Standards Council of Canada
Accredited Laboratory
Scope of Accreditation 75

Conseil canadien des normes
Laboratoire accrédité
Portée d'accréditation 75

TM

Test Report:	4W29268 Issue III
Applicant:	Spotwave Wireless Inc. 1 Hines Rd. Ottawa, Ontario K2K 3C7
Equipment Under Test: (EUT)	DU 1900 Full Band
FCC ID:	**P3YSPOTCELL0013**
In Accordance With:	**FCC Part 24**
Tested By:	Nemko Canada Inc. 303 River Road, R.R. 5 Ottawa, Ontario K1V 1H2
Authorized By:	Kevin Carr, EMC/EMI/Wireless Specialist.
Date:	22 October 2004
Total Number of Pages:	27

Table of Contents

Section 1. Summary of Test Results

General

All measurements are traceable to national standards.

These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with FCC Part 24.

THIS TEST REPORT RELATES ONLY TO THE ITEM(S) TESTED.

THE FOLLOWING DEVIATIONS FROM, ADDITIONS TO, OR EXCLUSIONS FROM THE TEST SPECIFICATIONS HAVE BEEN MADE.

TESTED BY: _____ DATE: 22 October 2004
Glen Westwell, Wireless Specialist.

Summary Of Test Data

Name Of Test	Para. No.	Result
RF Power Output	2.1046	Complied
Occupied Bandwidth	2.1049	Complied
Spurious Emissions at Antenna Terminals	2.1051	Complied
Field Strength of Spurious Emissions	2.1053	Complied
Out of Band Rejection	EAB/RF-2-11-04	Complied
Frequency Stability	2.1055	Complied

Indoor Temperature: 25°C
Humidity: 44%

Outdoor Temperature: 18°C
Humidity: 45%

Section 2. General Equipment Specification

Manufacturer:	Spotwave Wireless Inc.
Model No.:	DU 1900 Full Band
Serial No.:	None.
Date Received In Laboratory:	15 Sept 2004
Nemko Identification No.:	#2
Supply Input Voltage:	10.5Vdc
Frequency Range:	Uplink: 1850-1910MHz
Rated Output Power (conducted composite):	GSM & CDMA: +18.5dBm, 0.071W WCDMA: +15.5dBm, 0.036W
Antenna Gain (maximum):	11.5dBi
Emission Designator	GXW (GSM) F9W (CDMA) F9W (WCDMA)

Section 3. RF Power Output

Para. No.: 2.1046

Test Performed By: Glen Westwell	**Date of Test: 13 Sept. 2004**

Minimum Standard: 24.232

Test Results: Complied.

Measurement Data:
The maximum RF output power is within +1dB of the manufacturer's rating. The Composite RF output power is de-rated according to the number of channels via AGC and is equal to Pmax –10LogN.

Pmax = Maximum Composite RF Output Power
N = Number Of Channels

The power levels were measured at maximum input drive and gain. This device uses AGC to prevent saturation or over-modulation.

Uplink Maximum Conducted Power

Channel Frequency (MHZ)	Measured Power (dBm)	Rated Max. Power (dBm)
1850	12.1	18.5
1860	16.2	18.5
1870	18.5	18.5
1870	18.2	18.5
1880	18.0	18.5
1890	18.5	18.5
1890	18.0	18.5
1900	18.5	18.5
1910	11.6	18.5

Note:
(1) Power measurements are shown across all three 20MHz band selections to cover the complete 60MHz uplink. Band edge attenuation due to the filter characteristics can be seen in the table above.

Section 4. Occupied Bandwidth

Para. No.: 2.1049

Test Performed By: Glen Westwell	**Date of Test: 15 Sept 2004**

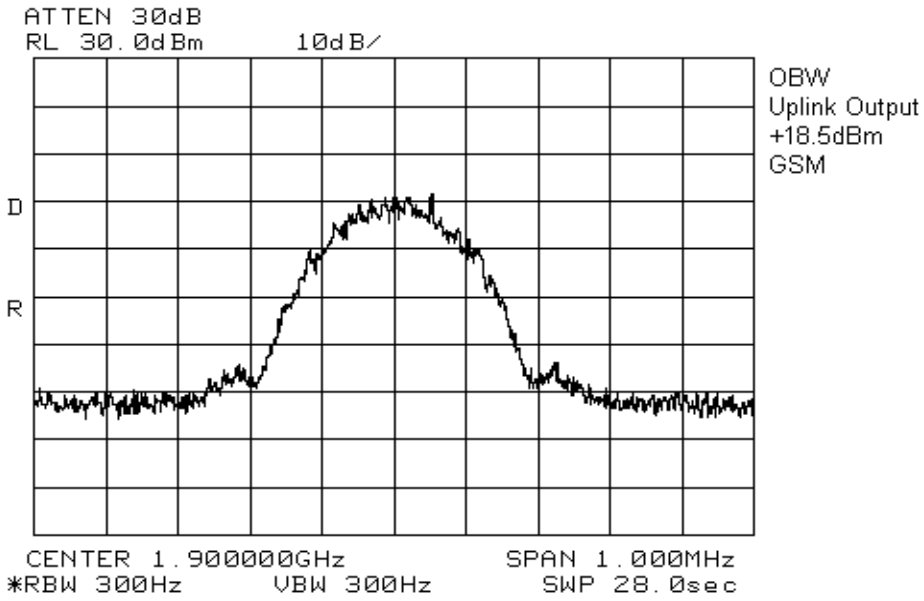
Minimum Standard: 24.238

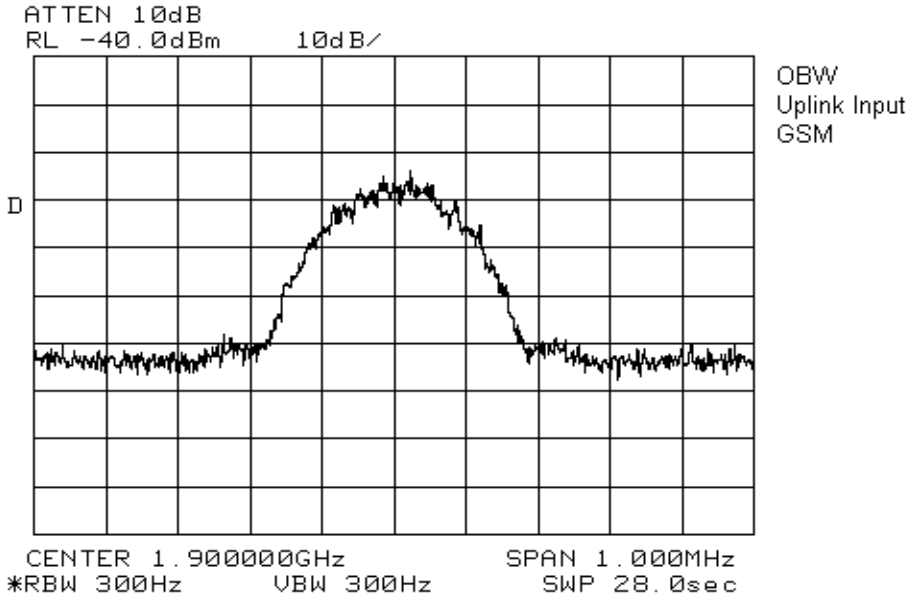
Test Results: Complies.

