

Compliance test report

**167135-2TRFWL**

Part 3/3

Date of issue  
June 20, 2011

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## **FCC Part 90, Boosters**

Private Land Mobile Radio Service

Applicant **Bird Technologies – TX RX Systems**  
Product **Channelized Signal Booster**  
Model **613-8**  
FCC ID **EZZ6138**

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Nemko Canada Inc., a testing laboratory, is accredited by the Standards Council of Canada. The tests included in this report are within the scope of this accreditation



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## Test location

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**Website** www.nemko.com  
**Test site IC number** 176392 (3 m Semi anechoic chamber)

**Tested by** Andrey Adelberg, Senior Wireless/EMC Specialist

**Reviewed by**



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David Duchesne, Wireless/EMC Specialist

June 20, 2011

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Date:

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## Limits of responsibility

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Note that the results contained in this report relate only to the items tested and were obtained in the period between the date of initial receipt of samples and the date of issue of the report.

This test report has been completed in accordance with the requirements of ISO/IEC 17025. All results contain in this report are within Nemko Canada's ISO/IEC 17025 accreditation.

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## Section 1: Report summary

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### 1.1 Applicant

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Bird Technologies - TX RX Systems  
30303 Aurora Road  
Solon, United States  
OH 44139

### 1.2 Manufacturer

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Bird Technologies - TX RX Systems  
30303 Aurora Road  
Solon, United States  
OH 44139

### 1.3 Test specification

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**FCC Part 90, Boosters**  
Private Land Mobile Radio Services

### 1.4 Statement of compliance

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In the configuration tested the EUT was found compliant.

This report contains an assessment of apparatus against specifications based upon tests carried out on samples submitted at Nemko Canada Inc. These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with FCC Part 90. Conducted measurements were performed in accordance with ANSI TIA-603-B-2002. Radiated tests were conducted in accordance with ANSI C63.4-2003.

### 1.5 Exclusions

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None

### 1.6 Test report revision history

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Revision #	Details of changes made to test report
TRF	Original report issued

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## Section 2: Summary of test results

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### 2.1 FCC Part 90 tests result summary

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Part	Test description	Verdict
90.205	Output power	Pass <sup>2</sup>
90.210	Conducted and radiated spurious emissions	Pass <sup>3</sup>
90.213	Frequency stability	N/A <sup>1</sup>
90.219	Use of boosters	Pass
2-11-04/EAB/RF	Occupied bandwidth	Pass <sup>2</sup>
2-11-04/EAB/RF	Out of band rejection	Pass

Notes: <sup>1</sup>The tested booster uses the same LO for down- and up-frequency conversion in the signal-processing chain; therefore the transmitted signal is identical in frequency to the received signal. This was verified by measuring the transmitted (output) signal frequency with a frequency counter that was phase-locked to a signal generator used to generate input RF signal. Measured frequency deviation was 0 Hz and the EUT was deemed to comply with frequency stability requirement.

<sup>2</sup>Please refer to 167135-2TRFWL Part 1 test report.

<sup>3</sup>Partial data. For the rest of the measurements please refer to 167135-2TRFWL Part 2 test report.

## Section 3: Equipment under test (EUT) details

### 3.1 Product details

**Model** 613-8  
**Type of product** Channelized Broadband signal booster

### 3.2 Product description

The EUT is a broadband channelized booster that operates in 763–869 MHz frequency range and has internal filter that can be set to fixed channels 12.5, 25 and 50 kHz and tunable channel bandwidths from 1 to 15 MHz.

### 3.3 Sub-assemblies

Item #	Type	Frequency range	Serial/Part number	Notes
1	Low power filter module	700 MHz	3-23350-1	Combination with Power amplifier
2	Low power filter module	800 MHz	3-23368-1	Combination with Power amplifier
3	Fiber Optic filter module	700 MHz	3-23919	Combination with Power amplifier
4	Fiber Optic filter module	800 MHz	3-23920	Combination with Power amplifier
5	High power filter module	700 MHz	3-23921	None
6	High power filter module	800 MHz	3-23922	None
7	High power Fiber Optic filter module	700 MHz	3-23923	None
8	High power Fiber Optic filter module	800 MHz	3-23924	None
9	Power amplifier	700–800 MHz	3-23365	None
10	Triplexer	700–800 MHz	3-23088	None
11	Controller	N/A	3-23360-1	None

### 3.4 Sample information

**Receipt date** May 16, 2011  
**Nemko sample ID number** 1

### 3.5 EUT technical specifications

**Operating bands** Downlink: 763–775 MHz Uplink: 793–805 MHz  
851–854 MHz 806–809 MHz  
854–869 MHz 809–824 MHz

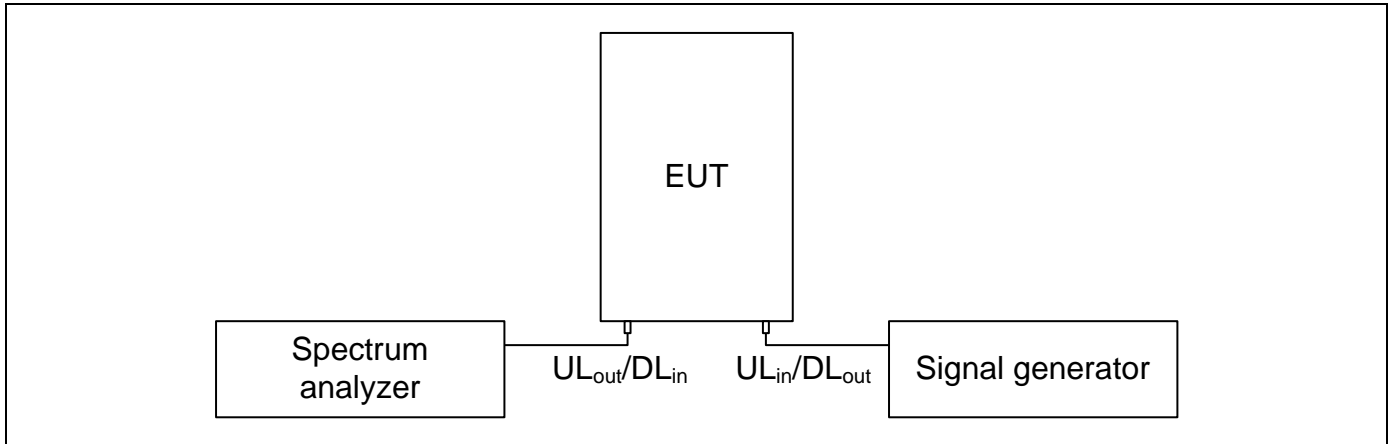
**Power source** 120 V<sub>AC</sub>, 60 Hz

Emission designator	Type of transmission	Modulation
F1D	Data	RD-LAP [9.6, 19.2] (4-L FSK)
		Dataradio 50 kHz (16FSK)
		P25 Phase 1 (C4FM) Control/Data
F1E	Voice	4-L FSK (Voice)
		P25 Phase 1 (C4FM)
		Tyco-M/A-Com EDACS (GFSK)
		Securenet (Encrypted Quantized Voice)
F3E	Voice Analog	
FXE	Voice	MotoTrbo, Kenwood, ICOM DMR
FXD	Data	ETSI DMR 2-slot TDMA
G1E	Voice	F4FM (Phase 2 P25 TDMA, Tetrapol)
G1D	Data	F4FM (Phase 2 P25 TDMA, Tetrapol)
D7W		TETRA, P25 Phase 2 (pi/4 [W]CQPSK)
D7D		Motorola HPD
D1E		CQPSK
D1W		LSM (Motorola Linear Simulcast)
F9W		Tyco-M/A-Com OpenSky (F4FGSK)
D1E	Voice	WCQPSK (Simulcast)

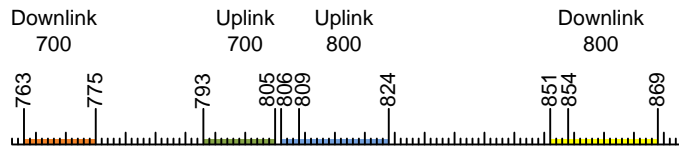
### 3.6 Operation of the EUT during testing

The EUT was controlled from laptop to tune to desired channel.

### 3.7 EUT setup diagram



### 3.8 Allocation bands



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## Section 4: Engineering considerations

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### 4.1 Modifications incorporated in the EUT

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There were no modifications performed to the EUT during this assessment

### 4.2 Deviations from laboratory tests procedures

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No deviations were made from laboratory test procedures

### 4.3 Technical judgment

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None



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## Section 5: Test conditions

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### 5.1 Atmospheric conditions

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Temperature: 15–30 °C  
Relative humidity: 20–75 %  
Air pressure: 86–106 kPa

When it is impracticable to carry out tests under these conditions, a note to this effect stating the ambient temperature and relative humidity during the tests shall be recorded and stated.

### 5.2 Power supply range

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The normal test voltage for equipment to be connected to the mains shall be the nominal mains voltage. For the purpose of the present document, the nominal voltage shall be the declared voltage, or any of the declared voltages  $\pm 5\%$ , for which the equipment was designed.

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## Section 6: Measurement uncertainty

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### 6.1 Measurement uncertainty

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Nemko Canada Inc. has calculated measurement uncertainty and is documented in EMC/MUC/001 "Uncertainty in EMC measurements." Measurement uncertainty was calculated using the methods described in CISPR 16-4 Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC measurements; as well as described in UKAS LAB34: The expression of Uncertainty in EMC Testing. Measurement uncertainty calculations assume a coverage factor of  $K=2$  with 95 % certainty.

## Section 7: Test equipment

### 7.1 Test equipment list

Equipment	Manufacturer	Model No.	Asset/Serial No.	Cal. cycle	Next cal.
3 m EMI test chamber	TDK	SAC-3	FA002047	1 year	Mar. 09/12
Flush mount turntable	Sunol	FM2022	FA002082	—	NCR
Controller	Sunol	SC104V	FA002060	—	NCR
Antenna mast	Sunol	TLT2	FA002061	—	NCR
Receiver/spectrum analyzer	Rohde & Schwarz	ESU 26	FA002043	1 year	April 27/12
Spectrum analyzer	Rohde & Schwarz	FSU	FA001877	1 year	Dec.06/11
Bilog antenna	Sunol	JB3	FA002108	1 year	Jan. 31/12
Horn antenna #2	EMCO	3115	FA000825	1 year	Feb. 04/12
1–18 GHz pre-amplifier	JCA	JCA118-503	FA002091	1 year	Sept. 23/11
Signal generator	Rohde & Schwarz	SMIQ03E	FA001269	1 year	Dec. 07/11
Signal generator	Rohde & Schwarz	SMIQ06B	FA001878	1 year	Dec. 07/11
Note: NCR = No Calibrate Required					

## Section 8: Testing data

### 8.4 Clause 90.210 Conducted and radiated spurious emissions

Except as indicated elsewhere in this part, transmitters used in the radio services governed by this part must comply with the emission masks outlined in this section. Unless otherwise stated, per paragraphs (d)(4), (e)(4), and (m) of this section, measurements of emission power can be expressed in either peak or average values provided that emission powers are expressed with the same parameters used to specify the unmodulated transmitter carrier power. For transmitters that do not produce a full power unmodulated carrier, reference to the unmodulated transmitter carrier power refers to the total power contained in the channel bandwidth. Unless indicated elsewhere, the Table below specifies the emission masks for equipment operating in the frequency bands governed under this part.

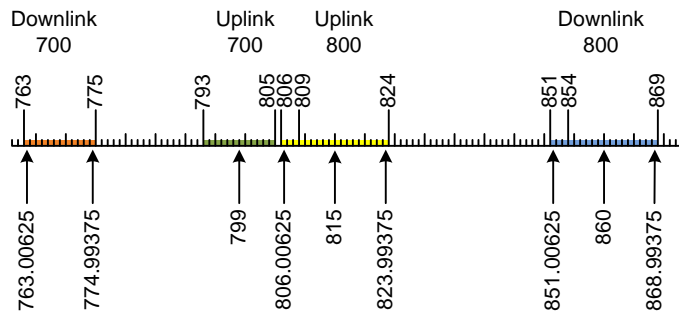
#### 8.4.1 Test summary

<b>Test date</b>	May 18–20 and 31, 2011	<b>Test engineer</b>	Andrey Adelberg	<b>Verdict</b>	Pass
<b>Temperature</b>	23 °C	<b>Air pressure</b>	1002 mbar	<b>Relative humidity</b>	40 %

#### 8.4.2 Special notes

Measurements were assessed against the requirements of 90.210 Mask C, for Downlink 700 and Uplink 700; 90.210 Mask H for Uplink 800 (806–809 MHz range) and Downlink 800 (851–854 MHz range); 90.210 Mask G for Uplink 800 (809–824 MHz range) and Downlink 800 (854–869 MHz range).

The conducted test was performed using a peak detector with 1 MHz RBW. The spectrum was swept from 30 MHz up to the 9 GHz. The EUT's filter was set to 12.5 kHz channel as a worst case scenario.

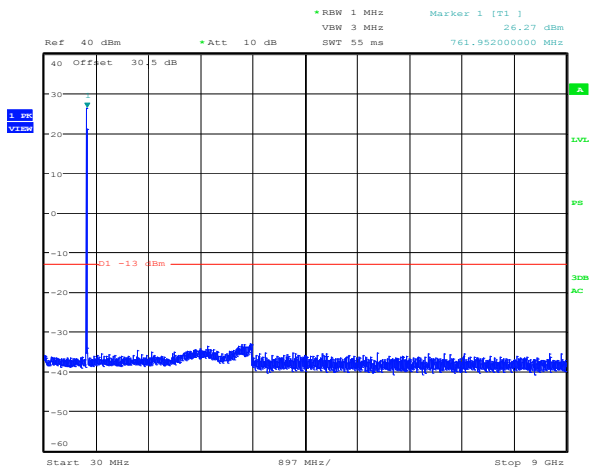


**Diagram 8.4-1:** Spurious emissions frequencies

All radiated measurements were performed using a Peak Detector with 100 kHz RBW below 1 GHz and a 1 MHz RBW above 1 GHz at a distance of 3 meters. The spectrum was swept from 30 MHz up to the 9 GHz. Radiated Spurious emissions were tested with -80 dBm CW at the input of the EUT and 50 Ω termination at the output. Theoretical field strength limit equivalent to -13 dBm is 82.23 dBμV/m. No emissions were found within 20 dB below the limit.

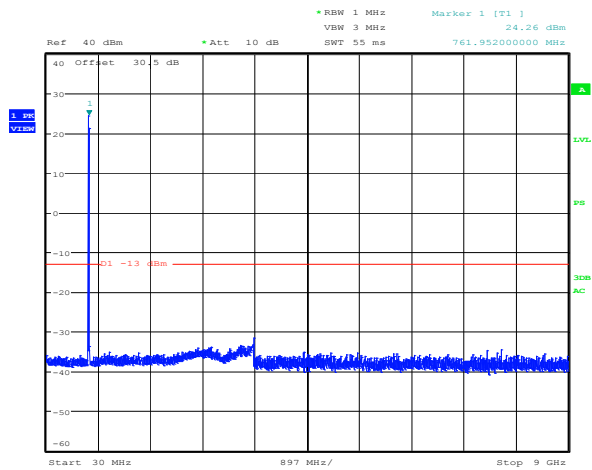
**Continued from 167135-2TRFWL Part 2 test report**

### 8.4.3 Test data, continued (beginning in 167135-2TRFWL Part 2)



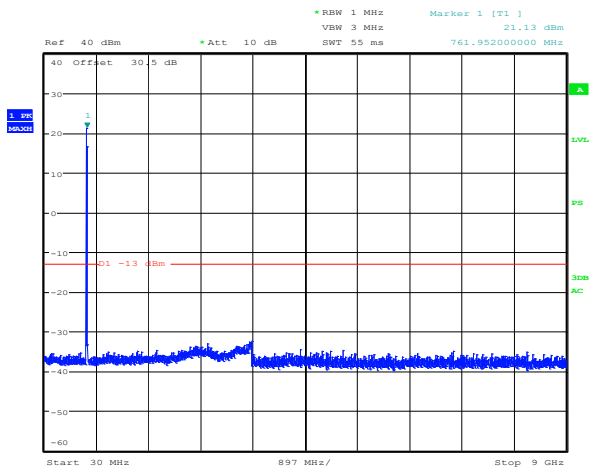
Date: 19.MAY.2011 10:54:53

**Plot 8.4-1:** Spurious emissions  
 Regular + power amplifier  
 Downlink 700 MHz  
 C4FM modulation  
 763.00625 MHz



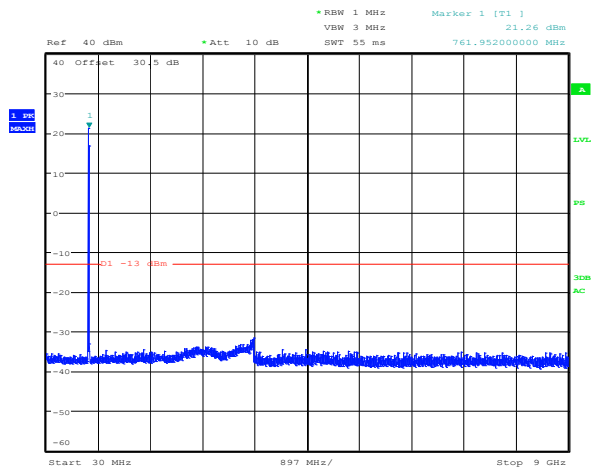
Date: 19.MAY.2011 10:57:36

**Plot 8.4-2:** Spurious emissions  
 Regular + power amplifier  
 Downlink 700 MHz  
 CQPSK modulation  
 763.00625 MHz



Date: 19.MAY.2011 11:00:11

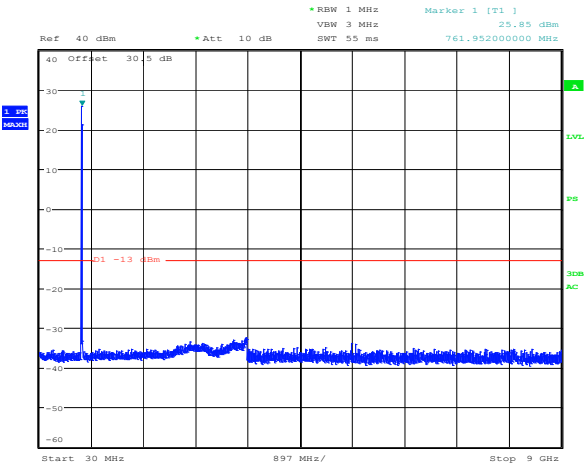
**Plot 8.4-3:** Spurious emissions  
 Regular + power amplifier  
 Downlink 700 MHz  
 CW modulation  
 763.00625 MHz



Date: 19.MAY.2011 11:02:21

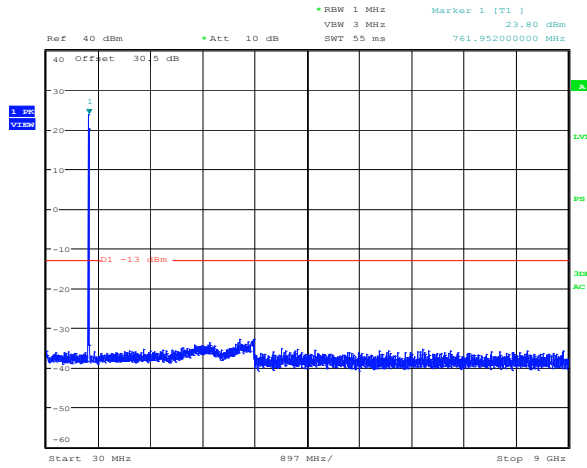
**Plot 8.4-4:** Spurious emissions  
 Regular + power amplifier  
 Downlink 700 MHz  
 Motorola HPD modulation  
 763.00625 MHz

8.4.3 Test data, continued



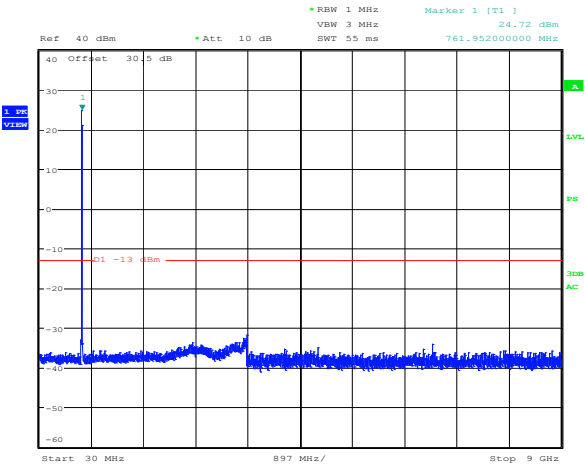
Date: 19.MAY.2011 10:59:38

**Plot 8.4-5:** Spurious emissions  
 Regular + power amplifier  
 Downlink 700 MHz  
 LSM modulation  
 763.00625 MHz



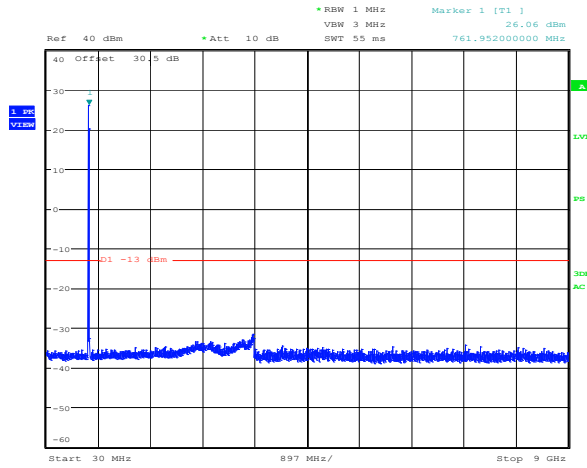
Date: 19.MAY.2011 11:02:58

**Plot 8.4-6:** Spurious emissions  
 Regular + power amplifier  
 Downlink 700 MHz  
 OpenSky modulation  
 763.00625 MHz



