TEST REPORT

Report Number: 3118301ATL-003

April 18, 2007

Product Designation: MPCA 2 x 4

Standard: FCC Part 22; FCC Part 15, Subpart B
Class II Permissive Change

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

Client:
Hitachi Telecom, USA
3617 Parkway Lane
Suite 100
Norcross, GA 30092
Contact: Nick Yasui
Phone: 770.797.2530
Fax: 770.797.2555

Tests performed by:

Shawn K. McGuinness
EMC Project Engineer

Report reviewed by:

David J. Schramm
EMC Department Manager

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 verbatum 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	RF Output Power (Conducted) (FCC Part 2.1046 Cond)	03/15/2006	PASS
6.0	Radiated emissions (E-field) (Radiated Emissions)	03/08/2007	PASS
7.0	Spurious emissions at antenna terminals (FCC Part 2.1051)	03/20/2007	PASS
8.0	Field strength of spurious radiation (FCC Part 2.1053)	03/08/2007	PASS
9.0	Revision History (Revision History)		

3.0 Description of Equipment Under Test

Equipment Under Test			
Description	Manufacturer	Model Number	Serial Number
850MHz MCPA (2Ea.)	Hitachi	HMC081901C	FCC-07022301 & FCC-07022302
DUP/Comb Tray	Hitachi	HMCDD0811C	FCC-07022301
Chassis	Hitachi	HMCSRD001C	002

EUT receive date:	March 7 2007
EUT receive condition:	Good

Description of EUT provided by Client:
The EUT is an 850 MHz 190W 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.

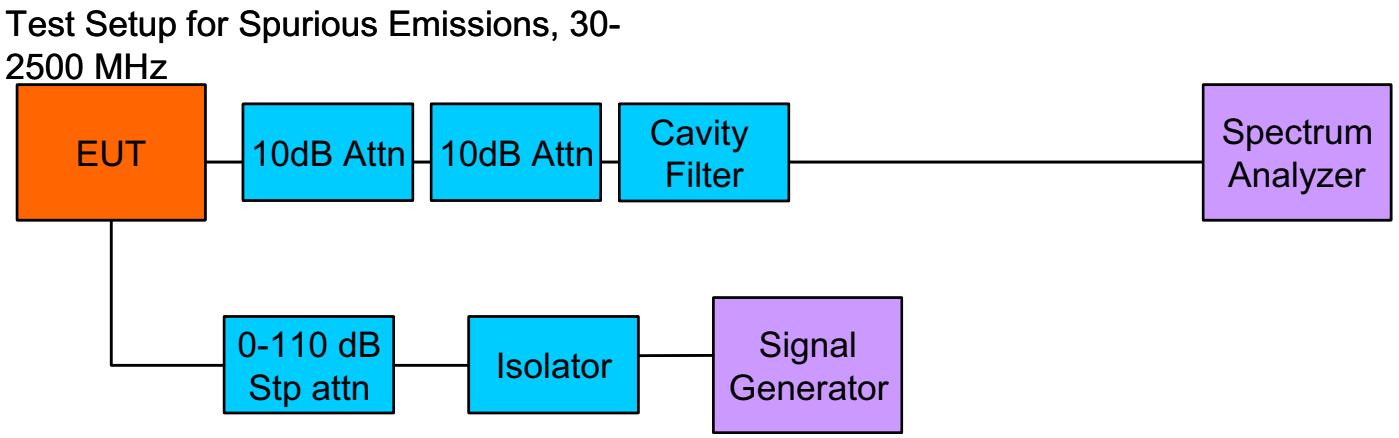
Description of EUT exercising:
During testing where a single carrier was used, the input level was adjusted to obtain 190 Watts out on a single channel. During testing where more than one channel is used, the power of each carrier must be reduced so the total power output is no greater than 190 Watts. GSM, GSM Edge, and W-CDMA signasl were used during the testing and are indicated in each section of this report as appropriate.

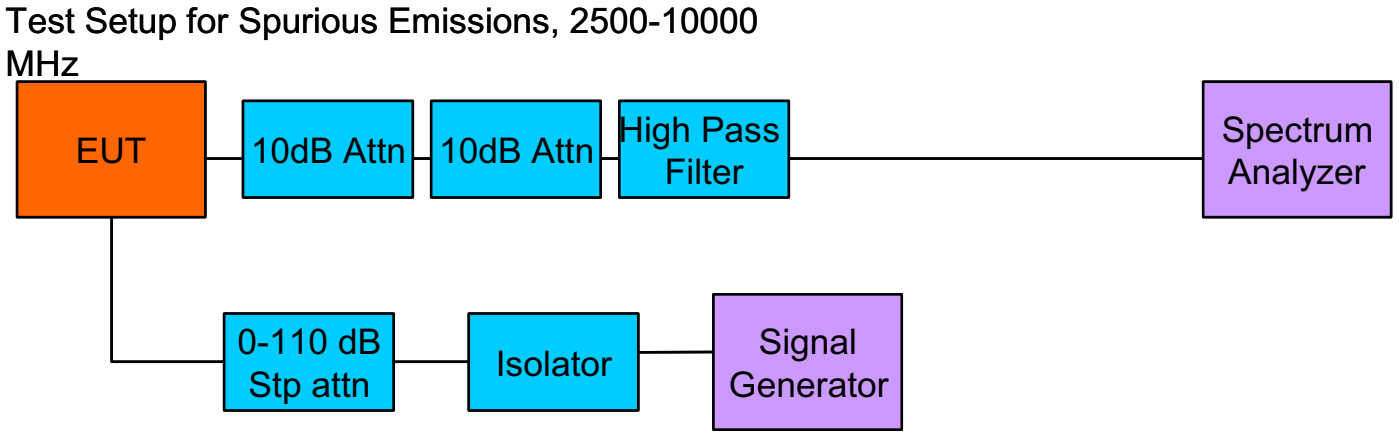
4.0 System setup including cable interconnection details, support equipment and simplified block diagram. (System Setup)

Method:

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

Photo:



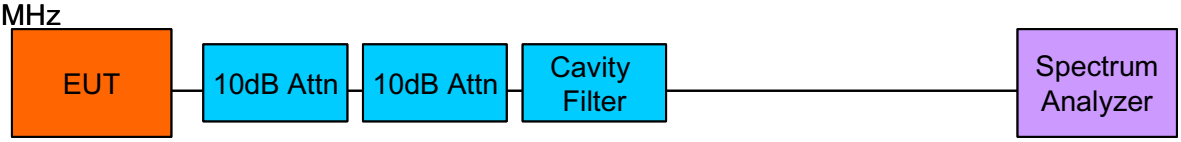


Block diagram spurious emissions

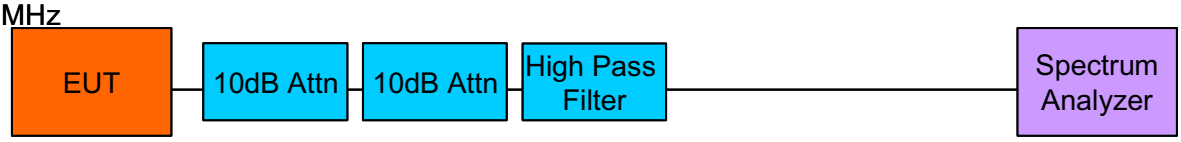
4.0 System setup including cable interconnection details, support equipment and simplified block diagram. (System Setup)

Photo:

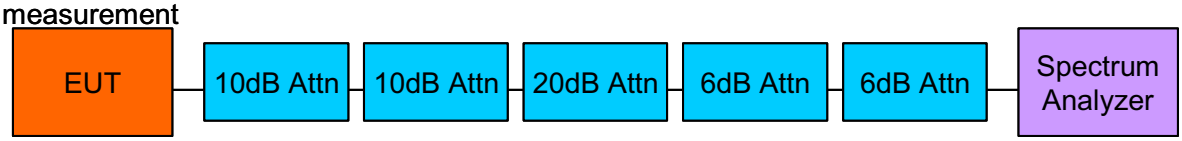
Test Setup for Spurious Emissions, 30-2500 MHz



Test Setup for Spurious Emissions, 2500-10000 MHz



Test Setup for Inter-modulation measurement



block diagram for spurious & intermod measurement

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

Data:

EUT Cabling						
					Connection	
ID	Description	Length	Shielding	Ferrites	From	To
A	DC Power Line In	15m	no	no	DC PS Pair	EUT Chassis
B	Coax 1	1.0m	yes	no	Signal Generator	Step Attenuator
C	Coax 2	1.4m	yes	no	Step Attenuator	EUT Amp RF IN
D	Coax 3	2.0m	yes	no	EUT Amp RF Out	Test/Meas. Equipment

Support Equipment			
Description	Manufacturer	Model Number	Serial Number
Signal Generator	Agilent	E4438C	MY4020908
Signal Generator	Agilent	E4438C	MY4020632
Power Meter	Agilent	E4419B	Not listed
Step Attenuator	Agilent	11716A	14003296
DC Power Supply	H/P	6012B	2732A-02525

5.0 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.

Canada typically requires this test to be repeated at +60° C and at -30° C.

Test Equipment Used:

Description:	Manufacturer:	Model:	Asset Number:	Cal Date:	Cal Due:
Attenuator, 06 dB	Weinschel Corp	2	200002	07/18/2006	07/18/2007
Attenuator, 06 dB	Weinschel Corp	2	200006	08/07/2006	08/07/2007
Attenuator, 10 dB, 150 Watt, <18GHz	Weinschel Corp	66-10-33	211683	03/14/2007	03/14/2008
Attenuator, 10 dB, 50 Watt, DC-18GHz	Weinschel	47-10-34	200061	07/18/2006	07/18/2007
Attenuator, 20 dB	Weinschel Corp	2	200001	08/07/2006	08/07/2007
Attenuator, 20 dB, SMA	Pasternack	PE7045-20	200014	07/18/2006	07/18/2007
Power Meter	Boonton	4232A	200063	11/03/2006	11/03/2007
Power Sensor, Dual Diode, 10kHz to 8GHz, 20 dBm	Boonton	51011-EMC	200064	11/03/2006	11/03/2007
Spectrum Analyzer, 20 Hz to 40 GHz	Rohde & Schwarz	FSEK30	200062	03/12/2007	03/12/2008

Results: The sample tested was found to Comply.

5.0 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	869.0	Low	APM (1)	52.77	189.2
	881.5	Mid	APM (1)	52.77	189.2
	894.0	High	APM (1)	52.77	189.2
GSM Edge	869.0	Low	APM (1)	52.80	190.5
	881.5	Mid	APM (1)	52.78	189.7
	894.0	High	APM (1)	52.80	190.5
WCDMA	871.5	Low	APM (1)	52.82	191.4
	881.5	Mid	APM (1)	52.79	190.1
	891.5	High	APM (1)	52.79	190.1

Note (1): Used average power meter
Note (2): Power for base stations are set at time of licensing.

6.0 Radiated emissions (E-field) (Radiated Emissions)

Method:

Measurements in the frequency range of 30 MHz to 1000 MHz shall be performed with a quasi-peak detector instrument that meets the requirements of Section One of CISPR 16. Above 1000 MHz, a peak detector shall be used. Peak values converted to average by appying the duty cycle correction factor, when applicable. When an average detector is used, it shall meet the requirements of Section One of CISPR 16. The measuring antenna shall correlate to a balanced dipole.

Bandwidths:
30 MHz to 1000 MHz: 120 kHz RBW and 1 MHz VBW
Above 1000 MHz: 1 MHz RBW and 3 MHz VBW

Measurements of the radiated field are made with the antenna located at a distance of 3 or 10 meters from the EUT. The limit applied to the measurement shall be appropriate for the test distance. The test distance shall be indicated in the results section.

The EUT shall be arranged and connected with cables terminated in accordance with the product specification.

Exploratory tests should be carried out while varying the cable positions to determine the maximum or near-maximum emission level. During manipulation, cables shall not be placed under or on top of the system test components unless such placement is required by the inherent equipment design.

The antenna shall be adjusted between 1m and 4m in height above the ground plane for maximum meter reading at each test frequency.

The antenna-to-EUT azimuth shall be varied during the measurement to find the maximum field-strength readings.

The antenna-to-EUT polarization (horizontal and vertical) shall be varied during the measurements to find the maximum field-strength readings.

If the EUT is intended for tabletop use, it shall be placed on a table whose top is 0.8m above the ground plane. The table shall be constructed of non-conductive materials. Its dimensions are at least 1m by 1.5m, but may be extended for larger EUT.

If EUT is floor standing, the EUT was placed on a horizontal metal ground plane and isolated from the ground plane by up to 12 mm of insulating material.

Equipment setup for radiated disturbance tests shall follow the guidelines of ANSI C63.4:2003.

TEST SITE
The test site for radiated emissions is located at 1950 Evergreen Blvd, Suite 100, Duluth, Georgia 30096.

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.
30 MHz to 1000 MHz at 3 meters: +/- 3.9 dB
30 MHz to 1000 MHz at 10 meters: +/- 3.6 dB
1 GHz to 18 GHz at 3 meters: +/- 4.2 dB

Test Equipment Used:

Description:	Manufacturer:	Model:	Asset Number:	Cal Date:	Cal Due:
10MHz-26.5GHz Preamp	Hewlett Packard	HP83006A preamp		02/27/07	02/27/08
Antenna, Bilog (20MHz to 2GHz)	Chase	CBL6112B	211386	08/29/2006	08/29/2007
Antenna, Horn, 0.7 - 18 GHz	A.H. Systems	SAS-200/571	213058a	02/26/2007	02/26/2008
Cable E01 (Formerly PE7000N-N2 or N2)	Pasternack	RG214/U	E01	05/11/2006	05/11/2007
Cable E05 (Formerly HS 1500 N-N)	Huber-Suhner	Sucoflex 104PEA	E05	05/11/2006	05/11/2007
Cable, 18 GHz, N, 118 inches	Megaphase	TM18 NKNK 118	E201	01/15/2007	01/15/2008
Coaxial Cable, 7m, N-N, 18 GHz	Storm Products Co.	PR90-206-7MTR	ST1	01/11/2007	01/11/2008
EMI Receiver	Hewlett Packard	8546A	211388	08/04/2006	08/04/2007
EMI Receiver, Preselector section	Hewlett Packard	85460A	211389	08/04/2006	08/04/2007
Excel spreadsheet for radiated emissions	Software	Excel - RE Worksh	SW004	08/01/2006	08/01/2007
Preamplifier, 10 MHz to 2000 MHz, 27 dB gain	Mini-Circuits	ZKL-2	200074	02/08/2007	02/08/2008
Spectrum Analyzer	Hewlett Packard	8593E	213180	04/18/2006	04/18/2007
Spectrum Analyzer, 20 Hz to 40 GHz	Rohde & Schwarz	FSEK30	200062	03/12/2007	03/12/2008
Tile software profile for radiated and conducted emissions testing.	Software	Tile - Emissions	SW006	06/25/2006	06/25/2007

Results: The sample tested was found to Comply.

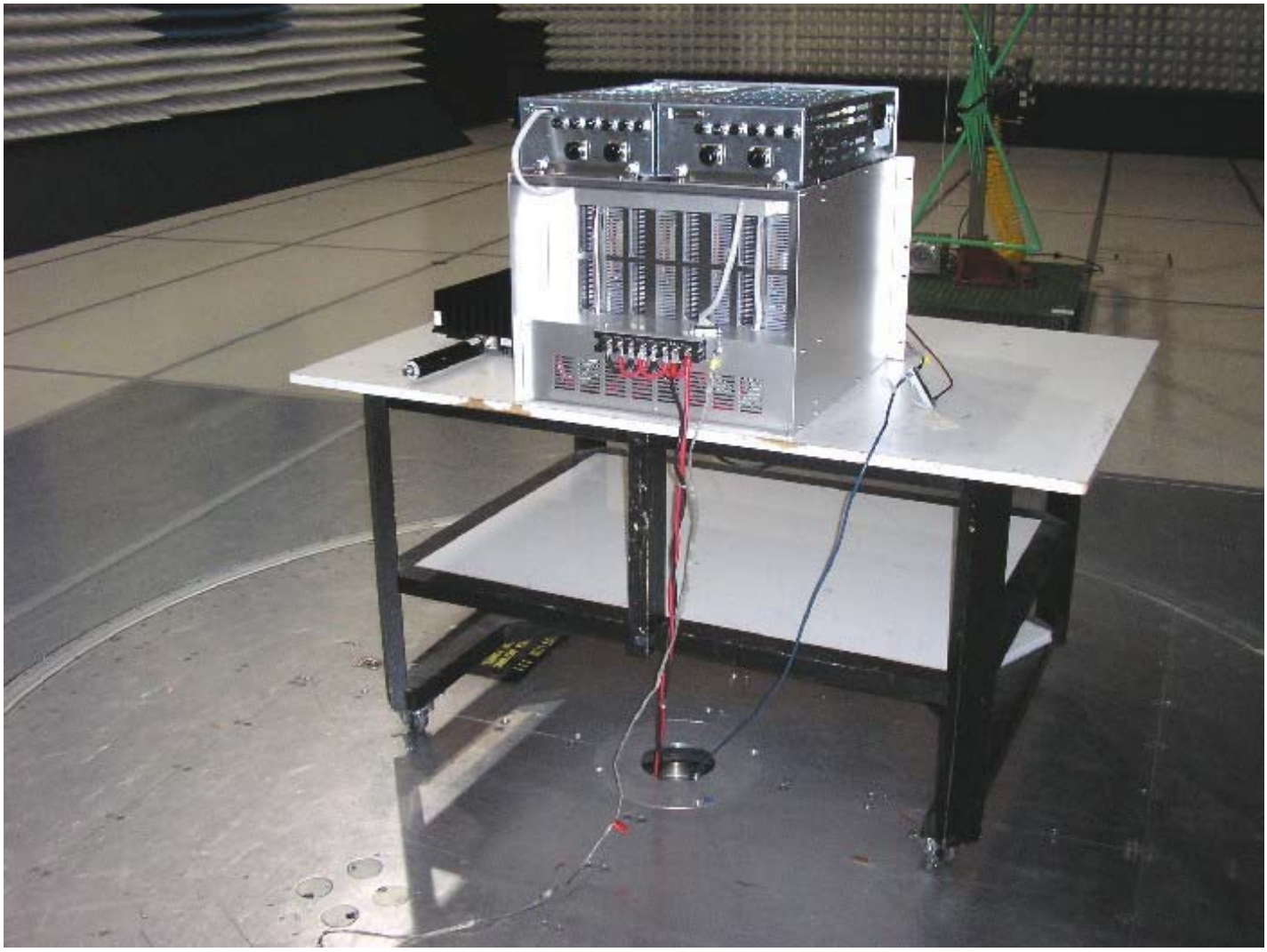
6.0 Radiated emissions (E-field) (Radiated Emissions)

