

EMC TEST REPORT #

496

Date of the report

06.08.2018.

Date of testing

19. – 26.07.2018.

Job #

496



ATC
01-404

АКРЕДИТОВАНА
ЛАБОРАТОРИЈА
ЗА ИСПИТИВАЊЕ
SRPS ISO/IEC 17025:2006

Customer

Grigorii Grabovoi PR KONSALTING TECHNOLOGIES OF ETERNAL DEVELOPMENT, Kneza Mihaila 21A lok 113 TC Milenijum, 11102 Beograd, Serbia

Manufacturer

Grigorii Grabovoi PR KONSALTING TECHNOLOGIES OF ETERNAL DEVELOPMENT, Kneza Mihaila 21A lok 113 TC Milenijum, 11102 Beograd, Serbia

EUT

The device of development of concentrations of eternal life PRK-1U is of three-modes

Model/Serial No.

PRK-1U three-modes
S/N: P160327 (first sample delivered)
S/N: P160823 (second sample delivered)


Test result

(according to methods and criteria reported in Clause 4 only)

PASS


Remarks: None.

Tested by:


LAB engineer
Andrijana Lazić


LAB engineer
Milivoje Miletić

Verified by:


LAB engineer Andrijana Lazić



Approved by:


p.p. Technical Manager Saša Jorgovanović

The electromagnetic compatibility (EMC) tests and the test results are valid for the tested product (EUT) sample only.

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2. Product identification

2.1. Data

EUT description: Development of concentrations providing eternal life for all is carried out by the concentration of attention on the receiver of generated bio-signal and in the same time control for achieving result of the concentrations. It is known in psychology that the longer the concentration is carried out, the faster the goal is achieved, and the events are optimized. The device, in addition to this factor of psychology, according to the law of universal connections has a control of the goal of concentration through superposition of the fields from generation of the bio-signal, electromagnetic fields. The device develops concentrations of creative control.

The device has been created by Grigori Grabovoi on the bases on his two currently effective patented inventions: "Method of prevention of catastrophes and the device for its realization" and "Information transmission system". In the patent "Information transmission system" has been written that it is known in the theory of wave synthesis that a thought generated emission may exist in two quantum states simultaneously. One of these states is located on the sensor element of the transmitter of the signals and another on the receiver of the signals. This makes it possible to create devices for ensuring eternal life, which interact with thinking. In the patented inventions of Grigori Grabovoi it is written that human operator generates information in the form of the emission of thought. In order to activate the function of the device "PRK - 1U" a person concentrates emission of creative thought on the lenses located on the upper surface of the device.

General technical characteristics of the EUT

- Input voltage: 100-240V, 50Hz / 60Hz, 0,45 A Max
- Power consumption: no more than 12 watts
- Size: 250 mm x 190 mm x 80 mm
- Weight: 1 kg

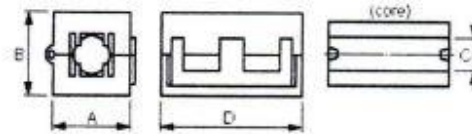
Note: the EUT is not considered to be a medical device.

Note: two EUT samples of the same model were delivered. Following the customer's request, the **first sample (S/N: P160327)** was to be used for every test except for radiated RF emissions test. The **second sample (S/N: P160823)**, which contained added ferrite beads (details given below), was to be used only for the radiated RF emissions test. Four ferrite beads were placed inside the EUT (3 turns each), one was placed outside on the power cable of the AC/DC adapter. The second sample also contains a ferrite bead which comes with the AC/DC adapter. Also, there is a difference in the lengths of the power cables. The length of the power cable (cable between the adapter and the DC input power port) of the first sample is 1 m, while the second sample has a 1.2 m long power cable.

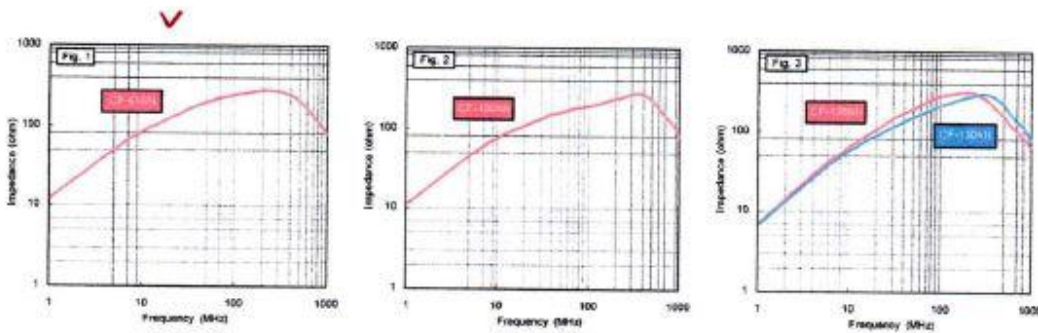
AC/DC adapter information

Manufacturer:	SHENZEN JINHUASHENG POWER TECHNOLOGY CO. LTD.
Model:	RS-AB1000
Made in:	China

Split EMI Suppression Cores (CF Series)



Part Number	A (mm)	B (mm)	C (mm)	D (mm)	Typical Impedance (ohm)		Z-F Fig.
					25MHz	100MHz	
✓ CF-65SN	17.8	19.5	6.5	32.5	140	240	①
CF-100SN	22.3	23.3	10.0	32.6	120	190	2
CF-130SN	29.6	30.5	13.0	33.0	125	280	3



Description of the added ferrite beads (the red marker indicates the model that was used) to the second sample (the sample used for the radiated RF emission test)

Manufacturer of the added ferrite beads: Crown Ferrite Enterprise Co., 17, Alley 14, Lane 165, Kang-Ning Rd., Sec. 3, Nei-Hu District Taipei, Taiwan



Ferrite beads placed inside the second sample



Ferrite bead placed outside the second sample on the AC/DC adapter's power cable

2.2. Photographs/schematics



EUT (first sample), front



EUT (first sample), top



EUT (first sample), right side



EUT (first sample), left side



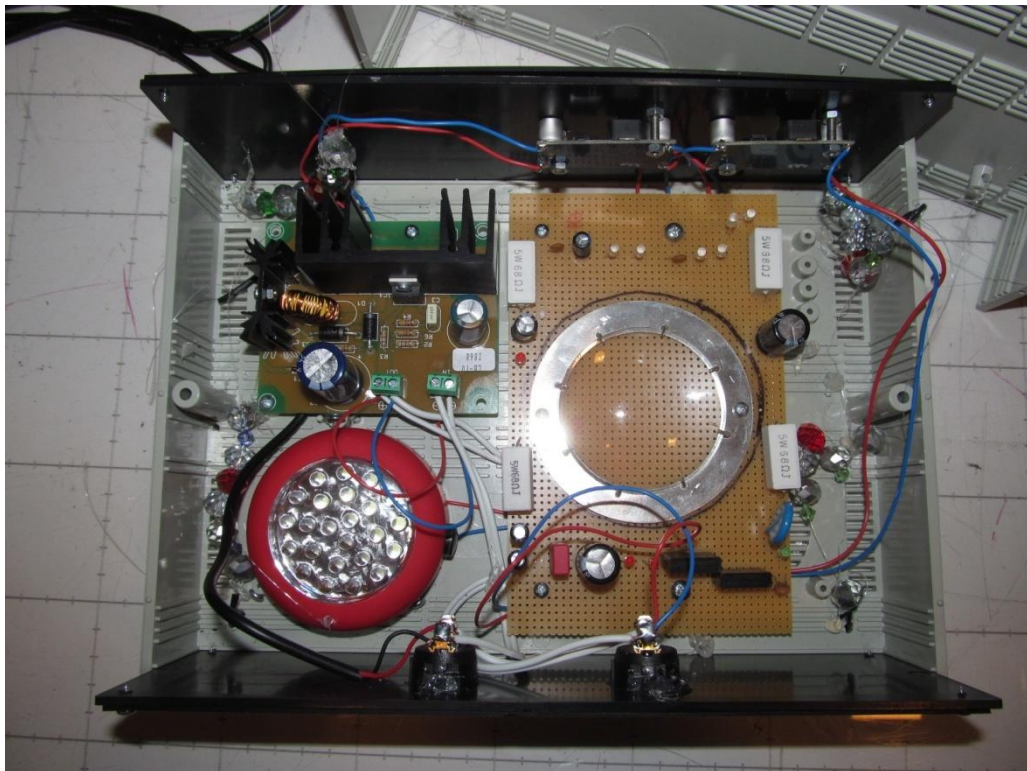
EUT (first sample), rear



EUT (first sample), bottom



AC/DC adapter (first sample)



EUT (first sample), inside



EUT (second sample), front



EUT (second sample), top



EUT (second sample), right side



EUT (second sample), left side



EUT (second sample), rear



EUT (second sample), bottom



AC/DC adapter (second sample)



EUT (second sample), inside

2.3. Operation modes

Operation mode	Description of operation mode and exercise method
Third mode of operation	The EUT is connected to the 230 V, 50 Hz mains electrical grid and is turned on using button 1. The EUT is now in its first operation mode, which is a kind of standby mode. Pressing button 2 turns on the LEDs. This is the second mode of operation. The third mode of operation is achieved by turning the EUT off using button 1, while button remains in the on position, and then turning it back on. The light coming from the LEDs within the EUT is now pulsating.