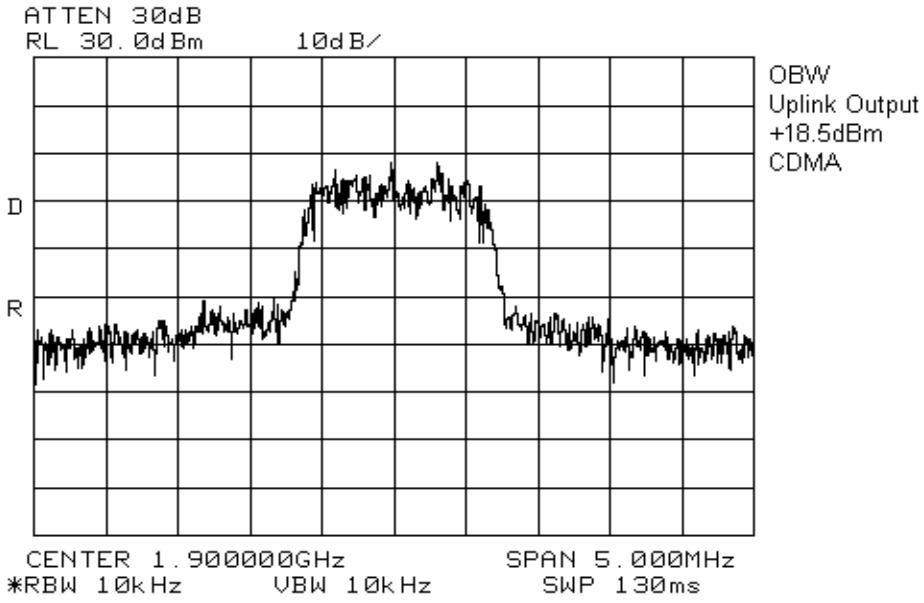
Measurement Data: See attached graphs.

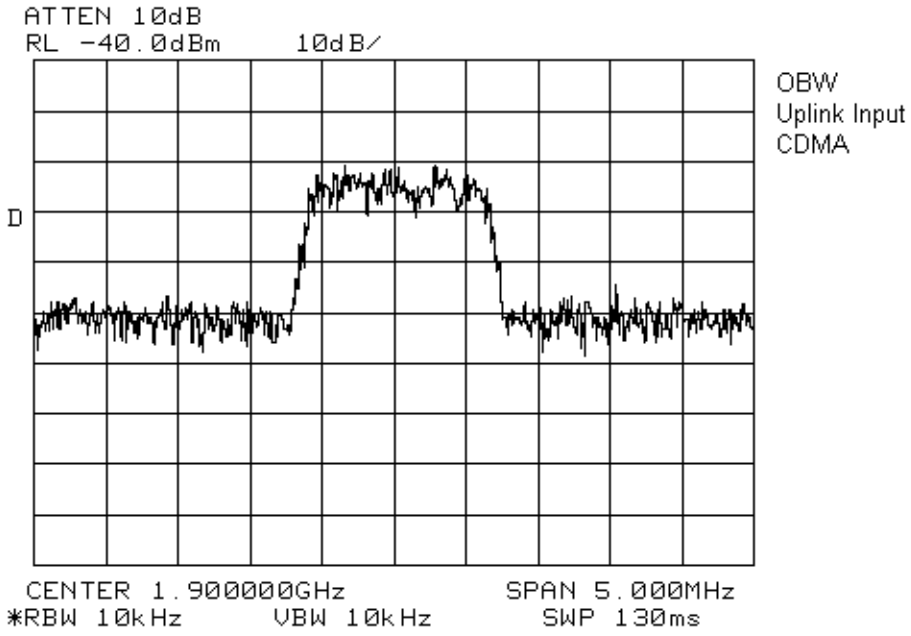
The occupied bandwidth was measured by comparison of input from the signal generator to the output signal from the amplifier. This was done in order to determine if there was any degradation to the output signal due to the amplification and conversion through the repeater.

