

## TEST REPORT

**IEC / EN 61000-6-2 and IEC / EN 61000-6-3**

**Part 6-2: Immunity for industrial environments**

**Part 6-3: Emission standard for residential, commercial and light-industrial environments**

<b>Report reference No:</b>	<b>E2148-05a-15</b>																							
Tested by:	B. Belegu																							
Approved by management:	Dr. F. Stucki General Manager																							
Date of issue:	23 February 2016																							
Number of pages:	13 pages																							
<b>Testing laboratory:</b>	<b>QUINEL AG</b>	 S Schweizerischer Prüfstellendienst T Service Suisse d'essais S Servizio di prova in Svizzera Swiss testing service STS 0037																						
Address:	Elsihof 3 CH-6035 Perlen																							
Testing location:	Perlen Tel. 041-799 47 00																							
<b>Applicant's Name:</b>	<b>MSR Electronics GmbH, Mr. Wendelin Egli</b>																							
Address:	Mettlenstrasse 6, CH-8472 Seuzach																							
<b>Manufacturer:</b>	<b>MSR Electronics GmbH</b>																							
Address:	Mettlenstrasse 6, CH-8472 Seuzach																							
<b>Test specification:</b>	Standards: IEC 61000-6-2:2005, EN 61000-6-2:2005 IEC 61000-6-3:2006+A1:2010, EN 61000-6-3:2007+A1:2011 Test procedure: Type testing for Swiss and EU legal requirements Procedure deviation: None Non-standard test method: None Test-specification: The used test setup fulfils the specification described in the relevant standards																							
<b>Test item description:</b>	Datalogger																							
Trademark:	MSR Electronics GmbH																							
Model and/or type reference:	MSR385(SMB63, SMB65, WDB61)																							
Ratings:	-																							
Date of receipt of the test item(s):	10 December 2015																							
<b>Summary of testing:</b>	<b>Passed</b>																							
<b>Applied standards:</b>	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 10%;">No</th> <th style="width: 35%;">Title</th> <th style="width: 40%;">Standard (up dated)</th> <th style="width: 10%;">pages</th> <th style="width: 5%;">Verdict</th> </tr> </thead> <tbody> <tr> <td>E2148-22a-15</td> <td>RF disturbances</td> <td>CISPR 22:2008 EN 55022:2010</td> <td style="text-align: center;">4</td> <td style="text-align: center;">P</td> </tr> <tr> <td>E2148-03a-15</td> <td>Radiated electromagnetic field</td> <td>IEC61000-4-3:2006+A1:2007+A2:2010 EN 61000-4-3:2006+A1:2008+A2:2010</td> <td style="text-align: center;">4</td> <td style="text-align: center;">P</td> </tr> <tr> <td>E2148-02a-15</td> <td>Electrostatic discharge</td> <td>IEC 61000-4-2:2008 EN 61000-4-2:2009</td> <td style="text-align: center;">3</td> <td style="text-align: center;">P</td> </tr> </tbody> </table>				No	Title	Standard (up dated)	pages	Verdict	E2148-22a-15	RF disturbances	CISPR 22:2008 EN 55022:2010	4	P	E2148-03a-15	Radiated electromagnetic field	IEC61000-4-3:2006+A1:2007+A2:2010 EN 61000-4-3:2006+A1:2008+A2:2010	4	P	E2148-02a-15	Electrostatic discharge	IEC 61000-4-2:2008 EN 61000-4-2:2009	3	P
No	Title	Standard (up dated)	pages	Verdict																				
E2148-22a-15	RF disturbances	CISPR 22:2008 EN 55022:2010	4	P																				
E2148-03a-15	Radiated electromagnetic field	IEC61000-4-3:2006+A1:2007+A2:2010 EN 61000-4-3:2006+A1:2008+A2:2010	4	P																				
E2148-02a-15	Electrostatic discharge	IEC 61000-4-2:2008 EN 61000-4-2:2009	3	P																				
Verdicts: P = passed, F = failed, NA = not applicable, NT = not tested																								

**Acceptance criteria/operating conditions:**

During and after the test the apparatus should show no damage or loss of information and should function according to specifications.

