KTL Test Report No.:	9L0482R
Applicant:	Allen Telecom 140 Vista Centre Dr. Forest, VA 24551
Equipment Under Test:	MR701B
FCC ID:	BCR-RPT-MR701
In Accordance With:	**FCC Part 24, Subpart E** Broadband PCS Repeaters
Tested By:	KTL Dallas Inc. 802 N. Kealy Lewisville, Texas 75057-3136
Authorized By:	Tom Tidwell, RF Group Manager
Date:	December 14, 1999
Total Number of Pages:	75

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Section 1. Summary of Test Results

Manufacturer: Allen Telecom

Model No.: MR701B

Serial No.: 24

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".

NVLAP LAB CODE: 100426-0

TESTED BY: _____ DATE: _____

Summary Of Test Data

NAME OF TEST	PARA. NO.	SPEC.	MEAS.	RESULT
RF Power Output	24.232	100W	5 W	Complies
Occupied Bandwidth (CDMA)	24.238	Input/Output	-	Complies
Occupied Bandwidth (GSM)	24.238	Input/Output	-	Complies
Occupied Bandwidth (NADC)	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.	- 34 dBm	Complies
Frequency Stability	24.235	N/A	N/A	N/A

Footnotes:

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

(2) Field strength of spurious emission was tested previously with higher output power

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

Section 2. General Equipment Specification

Supply Voltage Input:		
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:**	☒ 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 (G7W)** ☒ **GSM (GXW)** ☒ **NADC (DXW)** ☒
System Gain:		85 dB
Output Impedance:		50 ohms
RF Output (Rated):	**Uplink**	Single channel: 4 W Per channel: 1 W
RF Output (Rated):	**Downlink**	Per channel: 4 W Total: 1 W
Frequency Translation:		**F1-F1** ☒ **F1-F2** ☐ **N/A** ☐
Band Selection:		**Software** ☐ **Duplexer** ☒ **Fullband** ☐

Description of Modifications For Class II Permissive Change

This system has previously been approved with a high power amplifier module under FCC Identifier BCR-RPT-MR701. This permissive change is to add the low power option. This simply involves replacing the high power amplifier with a low power amplifier module. This module is marketed to the end-user as a kit. It would be the case that a system previously installed as a high power version may later be configured in the field to operate as a low power version. The system, therefore, was intended to be approved as a low/high power system under one certification, thus eliminating the possibility of incorrectly labeled equipment. There are no other changes to the system except for the addition of the alternate power amplifier.

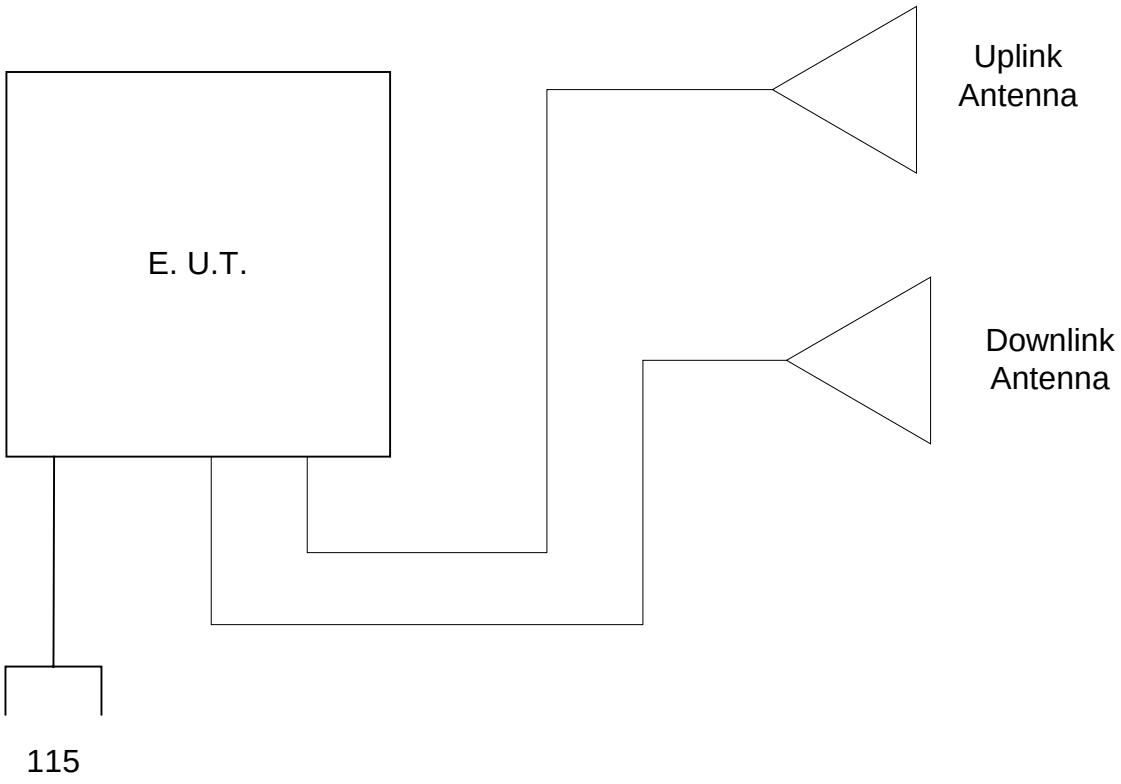
Modifications Made During Testing

None

Description of Operation

The unit is a repeater operating in the PCS Band.

System Diagram



Section 3. RF Power Output

NAME OF TEST: RF Power Output	PARA. NO.: 2.1046
TESTED BY: David Light	DATE:6-7/12/99

Test Results: Complies.

Measurement Data:

	Modulation Type	Multi-carrier Per Channel Output Power (dBm)	Single Channel Output Power (dBm)
Uplink	CDMA	+29.9	+31.8
Downlink	CDMA	+29.8	+33.2
Uplink	GSM	+30.1	+35.2
Downlink	GSM	+31.5	+37.6
Uplink	NADC	+28.4	+34.3
Downlink	NADC	+26.6	+35.1

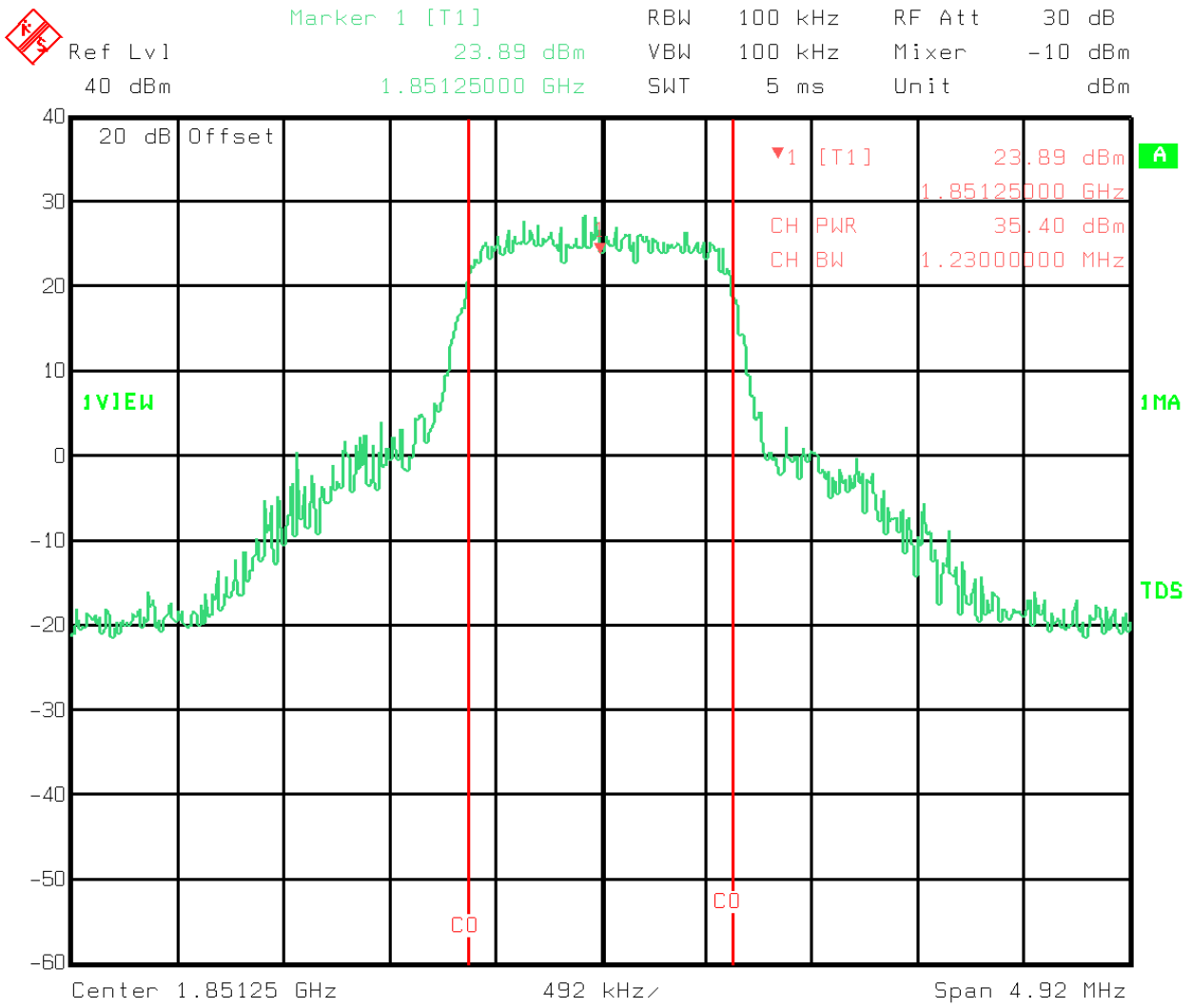
Equipment Used: G2736, G3726, G1366, G2632, CF44, CF41, CF39, CF38, CF40, Mini-Circuit attenuator p/n BW-520W2

Measurement Uncertainty: +/- 1.6 dB

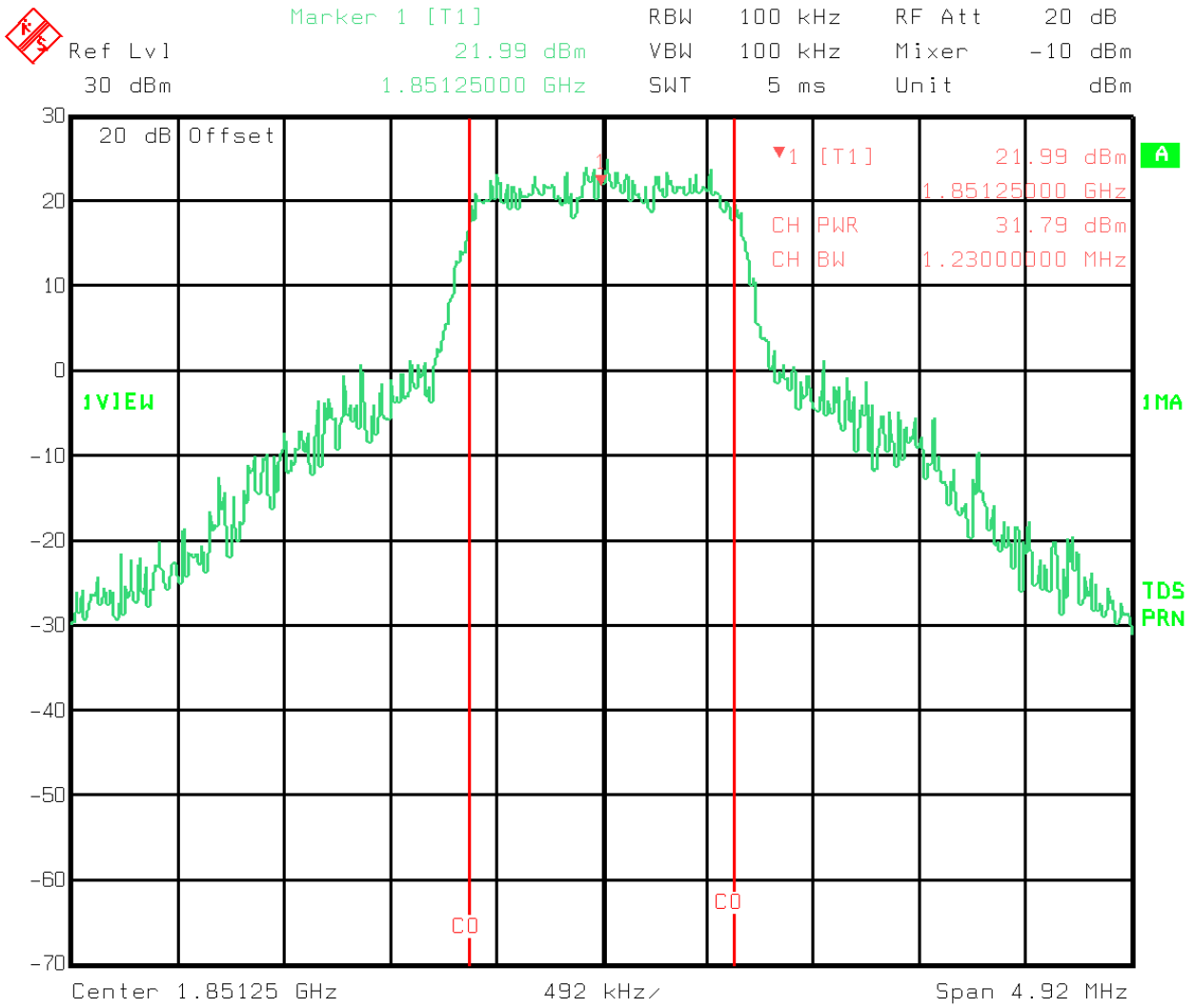
Temperature: 25°C

Relative Humidity: 50%

SINGLE CARRIER POWER OUTPUT

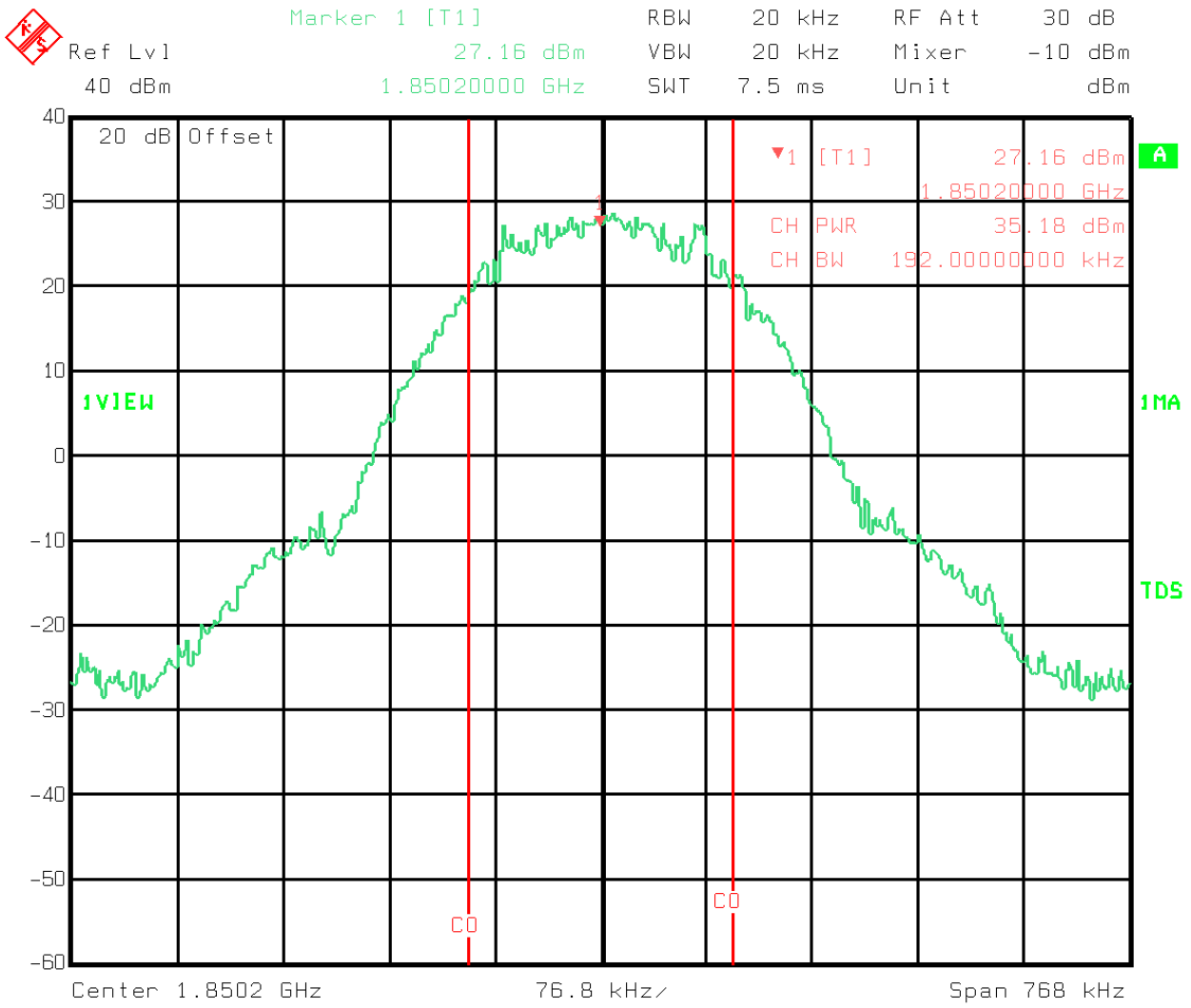

Marker 1 [T1]
RBW 100 kHz
RF Att 30 dB
Ref Lvl
23.89 dBm
VBW 100 kHz
Mixer -10 dBm
40 dBm
1.85125000 GHz
SWT 5 ms
Unit dBm
20 dB Offset
1 [T1]
23.89 dBm
1.85125000 GHz
CH PWR
35.40 dBm
CH BW
1.23000000 MHz
A
1MA
TDS
1VIEW
C0
C0
Center 1.85125 GHz
492 kHz/
Span 4.92 MHz
Title: 9L0482R LOW POWER MODULE W/ CDMA MODULE
Comment A: LBECP10.PCX LOWER BAND EDGE CHANNEL POWER - UPLINK - CDMA
Date: 7.DEC.1999 15:58:53

Plot 1



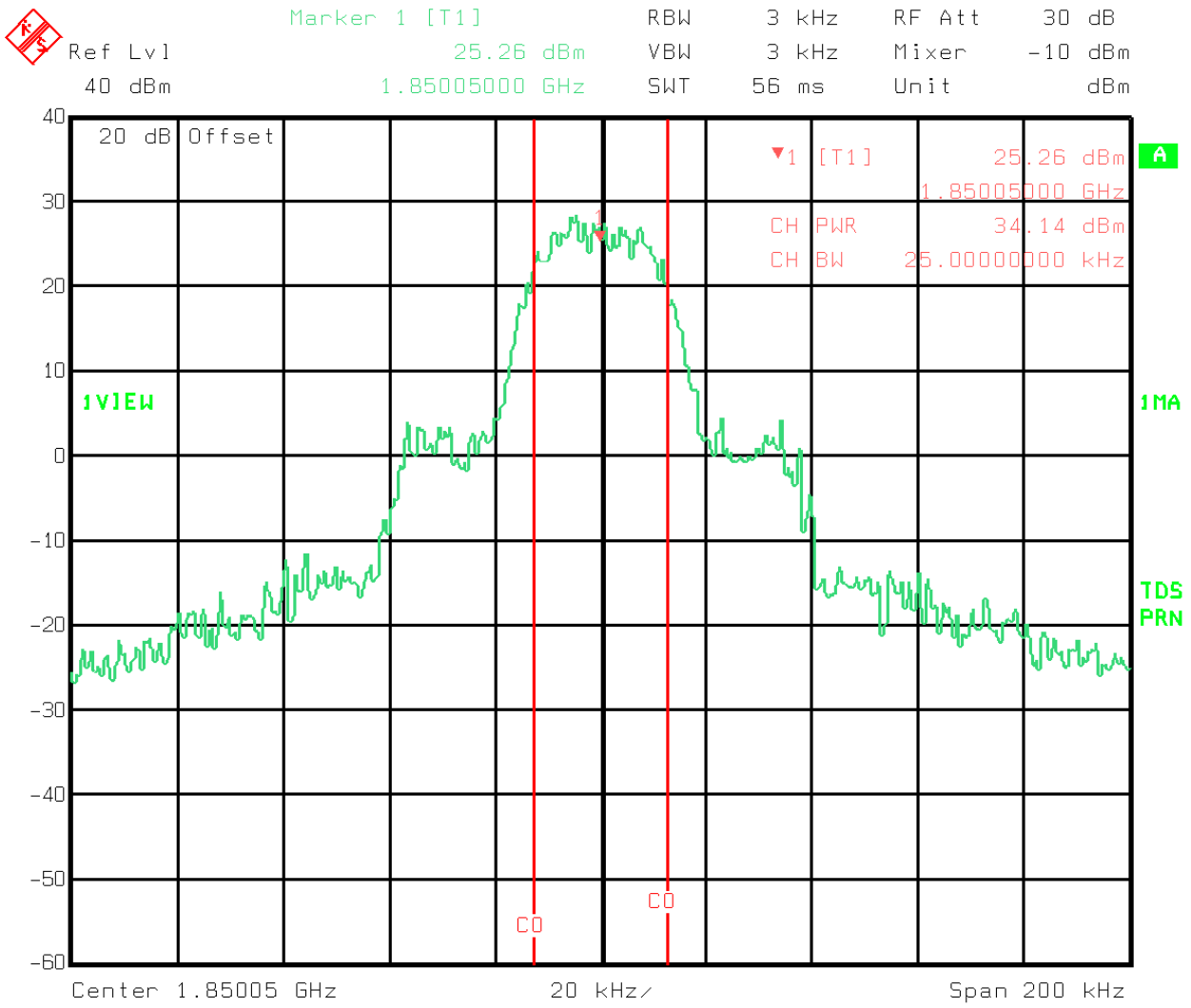
Title: 9L0482R LOW POWER MODULE W/VARIABLE BW MODULE
Comment A: LBECP05.PCX LOWER BAND EDGE CHANNEL POWER - CDMA - UPLINK
Date: 6.DEC.1999 17:34:34

Plot 2



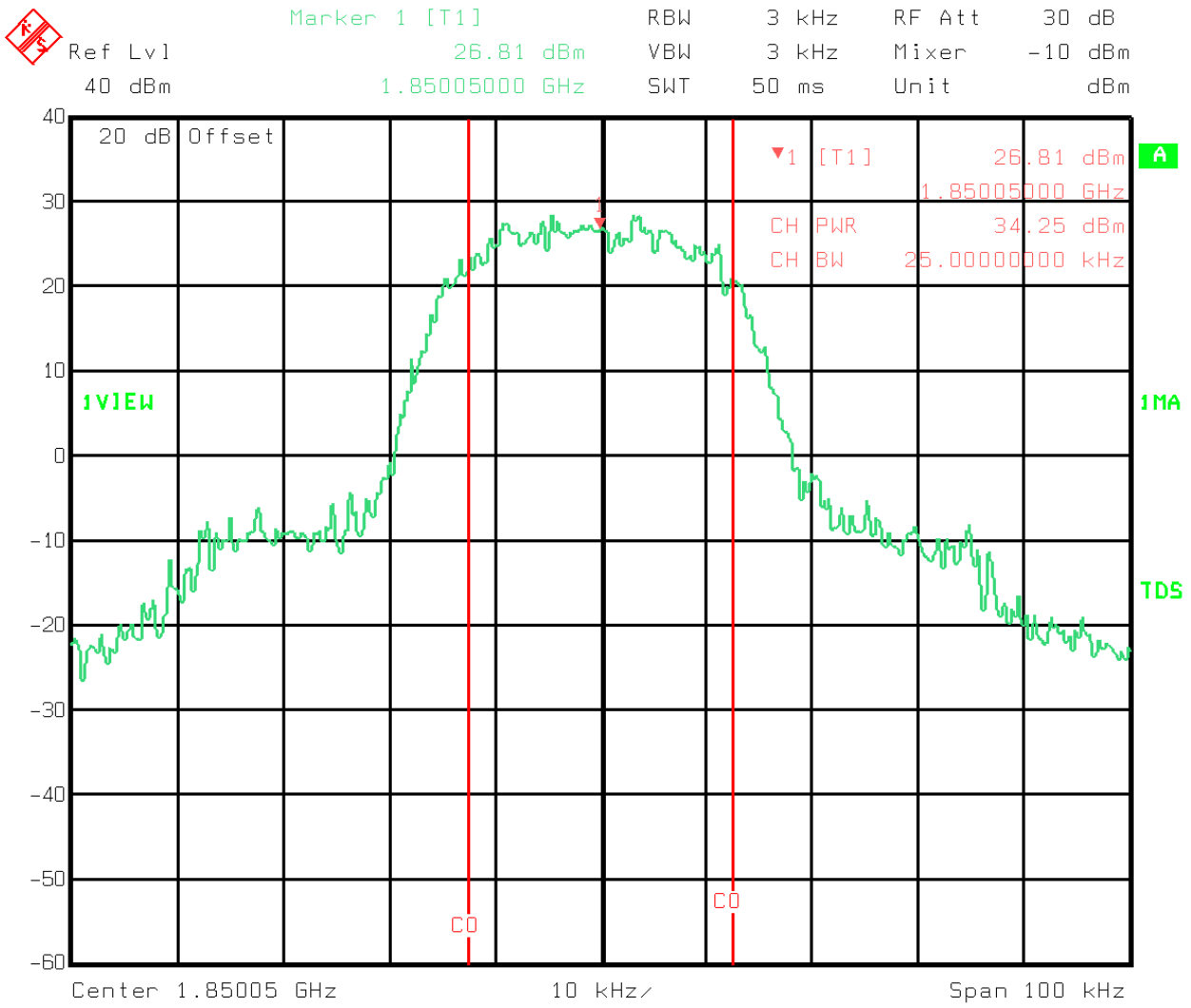
Title: 9L0482R LOW POWER MODULE W/VARIABLE BW MODULE
Comment A: LBECP01.PCX LOWER BAND EDGE CHANNEL POWER - GSM - UPLINK
Date: 6.DEC.1999 14:51:01

