



Nemko Test Report: 5L0546RUS1

Applicant: Nokia, Inc.

Equipment Under Test: 6265i
(E.U.T.)

FCC ID: QMNRM-66

In Accordance With: **FCC Part 24, Subpart E**
Broadband PCS Subscriber Station

Tested By: Nemko USA Inc.
802 N. Kealy
Lewisville, TX
75057-3136

Authorized By: 
Resource Manager

Date: 11/30/05



NVLAP LAB CODE: 100426-0

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*EQUIPMENT: 6265i**FCC ID: QMNRM-66*PROJECT NO.: **5L0546RUS1**

Section 1. Summary of Test Results

Manufacturer: Nokia, Inc.

Model No.: 6265i

Type: RM-66

Serial No.: ESN:033/07776604

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, Subpart E.

☐

New Submission

☐

Production Unit

☒

Class II Permissive Change

☒

Pre-Production Unit

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.

See “ Summary of Test Data”.

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This report applies only to the items tested.

*EQUIPMENT: 6265i**FCC ID: QMNRM-66*PROJECT NO.: **5L0546RUS1**

Summary Of Test Data

NAME OF TEST	PARA. NO.	RESULT
RF Power Output	24.232	*Not Tested
Occupied Bandwidth	24.238	Complies
Spurious Emissions at Antenna Terminals	24.238(a)	Complies
Field Strength of Spurious Emissions	24.238(a)	Complies
Frequency Stability	24.235	Complies

Footnotes:

* Tested by Nokia

EQUIPMENT: 6265i

FCC ID: QMNRM-66

PROJECT NO.: **5L0546RUS1**

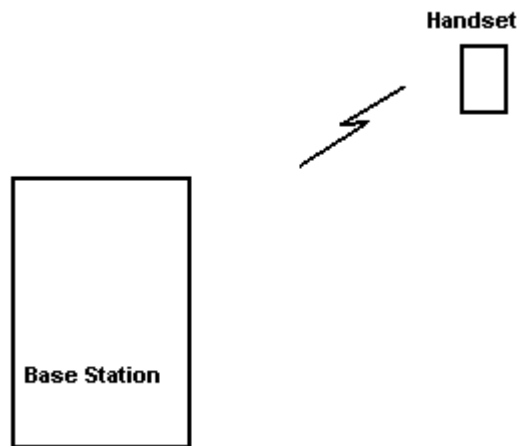
Section 2. General Equipment Specification

Supply Voltage Input:			
Frequency Bands:	☒ Block A : 1850 – 1865 MHz ☒ Block B : 1865 – 1870 MHz ☒ Block C : 1870 – 1885 MHz ☒ Block D : 1885 – 1890 MHz ☒ Block E : 1890 – 1895 MHz ☒ Block F : 1895 – 1910 MHz		
Type of Modulation and Designator:	CDMA (F9W) ☒	GSM (GXW) ☐	NADC (DXW) ☐
Emission Designator:	1M23F9W		
Necessary Bandwidth:	1.23 MHz		
Output Impedance:	50 ohms		

System Description

Cellular handset operating at 850AMPS, 850 CDMA and 1900 CDMA

System Diagram



EQUIPMENT: 6265i

FCC ID: QMNRM-66

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Section 3. Occupied Bandwidth

NAME OF TEST: Occupied Bandwidth (CDMA)	PARA. NO.: 2.1047
TESTED BY: David Light	DATE: 10 November 2005

Test Results: Complies.

Test Data: See attached plots.

