TEST REPORT CISPR 15

Equipment for General Lighting Purposes – EMC Requirements

Report Reference No.....:	BS-3/093/EMC/19
Date of issue.....:	14.06.2019
Total number pages:.....:	62
Applicant´s name.....:	GTV Poland spółka z ograniczoną odpowiedzialnością sp. k.
Address .....:	ul. Przejazdowa 21, 05-800 Pruszków, Poland
Test specification	
Standard.....:	IEC CISPR 15 (Eighth Edition) +A1:2015 in conjunction with IEC 61547 (Second Edition), IEC 61000-3-2 (Fourth Edition), IEC 61000-3-3 (Third Edition) EN55015:2013+A1:2015, EN61547:2009, EN IEC 61000-3-2:2019 EN 61000-3-3:2013, PN-EN55015:2013-10+A1:2015-08, PN-EN61547:2009, PN-EN IEC 61000-3-2:2019-04, PN-EN 61000-3-3:2013-10
Test procedure .....:	EMC
Non-standard test method .....:	N/A
Supplementary information.....:	---
Test Report Form No. .....:	PREDOM CISPR15
Test Report Form(s) Originator.....:	ITE PREDOM Division
Master TRF.....:	Dated 2019-04

This report is not valid as a CB Test Report unless signed by an approved CB Testing Laboratory and appended to CB Test Certificate issued by an NCB in accordance with IECEE 02.

General disclaimer:

The test results presented in this report relate only to the object tested.
This report shall not be reproduced, except in full, without the written approval of the Issuing CB testing laboratory. The authenticity of this Test Report and its contents can be verified by contacting the NCB, responsible for this Test Report.

Test item description ..... :	LED lighting luminaire
Trademark ..... :	GTV
Manufacturer ..... :	GTV Poland spółka z ograniczoną odpowiedzialnością sp. k. ul. Przejazdowa 21, 05-800 Pruszków, Poland
Model / Type reference ..... :	LED VERONA 50W, LD-VE4060W-50
Rating(s)..... :	230V AC, 50/60Hz, 50W, 4000K, IP20

Testing procedure and testing location:			
☒	**Testing Laboratory:**	Łukasiewicz Research Network - Instytut Technologii Elektronowej ITE PREDOM Division 02-255 Warszawa ul. Krakowiaków 53 Poland	
Testing location / address ..... :			
	Tested by (name + signature)..... :	Jarosław Nawrocki	
	Approved by (name + signature)..... :	Tomasz Małyska	
	Supervised by (name + signature)..... :	Aleksander Piotrowski	
☐	Testing procedure: CTF Stage 1:		
Testing location/ address.....:			
Tested by (name, signature).....:			
Approved by (name, function, signature).....:			
☐	Testing procedure: CTF Stage 2:		
Testing location/ address.....:			
Tested by (name, signature).....:			
Witnessed by (name, function, signature).....:			
Approved by (name, function, signature).....:			
☐	Testing procedure: CTF Stage 3:		
☐	Testing procedure: CTF Stage 4:		

List of Attachments (including a total number of pages in each attachment): N/A	
Summary of testing:	Positive
Summary of compliance with National Differences:	
List of countries addressed.....:	N/A
☐The product fulfils the requirements of..:	N/A

Copy of marking plate.....:	See section 1.2

Testing:	
Date of receipt of test item.....:	27.05.2019
Date(s) of performance of tests.....:	27.05.2019 ÷ 11.06.2019
Manufacturer´s Declaration regarding factories.....:	N/A
The application for obtaining a Certificate includes more than one factory location and a declaration from the manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided.....:	☒ Not Applicable ☐ Yes (When differences exist, they shall be identified in the General Product Information section).
Name and address of factory(ies).....:	GTV Poland spółka z ograniczoną odpowiedzialnością sp. k. ul. Przejazdowa 21, 05-800 Pruszków, Poland

General remarks:	
"(see Enclosure #)" refers to additional information appended to the report. "(see appended table)" refers to a table appended to the report. A cross ☒ in a rectangular shape means that this option is applied.	
Possible test case verdicts:	
- test case does not apply to test object ..:	N/A
- test object does meet requirement .....:	P (Pass)
- test object does not meet requirement ..:	F (Fail)
Definition of symbols used in this test report:	
☒Indicates that the listed condition, standard or equipment is applicable for this report.	
☐Indicates that the listed condition, standard or equipment is not applicable for this report.	
Decimal separator used in this report.....:	☒Comma (,)
	☐Point (.)

Table of Contents:

1 General description of test item(s)

Description .....:	LED lighting luminaire					
Type/ Model Number .....:	LED VERONA 50W LD-VE4060W-50					
Serial Number.....:	---					
Brand name .....:	GTV					
Ports.....:	Port name and description	Cable				
		Specified length [m]	Attached during test	Shielded		
	Mains, Supply Connection: power cord	2,40	☒	☐		
			☐	☐		
			☐	☐		
Supplemental information to the ports.....:	N/A					
Rated power supply.....:		Voltage and Frequency	Reference poles			
			N	L1	L2	L3
	☒	AC: 230V, 50Hz	☒	☒	☐	☐
	☐	AC: N/A	☐	☐	☐	☐
	☐	DC: N/A				
Rated Power .....:	50W					
Protection Class.....:	cl. I					
Clock frequencies .....:	N/A					
Other parameters.....:	N/A					
Software version .....:	N/A					
Hardware version.....:	N/A					
Dimensions in cm (W x H x D).....:	59,0 x 3,5 x 59,0					
Mounting position:	☐	Table top equipment				
	☒	Wall/Ceiling mounted equipment				
	☐	Floor standing equipment				
	☐	Hand-held equipment				
	☐	Other: In accordance with the manufacturer's instructions				

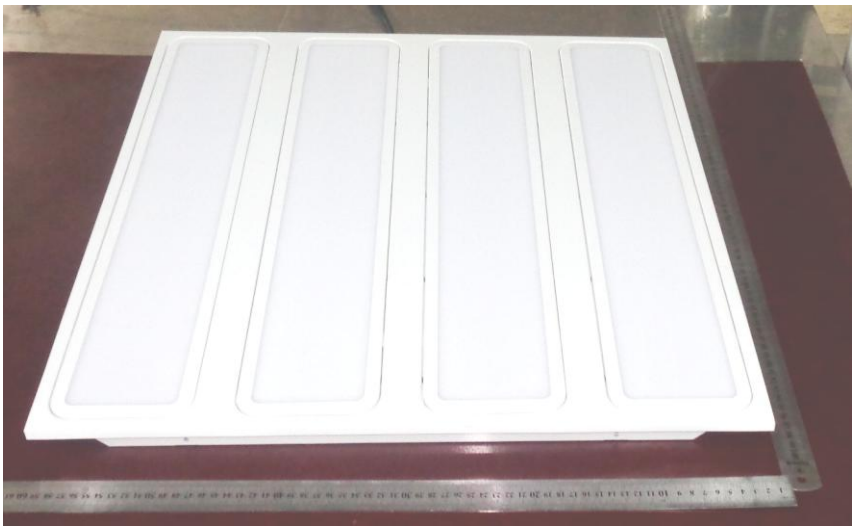
<table>
<tr><td rowspan="2">Modules/parts ..... :</td><td colspan="2">Module/parts of test item</td><td>Type</td><td>Manufacturer</td></tr>
<tr><td colspan="4">See section 10.1 Annex A

