

Type Acceptance Test Report

**Multimode PCS Repeater
FCC Rule Parts: 2, 15 & 24**

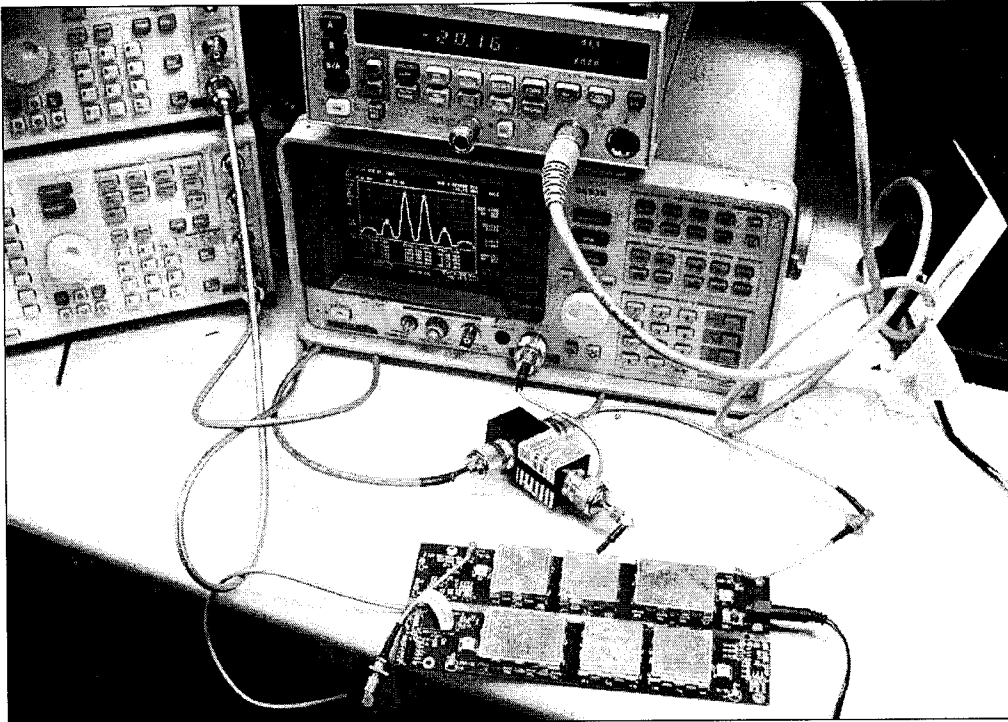
ACS Report Number: 03-0089-24TA

Manufacturer: EMS Wireless
Model: Link2Cell

Intermodulation Test

**Two Tone Conducted
Spurious Emissions Test**

Test Setup



Test Equipment

| Diagram Number | Equipment Type | MFG | Model | Serial Number | Cal Date | Cal Due |
|----------------|---------------------|---------|----------|---------------|----------|----------|
| 1 | RF Signal Generator | Agilent | E4432B | A55445-4 | 4/5/2003 | 4/5/2004 |
| 2 | RF Signal Generator | Agilent | E4432B | A55445-4 | 4/5/2003 | 4/5/2004 |
| 3 | Spectrum Analyzer | Agilent | 8593E | A55445-1 | 4/5/2003 | 4/5/2004 |
| 4 | Power Meter | Agilent | 438A | A55444-1 | 4/5/2003 | 4/5/2004 |
| 5 | Power Sensor | Agilent | 8481A | A55444-2 | 4/5/2003 | 4/5/2004 |
| 6 | Power Divider | Telwave | ANTPD218 | N/A | | |

Test Results

See following pages.

UPLINK

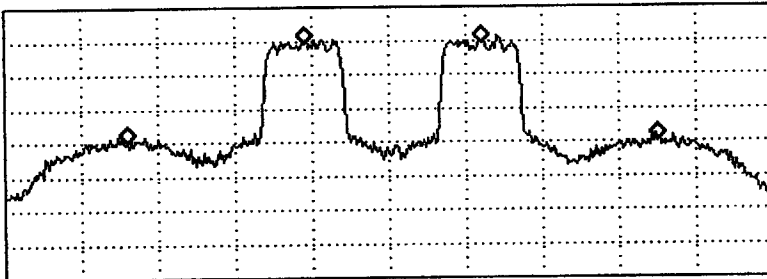
05:16:39 JUN 25, 2003

CDMA

MKR 1.84808 GHz
-25.01 dBm

REF 15.0 dBm AT 30 dB

PEAK
LOG
10
dB/
OFFST
.5
dB



CLEAR
WRITE A

MAX
HOLD A

VIEW A

BLANK A

Trace
A B C

More
1 of 3

| Marker | Trace | Type | Freq / Time | Amplitude |
|--------|-------|------|-------------|------------|
| 1: | (A) | Freq | 1848.08 MHz | -25.01 dBm |
| 2: | (A) | Freq | 1851.07 MHz | 4.25 dBm |
| 3: | (A) | Freq | 1854.06 MHz | 4.33 dBm |
| 4: | (A) | Freq | 1857.05 MHz | -24.90 dBm |

CENTER 1.85250 GHz
#RES BW 30 kHz

VBW 30 kHz

SPAN 13.00 MHz
SWP 43.3 msec

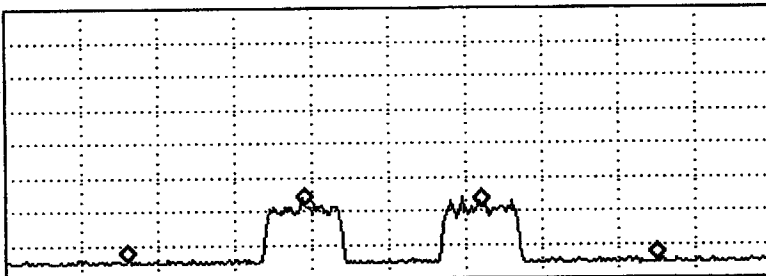
05:18:31 JUN 25, 2003

Input

MKR 1.84808 GHz
-59.77 dBm

REF 15.0 dBm AT 30 dB

PEAK
LOG
10
dB/
OFFST
.5
dB



CLEAR
WRITE A

MAX
HOLD A

VIEW A

BLANK A

Trace
A B C

More
1 of 3

| Marker | Trace | Type | Freq / Time | Amplitude |
|--------|-------|------|-------------|------------|
| 1: | (A) | Freq | 1848.08 MHz | -59.77 dBm |
| 2: | (A) | Freq | 1851.07 MHz | -43.71 dBm |
| 3: | (A) | Freq | 1854.06 MHz | -43.75 dBm |
| 4: | (A) | Freq | 1857.05 MHz | -59.64 dBm |

