

# SC300 @ 1.9 GHz CDMA BTS FRAME

## TEST REPORT EXHIBIT

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**MOTOROLA**

*Network Systems Group  
CDMA Systems Division*

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**FCC ID: IHET6AQ2**

**SECTION A**

**SUMMARY OF RF  
MEASUREMENTS**

APPLICANT: MOTOROLA

TRANSCEIVER TYPE: IHET6AQ2

## Summary of Radiated RF Measurements

### Worst Case Radiated RF Spur Levels for SC300 @ 1.9 GHz

Radiated Data			Substituted Power				Spec	Result
TX Channel	Spurious Frequency (MHz)	Antenna Polarity	Measured Radiated Field Strength (dBuV/M)	Measured Radiated Field Strength (dBm) (Note 1)	TX Antenna Terminal Voltage (dBm) (Note 2)	EDRP (dBm) (Note 3)	FCC Part 24 MAX LIMIT (dBm)	Pass/Fail
1175	1988.71	H	58.8	-36.35	-35.43	-30.38	- 13	Pass

Notes:

1. Converting dBuV/M to dBm at 3 meters  
(dBuV/M) +9.542-104.77dB=dBm  
Converting dBuV/M to dBm at 10 meters  
(dBuV/M) +20 -104.77dB=dBm
2. The same horn antenna and measurement system was used for EUT scan and during substitution method. After maximizing the receive antenna and adjusting signal generator power level to measure the same emission level with the spectrum analyzer as with the EUT. Signal generator output level was recorded for each of the spurious frequencies. Test cable was then disconnected from the transmit horn and was connected to the input of the S/A measuring the voltage at the terminals of the antenna.
3. This value was obtained by converting the Equivalent Isotropic Radiated Power (EIRP) to ideal half-wave dipole reference power - (Equivalent Di-Pole Radiated Power - EDRP) per (TIA-603, 2.2.12.2(i)(m))



Radiated Engineer

3/22/01

Date

APPLICANT: MOTOROLA

TRANSCEIVER TYPE: IHET6AQ2

## Summary of Conducted RF Measurements

SC300 @ 1.9 GHz

FCC Part 24 at 40 dBm output (Max power)

CHANNEL	FREQUENCY (MHz)	SPUR LEVEL MEASURED (dB $\mu$ V)	SPUR LEVEL MEASURED (dBm)	FCC MAX LIMIT dBm
25	13696.207	87.39	-19.61	-13

Engineer:



3/27/01  
Date



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**SECTION B**

**MODULATION  
CHARACTERISTICS**



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SECTION B

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# MODULATION CHARACTERISTICS

## Maximum Power

Wed Mar 7 2001 15:08

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

Results

$\rho$ (Waveform Quality Factor) :	0.98994
$\tau$ (Time Alignment Error) :	4.78 $\mu$ s
	6 chip
Carrier Frequency Error :	0.1 Hz
Carrier Feedthrough :	-24.35 dBc
Magnitude Error :	7.21 % rms
Phase Error :	6.32 deg. rms
Error Vector Magnitude :	13.09 % rms
PN Offset :	0
Ext. Trigger Delay :	0.000 chip

Parameters

Frequency :	1.988750000 GHz
Reference Level :	52.2 dBm
Attenuator :	40.0 dB

**PASS**

OK...

Wed Mar 7 2001 12:31

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

Results

$\rho$ (Waveform Quality Factor) :	0.99223	
$\tau$ (Time Alignment Error) :	4.95	$\mu$ s
	6	chip
Carrier Frequency Error :	-0.3	Hz
Carrier Feedthrough :	-38.48	dBc
Magnitude Error :	6.09	% rms
Phase Error :	7.79	deg. rms
Error Vector Magnitude :	14.79	% rms
PN Offset :	0	
Ext. Trigger Delay :	0.000	chip

