**CETECOM™****CETECOM ICT Services**  
consulting - testing - certification >>>

## TEST REPORT

Test report no.: 1-2977-35-10/11



### Testing laboratory

**CETECOM ICT Services GmbH**  
Untertuerkheimer Strasse 6 – 10  
66117 Saarbruecken / Germany  
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e-mail: [ict@cetecom.com](mailto:ict@cetecom.com)

**Accredited test laboratory:**

The test laboratory (area of testing) is accredited according to DIN EN ISO/IEC 17025  
DAkks registration number: D-PL-12076-01-01

Area of Testing: Radio/Satellite Communications

### Applicant

**Sony Ericsson Mobile Communications AB**  
Nya Vattentornet  
22188 Lund / SWEDEN  
Phone: +46 46 19 30 00  
Fax: +46 46 19 32 95  
Contact: Håkan Sjöberg  
e-mail: [hakan.sjoberg@sonyericsson.com](mailto:hakan.sjoberg@sonyericsson.com)  
Phone: +46 46 19 35 59

### Manufacturer

**Sony Ericsson Mobile Communications AB**  
Nya Vattentornet  
22188 Lund / SWEDEN

### Test standard/s

47 CFR Part 15 Title 47 of the Code of Federal Regulations; Chapter I  
Part 15 - Radio frequency devices

RSS - 210 Issue 8 Spectrum Management and Telecommunications - Radio Standards Specification  
Low-power Licence-exempt Radiocommunication Devices (All Frequency Bands):  
Category I Equipment

*For further applied test standards please refer to section 3 of this test report.*

### Test item

Kind of test item: GSM Mobile Phone (GPRS/EGPRS) 850/900/1800/1900; UMTS FDD1/FDD8 (HSUPA/HSDPA); BT+EDR; WLAN+Hotspot; A-GPS; ANTplus

Model name: AAD-3880104-BV

FCC ID: PY7A3880104

IC: 4170B-A3880104

Frequency: ISM band 2400 MHz to 2483.5 MHz  
(Lowest channel 00 – 2402 MHz, highest channel 78 – 2480 MHz)

Power supply: 3.7 V DC by battery EP500 + charger EP800

Temperature range: -20°C to 55 °C

**Test performed:**

2011-07-05 Jakob Reschke

**Test report authorised:**

2011-07-05 Joerg Warken

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## 2 General information

### 2.1 Notes

The test results of this test report relate exclusively to the test item specified in this test report. CETECOM ICT Services GmbH does not assume responsibility for any conclusions and generalisations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item. The test report may only be reproduced or published in full. Reproduction or publication of extracts from the report requires the prior written approval of CETECOM ICT Services GmbH.

### 2.2 Application details

Date of receipt of order:	2011-05-03
Date of receipt of test item:	2011-07-04
Start of test:	2011-05-11
End of test:	2011-07-04
Person(s) present during the test:	-/-

## 3 Test standard/s

Test standard	Version	Test standard description
47 CFR Part 15	2009-10	Title 47 of the Code of Federal Regulations; Chapter I Part 15 - Radio frequency devices
RSS - 210 Issue 8	2010-12	Spectrum Management and Telecommunications - Radio Standards Specification Low-power Licence-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment

## 4 Test environment

Temperature:	$T_{nom}$	20 °C during room temperature tests
	$T_{max}$	55 °C during high temperature tests
	$T_{min}$	-20 °C during low temperature tests
Relative humidity content:		52 %
Air pressure:		not relevant for this kind of testing
Power supply:	$V_{nom}$	3.7 V DC by battery EP500 + charger EP800
	$V_{max}$	4.1 V
	$V_{min}$	3.4 V

**5 Test item**

Kind of test item	:	GSM Mobile Phone (GPRS/EGPRS) 850/900/1800/1900; UMTS FDD1/FDD8 (HSUPA/HSDPA); BT+EDR; WLAN+Hotspot; A-GPS; ANTplus
Type identification	:	AAD-3880104-BV
S/N serial number	:	BT radiated units: BX902C78U0, BX902C6S04 BT conducted units: BX902C7RBL, BX902C796A
HW hardware status	:	AP
SW software status	:	4.0.A.0.195 ATP R1A034
Frequency band [MHz]	:	ISM band 2400 MHz to 2483.5 MHz (Lowest channel 00 – 2402 MHz, highest channel 78 – 2480 MHz)
Type of modulation	:	DHSS using GFSK modulation.
Number of channels	:	79
Antenna	:	Integrated printed antenna
Power supply	:	3.7 V DC by battery EP500 + charger EP800
Temperature range	:	-20°C to 55 °C

**6 Test laboratories sub-contracted**

None

## 7 Summary of measurement results

- No deviations from the technical specifications were ascertained
- There were deviations from the technical specifications ascertained

TC Identifier	Description	Verdict	Date	Remark
RF-Testing	CFR Part 15 RSS 210, Issue 8, Annex 2	Passed	2011-07-05	-/-

Test specification clause	Test case	Temperature conditions	Power source voltages	Mode	Pass	Fail	NA	NP	Results (max.)
CFR 15.35(c) RSS Gen (Issue 3) / 4.5	Timing of the transmitter	Nominal	Nominal	TX	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Not limited
RSS Gen (Issue 3) / 4.6.1	99% - Occupied Bandwidth	Nominal	Nominal	TX	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Not limited
§15.249(a)(e) RSS-210 / A2.9(a)	Maximum field strength	Nominal	Nominal	TX	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	complies
§15.249(d) RSS-210 / A2.9(a)(b)	Band edge compliance radiated	Nominal	Nominal	TX	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	complies
§15.249(d) RSS-210 / A2.9(a)(b)	TX spurious emissions radiated	Nominal	Nominal	TX	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	complies
§15.109 RSS-Gen	RX spurious emissions radiated	Nominal	Nominal	Idle	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	complies
§15.209(a) RSS-Gen	Spurious emissions radiated < 30 MHz	Nominal	Nominal	TX/Idle	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	complies
§15.107(a) RSS-Gen	Spurious emissions conducted < 30 MHz	Nominal	Nominal	TX/Idle	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	complies

**Note:** NA = Not Applicable; NP = Not Performed

## 8 RF measurements

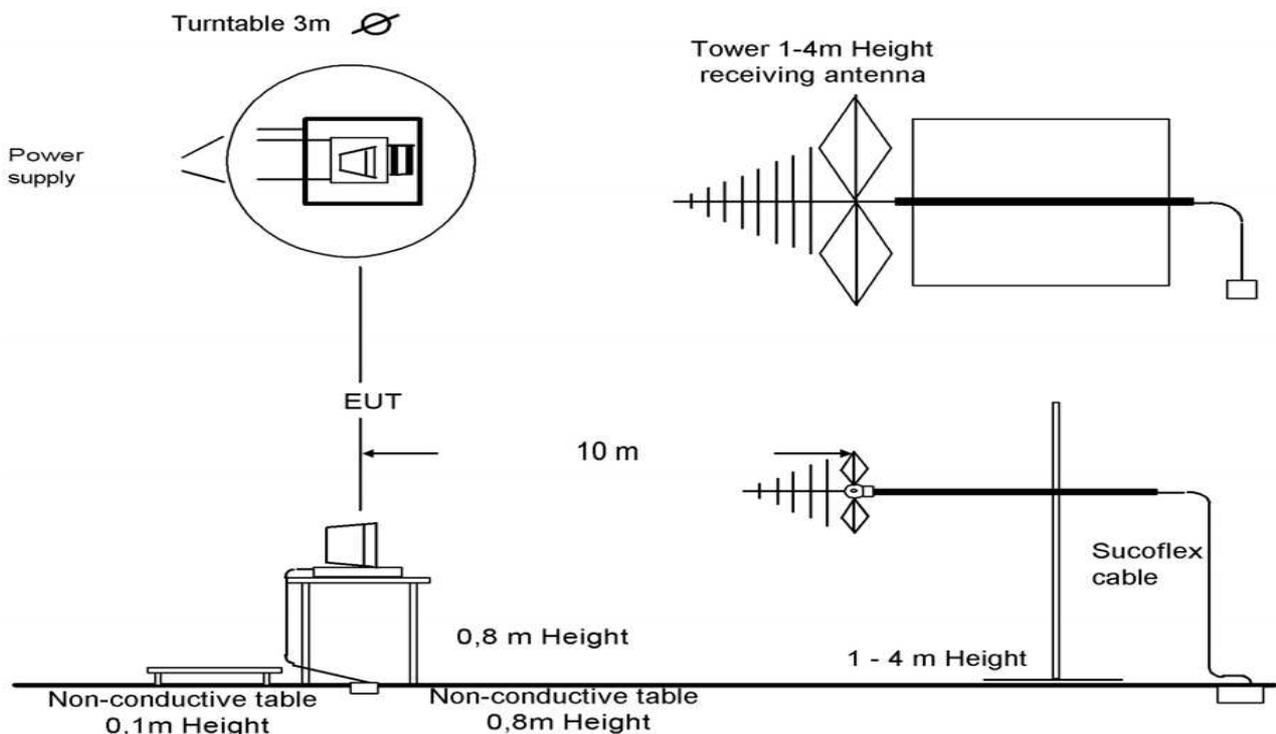
### 8.1 Description of test setup

#### 8.1.1 Radiated measurements

The radiated measurements are performed in vertical and horizontal plane in the frequency range from 9 kHz to 25 GHz in semi-anechoic chambers. The EUT is positioned on a non-conductive support with a height of 0.80 m above a conductive ground plane that covers the whole chamber. The receiving antennas are confirmed with specifications ANSI C63.2-1996 clause 15 and ANSI C63.10-2009 clause 4.1.5. These antennas can be moved over the height range between 1.0 m and 4.0 m in order to search for maximum field strength emitted from EUT. The measurement distances between EUT and receiving antennas are indicated in the test setups for the various frequency ranges. For each measurement, the EUT is rotated in all three axes until the maximum field strength is received. The wanted and unwanted emissions are received by spectrum analysers where the detector modes and resolution bandwidths over various frequency ranges are set according to requirement ANSI C63.10-2009 clause 4.2.

Antennas are confirmed with ANSI C63.2-1996 item 15.

Semi anechoic chamber



Picture 1: Diagram radiated measurements

9 kHz - 30 MHz:	active loop antenna
30 MHz – 1 GHz:	tri-log antenna
> 1 GHz:	horn antenna

The EUT is powered by an external power supply with nominal voltage or with battery.

## 8.2 Additional comments

Reference documents: None

Special test descriptions: None

Configuration descriptions: None

Test mode:

- No test mode available.  
Iperf was used to ping another device with the largest support packet size
- Special software is used.  
EUT is transmitting pseudo random data by itself

### 8.3 RSP100 test report cover sheet / performance test data

Test report number	:	1-2977-35-10/11
Equipment model number	:	AAD-3880104-BV
Certification number	:	4170B-A3880104
Manufacturer (complete address)	:	Sony Ericsson Mobile Communications AB Nya Vattentorget 22188 Lund / SWEDEN
Tested to radio standards specification no.	:	RSS 210, Issue 8, Annex 2
Open area test site IC No.	:	IC 3462C-1
Frequency range	:	ISM band 2400 MHz to 2483.5 MHz (lowest channel 2402 MHz, highest channel 2480 MHz)
RF-field strength [dB $\mu$ V/m @ 3 m] (max.)	:	102.23
Occupied bandwidth (99%-BW) [kHz]	:	1070
Type of modulation	:	GFSK modulation
Emission designator (TRC-43)	:	1M07FXD
Antenna information	:	Integrated printed antenna
Transmitter spurious (worst case) [dB $\mu$ V/m @ 3m]:	:	49.9 @ 4804 MHz
Receiver spurious (worst case) [dB $\mu$ V/m @ 3m]:	:	43.0 @ 12.3 GHz (noise floor)

#### **ATTESTATION:**

#### **DECLARATION OF COMPLIANCE:**

I attest that the testing was performed or supervised by me; that the test measurements were made in accordance with the above-mentioned Industry Canada standard(s); and that the equipment identified in this application has been subjected to all the applicable test conditions specified in the Industry Canada standards and all of the requirements of the standard have been met.

#### **Laboratory manager:**

2011-07-05

Date

Jakob Reschke

Name



Signature

## 9 Measurement results

### 9.1 Timing of the transmitter

#### Measurement:

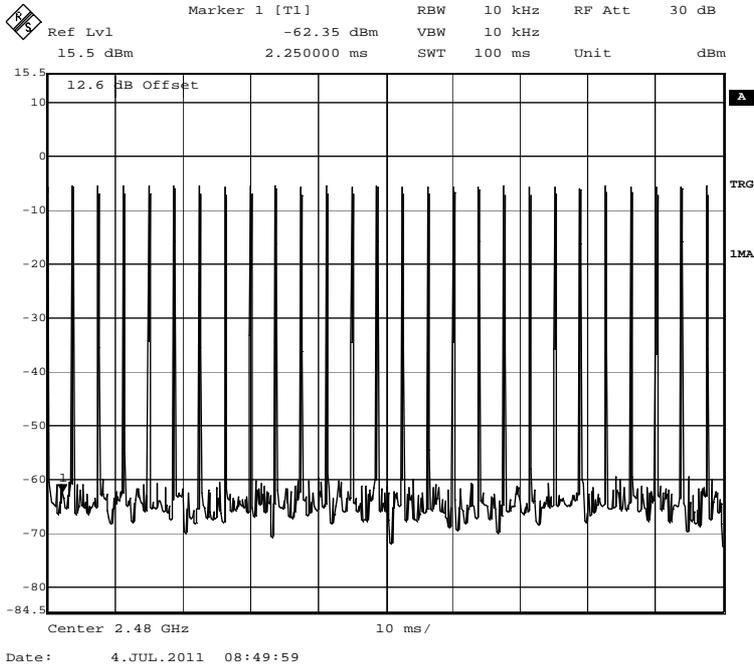
Measurement parameter	
Detector:	Peak
Sweep time:	See plot
Resolution bandwidth:	See plot
Video bandwidth:	See plot
Span:	Zero
Trace-Mode:	Single

#### Limits:

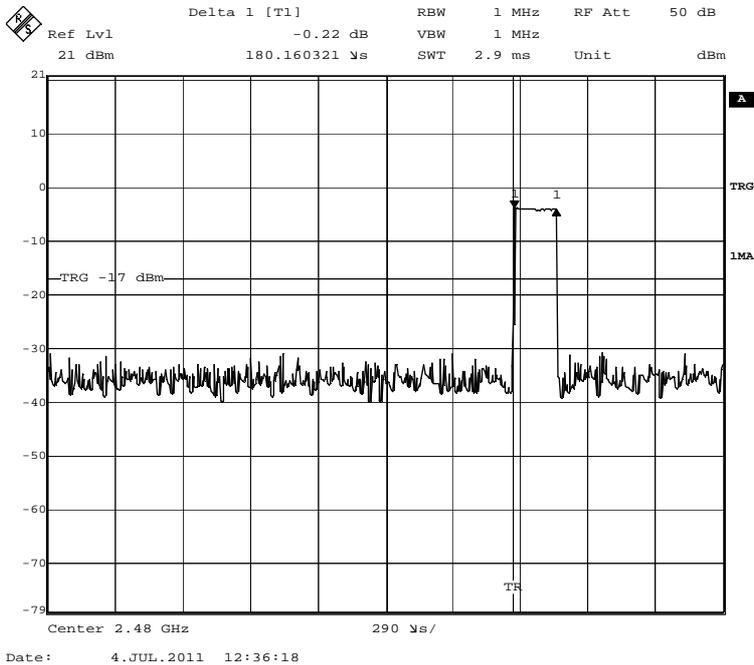
FCC	IC
CFR 15.35 (c)	RSS-GEN Issue 3 Section 4.5
Timing of the transmitter	
<p>(c) Unless otherwise specified, e.g. Section 15.255(b), when the radiated emission limits are expressed in terms of the average value of the emission, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum value. The exact method of calculating the average field strength shall be submitted with any application for certification or shall be retained in the measurement data file for equipment subject to notification or verification.</p>	

**Result:**

**Plot 1: Transmit burst**



**Plot 2: Transmit burst**



Transmit time (Tx on) within 100 ms = 27 x 180  $\mu$ s = 4.860 ms  
 Assumed transmit time (Tx on) within 100 ms for further calculations: 5 ms

The peak-to-average correction factor [dB] is calculated with  $20\text{Log} [\text{Tx on} / 100\text{ms}]$ .

peak-to-average correction factor [dB]: 26.0

## 9.2 Spectrum bandwidth – 99% bandwidth

**Description:**

Measurement of the 99% bandwidth of the modulated signal.