Supplementary information: See section 10.2 Annex B</td></tr>
<tr><td></td><td colspan="2">-</td><td>-</td><td>-</td></tr>
<tr><td rowspan="4">Operating modes..... :</td><td rowspan="2">No.</td><td rowspan="2">Operating mode of test item</td><td colspan="2">Applied for testing</td></tr>
<tr><td>Emission</td><td>Immunity</td></tr>
<tr><td>1</td><td>In accordance with the manufacturer’s instructions</td><td>☒</td><td>☒</td></tr>
<tr><td>2</td><td></td><td>☐</td><td>☐</td></tr>
<tr><td>Supplemental information to the operating modes..... :</td><td colspan="4">N/A</td></tr>
<tr><td rowspan="6">Accessories (not part of the test item) ..... :</td><td colspan="2">Accessory</td><td>Type</td><td>Manufacturer</td></tr>
<tr><td colspan="2">N/A</td><td>N/A</td><td>N/A</td></tr>
<tr><td colspan="2"></td><td></td><td></td></tr>
<tr><td colspan="2"></td><td></td><td></td></tr>
<tr><td colspan="2"></td><td></td><td></td></tr>
<tr><td rowspan="6">Documents as provided by the applicant..... :</td><td colspan="2">Description</td><td>File name</td><td>Issue date</td></tr>
<tr><td colspan="2">N/A</td><td>N/A</td><td>N/A</td></tr>
<tr><td colspan="2"></td><td></td><td></td></tr>
<tr><td colspan="2"></td><td></td><td></td></tr>
<tr><td colspan="2"></td><td></td><td></td></tr>
<tr><td>Modifications to the test item during testing: ..... :</td><td colspan="4">N/A</td></tr>
</table>

1.1 Lamp technology used in test item(s)

Lamp technology used..... :	☐	Fluorescent lamp
	☐	High pressure discharge lamp (HID)
	☒	Light emitting diode (LED/OLED)
	☐	Tungsten halogen lamp
	☐	Incandescent lamp
	☐	Others:

1.2 Photos of the test item

Copy of marking plate.....:	
Photo of test item.....:	

2 Verdict summary section

CISPR-15, EN 55015:2013+A1:2015, PN-EN 55015-2013-10+A1:2015-08			
Clause	**Requirement – Test case**	**Basic standard**	**Verdict**
4.2	Insertion loss	CISPR 15 (ed. 8) + am1	N/A
4.3.1	Disturbance voltage at mains terminals	CISPR 15 (ed. 8) + am1	P
4.3.2	Disturbance voltage at load terminals	CISPR 16-1-2 (ed. 1) +am1+am2	N/A
4.3.3	Disturbance voltage at control terminals	CISPR 32 (ed.1)	N/A
4.4.1	Radiated electromagnetic disturbances (9kHz to 30 MHz)	CISPR 16-1-4 (ed. 3) CISPR 15 (ed. 8) + am1	P
4.4.2	Radiated electromagnetic disturbances (30 MHz to 300 MHz)	CISPR 32 (ed. 1)	P
Annex B	Independent method of measurement of radiated emission (CDNE)	CISPR 15(ed. 8)+ am1	N/A
IEC 61000-3-2; EN IEC 61000-3-2:2019; PN-EN IEC 61000-3-2:2019-04			
Clause	**Requirement – Test case**	**Basic standard**	**Verdict**
6.1	Control principle shall be allowed for the application according to the clause 6.1	IEC 61000-3-2 (ed. 4)	N/A
6.2	Harmonic current emissions	IEC 61000-4-7	P
IEC 61000-3-3; EN 61000-3-3:2013; PN-EN 61000-3-3:2013-10			
Clause	**Requirement – Test case**	**Basic standard**	**Verdict**
4	Voltage changes, voltage fluctuations and flicker	IEC 61000-4-15 (ed. 2)	P
IEC 61547; EN 61547:2009; PN-EN 61547:2009			
Clause	**Requirement – Test case**	**Basic standard**	**Verdict**
5.2	Electrostatic discharge	IEC 61000-4-2 (ed. 2)	P
5.3	Radio-frequency electromagnetic fields	IEC 61000-4-3 (ed. 3) + am1	P
5.4	Power frequency magnetic fields	IEC 61000-4-8 (ed. 1) + am1	P
5.5	Fast transients	IEC 61000-4-4 (ed. 2)	P
5.6	Injected currents (radio-frequency common mode)	IEC 61000-4-6 (ed. 3)	P
5.7	Surges	IEC 61000-4-5 (ed. 2)	P
5.8	Voltage dips and short interruptions	IEC 61000-4-11 (ed. 2)	P
Supplementary information: N/A			

3 Test conditions

3.1 General

<table>
<tr><td>Environmental reference conditions..... :</td><td>The climatic conditions during the tests are within the limits specified by the manufacturer for the operation of the EUT and the test equipment.
The climatic conditions during the tests were within the following limits:
<table>
<tr><th>Temperature</th><th>Humidity</th><th>Atmospheric pressure</th></tr>
<tr><td>15 °C ÷ 35 °C</td><td>30 % ÷ 60 %</td><td>800 hPa ÷ 1060 hPa</td></tr>
</table>
If explicitly required in the basic standard or applied product standard the climatic values are recorded and documented separately in this test report.</td></tr>
<tr><td>Measurement uncertainties..... :</td><td>For all measurements where guidance for the calculation of the instrumentation uncertainty of a measurement is specified in CISPR 16-4-2 , IEC 61000-4 series or a product standard, the measurement instrumentation uncertainty has been calculated an applied in accordance with these standards.
In all cases if the test laboratory uncertainty is larger than the value for UCISPR given in CISPR 16-4-2 the uncertainty are included in the test report annex.
In case the standards in the IEC 61000-4 series or the product standard requires the indication of the uncertainty in the report these uncertainty values are included in the annex.</td></tr>
</table>

3.2 Specific test conditions for CISPR 15

Test set up..... :	☒	CISPR 15
	☐	CISPR 30 technical report applied for built-in appliances

4 Emission

4.1 Insertion loss

Tested by ..... :	N/A	
Test date ..... :	N/A	
Test Location (stand) ..... :	N/A	
Test set-up description ..... :	☐	Figure 1: Linear and U-type fluorescent lamp luminaries
	☐	Figure 2: Circular fluorescent lamp luminaries
	☐	Figure 3: Luminaries for single-capped fluorescent lamps with integrated starter
	☐	Other:
Supplementary Test set-up description ..... :	N/A	
Operating mode(s) ..... :	N/A	
Supplementary information ..... :	N/A	

Test set-up photo	N/A

Table: Measurement data for insertion loss

Frequency	Limit [dB]	Measured value [dB]	Margin (Limit – Reading) [dB]
150 kHz – 160 kHz	28	N/A	N/A
160 kHz – 1400 kHz	28 to 20 linear with logarithm	N/A	N/A
1400 kHz – 1605 kHz	20	N/A	N/A