CENTER 1.85250 GHz
#RES BW 30 kHz

VBW 30 kHz

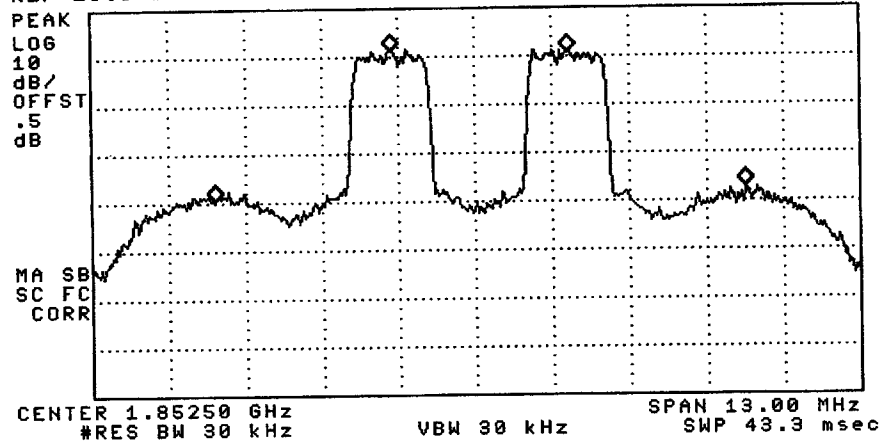
SPAN 13.00 MHz
SWP 43.3 msec

COMA

05:20:33 JUN 25, 2003

MKR 1.84808 GHz
-24.41 dBm

REF 15.0 dBm AT 30 dB



CLEAR
WRITE A

MAX
HOLD A

VIEW A

BLANK A

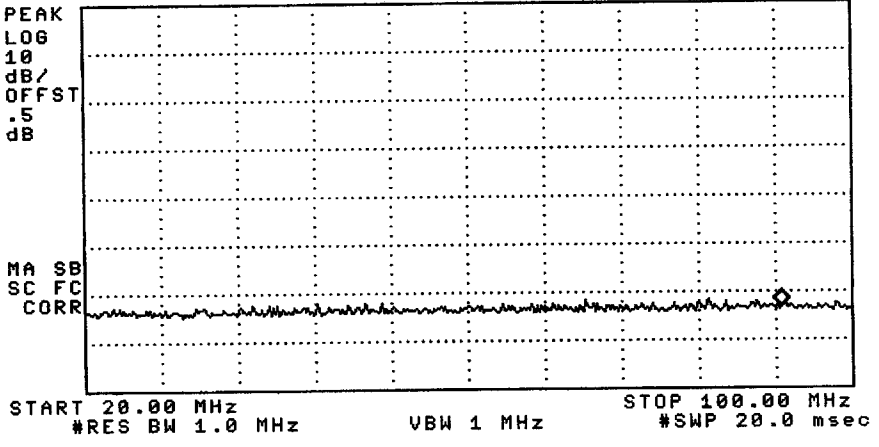
Trace
A B C

More
1 of 3

05:21:58 JUN 25, 2003

MKR 92.60 MHz
-48.18 dBm

REF 15.0 dBm AT 30 dB



CLEAR
WRITE A

MAX
HOLD A

VIEW A

BLANK A

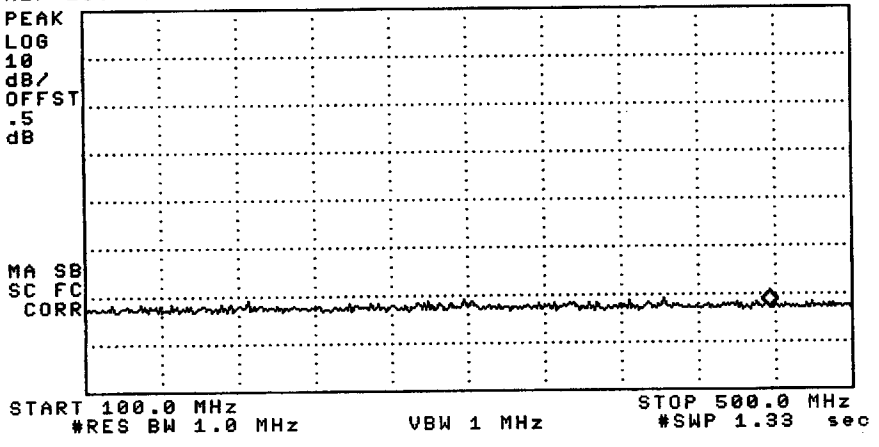
Trace
A B C

More
1 of 3

05:22:46 JUN 25, 2003

MKR 457.0 MHz
-47.85 dBm

REF 15.0 dBm AT 30 dB



CLEAR
WRITE A

MAX
HOLD A

VIEW A

BLANK A

Trace
A B C

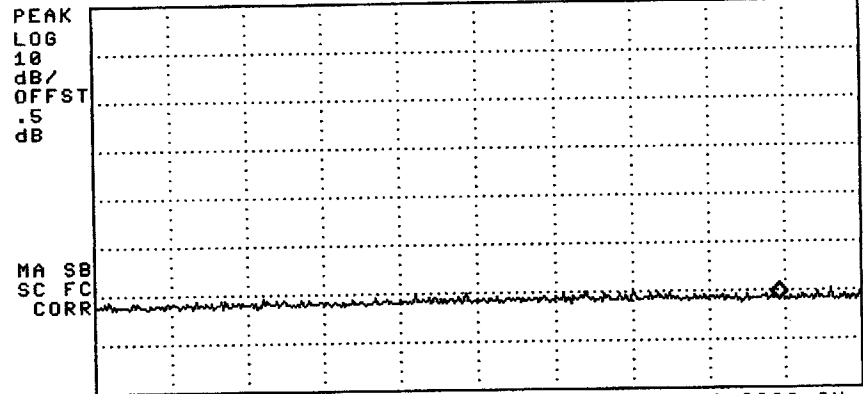
More
1 of 3

CDMA

05:24:42 JUN 25, 2003

MKR 946.2 MHz
-47.04 dBm

REF 15.0 dBm AT 30 dB

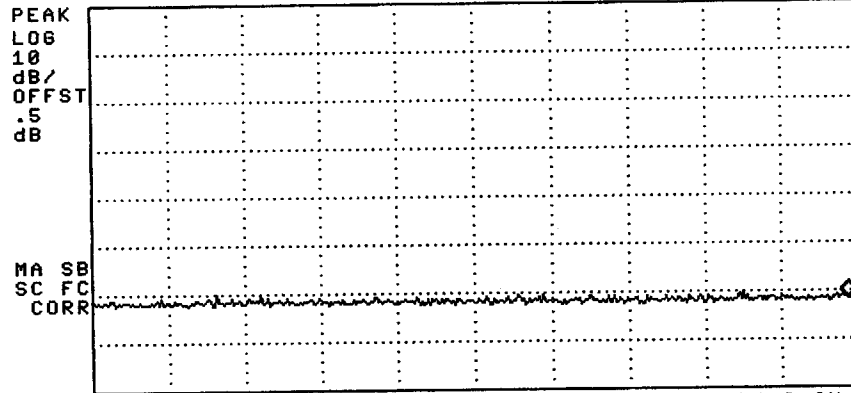


START 500.0 MHz STOP 1.0000 GHz
#RES BW 1.0 MHz VBW 1 MHz #SWP 500 msec

05:25:31 JUN 25, 2003

MKR 1.4938 GHz
-46.42 dBm

REF 15.0 dBm AT 30 dB

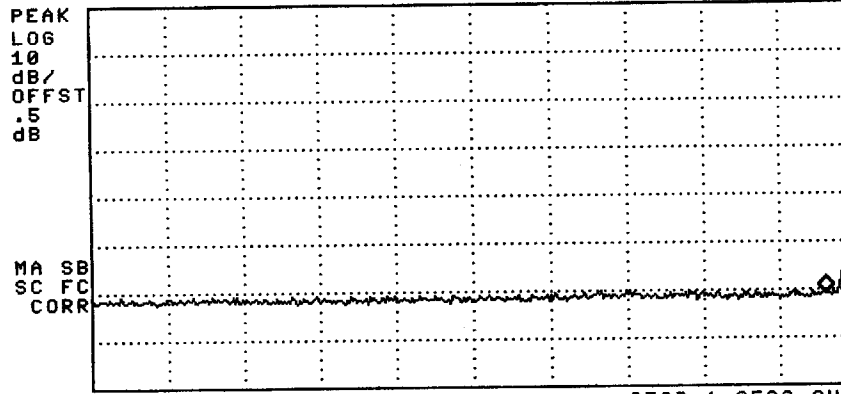


START 1.0000 GHz STOP 1.5000 GHz
#RES BW 1.0 MHz VBW 1 MHz #SWP 500 msec

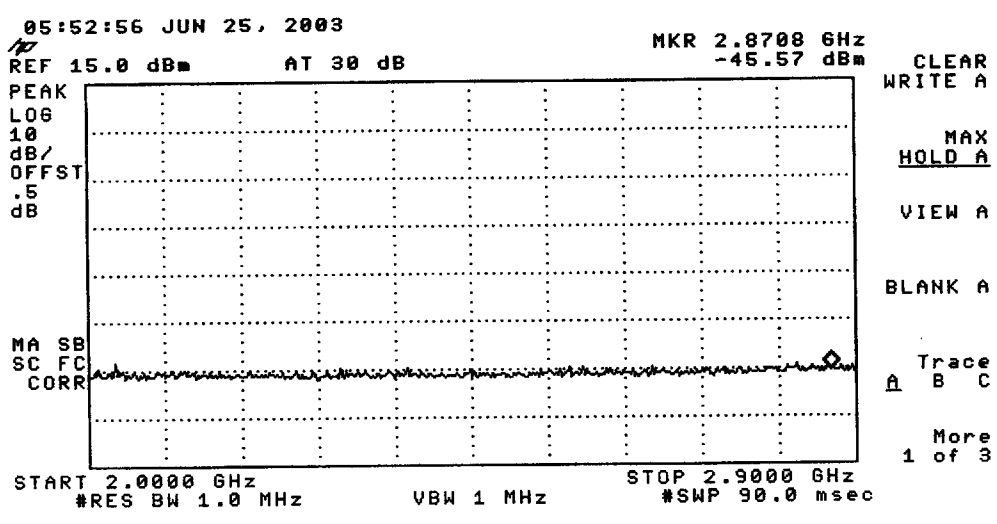
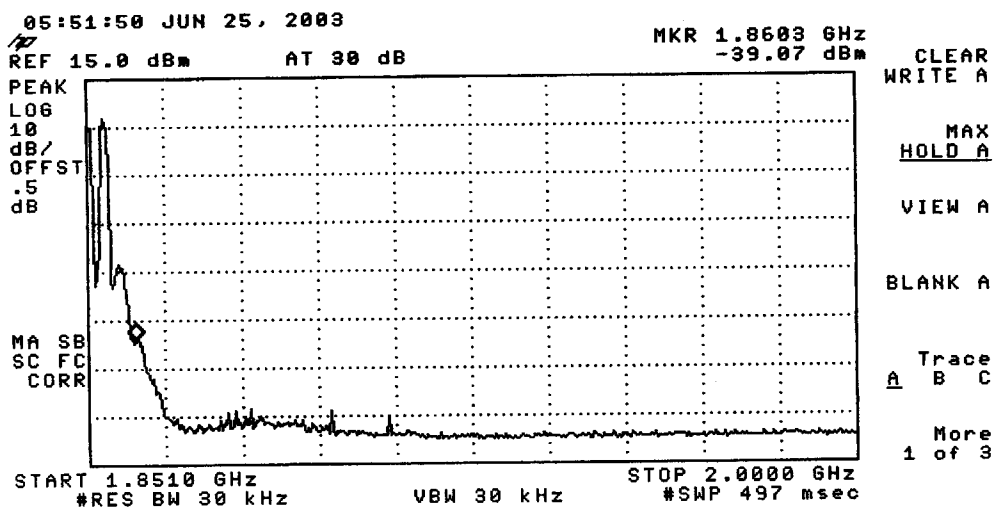
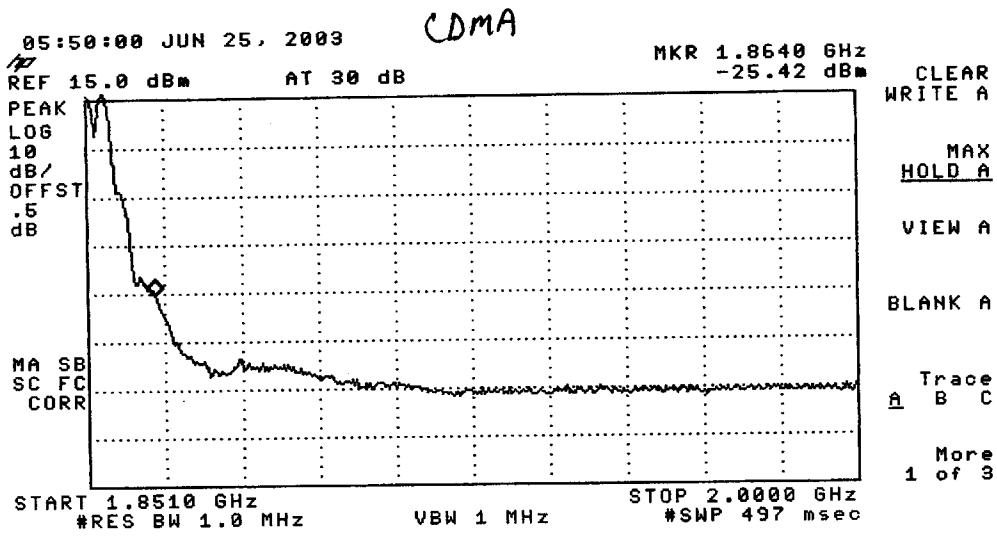
05:26:21 JUN 25, 2003

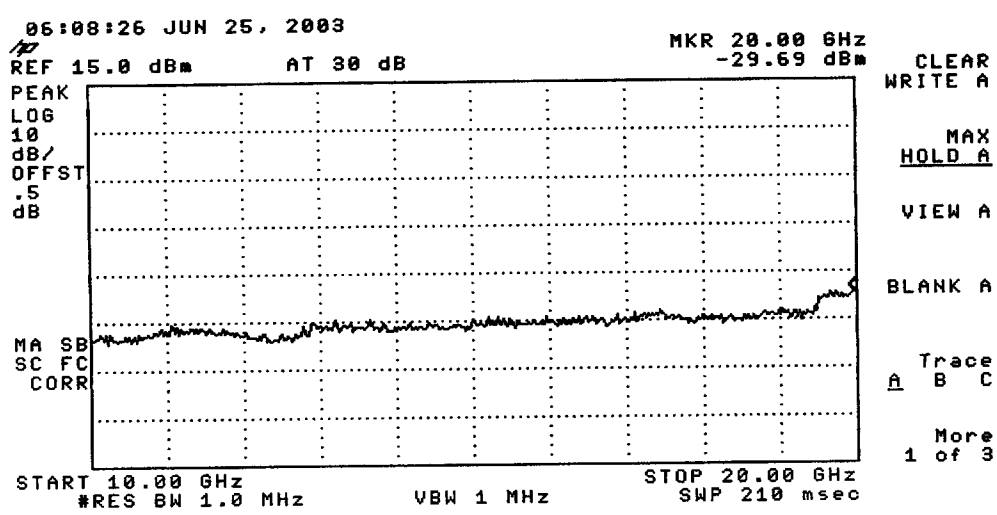
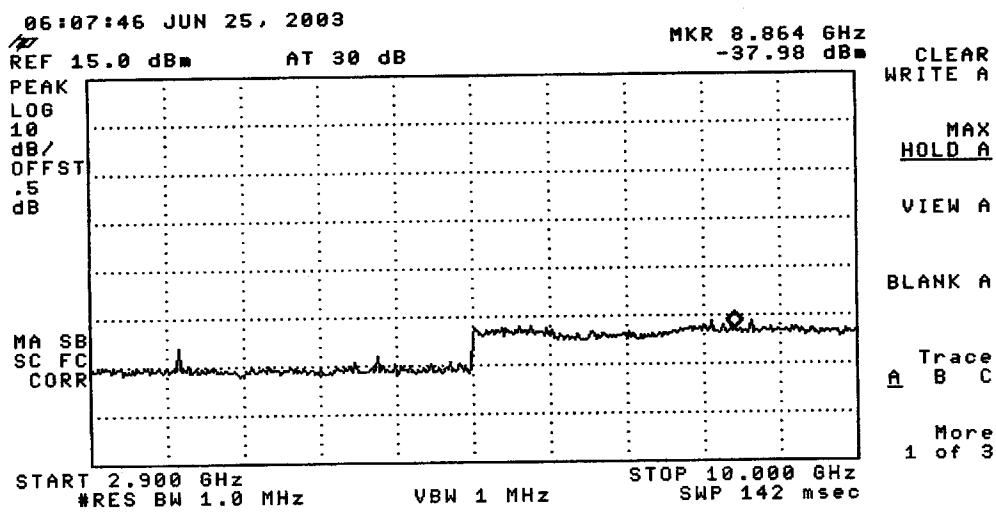
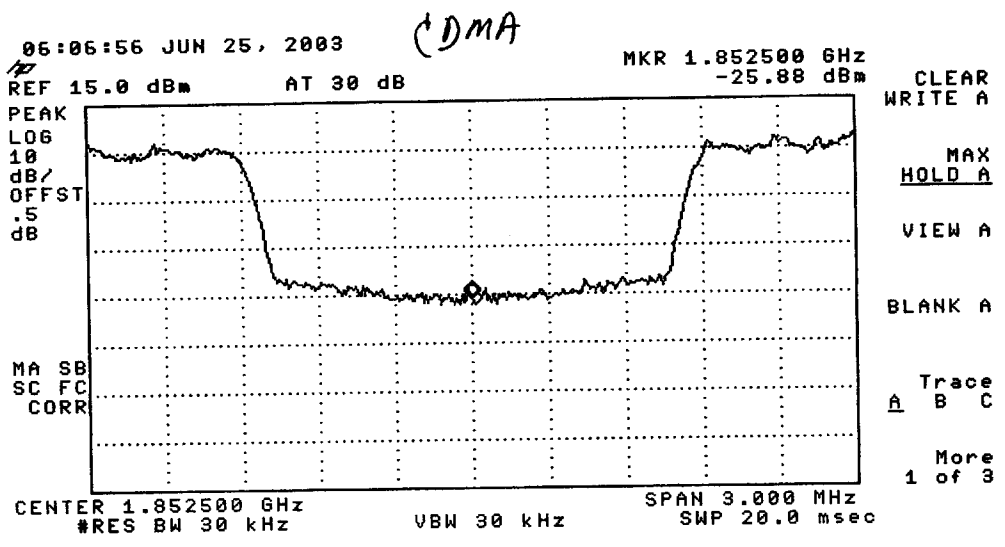
MKR 1.8160 GHz
-45.63 dBm

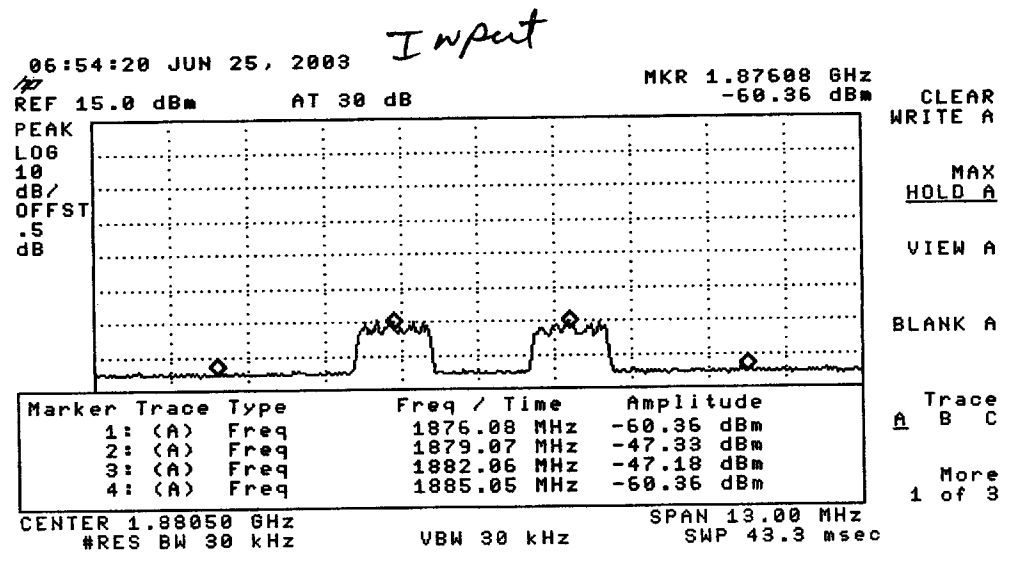
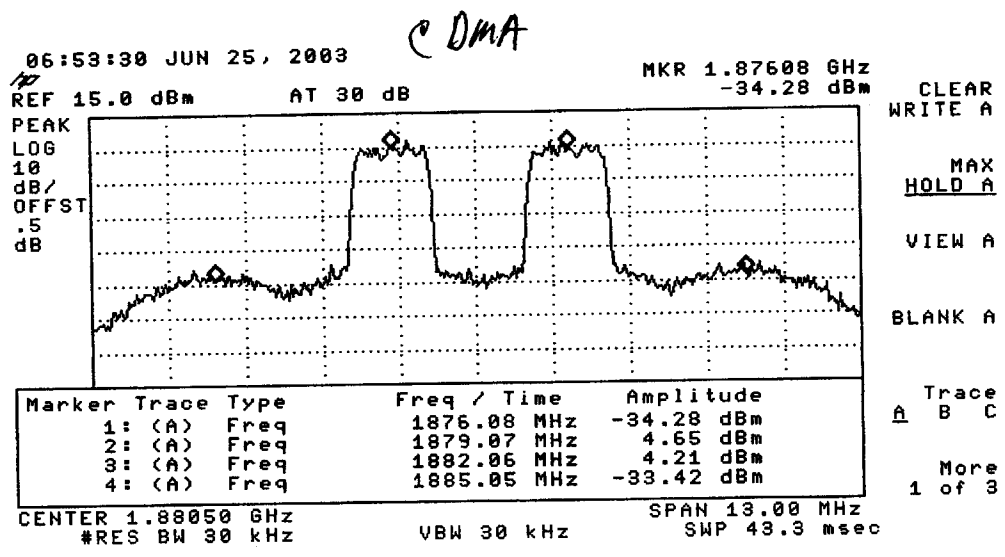
REF 15.0 dBm AT 30 dB