Date: 19.MAY.2011 10:58:03

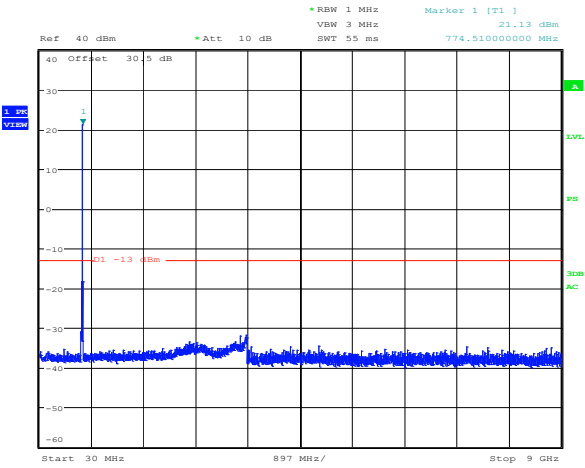
**Plot 8.4-7:** Spurious emissions  
 Regular + power amplifier  
 Downlink 700 MHz  
 TETRA modulation  
 763.00625 MHz



Date: 19.MAY.2011 10:54:17

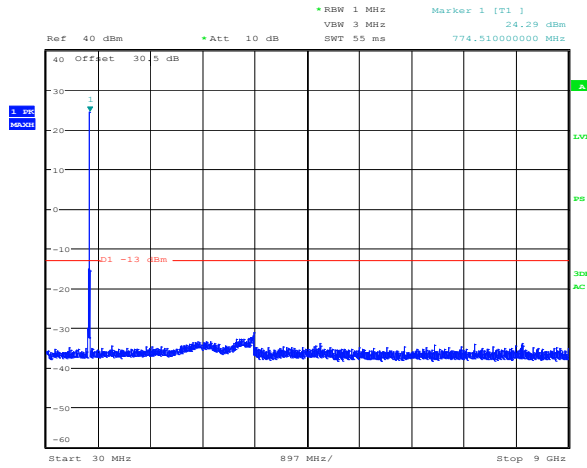
**Plot 8.4-8:** Spurious emissions  
 Regular + power amplifier  
 Downlink 700 MHz  
 WCQPSK modulation  
 763.00625 MHz

### 8.4.3 Test data, continued



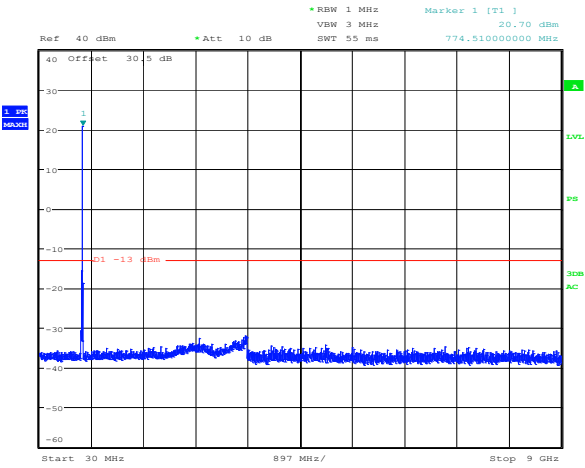
Date: 19.MAY.2011 10:55:27

**Plot 8.4-9:** Spurious emissions  
 Regular + power amplifier  
 Downlink 700 MHz  
 C4FM modulation  
 774.99375 MHz



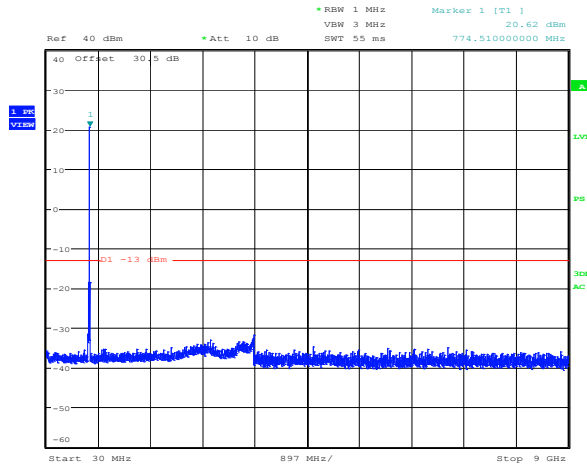
Date: 19.MAY.2011 10:57:00

**Plot 8.4-10:** Spurious emissions  
 Regular + power amplifier  
 Downlink 700 MHz  
 CQPSK modulation  
 774.99375 MHz



Date: 19.MAY.2011 11:00:38

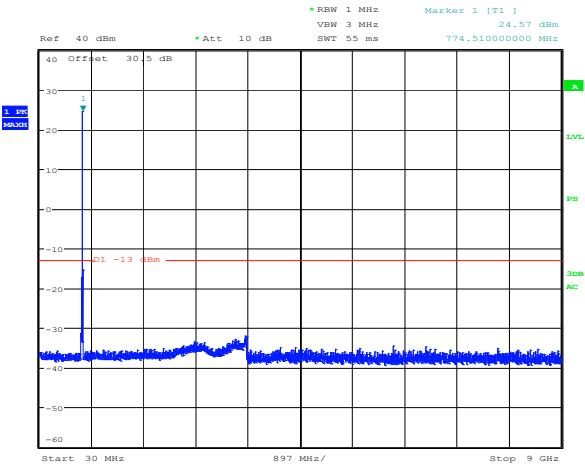
**Plot 8.4-11:** Spurious emissions  
 Regular + power amplifier  
 Downlink 700 MHz  
 CW modulation  
 774.99375 MHz



Date: 19.MAY.2011 11:01:48

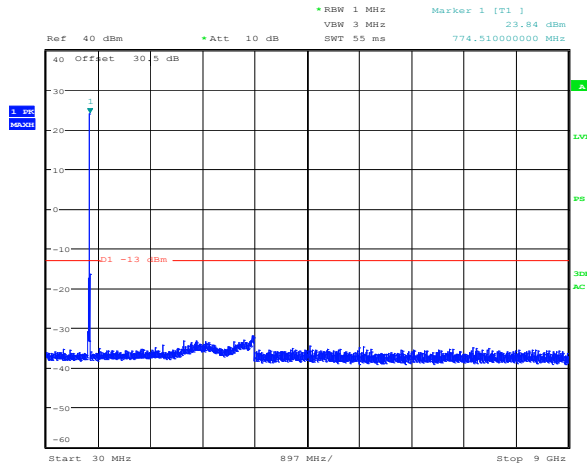
**Plot 8.4-12:** Spurious emissions  
 Regular + power amplifier  
 Downlink 700 MHz  
 Motorola HPD modulation  
 774.99375 MHz

### 8.4.3 Test data, continued



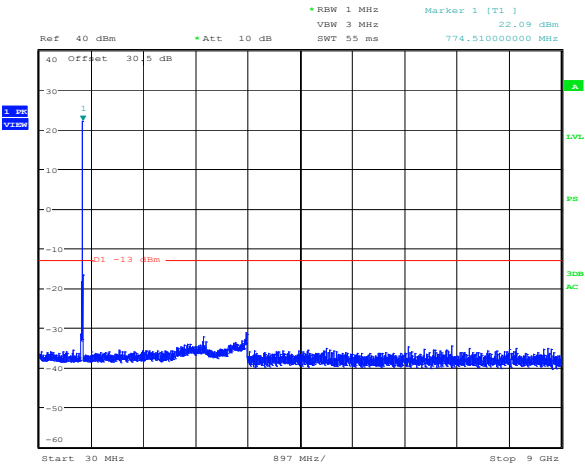
Date: 19.MAY.2011 10:59:03

**Plot 8.4-13:** Spurious emissions  
 Regular + power amplifier  
 Downlink 700 MHz  
 LSM modulation  
 774.99375 MHz



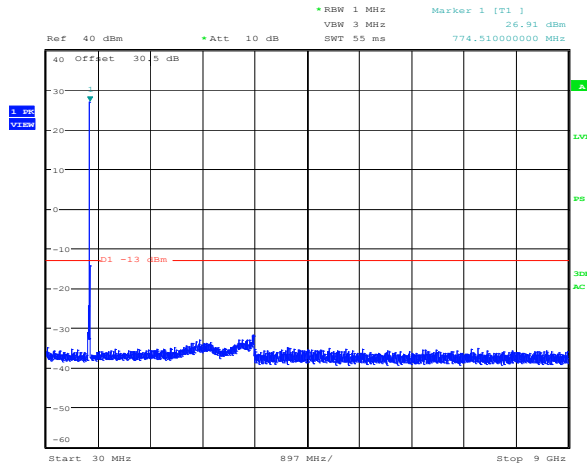
Date: 19.MAY.2011 11:03:29

**Plot 8.4-14:** Spurious emissions  
 Regular + power amplifier  
 Downlink 700 MHz  
 OpenSky modulation  
 774.99375 MHz



Date: 19.MAY.2011 10:58:32

**Plot 8.4-15:** Spurious emissions  
 Regular + power amplifier  
 Downlink 700 MHz  
 TETRA modulation  
 774.99375 MHz

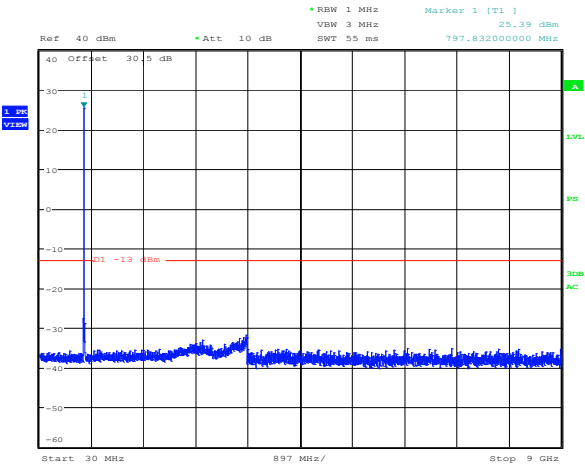


Date: 19.MAY.2011 10:51:20

**Plot 8.4-16:** Spurious emissions  
 Regular + power amplifier  
 Downlink 700 MHz  
 WCQPSK modulation  
 774.99375 MHz

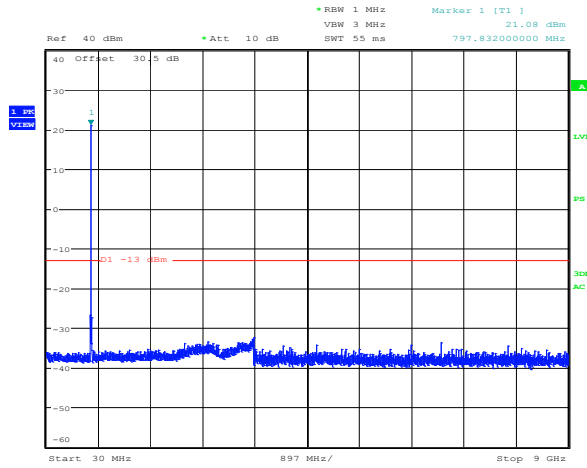


### 8.4.3 Test data, continued



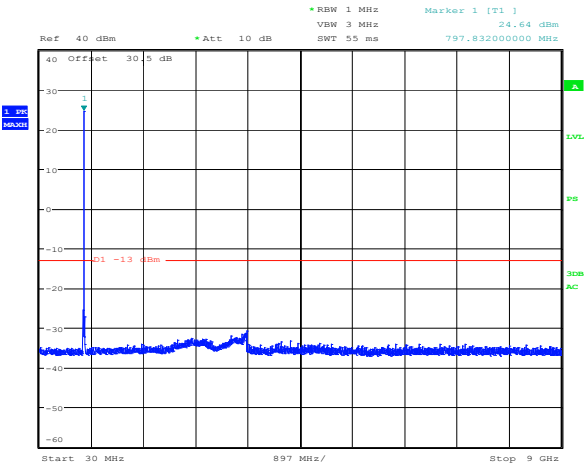
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**Plot 8.4-17:** Spurious emissions  
 Regular + power amplifier  
 Uplink 700 MHz  
 C4FM modulation  
 779 MHz



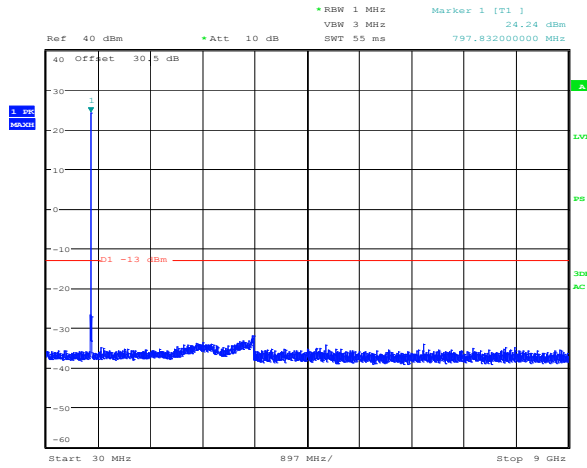
Date: 19.MAY.2011 12:05:06

**Plot 8.4-18:** Spurious emissions  
 Regular + power amplifier  
 Uplink 700 MHz  
 CQPSK modulation  
 779 MHz



Date: 19.MAY.2011 12:02:56

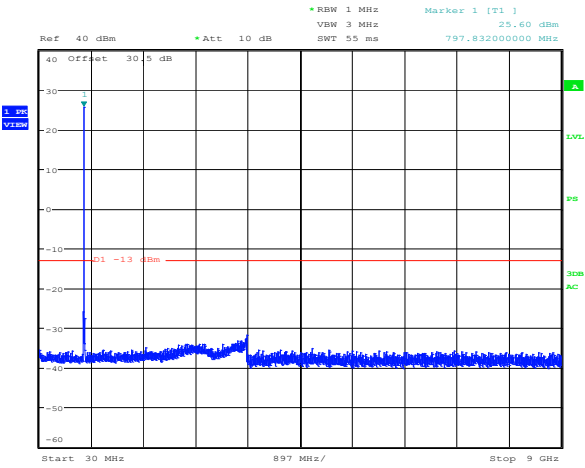
**Plot 8.4-19:** Spurious emissions  
 Regular + power amplifier  
 Uplink 700 MHz  
 CW modulation  
 779 MHz



Date: 19.MAY.2011 12:03:38

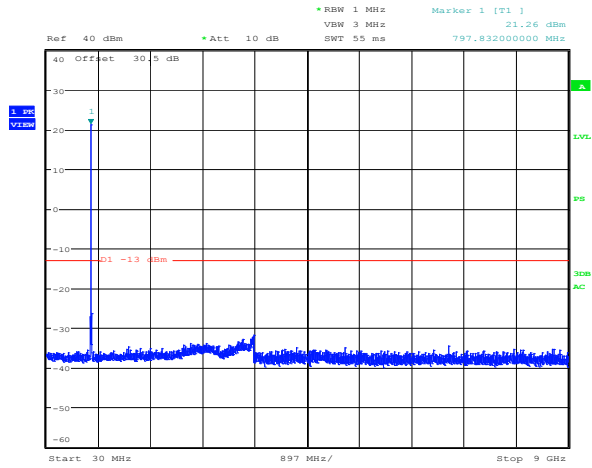
**Plot 8.4-20:** Spurious emissions  
 Regular + power amplifier  
 Uplink 700 MHz  
 Motorola HPD modulation  
 779 MHz

### 8.4.3 Test data, continued



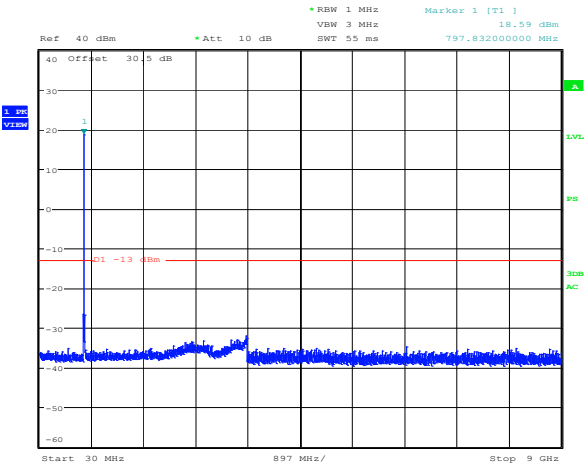
Date: 19.MAY.2011 12:08:46

**Plot 8.4-21:** Spurious emissions  
 Regular + power amplifier  
 Uplink 700 MHz  
 LSM modulation  
 779 MHz



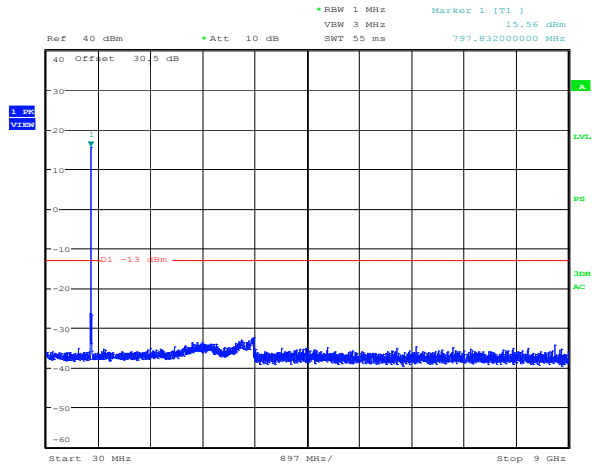
Date: 19.MAY.2011 12:07:33

**Plot 8.4-22:** Spurious emissions  
 Regular + power amplifier  
 Uplink 700 MHz  
 OpenSky modulation  
 779 MHz



Date: 19.MAY.2011 12:06:38

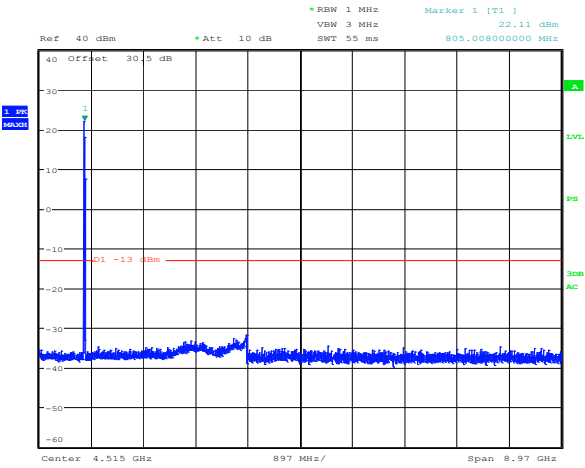
**Plot 8.4-23:** Spurious emissions  
 Regular + power amplifier  
 Uplink 700 MHz  
 TETRA modulation  
 779 MHz



Date: 19.MAY.2011 12:05:53

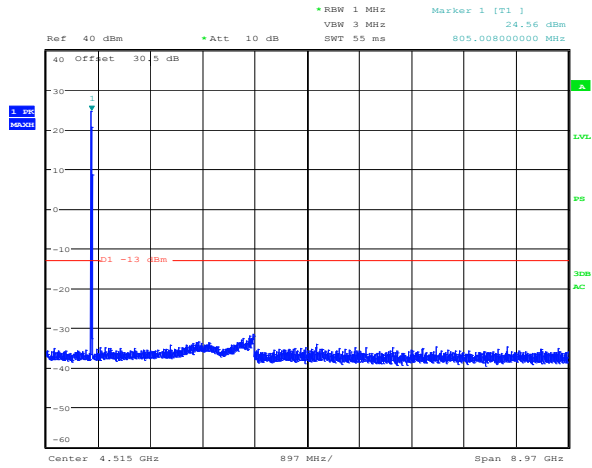
**Plot 8.4-24:** Spurious emissions  
 Regular + power amplifier  
 Uplink 700 MHz  
 WCQPSK modulation  
 779 MHz

### 8.4.3 Test data, continued



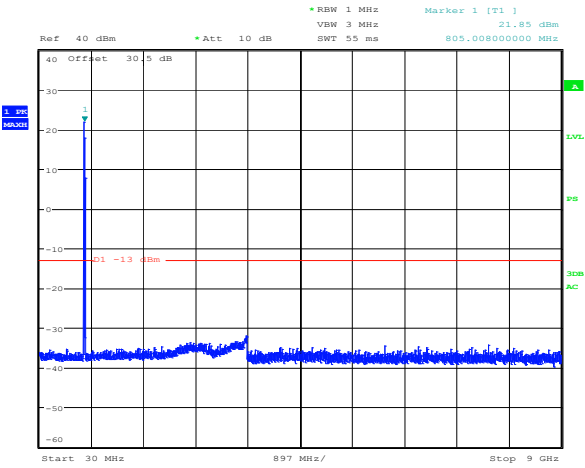
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**Plot 8.4-25:** Spurious emissions  
 Regular + power amplifier  
 Uplink 800 MHz  
 C4FM modulation  
 806.00625 MHz