**Type List:**

This Test Report is valid for the following types:MSR385

**Photograph of the tested item:**



SMB63



SMB 65



WDB61

**Photograph of the type label:**



**Notes:**

The test results presented in this test report relate only to the tested object(s).

This test report shall not be reproduced except in full.

## EMC: RF-disturbances

QNL-E2148-22a-15

### Test requirements:

The apparatus shall be tested in its normal position for use and be supplied with nominal voltage. All parts, which are normally earthed, should also be earthed during testing.

- Frequency range: 0.15 MHz ... 1000 MHz
- Measuring distance: 3 meters
- Temperature: 22°C
- Humidity: 50%

### Acceptance criteria:

The measured disturbances should not reach the limits, for the measuring distance of 3m, specified in EN55022, CISPR22, IEC/EN61000-6-3.

### Reference:

EN55022, CISPR22, IEC/EN61000-6-3

### Test equipment:

Test equipment	Manufacturer / Type	QUINEL Inventory no.	Calibration	
			last	next
Receiver	Rohde & Schwarz ESR-7	500209	Aug 15	Aug 16
Receiver	Rohde & Schwarz ESH3	500100	Oct 15	Oct 16
Mains-simulation	Electrometric ANS-25/2	500146	Dec 12	Dec 16
Artificial-mains-network	Rohde & Schwarz ESH 2-Z5	500045	Feb 15	Feb 17
Coaxial Cable 7m	Suhner, PKI M17/75 - RG 214	500220	Oct 14	Oct 17
Coaxial Cable 5m	Suhner, PKI M17/75 - RG 214	500221	Oct 14	Oct 17
Coaxial Cable 3m	SPUMA400FR 2X11N769	500174	Oct 14	Oct 17
Coaxial Cable 3m	SPUMA400FR 2X11N769	500175	Oct 14	Oct 17
Antenna	ETS Lindgren BICONILOG 3142	500096	Sep 15	Sep 16
EMC-anechoic room	Frankonia SAC plus L	24655	Apr 15	Apr 20
SW radiated/conducted emission	SP2_to_ES-K1_1_71			

