FCC CFR47 PART 24 E CERTIFICATION

TEST REPORT

FOR

PCS MULTI CARRIER POWER AMPLIFIER

MODEL: MCPA4080

FCC ID: I2OMCPA4080

REPORT NUMBER: 01U1044-1

ISSUE DATE: November 12, 2001

Prepared for
SPECTRIAN
350 WEST JAVA DRIVE
SUNNYVALE, CA 94089
USA

Prepared by
COMPLIANCE ENGINEERING SERVICES, INC.
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LAB CODE:200065-0

TABLE OF CONTENT

1. TEST RESULT CERTIFICATION

COMPANY NAME: **SPECTRIAN**
350 WEST JAVA DRIVE
SUNNYVALE, CA 94089, USA

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TELPHONE NO: **(408) 745-5507**

EUT DESCRIPTION: **PCS MULTI CARRIER POWER AMPLIFIER**

MODEL NAME: **MCPA4080**

DATE TESTED: **NOVEMBER 12, 2001**

EQUIPMENT TYPE	1930-1990 MHz POWER AMPLIFIER
MEASUREMENT PROCEDURE	ANSI 63.4 / 1992, TIA/EIA 603
PROCEDURE	CERTIFICATION
FCC RULE	CFR 47 PART 24 Subpart E

Compliance Certification Services, Inc. tested the above equipment for compliance with the requirement set forth in CFR 47, PART 24 Subpart E-Broadband PCS. This said equipment in the configuration described in this report, shows the maximum emission levels emanating from equipment are within the compliance requirements.

Warning : This document reports conditions under which testing was conducted and results of tests performed. This document may not be altered or revised in any way unless done so by Compliance Certification Services and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by Compliance Certification Services will constitute fraud and shall nullify the document.

Released For CCS By:

STEVE CHENG
EMC ENGINEERING MANAGER
COMPLIANCE CERTIFICATION SERVICES

Tested By:

KERWIN CORPUZ
ASSOCIATE EMC ENGINEER
COMPLIANCE CERTIFICATION SERVICES

2. EUT DESCRIPTION

This product is designed to provide power gain over the PCS cellular band transmit frequency range of 1930 MHz to 1990 MHz, with a minimum channel frequency separation of 60 kHz and a maximum channel frequency separation of 20 MHz.

3. TEST METHODOLOGY

Both conducted and radiated testing were performed according to the procedures documented on chapter 13 of ANSI C63.4 and FCC CFR 47 2.1046, 2.1047, 2.1049, 2.1051, 2.1053, 2.1055 and 2.1057.

4. TEST FACILITY

The open area test sites and conducted measurement facilities used to collect the radiated data are located at 561F Monterey Road, Morgan Hill, California, USA. The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22.

5. ACCREDITATION AND LISTING

The test facilities used to perform radiated and conducted emissions tests are accredited by National Voluntary Laboratory Accreditation Program for the specific scope of accreditation under Lab Code: 200065-0 to perform Electromagnetic Interference tests according to FCC PART 15 AND CISPR 22 requirements. No part of this report may be used to claim or imply product endorsement by NVLAP or any agency of the US Government. In addition, the test facilities are listed with Federal Communications Commission (reference no: 31040/SIT (1300B3) and 31040/SIT (1300F2))

6. MEASURING INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment, which is traceable to recognized national standards.

7. APPLICABLE RULES AND BRIEF TEST RESULT

§24.232- POWER LIMIT

24.232(a); Maximum Peak output power for base station transmitters should not exceed 100 Watts EIRP (equivalent isotropically radiated power).

24.232(b); Mobile/Portable stations are limited to 2 Watts EIRP peak power.

Spec limit: As specified above, 100W maximum.
Test result: Measured with power meter. All outputs were adjusted to 50.0dBm (100Watts), during testing.

TYPE OF EMISSIONS

30K0DXW (TDMA), 1M25F9W (CDMA), 300KGXW (GSM), 300KG7W (EDGE)

§24.235- FREQUENCY STABILITY

The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

Spec limit: As stated above.
Test result: Not Applicable, EUT is a power amplifier.

§24.238- EMISSION LIMITS

24.238(a); The magnitude of each spurious and harmonic emission that can be detected when the equipment is operated under conditions specified in the instruction manual and/or alignment procedure, shall not be less than 43+10 log (mean output power in watts) dBc below the mean power output outside a licensee's frequency block.

Power Amplifier Mean Power = 100 Watts (50dBm)
43 + 10 log (100 Watts) = 63 dB

Out-of-Band and Band-Edges emissions must be attenuated by the following amount:
50 dBm – 63 dB = -13dBm
24.238(b) & (c);

(1) Compliance with the out-of-band emissions requirement is based on test being performed with 1MHz analyzer RES BW.

(2) At block edges, RES BW may be adjusted to a level at least as large as 1% of emission bandwidth. The emissions bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power. For the EUT this is at least:

TDMA:
0.01 * 30 kHz = 300 Hz. A RES BW of 1 kHz was used for measuring at the block edges.

CDMA:
0.01 * 1.25 MHz = 12.5 kHz. A RES BW of 30 kHz was used for measuring at the block edges.

GSM and EDGE:
0.01 * 300 kHz = 3 kHz. A RES BW of 3 kHz was used for measuring at the block edges.

Spec limit: As specified as above.
Test result: This measurement results shows that the EUT complies with the rule.

§2.1057- SPECTRUM RANGE TO BE INVESTIGATED

Lowest radio frequency signal generated in the equipment, without going below 9 kHz, up to at least the frequency shown below:

(1) If the equipment operates below 10 GHz: to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.

(2) If the equipment operates at or above 10 GHz and below 30 GHz:
to the fifth harmonic of the highest fundamental frequency or to 100 GHz, whichever is lower.

(3) If the equipment operates at or above 30 GHz: to the fifth harmonic of the highest fundamental frequency or to 200 GHz, whichever is lower.

(b) Particular attention should be paid to harmonics and sub-harmonics of the carrier frequency as well as to those frequencies removed from the carrier by multiples of the oscillator frequency.
Radiation at the frequencies of multiplier stages should also be checked.

(c) The amplitude of spurious emissions, which are attenuated more than 20 dB below the permissible value, need not be reported.

(d) Unless otherwise specified, measurements above 40 GHz shall be performed using a minimum resolution bandwidth of 1 MHz.

Spec limit: Frequency investigation range from 15M to tenth harmonic (i.e. 20 GHz.).

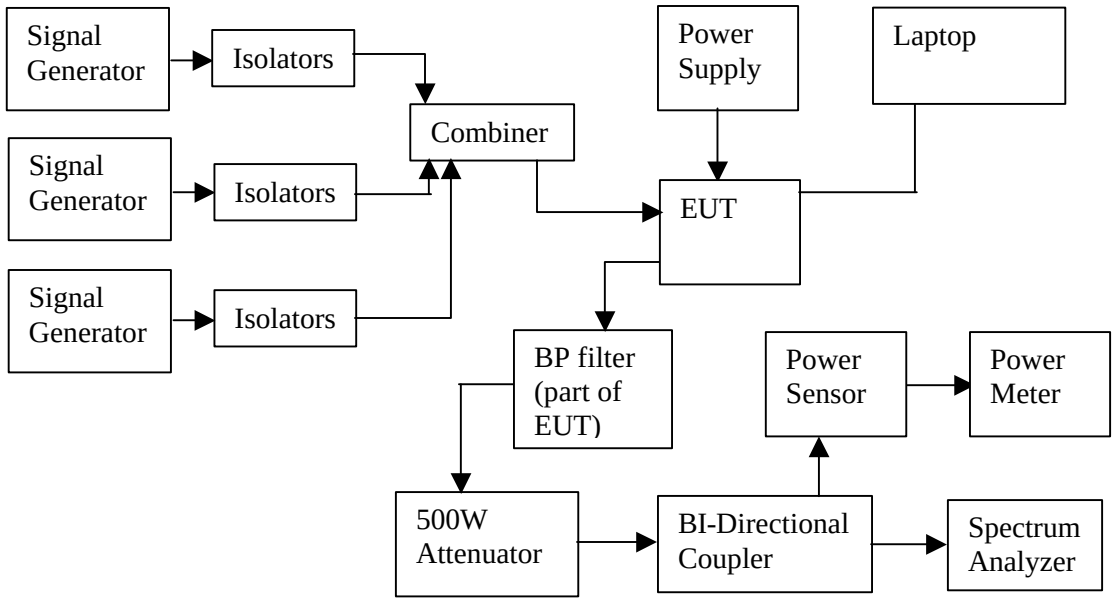
8. TEST SETUP, PROCEDURE AND RESULT

8.1. SECTION 2.1046: RF POWER OUTPUT

INSTRUMENTS LIST

EQUIPMENT	MANUFACTURE	MODEL NO.	SERIAL NO.	CAL. DUE DATE
Signal Generator	HP	E4432B	US37040764	4/6/02
Signal Generator	AGILENT	E4432B	MY41310379	N/A
Signal Generator	AGILENT	E4432B	MY41310380	N/A
Isolators	UTE Microwave	CT-2003-N	T8564	N/A
Isolators	UTE Microwave	CT-2003-N	T8565	N/A
Isolators	UTE Microwave	CT-2003-N	U197	N/A
Combiner	ANAREN	40275	1274	N/A
500W Attenuator	WEINSCHEL	53-30-34	LA854	N/A
BI-Direct. Coupler	NARDA	3022	75597	N/A
Power Sensor	HP	8482A	14379	12/11/01
Power Meter	AGILENT	E4419B	MY40510693	7/2/02
Power Supply	HP	6673A	3638A01447	N/A
Laptop	TOSHIBA	PA1246U XCD	87146481-3	N/A
Spectrum Analyzer	HP	8593EM	3710A00205	6/20/02
BP filter (part of EUT)	ClearComm Tech.	CCTF-80	AA643-02	N/A

TEST SETUP



TEST PROCEDURE

The EUT was set to maximum output power (maximum gain). RF output power was measured with Power Meter.

RESULT

Measured with power meter. All outputs were adjusted to 100 watts (50 dBm) during testing.

8.2. SECTION 2.1047: MODULATION CHARACTERISTICS

(NOT APPLICABLE, EUT IS A POWER AMPLIFIER)

8.3. SECTION 2.1049: OCCUPIED BANDWIDTH

SECTION 2.1049(i)

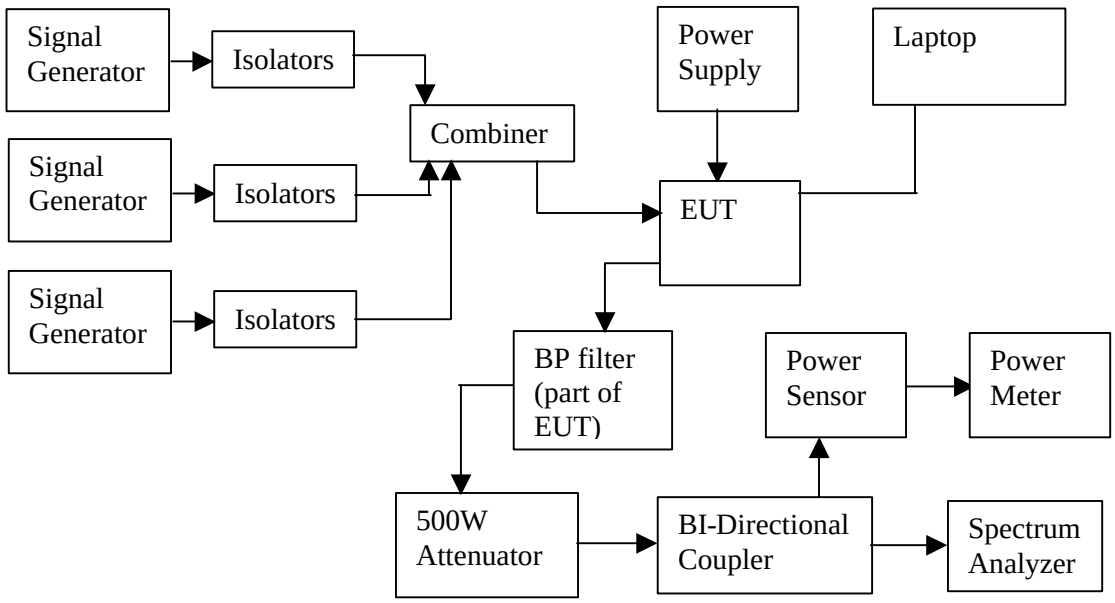
Transmitters designed for other types of modulation – when modulated by an appropriate signal of sufficient amplitude to be representative of the type of service in which used. A description of the input signal should be supplied.

INSTRUMENTS LIST

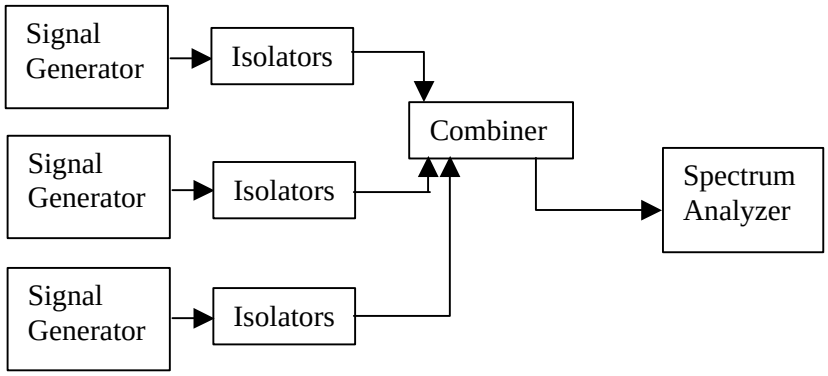
EQUIPMENT	MANUFACTURE	MODEL NO.	SERIAL NO.	CAL. DUE DATE
Signal Generator	HP	E4432B	US37040764	4/6/02
Signal Generator	AGILENT	E4432B	MY41310379	N/A
Signal Generator	AGILENT	E4432B	MY41310380	N/A
Isolators	UTE Microwave	CT-2003-N	T8564	N/A
Isolators	UTE Microwave	CT-2003-N	T8565	N/A
Isolators	UTE Microwave	CT-2003-N	U197	N/A
Combiner	ANAREN	40275	1274	N/A
500W Attenuator	WEINSCHEL	53-30-34	LA854	N/A
BI-Direct. Coupler	NARDA	3022	75597	N/A
Power Sensor	HP	8482A	14379	12/11/01
Power Meter	AGILENT	E4419B	MY40510693	7/2/02
Power Supply	HP	6673A	3638A01447	N/A
Laptop	TOSHIBA	PA1246U XCD	87146481-3	N/A
Spectrum Analyzer	HP	8593EM	3710A00205	6/20/02
BP filter (part of EUT)	ClearComm Tech.	CCTF-80	AA643-02	N/A

TEST SETUP

OUTPUT SETUP



INPUT SETUP



TEST PROCEDURE

The EUT's occupied bandwidth output plot is compared with the input source plot to check that no distortion is created when the input signal is amplified by the EUT. Identical bandwidths, spans and center frequencies are used for both plots. Reference levels and attenuation are adjusted.

RESULT

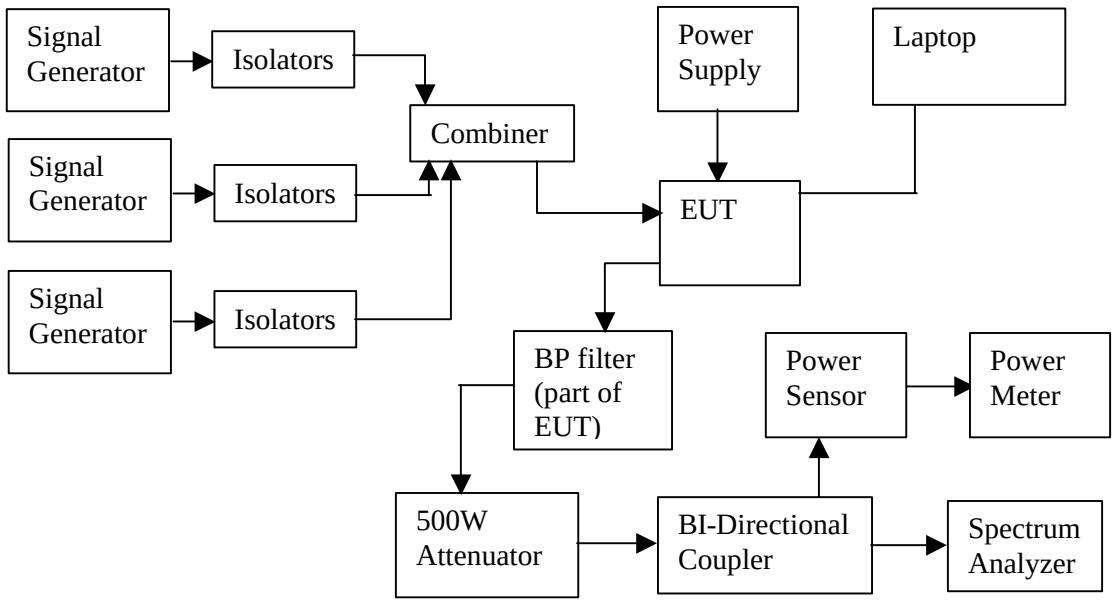
Plots of the input and output are included. Please refer to spectrum plots under SECTION 2.1051: SPURIOUS EMISSION AT ANTENNA TERMINAL.

8.4. SECTION 2.1051: SPURIOUS EMISSION AT ANTENNA TERMINAL

INSTRUMENTS LIST

EQUIPMENT	MANUFACTURE	MODEL NO.	SERIAL NO.	CAL. DUE DATE
Signal Generator	HP	E4432B	US37040764	4/6/02
Signal Generator	AGILENT	E4432B	MY41310379	N/A
Signal Generator	AGILENT	E4432B	MY41310380	N/A
Isolators	UTE Microwave	CT-2003-N	T8564	N/A
Isolators	UTE Microwave	CT-2003-N	T8565	N/A
Isolators	UTE Microwave	CT-2003-N	U197	N/A
Combiner	ANAREN	40275	1274	N/A
500W Attenuator	WEINSCHEL	53-30-34	LA854	N/A
BI-Direct. Coupler	NARDA	3022	75597	N/A
Power Sensor	HP	8482A	14379	12/11/01
Power Meter	AGILENT	E4419B	MY40510693	7/2/02
Power Supply	HP	6673A	3638A01447	N/A
Laptop	TOSHIBA	PA1246U XCD	87146481-3	N/A
Spectrum Analyzer	HP	8593EM	3710A00205	6/20/02
BP filter (part of EUT)	ClearComm Tech.	CCTF-80	AA643-02	N/A

TEST SETUP



TEST PROCEDURE

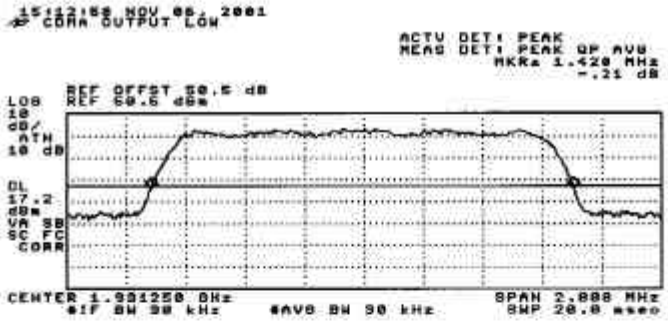
1) Three balanced signals were applied to the RF input. One set as close as possible to the bottom of the block edge and one set as close as possible to the top of the block edge. Set the RES BW to 1% of the emission bandwidth to show compliance with the –13dBm limit, in the 1 MHz bands immediately outside and adjacent to the top and bottom edges of the frequency block.

2) For the Out-of-Band measurements a 1 MHz RES BW was used to scan from 15 MHz to 10*fo* of the fundamental carrier for all frequency block. A display line was placed at –13dBm to show compliance.

RESULT

The following table indicates the plot number associated with the Input Bandwidth, Output Bandwidth, Block Edges, Intermodulation and Out-of-Band emission plots. All measurements are in peak detector mode.