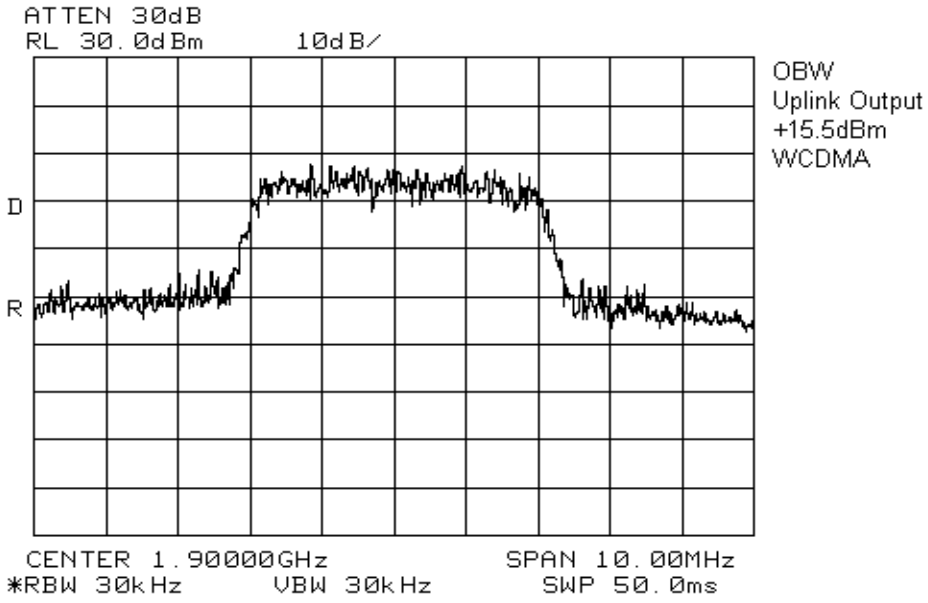
Uplink, Input vs Output
PCS Band

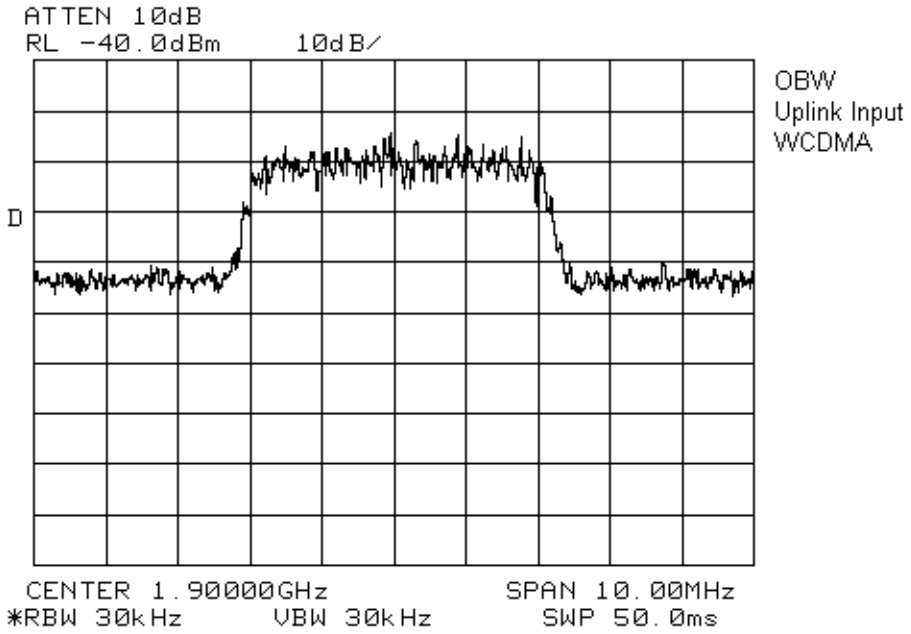





ATTEN 30dB
RL 30.0dBm
10dB/
D
R
OBW
Uplink Output
+18.5dBm
CDMA
CENTER 1.900000GHz
SPAN 5.000MHz
*RBW 10kHz
VBW 10kHz
SWP 130ms


ATTEN 10dB
RL -40.0dBm
10dB/
D
OBW
Uplink Input
CDMA
CENTER 1.900000GHz
SPAN 5.000MHz
*RBW 10kHz
VBW 10kHz
SWP 130ms


ATTEN 30dB
RL 30.0dBm
10dB/
D
R
OBW
Uplink Output
+15.5dBm
WCDMA
CENTER 1.90000GHz
SPAN 10.00MHz
*RBW 30kHz
VBW 30kHz
SWP 50.0ms


ATTEN 10dB
RL -40.0dBm
10dB/
D
OBW
Uplink Input
WCDMA
CENTER 1.90000GHz
SPAN 10.00MHz
*RBW 30kHz
VBW 30kHz
SWP 50.0ms

Section 5. Spurious Emissions at Antenna Terminals

Para. No.: 2.1051

Test Performed By: Glen Westwell	**Date of Test: 17 Sept 2004**

Minimum Standard: 24.238, -13dBm

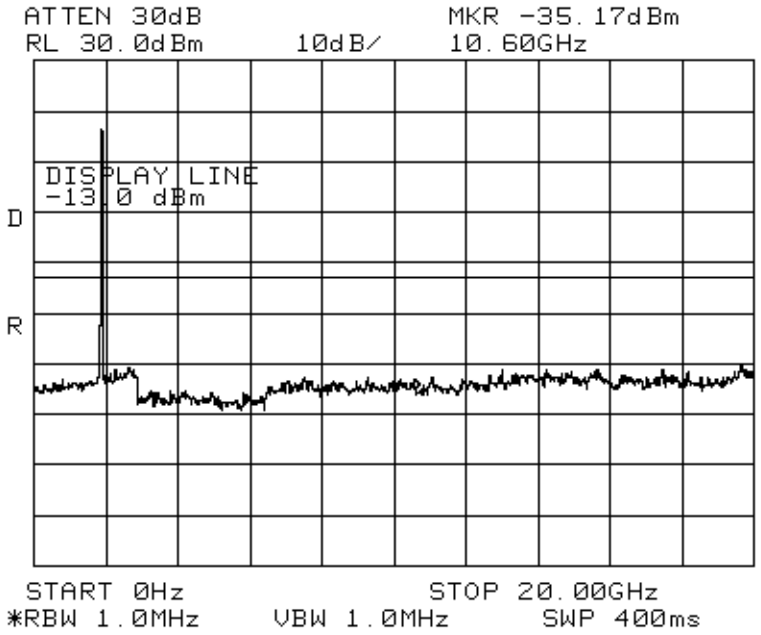
Test Results: Complies.

(1) Spurious emissions were searches at low, mid & high ends of the band. Worst case plots have been included.

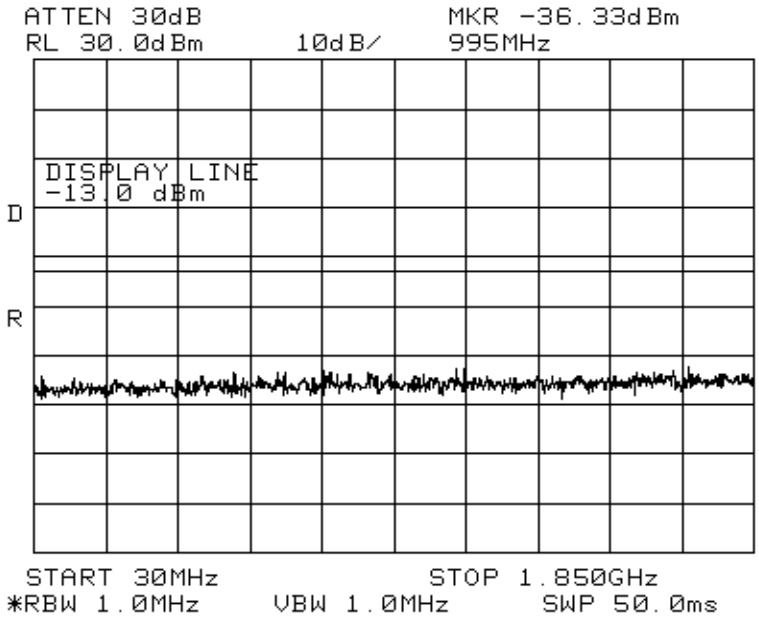
(2) See section 7, Out-of-Band rejection.

Measurement Data: See Attached Graphs.

