



MOTOROLA

Cellular Infrastructure Group

FCC ID: IHET6ZD1

TEST REPORT AND DATA

Test Report Contents

APPLICANT: MOTOROLA

TRANSCEIVER TYPE: IHET6ZD1

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Summary of Radiated Spurious RF Measurements

APPLICANT: MOTOROLA

TRANSCEIVER TYPE: IHET6ZD1

**WORST CASE RADIATED SPUR LEVEL
MEASURED IN TRANSMIT AND RECEIVE MODE
FOR SC1900 @1900 Mhz CDMA FIXED WIRELESS TERMINAL**

Table 1:

SPUR FREQUENCY (Mhz)	DISTANCE MEASURED (meters)	SPUR LEVEL MEASURED (dBuV/meter)	FCC MAX LIMIT (dBuV/meter)
1722	3	48.9	54
3445	3	39.5	54
3796	3	44.2	54
5160	3	44.8	54
5639	3	45.8	54
9399	3	47.8	54

FCC Max. Limit Per 47 CFR Part 15, Subpart B

Unit was tested at an off site FCC approved range at 3 meters distance from 30 Mhz to 10 times the highest Oscillator frequency (20 Ghz)



KTL Dallas, Inc.

Dallas Headquarters:
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 Lewisville, TX 75057
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Microwave Radiated Emissions Data

Complete X Preliminary Page 1 of 2

Client: MOTOROLA Test #: MW-2 W.O.#: 9L0070E

EUT: ST1001B S/N: 634GZF57CX Photo ID: 9L0070E MW-2

Technician: Ron Gaytan Specification: GRR 47 Part 15.209 Lab: D OATS Date: 4-22-99

Equipment Used: G2624, EM2200, CF35, CF30, 494

Configuration: TX MODE

Bandwidth: 1MHz Video Bandwidth: 1MHz Antenna Distance 3 m Detector:

Climatic Conditions: EUT Power: X 115 V.A.C. X 60 Hz X Peak
 Temperature: 26 C 200 V.A.C. 50 Hz Average
 Relative Humidity: 50 % 230 V.A.C.
 Atmospheric Pressure: 1002 mbar Other 1 Phase 3 Phase

Freq. (GHz)	Meter Reading (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	RF Gain (dB)	Conver. Factor	Corrected Reading (dBuV/m)	Spec. Limit (dBuV/m)	Pol.	Comments:
1.8798	79.1	27.9	1.4	31	0	77.4	54	H	Fundamental
1.7227	51	27.5	1.4	31	0	48.9	54	H	Local Osc.
3.445	38.8	30.4	1.9	31.6	0	39.5	54	H	Noise Floor
3.796	38.8	34	1.9	30.5	0	44.2	54	H	Noise Floor
5.639	38.8	34.8	2.4	30.2	0	45.8	54	H	Noise Floor
7.519	40	37	2.9	30.8	0	49.1	54	H	Noise Floor
9.399	40	37.8	3.1	33.1	0	47.8	54	H	Noise Floor
11.278	26	39.7	3.5	33.2	0	36	54	H	N.F. KTL# 677 AVG
13.153	26	40.5	3.8	33.2	0	37.1	54	H	N.F. KTL# 677 AVG
15.038	26	41.4	4.2	31.9	0	39.7	54	H	N.F. KTL# 677 AVG
15.903	26	40.8	4.3	32	0	39.1	54	H	N.F. KTL# 677 AVG
1.8798	89	27.9	1.4	31	0	87.3	54	V	Fundamental
1.7227	51	27.5	1.4	31	0	48.9	54	V	Local Osc.
3.445	38.8	30.4	1.9	31.6	0	39.5	54	V	Noise Floor
3.796	38.8	34	1.9	30.5	0	44.2	54	V	Noise Floor
5.639	38.8	34.8	2.4	30.2	0	45.8	54	V	Noise Floor
7.519	40	37	2.9	30.8	0	49.1	54	V	Noise Floor
9.399	40	37.8	3.1	33.1	0	47.8	54	V	Noise Floor
11.278	26	39.7	3.5	33.2	0	36	54	V	N.F. KTL# 677 AVG



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Microwave Radiated Emissions Data

Complete Preliminary Page 1 of 1

Client: MOTOROLA Test #: MW-1 W.O.#: 9L0070E

EUT: ST1001B S/N: 634GZF57CX Photo ID: 9L0070E MW-1

Technician: Ron Gaytan Specification: CFR 47 Part 15.109 Lab: D OATS Date: 4-22-99

Equipment Used: G2624, EM2200, CF35, CF30, 494

Configuration: RX MODE

Bandwidth: 1MHz Video Bandwidth: 1MHz Antenna Distance 3 m Detector:

Climatic Conditions: EUT Power: 115 V.A.C. 60 Hz Peak
 Temperature: 24 C 208 V.A.C. 50 Hz Average
 Relative Humidity: 48 % 230 V.A.C.
 Atmospheric Pressure: 1002 mbar Other 1 Phase 3 Phase

Freq. (GHz)	Meter Reading (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	RF Gain (dB)	Conver. Factor	Corrected Reading (dBuV/m)	Spec. Limit (dBuV/m)	Pol.	Comments:
1.7227	50.8	27.5	1.4	31	0	48.7	54	V	Local Osc.
1.987	38.4	24	1.4	30	0	34.8	54	V	Noise Floor
3.445	38.8	30.4	1.9	31.6	0	39.5	54	V	Noise Floor
5.16	38.8	34	2.5	30.5	0	44.8	54	V	Noise Floor
1.7227	47.9	27.5	1.4	31	0	45.8	54	H	Local Osc.
1.987	39.4	24	1.4	30	0	34.8	54	H	Noise Floor
3.445	38.8	30.4	1.9	31.6	0	39.5	54	H	Noise Floor
5.16	38.8	34	2.5	30.5	0	44.8	54	H	Noise Floor
									Scanned from 1-10 GHz

Summary of Maximum Transmitter Power

APPLICANT: MOTOROLA

TRANSCEIVER TYPE: IHET6ZD1

Table 1:

Channel	Frequency Ghz	RF Output Power dBm
25	1.8476	23.8
600	1.8764	23.3
1175	1.9051	23.7