2.4. Associated/auxiliary equipment

None.

2.5. Performance criteria

2.5.1. Emission criteria

Conducted RF emissions 150 kHz – 30 MHz: Required emission limits are according to the customer's request and also in accordance with table 1, clause 4.1.1.3 of EN 55014-1:2006 + A1:2009 + A2:2011.

Radiated RF emissions 30 MHz – 1 GHz: Required emission limits are according to the customer's request and also in accordance with table 4, clause 4.1.3 of EN 55014-1:2006 + A1:2009 + A2:2011.

Harmonics emission test: Required emission limits are according to the customer's request and also in accordance with table 1 for class A equipment from Annex A of the EN 61000-3-2:2014.

Flicker limitations test: Required emission limits are according to the customer's request and also in accordance with clause 5 of EN 61000-3-3:2013.

2.5.2. Immunity criteria

Performance criteria:	
Description of normal operation or performance degradation and monitoring	Operation mode
<p>Criterion A – <i>The apparatus shall continue to operate as intended during the test. No degradation of performance or loss of function is allowed below a performance level (or permissible loss of performance) specified by the manufacturer, when the apparatus is used as intended. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and from what the user may reasonably expect from the apparatus if used as intended.</i></p> <p>The disturbances may not influence the EUT's performance in any way. No restart, change of operation mode or change in the pulsating light's intensity or repetition frequency, which is constantly visually monitored, is allowed.</p>	Third mode of operation

Criterion B – *The apparatus shall continue to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level (or permissible loss of performance) specified by the manufacturer, when the apparatus is used as intended. During the test, degradation of performance is allowed, however no change of actual operating state or stored data is allowed to persist after the test. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and from what the user may reasonably expect from the apparatus if used as intended.*

The disturbances may not cause the EUT to restart or change its operation mode, but may temporarily (i.e. a few seconds) influence the operation mode, i.e. changing the pulsating light's intensity or repetition frequency. No human intervention is allowed to assist the EUT to get rid of any lasting changes the disturbances may have had on the EUT's operation mode.

Criterion C – *Temporary loss of function is allowed, provided the function is self-recoverable or can be restored by the operation of the controls, or by any operation specified in the instructions for use.*

The disturbances may cause the EUT to restart, change its operation mode, or influence in any way its current operation mode. Any influences on the EUT's performance must be either temporary, or removable by human intervention.

2.6. Product related notes

None.

3. Test conditions

Temperature: 20.5 – 23.7 °C
Relative humidity: 42 – 49.8 % RH
Atmospheric pressure: 989 - 995 hPa

4. Test methods and short overview of the results

EUT is tested in the laboratory.

EUT is tested as tabletop equipment.

EUT is tested as category II equipment from clause 7.2.2 of EN 55014-2:2015.

According to criteria from Clause 2.5 of the report and the test plan according to the customer's request:

METHOD / STANDARD	PORT	TEST LEVEL (STANDARD)	OPERATING MODE	CRITERIA REQUESTED	RESULT
Conducted RF emissions EN 55014-1:2006 + A1:2009 + A2:2011	AC input power port	EN 55014-1:2006 + A1:2009 + A2:2011 Table 1, clause 4.1.1.3 150 kHz - 30 MHz Measurement by application of LISN.	Third mode of operation	/	PASS
Radiated RF emissions Referenced ⁽¹⁾ EN 55022:2006 To apply EN 55022:2010 + AC:2011	Enclosure port	EN 55014-1:2006 + A1:2009 + A2:2011 Table 3, clause 4.1.3 30 MHz - 1 GHz Measurement at 3 m distance in semi-anechoic chamber.	Third mode of operation	/	PASS
Harmonics emission test EN 61000-3-2:2014	AC input power port	EN 61000-3-2:2014 Class A, table 1 Test type: fluctuating harmonics 2.5 min Test voltage 230 V, 50 Hz Time window: 200 ms	Third mode of operation	/	PASS
Flicker limitations test EN 61000-3-3:2013	AC input power port	EN 61000-3-3:2013 Clause 5 Test voltage 230 V, 50 Hz Observation period: 10 min Number of observations: 1	Third mode of operation	/	PASS
Immunity to radiated RF field EN 61000-4-3:2006+ A1:2008+A2:2010	Enclosure	EN 55014-2:2015 clause 5.5 3 V/m, AM 80 %, 1 kHz 1 s dwell time 80 MHz – 1000 MHz Test performed in SAC UFA: 1.5 m x 1.5 m, 2.3 m from the antenna	Third mode of operation	A	PASS
Immunity to conducted RF disturbances EN 61000-4-6:2014	AC input power port	EN 55014-2:2015 clause 5.3 3 V, AM 80 %, 1 kHz 1 s dwell time Disturbances applied through CDN M216	Third mode of operation	A	PASS
Immunity to EFT/Burst EN 61000-4-4:2012	AC input power port	EN 55014-2:2015 clause 5.2 Laboratory test CDN, common mode ±1 kV (peak), 5/50 Tr/Th ns, Repetition frequency: 5 kHz Duration: 120 s per polarity	Third mode of operation	B	PASS

Immunity to surge EN 61000-4-5:2014	AC input power port	EN 55014-2:2015 clause 5.6 1,2/50 (8/20) Tr/Th μ S ± 1 kV phase line to neutral line 5 positive and 5 negative pulses Pause: 60 s Generator impedance: 2 Ω Phase angle: 90 deg for positive, 270 deg for negative pulses Pulses to be applied through CDN	Third mode of operation	B	PASS
Immunity to ESD EN 61000-4-2:2009	Enclosure	EN 55014-2:2015 clause 5.1 Table-top equipment 4 kV (charge voltage)(Contact discharge) at horizontal and vertical conducting plane, screws, metallic parts of the housing, metallic plates 8 kV (charge voltage) (Air discharge) at buttons, plastic housing, vents, ac/dc adapter housing No post-installation test	Third mode of operation	B	PASS
Immunity to voltage dips and interruptions EN 61000-4-11:2004	AC input power port	EN 55014-2:2015 clause 5.7 Supply voltage 230 V, 50 Hz Changes of supply voltage occur at zero crossings of the voltage Number of applications: 3 Pause duration between applications: 10 s Voltage dip to: 70%/40%/0% for 25/10/0.5 cycles	Third mode of operation	C	PASS

- (1) Referenced test method as specified by EN 55014-1:2006 + A1:2009 + A2:2011 in Annex ZA. The laboratory shall apply the test standard according to its scope of accreditation as noted. The standards have been compared previously and no significant changes in the test methods consinging to the testing had been found.

