

SC4812ETL @ 1.9 GHz CDMA BTS

TEST REPORT EXHIBIT

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MOTOROLA

Cellular Infrastructure Group

FCC ID: IHET6AP1

SECTION A

Summary of RF Measurements

APPLICANT: MOTOROLA

TRANSCEIVER TYPE: IHET6AP1

Summary of Radiated RF Measurements

WORST TRANSMIT RADIATED RF SPUR LEVEL FOR SC4812ETL @1.9 GHz BTS

SPUR FREQUENCY (MHz)	DISTANCE MEASURED (meters)	SPUR LEVEL MEASURED (dB μ V/meter)	SPUR LEVEL MEASURED (dBm)	FCC MAX LIMIT dBm
75.5487	10	24.93	-59.84	-55.27

Engineer: _____

 10/2/00
Date

APPLICANT: MOTOROLA

TRANSCIVER TYPE: IHET6AP1

Summary of Conducted RF Measurements

SC4812ETL @1.9GHz

FCC Part 24 at 46 dBm output (Max power)

CHANNEL	FREQUENCY (MHz)	SPUR LEVEL MEASURED (dBμV/meter)	SPUR LEVEL MEASURED (dBm)	FCC MAX LIMIT dBm
25	5793.149	88.91	-18.09	-13

Engineer: _____



10/2/00
Date



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SECTION B

Modulation Characteristics

Maximum Power

Channel 25
Maximum Power

IHET6AP1
SC4812ETL 1.9GHz
CDMA BTS

Tue Sep 12 2000 11:48

Waveform Quality (CDMA FWD Link, 9600/14400bps)

Results

ρ (Waveform Quality Factor) :	0.98003	
τ (Time Alignment Error) :	1.04	μs
:	1	chip
Carrier Frequency Error :	-2.6	Hz
Carrier Feedthrough :	-36.82	dBc
Magnitude Error :	10.03	% rms
Phase Error :	5.90	deg. rms
Error Vector Magnitude :	14.29	% rms
PN Offset :	0	
Ext. Trigger Delay :	0.000	chip

Parameters

Frequency	:	25 Ch (1931.250MHz)
Reference Level	:	17.0 dBm
Attenuator	:	30.0 dB

PASS

OK...

Channel 1175
Maximum Power

IHET6AP1
SC4812ETL 1.9GHz
CDMA BTS

Mon Sep 11 2000 18:19

Waveform Quality (CDMA FWD Link, 9600/14400bps)

Results

ρ (Waveform Quality Factor) :	0.97965	
τ (Time Alignment Error) :	0.93	μ s
	1	chip
Carrier Frequency Error :	-3.2	Hz
Carrier Feedthrough :	-32.32	dBc
Magnitude Error :	10.08	% rms
Phase Error :	6.08	deg. rms
Error Vector Magnitude :	14.53	% rms
PN Offset :	0	
Ext. Trigger Delay :	0.000	chip

Parameters

PASS

Frequency	:	1.988750000 GHz
Reference Level	:	17.0 dBm
Attenuator	:	30.0 dB

CENTER
1.988750000 GHz

OK...



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FCC ID: IHET6AP1

Modulation Characteristics

Minimum Power

Channel 25
Minimum Power

IHET6AP1
SC4812ETL 1.9GHz
CDMA BTS

Tue Sep 12 2000 11:33

Waveform Quality (CDMA FWD Link, 9600/14400bps)

Results

ρ (Waveform Quality Factor) :	0.98006	
τ (Time Alignment Error) :	1.04	μs
	1	chip
Carrier Frequency Error :	-1.8	Hz
Carrier Feedthrough :	-38.47	dBc
Magnitude Error :	9.97	% rms
Phase Error :	5.95	deg. rms
Error Vector Magnitude :	14.30	% rms
PN Offset :	0	
Ext. Trigger Delay :	0.000	chip

Parameters

Frequency : 25 Ch (1931.250MHz)
Reference Level : 5.0 dBm
Attenuator : 20.0 dB

PASS

OK...

Channel 1175
Minimum Power

IHET6AP1
SC4812ETL 1.9GHz
CDMA BTS

Tue Sep 12 2000 11:15

Waveform Quality (CDMA FWD Link, 9600/14400bps)

Results

ρ (Waveform Quality Factor) :	0.98359	
τ (Time Alignment Error) :	1.02	μs
	1	chip
Carrier Frequency Error :	2.0	Hz
Carrier Feedthrough :	-28.55	dBc
Magnitude Error :	9.06	% rms
Phase Error :	6.02	deg. rms
Error Vector Magnitude :	13.78	% rms
PN Offset :	0	
Ext. Trigger Delay :	0.000	chip

Parameters

PASS

Frequency	:	1.988750000 GHz
Reference Level	:	4.0 dBm
Attenuator	:	20.0 dB

OK...



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Cellular Infrastructure Group

FCC ID: IHET6AP1

SECTION C

Spurious & Harmonic Emissions Radiated

APPLICANT: MOTOROLA

TRANSCIVER TYPE: IHET6AP1

Radiated RF Measurements

WORST CASE RADIATED RF SPUR LEVEL FOR SC4812ETL @ 1.9GHz

Radiated 30-1000 MHz FCC 47 CFR part 15 Class B and part 24 measured at 10 Meter

Radiated 1 – 20 GHz FCC 47 CFR part 15 Class B and part 24 measured at 3 Meters

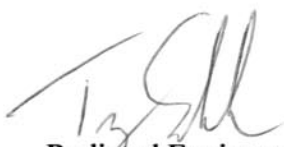
Spur Frequency (MHz)	Axis	Measured Signal Level dBm	Specification 47 CFR Part 15 Class B dBm	Pass/Fail
75.5487	Vertical	-59.84	-55.27	Pass

Converting dBuV/meter to dBm when at 3 meters.

1. $(\text{dBuV/M}) + 9.542 - 104.77\text{dB} = \text{dBm}$

Converting dBuV/meter to dBm when at 10 meters.

2. $(\text{dBuV/M}) + 20 - 104.77\text{dB} = \text{dBm}$


Radiated Engineer

10/2/00
Date



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SECTION D

Spurious & Harmonic Emissions Conducted

APPLICANT: MOTOROLA

TRANSCEIVER TYPE: IHET6AP1

Conducted RF Measurements

SC4812ETL @1.9GHz

FCC Part 24 at 46 dBm output (Max power)

CHANNEL	FREQUENCY (MHz)	SPUR LEVEL MEASURED (dBμV/meter)	SPUR LEVEL MEASURED (dBm)	FCC MAX LIMIT dBm
25	5793.149	88.91	-18.09	-13
1175	5966.237	88.42	-18.58	-13

FCC Max. Limit Per 47 CFR:

“ =Transmitted Power ($10 \log_{10} (P_{\text{watt}})$) - ($43 + 10 \log_{10} (P_{\text{watt}})$)dBW

“ = $10 \log_{10} (P_{\text{watt}})$ - ($43 + 10 \log_{10} (P_{\text{watt}})$)dBW

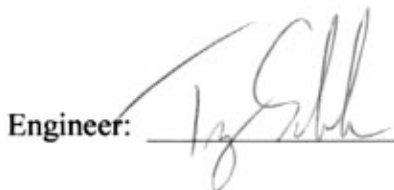
“ =-43 dBW

“ =-13 dBm

Conversion from dBuV to dBm:

$\text{dBuV} - 107 = \text{dBm}$

Engineer: _____



10/2/00
Date



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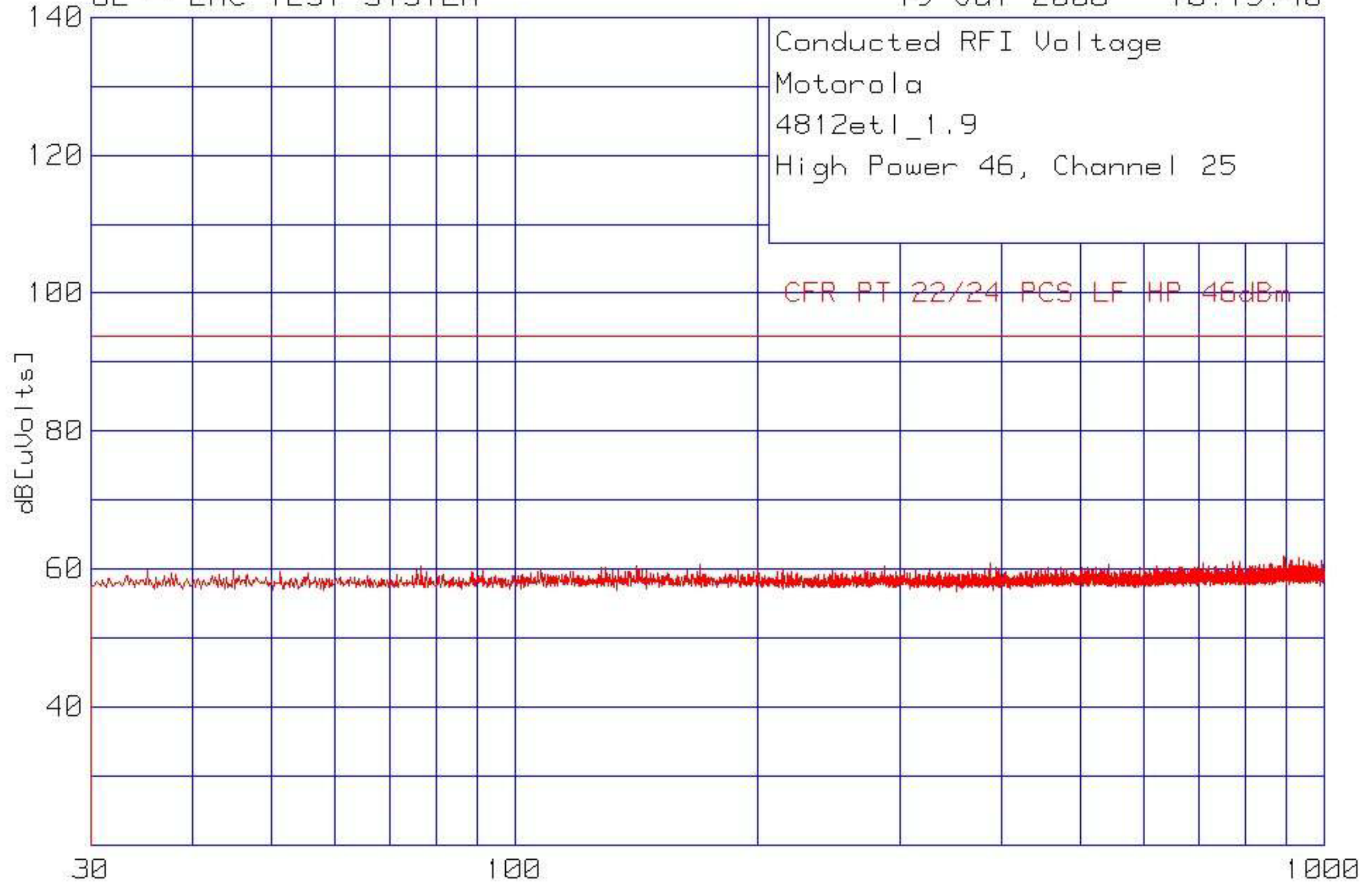
Cellular infrastructure group