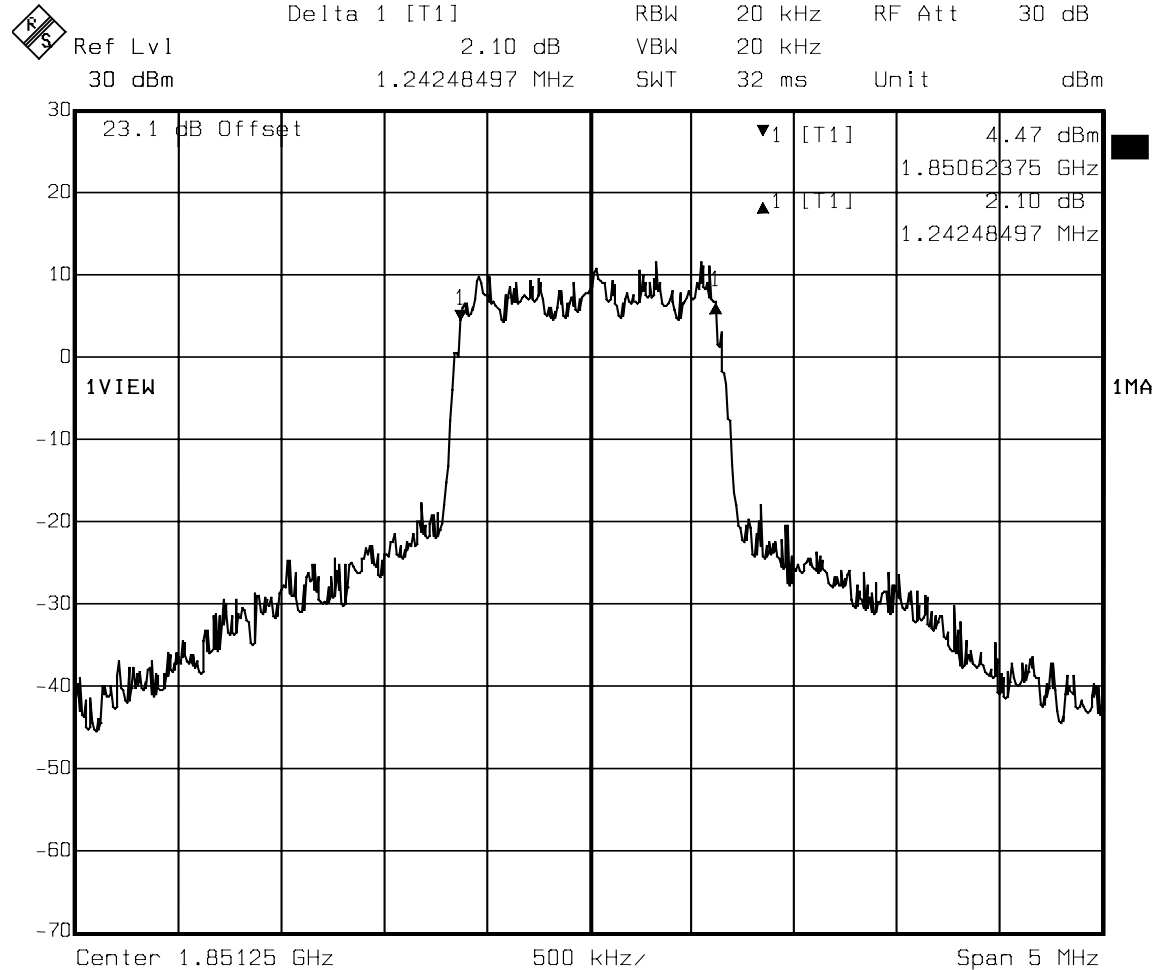
EQUIPMENT: 6265i

FCC ID: QMNRM-66

PROJECT NO.: 5L0546RUS1

Test Data – Occupied Bandwidth

Channel 25



Date: 10.NOV.2005 12:14:14

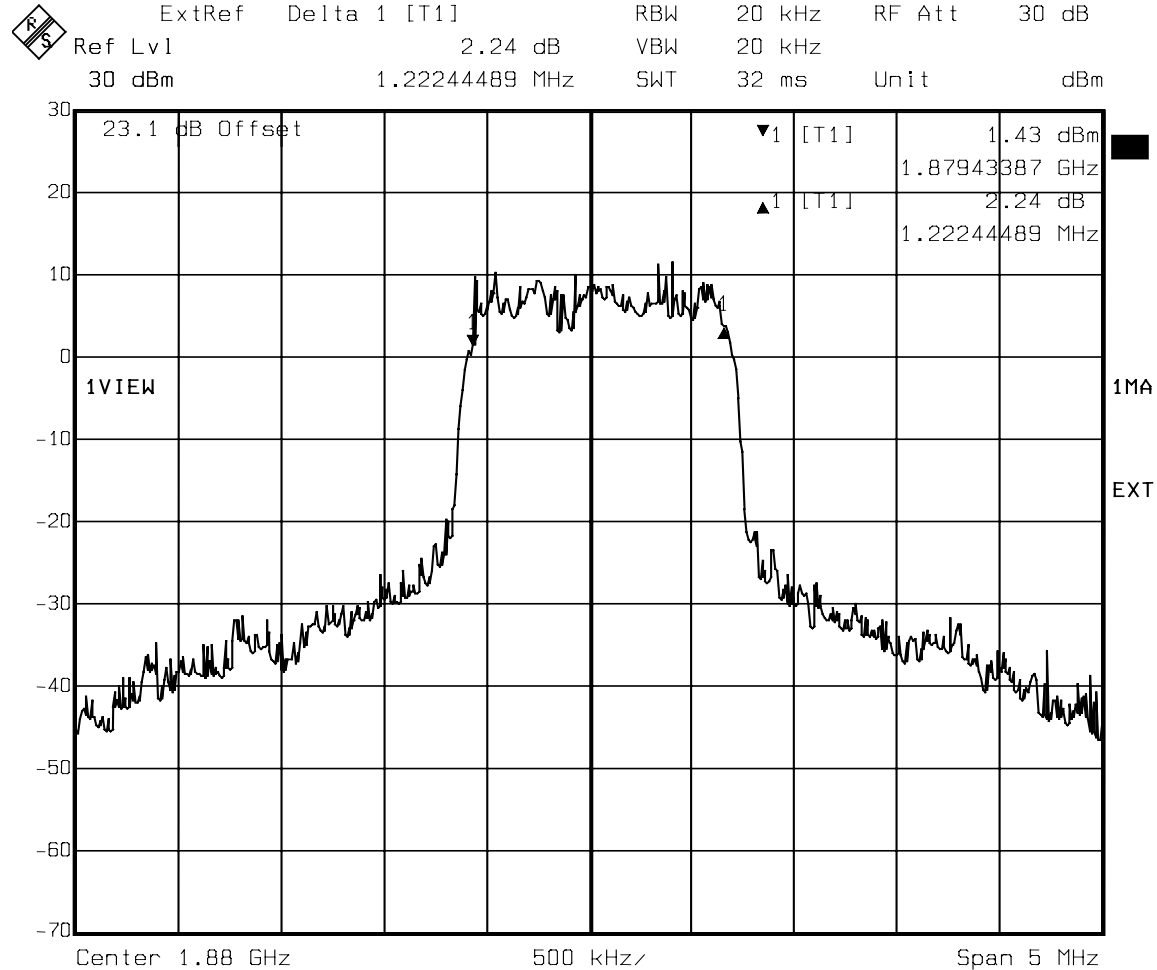
EQUIPMENT: 6265i

FCC ID: QMNRM-66

PROJECT NO.: 5L0546RUS1

Test Data – Occupied Bandwidth

Channel 600



Date: 10.NOV.2005 11:56:39

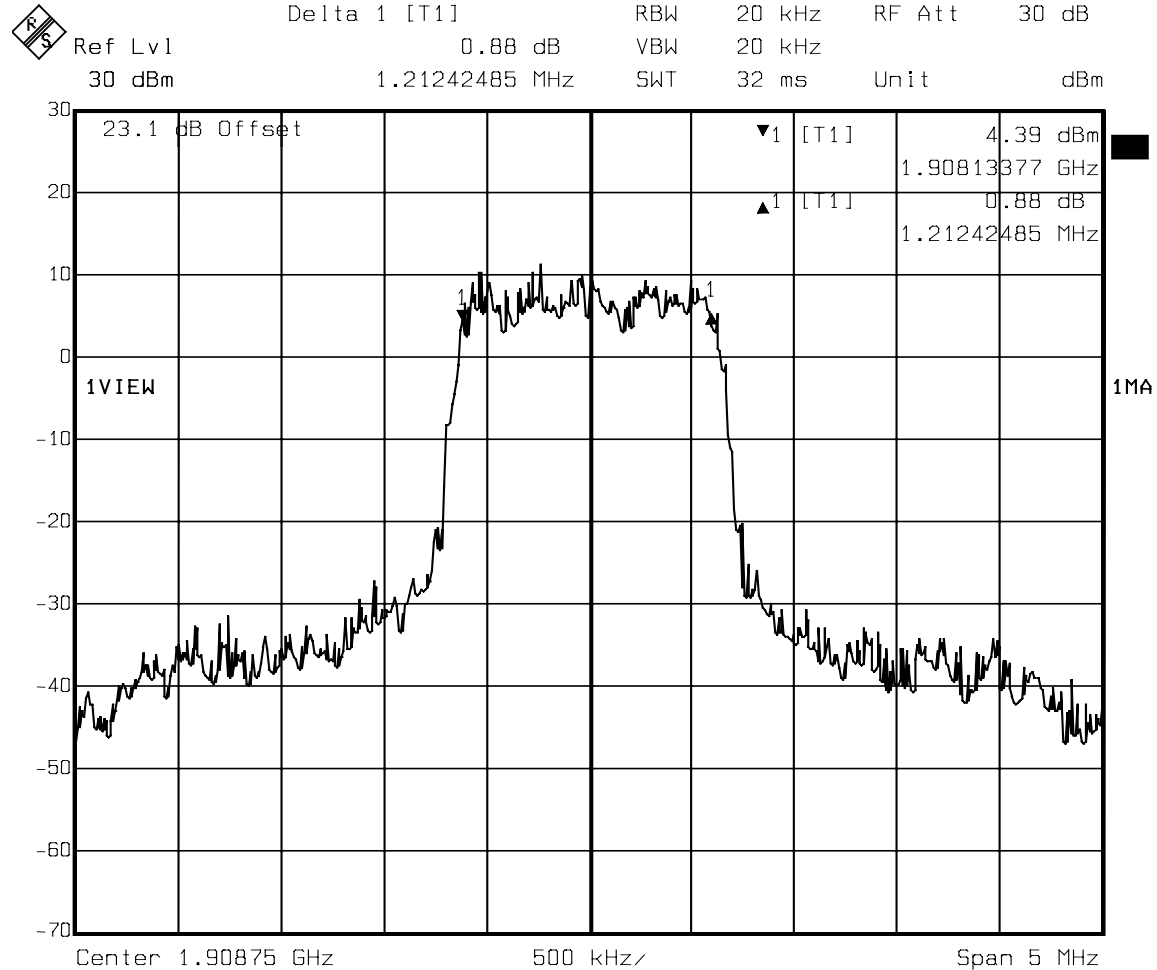
EQUIPMENT: 6265i

FCC ID: QMNRM-66

PROJECT NO.: 5L0546RUS1

Test Data – Occupied Bandwidth

Channel 1175



Date: 10.NOV.2005 12:15:53

EQUIPMENT: 6265i

FCC ID: QMNRM-66

PROJECT NO.: **5L0546RUS1**

Section 4. Spurious Emissions at Antenna Terminals

NAME OF TEST: Spurious Emissions @ Antenna Terminals	PARA. NO.: 2.1051
TESTED BY: David Light	DATE: 10 November 2005

Test Results: Complies.

Test Data: Attached

Note: The handset was tested on three channels. The noise floor data presented is representative of all PCS channels tested.