Photo:

Test set up front

6.0 Radiated emissions (E-field) (Radiated Emissions)

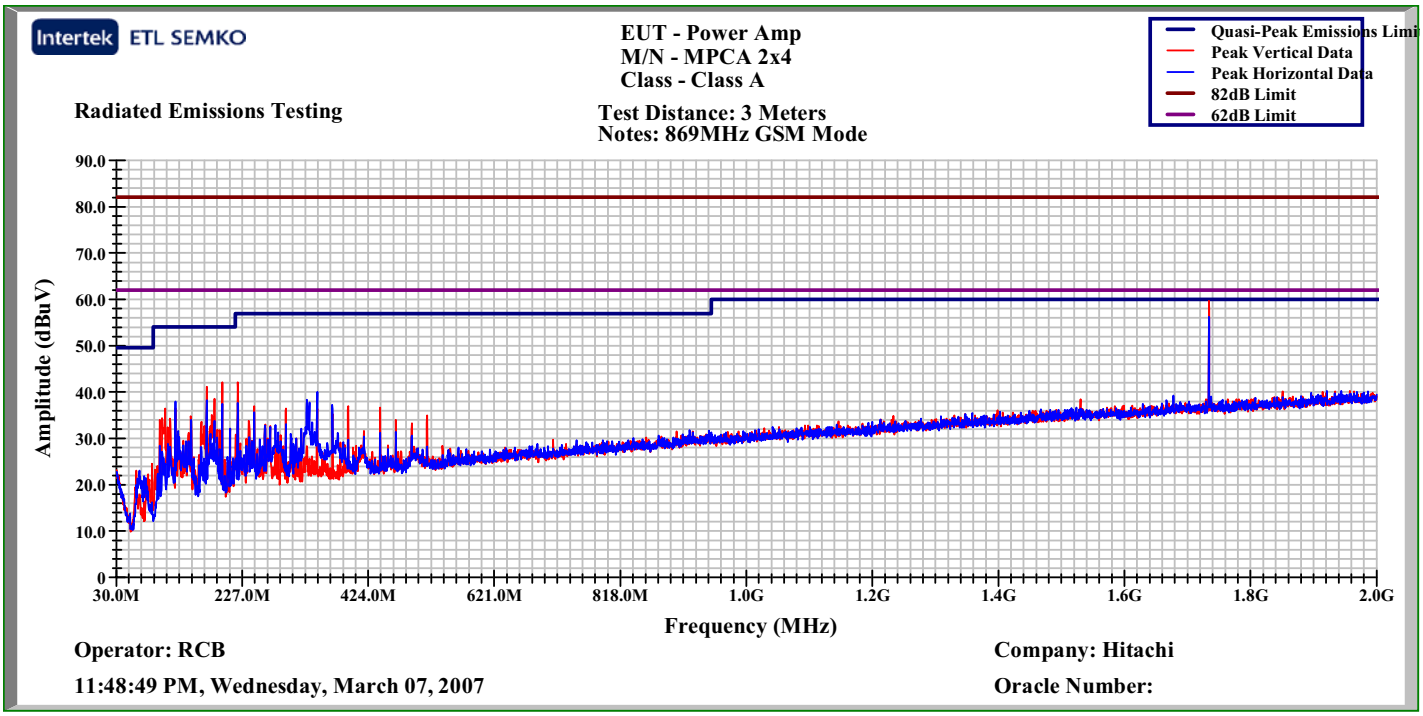
Photo:



Test set up rear

6.0 Radiated emissions (E-field) (Radiated Emissions)

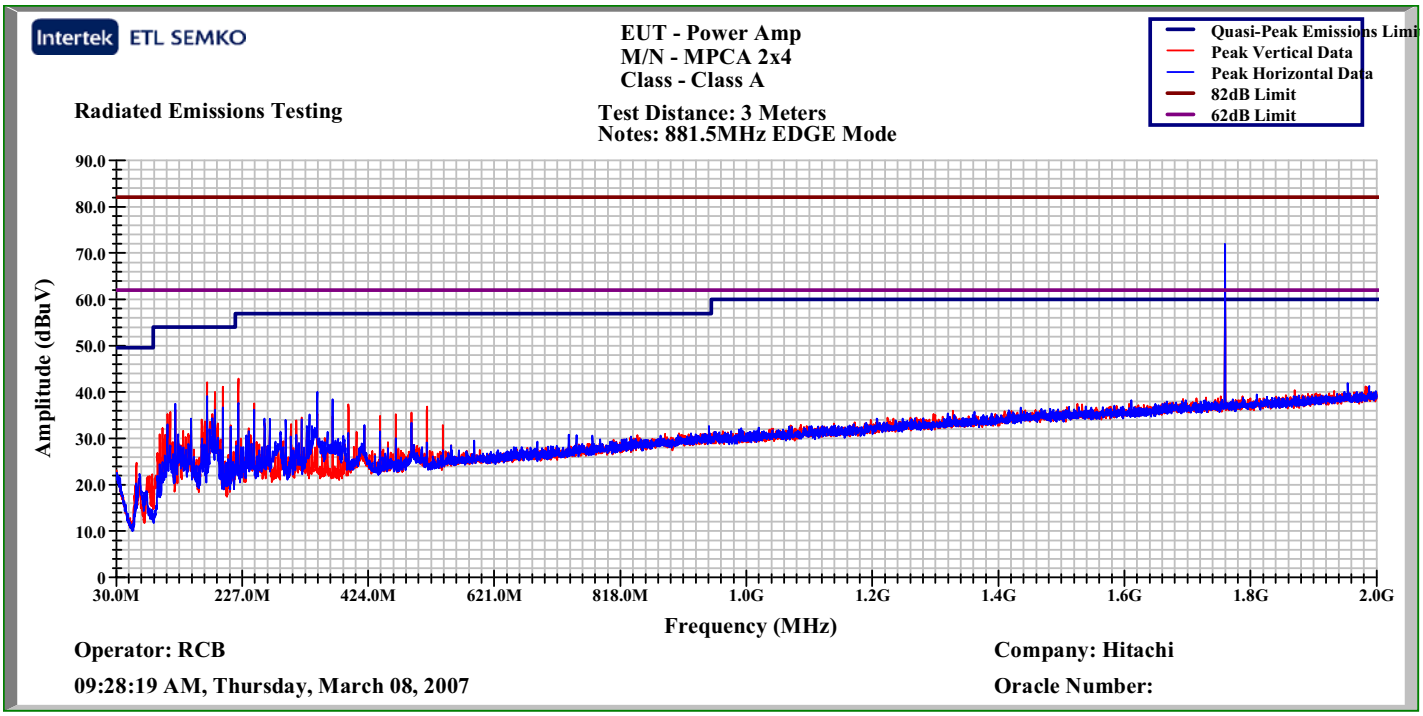
Plot:



Scan plot GSM mode

6.0 Radiated emissions (E-field) (Radiated Emissions)

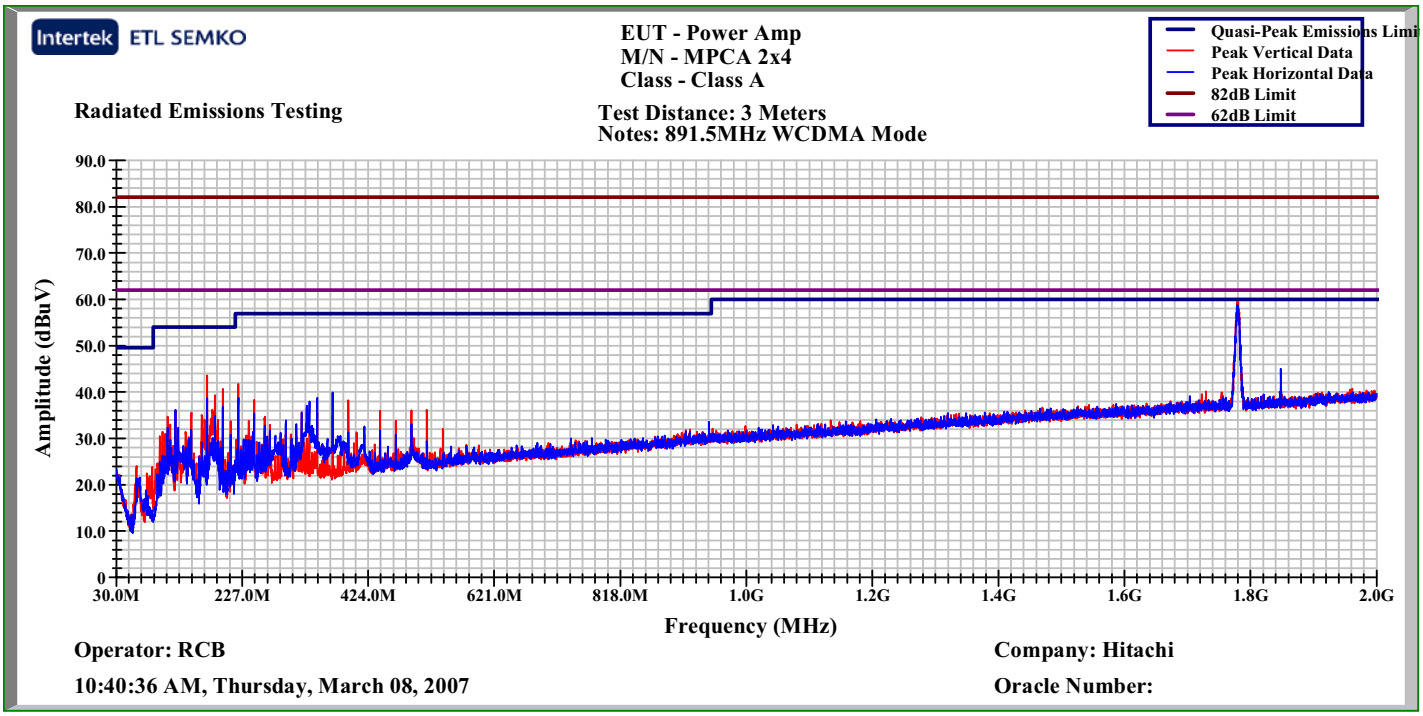
Plot:



Scan plot EDGE mode

6.0 Radiated emissions (E-field) (Radiated Emissions)

Plot:



Scan plot WCDMA mode

6.0 Radiated emissions (E-field) (Radiated Emissions)

Data:

Date: 03/08/2007 **Limit:** FCC15 Class A-3m
Frequency Range (MHz): 30-2000 **Test Distance (m):** 3
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**
869MHz GSM									
V	172.034	57.4	10.7	1.9	27.7	42.3	54.0	-11.7	QP/120k/300k
V	196.615	58.1	10.2	1.9	27.7	42.5	54.0	-11.5	QP/120k/300k
V	221.175	56.6	10.7	2.8	27.6	42.5	56.9	-14.4	QP/120k/300k
881.5MHz EDGE									
V	172.023	57.1	10.7	1.9	27.7	42.0	54.0	-12.0	QP/120k/300k
V	196.600	56.2	10.2	1.9	27.7	40.6	54.0	-13.4	QP/120k/300k
V	221.180	56.8	10.7	2.8	27.6	42.7	56.9	-14.2	QP/120k/300k
891.5MHz CDMA									
V	172.000	56.8	10.7	1.9	27.7	41.7	54.0	-12.3	QP/120k/300k
V	196.615	54.4	10.2	1.9	27.7	38.8	54.0	-15.2	QP/120k/300k
V	221.173	56.7	10.7	2.8	27.6	42.6	56.9	-14.3	QP/120k/300k
Calculations		G=C+D+E-F		I=G-H					

Data 30 to 2000MHz

6.0 Radiated emissions (E-field) (Radiated Emissions)

Data:

Date: 03/08/2007 **Limit:** FCC15 Class A-3m
Frequency Range (GHz): 2 to 10 **Test Distance (m):** 3
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**	
869MHz GSM										
V	2607	27.9	28.7	8.0	26.6	37.9	60.0	-22.1	AV/1M/1.6Hz	NF
V	3476	31.5	30.4	9.9	26.2	45.6	60.0	-14.4	AV/1M/1.6Hz	NF
V	4345	30.6	32.9	11.7	27.3	47.8	60.0	-12.2	AV/1M/1.6Hz	NF
V	5214	30.1	33.9	13.2	27.8	49.5	60.0	-10.5	AV/1M/1.6Hz	NF
881.5MHz EDGE										
V	2644.500	28.4	28.7	8.0	26.6	38.4	60.0	-21.6	AV/1M/1.6Hz	NF
V	3526.000	31.2	31.5	9.9	26.2	46.4	60.0	-13.6	AV/1M/1.6Hz	NF
V	4407.500	30.5	32.9	11.7	27.3	47.7	60.0	-12.3	AV/1M/1.6Hz	NF
V	5289.000	30.2	33.9	13.2	27.8	49.6	60.0	-10.4	AV/1M/1.6Hz	NF
891.5MHz CDMA										
V	2674.500	28.1	28.7	8.0	26.6	38.1	60.0	-21.9	AV/1M/1.6Hz	NF
V	3556.000	31.4	31.5	9.9	26.8	46.0	60.0	-14.0	AV/1M/1.6Hz	NF
V	4457.500	30.5	32.9	11.7	27.3	47.7	60.0	-12.3	AV/1M/1.6Hz	NF
V	5349.000	30.1	33.9	13.2	27.8	49.5	60.0	-10.5	AV/1M/1.6Hz	NF
Calculations		G=C+D+E-F		I=G-H						

NF Denotes Noise Floor Measurement

Data 2 to 20 GHz

7.0 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 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.

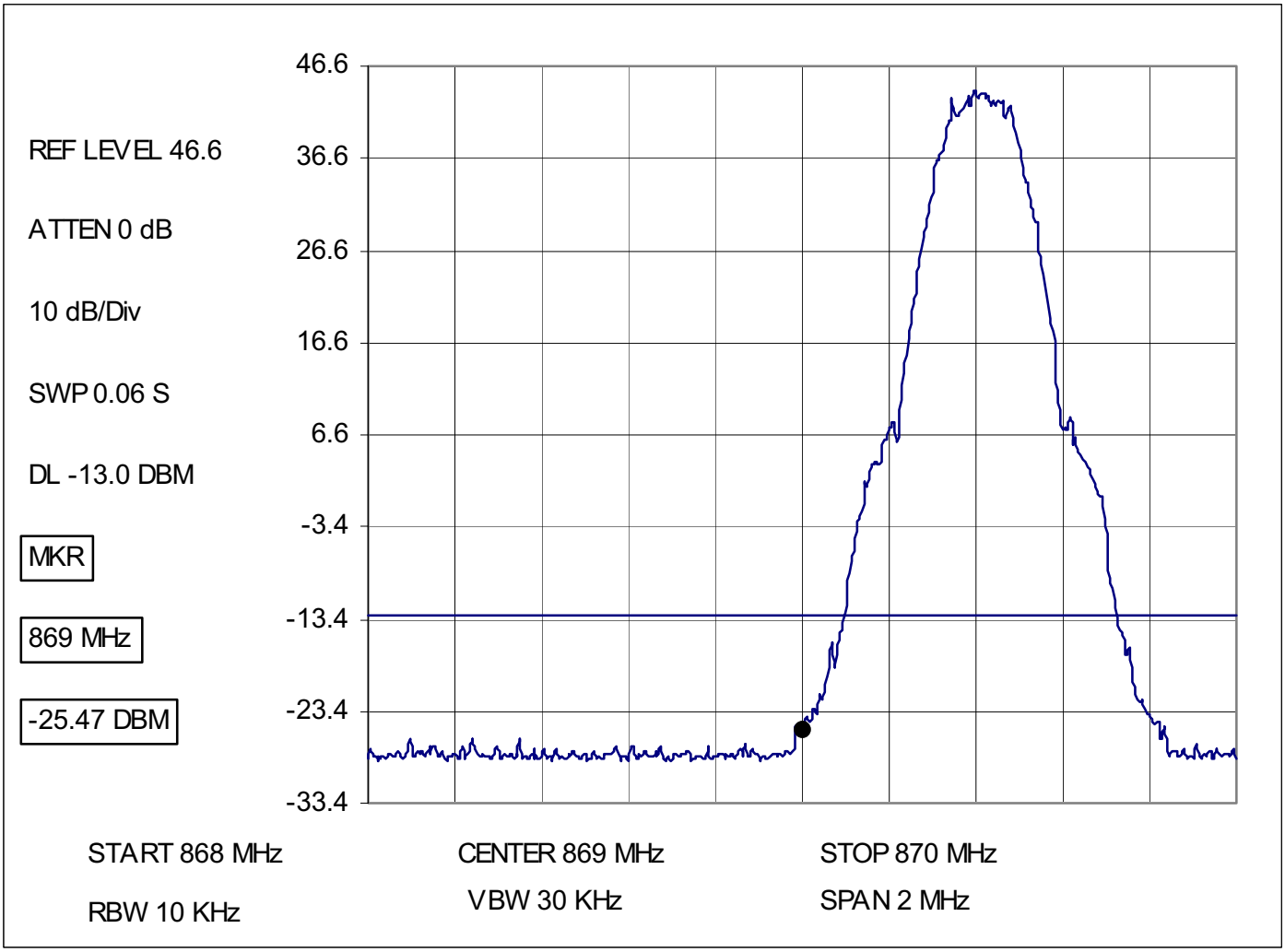
Test Equipment Used:

Description:	Manufacturer:	Model:	Asset Number:	Cal Date:	Cal Due:
Attenuator, 10 dB	Weinschel Corp	2	200009	07/18/2006	07/18/2007
Attenuator, 10 dB, 1000 Watt	JFW Industries, Inc	40FHAM-010-1000	200073	03/07/2007	03/07/2008
Attenuator, 10 dB, 150 Watt, <18GHz	Weinschel Corp	66-10-33	211683	03/14/2007	03/14/2008
Attenuator, 40 dB	Weinschel Corp	48-40-34	200021	07/18/2006	07/18/2007
Cable E11 (Formerly HS 7000 N-SMA)	Huber-Suhner	Sucoflex 104PEA	E11 211266	05/11/2006	05/11/2007
Cable, 18 GHz, N, 118 inches	Megaphase	TM18 NKNK 118	E202	01/15/2007	01/15/2008
Filter, Band Reject, Cavity Design, 80 dB	Wainwright Inst.	WRCG 869/894	200078	12/08/2006	12/08/2007
High Pass Filter, 1 GHz	Filtek	HP12/1000-5AB	213156a	03/14/2007	03/14/2008
Spectrum Analyzer	Hewlett Packard	8593E	213180	04/18/2006	04/18/2007

Results: The sample tested was found to Comply.

