TEST REPORT
FOR FCC TYPE ACCEPTANCE
MODEL A300
DUAL BAND
BIDIRECTIONAL AMPLIFIER
FCC ID: P6T81903

TEST REPORT

P. G. Electronics, Ltd. is pleased to submit this technical report on tests performed on the Model A300 dual band bidirectional amplifier (FCC ID: P6T81903) to demonstrate compliance with the requirements for Type Acceptance by the FCC.

The undersigned personnel verify that the tests were performed as described herein and the results given were measured on the production unit.

Model Number A300 Serial Number 100973

____________________________ Date _______________
Paul Liber – Test Engineer

____________________________ Date _______________
Gerry Graham – P. Eng. President

1.0 NAMES AND ADDRESSES

1.1 Manufacturer

The Model A300 bidirectional amplifier (FCC ID: P6T81903) is manufactured by:

P. G. Electronics, Ltd.
800 Arrow Rd., Unit 8,
Toronto, Ontario M9M 2Z8
Canada

1.2 Applicant

The applicant for the acceptance of the amplifier is:

P. G. Electronics, Ltd.
800 Arrow Rd., Unit 8,
Toronto, Ontario M9M 2Z8
Canada

2.0 COMPLIANCE

The equipment has been tested in accordance with the following performance tests and the results provided below demonstrate compliance with FCC regulations. Please refer to section 3.0 for the list of test equipment used.

Notes: For all tests, the D.U.T. internal attenuator has been set to 0 dB which makes the overall unit gain equal to 20 dB.

The D.U.T. was locally powered from a PS293 24 VDC power source for all tests.

2.1 Gain

The gain was measured using the test arrangement as shown in Figure 2.1-1 below. Measurements were made over typical customer's bands.

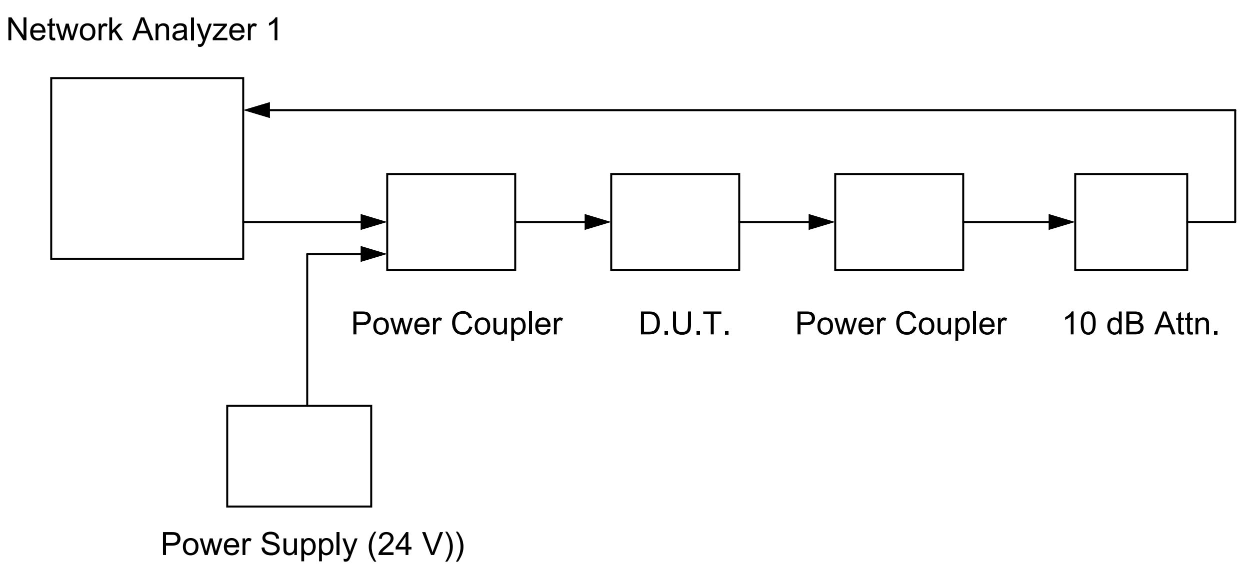
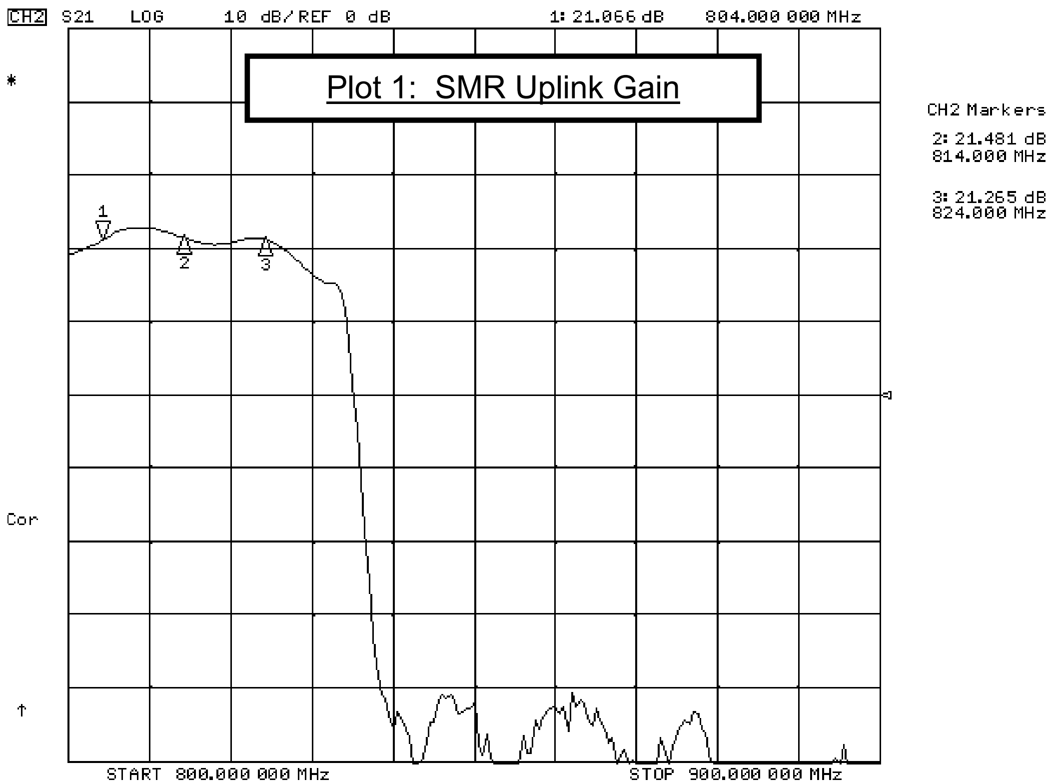
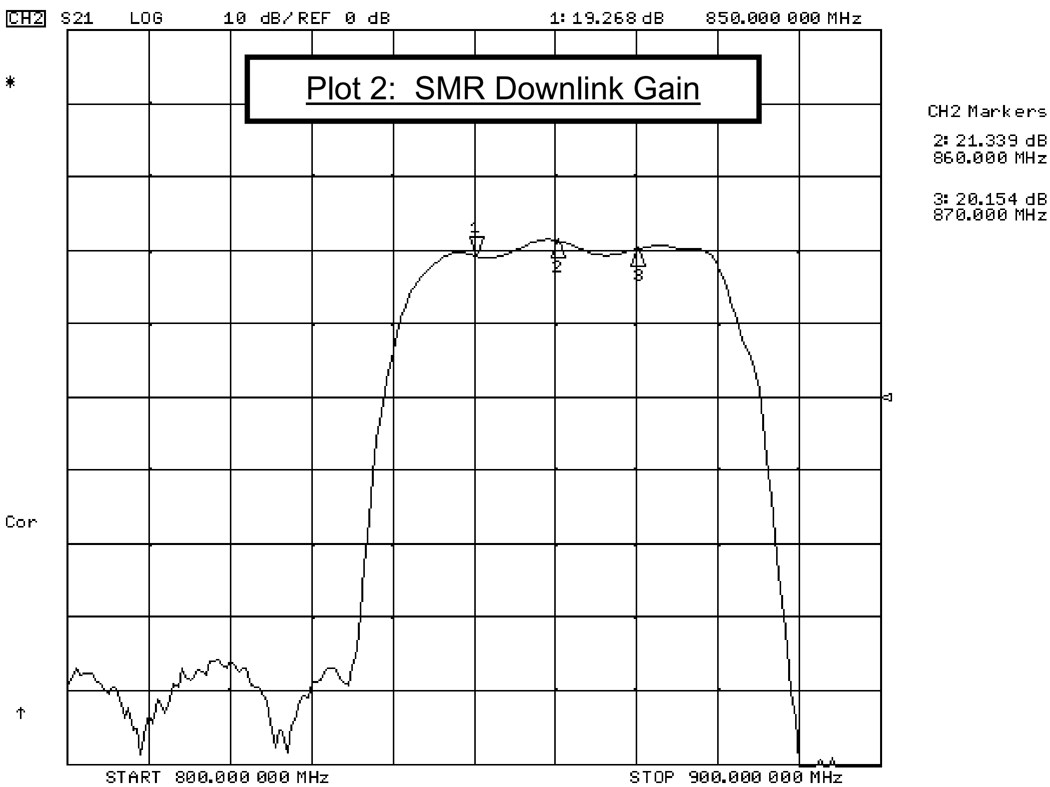
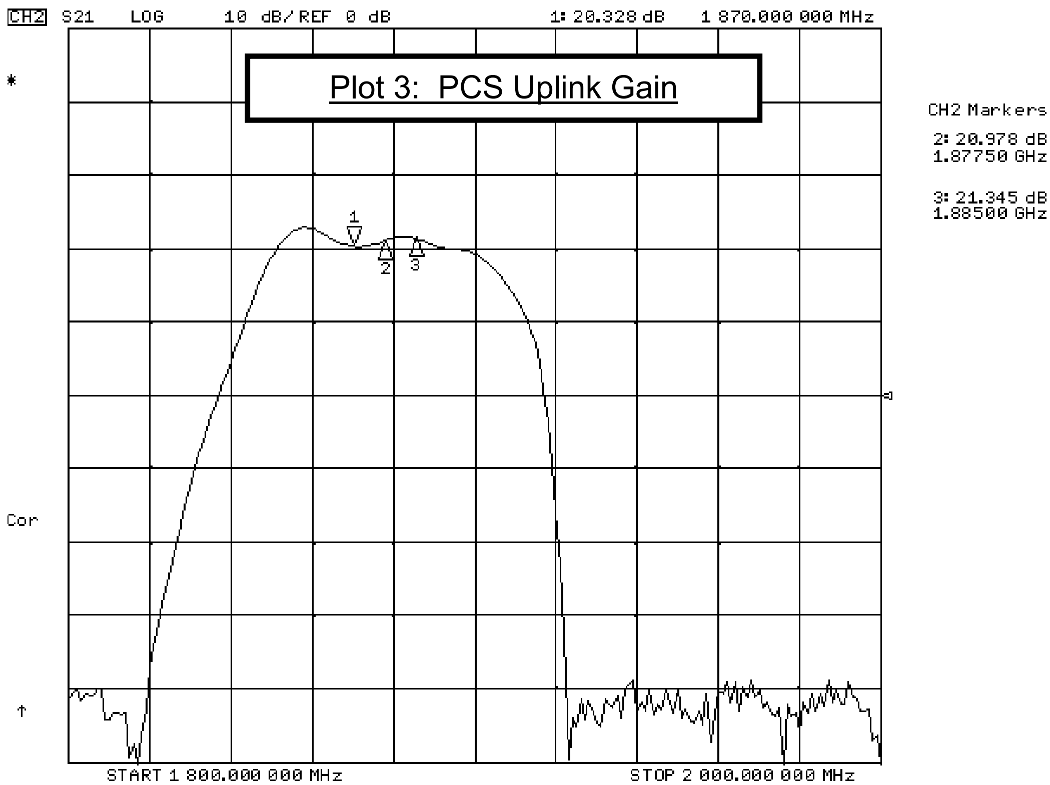


Figure 2.1-1

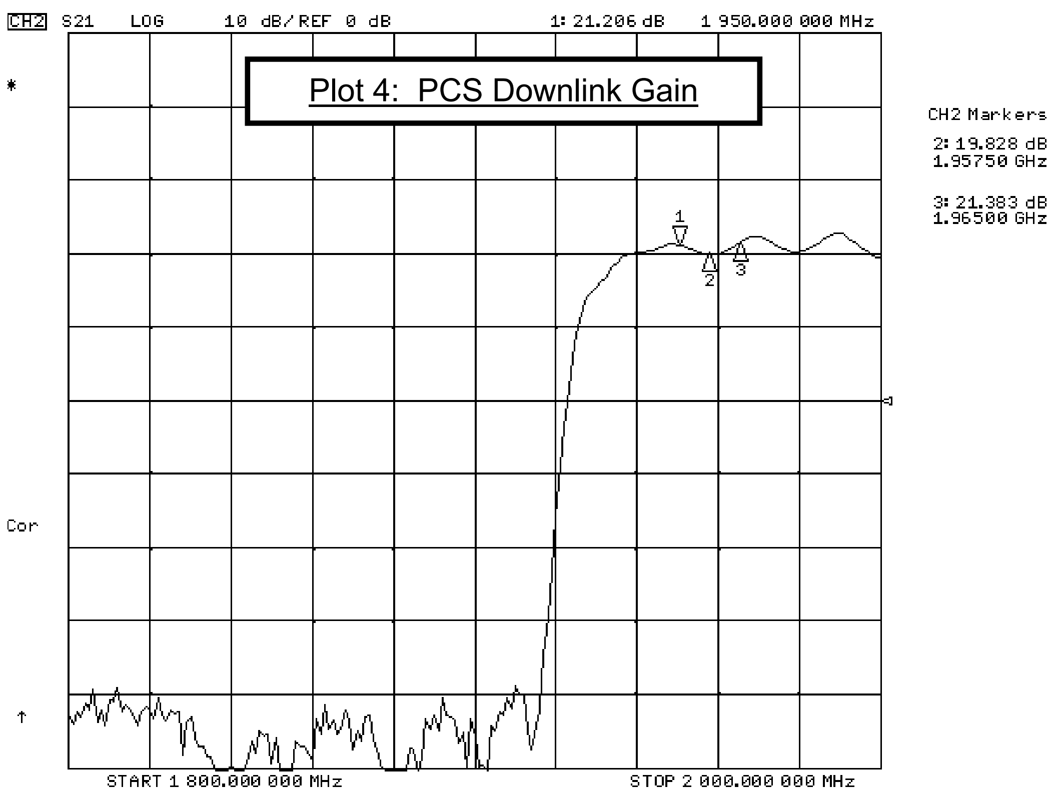
The unit gain was measured for both the SMR and PCS bands in both uplink and downlink directions. These results are shown in Plots 1 through 4 that follow. Plot 1 and Plot 2 show the SMR uplink and downlink gains respectively. Plot 3 and Plot 4 show the PCS uplink and downlink gains respectively.