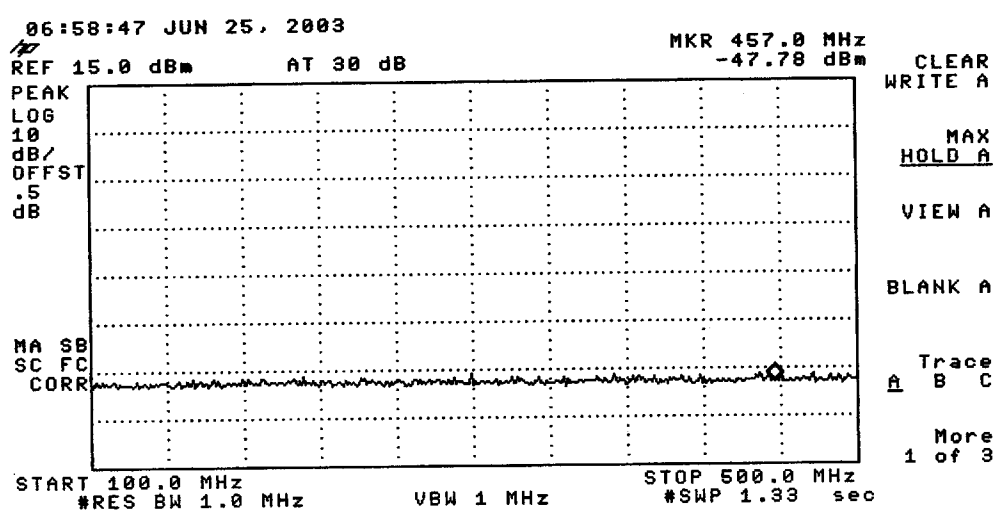
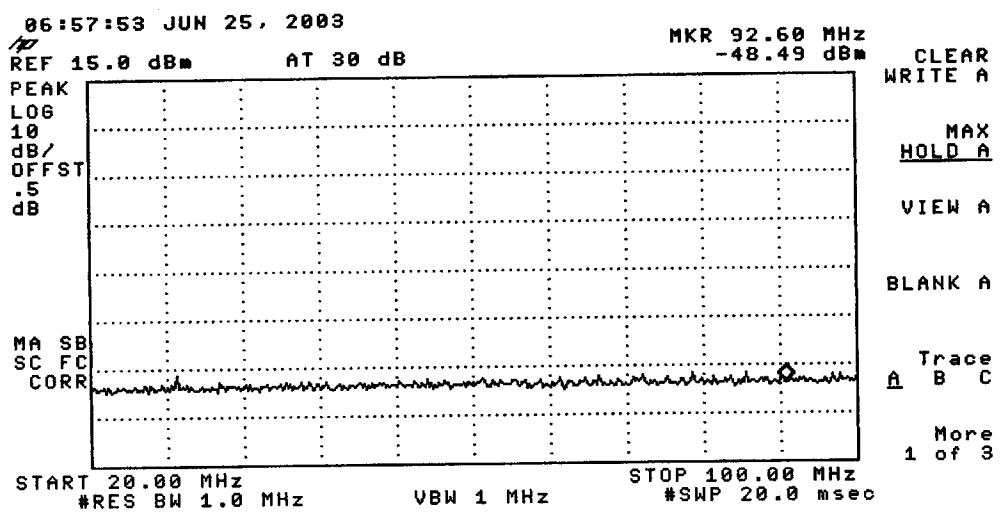
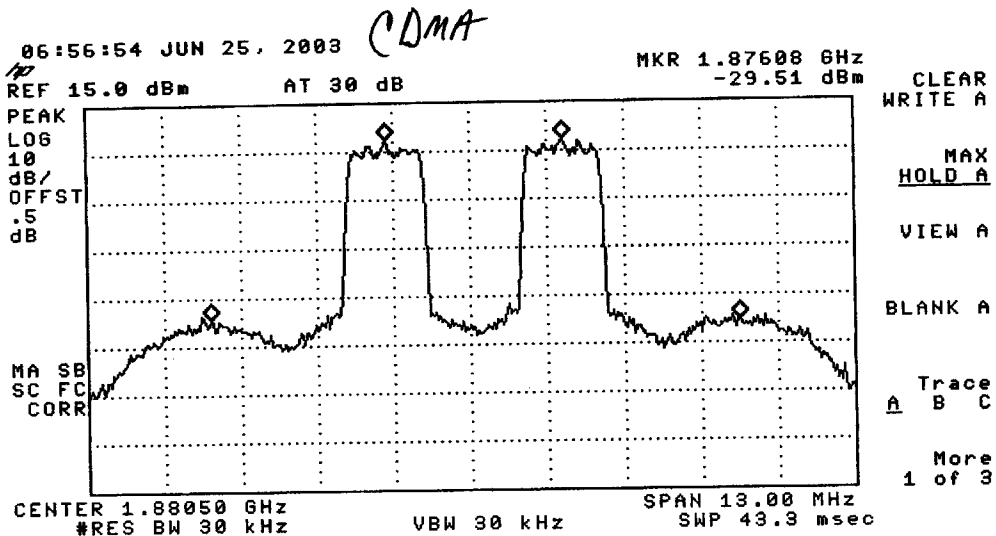