Plot 3



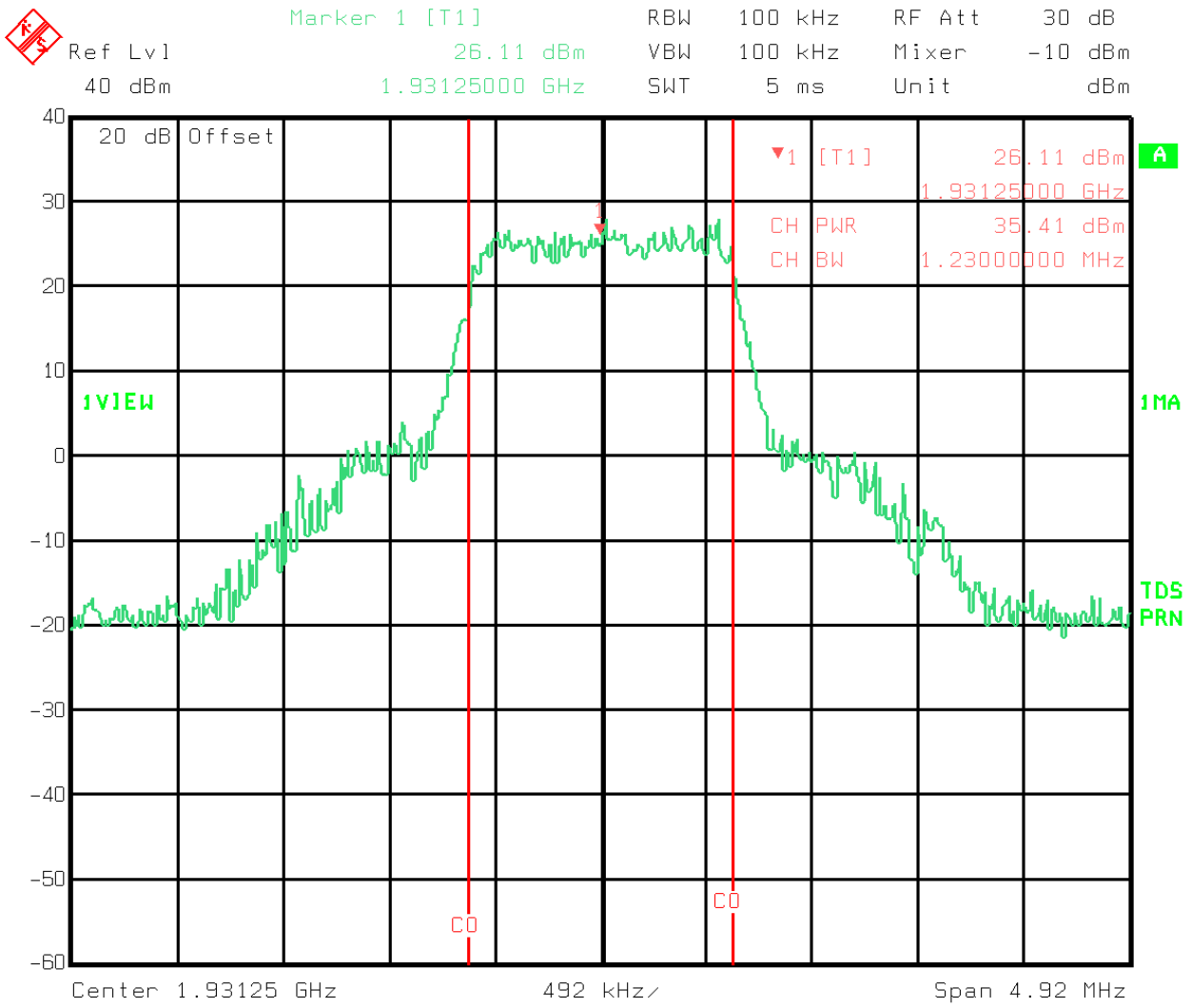
Title: 9L0482R LOW POWER MODULE W/VARIABLE BW MODULE
Comment A: LBECP03.PCX LOWER BAND EDGE CHANNEL POWER - TDMA - UPLINK
Date: 6.DEC.1999 14:59:31

Plot 4



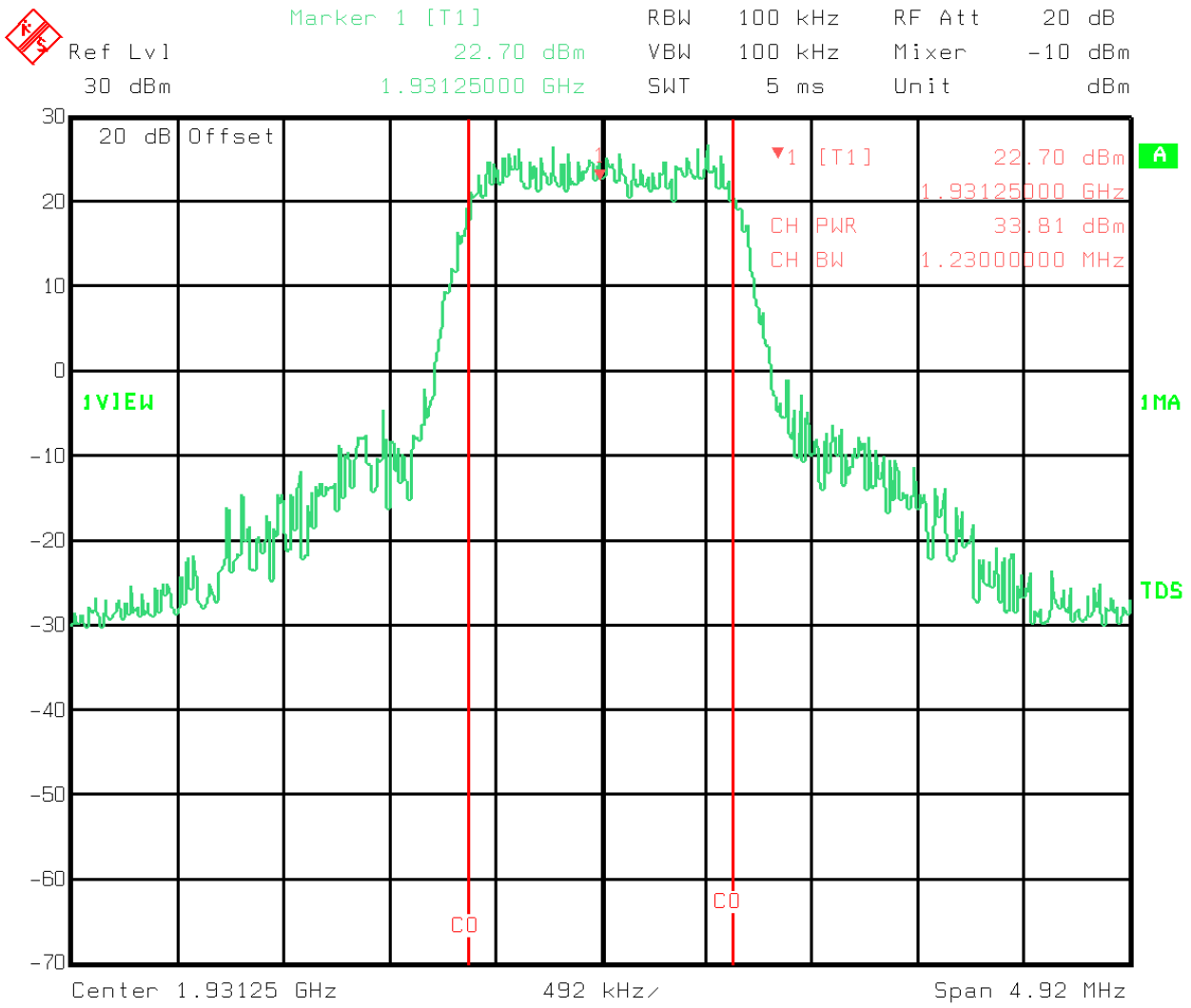
Title: 9L0482R LOW POWER MODULE W/ TDMA MODULE
Comment A: LBECP07.PCX LOWER BAND EDGE CHANNEL POWER - UPLINK - TDMA
Date: 7.DEC.1999 15:27:50

Plot 5



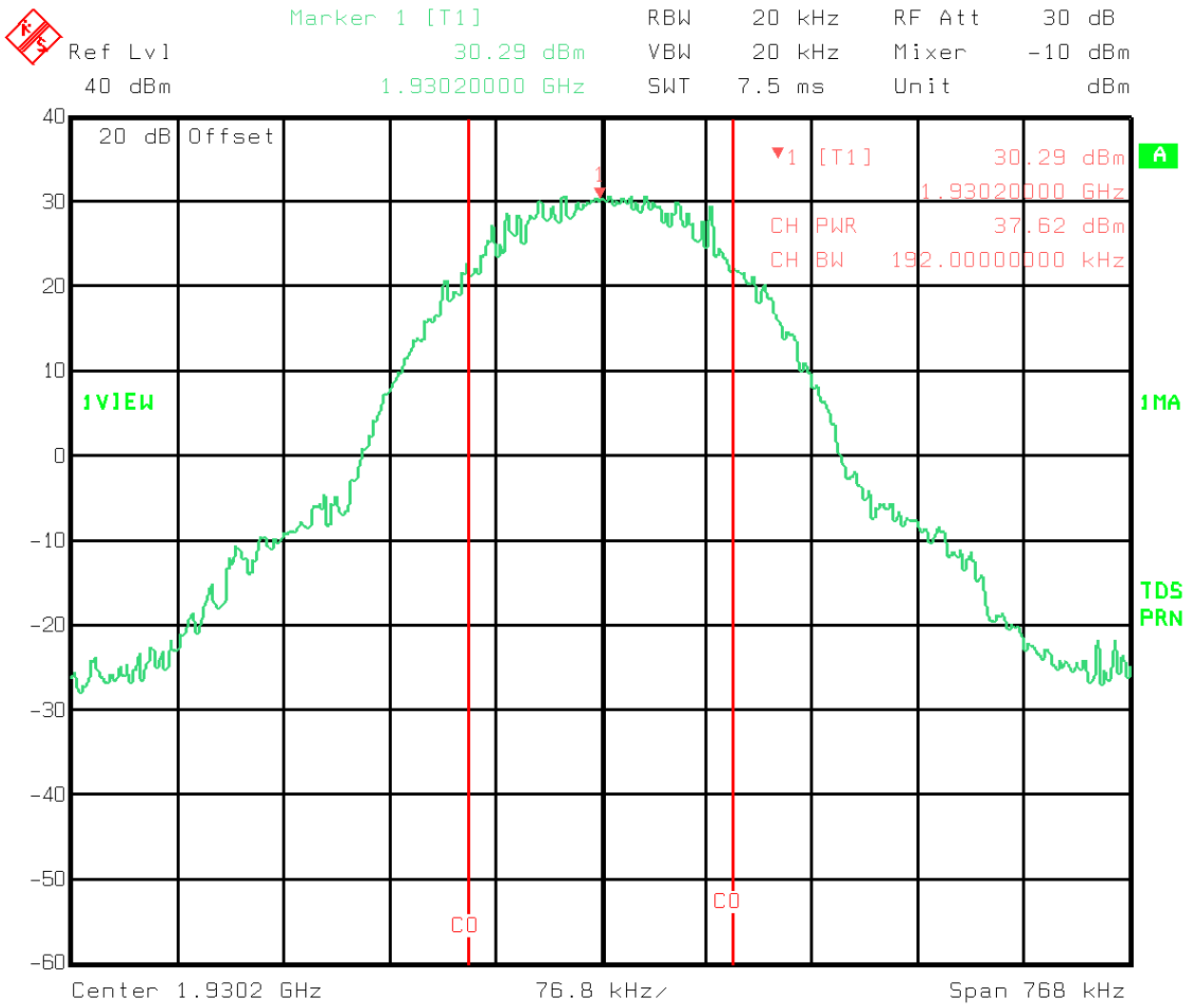
Title: 9L0482R LOW POWER MODULE W/ CDMA MODULE
Comment A: LBECP09.PCX LOWER BAND EDGE CHANNEL POWER- DOWNLINK - CDMA
Date: 7.DEC.1999 15:48:34

Plot 6



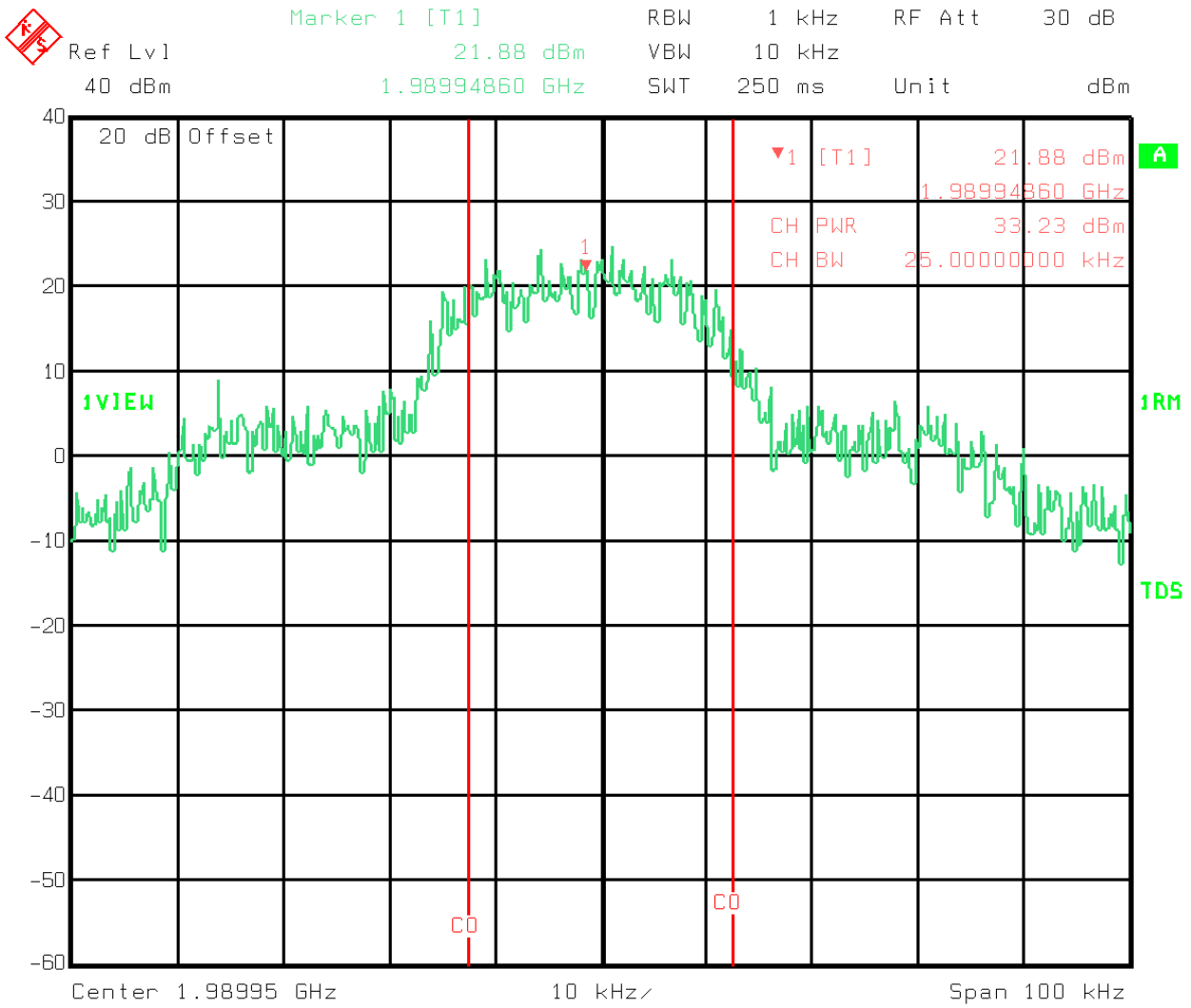
Title: 9L0482R LOW POWER MODULE W/VARIABLE BW MODULE
Comment A: LBECP05.PCX LOWER BAND EDGE CHANNEL POWER - CDMA - DOWNLINK
Date: 6.DEC.1999 17:42:48

Plot 7



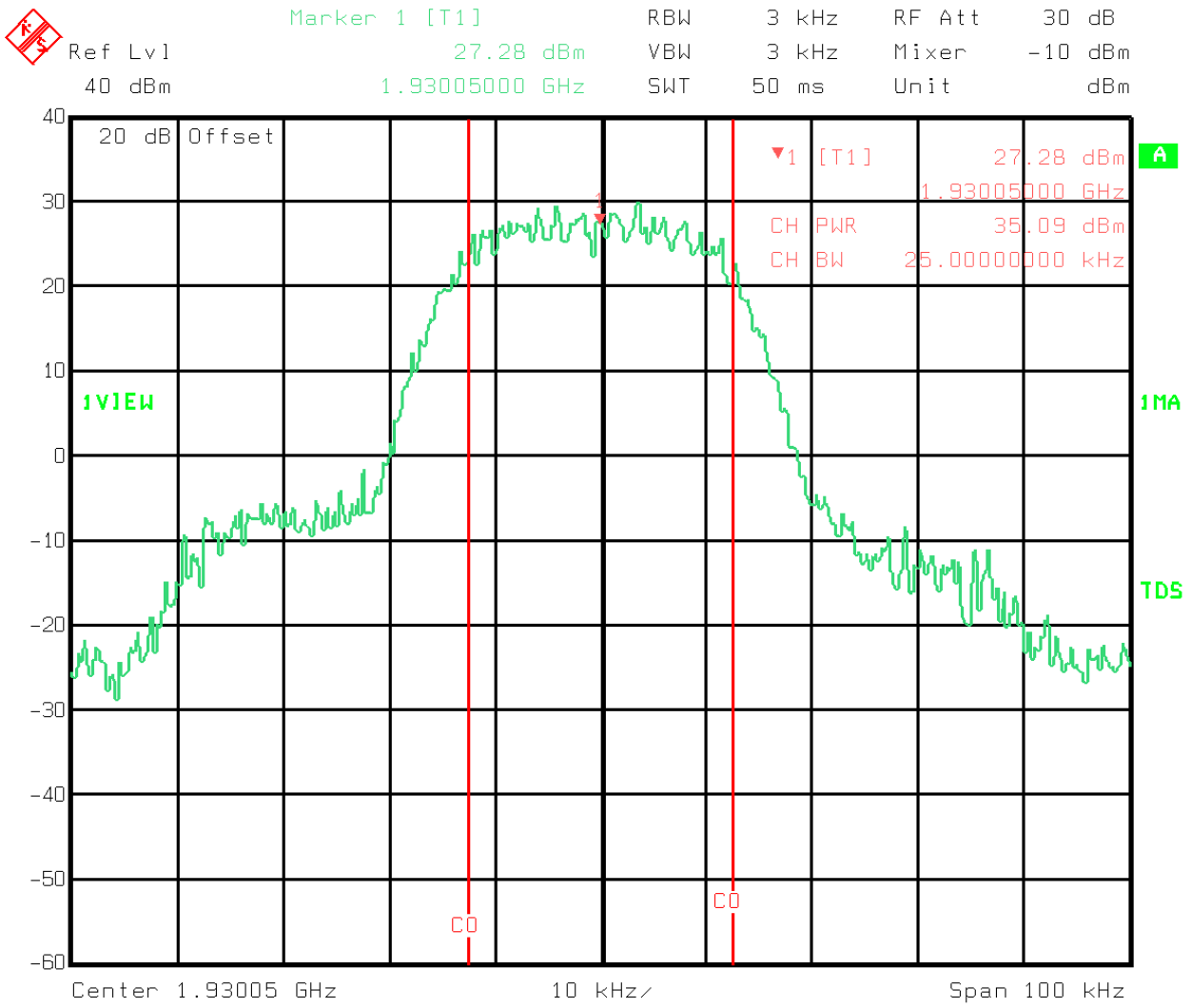
Title: 9L0482R LOW POWER MODULE W/VARIABLE BW MODULE
Comment A: LBECP02.PCX LOWER BAND EDGE CHANNEL POWER - GSM - DOWNLINK
Date: 6.DEC.1999 14:48:48

Plot 8



Title: 9L0482R LOW POWER MODULE W/VARIABLE BW MODULE-TDMA
Comment A: CP03.PCX CHANNEL POWER
CHANNEL 1199
Date: 18.NOV.1999 8:56:14