Supplementary information: N/A

Graphical presentation of the result (if applicable)

N/A

Supplementary information: N/A

4.2 Disturbance voltages

Tested by..... :	Jarosław Nawrocki	
Test date ..... :	04.06.2019	
Test Location (stand) ..... :	Disturbance voltage stand Faraday Cage U-11	
Test set-up description..... :	☐	Set-up Type A (40 cm distance to vertical ground plane, 80 cm over ground plane)
	☒	Set-up Type B (40 cm distance to horizontal ground plane)
	☐	Floor standing equipment set-up (10 cm over ground plane)
	☐	Other:
	☐	Artificial hand applied
Supplementary Test set-up description..... :	Operating mode: 1	
Test method applied..... :	☒	Artificial mains network
	☐	Artificial mains network used as voltage probe
	☐	Voltage probe
	☐	CDN according to IEC 61000-4-6
	☐	Current probe and capacitive voltage probe (CVP)
	☐	ISN
	☐	In situ CDN (150 Ohm and current probe)
	☐	Other:
Used mains voltage/frequency for the test. Evaluated at 160 kHz (0,9 – 1,1 of U_N) ..... :	After the analysis, it was found that voltage variations in the range of 0.9-1.1 V of 230V did not significantly affect the measurement results of the device under test.	
Supplementary information ..... :	Measurements were conducted under: 230V/50Hz	

Test set-up photo.....:

Supplementary information: N/A

Graphical presentation of the result

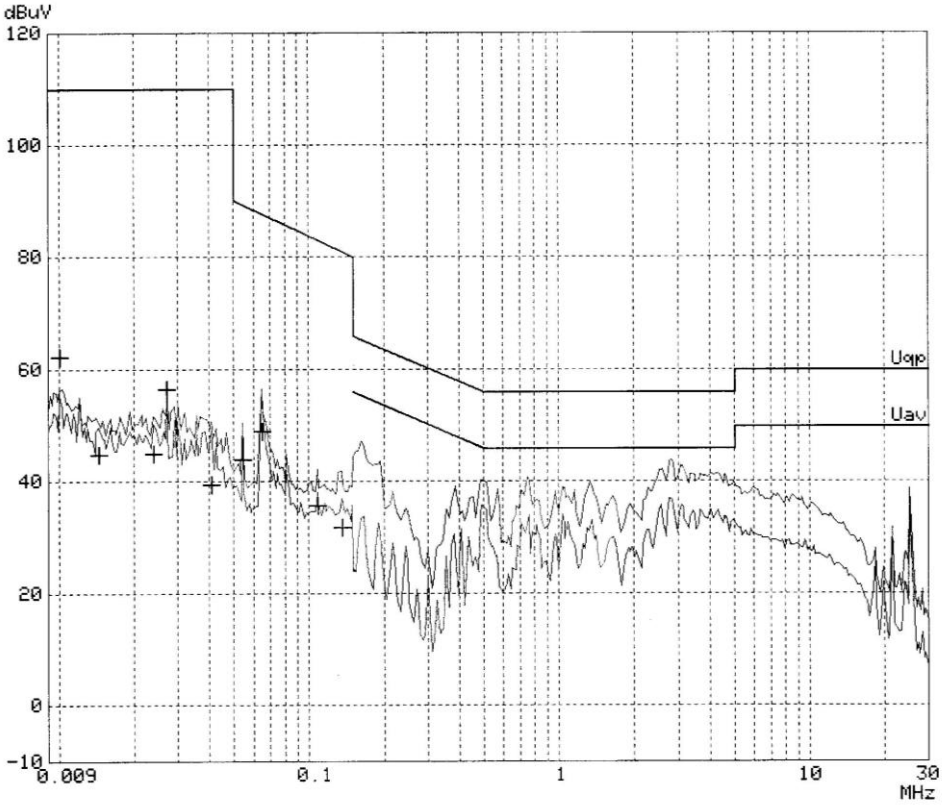
ITE PREDOM Division
Disturbance Voltage Measurement

EUT: LED VERONA 50W LD-VE4060W-50
Manuf: GTV Poland
Operator: Jaroslaw Nawrocki
Test Spec: EN 55015
File name: 55015_.RES
Date: 04. Jun 19 12:54

Overview Scan Settings (2 Ranges)

Frequencies			Receiver Settings				
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp
9k	150k	61.0Hz	200Hz	PK+AV	10ms	60dBLN	OFF
150k	30M	3.9k	9k	PK+AV	10ms	15dBLN	OFF

Final Measurement: x QP / + AV
Meas Time: 1 s
Subranges: 25
Acc Margin: 6dB



ITE PREDOM Division
Disturbance Voltage Measurement

EUT: LED VERONA 50W LD-VE4060W-50
Manuf: GTV Poland
Operator: Jaroslaw Nawrocki
Test Spec: EN 55015
File name: 55015_.RES
Date: 04. Jun 19 12:54

Final Measurement Results:

Indicated Phase/PE shows Configuration of max. Emission

Frequency MHz	QP Level dBuV	Delta Limit dB	Phase -	PE -

no Results

Frequency MHz	AV Level dBuV	Delta Limit dB	Phase -	PE -
0.0100376	62.3		L1	fl
0.0143711	44.9		N	fl
0.0237705	45.1		N	fl
0.0270054	56.6		L1	fl
0.0404941	39.6		N	fl
0.05429	44.0		N	fl
0.06460	49.1		L1	fl
0.10849	35.7		N	fl
0.13589	31.8		L1	fl

* limit exceeded

Supplementary information: N/A

4.3 Radiated electromagnetic disturbances (9 kHz to 30 MHz)

Tested by ..... :	Jarosław Nawrocki	
Test date ..... :	04.06.2019	
Test Location (stand) ..... :	Radiated electromagnetic disturbances (9 kHz to 30 MHz) stand	
Applied limit according to loop antenna diameter ..... :	☒	2 m for equipment length not exceeding 1,6 m
	☐	3 m for equipment length between 1,6 m and 2,6 m
	☐	4 m for equipment length between 2,6 m and 3,6 m
Test set-up description ..... :	☒	Equipment placed in the centre of the LLA
	☐	Other:
Supplementary test set-up description ..... :	Position: Vertical and Horizontal Operating mode: 1	
Test method applied ..... :	☒	Large Loop Antenna
	☐	Other:
Supplementary information..... :	230V/50Hz	

Test set-up photo……:

Supplementary information: N/A

Graphical presentation of the result

ITE PREDOM Division
Measurement of Radiation Disturbances

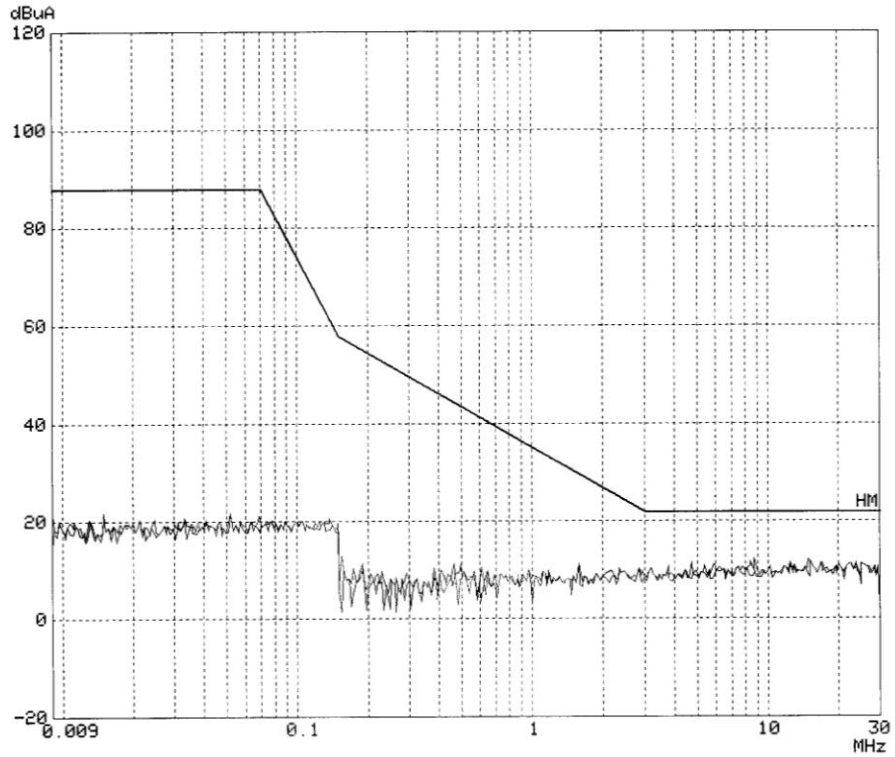
EUT: LED VERONA 50W LD-VE4060W-50
Manuf: GTV Poland
Operator: Jaroslaw Nawrocki
Test Spec: EN 55015
Comment: Vertical
File name: 55015V.RES
Date: 04. Jun 19 12:39

Overview Scan Settings (2 Ranges)

Frequencies			Receiver Settings				
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp
9k	150k	61.0Hz	200Hz	PK	0.10ms	35dBLN	OFF
150k	30M	3.9k	9k	PK	0.05ms	5dBLN	OFF

Transducer No.	Start	Stop	Name
1	9k	30M	antenaHM

Final Measurement: x Hor-Max / + Vert-Max
Meas Time: 1 s
Subranges: 25
Acc Margin: 6dB



ITE PREDOM Division
Measurement of Radiation Disturbances

EUT: LED VERONA 50W LD-VE4060W-50
Manuf: GTV Poland
Operator: Jaroslaw Nawrocki
Test Spec: EN 55015
Comment: Vertical
File name: 55015V.RES
Date: 04. Jun 19 12:39

Prescan Measurement Results:

no Results

ITE PREDOM Division
Measurement of Radiation Disturbances

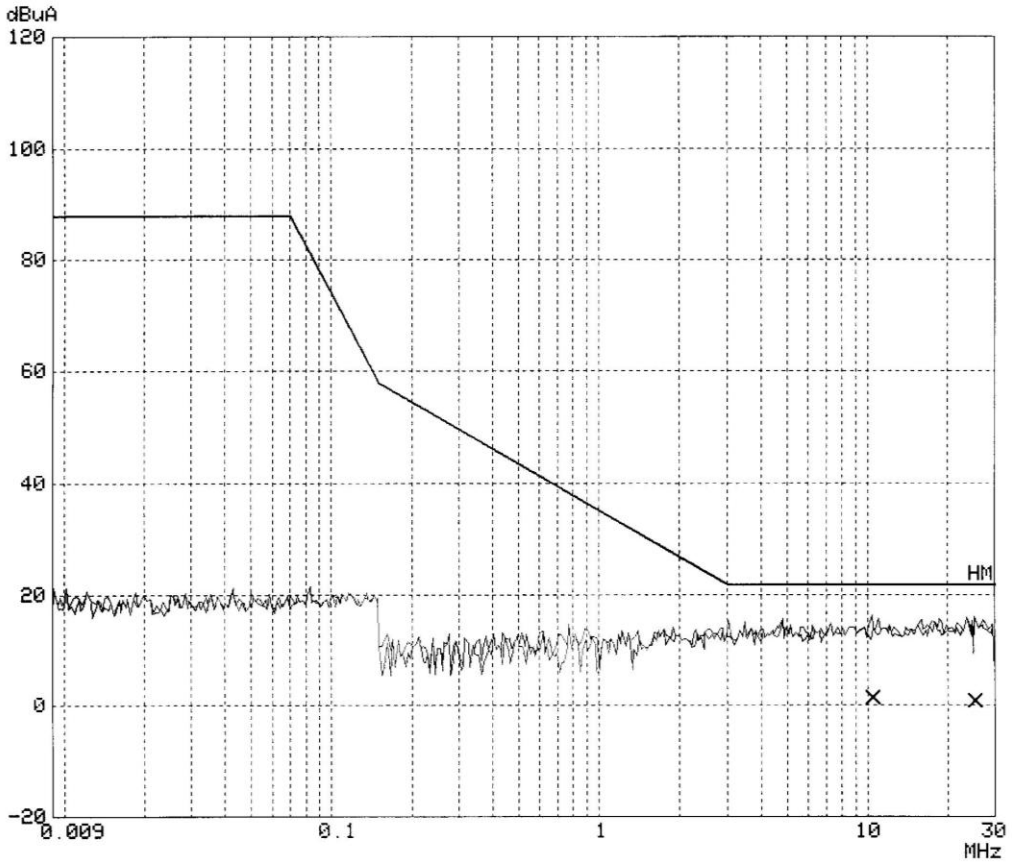
EUT: LED VERONA 50W LED-VE4060W-50
Manuf: GTV Poland
Operator: Jaroslaw Nawrocki
Test Spec: EN 55015
Comment: Horizontal
File name: 55015H.RES
Date: 04. Jun 19 12:43

Overview Scan Settings (2 Ranges)

Frequencies			Receiver Settings				
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp
9k	150k	61.0Hz	200Hz	PK	0.10ms	35dBLN	OFF
150k	30M	3.9k	9k	PK	0.05ms	10dBLN	OFF

Transducer No.	Start	Stop	Name
1	9k	30M	antenaHM

Final Measurement: x QP
Meas Time: 1 s
Subranges: 25
Acc Margin: 6dB



ITE PREDOM Division
Measurement of Radiation Disturbances

EUT: LED VERONA 50W LED-VE4060W-50
Manuf: GTV Poland
Operator: Jaroslaw Nawrocki
Test Spec: EN 55015
Comment: Horizontal
File name: 55015H.RES
Date: 04. Jun 19 12:43

Final Measurement Results:

Frequency MHz	QP Level dBuA	Delta Limit dB
10.37656	1.5	-20.5
25.13047	1.0	-21.0

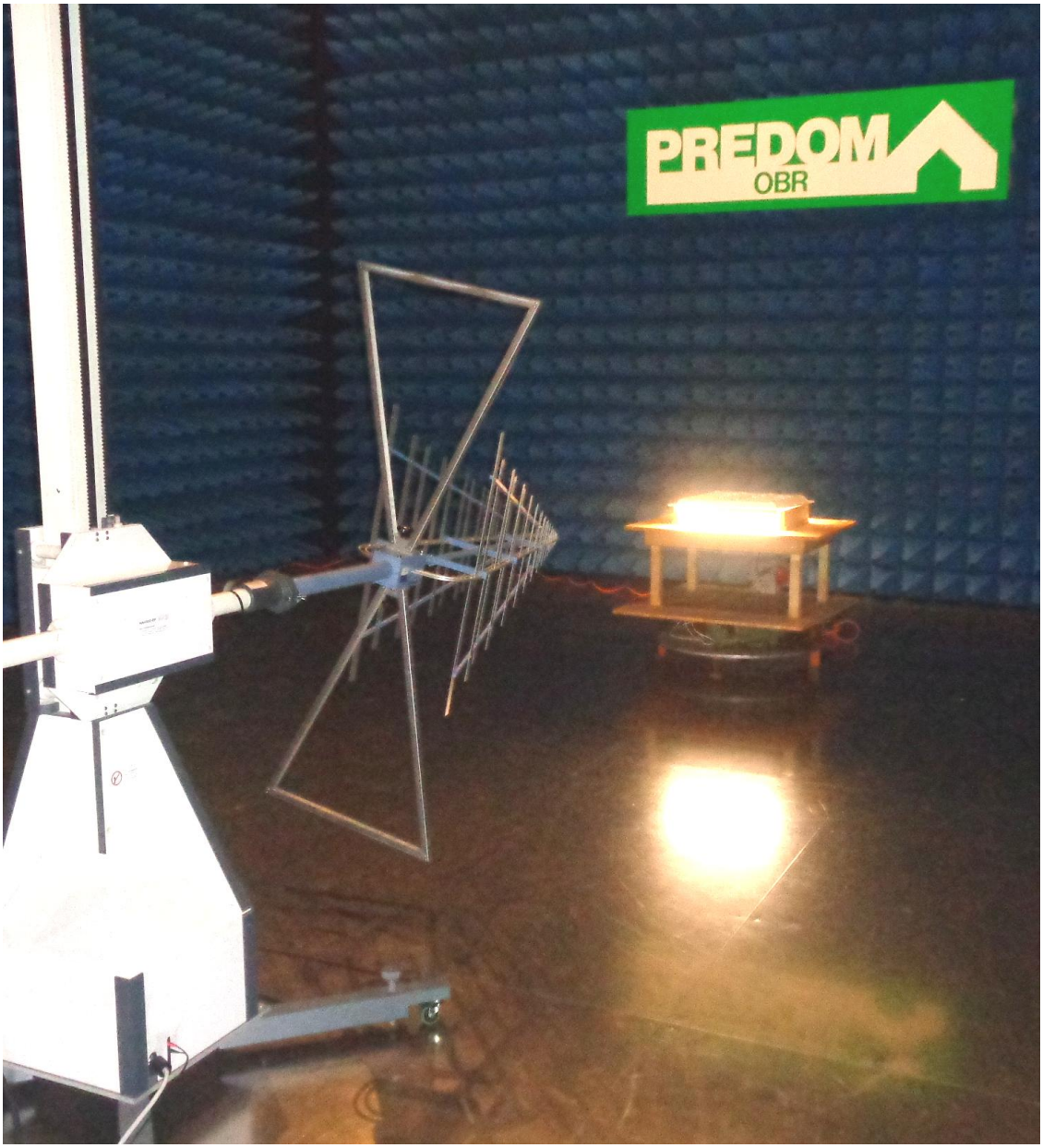
* limit exceeded

Supplementary information: N/A

4.4 Radiated electromagnetic disturbances, Antenna or CDN(E) (30 MHz to 300 MHz)

Tested by ..... :	Jarosław Nawrocki	
Test date ..... :	06.06.2019	
Test Location (stand) ..... :	Radiated electromagnetic disturbances stand Semi- anechoic chamber U-86	
Applied limit class ..... :	☒	Table 3b Radiated disturbance limits
	☐	Table B.1 Common mode terminal voltage, CDN method
	☐	Other:
Test set-up description ..... :	☒	Equipment on a table of 80 cm height
	☐	Equipment on the floor (insulated from ground plane)
	☐	Equipment on a 10 cm support over the ground plane according CISPR 15 Annex B
	☐	Other:
Supplementary test set-up description ..... :	Operating mode: 1	
Test method applied..... :	☒	OATS or SAC with measurement distance [m]: 3
	☐	FAR with measurement distance [m]:
	☐	TEM Waveguide
	☐	CDN(E) according to CISPR 15 Annex B
Supplementary information..... :	230V/50Hz	

Test set-up photo……...:



Supplementary information: N/A

Graphical presentation of the result

EMC32 Report 0^0

EMI Auto Test Template: EMI Test Auto 30MHz-300MHz 55015

Hardware Setup:	HL562 EMI
Frequency Range:	30 MHz - 300 MHz
Graphics Level Range:	0 dBµV/m - 100 dBµV/m

Preview Measurements:

Scan Test Template:	EMI Prescan auto

Data Reduction:

Limit Line #1:	EN 55015.A1 Electric Strength Field 30-300MHz
Maximum Results:	0
Maxima per Subrange	1
Acceptance Offset:	0 dB

Zoom:

Zoom Scan Template:	EMI Zoom auto

Maximization Measurements:

Template for Single Meas.:	EMI Prescan auto

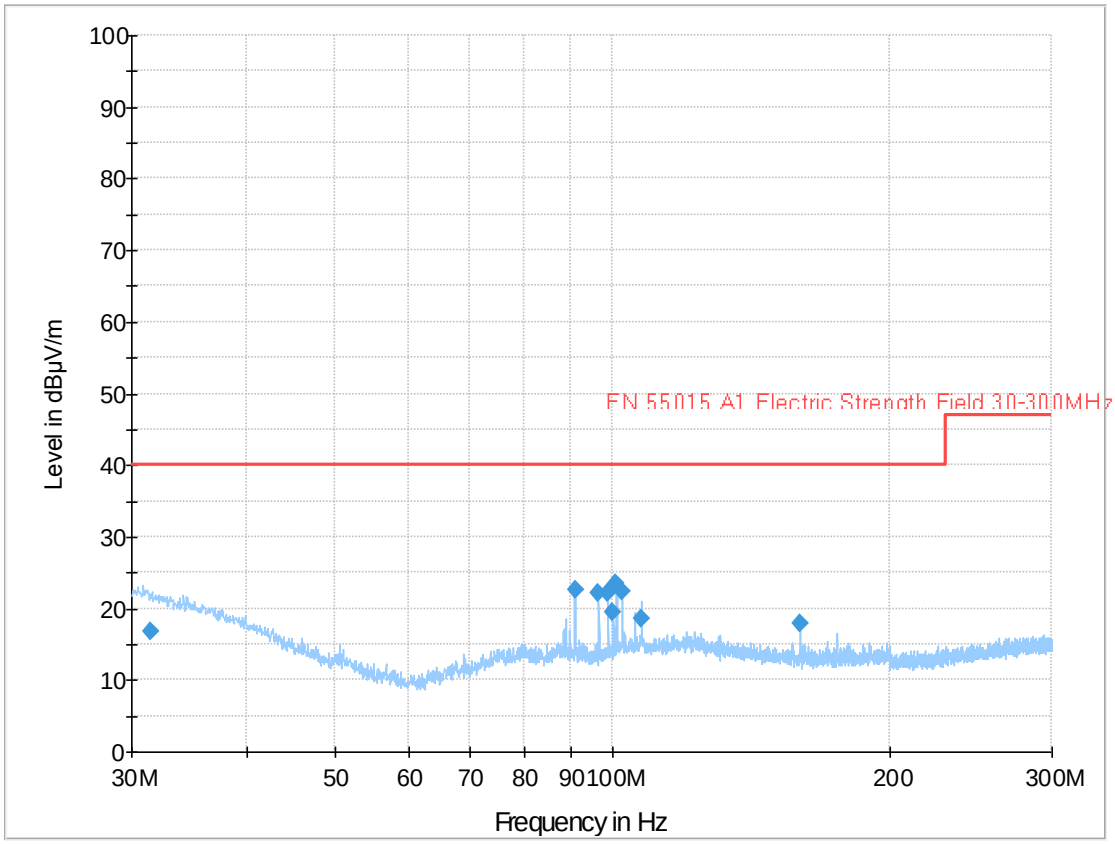
Final Measurements:

Template for Single Meas.:	EMI Final auto
FCC:	No

Report Settings:

Create Electronic Report: PDF

Document Name: EMI Report



Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
31.455000	16.79	40.00	23.21	1000.0	120.000	110.0	V	0.0	21
90.956000	22.53	40.00	17.47	1000.0	120.000	110.0	V	0.0	11
96.494000	22.06	40.00	17.94	1000.0	120.000	110.0	V	0.0	11
98.785000	22.22	40.00	17.78	1000.0	120.000	110.0	V	0.0	11
100.092000	19.38	40.00	20.62	1000.0	120.000	110.0	V	0.0	11
100.947000	23.50	40.00	16.51	1000.0	120.000	110.0	V	0.0	11
102.413000	22.29	40.00	17.71	1000.0	120.000	110.0	V	0.0	11
107.507000	18.48	40.00	21.52	1000.0	120.000	210.0	H	0.0	13
159.987000	17.88	40.00	22.12	1000.0	120.000	110.0	V	0.0	11

(continuation of the "Final_Result" table from column 16 ...)

Frequency (MHz)	Comment
31.455000	10:10:43 - 2019-06-06
90.956000	10:10:48 - 2019-06-06
96.494000	10:10:53 - 2019-06-06
98.785000	10:10:58 - 2019-06-06
100.092000	10:11:03 - 2019-06-06
100.947000	10:11:08 - 2019-06-06
102.413000	10:11:13 - 2019-06-06
107.507000	10:10:05 - 2019-06-06
159.987000	10:11:18 - 2019-06-06

EMC32 Report 90^0

EMI Auto Test Template: EMI Test Auto 30MHz-300MHz 55015

Hardware Setup: HL562 EMI
Frequency Range: 30 MHz - 300 MHz
Graphics Level Range: 0 dBµV/m - 100 dBµV/m

Preview Measurements:
- Scan Test Template: EMI Prescan auto

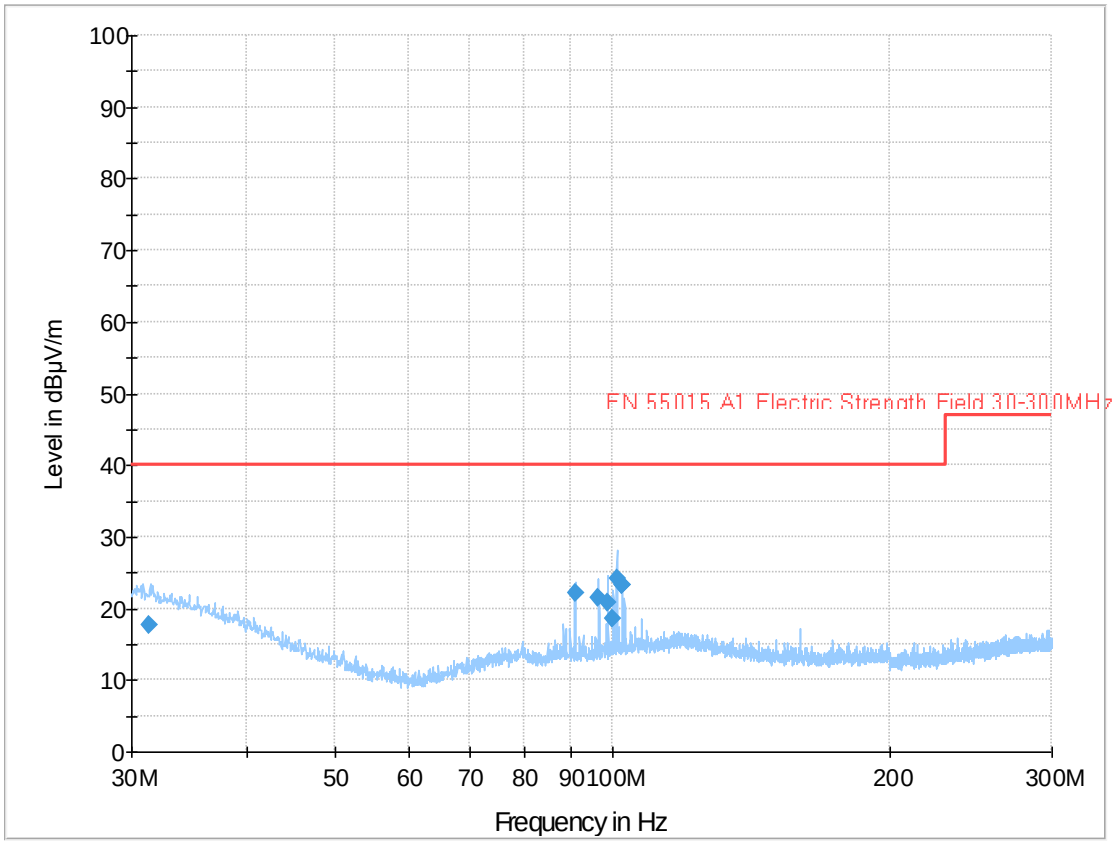
Data Reduction:
- Limit Line #1: EN 55015.A1 Electric Strength Field 30-300MHz
- Maximum Results: 0
- Maxima per Subrange 1
- Acceptance Offset: 0 dB

Zoom:
- Zoom Scan Template: EMI Zoom auto

Maximization Measurements:
- Template for Single Meas.: EMI Prescan auto

Final Measurements:
- Template for Single Meas.: EMI Final auto
- FCC: No

Report Settings:
- Create Electronic Report: PDF
- Document Name: EMI Report



Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
31.295000	17.73	40.00	22.27	1000.0	120.000	210.0	H	90.0	22
90.966000	22.09	40.00	17.91	1000.0	120.000	110.0	V	90.0	11
96.503000	21.51	40.00	18.49	1000.0	120.000	110.0	V	90.0	11
98.764000	20.79	40.00	19.21	1000.0	120.000	110.0	V	90.0	11
100.072000	18.64	40.00	21.36	1000.0	120.000	110.0	V	90.0	11
100.967000	24.12	40.00	15.88	1000.0	120.000	110.0	V	90.0	11
102.413000	23.22	40.00	16.78	1000.0	120.000	110.0	V	90.0	11
102.423000	23.17	40.00	16.83	1000.0	120.000	110.0	V	90.0	11

(continuation of the "Final_Result" table from column 16 ...)