START 1.0000 GHz STOP 1.8500 GHz
#RES BW 1.0 MHz VBW 1 MHz #SWP 850 msec







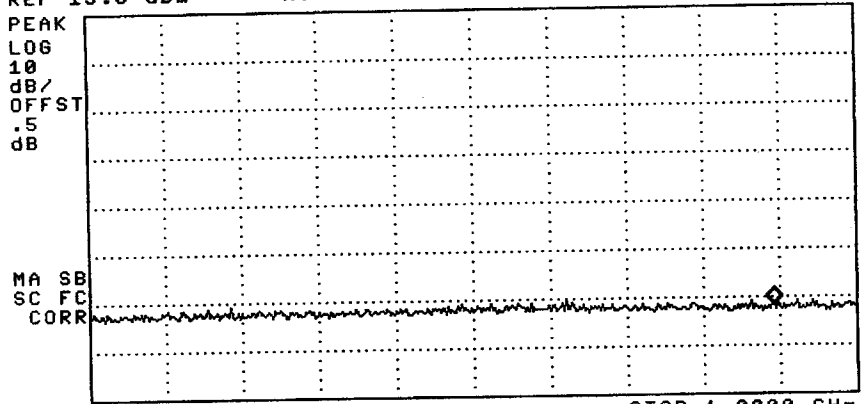


CDMA

07:00:43 JUN 25, 2003

MKR 946.2 MHz
-46.79 dBm

REF 15.0 dBm AT 30 dB



START 500.0 MHz #RES BW 1.0 MHz VBW 1 MHz STOP 1.0000 GHz #SWP 500 msec

CLEAR
WRITE A

MAX
HOLD A

VIEW A

BLANK A

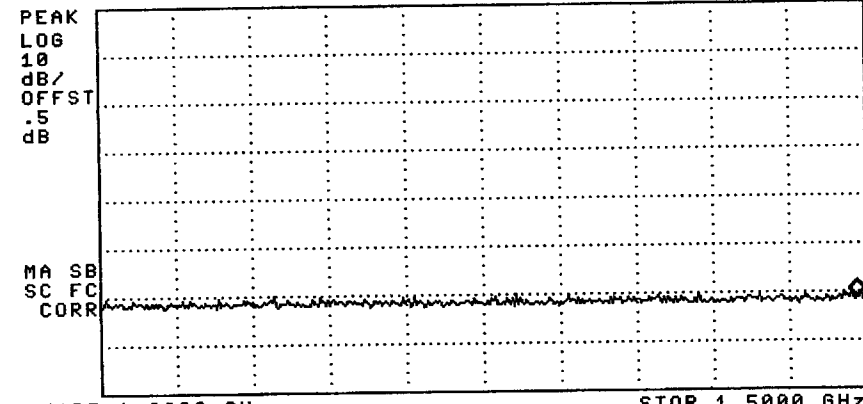
Trace
A B C

More
1 of 3

07:01:31 JUN 25, 2003

MKR 1.4938 GHz
-46.10 dBm

REF 15.0 dBm AT 30 dB



START 1.0000 GHz #RES BW 1.0 MHz VBW 1 MHz STOP 1.5000 GHz #SWP 500 msec

CLEAR
WRITE A

MAX
HOLD A

VIEW A

BLANK A

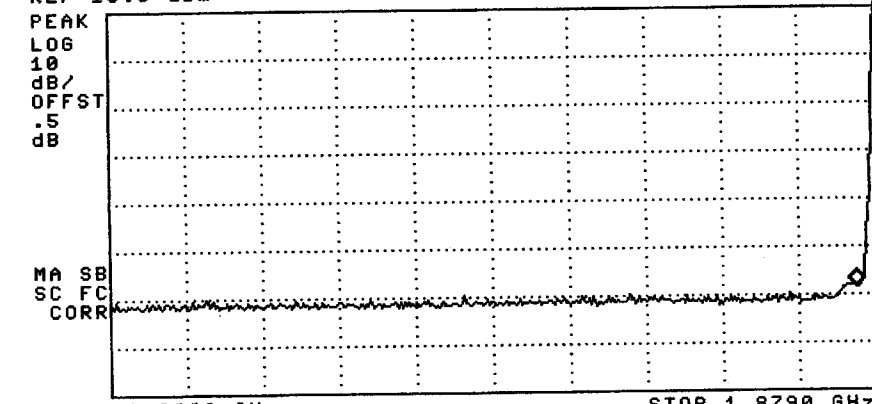
Trace
A B C

More
1 of 3

07:02:32 JUN 25, 2003

MKR 1.8570 GHz
-43.56 dBm

REF 15.0 dBm AT 30 dB



START 1.0000 GHz #RES BW 1.0 MHz VBW 1 MHz STOP 1.8790 GHz #SWP 850 msec

CLEAR
WRITE A

MAX
HOLD A

VIEW A

BLANK A

Trace
A B C

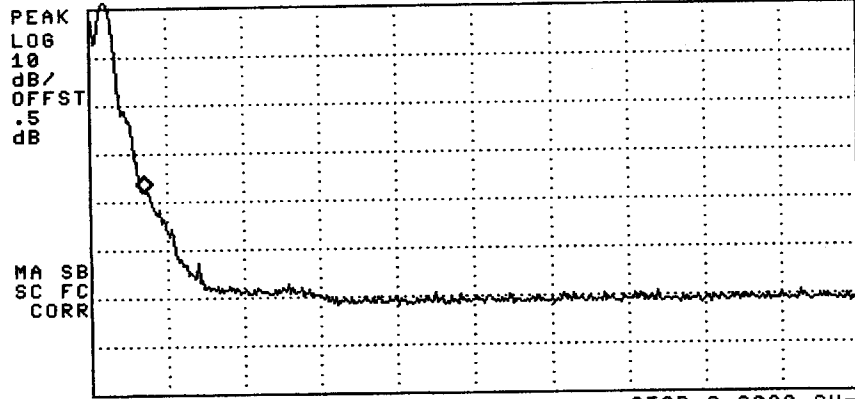
More
1 of 3

CDMA

07:03:58 JUN 25, 2003

MKR 1.8884 GHz
-23.06 dBm

REF 15.0 dBm AT 30 dB



CLEAR
WRITE A

MAX
HOLD A

VIEW A

BLANK A

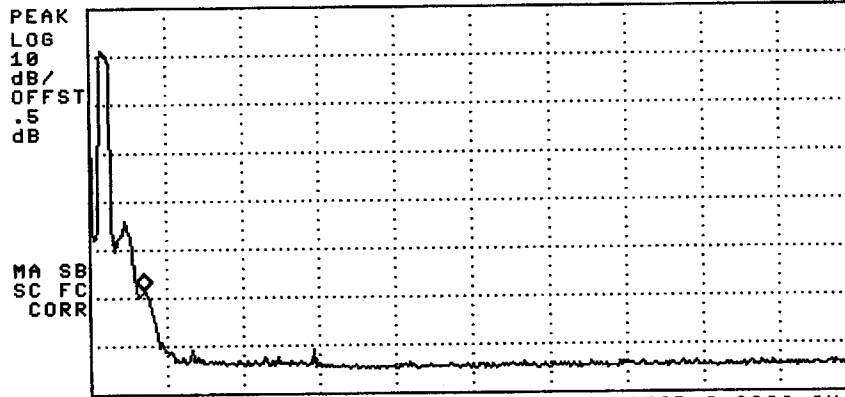
Trace
A B C

More
1 of 3

07:04:34 JUN 25, 2003

MKR 1.8884 GHz
-43.47 dBm

REF 15.0 dBm AT 30 dB



CLEAR
WRITE A

MAX
HOLD A

VIEW A

BLANK A

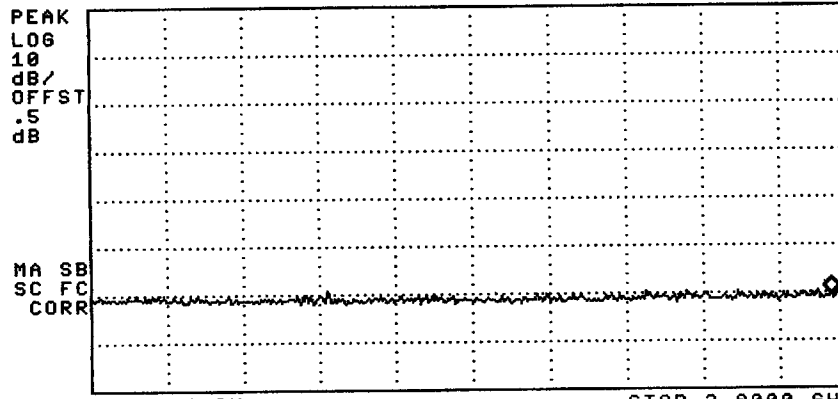
Trace
A B C

More
1 of 3

07:05:27 JUN 25, 2003

MKR 2.8708 GHz
-45.54 dBm

REF 15.0 dBm AT 30 dB



CLEAR
WRITE A

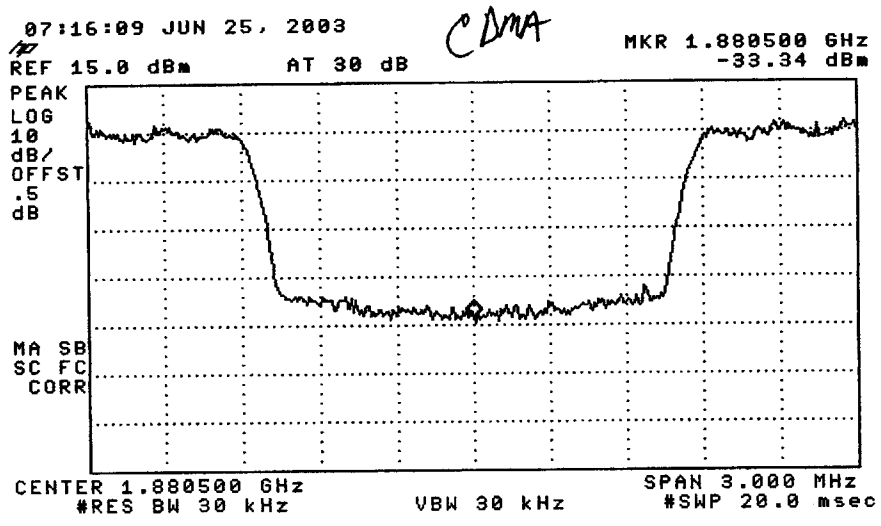
MAX
HOLD A

VIEW A

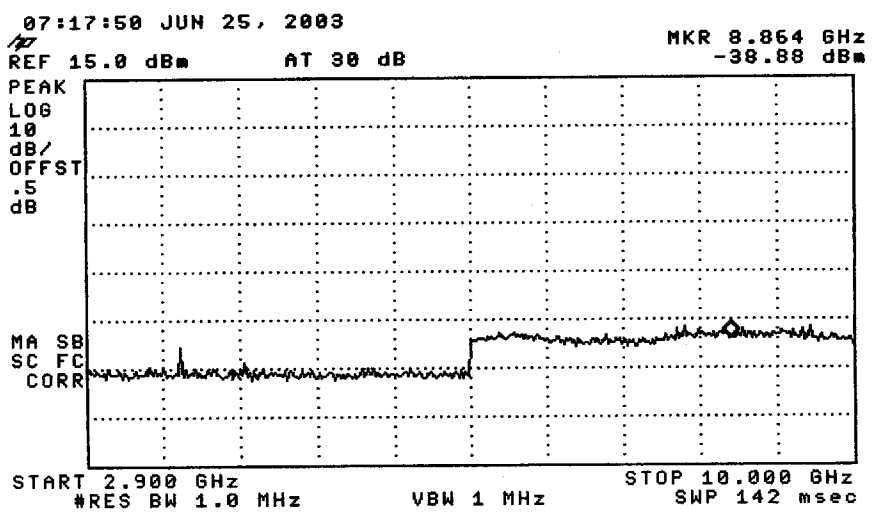
BLANK A

Trace
A B C

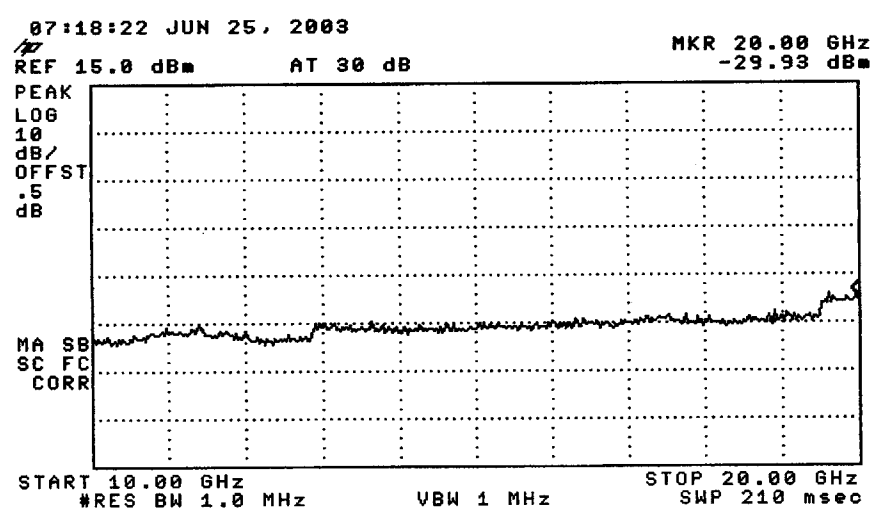
More
1 of 3



CLEAR
 WRITE A
 MAX
 HOLD A
 VIEW A
 BLANK A
 Trace
 A B C
 More
 1 of 3

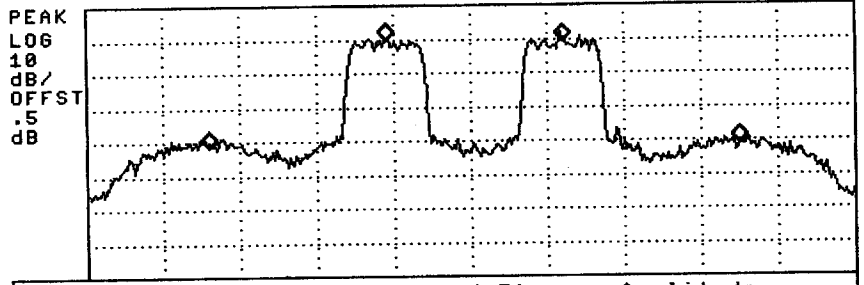


CLEAR
 WRITE A
 MAX
 HOLD A
 VIEW A
 BLANK A
 Trace
 A B C
 More
 1 of 3



CLEAR
 WRITE A
 MAX
 HOLD A
 VIEW A
 BLANK A
 Trace
 A B C
 More
 1 of 3

08:54:49 JUN 25, 2003 *CDMA* MKR 1.91305 GHz
 REF 15.0 dBm AT 30 dB -26.18 dBm

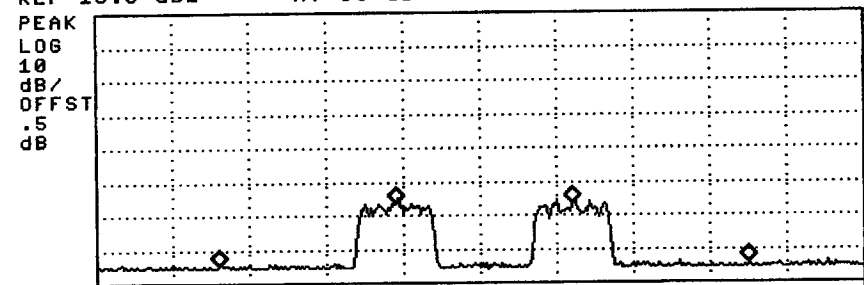


| Marker | Trace | Type | Freq / Time | Amplitude |
|--------|-------|------|-------------|------------|
| 1: | (A) | Freq | 1904.08 MHz | -26.40 dBm |
| 2: | (A) | Freq | 1907.07 MHz | 4.64 dBm |
| 3: | (A) | Freq | 1910.05 MHz | 4.18 dBm |
| 4: | (A) | Freq | 1913.05 MHz | -26.18 dBm |

CENTER 1.90850 GHz SPAN 13.00 MHz
 #RES BW 30 kHz VBW 30 kHz SWP 43.3 msec

CLEAR
 WRITE A
 MAX
 HOLD A
 VIEW A
 BLANK A
 Trace
 A B C
 More
 1 of 3

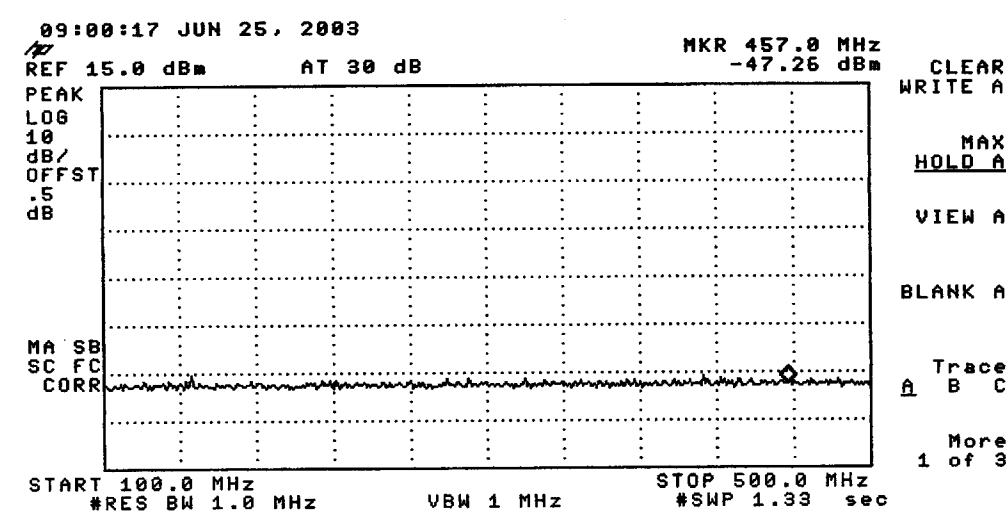
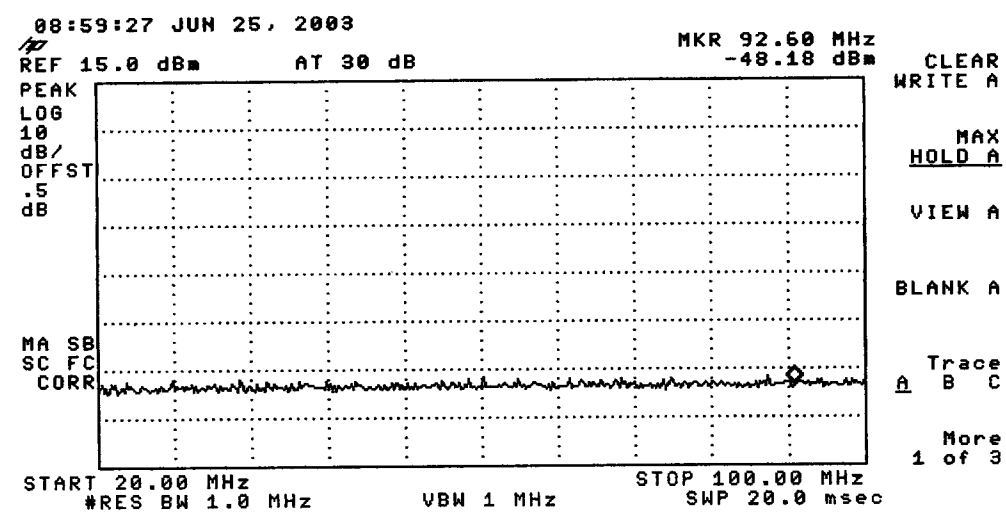
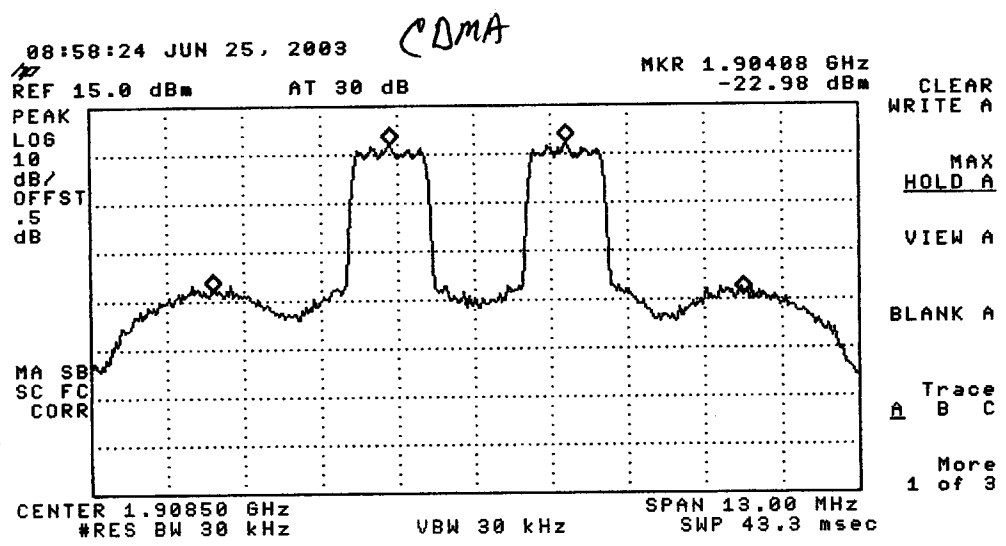
08:56:18 JUN 25, 2003 *Input* MKR 1.91305 GHz
 REF 15.0 dBm AT 30 dB -59.32 dBm



| Marker | Trace | Type | Freq / Time | Amplitude |
|--------|-------|------|-------------|------------|
| 1: | (A) | Freq | 1904.08 MHz | -59.85 dBm |
| 2: | (A) | Freq | 1907.07 MHz | -41.67 dBm |
| 3: | (A) | Freq | 1910.06 MHz | -41.38 dBm |
| 4: | (A) | Freq | 1913.05 MHz | -59.32 dBm |

