

TEST REPORT
No.: 2-20745197b/08

According to:
FCC Regulations
Part 15.239

for

Sony Ericsson Mobile Communications AB

Mobile Phone with integrated FM-Transmitter AAD-3052091-BV
FCC ID: PY7A3052091





Laboratory Accreditation and Listings			
 Deutscher Akkreditierungs Rat DAT-P176/94-02	 Reg. No.: 99538 MRA US-EU 0003	 Industry Canada Reg. No.: IC 3465	 Reg. No.: R-2665,R-2666 C-2914,T-339
accredited according to DIN EN ISO/IEC 17025			
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Table of contents

1. SUMMARY OF TEST RESULTS	3
1.1. TESTS OVERVIEW	3
2. ADMINISTRATIVE DATA	4
2.1. Identification of the testing laboratory	4
2.2. Test location	4
2.3. Organizational items	4
2.4. Applicant’s details	4
2.5. Manufacturer’s details	5
3. EQUIPMENT UNDER TEST (EUT)	6
3.1. Additional declaration and description of main EUT	6
3.2. Configuration of cables used for testing	6
3.3. EUT: Type, S/N etc. and short descriptions used in this test report	6
3.4. Auxiliary Equipment (AE): Type, S/N etc. and short descriptions	6
3.5. EUT set-ups	7
3.6. EUT operating modes	7
3.7. Parameter Settings on mobile phone and base station CMU200	8
4. DESCRIPTION OF TEST SET-UP’S	9
4.1. Test Set-up for conducted measurements	9
4.2. Test set-up for radiated measurements	10
5. MEASUREMENTS	11
5.1. 20 dB Bandwidth FCC 15.239 (a)	11
5.2. Field strength within the permitted 200kHz band FCC 15.239 (b)	14
5.3. Field strength outside of the specified 200kHz band FCC 15.239 (c)	16
5.4. Conducted emissions on AC-Power lines	19
5.5. Measurement uncertainties	21
6. INSTRUMENTS AND ANCILLARY	22
6.1. Used equipment “CTC”	22
7. PHOTOGRAPHS	26
8. MEASUREMENT DIAGRAMS	27
8.1. Conducted emissions on AC-Power lines (§15.207)	27
8.2. Electric field strength (§15.209&§15.239)	41
8.3. 20 dB Bandwidth	60

Annex

Total pages

PHOTOGRAPHS OF EQUIPMENT UNDER TEST, B_2_20745197B_A1_08	12
PHOTOGRAPHS OF MEASUREMENTS, B_2_20745197B_A2_08	4

1. Summary of test results

The test results apply exclusively to the test samples as presented in chapter 3.1. The CETECOM GmbH does not assume responsibility for any conclusions and generalizations taken in conjunction with other specimens or samples of the type of the item presented to tests.

Following tests have been performed to show compliance with applicable FCC Part 2 and Part 15, Subpart C (Intentional Radiators) of the FCC CFR 47 Rules:

1.1. TESTS OVERVIEW

TEST CASES	PORT	REFERENCES & LIMITS			EUT set-up	EUT operating mode	Result
		FCC Standard	RSS Section	TEST LIMIT			
TX-Mode							
20 dB Bandwidth	conducted	§15.239(a) §15.215(c) §2.1055	--	1.) within 88-108MHz band 2.) <200kHz BW	2	2+3	Passed
Field strength within the permitted 200kHz band	Cabinet	§15.239(b)	--	< 250µV/m	1	2+3+4	Passed
Field strength radiated outside 200kHz band	Cabinet	§15.239(c)	--	Limits according §15.209	1	2+3+4	Passed
AC-Power Lines Conducted Emissions	AC-Power lines	§15.207	--	FCC §15.207(a) Limits	3	1+3+4	Passed

.....
D. Franke
Responsible for testing laboratory



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.....
Dipl.-Ing. C. Lorenz
Responsible for test report

2. Administrative Data

2.1. Identification of the testing laboratory

Company name:	CETECOM GmbH
Address:	Im Teelbruch 116 45219 Essen - Kettwig Germany
Laboratory accreditations/Listings:	DAR-Registration No. DAT-P176/94-02 FCC-Registration No. 99538, MRA US-EU 0003 IC-Registration No. 3465 VCCI Registration No. R-2665,R-2666,C-2914,T-339
Responsible for testing laboratory:	Dipl.-Ing. W. Richter
Deputies:	Dipl.-Ing. H. Strehlow, D. Franke

2.2. Test location

2.2.1. Test laboratory "CTC"

Company name:	see chapter 2.1. Identification of the testing laboratory
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2.3. Organizational items

Order No.:	207 45197
Responsible for test report and project leader:	Dipl.-Ing. C. Lorenz
Receipt of EUT:	2008-04-10
Date(s) of test:	2008-04-11 – 2008-04-28
Date of report:	2008-05-07

Version of template:	08.04

2.4. Applicant's details

Applicant's name:	Sony Ericsson Mobile Communications AB
Address:	Nya Vattentornet 22188 Lund SWEDEN
Contact person:	Mr. Bo Johansson

2.5. Manufacturer's details

Manufacturer's name:	please see Applicant's details
Address:	please see Applicant's details

3. Equipment under test (EUT)

3.1. Additional declaration and description of main EUT

Main function	GSM Mobile Phone with FM transmitter		
Type	AAD-3052091-BV		
FM Frequency range	88.2-107.8Hz		
Type of modulation	FM		
Number of channels	Tested: 3		
EMISSION DESIGNATOR(S)	--		
Antenna Type	Integrated		
MAX Field strength (radiated):	45.2 dB μ V/m@3m distance and 88.2 MHz		
FCC-ID	PY7A3052091		
Installed option	--		
Special EMI components	--		
EUT sample type	<input type="checkbox"/> Production	<input type="checkbox"/> Pre-Production	<input checked="" type="checkbox"/> Engineering

3.2. Configuration of cables used for testing

The main EUT A was connected to power supplying accessories, like AE 1 and AE 4 over the standard multiconnector.

3.3. EUT: Type, S/N etc. and short descriptions used in this test report

Short description*)	EUT	Type	S/N serial number	HW hardware status	SW software status
EUT A	Mobile Phone with integrated FM-Transmitter	AAD-3052091-BV	CB510YGH28 IMEI: 00440107- 273586-9	AP1	R3CA001

*) EUT short description is used to simplify the identification of the EUT in this test report.

3.4. Auxiliary Equipment (AE): Type, S/N etc. and short descriptions

AE short description *)	Auxiliary Equipment	Type	S/N serial number	HW hardware status	SW software status
AE 1	DC-Adapter	CAA-000-2003	#4748	--	--
AE 2	Battery	BST-38	816666PTMDL S 07W46	--	--
AE 3	Dummy Battery	--	--	--	--
AE 4	AC-Adapter	CAA-002001-BV	9550	--	--

*) AE short description is used to simplify the identification of the auxiliary equipment in this test report.

3.5.EUT set-ups

EUT set-up no.*)	Combination of EUT and AE	Remarks
Set. 1	EUT A + AE1 + AE 2	--
Set. 2	EUT A + AE 3	Used for 20 dB Bandwidth measurement and variations of power supply voltage
Set. 3	EUT A + AE2 + AE 4	Used conducted emission measurements

*) EUT set-up no. is used to simplify the identification of the EUT set-up in this test report.

3.6. EUT operating modes

EUT operating mode no.*)	Description of operating modes	Additional information
op. 1	GSM 850 Idle mode BCCH 182	The mobile station is synchronized to the Broadcast Control Channel (BCCH) and listening to the Common Control Channel (CCCH). MCC country code=310 set-up on base simulators side.
op. 2	GSM 1900 Idle mode BCCH 651	The mobile station is synchronized to the Broadcast Control Channel (BCCH) and listening to the Common Control Channel (CCCH). MCC country code=310 set-up on base simulators side.
op. 3	FM-Transmit Mode	The FM Transmitter is set to certain transmission frequency within the operational range and broadcast an modulated carrier only. The EUT was set to lowest (88.2MHz), middle (98.0 MHz) and highest (107.8MHz) possible working frequency within the assigned operational band. For the tests a signal of 1kHz was used during the tests.
op. 4	Charging battery	Charging standard battery. This operating mode is combined with other op. modes.

*) EUT operating mode no. is used to simplify the test report.

3.7. Parameter Settings on mobile phone and base station CMU200

The mobile phone is registered to a simulated GSM network during the tests. Because the FM regulations are different in each country, the software of mobile phone takes the MCC setting (Mobile Country Code) into considerations when making the settings of the FM transmitter. The typical settings for FM-testing were set-up according applicants indications.

Following GSM typical settings apply to the MS during the measurements:

Parameter	Traffic Mode	Idle Mode
Traffic Channels mobile station	GSM 850 TCH _{MS} = 128 / 192 / 251 GSM 1900 TCH _{MS} = 512 / 681 / 810	--
maximum power step (PCL)	GSM 850: PCL = 5 (2 Watt) GSM 1900: PCL = 0 (1 Watt)	--
Modulation	GSM: GMSK-Modulation Scheme EDGE: 8-PSK Modulation Scheme	--
DTX	off	--
Bitstream	PRBS 2E9-1 (pseudo-random-sequence) – CCITT 0.153	--
Timeslot	3	--
Hopping	off	--
Timeslot (slot mode)	single	--
Maximum data transmission rate, single time slot	GSM: 17,6 kBit/s Slot EDGE: 59,2 kBit/s Slot	--
Speech transcoding (Traffic Mode)	Full rate Version 1	--
Mode	BCCH and TCH	--
BCCH – base station (CMU,CMD)	Channel 661	GSM 850: 182 GSM1900: 651
TCH – base station (CMD, CMU)	auto	--
Power level TCH – base station (used timeslot level)	- 70 dBm	--
Power level BCCH – base station (control channel level)	- 80 dBm	-80 dBm
External attenuation RF/AF-Input/Output	Accord. calibration prior to measurements	--
P/PCL	3 channels	
Mobile country code (MCC)	310	310
BS AG BLKS RES	Not applicable	0
Paging reorganisation		Off (0)
Signalling channel		SDCCH
Location Update		Auto
Cell access		Disabled (barred)

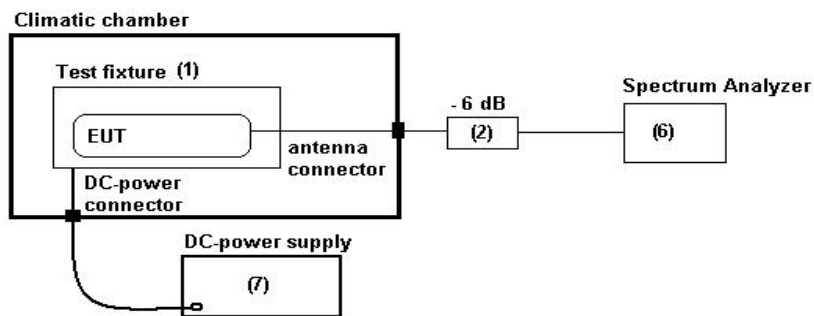
Settings for CMU (general)

4. DESCRIPTION OF TEST SET-UP'S

4.1. Test Set-up for conducted measurements

The following test set-up schematic apply for tests performed inside the climatic chamber such as frequency stability or modulation bandwidth.

In case **an external connector (test fixture) is not available**, the coupling unit consists of a near-field antenna which is directly connected to the spectrum analyzer. The power level calibration of the spectrum analyzer is related to the power levels (field strengths) of the carrier determined in the anechoic-chamber.



Schematic: Test set-up conducted within climatic chamber

4.2. Test set-up for radiated measurements

The radiated emissions from the test device are measured first as exploratory measurement in a FCC recognized semi anechoic chamber (registration no 99538) or fully anechoic chamber with the dimensions of 8.05m x 6.85m x 5.48m. Very critical frequencies within a defined range, can be re-checked on CETECOM's Open Area Test side, recognized by the FCC to be compliant with ANSI 63.4: 2001.

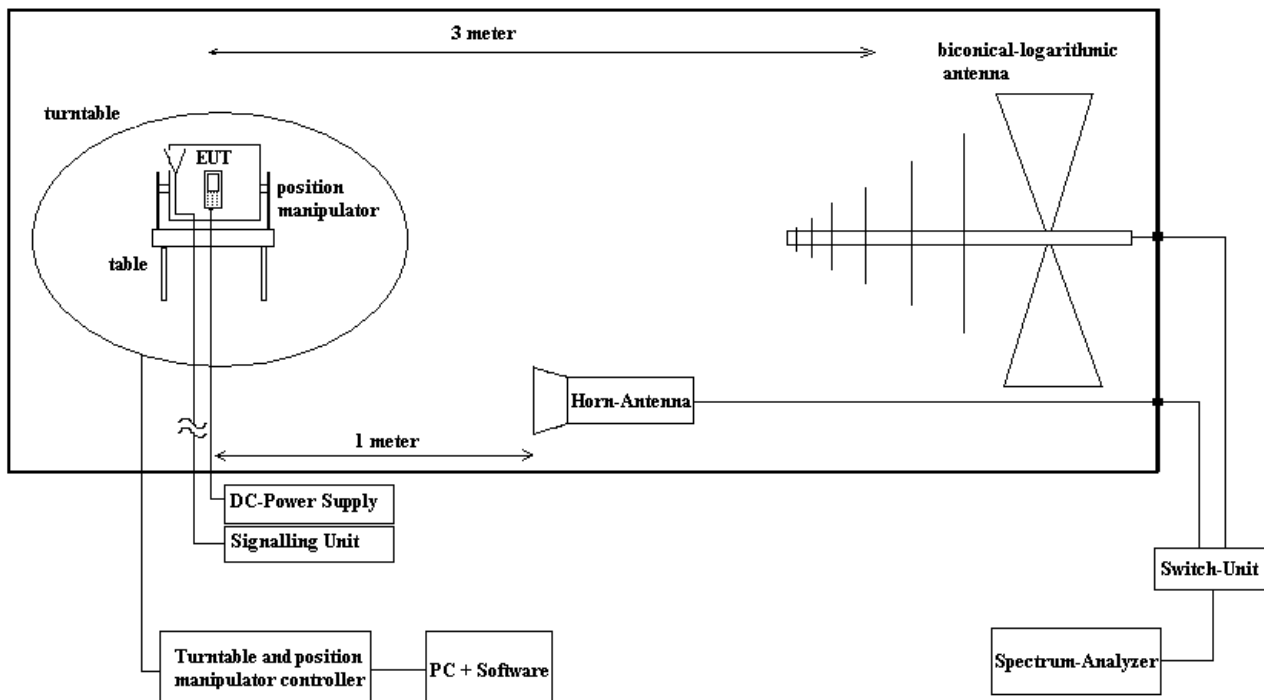
The EUT and accessories are placed on a non-conducting tipping table of 0.8 meter height (semi-anechoic chamber) or 1.55m height (fully-anechoic chamber) which is situated in the middle of the turntable. The turntable can rotate the device under test 360 degree, the tipping table can rotate the device from laid to standing position. This way the device under test can be rotated in all three orthogonal planes in order to maximize the detected emissions. The antenna height is raised and lowered in the range 1m to 4 meters. The turn-, tipping table and antenna height are controlled by a controller unit. All positions manipulations are software controlled from a operator PC.

The measurements are performed for both receiving antenna polarisations: vertical and horizontal.

Up to 18GHz a measurement distance of 3 meters is used, above 18GHz the distance is 1meter. A biconical-logarithmic antenna up to 1 GHz and a horn antenna for frequencies above 1 GHz used. (see equipment list)

The EUT is powered either by a external DC-supply with nominal voltage or a AC/DC power supply as accessory. The communication signalling is performed from outside the chamber with a communication test simulator (CMU200 from Rohde&Schwarz) by airlink.

Anechoic Chamber



Schematic: radiated measurements test set-up

5. Measurements

5.1. 20 dB Bandwidth

FCC 15.239 (a)

STANDARDS

15.239 (a): *Emissions from the intentional radiator shall be confined within a band 200kHz wide centered on the operating frequency. The wholly 200kHz band shall lie wholly within the frequency range of 88-108MHz.*

15.215 (c): *..must be designed to ensure that the 20dB bandwidth of the emission.. is contained within the frequency band designated..*

..includes the effects from frequency sweeping, frequency hopping and other modulation techniques that may be employed as well as frequency stability of the transmitter over expected variations in temperature and supply voltage.

TEST METHOD

The test is performed at normal test conditions as well as extreme conditions in the climatic chamber, with the set-up described in chapter 4.1.

The extreme temperature conditions were performed in temperature steps of 10°C over the applicants declared temperature range of the equipment. This was combined with EUT's declared extreme power supply voltage range.

The power level calibration of the spectrum analyzer is related to the power levels (field strengths) as determined in chapter 15.239(b) This way the readings in the climatic chamber are correlated to the results in the anechoic chamber. This procedure is done for all three channels separately before reading the final results.

For determining the required bandwidth following settings of the spectrum analyzer have been used.

- Span frequency: 2 to 3 times the 20dB bandwidth
- Detector: PEAK
- TRACE Max Hold
- RBW=1kHz (approx 1% of the 20dB bandwidth), VBW = 3 kHz
- Sweet time = auto
- Use the integrated spectrum analyzer function *20dB DOWN* to capture the 20dB lower emissions at left and right side of the nominal carrier.

RESULTS

Lowest channel = 88.2 MHz
 Set-up 2, Op. mode 2+3

Ambient conditions [°C]	Voltage conditions [V]	Result 20 dB-BW [kHz]	Lowest Frequency within assigned operating band (FL)	
			Highest frequency within assigned operating band (FH)	
T _{NOM} (21)°C	V _{NOM} (4.0)V	178,3653	FL	88,110576923 MHz
			FH	88,288942308 MHz
T _{MIN} (-10)°C	V _{MIN} (3.4)V	178,3653	FL	88,110096154 MHz
			FH	88,288461538 MHz
	V _{MAX} (4.0)V	178,3653	FL	88,108173077 MHz
			FH	88,286538462 MHz
T _{MAX} (+50)°C	V _{MIN} (3.4)V	177,8846	FL	88,111057692 MHz
			FH	88,288942308 MHz
	V _{MAX} (4.0)V	178,8461	FL	88,107692308 MHz
			FH	88,286538462 MHz

Remark: --

Lowest Frequency within assigned operating band (FL) = 88,107692308 MHz at T=50°C, V_{MAX} (see diagrams)

Middle channel = 98MHz
 Set-up 2, Op. mode 2+3

Ambient conditions [°C]	Voltage conditions [V]	Result 20 dB-BW [kHz]	Lowest Frequency within assigned operating band (FL)	
			Highest frequency within assigned operating band (FH)	
T _{NOM} (21)°C	V _{NOM} (4.0)V	175,4807	FL	97,913461538 MHz
			FH	98,088942308 MHz
T _{MIN} (-10)°C	V _{MIN} (3.4)V	175,0000	FL	97,911057692 MHz
			FH	98,086057692 MHz
	V _{MAX} (4.0)V	175,4807	FL	97,910096154 MHz
			FH	98,085576923 MHz
T _{MAX} (+50)°C	V _{MIN} (3.4)V	174,5192	FL	97,912980769 MHz
			FH	98,087500000 MHz
	V _{MAX} (4.0)V	174,0384	FL	97,910576923 MHz
			FH	98,084615385 MHz

Remark: --

Highest channel = 107.8 MHz
 Set-up 2, Op. mode 2+3

Ambient conditions [°C]	Voltage conditions [V]	Result 20 dB-BW [kHz]	Lowest Frequency within assigned operating band (FL)	
			Highest frequency within assigned operating band (FH)	
T _{NOM} (21)°C	V _{NOM} (4.0)V	175,0000	FL	107,712980769 MHz
			FH	107,887980769 MHz
T _{MIN} (-10)°C	V _{MIN} (3.4)V	172,5961	FL	107,713461538 MHz
			FH	107,886057692 MHz
	V _{MAX} (4.0)V	173,5576	FL	107,712980769 MHz
			FH	107,886538462 MHz
T _{MAX} (+50)°C	V _{MIN} (3.4)V	173,0769	FL	107,712019231 MHz
			FH	107,886538462 MHz
	V _{MAX} (4.0)V	173,5576	FL	107,711538462 MHz
			FH	107,885096154 MHz

Remark: --

Highest frequency within assigned operating band (FH) = 107,888942308 MHz at T=30°, V_{MIN} (not included in the table, see therefore diagrams)

AMBIENT ENVIRONMENTAL CONDITIONS

Temperature	22,1 °C
Relative Humidity	32 %
Air pressure	990 hPa

TEST EQUIPMENT

Used equipment (see reference in the annex)
431 (Near field probe)
489 (EMI test receiver ESU40)
298 (R&S CMU 200 GSM base simulator)
354 (Power supply R&S)

**5.2. Field strength within the permitted 200kHz band
15.239 (b)**

FCC

STANDARDS

15.239 (b): the field strength of any emissions within the permitted 200kHz band shall not exceed 250µV/m at 3 meters...The provisions in §15.35 for limiting peak emissions apply.

TEST METHOD

The test is performed in a semi-anechoic room as described in chapter 4.2.

The EUT was placed on a non-conductive position manipulator (tipping device) of 0.8 m height. By rotating the turntable angle (range 0° to 360°), the EUT itself in 3-orthogonal axis and the measurement antenna height from 1 meter to 4 meters, the maximized emissions for the TX-carrier are recorded. This measurements are performed for both polarizations of the measuring antenna: horizontal and vertical.