Parameters

**PASS**

Frequency	:	1.931250000 GHz
Reference Level	:	52.2 dBm
Attenuator	:	40.0 dB





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SECTION B

FCC ID: IHET6AQ2

# MODULATION CHARACTERISTICS

## Minimum Power

Wed Mar 7 2001 15:03

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

Results

$\rho$  (Waveform Quality Factor) : 0.99096  
 $\tau$  (Time Alignment Error) : 4.72  $\mu$ s  
: 6 chip  
Carrier Frequency Error : -0.9 Hz  
Carrier Feedthrough : -25.50 dBc  
Magnitude Error : 6.88 % rms  
Phase Error : 4.79 deg. rms  
Error Vector Magnitude : 10.78 % rms  
PN Offset : 0  
Ext. Trigger Delay : 0.000 chip

Parameters

**PASS**

Frequency : 1.988750000 GHz  
Reference Level : 35.0 dBm  
Attenuator : 20.0 dB

OK...

Wed Mar 7 2001 14:58

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

Results

$\rho$ (Waveform Quality Factor) :	0.99347	
$\tau$ (Time Alignment Error) :	4.92	$\mu$ s
	6	chip
Carrier Frequency Error :	-0.3	Hz
Carrier Feedthrough :	-39.69	dBc
Magnitude Error :	6.01	% rms
Phase Error :	4.12	deg. rms
Error Vector Magnitude :	9.35	% rms
PN Offset :	0	
Ext. Trigger Delay :	0.0000	chip

Parameters

Frequency :	1.931250000 GHz
Reference Level :	35.0 dBm
Attenuator :	20.0 dB

**PASS**

OK...



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## **SECTION C**

# **Spurious & Harmonic Emissions Radiated**

APPLICANT: MOTOROLA

TRANSCEIVER TYPE: IHET6AQ2


## Radiated RF Measurements

### Worst Case Radiated RF Spur Levels for SC300 @ 1.9GHz

Radiated Data			Substituted Power				Spec	Result
TX Channel	Spurious Frequency (MHz)	Antenna Polarity	Measured Radiated Field Strength (dBuV/M)	Measured Radiated Field Strength (dBm) (Note 1)	TX Antenna Terminal Voltage (dBm) (Note 2)	EDRP (dBm) (Note 3)	FCC Part 24 MAX LIMIT (dBm)	Pass/Fail
25	1931.38	H	51.08	-44.15	-42.7	-37.65	- 13	Pass
25	3862.51	V	50.33	-44.90	-44.64	-39.09	- 13	Pass
1175	1988.71	H	58.88	-36.35	-35.43	-30.38	- 13	Pass
1175	1988.81	V	53.57	-41.66	-39.88	-34.83	- 13	Pass

Notes:

1. Converting dBuV/M to dBm at 3 meters  
 $(dBuV/M) + 9.542 - 104.77dB = dBm$   
 Converting dBuV/M to dBm at 10 meters  
 $(dBuV/M) + 20 - 104.77dB = dBm$
2. The same horn antenna and measurement system was used for EUT scan and during substitution method. After maximizing the receive antenna and adjusting signal generator power level to measure the same emission level with the spectrum analyzer as with the EUT. Signal generator output level was recorded for each of the spurious frequencies. Test cable was then disconnected from the transmit horn and was connected to the input of the S/A measuring the voltage at the terminals of the antenna.
3. This value was obtained by converting the Equivalent Isotropic Radiated Power (EIRP) to ideal half-wave dipole reference power - (Equivalent Di-Pole Radiated Power - EDRP) per (TIA-603, 2.2.12.2(i)(m))



Radiated Engineer

Date 3/22/01



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FCC ID: IHET6AQ2

## **SECTION D**

# **Spurious & Harmonic Emissions Conducted**

APPLICANT: MOTOROLA

TRANSCEIVER TYPE: IHET6AQ2

## Conducted RF Measurements

SC300 @ 1.9 GHz

FCC Part 24 at 40 dBm output (Max power)

CHANNEL	FREQUENCY (MHz)	SPUR LEVEL MEASURED (dBμV)	SPUR LEVEL MEASURED (dBm)	FCC MAX LIMIT dBm
25	13696.207	87.39	-19.61	-13
1175	13852.004	86.2	-20.8	-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:  3/27/01  
Date



