
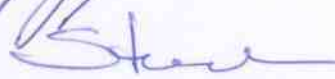
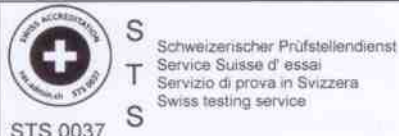


## TEST REPORT

**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>E2148-05-15</b>																																						
Tested by:	B. Belegu																																						
Approved by management:	Dr. F. Stucki General Manager																																						
Date of issue:	11 December 2015																																						
Number of pages:	30 pages																																						
<b>Testing laboratory:</b>	<b>QUINEL AG</b>																																						
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>	Charger																																						
Trademark:	MSR Electronics GmbH																																						
Model and/or type reference:	Powerpack																																						
Ratings:	230V, 50Hz																																						
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>No</th> <th>Title</th> <th>Standard (up dated)</th> <th>pages</th> <th>Verdict</th> </tr> </thead> <tbody> <tr> <td>E2148-22-15</td> <td>RF disturbances</td> <td>CISPR 22:2008 EN 55022:2010</td> <td>7</td> <td>P</td> </tr> <tr> <td>E2148-06-15</td> <td>RF immunity to conducted disturbances</td> <td>IEC 61000-4-6:2013</td> <td>2</td> <td>P</td> </tr> <tr> <td>E2148-03-15</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>4</td> <td>P</td> </tr> <tr> <td>E2148-04-15</td> <td>Electrical fast transient burst</td> <td>IEC 61000-4-4:2012 EN 61000-4-4: 2012</td> <td>2</td> <td>P</td> </tr> <tr> <td>E2148-02-15</td> <td>Electrostatic discharge</td> <td>IEC 61000-4-2:2008 EN 61000-4-2:2009</td> <td>3</td> <td>P</td> </tr> <tr> <td>E2148-55-15</td> <td>Surge</td> <td>IEC 61000-4-5:2014 EN 61000-4-5:2014</td> <td>2</td> <td>P</td> </tr> </tbody> </table>				No	Title	Standard (up dated)	pages	Verdict	E2148-22-15	RF disturbances	CISPR 22:2008 EN 55022:2010	7	P	E2148-06-15	RF immunity to conducted disturbances	IEC 61000-4-6:2013	2	P	E2148-03-15	Radiated electromagnetic field	IEC61000-4-3:2006+A1:2007+A2:2010 EN 61000-4-3:2006+A1:2008+A2:2010	4	P	E2148-04-15	Electrical fast transient burst	IEC 61000-4-4:2012 EN 61000-4-4: 2012	2	P	E2148-02-15	Electrostatic discharge	IEC 61000-4-2:2008 EN 61000-4-2:2009	3	P	E2148-55-15	Surge	IEC 61000-4-5:2014 EN 61000-4-5:2014	2	P
No	Title	Standard (up dated)	pages	Verdict																																			
E2148-22-15	RF disturbances	CISPR 22:2008 EN 55022:2010	7	P																																			
E2148-06-15	RF immunity to conducted disturbances	IEC 61000-4-6:2013	2	P																																			
E2148-03-15	Radiated electromagnetic field	IEC61000-4-3:2006+A1:2007+A2:2010 EN 61000-4-3:2006+A1:2008+A2:2010	4	P																																			
E2148-04-15	Electrical fast transient burst	IEC 61000-4-4:2012 EN 61000-4-4: 2012	2	P																																			
E2148-02-15	Electrostatic discharge	IEC 61000-4-2:2008 EN 61000-4-2:2009	3	P																																			
E2148-55-15	Surge	IEC 61000-4-5:2014 EN 61000-4-5:2014	2	P																																			

E2148-11-15	Voltage dips - interruptions	IEC 61000-4-11:2004 EN 61000-4-11:2004	3	P
E2148-32-15	Harmonic current emissions	IEC 61000-3-2:2005+A1:2008+A2:2009 EN 61000-3-2:2006+A1:2009+A2:2009	2	P
E2148-33-15	Voltage fluctuations and flicker	IEC 61000-3-3:2013 EN 61000-3-3:2013	2	P
E2148-08-15	Power Frequency magnetic field	IEC 61000-4-8:2009 EN 61000-4-8:2010	1	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.

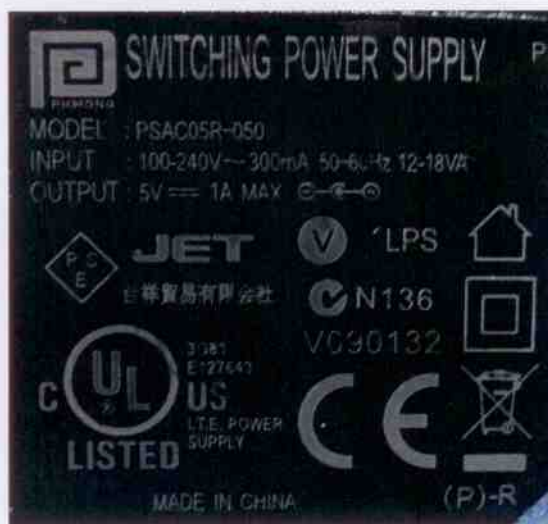
**Type List:**

This Test Report is valid for the following types: Powerpack

Photograph of the tested item:



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-E2148-22-15

**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 ESR7	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:** Charger