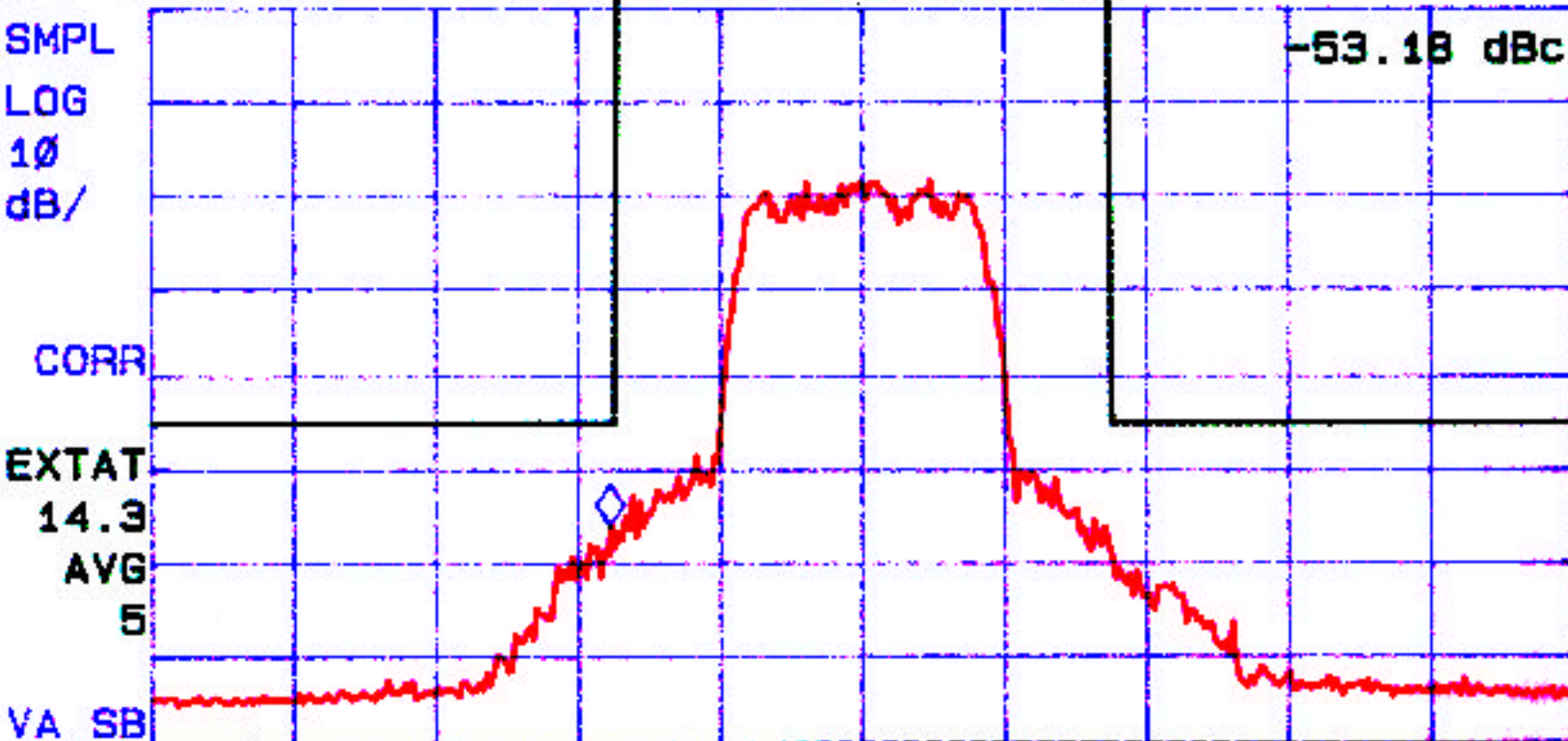
21: 12: 49 APR 26, 1999

MKR 1.849972 GHz

REF 26.8 dBm

AT 30 dB

-29.35 dBm



SC FS MS CH 25

START 1.847650 GHz

STOP 1.854850 GHz

#RES BW 30 KHZ

#VBW 3 KHZ

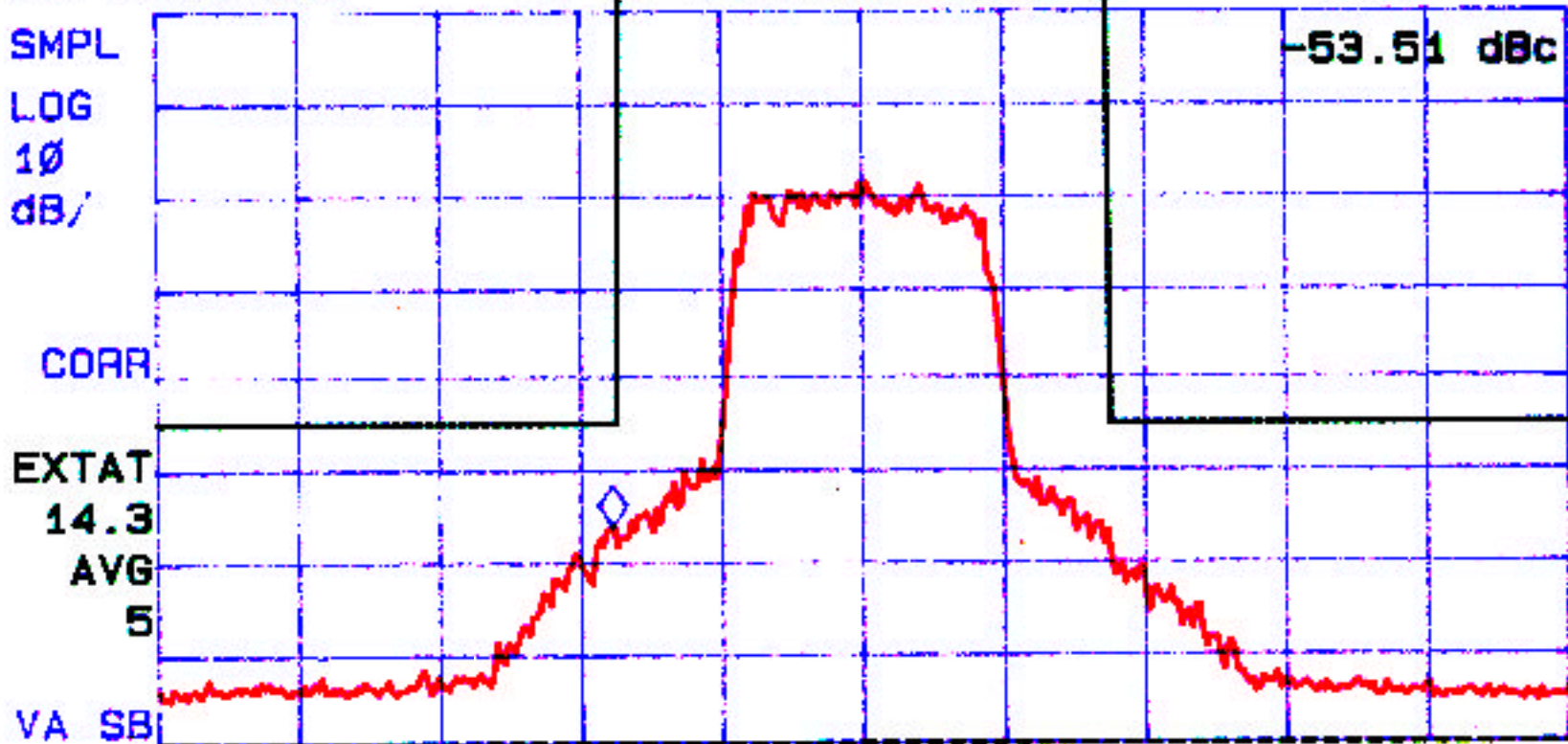
SWP 240 msec

SPUR CLOSE ($\Delta f_c \leq 25$ MHz) [FAST]		PASS
a) (dBc/30kHz) Fc $\Delta 1m - 11.2$ dB P		Chan Power
		23.8 dBm

20:59:58 APR 26, 1999

MKR 1.878722 GHz
-29.99 dBm

REF 26.3 dBm AT 30 dB



SC FS MS CH 600

START 1.876400 GHz

STOP 1.883600 GHz

#RES BW 30 kHz

#VBW 3 kHz

SWP 240 msec

SPUR CLOSE ($\Delta f_c \leq 25$ MHz) [FAST]

PASS

a) (dBc/30kHz) Fc Δ Lim - 11.3 dB P

Chan Power

23.3 dBm

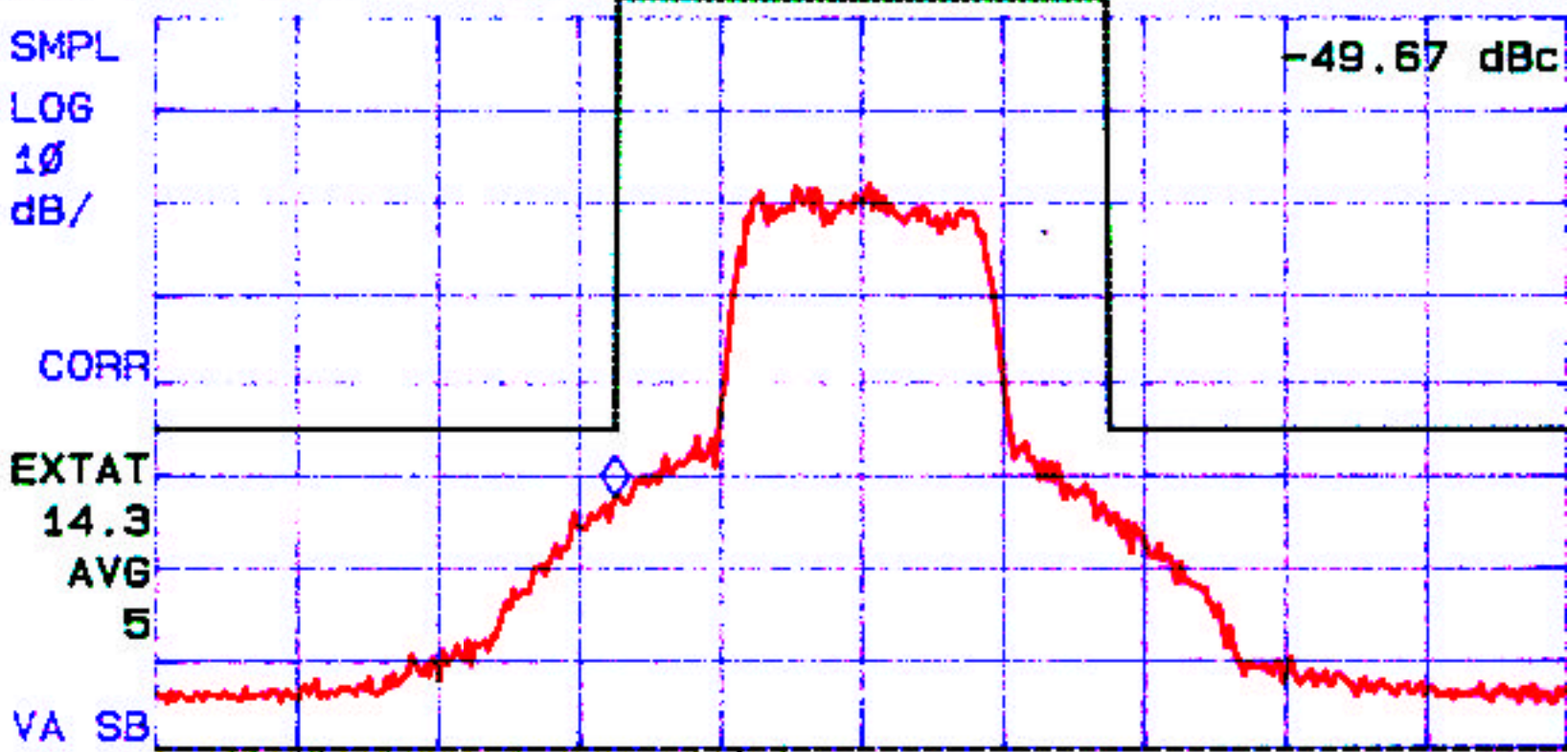
21:20:44 APR 26, 1999

MKR 1.907490 GHz

REF 26.7 dBm

AT 30 dB

-25.74 dBm



-49.67 dBc

SC FS MS CH 1175

START 1.905150 GHz

STOP 1.912350 GHz

#RES BW 30 KHz

#VBW 3 KHz

SWP 240 msec

SPUR CLOSE ($\Delta f_c \leq 25$ MHz)			[FAST]	PASS
a)	(dBc/30kHz)	Fc Δ lim	-7.5 dB P	
				Chan Power
				23.7 dBm

Summary of Transmitter Conducted Spurious

APPLICANT: MOTOROLA

TRANSCEIVER TYPE: IHET6ZD1

Table 1:

SPUR FREQUENCY (Ghz)	SPUR LEVEL MEASURED (dBc)	FCC LIMIT (dBc)
3.7025	-51	36
3.7600	-50	36
3.8175	-49	36

Note:

1. Spurious emissions were measured at the harmonics of the Transmitter at low, mid, and high channels. All other conducted emissions were at least 20 dB below the FCC limits.