CENTER 1.90850 GHz SPAN 13.00 MHz
 #RES BW 30 kHz VBW 30 kHz SWP 43.3 msec

CLEAR
 WRITE A
 MAX
 HOLD A
 VIEW A
 BLANK A
 Trace
 A B C
 More
 1 of 3

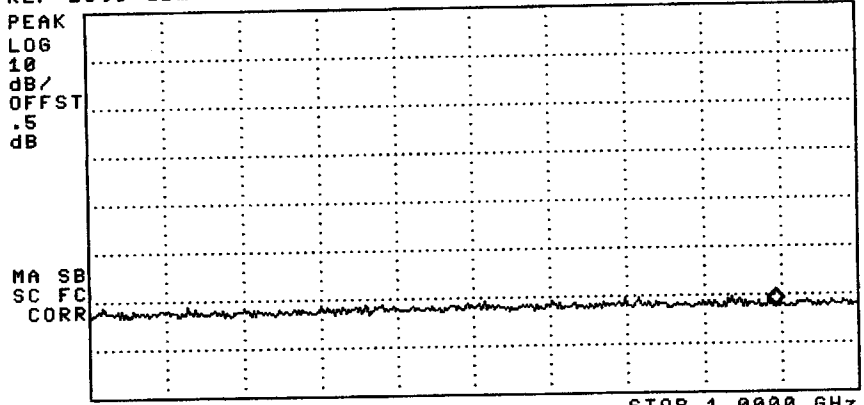


CDMA

09:04:44 JUN 25, 2003

MKR 946.2 MHz
-47.57 dBm

REF 15.0 dBm AT 30 dB



CLEAR
WRITE A

MAX
HOLD A

VIEW A

BLANK A

Trace
A B C

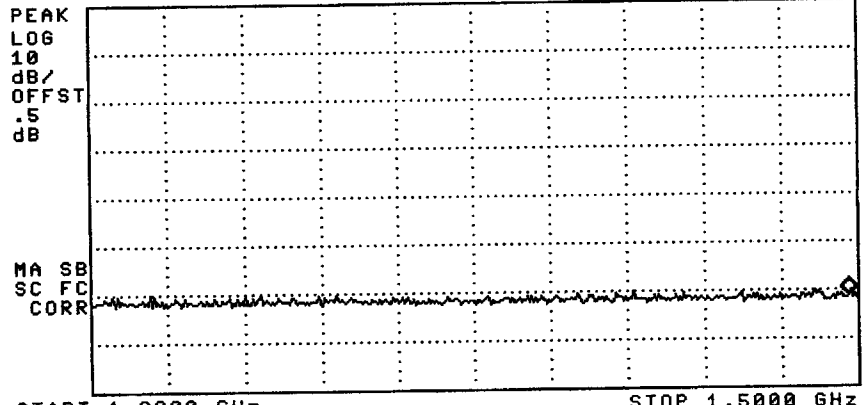
More
1 of 3

START 500.0 MHz #RES BW 1.0 MHz VBW 1 MHz STOP 1.0000 GHz #SWP 500 msec

09:05:24 JUN 25, 2003

MKR 1.4938 GHz
-46.12 dBm

REF 15.0 dBm AT 30 dB



CLEAR
WRITE A

MAX
HOLD A

VIEW A

BLANK A

Trace
A B C

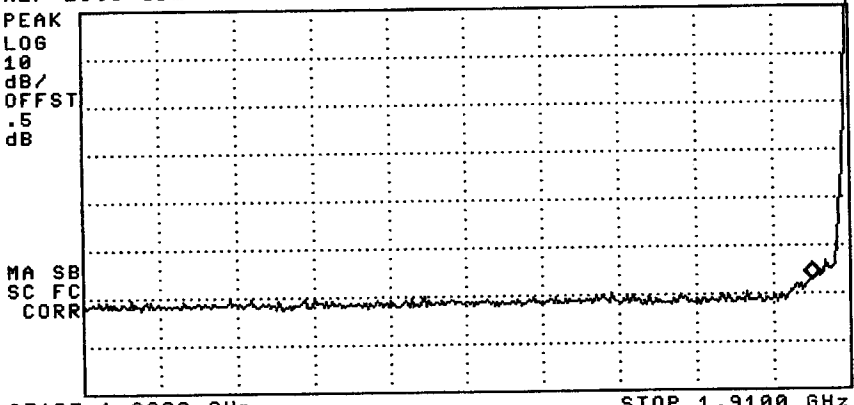
More
1 of 3

START 1.0000 GHz #RES BW 1.0 MHz VBW 1 MHz STOP 1.5000 GHz #SWP 500 msec

09:06:08 JUN 25, 2003

MKR 1.8645 GHz
-42.39 dBm

REF 15.0 dBm AT 30 dB



CLEAR
WRITE A

MAX
HOLD A

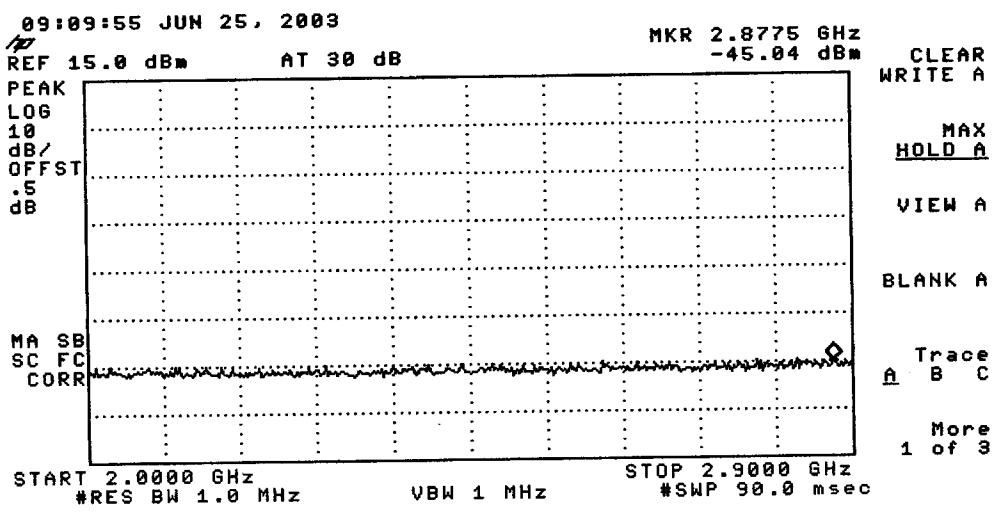
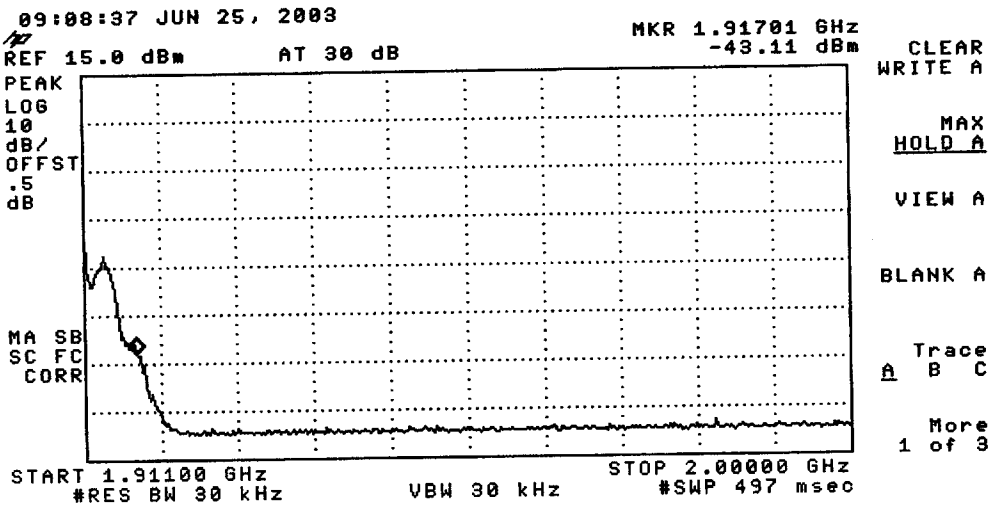
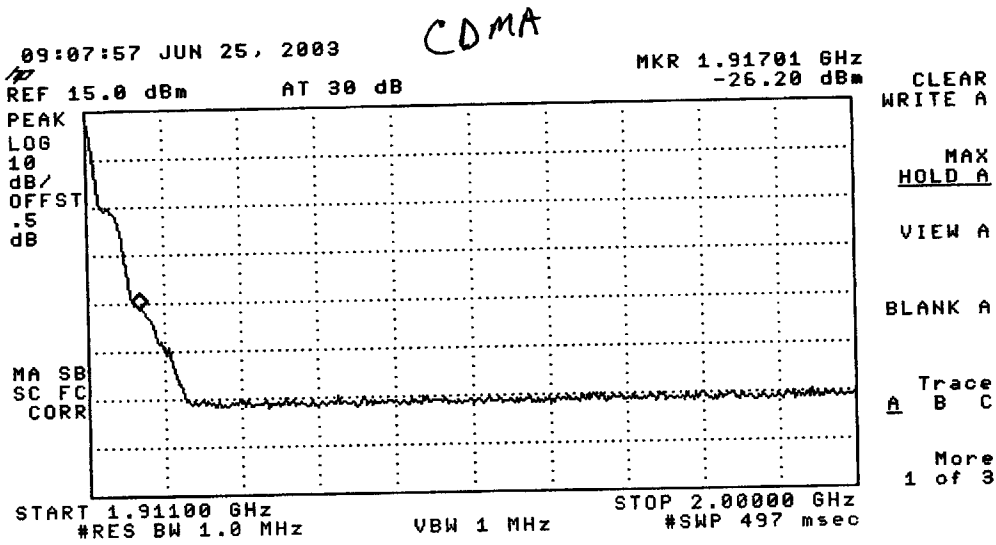
VIEW A

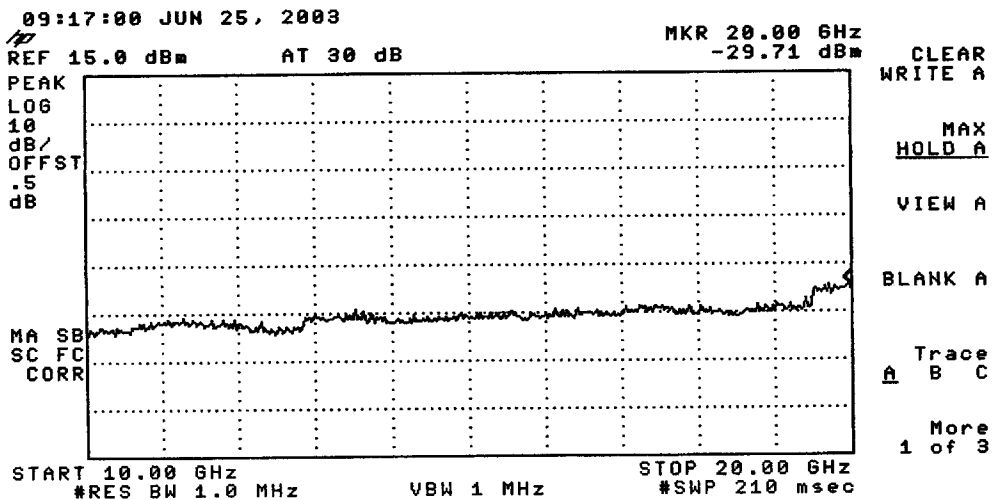
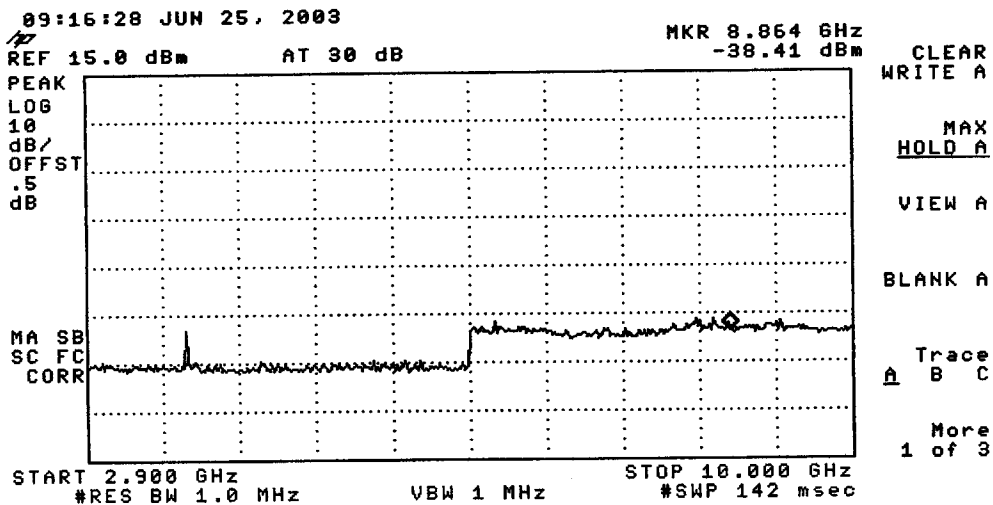
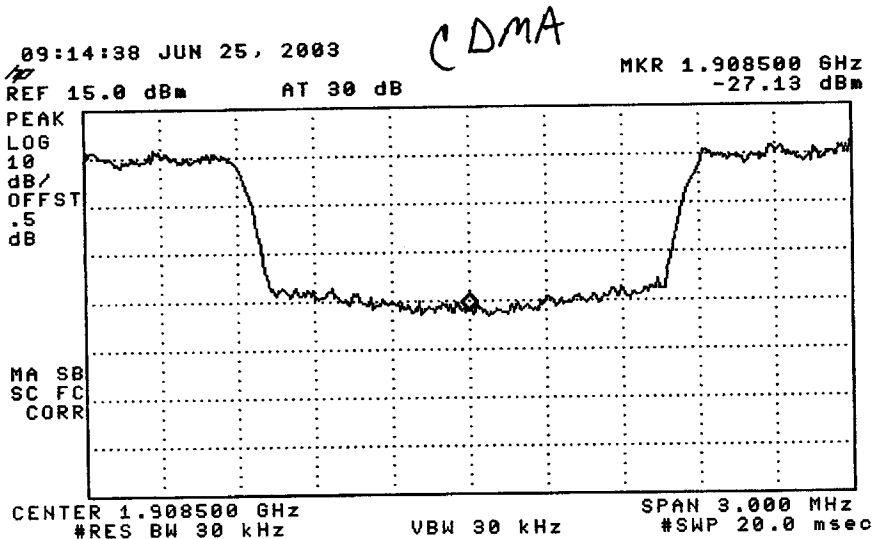
BLANK A