CH2 S21 LOG 10 dB/ REF 0 dB 1: 21.066 dB 804.000 000 MHz
Plot 1: SMR Uplink Gain
CH2 Markers
2: 21.481 dB
814.000 MHz
3: 21.265 dB
824.000 MHz
Cor
START 800.000 000 MHz
STOP 900.000 000 MHz


CH2 S21 LOG 10 dB/ REF 0 dB 1: 19.268 dB 850.000 000 MHz
Plot 2: SMR Downlink Gain
CH2 Markers
2: 21.339 dB
860.000 MHz
3: 20.154 dB
870.000 MHz
Cor
START 800.000 000 MHz
STOP 900.000 000 MHz



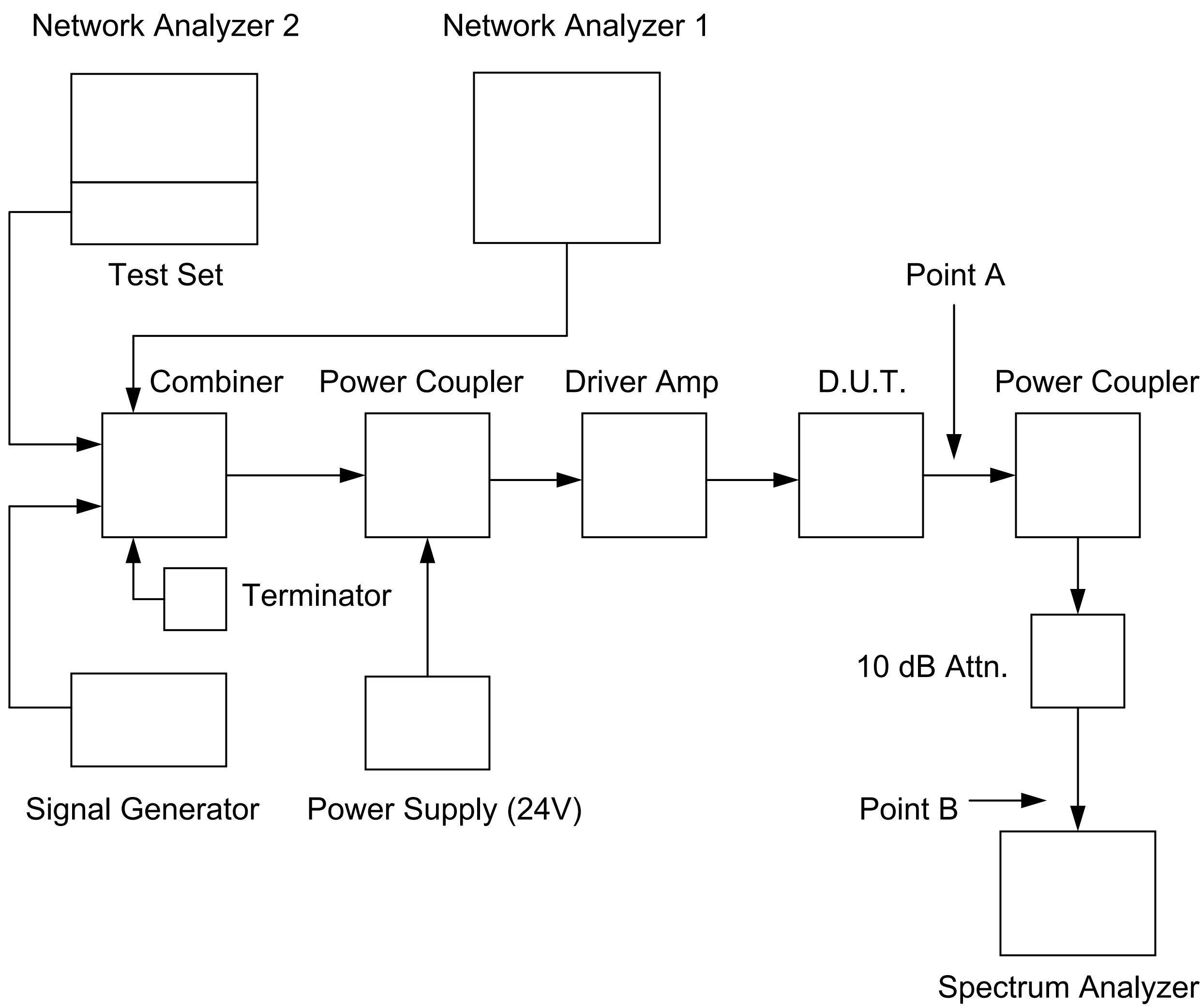
Plot 3: PCS Uplink Gain



Plot 4: PCS Downlink Gain

2.2 Intermodulation and Spurious

Intermodulation and spurious products were measured with the amplifier operating at the maximum rated total inband power level as specified in the Operator's Manual. Three tone intermodulation tests were performed using the equipment test arrangement in Figure 2.2-1 below.



***Notes**: Model A232 driver amp was used for testing.

Loss from Point A (D.U.T. output) to Point B (Spectrum Analyzer input) was 10.7 dB at SMR and 11.2 dB at PCS. This includes the loss of the 10 dB attenuator, Power Coupler and cables.

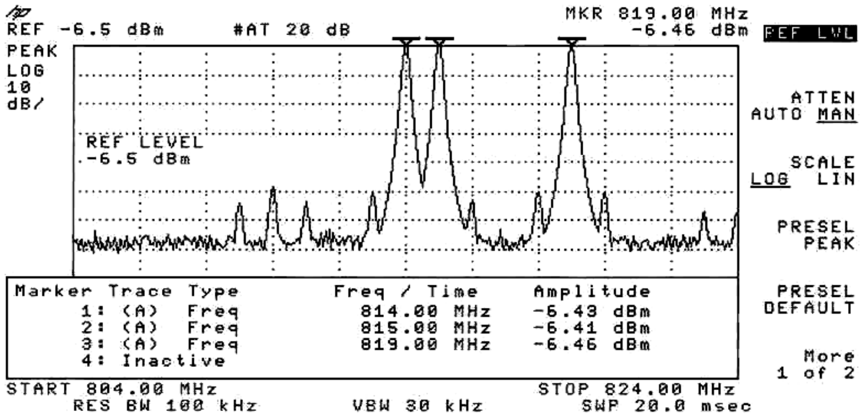
Figure 2.2-1

A three tone test was performed on the unit in the SMR uplink band with the input set to give the output power of +4.2 dBm for each uplink tone (+9 dBm maximum rated total inband power). The Network Analyzers were used as signal sources. The 10.7 dB loss to the spectrum analyzer results in tone levels of –6.5 dBm into the instrument. Plots 5 and 6 show the results of the test. In Plot 5, the narrower sweep setting shows in-band intermodulation products, while in Plot 6 the spectrum outside the SMR band is displayed on a broad sweep to show harmonics and spurious. The spectrum analyzer reference level was set to –6.5 dBm.

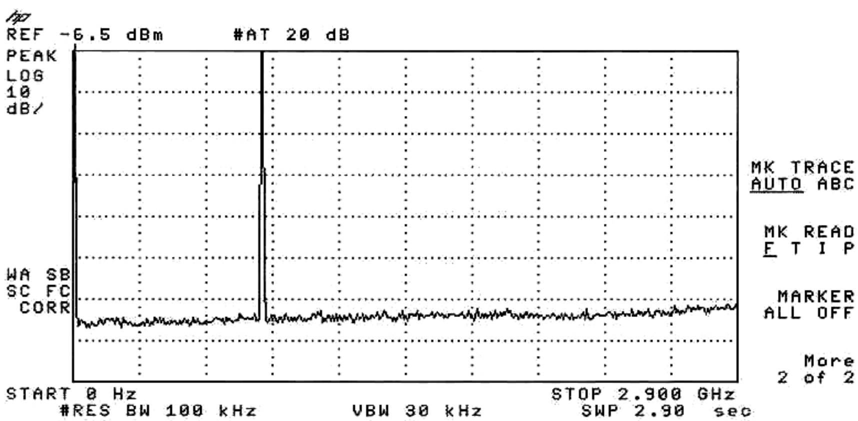
A three tone test was also performed in the SMR downlink band with the input power levels adjusted to give the output power of +19.2 dBm for each downlink tone (+24 dBm maximum rated total inband power). The 10.7 dB loss to the spectrum analyzer results in tone levels of +8.5 dBm into the instrument. Plots 7 and 8 show the results of the test for both narrow and broad sweeps with the spectrum analyzer reference level set to +8.5 dBm.

A three tone test was also performed in the PCS uplink band with the input power levels adjusted to give the output power of –0.8 dBm for each uplink tone (+4 dBm maximum rated total inband power). The 11.2 dB loss to the spectrum analyzer results in tone levels of –12 dBm into the instrument. Plots 9, 10A and 10B show the results of the test for both narrow and broad sweeps with the spectrum analyzer reference level set to –12 dBm.

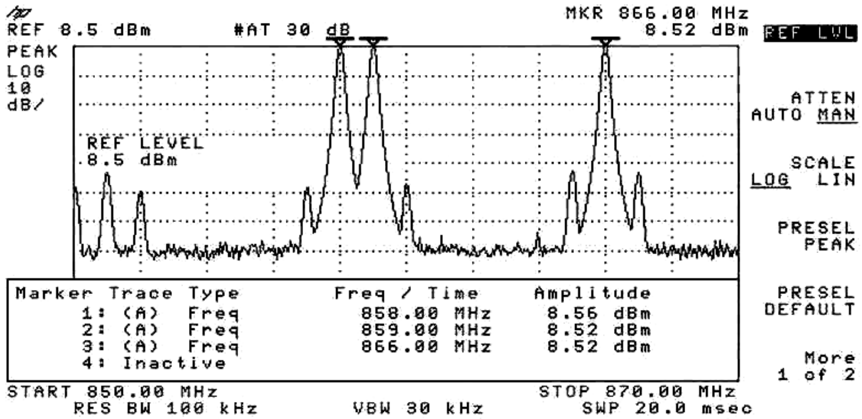
A three tone test was also performed in the PCS downlink band with the input power levels adjusted to give the output power of +19.2 dBm for each downlink tone (+24 dBm maximum rated total inband power). The 11.2 dB loss to the spectrum analyzer results in tone levels of +8 dBm into the instrument. Plots 11, 12A and 12B show the results of the test for both narrow and broad sweeps with the spectrum analyzer reference level set to +8 dBm.