2. FCC limit

$43 + 10 \log (p)$ in dB where $P=0.20$ Watt; Limit = 36 dBc

22:56:25 APR 28, 1999

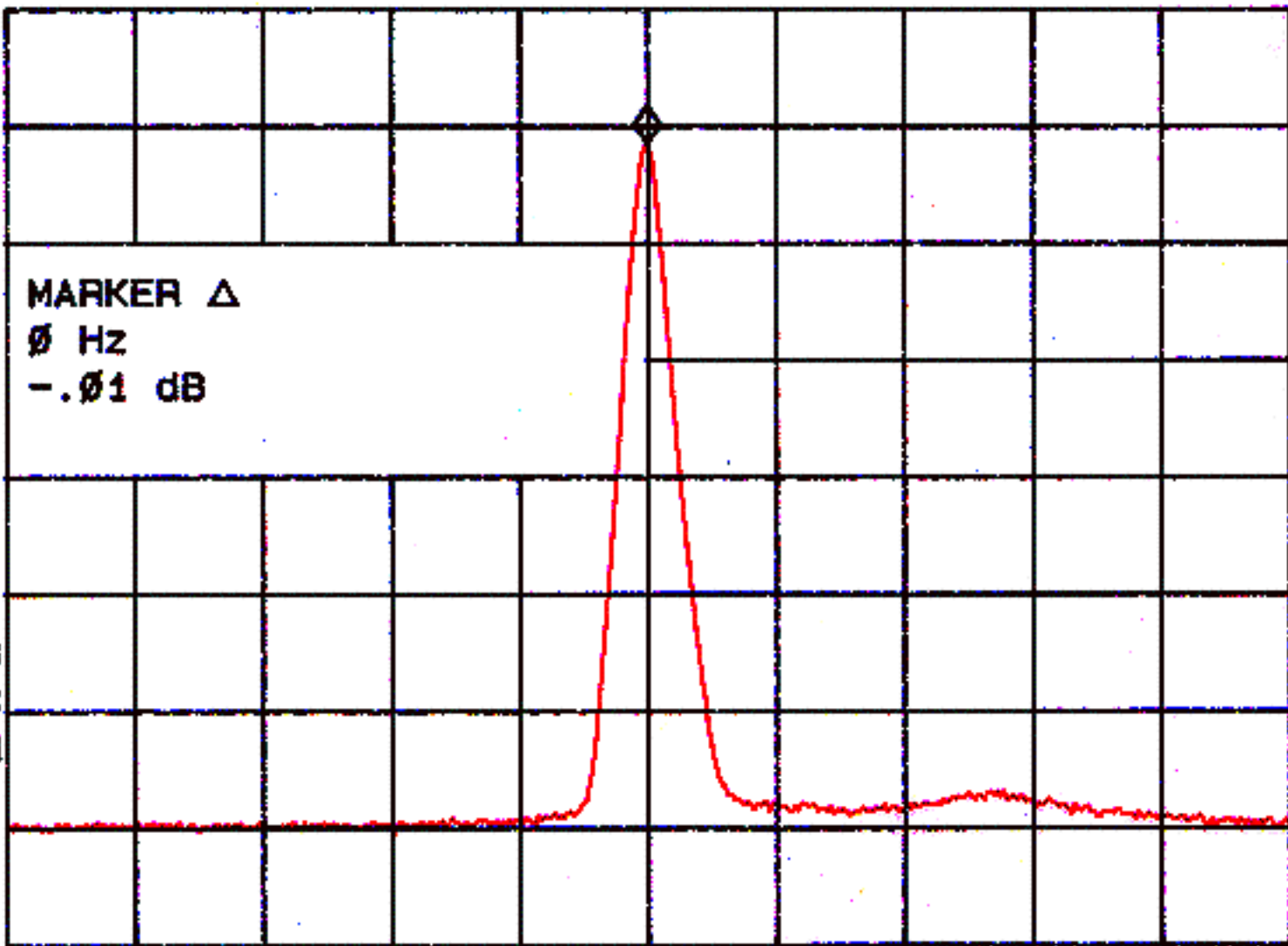
MKR Δ 0 Hz
-.01 dB

REF 11.0 dBm AT 30 dB

SMPL
LOG
10
dB/

AVG
100

WA SB
SC FC
CORR



CENTER 1.8513 GHz

RES BW 1.0 MHz

VBW 300 kHz

SPAN 100.0 MHz

SWP 20.0 msec

22:59:18 APR 28, 1999

MKR Δ 1.8512 GHz

REF 11.0 dBm

AT 30 dB

-51.09 dB

SMPL

LOG

10

dB/

CENTER
3.7025 GHz

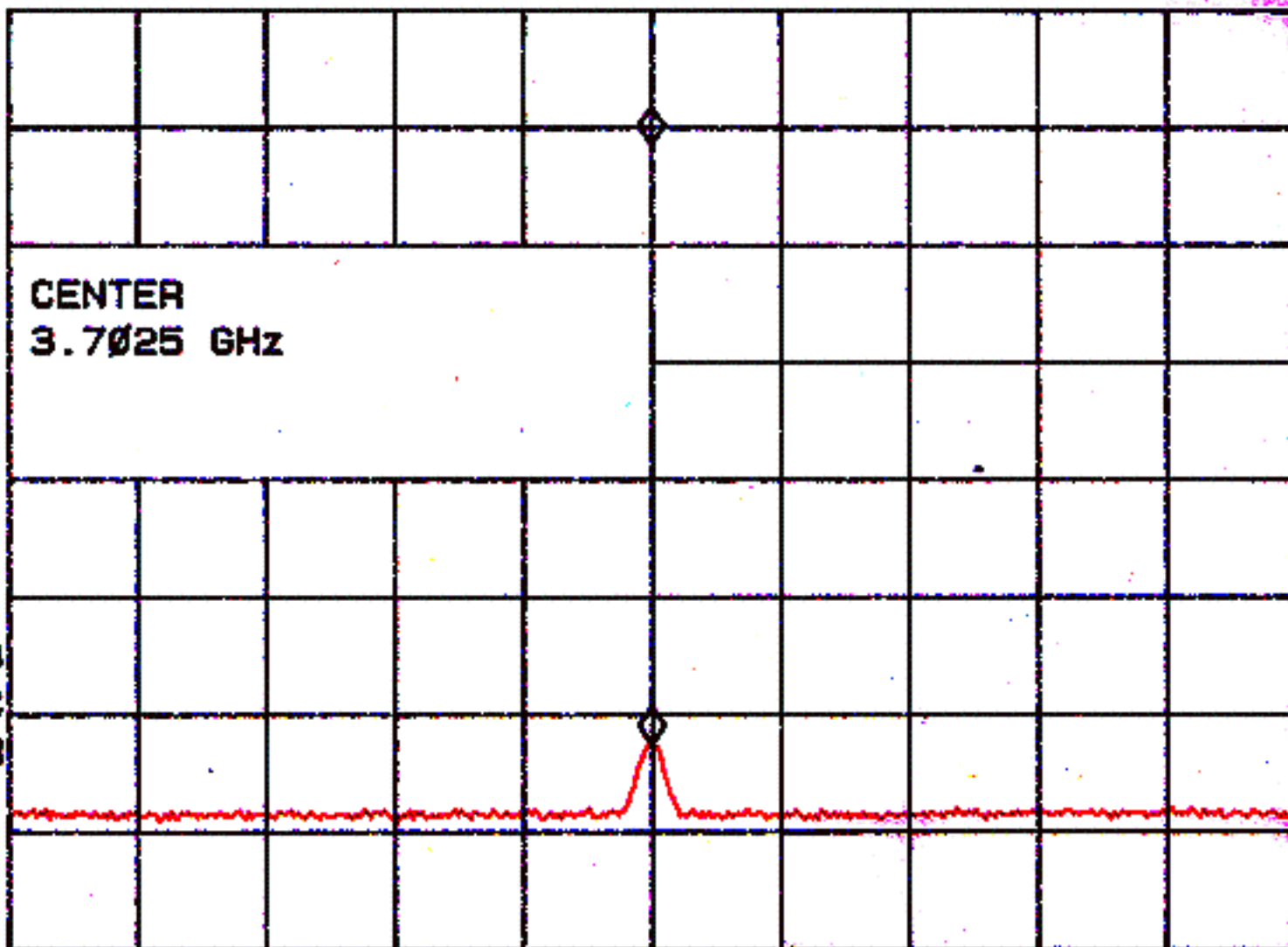
AVG

100

WA SB

SC FC

CORR



CENTER 3.7025 GHz

RES BW 1.0 MHz

VBW 300 kHz

SPAN 100.0 MHz

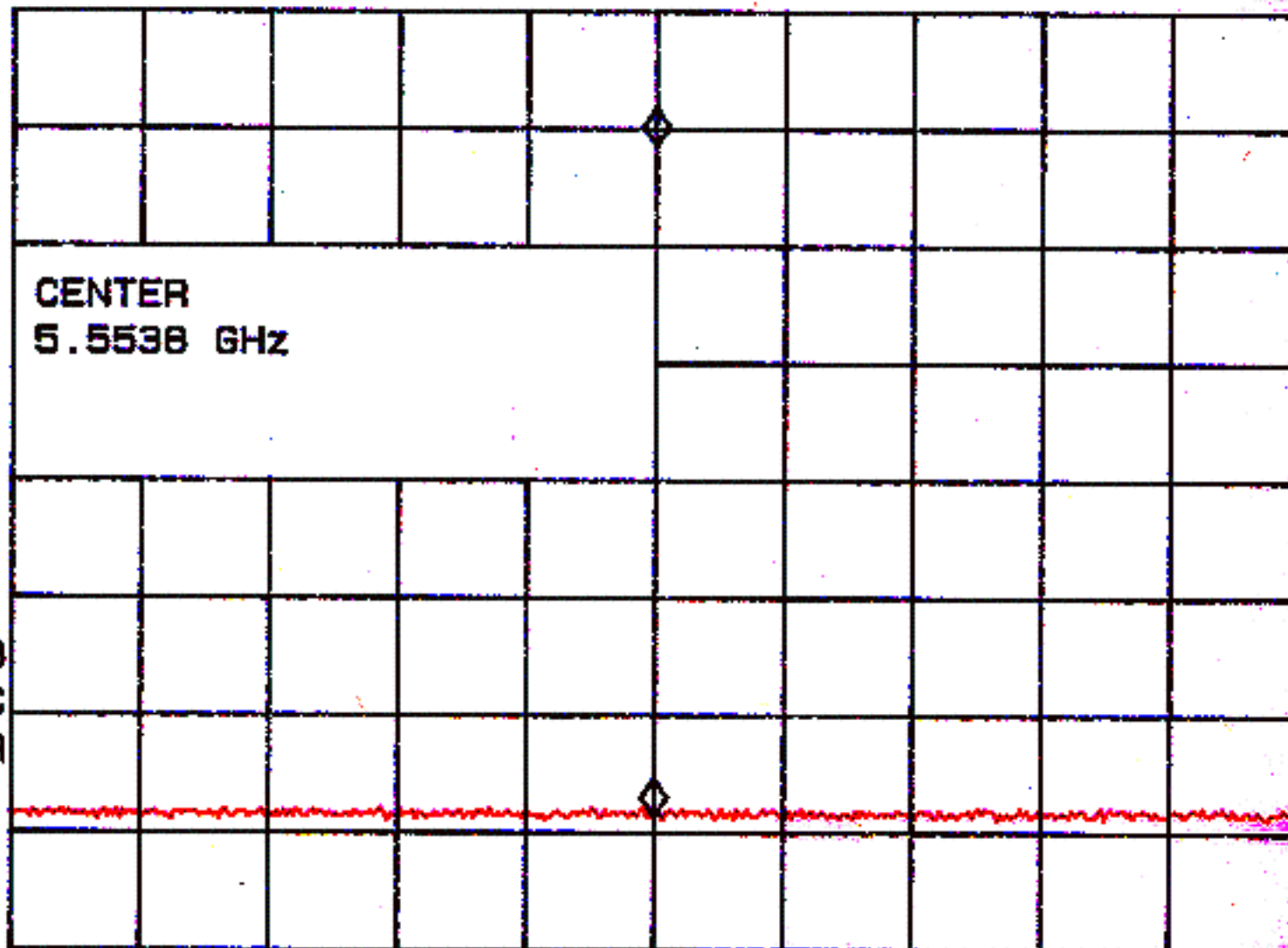
SWP 20.0 msec

23:02:02 APR 28, 1999

MKR Δ 3.7025 GHz
-57.17 dB

REF 11.0 dBm AT 30 dB

SMPL
LOG
10
dB/



AVG
100

WA SB
SC FC
CORR

CENTER 5.5538 GHz

RES BW 1.0 MHz