*** CDMA ***		
Plot#	**Description**	**Frequency Range (MHz)**
1	Low Channel Output Bandwidth	1931.25
2	Mid Channel Output Bandwidth	1960
3	High Channel Output Bandwidth	1988.75
4	Low Channel Input Bandwidth	1931.25
5	Low Channel Input Bandwidth	1960
6	Low Channel Input Bandwidth	1988.75
7	Bottom Block Edge	1927 to 1931.25
8	Bottom Block Edge out-of-band	15 to 2900
9	Bottom Block Edge out-of-band	2900 to 20000
10	Top Block Edge	1988.75 to 1993
11	Top Block Edge out-of-band	15 to 2900
12	Top Block Edge out-of-band	2900 to 20000
13	Block **A** Intermod	1931.25, 1933.75, 1943.75 (zoom in)
14	Block **A** Intermod	1931.25, 1933.75, 1943.75 (zoom out)
15	Block **A** Intermod out-of-band	15 to 2900
16	Block **A** Intermod out-of-band	2900 to 20000
17	Block **A** Intermod	1931.25, 1941.25, 1943.75 (zoom in)
18	Block **A** Intermod	1931.25, 1941.25, 1943.75 (zoom out)
19	Block **A** Intermod out-of-band	15 to 2900
20	Block **A** Intermod out-of-band	2900 to 20000
21	Block **B** Intermod	1951.25, 1953.75, 1963.75 (zoom in)
22	Block **B** Intermod	1951.25, 1953.25, 1963.75 (zoom out)
23	Block **B** Intermod out-of-band	15 to 2900
24	Block **B** Intermod out-of-band	2900 to 20000
25	Block **B** Intermod	1951.25, 1961.25, 1963.75 (zoom in)
26	Block **B** Intermod	1951.25, 1961.25, 1963.75 (zoom out)
27	Block **B** Intermod out-of-band	15 to 2900
28	Block **B** Intermod out-of-band	2900 to 20000
29	Block **C** Intermod	1976.25, 1978.75, 1988.75 (zoom in)
30	Block **C** Intermod	1976.25, 1978.25, 1988.75 (zoom out)
31	Block **C** Intermod out-of-band	15 to 2900
32	Block **C** Intermod out-of-band	2900 to 20000
33	Block **C** Intermod	1976.25, 1986.25, 1988.75 (zoom in)
34	Block **C** Intermod	1976.25, 1986.25, 1988.75 (zoom out)
35	Block **C** Intermod out-of-band	15 to 2900
36	Block **C** Intermod out-of-band	2900 to 20000



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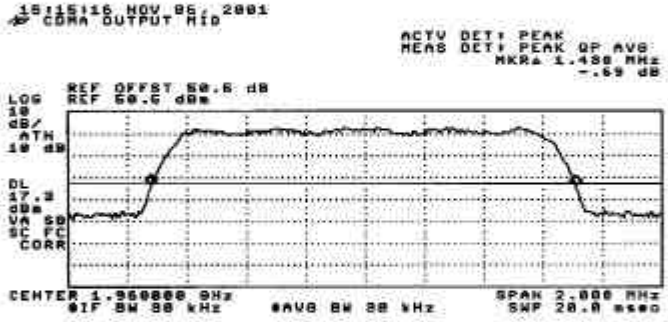

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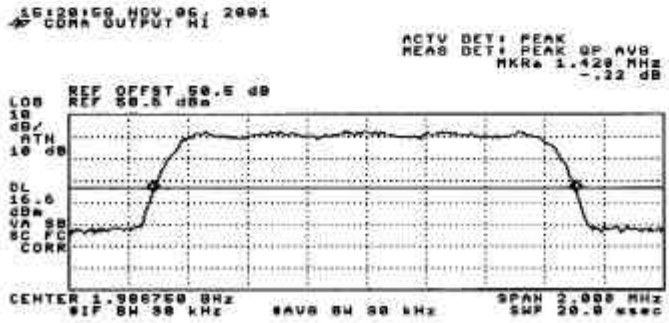

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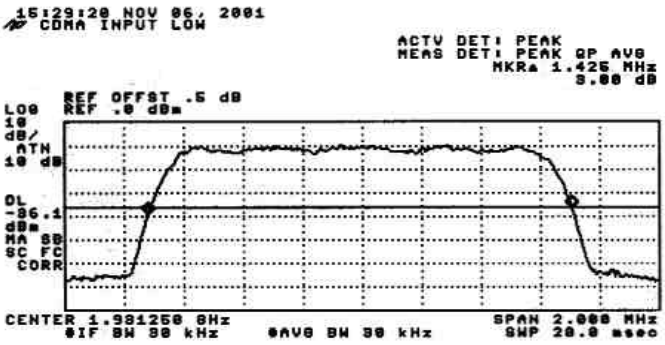

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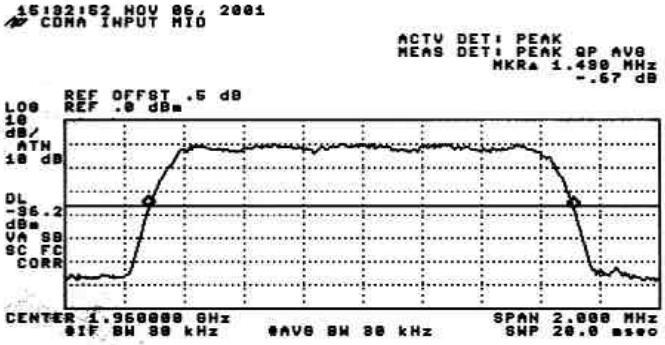

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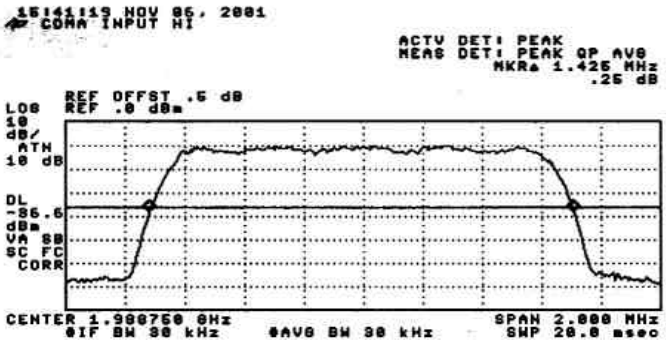

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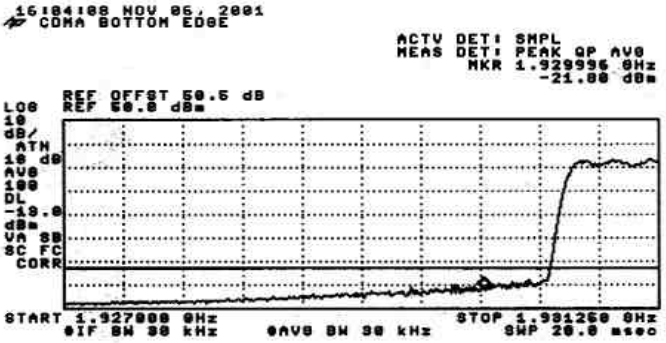

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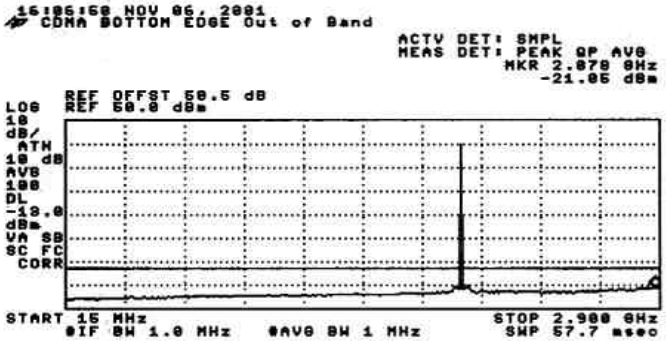

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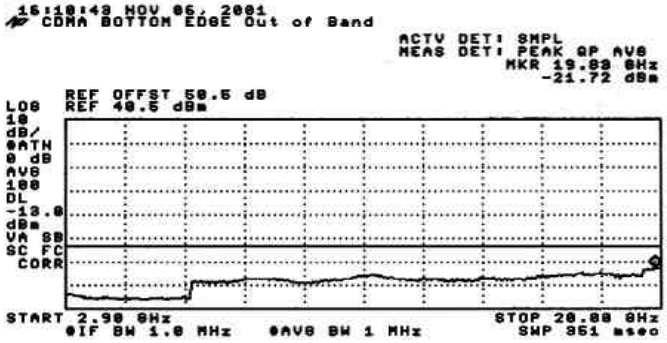

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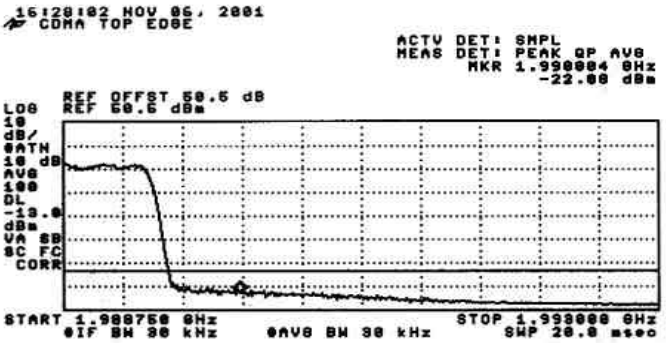

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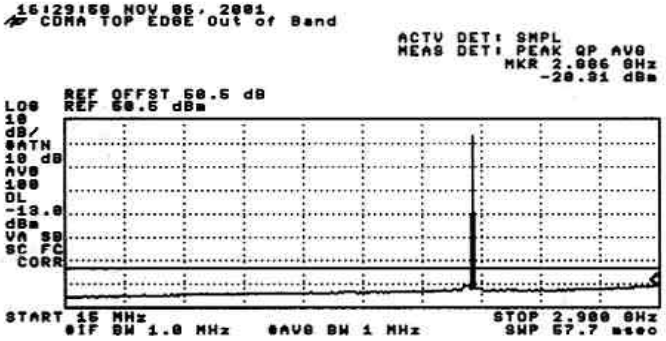

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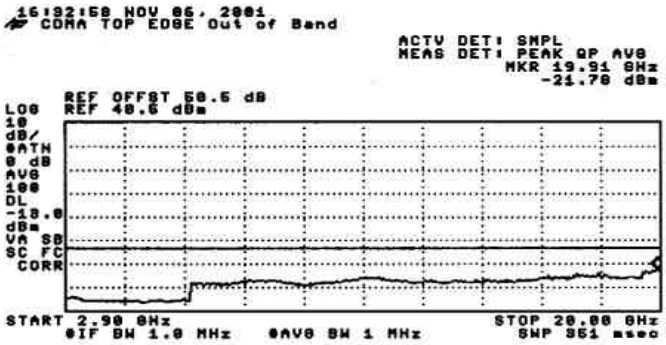

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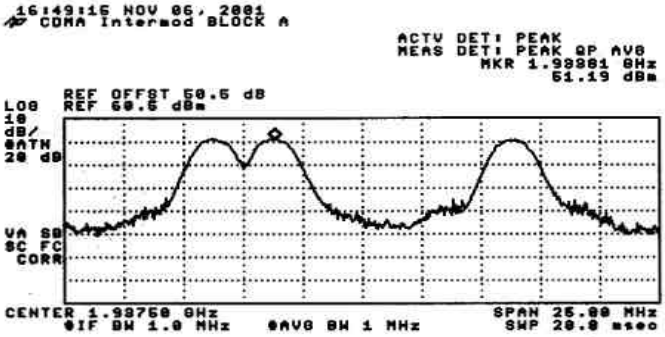

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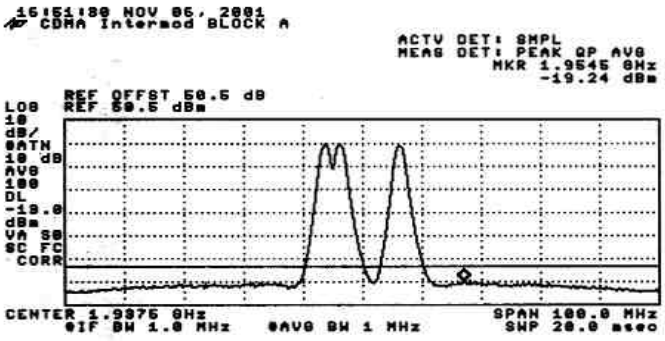

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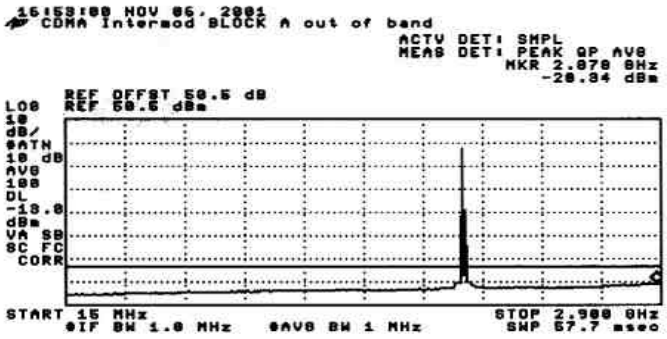

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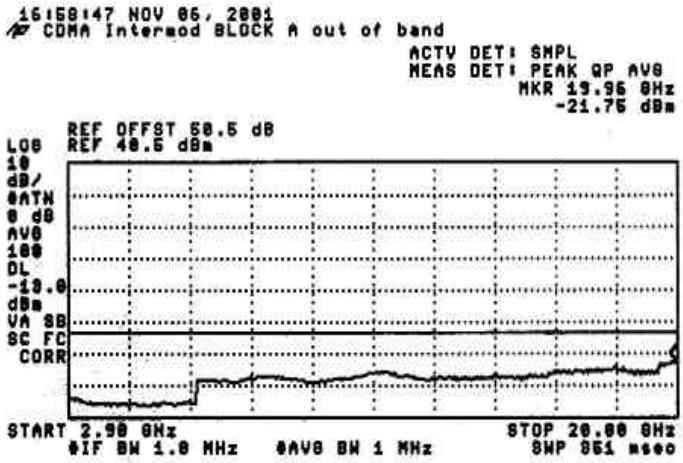

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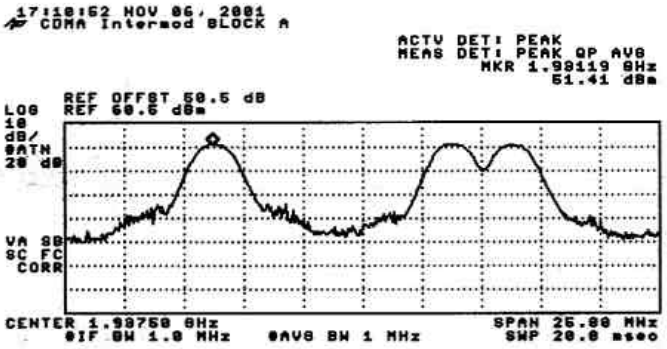

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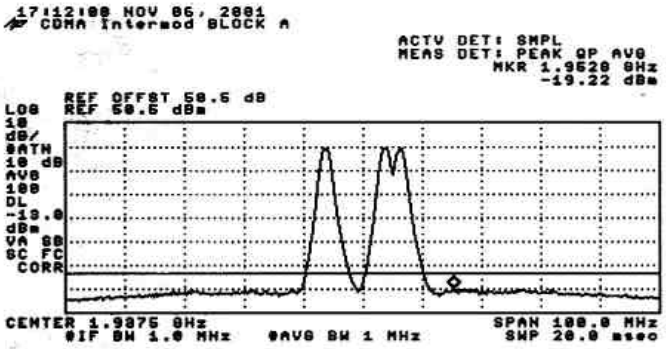

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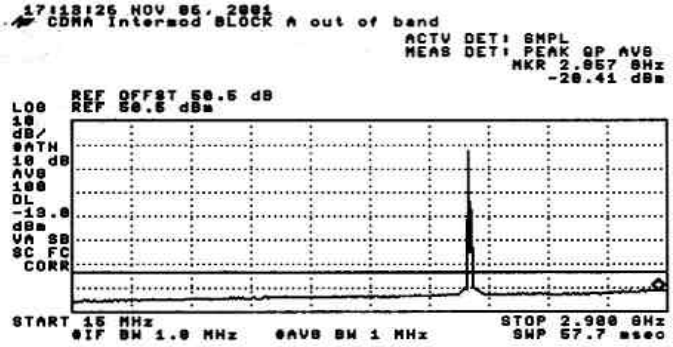

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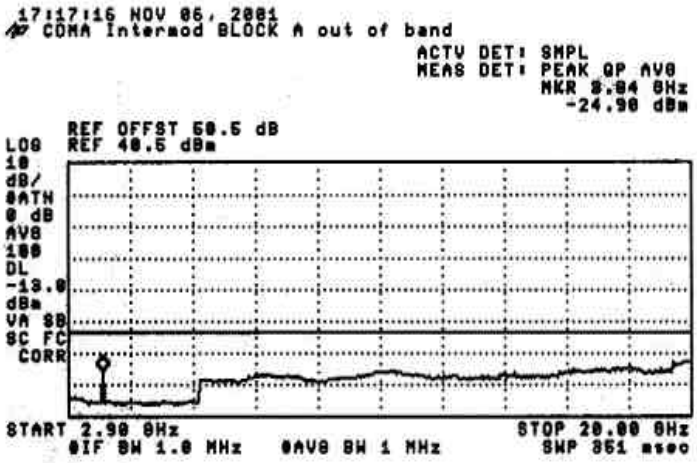

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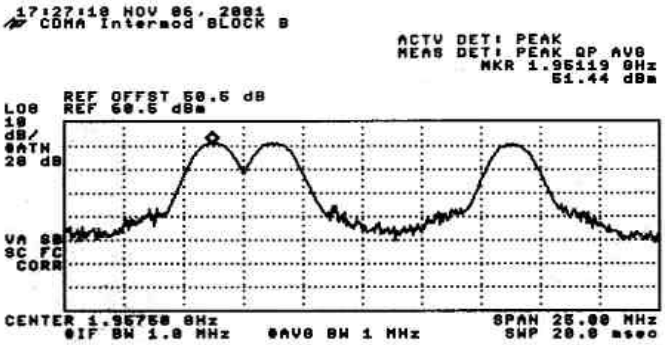

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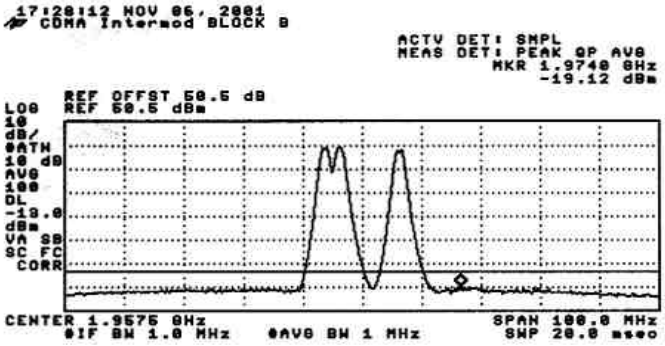

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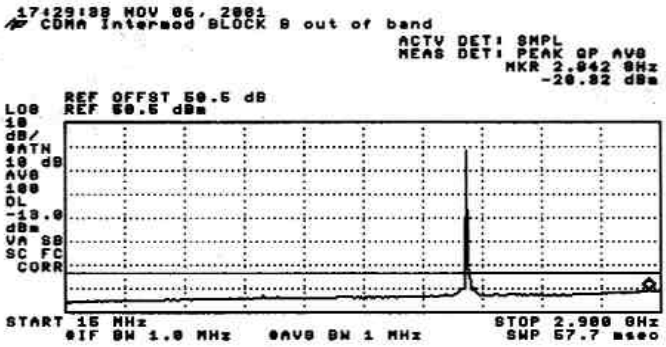

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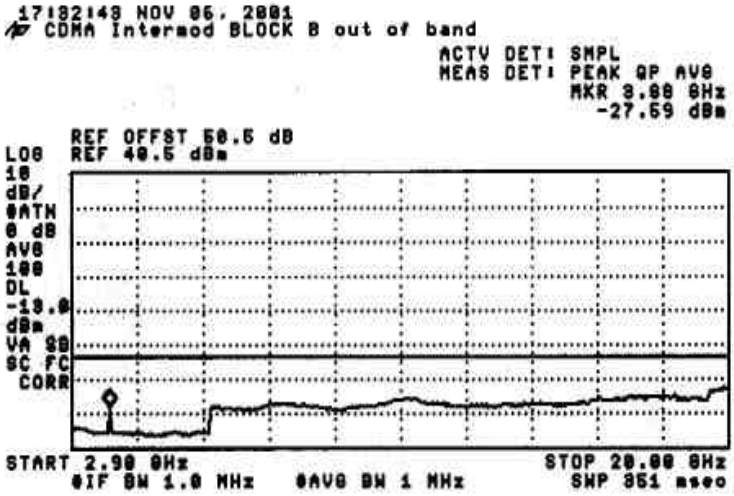

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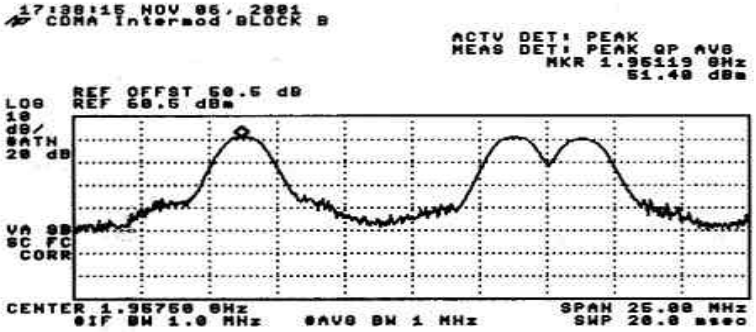

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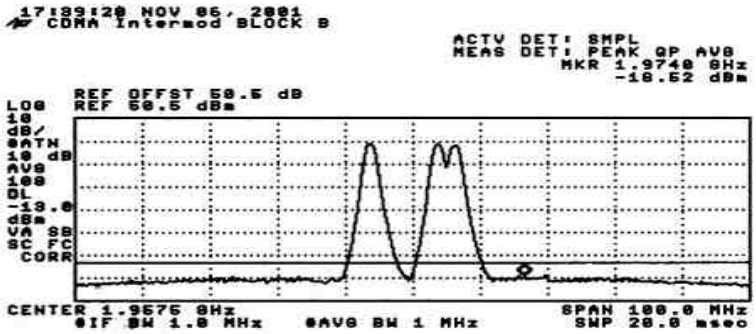

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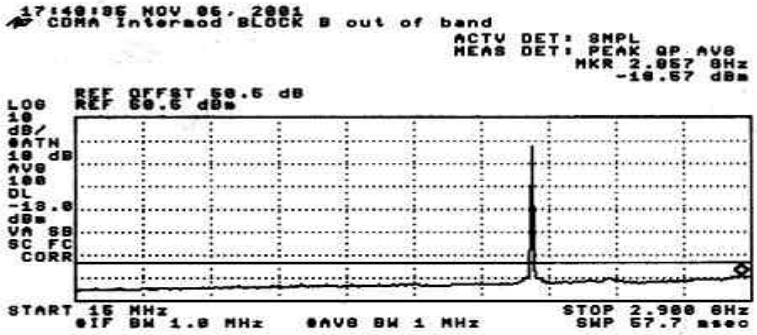

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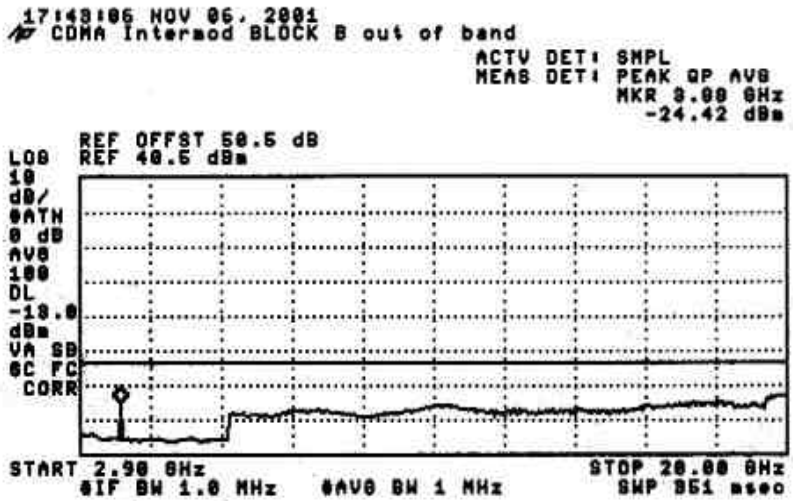