Applicant: MSR Electronics GmbH

Manufacturer: MSR Electronics GmbH

Type: Powerpack

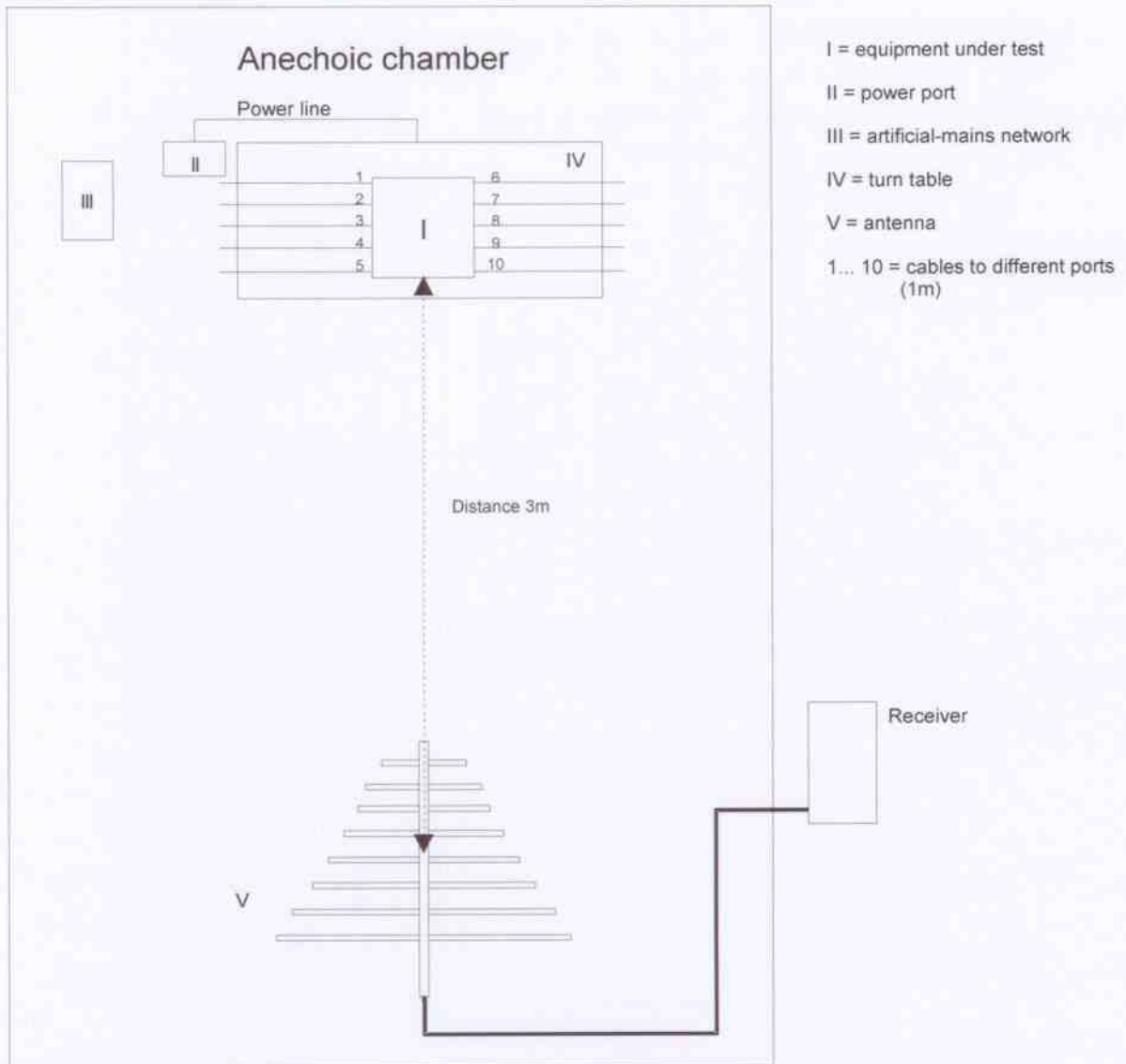
Object/serial number: 100033

**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	$U_{LAB}$ $\leq 5dB$
---	----------------------	-------------------------

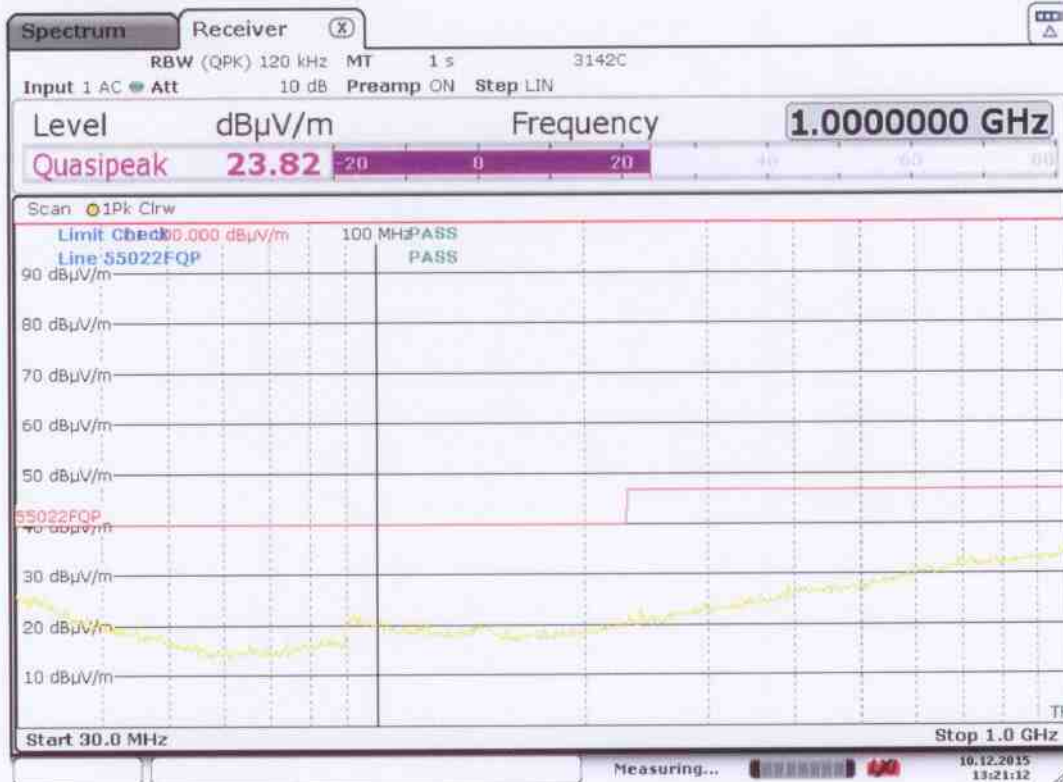
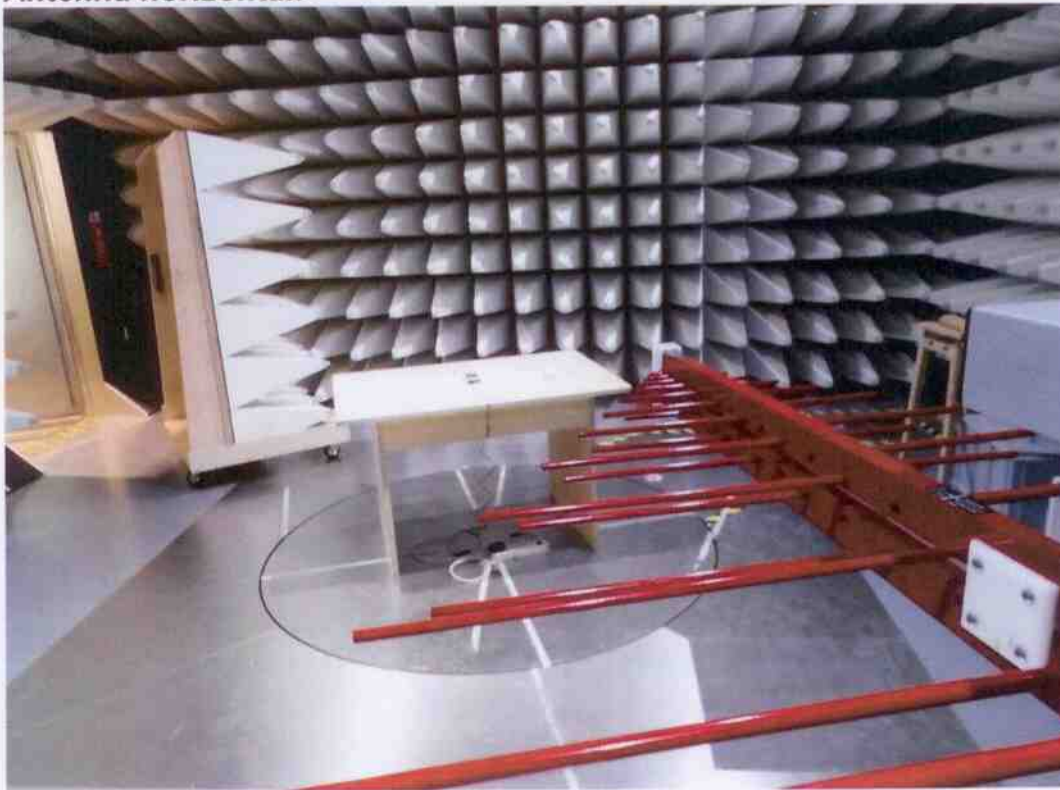
**Radiated emissions:**