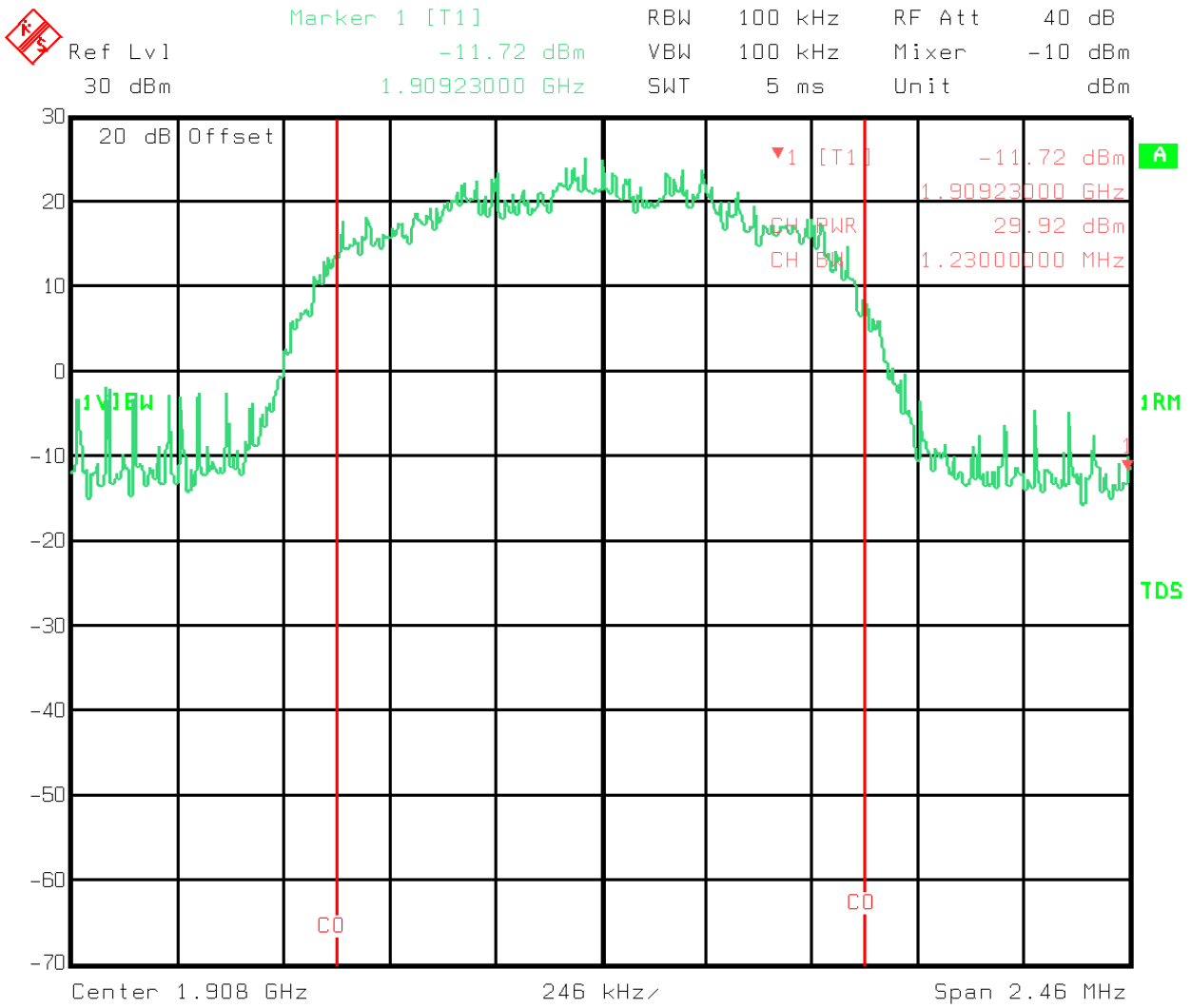
Plot 9



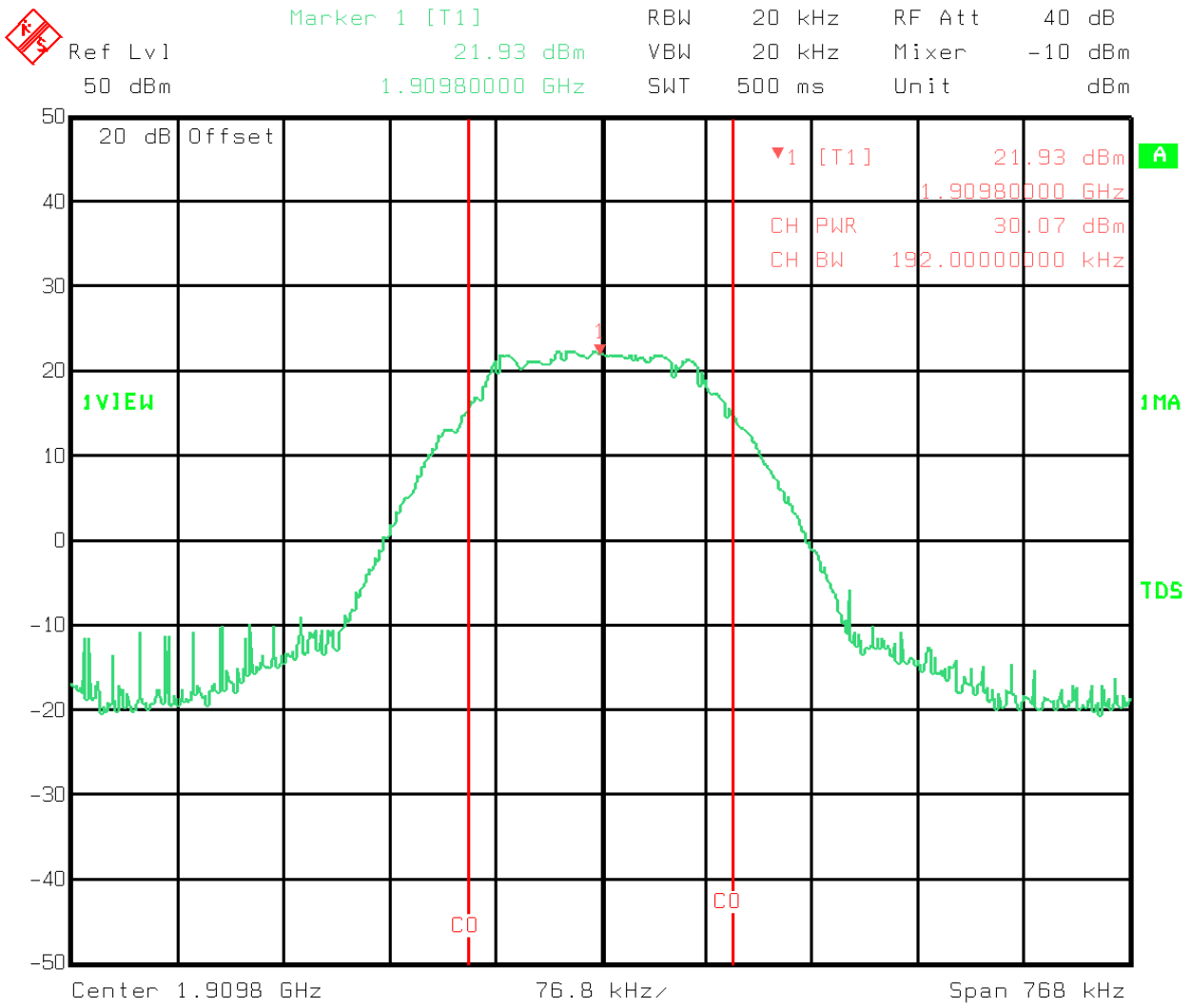
Title: 9L0482R LOW POWER MODULE W/ TDMA MODULE
Comment A: LBECP08.PCX LOWER BAND EDGE CHANNEL POWER - DOWNLINK - TDMA
Date: 7.DEC.1999 15:33:44

Plot 10

MULTI-CARRIER POWER OUTPUT

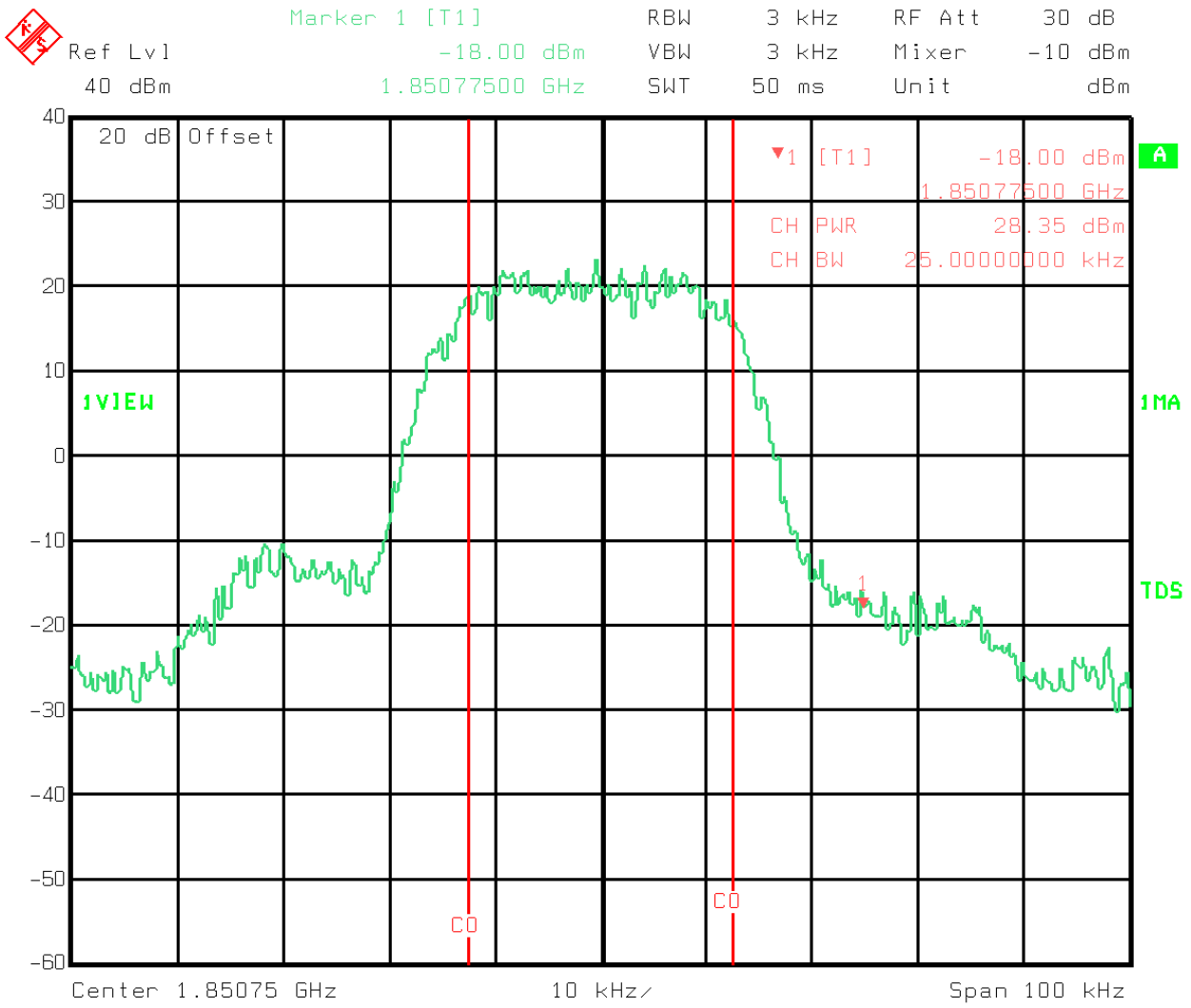

Marker 1 [T1]
Ref Lvl
30 dBm
-11.72 dBm
1.90923000 GHz
RBW 100 kHz
VBW 100 kHz
SWT 5 ms
RF Att 40 dB
Mixer -10 dBm
Unit dBm
20 dB Offset
1 [T1]
-11.72 dBm
1.90923000 GHz
CH PWR
29.92 dBm
CH BW
1.23000000 MHz
1VIEW
1RM
TDS
A
CO
CO
Center 1.908 GHz
246 kHz/
Span 2.46 MHz
Title: 9L0482R LOW POWER MODULE W/ VARIABLE BW MODULE (CDMA)
Comment A: IMCP01.PCX
(UPLINK)
Date: 17.NOV.1999 12:52:26

Plot 11



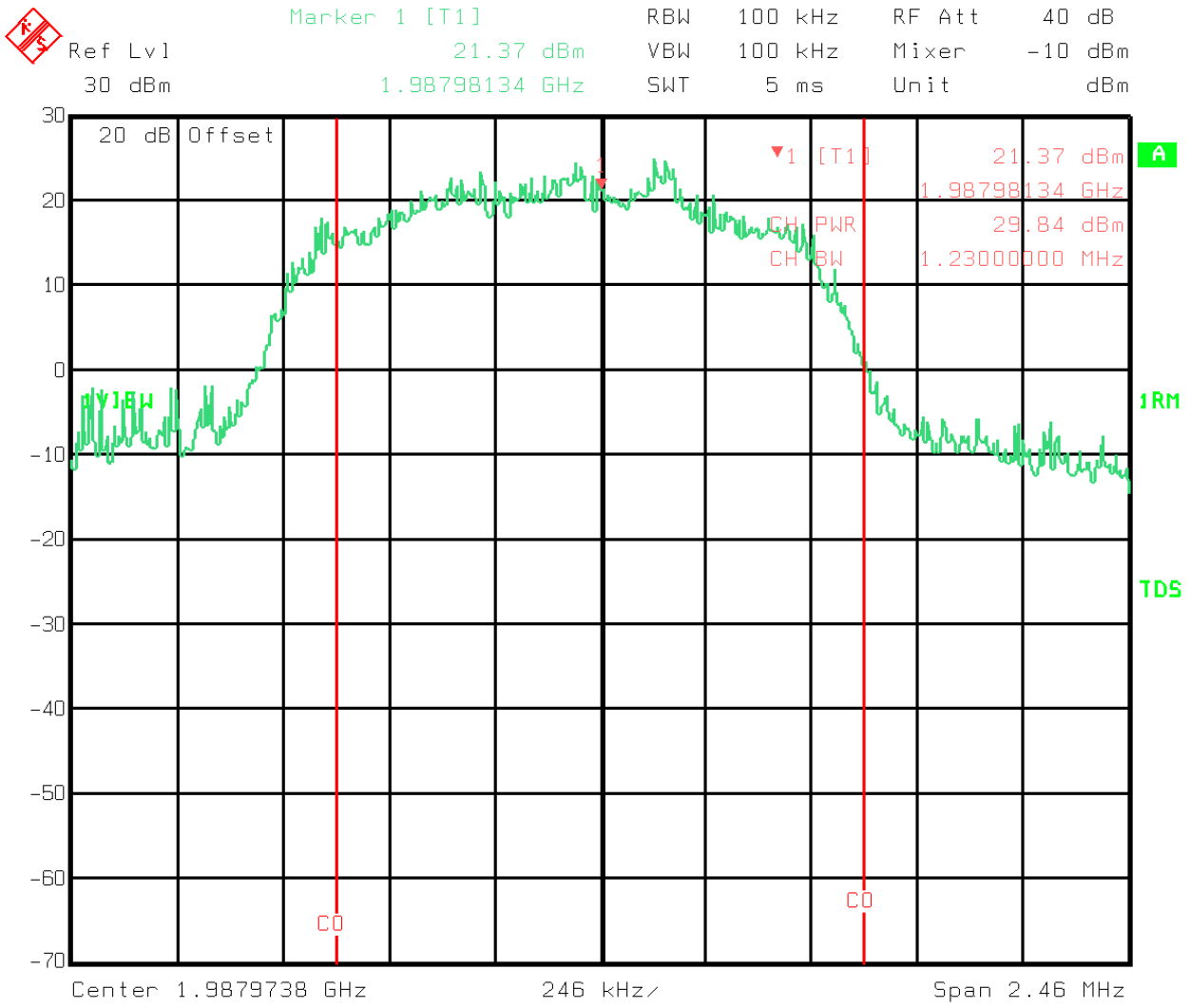
Title: 9L0482R LOW POWER MODULE W/VARIABLE BW MODULE
Comment A: IMCP05.PCX INTERODULATION CHANNEL POWER - UPLINK - GSM
Date: 6.DEC.1999 10:05:40

Plot 12



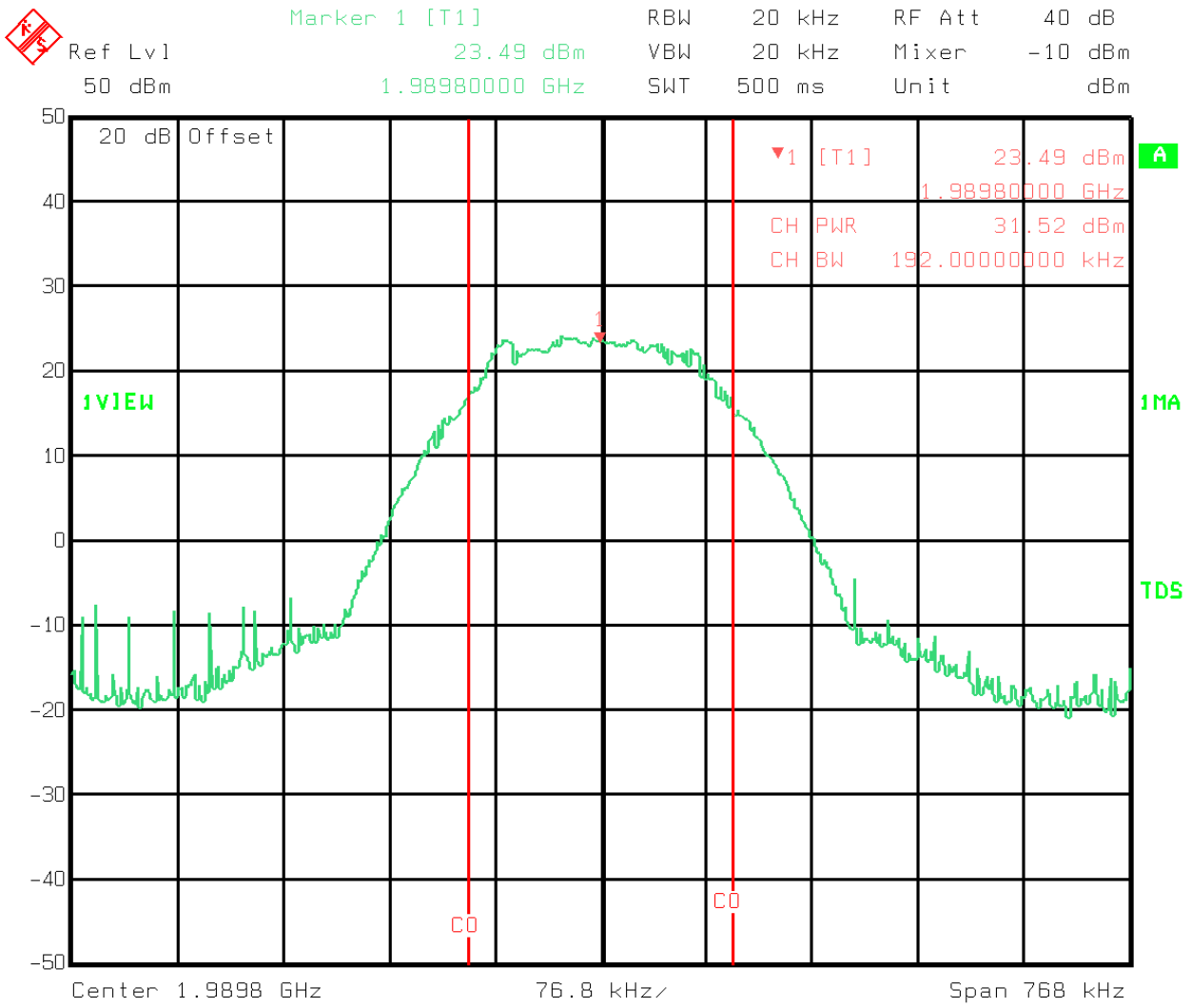
Title: 9L0482R LOW POWER MODULE W/VARIABLE BW MODULE
Comment A: IMCP10.PCX INTERMODULATION CHANNEL POWER - TDMA - UPLINK
Date: 6.DEC.1999 16:57:53

Plot 13



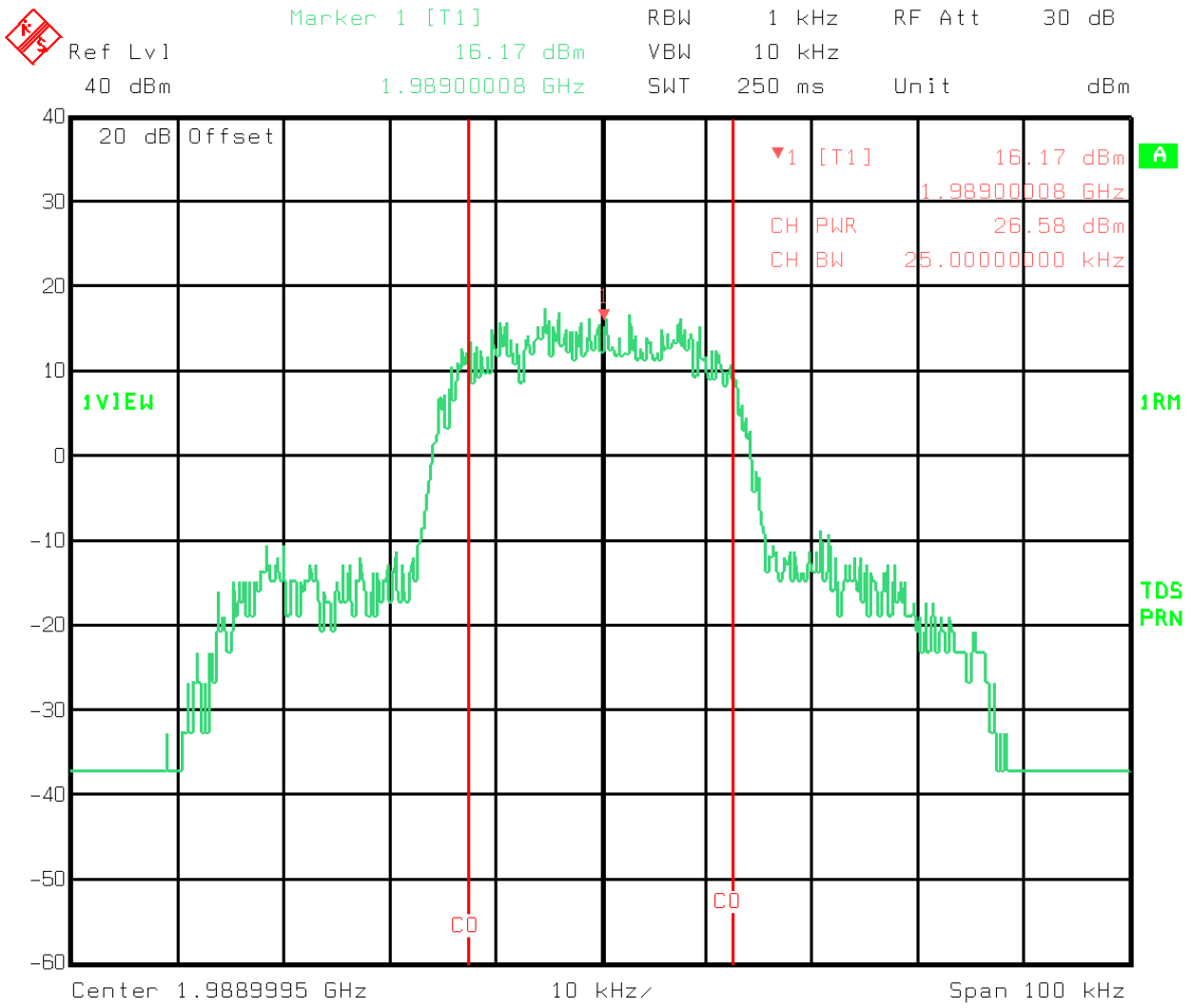
Title: 9L0482R LOW POWER MODULE W/ VARIABLE BW MODULE (CDMA)
Comment A: IMCP02.PCX
(DOWNLINK)
Date: 17.NOV.1999 13:05:50

Plot 14



Title: 9L0482R LOW POWER MODULE W/VARIABLE BW MODULE
Comment A: IMCP06.PCX INTERMODULATION CHANNEL POWER - DOWNLINK - GSM
Date: 6.DEC.1999 10:20:48

Plot 15



Title: 9L0482R LOW POWER MODULE W/VARIABLE BW MODULE-TDMA
Comment A: IMCP03.PCX INTERMODULATION CHANNEL POWER
Date: 18.NOV.1999 13:04:55

Plot 16

Section 4. Occupied Bandwidth

NAME OF TEST: Occupied Bandwidth (CDMA)	PARA. NO.: 2.1049
TESTED BY: David Light	DATE: 11/17/99

Test Results: Complies.

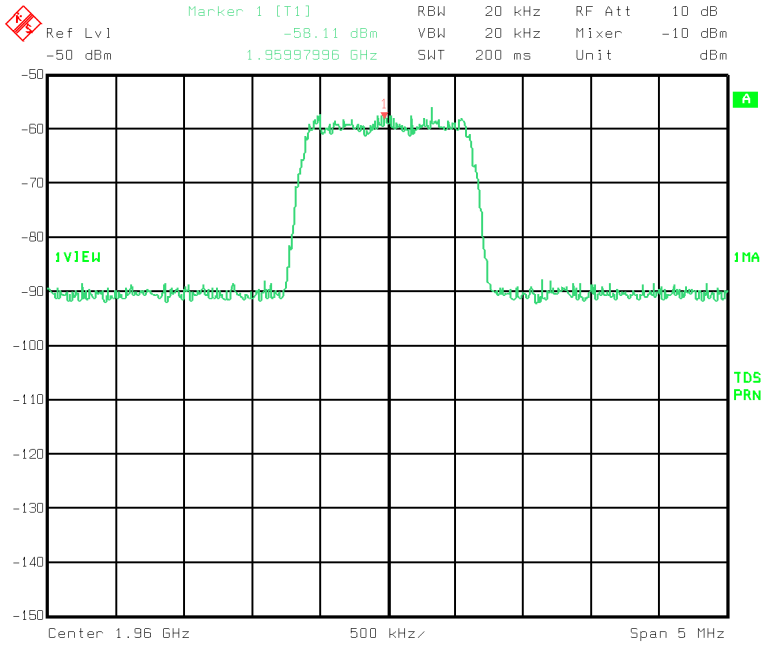
Test Data: See attached plot(s).

