

RADIO TEST REPORT

No. 1510929STO-001 Ed. 1

RF performance

EQUIPMENT UNDER TEST

Equipment : DAS Remote
Type / model : DDS499
Manufacturer : Deltanode AB
Tested by request of : Deltanode AB

SUMMARY

Referring to the emission limits and the operating mode during the tests specified in this report the equipment complies with the requirements according to

47 CFR Part 2, subpart J
47 CFR Part 20
47 CFR Part 22 subpart H,
47 CFR Part 24 subpart E,
47 CFR Part 27 Subpart C
Only partial testing has been performed.

Date of issue: 2015-07-02

Tested by:


Matti Virkki

Approved by:


Stefan Andersson

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Revision History

Edition	Date	Description
1	2015-07-02	First release

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1 CLIENT INFORMATION

The EUT has been tested by request of

Company: Deltanode AB
Hammarby fabriksväg 61 6tr
120 33 Stockholm
Sweden

Name of contact: Daniel Kerek

2 EQUIPMENT UNDER TEST (EUT)

2.1 Identification of the EUT according to the manufacturer/client declaration

Equipment:

Tested Model: DDS499

Brand name: Deltanode

Serial number: 99995

Manufacturer: Deltanode AB

Transmitter frequency range: 746 – 757 MHz, 869 – 894 MHz, 1930 – 1995 MHz,
2110 – 2155MHz

Receiver frequency range: 776 – 787 MHz, 824 – 849 MHz, 1850 – 1915 MHz
1710 – 1755 MHz

Frequency agile or hopping: ☐ Yes ☒ No

Antenna: ☐ Internal antenna ☒ External antenna

Antenna connector: ☐ None, internal antenna ☒ Yes, type N

Rating RF output power: 41 dBm rms

Type of modulation: Tested with GMSK, QPSK

Temperature range: ☐ Category I (General): -20°C to +55°C
☐ Category II (Portable equipment): -10°C to +55°C
☐ Category III (Equipment for normal indoor use): +5°C to +35°C
☒ Other: -30°C to +55°C

Power rating: 120 V 60 Hz

Transmitter standby mode supported: ☒ Yes ☐ No

2.2 Additional hardware information about the EUT

The EUT consists of the following units:

2.3 Remote unit type

DDS 499/1--:w ver 0.0.1 Ser:99995 Week:2015W12

2.4 FOR type

FOR 101 Rev:1.2.1 Week:2015w06 Ser:2398

RF Lineup 1

Item	Information
APD Type	11:09 Multisystem APD 700MHz band ver. 0.0 prod. 2014W33 SN:0001-00505
APD HW-version	KS47.1 R1A 2014W33 LH00505
APD Linearizer	HW 87.1.6, FW 1.2.21.00, band 04(Low)
VGA Type	81:09 Multisystem VGA 700MHz band ver. 0.2 prod. 2014W27 SN:0001-00402
VGA HW-version	KS30.18 R2B 2014W27 LH00402

RF Lineup 2

Item	Information
APD Type	11:01 Multisystem APD 850MHz band ver. 0.0 prod. 2015W05 SN:0001-00175
APD HW-version	KS47.2 R1A 2015W05 LH00175
APD Linearizer	HW 87.1.6, FW 1.2.21.00, band 04(Low)
VGA Type	81:01 Multisystem VGA 850MHz band ver. 0.2 prod. 2014W42 SN:0001-00870
VGA HW-version	KS30.4 R2B 2014W42 LH00870

RF Lineup 3

Item	Information
APD Type	11:04 Multisystem APD 1900MHz band ver. 0.0 prod. 2012W38 SN:0001-00184
APD HW-version	KS49.1 P1A 2012W38 LH00184
APD Linearizer	HW 87.1.6, FW 1.2.31.00, band 07(High)
VGA Type	81:14 GSM VGA 1900MHz band ver. 0.2 prod. 2015W05 SN:0001-00999
VGA HW-version	KS30.3 R2B 2015W05 LH00999

RF Lineup 4

Item	Information
APD Type	11:06 Multisystem APD AWS 2100/1700 band ver. 0.0 prod. 2012W11 SN:0001-00128
APD HW-version	KS48.1 R1A 2012W11 LH00128
APD Linearizer	HW 87.1.6, FW 1.2.31.00, band 07(High)
VGA Type	81:36 CDMA 2000/IS-95 VGA AWS 2100/1700 band ver. 0.1 prod. 2014W26 SN:0001-00687
VGA HW-version	KS30.5 R2B 2014W26 LH00687

2.5 Additional information about the EUT

The EUT firmware configuration during the test.

PA/VGA Firmware Manager

RF Lineup 1

Item	Information
PA Type	11:09 Multisystem APD 700MHz band ver. 0.0 prod. 2014W33 SN:0001-00505
PA HW-version	KS47.1 R1A 2014W33 LH00505
PA Bootloader	BF002006 0.0.0 Boot APD 2011-08-25 13:19:59
PA Application	AF002006 0.0.4 APD 2012-08-30 16:16:17
PA Loaded ver	AF002006 0.0.4 APD 2012-08-30 16:16:17
Available PA upgrade	AF002006 0.0.4 APD 2012-08-30 16:16:17
Linearizer version	HW 87.1.6, FW 1.2.21.00, band 04(Low)
Available Linearizer upgrade	Exists, 28583 bytes, CRC 6708h, LRC AEh
PA SWL Status	Idle
VGA Type	81:09 Multisystem VGA 700MHz band ver. 0.2 prod. 2014W27 SN:0001-00402
VGA HW-version	KS30.18 R2B 2014W27 LH00402
VGA Bootloader	BF002002 0.0.1 Boot VGA 2008-02-20 15:12:23
VGA Application	AF002002 0.2.2 VGA 2012-05-09 15:23:13
VGA Loaded ver	AF002002 0.2.2 VGA 2012-05-09 15:23:13
Available VGA upgrade	AF002002 0.2.2 VGA 2012-05-09 15:23:13

RF Lineup 2

Item	Information
PA Type	11:01 Multisystem APD 850MHz band ver. 0.0 prod. 2015W05 SN:0001-00175
PA HW-version	KS47.2 R1A 2015W05 LH00175
PA Bootloader	BF002006 0.0.0 Boot APD 2011-08-25 13:19:59
PA Application	AF002006 0.0.4 APD 2012-08-30 16:16:17
PA Loaded ver	AF002006 0.0.4 APD 2012-08-30 16:16:17
Available PA upgrade	AF002006 0.0.4 APD 2012-08-30 16:16:17
Linearizer version	HW 87.1.6, FW 1.2.21.00, band 04(Low)
Available Linearizer upgrade	Exists, 28583 bytes, CRC 6708h, LRC AEh
VGA Type	81:01 Multisystem VGA 850MHz band ver. 0.2 prod. 2014W42 SN:0001-00870
VGA HW-version	KS30.4 R2B 2014W42 LH00870
VGA Bootloader	BF002002 0.0.1 Boot VGA 2008-02-20 15:12:23
VGA Application	AF002002 0.2.2 VGA 2012-05-09 15:23:13
VGA Loaded ver	AF002002 0.2.2 VGA 2012-05-09 15:23:13
Available VGA upgrade	AF002002 0.2.2 VGA 2012-05-09 15:23:13

RF Lineup 3**Item****Information**

PA Type	11:04 Multisystem APD 1900MHz band ver. 0.0 prod. 2012W38 SN:0001-00184
PA HW-version	KS49.1 P1A 2012W38 LH00184
PA Bootloader	BF002006 0.0.0 Boot APD 2011-08-25 13:19:59
PA Application	AF002006 0.0.4 APD 2012-08-30 16:16:17
PA Loaded ver	AF002006 0.0.4 APD 2012-08-30 16:16:17
Available PA upgrade	AF002006 0.0.4 APD 2012-08-30 16:16:17
Linearizer version	HW 87.1.6, FW 1.2.31.00, band 07(High)
Available Linearizer upgrade	Exists, 28583 bytes, CRC 6708h, LRC AEh
VGA Type	81:14 GSM VGA 1900MHz band ver. 0.2 prod. 2015W05 SN:0001-00999
VGA HW-version	KS30.3 R2B 2015W05 LH00999
VGA Bootloader	BF002002 0.0.1 Boot VGA 2008-02-20 15:12:23
VGA Application	AF002002 0.2.2 VGA 2012-05-09 15:23:13
VGA Loaded ver	AF002002 0.2.2 VGA 2012-05-09 15:23:13
Available VGA upgrade	AF002002 0.2.2 VGA 2012-05-09 15:23:13

RF Lineup 4

Item	Information
PA Type	11:06 Multisystem APD AWS 2100/1700 band ver. 0.0 prod. 2012W11 SN:0001-00128
PA HW-version	KS48.1 R1A 2012W11 LH00128
PA Bootloader	BF002006 0.0.0 Boot APD 2011-08-25 13:19:59
PA Application	AF002006 0.0.4 APD 2012-08-30 16:16:17
PA Loaded ver	AF002006 0.0.4 APD 2012-08-30 16:16:17
Available PA upgrade	AF002006 0.0.4 APD 2012-08-30 16:16:17
Linearizer version	HW 87.1.6, FW 1.2.31.00, band 07(High)
Linearizer loaded ver	Image not ready
Available Linearizer upgrade	Exists, 28583 bytes, CRC 6708h, LRC AEh
PA SWL Status	Idle
VGA Type	81:36 CDMA 2000/IS-95 VGA AWS 2100/1700 band ver. 0.1 prod. 2014W26 SN:0001-00687
VGA HW-version	KS30.5 R2B 2014W26 LH00687
VGA Bootloader	BF002002 0.0.1 Boot VGA 2008-02-20 15:12:23
VGA Application	AF002002 0.2.2 VGA 2012-05-09 15:23:13
VGA Loaded ver	AF002002 0.2.2 VGA 2012-05-09 15:23:13
Available VGA upgrade	AF002002 0.2.2 VGA 2012-05-09 15:23:13

2.6 Peripheral equipment

Peripheral equipment is defined as equipment needed for correct operation of the EUT during the tests, but not included as a part of the testing and evaluation of the EUT.

Equipment	Manufacturer / Type
Fiber optical interface	Deltanode AB
Laptop PC	Dell
Ethernet hub	Deltanode AB

2.7 Test signals

Continuous transmission on full power
As requested in KDB 935210 D05 V01

Narrow band signal: GSM with GMSK modulation
Wide band signal: WCDMA with QPSK modulation

2.8 Modification during the tests

No modifications were made during the testing.

3 TEST SPECIFICATIONS

3.1 Standards

47 CFR Part 2, Part 22 subpart H, Part 24 subpart E, Part 27 subpart C

Test methods in:

KDB 935210 D05 Industrial booster Basic measurement

3.2 Additions, deviations and exclusions from standards and accreditation

This report is a supplementary to Intertek test report 1211824 Ed. 3.

Only partial testing has been made.

No other additions, deviations or exclusions have been made from standards and accreditation.

3.3 Test site

Measurements were performed at:

Intertek Semko AB.
Torshamnsgatan 43,
P.O. Box 1103
SE-164 22 Kista

Intertek Semko AB is a FCC listed test site with site registration number 90913

Intertek Semko AB is a Industry Canada listed test facility with IC assigned code 2042G

3.4 Test conditions

If not additionally specified, the tests were performed under the following environmental conditions:

Parameter	Normal	Extreme
Supplying voltage, V	120	-
Air temperature, °C	20 24	-

4 TEST SUMMARY

The results in this report apply only to the tested sample:

Test	Result	Section in report	Note
Standard test methods			
AGC threshold and RF output power	Pass	5	
Intermodulation and band edge measurements	Pass	6	
Occupied bandwidth	Pass	7	
Conducted spurious emission	Pass	8	

NT = Not Tested, by request of the Client

NA = Not Applicable

5 AGC TRESHOLD AND RF OUTPUT POWER

Date of test:	May 22 nd 2015	Test location:	EMC Center
EUT Serial:	99995	Ambient temp. °C	21
Tested by:	MTV	Relative humidity %	36
Test result:	Pass	Margin:	16.4 dB

5.1 Requirement

Reference: CFR 47 §2.1049, §22.913 (a)(2), §24.232, §27.50(b), §27.50(d)

5.2 Test set-up

Signal generator was connected to the FOI unit which converted rf signal to optical signal. The optical signal was then fed via fibre to the EUT.

The EUT's output port was connected to spectrum analyser via rf cables and 30 dB attenuator. A PC was connected to FOI via Ethernet hub. The PC was then used to control the EUT.

The output power was measured with maximum 75 dB gain and input signal was adjusted so that Automatic Gain Control did not yet limit the output power. This is also the AGC threshold power. The test was then repeated with higher input signal level so that AGC limited the output power.

5.3 Test data

700 MHz band GSM

Frequency MHz	Peak power dBm	RMS power dBm	Automatic level control	Limit dBm	Peak to avg ratio
751.4	39.9	39.4	Off	60	0.5
751.4	40.3	39.6	On	60	0.7

700 MHz band WCDMA

Frequency MHz	Peak power dBm	Average power dBm	Automatic level control	Limit dBm	Peak to avg ratio
751.4	48.4	39.4	Off	60	9.0
751.4	48.4	39.5	On	60	8.9

850 MHz band GSM

Frequency MHz	Peak power dBm	Average power dBm	Automatic level control	Limit ERP dBm	Peak to avg ratio
871.4	43.4	40.3	Off	57	3.1
871.4	41.3	40.6	On	57	0.7

850 MHz band WCDMA

Frequency MHz	Peak power dBm	Average power dBm	Automatic level control	Limit ERP dBm	Peak to avg ratio
871.4	49.9	40.3	Off	57	9.6
871.4	49.7	40.1	On	57	9.6

1900 MHz GSM

Frequency MHz	Peak power dBm	Average power dBm		Limit dBm	Peak to avg ratio
1942.5	40.4	38.9	Off	62	1.5
1942.5	40.8	39.0	On	62	1.8

1900 MHz WCDMA

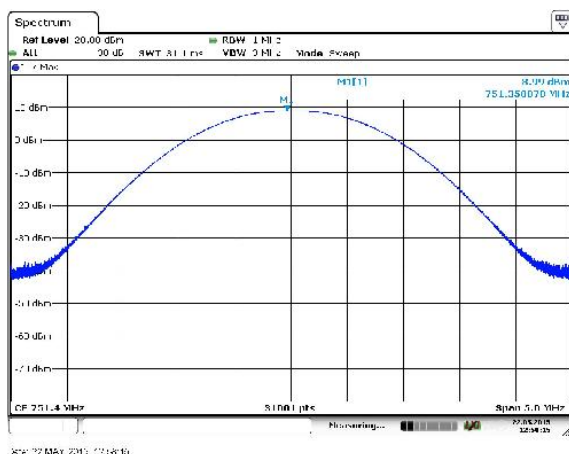
Frequency MHz	Peak power dBm	Average power dBm		Limit dBm	Peak to avg ratio
1942.5	46,5	38.9	Off	62	7.6
1942.5	47,0	39.1	On	62	7.9