**Antenna vertical:**



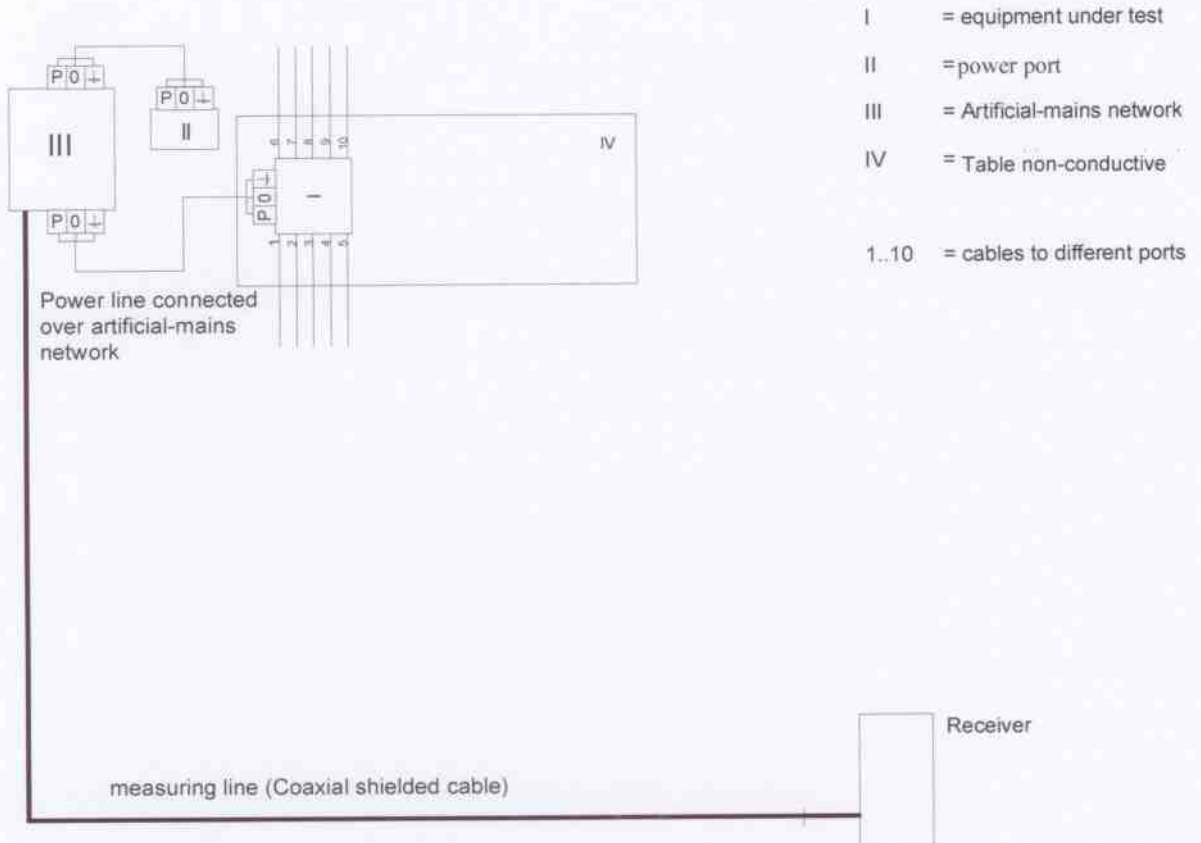
Date: 10.DEC.2015 13:19:34

**Antenna horizontal:**



Date: 10.DEC.2015 13:21:12

## EMC: RF disturbances (Mains)



Conducted disturbances level(Line conection)	$U_{CISPR}$	$U_{LAB}$
9kHz bis 150kHz	3.8dB	≤3dB
150kHz bis 30MHz	3.4dB	

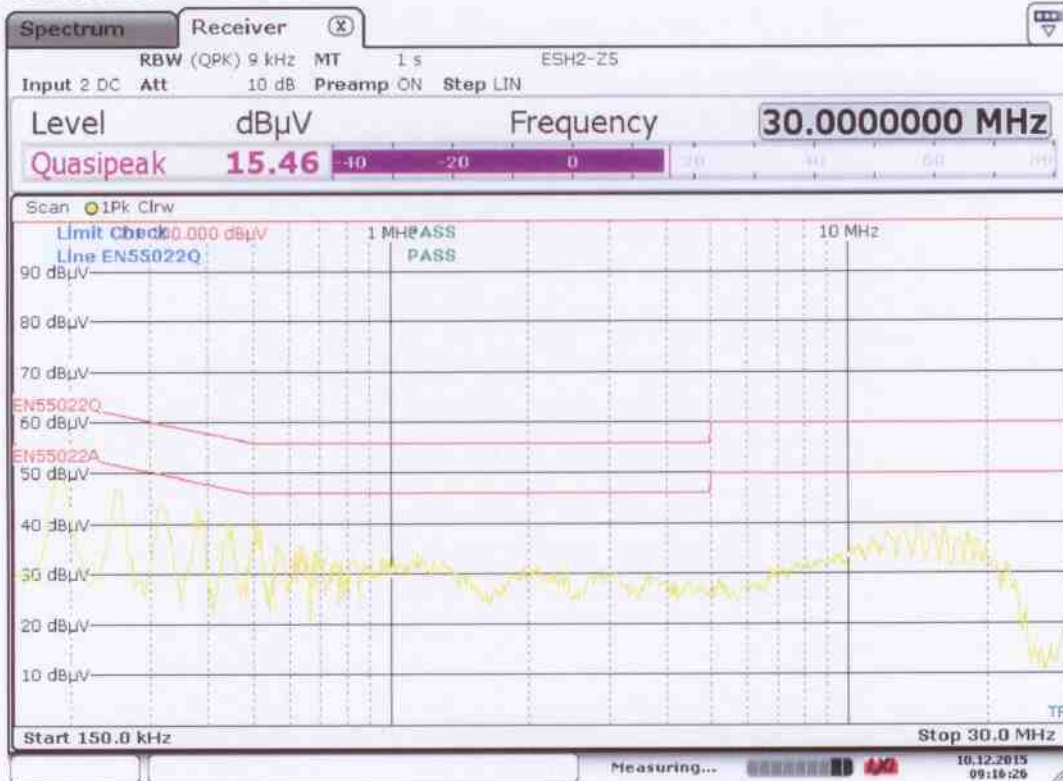


Conducted emission:

Photographs:



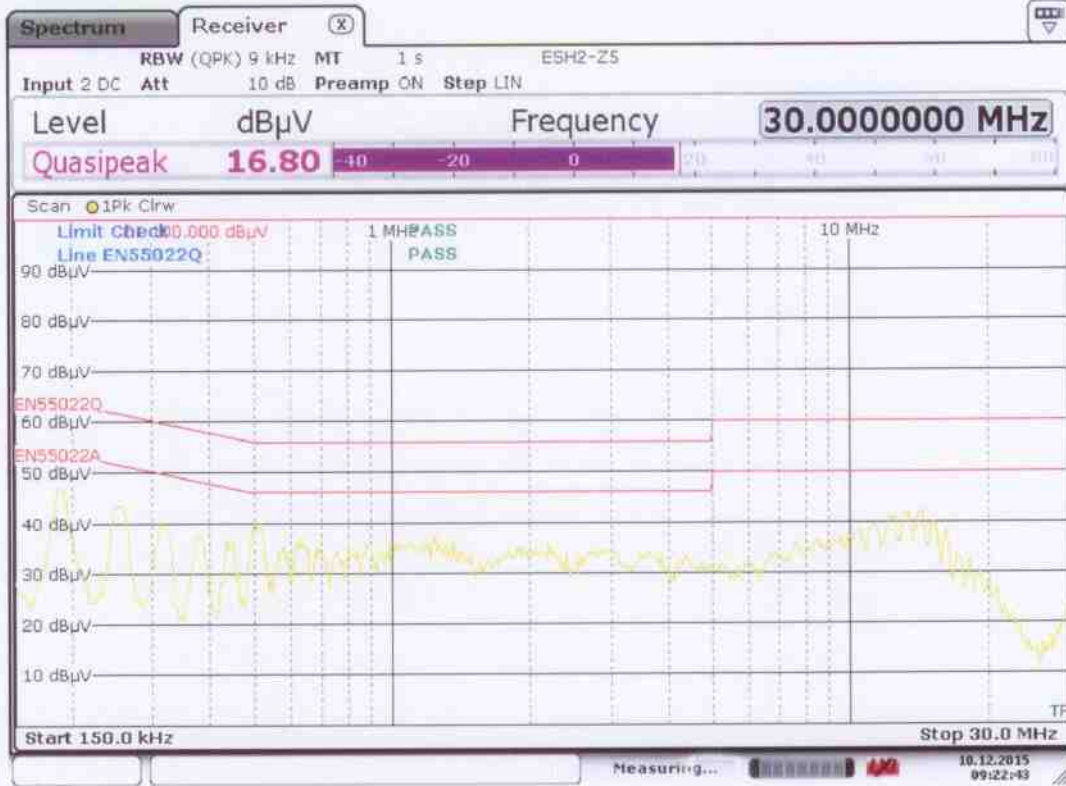
Neutral line:



Date: 10.DEC.2015 09:16:26



Phase line:



Date: 10.DEC.2015 09:22:43

## **EMC: RF Immunity to conducted disturbances**

QNL-E2148-06-15

### **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 ... 80 MHz
- Amplitude: >10 Vrms
- Modulation: 80 %/ 1 kHz
- Test points are: Mains
- Temperature: 22°C
- Humidity: 42%

### **Acceptance criteria:**

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

**Reference:** IEC/EN 61000-4-6

### **Test equipment:**

Test equipment	Manufacturer / Type	QUINEL Inventory no.	Calibration	
			last	next
HF-Clamp	Lüthi EM 101	327926	Oct 14	Oct 16
HF-Clamp	Lüthi MDS-20	500156	Oct 14	Oct 16
CDN	Lüthi 801-M2/M3	500041	Oct 14	Oct 16
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 150 L	326639	April 15	April 17
Coaxial Cable 2.5m	Suhner 50 Ohm	500223	Oct 14	Oct 17
Power Reflection meter	Rohde & Schwarz NAP	327803	Jan 15	Jan 17
Attenuator	JFW 50FH-006-300	500047	Dec 12	Dec 16
Power head	Rohde & Schwarz NAP Z8	863.190/016	Jan 15	Jan 17
SW RF cond. dist.	EMV HP VEE 1_6_01			

**Object:** Charger

Applicant: MSR Electronics GmbH

Manufacturer: MSR Electronics GmbH

Type: Powerpack

Object/serial number: 100033

### **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

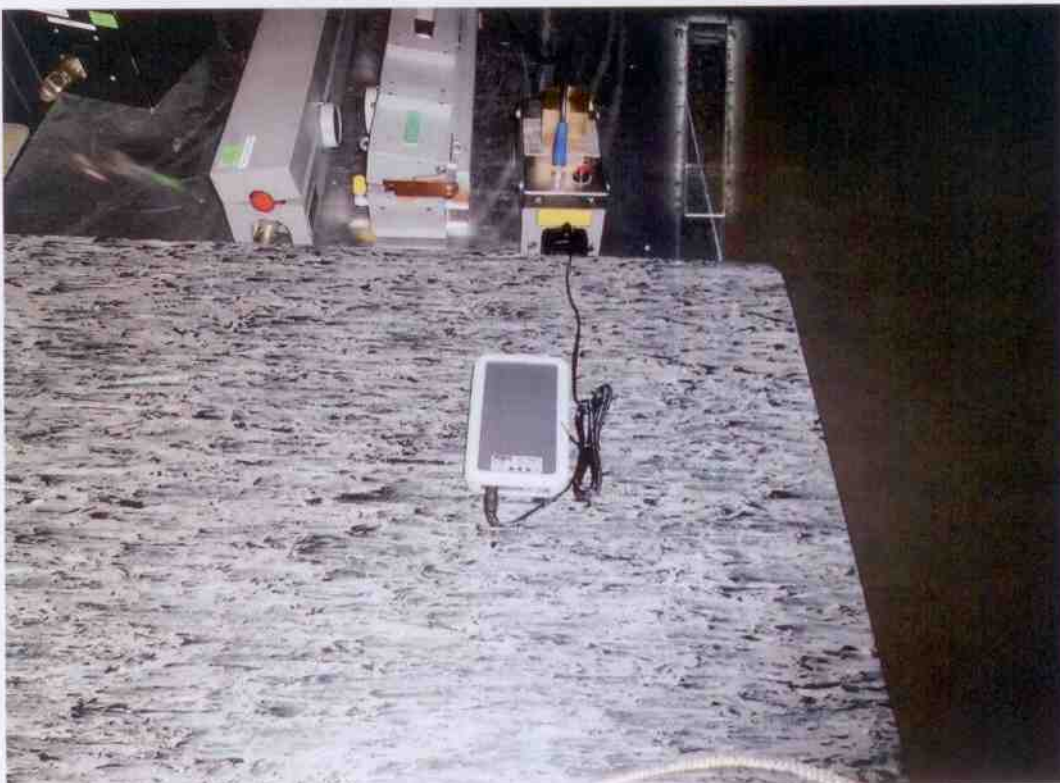
**Result:** **Test passed (criterion a)**

**Remarks:**

-

**Photographs:**

Conducted immunity test:





**EMC: Radiated electromagnetic field**

QNL-E2148-03-15

**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
Field monitor	Amplifier Research FM1000 AR	326642	Dec 10	Dec 15

**Object:** Charger  
**Applicant:** MSR Electronics GmbH  
**Manufacturer:** MSR Electronics GmbH  
**Type:** Powerpack  
**Object/serial number:** 100033

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

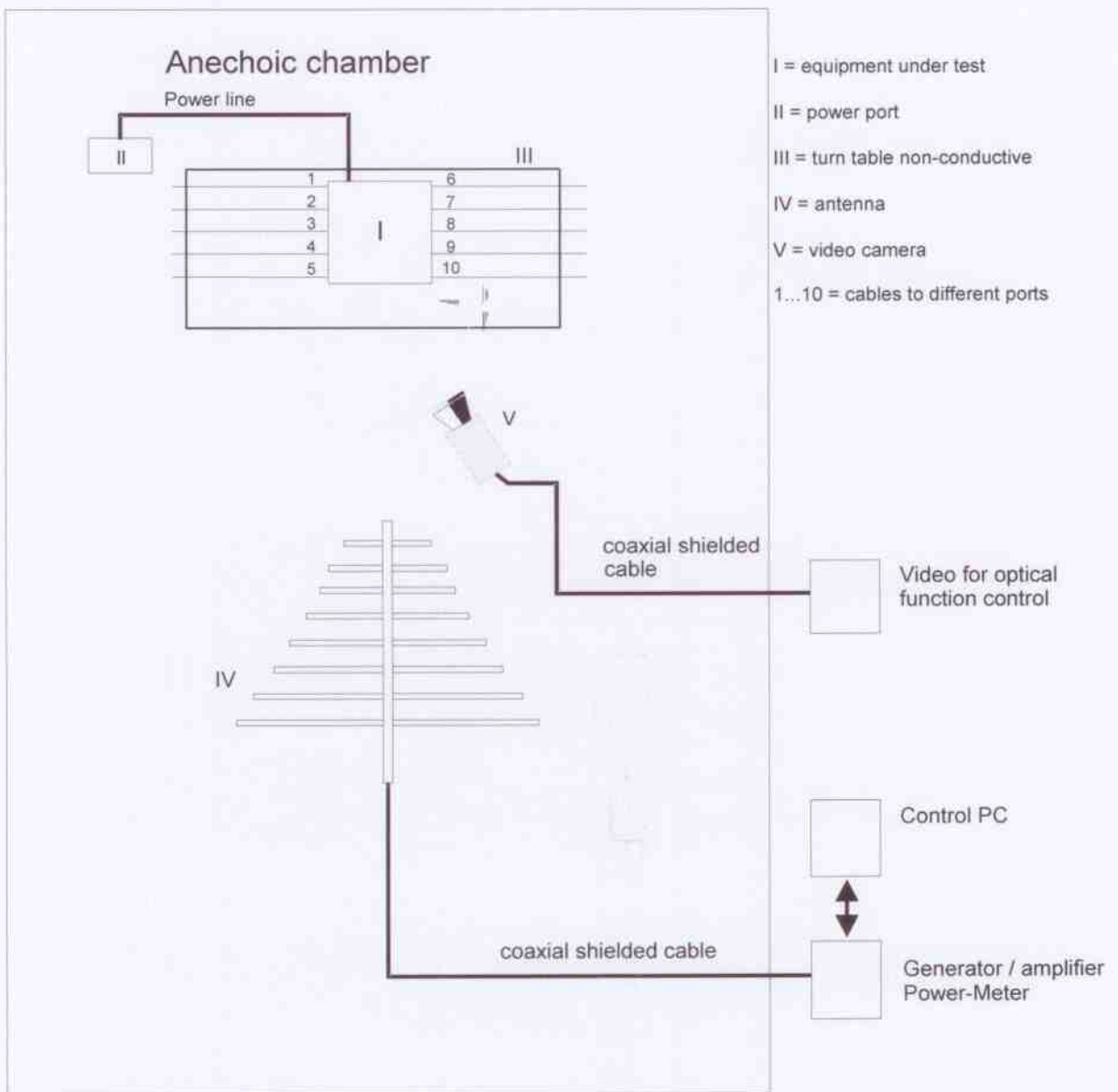
- a) Normal performance
- b) Temporary loss of function, recovery without operator intervention