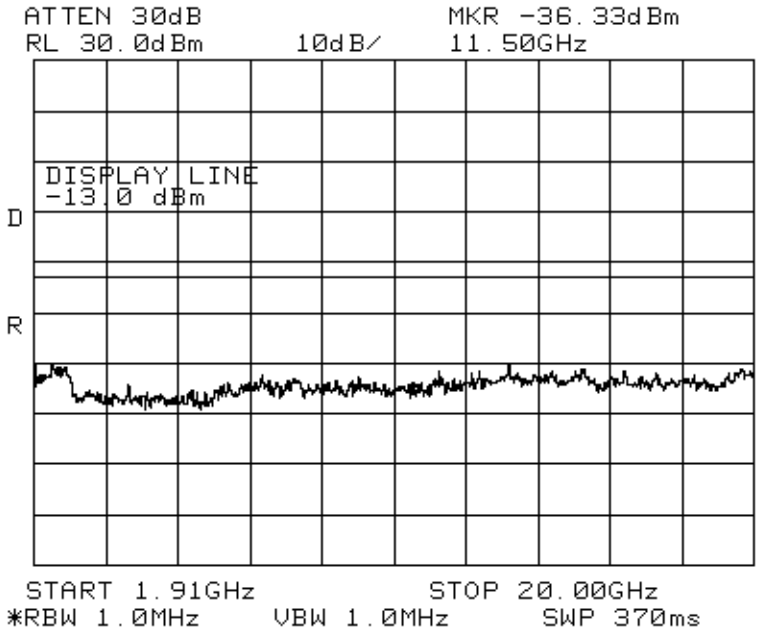
PCS Band



Conducted Spurious
+18.5dBm Composite
Uplink

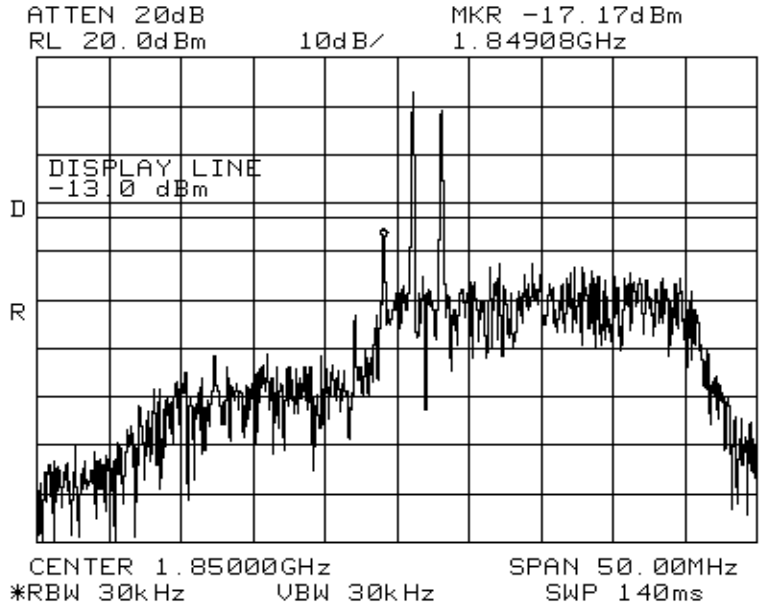


Conducted Spurious
+18.5dBm Composite
Uplink

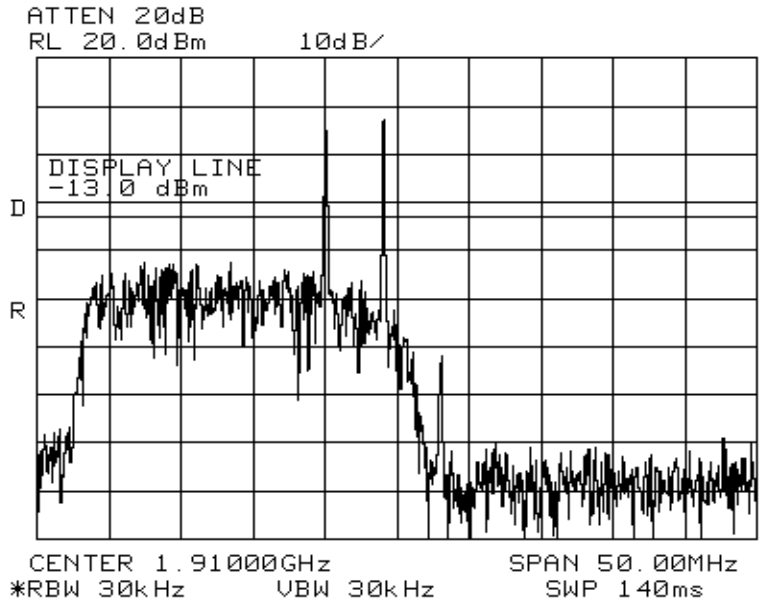


Conducted Spurious
+18.5dBm Composite
Uplink

GSM

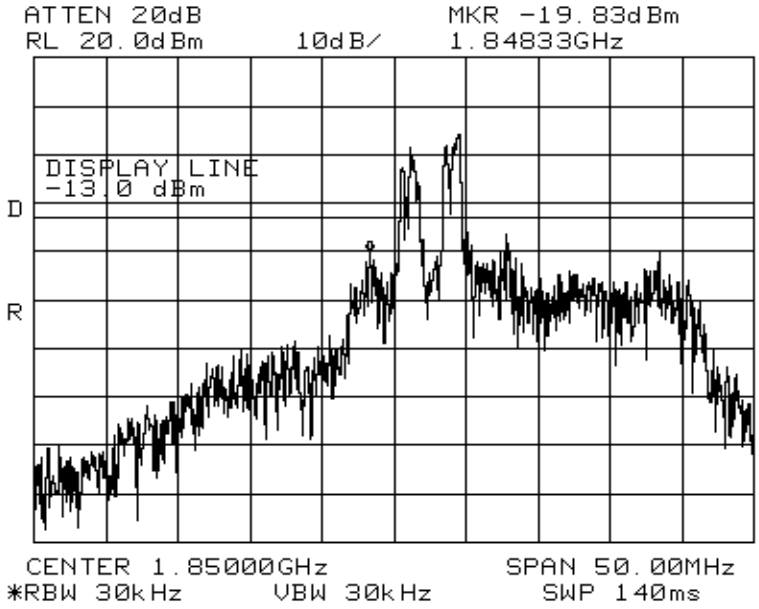


Lower Band Edge
+18.5dBm Composite
GSM

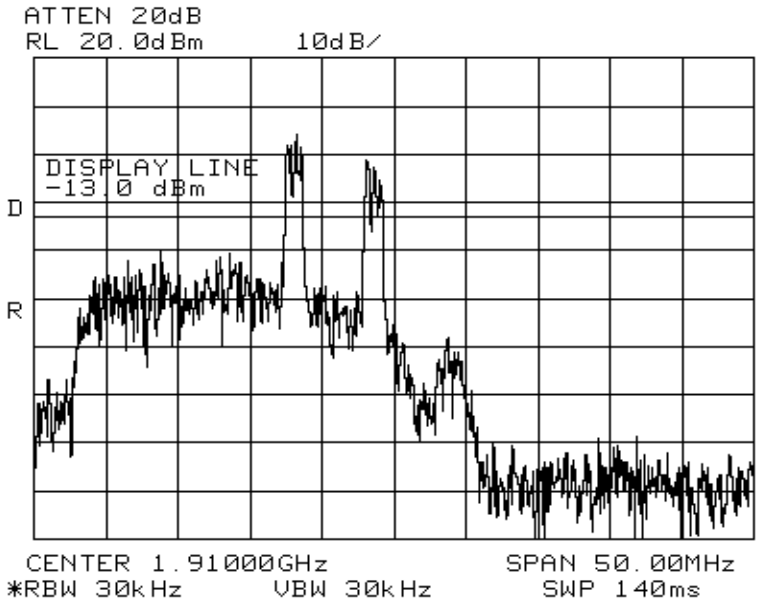


Upper Band Edge
+18.5dBm Composite
GSM

CDMA

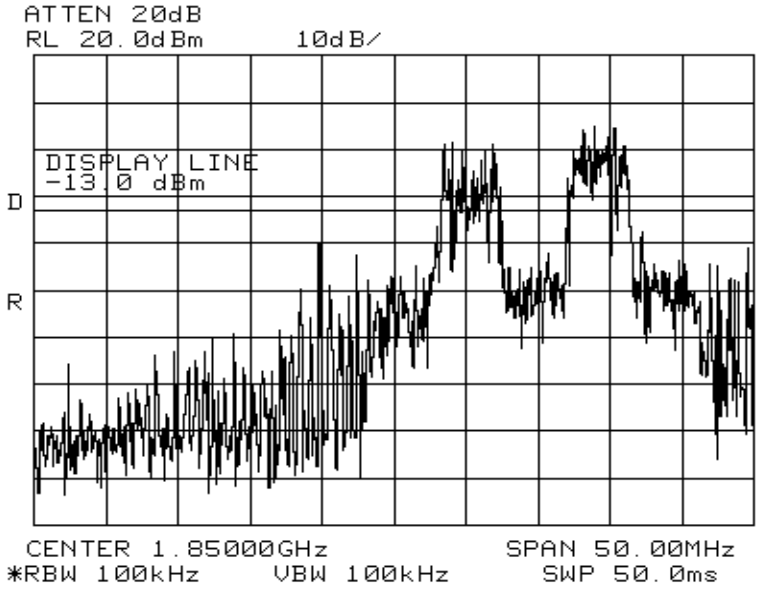


Lower Band Edge
+18.5dBm Composite
CDMA