AWS GSM

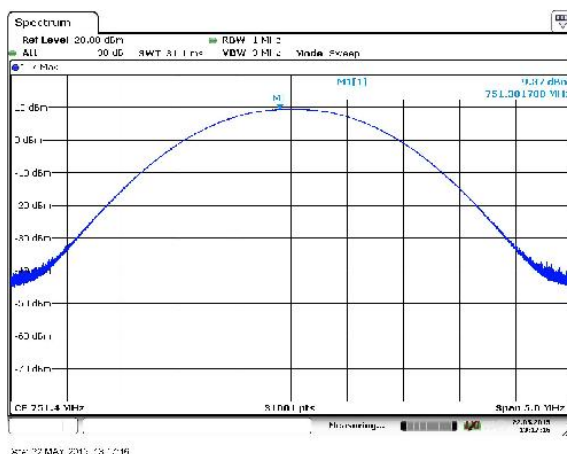
Frequency MHz	Peak power dBm	Average power dBm	Automatic level control	Limit dBm	Peak to avg ratio
2132.5	40.5	40.3	Off	62	0.2
2132.5	40.7	40.3	On	62	0.5

AWS WCDMA

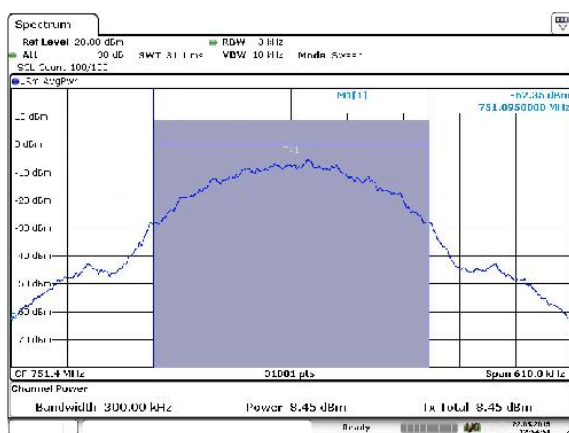
Frequency MHz	Peak power dBm	Average power dBm	Automatic level control	Limit dBm	Peak to avg ratio
2132.5	48.3	40.0	Off	62	8.3
2132.5	48.6	40.2	On	62	8.4



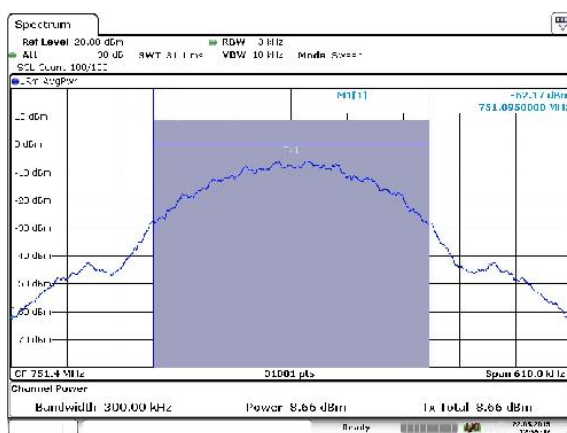
700 GSM peak power AGC off



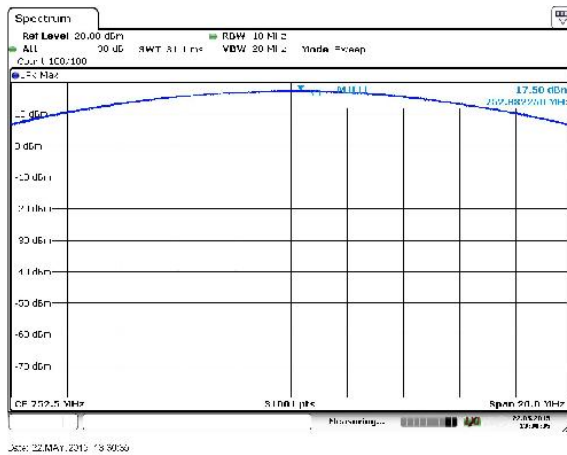
700 GSM peak power AGC on



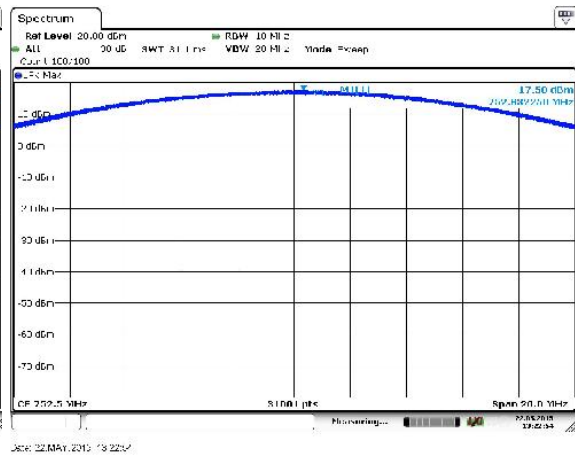
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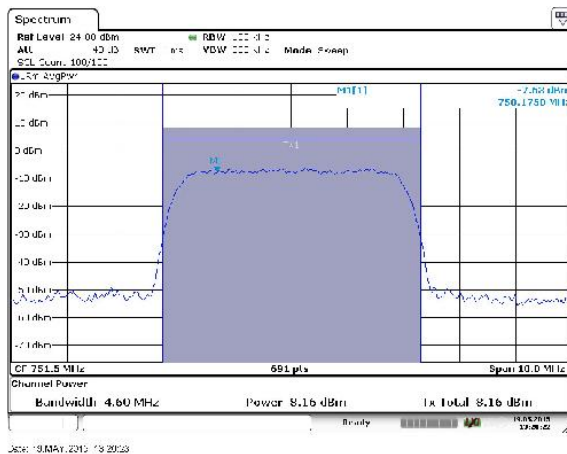
700 GSM rms power AGC on



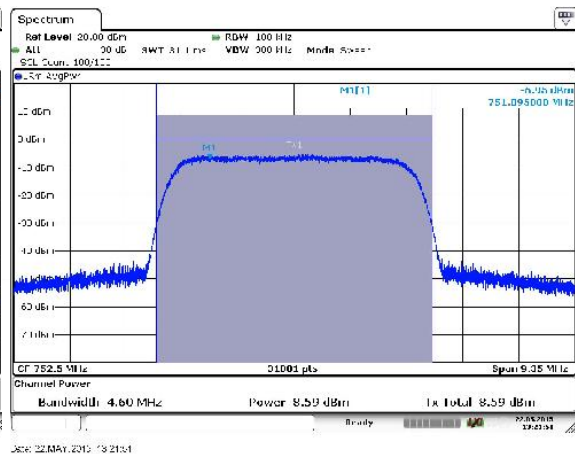
700 WCDMA peak power AGC off



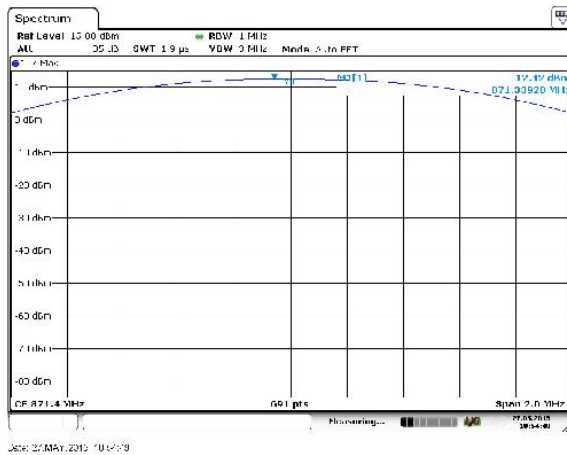
700 WCDMA peak power AGC on



700 WCDMA rms power AGC off

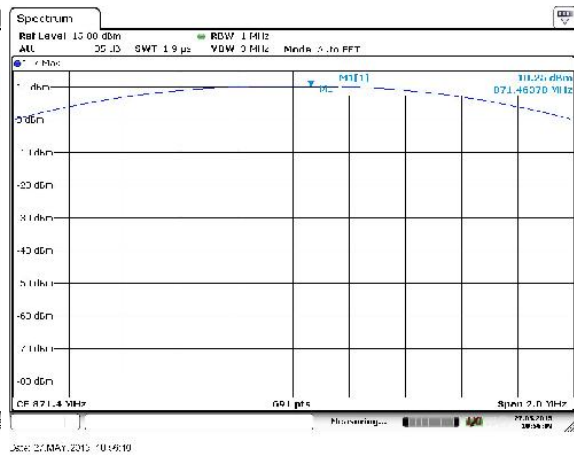


700 WCDMA rms power AGC on



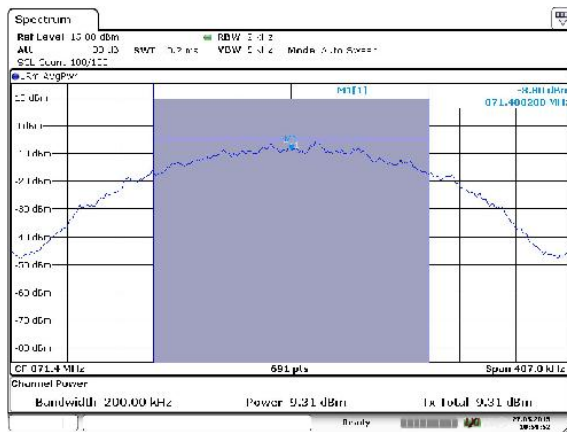
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850 GSM peak power AGC off



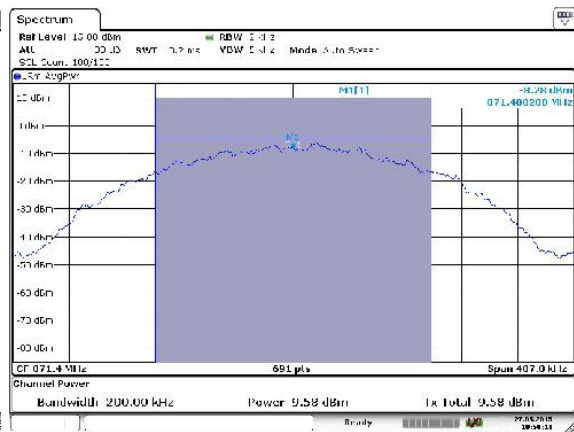
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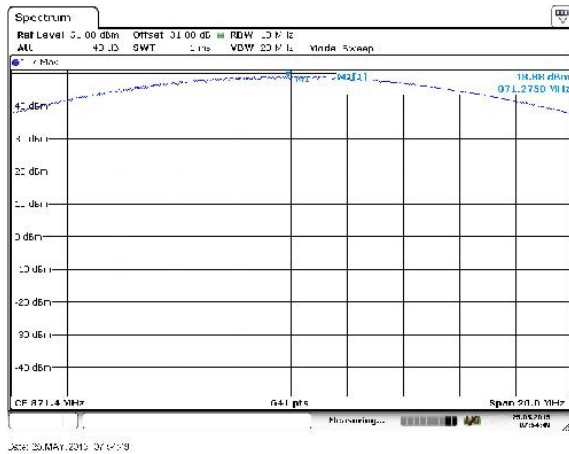
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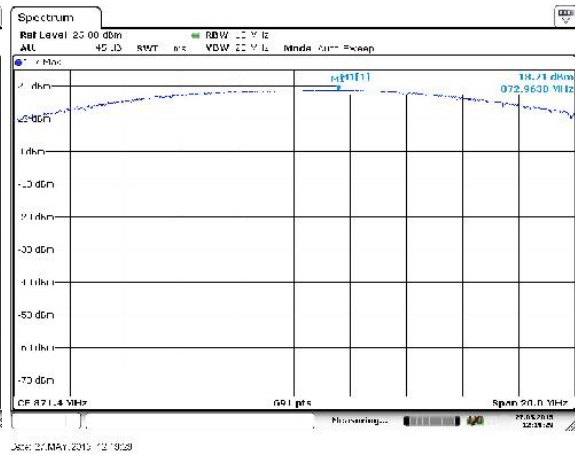


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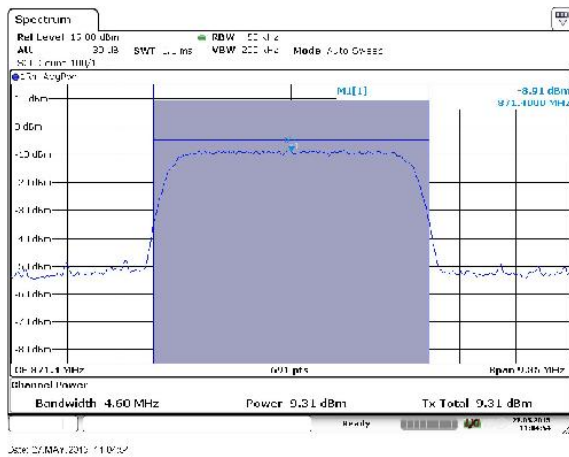
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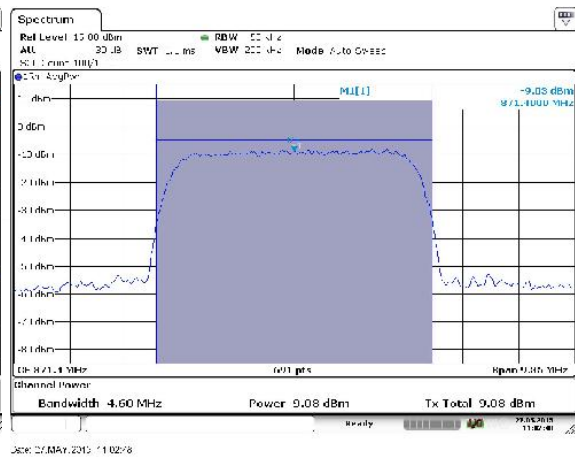
850 WCDMA peak power AGC off