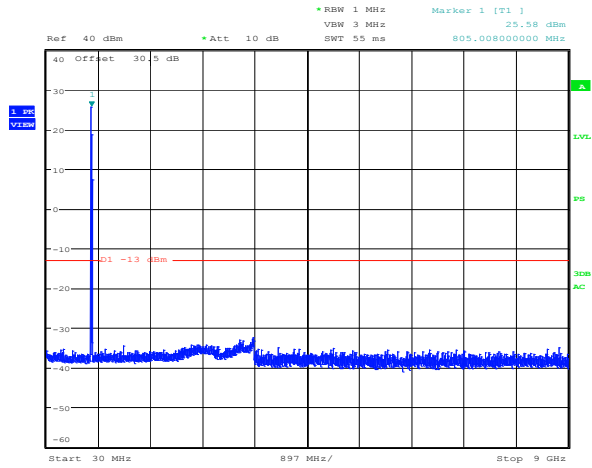
Date: 19.MAY.2011 16:39:17

**Plot 8.4-26:** Spurious emissions  
 Regular + power amplifier  
 Uplink 800 MHz  
 CQPSK modulation  
 806.00625 MHz



Date: 19.MAY.2011 16:35:41

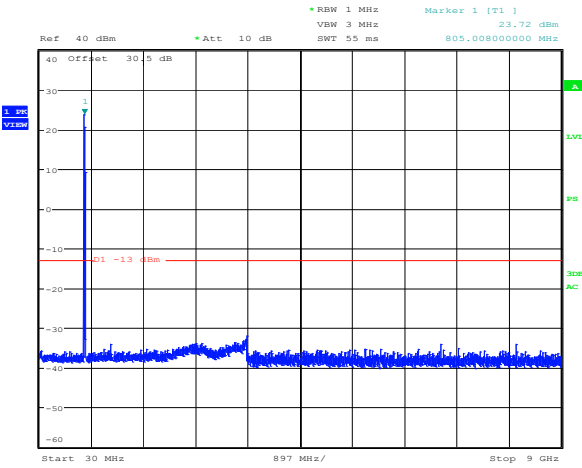
**Plot 8.4-27:** Spurious emissions  
 Regular + power amplifier  
 Uplink 800 MHz  
 CW modulation  
 806.00625 MHz



Date: 19.MAY.2011 16:36:22

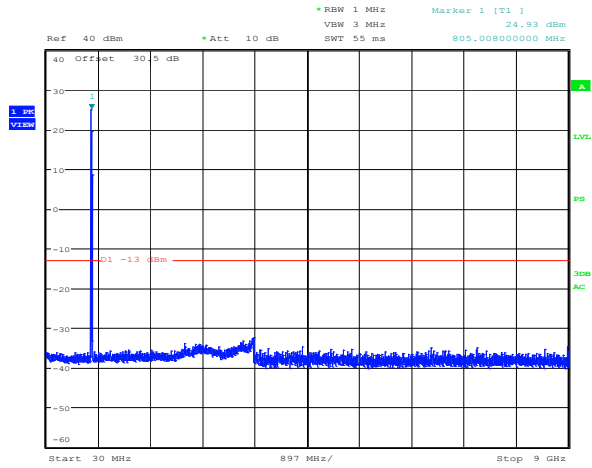
**Plot 8.4-28:** Spurious emissions  
 Regular + power amplifier  
 Uplink 800 MHz  
 Motorola HPD modulation  
 806.00625 MHz

### 8.4.3 Test data, continued



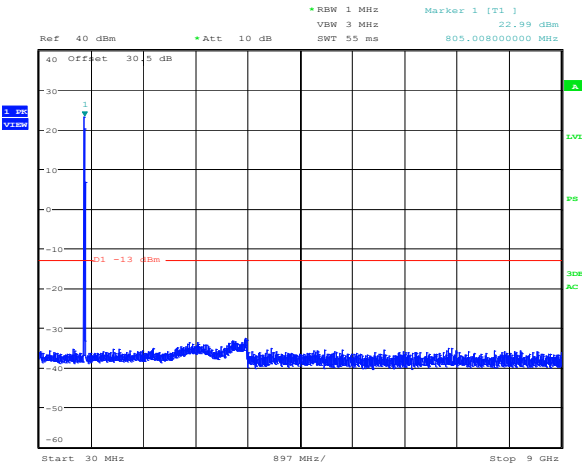
Date: 19.MAY.2011 16:41:54

**Plot 8.4-29:** Spurious emissions  
 Regular + power amplifier  
 Uplink 800 MHz  
 LSM modulation  
 806.00625 MHz



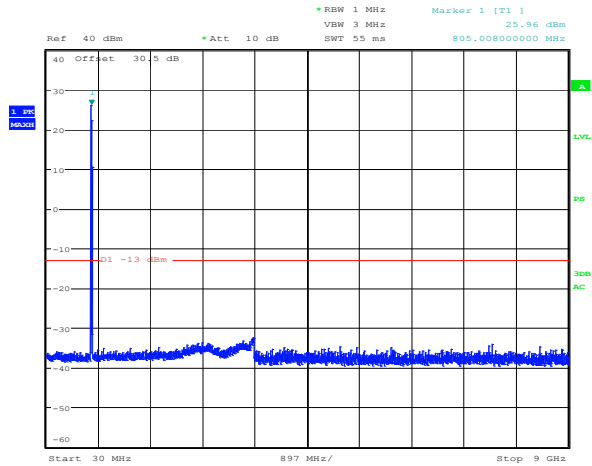
Date: 19.MAY.2011 16:44:44

**Plot 8.4-30:** Spurious emissions  
 Regular + power amplifier  
 Uplink 800 MHz  
 OpenSky modulation  
 806.00625 MHz



Date: 19.MAY.2011 16:42:23

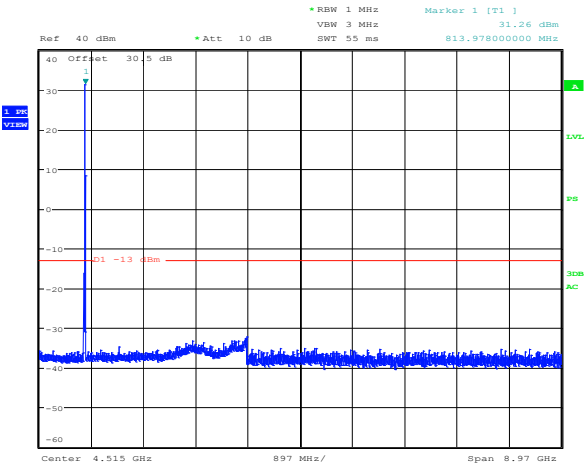
**Plot 8.4-31:** Spurious emissions  
 Regular + power amplifier  
 Uplink 800 MHz  
 TETRA modulation  
 806.00625 MHz



Date: 19.MAY.2011 16:31:01

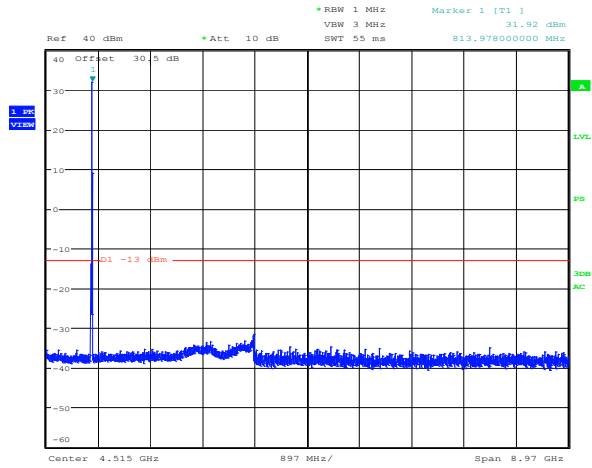
**Plot 8.4-32:** Spurious emissions  
 Regular + power amplifier  
 Uplink 800 MHz  
 WCQPSK modulation  
 806.00625 MHz

### 8.4.3 Test data, continued



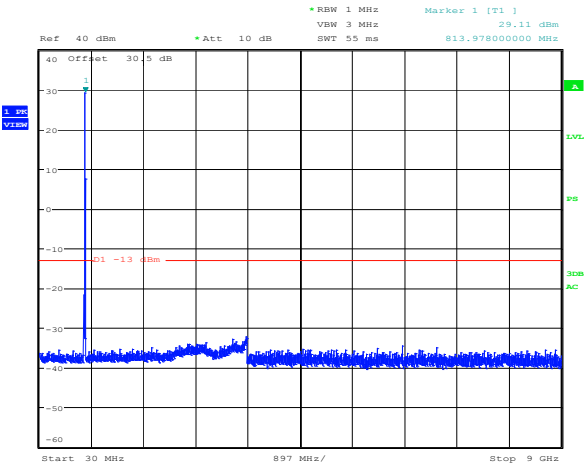
Date: 19.MAY.2011 16:38:13

**Plot 8.4-33:** Spurious emissions  
 Regular + power amplifier  
 Uplink 800 MHz  
 C4FM modulation  
 815 MHz



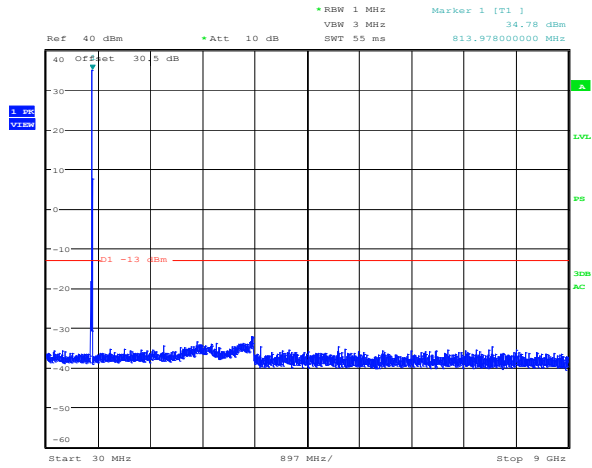
Date: 19.MAY.2011 16:39:37

**Plot 8.4-34:** Spurious emissions  
 Regular + power amplifier  
 Uplink 800 MHz  
 CQPSK modulation  
 815 MHz



Date: 19.MAY.2011 16:34:08

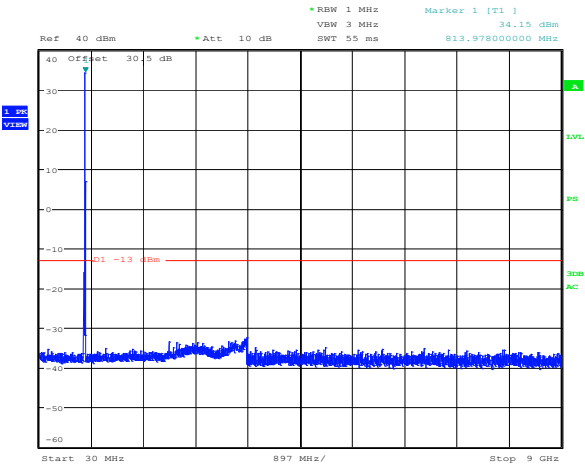
**Plot 8.4-35:** Spurious emissions  
 Regular + power amplifier  
 Uplink 800 MHz  
 CW modulation  
 815 MHz



Date: 19.MAY.2011 16:36:48

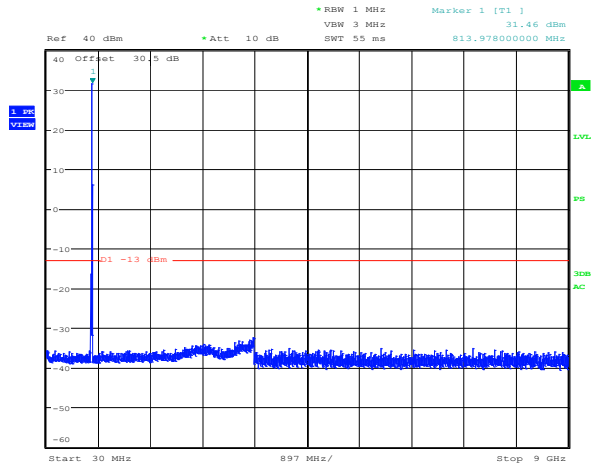
**Plot 8.4-36:** Spurious emissions  
 Regular + power amplifier  
 Uplink 800 MHz  
 Motorola HPD modulation  
 815 MHz

### 8.4.3 Test data, continued



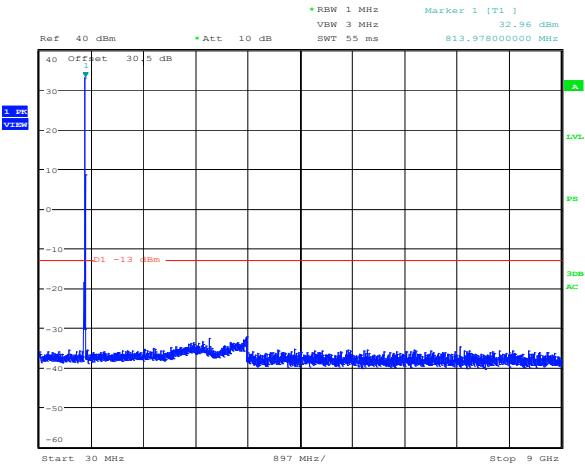
Date: 19.MAY.2011 16:41:22

**Plot 8.4-37:** Spurious emissions  
 Regular + power amplifier  
 Uplink 800 MHz  
 LSM modulation  
 815 MHz



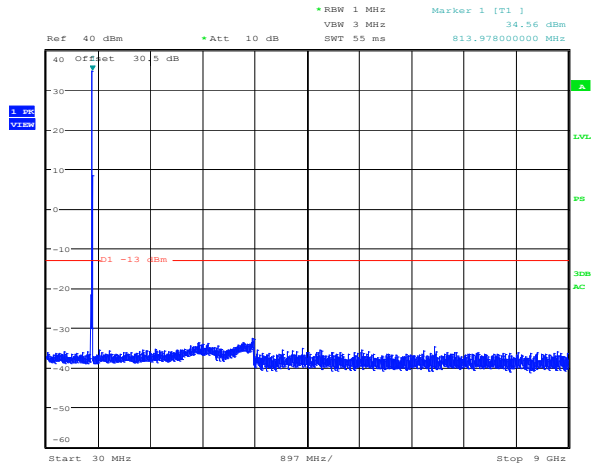
Date: 19.MAY.2011 16:44:18

**Plot 8.4-38:** Spurious emissions  
 Regular + power amplifier  
 Uplink 800 MHz  
 OpenSky modulation  
 815 MHz



Date: 19.MAY.2011 16:42:46

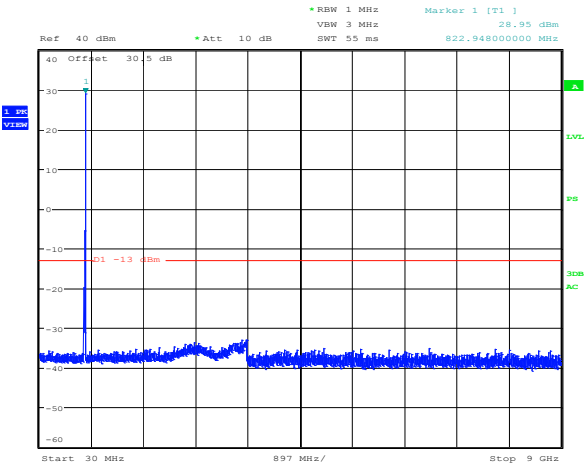
**Plot 8.4-39:** Spurious emissions  
 Regular + power amplifier  
 Uplink 800 MHz  
 TETRA modulation  
 815 MHz



Date: 19.MAY.2011 16:34:25

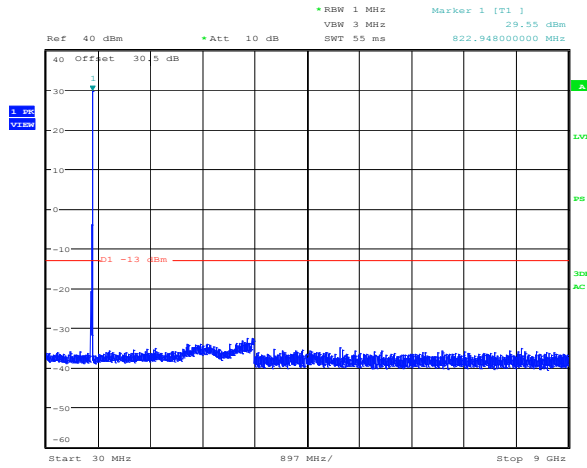
**Plot 8.4-40:** Spurious emissions  
 Regular + power amplifier  
 Uplink 800 MHz  
 WCQPSK modulation  
 815 MHz

### 8.4.3 Test data, continued



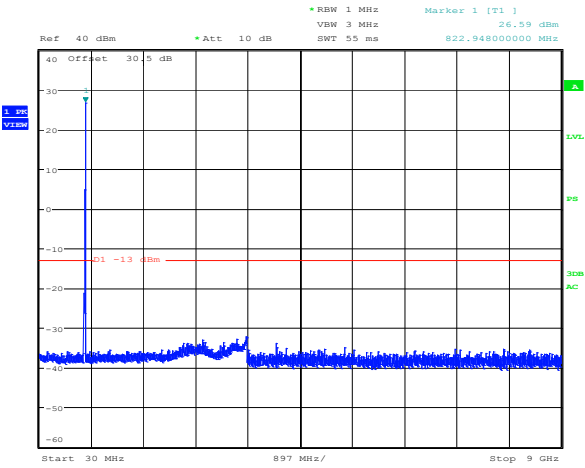
Date: 19.MAY.2011 16:37:47

**Plot 8.4-41:** Spurious emissions  
 Regular + power amplifier  
 Uplink 800 MHz  
 C4FM modulation  
 823.99375 MHz



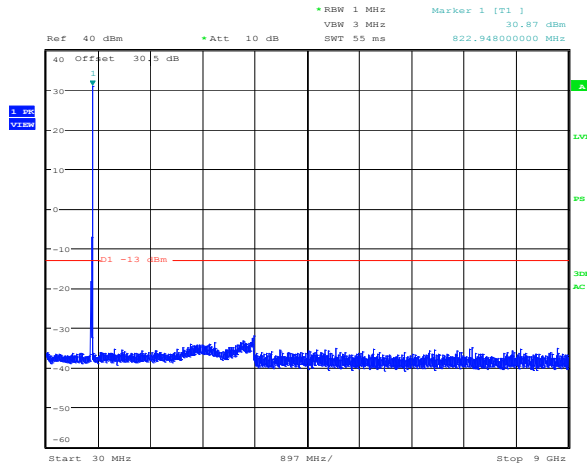
Date: 19.MAY.2011 16:40:14

**Plot 8.4-42:** Spurious emissions  
 Regular + power amplifier  
 Uplink 800 MHz  
 CQPSK modulation  
 823.99375 MHz



Date: 19.MAY.2011 16:33:22

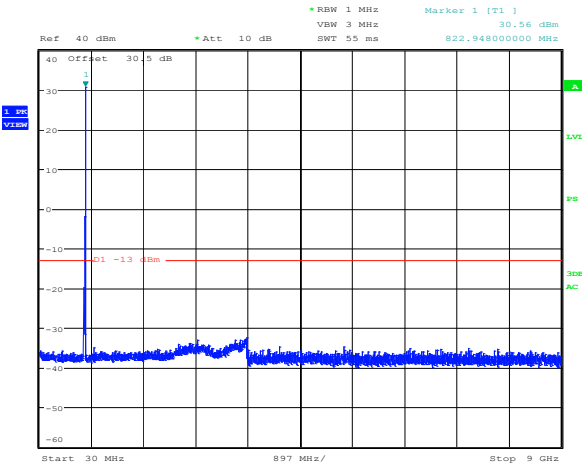
**Plot 8.4-43:** Spurious emissions  
 Regular + power amplifier  
 Uplink 800 MHz  
 CW modulation  
 823.99375 MHz



Date: 19.MAY.2011 16:37:12

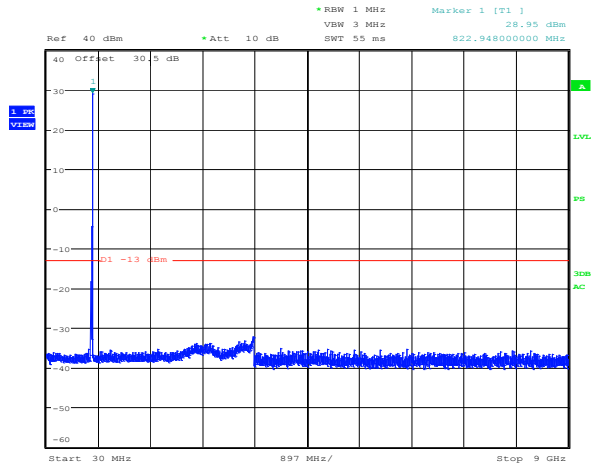
**Plot 8.4-44:** Spurious emissions  
 Regular + power amplifier  
 Uplink 800 MHz  
 Motorola HPD modulation  
 823.99375 MHz