FCC ID: IHET6AP1

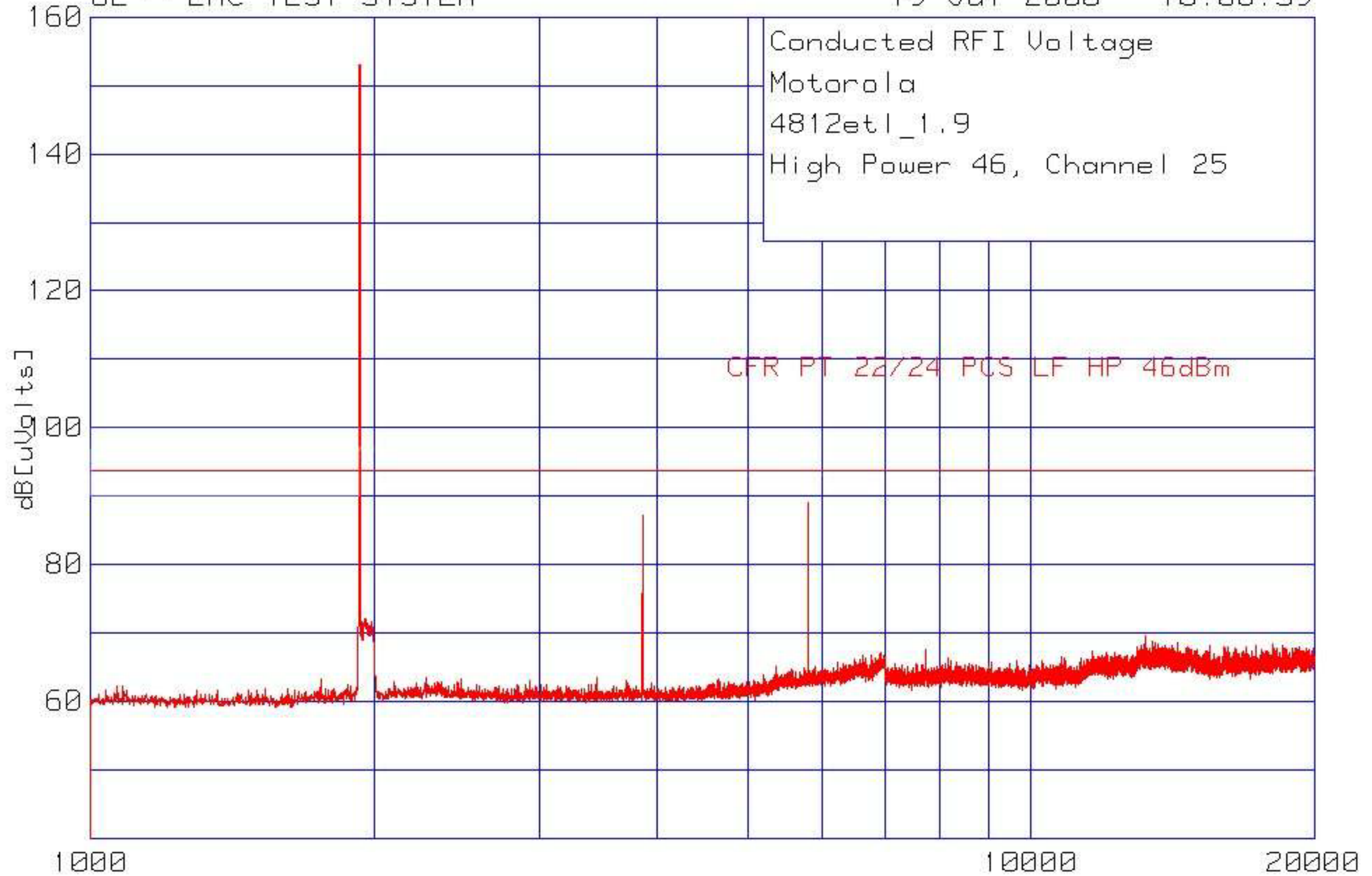
SPURIOUS & HARMONIC EMISSIONS CONDUCTED

CDMA Transmitter Channel 25

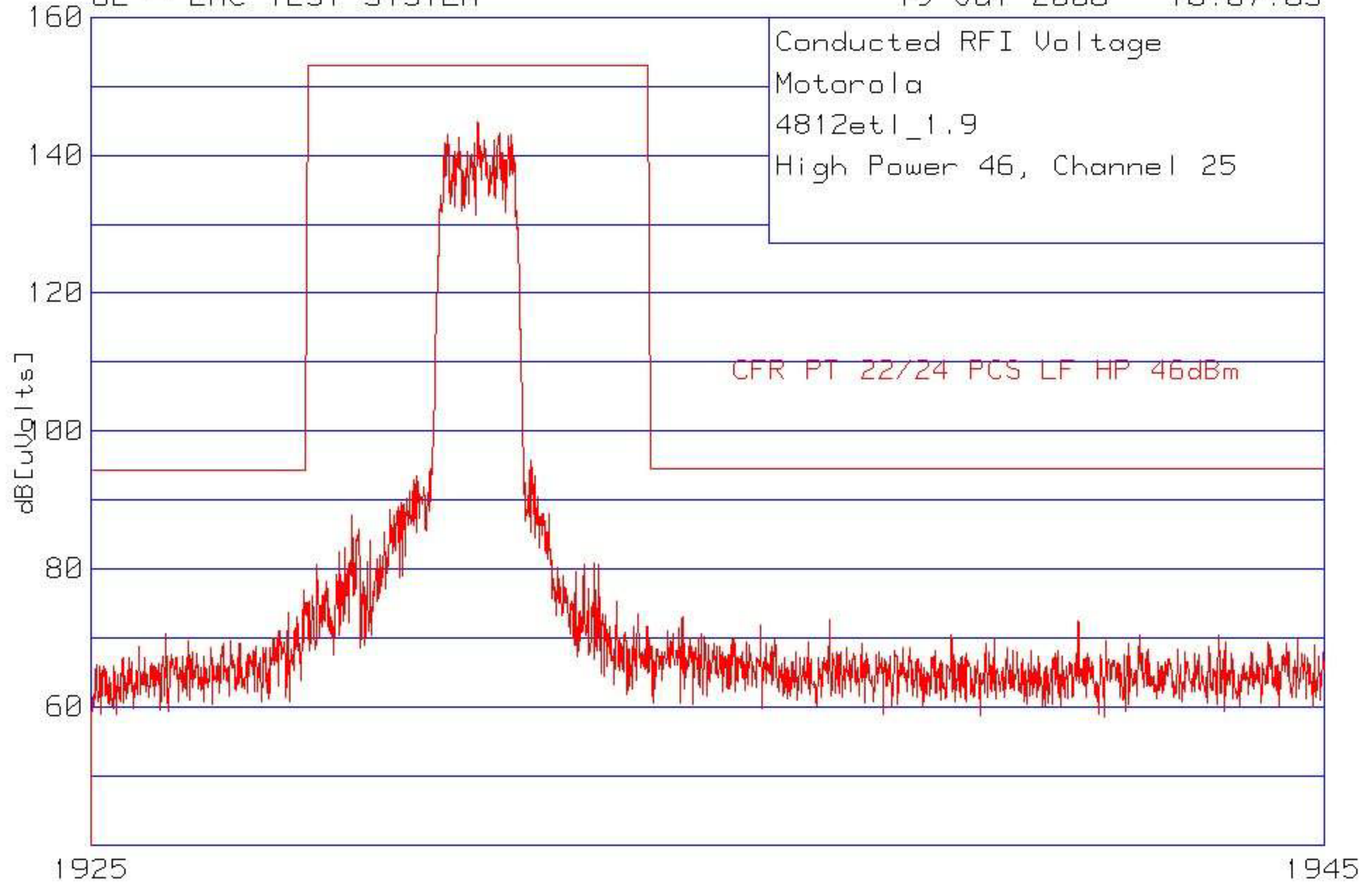
Maximum Power



IHET6AP1
SC4812ETL 1.9 GHz
CDMA BTS



IHET6AP1
SC4812ETL 1.9 GHz
CDMA BTS



IHET6AP1
SC4812ETL 1.9 GHz
CDMA BTS



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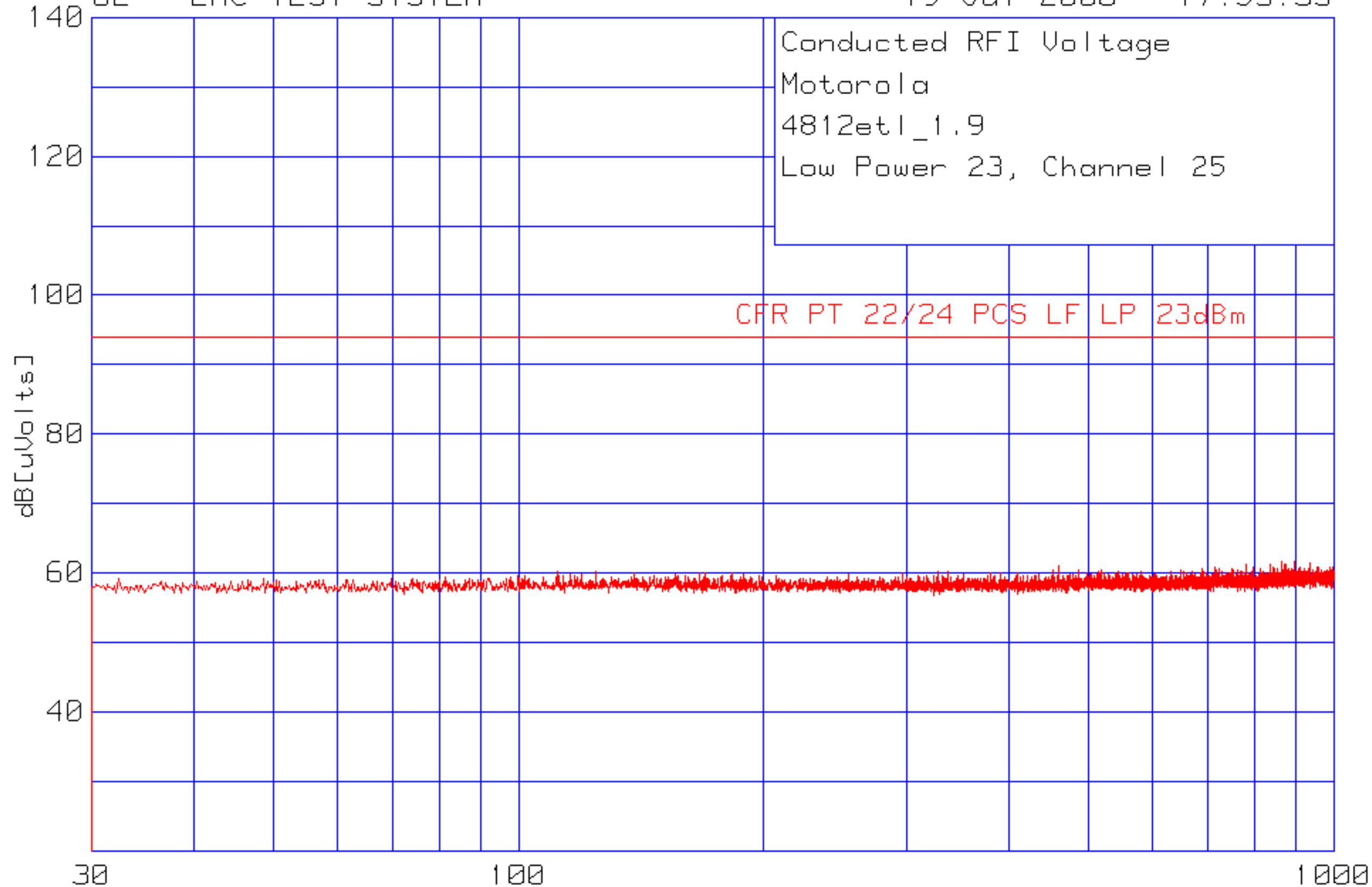
Cellular infrastructure group

