	37.6	28.0	4.2	51.7	2.68E-05	70.2	-32
7421.74	39.1	Peak	8	8	V	38.0	28.0	4.3	53.4	4.02E-05	68.5	-31
8246.36	37.0	Peak	8	8	H	35.7	27.2	4.8	50.3	1.95E-05	71.6	-34
8483.66	37.5	Peak	8	8	H	35.7	27.1	4.8	50.9	2.24E-05	71.0	-33
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												--
												--

- Notes:**
- a) O.C.F.: Other Correction Factor
 - b) Insert. Loss = Cable A + Cable B + Cable C + Transducer.
 - c) Net = Reading + Antenna Factor - Pre-Amp + Insert. Loss.
 - d) Attn. = Field Strength (Fundamental) - Field Strength (Harmonics).
 - e) Negative signs (-) in Margin column signify levels below the limits.

Radiated Emissions Test Data

Company: SAMSUNG ELECTRONICS AMERICA	Model #: SCH611	Standard: FCC 47 CFR 15.205
EUT:	S/N #:	Limit: 3
Project #: J99017175	Test Date: July 7, 1999	Test Distance: 3 meters
Test Mode: Rx	Engineer: Xi-Ming Y.	Duty Relaxation: 0 dB

	Antenna Used			Pre-Amp Used			Cable Used			Transducer Used
Number:	17	8	1	5	2	8	12	0	0	0
Model:	EMCO 3303	EMCO 3145	EMCO 3145	CDI P250	HP 8447D	CDI P1000	Gen. 10-1	None	None	None

Frequency	Reading	Detector	Ant	Amp	Ant Pol	Ant Factor	Pre-Amp	Insert Loss	D.C.F.	Net	Limit @3m	Margin
MHz	dB(μV)	P/A/V	F	#	H/V	dB(μV/m)	dB	dB	dB	dB(μV/m)	dB(μV/m)	dB
54.00E+0	32.0	Peak	1	5	V	5.3	18.8	0.4	0.0	18.9	40.0	-21.1
135.00E+0	34.0	Peak	1	5	V	8.0	19.1	0.8	0.0	23.7	43.5	-19.8
216.00E+0	31.9	Peak	1	5	H	11.1	18.5	1.0	0.0	25.5	46.0	-20.5
270.00E+0	31.7	Peak	1	5	H	12.7	18.2	1.1	0.0	27.3	46.0	-18.7
594.00E+0	17.0	Peak	1	5	H	19.6	15.8	1.6	0.0	22.4	46.0	-23.6
955.02E+0	21.2	Peak	1	5	H	24.2	14.1	2.3	0.0	33.6	46.0	-12.4
966.28E+0	21.4	Peak	1	5	H	24.2	14.1	2.3	0.0	33.8	54.0	-20.2
978.75E+0	20.6	Peak	1	5	H	24.5	14.1	2.3	0.0	33.3	54.0	-20.7
1910.04E+0	38.4	Ave.	8	8	H	27.4	29.2	2.2	0.0	38.8	54.0	-15.2
1932.54E+0	36.0	Ave.	8	8	H	27.4	29.2	2.2	0.0	36.4	54.0	-17.6
1957.50E+0	39.0	Ave.	8	8	H	27.4	29.2	2.2	0.0	39.4	54.0	-14.6
2865.06E+0	34.0	Ave.	8	8	H	30.7	28.2	2.3	0.0	38.8	54.0	-15.2
2898.81E+0	29.8	Ave.	8	8	H	30.7	28.2	2.3	0.0	34.6	54.0	-19.4
2936.25E+0	37.4	Ave.	8	8	H	30.7	28.2	2.3	0.0	42.2	54.0	-11.2

Notes:	a) D.C.F.: Distance Correction Factor
	b) Insert. Loss (dB) = Cable A + Cable B + Cable C.
	c) Net (dB) = Reading + Antenna Factor - Pre-amp + Insert. Loss. - Transducer Loss - Duty Relaxation (transmit only).
	d) Negative signs (-) in Margin column signify levels below the limits.
	e) All other emissions not reported are below the equipment noise floor which is at least 20 dB below the limits.

