

TEST REPORT
of the accredited test laboratory

TÜV Nr.:M/FG-05/121

Geschäftsbereich
Medizintechnik,
Nachrichtentechnik
und EMV

Prüfstelle für
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Applicant: MicroElectronicDesign Spath KEG
Reininghausstraße 13
8020 Graz

Tested Product: Radio alarm clock

Type: aXbo

Manufacturer: MicroElectronicDesign Spath KEG
Reininghausstraße 13
8020 Graz

Akkreditierte Prüf-,
Überwachungs-,
Zertifizierungs- und
Kalibrierstelle

Notified Body 0408

Output power / 6,31 mV/m @ **Spannungsversorgung:** 3 VDC
field strength: 3m distance

Frequency range: 2449 MHz **Channel separation:** n.a.

Standard: FCC: 47 CFR 15.249 Edition 19. September 2005;
RSS-210 Issue 6 - September 2005

TÜV Österreich
Test laboratory for EMC

Deputy supervisor of EMC-
laboratory:


Ing. Wilhelm Seier



1. 12. 2005

Copy Nbr.: 01

checked by:


Ing. Michael Emminger

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The results of this test report only refer to the provided equipment.

LIST OF MEASUREMENTS

The complete list of measurements called for in 47 CFR 15.249 and RSS-210 is given below.

SUBCLAUSE	PARAMETER TO BE MEASURED	PAGE
	Intentional Radiators	
15.249 a A2.9(1)	Field strength	3
15.249 c A2.9(2)	Radiated emissions	4

FIELD STRENGTH (Intentional Radiator)

§ 15.249/a / A2.9(1)

Field strength at a distance of 3m						
f (MHz)	Bandwidth (MHz)	Limit (µV/m) (Average)	Average detector		Peak detector	
			dBµV/m	µV/m	dBµV/m	µV/m
2449	1	50000	76,0	6309,6	88,0	25118,9
4898	1	500	47,28	231,2	63,35	1470,6
7347	1	500	44,41	166,1	64,12	1606,9
9796	1	500	42,78	137,7	57,39	740,5
12245	1	500	44,09	160,1	61,25	1154,8
Measurement uncertainty ± 6 dB						

Bandwidth: this refers to the bandwidth of the measurement receiver

LIMIT

§ 15.249/a / A2.9(1)

f (MHz)	Bandwidth (MHz)	Field strength at a distance of 3 m	
		of fundamental emissions (mV/m)	of harmonic emissions (µV/m)
2400-2483,5	1	50	500

The above standing field strength limit is based on average limits.

Reference numbers of test equipment used:

NT-100; NT-110; NT-111; NT-112; NT-125; NT-126; NT-150; NT-207; NT-500; NT-520; NT-550

RADIATED EMISSIONS (Intentional Radiator)

§ 15.249/c / A2.9(2)

Radiated Emissions at a distance of 3 m				
No other emissions additional to the harmonics were found above noise level.				
Measurement uncertainty ± 6 dB				

Bandwidth: this refers to the bandwidth of the measurement receiver

LIMIT

§ 15.249/c according to § 15.209 / A2.9(2) Table 2

f (MHz)	Bandwidth (kHz)	Meas. distance (m)	Field strength (μ V/m)
0,009-0,150	0,2	300	2400/f (kHz)
0,150-0,490	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

The above standing field strength limits in the frequency band 9-90kHz, 110-490 kHz and above 1 GHz are based on average limits. All other above standing limits are based on quasi peak limits.

Reference numbers of test equipment used:

NT-100; NT-110; NT-111; NT-112; NT-125; NT-126; NT-150; NT-207; NT-500; NT-520; NT-550

Appendix 1

Test equipment used

☐ Anechoic Chamber with 3m measurement distance	NT-100	☐ ESVP - Test receiver 20 - 1000 MHz	NT-201
☐ MA 240 - Antenna mast 1 - 4 m height	NT-110	☐ ESPC - Test receiver 9 kHz - 2,5 GHz	NT-203
☐ DS 412 - Turntable 0 - 400 ° Azimuth	NT-111	☐ ESI26 - Test receiver 20 Hz - 26,5 GHz	NT-207
☐ HD 100 Controller Mast+Turntable	NT-112	☐ Digital Radio Tester CTS55	NT-208
☐ HUF-Z2 - Bicon. Antenna 20 - 300 MHz	NT-120	☐ Noise-gen., ITU-R 559-2 20 Hz - 20 kHz	NT-209
☐ HUF-Z3 - Log. Per. Antenna 200 - 1000 MHz	NT-121	☐ CMTA - Radiocommunication analyzer; 0,1 - 1000 MHz	NT-210
☐ HFH-Z2 - Loop Antenna 9 kHz - 30 MHz	NT-122	☐ 3271 - Spectrum analyzer 100 Hz - 26,5 GHz	NT-211
☐ HFH-Z6 - Rod Antenna 9 kHz - 30 MHz	NT-123	☐ Radiocommunication analyzer Marconi 2945A	NT-212
☐ 3121C - Dipole Antenna 28 - 1000 MHz	NT-124	☐ 2855S - Communication analyzer	NT-213
☐ 3115 - Horn Antenna 1 - 18 GHz	NT-125	☐ Mixer M28HW 26,5 GHz - 40 GHz	NT-214
☐ 3116 - Horn Antenna 18 - 40 GHz	NT-126	☐ Diode Detector 0,01 GHz - 26,5 GHz	NT-215
☐ SAS-200/543 - Bicon. Ant. 20 MHz - 300 MHz	NT-127	☐ RubiSource T&M Timing reference	NT-216
☐ AT-1080 - Log. Per. Ant. 80 - 1000 MHz	NT-128	☐ Radiocommunication analyzer SWR 1180 MD	NT-217
☐ HK-116 - bicon. Ant. 20 MHz - 300 MHz	NT-129	☐ Mixer M19HWD 40 GHz - 60 GHz	NT-218
☐ HK-116 - bicon. Ant. 20 MHz - 300 MHz	NT-130	☐ Mixer M12HWD 60 GHz - 90 GHz	NT-219
☐ 3146 - Log. Per. Ant. 200 - 1000MHz	NT-131	☐ TDS - 540 DSO Digital scope	NT-220
☐ Loop Antenna H-Field	NT-132	☐ PM97 Scopemeter	NT-221
☐ Horn Antenna 500 MHz - 2900 MHz	NT-133	☐ TPS 2014 Digital scope	NT-222
☐ Log. per. Antenna 800 MHz - 2500 MHz	NT-134	☐ B10 - Harmonics and flicker analyzer	NT-232
☐ Log. per. Antenna 800 MHz - 2500 MHz	NT-135	☐ SRM-3000 Spectrum analyzer	NT-233
☐ BiConiLog Antenna 26 MHz - 2000 MHz	NT-137	☐ E-field probe SRM 75 MHz - 3 GHz	NT-234
☐ Conical Dipol Antenna PCD8250	NT-138	☐ Hall-Teslameter ETM-1	NT-241
☐ HZ-1 Antenna tripod	NT-150	☐ EFA-3 H-field- / E-field probe	NT-243
☐ BN 1500 Antenna tripod	NT-151	☐ E-field measuring instrument EMR-200; 100 kHz - 3 GHz	NT-244
☐ Ant. tripod for EN61000-4-3 Model TP1000A	NT-156	☐ E-field probe 100 kHz - 3 GHz	NT-245
☐ Spectrum analyzer - FSP7 9 kHz - 7 GHz	NT-200	☐ Magnetic field-Sensor 300 kHz - 30 MHz	NT-246

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Appendix 1 (continued) Test equipment used

☐ E-field probe 10 MHz – 18 GHz	NT-247	☐ TRANSIENT 1000 Immunity test system	NT-325
☐ H-field probe 10 MHz – 1 GHz	NT-248	☐ VCS 500-M6 Surge-Generator	NT-326
☐ ELT-400 1 Hz – 400 kHz	NT-249	☐ BTA-250 - RF-Amplifier 9 kHz - 220 MHz / 250 W	NT-330
☐ MDS 21 - Absorbing clamp 30 - 1000 MHz	NT-250	☐ T82-50 RF-Amplifier 2 GHz – 8 GHz	NT-331
☐ FCC-203I EM Injection clamp	NT-251	☐ 500W1000M7 - RF-Amplifier 80 - 1000 MHz / 500 W	NT-332
☐ FCC-203I-DCN Femte decoupling network	NT-252	☐ AS0102-65R - RF-Amplifier 1 GHz - 2 GHz	NT-333
☐ PR50 Current Probe	NT-253	☐ APA01 – RF-Amplifier 0,5 GHz – 2,5 GHz	NT-334
☐ PR630 Current Probe	NT-254	☐ Preamplifier 1 GHz - 4 GHz	NT-335
☐ Fluke 87 V True RMS Multimeter	NT-260	☐ Preamplifier for GPS MKU 152 A	NT-336
☐ Model 2000 Digital Multimeter	NT-261	☐ Preamplifier 100 MHz – 23 GHz	NT-337
☐ Fluke 79 Digital Multimeter	NT-262	☐ DC Block 10 MHz – 18 GHz Model 8048	NT-338
☐ Fluke 79 Digital Multimeter	NT-263	☐ 2-97201 Electronic load	NT-341
☐ ESH2-Z5 Artificial mains network 4x25A	NT-300	☐ TSX3510P - Power supply 0-30 V / 0 - 10 A	NT-344
☐ ESH3-Z5 Artificial mains network 2x10A	NT-301	☐ TSX3510P - Power supply 0-30 V / 0 - 10 A	NT-345
☐ ESH3-Z6 Artificial mains network 1x100A	NT-302	☐ VDS 200 Mobil-impuls-generator	NT-350
☐ ESH3-Z4 T-Artificial network	NT-303	☐ LD 200 Mobil-impuls-generator	NT-351
☐ PHE 4500/B Power amplifier	NT-304	☐ MPG 200 Mobil-Impuls-Generators	NT-352
☐ EZ10 T-Artificial network	NT-305	☐ EFT 200 Mobil-impuls-generator	NT-353
☐ SMG - Signal generator 0,1 - 1000 MHz	NT-310	☐ FP 16/3-1 3 ph. Coupling filter (Burst)	NT-400
☐ PM 5518 TXVPS Video generator	NT-311	☐ PHE 4500 - Mains impedance network	NT-401
☐ RefRad Reference generator	NT-312	☐ IP 6 2 Coupling filter for data lines (Surge)	NT-403
☐ SMP 02 Signal generator 10 MHz - 20 GHz	NT-313	☐ ESH2-Z3 - Probe 9 kHz - 30 MHz	NT-410
☐ 40 MHz Arbitrary Generator T1241	NT-315	☐ IP 4 - Capacitive clamp (Burst)	NT-411
☐ PEFT - Burst generator up to 4 kV	NT-320	☐ Highpass-Filter 100 MHz – 4 GHz	NT-412
☐ ESD 30 System up to 25 kV	NT-321	☐ Highpass-Filter 600 MHz – 4 GHz	NT-413
☐ PSURGE 4.1 Surge generator	NT-324	☐ Highpass-Filter 1250 MHz – 4 GHz	NT-414

