

TEST REPORT

Report Number: 3161967ATL-003

September 30, 2008

Product Designation: 1900 MHz MCPA, HMC190951C

Standard: FCC Part 24

Tested by:

Intertek Testing Services NA Inc.
1950 Evergreen Blvd., Suite 100
Duluth, GA 30096

Client:

Hitachi Telecom, USA
13617 Parkway Lane, Suite 100
Norcross, GA 30092
Contact: Nick Yasui
Phone: 770.797.2530
Fax: 770.242.1417

Tests performed by:

A handwritten signature in blue ink, appearing to read "David J. Schramm".

David J. Schramm
Assistant Chief Engineer - EMC

Report reviewed by:

A handwritten signature in blue ink, appearing to read "Jeremy O. Pickens".

Jeremy O. Pickens
EMC Department Manager

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1.0 Introduction and Conclusion

The tests indicated in section 2.0 were performed on the product constructed as described in section 3.0. The remaining test sections are the verbatim text from the actual data sheets used during the investigation. These test sections include the test name, the specified test Method, a list of the actual Test Equipment Used, documentation Photos, Results and raw Data. No additions, deviations, or exclusions have been made from the standard(s) unless specifically noted.

Based on the results of our investigation, we have concluded the product tested complies with the requirements of the standard(s) indicated. The results obtained in this test report pertain only to the item(s) tested.

2.0 Test Summary

Section	Test Full Name	Test Date	Result
4.0	System setup including cable interconnection details, support equipment and simplified block diagram. (System Setup)		
5.0	Description of test facility (Test Site Location)		
6.0	RF Output Power (Conducted) (FCC Part 2.1046 Cond)	09/12/2008	PASS
7.0	Occupied Bandwidth (FCC Part 2.1049)	09/15/2008	PASS
8.0	Spurious emissions at antenna terminals (FCC Part 2.1051)	09/15/2008	PASS
NA	FCC Part 22 Radiated Power (ERP) and FCC Part 24 Radiated Power (EIRP) (Radiated Power) was waived due to EUT is an amplifier		
9.0	Spurious emissions at antenna terminals (Band Edge) (FCC Part 2.1051)	09/12/2008	PASS
10.0	Spurious emissions at antenna terminals (Intermodulation Products) (FCC Part 2.1051)	09/15/2008	PASS
11.0	Field strength of spurious radiation (FCC Part 2.1053)	09/16/2008	PASS
NA	Frequency Stability (FCC Part 2.1055) was waived due to EUT is an amplifier		

3.0 Description of Equipment Under Test

Equipment Under Test			
Description	Manufacturer	Model Number	Serial Number
MCPA	Hitachi	HMC190951C	No 1
Duplexer ¹	Communication Components Inc.	DUP-1900MCPA-IO	AR34080085
Chassis	Hitachi Kokusai Electric Inc.	HMCSRS021C	HKN0707000003

EUT receive date:	9/8/2008
EUT receive condition:	Good

Description of EUT provided by Client:

The EUT is an 1900 MHz 95W MCPA (Multi-Carrier Power Amplifier) for GSM, EDGE and W-CDMA base-station applications. The amplifier is installed in a 19 inch rack which receives power from a +27 Vdc power source.

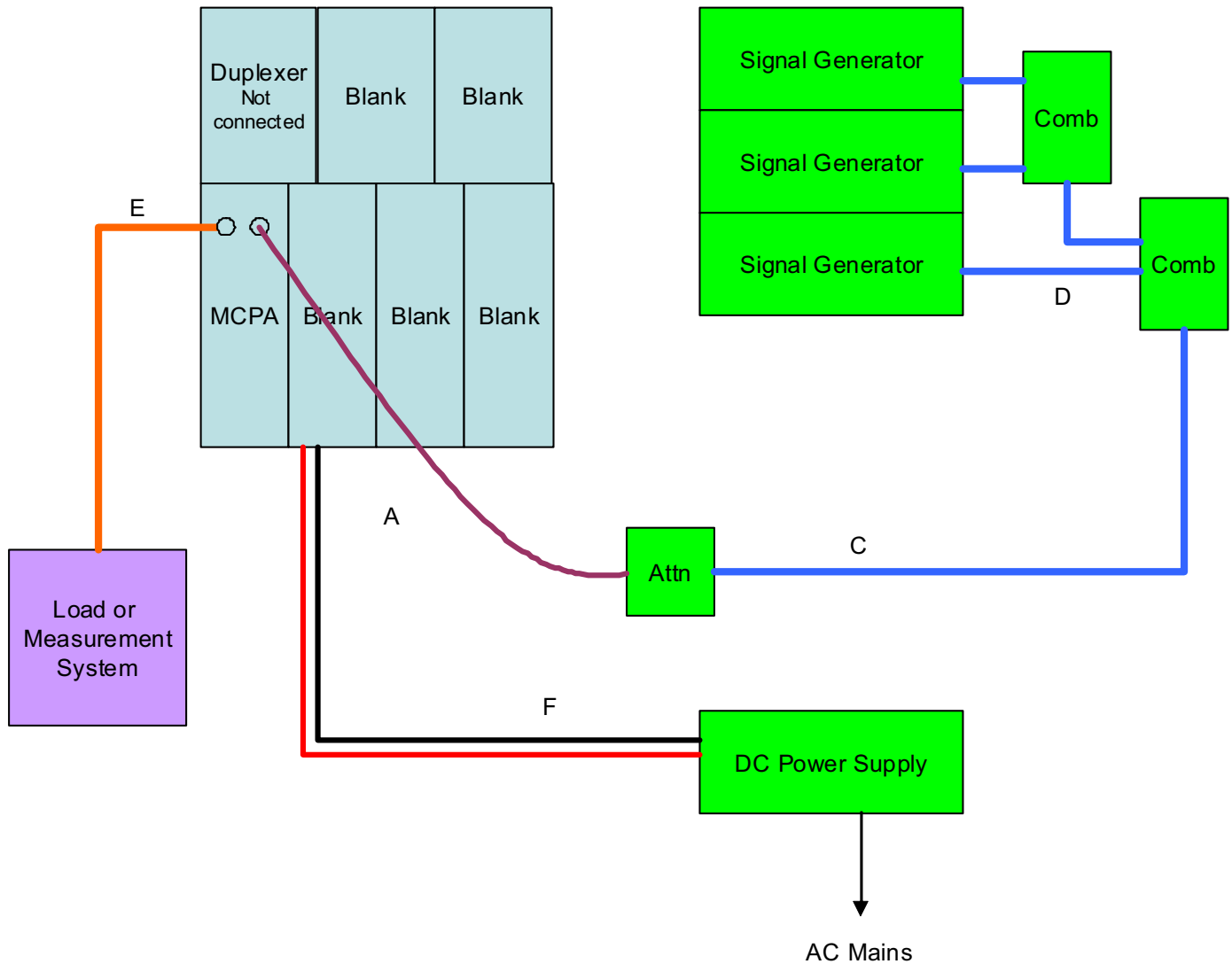
Description of EUT exercising:

During testing where a single carrier was used, the input level was adjusted to obtain 95 Watts out on a single channel. During testing where more than one channel is used, the power of each carrier must be reduced so the total power output is no greater than 95 Watts composite power. GSM, GSM Edge, CDMA and W-CDMA signals were used during the testing and are indicated in each section of this report as appropriate.

4.0 System setup including cable interconnection details, support equipment and simplified block diagram. (System Setup)

Method:

Record the details of EUT cabling, document the support equipment, and show the interconnections in a block diagram.

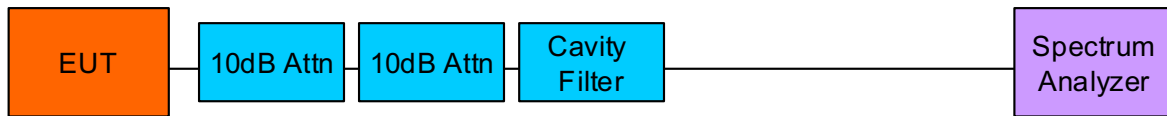
Drawing:

Setup block diagram

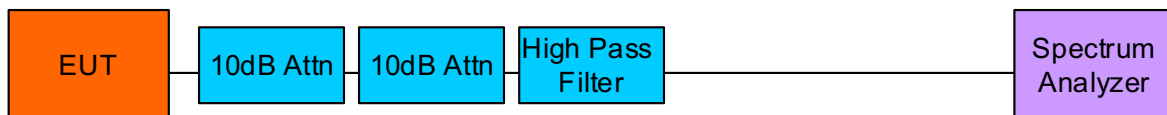
4.0 System setup including cable interconnection details, support equipment and simplified block diagram. (System Setup)

Drawing:

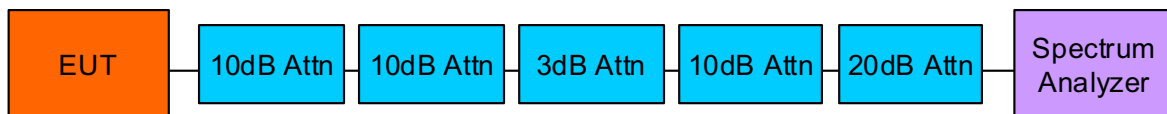
Test Setup for Spurious Emissions and Band Edge, 30-4000 MHz



Test Setup for Spurious Emissions, 4000-20000 MHz



Test Setup for Power, Occupied Bandwidth and Inter-modulation measurement



Measurement block diagram

4.0 System setup including cable interconnection details, support equipment and simplified block diagram. (System Setup)

Data:

EUT Cabling						
ID	Description	Length	Shielding	Ferrites	Connection	
					From	To
A	Coax x2	1m	Coax	None	EUT	Step Attenuator
B	Not used	--	--	--	--	--
C	Coax	2m	Coax	None	Step Attenuator	Combiner
D	Coax x4	0.3m	Coax	None	Combiner	Signal Generators
E	Coax	3m	Coax	None	EUT	Load / Measurement system
F	DC Supply	10m	None	None	EUT	DC Supply

Support Equipment			
Description	Manufacturer	Model Number	Serial Number
Signal Generator	Agilent	E4438C	MY42081816
Signal Generator	Agilent	E4438C	MY42080517
Signal Generator	Agilent	E4438C	MY42080520
DC Power Supply	Argantix	XPS 30-167-208	11579

5.0 Description of test facility (Test Site Location)

Method:

The Intertek-Duluth site is located at 1950 Evergreen Blvd., Suite 100, Duluth, Georgia. The radiated emission test site is a 10-meter semi-anechoic chamber. The chamber meets the characteristics of ANSI C63.4: 2003. For measurements, a remotely controlled flush-mount metal-top turntable is used to rotate the EUT a full 360 degrees. A remote controlled non-conductive antenna mast is used to scan the antenna height from one to four meters.

This site is on file with the FCC.

6.0 RF Output Power (Conducted) (FCC Part 2.1046 Cond)

Method:

Connect the transmitter output to a calibrated coaxial attenuator. Connect the other end of the attenuator to a power meter. Transmitter output was read off the power meter in dBm.

Performed the test at three frequencies (low, middle, and high channels) and on the highest power levels, which can be setup on the transmitter.

Test Equipment Used:

Description:	Manufacturer:	Model:	Asset Number:	Cal Date:	Cal Due:
Attenuator, 03 dB, <18GHz	Weinschel Corp	2	200003	08/05/2008	08/05/2009
Attenuator, 10 dB, <18GHz	Weinschel Corp	2	200009	08/05/2008	08/05/2009
Attenuator, 10 dB, <18GHz, 50W	Weinschel	47-10-34	200061	08/05/2008	08/05/2009
Attenuator, 10 dB, <2.5 GHz 1000W	JFW Industries, Inc	50FHAM-010-1000	200073	03/21/2008	03/21/2009
Attenuator, 20 dB, <18GHz	Hewlett Packard	11582A 8491B 020	213101a	08/19/2008	08/19/2009
Cable E04, <18GHz	Huber-Suhner	Sucoflex 104PE	E04	06/04/2008	06/04/2009
Cable E202, 18 GHz, N, 3m	Megaphase	TM18 NKNK 118	E202	01/16/2008	01/16/2009
Spectrum Analyzer, 20Hz-40GHz	Rohde & Schwarz	FSEK30	200062	03/19/2008	03/19/2009
Splitter, 10 MHz to 2.5 GHz	Mini-Circuits	ZFSC-2-2500	200053	11/30/2007	11/30/2008

Results: The sample tested was found to Comply.

6.0 RF Output Power (Conducted) (FCC Part 2.1046 Cond)**Data:**

EUT Mode	Frequency MHz	Channel	RBW/VBW MHz	Measured Power dBm	Measured Power
					Watts
GSM	1930.4	Low	1/1 MHz	49.98	99.5
	1960.0	Mid	1/1 MHz	50.11	102.6
	1989.6	High	1/1 MHz	49.93	98.4
Edge	1930.4	Low	1/1 MHz	49.54	89.9
	1960.0	Mid	1/1 MHz	49.78	95.1
	1989.6	High	1/1 MHz	49.99	99.8
CDMA	1931.0	Low	Note 1	49.87	97.1
	1960.0	Mid	Note 1	49.90	97.7
	1989.0	High	Note 1	49.65	92.3
W-CDMA	1932.5	Low	Note 1	49.89	97.5
	1960.0	Mid	Note 1	49.93	98.4
	1987.5	High	Note 1	49.72	93.8

Note 1: Used Channel Power function from Spectrum Analyzer (RS FSEK30)

7.0 Occupied Bandwidth (FCC Part 2.1049)

Method:

The occupied bandwidth 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.

Connect the antenna port of the EUT to a spectrum analyzer using a calibrated coaxial cable and attenuator. Set the EUT to transmit at its highest power setting. The 99% bandwidth function of the analyzer was used to automatically generate the occupied bandwidth plots. Repeat for low, mid, and high channels of each band of the EUT.

For amplifiers, the output bandwidth shall be less than or equal to the input bandwidth.

Test Equipment Used:

Description:	Manufacturer:	Model:	Asset Number:	Cal Date:	Cal Due:
Attenuator, 03 dB, <18GHz	Weinschel Corp	2	200003	08/05/2008	08/05/2009
Attenuator, 10 dB, <18GHz	Weinschel Corp	2	200009	08/05/2008	08/05/2009
Attenuator, 10 dB, <18GHz, 50W	Weinschel	47-10-34	200061	08/05/2008	08/05/2009
Attenuator, 10 dB, <2.5 GHz 1000W	JFW Industries, Inc	50FHAM-010-1000	200073	03/21/2008	03/21/2009
Attenuator, 20 dB, <18GHz	Hewlett Packard	11582A 8491B 020	213101a	08/19/2008	08/19/2009
Cable E04, <18GHz	Huber-Suhner	Sucoflex 104PE	E04	06/04/2008	06/04/2009
Cable E202, 18 GHz, N, 3m	Megaphase	TM18 NKNK 118	E202	01/16/2008	01/16/2009
Spectrum Analyzer, 20Hz-40GHz	Rohde & Schwarz	FSEK30	200062	03/19/2008	03/19/2009
Splitter, 10 MHz to 2.5 GHz	Mini-Circuits	ZFSC-2-2500	200053	11/30/2007	11/30/2008

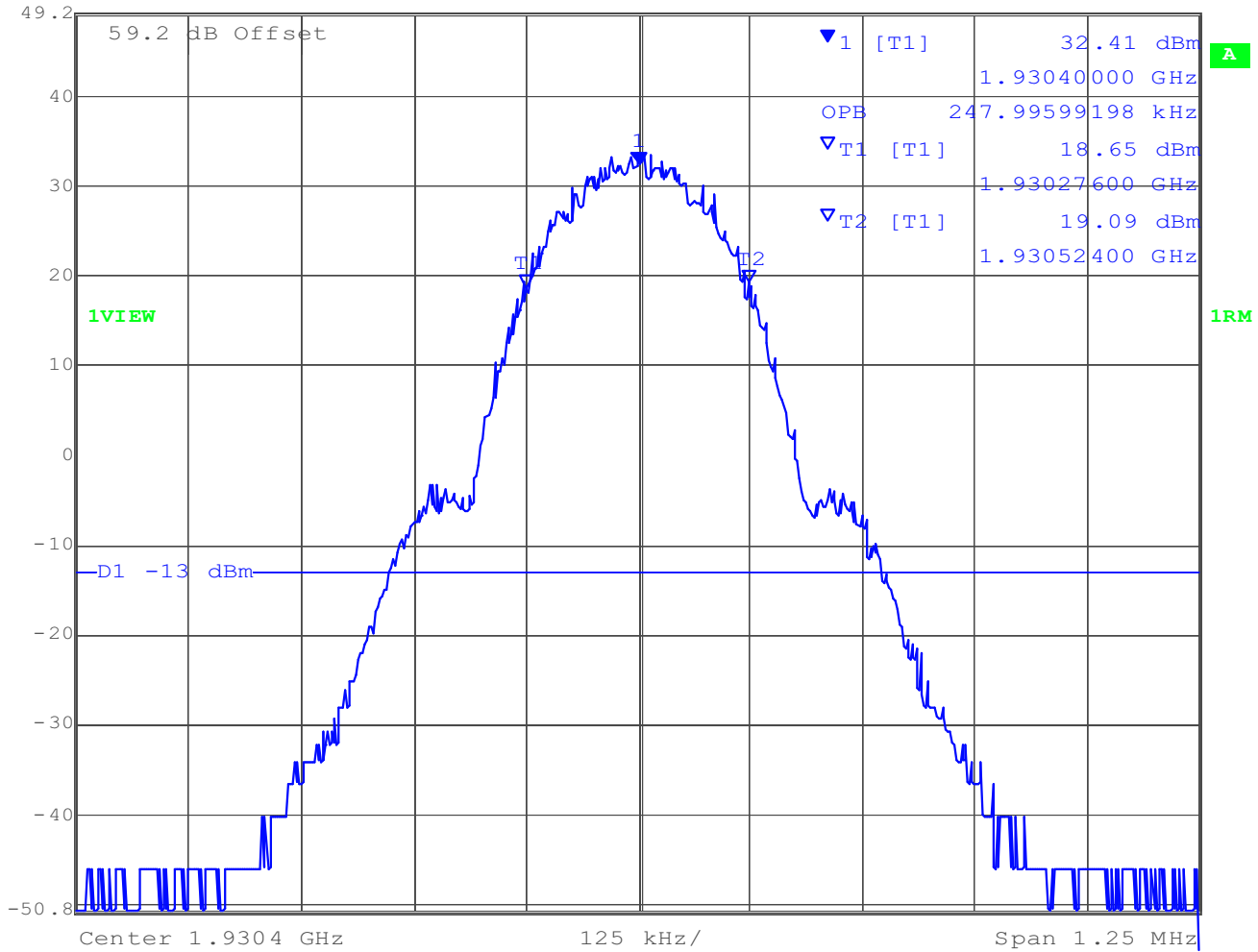
Results: The sample tested was found to Comply.

7.0 Occupied Bandwidth (FCC Part 2.1049)

Drawing:



Marker 1 [T1] RBW 3 kHz RF Att 10 dB
Ref Lvl 32.41 dBm VBW 30 kHz Mixer -10 dBm
49.2 dBm 1.93040000 GHz SWT 2 s Unit dBm



Date: 15.SEP.2008 09:14:04

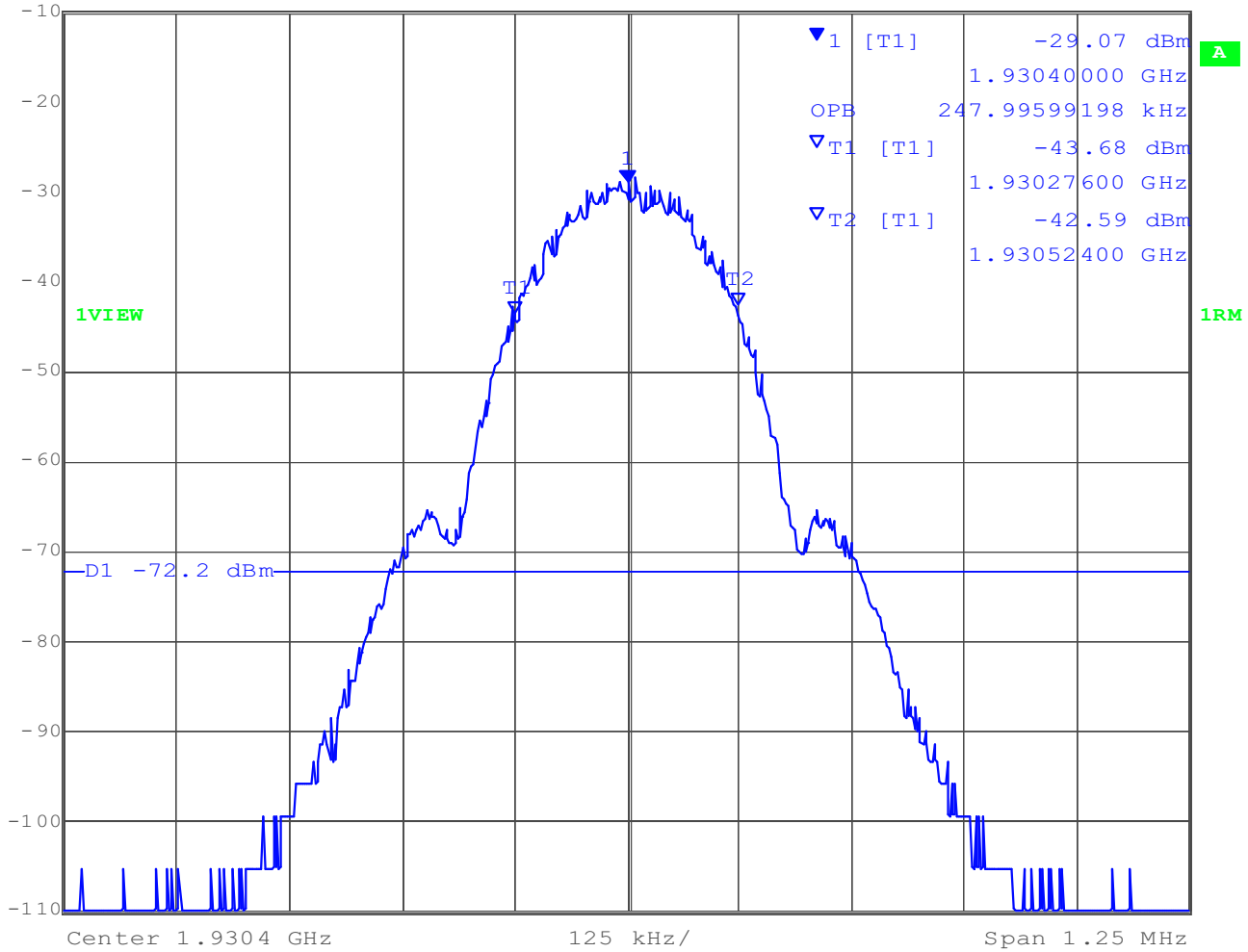
GSM - Low Channel - Amplifier Output

7.0 Occupied Bandwidth (FCC Part 2.1049)

Drawing:



Marker 1 [T1] RBW 3 kHz RF Att 10 dB
 Ref Lvl -29.07 dBm VBW 30 kHz Mixer -10 dBm
 -10 dBm 1.93040000 GHz SWT 2 s Unit dBm



Date: 15.SEP.2008 09:28:57

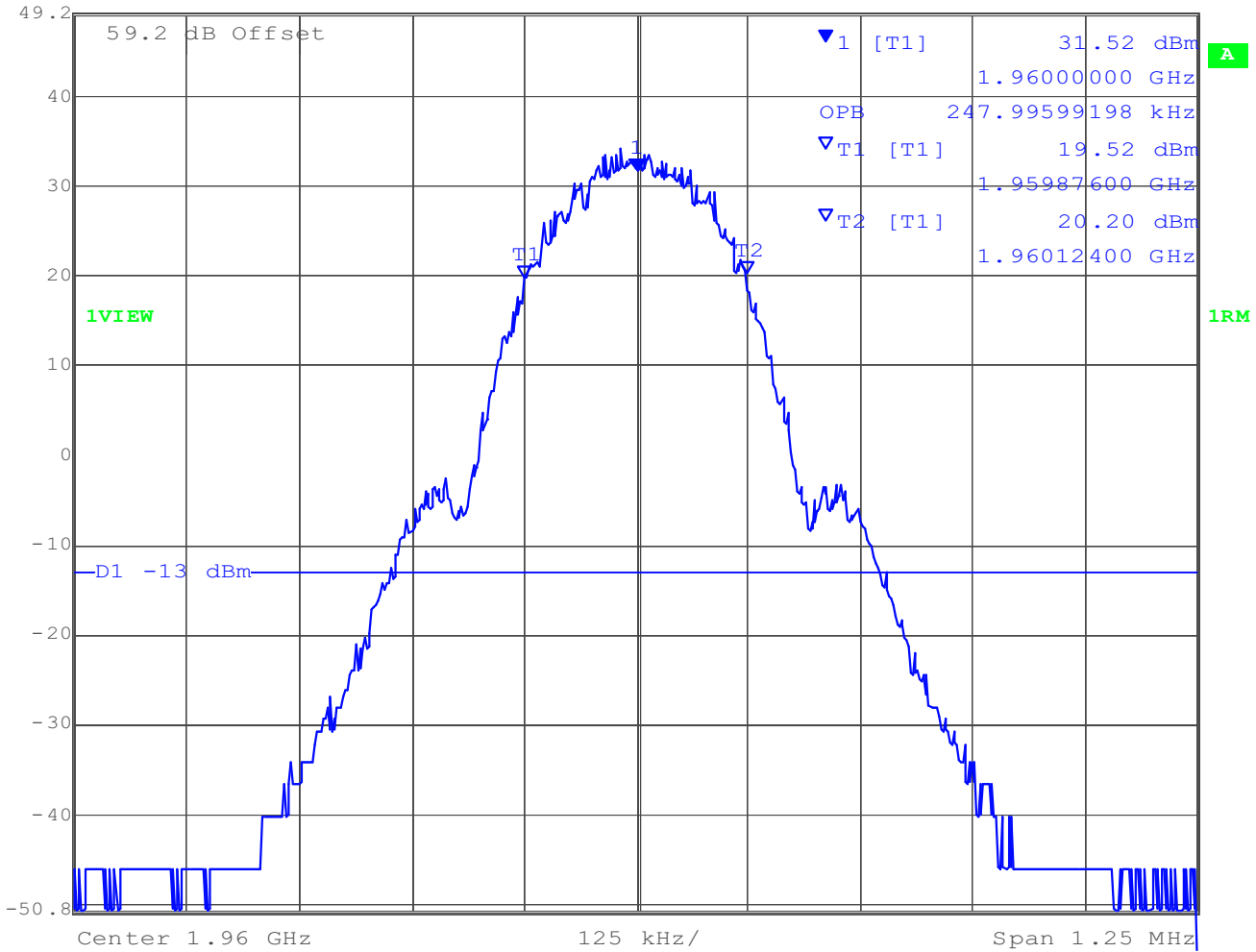
GSM - Low Channel - Amplifier Input

7.0 Occupied Bandwidth (FCC Part 2.1049)

Drawing:



Marker 1 [T1] RBW 3 kHz RF Att 10 dB
 Ref Lvl 31.52 dBm VBW 30 kHz Mixer -10 dBm
 49.2 dBm 1.96000000 GHz SWT 2 s Unit dBm



Date: 15.SEP.2008 09:14:48

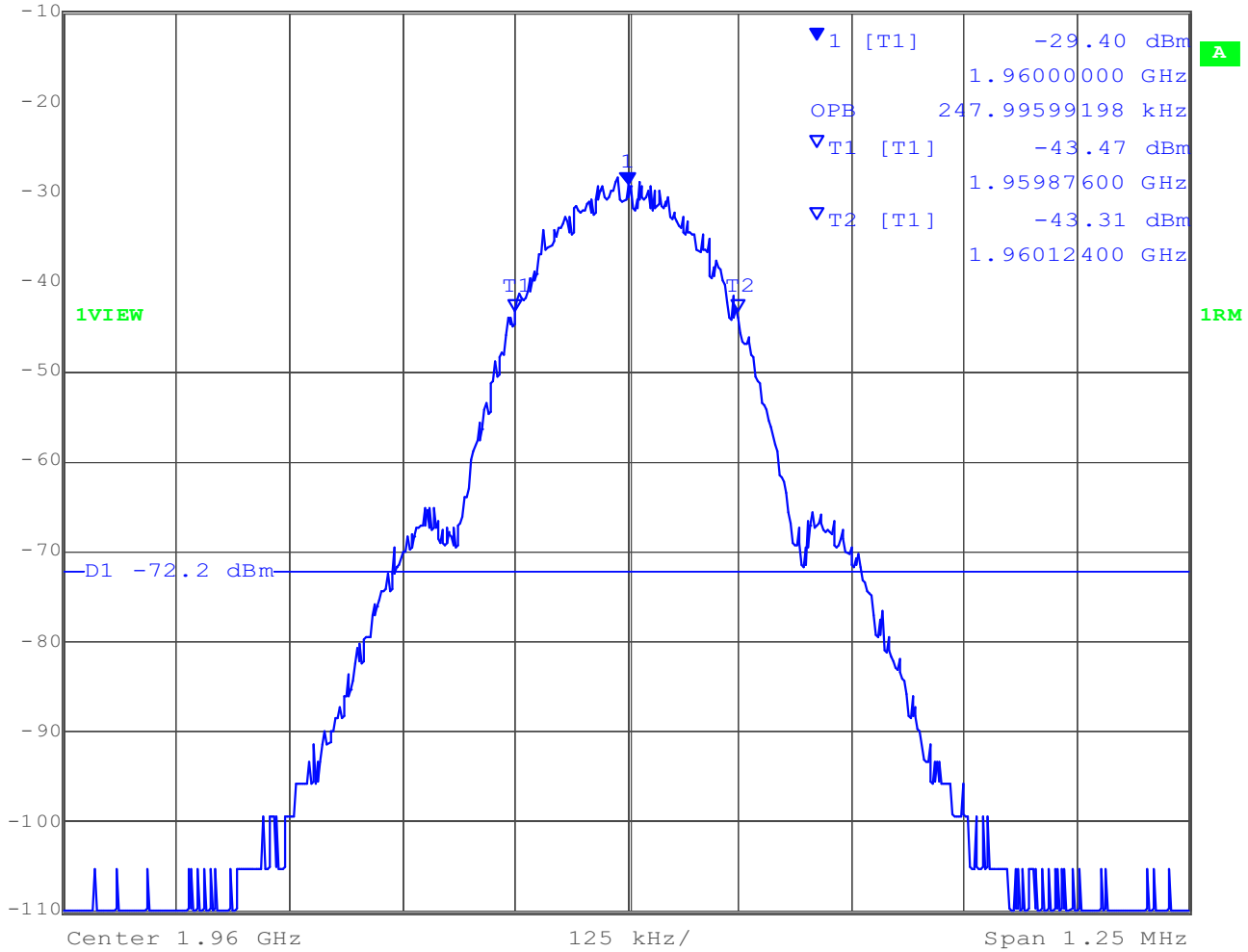
GSM - Mid Channel - Amplifier Output

7.0 Occupied Bandwidth (FCC Part 2.1049)

Drawing:



Marker 1 [T1] RBW 3 kHz RF Att 10 dB
 Ref Lvl -29.40 dBm VBW 30 kHz Mixer -10 dBm
 -10 dBm 1.96000000 GHz SWT 2 s Unit dBm