FCC ID: IHET6AP1

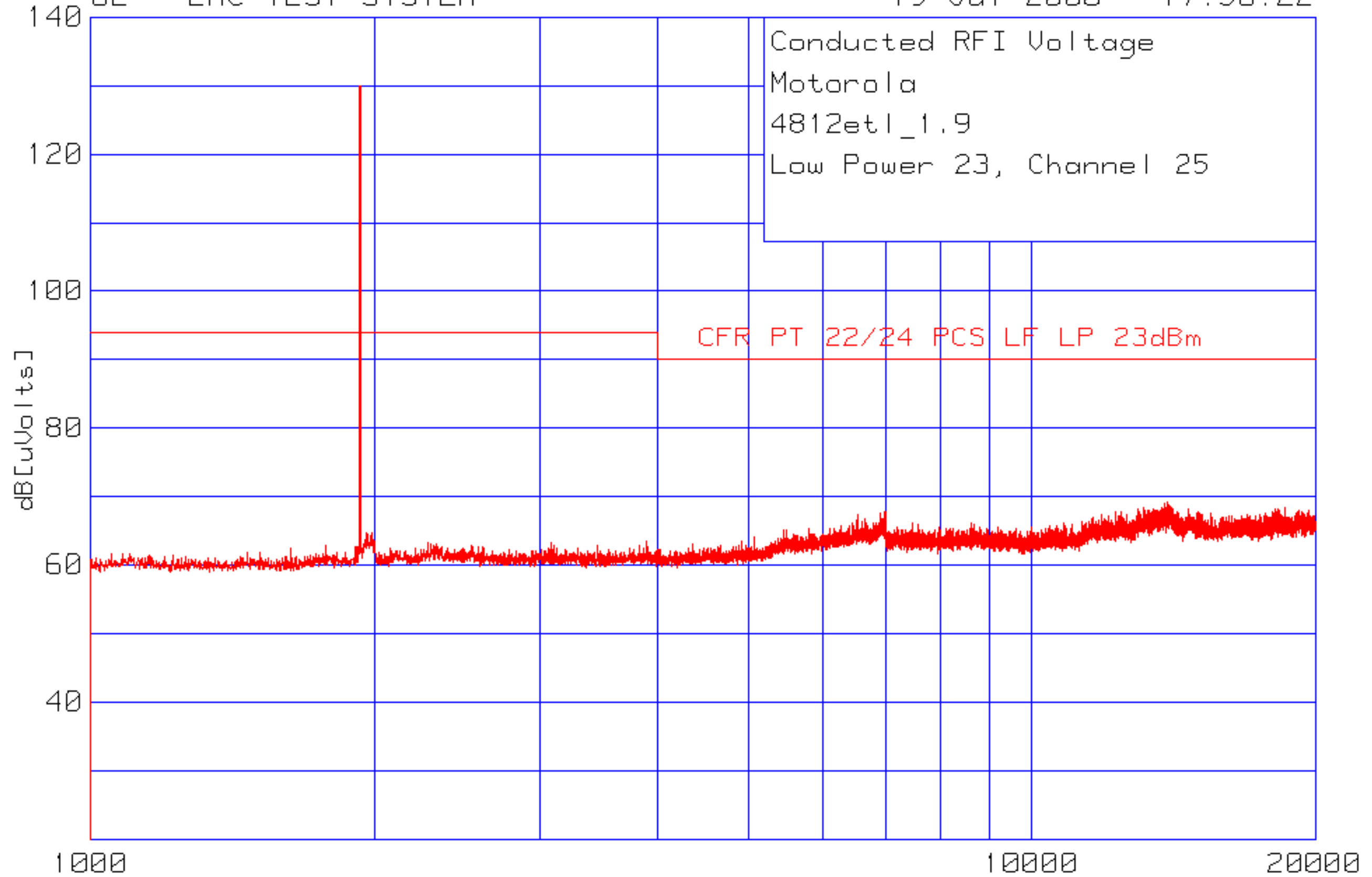
SPURIOUS & HARMONIC EMISSIONS CONDUCTED

CDMA Transmitter Channel 25

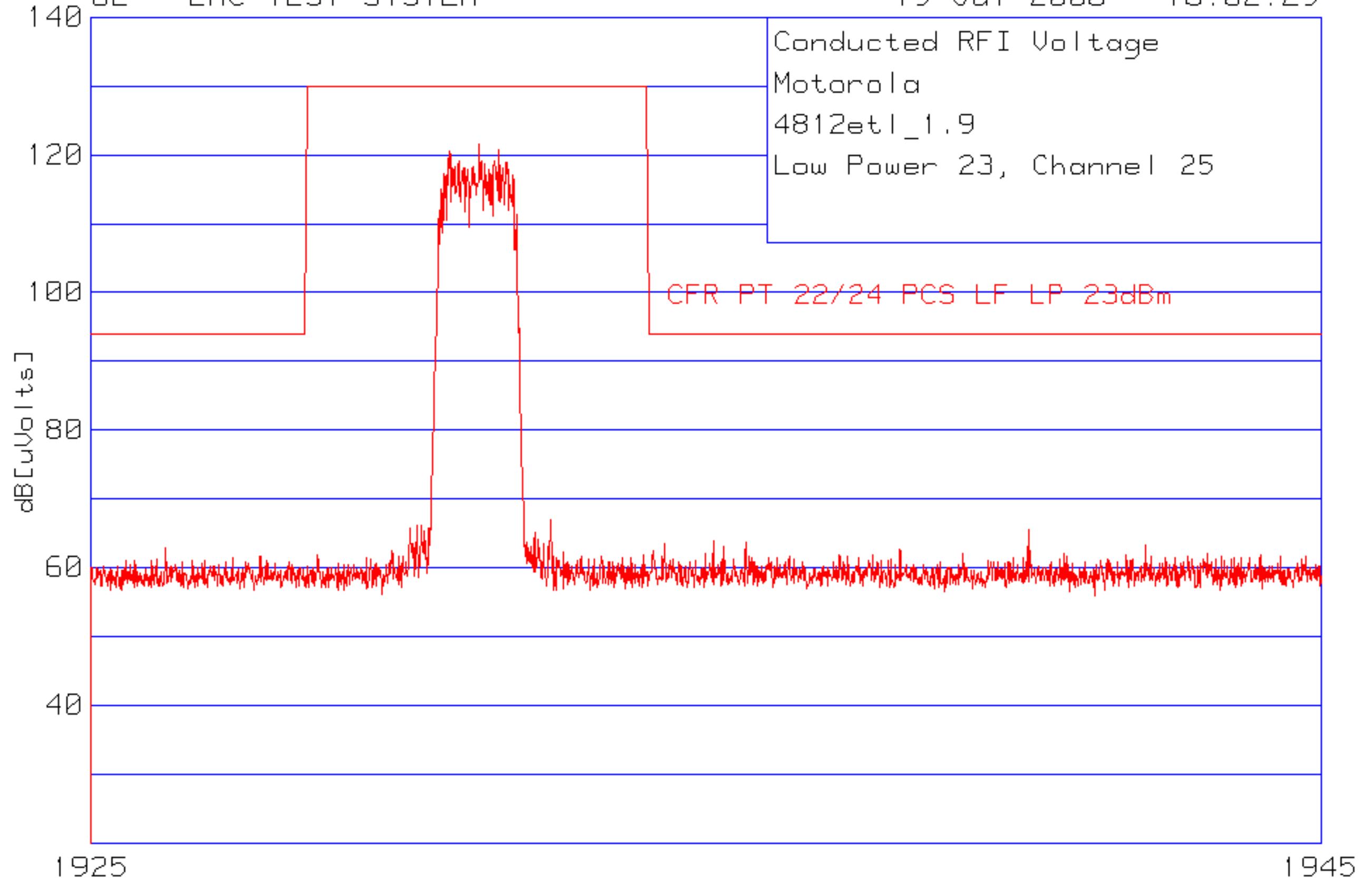
Minimum Power



IHET6AP1
SC4812ETL 1.9 GHz
CDMA BTS



IHET6AP1
SC4812ETL 1.9 GHz
CDMA BTS



IHET6AP1
SC4812ETL 1.9 GHz
CDMA BTS



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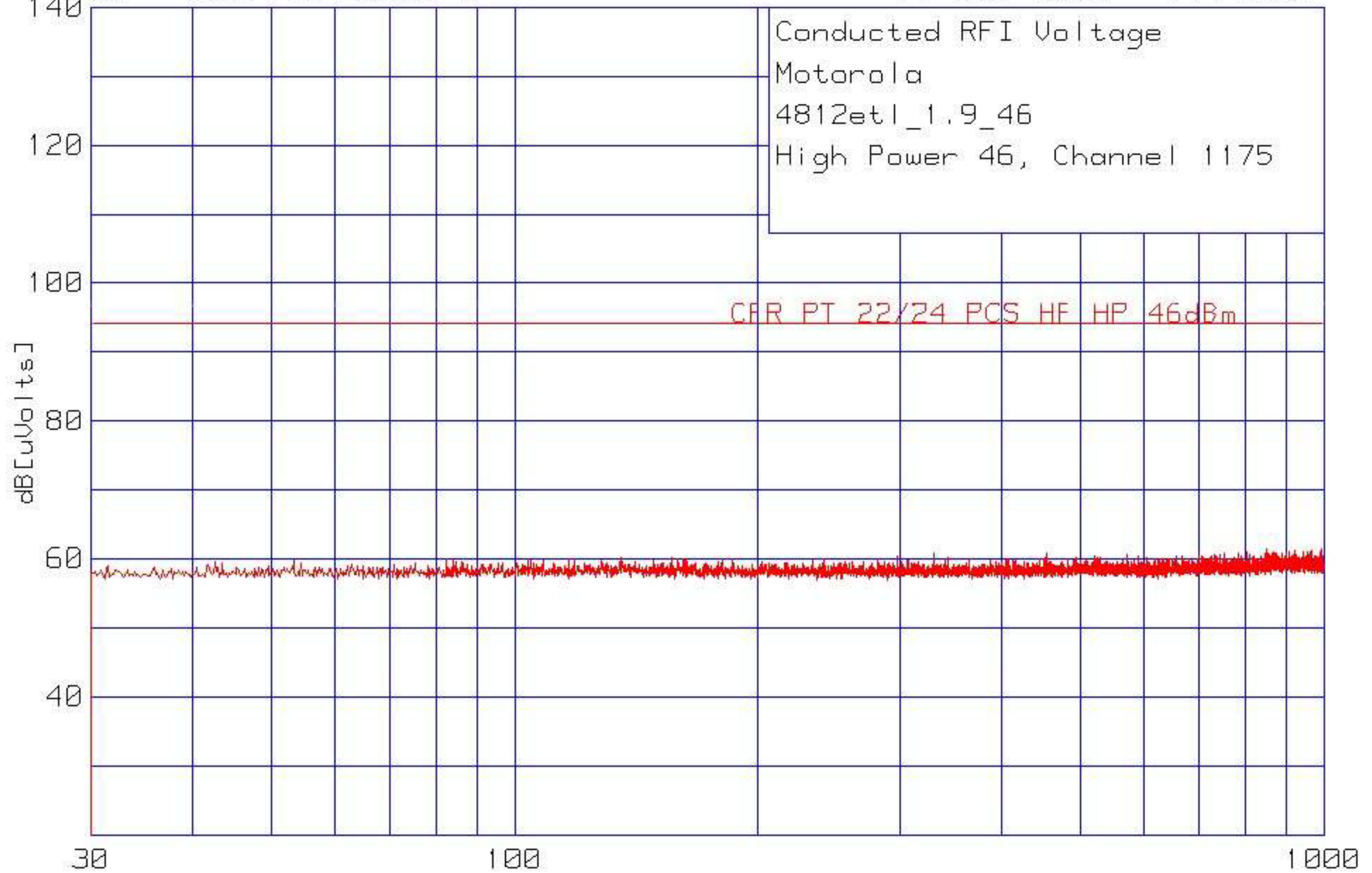
*Network Systems Group
CDMA Systems Division*

