Nemko Test Report No.:	4L0571RUS2
Applicant:	Andrew Corporation 108 Rand Park Drive Garner, NC 27529
Equipment Under Test:	TFAH 80/85/19
In Accordance With:	**FCC Part 24, Subpart E** Broadband PCS Repeaters
Tested By:	Nemko Dallas Inc. 802 N. Kealy Lewisville, Texas 75057-3136
Authorized By:	 Tom Tidwell, Frontline Group Manager
Date:	9/1/04
Total Number of Pages:	43

Table of Contents

Section 1. Summary of Test Results

Manufacturer: Andrew Corporation

Model No.: TFAH 80/85/19

Serial No.: 043003403

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. NONE

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Summary Of Test Data

NAME OF TEST	PARA. NO.	SPEC.	RESULT
RF Power Output	24.232	100W	Complies
Occupied Bandwidth	24.238	Input/Output	Complies
Spurious Emissions at Antenna Terminals	24.238(a)	-13 dBm	Complies
Field Strength of Spurious Emissions	24.238(a)	-13 dBm E.I.R.P.	Complies
Frequency Stability	24.235		NA

Footnotes:

(1) Modulation characteristics were not tested since the E.U.T. processes but does not produce a modulated waveform.

Measurement uncertainty for each test configuration is expressed to 95% probability.

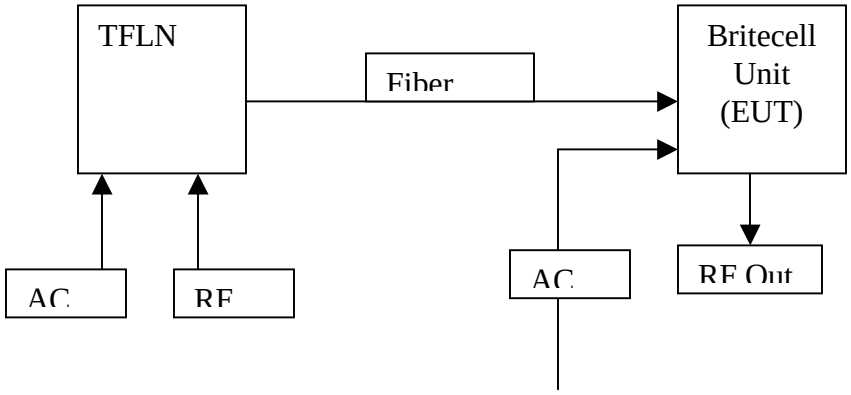
Section 2. General Equipment Specification

Supply Voltage Input:		115 Vac
Frequency Bands:	**Downlink:**	☒ Block A : 1930 – 1945 MHz ☒ Block D : 1945 – 1950 MHz ☒ Block B : 1950 – 1965 MHz ☒ Block E : 1965 – 1970 MHz ☒ Block F : 1970 – 1975 MHz ☒ Block C : 1975 – 1990 MHz
Frequency Bands:	**Uplink:**	NA
Type of Modulation and Designator:		**CDMA (F9W)** ☒ **GSM (G7W)** ☒ **NADC (DXW)** ☒ **EDGE (G7W)** ☒
Output Impedance:		50 ohms
RF Output (Rated dBm/carrier):	**DL**	Modulation: CDMA — 1 Carrier: 31 — 2 Carriers: 24.5 GSM — 37 — 27 EDGE — 33.5 — 25 TDMA — 34.5 — 25.5
Frequency Translation:		**F1-F1** ☒ **F1-F2** ☐ **N/A** ☐
Band Selection:		**Software** ☐ **Duplexer** ☐ **Fullband** ☒

Description of Operation

TFAH 80/58/19 is a fiber based tri-band repeater operating in the 800 MHz SMR, the 800 MHz cellular and the 1900 MHz PCS bands

System Diagram



Section 3. RF Power Output

NAME OF TEST: RF Power Output	PARA. NO.: 2.1046
TESTED BY: David Light	DATE: 8/30/04

Test Results: Complies.

Measurement Data:

Direction	Modulation Type	Per Channel Power Output (dBm)	Composite Power Output (dBm)
Downlink	CDMA	24.5	27.5
Downlink	GSM	27	30
Downlink	NADC	25	28
Downlink	CDPD	25.5	28.8

Equipment Used: 1036-1065-1604-1629

Measurement Uncertainty: +/- 1.7 dB

Temperature: 25 °C

Relative Humidity: 40 %

Section 4. Occupied Bandwidth

NAME OF TEST: Occupied Bandwidth	PARA. NO.: 2.1049
TESTED BY: David Light	DATE: 8/30/04

Test Results: Complies.

Test Data: See attached plot(s).

Test Data – Occupied Bandwidth

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Fax: (972) 436-2667

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Data Plot — **Occupied Bandwidth**

Page 1 of 2

Complete X
Preliminary:

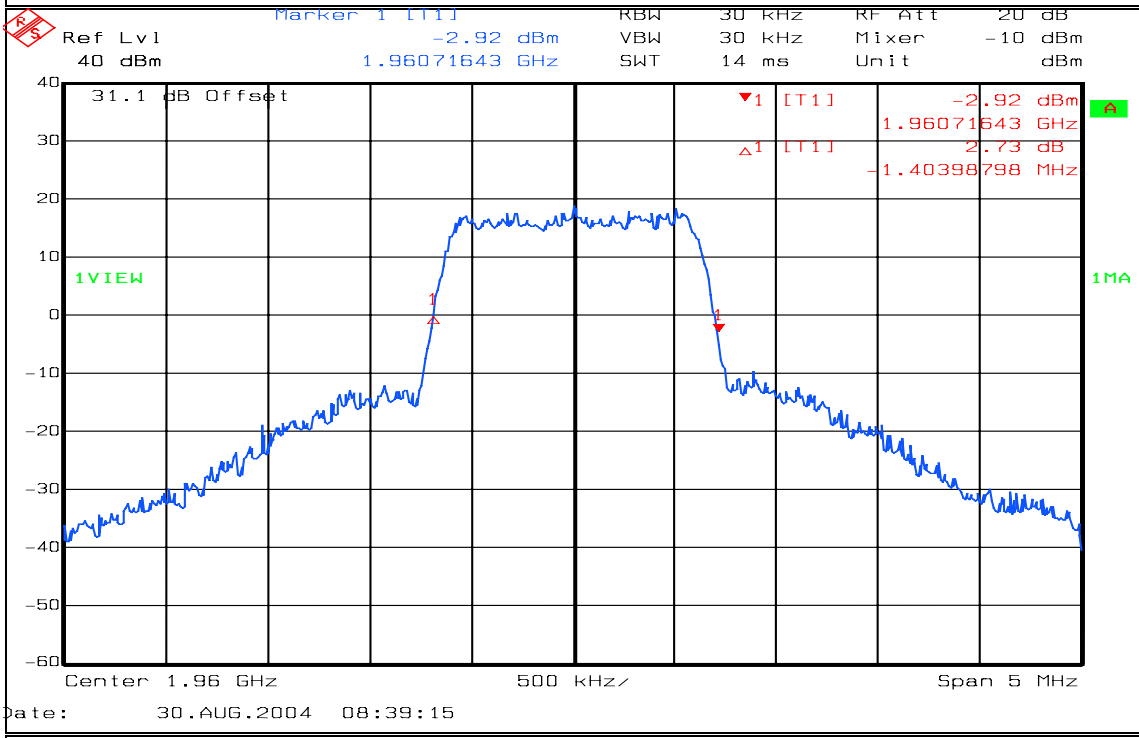
Job No.:	4L0571	Date:	8/30/2004
Specification:	PT24	Temperature(°C):	25
Tested By:	David Light	Relative Humidity(%)	40
E.U.T.:	PCS AMPLIFIER		
Configuration:	TX		
Sample Number:	1		
Location:	Lab 1	RBW:	30 kHz
Detector Type:	Peak	VBW:	30 kHz

Measurement Distance: NA m

Test Equipment Used

Antenna:		Directional Coupler:	
Pre-Amp:		Cable #1:	1629
Filter:		Cable #2:	
Receiver:	1036	Cable #3:	
Attenuator #1	1065	Cable #4:	
Attenuator #2:	1604	Mixer:	

Additional equipment used:
Measurement Uncertainty: +/-1.7 dB



Notes: **CDMA OUTPUT**
MAX POWER 30.7 dBm

Test Data – Occupied Bandwidth

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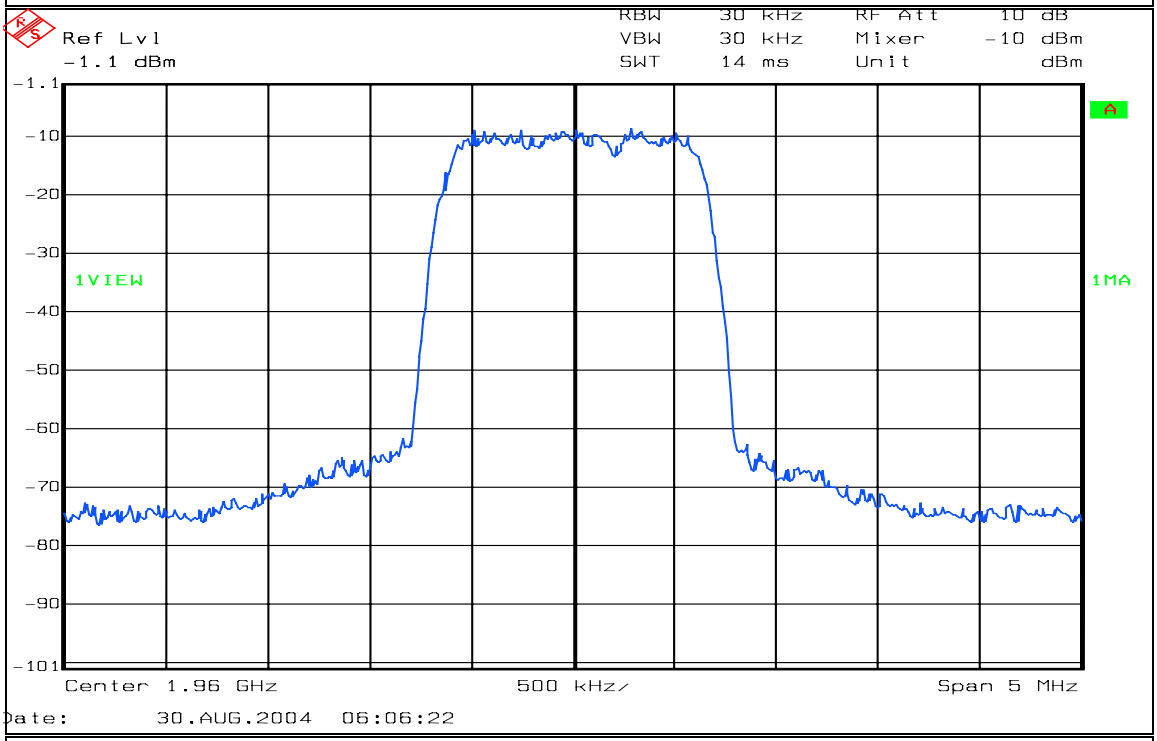
Data Plot — **Occupied Bandwidth**

Page 2 of 2

Job No.:	4L0571	Date:	8/30/2004
Specification:	PT24	Temperature(°C):	25
Tested By:	David Light	Relative Humidity(%)	40
E.U.T.:	PCS AMPLIFIER		
Configuration:	TX		



Notes: **CDMA INPUT**

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Data Plot — **Occupied Bandwidth**

Page 1 of 2 — Complete: X — Preliminary:

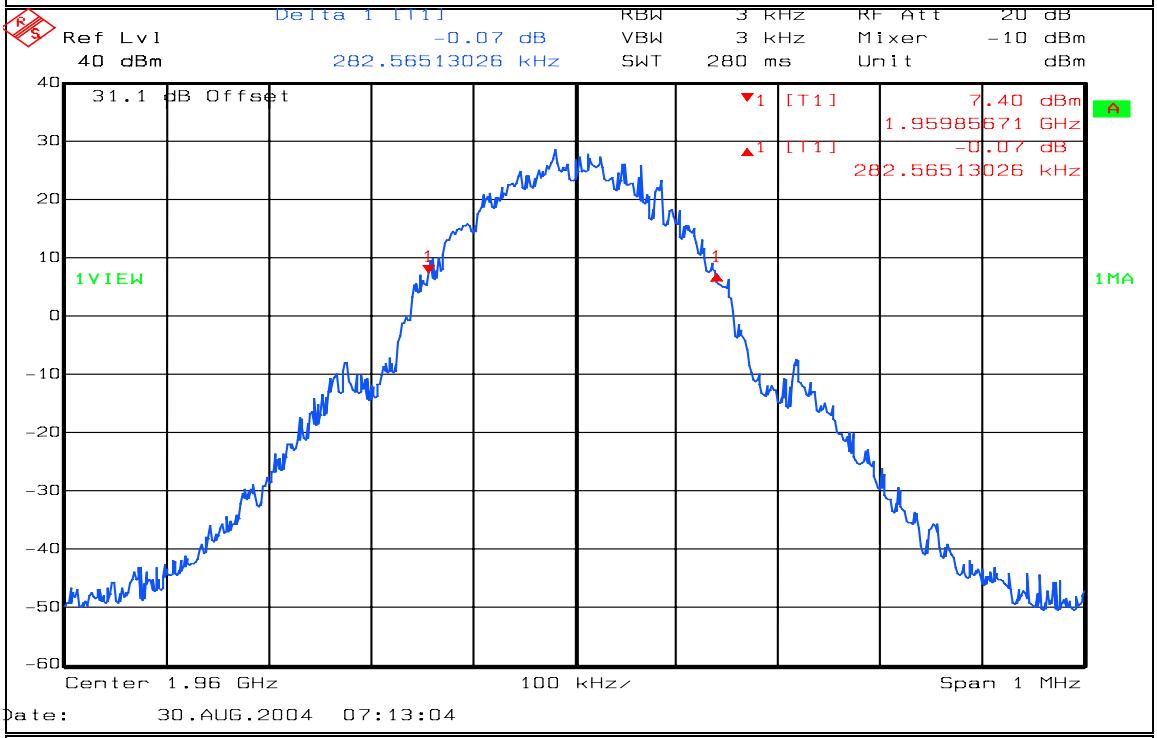
Job No.:	4L0571	Date:	8/30/2004		
Specification:	PT24	Temperature(°C):	25		
Tested By:	David Light	Relative Humidity(%)	40		
E.U.T.:	PCS AMPLIFIER				
Configuration:	TX				
Sample Number:	1				
Location:	Lab 1	RBW:	3 kHz	Measurement	
Detector Type:	Peak	VBW:	3 kHz	Distance:	NA m

Test Equipment Used

Antenna:		Directional Coupler:	
Pre-Amp:		Cable #1:	1629
Filter:		Cable #2:	
Receiver:	1036	Cable #3:	
Attenuator #1	1065	Cable #4:	
Attenuator #2:	1604	Mixer:	

Additional equipment used:

Measurement Uncertainty: +/-1.7 dB



Notes: **GSM OUTPUT**
MAX POWER 37 dBm

Test Data – Occupied Bandwidth

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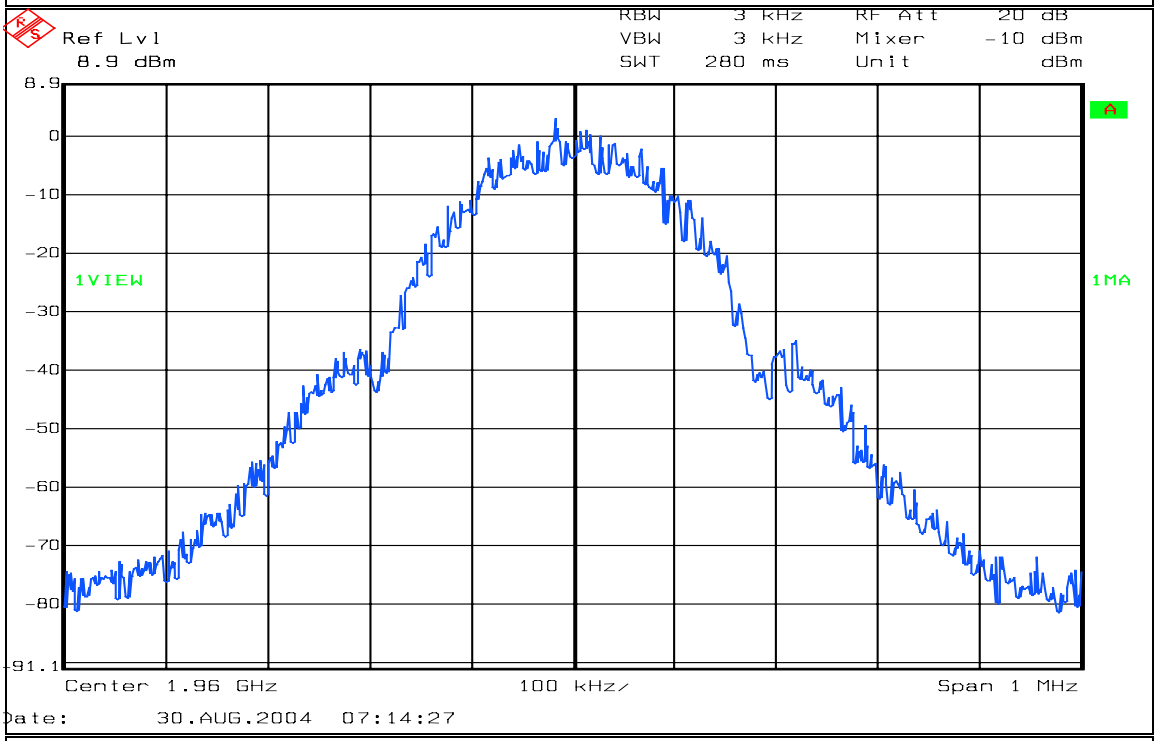
Data Plot — **Occupied Bandwidth**

Page 2 of 2

Job No.:	4L0571	Date:	8/30/2004
Specification:	PT24	Temperature(°C):	25
Tested By:	David Light	Relative Humidity(%)	40
E.U.T.:	PCS AMPLIFIER		
Configuration:	TX		



Notes: GSM INPUT

Test Data – Occupied Bandwidth

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Data Plot — **Occupied Bandwidth**

Page 1 of 2

Complete X
Preliminary:

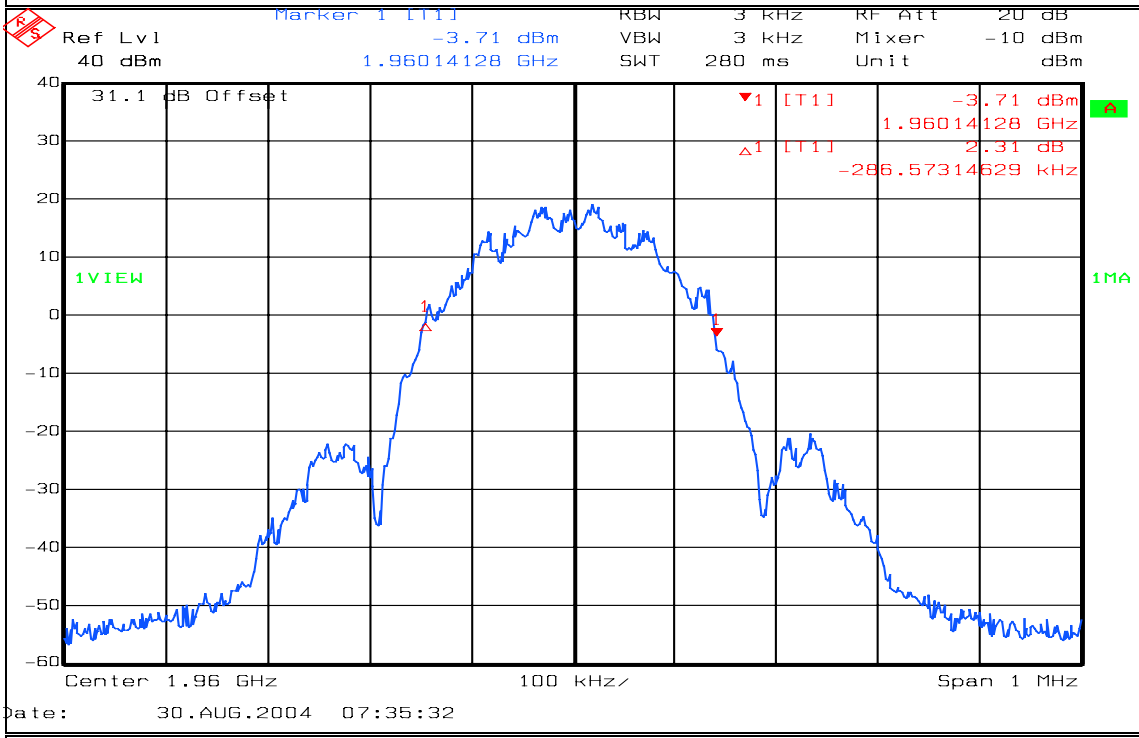
Job No.:	4L0571	Date:	8/30/2004
Specification:	PT24	Temperature(°C):	25
Tested By:	David Light	Relative Humidity(%)	40
E.U.T.:	PCS AMPLIFIER		
Configuration:	TX		
Sample Number:	1		
Location:	Lab 1	RBW:	3 kHz
Detector Type:	Peak	VBW:	3 kHz

Measurement Distance: NA m

Test Equipment Used

Antenna:		Directional Coupler:	
Pre-Amp:		Cable #1:	1629
Filter:		Cable #2:	
Receiver:	1036	Cable #3:	
Attenuator #1	1065	Cable #4:	
Attenuator #2:	1604	Mixer:	

Additional equipment used:
Measurement Uncertainty: +/-1.7 dB



Notes: **EDGE OUTPUT**
MAX POWER 33.5 dBm

Test Data – Occupied Bandwidth

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Data Plot — **Occupied Bandwidth**

Page 1 of 2 — Complete: X — Preliminary:

Job No.:	4L0571	Date:	8/30/2004
Specification:	PT24	Temperature(°C):	25
Tested By:	David Light	Relative Humidity(%)	40
E.U.T.:	PCS AMPLIFIER		
Configuration:	TX		
Sample Number:	1		
Location:	Lab 1	RBW:	3 kHz
Detector Type:	Peak	VBW:	3 kHz

