



ACCREDITED TESTING LABORATORY (NR. 32) for Electromagnetic Compatibility

Competent Body according to EU-Directive 89/336
FCC listed laboratory (Registration Number: 285819)

TEST REPORT No. EMV-E 25/02

On: FCC: 47 CFR Part 15, Edition 10-1-01

Ordered by: SKIDATA AG

Address: Untersbergstraße 40
A-5083 Gartenau

Manufacturer: SKIDATA AG

Subject: Parking Column

Type: AS 450 SA00-BLL

S/No.: 00001

Internal Order No.: E-671

Technical responsibility:

Dipl.-Ing. Kurt Lamedschwandner, M.B.A

Date: 23th of August 2002

Test performed by:

Erich Gärtner

Number of Pages: 17

Comments:

The test results refers exclusively to the test subject.

The production or transmission of extracts of the present report is subject to authorisation by the testing laboratory

LIST OF MEASUREMENTS

Measurements list according to FCC: 47 CFR Part 15, Edition 10-1-01

<u>Paragraph</u>		<u>Page Nr. of this test report</u>	<u>Passed</u>
INTENTIONAL RADIATORS			
§ 15.207	Conducted emissions	3	Y
§ 15.225	Operation within the band 13.553 – 13.567 MHz		
a	Field strength	4	Y
b	Radiated emissions	5	Y
c	Frequency tolerance of the carrier signal	7	Y
UNINTENTIONAL RADIATORS			
§ 15.107	Conducted emissions	8	Y
§ 15.109	Radiated emissions	9	Y
ADDITIONAL INFORMATION		10	
	Plots	14	

Abbreviations:

Y	Yes
N	No
n. a.	Not applicable

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Ambient temperature 22 °C

Relative humidity 50 %

Conducted Emissions (Intentional Radiator)

§ 15.207 / a

Conducted Emissions			
f (MHz)	BW (kHz)	Voltage (dB μ V)	Voltage (μ V)
13.56	9	46.2 (Peak)	204.17
Measurement uncertainty \pm 6 dB			

Bandwidth; this refers to the bandwidth of measurement receiver.

LIMITS

§ 15.207 / a

f (MHz)	BW (kHz)	Field strength (μ V)
0.450-30	9	250 (48 dBμV)

The above standing radio frequency voltages are based on **quasi peak limits**.

Reference numbers of test equipment used:

01 – 04, 28, 47

Ambient temperature 15 °C Relative humidity 40 %

Field strength (Intentional Radiator) § 15.225 / a

Field strength at a distance of 30 m			
f (MHz)	Bandwidth (kHz)	Field strength (dBµV/m)	Field strength (µV/m)
13.56	9	≤ 34 (QP)	≤ 50.12
Measurement uncertainty ± 6 dB			

Bandwidth; this refers to the bandwidth of measurement receiver.

LIMITS § 15.225 / a

f (MHz)	Bandwidth (kHz)	Field strength at a distance of 30 m
13.553 – 13.567	9	10000 (80dBµV/m)

The above standing field strength limit is based on **Quasi-Peak** measurements.

Reference numbers of test equipment used:
01 – 04, 15, 47

Ambient temperature 22 °C

Relative humidity 50 %

Radiated Emissions (Intentional Radiator)

§ 15.225 / b

Radiated Emissions				
f (MHz)	BW (kHz)	Distance (m)	Field strength (dBµV/m)	Field strength (µV/m)
123 kHz	9	5	68.3	2600
	9	10	53.5	473.1
		30	35.18*)	57.4*)
		100	20.23*)	10.32*)
		300	10.30*)	3.27*)
Measurement uncertainty ± 6 dB				

*) The free field noise level was > 48dBµV/m, so it was not possible to measure the emissions of the DUT in a distance more than 10 m to the measurement antenna. Because of this, we had to approach the emission levels to a distance of 300 m.

Radiated Emissions at a distance of 3 m				
f (MHz)	BW (kHz)	Limit (µV/m)	Field strength (dBµV/m)	Field strength (µV/m)
39.84	120	100	33.6 (Peak)	47.9
71.77	120	100	34.1 (Peak)	50.7
105.88	120	150	38.4 (Peak)	83.2
190.72	120	150	38.4 (Peak)	83.2
339.96	120	200	41.5 (Peak)	118.9
692.24	120	200	41.6 (Peak)	120.2
Measurement uncertainty ± 6 dB				

Bandwidth; this refers to the bandwidth of measurement receiver.