EMI-RECEIVER SETTINGS

Span	2..3 times the 20dB Bandwidth of the tested signal
Detector/ Mode	PEAK, TRACE max-hold, repetitive scan AV and PK for final result
RBW/ VBW	120 kHz / (auto)
Sweep-Time	Coupled (calibrated display)

RESULTS

Lowest channel=88.2MHz (clampshell open)

Set-up 1, Op. mode 2+3+4

Frequency [MHz]	Antenna Polarisation	Receiver Reading (R _R) [dBµV/m]		Correction factor (C _F)	Field strength of Carrier within 200kHz permitted Band [dBµV/m]		Limits (L _T) [dBµV/m]		Margin (M) [dBµV/m]		Remarks
		PK	AV		PK	AV	PK	AV	PK	AV	
		88,2	V		39,8	35,7	9,5	49,3	45,2	67,9	
	H	37,0	32,5	46,5	42,0	21,4		5,9			

Middle channel=88,2MHz (clampshell closed)

Set-up 1, Op. mode 2+3+4

Frequency [MHz]	Antenna Polarisation	Receiver Reading (R _R) [dBµV/m]		Correction factor (C _F)	Field strength of Carrier within 200kHz permitted Band [dBµV/m]		Limits (L _T) [dBµV/m]		Margin (M) [dBµV/m]		Remarks
		PK	AV		PK	AV	PK	AV	PK	AV	
		88,2	V		39,3	35,1	9,5	48,8	44,6	67,9	
	H	32,5	27,4	42,0	36,9	25,9		11			

Remark: not worst-case configuration, so further tests have been performed only with clampshell opened

Middle channel=98MHz (clampsell open)

Set-up 1 , Op. mode 2+3+4

Frequency [MHz]	Antenna Polarisation	Receiver Reading (R _R) [dBμV/m]		Correction factor (C _F)	Field strength of Carrier within 200kHz permitted Band [dBμV/m]		Limits (L _T) [dBμV/m]		Margin (M) [dBμV/m]		Remarks
		PK	AV		PK	AV	PK	AV	PK	AV	
		98,0	H		36,2	31,7	10,7	46,9	42,4	67,9	
	V	37,3	32,8	48,0	43,5	19,9		4,6			

Highest channel=107.8 MHz

Set-up 1, Op. mode 2+3+4

Frequency [MHz]	Antenna Polarisation	Receiver Reading (R _R) [dBμV/m]		Correction factor (C _F)	Field strength of Carrier within 200kHz permitted Band [dBμV/m]		Limits (L _T) [dBμV/m]		Margin (M) [dBμV/m]		Remarks
		PK	AV		PK	AV	PK	AV	PK	AV	
		107,8	V		37,2	33,0	11,9	49,1	44,9	67,9	
	H	35,4	30,9	47,3	42,8	20,6		5,1			

Margin to Limit:

$$M = L_T - R_R + C_F + D_F$$

$$= L_T - (AF_{ANTENNA} + Cable_{LOSS}) + D_F$$

Remark: positive margin means passed result

Abbreviations used:

- R_R : Receiver readings in dBμV/m
- C_F: Transducer in dB = AF (antenna factor) + CL (cable loss)
- D_F : distance correction factor (if different measurement distance used than specified in the standard)
- L_T : Limit in dBμV/m

AMBIENT ENVIRONMENTAL CONDITIONS

Temperature	24 °C
Relative Humidity	38 %
Air pressure	985 hPa

TEST EQUIPMENT

Used equipment (see reference in the annex)
289 (CBL 6141)
377 (Emi test receiver ESCS 30)
441 (System CTC-SAR-EMI)
482 (Filtermatrix SAR1)

5.3. Field strength outside of the specified 200kHz band
15.239 (c)

FCC

STANDARDS

15.239 (c): the field strength of any emissions radiated on any frequency outside of the specified 200kHz band shall not exceed the general radiated emission limits in §15.209.

TEST METHOD

The test were performed in a NSA compliant semi-anechoic room as described in chapter 4.2

1. **Step (Pre-)Measurement in semi anechoic-chamber (30 MHz<f <1 GHz) exploratory measurement:** The EUT was placed on a non-conductive position manipulator (tipping device) of 0.8 m height. By rotating the turntable angle (range 0° to 360°) and the EUT itself in 3-orthogonal axis, the emission spectrum of the device under test was recorded with Peak-Detector. This measurements are performed for both polarizations of the measuring antenna: horizontal and vertical. The results are documented in a diagram. Critical frequencies (margin lower then 6dB to limit) are saved within a data reduction table for further investigations.
2. **Step: final measurement on most critical frequencies:** In a second step, the emissions are maximized for the most critical frequencies. First a frequency zoom around the critical frequency is done to locate the frequency more precisely. After this step, for all identified critical frequencies, the turntable rotated within the range 0° to 360° and the measurement antenna height from 1 meter to 4 meters changed. On the determined worst-case position, a final measurement with QP/AV-detector has been carried out.

EMI-RECEIVER SETTINGS

Frequency range	30 MHz to 1.1 GHz
Detector/ Mode	PEAK, TRACE max-hold, repetitive scan Quasi-Peak, for final measurement (f<1GHz) Average, for final measurement (f>1Ghz)
RBW/ VBW	120 kHz / (auto)
Sweep-Time	Coupled (calibrated display)

RESULTS

Lowest channel=88.2 MHz

Set-up No.		1							
Operating Mode		2+3+4							
Diagram no.	Polarisation	Frequency [MHz]	Receiver readings (R _R) [dBμV/m]	Correction factor (C _F) [dB]	Corrected value dBμV/m	Limit (L _T) [dBμV/m]	Margin (M) [dB]	Verdict	Remarks
						QP			
2.06	H/V	Noise floor	--	--	--	--	--	Passed	FM-Carrier at 88.2MHz
2.07/ 2.08	V/H	Noise floor	--	--	--	--	--	Passed	Vertical and horizontal EUT position performed in separated scans
2.13	--	--	--	--	--	--	--	Passed	Overview measurements ^{1.)} with reduced resolution bandwidth (RBW=1kHz)

Remarks: 1.) performed with set-up described in chapter 4.1, in order to identify possible emissions very near to the band-edge (out-of band emissions) which can not be identified in the presence of the carrier with high measurement RBW

Middle channel=98 MHz

Set-up No.		1							
Operating Mode		2+3+4							
Diagram no.	Polarisation	Frequency [MHz]	Receiver readings (R _R) [dBμV/m]	Correction factor (C _F) [dB]	Corrected value dBμV/m	Limit (L _T) [dBμV/m]	Margin (M) [dB]	Verdict	Remarks
						QP			
2.05	H/V	Noise floor	--	--	--	--	--	Passed	FM-Carrier at 98.0 MHz
2.09/ 2.10	H/V	Noise floor	--	--	--	--	--	Passed	Vertical and horizontal EUT position performed in separated scans

Highest channel=107.8 MHz

Set-up No.		1							
Operating Mode		2+3+4							
Diagram no.	Polarisation	Frequency [MHz]	Receiver readings (R _R) [dBμV/m]	Correction factor (C _F) [dB]	Corrected value dBμV/m	Limit (L _T) [dBμV/m]	Margin (M) [dB]	Verdict	Remarks
						QP			
2.04	H/V	Noise floor	--	--	--	--	--	Passed	FM-Carrier at 107.8 MHz
2.11/ 2.12	H/V	Noise floor	--	--	--	--	--	Passed	Vertical and horizontal EUT position performed in separated scans
2.14	--	--	--	--	--	--	--	Passed	Overview measurements ¹⁾ with reduced resolution bandwidth (RBW=1kHz)

Remarks: 1.) performed with set-up described in chapter 4.1, in order to identify possible emissions very near to the band-edge (out-of band emissions) which can not be identified in the presence of the carrier with high measurement RBW

<p>Margin to Limit:</p> $M = L_T - R_R + C_F + D_F$ $= L_T - R_R + (AF_{ANTENNA} + Cable_{LOSS}) + D_F$ <p>Remark: positive margin means passed result</p>	<p>Abbreviations used:</p> <ul style="list-style-type: none"> • R_R : Receiver readings in dBμV/m • C_F: Transducer in dB = AF (antenna factor) + CL (cable loss) • D_F : distance correction factor (if different measurement distance used than specified in the standard) • L_T : Limit in dBμV/m
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LIMITS - SECTION 15.209: RADIATED EMISSION LIMITS, GENERAL REQUIREMENTS FOR INTENTIONAL RADIATORS

Frequency [MHz]	Field strength		Measurement distance [meters]	Remarks
	[μ V/m]	[dB μ V/m]		
0,009 – 0,490	2400/F (kHz)	67,6 – 20Log(F)	300	Due to reduced measurement distance, corrections factors were used.
0,490 – 1,705	24000/F (kHz)	87,6 – 20 Log(f)	30	
1,705 – 30,0	30	29,54	30	
30 – 88	100	40	3	
88 – 216	150	43,5	3	
216 – 960	200	46	3	
Above 960	500	54	3	

AMBIENT ENVIRONMENTAL CONDITIONS

Temperature	22,8 °C
Relative Humidity	42 %
Air pressure	990 hPa

TEST EQUIPMENT

Used equipment (see reference in the annex)
289 (CBL 6141)
133 (EMCO 3115)
377 (EMI test receiver ESCS30)
489 (EMI test receiver ESU40)
441 (System CTC-SAR-EMI)
482 (Filtermatrix SAR1)
443 (System CTC-FAR-EMI-Spuri)

5.4. Conducted emissions on AC-Power lines

Standards: **Part 15, Subpart B, §15.207, ANSI C63.4**

Devices which can be connected to the public AC-power network, should be tested against the radio frequency voltage conducted back into the AC-power line in the frequency range 150kHz to 30 MHz. Compliance should be tested by measuring the radio frequency voltage between each power line and ground at the power terminals in the stated frequency range.

A 50Ohm/50µH line impedance stabilization network (LISN) is used therefore. The EUT power input leads are connected through the LISN to the AC-power source. The LISN enclosure is electrically connected to the GND-plane. The measuring instrument is connected to the coaxial output of the LISN.

Measurement procedures and test set-up

Tabletop devices were set-up on a 80 cm height over reference ground plane, floor standing equipment 10 cm raised above ground plane.

Measurements have been performed on each phase line and neutral line of the devices AC-power lines. The EUT was power supplied with 110 V/60Hz.

The EUT was tested in the defined operating mode and installed (connected) to accessory equipment according the general description of use given by the applicant. The tests have been performed with a empty battery on the beginning of the tests.

Preliminary testing as a first step, determines the worst-case phase line (neutral or phase) as well as the most critical amplitude by changing the operating mode or cable positions of the test sample set-up. A complete frequency-sweep is performed with PK-Detector.

Final testing for power phases and critical frequencies (Margin to AV- or QP limit lower than 3dB) as a second step includes measurements either on discrete frequency components with receivers detector set to Quasi-Peak and Average per frequency component or a complete sweep over the frequency range.

EMI-Receiver (Analyzer) Settings

Span/ Range	150 kHz .. 30 MHz
Detector/ Mode	PEAK-hold, repetitive scan for preliminary testing Quasi-Peak Detector and Average-Detector for final measurement (ANSI 63.4, CISPR 16)
RBW	10 kHz

Results

Set-up no.	3						
Operating Mode	1+3+4 / (Channel = 98.9MHz)						
Frequency [MHz]	Power lead	Readings on SA. (R _R) [dBµV]	Used Detector			Margin (M) [dB]	Verdict
			PK	QP	AV		
0.15-30 MHz	N/L1	See diagram 1.1	X	--	--	< 3dB to AV-Limit	Final measurement necessary with AV detector
	N	See diagram 1.6	--	--	X	>3dB to AV-limit	Passed
	L1	See diagram 1.7	--	--	X	>3dB to AV-limit	Passed

Remarks: See diagrams enclosed in the annex

Set-up no.		3					
Operating Mode		1+3+4 / (Channel = 88.2MHz)					
Frequency [MHz]	Power lead	Readings on SA. (R _R) [dBμV]	Used Detector			Margin (M) [dB]	Verdict
			PK	QP	AV		
0.15-30 MHz	N/L1	See diagram 1.2	X	--	--	< 3dB to AV-Limit	Final measurement necessary with AV detector
	L1	See diagram 1.4	--	--	X	>3dB to AV-limit	Passed
	N	See diagram 1.5	--	--	X		

Remarks: See diagrams enclosed in the annex

Set-up no.		3					
Operating Mode		1+3+4 / (Channel = 107.8MHz)					
Frequency [MHz]	Power lead	Readings on SA. (R _R) [dBμV]	Used Detector			Margin (M) [dB]	Verdict
			PK	QP	AV		
0.15-30 MHz	N/L1	See diagram 1.3	X	--	--	> 3dB to AV-limit	Margin > 3 dB, final measurement not necessary (not worst-case op. Mode)

Remarks: See diagrams enclosed in the annex

Margin to Limit for verdict: $M = L_T - R_R + C_{Loss}$

Abbreviations used:

- R_R : Receiver readings in dBμV
- C_{Loss}: Cable loss
- L_T : Limit in dBμV

Positive Margin means passed result

Limits

Section 15.207: conducted emission limits

Frequency [MHz]	Conducted limit [dBμV]	
	QUASI-Peak	AVERAGE
0.15 – 0.5	66 to 56*	56 to 46*
0.5 – 5	56	46
5 – 30	60	50

Remark: * decreases with the logarithm of the frequency

Summary of test results

- pls. See diagrams enclosed in the annex of this test report

Ambient environmental conditions

Temperature	24 °C
Relative Humidity	31 %
Air pressure	999 hPa

Test equipment

Used equipment (see reference in the annex)
001, 005, 340

5.5. Measurement uncertainties

The reported uncertainties are calculated based on the standard uncertainty multiplied with the appropriate coverage factor **k**, such that a confidence level of approximately 95% is achieved.

For uncertainty determination, each component used in the concrete measurement set-up was taken in account and it's contribution to the overall uncertainty according it's statistical distribution calculated.

Following table shows expectable uncertainties for each measurement type performed.

Measurement	Frequency range	Calculated uncertainty based on a confidence level of 95%	Remarks:
RF-Power Output conducted	9 kHz .. 20 GHz	1 dB	--
RF-Power Output radiated	30 MHz .. 4 GHz	3,17 dB	Substitution method
Conducted RF-emissions on antenna ports	9 kHz .. 20 GHz	1 dB	--
Radiated RF-emissions enclosure	150 kHz .. 30 MHz	5 dB	Magnetic field
	30 MHz .. 1 GHz	4,2 dB	E-Field
	1 GHz .. 20 GHz	3.17 dB	Substitution method
Occupied bandwidth	9 kHz .. 4 GHz	0,1272 ppm (Delta Marker method)	Frequency error
		1 dB	Power
Emission bandwidth	9 kHz .. 4 GHz	0,1272 ppm (Delta Marker method)	Frequency error
		1 dB	Power
Frequency stability	9 kHz .. 20 GHz	0,0636 ppm	--
Conducted emissions on AC-mains port (U _{CISPR})	9 kHz .. 150 kHz	4 dB	--
	150 kHz .. 30 MHz	3.6 dB	

Table : measurement uncertainties, valid for conducted/radiated measurements

6. Instruments and Ancillary

6.1. Used equipment “CTC”

The “Ref.-No” in the left column of the following tables allows the clear identification of the laboratory equipment.

6.1.1. Test software and firmware of equipment

Ref.-No	Equipment	Type	Serial-No.	Version of Firmware or Software during the test
001	emi test receiver	ESS	825132/017	Firm.= 1.21 , OTP=2.0, GRA=2.0
012	signal generator (EMS-cond.)	SMY 01	839069/027	Firm.= V 2.02
013	power meter (EMS cond.)	NRVD	839111/003	Firm.= V 1.51
017	Communication Tester	CMD 60 M	844365/014	Firmware = V 3.52 .22.01.99, DECT Firmware D2.87
053	audio analyzer	UPA3	860612/022	Firm. V 4.3
119	RT harmonics analyser/dig. flickermeter	B10	G60547	Firm.= V 3.1DHG
120	spectrum analyzer	FSEM 30	845538/011	Bios=2.1, Analyzer-Firmware= 3.30.3
140	signal generator	SMHU	831314/006	Firm.= 3.21
261	thermal power sensor	NRV-Z55	825083/0008	EPROM-Datum 02.12.04, SE EE 1 B
262	power meter	NRV-S	825770/0010	Firm.= 2.6
263	signal generator	SMP 04	826190/0007	Firm.=3.21
264	spectrum analyzer	FSEK 30	826939/005	Bios=2.1, Analyzer= 3.20
277	Vector-Networkanalyzer	ZVC	831363/0005	Bios= 3.3, Analyzer=3.52
295	Racal Digital Radio Test Set	6103	1572	UNIT Firmware= 4.04, SW-Main=4.04, SW-BBP=1.04,
298	Radio Communication Tester	CMU 200	832221/091	R&S Test Firmware =3.53 /3.54 (current Testsoft. f.
323	Communication Tester	CMD 55	825878/034	Firm.= 3.52 .22.01.99
331	climatic test chamber -40/+80 Grad	HC 4055	43146	TSI 1.53
335	System-CTC-EMS-Conducted	System EMS Conducted	-	EMS-K1 Immunity Test-Software 1.20SR10
340	Communication Tester	CMD 55	849709/037	Firm.= 3.52 .22.01.99
355	power meter	URV 5	891310/027	Firm.= 1.31
365	10V Insertion Unit 50 Ohm	URV5-Z2	100880	Eprom Data = 31.03.08
366	Ultra Compact Simulator	UCS 500 M4	V0531100594	Firm. UCS 500=001925/3.06a02, rc=ISMIEC 4.10
377	emi test receiver	ESCS 30	100160	Firm.= 2.29, OTP= 02.01, GRA= 02.36
378	broadband RF field monitor	RadiSense III	03D00013SNO-08	Firm.= V.03D13
383	signal generator	SME 03	842 828 /034	Firm.= 4.61
389	digital multimeter	Keithley 2000	0583926	Firm. = A13 (Mainboard) A02 (Display)
392	Radio Communication Tester	MT8820A	6K00000788	Firm.= 4.50 #005, IPL=4.01#001, OS=4.02#001,
420	System CTC CTIA-OTA	System CTC CTIA-OTA	-	EMQuest EMQ-100 Ver. 1.05
436	Radio Communication Tester	CMU 200	103083	R&S Test Firmware =4.52 (current Testsoft. f. all band
441	System CTC-SAR-EMI	System EMI field (SAR)	-	EMC 32 Version 6.10. 3, ESXS-K1 Version 2.20
442	System CTC-SAR-EMS	System EMS field (SAR)	-	EMS-K1 Immunity-Software 1.20SR10
443	System CTC-FAR-EMI-Spuri	System CTC-FAR-EMI-	-	Spuri 6.4a und Spuri 7.0
444	System CTC FAR-EMS	System EMS-Field (FAR)	-	EMS-K1 Immunity-Software 1.20SR10
460	Radio Communication Tester	CMU 200	108901	R&S Test Firmware Base=4.52/Messsoftware=4.51
489	emi test receiver	ESU40	1000-30	Firmware=3.93, Bios=V5.1-16-3, Specification=01.00
491	ESD Simulator dito	ESD dito	dito307022	V 2.30
524	Voltage Drop Simulator	VDS 200	0196-16	Software Nr: 000037 Version V4.20a01
526	Burst Generator	EFT 200 A	0496-06	Software Nr. 000034 Version V2.32
527	Micro Pulse Generator	MPG 200 B	0496-05	Software-Nr. 000030 Version V2.43
528	Load Dump Simulator	LD 200B	0496-06	Software-Nr. 000031 Version V2.35a01

6.1.2. Single instruments and test systems

Ref.-No.	Equipment	Type	Serial-No.	Manufacturer	Interval of calibration	Remark	Cal due
001	emi test receiver	ESS	825132/017	Rohde & Schwarz	12 M	-	31.03.2009
005	AC - LISN (50 Ohm/50µH, test site 1)	ESH2-Z5	861741/005	Rohde & Schwarz	12 M	-	31.03.2009
007	DC - LISN (50 Ohm/5µH)	ESH3-Z6	892563/002	Rohde & Schwarz	12 M	-	31.03.2009
009	power meter (EMS-radiated)	NRV	863056/017	Rohde & Schwarz	12 M	-	31.03.2009
012	signal generator (EMS-cond.)	SMY 01	839069/027	Rohde & Schwarz	36/12 M	-	31.03.2011
013	power meter (EMS cond.)	NRVD	839111/003	Rohde & Schwarz	12 M	-	31.03.2009
014	insertion unit (EMS cond.)	URV5-Z2	838519/029	Rohde & Schwarz	12 M	-	31.03.2009
015	insertion unit (EMS cond.)	URV5-Z4	838570/024	Rohde & Schwarz	12 M	-	31.03.2009
016	line impedance simulating network	Op. 24-D	B6366	Spitzenberger+Spies	36 M	-	31.10.2010
017	Communication Tester	CMD 60 M	844365/014	Rohde & Schwarz	12 M	-	31.03.2009
020	horn antenna 18 GHz (Subst 1)	3115	9107-3699	EMCO	36/12 M	-	31.03.2010
021	loop antenna (H-Field)	6502	9206-2770	EMCO	36 M	-	31.03.2010
022	audio measurement amplifier	2636C	1537643	Brüel & Kjaer	12 M	-	31.03.2009
030	loop antenna (H-field)	HFH-Z2	879604/026	Rohde & Schwarz	36 M	-	31.03.2009
031	absorbing clamp	MDS-21	863325/015	Rohde & Schwarz	24/12 M	-	31.03.2009
033	RF-current probe (100kHz-30MHz)	ESH2-Z1	879581/18	Rohde & Schwarz	12 M	-	31.03.2009
048	bicon. - log. antenna (SAR)	3143	1108	EMCO	36/12 M	-	31.10.2008
049	current clamp (injection)	F-120-2	48	FCC	12 M	-	31.03.2009
050	3-ph coupling-decoupling-netw. (Burst)	CDN 300	176	Schaffner	12 M	-	31.03.2009
051	VHF-current probe 20-300 MHz	ESV-Z1	872421	Rohde & Schwarz	12 M	-	31.03.2009
052	notch filter DECT	WRCB 1887,82/1889,55SS	12	Wainwright Industries	12 M	-	31.03.2009
053	audio analyzer	UPA3	860612/022	Rohde & Schwarz	36 M	-	31.03.2011
058	capacitive clamp (Burst)	IP 4	99	Hafely	-	4	
059	ferrite tube	FGZ 40 X 15 E	4225	Lüthi	36 M	-	31.03.2010
060	power amplifier (DC-2kHz)	PAS 5000	B6363	Spitzenberger+Spies	-	3	
061	ferrite tube	FGZ 40 X 15 E	4250	Lüthi	36 M	-	31.03.2010
063	log.-per. antenna (Subst 1)	3146	860941/007	EMCO	36/12 M	-	31.10.2010
066	notch filter (WCDMA; FDD1)	WRCT 1900/2200-5/40-	5	Wainwright GmbH	12 M	-	31.03.2009
067	coupling decoupling-network	CDN801-M2/M3	272	Lüthi	12 M	-	31.03.2009
068	coupling decoupling-network	CDN 801-M5	95226	Lüthi	12 M	-	31.03.2009
069	EM - clamp	EM101	9535159	Lüthi	36 M	-	31.03.3009
070	ferrite tube	FTC101	4199	Lüthi	24/12 M	-	31.03.2010
071	biconical antenna (Subst 1)	HUF-Z2	863.029/010	Rohde & Schwarz	36/12 M	-	31.10.2010
072	coupling decoupling-network	CDN801-M2/M3	276	Lüthi	12 M	-	31.03.2009
079	4 wire T-network	EZ-10	862.939 / 011	Rohde & Schwarz	24/12 M	-	31.03.2009
083	AC - power supply, 0-10 A	EAC/MT 27010	910502096	EURO TEST	pre-m	2	
084	AC - power supply, 0-5 A	ELABO-8-34214	-	ELABO	pre-m	2	
085	AC - power supply, 0-10 A	R250	-	Schunterm.&Benningh.	pre-m	2	
086	DC - power supply, 0 -10 A	LNG 50-10	-	Heinzinger Electronic	pre-m	2	
087	DC - power supply, 0 -5 A	EA-3013 S	-	Elektro Automatik	pre-m	2	
090	Helmholtz coil: 2x10 coils in series	-	-	RWTÜV	pre-m	4	
091	USB-LWL-Converter	OLS-1	007/2006	Ing. Büro Scheiba	-	4	
094	artificial head (No.1)	4905	1566990	Brüel & Kjaer	pre-m	2	
099	passive voltage probe	ESH2-Z3	299.7810.52	Rohde & Schwarz	12 M	-	31.03.2009
100	passive voltage probe	Probe TK 9416	without	Schwarzbeck	12 M	-	31.03.2009
110	USB-LWL-Converter	OLS-1	-	Extreme USB	-	4	
119	RT harmonics analyser/dig. flickermeter	B10	G60547	BOCONSULT	36 M	-	31.03.2010
120	spectrum analyzer	FSEM 30	845538/011	Rohde & Schwarz	12 M	-	31.03.2009
121	notch filter GSM 1900	WRCB 1879,5/1880.5EE	15	Wainwright GmbH	12 M	-	31.03.2009
122	notch filter GSM 1800	WRCB 1747/1748	12	Wainwright GmbH	12 M	-	31.03.2009
123	biconical antenna (Subst 2)	HUF-Z2,	860941/007	Rohde & Schwarz	36/12 M	-	31.03.2010
131	RF-Current Probe	F-52	19	FCC	12 M	-	31.03.2009
132	log.-per. antenna (Subst 2)	HUF-Z3	860862/014	Rohde & Schwarz	36/12 M	-	31.03.2010
133	horn antenna 18 GHz (Meas 1)	3115	9012-3629	EMCO	36/12 M	-	31.03.2010
134	horn antenna 18 GHz (Subst 2)	3115	9005-3414	EMCO	12 M	-	31.03.2009
136	adjustable dipole antenna (Dipole 1)	3121C-DB4	9105-0697	EMCO	12 M	-	31.03.2009
137	1000 Hz calibrator 94 dB SPL	4230 94 dB	1 594 698	Brüel & Kjaer	12 M	-	31.03.2009
140	signal generator	SMHU	831314/006	Rohde & Schwarz	24/12 M	-	31.03.2010
248	attenuator	SMA 6dB 2W	-	Radiall	pre-m	2	
249	attenuator	SMA 10dB 10W	-	Radiall	pre-m	2	
252	attenuator	N 6dB 12W	-	Radiall	pre-m	2	
254	high pass GSM1800/1900/DECT	5HC 2600/12750-1.5KK	23042	Trilithic	12 M	-	31.03.2009
256	attenuator	SMA 3dB 2W	-	Radiall	pre-m	2	
257	hybrid	4031C	04491	Narda	pre-m	2	
260	hybrid coupler	4032C	11342	Narda	pre-m	2	
261	thermal power sensor	NRV-Z55	825083/0008	Rohde & Schwarz	24/12 M	-	31.03.2010
262	power meter	NRV-S	825770/0010	Rohde & Schwarz	24/12 M	-	31.03.2010
263	signal generator	SMP 04	826190/0007	Rohde & Schwarz	36/12 M	-	31.03.2010
264	spectrum analyzer	FSEK 30	826939/005	Rohde & Schwarz	12 M	-	31.03.2009
265	peak power sensor	NRV-Z33, Model 04	840414/009	Rohde & Schwarz	24/12 M	-	31.03.2010
266	peak power sensor	NRV-Z31, Model 04	843383/016	Rohde & Schwarz	24/12 M	-	31.03.2010
267	notch filter GSM 850	WRCA 800/960-6EEK	9	Wainwright GmbH	12 M	-	31.03.2009
268	AC/DC power supply	EA 3050-A	9823636	-	pre-m	2	
270	termination	1418 N	BB6935	Weinschel	pre-m	2	
271	termination	1418 N	BE6384	Weinschel	pre-m	2	
272	attenuator (20 dB) 50 W	Model 47	BF6239	Weinschel	pre-m	2	
273	attenuator, (10 dB) 100 W	Model 48	BF9229	Weinschel	pre-m	2	
274	attenuator (10 dB) 50 W	Model 47 (10 dB) 50 W	BG0321	Weinschel	pre-m	2	
275	DC-Block	Model 7003 (N)	C5129	Weinschel	pre-m	2	