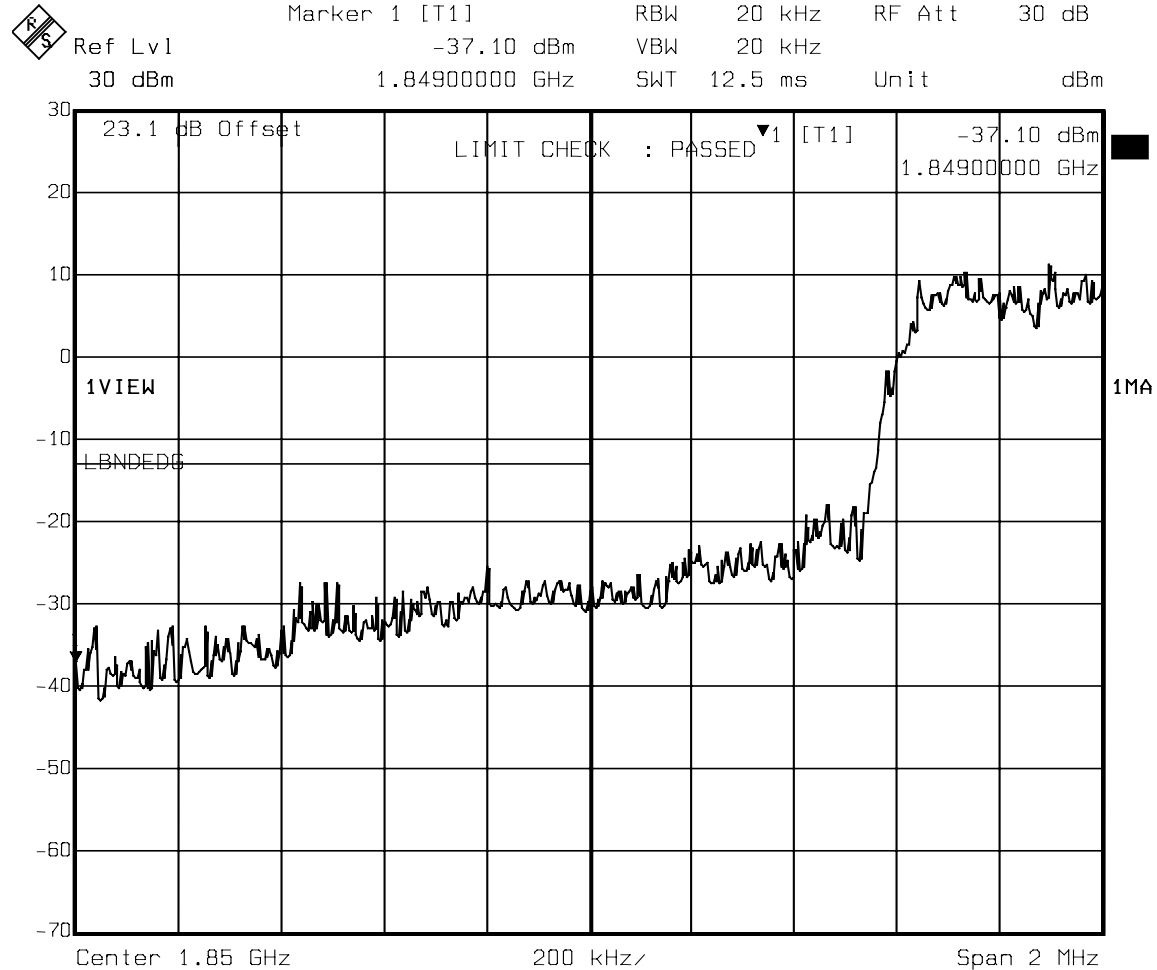
EQUIPMENT: 6265i

FCC ID: QMNRM-66

PROJECT NO.: 5L0546RUS1

Test Data – Spurious Emissions at Antenna Terminals

Channel 25



Date: 10.NOV.2005 12:09:37

EQUIPMENT: 6265i

FCC ID: QMNRM-66

PROJECT NO.: 5L0546RUS1

Test Data – Spurious Emissions at Antenna Terminals

Channel 1175

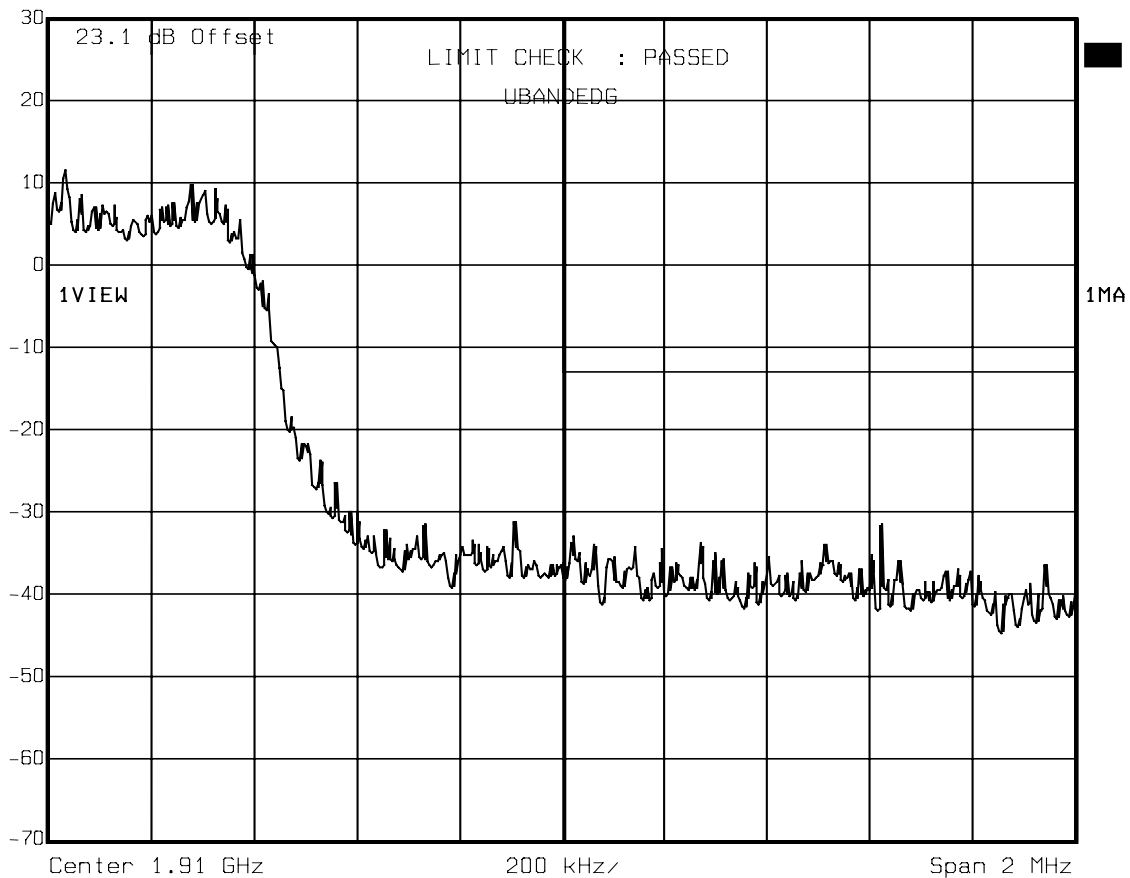


Ref Lvl
30 dBm

RBW 20 kHz RF Att 30 dB

VBW 20 kHz

SWT 12.5 ms Unit dBm



Date: 10.NOV.2005 12:11:18

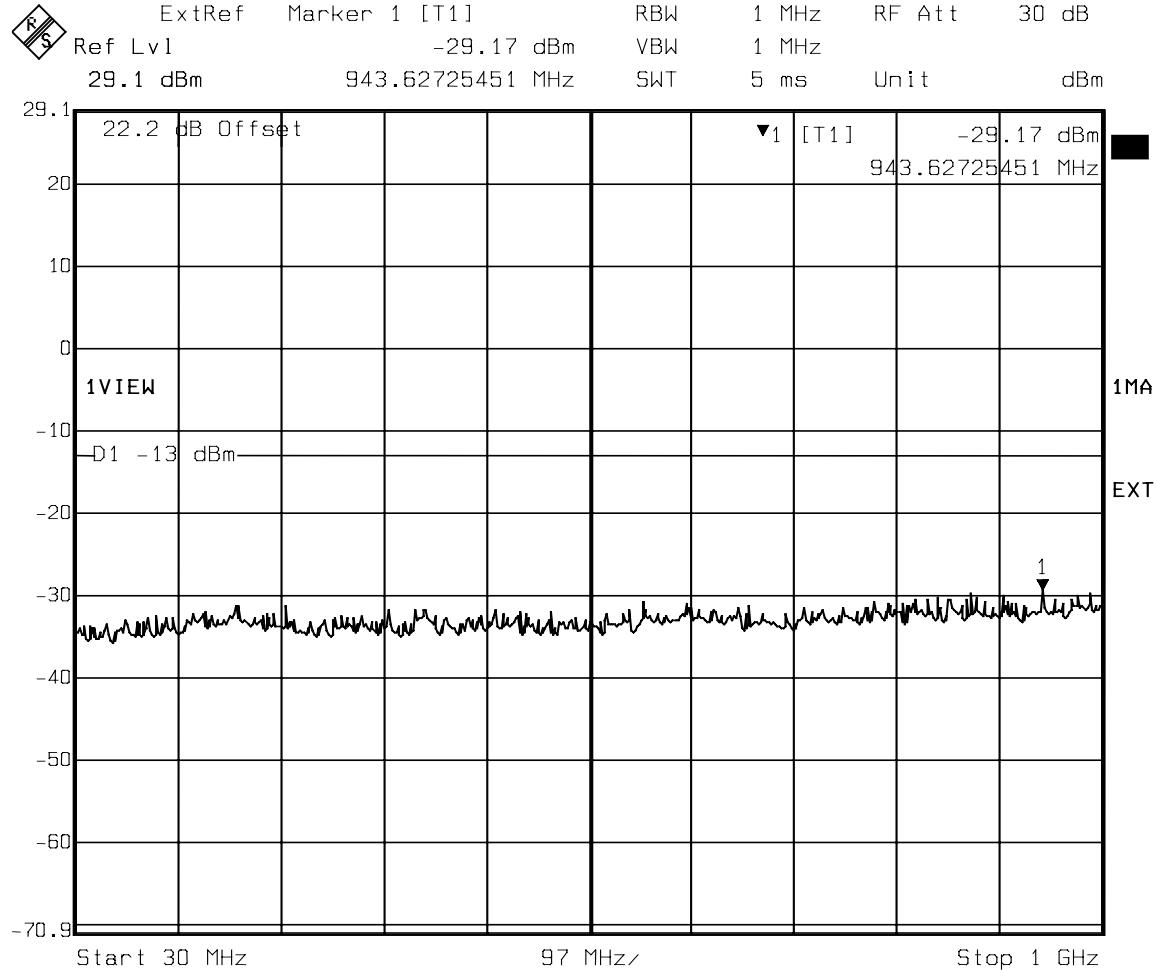
EQUIPMENT: 6265i

FCC ID: QMNRM-66

PROJECT NO.: 5L0546RUS1

Test Data – Spurious Emissions at Antenna Terminals

Channel 600



Date: 10.NOV.2005 12:06:16

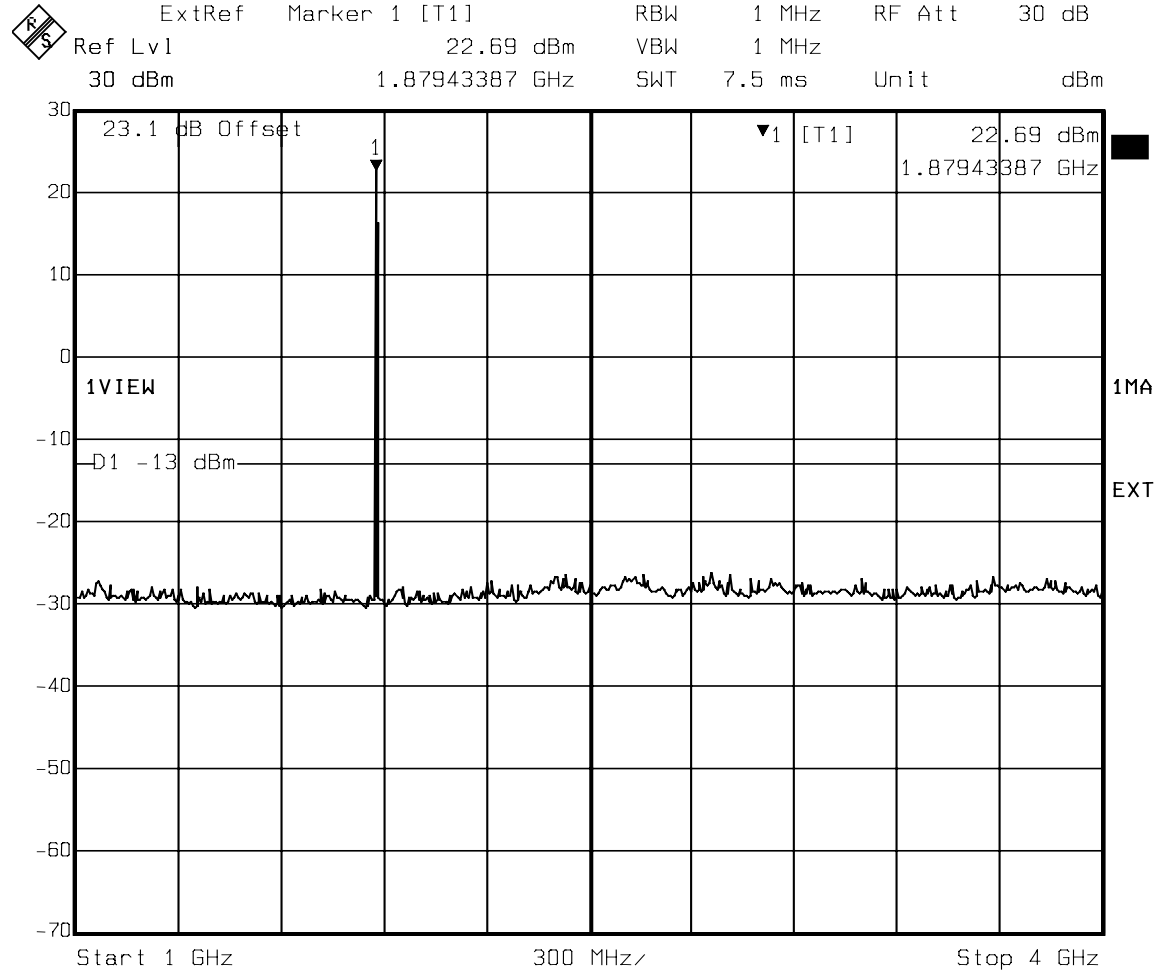
EQUIPMENT: 6265i

FCC ID: QMNRM-66

PROJECT NO.: 5L0546RUS1

Test Data – Spurious Emissions at Antenna Terminals

Channel 600



Date: 10.NOV.2005 12:01:29

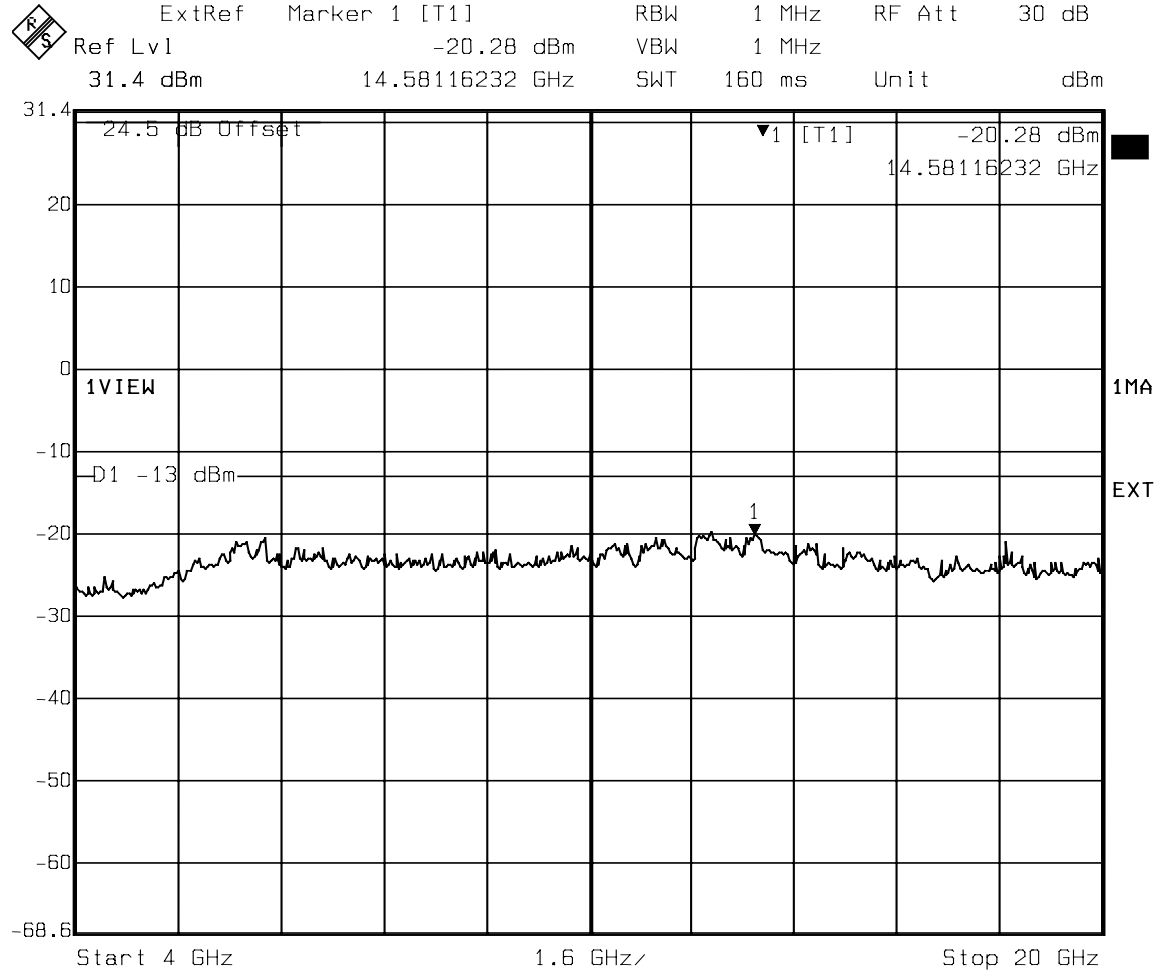
EQUIPMENT: 6265i

FCC ID: QMNRM-66

PROJECT NO.: 5L0546RUS1

Test Data – Spurious Emissions at Antenna Terminals

Channel 600



Date: 10.NOV.2005 12:05:31

EQUIPMENT: 6265i

FCC ID: QMNRM-66

PROJECT NO.: **5L0546RUS1**

Section 5. Field Strength of Spurious

NAME OF TEST: Field Strength of Spurious	PARA. NO.: 2.1053
TESTED BY: David Light	DATE: 21 November 2005

Test Results: Complies.

Test Data: See attached table.

EQUIPMENT: 6265i

FCC ID: QMNRM-66

PROJECT NO.: 5L0546RUS1

Test Data - Radiated Emissions

Field Strength of Spurious Emissions										
Page <u>1</u> of <u>1</u>							Complete <u>X</u>			
