



FCC Test Report

FCC Part 22,24 / RSS 132,133

FOR:

Quad-Band GPRS/EDGE/UMTS module

MODEL #: XU870

Novatel Wireless
9645 Scranton Rd., Suite 205
San Diego, CA 92121
USA

FCC ID: NBZNRM-XU870
IC-ID: 3229A-XU870

TEST REPORT #: EMC_NOVAT_010_06002_FCC22_24
DATE: 2006-08-21



FCC listed#
101450

IC recognized #
3925

CETECOM Inc.

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CETECOM Inc. is a Delaware Corporation with Corporation number: 2113686

Board of Directors: Dr. Harald Ansorge, Dr. Klaus Matkey, Hans Peter May

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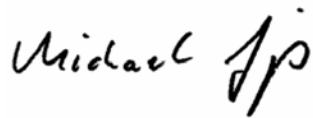
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1 Assessment

The following is in compliance with the applicable criteria specified in FCC rules Parts 2, 22 and 24 of Title 47 of the Code of Federal Regulations and in compliance with the applicable criteria specified in Industry Canada rules RSS132 and RSS133.

Company	Description	Model #
NOVATEL WIRELESS	Quad-Band GPRS/EDGE/UMTS module	XU870

A handwritten signature in black ink that reads "Michael Grings".

2006-08-21
Michael Grings
Deputy Testlab Manager

The test results of this test report relate exclusively to the test item specified in Identification of the Equipment under Test. The CETECOM Inc. USA does not assume responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item. The test report may only be reproduced or published in full. Reproduction or publication of extracts from the report requires the prior written approval of the CETECOM Inc USA.

2 Administrative Data

2.1 Identification of the Testing Laboratory Issuing the EMC Test Report

Company Name:	CETECOM Inc.
Department:	EMC
Address:	411 Dixon Landing Road Milpitas, CA 95035 U.S.A.
Telephone:	+1 (408) 586 6200
Fax:	+1 (408) 586 6299
Responsible Test Lab Manager:	Lothar Schmidt
Responsible Project Leader:	Michael Grings
Date of test:	2006-07-10 to 2006-08-21

2.2 Identification of the Client

Applicant's Name:	Novatel Wireless
Street Address:	9645 Scranton Rd., Suite 205
City/Zip Code	San Diego, CA 92121
Country	USA
Contact Person:	Mohammad Toossi
Phone No.	858-349-3641
Fax:	858-812-3402
e-mail:	mttoossi@nvtl.com

2.3 Identification of the Manufacturer

Manufacturer's Name:	Novatel Wireless
Manufacturers Address:	9645 Scranton Rd., Suite 205
City/Zip Code	San Diego, CA 92121
Country	USA

3 Equipment under Test (EUT)

3.1 Identification of the Equipment under Test

Marketing Name:	Merlin XU870
Description:	Quad-Band GPRS/EDGE/UMTS PC Card
Model No:	XU870
FCC ID:	NBZNRM-XU870
IC ID:	3229A-XU870
Frequency Range:	824.2MHz – 848.8MHz for GSM 850 826.4MHz – 846.6MHz for FDD5 1850.2MHz – 1909.8MHz for PCS 1900 1852.4MHz – 1907.6MHz for FDD2
Type(s) of Modulation:	GMSK, 8-PSK, QPSK
Number of Channels:	124 for GSM-850, 299 for PCS-1900, 300 for WCDMA
Antenna Type:	Patch Antenna
Max. Output Power:	Conducted : see page 9, please Radiated : see page 29, please

3.2 Identification of Accessory equipment

AE #	TYPE	MANF.	MODEL	SERIAL #
1	Laptop	SONY	VAIO	3790DVt1 110013
2	AC-Adapter	SONY	VGP-AC19V12	1479231210205858
3	Laptop	DELL	LATITUDE 1201	34BB00
4	AC-Adapter	DELL	PA-1600-06D2	CN OTD231 71615 58N 01DA



4 Subject of Investigation

All testing was performed on the EUT listed in Section 3. The EUT was maximized in the X,Y, Z positions , all data in this report shows the worst case between horizontal and vertical polarization for above 1GHz. The dual band antenna used has 2dBi only and is provided with a 3m cable.

The objective of the measurements done by Cetecom Inc. was to measure the performance of the EUT as specified by requirements listed in FCC rules Parts 2, 22 and 24 of Title 47 of the Code of Federal Regulations and Industry Canada rules RSS132 and RSS133.

5 Measurements

5.1 RF Power Output

5.1.1 FCC 2.1046 Measurements required: RF power output.

Power output shall be measured at the RF output terminals when the transmitter is adjusted in accordance with the tune-up procedure to give the values of current and voltage on circuit elements as specified. The electrical characteristics of the radio frequency load attached to the output terminals when this test is made shall be stated.

5.1.2 Limits:

5.1.2.1 FCC 22.913 (a) Effective radiated power limits.

The effective radiated power (ERP) of mobile transmitters must not exceed 7 Watts.

5.1.2.2 FCC 24.232 (b)(c) Power limits.

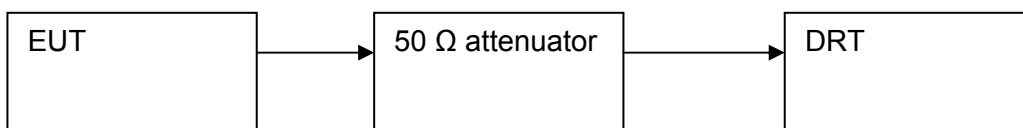
(b) Mobile/portable stations are limited to 2 Watts effective isotropic radiated power (EIRP).

(c) Peak transmit power must be measured over any interval of continuous transmission using instrumentation calibrated in terms of an rms equivalent voltage. The measurement results shall be properly adjusted for any limitations, such as detector response times, limited resolution bandwidth capability when compared to the emission bandwidth, sensitivity, etc., so as to obtain a true peak measurement over the full bandwidth of the channel.

5.1.3 Conducted Output Power Measurement procedure:

Based on TIA-603C 2004

2.2.1 Conducted Carrier Output Power Rating



1. Connect the equipment as shown in the above diagram. A Digital Radiocommunication Tester (DRT) is used to enable the EUT to transmit and to measure the output power.
2. Adjust the settings of the DRT to set the EUT to its maximum power at the required channel.
3. Record the output power level measured by the DRT.
4. Correct the measured level for all losses in the RF path.
5. Measurements are to be performed with the EUT set to the low, middle and high channel of each frequency band.

5.1.4 Results 850 MHz band(conducted):

Frequency (MHz)	Conducted Output Power (dBm)	
	GPRS	EGPRS
824.2	32.29	30.24
836.6	32.29	30.24
848.8	32.37	30.39

5.1.5 Results 1900 MHz band(conducted):

Frequency (MHz)	Conducted Output Power (dBm)	
	GPRS	EGPRS
1850.2	28.58	25.83
1880.0	28.96	26.16
1909.8	29.72	26.03

5.1.6 Results 850 MHz band FDD5 (conducted):

Frequency (MHz)	Conducted Output Power (dBm)
826.4	25.48
836.6	25.44
846.6	25.56

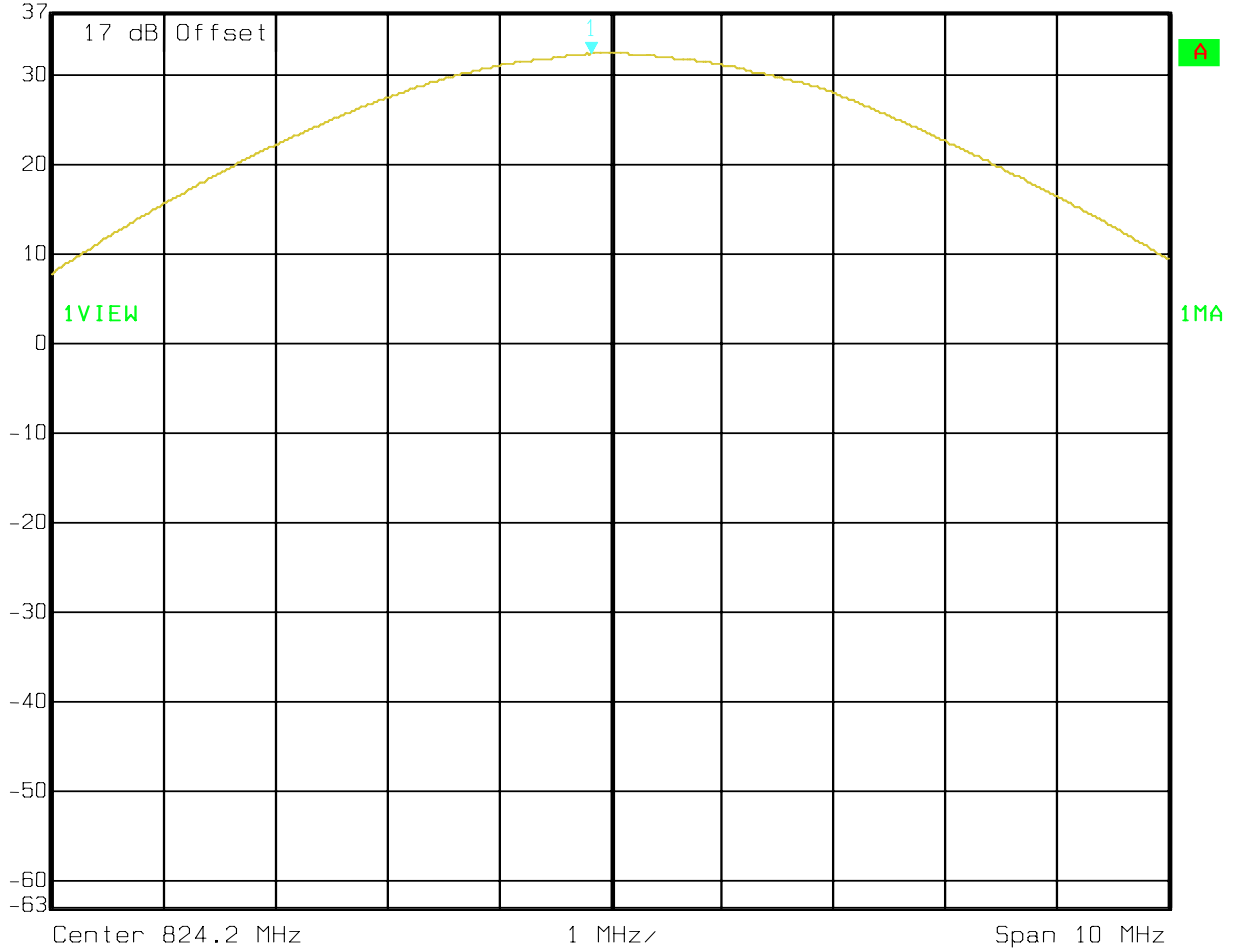
5.1.7 Results 1900 MHz band FDD2 (conducted):

Frequency (MHz)	Conducted Output Power (dBm)
1850.2	26.14
1880.0	26.36
1907.6	25.79



RF OUTPUT POWER (GSM-850) CHANNEL 128 GPRS

 Marker 1 [T1] RBW 3 MHz RF Att 50 dB
Ref Lvl 32.29 dBm VBW 3 MHz
37 dBm 824.02965932 MHz SWT 5 ms Unit dBm



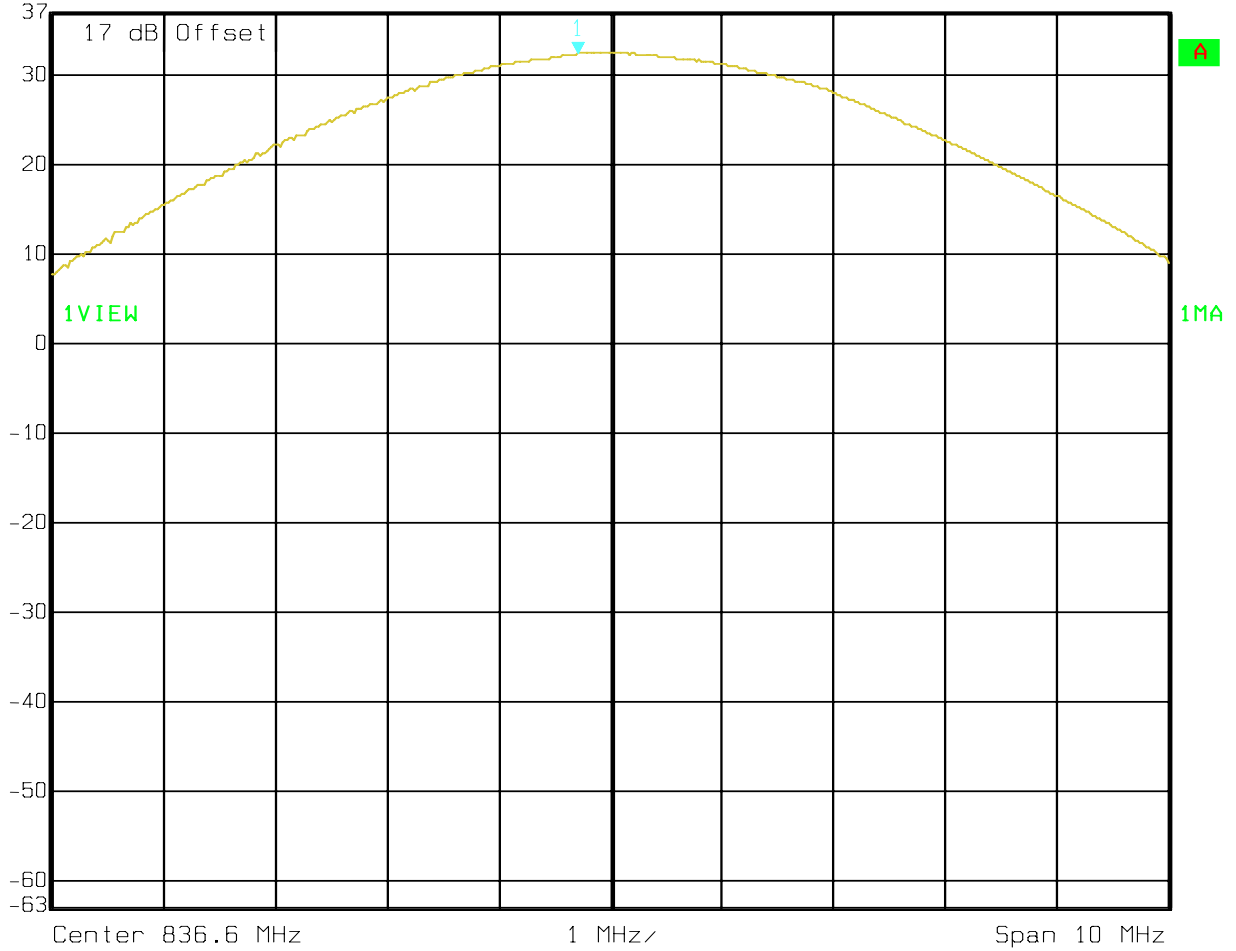
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**RF OUTPUT POWER (GSM-850)
CHANNEL 190 GPRS**



Ref Lvl	37 dBm	Marker 1 [T1]	32.29 dBm	RBW	3 MHz	RF Att	50 dB
			836.30941884 MHz	VBW	3 MHz		
				SWT	5 ms	Unit	dBm

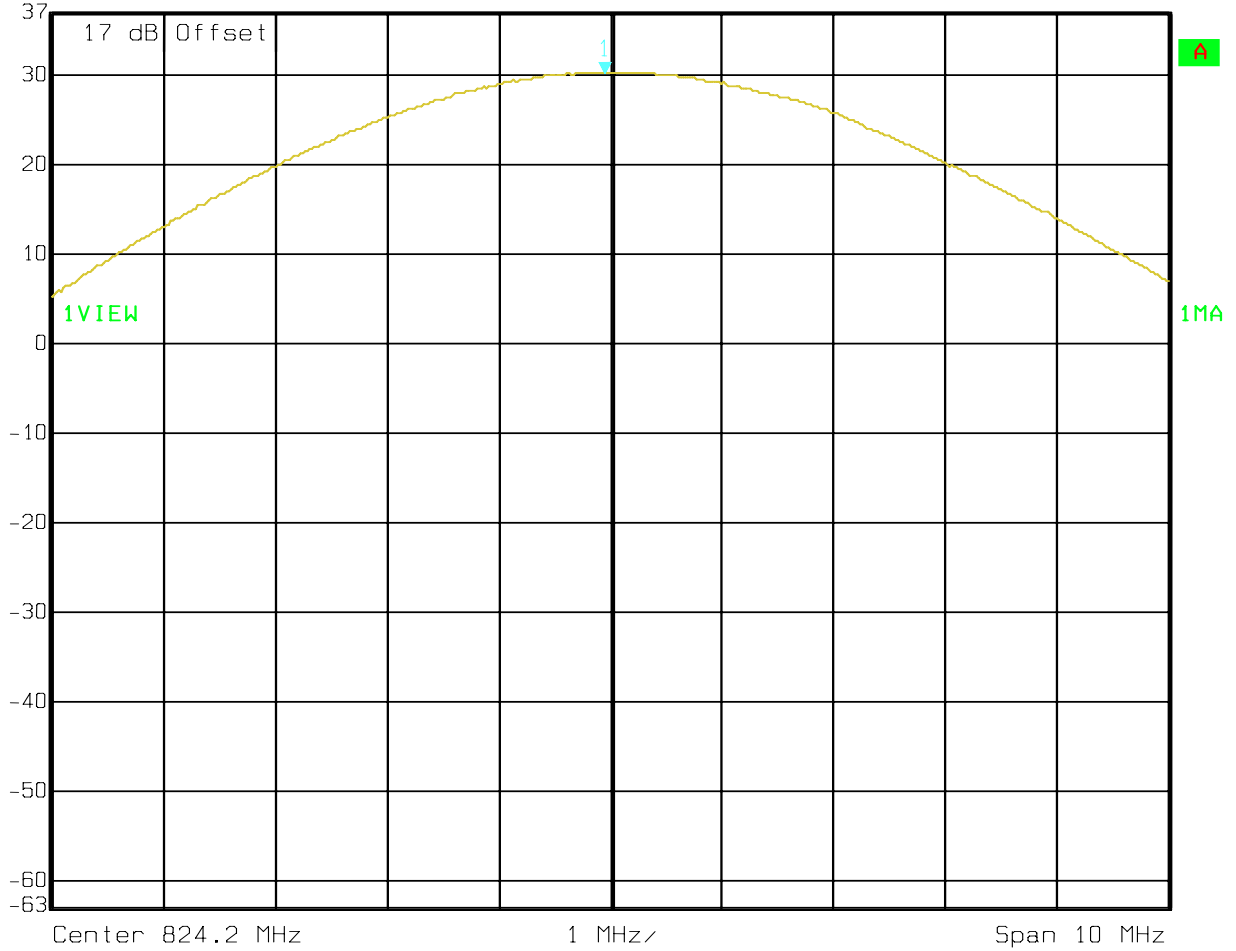


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**RF OUTPUT POWER (GSM-850)
CHANNEL 128 EGPRS**



Marker 1 [T1] RBW 3 MHz RF Att 50 dB
Ref Lvl 30.24 dBm VBW 3 MHz
37 dBm 824.14989980 MHz SWT 5 ms Unit dBm

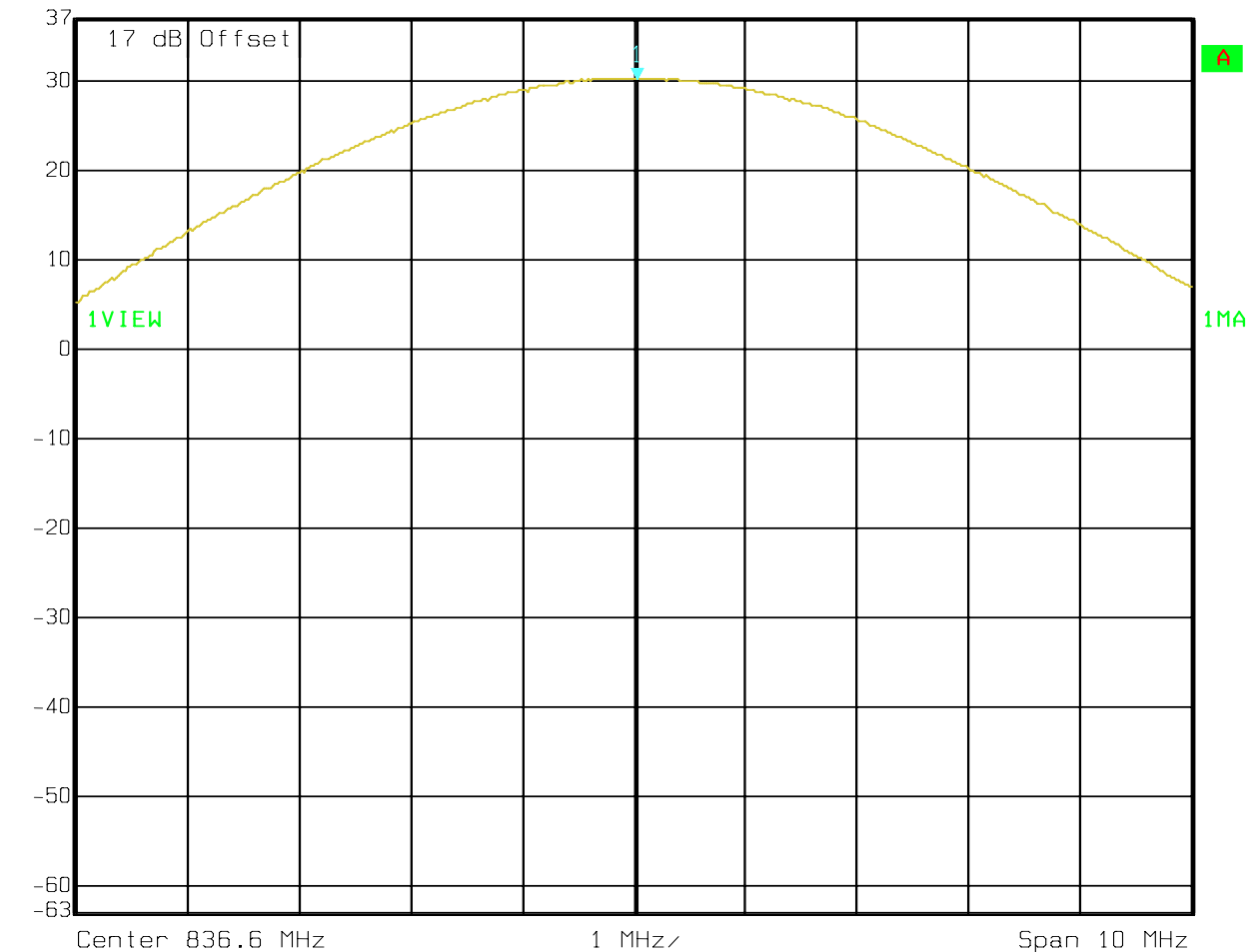


Date: 11.JUL.2006 10:29:24



RF OUTPUT POWER (GSM-850) CHANNEL 190 EGPRS

Ref Lvl 37 dBm
Marker 1 [T1] 30.24 dBm
836.63006012 MHz
RBW 3 MHz
RF Att 50 dB
VBW 3 MHz
SWT 5 ms
Unit dBm

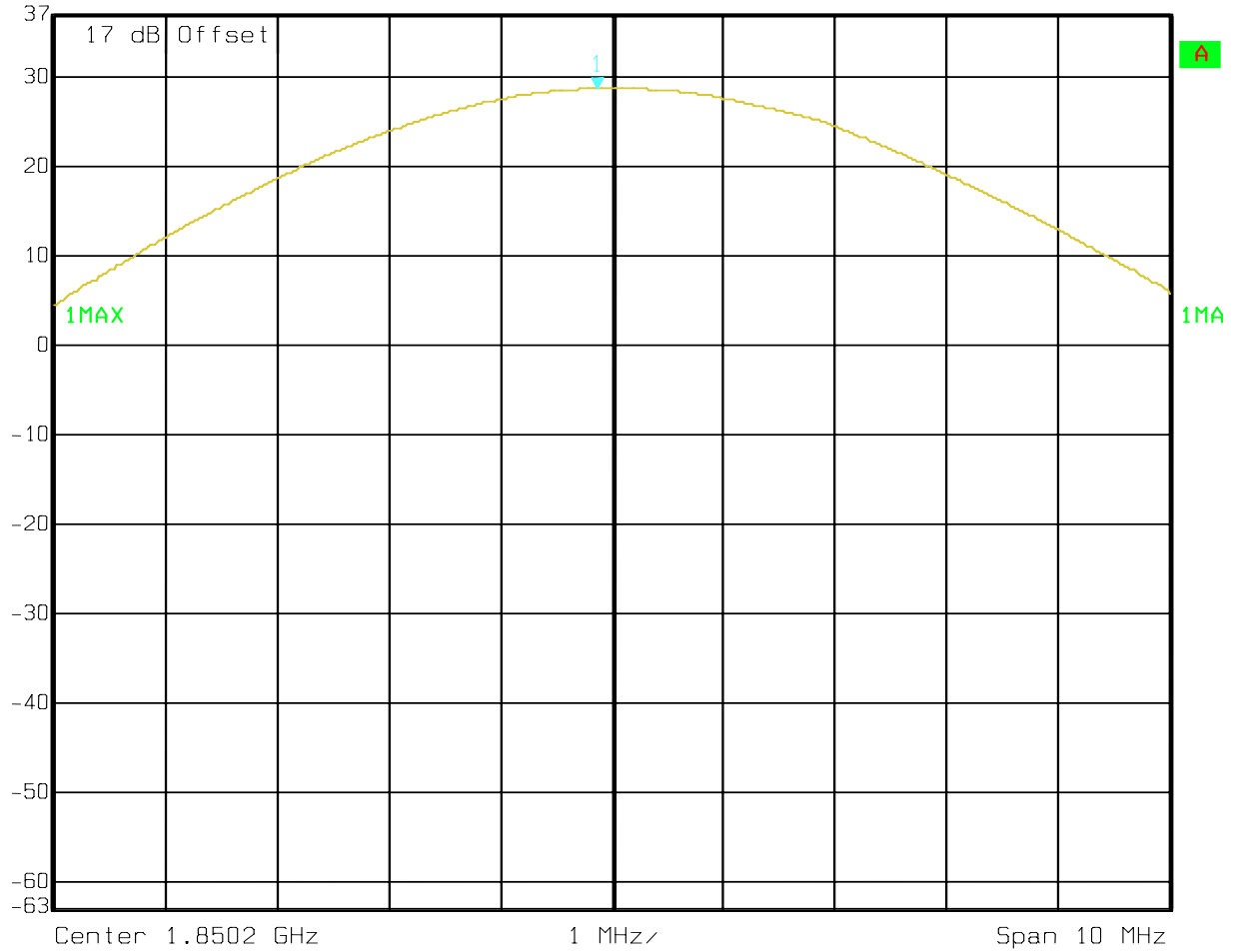


Date: 11.JUL.2006 10:33:48



**RF OUTPUT POWER (PCS-1900)
CHANNEL 512 GPRS**

 Ref Lvl 37 dBm Marker 1 [T1] 28.58 dBm RBW 3 MHz RF Att 50 dB
1.85006974 GHz VBW 3 MHz Unit dBm
SWT 5 ms

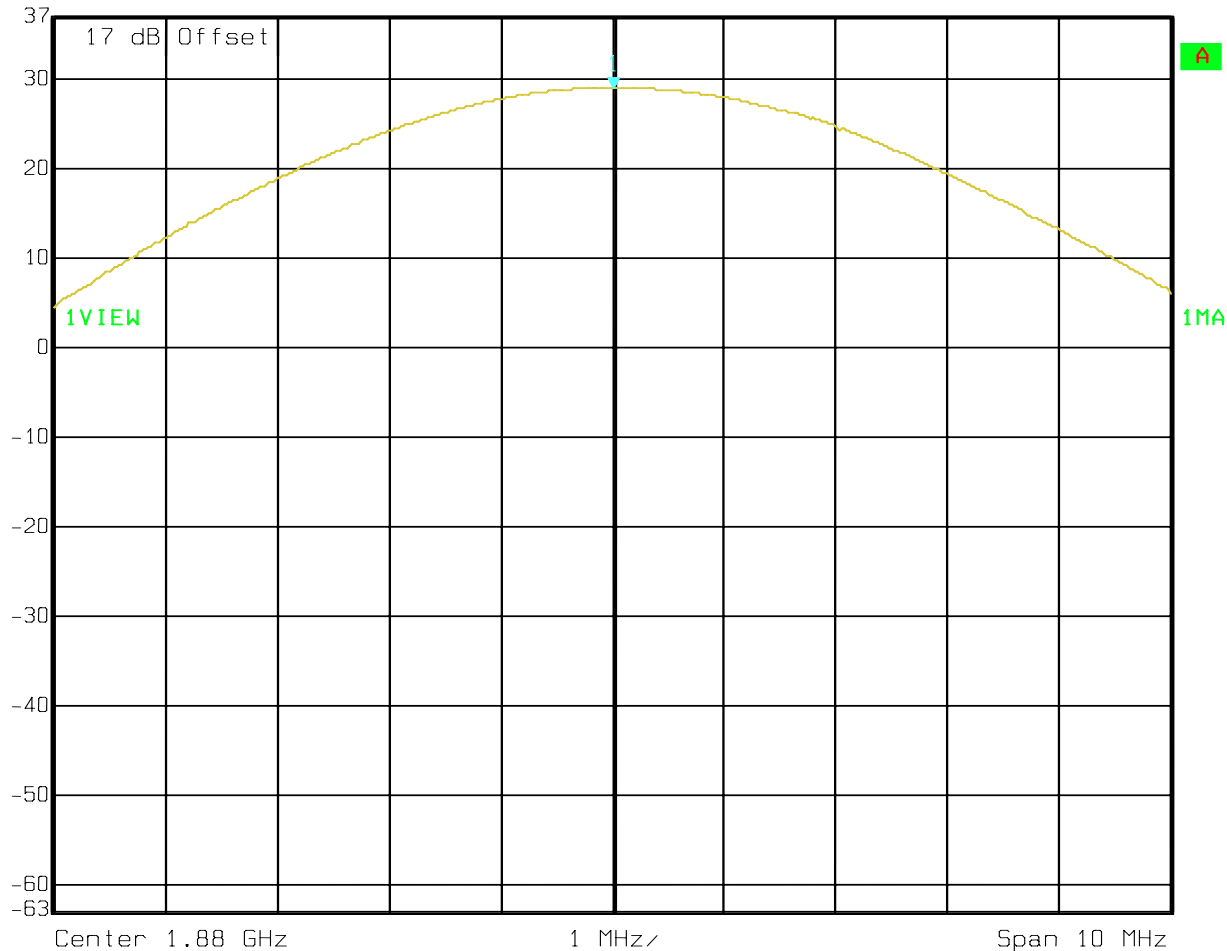


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**RF OUTPUT POWER (PCS-1900)
CHANNEL 661 GPRS**

 Ref Lvl 37 dBm Marker 1 [T1] 28.96 dBm RBW 3 MHz RF Att 50 dB
1.88001002 GHz VBW 3 MHz Unit dBm
SWT 5 ms

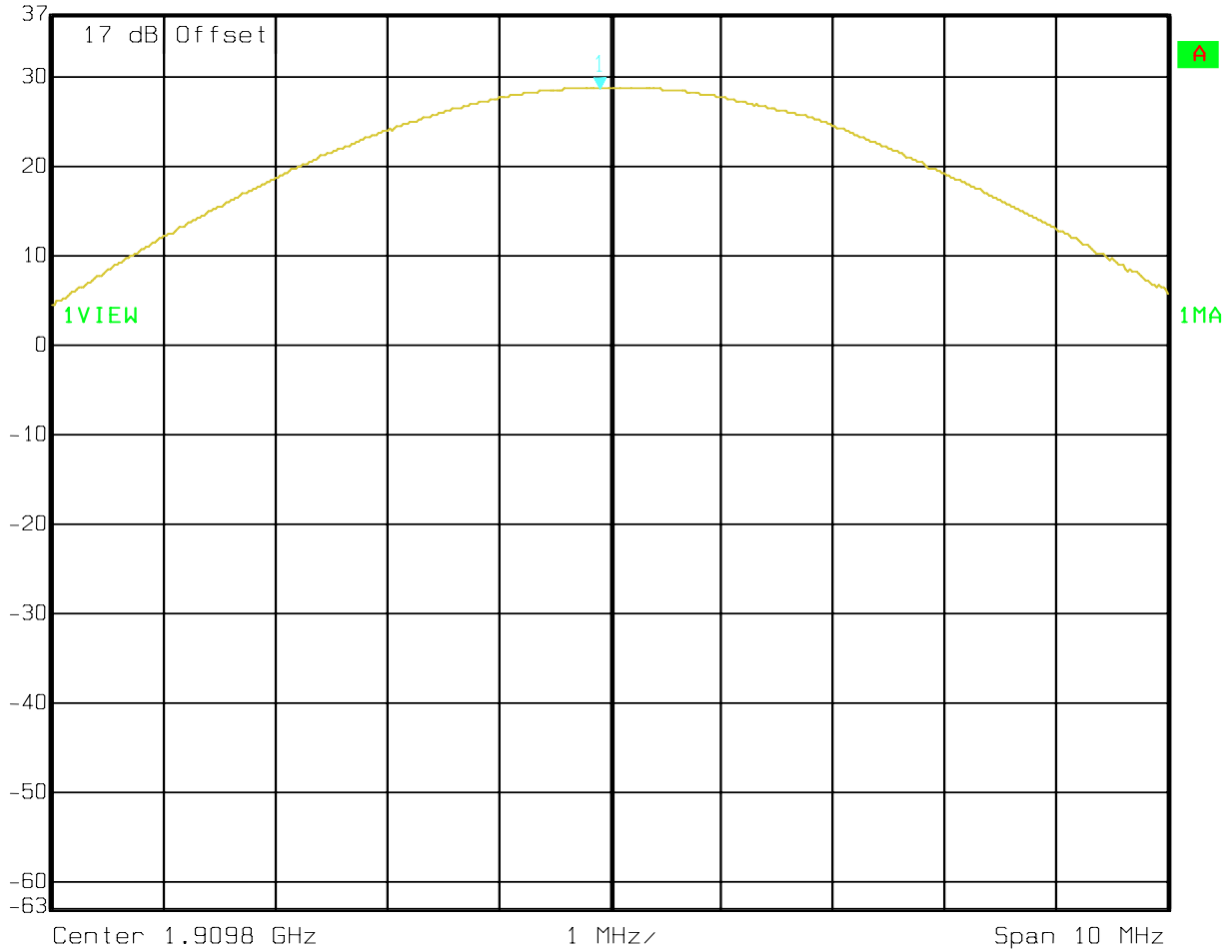


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**RF OUTPUT POWER (PCS-1900)
CHANNEL 810 GPRS**

 Ref Lvl 37 dBm Marker 1 [T1] 28.72 dBm RBW 3 MHz RF Att 50 dB
1.90970982 GHz VBW 3 MHz Unit dBm
SWT 5 ms

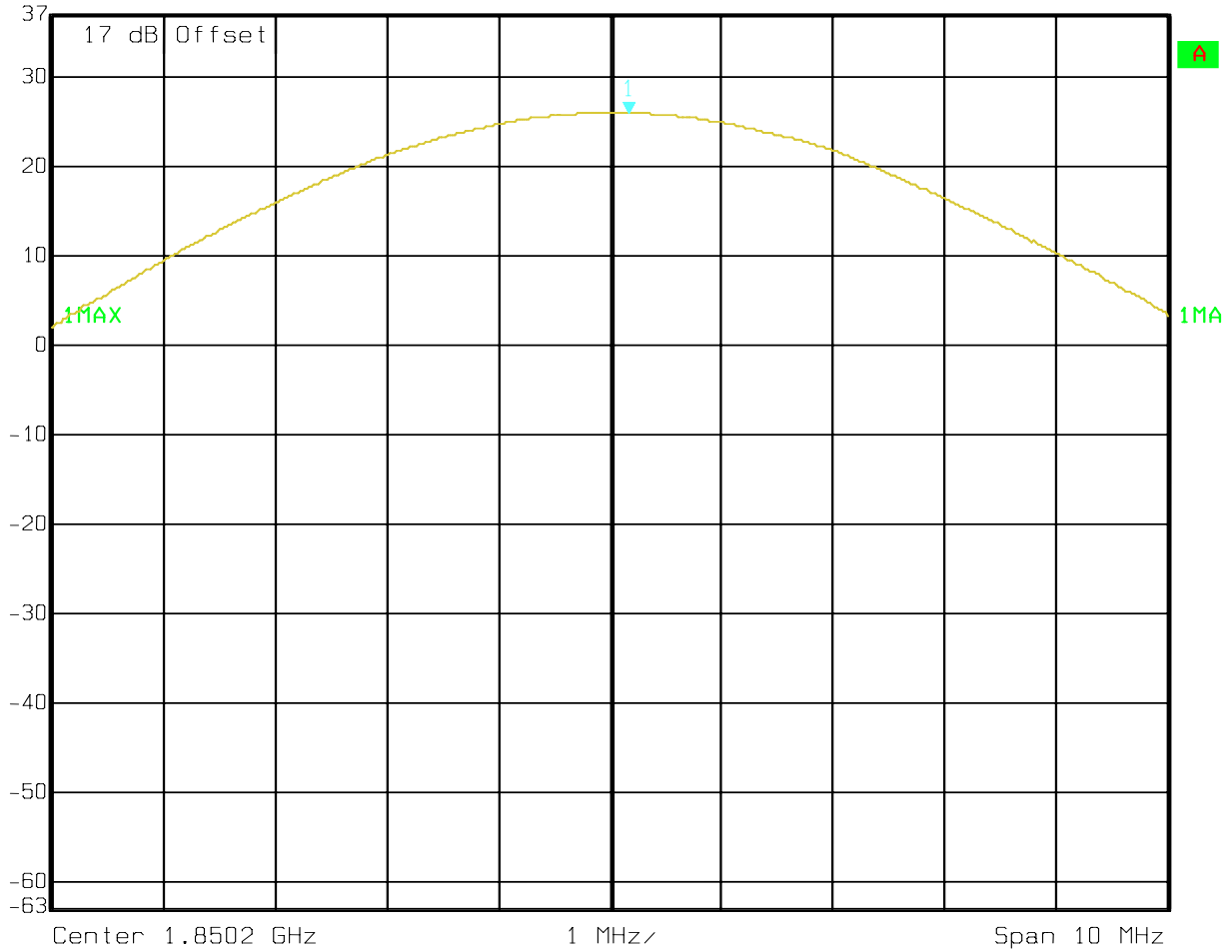


Date: 11.JUL.2006 13:56:27



**RF OUTPUT POWER (PCS-1900)
CHANNEL 512 EGPRS**

 Ref Lvl 37 dBm Marker 1 [T1] 25.83 dBm RBW 3 MHz RF Att 50 dB
1.85037034 GHz VBW 3 MHz Unit dBm
SWT 5 ms

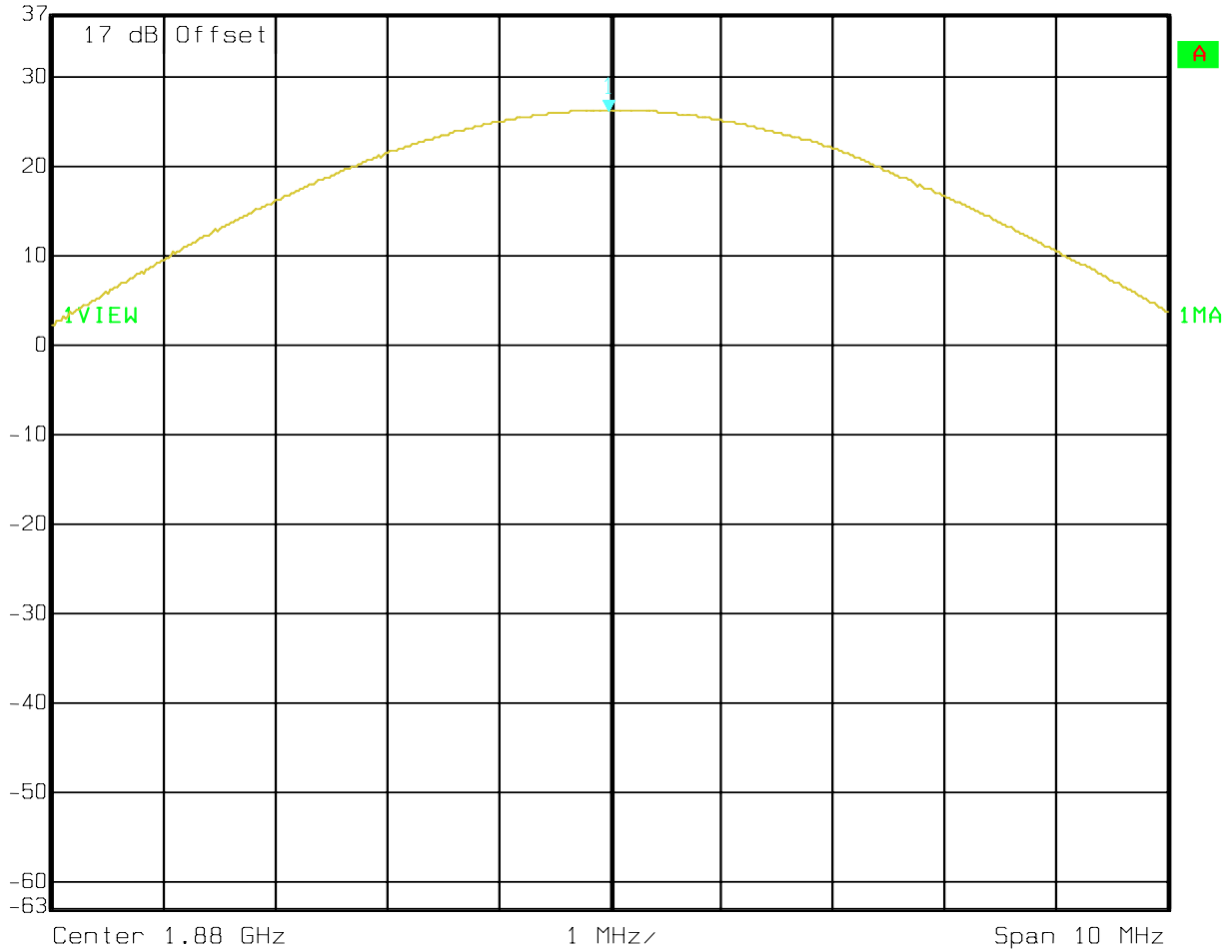


Date: 12.JUL.2006 13:20:35



**RF OUTPUT POWER (PCS-1900)
CHANNEL 661 EGPRS**

 Ref Lvl 37 dBm Marker 1 [T1] 26.16 dBm RBW 3 MHz RF Att 50 dB
1.87998998 GHz VBW 3 MHz Unit dBm
SWT 5 ms

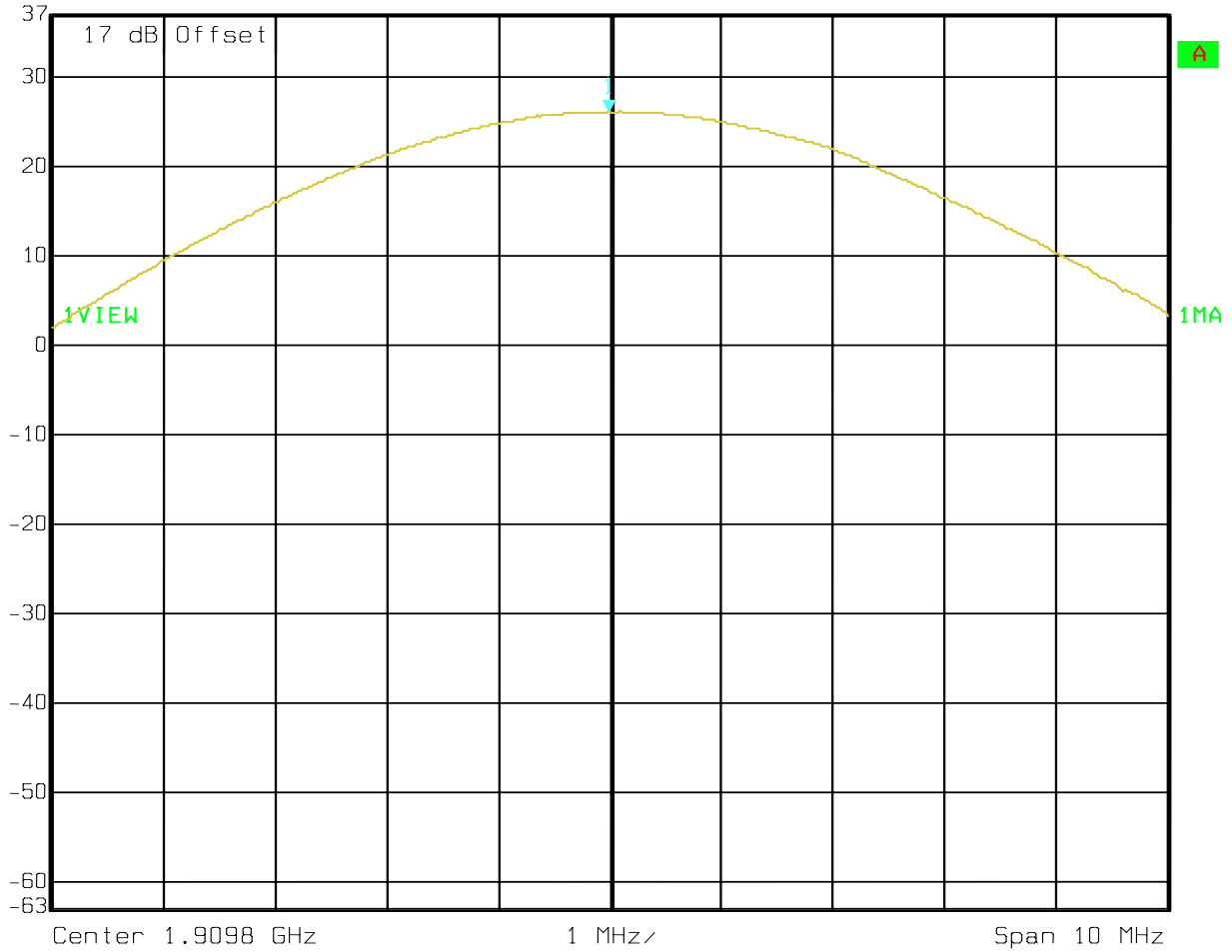


Date: 12.JUL.2006 13:21:12



**RF OUTPUT POWER (PCS-1900)
CHANNEL 810 EGPRS**

 Ref Lvl 37 dBm Marker 1 [T1] 26.03 dBm RBW 3 MHz RF Att 50 dB
1.90978998 GHz VBW 3 MHz Unit dBm
SWT 5 ms



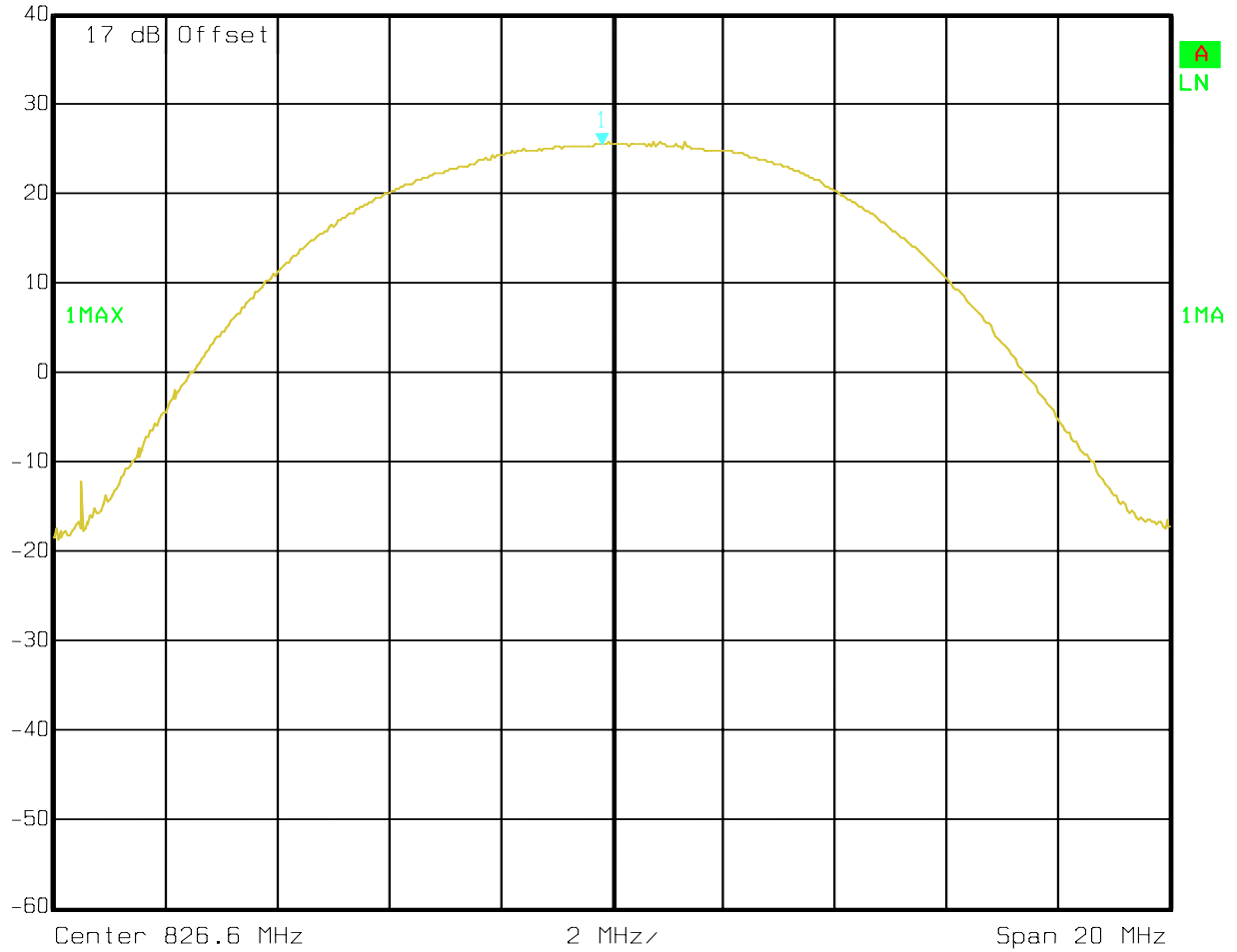
Date: 12.JUL.2006 13:21:47



**RF OUTPUT POWER (GSM-850)
CHANNEL 4132 GPRS FDD5**



Ref Lvl 40 dBm
Marker 1 [T1] 25.48 dBm
826.41963928 MHz
RBW 5 MHz
VBW 5 MHz
SWT 5 ms
RF Att 40 dB
Mixer -20 dBm
Unit dBm



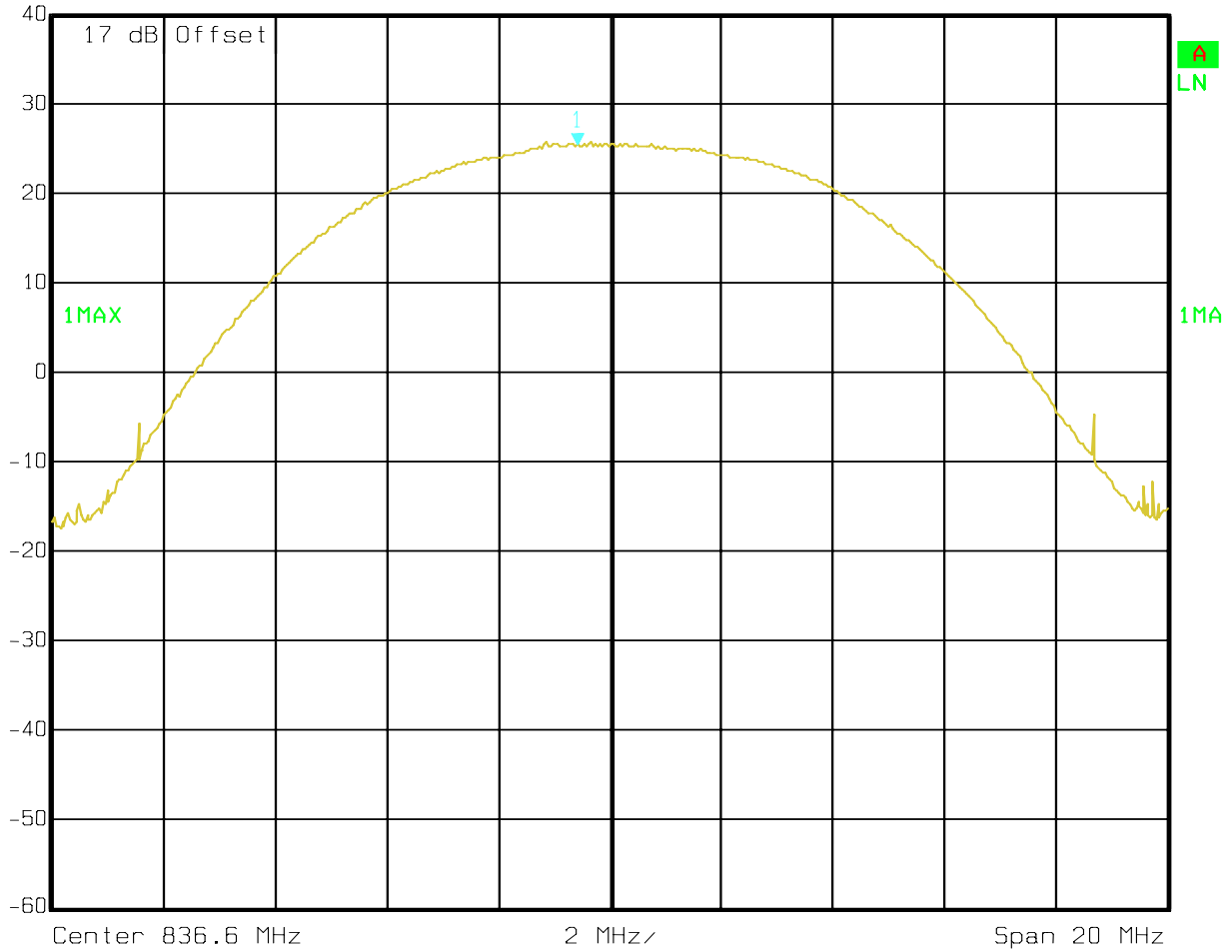
Date: 26.JUL.2006 10:06:46



**RF OUTPUT POWER (GSM-850)
CHANNEL 4183 GPRS FDD5**



Ref Lvl 40 dBm
Marker 1 [T1] 25.44 dBm
836.01883768 MHz
RBW 5 MHz RF Att 40 dB
VBW 5 MHz Mixer -20 dBm
SWT 5 ms Unit dBm



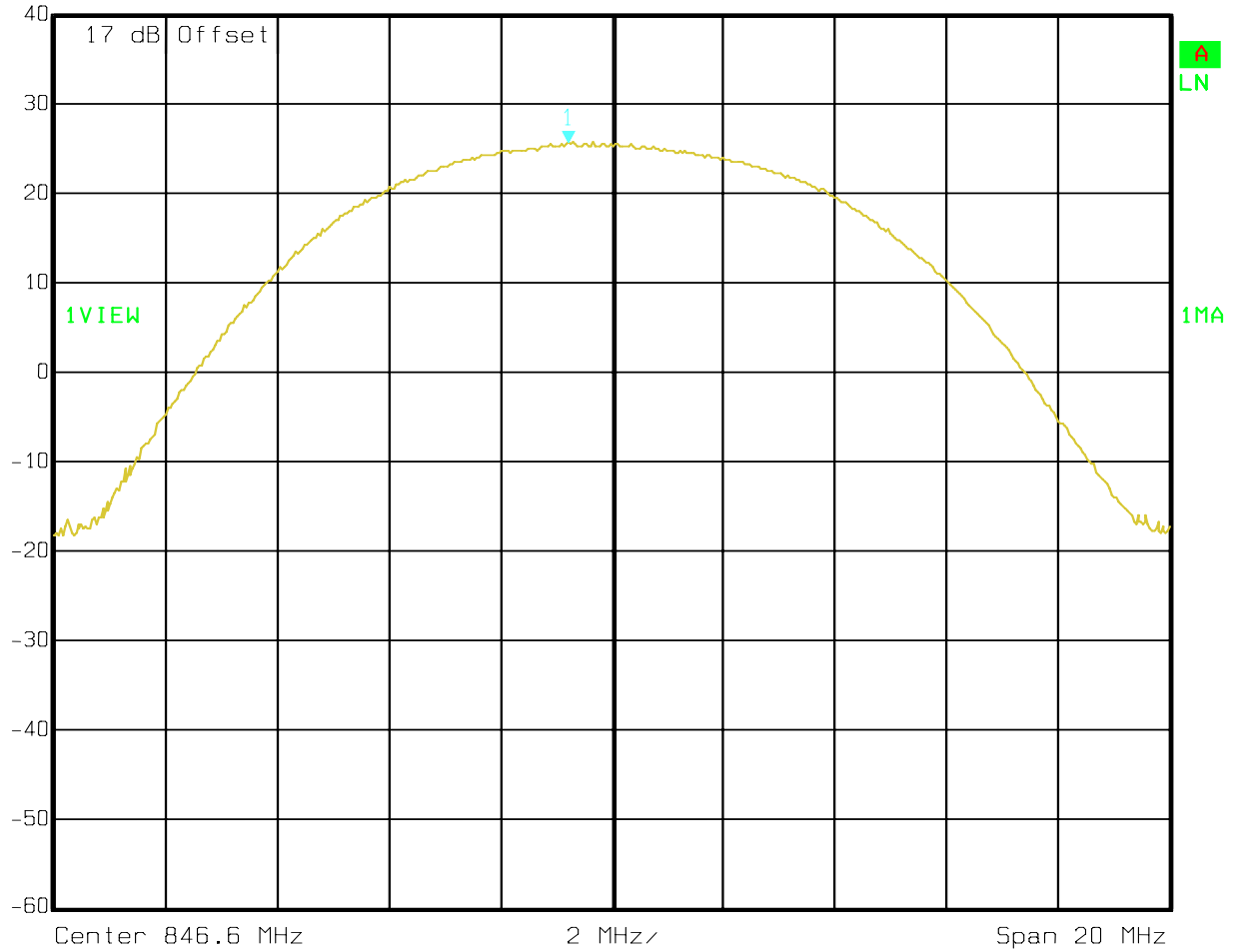
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**RF OUTPUT POWER (GSM-850)
CHANNEL 4233 GPRS FDD5**



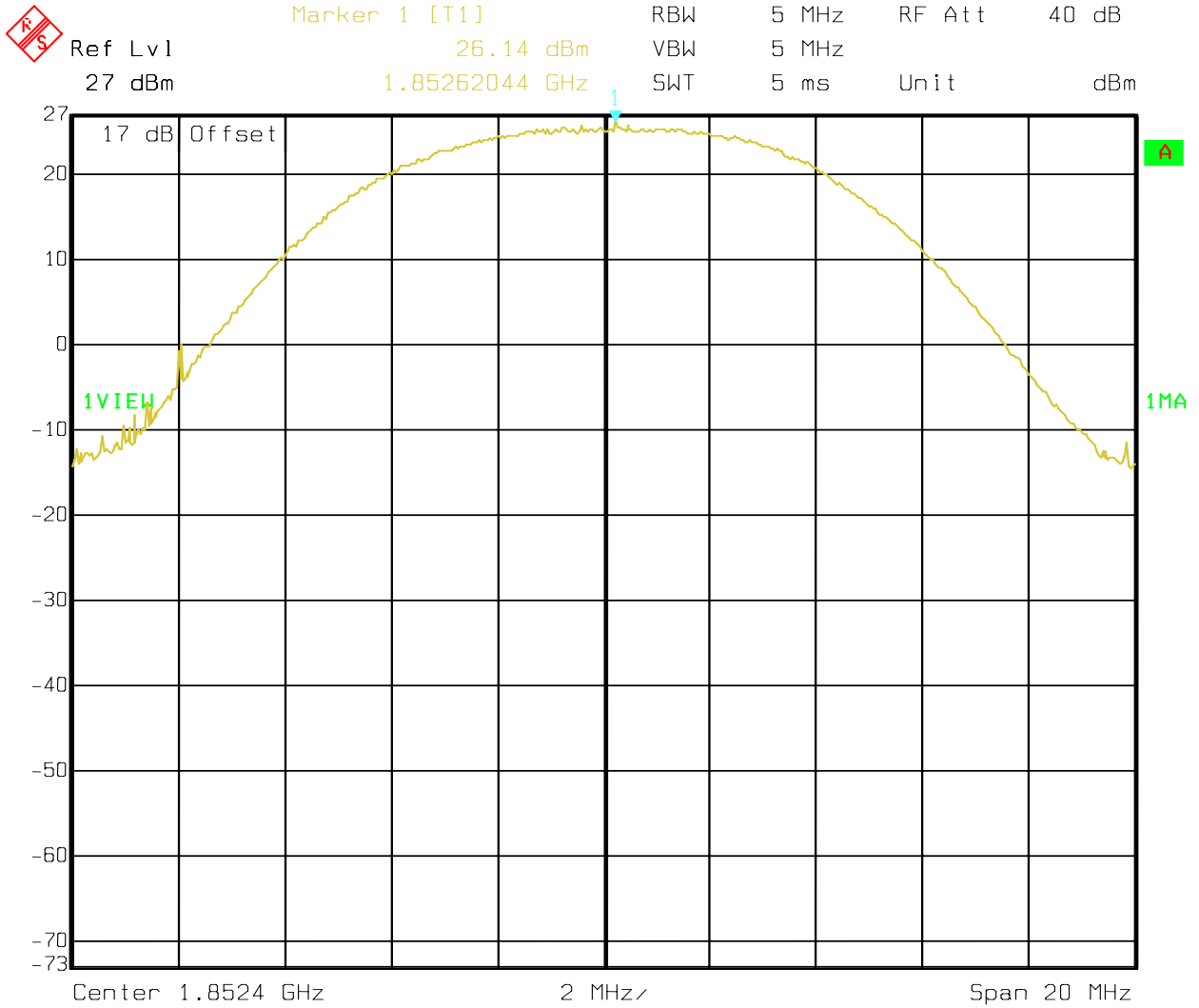
Ref Lvl 40 dBm
Marker 1 [T1] 25.56 dBm
845.81843687 MHz
RBW 5 MHz RF Att 40 dB
VBW 5 MHz Mixer -20 dBm
SWT 5 ms Unit dBm



Date: 26.JUL.2006 10:03:06



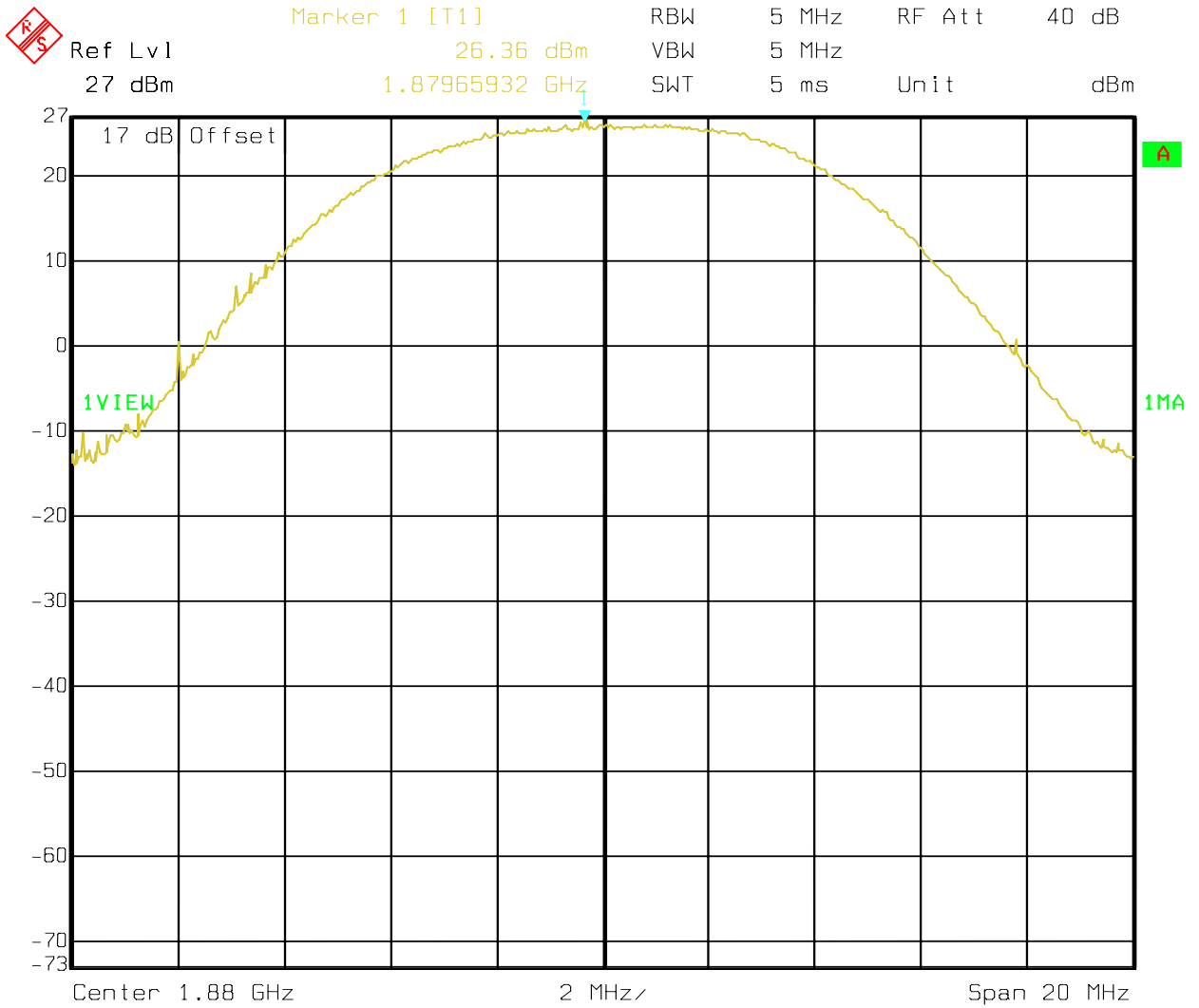
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CHANNEL 9262 GPRS FDD2**



Date: 26.JUL.2006 14:15:18



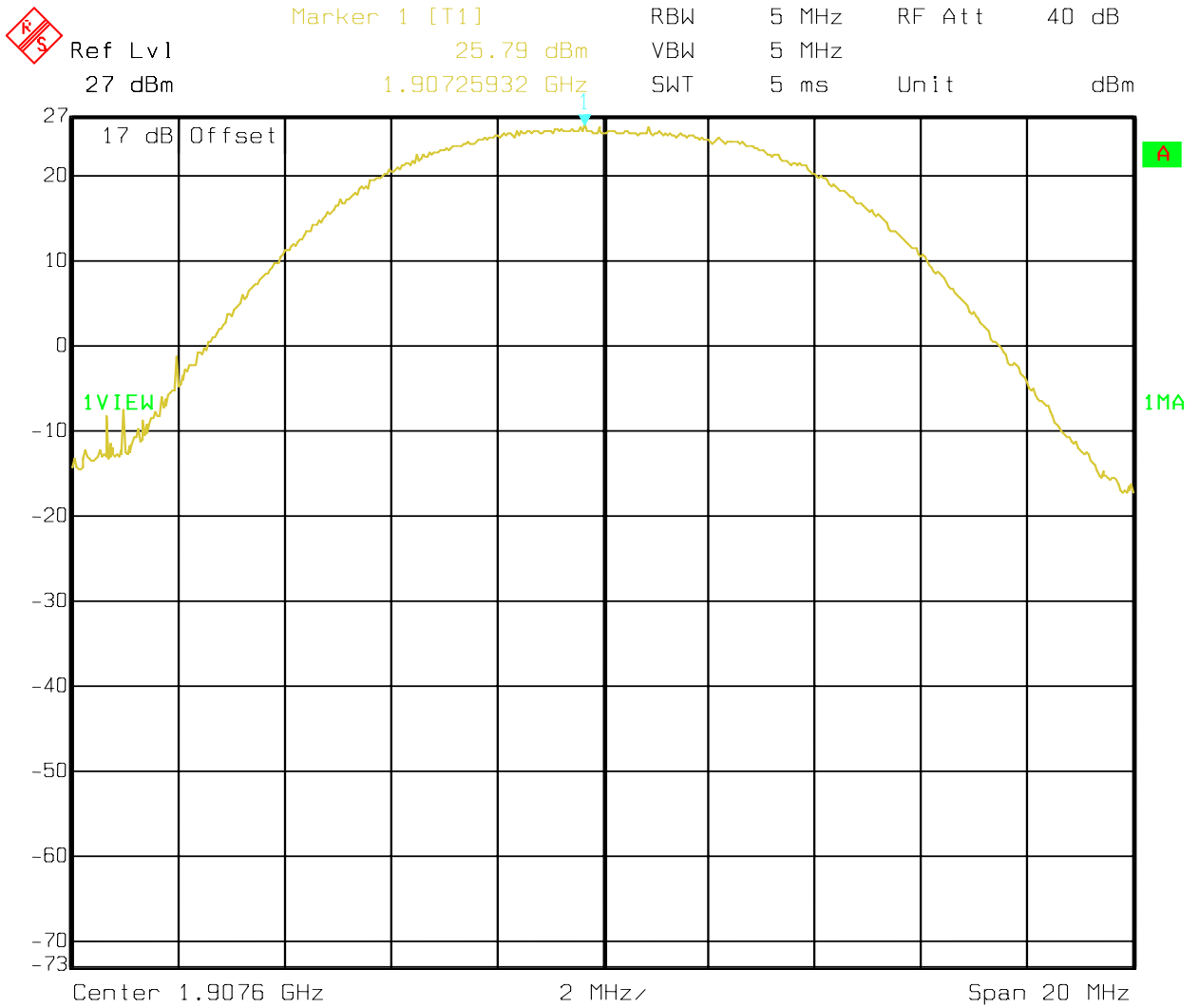
**RF OUTPUT POWER (PCS-1900)
CHANNEL 9400 GPRS FDD2**



Date: 26.JUL.2006 14:19:48



**RF OUTPUT POWER (PCS-1900)
CHANNEL 810 GPRS FDD2**

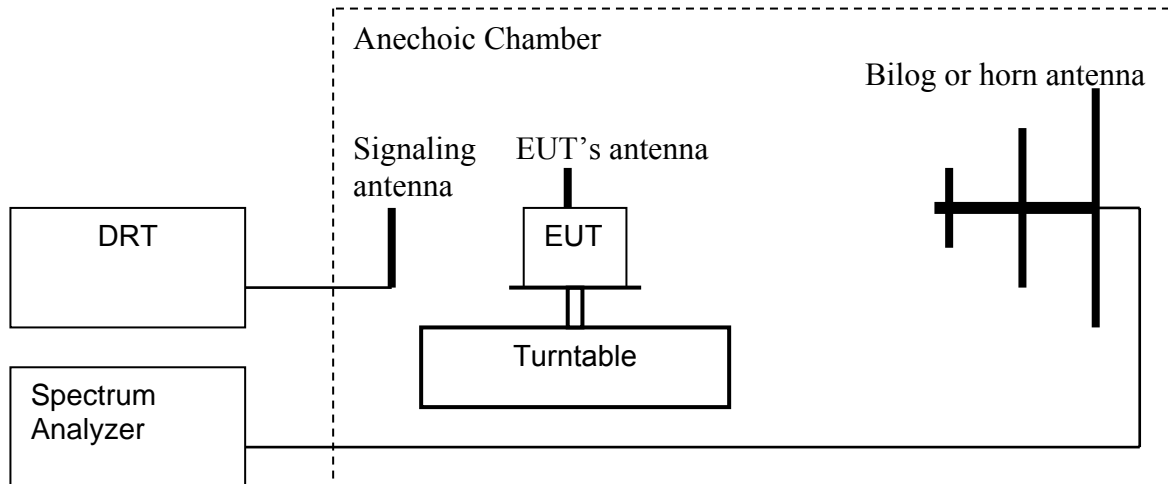


Date: 26.JUL.2006 14:19:08

5.1.8 Radiated Output Power Measurement procedure:

Based on TIA-603C 2004

2.2.17.2 Effective Radiated Power (ERP) or Effective Isotropic Radiated Power (EIRP)



1. Connect the equipment as shown in the above diagram with the EUT's antenna in a vertical orientation.
 2. Adjust the settings of the Digital Radiocommunication Tester (DRT) to set the EUT to its maximum power at the required channel.
 3. Set the spectrum analyzer to the channel frequency. Set the analyzer to measure peak hold with the required settings.
 4. Rotate the EUT 360°. Record the peak level in dBm (**LVL**).
 5. Replace the EUT with a vertically polarized half wave dipole or known gain antenna. The center of the antenna should be at the same location as the center of the EUT's antenna.
 6. Connect the antenna to a signal generator with known output power and record the path loss in dB (**LOSS**). **LOSS** = Generator Output Power (dBm) – Analyzer reading (dBm).
 7. Determine the ERP using the following equation:

$$\mathbf{ERP\ (dBm) = LVL\ (dBm) + LOSS\ (dB)}$$
 8. Determine the EIRP using the following equation:

$$\mathbf{EIRP\ (dBm) = ERP\ (dBm) + 2.14\ (dB)}$$
 9. Measurements are to be performed with the EUT set to the low, middle and high channel of each frequency band. **Spectrum analyzer settings = rbw=vbw=3MHz**
- (note: Steps 5 and 6 above are performed prior to testing and **LOSS** is recorded by test software. Steps 3, 4, 7 and 8 above are performed with test software.)