Date: 15.SEP.2008 09:27:53

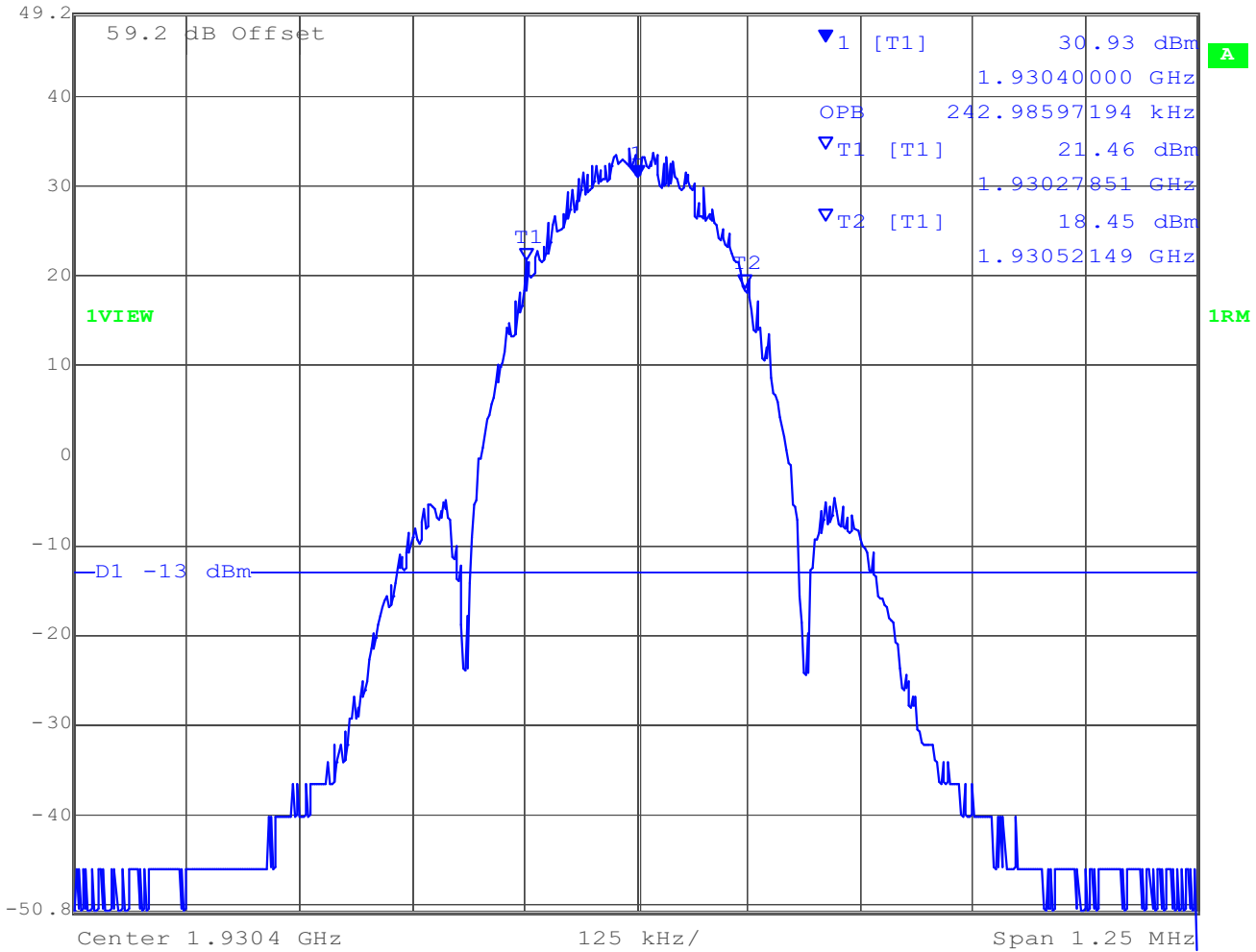
GSM - Mid Channel - Amplifier Input

7.0 Occupied Bandwidth (FCC Part 2.1049)

Drawing:



Marker 1 [T1] RBW 3 kHz RF Att 10 dB
 Ref Lvl 30.93 dBm VBW 30 kHz Mixer -10 dBm
 49.2 dBm 1.93040000 GHz SWT 2 s Unit dBm



Date: 15.SEP.2008 09:19:46

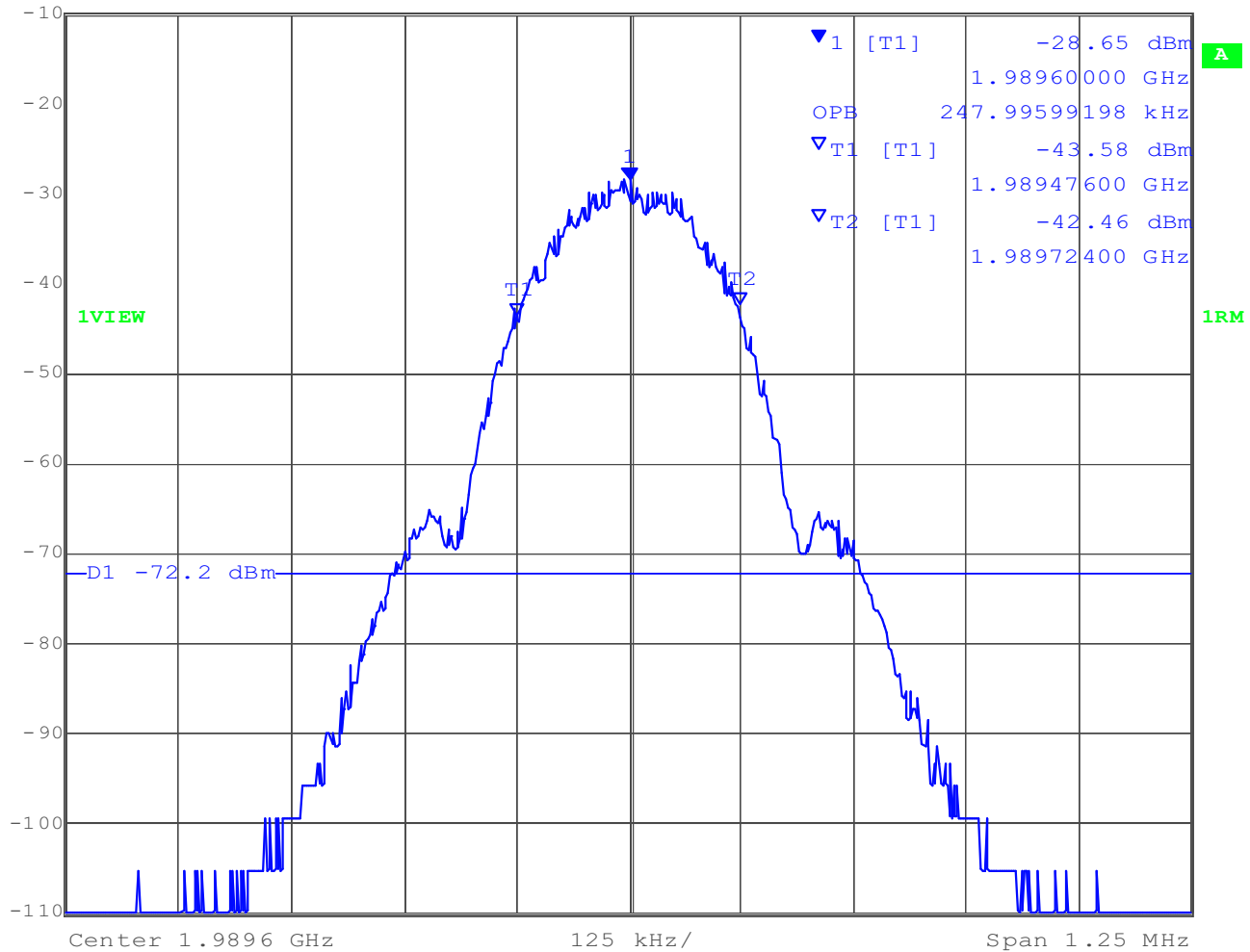
GSM Edge - Low Channel - Amplifier Output

7.0 Occupied Bandwidth (FCC Part 2.1049)

Drawing:



Marker 1 [T1] RBW 3 kHz RF Att 10 dB
Ref Lvl -28.65 dBm VBW 30 kHz Mixer -10 dBm
-10 dBm 1.98960000 GHz SWT 2 s Unit dBm



Date: 15.SEP.2008 09:27:13

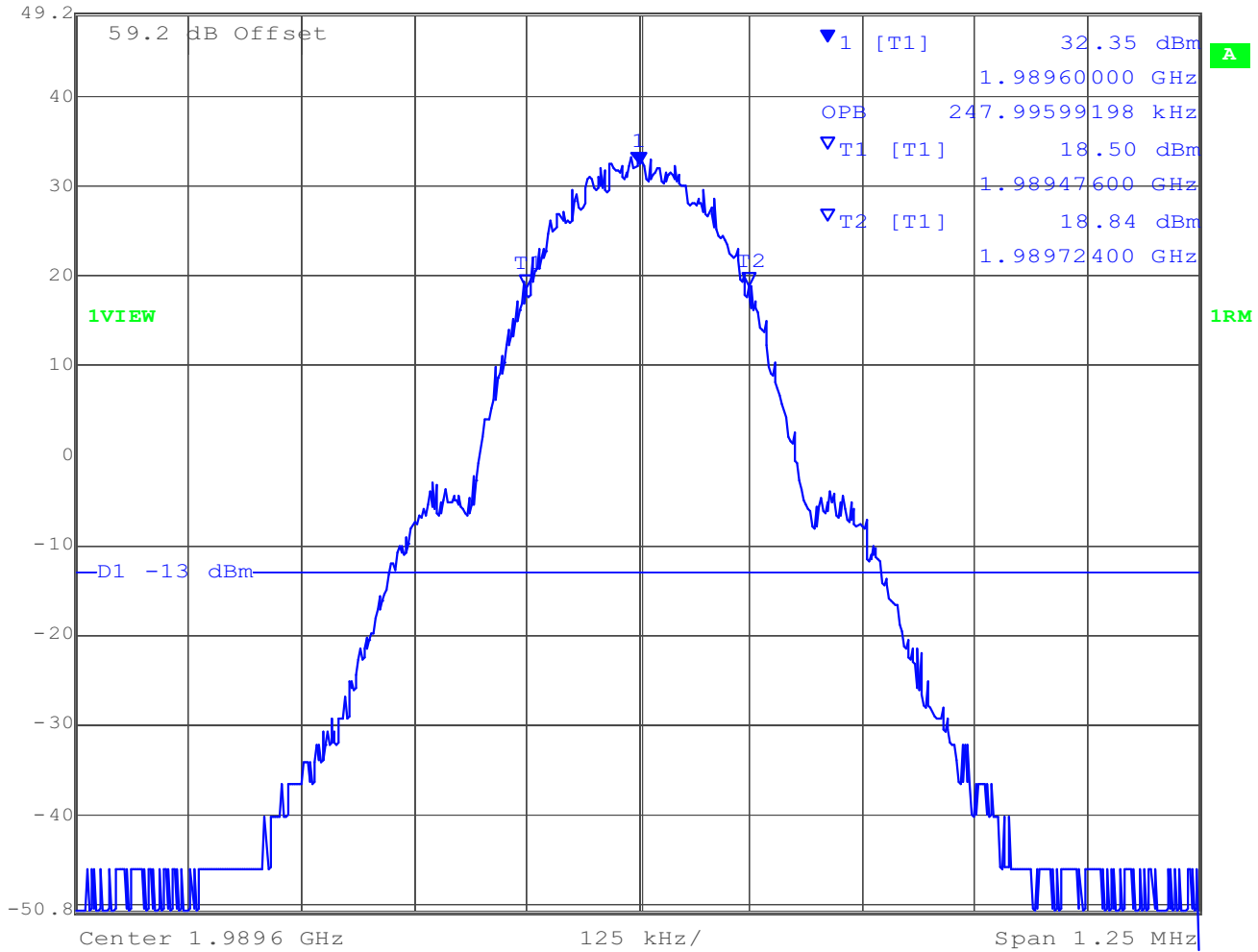
GSM - High Channel - Amplifier Input

7.0 Occupied Bandwidth (FCC Part 2.1049)

Drawing:



Marker 1 [T1] RBW 3 kHz RF Att 10 dB
Ref Lvl 32.35 dBm VBW 30 kHz Mixer -10 dBm
49.2 dBm 1.98960000 GHz SWT 2 s Unit dBm



Date: 15.SEP.2008 09:15:32

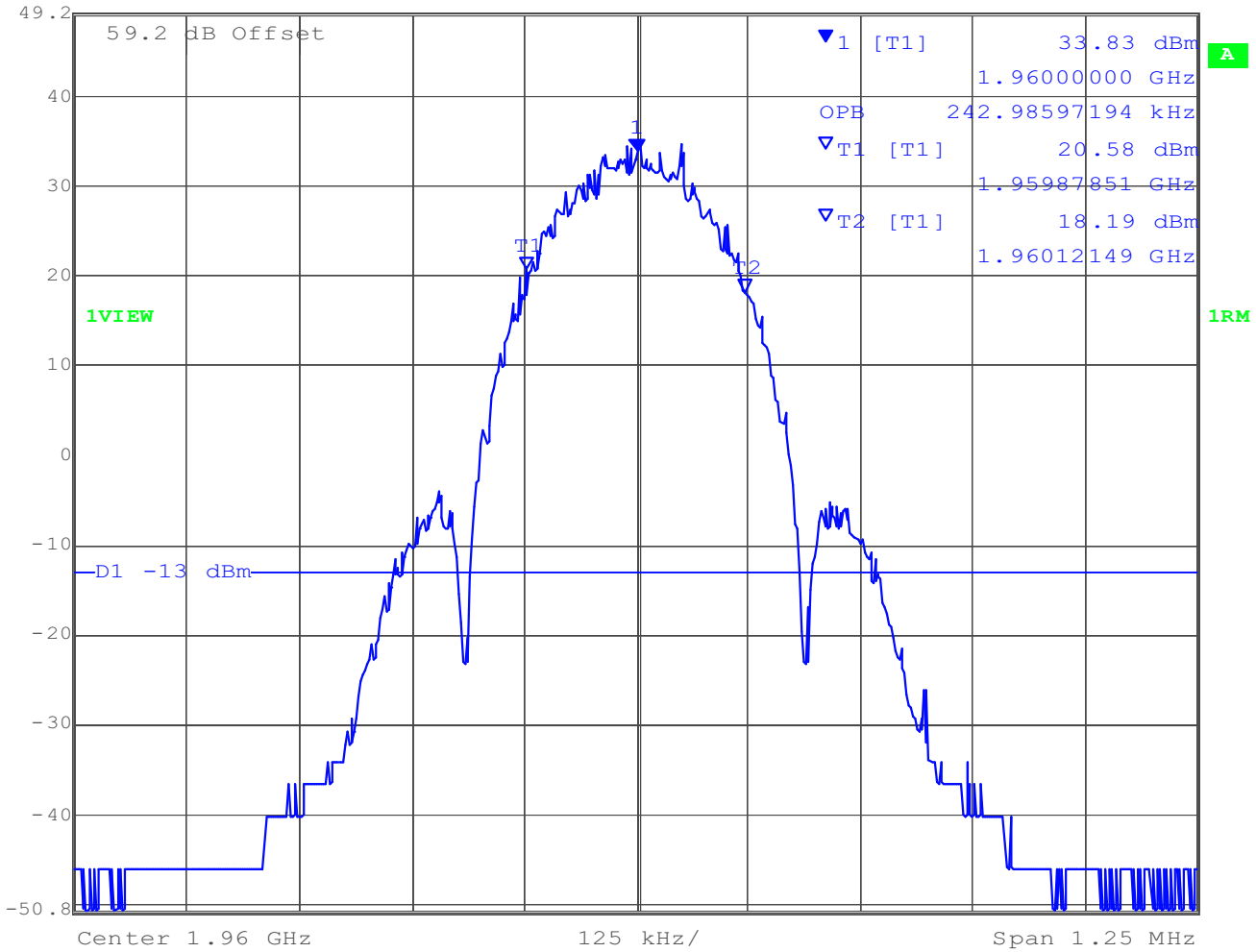
GSM - High Channel - Amplifier Output

7.0 Occupied Bandwidth (FCC Part 2.1049)

Drawing:



Ref Lvl	Marker 1 [T1]	RBW	3 kHz	RF Att	10 dB
49.2 dBm	33.83 dBm	VBW	30 kHz	Mixer	-10 dBm
	1.96000000 GHz	SWT	2 s	Unit	dBm



Date: 15.SEP.2008 09:18:12

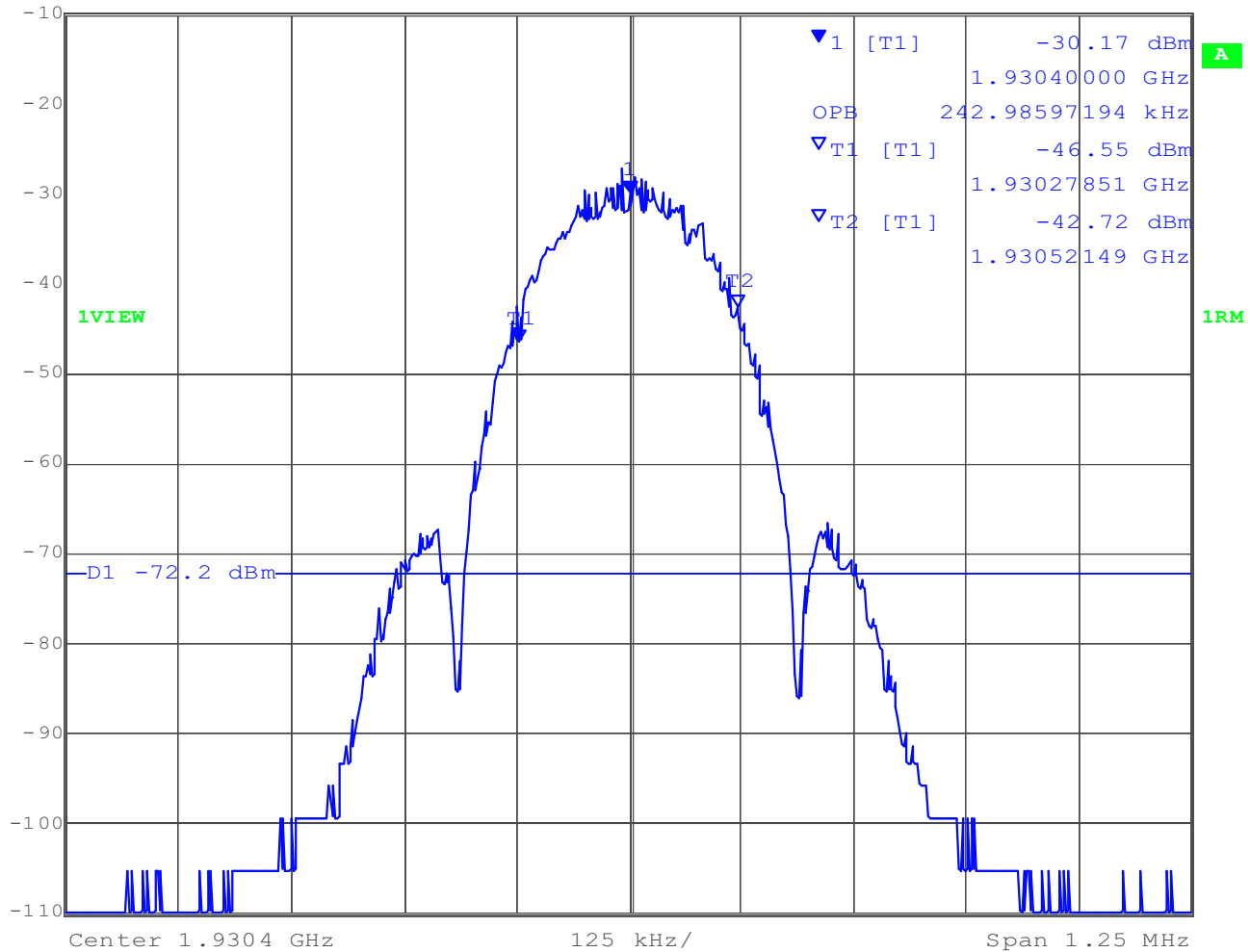
GSM Edge - Mid Channel - Amplifier Output

7.0 Occupied Bandwidth (FCC Part 2.1049)

Drawing:



Marker 1 [T1] RBW 3 kHz RF Att 10 dB
Ref Lvl -30.17 dBm VBW 30 kHz Mixer -10 dBm
-10 dBm 1.93040000 GHz SWT 2 s Unit dBm



Date: 15.SEP.2008 09:24:05

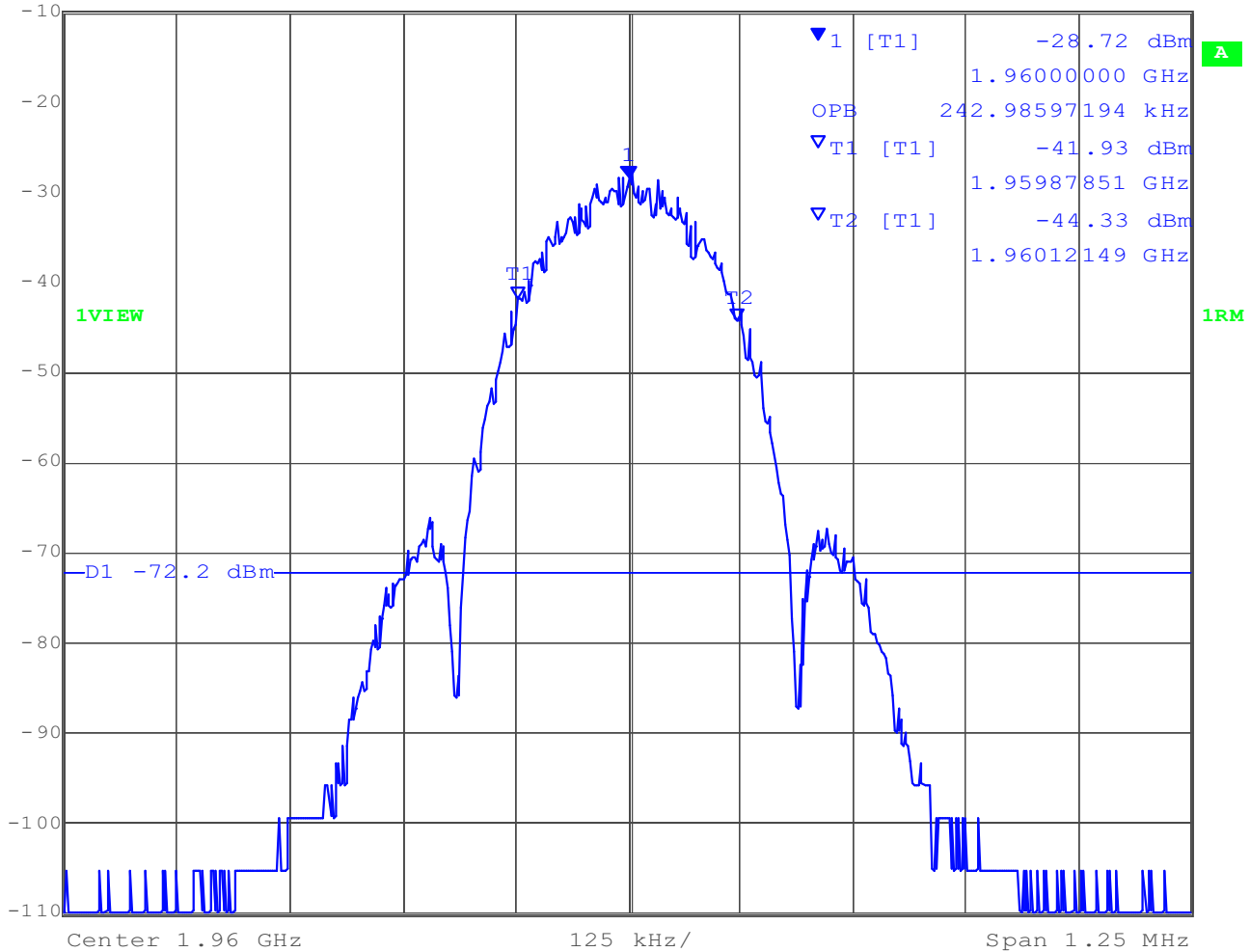
GSM Edge - Low Channel - Amplifier Input

7.0 Occupied Bandwidth (FCC Part 2.1049)

Drawing:



Marker 1 [T1] RBW 3 kHz RF Att 10 dB
Ref Lvl -28.72 dBm VBW 30 kHz Mixer -10 dBm
-10 dBm 1.96000000 GHz SWT 2 s Unit dBm

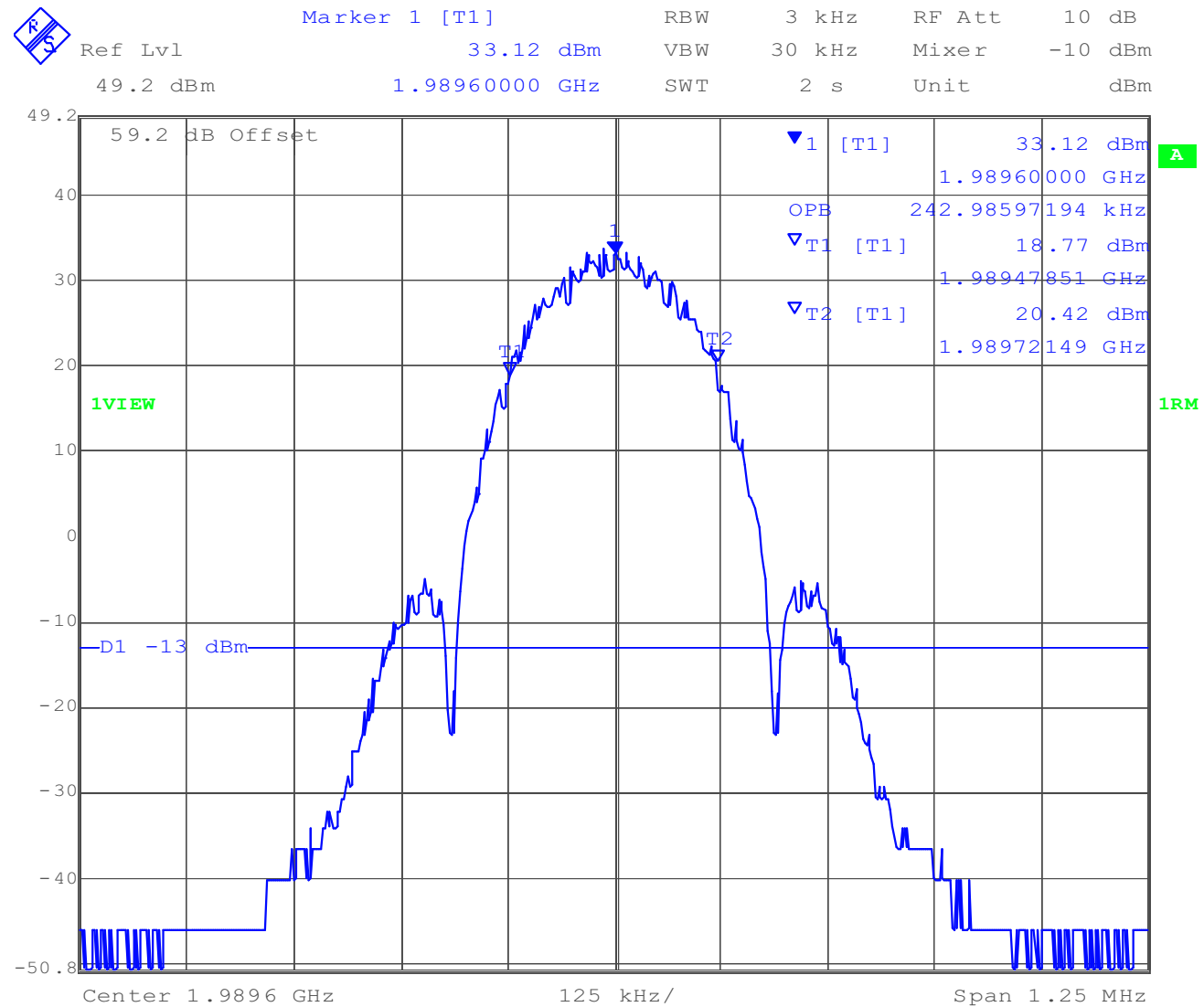


Date: 15.SEP.2008 09:25:00

GSM Edge - Mid Channel - Amplifier Input

7.0 Occupied Bandwidth (FCC Part 2.1049)

Drawing:



Date: 15.SEP.2008 09:17:09

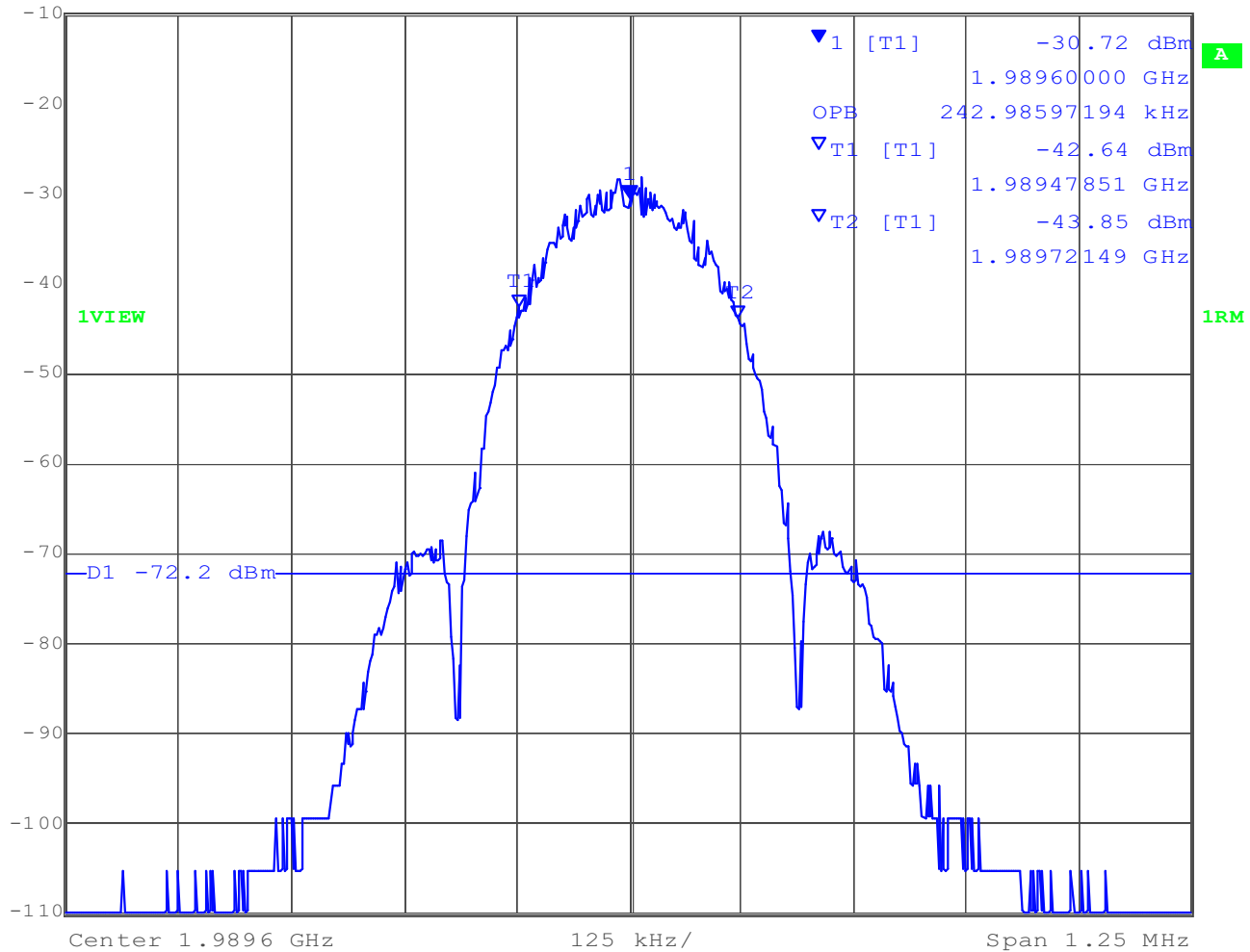
GSM Edge - High Channel - Amplifier Output

7.0 Occupied Bandwidth (FCC Part 2.1049)

Drawing:



Marker 1 [T1] RBW 3 kHz RF Att 10 dB
Ref Lvl -30.72 dBm VBW 30 kHz Mixer -10 dBm
-10 dBm 1.98960000 GHz SWT 2 s Unit dBm