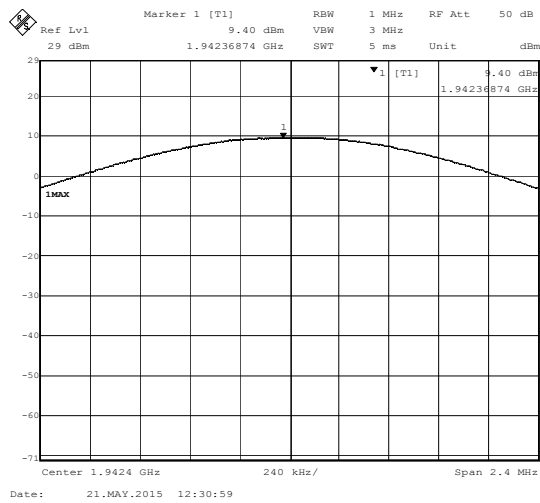
850 WCDMA peak power AGC on



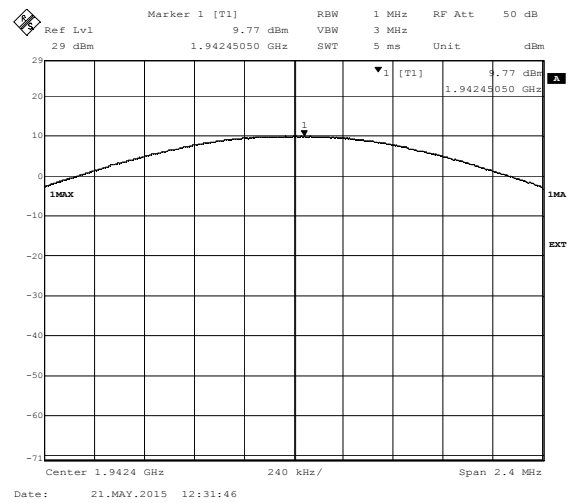
850 WCDMA rms power AGC off



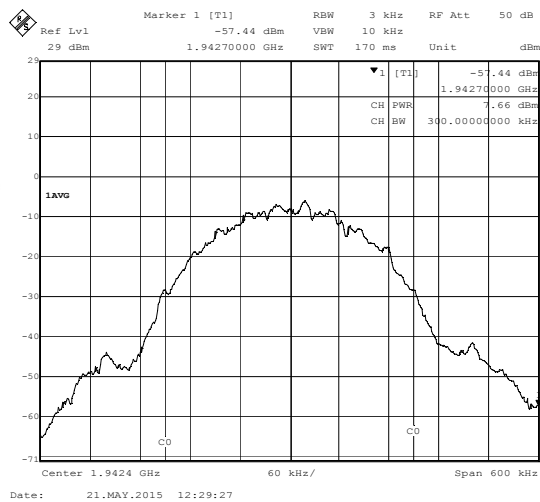
850 WCDMA rms power AGC on



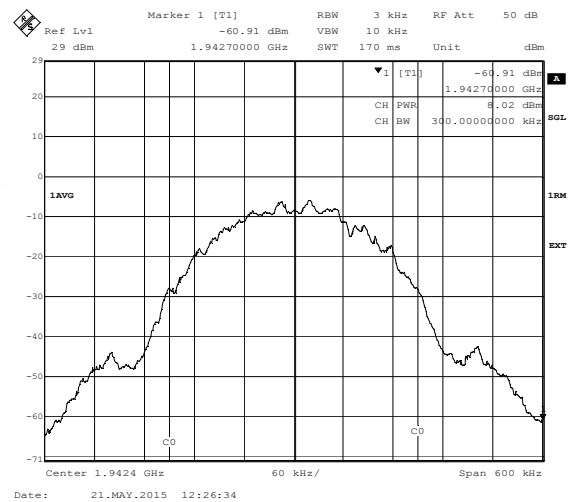
1900 MHz GSM peak power AGC off



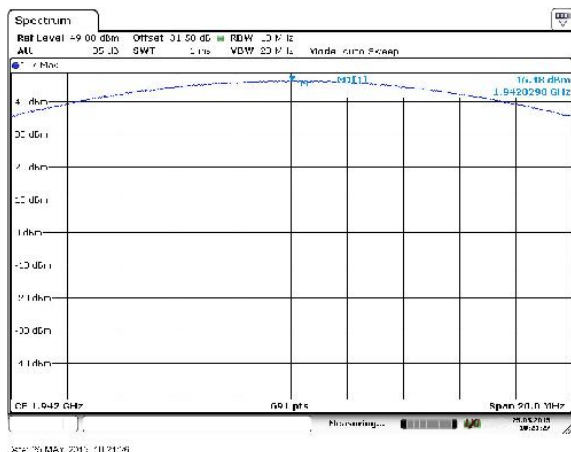
1900 MHz GSM peak power AGC on



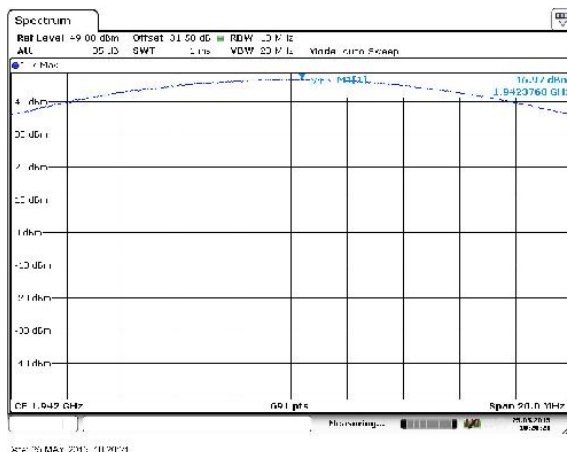
1900 MHz GSM rms power AGC off



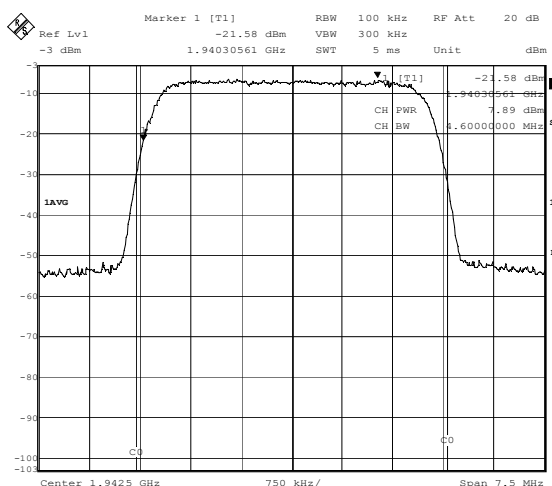
1900 MHz GSM rms power AGC on



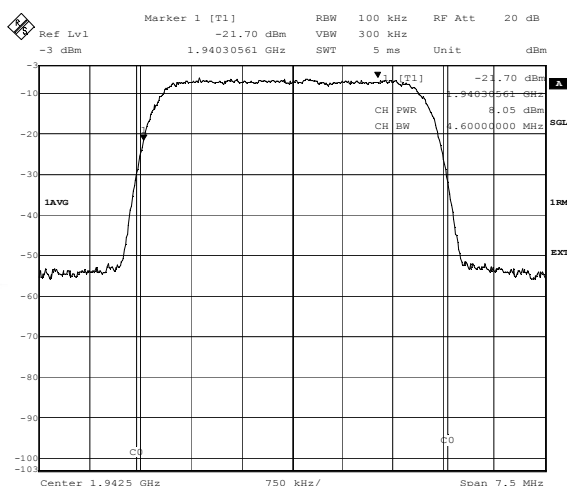
1900 MHz wcdma peak power AGC off



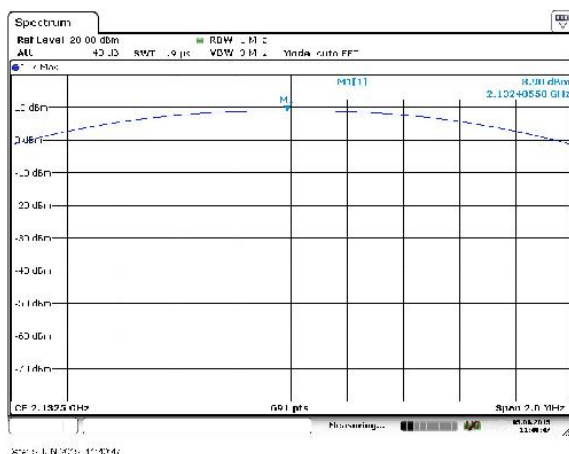
1900 MHz wcdma peak power AGC on



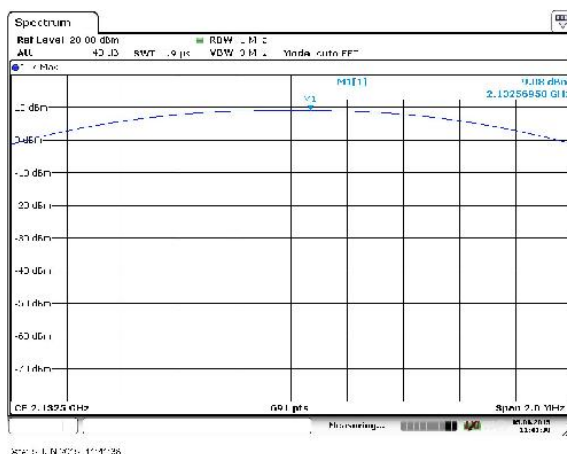
1900 MHz wcdma rms power AGC off



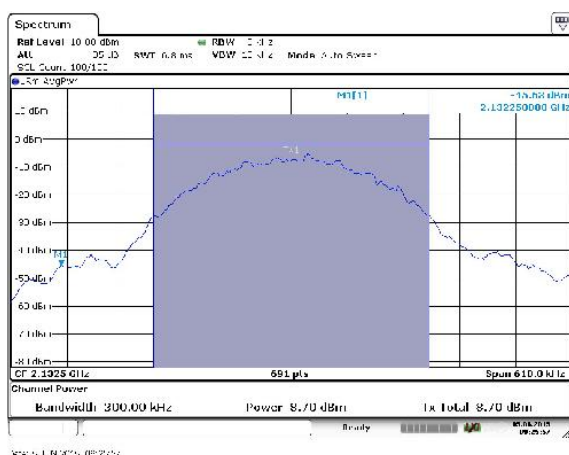
1900 MHz wcdma rms power AGC on



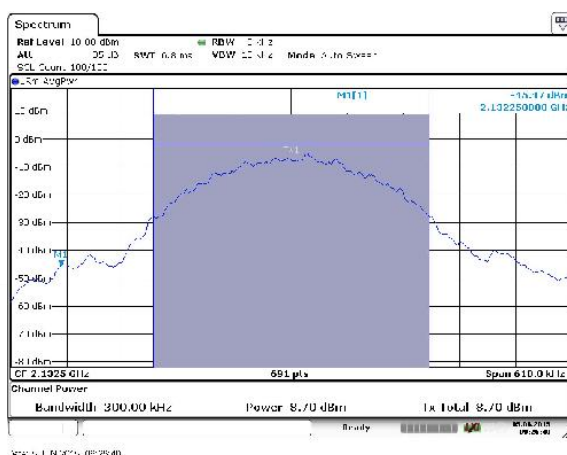
AWS peak power GSM AGC off



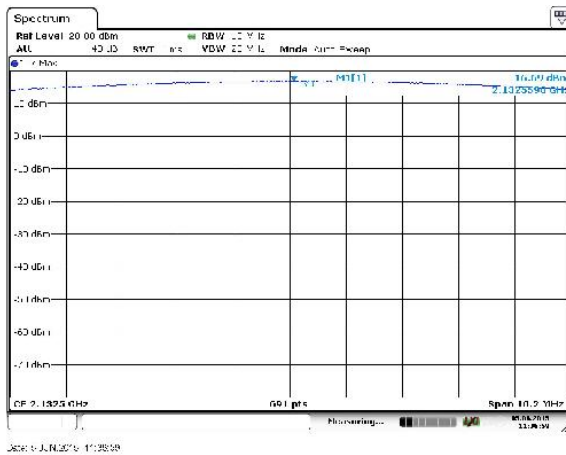
AWS peak power GSM AGC on



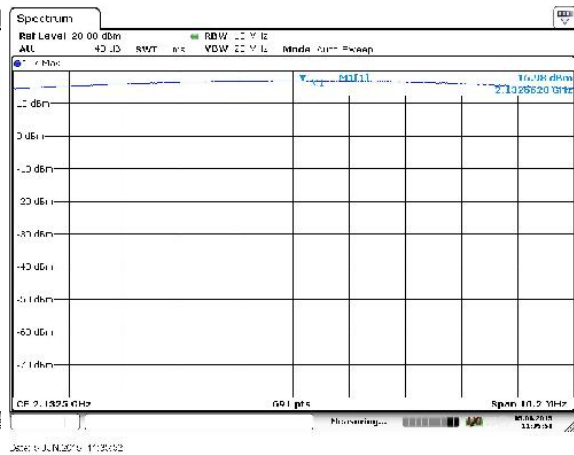
AWS average power GSM AGC off



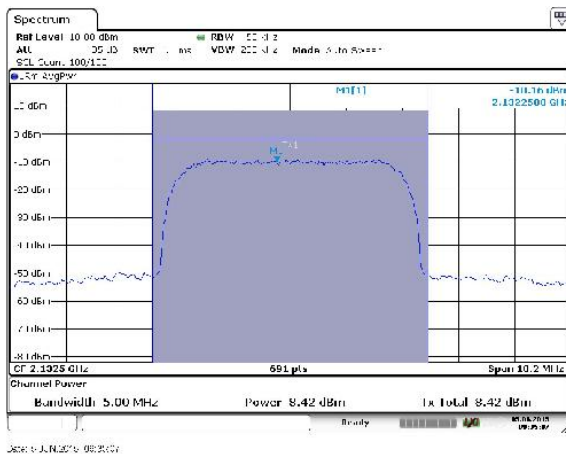
AWS average power GSM AGC on



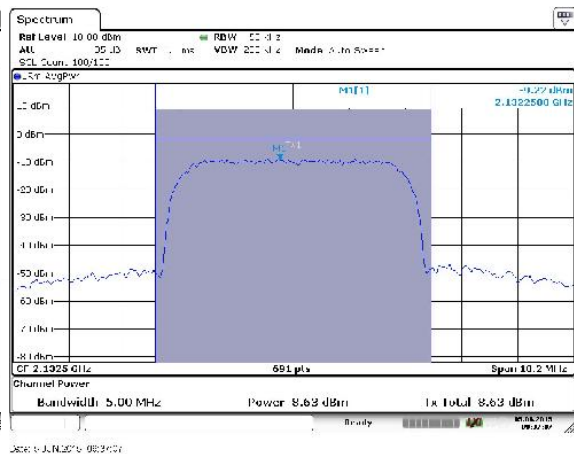
AWS WCDMA peak power AGC off



AWS WCDMA peak power AGC on



AWS WCDMA rms power AGC off



AWS WCDMA rms power AGC on

5.4 Test equipment

Equipment type	Manufacturer	Model	Inv. No.	Cal. due date
Spectrum analyser	Rohde & Schwarz	FSV	32594	7/2015
Spectrum analyser	Rohde & Schwarz	FSIQ	12793	7/2015
Rf-attenuator	JFW	50FHD0-030-200	32526	7/2015
Signal generator	Rohde & Schwarz	SMIQ03B	12792	7/2015
Signal generator	Rohde & Schwarz	SMIQ03B	40017	7/2015

6 OCCUPIED BANDWIDTH INPUT VS OUTPUT COMPARISON

Date of test:	June 3 – 5 2015	Test location:	Wireless centre
EUT Serial:	99995	Ambient temp.	21 °C
Tested by:	MTV	Relative humidity	38%
Test result:	Pass	Margin:	--

6.1 Requirement

The spectral shape of the rf-output shall look similar to input for all modulations.

6.2 Test set-up

Signal generator was connected to the FOI unit which converted rf signal to optical signal. The optical signal was then fed via fibre to the EUT.

The EUT's output port was connected to spectrum analyser via rf cables and 30 dB attenuator. A PC was connected to FOI via Ethernet hub. The PC was then used to control the EUT.

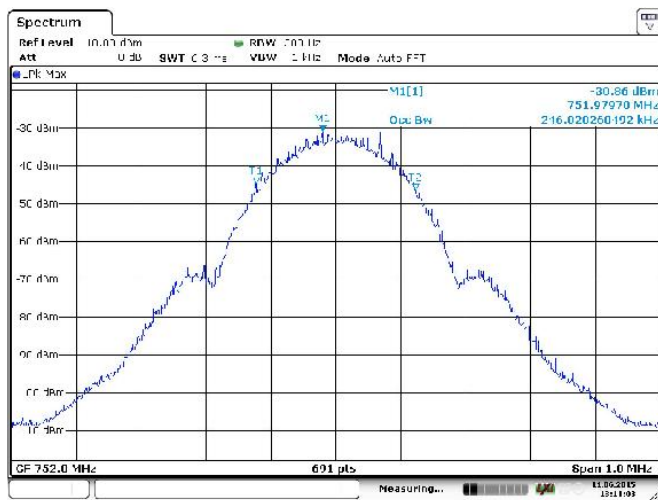
The 99% occupied bandwidth was measured using spectrum analyser's occupied bandwidth function.