Job No.:	5L0546R	Date: 11/21/05					Preliminary _____			
Specification:	PT24	Temperature(°C): <u>20</u>								
Tested By:	David Light	Relative Humidity(%) <u>40</u>								
E.U.T.:	DUAL BAND TRI-MODE PHONE									
Configuration:	TX									
Sample No:	<u>1</u>									
Location:	<u>AC 3</u>					RBW:	<u>1 MHz</u>	Measurement		
Detector Type:	<u>Peak</u>					VBW:	<u>1 MHz</u>	Distance: <u>3</u> m		
Test Equipment Used										
Antenna:	<u>993</u>	Directional Coupler:								
Pre-Amp:	<u>1016</u>	Cable #1:					<u>1484</u>			
Filter:	<u>1482</u>	Cable #2:					<u>1485</u>			
Receiver:	<u>1464</u>	Cable #3:								
Attenuator #1:		Cable #4:								
Attenuator #2:		Mixer:								
Additional equipment used:	<u>1034</u>	<u>760</u>	<u>791</u>							
Measurement Uncertainty:	<u>+/-1.7 dB</u>									
Frequency (MHz)	Meter Reading (dBm)	Correction Factor (dB)		Pre-Amp Gain (dB)	Substitution Antenna Gain (dBi)	Limit	EIRP (dBm)	EIRP (mW)	Polarity	Comments
3760	-75.3	42.5		0	10.2		-22.7	0.0054	V	Noise floor
5640	-61.0	40.4		31.6	10.6		-41.6	0.0001	V	
7520	-48.3	41.6		32.6	11.2		-28.1	0.0015	V	
11280	-58.0	43.8		35.7	11.7		-38.2	0.0002	V	
5640	-62.0	36.6		31.6	8.4		-48.6	0.0000	H	
7520	-38.6	40.4		32.6	9.0		-21.8	0.0065	H	
9400	-61.5	41.6		35.6	9.8		-45.7	0.0000	H	
11280	-56.0	45.7		35.7	9.5		-36.5	0.0002	H	
Notes: The handset was tested on three channels The spectrum was searched from 30 MHz to the tenth harmonic of carrier.										

Photographs of Test Setup



EQUIPMENT: 6265i