### 8.4.3 Test data, continued



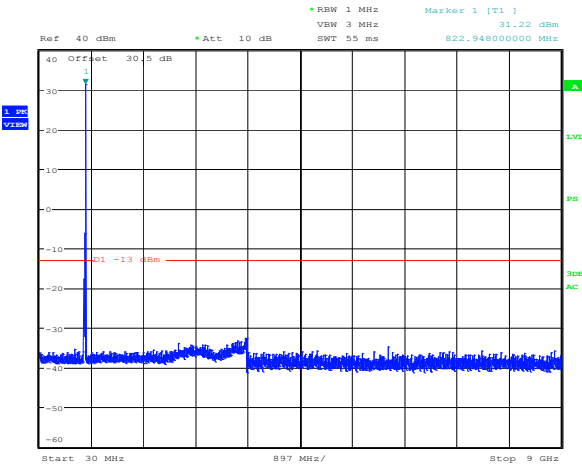
Date: 19.MAY.2011 16:40:59

**Plot 8.4-45:** Spurious emissions  
 Regular + power amplifier  
 Uplink 800 MHz  
 LSM modulation  
 823.99375 MHz



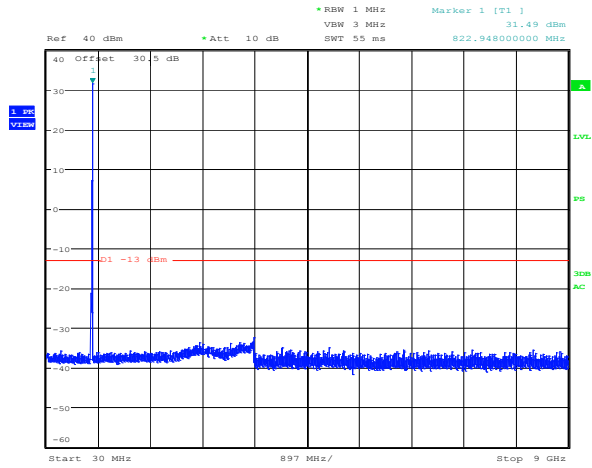
Date: 19.MAY.2011 16:43:46

**Plot 8.4-46:** Spurious emissions  
 Regular + power amplifier  
 Uplink 800 MHz  
 OpenSky modulation  
 823.99375 MHz



Date: 19.MAY.2011 16:43:15

**Plot 8.4-47:** Spurious emissions  
 Regular + power amplifier  
 Uplink 800 MHz  
 TETRA modulation  
 823.99375 MHz

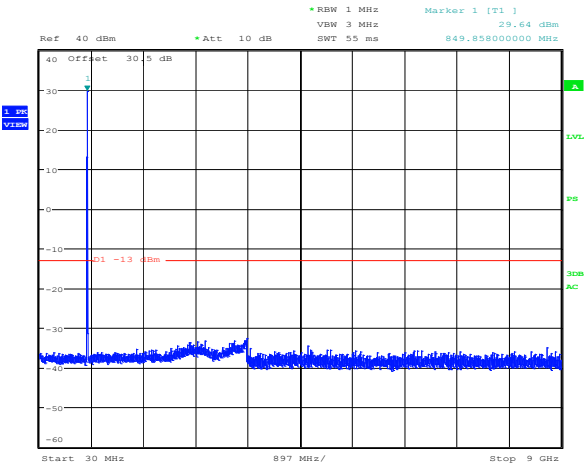


Date: 19.MAY.2011 16:32:52

**Plot 8.4-48:** Spurious emissions  
 Regular + power amplifier  
 Uplink 800 MHz  
 WCQPSK modulation  
 823.99375 MHz

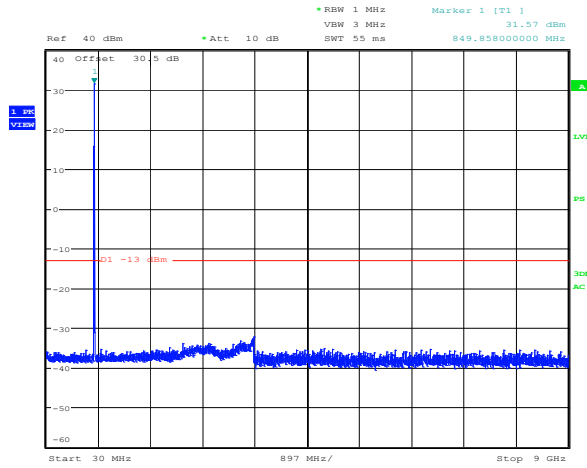


### 8.4.3 Test data, continued



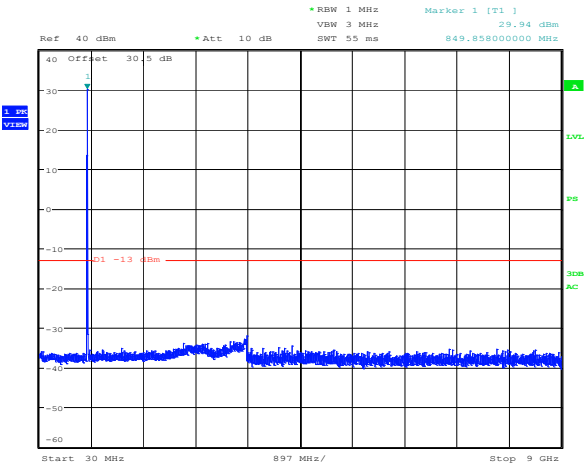
Date: 20.MAY.2011 07:17:18

**Plot 8.4-49:** Spurious emissions  
 Regular + power amplifier  
 Downlink 800 MHz  
 C4FM modulation  
 851.00625 MHz



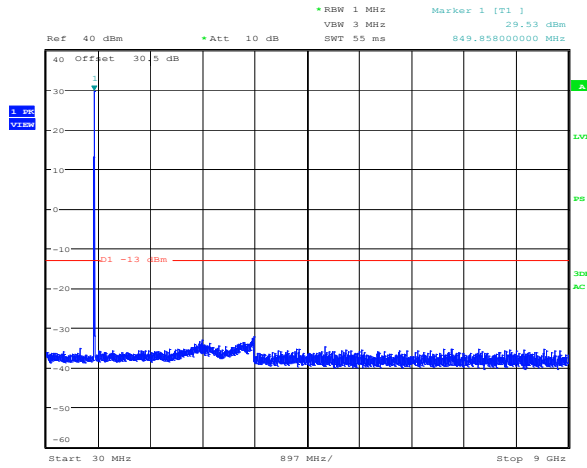
Date: 20.MAY.2011 07:17:44

**Plot 8.4-50:** Spurious emissions  
 Regular + power amplifier  
 Downlink 800 MHz  
 CQPSK modulation  
 851.00625 MHz



Date: 20.MAY.2011 07:23:52

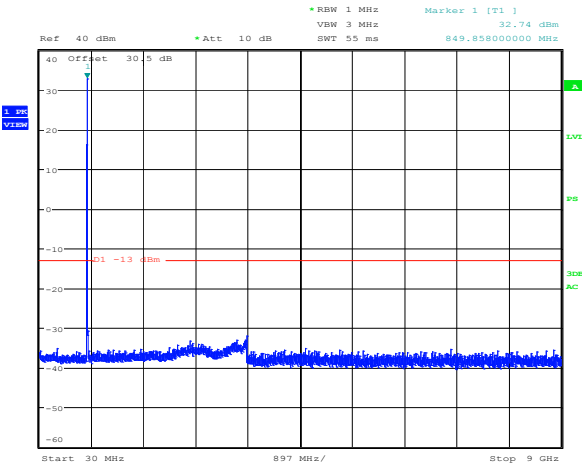
**Plot 8.4-51:** Spurious emissions  
 Regular + power amplifier  
 Downlink 800 MHz  
 CW modulation  
 851.00625 MHz



Date: 20.MAY.2011 07:26:08

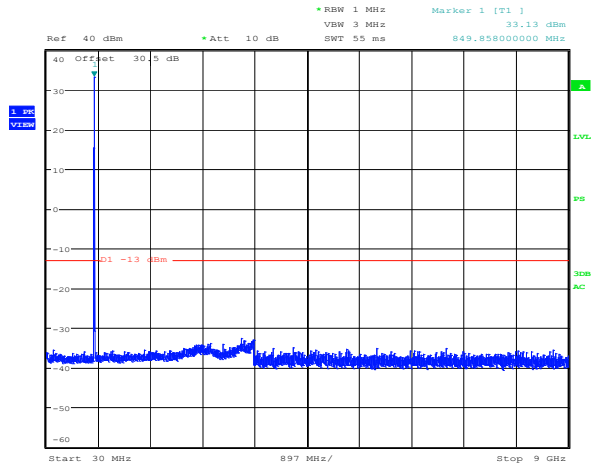
**Plot 8.4-52:** Spurious emissions  
 Regular + power amplifier  
 Downlink 800 MHz  
 Motorola HPD modulation  
 851.00625 MHz

### 8.4.3 Test data, continued



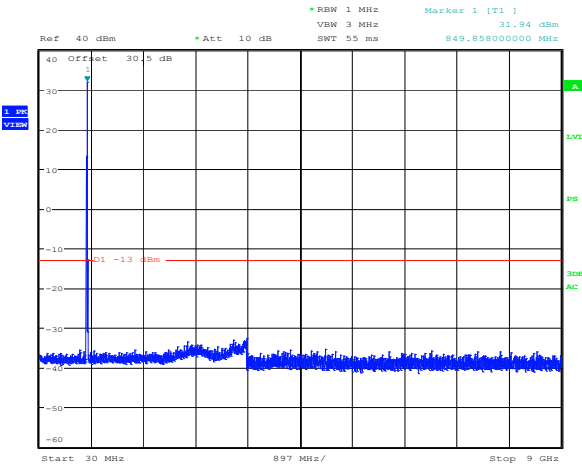
Date: 20.MAY.2011 07:20:22

**Plot 8.4-53:** Spurious emissions  
 Regular + power amplifier  
 Downlink 800 MHz  
 LSM modulation  
 851.00625 MHz



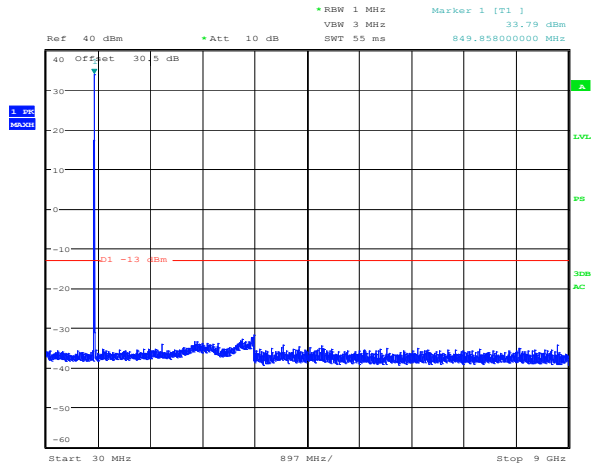
Date: 20.MAY.2011 07:21:02

**Plot 8.4-54:** Spurious emissions  
 Regular + power amplifier  
 Downlink 800 MHz  
 OpenSky modulation  
 851.00625 MHz



Date: 20.MAY.2011 07:13:37

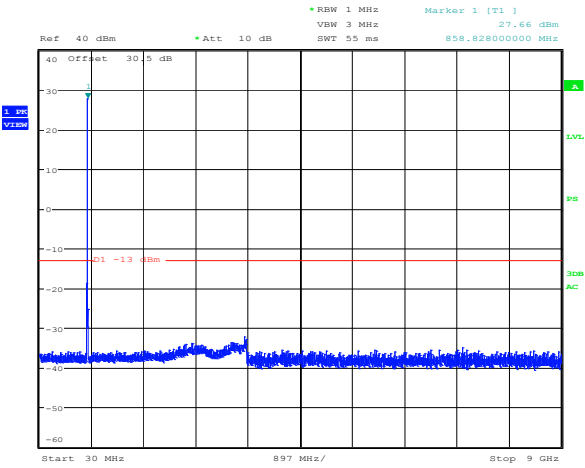
**Plot 8.4-55:** Spurious emissions  
 Regular + power amplifier  
 Downlink 800 MHz  
 TETRA modulation  
 851.00625 MHz



Date: 20.MAY.2011 07:23:18

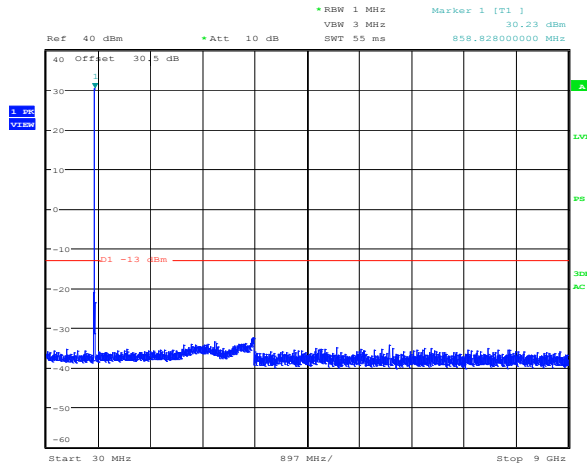
**Plot 8.4-56:** Spurious emissions  
 Regular + power amplifier  
 Downlink 800 MHz  
 WCQPSK modulation  
 851.00625 MHz

8.4.3 Test data, continued



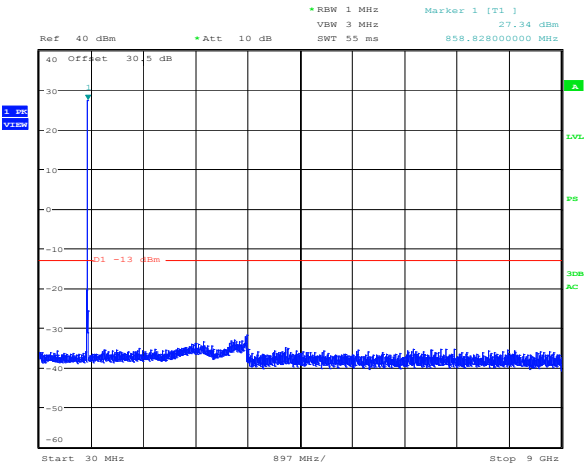
Date: 20.MAY.2011 07:16:08

**Plot 8.4-57:** Spurious emissions  
 Regular + power amplifier  
 Downlink 800 MHz  
 C4FM modulation  
 860 MHz



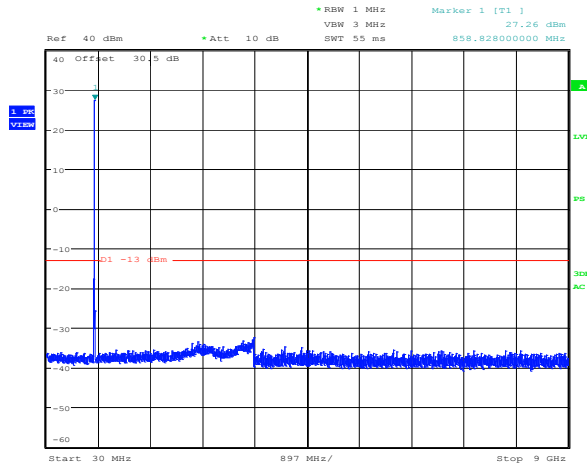
Date: 20.MAY.2011 07:18:13

**Plot 8.4-58:** Spurious emissions  
 Regular + power amplifier  
 Downlink 800 MHz  
 CQPSK modulation  
 860 MHz



Date: 20.MAY.2011 07:24:20

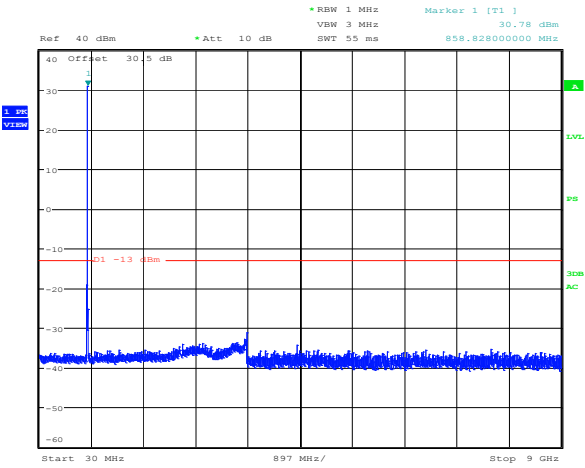
**Plot 8.4-59:** Spurious emissions  
 Regular + power amplifier  
 Downlink 800 MHz  
 CW modulation  
 860 MHz



Date: 20.MAY.2011 07:25:41

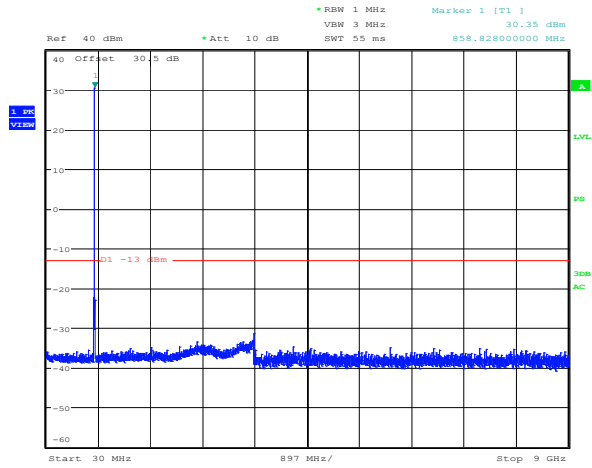
**Plot 8.4-60:** Spurious emissions  
 Regular + power amplifier  
 Downlink 800 MHz  
 Motorola HPD modulation  
 860 MHz

### 8.4.3 Test data, continued



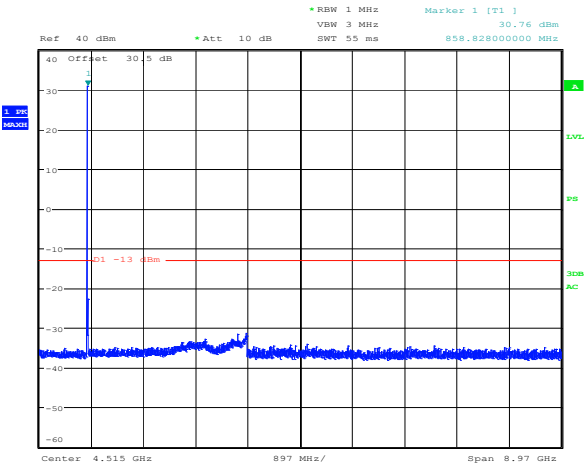
Date: 20.MAY.2011 07:19:54

**Plot 8.4-61:** Spurious emissions  
 Regular + power amplifier  
 Downlink 800 MHz  
 LSM modulation  
 860 MHz



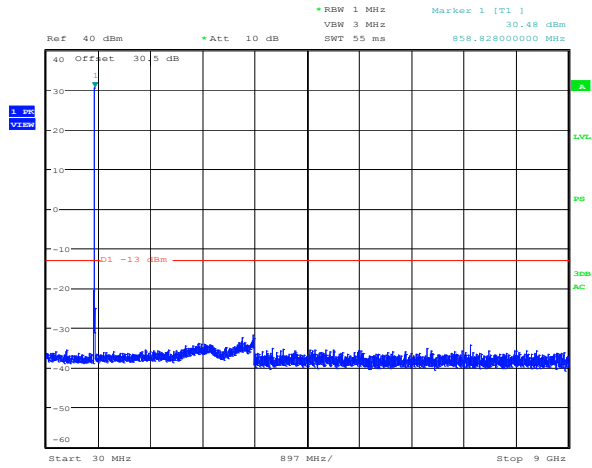
Date: 20.MAY.2011 07:21:25

**Plot 8.4-62:** Spurious emissions  
 Regular + power amplifier  
 Downlink 800 MHz  
 OpenSky modulation  
 860 MHz



Date: 20.MAY.2011 07:10:17

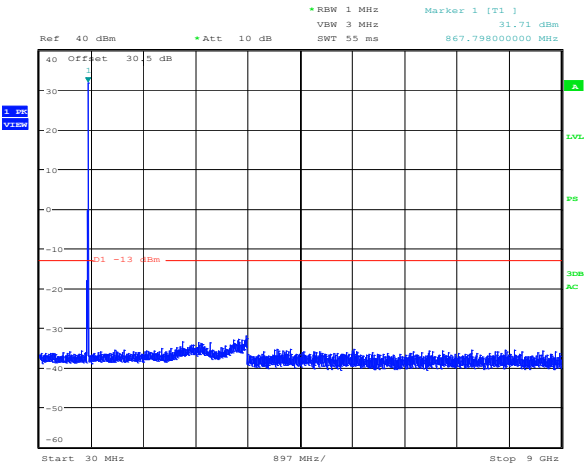
**Plot 8.4-63:** Spurious emissions  
 Regular + power amplifier  
 Downlink 800 MHz  
 TETRA modulation  
 860 MHz