The EUT was set to use maximum 75 dB gain and input signal was adjusted so that Automatic Gain Control did not yet limit the output power.

The test was then repeated with higher input signal level so that AGC limited the output power. Finally occupied bandwidth of signal generator was measured and input signal output was compared to EUT outputs.

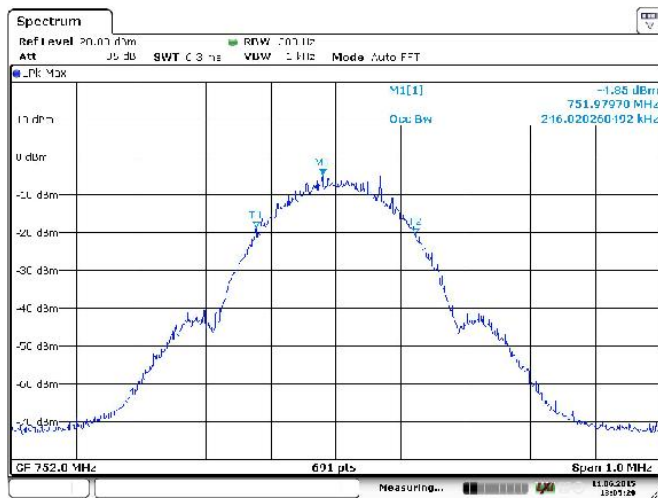
6.3 Test data

Frequency MHz	Signal type	Occupied band width Input (kHz)	Occupied band width output (kHz)	Occupied band width output with AGC (kHz)
752	GSM	246.02	246.02	246.02
752	WCDMA	4011.58	4001.45	4001.45
882	GSM	246.02	246.02	246.02
882	WCDMA	4011.58	4021.71	4021.71
1952	GSM	246.02	246.02	246.02
1952	WCDMA	4011.58	4011.58	4011.58
2132	GSM	246.02	246.02	246.02
2132	WCDMA	4011.58	4021.71	4021.71



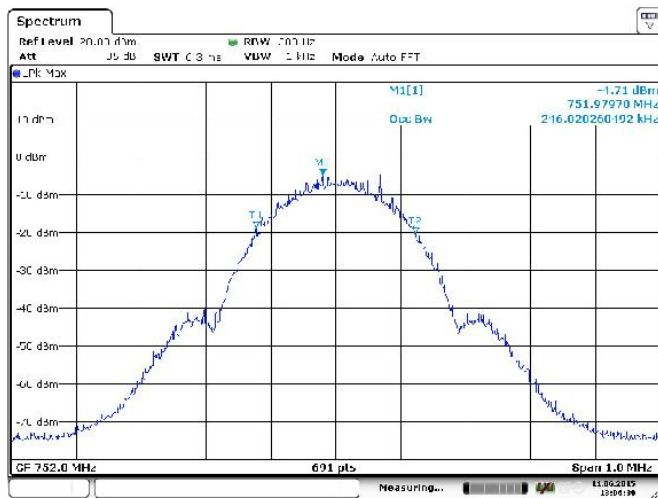
Date: 11 JUN 2015 13:11:03

700 MHz Occupied bandwidth GSM input



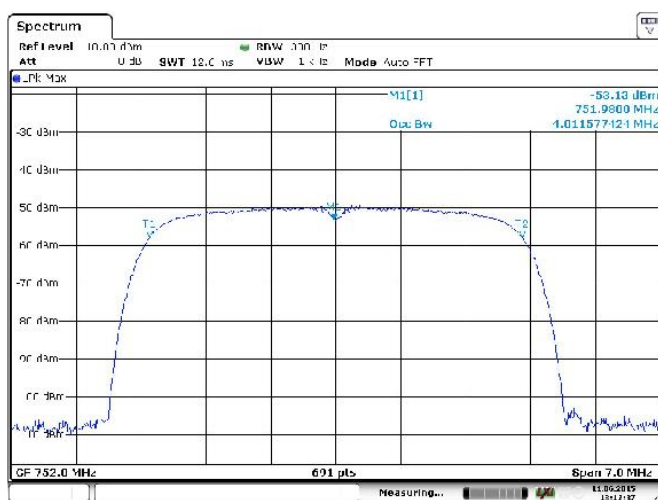
Date: 11 JUN 2015 13:05:35

700 MHz Occupied bandwidth gsm agc off



Date: 11 JUN 2015 13:06:35

700 MHz Occupied bandwidth gsm agc on



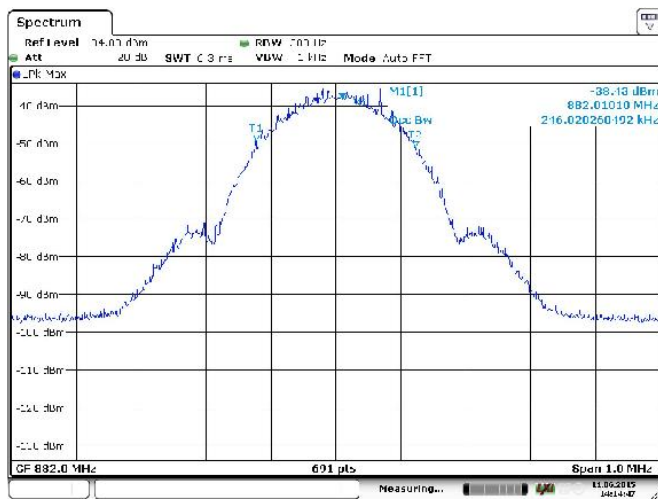
700 MHz Occupied bandwidth WCDMA input.