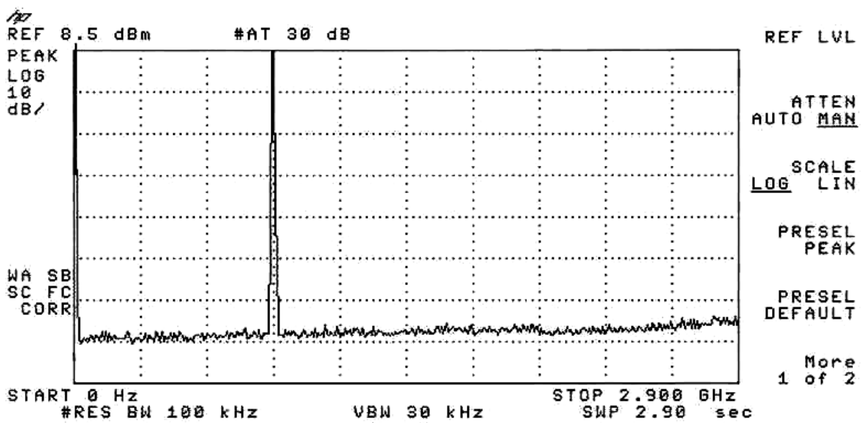
Plot 5: SMR Uplink 3-tone Intermodulation (Narrow Sweep)



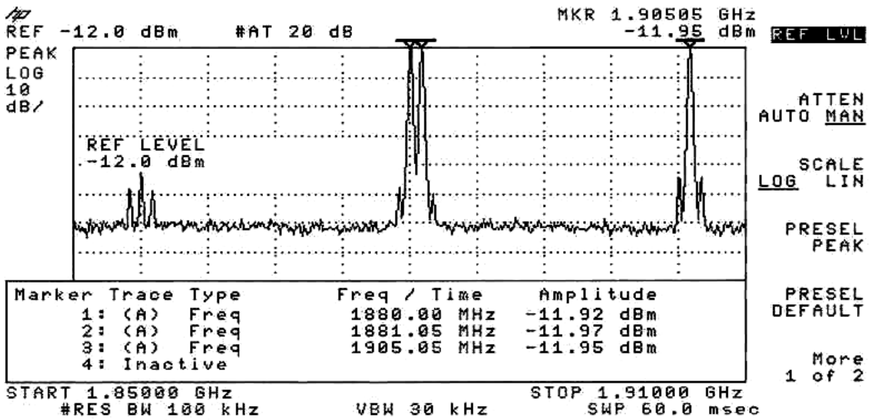
Plot 6: SMR Uplink 3-tone Intermodulation (Broad Sweep)



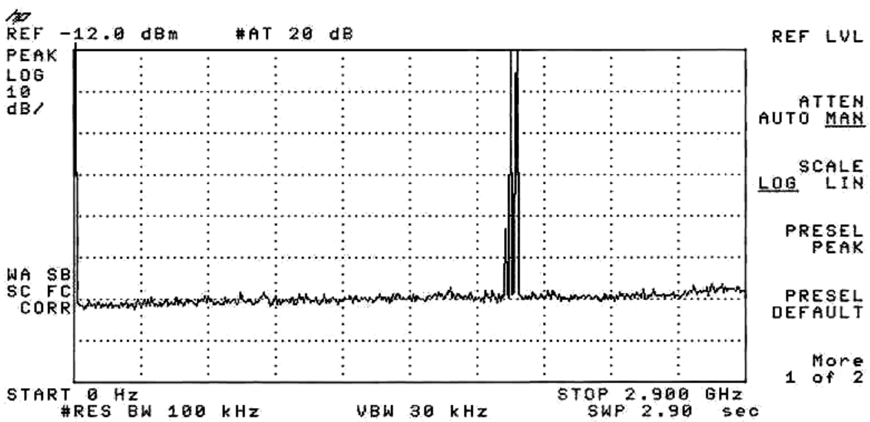
Plot 7: SMR Downlink 3-tone Intermodulation (Narrow Sweep)



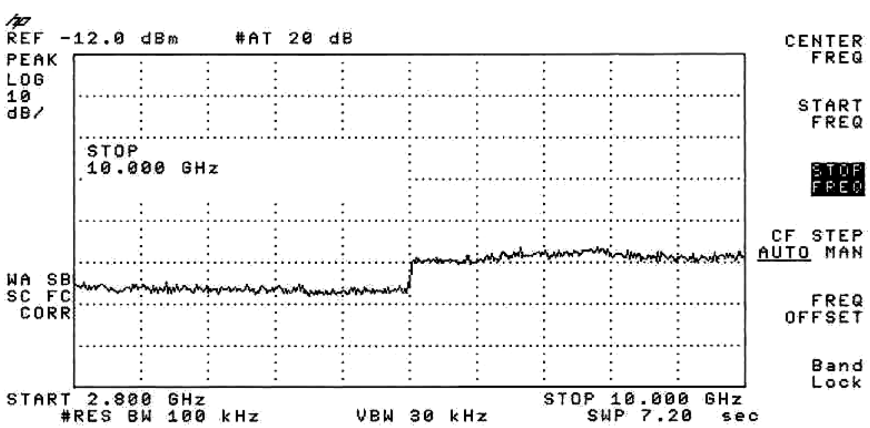
Plot 8: SMR Downlink 3-tone Intermodulation (Broad Sweep)



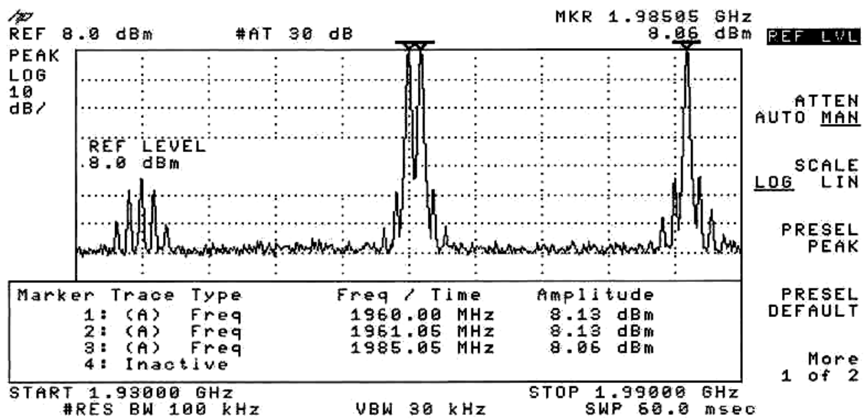
Plot 9: PCS Uplink 3-tone Intermodulation (Narrow Sweep)



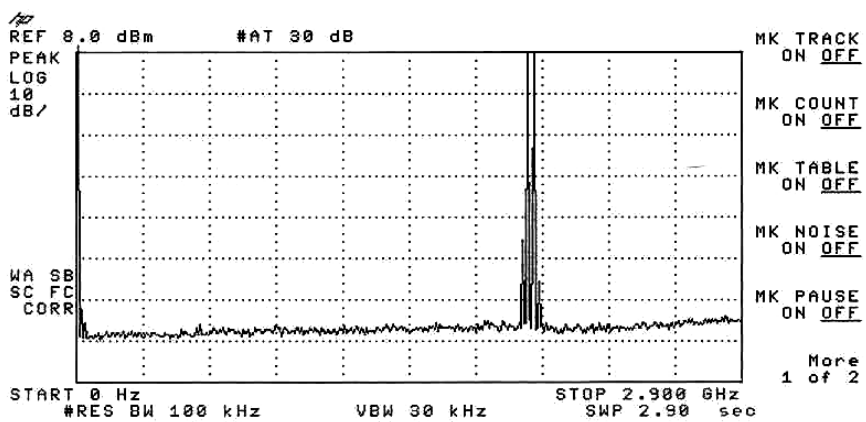
Plot 10A: PCS Uplink 3-tone Intermodulation (Sweep 0 – 2.9 GHz)



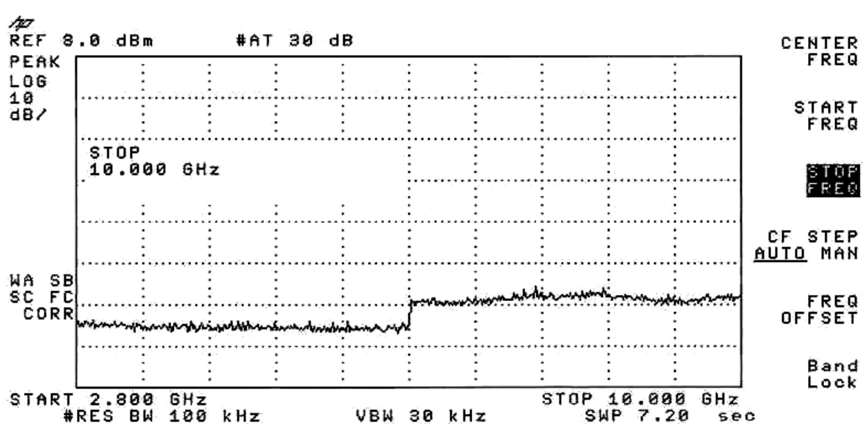
Plot 10B: PCS Uplink 3-tone Intermodulation (Sweep 2.8 – 10 GHz)



Plot 11: PCS Downlink 3-tone Intermodulation (Narrow Sweep)



Plot 12A: PCS Downlink 3-tone Intermodulation (Sweep 0 – 2.9 GHz)



Plot 12B: PCS Downlink 3-tone Intermodulation (Sweep 2.8 – 10 GHz)

Examination of the above results shows that all products are at least 42 dB down.

2.3 Modulated Channel Tests

These tests show a comparison of the input and output signals for operation with a single modulated signal at the maximum rated RF input drive level of the amplifier.

Figure 2.3-1 below shows the test arrangement used for the tests. All the test results display the input level and the output level with sufficient attenuation to display it as an overlay on the same screen.

Tests were performed for both the uplink and downlink directions. SMR tests were performed for both FM and digital (NADC) modulations. PCS tests were performed for each of NADC, GSM and CDMA modulations.

The CDMA test signal was generated by using an external CDMA baseband modulation source connected to the signal generator as shown in the diagram. The CDMA baseband source was not connected to the signal generator for other modulation tests.

The input signal is displayed on the spectrum analyzer using the reference bypass. The output signal is displayed on the spectrum analyzer with the equipment connected as shown in the diagram.

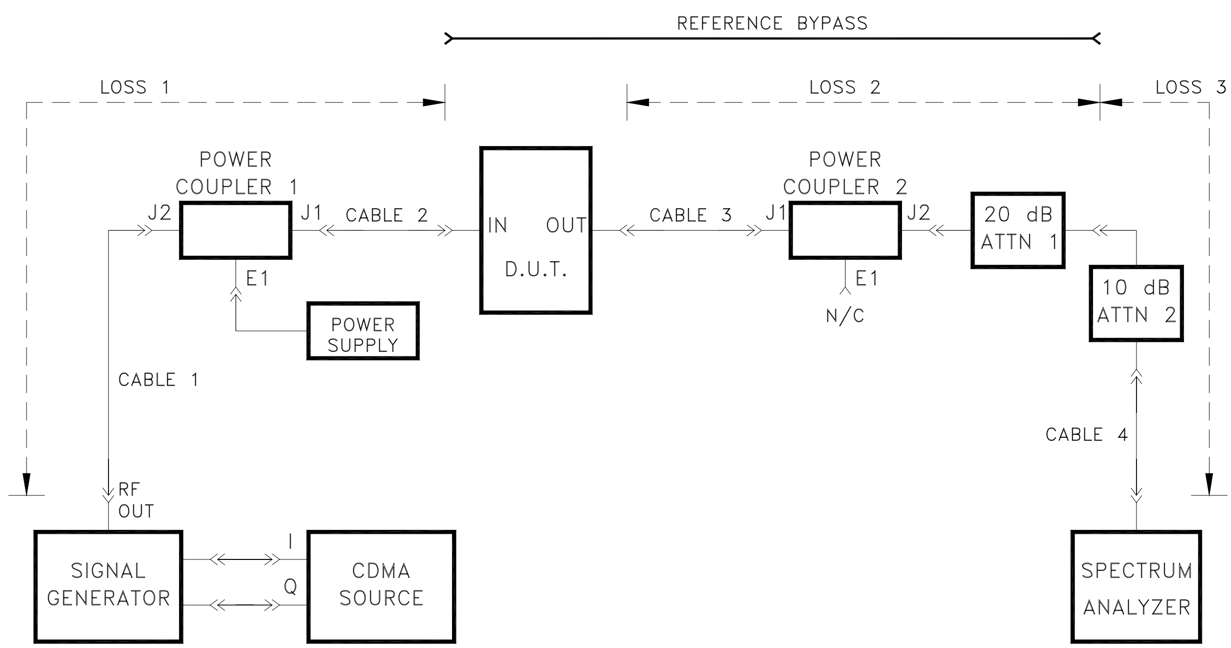


Figure 2.3-1

Notes For SMR Tests:

a. Loss 1, loss 2 and loss 3 measured at SMR frequencies:

   Loss 1 = 0.8 dB (Cable 1 + Power Coupler 1 + Cable 2)
   Loss 2 = 20.7 dB (Cable 3 + Power Coupler 2 + 20 dB Attn.)
   Loss 3 = 10.5 dB at SMR (10 dB Attn. + Cable 4)

b. Cable 1 and Cable 4 loss measured 0.6 dB each at SMR.

c. Signal generator set to test frequency and desired modulation. Amplitude set to DUT maximum rated output level minus 20 dB (DUT gain) plus Loss 1. Therefore, to obtain +9 dBm at the output of the DUT requires a Generator level of: +9 dBm (test level) – 20 dB (DUT gain) + 0.8 dB (Loss 1) = -10.2 dBm. Similarly, to obtain +24 dBm at the output of the DUT requires a Generator level of: +24 dBm (test level) - 20 dB (DUT gain) + 0.8 dB (Loss 1) = +4.8 dBm.

d. The DUT output level is equal to the displayed spectrum analyzer level + Loss 2 + Loss 3; which is the spectrum analyzer level + 31.2 dB.

Notes For PCS Tests:

a. Loss 1, loss 2 and loss 3 measured at PCS frequencies.