FCC ID: QMNRM-66

PROJECT NO.: **5L0546RUS1**

Section 6. Frequency Stability

NAME OF TEST: Frequency Stability	PARA. NO.: 24.235
TESTED BY: David Light	DATE:

Test Results: Complies.

Measurement Data: Standard Test Frequency: 1880MHz
Standard Test Voltage: 3.7 Vdc

EQUIPMENT: 6265i

FCC ID: QMNRM-66

PROJECT NO.: 5L0546RUS1

Test Data – Frequency Stability

<u>Frequency Stability</u>							
Page 1 of 1							
Job No.: 5L0546		Date: 11/24/2005					
Specification: Pt 24		Temperature(°C): 22					
Tested By: David Light		Relative Humidity(%) 45					
E.U.T.: PCS handset							
Configuration: TX							
Sample Number: 1							
<u>Test Equipment Used</u>							
Antenna:		Directional Coupler:					
Pre-Amp:		Cable #1: 1082					
Filter:		Cable #2:					
Receiver: HP8924C							
Attenuator #1							
Attenuator #2:							
Measurement							
Uncertainty: 1×10^{-17} ppm		Standard Test Frequency 1880.000000 MHz					
Temp (°C)	Measured Frequency (MHz)	Rho	Test Voltage	Frequency Error (Hz)	Limit (+/-Hz)	Error (ppm)	Comment
20	1880.000003	0.990	3.7	3	1880.0	0.0	
20	1879.999990	0.991	4.3	-10	1880.0	0.0	
20	1879.999996	0.99	3.0	-4	1880.0	0.0	Battery cutoff
50	1880.000006	0.990		6	1880.0	0.0	
40	1880.000002	0.992		2	1880.0	0.0	
30	1880.000008	0.991		8	1880.0	0.0	
10	1879.999988	0.991		-12	1880.0	0.0	
0	1879.999991	0.993		-9	1880.0	0.0	
-10	1879.999992	0.991		-8	1880.0	0.0	
-20	1879.999985	0.992		-15	1880.0	0.0	
-25	1879.999996	0.992		-4	1880.0	0.0	
Notes: The handset ceased operation at -25C							