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SECTION D

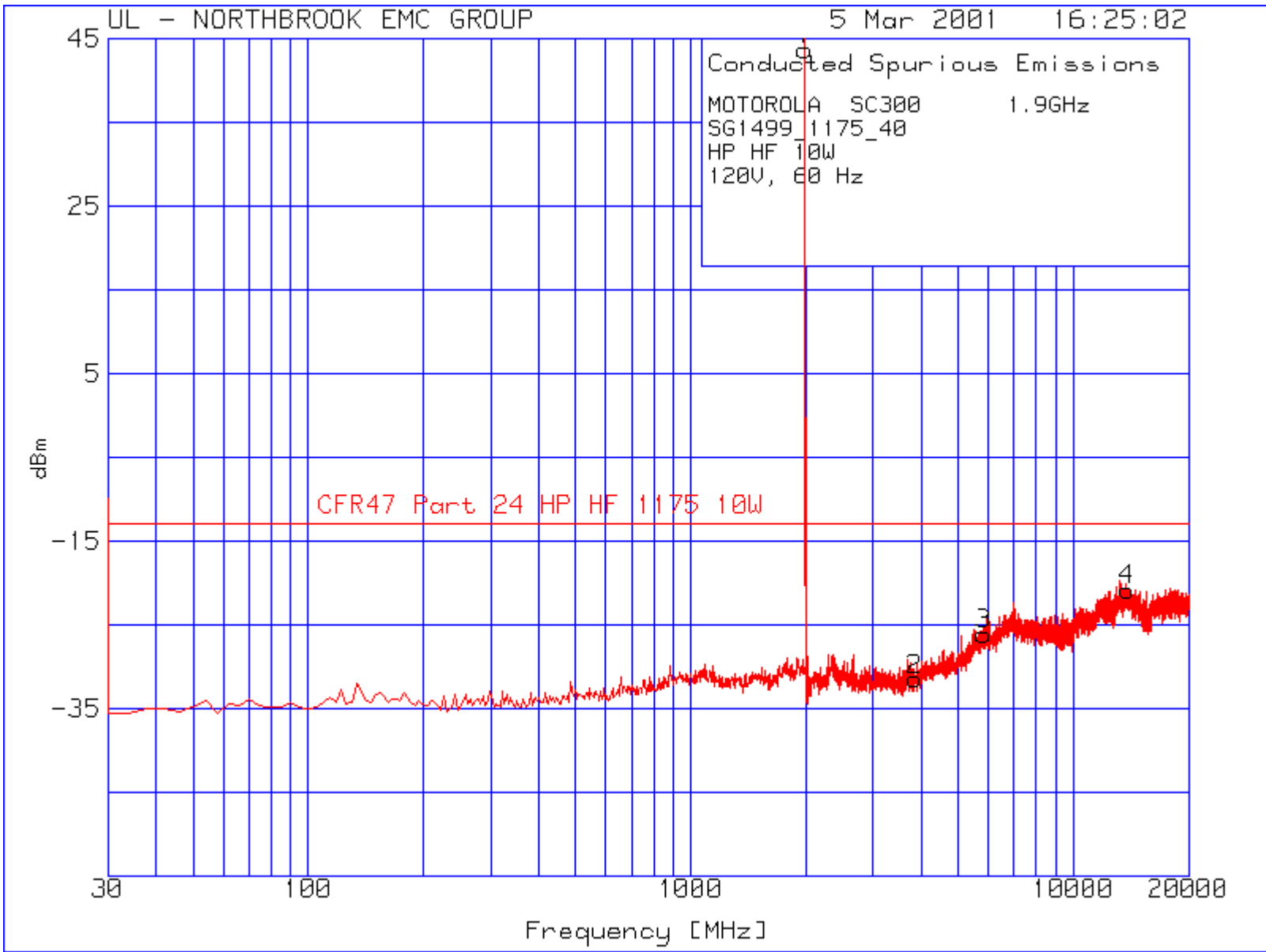
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# **SPURIOUS & HARMONIC EMISSIONS CONDUCTED**