**Measurement:**

Measurement parameter	
Detector:	Peak
Sweep time:	Auto
Resolution bandwidth:	10 kHz
Video bandwidth:	10 kHz
Span:	3 MHz
Trace-Mode:	Max Hold

**Limits:**

FCC	IC
-	RSS Gen, Issue 3, 4.6.1
Spectrum Bandwidth – 99% Bandwidth	
Required for emission designator	

**Results:**

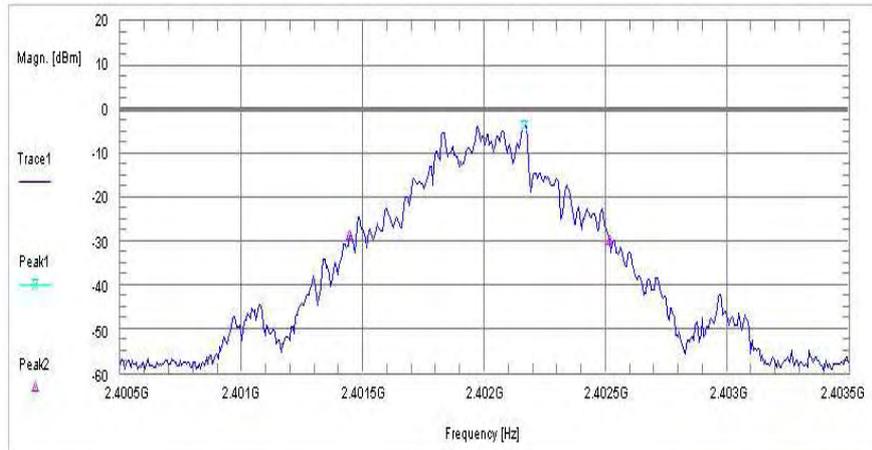
Modulation Frequency	99% BANDWIDTH [kHz]		
	2402 MHz	2441 MHz	2480 MHz
ANT+	1070	1052	1064
Measurement uncertainty	± 30 kHz		

**Plots: ANT+**

**Plot 1: lowest channel**

C.BER by Cetecom Saarbruecken Germany

Ref. Level Offset [dB]	Detector	Sweeptime [s]	Video BW [Hz]	RBW [Hz]
12.6	POS	76m	10k	10000

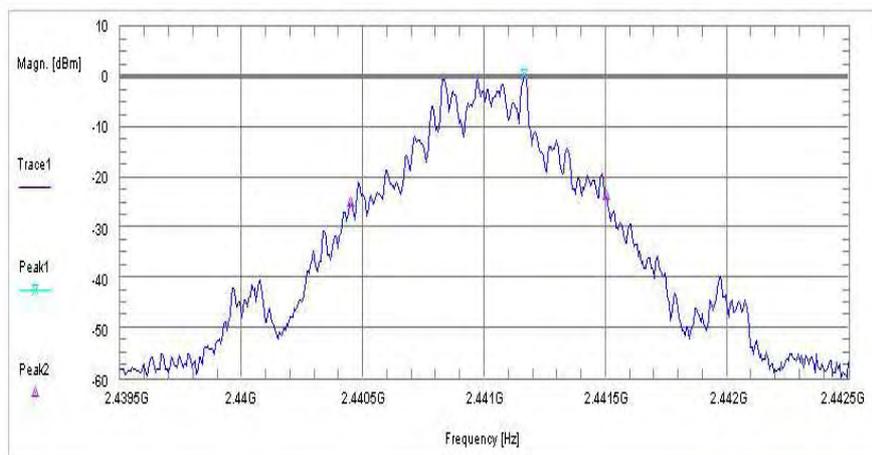


Found Peak [dBm]	Found Peak [Hz]	Tracemode	Bandwidth [Hz]
-3.821465383	2.4021663316	MAXH	1070

**Plot 2: middle channel**

C.BER by Cetecom Saarbruecken Germany

Ref. Level Offset [dB]	Detector	Sweeptime [s]	Video BW [Hz]	RBW [Hz]
12.5	POS	76m	10k	10000



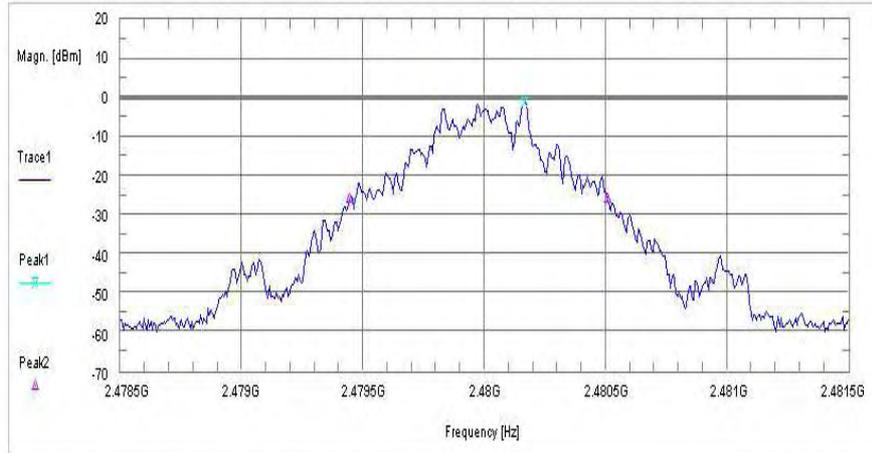
Found Peak [dBm]	Found Peak [Hz]	Tracemode	Bandwidth [Hz]
0.7055892944	2.4411663316	MAXH	1052

**Plot 3: highest channel**

C.BER by Cetecom Saarbruecken Germany

Ref. Level Offset [dB]	Detector	SweepTime [s]
12.6	POS	76m

Video BW [Hz]	RBW [Hz]
10k	10000



Found Peak [dBm]	Found Peak [Hz]	TraceMode
-1.16247406	2.480165331G	MAXH

Bandwidth [Hz]
1064

### 9.3 Maximum field strength

#### Description:

Measurement of the maximum field strength radiated.

#### Measurement:

Measurement parameter	
Detector:	Peak
Sweep time:	Auto
Resolution bandwidth:	1 MHz
Video bandwidth:	1 MHz
Span:	3 MHz
Trace-Mode:	Max Hold
Measurement distance:	3 m

#### Limits:

FCC	IC
CFR 15.249(a)(e)	RSS-210, Issue 8, A2.9(a)
Maximum field strength	
The field strength of emissions of intentional radiators shall comply with the following: Field strength of fundamental: 50 mV/m / (94 dB $\mu$ V/m) @ 3 m (AVG) 500 mV/m / (114 dB $\mu$ V/m) @ 3 m (Peak)	

#### Result:

Modulation Frequency	Maximum field strength [dB $\mu$ V/m]		
	2402 MHz	2441 MHz	2480 MHz
Peak	101.76	102.23	100.00
AVG*)	75.76	76.23	74.00
Measurement uncertainty	± 3 dB		

\*) Average value calculated with duty cycle correction factor. (see chapter 9.1)

**Result: The result of the measurement is passed.**

## 9.4 Band edge compliance radiated

### Description:

Measurement of the radiated band edge compliance. The EUT is turned in the position that results in the maximum level at the band edge. Then a sweep over the corresponding restricted band is performed. The EUT is set to lowest channel for the lower restricted band and to highest channel for the upper restricted band. Measurement distance is 3m.

### Measurement:

Measurement parameter	
Detector:	Peak
Sweep time:	Auto
Resolution bandwidth:	1 MHz
Video bandwidth:	10 Hz
Span:	Lower Band: 2300 – 2400 MHz Higher Band: 2480 – 2500 MHz
Trace-Mode:	Max Hold

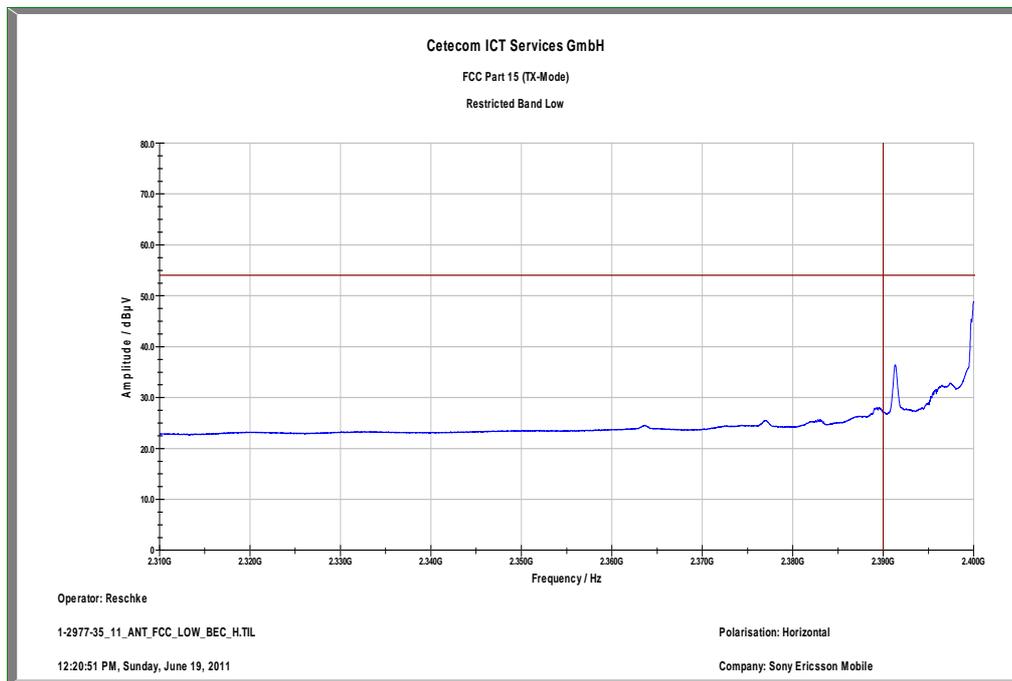
### Limits:

FCC	IC
CFR Part 15.249(d)	RSS 210, Issue 8, A 2.9(a)(b)
Band Edge Compliance Radiated	
Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209 / RSS GEN, whichever is the lesser attenuation.	
54 dB $\mu$ V/m (AVG) / 74 dB $\mu$ V/m (Pk)	

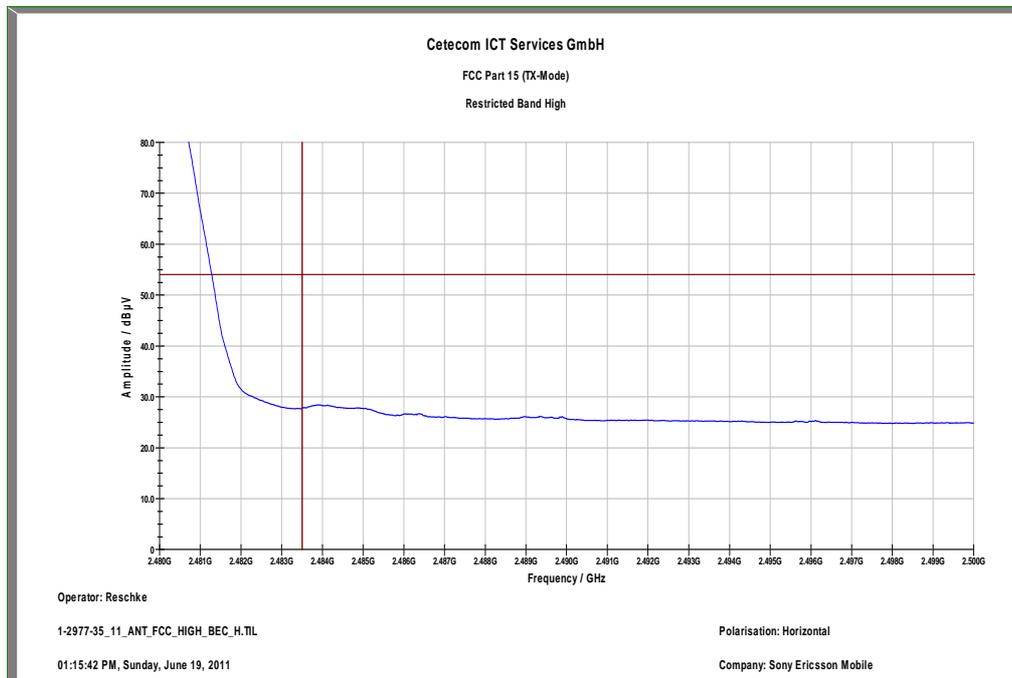
### Result:

Modulation	Band Edge Compliance Radiated [dB $\mu$ V/m]
	GFSK
Lower Band Edge – Lowest Channel	< 54 dB $\mu$ V/m (see plots 1/3)
Upper Band Edge – Highest Channel	< 54 dB $\mu$ V/m (see plot 2/4)
Measurement uncertainty	$\pm$ 3 dB

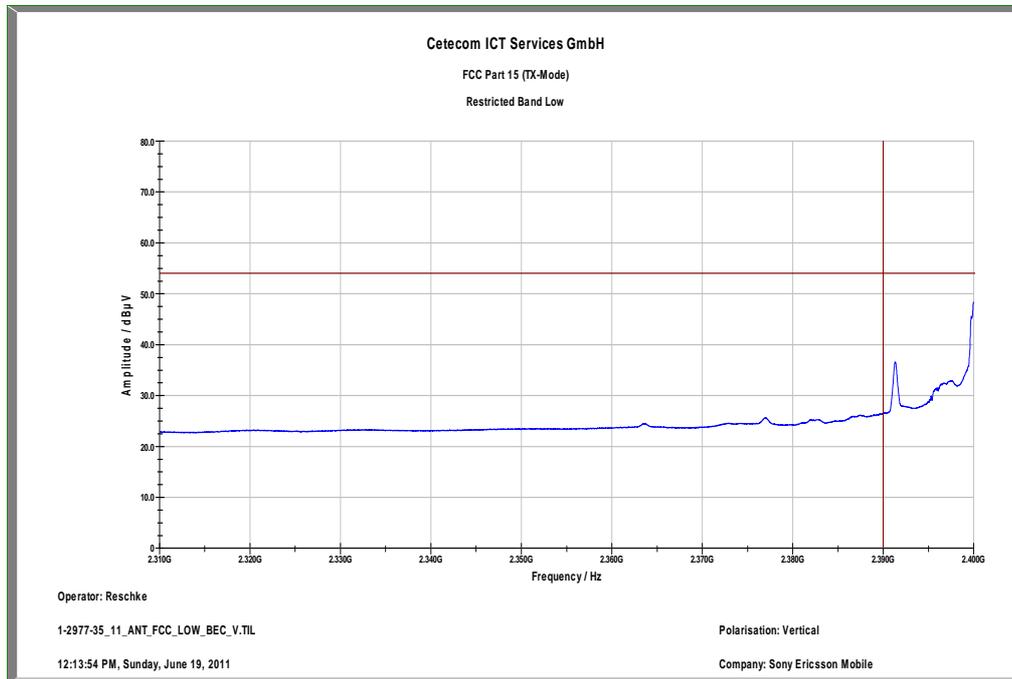
Plot 1: lower band edge, horizontal polarization



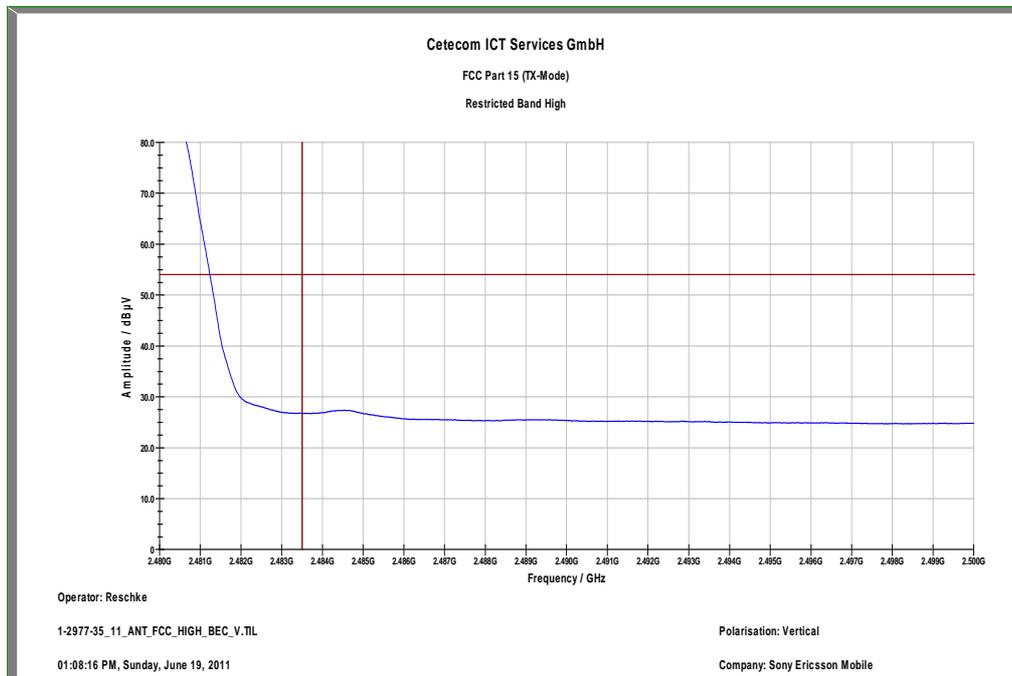
Plot 2: upper band edge, horizontal polarization



**Plot 3: lower band edge, vertical polarization**



**Plot 4: upper band edge, vertical polarization**



**Result:** The result of the measurement is passed.

## 9.5 TX spurious emissions radiated

### Description:

Measurement of the radiated spurious emissions in transmit mode. The measurement is performed at lowest, middle and highest channel.

### Measurement:

Measurement parameter	
Detector:	Peak / Quasi Peak
Sweep time:	Auto
Resolution bandwidth:	F < 1 GHz: 100 kHz F > 1 GHz: 1 MHz
Video bandwidth:	Sweep: 100 kHz Remeasurement: 10 Hz or Duty cycle correction
Span:	30 MHz to 25 GHz
Trace-Mode:	Max Hold

### Limits:

FCC		IC	
CFR Part 15.249(d)		RSS 210, Issue 8, A 2.9(a)(b)	
TX spurious emissions radiated			
Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209 / RSS GEN, whichever is the lesser attenuation.			
§15.209			
Frequency (MHz)	Field Strength (dBµV/m)	Measurement distance	
30 - 88	30.0	10	
88 – 216	33.5	10	
216 – 960	36.0	10	
Above 960	54.0	3	

**Results:**

TX Spurious Emissions Radiated [dB $\mu$ V/m]								
2402 MHz			2441 MHz			2480 MHz		
F [MHz]	Detector	Level [dB $\mu$ V/m]	F [MHz]	Detector	Level [dB $\mu$ V/m]	F [MHz]	Detector	Level [dB $\mu$ V/m]
4804	1 MHz / 1 MHz PP	49.90	No critical peak detected.			4960	1 MHz / 1 MHz PP	47.47
Measurement uncertainty			± 3 dB					

**Result:** The result of the measurement is passed.

Plot 1: Lowest channel, 30 MHz to 1 GHz, vertical & horizontal polarization

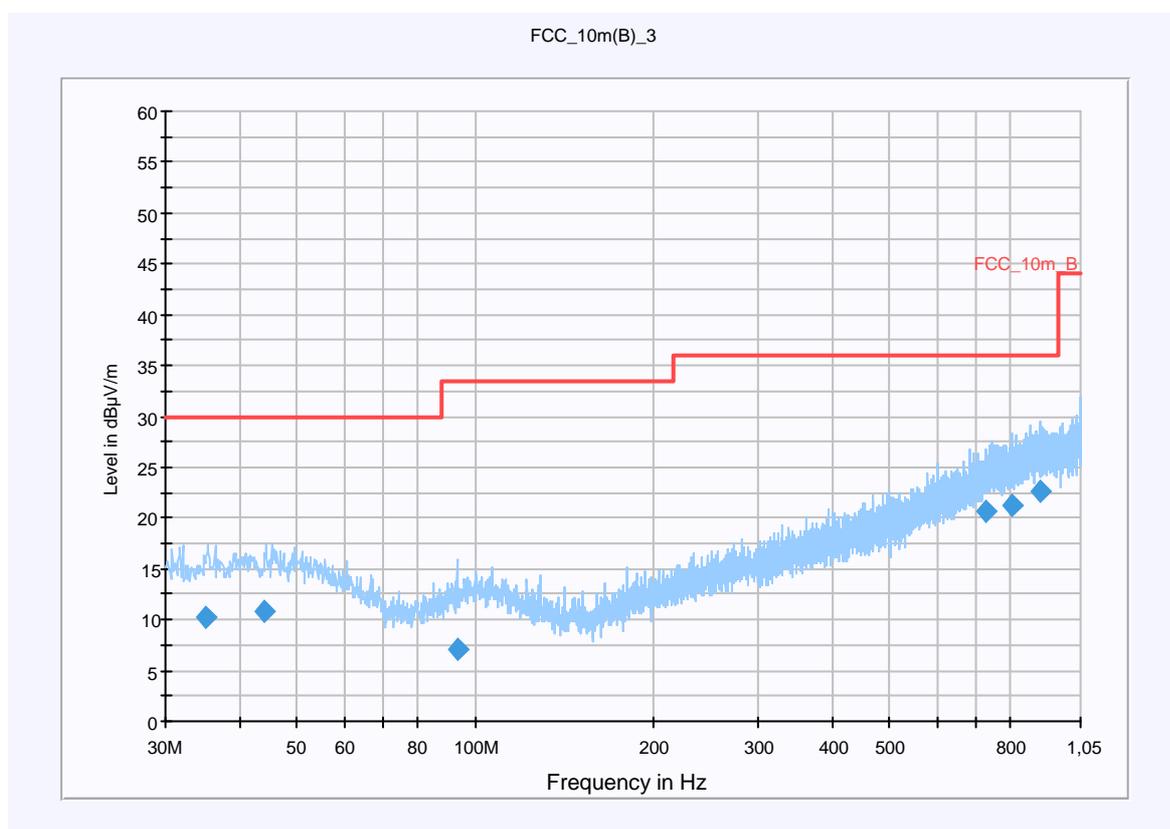
**CETECOM ICT Services GmbH**

**Common Information**

EUT: AAD-3880104-BV + CAA-0002016-BV  
 Serial Number: BX902C78U0 | IMEI: 00440214-117227-4  
 Test Description: FCC Part 15 C < 1GHz @ 10m  
 Operating Conditions: ANT + tx CH: 0  
 Operator Name: Langer  
 Comment: AC 115 V / 60 Hz

**Scan Setup: STAN\_Fin [EMI radiated]**

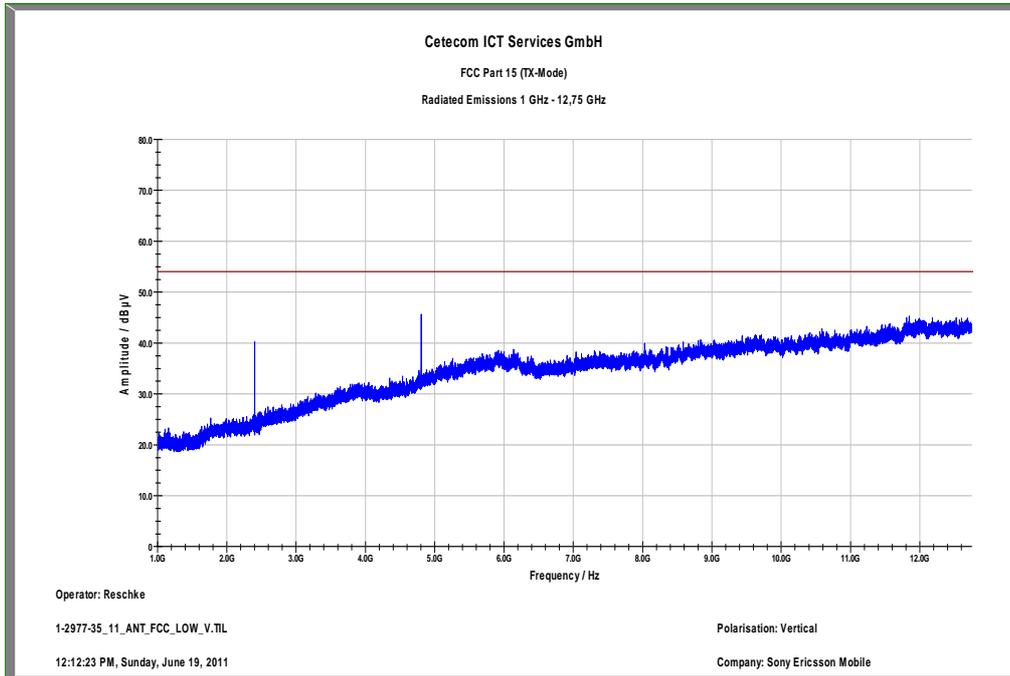
Hardware Setup: Electric Field (NOS)  
 Level Unit: dB $\mu$ V/m  
**Subrange**                      **Detectors**                      **IF Bandwidth**                      **Meas. Time**                      **Receiver**  
 30 MHz - 2 GHz                      QuasiPeak                      120 kHz                      15 s                      Receiver