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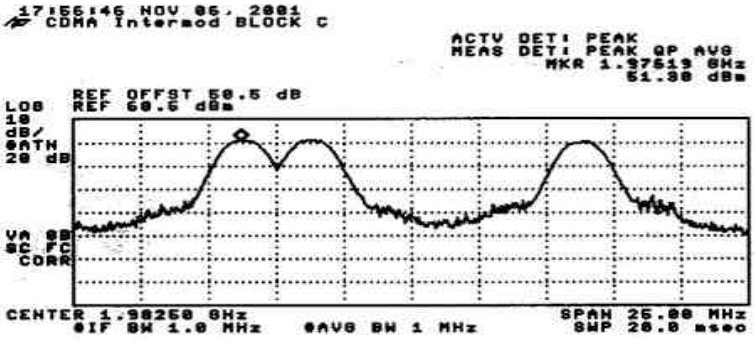

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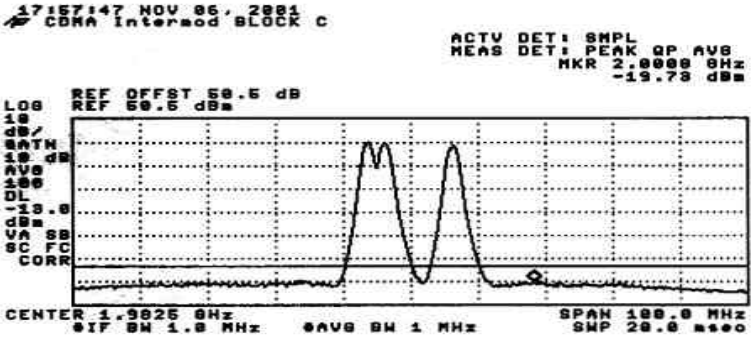

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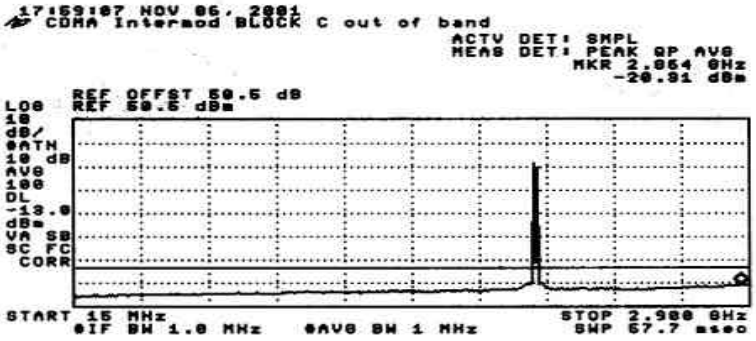

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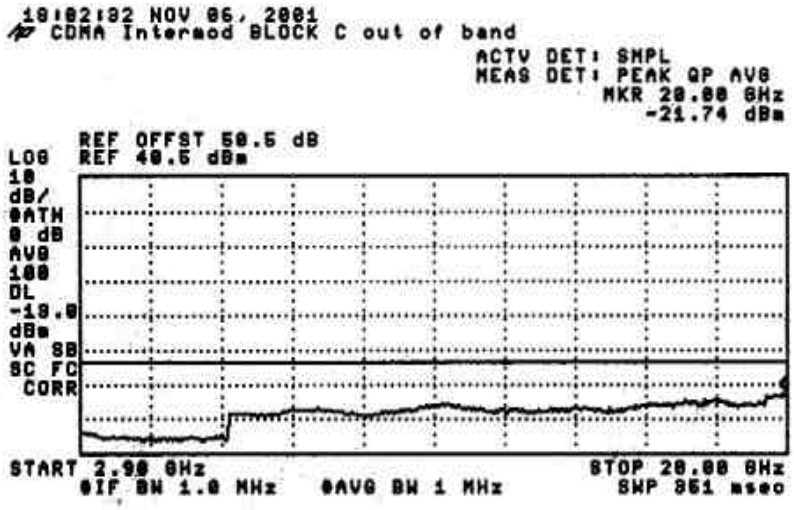

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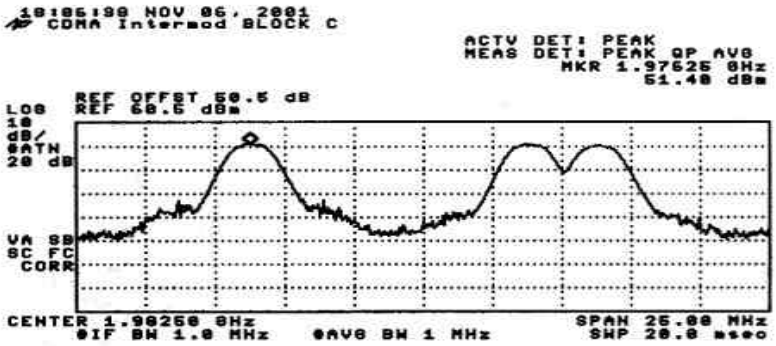

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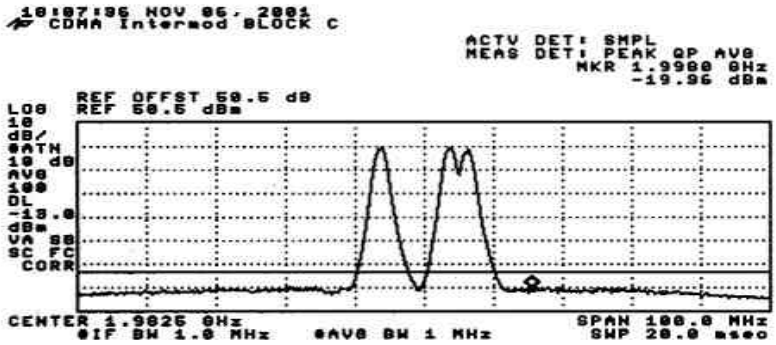

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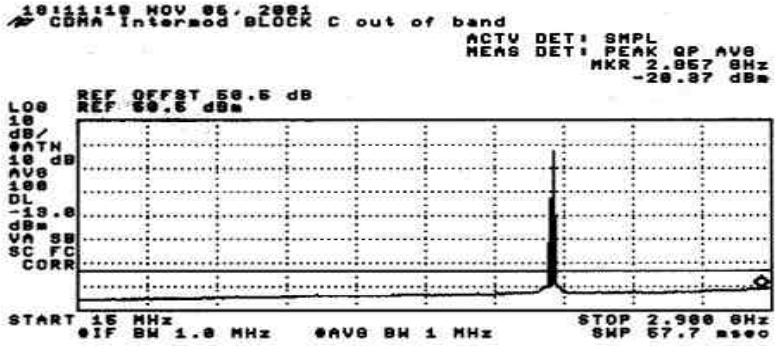

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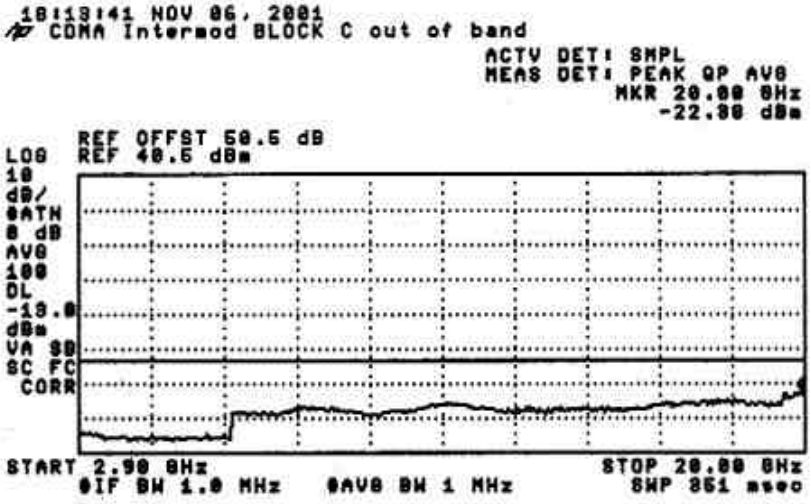
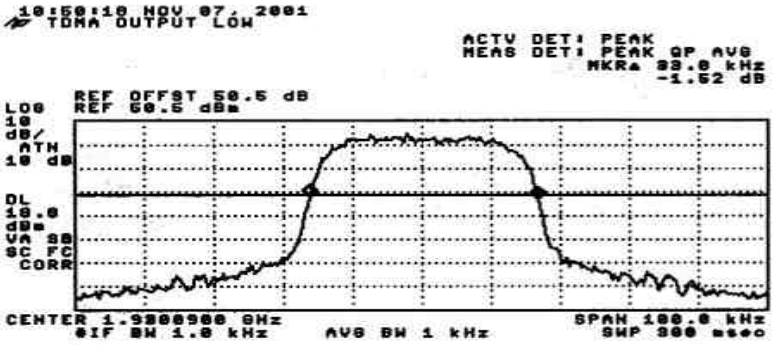


36

*** TDMA ***		
Plot#	**Description**	**Frequency Range (MHz)**
37	Low Channel Output Bandwidth	1930.09
38	Mid Channel Output Bandwidth	1960
39	High Channel Output Bandwidth	1989.91
40	Low Channel Input Bandwidth	1930.09
41	Low Channel Input Bandwidth	1960
42	Low Channel Input Bandwidth	1989.91
43	Bottom Block Edge	1927 to 1930.1
44	Bottom Block Edge out-of-band	15 to 2900
45	Bottom Block Edge out-of-band	2900 to 20000
46	Top Block Edge	1989.9 to 1993
47	Top Block Edge out-of-band	15 to 2900
48	Top Block Edge out-of-band	2900 to 20000
49	Block **A** Intermod	1930.09, 1932.09, 1944.91 (zoom in)
50	Block **A** Intermod	1930.09, 1932.09, 1944.91 (zoom out)
51	Block **A** Intermod out-of-band	15 to 2900
52	Block **A** Intermod out-of-band	2900 to 20000
53	Block **A** Intermod	1930.09, 1942.91, 1944.91 (zoom out)
54	Block **A** Intermod	1930.09, 1942.91, 1944.91 (zoom out)
55	Block **A** Intermod out-of-band	15 to 2900
56	Block **A** Intermod out-of-band	2900 to 20000
57	Block **B** Intermod	1950.09, 1952.09, 1964.91 (zoom in)
58	Block **B** Intermod	1950.09, 1952.09, 1964.91 (zoom out)
59	Block **B** Intermod out-of-band	15 to 2900
60	Block **B** Intermod out-of-band	2900 to 20000
61	Block **B** Intermod	1950.09, 1962.91, 1964.91 (zoom in)
62	Block **B** Intermod	1950.09, 1962.91, 1964.91 (zoom out)
63	Block **B** Intermod out-of-band	15 to 2900
64	Block **B** Intermod out-of-band	2900 to 20000
65	Block **C** Intermod	1975.09, 1977.09, 1989.91 (zoom in)
66	Block **C** Intermod	1975.09, 1977.09, 1989.91 (zoom out)
67	Block **C** Intermod out-of-band	15 to 2900
68	Block **C** Intermod out-of-band	2900 to 20000
69	Block **C** Intermod	1975.09, 1987.91, 1989.91 (zoom in)
70	Block **C** Intermod	1975.09, 1987.91, 1989.91 (zoom out)
71	Block **C** Intermod out-of-band	15 to 2900
72	Block **C** Intermod out-of-band	2900 to 20000



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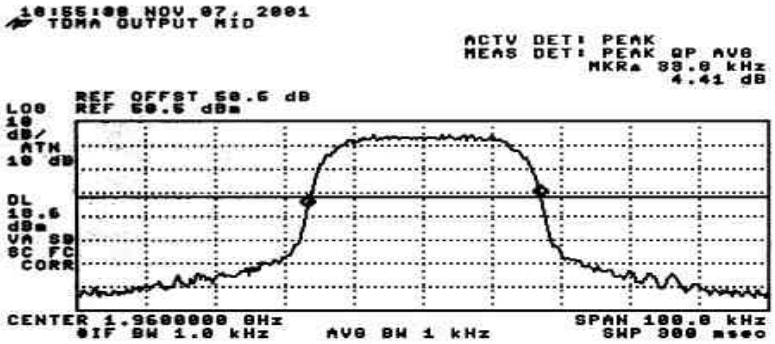

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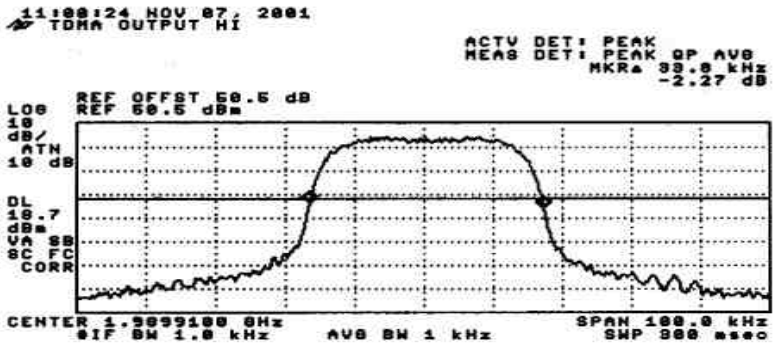

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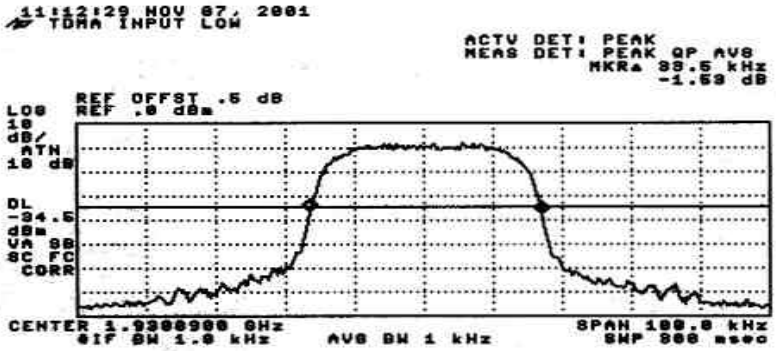

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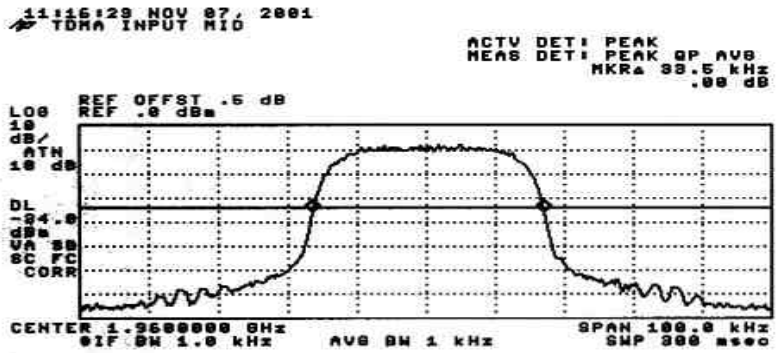

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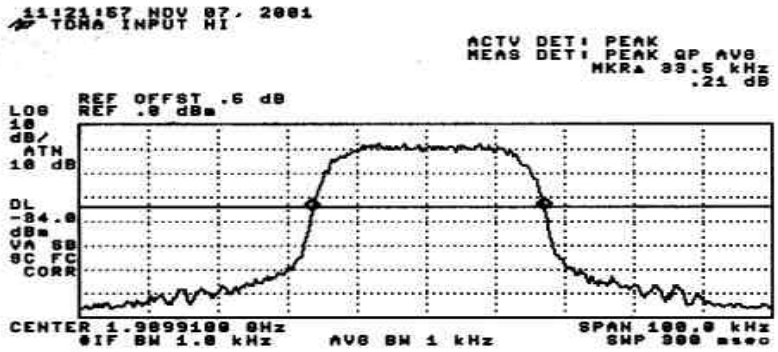

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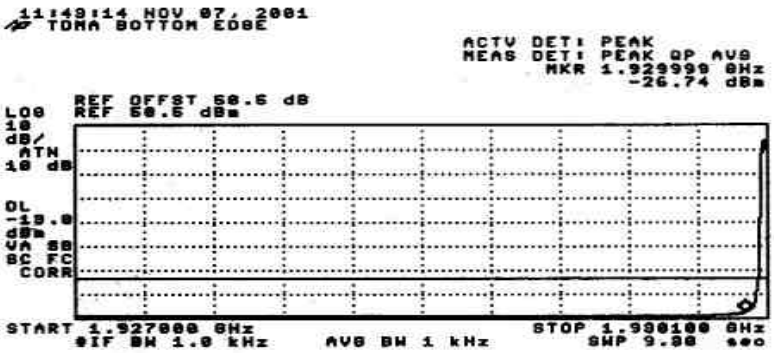

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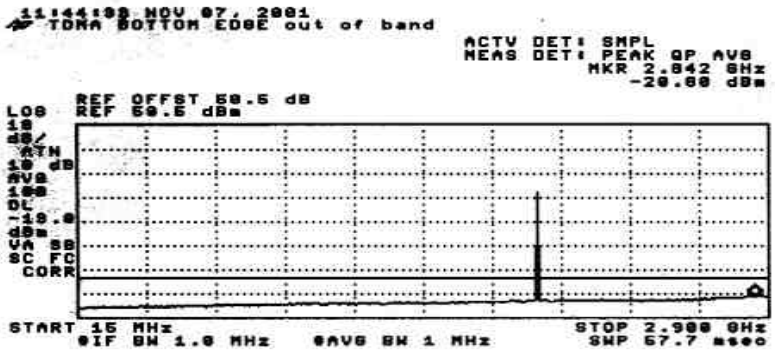

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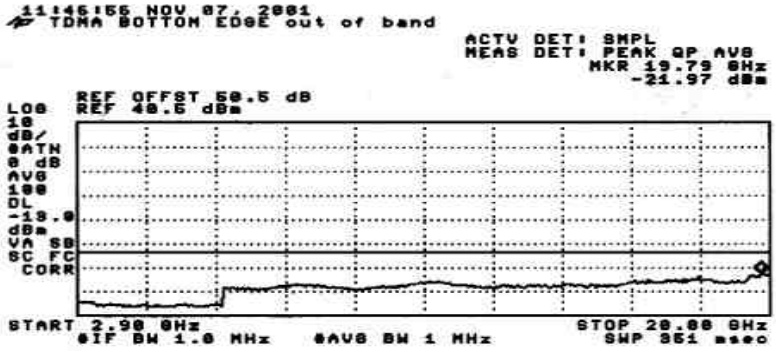

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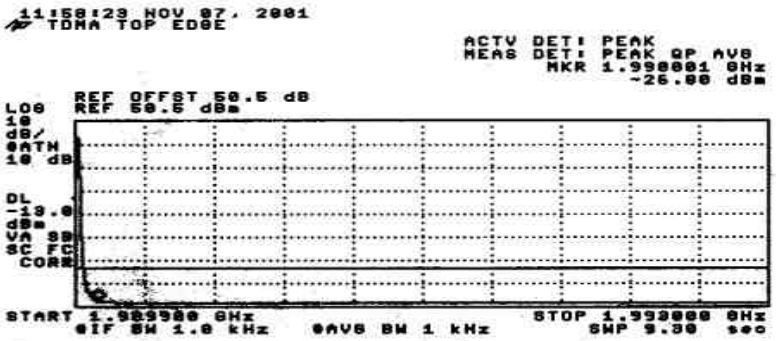

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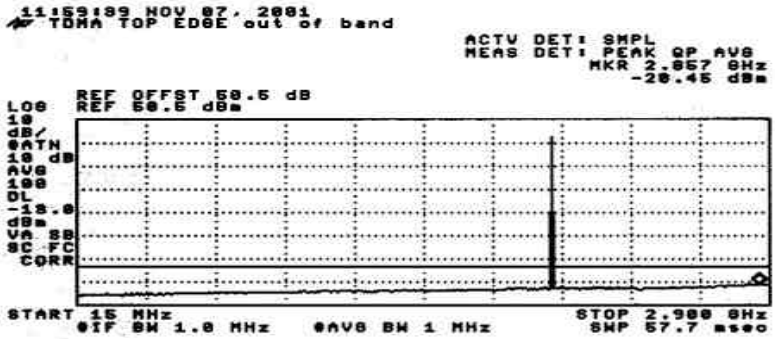

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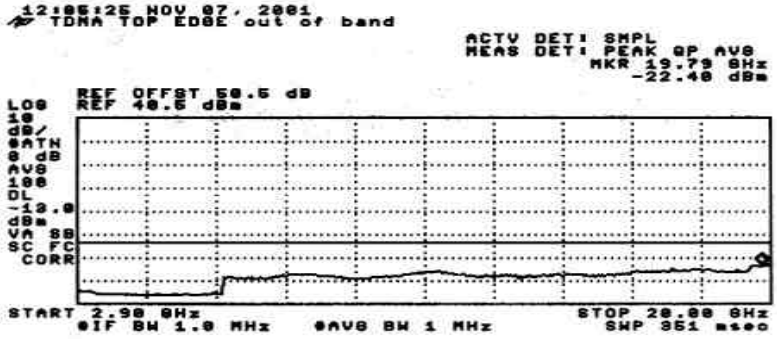

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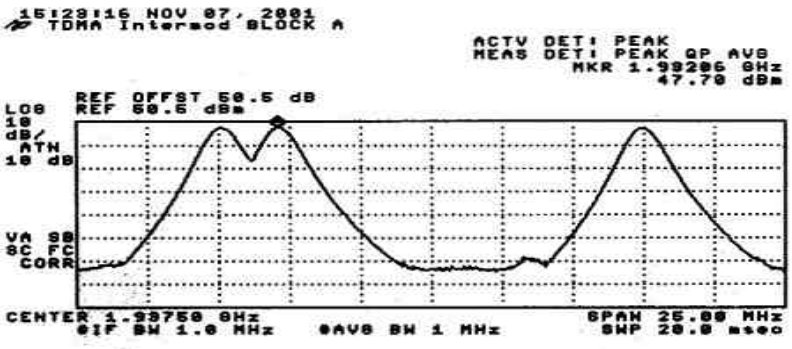