Date: 20.MAY.2011 07:22:52

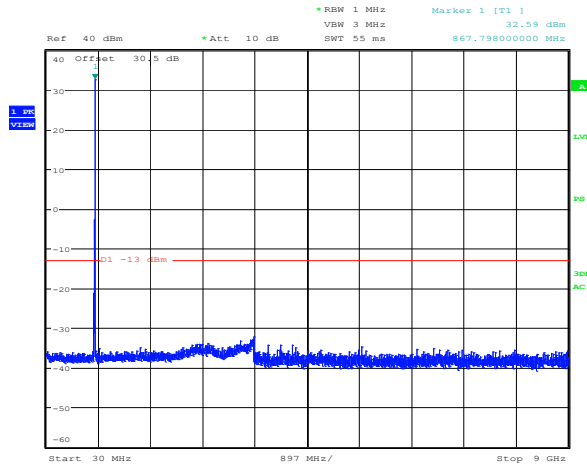
**Plot 8.4-64:** Spurious emissions  
 Regular + power amplifier  
 Downlink 800 MHz  
 WCQPSK modulation  
 860 MHz

### 8.4.3 Test data, continued



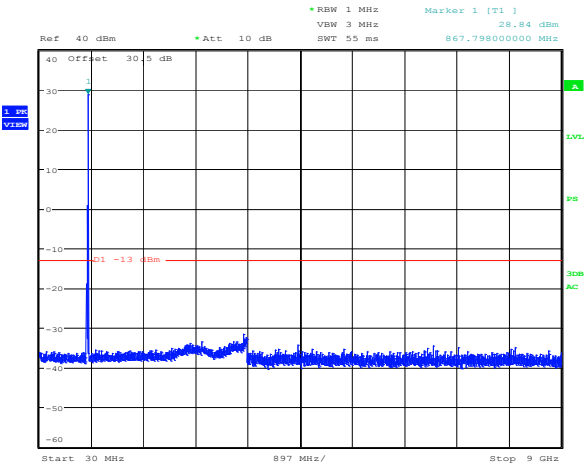
Date: 20.MAY.2011 07:15:47

**Plot 8.4-65:** Spurious emissions  
 Regular + power amplifier  
 Downlink 800 MHz  
 C4FM modulation  
 868.99375 MHz



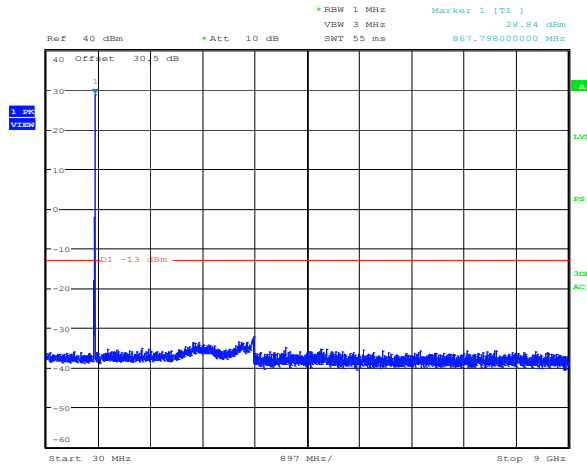
Date: 20.MAY.2011 07:18:46

**Plot 8.4-66:** Spurious emissions  
 Regular + power amplifier  
 Downlink 800 MHz  
 CQPSK modulation  
 868.99375 MHz



Date: 20.MAY.2011 07:24:46

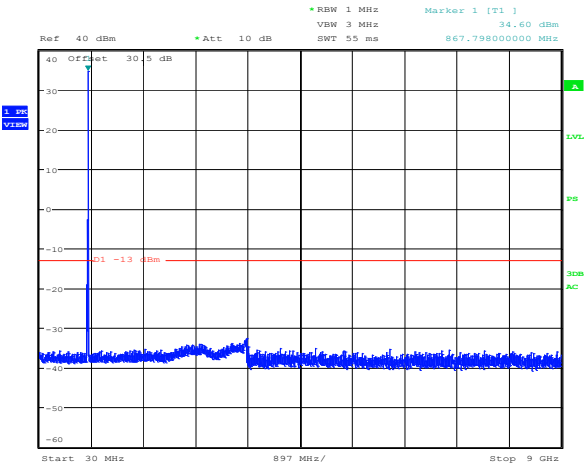
**Plot 8.4-67:** Spurious emissions  
 Regular + power amplifier  
 Downlink 800 MHz  
 CW modulation  
 868.99375 MHz



Date: 20.MAY.2011 07:25:19

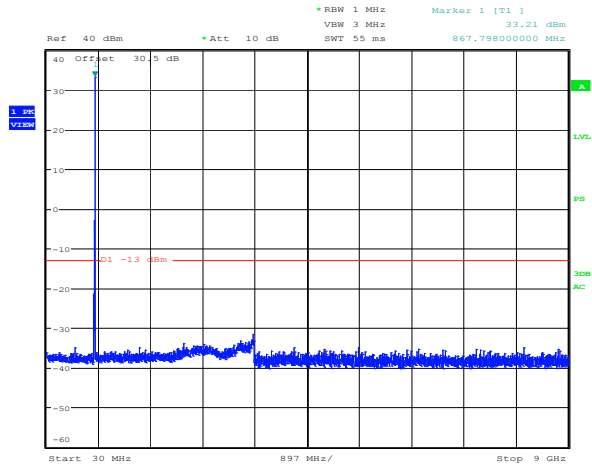
**Plot 8.4-68:** Spurious emissions  
 Regular + power amplifier  
 Downlink 800 MHz  
 Motorola HPD modulation  
 868.99375 MHz

### 8.4.3 Test data, continued



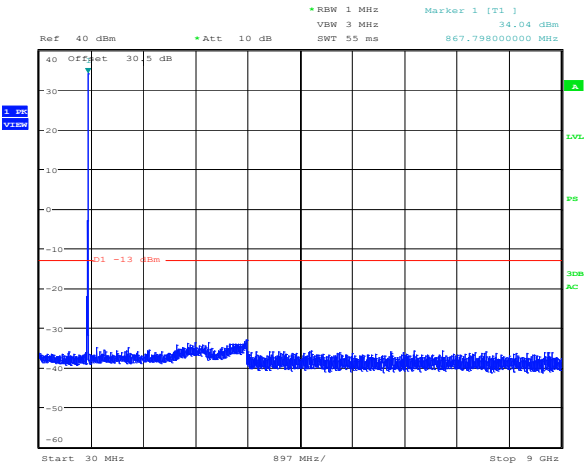
Date: 20.MAY.2011 07:19:33

**Plot 8.4-69:** Spurious emissions  
 Regular + power amplifier  
 Downlink 800 MHz  
 LSM modulation  
 868.99375 MHz



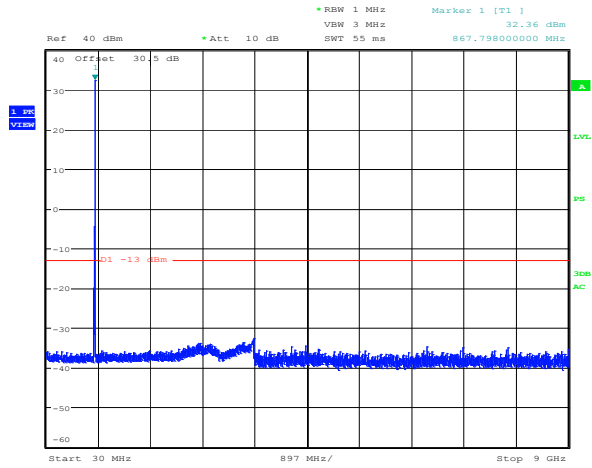
Date: 20.MAY.2011 07:21:49

**Plot 8.4-70:** Spurious emissions  
 Regular + power amplifier  
 Downlink 800 MHz  
 OpenSky modulation  
 868.99375 MHz



Date: 20.MAY.2011 07:15:11

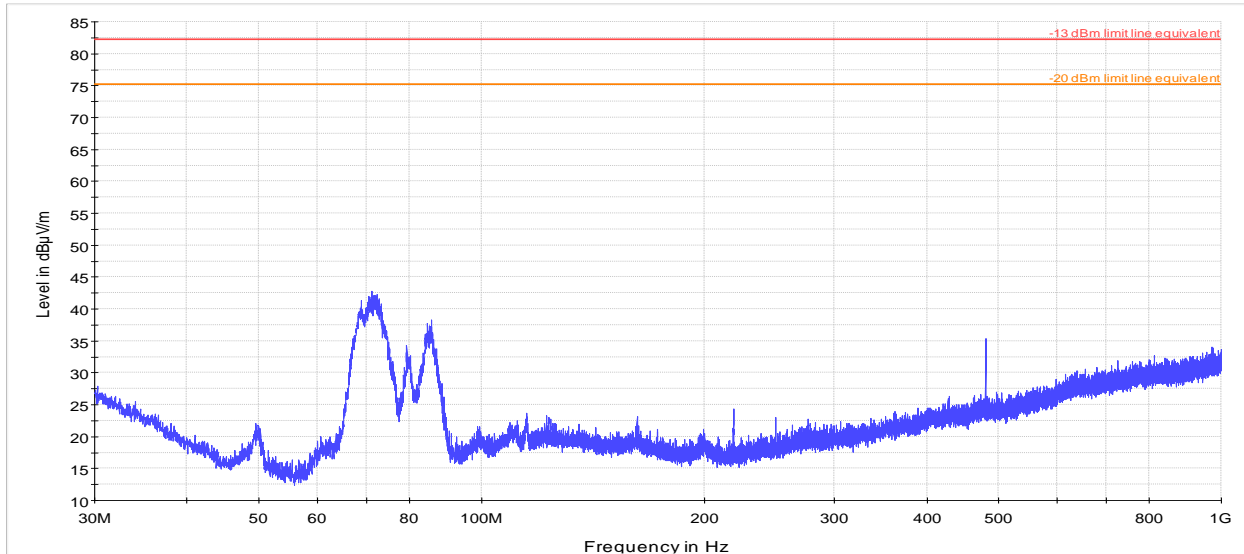
**Plot 8.4-71:** Spurious emissions  
 Regular + power amplifier  
 Downlink 800 MHz  
 TETRA modulation  
 868.99375 MHz



Date: 20.MAY.2011 07:22:33

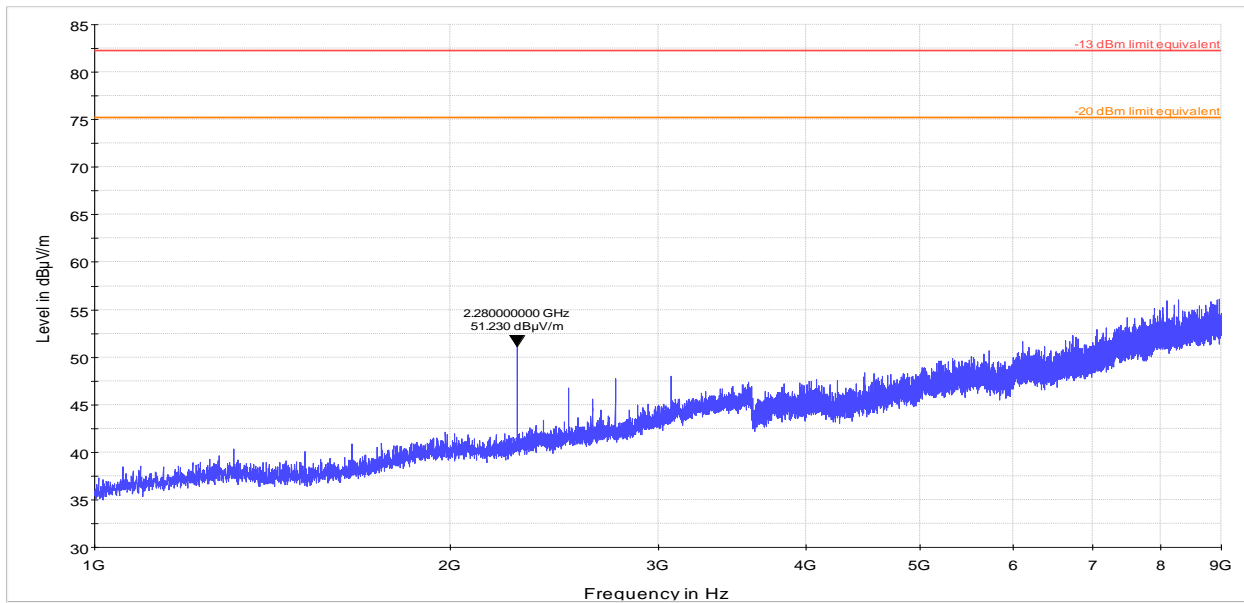
**Plot 8.4-72:** Spurious emissions  
 Regular + power amplifier  
 Downlink 800 MHz  
 WCQPSK modulation  
 868.99375 MHz

8.4.3 Test data, continued



RSE Downlink 700  
 MaxPeak-MaxHold  
 -13 dBm limit line equivalent  
 -20 dBm limit line equivalent

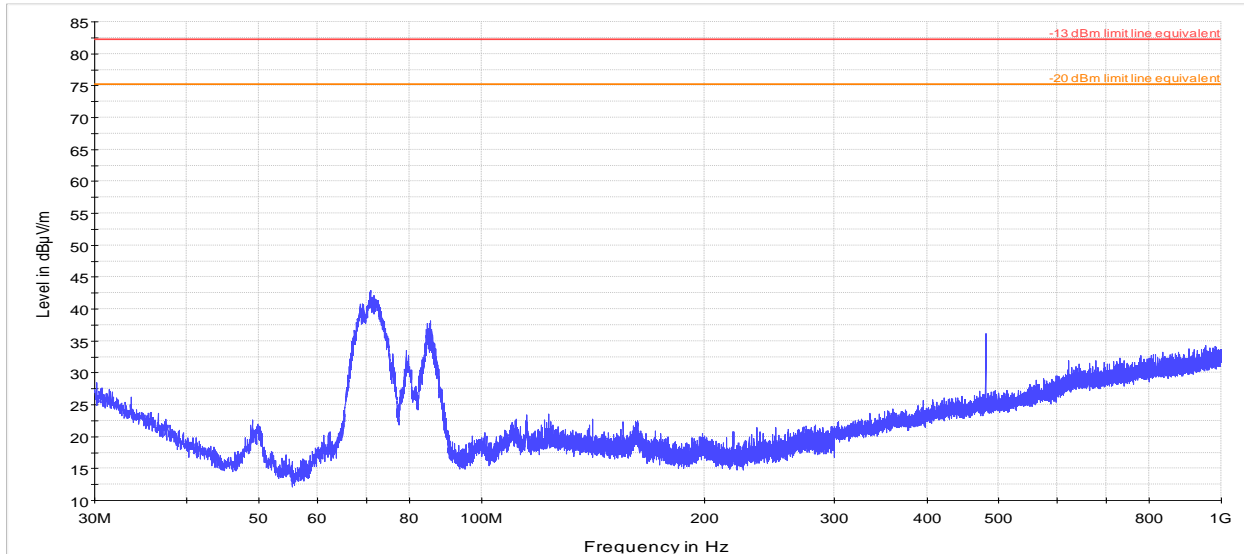
**Plot 8.4-73:** Radiated spurious emissions  
 Regular + power amplifier  
 Downlink 700 MHz



MaxPeak-MaxHold    -13 dBm limit equivalent    -20 dBm limit equivalent

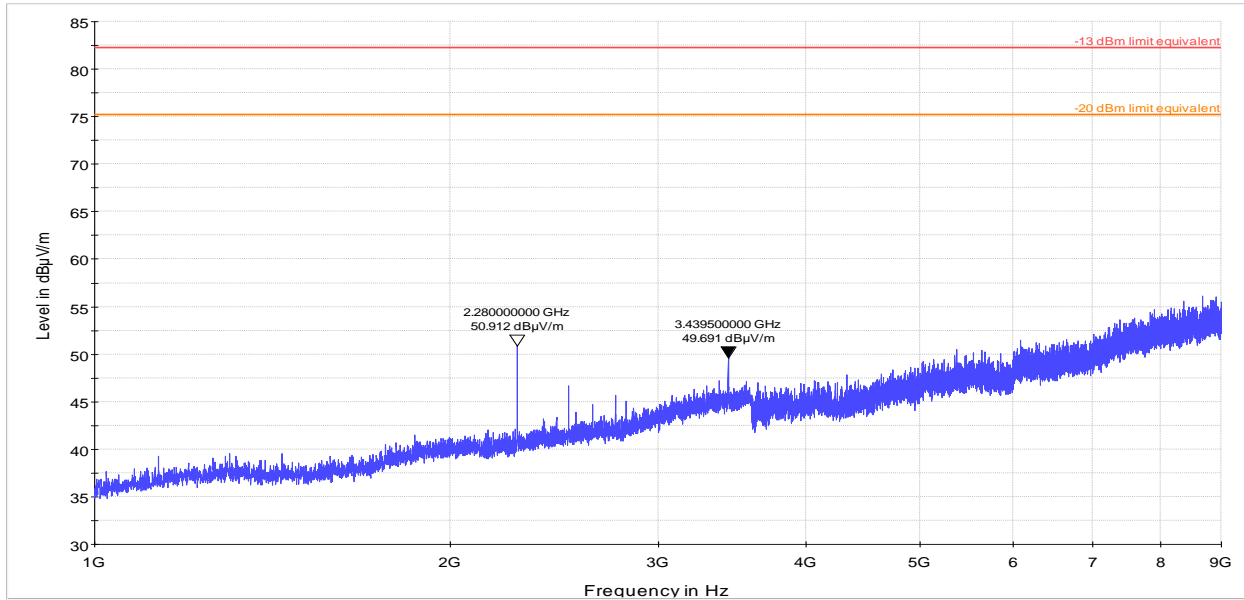
**Plot 8.4-74:** Radiated spurious emissions  
 Regular + power amplifier  
 Downlink 700 MHz

8.4.3 Test data, continued



RSE Downlink 800  
 MaxPeak-MaxHold  
 -13 dBm limit line equivalent  
 -20 dBm limit line equivalent

**Plot 8.4-75:** Radiated spurious emissions  
 Regular + power amplifier  
 Downlink 800 MHz

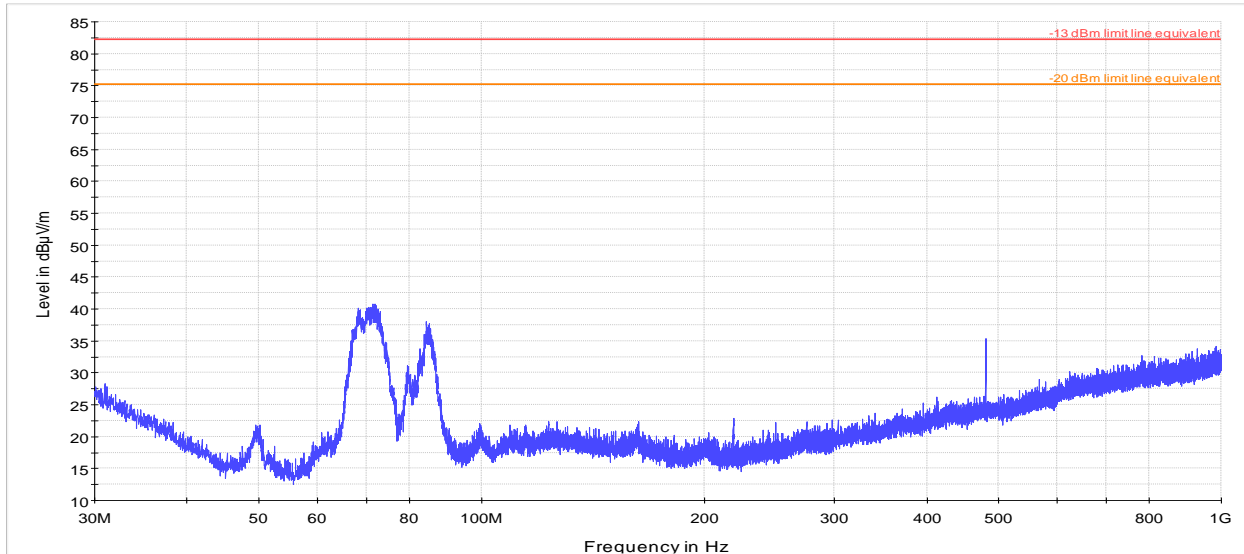


MaxPeak-MaxHold    -13 dBm limit equivalent    -20 dBm limit equivalent

**Plot 8.4-76:** Radiated spurious emissions  
 Regular + power amplifier  
 Downlink 800 MHz

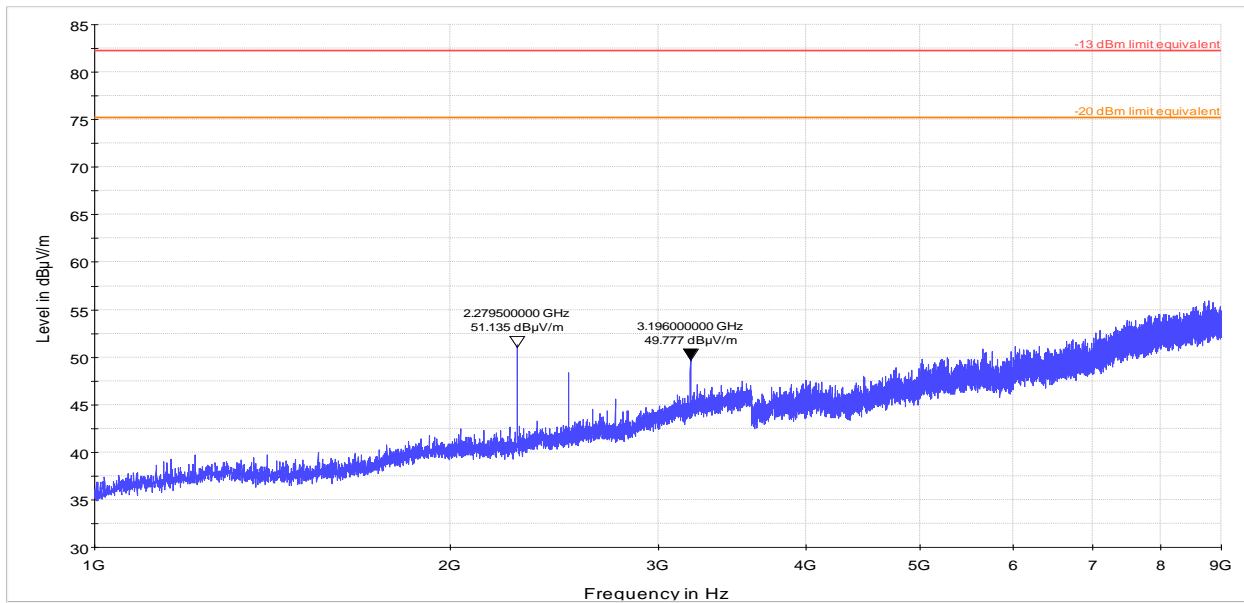


8.4.3 Test data, continued



RSE Uplink 700  
 MaxPeak-MaxHold  
 -13 dBm limit line equivalent  
 -20 dBm limit line equivalent