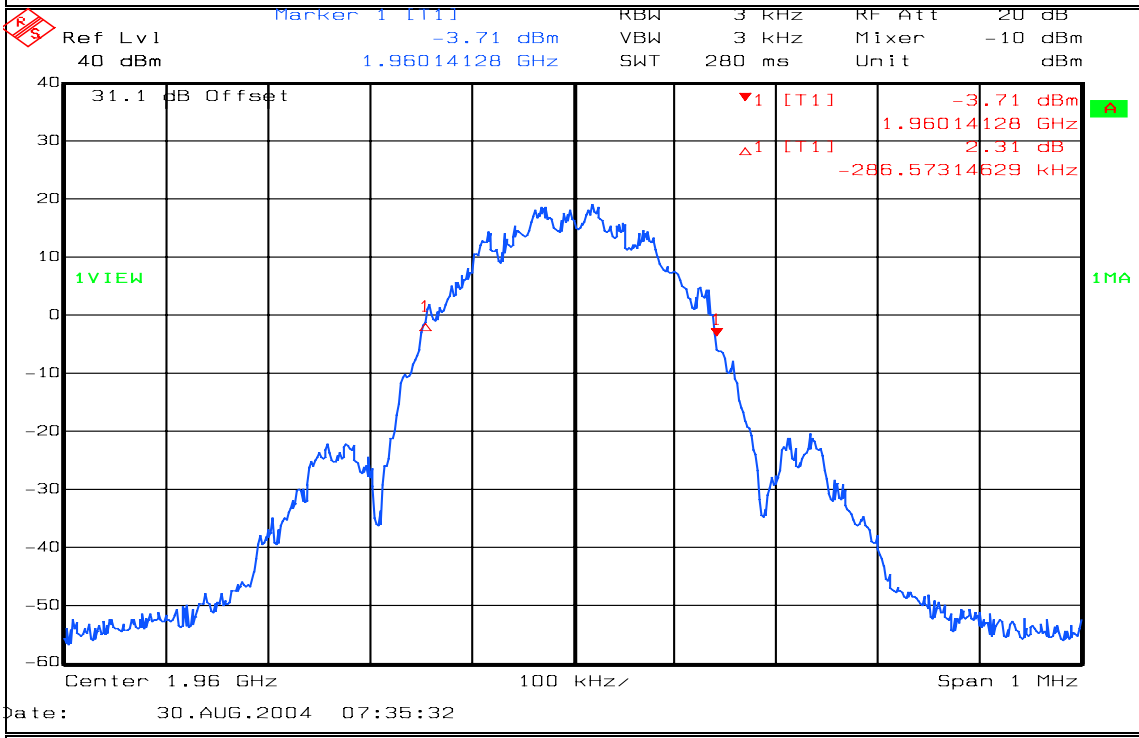
Measurement Distance: NA m

Test Equipment Used

Antenna:		Directional Coupler:	
Pre-Amp:		Cable #1:	1629
Filter:		Cable #2:	
Receiver:	1036	Cable #3:	
Attenuator #1	1065	Cable #4:	
Attenuator #2:	1604	Mixer:	

Additional equipment used:

Measurement Uncertainty: +/-1.7 dB



Notes: **EDGE OUTPUT**
MAX POWER 33.5 dBm

Test Data – Occupied Bandwidth

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Data Plot — **Occupied Bandwidth**

Page 1 of 2

Complete X
Preliminary:

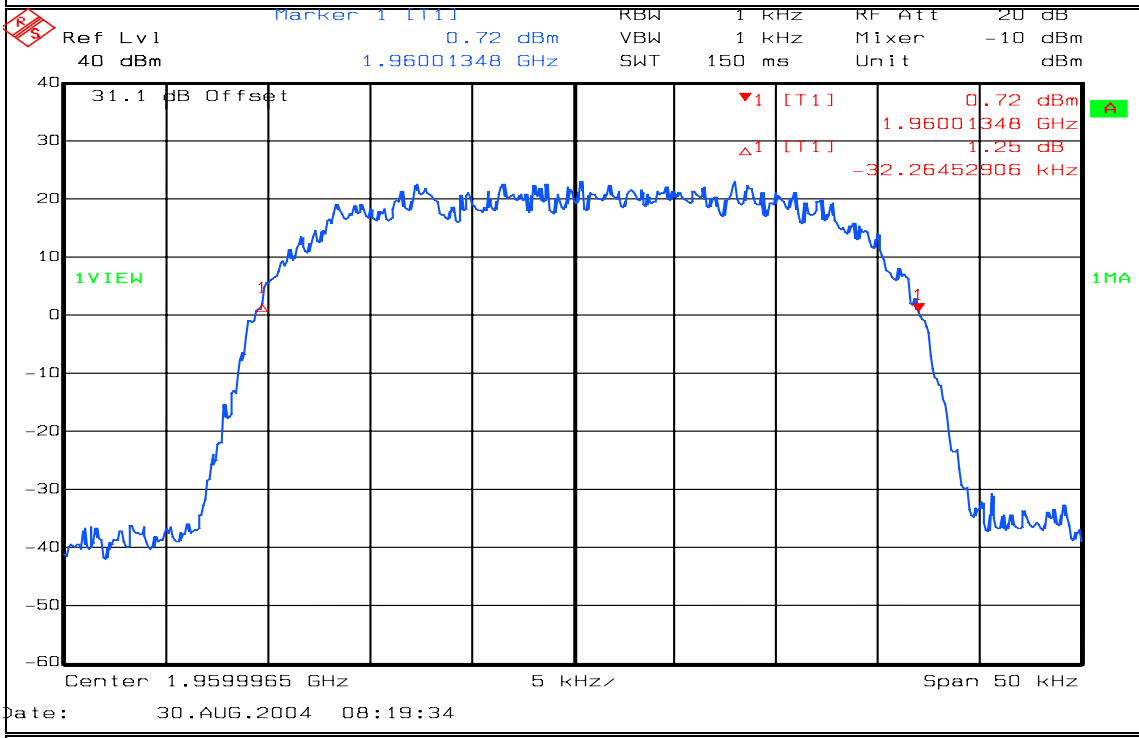
Job No.:	4L0571	Date:	8/30/2004
Specification:	PT24	Temperature(°C):	25
Tested By:	David Light	Relative Humidity(%)	40
E.U.T.:	PCS AMPLIFIER		
Configuration:	TX		
Sample Number:	1		
Location:	Lab 1	RBW:	1 kHz
Detector Type:	Peak	VBW:	1 kHz

Measurement Distance: NA m

Test Equipment Used

Antenna:		Directional Coupler:	
Pre-Amp:		Cable #1:	1629
Filter:		Cable #2:	
Receiver:	1036	Cable #3:	
Attenuator #1	1065	Cable #4:	
Attenuator #2:	1604	Mixer:	

Additional equipment used:
Measurement Uncertainty: +/-1.7 dB



Notes: **TDMA OUTPUT**
MAX POWER 34.5 dBm

Test Data – Occupied Bandwidth

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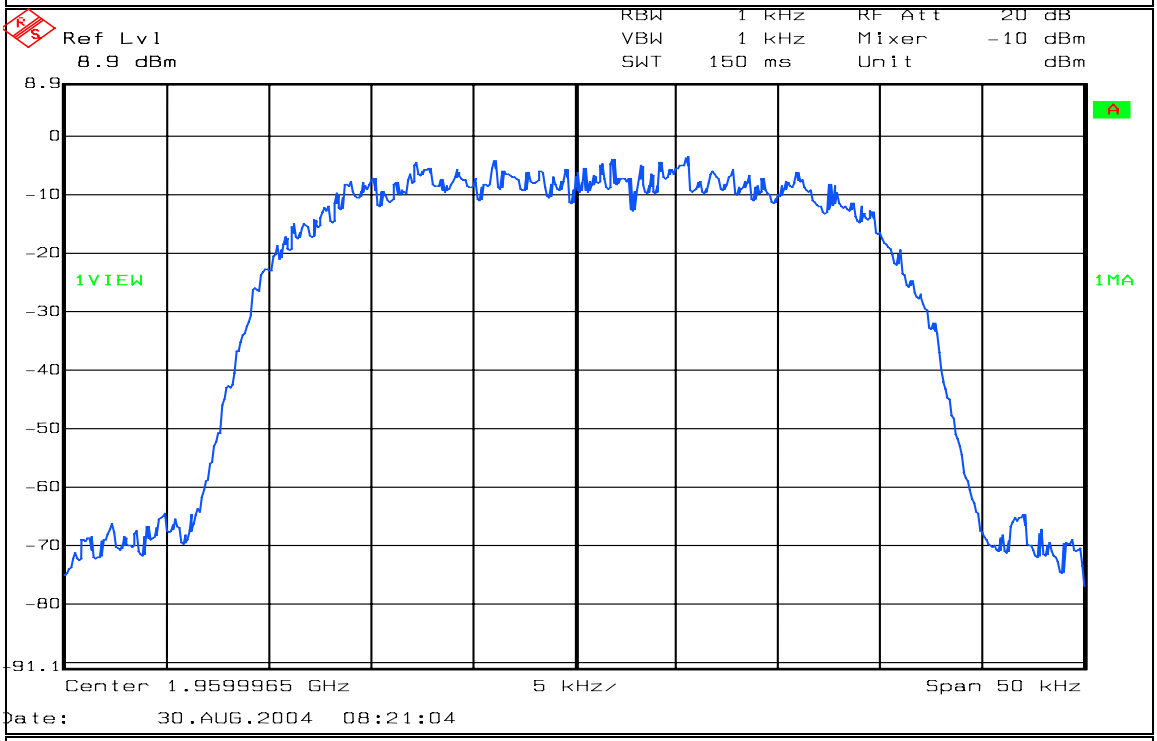
Data Plot — **Occupied Bandwidth**

Page 2 of 2

Job No.:	4L0571	Date:	8/30/2004
Specification:	PT24	Temperature(°C):	25
Tested By:	David Light	Relative Humidity(%)	40
E.U.T.:	PCS AMPLIFIER		
Configuration:	TX		



Notes: **TDMA INPUT**

Section 5. Spurious Emissions at Antenna Terminals

NAME OF TEST: Spurious Emissions @ Antenna Terminals	PARA. NO.: 2.1051
TESTED BY: David Light	DATE: 8/30/04

Test Results: Complies.

Test Data: See attached plot(s).

Test Data – Spurious Emissions at Antenna Terminals

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Data Plot — **Spurious Emissions at Antenna Terminals**

Page 1 of 3 — Complete: X — Preliminary:

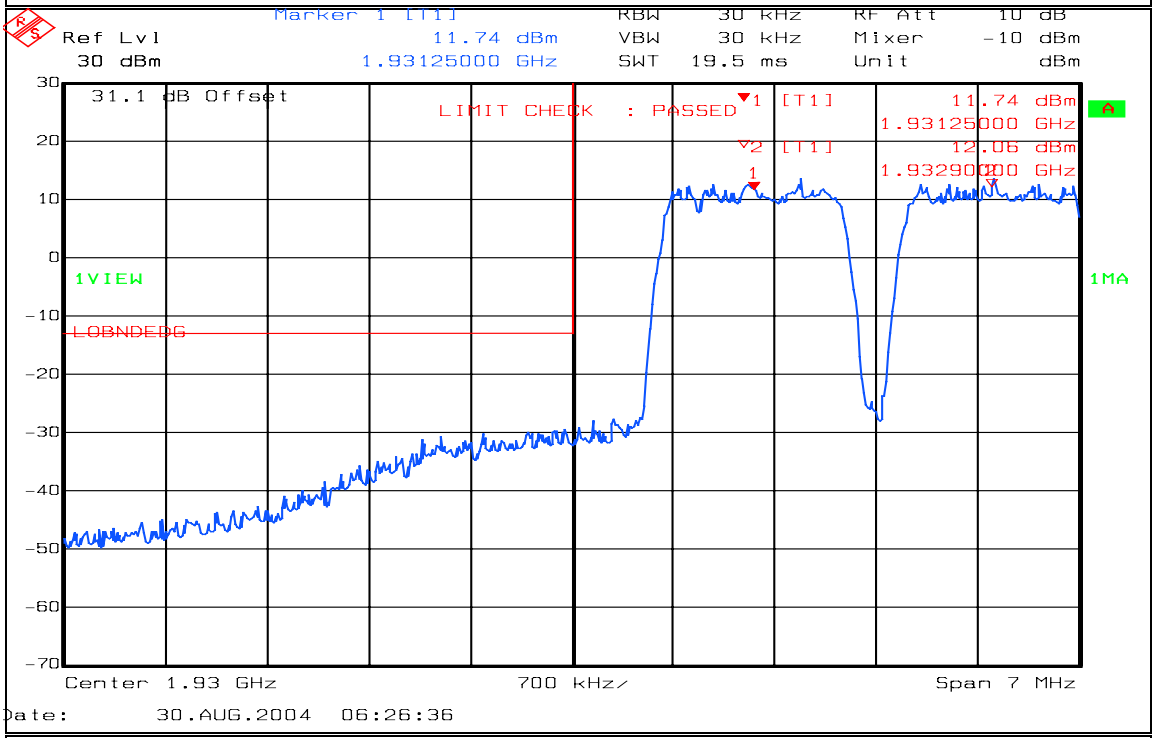
Job No.:	4L0571	Date:	8/30/2004		
Specification:	PT24	Temperature(°C):	25		
Tested By:	David Light	Relative Humidity(%)	40		
E.U.T.:	PCS AMPLIFIER				
Configuration:	TX				
Sample Number:	1				
Location:	Lab 1	RBW:	Refer to plots	Measurement Distance:	NA m
Detector Type:	Peak	VBW:	Refer to plots		