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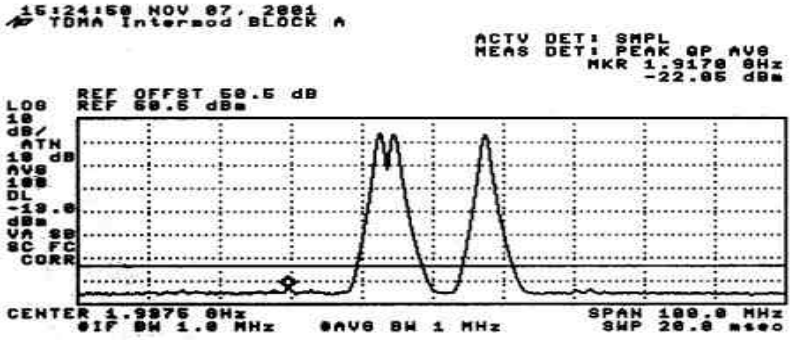

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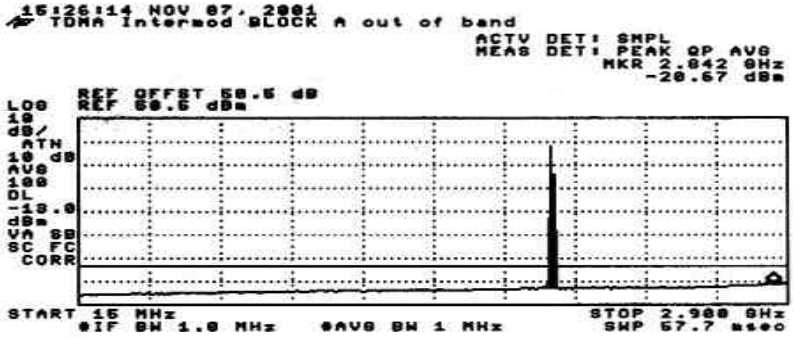

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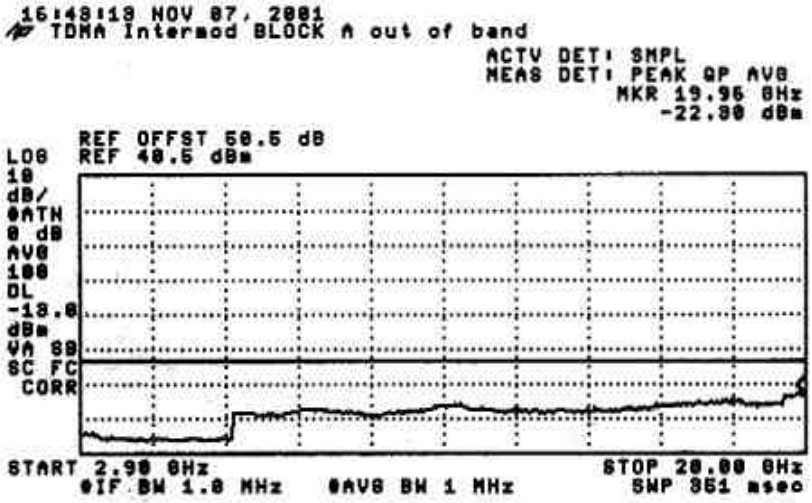

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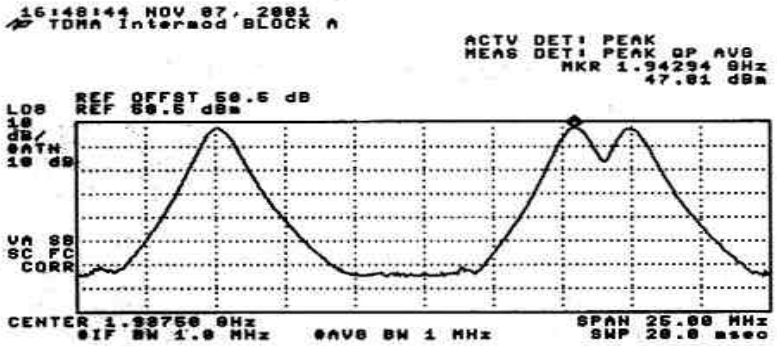

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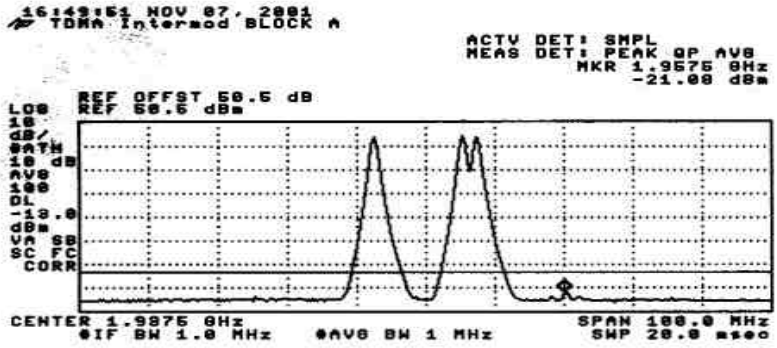

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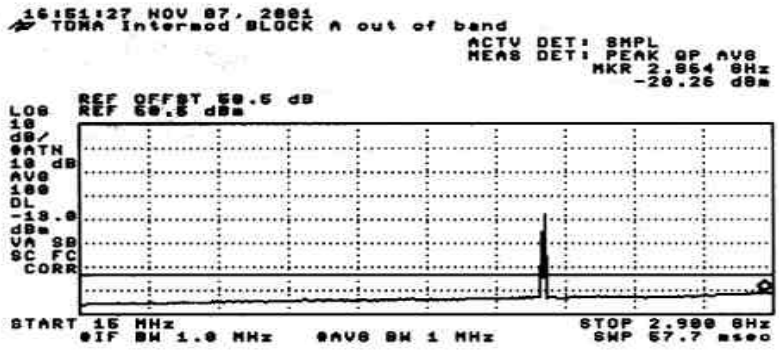

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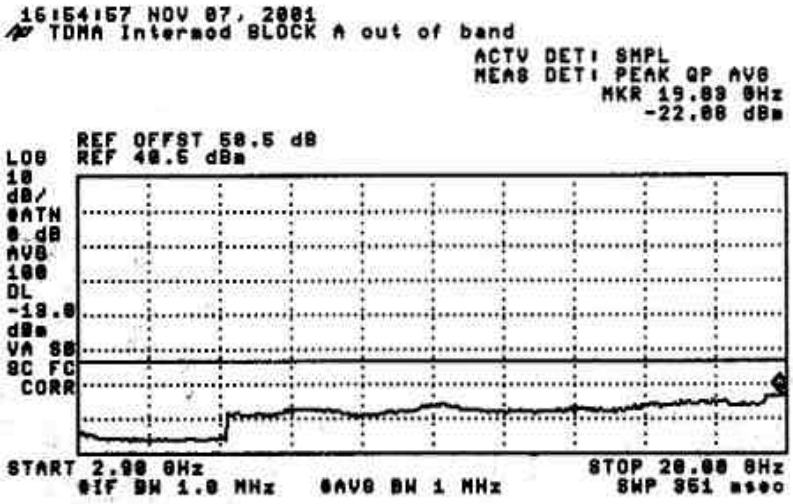

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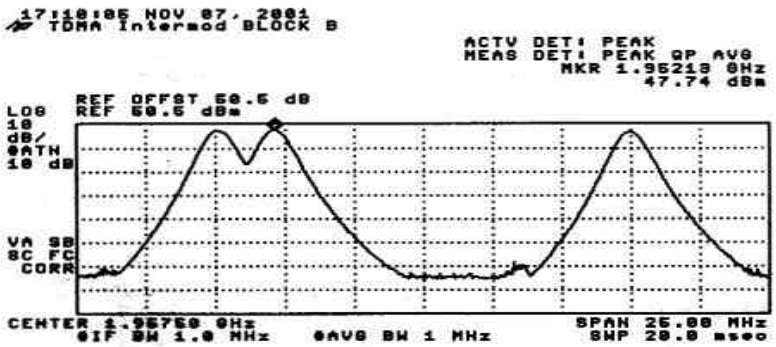

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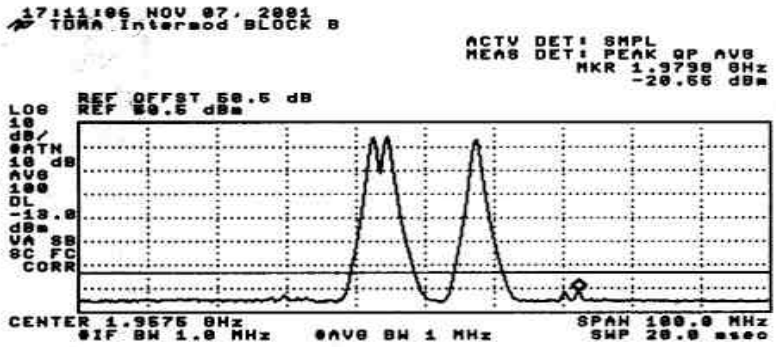

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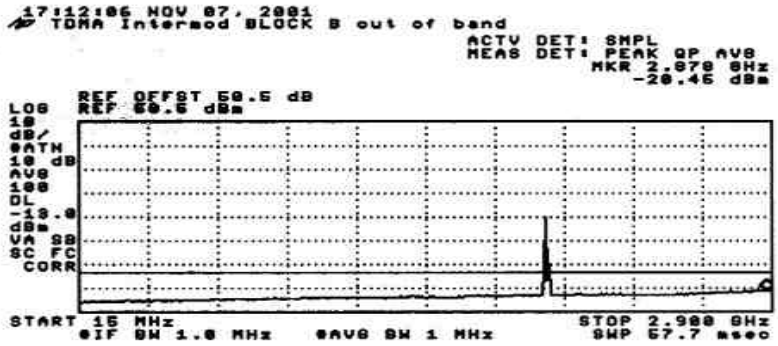

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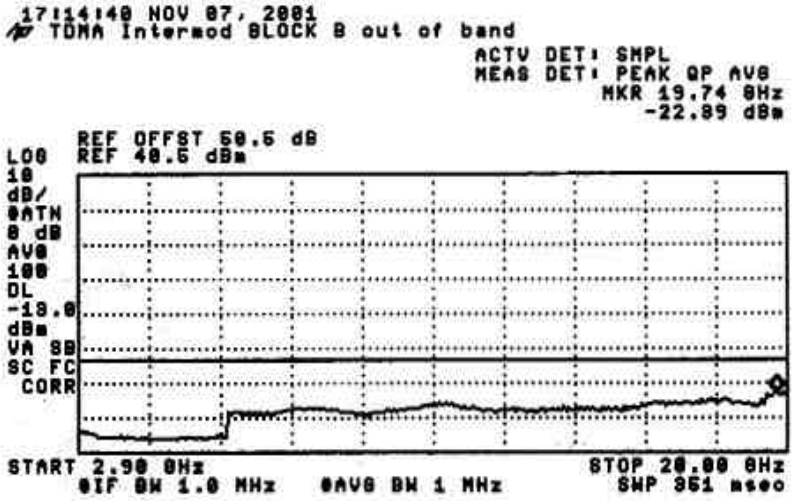

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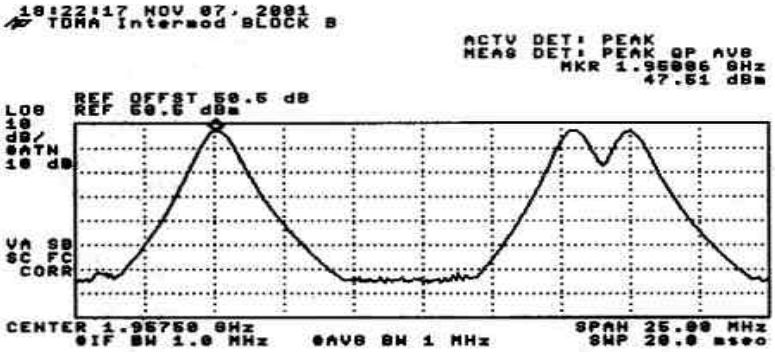

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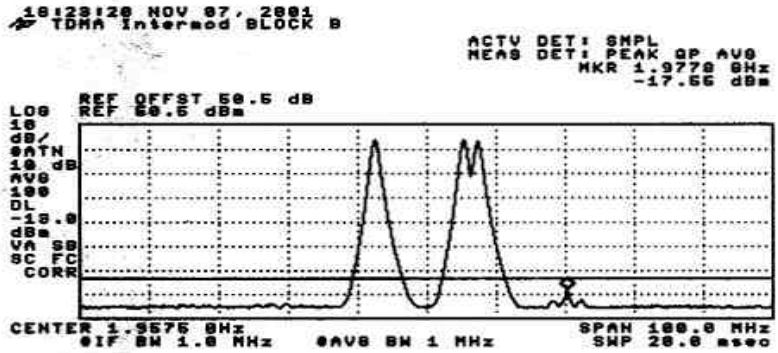

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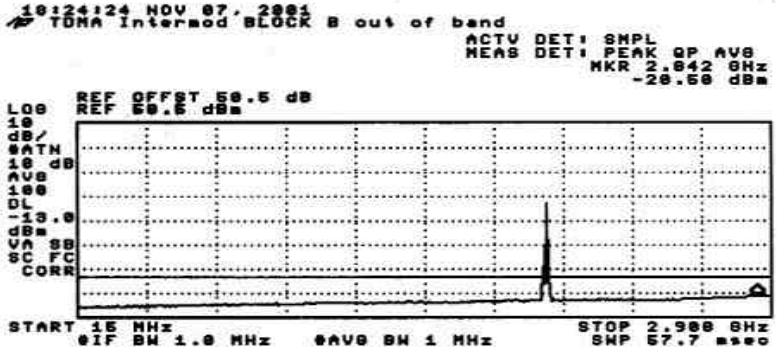

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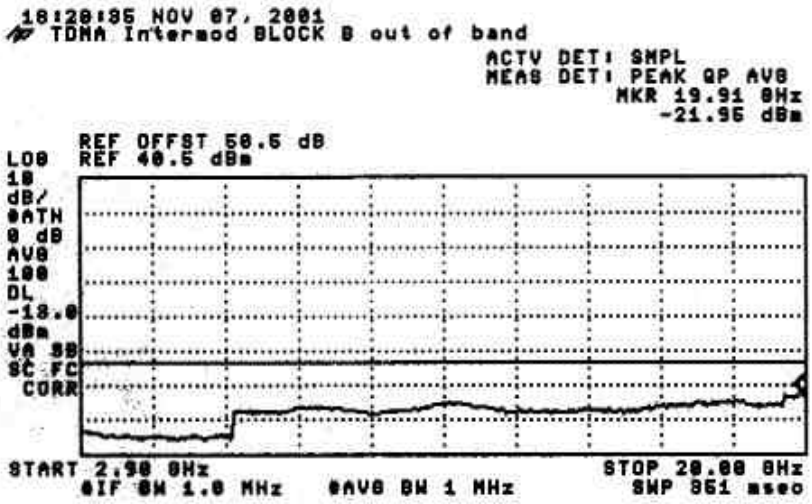

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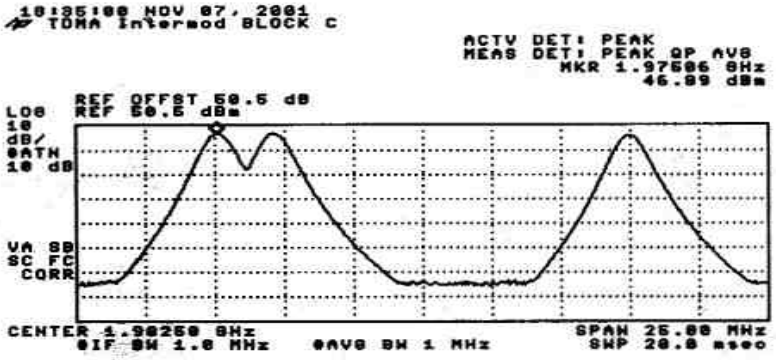

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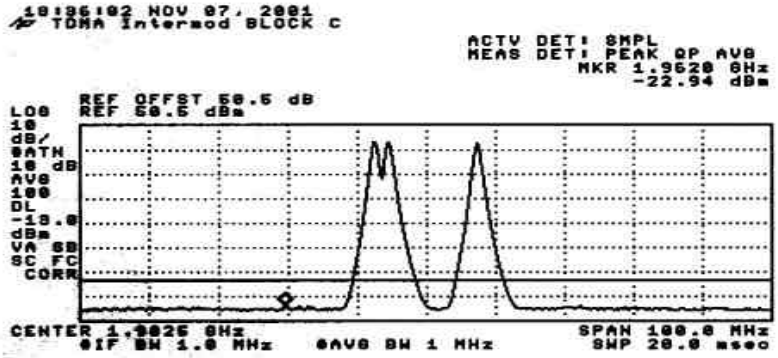

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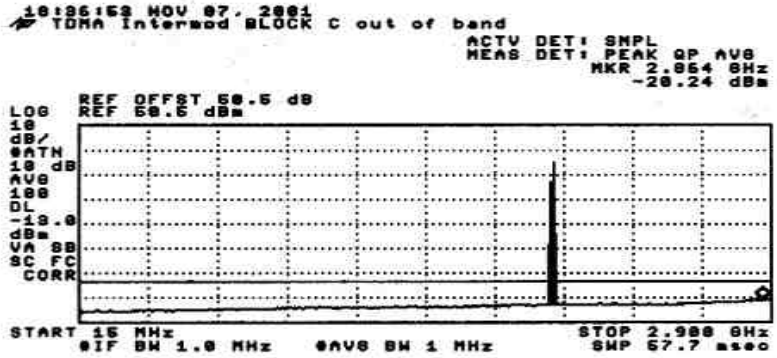

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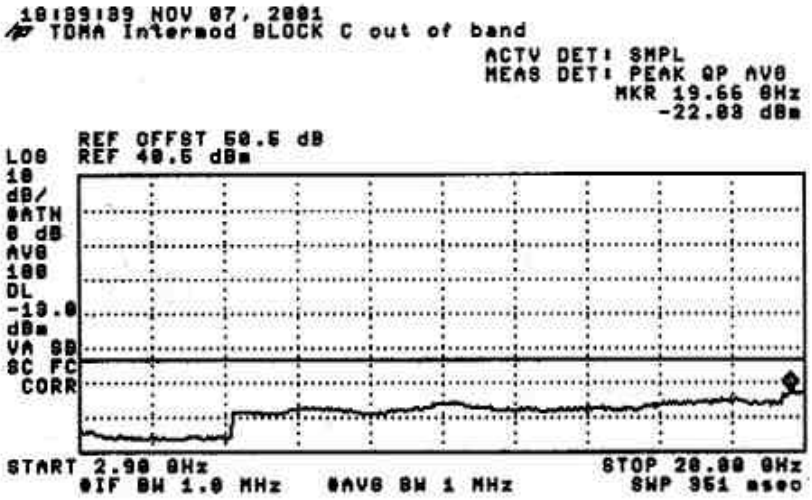

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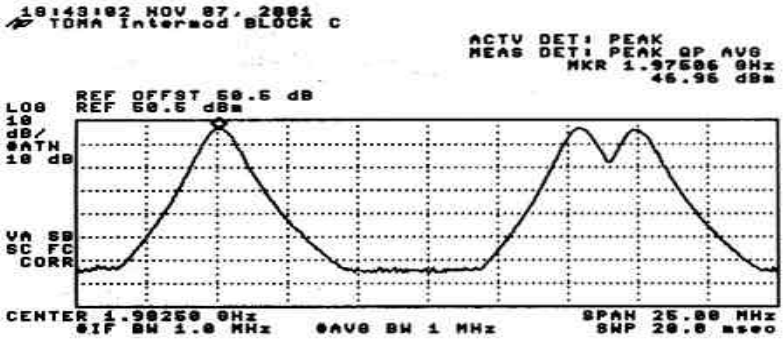

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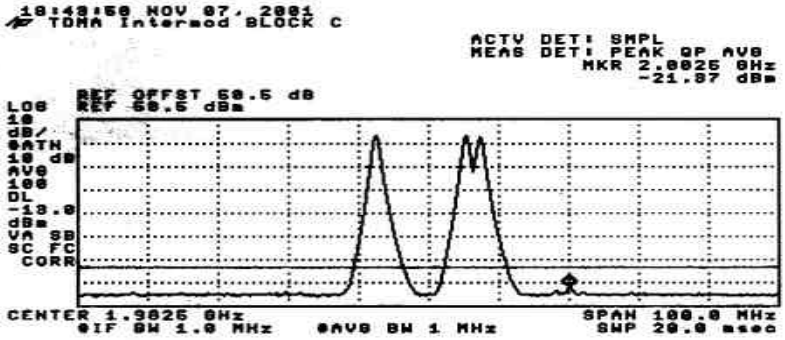

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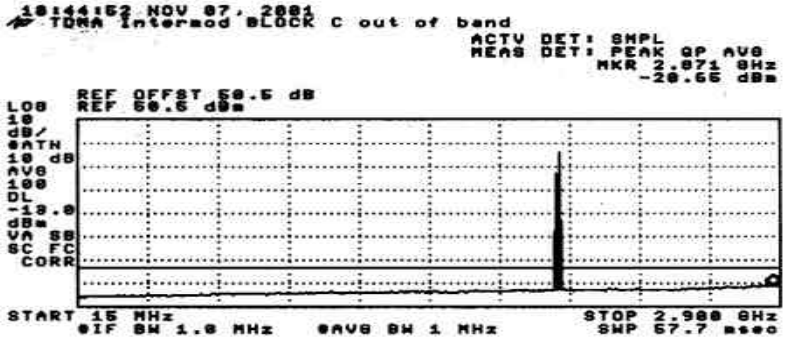