7.0 Spurious emissions at antenna terminals (FCC Part 2.1051)

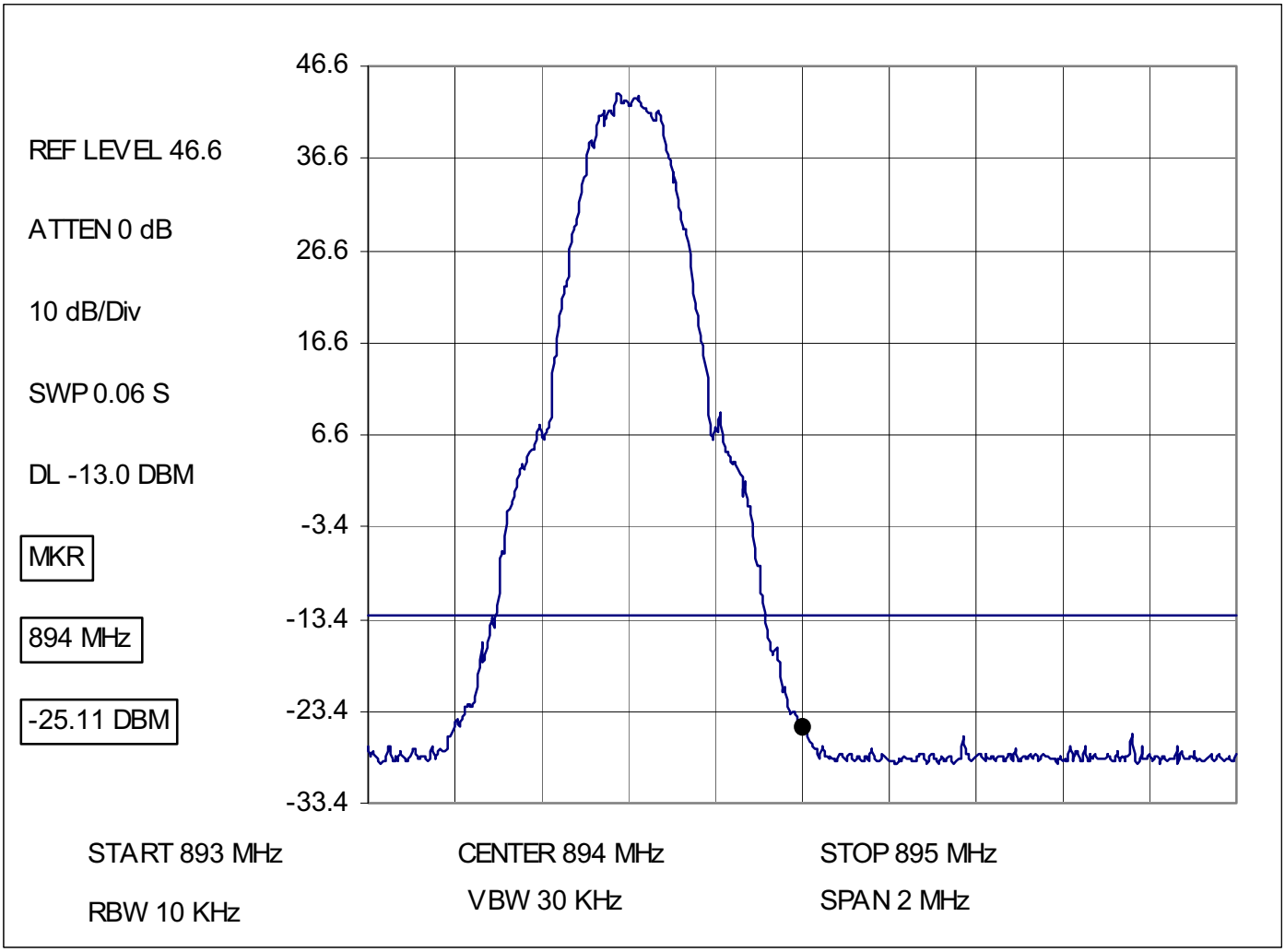
Drawing:



Bandedge GSM Lo Frequency

7.0 Spurious emissions at antenna terminals (FCC Part 2.1051)

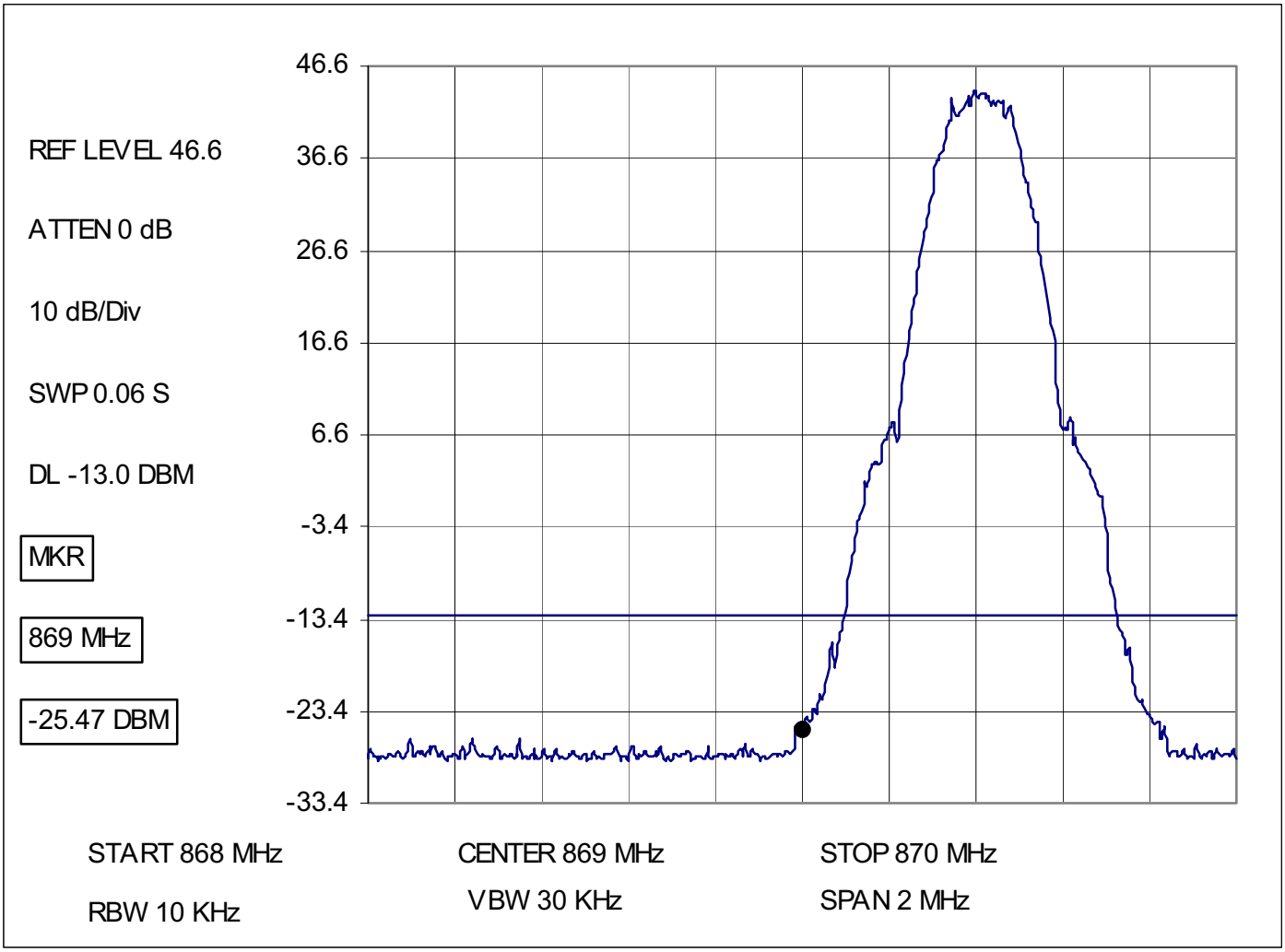
Drawing:



Bandedge GSM Hi Frequency

7.0 Spurious emissions at antenna terminals (FCC Part 2.1051)

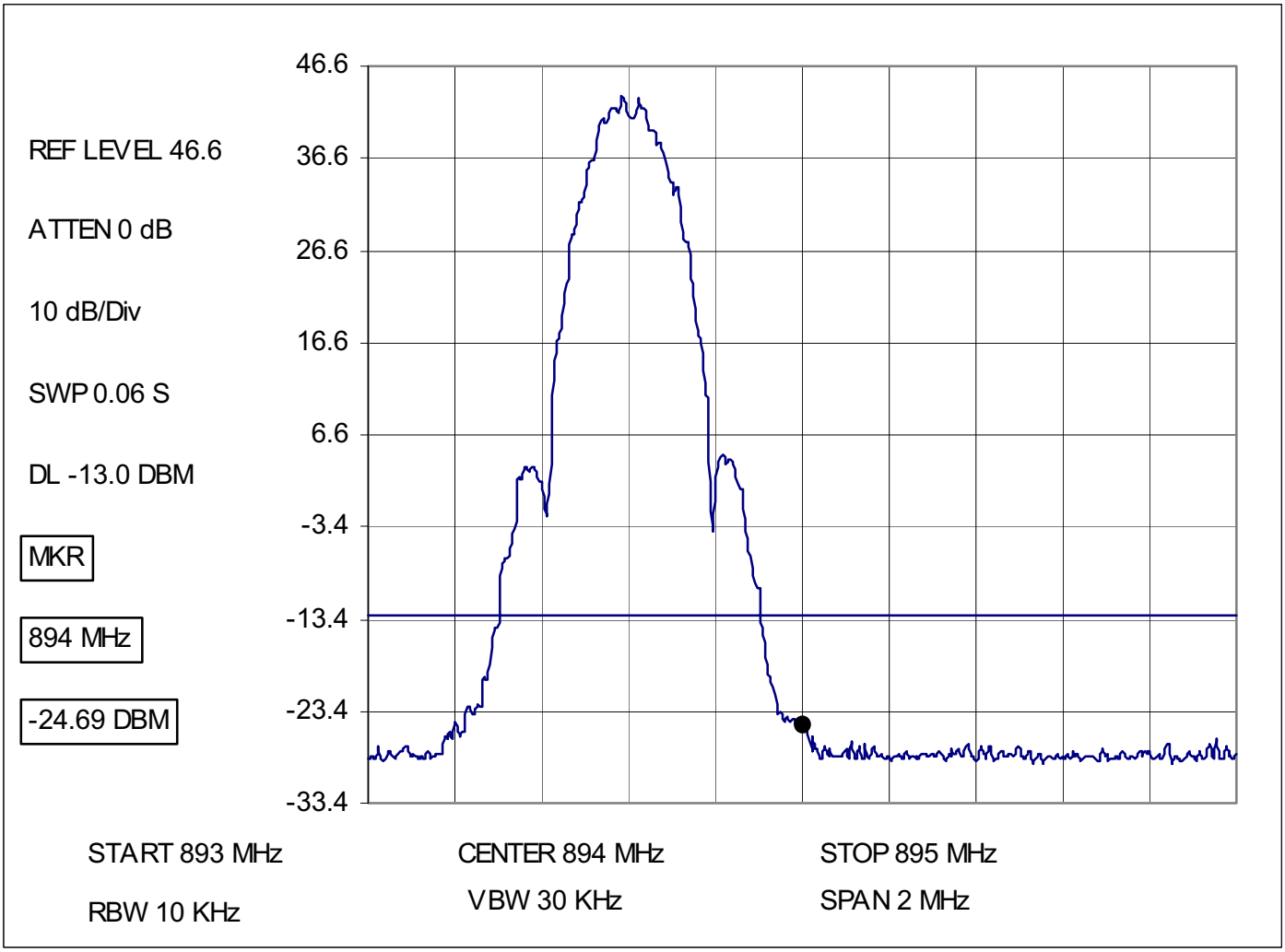
Drawing:



Bandedge GSM Edge Lo Frequency

7.0 Spurious emissions at antenna terminals (FCC Part 2.1051)

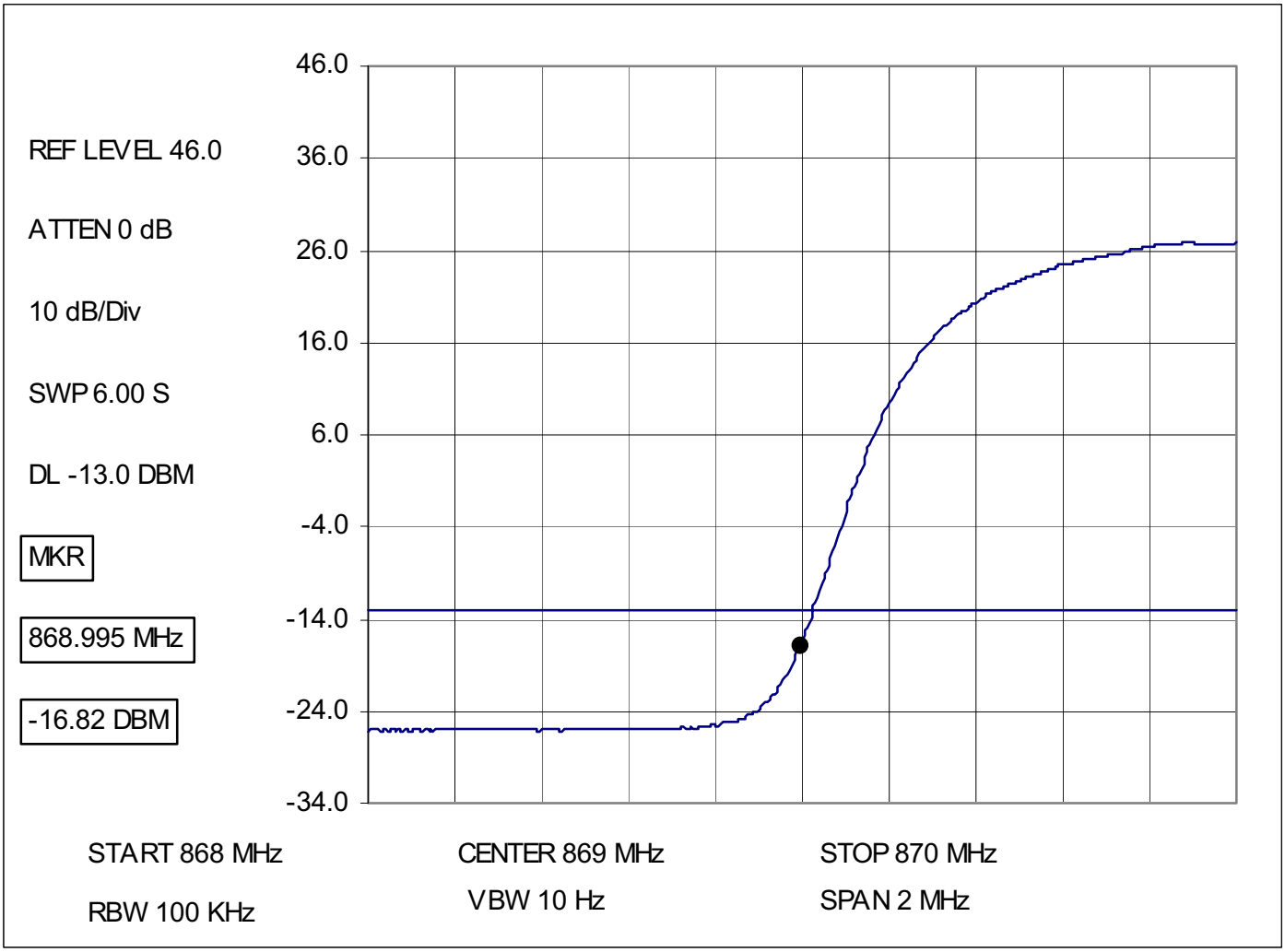
Drawing:



Bandedge GSM Edge Hi Frequency

7.0 Spurious emissions at antenna terminals (FCC Part 2.1051)

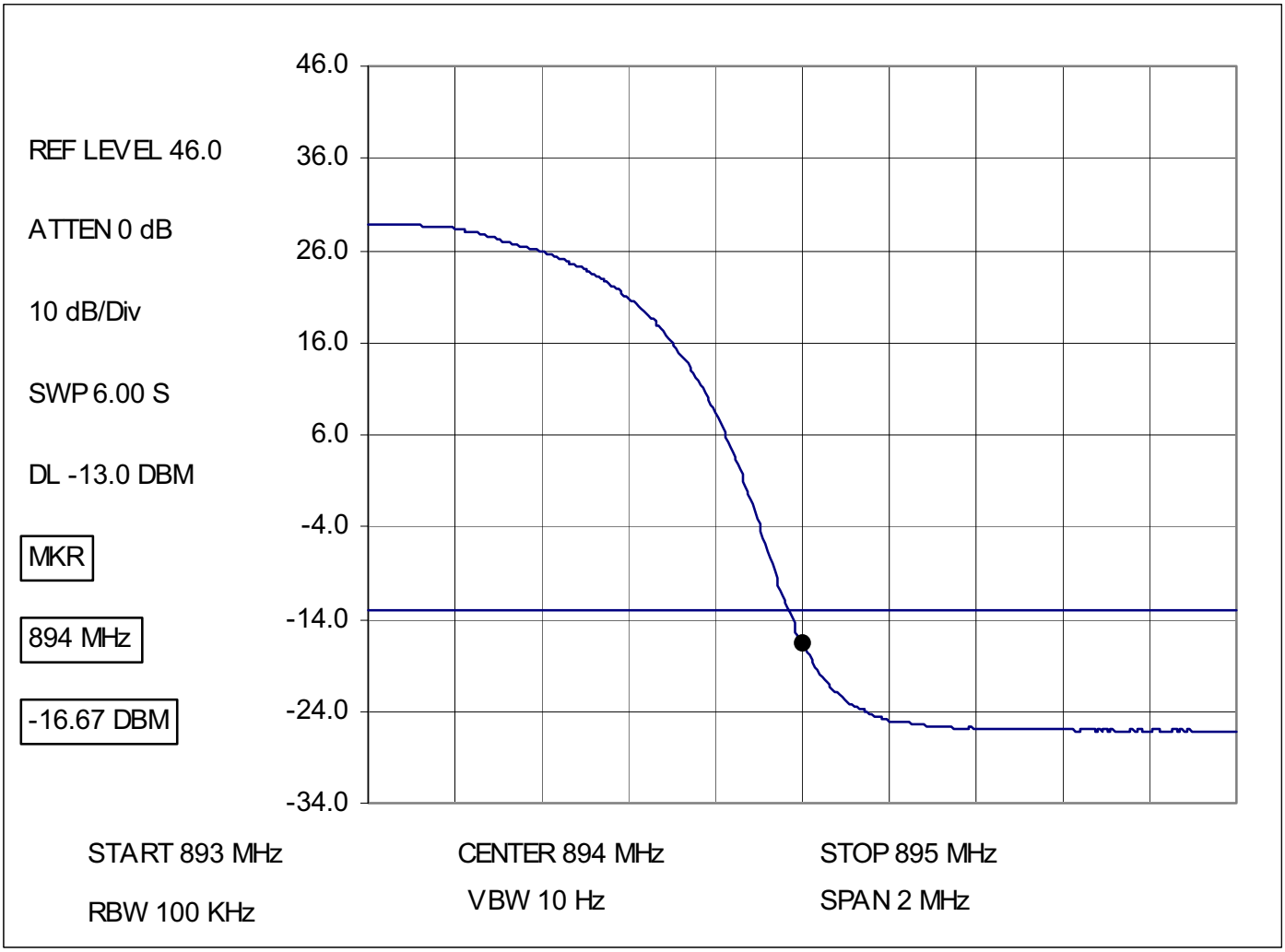
Drawing:



Bandedge WCDMA Lo Frequency

7.0 Spurious emissions at antenna terminals (FCC Part 2.1051)

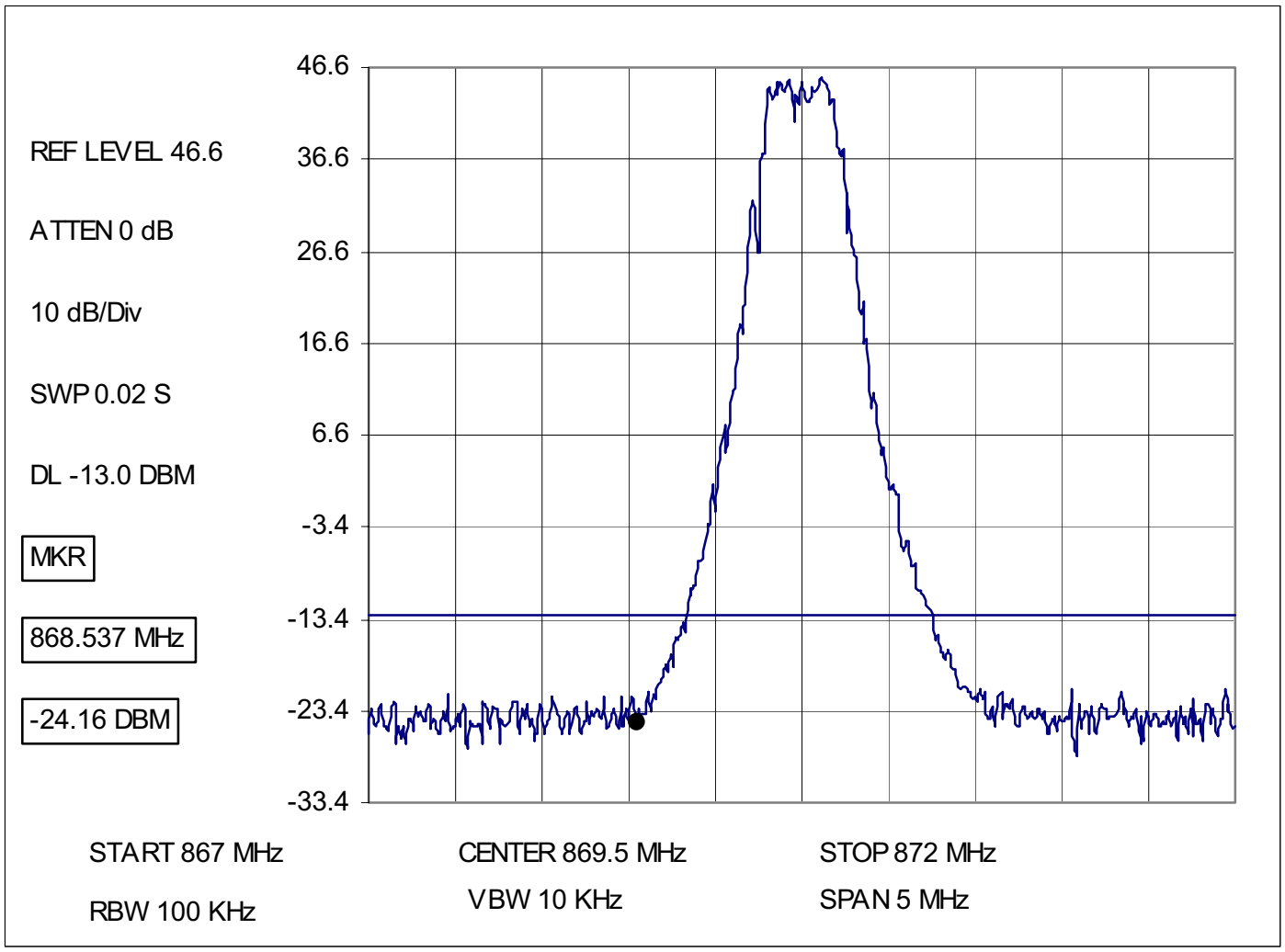
Drawing:



Bandedge WCDMA Hi Frequency

7.0 Spurious emissions at antenna terminals (FCC Part 2.1051)

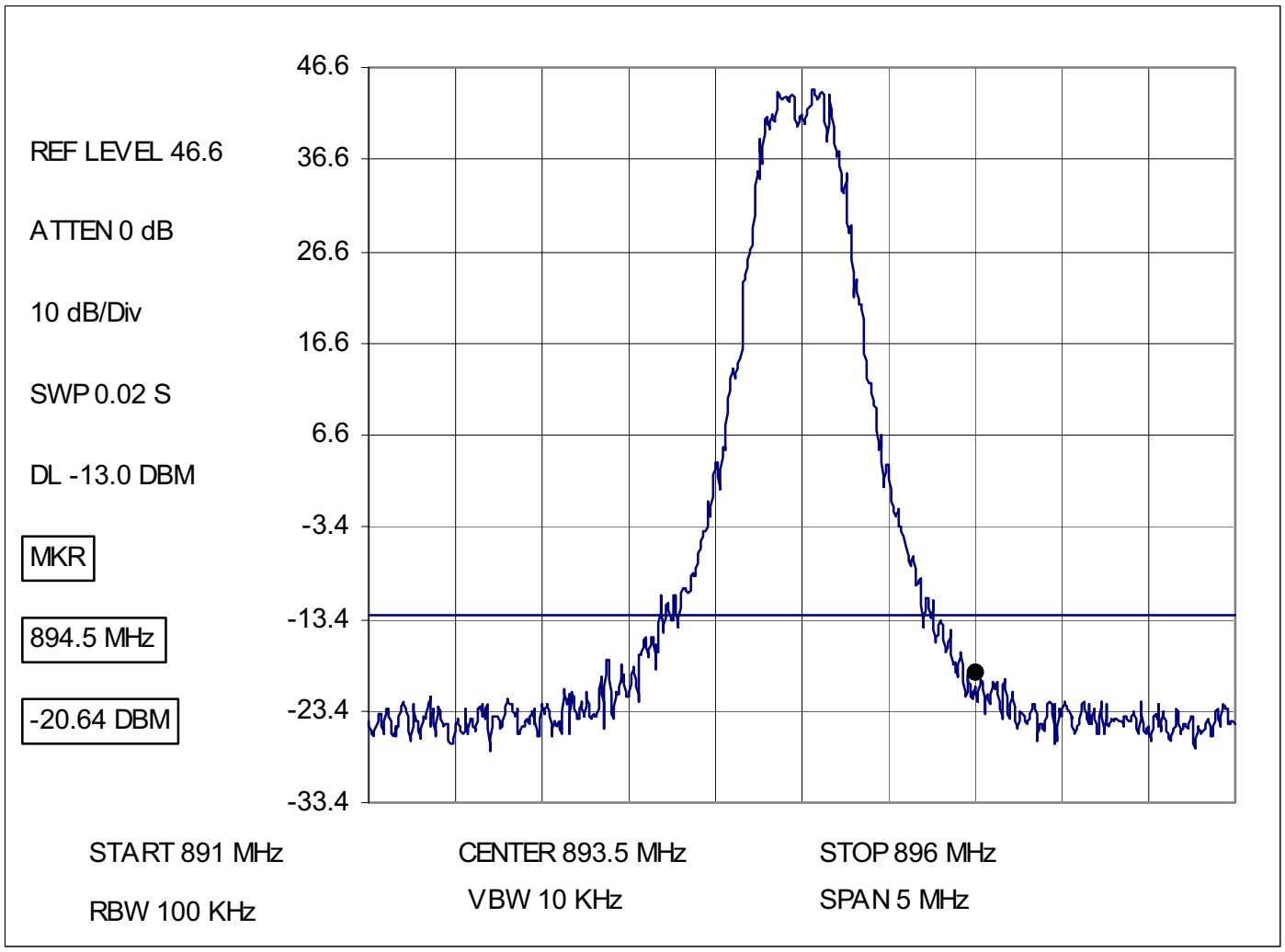
Drawing:



Intermod GSM 2 carriers Lo/Lo

7.0 Spurious emissions at antenna terminals (FCC Part 2.1051)

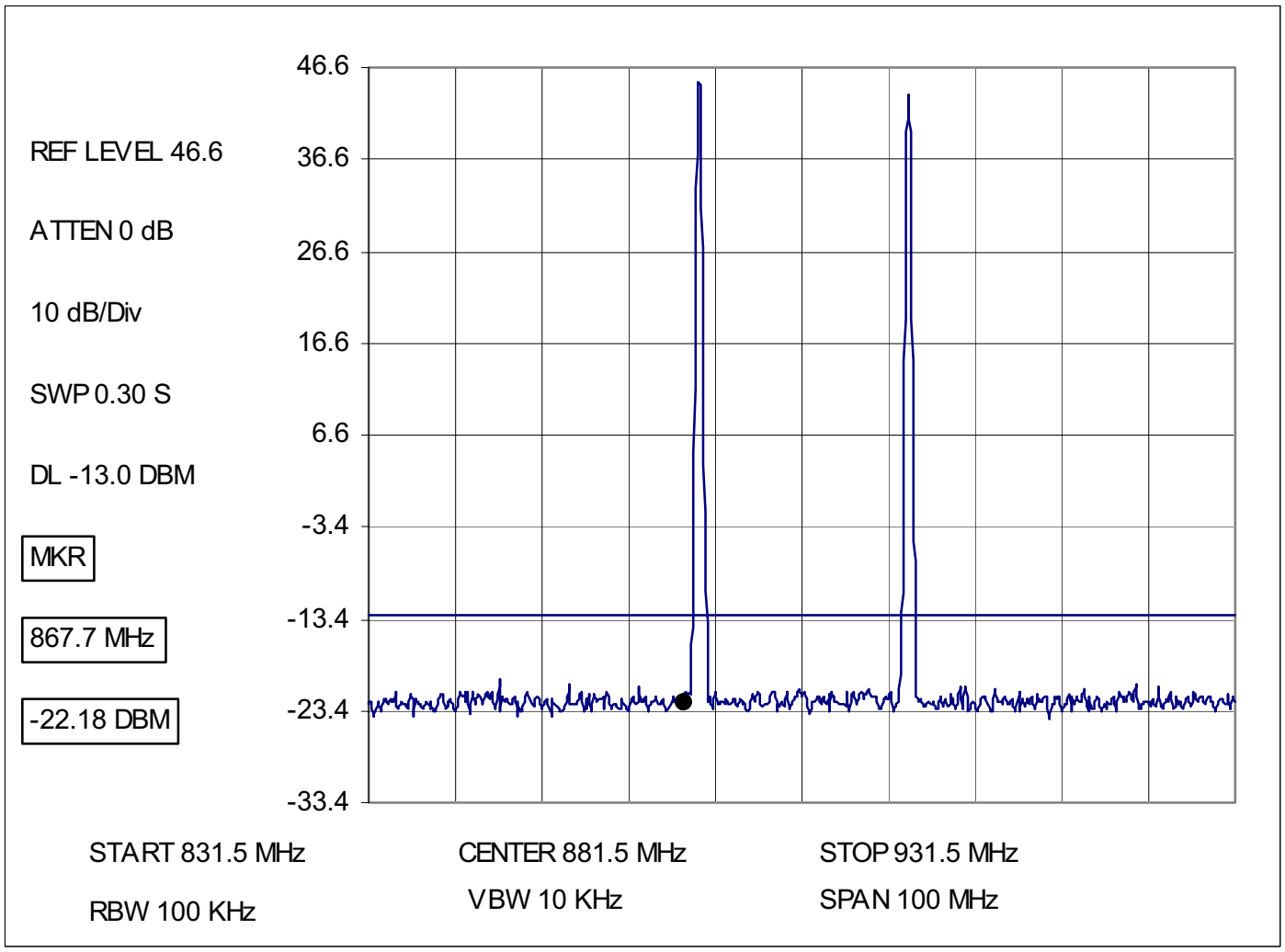
Drawing:



Intermod GSM 2 carriers Hi/Hi

7.0 Spurious emissions at antenna terminals (FCC Part 2.1051)

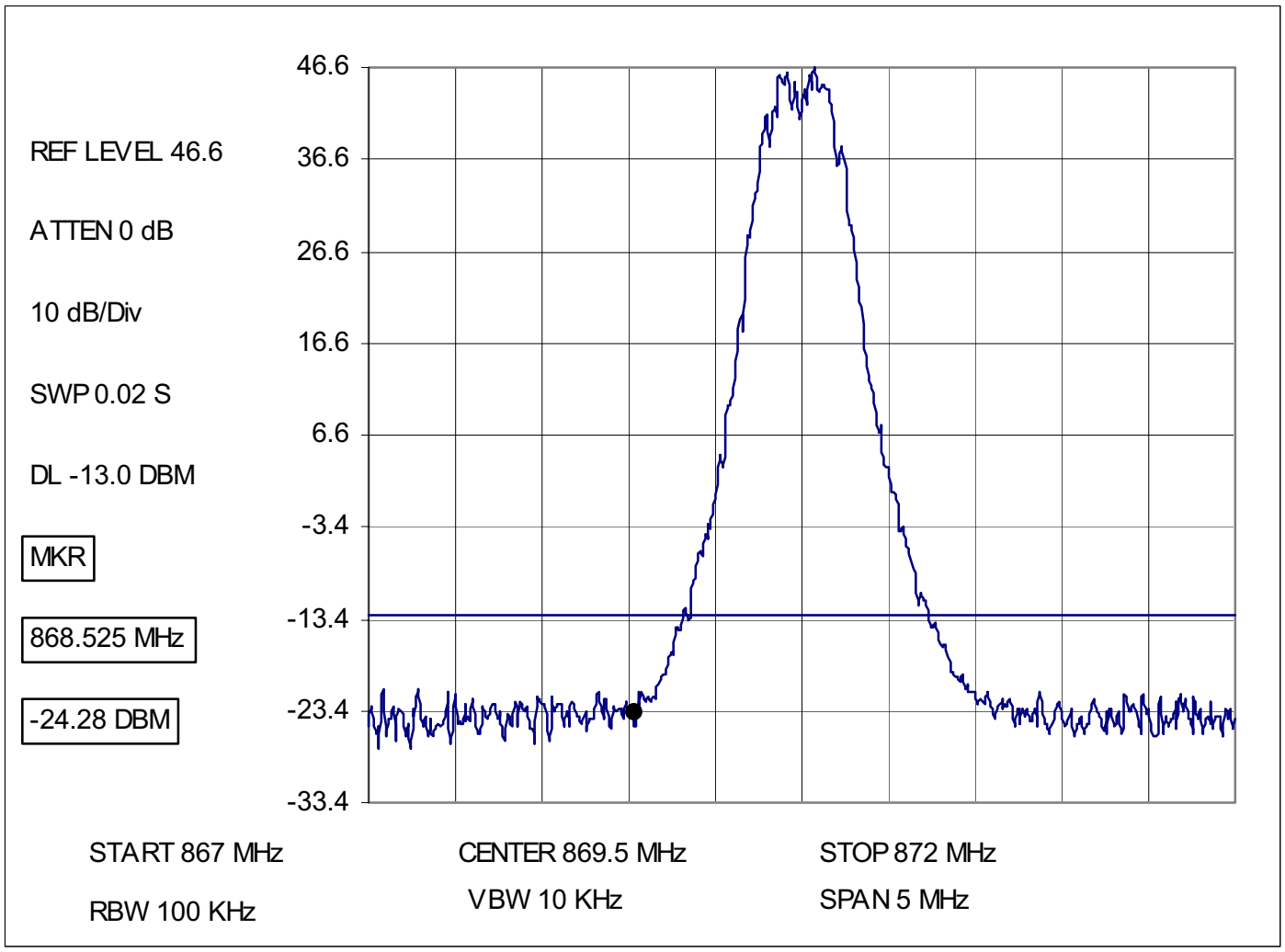
Drawing:



Intermod GSM 2 carriers Lo/Hi

7.0 Spurious emissions at antenna terminals (FCC Part 2.1051)

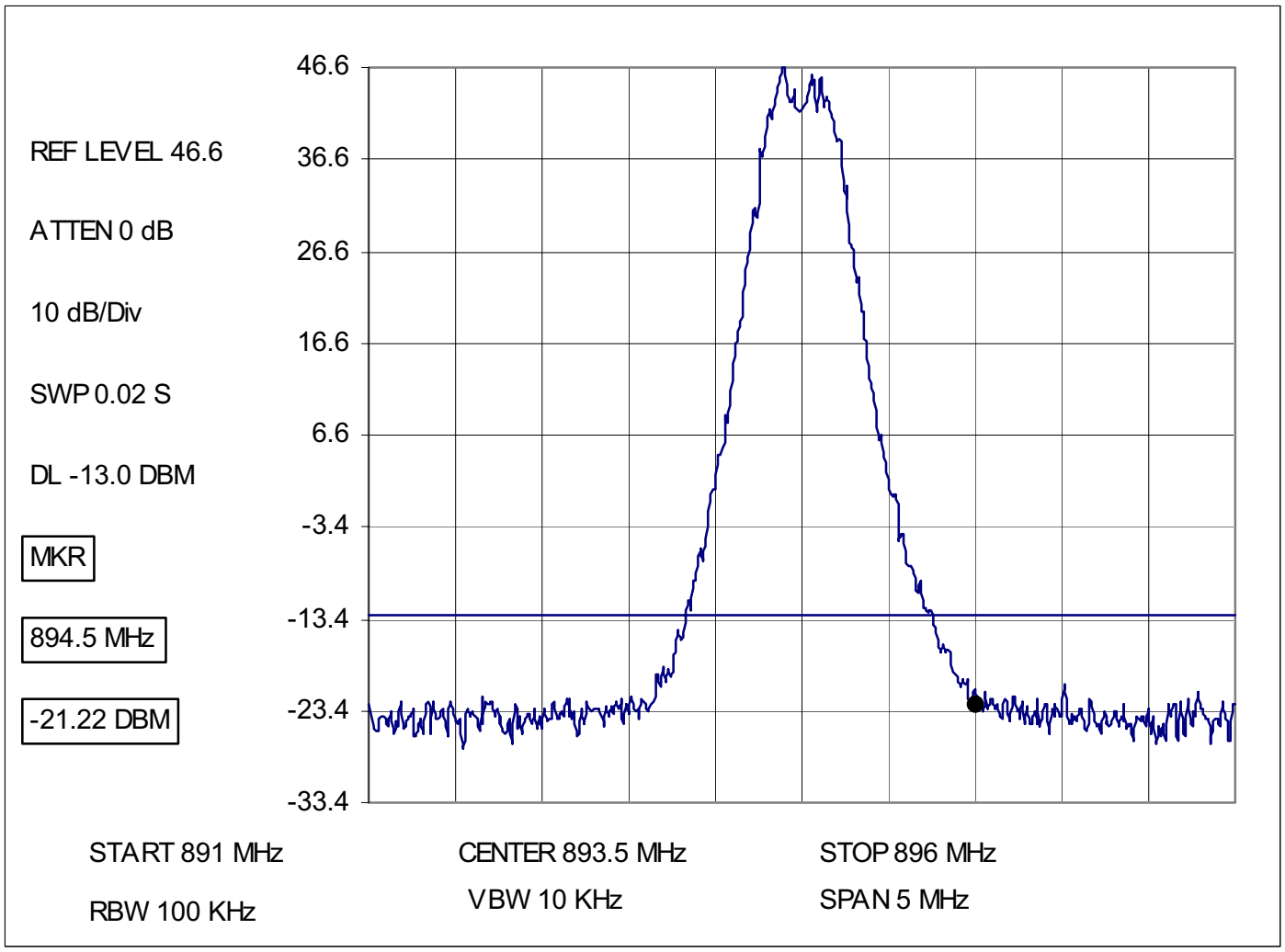
Drawing:



Intermod GSM Edge 2 carriers Lo/Lo

7.0 Spurious emissions at antenna terminals (FCC Part 2.1051)

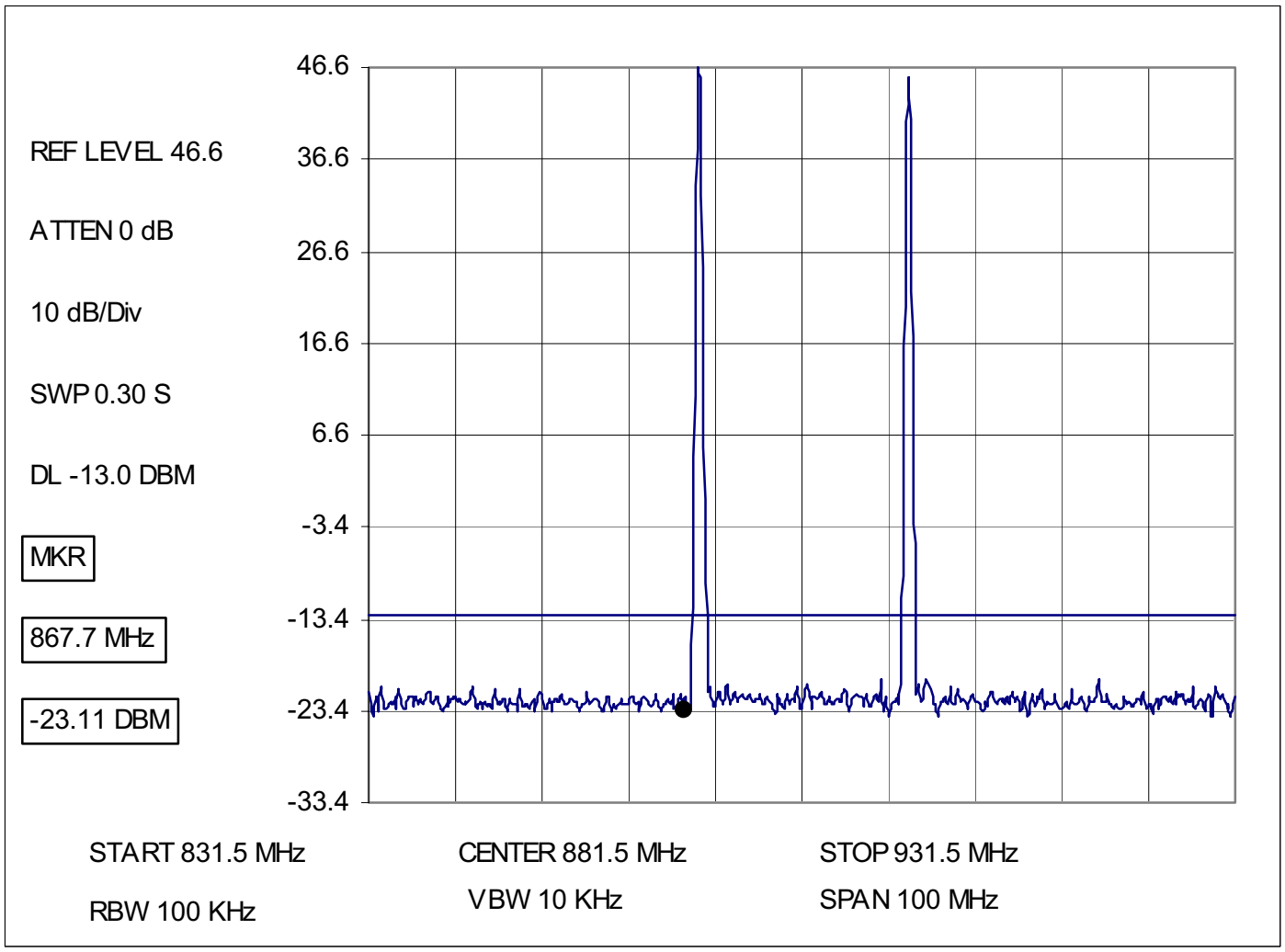
Drawing:



Intermod GSM Edge 2 carriers Hi/Hi

7.0 Spurious emissions at antenna terminals (FCC Part 2.1051)

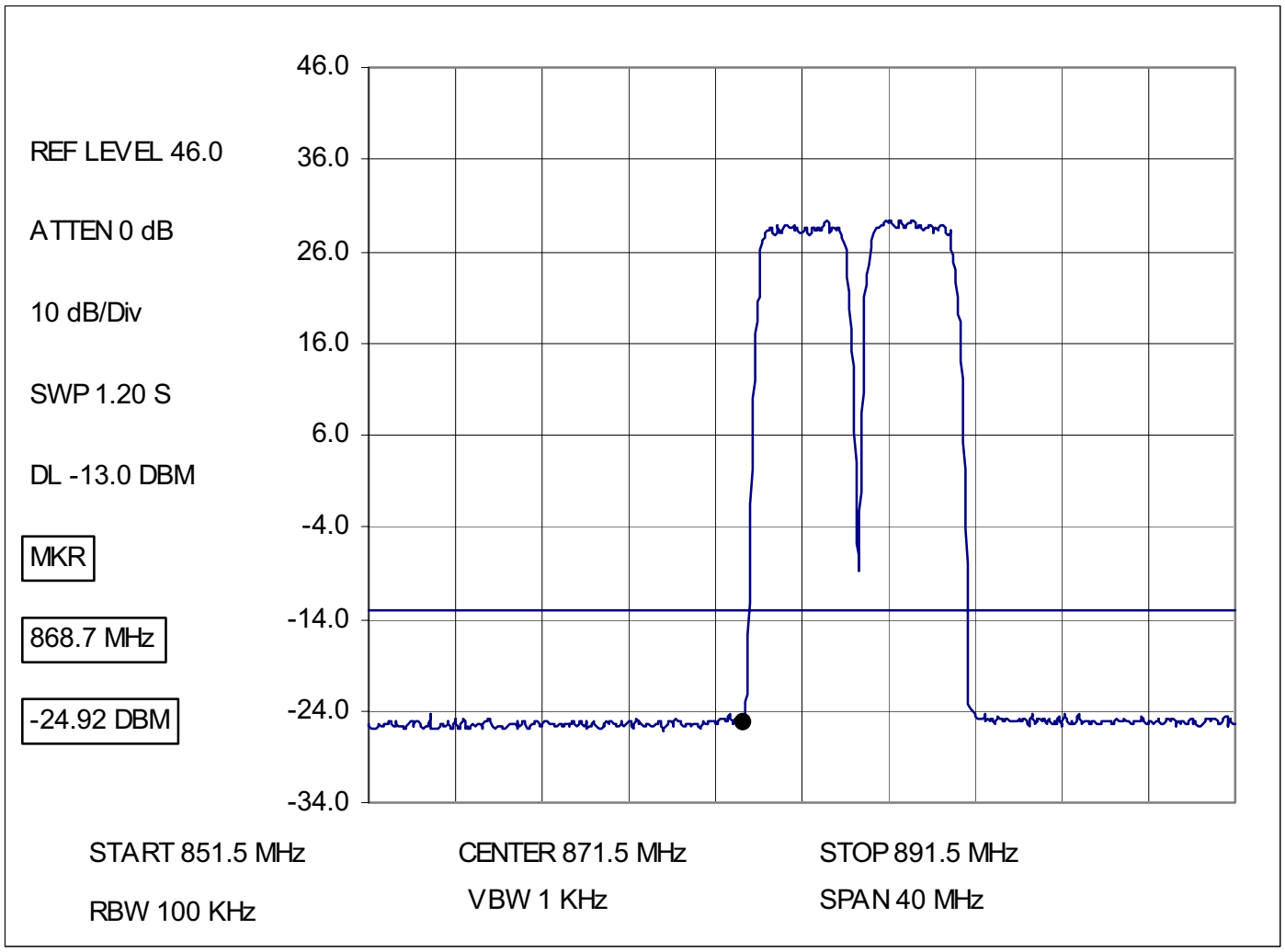
Drawing:



Intermod GSM Edge 2 carriers Lo/Hi

7.0 Spurious emissions at antenna terminals (FCC Part 2.1051)

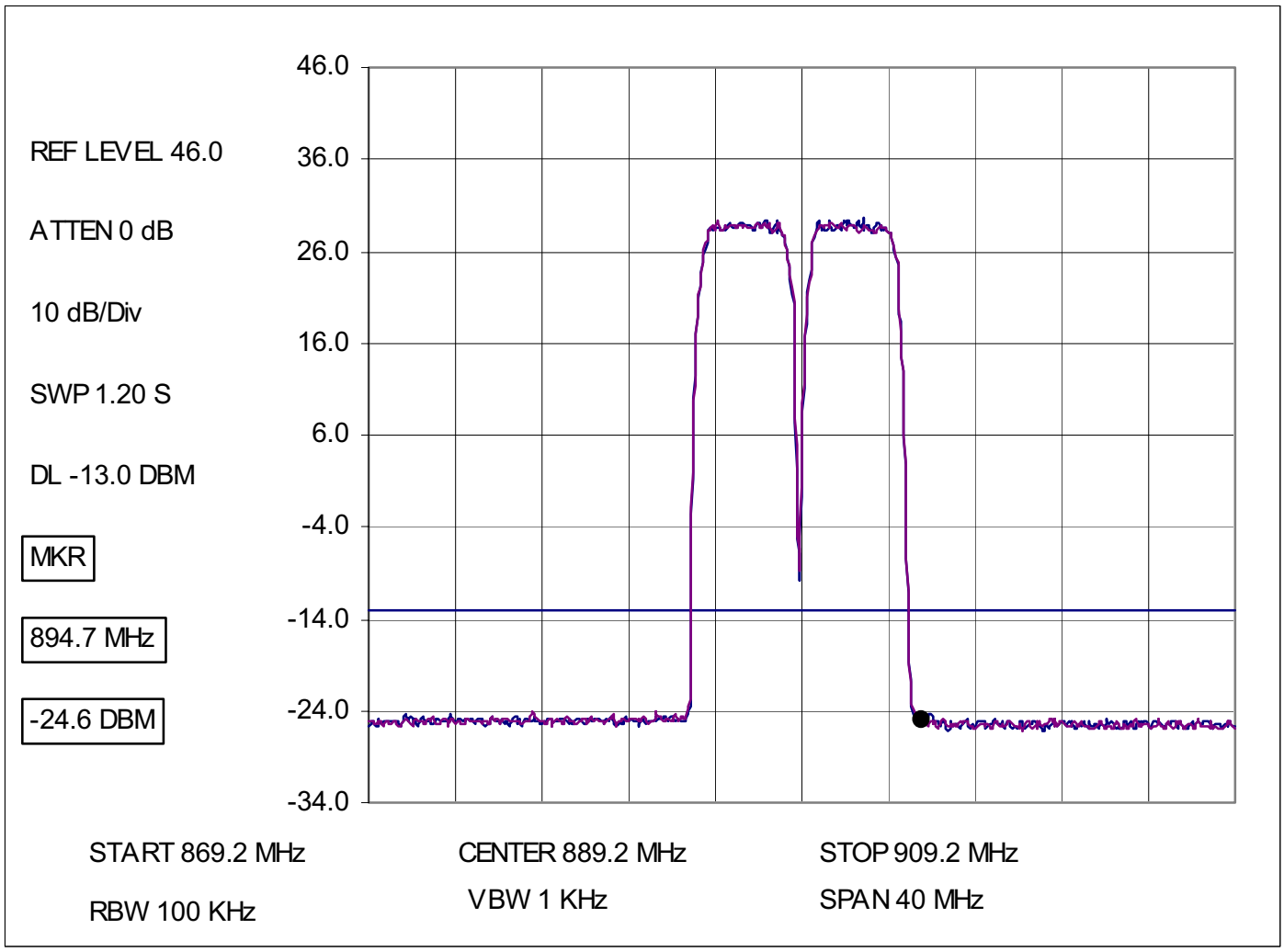
Drawing:



Intermod WCDMA 2 carriers Lo/Lo Average

7.0 Spurious emissions at antenna terminals (FCC Part 2.1051)

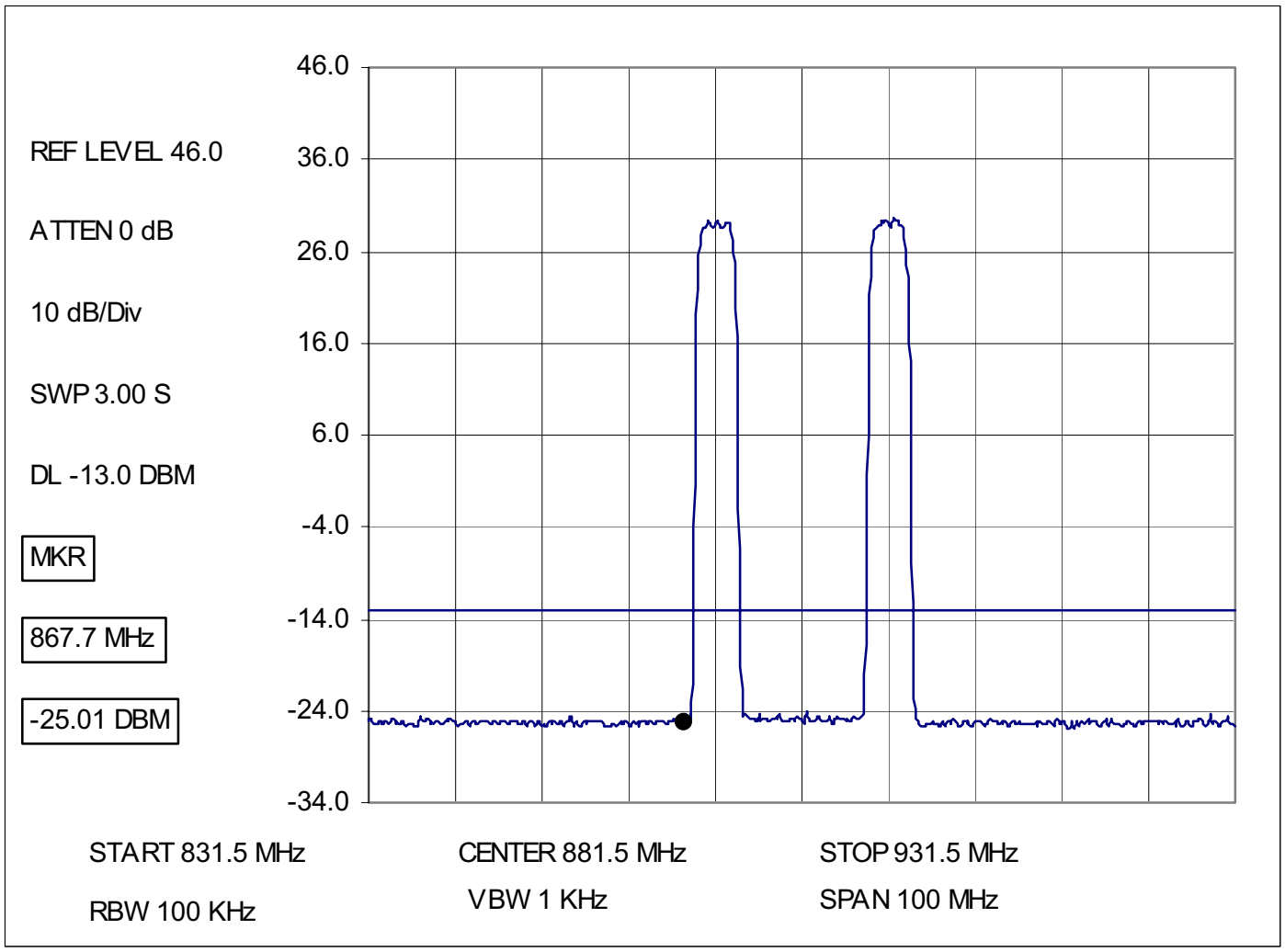
Drawing:



Intermod WCDMA 2 carriers Hi/Hi Average trace

7.0 Spurious emissions at antenna terminals (FCC Part 2.1051)

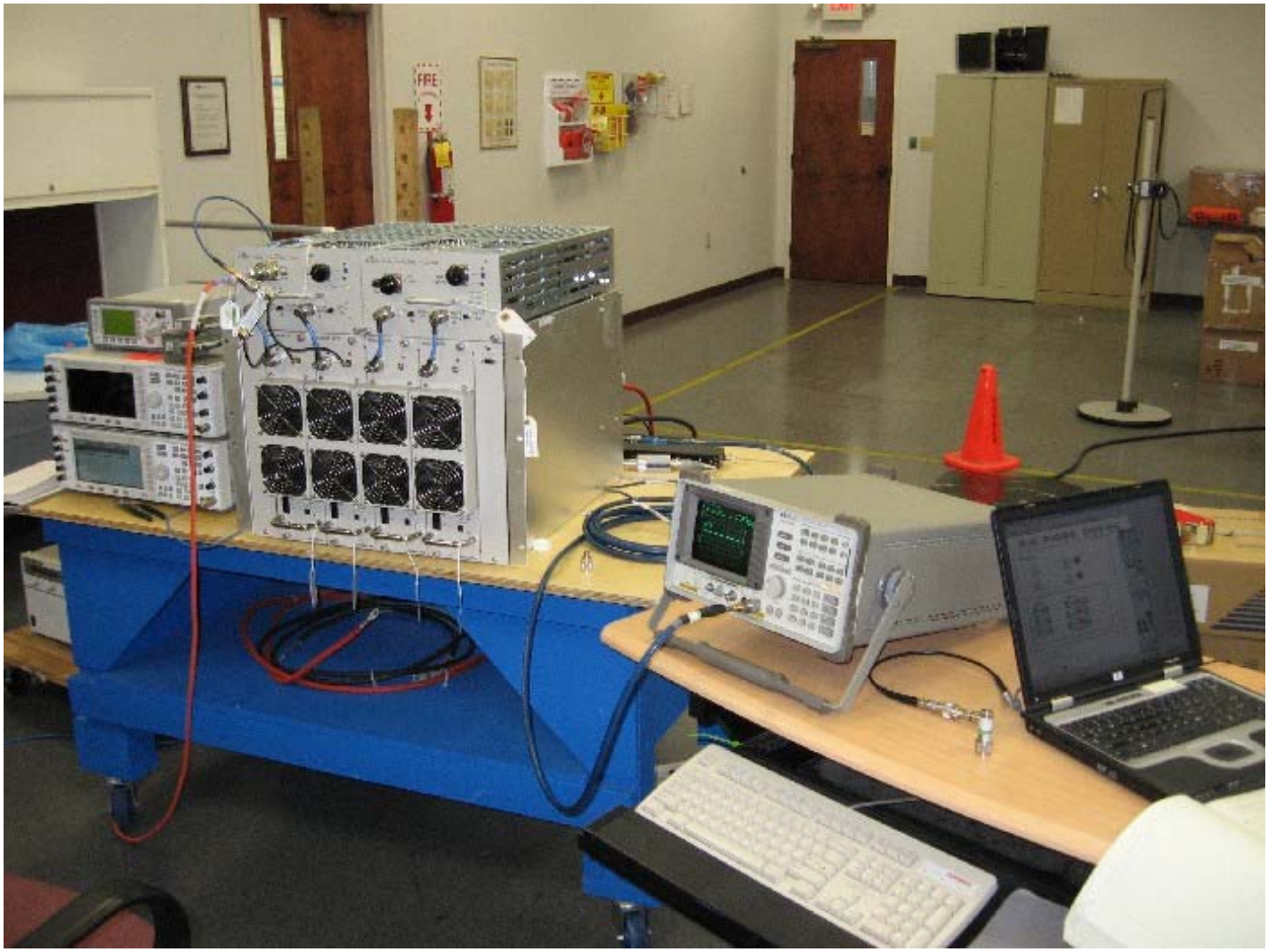
Drawing:



Intermod WCDMA 2 carriers Lo/Hi

7.0 Spurious emissions at antenna terminals (FCC Part 2.1051)

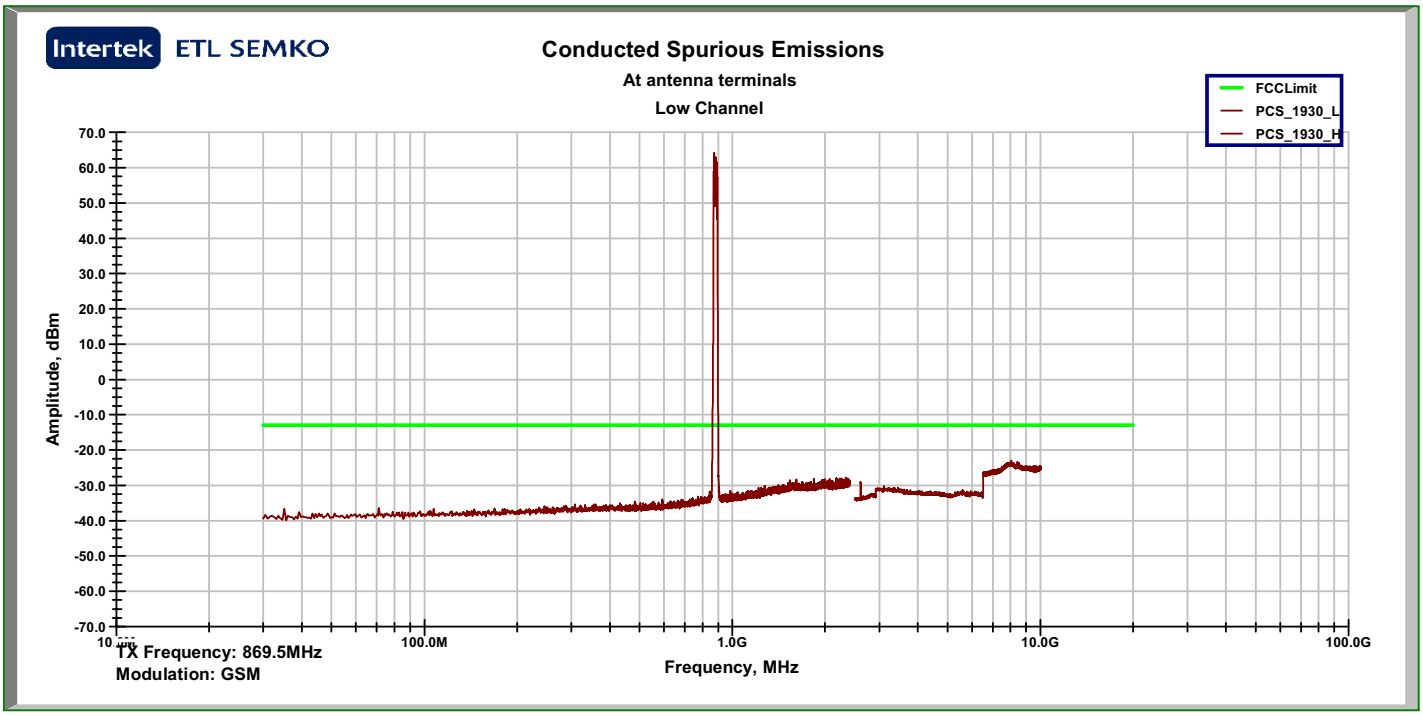
Photo:



Test set up front

7.0 Spurious emissions at antenna terminals (FCC Part 2.1051)

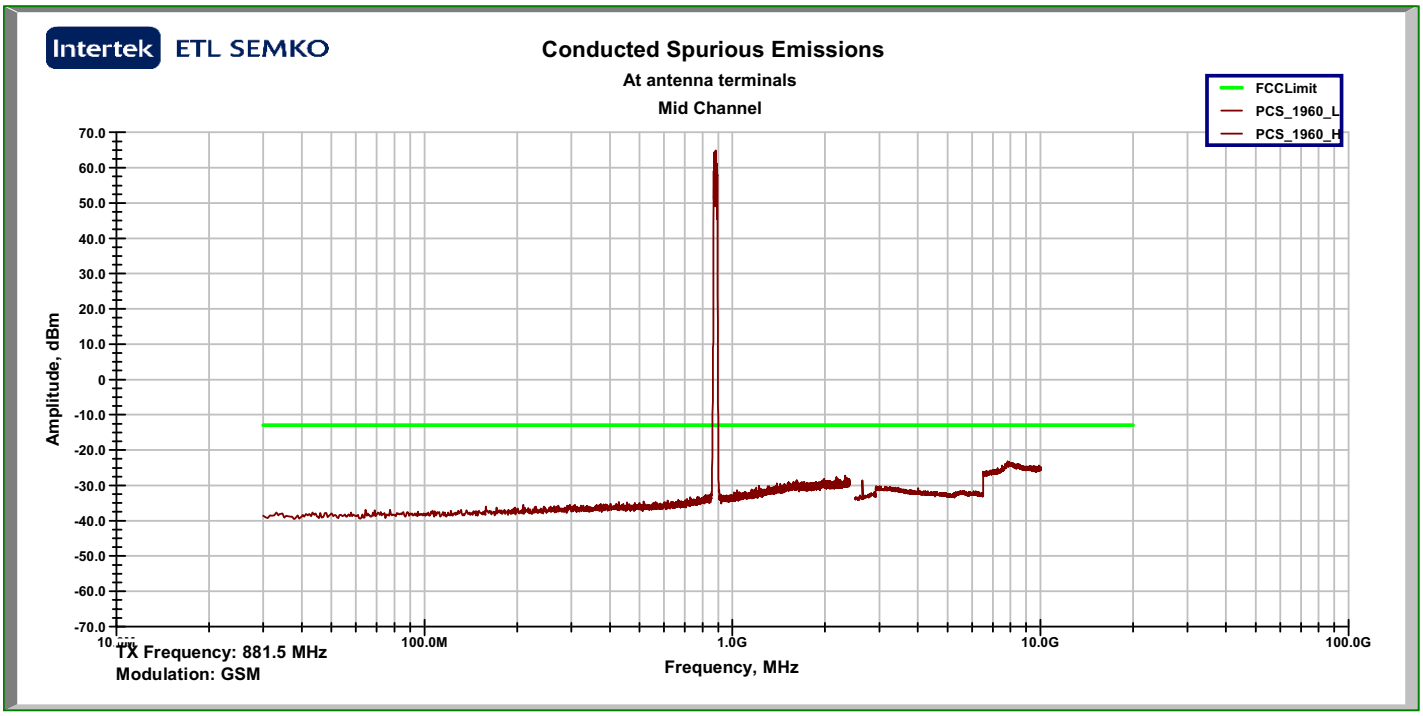
Plot:



GSM Lo Frequency

7.0 Spurious emissions at antenna terminals (FCC Part 2.1051)

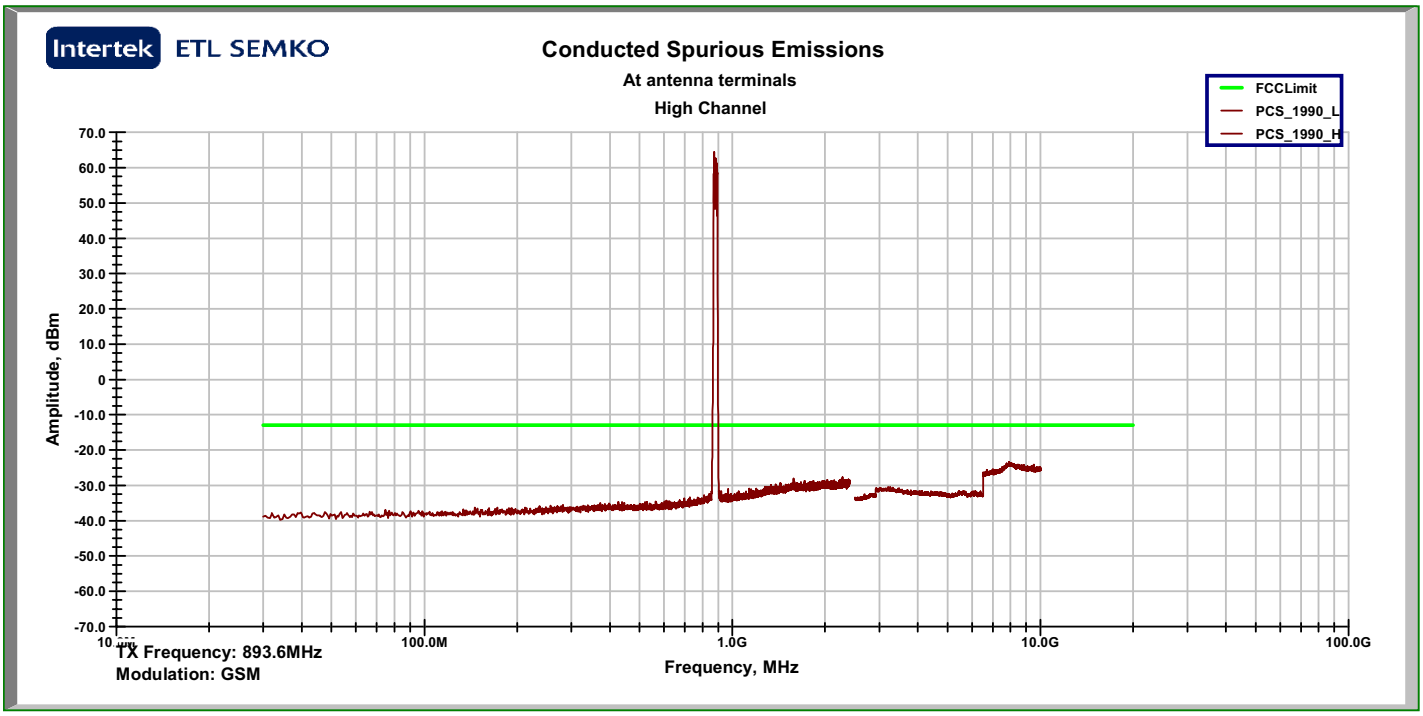
Plot:



GSM Mid Frquency

7.0 Spurious emissions at antenna terminals (FCC Part 2.1051)

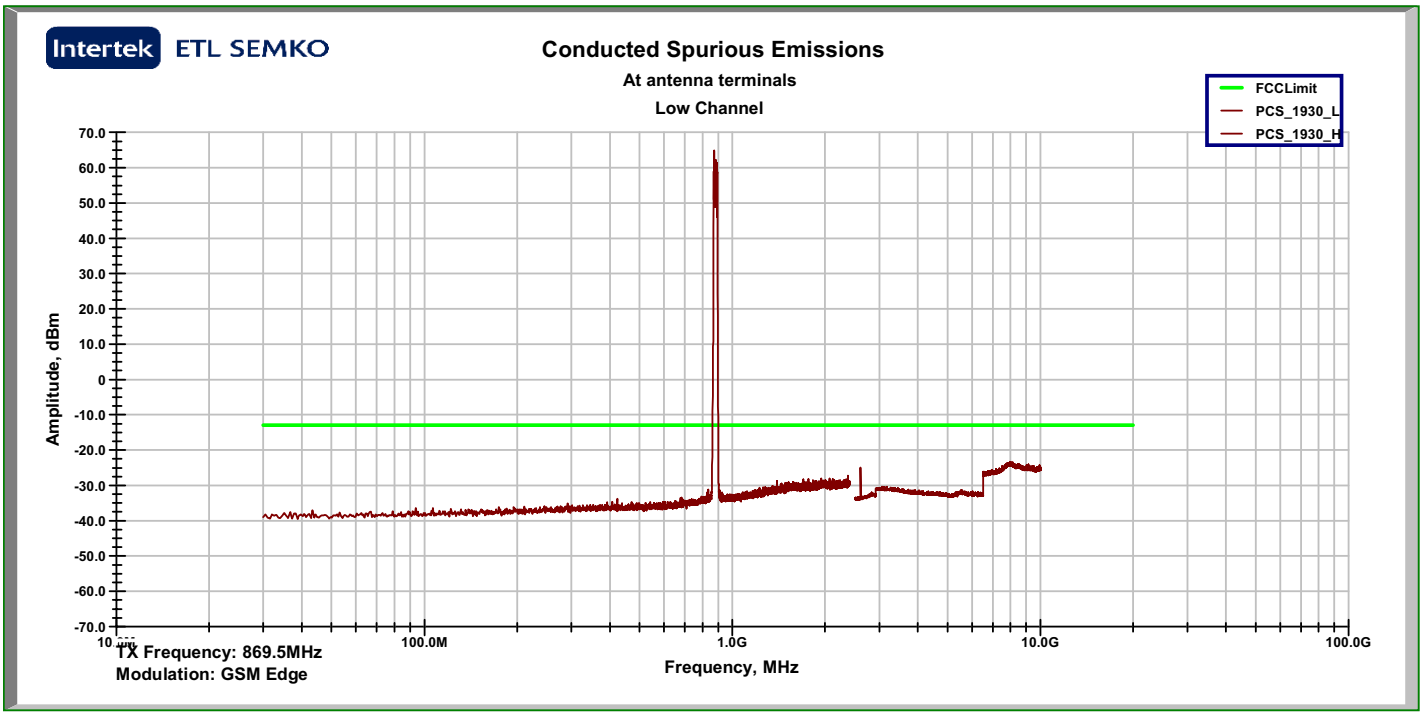
Plot:



GSM Hi Frequency

7.0 Spurious emissions at antenna terminals (FCC Part 2.1051)

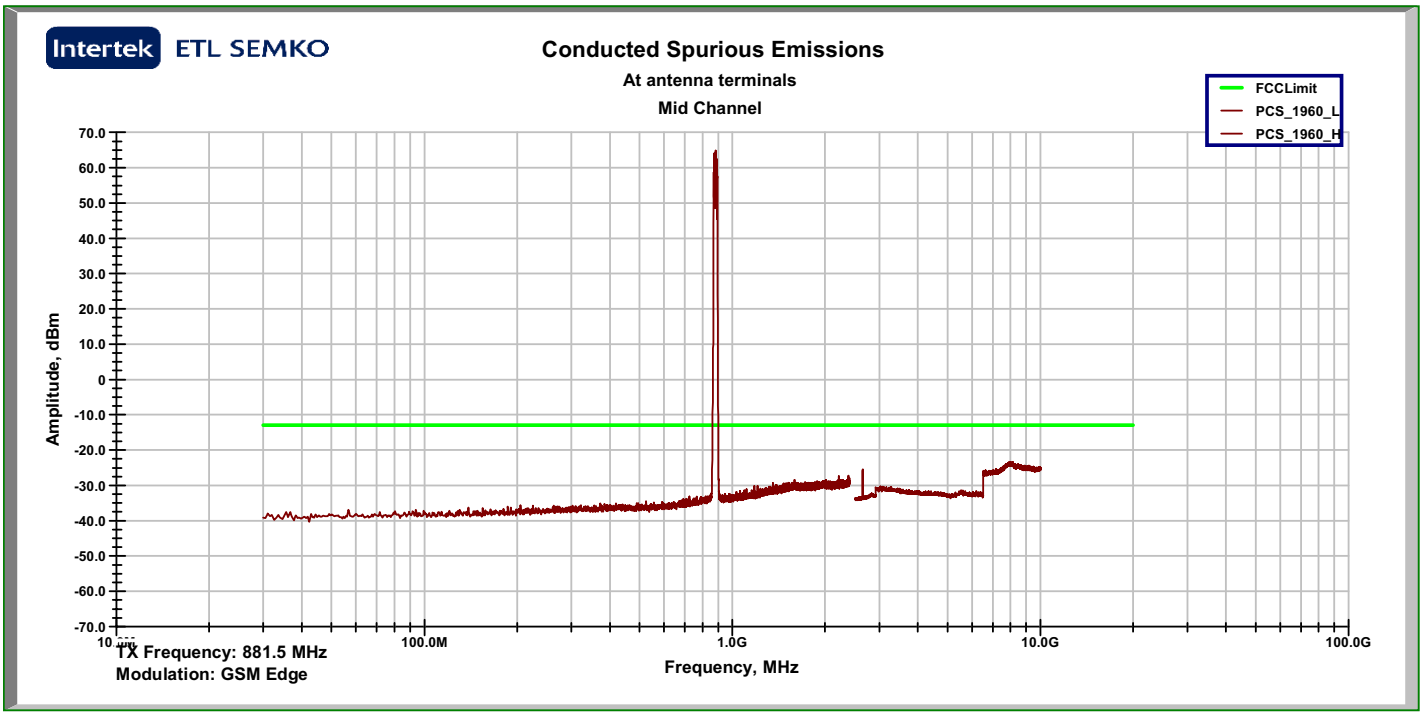
Plot:



GSM Edge Lo Frequency

7.0 Spurious emissions at antenna terminals (FCC Part 2.1051)

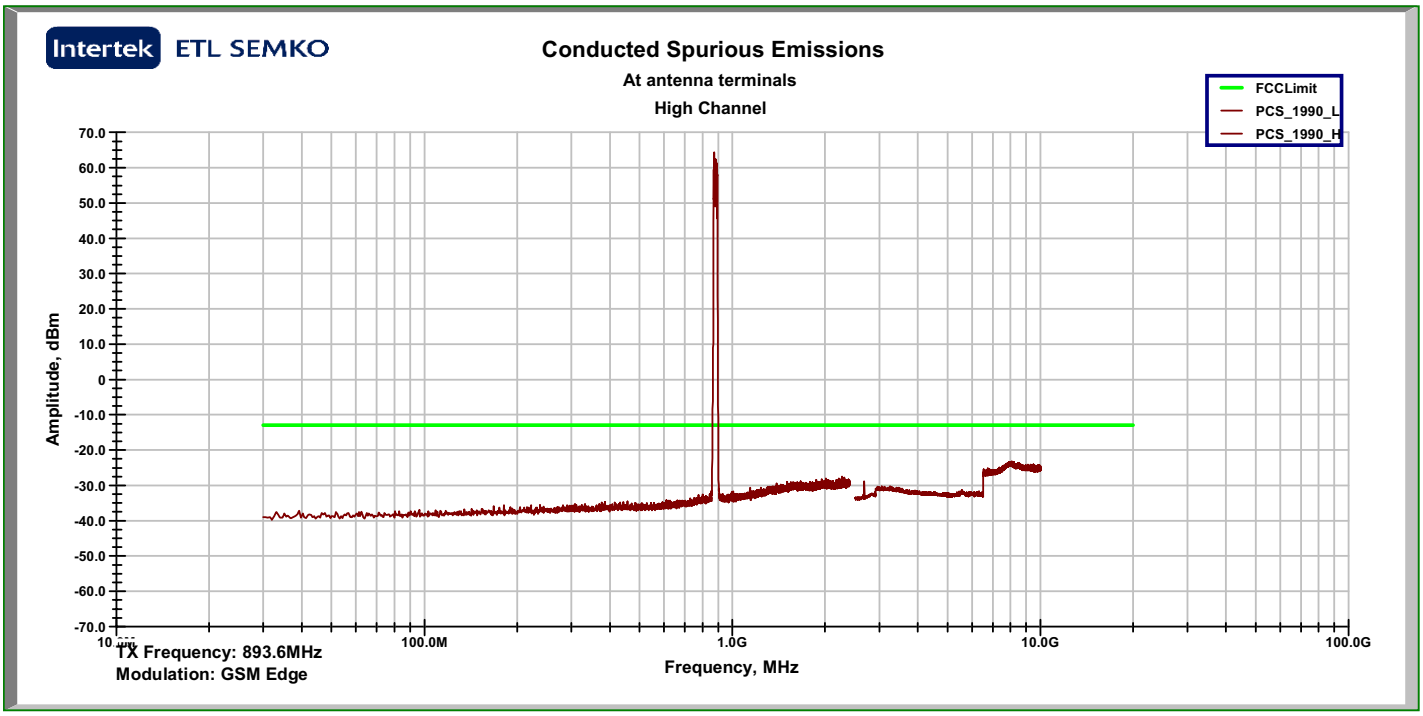
Plot:



GSM Edge Mid Frequency

7.0 Spurious emissions at antenna terminals (FCC Part 2.1051)

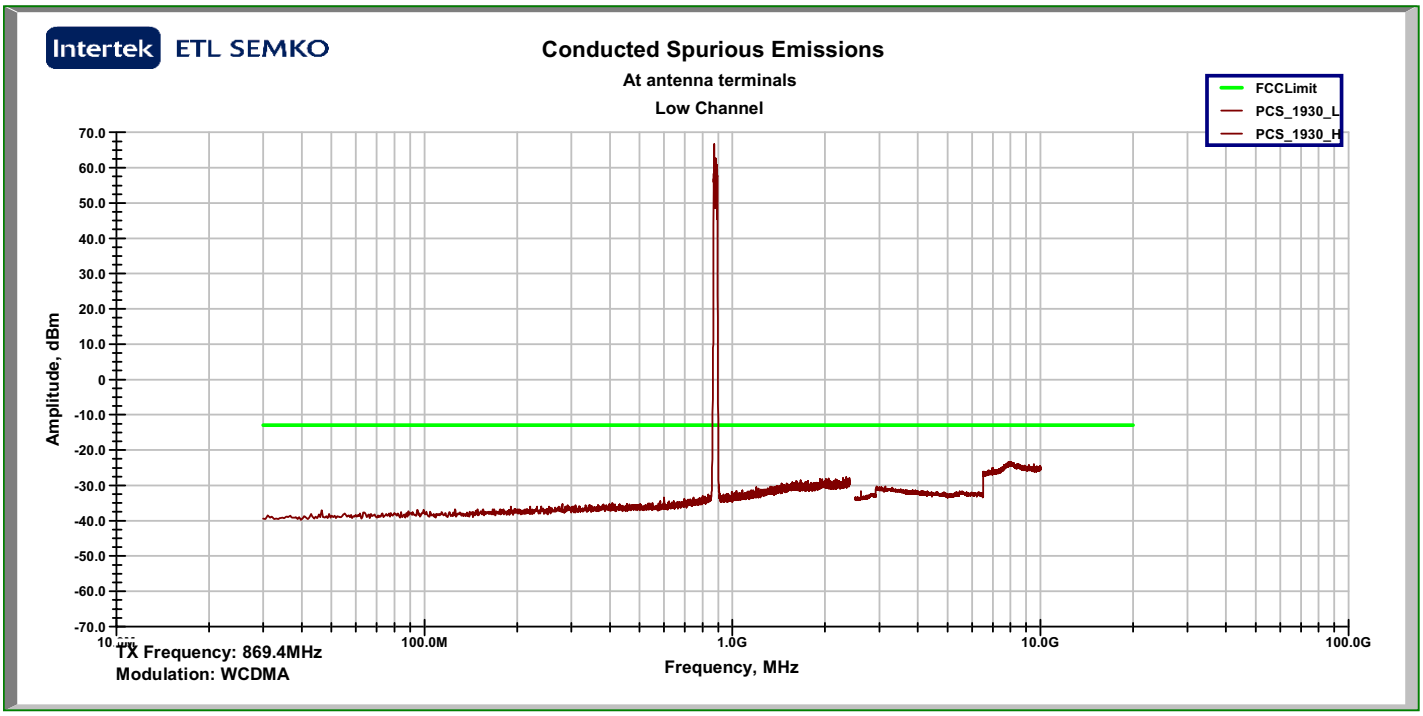
Plot:



GSM Edge Hi Frequency

7.0 Spurious emissions at antenna terminals (FCC Part 2.1051)

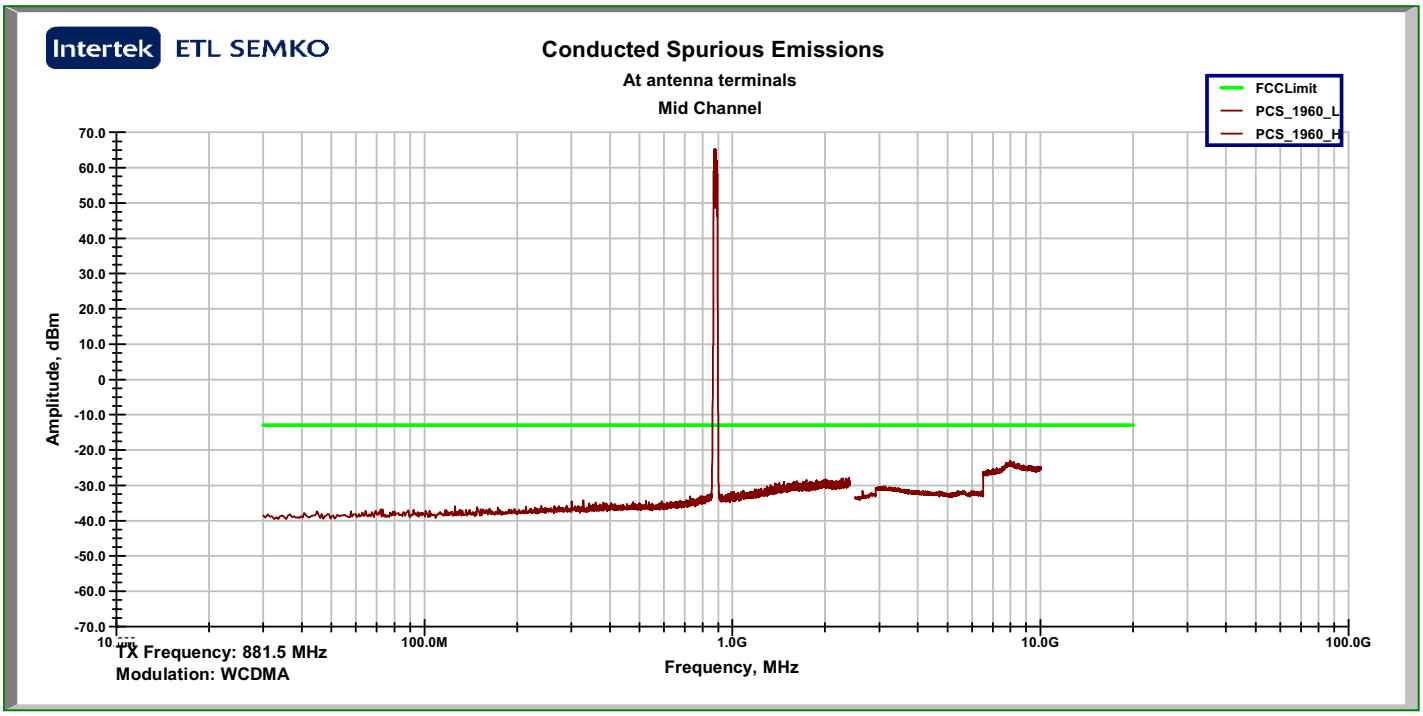
Plot:



WCDMA Lo frequency

7.0 Spurious emissions at antenna terminals (FCC Part 2.1051)

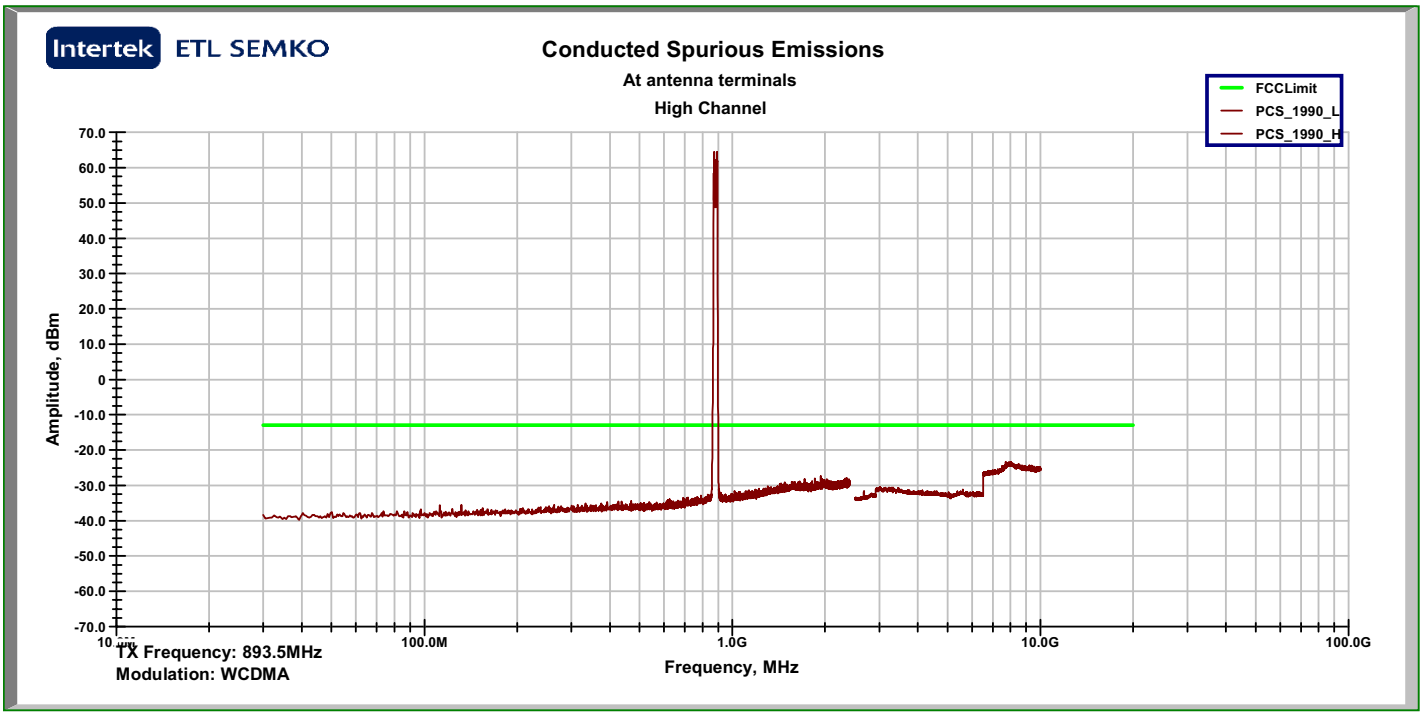
Plot:



WCDMA Mid Frequency

7.0 Spurious emissions at antenna terminals (FCC Part 2.1051)

Plot:



WCDMA Hi Frequency

8.0 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:
spurious power in (dBm) = dBmT - LC - S + 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