### Object:

Datalogger

Applicant: MSR Electronics GmbH

Manufacturer: MSR Electronics GmbH

Type: MSR 385

Object/serial number: 502038

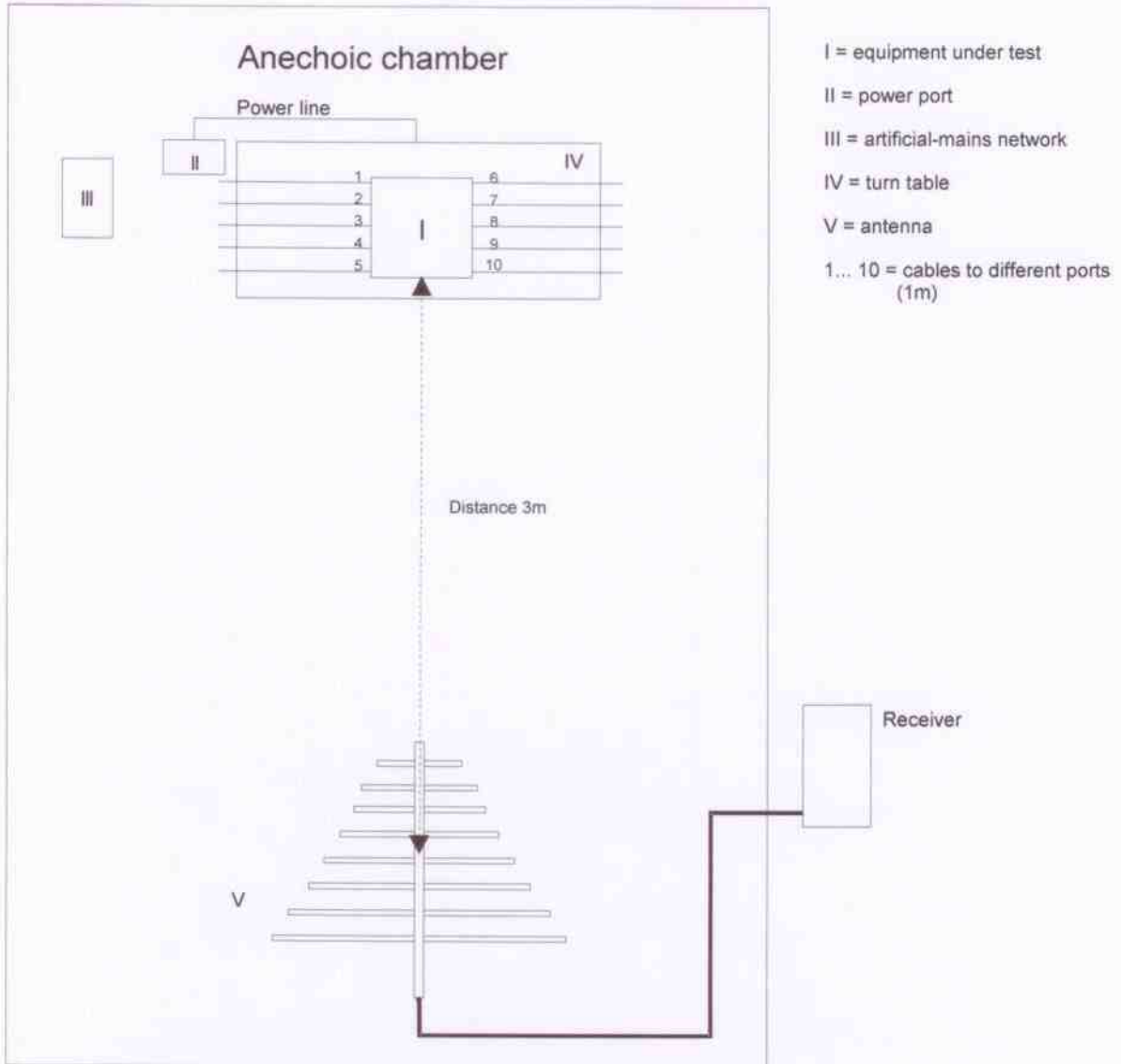
### Result:

**Test passed (Class B)**

### Remarks:

-