5.1.9 ERP Results 850 MHz band:

Power Control Level	Burst Peak ERP
5	≤38.45dBm (7W)

Frequency (MHz)	Effective Radiated Power (dBm)	
	GPRS	EGPRS
824.2	28.51	26.96
836.6	29.37	27.52
848.8	29.74	27.83

5.1.10 EIRP Results 1900 MHz band:

Power Control Level	Burst Peak EIRP
0	≤33dBm (2W)

Frequency (MHz)	Effective Isotropic Radiated Power (dBm)	
	GPRS	EGPRS
1850.2	27.39	25.8
1880.0	29.05	27.85
1909.8	27.37	27.04

5.1.11 ERP Results 850 MHz band FDD5:

Power Control Level	Burst Peak ERP
5	≤38.45dBm (7W)

Frequency (MHz)	Effective Radiated Power (dBm)
826.4	21.99
836.6	21.46
846.6	21.4

5.1.12 EIRP Results 1900 MHz band FDD2:

Power Control Level	Burst Peak EIRP
0	≤33dBm (2W)

Frequency (MHz)	Effective Isotropic Radiated Power (dBm)
1852.4	25.02
1880.0	25.27
1907.6	26.47



**EIRP (GSM 850)
CHANNEL 128 GPRS**

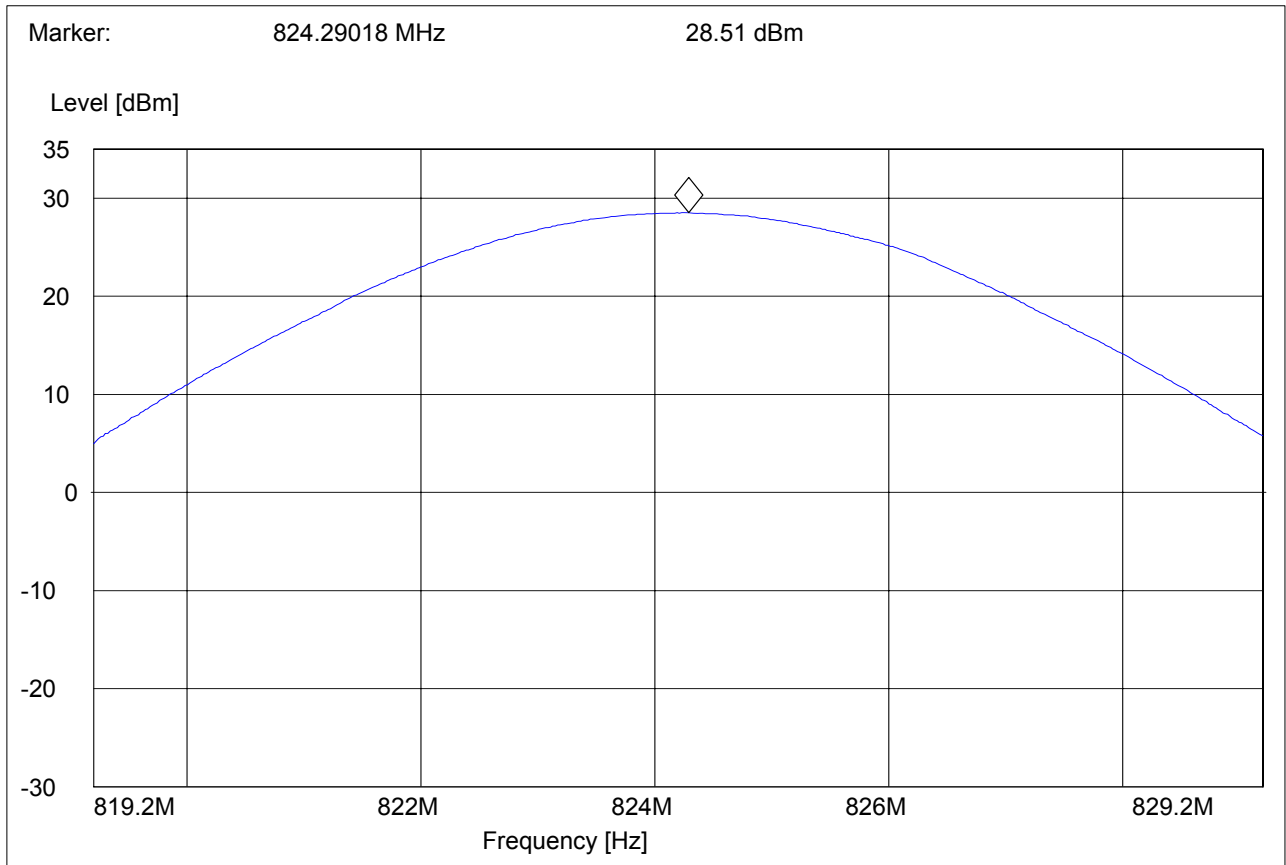
§22.913(a)

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT / Description: NOVAT_010_06002_XU870_EXPRESS
 Customer: NOVATEL
 Operating Mode: 850 GPRS; TABLE 90°
 Antenna: H
 EUT: V
 Test Engineer: SATYA
 Voltage: AC Adapter
 Sweep: EIRP 850 CH 128 H

SWEEP TABLE: "EIRP 850 CH 128 H"

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
819.2 MHz	829.2 MHz	MaxPeak	Coupled	3 MHz	DUMMY-DBM
		MaxPeak			





**EIRP (GSM 850)
CHANNEL 190 GPRS**

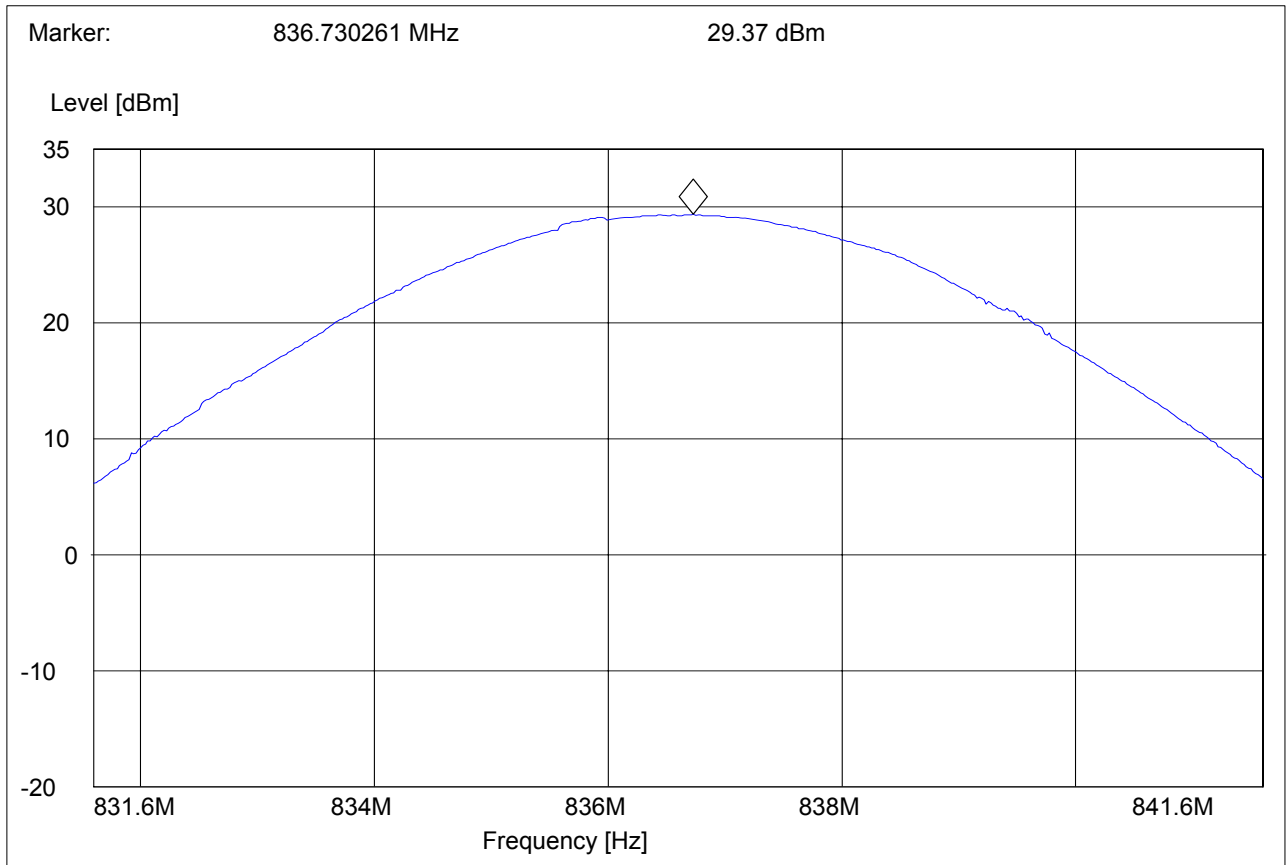
§22.913(a)

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT / Description: NOVAT_010_06002_XU870_EXPRESS
Customer: NOVATEL
Operating Mode: 850 GPRS; TABLE 90°
Antenna: H
EUT: V
Test Engineer: SATYA
Voltage: AC Adapter
Sweep: EIRP 850 CH 190 H

SWEEP TABLE: "EIRP 850 CH 190 H"

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
831.6 MHz	841.6 MHz	MaxPeak	Coupled	3 MHz	DUMMY-DBM
		MaxPeak			





**EIRP (GSM 850)
CHANNEL 251 GPRS**

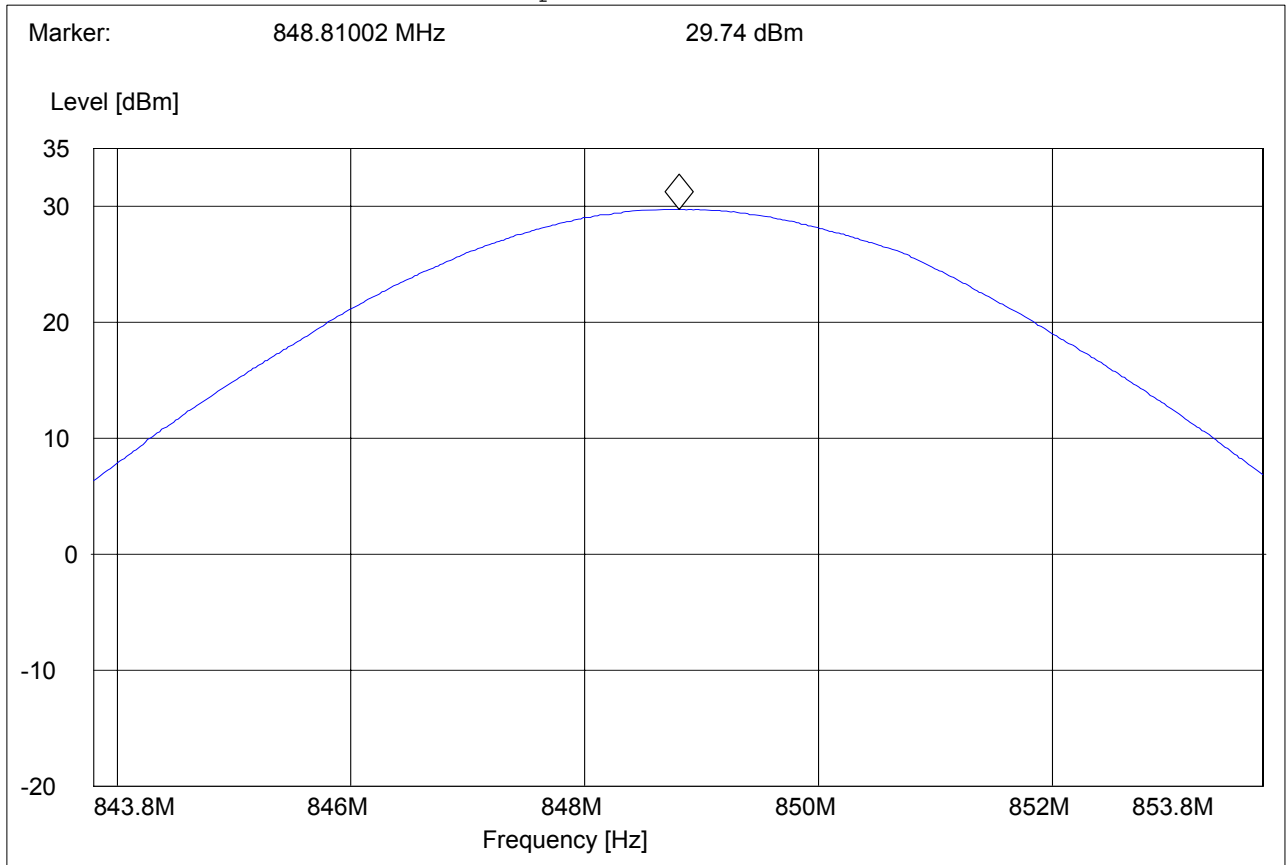
§22.913(a)

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT / Description: NOVAT_010_06002_XU870_EXPRESS
 Customer: NOVATEL
 Operating Mode: 850 GPRS; TABLE 104°
 Antenna: H
 EUT: V
 Test Engineer: SATYA
 Voltage: AC Adapter
 Sweep: EIRP 850 CH 251 H

SWEEP TABLE: "EIRP 850 CH 251 H"

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
843.8 MHz	853.8 MHz	MaxPeak	Coupled	3 MHz	DUMMY-DBM





**EIRP (GSM 850)
CHANNEL 128 EGPRS**

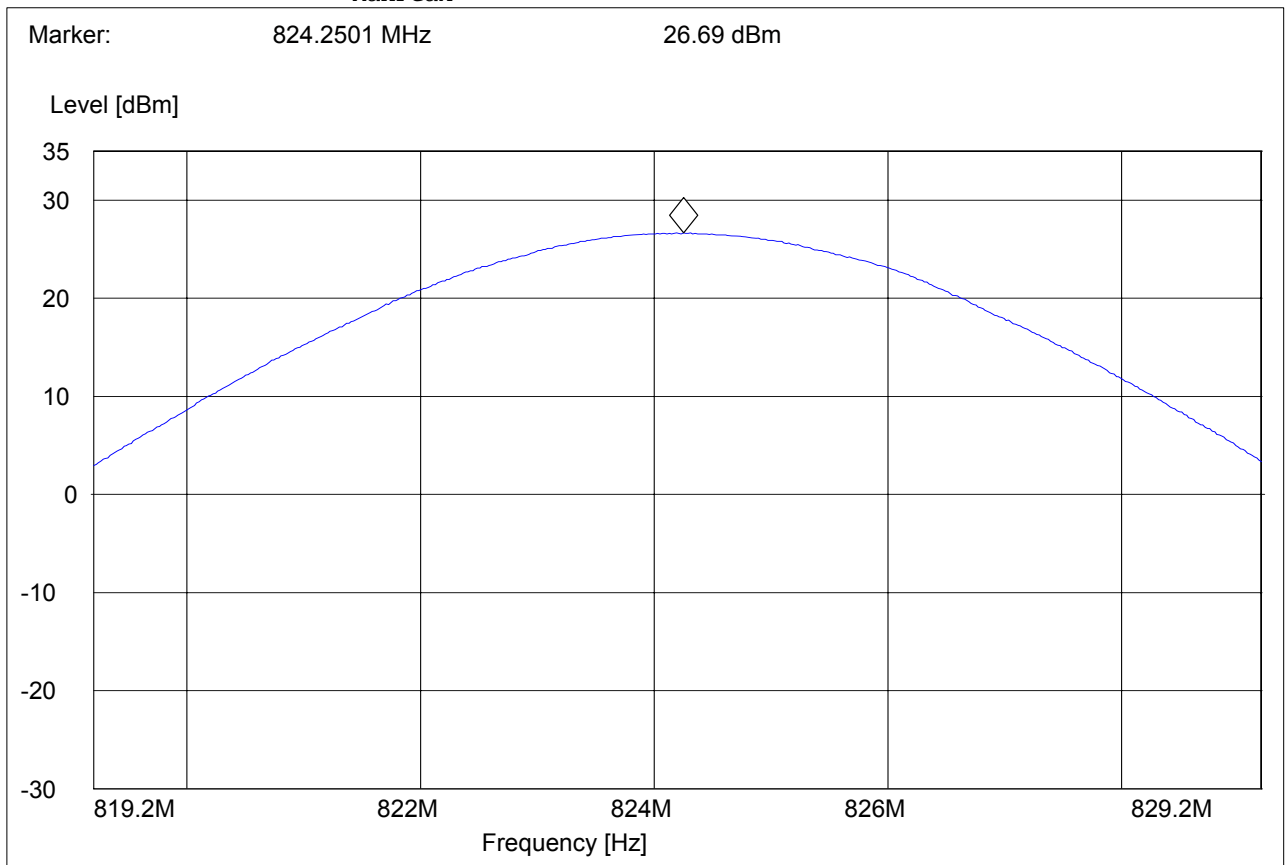
§22.913(a)

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT / Description: NOVAT_010_06002_XU870_EXPRESS
 Customer: NOVATEL
 Operating Mode: 850 EGPRS; TABLE 104°
 Antenna: H
 EUT: V
 Test Engineer: SATYA
 Voltage: AC Adapter
 Sweep: EIRP 850 CH 128 H

SWEEP TABLE: "EIRP 850 CH 128 V"

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
819.2 MHz	829.2 MHz	MaxPeak	Coupled	3 MHz	DUMMY-DBM
		MaxPeak			





**EIRP (GSM 850)
CHANNEL 190 EGPRS**

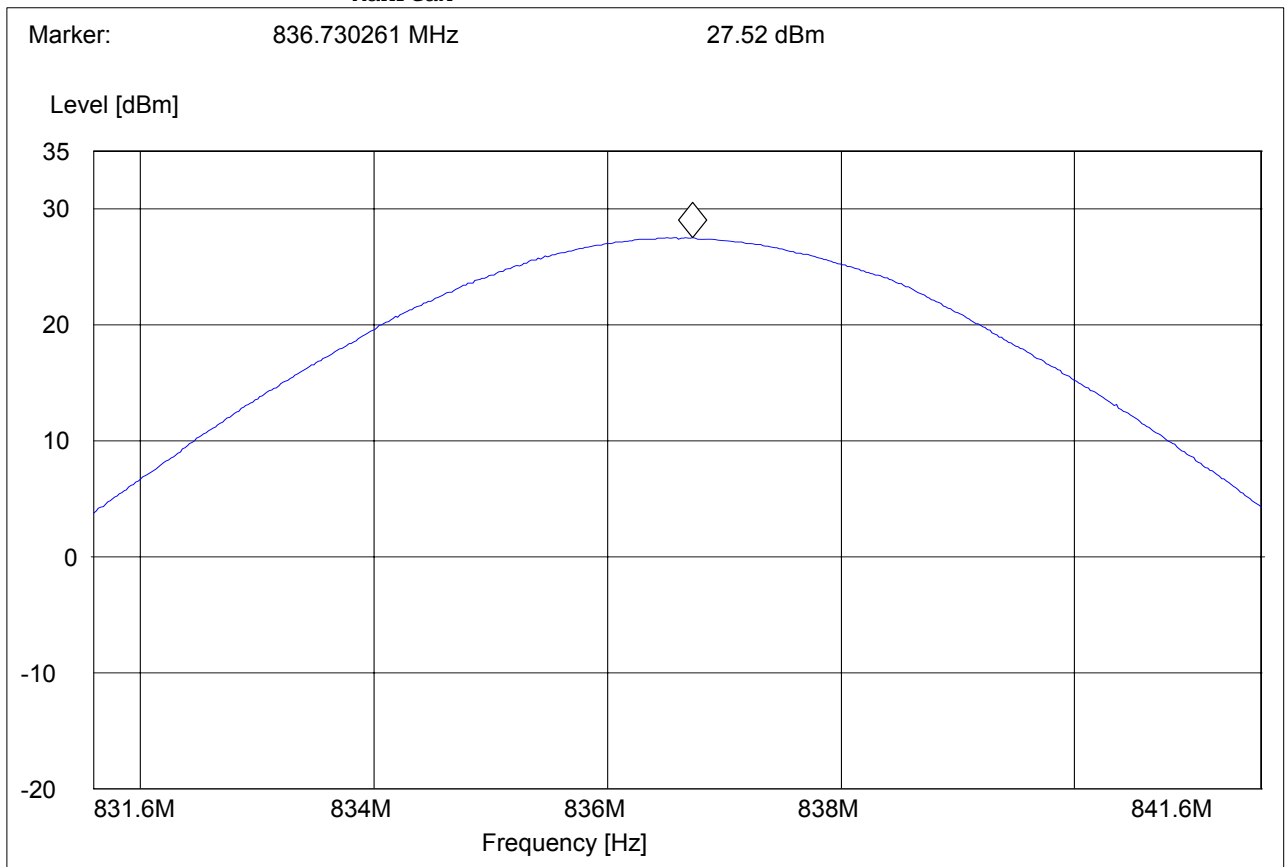
§22.913(a)

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT / Description: NOVAT_010_06002_XU870_EXPRESS
Customer: NOVATEL
Operating Mode: 850 EGPRS; TABLE 104°
Antenna: H
EUT: V
Test Engineer: SATYA
Voltage: AC Adapter
Sweep: EIRP 850 CH 190 H

SWEEP TABLE: "EIRP 850 CH 190 V"

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
831.6 MHz	841.6 MHz	MaxPeak	Coupled	3 MHz	DUMMY-DBM
		MaxPeak			





**EIRP (GSM 850)
CHANNEL 251 EGPRS**

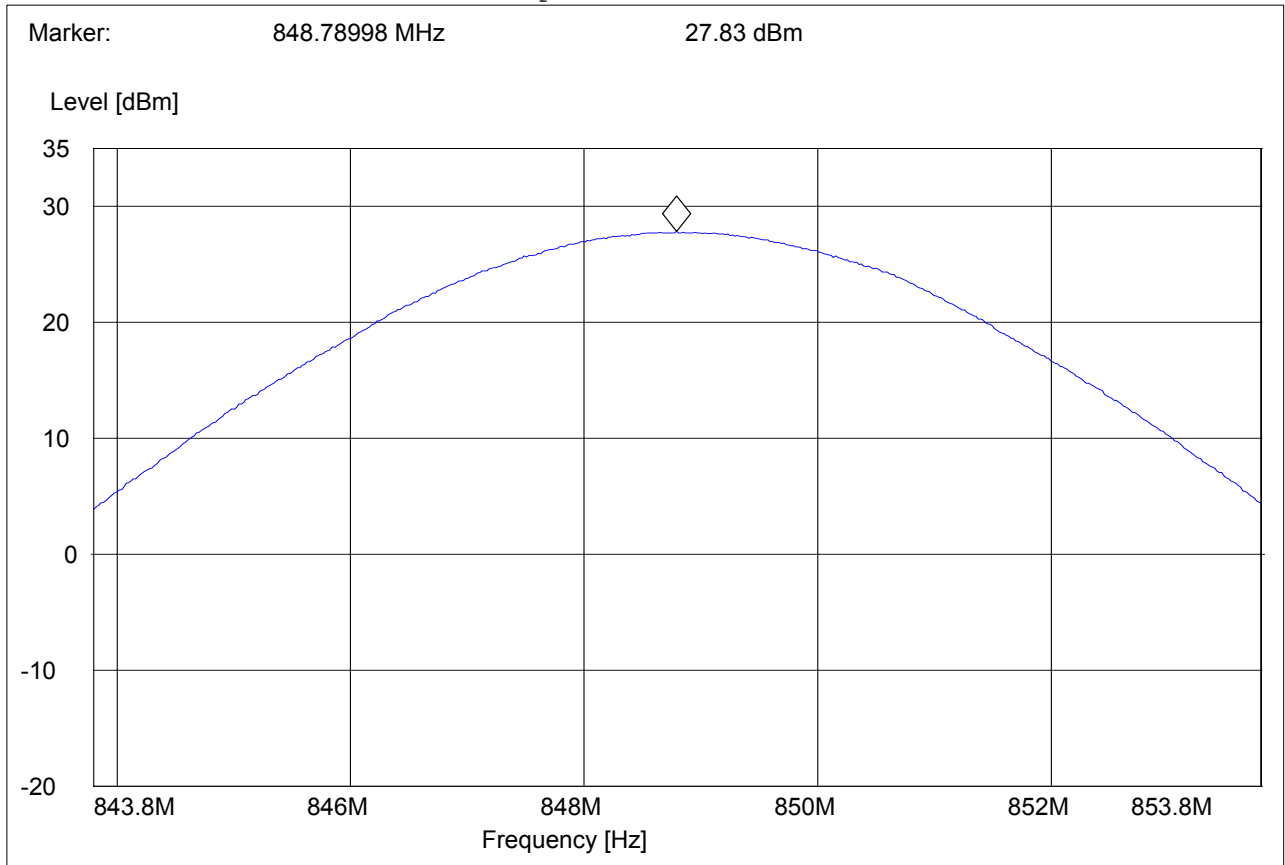
§22.913(a)

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT / Description: NOVAT_010_06002_XU870_EXPRESS
 Customer: NOVATEL
 Operating Mode: 850 EGPRS; TABLE 104°
 Antenna: H
 EUT: V
 Test Engineer: SATYA
 Voltage: AC Adapter
 Sweep: EIRP 850 CH 251 H

SWEEP TABLE: "EIRP 850 CH 251 V"

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
843.8 MHz	853.8 MHz	MaxPeak	Coupled	3 MHz	DUMMY-DBM





**EIRP (PCS-1900)
CHANNEL 512 GPRS**

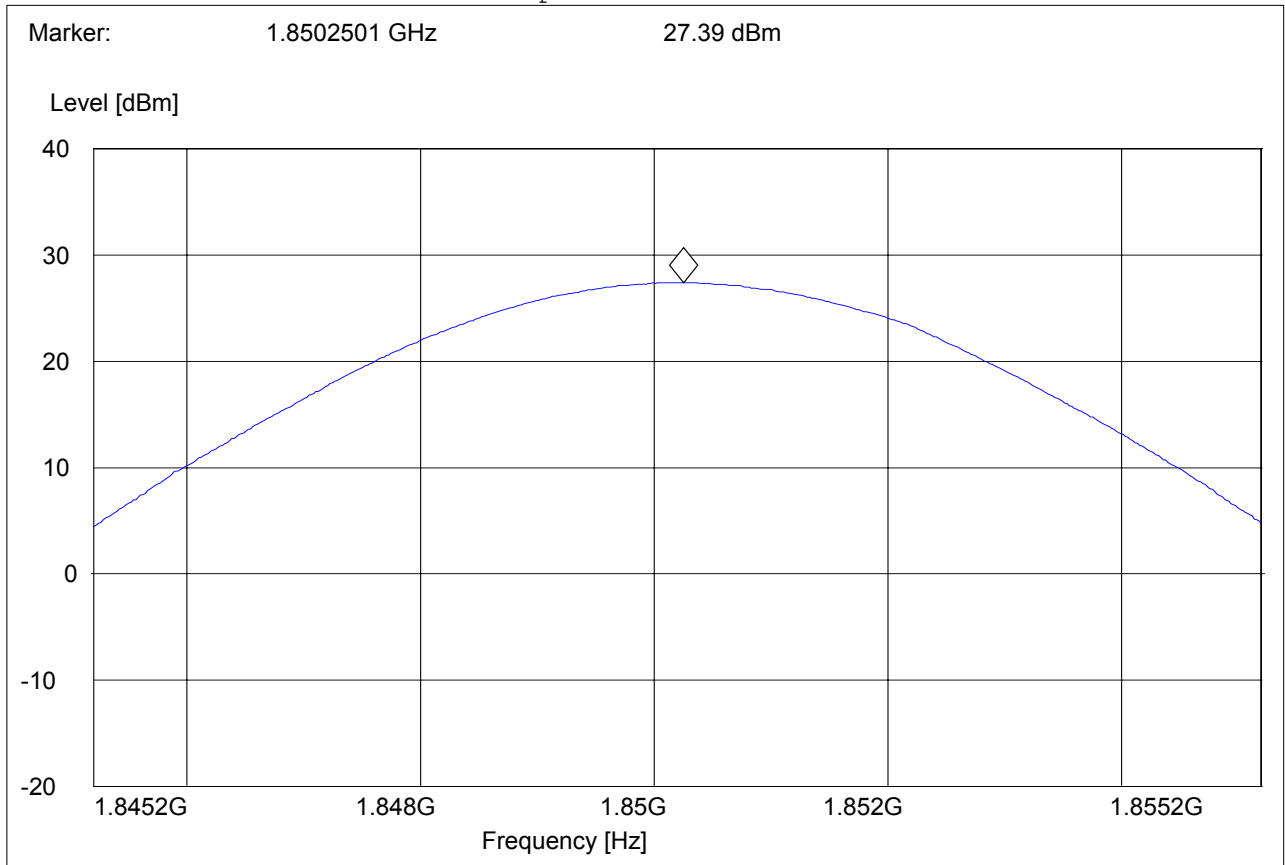
§24.232(b)

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT / Description: NOVAT_010_06002_XU870_EXPRESS
 Customer: NOVATEL
 Operating Mode: FDD24, 1900 GPRS, TABLE 184°
 Antenna: H
 EUT: V
 Test Engineer: PETER
 Voltage: AC Adapter
 Sweep: EIRP 1900 CH512

SWEEP TABLE: "EIRP 1900 CH512"

Short Description:		EIRP PCS 1900 for channel-512			
Start	Stop	Detector	Meas.	IF	Transducer
Frequency	Frequency		Time	Bandw.	
1.8 GHz	1.9 GHz	MaxPeak	Coupled	3 MHz	DUMMY-DBM





**EIRP (PCS-1900)
CHANNEL 661 GPRS**

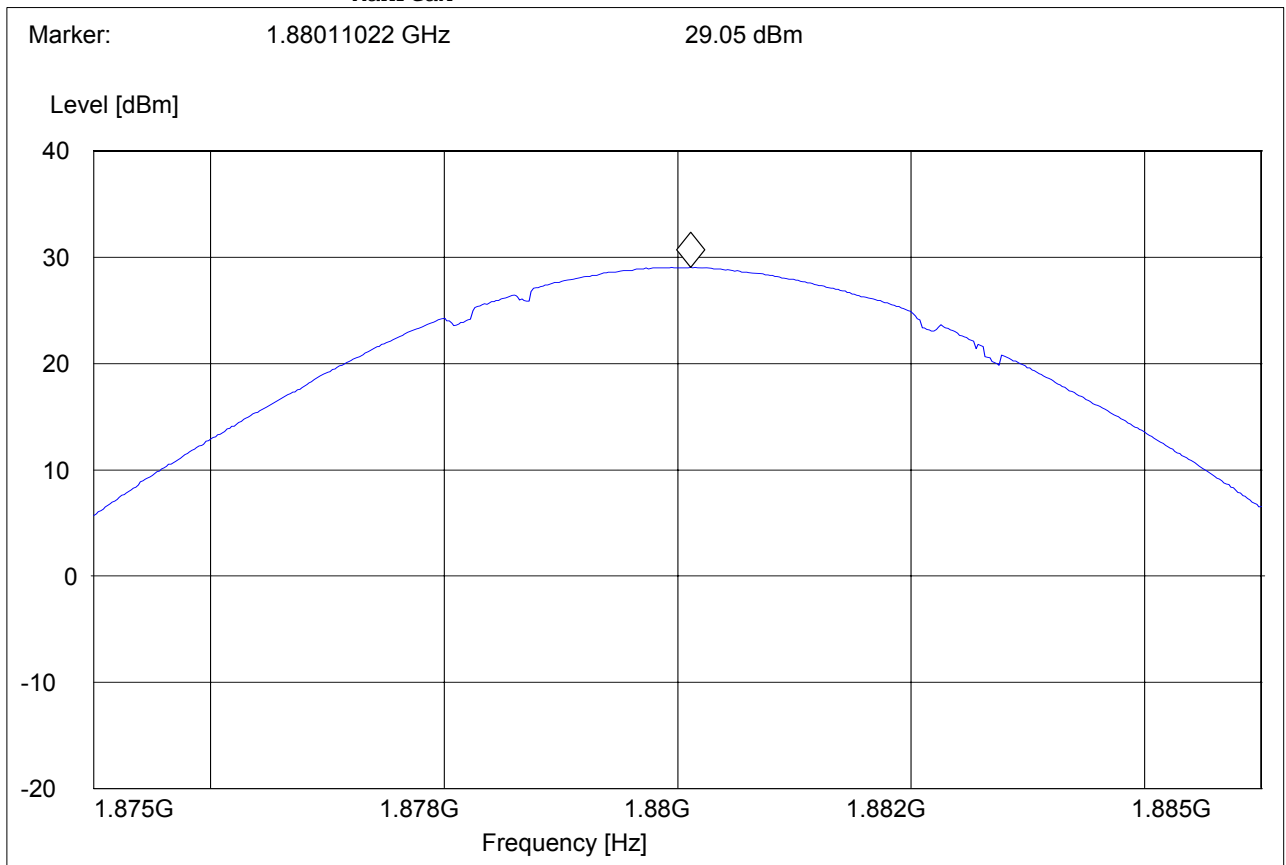
§24.232(b)

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT / Description: NOVAT_010_06002_XU870_EXPRESS
 Customer: NOVATEL
 Operating Mode: FDD24, 1900 GPRS, TABLE 30°
 Antenna: H
 EUT: V
 Test Engineer: PETER
 Voltage: AC Adapter
 Sweep: EIRP 1900 CH661

SWEEP TABLE: "EIRP 1900 CH661"

Short Description:		EIRP PCS 1900 for channel-661			
Start	Stop	Detector	Meas. Time	IF Bandw.	Transducer
1.9 GHz	1.9 GHz	MaxPeak	Coupled	3 MHz	DUMMY-DBM
		MaxPeak			





**EIRP (PCS-1900)
CHANNEL 810 GPRS**

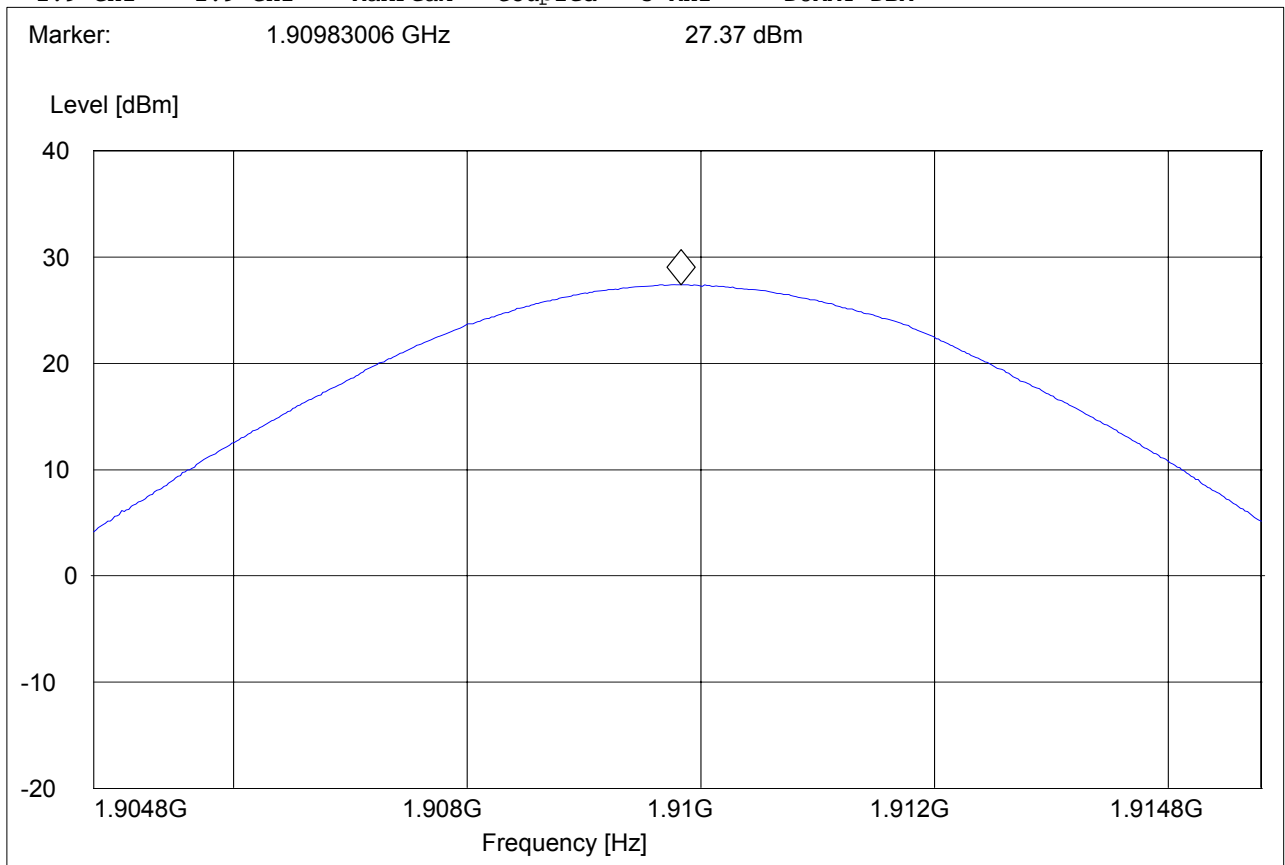
§24.232(b)

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT / Description: NOVAT_010_06002_XU870_EXPRESS
 Customer: NOVATEL
 Operating Mode: FDD24, 1900 GPRS, TABLE 184°
 Antenna: H
 EUT: V
 Test Engineer: PETER
 Voltage: AC Adapter
 Sweep: EIRP 1900 CH810

SWEEP TABLE: "EIRP 1900 CH810"

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
1.9 GHz	1.9 GHz	MaxPeak	Coupled	3 MHz	DUMMY-DBM





**EIRP (PCS-1900)
CHANNEL 512 EGPRS**

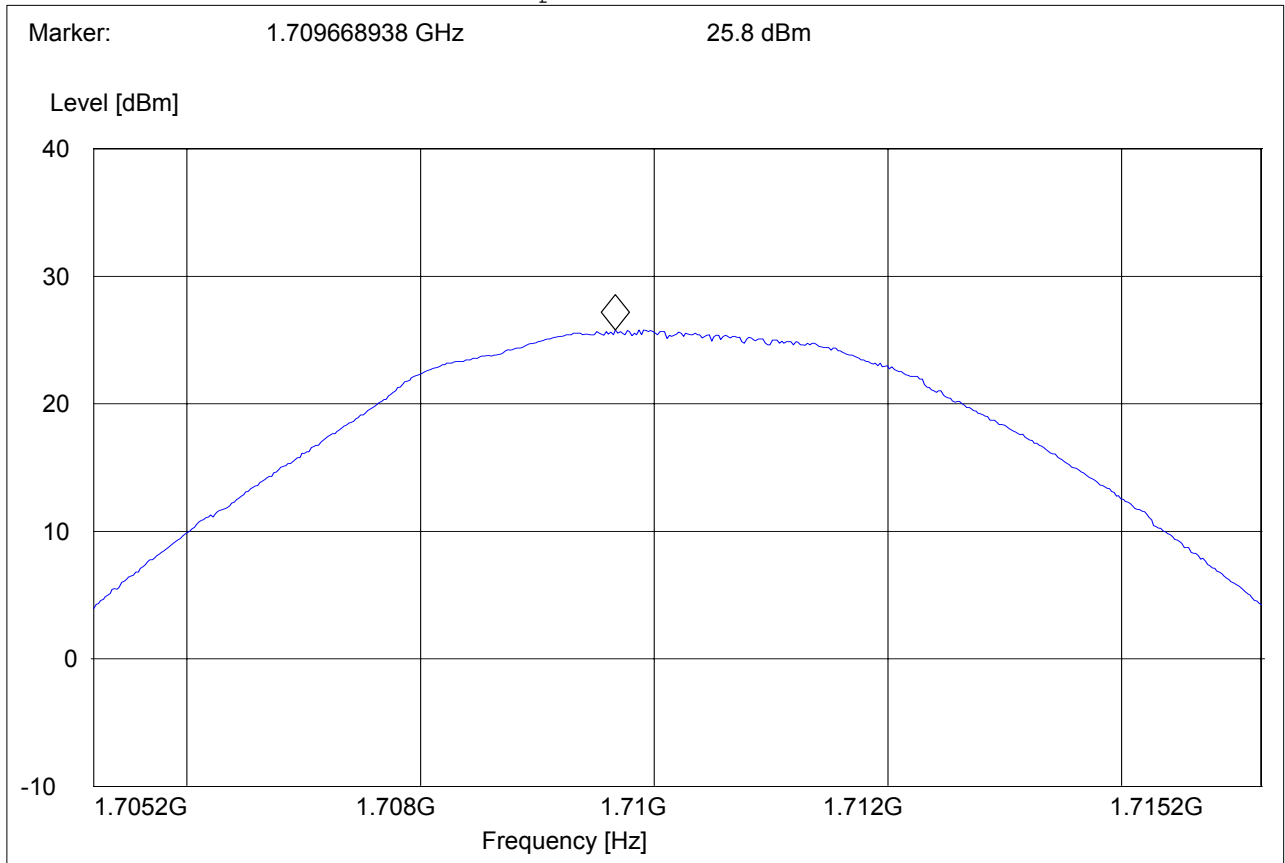
§24.232(b)

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT / Description: XU870
 Customer: NOVATEL
 Test mode: FCC24, 1900 EGPRS, TABLE 190°
 Antenna Polarization: H
 EUT: V
 Test Engineer: PETER
 Voltage: AC ADAPTOR
 Sweep: EIRP 1900 CH512

SWEEP TABLE: "EIRP 1900 CH512"

Short Description:		EIRP PCS 1900 for channel-512			
Start	Stop	Detector	Meas.	IF	Transducer
Frequency	Frequency		Time	Bandw.	
1.8 GHz	1.9 GHz	MaxPeak	Coupled	3 MHz	DUMMY-DBM





**EIRP (PCS-1900)
CHANNEL 661 EGPRS**

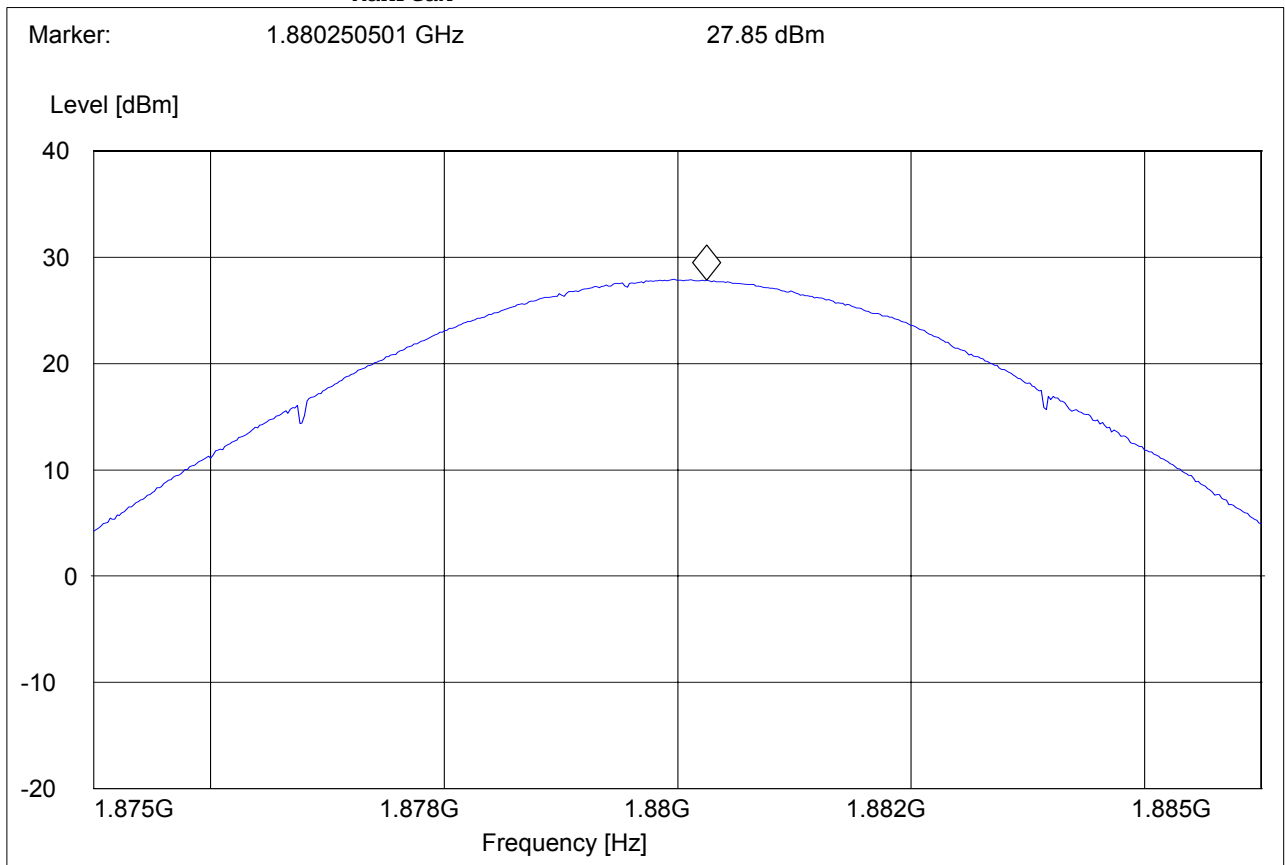
§24.232(b)

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT / Description: NOVAT_010_06002_XU870_EXPRESS
 Customer: NOVATEL
 Operating Mode: FDD24, 1900 EGPRS, TABLE 190°
 Antenna: H
 EUT: V
 Test Engineer: PETER
 Voltage: AC Adapter
 Sweep: EIRP 1900 CH661

SWEEP TABLE: "EIRP 1900 CH661"

Short Description:		EIRP PCS 1900 for channel-661			
Start	Stop	Detector	Meas. Time	IF Bandw.	Transducer
1.9 GHz	1.9 GHz	MaxPeak	Coupled	3 MHz	DUMMY-DBM
		MaxPeak			





**EIRP (PCS-1900)
CHANNEL 810 EGPRS**

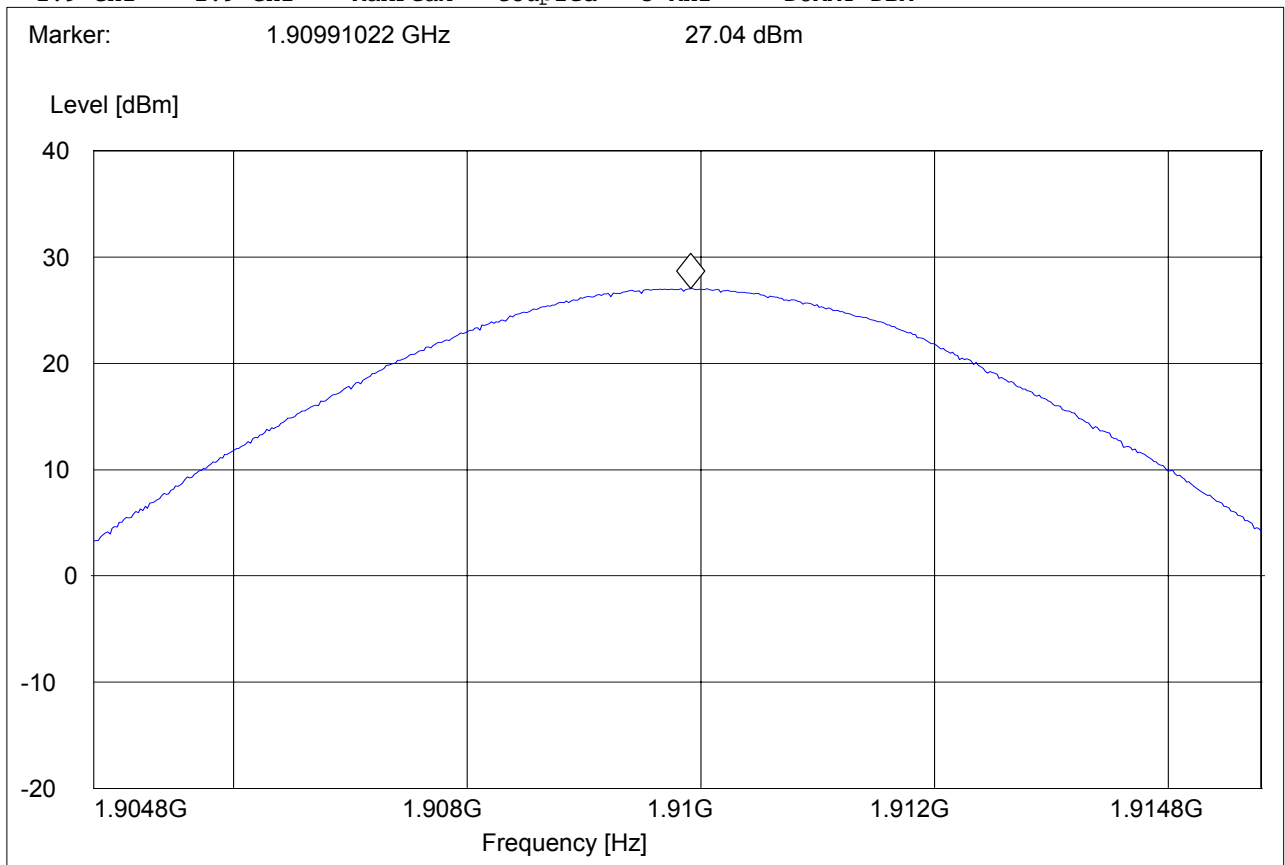
§24.232(b)

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT / Description: NOVAT_010_06002_XU870_EXPRESS
 Customer: NOVATEL
 Operating Mode: FDD24, 1900 EGPRS, TABLE 190°
 Antenna: H
 EUT: V
 Test Engineer: PETER
 Voltage: AC Adapter
 Sweep: EIRP 1900 CH810

SWEEP TABLE: "EIRP 1900 CH810"

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
1.9 GHz	1.9 GHz	MaxPeak	Coupled	3 MHz	DUMMY-DBM





**EIRP (GSM 850)
CHANNEL 4132 FDD5**

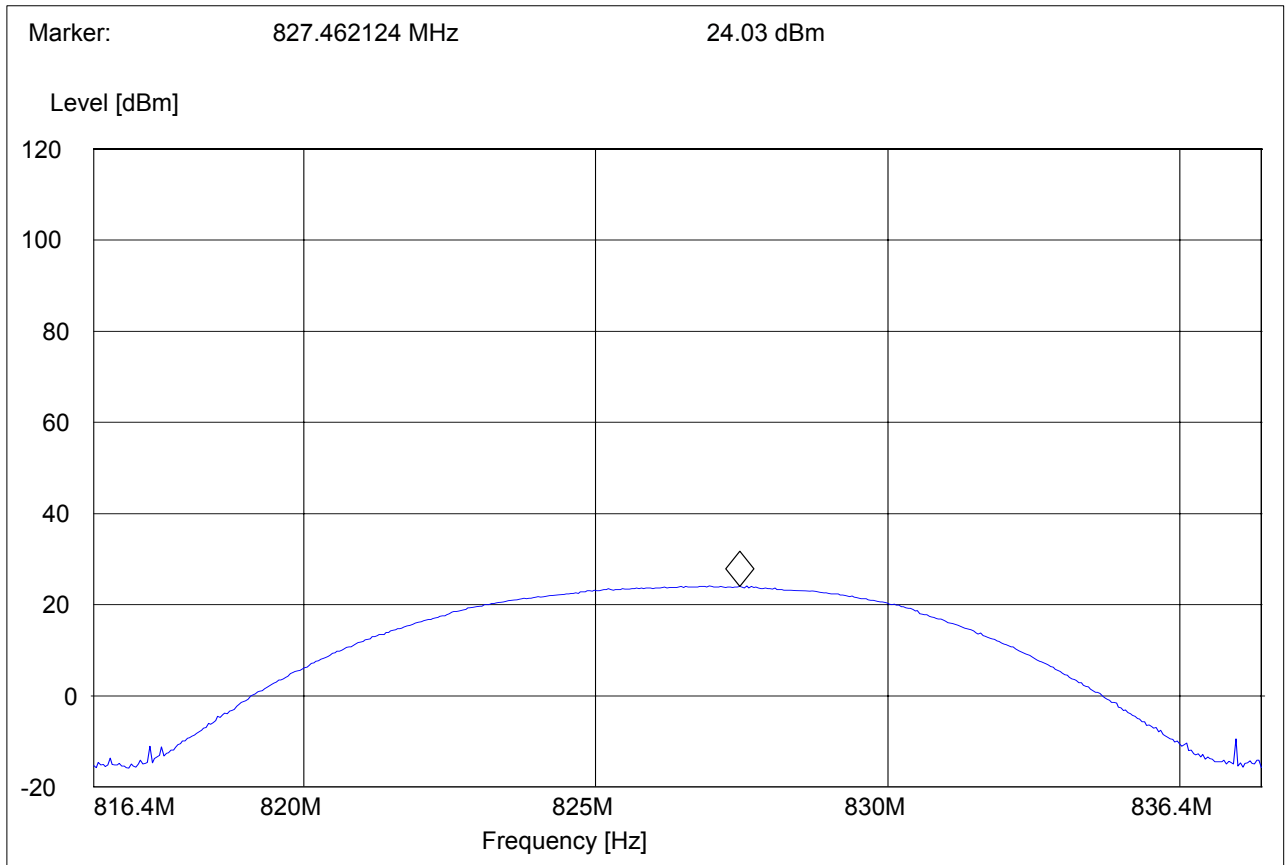
§22.913(a)

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT / Description: XU870
 Customer: Novatel
 Operating Mode: FDD5 CH4132, TABLE 65°
 Antenna: V
 EUT: 30°
 Test Engineer: Peter
 Voltage: AC Adaptor
 Sweep: EIRP 850 CH 4132V

SWEEP TABLE: "EIRP 850 CH 128 V"

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
819.2 MHz	829.2 MHz	MaxPeak	Coupled	3 MHz	DUMMY-DBM
		MaxPeak			





**EIRP (GSM 850)
CHANNEL 4183 FDD5**

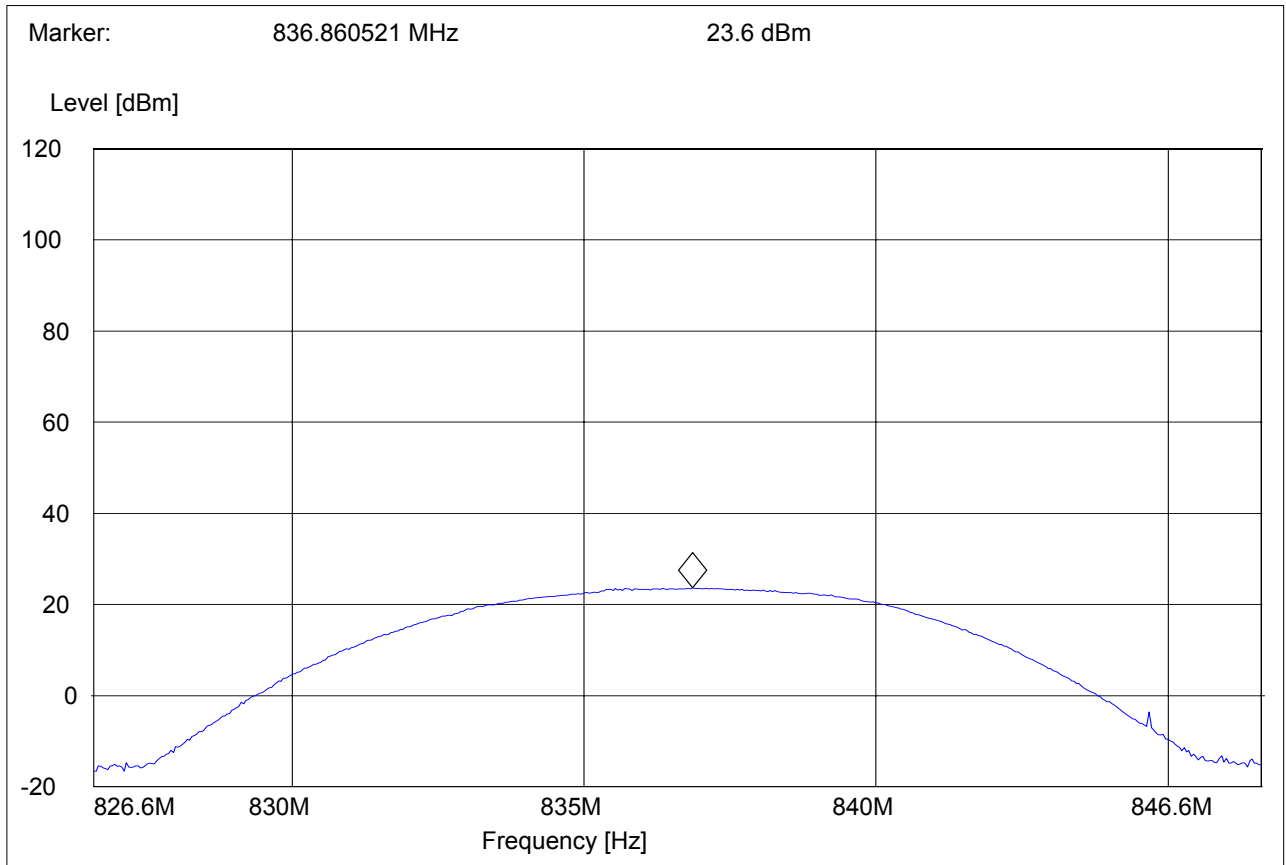
§22.913(a)

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT / Description: XU870
 Customer: Novatel
 Operating Mode: FDD5 CH4183, TABLE 65°
 Antenna: V
 EUT: 30°
 Test Engineer: Peter
 Voltage: AC Adaptor
 Sweep: EIRP 850 CH 4183V

SWEEP TABLE: "EIRP 850 CH 190 V"

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
831.6 MHz	841.6 MHz	MaxPeak	Coupled	3 MHz	DUMMY-DBM
		MaxPeak			





**EIRP (GSM 850)
CHANNEL 4233 FDD5**

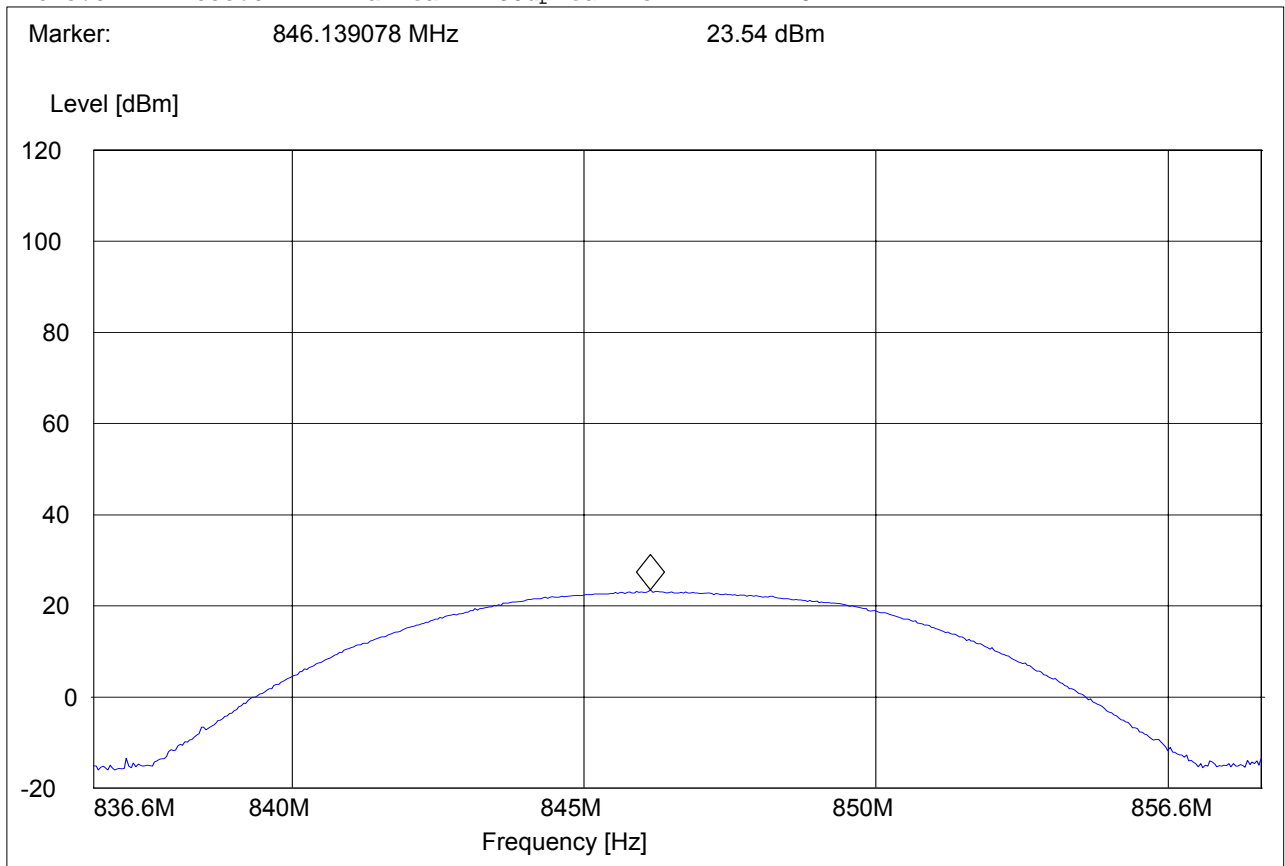
§22.913(a)

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT / Description: XU870
 Customer: Novatel
 Operating Mode: FDD5 CH4233, TABLE 65°
 Antenna: V
 EUT: 30°
 Test Engineer: Peter
 Voltage: AC Adaptor
 Sweep: EIRP 850 CH 4233V

SWEEP TABLE: "EIRP 850 CH 251 V"

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
843.8 MHz	853.8 MHz	MaxPeak	Coupled	3 MHz	DUMMY-DBM





**EIRP (PCS-1900)
CHANNEL 9262 FDD2**

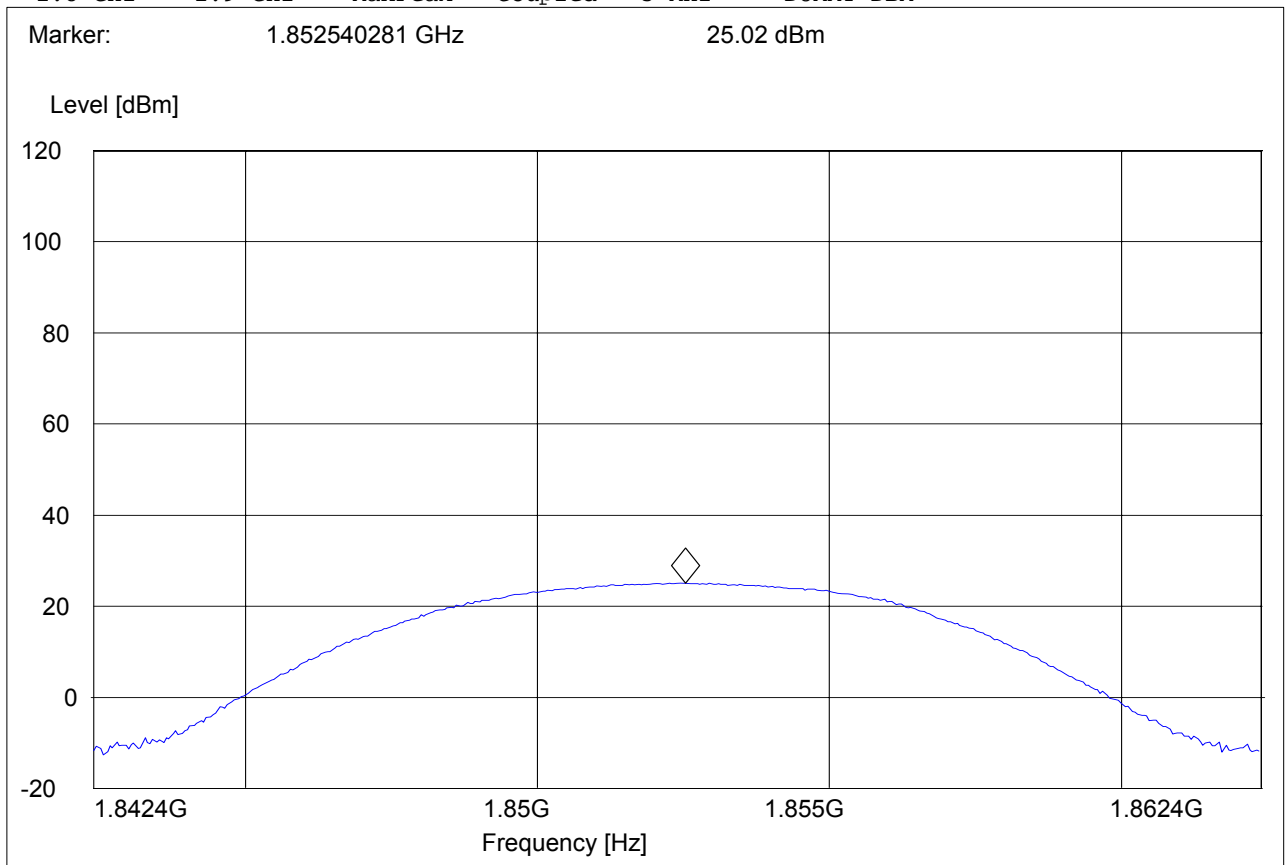
§24.232(b)

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT / Description: XU870
 Customer: Novatel
 Operating Mode: FDD2 CH9262, TABLE 198°
 Antenna: H
 EUT: 30°
 Test Engineer: Peter
 Voltage: AC Adaptor
 Sweep: EIRP 1900 CH 9262

SWEEP TABLE: "EIRP 1900 CH512"

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
1.8 GHz	1.9 GHz	MaxPeak	Coupled	3 MHz	DUMMY-DBM





**EIRP (PCS-1900)
CHANNEL 9400 FDD2**

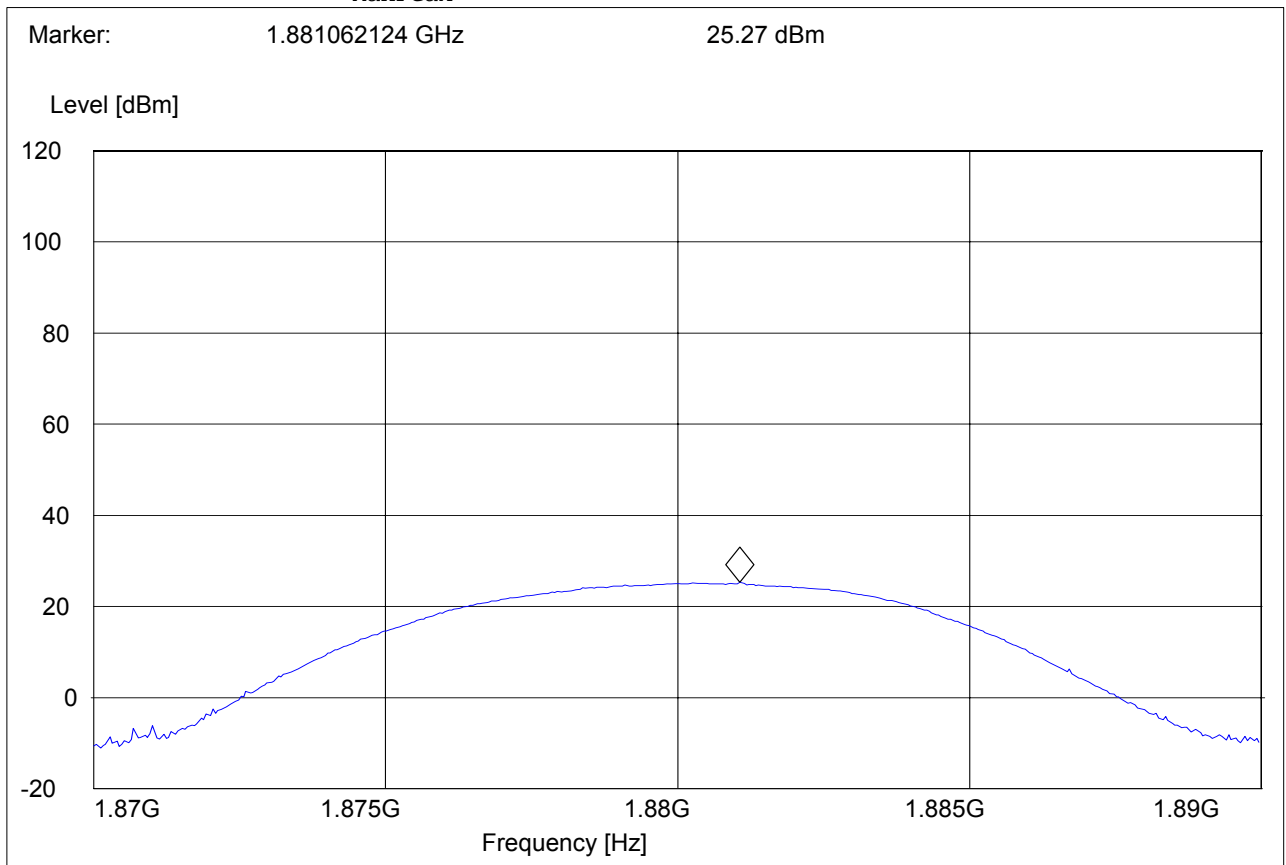
§24.232(b)

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT / Description: XU870
 Customer: Novatel
 Operating Mode: FDD2 CH9400, TABLE 198°
 Antenna: H
 EUT: 30°
 Test Engineer: Peter
 Voltage: AC Adaptor
 Sweep: EIRP 1900 CH 9400

SWEEP TABLE: "EIRP 1900 CH9400"

Short Description:		EIRP PCS 1900 for channel-9400				
Start	Stop	Detector	Meas. Time	IF Bandw.	Transducer	
1.9 GHz	1.9 GHz	MaxPeak	Coupled	3 MHz	DUMMY-DBM	
		MaxPeak				





**EIRP (PCS-1900)
CHANNEL 810 FDD2**

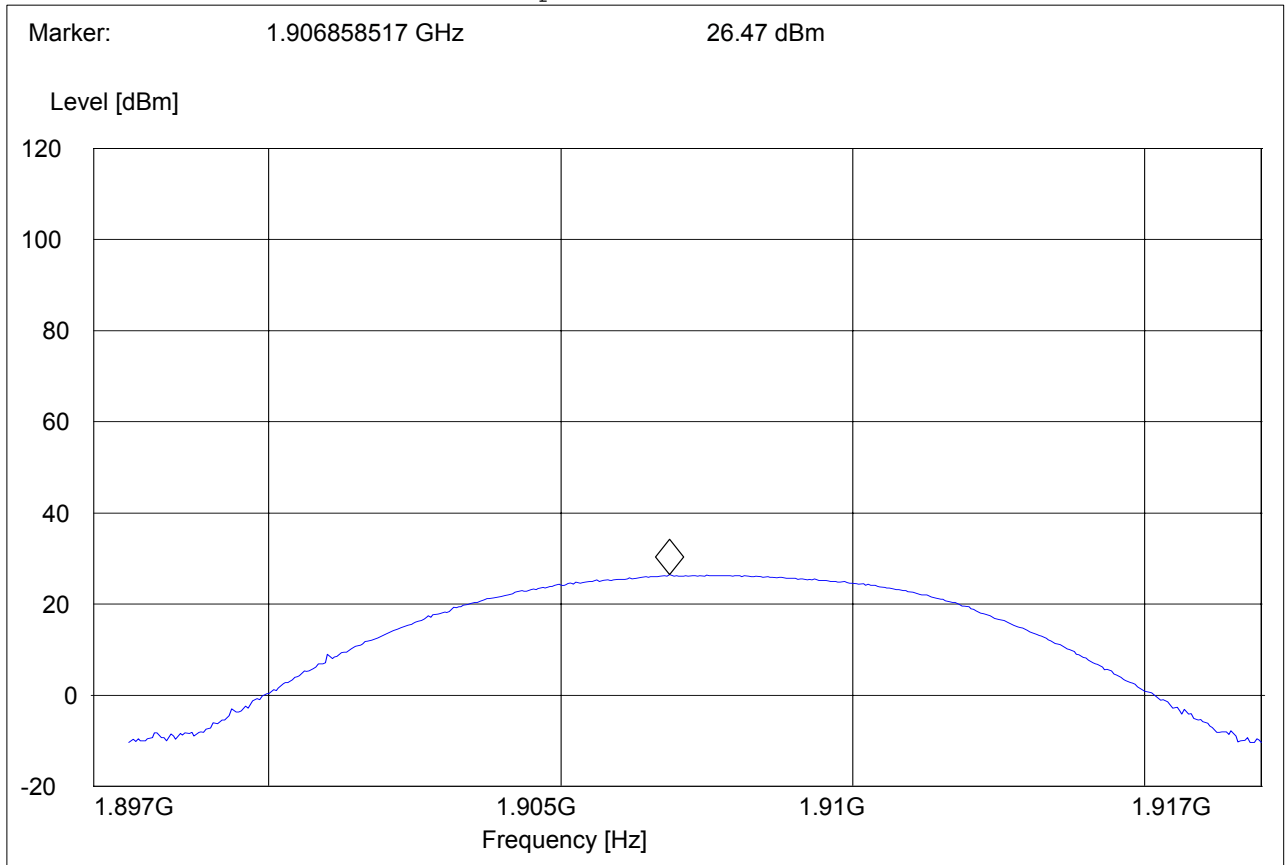
§24.232(b)

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT / Description: XU870
Customer: Novatel
Operating Mode: FDD2 CH9538, TABLE 198°
Antenna: H
EUT: 30°
Test Engineer: Peter
Voltage: AC Adaptor
Sweep: EIRP 1900 CH 9538

SWEEP TABLE: "EIRP 1900 CH810"

Short Description:		EIRP PCS 1900 for channel-810			
Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
1.9 GHz	1.9 GHz	MaxPeak	Coupled	3 MHz	DUMMY-DBM



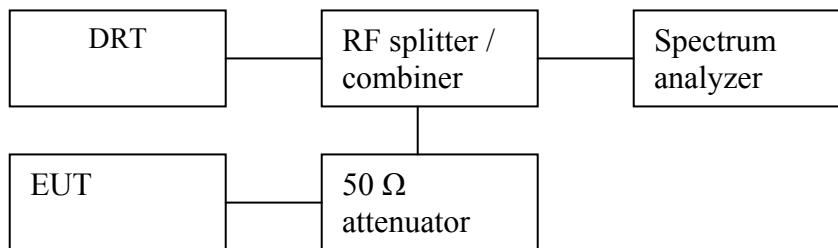
5.2 Occupied Bandwidth/Emission Bandwidth

5.2.1 FCC 2.1049 Measurements required: Occupied bandwidth

The occupied bandwidth, that is the frequency bandwidth such that below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission shall be measured under the following conditions as applicable.

(h) Transmitters employing digital modulation techniques-when modulated by an input signal such that its amplitude and symbol rate represent the maximum rated conditions under which the equipment will be operated.

5.2.2 Occupied / emission bandwidth measurement procedure:



1. Connect the equipment as shown in the above diagram.
2. Adjust the settings of the Digital Radiocommunication Tester (DRT) to set the EUT to its maximum power at the required channel.
3. Set the spectrum analyzer to measure the 99% (-20 dB) occupied bandwidth. Record the value.
4. Set the spectrum analyzer to measure the 99.5% (-26 dB) emission bandwidth. Record the value.
5. Measurements are to be performed with the EUT set to the low, middle and high channel of each frequency band.