- c) Temporary loss of function, recovery requires operator intervention
- d) Loss of function not recoverable

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

**Remarks:** -

## EMC: Immunity test

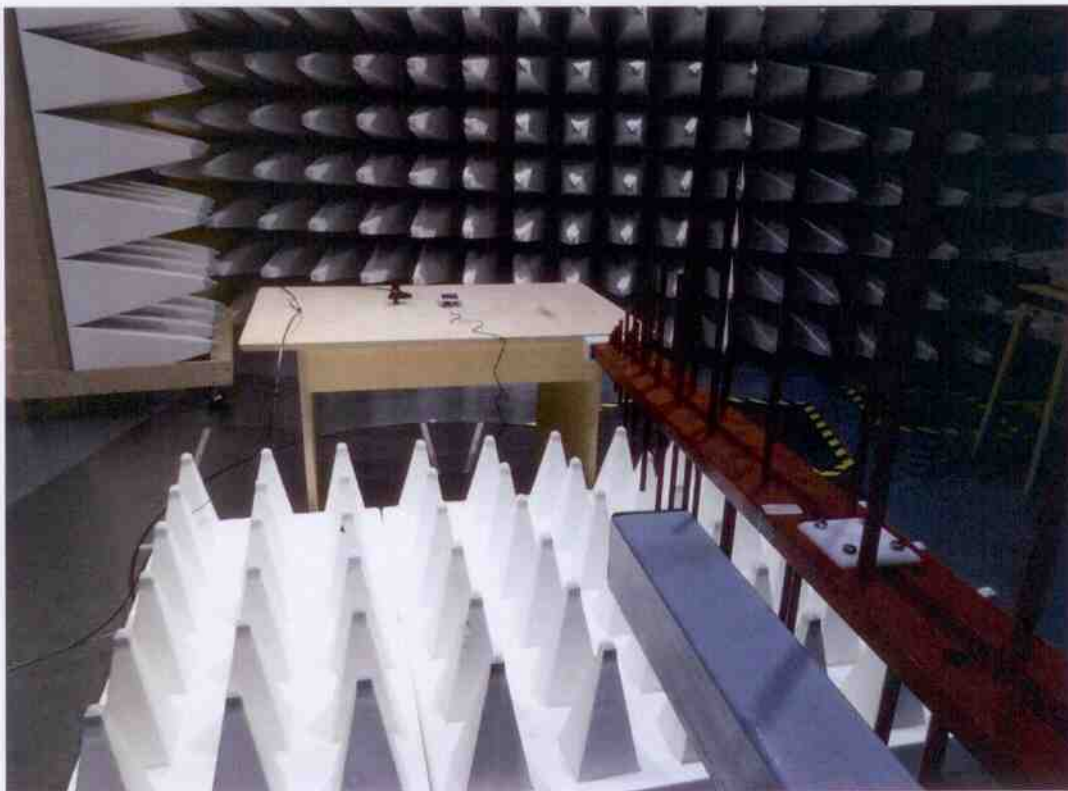
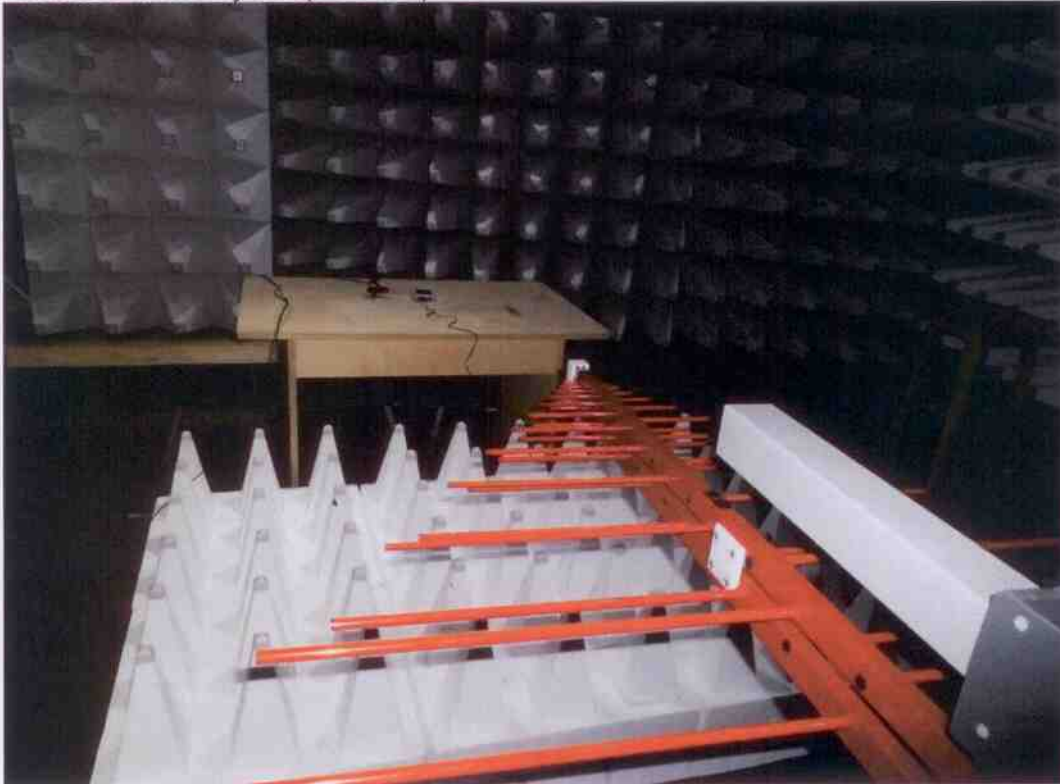