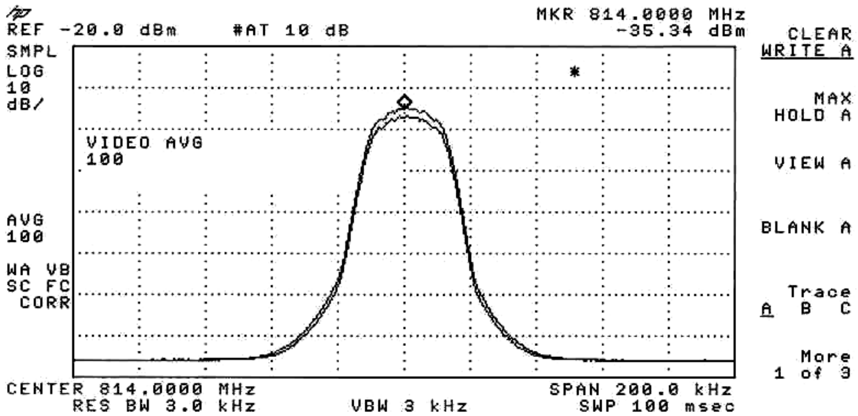
   Loss 1 = 1.5 dB (Cable 1 + Power Coupler 1 + Cable 2)
   Loss 2 = 20.8 dB (Cable 3 + Power Coupler 2 + 20 dB Attn.)
   Loss 3 = 10.8 dB at PCS (10 dB Attn. + Cable 4)

b. Cable 1 and Cable 4 loss measured 1.0 dB each.

c. Signal generator set to test frequency and desired modulation. Amplitude set to DUT maximum rated output level minus 20 dB (DUT gain) plus Loss 1. Therefore, to obtain +4 dBm at the output of the DUT requires a Generator level of: +4 dBm (test level) – 20 dB (DUT gain) + 1.5 dB (Loss 1) = -14.5 dBm. Similarly, to obtain +24 dBm at the output of the DUT requires a Generator level of: +24 dBm (test level) - 20 dB (DUT gain) + 1.5dB (Loss 1) = +5.5 dBm.

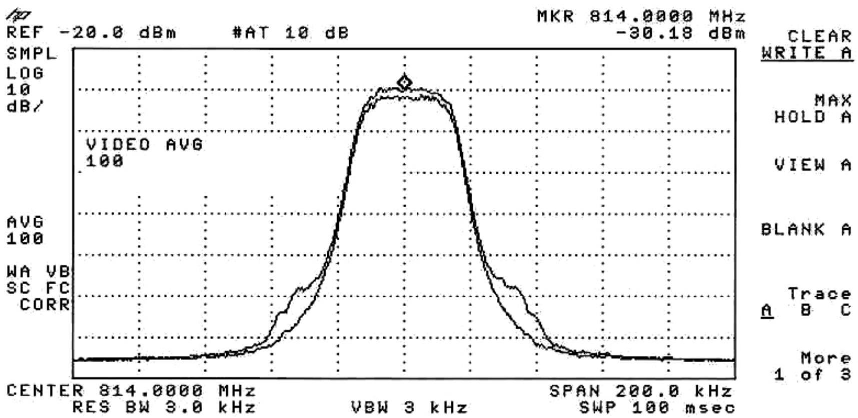
d. The DUT output level is equal to the displayed spectrum analyzer level + Loss 2 + Loss 3; which is the spectrum analyzer level + 31.6 dB.

The results of these tests are shown in Plots 13 through 22 that follow. Plots 13 and 14 show uplink results for SMR FM and digital (NADC) modulations. Plots 15 and 16 show downlink results for SMR FM and digital (NADC) modulations. Plots 17 through 19 show uplink results for PCS NADC, GSM and CDMA modulations. Plots 20 through 22 show downlink results for PCS NADC, GSM and CDMA modulations.



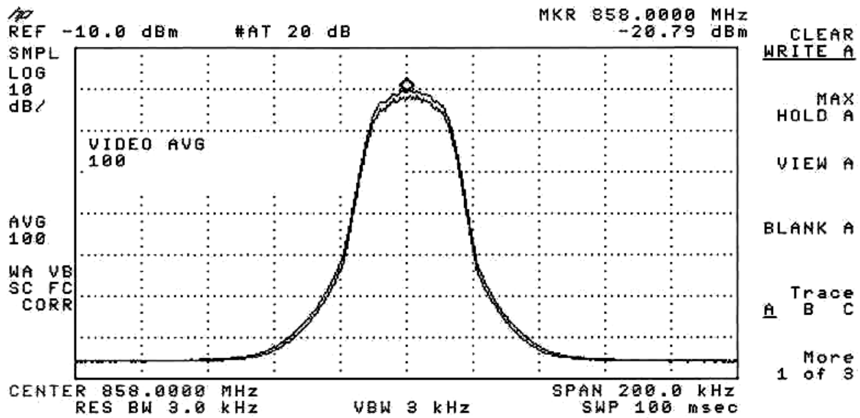
Plot 13: SMR Uplink FM Modulated Channel Test

Generator Level = -10.2 dBm Modulation = 1KHz
Deviation = 12KHz Span = 200 KHz
Video Averaging = ON



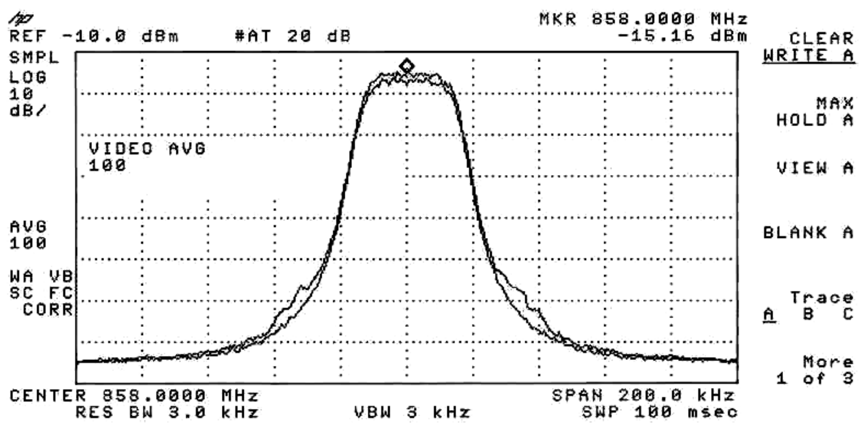
Plot 14: SMR Uplink NADC Modulated Channel Test

Generator Level = -10.2 dBm Modulation = NADC
Span = 200 KHz Video Averaging = ON



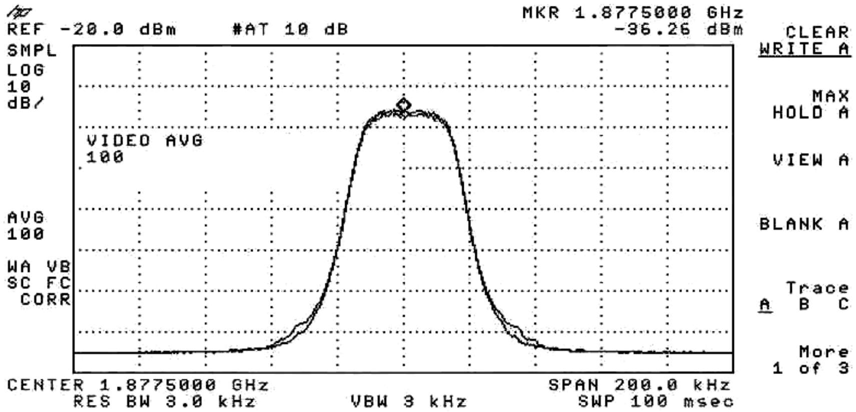
Plot 15: SMR Downlink FM Modulated Channel Test

Generator Level = +4.8 dBm Modulation = 1KHz
Deviation = 12KHz Span = 200 KHz
Video Averaging = ON



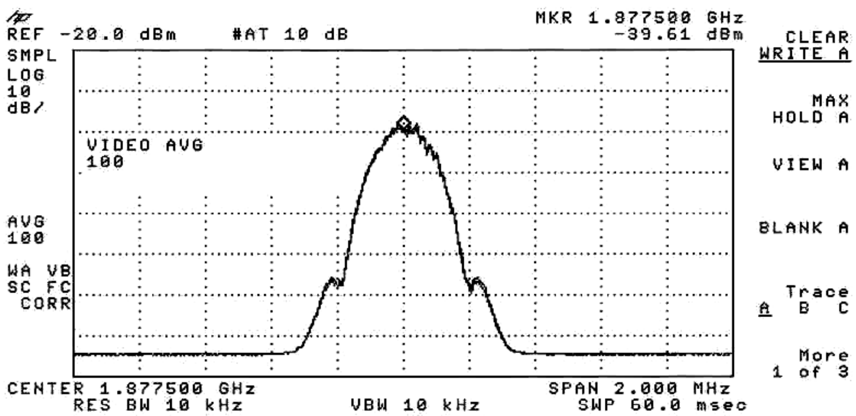
Plot 16: SMR Downlink NADC Modulated Channel Test

Generator Level = +4.8 dBm Modulation = NADC
Span = 200 KHz Video Averaging = ON



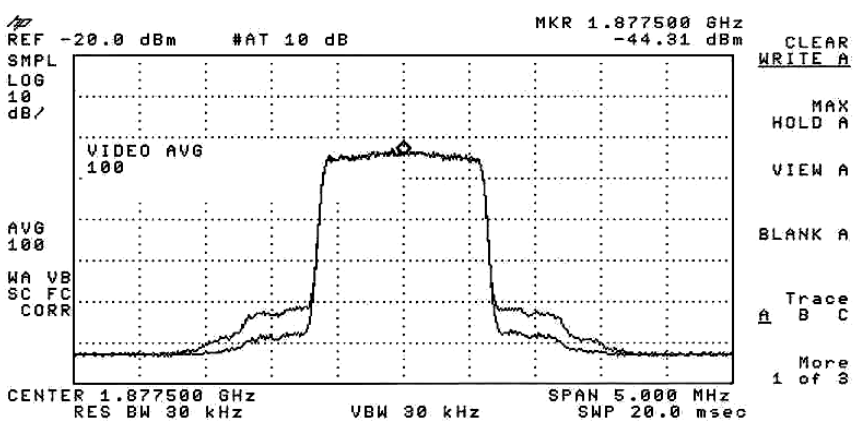
Plot 17: PCS Uplink NADC Modulated Channel Test

Generator Level = -14.5 dBm Modulation = NADC
Span = 200 KHz Video Averaging = ON



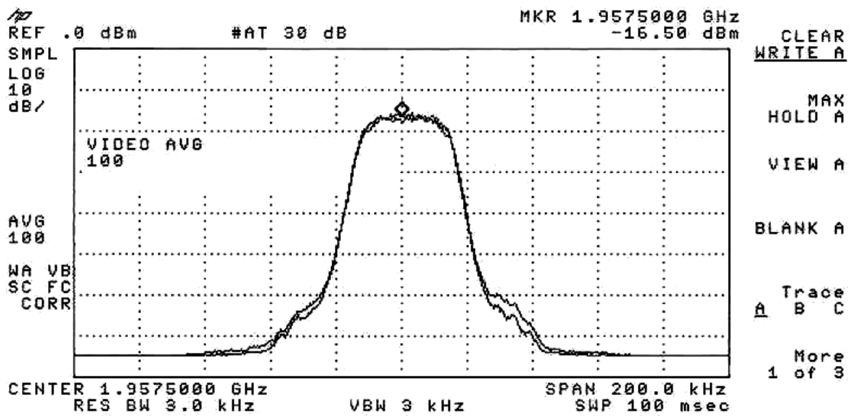
Plot 18: PCS Uplink GSM Modulated Channel Test

Generator Level = -14.5 dBm Modulation = GSM
Span = 2 MHz Video Averaging = ON



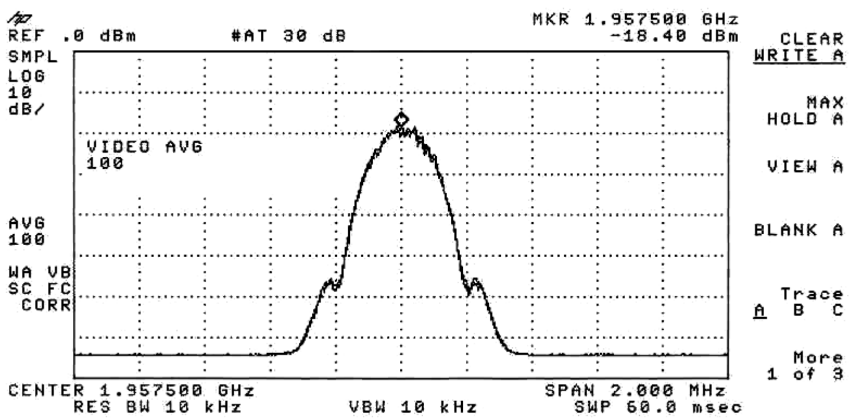
Plot 19: PCS Uplink CDMA Modulated Channel Test

Generator Level = -14.5 dBm Modulation = CDMA
Span = 5 MHz Video Averaging = ON



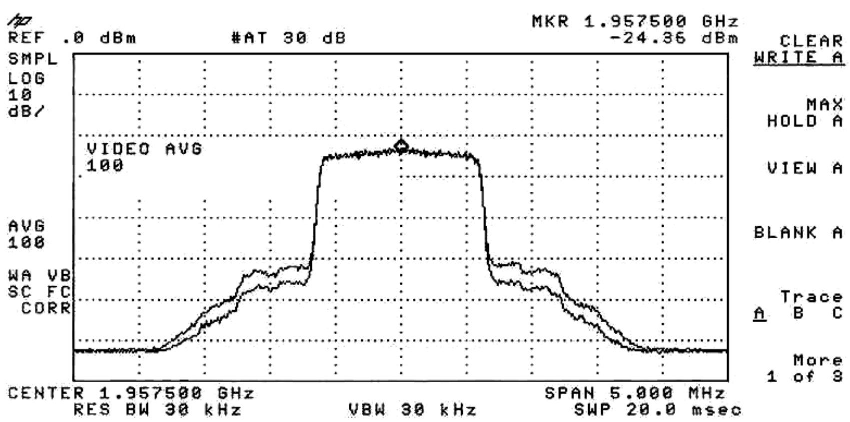
Plot 20: PCS Downlink NADC Modulated Channel Test

Generator Level = +5.5 dBm Modulation = NADC
Span = 200 KHz Video Averaging = ON



Plot 21: PCS Downlink GSM Modulated Channel Test

Generator Level = +5.5 dBm Modulation = GSM
Span = 2 MHz Video Averaging = ON



Plot 22: PCS Downlink CDMA Modulated Channel Test

Generator Level = +5.5 dBm Modulation = CDMA
Span = 5 MHz Video Averaging = ON

The SMR uplink result for FM modulation at the rated output level (Plot 13) shows no measurable distortion visible on the spectrum analyzer.