LIMITS

§ 15.209 / a

f (MHz)	BW (kHz)	Meas. distance (m)	Field strength ($\mu\text{V}/\text{m}$)
0.009-0.150	0.2	300	2400/F (kHz)
0.009-0.490	9	300	2400/F (kHz)
0.490-1.705	9	30	24000/F (kHz)
1.705-30.0	9	30	30
30-88	120	3	100**
88-216	120	3	150**
216-960	120	3	200**
960-1000	120	3	500
1000-2400	1000	3	500
Above 2483.5	1000	3	500

** Except as provided in § 15.209 / g

The above standing field strength limits in the frequency bands 9-90 kHz, 110-490 kHz and above 1 GHz are based on **average limits**.

All other above standing field strength limits are based on **quasi peak limits**.

Reference numbers of test equipment used:

01 – 04, 30, 35, 45

Ambient temperature 22 °C

Relative humidity 50 %

Frequency tolerance of the carrier signal

§ 15.225 / c

TEST CONDITIONS		FREQUENCY TOLERANCE	
		13.56 MHz	
		f_l	f_h
V_{nom}	-20°C	13.558720	13.561178
V_{nom}	+50°C	13.558821	13.561202
85% of V_{nom}	+20°C	13.56	13.56
115% of V_{nom}	+20°C	13.56	13.56

Bandwidth; this refers to the bandwidth of measurement receiver.

LIMITS

§ 15.225 / c

TEST CONDITIONS		FREQUENCY TOLERANCE
V_{nom}	-20°C	$\pm 0.01\%$ (13.558644 ; 13.561356 MHz)
V_{nom}	+50°C	$\pm 0.01\%$ (13.558644 ; 13.561356 MHz)
V_{nom}	+50°C	$\pm 0.01\%$ (13.558644 ; 13.561356 MHz)
V_{nom}	+50°C	$\pm 0.01\%$ (13.558644 ; 13.561356 MHz)
85% of V_{nom}	+20°C	$\pm 0.01\%$ (13.558644 ; 13.561356 MHz)
115% of V_{nom}	+20°C	$\pm 0.01\%$ (13.558644 ; 13.561356 MHz)

Reference numbers of test equipment used:
01 – 04, 49

Ambient temperature 22 °C Relative humidity 50 %

Conducted Emissions (Unintentional Radiator) § 15.107 / a

Conducted Emissions				
No other emissions additional to the intentional radiator emission spectrum was found (The limits of § 15.107 / a are higher than those of § 15.207).				
Measurement uncertainty ± 6 dB				

Bandwidth; this refers to the bandwidth of measurement receiver.

LIMITS § 15.107 / a

f (MHz)	BW (kHz)	Field strength (µV)
0.450-1.705	9	1000
1.705-30	9	3000

The above standing radio frequency voltages are based on **quasi peak limits**.

Reference numbers of test equipment used:
01 – 04, 35, 75

Ambient temperature 22 °C

Relative humidity 50 %

Radiated Emissions (Unintentional Radiator)

§ 15.109 / a

Radiated Emissions at a distance of 3 m				
No other emissions additional to the intentional radiator emission spectrum was found above noise level (The limits of § 15.109 / a and § 15.209 / a in the frequency spectrum 30 MHz – 1 GHz are the same).				
Measurement uncertainty ± 6 dB				

Bandwidth; this refers to the bandwidth of measurement receiver.

LIMITS

§ 15.109 / a

f (MHz)	BW (kHz)	Meas. distance (m)	Field strength (µV/m)
30-88	120	3	100
88-216	120	3	150
216-960	120	3	200
960-1000	120	3	500
Above 1000	1000	3	500

The above standing field strength limits are based on **quasi peak limits**.

Reference numbers of test equipment used:
01 – 04, 30, 35, 45

ADDITIONAL INFORMATION SUPPLEMENTARY TO THE TEST REPORT

Page No.	Plot No.	Remarks			Clause
14	02	30 MHz - 1000 MHz	transmit	pol V/90°	§ 15.209
14	03	30 MHz - 1000 MHz	transmit	pol V/180°	§ 15.209
15	05	30 MHz - 1000 MHz	transmit	pol H/270°	§ 15.209
15	06	30 MHz - 1000 MHz	transmit	pol H/180°	§ 15.209
16	09	0.009 MHz - 30 MHz	transmit	pol 0°/0°	§ 15.209
16	10	0.009 MHz - 30 MHz	transmit	pol 0°/90°	§ 15.209
17	01	0.45 MHz - 30 MHz	transmit	meas. at N	§ 15.207
17	02	0.45 MHz - 30 MHz	transmit	meas. at L	§ 15.207