FCC ID: IHET6AP1

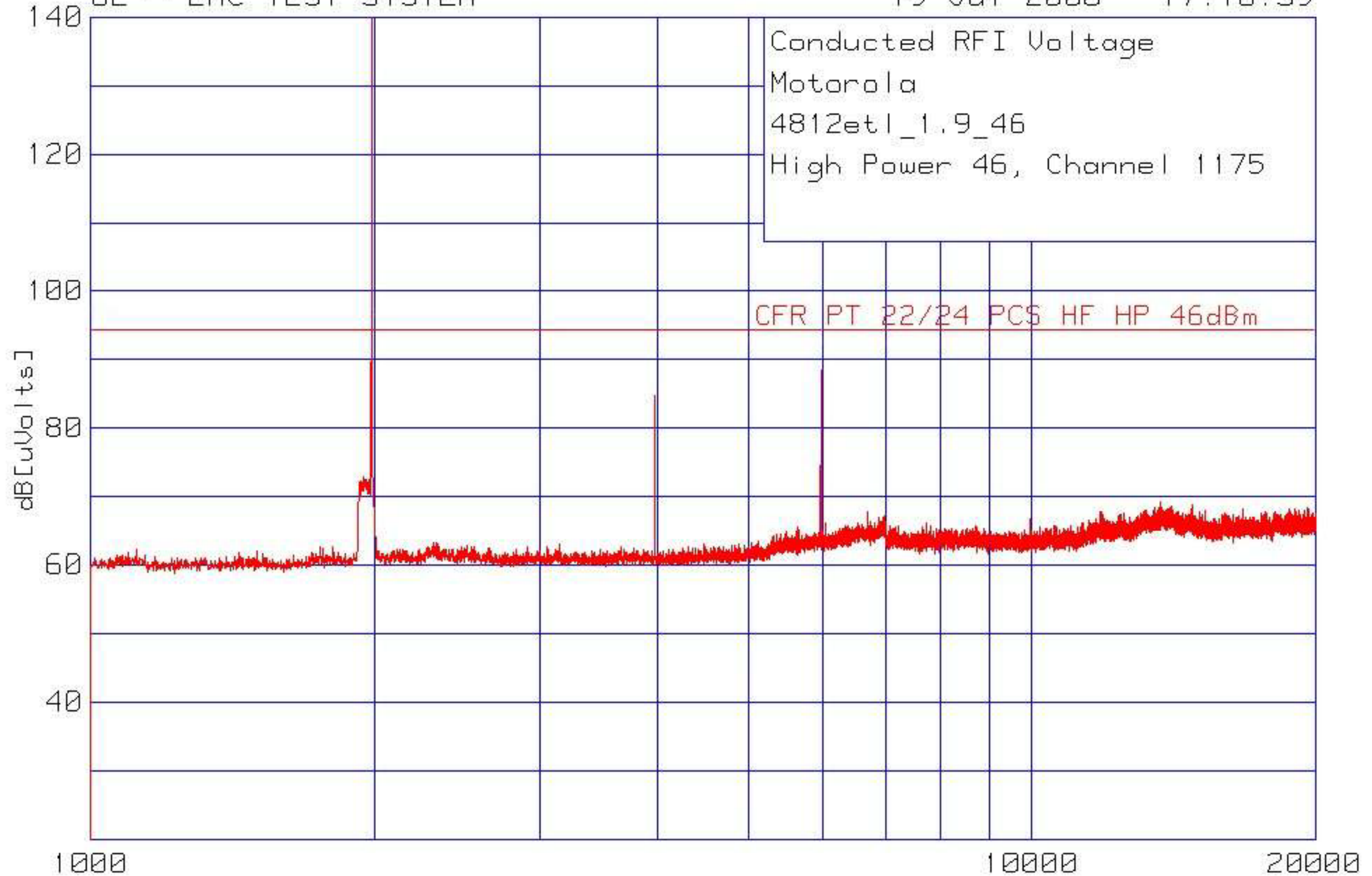
SPURIOUS & HARMONIC EMISSIONS CONDUCTED

CDMA Transmitter Channel 1175

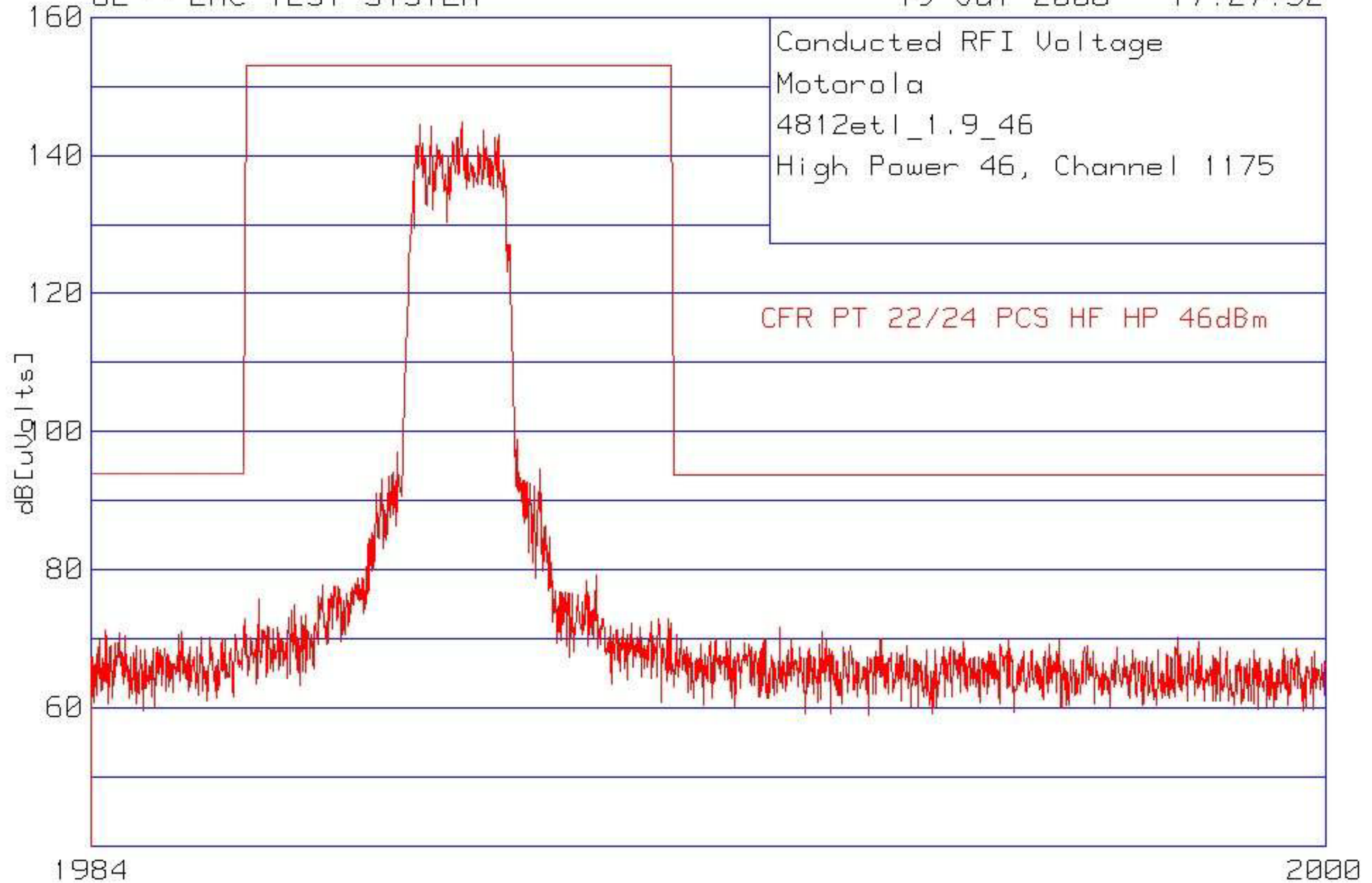
Maximum Power



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SC4812ETL 1.9 GHz
CDMA BTS



IHET6AP1
SC4812ETL 1.9 GHz
CDMA BTS



IHET6AP1
SC4812ETL 1.9 GHz
CDMA BTS



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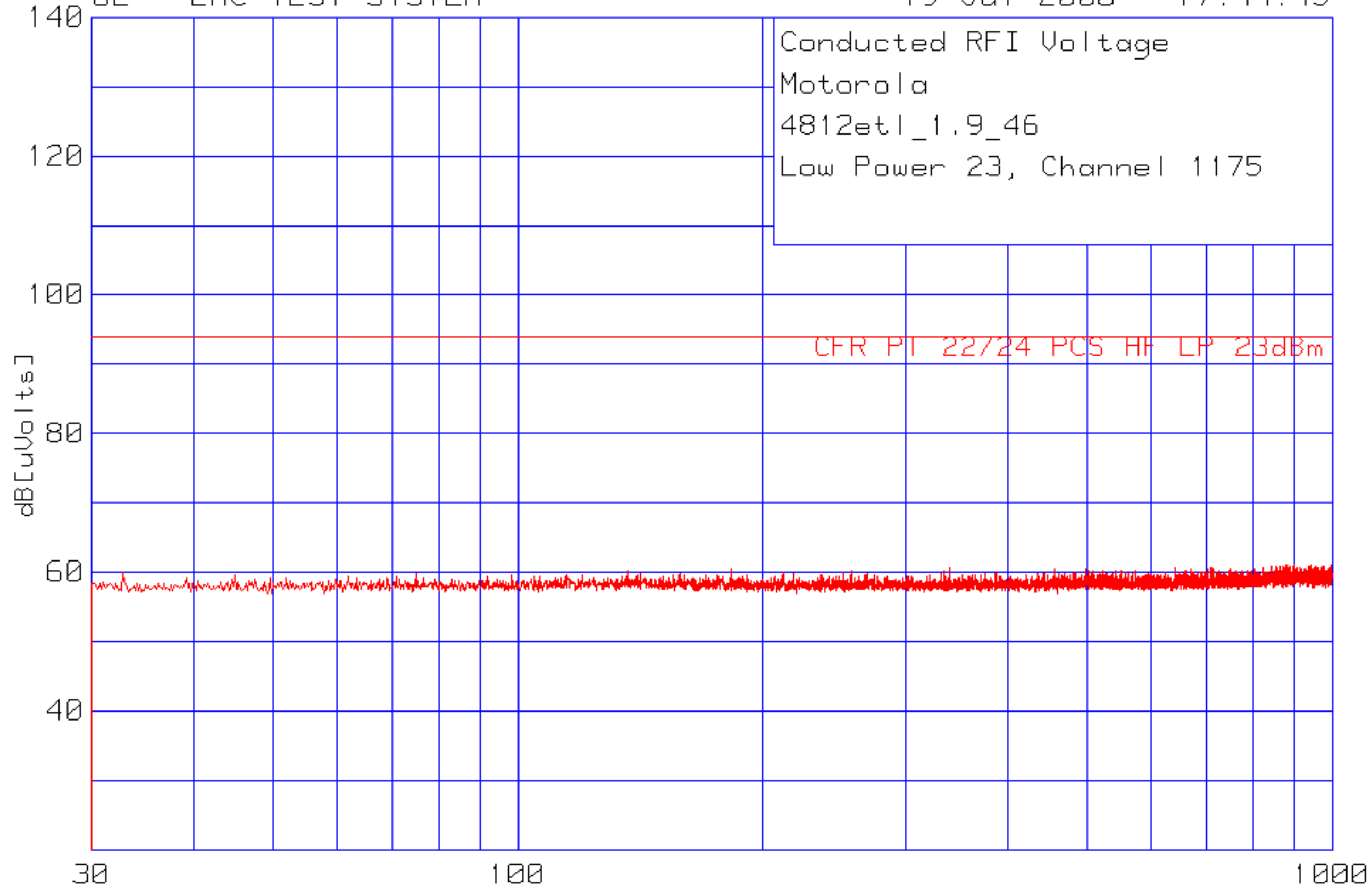
Cellular infrastructure group