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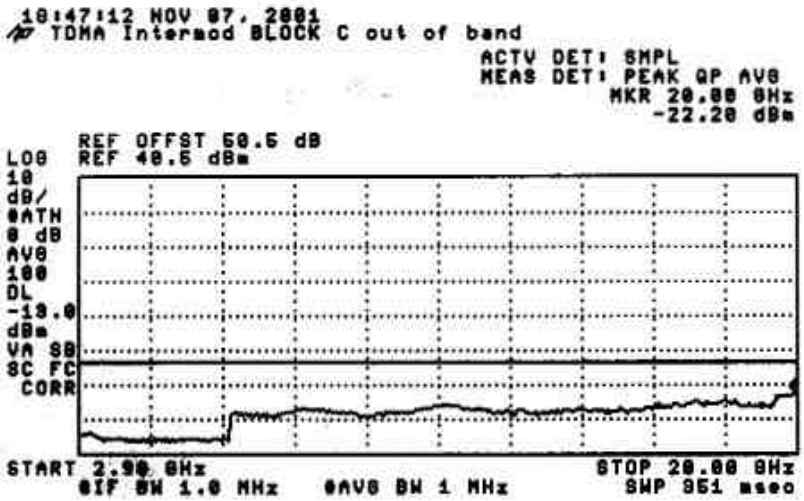
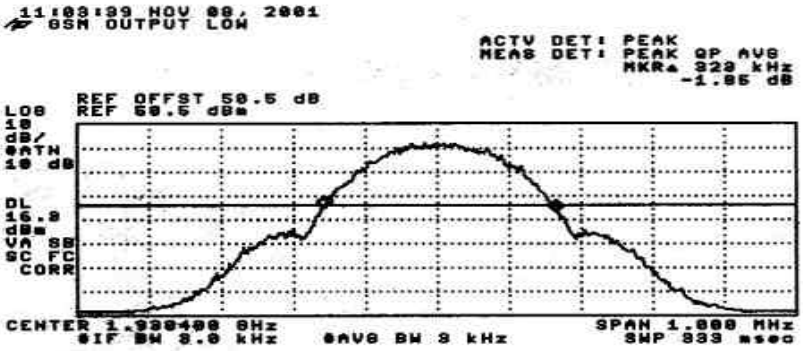


72

*** GSM ***		
Plot#	**Description**	**Frequency Range (MHz)**
73	Low Channel Output Bandwidth	1930.4
74	Mid Channel Output Bandwidth	1960
75	High Channel Output Bandwidth	1989.6
76	Low Channel Input Bandwidth	1930.4
77	Low Channel Input Bandwidth	1960
78	Low Channel Input Bandwidth	1989.6
79	Bottom Block Edge	1927 to 1930.4
80	Bottom Block Edge out-of-band	15 to 2900
81	Bottom Block Edge out-of-band	2900 to 20000
82	Top Block Edge	1989.6 to 1993
83	Top Block Edge out-of-band	15 to 2900
84	Top Block Edge out-of-band	2900 to 20000
85	Block **A** Intermod	1930.4, 1932.4, 1944.6 (zoom in)
86	Block **A** Intermod	1930.4, 1932.4, 1944.6 (zoom out)
87	Block **A** Intermod out-of-band	15 to 2900
88	Block **A** Intermod out-of-band	2900 to 20000
89	Block **A** Intermod	1930.4, 1942.6, 1944.6 (zoom out)
90	Block **A** Intermod	1930.4, 1942.6, 1944.6 (zoom out)
91	Block **A** Intermod out-of-band	15 to 2900
92	Block **A** Intermod out-of-band	2900 to 20000
93	Block **B** Intermod	1950.4, 1952.4, 1964.6 (zoom in)
94	Block **B** Intermod	1950.4, 1952.4, 1964.6 (zoom out)
95	Block **B** Intermod out-of-band	15 to 2900
96	Block **B** Intermod out-of-band	2900 to 20000
97	Block **B** Intermod	1950.4, 1962.6, 1964.6 (zoom in)
98	Block **B** Intermod	1950.4, 1962.6, 1964.6 (zoom out)
99	Block **B** Intermod out-of-band	15 to 2900
100	Block **B** Intermod out-of-band	2900 to 20000
101	Block **C** Intermod	1975.4, 1977.4, 1989.6 (zoom in)
102	Block **C** Intermod	1975.4, 1977.4, 1989.6 (zoom out)
103	Block **C** Intermod out-of-band	15 to 2900
104	Block **C** Intermod out-of-band	2900 to 20000
105	Block **C** Intermod	1975.4, 1987.6, 1989.6 (zoom in)
106	Block **C** Intermod	1975.4, 1987.6, 1989.6 (zoom out)
107	Block **C** Intermod out-of-band	15 to 2900
108	Block **C** Intermod out-of-band	2900 to 20000



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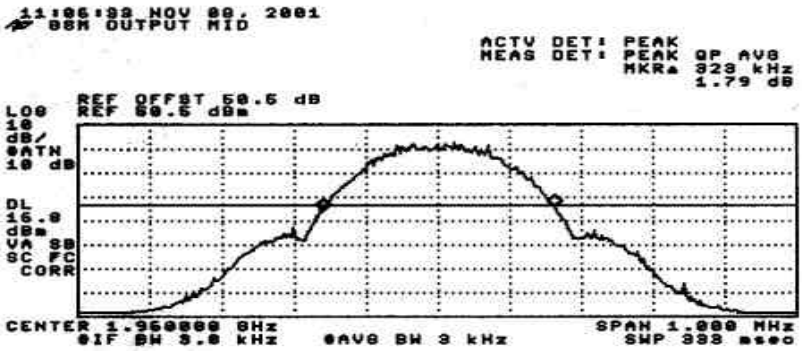

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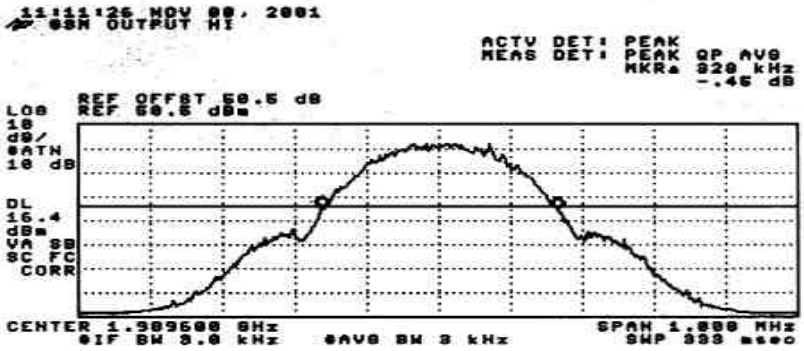

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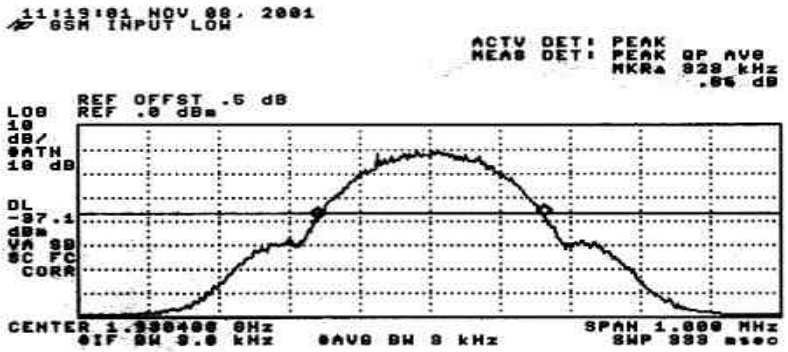

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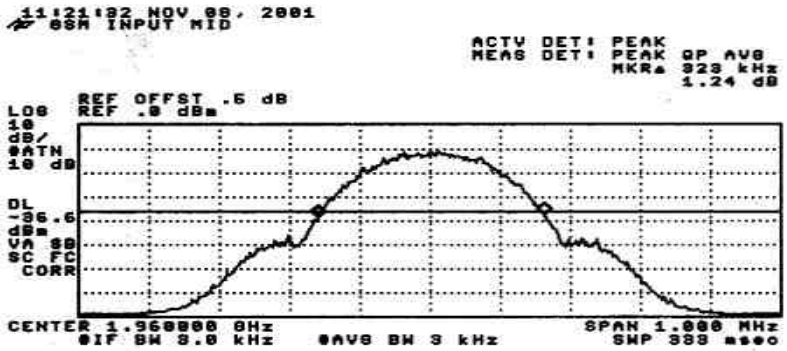

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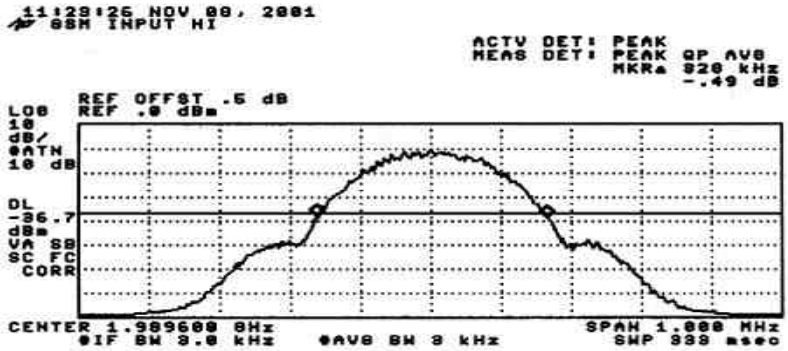

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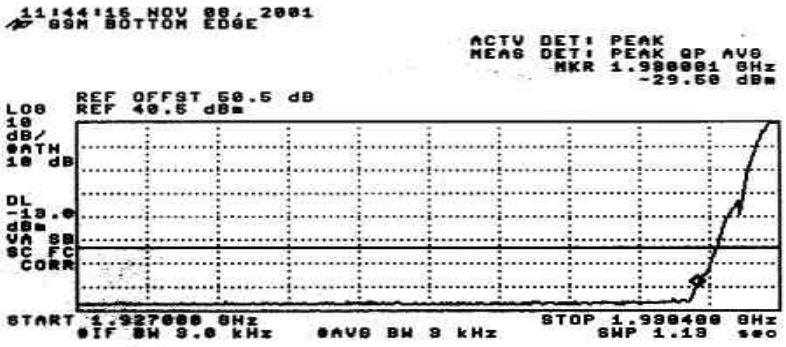

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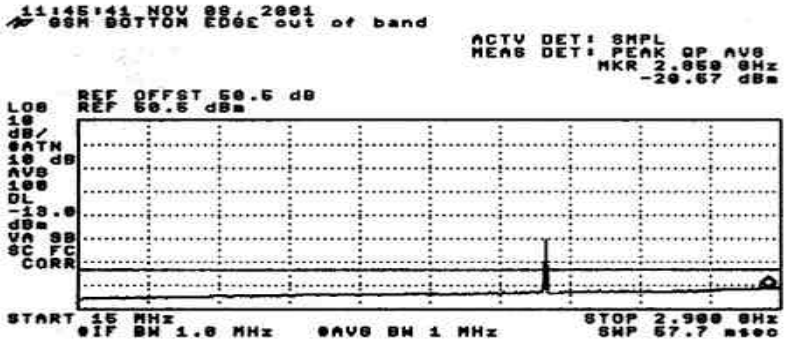

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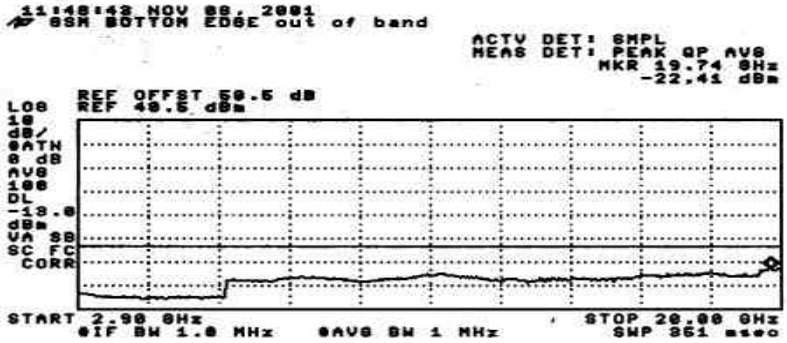

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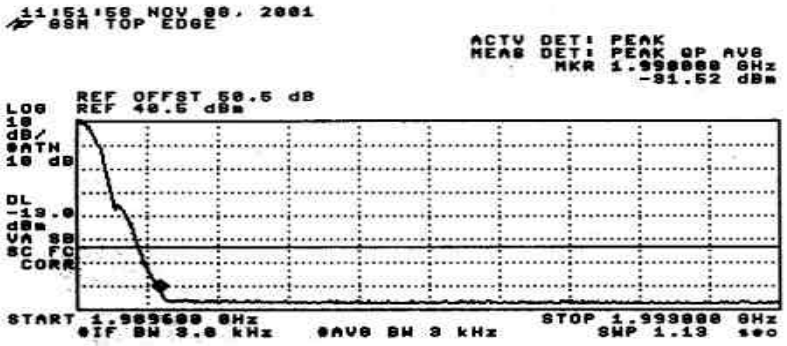

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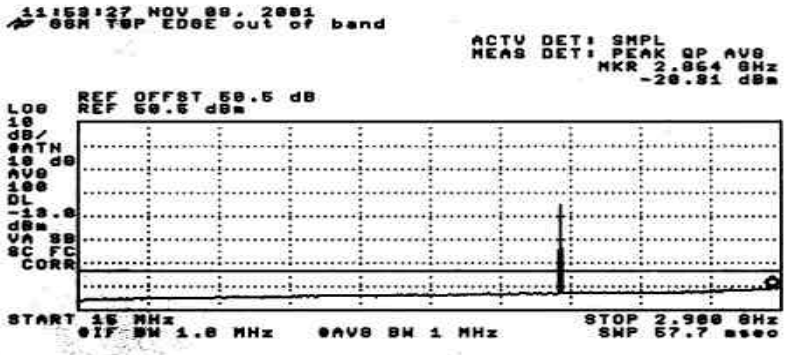

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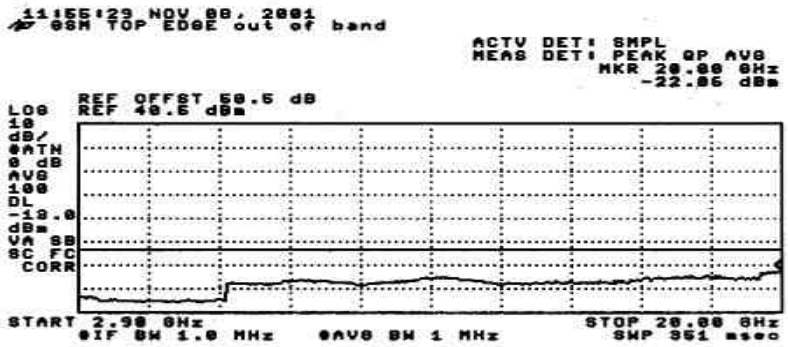

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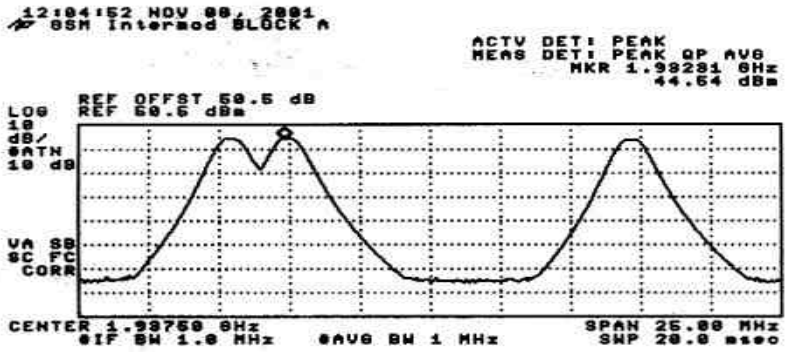

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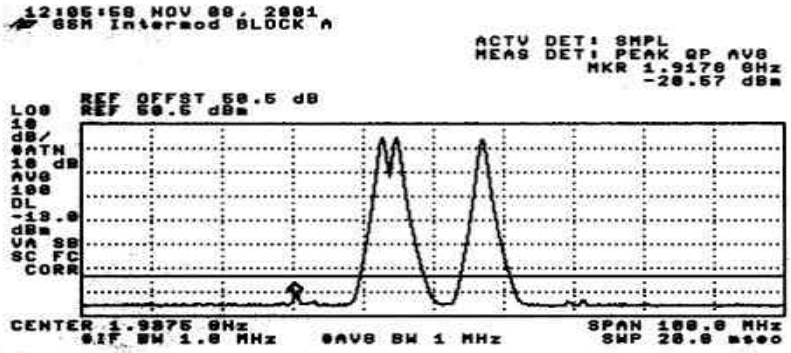

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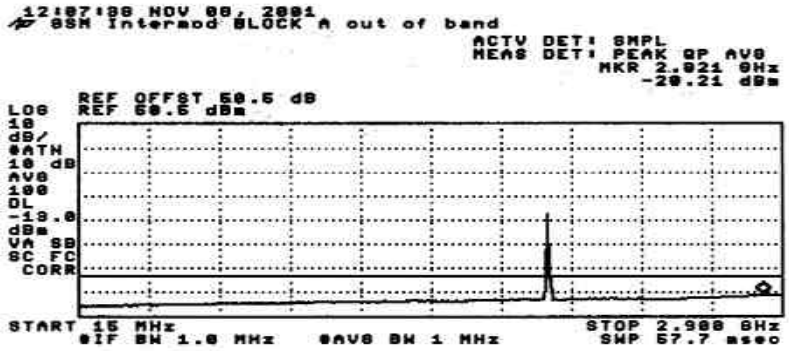

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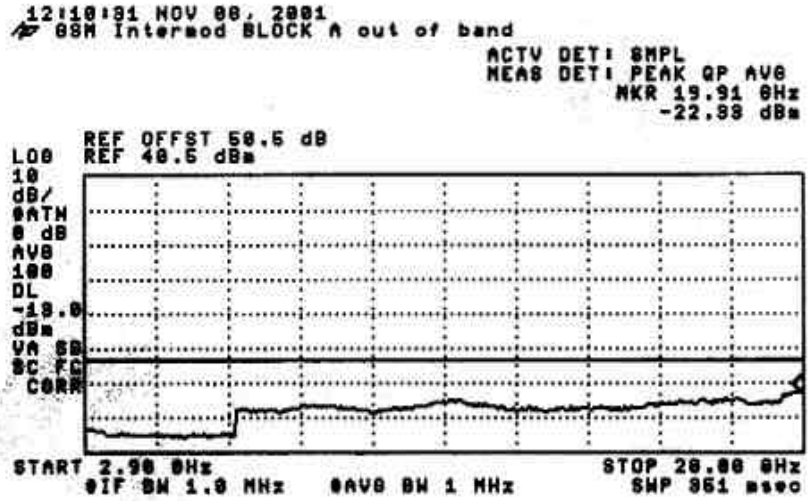

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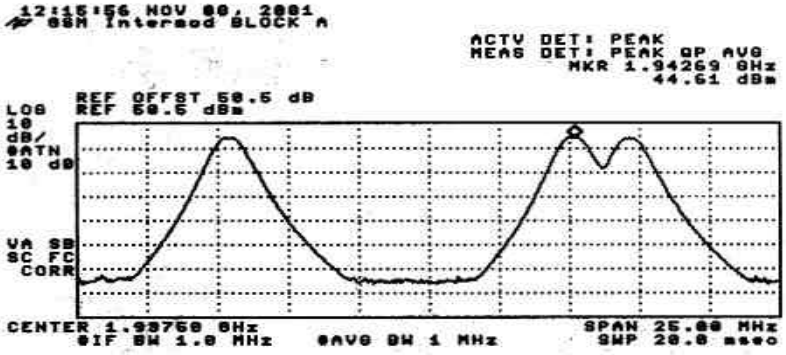

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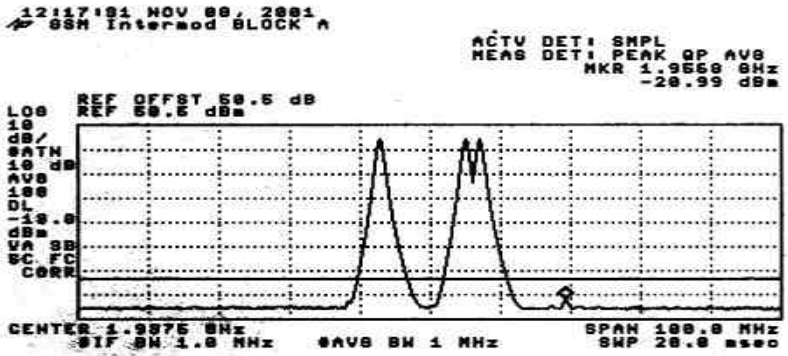

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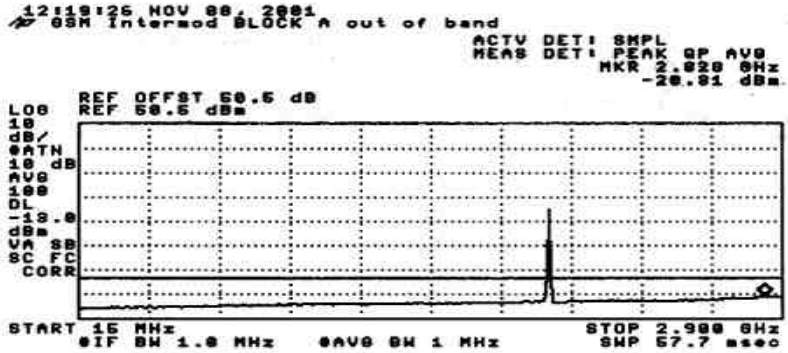

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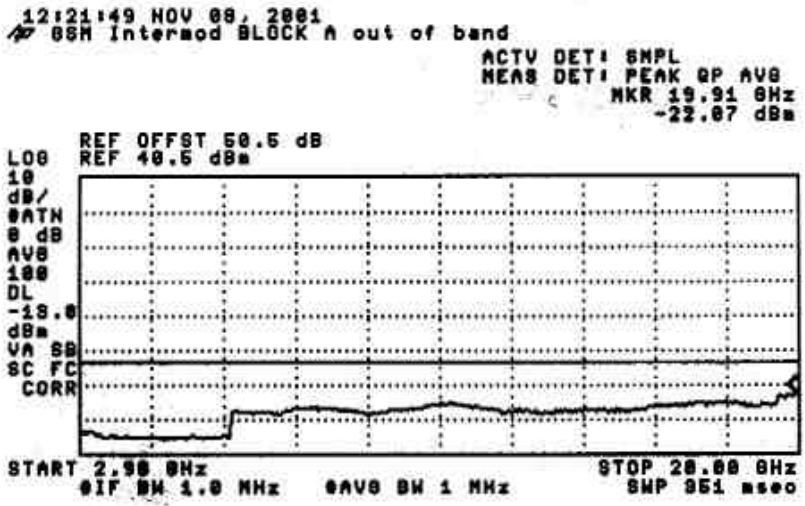