Trace
A B C

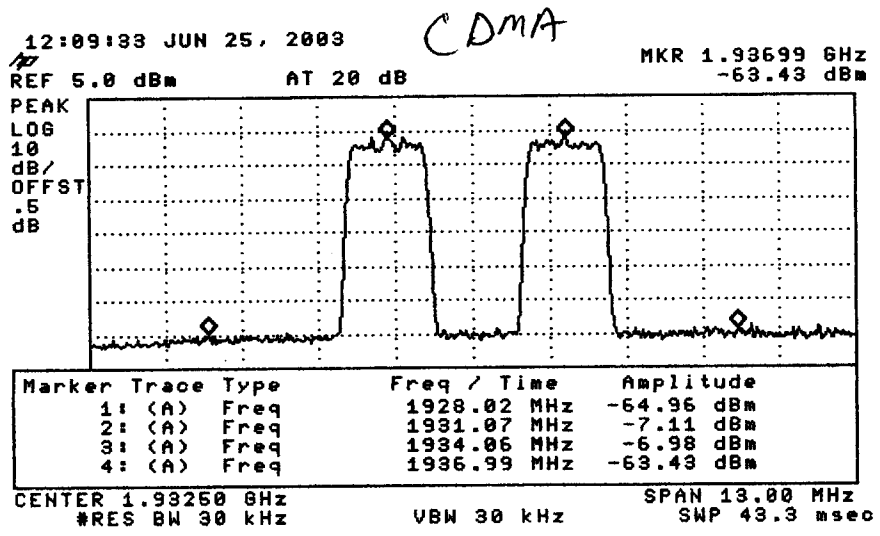
More
1 of 3

START 1.0000 GHz #RES BW 1.0 MHz VBW 1 MHz STOP 1.9100 GHz #SWP 850 msec

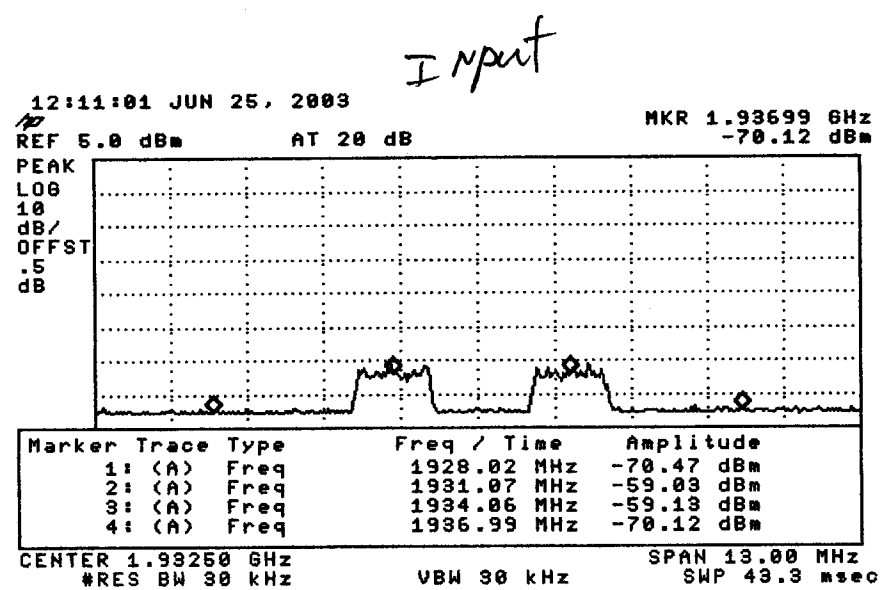




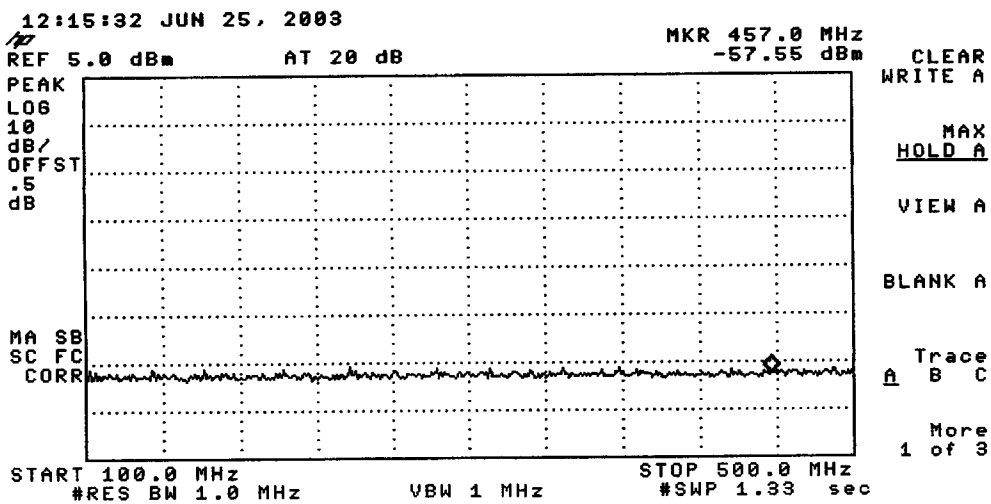
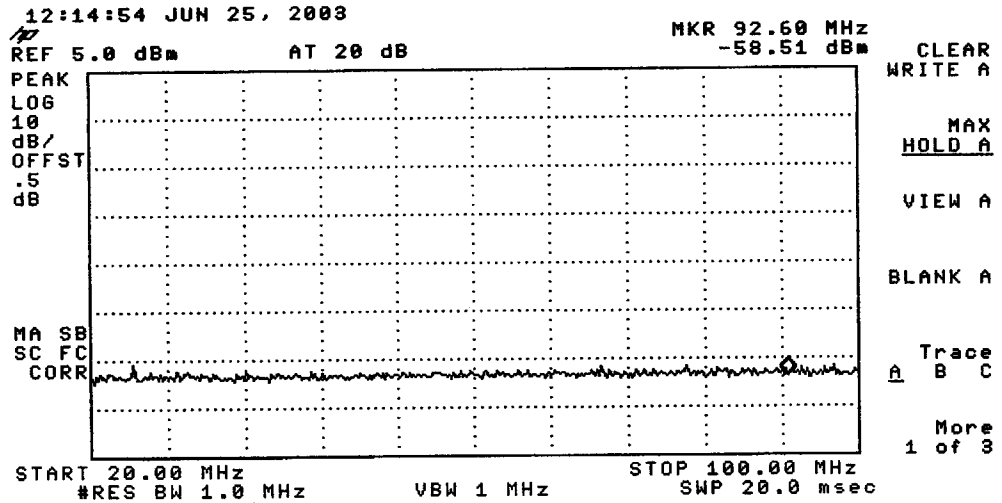
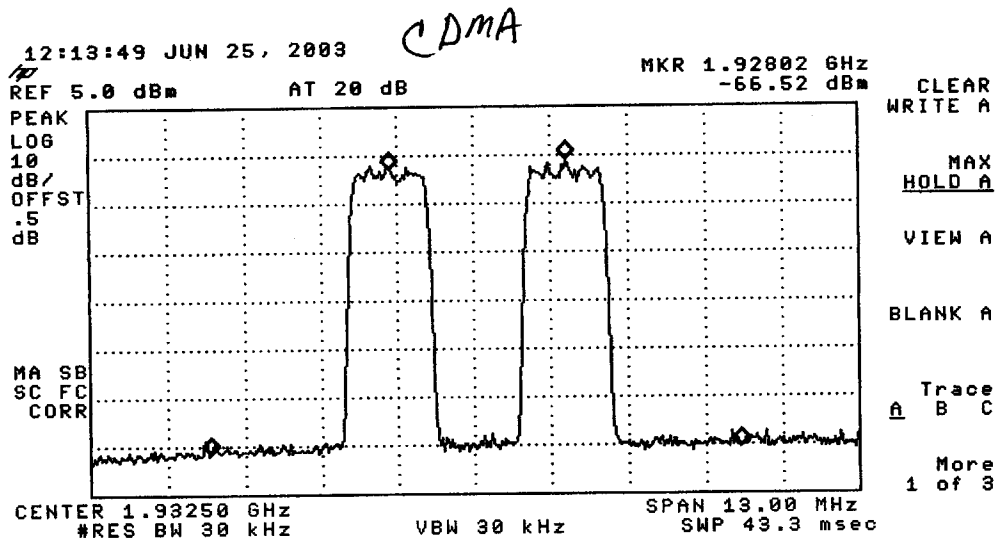
DOWNLINK

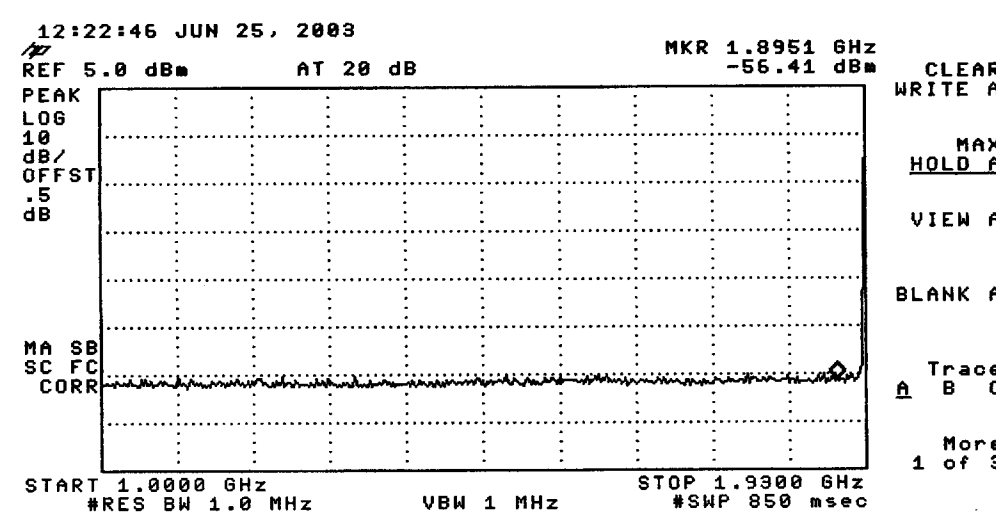
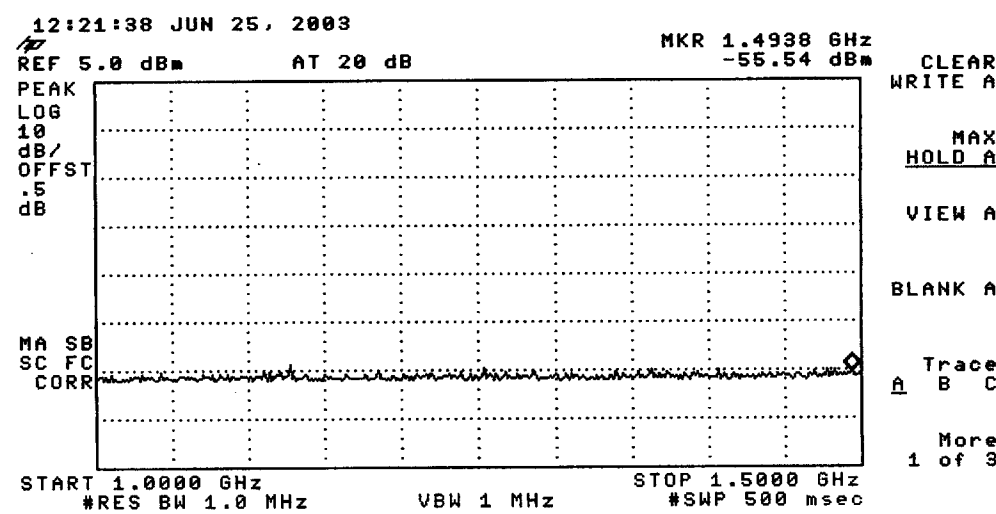
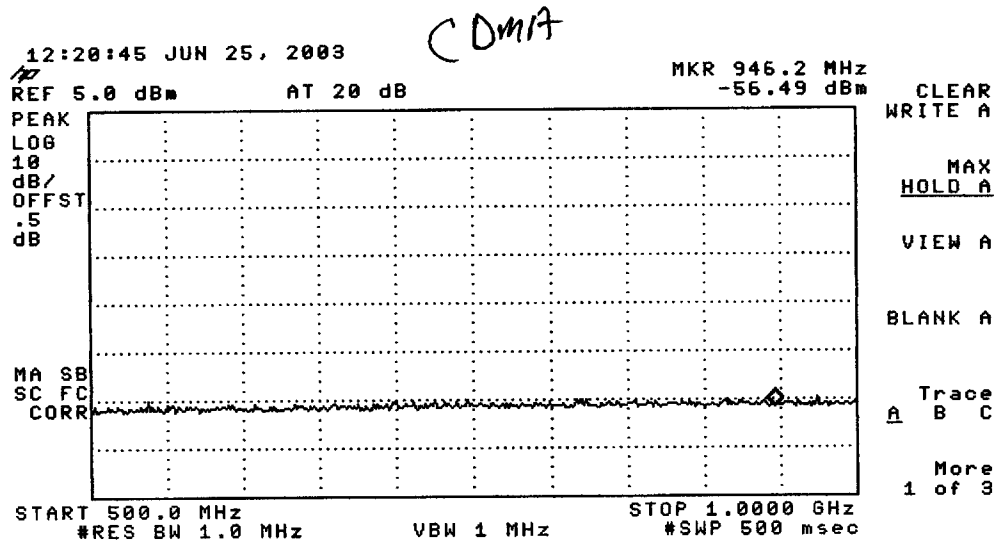


