Nemko Test Report:	49822RUS1
Applicant:	Communication Components, Inc. 89 Leuning Street Second Floor Hackensack, NJ, 07606 USA
Equipment Under Test: (E.U.T.)	DAB-1819-125G2
FCC ID:	NT3DAB1819125G2
In Accordance With:	**CFR 47, Part 24, Subpart E** Broadband PCS Repeaters
Tested By:	Nemko USA, Inc. 802 N. Kealy Lewisville, TX 75057-3136

TESTED BY: _____ **DATE:** **18 June 2010**

David Light, Senior Wireless Engineer

APPROVED BY: _____ **DATE:** **27 July 2010**

Tom Tidwell, Telecom Direct

Number of Pages: 39

Table of Contents

Section 1. Summary of Test Results

Manufacturer Communication Components, Inc.

Model No.: DAB-1819-125G2

Serial No.: None

General: **All measurements are traceable to national standards.**

These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with CFR 47, Part 24, Subpart E.

☒ New Submission ☒ Production Unit

☐ Class II Permissive Change ☐ Pre-Production Unit

THIS TEST REPORT RELATES ONLY TO THE ITEM(S) TESTED.

THE FOLLOWING DEVIATIONS FROM, ADDITIONS TO, OR EXCLUSIONS FROM THE TEST SPECIFICATIONS HAVE BEEN MADE.
See " Summary of Test Data".

NVLAP Lab Code 100426-0

Summary Of Test Data

NAME OF TEST	PARA. NO.	SPEC.	RESULT
RF Power Output	24.232	100W	Complies[1]
Occupied Bandwidth	2.1049	Input/Output	Complies
Spurious Emissions at Antenna Terminals	24.238(a)	-13 dBm	Complies
Field Strength of Spurious Emissions	24.238(a)	-13 dBm E.I.R.P.	Complies
Frequency Stability	24.235		NA

Footnotes:

(1) Although the amplifier marketing literature indicates 125 watts and the maximum rf power that can be obtained at the antenna port is 125 watts, the user manual warnings indicate that a maximum of 100 watts at the input to the antenna is allowed. The difference between 125 watts and 100 watts is 1 dB and the manufacturer provides 125 watts maximum rf output at the rf output connector of the amplifier so that the installer can adjust to 100 watts at the input to the antenna.
(2) Modulation characteristics were not tested since the E.U.T. processes but does not produce a modulated waveform.

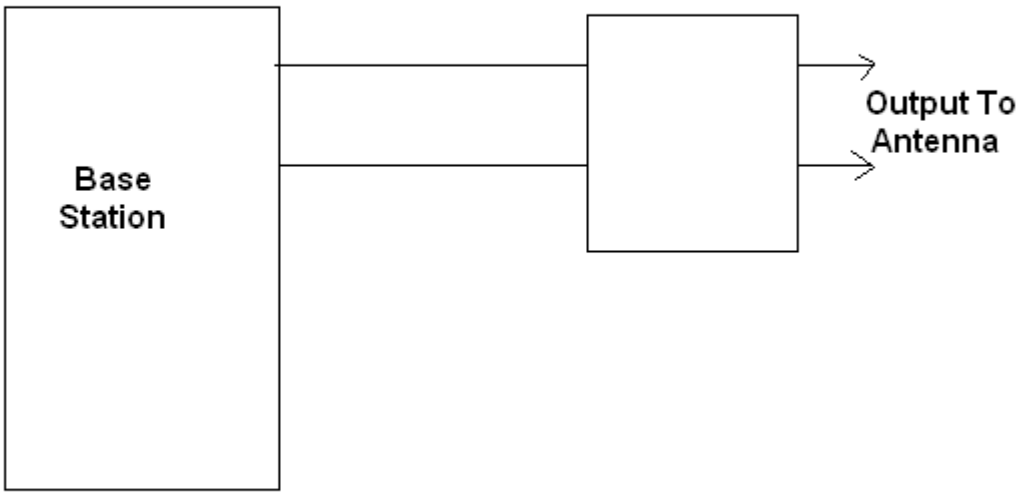
Section 2. General Equipment Specification

Supply Voltage Input:		+29 to +34 Vdc
Frequency Bands:	**Downlink:**	1930 to 1990 MHz
Frequency Bands:	**Uplink:**	NA
Type of Modulation and Designator:		**CDMA (F9W)** ☐ **GSM (GXW)** ☒ **NADC (DXW)** ☐ **W-CDMA (F9W)** ☐ **EDGE (G7W)** ☒
System Gain:		
Output Impedance:		50 ohms
RF Output (Rated):	**Uplink**	125.0 W 51 dBm
RF Output (Rated):	**Downlink**	125.0 W 51 dBm **Power output needs to be lowered to +36 dBm at 1930.2 and 1989.8 MHz (Band edges) to achieve compliance**
Frequency Translation:		**F1-F1** ☒ **F1-F2** ☐ **N/A** ☐
Band Selection:		**Software** ☒ **Duplexer** ☐ **Fullband** ☐

Description of EUT

The device is a base station amplifier operating in the PCS band utilizing GSM and GSM EDGE technology. Each input outputs 125 Watts single carrier only. The device is rated at 125 Watts per output.

System Diagram



Section 3. RF Power Output

NAME OF TEST: RF Power Output	PARA. NO.: 24.232
TESTED BY: David Light	DATE: 17 June 2010

Test Results: Complies.

Measurement Data:

	Modulation Type	Per Channel Output Power (dBm)	Composite Output Power (dBm)
Uplink	GSM	NA	NA
Downlink	GSM	51	51
Uplink	GSM EDGE	NA	NA
Downlink	GSM EDGE	51	51

Settings: RBW/VBW = 300 kHz Peak detector

Equipment Used: 1036-1082-1055-1469-1026

Measurement Uncertainty: +/- 1.7 dB

Temperature: 22 °C

Relative Humidity: 35 %

Section 4. Occupied Bandwidth

NAME OF TEST: Occupied Bandwidth	PARA. NO.: 24.238
TESTED BY: David Light	DATE: 17 June 2010

Test Results: Complies.

Test Data: See attached plot(s).

Equipment Used: 1036-1026-1082-1055-1469
1036

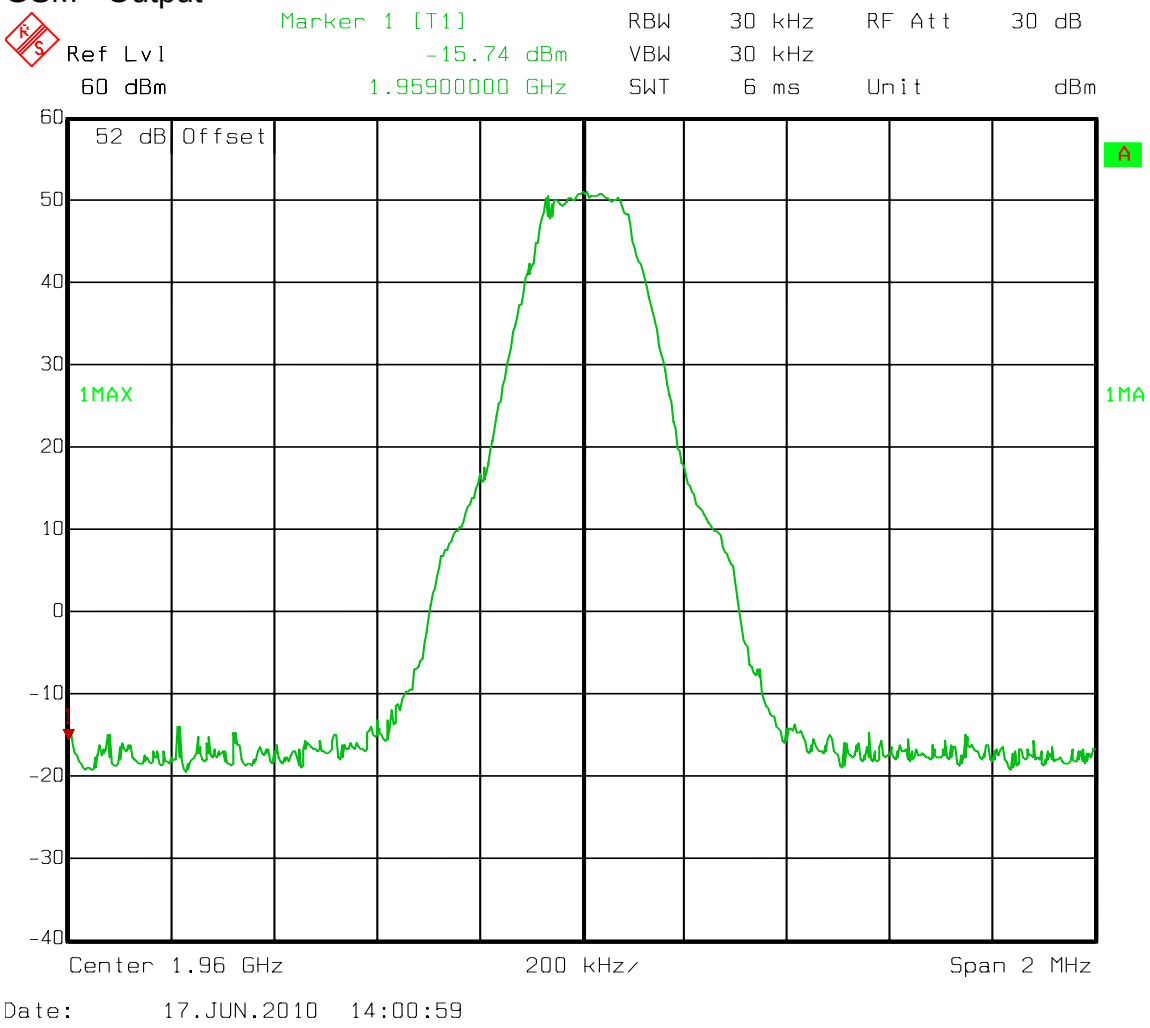
Measurement Uncertainty: $1X10^{-7}$ ppm

