

**TEST REPORT**  
of the accredited test laboratory

TÜV Nr.:M/FG-05/121

Geschäftsbereich  
Medizintechnik,  
Nachrichtentechnik  
und EMV

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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
	<b>Intentional Radiators</b>	
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 $\pm 6$ 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 ( $\mu$ 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

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

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## Appendix 1 (continued)

### Test equipment used

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

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### Test equipment used

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

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