5.2.3 Occupied / Emission bandwidth results 850 MHz band:

Frequency (MHz)	Occupied B/W -20 dB (KHz)		Emission B/W -26 dB (KHz)	
	GPRS	E-GPRS	GPRS	E-GPRS
824.2	256.5	240.5	292.6	316.6
836.6	262.5	240.5	302.6	320.6
848.8	278.6	244.5	316.6	310.6

5.2.4 Occupied / Emission bandwidth results 850 MHz band:FDD 5

Frequency (MHz)	Occupied B/W -20 dB (KHz)	Emission B/W -26 dB (KHz)
826.4	4569	4669
836.6	4589	4649
846.6	4549	4649

5.2.5 Occupied / Emission bandwidth results 1900 MHz band:

Frequency (MHz)	Occupied B/W -20 dB (KHz)		Emission B/W -26 dB (KHz)	
	GPRS	E-GPRS	GPRS	E-GPRS
1850.2	260.5	244.5	314.6	318.6
1880.0	256.5	244.5	316.6	318.6
1909.8	258.5	242.5	318.6	316.6

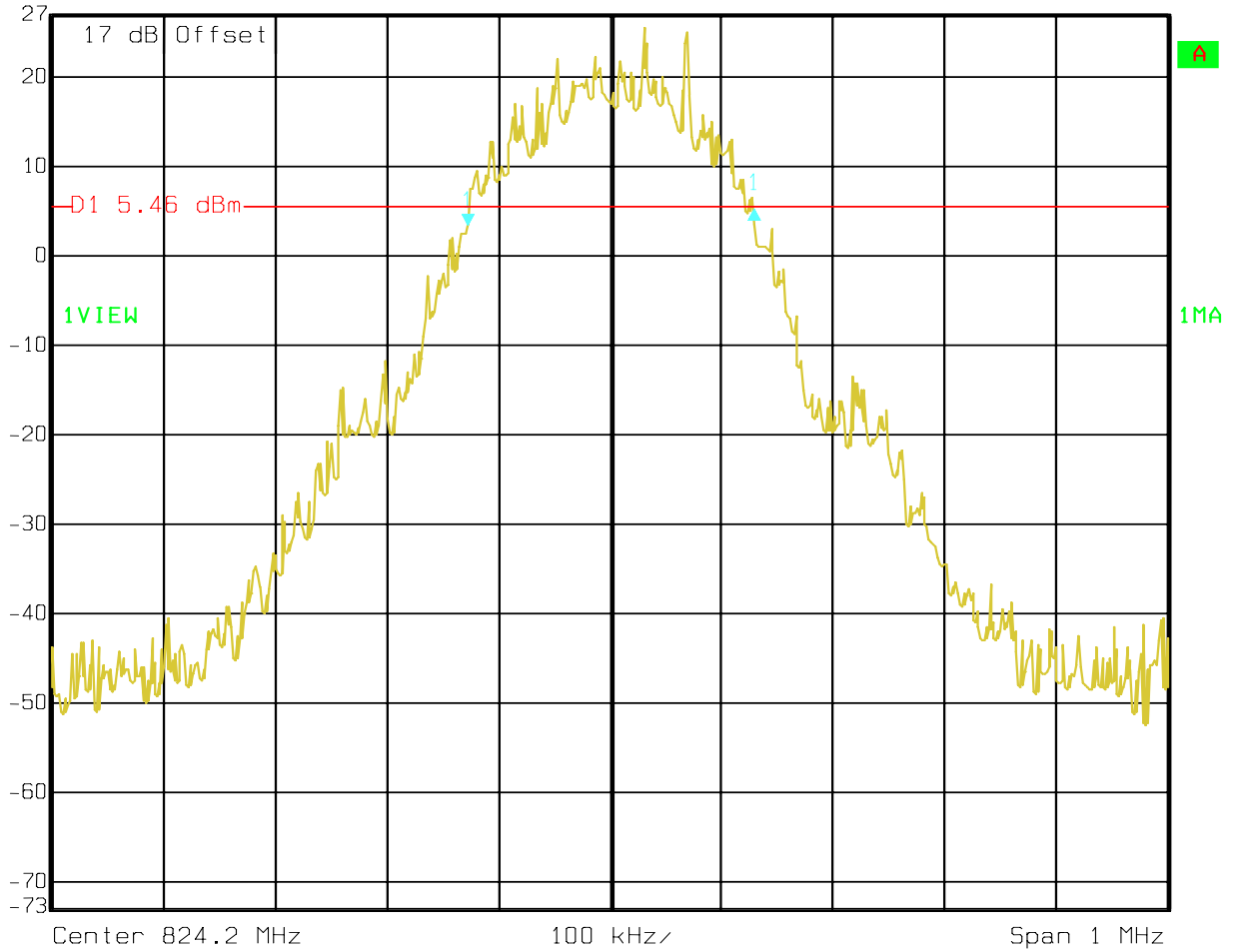
5.2.6 Occupied / Emission bandwidth results 1900 MHz band: FDD 2

Frequency (MHz)	Occupied B/W -20 dB (KHz)	Emission B/W -26 dB (KHz)
1852.4	4529	4629
1880.0	4529	4629
1907.6	4509	4629



**-20dB (GSM-850)
CHANNEL 128 GPRS**

 Delta 1 [T1] RBW 3 kHz RF Att 40 dB
Ref Lvl 1.98 dB VBW 3 kHz
27 dBm 256.51302605 kHz SWT 280 ms Unit dBm



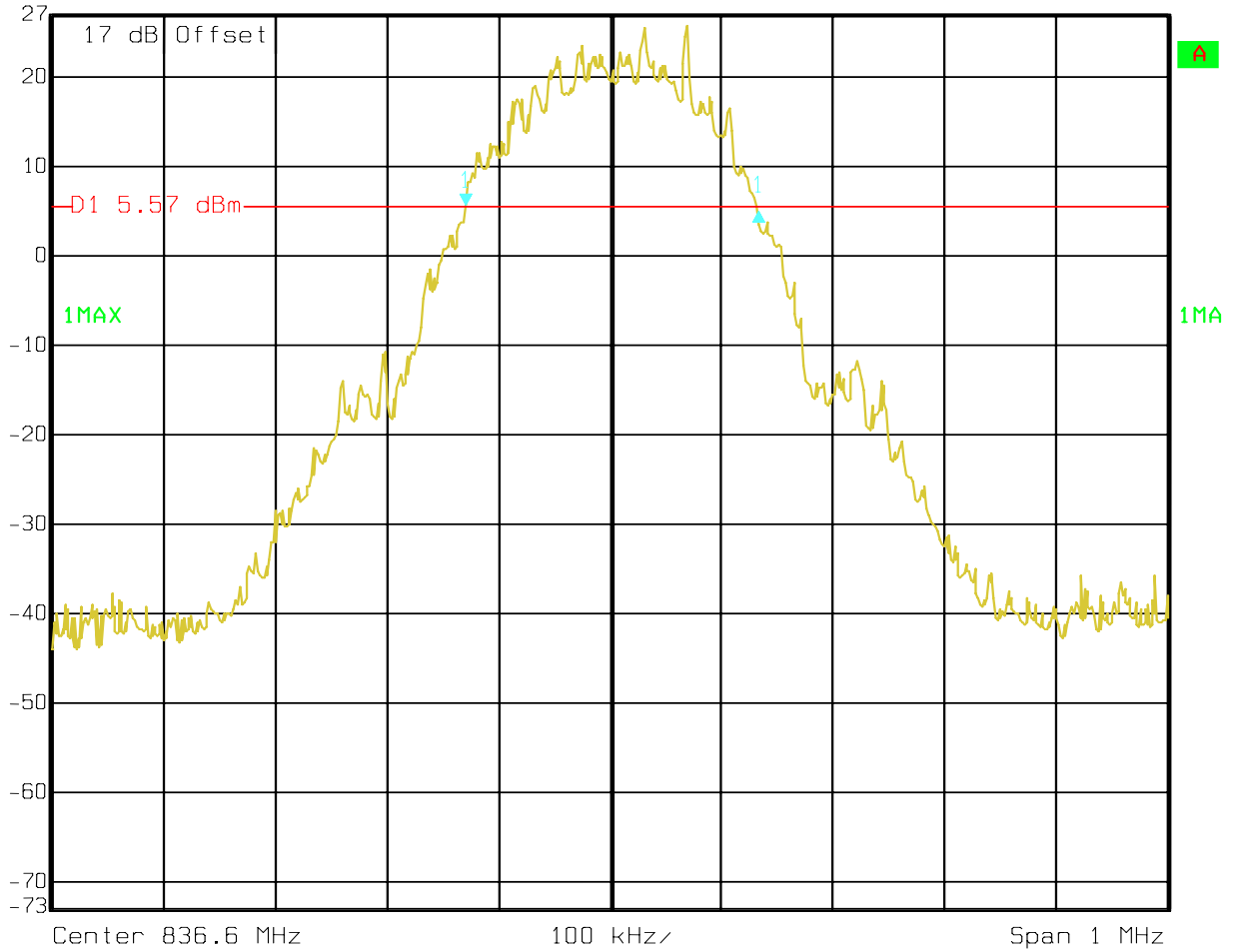
Date: 11.JUL.2006 10:52:57



**-20dB (GSM-850)
CHANNEL 190 GPRS**



Delta 1 [T1] RBW 3 kHz RF Att 40 dB
Ref Lvl -0.59 dB VBW 3 kHz
27 dBm 262.52505010 kHz SWT 280 ms Unit dBm

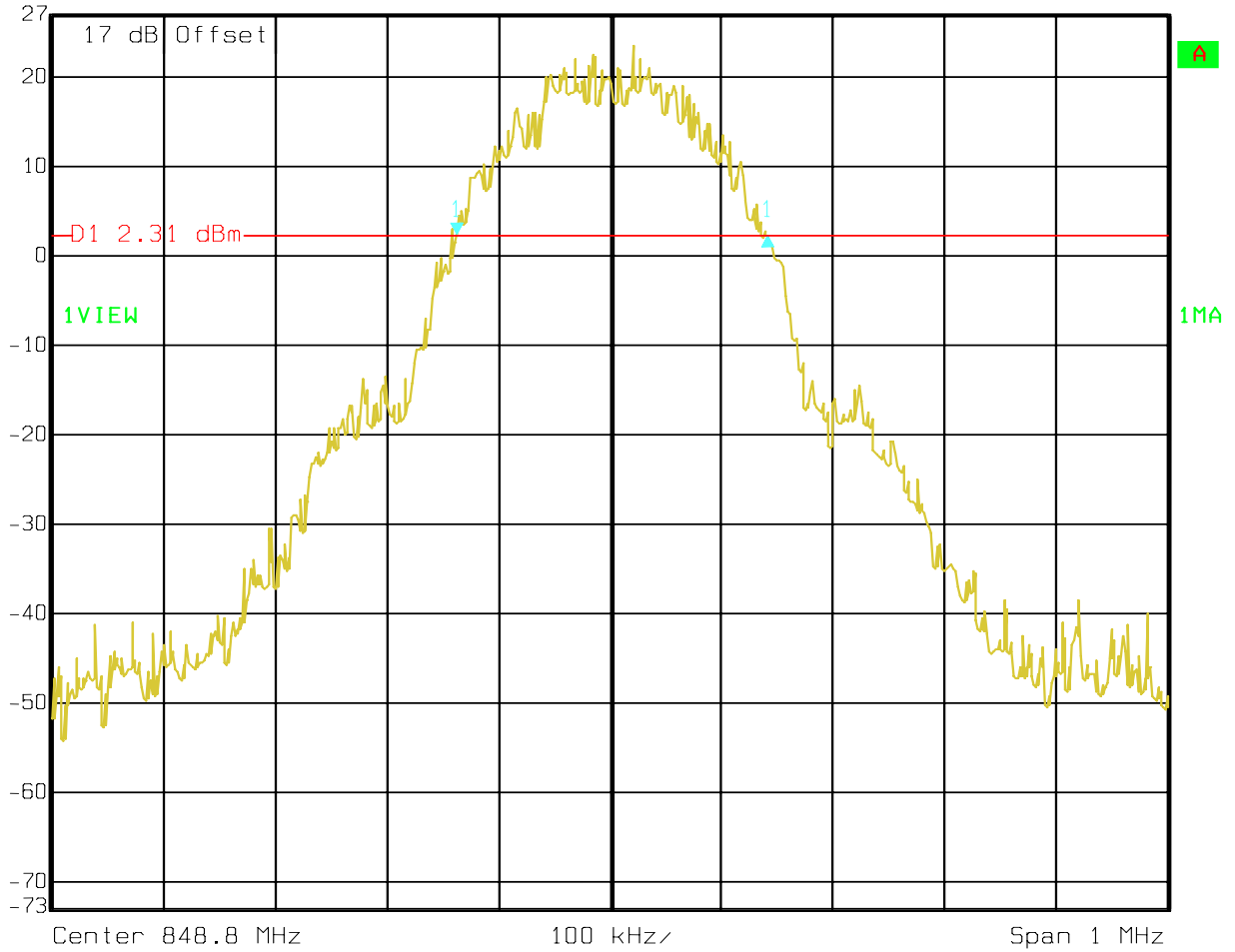


Date: 11.JUL.2006 11:07:12



**-20dB (GSM-850)
CHANNEL 251 GPRS**

 Delta 1 [T1] RBW 3 kHz RF Att 40 dB
Ref Lvl 0.04 dB VBW 3 kHz
27 dBm 278.55711423 kHz SWT 280 ms Unit dBm

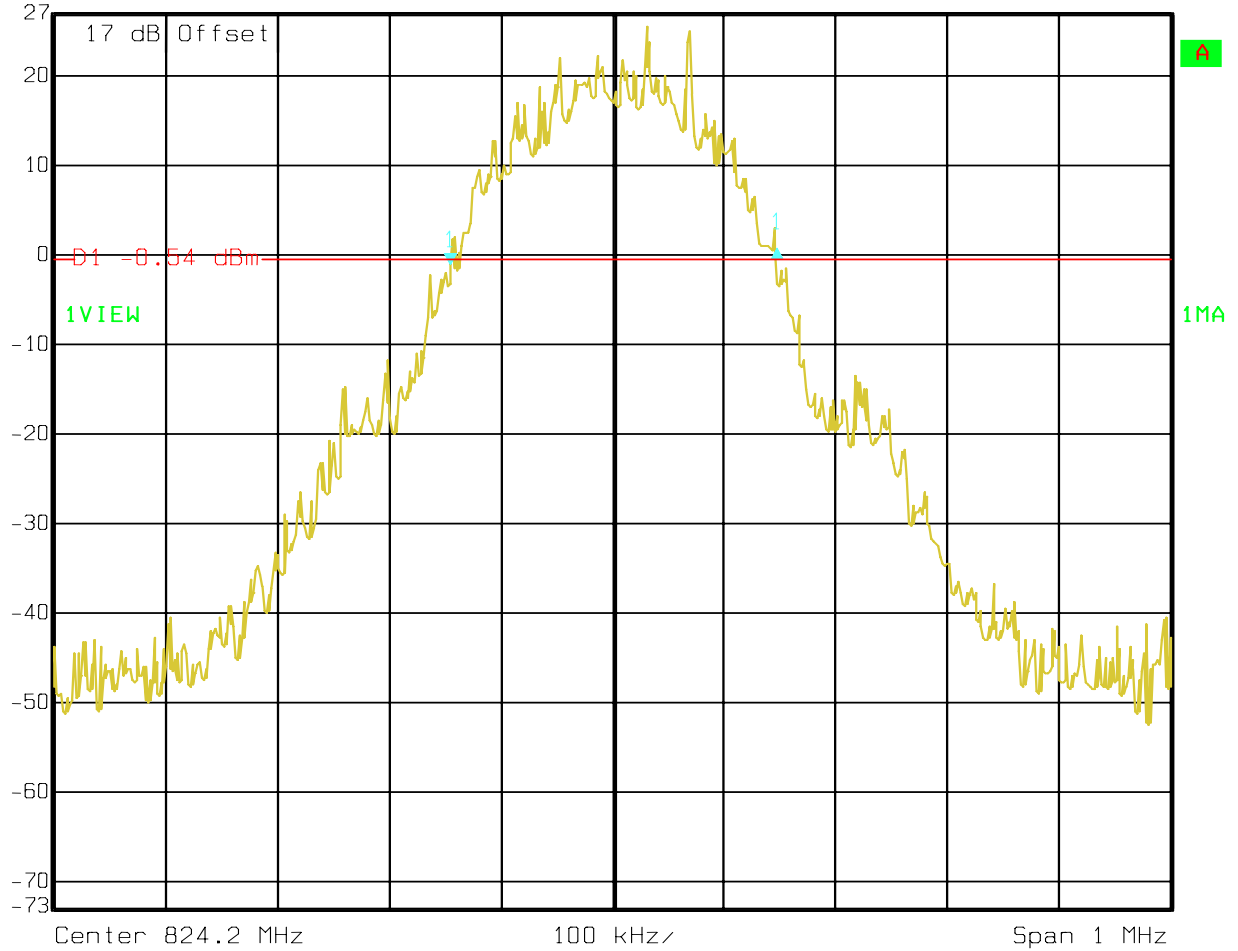


Date: 11.JUL.2006 11:14:42



**-26dB (GSM-850)
CHANNEL 128 GPRS**

 Delta 1 [T1] RBW 3 kHz RF Att 40 dB
Ref Lvl 1.85 dB VBW 3 kHz
27 dBm 292.58517034 kHz SWT 280 ms Unit dBm

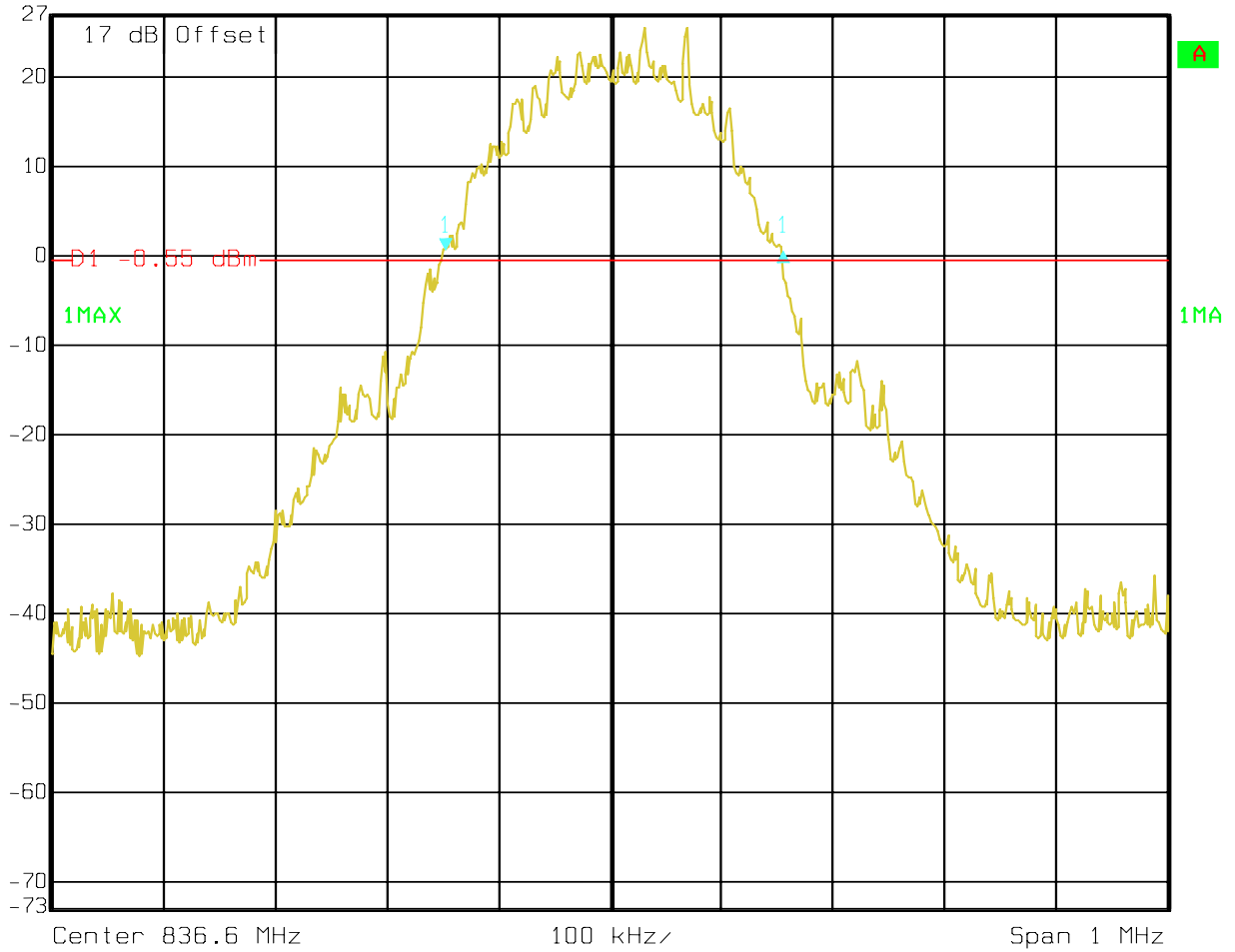


Date: 11.JUL.2006 10:54:34



**-26dB (GSM-850)
CHANNEL 190 GPRS**

 Delta 1 [T1] RBW 3 kHz RF Att 40 dB
Ref Lvl -0.03 dB VBW 3 kHz
27 dBm 302.60521042 kHz SWT 280 ms Unit dBm

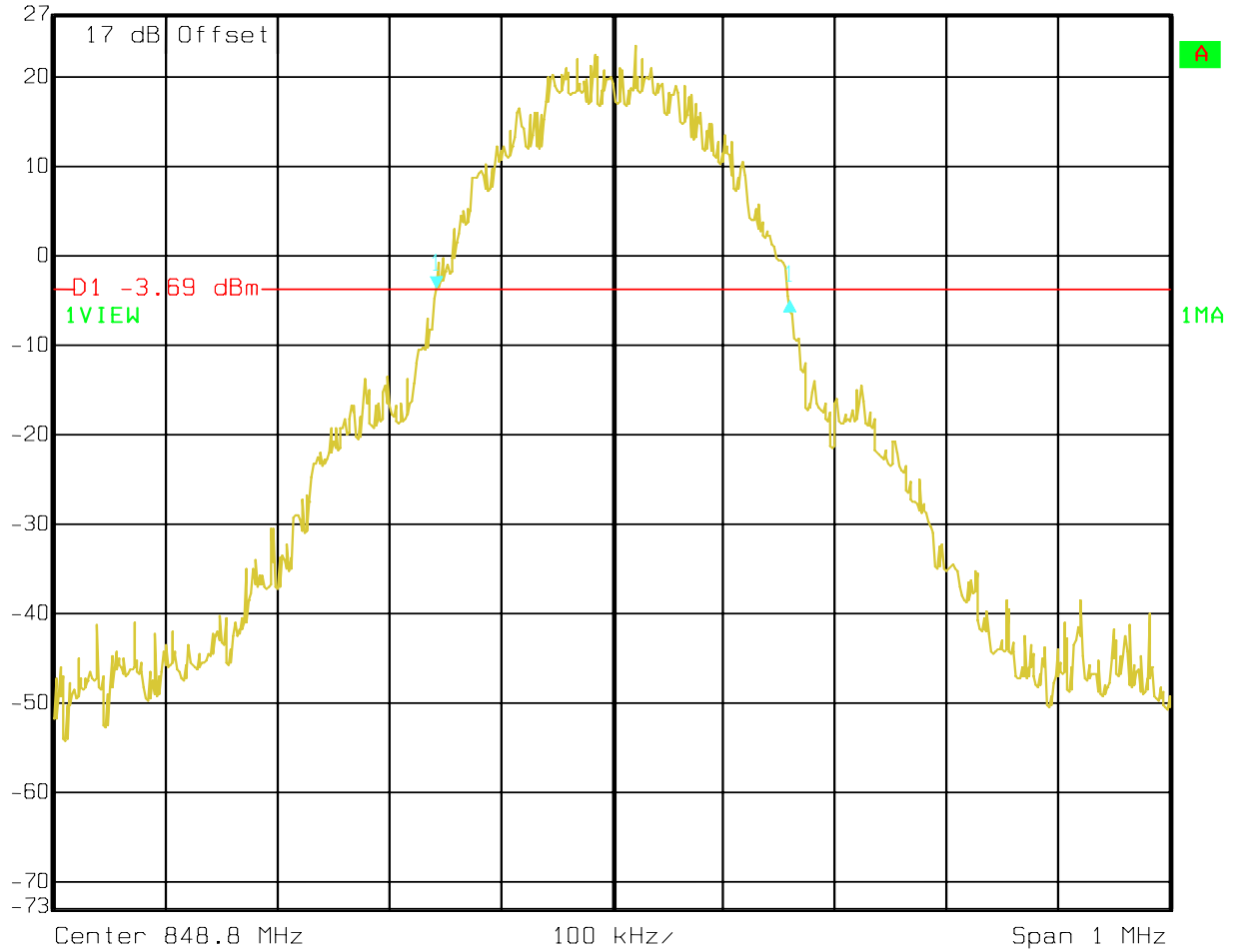


Date: 11.JUL.2006 11:01:32



**-26dB (GSM-850)
CHANNEL 251 GPRS**

 Delta 1 [T1] RBW 3 kHz RF Att 40 dB
Ref Lvl -1.37 dB VBW 3 kHz
27 dBm 316.63326653 kHz SWT 280 ms Unit dBm

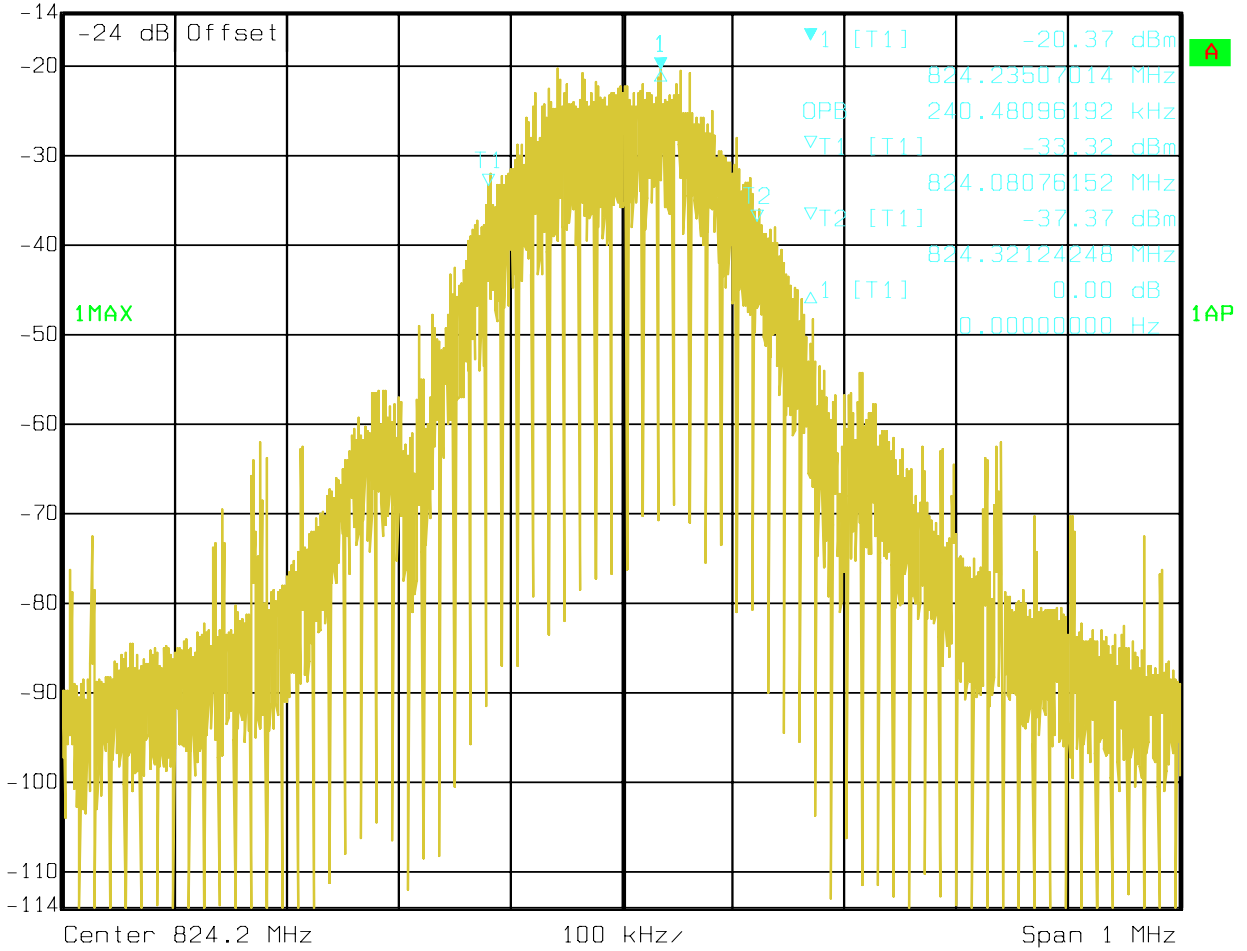


Date: 11.JUL.2006 11:16:40



**-20dB (GSM-850)
CHANNEL 128 EGPRS**

 Ref Lvl -14 dBm Marker 1 [T1] -20.37 dBm RBW 3 kHz RF Att 20 dB
824.23507014 MHz VBW 3 kHz Unit dBm
SWT 280 ms

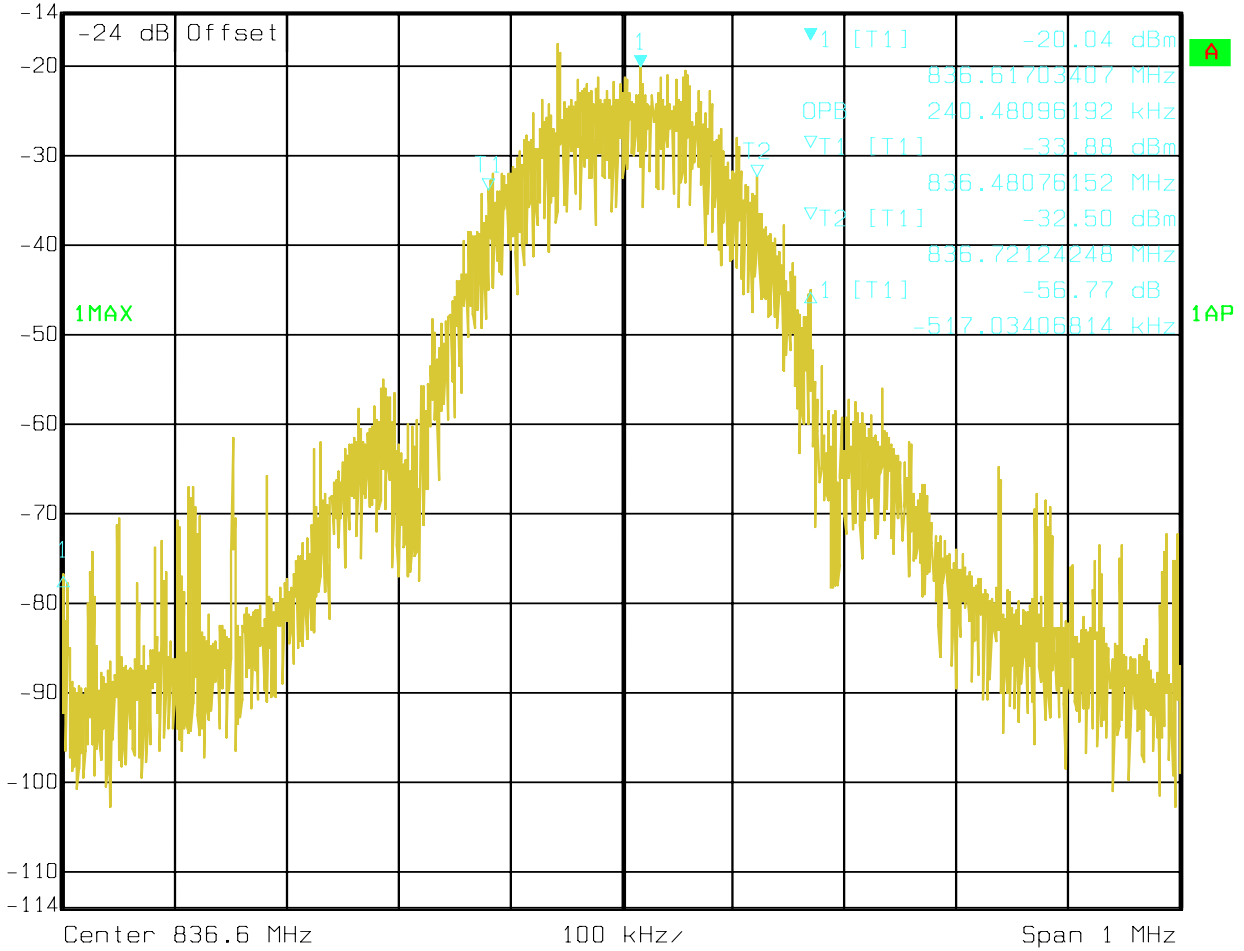


Date: 17.AUG.2006 09:23:10



**-20dB (GSM-850)
CHANNEL 190 EGPRS**

 Ref Lvl -14 dBm Marker 1 [T1] 836.61703407 MHz RBW 3 kHz RF Att 20 dB
-20.04 dBm VBW 3 kHz
SWT 280 ms Unit dBm

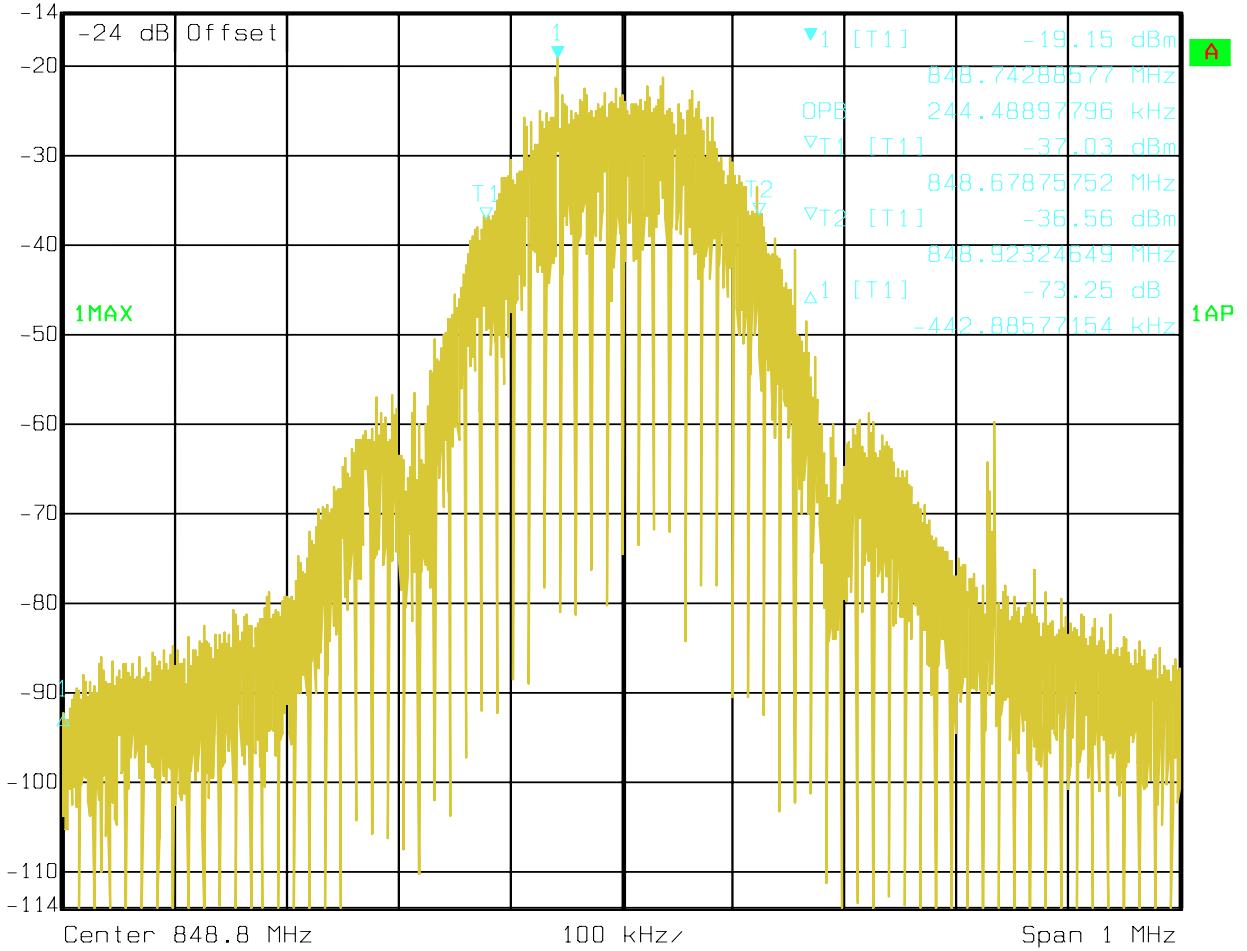


Date: 17.AUG.2006 09:27:25



**-20dB (GSM-850)
CHANNEL 251 EGPRS**

R/S Marker 1 [T1] RBW 3 kHz RF Att 20 dB
 Ref Lvl -19.15 dBm VBW 3 kHz
 -14 dBm 848.74288577 MHz SWT 280 ms Unit dBm

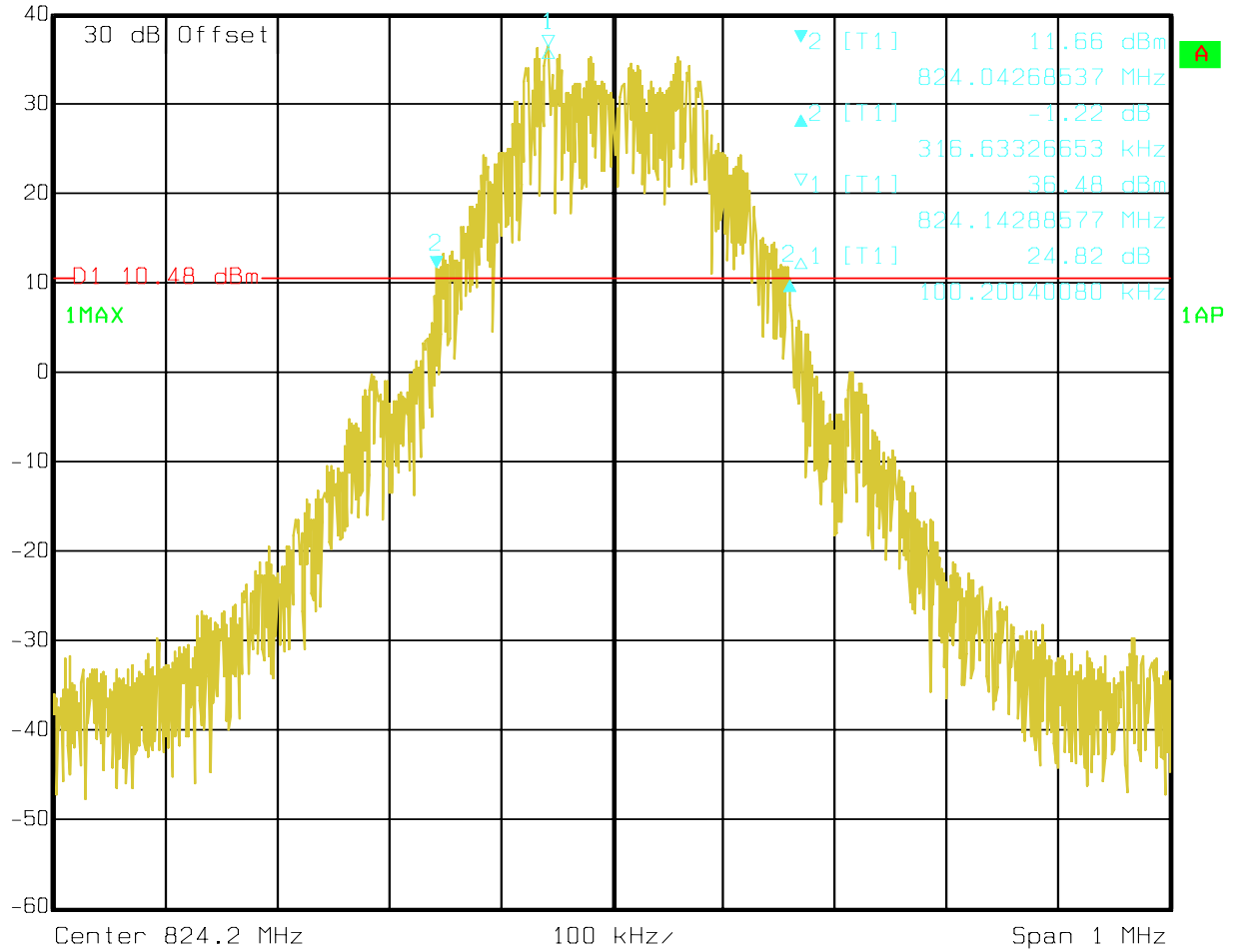


Date: 17.AUG.2006 09:33:15



**-26dB (GSM-850)
CHANNEL 128 EGPRS**

R/S Delta 2 [T1] RBW 3 kHz RF Att 20 dB
 Ref Lvl -1.22 dB VBW 3 kHz
 40 dBm 316.63326653 kHz SWT 280 ms Unit dBm

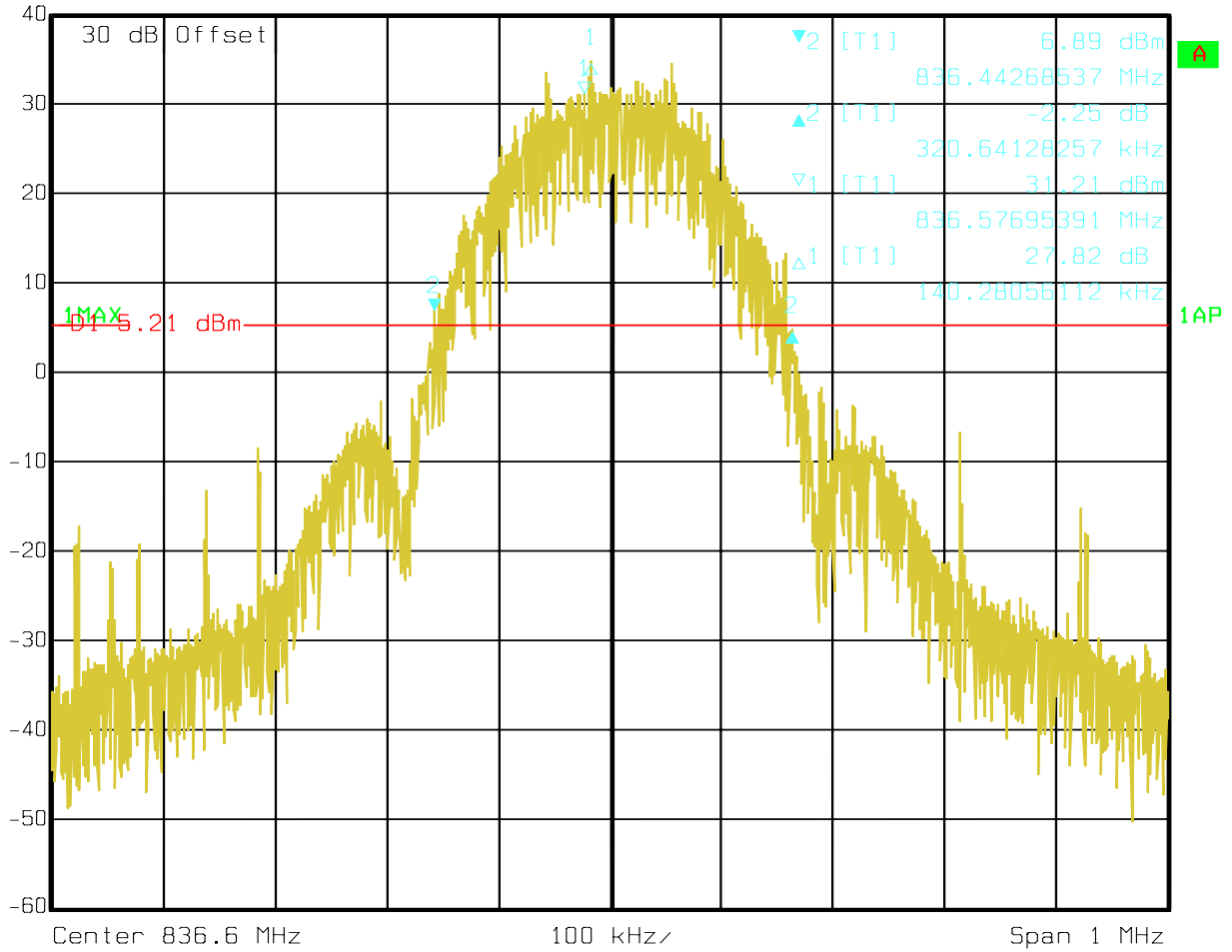


Date: 17.AUG.2006 10:47:10



**-26dB (GSM-850)
CHANNEL 190 EGPRS**

R/S Delta 2 [T1] RBW 3 kHz RF Att 20 dB
 Ref Lvl -2.25 dB VBW 3 kHz
 40 dBm 320.64128257 kHz SWT 280 ms Unit dBm

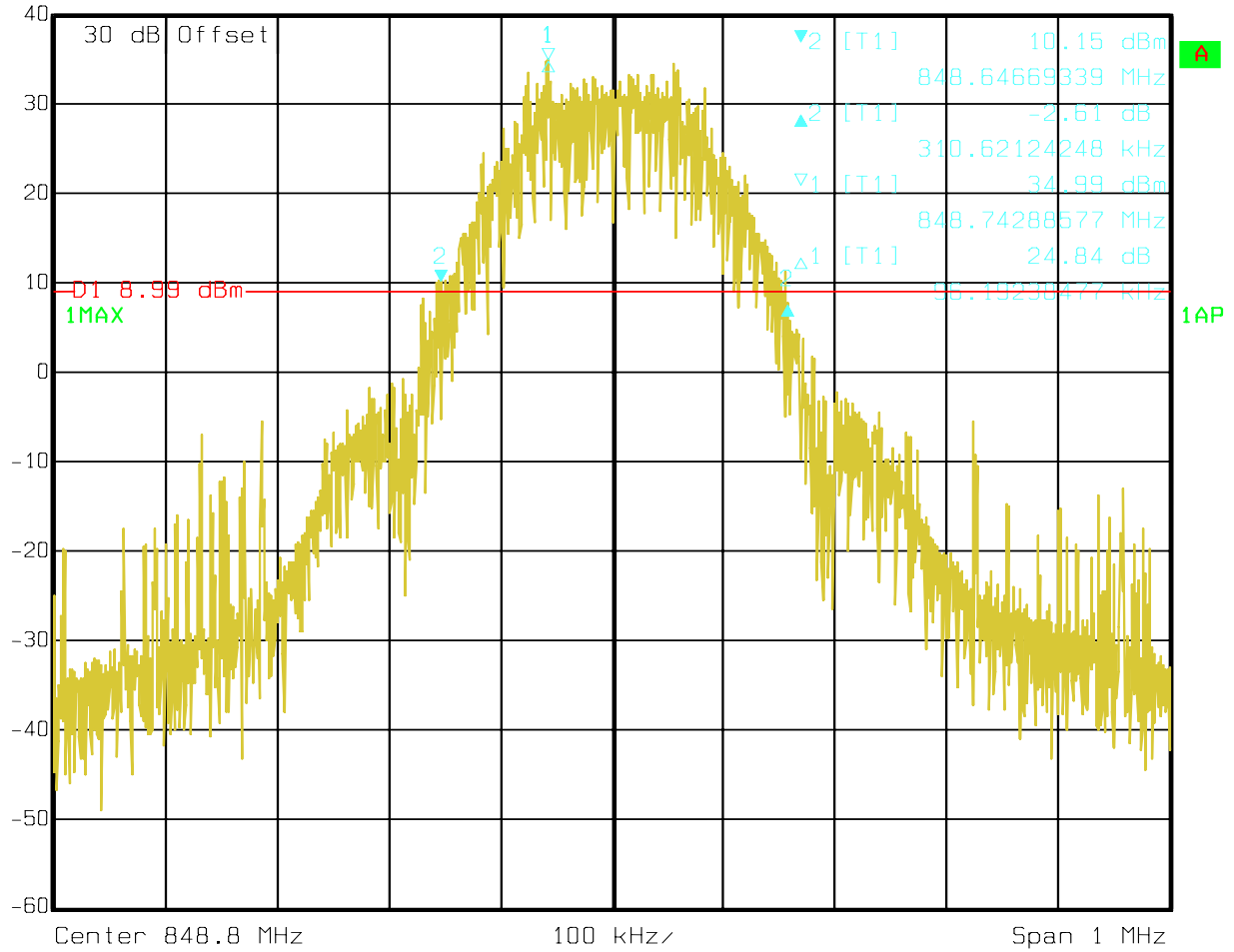


Date: 17.AUG.2006 10:45:09



**-26dB (GSM-850)
CHANNEL 251 EGPRS**

R/S Delta 2 [T1] RBW 3 kHz RF Att 20 dB
 Ref Lvl -2.61 dB VBW 3 kHz
 40 dBm 310.62124248 kHz SWT 280 ms Unit dBm

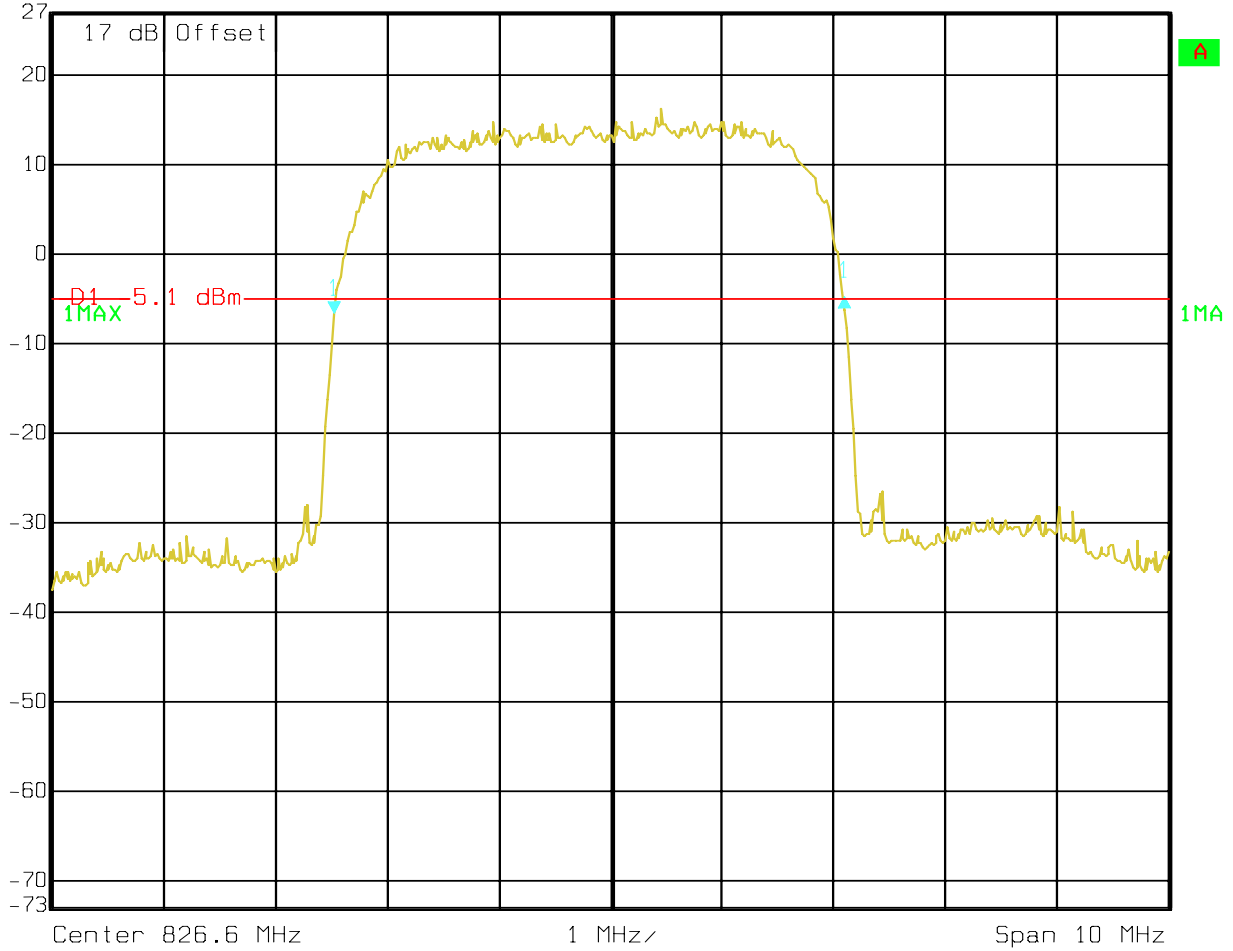


Date: 17.AUG.2006 10:30:23



**-20dB (GSM-850)
CHANNEL 4132 FDD5**

 Delta 1 [T1] RBW 50 kHz RF Att 20 dB
Ref Lvl 1.97 dB VBW 50 kHz
27 dBm 4.56913828 MHz SWT 10 ms Unit dBm

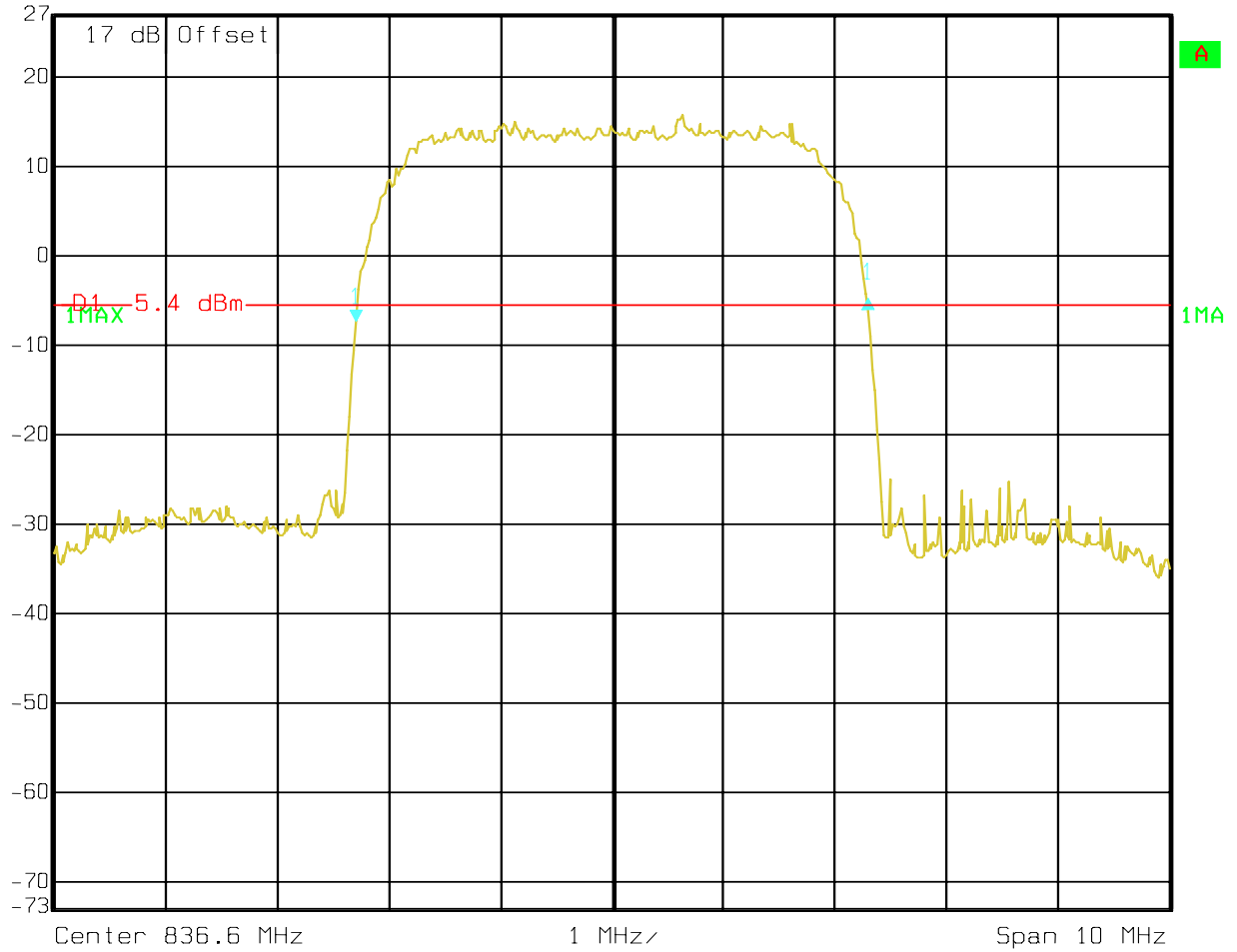


Date: 26.JUL.2006 11:01:38



**-20dB (GSM-850)
CHANNEL 4183 FDD5**

 Delta 1 [T1] RBW 50 kHz RF Att 20 dB
Ref Lvl 2.67 dB VBW 50 kHz
27 dBm 4.58917836 MHz SWT 10 ms Unit dBm

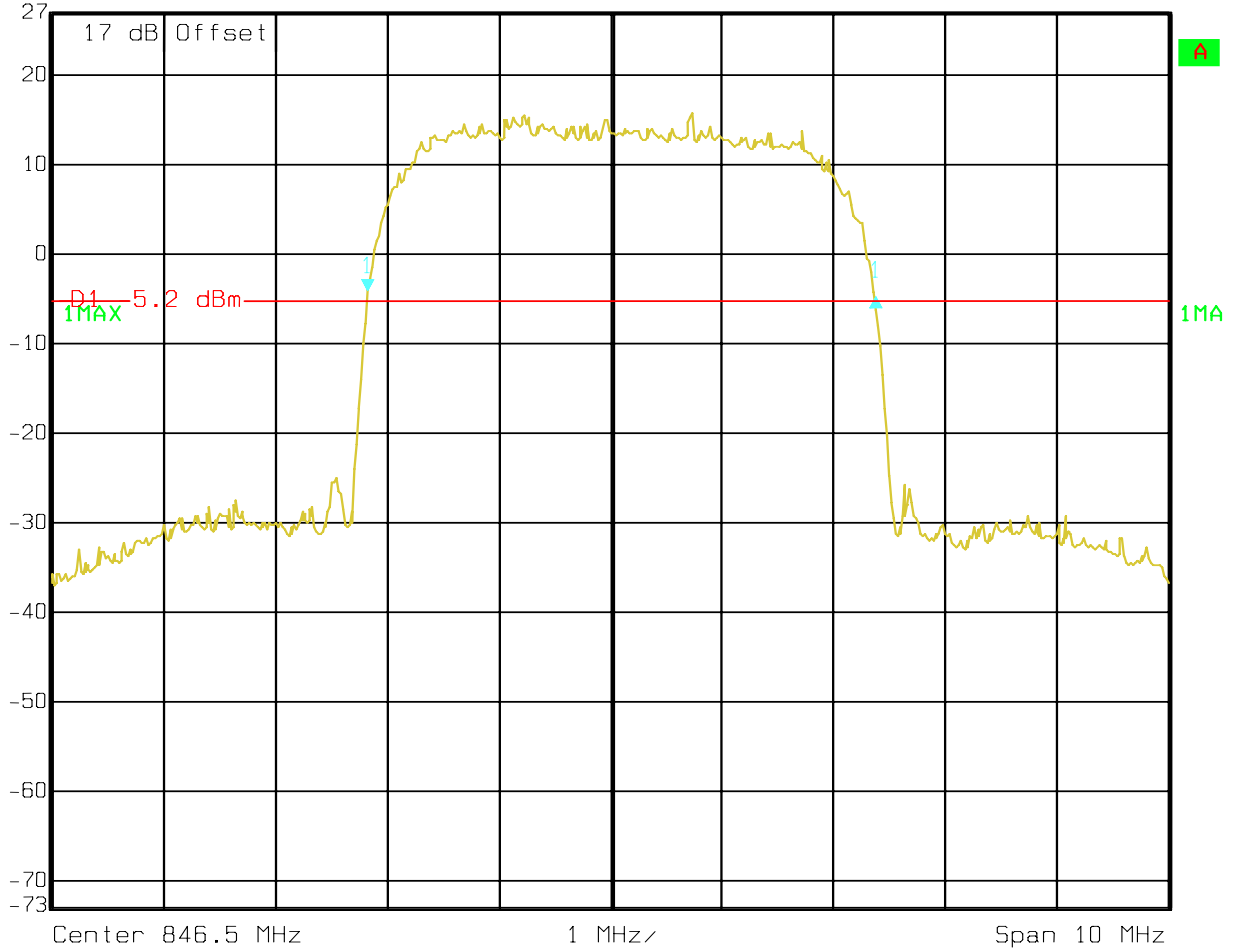


Date: 26.JUL.2006 10:59:05



**-20dB (GSM-850)
CHANNEL 4233 FDD5**

 Delta 1 [T1] RBW 50 kHz RF Att 20 dB
Ref Lvl -0.34 dB VBW 50 kHz
27 dBm 4.54909820 MHz SWT 10 ms Unit dBm

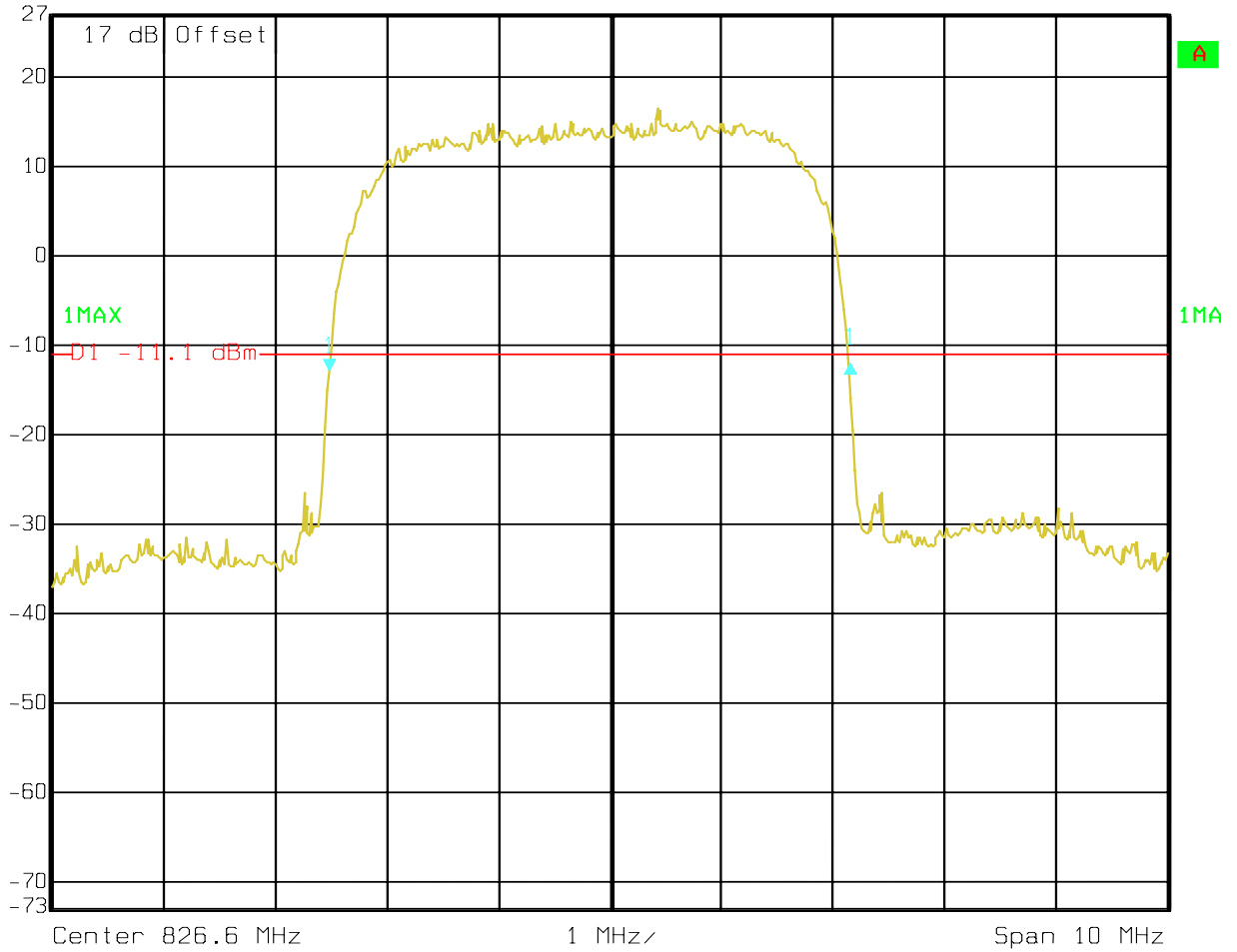


Date: 26.JUL.2006 10:37:18



**-26dB (GSM-850)
CHANNEL 4132 FDD5**

 Ref Lvl 27 dBm Delta 1 [T1] 0.93 dB RBW 50 kHz RF Att 20 dB
4.66933868 MHz VBW 50 kHz Unit dBm
SWT 10 ms

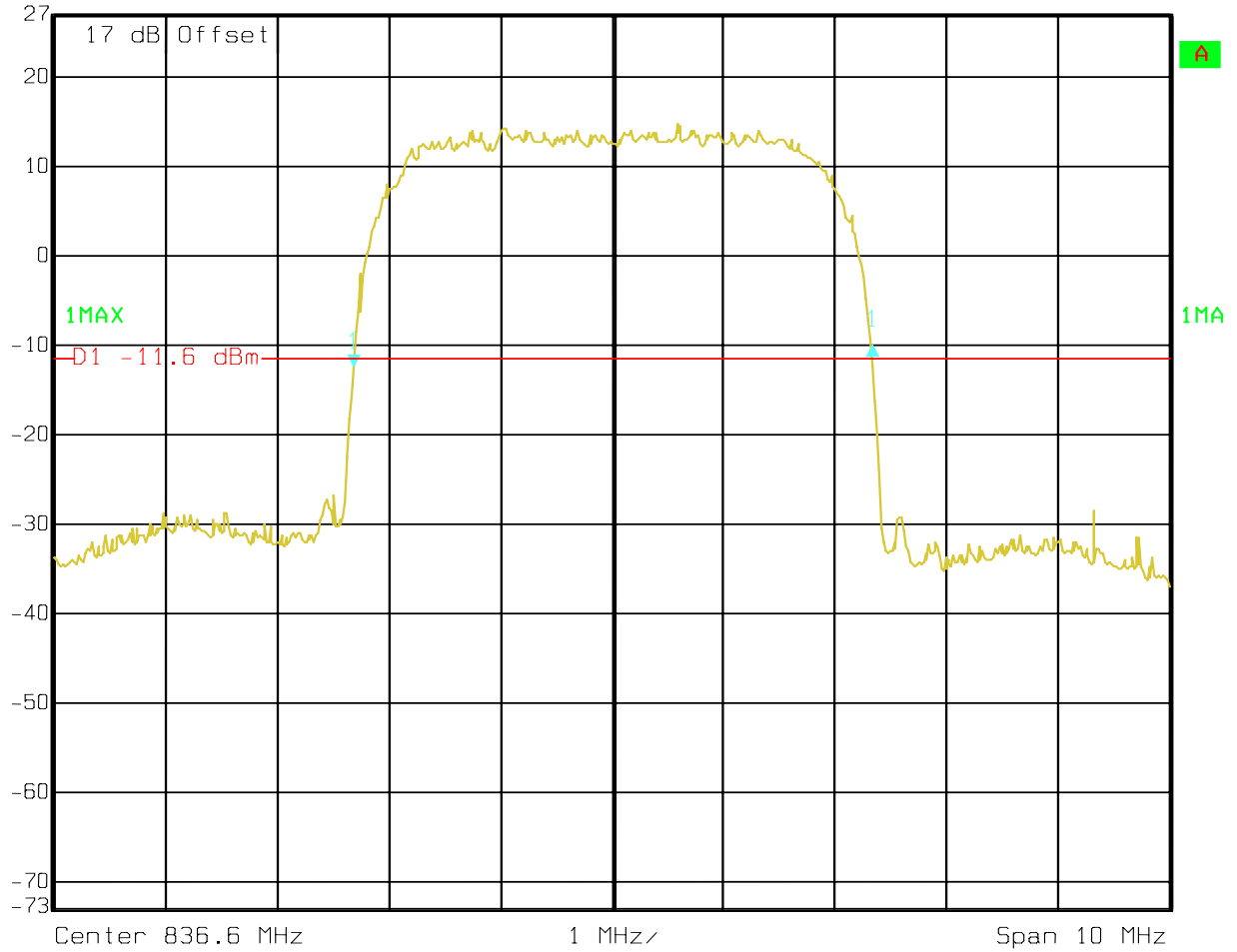


Date: 26.JUL.2006 11:03:16



**-26dB (GSM-850)
CHANNEL 4183 FDD5**

 Delta 1 [T1] RBW 50 kHz RF Att 20 dB
Ref Lvl 27 dBm 2.57 dB VBW 50 kHz
4.64929860 MHz SWT 10 ms Unit dBm

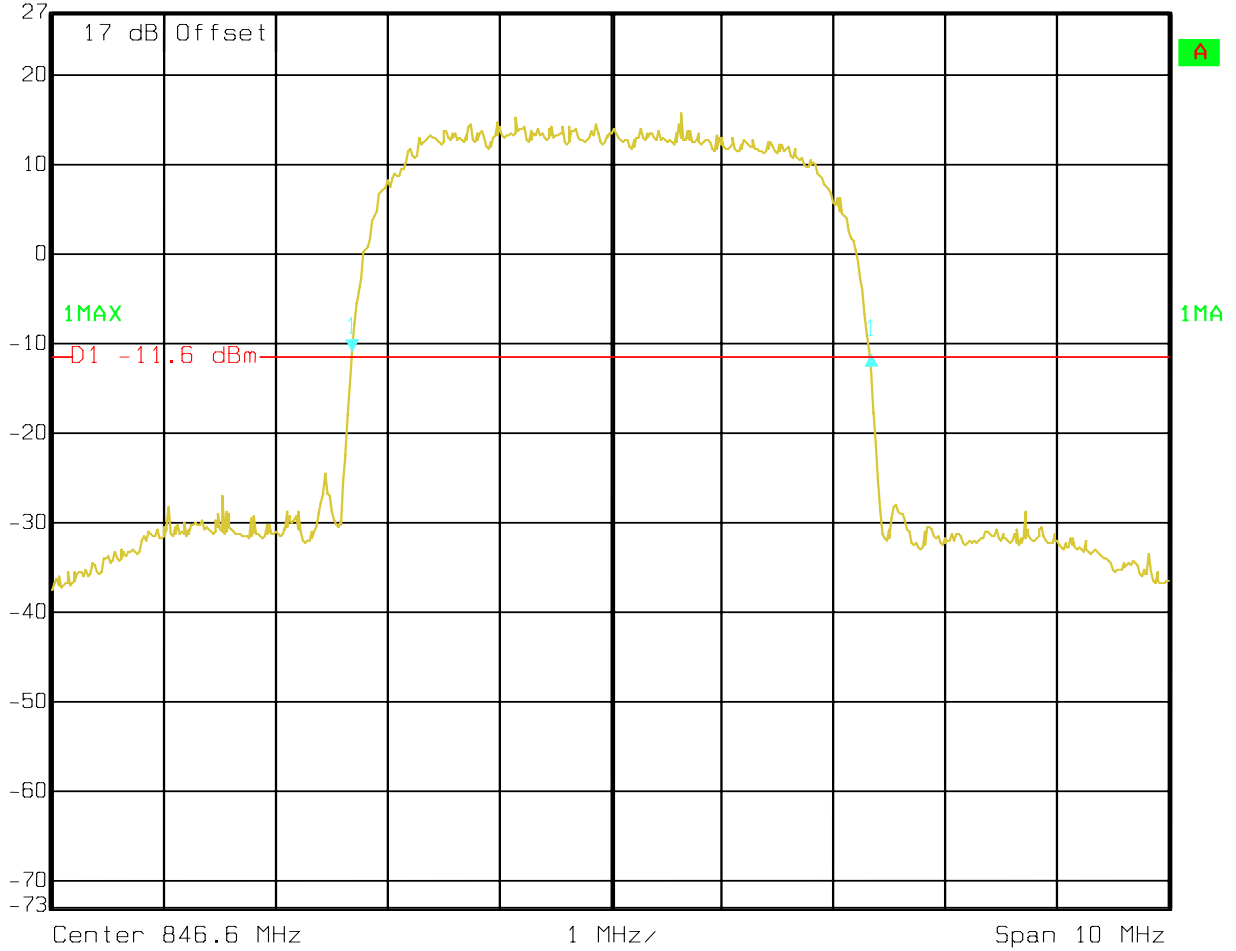


Date: 26.JUL.2006 11:04:57



**-26dB (GSM-850)
CHANNEL 4233 FDD5**

 Delta 1 [T1] RBW 50 kHz RF Att 20 dB
Ref Lvl -0.09 dB VBW 50 kHz
27 dBm 4.64929860 MHz SWT 10 ms Unit dBm

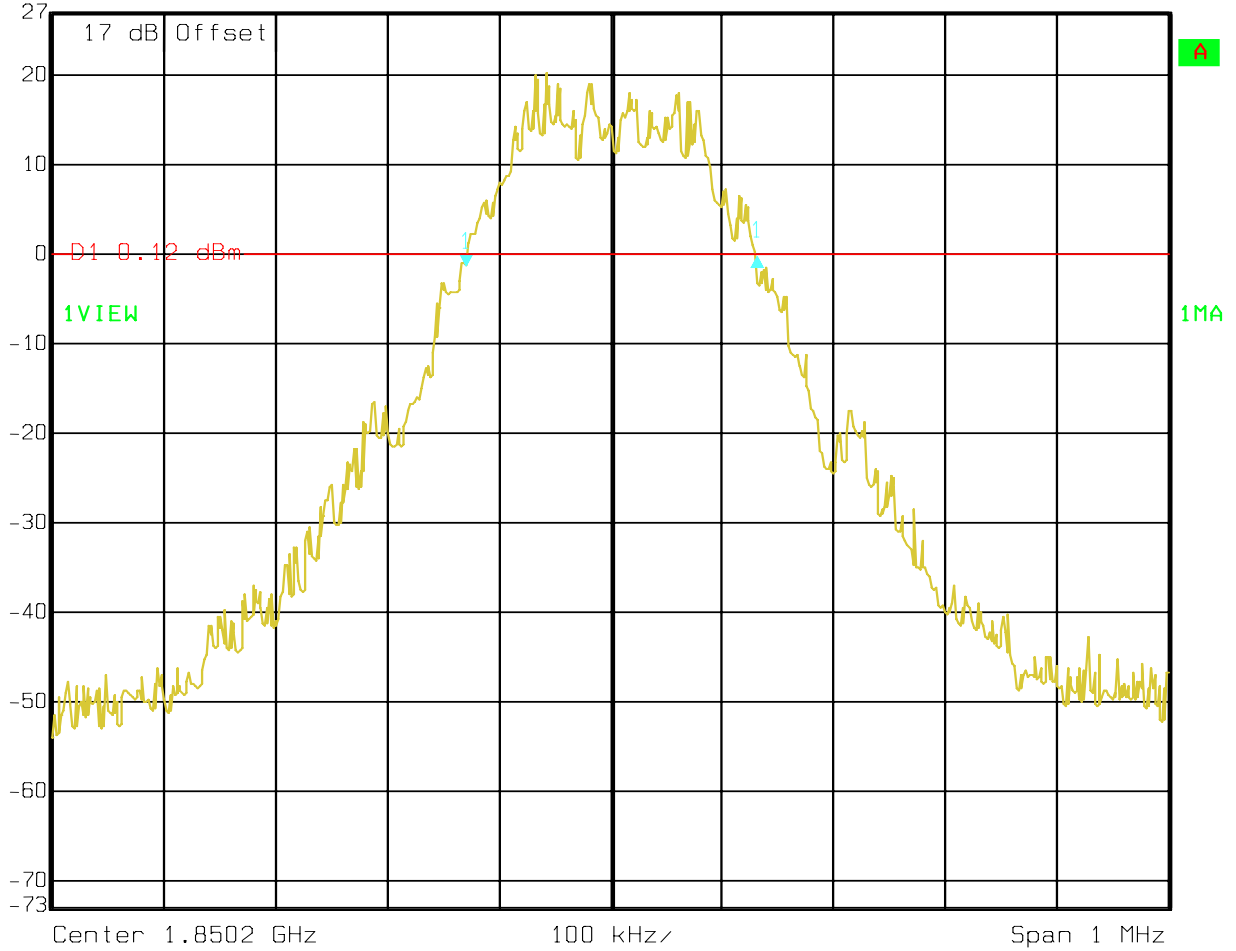


Date: 26.JUL.2006 11:06:33



**-20dB (PCS-1900)
CHANNEL 512 GPRS**

 Delta 1 [T1] RBW 3 kHz RF Att 20 dB
Ref Lvl 1.09 dB VBW 3 kHz
27 dBm 260.52104208 kHz SWT 280 ms Unit dBm

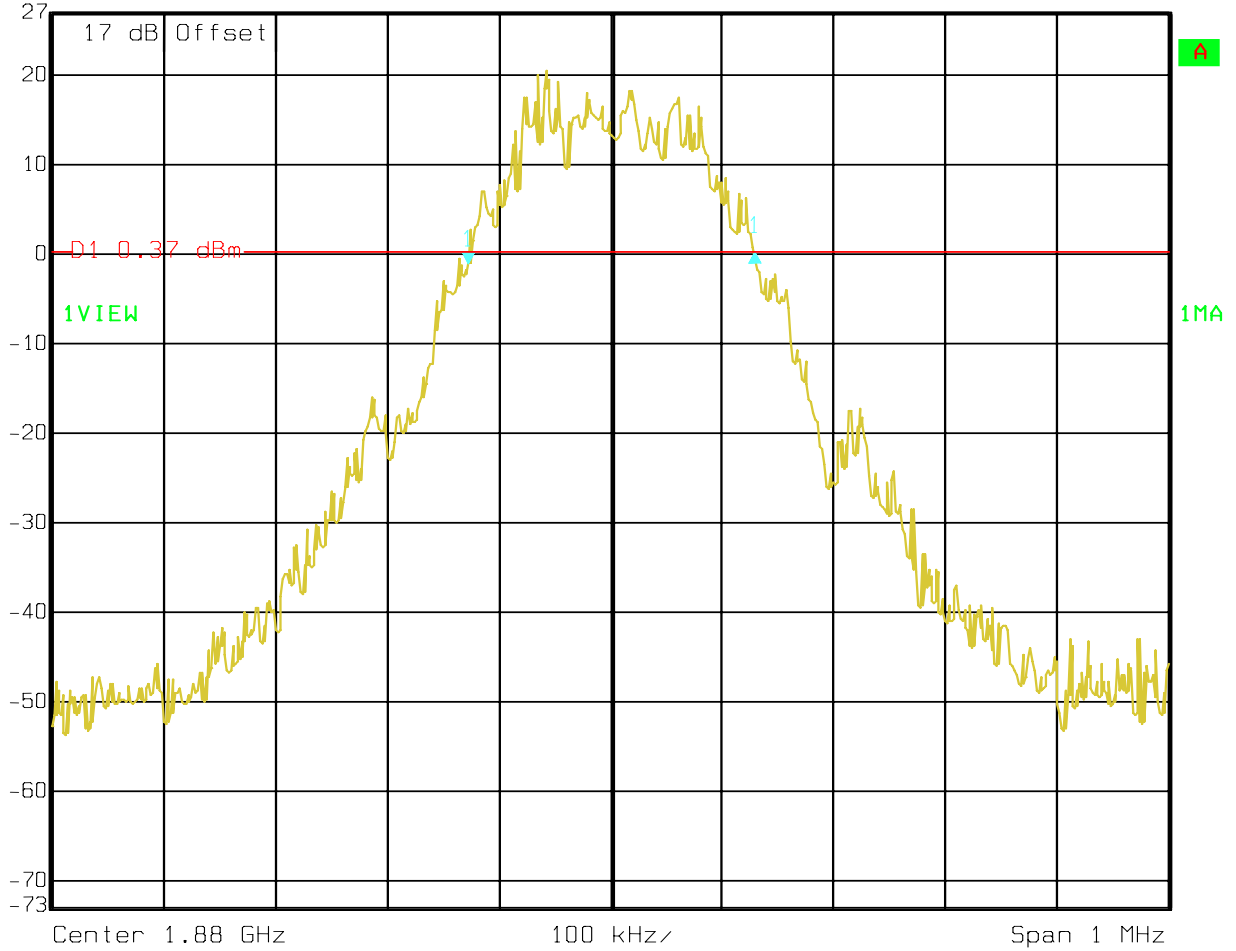


Date: 12.JUL.2006 12:47:26



**-20dB (PCS-1900)
CHANNEL 661 GPRS**

 Delta 1 [T1] RBW 3 kHz RF Att 20 dB
Ref Lvl 1.50 dB VBW 3 kHz
27 dBm 256.51302605 kHz SWT 280 ms Unit dBm