EQUIPMENT: 6265i

FCC ID: QMNRM-66

PROJECT NO.: 5L0546RUS1

Section 7. Test Equipment List

Nemko ID	Description	Manufacturer Model Number	Serial Number	Calibration Date	Calibration Due
619	THERMOMETER	FLUKE 51	4520028	09/26/05	09/26/06
283	Environmental Chamber with controller # 1189006	ENVIROTRONICS SH27 & 2030-22844	129010083	NA	NA
993	Horn antenna	A.H. Systems SAS-200/571	XXX	09/01/05	09/01/07
1464	Spectrum analyzer	Hewlett Packard 8563E	3551A04428	07/30/04	07/31/06
1484	Cable 2.0-18.0 Ghz	Storm PR90-010-072	N/A	08/26/05	08/26/06
1485	Cable 2.0-18.0 Ghz	Storm PR90-010-216	N/A	08/02/05	08/02/06
760	Antenna biconical	Electro Metrics MFC-25	477	09/04/05	09/04/06
1034	ANTENNA,LP	A.H. SYSTEMS SAS-200/510	121	09/04/05	09/04/06
791	PREAMP, 25dB	ICC LNA25	398	11/12/05	11/12/06
1016	Pre-Amp	HEWLETT PACKARD 8449A	2749A00159	11/12/05	11/12/06
	Cell site simulator	HP 8924C	US38283285	07/16/05	07/16/07
	PCS Extender	HP	3711J04715	07/16/05	07/16/07
1082	CABLE 2m	Astrolab 32027-2-29094-72TC	N/A	CBU	N/A

ANNEX A - TEST METHODOLOGIES

*EQUIPMENT: 6265i**FCC ID: QMNRM-66*PROJECT NO.: **5L0546RUS1****NAME OF TEST: RF Power Output****PARA. NO.: 2.1046**

Minimum Standard: Para. No.24.232. Base stations are limited to 1640 watts peak E.I.R.P. with an antenna height up to 300 meters HAAT. In no case may the peak output power of a base station transmitter exceed 100 watts.

Method Of Measurement: CDMA Per ANSI/J-STD-008
TDMA Per ANSI/J-STD-010
PCS 1900 Per ANSI/J-STD-007

Detachable Antenna:

The peak power at antenna terminals is measured using an in-line peak power meter or a spectrum analyzer.

Integral Antenna:

Test Method: TIA/EIA-603-1992, Section 2.2.12

The antenna substitution method was used to determine the equivalent radiated power at spurious frequencies. The spurious emissions were measured at a distance of 3 meters. The EUT was then replaced with a reference substitution antenna with a known gain referenced to a dipole. This antenna was fed with a signal at the spurious frequency. The level of the signal was adjusted to repeat the previously measured level. The resulting erp is the signal level fed to the reference antenna corrected for gain referenced to a dipole.

EQUIPMENT: 6265i

FCC ID: QMNRM-66

PROJECT NO.: **5L0546RUS1**

NAME OF TEST: Occupied Bandwidth	PARA. NO.: 2.1049
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Minimum Standard:

Para. No. 24.238(b). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB.

Method Of Measurement:

CDMA Per ANSI/J-STD-008

Spectrum analyzer settings:

RBW: 30 kHz

VBW: $\geq$ RBW

Span: 5 MHz

Sweep: Auto

GSM Per ANSI/J-STD-007

RBW: 3 kHz

VBW: $\geq$ RBW

Span: 2 MHz

Sweep: Auto

NADC Per IS-136

RBW: 1 kHz

VBW: $\geq$ RBW

Span: 1 MHz

Sweep: Auto

EQUIPMENT: 6265i

FCC ID: QMNRM-66

PROJECT NO.: **5L0546RUS1**

NAME OF TEST: Spurious Emission at Antenna Terminals	PARA. NO.: 2.1051
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Minimum Standard: Para. No.24.238(a). On any frequency outside a licensee's frequency block, the power of any emission shall be attenuated below the transmitter power by at least $43 + 10 \log (P)$ dB.

Method Of Measurement:

Spectrum analyzer settings:

CDMA Per ANSI/J-STD-008

RBW: 1 MHz (> 1 MHz from Band Edge)
RBW: 20 kHz (< 1MHz from Band Edge)
VBW: $\geq$ RBW
Sweep: Auto
Video Avg: 6 Sweeps

GSM Per ANSI/J-STD-007

RBW: 1 MHz (> 1 MHz from Band Edge)
RBW: 3 kHz (< 1 MHz from Band Edge)
VBW: $\geq$ RBW
Sweep: Auto
Video Avg: Disabled

NADC Per IS-136

RBW: 1 MHz (> 1 MHz from Band Edge)
RBW: 1 kHz (< 1 MHz from Band Edge)
VBW: $\geq$ RBW
Sweep: Auto
Video Avg: Disabled

To demonstrate compliance at band edges the frequency of the input signal is set to the lowest and highest assigned channel and the center frequency of the spectrum analyzer is set to the upper and lower edges of the appropriate frequency block.

*EQUIPMENT: 6265i**FCC ID: QMNRM-66*PROJECT NO.: **5L0546RUS1****NAME OF TEST: Field Strength of Spurious Radiation****PARA. NO.: 2.1053****Minimum Standard:**

Para. No.24.238(a). On any frequency outside a licensee's frequency block, the power of any emission shall be attenuated below the transmitter power by at least $43 + 10 \log (P)$ dB.

Test Method:

TIA/EIA-603-1992, Section 2.2.12

The antenna substitution method was used to determine the equivalent radiated power at spurious frequencies. The spurious emissions were measured at a distance of 3 meters. The EUT was then replaced with a reference substitution antenna with a known gain referenced to a dipole. This antenna was fed with a signal at the spurious frequency. The level of the signal was adjusted to repeat the previously measured level. The resulting erp is the signal level fed to the reference antenna corrected for gain referenced to a dipole.