5. Test results

5.1. Conducted RF emissions

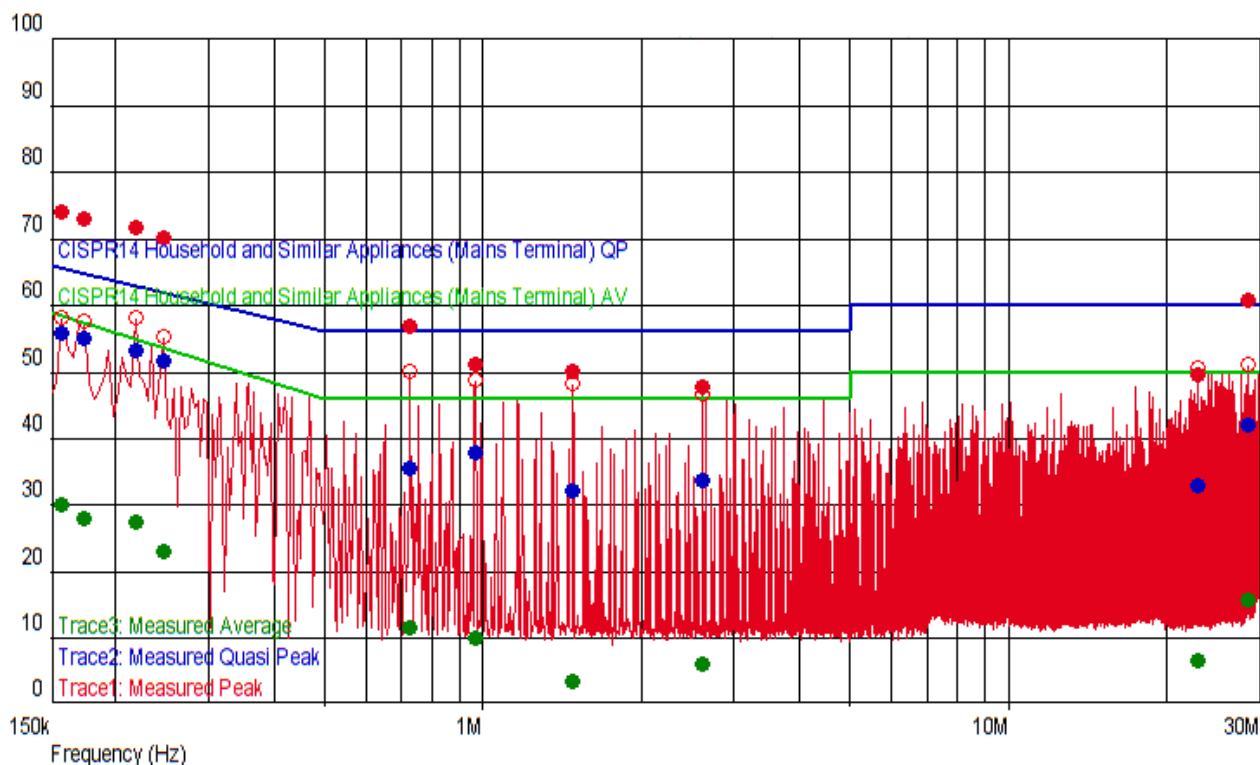
Date: 19.07.2018.
Test standard: EN 55014-1:2006 + A1:2009 + A2:2011
Tested by: Andrijana Lazić

5.1.1. Set up



Port under test:	AC power port
AC power port voltage:	223 V, 50 Hz
Frequency range:	150 kHz – 30 MHz
Pre-scan dwell time:	10 ms
Pre-scan detector:	Peak
Step:	4 kHz
Final measurement time:	15 s
EUT operation mode:	Third mode of operation

5.1.2. Results



f [MHz]	Pk level [dBuV]	QP level [dBuV]	QP limit [dBuV]	QP margin [dB]	Av level [dBuV]	Av limit [dBuV]	Av margin [dB]	LINE
0.158	73.825	55.54	65.568	-10.03	29.765	58.439	-28.674	N
0.174	72.768	54.78	64.767	-9.99	27.848	57.397	-29.549	L1
0.218	71.444	52.9	62.895	-9.99	27.114	54.963	-27.849	L1
0.246	69.809	51.55	61.891	-10.34	22.739	53.658	-30.919	L1
0.726	56.769	35.36	56	-20.64	11.259	46	-34.741	L1
0.966	50.799	37.56	56	-18.44	9.689	46	-36.311	L1
1.482	49.945	32.01	56	-23.99	3.355	46	-42.645	N
2.614	47.5	33.34	56	-22.66	5.74	46	-40.26	L1
22.91	49.395	32.79	60	-27.21	6.445	50	-43.555	L1
28.498	60.608	41.76	60	-18.24	15.458	50	-34.542	L1

Test result: **PASS**

5.1.3. Deviations

None.

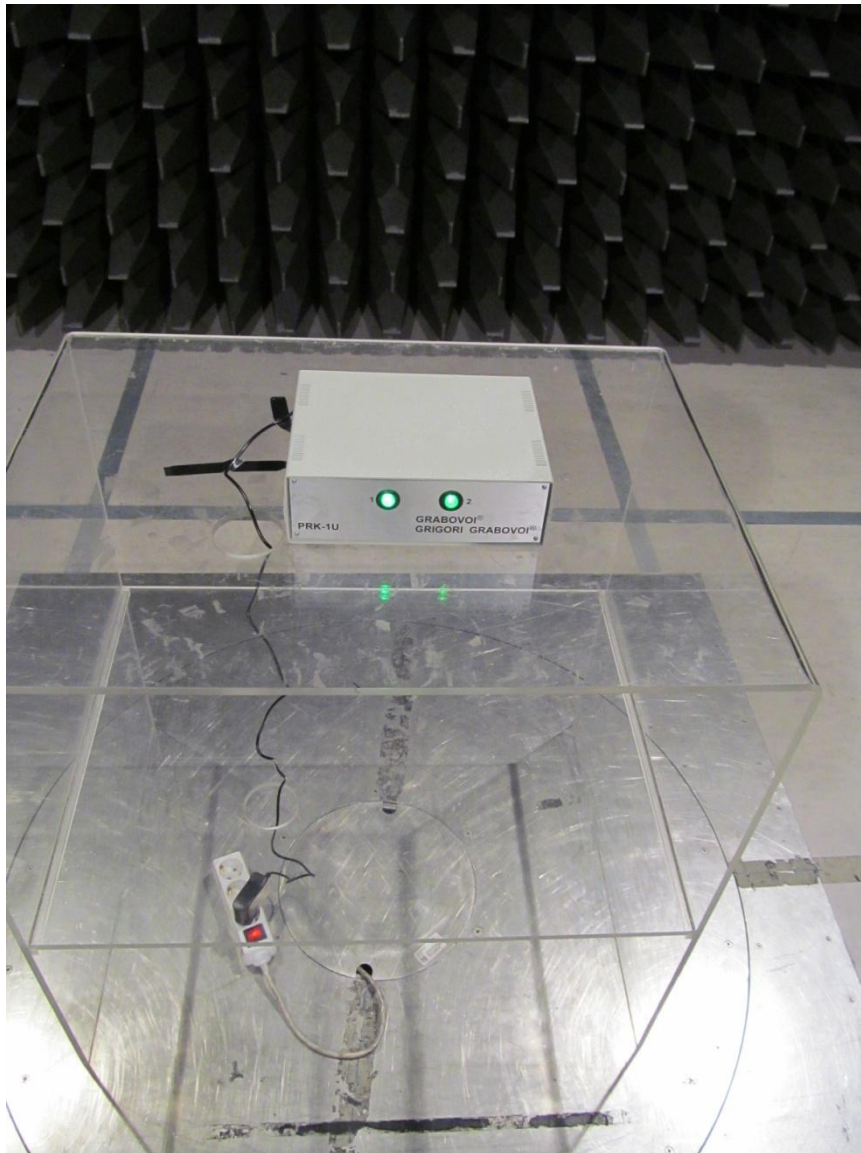
5.1.4. Comments

None.