The SMR uplink result for NADC modulation at the rated output level (Plot 14) shows that the adjacent channel distortion produced is at least 45 dB below the level of the carrier. The requirement is that the attenuation be 43 dB + 10 log (P); where P is the signal power in watts. Since the output power is -21 dBW (+ 9 dBm), then the required attenuation is 43 dB – 21 = 22 dB. Thus the DUT is compliant.

The SMR downlink result for FM modulation at the rated output level (Plot 15) shows no measurable distortion.

The SMR downlink result for NADC modulation at the rated output level (Plot 16) shows that the adjacent channel distortion produced is at least 45 dB below the level of the carrier. The requirement is that the attenuation be 43 dB + 10 log (P); where P is the signal power in watts. Since the output power is -6 dBW (+ 24 dBm), then the required attenuation is 43 dB – 6 = 37 dB. Thus the DUT is compliant.

The PCS uplink result for NADC modulation at the rated output level (Plot 17) shows that the adjacent channel distortion produced is at least 50 dB below the level of the carrier. The requirement is that the attenuation be 43 dB + 10 log (P); where P is the signal power in watts. Since the output power is -26 dBW (+ 4 dBm), then the required attenuation is 43 dB – 26 = 17 dB. Thus the DUT is compliant.

The PCS uplink result for GSM modulation at the rated output level (Plot 18) shows no measurable distortion visible on the spectrum analyzer.

The PCS uplink result for CDMA modulation at the rated output level (Plot 19) shows that the maximum uplink adjacent channel distortion is at a level of –50.4 dBm (spectrum analyzer level plus Loss 2 plus Loss 3, which is –82 dBm + 20.8 dB + 10.8 dB = -50.4 dBm.) Since the carrier output level is +4 dBm, the adjacent channel distortion is +4 dBm – (–50.4 dBm) = 54.4 dB below the carrier. The requirement is that the attenuation be 43 dB + 10 log (P); where P is the signal power in watts. Since the output power is -26 dBW (+ 4 dBm), then the required attenuation is 43 dB – 26 = 17 dB. Thus the DUT is compliant.

The PCS downlink result for NADC modulation at the rated output level (Plot 20) shows that the adjacent channel distortion produced is at least 45 dB below the level of the carrier. The requirement is that the attenuation be 43 dB + 10 log (P); where P is the signal power in watts. Since the output power is -6 dBW (+ 24 dBm), then the required attenuation is 43 dB – 6 = 37 dB. Thus the DUT is compliant.

The PCS downlink result for GSM modulation at the rated output level (Plot 21) shows no measurable distortion visible on the spectrum analyzer.

The PCS downlink result for CDMA modulation at the rated output level (Plot 22) shows that the maximum downlink adjacent channel distortion is at a level of –19.4 dBm (spectrum analyzer level plus Loss 2 plus Loss 3, which is –51 dBm + 20.8 dB + 10.8 dB = -19.4 dBm.) Since the carrier output level is +24 dBm, the adjacent channel distortion is +24 dBm – (–19.4 dBm) = 43.4 dB below the carrier. The requirement is that the attenuation be 43 dB + 10 log (P); where P is the signal power in watts. Since the output power is -6 dBW (+ 24 dBm), then the required attenuation is 43 dB – 6 = 37 dB. Thus the DUT is compliant.

2.4 Radiated Spurious Emissions

These tests address the requirements for spurious emissions as specified in Sections 2.991 and 2.997 of the FCC R&Rs.

The testing was performed in three parts using the equipment arrangements shown in Figure 2.4-1 parts A, B, and C as shown below. Note that for these tests, DC was blocked to the DUT output by removing an internal jumper as would be done in a typical application in which DC is blocked to a connected antenna.

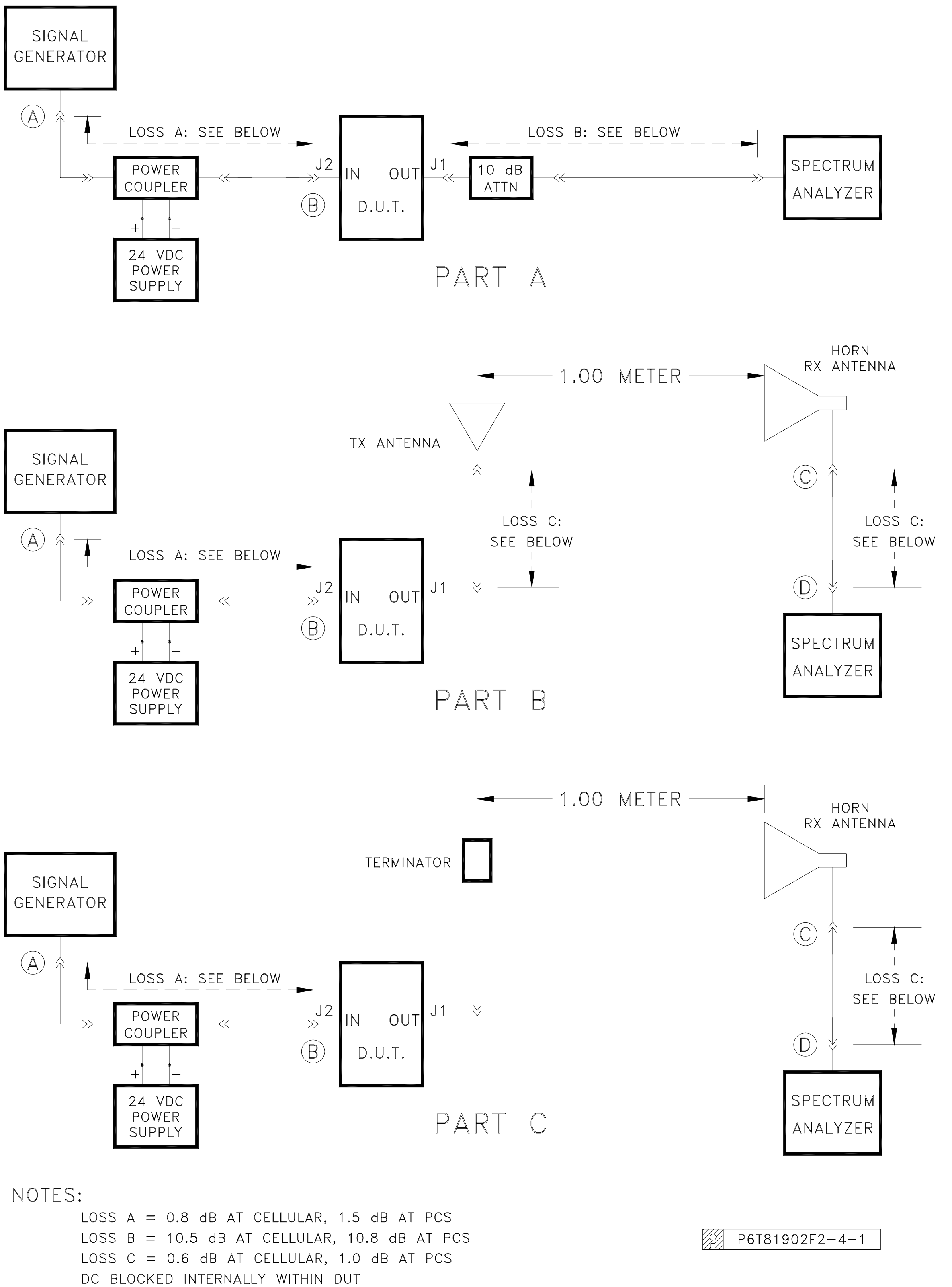

SIGNAL GENERATOR
A
LOSS A: SEE BELOW
POWER COUPLER
+
−
24 VDC POWER SUPPLY
B
J2
IN
OUT
D.U.T.
J1
10 dB ATTN
LOSS B: SEE BELOW
SPECTRUM ANALYZER
PART A
SIGNAL GENERATOR
A
LOSS A: SEE BELOW
POWER COUPLER
+
−
24 VDC POWER SUPPLY
B
J2
IN
OUT
D.U.T.
J1
TX ANTENNA
LOSS C: SEE BELOW
1.00 METER
HORN RX ANTENNA
C
LOSS C: SEE BELOW
D
SPECTRUM ANALYZER
PART B
SIGNAL GENERATOR
A
LOSS A: SEE BELOW
POWER COUPLER
+
−
24 VDC POWER SUPPLY
B
J2
IN
OUT
D.U.T.
J1
TERMINATOR
1.00 METER
HORN RX ANTENNA
C
LOSS C: SEE BELOW
D
SPECTRUM ANALYZER
PART C
NOTES:
LOSS A = 0.8 dB AT CELLULAR, 1.5 dB AT PCS
LOSS B = 10.5 dB AT CELLULAR, 10.8 dB AT PCS
LOSS C = 0.6 dB AT CELLULAR, 1.0 dB AT PCS
DC BLOCKED INTERNALLY WITHIN DUT
P6T81902F2-4-1

Figure 2.4-1

Part A: Antenna Terminal Emissions

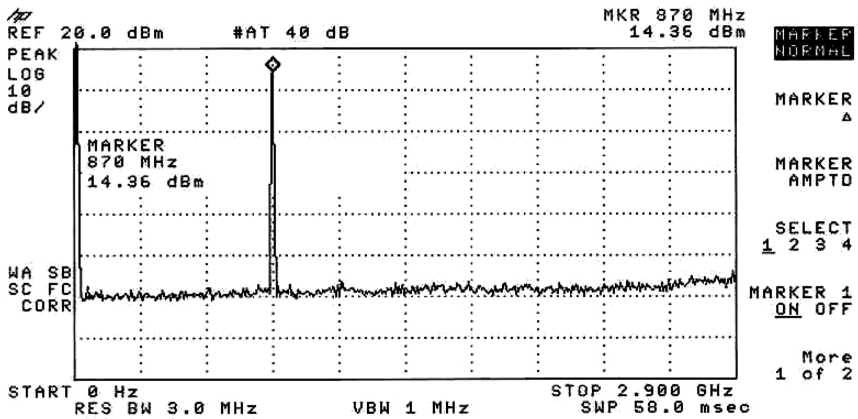
In these tests, the generator fed the maximum rated input signal into the DUT and the spectrum analyzer was connected to the output of the DUT through a 10 dB attenuator as per Figure 2.4.-1 Part A. The maximum rated input level is the maximum rated output level minus the DUT gain (20dB).

The output spectrum was recorded in the SMR downlink direction for both FM and digital (NADC) type modulations. The output spectrum was recorded in the PCS downlink direction for each of NADC, GSM and CDMA type modulations.

For SMR tests, the signal generator was set to the maximum rated DUT output level minus 20 dB (DUT gain) plus Loss A at SMR. Therefore to obtain +24 dBm at the output of the DUT required a Generator level of: +24 dBm (test level) - 20 dB (DUT gain) + 0.8 dB (Loss A) = +4.8 dBm.

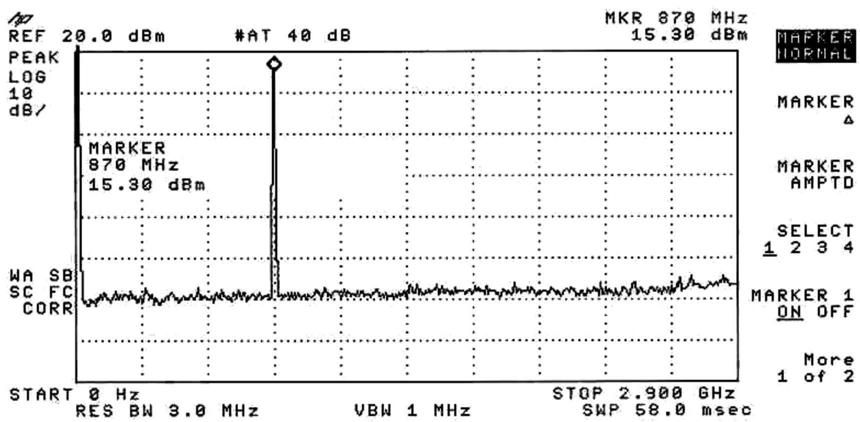
For PCS tests, the signal generator was set to the maximum rated DUT output level minus 20 dB (DUT gain) plus Loss A at PCS. Therefore to obtain +24 dBm at the output of the DUT required a Generator level of: +24 dBm (test level) - 20 dB (DUT gain) + 1.5 dB (Loss A) = +5.5 dBm.