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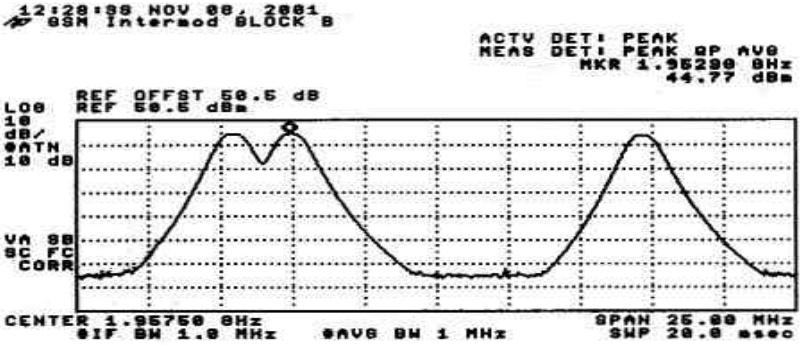

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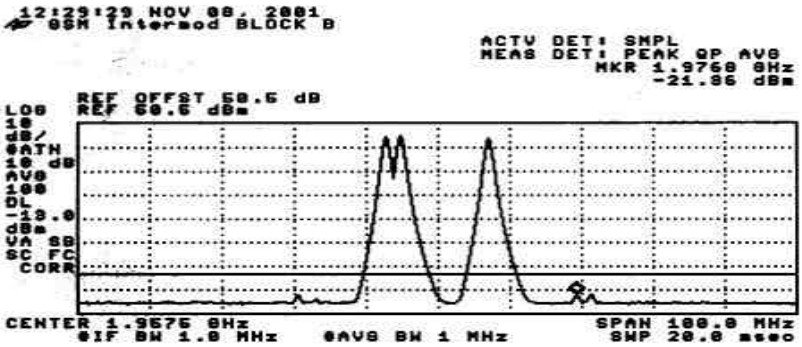

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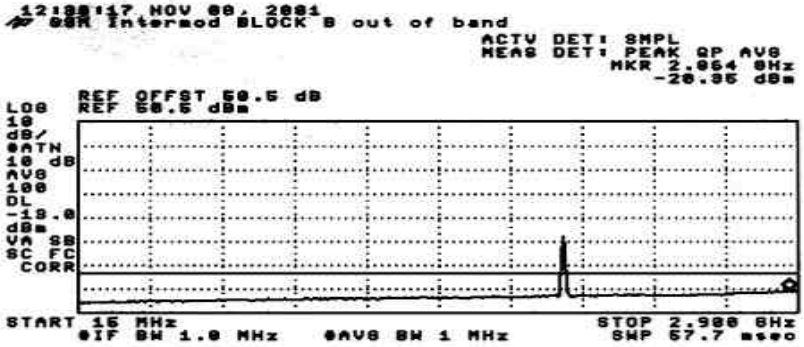

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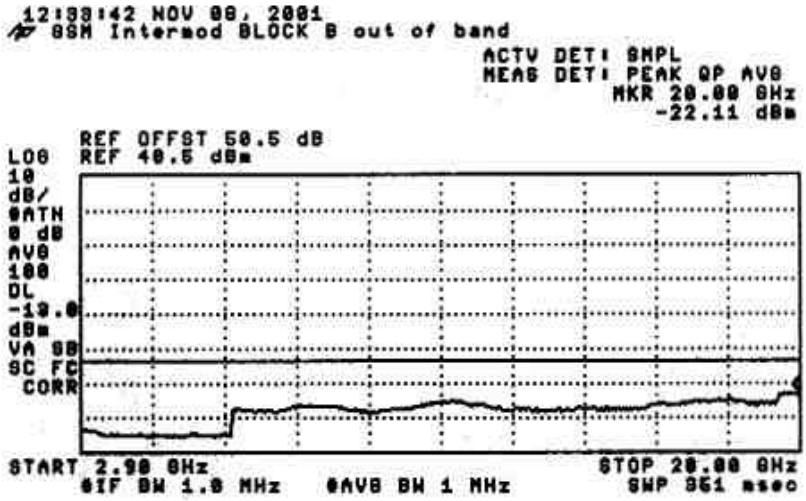

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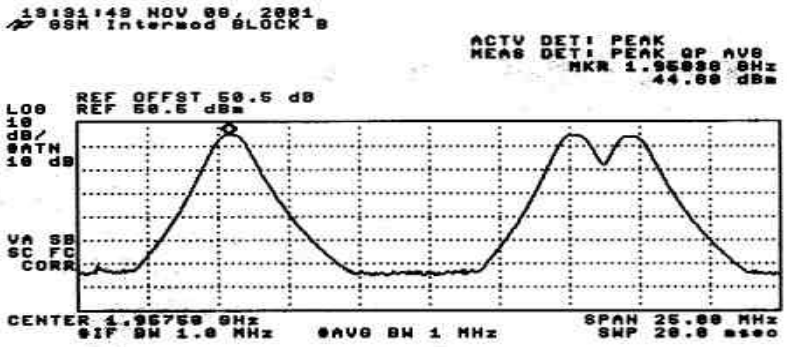

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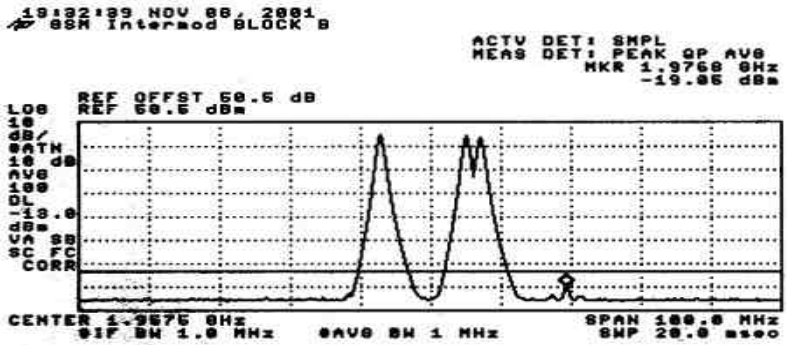

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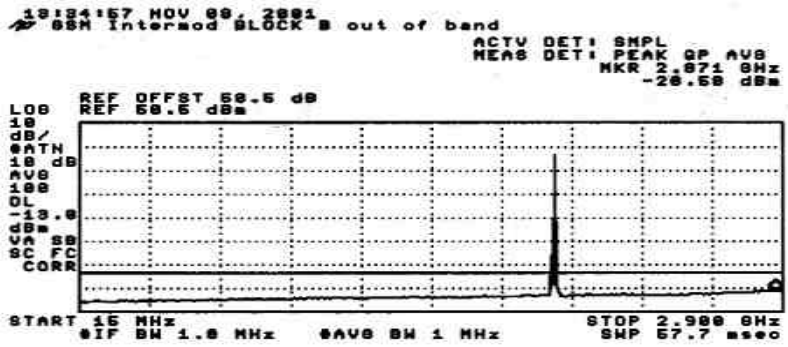

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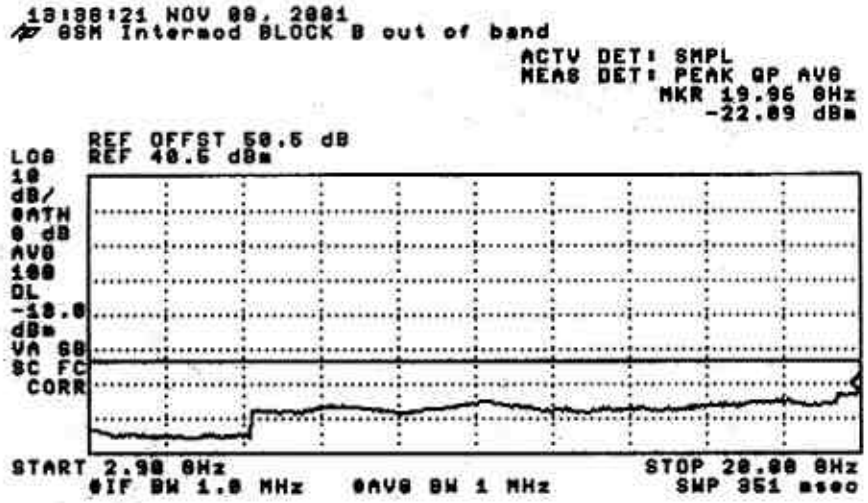

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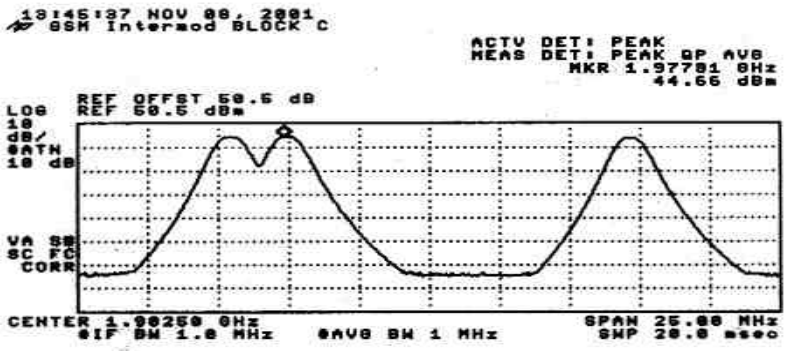

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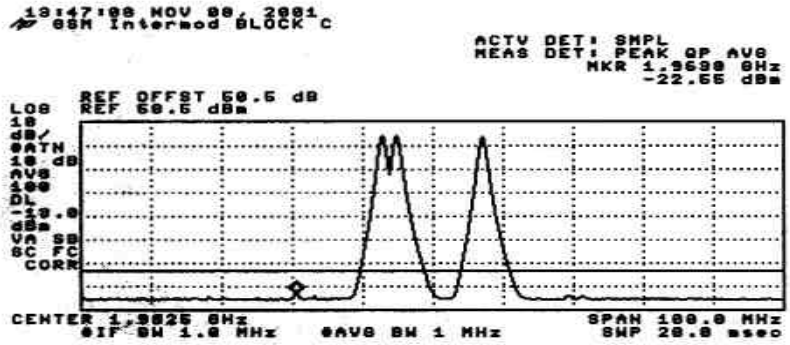

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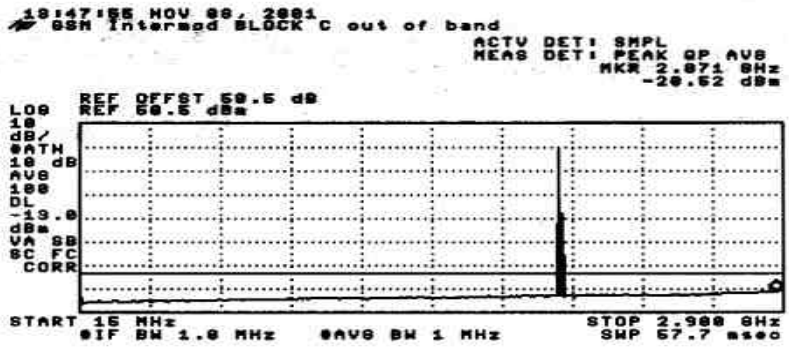

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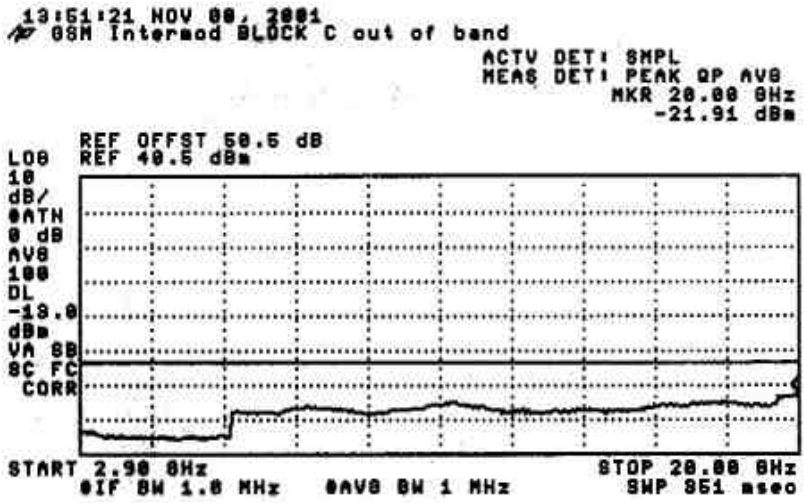

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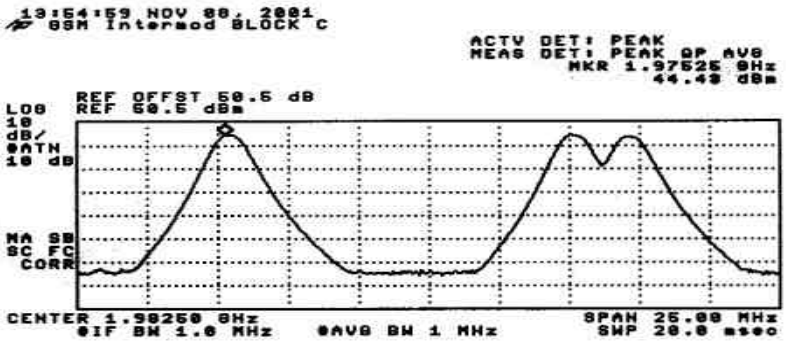

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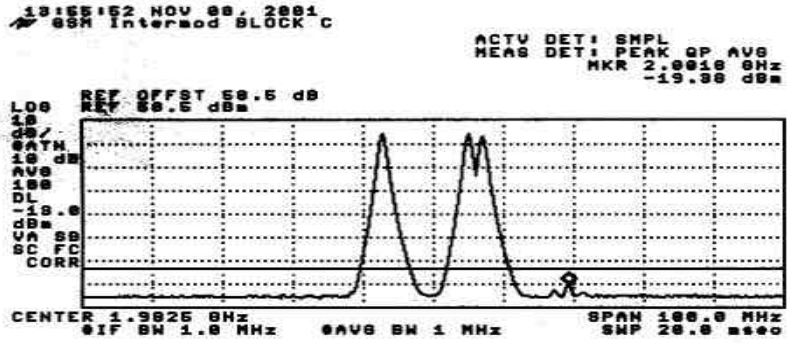

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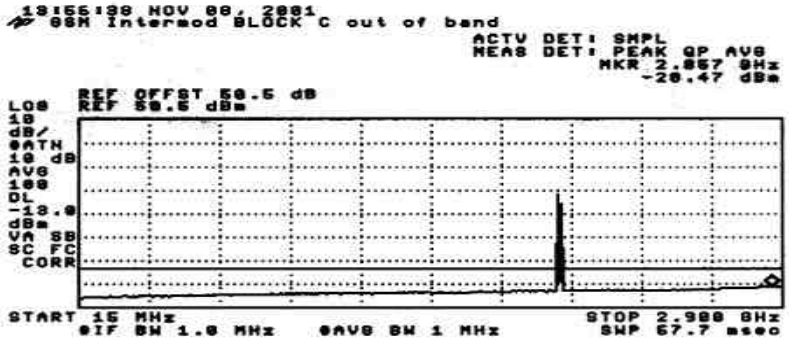

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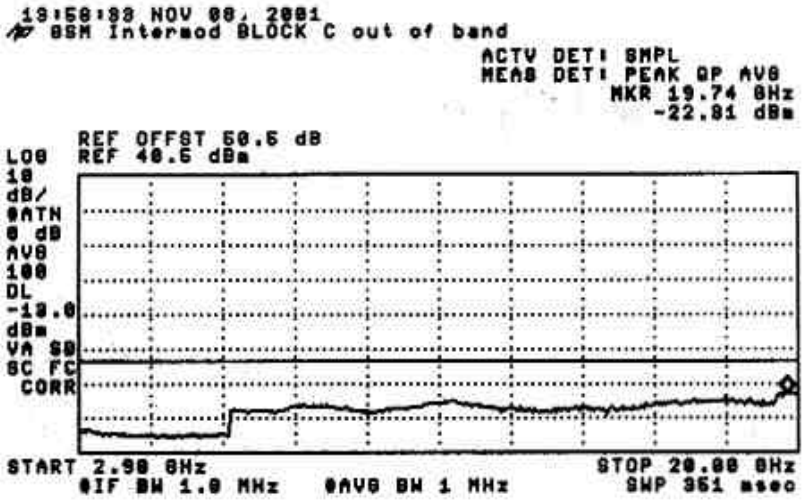
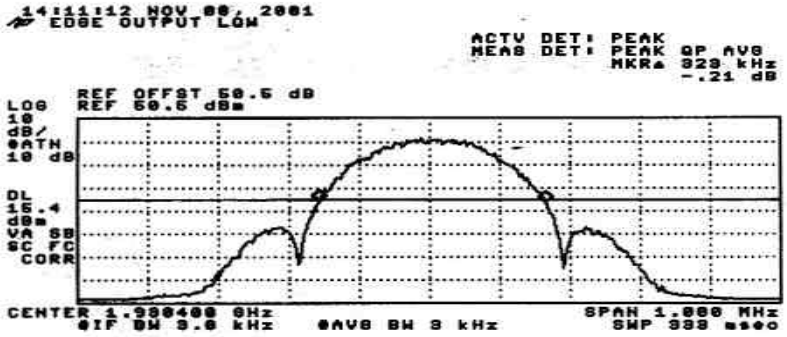


108

*** EDGE ***		
Plot#	**Description**	**Frequency Range (MHz)**
109	Low Channel Output Bandwidth	1930.4
110	Mid Channel Output Bandwidth	1960
111	High Channel Output Bandwidth	1989.6
112	Low Channel Input Bandwidth	1930.4
113	Low Channel Input Bandwidth	1960
114	Low Channel Input Bandwidth	1989.6
115	Bottom Block Edge	1927 to 1930.4
116	Bottom Block Edge out-of-band	15 to 2900
117	Bottom Block Edge out-of-band	2900 to 20000
118	Top Block Edge	1989.6 to 1993
119	Top Block Edge out-of-band	15 to 2900
120	Top Block Edge out-of-band	2900 to 20000
121	Block **A** Intermod	1930.4, 1932.4 (zoom in)
122	Block **A** Intermod	1930.4, 1932.4 (zoom out)
123	Block **A** Intermod out-of-band	15 to 2900
124	Block **A** Intermod out-of-band	2900 to 20000
125	Block **A** Intermod	1942.6, 1944.6 (zoom out)
126	Block **A** Intermod	1942.6, 1944.6 (zoom out)
127	Block **A** Intermod out-of-band	15 to 2900
128	Block **A** Intermod out-of-band	2900 to 20000
129	Block **B** Intermod	1950.4, 1952.4 (zoom in)
130	Block **B** Intermod	1950.4, 1952.4 (zoom out)
131	Block **B** Intermod out-of-band	15 to 2900
132	Block **B** Intermod out-of-band	2900 to 20000
133	Block **B** Intermod	1962.6, 1964.6 (zoom in)
134	Block **B** Intermod	1962.6, 1964.6 (zoom out)
135	Block **B** Intermod out-of-band	15 to 2900
136	Block **B** Intermod out-of-band	2900 to 20000
137	Block **C** Intermod	1975.4, 1977.4 (zoom in)
138	Block **C** Intermod	1975.4, 1977.4 (zoom out)
139	Block **C** Intermod out-of-band	15 to 2900
140	Block **C** Intermod out-of-band	2900 to 20000
141	Block **C** Intermod	1987.6, 1989.6 (zoom in)
142	Block **C** Intermod	1987.6, 1989.6 (zoom out)
143	Block **C** Intermod out-of-band	15 to 2900
144	Block **C** Intermod out-of-band	2900 to 20000



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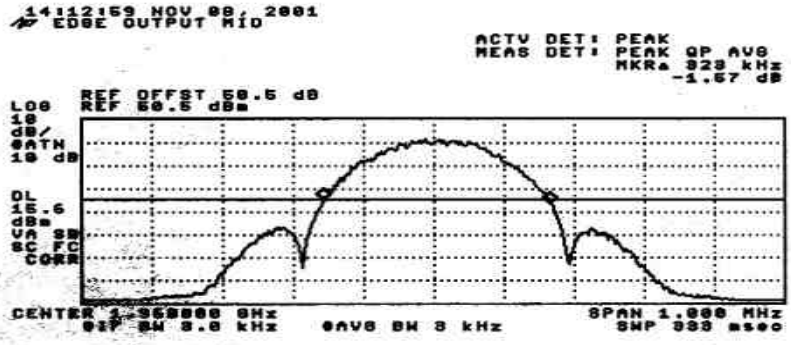

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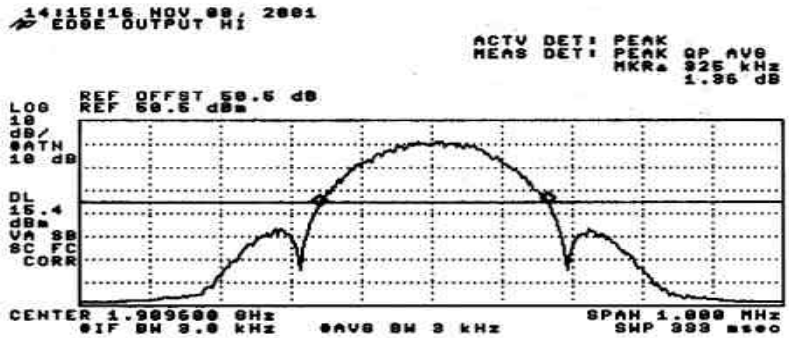

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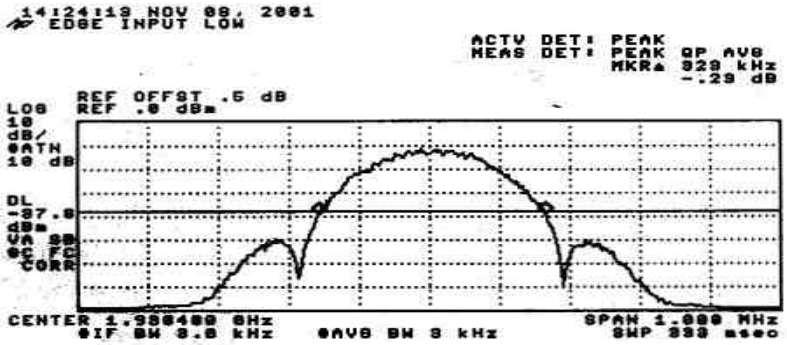