Temperature: 22 °C

Relative Humidity: 35 %

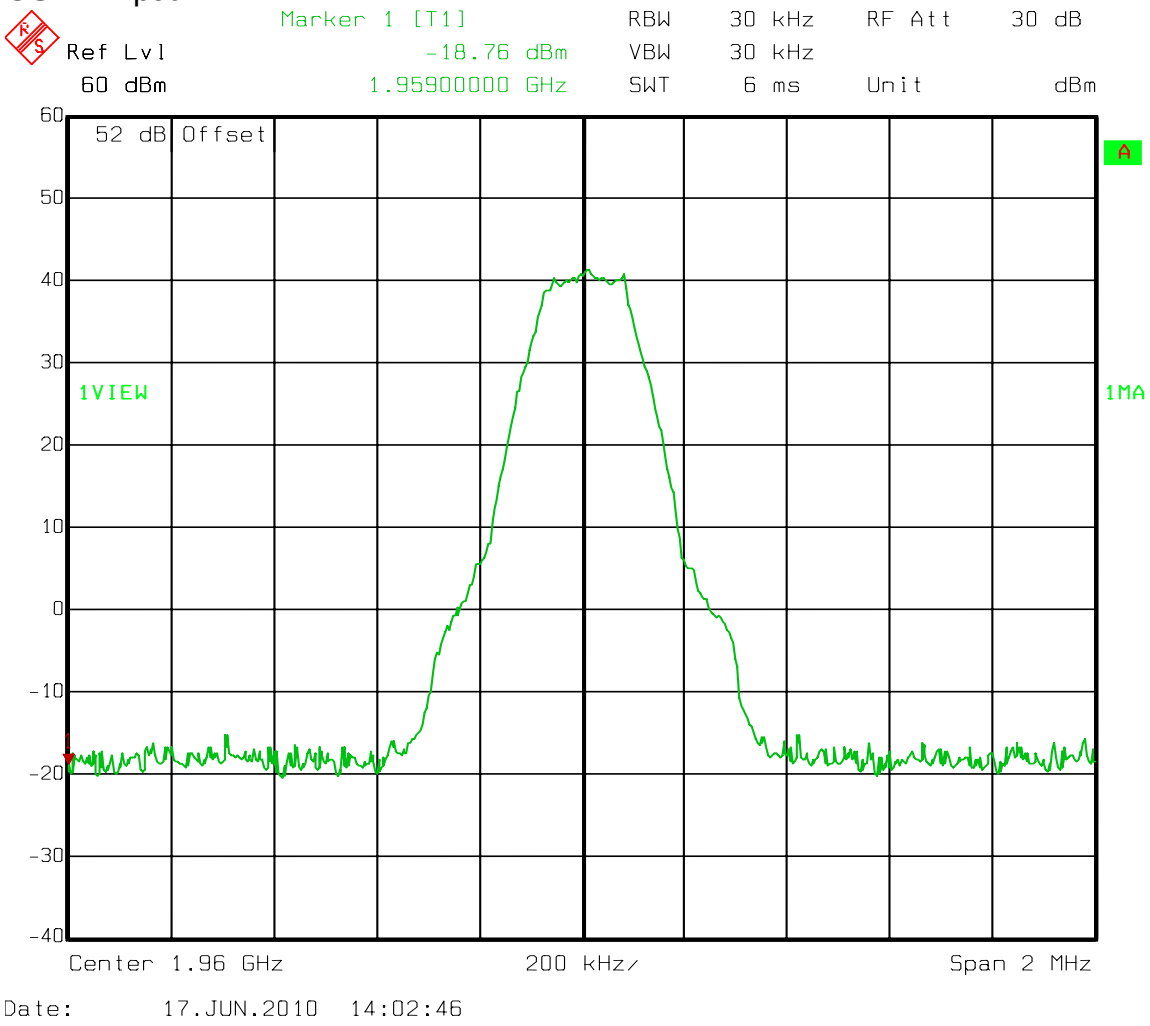
Test Data – Occupied Bandwidth

GSM - Output



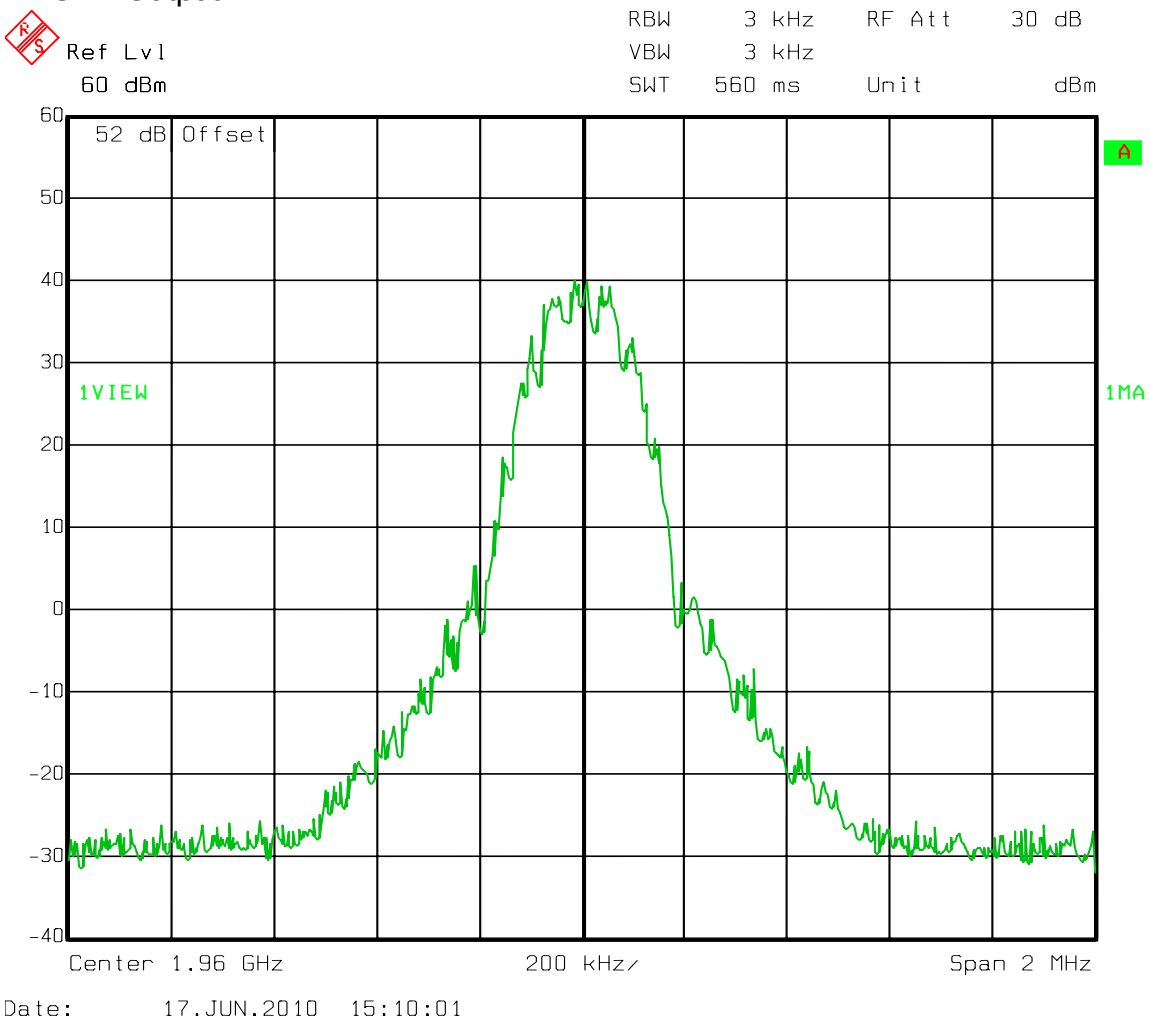
Test Data – Occupied Bandwidth

GSM - Input



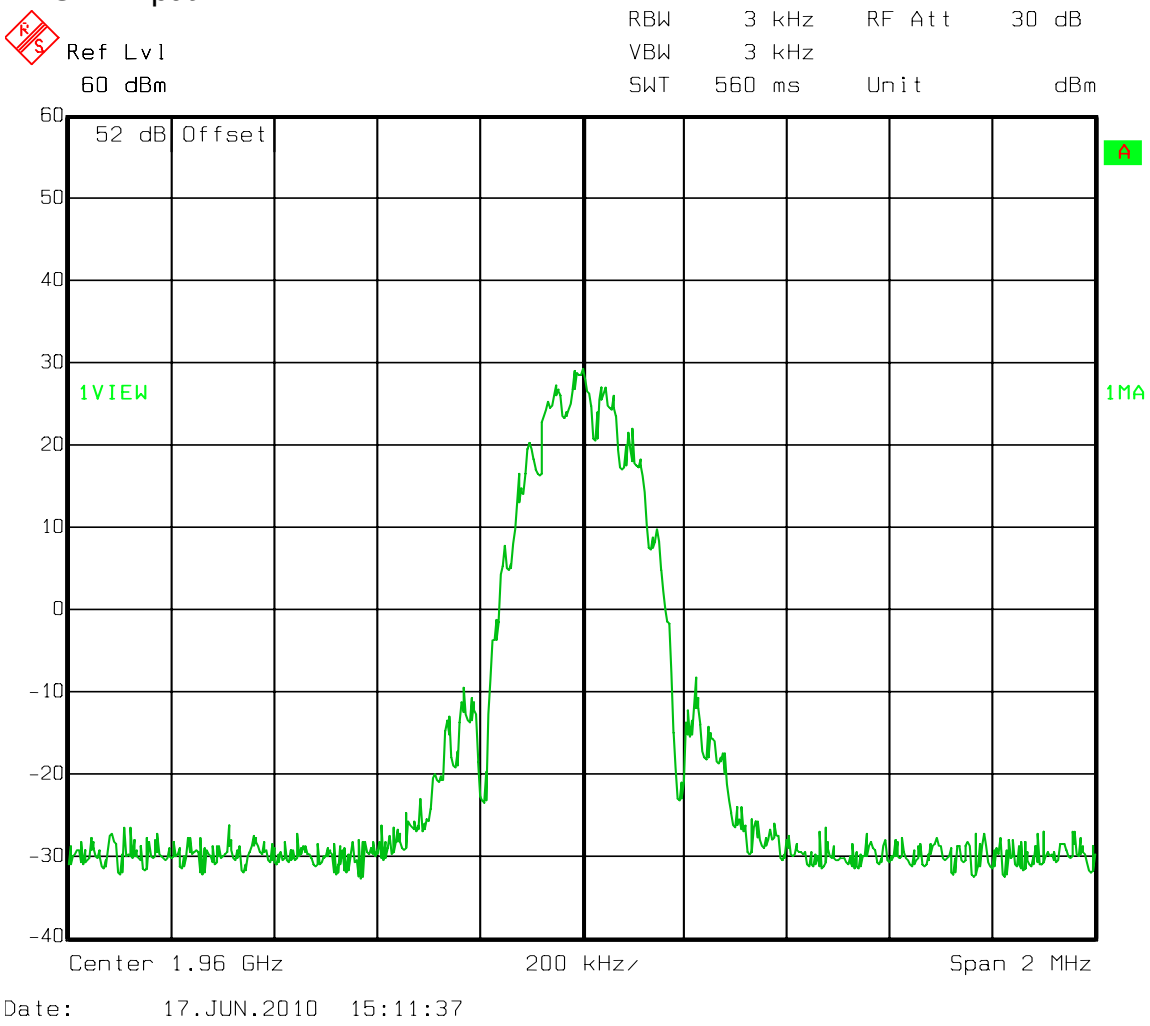
Test Data – Occupied Bandwidth

EDGE - Output



Test Data – Occupied Bandwidth

EDGE - Input



Section 5. Spurious Emissions at Antenna Terminals

NAME OF TEST: Spurious Emissions @ Antenna Terminals	PARA. NO.: 24.238
TESTED BY: David Light	DATE:17-18 June 2010

Test Results: Complies.

Test Data: See attached plot(s).