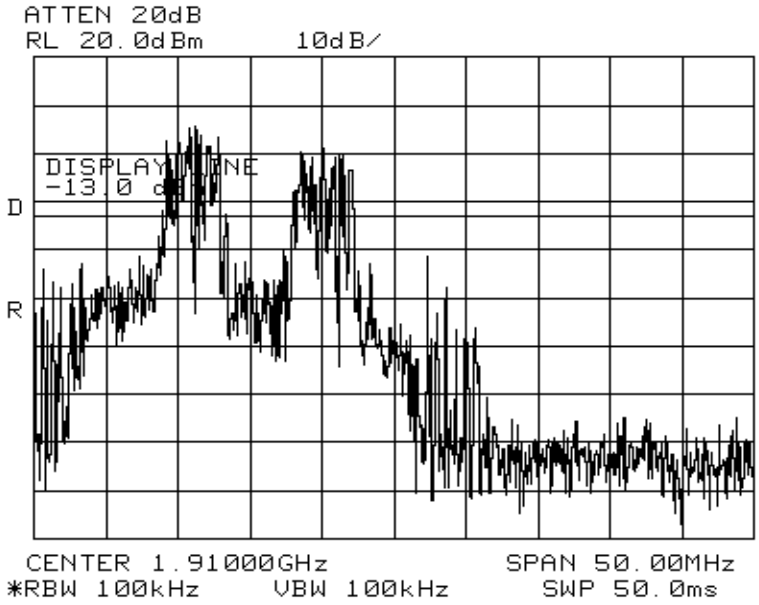


Upper Band Edge
+18.5dBm Composite
CDMA

WCDMA



Lower Band Edge
+15.5dBm Composite
WCDMA



Upper Band Edge
+15.5dBm Composite
WCDMA

Section 6. Field Strength of Spurious Emissions

Para. No.: 2.1053

Test Performed By: Glen Westwell	**Date of Test: 29 Sept. 2004**

Minimum Standard: 24.238, -13dBm

Test Results: Complied.

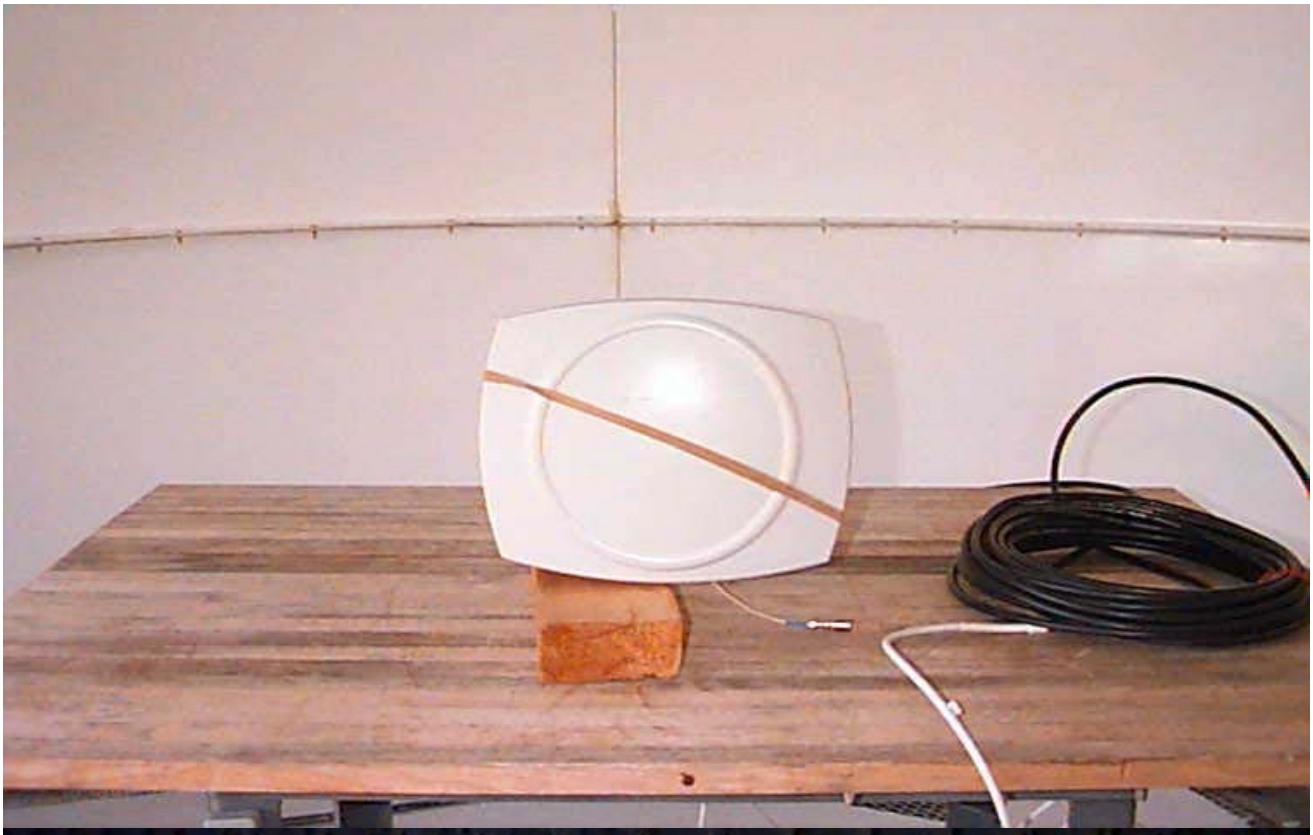
Note: Radiated spurious and harmonic emissions were searched from 30MHz to the 18GHz. One was detected.
All emissions within 20dB of the limit were reported.