VBW 300 kHz

SPAN 100.0 MHz

SWP 20.0 msec

23:04:48 APR 28, 1999

MKR Δ 5.5537 GHz

REF 11.0 dBm

AT 30 dB

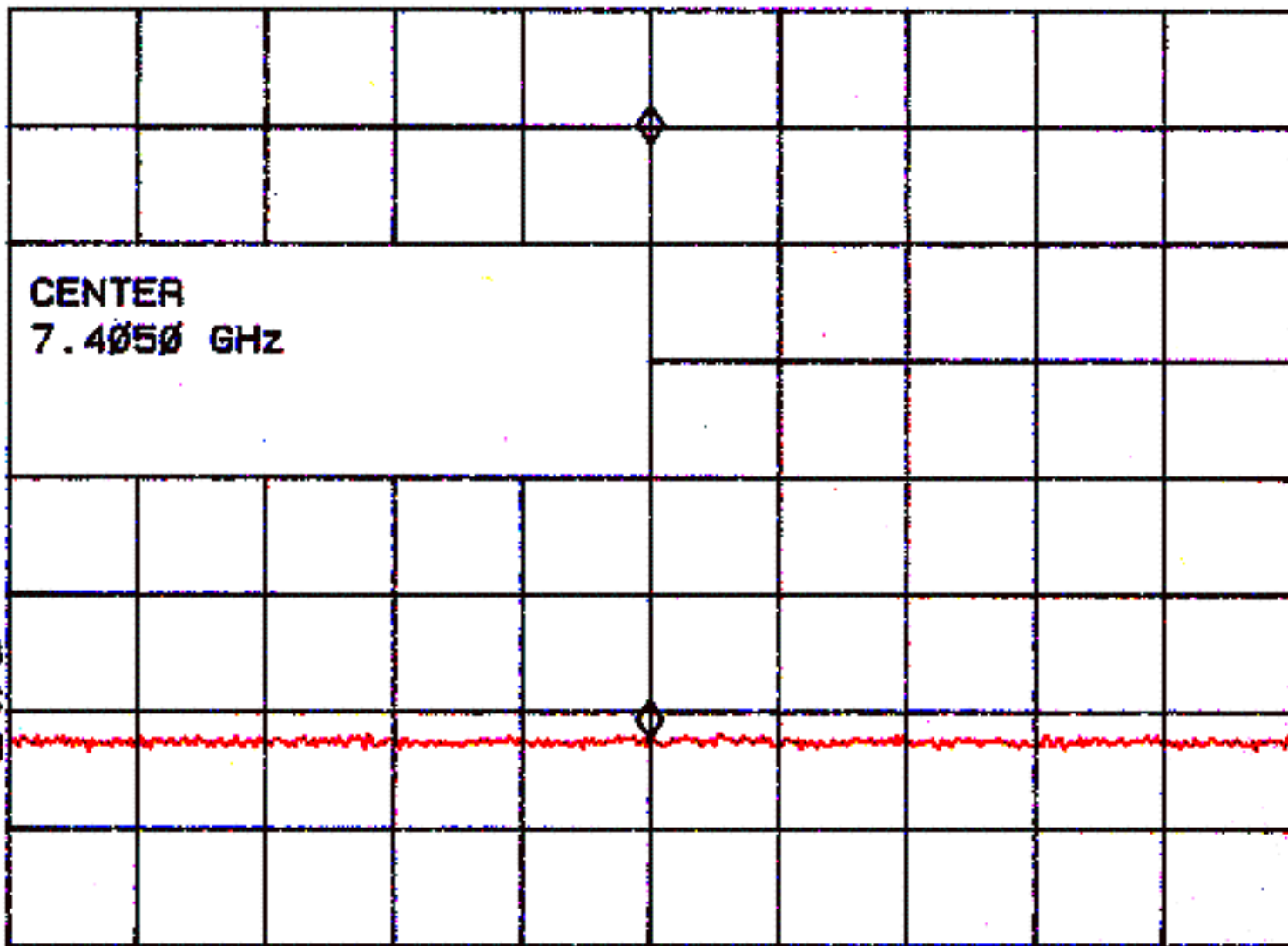
-50.83 dB

SMPL

LOG

10

dB/



CENTER
7.4050 GHz

AVG

100

WA SB

SC FC

CORR

CENTER 7.4050 GHz

RES BW 1.0 MHz

VBW 300 kHz

SPAN 100.0 MHz

SWP 20.0 msec

23: 08: 08 APR 28, 1999

10

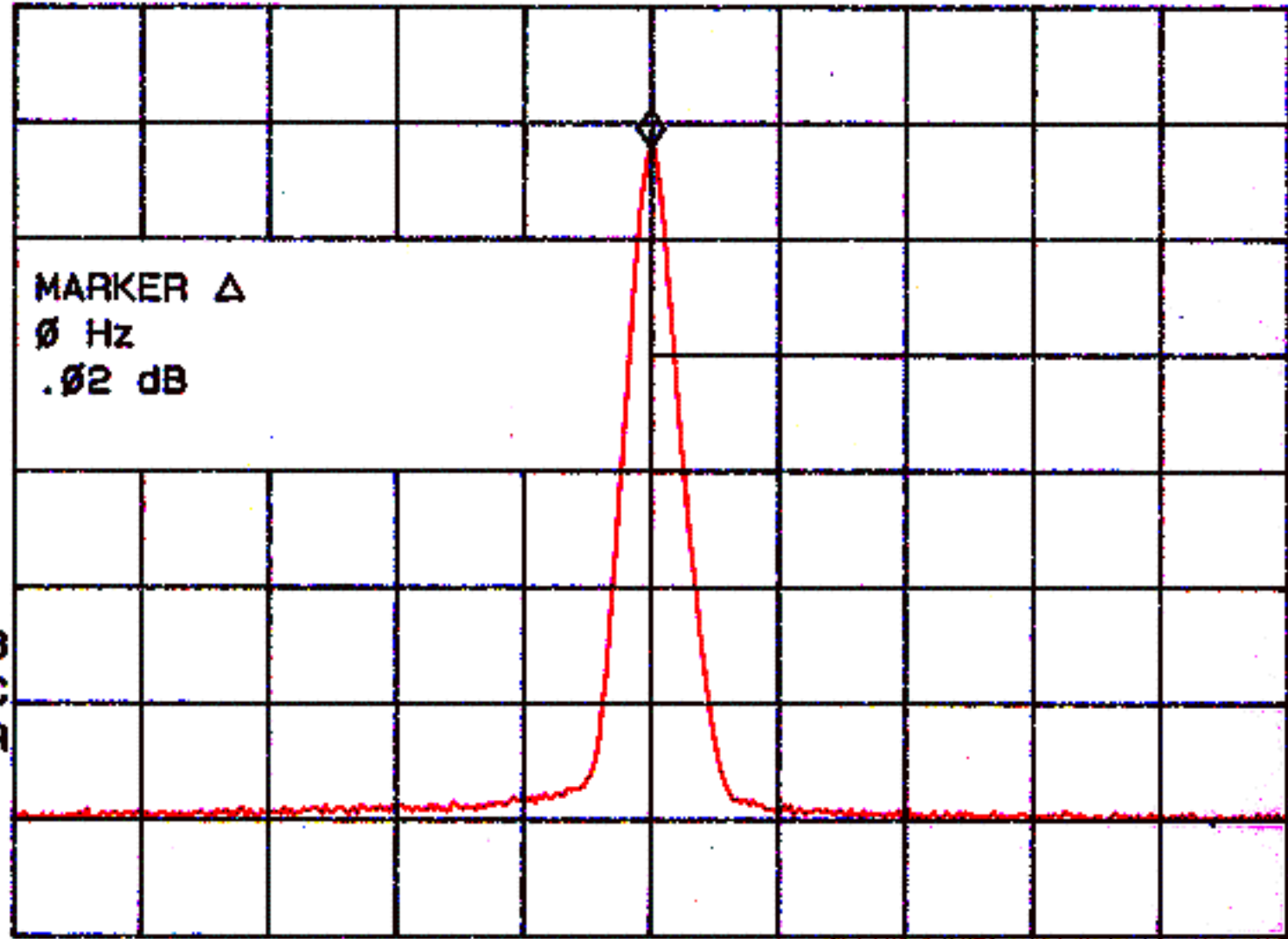
REF 11.0 dBm

AT 30 dB

MKR Δ 0 Hz

.02 dB

SMPL
LOG
10
dB/



MARKER Δ
0 Hz
.02 dB

AVG
100

WA SB
SC FC
CORR

CENTER 1.8800 GHz

RES BW 1.0 MHz

VBW 300 kHz

SPAN 100.0 MHz

SWP 20.0 msec

23: 12: 31 APR 28, 1999

MKR Δ 1.8800 GHz

REF 11.0 dBm

AT 30 dB

-50.37 dB

SMPL

LOG

10

dB/

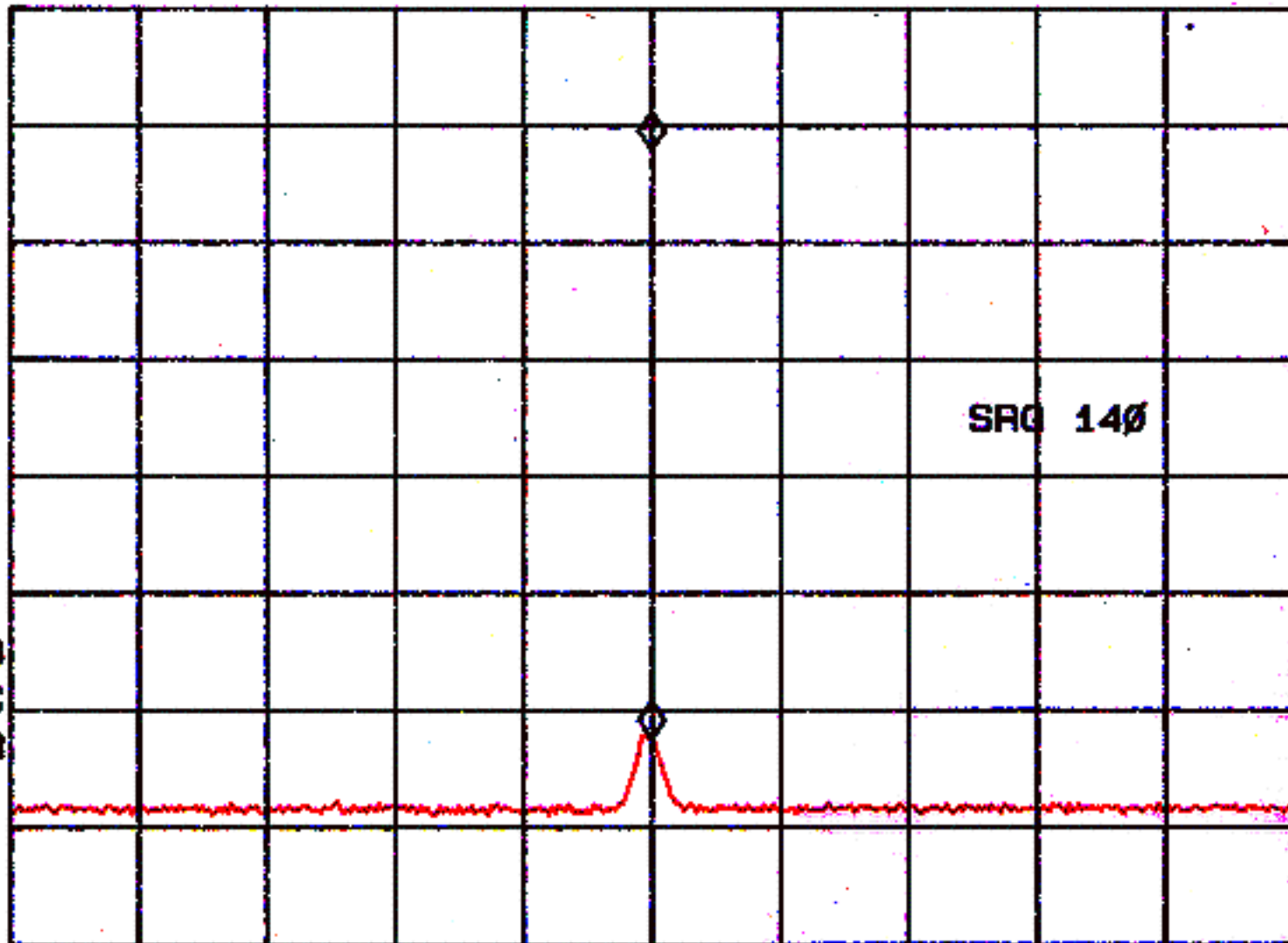
AVG

100

WA SB

SC FC

CORR



SRG 140

CENTER 3.7600 GHz