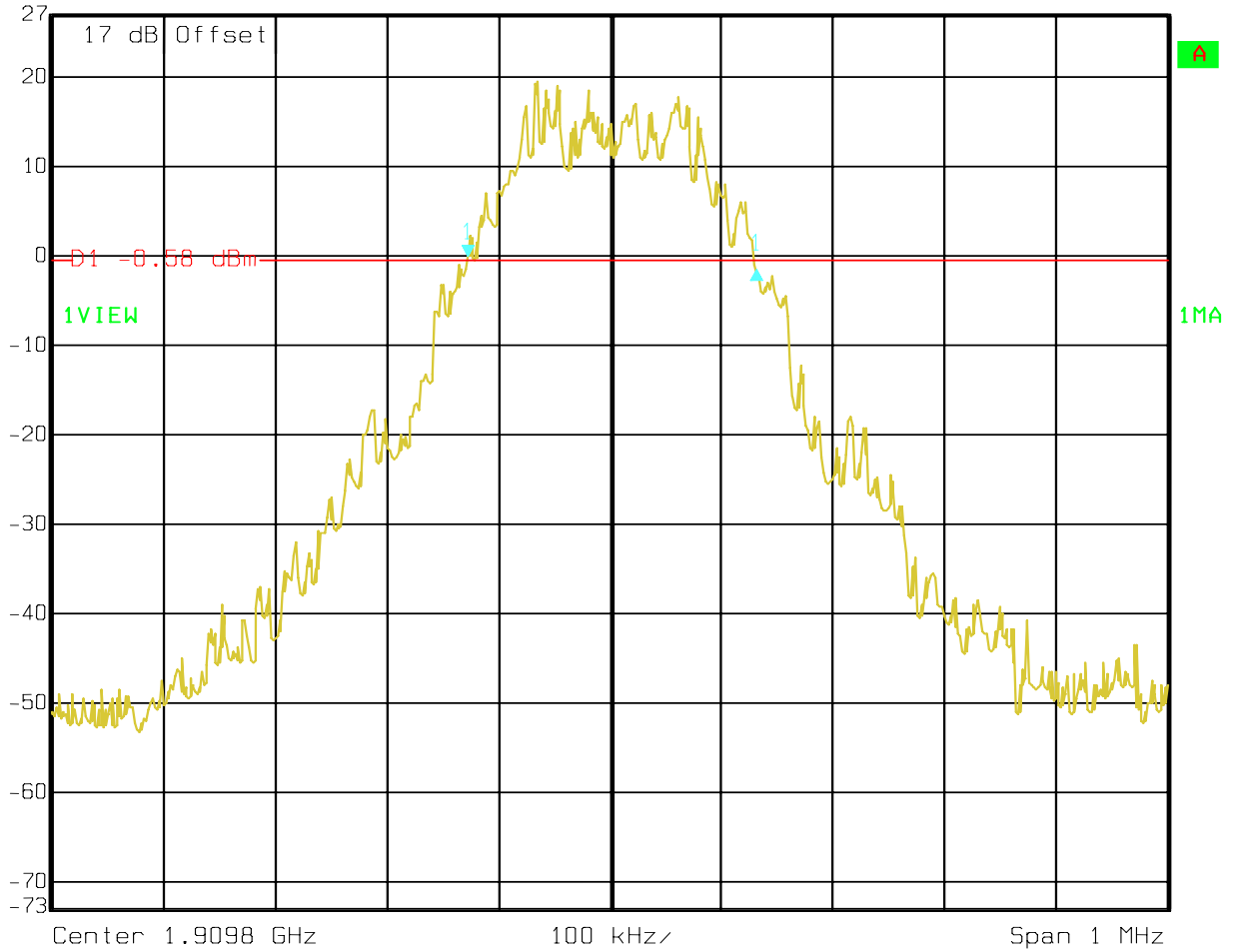


Date: 12.JUL.2006 12:50:34



**-20dB (PCS-1900)
CHANNEL 810 GPRS**

 Delta 1 [T1] RBW 3 kHz RF Att 20 dB
Ref Lvl -1.10 dB VBW 3 kHz
27 dBm 258.51703407 kHz SWT 280 ms Unit dBm

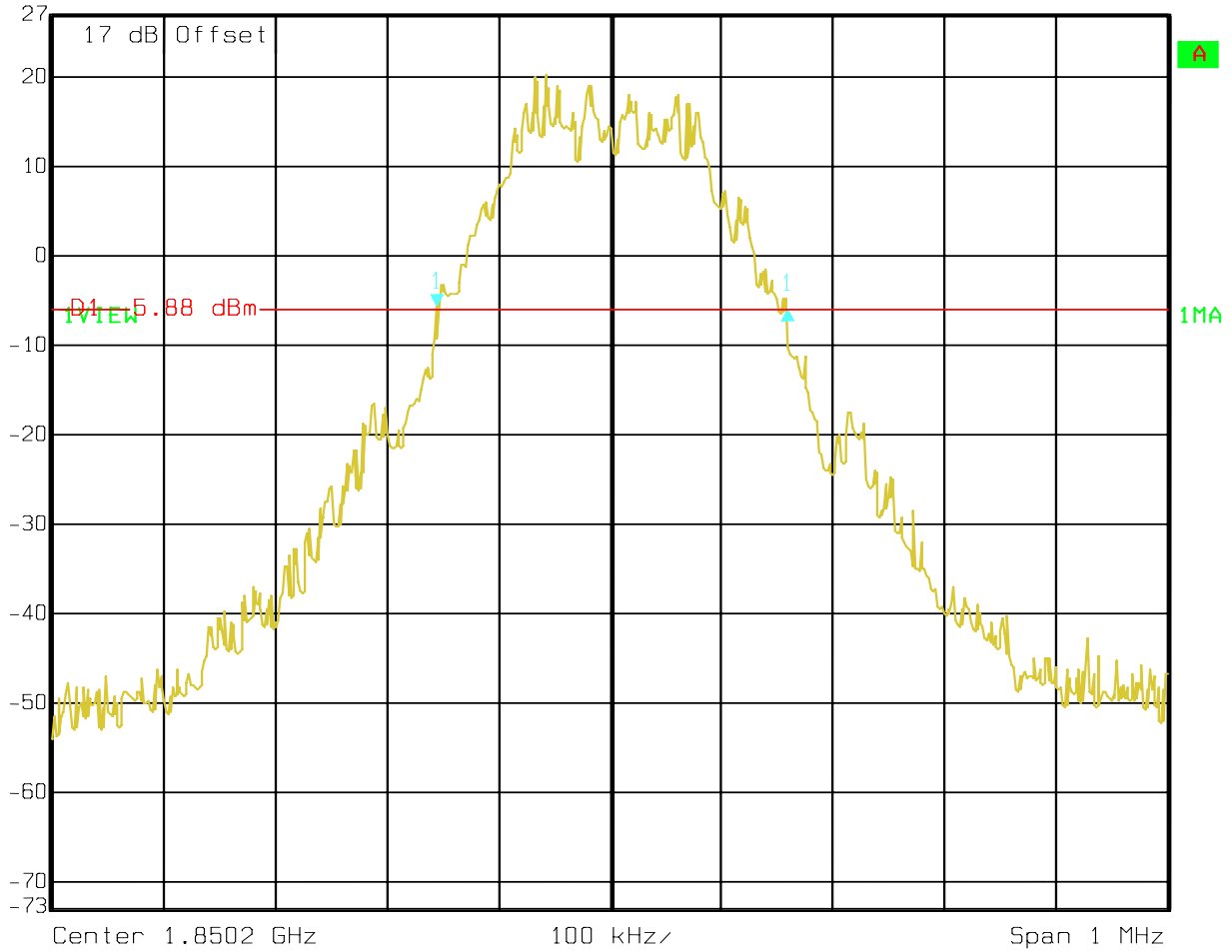


Date: 12.JUL.2006 12:52:31



**-26dB (PCS-1900)
CHANNEL 512 GPRS**

 Delta 1 [T1] RBW 3 kHz RF Att 20 dB
Ref Lvl -0.32 dB VBW 3 kHz
27 dBm 314.62925852 kHz SWT 280 ms Unit dBm

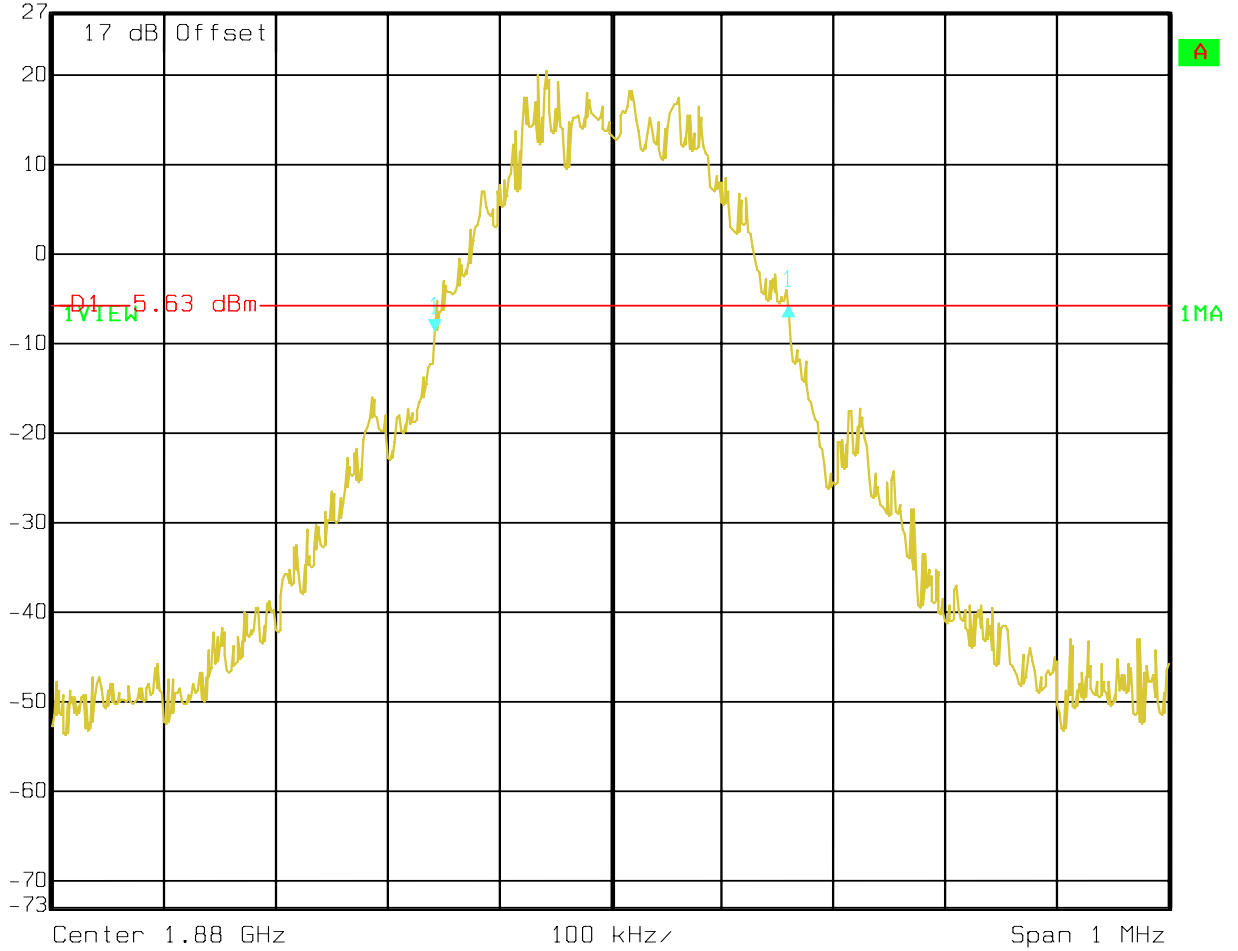


Date: 12.JUL.2006 12:49:06



**-26dB (PCS-1900)
CHANNEL 661 GPRS**

 Delta 1 [T1] RBW 3 kHz RF Att 20 dB
Ref Lvl 3.11 dB VBW 3 kHz
27 dBm 316.63326653 kHz SWT 280 ms Unit dBm

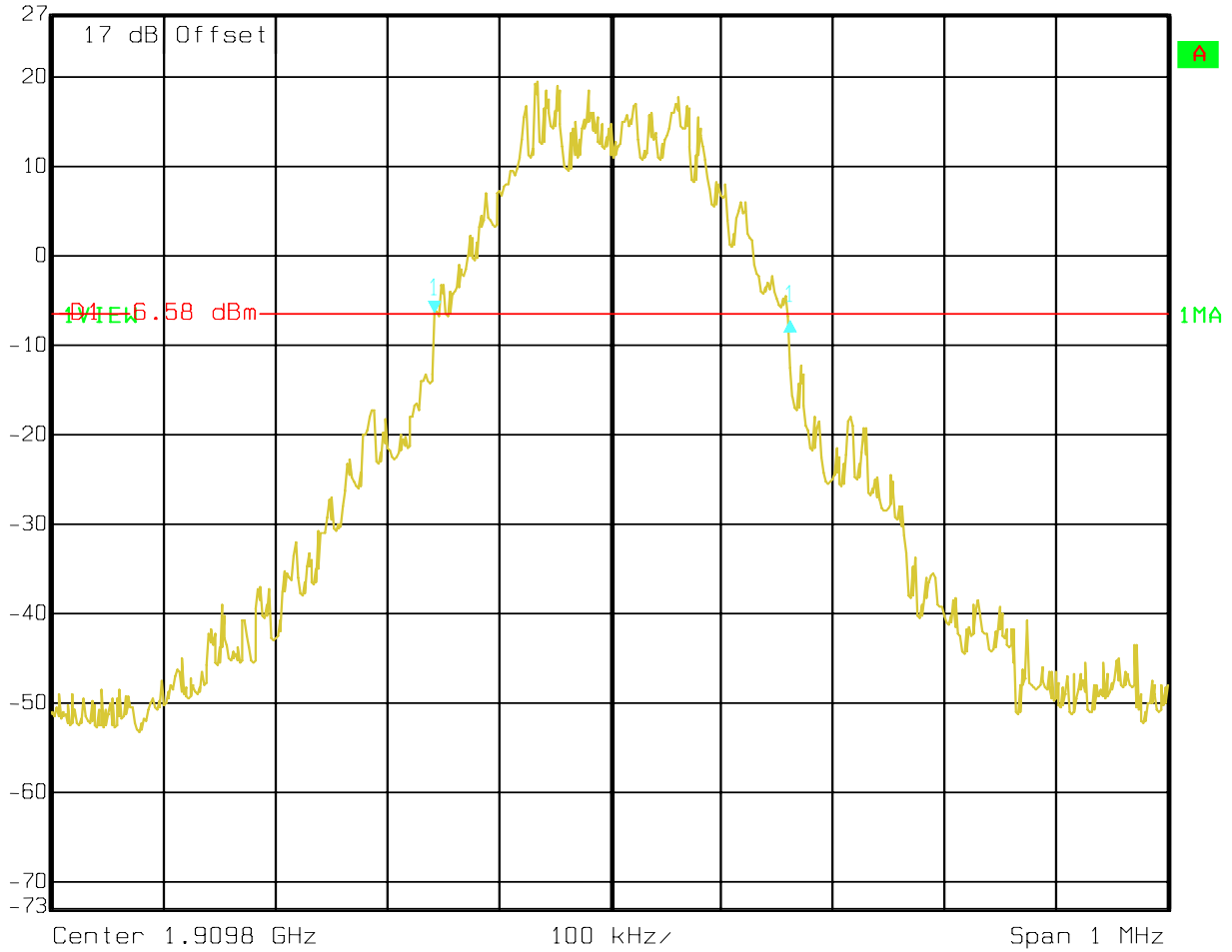


Date: 12.JUL.2006 12:51:20



**-26dB (PCS-1900)
CHANNEL 810 GPRS**

 Delta 1 [T1] RBW 3 kHz RF Att 20 dB
Ref Lvl -0.86 dB VBW 3 kHz
27 dBm 318.63727455 kHz SWT 280 ms Unit dBm

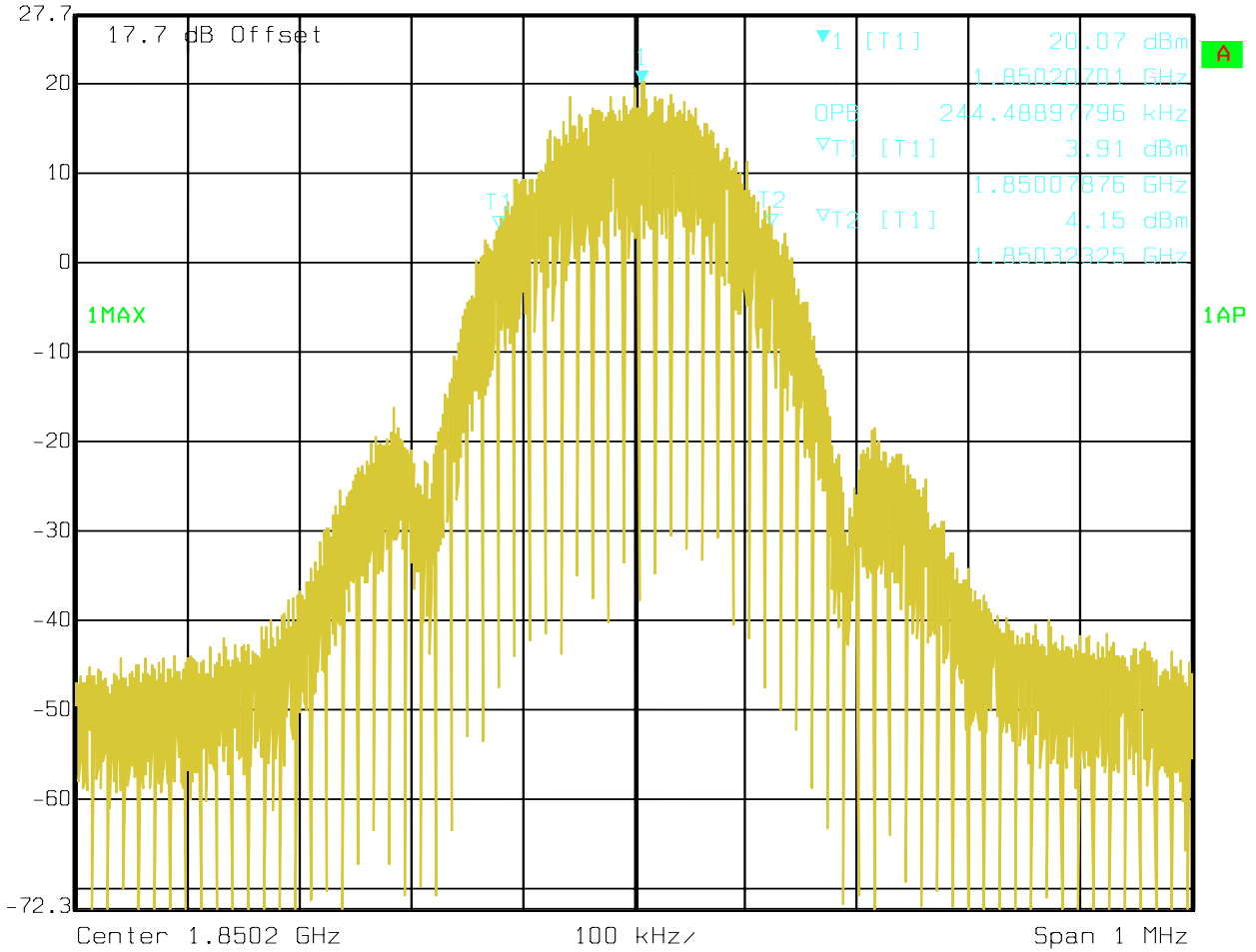


Date: 12.JUL.2006 13:07:18



**-20dB (PCS-1900)
CHANNEL 512 EGPRS**

 Marker 1 [T1] RBW 3 kHz RF Att 20 dB
Ref Lvl 20.07 dBm VBW 3 kHz
27.7 dBm 1.85020701 GHz SWT 280 ms Unit dBm

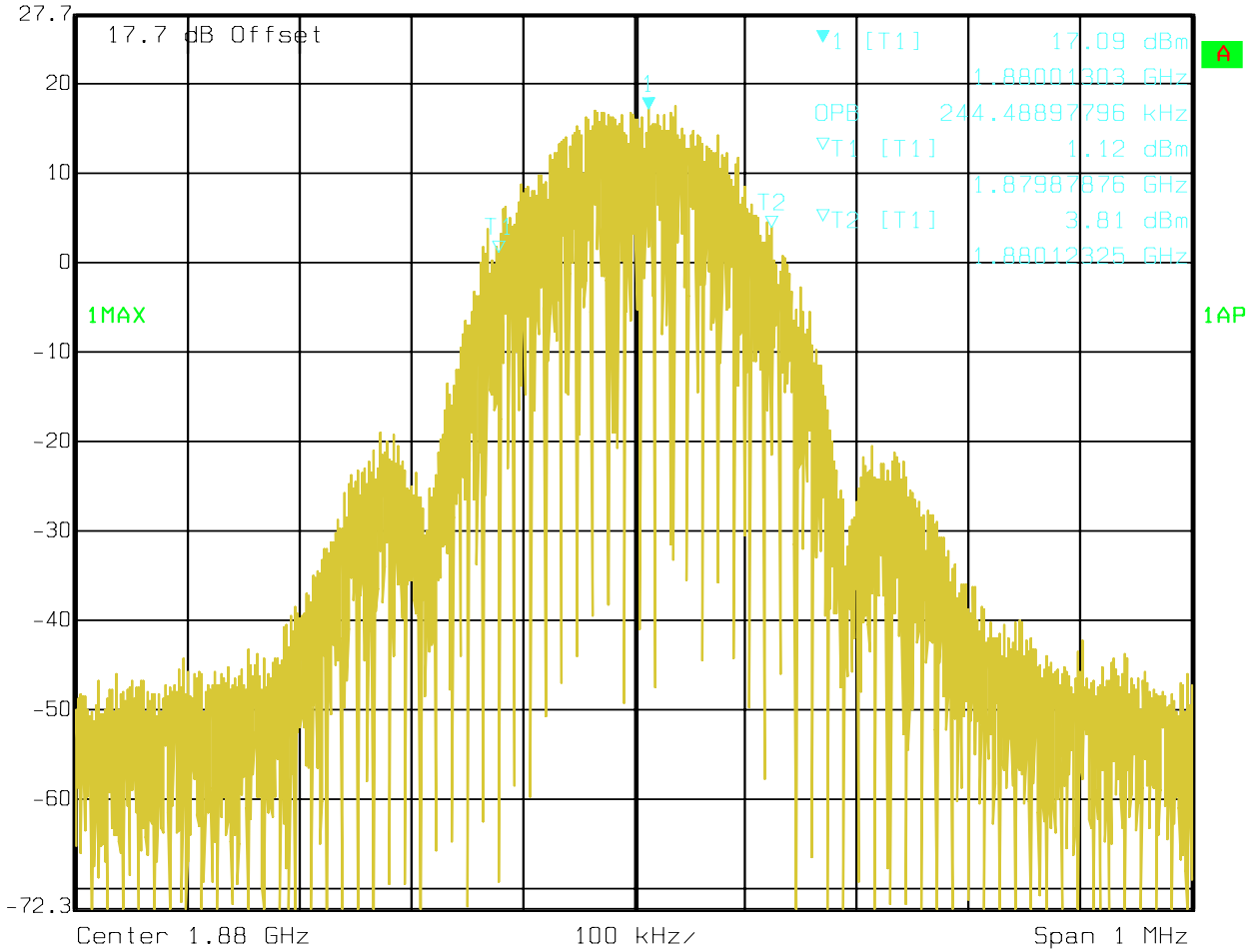


Date: 17.AUG.2006 11:10:19



**-20dB (PCS-1900)
CHANNEL 661 EGPRS**

 Marker 1 [T1] RBW 3 kHz RF Att 20 dB
Ref Lvl 17.09 dBm VBW 3 kHz
27.7 dBm 1.88001303 GHz SWT 280 ms Unit dBm



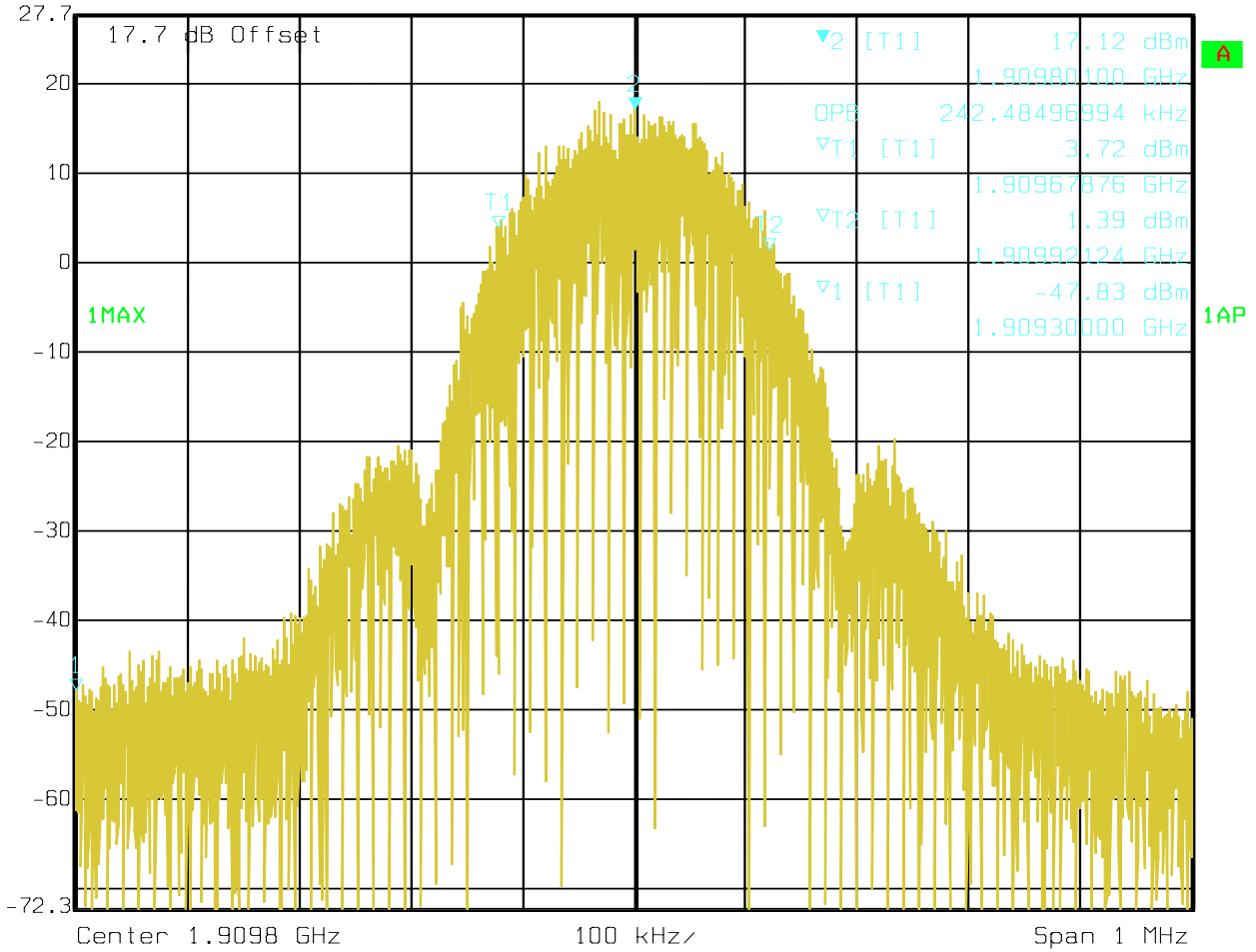
Date: 17.AUG.2006 11:12:13



**-20dB (PCS-1900)
CHANNEL 810 EGPRS**



Marker 2 [T1] RBW 3 kHz RF Att 20 dB
 Ref Lvl 17.12 dBm VBW 3 kHz
 27.7 dBm 1.90980100 GHz SWT 280 ms Unit dBm

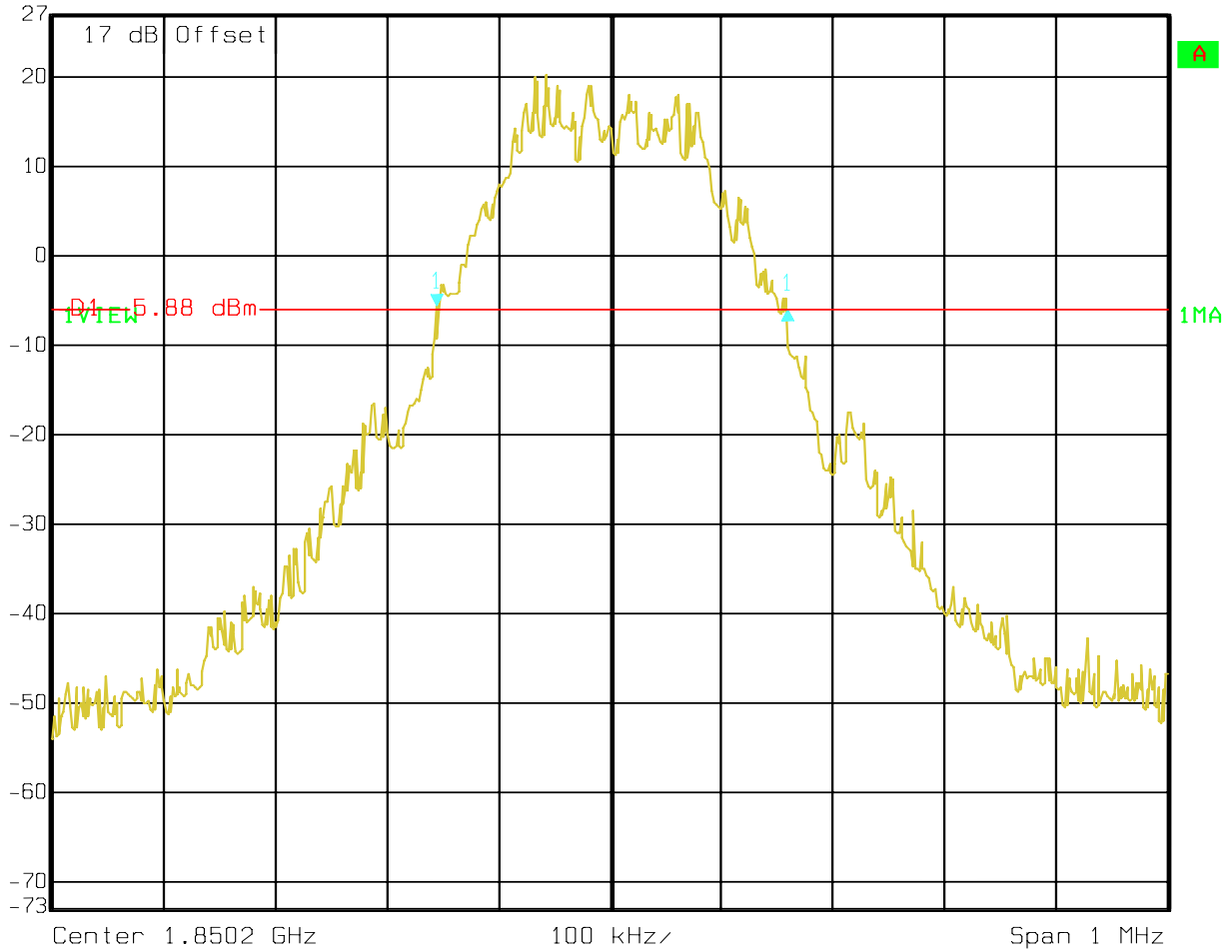


Date: 17.AUG.2006 11:16:30



**-26dB (PCS-1900)
CHANNEL 512 EGPRS**

 Delta 1 [T1] RBW 3 kHz RF Att 20 dB
Ref Lvl -0.32 dB VBW 3 kHz
27 dBm 314.62925852 kHz SWT 280 ms Unit dBm

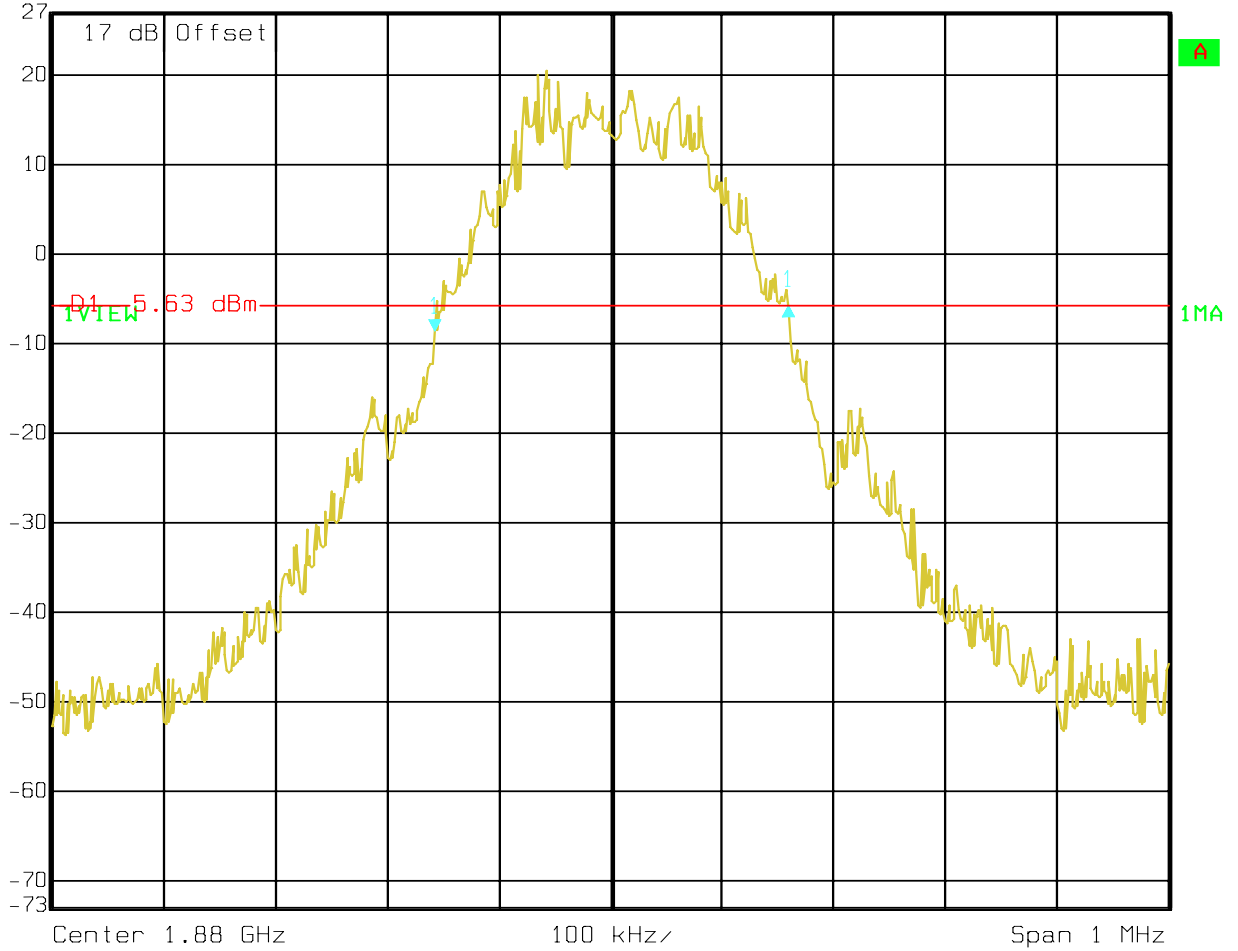


Date: 12.JUL.2006 12:49:06



**-26dB (PCS-1900)
CHANNEL 661 EGPRS**

 Delta 1 [T1] RBW 3 kHz RF Att 20 dB
Ref Lvl 3.11 dB VBW 3 kHz
27 dBm 316.63326653 kHz SWT 280 ms Unit dBm

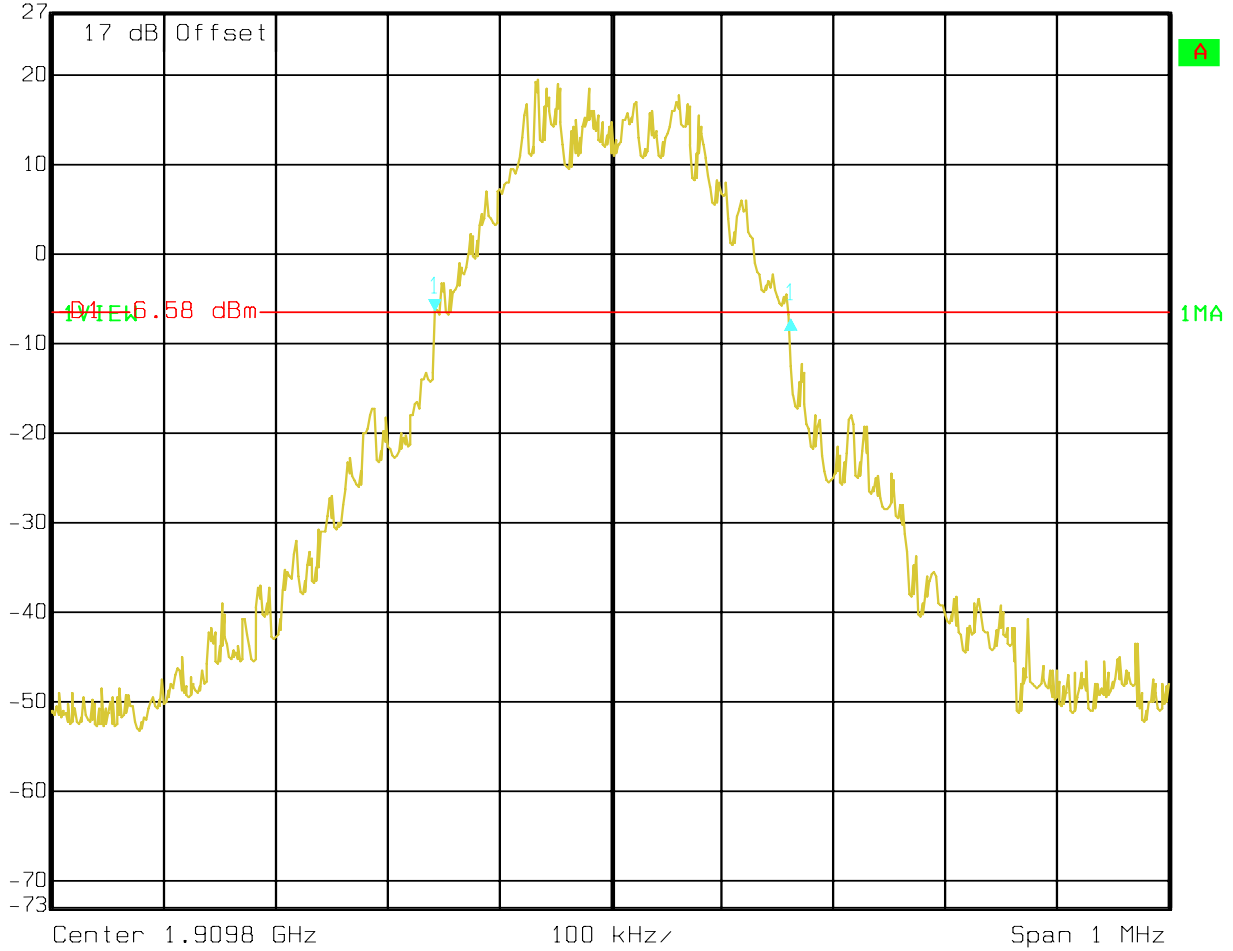


Date: 12.JUL.2006 12:51:20



**-26dB (PCS-1900)
CHANNEL 810 EGPRS**

 Delta 1 [T1] RBW 3 kHz RF Att 20 dB
Ref Lvl -0.86 dB VBW 3 kHz
27 dBm 318.63727455 kHz SWT 280 ms Unit dBm

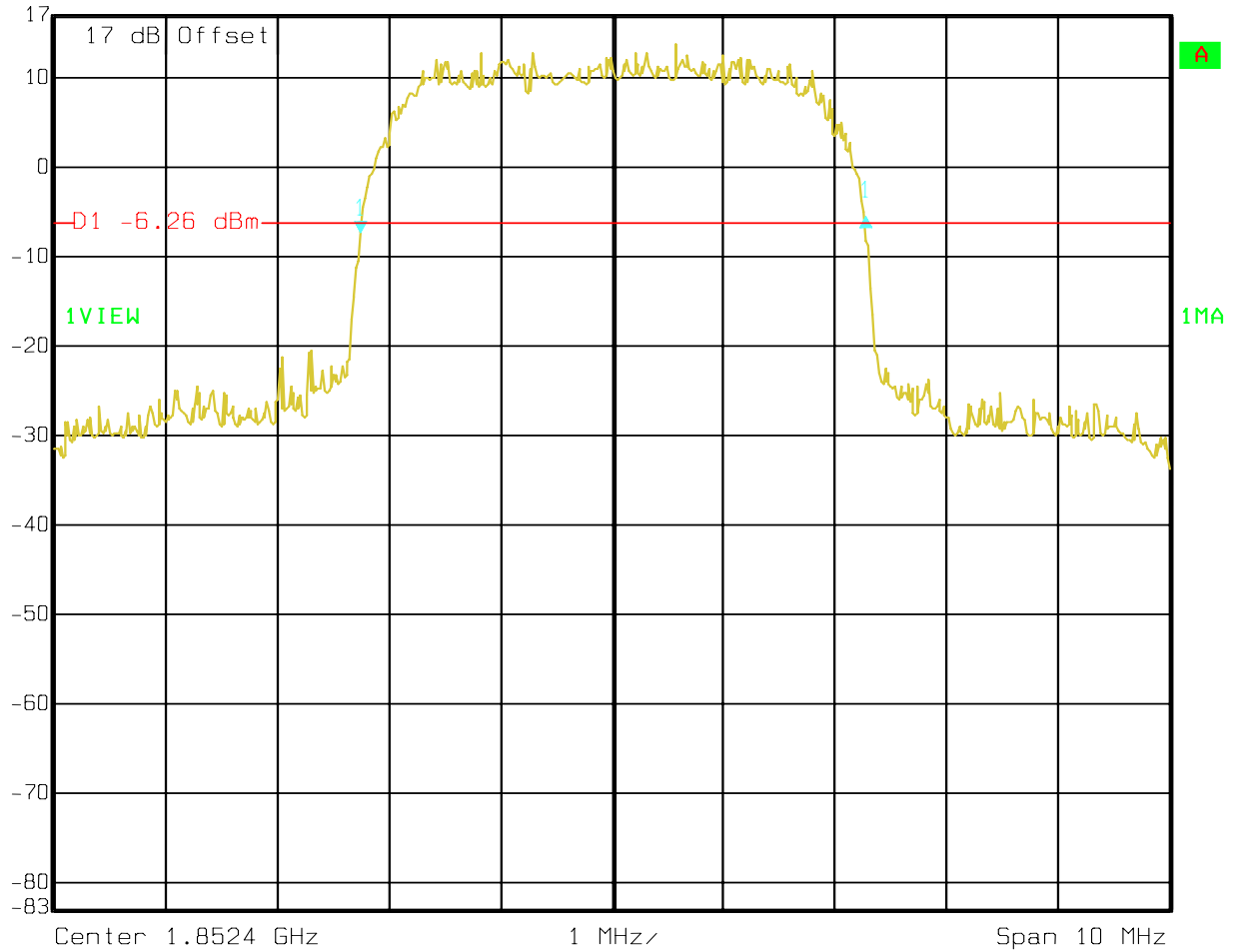


Date: 12.JUL.2006 13:07:18



**-20dB (PCS-1900)
CHANNEL 9262 FDD2**

 Delta 1 [T1] RBW 50 kHz RF Att 30 dB
Ref Lvl 17 dBm 1.92 dB VBW 50 kHz
17 dBm 4.52905812 MHz SWT 10 ms Unit dBm

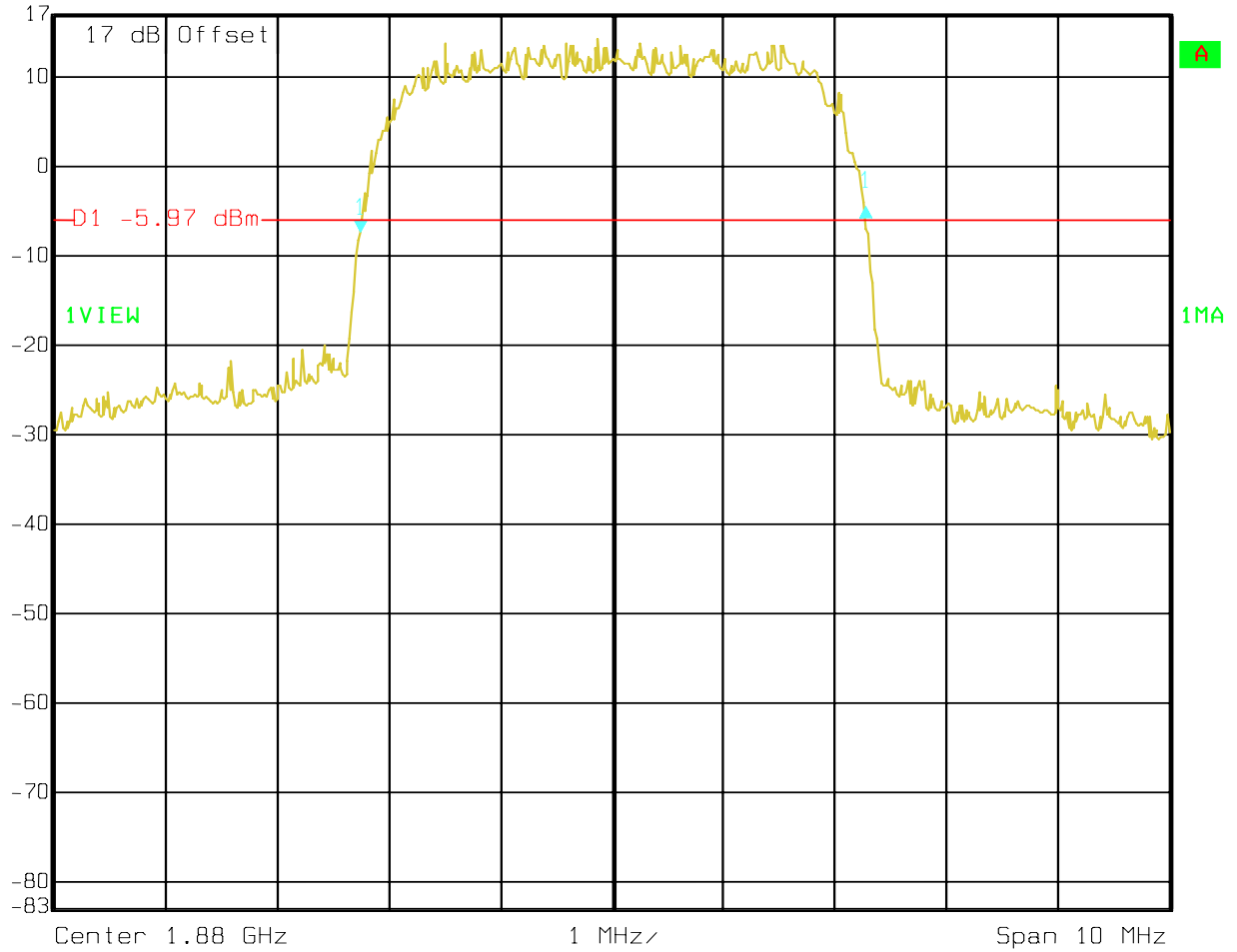


Date: 26.JUL.2006 14:27:53



**-20dB (PCS-1900)
CHANNEL 9400 FDD2**

 Delta 1 [T1] RBW 50 kHz RF Att 30 dB
Ref Lvl 2.88 dB VBW 50 kHz
17 dBm 4.52905812 MHz SWT 10 ms Unit dBm

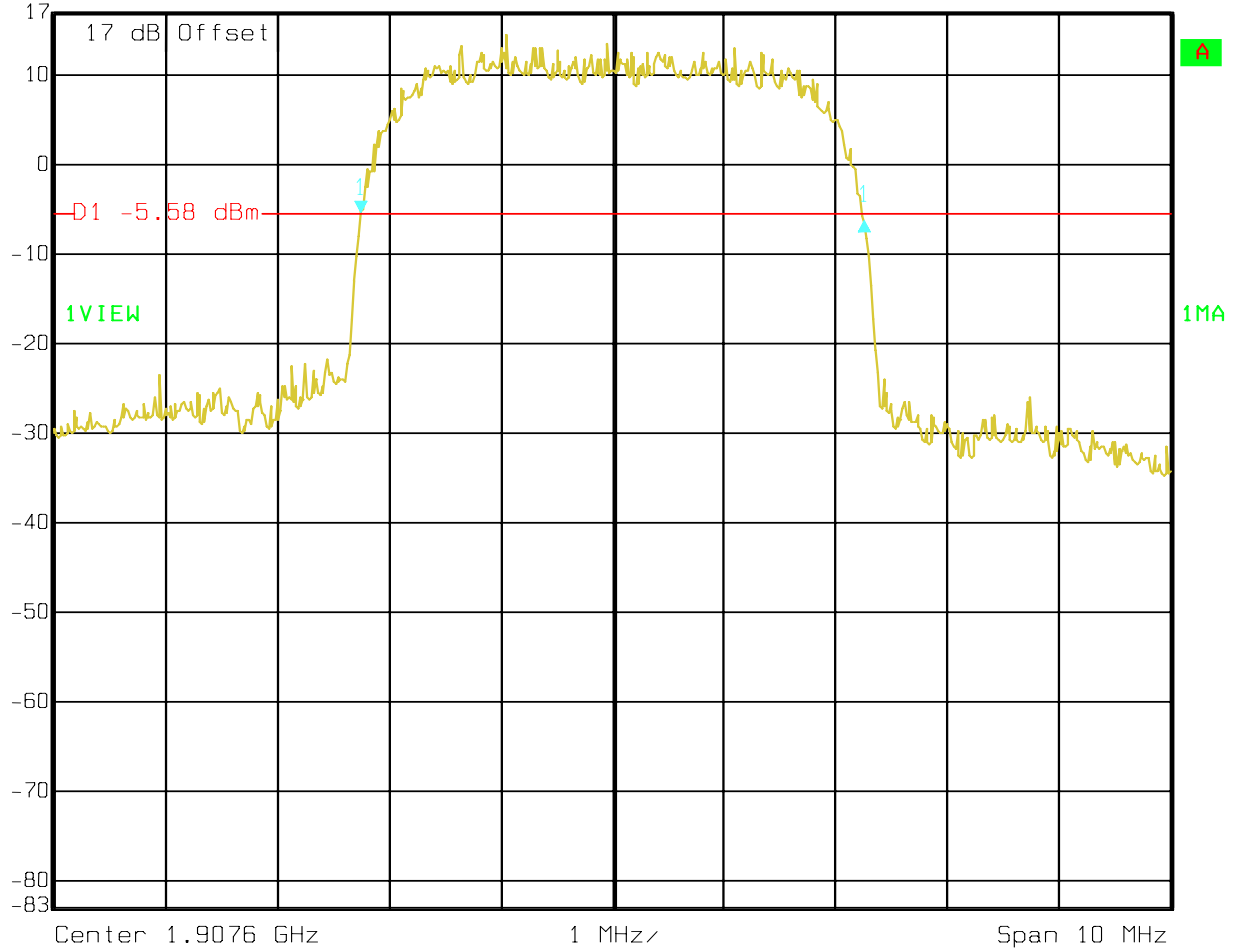


Date: 26.JUL.2006 14:26:10



**-20dB (PCS-1900)
CHANNEL 810 FDD2**

 Ref Lvl 17 dBm Delta 1 [T1] -0.65 dB RBW 50 kHz RF Att 30 dB
4.50901804 MHz VBW 50 kHz Unit dBm
SWT 10 ms

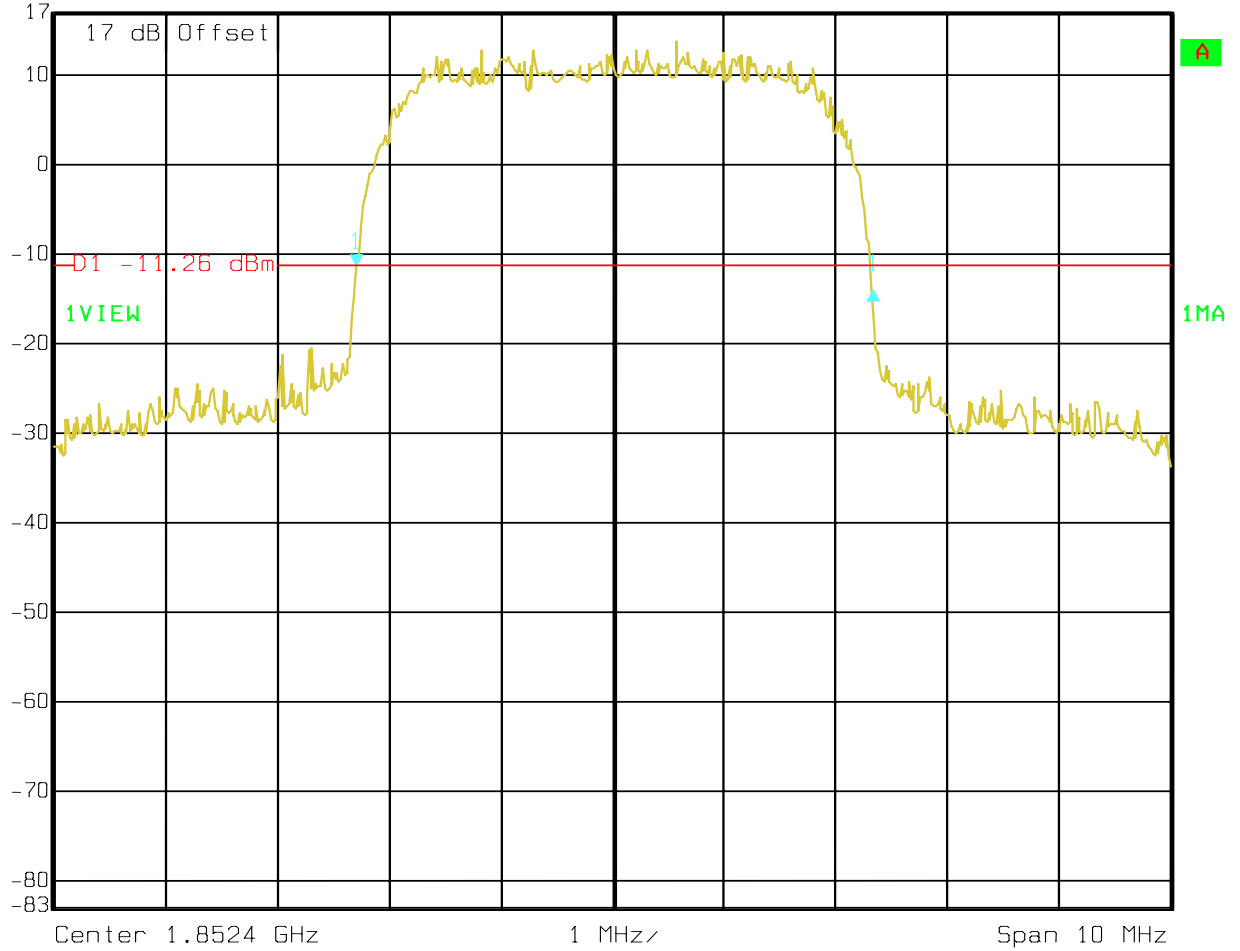


Date: 26.JUL.2006 14:24:33



**-26dB (PCS-1900)
CHANNEL 9262 FDD2**

 Delta 1 [T1] RBW 50 kHz RF Att 30 dB
Ref Lvl -2.41 dB VBW 50 kHz
17 dBm 4.62925852 MHz SWT 10 ms Unit dBm

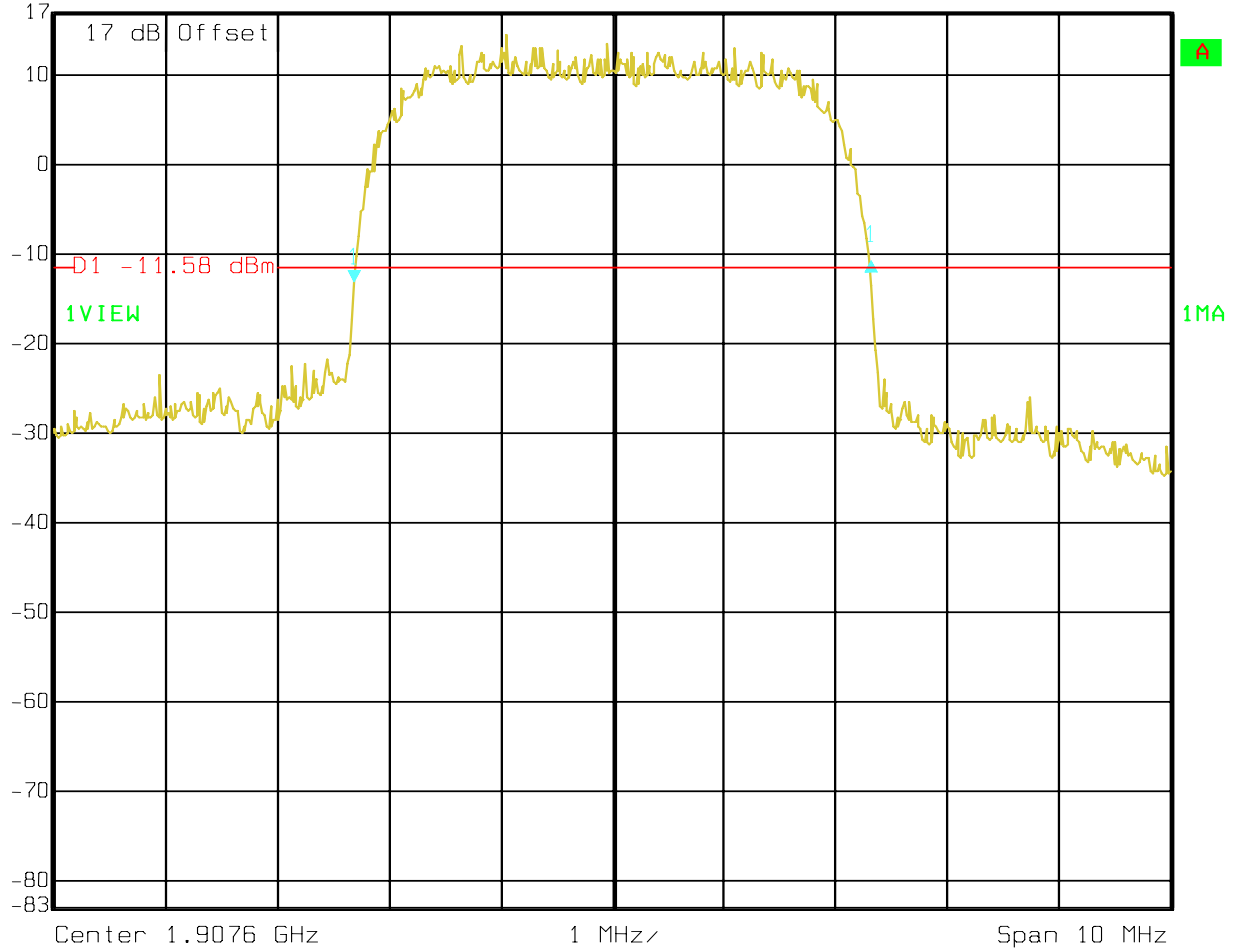


Date: 26.JUL.2006 14:29:10



**-26dB (PCS-1900)
CHANNEL 810 FDD2**

 Delta 1 [T1] RBW 50 kHz RF Att 30 dB
Ref Lvl 2.47 dB VBW 50 kHz
17 dBm 4.62925852 MHz SWT 10 ms Unit dBm



Date: 26.JUL.2006 14:25:12

5.3 Frequency Stability

5.3.1 Limit

For Hand carried battery powered equipment:

According to the JTC standard the frequency stability of the carrier shall be accurate to within 0.1 ppm of the received frequency from the base station. This accuracy is sufficient to meet Sec. 24.235, Frequency Stability. The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. As this transceiver is considered "Hand carried, battery powered equipment" Section 2.1055(d)(2) applies. This requires that the lower voltage for frequency stability testing be specified by the manufacturer. This transceiver is specified to operate with an input voltage of between 3.2VDC and 4.5VDC, with a nominal voltage of 3.7VDC. Operation above or below these voltage limits is prohibited by transceiver software in order to prevent improper operation as well as to protect components from overstress. These voltages represent a tolerance of -2.7% and +21.62%. For the purposes of measuring frequency stability these voltage limits are to be used.

Method of Measurement:

In order to measure the carrier frequency under the condition of AFC lock, it is necessary to make measurements with the EUT in a "call mode". This is accomplished with the use of R&S CMU 200 UNIVERSAL RADIO COMMUNICATION TESTER.

1. Measure the carrier frequency at room temperature.
2. Subject the EUT to overnight soak at -30 C.
3. With the EUT, powered via nominal voltage, connected to the CMU 200 and in a simulated call on mid channel (190 for GSM 850 & 4183 for FDD5 & 661 for PCS-1900&9400 for FDD2), measure the carrier frequency. These measurements should be made within 2 minutes of powering up the EUT, to prevent significant self-warming.
4. Repeat the above measurements at 10 C increments from -30 C to +50 C. Allow at least 1 1/2 hours at each temperature, unpowered, before making measurements.
5. Remeasure carrier frequency at room temperature with nominal voltage. Vary supply voltage from minimum voltage to maximum voltage, in 0.1Volt increments remeasuring carrier frequency at each voltage. Pause at nominal voltage for 1 1/2 hours unpowered, to allow any self-heating to stabilize, before continuing.
6. Subject the EUT to overnight soak at +50 C.
7. With the EUT, powered via nominal voltage, connected to the CMU 200 and in a simulated call on mid channel (190 for GSM 850 & 4183 for FDD5 & 661 for PCS-1900&9400 for FDD2), measure the carrier frequency. These measurements should be made within 2 minutes of powering up the EUT, to prevent significant self-warming.
8. Repeat the above measurements at 10 C increments from +50 C to -30 C. Allow at least 1 1/2 hours at each temperature, unpowered, before making measurements.
9. At all temperature levels hold the temperature to +/- 0.5 C during the measurement procedure.

For equipment powered by primary supply voltage:

According to the JTC standard the frequency stability of the carrier shall be accurate to within 0.1 ppm of the received frequency from the base station. This accuracy is sufficient to meet Sec. 24.235, Frequency Stability. The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

For this EUT section 2.1055(d)(1) applies. This requires to vary primary supply voltage from 85 to 115 percent of the nominal value for other than hand carried battery equipment.

5.3.2 FREQUENCY STABILITY (GSM-850)

Channel No. : 190 at 836.6 MHz

§2.1055 AFC FREQ ERROR VS. VOLTAGE

NOTE: Freq. Error (ppm) = Freq. Error (Hz) / 836.6

Voltage (VDC)	Frequency Error (Hz)	Frequency Error (ppm)
2.8	23	0.0274
3.8	19	0.0227

AFC FREQ ERROR vs. TEMPERATURE

TEMPERATURE (°C)	Frequency Error (Hz)	Frequency Error (ppm)
-30	-22	-0.0239
-20	-22	-0.0239
-10	46	0.0500
0	29	0.0347
+10	37	0.0442
+20	21	0.0251
+30	-9	-0.0108
+40	31	0.0371
+50	26	0.0311

5.3.3 FREQUENCY STABILITY (PCS-1900)

Channel No. : 661 at 1880 MHz

§2.1055 / §24.235 AFC FREQ ERROR vs. VOLTAGE

NOTE: Freq. Error (ppm) = Freq. Error (Hz) / 1880

Voltage (VDC)	Frequency Error (Hz)	Frequency Error (ppm)
2.8	32	0.0171
3.8	27	0.0144

AFC FREQ ERROR vs. TEMPERATURE

TEMPERATURE (°C)	Frequency Error (Hz)	Frequency Error (ppm)
-30	-25	-0.0106
-20	24	0.0128
-10	25	0.0106
0	19	0.0101
+10	33	0.0176
+20	27	0.0144
+30	-22	-0.0177
+40	14	0.0074
+50	25	0.0106

5.4 Spurious Emissions Conducted

5.4.1 FCC 2.1051 Measurements required: Spurious emissions at antenna terminals.

The radio frequency voltage or power generated within the equipment and appearing on a spurious frequency shall be checked at the equipment output terminals when properly loaded with a suitable artificial antenna. Curves or equivalent data shall show the magnitude of each harmonic and other spurious emission that can be detected when the equipment is operated under the conditions specified in FCC 2.1049 as appropriate. The magnitude of spurious emissions which are attenuated more than 20 dB below the permissible value need not be specified.

5.4.2 Limits:

5.4.2.1 **FCC 22.917 Emission limitations for cellular equipment.**

The rules in this section govern the spectral characteristics of emissions in the Cellular Radiotelephone Service.

(a) *Out of band emissions.* The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

(b) *Measurement procedure.* Compliance with these provisions is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (*i.e.* 100 kHz of 1 percent of emission bandwidth, as specified). 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 below the transmitter power.

5.4.2.2 **FCC 24.238 Emission limitations for Broadband PCS equipment.**

The rules in this section govern the spectral characteristics of emissions in the Broadband Personal Communications Service.

(a) *Out of band emissions.* The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

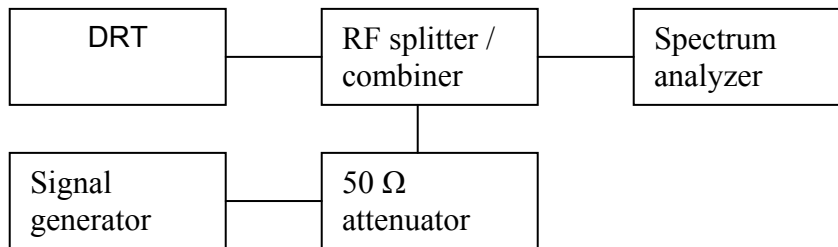
(b) *Measurement procedure.* Compliance with these provisions is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to

improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (*i.e.* 100 kHz of 1 percent of emission bandwidth, as specified). 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 below the transmitter power.

5.4.3 Conducted out of band emissions measurement procedure:

Based on TIA-603C 2004

2.2.13 Unwanted Emissions: Conducted Spurious



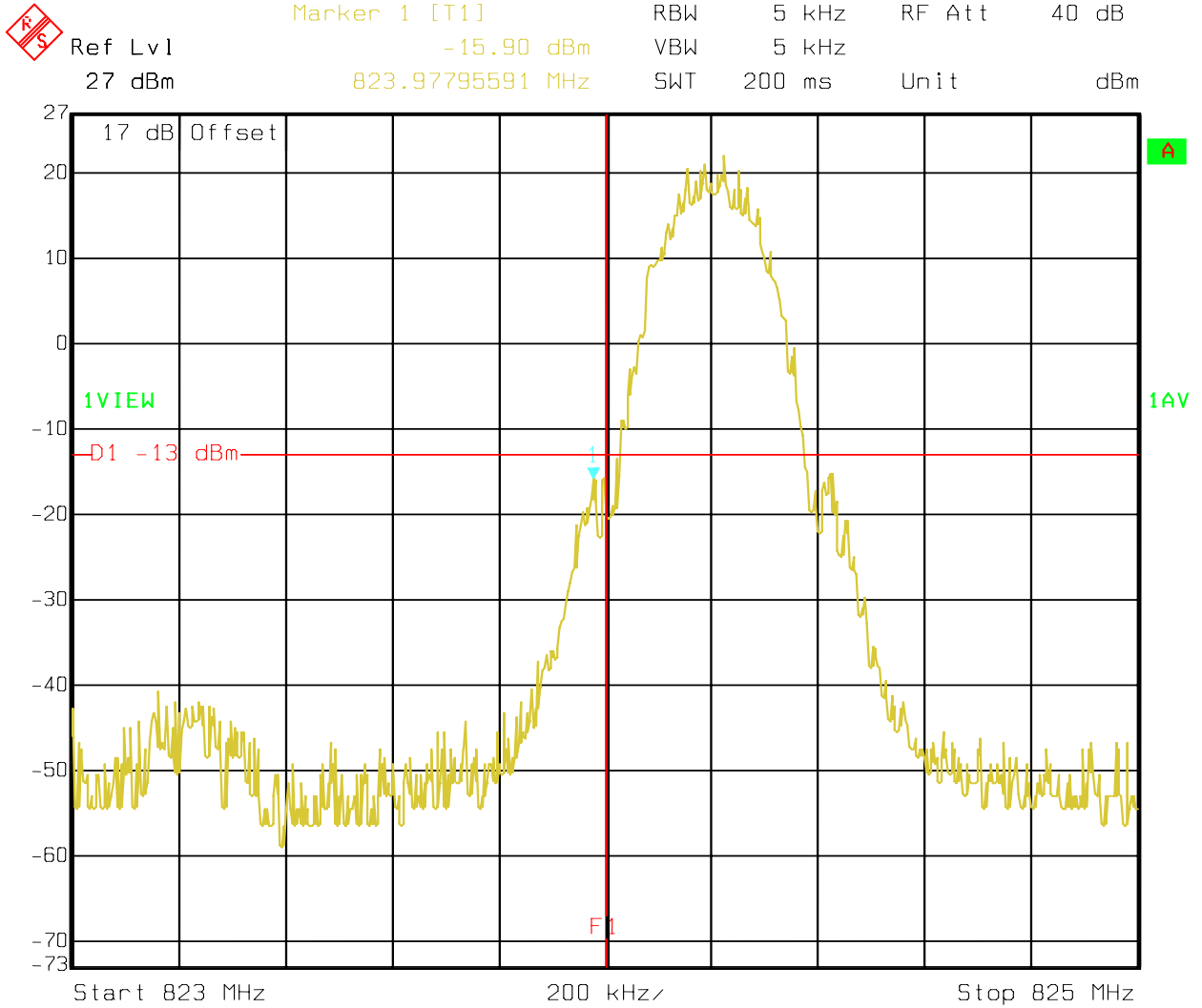
1. Connect the equipment as shown in the above diagram.
2. Set the spectrum analyzer to measure peak hold with the required settings.
3. Set the signal generator to a known output power and record the path loss in dB (**LOSS**) for frequencies up to the tenth harmonic of the EUT's carrier frequency. **LOSS** = Generator Output Power (dBm) – Analyzer reading (dBm).
4. Replace the signal generator with the EUT.
5. Adjust the settings of the Digital Radiocommunication Tester (DRT) to set the EUT to its maximum power at the required channel.
6. Set the spectrum analyzer to measure peak hold with the required settings. Offset the spectrum analyzer reference level by the path loss measured above.
7. Measure and record all spurious emissions up to the tenth harmonic of the carrier frequency.
8. Measurements are to be performed with the EUT set to the low, middle and high channel of each frequency band.
9. If necessary steps 6 and 7 may be performed with the spectrum analyzer set to average detector.

(**note:** Step 3 above is performed prior to testing and **LOSS** is recorded by test software. Steps 2, 6, and 7 above are performed with test software.)