Equipment Used: G2736, G3726, G1366, G2632, CF44, CF41, CF39, CF38, CF40. Mini-Circuits 20 dB attenuator p/s S20W2

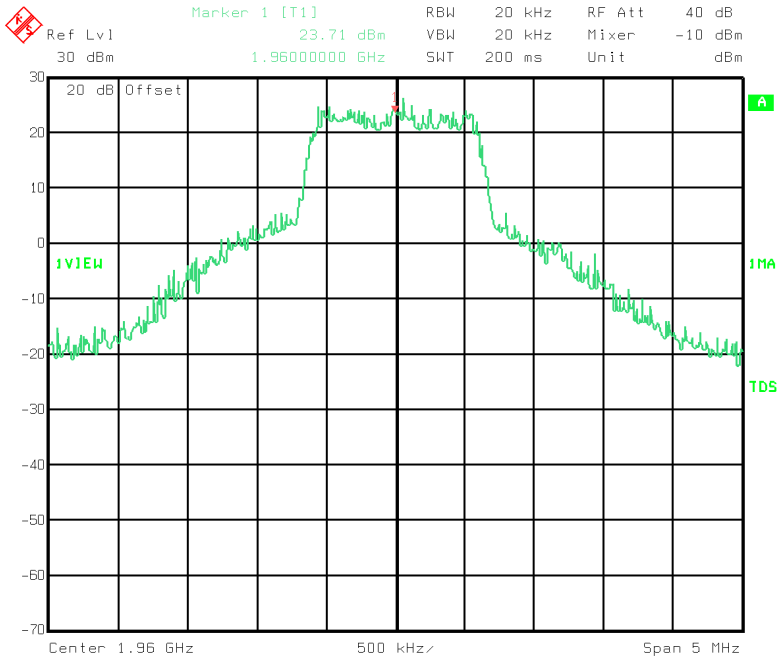
Temperature: 25°C

Relative Humidity: 50%

Occupied Bandwidth – CDMA Downlink

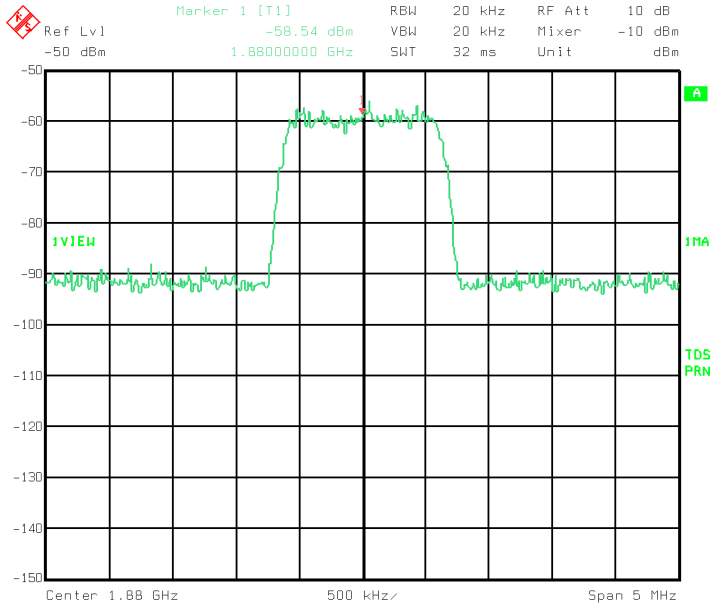


Title: 9L0482R LOW POWER MODULE W/ VARIABLE BW MODULE (CDMA)
Comment A: OBW01B.PCX OCCUPIED BANDWIDTH (CHANNEL 600)
Date: 17.NOV.1999 9:50:50

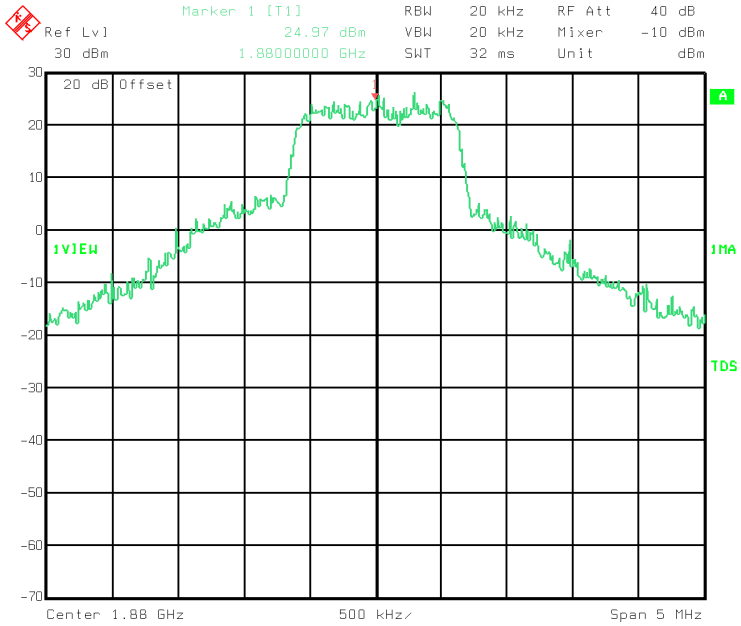


Title: 9L0482R LOW POWER MODULE W/ VARIABLE BW MODULE (CDMA)
Comment A: OBW01A.PCX OCCUPIED BANDWIDTH (CHANNEL 600)
Date: 17.NOV.1999 9:44:42

Occupied Bandwith – CDMA Uplink



Title: 9L0482R LOW POWER MODULE W/ VARIABLE BW MODULE (CDMA)
Comment A: OBW02B.PCX
(UPLINK)
Date: 17.NOV.1999 11:23:52



Title: 9L0482R LOW POWER MODULE W/ VARIABLE BW MODULE (CDMA)
Comment A: OBW02A.PCX
(UPLINK)
Date: 17.NOV.1999 11:20:44

NAME OF TEST: Occupied Bandwidth (GSM)	PARA. NO.: 2.1049
TESTED BY: David Light	DATE: 11/18/99

Test Results: Complies.

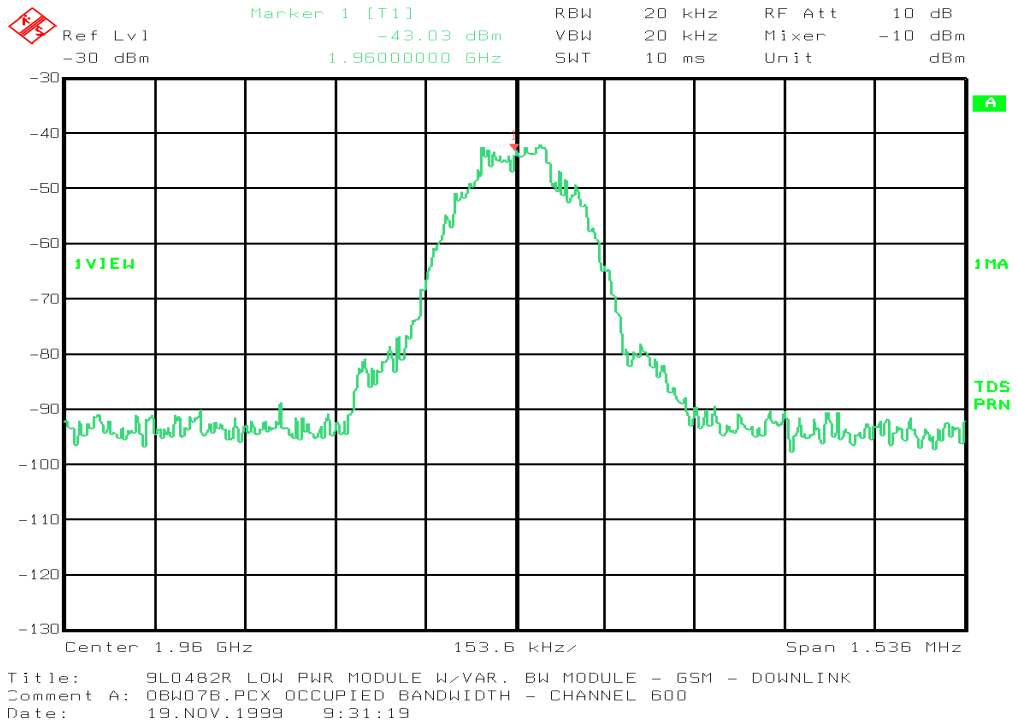
Test Data: See attached plot(s).

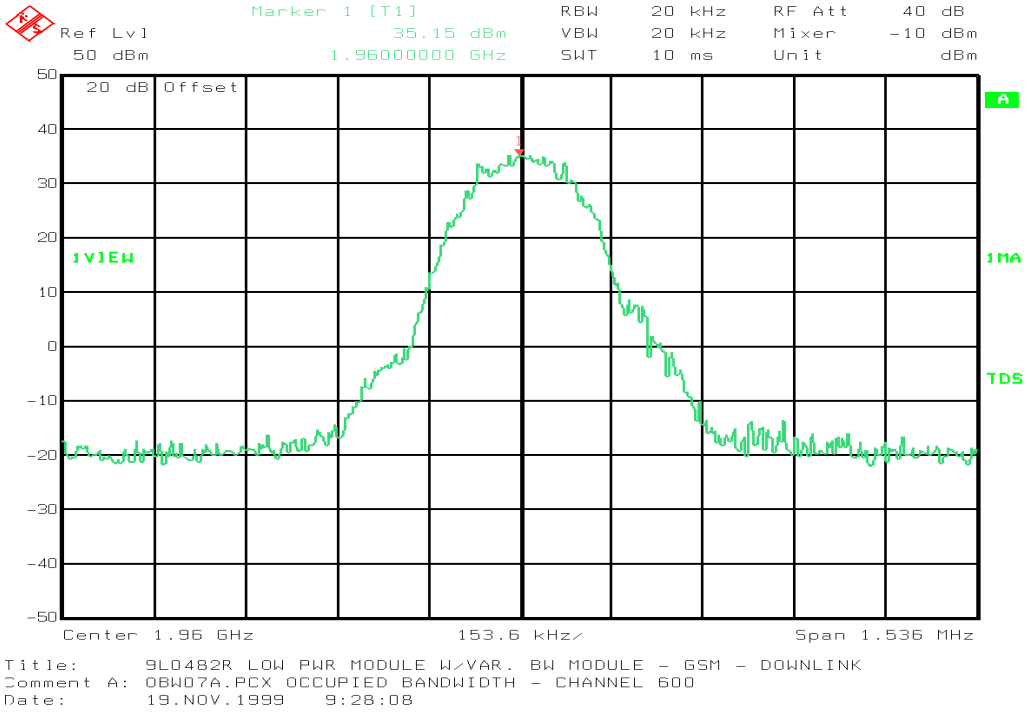
Equipment Used: G2736, G3726, G1366, G2632, CF44, CF41, CF39, CF38, CF40. Mini-Circuits 20 dB attenuator p/n S20W2

Temperature: 25°C

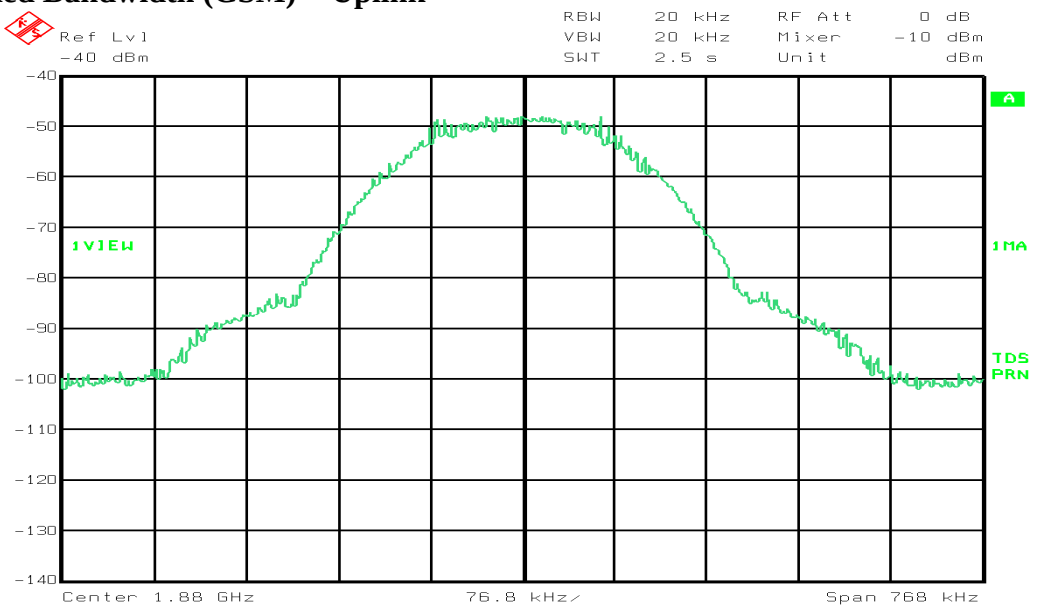
Relative Humidity: 50%

Occupied Bandwidth (GSM) - Downlink

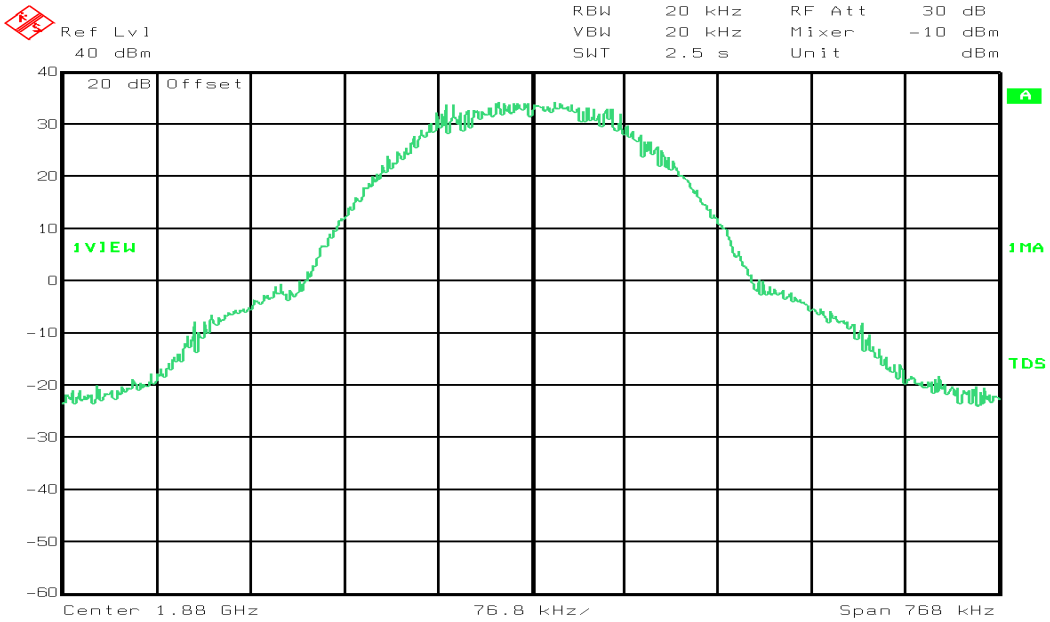




Occupied Bandwidth (GSM) - Uplink



Title: 9L0482R LOW POWER MODULE W/VARIABLE BW MODULE-GSM-UPLINK
Comment A: OBW06b.PCX Occupied Bandwidth Input Signal (GSM)
Channel 600
Date: 18.NOV.1999 19:52:58



Title: 9L0482R LOW POWER MODULE W/VARIABLE BW MODULE-GSM-UPLINK
Comment A: OBW06a.PCX Occupied Bandwidth (GSM)
Channel 600
Date: 18.NOV.1999 19:55:33

NAME OF TEST: Occupied Bandwidth (NADC)	PARA. NO.: 2.1049
TESTED BY: David Light	DATE: 11/18/99

Test Results: Complies.

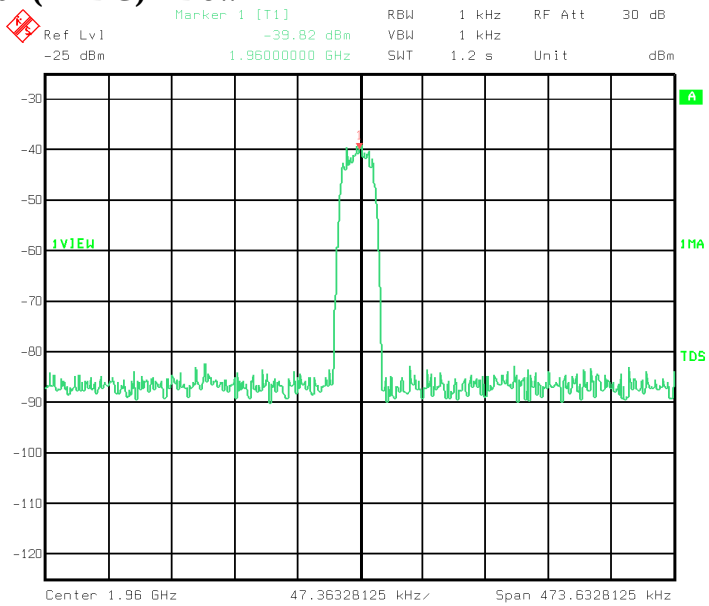
Test Data: See attached plot(s).

Equipment Used: G2736, G3726, G1366, G2632, CF44, CF41, CF39, CF38, CF40. Mini-circuits 20dB attenuator p/n S20W2

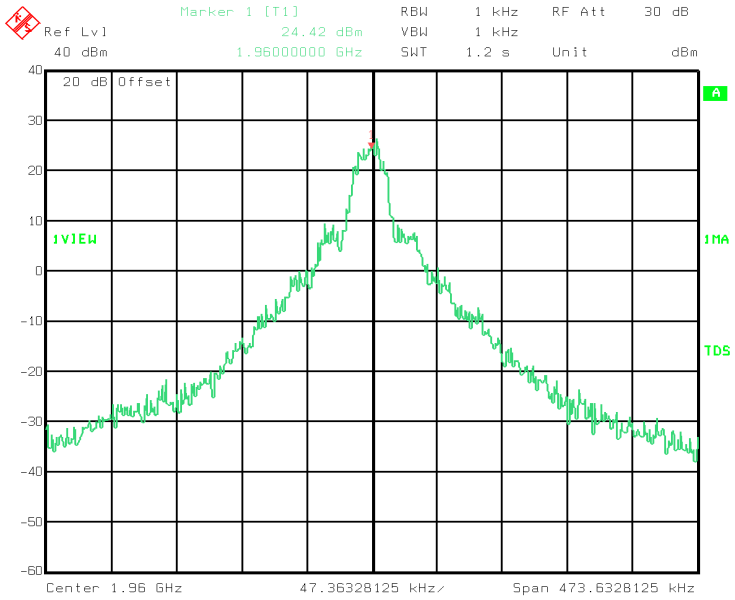
Temperature: 25°C

Relative Humidity: 50%

Occupied Bandwidth (NADC) – Downlink

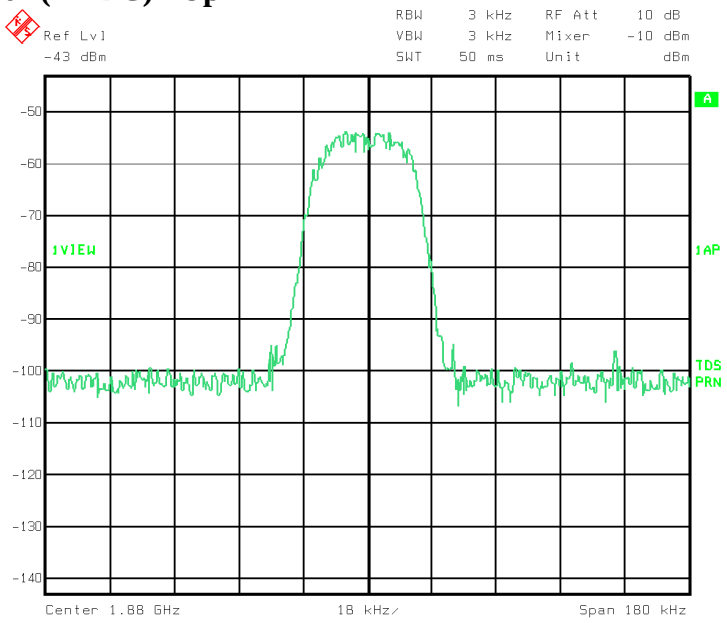


Title: 9L0482R LOW POWER MODULE W/VARIABLE BW MODULE-TDMA
Comment A: OBW03B.PCX
OCCUPIED BANDWIDTH CHANNEL 600
Date: 18.NOV.1999 9:52:16

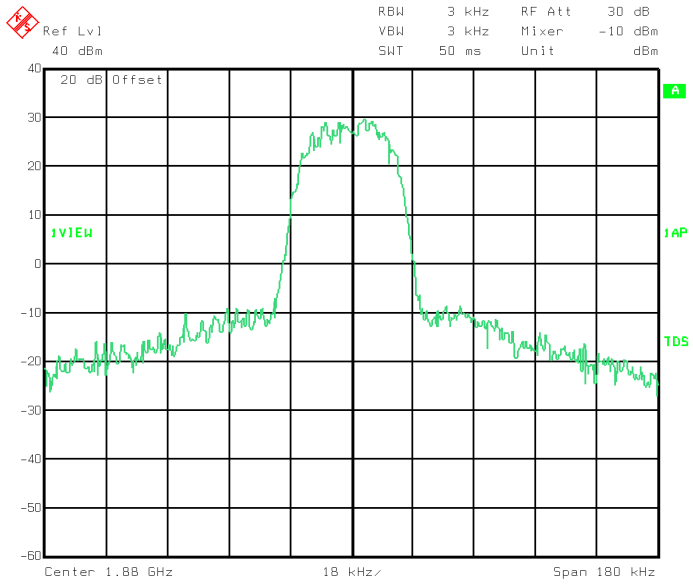


Title: 9L0482R LOW POWER MODULE W/VARIABLE BW MODULE-TDMA
Comment A: OBW03A.PCX
OCCUPIED BANDWIDTH CHANNEL 600
Date: 18.NOV.1999 9:40:00

Occupied Bandwidth (NADC) - Uplink



Title: 9L0482R LOW POWER MODULE W/VARIABLE BW MODULE-TDMA-UPLINK
Comment A: OBW04b.PCX Occupied Bandwidth Input Signal (NADC)
Date: 18.NOV.1999 16:19:35



Title: 9L0482R LOW POWER MODULE W/VARIABLE BW MODULE-TDMA-UPLINK
Comment A: OBW04.PCX Occupied Bandwidth (NADC)
Date: 18.NOV.1999 16:13:49

Section 5. Spurious Emissions at Antenna Terminals

NAME OF TEST: Spurious Emissions @ Antenna Terminals	PARA. NO.: 2.1051
TESTED BY: David Light	DATE: 11/19/99

Test Results: Complies.

Test Data: See attached plot(s).

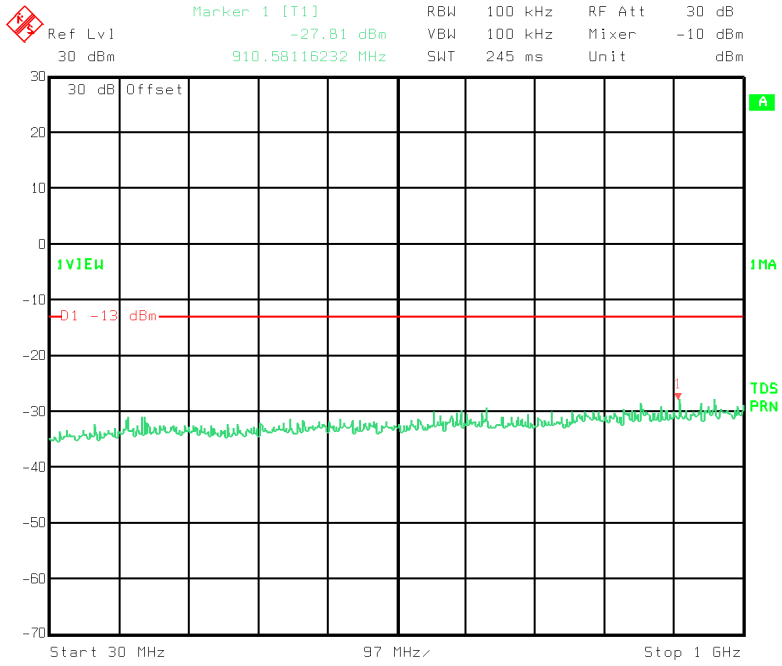
Equipment Used: G2736, G3726, G1366, G2632, CF44, CF41, CF40, CF39, CF38, G2735, G1711, G1017. Mini-Circuit attenuator p/n S20W2

Measurement Uncertainty: +/- 1.6 dB

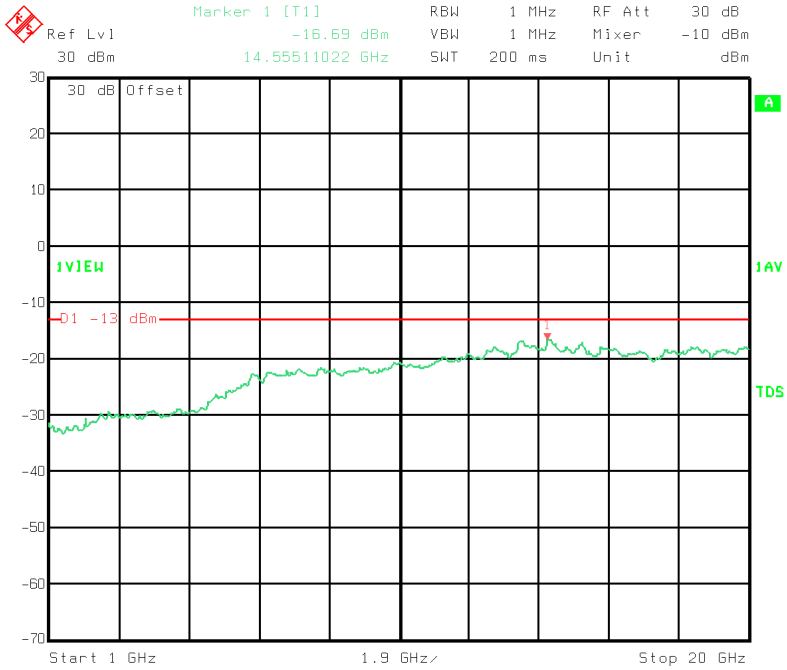
Temperature: 25°C

Relative Humidity: 50%

Spurious Emissions – CDMA Downlink

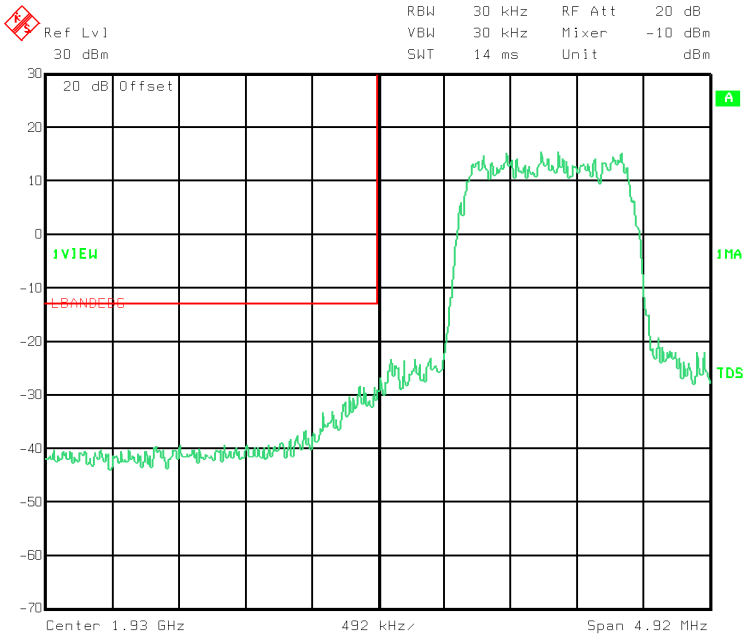


Title: 9L0482R LOW POWER MODULE W/ VARIABLE BW MODULE (CDMA)
Comment A: APSE02B.PCX ANTENNA PORT SPURIOUS EMISSIONS
(DOWNLINK) FUNDAMENTAL NOTCHED
Date: 17.NOV.1999 11:12:28