Test Equipment Used

Antenna:		Directional Coupler:	
Pre-Amp:		Cable #1:	1629
Filter:		Cable #2:	
Receiver:	1036	Cable #3:	
Attenuator #1	1065	Cable #4:	
Attenuator #2:	1604	Mixer:	

Additional equipment used:

Measurement Uncertainty: +/-1.7 dB



Notes:
LOWER BAND EDGE
2 CHANNELS AT 24.5 dBm EACH
CDMA

Test Data – Spurious Emissions at Antenna Terminals

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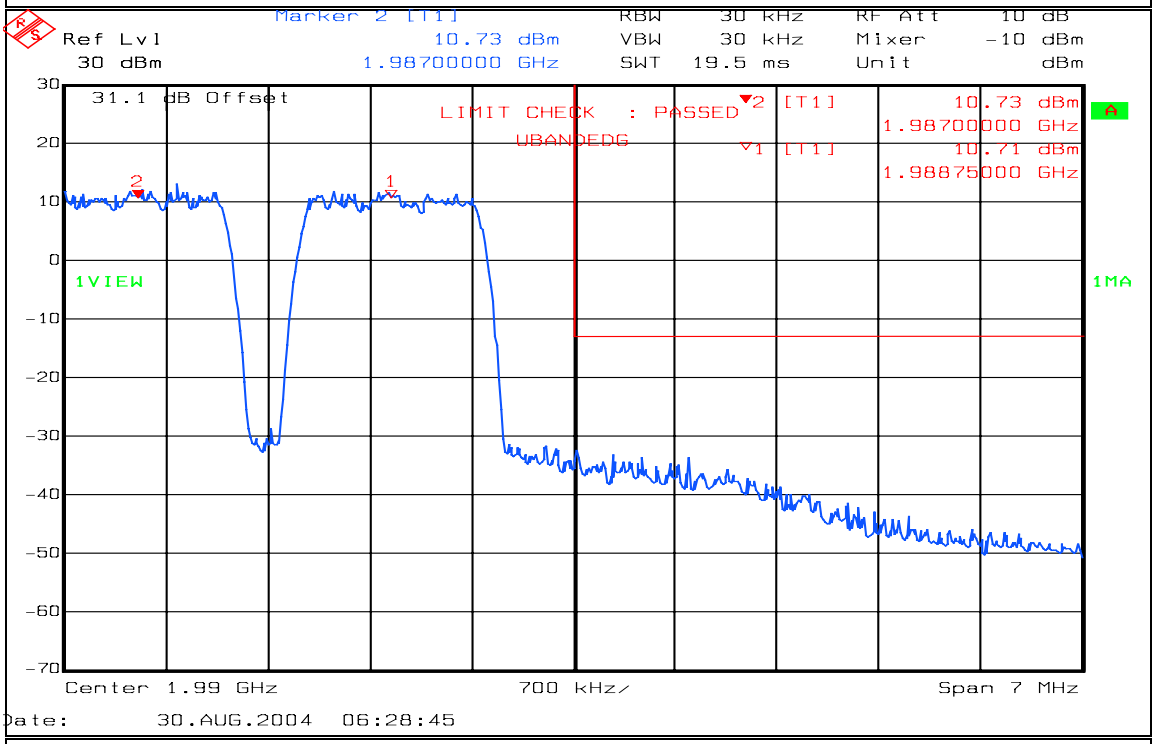
Data Plot — **Spurious Emissions at Antenna Terminals**

Page 2 of 3

Job No.:	4L0571	Date:	8/30/2004
Specification:	PT24	Temperature(°C):	25
Tested By:	David Light	Relative Humidity(%)	40
E.U.T.:	PCS AMPLIFIER		
Configuration:	TX		



Notes:
UPPER BAND EDGE
2 CHANNELS AT 24.5 dBm EACH
CDMA

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Data Plot — **Spurious Emissions at Antenna Terminals**

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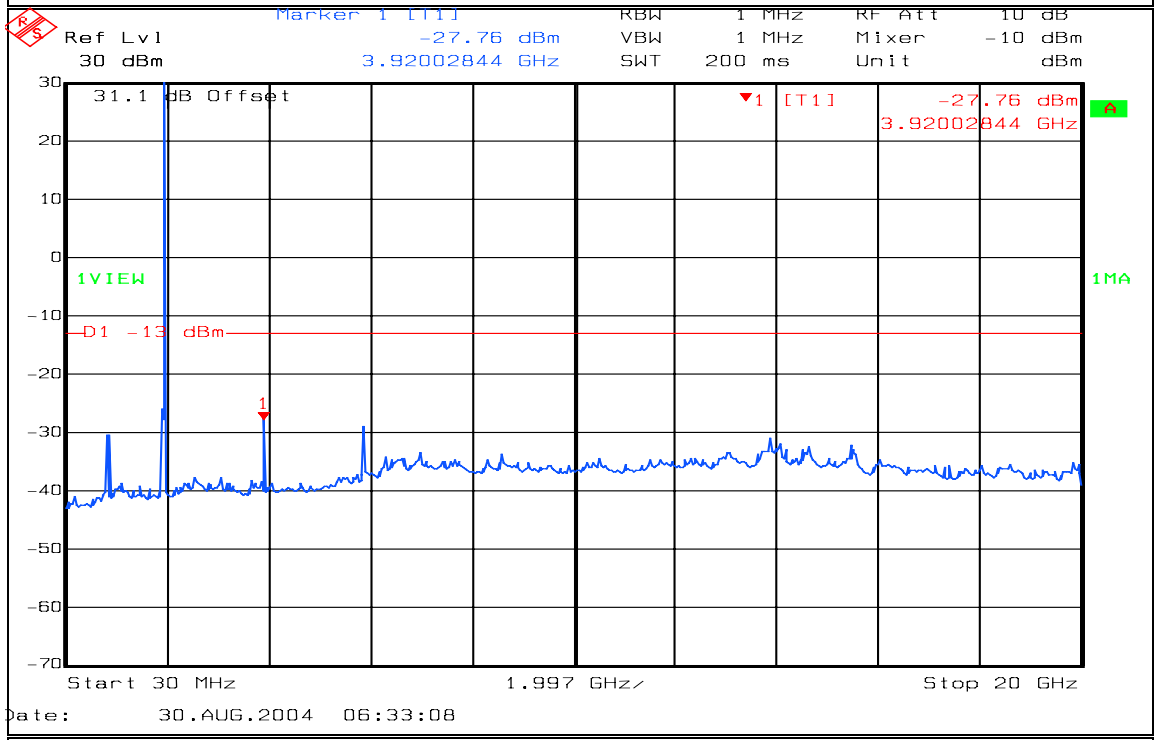
Job No.:	4L0571	Date:	8/30/2004
Specification:	PT24	Temperature(°C):	25
Tested By:	David Light	Relative Humidity(%)	40
E.U.T.:	PCS AMPLIFIER		
Configuration:	TX		



Notes:
TX 1960 MHz @ 30.7 dBm
The spectrum was searched in detail. This plot is a true indication of the emissions detected.
CDMA

Test Data – Spurious Emissions at Antenna Terminals

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Data Plot — **Spurious Emissions at Antenna Terminals**

Page 1 of 3 — Complete X — Preliminary:

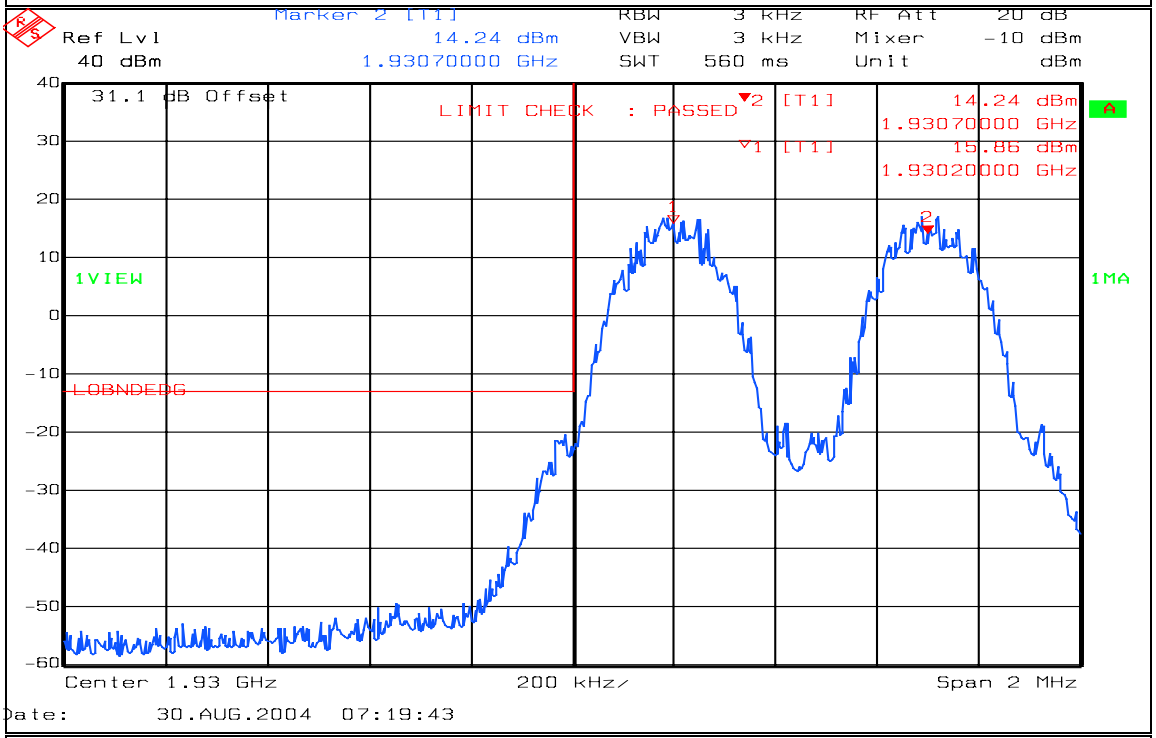
Job No.:	4L0571	Date:	8/30/2004		
Specification:	PT24	Temperature(°C):	25		
Tested By:	David Light	Relative Humidity(%)	40		
E.U.T.:	PCS AMPLIFIER				
Configuration:	TX				
Sample Number:	1				
Location:	Lab 1	RBW:	Refer to plots	Measurement Distance:	NA m
Detector Type:	Peak	VBW:	Refer to plots		

Test Equipment Used

Antenna:		Directional Coupler:	
Pre-Amp:		Cable #1:	1629
Filter:		Cable #2:	
Receiver:	1036	Cable #3:	
Attenuator #1	1065	Cable #4:	
Attenuator #2:	1604	Mixer:	

Additional equipment used:

Measurement Uncertainty: +/-1.7 dB



Notes: **LOWER BAND EDGE GSM**
2 CHANNELS AT 27 dBm EACH

Test Data – Spurious Emissions at Antenna Terminals

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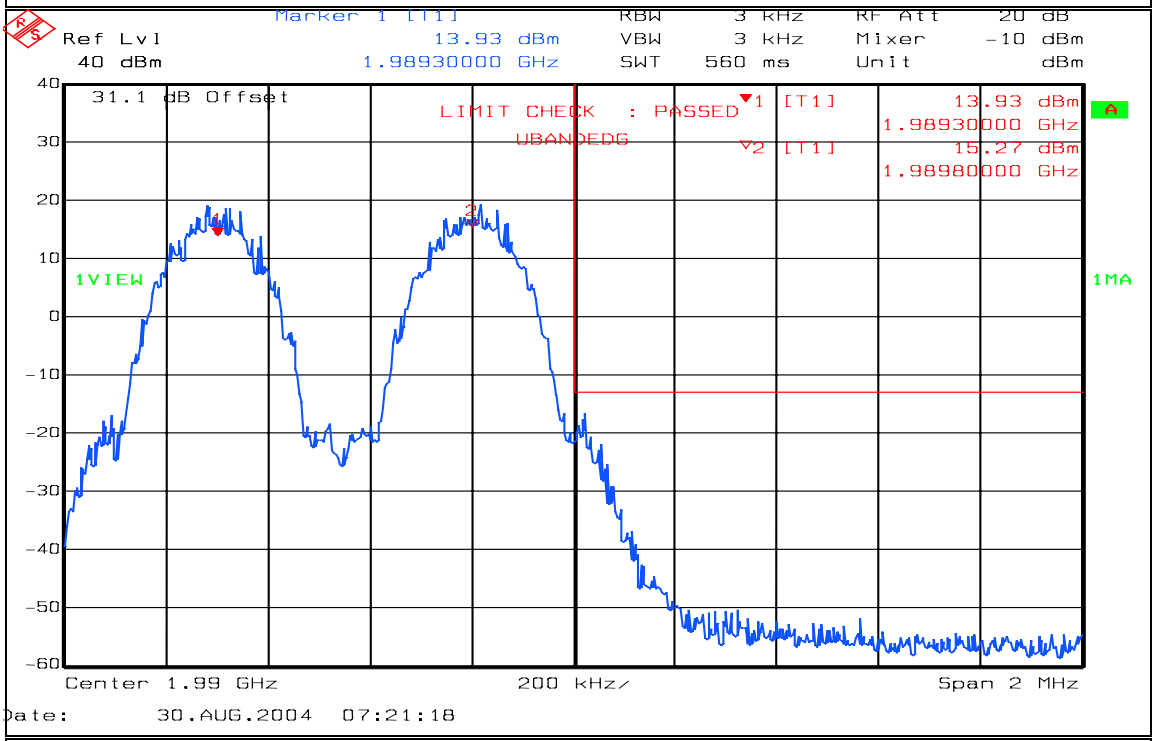
Data Plot — **Spurious Emissions at Antenna Terminals**

Page 2 of 3

Job No.:	4L0571	Date:	8/30/2004
Specification:	PT24	Temperature(°C):	25
Tested By:	David Light	Relative Humidity(%)	40
E.U.T.:	PCS AMPLIFIER		
Configuration:	TX		



Notes: **UPPER BAND EDGE - GSM**
2 CHANNELS AT 27 dBm EACH

Test Data – Spurious Emissions at Antenna Terminals

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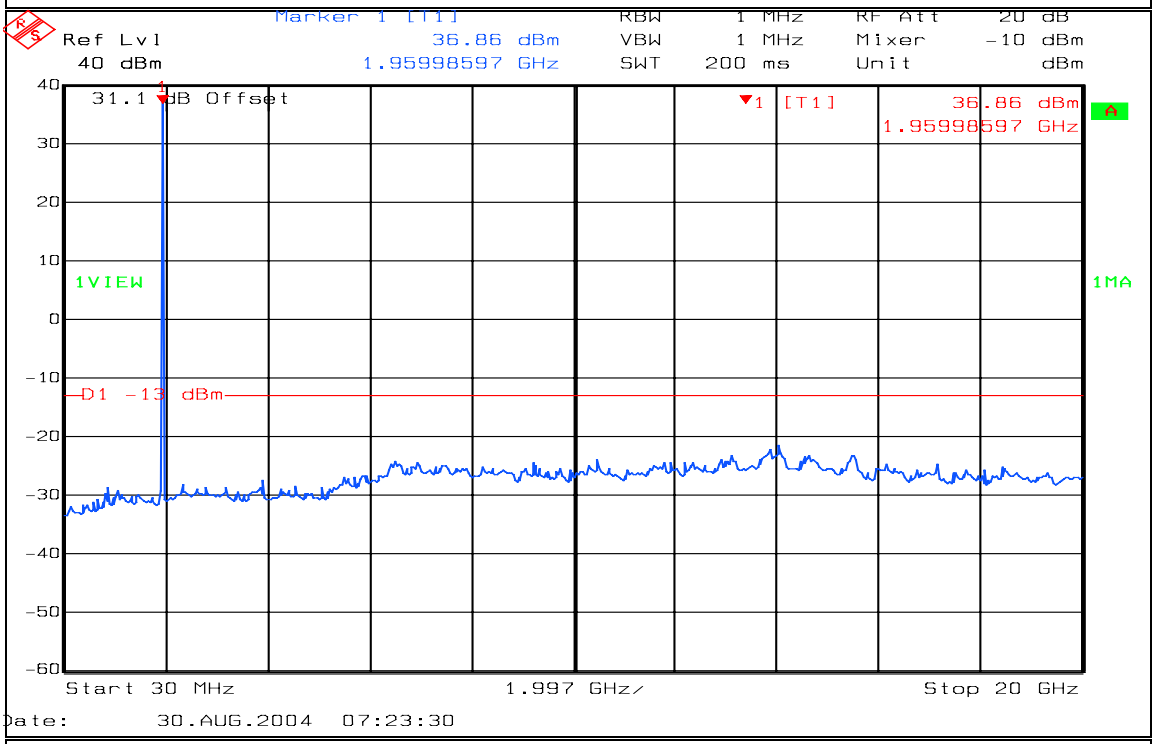
Data Plot — **Spurious Emissions at Antenna Terminals**

Page 3 of 3

Job No.:	4L0571	Date:	8/30/2004
Specification:	PT24	Temperature(°C):	25
Tested By:	David Light	Relative Humidity(%)	40
E.U.T.:	PCS AMPLIFIER		
Configuration:	TX		



Notes: **TX 1960 MHz @ 37 dBm**
The spectrum was searched in detail. This plot is a true indication of the emissions detected.

Test Data – Spurious Emissions at Antenna Terminals

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Data Plot — **Spurious Emissions at Antenna Terminals**

Page 1 of 3 — Complete X — Preliminary:

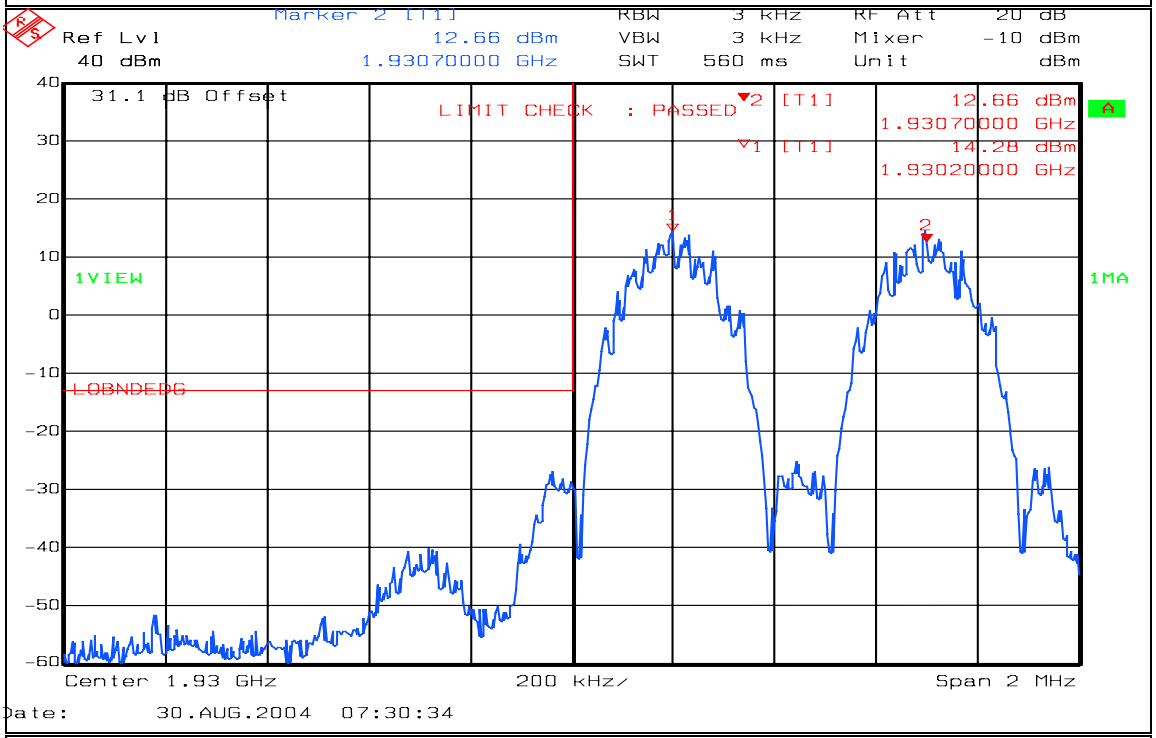
Job No.:	4L0571	Date:	8/30/2004		
Specification:	PT24	Temperature(°C):	25		
Tested By:	David Light	Relative Humidity(%)	40		
E.U.T.:	PCS AMPLIFIER				
Configuration:	TX				
Sample Number:	1				
Location:	Lab 1	RBW:	Refer to plots	Measurement Distance:	NA m
Detector Type:	Peak	VBW:	Refer to plots		

Test Equipment Used

Antenna:		Directional Coupler:	
Pre-Amp:		Cable #1:	1629
Filter:		Cable #2:	
Receiver:	1036	Cable #3:	
Attenuator #1	1065	Cable #4:	
Attenuator #2:	1604	Mixer:	

Additional equipment used:

Measurement Uncertainty: +/-1.7 dB



Notes:
LOWER BAND EDGE EDGE
2 CHANNELS AT 25 dBm EACH
EDGE

Test Data – Spurious Emissions at Antenna Terminals

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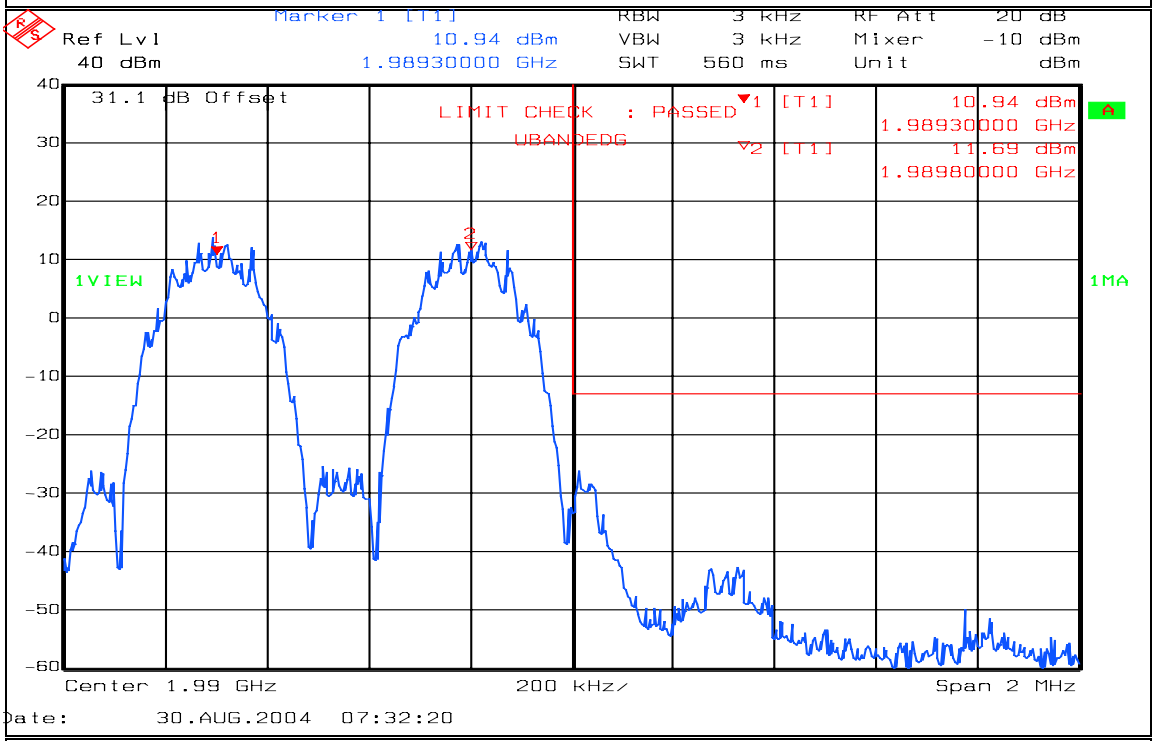
Nemko Dallas, Inc.