**Final Result 1**

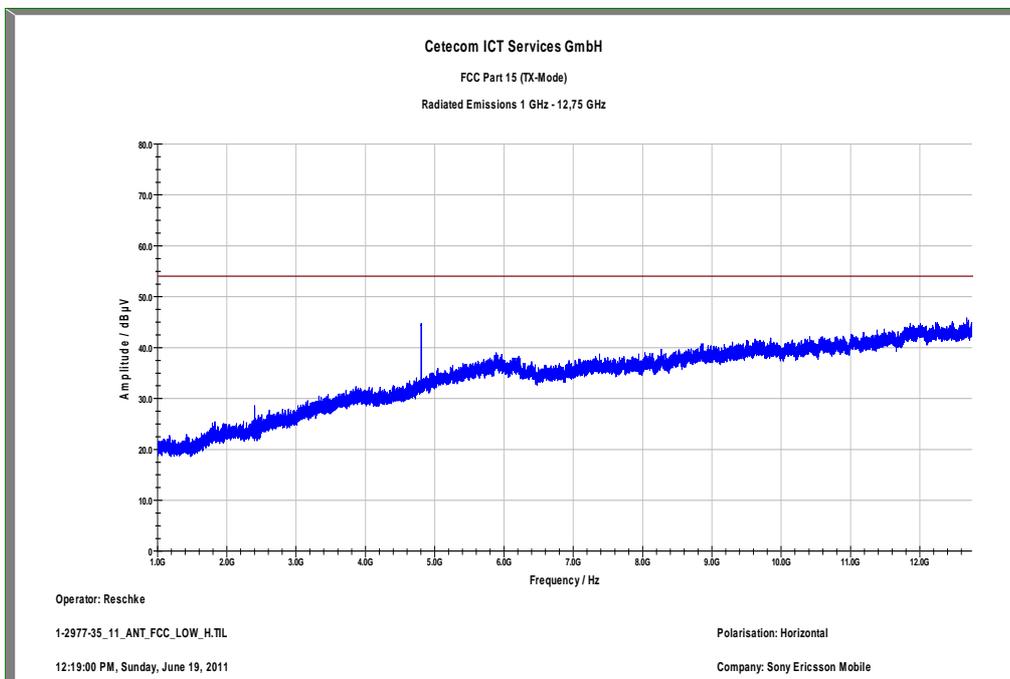
Frequency (MHz)	QuasiPeak (dB $\mu$ V/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dB $\mu$ V/m)	Comment
35.223000	10.3	15000.000	120.000	170.0	H	261.0	13.0	19.7	30.0	
43.874700	10.9	15000.000	120.000	98.0	V	196.0	13.3	19.1	30.0	
93.136650	7.0	15000.000	120.000	170.0	V	-5.0	11.0	26.5	33.5	
728.331150	20.6	15000.000	120.000	170.0	V	283.0	23.2	15.4	36.0	
802.600950	21.2	15000.000	120.000	170.0	H	173.0	23.8	14.8	36.0	
896.821050	22.5	15000.000	120.000	170.0	V	260.0	25.2	13.5	36.0	

**Plot 2: Lowest channel, 1 GHz to 12.75 GHz, vertical polarization**



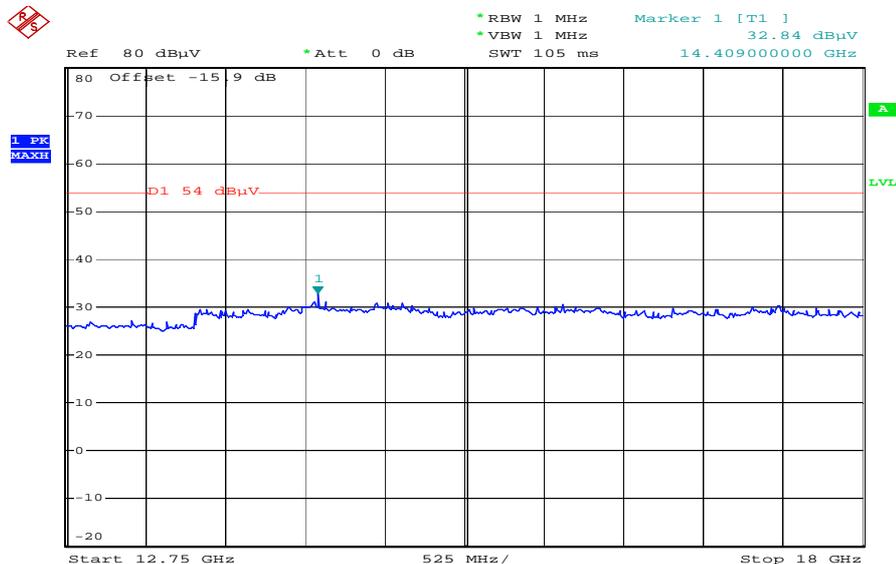
The carrier signal is notched with a 2.4 GHz band rejection filter.

**Plot 3: Lowest channel, 1 GHz to 12.75 GHz, horizontal polarization**



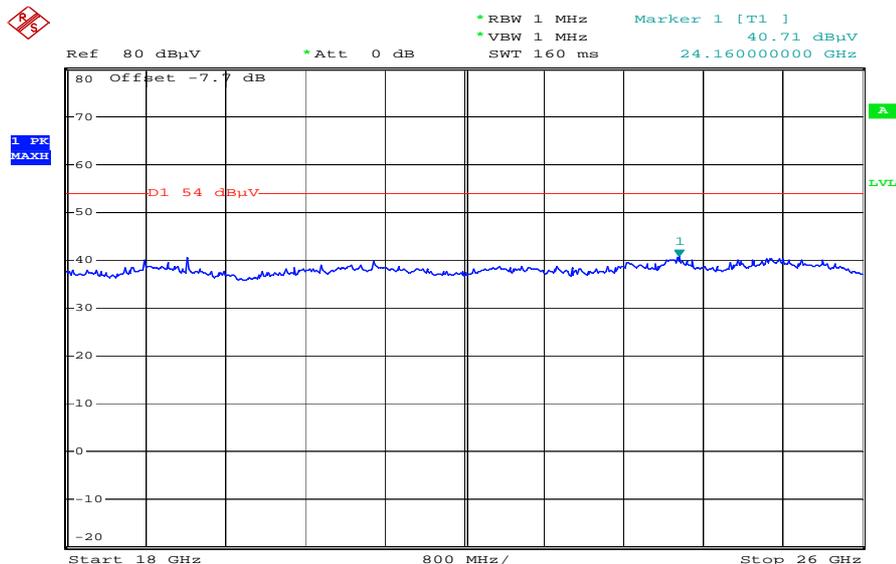
The carrier signal is notched with a 2.4 GHz band rejection filter.

Plot 4: Lowest channel, 12 GHz to 18 GHz, vertical & horizontal polarization



Date: 4.JUL.2011 12:27:34

Plot 5: Lowest channel, 18 GHz to 25 GHz, vertical & horizontal polarization



Date: 4.JUL.2011 13:45:56

**Plot 6: Middle channel, 30 MHz to 1 GHz, vertical & horizontal polarization**

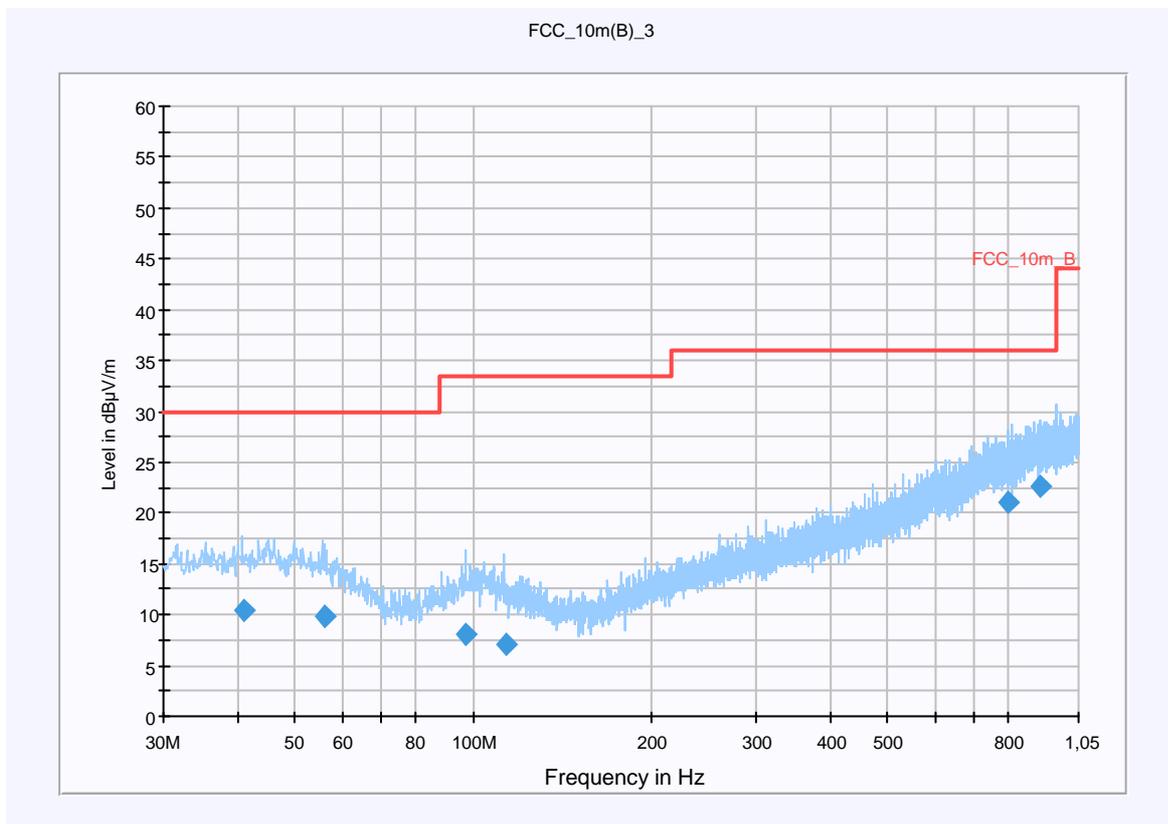
**CETECOM ICT Services GmbH**

**Common Information**

EUT: AAD-3880104-BV + CAA-0002016-BV  
 Serial Number: BX902C78U0 | IMEI: 00440214-117227-4  
 Test Description: FCC Part 15 C < 1GHz @ 10m  
 Operating Conditions: ANT + tx CH: 39  
 Operator Name: Langer  
 Comment: AC 115 V / 60 Hz

**Scan Setup: STAN\_Fin [EMI radiated]**

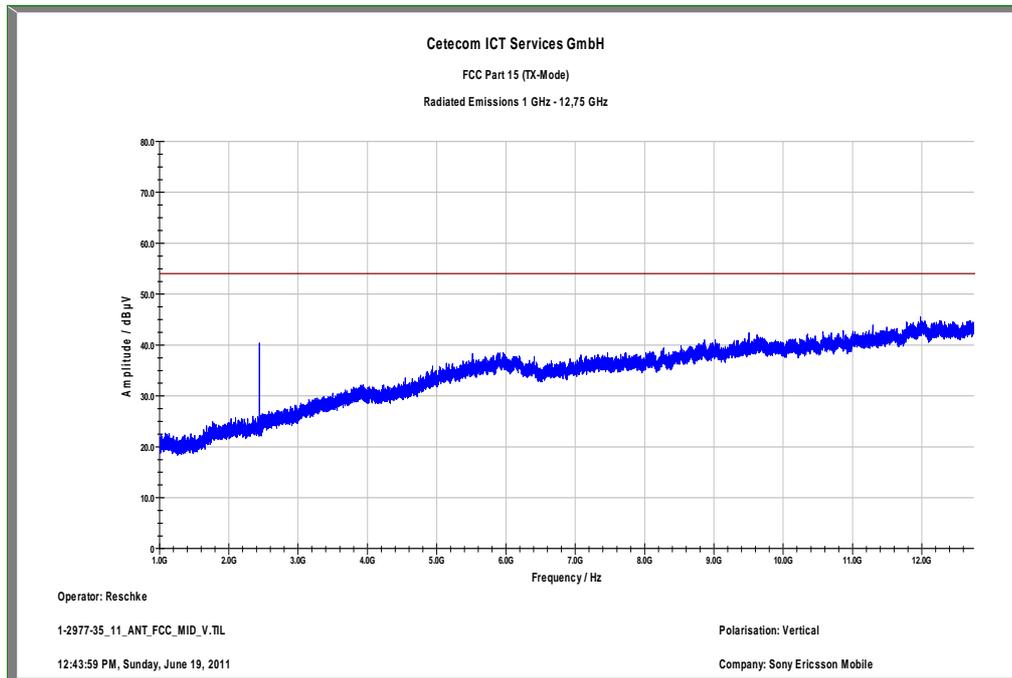
Hardware Setup: Electric Field (NOS)  
 Level Unit: dBµV/m  
**Subrange**                      **Detectors**                      **IF Bandwidth**                      **Meas. Time**                      **Receiver**  
 30 MHz - 2 GHz                      QuasiPeak                      120 kHz                      15 s                      Receiver



**Final Result 1**

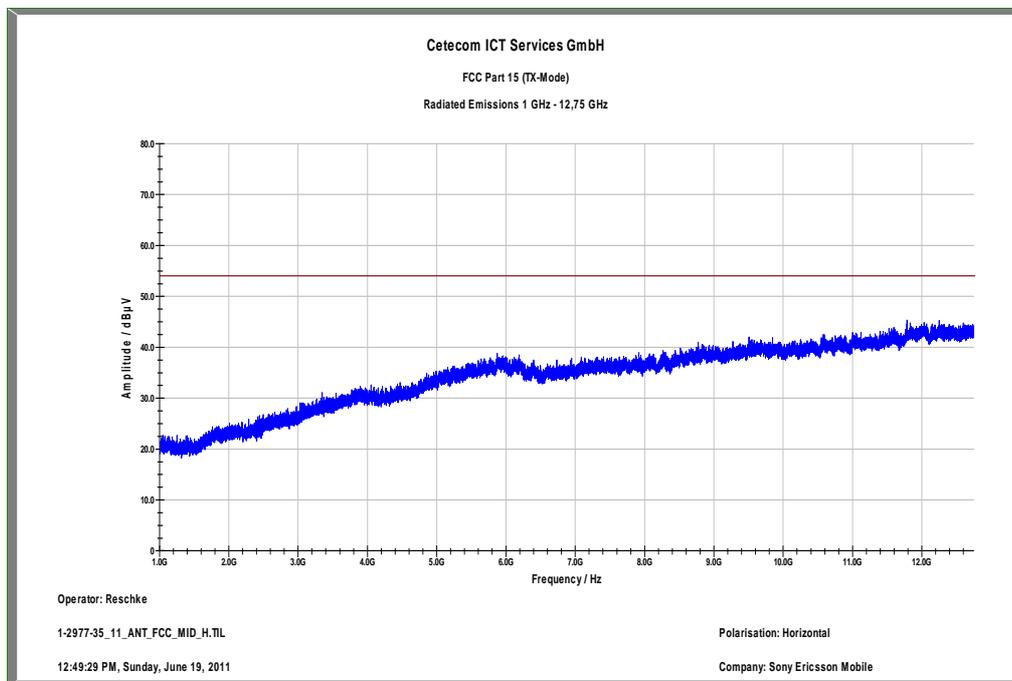
Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
41.120550	10.4	15000.000	120.000	158.0	H	106.0	13.4	19.6	30.0	
56.028450	9.9	15000.000	120.000	170.0	V	264.0	12.6	20.1	30.0	
96.961950	8.0	15000.000	120.000	98.0	H	196.0	11.5	25.5	33.5	
113.259000	7.1	15000.000	120.000	98.0	H	13.0	10.8	26.4	33.5	
797.432700	21.1	15000.000	120.000	170.0	V	86.0	23.8	14.9	36.0	
905.536200	22.5	15000.000	120.000	106.0	H	3.0	25.2	13.5	36.0	

**Plot 7: Middle channel, 1 GHz to 12.75 GHz, vertical polarization**



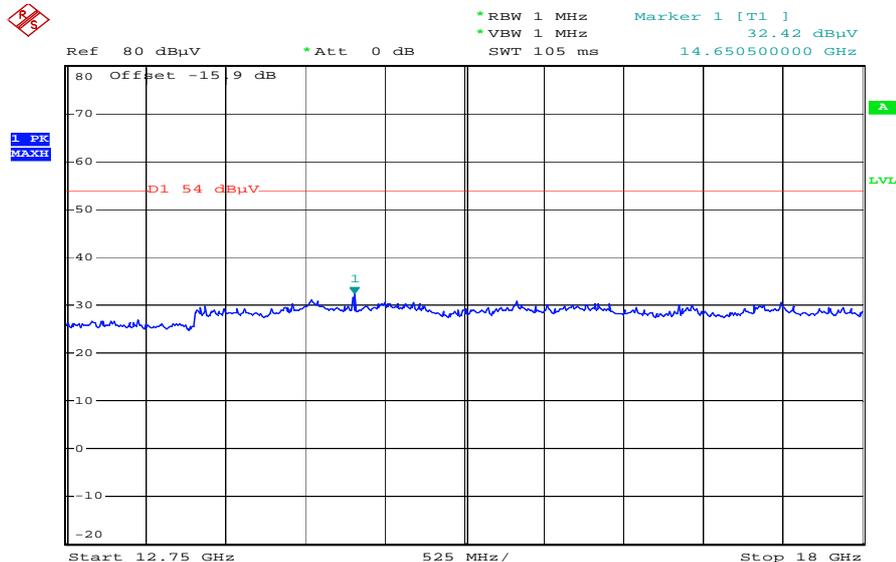
The carrier signal is notched with a 2.4 GHz band rejection filter.