Ref.-No.	Equipment	Type	Serial-No.	Manufacturer	Interval of calibration	Remark	Cal due
276	DC-Block	Model 7006 (SMA)	C7061	Weinschel	pre-m	2	
277	Vector-Networkanalyzer	ZVC	831363/0005	Rohde & Schwarz	12 M	-	31.03.2009
279	power divider	1515 (SMA)	LH855	Weinschel	pre-m	2	
284	coupling decoupling network	CDN 801-M1	1661	Lüthi	12 M	-	31.03.2009
285	coupling decoupling network	CDN 801-S1	1642	Lüthi	12 M	-	31.03.2009
287	pre-amplifier 25MHz - 4GHz	AMF-2D-100M4G-35-10P	379418	Miteq	12 M	-	31.03.2009
289	bicon. - log. antenna (OATS)	CBL 6141	4107	Schaffner Chase	36/12 M	-	31.10.2010
290	notch filter GSM 900	WRCA 901.9/903.1SS	3RR	Wainwright GmbH	12 M	-	31.03.2009
291	high pass filter GSM 850/900	WHJ 2200-4EE	14	Wainwright GmbH	12 M	-	31.03.2009
295	Racal Digital Radio Test Set	6103	1572	Racal	24/12 M	3	31.03.2009
298	Radio Communication Tester	CMU 200	832221/091	Rohde & Schwarz	12 M	-	31.03.2009
299	audio microphone	134	-	Brüel & Kjaer	pre-m	2	
300	AC LISN (50 Ohm/50µH, 1-phase)	ESH3-Z5	892 239/020	Rohde & Schwarz	12 M	-	31.03.2009
301	attenuator (20 dB) 50W, 18GHz	47-20-33	AW0272	Lucas Weinschel	pre-m	2	
302	horn antenna 40 GHz (Meas 1)	BBHA9170	155	Schwarzbeck	24/12 M	-	31.03.2010
303	horn antenna 40 GHz (Subst 1)	BBHA9170	156	Schwarzbeck	24/12 M	-	31.03.2010
304	fix dipole antenna 1,6 GHz	EMCO 3125-307	9907-1001	ETS	24/12 M	-	31.03.2009
305	fix dipole antenna 1,8-2,0 GHz	EMCO 3125-306	9907-1001	ETS	24/12 M	-	31.03.2009
306	fix dipole antenna 2,45 GHz	EMCO 3125-308	9907-1001	ETS	24/12 M	-	31.03.2009
307	fix dipole antenna 3 GHz	EMCO 3125-309	9907-1001	ETS	24 M	-	31.03.2009
317	1000 Hz calibrator 94 dB SPL	4230 94dB	1542286	Brüel & Kjaer	12 M	-	31.03.2009
323	Communication Tester	CMD 55	825878/034	Rohde & Schwarz	12 M	-	31.03.2009
331	climatic test chamber -40/+80 Grad	HC 4055	43146	Heraeus Vötsch	24 M	-	31.10.2008
337	System CTC OATS	System EMI OATS	-	HD GmbH	12 M	5	31.10.2008
338	pre-amplifier 26GHz	JS4-00102600-38-5P	838697	Miteq	12 M	-	31.03.2009
340	Communication Tester	CMD 55	849709/037	Rohde & Schwarz	12 M	-	31.03.2009
341	digital multimeter	Fluke 112	81650455	Fluke	24 M	-	31.03.2010
342	digital multimeter	Voltcraft M-4660A	IB 255466	Voltcraft	12 M	-	31.03.2009
344	adaptor 150/50 Ohm	150/50	-	Krohne	12 M	-	31.03.2009
345	adaptor 150/50 Ohm	150/50	-	Krohne	12 M	-	31.03.2009
347	laboratory site	radio lab.	-	-	-	3	
348	laboratory site	EMI conducted	-	-	-	3	
349	car battery 12 V	car battery 12 V	without	-	-	3	
350	car battery 12 V	car battery 12 V	without	-	-	3	
354	DC - power supply 40A	NGPE 40/40	448	Rohde & Schwarz	24 M	-	31.03.2010
355	power meter	URV 5	891310/027	Rohde & Schwarz	12 M	-	31.03.2009
356	power sensor	NRV-Z1	882322/014	Rohde & Schwarz	24/12 M	-	31.03.2009
357	power sensor	NRV-Z1	861761/002	Rohde & Schwarz	24/12 M	-	31.03.2009
362	TOSM Calibration Kit 50 Ohm	ZV-Z21/ZV-Z11	without	Rohde&Schwarz	12 M	-	31.03.2009
365	10V Insertion Unit 50 Ohm	URV5-Z2	100880	Rohde & Schwarz	24/12 M	-	31.03.2010
366	Ultra Compact Simulator	UCS 500 M4	V0531100594	EM-Test	12 M	-	31.03.2009
367	audio measurement amplifier	2636	316832/001	Brüel & Kjaer	12 M	-	31.03.2009
369	insertion unit (SAR-EMS, Ch. A)	URV5-Z2	100301	Rohde & Schwarz	24/12 M	-	31.03.2010
370	insertion unit (SAR-EMS, Ch. B)	URV5-Z2	100302	Rohde & Schwarz	24/12 M	-	31.03.2009
376	horn antenna 6 GHz	BBHA9120 E	BBHA 9120 E 179	Schwarzbeck	12 M	-	31.03.2009
377	emi test receiver	ESCS 30	100160	Rohde & Schwarz	12 M	-	31.03.2009
378	broadband RF field monitor	RadiSense III	03D00013SNO-08	DARE B.V.	12 M	-	31.03.2009
383	signal generator	SME 03	842 828 /034	Rohde & Schwarz	36/12 M	-	31.03.2010
386	coupling decoupling network	CDN USB/p	19397	Schaffner	12 M	-	31.03.2009
387	coupling decoupling network	CDN L-801 M2	2051	Lüthi	12 M	-	31.03.2009
388	coupling decoupling network	CDN L-801 T2	1929	Lüthi	12 M	-	31.03.2009
389	digital multimeter	Keithley 2000	0583926	Keithley	24/12 M	-	31.03.2009
392	Radio Communication Tester	MT8820A	6K00000788	Anritsu	12 M	-	31.03.2009
400	ferrite tube (>15 dB, EN 55022)	FTC 40 X 15 E	5559	Lüthi	12 M	-	31.03.2009
401	ferrite tube (>15 dB, EN 55022)	FTC 40 X 15 E	5560	Lüthi	12 M	-	31.03.2009
411	Test Cable Kit N 50 Ohm (male)	ZV-Z11	100200	R&S / Rosenberger	pre-m	2	
414	Circularly polarized com. Antenna	3102	00033734	EMCO	-	3	
415	Antenna Position Controller	2090	00035634	ETS-Lindgren	-	4	
416	MAPS Positioner	2010	-	ETS-Lindgren	-	4	
429	MAPS-Positionier	2015	-	ETS-Lindgren	-	4	
430	Thermo-Hygrometer	H270	54476	Dostmann electronic	24 M	-	30.11.2008
431	Model 7405	Near-Field Probe Set	9305-2457	EMCO	-	4	
432	pre-amplifier 100MHz-26GHz	JS4-00102600-38-5P	1030896	Miteq USA	12 M	-	31.03.2009
436	Radio Communication Tester	CMU 200	103083	Rohde & Schwarz	12 M	-	31.03.2009
439	UltraLog-Antenna	HL 562	100248	Rohde + Schwarz	12 M	-	31.03.2009
440	CDN for Datacable	CDN-UTP	CDN-UTP 029	EMC Partner AG,	24 M	-	31.03.2010
441	System CTC-SAR-EMI	System EMI field (SAR)	-	ETS	12 M	5	31.12.2008
442	System CTC-SAR-EMS	System EMS field (SAR)	-	ETS-Lindgren/Cetecom	12 M	5	30.04.2008
443	System CTC-FAR-EMI-Spuri	System CTC-FAR-EMI-	-	ETS-Lindgren/Cetecom	12 M	5	30.04.2009
448	notch filter WCDMA FDD II	WRCT 1850.0/2170.0-	5	Wainwright Instruments	12 M	1c	31.03.2009
449	notch filter WCDMA FDD V	WRCT 824.0/894.0-5/40-	1	Wainwright Instruments	12 M	1c	31.03.2009
454	Oscilloscope	HM 205-3	9210 P 29661	Hameg	-	4	
455	Oscilloscope	HP 54602B	US 350 336 45	Hawlett Packard	-	4	
456	DC-Power supply 0-5A	EA 3013 S	207810	Elektro Automatik	pre-m	2	
457	DC-Power supply, 0-5A	EA-3013 S	9624680	Elektro Automatik	pre-m	2	
459	DC -power supply 0-5 A , 0-32 V	EA-PS 2032-50	910722	Elektro Automatik	pre-m	2	
460	Radio Communication Tester	CMU 200	108901	Rohde & Schwarz	12 M	-	31.03.2009
462	AF-Generator	MX-2020	-	Conrad	-	4	
463	Universal source	HP3245A	2831A03472	Agilent	-	4	
464	Thermo-Hygro-Monitor	WS-9400	without	Europe Supplies Ltd.	24 M	-	30.11.2008
465	Thermo-Hygro-Monitor	WS-9400	without	Europe Supplies Ltd.	24 M	-	30.11.2008
466	digital multimeter	Fluke 112	89210157	Fluke USA	24 M	-	31.03.2010
467	digital multimeter	Fluke 112	89680306	Fluke USA	24 M	-	31.03.2010
468	digital multimeter	Fluke 112	90090455	Fluke USA	24 M	-	31.03.2010
470	Thermo-Hygro-Monitor	WS-9400	-	distr. by Conrad	24 M	-	30.11.2008

Ref.-No.	Equipment	Type	Serial-No.	Manufacturer	Interval of calibration	Remark	Cal due
476	Spectrum Analyzer	FSM	840500/004	Rohde & Schwarz	24/12 M	-	31.03.2009
477	ReRadiating GPS-System	AS-47	-	Automotive Cons. Fink	-	3	
482	filtermatrix	FilterMatrix SAR 1	-	CETECOM (Brl)	-	1d	
484	pre-amplifier 2.5 - 18 GHz	AMF-5D-02501800-25-	1244554	Miteq	12 M	-	31.03.2009
487	NSA-Verification of CTC-SAR-EMI	System EMI field (SAR)	-	ETS	12 M	-	31.10.2008
489	emi test receiver	ESU40	1000-30	Rohde & Schwarz	12 M	-	31.03.2009
490	high pass 2,65 GHz>18GHz	6HC 2650/18000-3-KK	200709138	Trilithic	12 M	-	31.03.2009
491	ESD Simulator dito	ESD dito	dito307022	EM-Test	24 M	-	31.03.2009
494	power supply (GPIB)	Agilent 66332A	US 37474017	Agilent	24/12 M	-	31.03.2009
498	Power Supply	NGPE 40/40	402	Rohde & Schwarz	-	2	
500	industry Acoustic System	MO 2000 Set	100048	Sennheiser	-	4	
502	band reject filter	WRCG 1709/1786-	SN 9	Wainwright	-	-	
503	band reject filter	WRCG 824/849-814/859-	SN 5	Wainwright	-	-	
517	relais switc matrix	HF Relais Box Keithley	SE 04	-	-	-	
522	electronical load	EL 9000	-	ELV	-	-	
523	Digitalmultimeter	L4411A	MY46000154	Agilent	24 M	-	31.03.2009
524	Voltage Drop Simulator	VDS 200	0196-16	EM Test	18 M	-	31.03.2009
525	Koppelnetzwerk	CNA 200	1196-01	EM Test	18 M	-	31.03.2009
526	Burst Generator	EFT 200 A	0496-06	EM Test	18 M	-	31.03.2009
527	Micro Pulse Generator	MPG 200 B	0496-05	EM Test	18 M	-	31.03.2009
528	Load Dump Simulator	LD 200B	0496-06	EM Test	18 M	-	31.03.2009
529	6 dB Broadband resistive power divider	Model 1515	LH 855	Weinschel	-	2	
530	10 dB Broadband resistive power divider	R 416110000	LOT 9828	-	2		
531	H-field system	Lackman System	without	Lackmann	-	2	

6.1.3. Legend

Note / remarks		Calibrated during system calibration:
	1a	System CTC-SAR-EMS (Ref.-No. 442)
	1b	System-CTC-EMS-Conducted (Ref.-No. 335)
	1c	System CTC-FAR-EMI-spurious emission (Ref.-No . 443)
	1d	System CTC-SAR-EMI (Ref.-No . 441)
	1e	System CTC-OATS (EMI radiated) (Ref.-No. 337)
	1 f	System CTC-CTIA-OTA (Ref.-No . 420)
	1 g	System CTC-FAR-EMS (Ref.-No . 444)
	2	Calibration or equipment check immediately before measurement
	3	Regulatory maintained equipment for functional check or support purpose,
	4	Ancillary equipment without calibration e.g. mechanical equipment or monitoring equipment
	5	Test System

Interval of calibration	12 M	12 month
	24 M	24 month
	36 M	36 month
	24/12 M	Calibration every 24 months, between this every 12 months internal validation
	36/12 M	Calibration every 36 months, between this every 12 months internal validation
	Pre-m	Check before starting the measurement
	-	Without calibration

7. Photographs

See separate documents B_2_20745197b_A1_08.pdf and B_2_20745197b_A2_08.pdf for photos of the EUT and test set-up.

8. Measurement diagrams

8.1. Conducted emissions on AC-Power lines (§15.207)

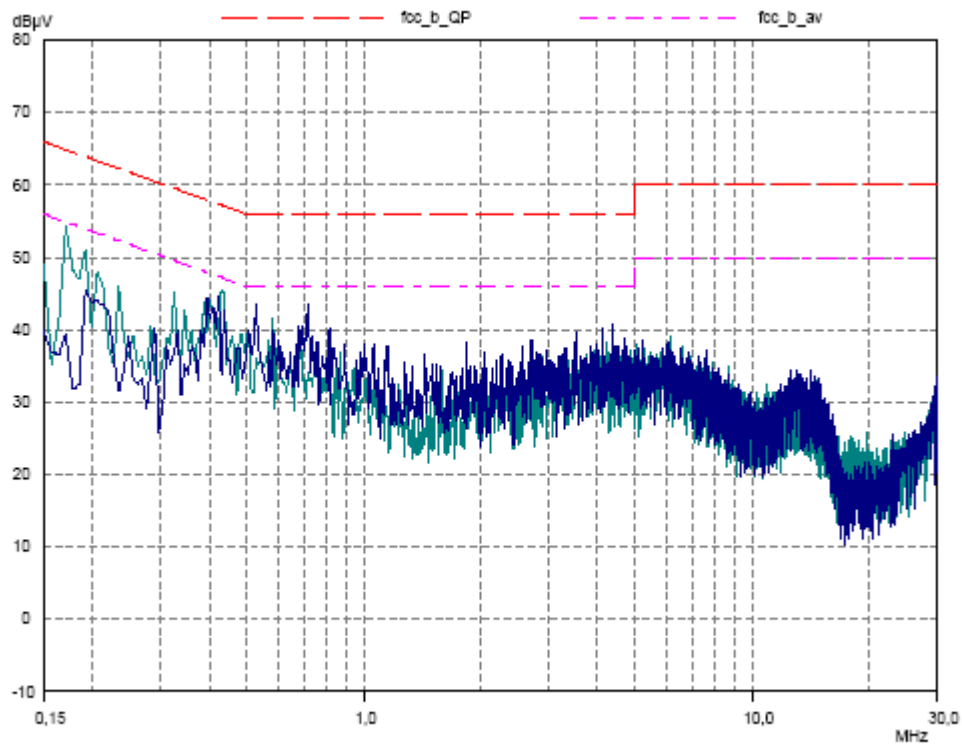
1.1 CETECOM GmbH Report No. 2-20745197b/08

11 Apr 2008 11:48

Conducted Interference Voltage Measurement

EUT: MS AAD-3052091-BV (S/N: FCC FM1) + AC Adapter CAA-0002001-BV (S/N:9550)
 Manuf: Sony-Ericsson
 Op Cond: FM-on (98MHz) +IDLE 850
 Operator: Lor
 Test Spec: FCC Part 15.207
 Comment: Measurement on L1 (green) / N (blue)
 Powered by 110 V AC / 60 Hz

Scan Settings (1 Range)			Receiver Settings						
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge	
150kHz	30MHz	7kHz	10kHz	PK	1msec	Auto	OFF	60dB	
Prescan Measurement:			Detector:	X PK					
			Meas Time:	see scan settings					
			Peaks:	8					
			Acc Margin:	6 dB					



1.1 CETECOM GmbH Report No. 2-20745197b/08

11 Apr 2008 11:48

Conducted Interference Voltage Measurement

EUT: MS AAD-3052091-BV (S/N: FCC FM1) + AC Adapter CAA-0002001-BV (S/N:9550)
 Manuf: Sony-Ericsson
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 Operator: Lor
 Test Spec: FCC Part 15.207
 Comment: Measurement on L1 (green) / N (blue)
 Powered by 110 V AC / 60 Hz

Scan Settings			(1 Range)		Receiver Settings				
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge	
150kHz	30MHz	7kHz	10kHz	PK	1msec	Auto	OFF	60dB	

Prescan Measurement: Detector: X PK
 Meas Time: see scan settings
 Peaks: 8
 Acc Margin: 6 dB