5.4.4 Band Edge Results GSM-850

GSM-850 Lower Band Edge CHANNEL 128



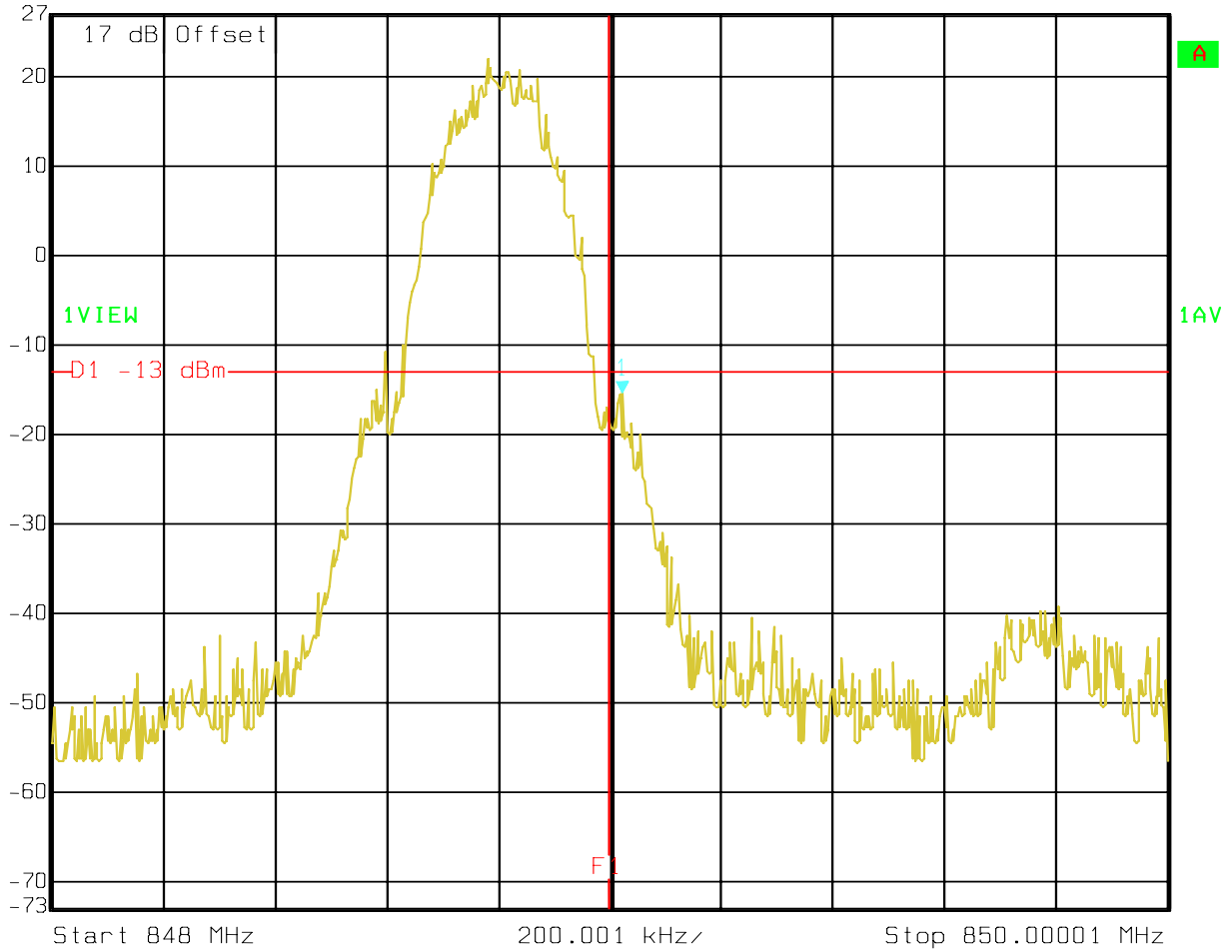
Date: 11.JUL.2006 11:23:41



GSM-850 Higher Band Edge CHANNEL 251



Marker 1 [T1] RBW 5 kHz RF Att 40 dB
Ref Lvl -15.31 dBm VBW 5 kHz
27 dBm 849.02203920 MHz SWT 205 ms Unit dBm



Date: 11.JUL.2006 11:29:07

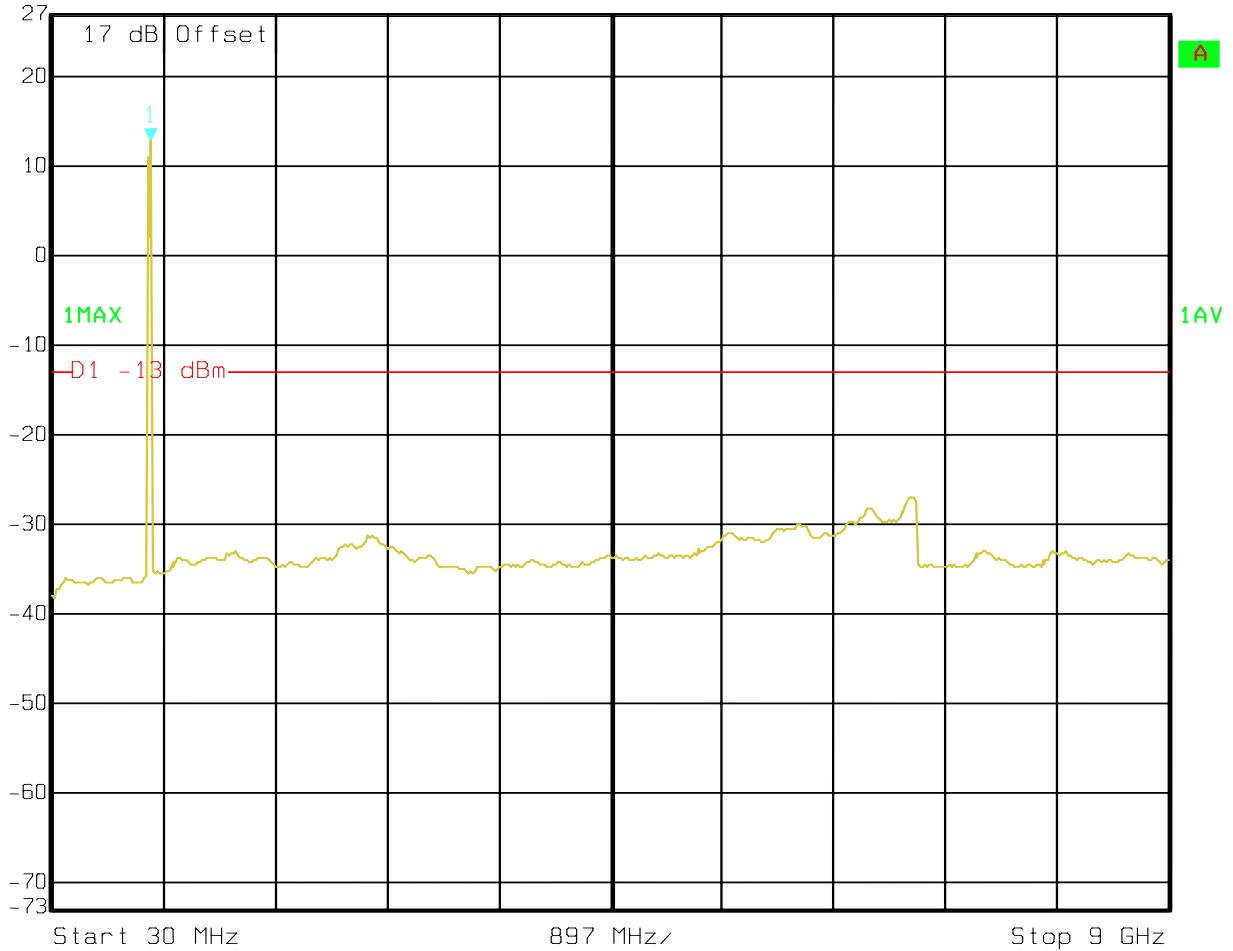


5.4.5 Conducted Spurious Results GSM-850

CHANNEL 128 (GSM-850)
30MHz – 9GHz

Note: The peak above the limit line is the carrier freq. at ch-128.

	Marker 1 [T1]	RBW	1 MHz	RF Att	40 dB
	Ref Lvl	12.93 dBm	VBW	1 MHz	
	27 dBm	824.20000000 MHz	SWT	52 ms	Unit dBm

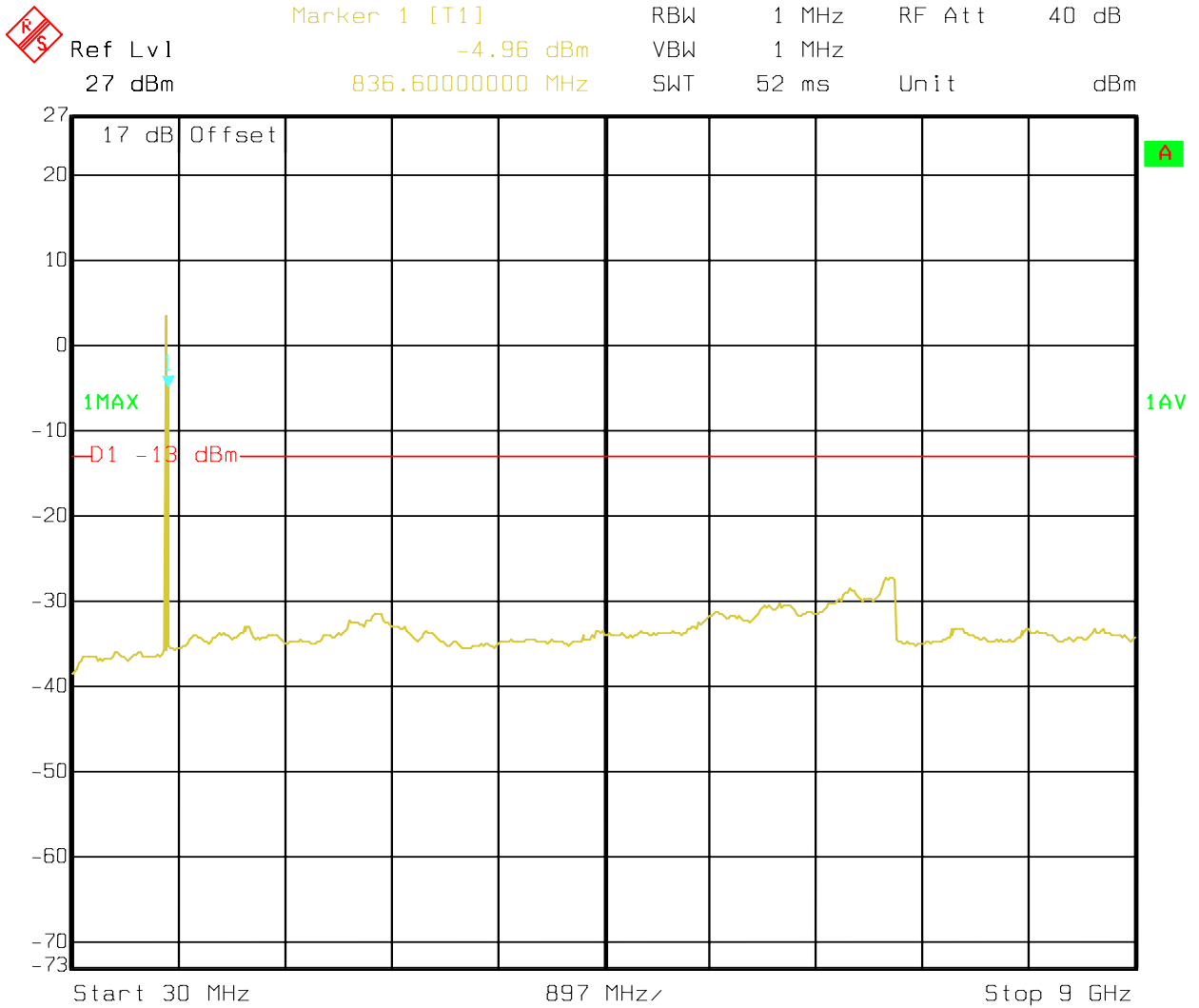


Date: 11.JUL.2006 11:34:59



**CHANNEL 190 (GSM-850)
30MHz – 9GHz**

Note: The peak above the limit line is the carrier freq. at ch-190.



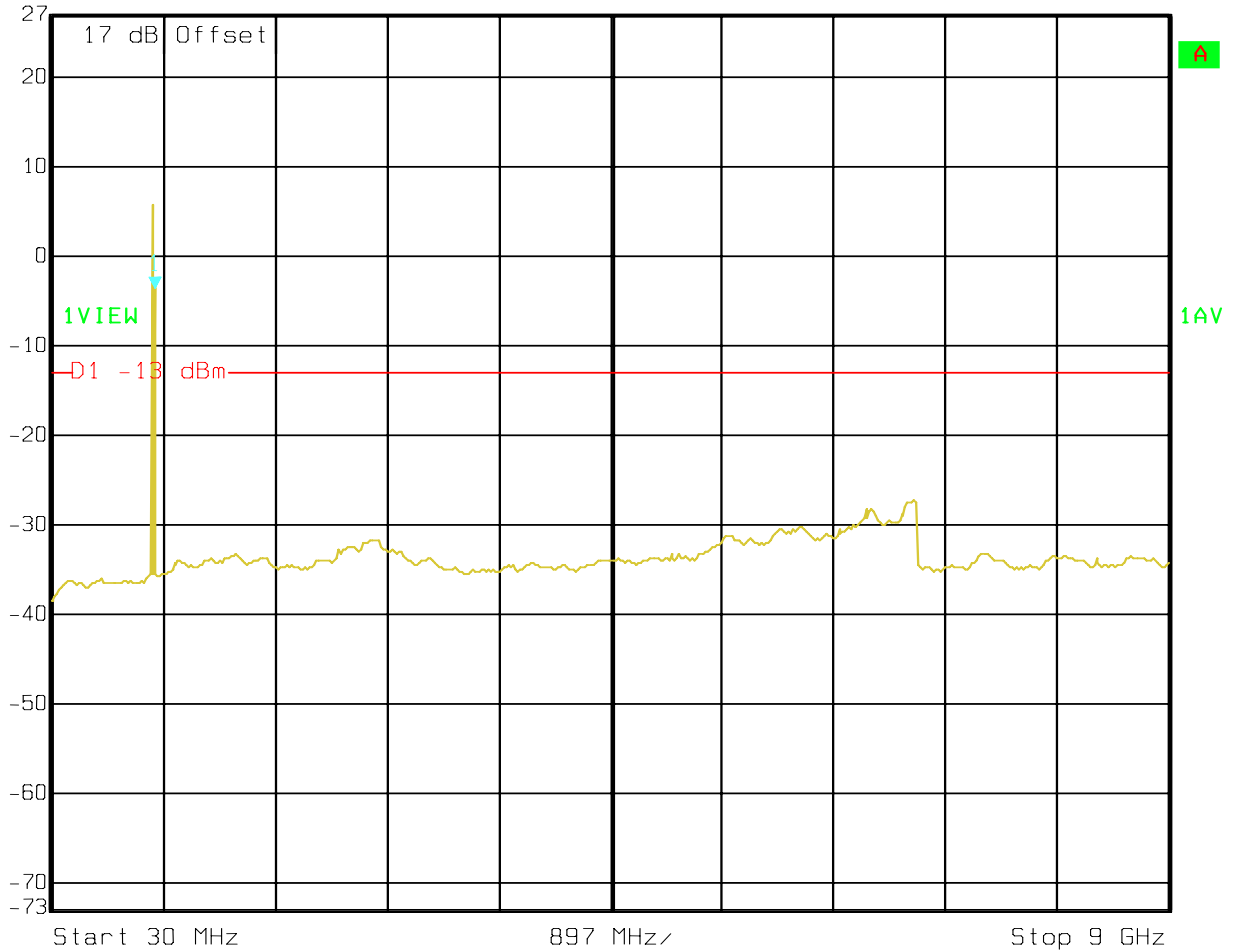
Date: 11.JUL.2006 11:37:10



CHANNEL 251 (GSM-850)
30MHz – 9GHz

Note: The peak above the limit line is the carrier freq. at ch-251.

 Ref Lvl 27 dBm Marker 1 [T1] -3.67 dBm RBW 1 MHz RF Att 40 dB
Unit dBm 848.8000000 MHz VBW 1 MHz SWT 52 ms



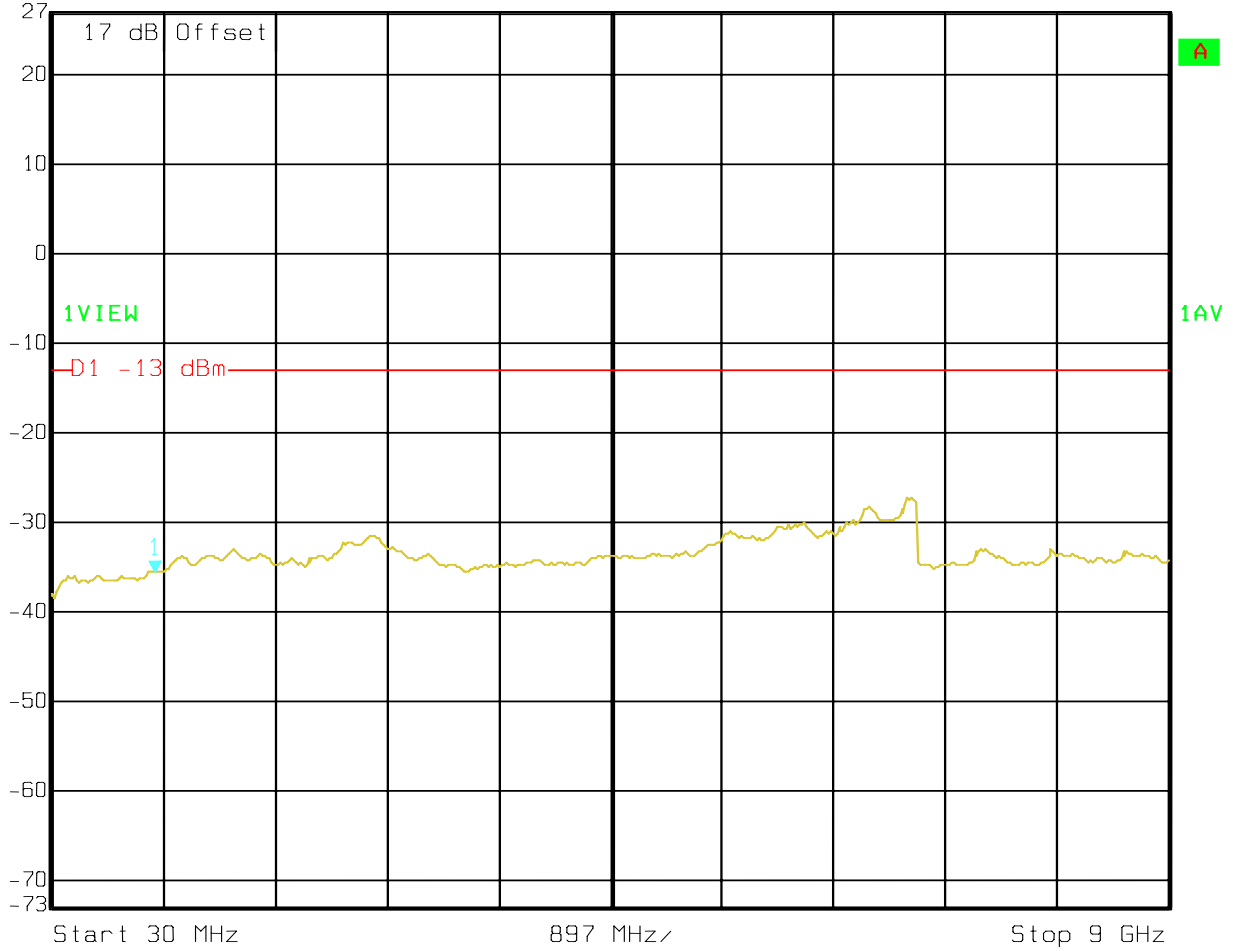
Date: 11.JUL.2006 11:41:00



**IDLE (GSM-850)
30MHz – 9GHz**



Ref Lvl	Marker 1 [T1]	RBW	1 MHz	RF Att	40 dB
27 dBm	-35.50 dBm	VBW	1 MHz		
	848.80000000 MHz	SWT	52 ms	Unit	dBm

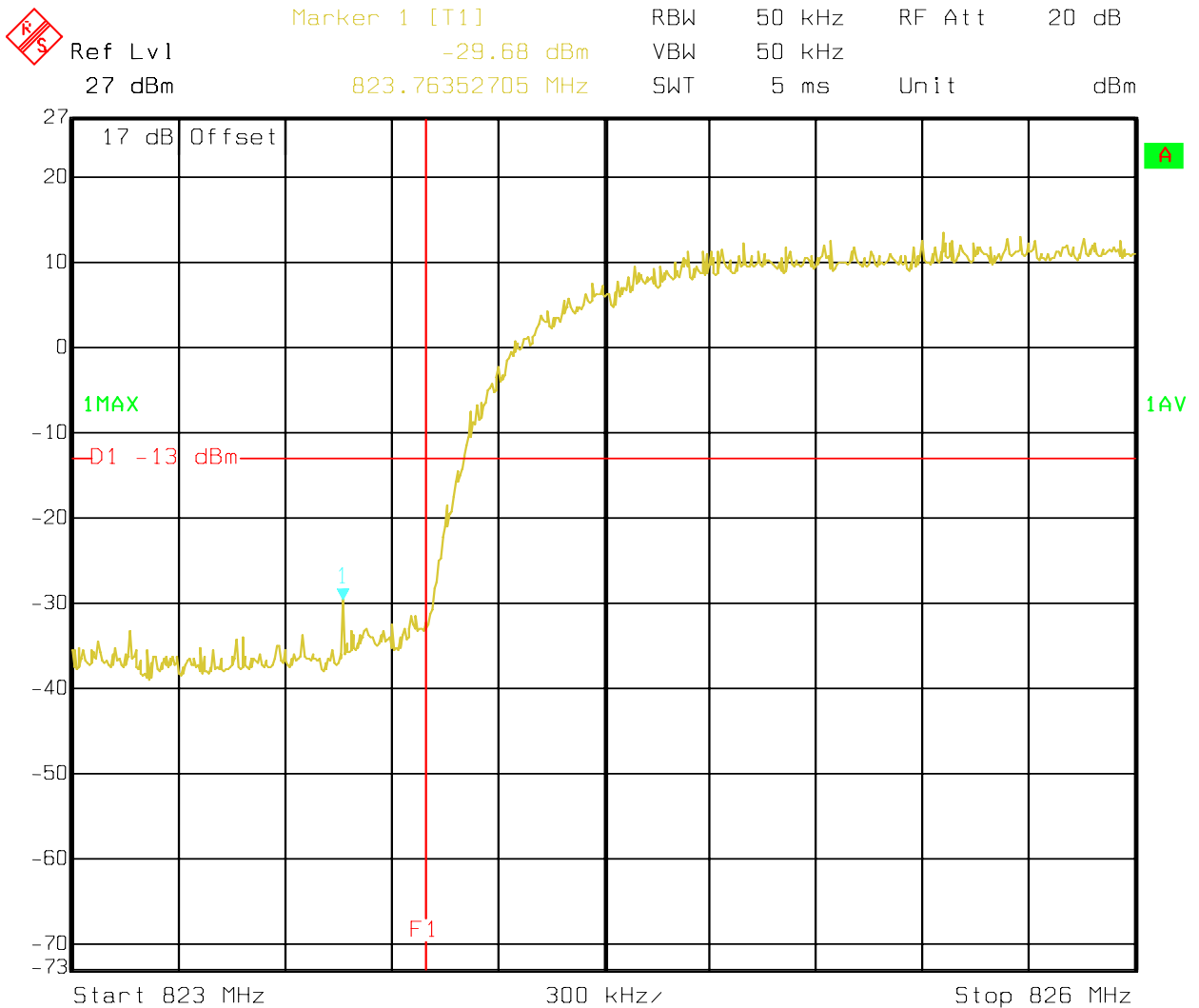


Date: 11.JUL.2006 11:43:39



5.4.6 Band Edge Results GSM-850 FDD5

GSM-850 Lower Band Edge CHANNEL 4132 FDD5

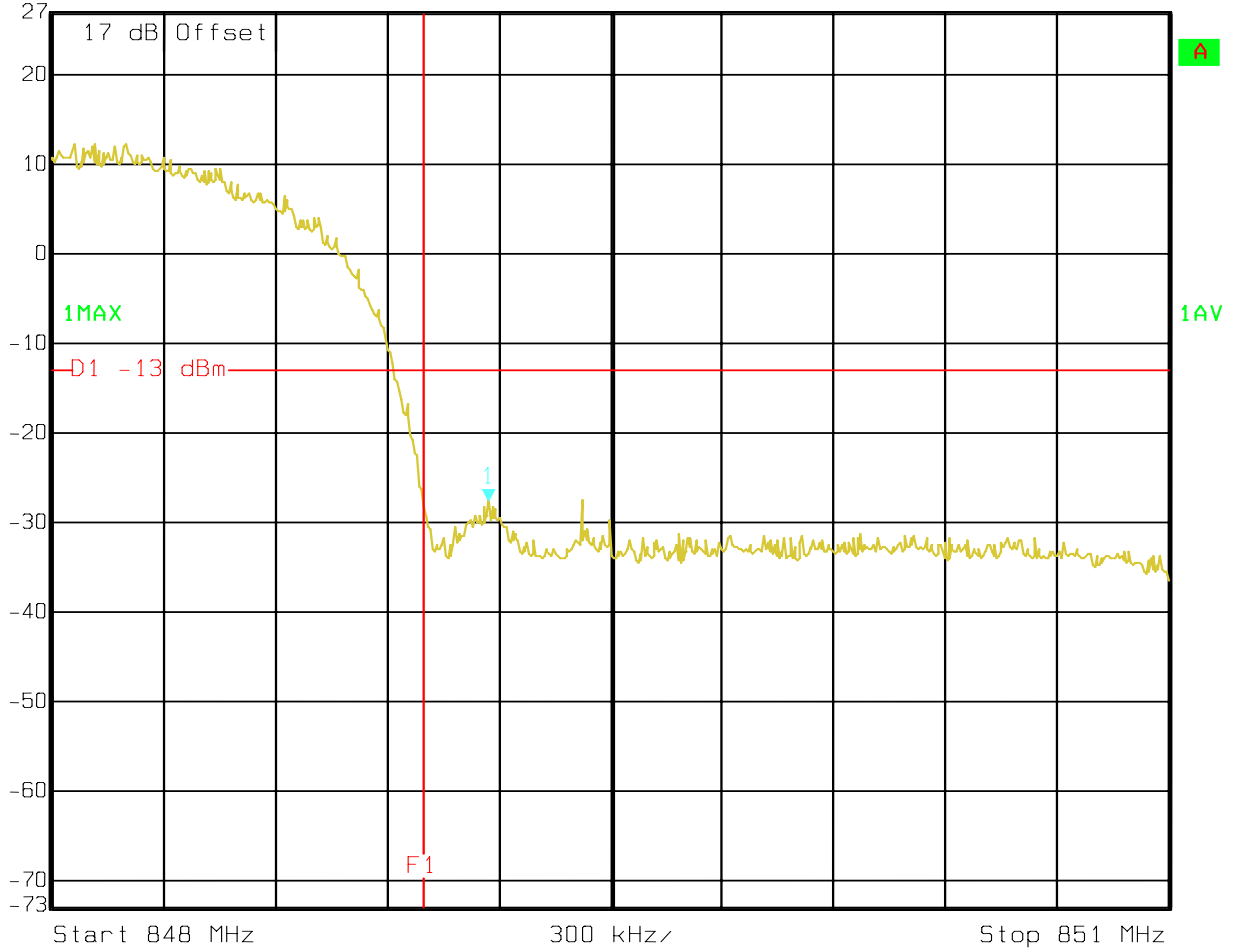


Date: 26.JUL.2006 11:32:53



GSM-850 Higher Band Edge CHANNEL 4233 FDD5

 Ref Lvl 27 dBm Marker 1 [T1] -27.58 dBm RBW 50 kHz RF Att 20 dB
849.17234469 MHz VBW 50 kHz Unit dBm
SWT 5 ms



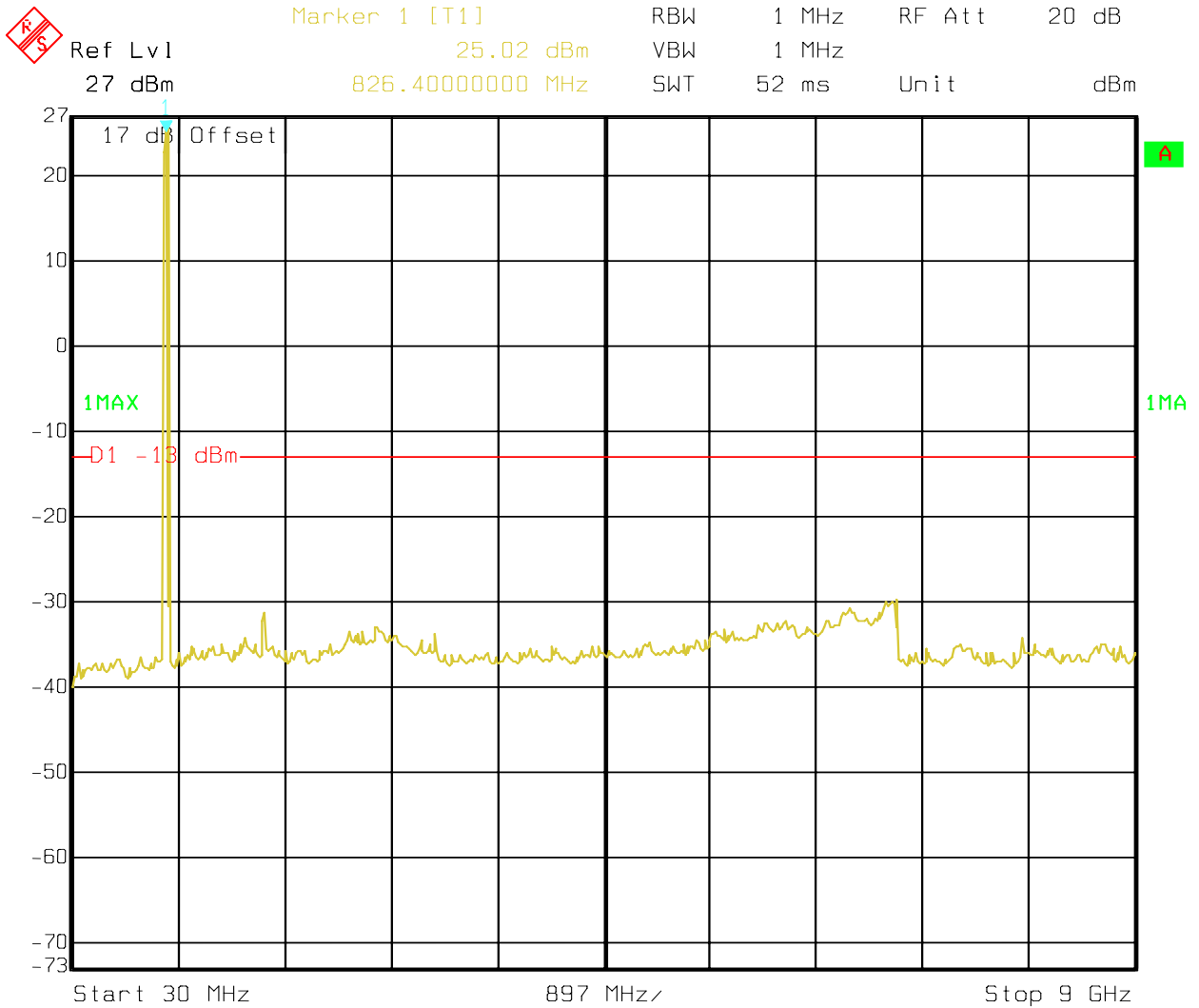
Date: 26.JUL.2006 11:30:29



5.4.7 Conducted Spurious Results GSM-850 FDD5

CHANNEL 4132 (GSM-850 FDD5)
30MHz – 9GHz

Note: The peak above the limit line is the carrier freq. at ch-4132.

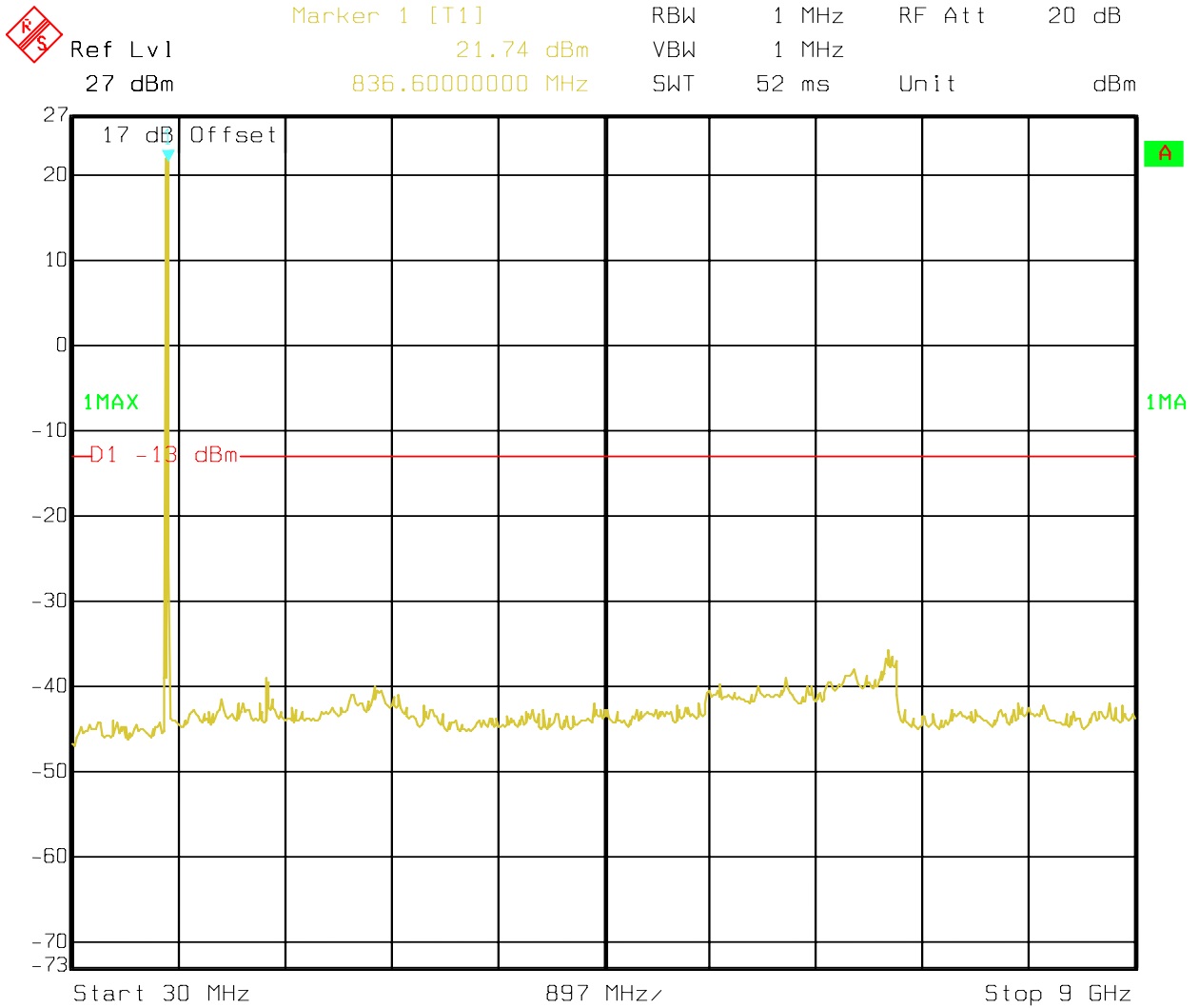


Date: 26.JUL.2006 10:16:09



**CHANNEL 4183 (GSM-850 FDD5)
30MHz – 9GHz**

Note: The peak above the limit line is the carrier freq. at ch-4183.

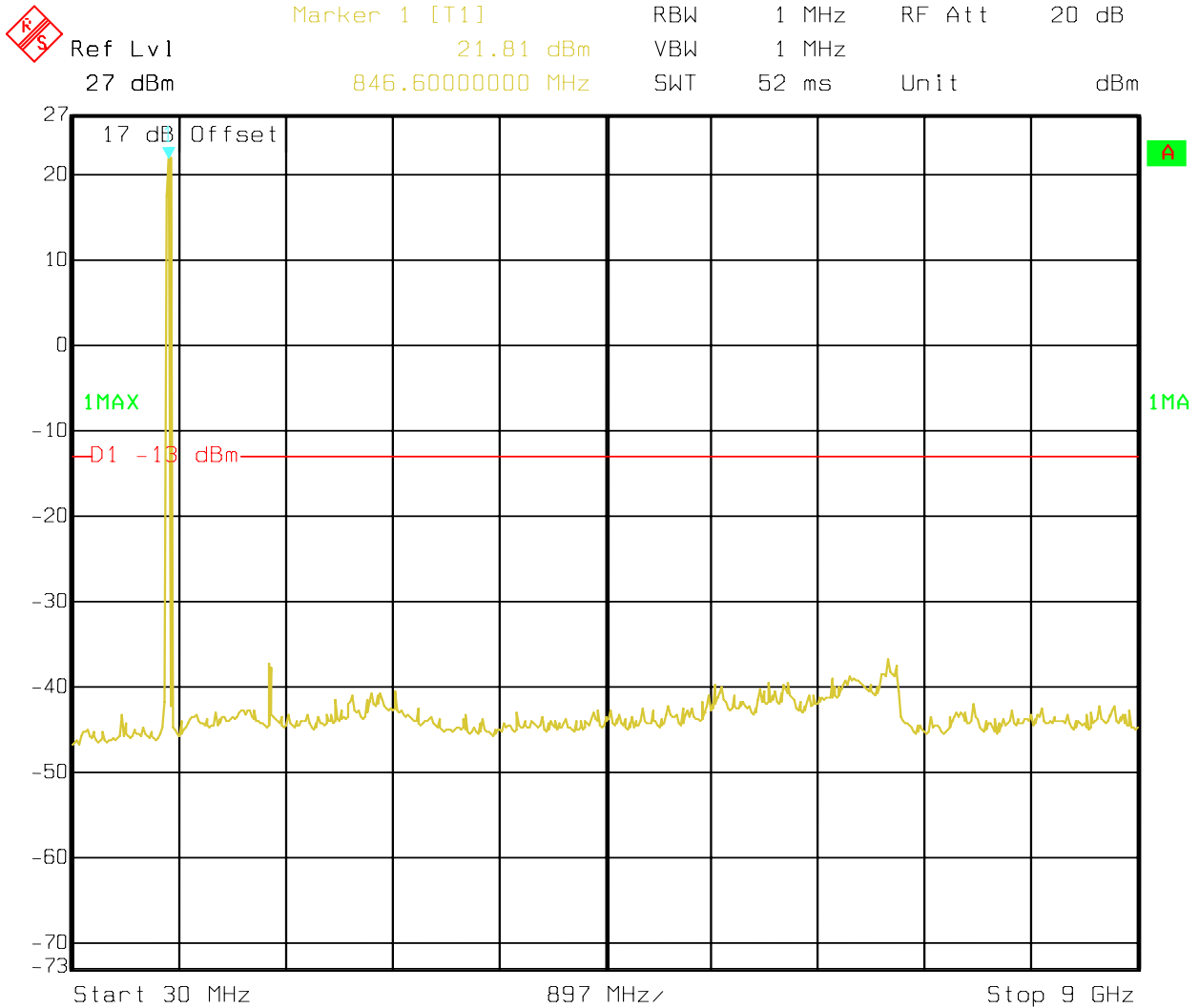


Date: 26.JUL.2006 10:17:41



**CHANNEL 4233 (GSM-850 FDD5)
30MHz – 9GHz**

Note: The peak above the limit line is the carrier freq. at ch-4233.



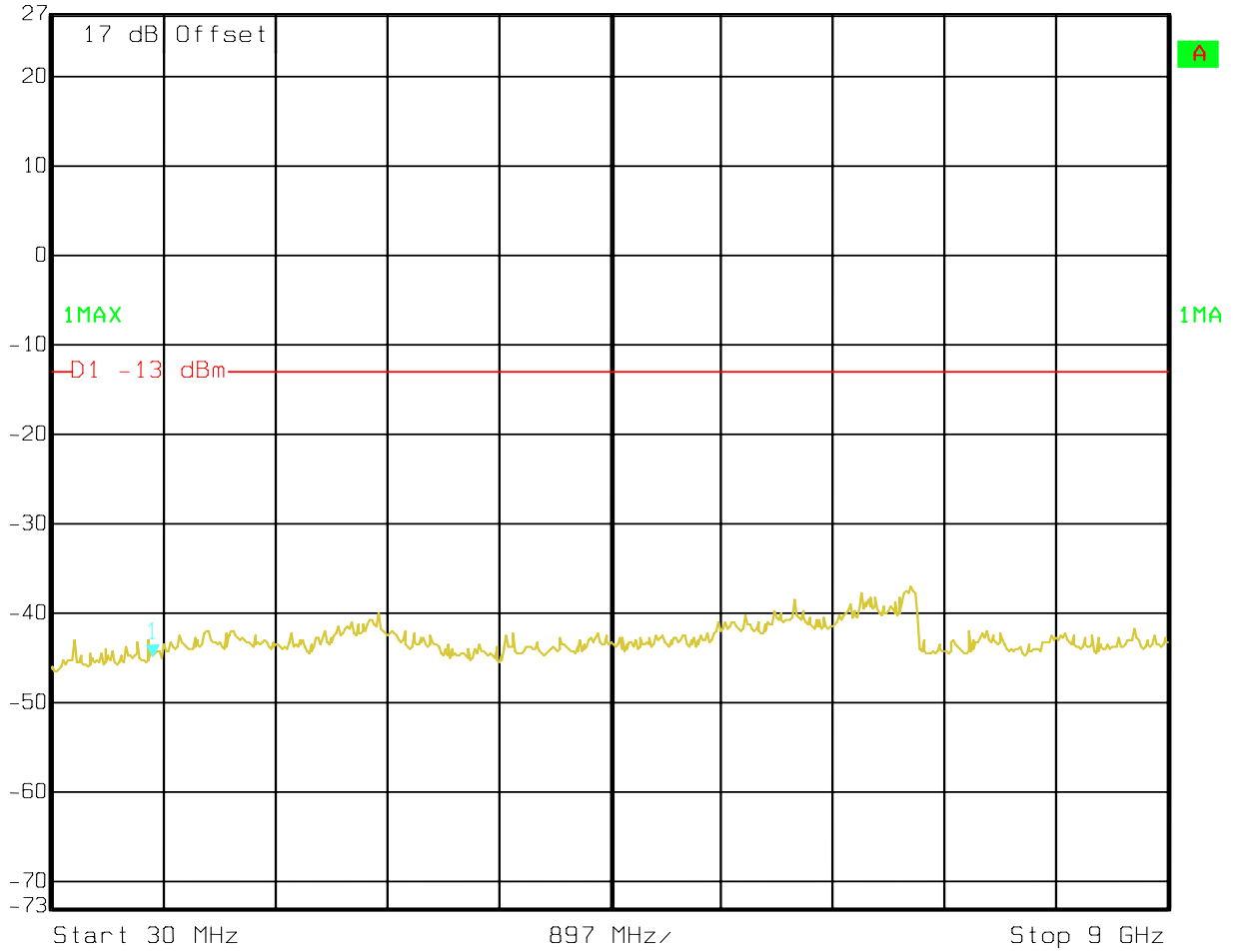
Date: 26.JUL.2006 10:18:59



IDLE (GSM-850 FDD5)
30MHz – 9GHz



Marker 1 [T1] RBW 1 MHz RF Att 20 dB
Ref Lvl -44.89 dBm VBW 1 MHz
27 dBm 846.60000000 MHz SWT 52 ms Unit dBm

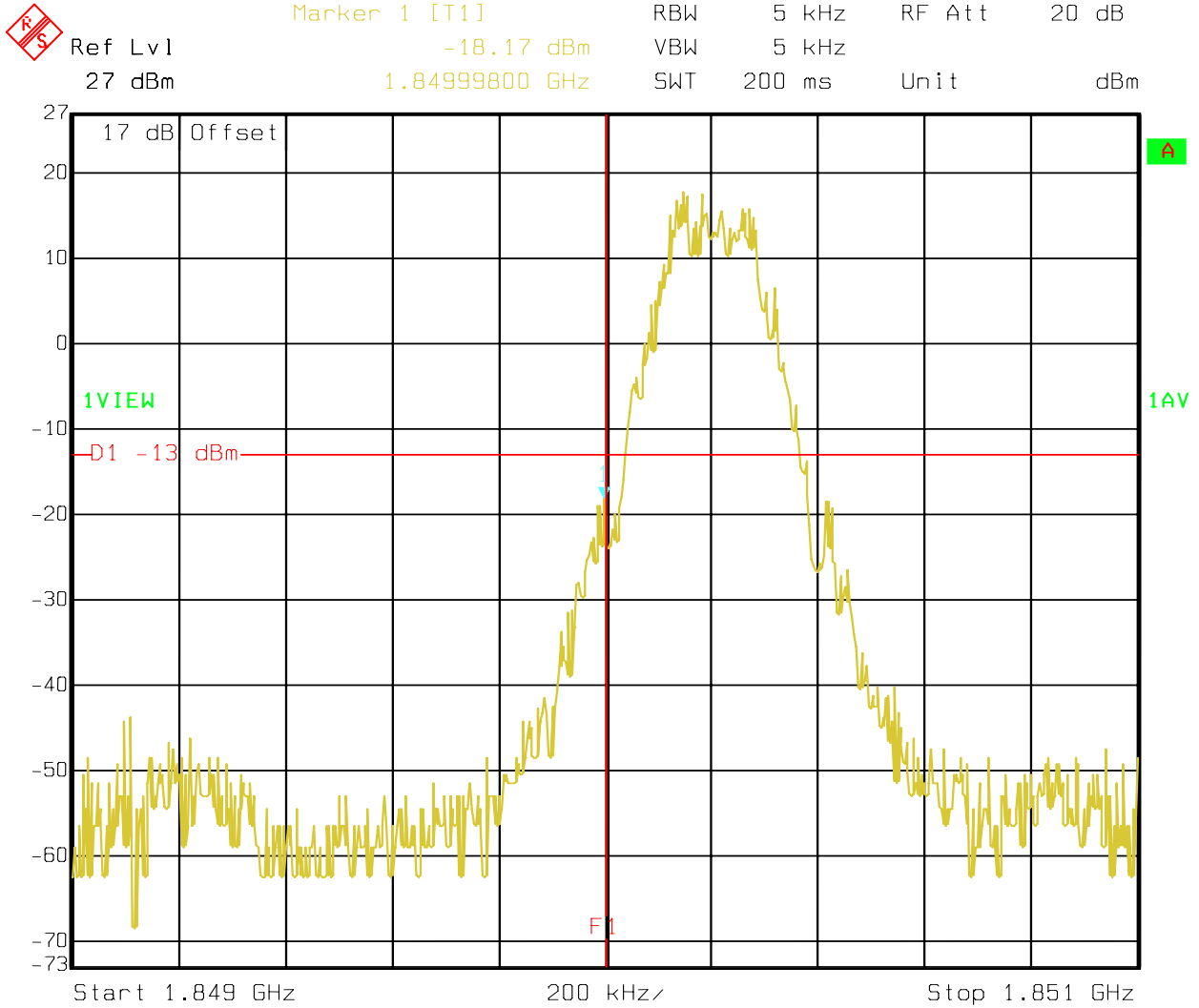


Date: 26.JUL.2006 10:20:03



5.4.8 Band Edge Results PCS-1900

PCS-1900 Lower Band Edge CHANNEL 512

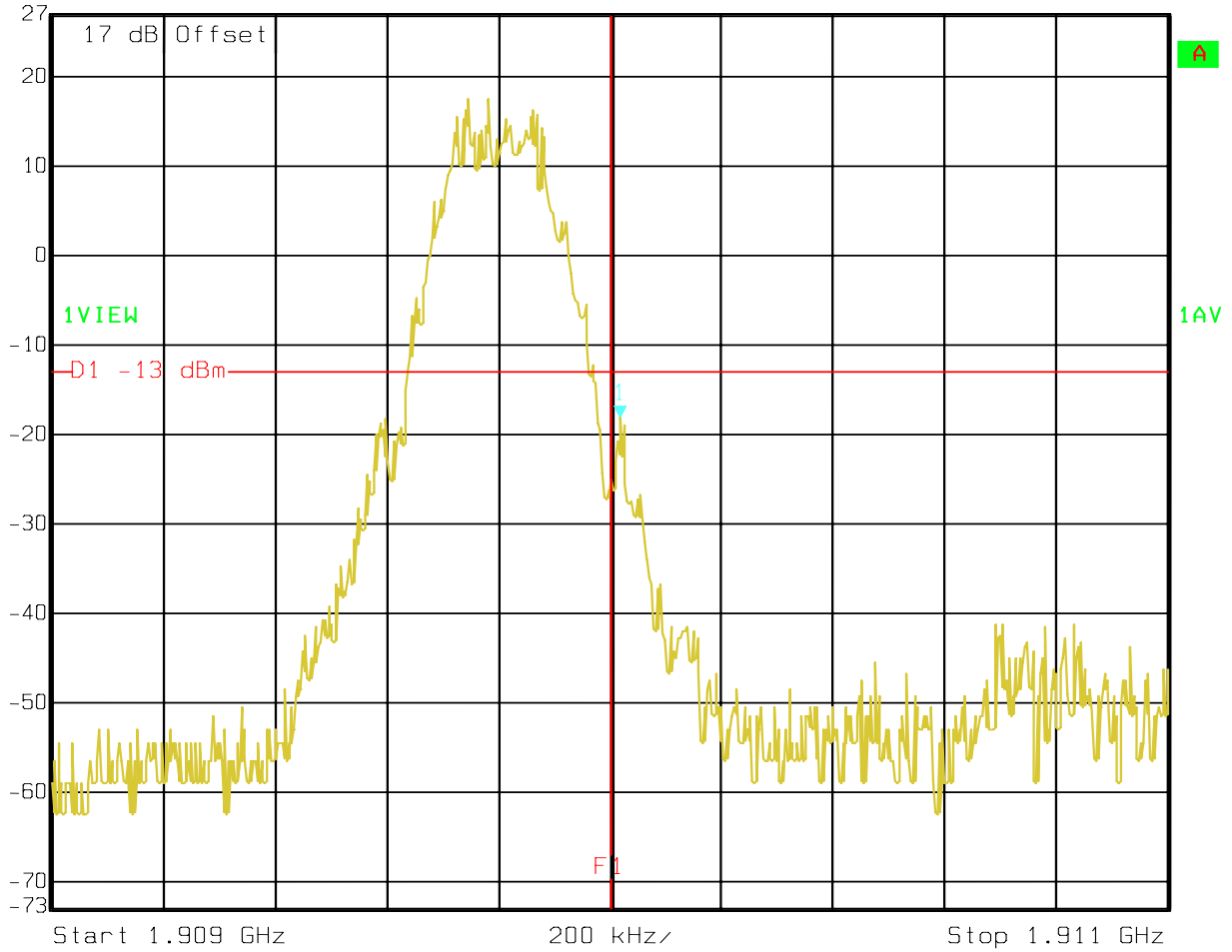


Date: 12.JUL.2006 13:10:46

PCS-1900 Higher Band Edge CHANNEL 810



Marker 1 [T1] RBW 5 kHz RF Att 20 dB
Ref Lvl -18.09 dBm VBW 5 kHz
27 dBm 1.91001944 GHz SWT 200 ms Unit dBm

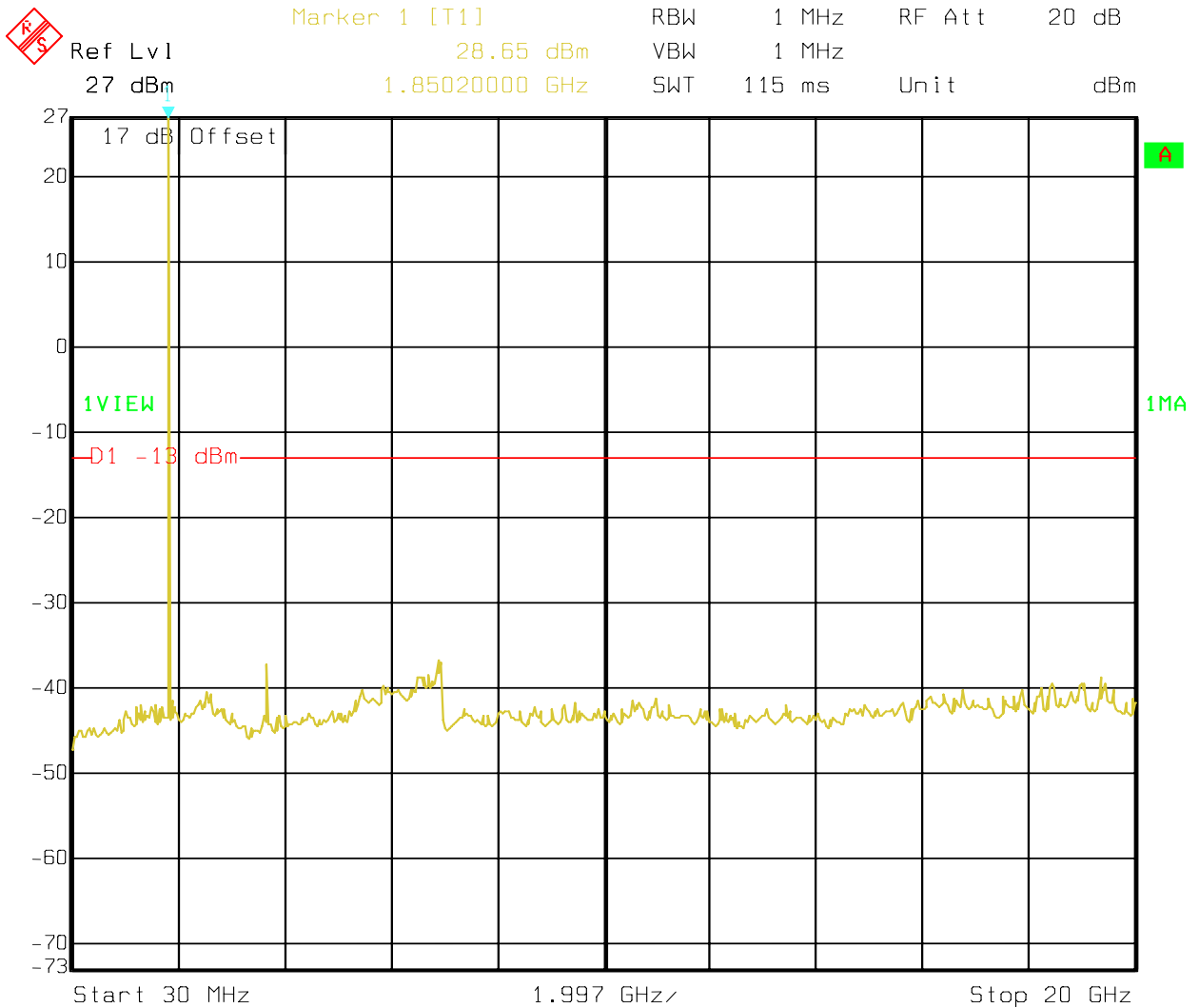


Date: 12.JUL.2006 13:09:03

5.4.9 Conducted Spurious Results PCS-1900

CHANNEL 512 (PCS-1900)
30MHz – 20GHz

Note: The peak above the limit line is the carrier freq. at ch-512

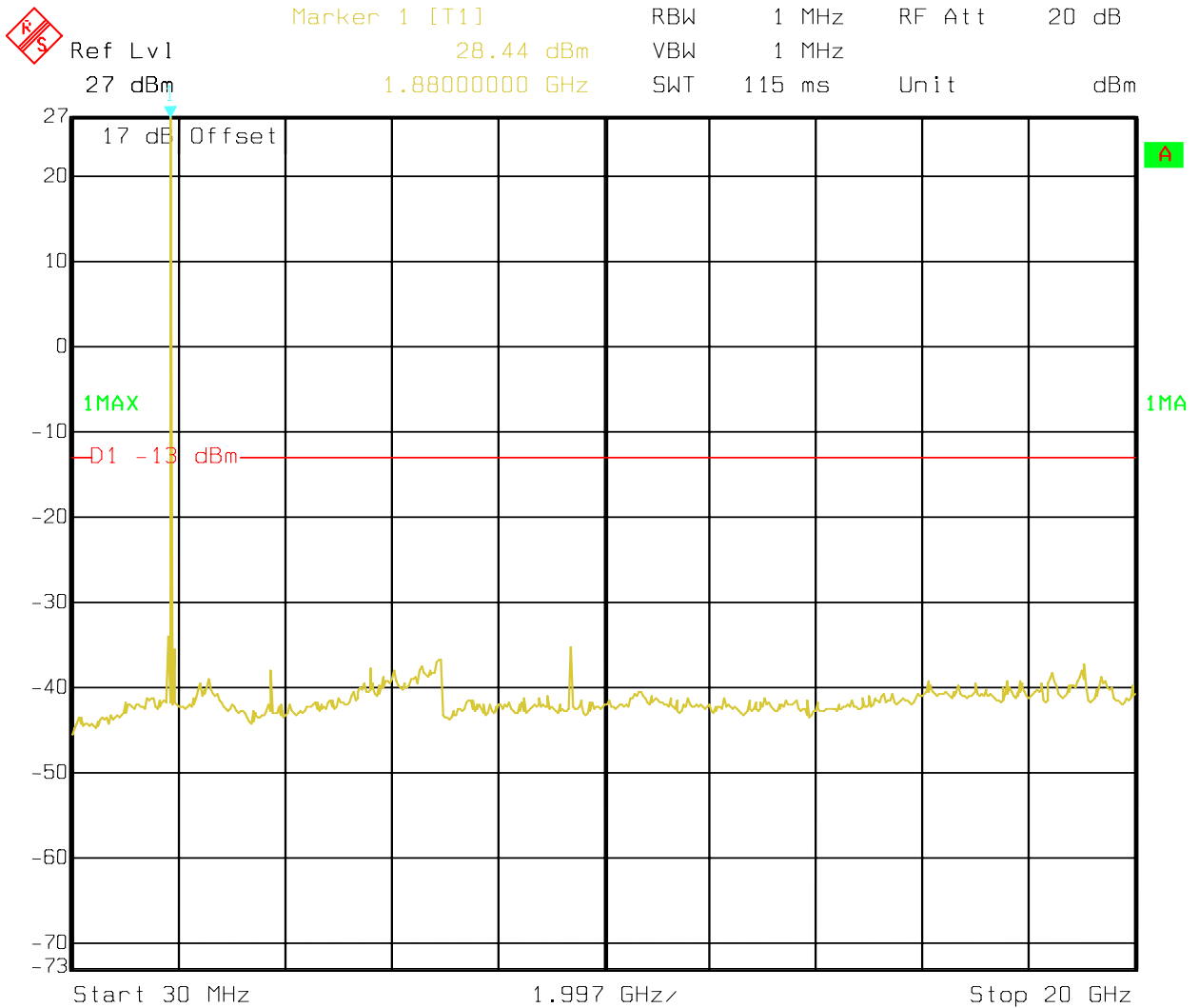


Date: 12.JUL.2006 12:44:37



CHANNEL 661 (PCS-1900)
30MHz – 20GHz

Note: The peak above the limit line is the carrier freq. at ch-661

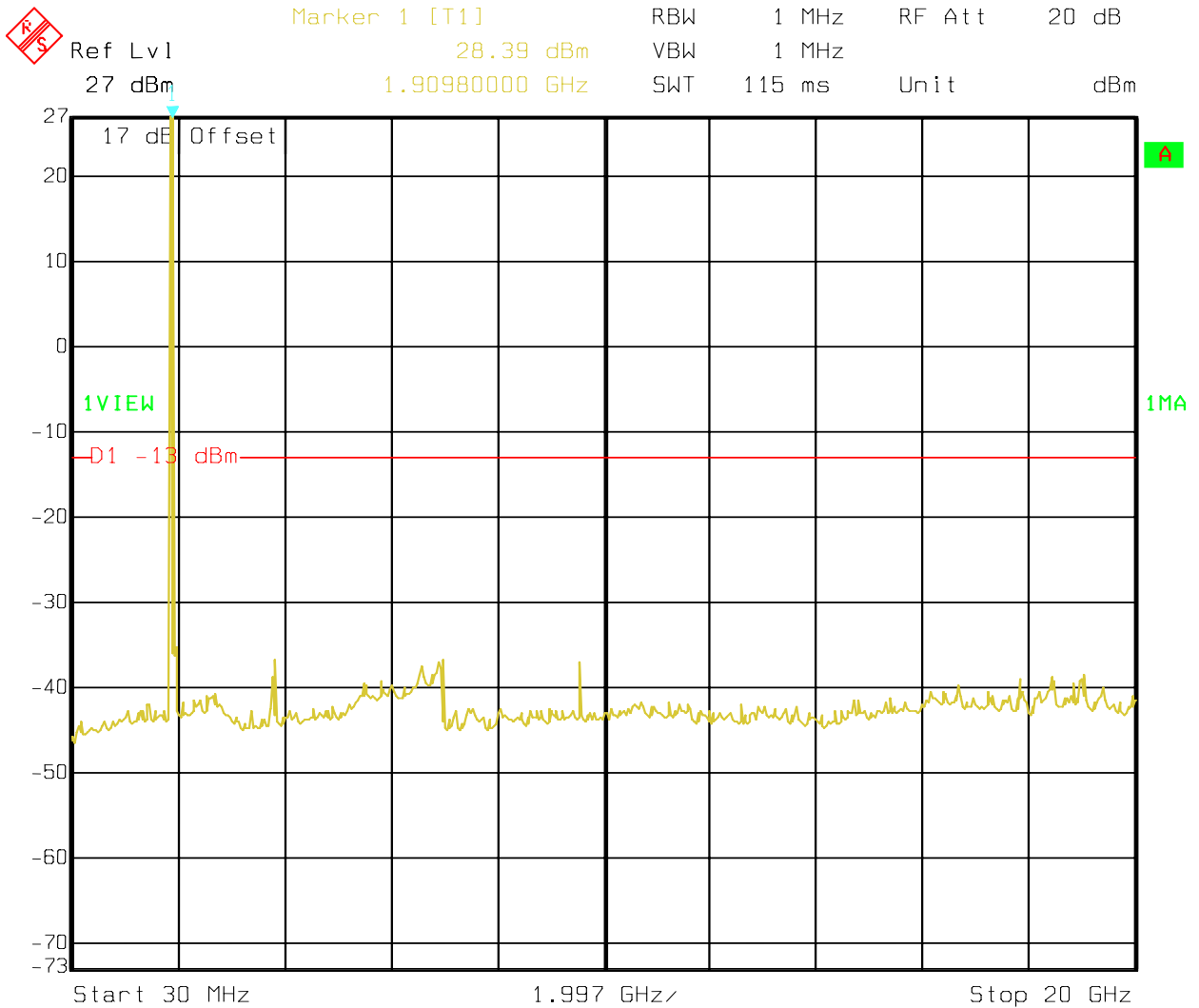


Date: 11.JUL.2006 14:07:26



CHANNEL 810 (PCS-1900)
30MHz – 20GHz

Note: The peak above the limit line is the carrier freq. at ch-810



Date: 11.JUL.2006 14:02:03

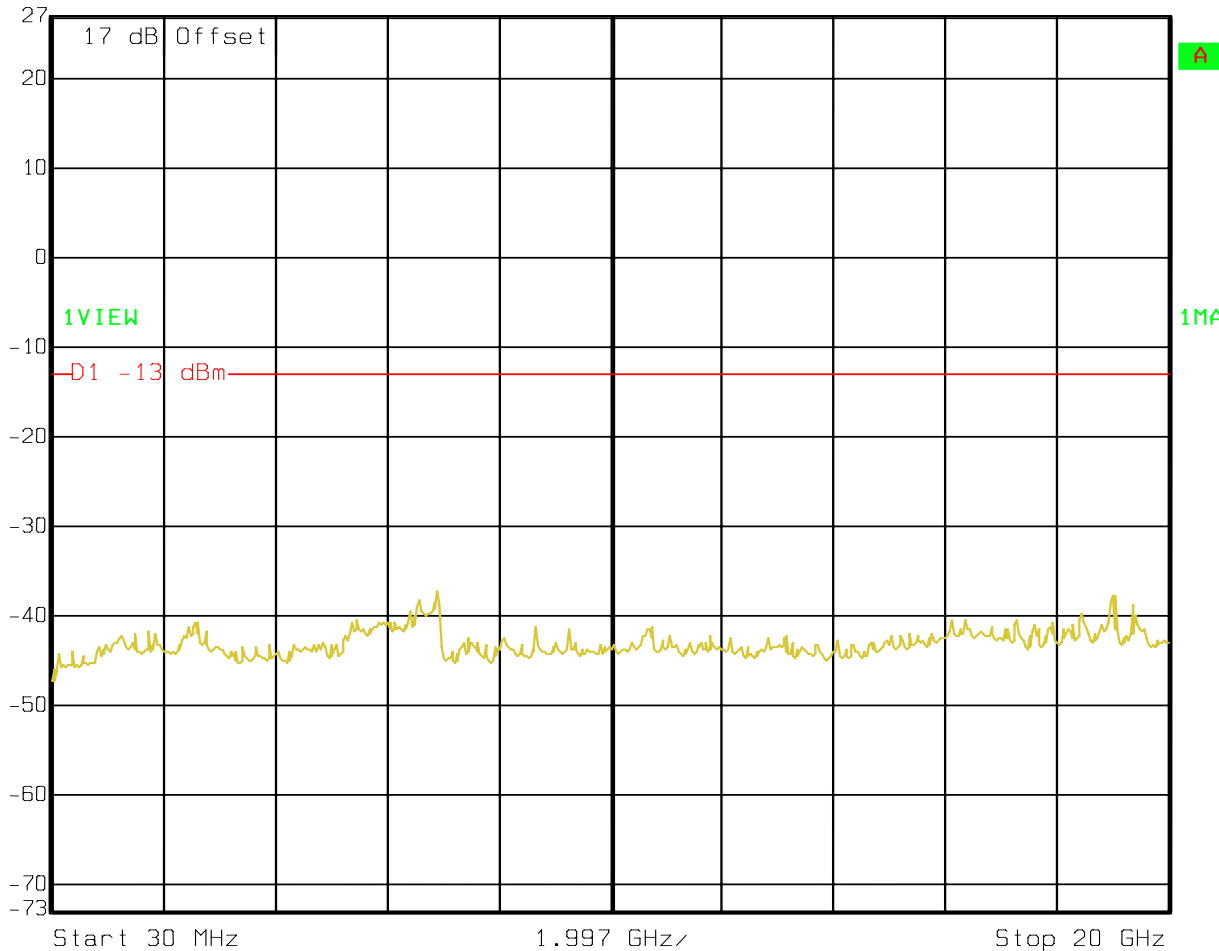


IDLE (PCS-1900)
30MHz – 20GHz



Ref Lvl
27 dBm

RBW 1 MHz RF Att 20 dB
VBW 1 MHz
SWT 115 ms Unit dBm

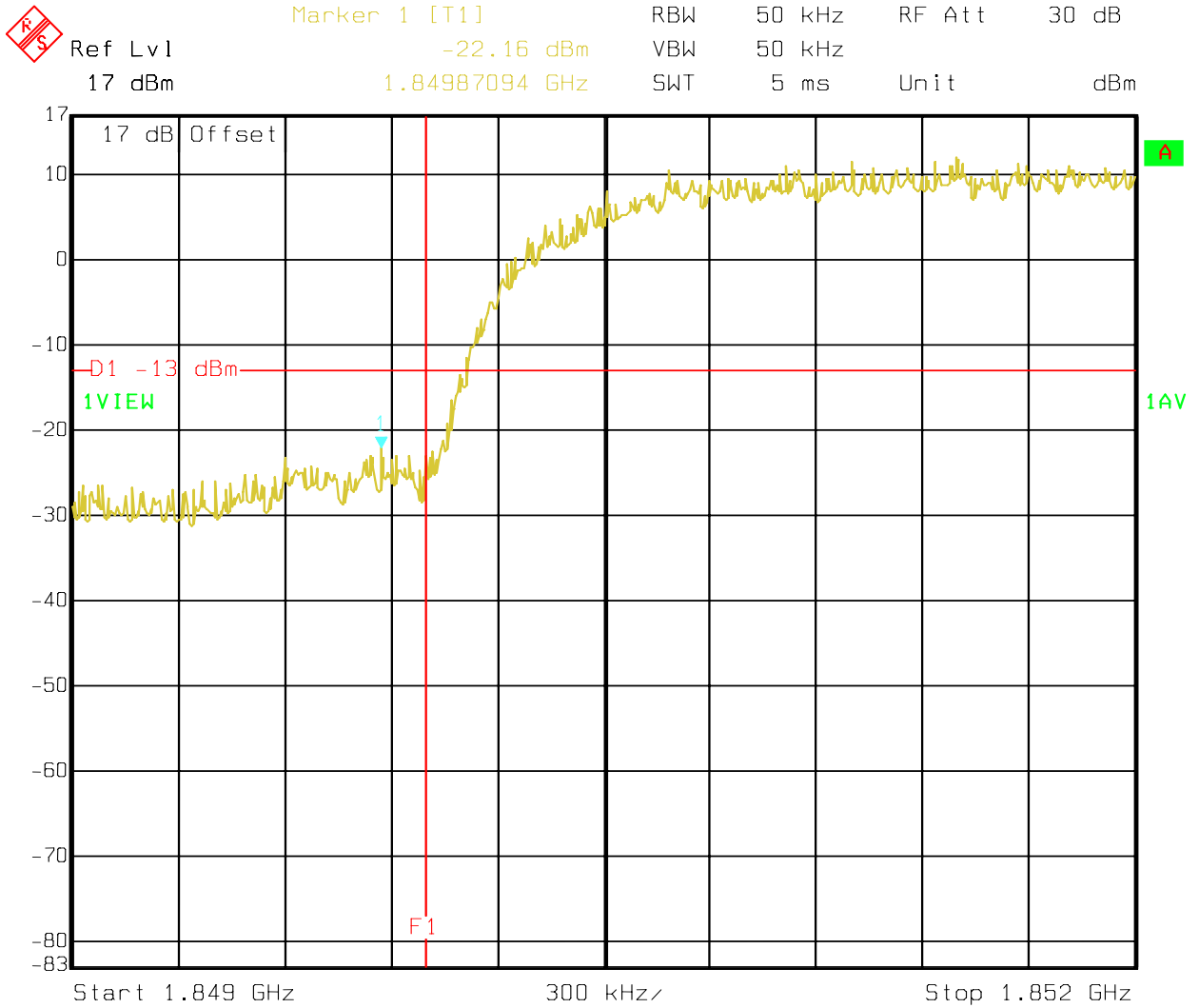


Date: 12.JUL.2006 13:12:10



5.4.10 Band Edge Results PCS-1900 FDD2

PCS-1900 Lower Band Edge CHANNEL 9262 FDD2

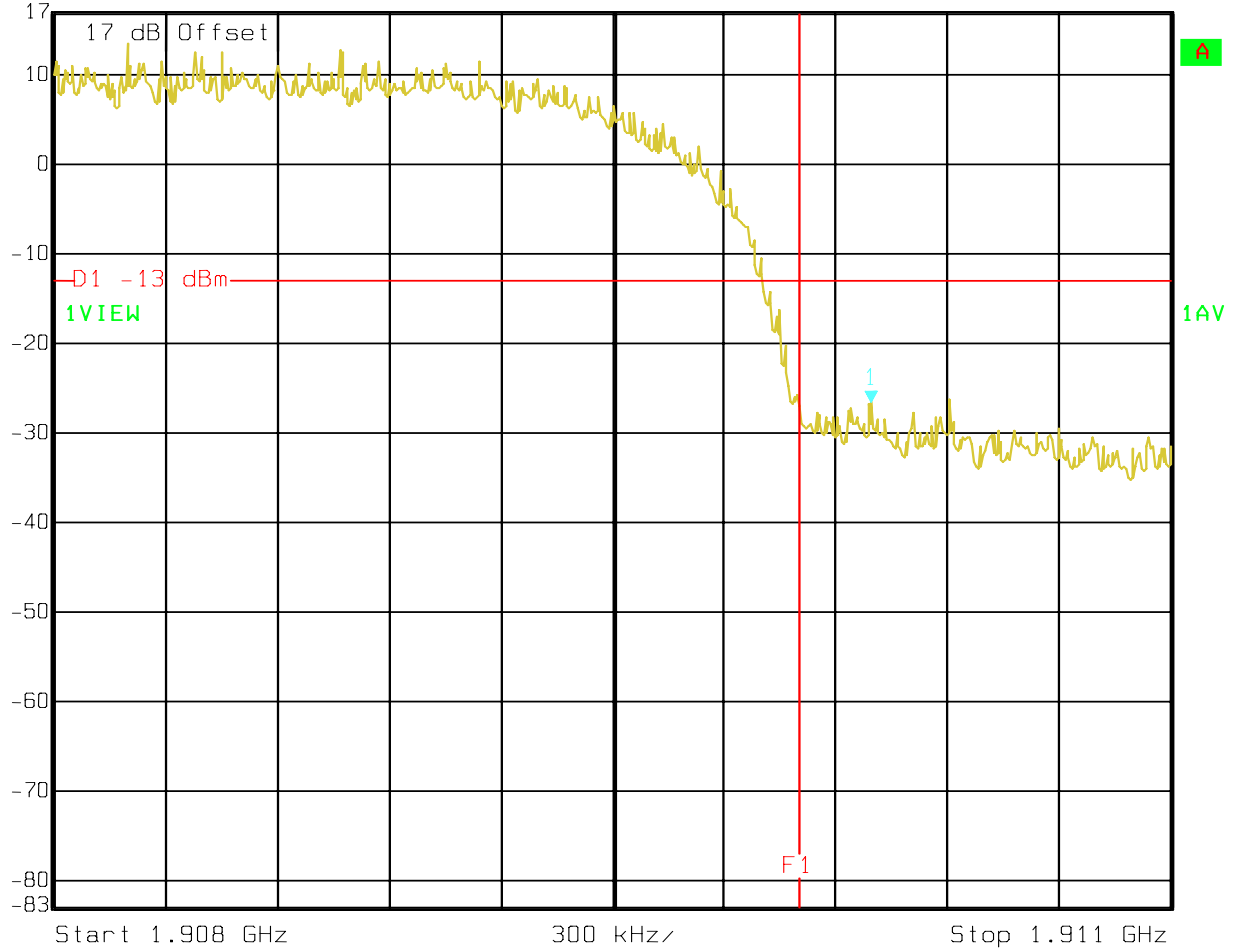


Date: 26.JUL.2006 14:31:09



PCS-1900 Higher Band Edge CHANNEL 9538 FDD2

	Ref Lvl	Marker 1 [T1]	RBW	50 kHz	RF Att	30 dB
	17 dBm	-26.55 dBm	VBW	50 kHz	Unit	dBm
		1.91019439 GHz	SWT	5 ms		



Date: 26.JUL.2006 14:32:46

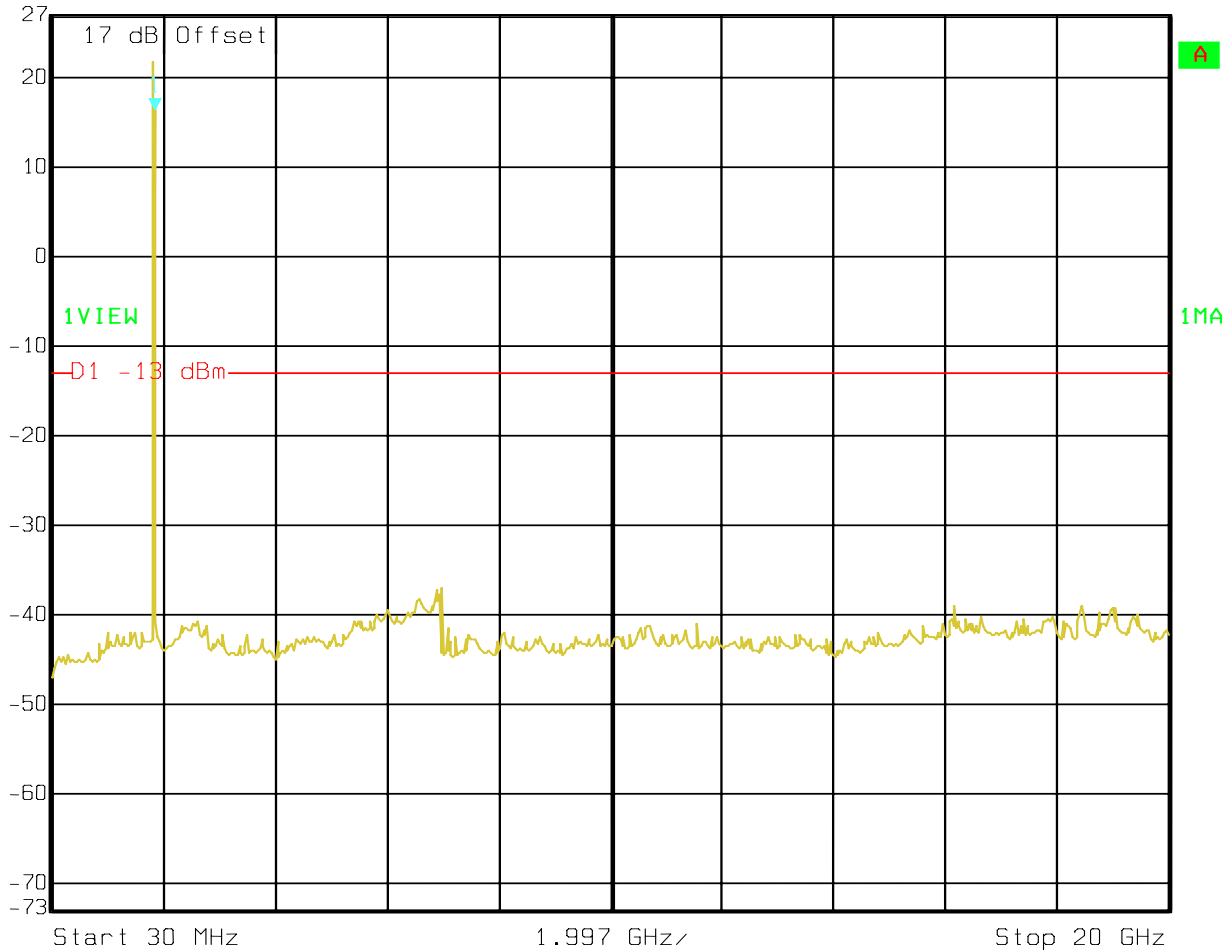


5.4.11 Conducted Spurious Results PCS-1900 FDD2

CHANNEL 9262 (PCS-1900 FDD2)
30MHz – 20GHz

Note: The peak above the limit line is the carrier freq. at ch-9262

 Ref Lvl 27 dBm Marker 1 [T1] 16.26 dBm RBW 1 MHz RF Att 20 dB
1.85240000 GHz VBW 1 MHz Unit dBm
SWT 115 ms

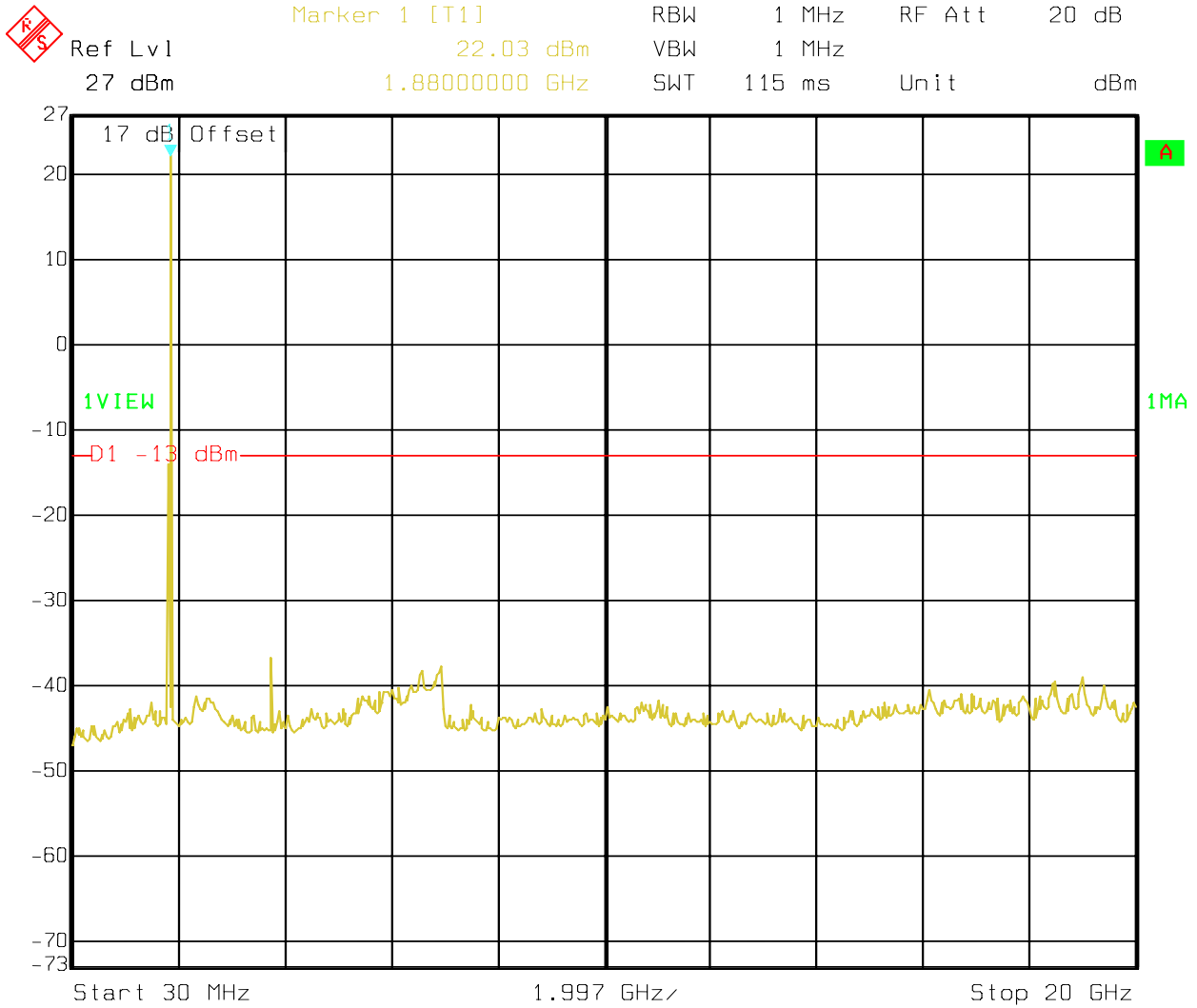


Date: 26.JUL.2006 14:21:56



CHANNEL 9400 (PCS-1900 FDD2)
30MHz – 20GHz

Note: The peak above the limit line is the carrier freq. at ch-9400



Date: 26.JUL.2006 14:21:18

5.5 Spurious Emissions Radiated

5.5.1 FCC 2.1053 Measurements required: Field strength of spurious radiation.

- (a) Measurements shall be made to detect spurious emissions that may be radiated directly from the cabinet, control circuits, power leads or intermediate circuit elements under normal conditions of installation and operation. Curves or equivalent data shall be supplied showing the magnitude of each harmonic and other spurious emission.