**Plot 8: Middle channel, 1 GHz to 12.75 GHz, horizontal polarization**



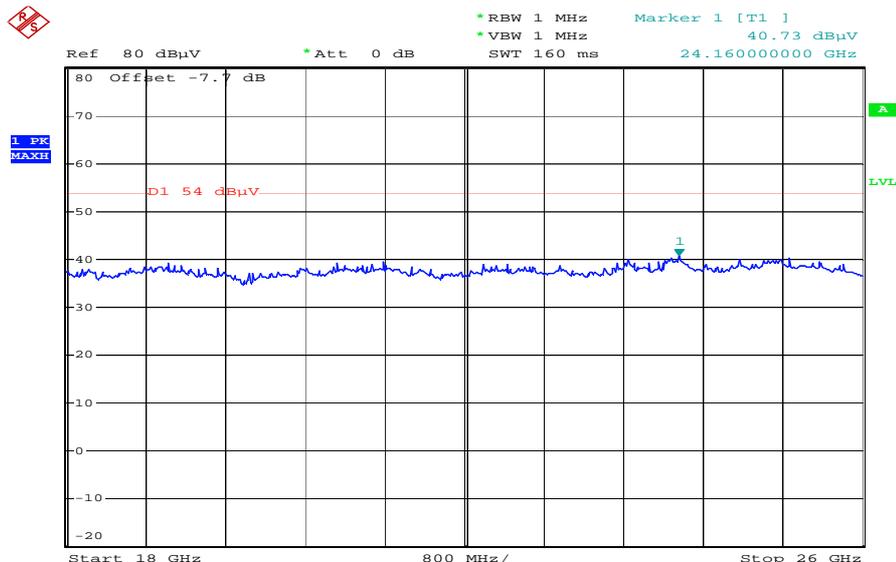
The carrier signal is notched with a 2.4 GHz band rejection filter.

Plot 9: Middle channel, 12 GHz to 18 GHz, vertical & horizontal polarization



Date: 4.JUL.2011 12:29:15

Plot 10: Middle channel, 18 GHz to 25 GHz, vertical & horizontal polarization



Date: 4.JUL.2011 13:50:15

**Plot 11: Highest channel, 30 MHz to 1 GHz, vertical & horizontal polarization**

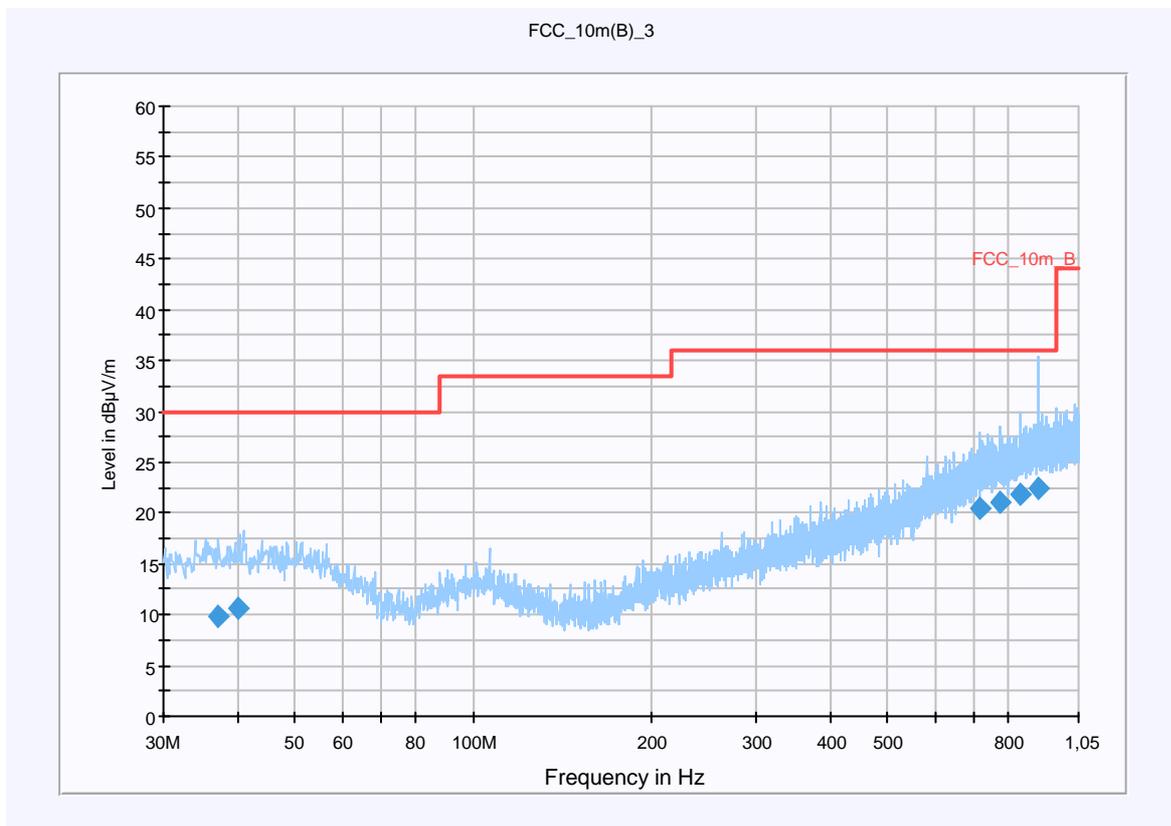
**CETECOM ICT Services GmbH**

**Common Information**

EUT: AAD-3880104-BV + CAA-0002016-BV  
 Serial Number: BX902C78U0 | IMEI: 00440214-117227-4  
 Test Description: FCC Part 15 C < 1GHz @ 10m  
 Operating Conditions: ANT + tx CH: 78  
 Operator Name: Langer  
 Comment: AC 115 V / 60 Hz

**Scan Setup: STAN\_Fin [EMI radiated]**

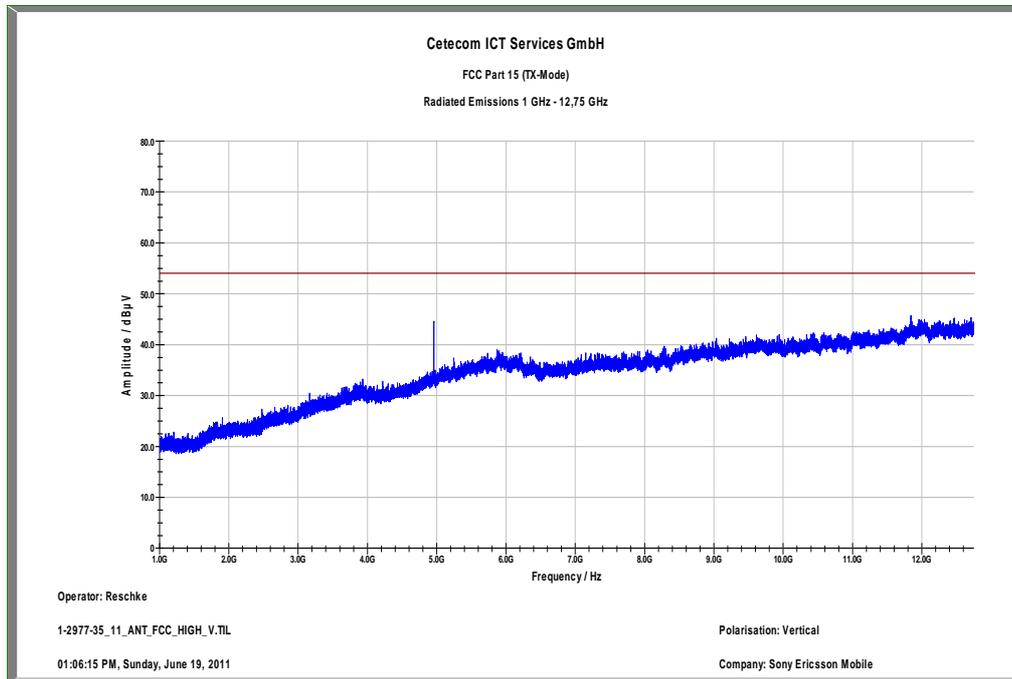
Hardware Setup: Electric Field (NOS)  
 Level Unit: dBµV/m  
**Subrange**                      **Detectors**                      **IF Bandwidth**                      **Meas. Time**                      **Receiver**  
 30 MHz - 2 GHz                      QuasiPeak                      120 kHz                      15 s                      Receiver



**Final Result 1**

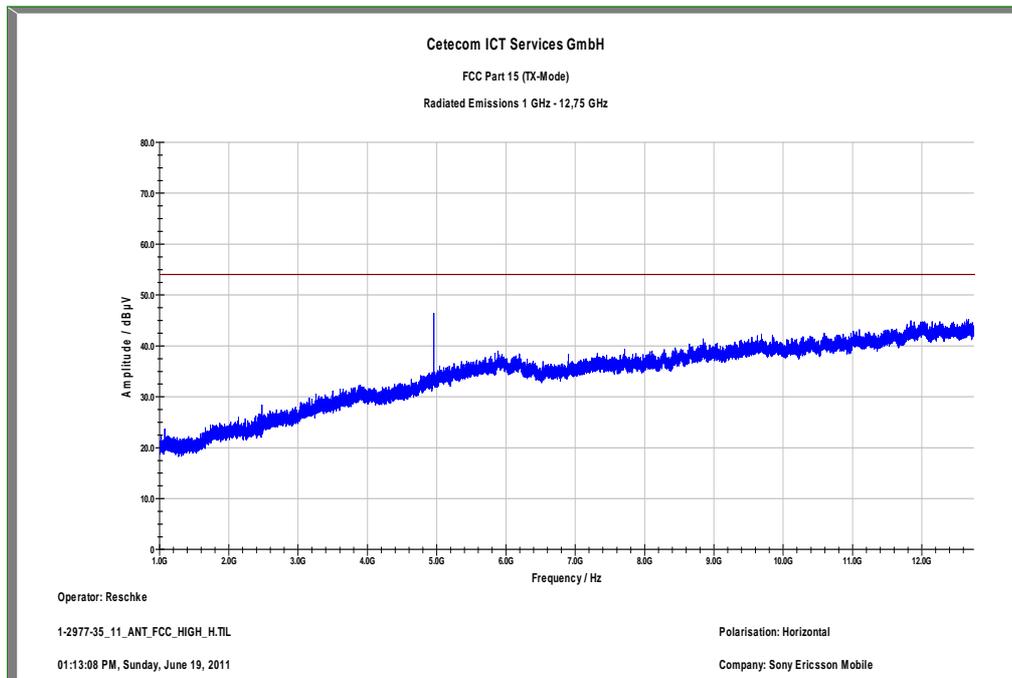
Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
37.042800	9.9	15000.000	120.000	117.0	H	196.0	13.2	20.1	30.0	
39.936300	10.6	15000.000	120.000	170.0	V	82.0	13.4	19.4	30.0	
717.136200	20.4	15000.000	120.000	170.0	H	180.0	22.9	15.6	36.0	
776.308800	21.1	15000.000	120.000	170.0	H	264.0	23.7	14.9	36.0	
835.911300	21.8	15000.000	120.000	170.0	V	90.0	24.3	14.2	36.0	
896.559300	22.5	15000.000	120.000	124.0	V	178.0	25.2	13.5	36.0	

**Plot 12: Highest channel, 1 GHz to 12.75 GHz, vertical polarization**



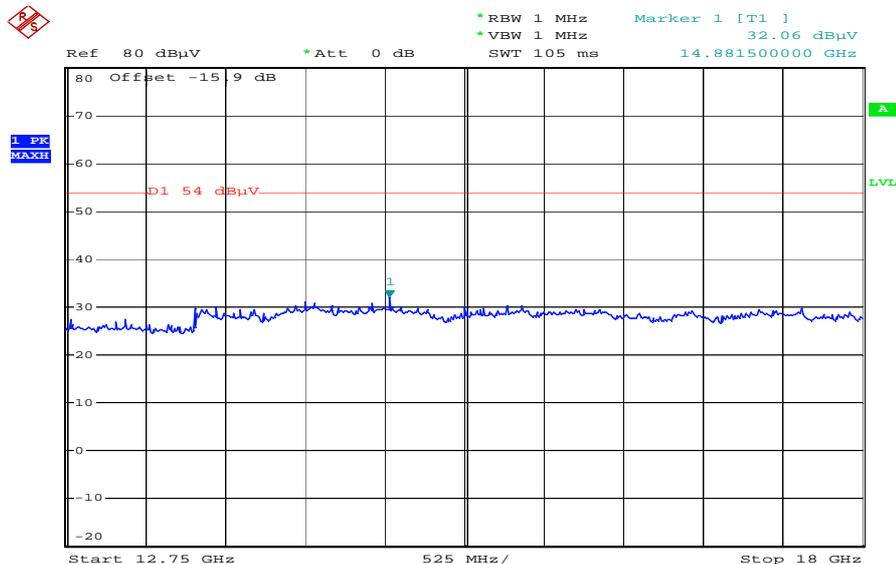
The carrier signal is notched with a 2.4 GHz band rejection filter.