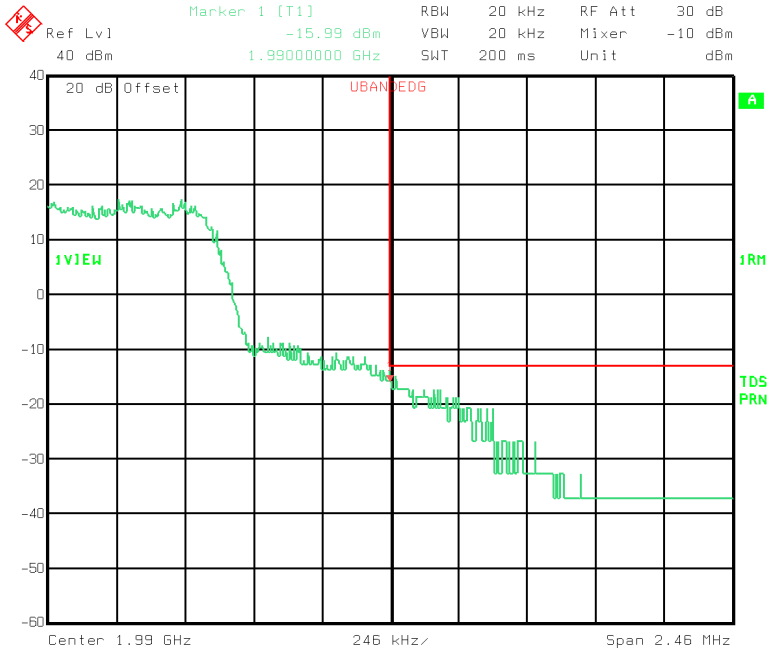


Title: 9L0482R LOW POWER MODULE W/ VARIABLE BW MODULE (CDMA)
Comment A: APSE02A.PCX ANTENNA PORT SPURIOUS EMISSIONS
FUNDAMENTAL NOTCHED
Date: 17.NOV.1999 8:52:55

Band Edge Spurious Emissions – CDMA Downlink

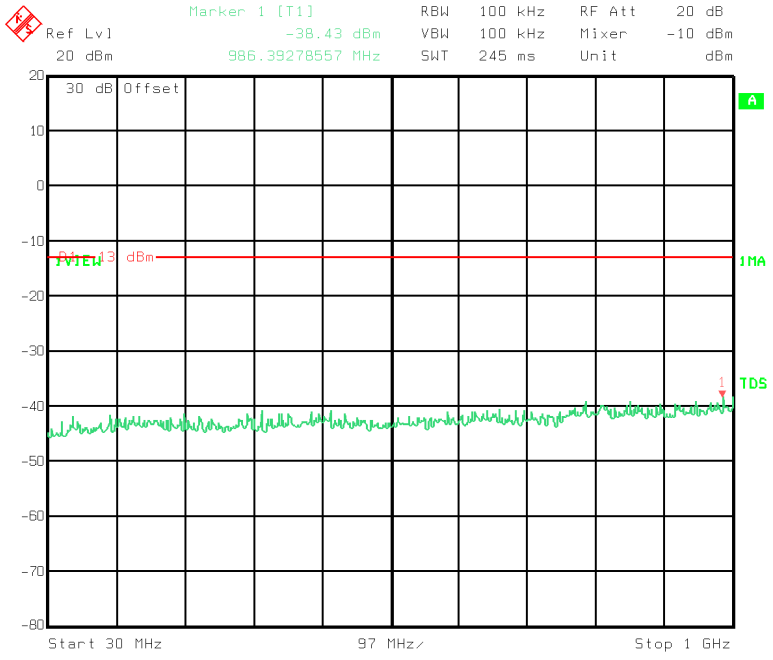


Title: 9L0482R LOW POWER MODULE W/VARIABLE BW MODULE
Comment A: LBE06.PCX LOWER BAND EDGE - CDMA - DOWNLINK
Date: 6.DEC.1999 17:44:12

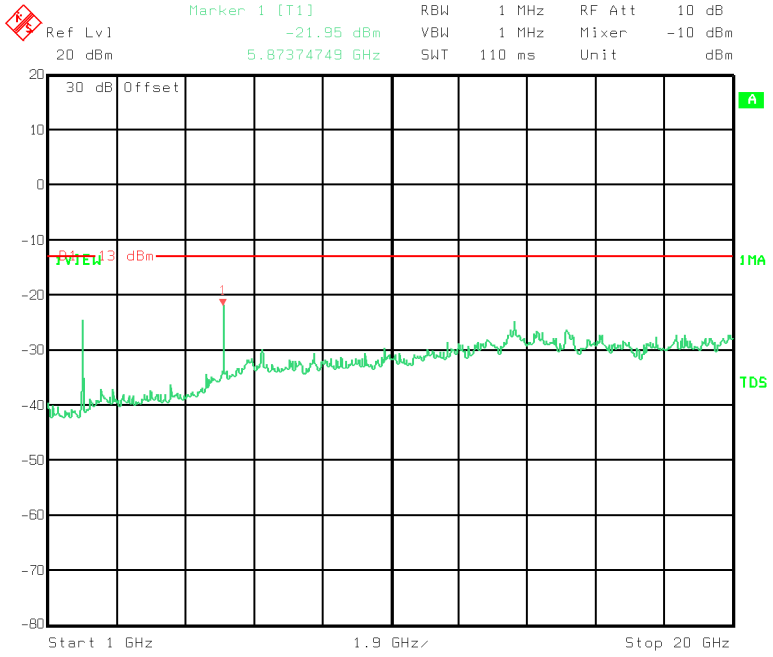


Title: 9L0482R LOW POWER MODULE W/ VARIABLE BW MODULE (CDMA)
Comment A: UBE01.PCX UPPER BAND EDGE (CHANNEL 1175)
Date: 17.NOV.1999 8:43:51

Spurious Emissions – Downlink CDMA Module

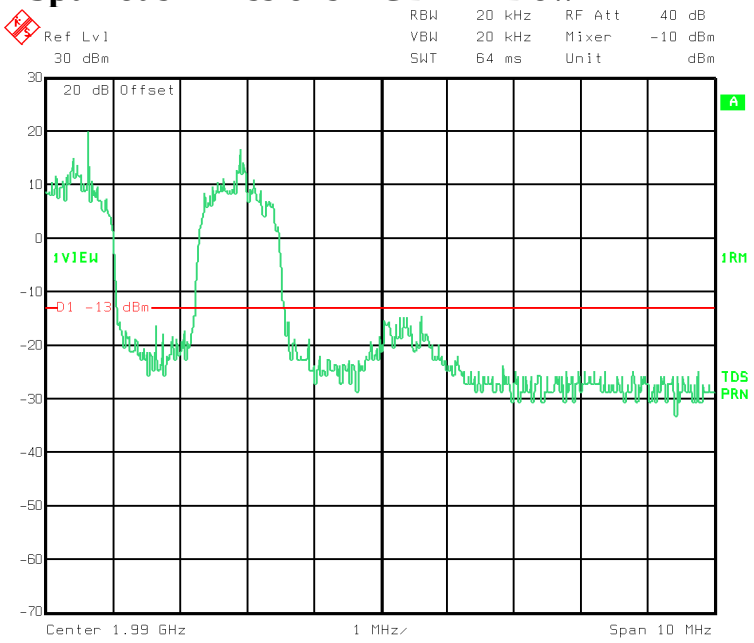


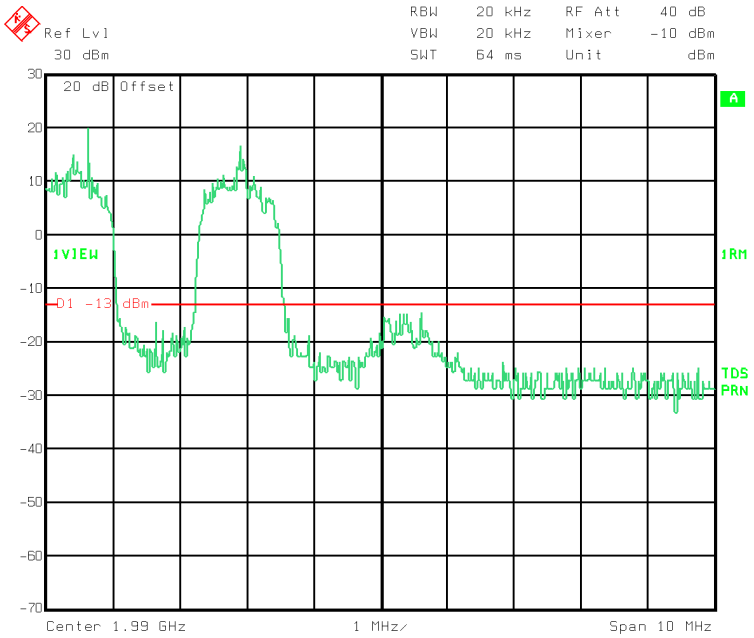
Title: 9L0482R LOW PWR MODULE W/ CDMA MODULE - CDMA - DOWNLINK
Comment A: APSE08B.PCX ANTENNA PORT SPURIOUS - CDMA
FUNDAMENTAL (CHANNEL 600) NOTCHED
Date: 19.NOV.1999 14:34:59



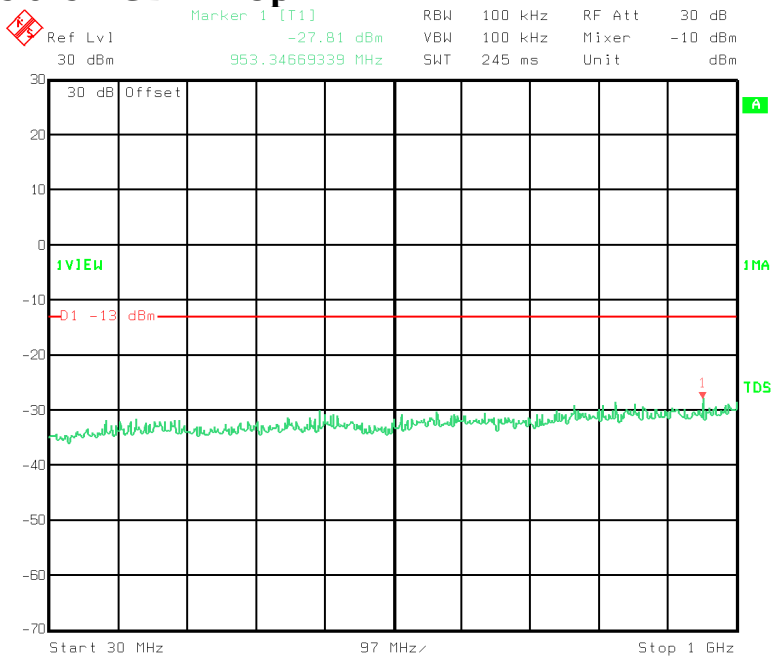
Title: 9L0482R LOW PWR MODULE W/ CDMA MODULE - CDMA - DOWNLINK
Comment A: APSE08A.PCX ANTENNA PORT SPURIOUS - CDMA
FUNDAMENTAL (CHANNEL 600) NOTCHED
Date: 19.NOV.1999 14:39:00

Intermodulation Spurious Emissions – CDMA Downlink

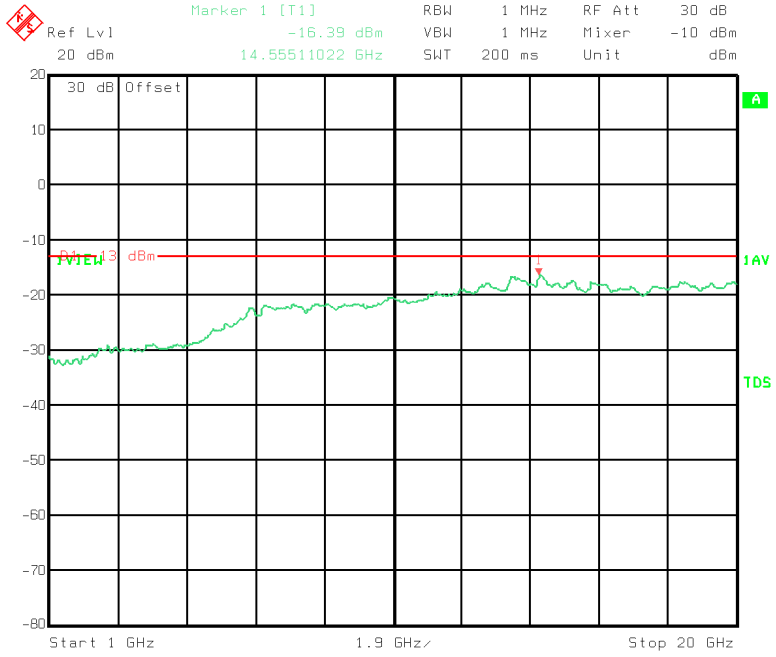




Spurious Emissions – CDMA Uplink

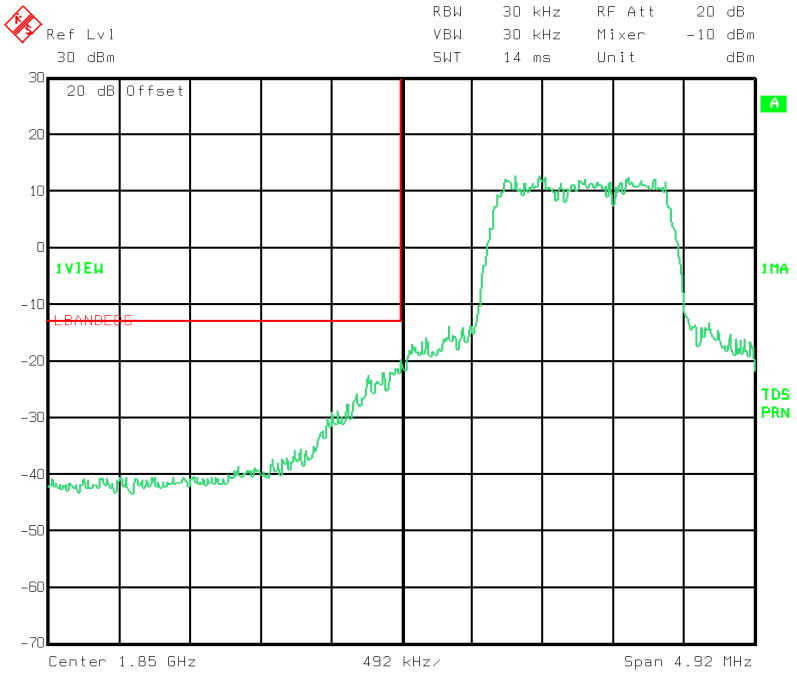


Title: 9L0482R LOW POWER MODULE W/ VARIABLE BW MODULE (CDMA)
Comment A: APSE03B.PCX ANTENNA PORT SPURIOUS EMISSIONS
(UPLINK) FUNDAMENTAL NOTCHED
Date: 17.NOV.1999 11:06:23

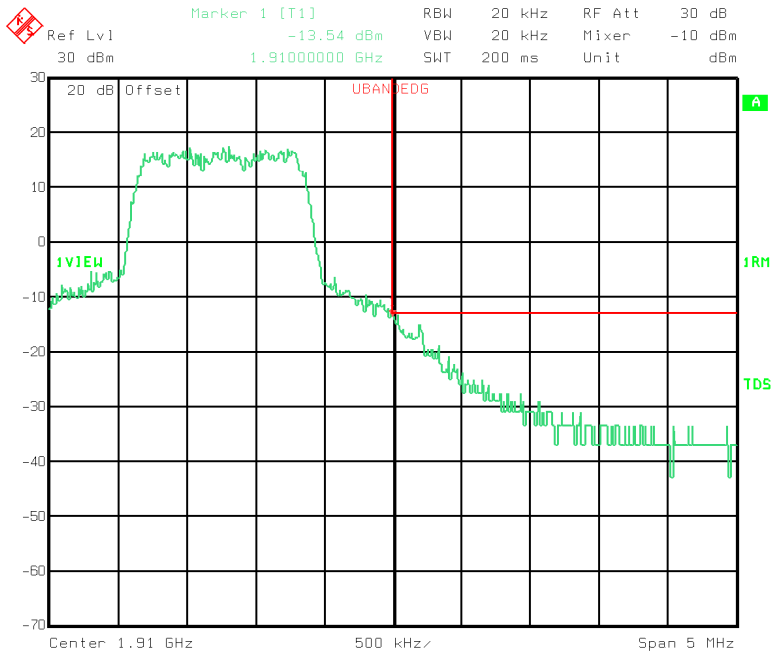


Title: 9L0482R LOW POWER MODULE W/ VARIABLE BW MODULE (CDMA)
Comment A: APSE03A.PCX ANTENNA PORT SPURIOUS EMISSIONS
(UPLINK) FUNDAMENTAL NOTCHED
Date: 17.NOV.1999 10:52:31

Band Edge Spurious Emissions – CDMA Uplink

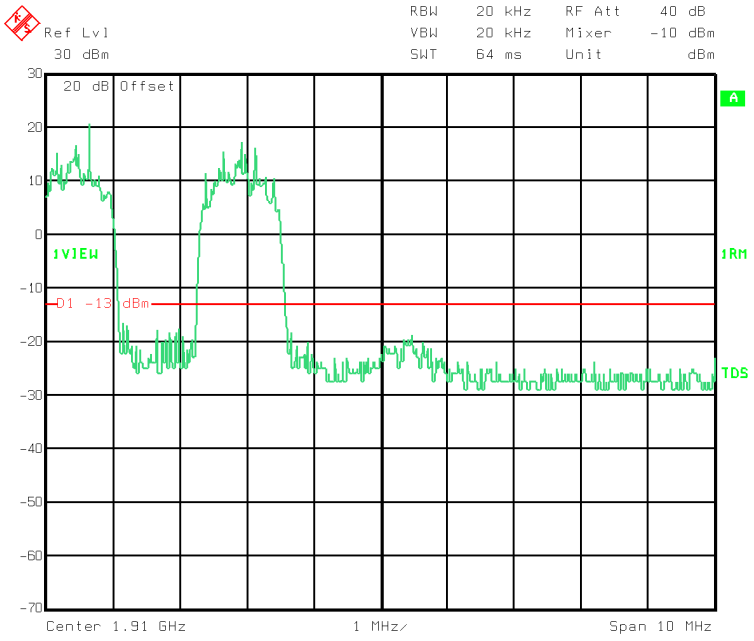


Title: 9L0482R LOW POWER MODULE W/VARIABLE BW MODULE
Comment A: LBE05.PCX LOWER BAND EDGE - CDMA - UPLINK
Date: 6.DEC.1999 17:38:27

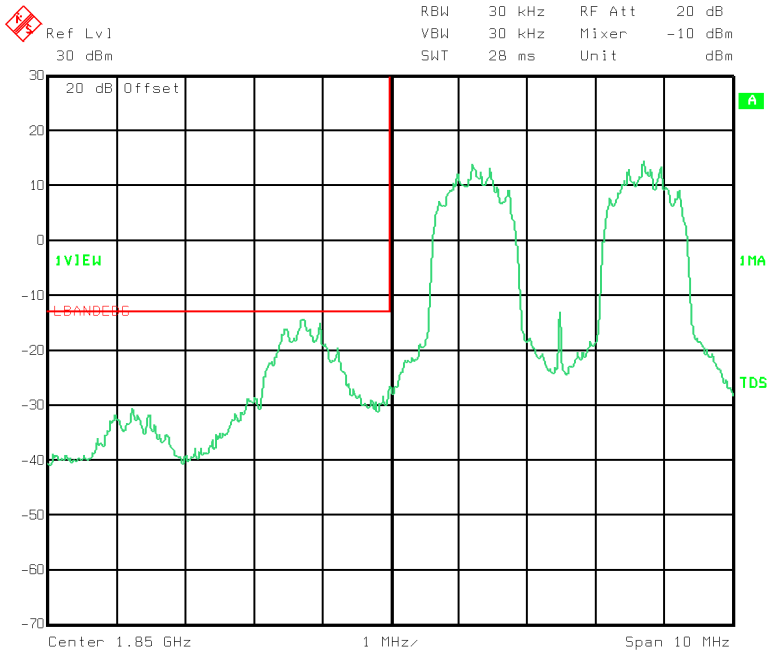


Title: 9L0482R LOW POWER MODULE W/ VARIABLE BW MODULE (CDMA) UPLINK
Comment A: UBE02.PCX UPPER BAND EDGE (CHANNEL 1175)
Date: 17.NOV.1999 10:40:04

Intermodulation Spurious Emissions – CDMA Uplink

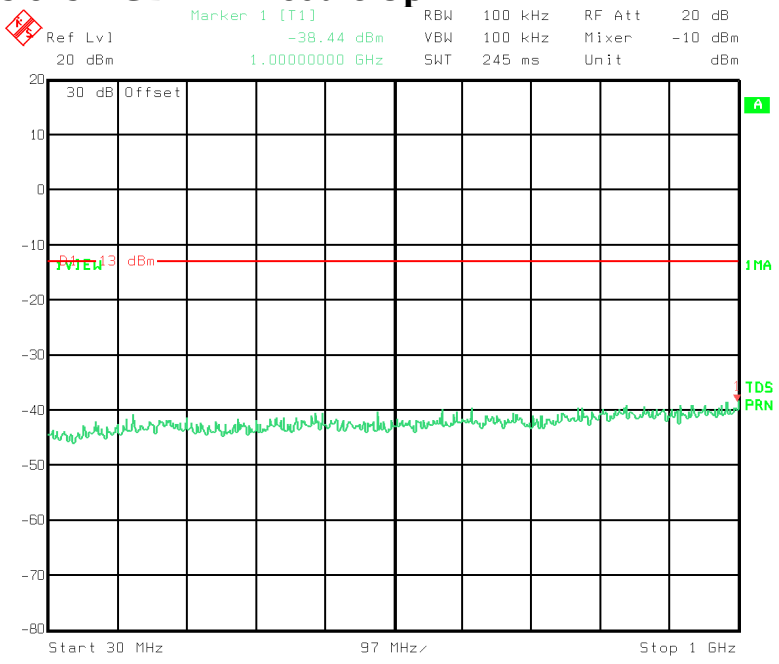


Title: 9L0482R LOW POWER MODULE W/ VARIABLE BW MODULE (CDMA)
Comment A: IM02.PCX
(UPLINK)
Date: 17.NOV.1999 12:56:24

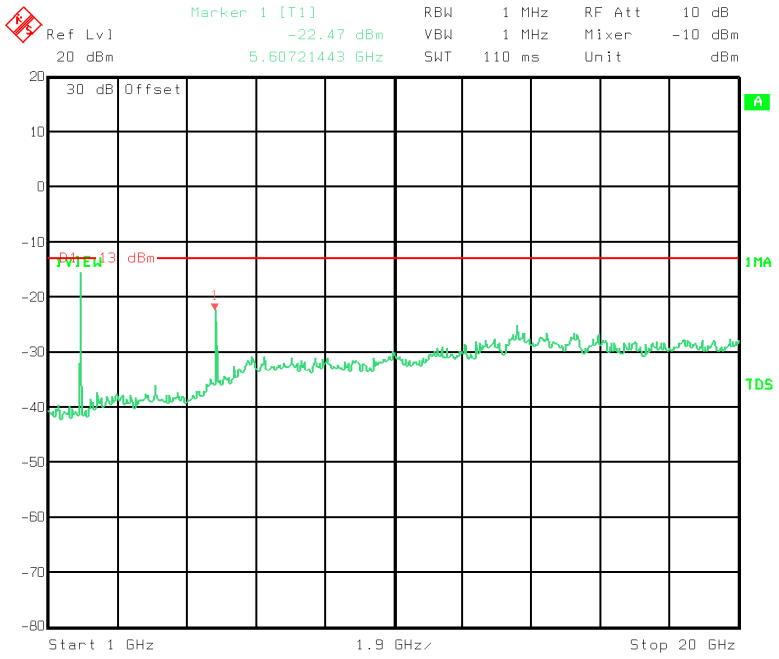


Title: 9L0482R LOW POWER MODULE W/VARIABLE BW MODULE
Comment A: IM14.PCX INTERMODULATION - CDMA - UPLINK
Date: 7.DEC.1999 10:21:43