Equipment Used: 1026-1036-1082-1469-1054-1055-1058

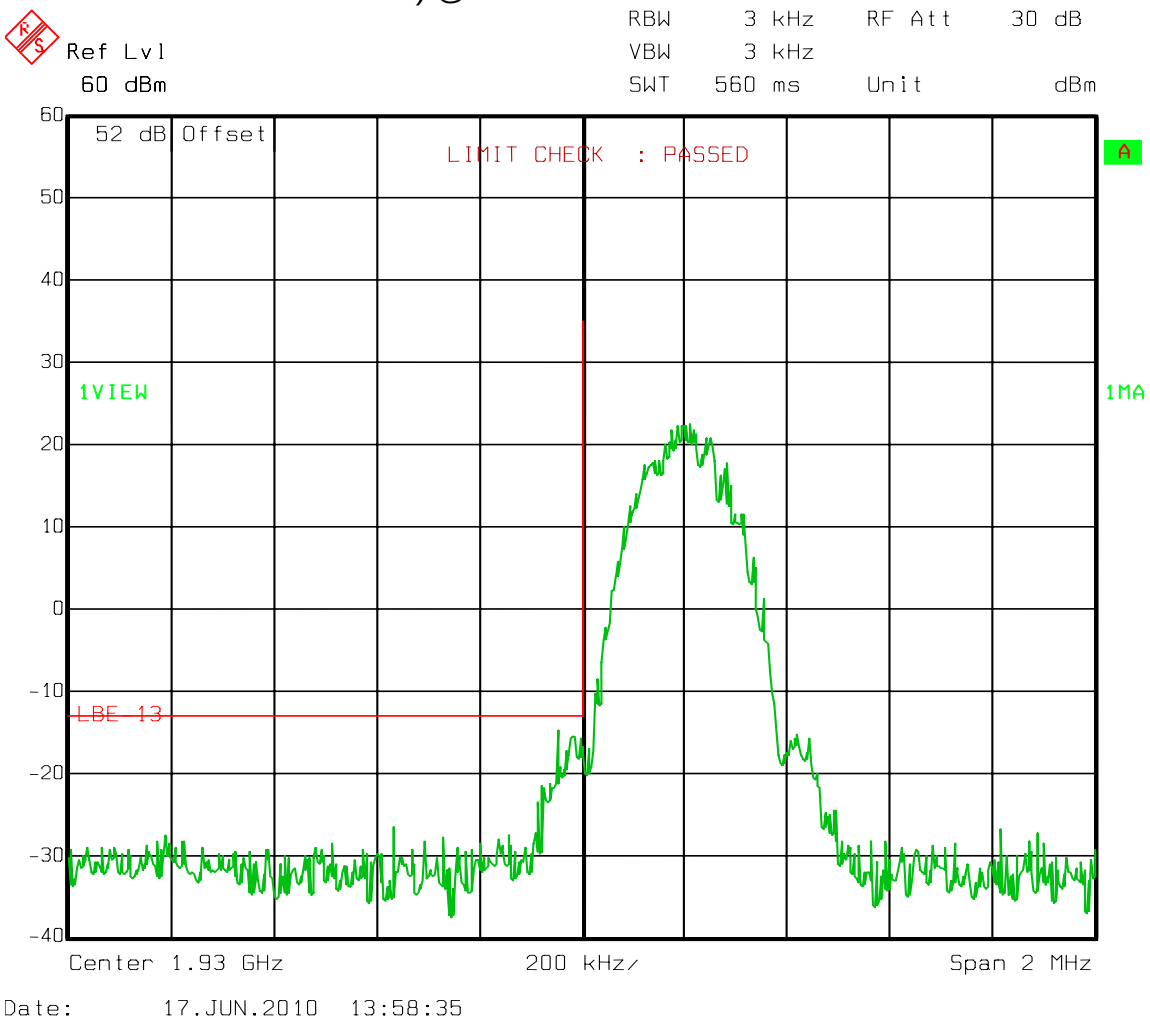
Measurement Uncertainty: +/- 1.7 dB

Temperature: 22 °C

Relative Humidity: 35 %

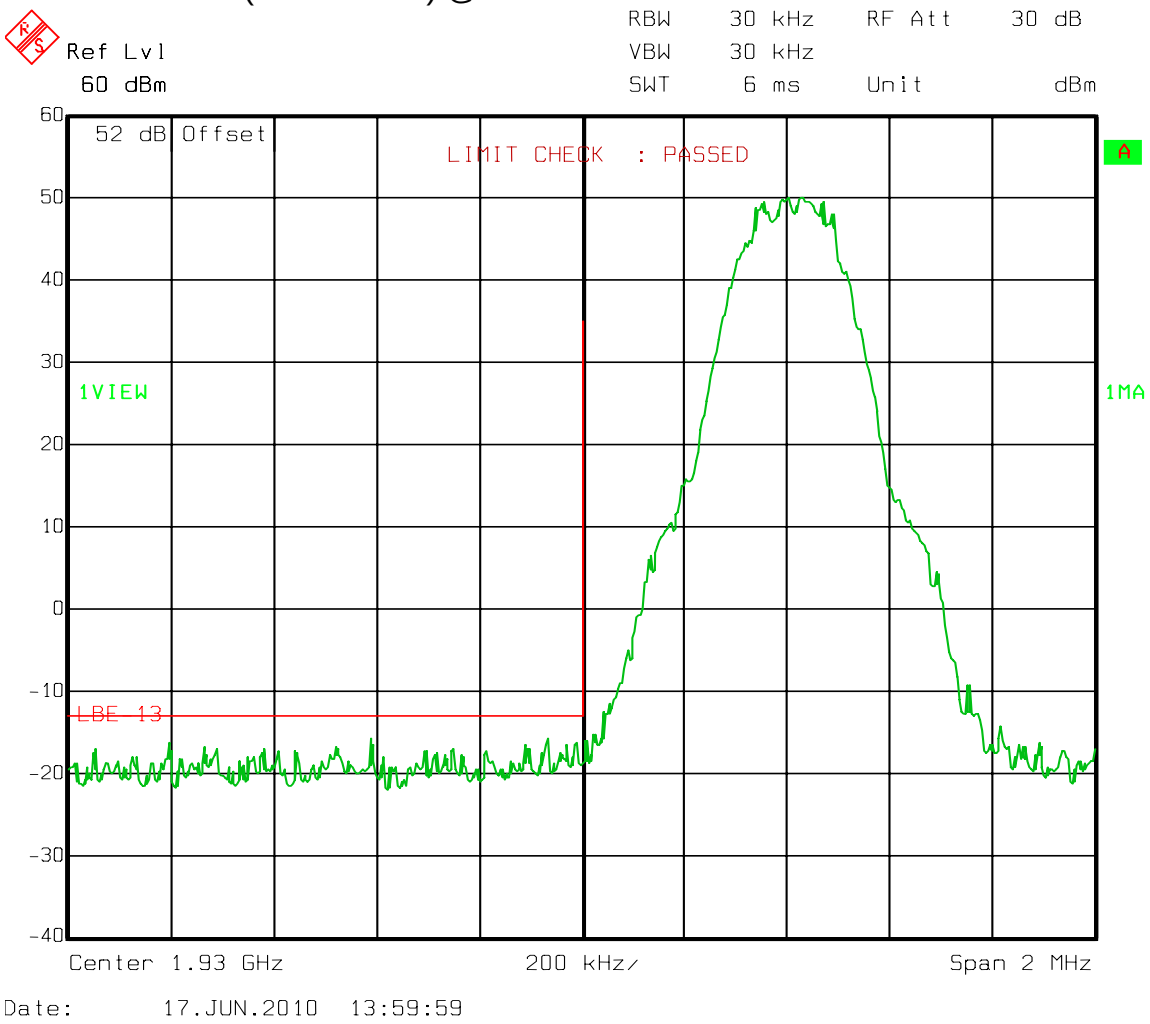
Test Data – Spurious Emissions at Antenna Terminals

Lower Bandedge
GSM
Lowest Channel 1930.2 MHz) @ +36 dBm



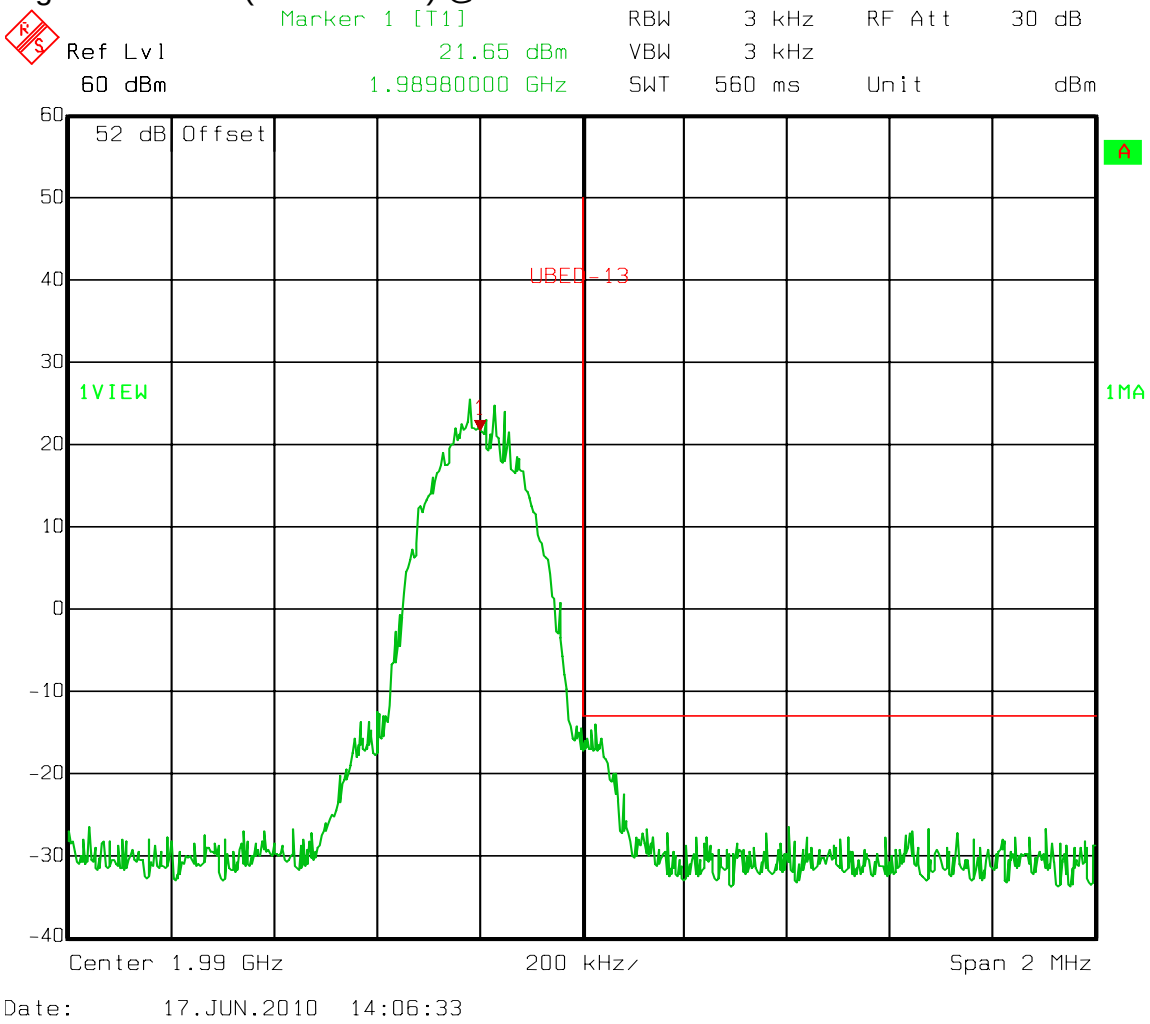
Test Data – Spurious Emissions at Antenna Terminals