RES BW 1.0 MHz

VBN 300 kHz

SPAN 100.0 MHz

SWP 20.0 msec

23: 15: 33 APR 28, 1999

MKR Δ 3.7600 GHz

REF 11.0 dBm

AT 30 dB

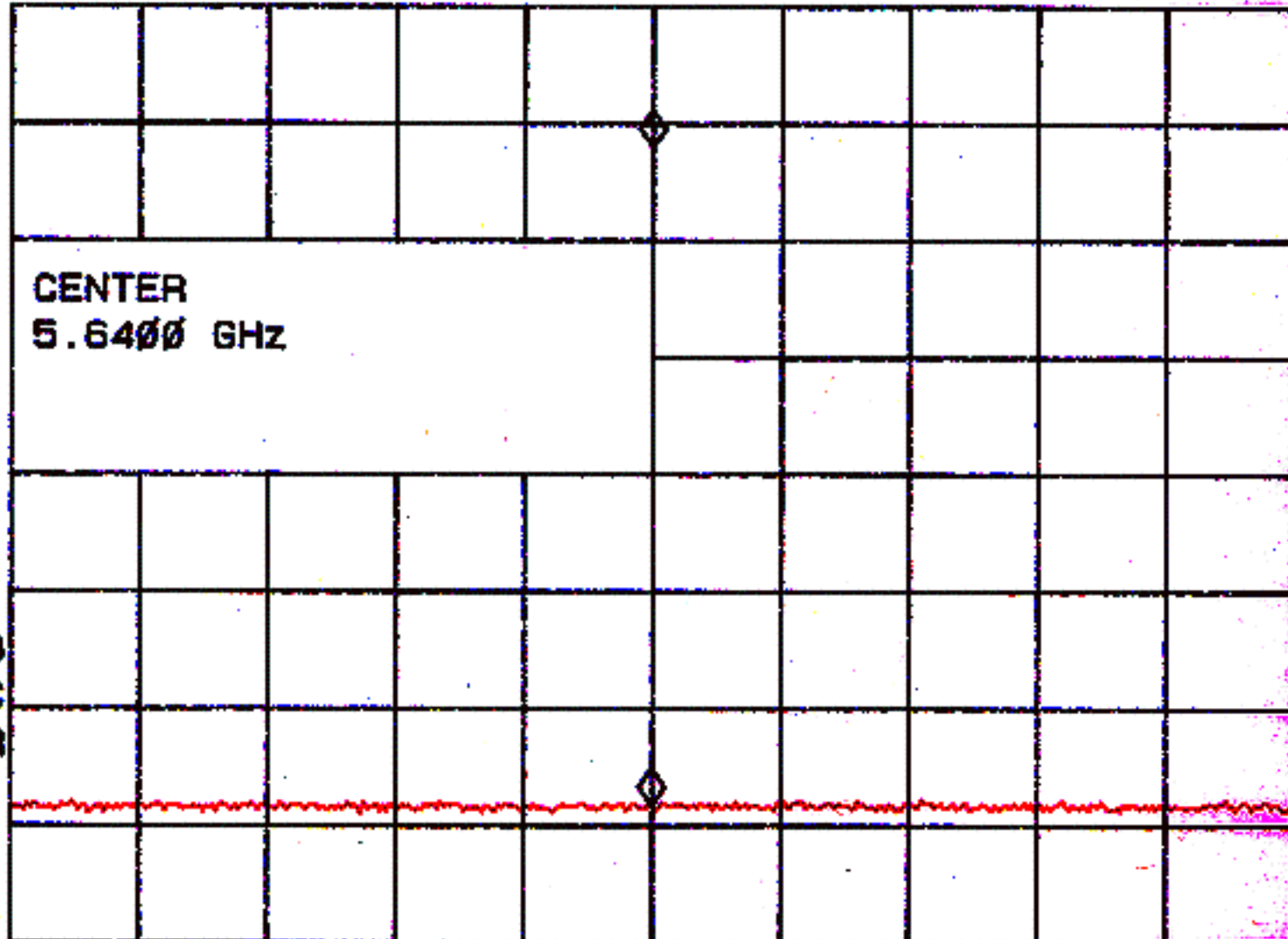
-56.22 dB

SMPL

LOG

10

dB/



CENTER
5.6400 GHz

AVG

100

WA SB

SC FC

CORR

CENTER 5.6400 GHz

RES BW 1.0 MHz

VBW 300 kHz

SPAN 100.0 MHz

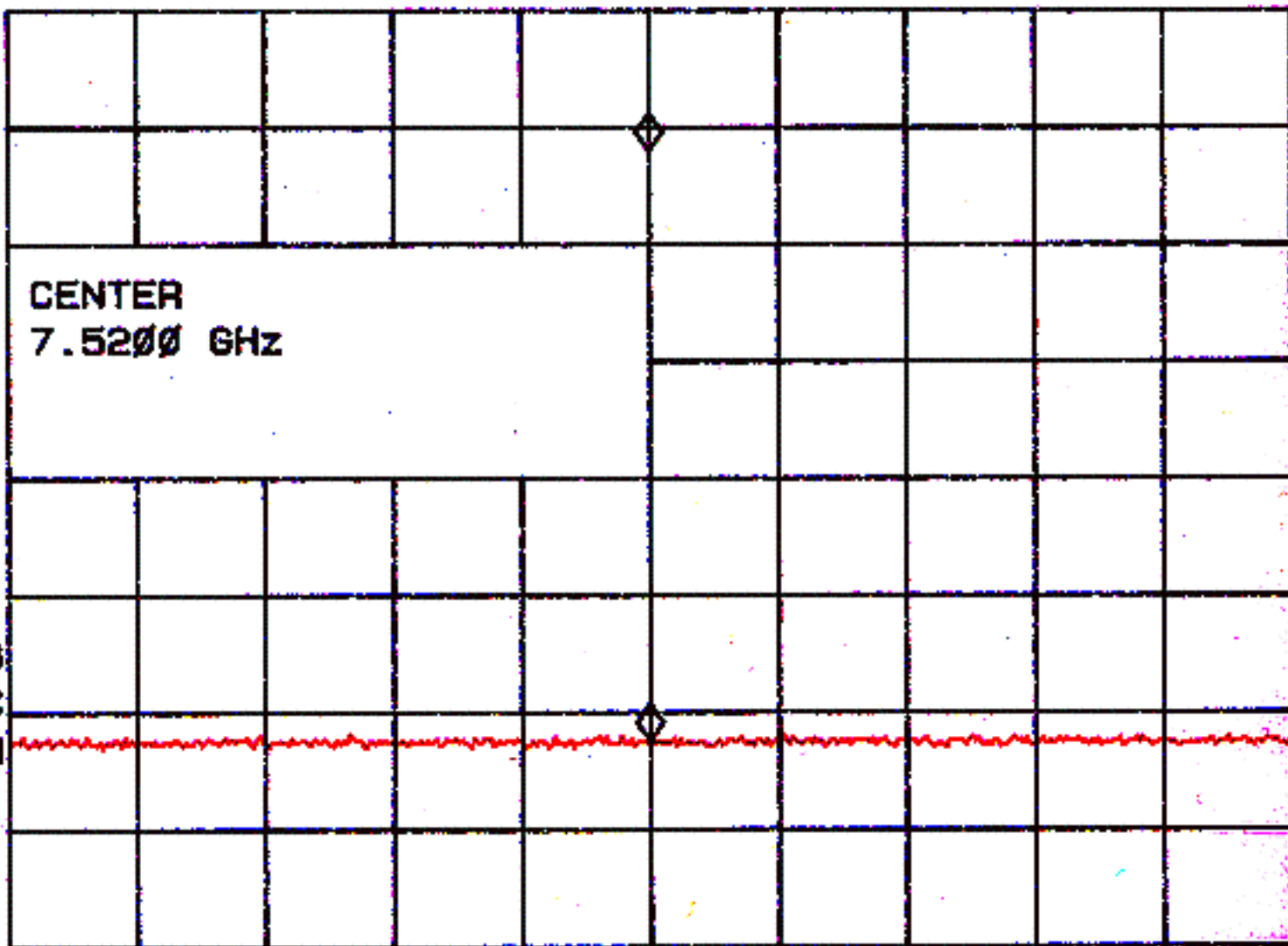
SWP 20.0 msec

23: 18: 34 APR 28, 1999

MKR Δ 5.6400 GHz
-50.40 dB

REF 11.0 dBm AT 30 dB

SMPL
LOG
10
dB/



AVG
100

WA SB
SC FC
CORR

CENTER 7.5200 GHz

RES BW 1.0 MHz

VBW 300 kHz

SPAN 100.0 MHz

SWP 20.0 msec

23: 22: 51 APR 28, 1999

~~17~~

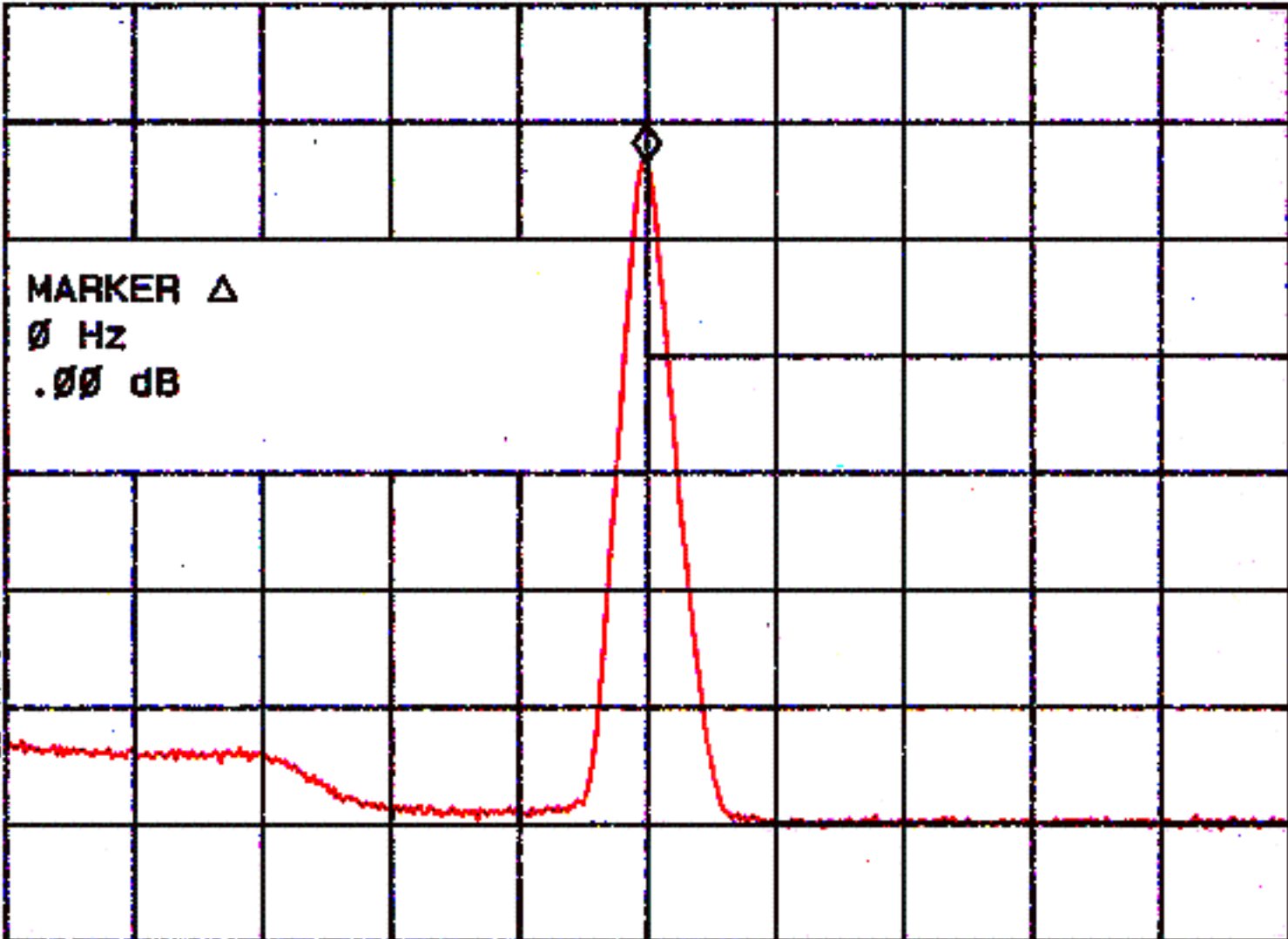
REF 11.0 dBm

AT 30 dB

MKR Δ 0 Hz

.00 dB

SMPL
LOG
10
dB/



MARKER Δ
0 Hz
.00 dB

AVG
100

WA SB
SC FC
CORR