CLEAR
 WRITE A
 MAX
 HOLD A
 VIEW A
 BLANK A
 Trace
 A B C
 More
 1 of 3

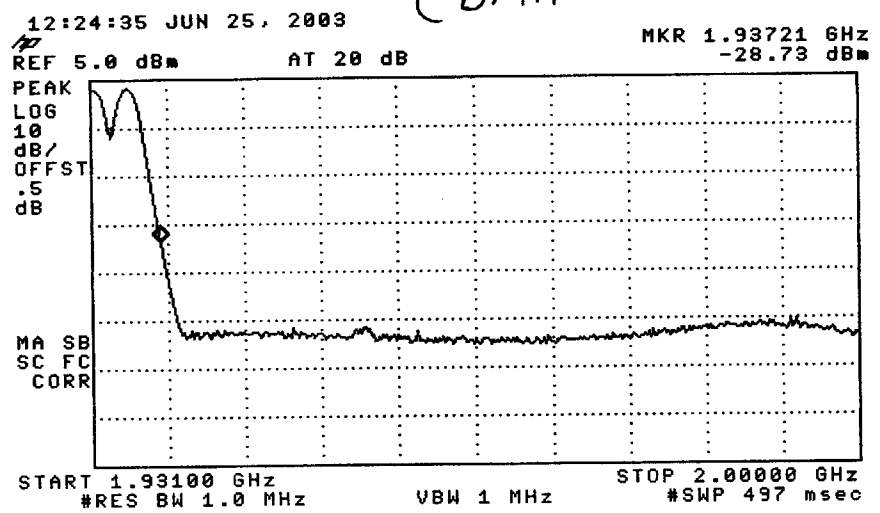


CLEAR
 WRITE A
 MAX
 HOLD A
 VIEW A
 BLANK A
 Trace
 A B C
 More
 1 of 3





CDMA



CLEAR
WRITE A

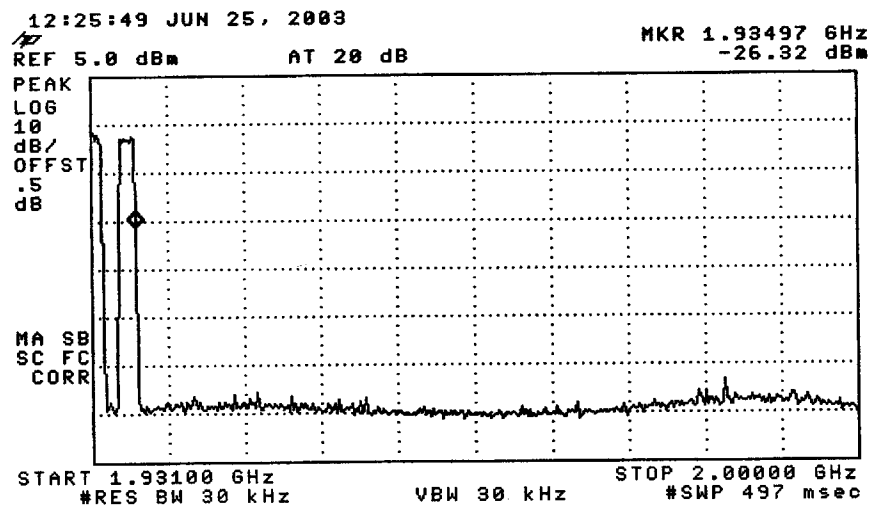
MAX
HOLD A

VIEW A

BLANK A

Trace
A B C

More
1 of 3



CLEAR
WRITE A

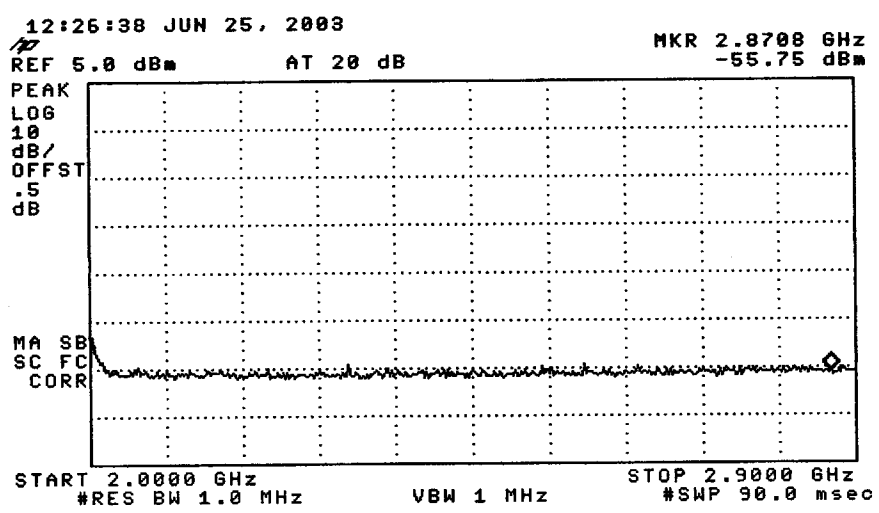
MAX
HOLD A

VIEW A

BLANK A

Trace
A B C

More
1 of 3



CLEAR
WRITE A

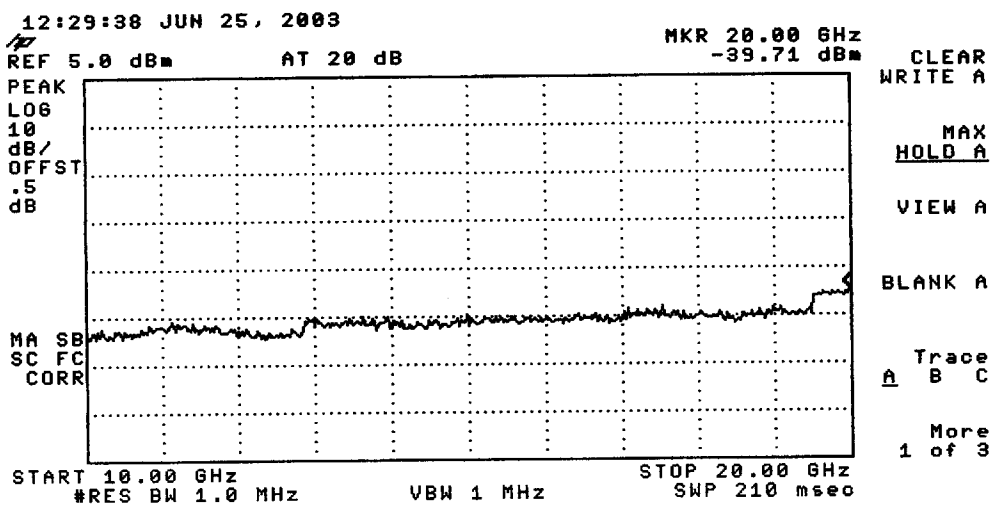
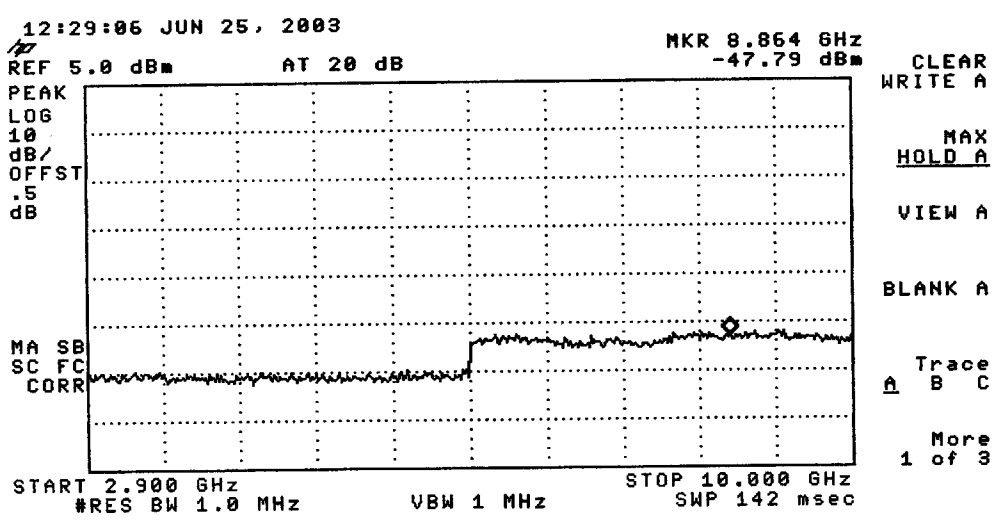
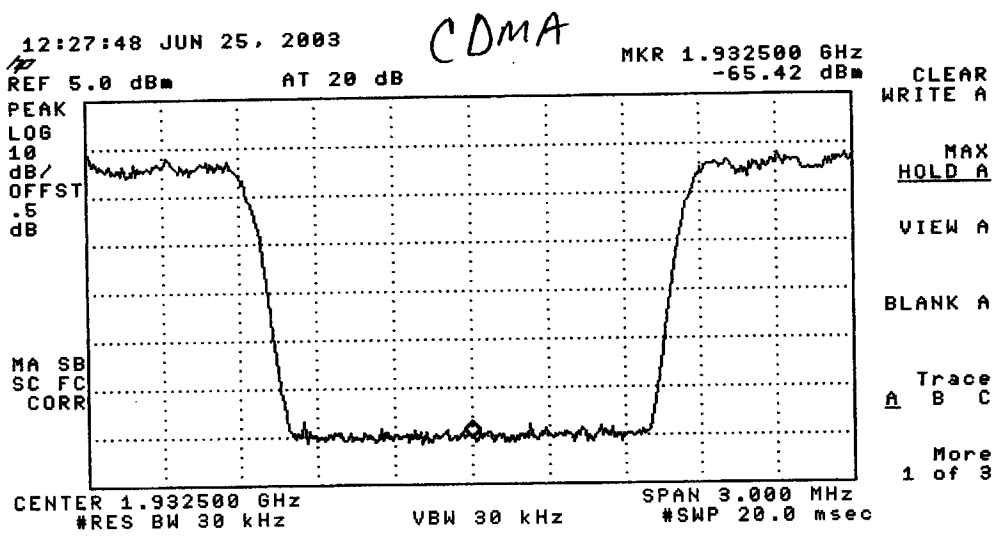
MAX
HOLD A

VIEW A

BLANK A

Trace
A B C

More
1 of 3



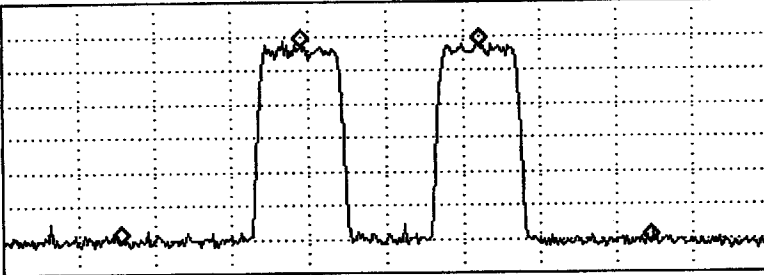
10:28:48 JUN 25, 2003

CDMA

MKR 1.95602 GHz
-65.66 dBm

REF 5.0 dBm AT 20 dB

PEAK
LOG
10
dB/
OFFST
.5
dB



| Marker | Trace | Type | Freq / Time | Amplitude |
|--------|-------|------|-------------|------------|
| 1: | (A) | Freq | 1956.02 MHz | -65.66 dBm |
| 2: | (A) | Freq | 1959.07 MHz | -8.19 dBm |
| 3: | (A) | Freq | 1962.06 MHz | -8.25 dBm |
| 4: | (A) | Freq | 1964.99 MHz | -66.36 dBm |

CENTER 1.96050 GHz SPAN 13.00 MHz
#RES BW 30 kHz VBW 30 kHz SWP 43.3 msec

CLEAR
WRITE A

MAX
HOLD A

VIEW A

BLANK A

Trace
A B C

More
1 of 3

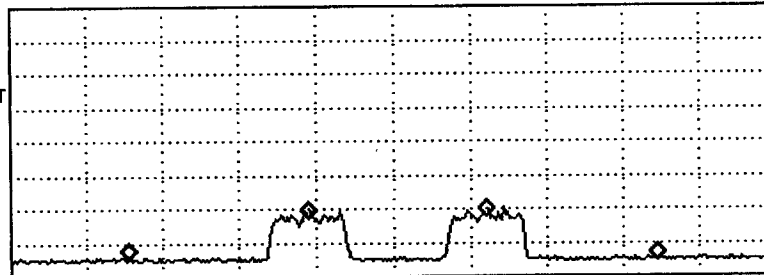
10:29:42 JUN 25, 2003

Input

MKR 1.95602 GHz
-70.05 dBm

REF 5.0 dBm AT 20 dB

PEAK
LOG
10
dB/
OFFST
.5
dB



| Marker | Trace | Type | Freq / Time | Amplitude |
|--------|-------|------|-------------|------------|
| 1: | (A) | Freq | 1956.02 MHz | -70.05 dBm |
| 2: | (A) | Freq | 1959.07 MHz | -57.81 dBm |
| 3: | (A) | Freq | 1962.06 MHz | -57.27 dBm |
| 4: | (A) | Freq | 1964.99 MHz | -70.32 dBm |