700 MHz Occupied bandwidth WCDMA agc off.

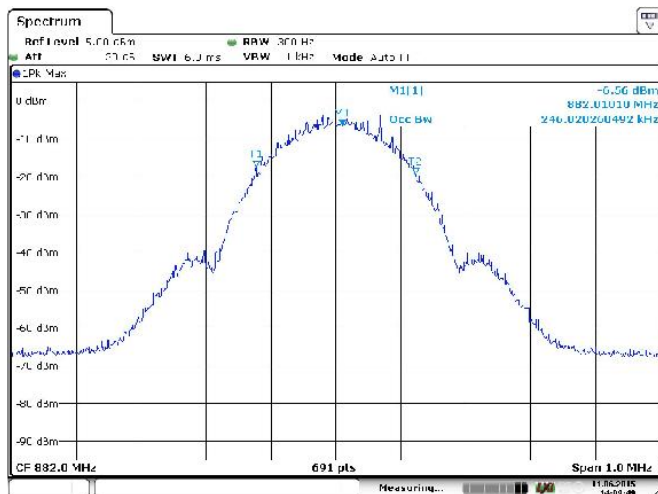


700 MHz Occupied bandwidth WCDMA agc on.



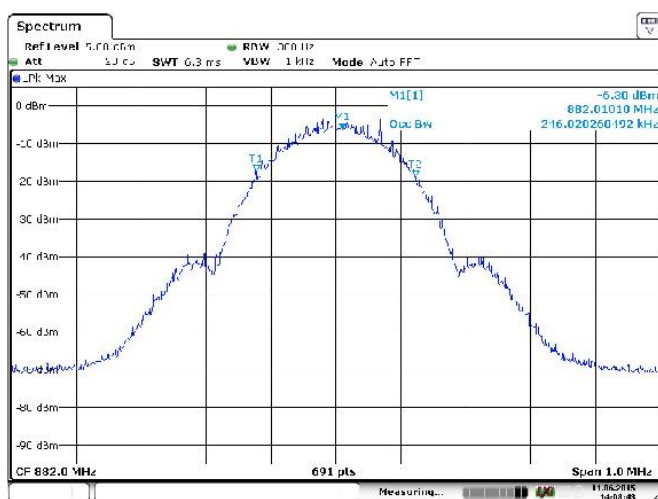
Date: 11 JUN 2015 14:14:47

850 MHz Occupied bandwidth GSM input



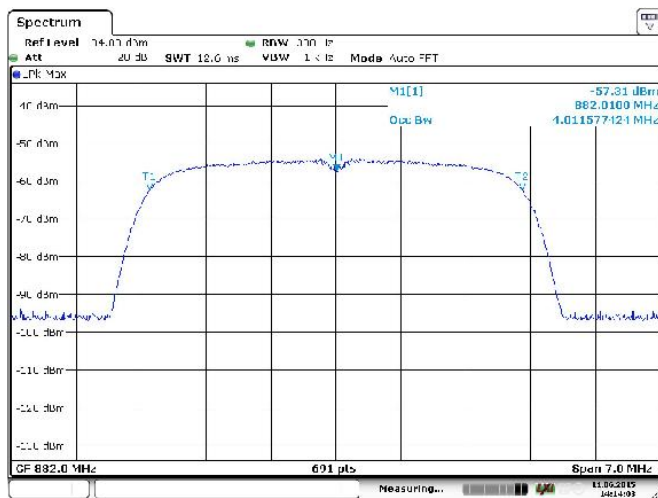
Date: 11 JUN 2015 14:05:45

850 MHz Occupied bandwidth GSM agc off



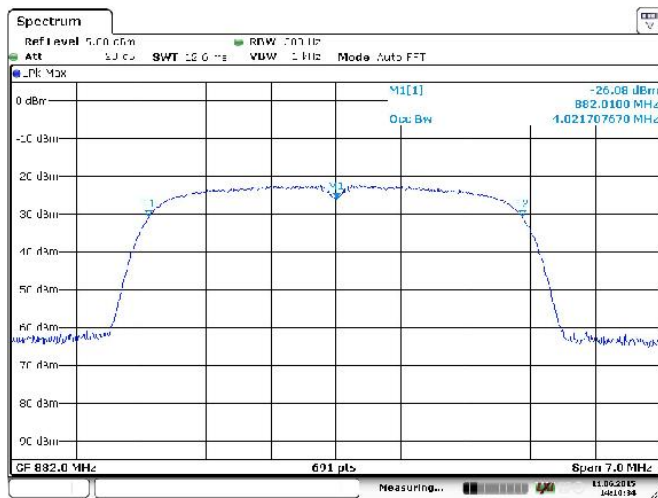
Date: 11 JUN 2015 14:02:49

850 MHz Occupied bandwidth GSM agc on



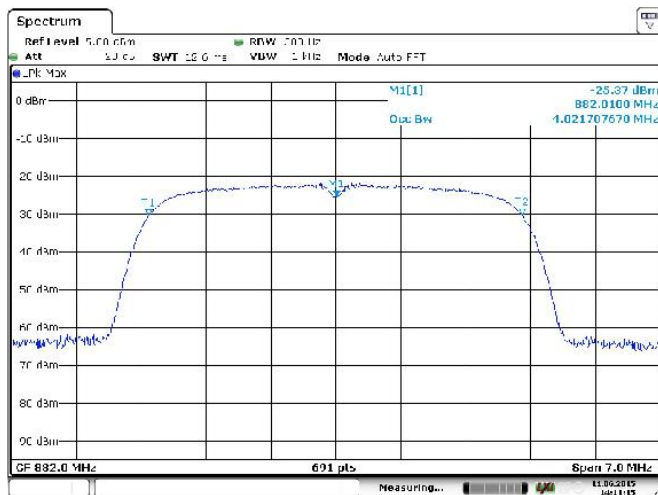
Date: 11 JUN 2015 14:11:03

850 MHz Occupied bandwidth WCDMA input



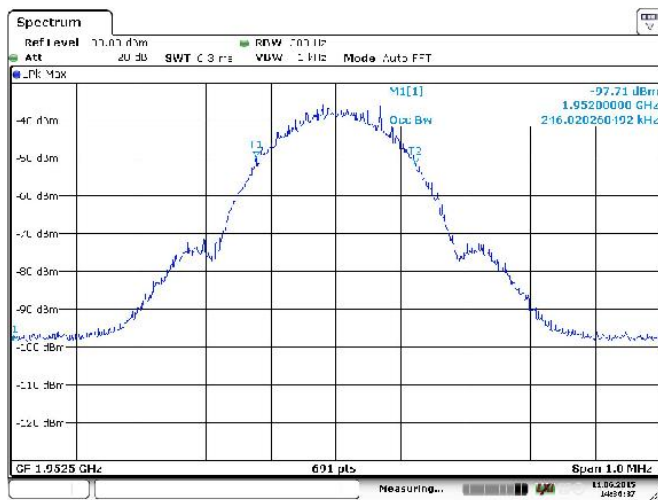
Date: 11 JUN 2015 14:10:31

850 MHz Occupied bandwidth WCDMA agc off



Date: 11 JUN 2015 14:11:15

850 MHz Occupied bandwidth WCDMA agc on



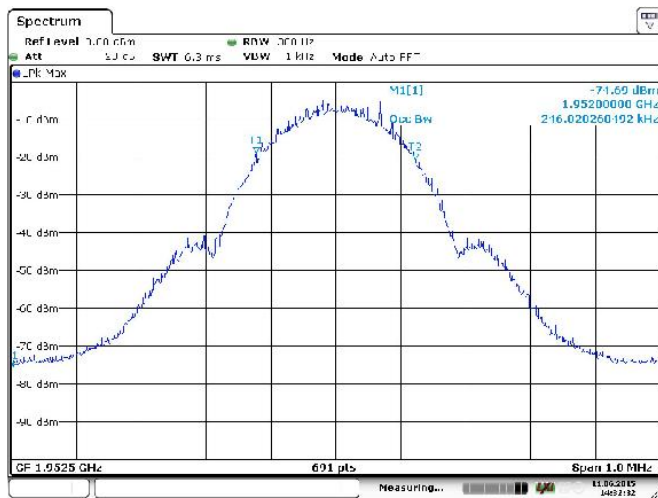
Date: 11 JUN 2015 14:36:30

1900 MHz Occupied bandwidth GSM input



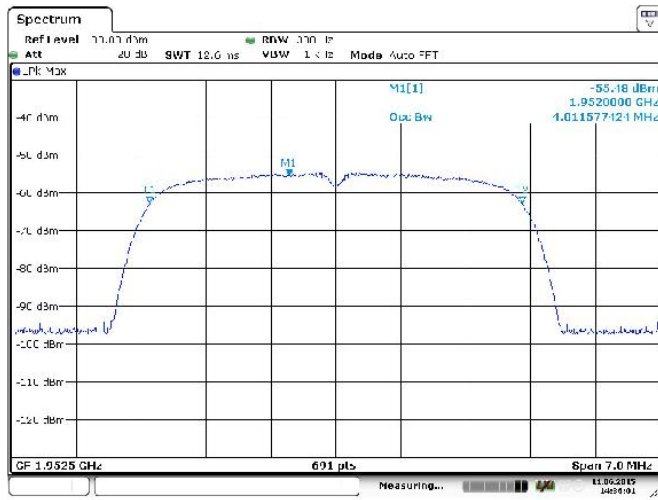
Date: 11 JUN 2015 14:35:30

1900 MHz Occupied bandwidth GSM agc off



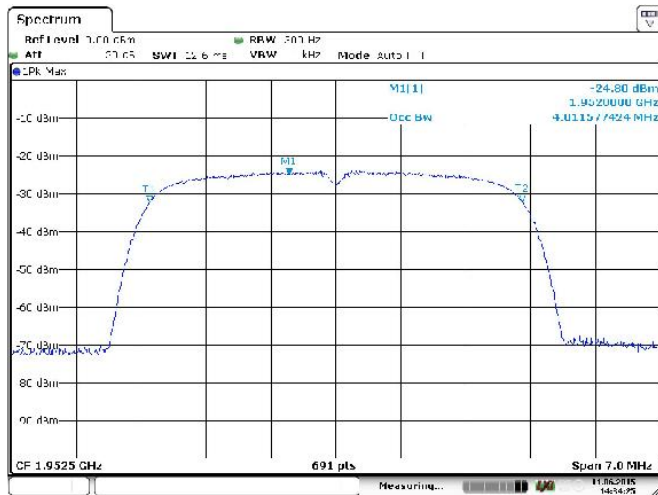
Date: 11 JUN 2015 14:32:32

1900 MHz Occupied bandwidth GSM agc on



Date: 11 JUN 2015 14:36:01

1900 MHz Occupied bandwidth WCDMA input



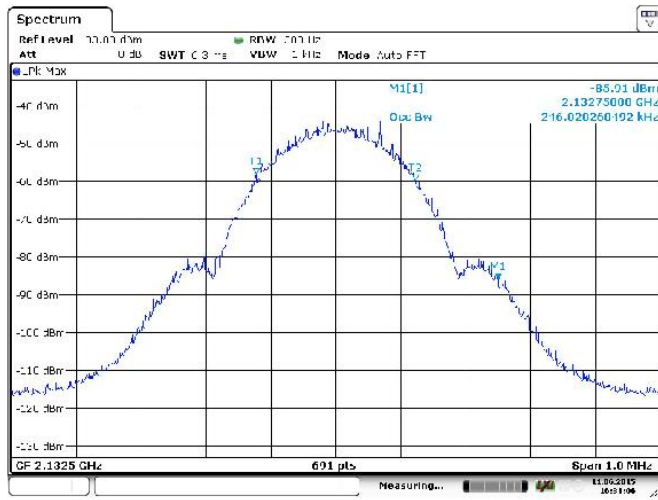
Date: 11 JUN 2015 14:34:21

1900 MHz Occupied bandwidth WCDMA agc off



Date: 11 JUN 2015 14:33:26

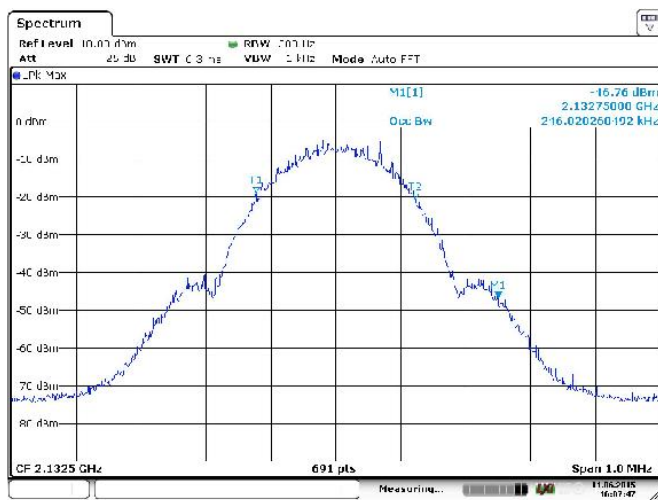
1900 MHz Occupied bandwidth WCDMA agc on



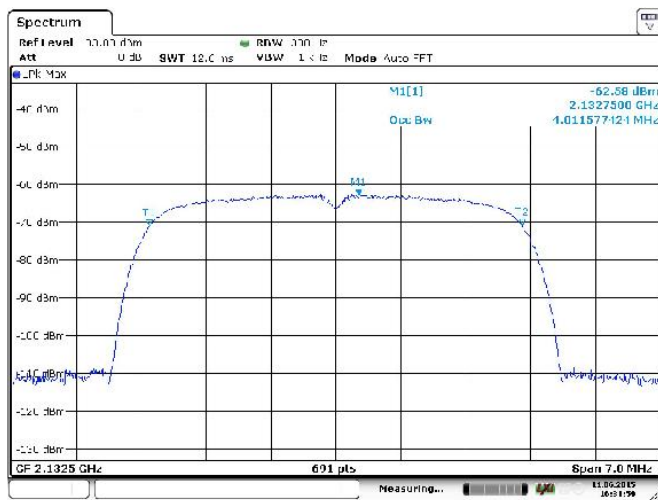
AWS Occupied bandwidth GSM input



AWS Occupied bandwidth GSM agc off



AWS Occupied bandwidth GSM agc on



Date: **JUN2015 15:31:55

AWS Occupied bandwidth WCDMA input



Date: **JUN2015 15:06:25

AWS Occupied bandwidth WCDMA agc off



Date: **JUN2015 15:06:55

AWS Occupied bandwidth WCDMA agc on

6.4 Test equipment

Equipment type	Manufacturer	Model	Inv. No.	Cal. due date
Spectrum analyser	Rohde & Schwarz	FSV	32594	7/2015
Rf-attenuator	JFW	50FHD0-030-200	32526	7/2015
Signal generator	Rohde & Schwarz	SMIQ03B	12792	7/2015

7 BAND EDGE EMISSION AND INTERMODULATION

Date of test:	June 11 th 2015	Test location:	Wireless centre
EUT Serial:	99995	Ambient temp.	24
Tested by:	MTV	Relative humidity	33
Test result:	Pass	Margin:	0.5 dB

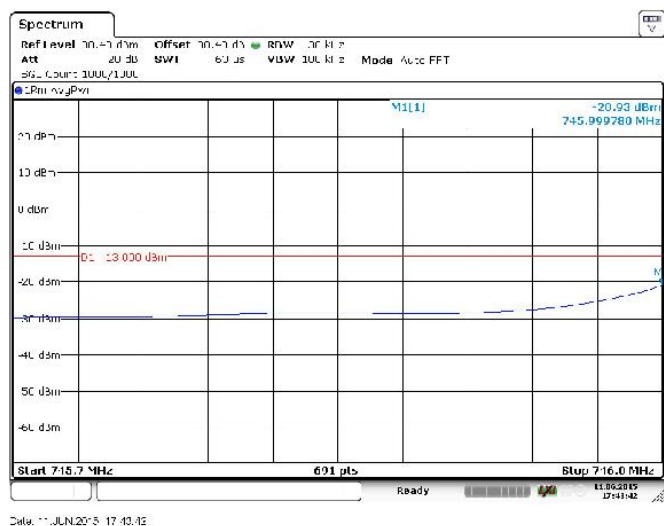
7.1 Requirement

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.

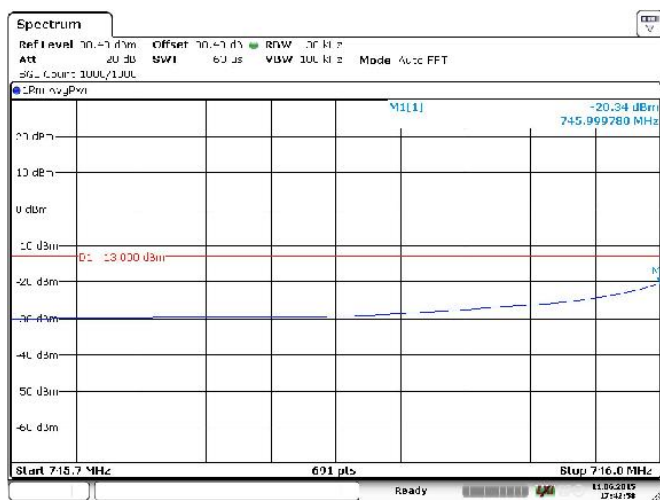
7.2 Test set-up

2 Signal generators were connected to power combiner who was then connected to the FOI unit. Signals were placed on two lowest adjacent channels of the band. The test was repeated on 2 highest channels. After that the test was repeated with single carrier.