CENTER 1.9088 GHz

RES BW 1.0 MHz

VBW 300 kHz

SPAN 100.0 MHz

SWP 20.0 msec

23: 25: 42 APR 28, 1999

MKR Δ 1.9087 GHz

REF 11.0 dBm

AT 30 dB

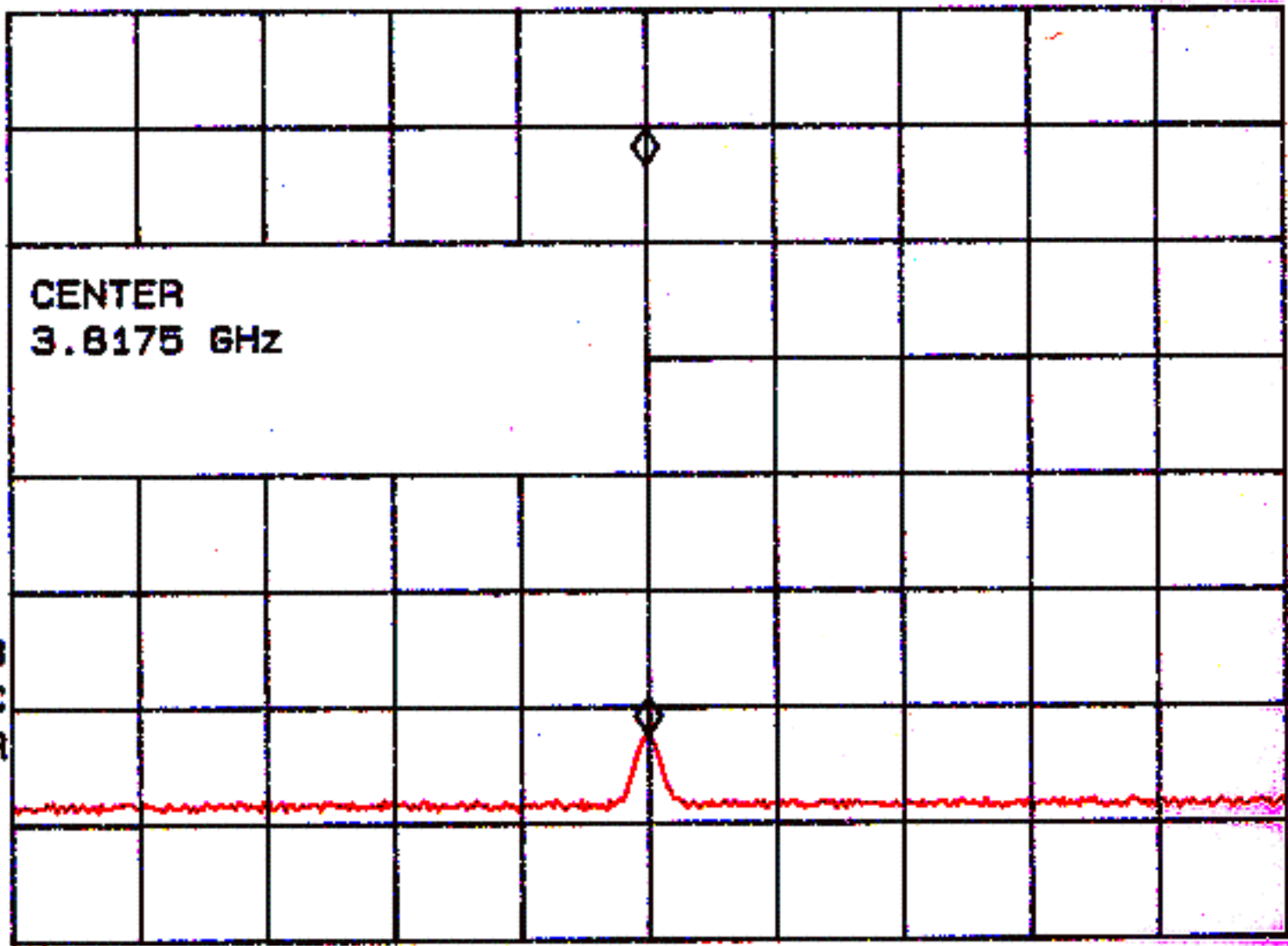
-49.01 dB

SMPL
LOG
10
dB/

CENTER
3.8175 GHz

AVG
100

WA SB
SC FC
CORR



CENTER 3.8175 GHz

RES BW 1.0 MHz

VBW 300 kHz

SPAN 100.0 MHz

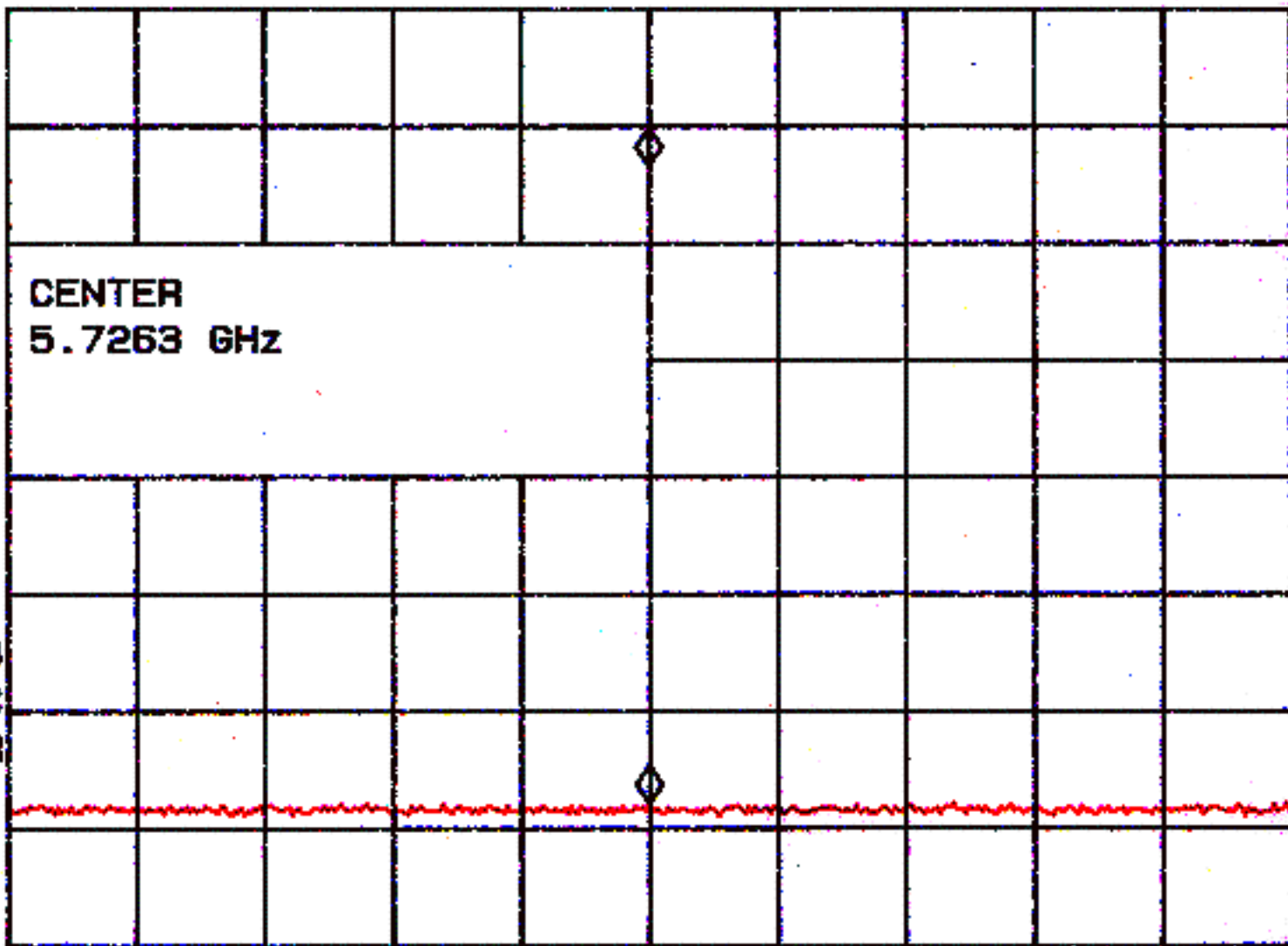
SWP 20.0 msec

23: 28: 28 APR 28, 1999

MKR Δ 3.8175 GHz
-54.44 dB

REF 11.0 dBm AT 30 dB

SMPL
LOG
10
dB/



CENTER
5.7263 GHz

AVG
100

WA SB
SC FC
CORR

CENTER 5.7263 GHz
RES BW 1.0 MHz

VBW 300 kHz

SPAN 100.0 MHz
SNP 20.0 msec

23: 31: 15 APR 28, 1999

MKR Δ 5.7262 GHz

REF 11.0 dBm

AT 30 dB

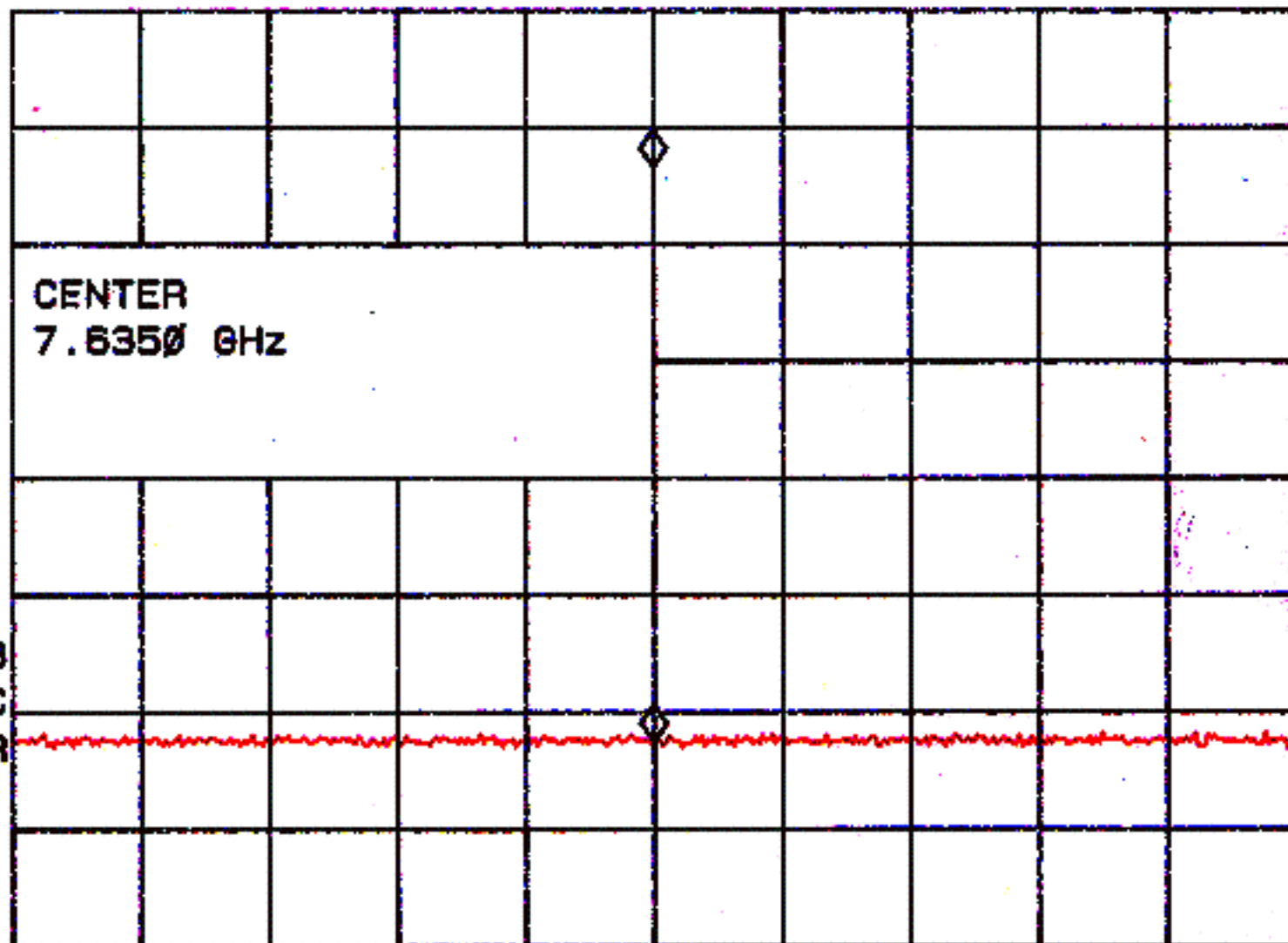
-49.17 dB

SMPL

LOG

10

dB/



AVG

100

WA SB

SC FC

CORR

CENTER 7.6350 GHz

RES BW 1.0 MHz

VBW 300 kHz

SPAN 100.0 MHz

SWP 20.0 msec

Summary of Transmit Frequency

Drift Vs. Temperature

APPLICANT: MOTOROLA

TRANSCEIVER TYPE: IHET6ZD1

Table 1:

Ambient Temperature Degrees C	Lowest Channel Frequency Error Hz Drift from Nominal Channel Center	Highest Channel Frequency Error Hz Drift from Nominal Channel Center
-30	-35	37
-20	-31	22
-10	-20	34
0	-32	25
10	-49	37
20	-33	25
30	-45	29
40	-34	31
50	-32	36

Summary of Transmit Frequency

Drift Vs. Line Voltage

APPLICANT: MOTOROLA

TRANSCEIVER TYPE: IHET6ZD1

Table 1:

Power Supply Line Voltage	Lowest Channel Frequency Error Hz Drift from Nominal Channel Center	Highest Channel Frequency Error Hz Drift from Nominal Channel Center
102Vac	-31	39
120Vac	-29	28
138Vac	-33	37