In each test, the results are plotted with two overlapping sweeps. SMR results are plotted with sweeps of 0 – 2.9 GHz and 2.8 – 10 GHz. PCS results are plotted with sweeps of 0 – 2.9 GHz and 2.8 – 20 GHz. The results are shown in Plots 23 through 32 on the following pages.



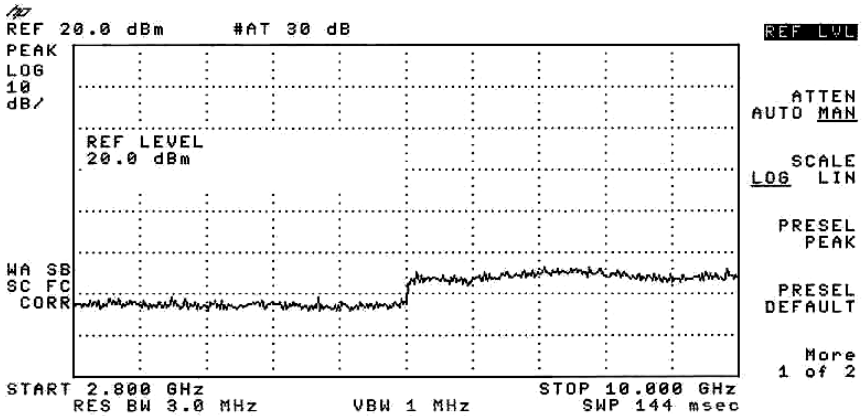
Plot 23 Antenna Terminal Emissions - SMR FM Modulation

Input Level = +4 dBm Modulation = FM
Span = 0 – 2.9 GHz Generator Level = +4.8 dBm



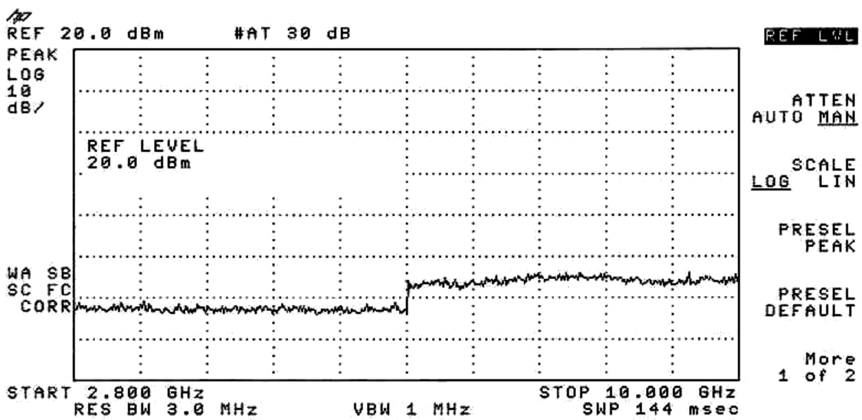
Plot 24 Antenna Terminal Emissions - SMR NADC Modulation

Input Level = +4 dBm Modulation = NADC
Span = 0 – 2.9 GHz Generator Level = +4.8 dBm



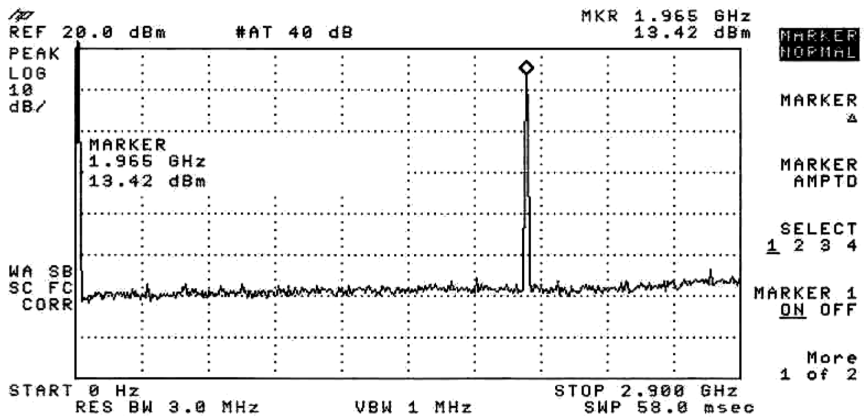
Plot 25 Antenna Terminal Emissions - SMR FM Modulation

Input Level = +4 dBm Modulation = FM
Span = 2.8 - 10 GHz Generator Level = +4.8 dBm



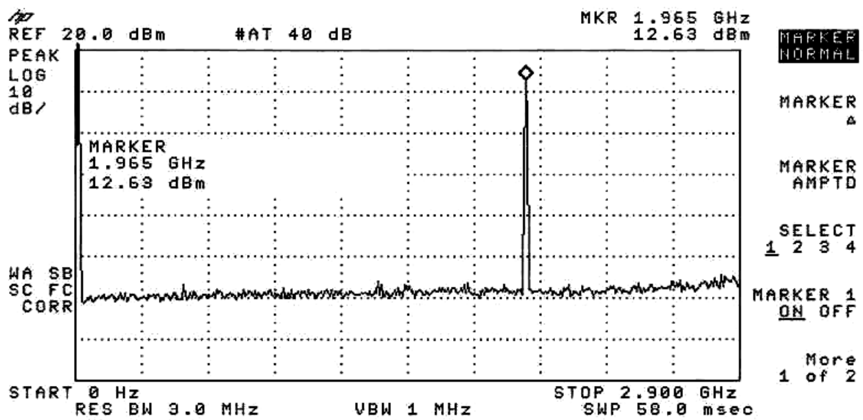
Plot 26 Antenna Terminal Emissions - SMR NADC Modulation

Input Level = +4 dBm Modulation = NADC
Span = 2.8 - 10 GHz Generator Level = +4.8 dBm



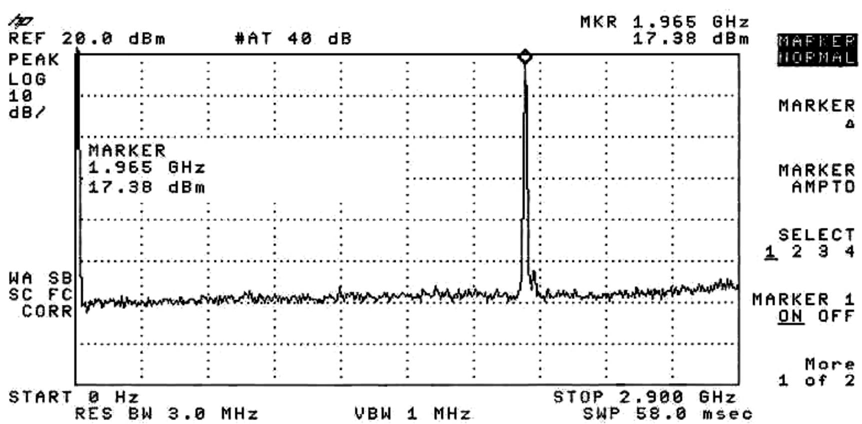
Plot 27 Antenna Terminal Emissions - PCS NADC Modulation

Input Level = +4 dBm Modulation = NADC
Span = 0 – 2.9 GHz Generator Level = +5.5 dBm



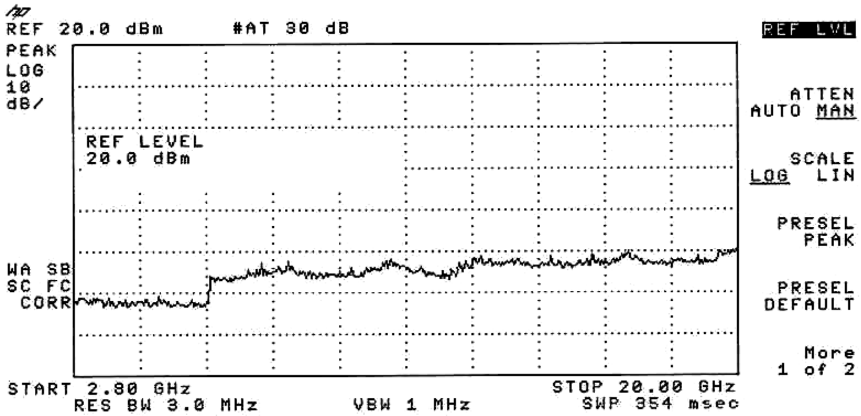
Plot 28 Antenna Terminal Emissions - PCS GSM Modulation

Input Level = +4 dBm Modulation = GSM
Span = 0 – 2.9 GHz Generator Level = +5.5 dBm



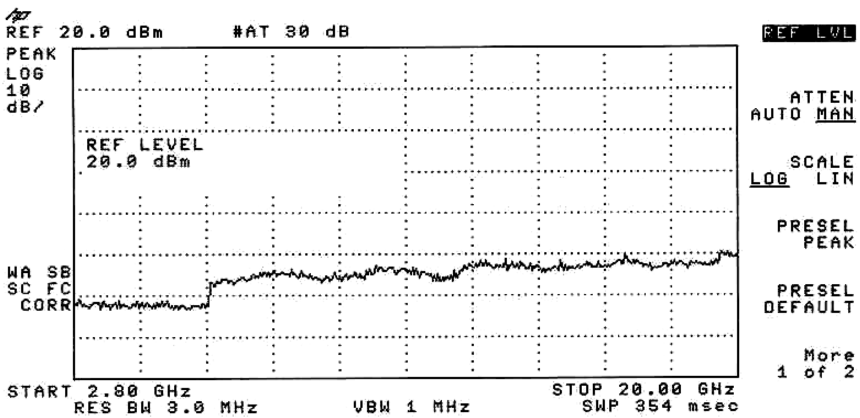
Plot 29 Antenna Terminal Emissions - PCS CDMA Modulation

Input Level = +4 dBm Modulation = CDMA
Span = 0 – 2.9 GHz Generator Level = +5.5 dBm



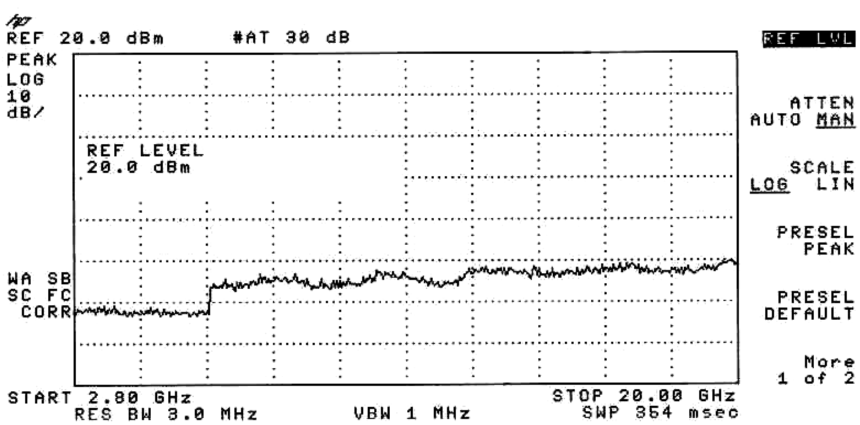
Plot 30 Antenna Terminal Emissions - PCS NADC Modulation

Input Level = +4 dBm Modulation = NADC
Span = 2.8 - 20 GHz Generator Level = +5.5 dBm



Plot 31 Antenna Terminal Emissions - PCS GSM Modulation

Input Level = +4 dBm Modulation = GSM
Span = 2.8 - 20 GHz Generator Level = +5.5 dBm



Plot 32 Antenna Terminal Emissions - PCS CDMA Modulation

Input Level = +4 dBm Modulation = CDMA
Span = 2.8 - 20 GHz Generator Level = +5.5 dBm

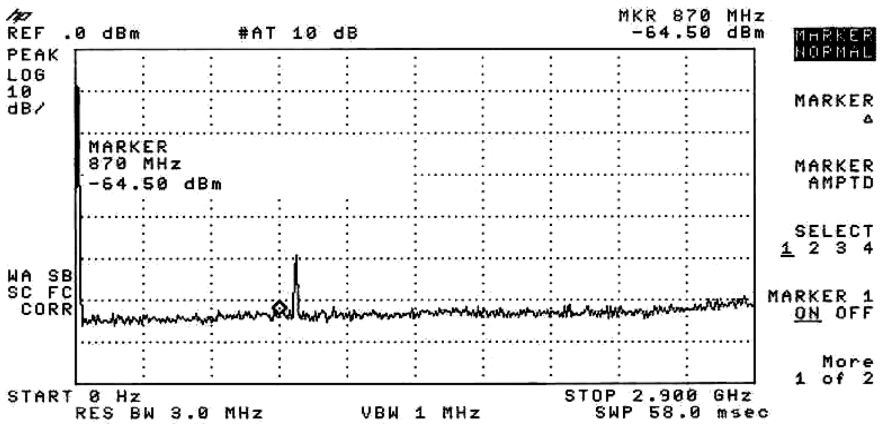
The specification limit for spurious signals is 43 dB + 10 log (P); where P is in watts. For an output signal of +24 dBm, the required spurious to carrier ratio is 37 dB. The results in Plots 23 through 32 show no measurable spurious above the analyzer noise floor which is at least 50 dB below the output signal. Thus the unit is compliant with the requirement.