7.3 Test data

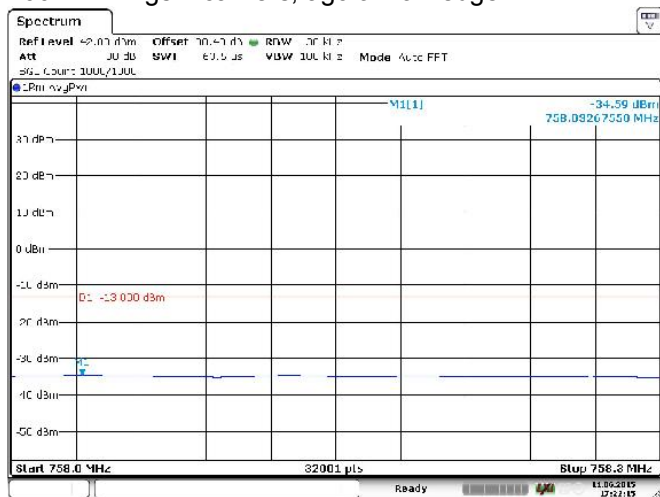


700 MHz 2 gsm carriers, agc off low edge



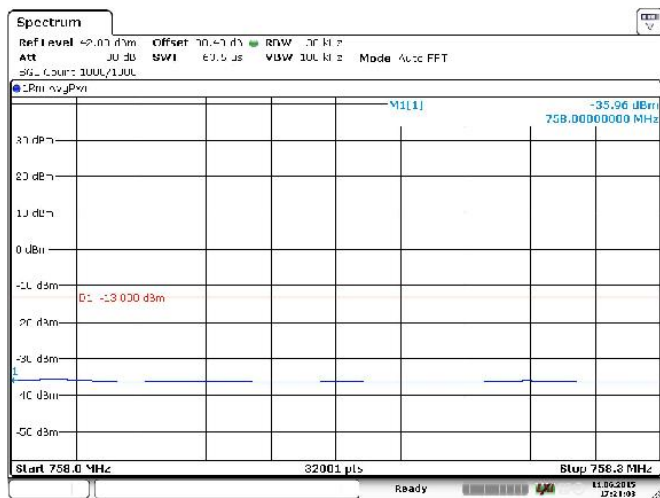
Date: 11 JUN 2015 17:41:58

700 MHz 2 gsm carriers, agc on low edge



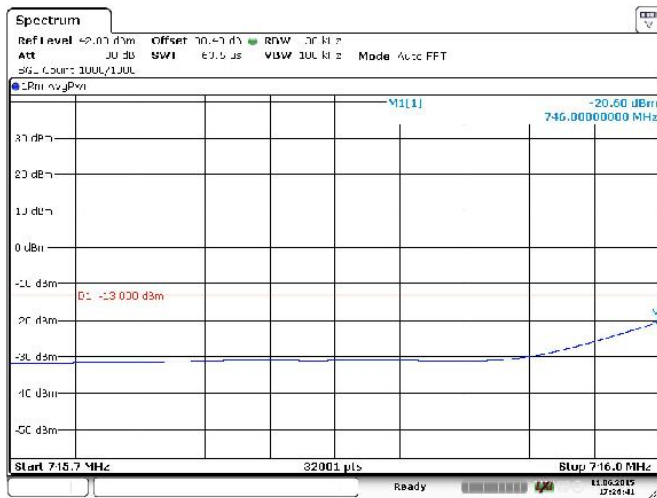
Date: 11 JUN 2015 17:52:15

700 MHz 2 gsm carriers, agc off high edge



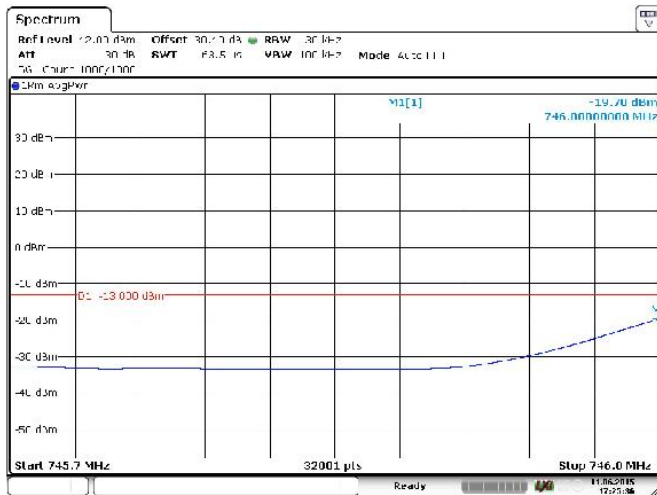
Date: 11 JUN 2015 17:51:03

700 MHz 2 gsm carriers, agc on high edge



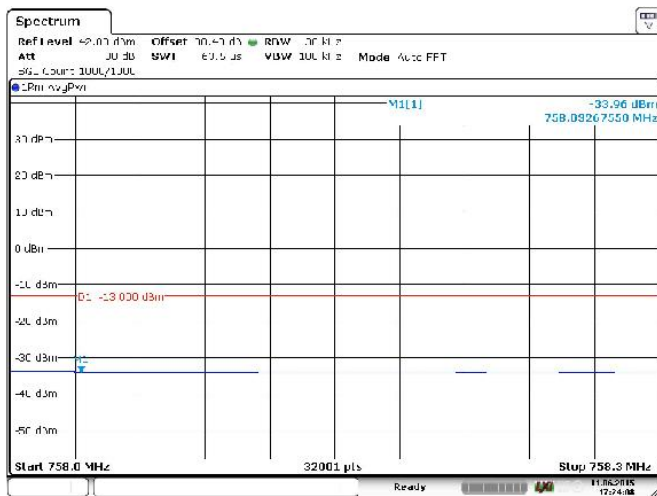
Date: 11 JUN 2015 17:26:43

700 MHz 2 WCDMA carriers agc off lower edge



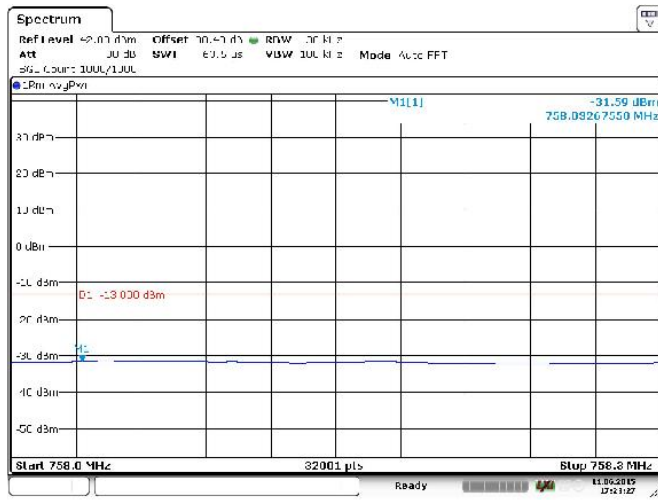
Date: 11 JUN 2015 17:25:36

700 MHz 2 WCDMA carriers agc on lower edge



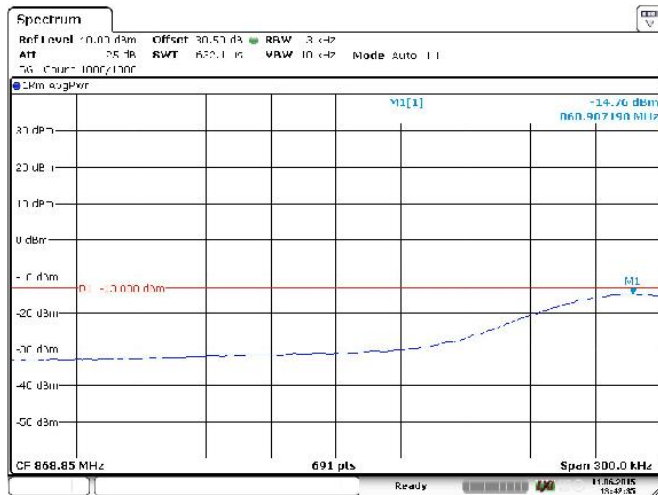
Date: 11 JUN 2015 17:21:02

700 MHz 2 WCDMA carriers agc off lower edge



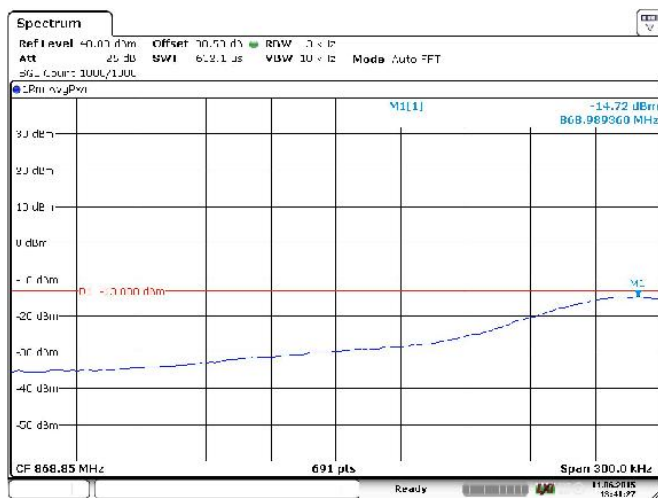
Date: 11 JUN 2015 17:23:27

700 MHz 2 WCDMA carriers agc off lower edge



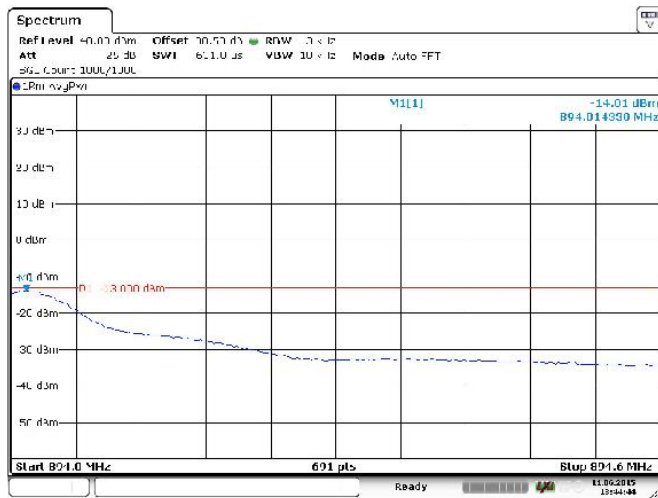
Date: 11 JUN 2015 19:42:35

850 MHz 2 gsm carriers low edge agc off

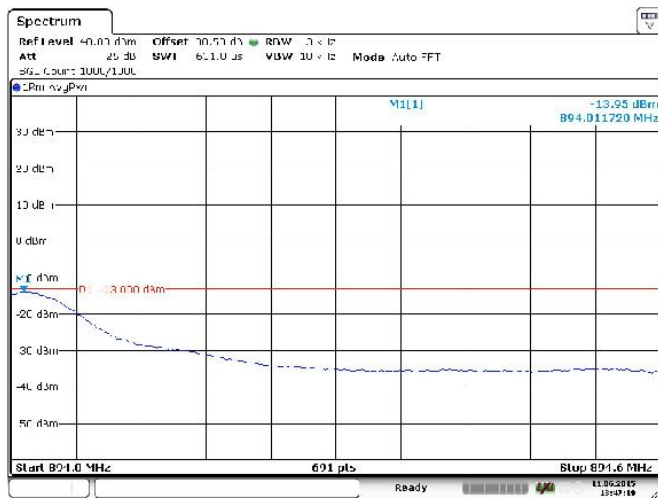


Date: 11 JUN 2015 19:41:27

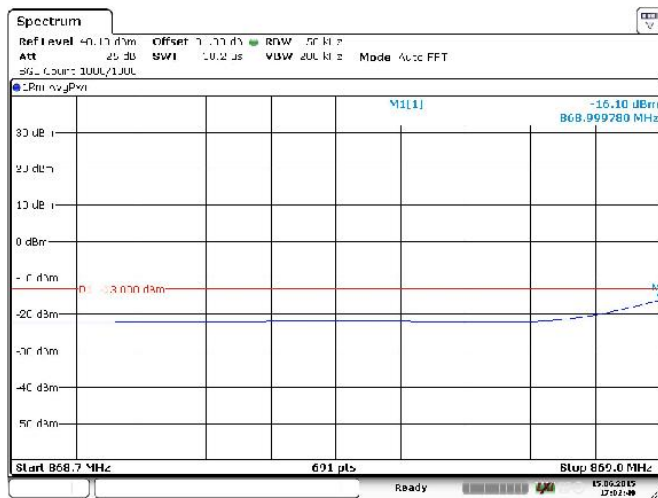
850 MHz 2 gsm carriers low edge agc on



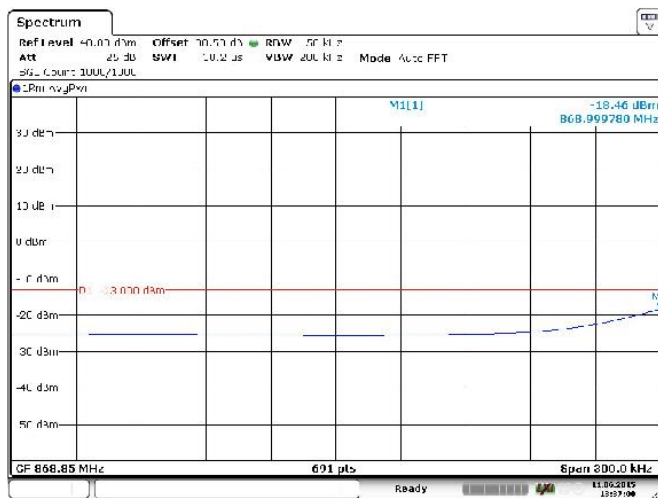
850 MHz 2 gsm carriers high edge agc off