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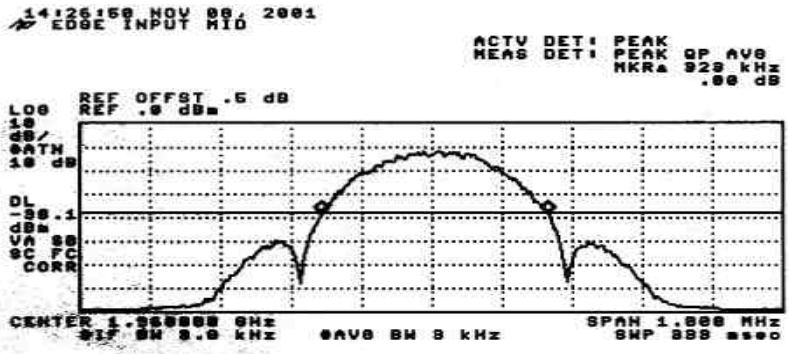

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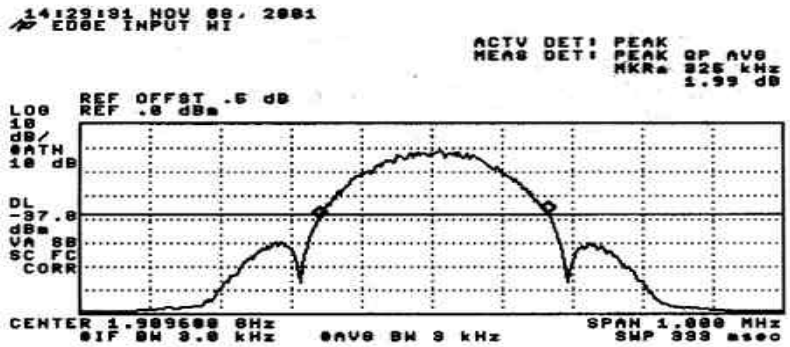

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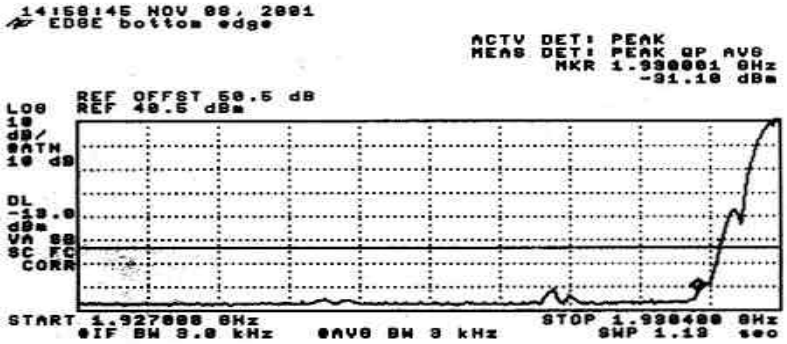

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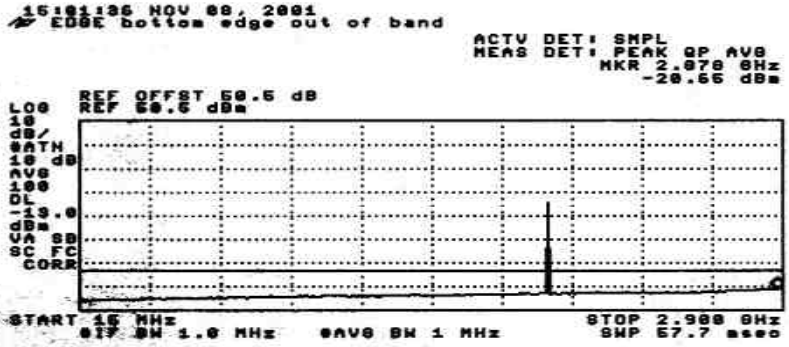

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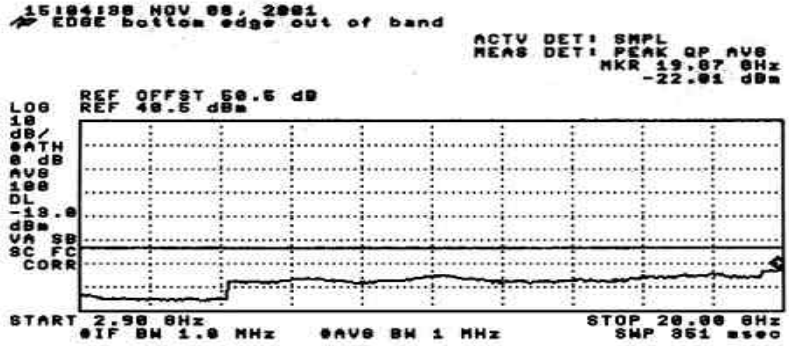

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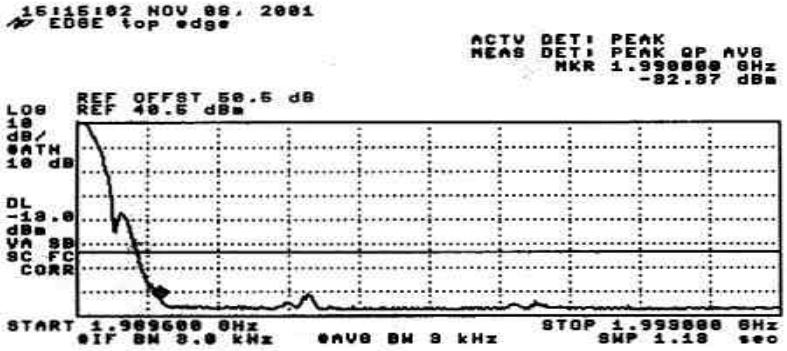

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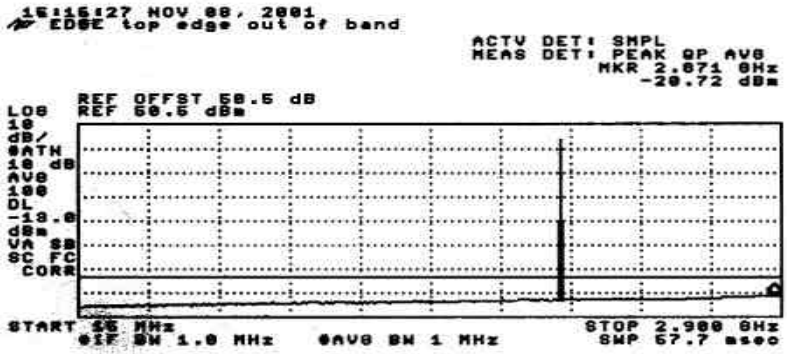

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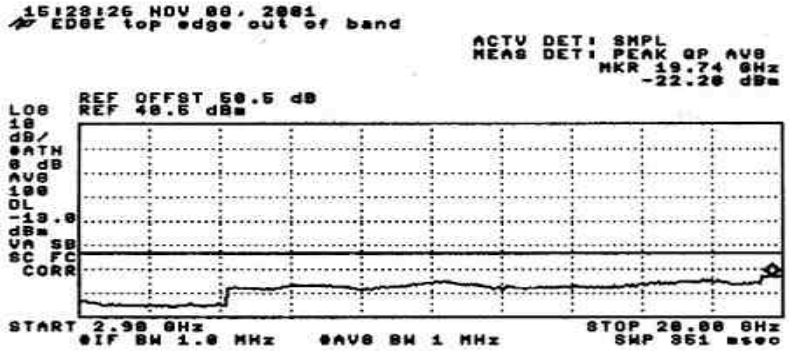

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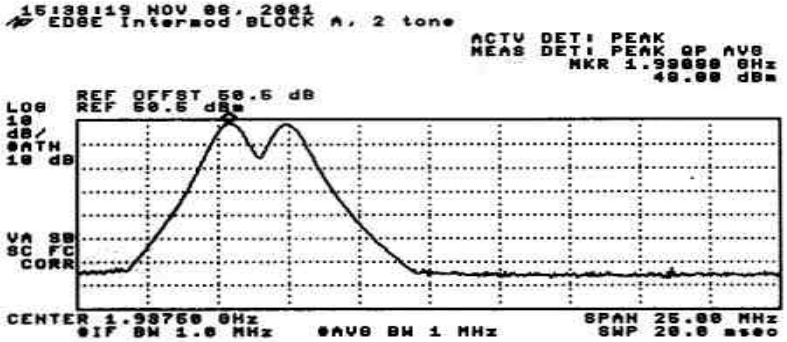

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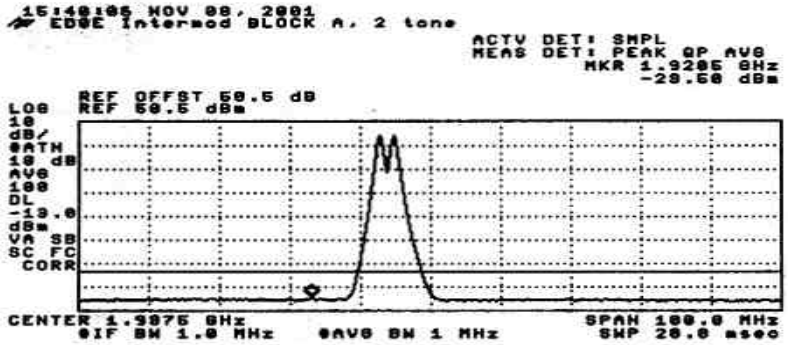

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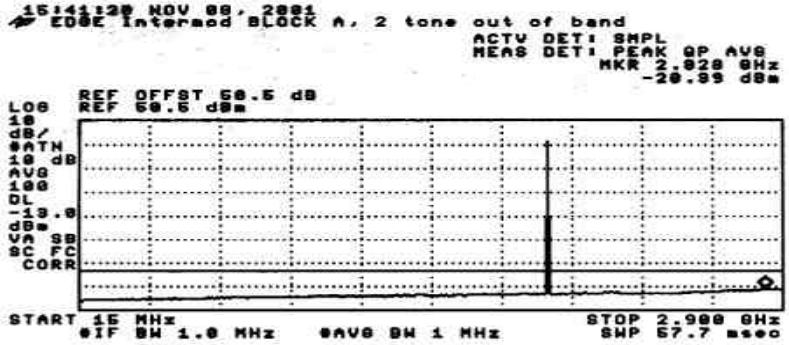

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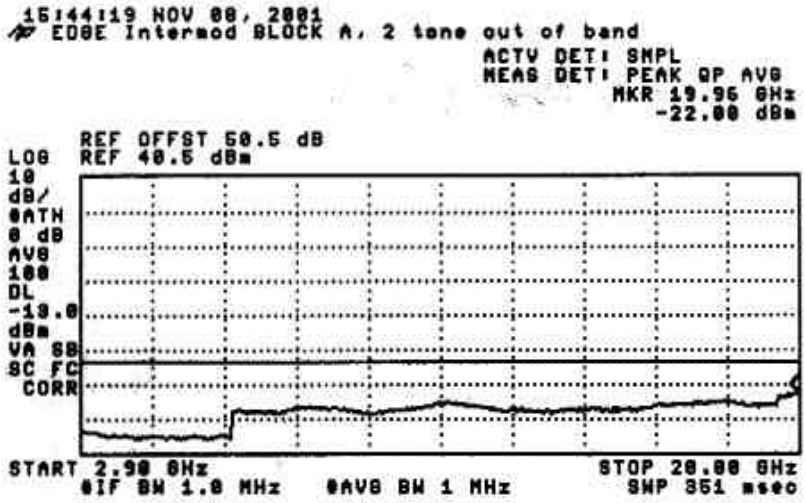

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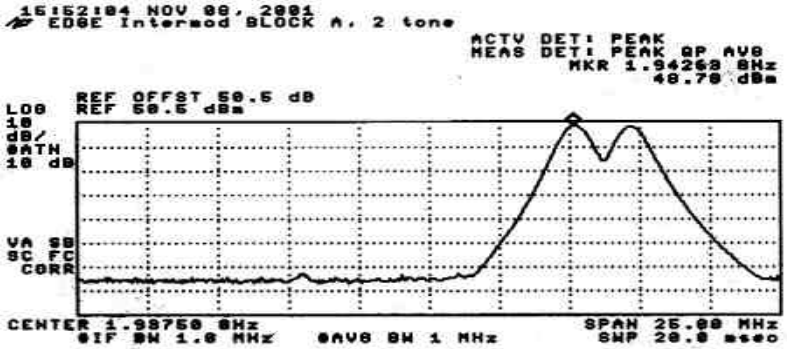

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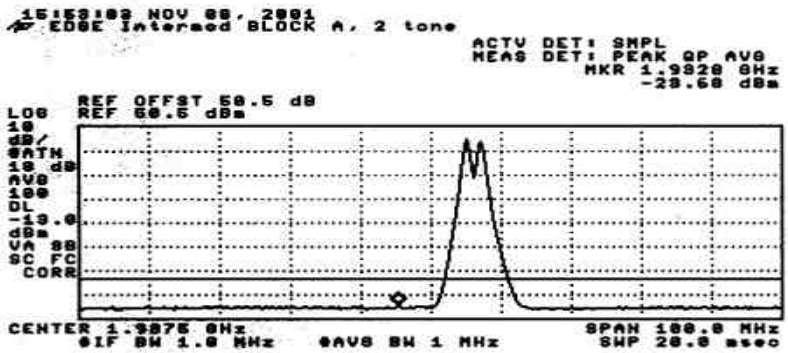

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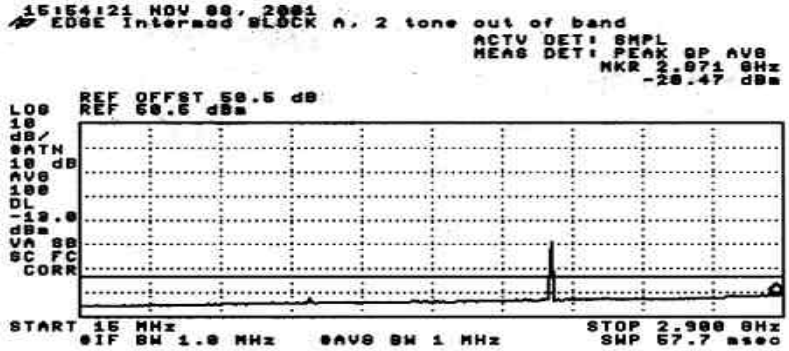

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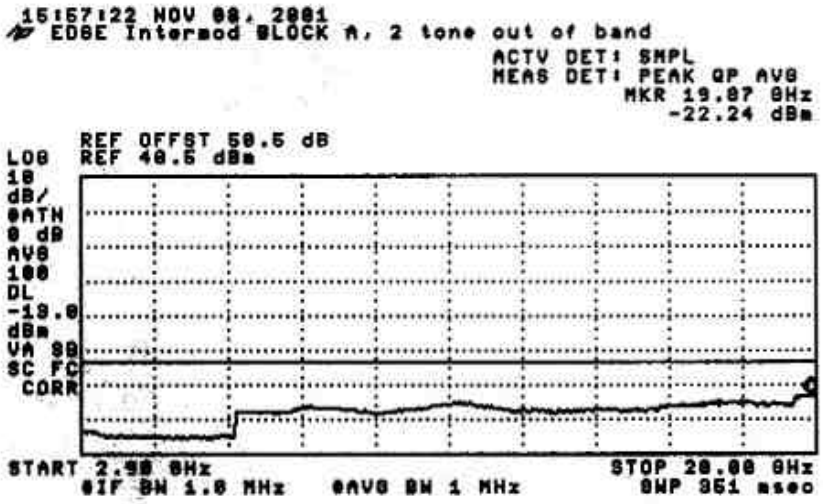

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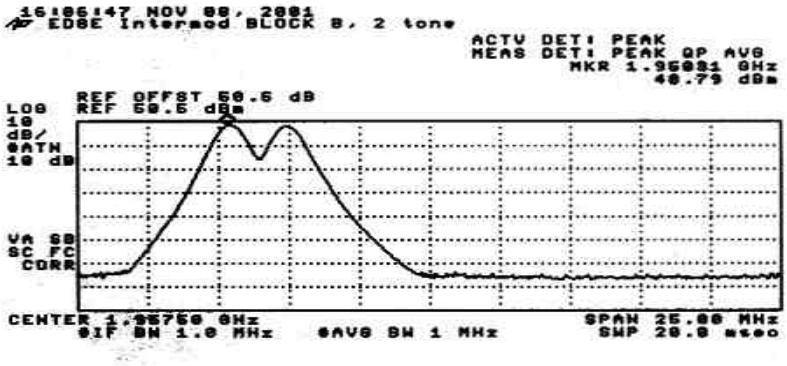

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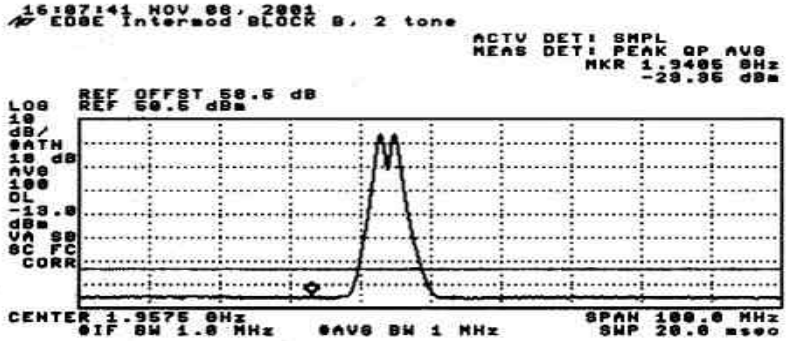

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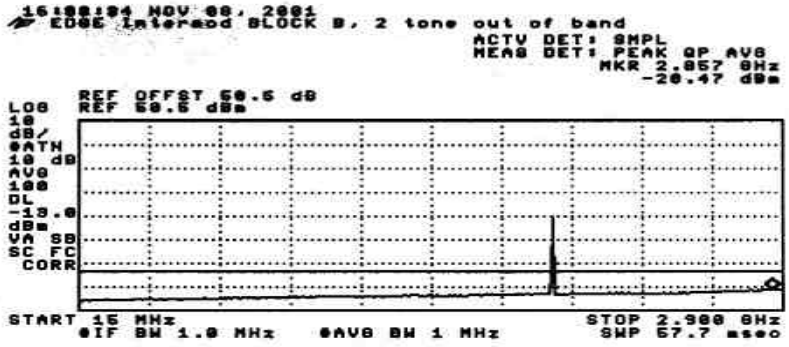

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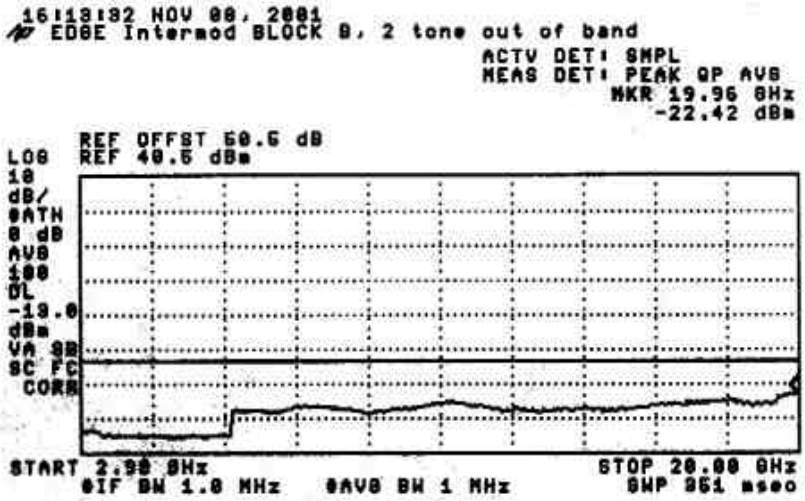

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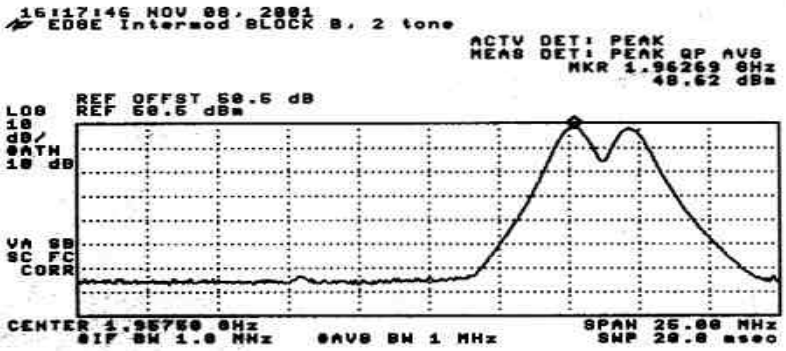

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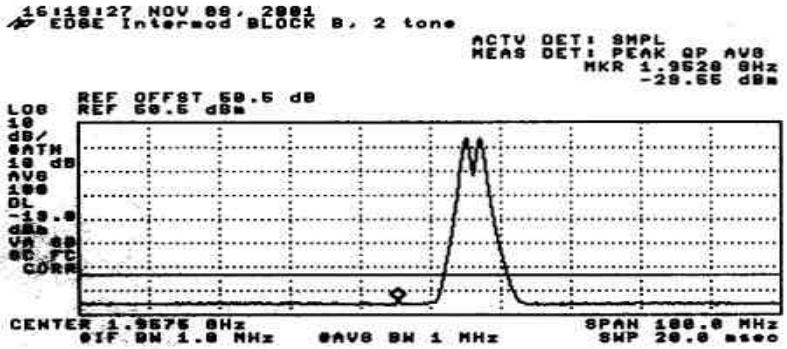

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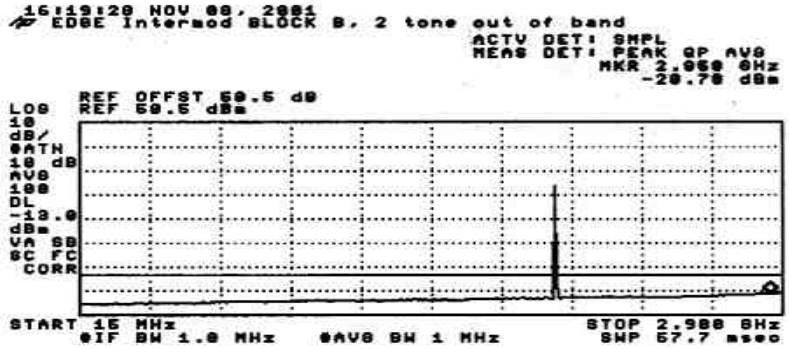