FCC ID: IHET6AP1

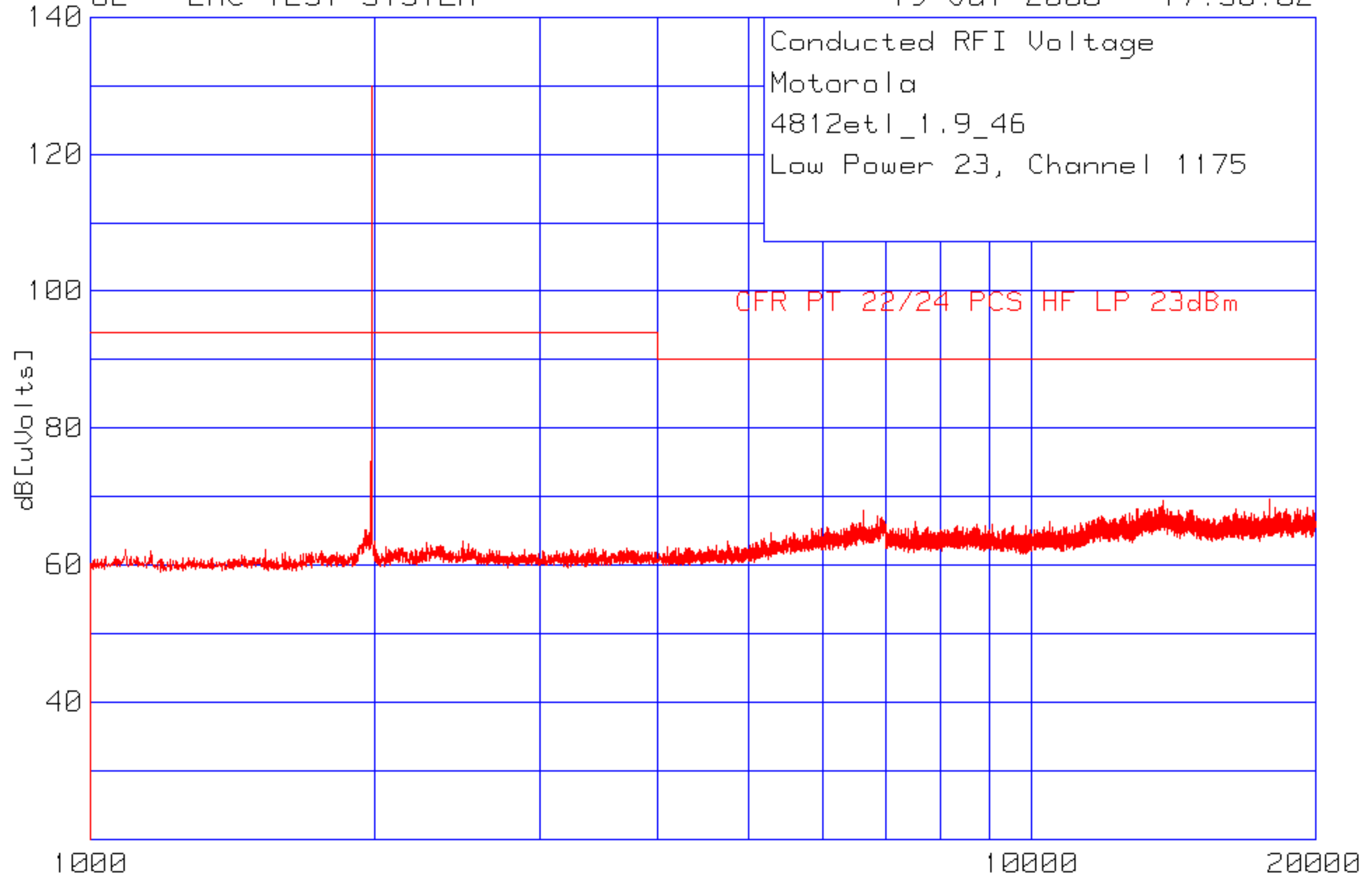
SPURIOUS & HARMONIC EMISSIONS CONDUCTED

CDMA Transmitter Channel 1175

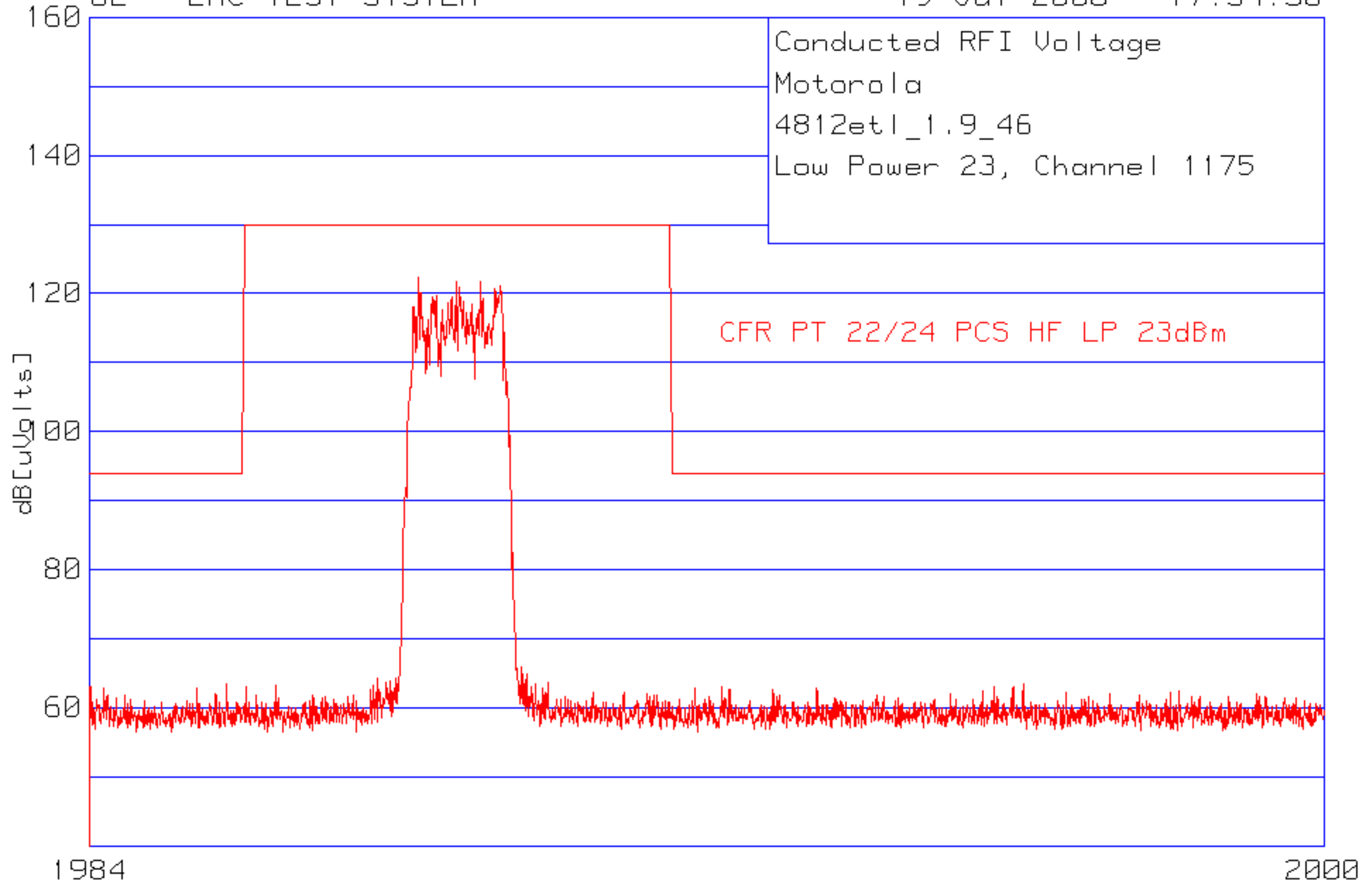
Minimum Power



IHET6AP1
SC4812ETL 1.9 GHz
CDMA BTS



IHET6AP1
SC4812ETL 1.9 GHz
CDMA BTS



IHET6AP1
SC4812ETL 1.9 GHz
CDMA BTS



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SECTION E

Occupied Bandwidth

Maximum Power

Channel 25
Maximum Power

IHET6AP1
SC4812ETL 1.9GHz
CDMA BTS

Mon Sep 11 2000 17:27

REF 32.0 dBm
10 dB/

A_Avg

B_Blank

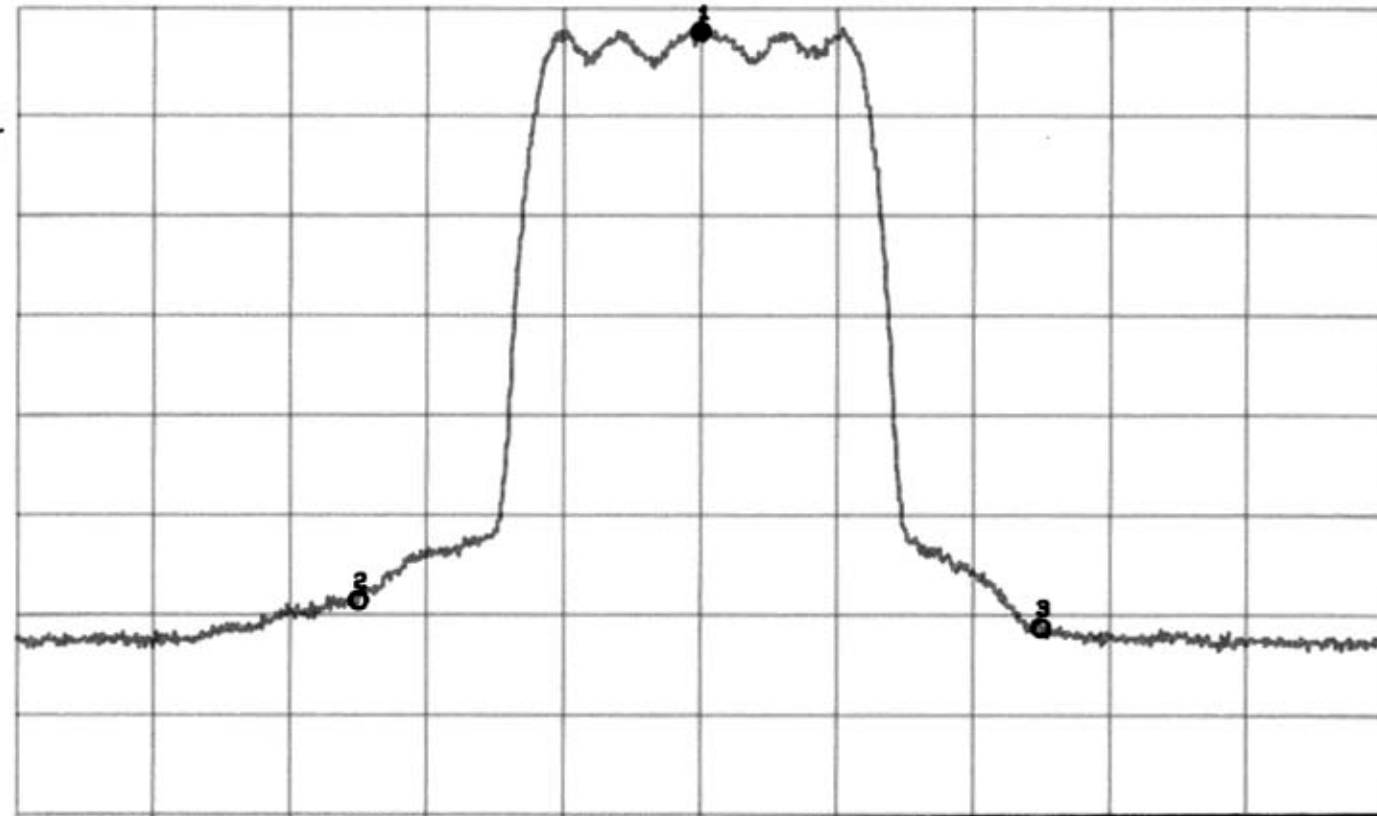
MKR

1.931250 GHz

29.71 dBm

LOF

200
200



Multi Marker List

EXT	1:	1.931250 GHz	29.71 dBm
	2:	1.930000 GHz	-26.82 dBm
	3:	1.932500 GHz	-29.56 dBm