Antenna position horizontal

Antenna position vertical

**Photographs:**

Radiated immunity test(80-1000)MHz





Radiated immunity test(1-2,7)GHz



**EMC: Electrical fast transient burst**

QNL-E2148-04-15

**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:  $\pm 2$  kV
- Pulse arise time: 5 ns
- Pulse length (50 %): 50 ns
- Pulse frequency: 5 kHz
- Length of one packet: 15 ms
- Rate of repetition: 1 packet each 300 ms
- Test-time: 60 s
- Temperature: 22°C
- Humidity: 50%
- Test points are: Mains cable

**Acceptance criteria:**

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

**Reference:**

IEC/EN 61000-4-4

**Test equipment:**

Test equipment	Manufacturer / Type	QUINEL Inventory no.	Calibration	
			last	next
Burst tester	Haefely PEFT 4010	500198	Aug 14	Aug 16
Coupling Filter	Haefely FP 16/3-1	450006	May 15	May 17
Clamp	Haefely	450007	Feb 15	Feb 17

**Object:**

Charger

Applicant:

MSR Electronics GmbH

Manufacturer:

MSR Electronics GmbH

Type:

Powerpack

Object/serial number:

100033

**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 a)**

**Remarks:**

-

**Photographs:**





**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: ±2; ±4; ±8 kV air discharge  
±2; ±4 kV contact discharge
- Pulse-arise time: 0.7 ... 1 ns
- Pulse-length (50 %): 30 ns
- Time between 2 discharges: min. 2 s
- Temperature: 22.8°C
- Humidity: 41%
- Air pressure: 977mbar

**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:** Charger

Applicant: MSR Electronics GmbH

Manufacturer: MSR Electronics GmbH

Type: Powerpack

Object/serial number: 100033

**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 c) see remarks**

**Remarks:** During the test device blocks and is necessary to disconnect from power for 30seconds than by new connection in power device is functioning normally

**Photographs:**







**EMC: Surge**

QNL-E2148-55-15

**Test requirements:**

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

Line to line:

- Voltage pulse: 05. kV, 1 kV 1.2/50  $\mu$ s
- Current pulse 8/20  $\mu$ s
- Source impedance: 2  $\Omega$
- 5 pulses each in both polarities, start with 0°, every 45° until 330° phase angle
- 
- Temperature: 22°C
- Humidity: 50%

**Acceptance criteria:**

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

**Reference:** IEC/EN 61000-4-5

**Test equipment:**

Test equipment	Manufacturer / Type	QUINEL Inventory no.	Calibration	
			last	next
Impulse Tester	Haefely PC6-288	325333	Jan 14	Jan 16
Coupling Filter	Haefely FP20/3-3.2	500057	Feb 15	Feb 17
Coupling Network	Haefely IP6.2	500058	Feb 15	Feb 17
Oscilloscope	Le Croy 9400A	326490	Dec 15	Dec 17
Hi Voltage Probe	Tektronix P6013	312497	Aug 14	Aug 16

**Object:** Charger

Applicant: MSR Electronics GmbH

Manufacturer: MSR Electronics GmbH

Type: Powerpack


Object/serial number: 100033

**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 c)see remarks**

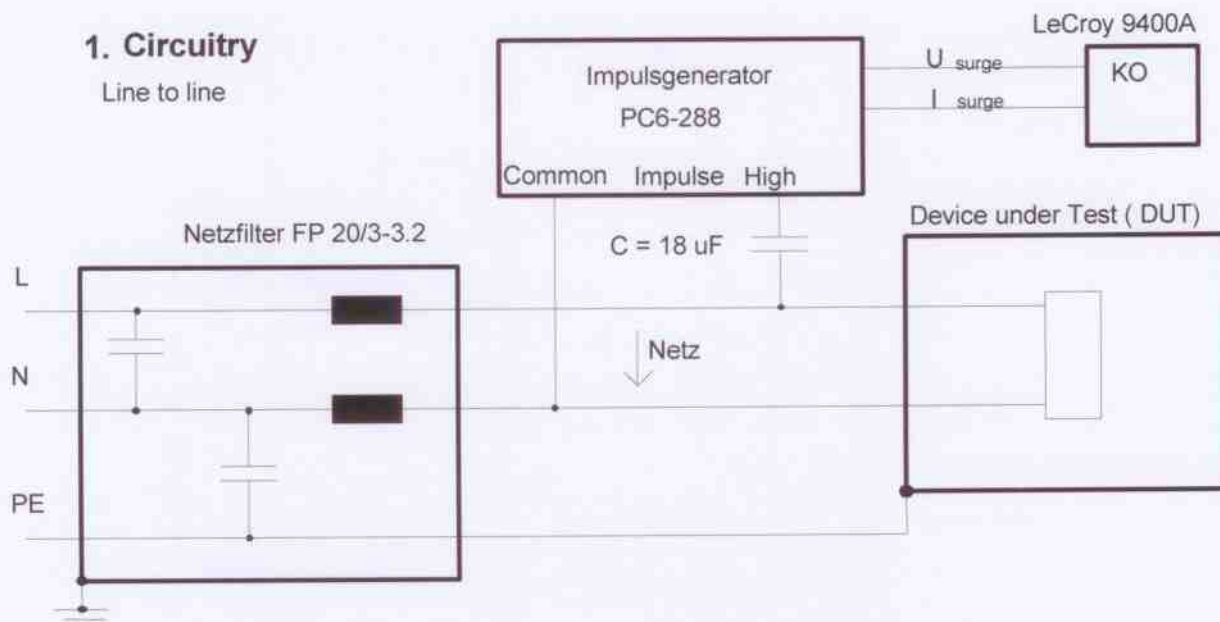
**Remarks:** During the test device blocks and is necessary to disconnect from power for 30seconds than by new connection in power device is functioning normally



## Surge

### 1. Circuitry

Line to line



### Photographs:



**EMC: Voltage dips, short interruptions and voltage variations**  
QNL-E2148-11-15

**Test requirements:**

The apparatus shall be tested in its normal position for use.

- |                               |                       |
|-------------------------------|-----------------------|
| a) Voltage dips:              | V <sub>n</sub> = 0 %  |
| Time between 2 interruptions: | 10 s                  |
| Test duration:                | 1 min.                |
| Interruption time:            | 20 ms                 |
| b) Voltage dips               | V <sub>n</sub> = 40 % |
| Time between 2 interruptions: | 10 s                  |
| Test duration:                | 1 min.                |
| Interruption time:            | 200 ms                |
| c) Voltage dips:              | V <sub>n</sub> = 70 % |
| Time between 2 interruptions: | 10 s                  |
| Test duration:                | 1 min.                |
| Interruption time:            | 500 ms                |
| d) Voltage interruptions      | V <sub>n</sub> = 0 %  |
| Time between 2 interruptions: | 10 s                  |
| Test duration:                | 1 min.                |
| Interruption time:            | 5000 ms               |
| - Temperature:                | 22°C                  |
| - Humidity:                   | 50%                   |

**Acceptance criteria:**

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

**Reference:** IEC/EN 61000-4-11

**Test equipment:**

Test equipment	Manufacturer / Type	QUINEL Inventory no.	Calibration	
			last	next
Flicker Meter	SPITZENBERGER & SPIES E 5000/PAS	500055	July 14	July 16

**Object:** Charger

Applicant: MSR Electronics GmbH

Manufacturer: MSR Electronics GmbH

Type: Powerpack

Object/serial number: 100033

Peak current consumption test		
	Peak current at 90° switch on	Peak current at 270° switch on
EUT ≥ 5 min off	<81A (≤ 81A)	<81A (≤ 81A)
EUT ≥ 1 min on, 5s off	<81A (≤ 81A)	<81A (≤ 81A)



If peak current consumption is higher than 81A test has to be done in external laboratory with stronger generator ( $\geq 500A$ )!