Lower Band Edge
GSM
Second channel (1930.4 MHz) @ +51 dBm



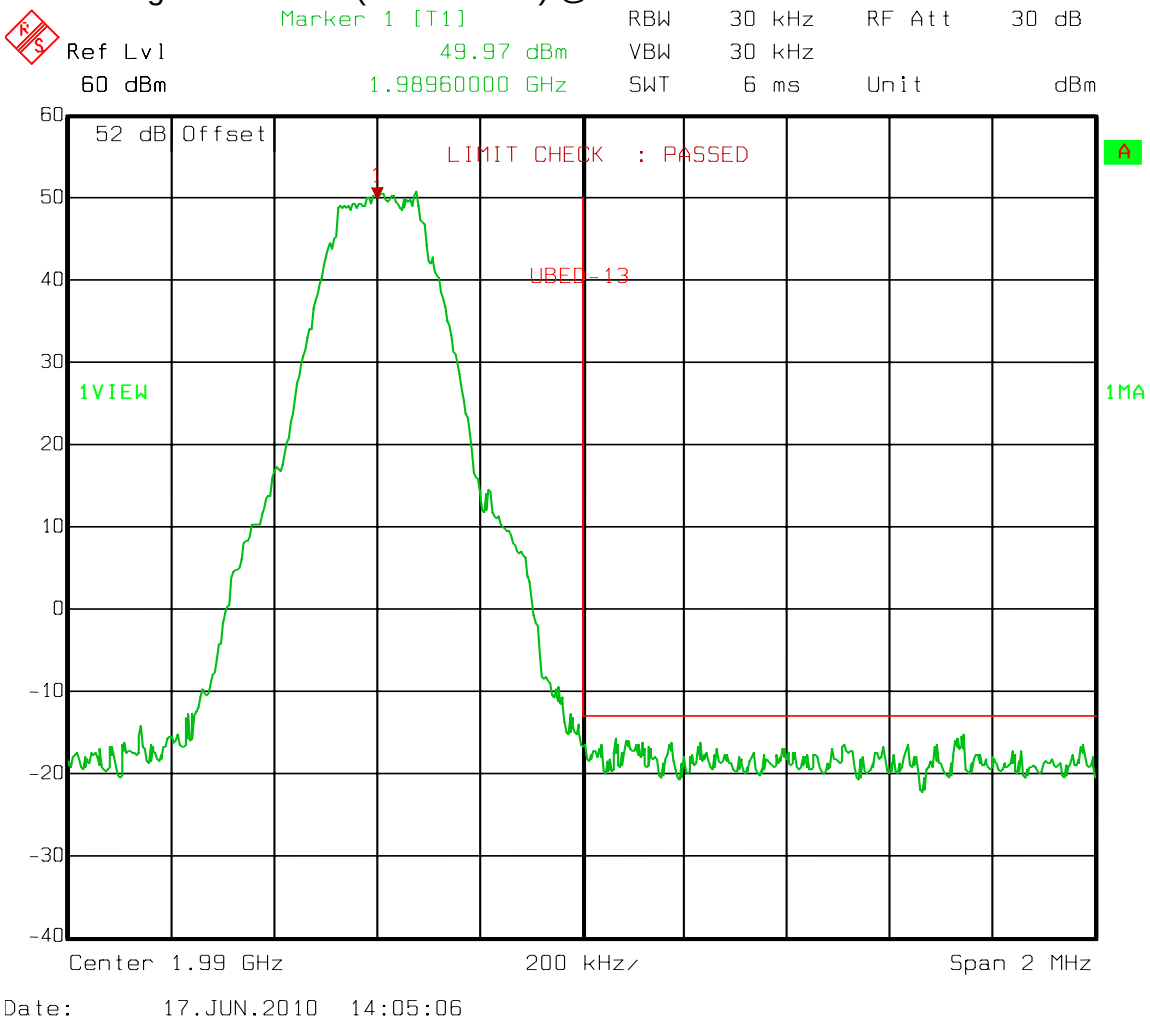
Test Data – Spurious Emissions at Antenna Terminals

Upper Band Edge
GSM
Highest channel (1989.8 MHz) @ +36 dBm



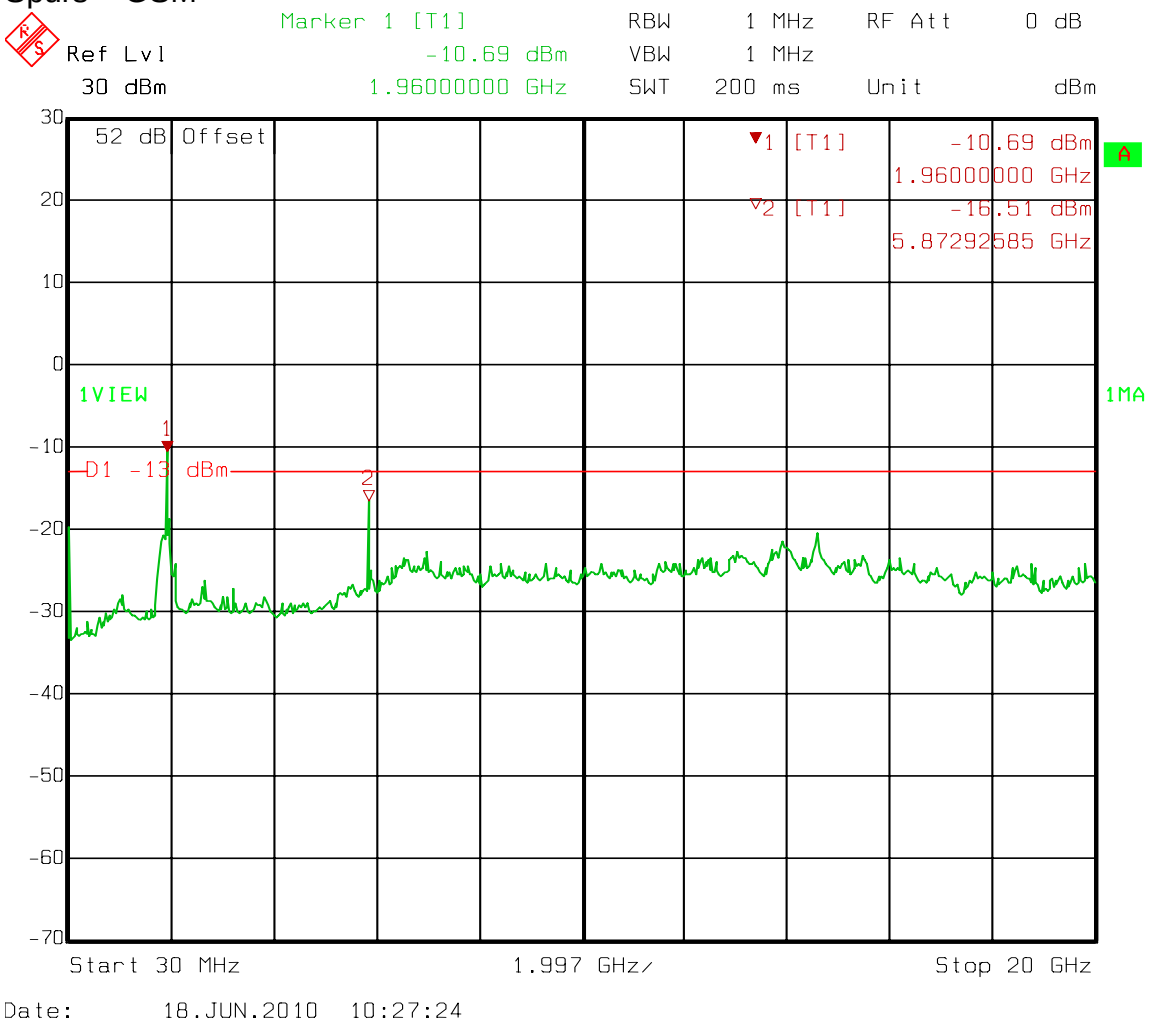
Test Data – Spurious Emissions at Antenna Terminals

Upper Band Edge
GSM
Second highest channel (1989.6 MHz) @ +51 dBm



Test Data – Spurious Emissions at Antenna Terminals

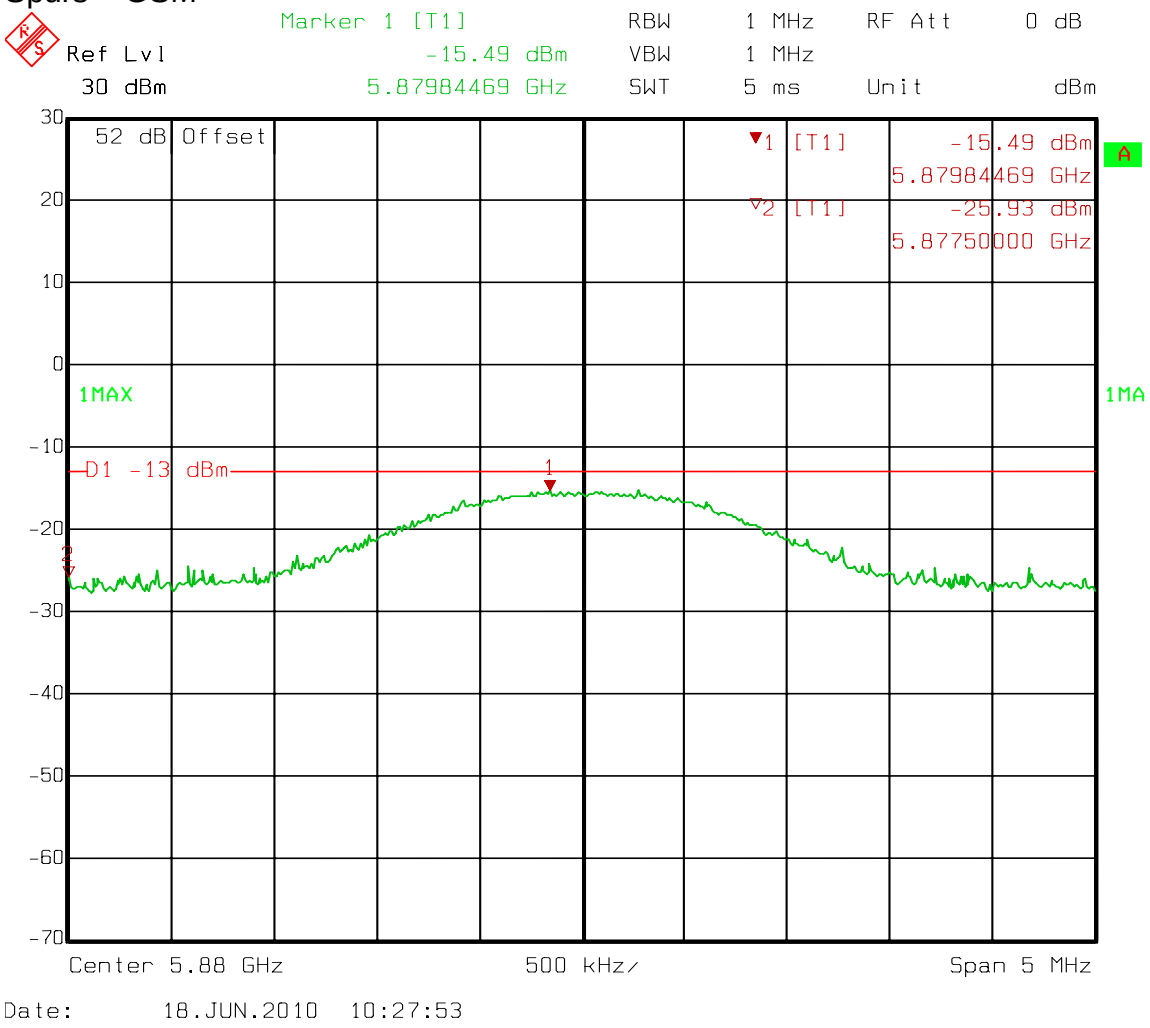
Spurs – GSM



Carrier filtered.