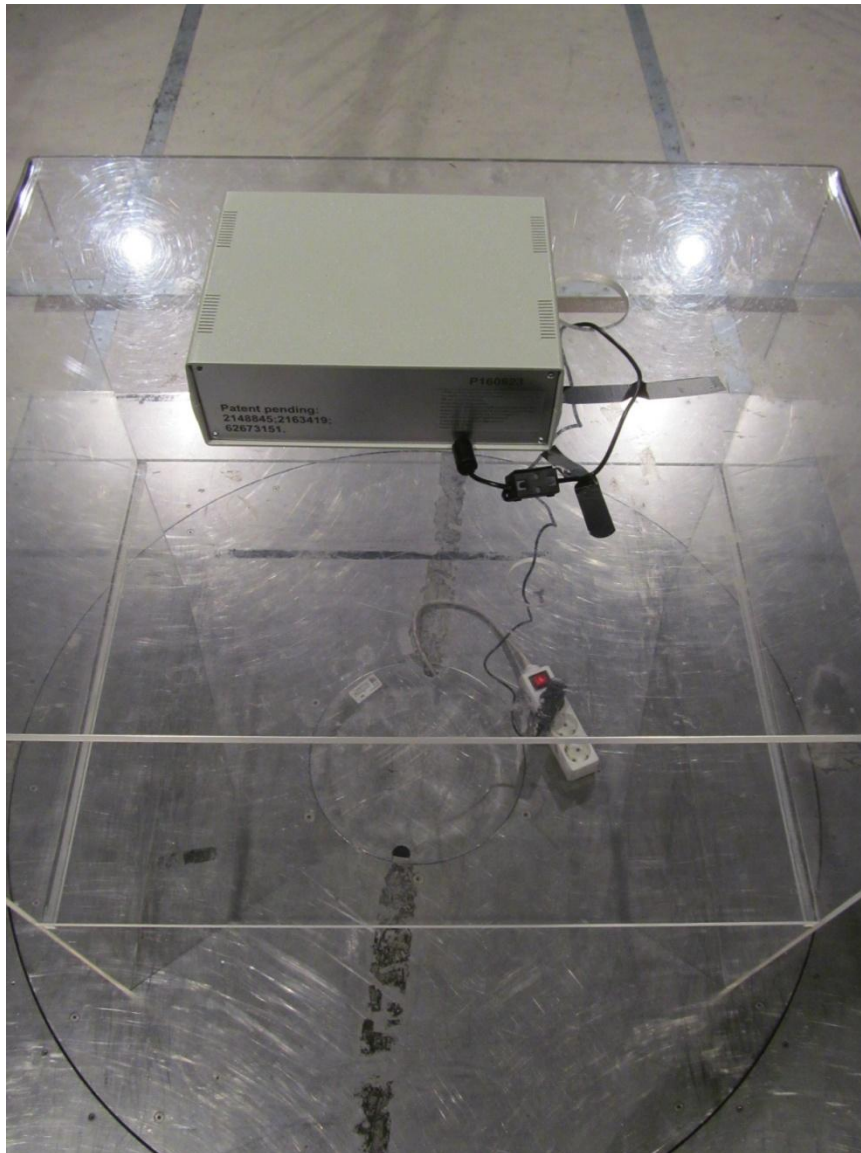
5.2. Radiated RF emissions

Date: 26.07.2018.
Test standard: EN 55022:2010 + AC:2011
Tested by: Milivoje Miletić

5.2.1. Set up:



Setup, front view



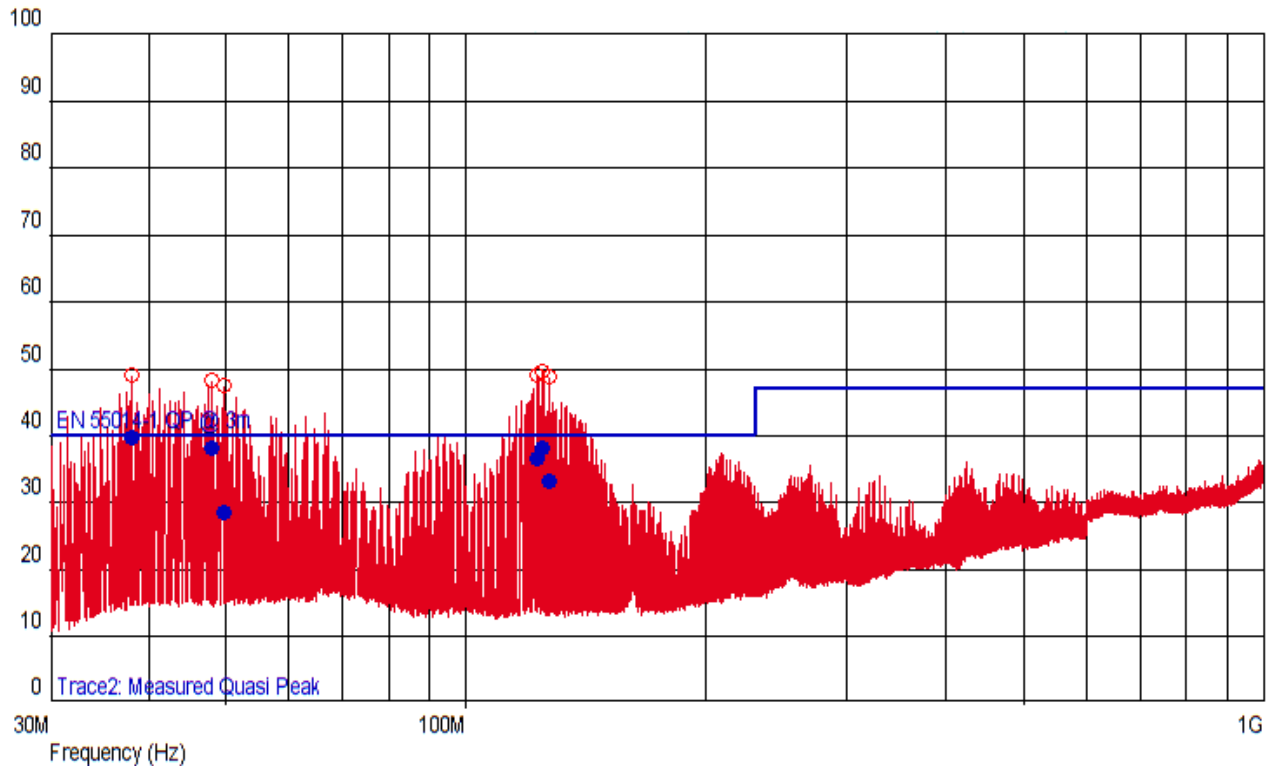
Setup, rear view

Test location: semi-anechoic chamber
EUT to antenna distance: 3 m
EUT operation mode: EMC operation mode

Limits:

Frequency range [MHz]	Quasi-peak limit dB(μ V/m)
30 – 230	40
230 – 1000	47

5.2.2. Results:



List of selected disturbances:

Frequency [MHz]	QP level [dBuV/m]	QP limit [dBuV/m]	Margin [dB]	Antenna polarization	Azimuth [deg]	Antenna height [m]
38.000800	39.36	40	-0.64		12	1.06
48.040850	37.94	40	-2.06		261	1.06
49.719025	28.36	40	-11.64		181	3.7
122.599650	36.37	40	-3.63		156	1.95
124.599925	37.96	40	-2.04		162	1.61
127.319750	32.91	40	-7.09		95	2.62

Test result: **PASS**

5.2.3. Deviations

None.

5.2.4. Comments

These test results are valid only with the used ferrite beads described in clause 2.1.

5.3. Harmonics emission test

Date: 19.07.2018.
Test standard: EN 61000-3-2:2014
Tested by: Milivoje Miletić

5.3.1. Set up



Parameter	Equipment setting
Device class	A
Test type	Fluctuating harmonics, 2.5 min
Test voltage	230V, 50 Hz
Time window	200 ms
Operation mode	Third mode of operation

5.3.2. Results

Maximum RMS current and corresponding values in timewindow 65:

Voltage: 230.31 Vrms THD=0.01 % THV=0.027 V POHV=0.009 V PWHD=0.03 %
 Current: 0.048 Arms THD=514.60 % THC=0.042 A POHC=0.012 A PWHD=1106.32 %
 Power: 1.8 W P1=1.8 W 11.1 VA
 Power factor: 0.165 CosPhi1: 0.978

HARMONIC ANALYSIS: Test PASS
 Tobs = entire measurement; POHC: avg=0.00 A, limits=0.25 A
 Iavg=0.042 Arms