**Plot 13: Highest channel, 1 GHz to 12.75 GHz, horizontal polarization**



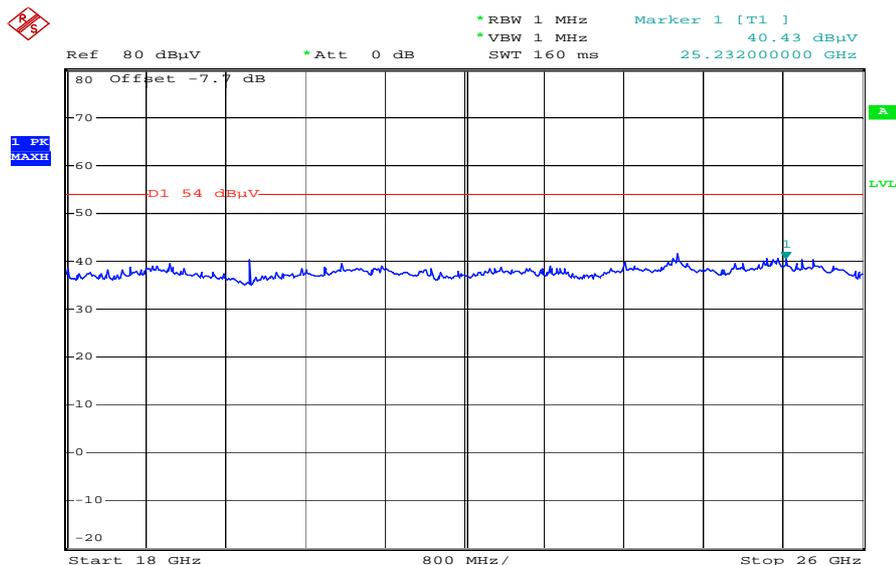
The carrier signal is notched with a 2.4 GHz band rejection filter.

Plot 14: Highest channel, 12 GHz to 18 GHz, vertical & horizontal polarization



Date: 4.JUL.2011 13:40:29

Plot 15: Highest channel, 18 GHz to 25 GHz, vertical & horizontal polarization



Date: 4.JUL.2011 13:53:38

## 9.6 RX spurious emissions radiated

### Description:

Measurement of the radiated spurious emissions in idle/receive mode.

### Measurement:

Measurement parameter	
Detector:	Peak / Quasi Peak
Sweep time:	Auto
Resolution bandwidth:	F < 1 GHz: 100 kHz F > 1 GHz: 1 MHz
Video bandwidth:	Sweep: 100 kHz Remeasurement: 10 Hz
Span:	30 MHz to 25 GHz
Trace-Mode:	Max Hold

### Limits:

FCC		IC
CFR Part 15.109		RSS Gen, Issue 3, 4.10
RX Spurious Emissions Radiated		
Frequency (MHz)	Field Strength (dB $\mu$ V/m)	Measurement distance
30 - 88	30.0	10
88 - 216	33.5	10
216 - 960	36.0	10
Above 960	54.0	3

### Results:

RX Spurious Emissions Radiated [dB $\mu$ V/m]		
F [MHz]	Detector	Level [dB $\mu$ V/m]
No critical peaks found		
Measurement uncertainty	± 3 dB	

**Result:** The result of the measurement is passed.

**Plots: RX / Idle – mode**

Plot 1: 30 MHz to 1 GHz, vertical & horizontal polarization

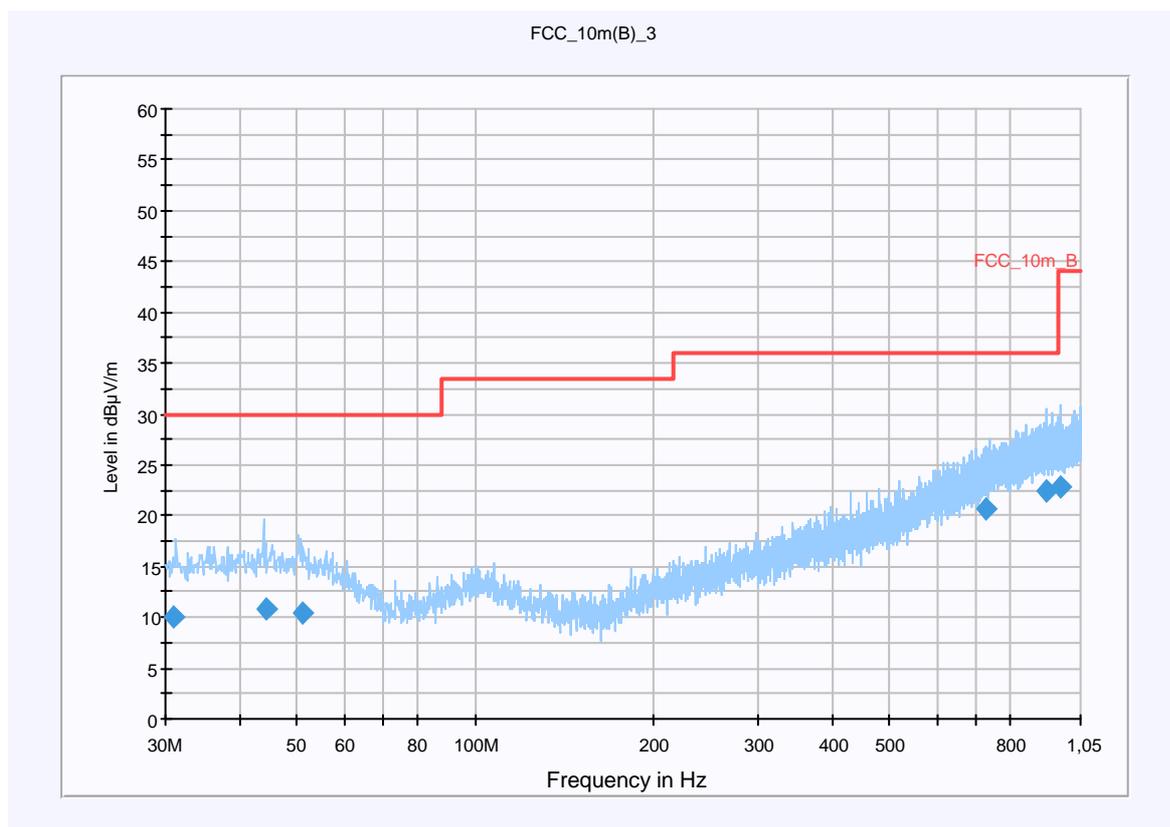
**CETECOM ICT Services GmbH**

**Common Information**

EUT: AAD-3880104-BV + CAA-0002016-BV  
 Serial Number: BX902C78U0 | IMEI: 00440214-117227-4  
 Test Description: FCC Part 15 C < 1GHz @ 10m  
 Operating Conditions: ANT + Rx  
 Operator Name: Langer  
 Comment: AC 115 V / 60 Hz

**Scan Setup: STAN\_Fin [EMI radiated]**

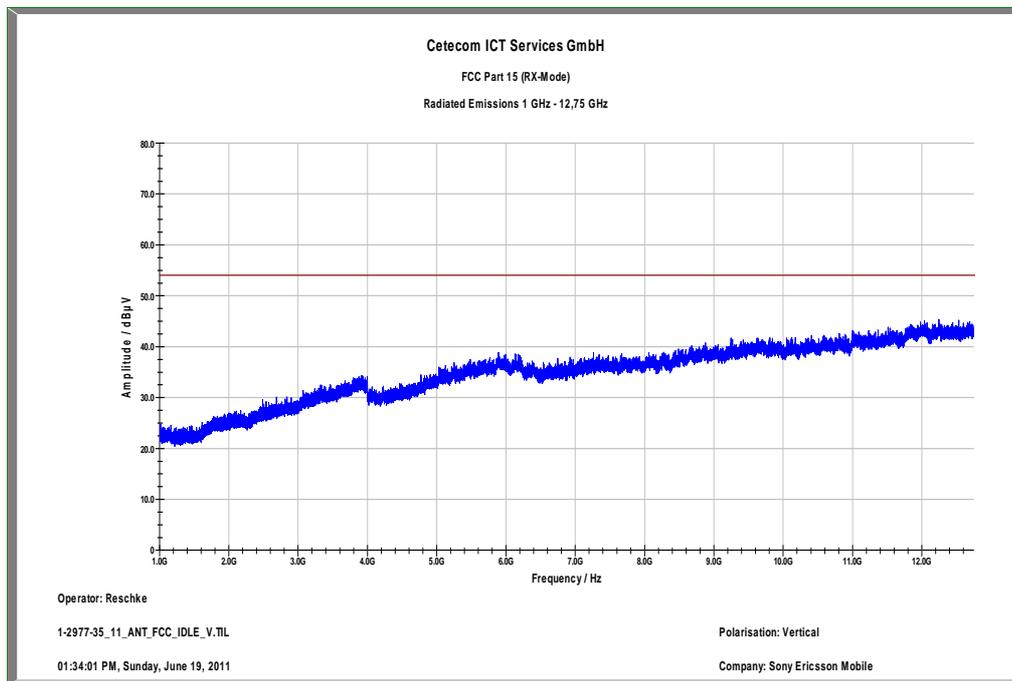
Hardware Setup: Electric Field (NOS)  
 Level Unit: dBµV/m  
**Subrange**                      **Detectors**                      **IF Bandwidth**                      **Meas. Time**                      **Receiver**  
 30 MHz - 2 GHz                      QuasiPeak                      120 kHz                      15 s                      Receiver



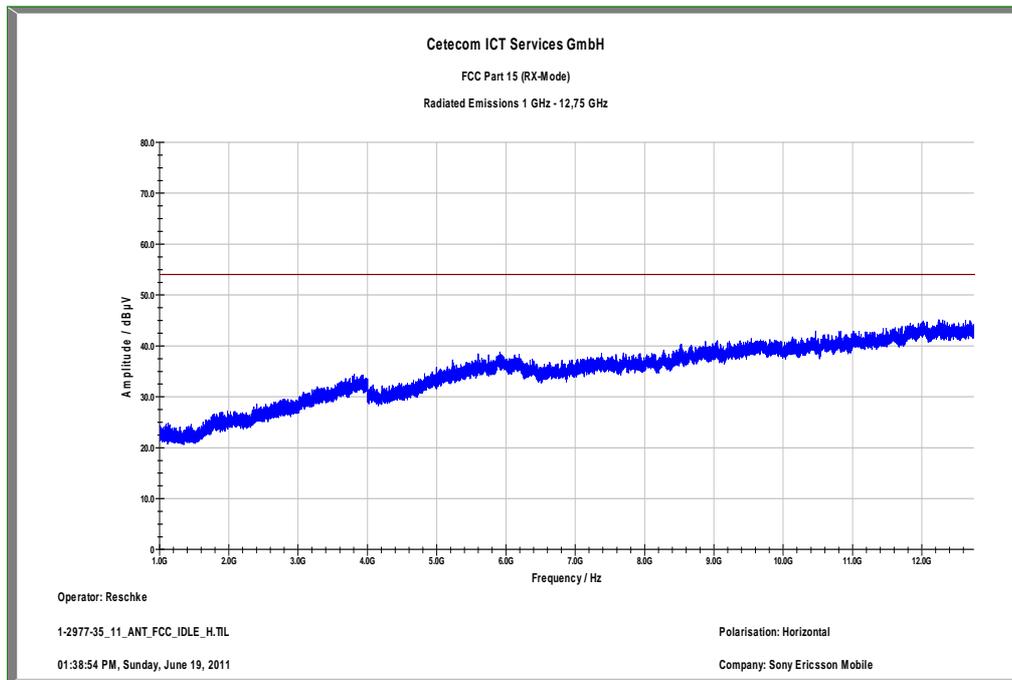
**Final Result 1**

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
31.033950	10.1	15000.000	120.000	170.0	H	12.0	12.6	19.9	30.0	
44.205300	10.8	15000.000	120.000	170.0	V	196.0	13.3	19.2	30.0	
50.953050	10.4	15000.000	120.000	170.0	H	96.0	13.3	19.6	30.0	
727.803600	20.6	15000.000	120.000	157.0	V	180.0	23.2	15.4	36.0	
915.913500	22.4	15000.000	120.000	170.0	H	106.0	25.2	13.6	36.0	
973.271850	22.8	15000.000	120.000	170.0	V	-1.0	25.6	21.2	44.0	

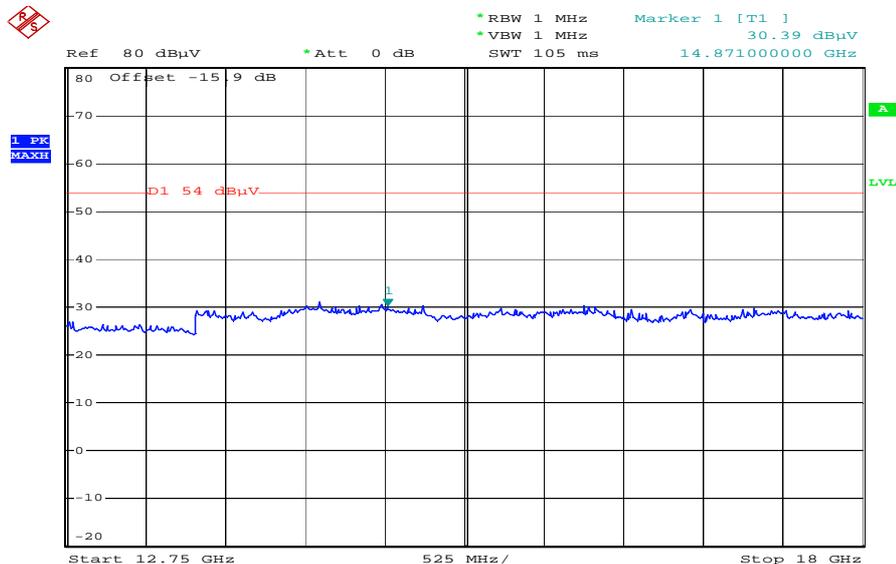
Plot 2: 1 GHz to 12.75 GHz, vertical polarization