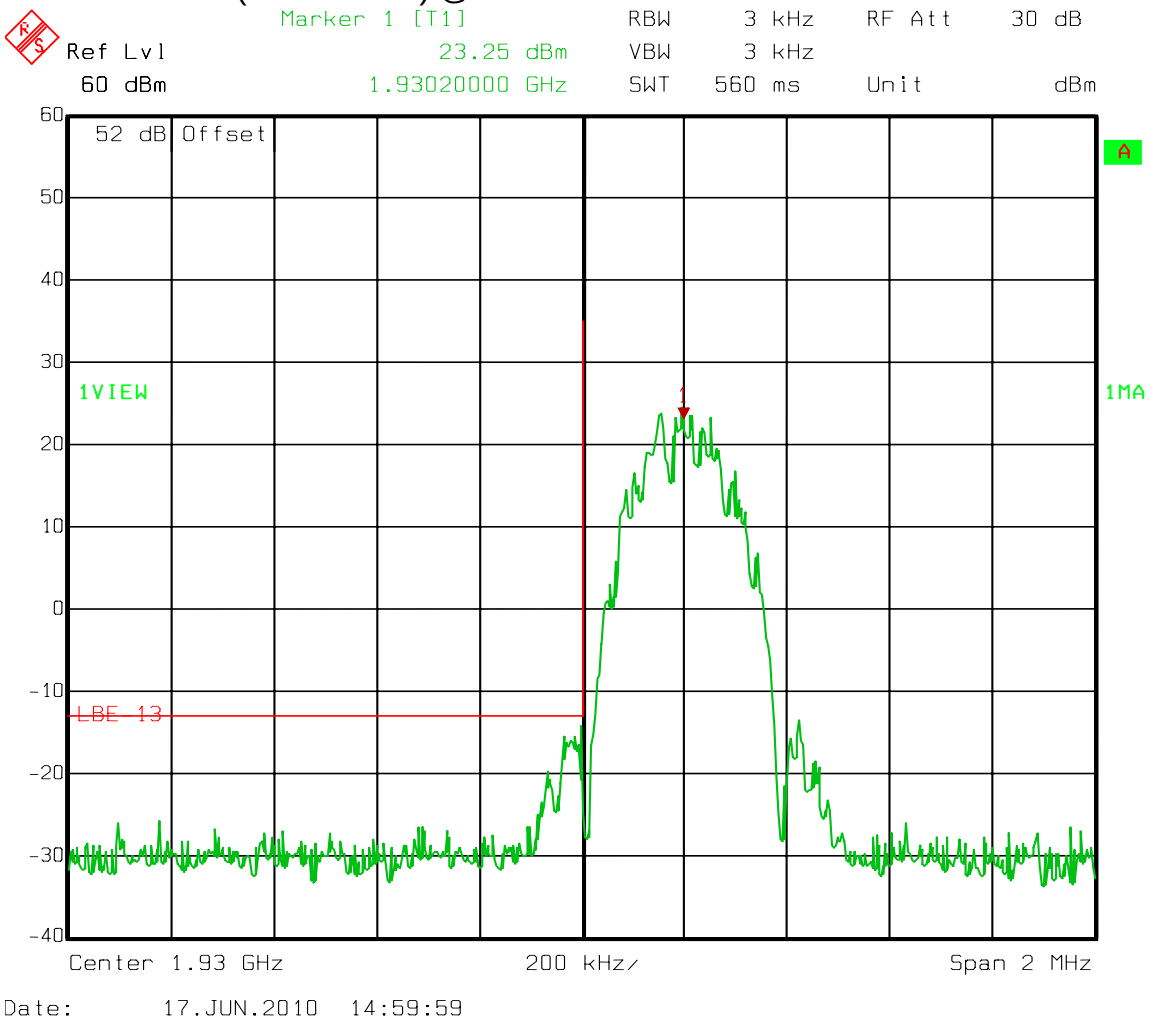
Test Data – Spurious Emissions at Antenna Terminals

Spurs – GSM



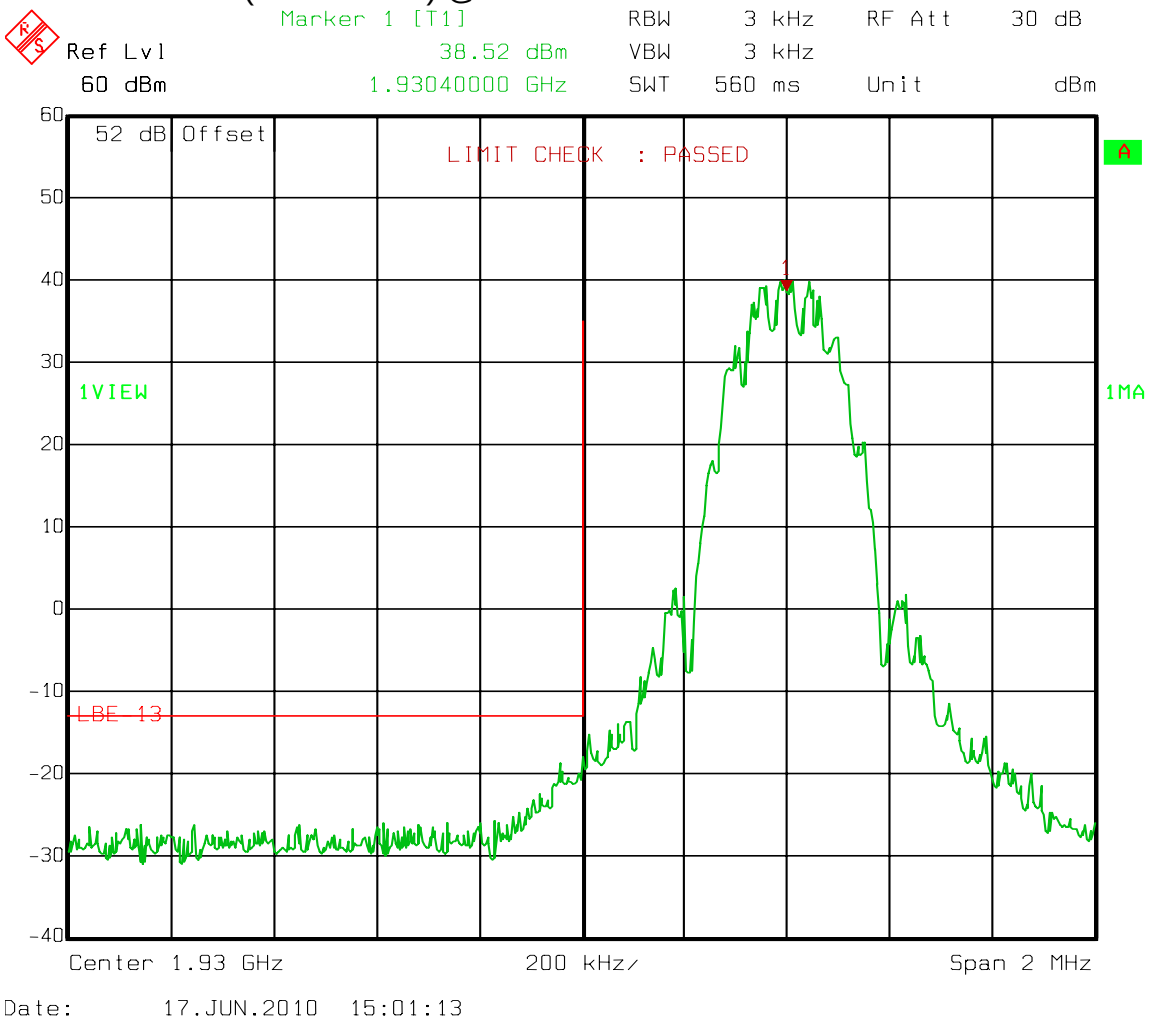
Test Data – Spurious Emissions at Antenna Terminals

Lower Band Edge
EDGE
Lowest channel (1930.2 MHz) @ +36 dBm



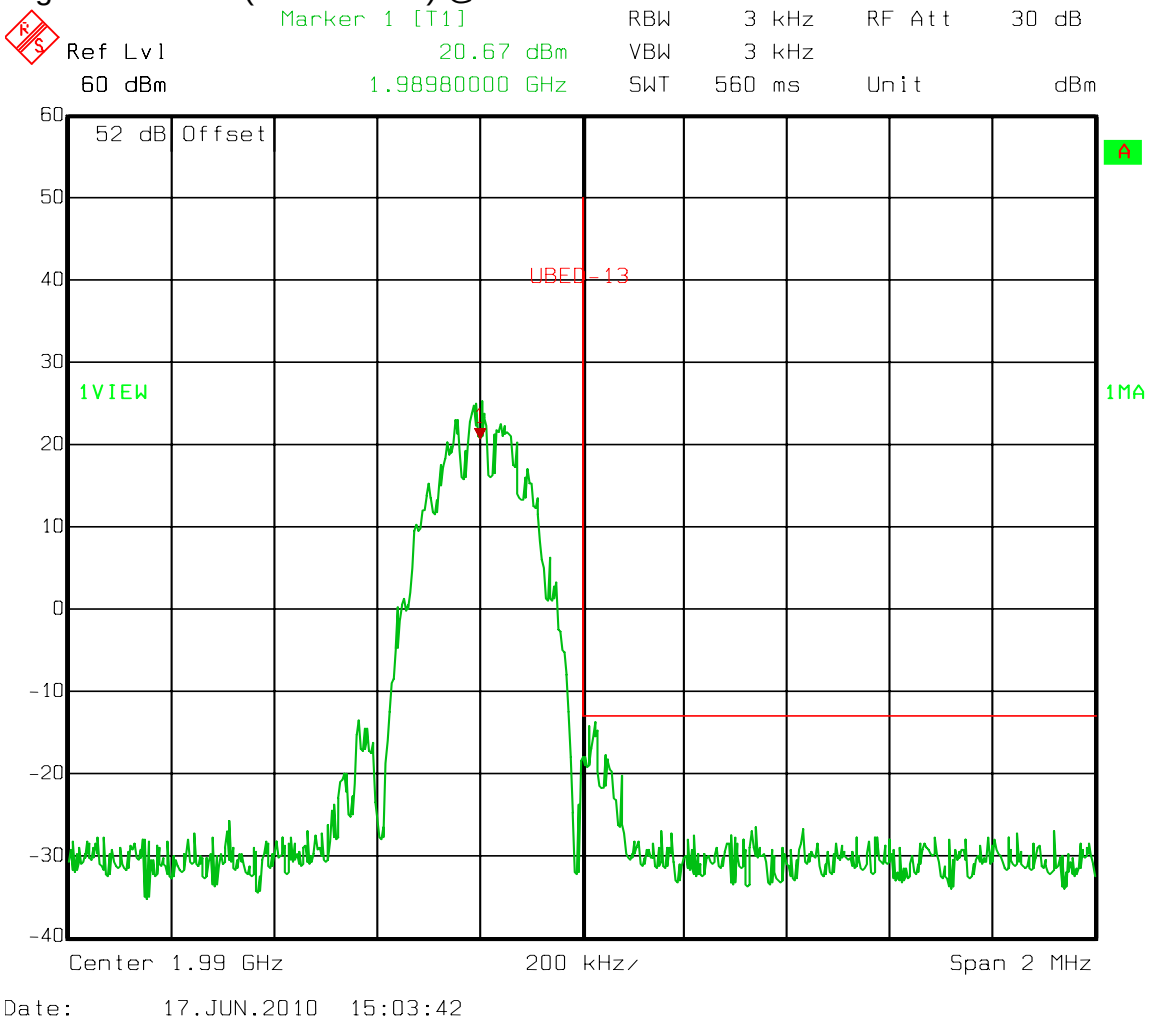
Test Data – Spurious Emissions at Antenna Terminals