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Appendix 1 (continued)

Test equipment used

☐ Highpass-Filter 1800 MHz – 18 GHz	NT-415	☐ FCC-801-AF10 Coupling decoupling network	NT-461
☐ Highpass-Filter 3500 MHz – 18 GHz	NT-416	☐ FCC-801-S25 Coupling decoupling network	NT-462
☐ RF-Attenuator 20 dB 0,1 - 1000 MHz / 25 W	NT-421	☐ FCC-801-T4 Coupling decoupling network	NT-463
☐ RF-Attenuator 10 dB 0,1 - 1000 MHz / 20 W	NT-422	☐ FCC-801-C1 Coupling decoupling network	NT-464
☐ RF-Attenuator 30 dB 0,1 - 1000 MHz / 1 W	NT-423	☐ F-16A - Current probe 1kHz - 70MHz	NT-465
☐ RF-Attenuator 30 dB	NT-424	☐ PC P4 3 GHz Test computer	NT-500
☐ RF-Attenuator 6 dB 0,1 - 1000 MHz / 1 W	NT-425	☐ PC P4 1700 MHz Notebook	NT-505
☐ RF-Attenuator 6 dB 0,1 - 1000 MHz / 1 W	NT-426	☐ PC Intel Centrino 1600 MHz Notebook	NT-506
☐ RF-Attenuator 6 dB	NT-428	☐ Monitoring camera with Monitor	NT-511
☐ RF-Attenuator 0 dB - 81 dB	NT-429	☐ ES-K1 Version 1.71 Test software	NT-520
☐ WRU 27 - Band blocking 27 MHz	NT-430	☐ SRM-TS Version 1.3 software for SRM-3000	NT-522
☐ WHJ450C9 AA - High pass 450 MHz	NT-431	☐ SPS-PHE Test software V2.32 voltage fluctuations/harmonics	NT-525
☐ WHJ250C9 AA - High pass 250 MHz	NT-432	☐ SPS-EM Test software V2.32 for PHE 4500/B	NT-527
☐ RF-Load 150 W	NT-433	☐ Noise power test apparatus according to EN 55014	NT-530
☐ Impedance transducer 1:4 ; 1:9 ; 1:16	NT-435	☐ Vertical coupling plane (ESD)	NT-531
☐ RF-Attenuator DC – 18 GHz 6 dB	NT-436	☐ Test cable #4 for EN 61000-4-6	NT-553
☐ RF-Attenuator DC – 18 GHz 6 dB	NT-437	☐ Test cable #3 for conducted emission	NT-554
☐ RF-Attenuator DC – 18 GHz 10 dB	NT-438	☐ Test cable #5 ESD-cable (2x470k)	NT-555
☐ RF-Attenuator DC – 18 GHz 20 dB	NT-439	☐ Test cable #6 ESD-cable (2x470k)	NT-556
☐ I+P 7780 Directional coupler 100 - 2000 MHz	NT-440	☐ Test cable #8 Sucoflex 104EA	NT-559
☐ ESH3-Z2 - Pulse limiter 9 kHz - 30 MHz	NT-441	☐ Test cable #9 (for outdoor measurements)	NT-580
☐ Power Divider 6 dB/1 W/50 Ohm	NT-443	☐ Test cable #10 (for outdoor measurements)	NT-581
☐ Directional coupler 0,1 MHz – 70 MHz	NT-444	☐ Test cable #13 Sucoflex 104PE	NT-584
☐ Directional coupler 0,1 MHz – 70 MHz	NT-445	☐ Test cable #21 for SRM-3000	NT-592
☐ Tube imitations according to EN 55015	NT-450	☐ Shield chamber	NT-600
☐ FCC-801-M2-50A Coupling decoupling network	NT-459	☐ Climatic chamber -55°C to +180°C	M-512
☐ FCC-801-M5-25 Coupling decoupling network	NT-460	☐ Control and simulation equipment for EUT	---

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