Measurement Data: See table.

Radiated Emissions
Tower: A Search Distance: 3m Standard: Signal Substitution, TIA/EIA-603
Receiver: HP8565E

Emission Frequency (MHz)	Ant.	Pol.	Maximized Emission (dBuV)	Signal Substitution Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Amp.
3720	Hrn1	V	68.2	-48.5	-13.0	35.5	Peak	2-4GHz
3720	Hrn 1	H	68.5	-51.1	-13.0	38.1	Peak	2-4GHz

Emissions Search Photos



Section 7. Out of Band Rejection

Para. No.: EAB/RF-2-11-04

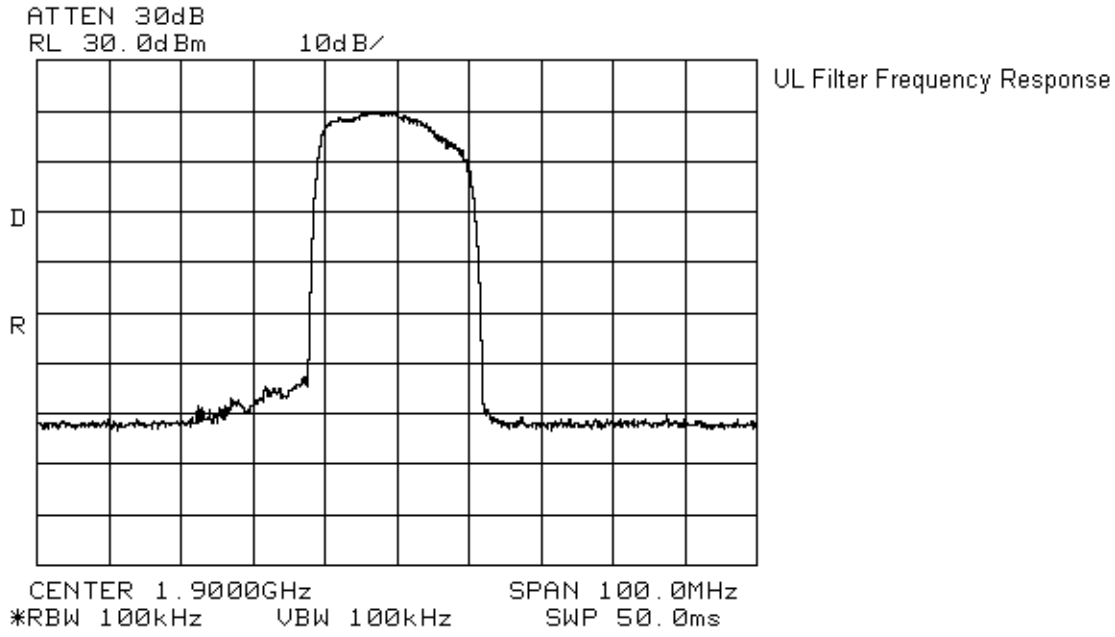
Test Performed By: Glen Westwell	**Date of Test: 17 Sept. 2004**

Limit: -13dBm

Test Results: Complied.

Measurement Data: See attached plots.

PCS Band


ATTEN 30dB
RL 30.0dBm
10dB/
UL Filter Frequency Response
D
R
CENTER 1.9000GHz
SPAN 100.0MHz
*RBW 100kHz
VBW 100kHz
SWP 50.0ms

Section 8. Frequency Stability

Para. No.: 2.1055

Test Performed By: Glen Westwell	**Date of Test: 29 Sept. 2004**

Minimum Standard: 24.235

Test Results: Complies. The maximum frequency drift is 0 Hz.