CENTER 1.931250 GHz

SPAN 5.00 MHz

*RBW 30 kHz

*VBW 100 kHz

*SWP 50 ms

*ATT 30 dB

Channel 1175
Maximum Power

IHET6AP1
SC4812ETL 1.9GHz
CDMA BTS

Mon Sep 11 2000 17:46

REF 32.0 dBm
10 dB/

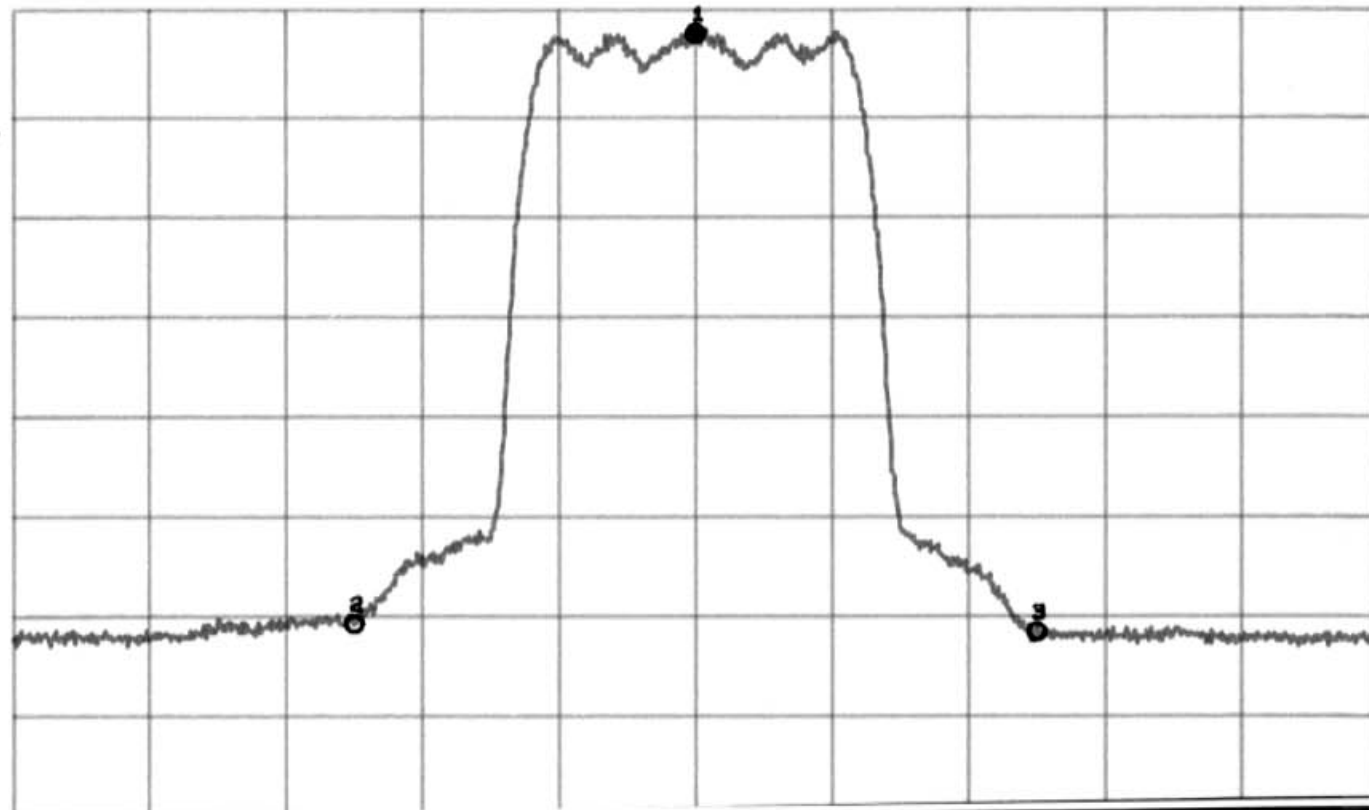
A_Avg

B_Blank

MKR 1.988750 GHz
29.81 dBm

LOF

200
200



Multi Marker List

1:	1.988750 GHz	29.81 dBm
2:	1.987500 GHz	-28.99 dBm
3:	1.990000 GHz	-29.73 dBm

CENTER 1988.750 MHz

SPAN 5.00 MHz

*RBW 30 KHz

*VBW 100 KHz

*SWP 50 ms

*ATT 30 dB



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FCC ID: IHET6AP1

Occupied Bandwidth

Minimum Power

Channel 25
Minimum Power

IHET6AP1
SC4812ETL 1.9GHz
CDMA BTS

Mon Sep 11 2000 17:08

REF 12.6 dBm
10 dB/

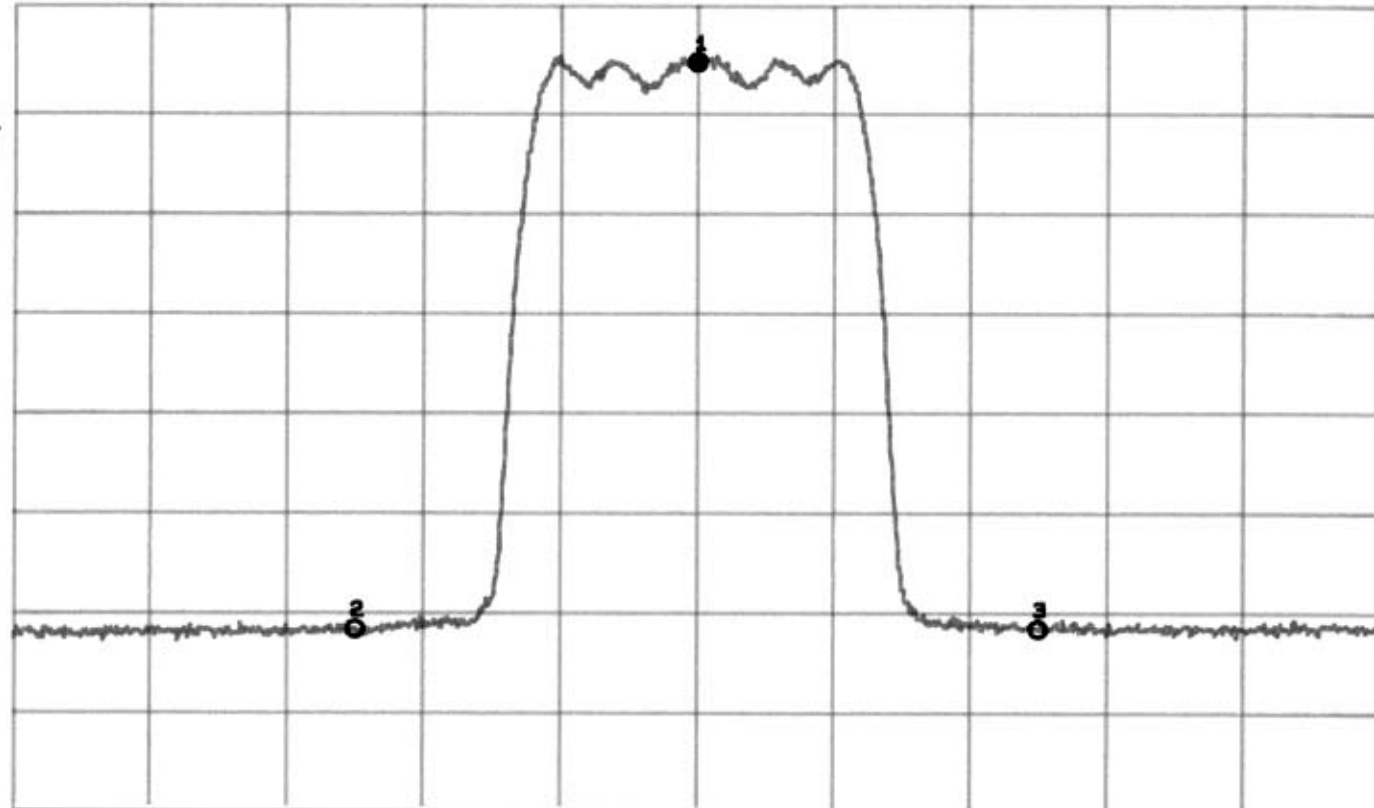
A_Avg

B_Blank