Photographs page 11

List of test equipment page 12

Documentation of the device under test:**AS 450 SA00-BLL**

Fact sheet
 Block diagram
 Grounding diagram
 Descriptions and modification notifications of:

Print	Version	Serial Number
sd582	V4.1	00002
sd591	V3.1	00446
sd589	V3.1	00526
sd437	V1.0	03668

Test information:

Location: ARC Seibersdorf research GmbH
 Testet: 2nd to 13th of May 2002

Test engineer 
 (Erich Gärtner)

Test Equipment and ancillaries used for tests:

Last update: 24.07.02

No	Instrument / Ancillary	Type	Manufacturer	Serial No	ID-No
1	Spectrum Analyzer	8566B	HP	2637A03869	E0100
2	Spectr. Analyzer Display	8566B	HP	2648A13827	E0101
3	Quasi - Peak Adapter	85650A	HP	2521A00861	E0102
4	RF Preselector	85685A	HP	2648A00448	E0103
5	Spectrum Analyzer	85680B	HP	3138A05505	E0104
6	Spectr. Analyzer Display	85662A	HP	3144A20395	E0105
7	Quasi-Peak Adapter	85650A	HP	3145A01605	E0106
8	RF Preselector	85685A	HP	3146A01305	E0107
9	Spectrum Analyzer	85422E	HP	3549A0016	E0113
10	RF Preselector	85420E	HP	3427A0014	E0114
11	Digital Oszilloscope	TDS 684B	Tektronix		E0136
12	Power Meter	436A	HP	2515U0351	E0140
13	Power Sensor	8481H	HP	2349A08053	E0147
14	Multimeter	Keithley 2001	Keithley		E0165
15	Audio Analyzer	UPA 3	R & S	894027/028	E0170
16	Test Receiver	ESH3	R & S	881364/005	E0171
17	Modulation - Analyzer	FMA	R & S	825630/006	E0173
18	Signal Generator	SMG	R & S	883056/082	E0210
19	Signal Generator	SMH	R & S	862490/013	E0211
20	Signal Generator	SMT 03	R & S	834665/00	E0212
21	Burst Tester	PB 4	Haefely	080844-28	E0300
22	Coupling Filter	FP 16/3-1	Haefely		E0303
23	Impulse Tester	PC 6-288	Haefely		E0310
24	Coupling Filter	FP 20/3	Haefely		E0311
25	Test Generator	PHV 1	Haefely		E0314
26	Impulse Tester	PSD 25	Haefely		E0320
27	Test Tip	PSD 25 BMM	Haefely		E0321
28	LISN	ESH3-Z5	R & S	831.5518.52	E0501
29	LISN	ESH2-Z5	R & S	890485/015	E0502
30	BILOG Antenne	CBL6112A	Chase	2230	E0517
31	Biconical Antenne	3109	EMCO	2230	E0520
32	Log periodic Antenne	3146	EMCO	1575	E0530
33	Log periodic Antenne	SAS-200/518	R & S	257	E0533

Test Equipment and ancillaries used for tests continued:

No	Instrument / Ancillary	Type	Manufacturer	Serial No	ID-No
34	Hornantenna	3115	EMCO	9808-5569	E0567
35	Active Loop	HFH2-Z2	R & S	891847/0013	E0578
36	Power Amplifier	2000 LA	AR		E0700
37	Power Amplifier	500W1000M7	AR		E0712
38	Power Amplifier	AR50S1G4	AR	27947	E0717
39	Power Amplifier	500A100A	AR	301583	E0718
40	Attenuator 20 dB/25 W	33-20-34	L. Weinschel	AZ0385	E0759
41	Richtkoppler	DC 2000	AR	9397/1673	E0800
42	Richtkoppler	DC 6280	AR	14627	E0816
43	Puls Shaper	ESH3-Z2	R & S	375.8810.52	E0885
44	Terminator	R 404522	Radiall		E0886
45	Anechoic Chamber		FZS		E1000
46	Comp.contr.meas.system	EMCE5000/PAS	Spitz.&Spies		E1040
47	Impuls Limiter	R&S	ESH3-Z2	34418	E1150
48	Power Supply	EA-3025	El.-Auto.	34418	
49	Power Supply	6112A	HP	1139A01125	
50	Temp. Chamber	300/40D	Weiß	512	
51	Cable Set	SET 3	ARCS		
52	Cable Set	SET 4	ARCS		