850 MHz 2 gsm carriers high edge agc on

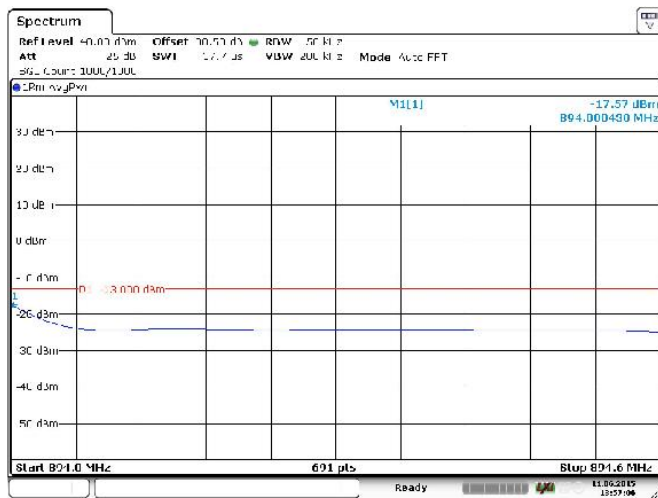


850 MHz 2 WCDMA carriers agc off lower edge



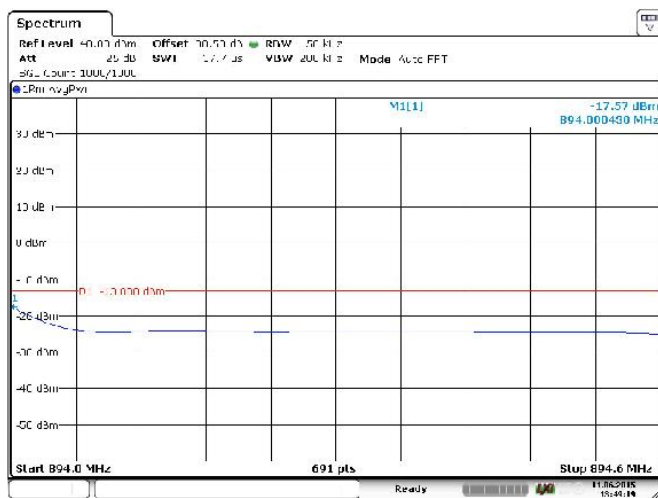
Date: 11 JUN 2015 13:37:00

850 MHz 2 WCDMA carriers agc on lower edge



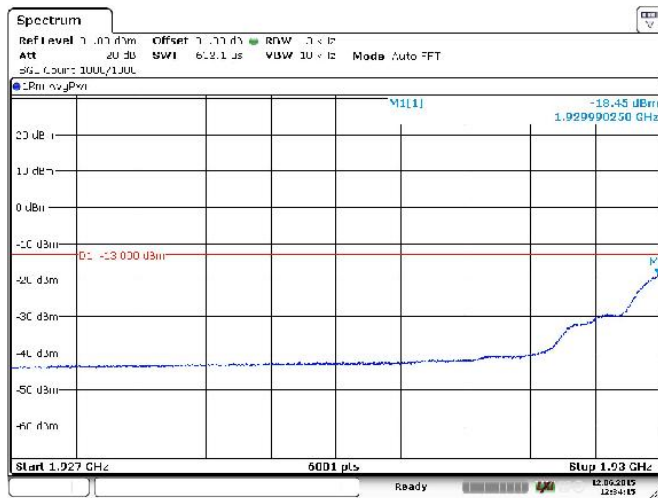
Date: 11 JUN 2015 13:57:06

850 MHz 2 WCDMA carriers agc off upper edge



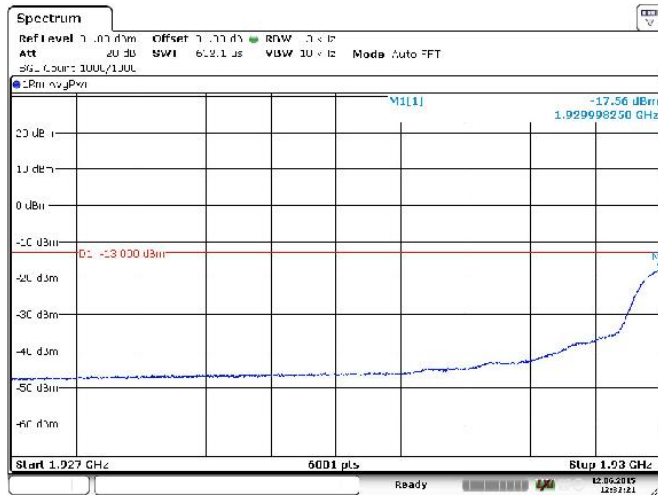
Date: 11 JUN 2015 13:46:20

850 MHz 2 WCDMA carriers agc on upper edge



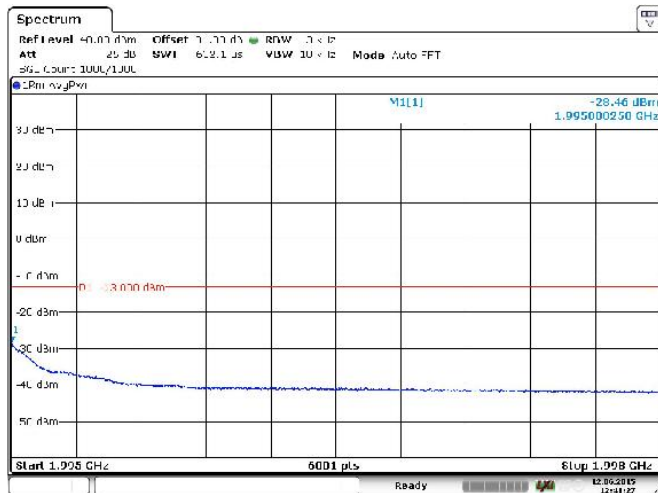
Date: 12 JUN 2015 12:34:15

1900 MHz 2 gsm carriers, agc off lower edge



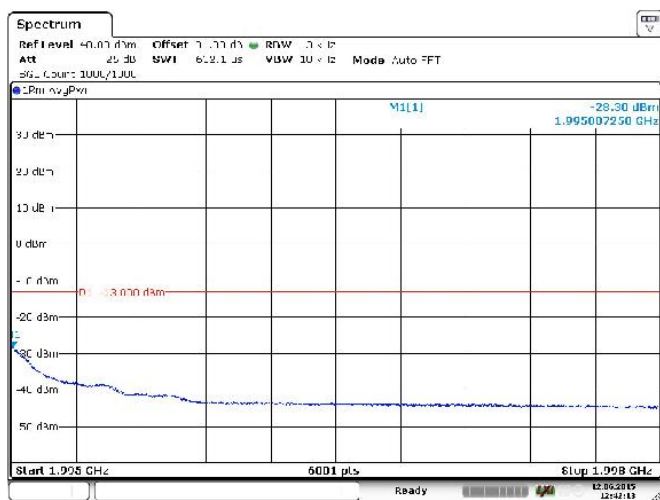
Date: 12 JUN 2015 12:35:31

1900 MHz 2 gsm carriers, agc on lower edge



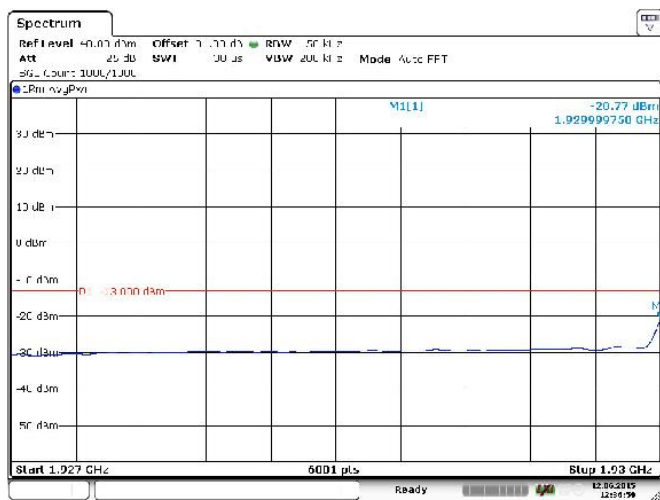
Date: 12 JUN 2015 12:41:27

1900 MHz 2 gsm carriers, agc off upper edge



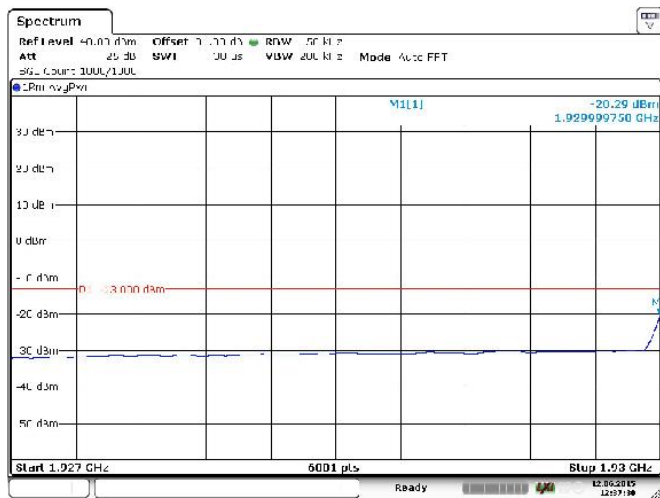
Date: 12 JUN 2013 12:42:13

1900 MHz 2 gsm carriers, agc on upper edge



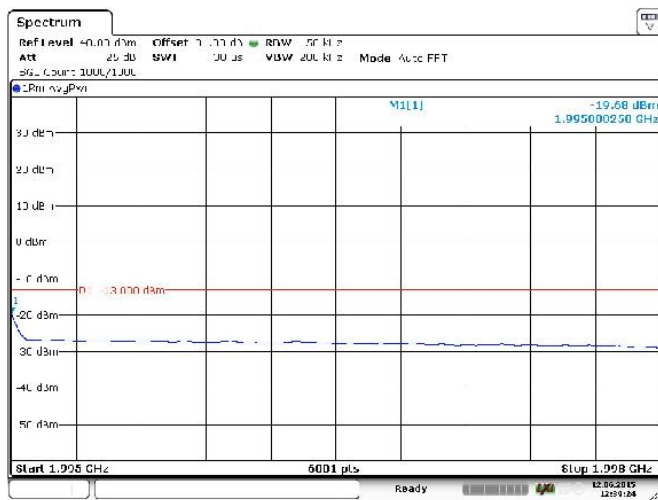
Date: 12 JUN 2013 12:36:50

1900 MHz 2 wcdma carriers, agc off lower edge



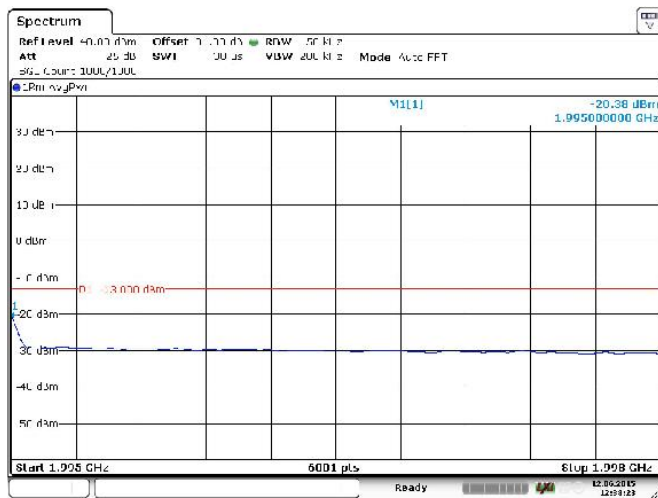
Date: 12 JUN 2013 12:37:30

1900 MHz 2 wcdma carriers, agc on lower edge



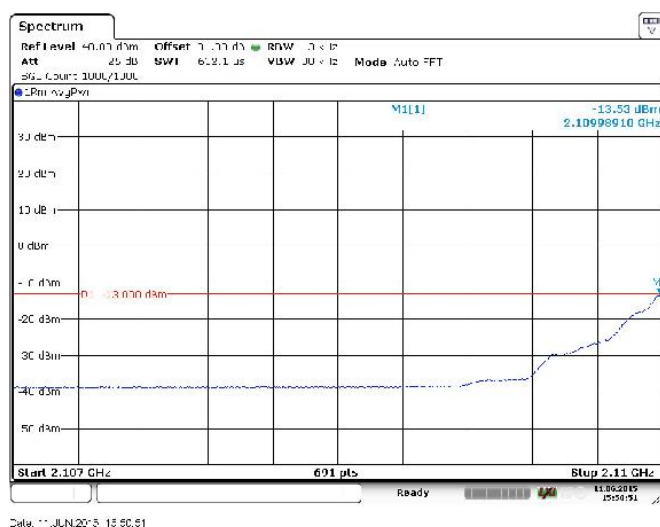
Date: 12 JUN 2005 12:35:21

1900 MHz 2 wcdma carriers, agc off

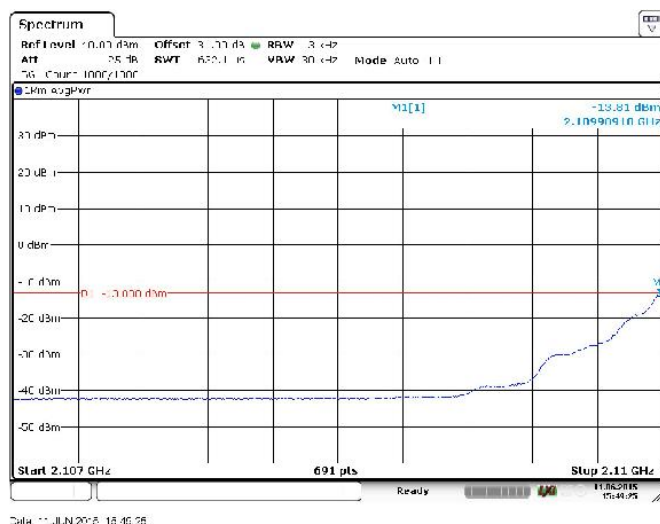


Date: 12 JUN 2005 12:35:23

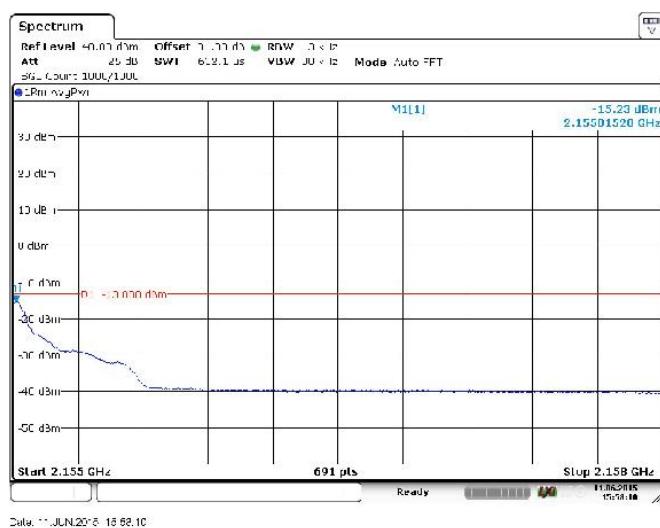
1900 MHz 2 wcdma carriers, agc on



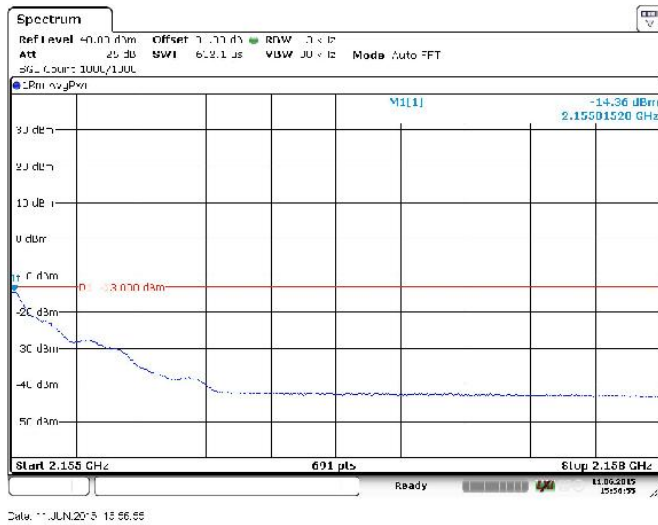
AWS 2 GSM carriers low edge AGC off



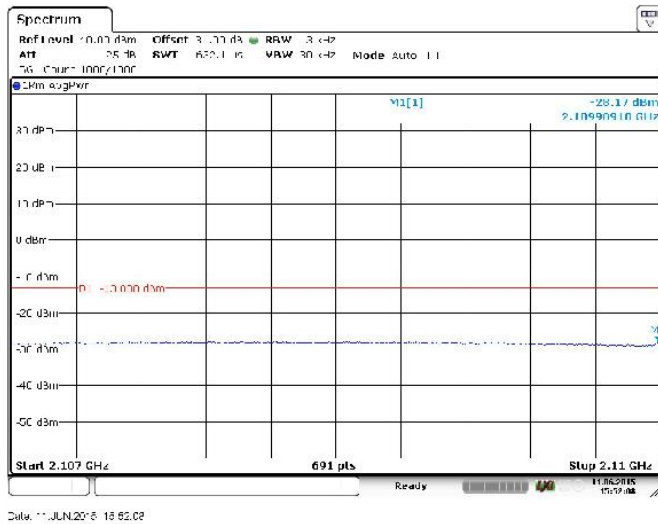
AWS 2 GSM carriers low edge AGC on



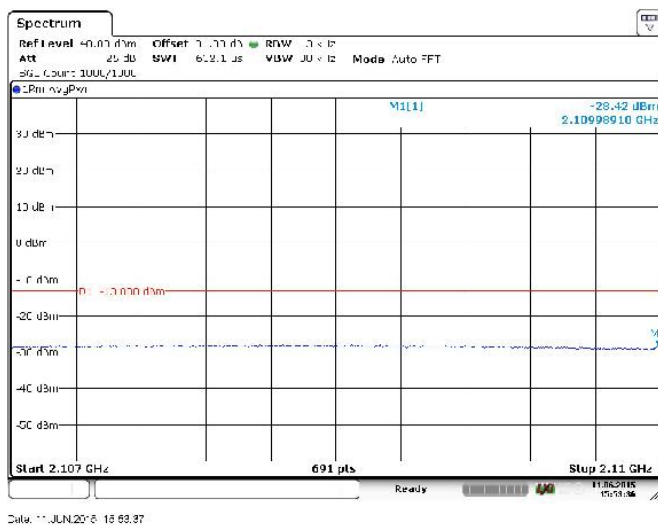
AWS 2 GSM carriers high edge AGC off



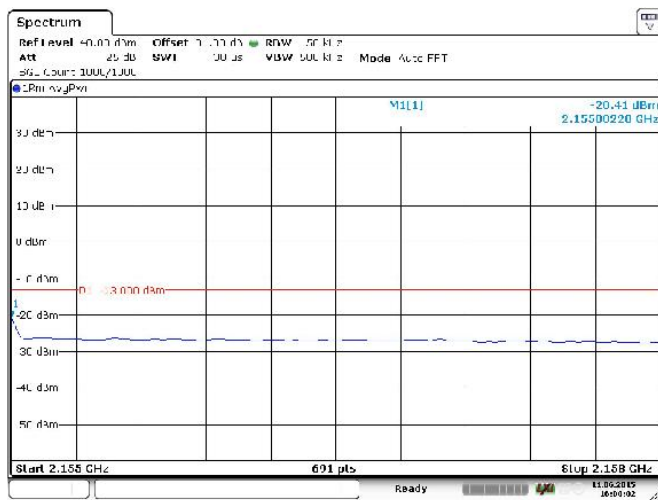
AWS 2 GSM carriers high edge AGC on



AWS 2 QPSK carriers low edge AGC off

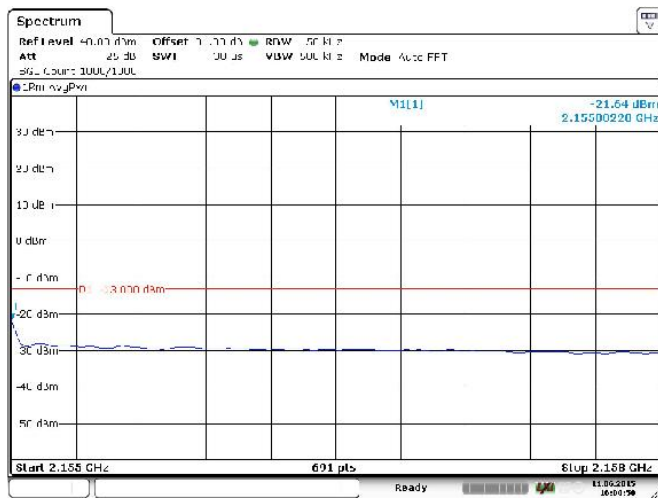


AWS 2 QPSK carriers low edge AGC on



Date: 11 JUN 2015 16:00:01

AWS 2 QPSK carriers high edge AGC off



Date: 11 JUN 2015 16:00:50

AWS 2 QPSK carriers high edge AGC on

7.4 Test equipment

Equipment type	Manufacturer	Model	Inv. No.	Cal. due date
Spectrum analyser	Rohde & Schwarz	FSV	32594	7/2015
Rf-attenuator	JFW	50FHD0-030-200	32526	7/2015
Signal generator	Rohde & Schwarz	SMIQ03B	12792	7/2015
Signal generator	Rohde & Schwarz	SMIQ03B	40017	7/2015

8 CONDUCTED SPURIOUS EMISSION FROM ANTENNA PORT

Date of test:	June 12 th 2015	Test location:	Wireless centre
EUT Serial:	99995	Ambient temp.	24
Tested by:	MTV	Relative humidity	36
Test result:	Pass	Margin:	1.6 dB

8.1 Requirement

(c) For operations in the 746-758 MHz band and the 776-788 MHz band, the power of any emission outside the licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, in accordance with the following:

(1) On any frequency outside the 746-758 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least $43 + 10 \log (P)$ dB;

(2) On any frequency outside the 776-788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least $43 + 10 \log (P)$ dB;

(3) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than $76 + 10 \log (P)$ dB in a 6.25 kHz band segment, for base and fixed stations;

(4) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than $65 + 10 \log (P)$ dB in a 6.25 kHz band segment, for mobile and portable stations;

(5) Compliance with the provisions of paragraphs (c)(1) and (c)(2) of this section is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. However, in the 100 kHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 30 kHz may be employed;

(6) Compliance with the provisions of paragraphs (c)(3) and (c)(4) of this section is based on the use of measurement instrumentation such that the reading taken with any resolution bandwidth setting should be adjusted to indicate spectral energy in a 6.25 kHz segment.

(f) For operations in the 746-758 MHz, 775-788 MHz, and 805-806 MHz bands, emissions in the band 1559-1610 MHz shall be limited to -70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and -80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth. For the purpose of equipment authorization, a transmitter shall be tested with an antenna that is representative of the type that will be used with the equipment in normal operation.

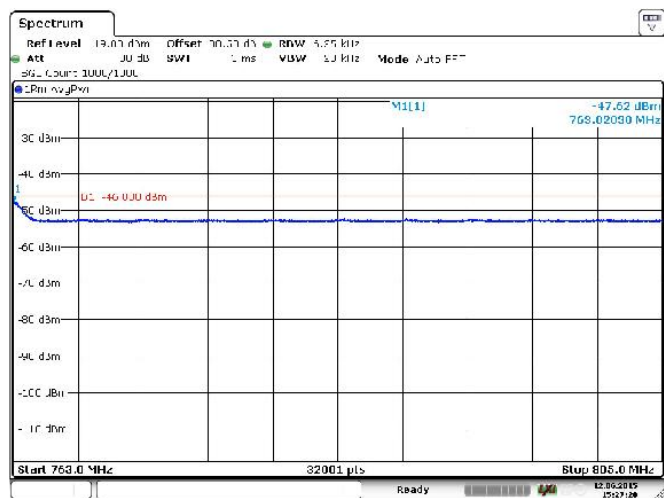
8.2 Test set-up

Signal generator was connected to the FOI unit which converted rf signal to optical signal. The optical signal was then fed via fibre to the EUT.