**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 a) for dips and (criterion b) for interrupts*

**Remarks:**

-

**Photographs:**



**Dips:**

Name:	Belegu Bujar	Serial no:	100033
Department:	EMV	Operating modes:	230VAC : 50Hz
Company:	Quinel AG	Comment1:	
Test report no:	E2148-15	Comment2:	--
Device:	Charger	Comment3:	--
Specimen:		Comment4:	--
Manufacturer:	MSR Electronics GmbH	Date:	10.12.2015
Type:	Powerpack	Test date:	10.12.2015

Test conditions: EN 61000-4-11 voltage dips, short interruptions and variations test

Voltage / frequency:	230.0 V / 50.0 Hz
Test phase:	Single phase / L1-N
Executed test:	EN61000-6-2 Dips
Test description:	Industrie
Disturbances per step:	3 (per phase angle) / 10.5 sec delay between

Step	Disturbance	Test level	Duration	Phase angle(s) (Ref. L1)
1	Voltage dip / short interruption	0 %	1 period	0° L1
2	Voltage dip / short interruption	40 %	10 periods	0° L1
3	Voltage dip / short interruption	70 %	25 periods	0° L1

**Test results:**

- Normal performance within limits specified by manufacturer, requestor or purchaser
- Temporary loss of function or degradation of performance which ceases after the disturbance ceases, and from which the equipment under test recovers its normal performance, without operator intervention
- Temporary loss of function or degradation of performance, the correction of which requires operator intervention
- Loss of function or degradation of performance which is not recoverable, owing to damage to hardware or software, or loss of data

**Comments:**

Tested with PS EMC 40.1 / PA 5000 by Splinterberger & Sykes GmbH & Co. KG, Schmalz, 3334, 94234 Vilsbiburg, Germany, 10.12.2015

**Interrupt:**

Name:	Belegu Bujar	Serial no:	100033
Department:	EMV	Operating modes:	230VAC : 50Hz
Company:	Quinel AG	Comment1:	
Test report no:	E2148-15	Comment2:	--
Device:	Charger	Comment3:	--
Specimen:		Comment4:	--
Manufacturer:	MSR Electronics GmbH	Date:	10.12.2015
Type:	Powerpack	Test date:	10.12.2015

Test conditions: EN 61000-4-11 voltage dips, short interruptions and variations test

Voltage / frequency:	230.0 V / 50.0 Hz
Test phase:	Single phase / L1-N
Executed test:	EN61000-6-2 Interrupt
Test description:	Industrie
Disturbances per step:	3 (per phase angle) / 10.5 sec delay between

Step	Disturbance	Test level	Duration	Phase angle(s) (Ref. L1)
1	Voltage dip / short interruption	0 %	250 periods	0° L1

**Test results:**

- Normal performance within limits specified by manufacturer, requestor or purchaser
- Temporary loss of function or degradation of performance which ceases after the disturbance ceases, and from which the equipment under test recovers its normal performance, without operator intervention
- Temporary loss of function or degradation of performance, the correction of which requires operator intervention
- Loss of function or degradation of performance which is not recoverable, owing to damage to hardware or software, or loss of data

**Comments:**

Tested with PS EMC 40.1 / PA 5000 by Splinterberger & Sykes GmbH & Co. KG, Schmalz, 3334, 94234 Vilsbiburg, Germany, 10.12.2015

**EMC: Harmonic current emissions**

QNL-E2148-32-15

**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.

- Temperature: 22°C
- Humidity: 50%

**Acceptance criteria:**

The measured disturbances from harmonic current emissions should not reach the limits specified in EN 61000-3-2 (A, B, C or D) (Class A).

**Reference:** EN 61000-3-2

**Test equipment:**

Test equipment	Manufacturer / Type	QUINEL Inventory no.	Calibration	
			last	next
Flicker Meter	SPITZENBERGER & SPIES E 5000/PAS	500055	July 14	July 16

**Object:** Charger  
 Applicant: MSR Electronics GmbH  
 Manufacturer: MSR Electronics GmbH  
 Type: Powerpack  
 Object/serial number: 100033

**Result:** *Test passed*

**Remarks:** -

**Photographs:**





Name:	Belegu Bujar	Serial no:	100033
Department:	EMV	Operating modes:	230VAC - 50Hz
Company:	Quinel AG	Comment1:	
Test report no:	E2148-15	Comment2:	--
Device:	Charger	Comment3:	--
Specimen:		Comment4:	--
Manufacturer:	MSR Electronics GmbH	Date:	10.12.2015
Type:	Powerpack	Test date:	10.12.2015

Maximum RMS current and corresponding values in timewindow 465:

Voltage:	230,46 Vrms	THD=0.01 %	THV=0.017 V	POHV=0.004 V	PWHD=0.01 %
Current:	0.039 Arms	THD=183.90 %	THC=0.034 A	POHC=0.008 A	PWHD=337.66 %
Power:	4.2 W	P1=4.2 W	8.9 VA		
Power factor:	0.474	CosPhi1: 0.995			

Test conditions: EN 61000-3-2:2006 + A1:2009 + A2:2009, f=50 Hz, Phase=L1, Range=0.80 A  
 Time window= 16, Grouping (>2nd harm)=off  
 No Ztest selected  
 harmonic currents < 0.6 % of I or < 5 mA are disregard for calc. of THD, THC, POHC, PWHD

HARMONIC ANALYSIS: Test PASS  
 Tobs = entire measurement; POHC: avg=0.00 A, limits=0.25 A  
 Iavg=0.039 Arms