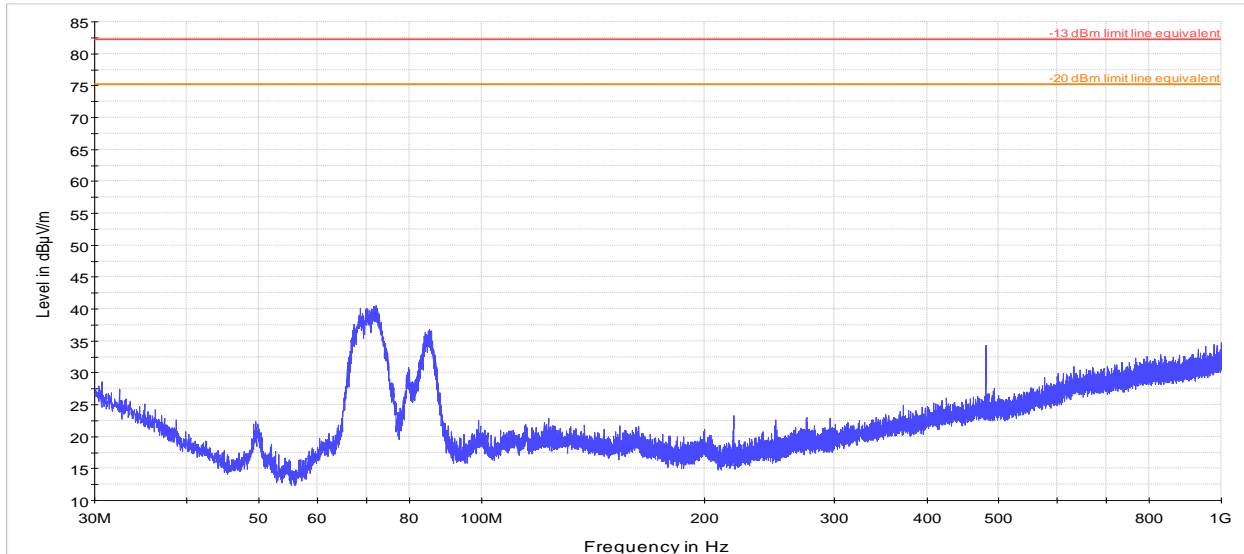
**Plot 8.4-77:** Radiated spurious emissions  
 Regular + power amplifier  
 Uplink 700 MHz



MaxPeak-MaxHold    -13 dBm limit equivalent    -20 dBm limit equivalent

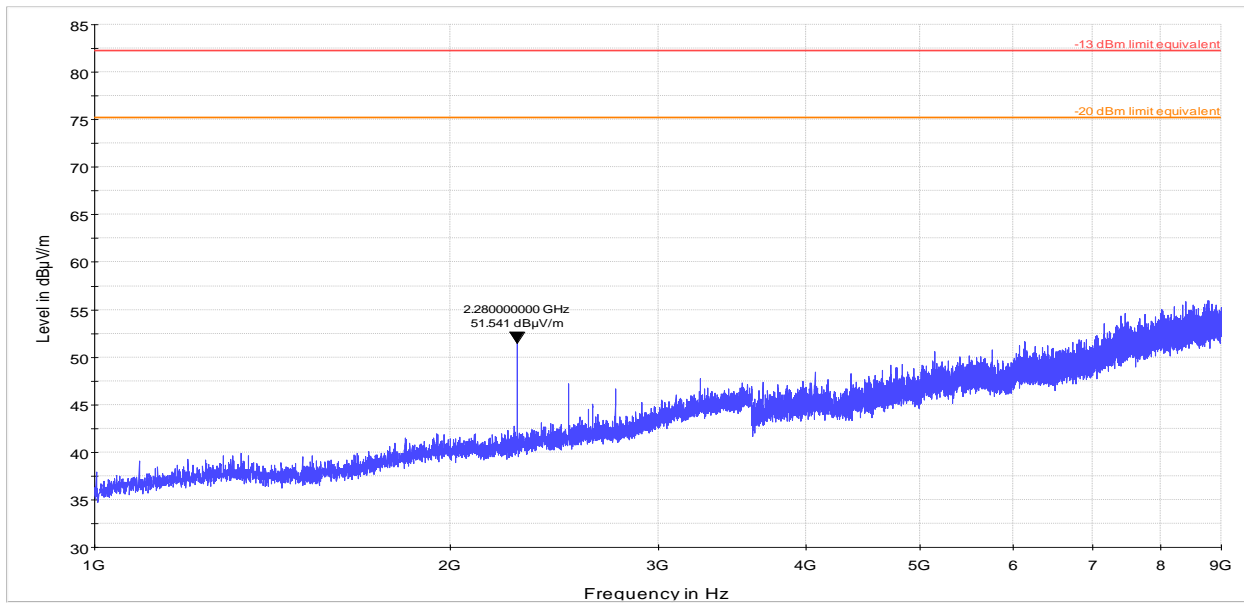
**Plot 8.4-78:** Radiated spurious emissions  
 Regular + power amplifier  
 Uplink 700 MHz

8.4.3 Test data, continued



RSE Uplink 800  
 MaxPeak-MaxHold  
 -13 dBm limit line equivalent  
 -20 dBm limit line equivalent

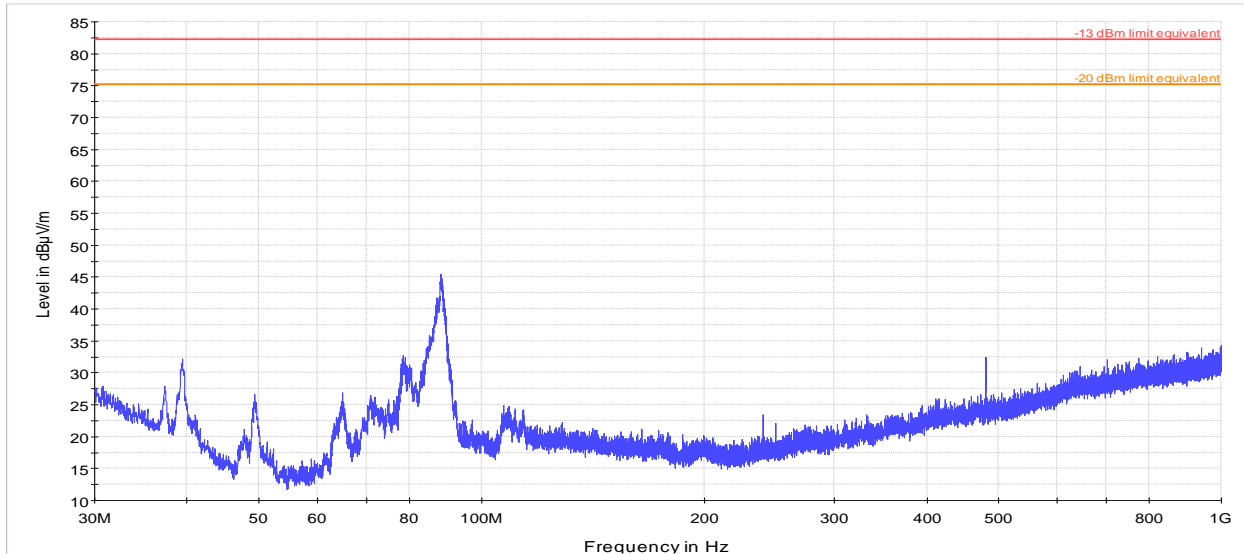
**Plot 8.4-79:** Radiated spurious emissions  
 Regular + power amplifier  
 Uplink 800 MHz



MaxPeak-MaxHold    -13 dBm limit equivalent    -20 dBm limit equivalent

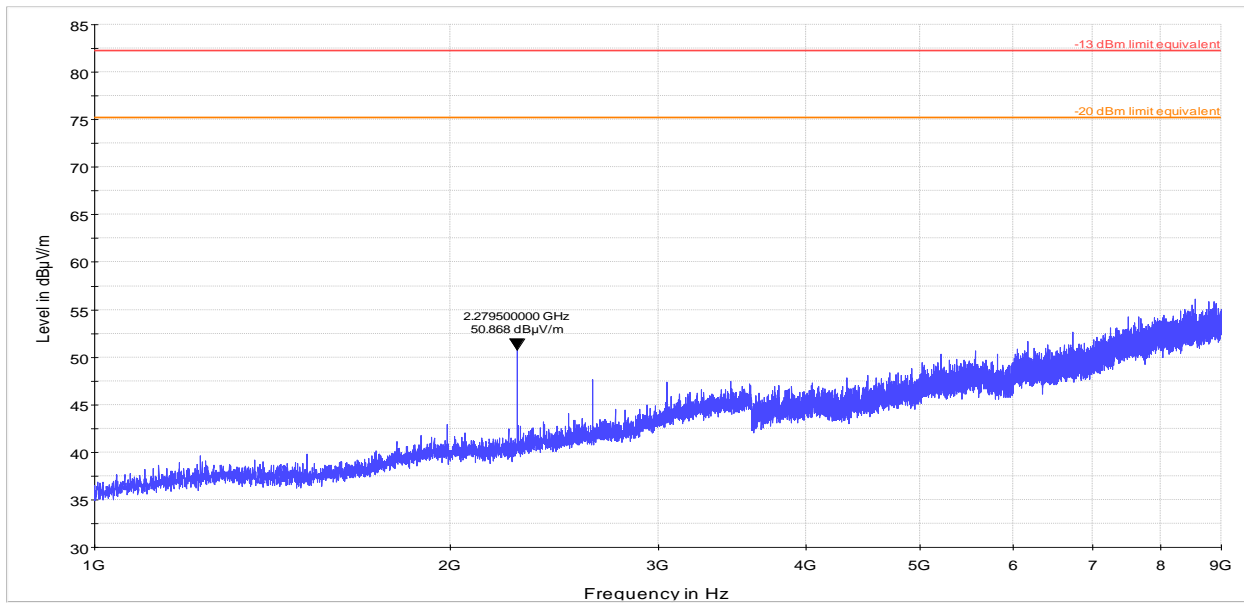
**Plot 8.4-80:** Radiated spurious emissions  
 Regular + power amplifier  
 Uplink 800 MHz

8.4.3 Test data, continued



RSE HP Downlink 700  
 — MaxPeak-MaxHold  
 — -13 dBm limit equivalent  
 — -20 dBm limit equivalent

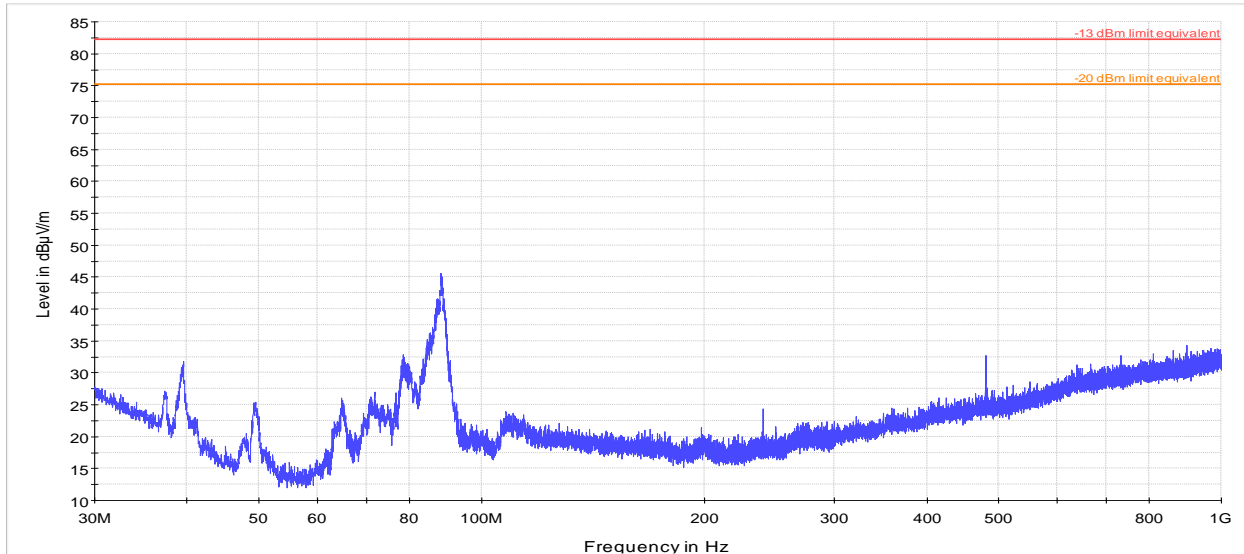
**Plot 8.4-81:** Radiated spurious emissions  
 Regular high power  
 Downlink 700 MHz



— MaxPeak-MaxHold — -13 dBm limit equivalent — -20 dBm limit equivalent

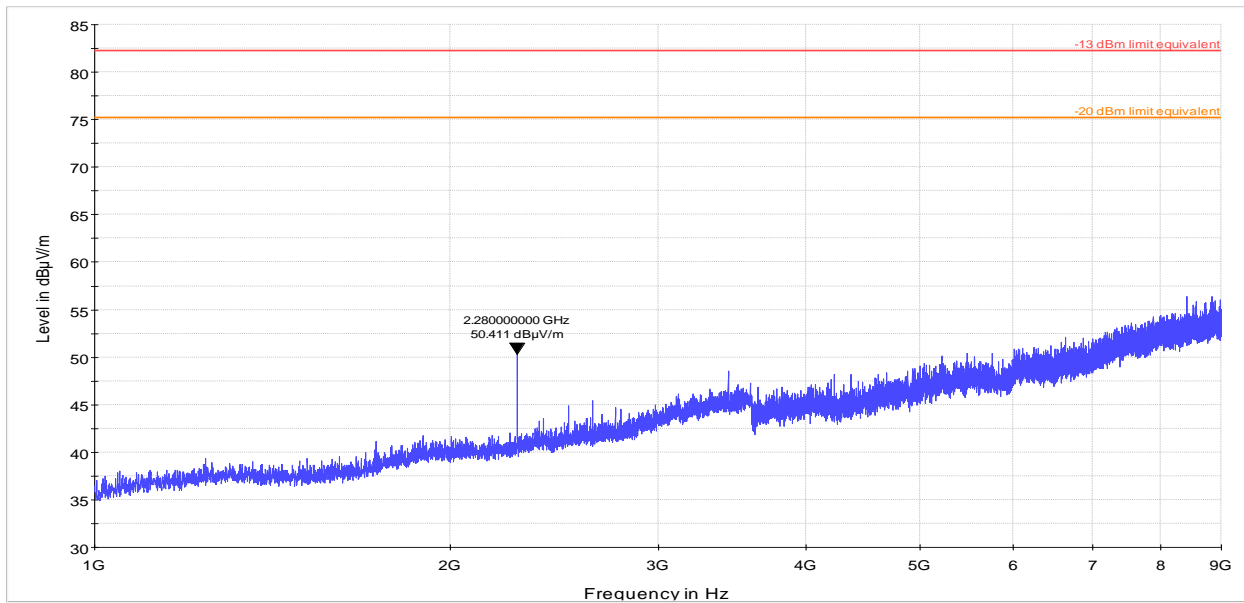
**Plot 8.4-82:** Radiated spurious emissions  
 Regular high power  
 Downlink 700 MHz

8.4.3 Test data, continued



RSE HP Downlink 800  
 — MaxPeak-MaxHold  
 — -13 dBm limit equivalent  
 — -20 dBm limit equivalent

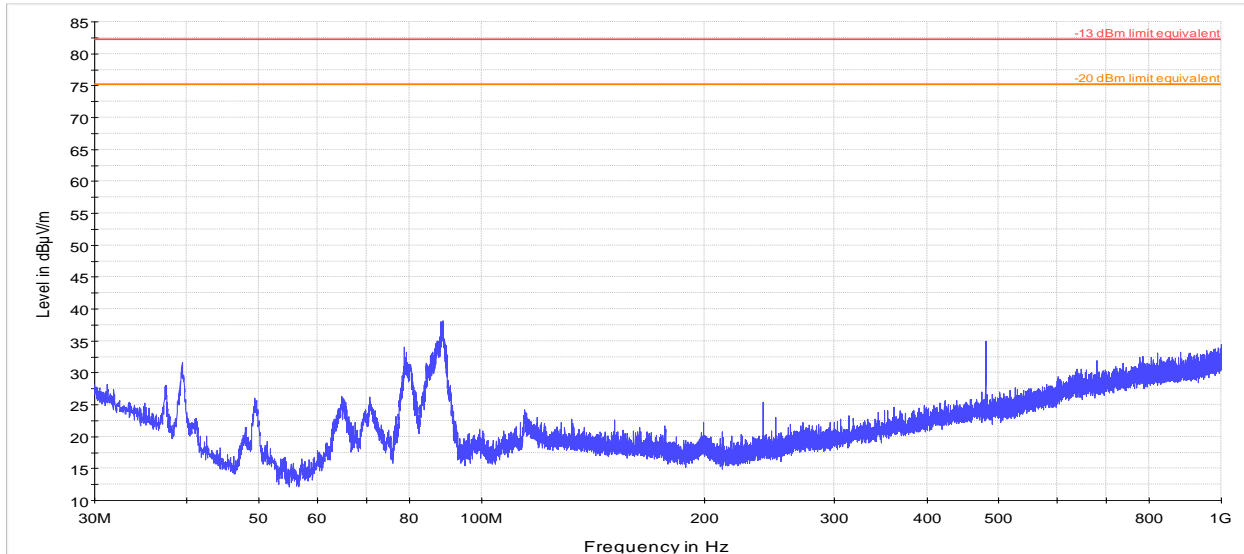
**Plot 8.4-83:** Radiated spurious emissions  
 Regular high power  
 Downlink 800 MHz



— MaxPeak-MaxHold — -13 dBm limit equivalent — -20 dBm limit equivalent

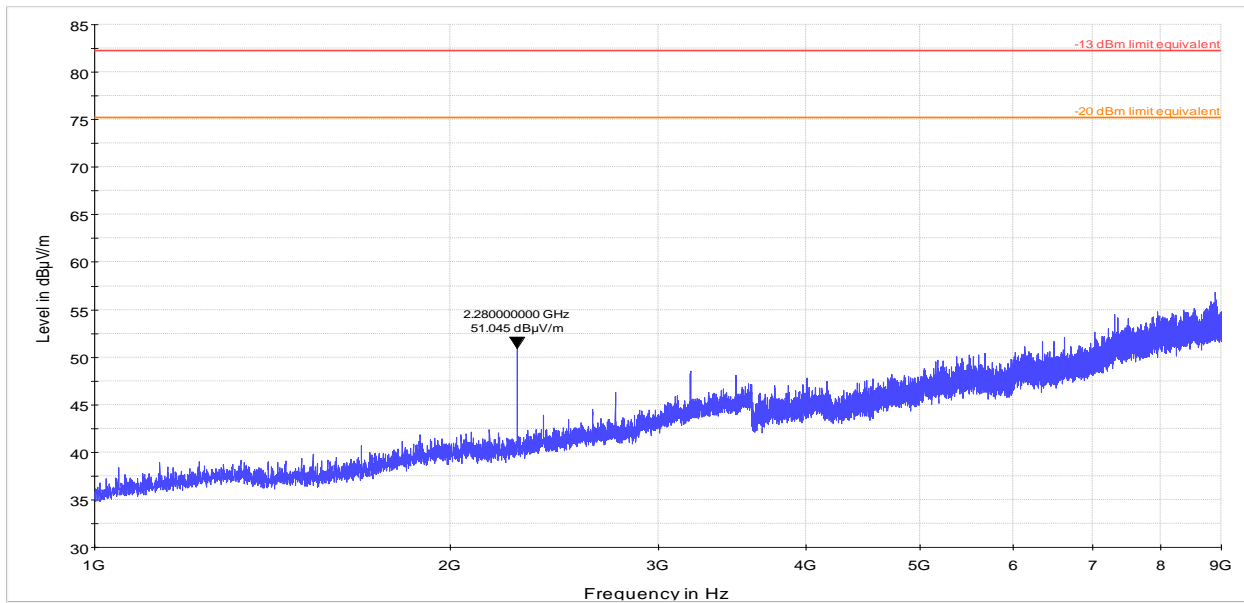
**Plot 8.4-84:** Radiated spurious emissions  
 Regular high power  
 Downlink 800 MHz