Spurious Emissions – CDMA Module Uplink

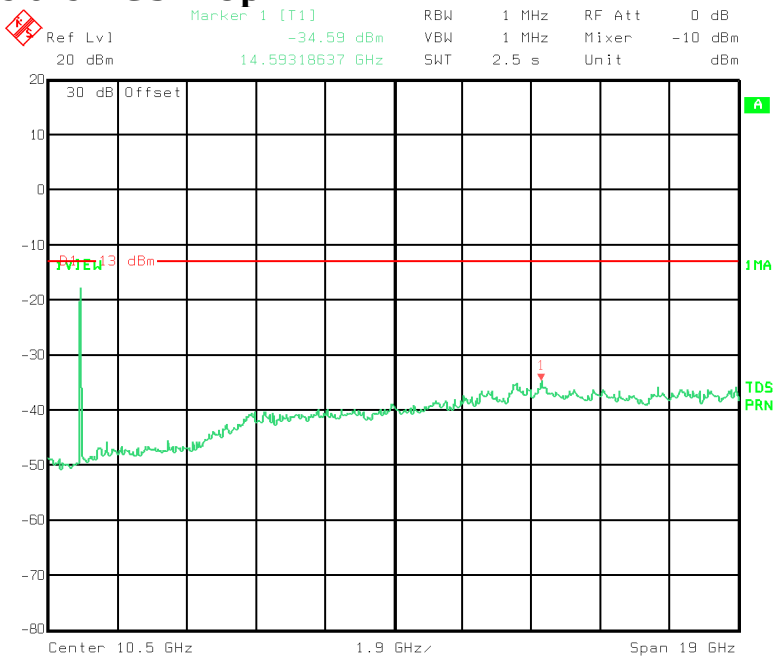


Title: 9L0482R LOW PWR MODULE W/ CDMA MODULE - CDMA - UPLINK
Comment A: APSE09B.PCX ANTENNA PORT SPURIOUS - CDMA
FUNDAMENTAL (CHANNEL 600) NOTCHED
Date: 19.NOV.1999 14:47:29

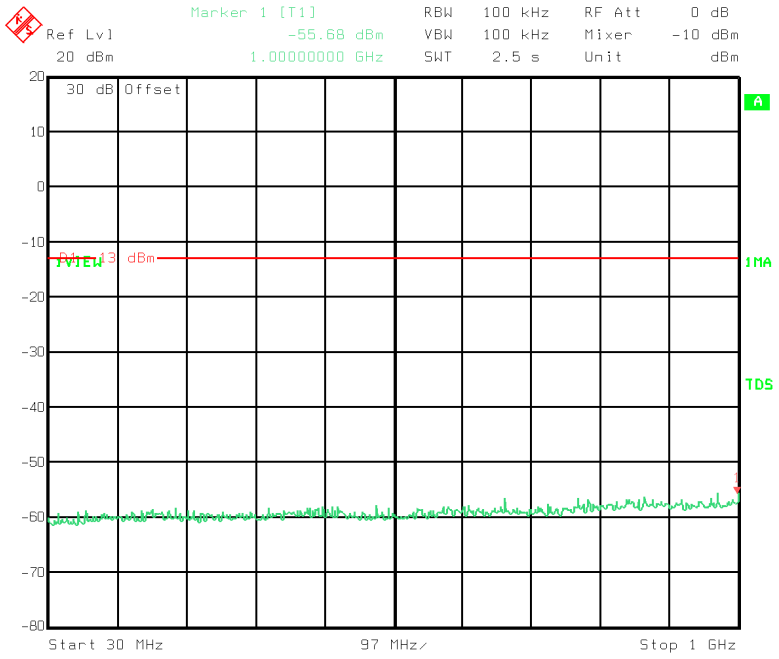


Title: 9L0482R LOW PWR MODULE W/ CDMA MODULE - CDMA - UPLINK
Comment A: APSE09A.PCX ANTENNA PORT SPURIOUS - CDMA
FUNDAMENTAL (CHANNEL 600) NOTCHED
Date: 19.NOV.1999 14:45:55

Spurious Emissions – GSM Uplink

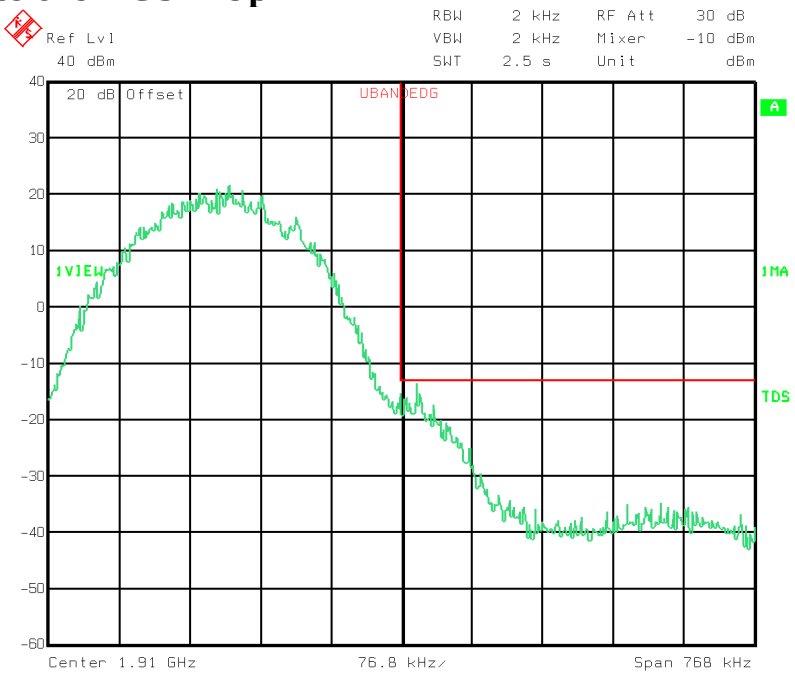


Title: 9L0482R LOW POWER MODULE W/VARIABLE BW MODULE-GSM-UPLINK
Comment A: APSE06a.PCX Antenna Port Spurious Emissions (GSM)
Channel 600
Date: 18.NOV.1999 20:02:42

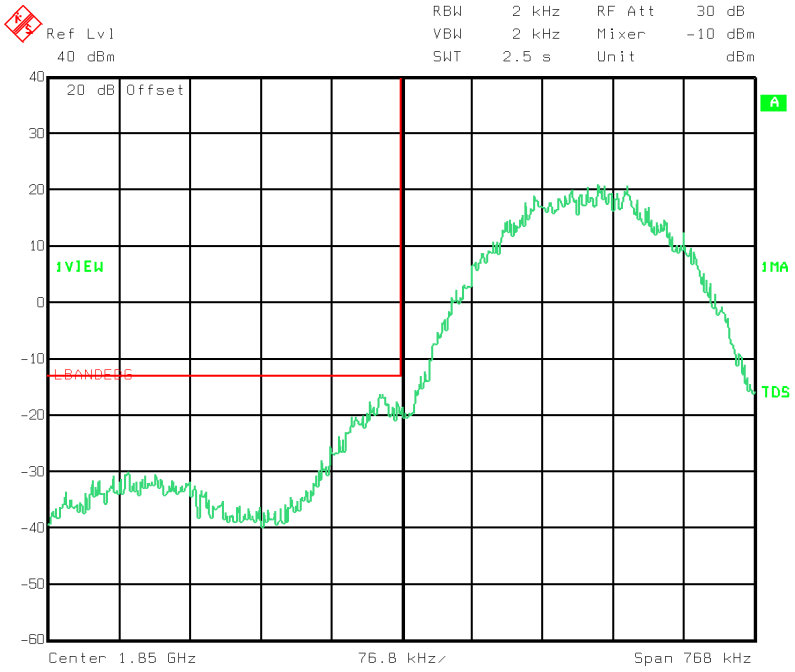


Title: 9L0482R LOW POWER MODULE W/VARIABLE BW MODULE-GSM-UPLINK
Comment A: APSE06b.PCX Antenna Port Spurious Emissions (GSM)
Channel 600
Date: 18.NOV.1999 20:04:52

Spurious Emissions – GSM Uplink

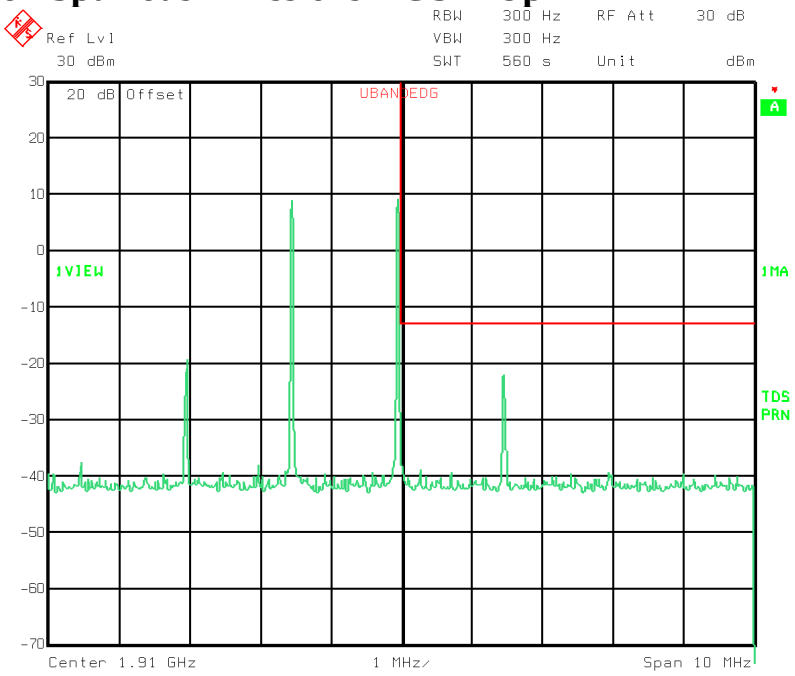


Title: 9L0482R LOW POWER MODULE W/ CDMA MODULE
Comment A: UBE12.PCX UPPER BAND EDGE - UPLINK - GSM
Date: 7.DEC.1999 17:09:55

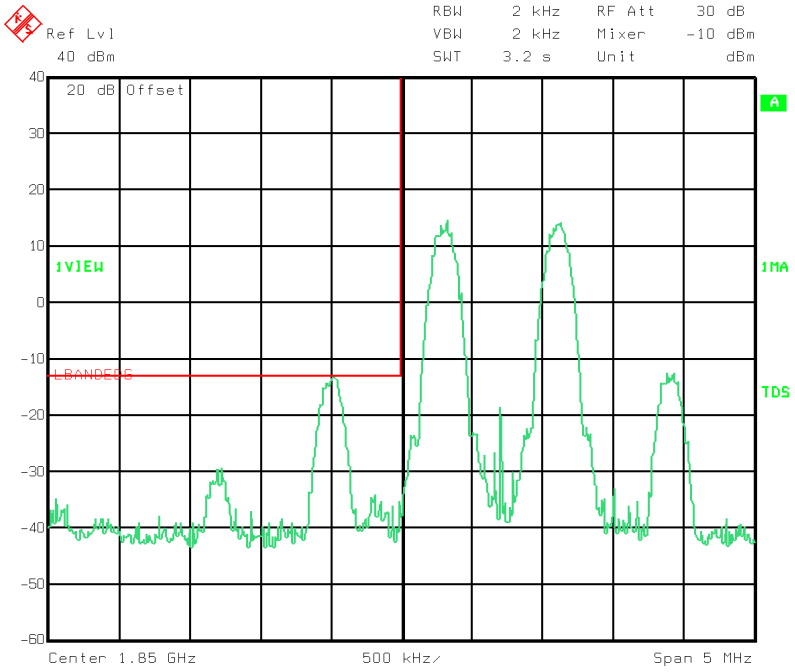


Title: 9L0482R LOW POWER MODULE W/ CDMA MODULE
Comment A: LBE11.PCX LOWER BAND EDGE - UPLINK - GSM
Date: 7.DEC.1999 16:06:24

Intermodulation Spurious Emissions – GSM Uplink

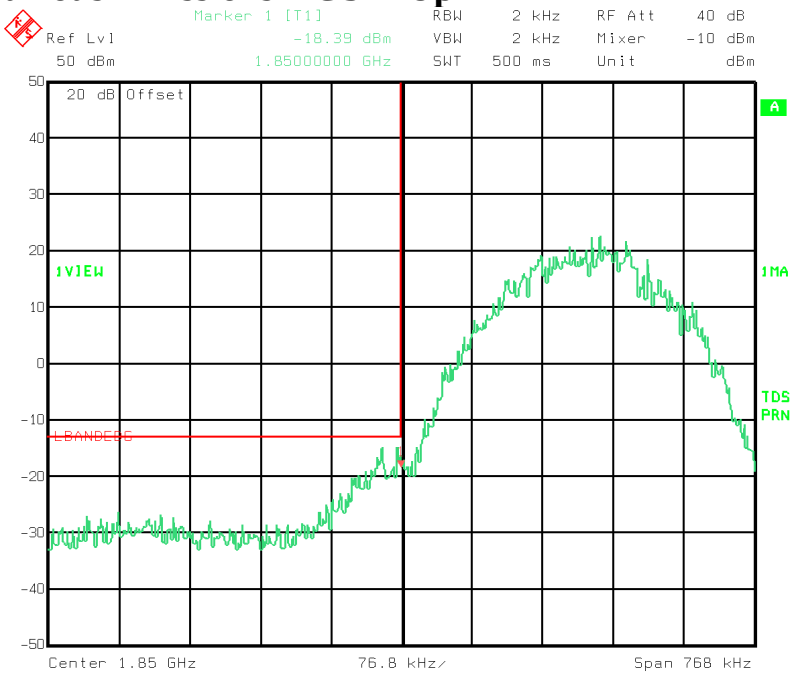


Title: 9L0482R LOW POWER MODULE W/VARIABLE BW MODULE
Comment A: IM06.PCX INTERODULATION - UPLINK
Date: 3.DEC.1999 15:26:49

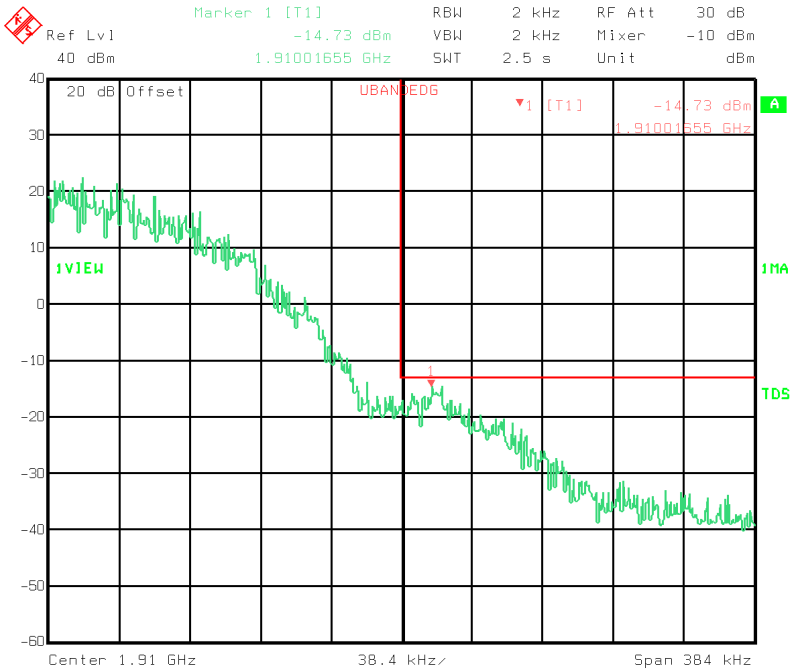


Title: 9L0482R LOW POWER MODULE W/VARIABLE BW MODULE
Comment A: IM10.PCX INTERMODULATION - GSM - UPLINK
Date: 6.DEC.1999 17:05:06

Band Edge Spurious Emissions – GSM Uplink

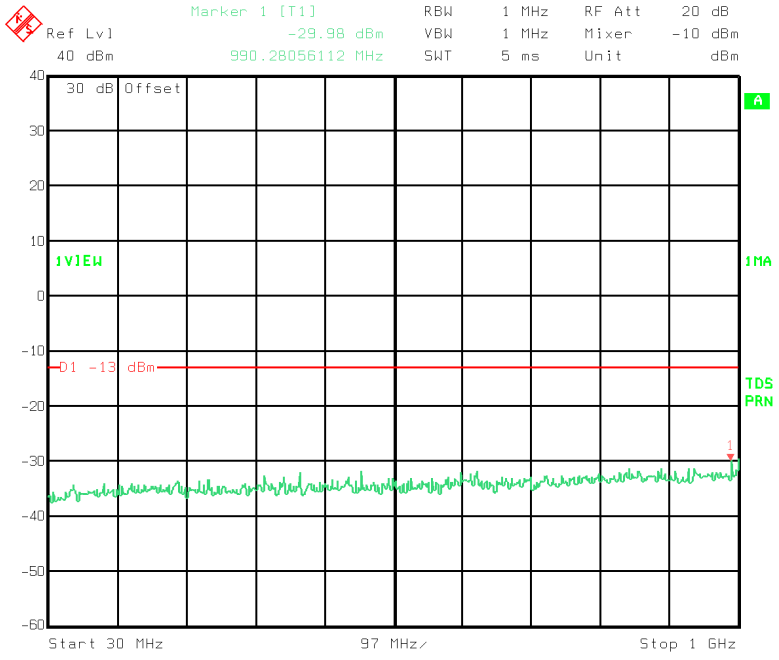


Title: 9L0482R LOW POWER MODULE W/VARIABLE BW MODULE
Comment A: LBE01.PCX LOWER BAND EDGE - GSM - UPLINK
Date: 6.DEC.1999 12:05:33

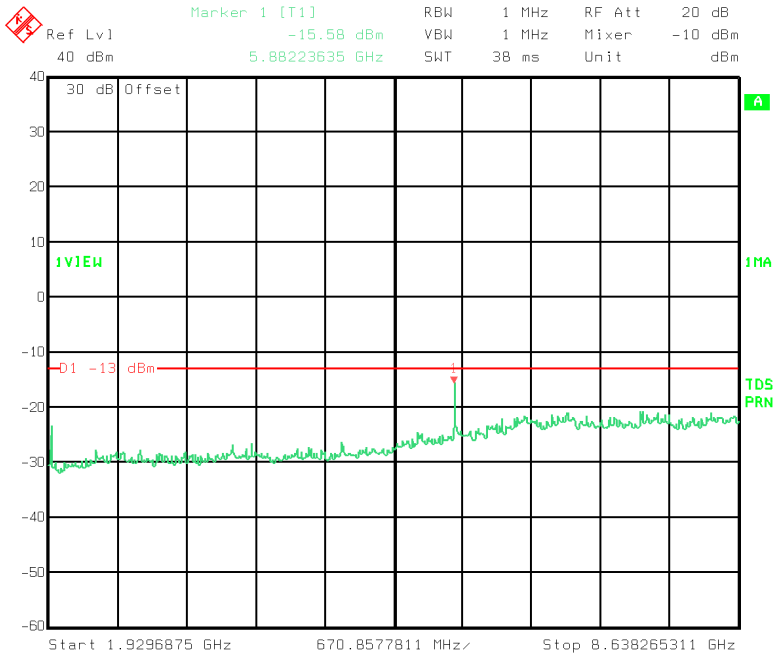


Title: 9L0482R LOW POWER MODULE W/VARIABLE BW MODULE-GSM-UPLINK
Comment A: UBE05.PCX Upper Band Edge (GSM)
Date: 18.NOV.1999 19:27:48

Spurious Emissions – GSM Downlink

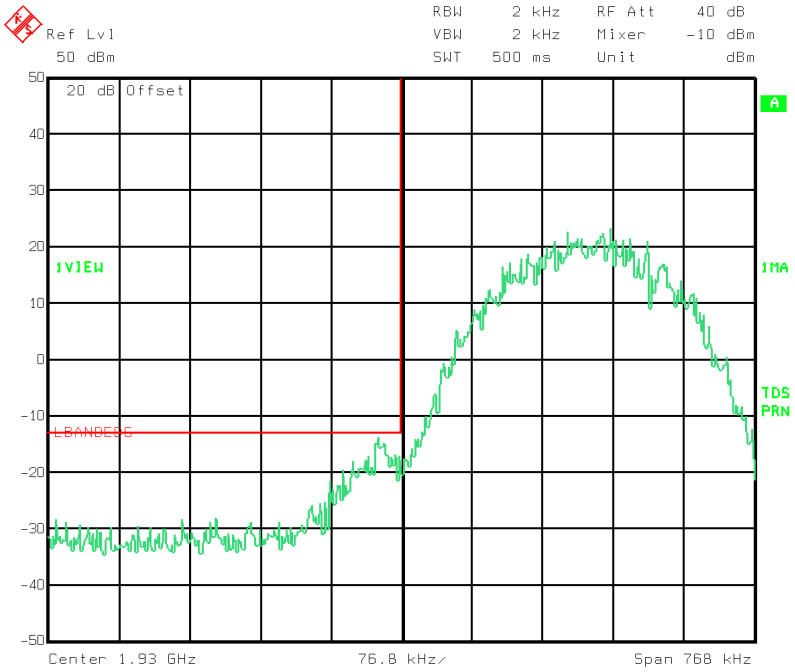


Title: 9L0482R LOW PWR MODULE W/VAR. BW MODULE - GSM - DOWNLINK
Comment A: APSE07B.PCX ANTENNA PORT SPURIOUS EMISSIONS
CHANNEL 600 NOTCHED
Date: 19.NOV.1999 10:08:27

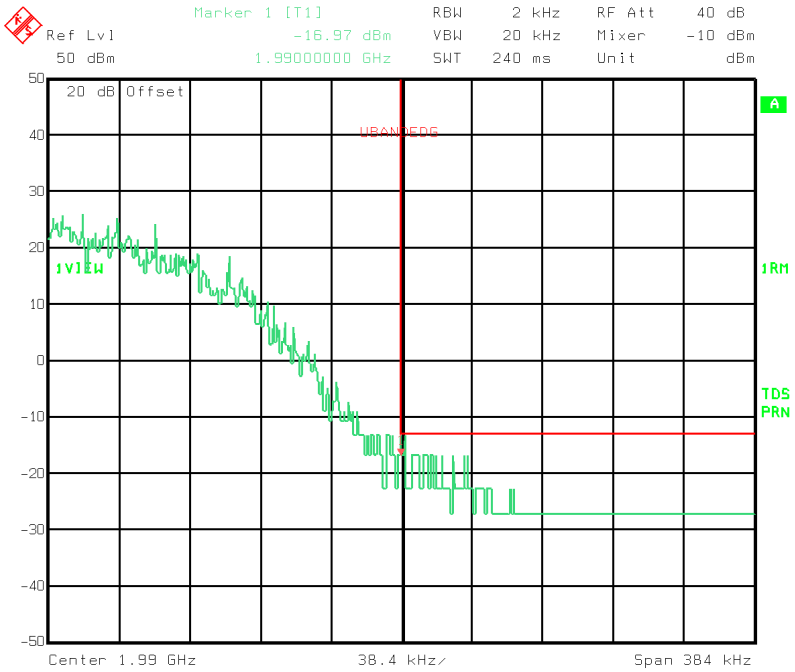


Title: 9L0482R LOW PWR MODULE W/VAR. BW MODULE - GSM - DOWNLINK
Comment A: APSE07A.PCX ANTENNA PORT SPURIOUS EMISSIONS
CHANNEL 600 NOTCHED
Date: 19.NOV.1999 10:20:44