Ha	Entire measurement (2.5 min = 469 time windows)							Worst 2.5 min		Average		P A S S	F A I L
	Maximum	Wfndow	EN61000-3-2 Class A	Margin in MaxWin	100 to 150%	150 to 200%	Ex- ceeded	100 to 150%	Ex- ceeded	Value	Ex- ceeded		
DC	-0.0009 A	29	-----	-----	0	0	0	n.e.	n.e.	-0.0008 A	0	X	
1	0.0185 A	63	-----	-----	0	0	0	n.e.	n.e.	0.0184 A	0	X	
2	0.0000 A	422	1.0800 A	-100.0 %	0	0	0	n.e.	n.e.	0.0000 A	0	X	
3	0.0148 A	468	2.3000 A	-99.4 %	0	0	0	n.e.	n.e.	0.0147 A	0	X	
4	0.0000 A	182	0.4300 A	-100.0 %	0	0	0	n.e.	n.e.	0.0000 A	0	X	
5	0.0142 A	463	1.1400 A	-98.8 %	0	0	0	n.e.	n.e.	0.0141 A	0	X	
6	0.0000 A	376	0.3000 A	-100.0 %	0	0	0	n.e.	n.e.	0.0000 A	0	X	
7	0.0133 A	464	0.7700 A	-98.3 %	0	0	0	n.e.	n.e.	0.0133 A	0	X	
8	0.0000 A	376	0.2300 A	-100.0 %	0	0	0	n.e.	n.e.	0.0000 A	0	X	
9	0.0122 A	463	0.4000 A	-96.9 %	0	0	0	n.e.	n.e.	0.0122 A	0	X	
10	0.0000 A	389	0.1840 A	-100.0 %	0	0	0	n.e.	n.e.	0.0000 A	0	X	
11	0.0109 A	272	0.3300 A	-96.7 %	0	0	0	n.e.	n.e.	0.0109 A	0	X	
12	0.0000 A	397	0.1533 A	-100.0 %	0	0	0	n.e.	n.e.	0.0000 A	0	X	
13	0.0096 A	411	0.2100 A	-95.4 %	0	0	0	n.e.	n.e.	0.0095 A	0	X	
14	0.0000 A	387	0.1314 A	-100.0 %	0	0	0	n.e.	n.e.	0.0000 A	0	X	
15	0.0081 A	411	0.1500 A	-94.6 %	0	0	0	n.e.	n.e.	0.0081 A	0	X	
16	0.0000 A	394	0.1150 A	-100.0 %	0	0	0	n.e.	n.e.	0.0000 A	0	X	
17	0.0067 A	420	0.1324 A	-94.9 %	0	0	0	n.e.	n.e.	0.0067 A	0	X	
18	0.0000 A	374	0.1022 A	-100.0 %	0	0	0	n.e.	n.e.	0.0000 A	0	X	
19	0.0054 A	420	0.1184 A	-95.4 %	0	0	0	n.e.	n.e.	0.0053 A	0	X	
20	0.0000 A	390	0.0920 A	-100.0 %	0	0	0	n.e.	n.e.	0.0000 A	0	X	
21	0.0042 A	421	0.1071 A	-96.1 %	0	0	0	n.e.	n.e.	0.0042 A	0	X	
22	0.0000 A	373	0.0836 A	-100.0 %	0	0	0	n.e.	n.e.	0.0000 A	0	X	
23	0.0032 A	422	0.0978 A	-96.7 %	0	0	0	n.e.	n.e.	0.0032 A	0	X	
24	0.0000 A	181	0.0767 A	-100.0 %	0	0	0	n.e.	n.e.	0.0000 A	0	X	
25	0.0025 A	376	0.0900 A	-97.2 %	0	0	0	n.e.	n.e.	0.0025 A	0	X	
26	0.0000 A	375	0.0708 A	-100.0 %	0	0	0	n.e.	n.e.	0.0000 A	0	X	
27	0.0021 A	284	0.0833 A	-97.4 %	0	0	0	n.e.	n.e.	0.0021 A	0	X	
28	0.0000 A	148	0.0657 A	-100.0 %	0	0	0	n.e.	n.e.	0.0000 A	0	X	
29	0.0020 A	285	0.0776 A	-97.4 %	0	0	0	n.e.	n.e.	0.0020 A	0	X	
30	0.0000 A	388	0.0613 A	-100.0 %	0	0	0	n.e.	n.e.	0.0000 A	0	X	
31	0.0020 A	287	0.0726 A	-97.2 %	0	0	0	n.e.	n.e.	0.0020 A	0	X	
32	0.0000 A	380	0.0575 A	-100.0 %	0	0	0	n.e.	n.e.	0.0000 A	0	X	
33	0.0020 A	287	0.0682 A	-97.1 %	0	0	0	n.e.	n.e.	0.0020 A	0	X	
34	0.0000 A	364	0.0541 A	-100.0 %	0	0	0	n.e.	n.e.	0.0000 A	0	X	
35	0.0019 A	289	0.0643 A	-97.0 %	0	0	0	n.e.	n.e.	0.0019 A	0	X	
36	0.0000 A	376	0.0511 A	-100.0 %	0	0	0	n.e.	n.e.	0.0000 A	0	X	
37	0.0018 A	288	0.0608 A	-97.1 %	0	0	0	n.e.	n.e.	0.0017 A	0	X	
38	0.0000 A	382	0.0484 A	-100.0 %	0	0	0	n.e.	n.e.	0.0000 A	0	X	
39	0.0016 A	427	0.0577 A	-97.3 %	0	0	0	n.e.	n.e.	0.0015 A	0	X	
40	0.0000 A	1	0.0460 A	-100.0 %	0	0	0	n.e.	n.e.	0.0000 A	0	X	

average value < 0.6 % of Iavg or < 5 mA n.e. = notevaluated

**EMC: Voltage fluctuations and flicker**

QNL-E2148-33-15

**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.

- Temperature: 22°C
- Humidity: 50%

**Acceptance criteria:**

The measured disturbances from voltage fluctuations and flicker should not reach the limits specified in EN 61000-3-3.

**Reference:**

EN 61000-3-3

**Test equipment:**

Test equipment	Manufacturer / Type	QUINEL Inventory no.	Calibration	
			last	next
Flicker Meter	SPITZENBERGER & SPIES E 5000/PAS	500055	July 14	July 16

**Observation period:**

10min / 2h

Relative voltage change characteristic	d(t)%	Limit:	3.3 %
Maximum relative voltage change	d <sub>max</sub> %	Limit:	4 %
Relative steady state voltage change	d <sub>c</sub> %	Limit:	3.3 %
Short-term flicker indicator:	P <sub>st</sub>	Limit:	1
Long-term flicker indicator:	P <sub>lt</sub>	Limit:	0.65

**Object:**

Charger

Applicant: MSR Electronics GmbH  
 Manufacturer: MSR Electronics GmbH  
 Type: Powerpack  
 Object/serial number: 100033

**Result:**

**Test passed**

**Remarks:**

-

Name:	Belegu Bujar	Serial no:	100033
Department:	EM V	Operating modes:	230VAC , 50Hz
Company:	Quinel AG	Comment1:	
Test report no:	E2148-15	Comment2:	--
Device:	Charger	Comment3:	--
Specimen:		Comment4:	--
Manufacturer:	MSR Electronics GmbH	Date:	10.12.2015
Type:	Powerpack	Test date:	10.12.2015

Test conditions: EN 61000-3-3:2013 / 230 V / 50 Hz / Phase L1  
 EN 61000-4-15:2011 / Obs 1 x 10 min / Ztest (0.400+j0.250) Ohm  
 Ra+jXa (0.2400+j0.1500) Ohm / Rn+jXn (0.1600+j0.1000) Ohm

FLICKER: Test PASS!

Time	Pmax	Pst	Sliding Plt d(t)>3.30% [s]	dmax [%]	dc [%]	PASS	FAIL	
08:31:32	0.001	0.0240	- . - . - . - .	0.000	+0.000	- . - . - . - .	X	
Limits:		1.000	0.650	0.500	4.000	3.300		
Plt: 0.010483 (calculated over 12 periods)							X	
Evaluated: PST, PLT, Sliding PLT, dc, dmax, d(t)								

FLICKER: Source test PASS!

Time	Pmax	Pst	Sliding Plt d(t)>3.30% [s]	dmax [%]	dc [%]	PASS	FAIL	
08:31:32	0.001	0.0230	- . - . - . - .	0.000	+0.000	- . - . - . - .	X	
Plt: 0.010046 (calculated over 12 periods)								
Evaluated: PST <= 0.4 dmax < 20 % dmax1								

Tested with 5 PS EMC 40.1/PA 55000 by Spitzenberger & Spies GmbH & Co. KG, Schrißdorf 3234, 94234 Vilsbiburg, Germany, 10.12.2015

**Photographs:**





**EMC: Power frequency magnetic field immunity**

QNL-E2148-08-15

**Test requirements:**

The apparatus shall be placed in the center of a Helmholtz-coil to be tested in its normal position for use. The Helmholtz-coil shall be supplied by a regulating transformer. The apparatus shall be supplied with nominal voltage.

- Frequency: 50 Hz
- Amplitude: 30 A/m
- Duration of test: 2 minutes

**Acceptance criteria:**

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

**Reference:** IEC/EN 61000-4-8

**Test equipment:**

Test equipment	Manufacturer / Type	QUINEL Inventory no.	Calibration	
			last	next
Helmholtz-coil	QUINEL	2371992	April 08	April 16
Neodymium magnet	QUINEL	500211	Feb 14	Feb 24

**Object:** Charger  
Applicant: MSR Electronics GmbH  
Manufacturer: MSR Electronics GmbH  
Type: Powerpack  
Object/serial number: 100033

**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:** *Not tested-see remarks*

**Remarks:** Not applicable