Ha	Entire measurement (2.5 min = 750 time windows)							Worst 2.5 min		Average		P A S S	F A I L
	Maximum	Window	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	-0.0048 A	372	-----	-----	0	0	0	n.e.	n.e.	-0.0013 A	0	X	
1	0.0083 A	453	-----	-----	0	0	0	n.e.	n.e.	0.0075 A	0	X	
2	0.0068 A	64	1.0800 A	-99.4 %	0	0	0	n.e.	n.e.	0.0045 A	0	X	
3	0.0180 A	86	2.3000 A	-99.2 %	0	0	0	n.e.	n.e.	0.0161 A	0	X	
4	0.0090 A	65	0.4300 A	-97.9 %	0	0	0	n.e.	n.e.	0.0062 A	0	X	
5	0.0164 A	86	1.1400 A	-98.6 %	0	0	0	n.e.	n.e.	0.0148 A	0	X	
6	0.0085 A	58	0.3000 A	-97.2 %	0	0	0	n.e.	n.e.	0.0060 A	0	X	
7	0.0143 A	86	0.7700 A	-98.1 %	0	0	0	n.e.	n.e.	0.0129 A	0	X	
8	0.0079 A	58	0.2300 A	-96.6 %	0	0	0	n.e.	n.e.	0.0057 A	0	X	
9	0.0119 A	93	0.4000 A	-97.0 %	0	0	0	n.e.	n.e.	0.0108 A	0	X	
10	0.0071 A	58	0.1840 A	-96.1 %	0	0	0	n.e.	n.e.	0.0053 A	0	X	
11	0.0095 A	93	0.3300 A	-97.1 %	0	0	0	n.e.	n.e.	0.0086 A	0	X	
12	0.0063 A	51	0.1533 A	-95.9 %	0	0	0	n.e.	n.e.	0.0048 A	0	X	
13	0.0073 A	93	0.2100 A	-96.5 %	0	0	0	n.e.	n.e.	0.0066 A	0	X	
14	0.0057 A	51	0.1314 A	-95.7 %	0	0	0	n.e.	n.e.	0.0044 A	0	X	
15	0.0057 A	86	0.1500 A	-96.2 %	0	0	0	n.e.	n.e.	0.0051 A	0	X	
16	0.0051 A	51	0.1150 A	-95.6 %	0	0	0	n.e.	n.e.	0.0039 A	0	X	
17	0.0050 A	86	0.1324 A	-96.2 %	0	0	0	n.e.	n.e.	0.0043 A	0	X	
18	0.0045 A	72	0.1022 A	-95.6 %	0	0	0	n.e.	n.e.	0.0034 A	0	X	
19	0.0049 A	86	0.1184 A	-95.9 %	0	0	0	n.e.	n.e.	0.0040 A	0	X	
20	0.0041 A	72	0.0920 A	-95.5 %	0	0	0	n.e.	n.e.	0.0031 A	0	X	
21	0.0049 A	85	0.1071 A	-95.5 %	0	0	0	n.e.	n.e.	0.0040 A	0	X	
22	0.0038 A	72	0.0836 A	-95.4 %	0	0	0	n.e.	n.e.	0.0028 A	0	X	
23	0.0048 A	85	0.0978 A	-95.1 %	0	0	0	n.e.	n.e.	0.0040 A	0	X	
24	0.0036 A	72	0.0767 A	-95.3 %	0	0	0	n.e.	n.e.	0.0027 A	0	X	
25	0.0045 A	65	0.0900 A	-94.9 %	0	0	0	n.e.	n.e.	0.0038 A	0	X	
26	0.0034 A	72	0.0708 A	-95.2 %	0	0	0	n.e.	n.e.	0.0026 A	0	X	
27	0.0041 A	35	0.0833 A	-95.0 %	0	0	0	n.e.	n.e.	0.0035 A	0	X	
28	0.0032 A	179	0.0657 A	-95.1 %	0	0	0	n.e.	n.e.	0.0025 A	0	X	
29	0.0037 A	35	0.0776 A	-95.2 %	0	0	0	n.e.	n.e.	0.0032 A	0	X	
30	0.0031 A	179	0.0613 A	-94.9 %	0	0	0	n.e.	n.e.	0.0024 A	0	X	
31	0.0034 A	35	0.0726 A	-95.3 %	0	0	0	n.e.	n.e.	0.0029 A	0	X	
32	0.0029 A	179	0.0575 A	-94.9 %	0	0	0	n.e.	n.e.	0.0023 A	0	X	
33	0.0032 A	35	0.0682 A	-95.3 %	0	0	0	n.e.	n.e.	0.0028 A	0	X	
34	0.0027 A	179	0.0541 A	-94.9 %	0	0	0	n.e.	n.e.	0.0022 A	0	X	
35	0.0030 A	35	0.0643 A	-95.3 %	0	0	0	n.e.	n.e.	0.0027 A	0	X	
36	0.0025 A	179	0.0511 A	-95.1 %	0	0	0	n.e.	n.e.	0.0020 A	0	X	
37	0.0029 A	86	0.0608 A	-95.2 %	0	0	0	n.e.	n.e.	0.0026 A	0	X	
38	0.0024 A	79	0.0484 A	-95.1 %	0	0	0	n.e.	n.e.	0.0019 A	0	X	
39	0.0028 A	35	0.0577 A	-95.1 %	0	0	0	n.e.	n.e.	0.0024 A	0	X	
40	0.0022 A	79	0.0460 A	-95.2 %	0	0	0	n.e.	n.e.	0.0018 A	0	X	

average value < 0.6 % of Iavg or < 5 mA n.e. = not evaluated

Limits: Given in table above and defined in standard
 EN 61000-3-2:2014.

Test result: **PASS**

5.3.3. Deviations

None.

5.3.4. Comments

None.

5.4. Flicker limitations test

Date: 19.07.2018.
Test standard: EN 61000-3-3:2013
Tested by: Milivoje Miletić

5.4.1. Set up



Parameter	Setting
Test voltage	230 V, 50 Hz
Number of observations	1
Observation period	10 min
Operation mode	Third mode of operation

5.4.2. Results

FLICKER: Test PASS!

Time	Pmax	Pst	Sliding Plt	d(t)>3.30% [s]	dmax [%]	dc [%]	PASS	FAIL
12:05:28	0.001	0.0210	-. - - - -	0.000	+0.000	- . - - - -	X	
Limits:		1.000	0.650	0.500	4.000	3.300		
Plt: 0.009173 (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
12:05:28	0.000	0.0040	-. - - - -	0.000	+0.000	- . - - - -	X	
Plt: 0.001747 (calculated over 12 periods)								
Evaluated: PST <= 0.4 dmax < 20 % dmax1								

Limits: Given in table above and defined in standard
EN 61000-3-3:2013.

Test result: **PASS**

5.4.3. Deviations

None.

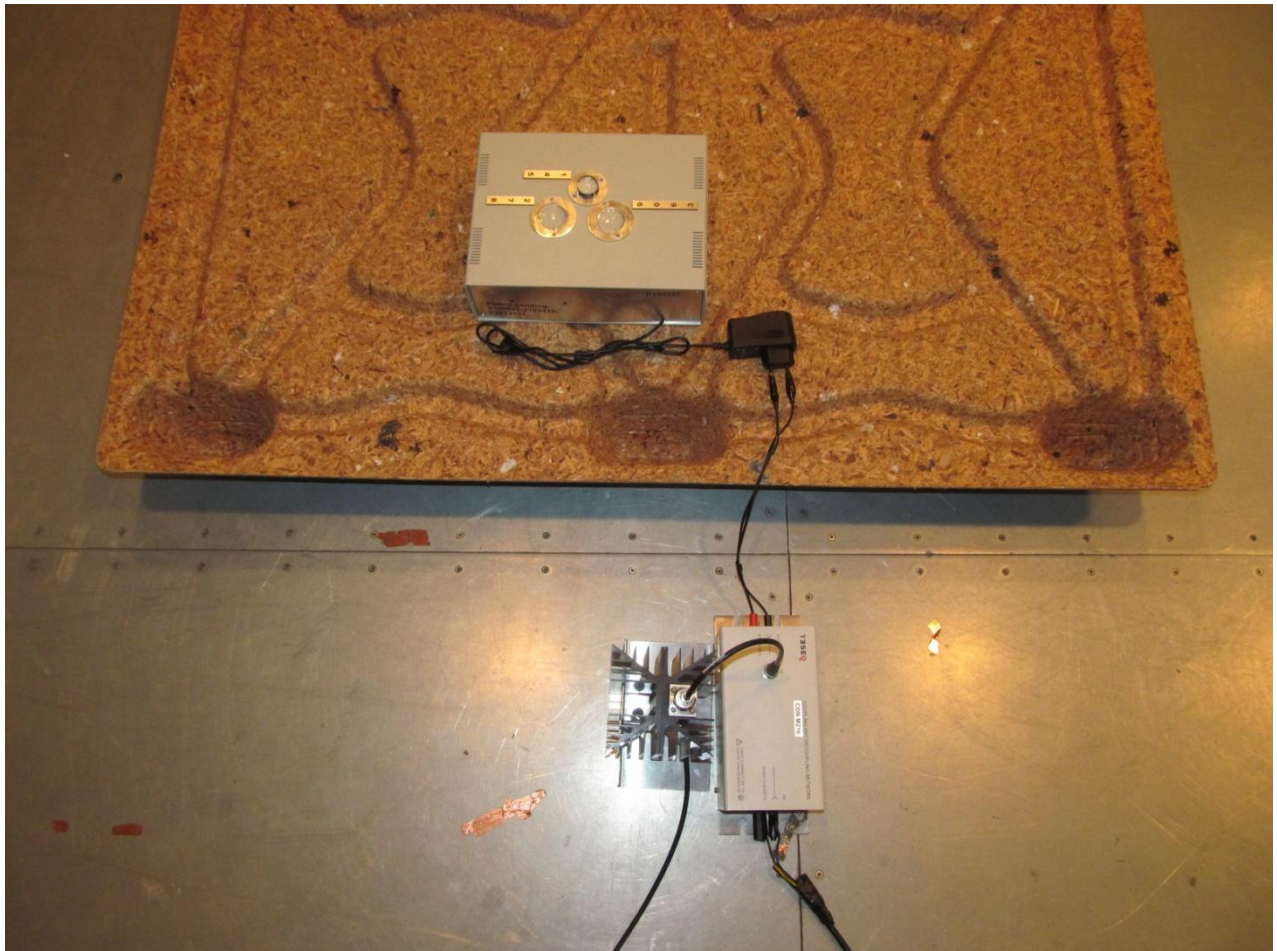
5.4.4. Comments

None.