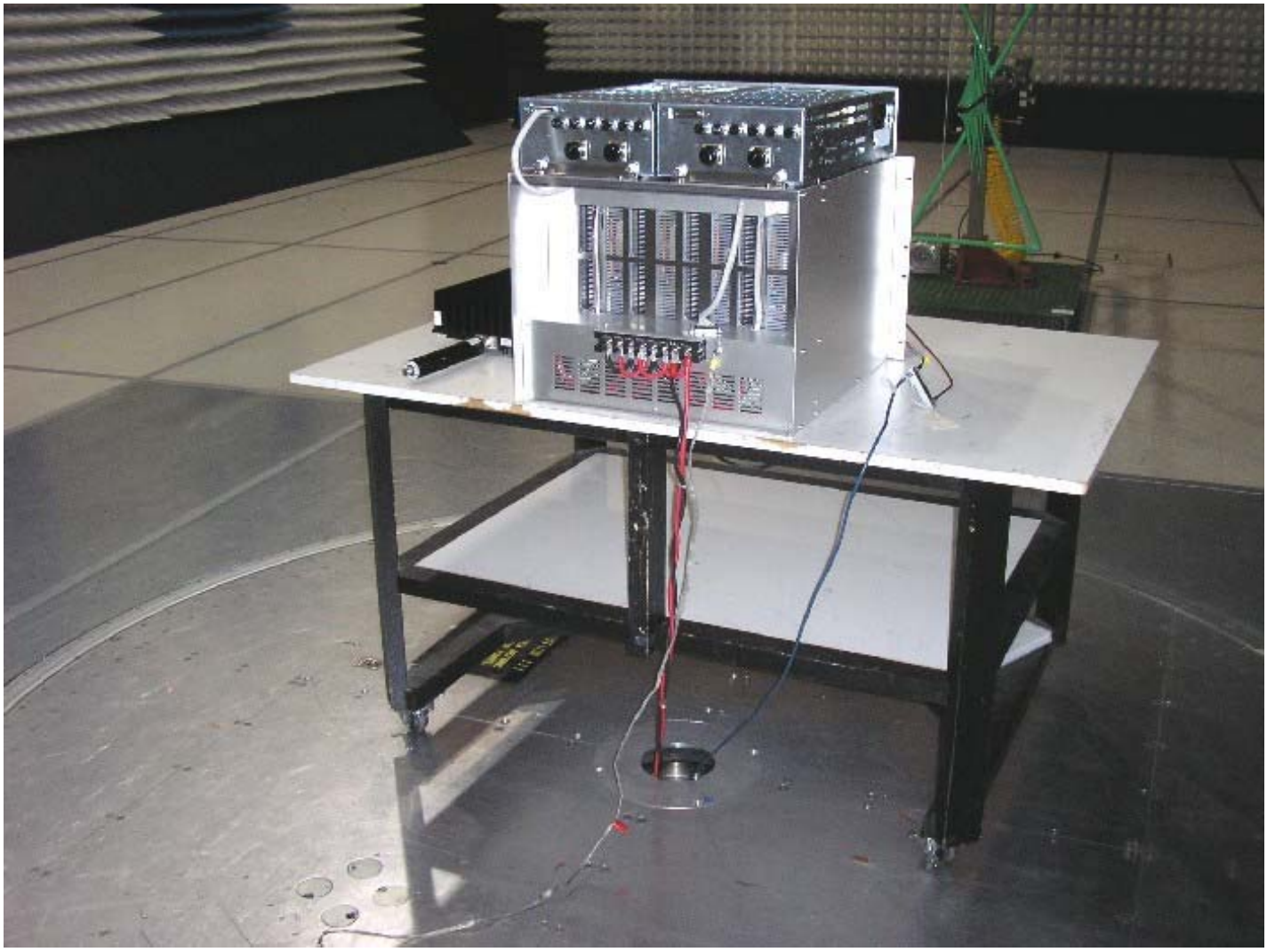
Test Equipment Used:

Description:	Manufacturer:	Model:	Asset Number:	Cal Date:	Cal Due:
Antenna, Bilog (20MHz to 2GHz)	Chase	CBL6112B	211386	08/29/2006	08/29/2007
Antenna, Horn, 0.7 - 18 GHz	A.H. Systems	SAS-200/571	213058a	02/26/2007	02/26/2008
Cable E05 (Formerly HS 1500 N-N)	Huber-Suhner	Sucoflex 104PEA	E05	05/11/2006	05/11/2007
Cable, 18 GHz, N, 118 inches	Megaphase	TM18 NKNK 118	E201	01/15/2007	01/15/2008
Cable, 18 GHz, N, 394 inches	Megaphase	G919-NKNK-394	MP3	05/11/2006	05/11/2007
Preamplifier, 10 MHz to 2000 MHz, 27 dB gain	Mini-Circuits	ZKL-2	200074	02/08/2007	02/08/2008
RF Power Meter	Agilent	E4419B	Hitachi 1	01/22/07	01/22/08

Results: The sample tested was found to Comply.

8.0 Field strength of spurious radiation (FCC Part 2.1053)

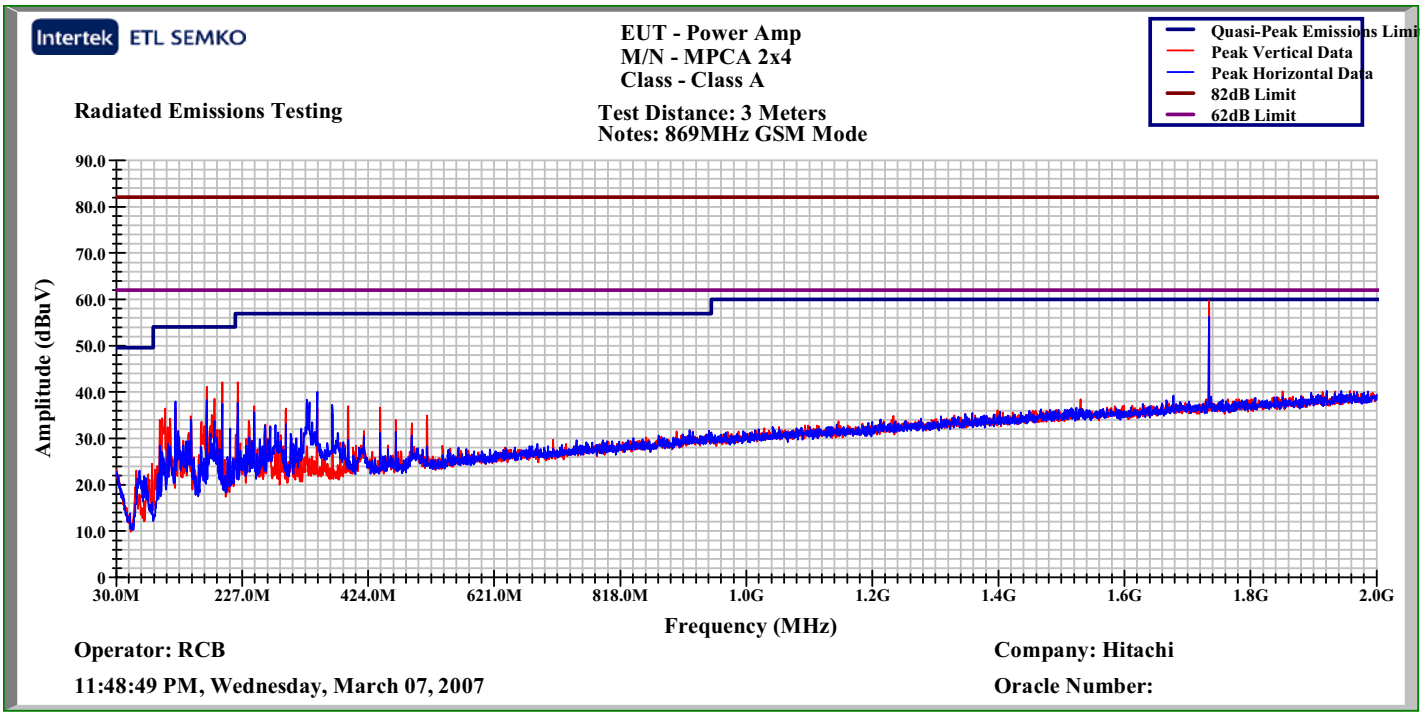
Photo:



Test set up rear

8.0 Field strength of spurious radiation (FCC Part 2.1053)

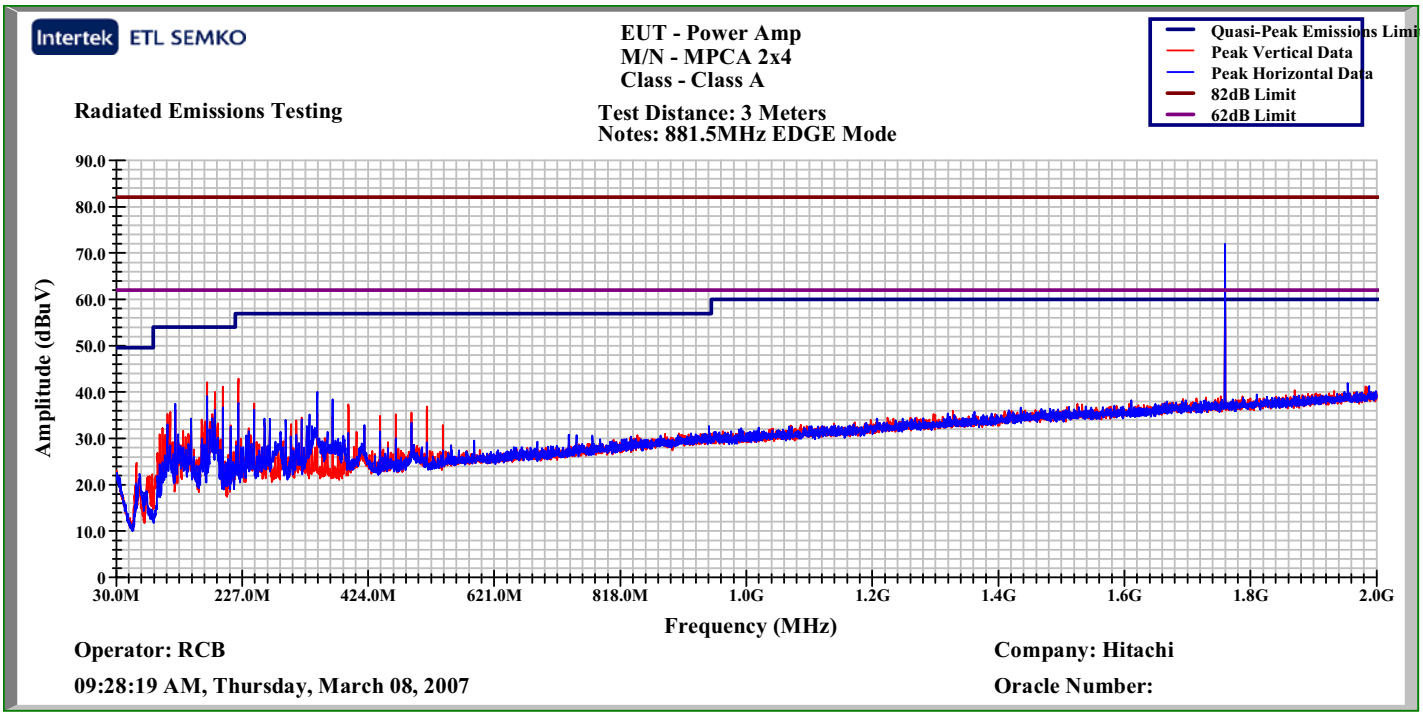
Plot:



Scan plot GSM mode

8.0 Field strength of spurious radiation (FCC Part 2.1053)

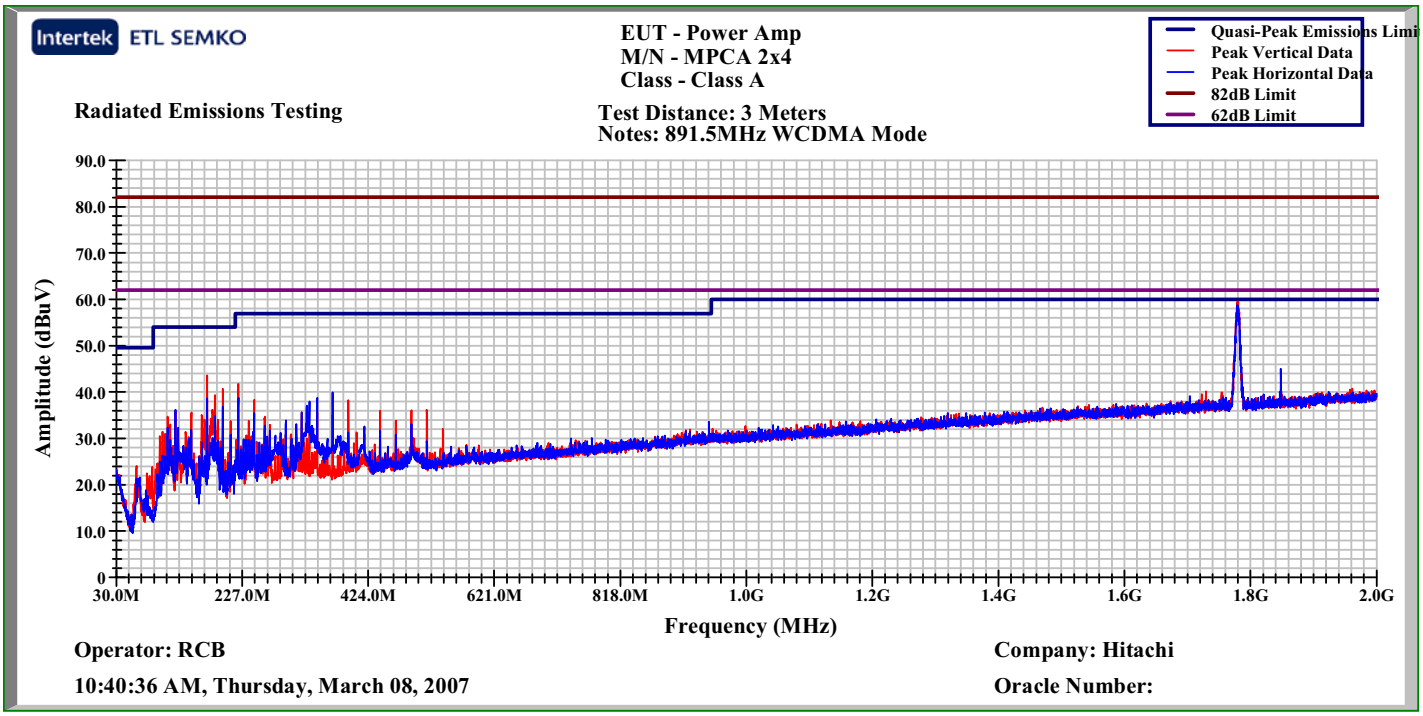
Plot:



Scan plot EDGE mode

8.0 Field strength of spurious radiation (FCC Part 2.1053)

Plot:



Scan plot WCDMA mode

8.0 Field strength of spurious radiation (FCC Part 2.1053)

Data:

Client: Hitachi
Model Number: MPCA 2x4
Project Number:
Tested By: RCB/SKM
Date: 03/08/2007
Frequency Range (MHz): 30-2000
Input power: 27Vdc

Receiver: HP 8546A
Antenna: Chase 2622
Cables: E01+MP3+E05+E201
Preamp: ZKL-2 D052005
Limit: FCC Part 22 (-13 dBm or 82.2 dBuV/m)
Test Distance (m): 3
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**
869MHz GSM									
V	1738.135	53.8	25.5	7.1	26.2	60.3	82.0	-21.7	AV/1M/1.6Hz
881.5MHz EDGE									
V	1763.025	57.5	25.6	7.1	26.2	64.1	82.0	-17.9	AV/1M/1.6Hz
891.5MHz CDMA									
V	1783.000	50.5	25.7	7.1	26.2	57.2	82.0	-24.8	AV/1M/1.6Hz
Calculations		G=C+D+E-F		I=G-H					

TX Antenna: AH 571
Substitution Measurement **Power Meter:** Agilent E4419B

A	B	C	D	E	F	G
Ant. Pol. (V/H)	**Frequency MHz**	**Substitution Reading dBm**	**TX ant Gain dBi**	**EIRP dBm**	**Limit dBm**	**Margin dB**
V	1763.025	-39.3	9.2	-30.1	-13.0	-17.1
Calculations		E=C+D		G=E-F		

30 to 2000MHz EIRP

8.0 Field strength of spurious radiation (FCC Part 2.1053)

Data:

Client:	Hitachi	**Receiver:**	HP 8546A
Model Number:	MPCA 2x4	**Antenna:**	Chase 2622
Project Number:		**Cables:**	E01+MP3+E05+E201
Tested By:	RCB/SKM	**Preamp:**	ZKL-2 D052005
Date:	03/08/2007	**Limit:**	FCC15 Class A-3m
Frequency Range (MHz):	30-2000	**Test Distance (m):**	3
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**
869MHz GSM									
V	172.034	57.4	10.7	1.9	27.7	42.3	54.0	-11.7	QP/120k/300k
V	196.615	58.1	10.2	1.9	27.7	42.5	54.0	-11.5	QP/120k/300k
V	221.175	56.6	10.7	2.8	27.6	42.5	56.9	-14.4	QP/120k/300k
881.5MHz EDGE									
V	172.023	57.1	10.7	1.9	27.7	42.0	54.0	-12.0	QP/120k/300k
V	196.600	56.2	10.2	1.9	27.7	40.6	54.0	-13.4	QP/120k/300k
V	221.180	56.8	10.7	2.8	27.6	42.7	56.9	-14.2	QP/120k/300k
891.5MHz CDMA									
V	172.000	56.8	10.7	1.9	27.7	41.7	54.0	-12.3	QP/120k/300k
V	196.615	54.4	10.2	1.9	27.7	38.8	54.0	-15.2	QP/120k/300k
V	221.173	56.7	10.7	2.8	27.6	42.6	56.9	-14.3	QP/120k/300k
Calculations		G=C+D+E-F		I=G-H					

30 to 2000MHz (FCC Class A limit)

9.0 Revision History (Revision History)

Method:

Document the history of the report.

Data:

Revision Level	Date	Report Number	Notes
Original issue	March 30, 2007	3118301ATL-003	--
1	April 18, 2007	3118301ATL-003	Corrected title of report. Removed blank data table in Section 7.