Lower Band Edge
EDGE
Second channel (1930.4 MHz) @ +51 dBm



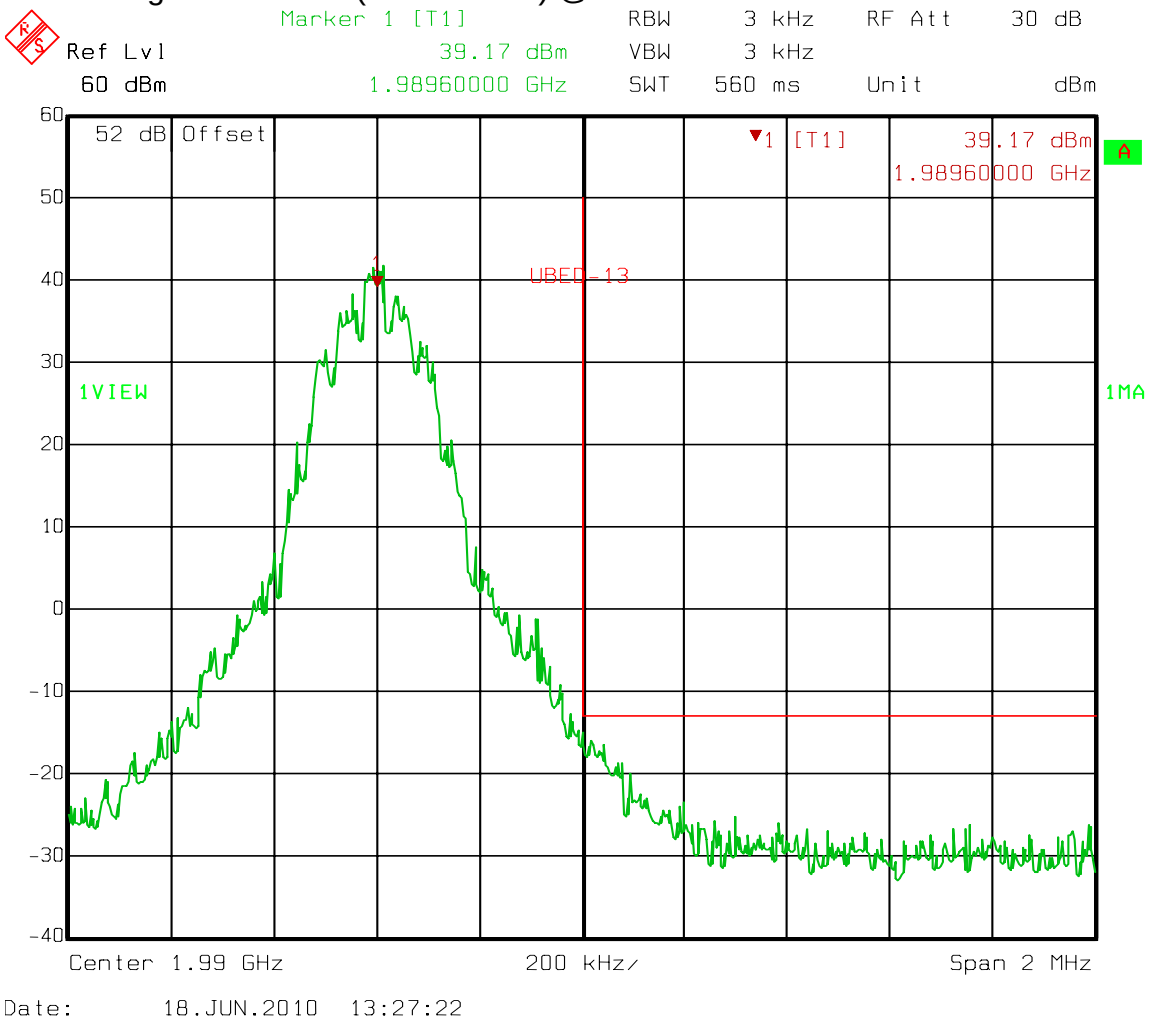
Test Data – Spurious Emissions at Antenna Terminals

Upper Band Edge
EDGE
Highest channel (1989.8 MHz) @ +36 dBm



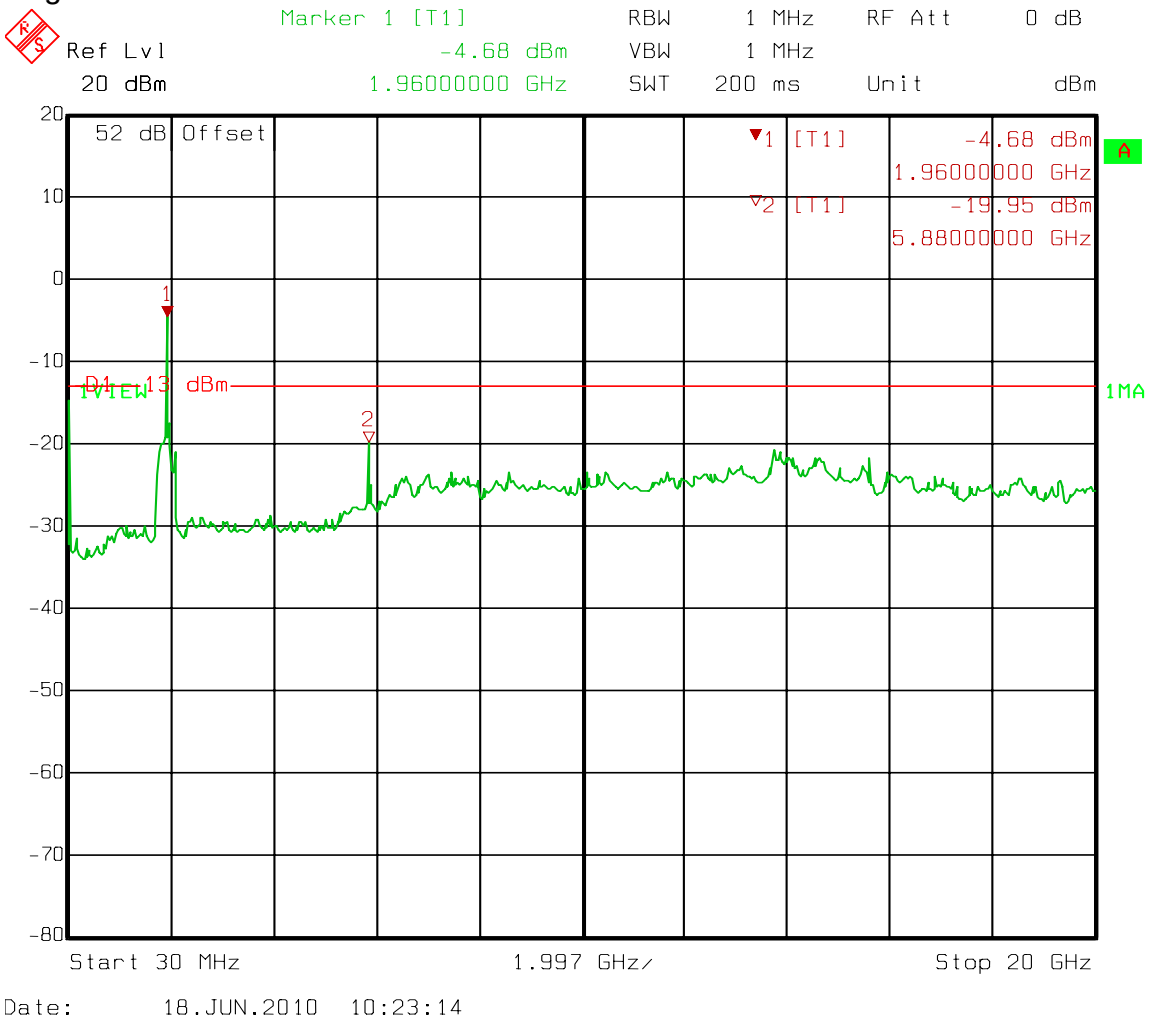
Test Data – Spurious Emissions at Antenna Terminals