Date: 15.SEP.2008 09:26:20

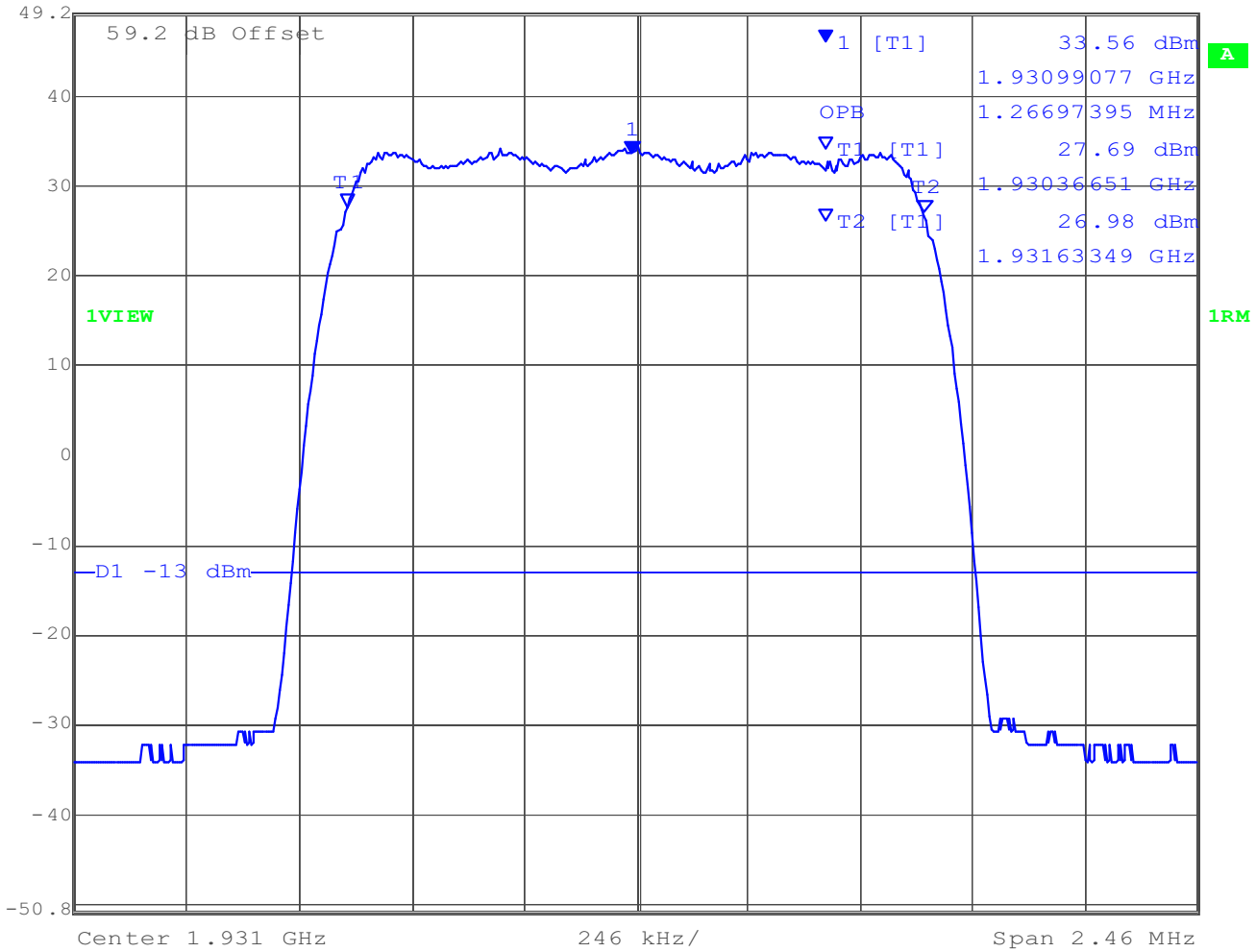
GSM Edge - High Channel - Amplifier Input

7.0 Occupied Bandwidth (FCC Part 2.1049)

Drawing:



Ref Lvl	Marker 1 [T1]	RBW	30 kHz	RF Att	10 dB
49.2 dBm	33.56 dBm	VBW	300 kHz	Mixer	-10 dBm
	1.93099077 GHz	SWT	3 s	Unit	dBm



Date: 15.SEP.2008 09:04:03

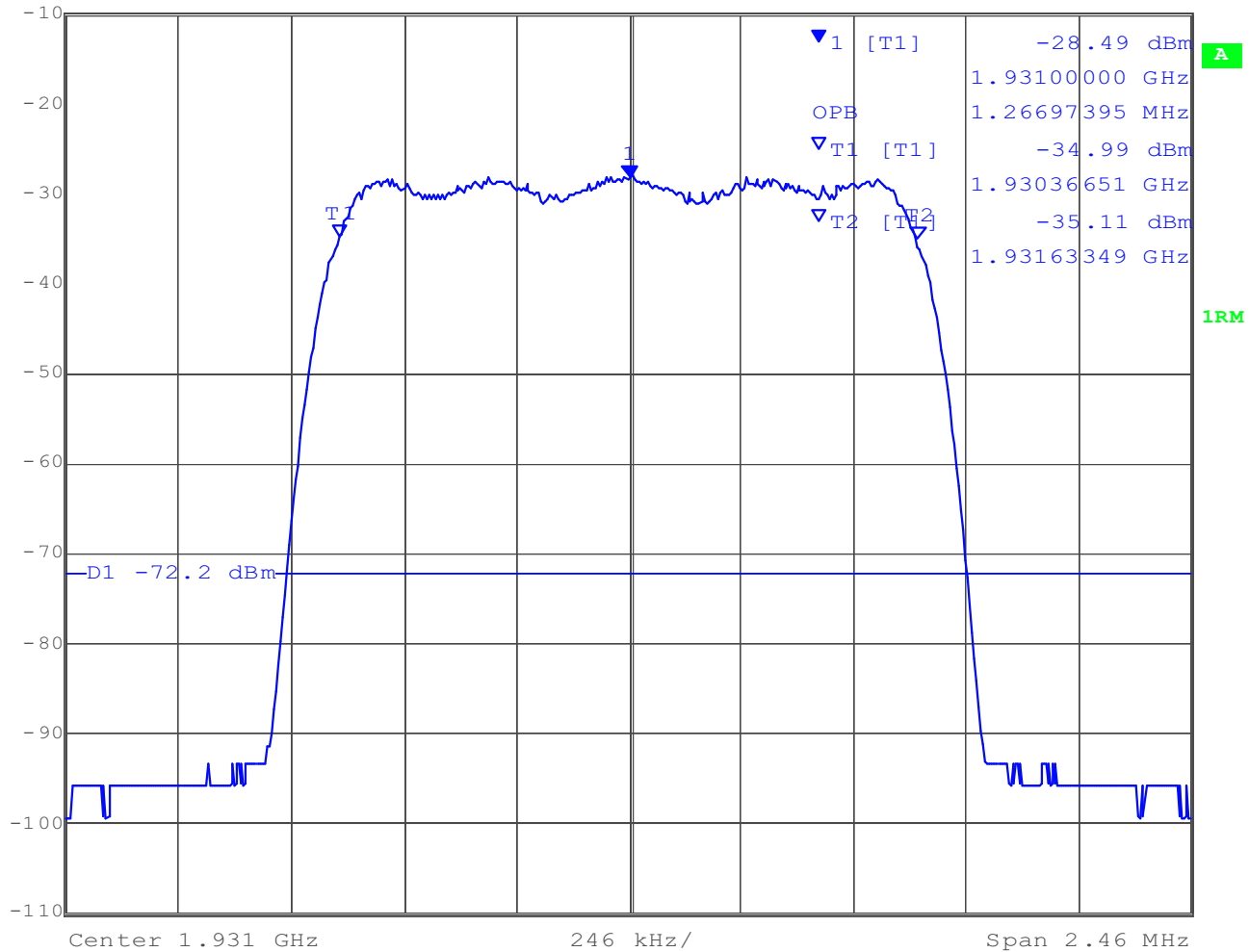
CDMA - Low Channel - Amplifier Output

7.0 Occupied Bandwidth (FCC Part 2.1049)

Drawing:



Marker 1 [T1] RBW 30 kHz RF Att 10 dB
Ref Lvl -28.49 dBm VBW 300 kHz Mixer -10 dBm
-10 dBm 1.93100000 GHz SWT 2 s Unit dBm



Date: 15.SEP.2008 09:33:43

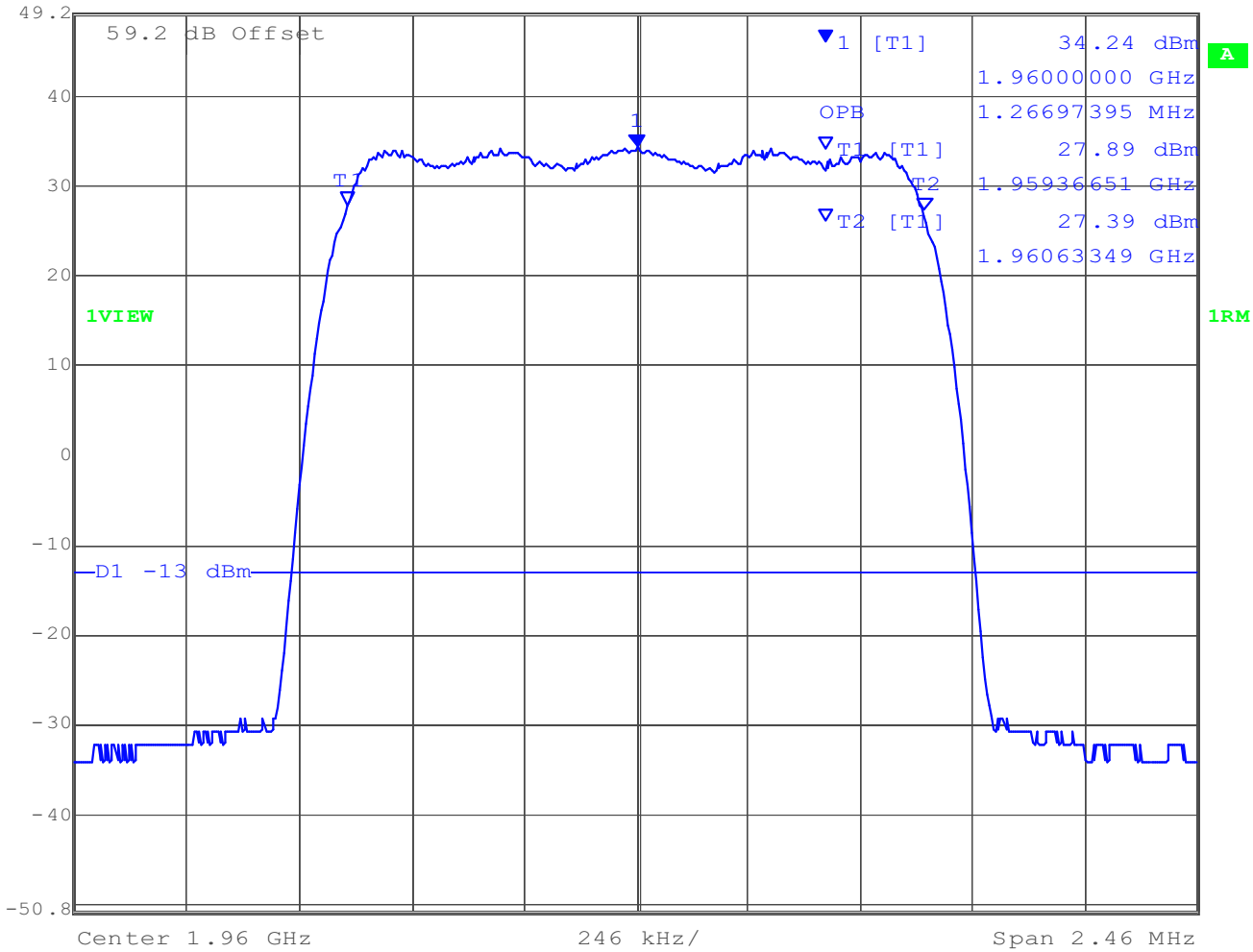
CDMA - Low Channel - Amplifier Input

7.0 Occupied Bandwidth (FCC Part 2.1049)

Drawing:



Ref Lvl	Marker 1 [T1]	RBW	30 kHz	RF Att	10 dB
49.2 dBm	34.24 dBm	VBW	300 kHz	Mixer	-10 dBm
	1.96000000 GHz	SWT	3 s	Unit	dBm



Date: 15.SEP.2008 09:06:09

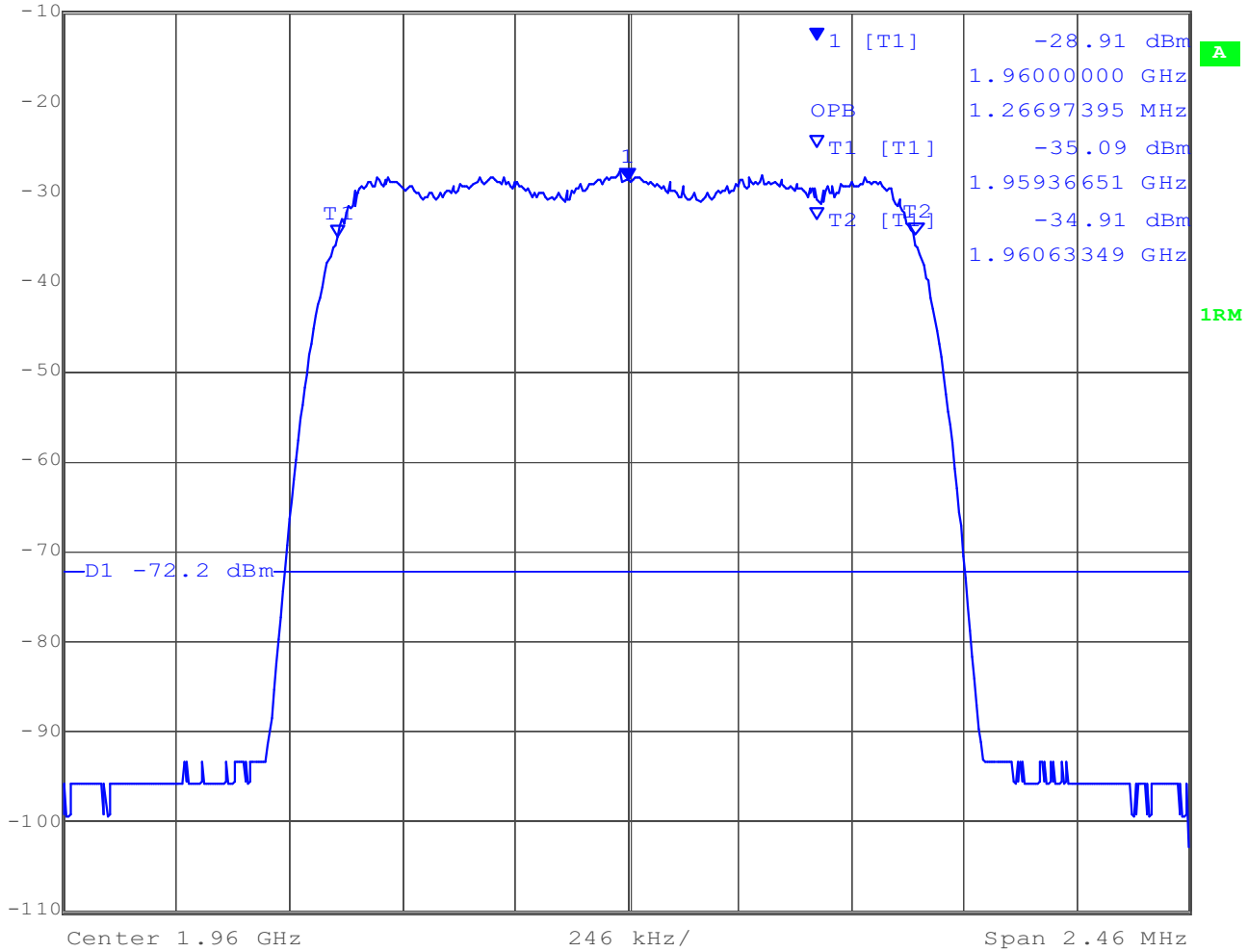
CDMA - Mid Channel - Amplifier Output

7.0 Occupied Bandwidth (FCC Part 2.1049)

Drawing:



Ref Lvl	Marker 1 [T1]	RBW	30 kHz	RF Att	10 dB
-10 dBm	-28.91 dBm	VBW	300 kHz	Mixer	-10 dBm
	1.96000000 GHz	SWT	2 s	Unit	dBm



Date: 15.SEP.2008 09:32:58

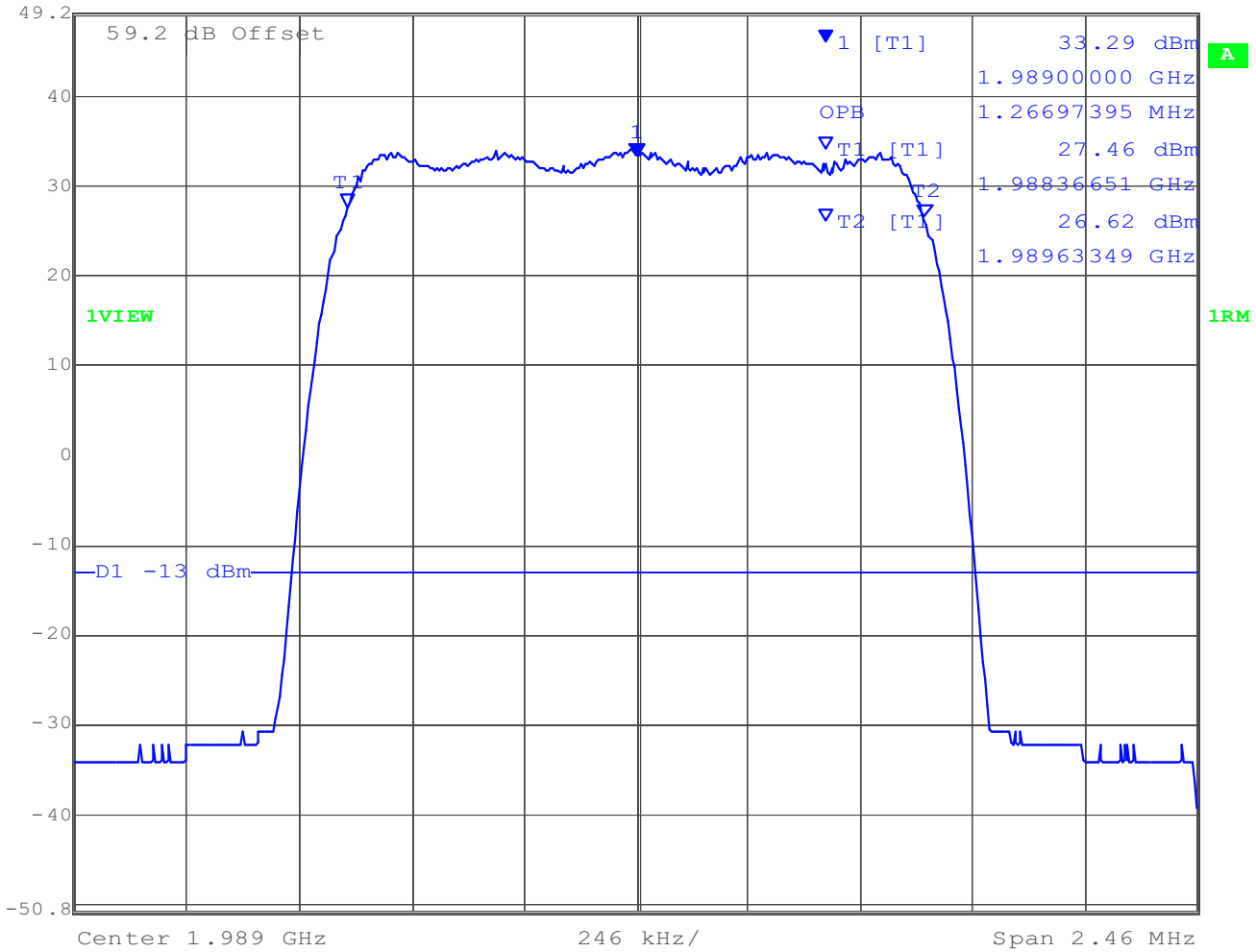
CDMA - Mid Channel - Amplifier Input

7.0 Occupied Bandwidth (FCC Part 2.1049)

Drawing:



Ref Lvl	Marker 1 [T1]	RBW	30 kHz	RF Att	10 dB
49.2 dBm	33.29 dBm	VBW	300 kHz	Mixer	-10 dBm
	1.98900000 GHz	SWT	3 s	Unit	dBm



Date: 15.SEP.2008 09:07:29

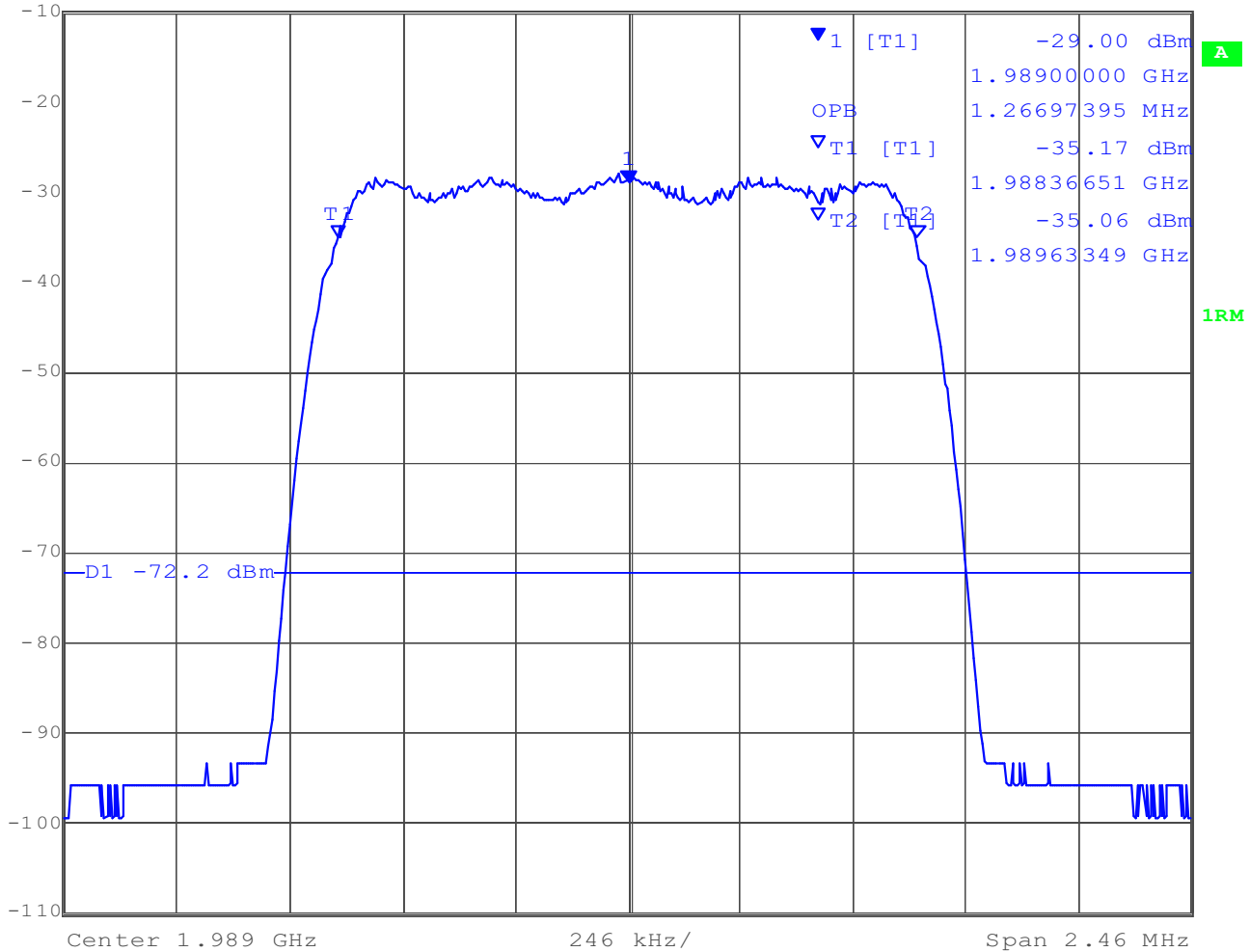
CDMA - High Channel - Amplifier Output

7.0 Occupied Bandwidth (FCC Part 2.1049)

Drawing:



Ref Lvl	Marker 1 [T1]	RBW	30 kHz	RF Att	10 dB
-10 dBm	-29.00 dBm	VBW	300 kHz	Mixer	-10 dBm
	1.98900000 GHz	SWT	2 s	Unit	dBm

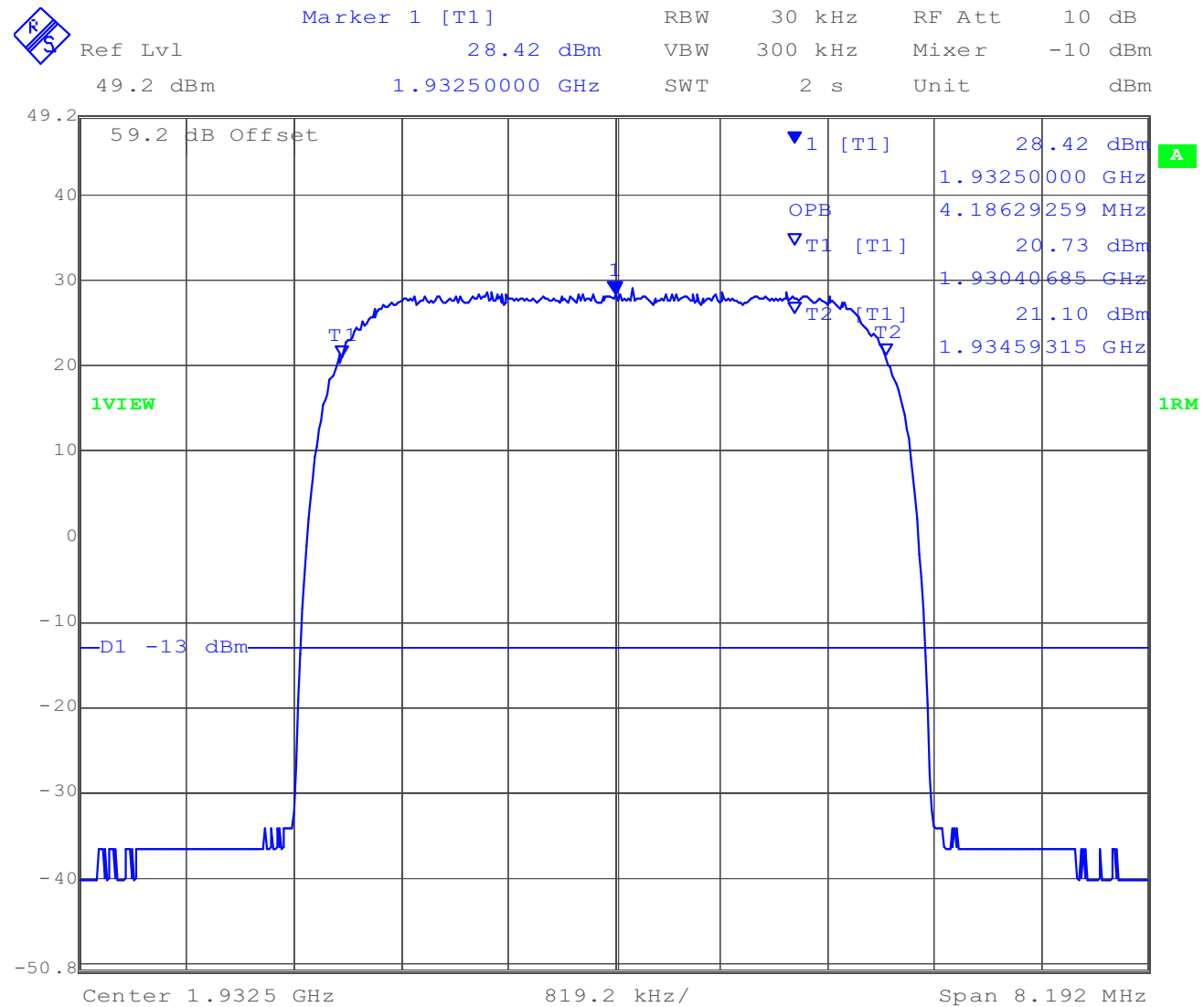


Date: 15.SEP.2008 09:32:18

CDMA - High Channel - Amplifier Input

7.0 Occupied Bandwidth (FCC Part 2.1049)

Drawing:



Date: 15.SEP.2008 09:09:35

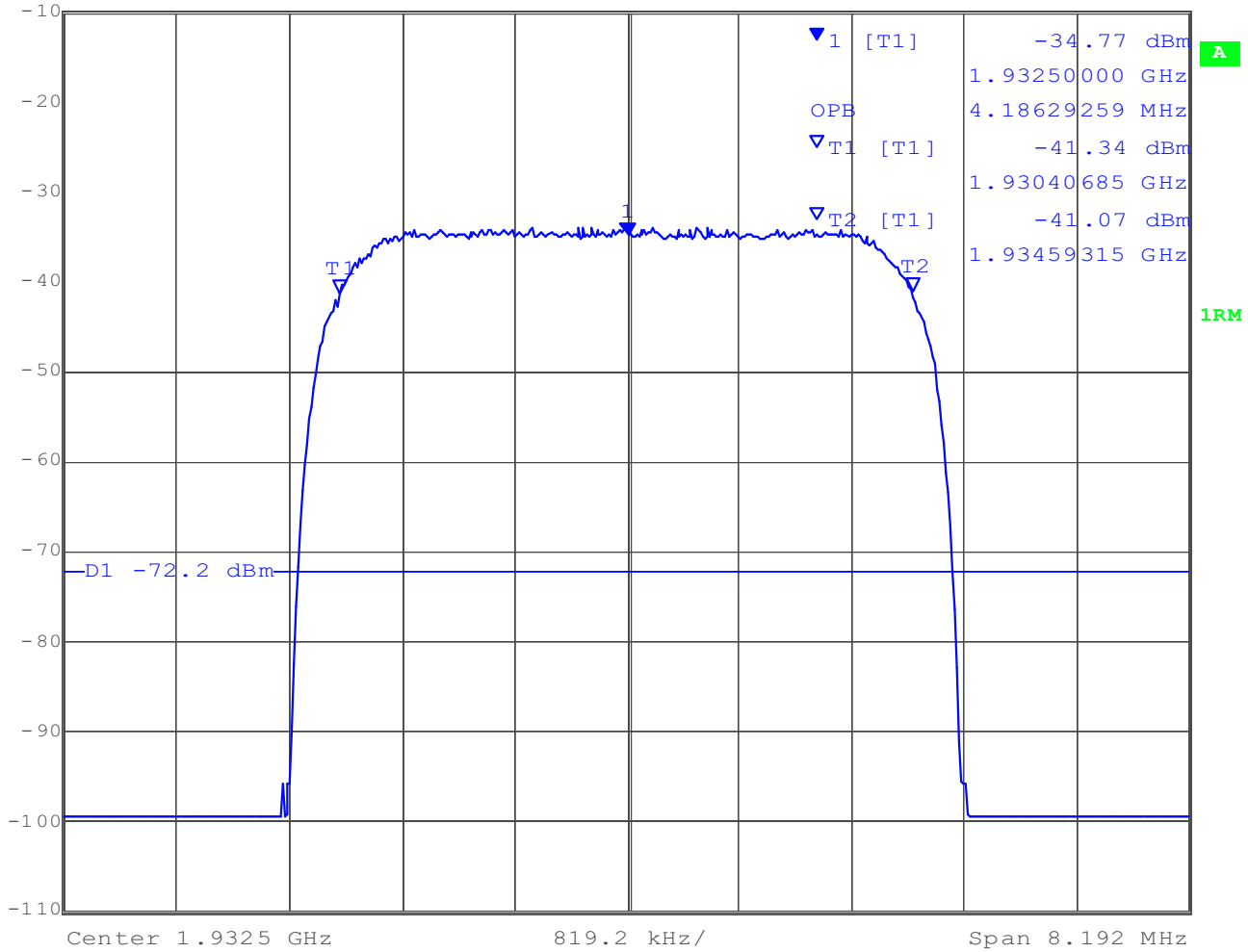
WCDMA - Low Channel - Amplifier Output

7.0 Occupied Bandwidth (FCC Part 2.1049)

Drawing:



Ref Lvl	Marker 1 [T1]	RBW	30 kHz	RF Att	10 dB
-10 dBm	-34.77 dBm	VBW	300 kHz	Mixer	-10 dBm
	1.93250000 GHz	SWT	2 s	Unit	dBm



Date: 15.SEP.2008 09:31:25

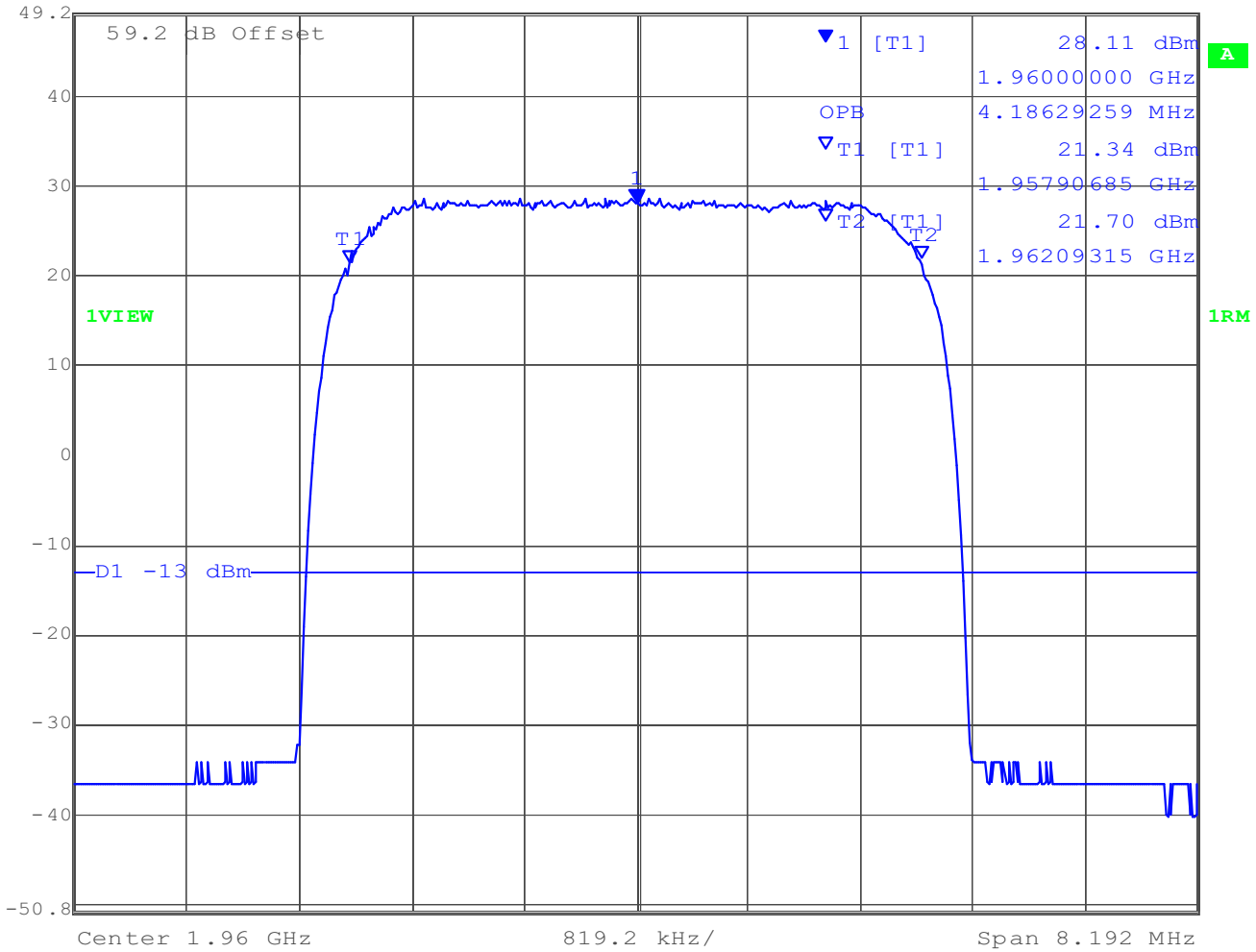
WCDMA - Low Channel - Amplifier Input

7.0 Occupied Bandwidth (FCC Part 2.1049)

Drawing:



Marker 1 [T1] RBW 30 kHz RF Att 10 dB
 Ref Lvl 28.11 dBm VBW 300 kHz Mixer -10 dBm
 49.2 dBm 1.96000000 GHz SWT 2 s Unit dBm



Date: 15.SEP.2008 09:10:50

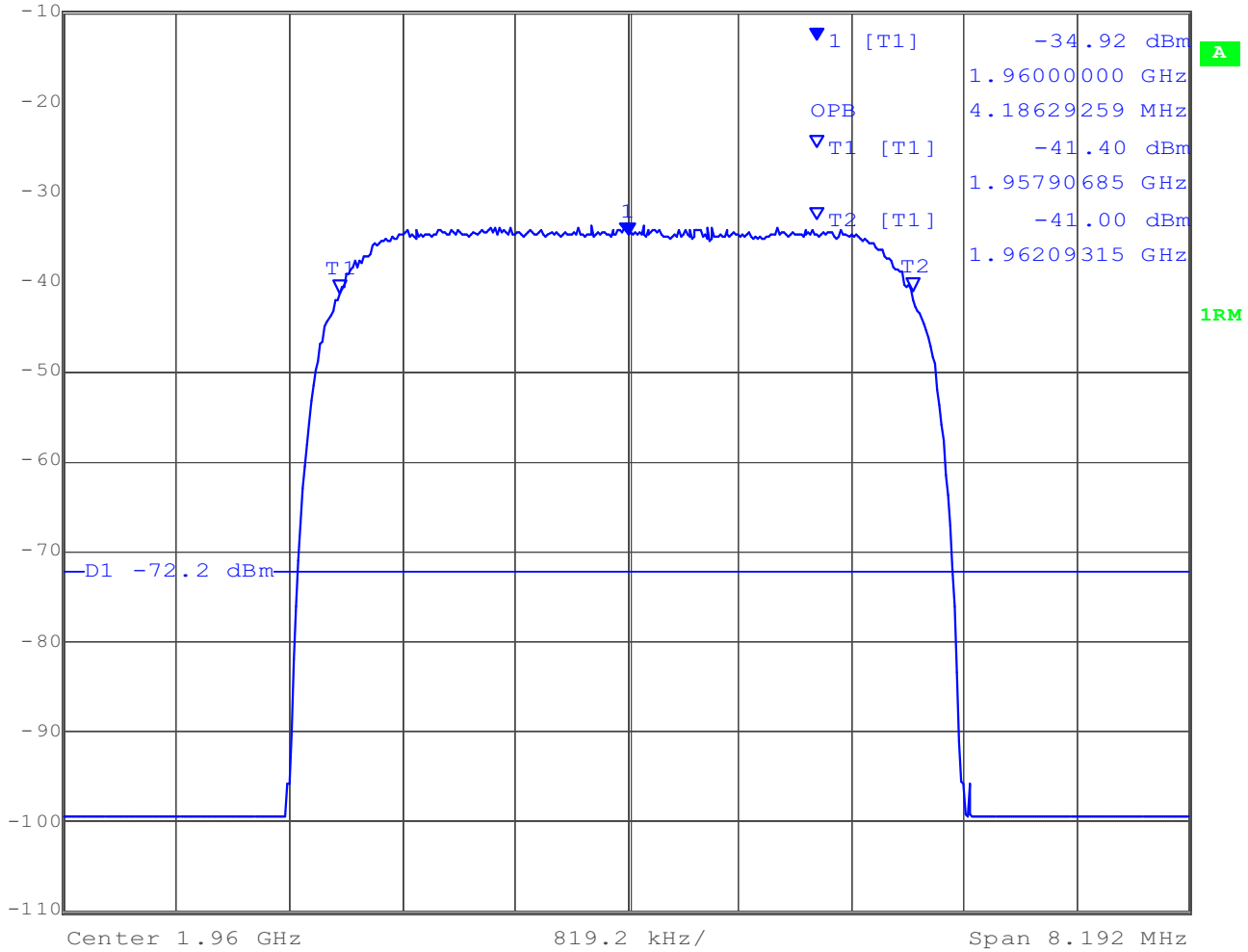
WCDMA - Mid Channel - Amplifier Output

7.0 Occupied Bandwidth (FCC Part 2.1049)

Drawing:



Ref Lvl	Marker 1 [T1]	RBW	30 kHz	RF Att	10 dB
-10 dBm	-34.92 dBm	VBW	300 kHz	Mixer	-10 dBm
	1.96000000 GHz	SWT	2 s	Unit	dBm



Date: 15.SEP.2008 09:30:46

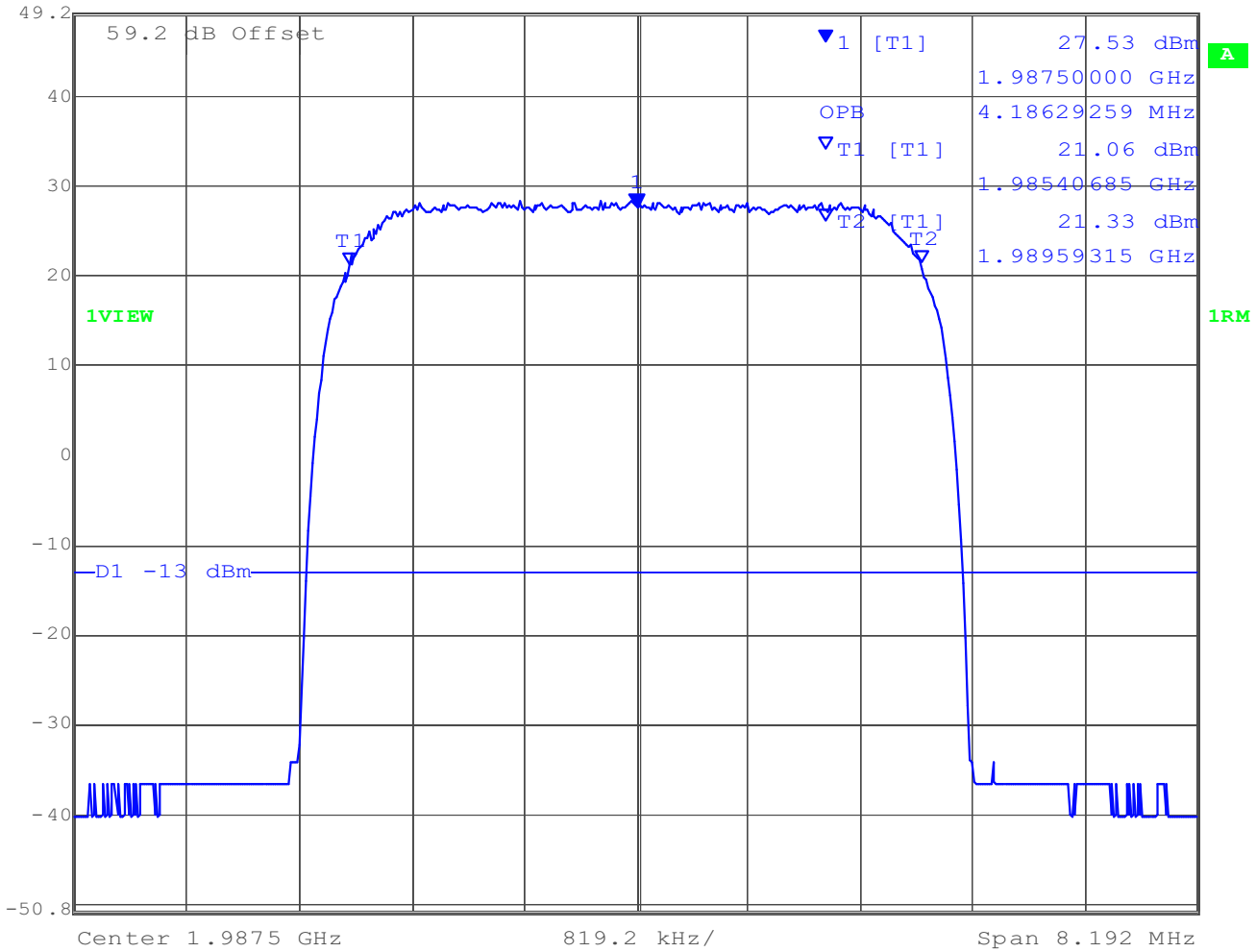
WCDMA - Mid Channel - Amplifier Input

7.0 Occupied Bandwidth (FCC Part 2.1049)

Drawing:



Marker 1 [T1] RBW 30 kHz RF Att 10 dB
 Ref Lvl 27.53 dBm VBW 300 kHz Mixer -10 dBm
 49.2 dBm 1.98750000 GHz SWT 2 s Unit dBm



Date: 15.SEP.2008 09:11:35

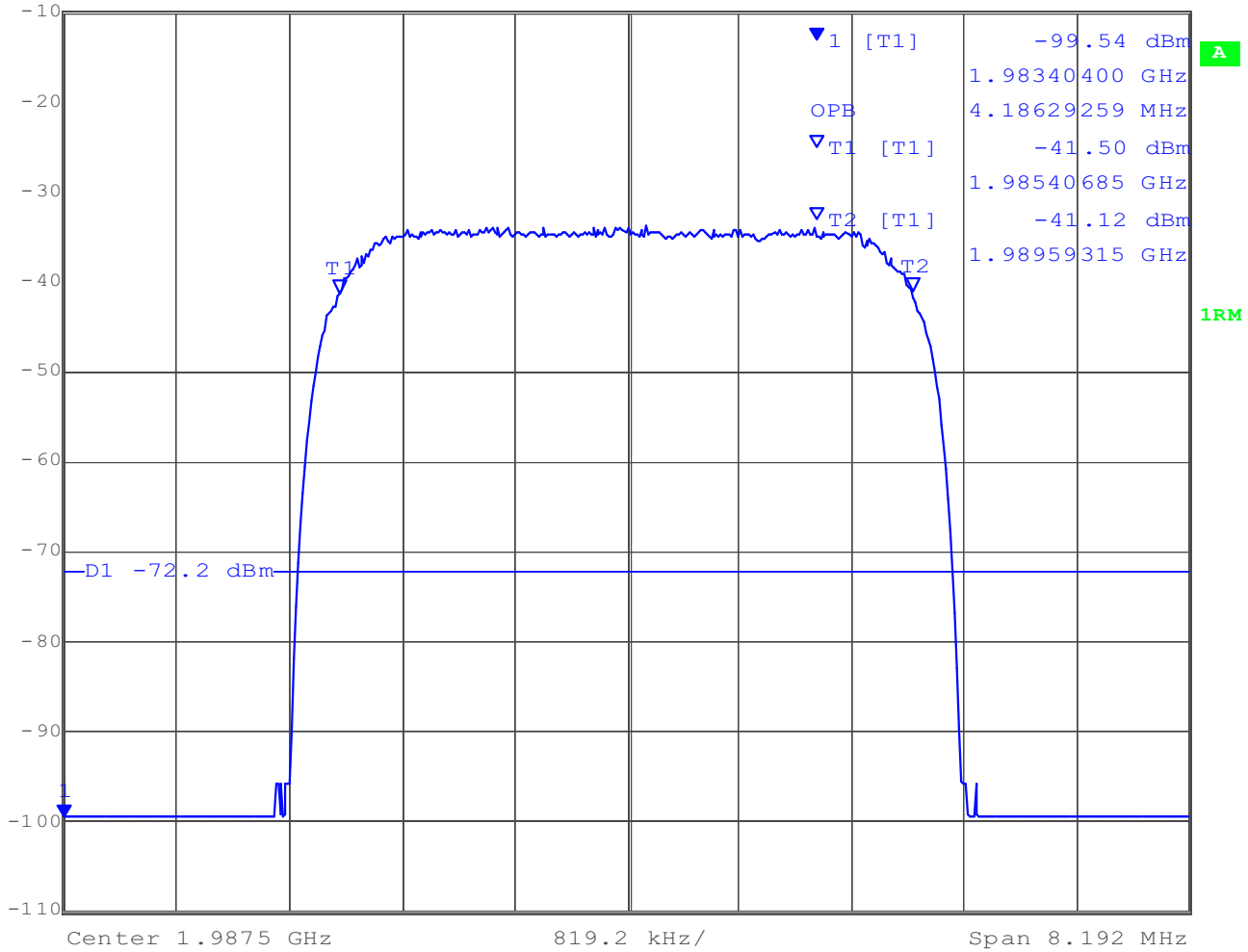
WCDMA - High Channel - Amplifier Output

7.0 Occupied Bandwidth (FCC Part 2.1049)

Drawing:



Ref Lvl	Marker 1 [T1]	RBW	30 kHz	RF Att	10 dB
-10 dBm	-99.54 dBm	VBW	300 kHz	Mixer	-10 dBm
	1.98340400 GHz	SWT	2 s	Unit	dBm



Date: 15.SEP.2008 09:30:10

WCDMA - High Channel - Amplifier Input

7.0 Occupied Bandwidth (FCC Part 2.1049)

Data:

Mode	Frequency MHz	Resolution Bandwidth (1)	Video Bandwidth	Sweep time Seconds	Output Measured Bandwidth MHz	Input Measured Bandwidth MHz
GSM	1989.400	3 kHz	30 kHz	2	0.24799599	0.24799599
GSM	1960.000	3 kHz	30 kHz	2	0.24799599	0.24799599
GSM	1989.600	3 kHz	30 kHz	2	0.24799599	0.24799599
GSM Edge	1989.400	3 kHz	30 kHz	2	0.24298597	0.24298597
GSM Edge	1960.000	3 kHz	30 kHz	2	0.24298597	0.24298597
GSM Edge	1989.600	3 kHz	30 kHz	2	0.24298597	0.24298597
CDMA	1931.000	30 kHz	300 kHz	2	1.26697395	1.26697395
CDMA	1960.000	30 kHz	300 kHz	2	1.26697395	1.26697395
CDMA	1989.000	30 kHz	300 kHz	2	1.26697395	1.26697395
WCDMA	1932.750	30 kHz	300 kHz	2	4.18629259	4.18629259
WCDMA	1960.000	30 kHz	300 kHz	2	4.18629259	4.18629259
WCDMA	1987.500	30 kHz	300 kHz	2	4.18629259	4.18629259

8.0 Spurious emissions at antenna terminals (FCC Part 2.1051)

Method:

FCC §2.1049, FCC §2.1051, §22.917(a), FCC §24.238(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.

Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater for the Cellular band and 1 MHz or greater in the PCS band. 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.

Connect the RF output of the EUT to a spectrum analyzer through appropriate attenuation. Set the EUT to transmit at its maximum power level. Sufficient scans were taken to show the out of band Emissions if any up to 10th harmonic.

For Amplifiers, an intermodulation test is also performed. Test all modulation types [TDMA, CDMA, and FM (covers GSM and F1D)].

- CW signal rather than typical signal is acceptable (for FM).
- At maximum drive level, for each modulation: one test with three tones, or two tests (high-, low-band edge) with two tones
- Limit usually is -13dBm conducted.
- Not needed for Single Channel systems.
- Combination of modulation types not needed.

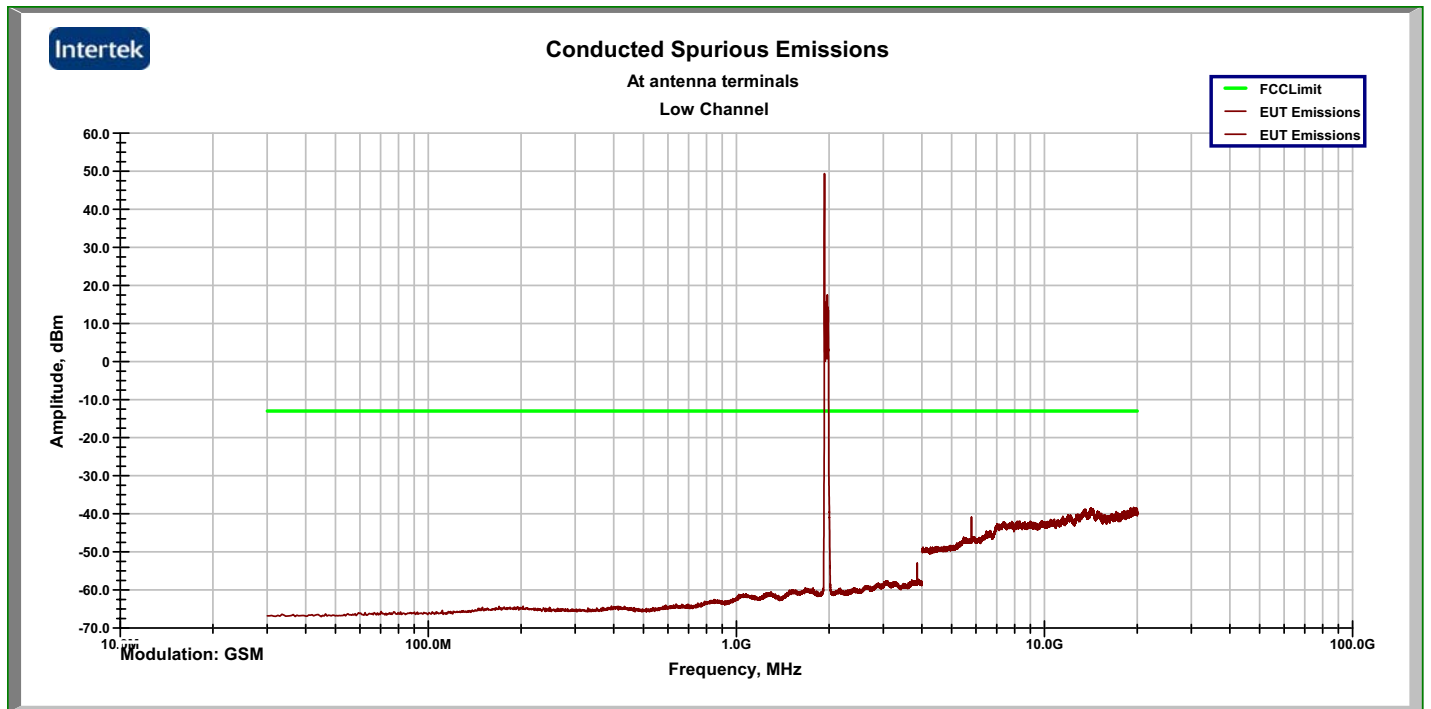
Test Equipment Used:

Description:	Manufacturer:	Model:	Asset Number:	Cal Date:	Cal Due:
Attenuator, 03 dB, <18GHz	Weinschel Corp	2	200003	08/05/2008	08/05/2009
Attenuator, 10 dB, <18GHz	Weinschel Corp	2	200009	08/05/2008	08/05/2009
Attenuator, 10 dB, <18GHz, 50W	Weinschel	47-10-34	200061	08/05/2008	08/05/2009
Attenuator, 10 dB, <2.5 GHz 1000W	JFW Industries, Inc	50FHAM-010-1000	200073	03/21/2008	03/21/2009
Attenuator, 20 dB, <18GHz	Hewlett Packard	11582A 8491B 020	213101a	08/19/2008	08/19/2009
Cable E04, <18GHz	Huber-Suhner	Sucoflex 104PE	E04	06/04/2008	06/04/2009
Cable E202, 18 GHz, N, 3m	Megaphase	TM18 NKNK 118	E202	01/16/2008	01/16/2009
Directional Coupler, -30dB, 2.5-20GHz	Narda	27004-30	0027	09/11/08	09/31/08
Filter, 4 GHz High Pass	Reactel, Inc.	7HS-4G/18G-S11	213153a	03/21/2008	03/21/2009
Filter, Band Reject, Cavity Design, 50 dB	Wainwright Inst.	WRCG 1930/1990	200079	12/18/2007	12/18/2008
Spectrum Analyzer, 20Hz-40GHz	Rohde & Schwarz	FSEK30	200062	03/19/2008	03/19/2009

Results: The sample tested was found to Comply.

8.0 Spurious emissions at antenna terminals (FCC Part 2.1051)

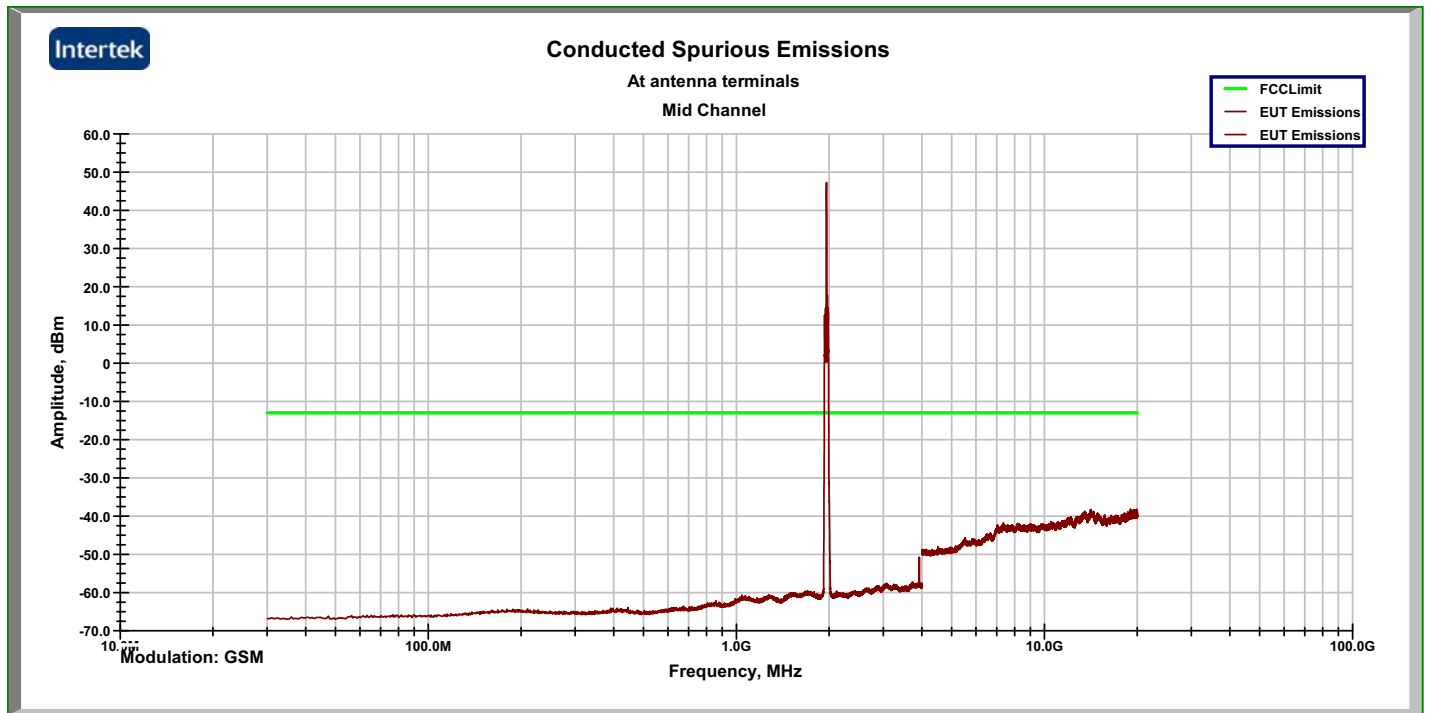
Plot:



GSM - Low Channel

8.0 Spurious emissions at antenna terminals (FCC Part 2.1051)

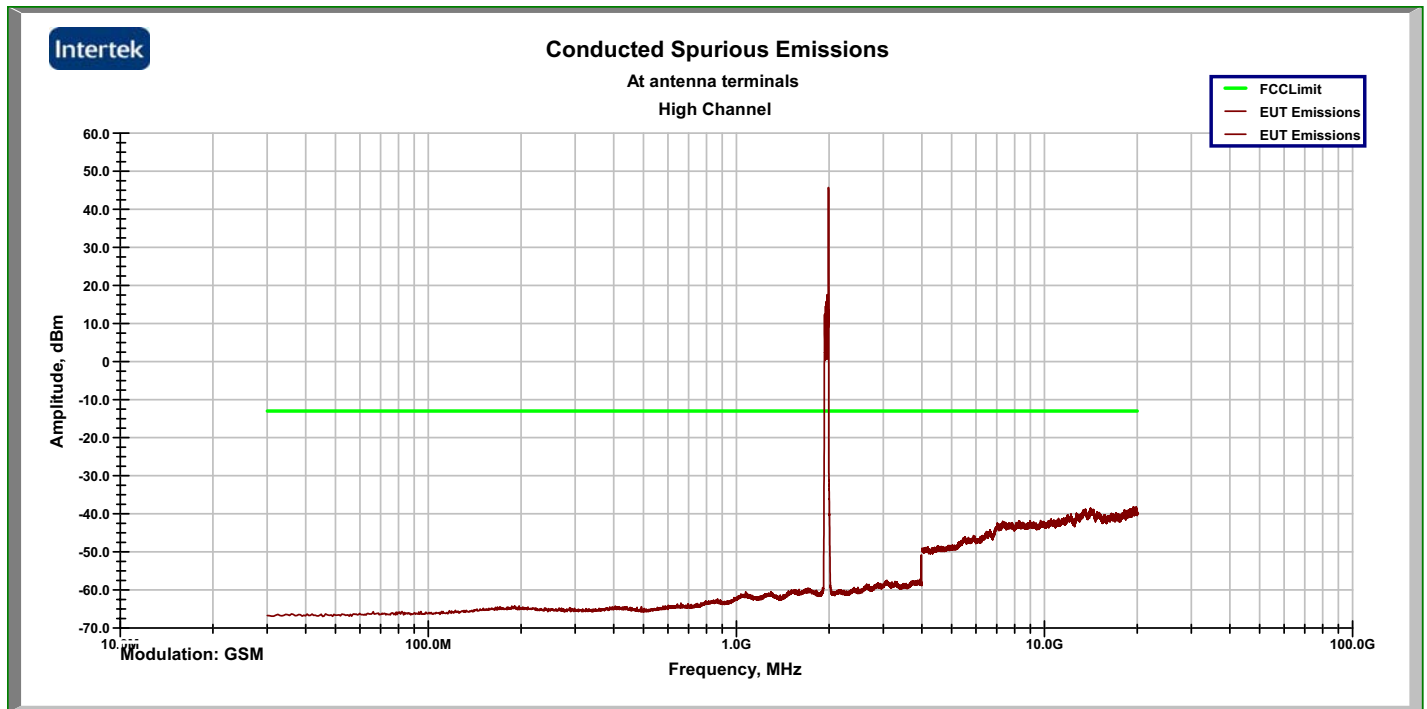
Plot:



GSM - Mid Channel

8.0 Spurious emissions at antenna terminals (FCC Part 2.1051)

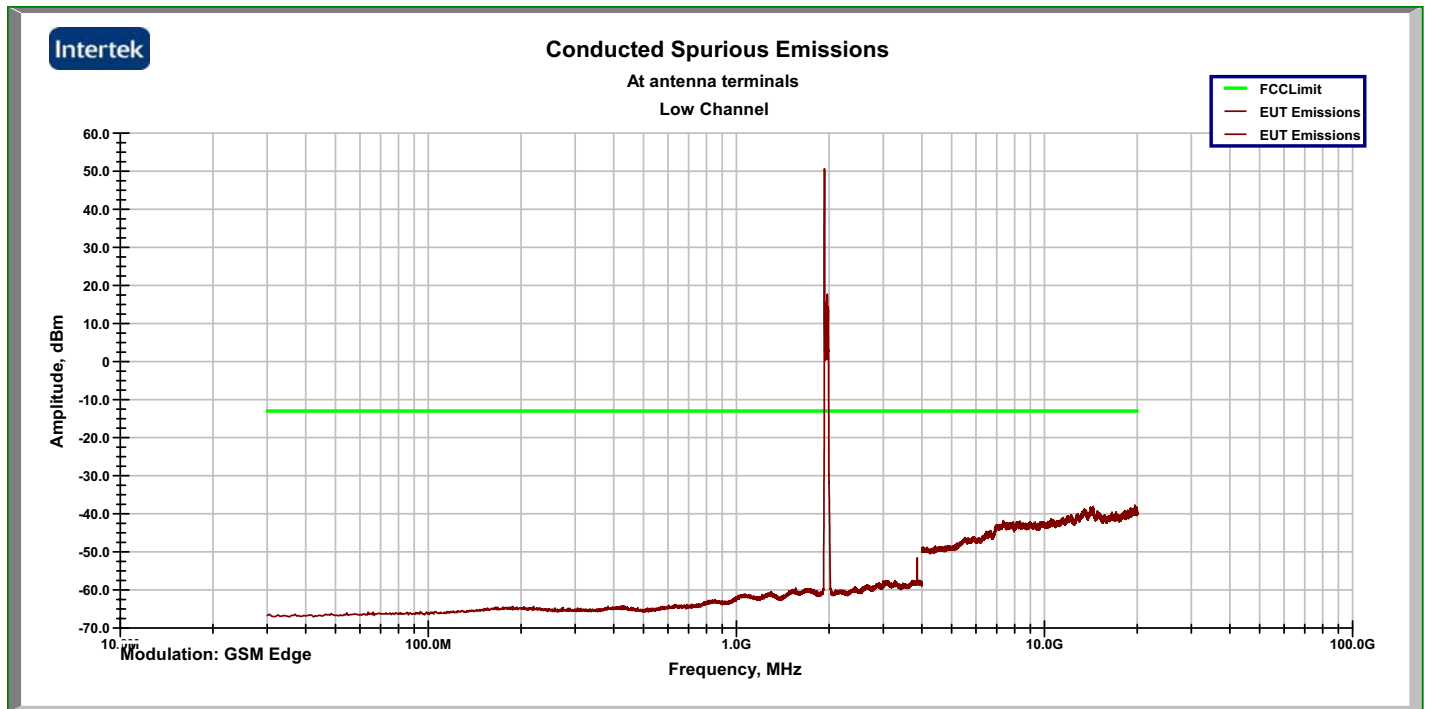
Plot:



GSM - High Channel

8.0 Spurious emissions at antenna terminals (FCC Part 2.1051)

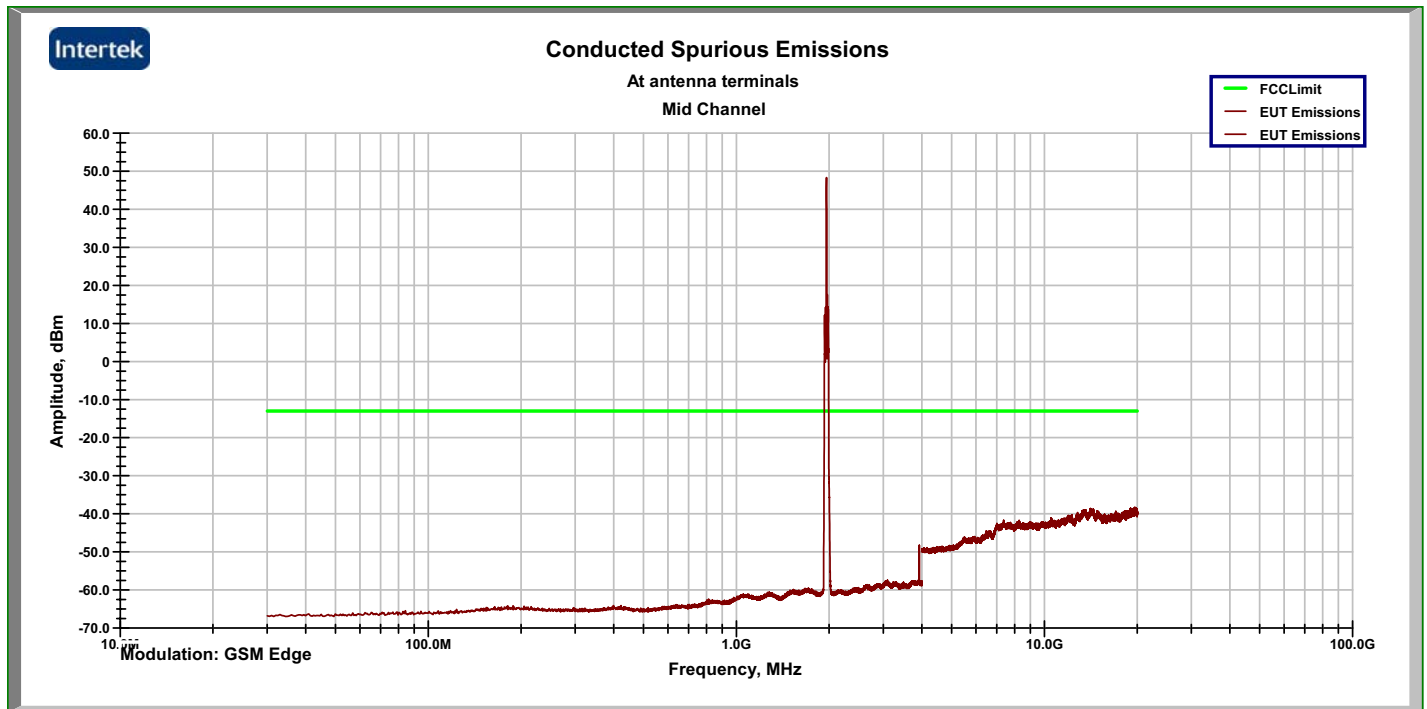
Plot:



GSM Edge - Low Channel

8.0 Spurious emissions at antenna terminals (FCC Part 2.1051)

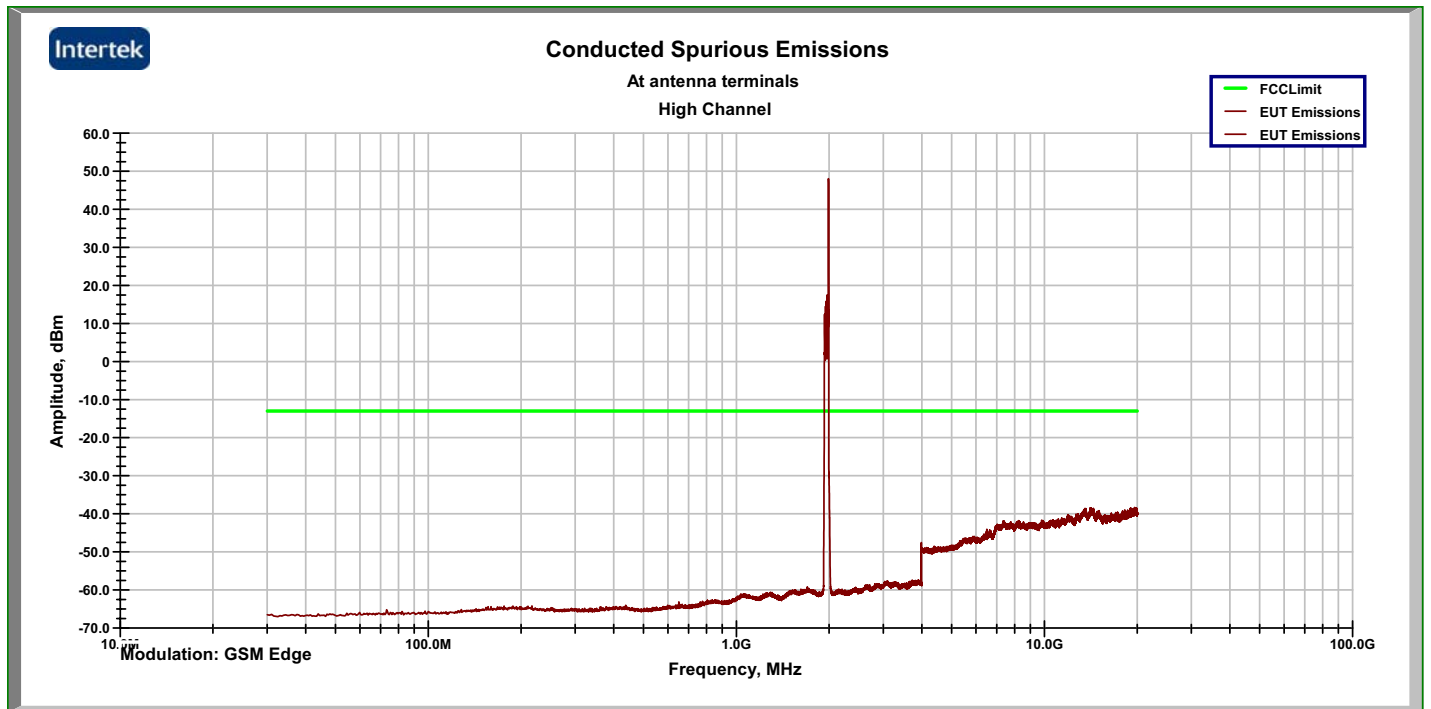
Plot:



GSM Edge - Mid Channel

8.0 Spurious emissions at antenna terminals (FCC Part 2.1051)

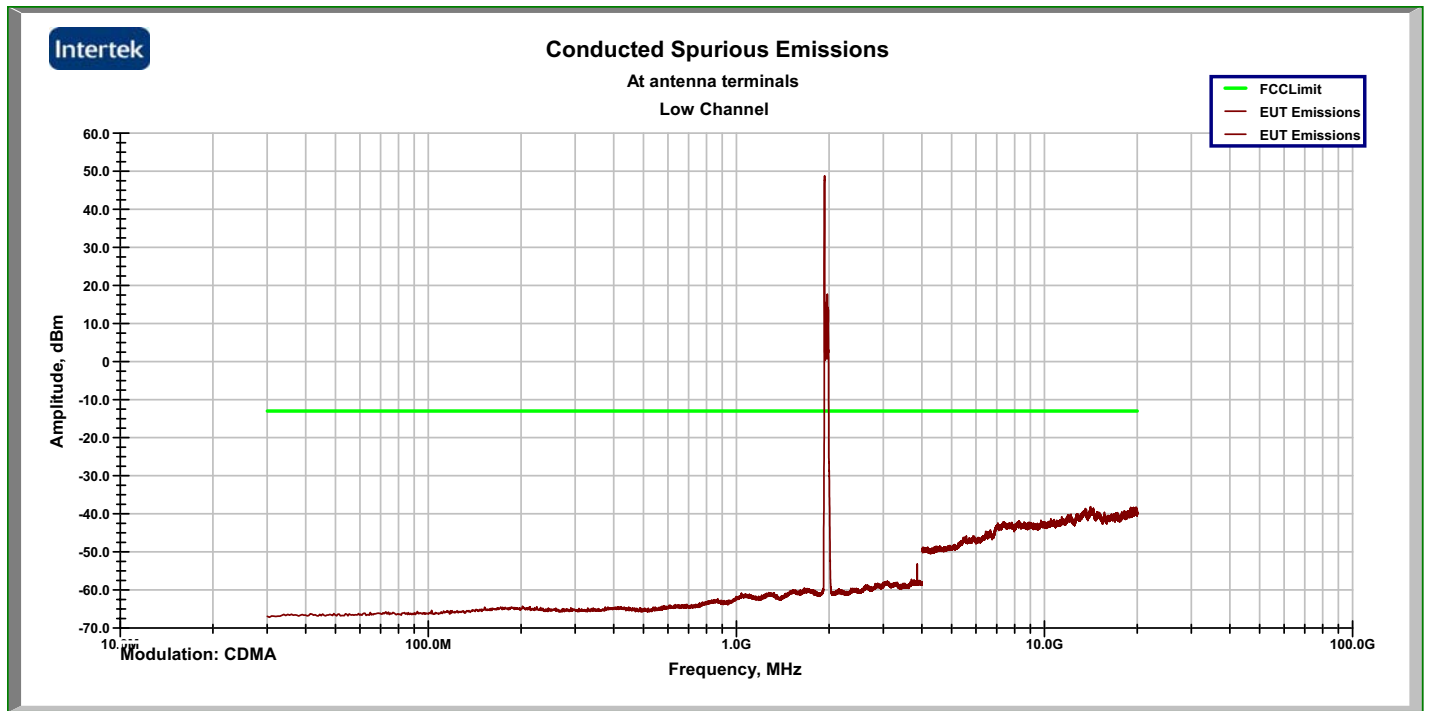
Plot:



GSM Edge - High Channel

8.0 Spurious emissions at antenna terminals (FCC Part 2.1051)

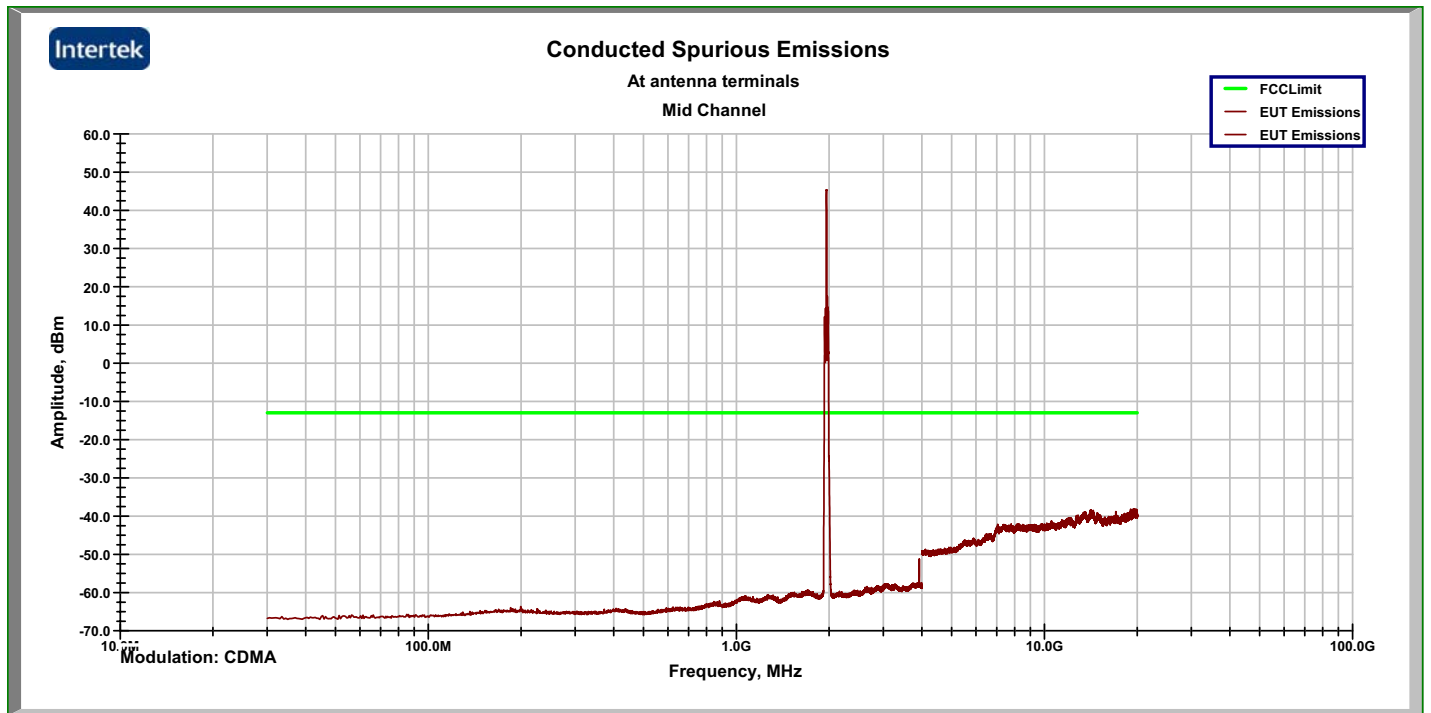
Plot:



CDMA - Low Channel

8.0 Spurious emissions at antenna terminals (FCC Part 2.1051)

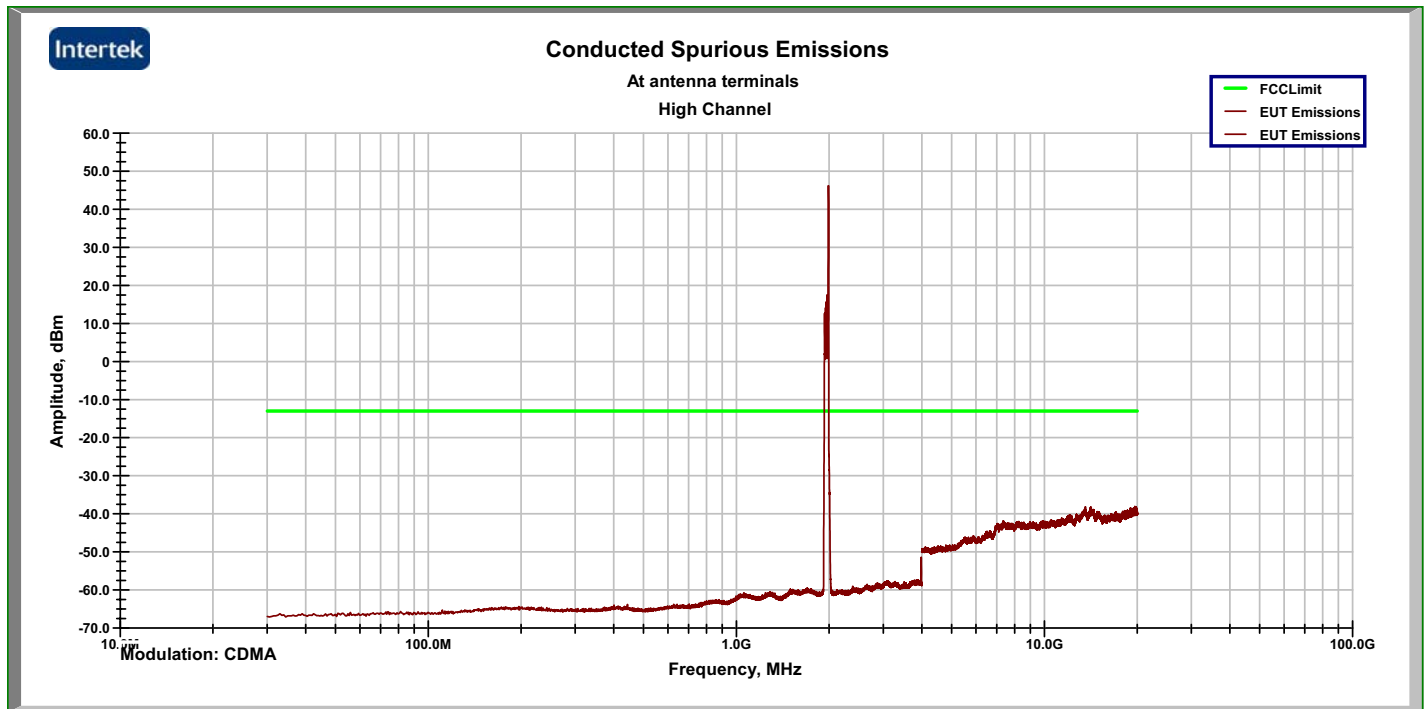
Plot:



GSM - Mid Channel

8.0 Spurious emissions at antenna terminals (FCC Part 2.1051)

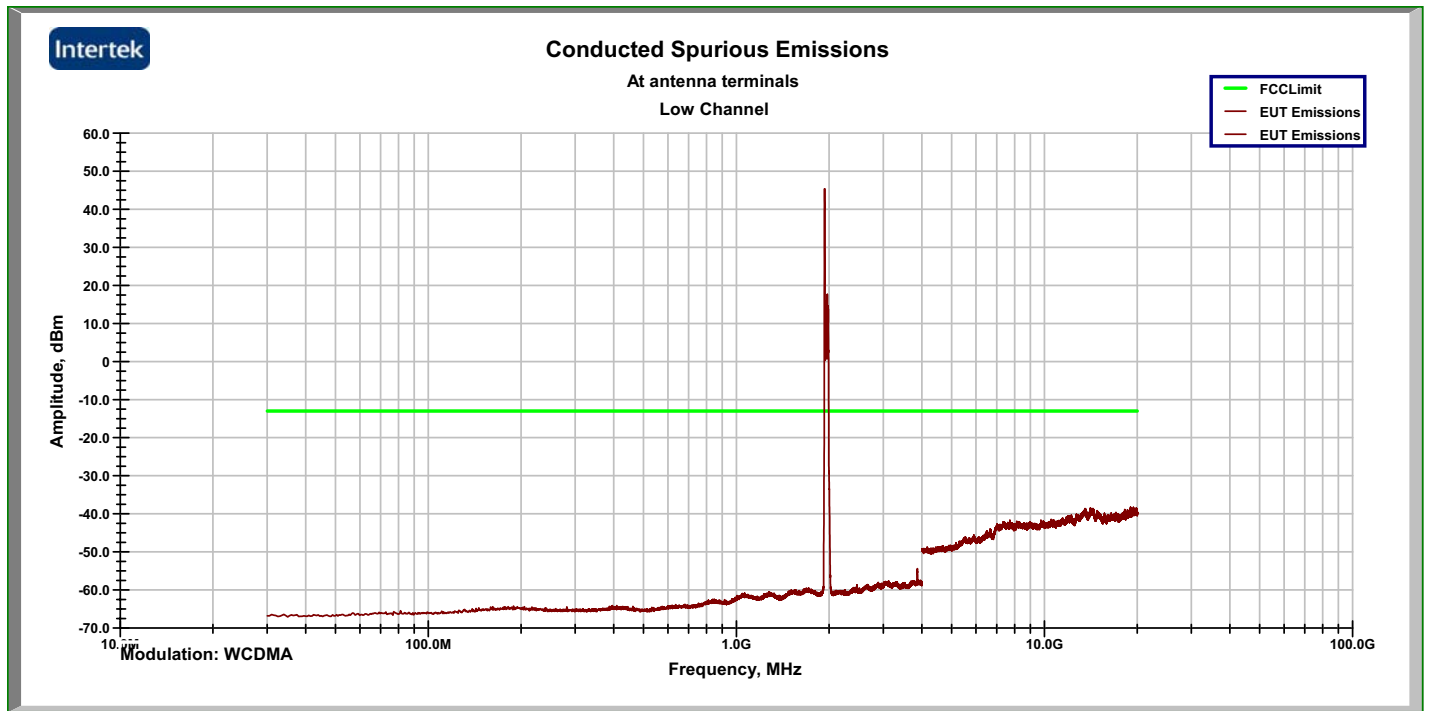
Plot:



GSM - High Channel

8.0 Spurious emissions at antenna terminals (FCC Part 2.1051)

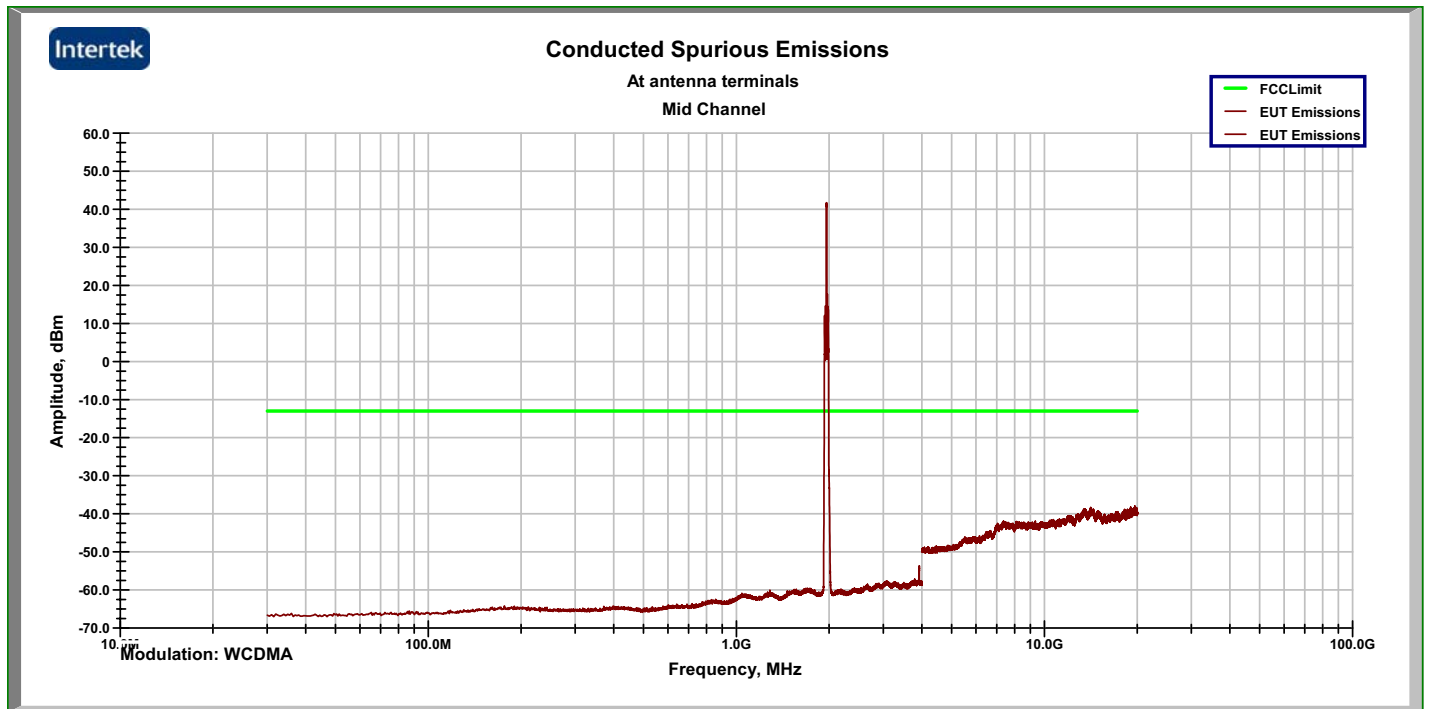
Plot:



WCDMA - Low Channel

8.0 Spurious emissions at antenna terminals (FCC Part 2.1051)

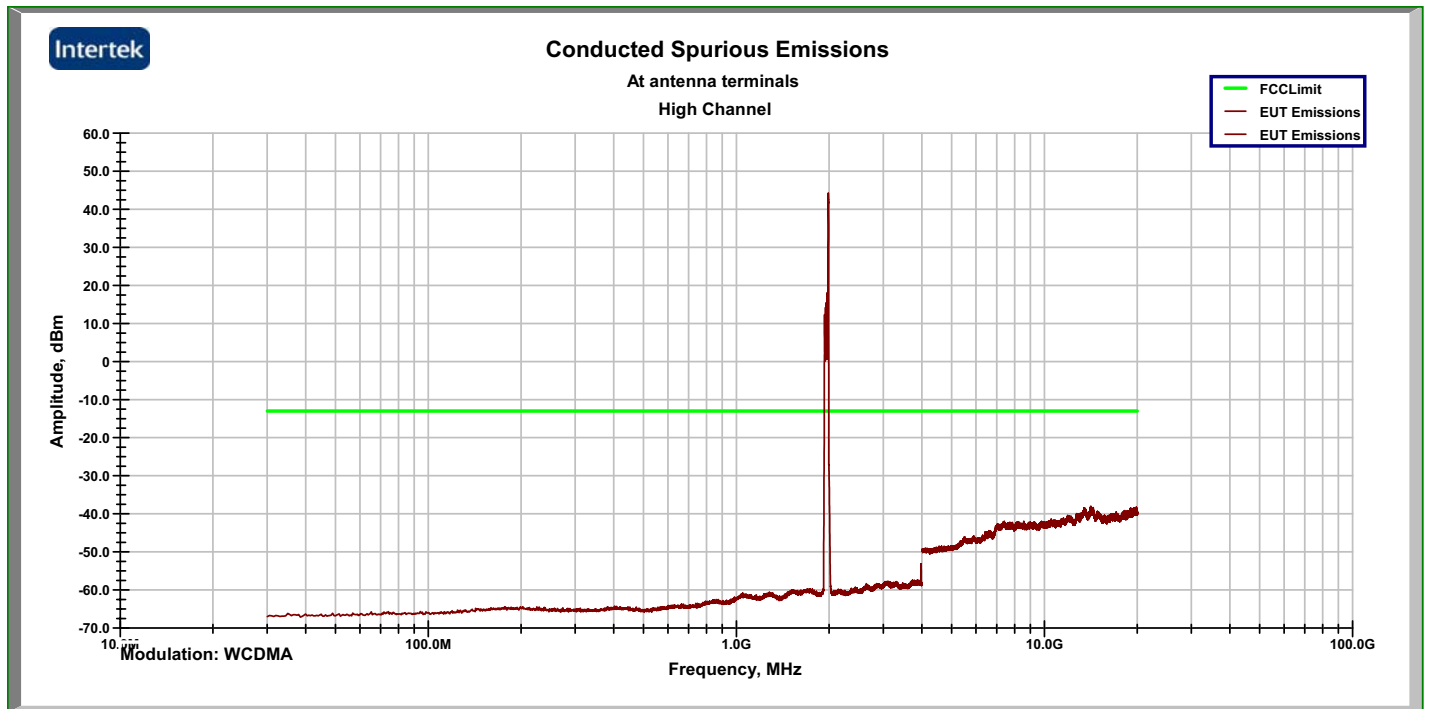
Plot:



WCDMA - Mid Channel

8.0 Spurious emissions at antenna terminals (FCC Part 2.1051)

Plot:



WCDMA - High Channel

9.0 Spurious emissions at antenna terminals (Band Edge) (FCC Part 2.1051)

Method:

FCC §2.1049, FCC §2.1051, §22.917(a), FCC §24.238(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.

Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater for the Cellular band and 1 MHz or greater in the PCS band. 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.

Connect the RF output of the EUT to a spectrum analyzer through appropriate attenuation. Set the EUT to transmit at its maximum power level. Sufficient scans were taken to show the out of band Emissions if any up to 10th harmonic.

For Amplifiers, an intermodulation test is also performed. Test all modulations types [TDMA, CDMA, and FM (covers GSM and F1D)].

- CW signal rather than typical signal is acceptable (for FM).
- At maximum drive level, for each modulation: one test with three tones, or two tests (high-, low-band edge) with two tones
- Limit usually is -13dBm conducted.
- Not needed for Single Channel systems.
- Combination of modulation types not needed.

Test Equipment Used:

Description:	Manufacturer:	Model:	Asset Number:	Cal Date:	Cal Due:
Attenuator, 03 dB, <18GHz	Weinschel Corp	2	200003	08/05/2008	08/05/2009
Attenuator, 10 dB, <18GHz	Weinschel Corp	2	200009	08/05/2008	08/05/2009
Attenuator, 10 dB, <18GHz, 50W	Weinschel	47-10-34	200061	08/05/2008	08/05/2009
Attenuator, 10 dB, <2.5 GHz 1000W	JFW Industries, Inc	50FHAM-010-1000	200073	03/21/2008	03/21/2009
Attenuator, 20 dB, <18GHz	Hewlett Packard	11582A 8491B 020	213101a	08/19/2008	08/19/2009
Cable E04, <18GHz	Huber-Suhner	Sucoflex 104PE	E04	06/04/2008	06/04/2009
Cable E202, 18 GHz, N, 3m	Megaphase	TM18 NKNK 118	E202	01/16/2008	01/16/2009
Spectrum Analyzer, 20Hz-40GHz	Rohde & Schwarz	FSEK30	200062	03/19/2008	03/19/2009
Splitter, 10 MHz to 2.5 GHz	Mini-Circuits	ZFSC-2-2500	200053	11/30/2007	11/30/2008

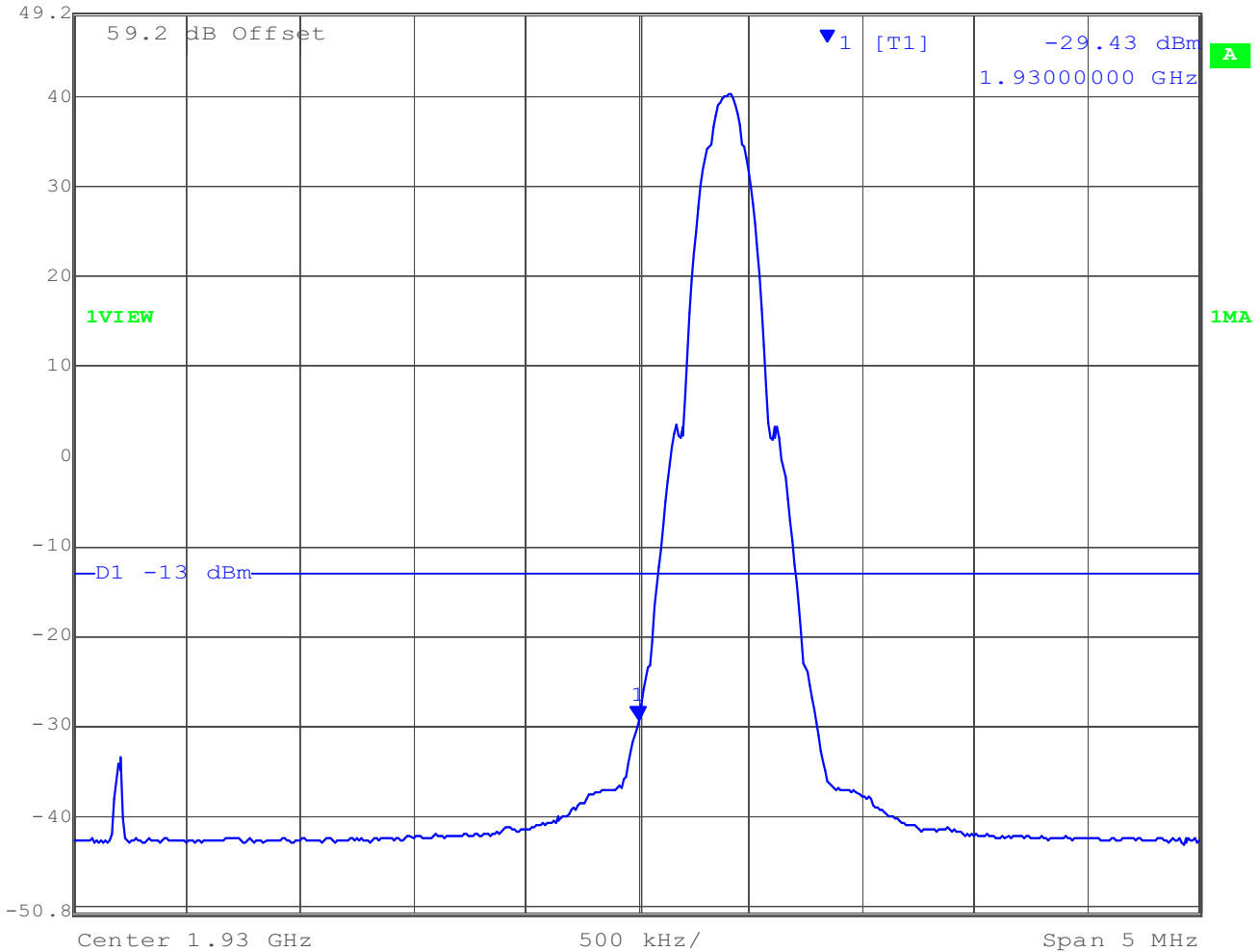
Results: The sample tested was found to Comply.