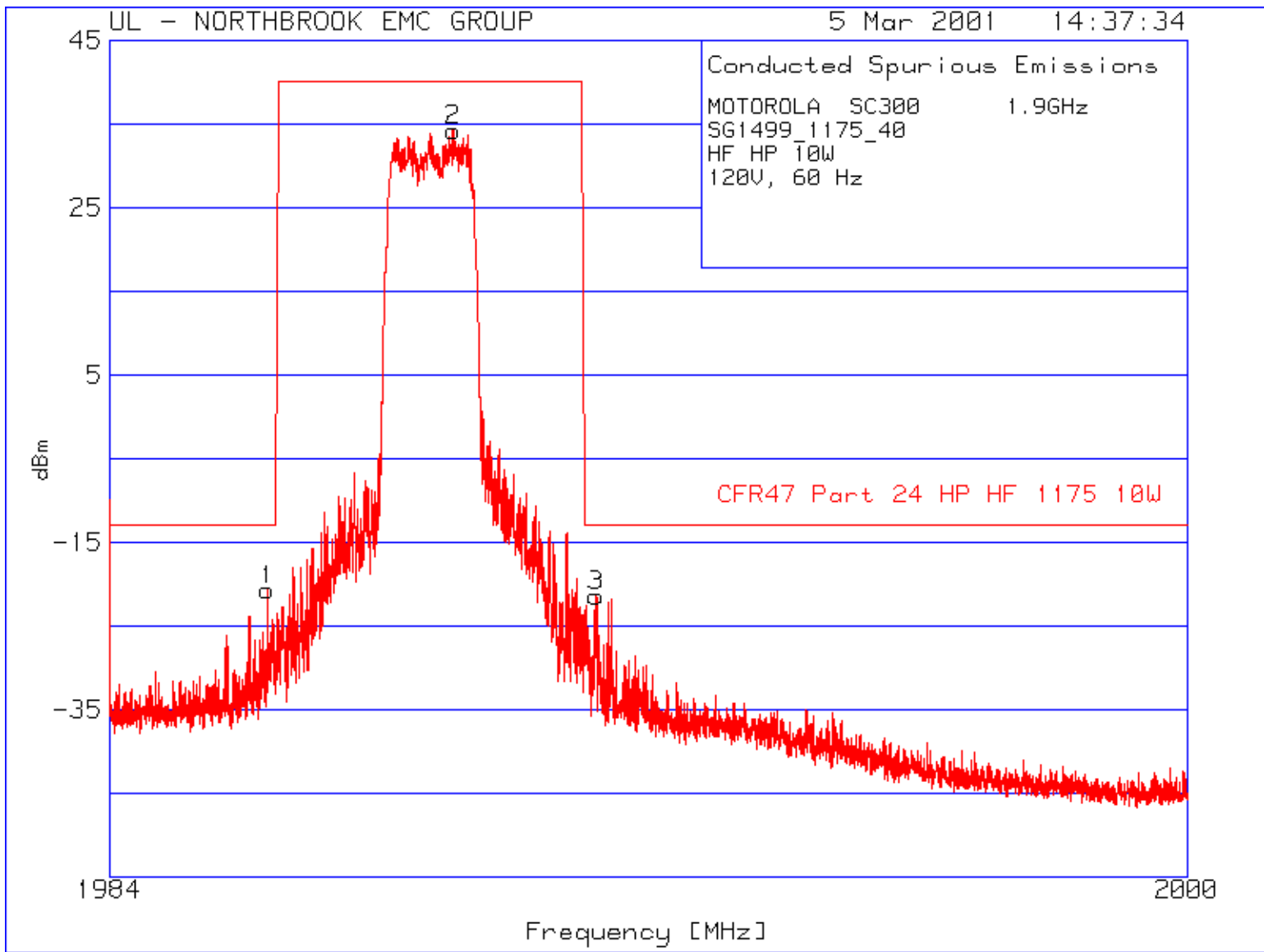
## **CDMA Transmitter Channel 1175**

### **Maximum Power**





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**SC300 @ 1.9GHz**  
**CDMA BTS**