8 FREQUENCY STABILITY

8.1 Test description

Parameter:	FCC §2.1055
Requirement:	FCC § 22
Frequency Tolerance:	Sufficient to ensure that the fundamental emission stays within the authorized frequency block

8.2 Test Procedure

The ppm frequency error of the transmitter was calculated by:

$$ppm\ error = \left(\frac{MCF}{ACF} - 1 \right) \cdot 10^6$$

Where MCF is the Measured Carrier Frequency in MHz
ACF is the Assigned Carrier Frequency in MHz

8.2.1 Frequency Stability vs. Temperature

The equipment under test was connected to an external DC power supply and the RF output was connected to a frequency counter via feedthrough attenuators. The EUT was placed inside the temperature chamber.

After the temperature stabilized for approximately 20 minutes, the frequency of the output signal was recorded from the counter.

8.2.2 Frequency Stability vs. Voltage

At room temperature ($25 \pm 5^\circ\text{C}$), an external variable DC power supply was connected to the EUT. The frequency of the transmitter was measured for 115%, 100% and 85% of the nominal operating input voltage.

8.3 Test Results

See attached page.

SCH-611 FREQUENCY STABILITY

Operating Frequency : 835.89 Hz
Channel : 363
Reference Voltage : 4.0 VDC
Deviation Limit : $\pm 0.00025\%$ or 2.5 ppm

Voltage(%)	Power(VDC)	Temp(°C)	Freq(Hz)	Deviation(ppm)
100	4.0	Ref	835,890,000	0
"	"	-30	835,890,827	0.99
"	"	-20	835,890,852	1.02
"	"	-10	835,890,702	0.84
"	"	0	835,890,518	0.62
"	"	10	835,890,243	0.29
"	"	20	835,890,102	0.12
"	"	30	835,889,893	-0.13
"	"	40	835,889,670	-0.39
"	"	50	835,889,368	-0.76
"	"	60	835,889,152	-1.01
85%	3.4	20	835,890,043	0.05
115%	4.6	20	835,890,010	0.01
End Point	3.2	20	835,890,052	0.06

8.3 Modifications made during testing

None

8.4 Test instrumentation

☒ Data provided by applicant

- ☐ Temperature Chamber, -50C to +100C
- ☐ Hewlett Packard 5383A Frequency Counter
- ☐ Tektronix 2784 Spectrum Analyzer
- ☐ Goldstar DC Power Supply, GR303

9 AC LINE CONDUCTED EMISSIONS**9.1 Test description**

Parameter:	ANSI C63.4
Requirement:	FCC § 15.107

9.2 Test Procedure

The EUT was connected to the DC power supply, that was connected to the AC line through the LISNs.
Both HOT and NEUTRAL leads were tested.

9.3 Test Results

☒ Not applicable, the EUT is battery powered only.

9.4 Modifications made during testing

None

9.5 Test instrumentation

☐ HP 8566B Spectrum Analyzer
☐ LISN

10 LIST OF EXHIBITS

The following exhibits are listed as reference only and are submitted as separate attachments:

<i>Exhibit 1</i>	ID Label Format, ID Label Location
<i>Exhibit 2a</i>	Equipment Photographs (External)
<i>Exhibit 2b</i>	Equipment Photographs (Internal)
<i>Exhibit 3</i>	Block Diagram
<i>Exhibit 4</i>	Circuit Diagram
<i>Exhibit 5</i>	Theory of Operation. Description of all circuitry and devices provided for determining and stabilizing frequency, for suppression of spurious radiation, for limiting modulation, and for limiting power.
<i>Exhibit 6</i>	Tune-Up Procedure over the power range
<i>Exhibit 7</i>	Test Setup Photos
<i>Exhibit 8</i>	Instruction Manual
<i>Exhibit 9</i>	Bandwidth Plots
<i>Exhibit 10</i>	Spurious Emission At Antenna Terminals
<i>Exhibit 11</i>	SAR Report