8.4.3 Test data, continued



RSE HP Uplink 700  
 — MaxPeak-MaxHold  
 — -13 dBm limit equivalent  
 — -20 dBm limit equivalent

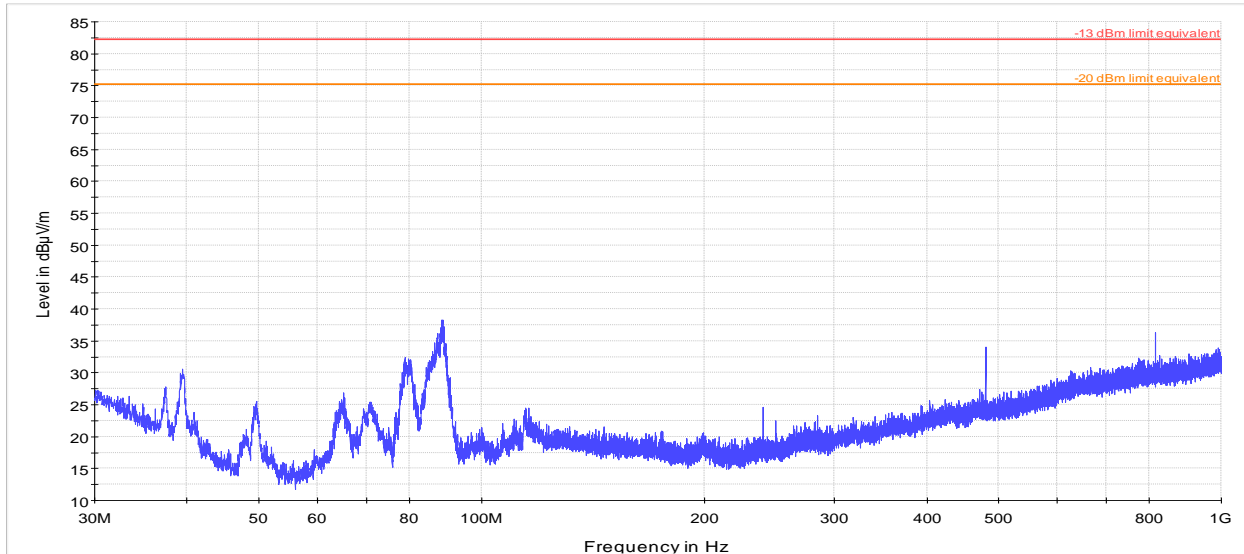
**Plot 8.4-85:** Radiated spurious emissions  
 Regular high power  
 Uplink 700 MHz



— MaxPeak-MaxHold — -13 dBm limit equivalent — -20 dBm limit equivalent

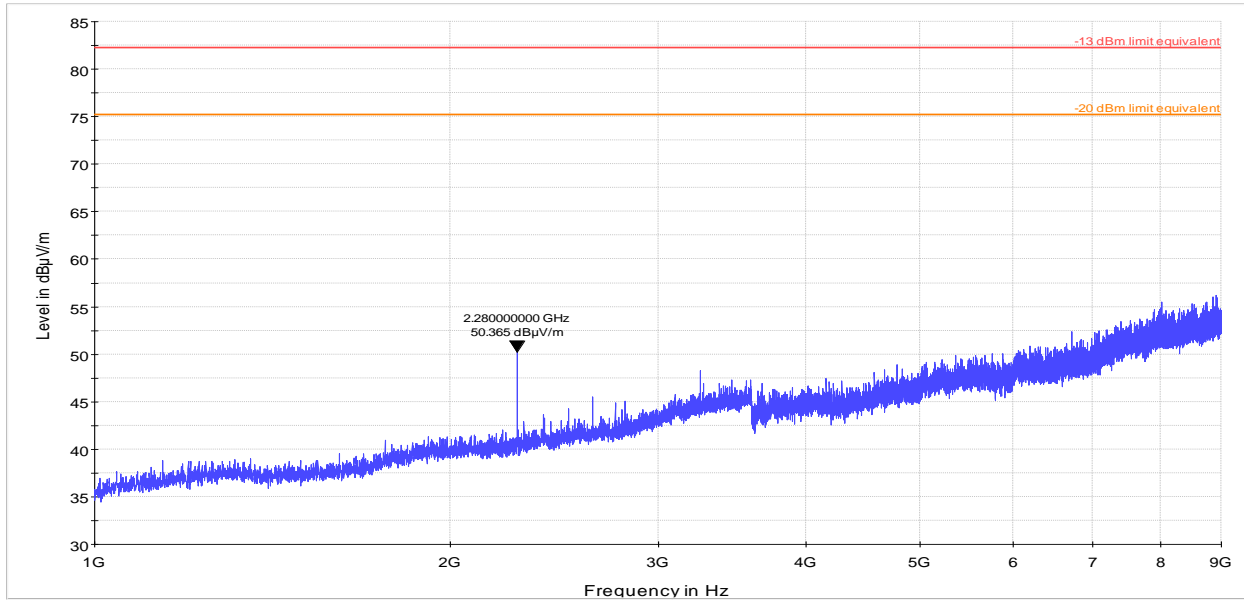
**Plot 8.4-86:** Radiated spurious emissions  
 Regular high power  
 Uplink 700 MHz

8.4.3 Test data, continued



RSE HP Uplink 800  
 — MaxPeak-MaxHold  
 — -13 dBm limit equivalent  
 — -20 dBm limit equivalent

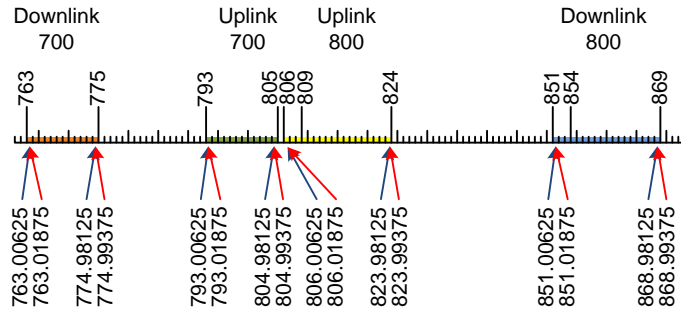
**Plot 8.4-87:** Radiated spurious emissions  
 Regular high power  
 Uplink 800 MHz



— MaxPeak-MaxHold — -13 dBm limit equivalent — -20 dBm limit equivalent

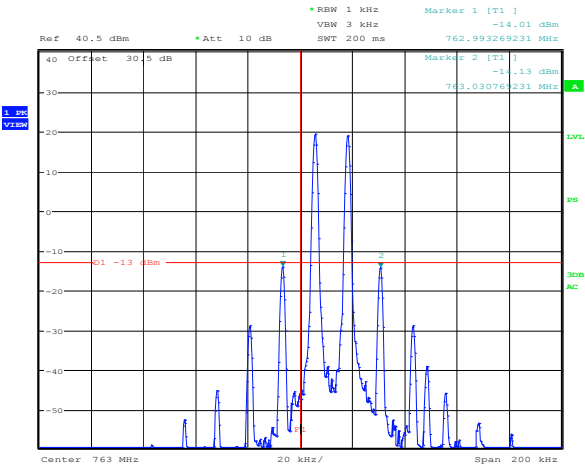
**Plot 8.4-88:** Radiated spurious emissions  
 Regular high power  
 Uplink 800 MHz

The test was performed when at the input of the EUT were 2 CW signals at two adjacent channels.



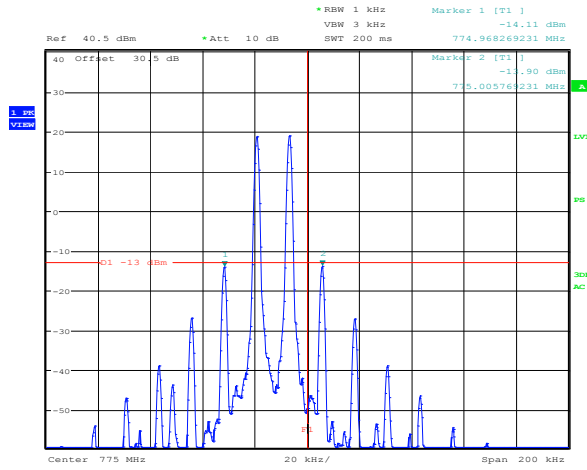
**Diagram 8.4-2:** Intermodulation channels

### 8.3.3 Test data



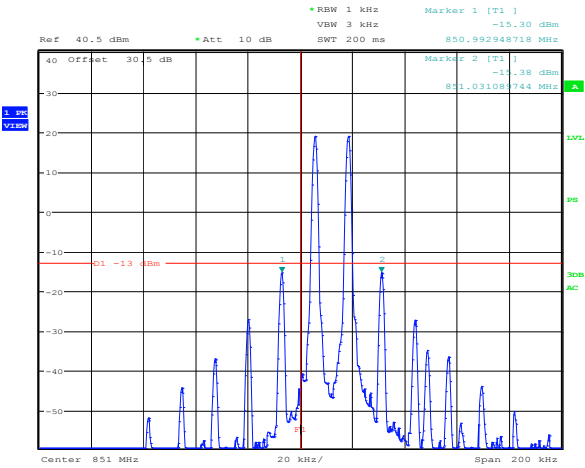
Date: 20.MAY.2011 09:03:42

**Plot 8.4-89:** 3<sup>rd</sup> order intermodulation  
 Fiber optic high power  
 Downlink 700 MHz  
 Lower band edge



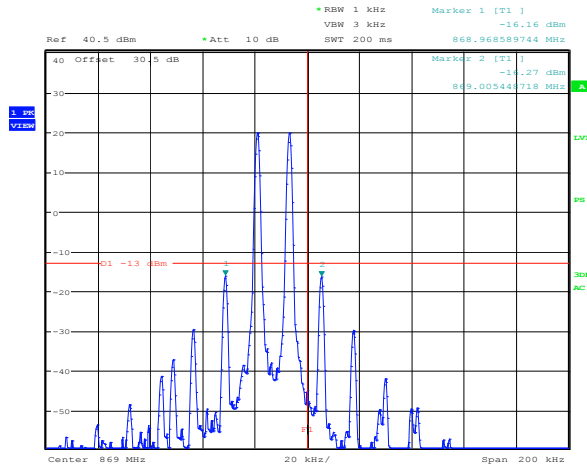
Date: 20.MAY.2011 09:05:21

**Plot 8.4-90:** 3<sup>rd</sup> order intermodulation  
 Fiber optic high power  
 Downlink 700 MHz  
 Upper band edge



Date: 20.MAY.2011 11:07:13

**Plot 8.4-91:** 3<sup>rd</sup> order intermodulation  
 Fiber optic high power  
 Downlink 800 MHz  
 Lower band edge

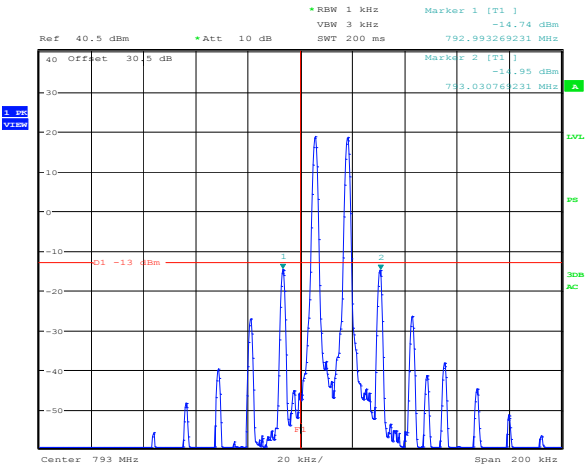


Date: 20.MAY.2011 11:09:07

**Plot 8.4-92:** 3<sup>rd</sup> order intermodulation  
 Fiber optic high power  
 Downlink 800 MHz  
 Upper band edge

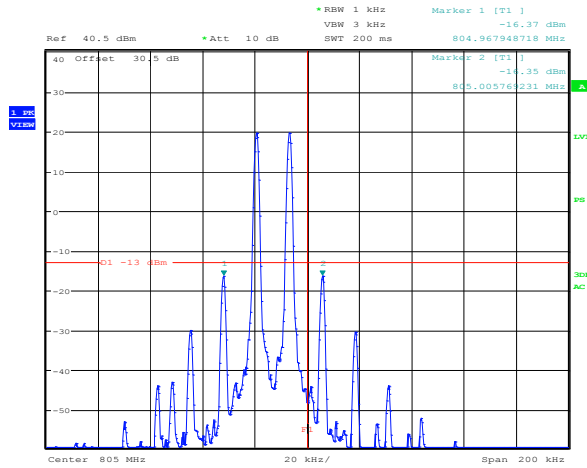


8.3.3 Test data, continued



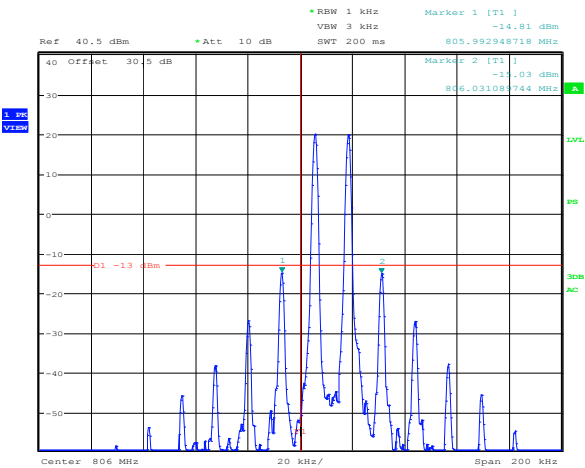
Date: 20.MAY.2011 08:52:40

**Plot 8.4-93:** 3<sup>rd</sup> order intermodulation  
 Fiber optic high power  
 Uplink 700 MHz  
 Lower band edge



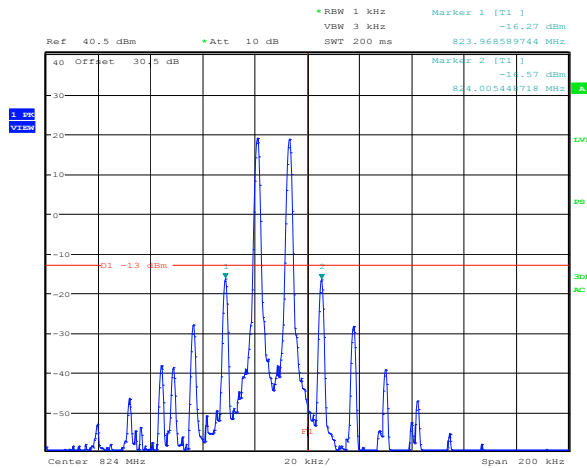
Date: 20.MAY.2011 08:54:04

**Plot 8.4-94:** 3<sup>rd</sup> order intermodulation  
 Fiber optic high power  
 Uplink 700 MHz  
 Upper band edge



Date: 20.MAY.2011 10:56:01

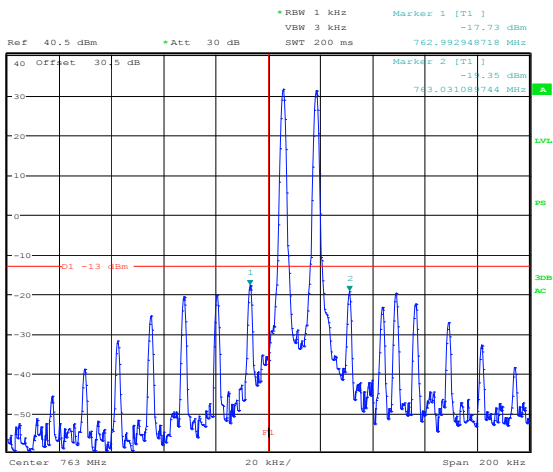
**Plot 8.4-95:** 3<sup>rd</sup> order intermodulation  
 Fiber optic high power  
 Uplink 800 MHz  
 Lower band edge



Date: 20.MAY.2011 11:01:15

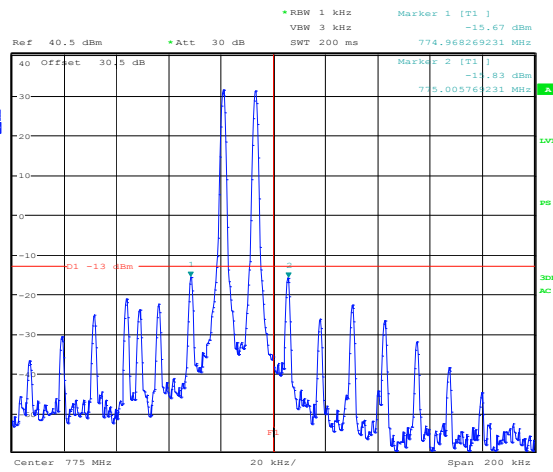
**Plot 8.4-96:** 3<sup>rd</sup> order intermodulation  
 Fiber optic high power  
 Uplink 800 MHz  
 Upper band edge

### 8.3.3 Test data, continued



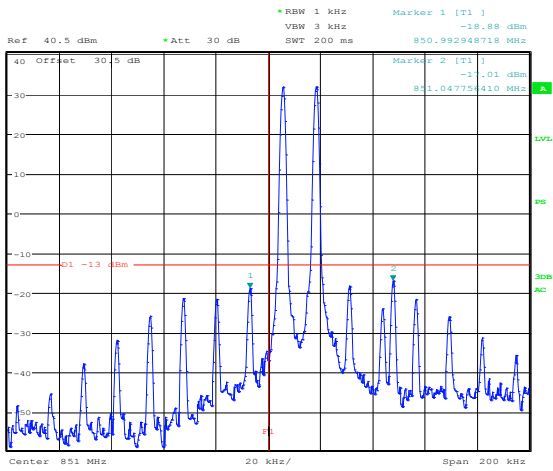
Date: 19.MAY.2011 14:02:52

**Plot 8.4-97:** 3<sup>rd</sup> order intermodulation  
 Fiber optic + power amplifier  
 Downlink 700 MHz  
 Lower band edge



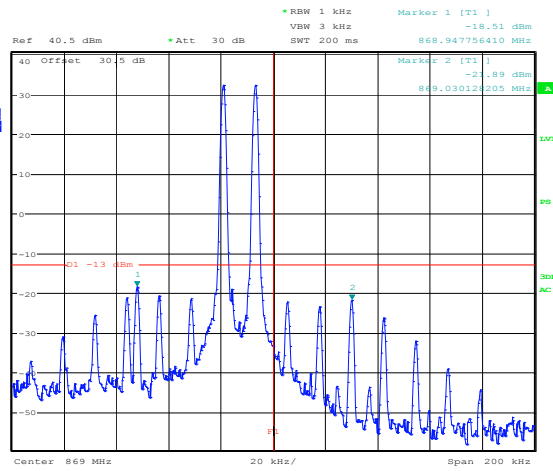
Date: 19.MAY.2011 13:59:11

**Plot 8.4-98:** 3<sup>rd</sup> order intermodulation  
 Fiber optic + power amplifier  
 Downlink 700 MHz  
 Upper band edge



Date: 19.MAY.2011 14:36:03

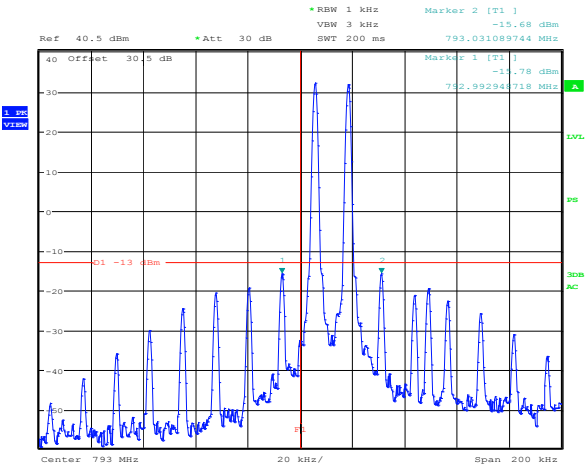
**Plot 8.4-99:** 3<sup>rd</sup> order intermodulation  
 Fiber optic + power amplifier  
 Downlink 800 MHz  
 Lower band edge