*EQUIPMENT: 6265i**FCC ID: QMNRM-66*PROJECT NO.: **5L0546RUS1****NAME OF TEST: Frequency Stability****PARA. NO.: 2.1055**

Minimum Standard: Para. No. 24.235. The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

Method Of Measurement: CDMA Per ANSI/J-STD-008
TDMA Per ANSI/J-STD-007
NADC Per IS-136

Frequency Stability With Voltage Variation

The E.U.T. is placed in an environmental chamber and allowed to stabilize at +20 degrees Celsius for at least 15 minutes. With the voltage input to the E.U.T. set to 85% S.T.V., the frequency is measured in 30 second intervals for a period of 5 minutes. This procedure is repeated at 100% S.T.V. and 115% S.T.V.

Frequency Stability With Temperature Variation

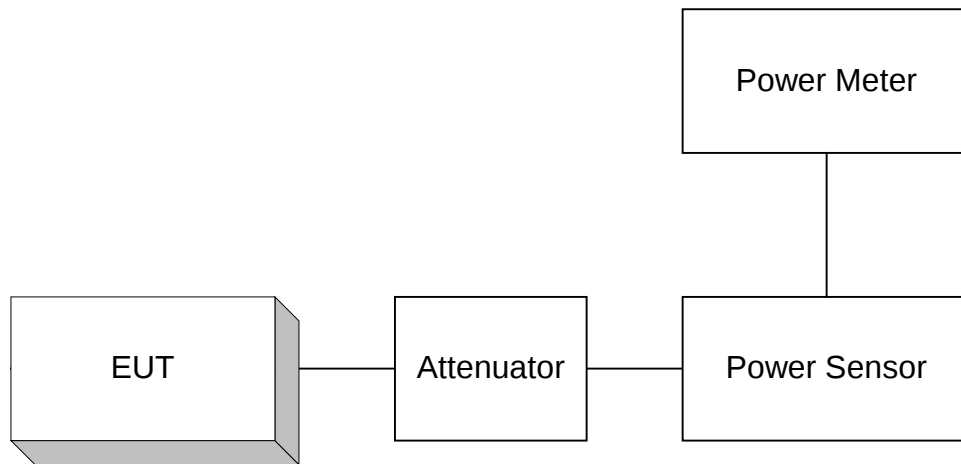
The input voltage to the E.U.T. is set to S.T.V. and the temperature of the environmental chamber is varied in 10 degree steps from -30 degrees C to +50 degrees C. The E.U.T. is allowed to stabilize at each temperature and the frequency is measured in 30 second intervals for a period of 5 minutes.

Digitally Modulated Signals

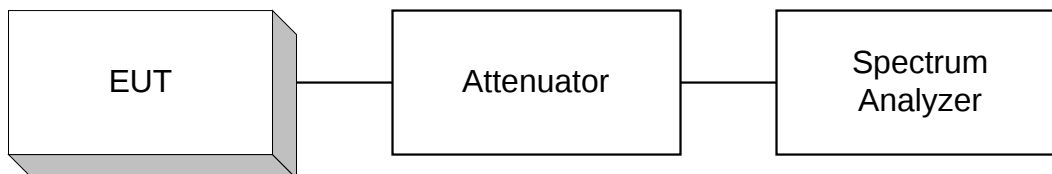
Equipment that produces a digitally modulated carrier is tested using a vector modulation analyzer. Frequency accuracy and rho are measured over the specified environmental extremes.

ANNEX B - TEST DIAGRAMS

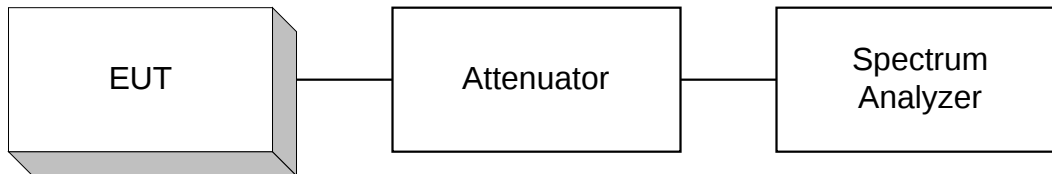
Para. No. 2.985 - R.F. Power Output



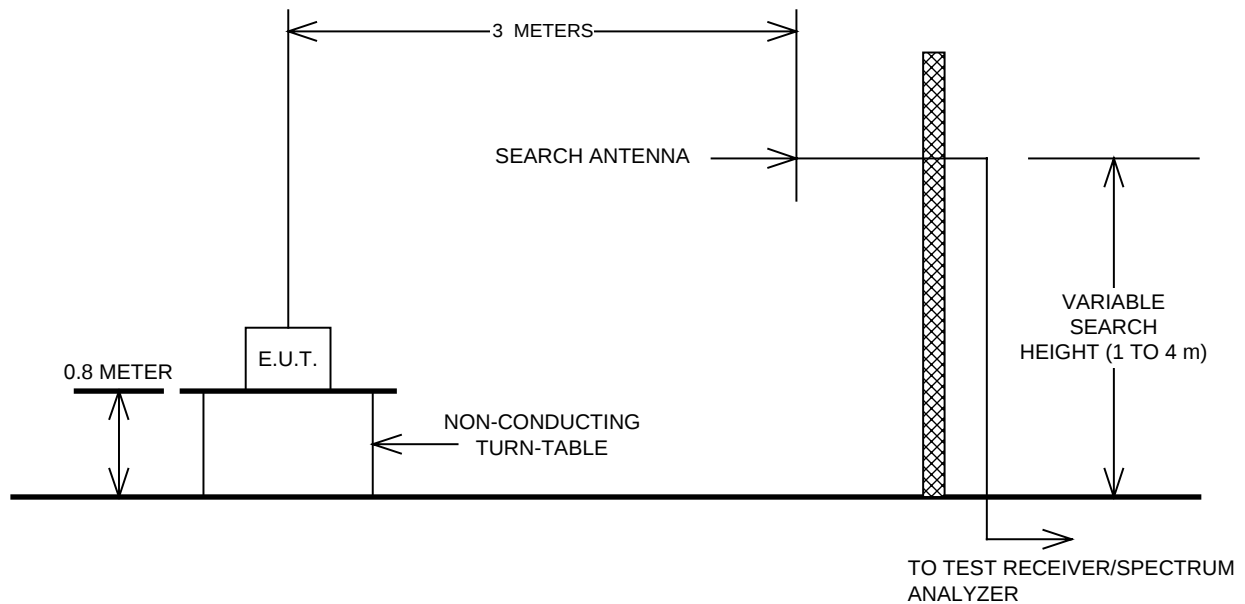
Para. No. 2.989 - Occupied Bandwidth



Para. No. 2.991 Spurious Emissions at Antenna Terminals



Para. No. 2.993 - Field Strength of Spurious Radiation



Para. No. 2.995 - Frequency Stability