9.0 Spurious emissions at antenna terminals (Band Edge) (FCC Part 2.1051)

Drawing:



Ref Lvl	Marker 1 [T1]	RBW	20 kHz	RF Att	10 dB
49.2 dBm	-29.43 dBm	VBW	20 Hz	Mixer	-10 dBm
	1.93000000 GHz	SWT	32 s	Unit	dBm

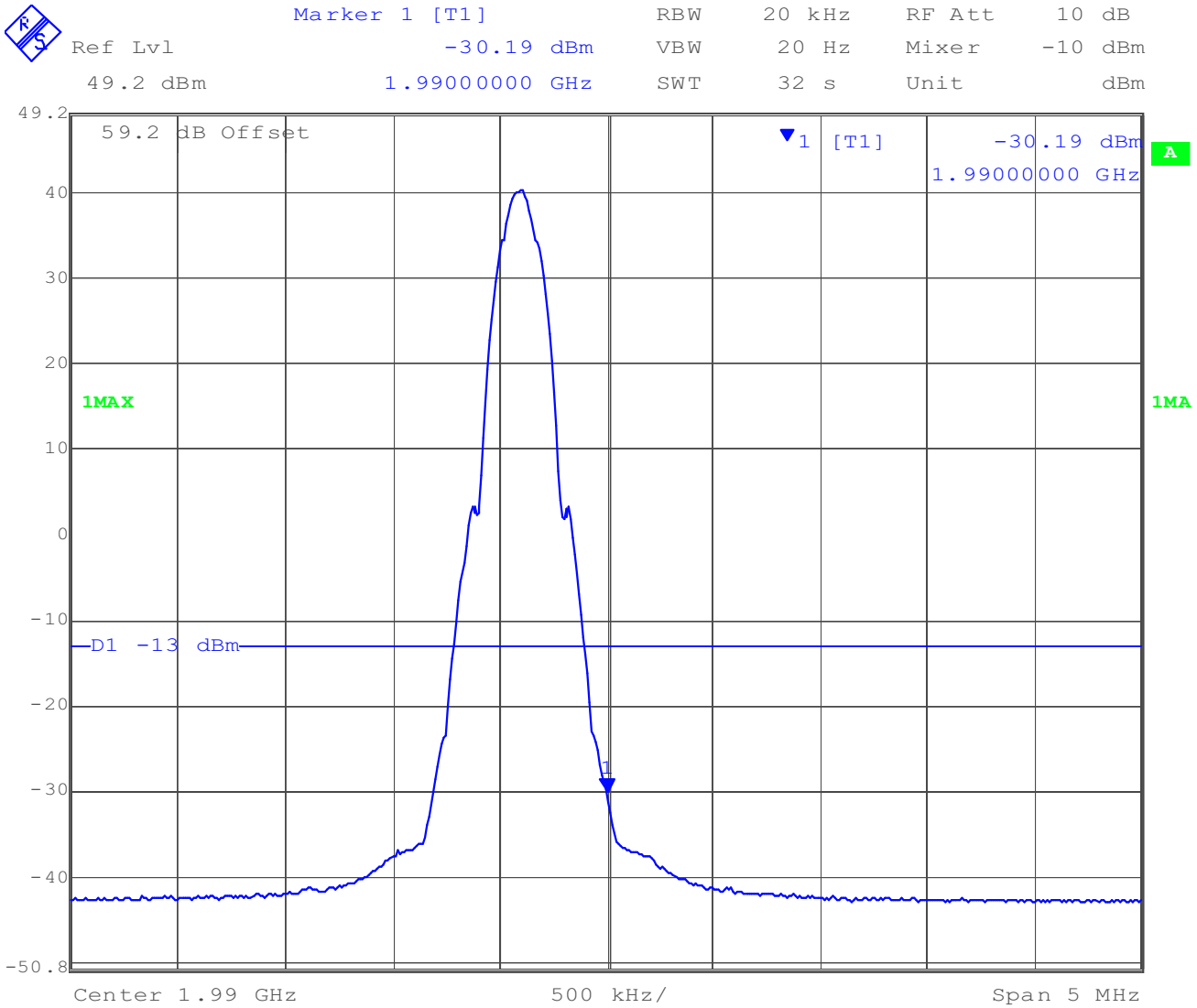


Date: 12.SEP.2008 14:12:04

GSM - Low Channel

9.0 Spurious emissions at antenna terminals (Band Edge) (FCC Part 2.1051)

Drawing:

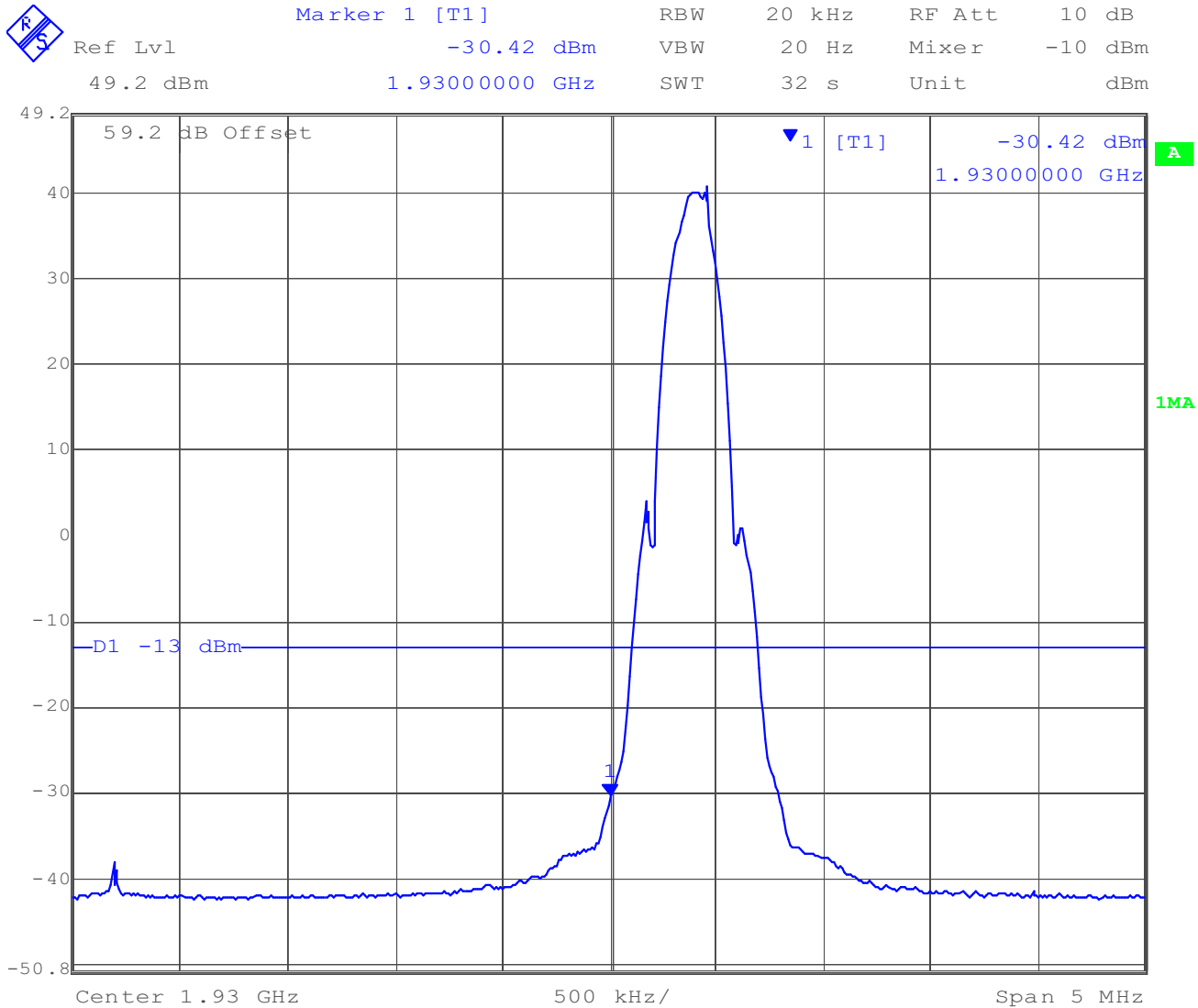


Date: 12.SEP.2008 14:10:27

GSM - High Channel

9.0 Spurious emissions at antenna terminals (Band Edge) (FCC Part 2.1051)

Drawing:

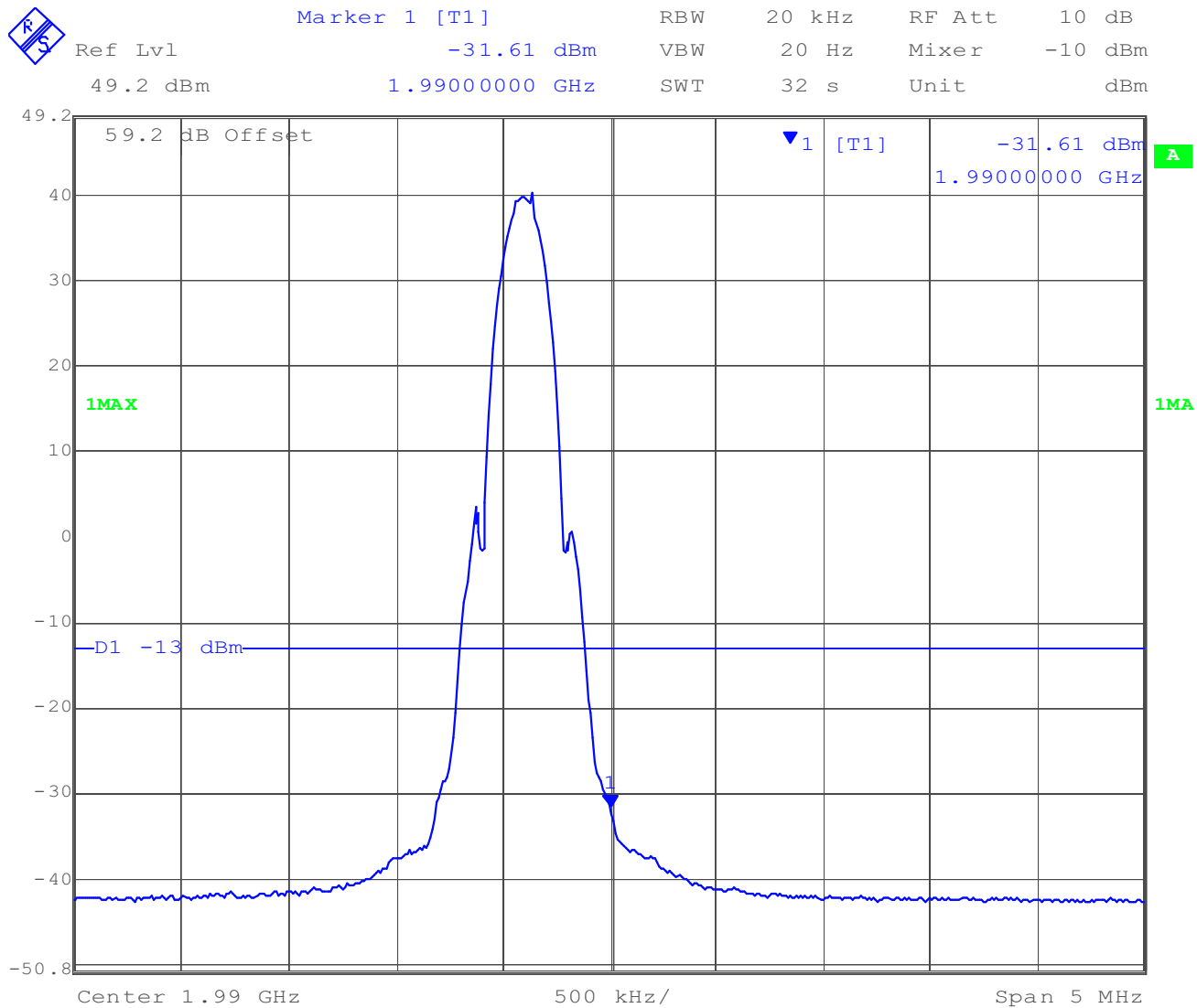


Date: 12.SEP.2008 14:06:02

GSM Edge - Low Channel

9.0 Spurious emissions at antenna terminals (Band Edge) (FCC Part 2.1051)

Drawing:



Date: 12.SEP.2008 14:07:37

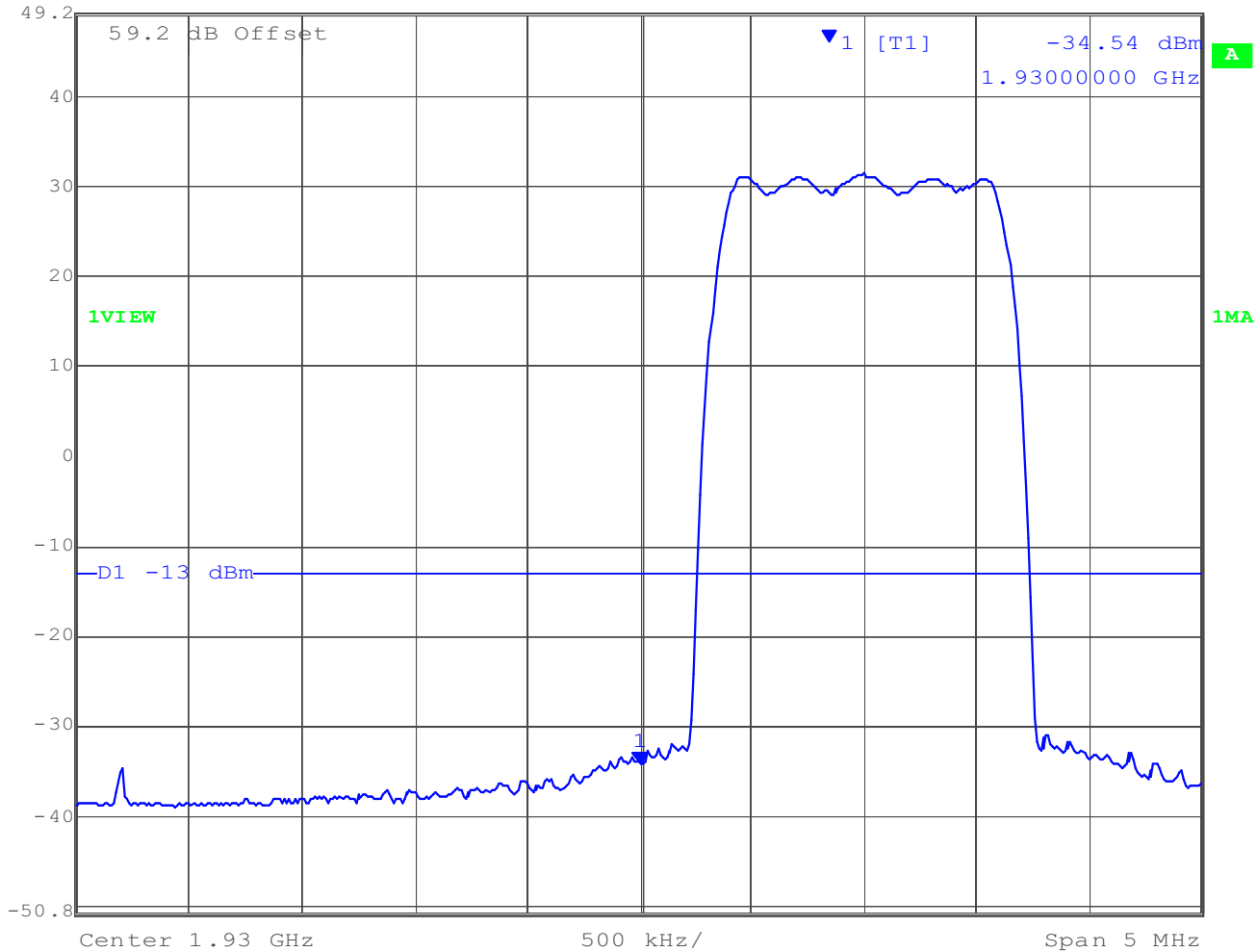
GSM Edge - High Channel

9.0 Spurious emissions at antenna terminals (Band Edge) (FCC Part 2.1051)

Drawing:



Marker 1 [T1] RBW 20 kHz RF Att 10 dB
Ref Lvl -34.54 dBm VBW 20 Hz Mixer -10 dBm
49.2 dBm 1.93000000 GHz SWT 32 s Unit dBm

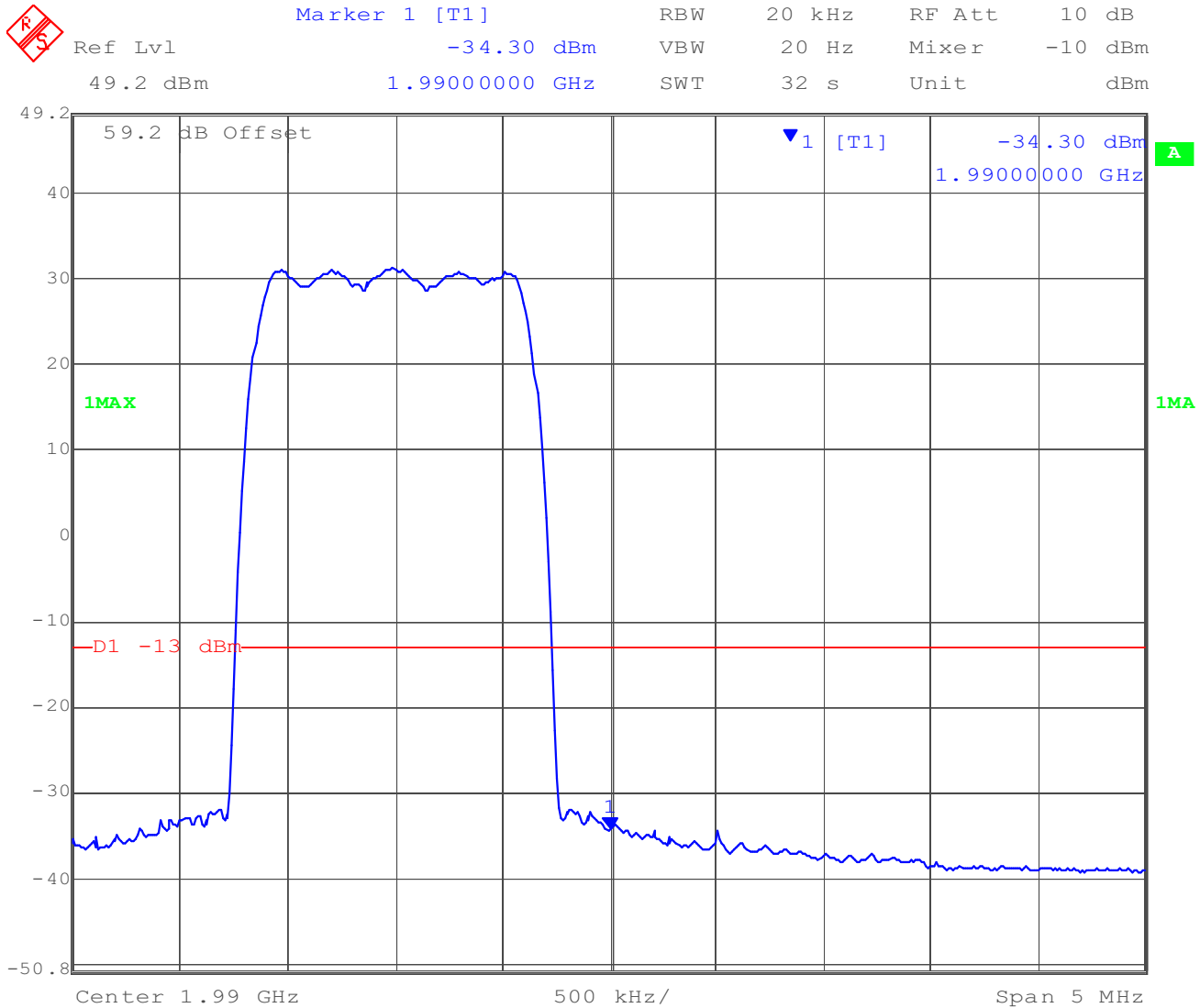


Date: 12.SEP.2008 14:02:37

CDMA - Low Channel

9.0 Spurious emissions at antenna terminals (Band Edge) (FCC Part 2.1051)

Drawing:



Date: 12.SEP.2008 14:00:41

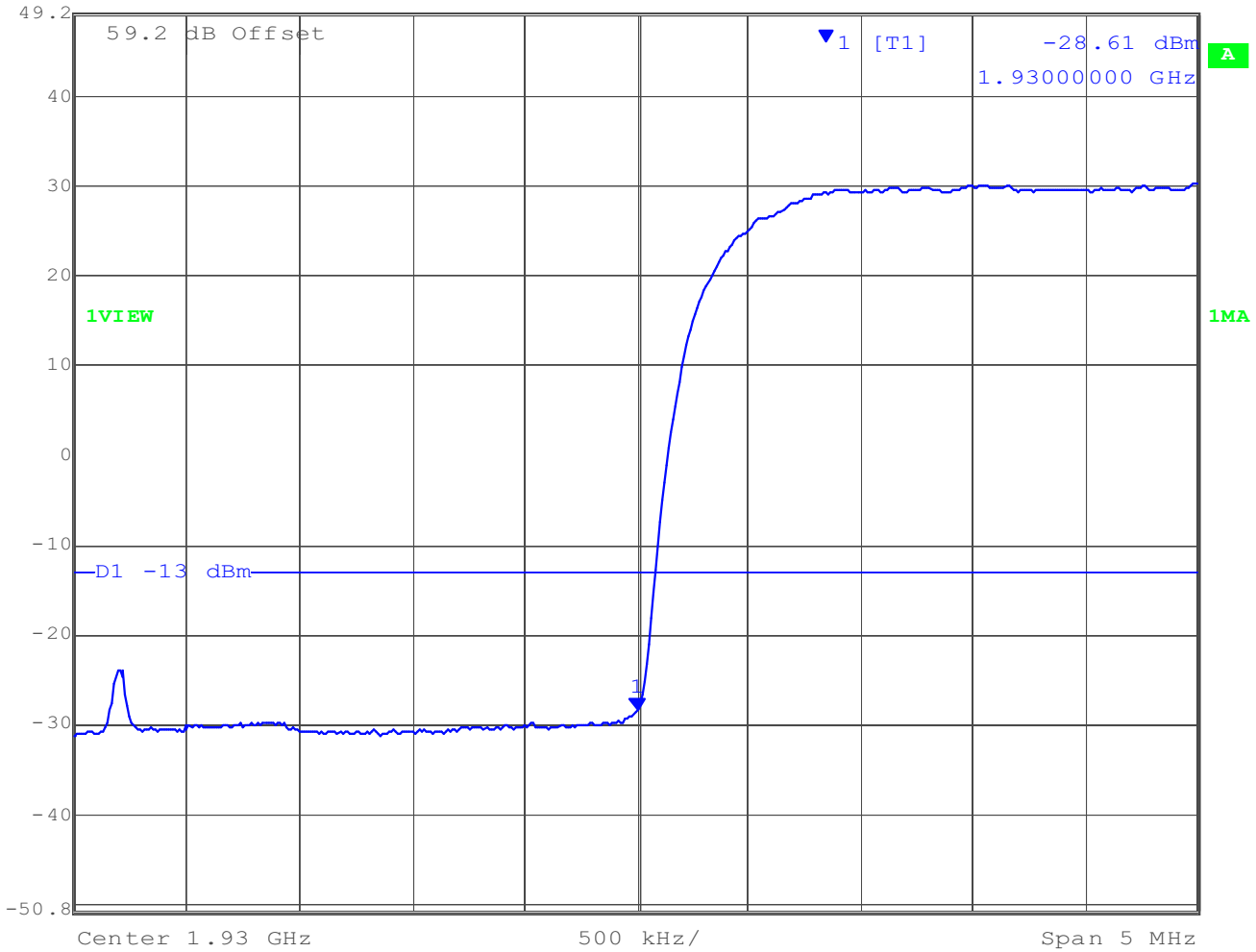
CDMA - High Channel

9.0 Spurious emissions at antenna terminals (Band Edge) (FCC Part 2.1051)

Drawing:



Ref Lvl	Marker 1 [T1]	RBW	50 kHz	RF Att	10 dB
49.2 dBm	-28.61 dBm	VBW	50 Hz	Mixer	-10 dBm
	1.93000000 GHz	SWT	5 s	Unit	dBm

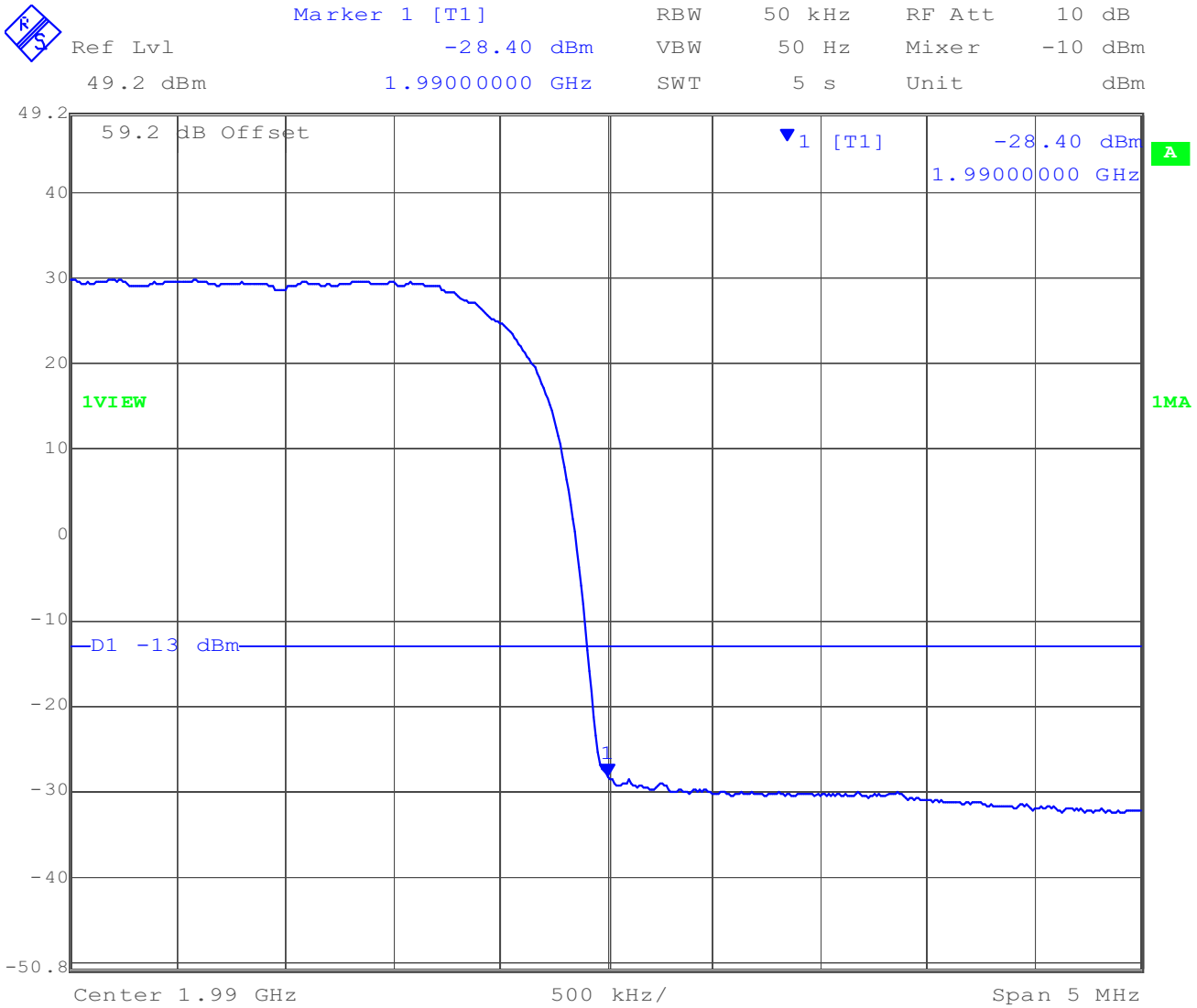


Date: 12.SEP.2008 14:04:29

WCDMA - Low Channel

9.0 Spurious emissions at antenna terminals (Band Edge) (FCC Part 2.1051)

Drawing:



Date: 12.SEP.2008 14:03:43

WCDMA - High Channel

10.0 Spurious emissions at antenna terminals (Intermodulation Products) (FCC Part 2.1051)**Method:**

FCC §2.1049, FCC §2.1051, §22.917(a), FCC §24.238(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.

Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater for the Cellular band and 1 MHz or greater in the PCS band. 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.

Connect the RF output of the EUT to a spectrum analyzer through appropriate attenuation. Set the EUT to transmit at its maximum power level. Sufficient scans were taken to show the out of band Emissions if any up to 10th harmonic.

For Amplifiers, an intermodulation test is also performed. Test all modulations types [TDMA, CDMA, and FM (covers GSM and F1D)].

- CW signal rather than typical signal is acceptable (for FM).
- At maximum drive level, for each modulation: one test with three tones, or two tests (high-, low-band edge) with two tones
- Limit usually is -13dBm conducted.
- Not needed for Single Channel systems.
- Combination of modulation types not needed.

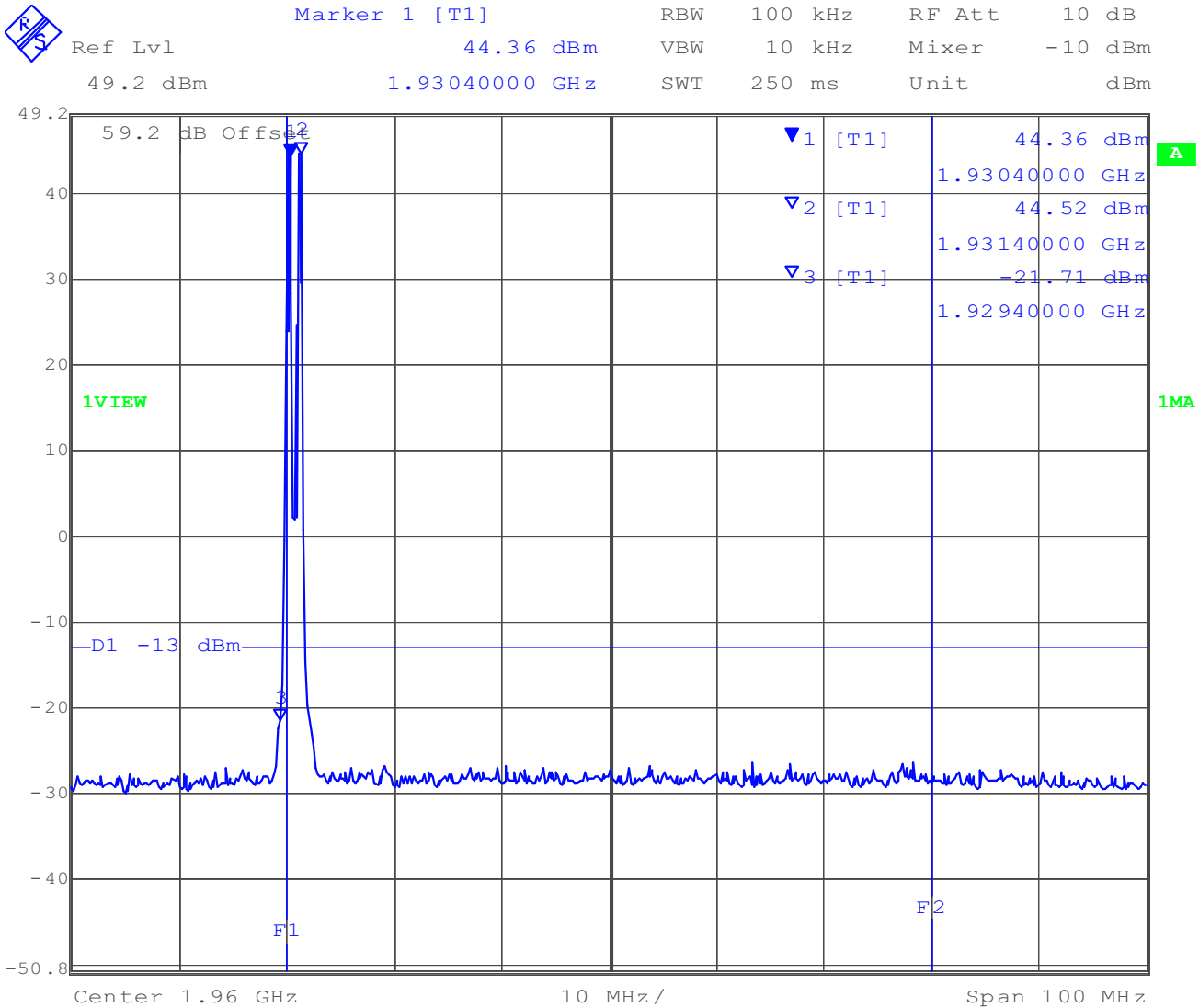
Test Equipment Used:

Description:	Manufacturer:	Model:	Asset Number:	Cal Date:	Cal Due:
Attenuator, 03 dB, <18GHz	Weinschel Corp	2	200003	08/05/2008	08/05/2009
Attenuator, 10 dB, <18GHz	Weinschel Corp	2	200009	08/05/2008	08/05/2009
Attenuator, 10 dB, <18GHz, 50W	Weinschel	47-10-34	200061	08/05/2008	08/05/2009
Attenuator, 10 dB, <2.5 GHz 1000W	JFW Industries, Inc	50FHAM-010-1000	200073	03/21/2008	03/21/2009
Attenuator, 20 dB, <18GHz	Hewlett Packard	11582A 8491B 020	213101a	08/19/2008	08/19/2009
Cable E04, <18GHz	Huber-Suhner	Sucoflex 104PE	E04	06/04/2008	06/04/2009
Cable E202, 18 GHz, N, 3m	Megaphase	TM18 NKNK 118	E202	01/16/2008	01/16/2009
Spectrum Analyzer, 20Hz-40GHz	Rohde & Schwarz	FSEK30	200062	03/19/2008	03/19/2009
Splitter, 10 MHz to 2.5 GHz	Mini-Circuits	ZFSC-2-2500	200053	11/30/2007	11/30/2008

Results: The sample tested was found to Comply.