Peak Search Results

Frequency	PK Level	PK Limit	PK Delta	Ref. Offset
MHz	dBµV	dBµV	dB	dB

No results

* limit exceeded

1.2 CETECOM GmbH Report No. 2-20745197b/08

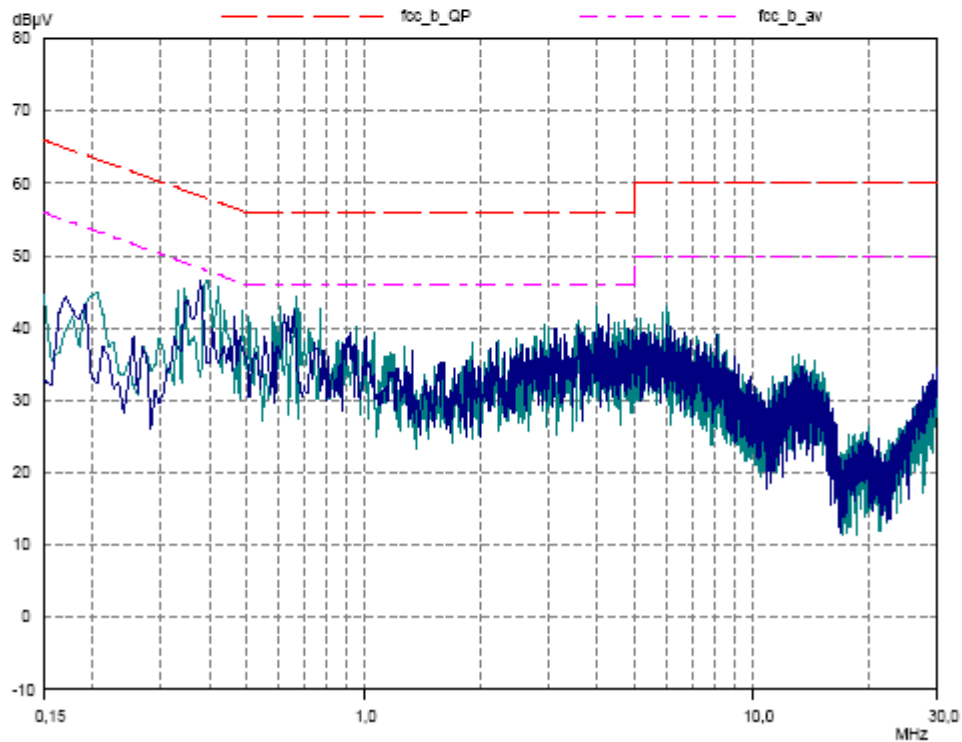
11 Apr 2008 12:07

Conducted Interference Voltage Measurement

EUT: MS AAD-3052091-BV (S/N:FCC FM1) + AC Adapter CAA-0002001-BV (S/N:9550)
 Manuf: Sony-Ericsson
 Op Cond: FM-on (88,2MHz) +IDLE 850
 Operator: Lor
 Test Spec: FCC Part 15.207
 Comment: Measurement on N/L1
 Powered by 110 V AC / 60 Hz
 Result File: 1_02.dat : New Measurement

Scan Settings			Receiver Settings					
(1 Range)								
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
150kHz	30MHz	7kHz	10kHz	PK	1msec	Auto	OFF	60dB

Prescan Measurement:	Detector:	X PK
	Meas Time:	see scan settings
	Peaks:	8
	Acc Margin:	6 dB





1.2 CETECOM GmbH Report No. 2-20745197b/08

11 Apr 2008 12:07

Conducted Interference Voltage Measurement

EUT: MS AAD-3052091-BV (S/N:FCC FM1) + AC Adapter CAA-0002001-BV (S/N:9550)
 Manuf: Sony-Ericsson
 Op Cond: FM-on (88,2MHz) +IDLE 850
 Operator: Lor
 Test Spec: FCC Part 15.207
 Comment: Measurement on N/L1
 Powered by 110 V AC / 60 Hz
 Result File: 1_02.dat : New Measurement

Scan Settings			(1 Range)				Receiver Settings			
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge		
150kHz	30MHz	7kHz	10kHz	PK	1msec	Auto	OFF	60dB		

Prescan Measurement: Detector: X PK
 Meas Time: see scan settings
 Peaks: 8
 Acc Margin: 6 dB

Peak Search Results

Frequency	PK Level	PK Limit	PK Delta	Ref. Offset
MHz	dBµV	dBµV	dB	dB

No results

* limit exceeded

1.3 CETECOM GmbH Report No. 2-20745197b/08

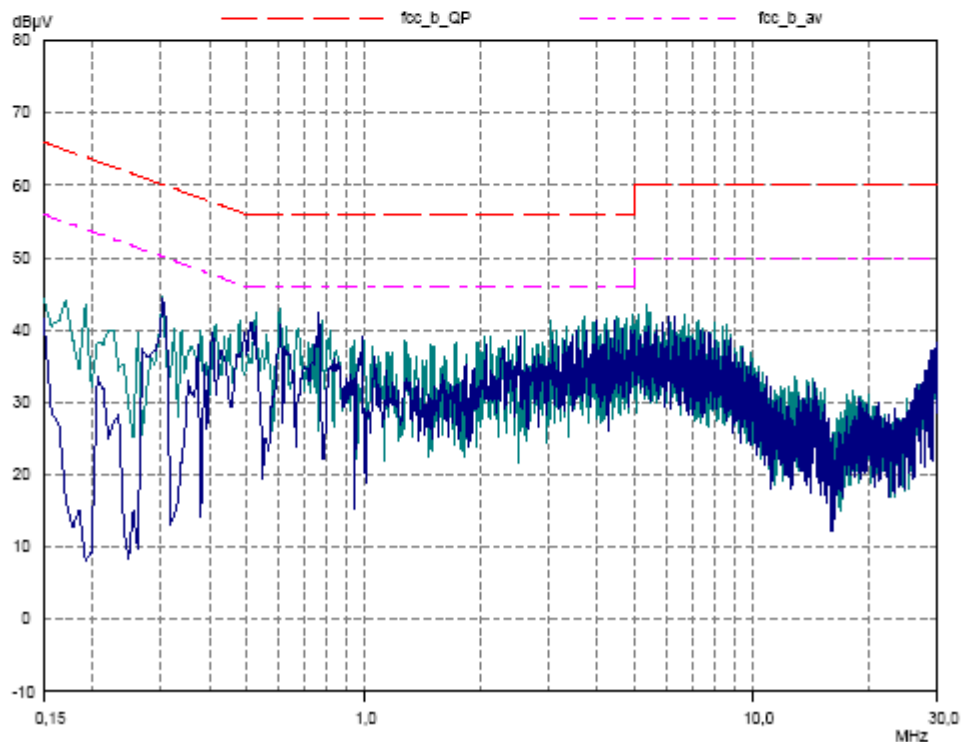
11 Apr 2008 12:23

Conducted Interference Voltage Measurement

EUT: MS AAD-3052091-BV (S/N:FCC FM1)+ AC Adapter CAA-0002001-BV (S/N:9550)
 Manuf: Sony-Ericsson
 Op Cond: FM-on (107,8MHz) +IDLE 850
 Operator: Lor
 Test Spec: FCC Part 15.207
 Comment: Measurement on N/L1
 Powered by 110 V AC / 60 Hz
 Result File: 1_03.dat : New Measurement

Scan Settings			Receiver Settings					
(1 Range)								
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
150kHz	30MHz	7kHz	10kHz	PK	1msec	Auto	OFF	60dB

Prescan Measurement:	Detector:	X PK
	Meas Time:	see scan settings
	Peaks:	8
	Acc Margin:	6 dB



1.3 CETECOM GmbH Report No. 2-20745197b/08

11 Apr 2008 12:23

Conducted Interference Voltage Measurement

EUT: MS AAD-3052091-BV (S/N:FCC FM1)+ AC Adapter CAA-0002001-BV (S/N:9550)
Manuf: Sony-Ericsson
Op Cond: FM-on (107,8MHz) +IDLE 850
Operator: Lor
Test Spec: FCC Part 15.207
Comment: Measurement on N/L1
Powered by 110 V AC / 60 Hz
Result File: 1_03.dat : New Measurement

Scan Settings (1 Range)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
150kHz	30MHz	7kHz	10kHz	PK	1msec	Auto	OFF	60dB

Prescan Measurement: Detector: X PK
Meas Time: see scan settings
Peaks: 8
Acc Margin: 6 dB

Peak Search Results

Frequency	PK Level	PK Limit	PK Delta	Ref. Offset
MHz	dB μ V	dB μ V	dB	dB

No results

* limit exceeded

1.4 CETECOM GmbH Report No. 2-20745197b/08

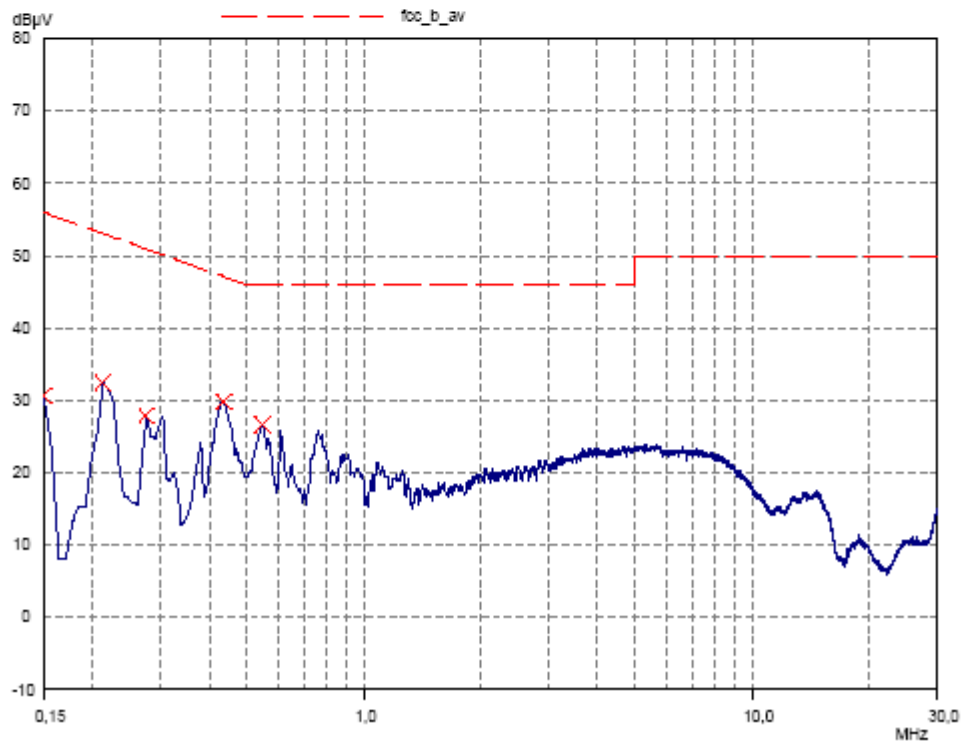
11 Apr 2008 12:40

Conducted Interference Voltage Measurement

EUT: MS AAD-3052091-BV (S/N: FCC FM1)+ AC Adapter CAA-0002001-BV (S/N:9550)
 Manuf: Sony-Ericsson
 Op Cond: FM-on (88,2MHz) +IDLE 850
 Operator: Lor
 Test Spec: FCC Part 15.207
 Comment: Measurement on L1/ AV-detector
 Powered by 110 V AC / 60 Hz
 Result File: 1_04.dat : New Measurement

Scan Settings			Receiver Settings					
(1 Range)								
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
150kHz	30MHz	7kHz	10kHz	AV	100msec	Auto	OFF	60dB

Prescan Measurement:	Detector:	X AV
	Meas Time:	see scan settings
	Peaks:	25
	Acc Margin:	25 dB



1.4 CETECOM GmbH Report No. 2-20745197b/08

11 Apr 2008 12:40

Conducted Interference Voltage Measurement

EUT: MS AAD-3052091-BV (S/N:FCC FM1)+ AC Adapter CAA-0002001-BV (S/N:9550)
 Manuf: Sony-Ericsson
 Op Cond: FM-on (88,2MHz) +IDLE 850
 Operator: Lor
 Test Spec: FCC Part 15.207
 Comment: Measurement on L1/ AV-detector
 Powered by 110 V AC / 60 Hz
 Result File: 1_04.dat : New Measurement

Scan Settings (1 Range)

Frequencies			Receiver Settings						
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge	
150kHz	30MHz	7kHz	10kHz	AV	100msec	Auto	OFF	60dB	

Prescan Measurement: Detector: X AV
 Meas Time: see scan settings
 Peaks: 25
 Acc Margin: 25 dB

Peak Search Results

Frequency MHz	AV Level dBµV	AV Limit dBµV	AV Delta dB
0,15	30,70	56,00	25,30
0,213	32,49	53,09	20,60
0,276	27,92	50,94	23,02
0,437	29,77	47,12	17,35
0,549	26,69	46,00	19,31

* limit exceeded

1.5 CETECOM GmbH Report No. 2-20745197b/08

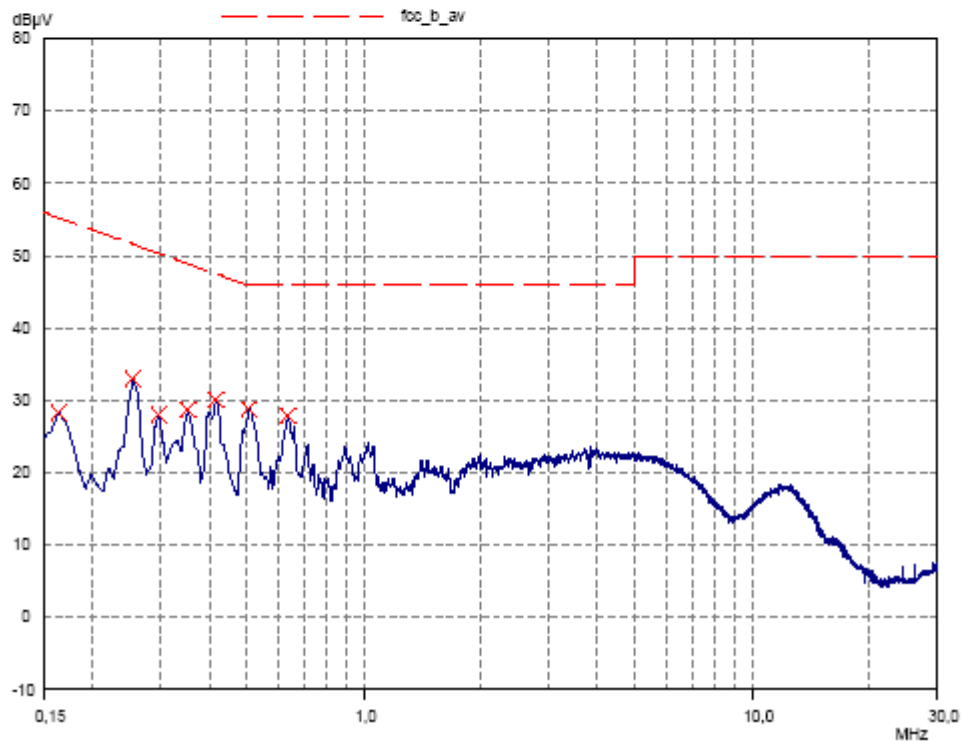
11 Apr 2008 12:54

Conducted Interference Voltage Measurement

EUT: MS AAD-3052091-BV (S/N:FCC FM1)+ AC Adapter CAA-0002001-BV (S/N:9550)
Manuf: Sony-Ericsson
Op Cond: FM-on (88,2MHz) +IDLE 850
Operator: Lor
Test Spec: FCC Part 15.207
Comment: Measurement on N/AV-detector
Powered by 110 V AC / 60 Hz
Result File: 1_05.dat : New Measurement

Scan Settings			Receiver Settings					
(1 Range)								
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
150kHz	30MHz	7kHz	10kHz	AV	100msec	Auto	OFF	60dB

Prescan Measurement:	Detector:	X AV
	Meas Time:	see scan settings
	Peaks:	8
	Acc Margin:	6 dB



1.5 CETECOM GmbH Report No. 2-20745197b/08

11 Apr 2008 12:54

Conducted Interference Voltage Measurement

EUT: MS AAD-3052091-BV (S/N:FCC FM1)+ AC Adapter CAA-0002001-BV (S/N:9550)
 Manuf: Sony-Ericsson
 Op Cond: FM-on (88,2MHz) +IDLE 850
 Operator: Lor
 Test Spec: FCC Part 15.207
 Comment: Measurement on N/AV-detector
 Powered by 110 V AC / 60 Hz
 Result File: 1_05.dat : New Measurement

Scan Settings (1 Range)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
150kHz	30MHz	7kHz	10kHz	AV	100msec	Auto	OFF	60dB

Prescan Measurement: Detector: X AV
 Meas Time: see scan settings
 Peaks: 8
 Acc Margin: 6 dB

Peak Search Results

Frequency MHz	AV Level dBµV	AV Limit dBµV	AV Delta dB
0,164	28,29	55,26	26,97
0,255	32,96	51,59	18,63
0,297	28,03	50,33	22,30
0,353	28,69	48,89	20,20
0,416	30,13	47,53	17,40
0,507	28,74	46,00	17,26
0,64	27,92	46,00	18,08

* limit exceeded

1.6 CETECOM GmbH Report No. 2-20745197b/08

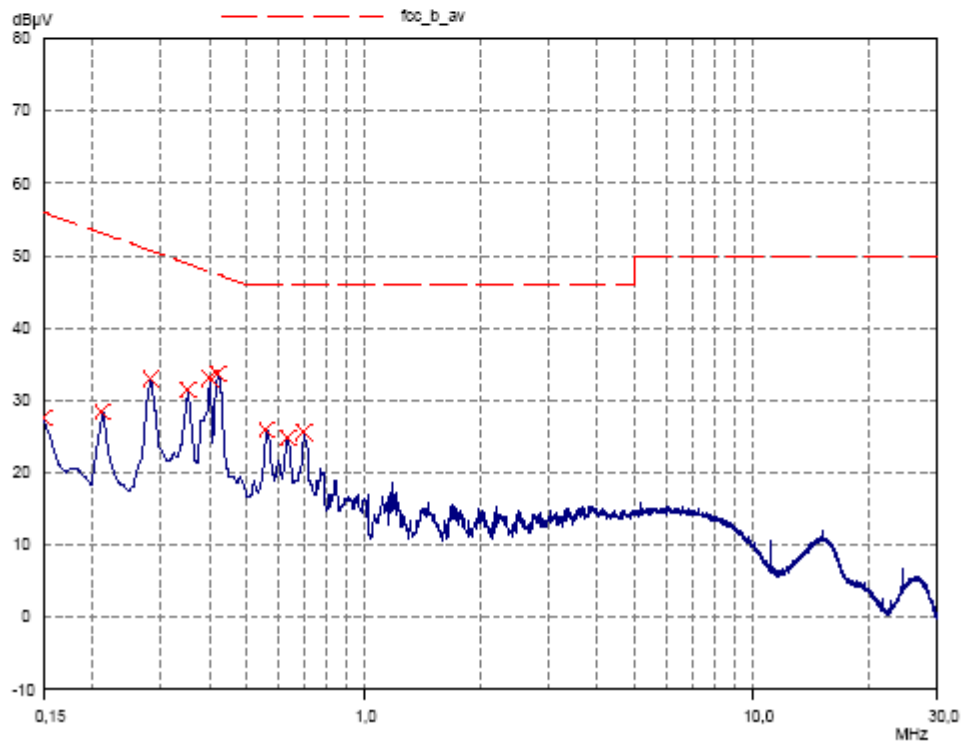
11 Apr 2008 13:09

Conducted Interference Voltage Measurement

EUT: MS AAD-3052091-BV (S/N: FCC FM1) + AC Adapter CAA-0002001-BV (S/N:9550)
Manuf: Sony-Ericsson
Op Cond: FM-on (98MHz) +IDLE 850
Operator: Lor
Test Spec: FCC Part 15.207
Comment: Measurement on N/AV-detector
Powered by 110 V AC / 60 Hz
Result File: 1_05.dat : New Measurement

Scan Settings			Receiver Settings					
(1 Range)								
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
150kHz	30MHz	7kHz	10kHz	AV	100msec	Auto	OFF	60dB

Prescan Measurement:	Detector:	X AV
	Meas Time:	see scan settings
	Peaks:	8
	Acc Margin:	6 dB



1.6 CETECOM GmbH Report No. 2-20745197b/08

11 Apr 2008 13:09

Conducted Interference Voltage Measurement

EUT: MS AAD-3052091-BV (S/N: FCC FM1) + AC Adapter CAA-0002001-BV (S/N:9550)
 Manuf: Sony-Ericsson
 Op Cond: FM-on (98MHz) +IDLE 850
 Operator: Lor
 Test Spec: FCC Part 15.207
 Comment: Measurement on N/AV-detector
 Powered by 110 V AC / 60 Hz
 Result File: 1_05.dat : New Measurement

Scan Settings (1 Range)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
150kHz	30MHz	7kHz	10kHz	AV	100msec	Auto	OFF	60dB

Prescan Measurement: Detector: X AV
 Meas Time: see scan settings
 Peaks: 8
 Acc Margin: 6 dB

Peak Search Results

Frequency MHz	AV Level dBµV	AV Limit dBµV	AV Delta dB
0,15	27,55	56,00	28,45
0,213	28,42	53,09	24,67
0,283	33,02	50,73	17,71
0,353	31,49	48,89	17,40
0,402	33,02	47,81	14,79
0,423	33,70	47,39	13,69
0,563	25,92	46,00	20,08
0,64	24,86	46,00	21,14
0,703	25,55	46,00	20,45

* limit exceeded

1.7 CETECOM GmbH Report No. 2-20745197b/08

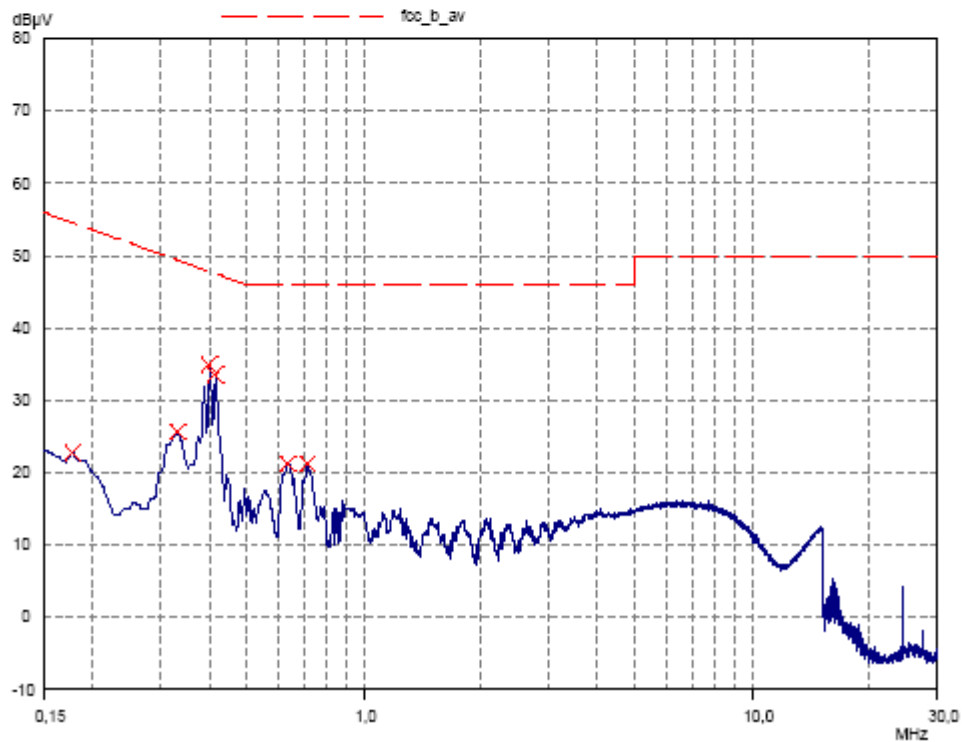
11 Apr 2008 13:25

Conducted Interference Voltage Measurement

EUT: MS AAD-3052091-BV (S/N: FCC FM1) + AC Adapter CAA-0002001-BV (S/N:9550)
Manuf: Sony-Ericsson
Op Cond: FM-on (98MHz) +IDLE 850
Operator: Lor
Test Spec: FCC Part 15.207
Comment: Measurement on L1/AV-detector
Powered by 110 V AC / 60 Hz
Result File: 1_07.dat : New Measurement