Data Plot — **Spurious Emissions at Antenna Terminals**

Page 2 of 3

Job No.:	4L0571	Date:	8/30/2004
Specification:	PT24	Temperature(°C):	25
Tested By:	David Light	Relative Humidity(%)	40
E.U.T.:	PCS AMPLIFIER		
Configuration:	TX		



Notes:
UPPER BAND EDGE - EDGE
2 CHANNELS AT 25 dBm EACH
EDGE

Test Data – Spurious Emissions at Antenna Terminals

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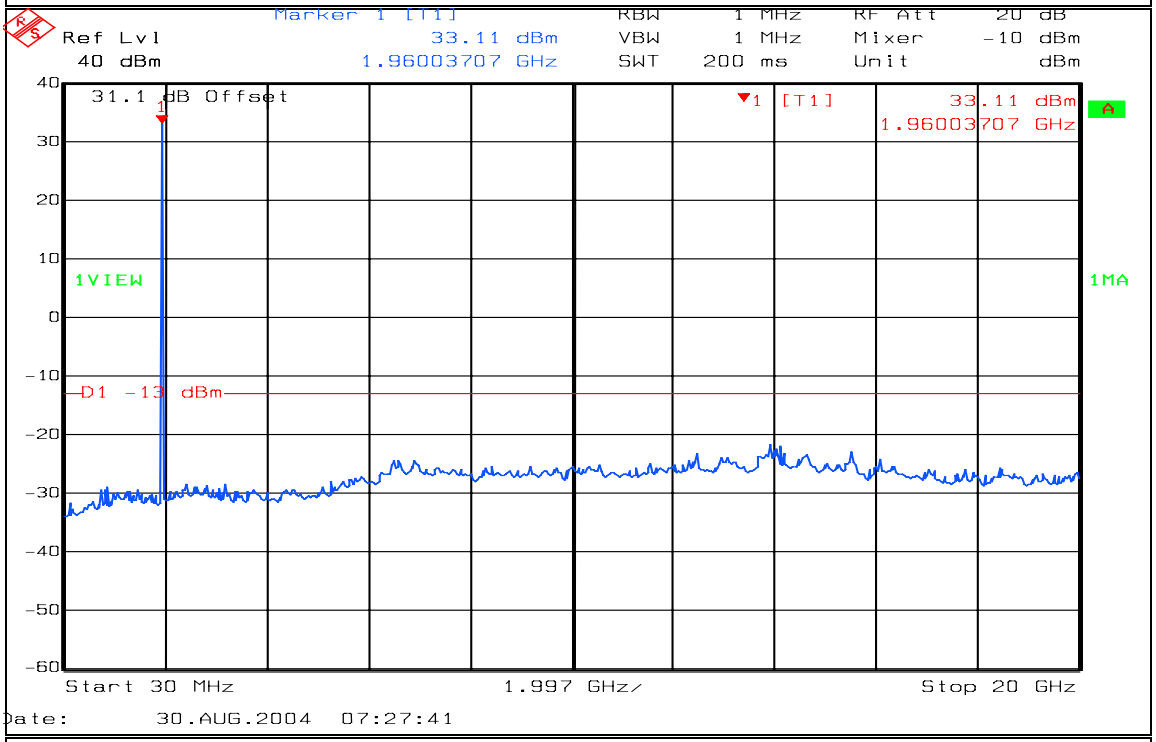
Data Plot — **Spurious Emissions at Antenna Terminals**

Page 3 of 3

Job No.:	4L0571	Date:	8/30/2004
Specification:	PT24	Temperature(°C):	25
Tested By:	David Light	Relative Humidity(%)	40
E.U.T.:	PCS AMPLIFIER		
Configuration:	TX		



Notes:
TX 1960 MHz @ 33.5 dBm
The spectrum was searched in detail. This plot is a true indication of the emissions detected.
EDGE

Test Data – Spurious Emissions at Antenna Terminals

Dallas Headquarters:
802 N. Kealy
Lewisville, TX 75057
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Nemko Dallas, Inc.

Data Plot — **Spurious Emissions at Antenna Terminals**

Page 1 of 3 — Complete: X — Preliminary:

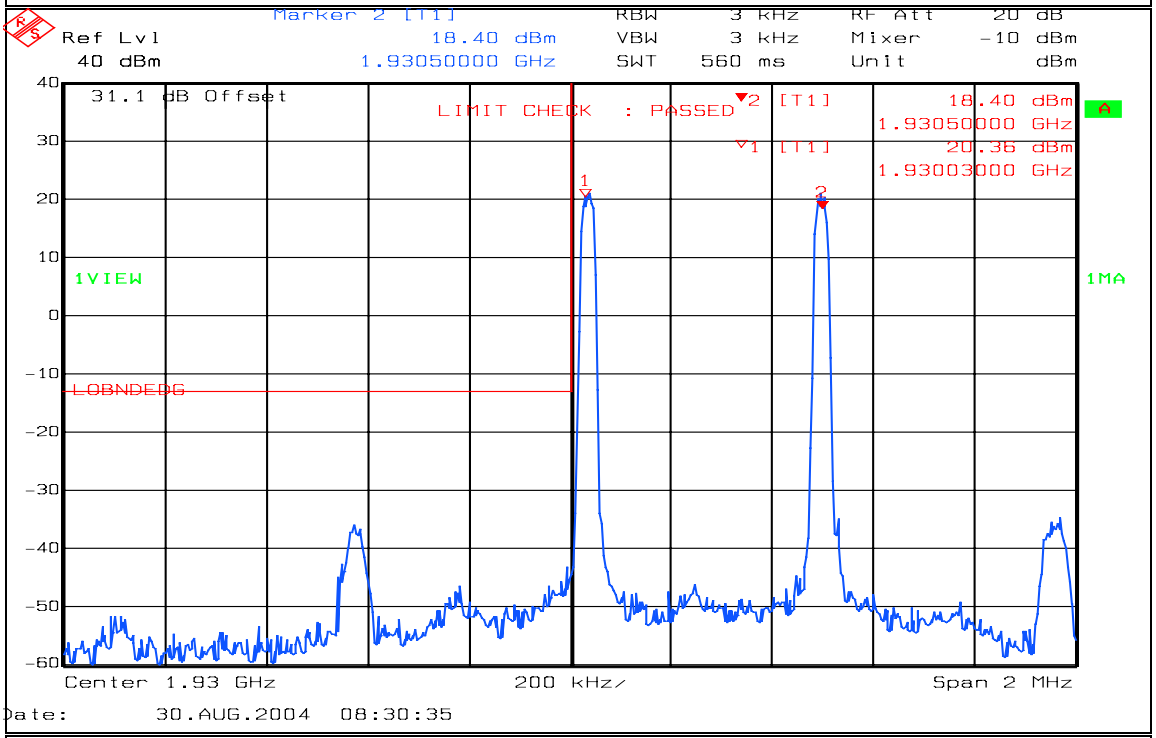
Job No.:	4L0571	Date:	8/30/2004		
Specification:	PT24	Temperature(°C):	25		
Tested By:	David Light	Relative Humidity(%)	40		
E.U.T.:	PCS AMPLIFIER				
Configuration:	TX				
Sample Number:	1				
Location:	Lab 1	RBW:	Refer to plots	Measurement Distance:	NA m
Detector Type:	Peak	VBW:	Refer to plots		

Test Equipment Used

Antenna:		Directional Coupler:	
Pre-Amp:		Cable #1:	1629
Filter:		Cable #2:	
Receiver:	1036	Cable #3:	
Attenuator #1	1065	Cable #4:	
Attenuator #2:	1604	Mixer:	

Additional equipment used:

Measurement Uncertainty: +/-1.7 dB



Notes:
LOWER BAND EDGE GSM
2 CHANNELS AT 25.5 dBm EACH
TDMA

Test Data – Spurious Emissions at Antenna Terminals

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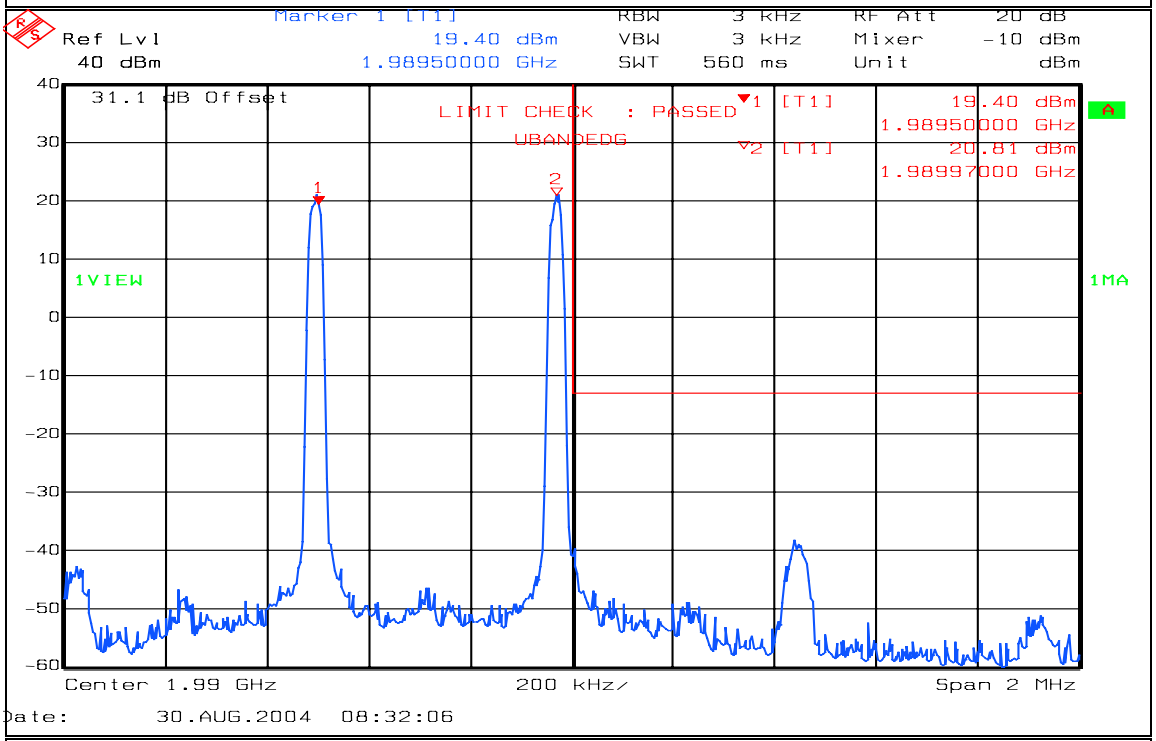
Page 2 of 3