5.5. Immunity to conducted RF disturbances

Date: 24.07.2018.
Test standard: EN 61000-4-6:2014
Tested by: Milivoje Miletić

5.5.1. Set up



Frequency range:	150 kHz – 80 MHz
Test level:	3 V
Modulation:	80 % AM, 1 kHz sine wave carrier
Frequency step:	1 % with dwell time 1 s
Injection ports:	AC power port (CDN M216)
EUT operation mode:	Third mode of operation

5.5.2. Results

A - During and after the test the EUT operated correctly and no changes were recorded in EUT behaviour.

Required performance criterion: A

Test result: **PASS**

5.5.3. Deviations

None.

5.5.4. Comments

None.

5.6. Immunity to radiated RF field

Date: 19.07.2018.
Test standard: EN 61000-4-3: 2006 + A1:2008 + A2:2010
Tested by: Milivoje Miletić

5.6.1. Set up



Frequency range: 80 MHz – 1 GHz
Frequency step: 1 %
Dwell time: 1 s
Level: 3 V/m
Polarization: HOR and VER
Modulation: 80 % AM; 1 kHz sine wave carrier
UFA: 1.5 x 1.5 m at 0.8 m height at 2.3 m distance from antenna
EUT operation mode: Third mode of operation

5.6.2. Results

3 V/m	80 MHz – 1 GHz HOR	80 MHz – 1 GHz VER
Front	A	A
Rear	A	A
Left	A	A
Right	A	A

A - During and after the test EUT operated correctly and no changes were recorded in EUT behaviour.

Required performance criterion: A

Test result: **PASS**

5.6.3. Deviations

None.

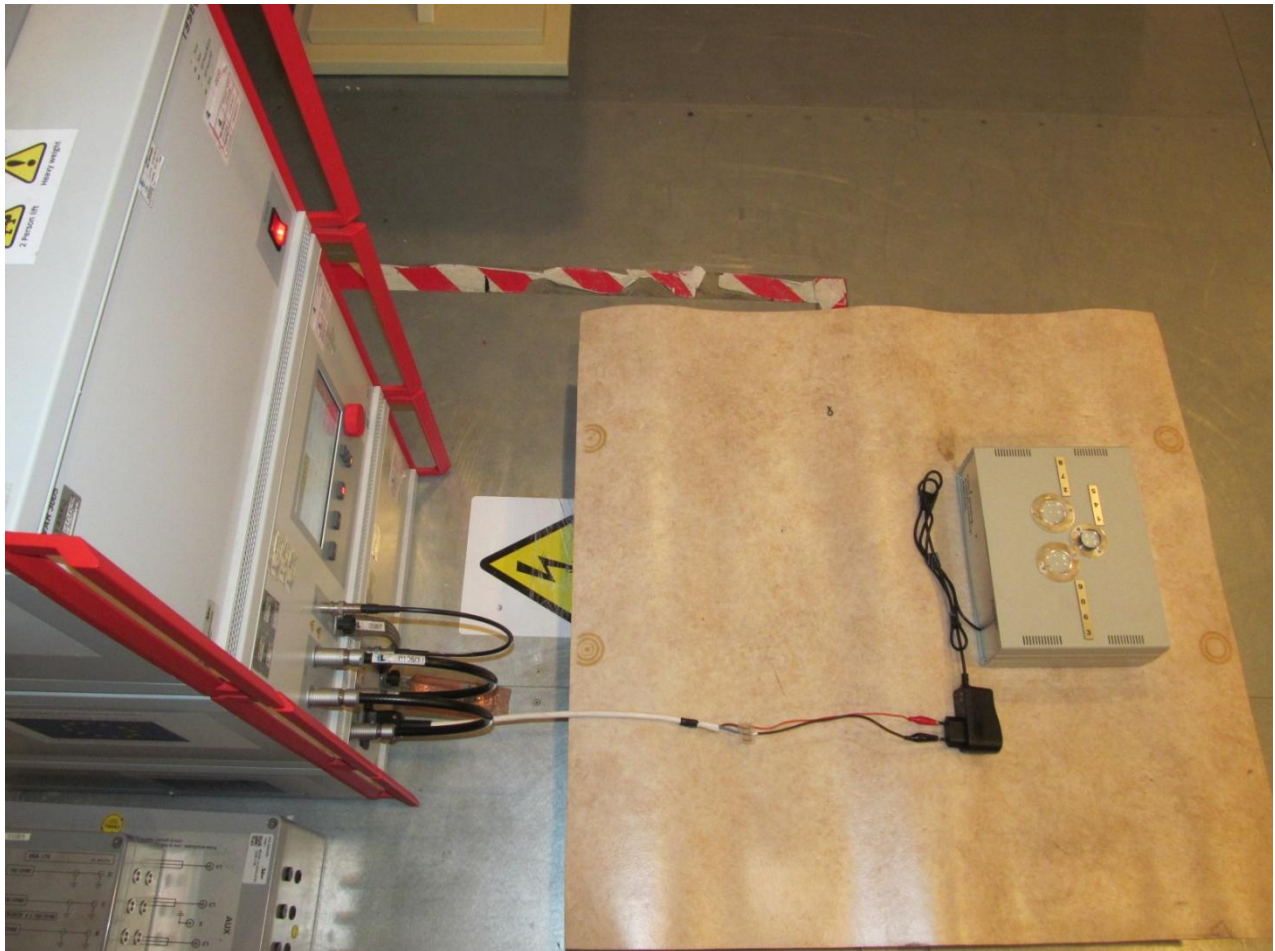
5.6.4. Comments

None.

5.7. EFT/Burst immunity test

Date: 14.07.2018.
Test standard: EN 61000-4-4:2012
Tested by: Milivoje Miletić

5.7.1. Set up



Level: ± 1 kV
Duration: 120 s per polarity
Coupling: Coupling/Decoupling network
Port: AC mains port
Frequency: 5 kHz
Burst time: 75 spikes
Repetition time: 300 ms
EUT operation mode: Third mode of operation

5.7.2. Results

Port	Test level [kV]	Required performance criterion	Result	Comments
AC power port	±1	B	A	During and after the test EUT operated correctly and no changes were recorded in EUT behaviour.

Required performance criterion: B

Test result: **PASS**

5.7.3. Deviations

None.

5.7.4. Comments

None.

5.8. Immunity to surge

Date: 26.07.2018.
Test standard: EN 61000-4-5:2014
Tested by: Milivoje Miletić

5.8.1. Set up



Port under test:	AC mains port
AC power port voltage:	230 V, 50 Hz
Test level:	±1 kV (peak) Line-to-line, differential mode Generator impedance: 2 Ω
Pulse shape:	1.2/50 (8/20) μs
Number of pulses:	5 POS and 5 NEG
Pause:	60 s
Synchronization angle:	90° for positive, 270° for negative pulses
EUT operation mode:	Third mode of operation

5.8.2. Results

A - During and after the test the EUT operated correctly and no changes were recorded in EUT behaviour.

Required performance criterion: B

Test result: **PASS**

5.8.3. Deviations

None.