Scan Settings			(1 Range)		Receiver Settings				
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge	
150kHz	30MHz	7kHz	10kHz	AV	100msec	Auto	OFF	60dB	

Prescan Measurement:	Detector:	X AV
	Meas Time:	see scan settings
	Peaks:	8
	Acc Margin:	6 dB



1.7 CETECOM GmbH Report No. 2-20745197b/08

11 Apr 2008 13:25

Conducted Interference Voltage Measurement

EUT: MS AAD-3052091-BV (S/N:FCC FM1) + AC Adapter CAA-0002001-BV (S/N:9550)
 Manuf: Sony-Ericsson
 Op Cond: FM-on (98MHz) +IDLE 850
 Operator: Lor
 Test Spec: FCC Part 15.207
 Comment: Measurement on L1/AV-detector
 Powered by 110 V AC / 60 Hz
 Result File: 1_07.dat : New Measurement

Scan Settings (1 Range)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
150kHz	30MHz	7kHz	10kHz	AV	100msec	Auto	OFF	60dB

Prescan Measurement: Detector: X AV
 Meas Time: see scan settings
 Peaks: 8
 Acc Margin: 6 dB

Peak Search Results

Frequency MHz	AV Level dBµV	AV Limit dBµV	AV Delta dB
0,178	22,71	54,58	31,87
0,332	25,63	49,40	23,77
0,402	34,92	47,81	12,89
0,416	33,58	47,53	13,95
0,64	21,25	46,00	24,75
0,717	21,25	46,00	24,75

* limit exceeded

8.2. Electric field strength (§15.209&§15.239)

Report 2-20745197b/07, CETECOM GmbH

Page 1

Diagram No. 2.04

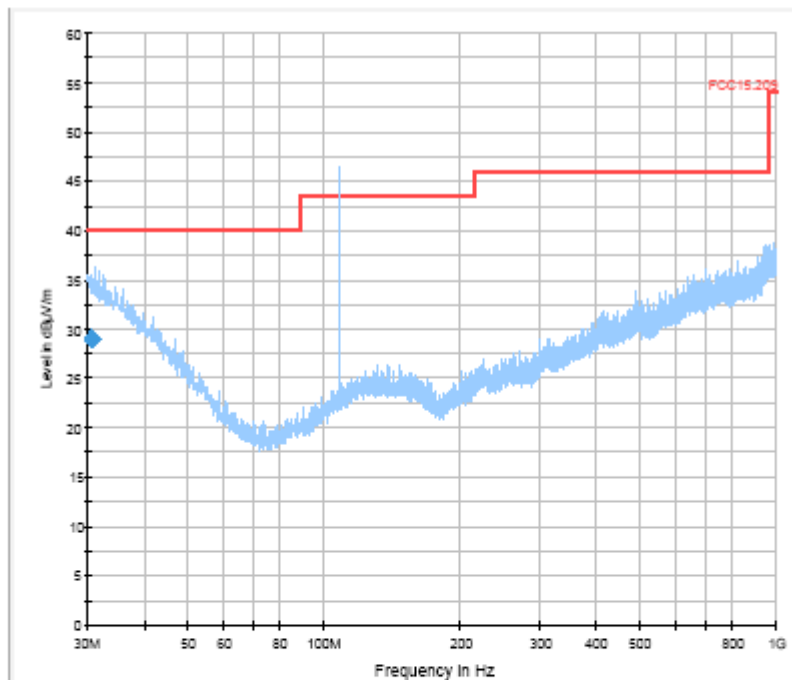
Common Information

Test description:	Electric Fieldstrength Measurement related to 3 m distance
Test site and distance:	Semi Anechoic Room (SAR) with 3 m measurement distance
Measured sides of EUT:	front, right, rear, left, top & under side
Rec. antenna (pre-scan):	height 1.00 m and 1.82 m, horizontal and vertical polarisation
Rec. antenna (final):	height between 1 m to 4 m, polarisation according to pre-scan results
Turntable step:	90° during pre-scan, continuously turning during final measurement
Used filter:	lowpass 1200 MHz
Test specification.:	FCC 15.209/ (15.239)
Operator:	x_per
Comment 1:	highest channel - 107.8 Mhz modulated 1 KHz
Comment 2:	

EUT Information

EUT Name:	AAD-3052091-BV + DC-Charger
Manufacturer:	Sony-Ericsson
Serial Number:	MS: FCC FM1
Hardware Rev:	-
Software Rev:	-
Comment:	FM RADIO ON + IDLE 1900

01_FCC15.209_hor+vert_kipp



25.04.2008

11:07:05

EMI Auto Test Template: 01_FCC15.209_hor+vert_kipp

Hardware Setup: HW11_FCC_ESCS30_TP1200_EUTkipp
 Frequency Range: 30 MHz - 1 GHz
 Graphics Level Range: 0 dBµV/m - 60 dBµV/m

Preview Measurements:
 Scan Test Template: EMI Scan 01_fast_

Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
30 MHz - 1 GHz	MaxPeak	120 kHz	0,00005 s	ESCS 30

Data Reduction:
 Limit Line #1: FCC15.209
 Display titles of limit lines in graphic: Yes
 Maximum Results: 25
 Maxima per Subrange: 1
 Acceptance Offset: -6 dB

Zoom:
 Zoom Scan Template: EMI Scan 02_20ms_zoom_

Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
30 MHz - 1 GHz	MaxPeak	120 kHz	0,02 s	ESCS 30

Adjustment:
 Scan Template for EMI Scan 02_20ms_

Adjustment Measurements

Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
30 MHz - 1 GHz	MaxPeak	120 kHz	0,02 s	ESCS 30

Final Measurements:
 Template for Single Meas.: EMI Scan 03_1s_

Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
30 MHz - 1 GHz	QuasiPeak	120 kHz	1 s	ESCS 30

Report Settings:
 Report Template: FCC15_209_vert_hor
 Create Electronic Report: PDF
 Document Name: EMI Report

Diagram No. 2.05

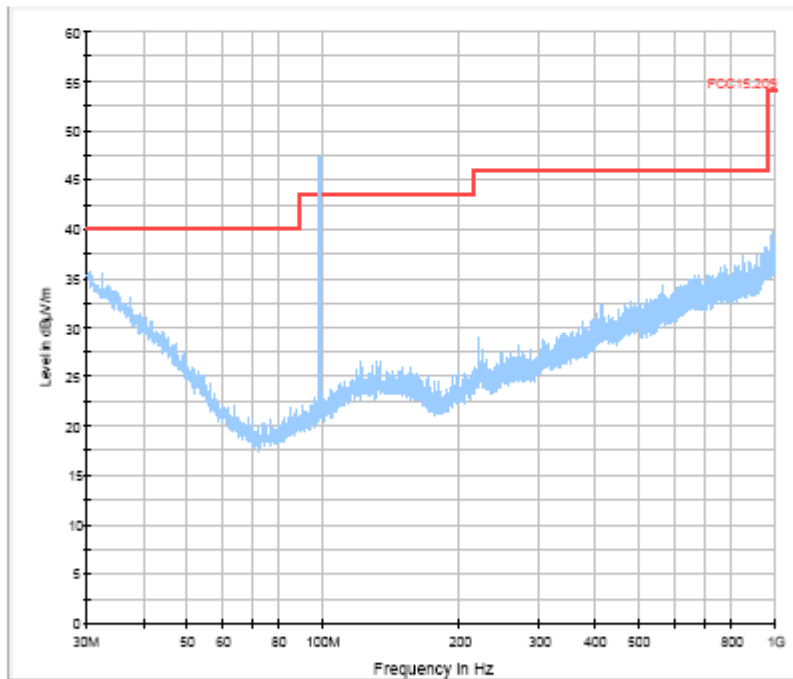
Common Information

Test description:	Electric Fieldstrength Measurement related to 3 m distance
Test site and distance:	Semi Anechoic Room (SAR) with 3 m measurement distance
Measured sides of EUT:	front, right, rear, left, top & under side
Rec. antenna (pre-scan):	height 1.00 m and 1.82 m, horizontal and vertical polarisation
Rec. antenna (final):	height between 1 m to 4 m, polarisation according to pre-scan results
Turntable step:	90° during pre-scan, continuously turning during final measurement
Used filter:	lowpass 1200 MHz
Test specification.:	FCC 15.209/ (15.239)
Operator:	x_per
Comment 1:	middle channel - 98 Mhz modulated 1 KHz

EUT Information

EUT Name:	AAD-3052091-BV + DC-Charger
Manufacturer:	Sony-Ericsson
Serial Number:	MS: FCC FM1
Hardware Rev:	-
Software Rev:	-
Comment:	FM RADIO ON + IDLE 1900

01_FCC15.209_hor+vert_kipp



EMI Auto Test Template: 01_FCC15.209_hor+vert_kipp

Hardware Setup: HW11_FCC_ESCS30_TP1200_EUTkipp
 Frequency Range: 30 MHz - 1 GHz
 Graphics Level Range: 0 dBµV/m - 60 dBµV/m

Preview Measurements:
 Scan Test Template: EMI Scan 01_fast_

Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
30 MHz - 1 GHz	MaxPeak	120 kHz	0,00005 s	ESCS 30

Data Reduction:
 Limit Line #1: FCC15.209
 Display titles of limit lines in graphic: Yes
 Maximum Results: 25
 Maxima per Subrange: 1
 Acceptance Offset: -6 dB

Zoom:
 Zoom Scan Template: EMI Scan 02_20ms_zoom_

Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
30 MHz - 1 GHz	MaxPeak	120 kHz	0,02 s	ESCS 30

Adjustment:
 Scan Template for EMI Scan 02_20ms_

Adjustment Measurements

Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
30 MHz - 1 GHz	MaxPeak	120 kHz	0,02 s	ESCS 30

Final Measurements:
 Template for Single Meas.: EMI Scan 03_1s_

Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
30 MHz - 1 GHz	QuasiPeak	120 kHz	1 s	ESCS 30

Report Settings:
 Report Template: FCC15_209_vert_hor
 Create Electronic Report: PDF
 Document Name: EMI Report

Diagram No. 2.06

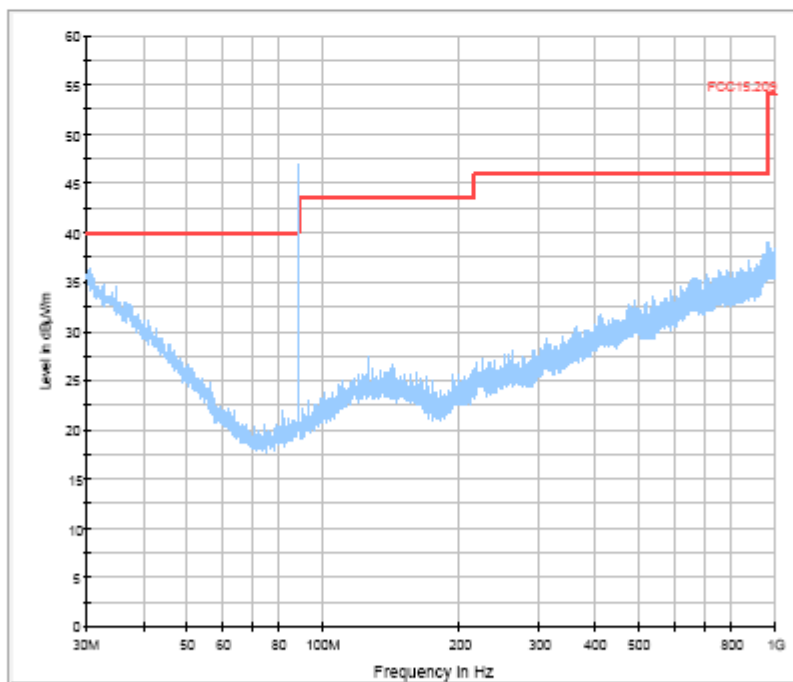
Common Information

Test description:	Electric Fieldstrength Measurement related to 3 m distance
Test site and distance:	Semi Anechoic Room (SAR) with 3 m measurement distance
Measured sides of EUT:	front, right, rear, left, top & under side
Rec. antenna (pre-scan):	height 1.00 m and 1.82 m, horizontal and vertical polarisation
Rec. antenna (final):	height between 1 m to 4 m, polarisation according to pre-scan results
Turntable step:	90° during pre-scan, continuously turning during final measurement
Used filter:	lowpass 1200 MHz
Test specification.:	FCC 15.209/ (15.239)
Operator:	x_per
Comment 1:	lowest channel 88.2 Mhz modulated 1 KHz
Comment 2:	

EUT Information

EUT Name:	AAD-3052091-BV + DC-Charger
Manufacturer:	Sony-Ericsson
Serial Number:	MS: FCC FM1
Hardware Rev:	--
Software Rev:	--
Comment:	FM RADIO ON + IDLE 1900

01_FCC15.209_hor+vert_kipp



EMI Auto Test Template: 01_FCC15.209_hor+vert_kipp

Hardware Setup: HW11_FCC_ESCS30_TP1200_EUTkipp
 Frequency Range: 30 MHz - 1 GHz
 Graphics Level Range: 0 dBµV/m - 60 dBµV/m

Preview Measurements:
 Scan Test Template: EMI Scan 01_fast_

Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
30 MHz - 1 GHz	MaxPeak	120 kHz	0,00005 s	ESCS 30

Data Reduction:
 Limit Line #1: FCC15.209
 Display titles of limit lines in graphic: Yes
 Maximum Results: 25
 Maxima per Subrange: 1
 Acceptance Offset: -6 dB

Zoom:
 Zoom Scan Template: EMI Scan 02_20ms_zoom_

Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
30 MHz - 1 GHz	MaxPeak	120 kHz	0,02 s	ESCS 30

Adjustment:
 Scan Template for EMI Scan 02_20ms_
 Adjustment Measurements

Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
30 MHz - 1 GHz	MaxPeak	120 kHz	0,02 s	ESCS 30

Final Measurements:
 Template for Single Meas.: EMI Scan 03_1s_

Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
30 MHz - 1 GHz	QuasiPeak	120 kHz	1 s	ESCS 30

Report Settings:
 Report Template: FCC15_209_vert_hor
 Create Electronic Report: PDF
 Document Name: EMI Report

Diagram No.: 2.07

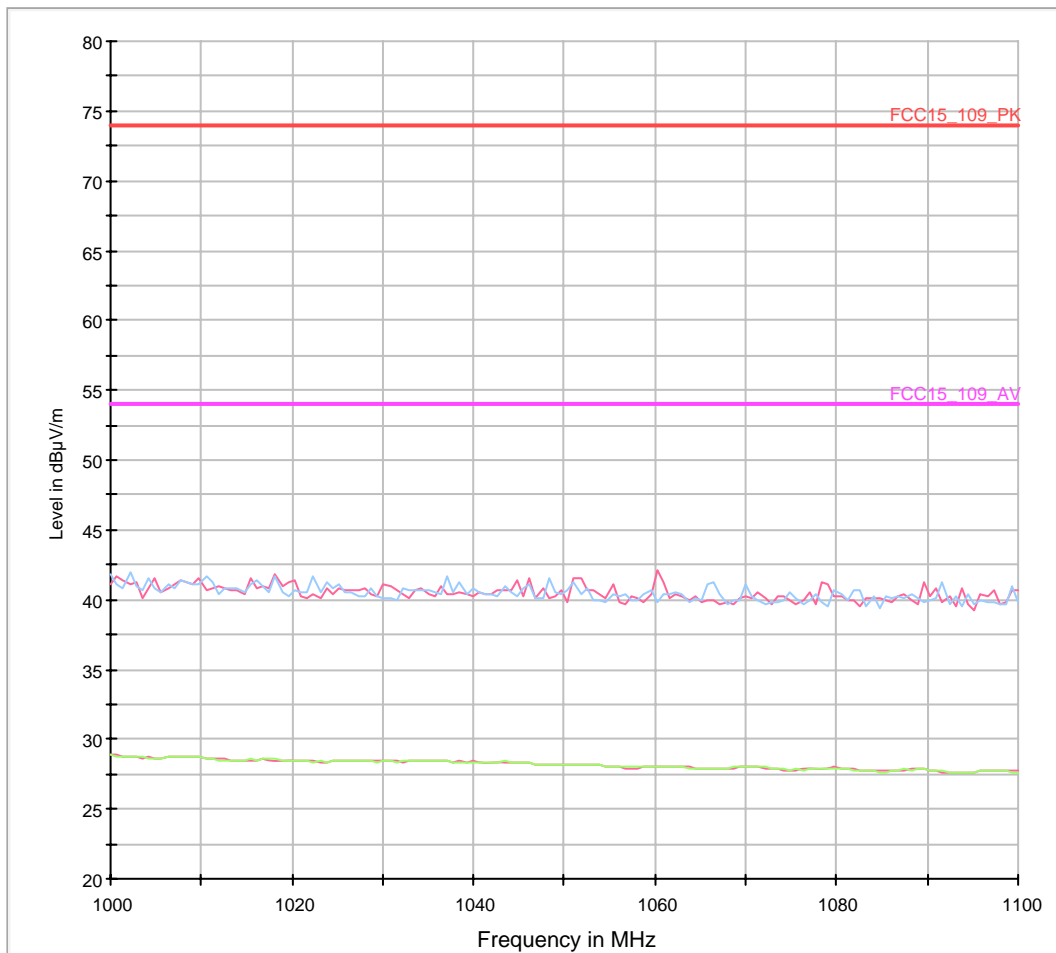
Common Information

Test Description:	Radiated field strength emission
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC 15.209, Intentional Radiator
Antenna polarisation:	horizontal/vertical
Operation mode:	FM88.2MHz + IDLE 1900 Mode + charging battery
Operator Name:	Lor
Comment:	EUT vertical

EUT Information

EUT:	AAD-3052091-BV(FM1)+DC Adapter
Manufacturer:	Sony Ericsson
Serial Number:	FM1

03_1_2.7_ohne switch H&V



EMI Auto Test Template: 03_1_2.7_ohne switch H&V

Hardware Setup: 13_ESU_Horn_18G_Preamp_ohne_SM
Frequency Range: 1 GHz - 1,1 GHz
Graphics Level Range: 20 dB μ V/m - 80 dB μ V/m

Preview Measurements:
Scan Test Template: 07_ESU_1_2.7G_pre

Data Reduction:
Limit Line #1: FCC15_109_PK
Limit Line #2: FCC15_109_AV
Display titles of limit lines in graphic : Yes
Maximum Results: 50
Maxima per Subrange 1
Acceptance Offset: -20 dB

Zoom:
Zoom Scan Template: 09_ESU_1_2.7G_zoom

Adjustment:
Scan Template for 07_ESU_1_2.7G_pre
Adjustment Measurements

Final Measurements:
Template for Single Meas.: 11_ESU_1_2.7G_fin
Template for Single Meas.:(>1GHz) 11_ESU_1_2.7G_fin

Report Settings:
Report Template: Report Setup FCC 15_209

Actions:
Test start
Notify: "Matrix richtig geschaltet !!"

Diagram No.: 2.08

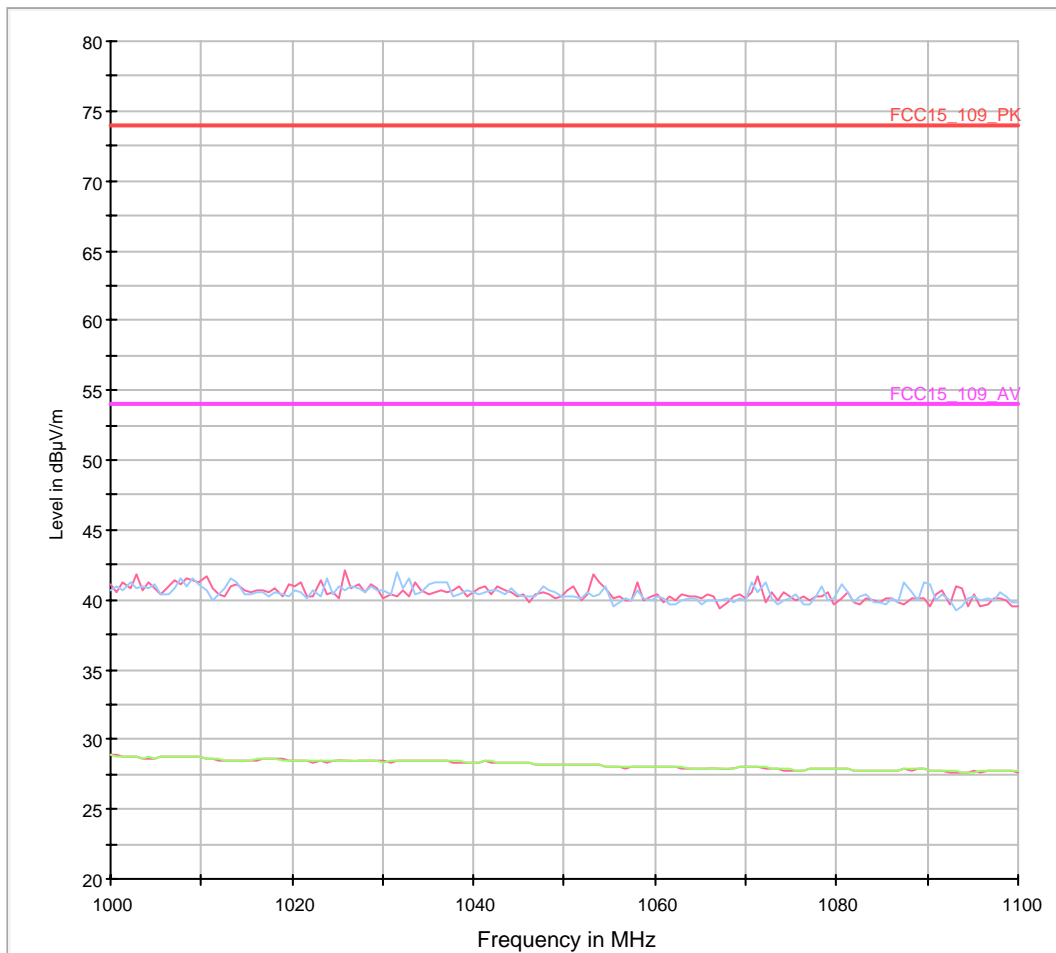
Common Information

Test Description:	Radiated field strength emission
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC 15.209 Intentional Radiator
Antenna polarisation:	horizontal/vertical
Operation mode:	FM88.2MHz + IDLE1900 + Charging battery
Operator Name:	Lor
Comment:	EUT horizontal

EUT Information

EUT:	AAD-3052091-BV(FM1)+DC Adapter
Manufacturer:	Sony Ericsson
Serial Number:	FCC FM1

03_1_2.7_ohne switch H&V



EMI Auto Test Template: 03_1_2.7_ohne switch H&V

Hardware Setup: 13_ESU_Horn_18G_Preamp_ohne_SM
Frequency Range: 1 GHz - 1,1 GHz
Graphics Level Range: 20 dB μ V/m - 80 dB μ V/m

Preview Measurements:
Scan Test Template: 07_ESU_1_2.7G_pre

Data Reduction:
Limit Line #1: FCC15_109_PK
Limit Line #2: FCC15_109_AV
Display titles of limit lines in graphic : Yes
Maximum Results: 50
Maxima per Subrange 1
Acceptance Offset: -20 dB

Zoom:
Zoom Scan Template: 09_ESU_1_2.7G_zoom

Adjustment:
Scan Template for 07_ESU_1_2.7G_pre
Adjustment Measurements

Final Measurements:
Template for Single Meas.: 11_ESU_1_2.7G_fin
Template for Single Meas.:(>1GHz) 11_ESU_1_2.7G_fin

Report Settings:
Report Template: Report Setup FCC 15_209

Actions:
Test start
Notify: "Matrix richtig geschaltet !!"