Job No.:	4L0571	Date:	8/30/2004
Specification:	PT24	Temperature(°C):	25
Tested By:	David Light	Relative Humidity(%)	40
E.U.T.:	PCS AMPLIFIER		
Configuration:	TX		



Notes:
UPPER BAND EDGE - GSM
2 CHANNELS AT 25.5 dBm EACH
TDMA

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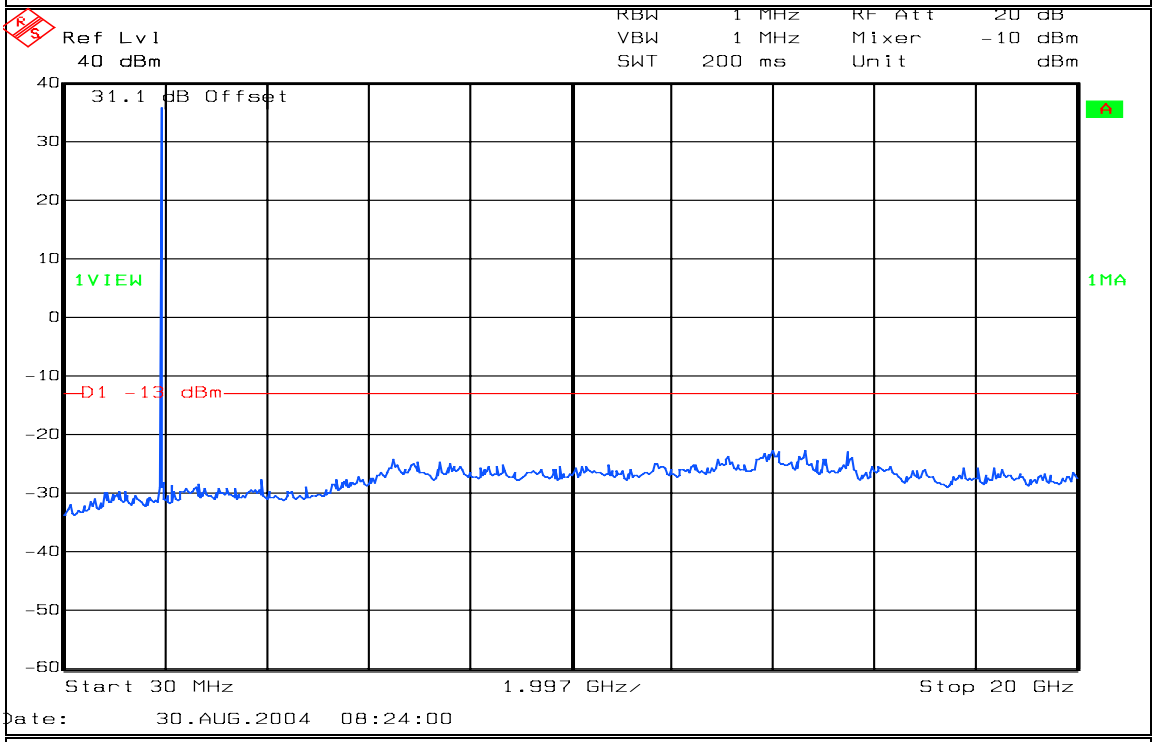
Data Plot — **Spurious Emissions at Antenna Terminals**

Page 3 of 3

Job No.:	4L0571	Date:	8/30/2004
Specification:	PT24	Temperature(°C):	25
Tested By:	David Light	Relative Humidity(%)	40
E.U.T.:	PCS AMPLIFIER		
Configuration:	TX		



Notes:
TX 1960 MHz @ 34.5 dBm
The spectrum was searched in detail. This plot is a true indication of the emissions detected.
TDMA

Section 6. Field Strength of Spurious

NAME OF TEST: Field Strength of Spurious Emissions	PARA. NO.: 2.1051
TESTED BY: Brian Boyea	DATE: 8/31/04

Test Results: Complies.

Test Data: See attached table.

Test Data - Radiated Emissions

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EIRP Substitution Method

Page 1 of

Complete X
Preliminary

Job No.: 4L0571R Date: 8/31/04
Specification: Temperature(°C): 23
Tested By: Brian Boyea Relative Humidity(%) 33
E.U.T.:
Configuration:
Sample No:
Location: AC 3 RBW: 1 MHz Measurement
Detector Type: Peak VBW: 1 MHz Distance: 3 m

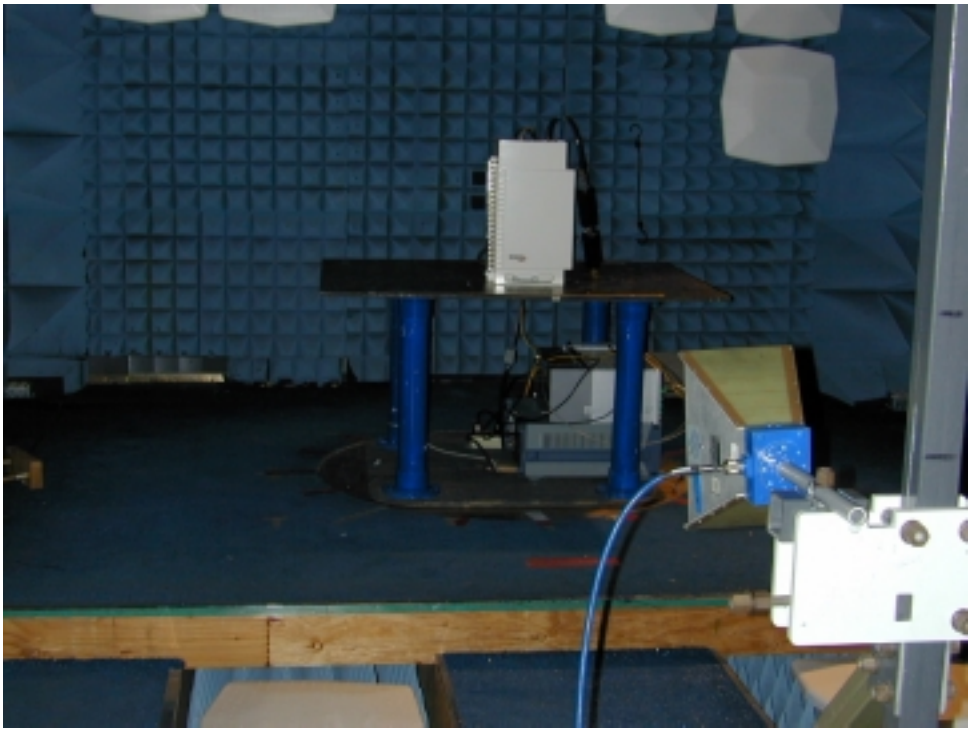
Test Equipment Used

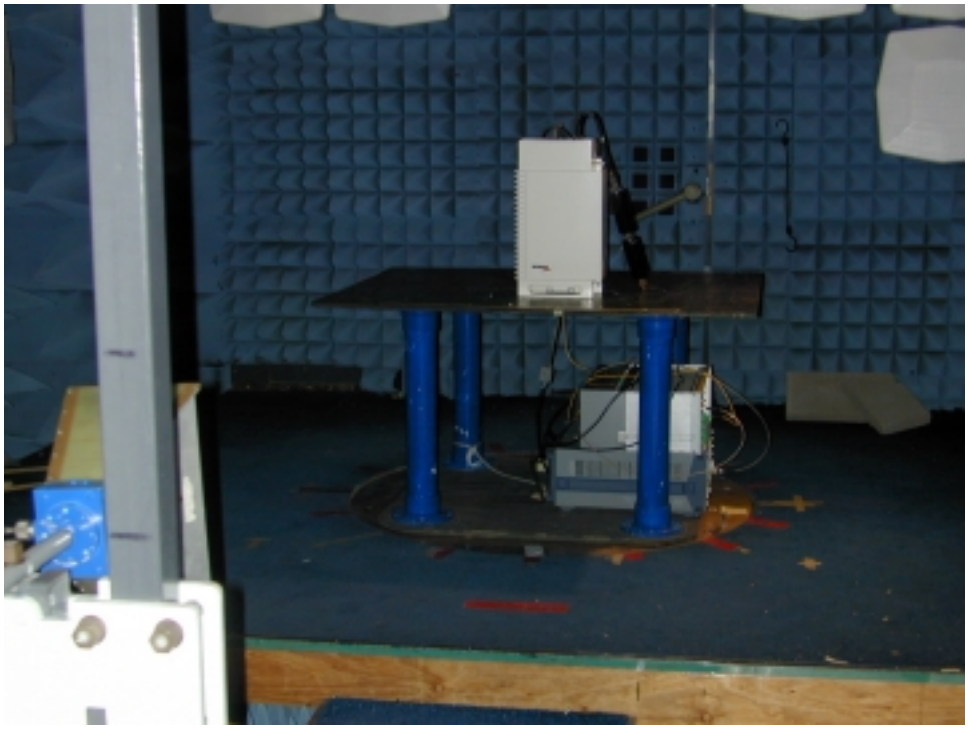
Antenna: 1304 Directional Coupler:
Pre-Amp: 1016 Cable #1: 1484
Filter: Cable #2: 1485
Receiver: 1464 Cable #3:
Attenuator #1 Cable #4:
Attenuator #2: Mixer:
Additional equipment used:
Measurement Uncertainty: +/-3.6 dB

Frequency (MHz)	Meter Reading (dBm)	Correction Factor (dB)		Pre-Amp Gain (dB)	Substitution Antenna Gain (dBi)	Spec Limit 13 dBm	EIRP (dBm)	EIRP (mW)	Polarity	Comments
3920	-45.7	43.3		33	10.7	13	-24.7	0.003415	V	
5880	-37.3	39.8		32.1	11.4	13	-18.2	0.015252	V	
7840	-50.3	41.8		32.9	11.3	13	-30.1	0.000985	V	
3920	-46.8	35.5		33	10.7	13	-33.6	0.000437	H	
5880	-38.2	37.8		32.1	11.4	13	-21.1	0.007822	H	
7840	-47.2	41.5		32.9	11.3	13	-27.3	0.001862	H	
										1960 MHz Channel

Notes: **Searched spectrum to the 10th harmonic.**
All emissions within 20 dB of the spec limit of -13 dBm were reported.

Photographs of Test Setup





Section 7. Test Equipment List

Nemko ID	Description	Manufacturer Model Number	Serial Number	Calibration Date	Calibration Due
1016	Pre-Amp	HEWLETT PACKARD 8449A	2749A00159	10/27/03	10/26/04
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	08/26/04	08/26/05
1485	Cable 2.0-18.0 Ghz	Storm PR90-010-216	N/A	08/02/04	08/02/05
1304	HORN ANTENNA	ELECTRO METRICS RGA-60	6151	09/22/03	09/22/05
1036	SPECTRUM ANALYZER	ROHDE & SCHWARZ FSEK30	830844/006	03/22/04	03/23/06
1065	ATTENUATOR	NARDA 776B-10	NONE	CBU	N/A
1604	ATTENUATOR	NARDA 776B-20	NONE	N/A	N/A
1629	CABLE, 6 ft	MEGAPHASE 10311 1GVT4	N/A	CBU	N/A

ANNEX A - TEST DETAILS

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:

Detachable Antenna:
The peak power at antenna terminals is measured using an in-line peak power meter. Power output is measured with the maximum rated input level.