MKR 1.931250 GHz
7.03 dBm

LOF

200
200



Multi Marker List

	1:	1.931250 GHz	7.03 dBm
	2:	1.930000 GHz	-49.13 dBm
EXT	3:	1.932500 GHz	-49.10 dBm

CENTER 1.931250 GHz

SPAN 5.00 MHz

*RBW 30 kHz

*VBW 100 kHz

*SWP 50 ms

*ATT 20 dB

Channel 1175
Minimum Power

IHET6AP1
SC4812ETL 1.9GHz
CDMA BTS

Mon Sep 11 2000 18:03

REF 12.6 dBm
10 dB/

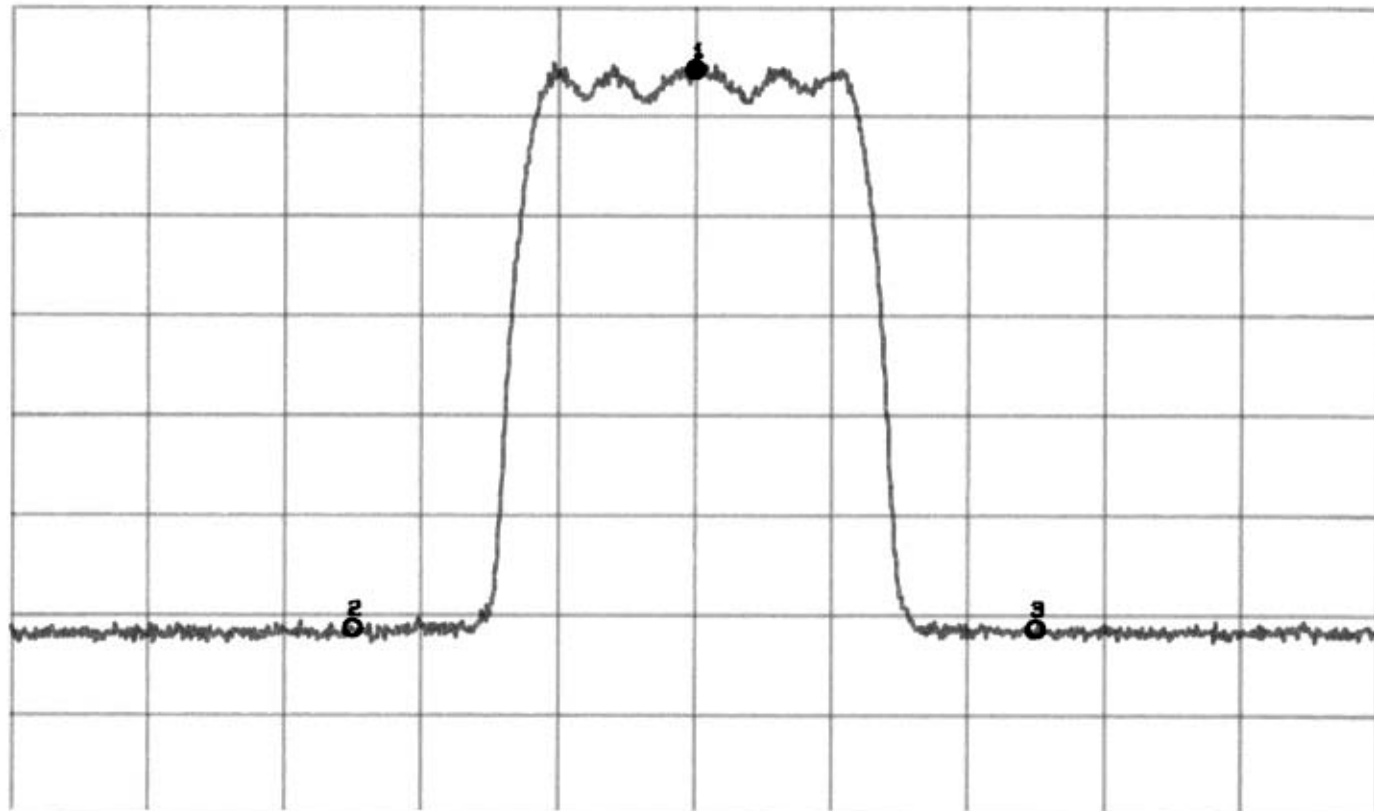
A_Avg

B_Blank

MKR 1.988750 GHz
6.53 dBm

LOF

200
200



Multi Marker List

EXT	1:	1.988750 GHz	6.53 dBm
	2:	1.987500 GHz	-48.81 dBm
	3:	1.990000 GHz	-49.03 dBm

CENTER 1988.750 MHz

SPAN 5.00 MHz

*RBW 30 kHz

*VBW 100 kHz

*SWP 50 ms

*ATT 20 dB



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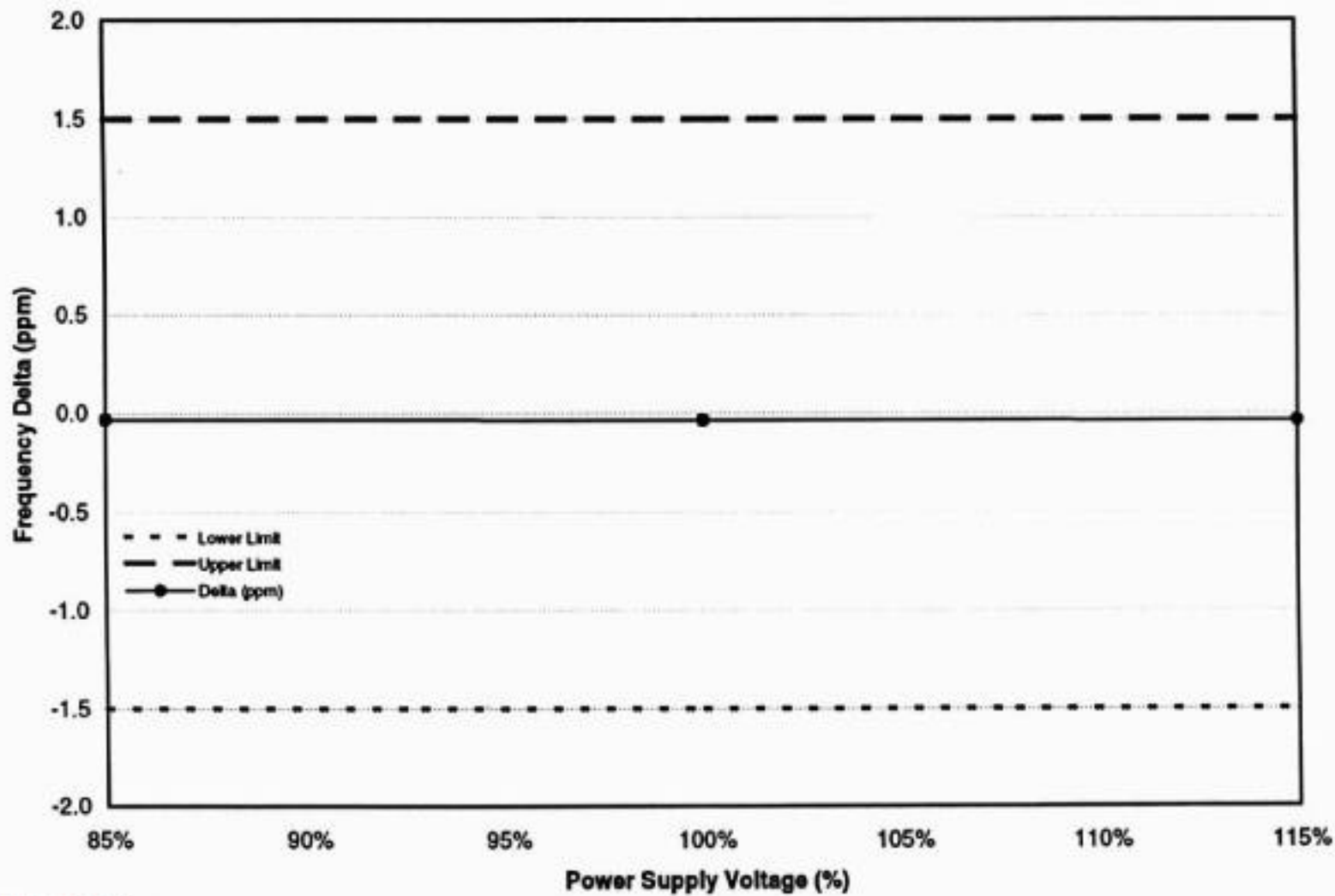
Cellular Infrastructure Group