Diagram No.: 2.09

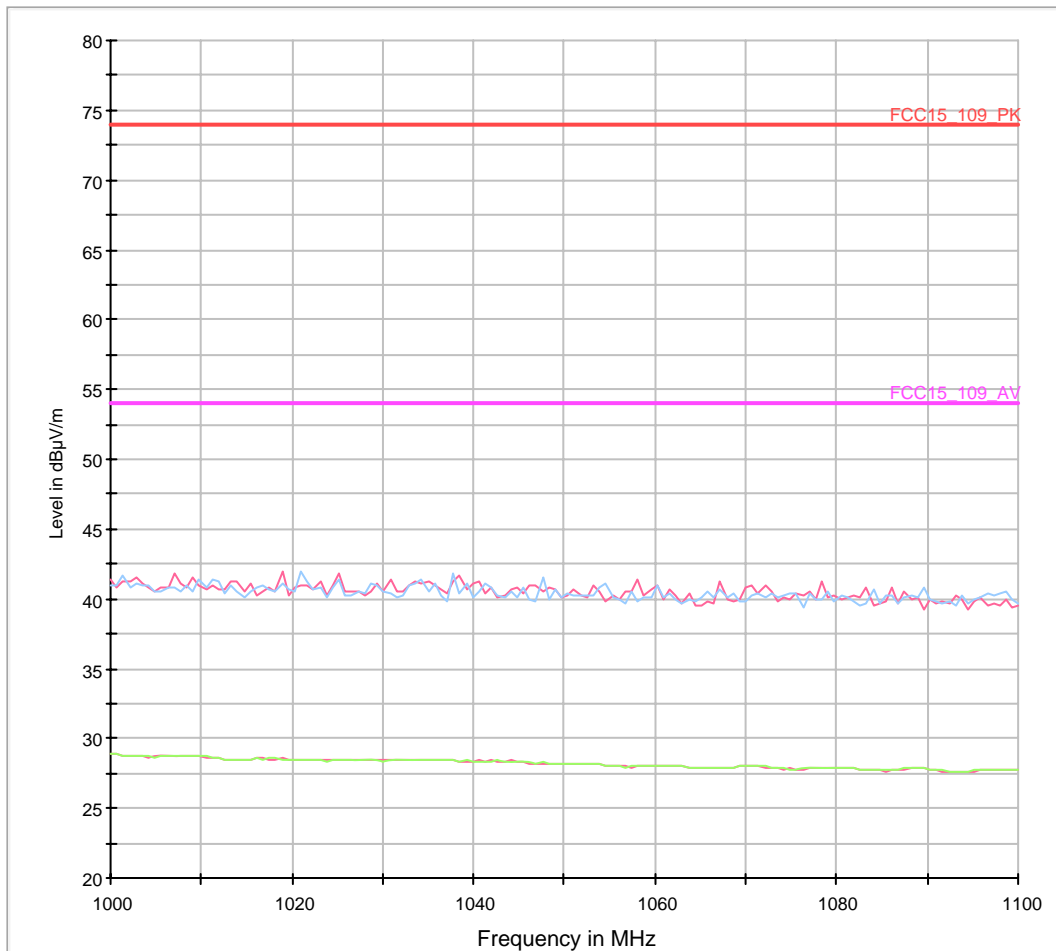
Common Information

Test Description:	Radiated field strength emission
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC 15.209 Intentional Radiator
Antenna polarisation:	horizontal/vertical
Op. Mode	FM98MHz + IDLE 1900 + Charging battery
Operator Name:	Lor
Comment:	EUT vertical

EUT Information

EUT:	AAD-3052091-BV(FM1)+DC Adapter
Manufacturer:	Sony Ericsson
Serial Number:	FM1

03_1_2.7_ohne switch H&V



EMI Auto Test Template: 03_1_2.7_ohne switch H&V

Hardware Setup: 13_ESU_Horn_18G_Preamp_ohne_SM
Frequency Range: 1 GHz - 1,1 GHz
Graphics Level Range: 20 dB μ V/m - 80 dB μ V/m

Preview Measurements:
Scan Test Template: 07_ESU_1_2.7G_pre

Data Reduction:
Limit Line #1: FCC15_109_PK
Limit Line #2: FCC15_109_AV
Display titles of limit lines in graphic : Yes
Maximum Results: 50
Maxima per Subrange 1
Acceptance Offset: -20 dB

Zoom:
Zoom Scan Template: 09_ESU_1_2.7G_zoom

Adjustment:
Scan Template for 07_ESU_1_2.7G_pre
Adjustment Measurements

Final Measurements:
Template for Single Meas.: 11_ESU_1_2.7G_fin
Template for Single Meas.:(>1GHz) 11_ESU_1_2.7G_fin

Report Settings:
Report Template: Report Setup FCC 15_209

Actions:
Test start
Notify: "Matrix richtig geschaltet !!"

Diagram No.: 2.10

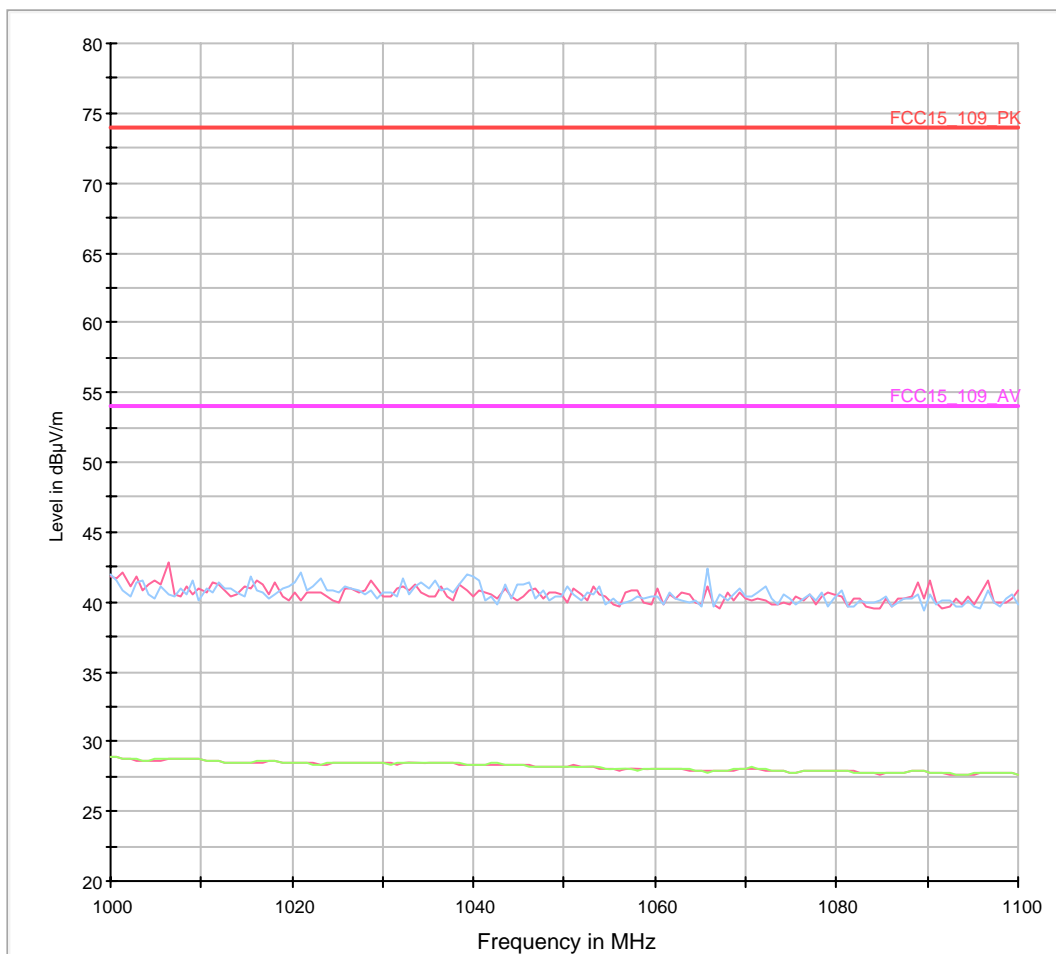
Common Information

Test Description:	Radiated field strength emission
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC 15.209 Intentional Radiator
Antenna polarisation:	horizontal/vertical
Operation mode:	FM98MHz + IDLE 1900 + charging battery
Operator Name:	Lor
Comment:	EUT Horizontal

EUT Information

Description:	
EUT:	AAE-3052091-BV(FM1)+DC Adapter
Manufacturer:	Sony Ericsson
Serial Number:	FM1

03_1_2.7_ohne switch H&V



EMI Auto Test Template: 03_1_2.7_ohne switch H&V

Hardware Setup: 13_ESU_Horn_18G_Preamp_ohne_SM
Frequency Range: 1 GHz - 1,1 GHz
Graphics Level Range: 20 dB μ V/m - 80 dB μ V/m

Preview Measurements:
Scan Test Template: 07_ESU_1_2.7G_pre

Data Reduction:
Limit Line #1: FCC15_109_PK
Limit Line #2: FCC15_109_AV
Display titles of limit lines in graphic : Yes
Maximum Results: 50
Maxima per Subrange 1
Acceptance Offset: -20 dB

Zoom:
Zoom Scan Template: 09_ESU_1_2.7G_zoom

Adjustment:
Scan Template for 07_ESU_1_2.7G_pre
Adjustment Measurements

Final Measurements:
Template for Single Meas.: 11_ESU_1_2.7G_fin
Template for Single Meas.:(>1GHz) 11_ESU_1_2.7G_fin

Report Settings:
Report Template: Report Setup FCC 15_209

Actions:
Test start
Notify: "Matrix richtig geschaltet !!"

Diagram No.: 2.11

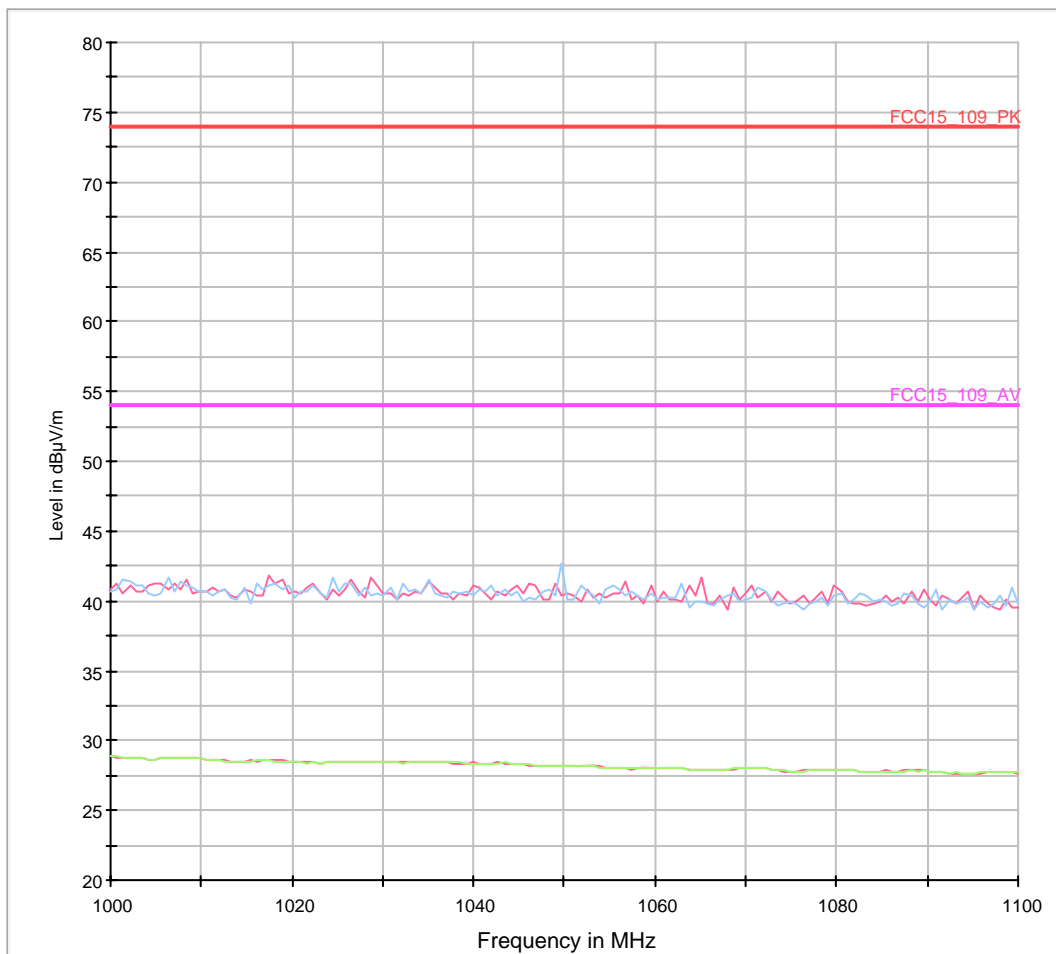
Common Information

Test Description:	Radiated field strength emission
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC 15.209 Intentional Radiator
Antenna polarisation:	horizontal/vertical
Operation mode:	FM107.8MHz + IDLE 1900 + charging battery
Operator Name:	Lor
Comment:	EUT vertical

EUT Information

EUT:	AAD-3052091-BV(FM1)+DC Adapter
Manufacturer:	Sony Ericsson
Serial Number:	FM1

03_1_2.7_ohne switch H&V



EMI Auto Test Template: 03_1_2.7_ohne switch H&V

Hardware Setup: 13_ESU_Horn_18G_Preamp_ohne_SM
Frequency Range: 1 GHz - 1,1 GHz
Graphics Level Range: 20 dB μ V/m - 80 dB μ V/m

Preview Measurements:
Scan Test Template: 07_ESU_1_2.7G_pre

Data Reduction:
Limit Line #1: FCC15_109_PK
Limit Line #2: FCC15_109_AV
Display titles of limit lines in graphic : Yes
Maximum Results: 50
Maxima per Subrange 1
Acceptance Offset: -20 dB

Zoom:
Zoom Scan Template: 09_ESU_1_2.7G_zoom

Adjustment:
Scan Template for 07_ESU_1_2.7G_pre
Adjustment Measurements

Final Measurements:
Template for Single Meas.: 11_ESU_1_2.7G_fin
Template for Single Meas.:(>1GHz) 11_ESU_1_2.7G_fin

Report Settings:
Report Template: Report Setup FCC 15_209

Actions:
Test start
Notify: "Matrix richtig geschaltet !!"

Diagram No.: 2.12

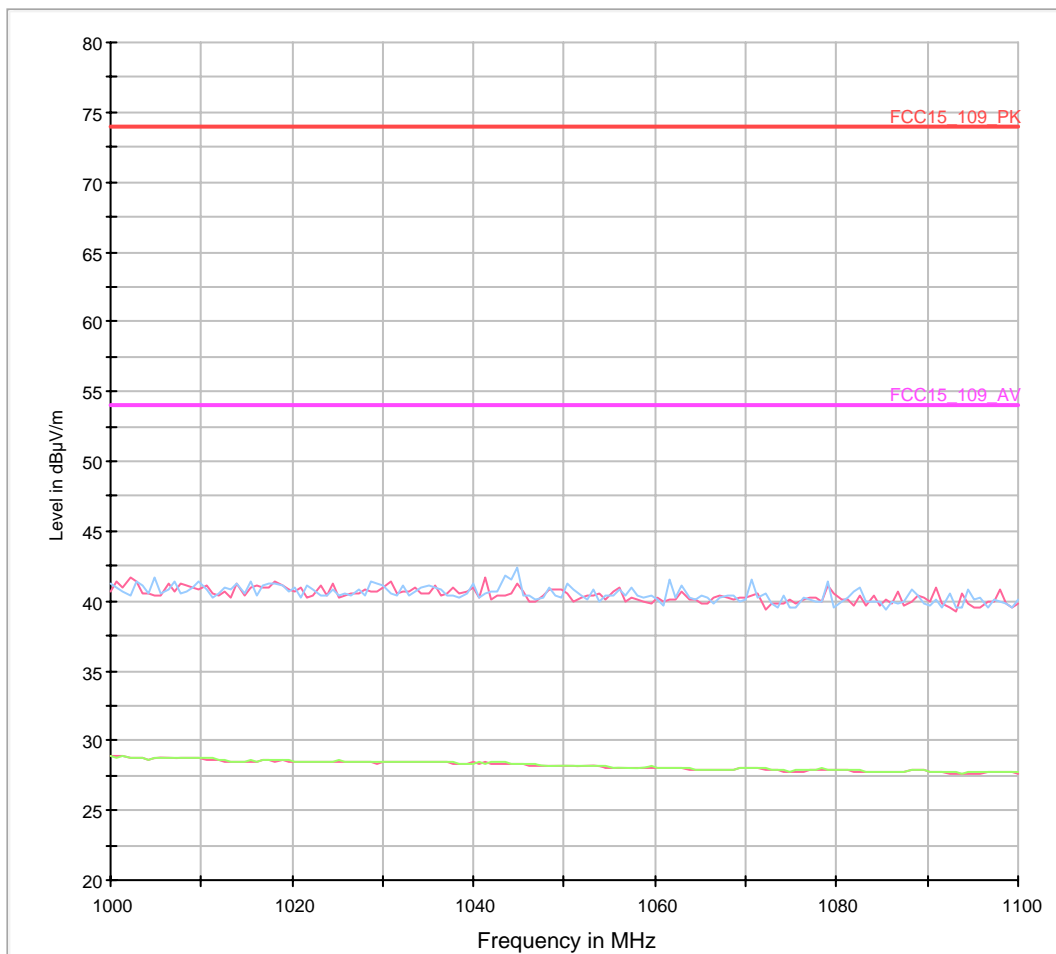
Common Information

Test Description:	Radiated field strength emission
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC 15.209 Intentional Radiator
Antenna polarisation:	horizontal/vertical
Operation mode:	FM107.8MHz + IDLE 1900 Mode + charging battery
Operator Name:	Lor
Comment:	EUT H

EUT Information

EUT:	AAD-3052091-BV(FM1)+DC Adapter
Manufacturer:	Sony Ericsson
Serial Number:	FM1

03_1_2.7_ohne switch H&V



EMI Auto Test Template: 03_1_2.7_ohne switch H&V

Hardware Setup: 13_ESU_Horn_18G_Preamp_ohne_SM
Frequency Range: 1 GHz - 1,1 GHz
Graphics Level Range: 20 dB μ V/m - 80 dB μ V/m

Preview Measurements:
Scan Test Template: 07_ESU_1_2.7G_pre

Data Reduction:
Limit Line #1: FCC15_109_PK
Limit Line #2: FCC15_109_AV
Display titles of limit lines in graphic : Yes
Maximum Results: 50
Maxima per Subrange 1
Acceptance Offset: -20 dB

Zoom:
Zoom Scan Template: 09_ESU_1_2.7G_zoom

Adjustment:
Scan Template for 07_ESU_1_2.7G_pre
Adjustment Measurements

Final Measurements:
Template for Single Meas.: 11_ESU_1_2.7G_fin
Template for Single Meas.:(>1GHz) 11_ESU_1_2.7G_fin

Report Settings:
Report Template: Report Setup FCC 15_209

Actions:
Test start
Notify: "Matrix richtig geschaltet !!"