Date: 19.MAY.2011 14:46:01

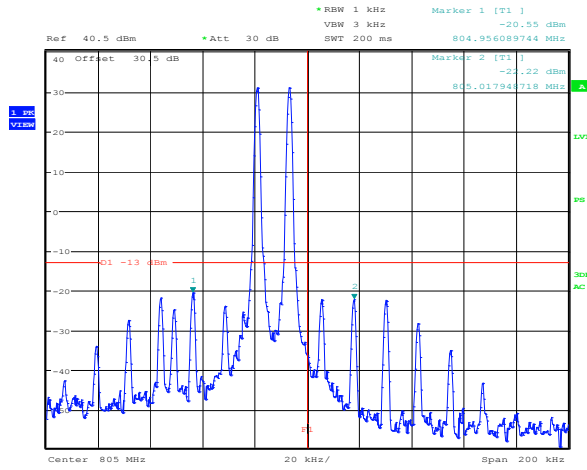
**Plot 8.4-100:** 3<sup>rd</sup> order intermodulation  
 Fiber optic + power amplifier  
 Downlink 800 MHz  
 Upper band edge

### 8.3.3 Test data, continued



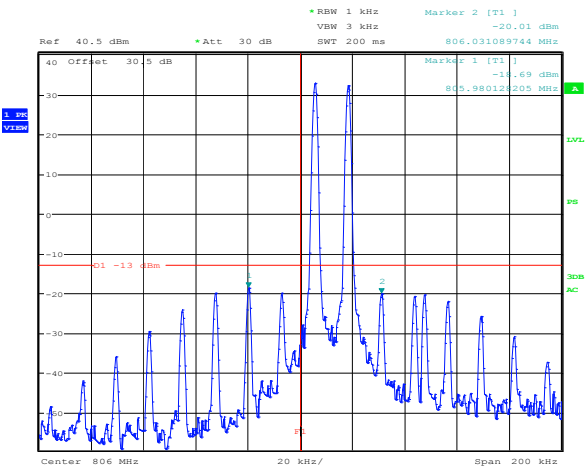
Date: 19.MAY.2011 14:10:10

**Plot 8.4-101:** 3<sup>rd</sup> order intermodulation  
 Fiber optic + power amplifier  
 Uplink 700 MHz  
 Lower band edge



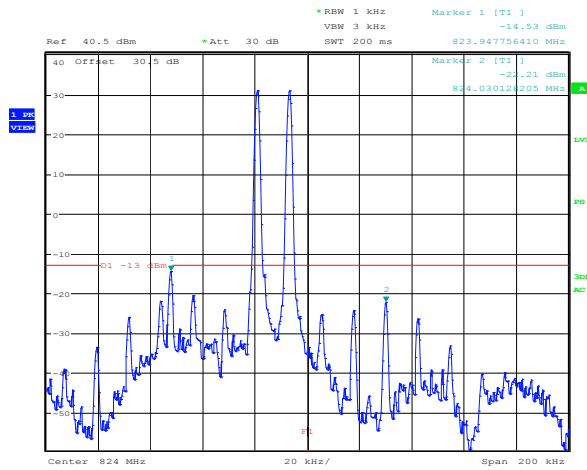
Date: 19.MAY.2011 14:15:50

**Plot 8.4-102:** 3<sup>rd</sup> order intermodulation  
 Fiber optic + power amplifier  
 Uplink 700 MHz  
 Upper band edge



Date: 19.MAY.2011 14:25:02

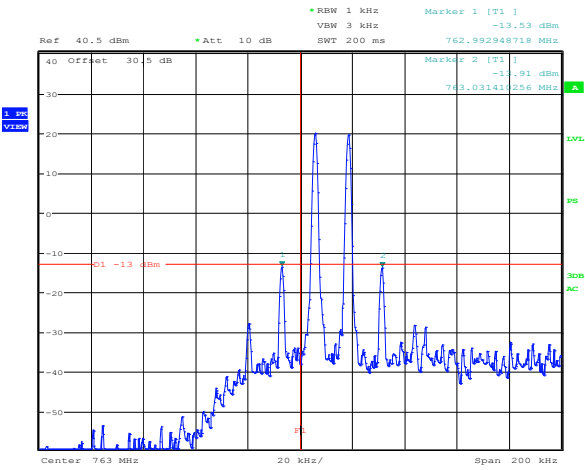
**Plot 8.4-103:** 3<sup>rd</sup> order intermodulation  
 Fiber optic + power amplifier  
 Uplink 800 MHz  
 Lower band edge



Date: 19.MAY.2011 14:29:47

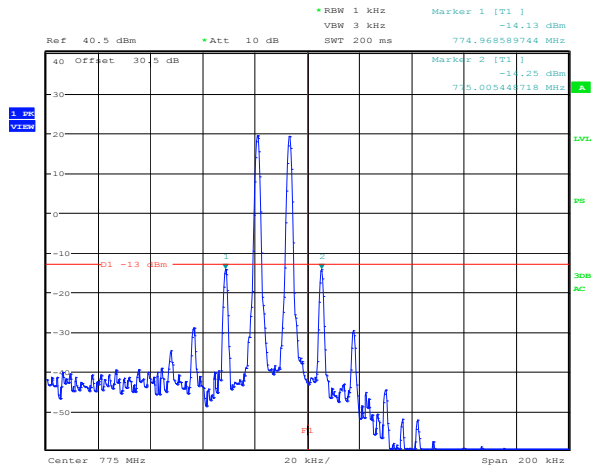
**Plot 8.4-104:** 3<sup>rd</sup> order intermodulation  
 Fiber optic + power amplifier  
 Uplink 800 MHz  
 Upper band edge

### 8.3.3 Test data, continued



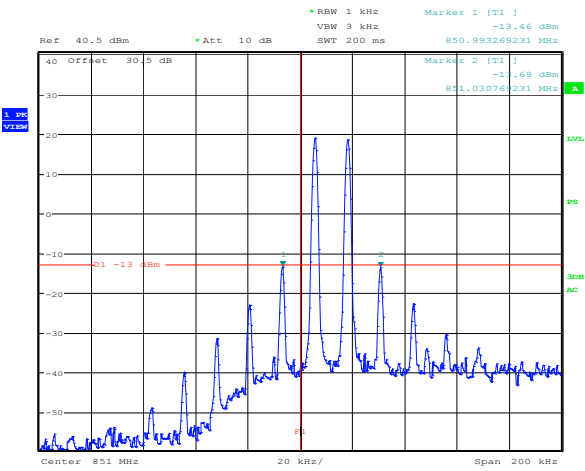
Date: 20.MAY.2011 13:13:01

**Plot 8.4-105:** 3<sup>rd</sup> order intermodulation  
 Regular high power  
 Downlink 700 MHz  
 Lower band edge



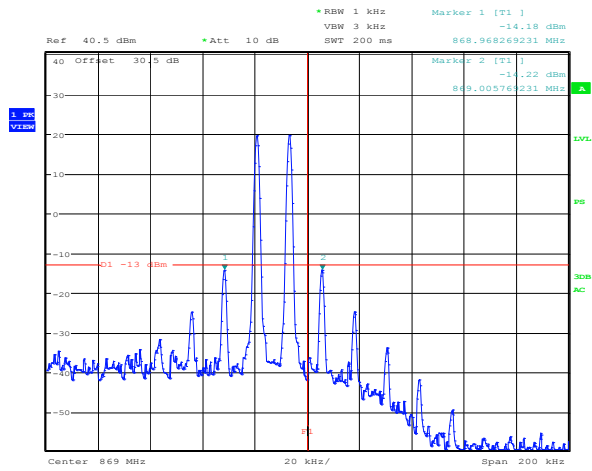
Date: 20.MAY.2011 13:16:17

**Plot 8.4-106:** 3<sup>rd</sup> order intermodulation  
 Regular high power  
 Downlink 700 MHz  
 Upper band edge



Date: 31.MAY.2011 11:16:41

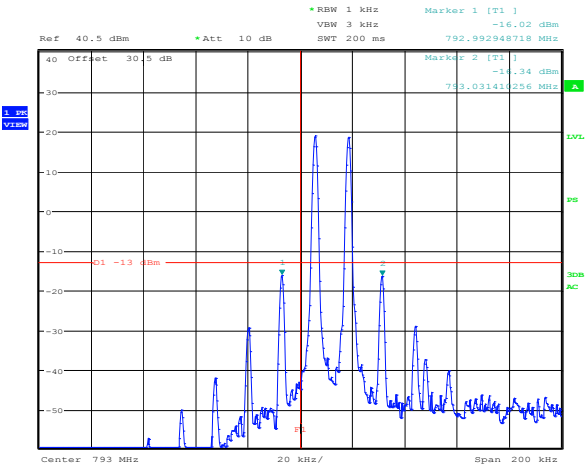
**Plot 8.4-107:** 3<sup>rd</sup> order intermodulation  
 Regular high power  
 Downlink 800 MHz  
 Lower band edge



Date: 31.MAY.2011 11:20:10

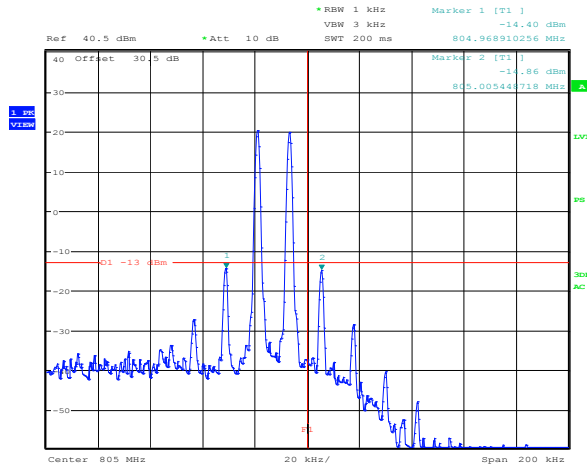
**Plot 8.4-108:** 3<sup>rd</sup> order intermodulation  
 Regular high power  
 Downlink 800 MHz  
 Upper band edge

### 8.3.3 Test data, continued



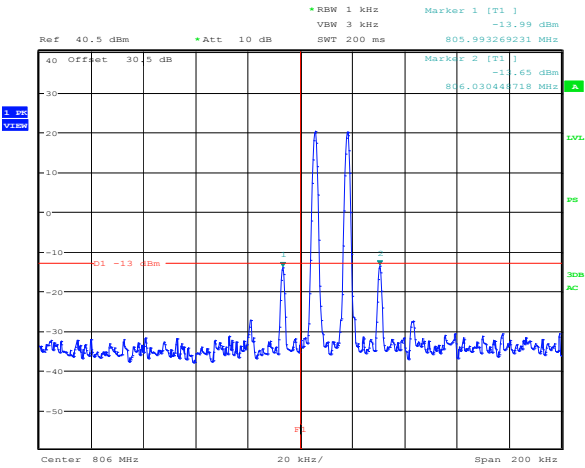
Date: 20.MAY.2011 14:16:17

**Plot 8.4-109:** 3<sup>rd</sup> order intermodulation  
 Regular high power  
 Uplink 700 MHz  
 Lower band edge



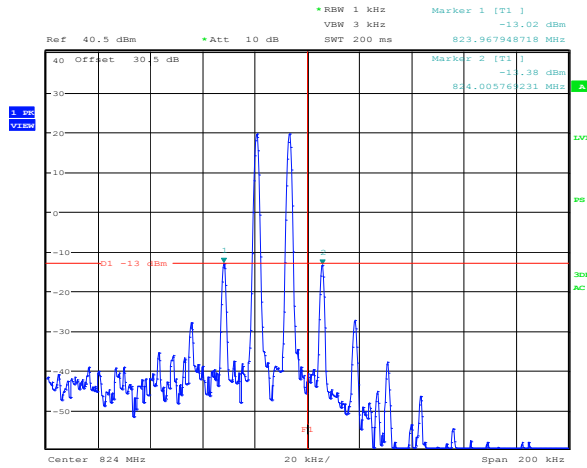
Date: 20.MAY.2011 14:24:54

**Plot 8.4-110:** 3<sup>rd</sup> order intermodulation  
 Regular high power  
 Uplink 700 MHz  
 Upper band edge



Date: 31.MAY.2011 11:01:49

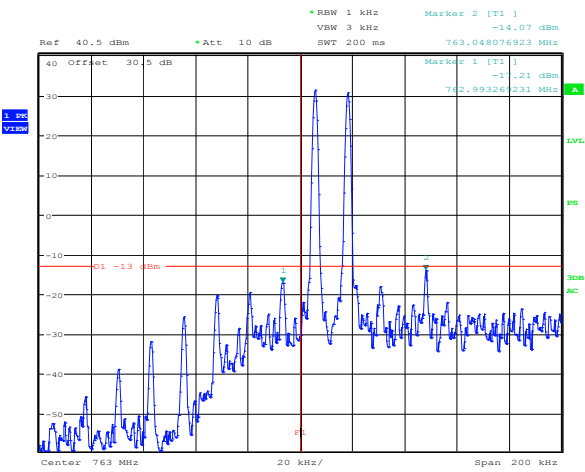
**Plot 8.4-111:** 3<sup>rd</sup> order intermodulation  
 Regular high power  
 Uplink 800 MHz  
 Lower band edge



Date: 31.MAY.2011 11:08:59

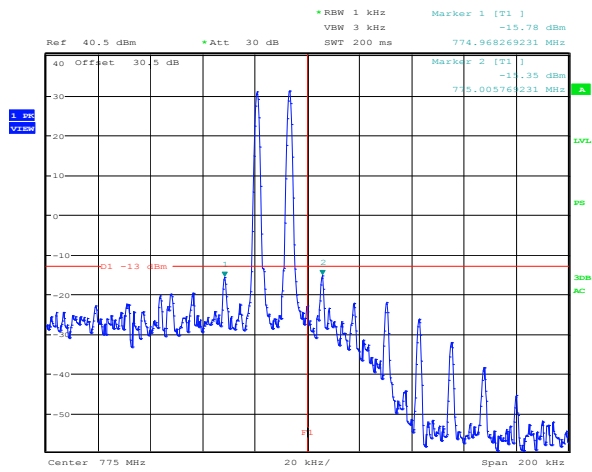
**Plot 8.4-112:** 3<sup>rd</sup> order intermodulation  
 Regular high power  
 Uplink 800 MHz  
 Upper band edge

### 8.3.3 Test data, continued



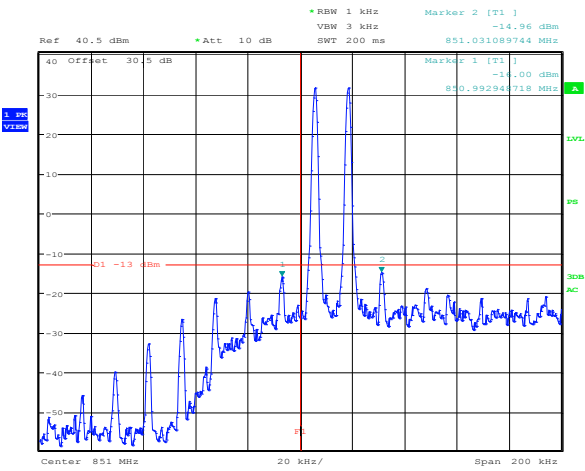
Date: 19.MAY.2011 13:43:01

**Plot 8.4-113:** 3<sup>rd</sup> order intermodulation  
 Regular + power amplifier  
 Downlink 700 MHz  
 Lower band edge



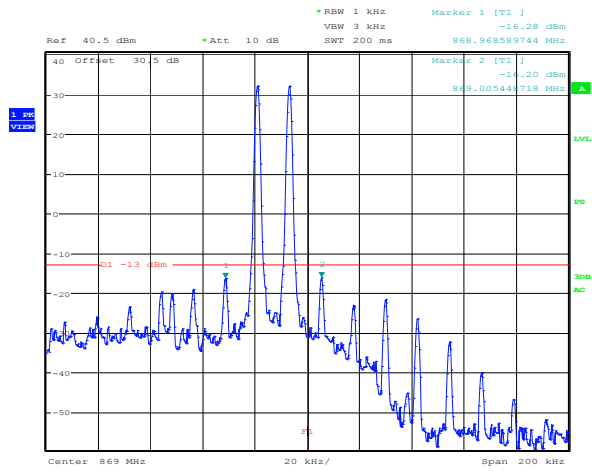
Date: 19.MAY.2011 13:51:30

**Plot 8.4-114:** 3<sup>rd</sup> order intermodulation  
 Regular + power amplifier  
 Downlink 700 MHz  
 Upper band edge



Date: 19.MAY.2011 15:35:21

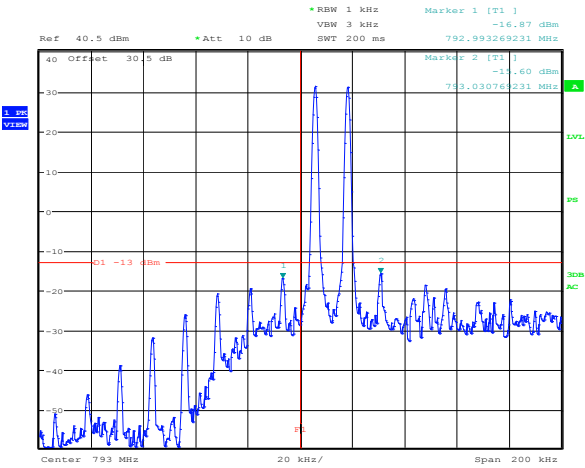
**Plot 8.4-115:** 3<sup>rd</sup> order intermodulation  
 Regular + power amplifier  
 Downlink 800 MHz  
 Lower band edge



Date: 19.MAY.2011 15:41:09

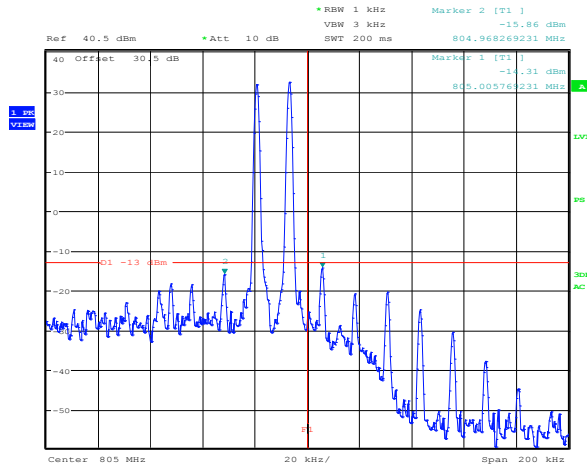
**Plot 8.4-116:** 3<sup>rd</sup> order intermodulation  
 Regular + power amplifier  
 Downlink 800 MHz  
 Upper band edge

### 8.3.3 Test data, continued



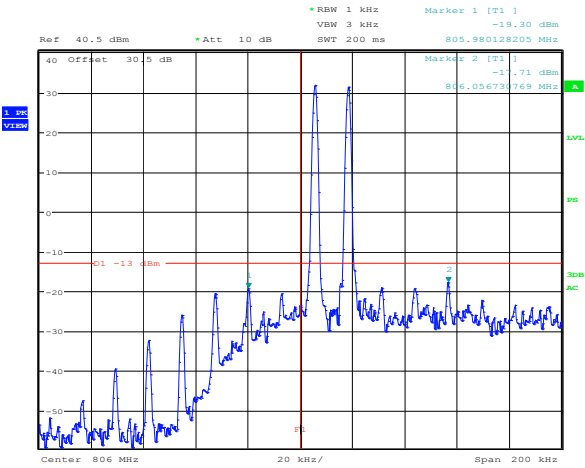
Date: 19.MAY.2011 13:33:32

**Plot 8.4-117:** 3<sup>rd</sup> order intermodulation  
 Regular + power amplifier  
 Uplink 700 MHz  
 Lower band edge



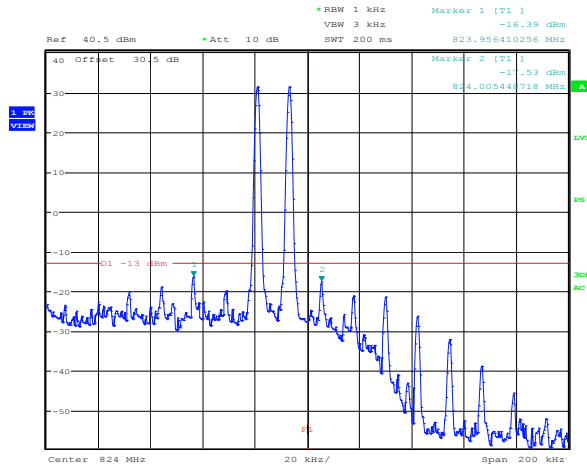
Date: 19.MAY.2011 13:37:24

**Plot 8.4-118:** 3<sup>rd</sup> order intermodulation  
 Regular + power amplifier  
 Uplink 700 MHz  
 Upper band edge



Date: 19.MAY.2011 15:52:21

**Plot 8.4-119:** 3<sup>rd</sup> order intermodulation  
 Regular + power amplifier  
 Uplink 800 MHz  
 Lower band edge



Date: 19.MAY.2011 15:56:57

**Plot 8.4-120:** 3<sup>rd</sup> order intermodulation  
 Regular + power amplifier  
 Uplink 800 MHz  
 Upper band edge