Integral Antenna:
If the antenna is not detachable from the circuit then the Peak Power Output is derived from the peak radiated field strength of the fundamental emission by using the plane wave relation $GP/4\pi R^2 = E^2/120\pi$ and proceeding as follows:

$$P = \frac{E^2 R^2}{30G} = \frac{E^2 3^2}{30G}$$

where,

P = the equivalent isotropic radiated power in watts
E = the maximum measured field strength in V/m
R = the measurement range (3 meters)
G = the numeric gain of the transmit antenna in relation to an isotropic radiator

NAME OF TEST: Occupied Bandwidth	**PARA. NO.: 2.1047**

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

Spectrum analyzer settings:
RBW: 30 kHz
VBW: ≥ RBW
Span: 5 MHz
Sweep: Auto
Mask: Set markers to -26 dB from peak of CW.

GSM

RBW: 3 kHz
VBW: ≥ RBW
Span: 2 MHz
Sweep: Auto
Mask: Set markers to -26 dB from peak of CW.

NADC

RBW: 1 kHz
VBW: ≥ RBW
Span: 1 MHz
Sweep: Auto
Mask: Set markers to -26 dB from peak of CW.

NAME OF TEST: Spurious Emission at Antenna Terminals	**PARA. NO.: 2.1051**

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

RBW: 1 MHz (> 1 MHz from Band Edge)
RBW: 30 kHz (< 1MHz from Band Edge)
VBW: ≥ RBW
Sweep: Auto
Video Avg: 6 Sweeps

GSM

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

NADC

RBW: 1 MHz (> 1 MHz from Band Edge)
RBW: 3 kHz (< 1 MHz from Band Edge)
VBW: ≥ 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.

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:

The maximum field strength of the spurious emission is measured at a distance of 3 meters. The device under test is then replaced with a substitution antenna of known gain with respect to a ¼ wave dipole antenna. A calibrated signal source is used to feed the substitution antenna. The rf level to the substitution antenna is adjusted to repeat the previously measured field strength. The rf input level to the substitution antenna is the effective radiated power of the spurious emission after any correction for substitution antenna gain against a ¼ wave dipole.

The spectrum was searched up to 20 GHz.

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:

Frequency Stability With Voltage Variation

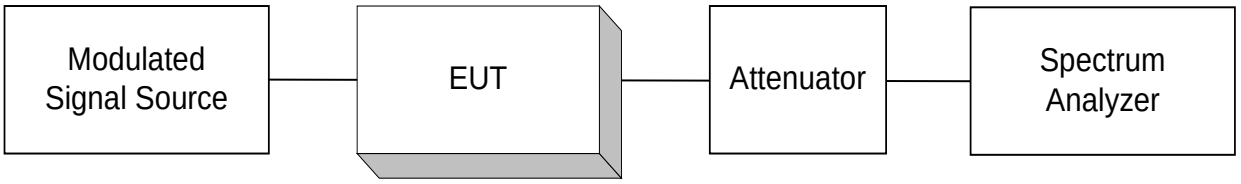
The E.U.T. is placed in an environmental chamber and allowed to stabilize at +20 degrees Celsius for at least 15 minutes. The frequency counter and signal generator are phase locked with the same 10 MHz reference frequency by connecting the 10 MHz ref. out of the counter to the 10 MHz ref, in of the signal generator. 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

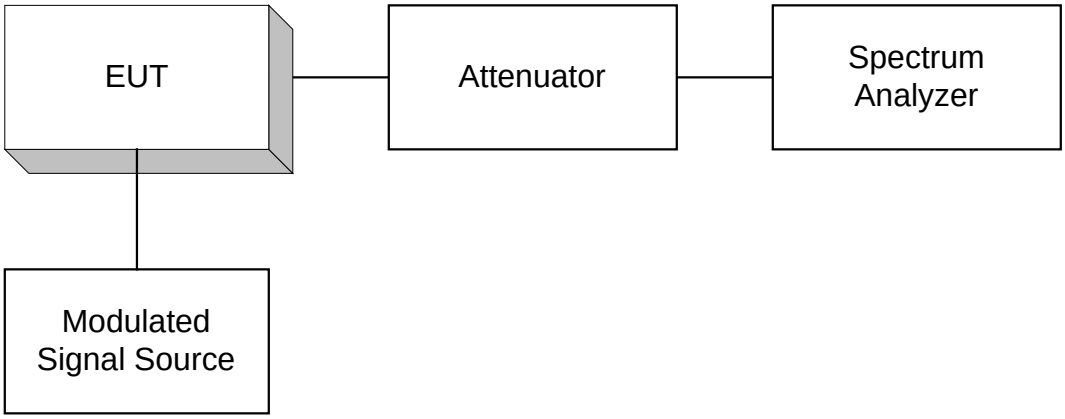
The input voltage to the E.U.T. is set to S.T.V. and the temperature of the environmental chamber is varied in 10 degree steps from -30 degrees C to +50 degrees C. The E.U.T. is allowed to stabilize at each temperature and the frequency is measured in 30 second intervals for a period of 5 minutes.

ANNEX B - TEST DIAGRAMS

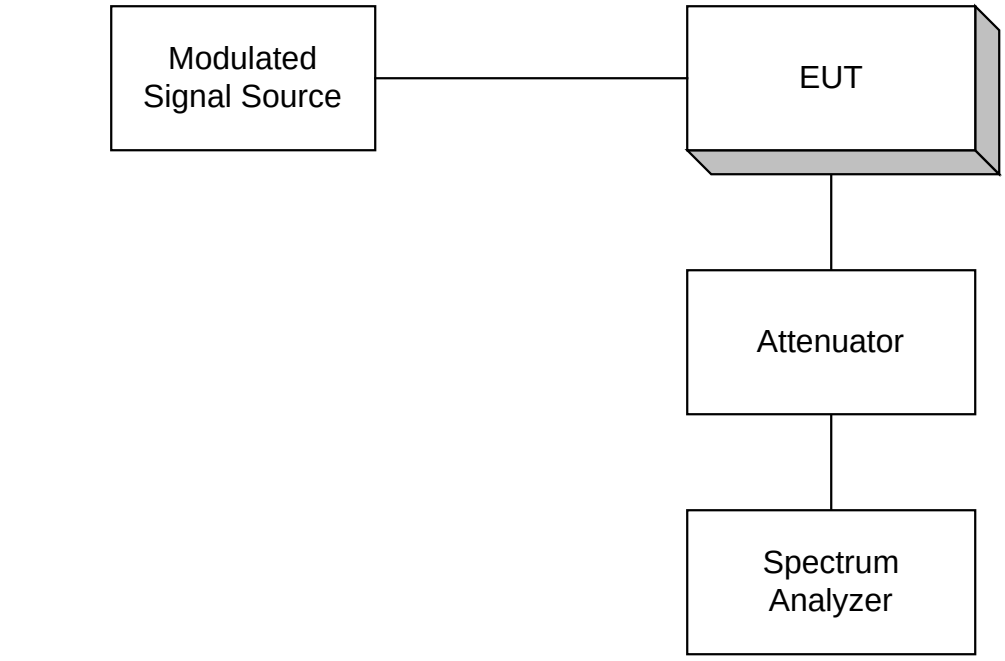
Para. No. 2.985 - R.F. Power Output

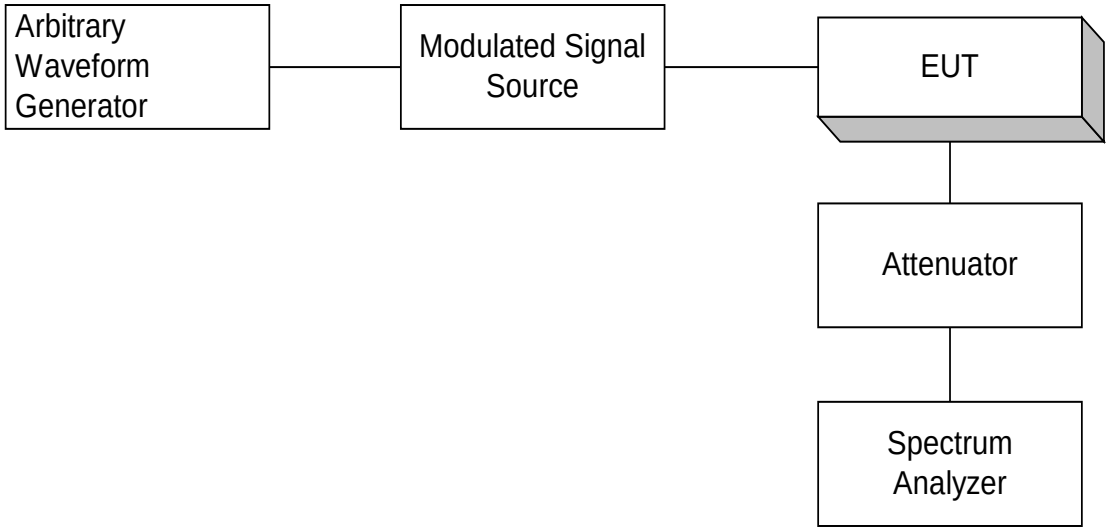


Para. No. 2.989 - Occupied Bandwidth

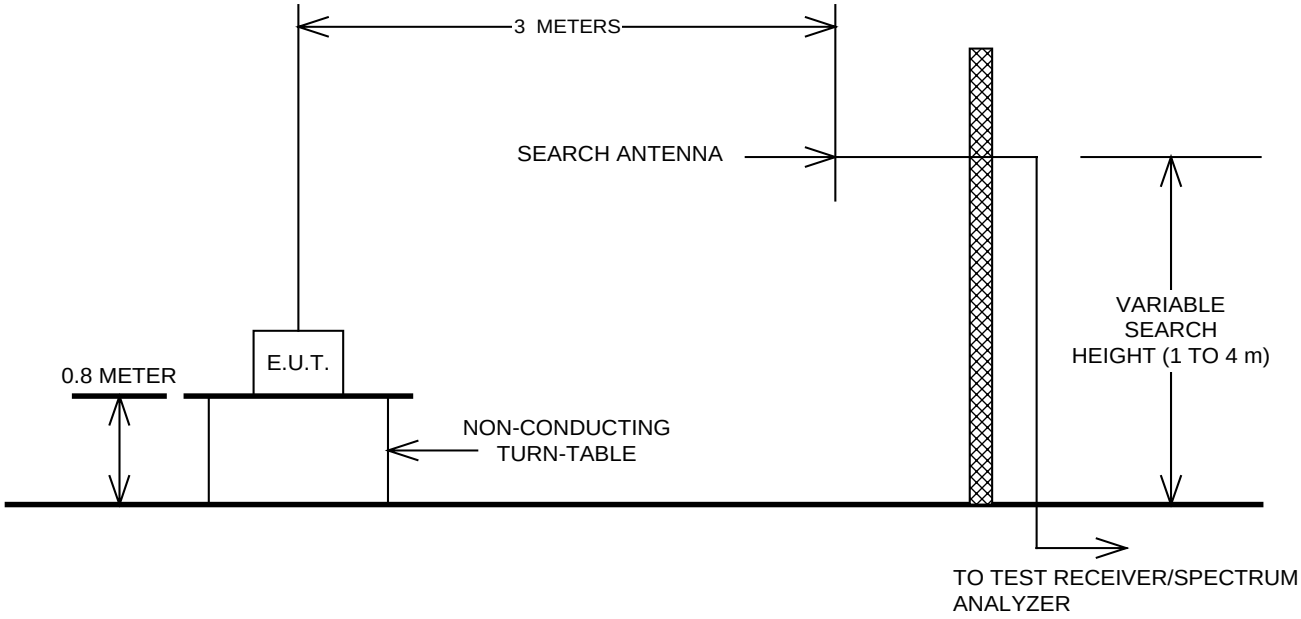


Para. No. 2.991 Spurious Emissions at Antenna Terminals





Para. No. 2.993 - Field Strength of Spurious Radiation



Para. No. 2.995 - Frequency Stability