Band Edge Spurious Emissions – GSM Downlink

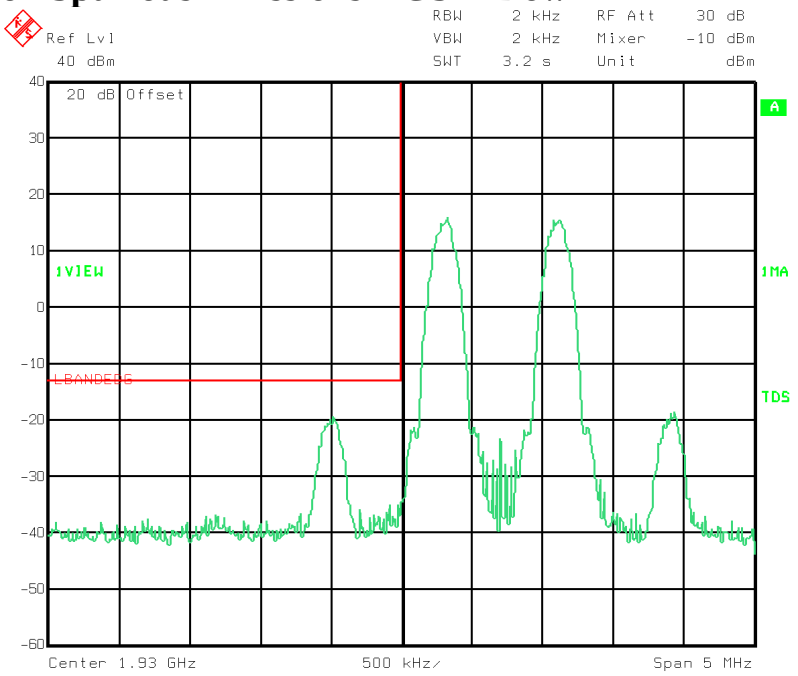


Title: 9L0482R LOW POWER MODULE W/VARIABLE BW MODULE
Comment A: LBE02.PCX LOWER BAND EDGE - GSM - DOWNLINK
Date: 6.DEC.1999 12:25:17



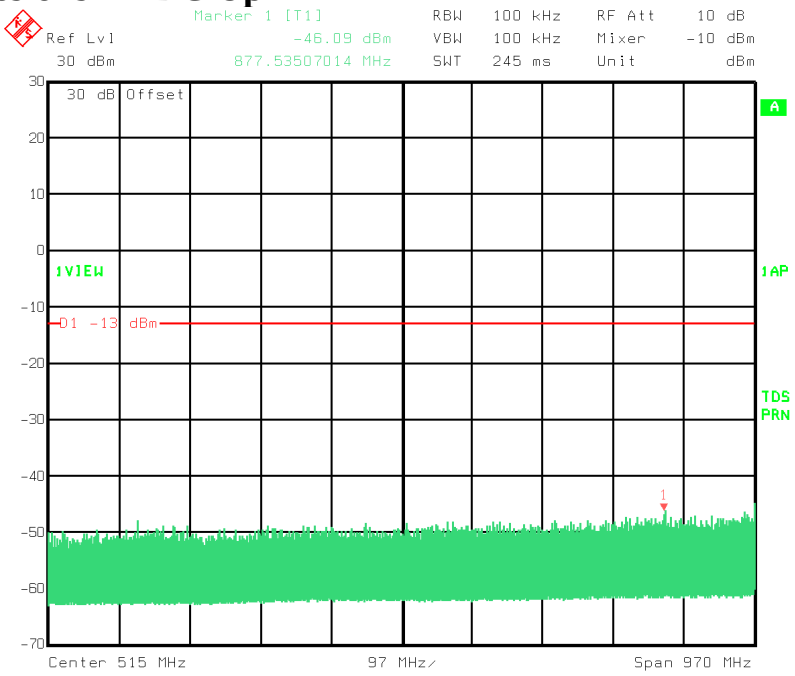
Title: 9L0482R LOW PWR MODULE W/VAR. BW MODULE - GSM - DOWNLINK
Comment A: UBE06.PCX UPPER BAND EDGE
Date: 19.NOV.1999 9:15:23

Intermodulation Spurious Emissions – GSM Downlink

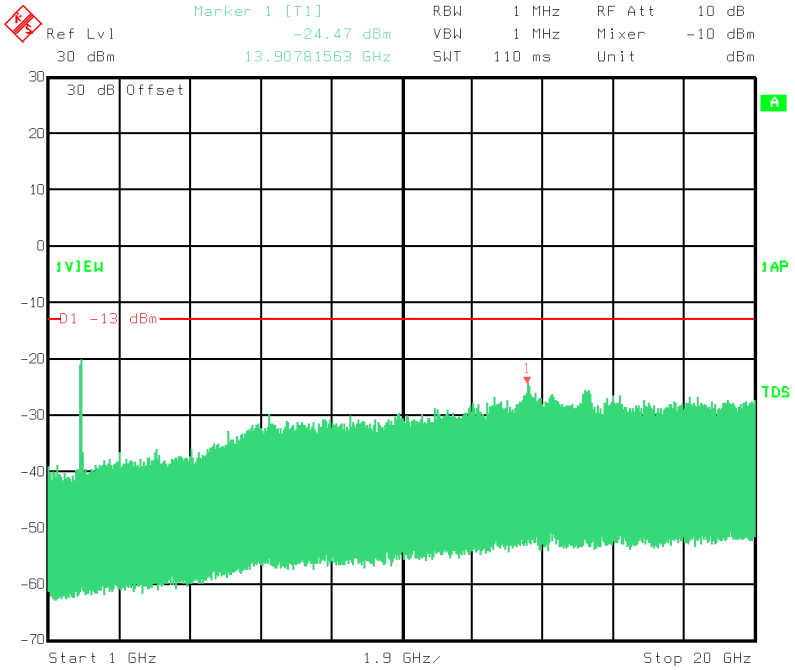


Title: 9L0482R LOW POWER MODULE W/VARIABLE BW MODULE
Comment A: IM09.PCX INTERMODULATION - GSM - DOWNLINK
Date: 6.DEC.1999 14:45:05

Spurious Emissions NADC Uplink

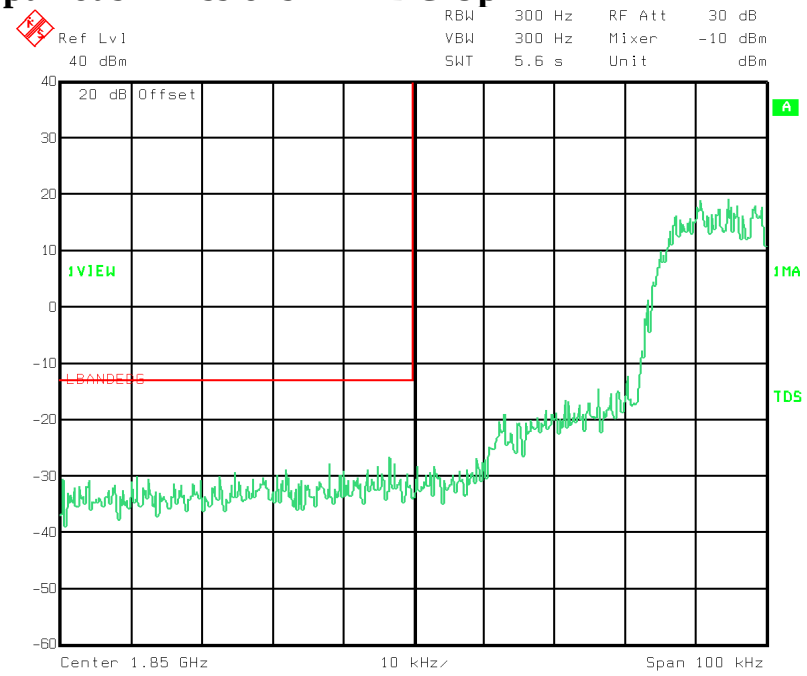


Title: 9L0482R LOW POWER MODULE W/VARIABLE BW MODULE-TDMA-UPLINK
Comment A: APSE05b.PCX Antenna Port Spurious Emissions (NADC)
Date: 18.NOV.1999 16:49:51

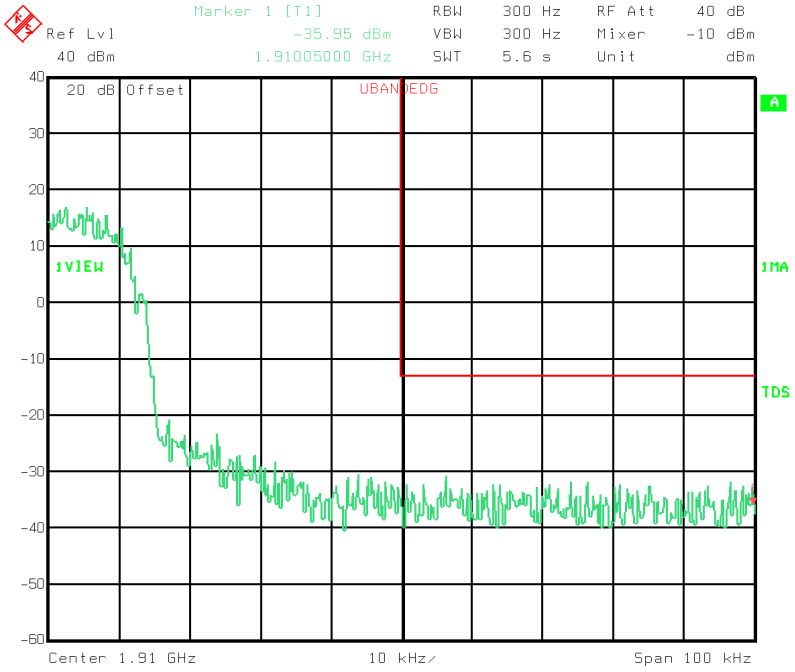


Title: 9L0482R LOW POWER MODULE W/VARIABLE BW MODULE-TDMA-UPLINK
Comment A: APSE05a.PCX Antenna Port Spurious Emissions (NADC)
Date: 18.NOV.1999 16:51:27

Band Edge Spurious Emissions – NADC Uplink

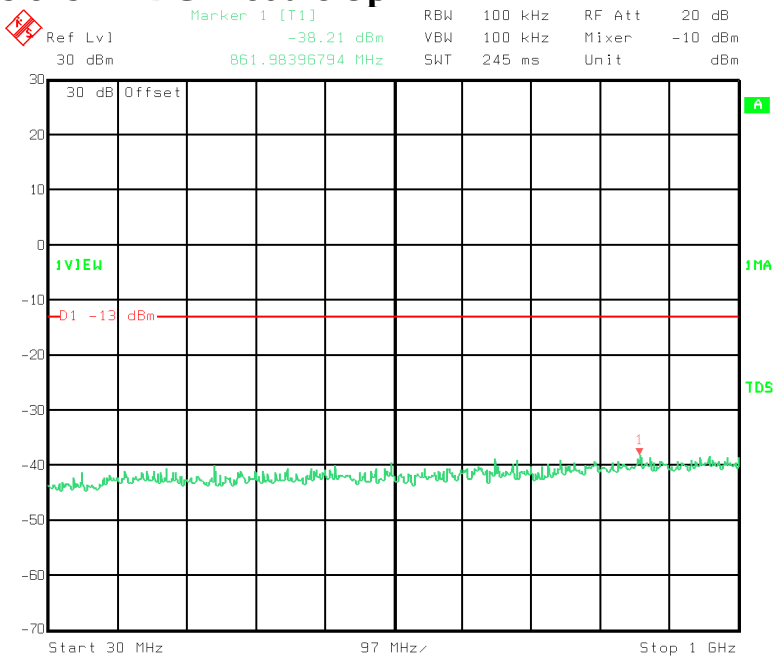


Title: 9L0482R LOW POWER MODULE W/ TDMA MODULE
Comment A: LBE07.PCX LOWER BAND EDGE - UPLINK - TDMA
Date: 7.DEC.1999 15:29:15

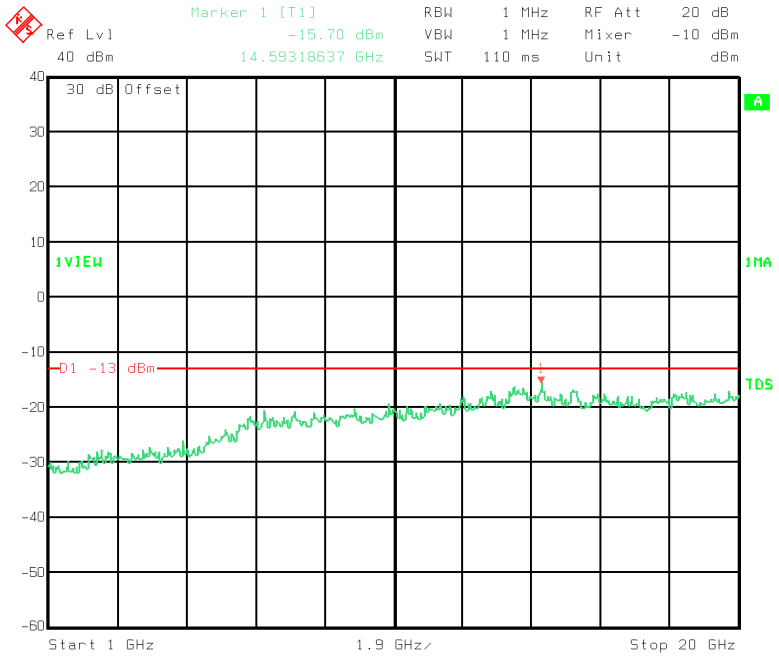


Title: 9L0482R LOW PWR MODULE W/ TDMA MODULE - TDMA - UPLINK
Comment A: UBE10.PCX UPPER BAND EDGE
Date: 22.NOV.1999 10:26:54

Spurious Emissions NADC Module Uplink

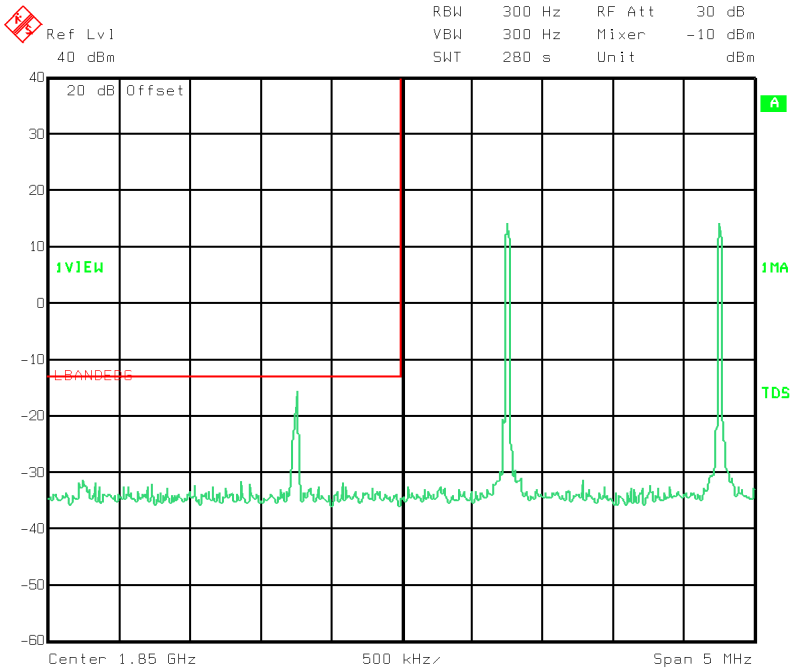


Title: 9L0482R LOW PWR MODULE W/ TDMA MODULE - TDMA - UPLINK
Comment A: APSE11B.PCX ANTENNA PORT SPURIOUS EMISSIONS
CHANNEL 600 NOTCHED
Date: 22.NOV.1999 10:48:59



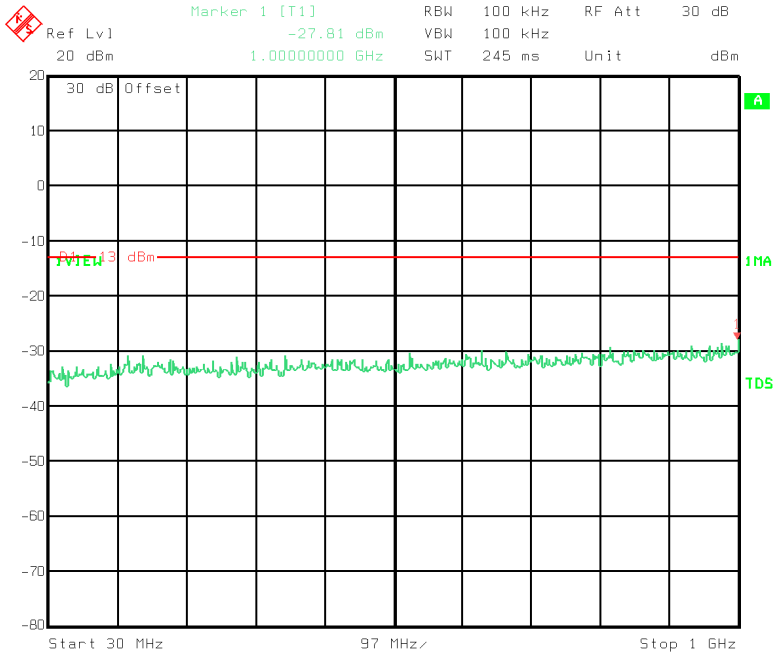
Title: 9L0482R LOW PWR MODULE W/ TDMA MODULE - TDMA - UPLINK
Comment A: APSE11A.PCX ANTENNA PORT SPURIOUS EMISSIONS
CHANNEL 600 NOTCHED
Date: 22.NOV.1999 10:47:46

Intermodulation Spurious Emissions – NADC Uplink

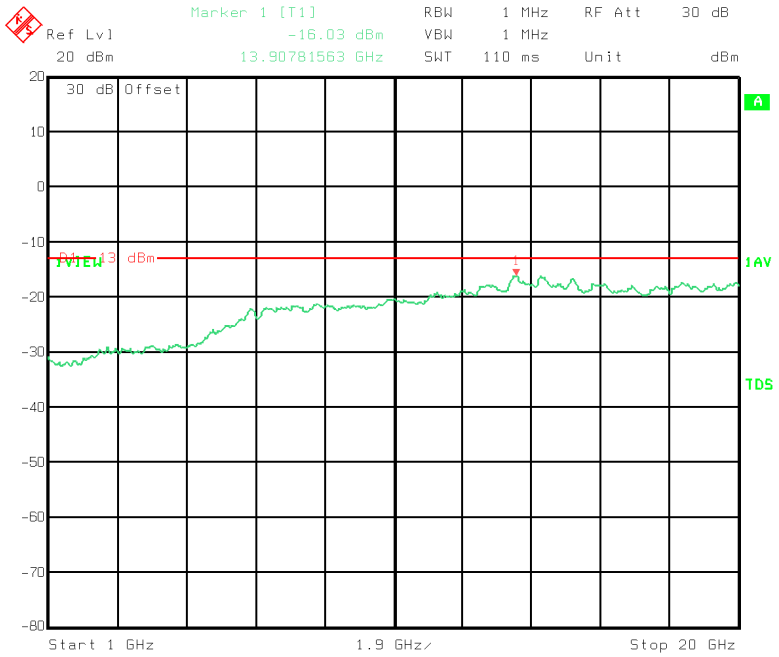


Title: 9L0482R LOW POWER MODULE W/VARIABLE BW MODULE
Comment A: IM12.PCX INTERMODULATION - TDMA - UPLINK
Date: 6.DEC.1999 16:53:43

Spurious Emissions – NADC Downlink

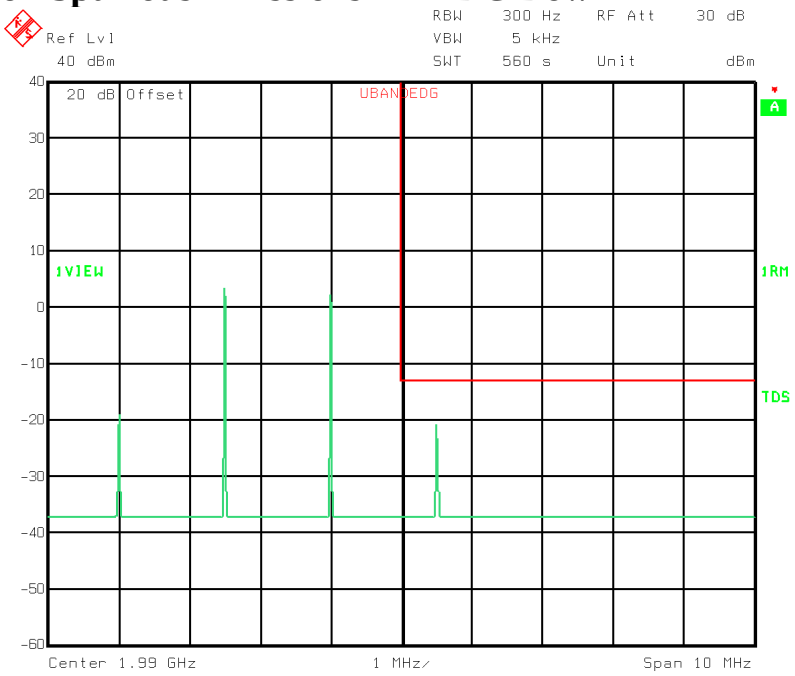


Title: 9L0482R LOW POWER MODULE W/VARIABLE BW MODULE-TDMA
Comment A: APSE04B.PCX ANTENNA PORT SPURIOUS EMISSIONS
CHANNEL 1199 (FUNDAMENTAL) NOTCHED
Date: 18.NOV.1999 9:13:03

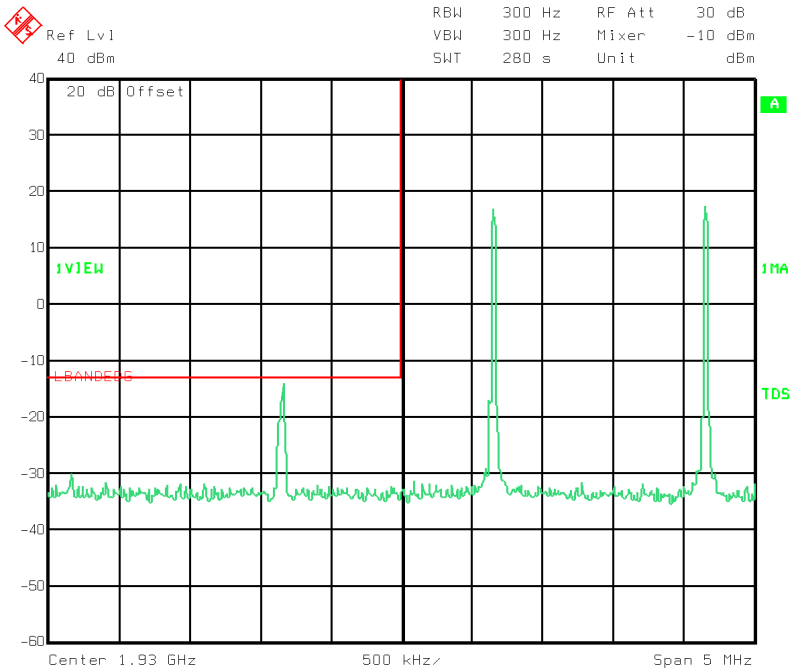


Title: 9L0482R LOW POWER MODULE W/VARIABLE BW MODULE-TDMA
Comment A: APSE04A.PCX ANTENNA PORT SPURIOUS EMISSIONS
CHANNEL 1199 (FUNDAMENTAL) NOTCHED
Date: 18.NOV.1999 9:09:42

Intermodulation Spurious Emissions – NADC Downlink

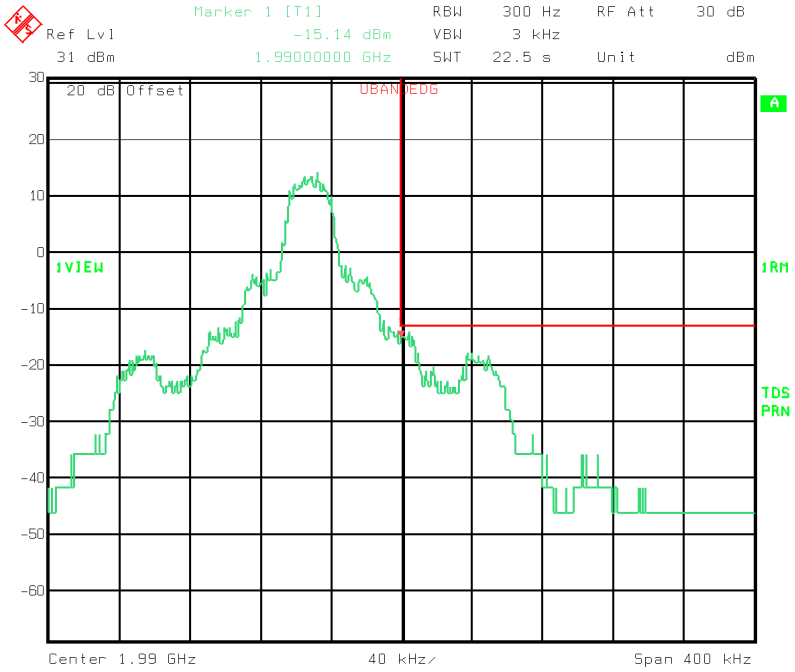


Title: 9L0482R LOW POWER MODULE W/VARIABLE BW MODULE-TDMA
Comment A: IM05.PCX INTERMODULATION
Date: 18.NOV.1999 13:22:04

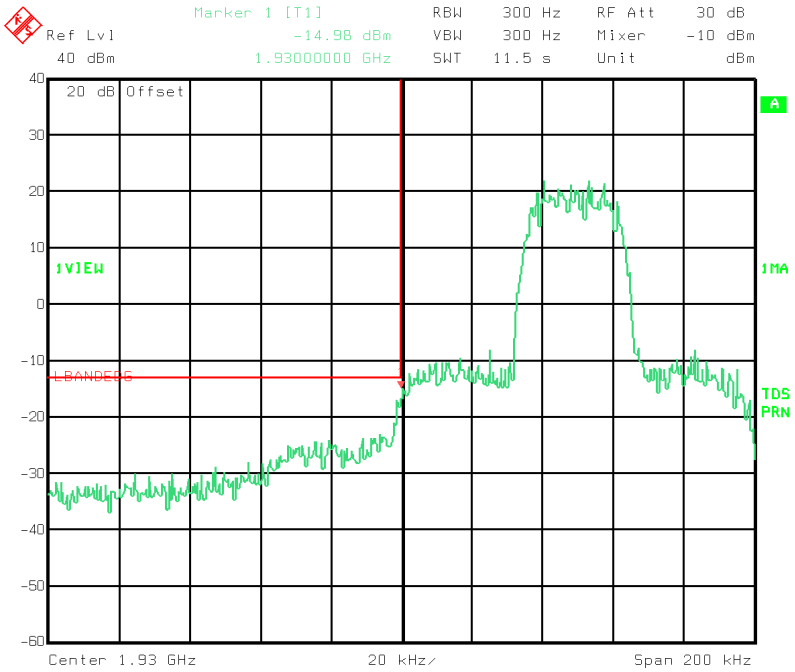


Title: 9L0482R LOW POWER MODULE W/VARIABLE BW MODULE
Comment A: IM11.PCX INTERMODULATION- TDMA - DOWNLINK
Date: 6.DEC.1999 15:35:22