Part B: Radiated Spurious Emissions – DUT Connected to Radiating Antenna

To check radiated spurious emissions, the (DUT) was located in an open test area and emissions were measured with a radiating antenna connected to the output connector. The receiving horn antenna was placed at a distance of 1 meter from the radiating antenna. Figure 2.4-1 part B shows the test arrangement. Tests were performed at SMR for both FM and digital (NADC) type modulations. Tests were performed at PCS for each of NADC, GSM and CDMA type modulations.

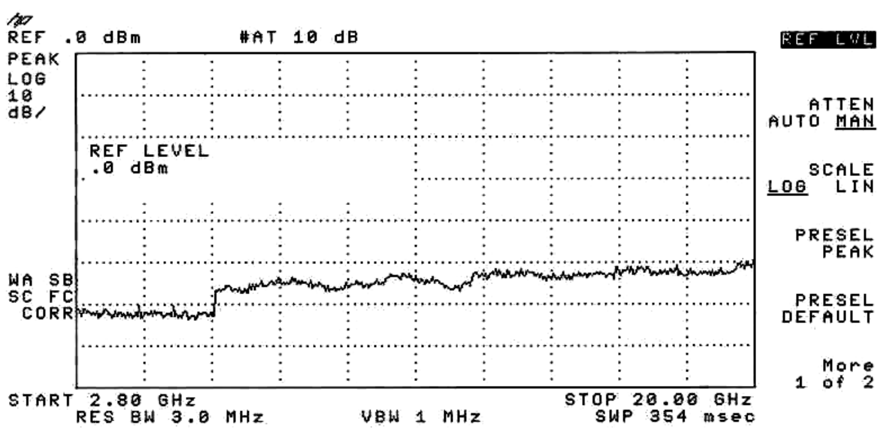
Plots 33 through 44 that follow show the results of the above tests. Plots 33 and 34 show the site background noise. Plots 35 and 36 show the measured SMR radiated signals with the DUT connected to a dual band omnidirectional antenna over a 0 – 2.9 GHz sweep for FM and NADC type modulations. Plots 37 and 38 show the measured SMR radiated signals over a 2.8 - 20 GHz sweep.

Similarly, plots 39 through 41 show the measured PCS radiated signals with the DUT connected to a dual band omnidirectional antenna over a 0 – 2.9 GHz sweep for NADC, GSM and CDMA type modulations. Plots 42 through 44 show the measured PCS radiated signals over a 2.8 - 20 GHz sweep.



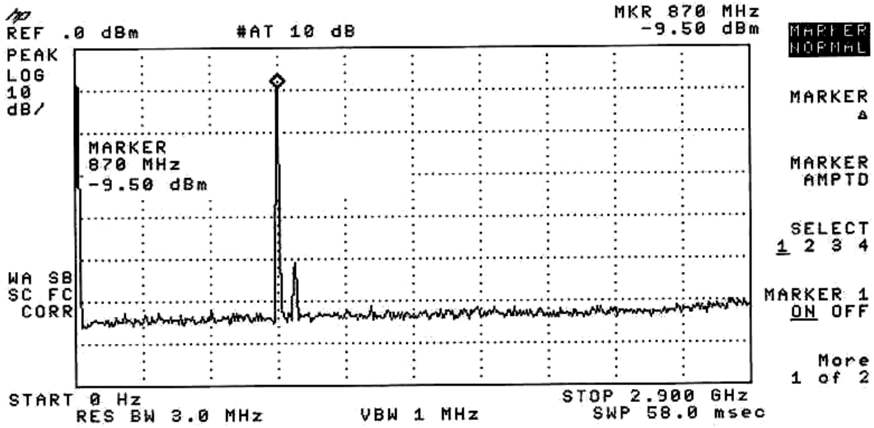
Plot 33 Radiated Spurious – Site Noise (DUT Unpowered)

Span = 0 – 2.9 GHz



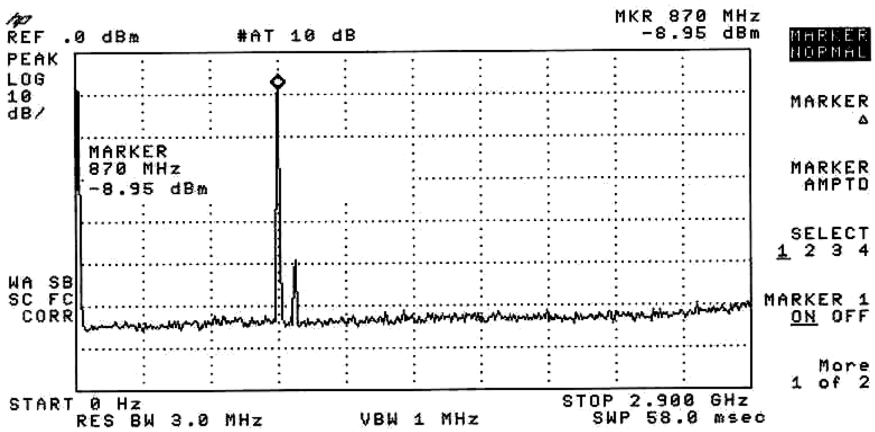
Plot 34 Radiated Spurious – Site Noise (DUT Unpowered)

Span = 2.8 – 20 GHz



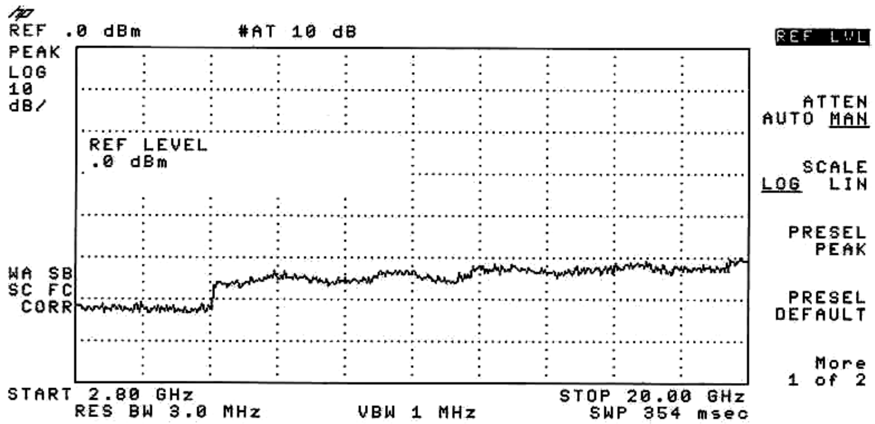
Plot 35 Radiated Spurious – SMR FM Modulation

Input Level = +4 dBm Modulation = FM
Span = 0 – 2.9 GHz Generator Level = +4.8 dBm



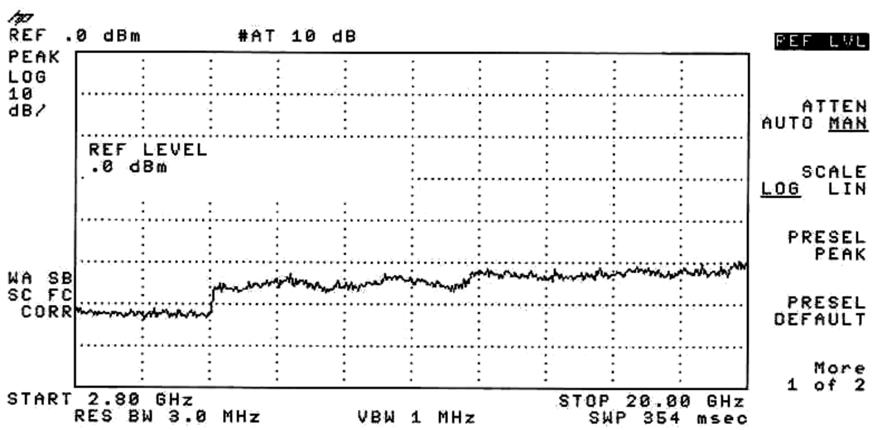
Plot 36 Radiated Spurious – SMR NADC Modulation

Input Level = +4 dBm Modulation = NADC
Span = 0 – 2.9 GHz Generator Level = +4.8 dBm



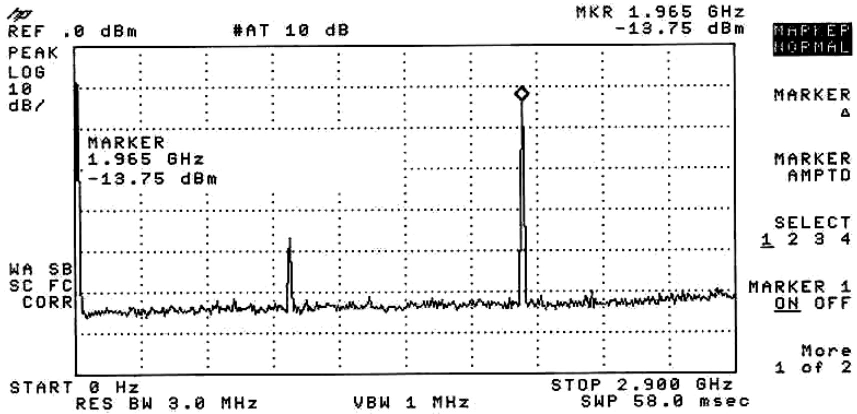
Plot 37 Radiated Spurious – SMR FM Modulation

Input Level = +4 dBm Modulation = FM
Span = 2.8 - 20 GHz Generator Level = +4.8 dBm



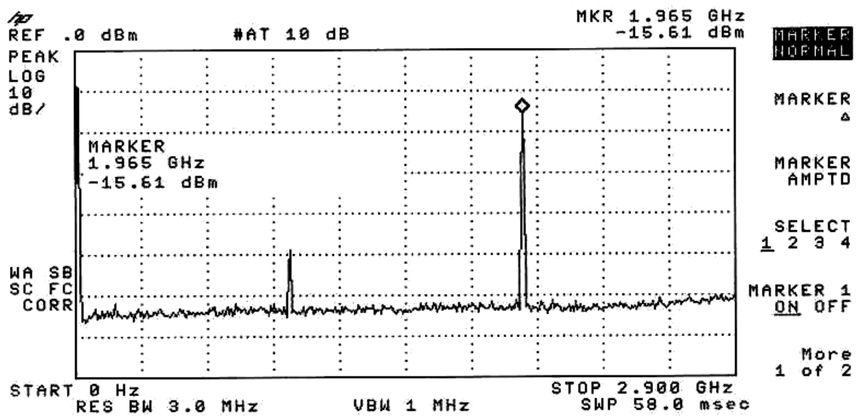
Plot 38 Radiated Spurious – SMR NADC Modulation

Input Level = +4 dBm Modulation = NADC
Span = 2.8 - 20 GHz Generator Level = +4.8 dBm



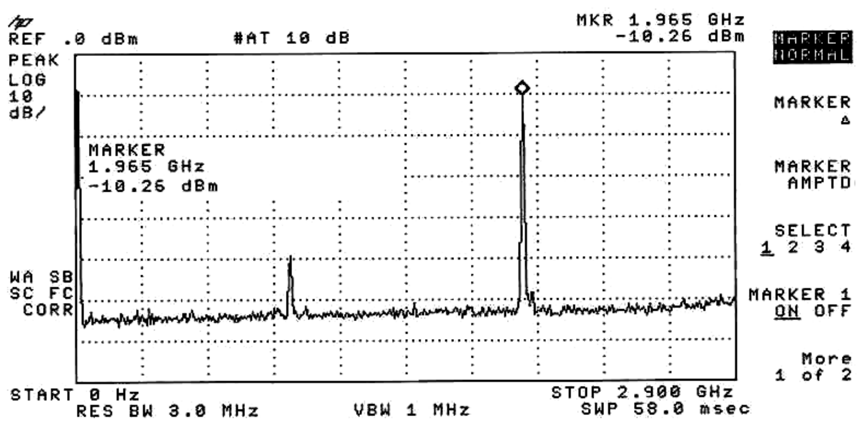
Plot 39 Radiated Spurious – PCS NADC Modulation

Input Level = +4 dBm	Modulation = NADC
Span = 0 – 2.9 GHz	Generator Level = +5.5 dBm