Upper Band Edge
EDGE
Second highest channel (1989.6 MHz) @ +51 dBm



Test Data – Spurious Emissions at Antenna Terminals

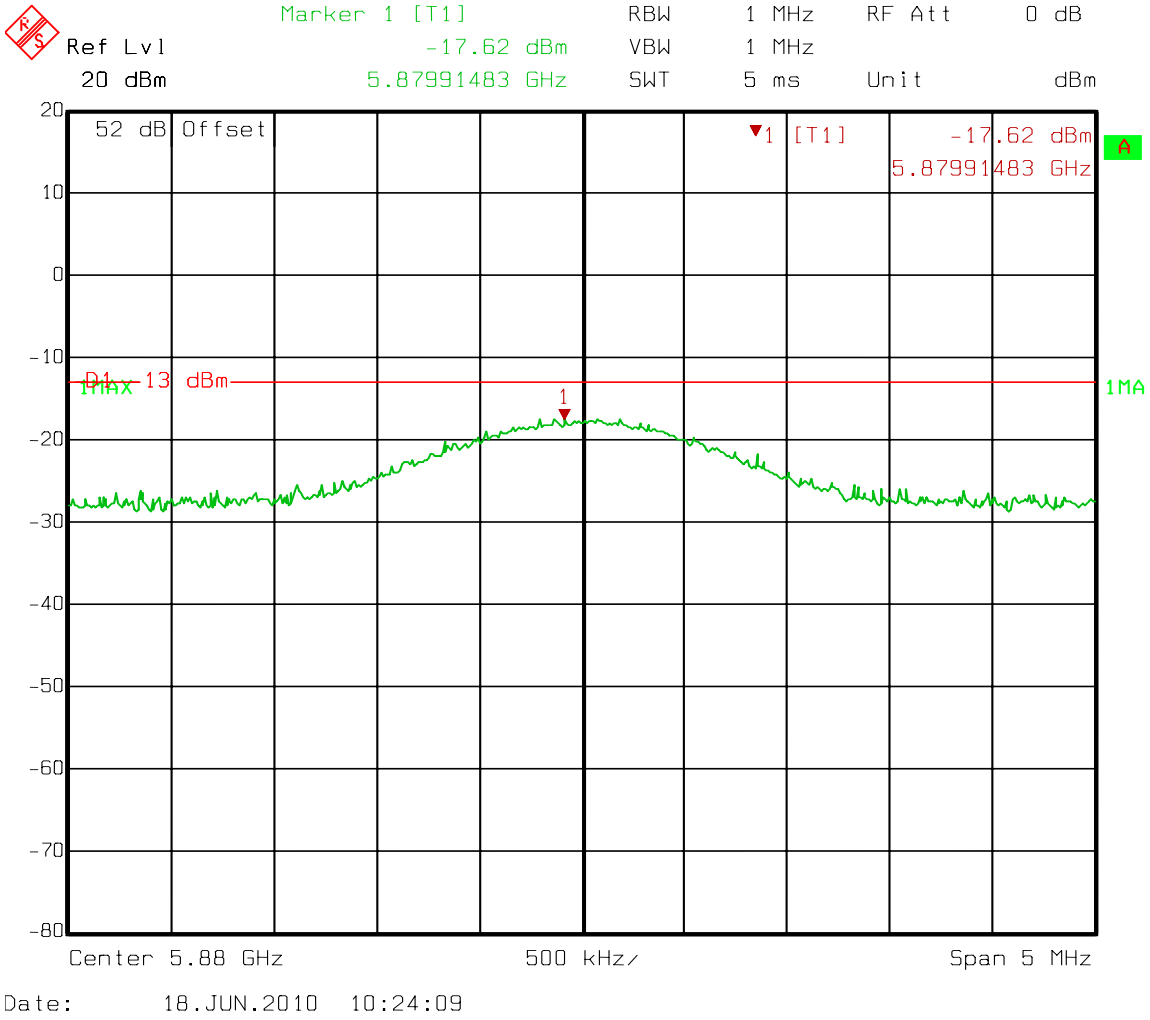
Spurs
Edge



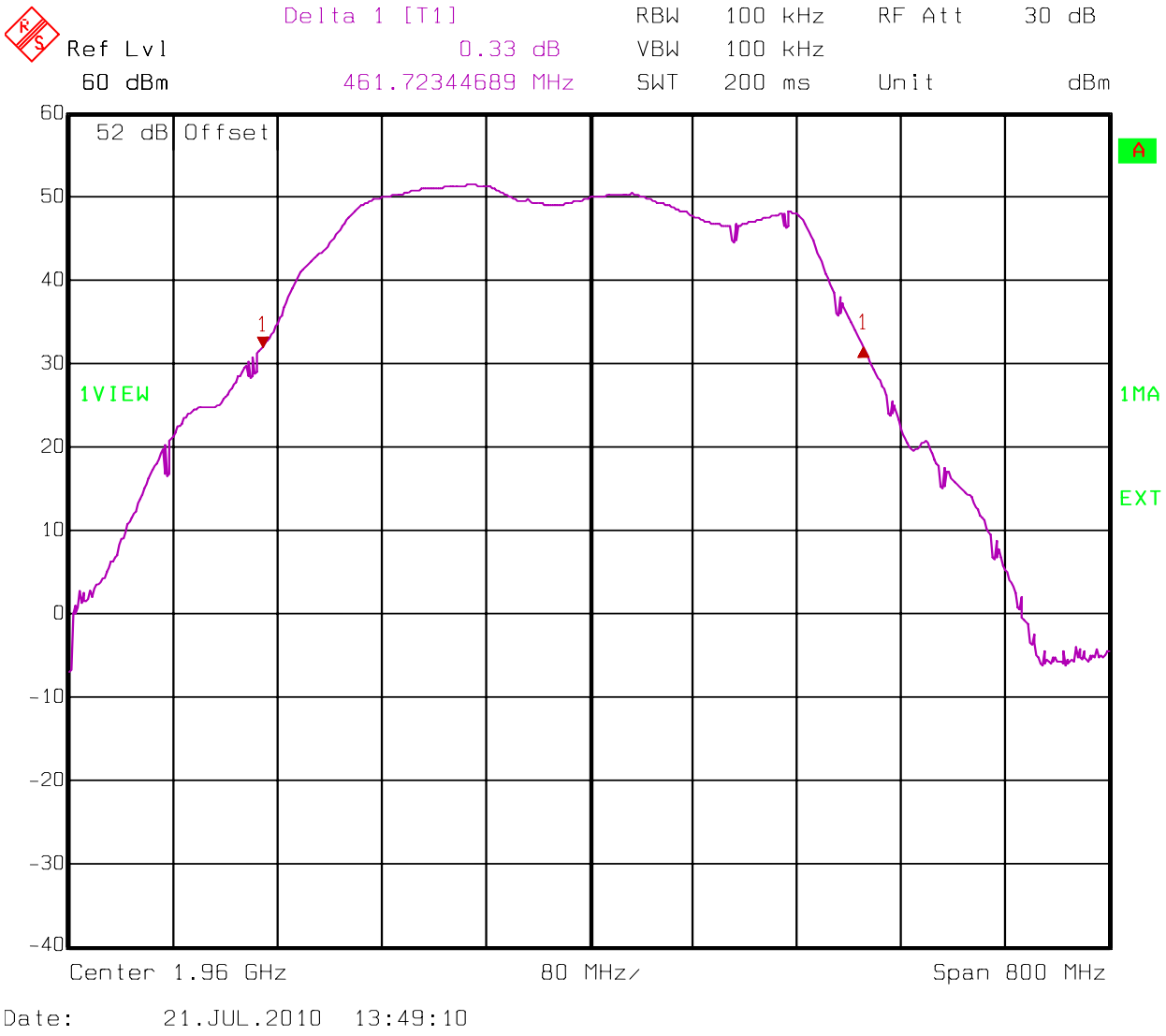
Carrier filtered

Test Data – Spurious Emissions at Antenna Terminals

Spurs
EDGE



Passband Response



This is the passband response of the amplifier.

Section 6. Field Strength of Spurious

NAME OF TEST: Field Strength of Spurious Emissions	PARA. NO.: 24.238
TESTED BY: David Light	DATE: 17 June 2010

Test Results: Complies.

Test Data: See attached table.

Equipment Used: 1464-1484-1485-1016-791-993-1480

Measurement Uncertainty: +/-1.7 dB

Temperature: 22 °C

Relative Humidity: 35 %

Test Data - Radiated Emissions

Frequency (MHz)	Meter Reading (dBm)	Substitution Level (dBm)		Pre-Amp Gain (dB)	Substitution Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Polarity	Comments
3920	-36.0	-26.5		33	8.0	-18.6	-13.0	-5.5500	V	
5880	-38.2	-29.7		31.9	8.4	-21.3	-13.0	-8.3300	V	
7840	-44.0	-35.3		32.9	9.0	-26.3	-13.0	-13.3400	V	
5880	-35.0	-30.3		31.9	8.4	-21.9	-13.0	-8.9300	H	
7840	-48.0	-40.5		32.9	9.0	-31.5	-13.0	-18.5400	H	
Notes:										

The spectrum was searched from 30 MHz to the 10th harmonic of the carrier. All emissions within -20 dB of the specification limit are reported.

Analyzer Settings: RBW/VBW = 1 MHz Peak detector

The EUT was tested at three meters in an anechoic chamber.

Section 7. Test Equipment List

Asset Tag	Description	Manufacturer	Model	Serial #	Last Cal	Next Cal
993	Antenna, Horn	A.H. Systems	SAS-200/571	162	09-Sep-2009	09-Sep-2011
1026	Frequency counter	Hewlett Packard	5350B	8232A01493	10-Jun-2010	10-Jun-2011
1036	Spectrum Analyzer	Rohde & Schwartz	FSEK30	830844/006	19-Jan-2009	19-Jan-2011
1054	Directional Coupler, Dual	Narda	3020A	34366	N/R	
1055	Directional Coupler, Dual	Narda	3022	73393	N/R	
1058	Directional Coupler, Dual	Hewlett Packard	11692D	1212A03366	N/R	
1082	Cable, 2m	Astrolab	32027-2-29094-72TC		N/R	
1464	Spectrum Analyzer	Hewlett Packard	8563E	3551A04428	27-Feb-2009	27-Feb-2011
1469	Attenuator, 10 db, DC 18 GHz	MCL Inc.	BW-S10W2 10db-2WDC		N/R	
1480	Antenna, Bilog	Schaffner-Chase	CBL6111C	2572	18-Jan-2010	18-Jan-2011
1484	Cable	Storm	PR90-010-072		23-Jun-2009	23-Jun-2010
1485	Cable	Storm	PR90-010-216		23-Jun-2009	23-Jun-2010
791	PreAmp	Nemko, USA			08-Mar-2010	08-Mar-2011
1016	Preamplifier	Hewlett Packard	8449A	2749A00159	19-Jun-2010	19-Jun-2011

ANNEX A - TEST DETAILS

NAME OF TEST: RF Power Output	**PARA. NO.: 2.1046**

Minimum Standard: Para. No.24.232. Base stations are limited to 1640 watts peak E.I.R.P. with an antenna height up to 300 meters HAAT. In no case may the peak output power of a base station transmitter exceed 100 watts.

Method Of Measurement:

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

Integral Antenna:
The antenna substitution method is used to determine the equivalent radiated power at spurious frequencies. The spurious emissions are measured at a distance of 3 meters. The EUT is then replaced with a reference substitution antenna with a known gain referenced to an isotropic radiator. This antenna is fed with a signal at the spurious frequency. The level of the signal is adjusted to repeat the previously measured level. The resulting eirp is the signal level fed to the reference antenna corrected for gain referenced to an isotropic radiator.

NAME OF TEST: Occupied Bandwidth	**PARA. NO.: 2.1049**

Minimum Standard: Input/Output

Method Of Measurement:

CDMA

Spectrum analyzer settings:
RBW=VBW=30 kHz
Span: 5 MHz
Sweep: Auto

GSM / EDGE

RBW=VBW= 3 kHz
Span: 1 MHz
Sweep: Auto

TDMA

RBW=VBW= 1 kHz
Span: 1 MHz
Sweep: Auto

W-CDMA

RBW=VBW= 100 kHz
Span: 10 MHz
Sweep: Auto

NAME OF TEST: Spurious Emission at Antenna Terminals PARA. NO.: 24.238

Minimum Standard: Para. No.24.238(a). On any frequency outside a licensee's frequency block, the power of any emission shall be attenuated below the transmitter power by at least 43 + 10 log (P) dB.

Method Of Measurement:

Spectrum analyzer settings:

CDMA

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

GSM / EDGE

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

TDMA

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

W-CDMA

RBW: 1 MHz (> 1 MHz from Band Edge)
RBW: 100 kHz (< 1MHz from Band Edge)
VBW: ≥ RBW
Sweep: Auto
Video Avg: 6 Sweeps

To demonstrate compliance at band edges the frequency of the input signal is set to the lowest and highest assigned channel and the center frequency of the spectrum analyzer is set to the upper and lower edges of the appropriate frequency block.