Diagram 2.13: Channel = Low (88.2MHz)

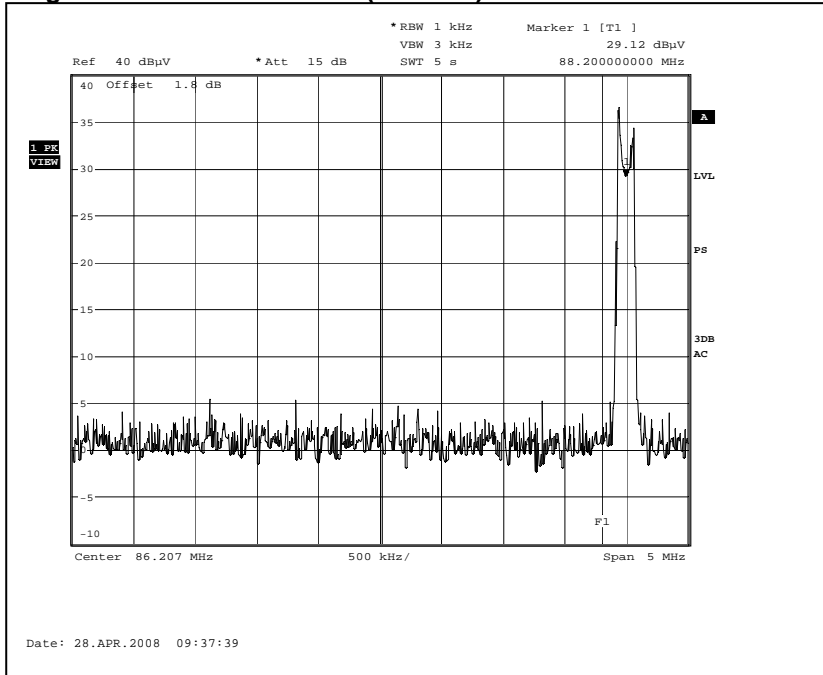
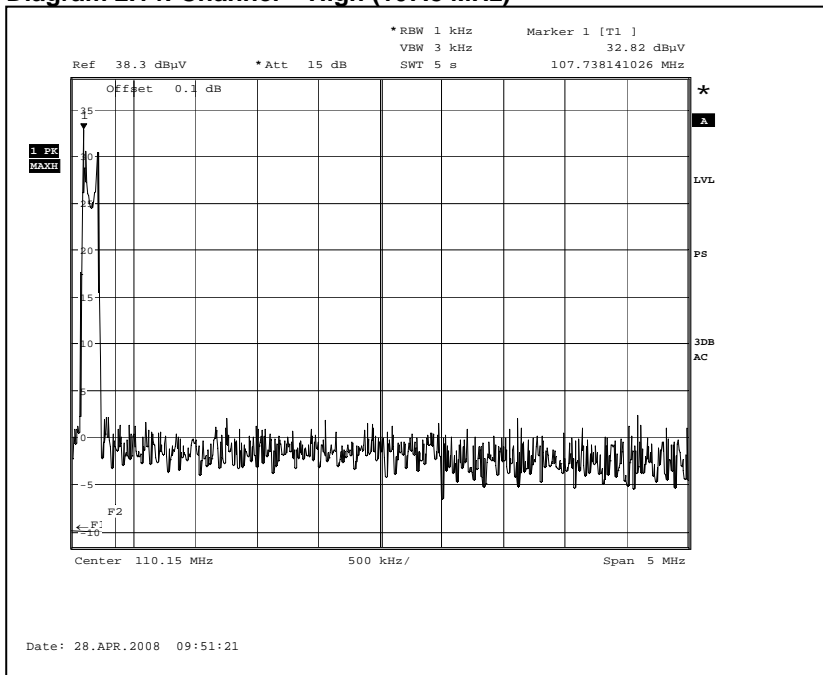
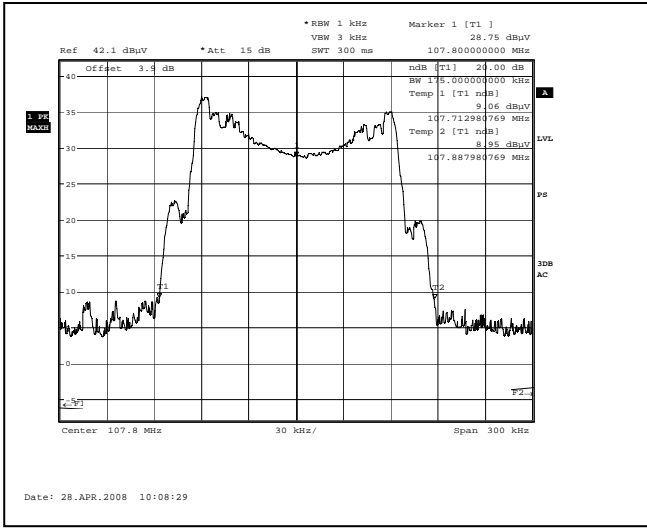


Diagram 2.14: Channel = High (107.8 MHz)