**IHET6AQ2**  
**SC300 @ 1.9GHz**  
**CDMA BTS**



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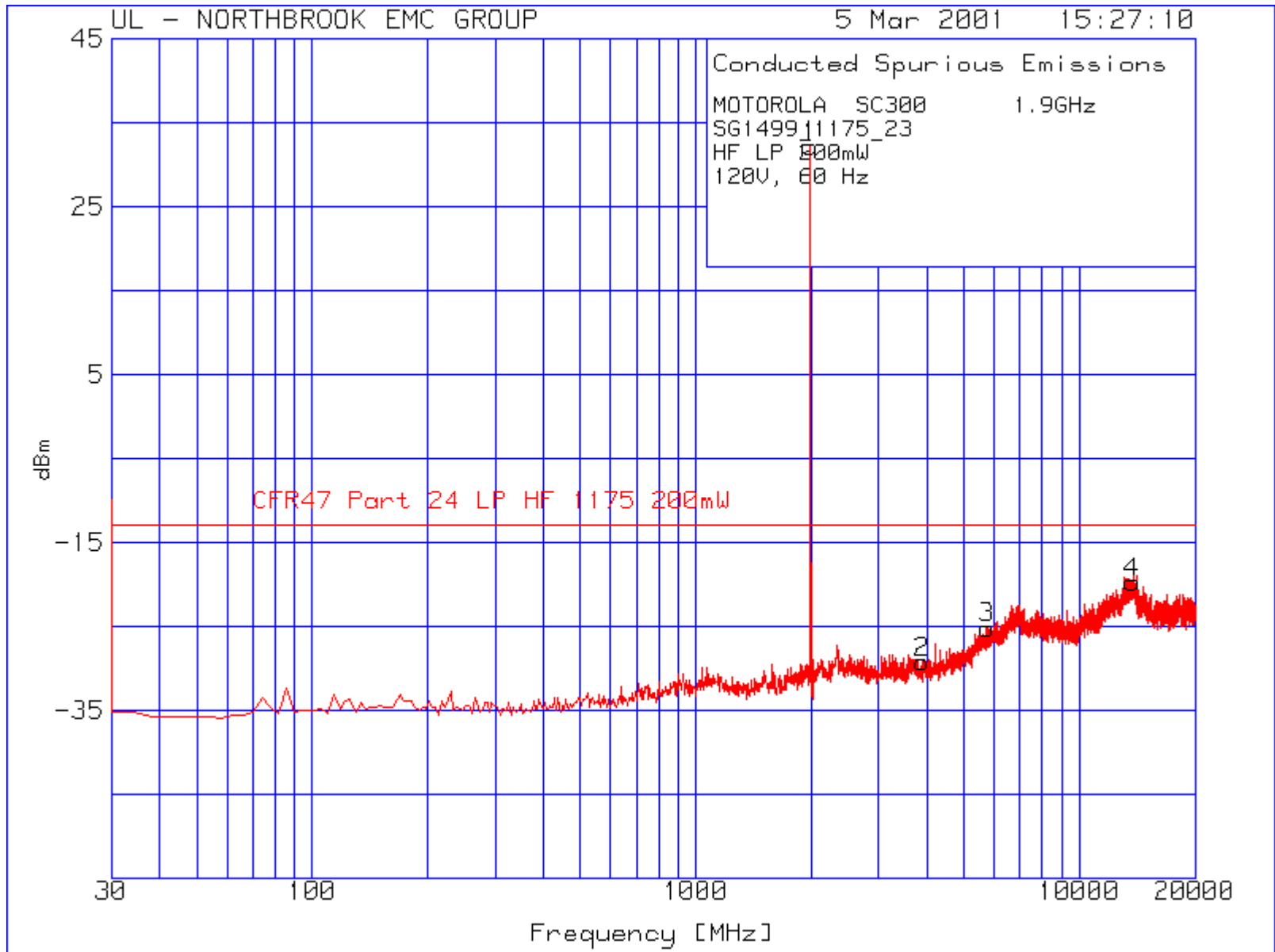
SECTION D