The EUT's output port was connected to spectrum analyser via rf cables and 30 dB attenuator. A PC was connected to FOI via Ethernet hub. The PC was then used to control the EUT.

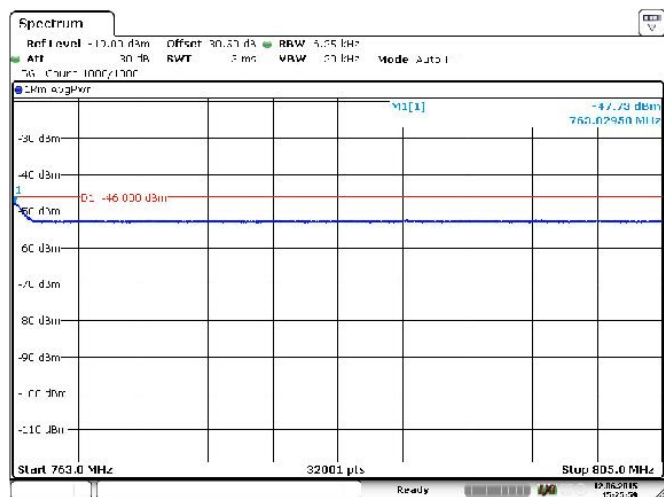
Only frequency ranges of 763 – 805 MHz and 1559 – 1610 MHz for 700 MHz band were measured.

8.3 Test data



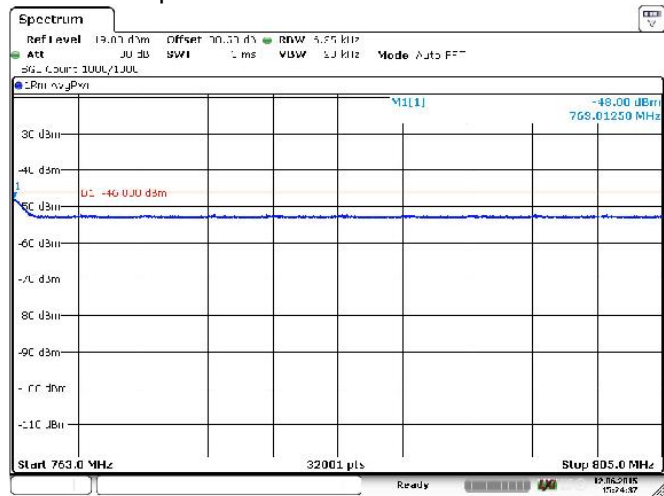
Date: 2 JUN 2015 15:27:20

Conducted spurious emission 763 – 805 MHz GMSK low channel



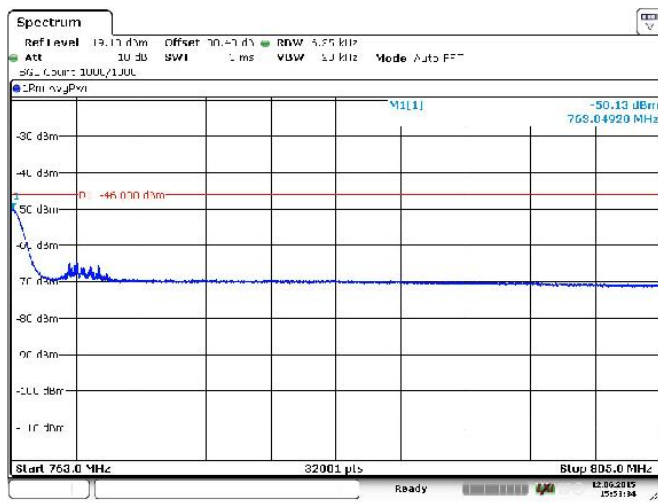
Date: 2 JUN 2015 15:26:50

Conducted spurious emission 763 – 805 MHz GMSK middle channel



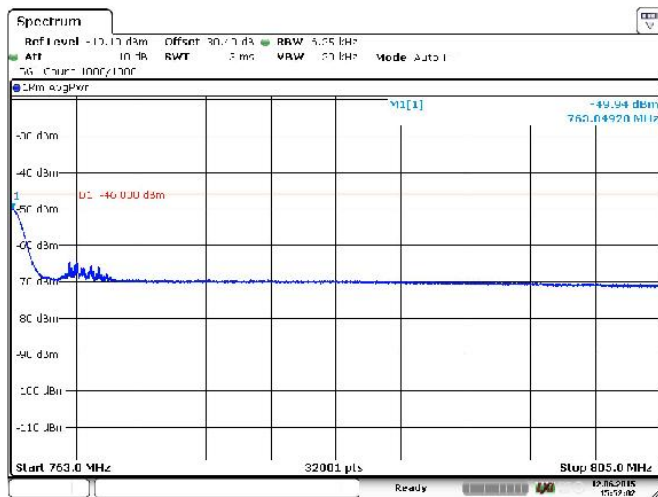
Date: 2 JUN 2015 16:24:37

Conducted spurious emission 763 – 805 MHz GMSK high channel



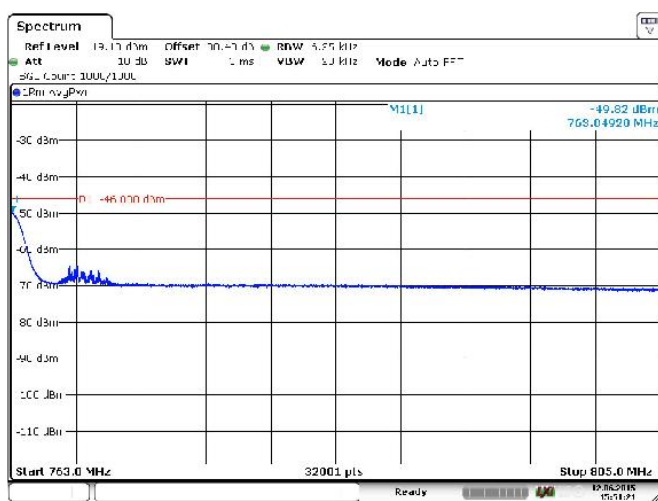
Date: 12 JUN 2015 15:53:34

Conducted spurious emission 763 – 805 MHz QPSK low channel



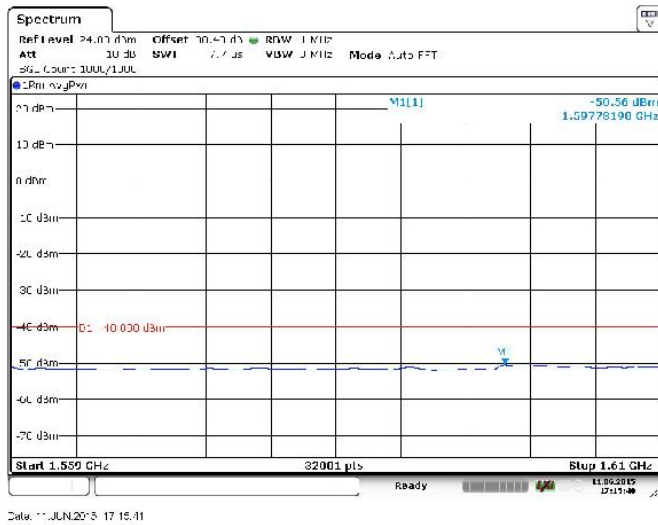
Date: 12 JUN 2015 15:53:37

Conducted spurious emission 763 – 805 MHz QPSK mid channel

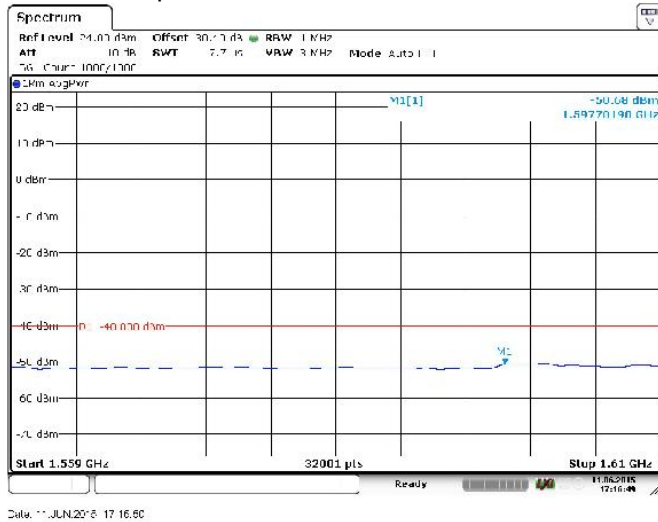


Date: 12 JUN 2015 15:53:41

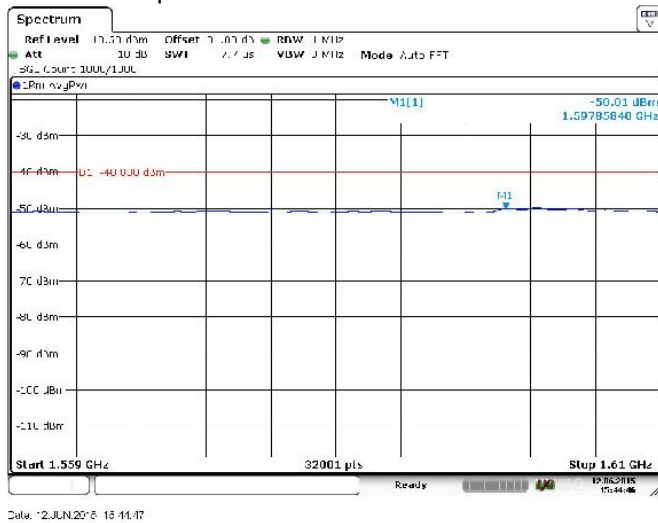
Conducted spurious emission 763 – 805 MHz QPSK high channel



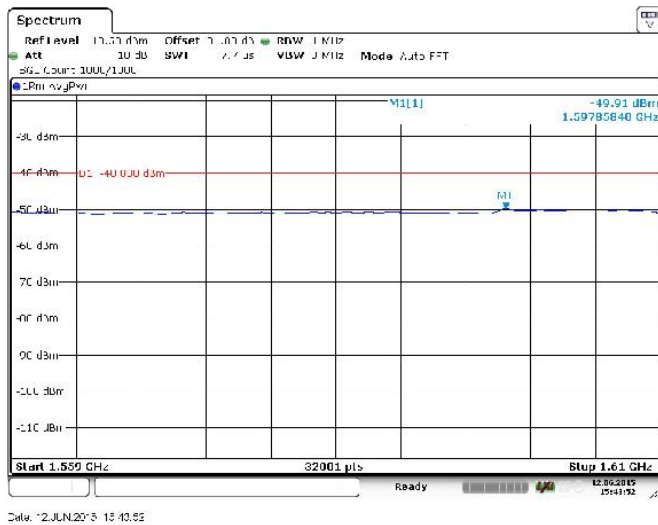
Conducted spurious emission 1559 – 1610 MHz GSM low channel



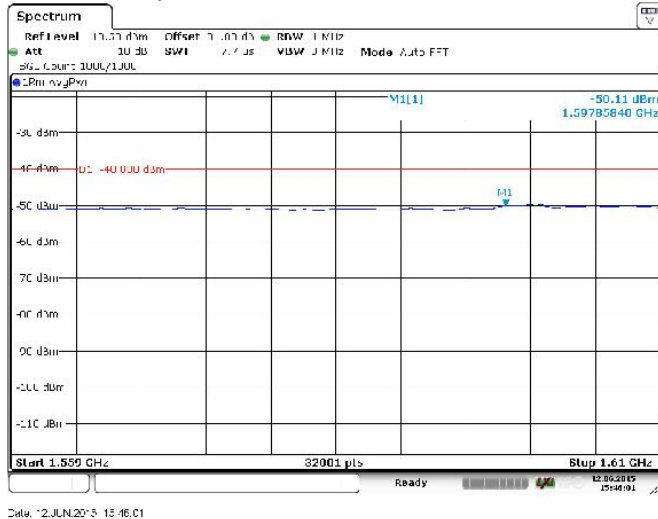
Conducted spurious emission 1559 – 1610 MHz GSM middle channel



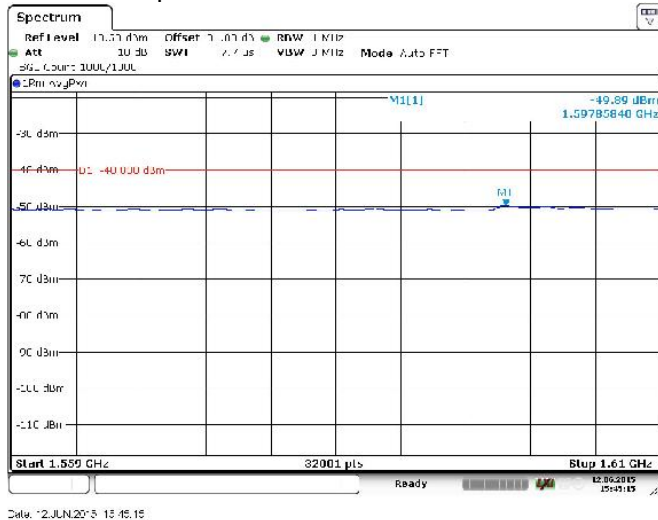
Conducted spurious emission 1559 – 1610 MHz GSM high channel



Conducted spurious emission 1559 – 1610 MHz QPSK low channel



Conducted spurious emission 1559 – 1610 MHz QPSK mid channel



Conducted spurious emission 1559 – 1610 MHz QPSK high channel

8.4 Test equipment

Equipment type	Manufacturer	Model	Inv. No.	Cal. due date
Spectrum analyser	Rohde & Schwarz	FSV	32594	7/2015
Rf-attenuator	JFW	50FHD0-030-200	32526	7/2015
Signal generator	Rohde & Schwarz	SMIQ03B	12792	7/2015
Signal generator	Rohde & Schwarz	SMIQ03B	40017	7/2015

9 UNCERTAINTIES SUMMARY

The measurement uncertainty describes the overall uncertainty of the given measured value during operation of the EUT.

Measurement uncertainty is calculated in accordance with EA-4/02-1997.

The measurement uncertainty is given with a confidence of 95% (k=2).

Radiated disturbance, field strength, 30 MHz - 1000 MHz

30 to 300 MHz at 3 m

± 4,7 dB

200 to 1000 MHz at 3 m

± 4,8 dB

Radiated disturbance, field strength, 1 to 40 GHz in Semi Anechoic Chambers

“Stora Hallen” and “Björkhallen”

1 to 18 GHz with filter or attenuator

± 5,4 dB

1 to 18 GHz without filter or attenuator

± 5,2 dB

18 to 26 GHz without filter or attenuator

± 5,5 dB

Conducted disturbances at the antenna port on radio equipment

Frequency range 9 kHz – 1 GHz

± 0,9 dB

Frequency range 1 GHz – 7 GHz

± 1,4 dB

Frequency range 7 GHz -18GHz

± 2,4 dB

Frequency range 18 GHz -26,5GHz

± 3,0 dB

Output power

Digital signals, conducted

± 0,6 dB

Peak power density

Conducted:

Spectrum analyser

± 2,5 dB