Plot 3: 1 GHz to 12.75 GHz, horizontal polarization

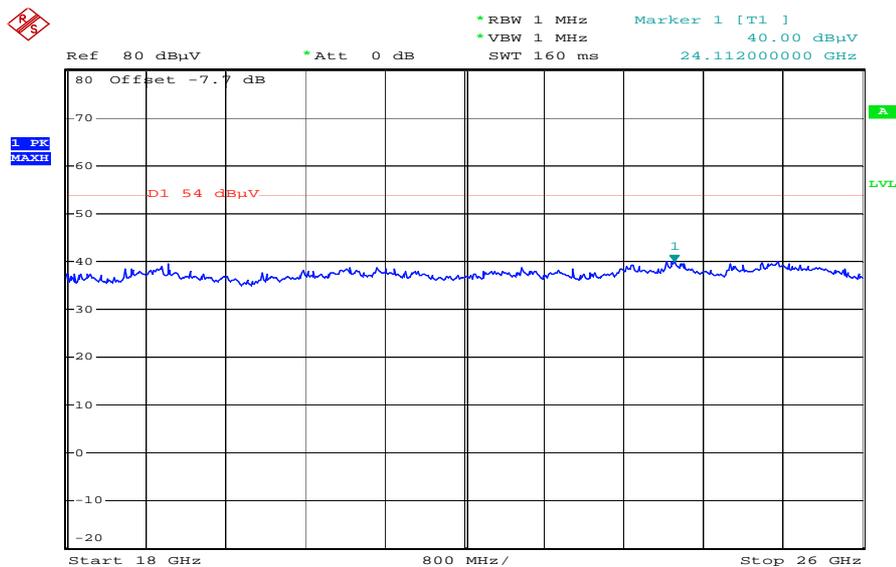


Plot 4: 12 GHz to 18 GHz, vertical & horizontal polarization



Date: 4.JUL.2011 13:41:40

Plot 5: 18 GHz to 25 GHz, vertical & horizontal polarization



Date: 4.JUL.2011 13:43:56

## 9.7 Spurious emissions radiated < 30 MHz

### Description:

Measurement of the radiated spurious emissions in transmit mode below 30 MHz. The EUT is set to lowest, middle and highest channel. The limits are recalculated to a measurement distance of 3 m with 40 dB/decade according CFR Part 2.

### Measurement:

Measurement parameter	
Detector:	Peak / Quasi Peak
Sweep time:	Auto
Resolution bandwidth:	F < 150 kHz: 1 kHz F > 150 kHz: 100 kHz
Video bandwidth:	F < 150 kHz: 200 Hz F > 150 kHz: 9 kHz
Span:	9 kHz to 30 MHz
Trace-Mode:	Max Hold

### Limits:

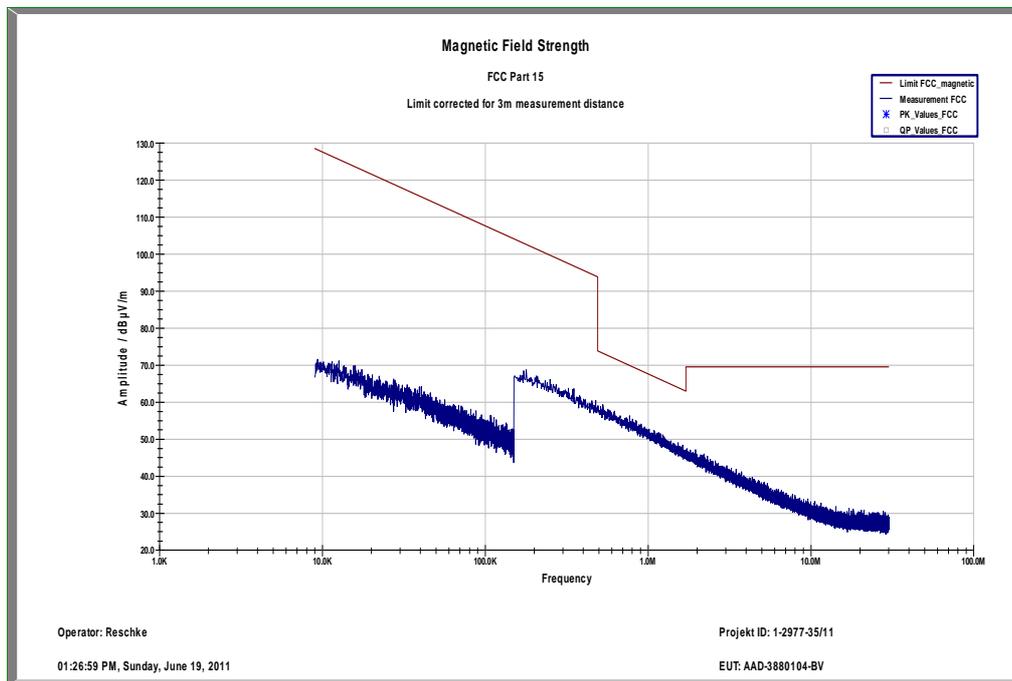
FCC		IC	
CFR Part 15.209(a)		RSS –Gen	
Spurious Emissions Radiated < 30 MHz			
Frequency (MHz)	Field Strength (dB $\mu$ V/m)	Measurement distance	
0.009 – 0.490	2400/F(kHz)	300	
0.490 – 1.705	24000/F(kHz)	30	
1.705 – 30.0	30	30	

### Results:

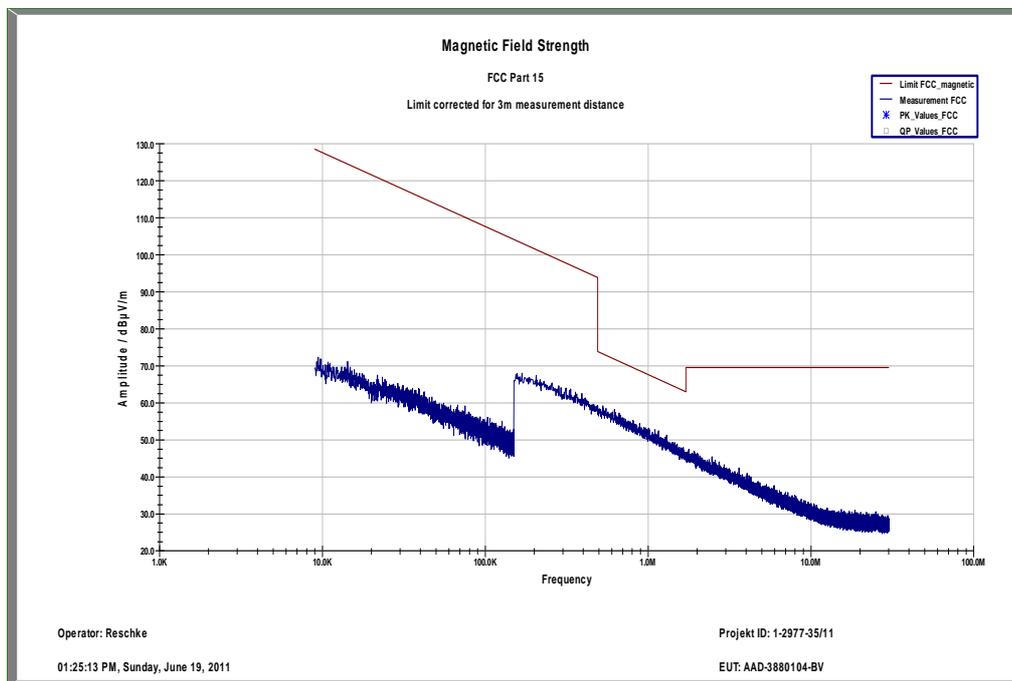
Spurious Emissions Radiated < 30 MHz [dB $\mu$ V/m]								
2402 MHz			2441 MHz			2480 MHz		
F [MHz]	Detector	Level [dB $\mu$ V/m]	F [MHz]	Detector	Level [dB $\mu$ V/m]	F [MHz]	Detector	Level [dB $\mu$ V/m]
No critical peaks found			No critical peaks found			No critical peaks found		
Measurement uncertainty			± 3 dB					

**Result:** The result of the measurement is passed.

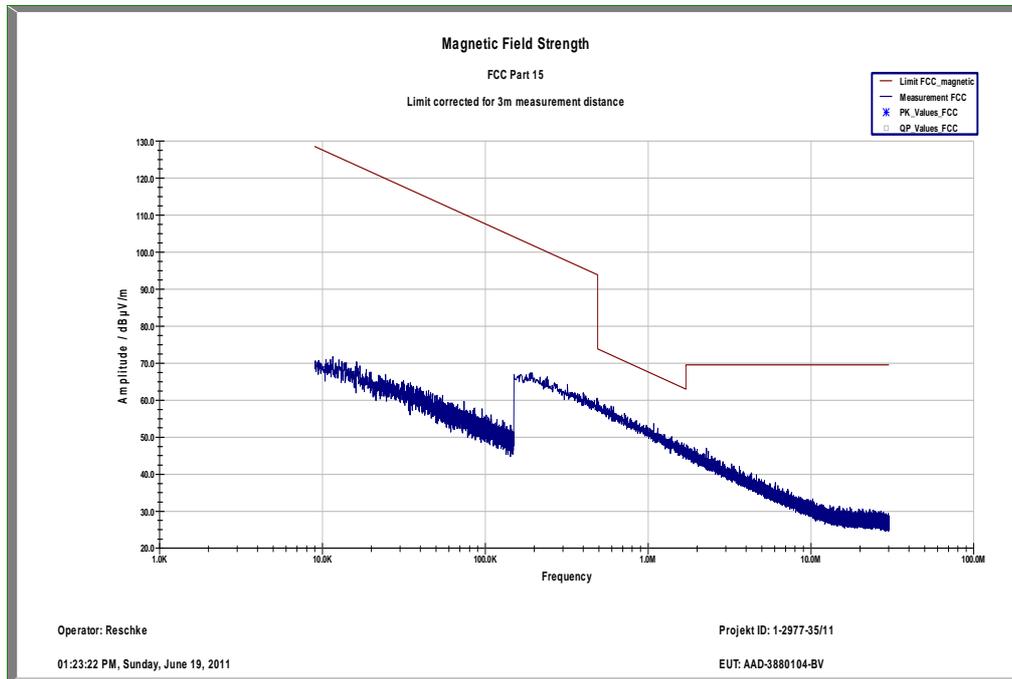
Plot 1: 9 kHz to 30 MHz / lowest channel



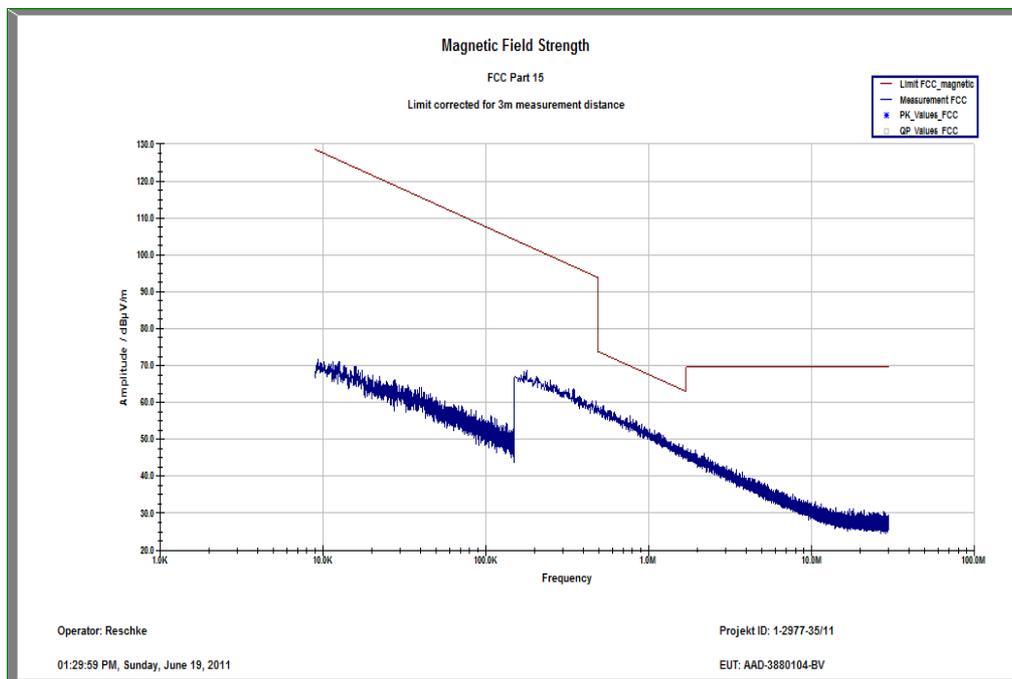
Plot 2: 9 kHz to 30 MHz / middle channel



Plot 3: 9 kHz to 30 MHz / highest channel



Plot 4: 9 kHz to 30 MHz / Idle mode



## 9.8 Spurious emissions conducted < 30 MHz

### Description:

Measurement of the conducted spurious emissions in transmit mode below 30 MHz. The EUT is set to middle channel and Idle mode. If critical peaks are found the lowest and highest channel will be measured too. Both power lines, phase and neutral line, are measured. Found peaks are remeasured with average and quasi peak detection to show compliance to the limits.