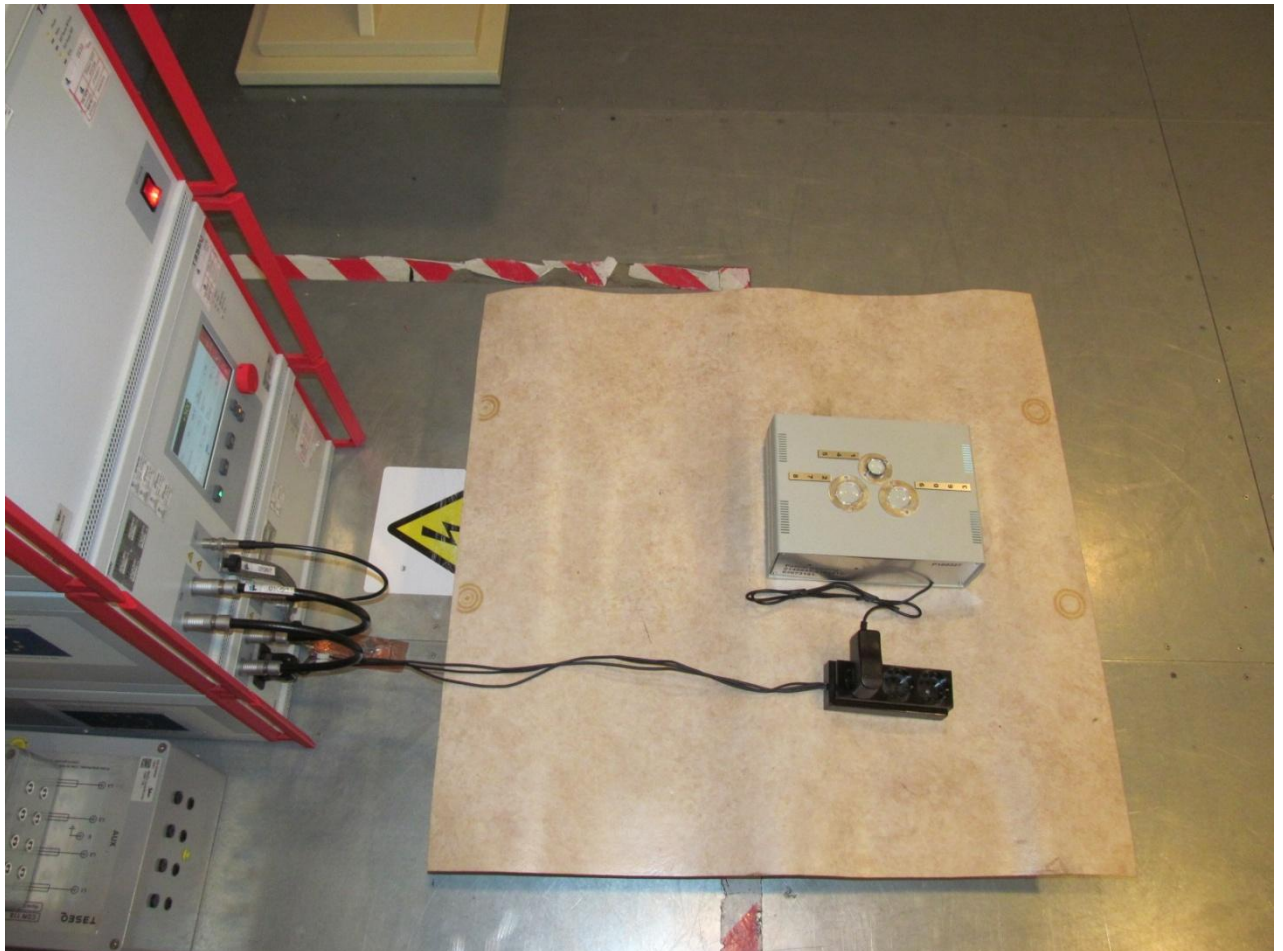
5.8.4. Comments

None.

5.9. Dips and short interruptions immunity test

Date: 26.07.2018.
Test standard: EN 61000-4-11:2004
Tested by: Milivoje Miletić

5.9.1. Set up



EUT operation mode: Third mode of operation
Changes to occur at: 0 degree crossover point of the voltage waveform.

5.9.2. Results

Test	Repetition time [s]	Test duration [trials]	T-event [cycles]	Voltage dip to [%]	Required performance criterion	Result	Comments
Voltage dips and short interruptions	10	3	0.5	0	C	A	No changes in the EUT's performance observed.
	10	3	10	40	C	A	No changes in the EUT's performance observed.
	10	3	25	70	C	A	No changes in the EUT's performance observed.

Required performance criterion: C

Test result: **PASS**

5.9.3. Deviations

None.

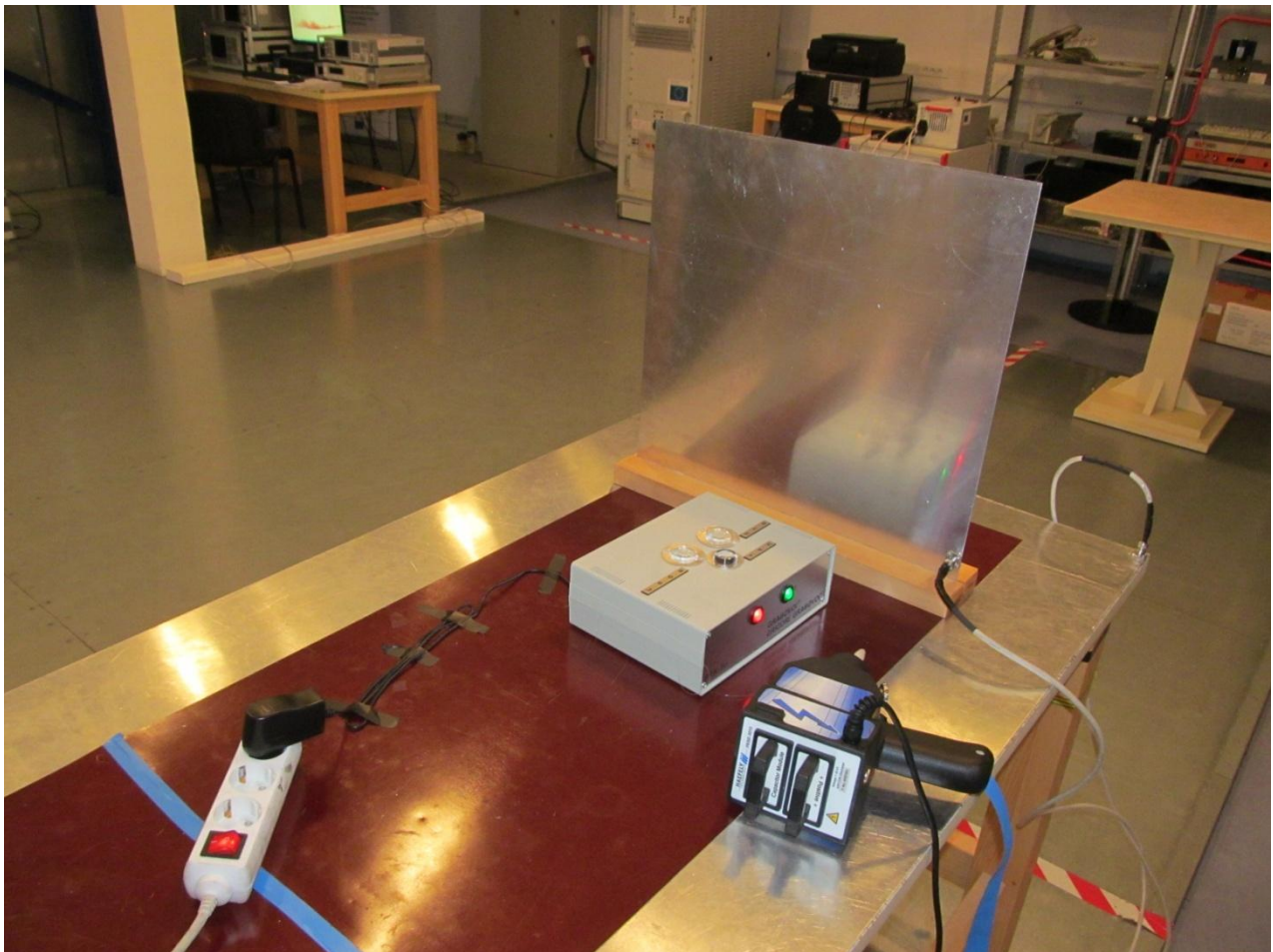
5.9.4. Comments

None.

5.10. Immunity to ESD

Date: 24.07.2018.
Test standard: EN 61000-4-2:2009
Tested by: Milivoje Miletić

5.10.1. Set up



EUT operation mode: Third mode of operation

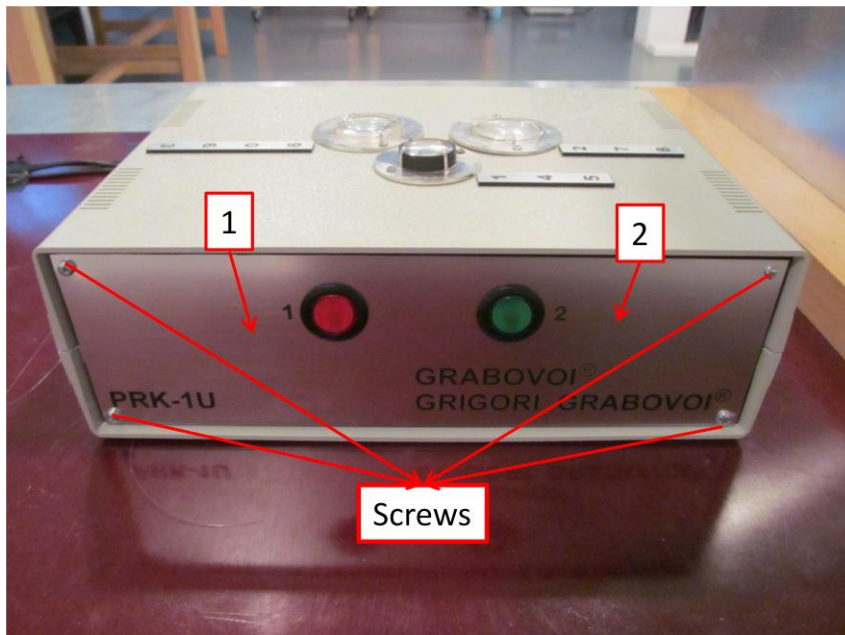
Environment conditions:

Temperature: 21.3 °C
Relative humidity: 42.1 % RH
Atmospheric pressure: 993 hPa

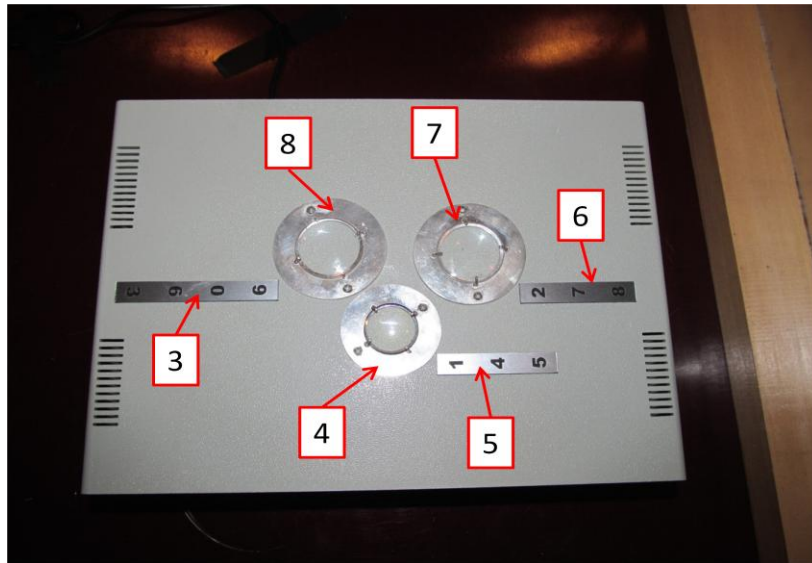
5.10.2. Results

Discharge type – Contact discharge			
<i>(A, B, C, D – performance criteria, X – not tested)</i>			
Test level [kV]	+4	-4	Notes
Place of discharge			
HCP	A	A	No deviations observed.
VCP	A	A	No deviations observed.
Screws	A	A	No deviations observed.
Metallic parts of the housing (discharge points 1~2, 9~10)	A	A	No deviations observed.
Metallic plates (discharge points 3~8)	A	A	No deviations observed.

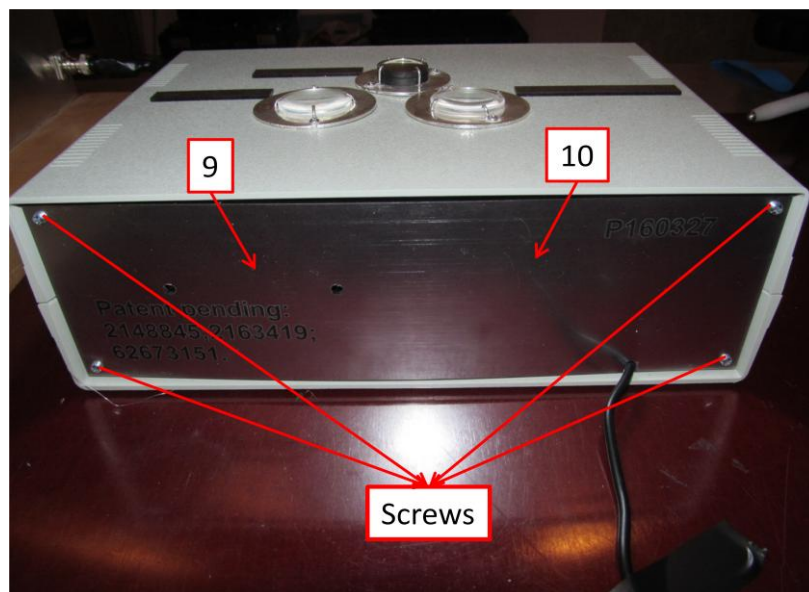
Discharge type – Air discharge							
<i>(A, B, C, D – performance criteria, X – not tested)</i>							
Test level [kV]	+2	-2	+4	-4	+8	-8	Notes
Place of discharge							
Housing	A	A	A	A	A	A	No discharge. No deviations observed.
Buttons	A	A	A	A	A	A	No discharge. No deviations observed.
Vents	A	A	A	A	A	A	No discharge. No deviations observed.
AC/DC adapter housing	A	A	A	A	A	A	No discharge. No deviations observed.



Discharge points 1~2



Discharge points 3~8



Discharge points 9~10

Required performance criterion: B

Test result: **PASS**

5.10.3. Deviations

None.

5.10.4. Comments

None.

6. Measurement equipment data

The following test equipment is used for tests:

Type	Manufacturer	Model	Ser.No.	IN number	USED IN TEST/-S Reported in the Clause/-s:
ESD gun set	Haefely	PESD3010	H707203	L-0052	5.10
Power supply/ Amplifier/ Control unit/ Analyser Reference System	Spitzenberger&Spies	EMV E 5000/PAS1	A 4979 02/0 1112	0100-0104	5.3, 5.4
CDN	Teseq	CDN 3061-C16	1422	0105	5.7, 5.8, 5.9
Conducted immunity generator	Teseq	NSG3060	1497	0106	5.7, 5.8, 5.9
dual variac	Teseq	VAR 3005-D16	1999	0110	5.9
Antenna	Teseq	CBL6144	35349	0115	5.2, 5.6
power meter	Teseq	PMU6006	73368	0123	5.6
Field strength sensor	Narda (PMM)	EP601	501WX2045 6	0124	5.6
software	Teseq	Compliance 5 E/I v5.26.4	517-2881623-74 and 517-2846725-70	0125	5.1, 5.2, 5.5, 5.6
Compact immunity test system	Teseq	NSG4070-75	35059	0126	5.5
attenuator	Teseq	ATN6075	33644	0127	5.5
V-network 4-line	Teseq	NNB52	27384	0134	5.1
ISN	Teseq	ISN T8	30901	0136	5.1
EMI receiver	Schaffner	SMR4503	81	0138	5.1, 5.2
Environmental monitor	Kimo	AQ200	12115072	0144	all
HCP					5.10
VCP					5.10
Semi anechoic chamber + antenna mast + controller	Comtest	3m		0305 + 306+ 307	5.2, 5.6
FU absorbers + ferrite tiles	DMAS HT45 + Comtest CAT-6			0308 + 309	5.6
CDN	Teseq	CDN M316S	33964	0128-2	5.5
Amplifier	Teseq	CBA 1G-150	T44175	0116	5.6
Amplifier	Teseq	CBA 3G-012	T44176	0117	5.6
Directional coupler	Bonn	BDC 0810-40/500	129058-02	0121	5.6
Directional coupler	Bonn	BDC 0842-40/200	129058-01	0122	5.6

7. Measurement uncertainty

- For test 5.1: $U_{LAB} = U_{CISPR} = 3.4$ dB - expanded uncertainty of measurement, expressed as the standard uncertainty of measurement multiplied by the coverage factor $k = 2$, which for normal distribution corresponds to a coverage probability of approximately 95 %. Measurement uncertainty calculation is carried out according to EN 55016-4-2:2011 + A1:2014.
- For test 5.2: 4.9 dB (HOR 30 MHz – 300 MHz), 5 dB (VER 30 MHz – 300 MHz), 5.2 dB (HOR and VER 300 MHz – 2700 MHz) - Expanded uncertainty of measurement, expressed as the standard uncertainty of measurement multiplied by the coverage factor $k = 2$, which for normal distribution corresponds to a coverage probability of approximately 95 %. Measurement uncertainty is according to EN 55016-4-2:2004.
- For test 5.3: 2,8654% - expanded uncertainty of measurement, expressed as the standard uncertainty of measurement multiplied by the coverage factor $k = 2$, which for normal distribution corresponds to a coverage probability of approximately 95 %.
- For test 5.4: 2.87 % (d), 4.23 % (Pst) - expanded uncertainty of measurement, expressed as the standard uncertainty of measurement multiplied by the coverage factor $k = 2$, which for normal distribution corresponds to a coverage probability of approximately 95 %.

For immunity tests (5.5 - 5.10) used test equipment has been demonstrated during calibration to comply with the requirements of test standards having the calibration uncertainty taken into account.

8. General remarks

Date format is dd.mm.yyyy.

Decimal mark is indicated by dot (.) within the report.

9. Appendixes

None.

END OF THE REPORT