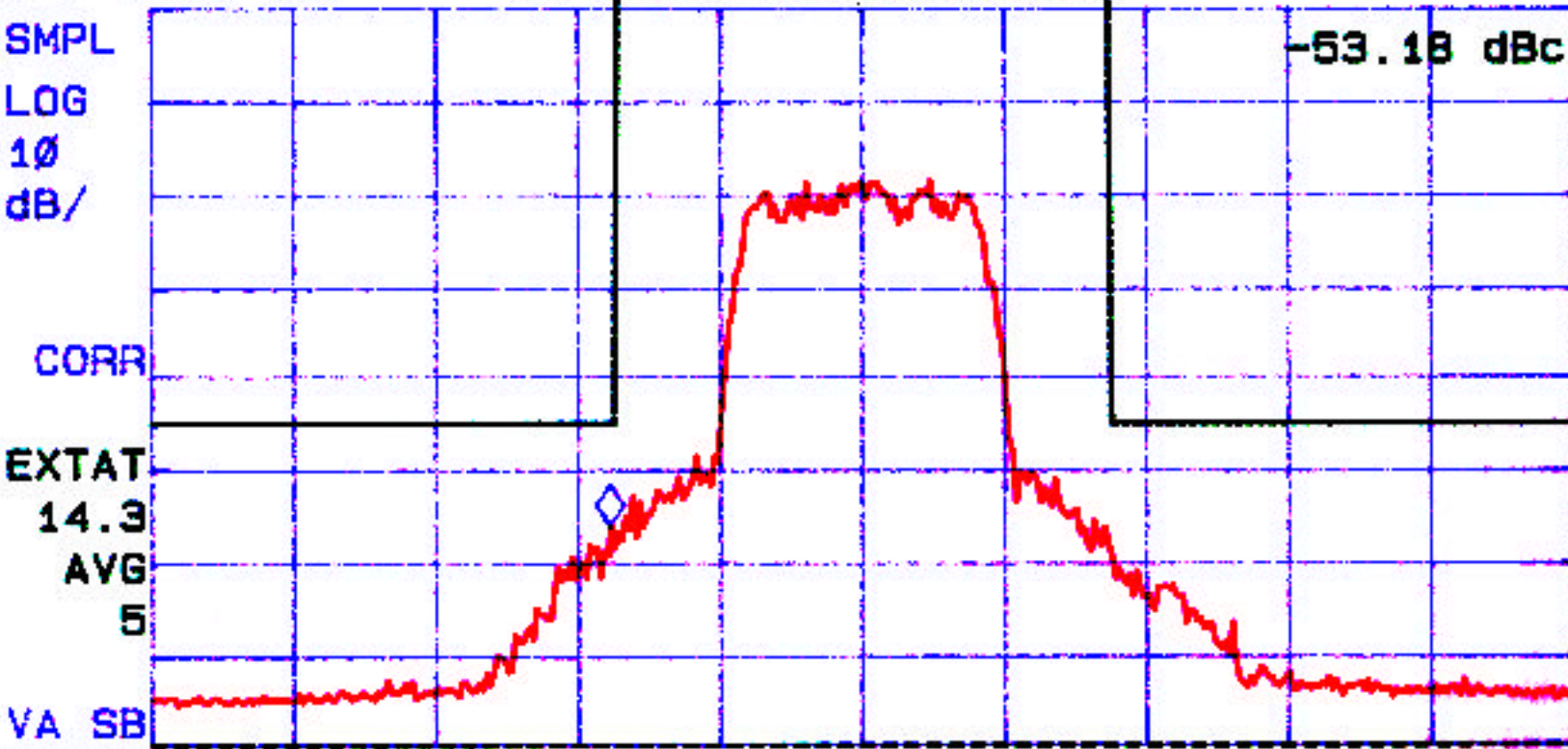
21: 12: 49 APR 26, 1999

MKR 1.849972 GHz

REF 26.8 dBm

AT 30 dB

-29.35 dBm



SC FS MS CH 25

START 1.847650 GHz

STOP 1.854850 GHz

#RES BW 30 KHZ

#VBW 3 KHZ

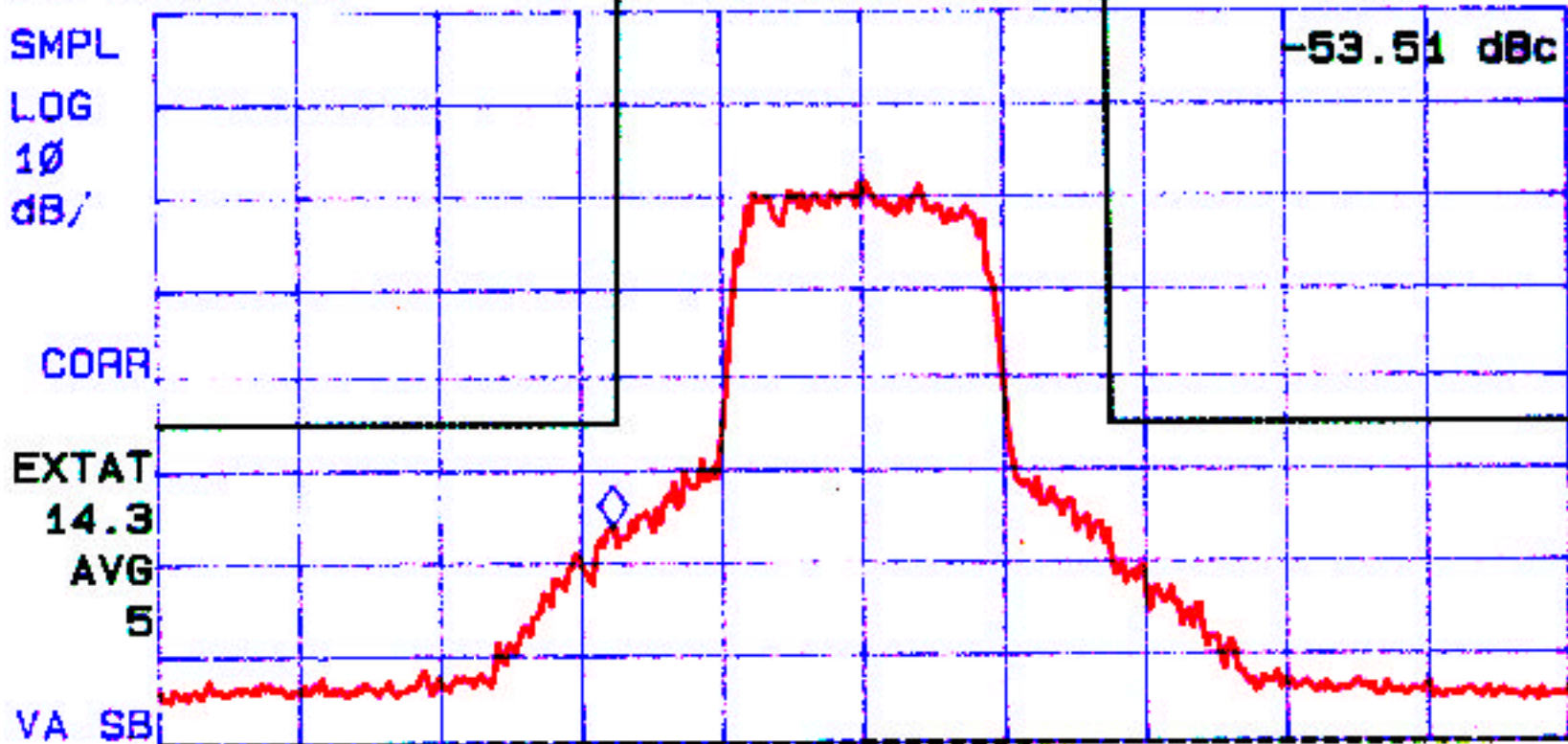
SWP 240 msec

SPUR CLOSE ($\Delta f_c \leq 25$ MHz) [FAST]		PASS
a) (dBc/30kHz) Fc $\Delta 1m - 11.2$ dB P		Chan Power
		23.8 dBm

20:59:58 APR 26, 1999

MKR 1.878722 GHz
-29.99 dBm

REF 26.3 dBm AT 30 dB



SC FS MS CH 600

START 1.876400 GHz

STOP 1.883600 GHz

#RES BW 30 KHz

#VBW 3 KHz

SWP 240 msec

SPUR CLOSE ($\Delta f_c \leq 25$ MHz) [FAST] PASS	
a) (dBc/30kHz) Fc Δ Lim - 11.3 dB P	Chan Power
	23.3 dBm

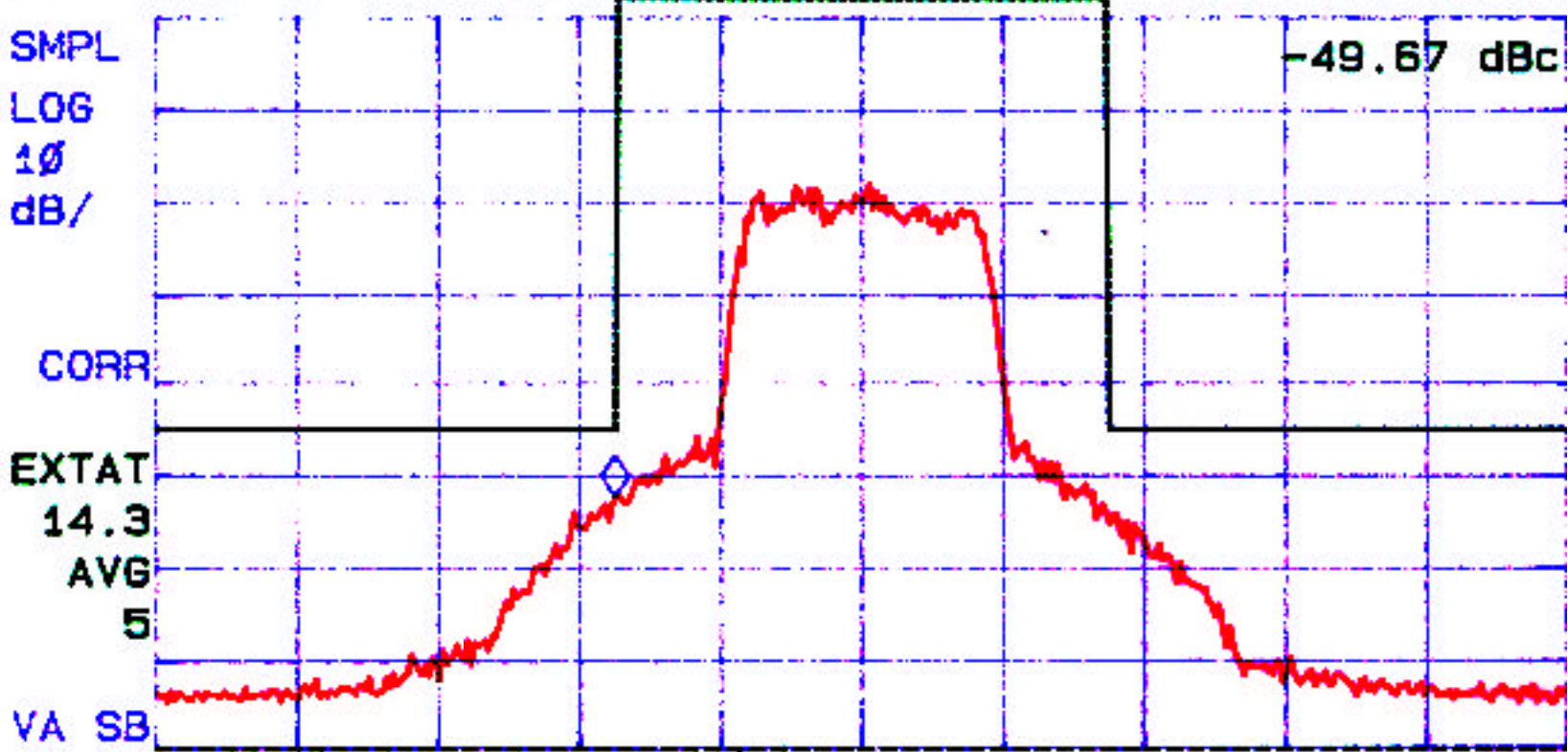
21:20:44 APR 26, 1999

MKR 1.907490 GHz

REF 26.7 dBm

AT 30 dB

-25.74 dBm



-49.67 dBc

SC FS MS CH 1175

START 1.905150 GHz

STOP 1.912350 GHz

#RES BW 30 KHz

#VBW 3 KHz

SWP 240 msec

SPUR CLOSE ($\Delta f_c \leq 25$ MHz)			[FAST]	PASS
a)	(dBc/30kHz)	Fc Δ lim	-7.5 dB P	
				Chan Power
				23.7 dBm

HP 8924C CDMA Mobile Station Test Set: 04/28/99 02:56:00 pm
CDMA Channel Assignment **25** T

CDMA CELLULAR MOBILE TRANSMITTER TEST

Traffic Rho	0.987	Phs Error	5.0
Freq Error	-7.4 Hz	Chan Power	1.37 dBm

Meas Cntl Single/Cont	Traffic Data Mode Svc Opt 3	Sctr A Pwr -76.0 dBm/BW	To Screen <input checked="" type="radio"/> CDMA CALL CNTL SMS AUTHN
	Data Rate Full	RF Power -76.00 dBm/BW	<input type="radio"/> Analog RX TEST
	Power Meas Calibrate		Confis TESTS

HP 8924C CDMA Mobile Station Test Set: 04/28/99 02:54:00 pm
 CDMA Channel Assignment **600** ↑

CDMA CELLULAR MOBILE TRANSMITTER TEST

Traffic Rho	0.987	Phs Error	5.0
Freq Error	-0.7 Hz	Chan Power	1.28 dBm

Meas Cntl <u>Sineler/Cont</u>		Traffic Data Mode <u>Svc Opt 2</u> Data Rate <u>Full</u> Power Meas <u>Calibrate</u>	Sctr A Pwr <u>-76.0</u> dBm/BW RF Power <u>-76.00</u> dBm/BW	To Screen <input checked="" type="radio"/> CDMA <u>CALL CNTL</u> <u>SMS</u> <u>AUTHEN</u> <input type="radio"/> Analog <u>RX TEST</u> Confis <u>TESTS</u>
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HP 8924C CDMA Mobile Station Test Set: 04/29/99 02:22:00 pm
CDMA Channel Assignment **1175** T

CDMA CELLULAR MOBILE TRANSMITTER TEST

Traffic Rho	0.986	Rhs Error	5.4 dec
Freq Error	-5.8 Hz	Chan Power	0.49 dBm

Meas Cntl Single/Cont		Traffic Data Mode Sub Opt 2	Sctr A Pwr -75.0 dBm/BW	To Screen
		Data Rate Full	RF Power -75.00 dBm/BW	<input checked="" type="radio"/> CDMA CALL CNTL SMS RUIHEN
		Power Meas Calibrate		<input type="radio"/> Analog RX TEST
				Confis TESTS