FCC ID: IHET6AQ2

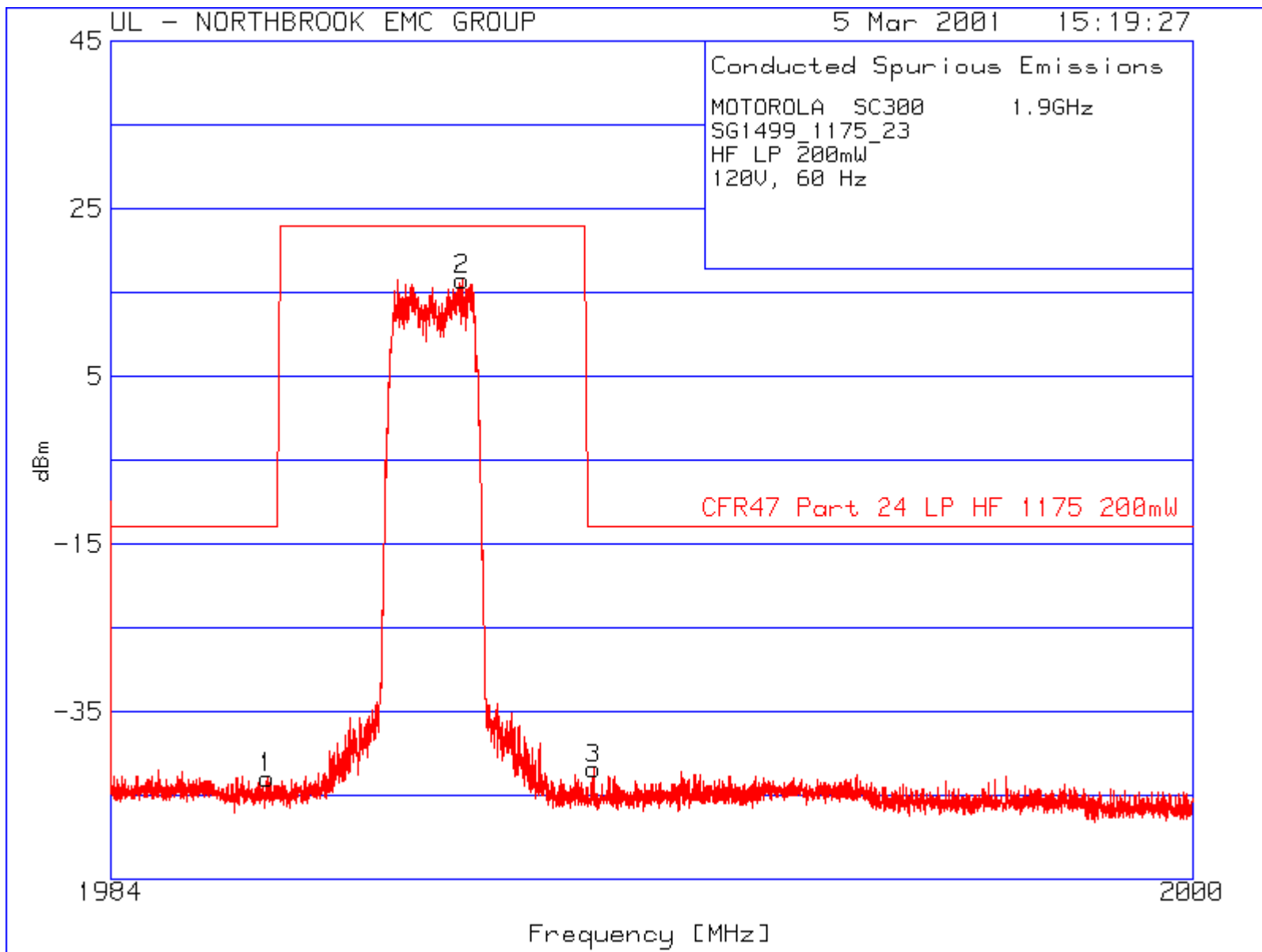
# **SPURIOUS & HARMONIC EMISSIONS CONDUCTED**

## **CDMA Transmitter Channel 1175**

### **Minimum Power**



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**SC300 @ 1.9GHz**  
**CDMA BTS**



**IHET6AQ2**  
**SC300 @ 1.9GHz**  
**CDMA BTS**