Frequency (MHz)	Comment
31.295000	09:08:59 - 2019-06-06
90.966000	09:09:35 - 2019-06-06
96.503000	09:09:41 - 2019-06-06
98.764000	09:09:46 - 2019-06-06
100.072000	09:09:52 - 2019-06-06
100.967000	09:09:58 - 2019-06-06
102.413000	09:10:03 - 2019-06-06
102.423000	09:10:09 - 2019-06-06

EMC32 Report 180^0

EMI Auto Test Template: EMI Test Auto 30MHz-300MHz 55015

Hardware Setup: HL562 EMI
Frequency Range: 30 MHz - 300 MHz
Graphics Level Range: 0 dBµV/m - 100 dBµV/m

Preview Measurements:
Scan Test Template: EMI Prescan auto

Data Reduction:
Limit Line #1: EN 55015.A1 Electric Strength Field 30-300MHz
Maximum Results: 0
Maxima per Subrange 1
Acceptance Offset: 0 dB

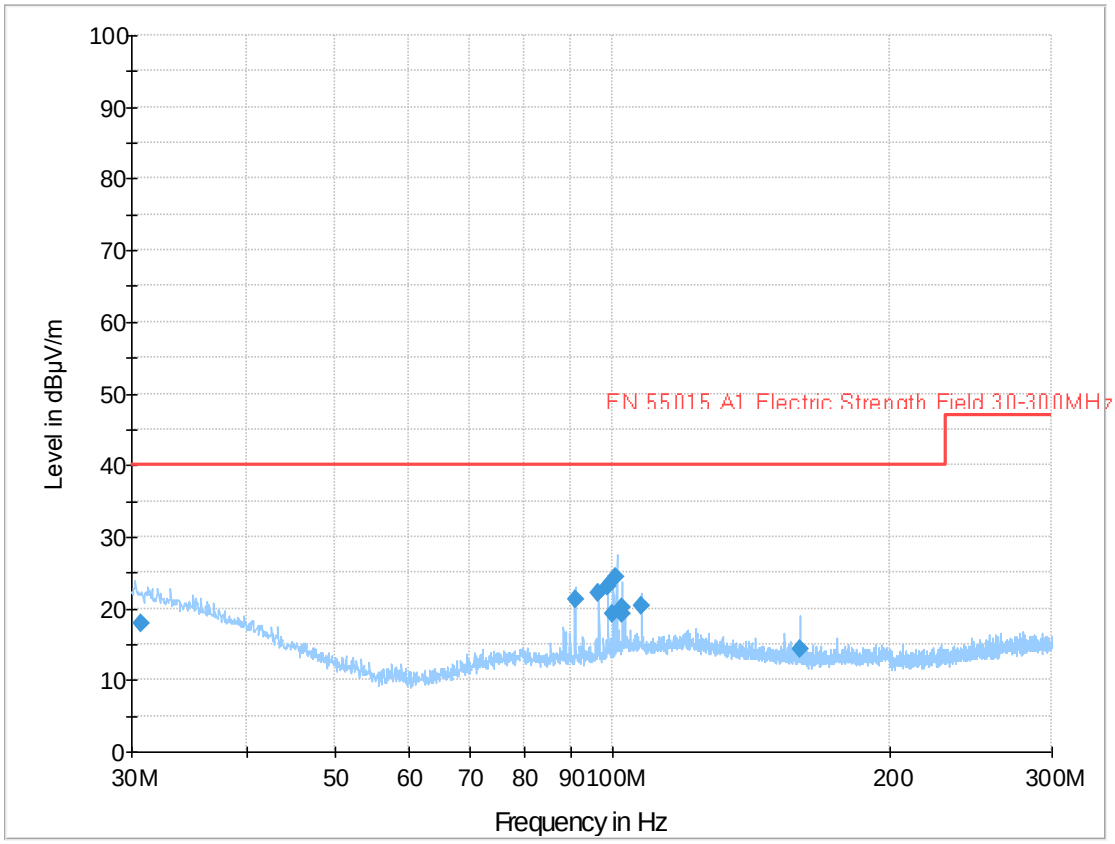
Zoom:
Zoom Scan Template: EMI Zoom auto

Maximization Measurements:
Template for Single Meas.: EMI Prescan auto

Final Measurements:
Template for Single Meas.: EMI Final auto
FCC: No

Report Settings:
Create Electronic Report: PDF

Document Name: EMI Report



Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
30.680000	17.98	40.00	22.02	1000.0	120.000	210.0	H	180.0	22
90.986000	21.34	40.00	18.66	1000.0	120.000	110.0	V	180.0	11
96.503000	22.04	40.00	17.96	1000.0	120.000	110.0	V	180.0	11
98.794000	22.94	40.00	17.06	1000.0	120.000	110.0	V	180.0	11
100.072000	19.34	40.00	20.66	1000.0	120.000	110.0	V	180.0	11
100.946000	24.47	40.00	15.53	1000.0	120.000	110.0	V	180.0	11
102.373000	19.19	40.00	20.81	1000.0	120.000	110.0	V	180.0	11
102.423000	20.23	40.00	19.77	1000.0	120.000	110.0	V	180.0	11
107.486000	20.42	40.00	19.58	1000.0	120.000	210.0	H	180.0	13
159.996000	14.22	40.00	25.78	1000.0	120.000	110.0	V	180.0	11

(continuation of the "Final_Result" table from column 16 ...)

Frequency (MHz)	Comment
30.680000	09:37:15 - 2019-06-06
90.986000	09:37:59 - 2019-06-06
96.503000	09:38:05 - 2019-06-06
98.794000	09:38:10 - 2019-06-06
100.072000	09:38:16 - 2019-06-06
100.946000	09:38:22 - 2019-06-06
102.373000	09:38:28 - 2019-06-06
102.423000	09:38:33 - 2019-06-06
107.486000	09:37:21 - 2019-06-06
159.996000	09:38:39 - 2019-06-06

EMC32 Report 270^0

EMI Auto Test Template: EMI Test Auto 30MHz-300MHz 55015

Hardware Setup: HL562 EMI
Frequency Range: 30 MHz - 300 MHz
Graphics Level Range: 0 dBµV/m - 100 dBµV/m

Preview Measurements:
Scan Test Template: EMI Prescan auto

Data Reduction:
Limit Line #1: EN 55015.A1 Electric Strength Field 30-300MHz
Maximum Results: 0
Maxima per Subrange 1
Acceptance Offset: 0 dB