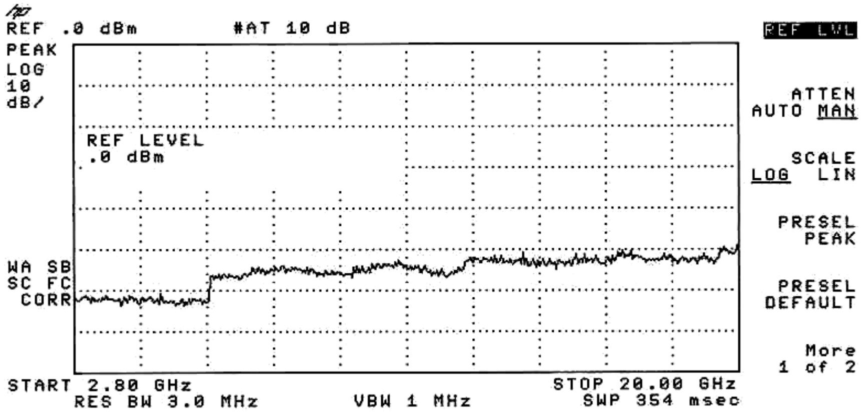
Plot 40 Radiated Spurious – PCS GSM Modulation

Input Level = +4 dBm	Modulation = GSM
Span = 0 – 2.9 GHz	Generator Level = +5.5 dBm



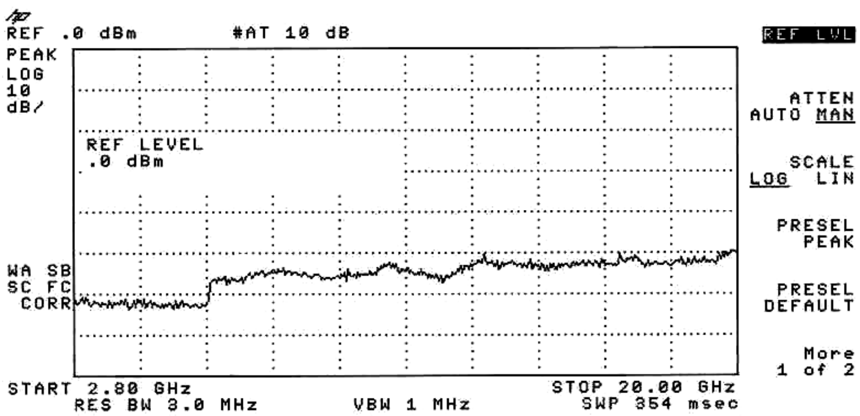
Plot 41 Radiated Spurious – PCS CDMA Modulation

Input Level = +4 dBm	Modulation = CDMA
Span = 0 – 2.9 GHz	Generator Level = +5.5 dBm



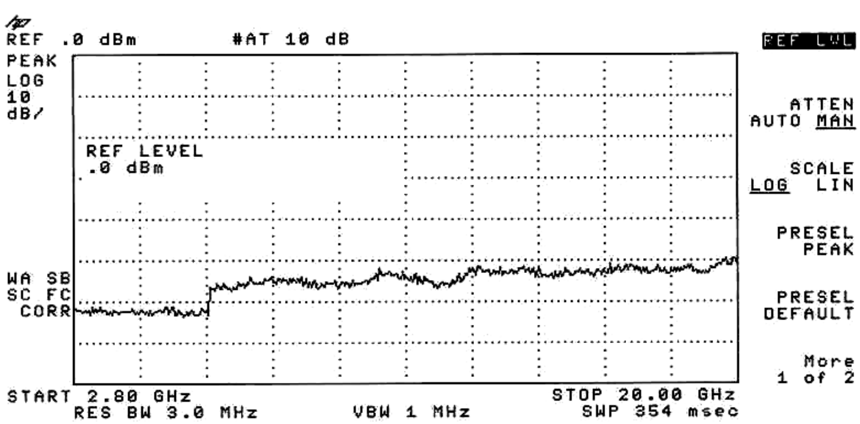
Plot 42 Radiated Spurious – PCS NADC Modulation

Input Level = +4 dBm Modulation = NADC
Span = 2.8 - 20 GHz Generator Level = +5.5 dBm



Plot 43 Radiated Spurious – PCS GSM Modulation

Input Level = +4 dBm Modulation = GSM
Span = 2.8 - 20 GHz Generator Level = +5.5 dBm



Plot 44 Radiated Spurious – PCS CDMA Modulation

Input Level = +4 dBm Modulation = CDMA
Span = 2.8 - 20 GHz Generator Level = +5.5 dBm

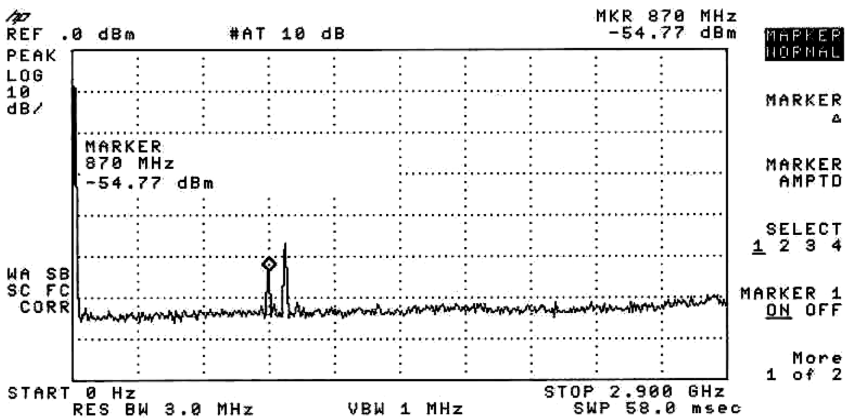
No spurious signals are measurable above the noise level Thus the DUT is compliant with radiated spurious emissions requirements.

Part C: Radiated Spurious Emissions – DUT Terminated

The tests of Part B were repeated with the DUT connected to a 50 ohm termination instead of a radiating antenna. Figure 2.4-1 part C shows the test arrangement.

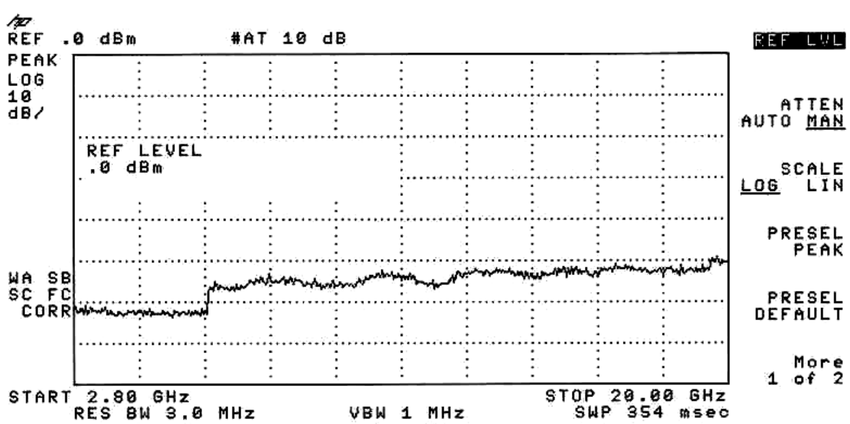
The orientation of the terminated enclosure was varied in various planes in order to find the highest radiated signals.

Results are shown for SMR and PCS frequencies in plots 45 through 48 that follow.



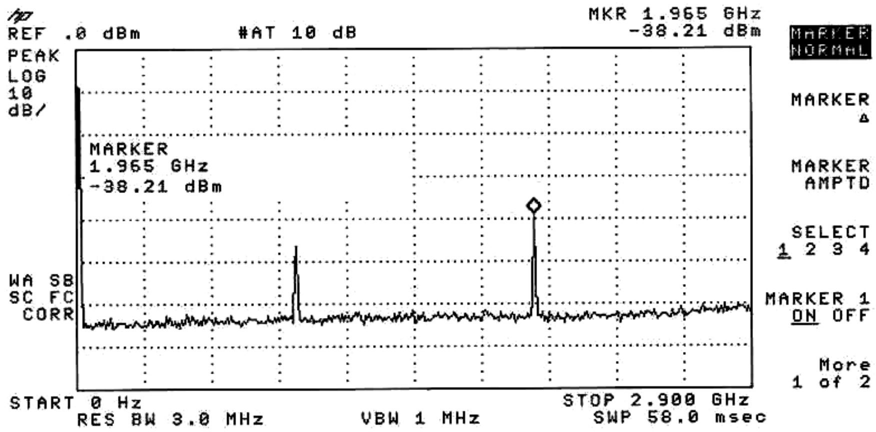
Plot 45 SMR Radiated Spurious – DUT Terminated

Input Level = +4 dBm Modulation = NADC
Span = 0 – 2.9 GHz Generator Level = +4.8 dBm



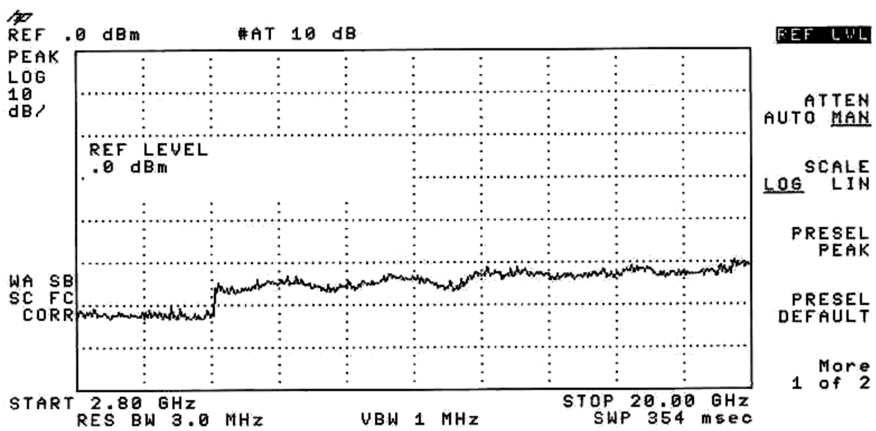
Plot 46 SMR Radiated Spurious – DUT Terminated

Input Level = +4 dBm Modulation = NADC
Span = 2.8 - 20 GHz Generator Level = +4.8 dBm



Plot 47 PCS Radiated Spurious – DUT Terminated

Input Level = +4 dBm Modulation = CDMA
Span = 0 – 2.9 GHz Generator Level = +5.5 dBm



Plot 48 PCS Radiated Spurious – DUT Terminated

Input Level = +4 dBm Modulation = CDMA
Span = 2.8 - 20 GHz Generator Level = +5.5 dBm

The SMR tests show no measurable spurious signals from the DUT. The only signal measurable is the fundamental leakage from the enclosure as shown on Plot 45. This is the same desired signal that is intentionally radiated from the antenna normally connected to the unit and thus does not impact system performance and is not considered a radiated spurious signal

Similarly, the PCS tests show no measurable spurious signals from the DUT. The only signal measurable is the fundamental leakage from the enclosure as shown on Plot 47. This is the same desired signal that is intentionally radiated from the antenna normally connected to the unit and thus does not impact system performance and is not considered a radiated spurious signal

3.0 TEST EQUIPMENT LIST

The test equipment used in performing the tests is listed below:

REFERENCE	PART NUMBER	MANUFACTURER	SERIAL NO.	DESCRIPTION
DUT	001-0300-001	P. G. Electronics	100973	A300 Device Under Test
Network Analyzer 1	HP8753ES	Hewlett-Packard	MY40002281	3 GHz Network Analyzer
Network Analyzer 2	HP8753C	Hewlett-Packard	3029A01161	3 GHz Network Analyzer
Test Set	HP85044A	Hewlett-Packard	2542A02097	Test set used with HP8753C
Spectrum Analyzer	HP8592L	Hewlett-Packard	3801A01119	22 GHz Spectrum Analyzer
Signal Generator	HP ESG-D3000A	Hewlett-Packard	US36260112	3 GHz Signal Generator
CDMA Source	Zebra (P/N 0032-G)	Berkeley Varitronics	987083	CDMA Baseband Source
Power Supply	1627	BK Precision	D30300443	Power Supply (set to 24 V)
PS293 Power Source	001-0293-001	P. G. Electronics		24 VDC DUT Power Source
Combiner	2089-6406-00	M/A-COM	--------	Power Divider/Combiner
Terminator	NTRM-50G	Mini-Circuits	--------	50 Ohm Terminator
10 dB Attn.	771-10	Narda	--------	10dB Attenuator
20 dB Attn.	RFA-60-NFF	RES-NET	--------	20dB Attenuator
Driver Amp	001-0232-001	P. G. Electronics	--------	A232 Amp used as driver
Power Coupler	193-0001-034	P. G. Electronics	--------	Used to couple DC to DUT
Tx Antenna		Allgon	--------	Dual-band Omnidirectional
Horn Antenna	SAS-299/571	AH Systems	289	Horn Antenna

4.0 TEST FACILITY DESCRIPTION

The testing in this exhibit was performed at the factory of the manufacturer:

P. G. Electronics, Ltd.
800 Arrow Rd., Unit 8,
Toronto, Ontario M9M 2Z8
Canada

P. G. Electronics has recently been granted equipment authorization on the Model A289 by the FCC (FCC ID: P6T81902, Grant Date: June 21, 2002). The Model A300 is similar to the A289 but uses SMR diplexers instead of cellular diplexers. The output power ratings of both units is the same.

Both units use diplexers which are fixed-tuned and neither unit requires any tuning. The units contain no oscillators or frequency translation circuitry.

All tests described herein were performed in the company laboratory using the same test arrangements as for the A289 (FCC ID: P6T81902).

5.0 CONCLUSIONS

Testing has demonstrated that the unit meets the requirements for FCC Type Acceptance.