5.5.2 Limits:

5.5.2.1 **FCC 22.917 Emission limitations for cellular equipment.**

The rules in this section govern the spectral characteristics of emissions in the Cellular Radiotelephone Service.

- (a) *Out of band emissions.* The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

(b) *Measurement procedure.* Compliance with these provisions is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (*i.e.* 100 kHz of 1 percent of emission bandwidth, as specified). 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 below the transmitter power.

5.5.2.2 **FCC 24.238 Emission limitations for Broadband PCS equipment.**

The rules in this section govern the spectral characteristics of emissions in the Broadband Personal Communications Service.

- (a) *Out of band emissions.* The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

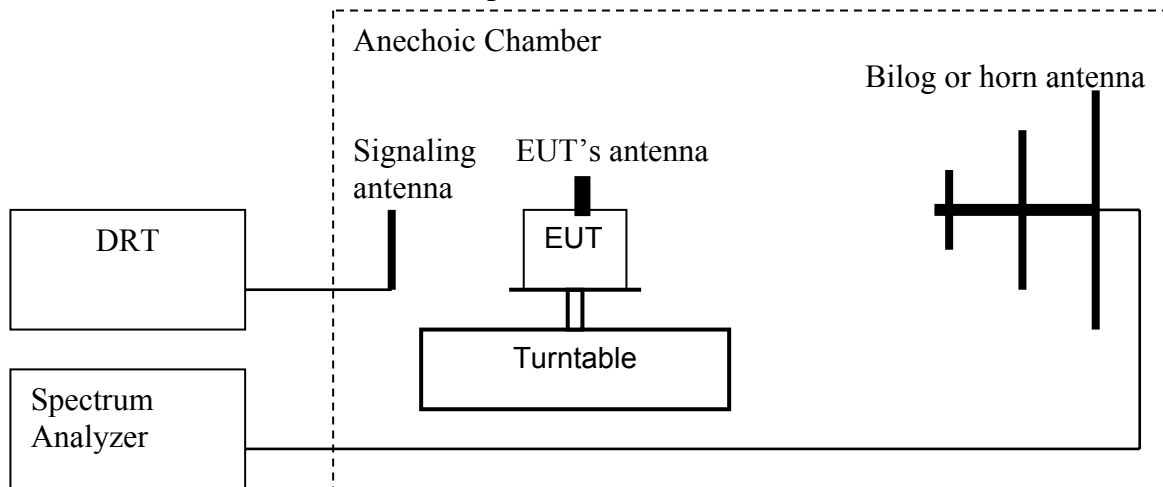
(b) *Measurement procedure.* Compliance with these provisions is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (*i.e.* 100 kHz of 1 percent of emission bandwidth, as specified). 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 below the transmitter power.

5.5.3 Radiated out of band measurement procedure:

Based on TIA-603C 2004

2.2.12 Unwanted emissions: Radiated Spurious



1. Connect the equipment as shown in the above diagram with the EUT's antenna in a horizontal orientation.
2. Adjust the settings of the Digital Radiocommunication Tester (DRT) to set the EUT to its maximum power at the required channel.
3. Set the spectrum analyzer to measure peak hold with the required settings.
4. Place the measurement antenna in a horizontal orientation. Rotate the EUT 360°. Raise the measurement antenna up to 4 meters in 0.5 meters increments and rotate the EUT 360° at each height to maximize all emissions. Measure and record all spurious emissions (LVL) up to the tenth harmonic of the carrier frequency.
5. Replace the EUT with a horizontally polarized half wave dipole or known gain antenna. The center of the antenna should be at the same location as the center of the EUT's antenna.
6. Connect the antenna to a signal generator with known output power and record the path loss in dB (LOSS). $LOSS = \text{Generator Output Power (dBm)} - \text{Analyzer reading (dBm)}$.
7. Determine the level of spurious emissions using the following equation:
Spurious (dBm) = LVL (dBm) + LOSS (dB):
8. Repeat steps 4, 5 and 6 with all antennas vertically polarized.
9. Determine the level of spurious emissions using the following equation:
Spurious (dBm) = LVL (dBm) + LOSS (dB):
10. Measurements are to be performed with the EUT set to the low, middle and high channel of each frequency band.

(note: Steps 5 and 6 above are performed prior to testing and LOSS is recorded by test software. Steps 3, 4 and 7 above are performed with test software.)



Spectrum analyzer settings:

Res B/W: 1 MHz

Vid B/W: 1 MHz

Measurement Survey:

Radiated emissions measurements were made only at the upper, middle, and lower carrier frequencies of the GSM-850 & PCS-1900 bands. It was decided that measurements at these three carrier frequencies would be sufficient to demonstrate compliance with emissions limits because it was seen that all the significant spurs occur well outside the band and no radiation was seen from a carrier in one block of the GSM-850 & PCS-1900 band into any of the other blocks respectively. The equipment must still, however, meet emissions requirements with the carrier at all frequencies over which it is capable of operating and it is the manufacturer's responsibility to verify this.

5.5.4 Radiated out of band emissions results on EUT:

5.5.4.1 RESULTS OF RADIATED TESTS GSM-850:

Harmonics	Tx ch-128 Freq. (MHz)	Level (dBm)	Tx ch-190 Freq. (MHz)	Level (dBm)	Tx ch-251 Freq. (MHz)	Level (dBm)
2	1648.4	NF	1673.2	NF	1697.6	NF
3	2472.6	NF	2509.8	NF	2546.4	NF
4	3296.8	NF	3346.4	NF	3395.2	NF
5	4121	NF	4183	NF	4244	NF
6	4945.2	NF	5019.6	NF	5092.8	NF
7	5769.4	NF	5856.2	NF	5941.6	NF
8	6593.6	NF	6692.8	NF	6790.4	NF
9	7417.8	NF	7529.4	NF	7639.2	NF
10	8242	NF	8366	NF	8488	NF
NF = NOISE FLOOR						



5.5.4.2 RADIATED SPURIOUS EMISSIONS (GSM-850)

TX: 30MHz - 1GHz

Spurious emission limit -13dBm

Antenna: vertical

Note:

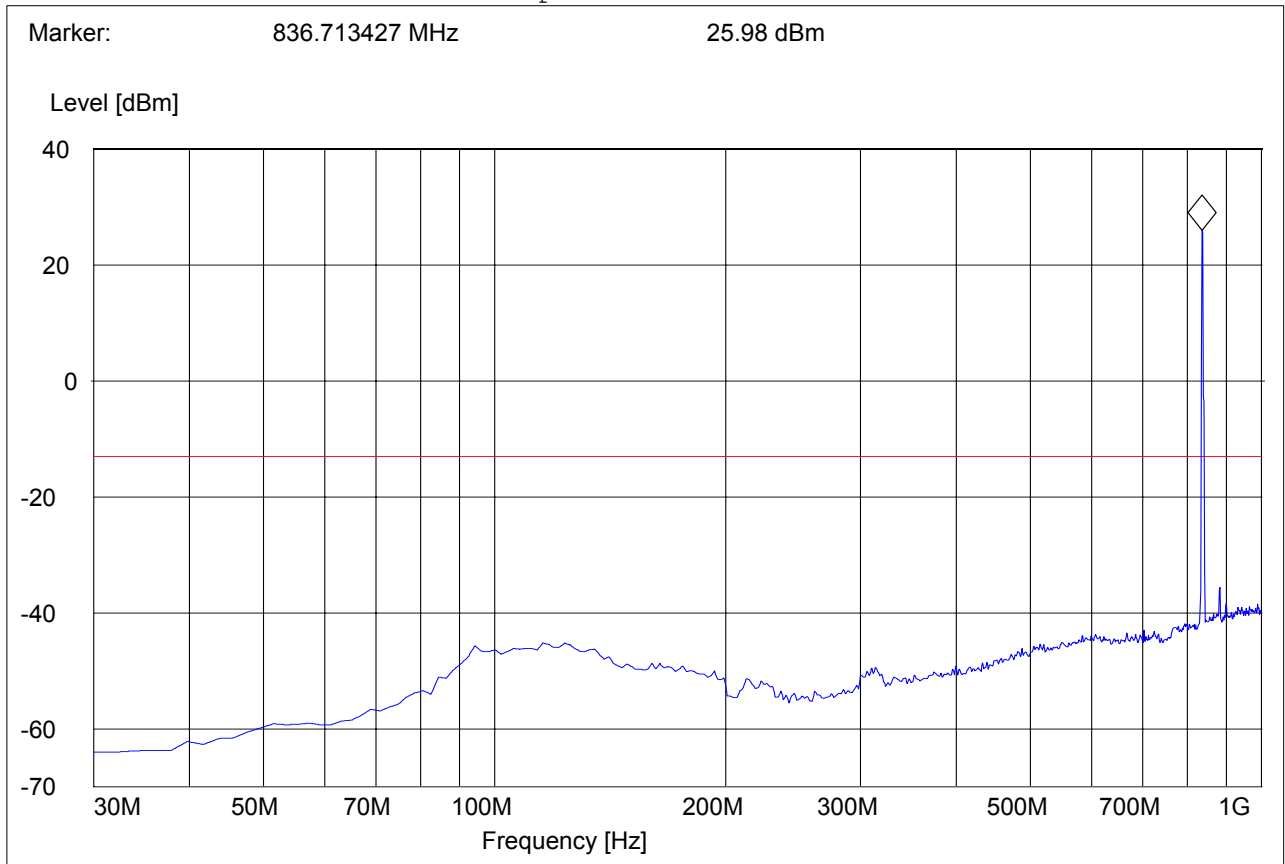
1. The peak above the limit line is the carrier freq.
2. This plot is valid for low, mid & high channels (worst-case plot)

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT / Description: EUT 34BB00I, C03, LAPTOP KKL-E3-C1, X01-00
 Customer: NOVATEL
 Operating Mode: FCC22, RADIATED, TABLE 217 DEGREES
 Antenna: V
 EUT: V
 Test Engineer: SATYA
 Voltage: AC ADAPTOR
 Sweep: FCC 24 SPUR 30M-1 G CH 190

SWEEP TABLE: "FCC 24 Spur 30M-1G_V"

Short Description:		FCC 24 30MHz-1GHz			
Start	Stop	Detector	Meas.	IF	Transducer
Frequency	Frequency		Time	Bandw.	
30.0 MHz	1.0 GHz	MaxPeak	Coupled	1 MHz	DUMMY-DBM





RADIATED SPURIOUS EMISSIONS (GSM-850)

Tx @ 824.2MHz: 1GHz – 1.58GHz

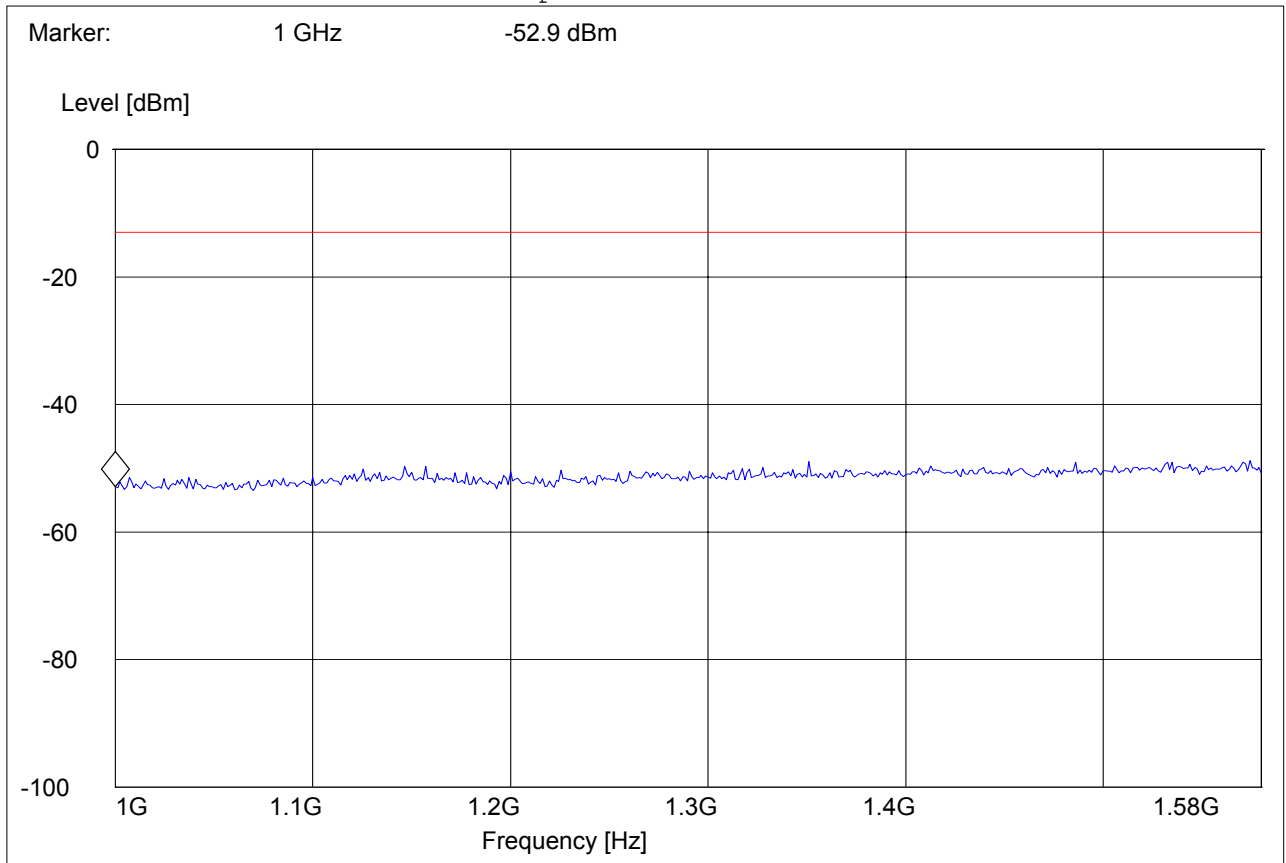
Spurious emission limit -13dBm

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT / Description: EUT 34BB00I, C03, LAPTOP KKL-E3-C1, X01-00
 Customer: NOVATEL
 Operating Mode: FCC22, RADIATED, TABLE 217 DEGREES
 Antenna: V
 EUT: V
 Test Engineer: SATYA
 Voltage: AC ADAPTOR
 Sweep: FCC 22 SPUR 1-1.58 G CH 128 V

SWEEP TABLE: "FCC 22Spuri 1-1.58G"

Short Description:		FCC 24 1GHz-8GHz			
Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
1.0 GHz	1.6 GHz	MaxPeak	Coupled	1 MHz	DUMMY-DBM





RADIATED SPURIOUS EMISSIONS (GSM-850)

Tx @ 824.2MHz: 1.58GHz – 3GHz

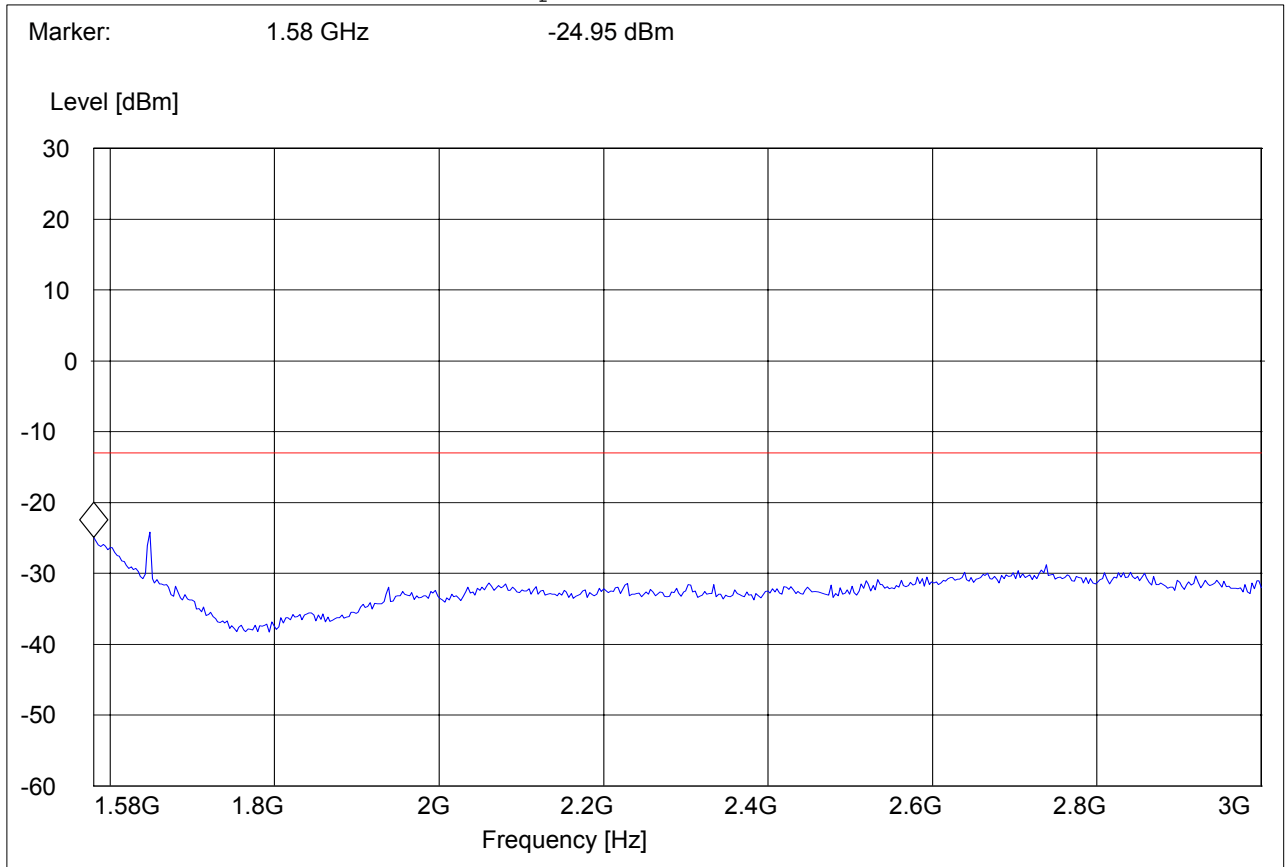
Spurious emission limit -13dBm

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT / Description: EUT 34BB00I, C03, LAPTOP KKL-E3-C1, X01-00
 Customer: NOVATEL
 Operating Mode: FCC22, RADIATED, TABLE 217 DEGREES
 Antenna: V
 EUT: V
 Test Engineer: SATYA
 Voltage: AC ADAPTOR
 Sweep: FCC 22 SPUR 1.58-3 G CH 128

SWEEP TABLE: "FCC 22Spuri 1.58-3G"

Short Description:	FCC 24 1GHz-8GHz				
Start	Stop	Detector	Meas.	IF	Transducer
Frequency	Frequency		Time	Bandw.	
1.6 GHz	3.0 GHz	MaxPeak	Coupled	1 MHz	DUMMY-DBM





RADIATED SPURIOUS EMISSIONS (GSM-850)

Tx @ 824.2MHz: 3GHz – 9GHz

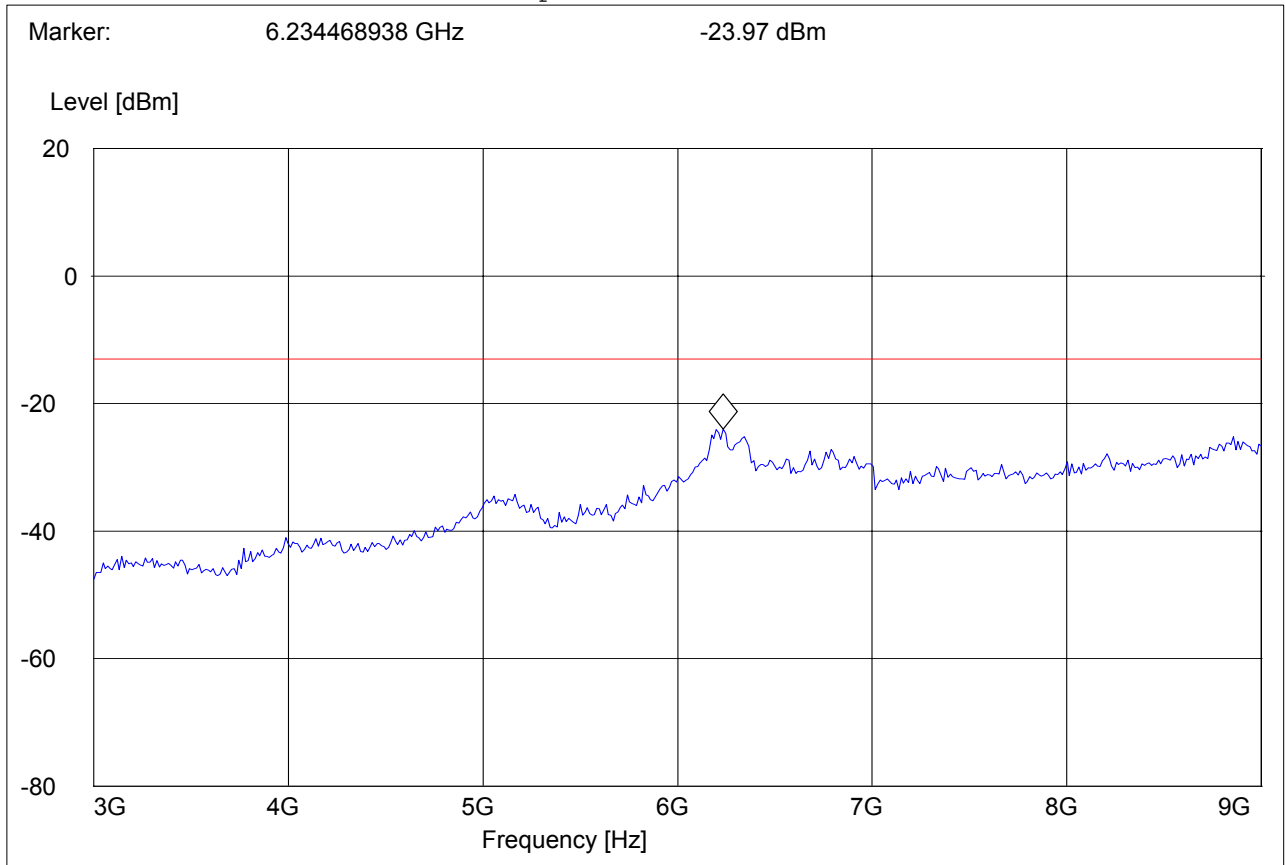
Spurious emission limit -13dBm

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT / Description: EUT 34BB00I, C03, LAPTOP KKL-E3-C1, X01-00
 Customer: NOVATEL
 Operating Mode: FCC22, RADIATED, TABLE 217 DEGREES
 Antenna: V
 EUT: V
 Test Engineer: SATYA
 Voltage: AC ADAPTOR
 Sweep: FCC 22 SPUR 3-9G CH 128

SWEEP TABLE: "FCC 22Spuri 3-9G"

Short Description:		FCC 24 1GHz-8GHz			
Start	Stop	Detector	Meas.	IF	Transducer
Frequency	Frequency		Time	Bandw.	
3.0 GHz	9.0 GHz	MaxPeak	Coupled	1 MHz	DUMMY-DBM





RADIATED SPURIOUS EMISSIONS (GSM-850)

Tx @ 836.6MHz: 1GHz – 1.58GHz

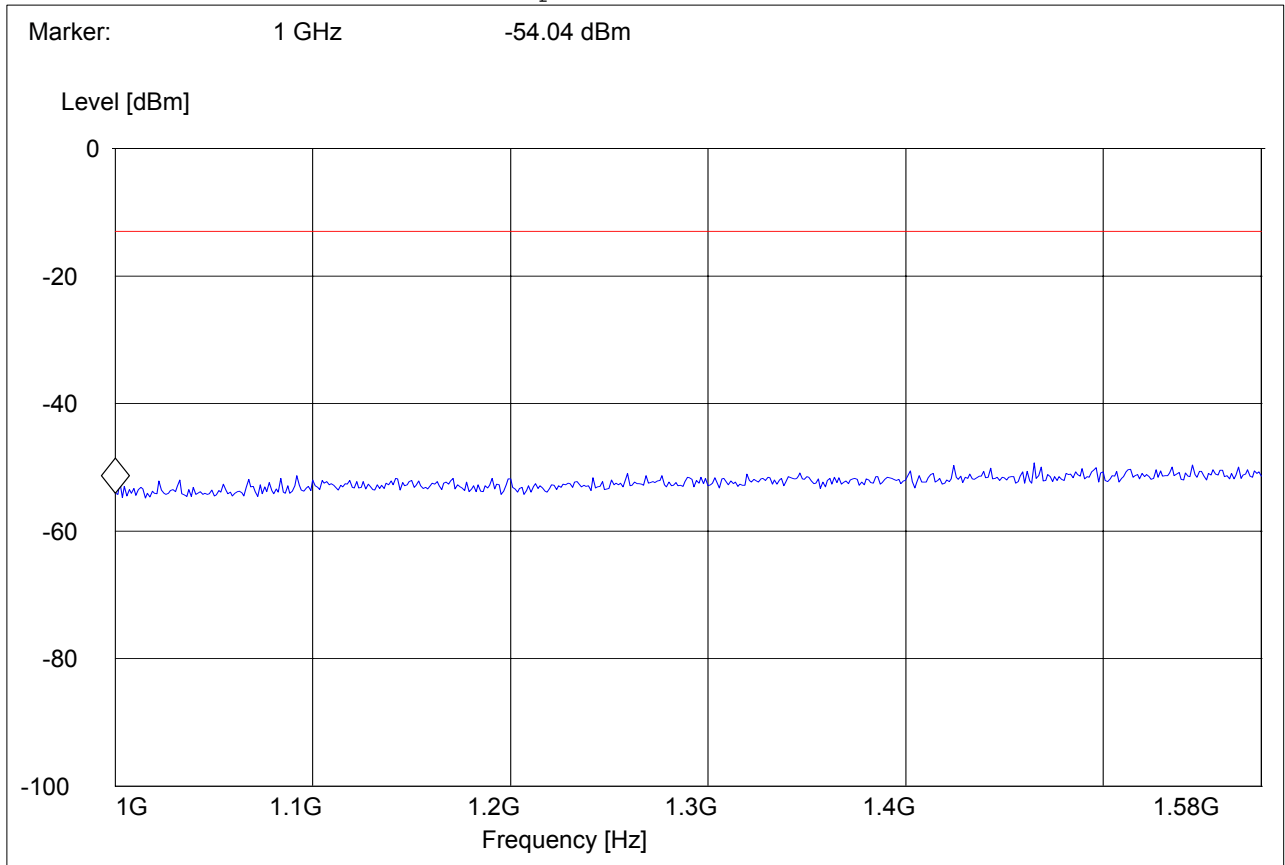
Spurious emission limit -13dBm

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT / Description: EUT 34BB00I, C03, LAPTOP KKL-E3-C1, X01-00
 Customer: NOVATEL
 Operating Mode: FCC22, RADIATED, TABLE 217 DEGREES
 Antenna: V
 EUT: V
 Test Engineer: SATYA
 Voltage: AC ADAPTOR
 Sweep: FCC 22 SPUR 1-1.58 G CH 190

SWEEP TABLE: "FCC 22Spuri 1-1.58G"

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
1.0 GHz	1.6 GHz	MaxPeak	Coupled	1 MHz	DUMMY-DBM





RADIATED SPURIOUS EMISSIONS (GSM-850)

Tx @ 836.6MHz: 1.58GHz – 3GHz

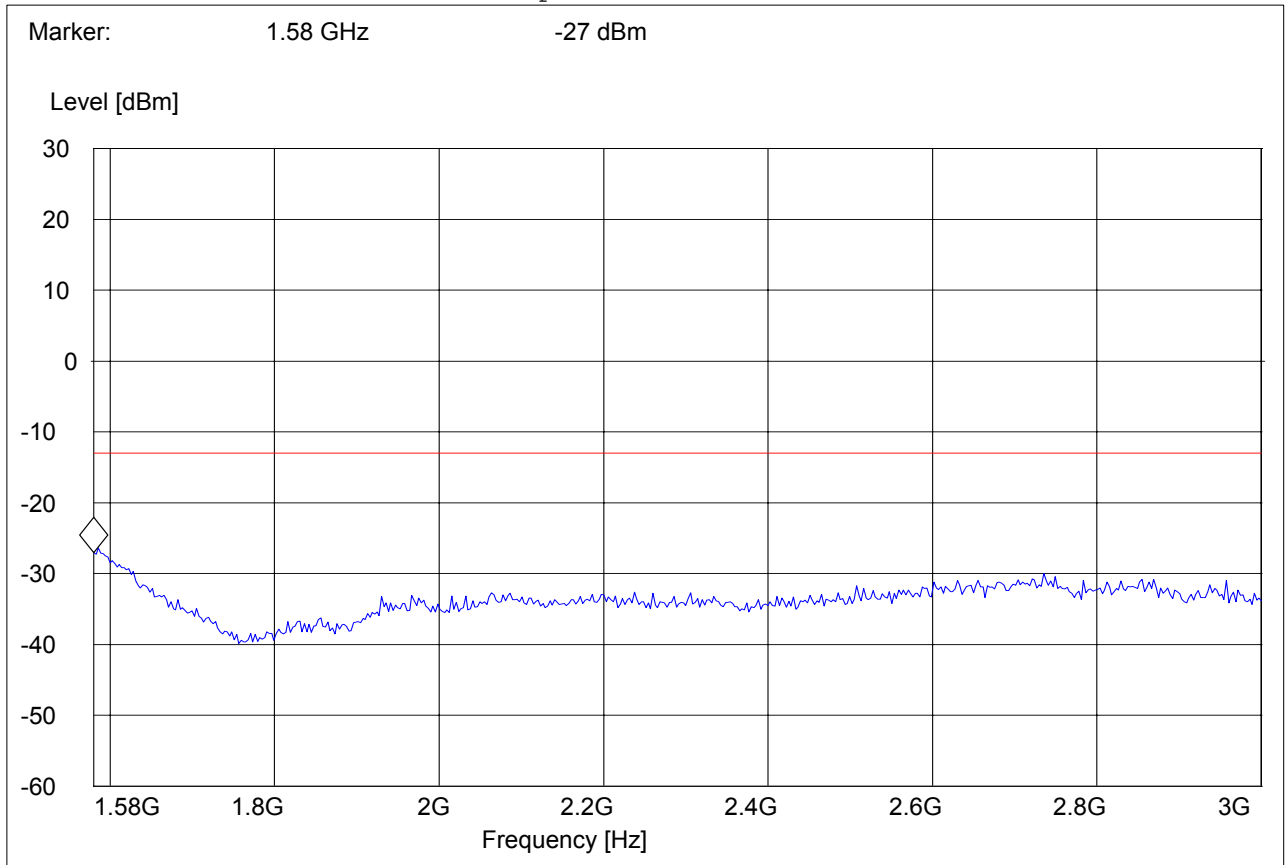
Spurious emission limit -13dBm

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT / Description: EUT 34BB00I, C03, LAPTOP KKL-E3-C1, X01-00
 Customer: NOVATEL
 Operating Mode: FCC22, RADIATED, TABLE 217 DEGREES
 Antenna: V
 EUT: V
 Test Engineer: SATYA
 Voltage: AC ADAPTOR
 Sweep: FCC 22 SPUR 1.58-3 G CH 190

SWEEP TABLE: "FCC 22Spuri 1.58-3G"

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
1.6 GHz	3.0 GHz	MaxPeak	Coupled	1 MHz	DUMMY-DBM





RADIATED SPURIOUS EMISSIONS (GSM-850)

Tx @ 836.6MHz: 3GHz – 9GHz

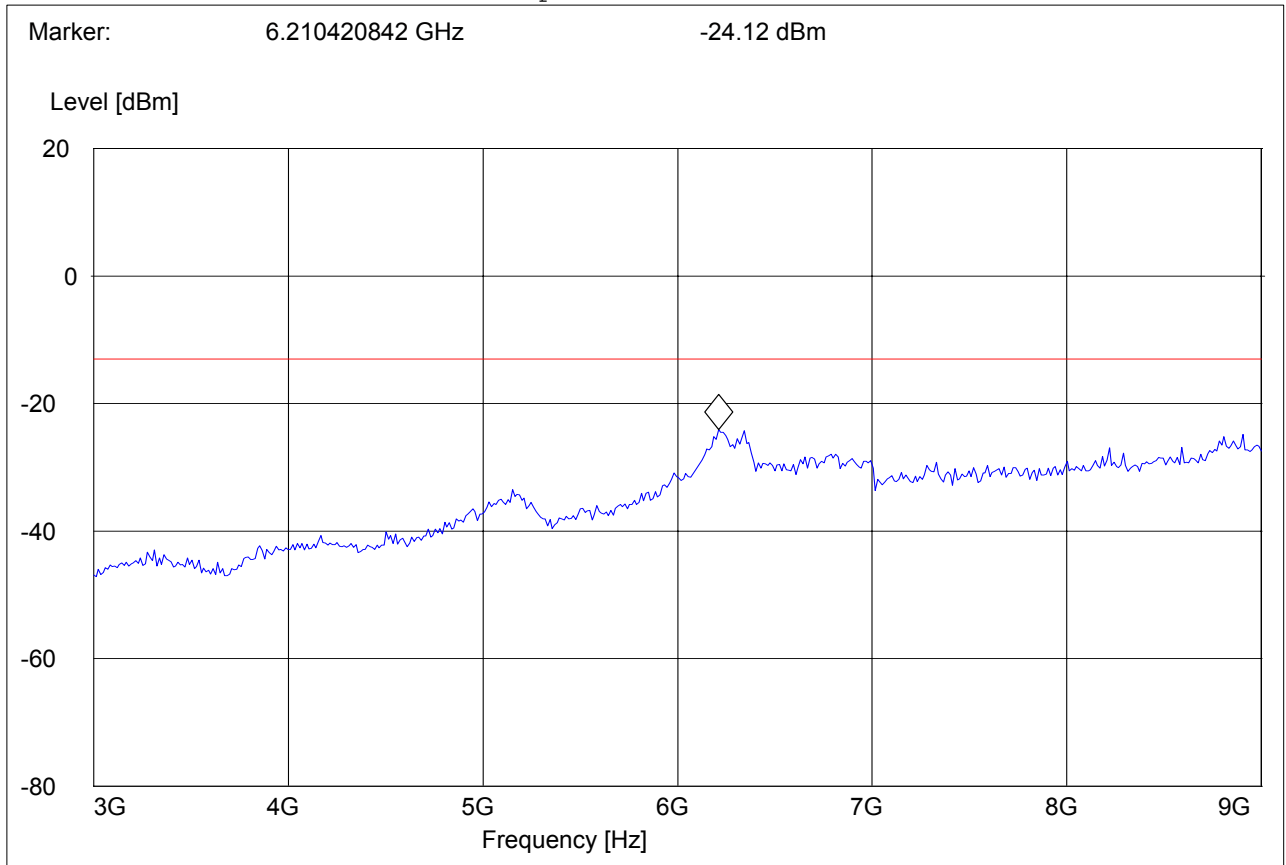
Spurious emission limit -13dBm

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT / Description: EUT 34BB00I, C03, LAPTOP KKL-E3-C1, X01-00
 Customer: NOVATEL
 Operating Mode: FCC22, RADIATED, TABLE 217 DEGREES
 Antenna: V
 EUT: V
 Test Engineer: SATYA
 Voltage: AC ADAPTOR
 Sweep: FCC 22 SPUR 3-9G CH 190

SWEEP TABLE: "FCC 22Spuri 3-9G"

Short Description:		FCC 24 1GHz-8GHz			
Start	Stop	Detector	Meas.	IF	Transducer
Frequency	Frequency		Time	Bandw.	
3.0 GHz	9.0 GHz	MaxPeak	Coupled	1 MHz	DUMMY-DBM





RADIATED SPURIOUS EMISSIONS (GSM-850)

Tx @ 848.8MHz: 1GHz – 1.58GHz

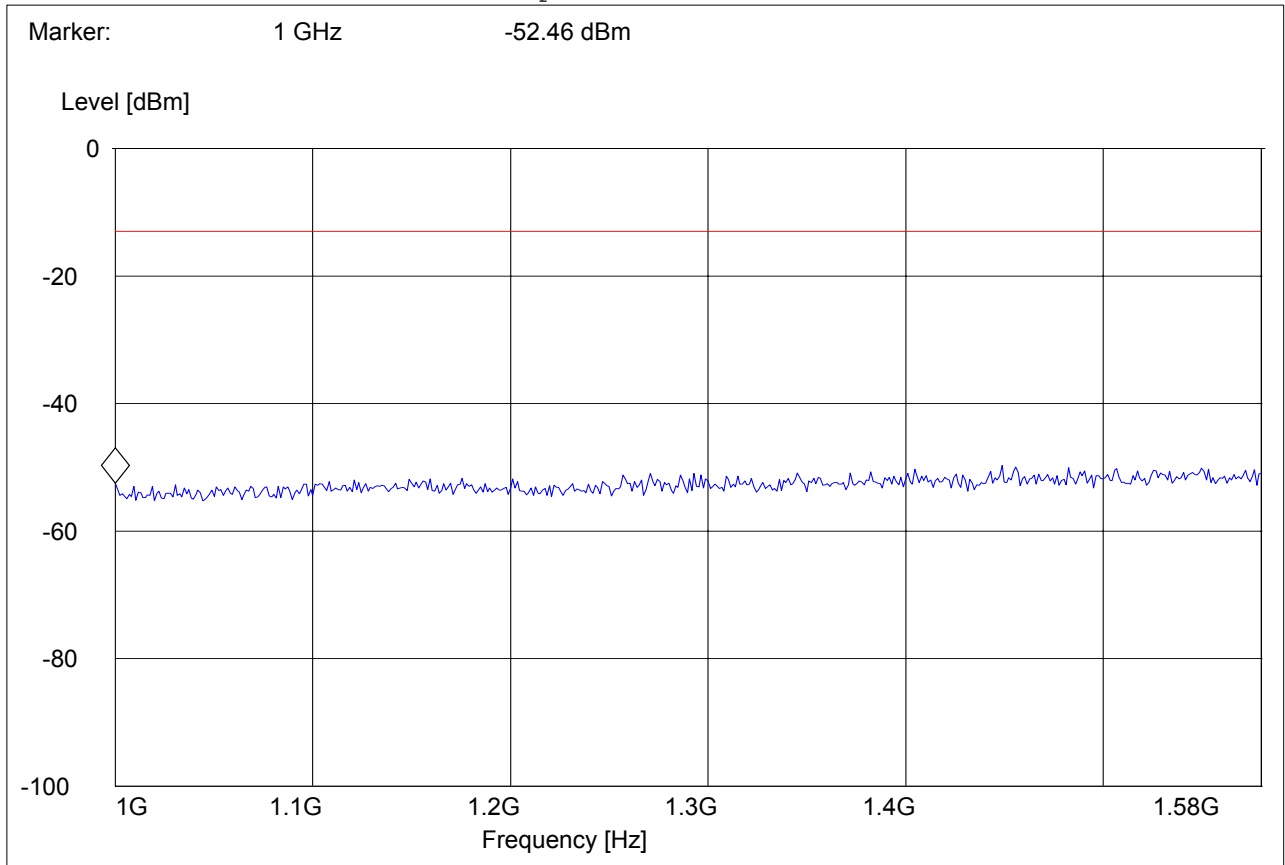
Spurious emission limit -13dBm

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT / Description: EUT 34BB00I, C03, LAPTOP KKL-E3-C1, X01-00
 Customer: NOVATEL
 Operating Mode: FCC22, RADIATED, TABLE 217 DEGREES
 Antenna: V
 EUT: V
 Test Engineer: SATYA
 Voltage: AC ADAPTOR
 Sweep: FCC 22 SPUR 1-1.58 G CH 251

SWEEP TABLE: "FCC 22Spuri 1-1.58G"

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
1.0 GHz	1.6 GHz	MaxPeak	Coupled	1 MHz	DUMMY-DBM





RADIATED SPURIOUS EMISSIONS (GSM-850)

Tx @ 848.8MHz: 1.58GHz – 3GHz

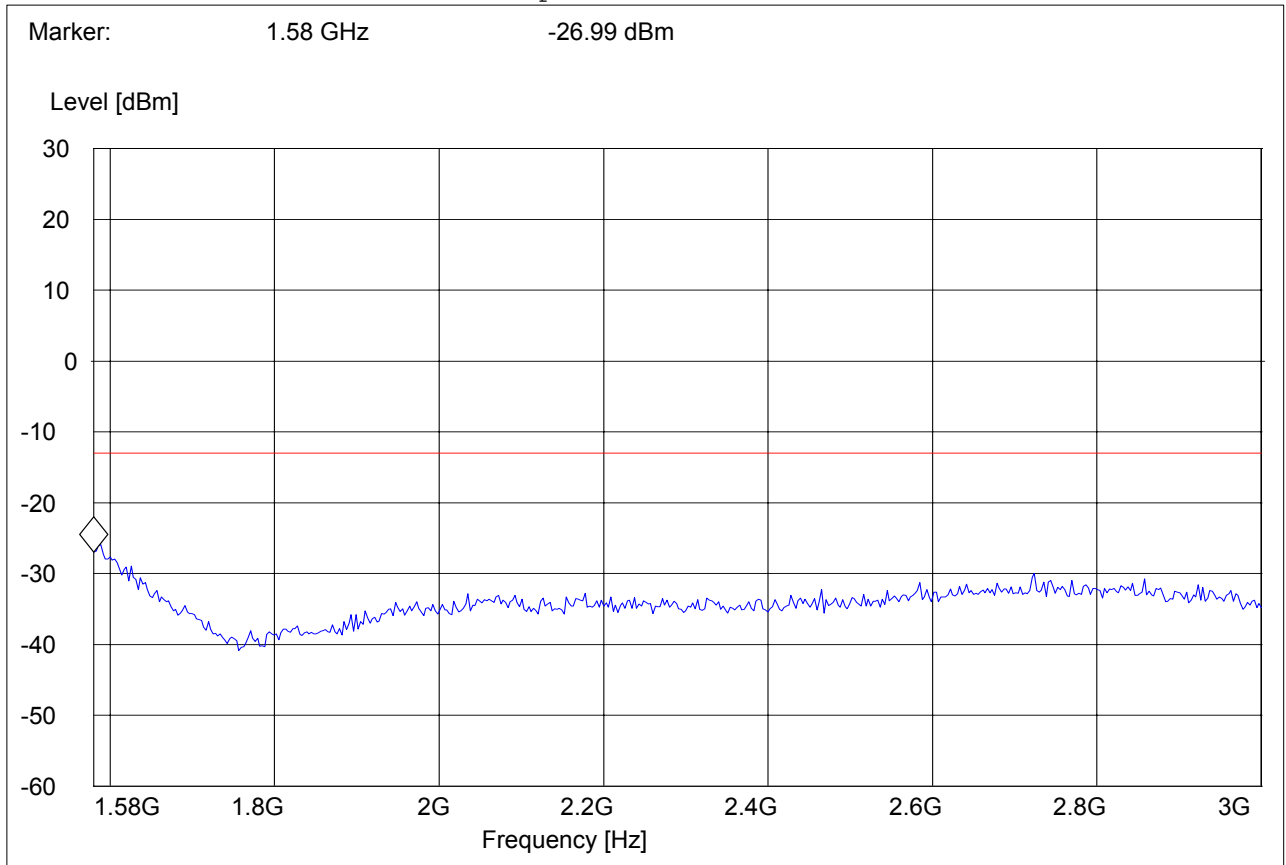
Spurious emission limit -13dBm

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT / Description: EUT 34BB00I, C03, LAPTOP KKL-E3-C1, X01-00
 Customer: NOVATEL
 Operating Mode: FCC22, RADIATED, TABLE 217 DEGREES
 Antenna: V
 EUT: V
 Test Engineer: SATYA
 Voltage: AC ADAPTOR
 Sweep: FCC 22 SPUR 1.58-3 G CH 251

SWEEP TABLE: "FCC 22Spuri 1.58-3G"

Short Description:	FCC 24 1GHz-8GHz				
Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
1.6 GHz	3.0 GHz	MaxPeak	Coupled	1 MHz	DUMMY-DBM





RADIATED SPURIOUS EMISSIONS (GSM-850)

Tx @ 848.8MHz: 3GHz – 9GHz

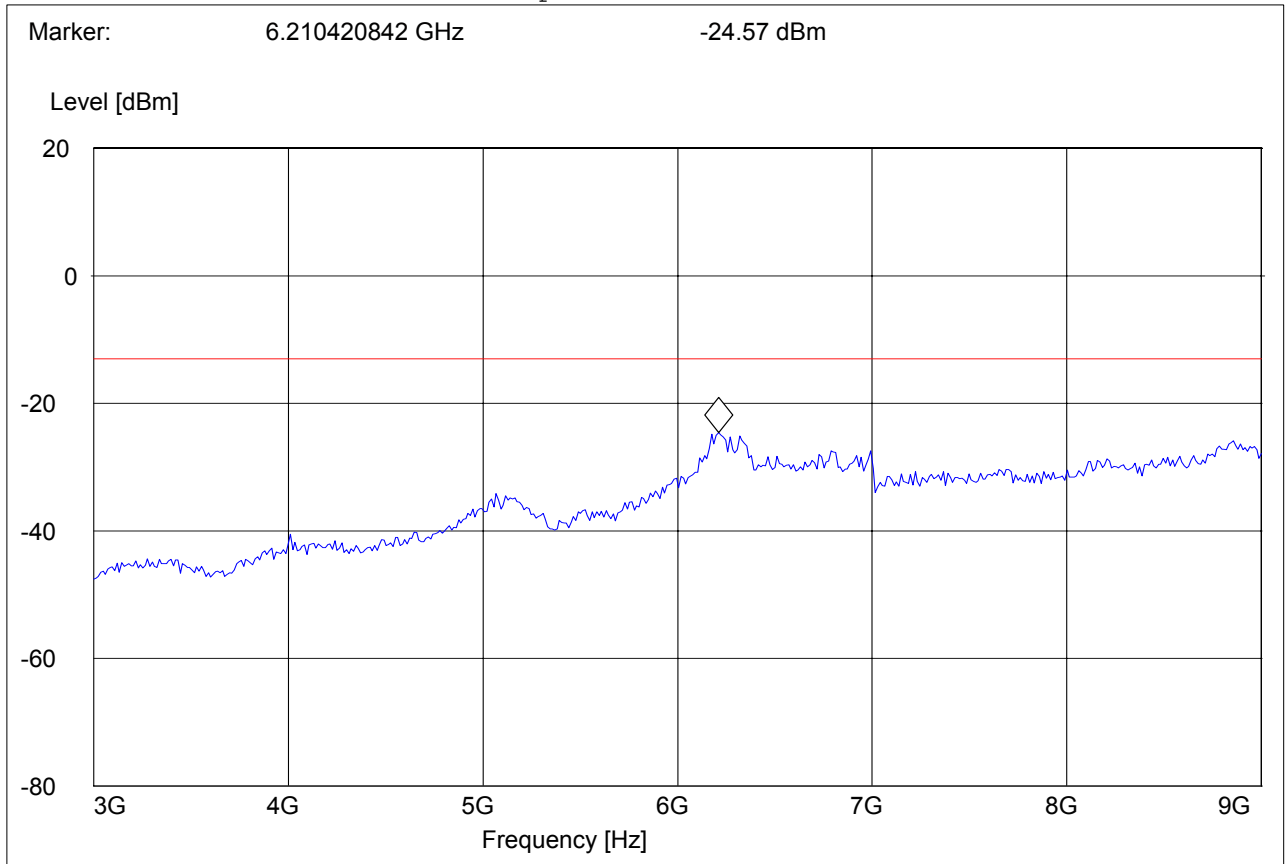
Spurious emission limit -13dBm

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT / Description: EUT 34BB00I, C03, LAPTOP KKL-E3-C1, X01-00
 Customer: NOVATEL
 Operating Mode: FCC22, RADIATED, TABLE 217 DEGREES
 Antenna: V
 EUT: V
 Test Engineer: SATYA
 Voltage: AC ADAPTOR
 Sweep: FCC 22 SPUR 3-9G CH 251

SWEEP TABLE: "FCC 22Spuri 3-9G"

Short Description:		FCC 24 1GHz-8GHz			
Start	Stop	Detector	Meas.	IF	Transducer
Frequency	Frequency		Time	Bandw.	
3.0 GHz	9.0 GHz	MaxPeak	Coupled	1 MHz	DUMMY-DBM



5.5.4.3 RESULTS OF RADIATED TESTS GSM-850 FDD5:

Harmonics	Tx ch-4132 Freq. (MHz)	Level (dBm)	Tx ch-4183 Freq. (MHz)	Level (dBm)	Tx ch-4233 Freq. (MHz)	Level (dBm)
2	1648.4	NF	1673.2	NF	1697.6	NF
3	2472.6	NF	2509.8	NF	2546.4	NF
4	3296.8	NF	3346.4	NF	3395.2	NF
5	4121	NF	4183	NF	4244	NF
6	4945.2	NF	5019.6	NF	5092.8	NF
7	5769.4	NF	5856.2	NF	5941.6	NF
8	6593.6	NF	6692.8	NF	6790.4	NF
9	7417.8	NF	7529.4	NF	7639.2	NF
10	8242	NF	8366	NF	8488	NF
NF = NOISE FLOOR						



5.5.4.4 RADIATED SPURIOUS EMISSIONS (GSM-850 FDD5)

TX: 30MHz - 1GHz

Spurious emission limit -13dBm

Antenna: vertical

Note:

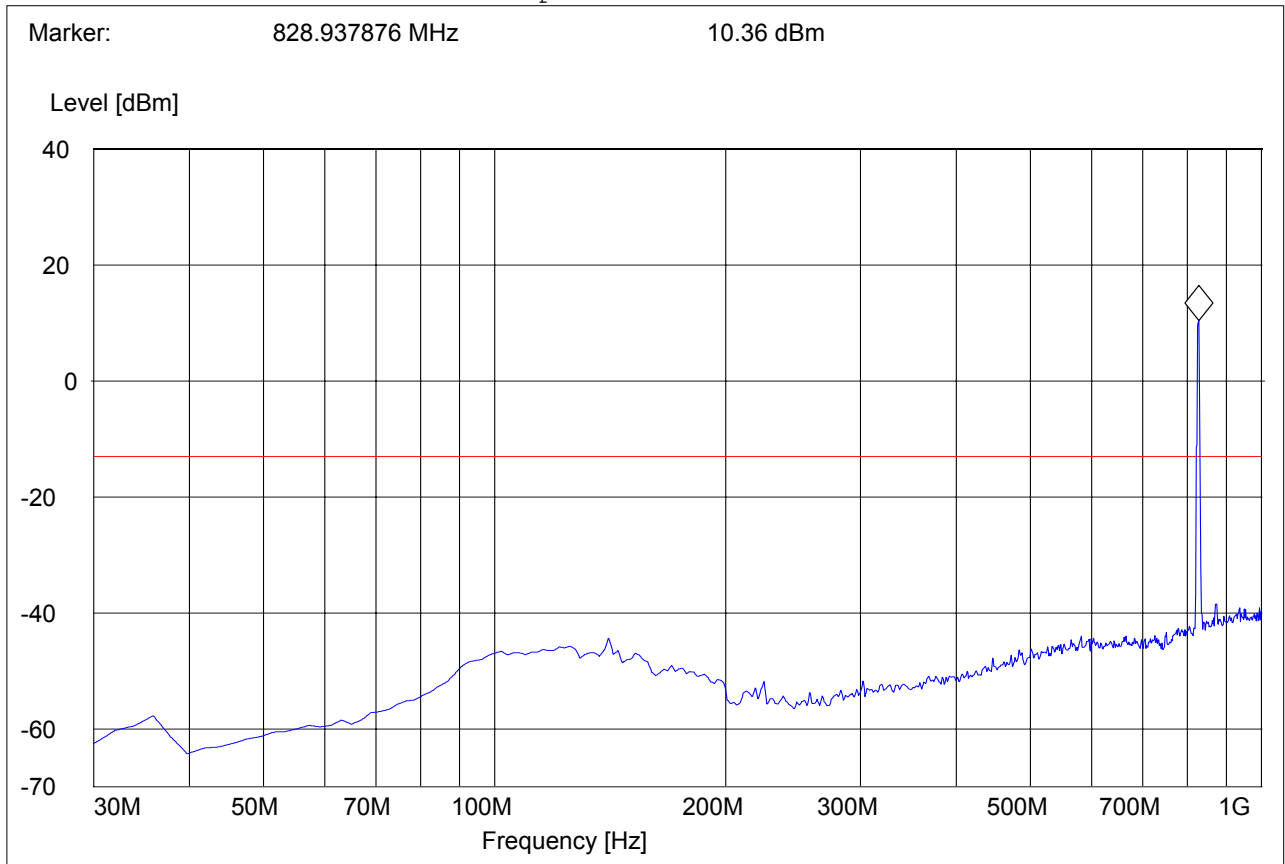
1. The peak above the limit line is the carrier freq.
2. This plot is valid for low, mid & high channels (worst-case plot)

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT / Description: EUT 34BB00t, C06, LAPTOP KKL-E3-C1, X01-00
 Customer: Novatel
 Operating Mode: FDD5
 Antenna: V
 EUT: V
 Test Engineer: Ed
 Voltage: AC Adapter
 Sweep: FCC 24 Spur 30M-1G_V (marker on TCH)

SWEEP TABLE: "FCC 24 Spur 30M-1G_V"

Short Description:		FCC 24 30MHz-1GHz			
Start	Stop	Detector	Meas.	IF	Transducer
Frequency	Frequency		Time	Bandw.	
30.0 MHz	1.0 GHz	MaxPeak	Coupled	1 MHz	DUMMY-DBM





RADIATED SPURIOUS EMISSIONS (GSM-850 FDD5)

Tx @ 826.4MHz: 1GHz – 1.58GHz

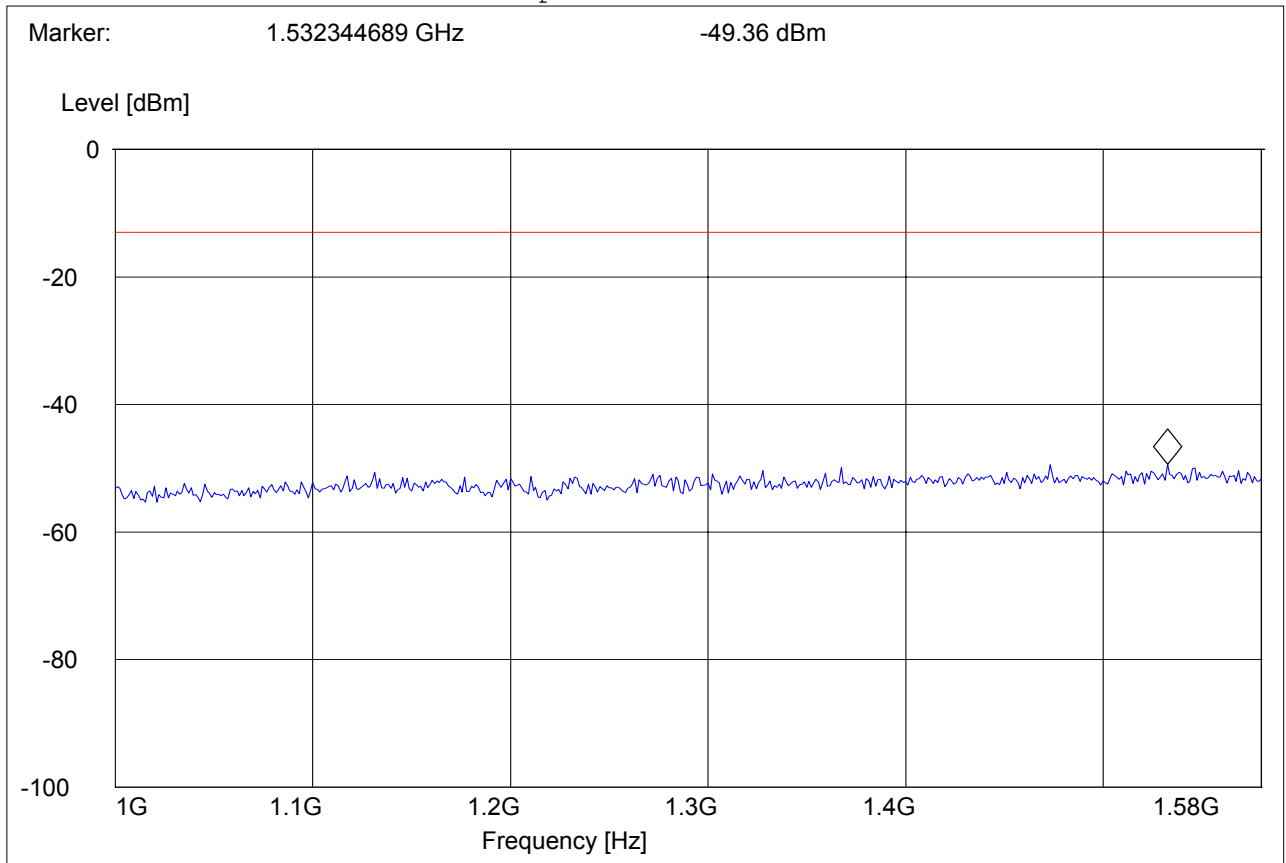
Spurious emission limit -13dBm

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT / Description: EUT 34BB00t, C06, LAPTOP KKL-E3-C1, X01-00
 Customer: Novatel
 Operating Mode: FDD5, TCH4132
 Antenna: V
 EUT: V
 Test Engineer: Ed
 Voltage: AC Adapter
 Sweep: FCC 22 Spur 1-1.58G

SWEEP TABLE: "FCC 22Spuri 1-1.58G"

Short Description:		FCC 24 1GHz-8GHz			
Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
1.0 GHz	1.6 GHz	MaxPeak	Coupled	1 MHz	DUMMY-DBM





RADIATED SPURIOUS EMISSIONS (GSM-850 FDD5)

Tx @ 826.4MHz: 1.58GHz – 3GHz

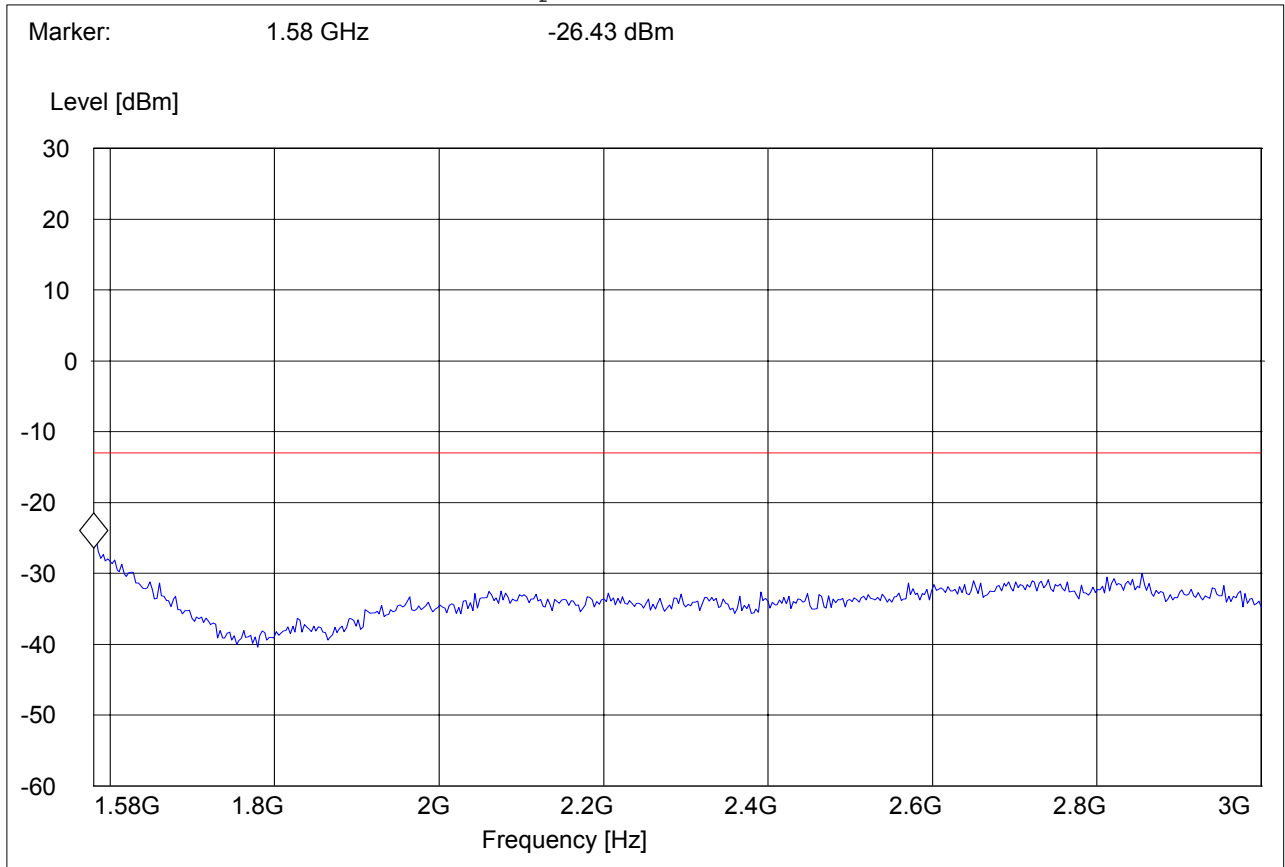
Spurious emission limit -13dBm

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT / Description: EUT 34BB00t, C06, LAPTOP KKL-E3-C1, X01-00
 Customer: Novatel
 Operating Mode: FDD5, TCH4132
 Antenna: V
 EUT: V
 Test Engineer: Ed
 Voltage: AC Adapter
 Sweep: FCC 22 Spur 1.58-3G

SWEEP TABLE: "FCC 22Spuri 1.58-3G"

Short Description:		FCC 24 1GHz-8GHz			
Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
1.6 GHz	3.0 GHz	MaxPeak	Coupled	1 MHz	DUMMY-DBM





RADIATED SPURIOUS EMISSIONS (GSM-850 FDD5)

Tx @ 826.4MHz: 3GHz – 9GHz

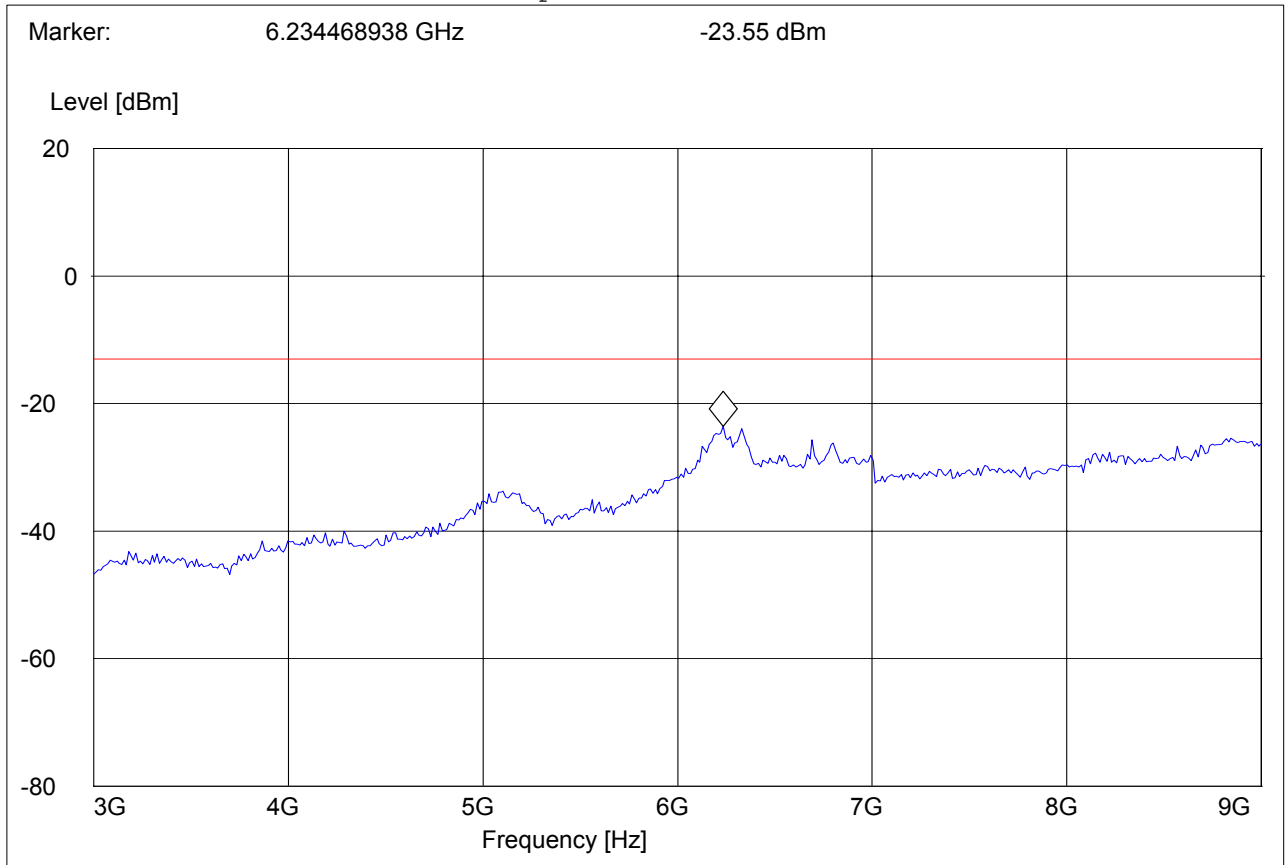
Spurious emission limit -13dBm

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT / Description: EUT 34BB00t, C06, LAPTOP KKL-E3-C1, X01-00
 Customer: Novatel
 Operating Mode: FDD5, TCH4132
 Antenna: V
 EUT: V
 Test Engineer: Ed
 Voltage: AC Adapter
 Sweep: FCC 22 Spur 3-9G

SWEEP TABLE: "FCC 22Spuri 3-9G"

Short Description:		FCC 24 1GHz-8GHz			
Start	Stop	Detector	Meas.	IF	Transducer
Frequency	Frequency		Time	Bandw.	
3.0 GHz	9.0 GHz	MaxPeak	Coupled	1 MHz	DUMMY-DBM





RADIATED SPURIOUS EMISSIONS (GSM-850 FDD5)

Tx @ 836.6MHz: 1GHz – 1.58GHz

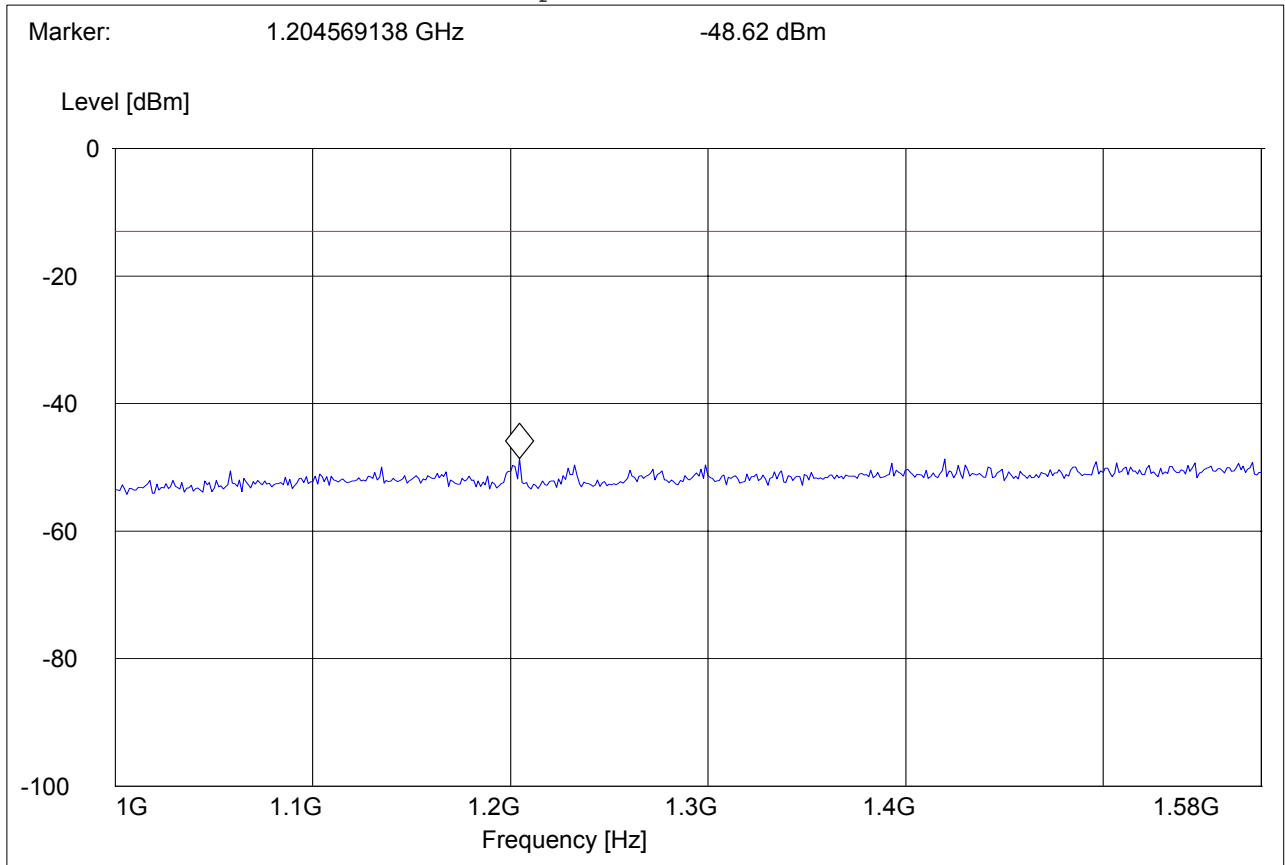
Spurious emission limit -13dBm

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT / Description: EUT 34BB00t, C06, LAPTOP KKL-E3-C1, X01-00
 Customer: Novatel
 Operating Mode: FDD5, TCH4183
 Antenna: V
 EUT: V
 Test Engineer: Ed
 Voltage: AC Adapter
 Sweep: FCC 22 Spur 1-1.58G

SWEEP TABLE: "FCC 22Spuri 1-1.58G"

Short Description:		FCC 24 1GHz-8GHz			
Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
1.0 GHz	1.6 GHz	MaxPeak	Coupled	1 MHz	DUMMY-DBM





RADIATED SPURIOUS EMISSIONS (GSM-850 FDD5)

Tx @ 836.6MHz: 1.58GHz – 3GHz

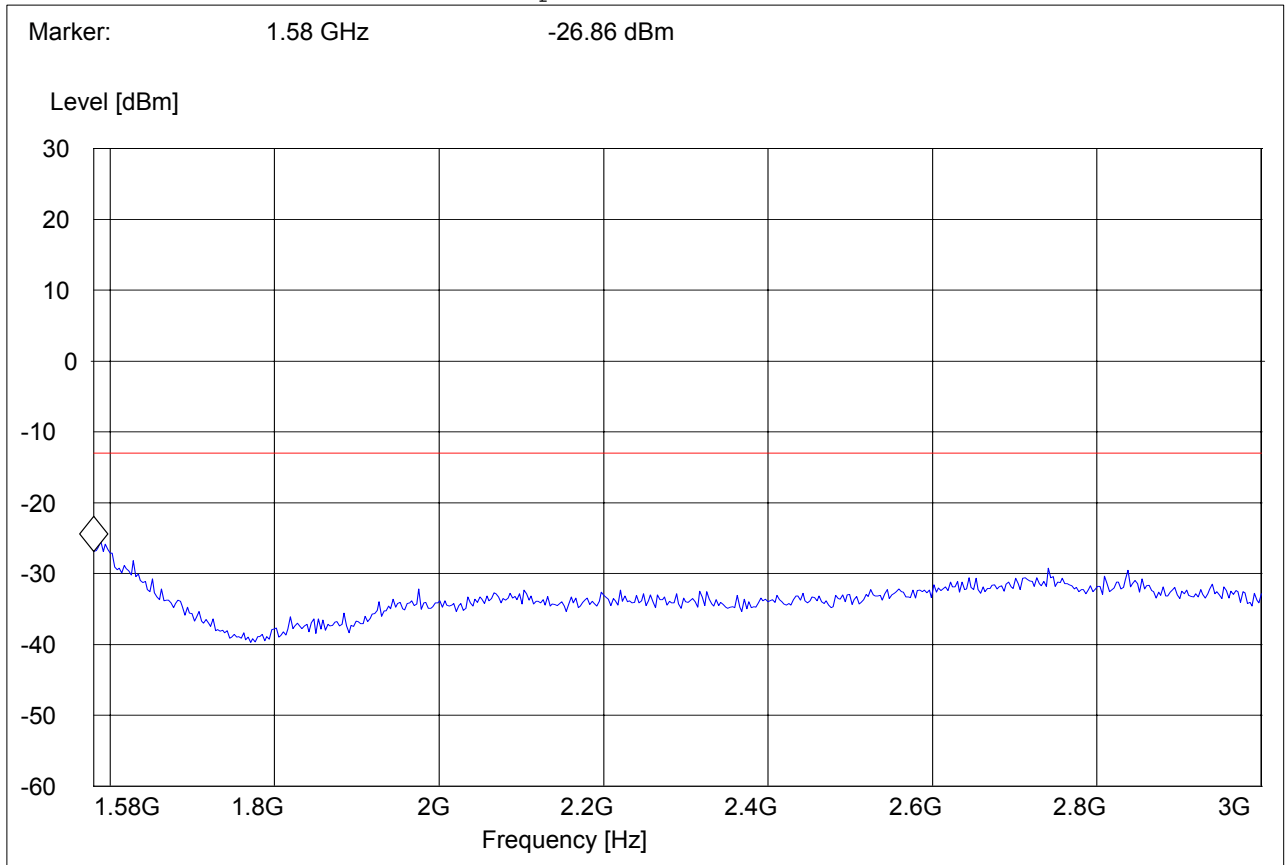
Spurious emission limit -13dBm

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT / Description: EUT 34BB00t, C06, LAPTOP KKL-E3-C1, X01-00
 Customer: Novatel
 Operating Mode: FDD5, TCH4183
 Antenna: V
 EUT: V
 Test Engineer: Ed
 Voltage: AC Adapter
 Sweep: FCC 22 Spur 1.58-3G