## EMC: Emission test



Antenna position horizontal

Antenna position vertical

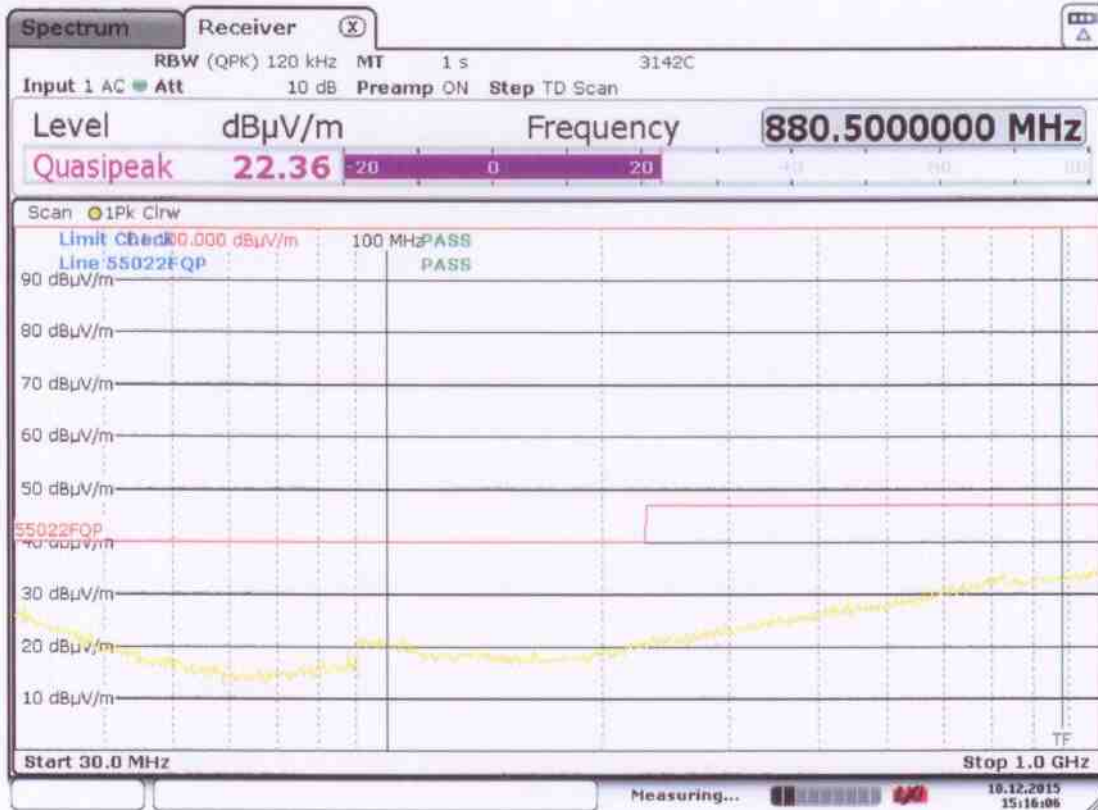
Radiated disturbances level (30 MHz - 1 000 MHz)	$U_{CISPR}$ 5.2dB	$U_{LAB}$ ≤ 5dB
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**Photographs:**