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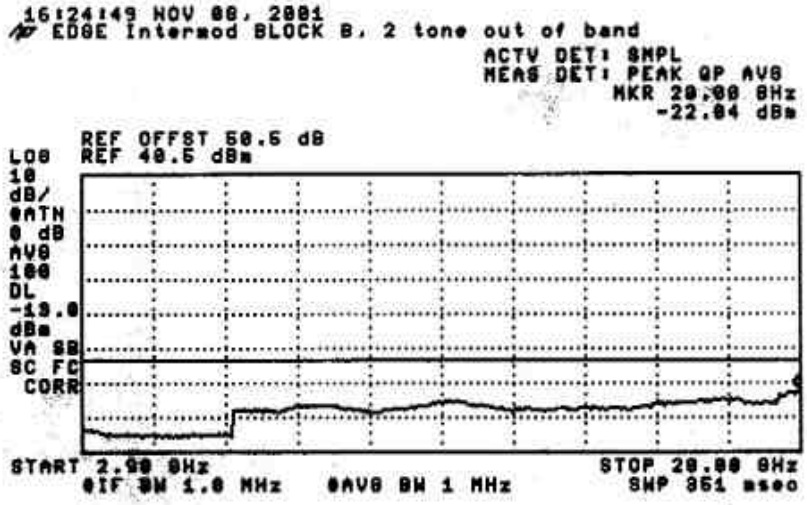

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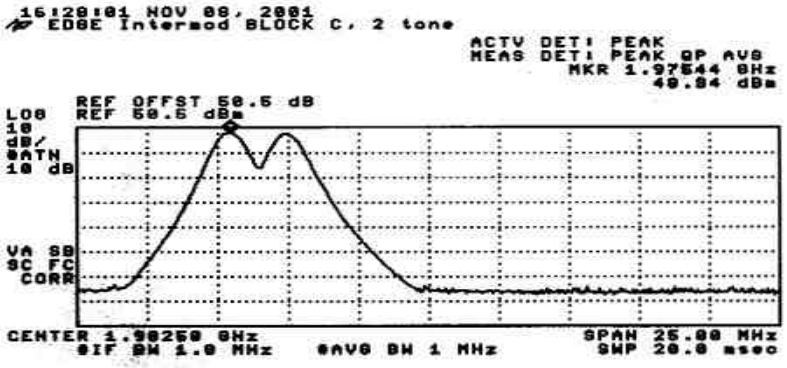

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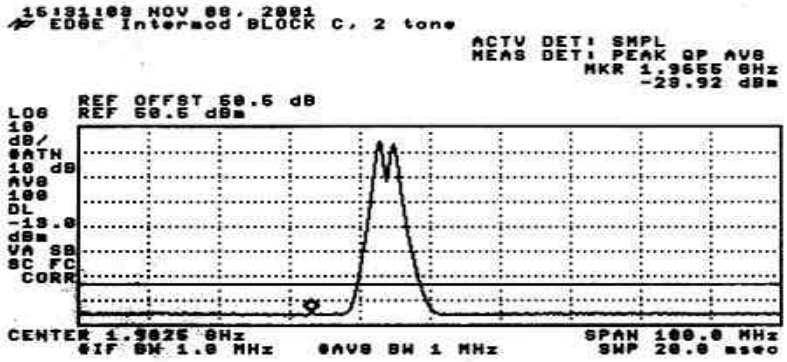

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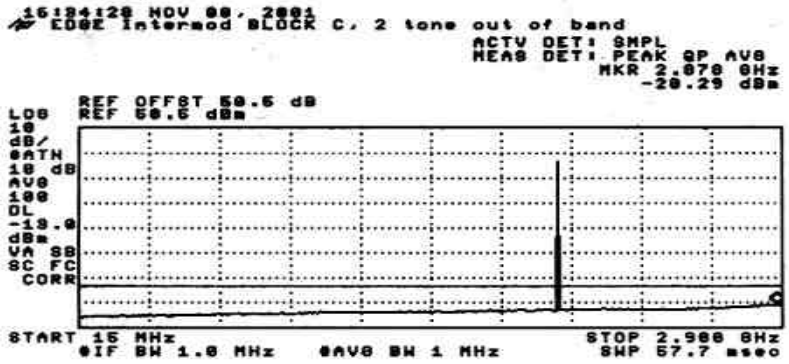

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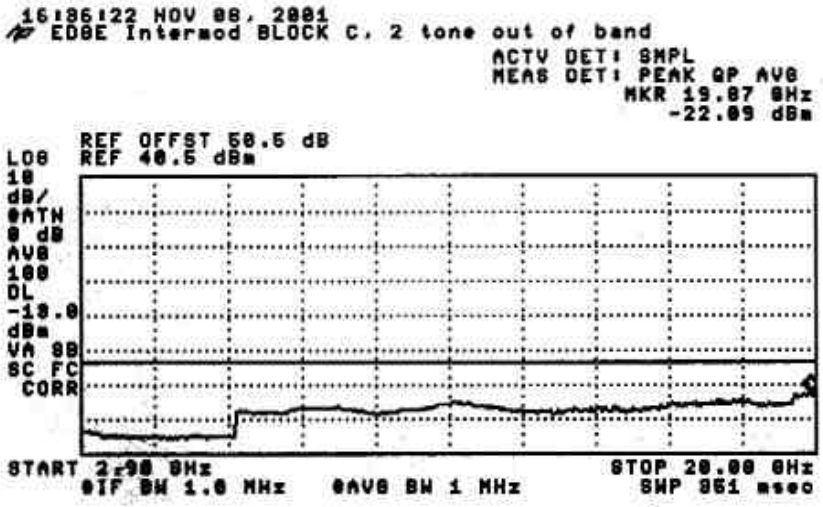

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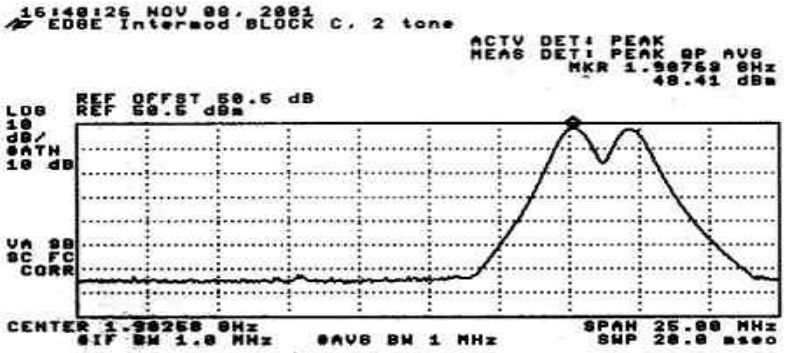

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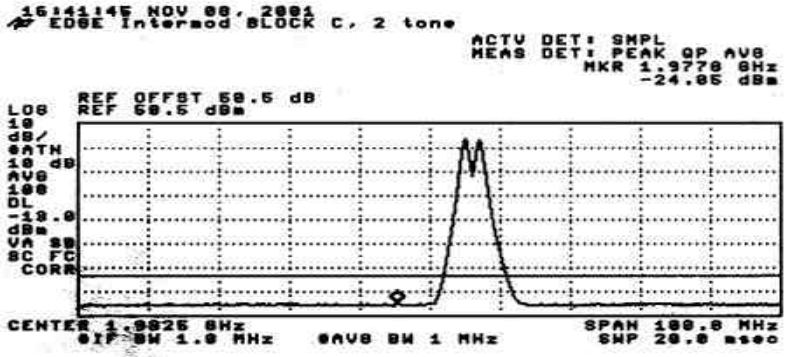

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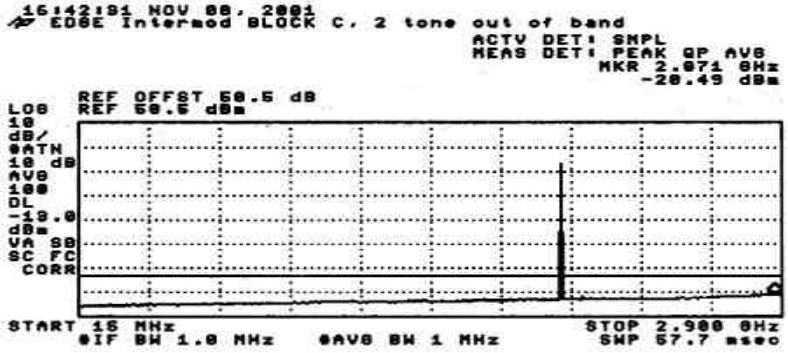

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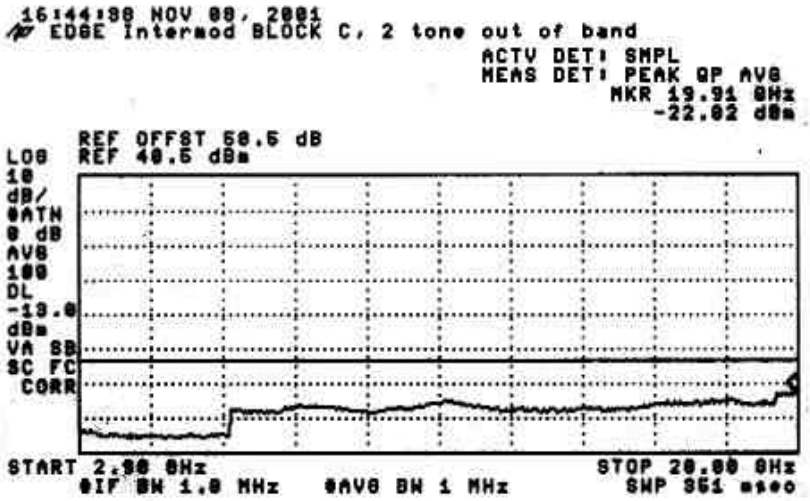

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8.5. SECTION 2.1053: FIELD STRENGTH OF SPURIOUS RADIATION

INSTRUMENTS LIST

EQUIPMENT	MANUFACTURE	MODEL NO.	SERIAL NO.	CAL. DUE DATE
Spectrum Analyzer	HP	8593EM	3710A00205	6/20/02
Amplifier	MITEQ	NSP2600-44	646456	4/12/02
Signal Generator	HP	83732B	US34490599	3/21/02
Rx Horn Antenna	EMCO	3115	9001-3245	6/20/02
Rx Horn Antenna	ARA	MWH1826/B	1013	7/26/02
Tx Horn Antenna	EMCO	3115	2238	6/20/02
HPF	MICROLAB	FH-2400H	N/A	N/A
50 ohm terminator	NARDA	370BNM	N/A	N/A

Detector Function Setting of Test Receiver

Frequency Range (MHz)	Detector Function	Resolution Bandwidth	Video Bandwidth
Above 1000	☒ Peak ☐ Average	☒ 1 MHz ☐ 1 MHz	☒ 1 MHz ☐ 10 Hz

TEST SETUP

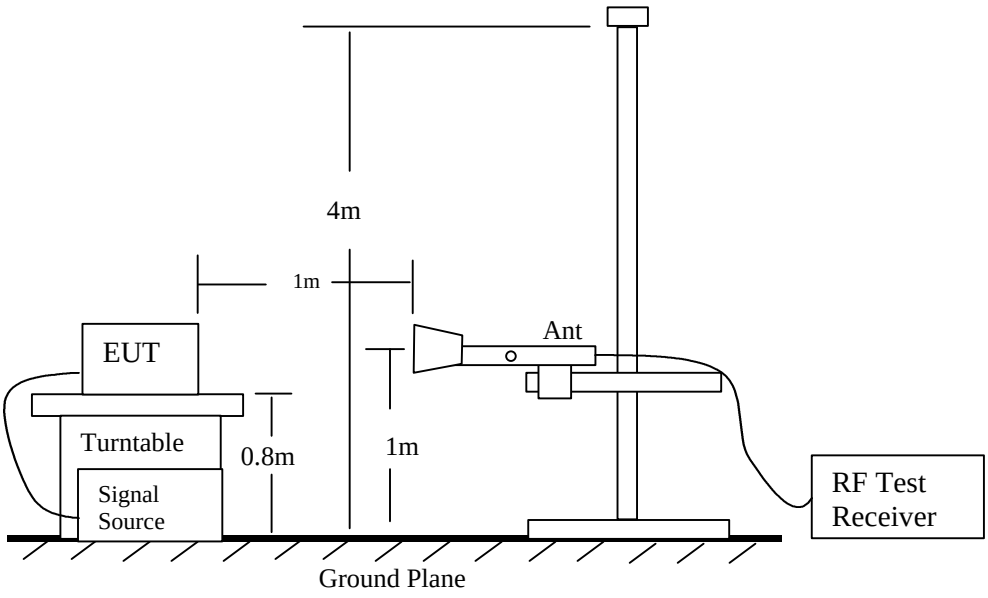


Fig 1: Radiated Emission Measurement

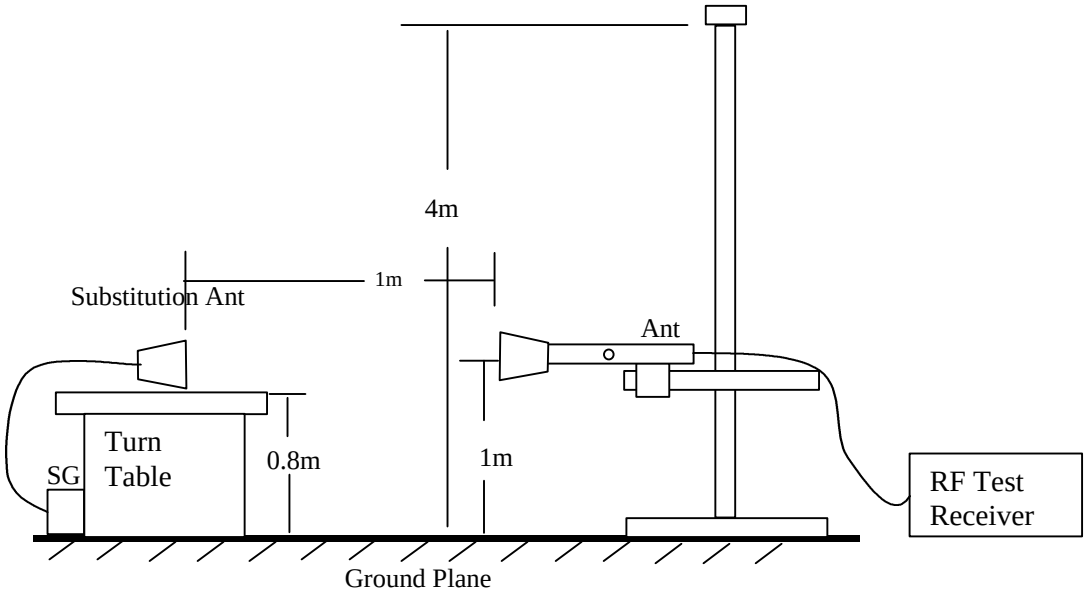
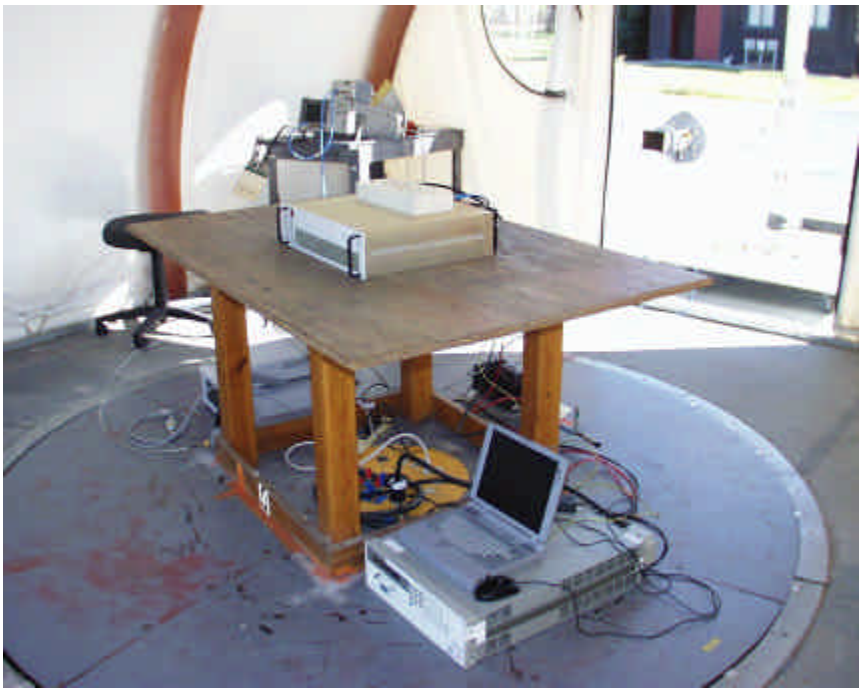


Fig 2: Radiated Emission – Substitution Method set-up

1 – 18 GHz Radiated Emission Setup



18 – 20 GHz Radiated Emission Setup

1 – 18 GHz Substitution Method Setup

18 – 20 GHz Substitution Method Setup

TEST PROCEDURE

1). On a test site, the EUT shall be placed on a turntable, and in the position closest to the normal use as declared by the user.
2). The test antenna shall be oriented initially for vertical polarization located 1m from the EUT to correspond to the frequency of the transmitter.
3). The output of the test antenna shall be connected to the measuring receiver and either a peak or average detector was used for the measurement as indicated on the report. The detector selection is based on how close the emission level was approaching the limit.
4). The transmitter shall be switched on, if possible, without the modulation and the measurement receiver shall be tuned to the frequency of the transmitter under test.
5). The test antenna shall be raised and lowered through the specified range of height until a maximum signal level is detected by the measuring receiver.
6). The transmitter shall than be rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver.
7). The test antenna shall be raised and lowered again through the specified range of height until a maximum signal level is detected by the measuring receiver.
8). The maximum signal level detected by the measuring receiver shall be noted.
9). The transmitter shall be replaced by a substitution antenna.
10). The substitution antenna shall be oriented for vertical polarization.
11). The substitution antenna shall be connected to a calibrated signal generator.
12). If necessary, the input attenuator setting of the measuring receiver shall be adjusted in order to increase the sensitivity of the measuring receiver.
13). The test antenna shall be raised and lowered through the specified range of the height to ensure that the maximum signal is received.

14). The input signal to the substitution antenna shall be adjusted to the level that produces a level detected by the measuring receiver, that is equal to the level noted while the transmitter radiated power was measured, corrected for the change of input attenuation setting of the measuring receiver.
15). The input level to the substitution antenna shall be recorded as power level in dBm, corrected for any change of input attenuator setting of the measuring receiver.
16). The measurement shall be repeated with the test antenna and the substitution antenna oriented for horizontal polarization.
17). The measure of the effective radiated power is the larger of the two levels recorded, at the input to the substitution antenna, corrected for the gain of the substitution antenna if necessary.

RESULT

Complies, as shown below

Compliance Certification Services

Radiated Emissions 11/9/01
24.238(a) A-Site
Kerwin Corpuz

SPECTRIAN
1930-1990 MHz PCS MULTI-CARRIER POWER AMPLIFIER (M/N: MCPA4080)

fo = 1930 MHz (LOW)

frequency (MHz)	SA reading (dBuV)	SG reading (dBm)	CL (dB)	Gain (dBi)	Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)
3860V	55.3	-53.2	0.56	8.5	6.35	-47.41	-13	-34.41
3860H	56.8	-51.7	0.56	8.5	6.35	-45.91	-13	-32.91
5790*	42.8	-75	0.66	9.9	7.75	-67.91	-13	-54.91
7720*	47	-70	0.74	10.2	8.05	-62.69	-13	-49.69
9650*	46.8	-70	0.9	11.7	9.55	-61.35	-13	-48.35
11580*	48.4	-68	0.96	12	9.85	-59.11	-13	-46.11
13510*	49	-68	1.06	12.2	10.05	-59.01	-13	-46.01
15440*	49.7	-65	1.18	15.7	13.55	-52.63	-13	-39.63
17370*	50	-65	1.32	11	8.85	-57.47	-13	-44.47
19300*	50.8	-62	1.42	23.9	21.75	-41.67	-13	-28.67

fo = 1960 MHz (MID)

frequency (MHz)	SA reading (dBuV)	SG reading (dBm)	CL (dB)	Gain (dBi)	Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)
3920V	54.6	-54	0.56	8.5	6.35	-48.21	-13	-35.21
3920H	58.1	-50.1	0.56	8.5	6.35	-44.31	-13	-31.31
5880*	42.8	-75	0.66	9.9	7.75	-67.91	-13	-54.91
7840*	47	-70	0.74	10.2	8.05	-62.69	-13	-49.69
9800*	46.8	-70	0.9	11.7	9.55	-61.35	-13	-48.35
11760*	48.4	-68	0.96	12	9.85	-59.11	-13	-46.11
13720*	49	-68	1.06	12.2	10.05	-59.01	-13	-46.01
15680*	49.7	-65	1.18	15.7	13.55	-52.63	-13	-39.63
17640*	50	-65	1.32	11	8.85	-57.47	-13	-44.47
19600*	50.8	-62	1.42	23.9	21.75	-41.67	-13	-28.67

fo = 1990 MHz (HIGH)

frequency (MHz)	SA reading (dBuV)	SG reading (dBm)	CL (dB)	Gain (dBi)	Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)
3980V	55.1	-53	0.56	8.5	6.35	-47.21	-13	-34.21
3980H	57.6	-50.7	0.56	8.5	6.35	-44.91	-13	-31.91
5970*	42.8	-75	0.66	9.9	7.75	-67.91	-13	-54.91
7960*	47	-70	0.74	10.2	8.05	-62.69	-13	-49.69
9950*	46.8	-70	0.9	11.7	9.55	-61.35	-13	-48.35
11940*	48.4	-68	0.96	12	9.85	-59.11	-13	-46.11
13930*	49	-68	1.06	12.2	10.05	-59.01	-13	-46.01
15920*	49.7	-65	1.18	15.7	13.55	-52.63	-13	-39.63
17910*	50	-65	1.32	11	8.85	-57.47	-13	-44.47
19900*	50.8	-62	1.42	23.9	21.75	-41.67	-13	-28.67

NOTE: * Measured noise floor (worse case vertical); H=horizontal and V=vertical
SA: Spectrum Analyzer
SG: Signal Generator
CL: Cable Loss (2ft) SMA type

Gain (dBd) = Gain (dBi) - 2.15
EPR = SG reading - CL + Gain (dBd)
Margin = EPR - Limit