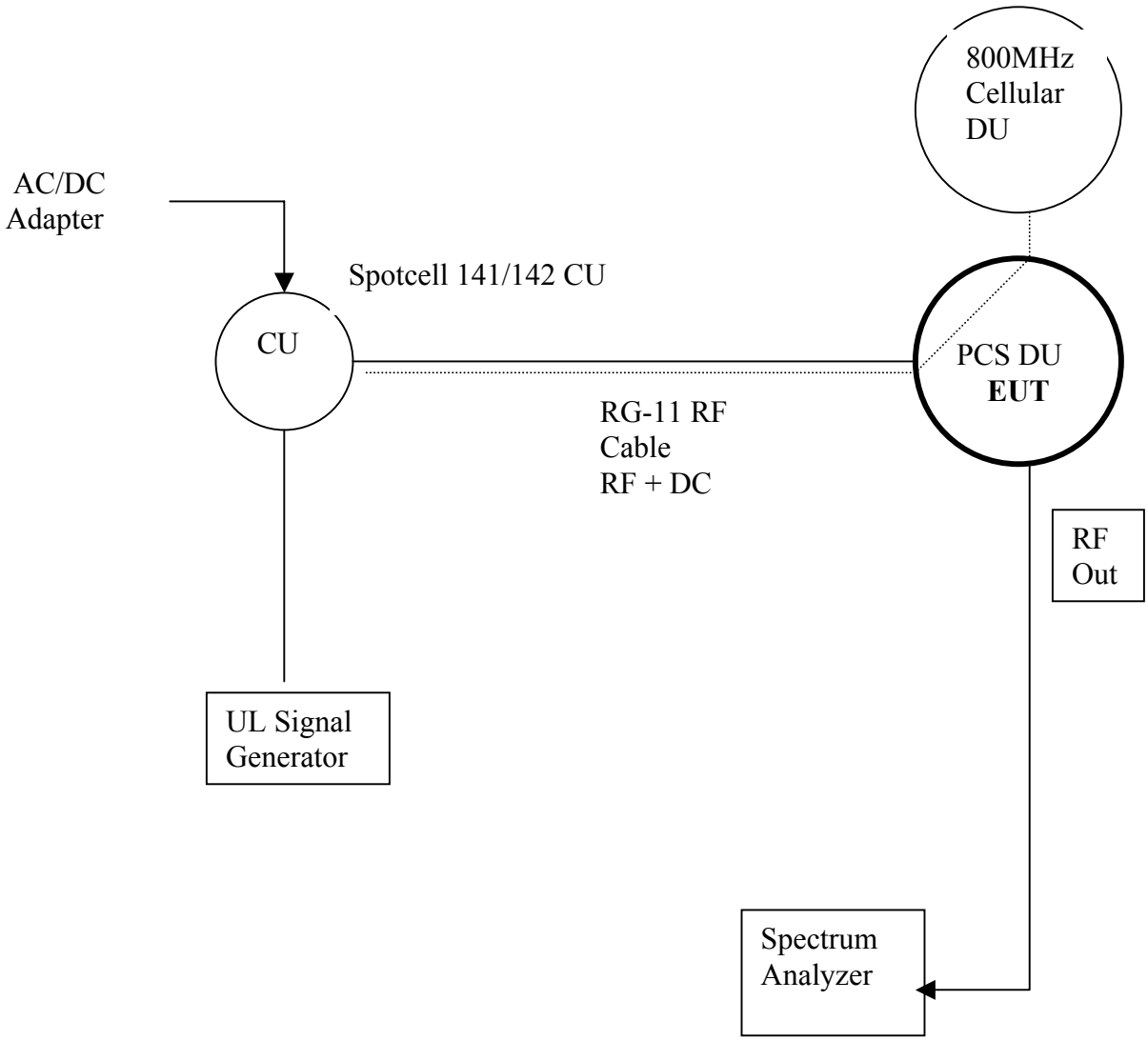
Measurement Data: Standard Test Frequency: (-30°C to +50°C)

PCS Uplink DU radio: 1860.000 000 MHz

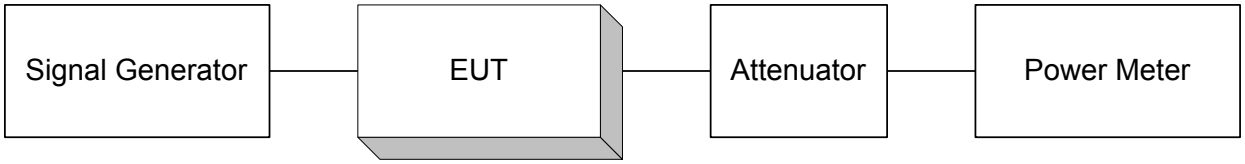
▪Frequency deviation was verified every 10°C from -30°C to +50°C, as well as at voltage variation of +/- 15% of supply voltage.