Radiated emission(30-1000)MHz

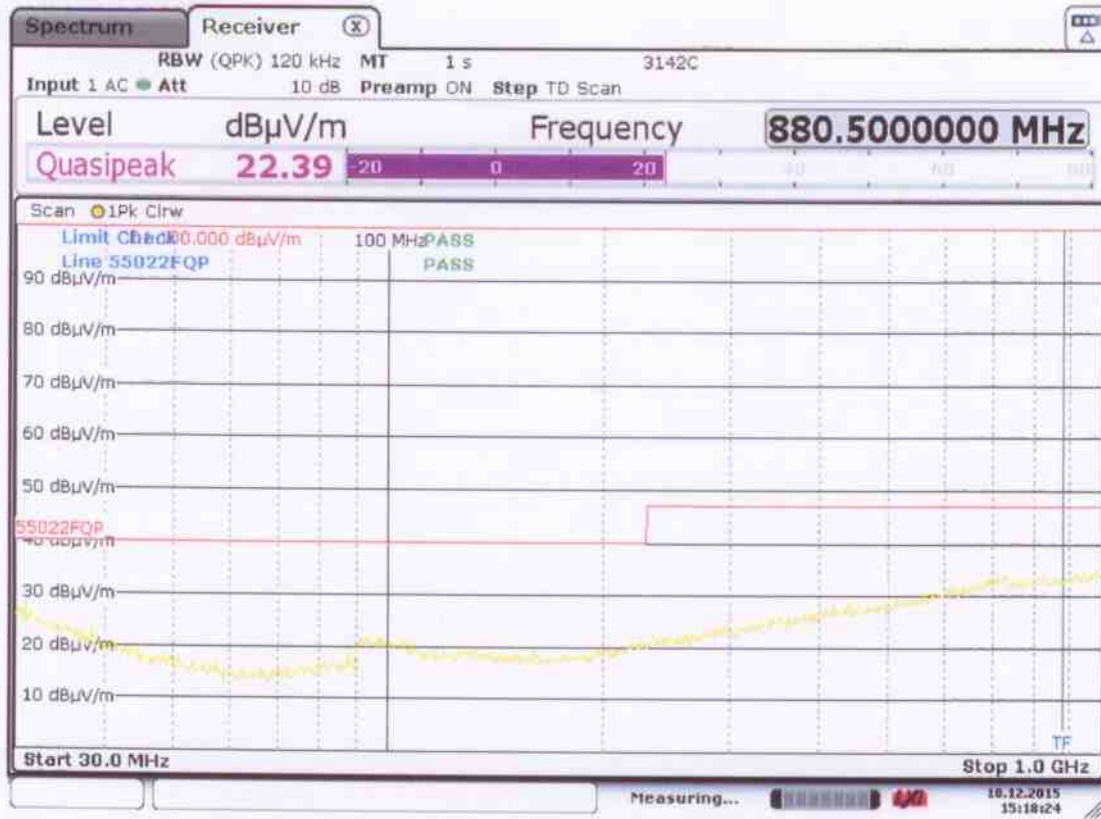


Antenna horizontal



Date: 10.DEC.2015 15:16:06

Antenna vertikal



Date: 10.DEC.2015 15:18:23

**EMC: Radiated electromagnetic field**

QNL-E2148-03a-15

**Test requirements:**

The apparatus is to be tested in his normal position for use. The apparatus is supplied with nominal voltage. All parts which are earthed should also be earthed during test.

- Frequency range: 80 - 2700 MHz (80% AM Mod. / 1 kHz)
- Field strength: > 10 V/m
- Temperature: 22°C
- Humidity: 50%

**Acceptance criteria:**

During and after the test the apparatus should not show change of information or influence in normal operation.

**Reference:**

IEC/EN 61000-4-3

**Test equipment:**

Test equipment	Manufacturer / Type	QUINEL Inventory no.	Calibration	
			last	next
Field Probe	ETS Lindgren HI-6005	500186	Apr 15	Apr 17
HF-generator	Rohde & Schwarz SME 03	500170	Oct 15	Oct 17
HF-generator	Rohde & Schwarz SME 03	500070	May 15	May 17
HF-amplifier	Amplifier Research 100 W 1000M1	500019	Apr 15	Apr 17
HF-amplifier	Amplifier Research 15S1G3	500079	Apr 15	Apr 17
SW radiated disturbances	Python(x,y)-2.6.6.1			
EMC-anechoic room	Frankonia SAC 3 plus L	24655	Apr 15	Apr 20
Antenna	ETS Lindgren BICONILOG 3142C	500096	Sep 15	Sep 17
Coaxial Cable 7m	Suhner, PKI M17/75 - RG 214	500220	Oct 14	Oct 17
Coaxial Cable 5m	Suhner, PKI M17/75 - RG 214	500221	Oct 14	Oct 17
Coaxial Cable 3m	SPUMA400FR 2X11N769	500174	Oct 14	Oct 17
Coaxial Cable 3m	SPUMA400FR 2X11N769	500175	Oct 14	Oct 17
Coaxial Cable 1.5m	Suhner, RG 214/U	500222	Oct 14	Oct 17
Waveguide Horn	ETS Lindgren EMCO 3115	500072	Sep 15	Sep 17
Power head	Rohde & Schwarz NAP Z5	863900/024	Jan 15	Jan 17
Power Reflection meter	Rohde & Schwarz NAP	327803	Jan 15	Jan 17

**Object:**

Datalogger

- Applicant: MSR Electronics GmbH
- Manufacturer: MSR Electronics GmbH
- Type: MSR 385
- Object/serial number: 502038

**Classification of test results (criteria a-d)**

- a) Normal performance
- b) Temporary loss of function, recovery without operator intervention
- c) Temporary loss of function, recovery requires operator intervention
- d) Loss of function not recoverable