FCC ID: IHET6AP1

SECTION F

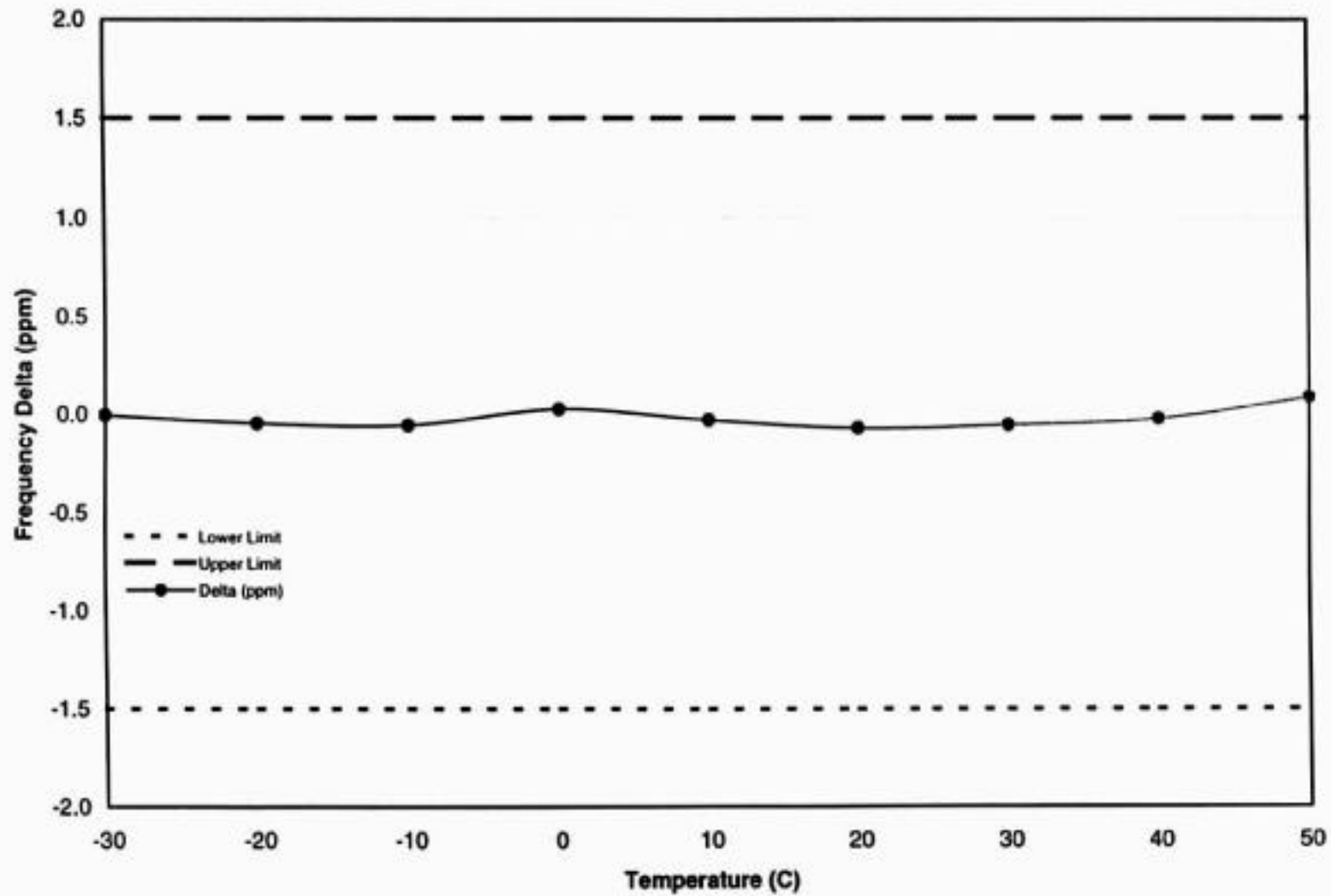
Frequency Stability

Frequency Stability with Varying Supply Voltage - CSM1



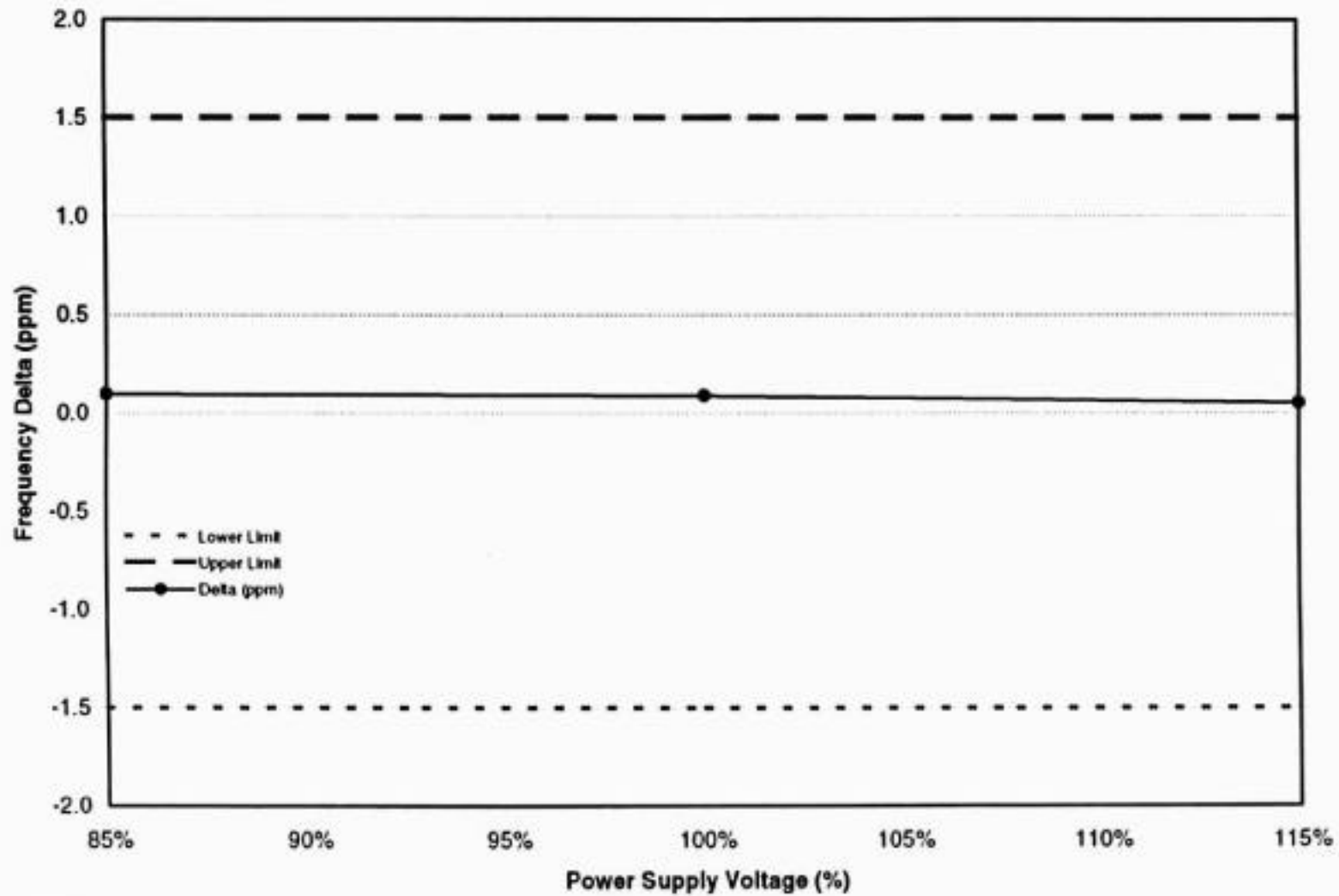
IHET6AP1
SC4812ET Lite 1.9GHz
CDMA BTS

Frequency Stability Over Temperature - CSM1



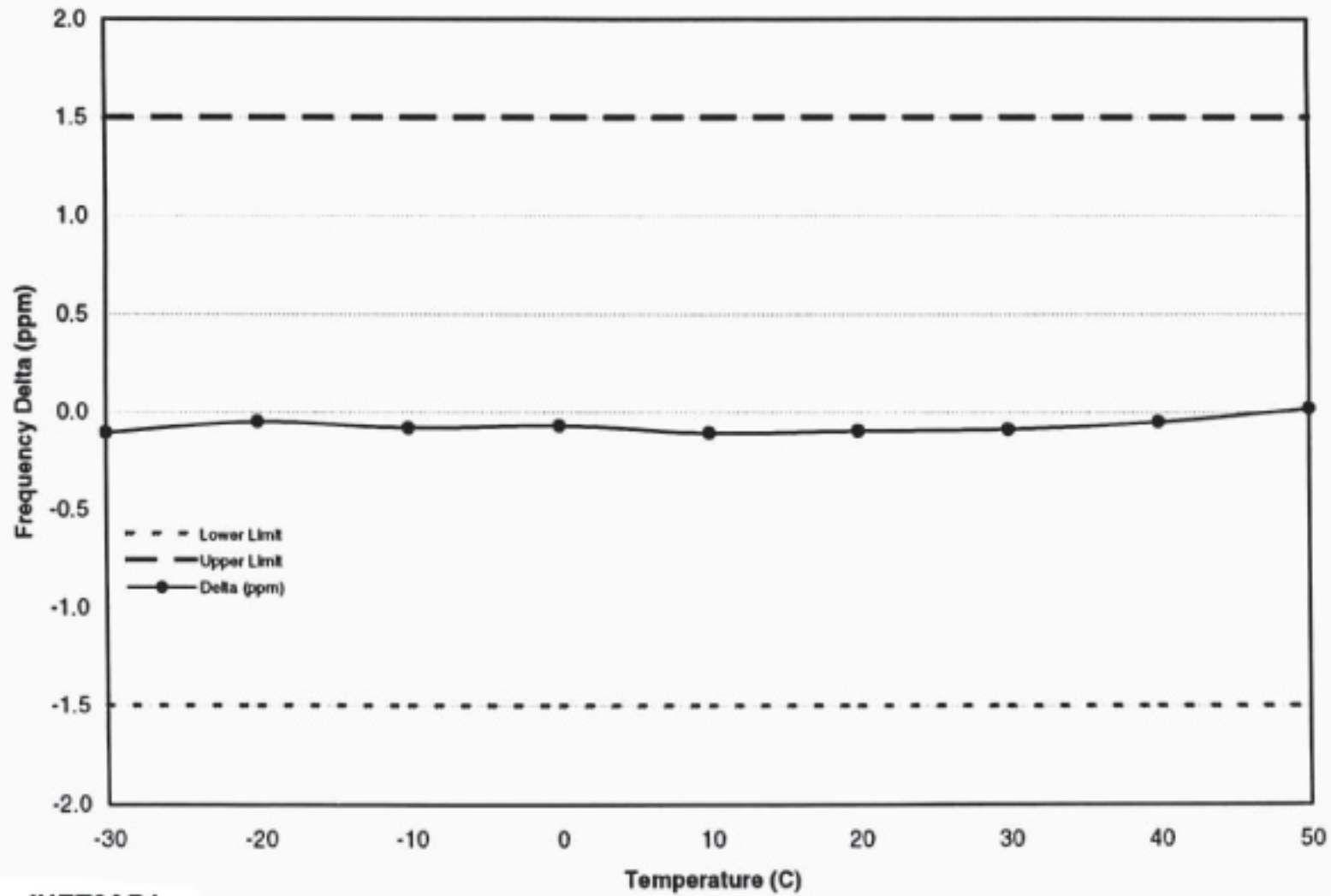
IHET6AP1
SC4812ET Lite 1.9GHz
CDMA BTS

Frequency Stability with Varying Supply Voltage - CSM2



IHET6AP1
SC4812ET Lite 1.9GHz
CDMA BTS

Frequency Stability Over Temperature - CSM2



IHET6AP1
SC4812ET Lite 1.9GHz
CDMA BTS