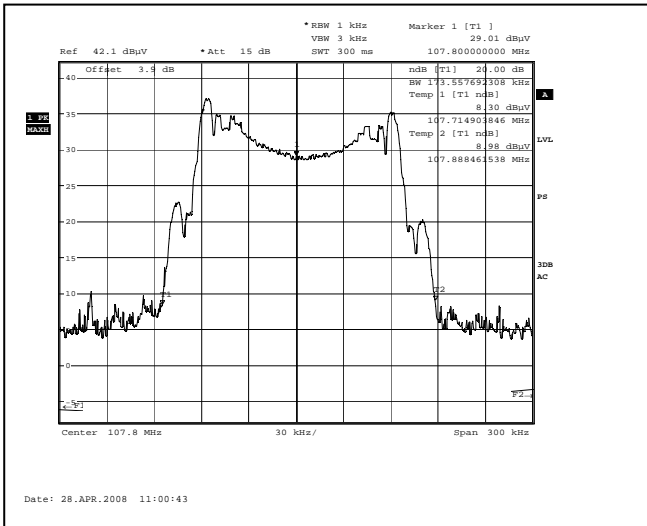


8.3. 20 dB Bandwidth

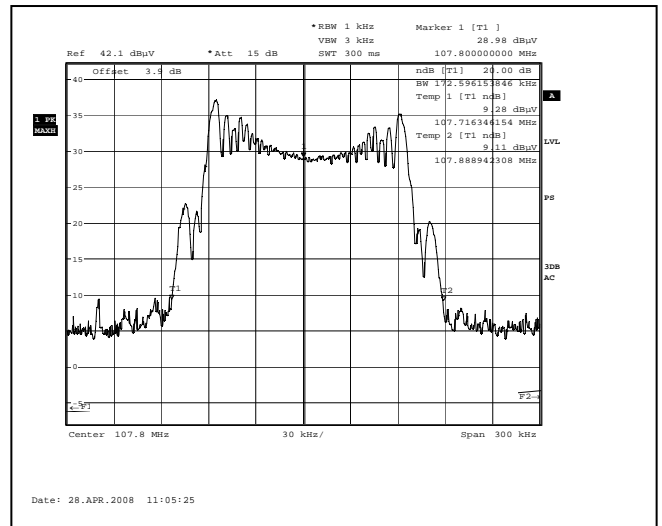
High Channel = 107,8 MHz



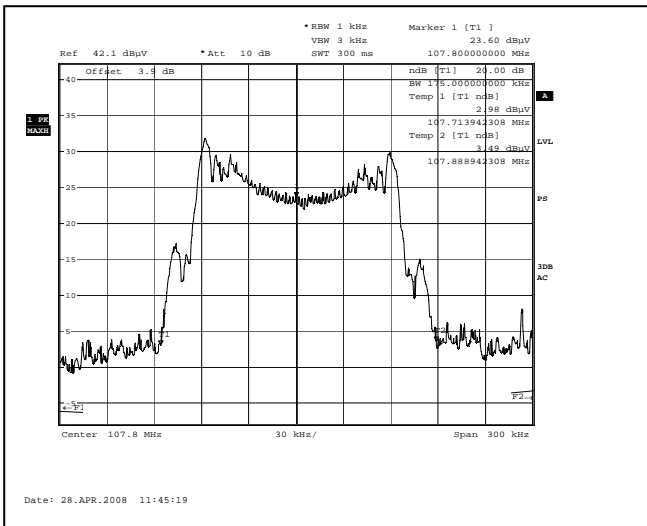
Tnom, Vmax



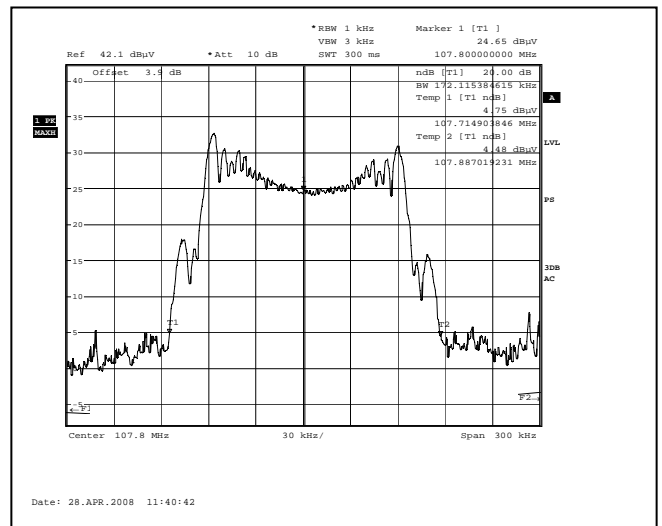
T=30°C, Vmax



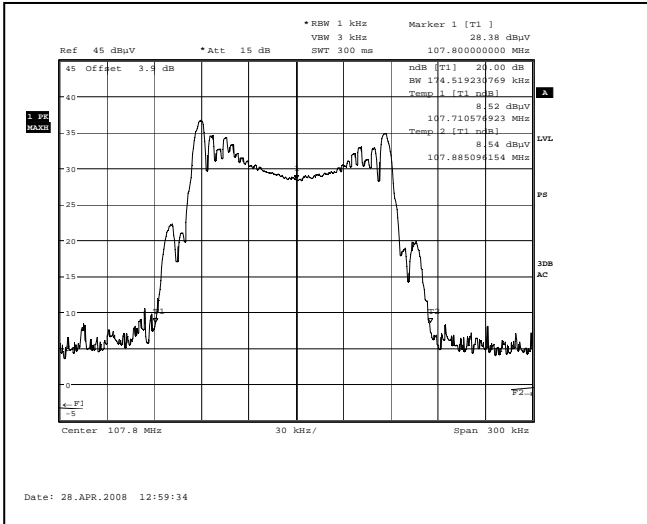
T=30°C, Vmin



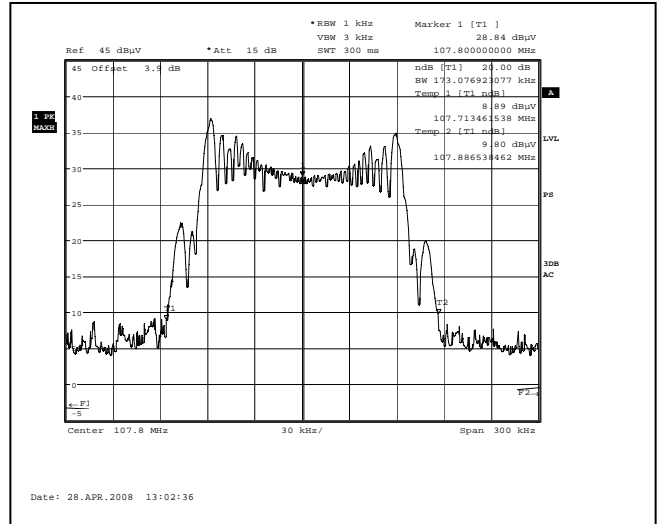
T=40°C, Vmax



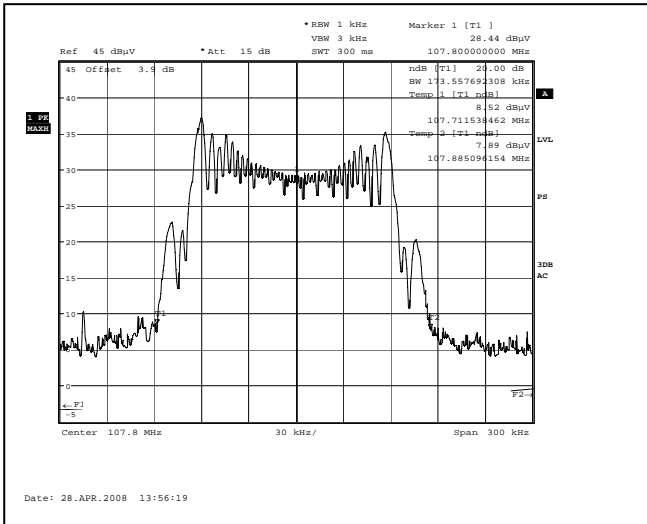
T=40°C, Vmin



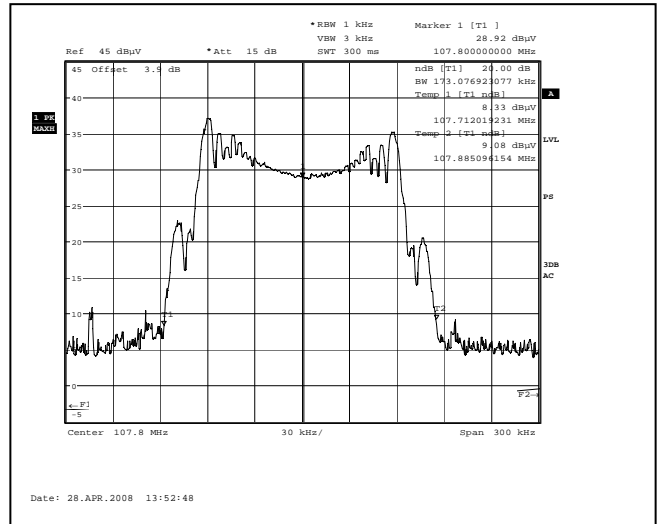
T=50°C, Vmax



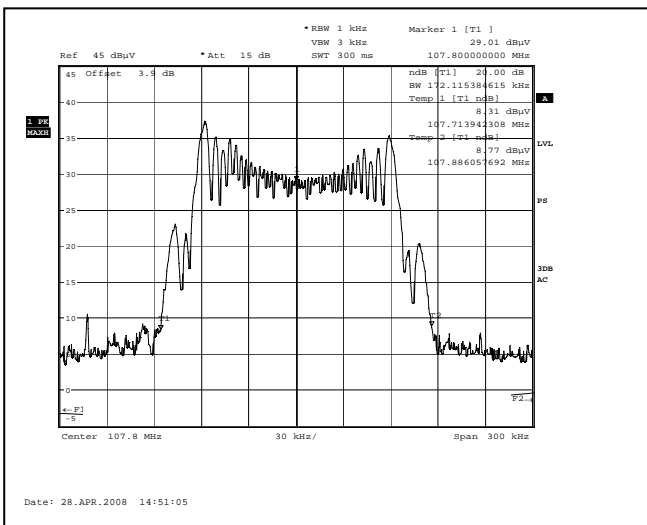
T=50°C, Vmin



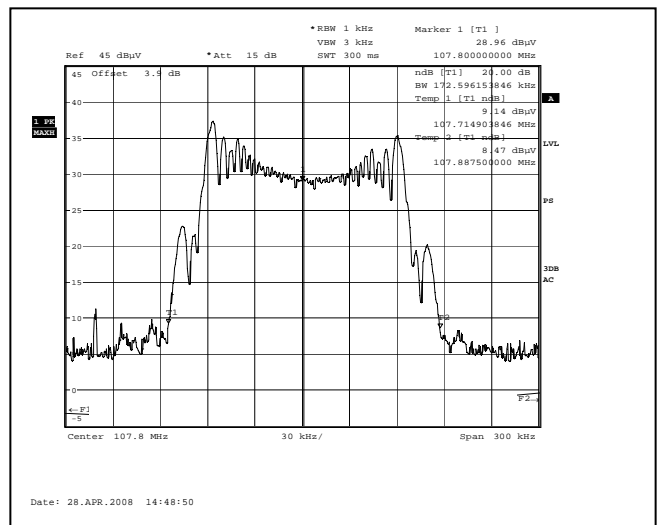
T=10°C, Vmax



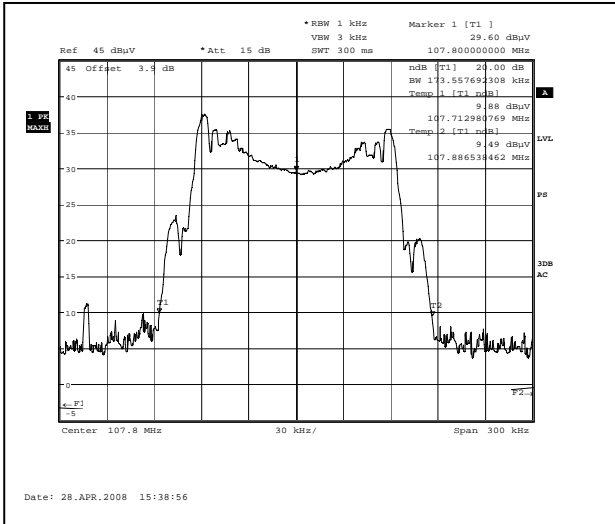
T=10°C, Vmin



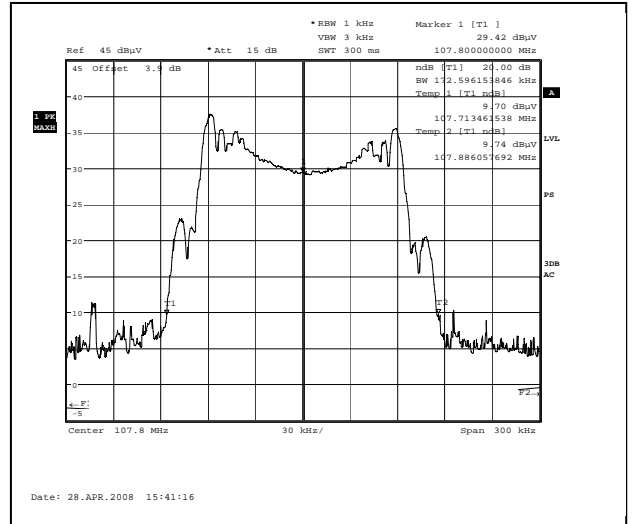
T=0°C, Vmax



T=0°C, Vmin

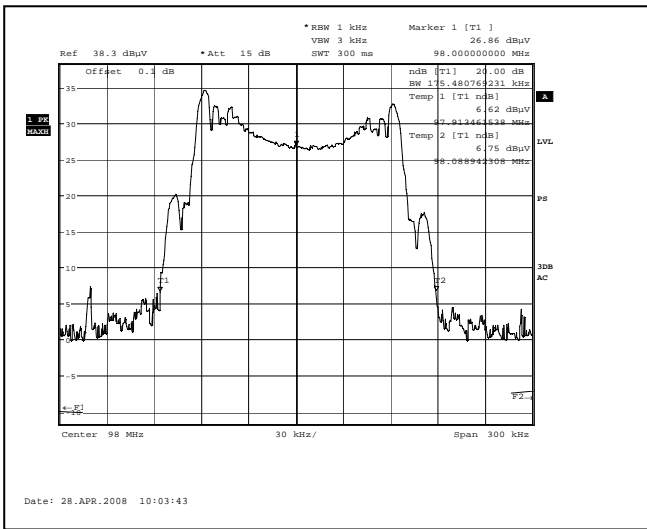


T=-10°C, Vmax

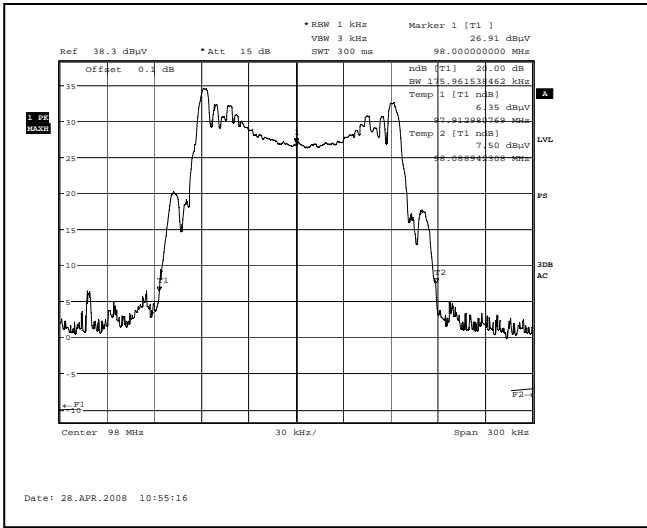


T=-10°C, Vmin

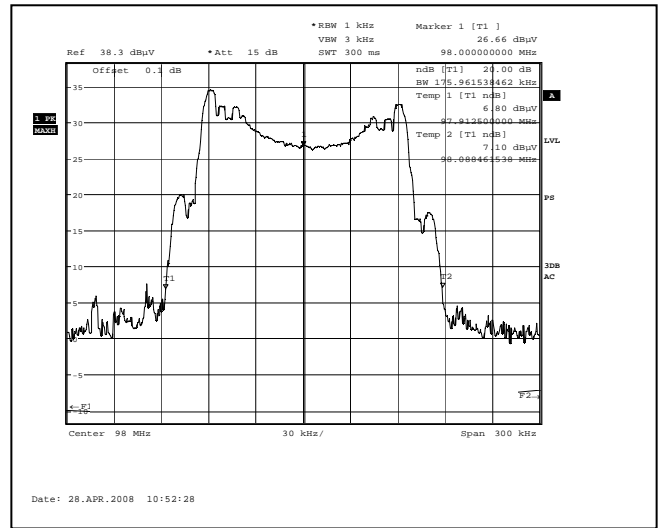
Middle Channel = 98 MHz



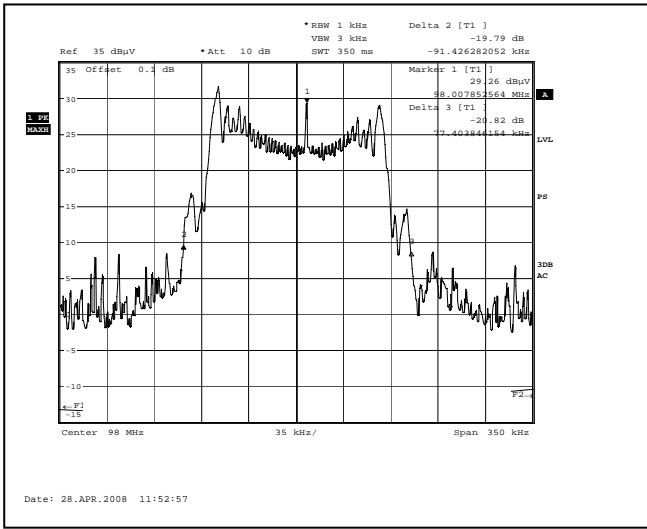
Tnom, Vmax



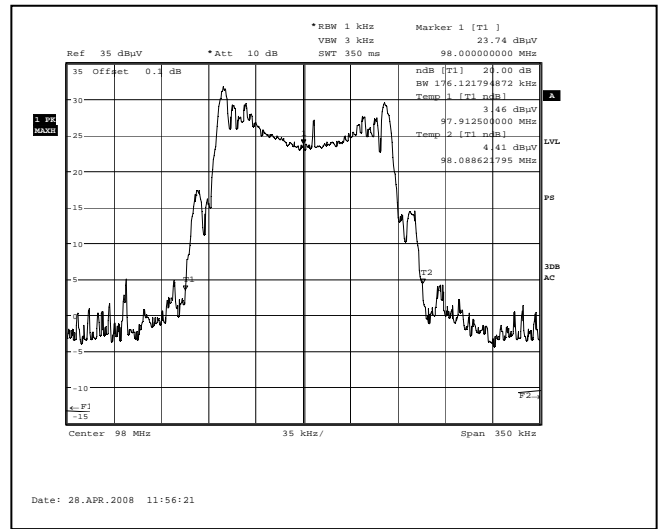
T=30°C, Vmax



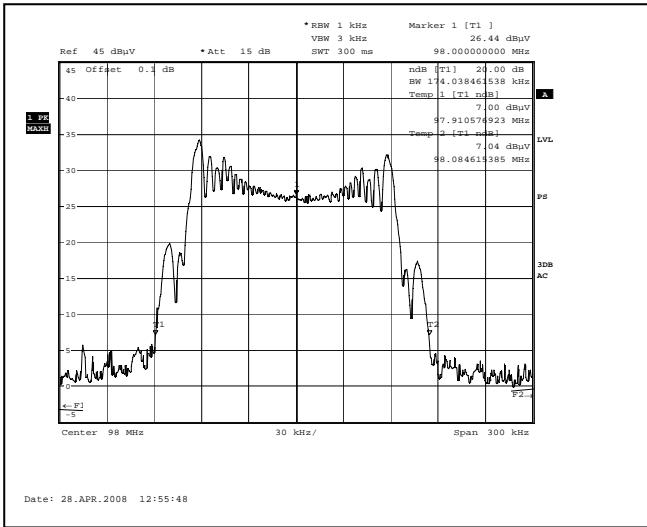
T=30°C, Vmin



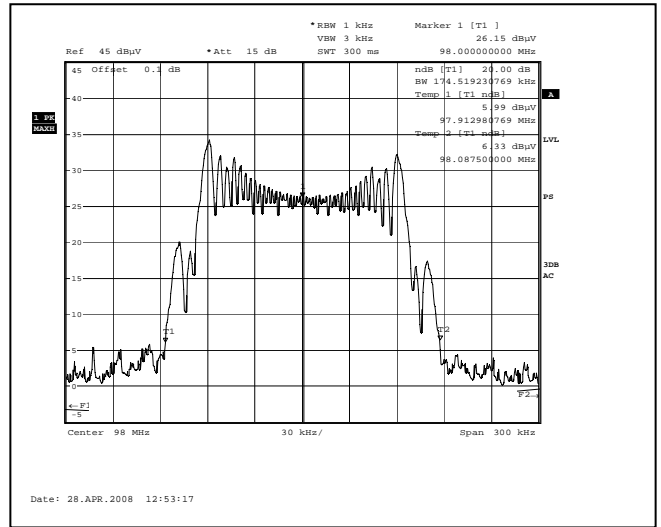
T=40°, Vmax



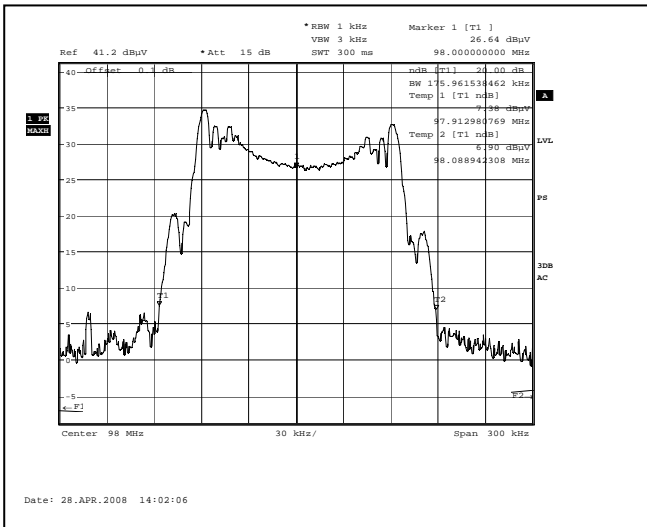
T=40°, Vmin



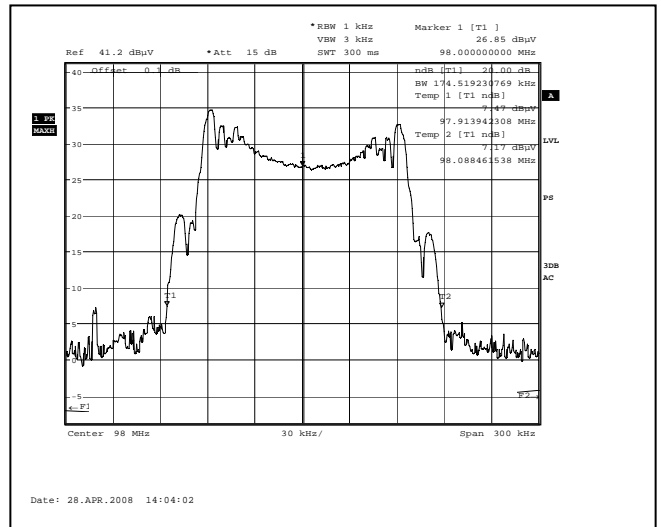
T=50°C, Vmax



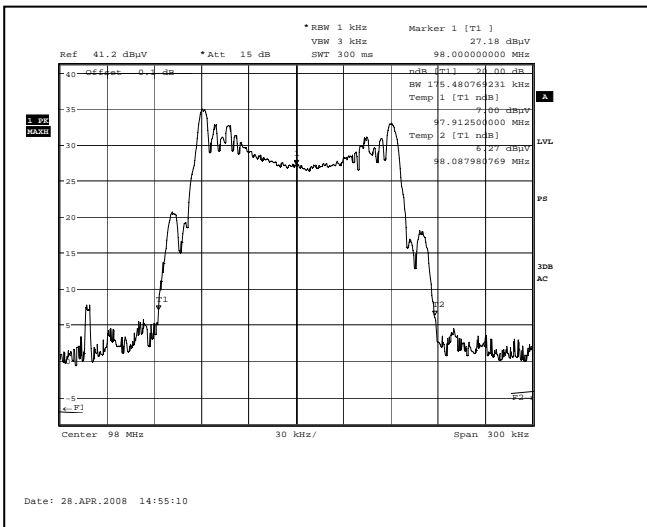
T=50°C, Vmin



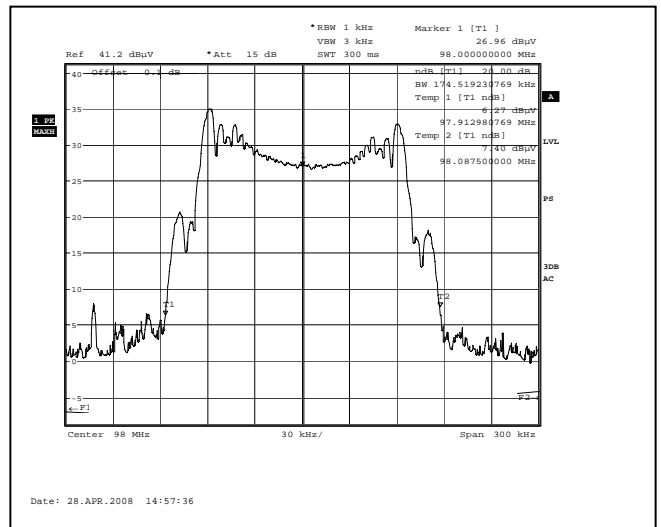
T=10°C, Vmax



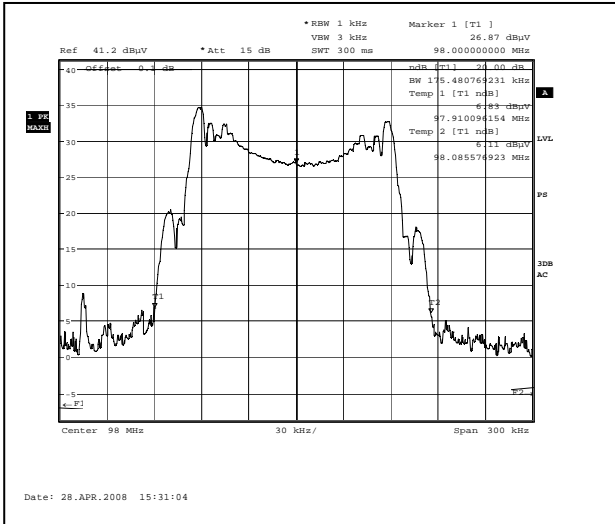
T=10°C, Vmin



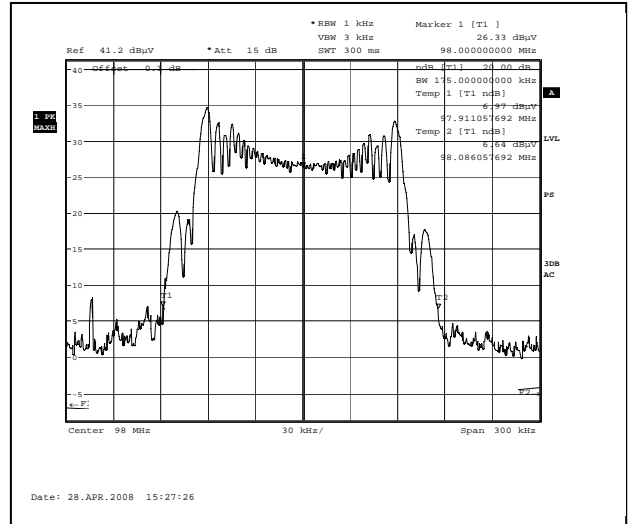
T=0°C, Vmax



T=0°C, Vmin

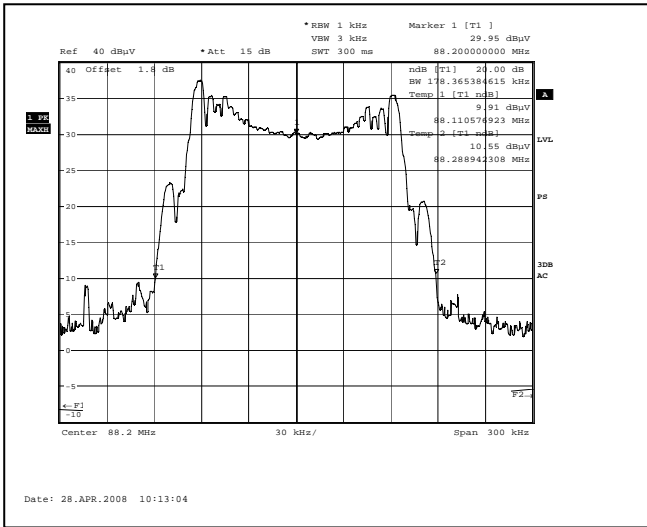


T=-10°C, Vmax

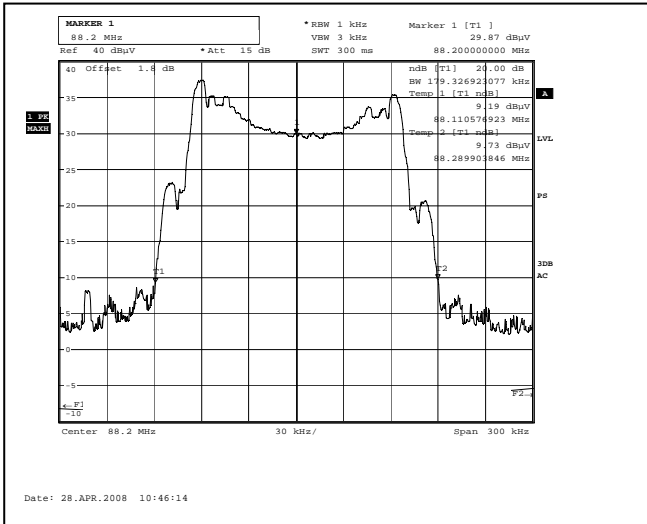


T=-10°C, Vmin

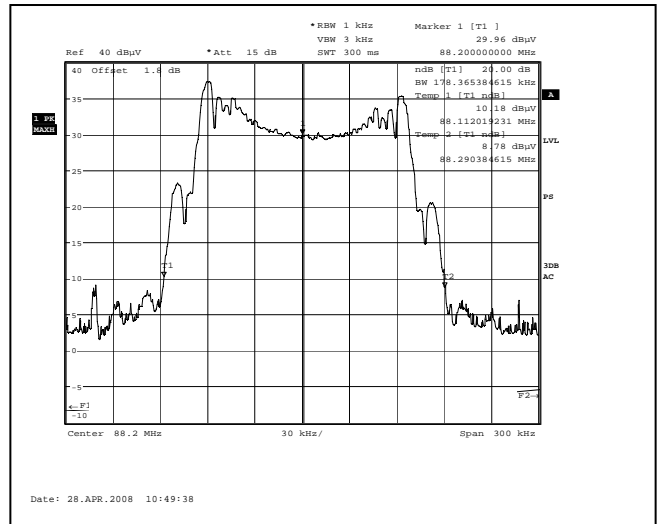
Lowest Channel = 88.2 MHz



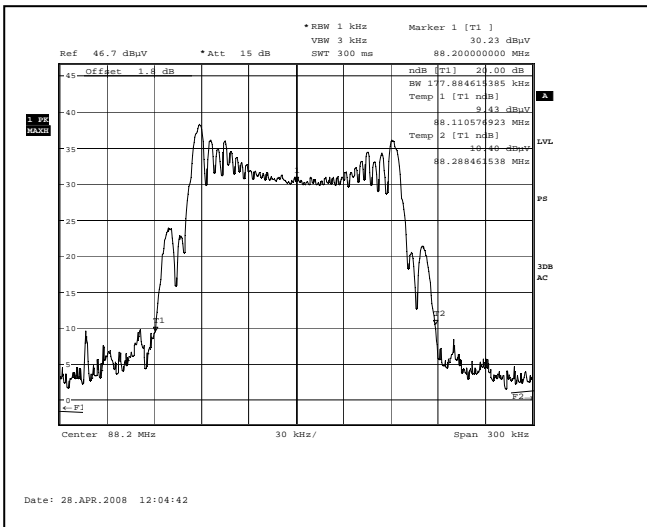
Tnom, Vmax



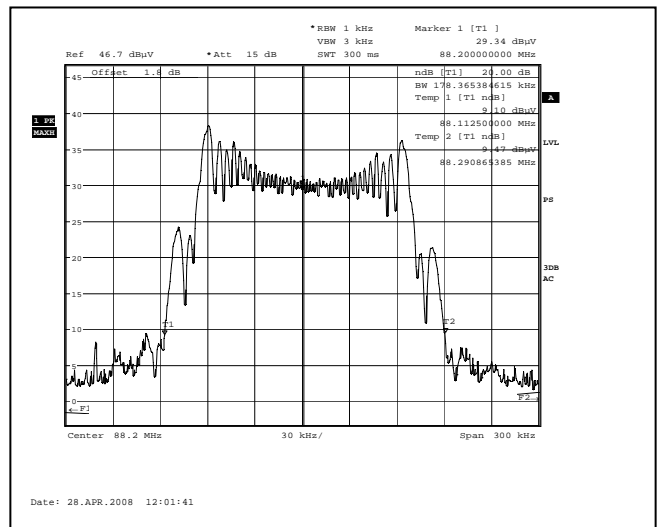
T=30°C, Vmax



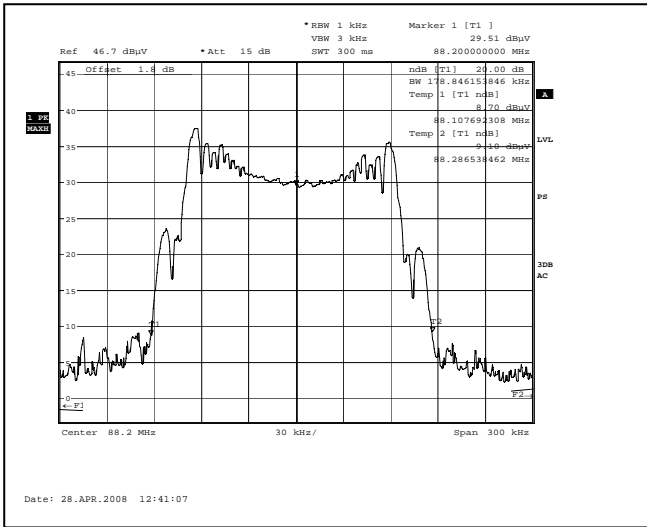
T=30°C, Vmin



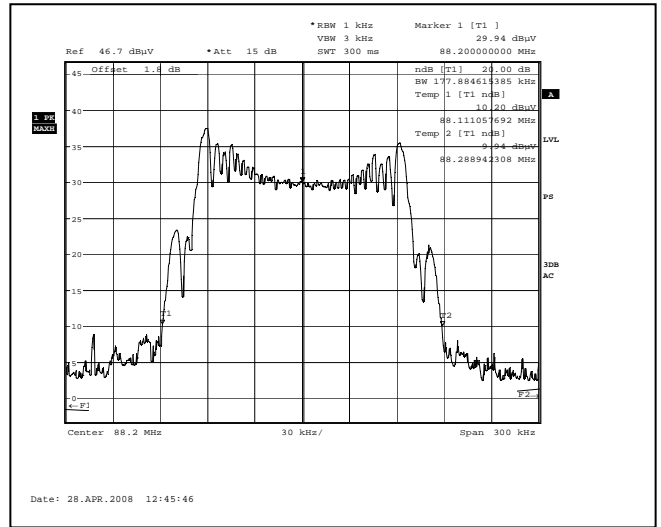
T=40°, Vmax



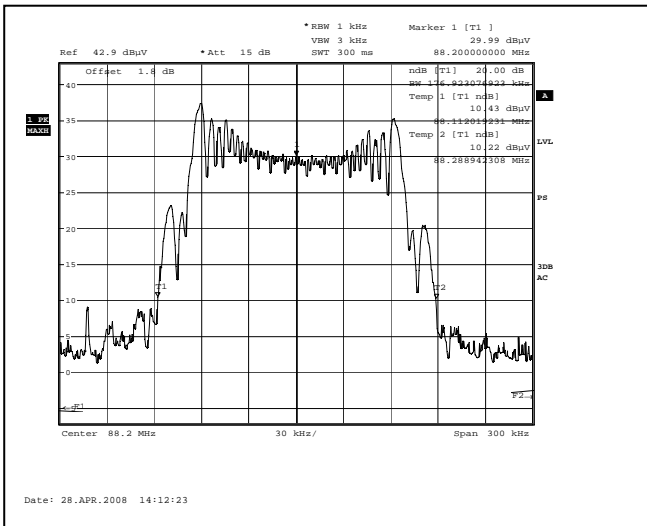
T=40°, Vmin



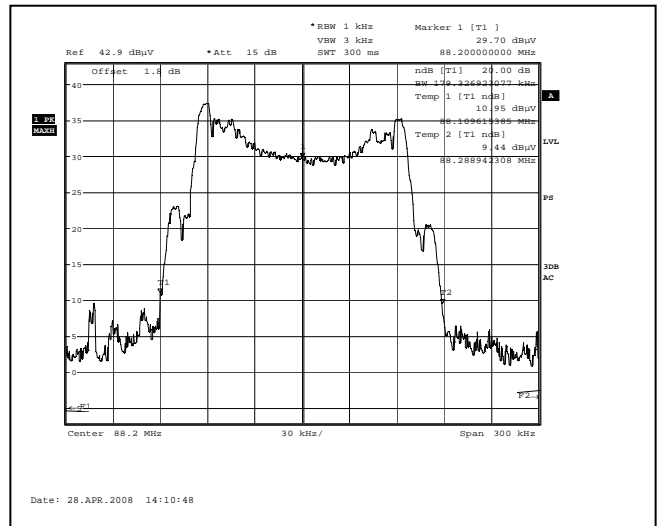
T=50°C, Vmax



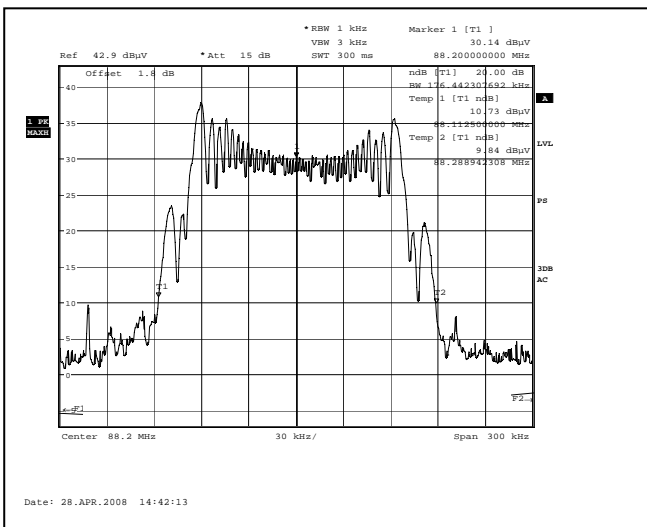
T=50°C, Vmin



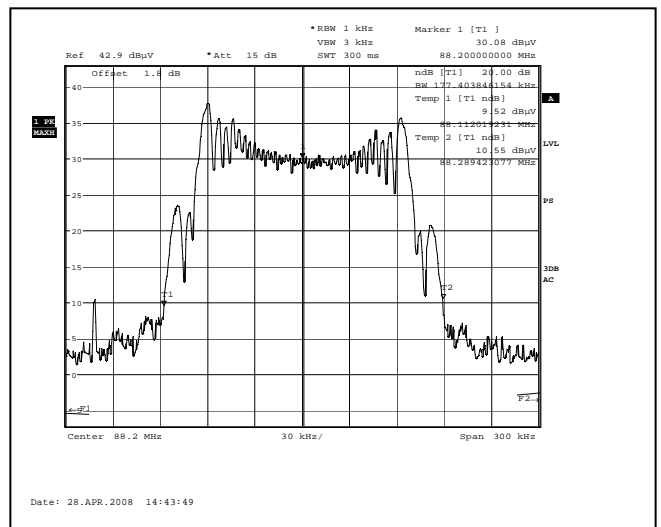
T=10°C, Vmax



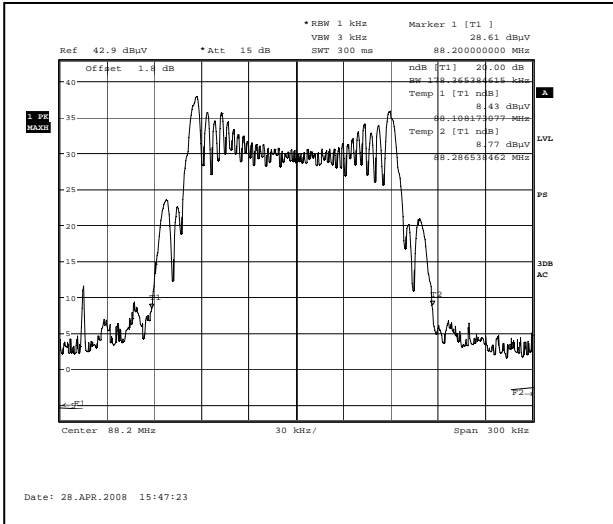
T=10°C, Vmin



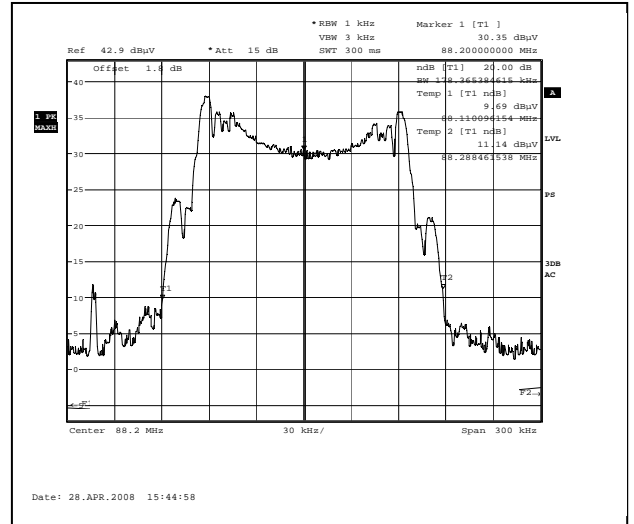
T=0°C, Vmax



T=0°C, Vmin



T=-10°C, Vmax



T=-10°C, Vmin