Perlen, 23 February 2016

QUINEL

  
Tester B. Belegu

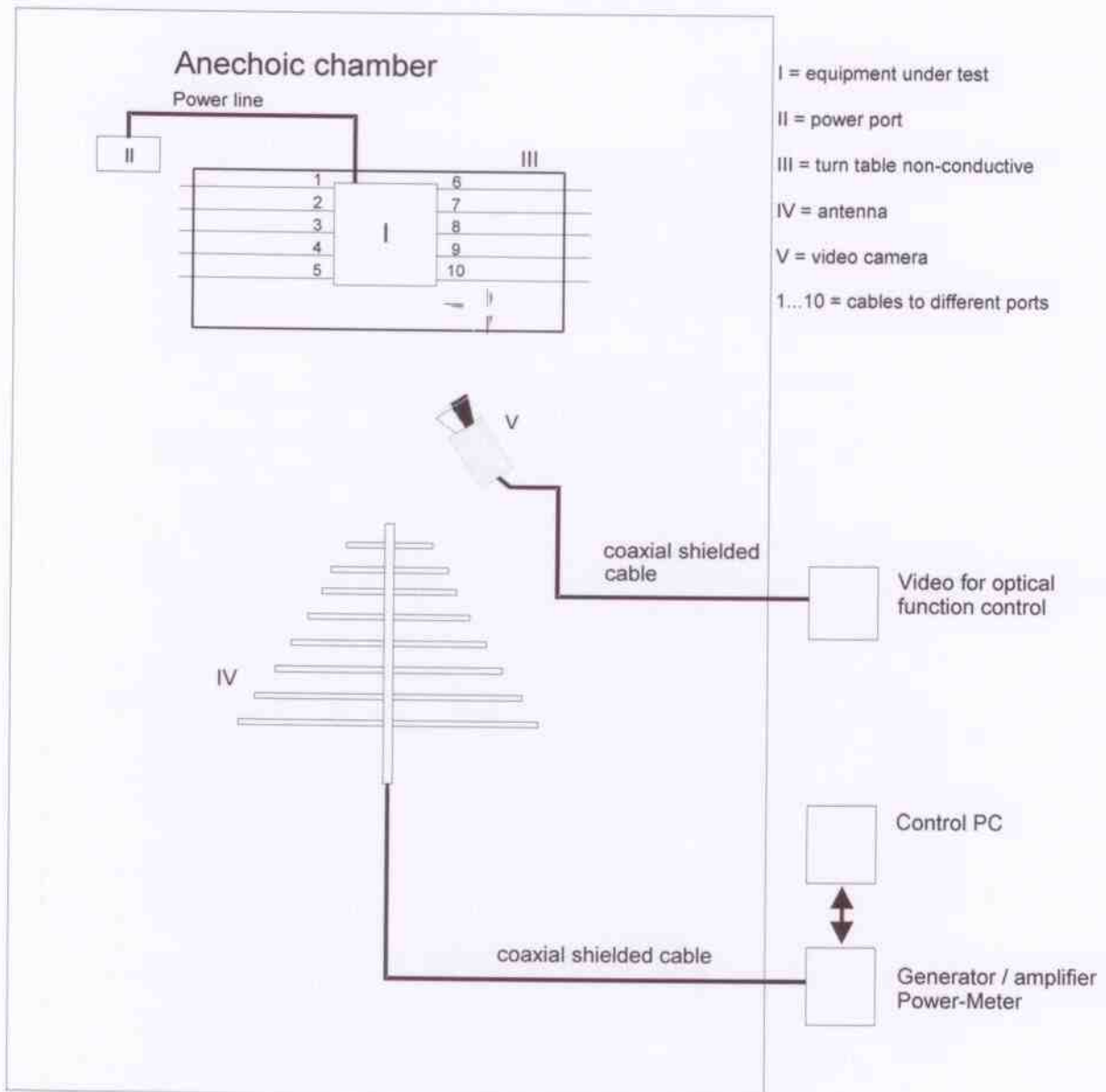
**Result:**

**Test passed (criterion a)**

**Remarks:**

-

## EMC: Immunity test

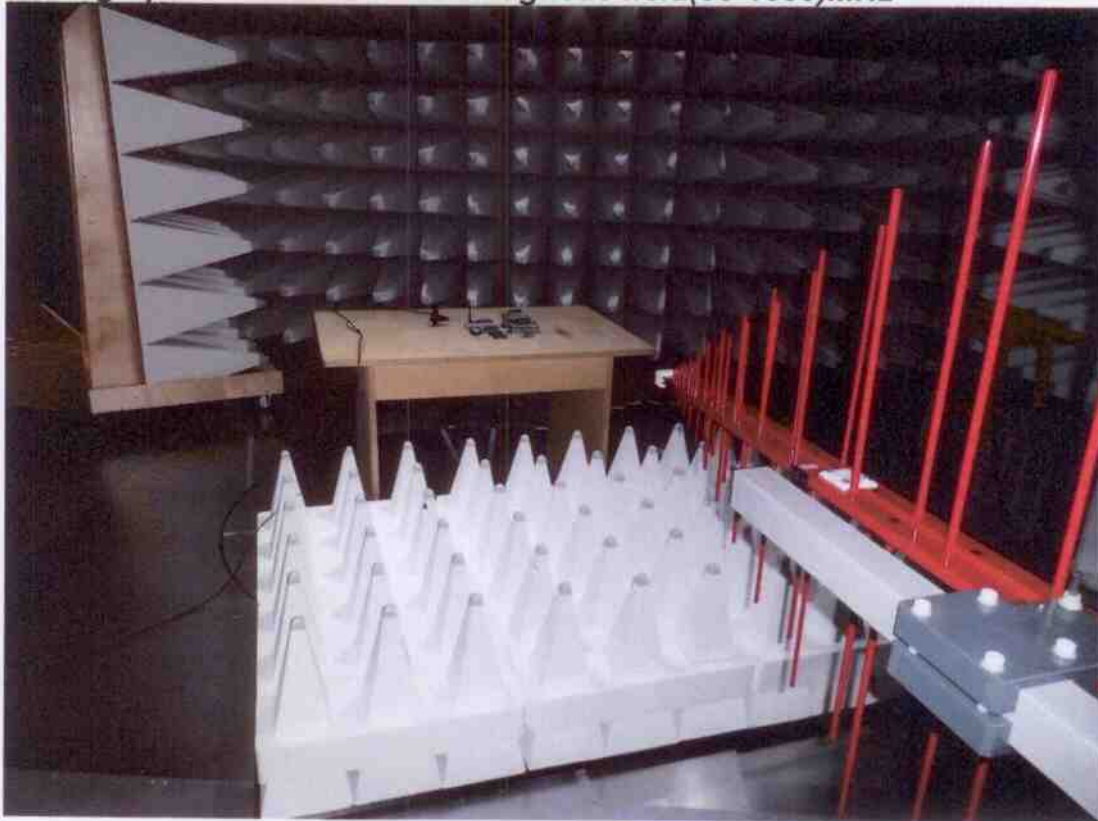


Antenna position horizontal

Antenna position vertical



**Photographs: Radiated electromagnetic field(80-1000)MHz**



*Photographs: Radiated electromagnetic field(1000-2700)MHz*



**EMC: Electrostatic discharge**

QNL-E2148-02-15

**Test requirements:**

The apparatus shall be tested in its normal position for use. All parts which are normally earthed should also be earthed during testing.

- Single pulses
- Testing voltage:  $\pm 2; \pm 4; \pm 8$ ; kV air discharge  
 $\pm 2; \pm 4; \pm 6$ ; kV contact discharge
- Pulse-rise time: 0.7 ... 1 ns
- Pulse-length (50 %): 30 ns
- Time between 2 discharges: min. 2 s
- Temperature: 21°C
- Humidity: 43%
- Air pressure: 975mbar

**Acceptance criteria:**

The pulses should not cause any change of information or influence the normal operation of the apparatus according to specifications.

**Reference:** IEC/EN 61000-4-2

**Test equipment:**

Test equipment	Manufacturer / Type	QUINEL Inventory no.	Calibration	
			last	next
ESD Simulator	Haefely Onyx30	500204	Aug 15	Aug 17

**Object:** Datalogger

Applicant: MSR Electronics GmbH

Manufacturer: MSR Electronics GmbH

Type: MSR 385

Object/serial number: 502038

**Classification of test results (criteria a-d)**

- a) Normal performance
- b) Temporary loss of function, recovery without operator intervention
- c) Temporary loss of function, recovery requires operator intervention
- d) Loss of function not recoverable

**Result:** **Test passed (criterion b)**

**Remarks:** -

**Photographs:**