SWEEP TABLE: "FCC 22Spuri 1.58-3G"

Short Description:		FCC 24 1GHz-8GHz			
Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
1.6 GHz	3.0 GHz	MaxPeak	Coupled	1 MHz	DUMMY-DBM





RADIATED SPURIOUS EMISSIONS (GSM-850 FDD5)

Tx @ 836.6MHz: 3GHz – 9GHz

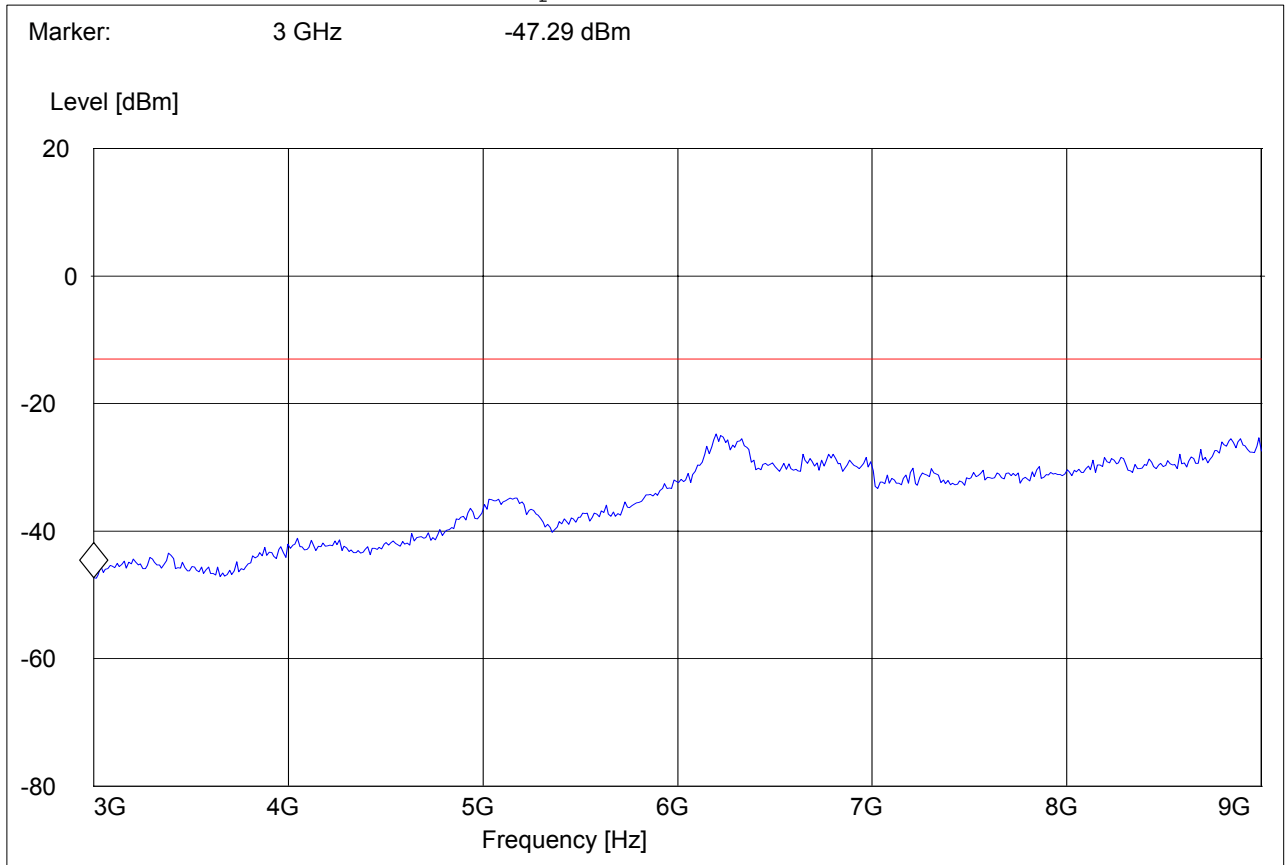
Spurious emission limit -13dBm

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT / Description: EUT 34BB00t, C06, LAPTOP KKL-E3-C1, X01-00
 Customer: Novatel
 Operating Mode: FDD5, TCH4183
 Antenna: V
 EUT: V
 Test Engineer: Ed
 Voltage: AC Adapter
 Sweep: FCC 22 Spur 3-9G

SWEEP TABLE: "FCC 22Spuri 3-9G"

Short Description:		FCC 24 1GHz-8GHz				
Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer	
3.0 GHz	9.0 GHz	MaxPeak	Coupled	1 MHz	DUMMY-DBM	





RADIATED SPURIOUS EMISSIONS (GSM-850 FDD5)

Tx @ 846.6MHz: 1GHz – 1.58GHz

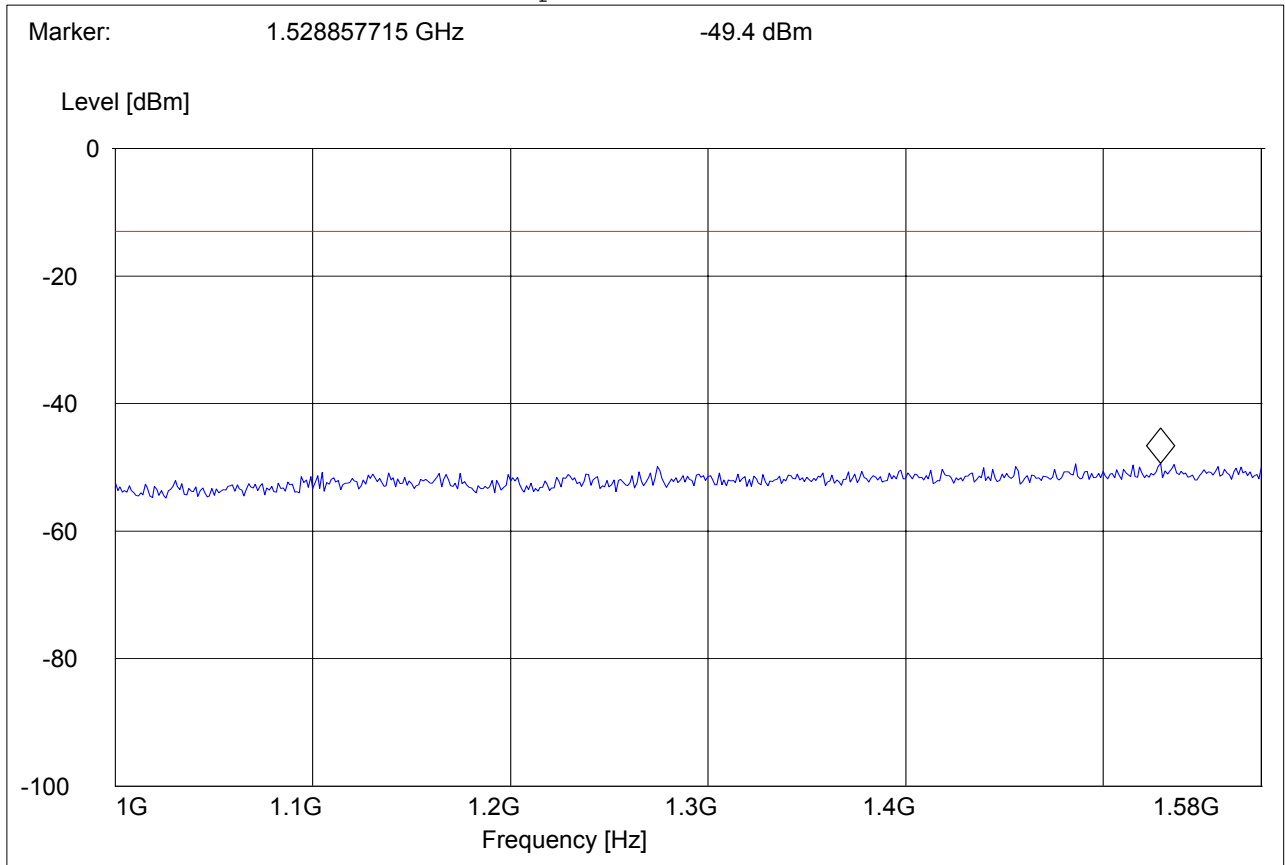
Spurious emission limit -13dBm

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT / Description: EUT 34BB00t, C06, LAPTOP KKL-E3-C1, X01-00
 Customer: Novatel
 Operating Mode: FDD5, TCH4233
 Antenna: V
 EUT: V
 Test Engineer: Ed
 Voltage: AC Adapter
 Sweep: FCC 22 Spur 1-1.58G

SWEEP TABLE: "FCC 22Spuri 1-1.58G"

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
1.0 GHz	1.6 GHz	MaxPeak	Coupled	1 MHz	DUMMY-DBM





RADIATED SPURIOUS EMISSIONS (GSM-850 FDD5)

Tx @ 846.6MHz: 1.58GHz – 3GHz

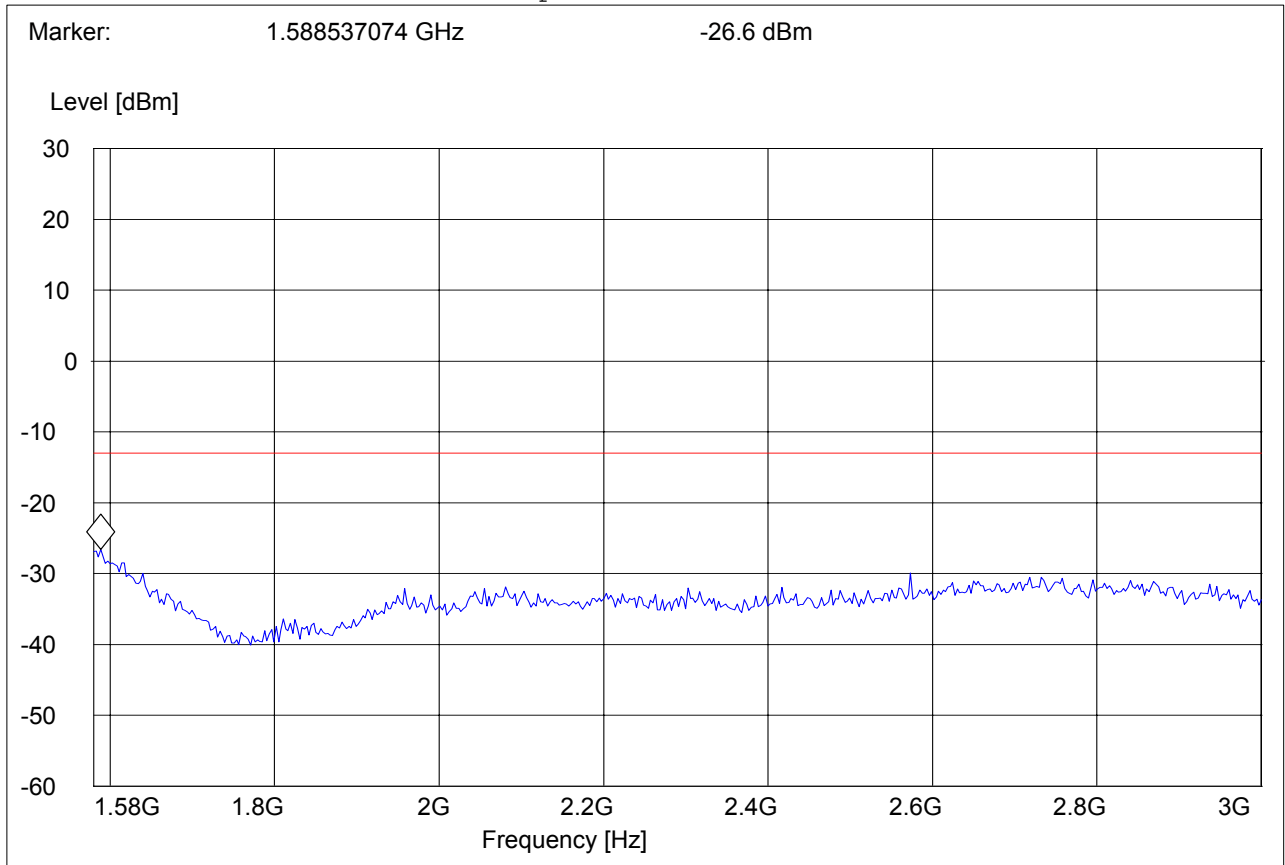
Spurious emission limit -13dBm

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT / Description: EUT 34BB00t, C06, LAPTOP KKL-E3-C1, X01-00
 Customer: Novatel
 Operating Mode: FDD5, TCH4233
 Antenna: V
 EUT: V
 Test Engineer: Ed
 Voltage: AC Adapter
 Sweep: FCC 22 Spur 1.58-3G

SWEEP TABLE: "FCC 22Spuri 1.58-3G"

Short Description:		FCC 24 1GHz-8GHz			
Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
1.6 GHz	3.0 GHz	MaxPeak	Coupled	1 MHz	DUMMY-DBM





RADIATED SPURIOUS EMISSIONS (GSM-850 FDD5)

Tx @846.6MHz: 3GHz – 9GHz

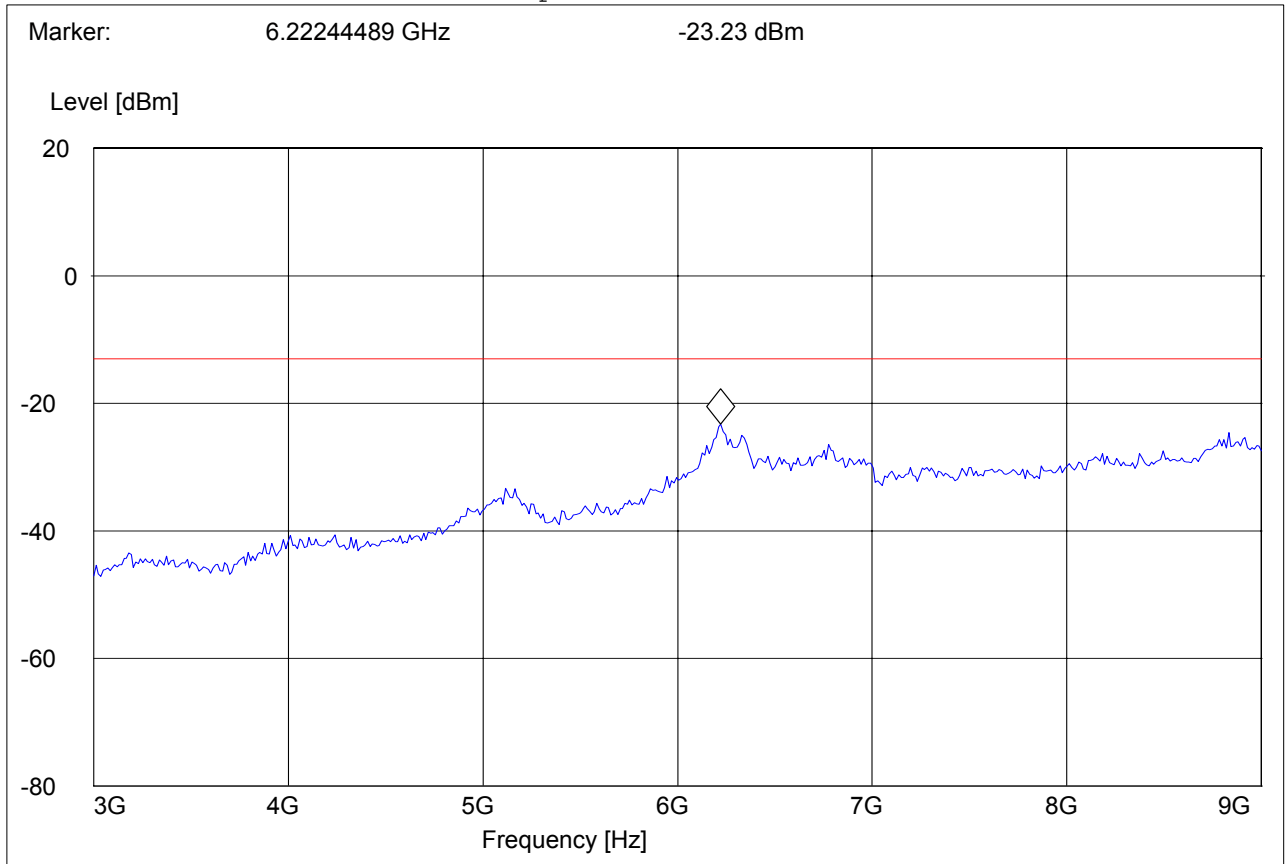
Spurious emission limit -13dBm

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT / Description: EUT 34BB00t, C06, LAPTOP KKL-E3-C1, X01-00
 Customer: Novatel
 Operating Mode: FDD5, TCH4233
 Antenna: V
 EUT: V
 Test Engineer: Ed
 Voltage: AC Adapter
 Sweep: FCC 22 Spur 3-9G

SWEEP TABLE: "FCC 22Spuri 3-9G"

Short Description:		FCC 24 1GHz-8GHz			
Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
3.0 GHz	9.0 GHz	MaxPeak	Coupled	1 MHz	DUMMY-DBM



5.5.4.5 RESULTS OF RADIATED TESTS PCS-1900:

Harmonic	Tx ch-512 Freq.(MHz)	Level (dBm)	Tx ch-661 Freq. (MHz)	Level (dBm)	Tx ch-810 Freq. (MHz)	Level (dBm)
2	3700.4	NF	3760	NF	3819.6	NF
3	5550.6	NF	5640	NF	5729.4	NF
4	7400.8	NF	7520	NF	7639.2	NF
5	9251	NF	9400	NF	9549	NF
6	11101.2	NF	11280	NF	11458.8	NF
7	12951.4	NF	13160	NF	13368.6	NF
8	14801.6	NF	15040	NF	15278.4	NF
9	16651.8	NF	16920	NF	17188.2	NF
10	18502	NF	18800	NF	19098	NF
NF = NOISE FLOOR						



5.5.4.6 RADIATED SPURIOUS EMISSIONS(PCS 1900)

TX: 30MHz - 1GHz

Spurious emission limit -13dBm

Antenna: vertical

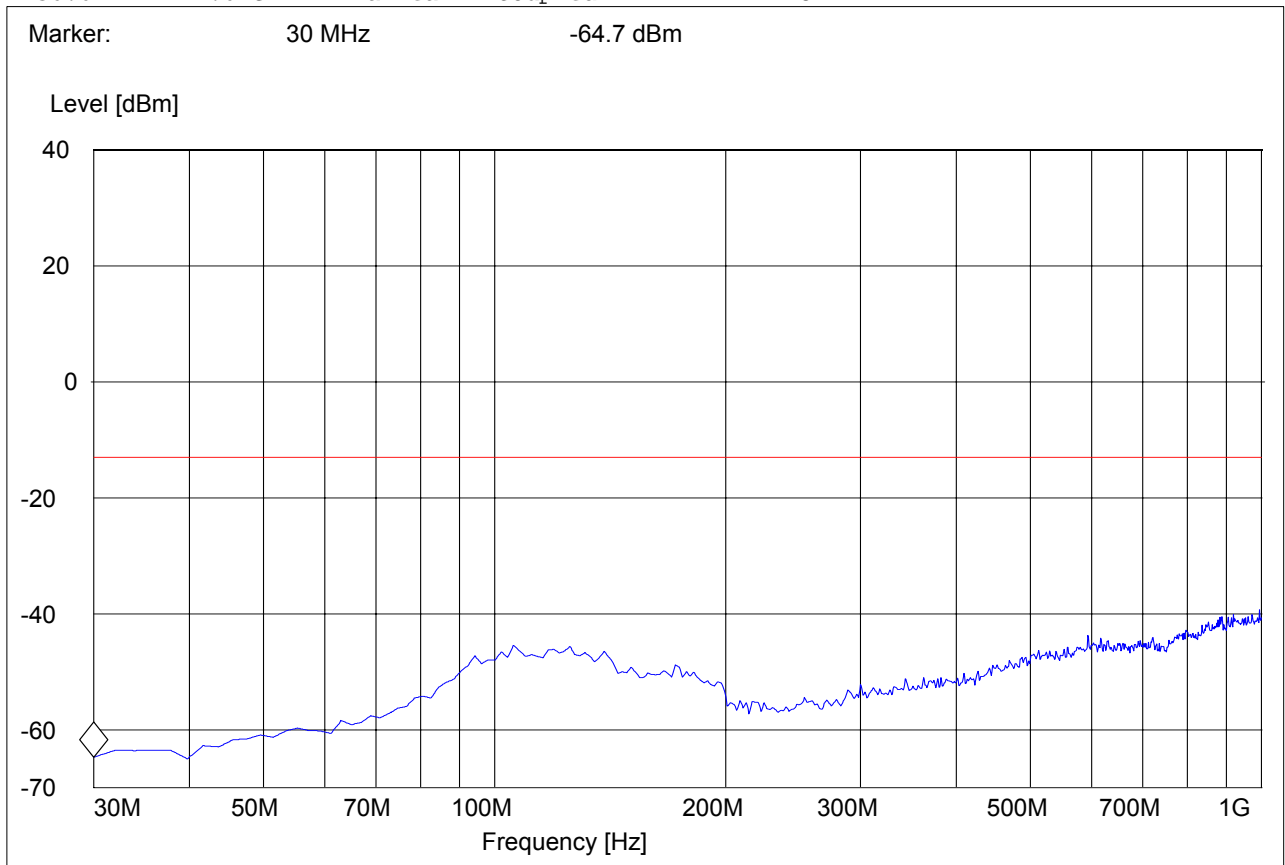
Note: This plot is valid for low, mid & high channels (worst-case plot)

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT / Description: EUT 34BB00I, C03, LAPTOP KKL-E3-C1, X01-00
 Customer: NOVATEL
 Operating Mode: FCC24, RADIATED, TCH 810
 Antenna: V
 EUT: V
 Test Engineer: SATYA
 Voltage: AC ADAPTOR
 Sweep: FCC24 SPURI 30M-1G

SWEEP TABLE: "FCC 24 Spur 30M-1G_V"

Short Description:		FCC 24 30MHz-1GHz			
Start	Stop	Detector	Meas.	IF	Transducer
Frequency	Frequency		Time	Bandw.	
30.0 MHz	1.0 GHz	MaxPeak	Coupled	1 MHz	DUMMY-DBM





RADIATED SPURIOUS EMISSIONS(PCS 1900)

Tx @ 1850.2MHz: 1GHz – 3GHz

Spurious emission limit -13dBm

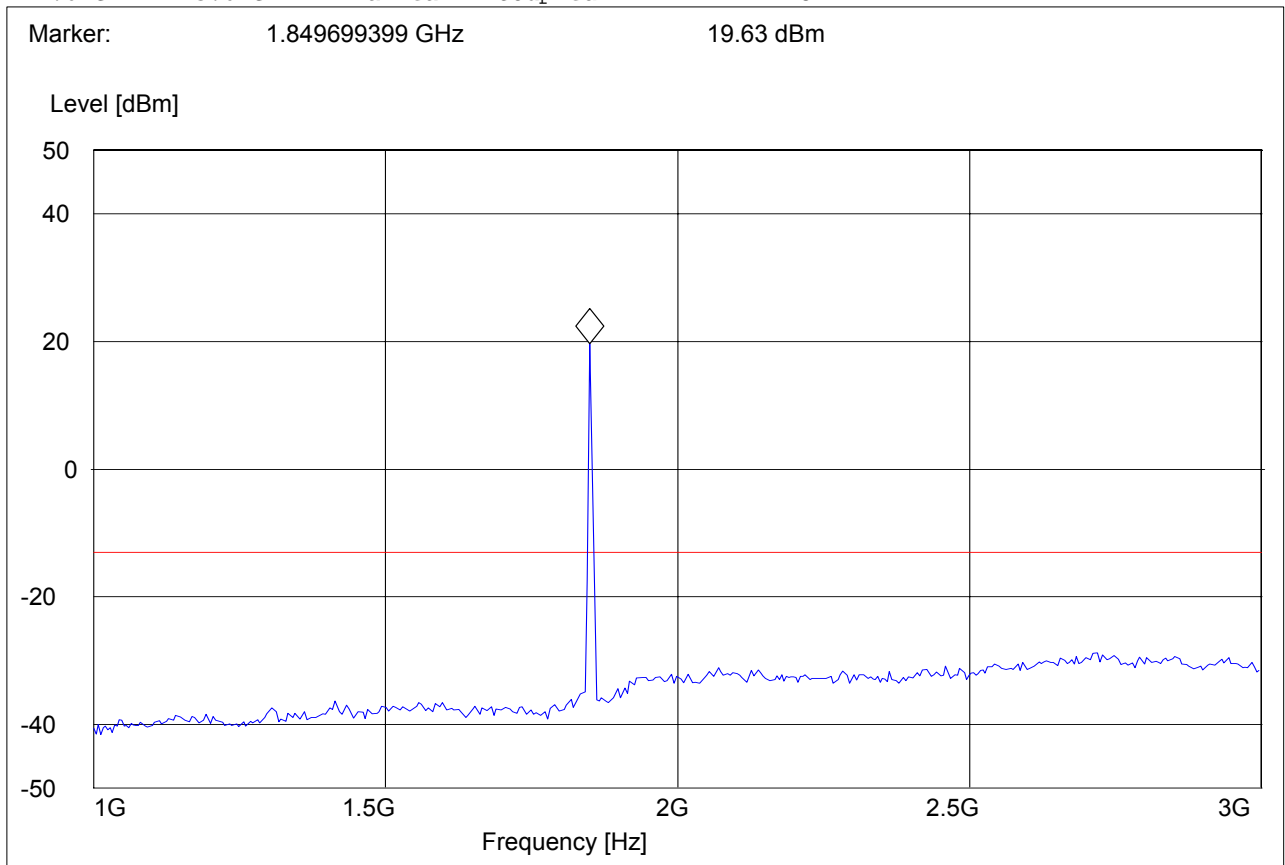
Note: The peak above the limit line is the carrier freq. at ch-512.

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT / Description: EUT 34BB00I, C03, LAPTOP KKL-E3-C1, X01-00
 Customer: NOVATEL
 Operating Mode: FCC24, RADIATED
 Antenna: V
 EUT: V
 Test Engineer: PETER
 Voltage: AC ADAPTOR
 Sweep: FCC24 SPURI 1-3G

SWEEP TABLE: "FCC 24Spuri 1-3G"

Short Description:		FCC 24 1GHz-8GHz			
Start	Stop	Detector	Meas.	IF	Transducer
Frequency	Frequency		Time	Bandw.	
1.0 GHz	3.0 GHz	MaxPeak	Coupled	1 MHz	DUMMY-DBM





RADIATED SPURIOUS EMISSIONS(PCS 1900)

Tx @ 1850.2MHz: 3GHz – 18GHz

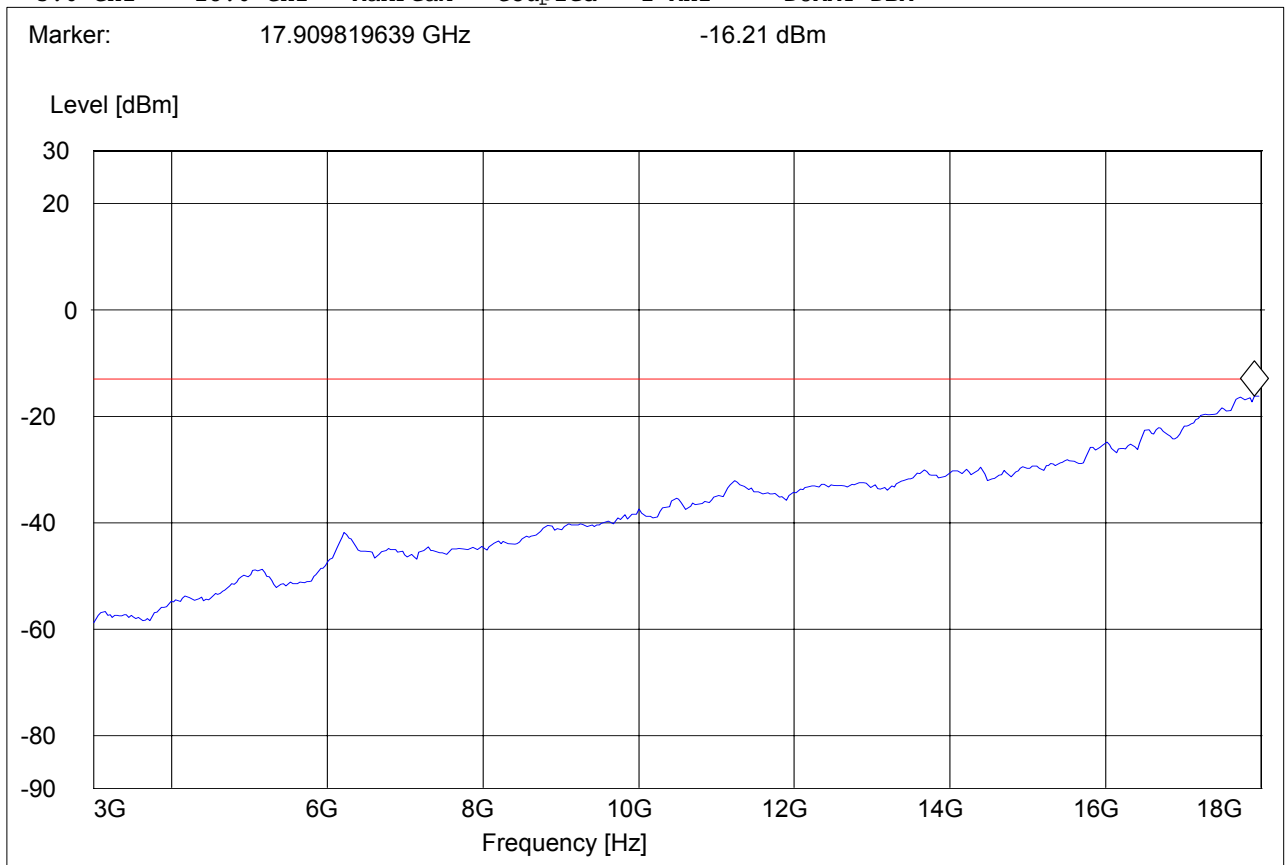
Spurious emission limit -13dBm

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT / Description: EUT 34BB00I, C03, LAPTOP KKL-E3-C1, X01-00
 Customer: NOVATEL
 Operating Mode: FCC24, RADIATED
 Antenna: V
 EUT: V
 Test Engineer: PETER
 Voltage: AC ADAPTOR
 Sweep: FCC24 SPURI 3-18G

SWEEP TABLE: "FCC 24Spuri 3-18G"

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
3.0 GHz	18.0 GHz	MaxPeak	Coupled	1 MHz	DUMMY-DBM





RADIATED SPURIOUS EMISSIONS(PCS 1900)

Tx @ 1880.0MHz: 1GHz – 3GHz

Spurious emission limit -13dBm

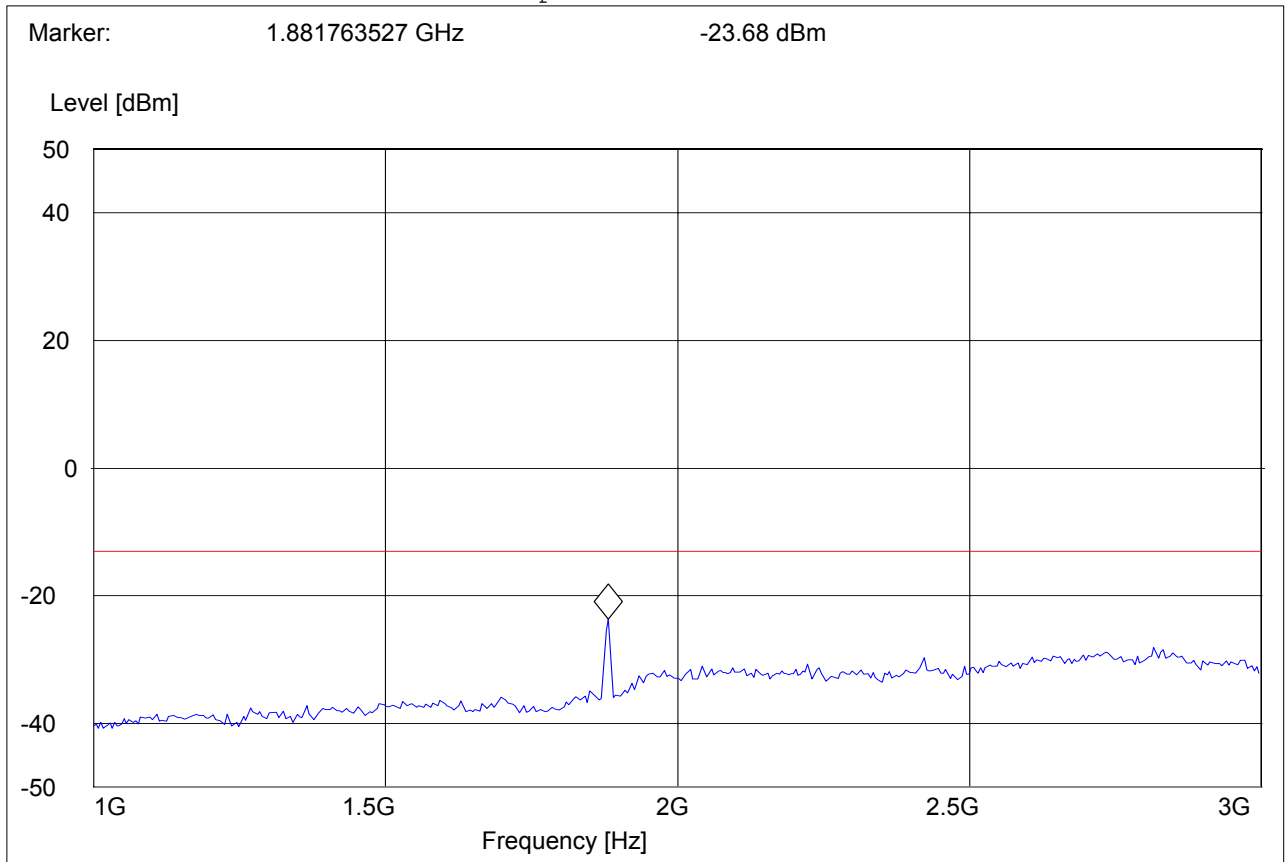
Note: The peak above/close to the limit line is the carrier freq. at ch-661.

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT / Description: EUT 34BB00I, C03, LAPTOP KKL-E3-C1, X01-00
 Customer: NOVATEL
 Operating Mode: FCC24, RADIATED
 Antenna: V
 EUT: V
 Test Engineer: PETER
 Voltage: AC ADAPTOR
 Sweep: FCC24 SPURI 1-3G

SWEEP TABLE: "FCC 24Spuri 1-3G"

Short Description:		FCC 24 1GHz-8GHz				
Start	Stop	Detector	Meas.	IF	Transducer	
Frequency	Frequency		Time	Bandw.		
1.0 GHz	3.0 GHz	MaxPeak	Coupled	1 MHz	DUMMY-DBM	





RADIATED SPURIOUS EMISSIONS(PCS 1900)

Tx @ 1880.0MHz: 3GHz – 18GHz

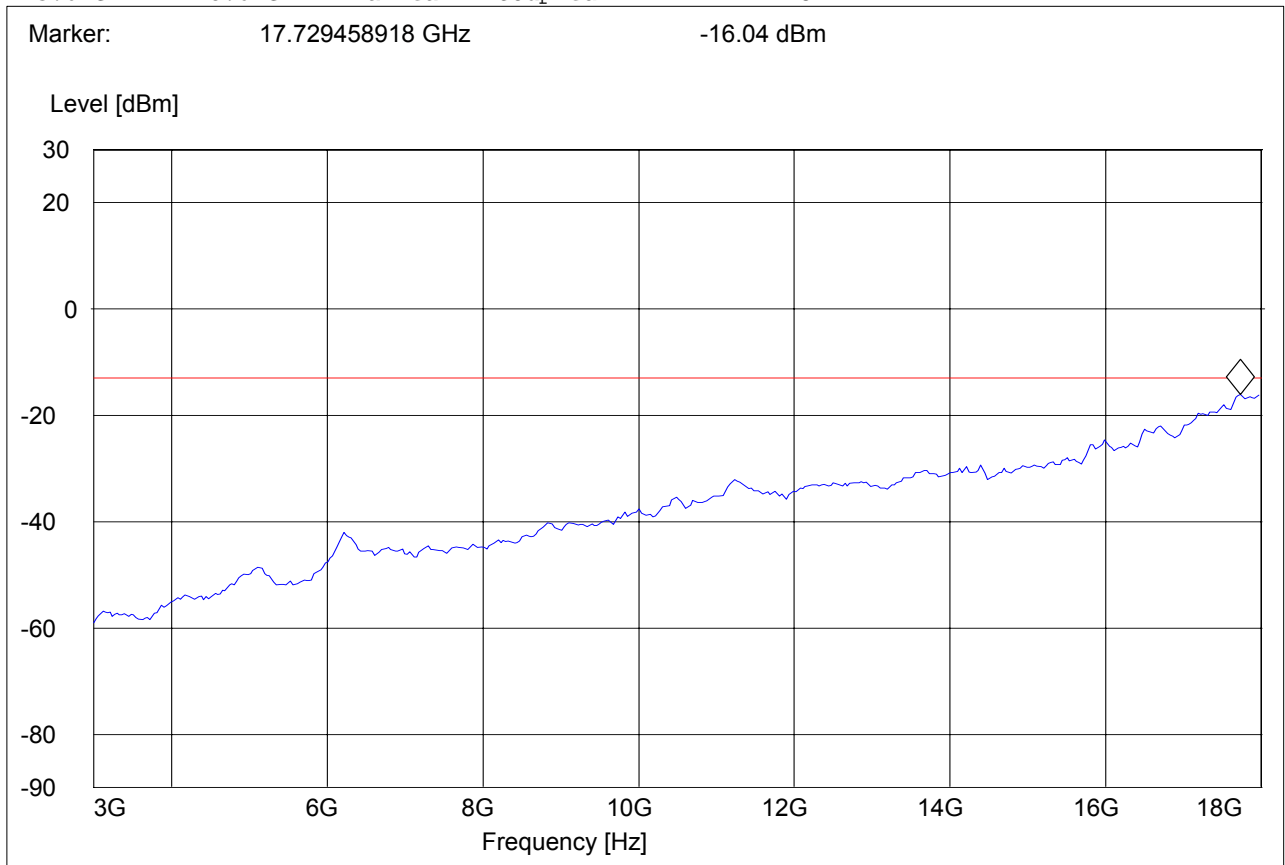
Spurious emission limit -13dBm

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT / Description: EUT 34BB00I, C03, LAPTOP KKL-E3-C1, X01-00
 Customer: NOVATEL
 Operating Mode: FCC24, RADIATED
 Antenna: V
 EUT: V
 Test Engineer: PETER
 Voltage: AC ADAPTOR
 Sweep: FCC24 SPURI 3-18G

SWEEP TABLE: "FCC 24Spuri 3-18G"

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
3.0 GHz	18.0 GHz	MaxPeak	Coupled	1 MHz	DUMMY-DBM





RADIATED SPURIOUS EMISSIONS(PCS 1900)

Tx @ 1909.8MHz: 1GHz – 3GHz

Spurious emission limit -13dBm

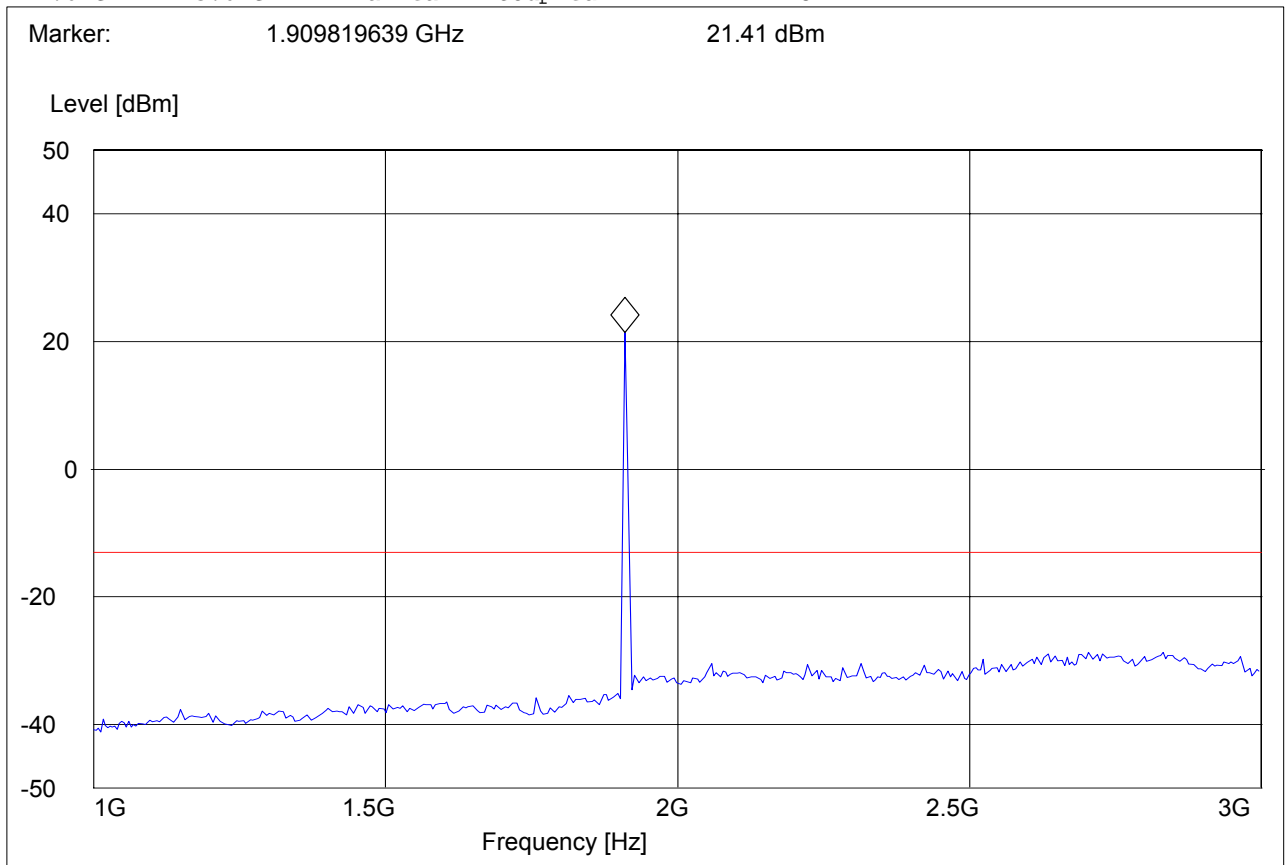
Note: The peak above the limit line is the carrier freq. at ch-810.

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT / Description: EUT 34BB00I, C03, LAPTOP KKL-E3-C1, X01-00
 Customer: NOVATEL
 Operating Mode: FCC24, RADIATED, TABLE 172°
 Antenna: V
 EUT: V
 Test Engineer: PETER
 Voltage: AC ADAPTOR
 Sweep: FCC24 SPURI 1-3G

SWEEP TABLE: "FCC 24Spuri 1-3G"

Short Description:		FCC 24 1GHz-8GHz			
Start	Stop	Detector	Meas.	IF	Transducer
Frequency	Frequency		Time	Bandw.	
1.0 GHz	3.0 GHz	MaxPeak	Coupled	1 MHz	DUMMY-DBM





RADIATED SPURIOUS EMISSIONS(PCS 1900)

Tx @ 1909.8MHz: 3GHz – 18GHz

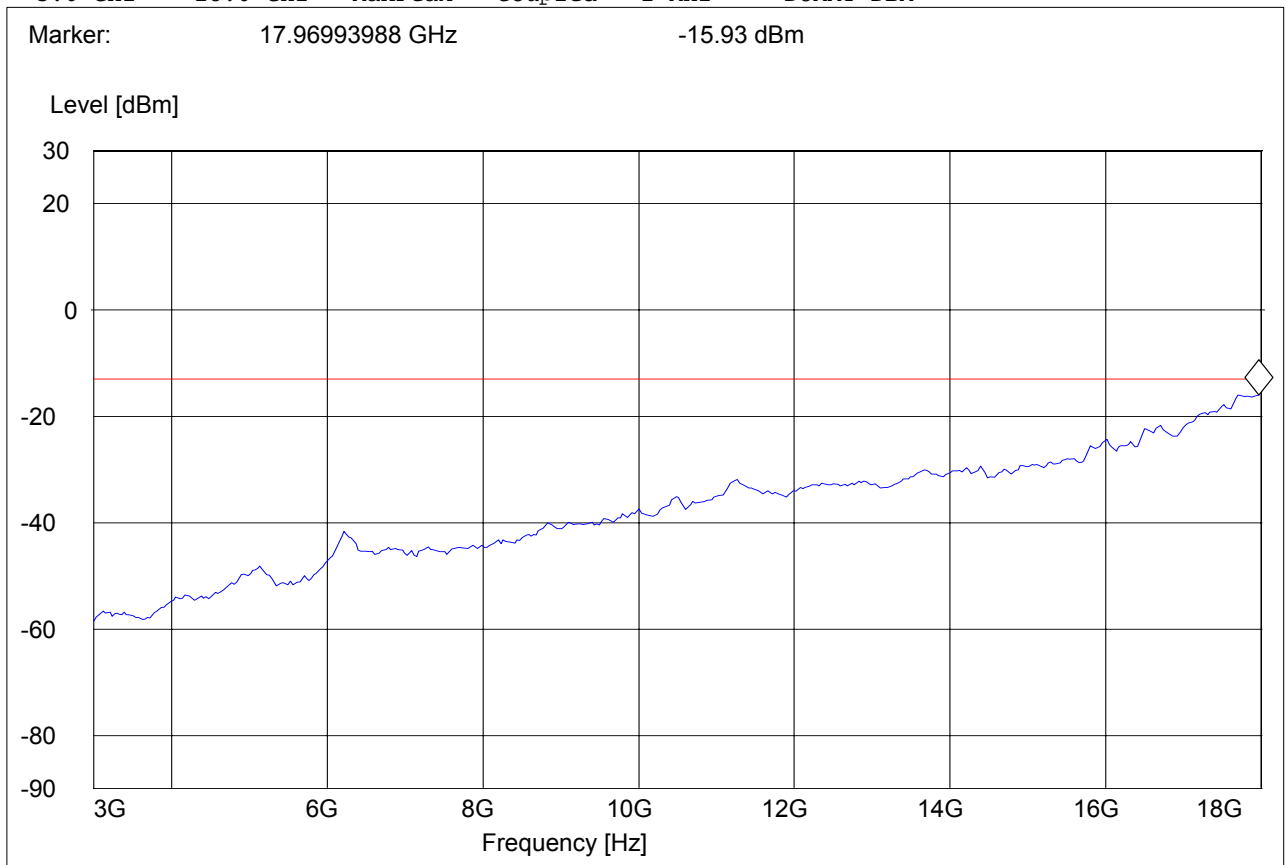
Spurious emission limit -13dBm

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT / Description: EUT 34BB00I, C03, LAPTOP KKL-E3-C1, X01-00
 Customer: NOVATEL
 Operating Mode: FCC24, RADIATED
 Antenna: V
 EUT: V
 Test Engineer: PETER
 Voltage: AC ADAPTOR
 Sweep: FCC24 SPURI 3-18G

SWEEP TABLE: "FCC 24Spuri 3-18G"

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
3.0 GHz	18.0 GHz	MaxPeak	Coupled	1 MHz	DUMMY-DBM





RADIATED SPURIOUS EMISSIONS(PCS 1900)

18GHz – 19.1GHz

Spurious emission limit -13dBm

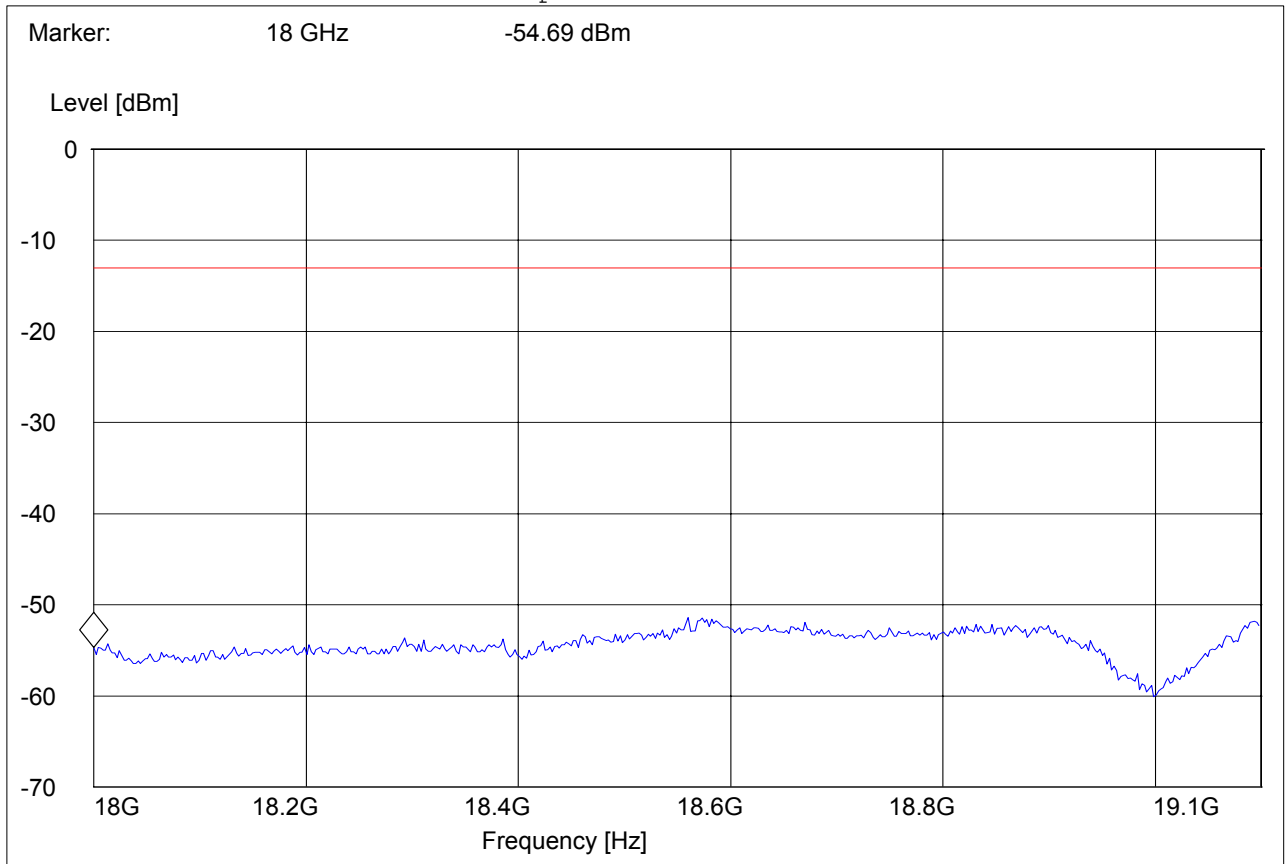
Note: This plot is valid for low, mid & high channels (worst-case plot)

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT / Description: EUT 34BB00I, C03, LAPTOP KKL-E3-C1, X01-00
 Customer: NOVATEL
 Operating Mode: FCC24, RADIATED, TCH 810
 Antenna: V
 EUT: V
 Test Engineer: SATYA
 Voltage: AC ADAPTOR
 Sweep: FCC24 SPURI 18-19.1G

SWEEP TABLE: "FCC 24spuri 18-19.1G"

Short Description:		FCC 24 18GHz-19.1GHz				
Start	Stop	Detector	Meas.	IF	Transducer	
Frequency	Frequency		Time	Bandw.		
18.0 GHz	19.1 GHz	MaxPeak	Coupled	1 MHz	DUMMY-DBM	



5.5.4.7 RESULTS OF RADIATED TESTS PCS-1900: FDD2

Harmonic	Tx ch-9262 Freq.(MHz)	Level (dBm)	Tx ch-9400 Freq. (MHz)	Level (dBm)	Tx ch-9538 Freq. (MHz)	Level (dBm)
2	3700.4	NF	3760	NF	3819.6	NF
3	5550.6	NF	5640	NF	5729.4	NF
4	7400.8	NF	7520	NF	7639.2	NF
5	9251	NF	9400	NF	9549	NF
6	11101.2	NF	11280	NF	11458.8	NF
7	12951.4	NF	13160	NF	13368.6	NF
8	14801.6	NF	15040	NF	15278.4	NF
9	16651.8	NF	16920	NF	17188.2	NF
10	18502	NF	18800	NF	19098	NF
NF = NOISE FLOOR						



5.5.4.8 RADIATED SPURIOUS EMISSIONS(PCS 1900 FDD2)

TX: 30MHz - 1GHz

Spurious emission limit -13dBm

Antenna: vertical

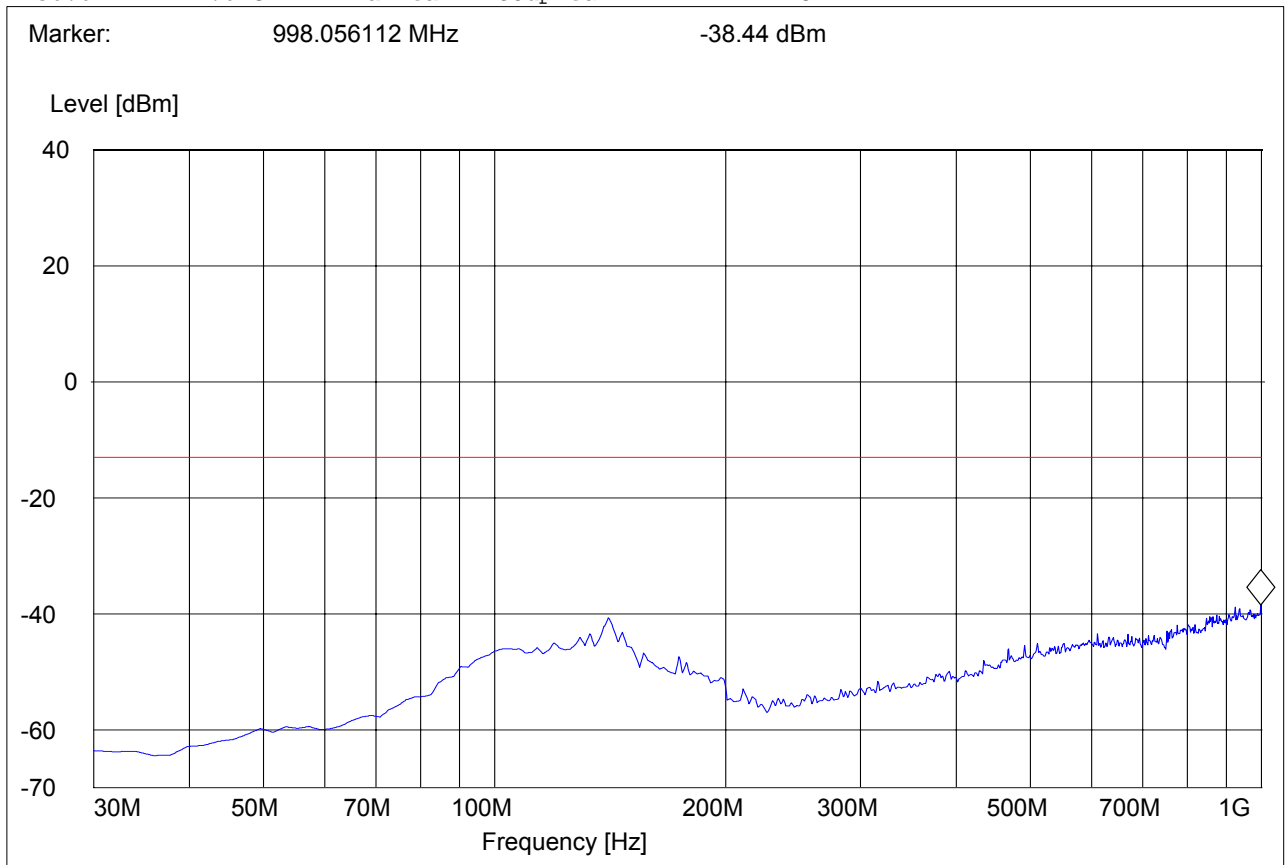
Note: This plot is valid for low, mid & high channels (worst-case plot)

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT / Description: EUT 34BB00t, C06, LAPTOP KKL-E3-C1, X01-00
 Customer: Novatel
 Operating Mode: FDD2, CH9400, 1880MHz
 Antenna: V
 EUT: V
 Test Engineer: PETER
 Voltage: AC Adapter
 Sweep: FCC24 SPURI 30-1G_V

SWEEP TABLE: "FCC 24 Spur 30M-1G_V"

Short Description:		FCC 24 30MHz-1GHz			
Start	Stop	Detector	Meas.	IF	Transducer
Frequency	Frequency		Time	Bandw.	
30.0 MHz	1.0 GHz	MaxPeak	Coupled	1 MHz	DUMMY-DBM





RADIATED SPURIOUS EMISSIONS(PCS 1900 FDD2)

Tx @ 1852.4MHz: 1GHz – 3GHz

Spurious emission limit -13dBm

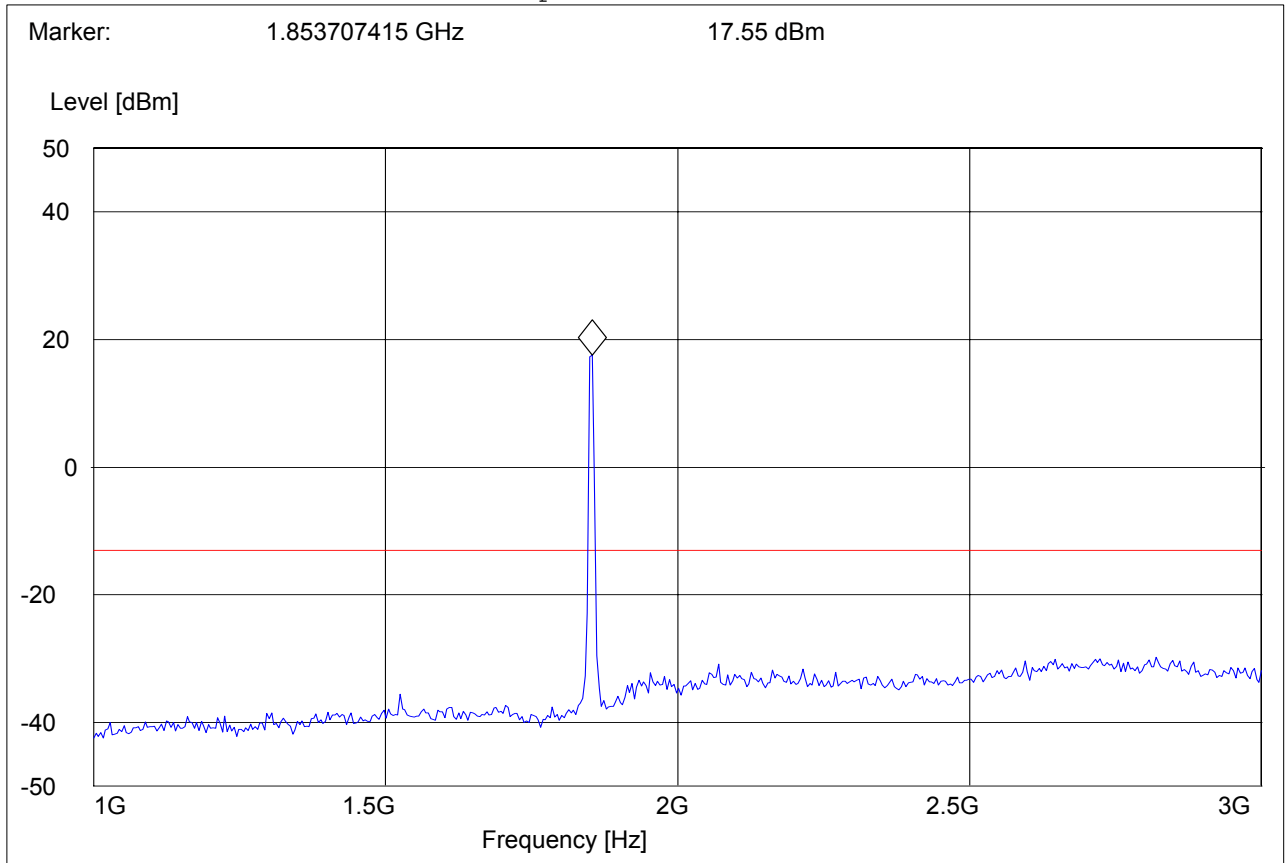
Note: The peak above the limit line is the carrier freq. at ch-512.

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT / Description: EUT 34BB00t, C06, LAPTOP KKL-E3-C1, X01-00
 Customer: Novatel
 Operating Mode: FDD2, CH9262, 1852.4MHz
 Antenna: V
 EUT: V
 Test Engineer: PETER
 Voltage: AC Adapter
 Sweep: FCC24 SPURI 1-3G

SWEEP TABLE: "FCC 24Spuri 1-3G"

Short Description:		FCC 24 1GHz-8GHz			
Start	Stop	Detector	Meas.	IF	Transducer
Frequency	Frequency		Time	Bandw.	
1.0 GHz	3.0 GHz	MaxPeak	Coupled	1 MHz	DUMMY-DBM





RADIATED SPURIOUS EMISSIONS(PCS 1900 FDD2)

Tx @ 1852.4MHz: 3GHz – 18GHz

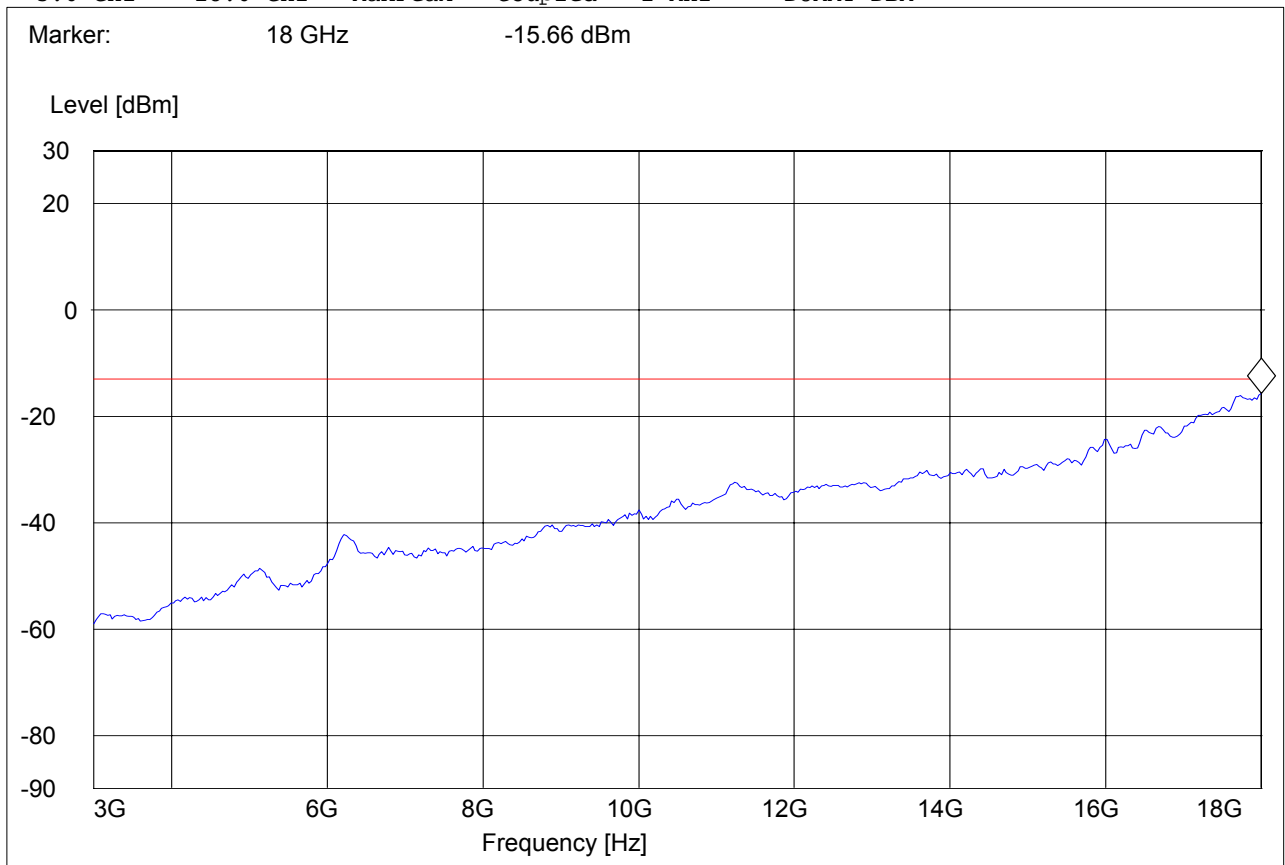
Spurious emission limit -13dBm

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT / Description: EUT 34BB00t, C06, LAPTOP KKL-E3-C1, X01-00
 Customer: Novatel
 Operating Mode: FDD2, CH9262, 1852.4MHz
 Antenna: V
 EUT: V
 Test Engineer: PETER
 Voltage: AC Adapter
 Sweep: FCC24 SPURI 3-18G

SWEEP TABLE: "FCC 24Spuri 3-18G"

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
3.0 GHz	18.0 GHz	MaxPeak	Coupled	1 MHz	DUMMY-DBM





RADIATED SPURIOUS EMISSIONS(PCS 1900 FDD2)

Tx @ 1880.0MHz: 1GHz – 3GHz

Spurious emission limit -13dBm

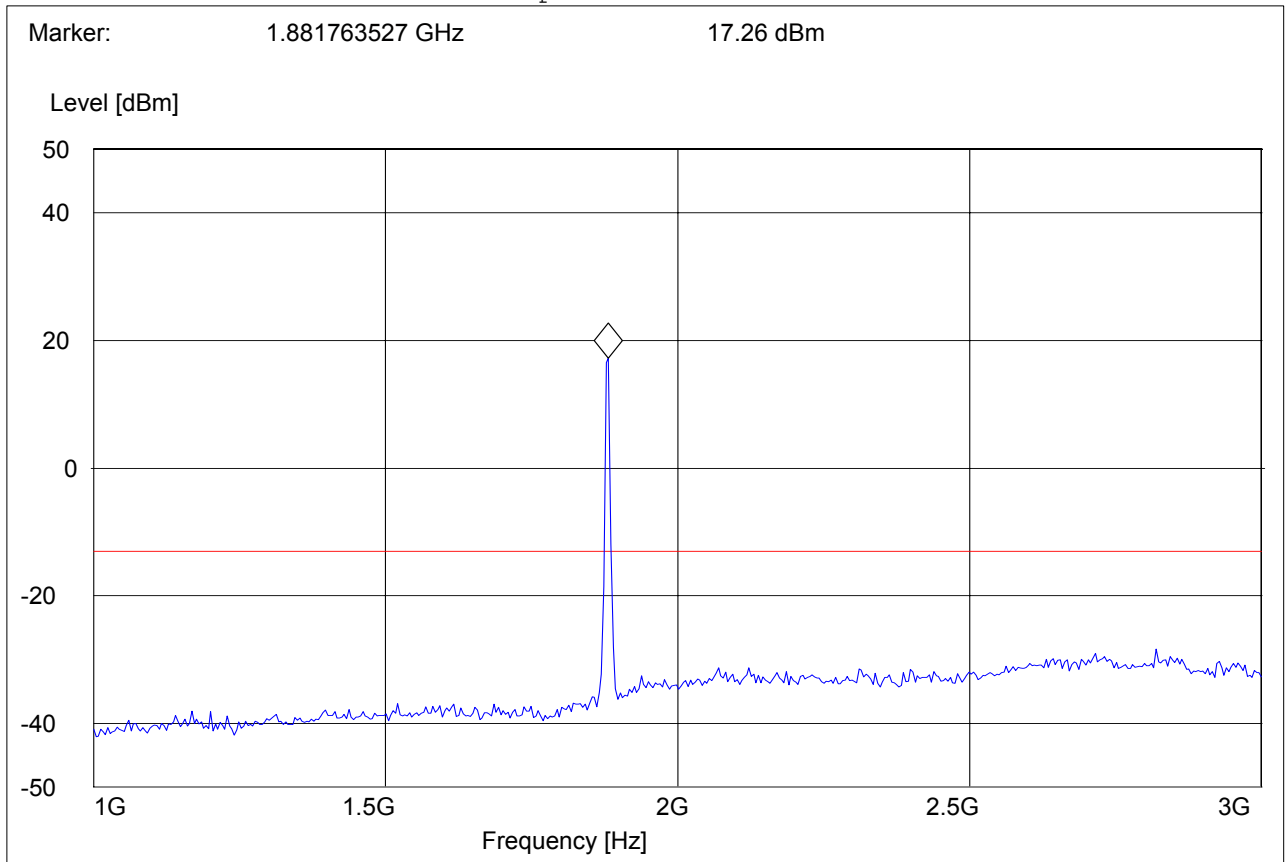
Note: The peak above/close to the limit line is the carrier freq. at ch-661.

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT / Description: EUT 34BB00t, C06, LAPTOP KKL-E3-C1, X01-00
 Customer: Novatel
 Operating Mode: FDD2, CH9400, 1880MHz
 Antenna: V
 EUT: V
 Test Engineer: PETER
 Voltage: AC Adapter
 Sweep: FCC24 SPURI 1-3G

SWEEP TABLE: "FCC 24Spuri 1-3G"

Short Description:		FCC 24 1GHz-8GHz				
Start	Stop	Detector	Meas.	IF	Transducer	
Frequency	Frequency		Time	Bandw.		
1.0 GHz	3.0 GHz	MaxPeak	Coupled	1 MHz	DUMMY-DBM	





RADIATED SPURIOUS EMISSIONS(PCS 1900 FDD2)

Tx @ 1880.0MHz: 3GHz – 18GHz

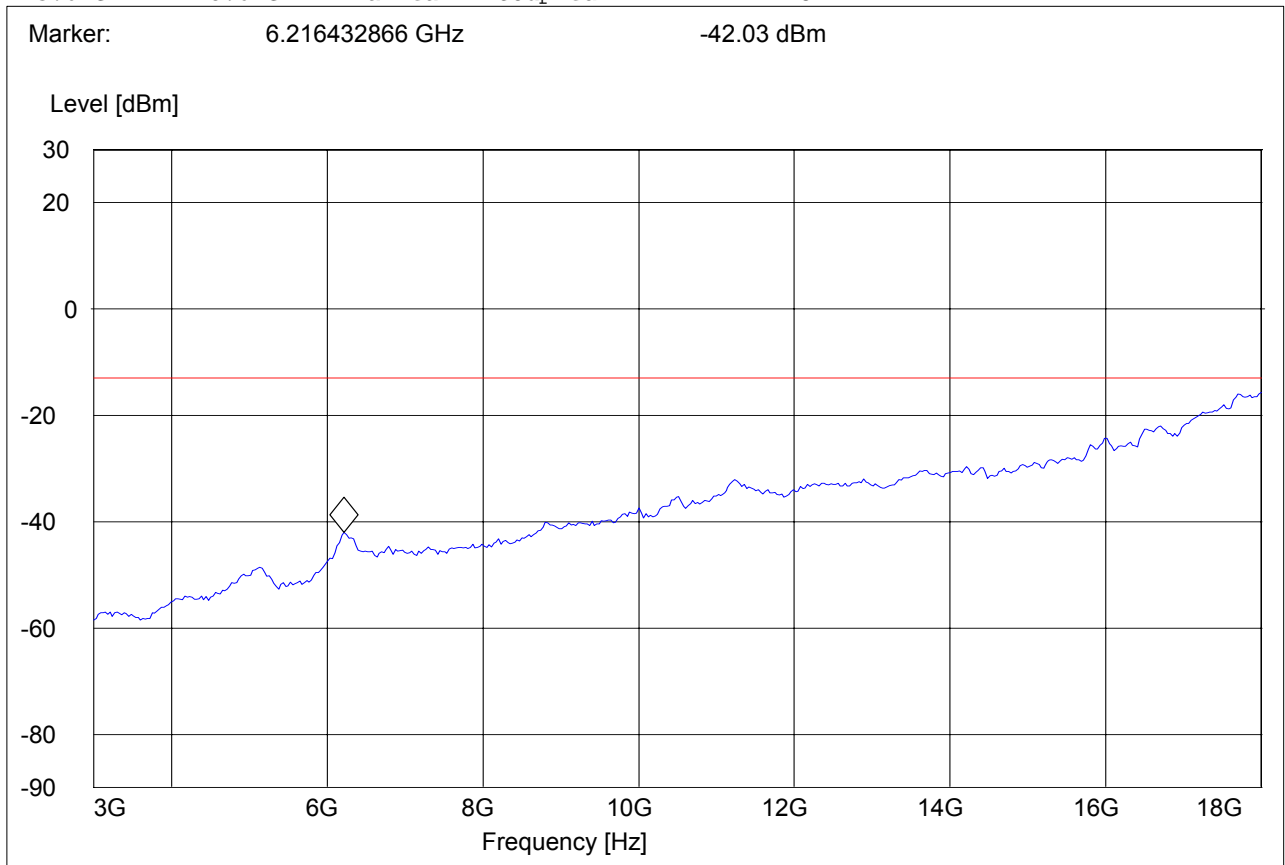
Spurious emission limit -13dBm

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT / Description: EUT 34BB00t, C06, LAPTOP KKL-E3-C1, X01-00
 Customer: Novatel
 Operating Mode: FDD2, CH9400, 1880MHz
 Antenna: V
 EUT: V
 Test Engineer: PETER
 Voltage: AC Adapter
 Sweep: FCC24 SPURI 3-18G

SWEEP TABLE: "FCC 24Spuri 3-18G"

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
3.0 GHz	18.0 GHz	MaxPeak	Coupled	1 MHz	DUMMY-DBM





RADIATED SPURIOUS EMISSIONS(PCS 1900 FDD2)

Tx @ 1907.6MHz: 1GHz – 3GHz

Spurious emission limit -13dBm

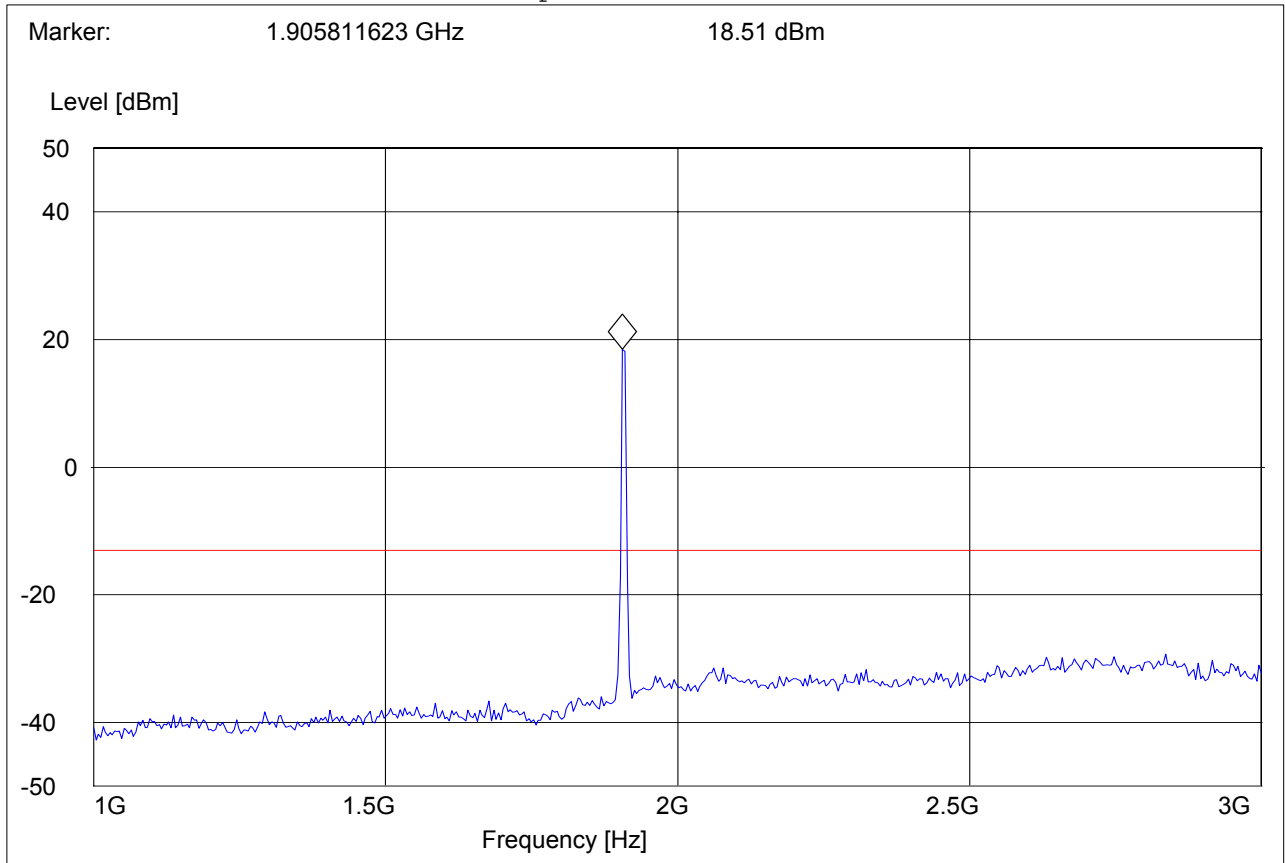
Note: The peak above the limit line is the carrier freq. at ch-810.