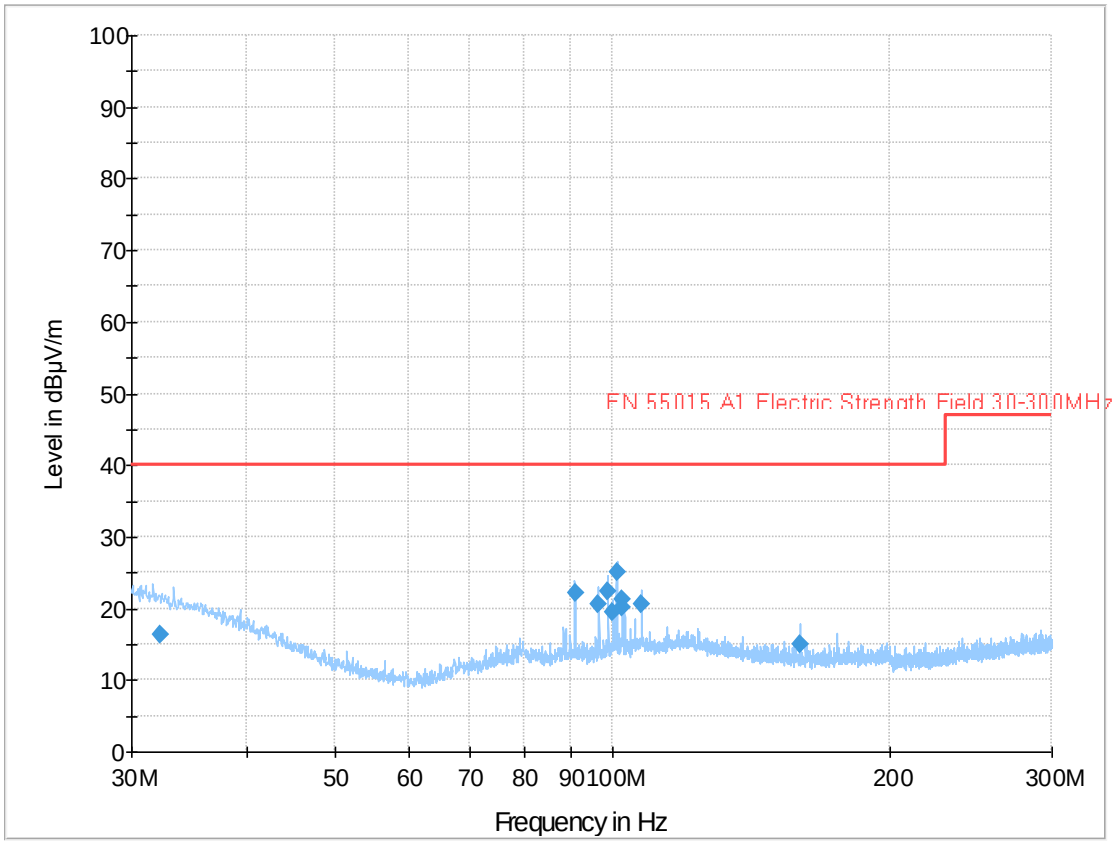
Zoom:
Zoom Scan Template: EMI Zoom auto

Maximization Measurements:
Template for Single Meas.: EMI Prescan auto

Final Measurements:
Template for Single Meas.: EMI Final auto
FCC: No

Report Settings:
Create Electronic Report: PDF

Document Name: EMI Report



Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
32.252000	16.35	40.00	23.65	1000.0	120.000	210.0	V	270.0	21
90.977000	22.15	40.00	17.85	1000.0	120.000	110.0	V	270.0	11
96.453000	20.62	40.00	19.38	1000.0	120.000	110.0	V	270.0	11
98.784000	22.48	40.00	17.52	1000.0	120.000	110.0	V	270.0	11
100.082000	19.56	40.00	20.44	1000.0	120.000	110.0	V	270.0	11
100.987000	25.16	40.00	14.84	1000.0	120.000	110.0	V	270.0	11
102.413000	21.20	40.00	18.80	1000.0	120.000	110.0	V	270.0	11
102.422000	20.14	40.00	19.86	1000.0	120.000	110.0	V	270.0	11
107.506000	20.66	40.00	19.34	1000.0	120.000	210.0	H	270.0	13
159.986000	15.05	40.00	24.95	1000.0	120.000	110.0	V	270.0	11

(continuation of the "Final_Result" table from column 16 ...)

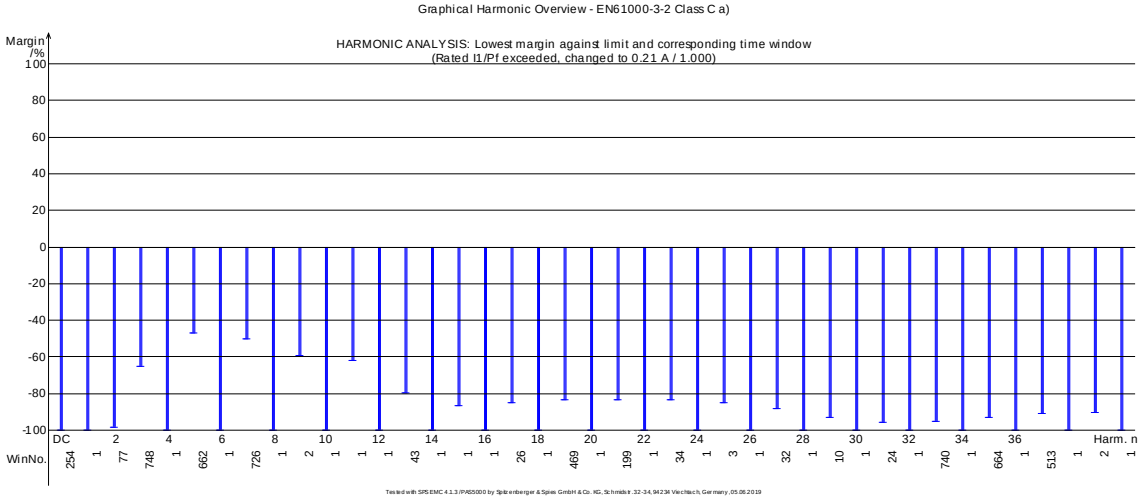
Frequency (MHz)	Comment
32.252000	09:51:28 - 2019-06-06
90.977000	09:50:22 - 2019-06-06
96.453000	09:50:27 - 2019-06-06
98.784000	09:50:32 - 2019-06-06
100.082000	09:50:37 - 2019-06-06
100.987000	09:50:43 - 2019-06-06
102.413000	09:50:48 - 2019-06-06
102.422000	09:50:52 - 2019-06-06
107.506000	09:49:43 - 2019-06-06
159.986000	09:50:57 - 2019-06-06

5 Harmonic current emissions

Tested by ..... :	Jarosław Nawrocki		
Test date ..... :	05.06.2019		
Test Location (stand) ..... :	U-84		
Test set-up description ..... :	N/A		
Operating modes of EUT ..... :	1		
Limit classification in accordance with the standard ..... :	☐	Class A	
	☐	Class B	
	☒	Class C with active input power > 25 W	
	☐	Class C with active input power ≤ 25 W (First requirement, