Test Report Contents

APPLICANT: MOTOROLA **TRANSCEIVER TYPE: IHET5ZA1**

Summary of Radiated Spurious

RF Measurements

WORST CASE RADIATED SPUR LEVEL
MEASURED IN TRANSMIT AND RECEIVE MODE
FOR SC800 @800 MHz CDMA FIXED WIRELESS TERMINAL

SPUR FREQUENCY (Mhz)	DISTANCE MEASURED (meters)	SPUR LEVEL MEASURED (dBμV/meter)	FCC MAX LIMIT dBuV/m
35.9	3	31.2	40.0
1672	3	48	54
2509	3	37	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 (10 Ghz)

Engineer: _____ 11/20/99
Date

Test Data - Radiated Emissions Test # RE-2

Emission Frequency (MHz)	Ant. Pol. (H/V)	Det. Atten. (dB)	Meter Reading (dBuV)	Antenna Factor (dB)	Path Loss (dB)	RF Gain (dB)	Corrected Reading (dBuV/m)	Spec. Limit (dBuV/m)	CRSL Delta (dB)	Pass Fail Marginal	Notes
											RX MODE
392.0	H		29.5	14.8	5.1	24.7	24.7	46.0	-21.3	Pass	
313.6	H		27.6	14.8	5.1	24.7	22.8	46.0	-23.2	Pass	
523.0	H		22.1	17.8	6.7	25.1	21.5	46.0	-24.5	Pass	NOISE FLOOR
840.0	H		22.1	21.6	8.5	25.0	27.2	46.0	-18.8	Pass	NOISE FLOOR
313.6	V		23.7	14.8	5.1	24.7	18.9	46.0	-27.1	Pass	
500.0	V		22.1	17.6	6.7	25.1	21.3	46.0	-24.7	Pass	NOISE FLOOR
850.0	V		22.1	21.4	8.5	25.0	27.0	46.0	-19.0	Pass	NOISE FLOOR
35.0	V		26.6	13.9	1.9	24.6	17.8	40.0	-22.2	Pass	NOISE FLOOR
170.0	V		23.7	12.5	3.3	24.6	14.9	43.5	-28.6	Pass	NOISE FLOOR
275.0	V		23.3	17.7	4.5	24.6	20.9	46.0	-25.1	Pass	NOISE FLOOR
35.0	H		21.7	13.9	1.9	24.6	12.9	40.0	-27.1	Pass	NOISE FLOOR
170.0	H		25.2	12.5	3.3	24.6	16.4	43.5	-27.1	Pass	NOISE FLOOR
275.0	H		22.7	17.7	4.5	24.6	20.3	46.0	-25.7	Pass	NOISE FLOOR
											TX MODE
35.9	H		40.0	13.9	1.9	24.6	31.2	40.0	-8.8	Pass	
46.3	H		37.9	12.5	1.9	24.6	27.6	40.0	-12.4	Pass	
275.0	H		21.7	17.7	4.5	24.6	19.3	46.0	-26.7	Pass	NOISE FLOOR
35.0	V		26.0	13.9	1.9	24.6	17.2	40.0	-22.8	Pass	NOISE FLOOR
175.0	V		26.0	12.9	3.3	24.6	17.6	43.5	-25.9	Pass	NOISE FLOOR
275.0	V		22.9	17.7	4.5	24.6	20.5	46.0	-25.5	Pass	NOISE FLOOR
836.5	H		61.6	21.7	8.5	25.0	66.8	46.0	20.8	Fail	FUNDAMENTAL
350.0	H		21.8	14.0	5.1	24.7	16.2	46.0	-29.8	Pass	NOISE FLOOR
950.0	H		21.8	23.4	9.1	24.9	29.4	46.0	-16.6	Pass	NOISE FLOOR
836.5	V		59.0	21.7	8.5	25.0	64.2	46.0	18.2	Fail	FUNDAMENTAL
350.0	V		21.7	14.0	5.1	24.7	16.1	46.0	-29.9	Pass	NOISE FLOOR
950.0	V		21.7	23.4	9.1	24.9	29.3	46.0	-16.7	Pass	NOISE FLOOR
											SCANNED 30 TO 1000 MHz

Microwave Radiated Emissions Test # MW-2

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: DELTA
									TX mode
1.672	48.6	25.1	4.415	31	0	47	54	V	6.9
3.346	24.6	30.3	3.5	31.5	0	27	54	V	27.1
4.183	31	31.8	4	31.6	0	35	54	V	18.8
5.019	28	33.9	4.67	30.5	0	36	54	V	17.9
5.855	22	35.3	5.33	30.5	0	32	54	V	21.9
1.672	49	25.1	4.415	31	0	48	54	H	6.5
2.509	33	29.1	5.2	30.2	0	37	54	H	16.9
3.346	21	30.3	3.5	31.5	0	23	54	H	30.7
4.182	23	31.8	4	31.6	0	27	54	H	26.8
4.96	33	33.9	4.67	30.5	0	41	54	H	12.9
									RX MODE
1.1	31	23.1	2.0	28.2	0	28	54	H	26.1 N. F.
2.5	33	29.1	5.2	30.2	0	37	54	H	16.9 N. F.
5.0	20.8	33.9	4.67	30.5	0	29	54	H	25.1 N. F.
1.1	31	23.1	2.0	28.2	0	28	54	V	26.1 N. F.
2.5	33	29.1	5.2	30.2	0	37	54	V	16.9 N. F.
5.0	20	33.9	4.67	30.5	0	28	54	V	25.9 N. F.
									SCANNED 1.0
									TO 10 GHz

Legend:
N.F. = Noise Floor reading

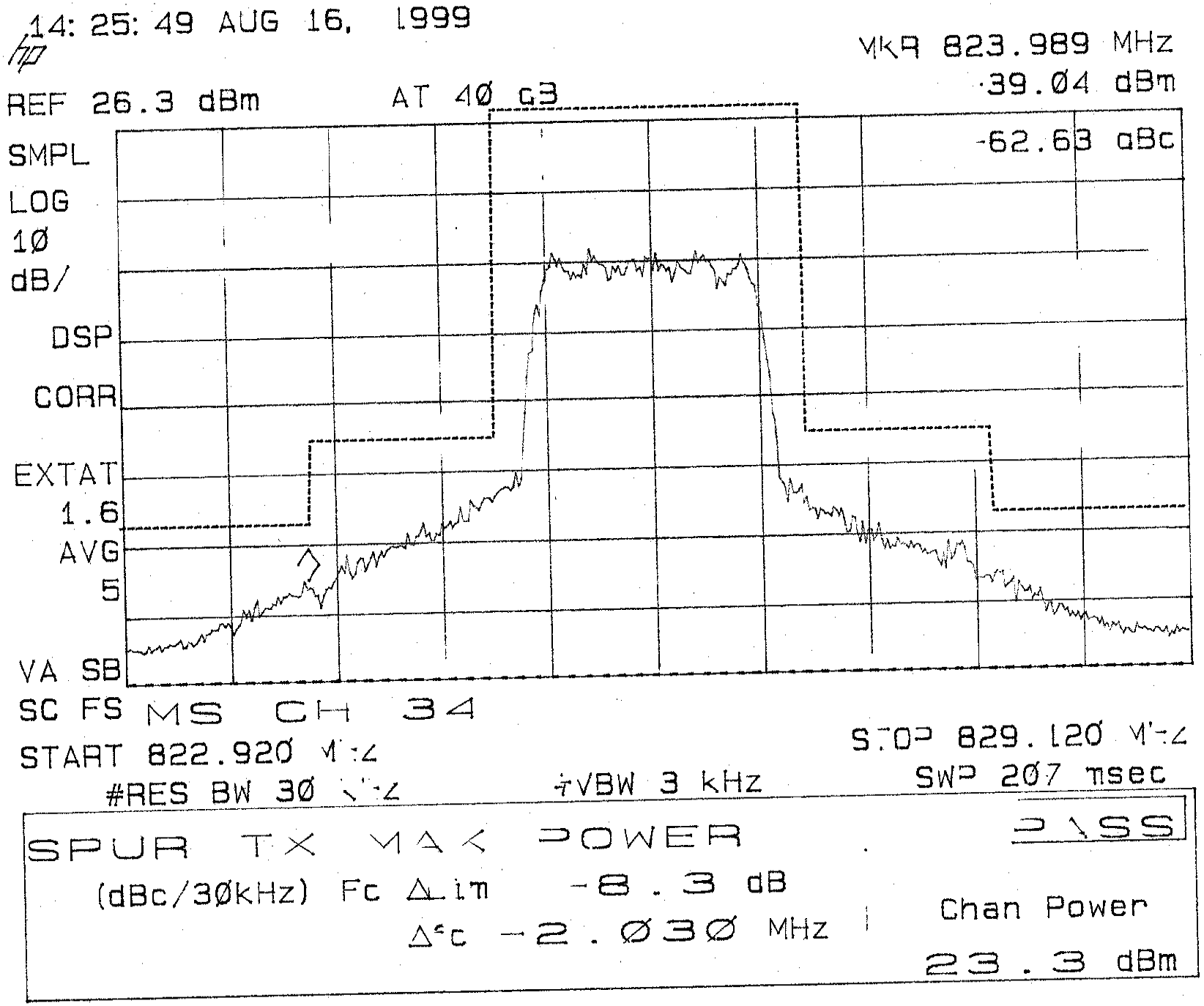
APPLICANT: MOTOROLA **TRANSCEIVER TYPE: IHET5ZA1**

Summary of Maximum

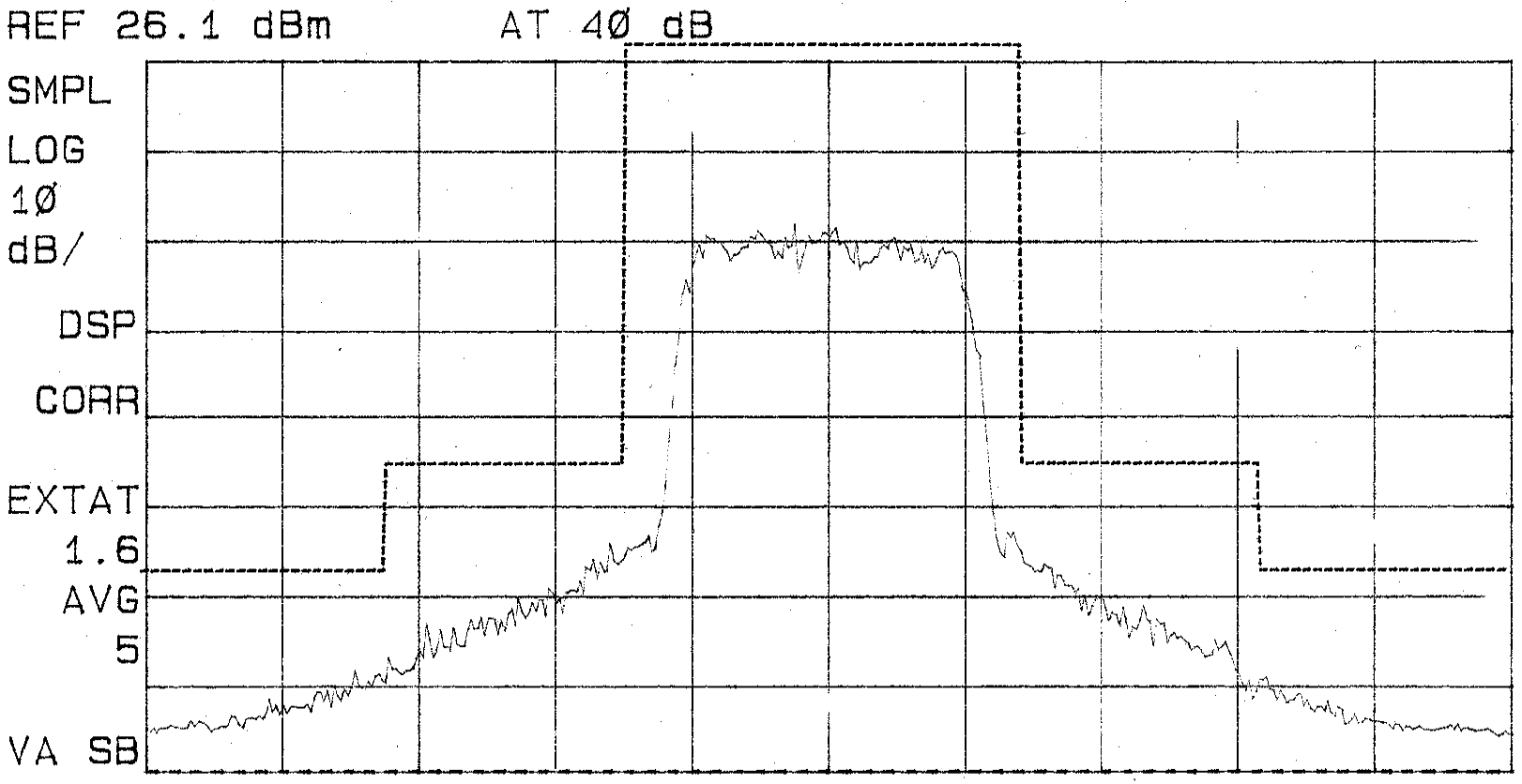
Transmitter Power

Frequency Mhz (Channel)	RF Output Power dBm	RF Output Power Watts
822.92 (034)	23.3	0.213
833.42 (384)	23.1	0.204
845.21 (777)	23.0	0.200

Engineer: 4/20/99
Date

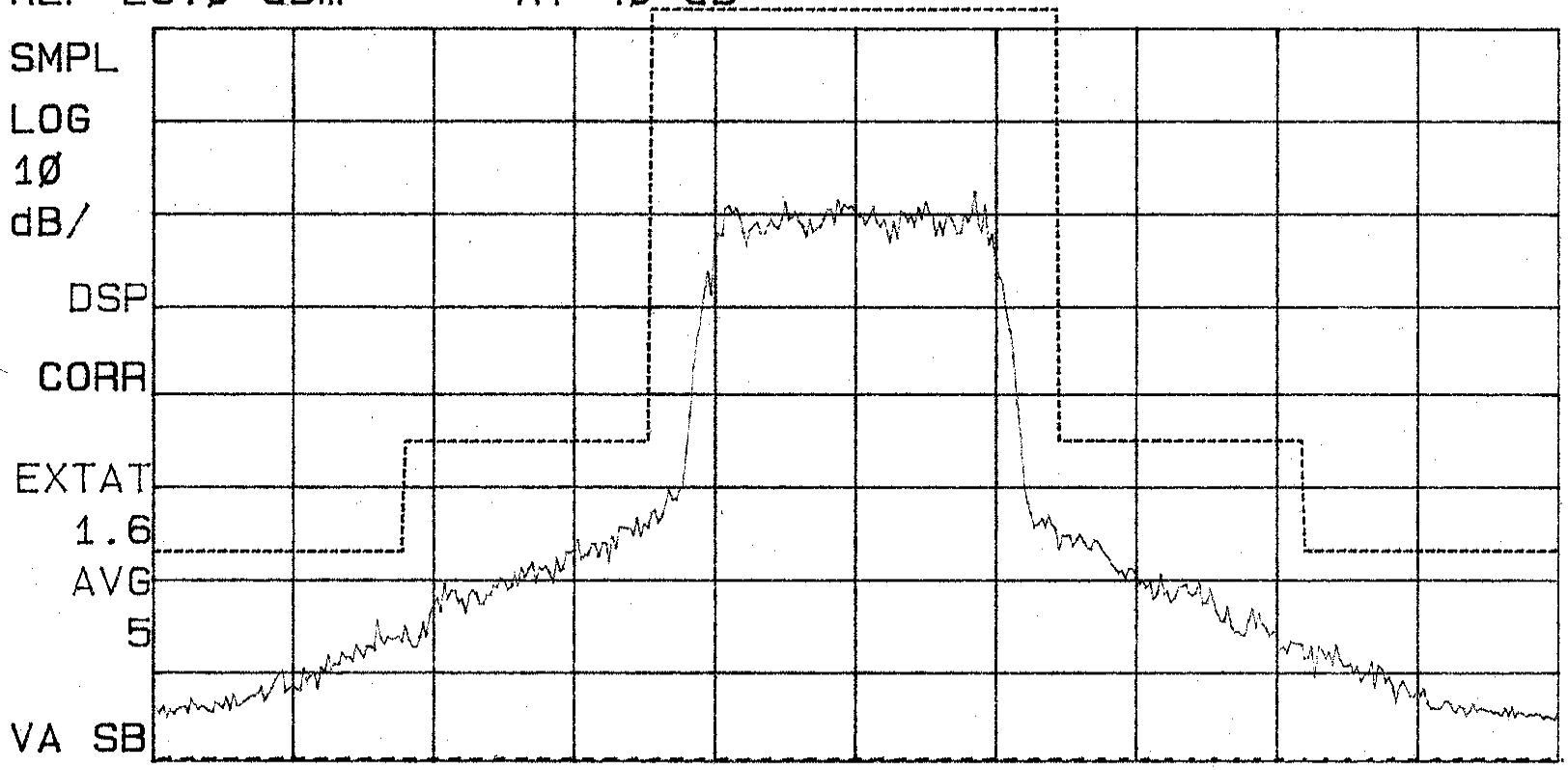

14: 25: 49 AUG 16, 1999
MKR 823.989 MHz
-39.04 dBm
REF 26.3 dBm
AT 40 dB
-62.63 dBc
SMPL
LOG
10
dB/
DSP
CORR
EXTAT
1.6
AVG
5
VA SB
SC FS MS CH 34
START 822.920 MHz
#RES BW 30 kHz
#VBW 3 kHz
STOP 829.120 MHz
SWP 207 msec
SPUR TX MAX POWER
(dBc/30kHz) Fc Δ Lim -8.3 dB
Δfc -2.030 MHz
PASS
Chan Power
23.3 dBm

14: 21: Ø8 AUG 16, 1999



14: 15: 37 AUG 16, 1999

REF 26.Ø dBm AT 4Ø dB



START 845.21Ø MHz STOP 851.41Ø MHz

#RES BW 3Ø kHz #VBW 3 kHz SWP 2Ø7 msec

SPUR TX MAX POWER PASS

(dBc/3ØkHz) Fc ΔLim −7.5 c3

Δfc −2.11Ø MHz

Chan Power

23.Ø dBm

APPLICANT: MOTOROLA **TRANSCEIVER TYPE: IHET5ZA1**

Summary of Transmitter

Conducted Spurious

Frequency MHz	Spur Level dBc	FCC Limit
1652	55.5	36 dBc
1673	58.2	36 dBc
1695.5	59	36 dBc

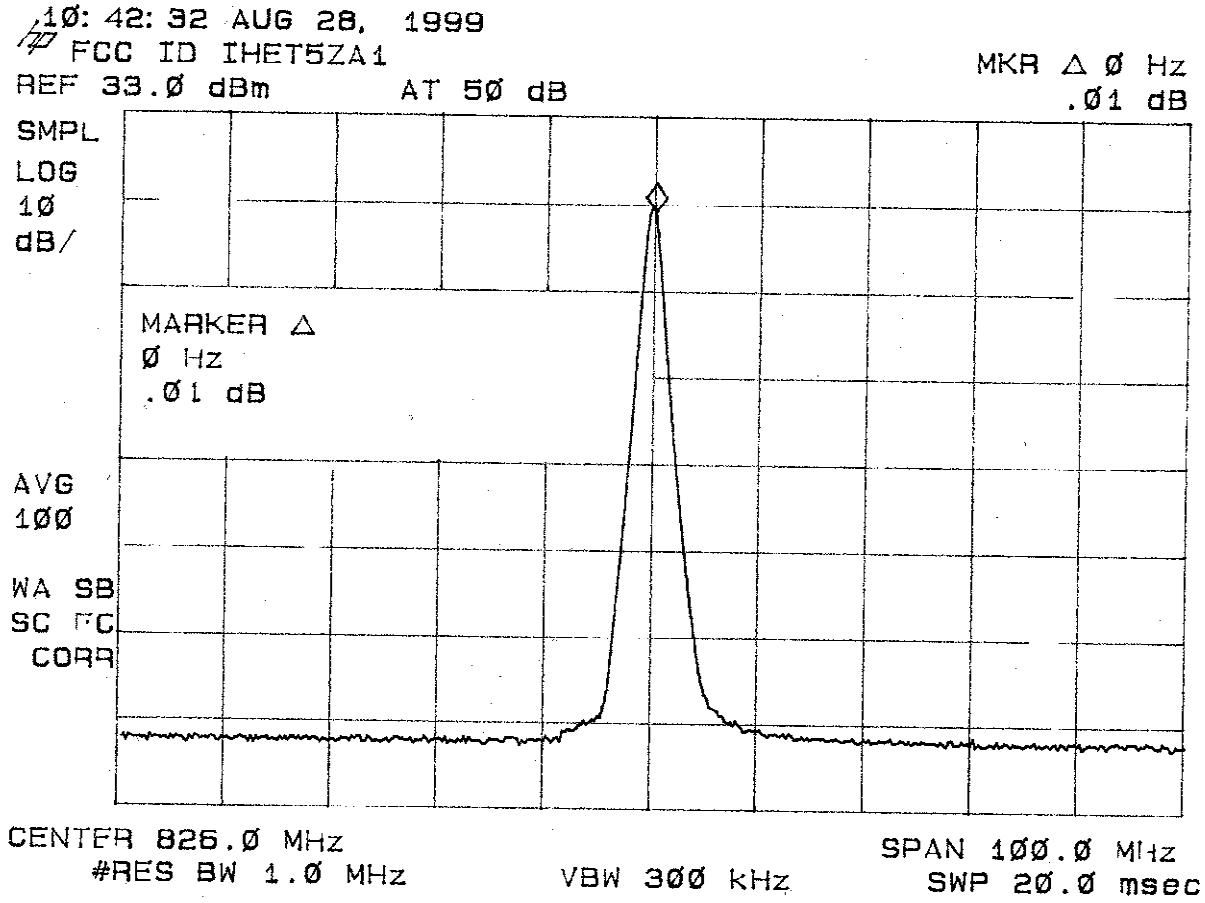
Note:

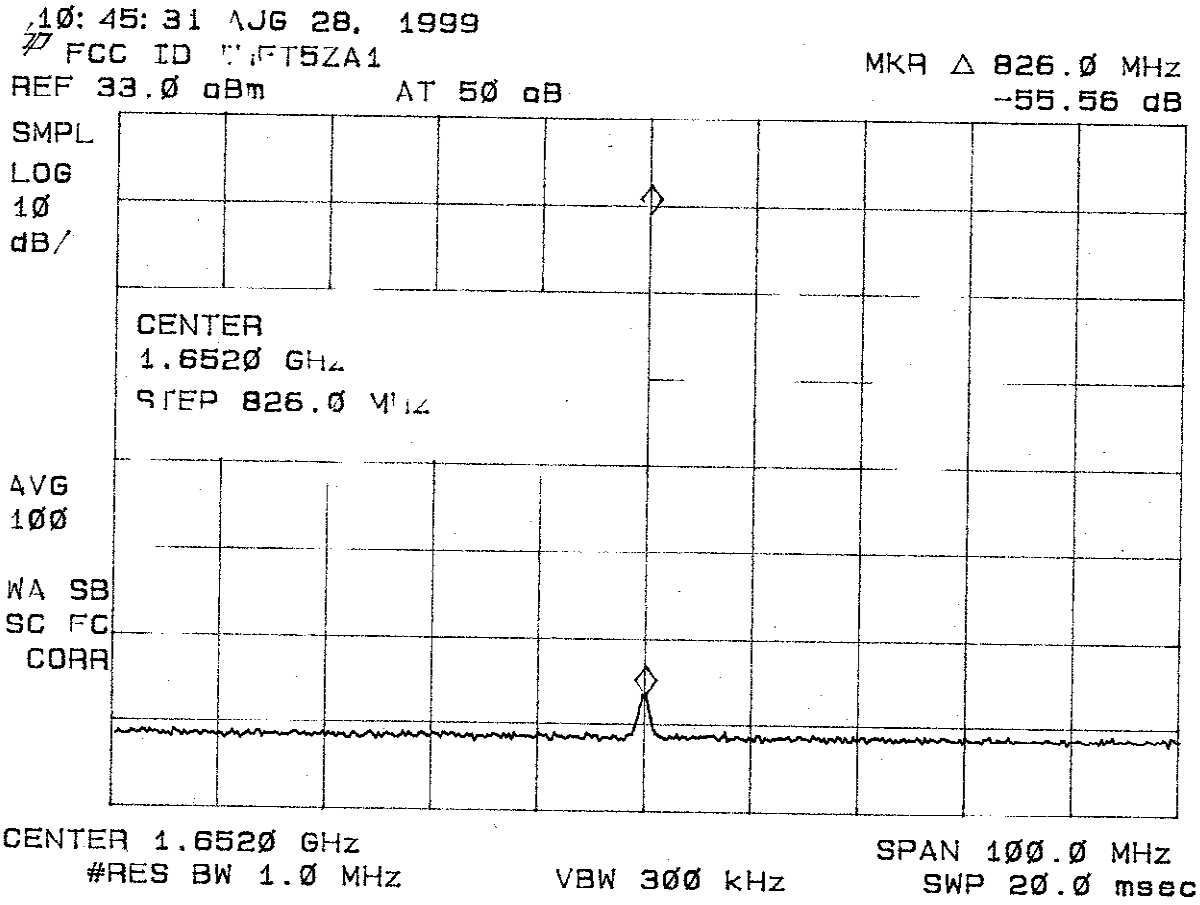
1. Spurious emissions were measured at the harmonics of the Transmitter at high, mid and low channel. All other conducted emissions were at least 20 dB below FCC limits

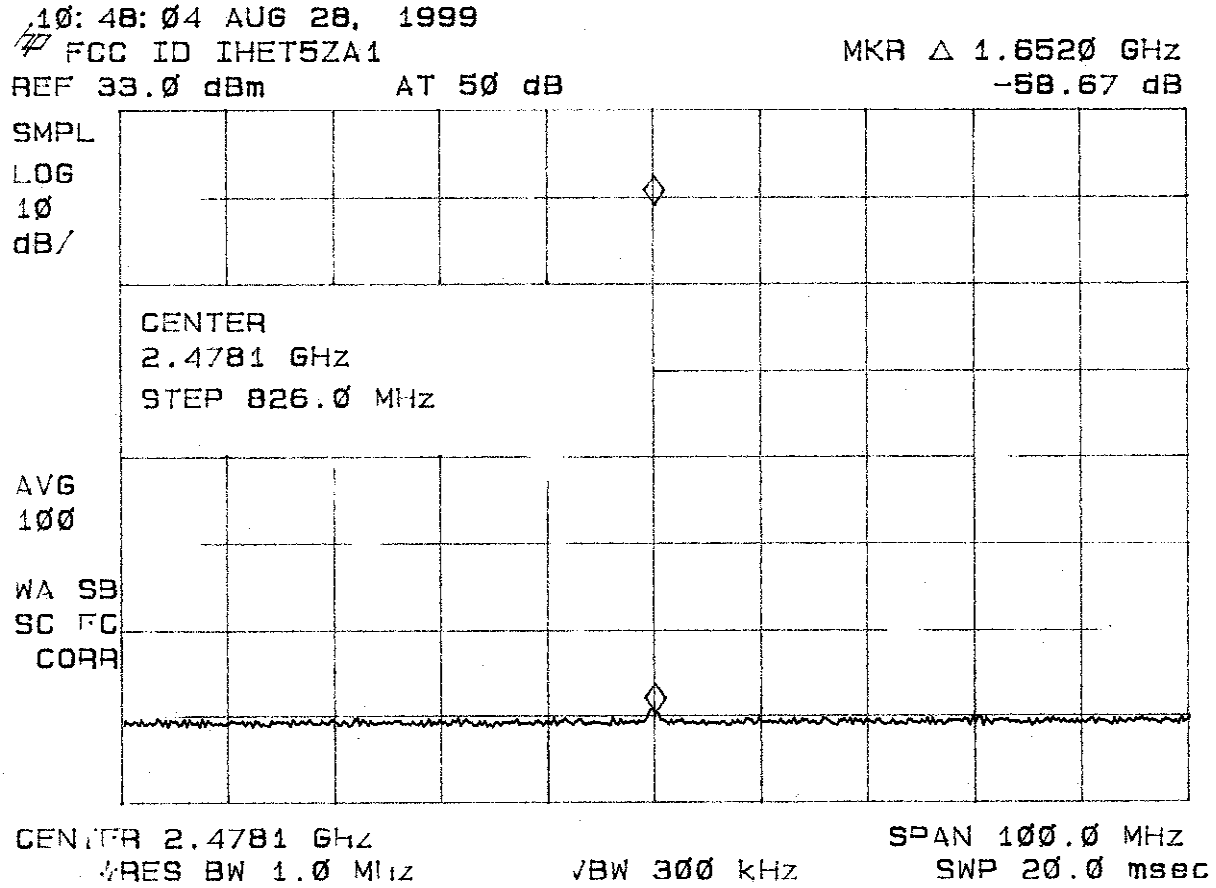
2. FCC limit

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

3. No signals were found in the 869 MHz to 894 MHz base station band.


10: 42: 32 AUG 28, 1999
FCC ID IHET5ZA1
REF 33.0 dBm
AT 50 dB
MKR Δ 0 Hz
.01 dB
SMPL
LOG
10
dB/
MARKER Δ
0 Hz
.01 dB
AVG
100
WA SB
SC FC
CORR
CENTER 826.0 MHz
#RES BW 1.0 MHz
VBW 300 kHz
SPAN 100.0 MHz
SWP 20.0 msec


10: 45: 31 AUG 28, 1999
FCC ID IHET5ZA1
REF 33.0 dBm
AT 50 dB
MKR Δ 826.0 MHz
-55.56 dB
SMPL
LOG
10
dB/
CENTER
1.652 GHz
STEP 826.0 MHz
AVG
100
WA SB
SC FC
CORR
CENTER 1.652 GHz
#RES BW 1.0 MHz
VBW 300 kHz
SPAN 100.0 MHz
SWP 20.0 msec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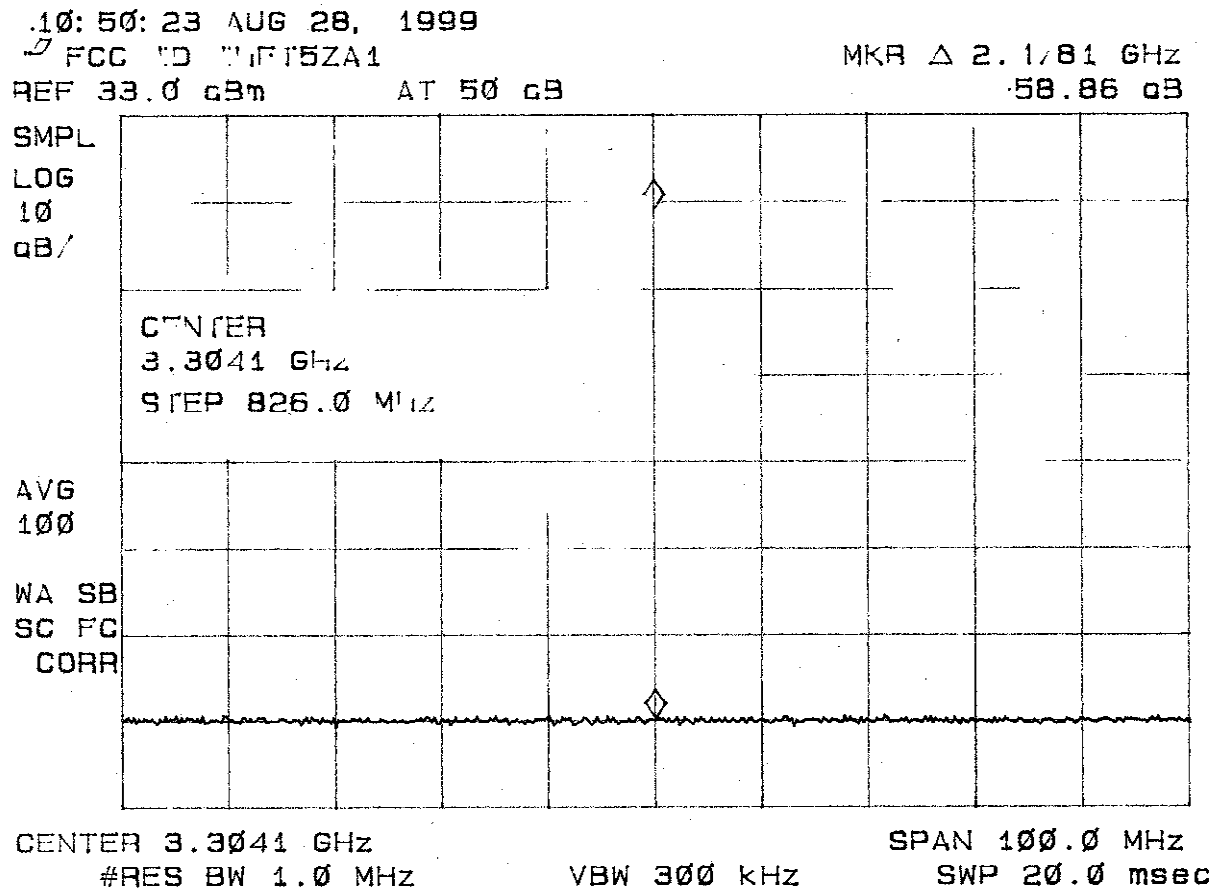
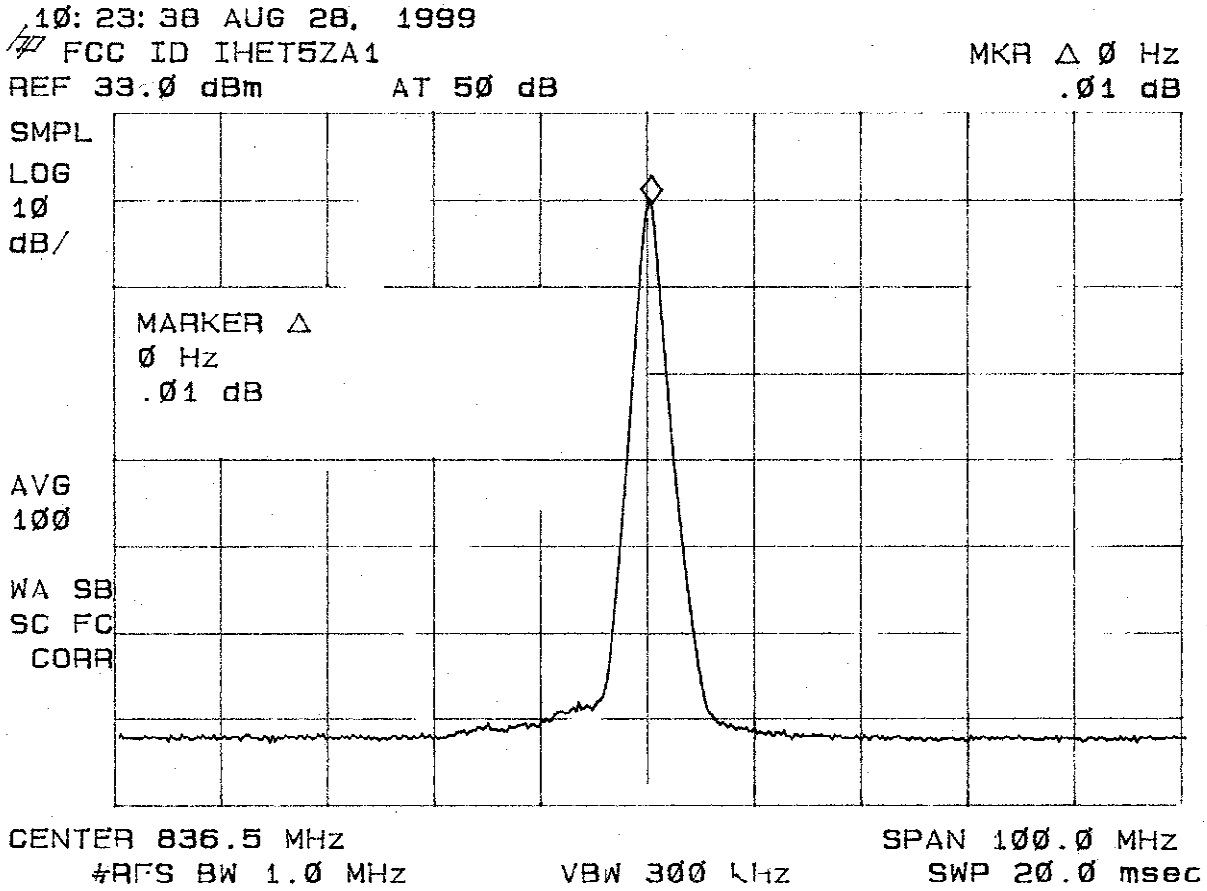
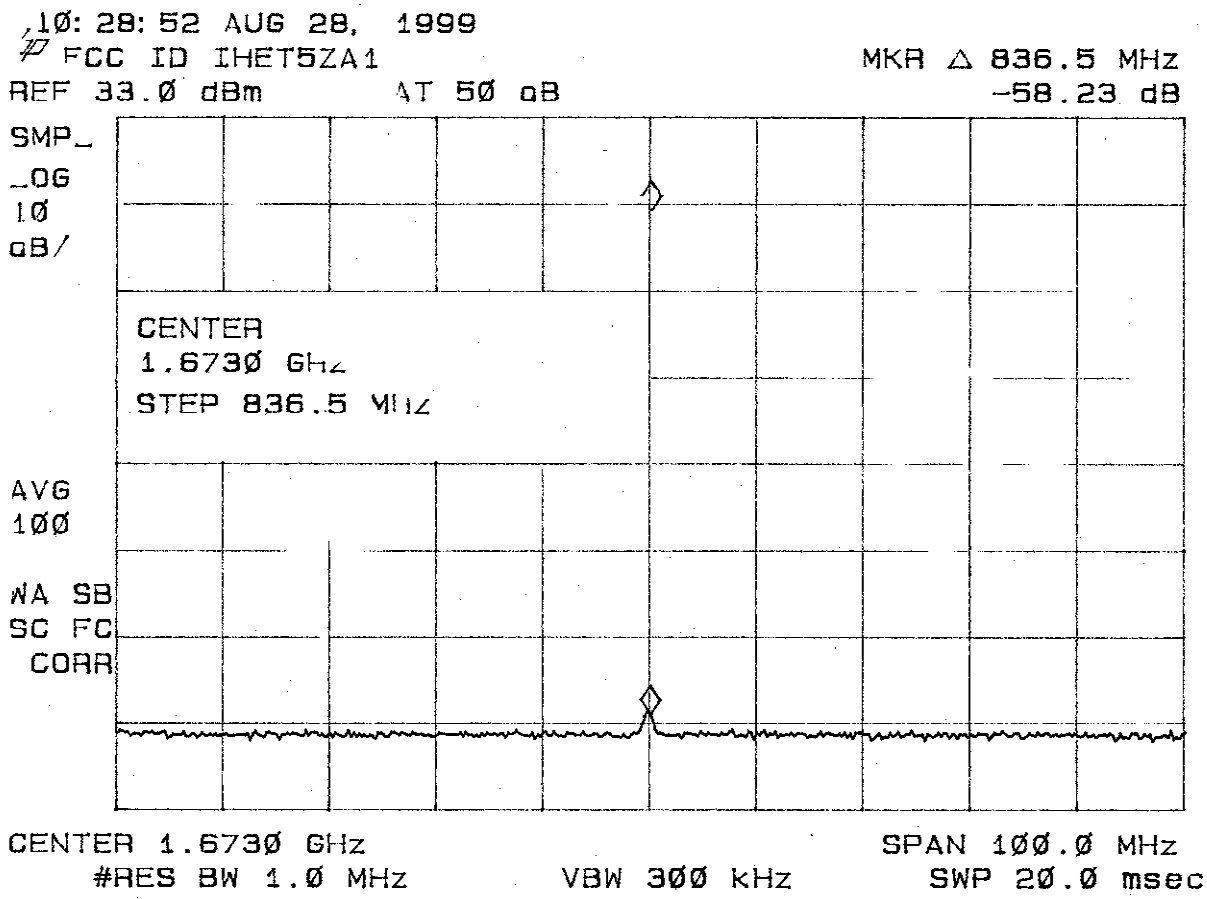
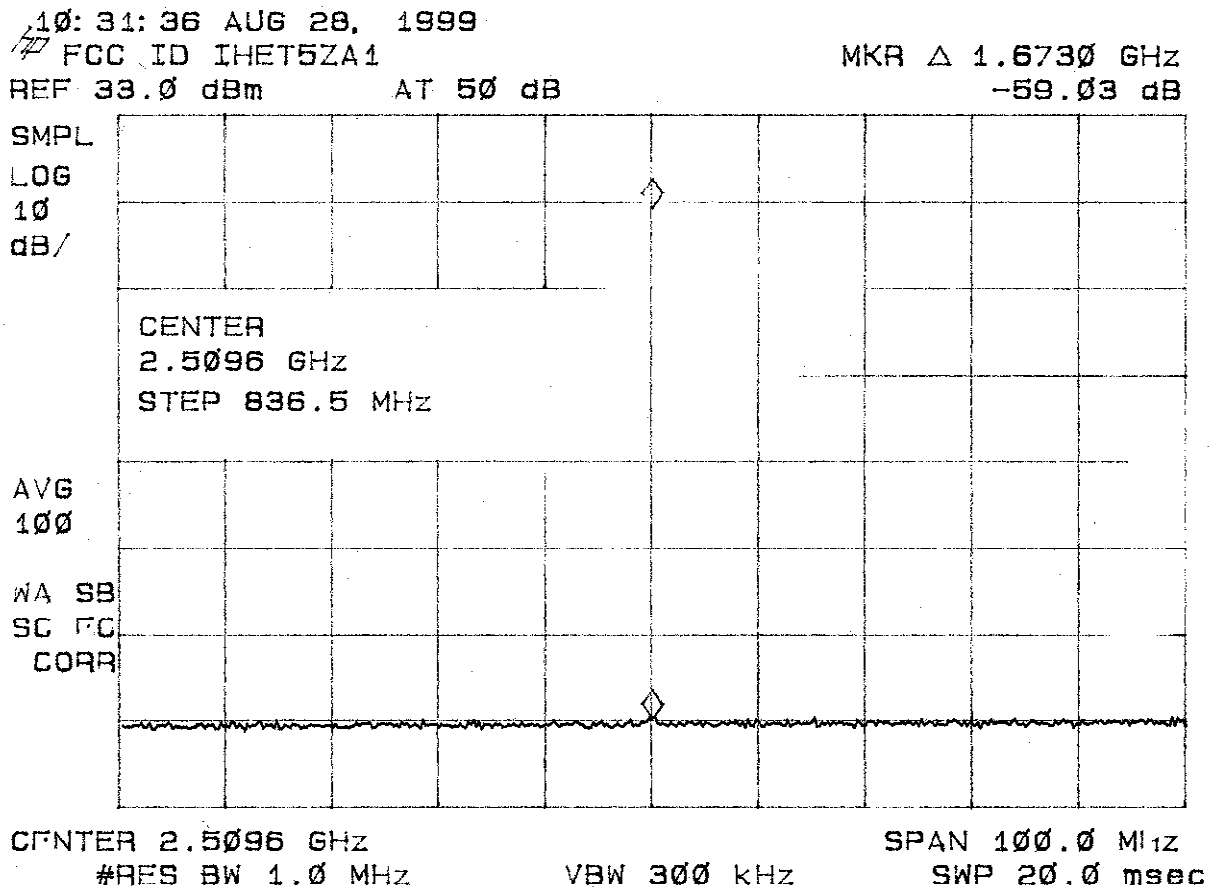
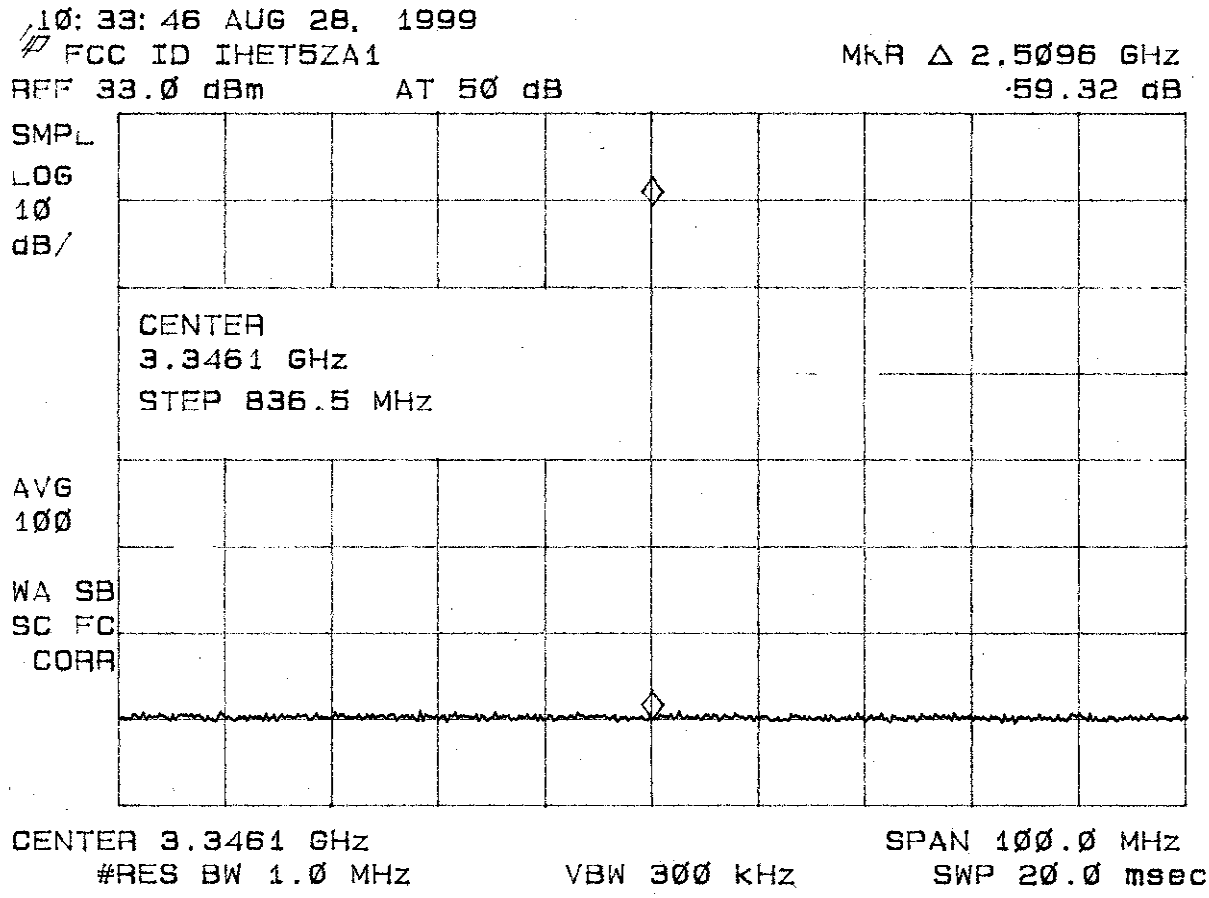
FCC ID IHET5ZA1
MKR Δ 1.6520 GHz
REF 33.0 dBm
AT 50 dB
-58.67 dB
SMPL
LOG
10
dB/
CENTER
2.4781 GHz
STEP 826.0 MHz
AVG
100
WA SB
SC FC
CORR
CENTER 2.4781 GHz
SPAN 100.0 MHz
#RES BW 1.0 MHz
VBW 300 kHz
SWP 20.0 msec

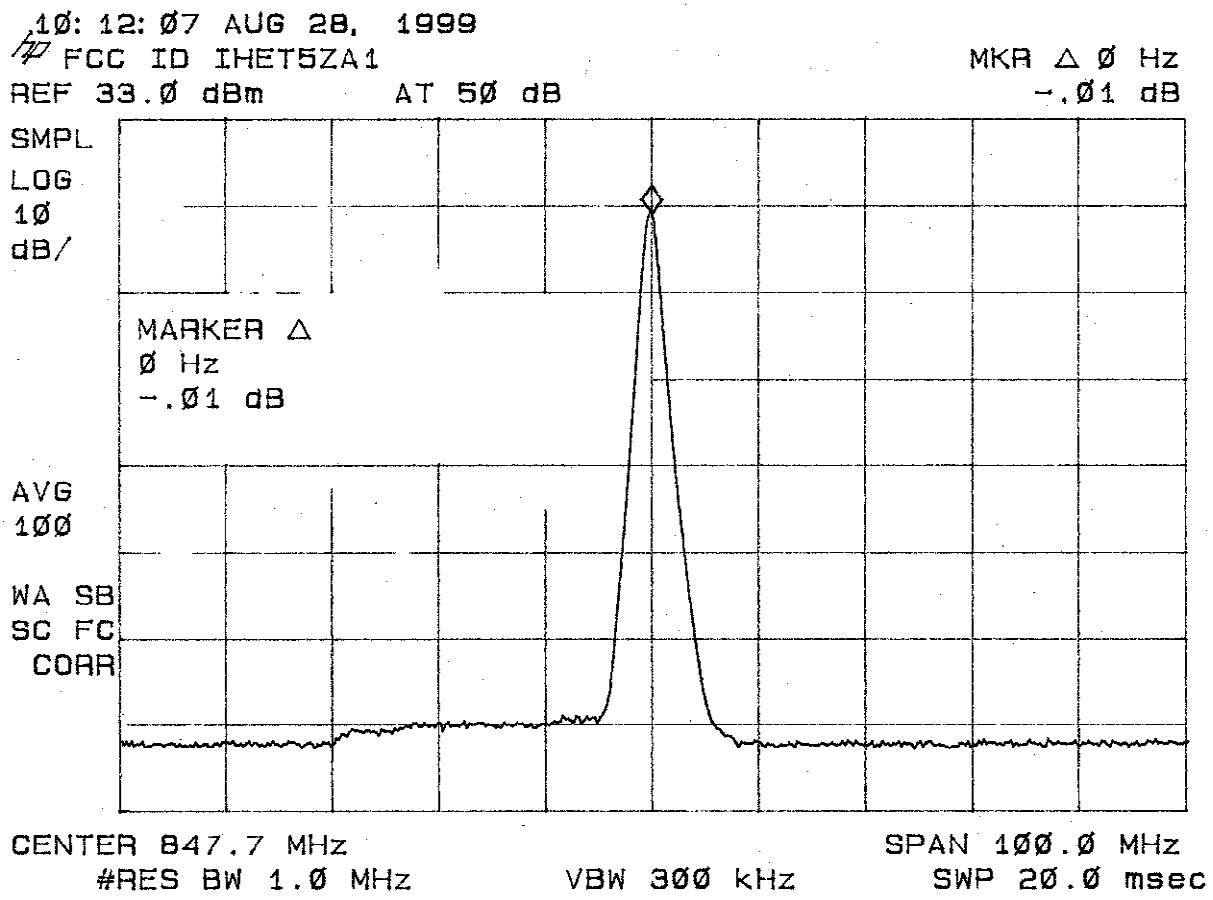

10: 50: 23 AUG 28, 1999
FCC ID IHET5ZA1
MKR Δ 2.1781 GHz
REF 33.0 dBm
AT 50 dB
-58.86 dB
SMPL
LOG
10
dB/
CENTER
3.3041 GHz
STEP 826.0 MHz
AVG
100
WA SB
SC FC
CORR
CENTER 3.3041 GHz
SPAN 100.0 MHz
#RES BW 1.0 MHz
VBW 300 kHz
SWP 20.0 msec

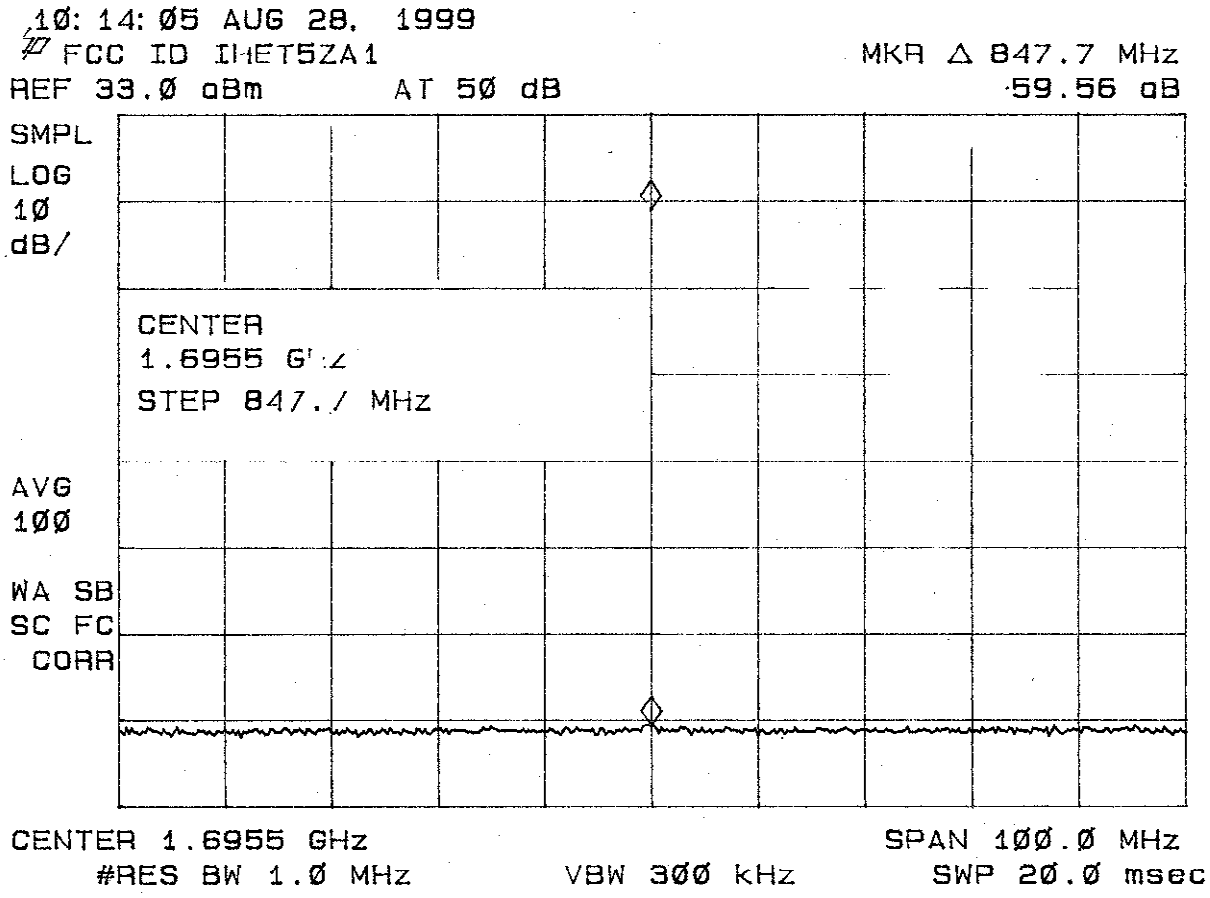

10: 23: 38 AUG 28, 1999
FCC ID IHET5ZA1
MKR Δ Ø Hz
REF 33.Ø dBm
AT 5Ø dB
.Ø1 dB
SMPL
LOG
1Ø
dB/
MARKER Δ
Ø Hz
.Ø1 dB
AVG
1ØØ
WA SB
SC FC
CORR
CENTER 836.5 MHz
SPAN 1ØØ.Ø MHz
#RES BW 1.Ø MHz
VBW 3ØØ kHz
SWP 2Ø.Ø msec

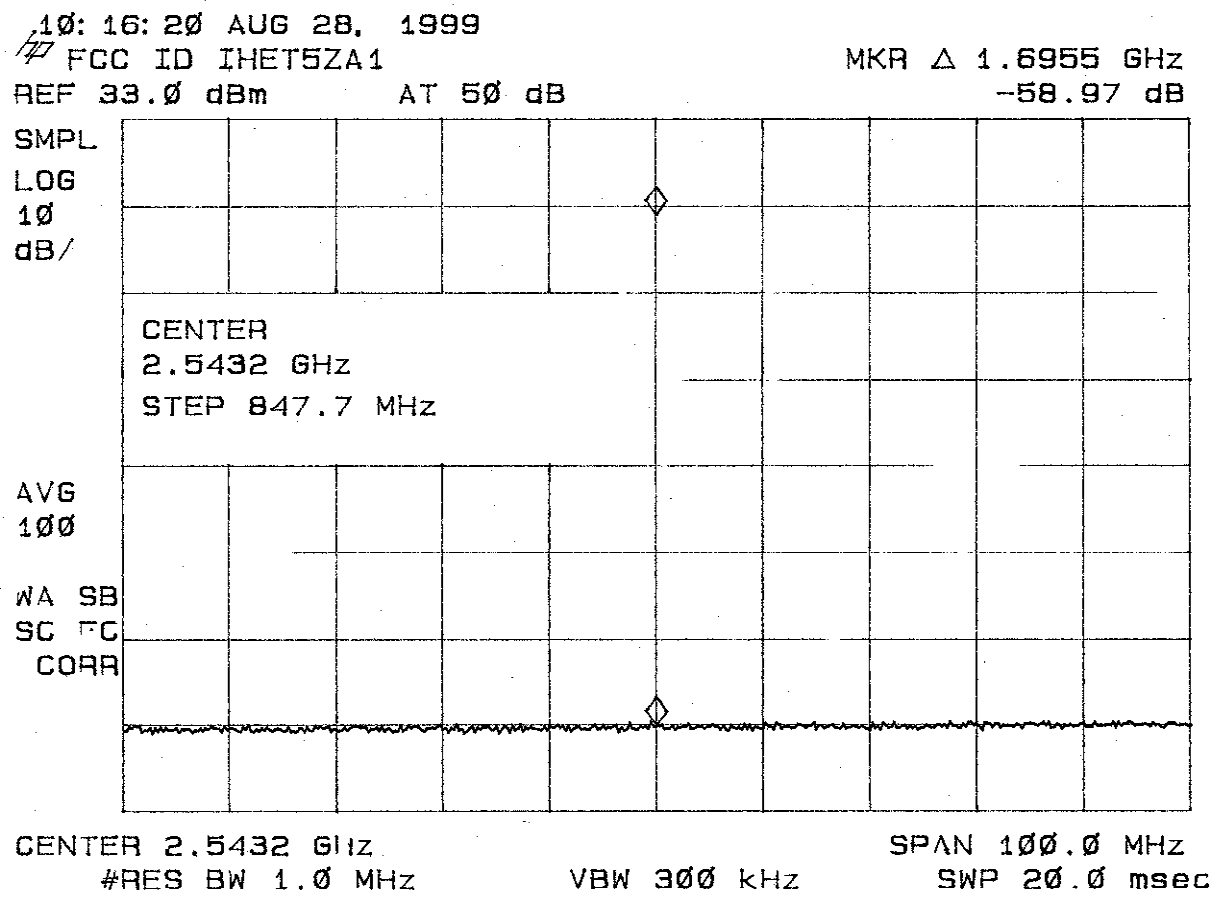

10: 28: 52 AUG 28, 1999
FCC ID IHET5ZA1
MKR Δ 836.5 MHz
REF 33.Ø dBm
AT 5Ø dB
-58.23 dB
SMPL
LOG
1Ø
dB/
CENTER
1.673Ø GHz
STEP 836.5 MHz
AVG
1ØØ
WA SB
SC FC
CORR
CENTER 1.673Ø GHz
SPAN 1ØØ.Ø MHz
#RES BW 1.Ø MHz
VBW 3ØØ kHz
SWP 2Ø.Ø msec


10: 31: 36 AUG 28, 1999
FCC ID IHET5ZA1
MKR Δ 1.673Ø GHz
REF 33.Ø dBm
AT 5Ø dB
-59.Ø3 dB
SMPL
LOG
1Ø
dB/
CENTER
2.5Ø96 GHz
STEP 836.5 MHz
AVG
1ØØ
WA SB
SC FC
CORR
CENTER 2.5Ø96 GHz
SPAN 1ØØ.Ø MHz
#RES BW 1.Ø MHz
VBW 3ØØ kHz
SWP 2Ø.Ø msec


10: 33: 46 AUG 28, 1999
FCC ID IHET5ZA1
MKR Δ 2.5Ø96 GHz
REF 33.Ø dBm
AT 5Ø dB
-59.32 dB
SMPL
LOG
1Ø
dB/
CENTER
3.3461 GHz
STEP 836.5 MHz
AVG
1ØØ
WA SB
SC FC
CORR
CENTER 3.3461 GHz
SPAN 1ØØ.Ø MHz
#RES BW 1.Ø MHz
VBW 3ØØ kHz
SWP 2Ø.Ø msec


10: 12: 07 AUG 28, 1999
FCC ID IHET5ZA1
MKR Δ Ø Hz
REF 33.Ø dBm
AT 5Ø dB
-.Ø1 dB
SMPL
LOG
1Ø
dB/
MARKER Δ
Ø Hz
-.Ø1 dB
AVG
1ØØ
WA SB
SC FC
CORR
CENTER 847.7 MHz
SPAN 1ØØ.Ø MHz
#RES BW 1.Ø MHz
VBW 3ØØ kHz
SWP 2Ø.Ø msec


10: 14: 05 AUG 28, 1999
FCC ID IHET5ZA1
MKR Δ 847.7 MHz
REF 33.Ø dBm
AT 5Ø dB
-59.56 dB
SMPL
LOG
1Ø
dB/
CENTER
1.6955 GHz
STEP 847.7 MHz
AVG
1ØØ
WA SB
SC FC
CORR
CENTER 1.6955 GHz
SPAN 1ØØ.Ø MHz
#RES BW 1.Ø MHz
VBW 3ØØ kHz
SWP 2Ø.Ø msec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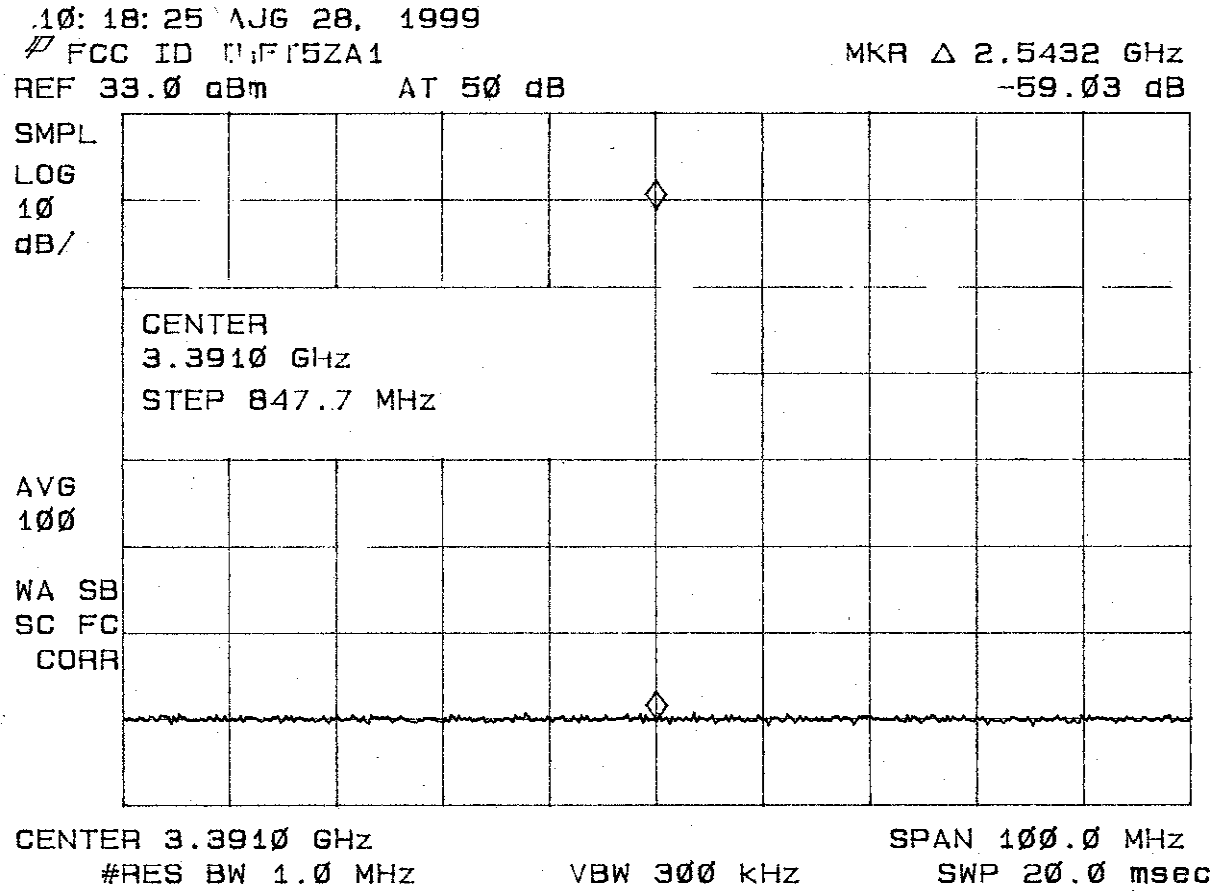
FCC ID IHET5ZA1
MKR Δ 1.6955 GHz
REF 33.0 dBm
AT 50 dB
-58.97 dB
SMPL
LOG
10
dB/
CENTER
2.5432 GHz
STEP 847.7 MHz
AVG
100
WA SB
SC FC
CORR
CENTER 2.5432 GHz
SPAN 100.0 MHz
#RES BW 1.0 MHz
VBW 300 kHz
SWP 20.0 msec


10: 18: 25 AUG 28, 1999
FCC ID IHET5ZA1
MKR Δ 2.5432 GHz
REF 33.0 dBm
AT 50 dB
-59.03 dB
SMPL
LOG
10
dB/
CENTER
3.3910 GHz
STEP 847.7 MHz
AVG
100
WA SB
SC FC
CORR
CENTER 3.3910 GHz
SPAN 100.0 MHz
#RES BW 1.0 MHz
VBW 300 kHz
SWP 20.0 msec

APPLICANT: MOTOROLA **TRANSCEIVER TYPE: IHET5ZA1**

Summary of Transmit Frequency

Drift Vs. Temperature

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	-18	22
-20	-27	40
-10	-22	43
0	-21	30
10	-24	31
20	-21	34
30	-24	37
40	-18	45
50	-21	44

Engineer: 11/20/99
Date

APPLICANT: MOTOROLA **TRANSCEIVER TYPE: IHET5ZA1**

Summary of Transmit Frequency

Drift Vs. Line Voltage

Power Supply Line Voltage	Lowest Channel Frequency Error Hz Drift from Nominal Channel Center	Highest Channel Frequency Error Hz Drift from Nominal Channel Center
102 Vac	-42	39
120 Vac	-38	45
138 Vac	-59	31

Engineer: 1/20/99
Date

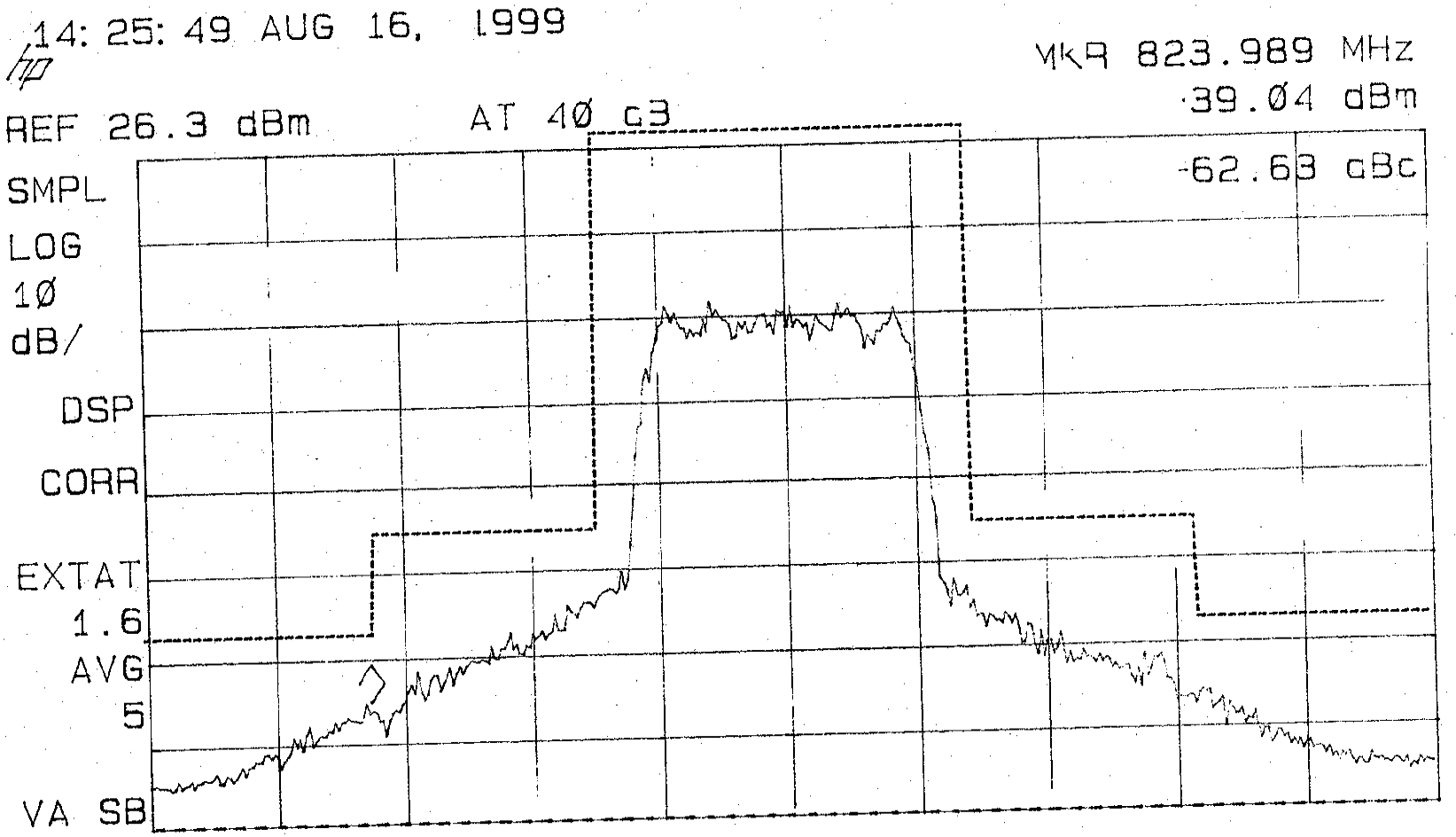
APPLICANT: MOTOROLA **TRANSCEIVER TYPE: IHET5ZA1**

Occupied Bandwidth

Plots attached

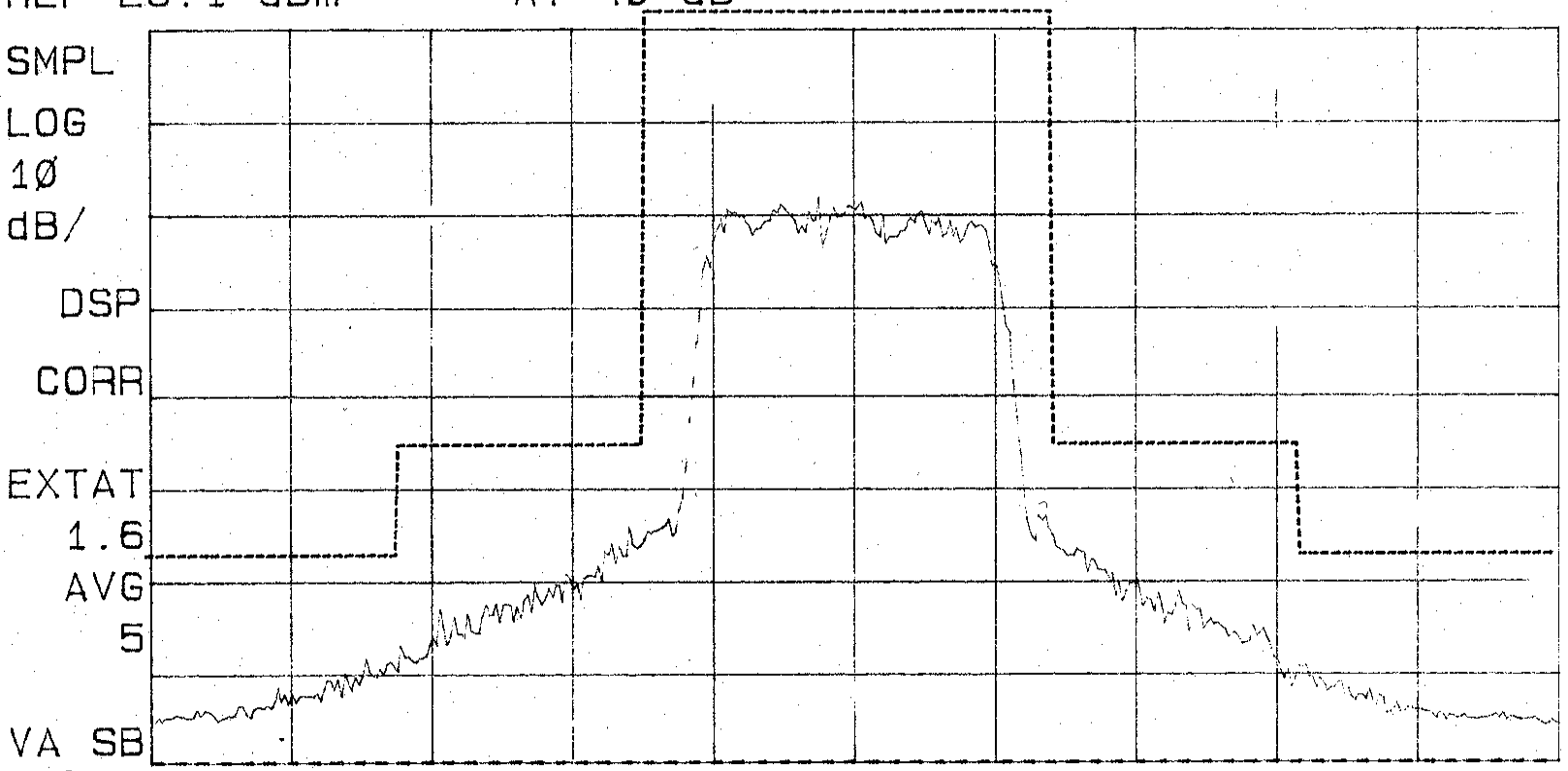
Comments: Modulation products in a bandwidth of 30 Khz centered +/- 900 Khz from the channel center frequency should be at least 45 dB and shall be at least 42 dB below the mean output power level.

OCCUPIED BANDWIDTH



14: 21: ØB AUG 16, 1999

REF 26.1 dBm AT 4Ø dB



START 833.42Ø MHz STOP 839.62Ø MHz

#RES BW 3Ø kHz #VBW 3 kHz SWP 2Ø/ msec

SPUR TX MIX POWER PASS

(dBc/3ØkHz) Fc Δlm −9.4 dB

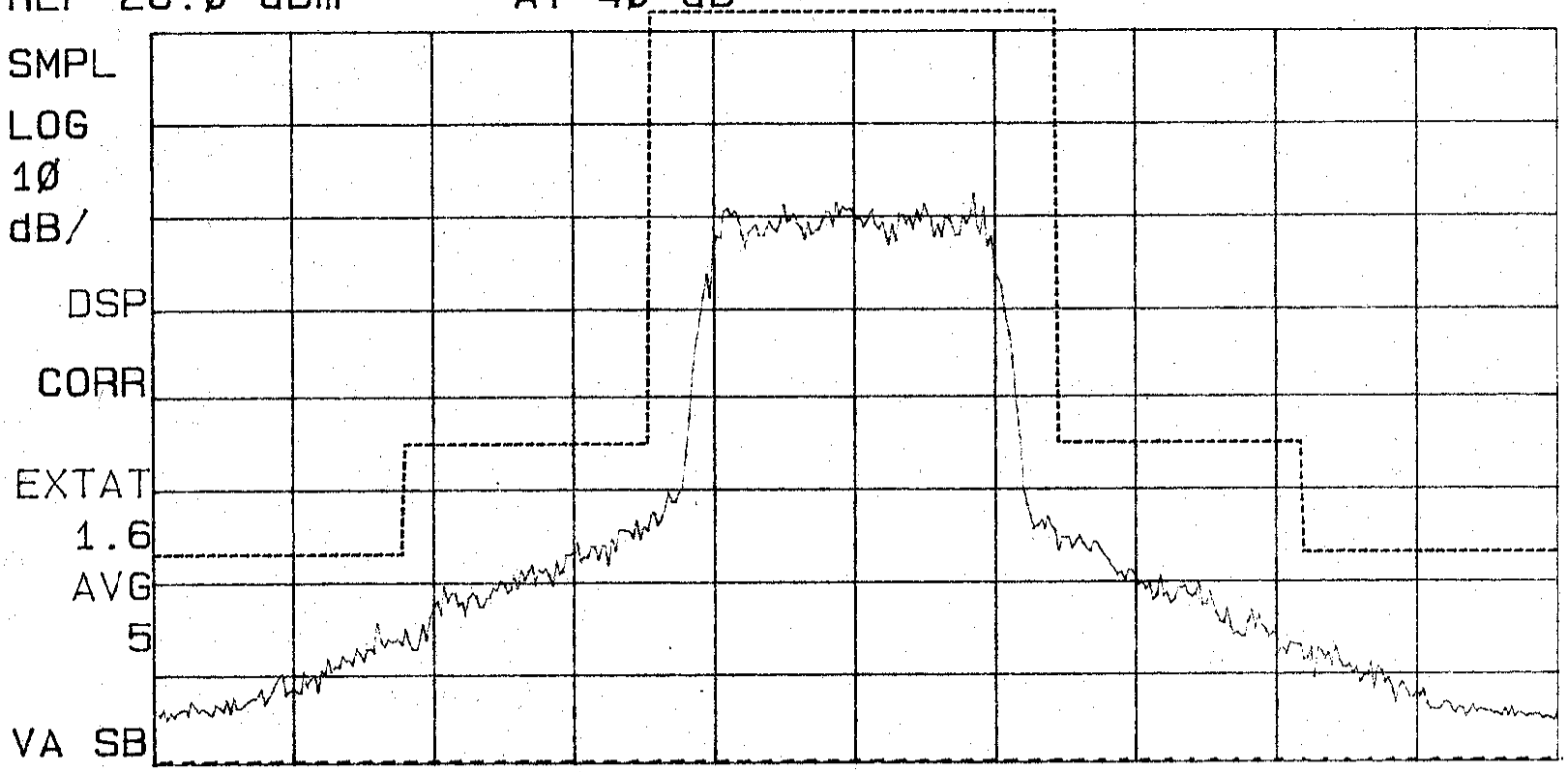
Δfc −99Ø.Ø kHz

Chan Power

23.1 dBm

14: 15: 37 AUG 16, 1999

REF 26.Ø dBm AT 4Ø dB



MS CH 777

START 845.21Ø MHz STOP 851.41Ø MHz

#RES BW 3Ø kHz #VBW 3 kHz SWP 2Ø7 msec

SPUR TX MAX POWER PASS

(dBc/3ØkHz) Fc ΔLim −7.5 dB

Δfc −2.11Ø MHz

Chan Power

23.Ø dBm

APPLICANT: MOTOROLA **TRANSCEIVER TYPE: IHET5ZA1**

CDMA Waveform Quality Rho

Frequency (Channel)	Power Level Maximum 23 dBm	Lower Power Level -20 dBm
(034)	0.976	0.973
(384)	0.983	0.975
(777)	0.983	0.979

Note: Minimum Standard per EIA IS-98-A is rho > 0.940

8924C CDMA Mobile Station Test Set: 01/22/99 05:04:00 pm

CDMA CELLULAR MOBILE TRANSMITTER TEST

Traffic Rho		Phs Error	deg
0.976		7.4	
Freq Error	Hz	Avg Power	dBm
12.4		22.23	

Meas Cntl Single/Cont		Traffic Data Mode Svc Opt 2 Data Rate Full Power Meas Zero	Sctr A Pwr -104.0 dBm/BW RF Power -104.00 dBm/BW	To Screen ● CDMA CALL CNTL SMS AUTHEN ○ Analog RX TEST Config TESTS

CH 34

8924C CDMA Mobile Station Test Set: 01/22/99 05:03:00 pm

CDMA CELLULAR MOBILE TRANSMITTER TEST

Traffic Rho		Phs Error	deg
0.983		6.8	
Freq Error	Hz	Ave Power	dBm
-48.0		19.96	

Meas Cntl Single/Cont		Traffic Data Mode Svc Opt 2 Data Rate Full Power Meas Zero	Sctr A Pwr -104.0 dBm/BW RF Power -104.00 dBm/BW	To Screen ● CDMA CALL CNTL SMS AUTHEN ○ Analog RX TEST Config TESTS

CH 384

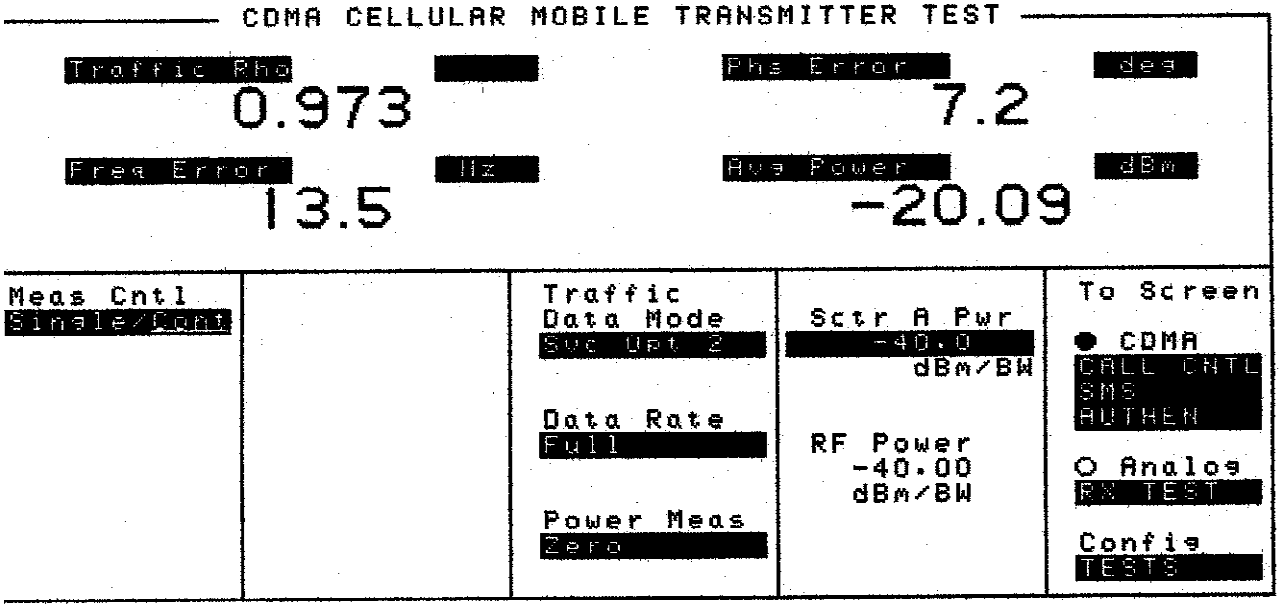
8924C CDMA Mobile Station Test Set: 01/22/99 05:05:00 PM

CDMA CELLULAR MOBILE TRANSMITTER TEST

Traffic Rho		Phs Error	deg
0.983		6.5	
Freq Error	Hz	Ave Power	dBm
-13.4		22.41	

Meas Cntl Single/Cont		Traffic Data Mode Svc Opt 2 Data Rate Full Power Meas Zero	Sctr A Pwr -104.0 dBm/BW RF Power -104.00 dBm/BW	To Screen ● CDMA CALL CNTL SMS AUTHEN ○ Analog RX TEST Config TESTS

CH758


CDMA CELLULAR MOBILE TRANSMITTER TEST
Traffic Rho
0.973
Phs Error
7.2
deg
Freq Error
13.5
Hz
Avg Power
-20.09
dBm
Meas Cntl
Single/Cont
Traffic
Data Mode
Svc Opt 2
Data Rate
Full
Power Meas
Zero
Sctr A Pwr
-40.0
dBm/BW
RF Power
-40.00
dBm/BW
To Screen
CDMA
CALL CNTL
SMS
AUTHEN
Analog
RX TEST
Config
TESTS

CH 34

8924C CDMA Mobile Station Test Set: 01/22/99 05:42:00 pm

CDMA CELLULAR MOBILE TRANSMITTER TEST

Traffic Rho		Phs Error	deg
0.975		7.8	
Freq Error	Hz	Ave Power	dBm
13.7		-20.10	

Meas Cntl Single/Cont		Traffic Data Mode Svc Opt 2 Data Rate Full Power Meas Zero	Sctr A Pwr -40.0 dBm/BW RF Power -40.00 dBm/BW	To Screen ● CDMA CALL CNTL SMS AUTHEN ○ Analog RX TEST Config TESTS

CH 384

› 8924C CDMA Mobile Station Test Set: 01/22/99 05:43:00 pm

CDMA CELLULAR MOBILE TRANSMITTER TEST

Traffic Rho 0.979		Phs Error 7.0	deg
Freq Error 29.3	Hz	Avg Power -19.74	dBm

Meas Cntl Single/Cont		Traffic Data Mode Svc Opt 2 Data Rate Full Power Meas Zero	Sctr A Pwr -40.0 dBm/BW RF Power -40.00 dBm/BW	To Screen ● CDMA CALL CNTL SMS AUTHEN ○ Analog RX TEST Config TESTS

CH 758