CENTER 1.96050 GHz SPAN 13.00 MHz
#RES BW 30 kHz VBW 30 kHz SWP 43.3 msec

CLEAR
WRITE A

MAX
HOLD A

VIEW A

BLANK A

Trace
A B C

More
1 of 3

10:31:11 JUN 25, 2003

CDMA

MKR 1.95602 GHz
-63.24 dBm

REF 5.0 dBm AT 20 dB

PEAK
LOG
10
dB/
OFFST
.5
dB

MA SB
SC FC
CORR



CENTER 1.96050 GHz SPAN 13.00 MHz
#RES BW 30 kHz VBW 30 kHz SWP 43.3 msec

CLEAR
WRITE A

MAX
HOLD A

VIEW A

BLANK A

Trace
A B C

More
1 of 3

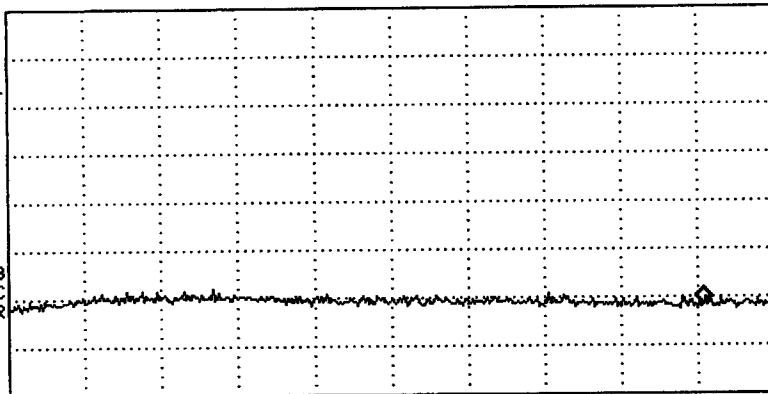
10:32:03 JUN 25, 2003

MKR 92.60 MHz
-56.60 dBm

REF 5.0 dBm AT 20 dB

PEAK
LOG
10
dB/
OFFST
.5
dB

MA SB
SC FC
CORR



START 20.00 MHz STOP 100.00 MHz
#RES BW 1.0 MHz VBW 1 MHz SWP 20.0 msec

CLEAR
WRITE A

MAX
HOLD A

VIEW A

BLANK A

Trace
A B C

More
1 of 3

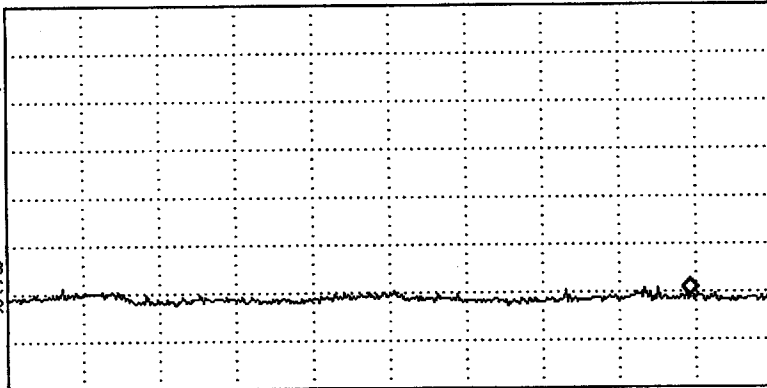
10:32:46 JUN 25, 2003

MKR 457.0 MHz
-55.82 dBm

REF 5.0 dBm AT 20 dB

PEAK
LOG
10
dB/
OFFST
.5
dB

MA SB
SC FC
CORR



START 100.0 MHz STOP 500.0 MHz
#RES BW 1.0 MHz VBW 1 MHz #SWP 1.33 sec

CLEAR
WRITE A

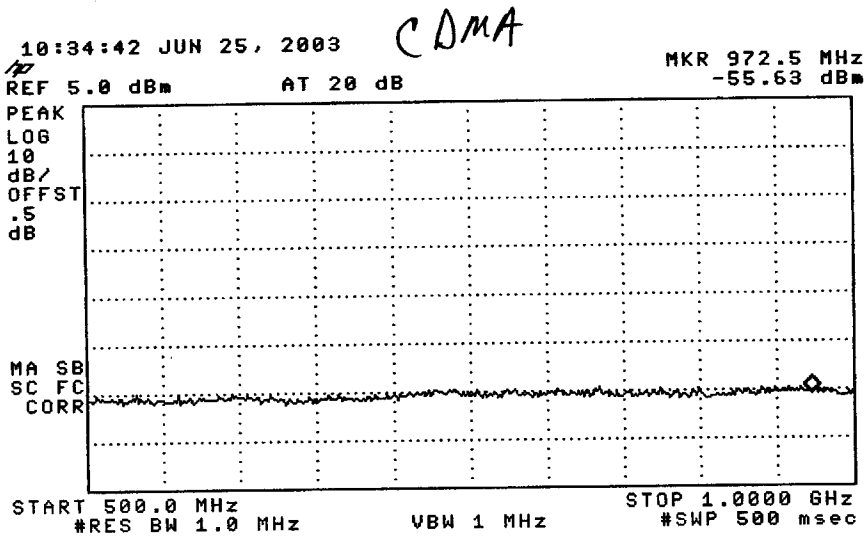
MAX
HOLD A

VIEW A

BLANK A

Trace
A B C

More
1 of 3



CLEAR
WRITE A

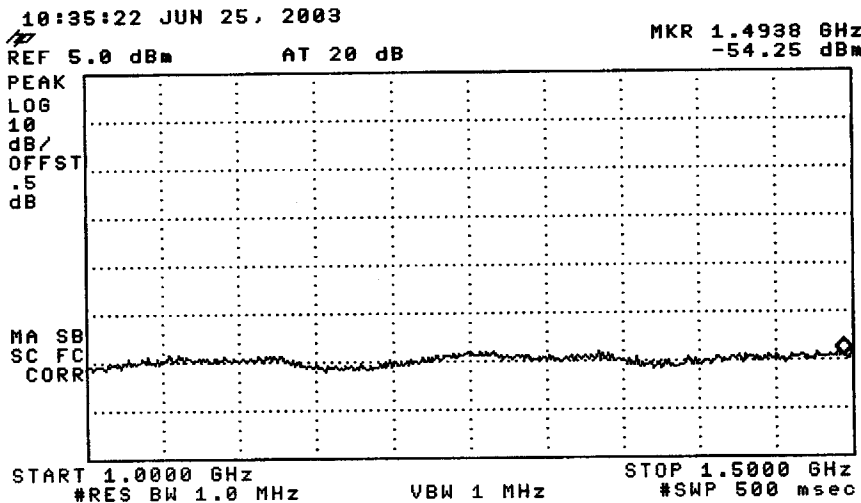
MAX
HOLD A

VIEW A

BLANK A

Trace
A B C

More
1 of 3



CLEAR
WRITE A

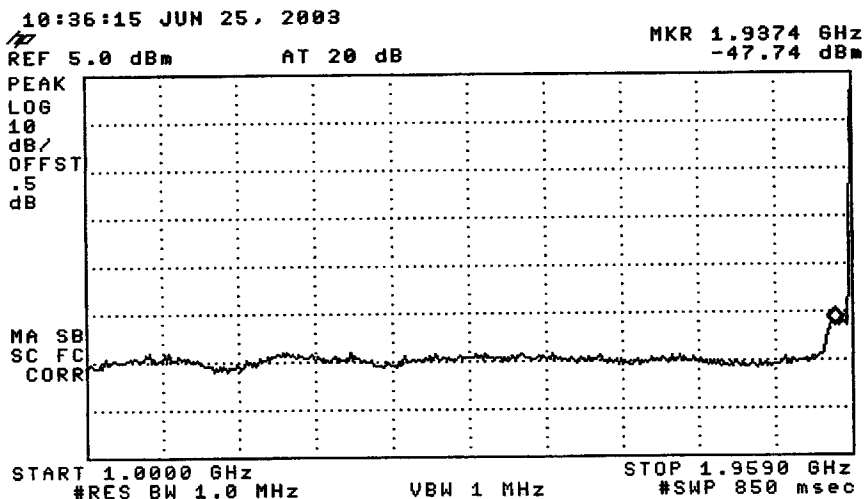
MAX
HOLD A

VIEW A

BLANK A

Trace
A B C

More
1 of 3



CLEAR
WRITE A

MAX
HOLD A

VIEW A

BLANK A

Trace
A B C

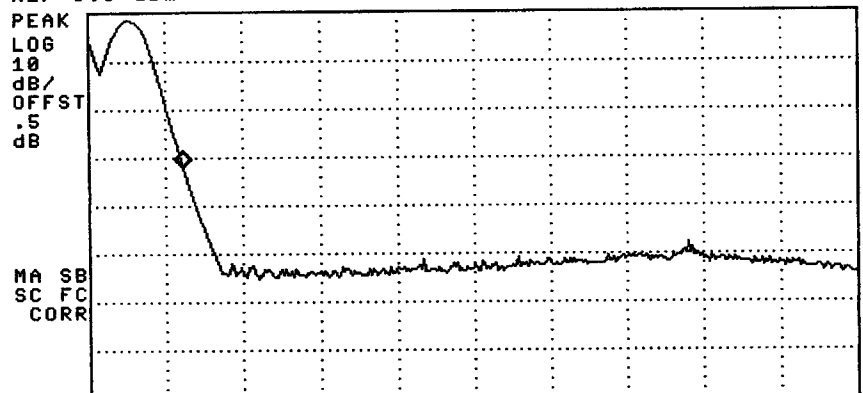
More
1 of 3

C DMA

10:37:36 JUN 25, 2003

MKR 1.96490 GHz
-27.17 dBm

REF 5.0 dBm AT 20 dB



CLEAR
WRITE A

MAX
HOLD A

VIEW A

BLANK A

Trace
A B C

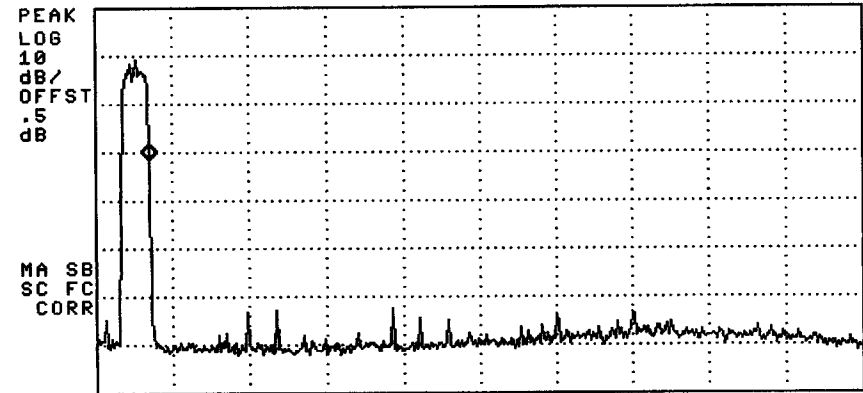
More
1 of 3

START 1.96000 GHz #RES BW 1.0 MHz VBW 1 MHz STOP 2.00000 GHz #SWP 497 msec

10:38:45 JUN 25, 2003

MKR 1.96280 GHz
-26.58 dBm

REF 5.0 dBm AT 20 dB



CLEAR
WRITE A

MAX
HOLD A

VIEW A

BLANK A

Trace
A B C

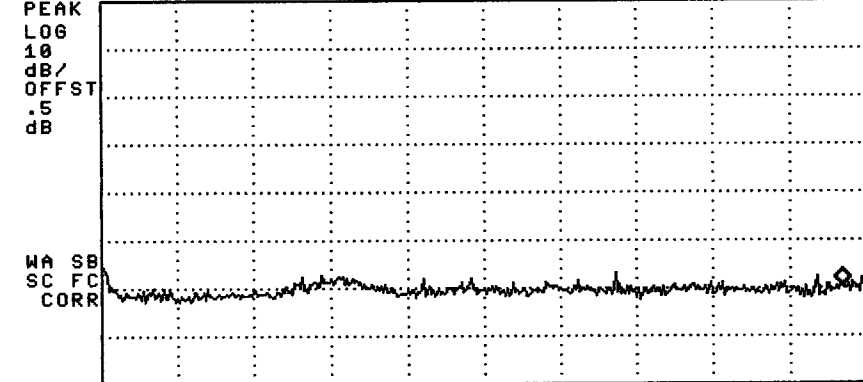
More
1 of 3

START 1.96000 GHz #RES BW 30 kHz VBW 30 kHz STOP 2.00000 GHz #SWP 497 msec

10:39:38 JUN 25, 2003

MKR 2.8708 GHz
-54.67 dBm

REF 5.0 dBm AT 20 dB



CLEAR
WRITE A

MAX
HOLD A

VIEW A

BLANK A

Trace
A B C

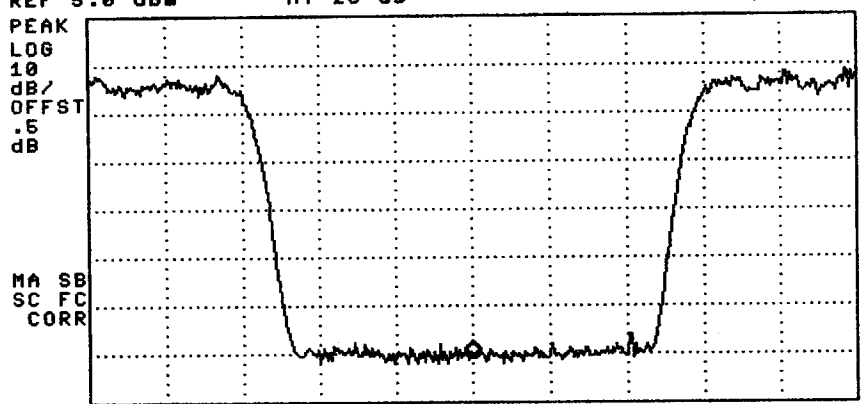
More
1 of 3

START 2.00000 GHz #RES BW 1.0 MHz VBW 1 MHz STOP 2.90000 GHz #SWP 90.0 msec

11:38:52 JUN 25, 2003

CDMA

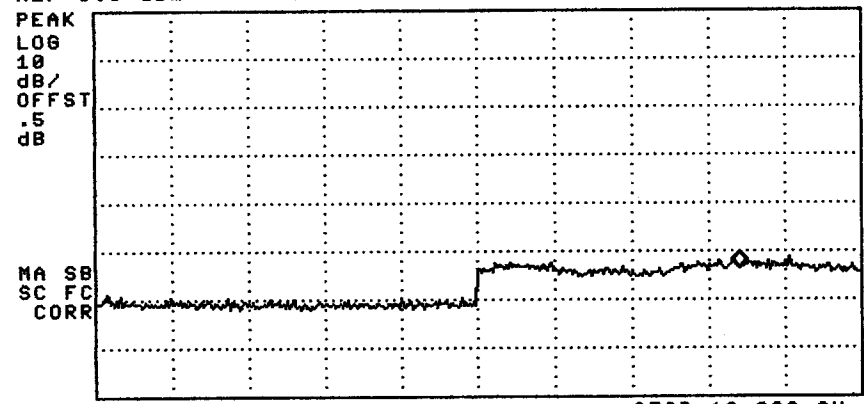
REF 5.0 dBm AT 20 dB MKR 1.960500 GHz -65.68 dBm



CLEAR
WRITE A
MAX
HOLD A
VIEW A
BLANK A
Trace
A B C
More
1 of 3

11:39:50 JUN 25, 2003

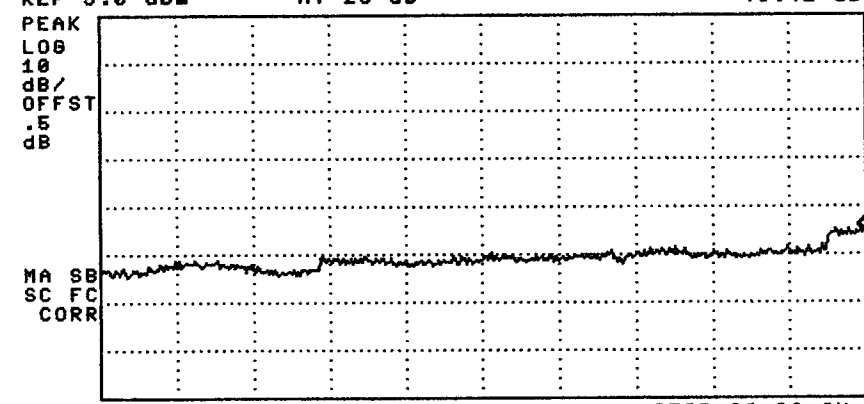
REF 5.0 dBm AT 20 dB MKR 8.864 GHz -48.76 dBm



CLEAR
WRITE A
MAX
HOLD A
VIEW A
BLANK A
Trace
A B C
More
1 of 3

11:40:23 JUN 25, 2003

REF 5.0 dBm AT 20 dB MKR 20.00 GHz -49.42 dBm



CLEAR
WRITE A
MAX
HOLD A
VIEW A
BLANK A
Trace
A B C
More
1 of 3

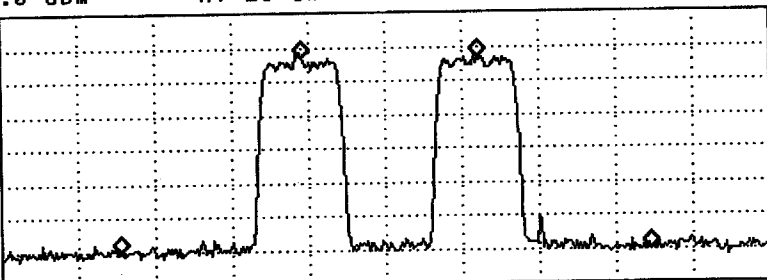
CDMA

09:40:44 JUN 25, 2003

MKR 1.99299 GHz
-65.02 dBm

REF 5.0 dBm AT 20 dB

PEAK
LOG
10
dB/
OFFST
.5
dB



CLEAR
WRITE A

MAX
HOLD A

VIEW A

BLANK A

Trace
A B C

More
1 of 3

| Marker | Trace | Type | Freq / Time | Amplitude |
|--------|-------|------|-------------|------------|
| 1: | (A) | Freq | 1984.02 MHz | -65.30 dBm |
| 2: | (A) | Freq | 1987.07 MHz | -8.35 dBm |
| 3: | (A) | Freq | 1990.06 MHz | -8.34 dBm |
| 4: | (A) | Freq | 1992.99 MHz | -65.02 dBm |

CENTER 1.98850 GHz
#RES BW 30 kHz

VBW 30 kHz

SPAN 13.00 MHz
SWP 43.3 msec

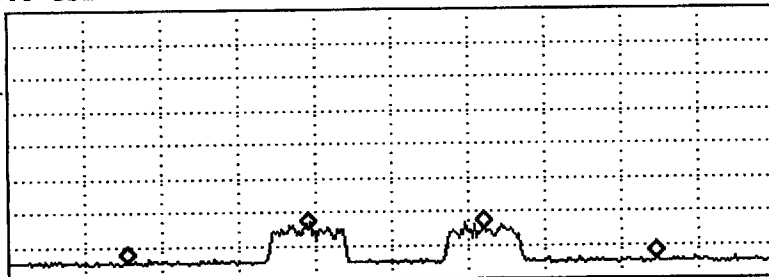
Input

09:42:21 JUN 25, 2003

MKR 1.99299 GHz
-69.45 dBm

REF 5.0 dBm AT 20 dB

PEAK
LOG
10
dB/
OFFST
.5
dB



CLEAR
WRITE A

MAX
HOLD A

VIEW A

BLANK A

Trace
A B C

More
1 of 3

| Marker | Trace | Type | Freq / Time | Amplitude |
|--------|-------|------|-------------|------------|
| 1: | (A) | Freq | 1984.02 MHz | -70.16 dBm |
| 2: | (A) | Freq | 1987.07 MHz | -59.88 dBm |
| 3: | (A) | Freq | 1990.06 MHz | -59.98 dBm |
| 4: | (A) | Freq | 1992.99 MHz | -69.45 dBm |

CENTER 1.98850 GHz
#RES BW 30 kHz

VBW 30 kHz

SPAN 13.00 MHz
SWP 43.3 msec