### Measurement:

Measurement parameter	
Detector:	Peak - Quasi Peak / Average
Sweep time:	Auto
Resolution bandwidth:	F < 150 kHz: 1 kHz F > 150 kHz: 100 kHz
Video bandwidth:	F < 150 kHz: 200 Hz F > 150 kHz: 9 kHz
Span:	9 kHz to 30 MHz
Trace-Mode:	Max Hold

### Limits:

FCC		IC	
CFR Part 15.107(a)		ICES-003, Issue 4	
TX Spurious Emissions Conducted < 30 MHz			
Frequency (MHz)	Quasi-Peak (dB $\mu$ V/m)	Average (dB $\mu$ V/m)	
0.15 – 0.5	66 to 56*	56 to 46*	
0.5 – 5	56	46	
5 – 30.0	60	50	

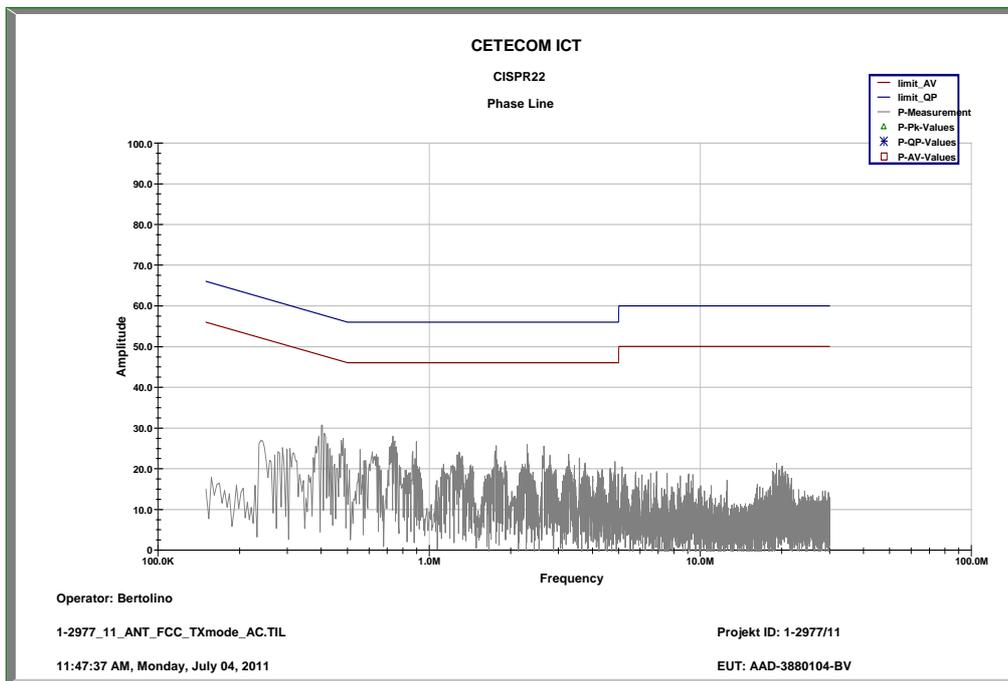
\*Decreases with the logarithm of the frequency

### Results:

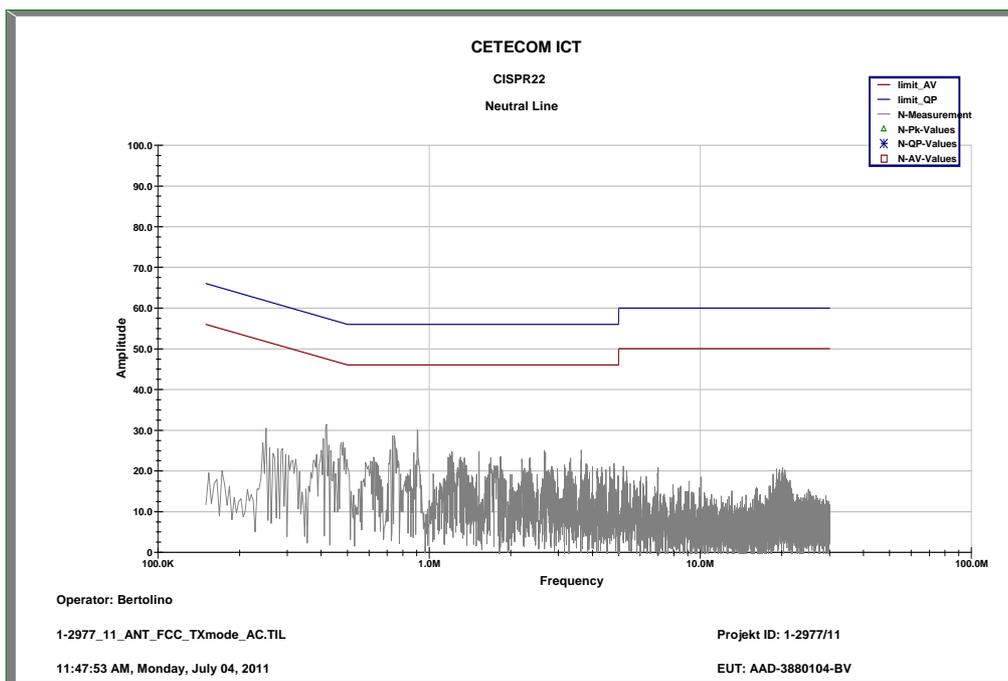
Spurious Emissions Conducted < 30 MHz [dB $\mu$ V/m]		
F [MHz]	Detector	Level [dB $\mu$ V/m]
No critical peaks found		
Measurement uncertainty	± 3 dB	

**Result:** The result of the measurement is passed.

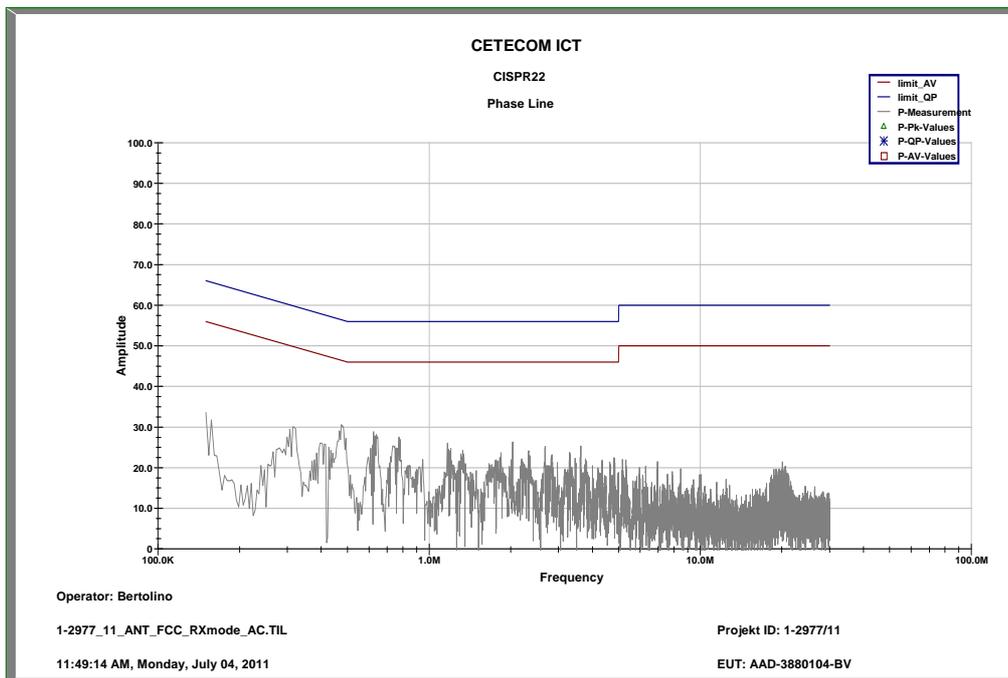
Plot 1: 9 kHz to 30 MHz / phase Line, TX mode



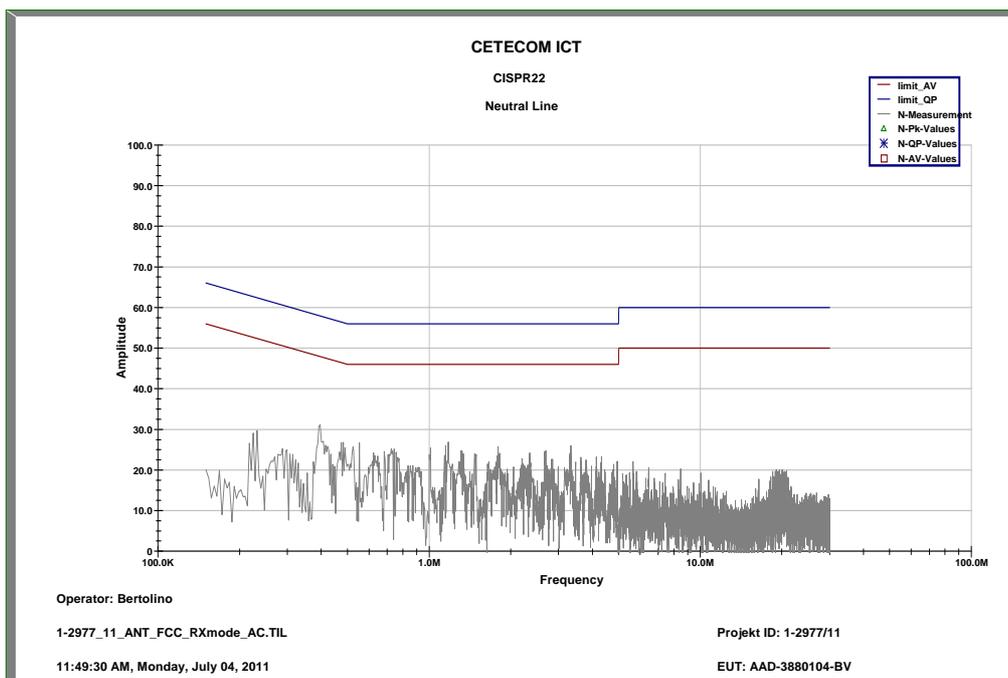
Plot 2: 9 kHz to 30 MHz / neutral Line, TX mode



Plot 3: 9 kHz to 30 MHz / phase Line, Idle mode



Plot 4: 9 kHz to 30 MHz / neutral Line, Idle mode



## 10 Test equipment and ancillaries used for tests

Typically, the calibrations of the test apparatus are commissioned to and performed by an accredited calibration laboratory. The calibration intervals are determined in accordance with the DIN EN ISO/IEC 17025. In addition to the external calibrations, the laboratory executes comparison measurements with other calibrated test systems or effective verifications. Weekly chamber inspections and range calibrations are performed. Where possible, rf-generating and signalling equipment as well as measuring receivers and analyzers are connected to an external high-precision 10 MHz reference (GPS-based or rubidium frequency standard).

In order to simplify the identification of the equipment used at some special tests, some items of test equipment and ancillaries can be provided with an identifier or number in the equipment list below (Labor/Item).

No.	Lab / Item	Equipment	Type	Manufact.	Serial No.	INV. No Cetecom	Kind of Calibration	Last Calibration	Next Calibration
1	n. a.	TRILOG Broadband Test-Antenna 30 MHz - 3 GHz	VULB9163	Schwarzbeck	371	300003854	vIKI!	17.12.2008	17.12.2011
2	50	DC power supply, 60Vdc, 50A, 1200 W	6032A	HP Meßtechnik	2920A04466	300000580	ne		
3	n. a.	software	SPS_PHE 1.4f	Spitzberger & Spieß	B5981; 5D1081;B5979	300000210	ne		
4	n. a.	EMI Test Receiver	ESCI 1166.5950.03	R&S	100083	300003312	k	05.01.2011	05.01.2013
5	n. a.	Analyser-Reference-System (Harmonics and Flicker)	ARS 16/1	SPS	A3509 07/0 0205	300003314	k	31.07.2009	31.07.2011
6	n. a.	Amplifier	JS42-00502650-28-5A	MITEQ	1084532	300003379	ev		
7	n. a.	Antenna Tower	Model 2175	ETS-LINDGREN	64762	300003745	izw		
8	n. a.	Positioning Controller	Model 2090	ETS-LINDGREN	64672	300003746	izw		
9	n. a.	Turntable Interface-Box	Model 105637	ETS-LINDGREN	44583	300003747	izw		
10	n. a.	TRILOG Broadband Test-Antenna 30 MHz - 3 GHz	VULB9163	Schwarzbeck	295	300003787	k	01.04.2010	01.04.2012
11	n. a.	Spectrum-Analyzer	FSU26	R&S	200809	300003874	k	10.01.2011	10.01.2013
12	n. a.	DC power supply, 60Vdc, 50A, 1200 W	6032A	HP Meßtechnik	2818A03450	300001040	Ve	08.01.2009	08.01.2012
13	n. a.	Coaxial Attenuator 30dB/500W	8325	Bird	1530	300001595	ev		
14	n. a.	Double-Ridged Waveguide Horn Antenna 1-18.0GHz	3115	EMCO	8812-3088	300001032	vIKI!	05.03.2009	05.09.2011
15	n. a.	Active Loop Antenna	6502	EMCO	2210	300001015	ne		
16	n. a.	Anechoic chamber	FAC 3/5m	MWB / TDK	87400/02	300000996		23.03.2009	
17	Spec.A. 2_2e	System rack for EMI measurement solution	85900	HP I.V.	*	300000222	ne		
18	9	Artificial Mains 9 kHz to 30 MHz	ESH3-Z5	R&S	828576/020	300001210	Ve	06.01.2010	06.01.2012
19	n. a.	Relais Matrix	3488A	HP Meßtechnik	2719A15013	300001156	ne		
20	n. a.	Relais Matrix	PSU	R&S	890167/024	300001168	ne		
21	n. a.	Isolating Transformer	RT5A	Grundig	9242	300001263	ne		
22	n. a.	Three-Way Power Splitter,	11850C	HP Meßtechnik		300000997	ne		

		50 Ohm							
23	n. a.	Switch / Control Unit	3488A	HP	2605e08770	300001443	ne		
24	n. a.	Amplifier	js42-00502650-28-5a	Parzich GMBH	928979	300003143	ne		
25	n. a.	Band Reject filter	WRCG1855/1910-1835/1925-40/8SS	Wainwright	7	300003350	ev		
26	n. a.	Band Reject filter	WRCG2400/2483-2375/2505-50/10SS	Wainwright	11	300003351	ev		
27	n. a.	TILE-Software Emission	Quantum Change, Modell TILE-ICS/FULL	EMCO	none	300003451	ne		
28	n. a.	Highpass Filter	WHKX2.9/18G-12SS	Wainwright	1	300003492	ev		
29	n. a.	Highpass Filter	WHK1.1/15G-10SS	Wainwright	3	300003255	ev		
30	n. a.	Highpass Filter	WHKX7.0/18G-8SS	Wainwright	18	300003789	ne		
31	n. a.	PSA Spectrum Analyzer 3 Hz - 26.5 GHz	E4440A	Agilent Technologies	MY48250080	300003812	k	08.09.2010	08.09.2012
32	n. a.	MXG Microwave Analog Signal Generator	N5183A	Agilent Technologies	MY47420220	300003813	k	13.09.2010	13.09.2012
33	n. a.	RF Filter Section 9kHz - 1GHz	N9039A	Agilent Technologies	MY48260003	300003825	vlKI!	08.09.2010	08.09.2012

**Agenda:** Kind of Calibration

k calibration / calibrated  
 ne not required (k, ev, izw, zw not required)  
 ev periodic self verification  
 Ve long-term stability recognized  
 vlKI! Attention: extended calibration interval  
 NK! Attention: not calibrated

EK limited calibration  
 zw cyclical maintenance (external cyclical maintenance)  
 izw internal cyclical maintenance  
 g blocked for accredited testing  
 \*) next calibration ordered / currently in progress