Band Edge Spurious Emissions – NADC Downlink

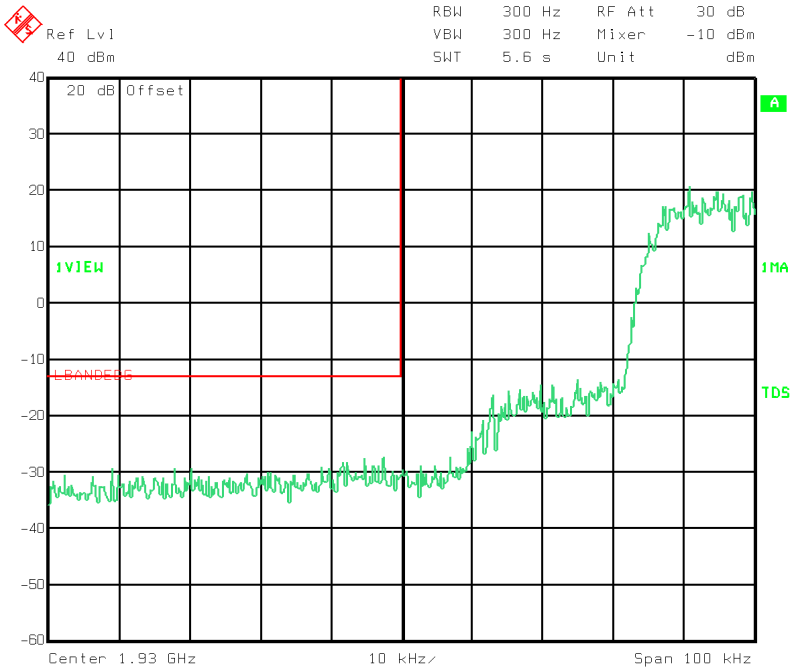


Title: 9L0482R LOW POWER MODULE W/VARIABLE BW MODULE-TDMA
Comment A: UBE03.PCX UPPER BAND EDGE
Date: 18.NOV.1999 8:45:24

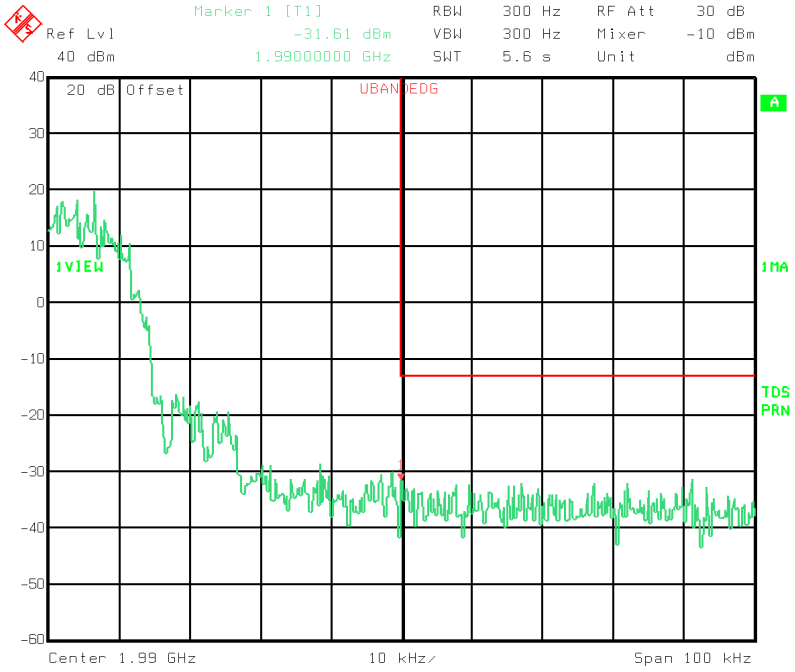


Title: 9L0482R LOW POWER MODULE W/VARIABLE BW MODULE
Comment A: LBE04.PCX LOWER BAND EDGE - TDMA - DOWNLINK
Date: 6.DEC.1999 15:04:08

Band Edge Spurious Emissions – NADC Module Downlink

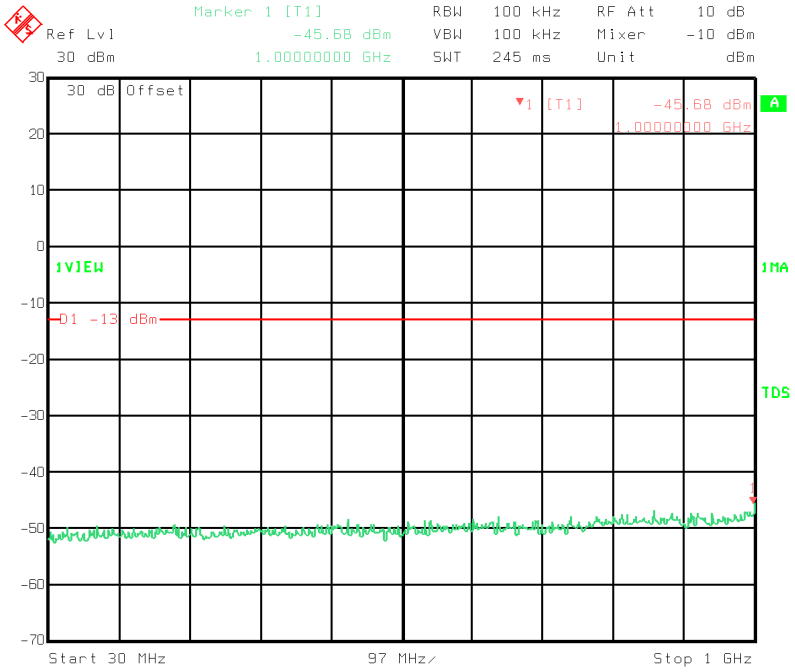


Title: 9L0482R LOW POWER MODULE W/ TDMA MODULE
Comment A: LBE08.PCX LOWER BAND EDGE - DOWNLINK - TDMA
Date: 7.DEC.1999 15:35:08

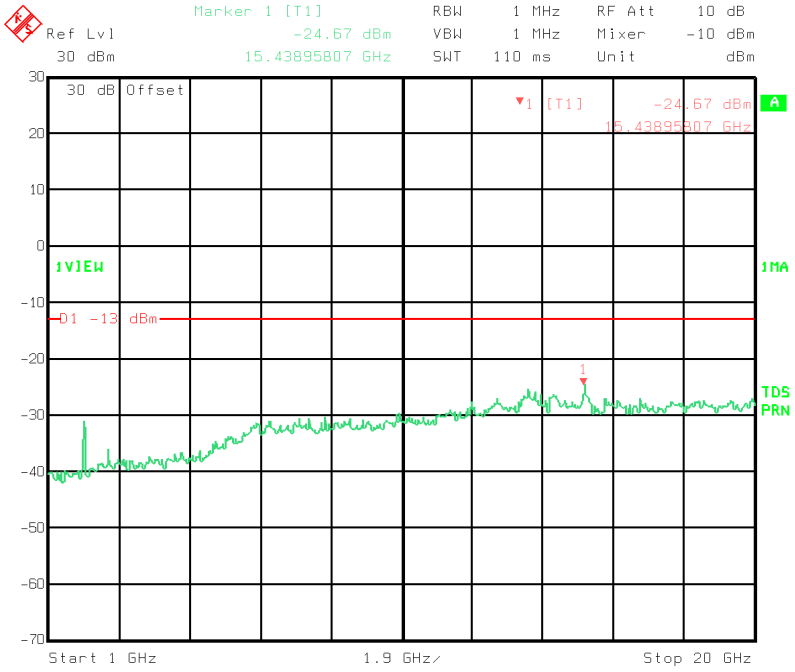


Title: 9L0482R LOW PWR MODULE W/ TDMA MODULE - TDMA - DOWNLINK
Comment A: UBE09.PCX UPPER BAND EDGE
Date: 22.NOV.1999 10:06:13

Spurious Emissions – NADC Module Downlink



Title: 9L0482R LOW PWR MODULE W/ TDMA MODULE - TDMA - DOWNLINK
Comment A: APSE10a.PCX Antenna Port Spurious Emissions (Channel 600)
Date: 19.NOV.1999 18:00:26



Title: 9L0482R LOW PWR MODULE W/ TDMA MODULE - TDMA - DOWNLINK
Comment A: APSE10b.PCX Antenna Port Spurious Emissions (Channel 600)
Date: 19.NOV.1999 17:54:41

Section 6. Field Strength of Spurious

NAME OF TEST: Field Strength of Spurious Emissions	PARA. NO.: 2.1051
TESTED BY: Kevin Carr	DATE: 08/19/99

Test Results: Complies.

Test Data: See attached table. - Data from KTL Ottawa report 9R01401

Microwave Radiated Emissions Data

Complete X Preliminary ___ Page 1 of 1

Client: Allen Telecom Test #: 9R1401D.FCC W.O.#: 9R01401

EUT: MR701 S/N: N/A

Technician: Kevin Carr Specification: FCC Part 24 Lab: A Date: 8/19/99

Configuration: High Power amplifier configuration, Maximum Output into 50 ohm load

Bandwidth: 1 MHz Video Bandwidth: 1 MHz Antenna Distance 3 m Detector:

EUT Power: X 115 V.A.C. X 60 Hz X Peak
___ 208 V.A.C. ___ 50 Hz ___ Average
___ 230 V.A.C.
___ Other _____ X 1 Phase ___ 3 Phase

Freq. (GHz)	Meter Reading (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	RF Gain (dB)	Corrected Reading (dBuV/m)	Spec. Limit (dBuV/m)	Pol.	Comments:
3.894	55.3	36		42.5	48.8	82.3	V	
3.895	53.5	36		42.5	47	82.3	H	
5.843	57.3	41.7		41.7	57.3	82.3	V	
5.842	55.3	41.7		41.7	55.3	82.3	H	
7.790	56.8	45.5		41.0	61.3	82.3	V	
7.790	55.5	45.5		41.0	60	82.3	H	
9.739	41.3	51.5		44.4	48.4	82.3	V	
9.738	40.1	51.5		44.4	47.2	82.3	H	
11.686	41.6	54.2		43.7	52.1	82.3	V	
11.685	39.8	54.2		43.7	50.3	82.3	H	
3.735	48.0	35.7		42.4	41.3	82.3	V	
3.735	48.8	35.7		42.4	42.1	82.3	H	
5.603	50.0	40.5		43.1	47.4	82.3	V	
7.470	47.3	44.8		42	50.1	82.3	V	
9.338	45.6	50.8		43.4	53	82.3	H	
11.205	46.0	53.8		43.5	56.3	82.3	H	

Section 7. Frequency Stability

NAME OF TEST: Frequency Stability	PARA. NO.: 2.1055
TESTED BY:	DATE:

Test Results: N/A

Measurement Data: See attached table.

Standard Test Frequency: MHz
Standard Test Voltage:

Not Applicable

Equipment Used:

Measurement Uncertainty: +/- 1.6 dB

Lab Temperature: °C

Relative Humidity: %

Section 8. Test Equipment List

KTL ID	Description	Manufacturer Model Number	Serial Number	Calibration Date
CF38	CABLE 2m	Astrolab 32027-2-29094-72TC	N/A	08/31/99
CF39	CABLE 2m	Astrolab 32027-2-29094-72TC	N/A	08/31/99
CF40	CABLE 2m	Astrolab 32027-2-29094-72TC	N/A	08/31/99
CF41	CABLE 2m	Astrolab 32027-2-29094-72TC	N/A	08/31/99
CF44	CABLE, 4M	STORM PR90-010-144	N/A	10/15/99
G1017	ATTENUATOR	NARDA 776B-20	NONE	09/30/99
G1018	ATTENUATOR	NARDA 776B-10	NONE	09/30/99
G1366	50 OHM LOAD	NARDA 27470	254	02/25/99
G1711	TUNABLE NOTCH FILTER	K&L 3TNF-1000/2000-N/N	144	CBU
G2632	SPECTRUM ANALYZER	ROHDE & SCHWARZ FSEK30	830844/006	06/14/99
G2735	I/Q MODULATION GENERATOR	ROHDE & SCHWARZ AMIQ	830848/005	05/26/99
G2736	SIGNAL GENERATOR	ROHDE & SCHWARZ SMIQ 03	DE22081	05/03/99
G3726	DUAL DIRECTIONAL COUPLER	NARDA 3022	73393	05/19/99
S20w2	Mini-Circuits 20 dB attenuator	S20W2		CBU

Calibration interval on all items is typically 12 months from the calibration date shown. Where relevant, measuring equipment is subjected to in-service checks between testing. Should any measurement equipment be utilized beyond its scheduled calibration date, the measuring equipment is subjected to in-service checks prior to use. KTL shall notify clients promptly, in writing, of identification of defective measuring equipment that casts doubt on the validity of results given in this report.

LEGEND:

CNR CALIBRATION NOT REQUIRED
N/A NOT APPLICABLE
CBU CALIBRATED BEFORE USE

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.

Calculation Of Field Strength Limit

An example of attenuation requirement of 43 + 10 Log P is equivalent to -13 dBm (5×10^{-5} Watts) at the antenna terminal. We determine the field strength limit by using the plane wave relation.

$GP/4\pi R^2 = E^2/120\pi$

For emissions ≤ 1 GHz:

G = 1.64 (Dipole Gain)
P = 10^{-5} Watts (Maximum spurious output power)
R = 3m (Measurement Distance)

$$E = \frac{\sqrt{30GP}}{R}$$

$$\mathrm{E} = \frac{\sqrt{30 \times 1.64 \times 5 \times 10^{-5}}}{3} = 0.016533 \text{ V / m} = 84.4 \text{ dB}\mu\text{V / m}$$

For emissions > 1 GHz:

G = 1 (Isotropic Gain)
P = 1×10^{-5} Watts (Maximum spurious output power)
R = 3m (Measurement Distance)

$$E = 84.4 - 20Log\sqrt{1.64} = 82.3dB\mu V \ / \ m@3m$$

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

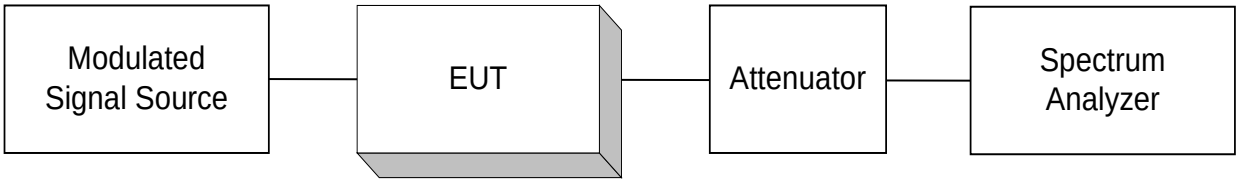
The E.U.T. is placed in an environmental chamber and allowed to stabilize at +20 degrees Celsius for at least 15 minutes. The frequency counter and signal generator are phase locked with the same 10 MHz reference frequency by connecting the 10 MHz ref. out of the counter to the 10 MHz ref, in of the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

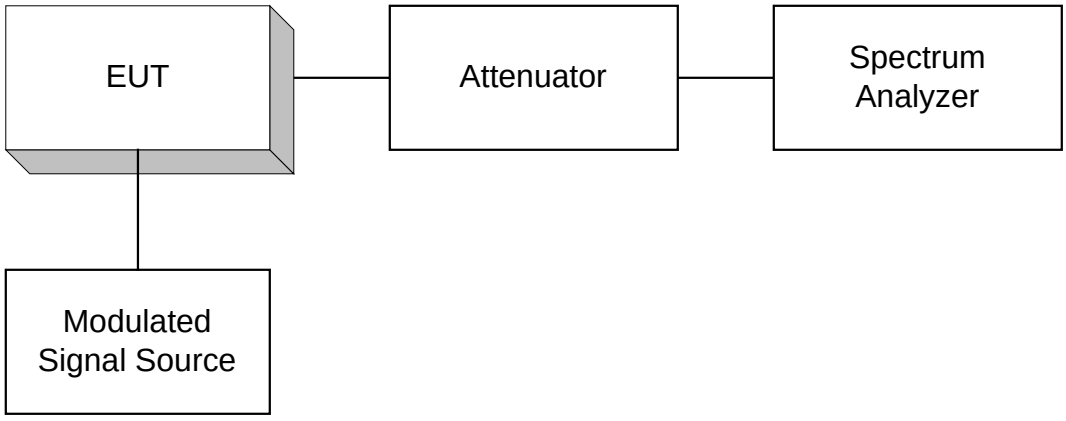
The input voltage to the E.U.T. is set to S.T.V. and the temperature of the environmental chamber is varied in 10 degree steps from -30 degrees C to +50 degrees C. The E.U.T. is allowed to stabilize at each temperature and the frequency is measured in 30 second intervals for a period of 5 minutes.

ANNEX B - TEST DIAGRAMS

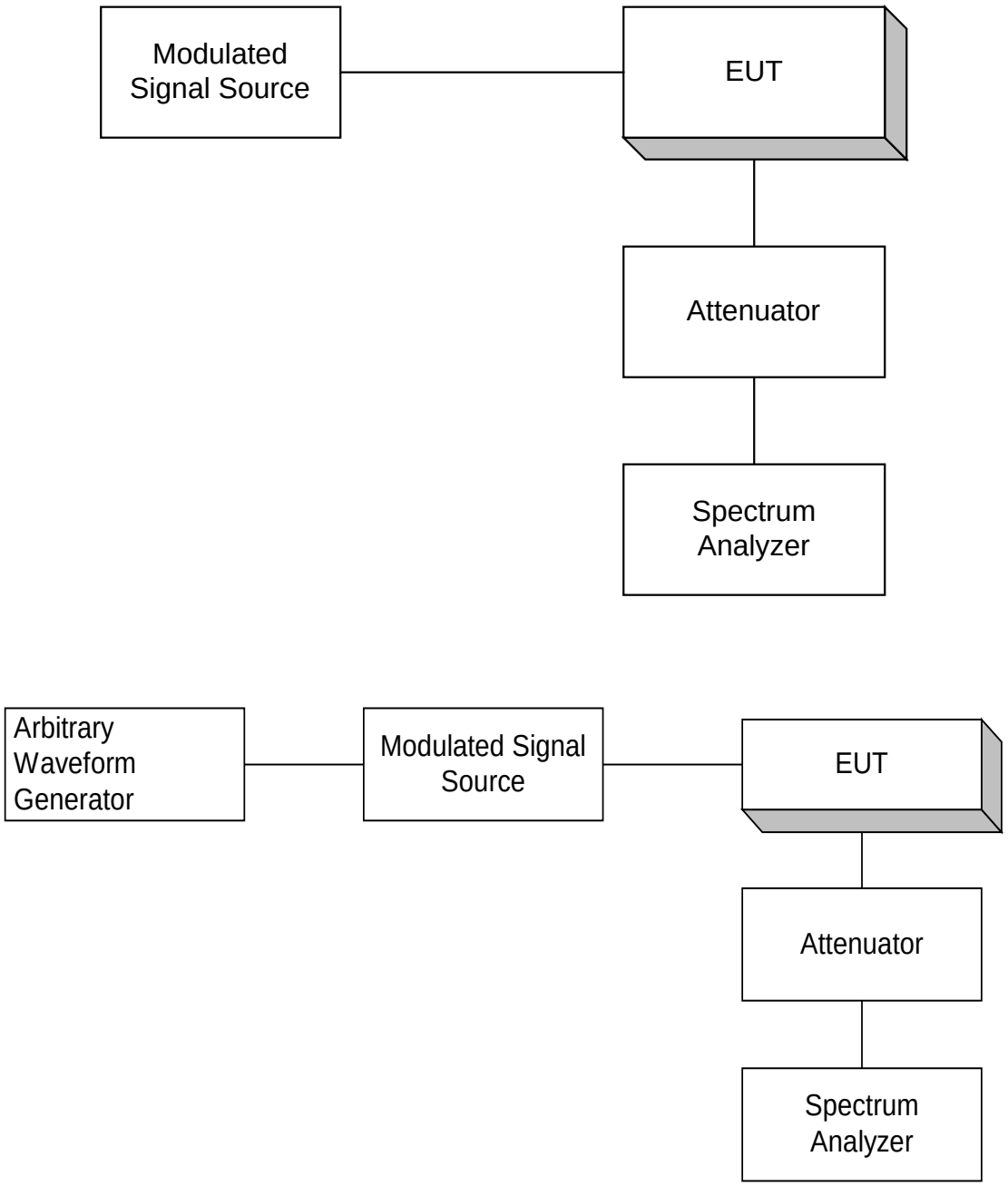
Para. No. 2.985 - R.F. Power Output



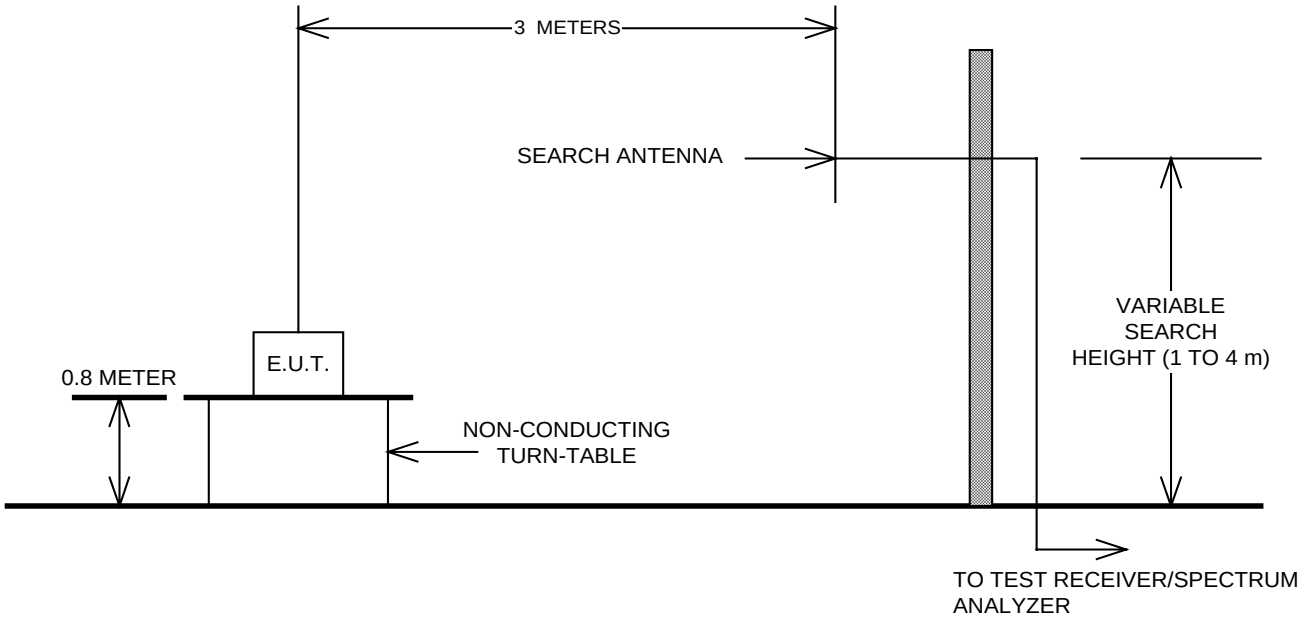
Para. No. 2.989 - Occupied Bandwidth



Para. No. 2.991 Spurious Emissions at Antenna Terminals



Para. No. 2.993 - Field Strength of Spurious Radiation



Para. No. 2.995 - Frequency Stability