NAME OF TEST: Field Strength of Spurious Radiation PARA. NO.: 24.238

Minimum Standard: Para. No.24.238(a). On any frequency outside a licensee's frequency block, the power of any emission shall be attenuated below the transmitter power by at least 43 + 10 log (P) dB.

Method of Measurement TIA/EIA-603-1992

The antenna substitution method is used to determine the equivalent radiated power at spurious frequencies. The spurious emissions are measured at a distance of 3 meters. The EUT is then replaced with a reference substitution antenna with a known gain referenced to an isotropic radiator. This antenna is fed with a signal at the spurious frequency. The level of the signal is adjusted to repeat the previously measured level. The resulting eirp is the signal level fed to the reference antenna corrected for gain referenced to an isotropic radiator.

NAME OF TEST: Frequency Stability **PARA. NO.: 2.1055**

Minimum Standard: Para. No. 24.235. The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

Method Of Measurement:

Frequency Stability With Voltage Variation

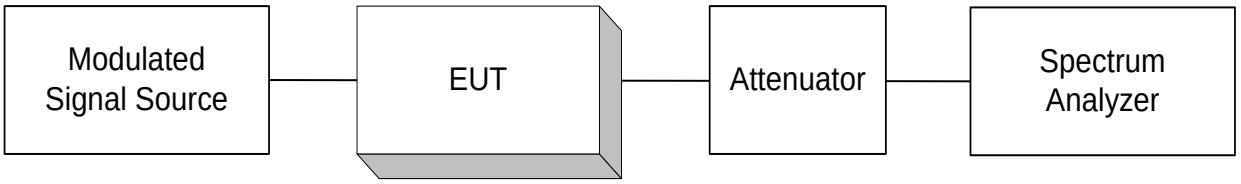
The E.U.T. is placed in an environmental chamber and allowed to stabilize at +20 degrees Celsius for at least 15 minutes. The frequency counter and signal generator are phase locked with the same 10 MHz reference frequency by connecting the 10 MHz ref. out of the counter to the 10 MHz ref, in of the signal generator. With the voltage input to the E.U.T. set to 85% S.T.V., the frequency is measured in 30 second intervals for a period of 5 minutes. This procedure is repeated at 100% S.T.V. and 115% S.T.V.

Frequency Stability With Temperature Variation

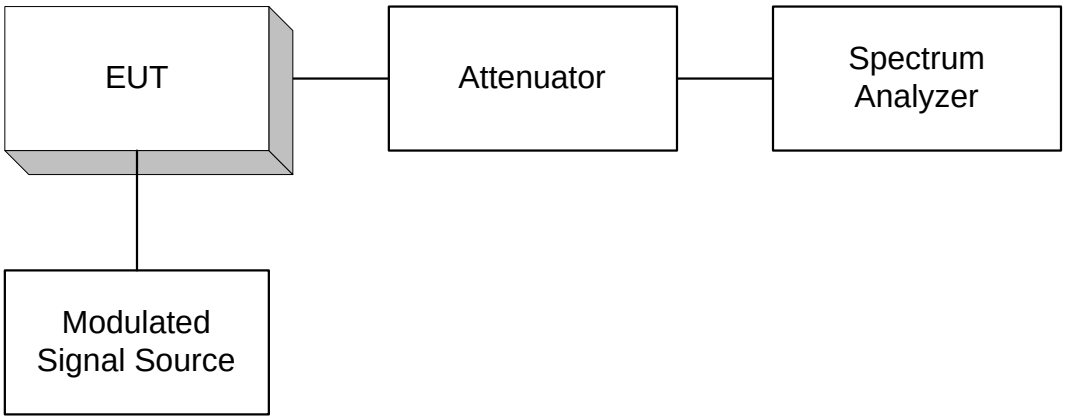
The input voltage to the E.U.T. is set to S.T.V. and the temperature of the environmental chamber is varied in 10 degree steps from -30 degrees C to +50 degrees C. The E.U.T. is allowed to stabilize at each temperature and the frequency is measured in 30 second intervals for a period of 5 minutes.

ANNEX B - TEST DIAGRAMS

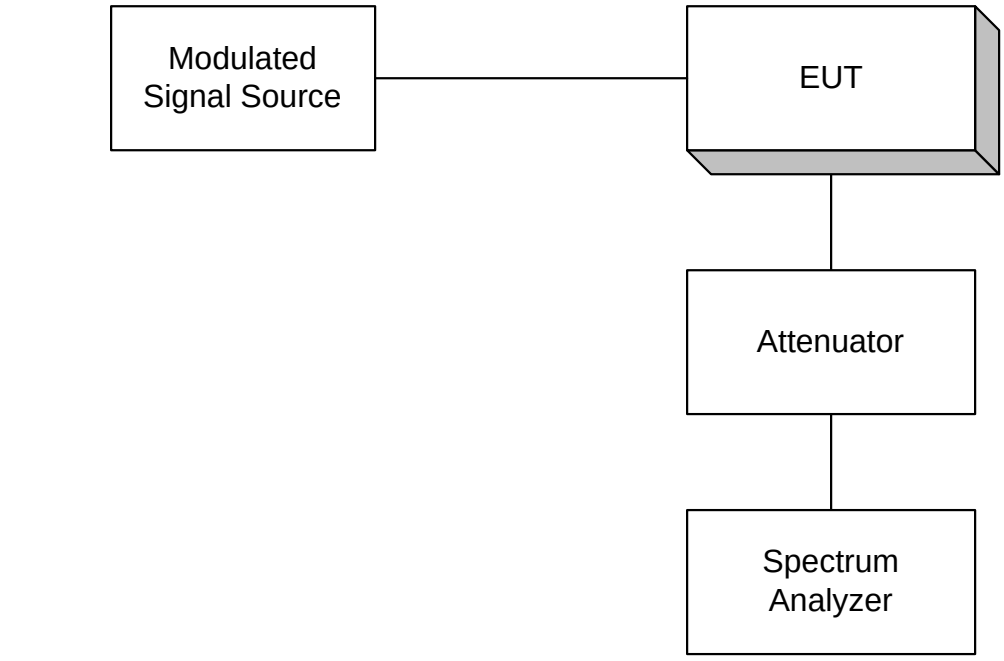
Para. No. 2.985 - R.F. Power Output

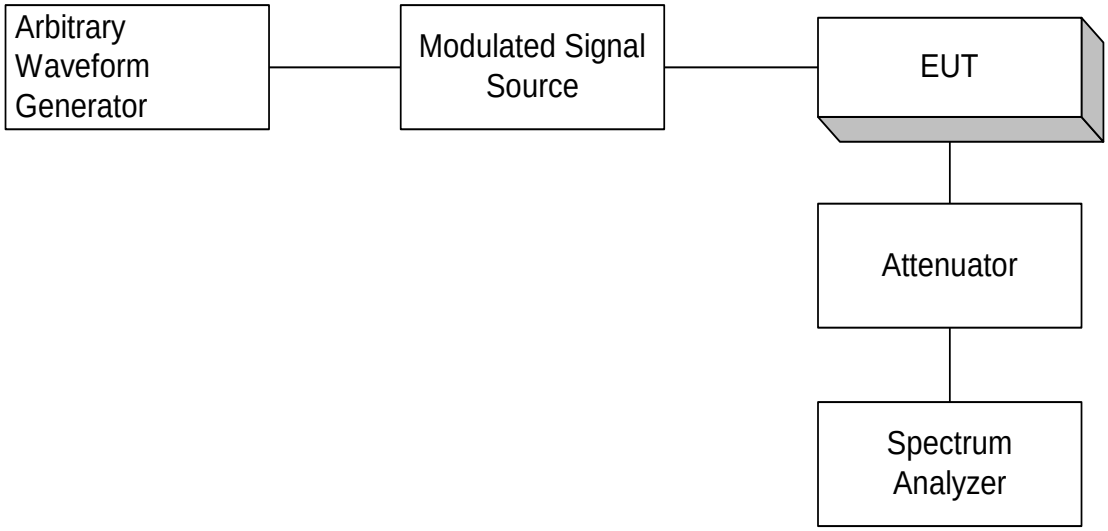


Para. No. 2.989 - Occupied Bandwidth

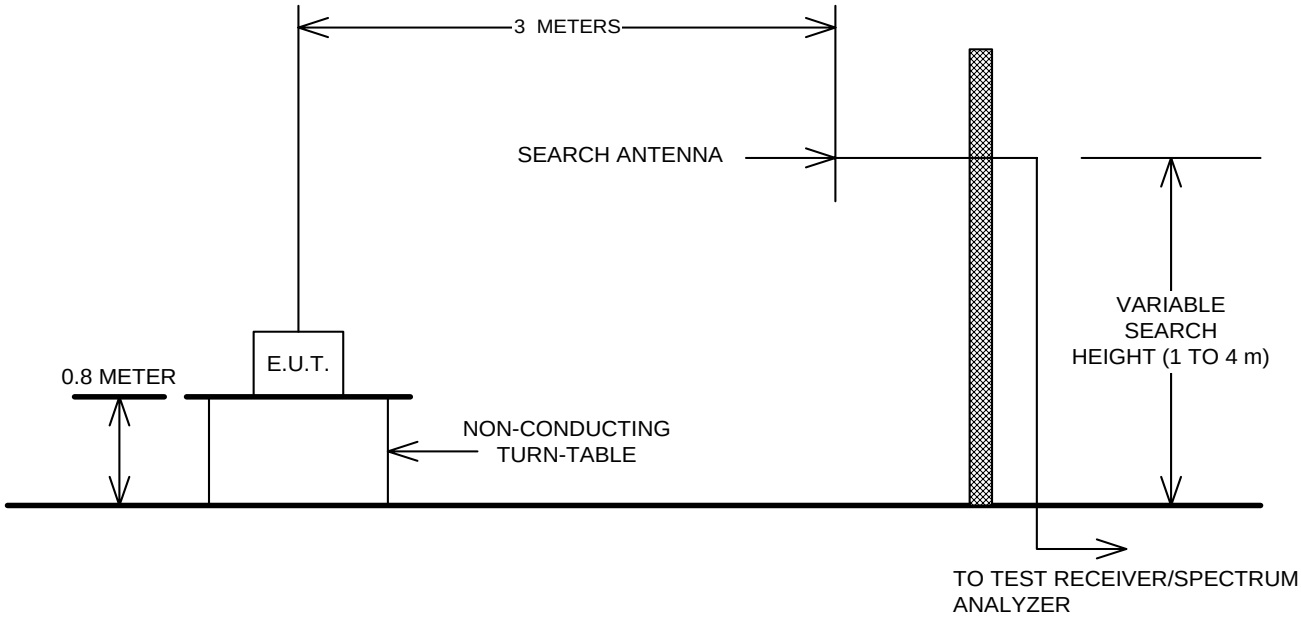


Para. No. 2.991 Spurious Emissions at Antenna Terminals





Para. No. 2.993 - Field Strength of Spurious Radiation



Para. No. 2.995 - Frequency Stability