Section 9. Block Diagrams

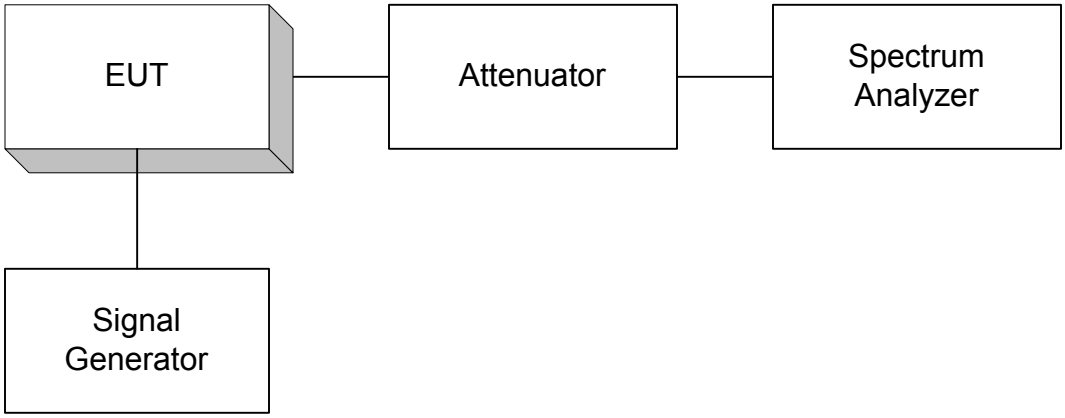
EUT Test Set Up



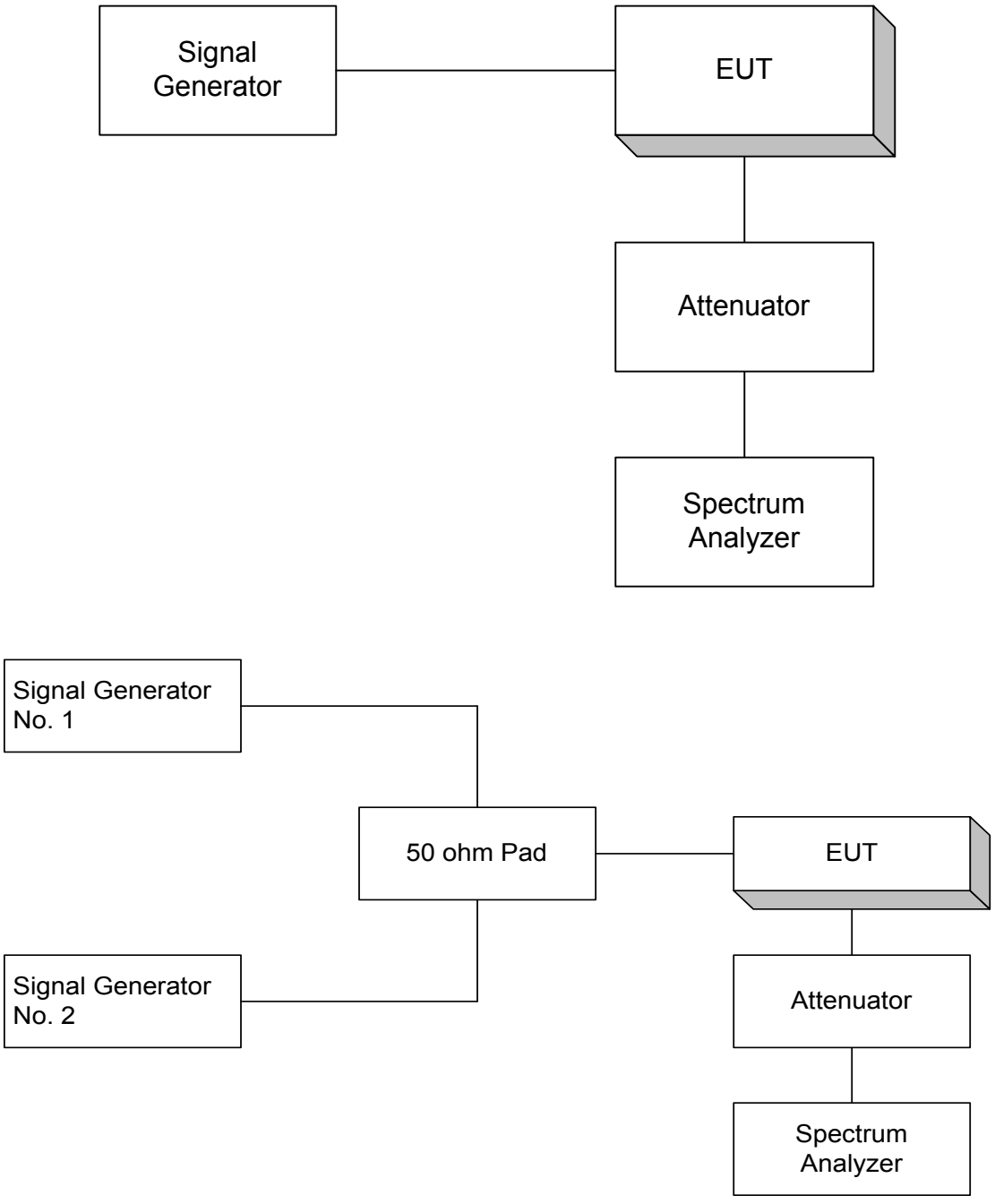
Para. No. 2.1046 - R.F. Power Output



Para. No. 2.1049 - Occupied Bandwidth

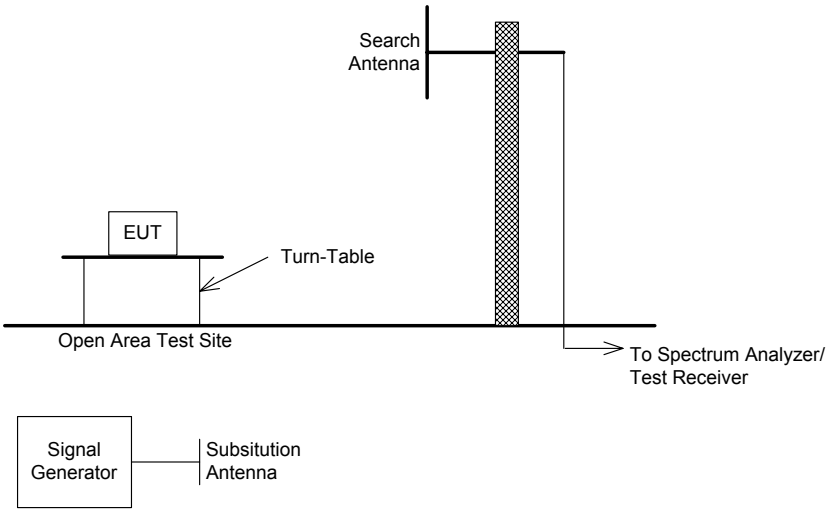


Para. No. 2.1051 - Spurious Emissions at Antenna Terminals

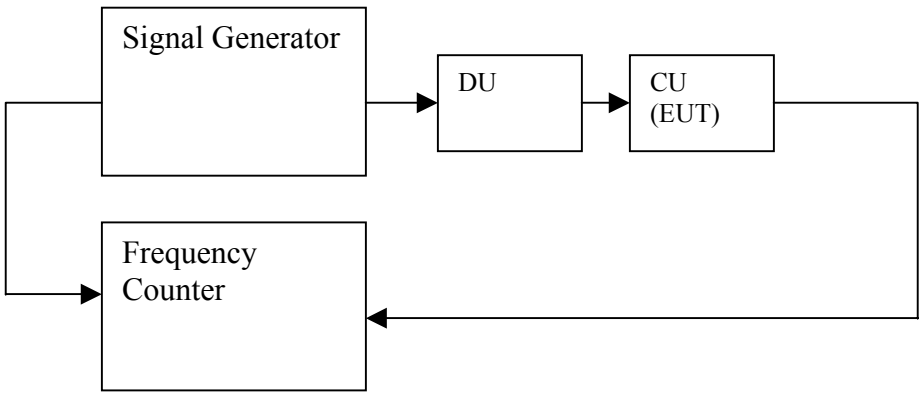


Para. No. 2.1053 - Field Strength of Spurious Radiation

TIA/EIA 603, Signal Substitution Method



Para. No. 2.1055 Frequency Stability



Section 10. Test Equipment List

CAL CYCLE	EQUIPMENT	MANUFACTURER	MODEL	SERIAL	LAST CAL.	NEXT CAL.
1 Year	Spectrum Analyzer	Hewlett Packard	8565E	FA000981	31 May 04	31 May 05
3 Year	Signal Generator	Rohde & Schwarz	SM1Q03	FA001091	25 Sep 03	25 Sep 06
1 Year	Signal Generator	Rohde & Schwarz	SM1Q06B	FA001878	18 May 04	18 May 05
1 Year	Power Meter	Hewlett Packard	E4418B	FA001413	26 May 04	26 May 05
1 Year	Power Sensor	Hewlett Packard	8487A	FA001741	09 Jun 04	09 Jun 05
1 Year	RF AMP	JCA	4-8 GHz	FA001497	18 June 04	18 June 05
1 Year	RF AMP	JCA	2-4 GHz	FA001496	18 June 04	18 June 05
1 Year	RF AMP	JCA	1-2 GHz	FA001498	18 June 04	18 June 05
1 Year	RF AMP	Narda	5 - 18GHz	FA001409	COU	COU
1 Year	Climate Chamber	Thermotron	SM-16C	15649-S	COU	COU
1 Year	Frequency Counter	Hewlett Packard	HP5350A	FA000086	19 Feb 04	19 Feb 05
1 Year	Spectrum Analyzer	Hewlett-Packard	8566B	FA001309	May 28/04	May 28/05
1 Year	Spectrum Analyzer Display	Hewlett-Packard	85662A	FA001309	May 28/04	May 28/05
NCR	Bilog	Schaffner	CBL6112B	FA001504	NCR	NCR
1 Year	Horn Antenna	EMCO #1	3115	FA000649	18 Dec 03	18 Dec 04
1 Year	Receiver	Rohde & Schwarz	ESVP	FA000871	Jan. 16/04	Jan. 16/05
1 Year	Log Periodic Antenna #2	EMCO	3148	FA001355	May 05/04	May 05/05
1 Year	Biconical (2) Antenna	EMCO	3109	FA000904	Aug 3/04	Aug 3/05

NA: Not Applicable
NCR: No Cal Required
COU: CAL On Use