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT / Description: EUT 34BB00t, C06, LAPTOP KKL-E3-C1, X01-00
 Customer: Novatel
 Operating Mode: FDD2, CH9538, 1907.6MHz
 Antenna: V
 EUT: V
 Test Engineer: PETER
 Voltage: AC Adapter
 Sweep: FCC24 SPURI 1-3G

SWEEP TABLE: "FCC 24Spuri 1-3G"

Short Description:		FCC 24 1GHz-8GHz			
Start	Stop	Detector	Meas.	IF	Transducer
Frequency	Frequency		Time	Bandw.	
1.0 GHz	3.0 GHz	MaxPeak	Coupled	1 MHz	DUMMY-DBM





RADIATED SPURIOUS EMISSIONS(PCS 1900 FDD2)

Tx @ 1907.6MHz: 3GHz – 18GHz

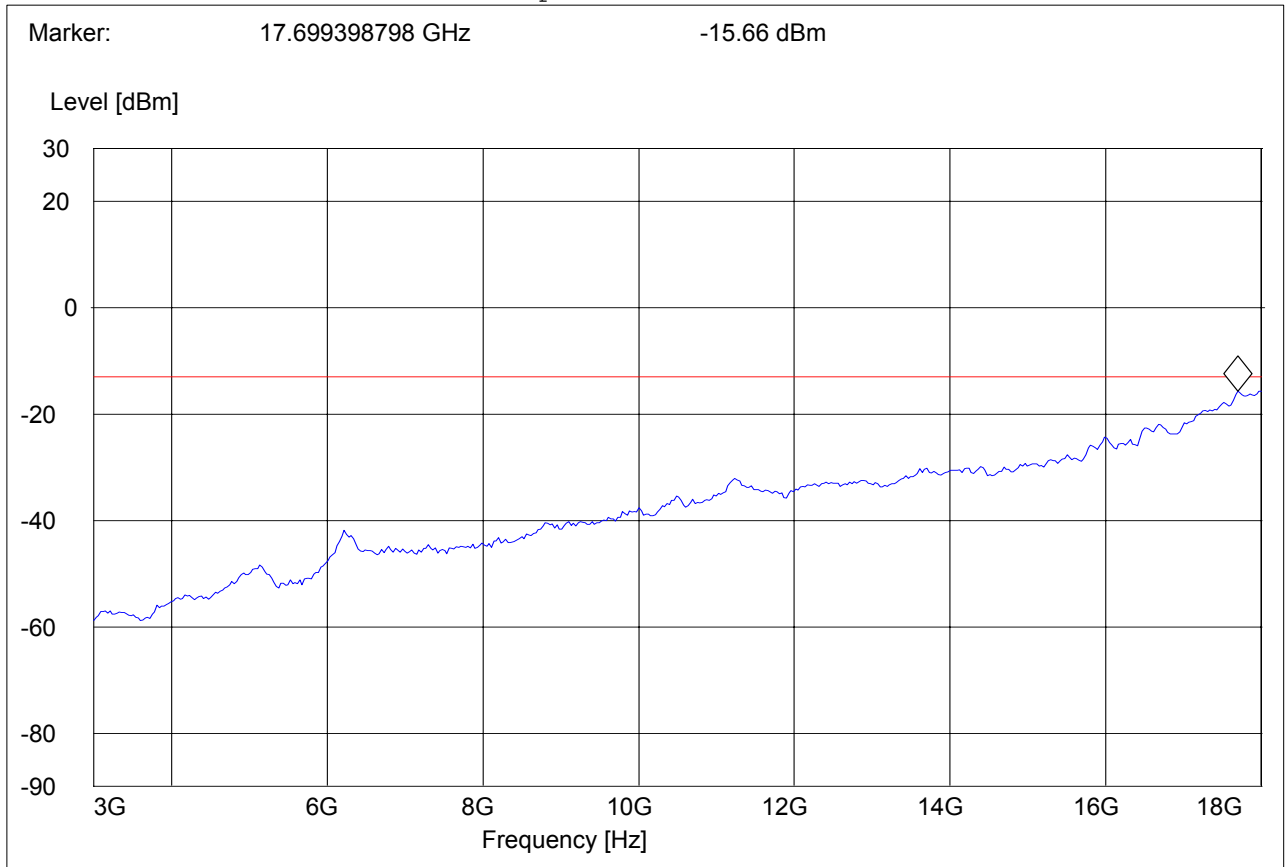
Spurious emission limit -13dBm

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT / Description: EUT 34BB00t, C06, LAPTOP KKL-E3-C1, X01-00
 Customer: Novatel
 Operating Mode: FDD2, CH9538, 1907.6MHz
 Antenna: V
 EUT: V
 Test Engineer: PETER
 Voltage: AC Adapter
 Sweep: FCC24 SPURI 3-18G

SWEEP TABLE: "FCC 24Spuri 3-18G"

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
3.0 GHz	18.0 GHz	MaxPeak	Coupled	1 MHz	DUMMY-DBM





RADIATED SPURIOUS EMISSIONS(PCS 1900 FDD2)

18GHz – 19.1GHz

Spurious emission limit -13dBm

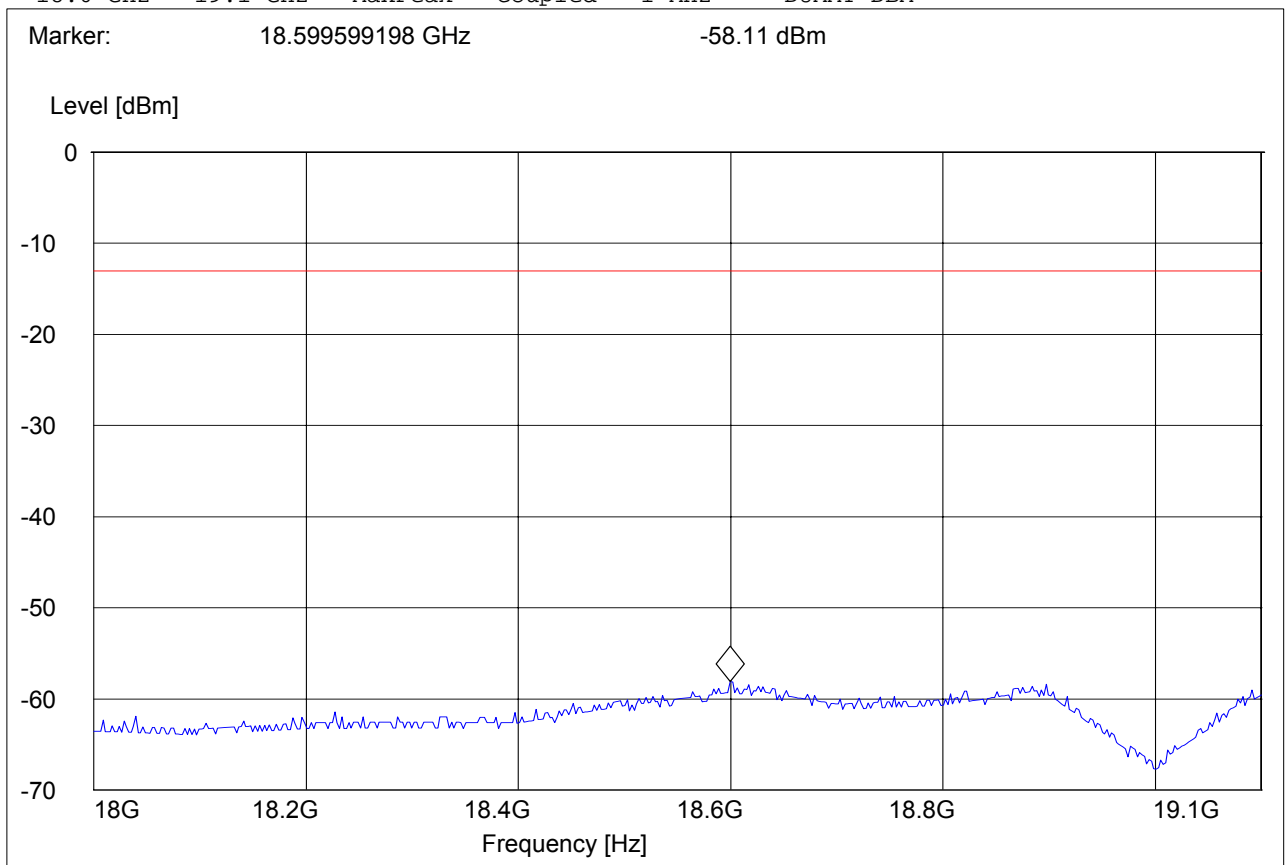
Note: This plot is valid for low, mid & high channels (worst-case plot)

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT / Description: EUT 34BB00t, C06, LAPTOP KKL-E3-C1, X01-00
 Customer: Novatel
 Operating Mode: FDD2, CH9400, 1880MHz
 Antenna: V
 EUT: V
 Test Engineer: PETER
 Voltage: AC Adapter
 Sweep: FCC24 SPURI 18-19.1G

SWEEP TABLE: "FCC 24spuri 18-19.1G"

Short Description:		FCC 24 18GHz-19.1GHz				
Start	Stop	Detector	Meas.	IF	Transducer	
Frequency	Frequency		Time	Bandw.		
18.0 GHz	19.1 GHz	MaxPeak	Coupled	1 MHz	DUMMY-DBM	



5.6 RECEIVER RADIATED EMISSIONS**§ 2.1053 / RSS-132 & 133****NOTE:**

1. The radiated emissions were done with different settings, using the relevant pre-amplifiers for the relevant frequency ranges. This is the reason that the graphs show different noise levels. In the range between 3GHz and 26.5GHz very short cable connections to the antenna was used to minimize the noise level.

Limits**SUBCLAUSE § RSS-133**

Frequency (MHz)	Field strength ($\mu\text{V}/\text{m}$)	Measurement distance (m)
0.009 - 0.490	2400/F (kHz)	300
0.490 - 1.705	24000/F (kHz)	30
1.705 - 30.0	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
Above 960	500	3



5.6.1 Receiver Spurious on EUT 850 MHz

RECEIVER RADIATED EMISSIONS

EUT in Idle Mode: 30MHz – 1GHz

Antenna: horizontal

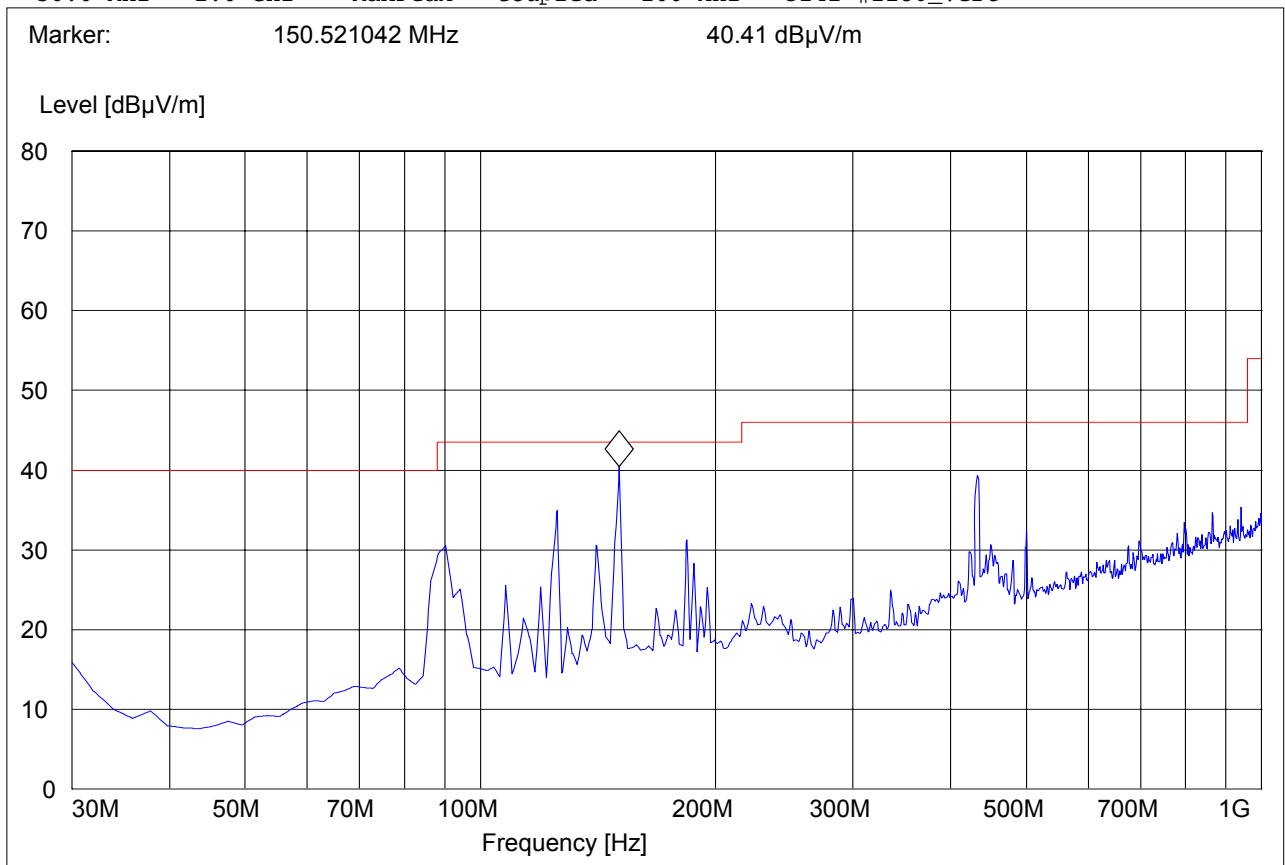
Note: Peak Reading Vs. Quasi-Peak Limit.

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT / Description: EUT 34BB00I, C03, LAPTOP KKL-E3-C1, X01-00
 Customer: NOVATEL
 Operating Mode: FCC22, RADIATED, TABLE 0°, IDLE
 Antenna: H
 EUT: V
 Test Engineer: ED
 Voltage: AC ADAPTOR
 Sweep: CANADA RE_30M-1G_H

SWEEP TABLE: "CANADA RE_30M-1G_Hor"

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
30.0 MHz	1.0 GHz	MaxPeak	Coupled	100 kHz	3141-#1186_Vert





RECEIVER RADIATED EMISSIONS
EUT in Idle Mode: 1GHz – 3GHz

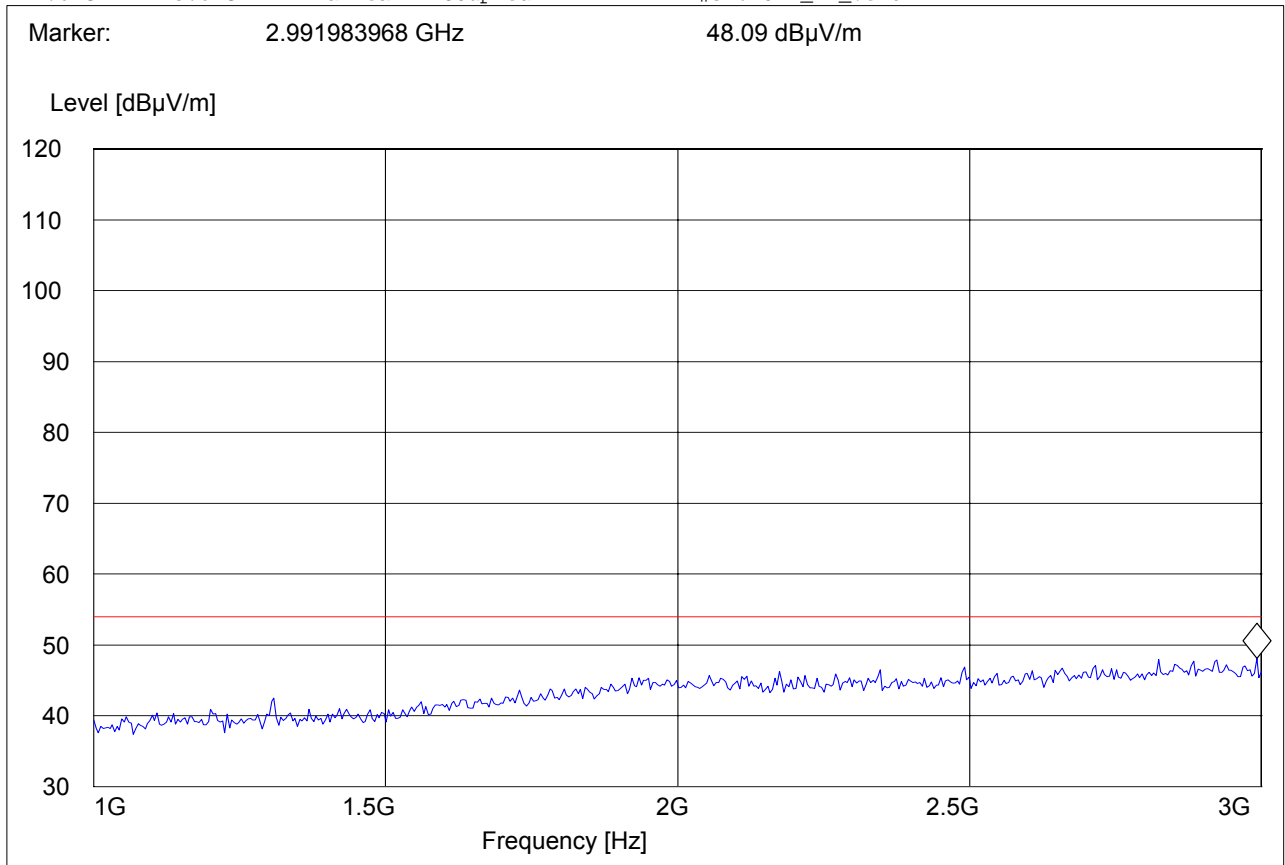
Note: Peak Reading Vs. Average Limit.

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT / Description: EUT 34BB00I, C03, LAPTOP KKL-E3-C1, X01-00
 Customer: NOVATEL
 Operating Mode: FCC22, RADIATED, TABLE 0°
 Antenna: V
 EUT: V
 Test Engineer: ED
 Voltage: AC ADAPTOR
 Sweep: CANADA RE 1-3G

SWEEP TABLE: "CANADA RE_1-3G"

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
1.0 GHz	3.0 GHz	MaxPeak	Coupled	1 MHz	#326horn_AF_vert





RECEIVER RADIATED EMISSIONS

EUT in Idle Mode: 3GHz – 18GHz

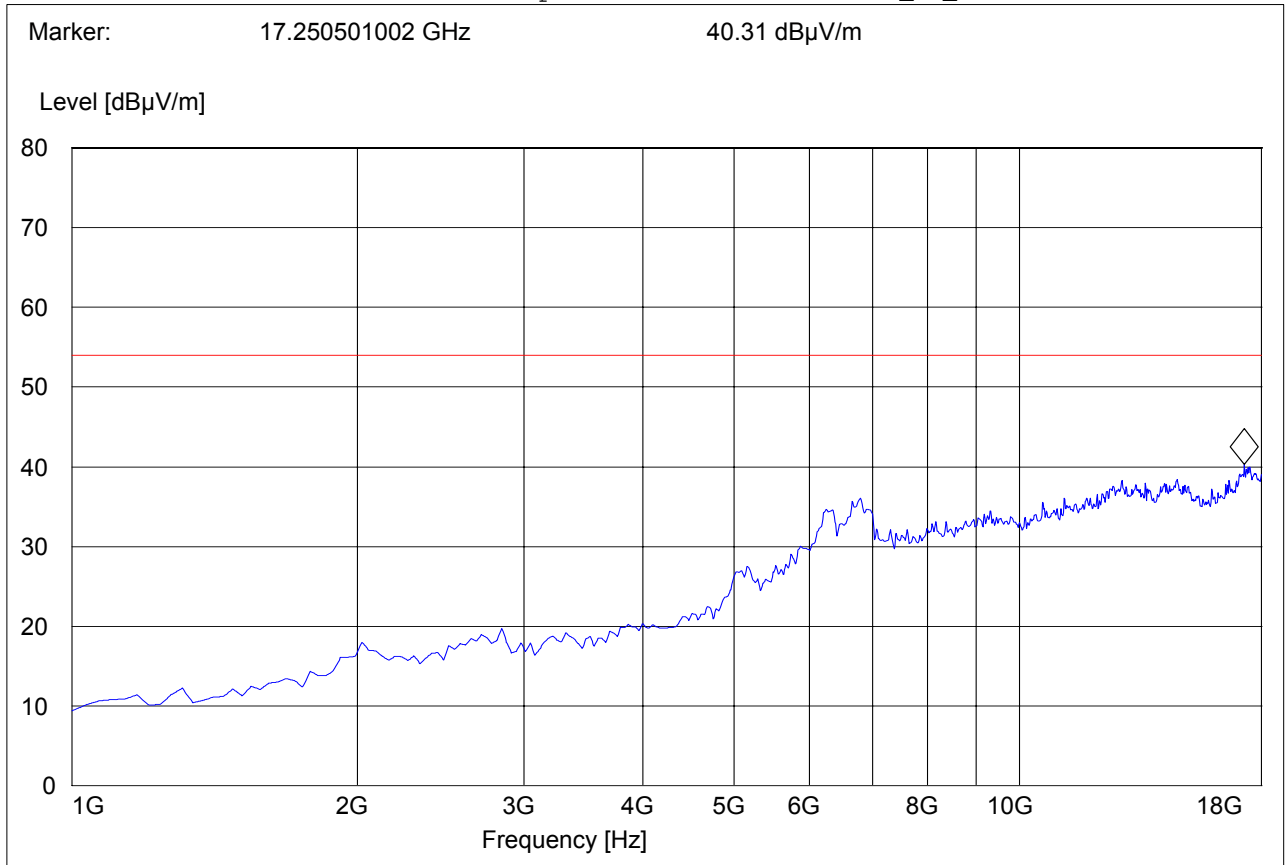
Note: Peak Reading Vs. Average Limit.

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT / Description: EUT 34BB00I, C03, LAPTOP KKL-E3-C1, X01-00
 Customer: NOVATEL
 Operating Mode: FCC22, RADIATED, TABLE 0°
 Antenna: V
 EUT: V
 Test Engineer: ED
 Voltage: AC ADAPTOR
 Sweep: CANADA RE 3-18G

SWEEP TABLE: "CANADA RE_3-18G"

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
1.0 GHz	18.0 GHz	MaxPeak	Coupled	1 MHz	#326horn_AF_vert





5.6.2 Receiver Spurious on EUT 850 MHz FDD5

RECEIVER RADIATED EMISSIONS FDD5

EUT in Idle Mode: 30MHz – 1GHz

Antenna: horizontal

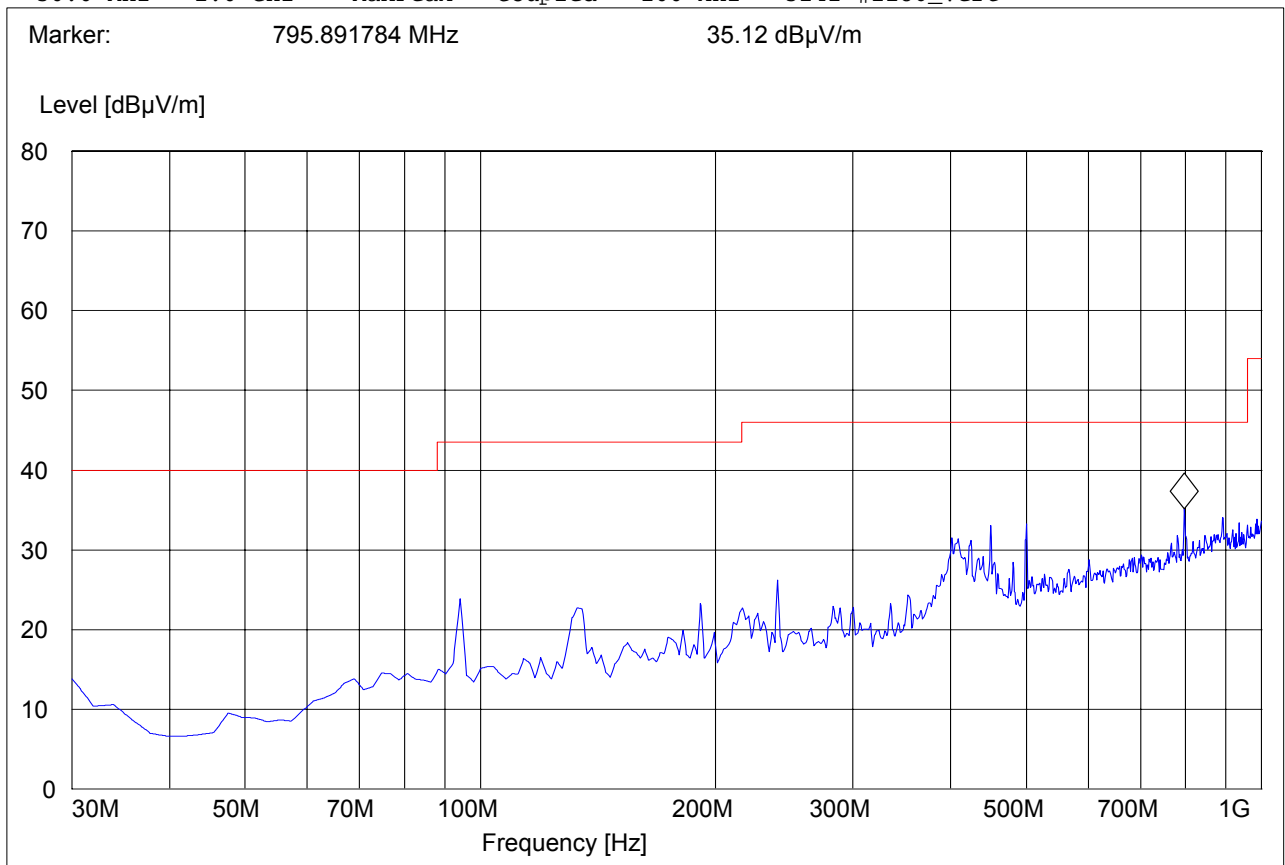
Note: Peak Reading Vs. Quasi-Peak Limit.

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT / Description: EUT 34BB00t, C06, LAPTOP KKL-E3-C1, X01-00
 Customer: Novatel
 Operating Mode: FDD5, idle mode
 Antenna: H
 EUT: V
 Test Engineer: Ed
 Voltage: AC Adapter
 Sweep: Canada RE 30M-1G_H

SWEEP TABLE: "CANADA RE_30M-1G_Hor"

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
30.0 MHz	1.0 GHz	MaxPeak	Coupled	100 kHz	3141-#1186_Vert





RECEIVER RADIATED EMISSIONS FDD5

EUT in Idle Mode: 1GHz – 3GHz

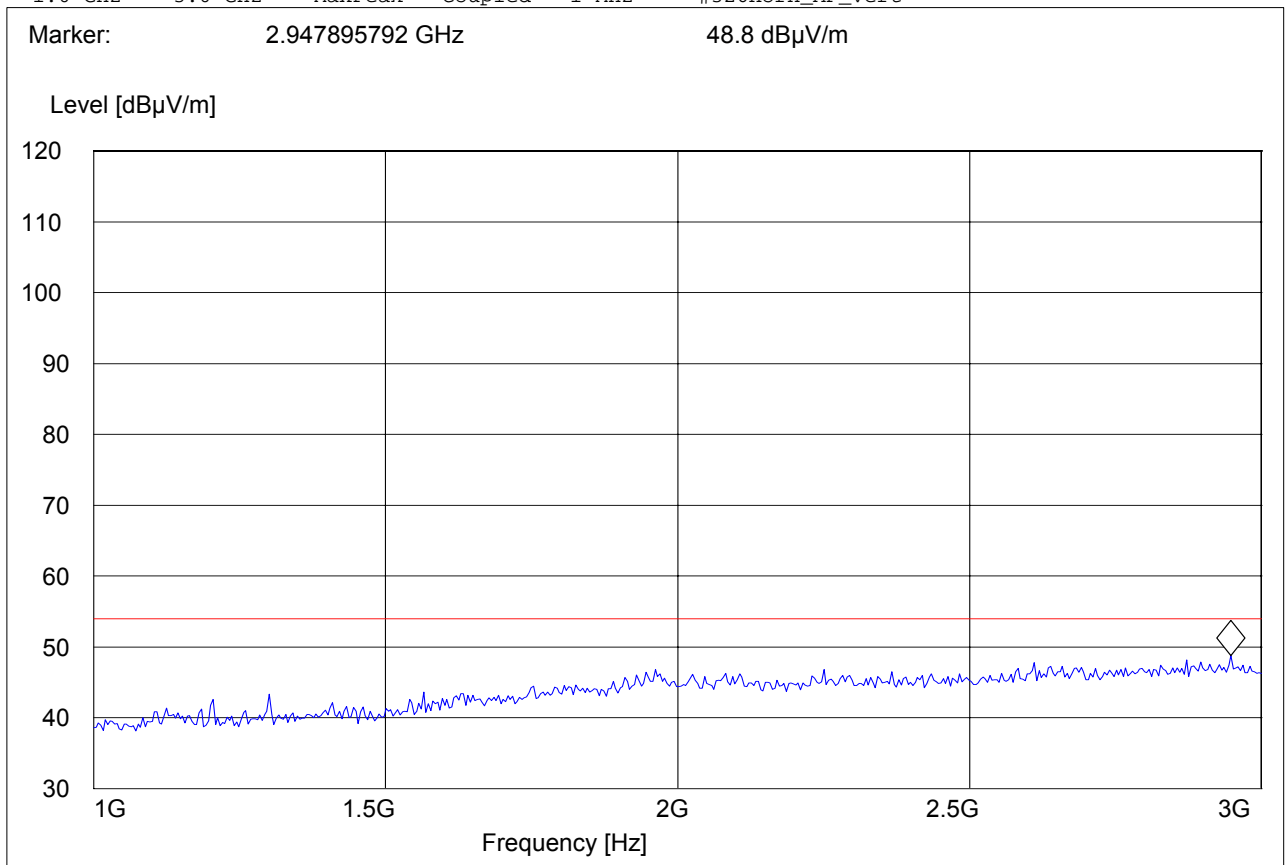
Note: Peak Reading Vs. Average Limit.

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT / Description: EUT 34BB00t, C06, LAPTOP KKL-E3-C1, X01-00
 Customer: Novatel
 Operating Mode: FDD5, idle mode
 Antenna: V
 EUT: V
 Test Engineer: Ed
 Voltage: AC Adapter
 Sweep: Canada RE 1-3G

SWEEP TABLE: "CANADA RE_1-3G"

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
1.0 GHz	3.0 GHz	MaxPeak	Coupled	1 MHz	#326horn_AF_vert





RECEIVER RADIATED EMISSIONS FDD5

EUT in Idle Mode: 3GHz – 18GHz

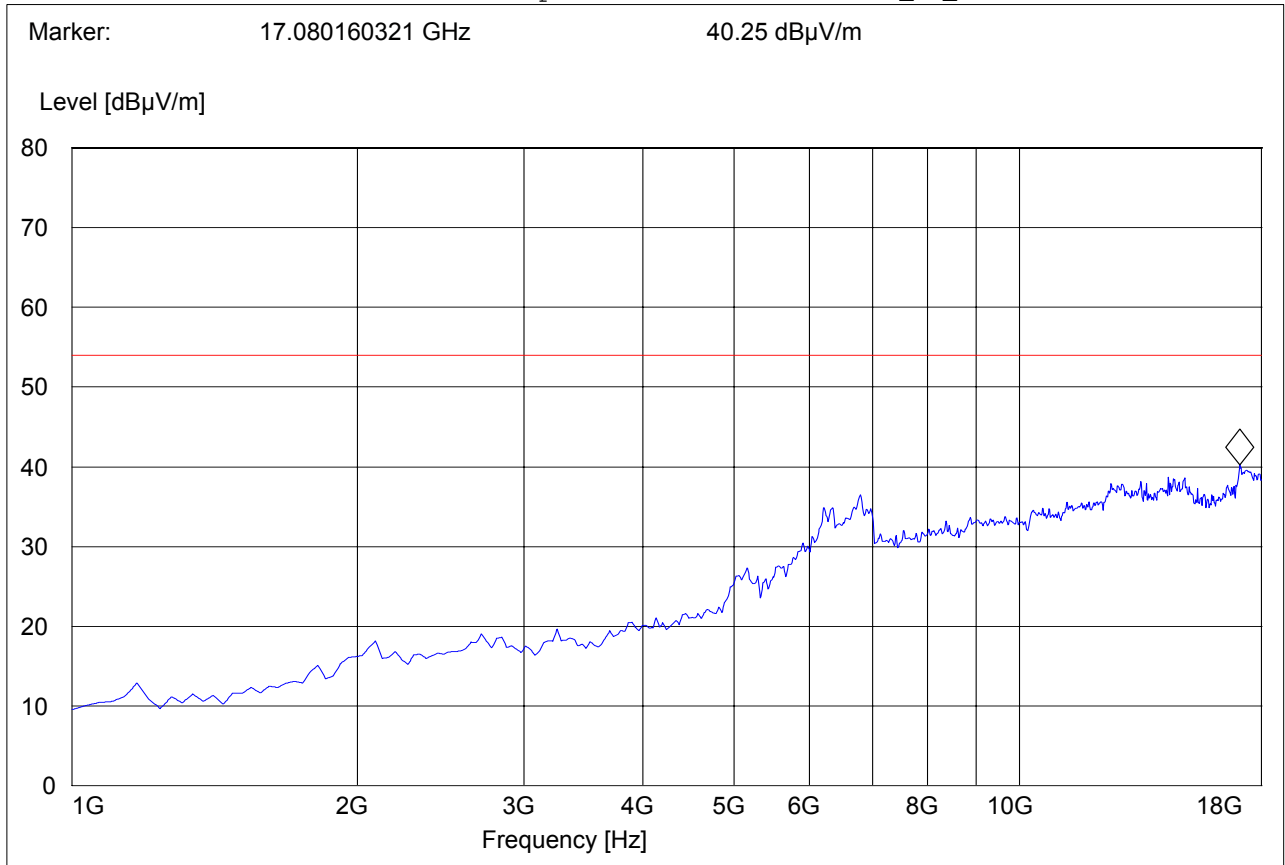
Note: Peak Reading Vs. Average Limit.

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT / Description: EUT 34BB00t, C06, LAPTOP KKL-E3-C1, X01-00
 Customer: Novatel
 Operating Mode: FDD5, idle mode
 Antenna: V
 EUT: V
 Test Engineer: Ed
 Voltage: AC Adapter
 Sweep: Canada RE3-18G

SWEEP TABLE: "CANADA RE_3-18G"

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
1.0 GHz	18.0 GHz	MaxPeak	Coupled	1 MHz	#326horn_AF_vert





5.6.3 Receiver Spurious on EUT 1900 MHz

RECEIVER RADIATED EMISSIONS

EUT in Idle Mode: 30MHz – 1GHz

Antenna: vertical

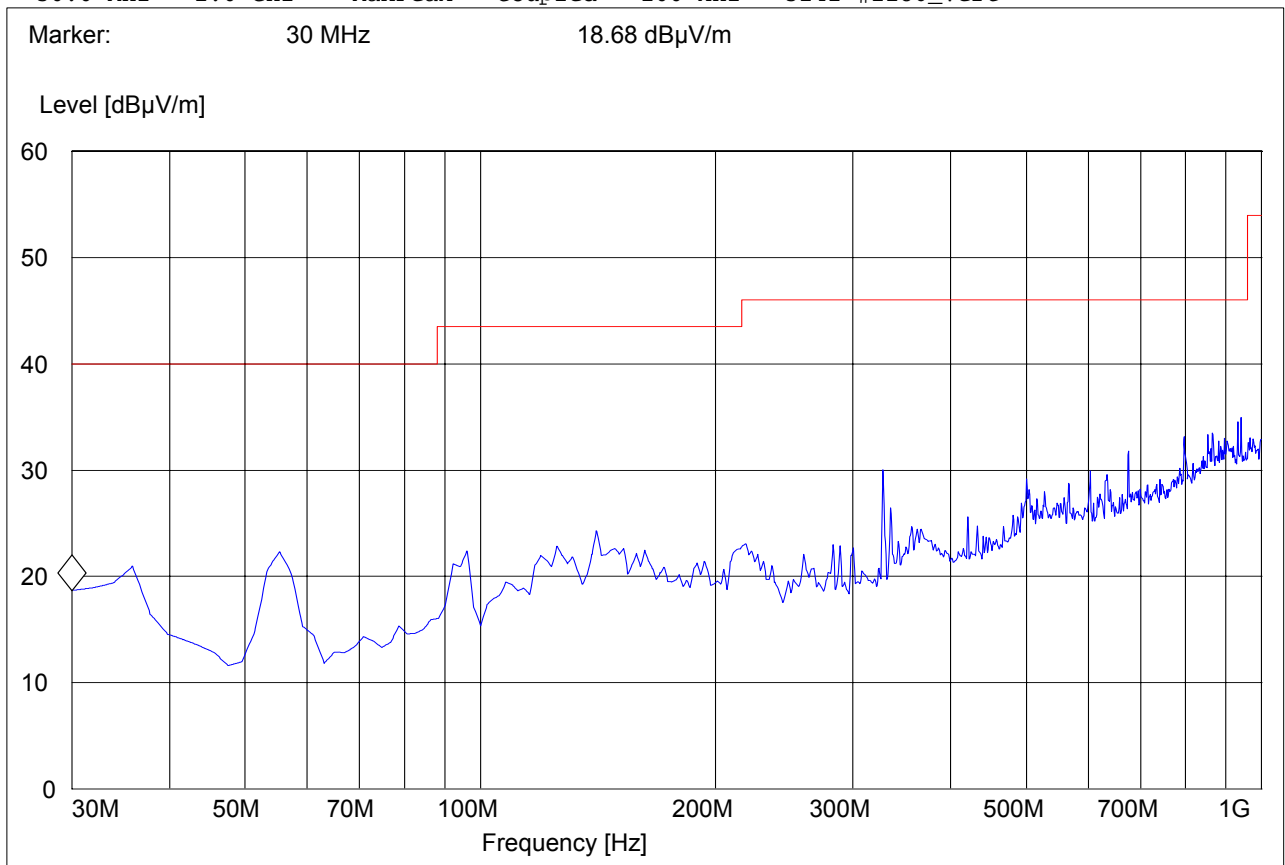
Note: Peak Reading Vs. Quasi-Peak Limit.

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT / Description: EUT 34BB00I, C03, LAPTOP KKL-E3-C1, X01-00
 Customer: NOVATEL
 Operating Mode: FCC24, RADIATED, TABLE 92 DEGREES, ANT 136 cm
 Antenna: V
 EUT: V
 Test Engineer: SATYA
 Voltage: AC ADAPTOR
 Sweep: CANADA RE 30M-1G V

SWEEP TABLE: "CANADA RE_30M-1G_Ver"

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
30.0 MHz	1.0 GHz	MaxPeak	Coupled	100 kHz	3141-#1186_Vert





RECEIVER RADIATED EMISSIONS
EUT in Idle Mode: 1GHz – 3GHz

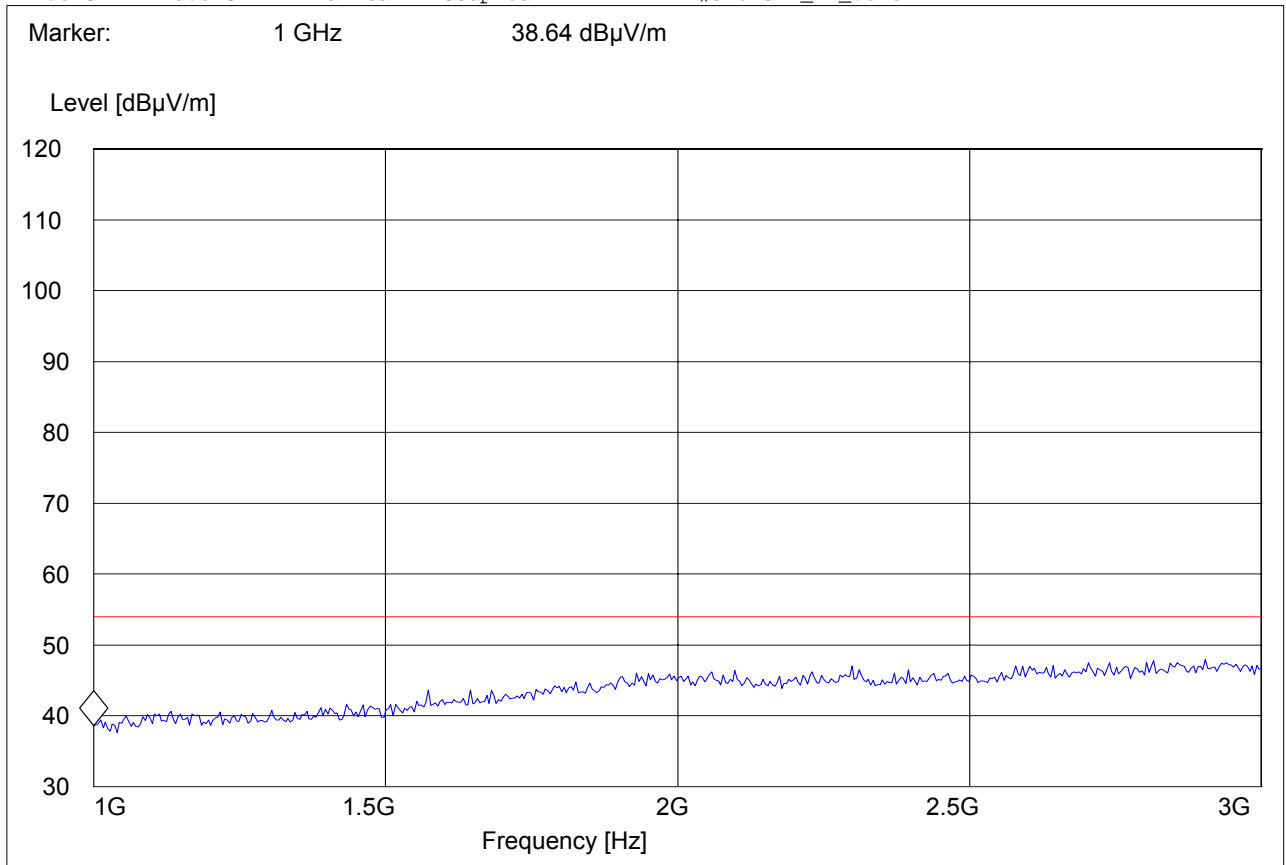
Note: Peak Reading Vs. Average Limit.

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT / Description: EUT 34BB00I, C03, LAPTOP KKL-E3-C1, X01-00
 Customer: NOVATEL
 Operating Mode: FCC24, RADIATED, TABLE 92 DEGREES
 Antenna: V
 EUT: V
 Test Engineer: SATYA
 Voltage: AC ADAPTOR
 Sweep: CANADA RE 1-3G

SWEEP TABLE: "CANADA RE_1-3G"

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
1.0 GHz	3.0 GHz	MaxPeak	Coupled	1 MHz	#326horn_AF_vert





RECEIVER RADIATED EMISSIONS

EUT in Idle Mode: 3GHz – 18GHz

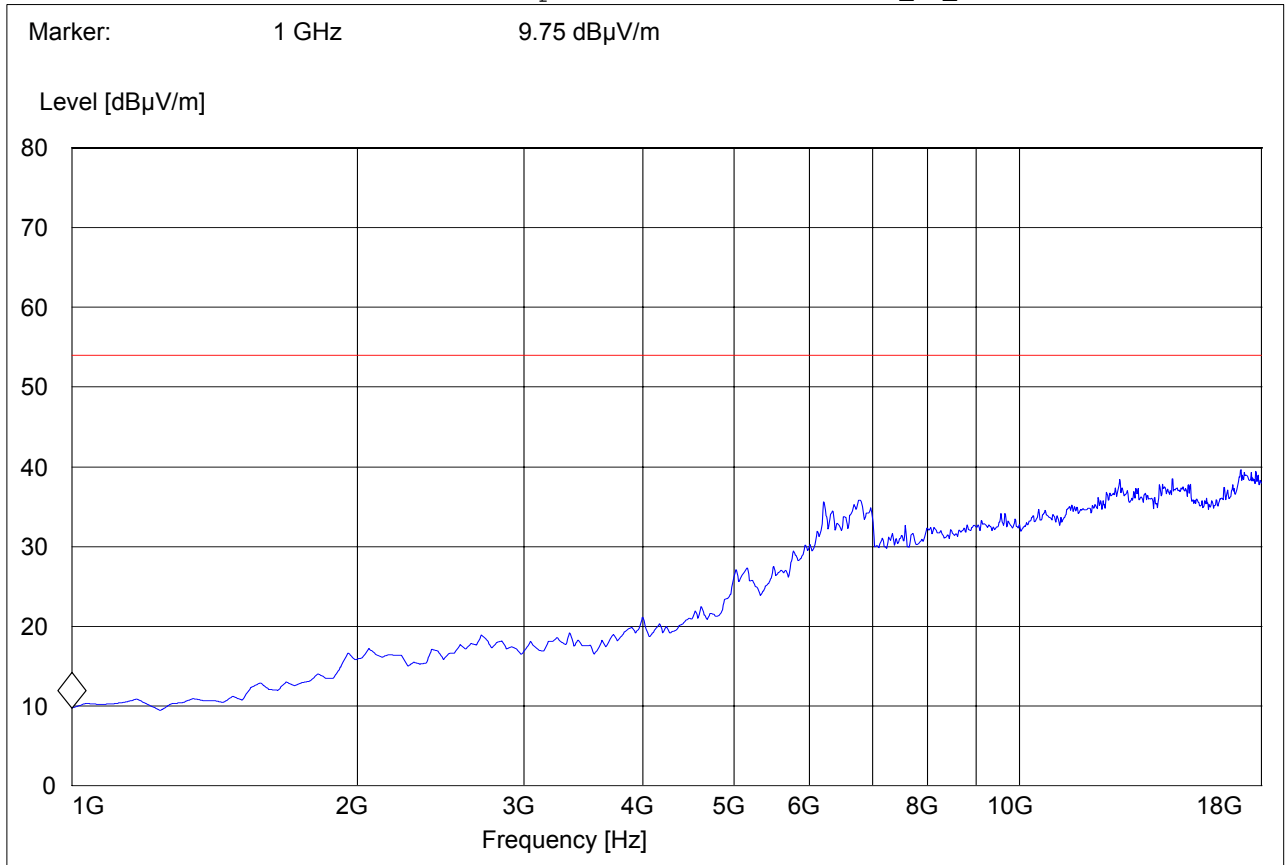
Note: Peak Reading Vs. Average Limit.

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT / Description: EUT 34BB00I, C03, LAPTOP KKL-E3-C1, X01-00
 Customer: NOVATEL
 Operating Mode: FCC24, RADIATED, TABLE 184 DEGREES
 Antenna: V
 EUT: V
 Test Engineer: SATYA
 Voltage: AC ADAPTOR
 Sweep: CANADA RE 3-18G

SWEEP TABLE: "CANADA RE_3-18G"

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
1.0 GHz	18.0 GHz	MaxPeak	Coupled	1 MHz	#326horn_AF_vert





RECEIVER RADIATED EMISSIONS

EUT in Idle Mode: 18GHz – 19.1GHz

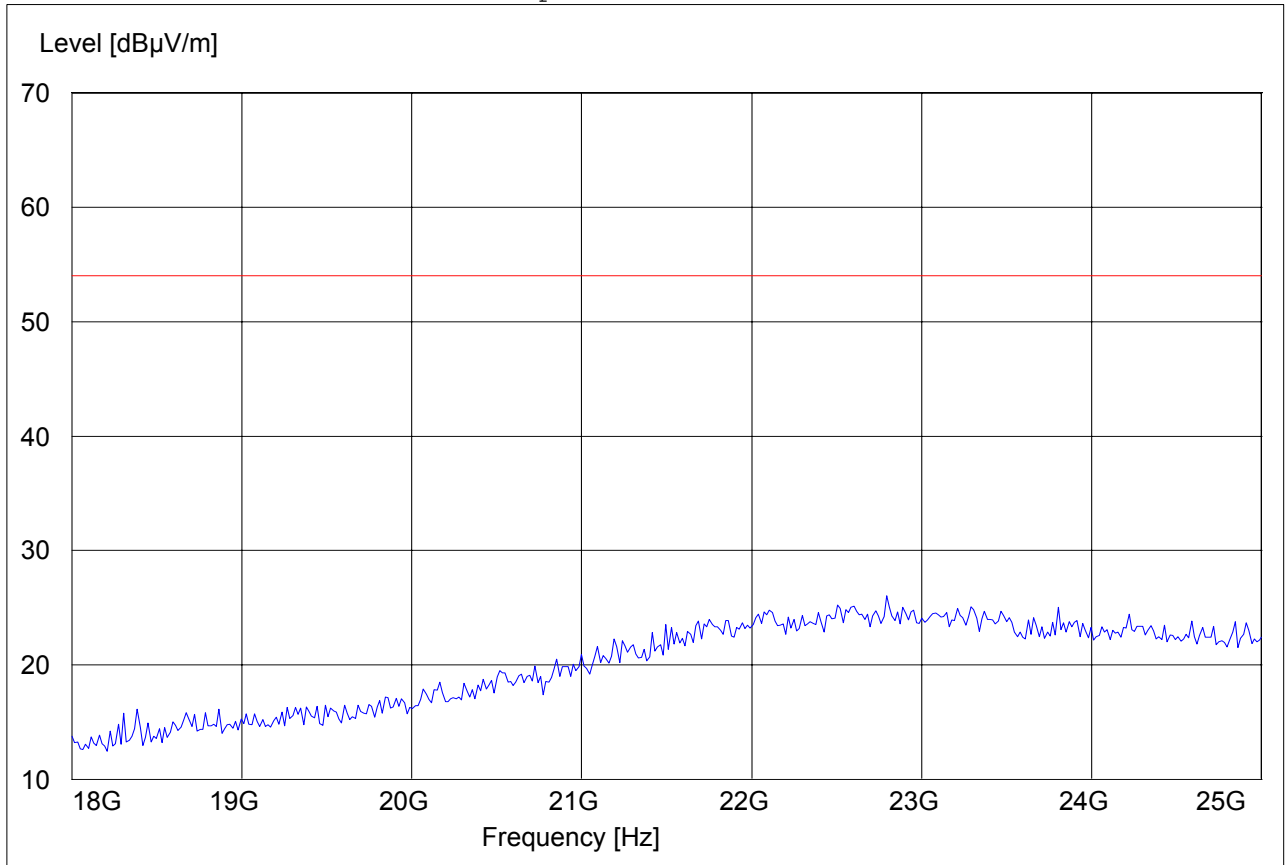
Note: Peak Reading Vs. Average Limit.

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT / Description: EUT 34BB00I, C03, LAPTOP KKL-E3-C1, X01-00
 Customer: NOVATEL
 Operating Mode: FCC24, RADIATED, TABLE 184 DEGREES
 Antenna: V
 EUT: V
 Test Engineer: SATYA
 Voltage: AC ADAPTOR
 Sweep: CANADA RE 18-26.5G

SWEEP TABLE: "CANADA RE_18-26.5G"

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
18.0 GHz	26.5 GHz	MaxPeak	Coupled	1 MHz	3160 Horn 18-26.5G





5.6.4 Receiver Spurious on EUT 1900 MHz FDD2

RECEIVER RADIATED EMISSIONS FDD2

EUT in Idle Mode: 30MHz – 1GHz

Antenna: vertical

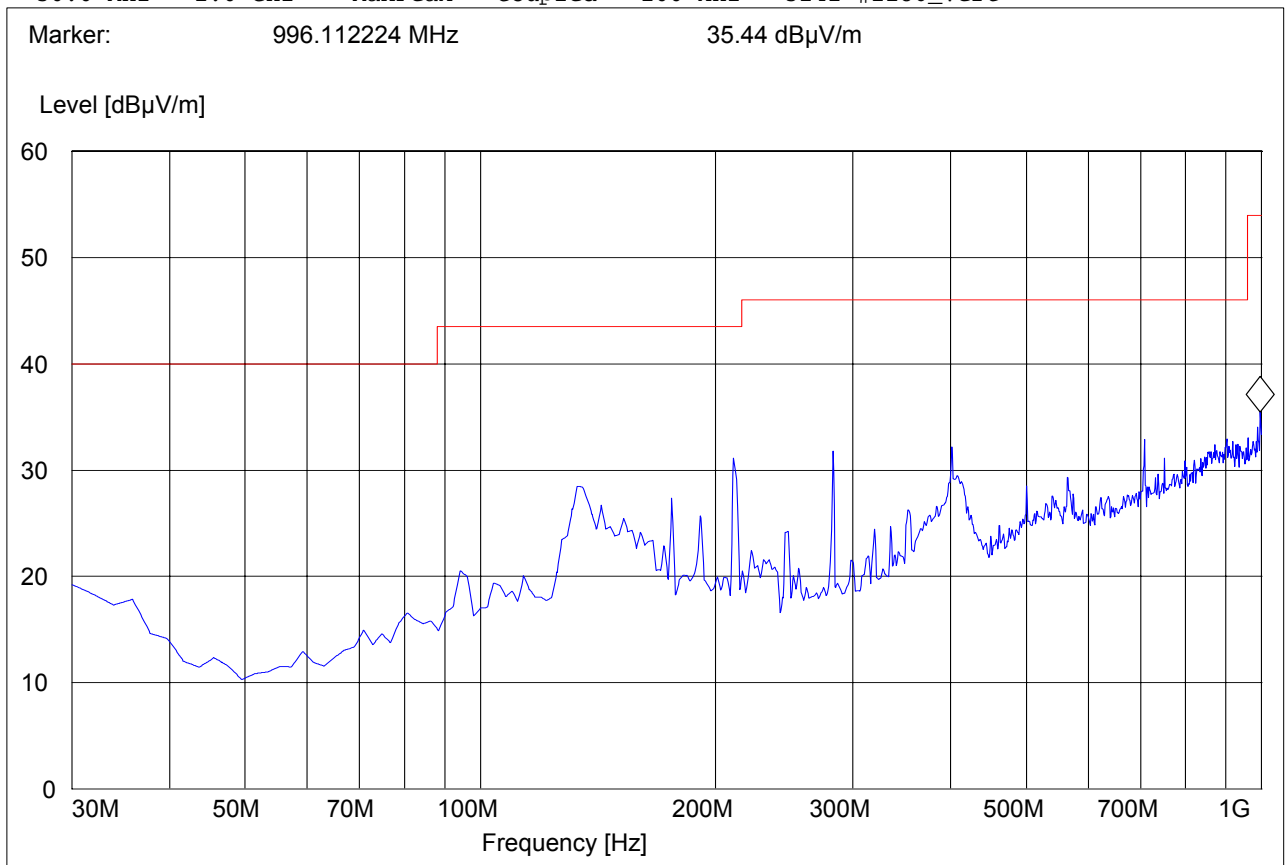
Note: Peak Reading Vs. Quasi-Peak Limit.

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT / Description: EUT 34BB00t, C06, LAPTOP KKL-E3-C1, X01-00
 Customer: Novatel
 Operating Mode: FDD2, idle mode
 Antenna: V
 EUT: V
 Test Engineer: Ed
 Voltage: AC Adapter
 Sweep: Canada RE 30M-1G_V

SWEEP TABLE: "CANADA RE_30M-1G_Ver"

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
30.0 MHz	1.0 GHz	MaxPeak	Coupled	100 kHz	3141-#1186_Vert





RECEIVER RADIATED EMISSIONS FDD2

EUT in Idle Mode: 1GHz – 3GHz

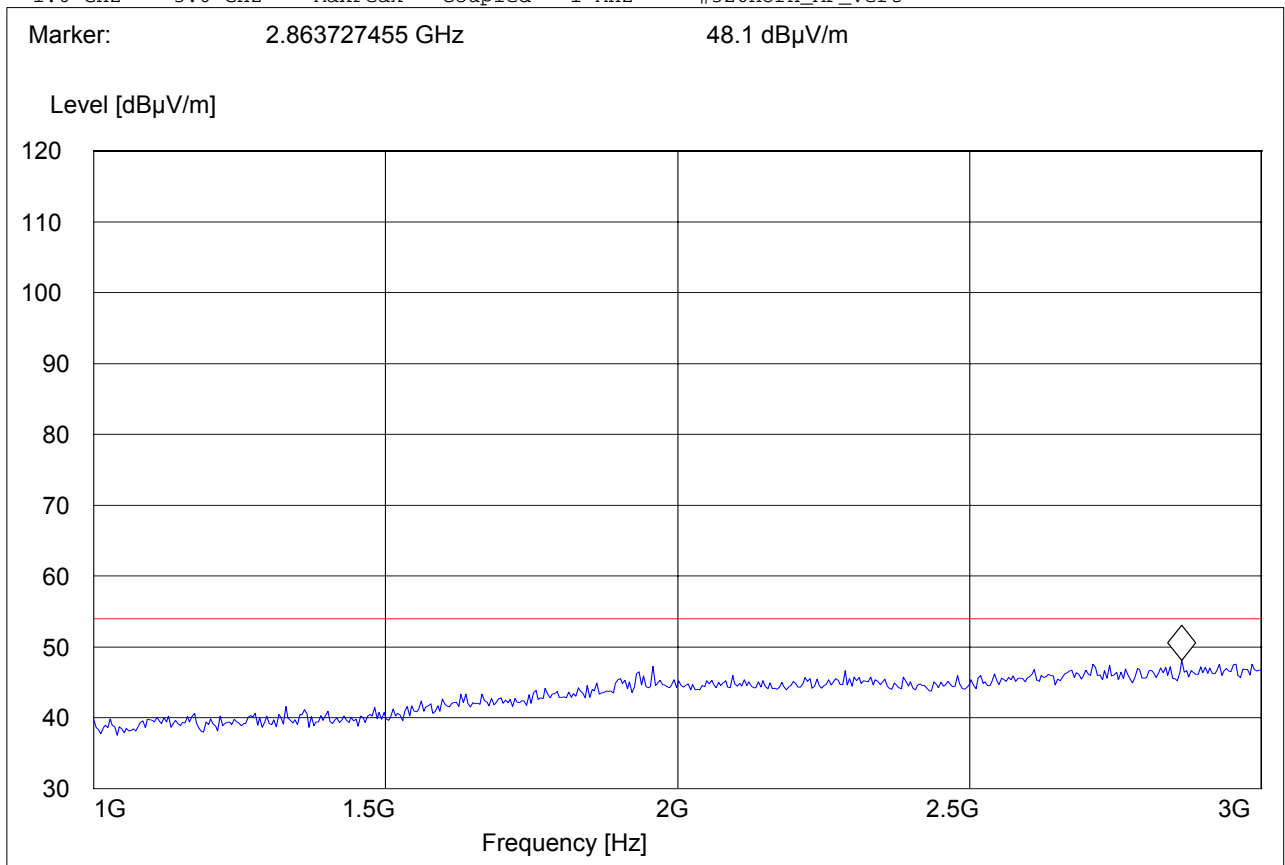
Note: Peak Reading Vs. Average Limit.

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT / Description: EUT 34BB00t, C06, LAPTOP KKL-E3-C1, X01-00
 Customer: Novatel
 Operating Mode: FDD2, idle mode
 Antenna: V
 EUT: V
 Test Engineer: Ed
 Voltage: AC Adapter
 Sweep: Canada RE 1-3G

SWEEP TABLE: "CANADA RE_1-3G"

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
1.0 GHz	3.0 GHz	MaxPeak	Coupled	1 MHz	#326horn_AF_vert





RECEIVER RADIATED EMISSIONS FDD2

EUT in Idle Mode: 3GHz – 18GHz

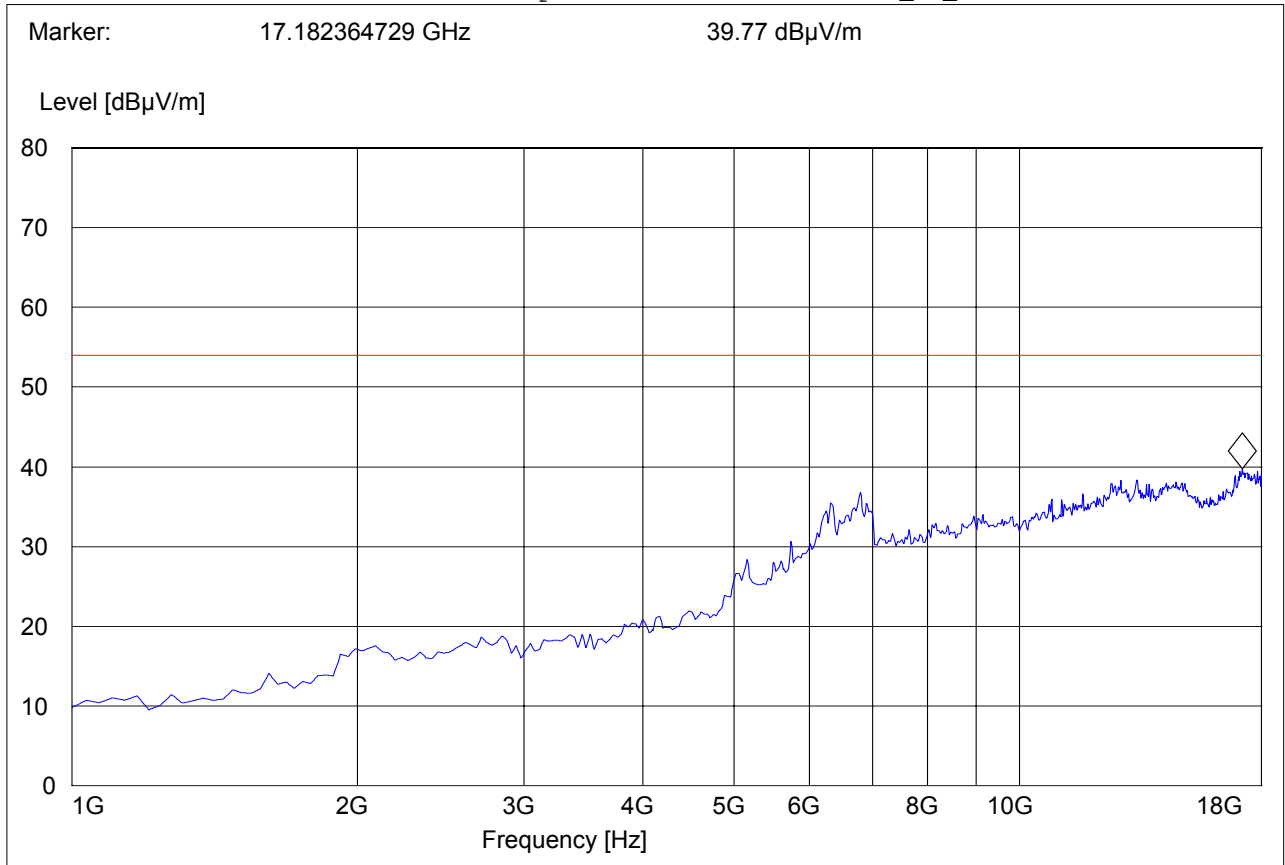
Note: Peak Reading Vs. Average Limit.

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT / Description: EUT 34BB00t, C06, LAPTOP KKL-E3-C1, X01-00
 Customer: Novatel
 Operating Mode: FDD2, idle mode
 Antenna: V
 EUT: V
 Test Engineer: Ed
 Voltage: AC Adapter
 Sweep: Canada RE 3-18G

SWEEP TABLE: "CANADA RE_3-18G"

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
1.0 GHz	18.0 GHz	MaxPeak	Coupled	1 MHz	#326horn_AF_vert





RECEIVER RADIATED EMISSIONS FDD2

EUT in Idle Mode: 18GHz – 19.1GHz

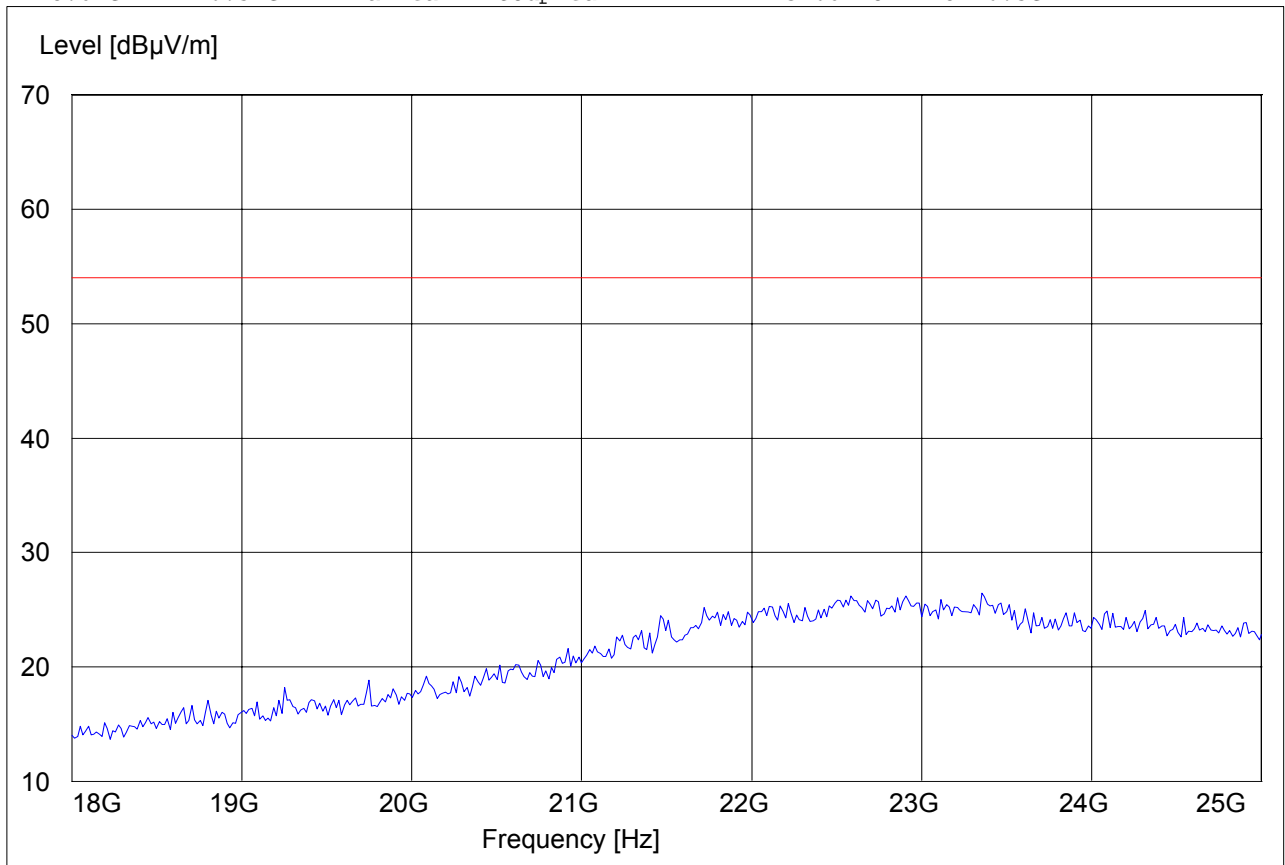
Note: Peak Reading Vs. Average Limit.

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT / Description: EUT 34BB00t, C06, LAPTOP KKL-E3-C1, X01-00
 Customer: Novatel
 Operating Mode: FDD2, idle mode
 Antenna: V
 EUT: V
 Test Engineer: Ed
 Voltage: AC Adapter
 Sweep: Canada RE 18-26.5G

SWEEP TABLE: "CANADA RE_18-26.5G"

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
18.0 GHz	26.5 GHz	MaxPeak	Coupled	1 MHz	3160 Horn 18-26.5G



6 TEST EQUIPMENT AND ANCILLARIES USED FOR TESTS

No	Instrument/Ancillary	Type	Manufacturer	Serial No.	Cal Due	Interval
01	Spectrum Analyzer	ESIB 40	Rohde & Schwarz	100107	May 2007	1 year
02	Spectrum Analyzer	FSEM 30	Rohde & Schwarz	100017	August 2007	1 year
03	Signal Generator	SMY02	Rohde & Schwarz	836878/011	May 2007	1 year
04	Power-Meter	NRVD	Rohde & Schwarz	0857.8008.02	May 2007	1 year
05	Biconilog Antenna	3141	EMCO	0005-1186	June 2007	1 year
06	Horn Antenna (1-18GHz)	SAS-200/571	AH Systems	325	June 2007	1 year
07	Horn Antenna (18-26.5GHz)	3160-09	EMCO	1240	June 2007	1 year
08	Power Splitter	11667B	Hewlett Packard	645348	n/a	n/a
09	Climatic Chamber	VT4004	Voltsch	G1115	May 2007	1 year
10	High Pass Filter	5HC2700	Trilithic Inc.	9926013	n/a	n/a
11	High Pass Filter	4HC1600	Trilithic Inc.	9922307	n/a	n/a
12	Pre-Amplifier	JS4-00102600	Miteq	00616	May 2007	1 year
13	Power Sensor	URV5-Z2	Rohde & Schwarz	DE30807	May 2007	1 year
14	Digital Radio Comm. Tester	CMD-55	Rohde & Schwarz	847958/008	May 2007	1 year
15	Universal Radio Comm. Tester	CMU 200	Rohde & Schwarz	832221/06	May 2007	1 year
16	LISN	ESH3-Z5	Rohde & Schwarz	836679/003	May 2007	1 year
17	Loop Antenna	6512	EMCO	00049838	July 2007	2 years



7 References

Title 47—Telecommunication, CHAPTER I--FEDERAL COMMUNICATIONS COMMISSION,
PART 2--FREQUENCY ALLOCATIONS AND RADIO TREATY MATTERS; GENERAL RULES AND REGULATIONS October 1, 2001.

Title 47—Telecommunication, CHAPTER I--FEDERAL COMMUNICATIONS COMMISSION,
PART 22 PUBLIC MOBILE SERVICES October 1, 1998.

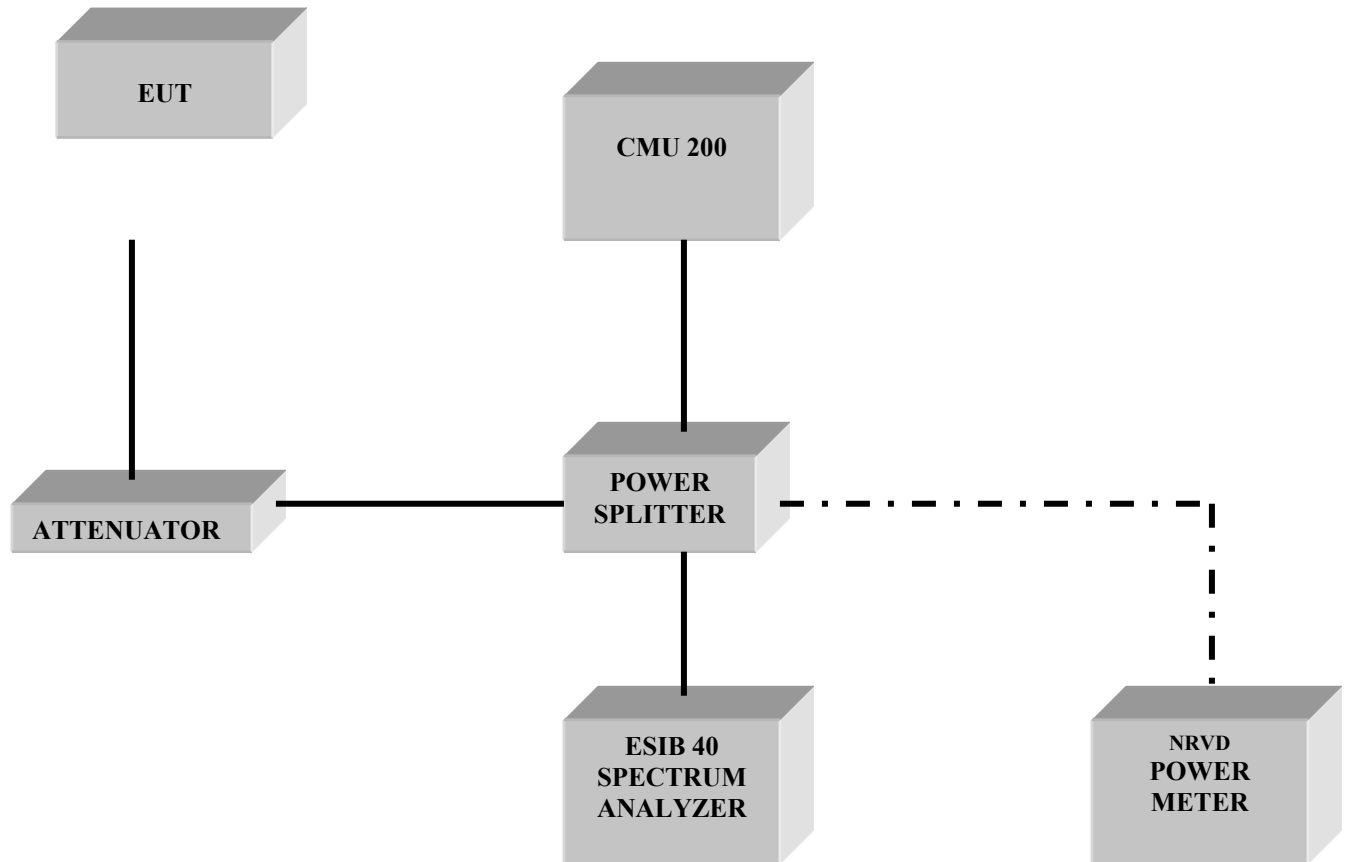
FCC Report and order 02-229 September 24, 2002.

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PART 24 PERSONAL COMMUNICATIONS SERVICES October 1, 1998.

ANSI / TIA-603-C-2004 Land Mobile FM or PM Communications Equipment Measurement and Performance Standard November 7, 2002.

8 BLOCK DIAGRAMS

Conducted Testing



Radiated Testing

ANECHOIC CHAMBER