10.0 Spurious emissions at antenna terminals (Intermodulation Products) (FCC Part 2.1051)

Drawing:



Date: 15.SEP.2008 08:24:39

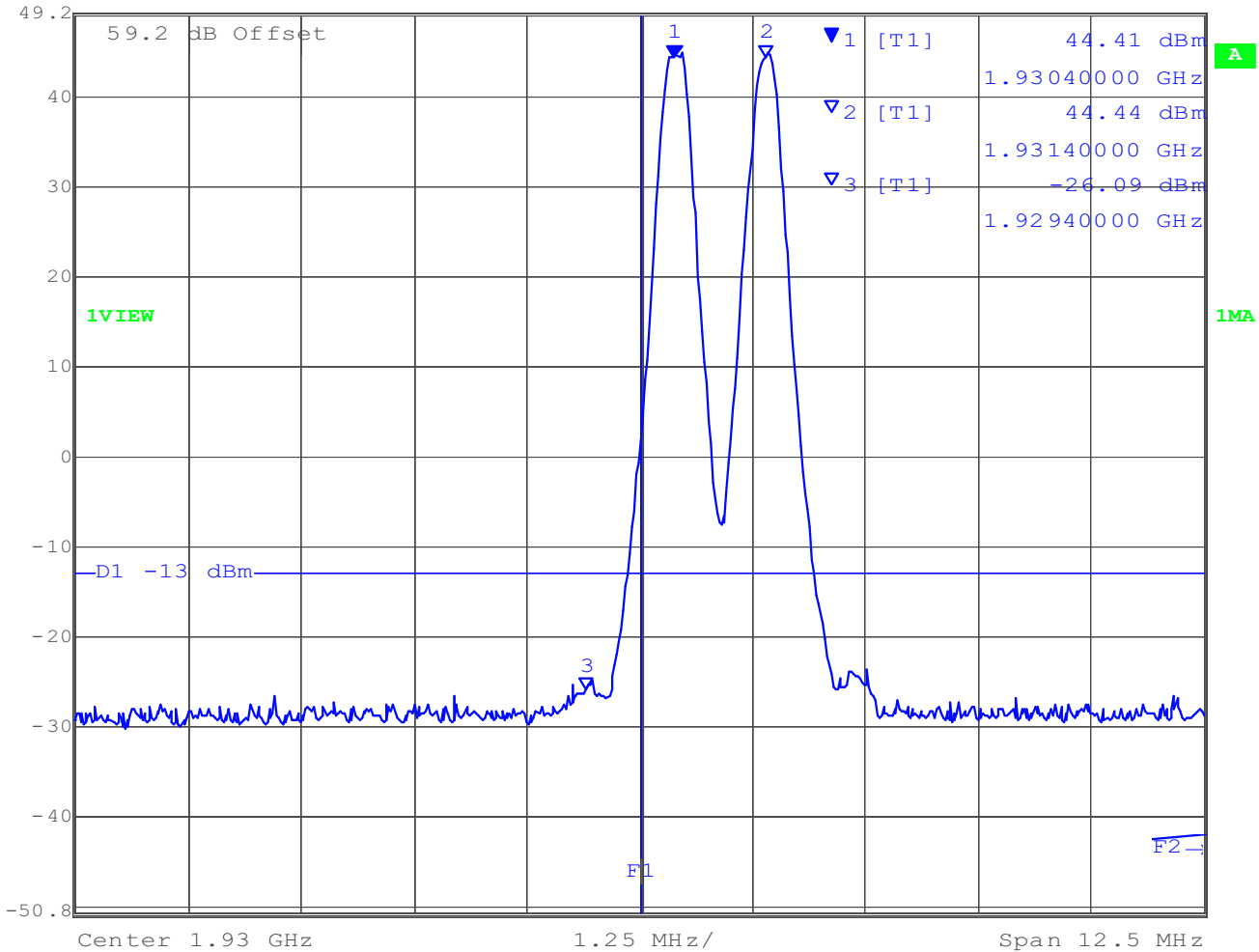
GSM - 2 channels low

10.0 Spurious emissions at antenna terminals (Intermodulation Products) (FCC Part 2.1051)

Drawing:



Marker 1 [T1] RBW 100 kHz RF Att 10 dB
 Ref Lvl 44.41 dBm VBW 10 kHz Mixer -10 dBm
 49.2 dBm 1.93040000 GHz SWT 32 ms Unit dBm



Date: 15.SEP.2008 08:25:23

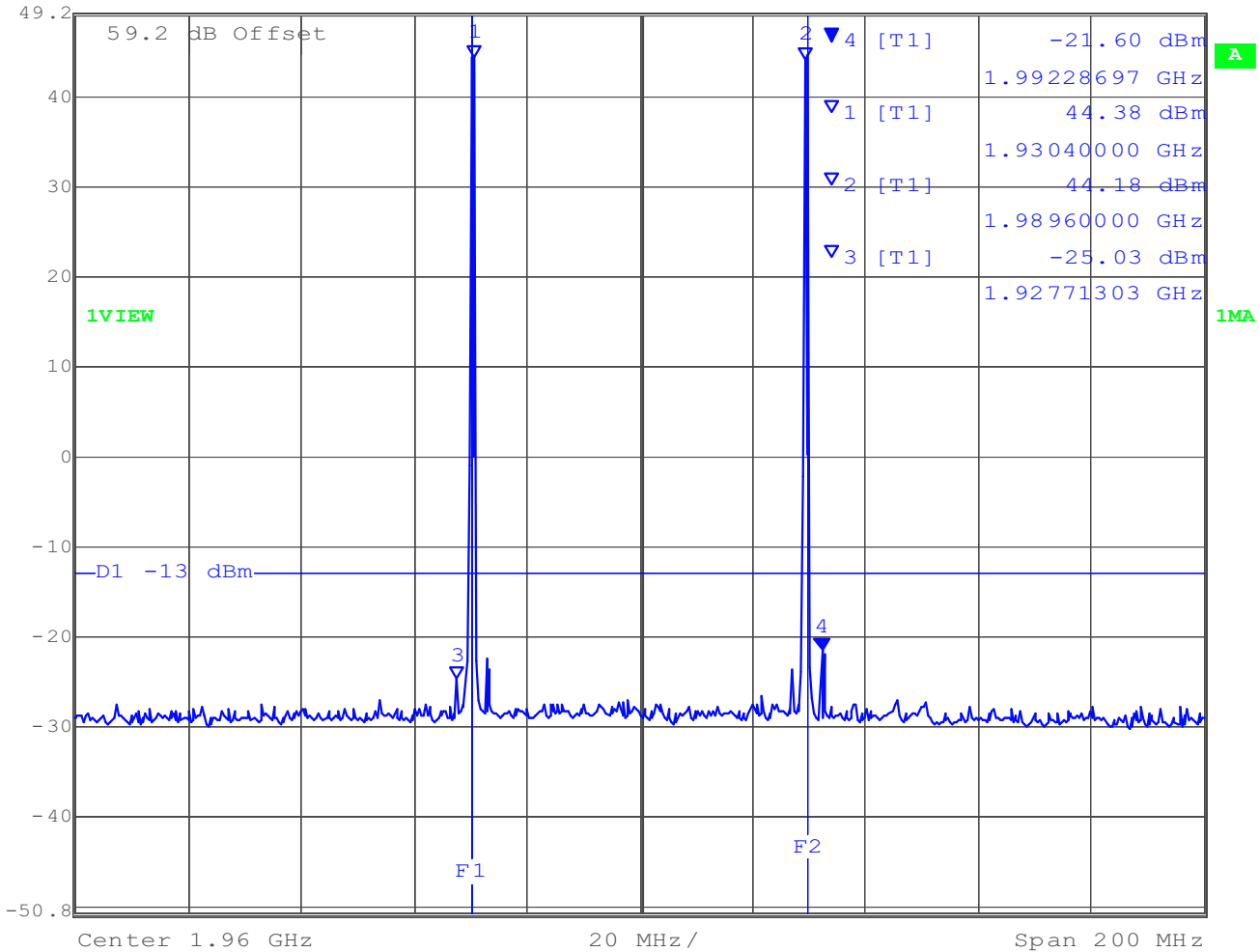
GSM - 2 channels low

10.0 Spurious emissions at antenna terminals (Intermodulation Products) (FCC Part 2.1051)

Drawing:



Marker 4 [T1] RBW 100 kHz RF Att 10 dB
 Ref Lvl -21.60 dBm VBW 10 kHz Mixer -10 dBm
 49.2 dBm 1.99228697 GHz SWT 500 ms Unit dBm

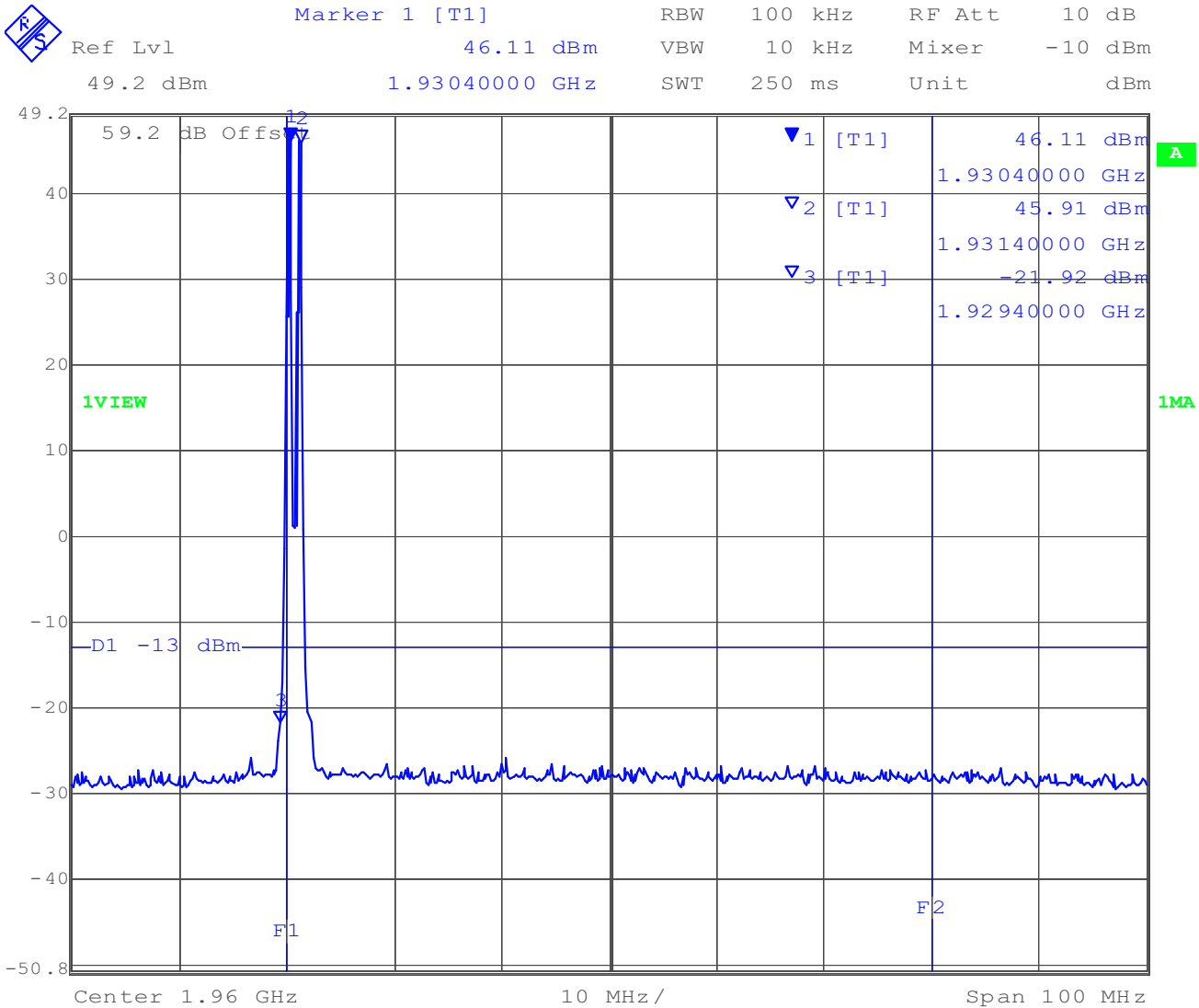


Date: 15.SEP.2008 08:28:48

GSM - 2 channels (1 low, 1 high)

10.0 Spurious emissions at antenna terminals (Intermodulation Products) (FCC Part 2.1051)

Drawing:

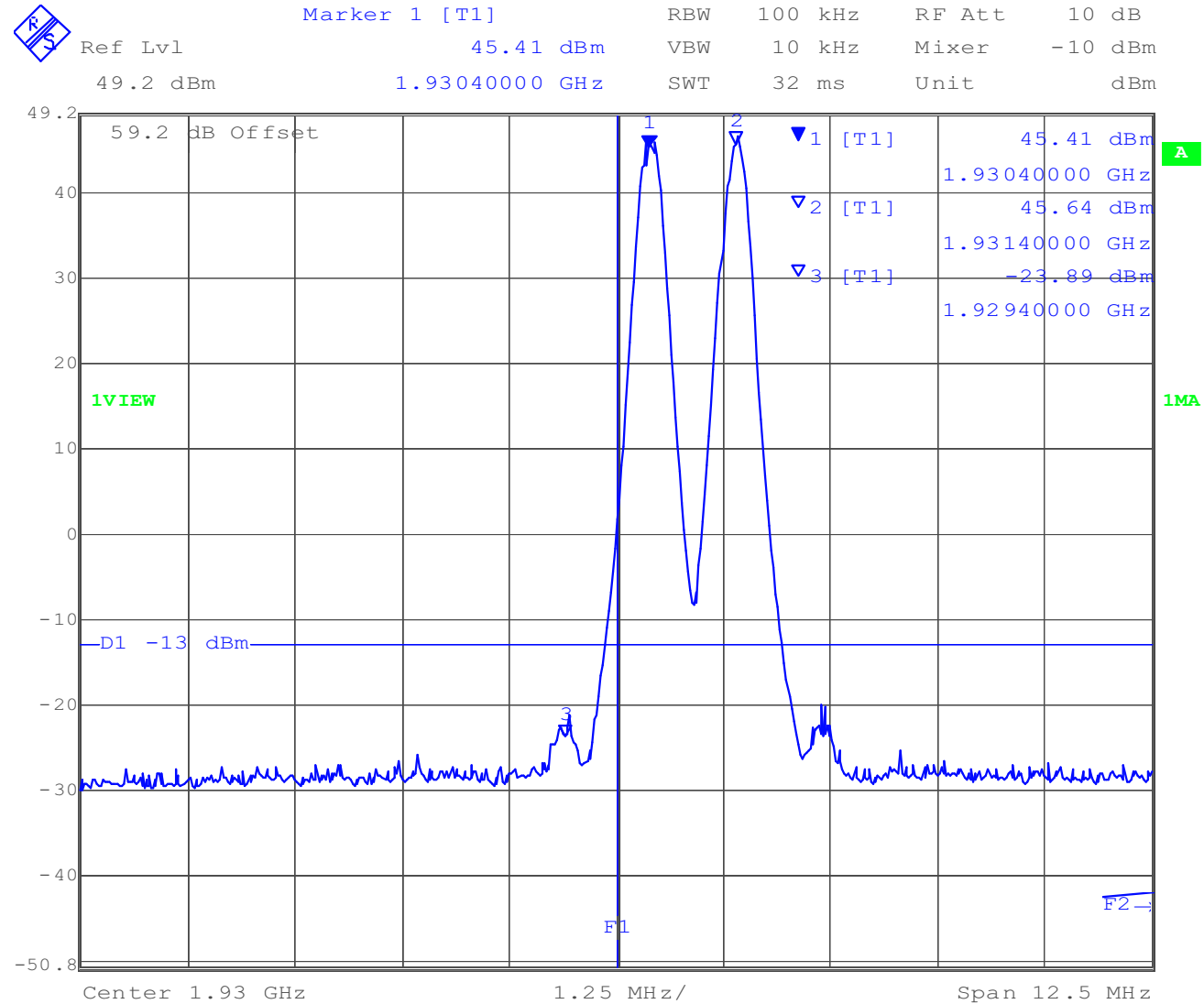


Date: 15.SEP.2008 08:32:44

GSM Edge - 2 channels low

10.0 Spurious emissions at antenna terminals (Intermodulation Products) (FCC Part 2.1051)

Drawing:



Date: 15.SEP.2008 08:33:22

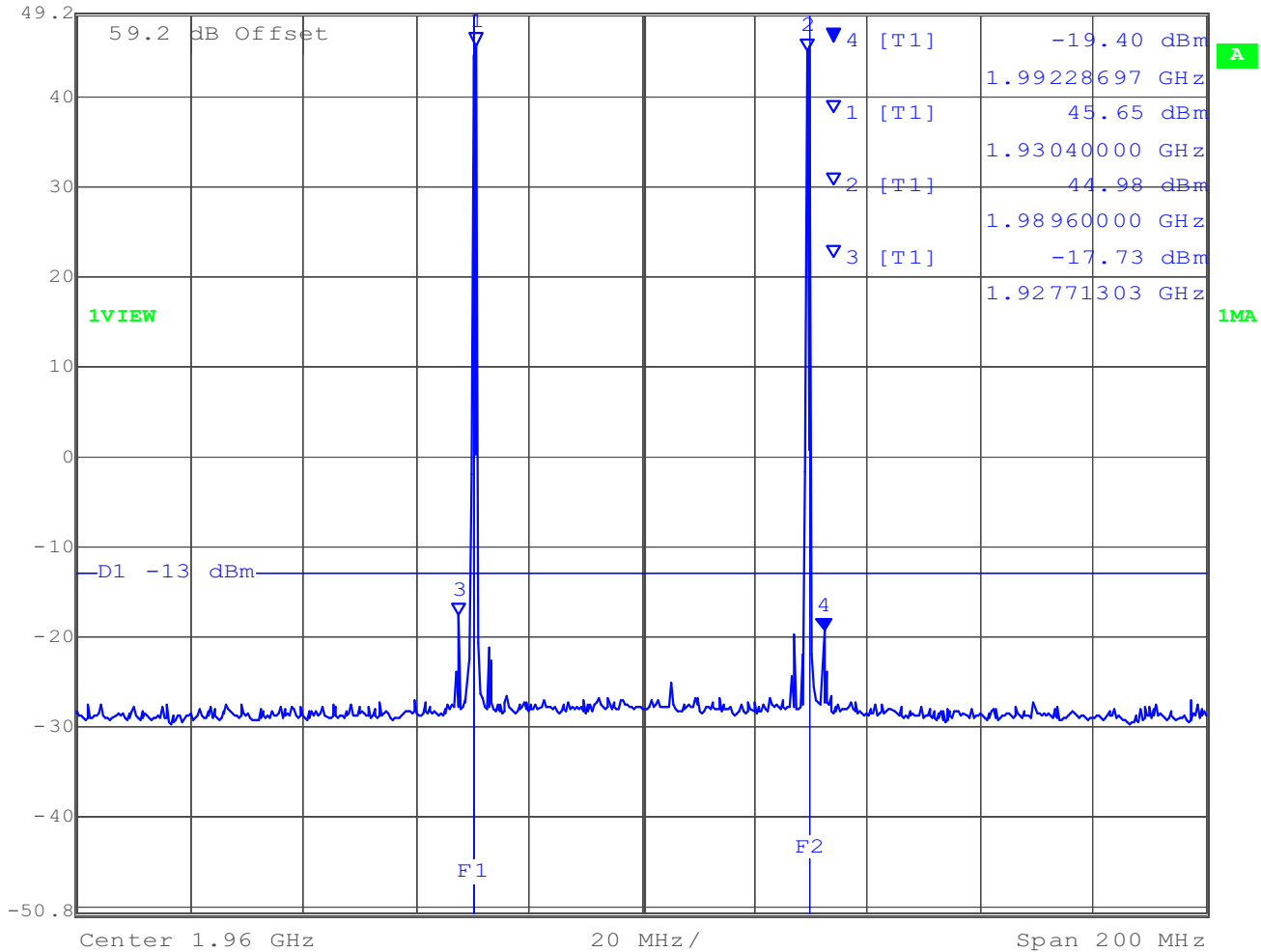
GSM Edge - 2 channels low

10.0 Spurious emissions at antenna terminals (Intermodulation Products) (FCC Part 2.1051)

Drawing:



Marker 4 [T1] RBW 100 kHz RF Att 10 dB
Ref Lvl -19.40 dBm VBW 10 kHz Mixer -10 dBm
49.2 dBm 1.99228697 GHz SWT 500 ms Unit dBm



Date: 15.SEP.2008 08:31:19

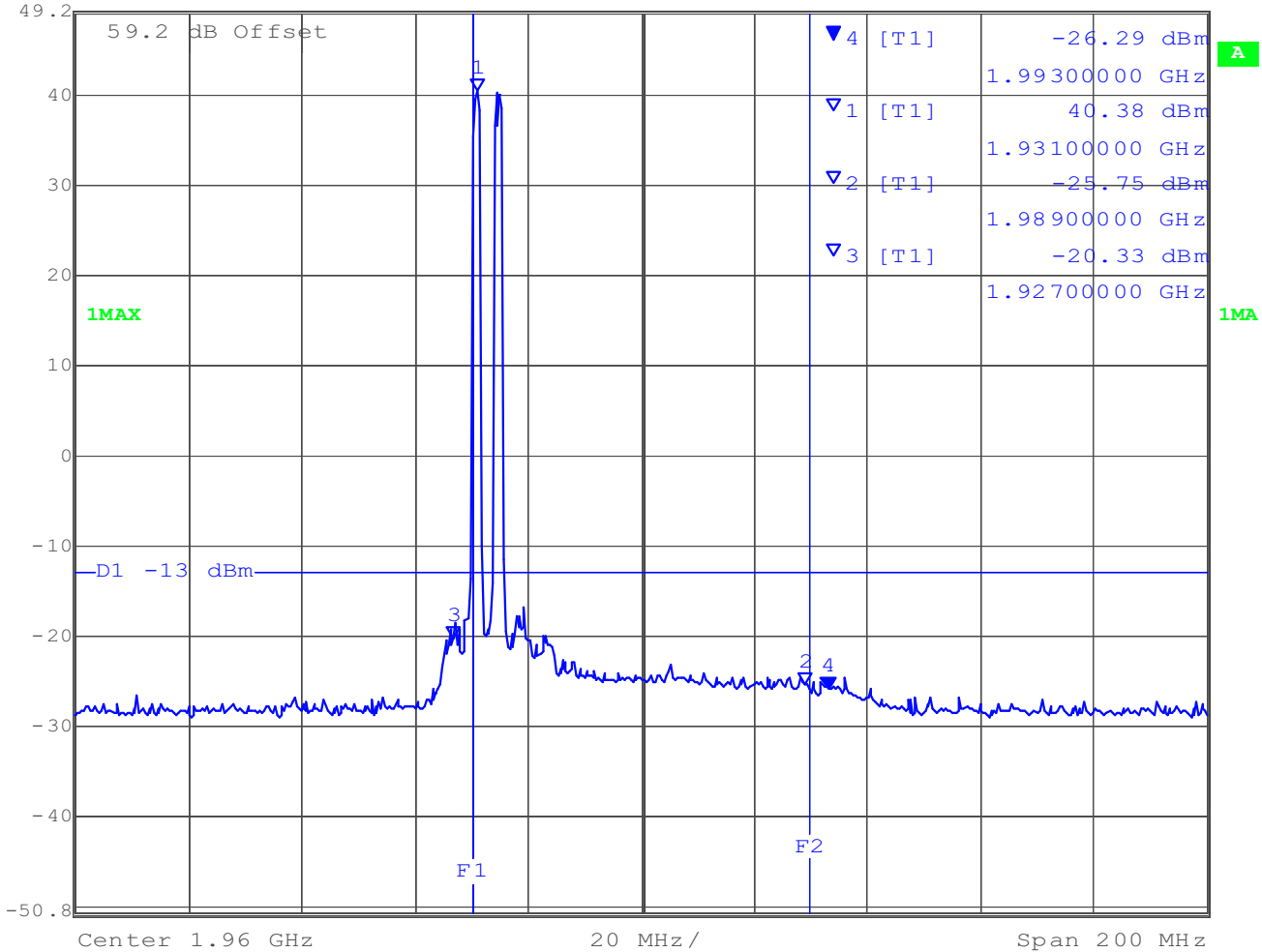
GSM Edge - 2 channels (1 low, 1 high)

10.0 Spurious emissions at antenna terminals (Intermodulation Products) (FCC Part 2.1051)

Drawing:



Marker 4 [T1] RBW 100 kHz RF Att 10 dB
 Ref Lvl -26.29 dBm VBW 10 kHz Mixer -10 dBm
 49.2 dBm 1.99300000 GHz SWT 500 ms Unit dBm



Date: 12.SEP.2008 14:48:06

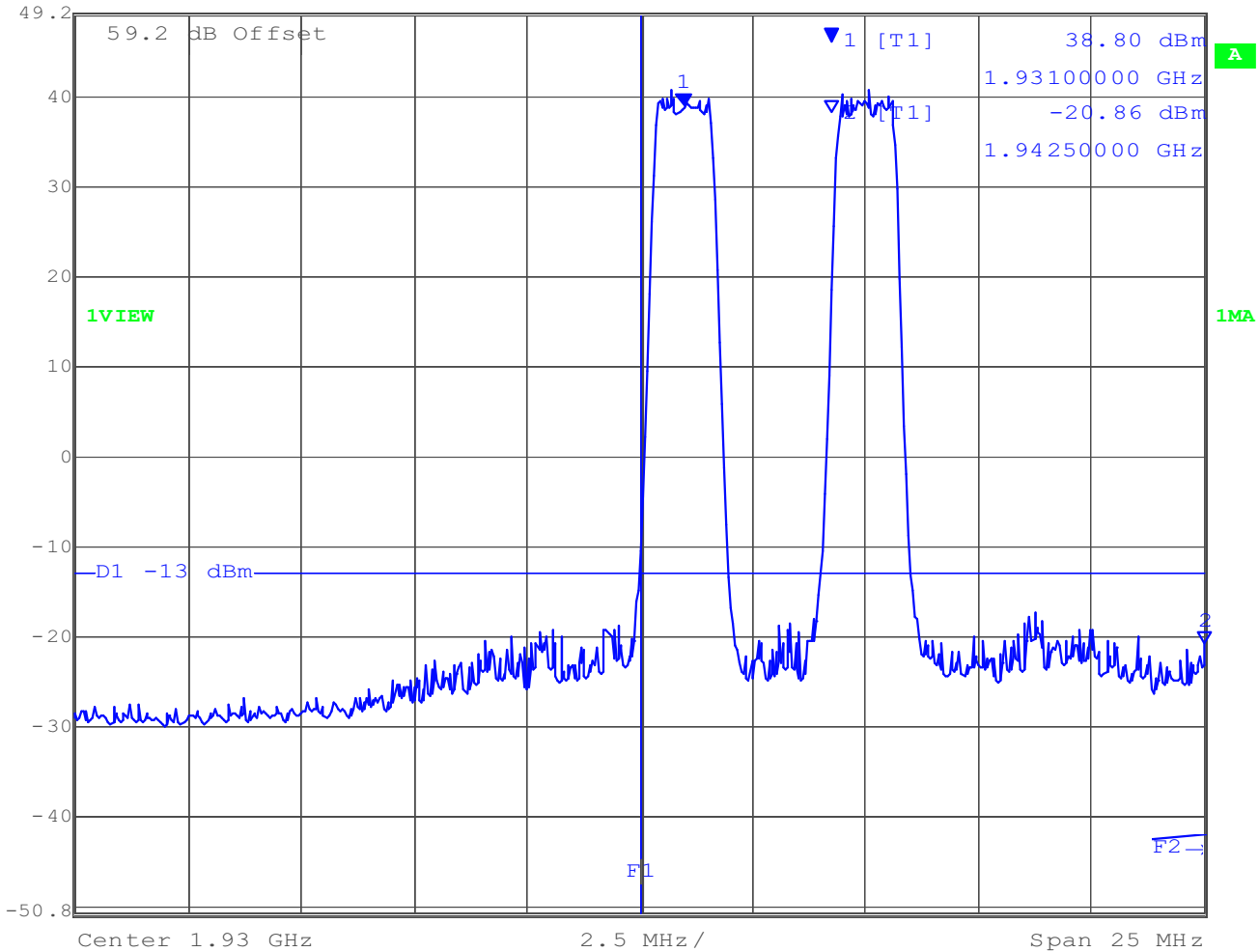
CDMA - 2 channels low

10.0 Spurious emissions at antenna terminals (Intermodulation Products) (FCC Part 2.1051)

Drawing:



Marker 1 [T1] RBW 100 kHz RF Att 10 dB
 Ref Lvl 38.80 dBm VBW 10 kHz Mixer -10 dBm
 49.2 dBm 1.93100000 GHz SWT 64 ms Unit dBm



Date: 12.SEP.2008 14:49:34

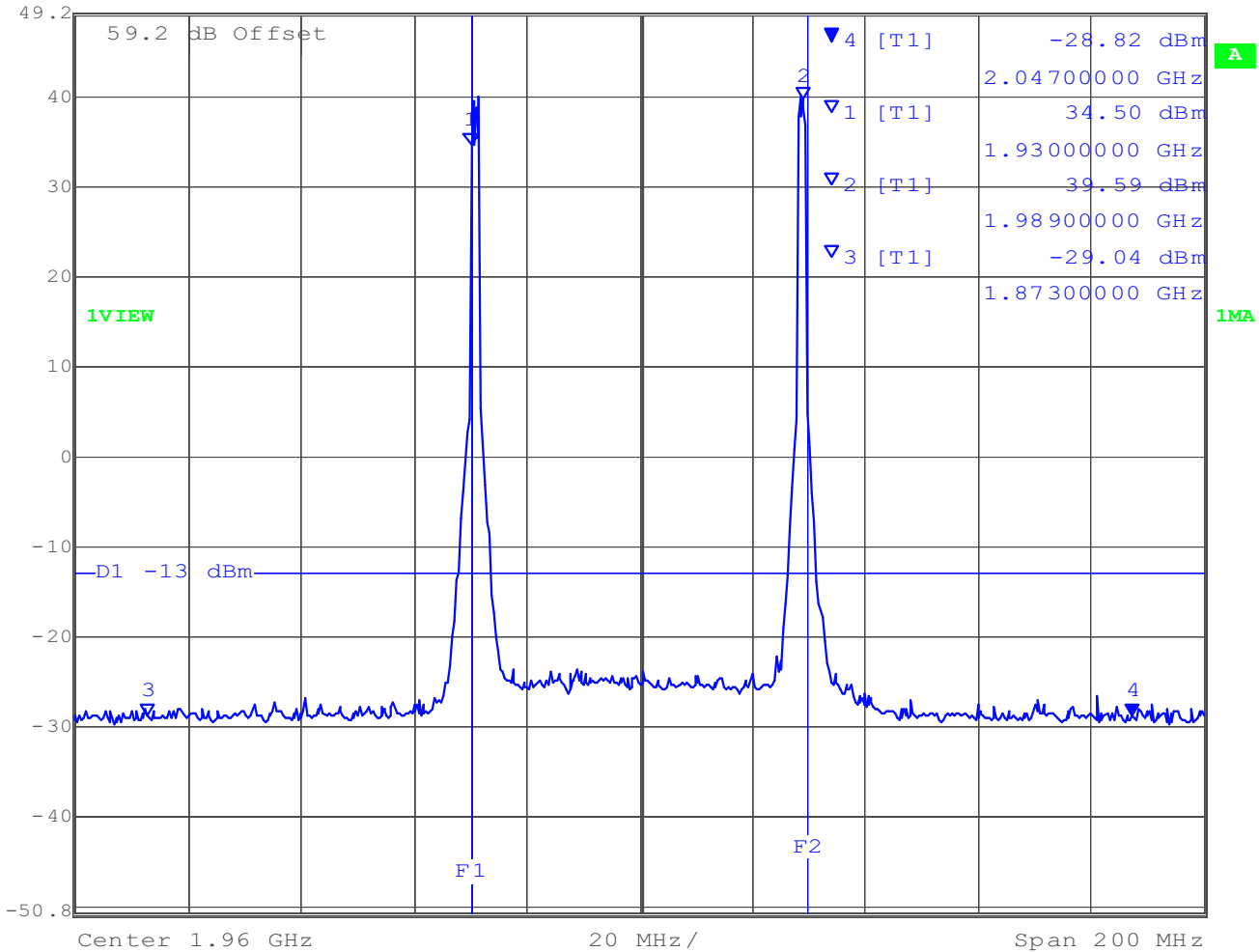
CDMA - 2 channels low

10.0 Spurious emissions at antenna terminals (Intermodulation Products) (FCC Part 2.1051)

Drawing:



Marker 4 [T1] RBW 100 kHz RF Att 10 dB
 Ref Lvl -28.82 dBm VBW 10 kHz Mixer -10 dBm
 49.2 dBm 2.04700000 GHz SWT 500 ms Unit dBm



Date: 12.SEP.2008 14:53:41

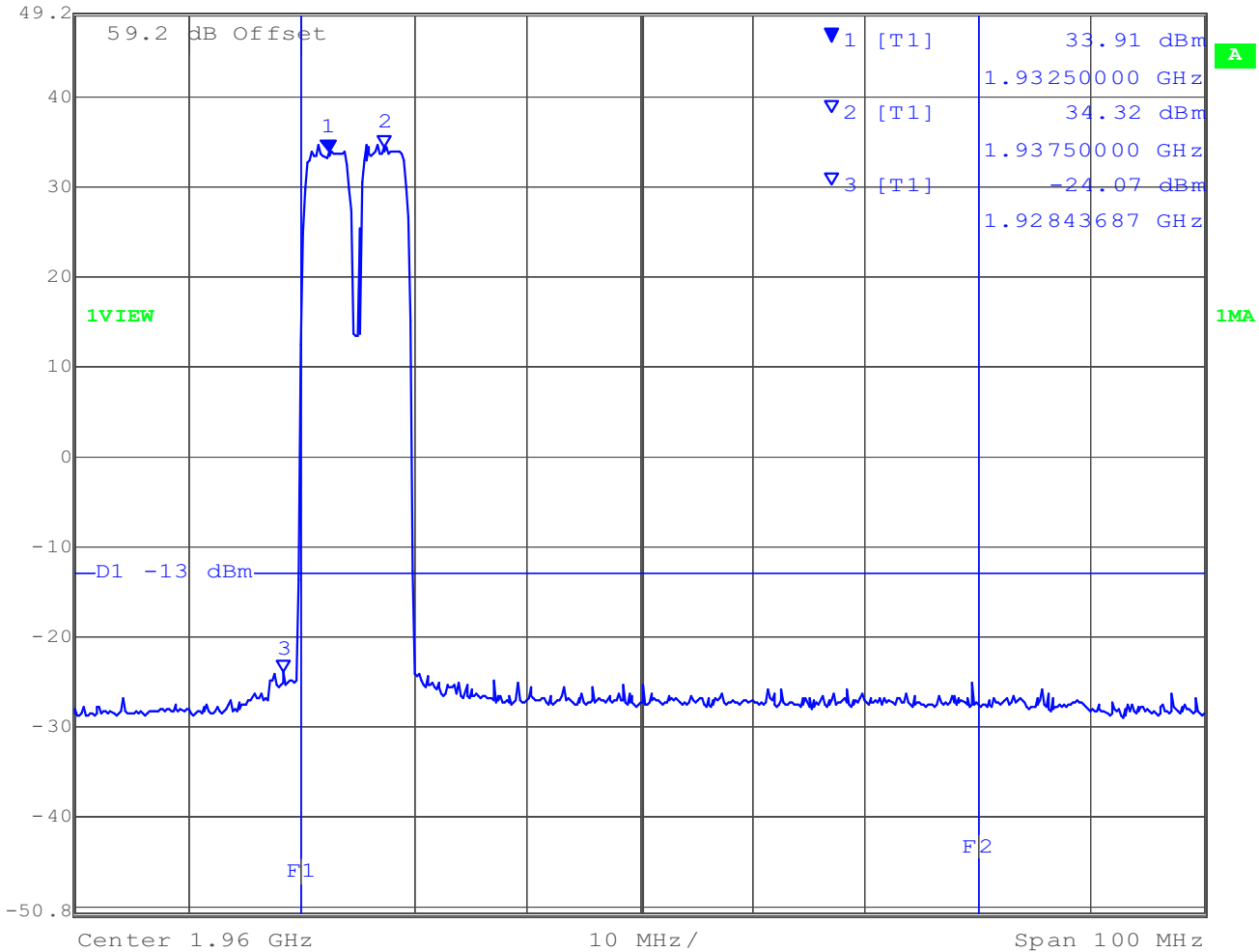
CDMA - 2 channels (1 low, 1 high)

10.0 Spurious emissions at antenna terminals (Intermodulation Products) (FCC Part 2.1051)

Drawing:



Marker 1 [T1] RBW 100 kHz RF Att 10 dB
 Ref Lvl 33.91 dBm VBW 10 kHz Mixer -10 dBm
 49.2 dBm 1.93250000 GHz SWT 250 ms Unit dBm



Date: 15.SEP.2008 08:08:39

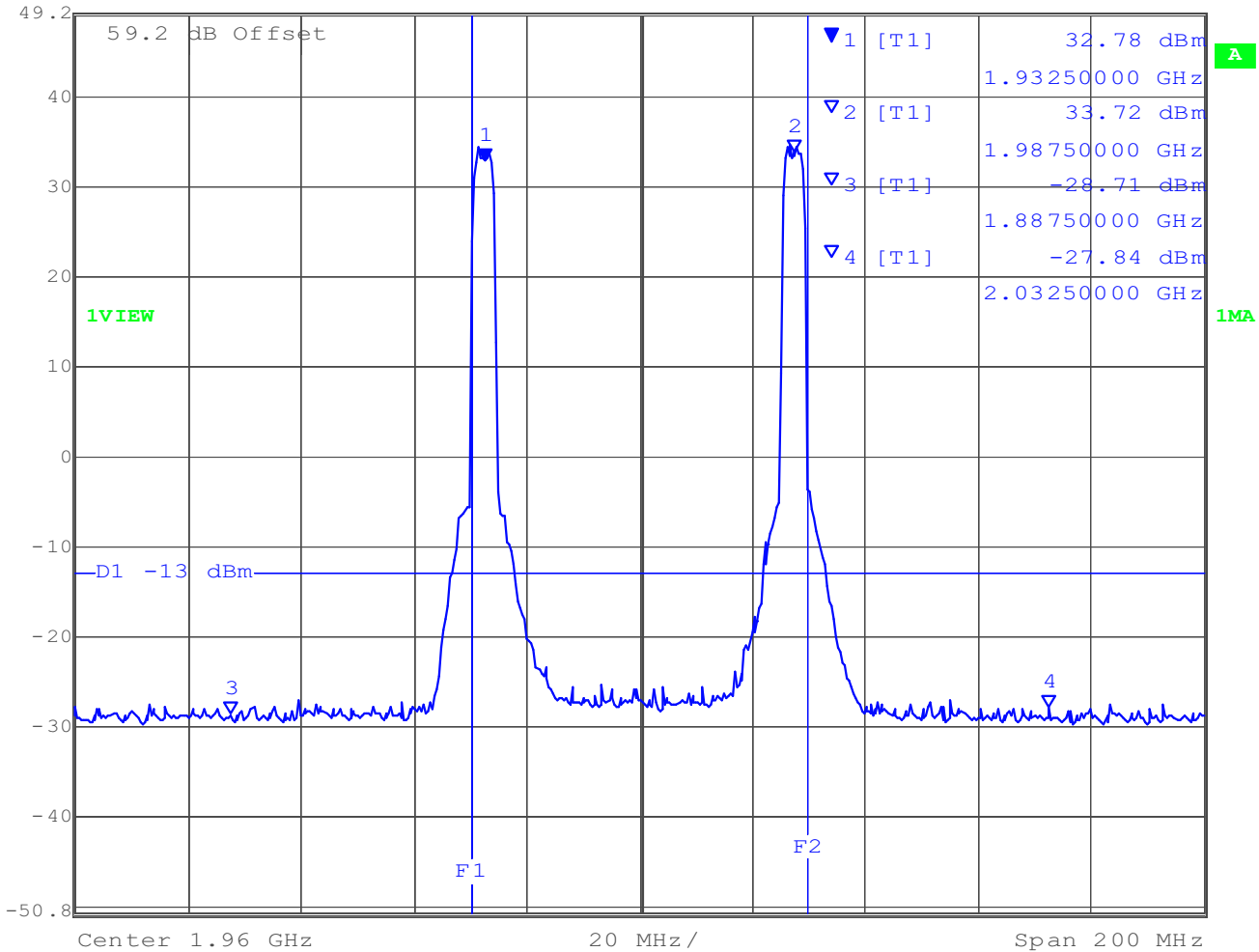
WCDMA - 2 channels low

10.0 Spurious emissions at antenna terminals (Intermodulation Products) (FCC Part 2.1051)

Drawing:



Marker 1 [T1] RBW 100 kHz RF Att 10 dB
 Ref Lvl 32.78 dBm VBW 10 kHz Mixer -10 dBm
 49.2 dBm 1.93250000 GHz SWT 500 ms Unit dBm



Date: 15.SEP.2008 08:14:30

WCDMA - 2 channels (1 low, 1 high)

11.0 Field strength of spurious radiation (FCC Part 2.1053)

Method:

Applies to the following Standards:

TIA-603-C (land mobile)

FCC 47 CFR Part 90 (land mobile)

RSS-119 (land mobile/fixed)

PROCEDURE

- A) Connect the equipment as illustrated. Place the transmitter to be tested on the turntable in the test site, in its normal operating position. If the transmitter is intended to be hand held, the testing must be repeated with the transmitter in three orthogonal orientations.
- B) Attach a non-radiating standard load to the antenna port, using the shortest possible interconnecting shielded cable. For devices with integral antennas, run the test with the integral antenna operating.
- C) Select the larger test distance consistent with the site noise floor; use 10m if possible, 3m if ambient noise requires a shorter distance.
- D) Typical spectrum analyzer settings are given below. Refer to the table above, and the specific standard, for correct settings.
 - 1) RBW = 10 kHz below 1 GHz, 1 MHz above 1 GHz.
 - 2) VBW = 300 kHz below 1 GHz, 3 MHz above 1 GHz.
 - 3) Sweep speed sufficiently slow to maintain calibration.
 - 4) detector mode = positive peak.
- E) Place the test antenna in its vertical polarization position; use an attenuator with 6 - 10 dB loss (A) as a matching pad between the test antenna and its cable.
- F) The spectrum is to be scanned from the lowest RF frequency generated in the equipment to the 10th harmonic of the carrier, excepting the occupied bandwidth. Specific standards may require a different maximum frequency.
- G) For each spurious emission detected, raise and lower the test antenna from 1 to 4m with the transmitter facing the test antenna, and record the highest received signal from the transmitter in dBmR. Rotate the turntable through 360 degrees to find the maximum emission value at that frequency.
- H) Rotate the test antenna to its horizontal polarization position. Repeat steps g) and h).
- I) Replace the transmitter under test with a substitution antenna whose gain above that of a half-wave dipole is known to be G(dBd). Refer to the illustration below.
- J) Place the center of the substitution antenna at the same location on the table as the transmitter under test, using vertical polarization for both substitution and test antennas. Connect the substitution antenna to the signal generator, using a cable with known signal loss LC. Use an attenuator with loss S as a matching pad between the substitution antenna and its cable.
- K) Raise the test antenna from 1m to 4m to maximize the analyzer display from the substitution antenna. At the maximum display value for each spurious frequency, adjust the signal level dBmT so that the spectrum analyzer displays the maximum signal observed in steps g) - h) above.
- L) Calculate the output power of the transmitter in ERP according to:

$$\text{spurious power in (dBm)} = \text{dBmT} - \text{LC} - \text{S} + \text{dBd}$$
- M) Repeat steps k) - l) for both antennas horizontally polarized. Record the spurious power separately for the vertical and horizontal polarizations.

NOTE: For FCC purposes, emissions > 20 dB below the regulatory spurious limit do not have to be determined by the substitution method. The regulatory limit for many licensed transmitters is -13 dBm (50 ?W) or 84.4 dBuV/m at 3m.

MEASUREMENT UNCERTAINTY

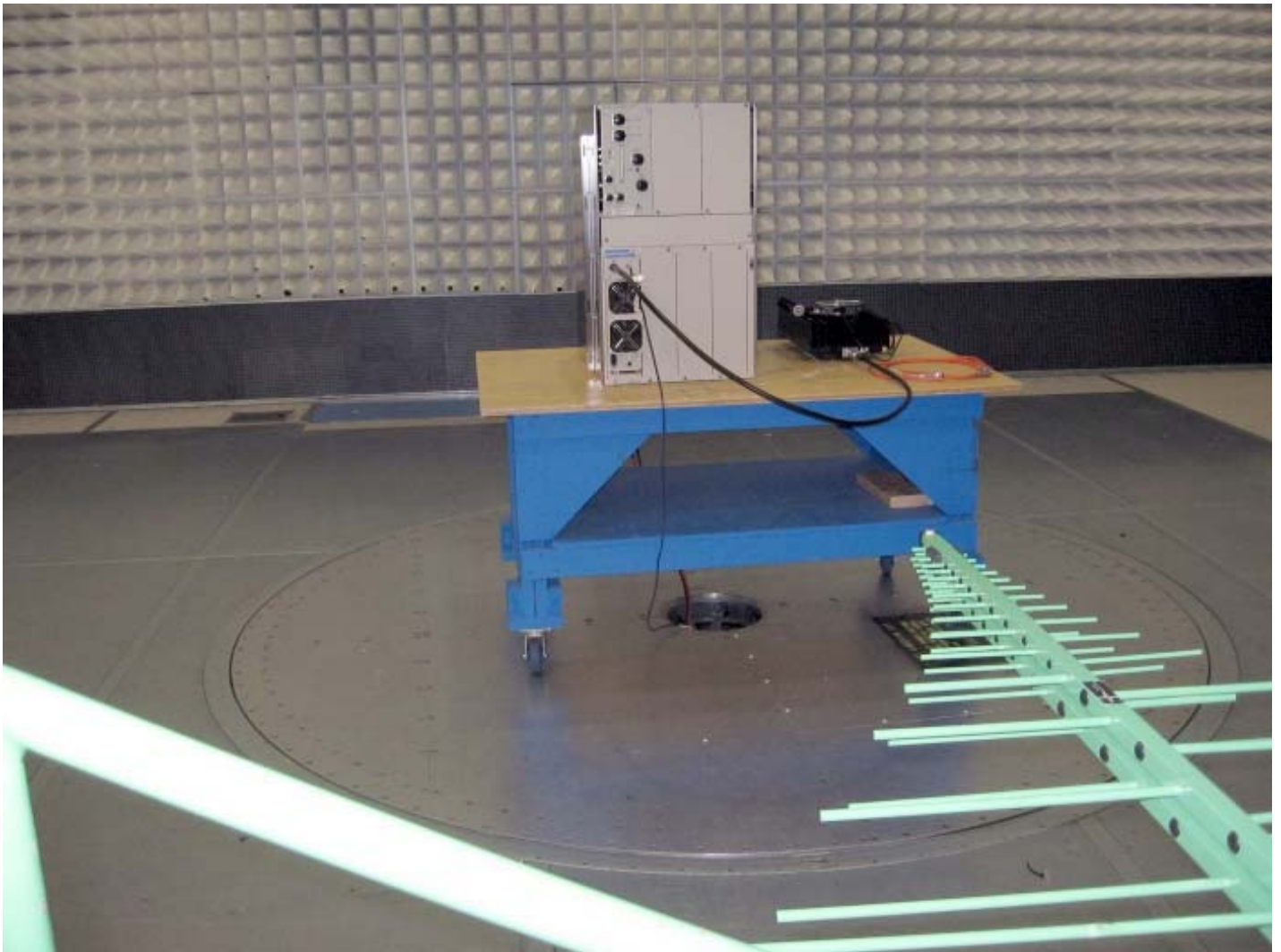
Compliance of the product is based on the measured value. However, the measurement uncertainty is included for informational purposes. The values given are the measurement uncertainty values with an expanded uncertainty of k=2.

+/- 3.85 dB

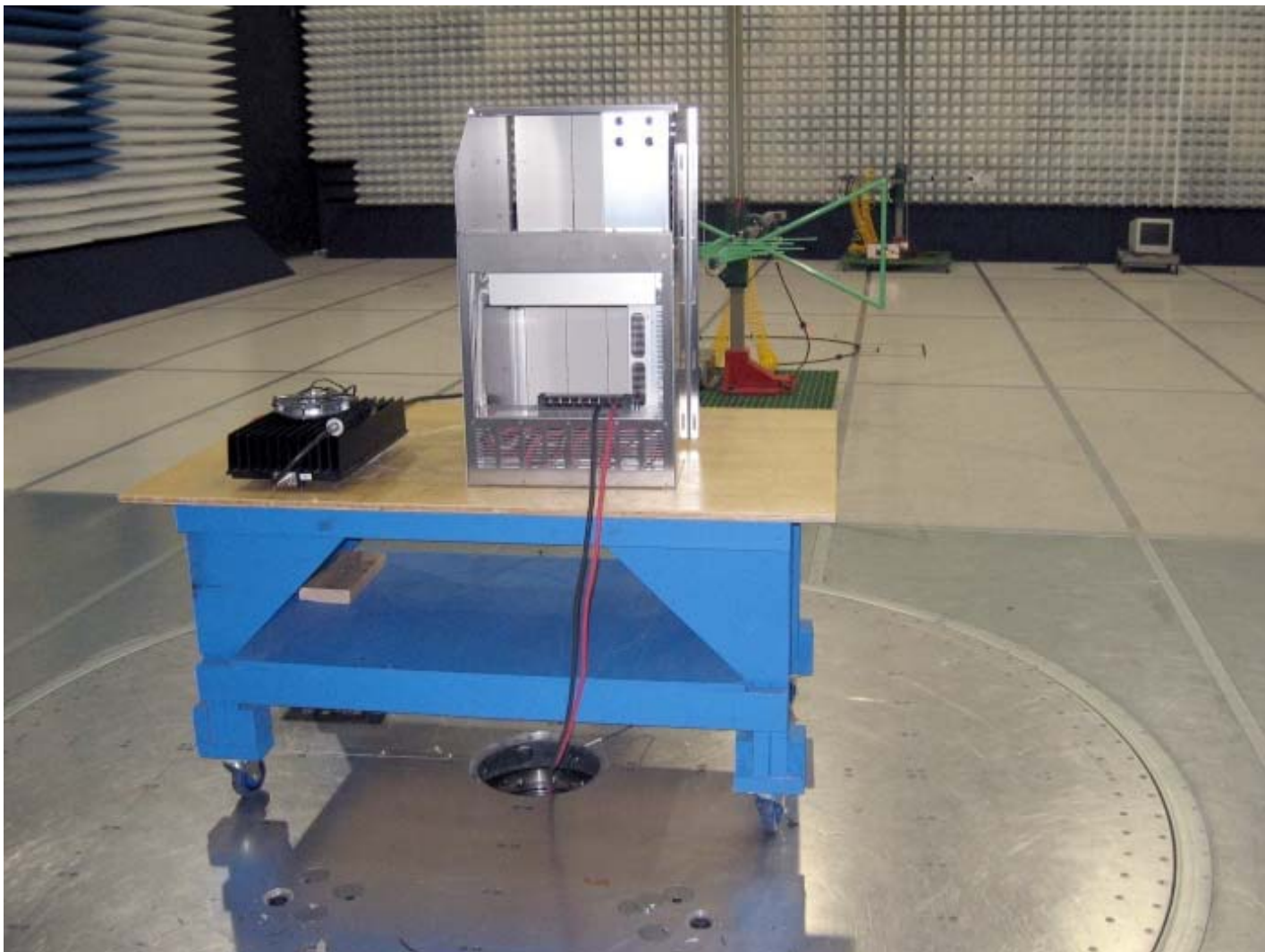
Test Equipment Used:

Description:	Manufacturer:	Model:	Asset Number:	Cal Date:	Cal Due:
Antenna, Horn, <18 GHz	EMCO	3115	213061	04/18/2008	04/18/2009
Cable E05, <18GHz	Huber-Suhner	Sucoflex 104PEA	E05	05/05/2008	05/05/2009
Cable E201, 18 GHz, N, 3m	Megaphase	TM18 NKNK 118	E201	01/16/2008	01/16/2009
Cable MP3, 18 GHz, N, 10m	Megaphase	G919-NKNK-394	MP3	05/05/2008	05/05/2009
Cable ST1, 7m, N-N, 18 GHz	Storm Products Co.	PR90-206-7MTR	ST1	01/16/2008	01/16/2009
EMI Receiver	Hewlett Packard	8546A	211505	12/13/2007	12/13/2008
EMI Receiver, Preselector section	Hewlett Packard	85460A	015762	12/13/2007	12/13/2008
Filter, Band Reject, Cavity Design, 50 dB	Wainwright Inst.	WRCG 1930/1990	200079	12/18/2007	12/18/2008
Preamplifier, 20 MHz to 18 GHz, 40 dB	A.H. Systems	PAM-0118	200108	03/27/2008	03/27/2009
Spectrum Analyzer, 20Hz-40GHz	Rohde & Schwarz	FSEK30	200062	03/19/2008	03/19/2009

Results: The sample tested was found to Comply.

11.0 Field strength of spurious radiation (FCC Part 2.1053)**Photo:**

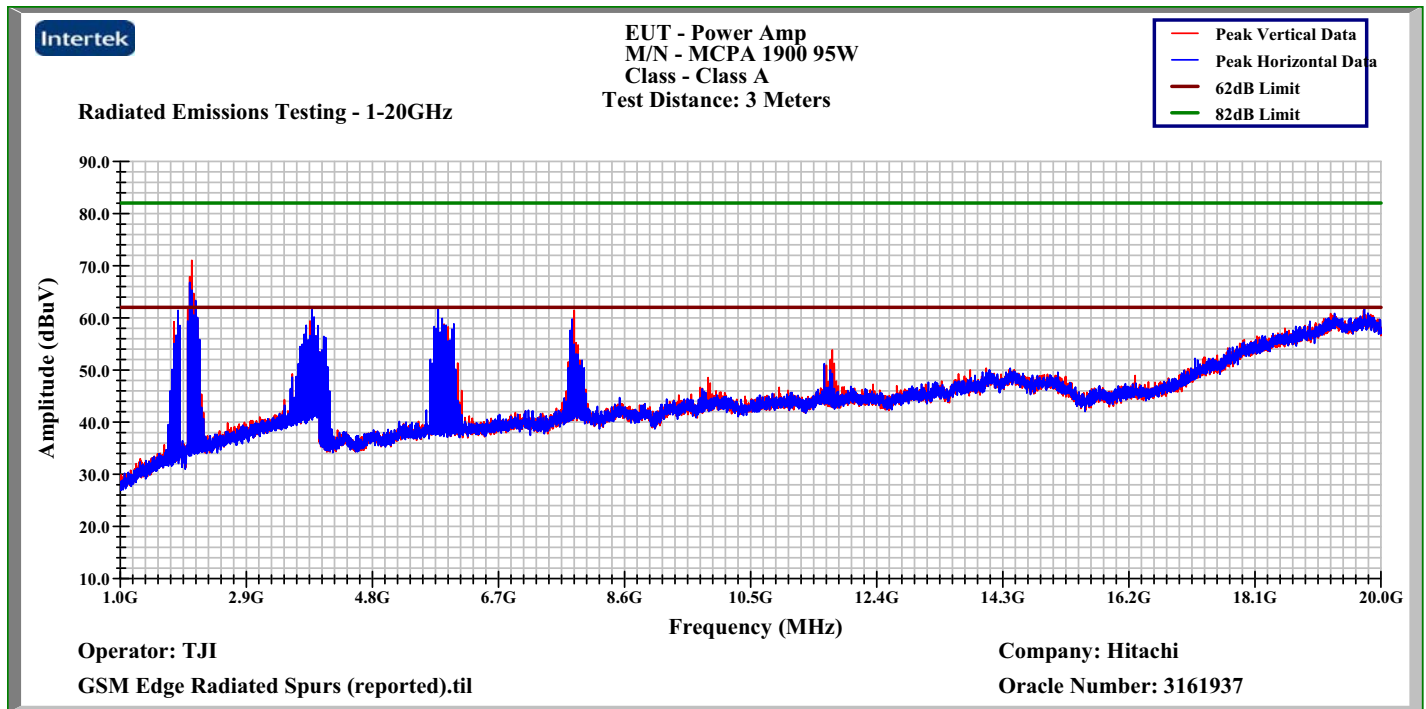
Test Setup

11.0 Field strength of spurious radiation (FCC Part 2.1053)**Photo:**

Test Setup

11.0 Field strength of spurious radiation (FCC Part 2.1053)

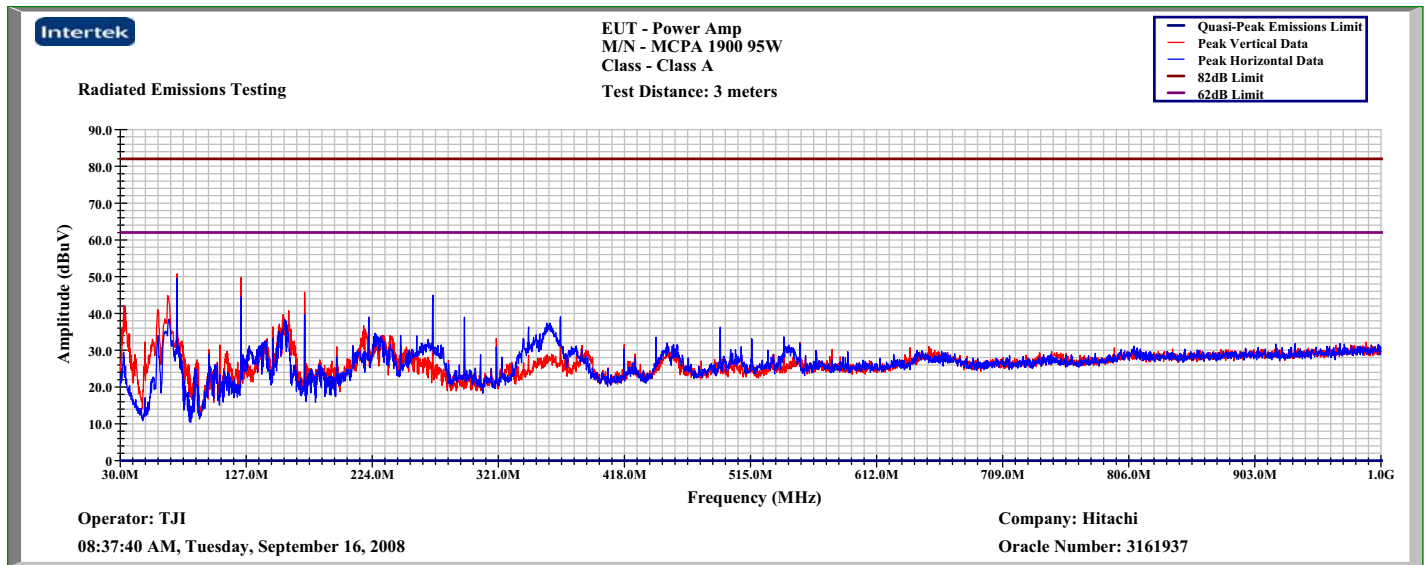
Plot:



Peak emissions - prescan

11.0 Field strength of spurious radiation (FCC Part 2.1053)

Plot:



Radiated Emissions Plot

11.0 Field strength of spurious radiation (FCC Part 2.1053)

Data:

Frequency Range (MHz): 1000 to 20000

Limit: FCC15 Class A-3m

Input power: 27VDC

Modifications for compliance (y/n): n

A	B	C	D	E	F	G	H	I	J
Ant. Pol. (V/H)	Frequency MHz	Reading dB(uV)	Antenna Factor dB(1/m)	Cable Loss dB	Pre-amp Factor dB	Net dB(uV/m)	3m Limit dB(uV/m)	Margin dB	Detectors / Bandwidths Det/RBW/VBW
Mode: GSM Edge									
V	2078.000	69.0	27.6	9.1	40.8	64.9	82.2	-17.3	Avg/1MHz/1.6Hz
V	2108.000	61.6	27.6	9.1	40.8	57.5	82.2	-24.7	Avg/1MHz/1.6Hz
V	2137.600	55.0	27.6	9.1	40.8	50.9	82.2	-31.3	Avg/1MHz/1.6Hz
H	3890.000	48.3	31.2	10.6	40.9	49.2	82.2	-33.0	Avg/1MHz/1.6Hz
h	5791.287	44.0	34.3	4.8	40.8	42.4	82.2	-39.8	Avg/1MHz/1Hz
h	19695.040	25.1	46.2	9.0	40.3	39.9	82.2	-42.3	Avg/1MHz/1Hz NF
Mode: GSM									
V	2048.750	63.9	27.6	9.1	40.8	59.8	82.2	-22.4	Avg/1MHz/1.6Hz
V	2078.500	70.4	27.6	9.1	40.8	66.3	82.2	-15.9	Avg/1MHz/1.6Hz
V	2108.000	61.1	27.6	9.1	40.8	57.0	82.2	-25.2	Avg/1MHz/1.6Hz
H	3890.000	50.7	31.2	10.6	40.9	51.6	82.2	-30.6	Avg/1MHz/1.6Hz
h	5791.210	44.7	34.3	4.8	40.8	43.1	82.2	-39.1	Avg/1MHz/1Hz
h	19708.557	30.3	46.2	9.0	40.3	45.1	82.2	-37.1	Avg/1MHz/1Hz NF
Mode: CDMA									
V	2076.500	60.1	27.6	9.1	40.8	56.0	82.2	-26.2	Avg/1MHz/1.6Hz
V	2104.850	54.7	27.6	9.1	40.8	50.6	82.2	-31.6	Avg/1MHz/1.6Hz
V	2134.150	45.9	27.6	9.1	40.8	41.8	82.2	-40.4	Avg/1MHz/1.6Hz
H	3891.000	42.0	31.2	10.6	40.9	42.9	82.2	-39.3	Avg/1MHz/1.6Hz
h	5792.324	42.7	34.3	4.8	40.8	41.1	82.2	-41.1	Avg/1MHz/1Hz
h	19701.202	30.4	46.2	9.0	40.3	45.2	82.2	-37.0	Avg/1MHz/1Hz NF
Mode: WCDMA									
V	2042.380	52.8	27.6	9.1	40.8	48.7	82.2	-33.5	Avg/1MHz/1.6Hz
V	2071.250	50.7	27.6	9.1	40.8	46.6	82.2	-35.6	Avg/1MHz/1.6Hz
V	2096.500	51.5	27.6	9.1	40.8	47.4	82.2	-34.8	Avg/1MHz/1.6Hz
H	3892.100	38.8	31.2	10.6	40.9	39.7	82.2	-42.5	Avg/1MHz/1.6Hz
h	5796.744	41.0	34.3	4.8	40.8	39.4	82.2	-42.8	Avg/1MHz/1Hz
h	19701.002	30.4	46.2	9.0	40.3	45.2	82.2	-37.0	Avg/1MHz/1Hz NF
Mode: CW 1955 1965									
H	1127.000	42.4	24.0	6.2	40.6	31.9	82.2	-50.3	Avg/1MHz/1.6Hz
V	1126.600	42.2	23.8	6.2	40.6	31.5	82.2	-50.7	Avg/1MHz/1.6Hz
v	5875.046	58.4	34.3	4.8	40.7	56.9	82.2	-25.3	Avg/1MHz/1Hz
v	5884.991	60.2	34.3	4.8	40.7	58.7	82.2	-23.5	Avg/1MHz/1Hz
Calculations		G=C+D+E-F		I=G-H					

Substitution Measurement

A	B	C	D	E	F	G
Ant. Pol. (V/H)	Frequency MHz	Substitution Reading dBm	TX ant Gain dBi	ERP dBm	Limit dBm	Margin dB
GSM						
v	2078.000	-38.7	9.2	-29.5	-13.0	-16.5
v	2108.000	-47.5	9.3	-38.2	-13.0	-25.2
GSM - Edge						
v	2048.750	-43.5	9.2	-34.3	-13.0	-21.3
v	2078.500	-37.3	9.2	-28.1	-13.0	-15.1
Calculations		E=C+D		G=E-F		

11.0 Field strength of spurious radiation (FCC Part 2.1053)

Data:

Frequency Range (MHz): 30-1000

Test Distance (m): 3

Input power: 27VDC

Limit: CISPR Class A-3m

Modifications for compliance (y/n): n

A	B	C	D	E	F	G	H	I	J
Ant. Pol. (V/H)	Frequency MHz	Reading dB(uV)	Antenna Factor dB(1/m)	Cable Loss dB	Pre-amp Factor dB	Net dB(uV/m)	3m Limit dB(uV/m)	Margin dB	Detectors / Bandwidths Det/RBW/VBW
Mode: CDMA									
v	73.736	69.6	5.9	2.0	28.0	49.5	50.5	-1.0	QP/120k/300k
v	122.894	57.4	12.7	2.1	27.9	44.3	50.5	-6.2	QP/120k/300k
v	172.044	61.4	10.7	2.1	27.9	46.3	50.5	-4.2	QP/120k/300k
v	221.189	58.1	10.8	3.0	27.8	44.0	50.5	-6.5	QP/120k/300k
h	270.343	55.7	14.0	3.0	27.8	44.8	57.5	-12.7	QP/120k/300k
Calculations		G=C+D+E-F			I=G-H				

Radiated Emissions Data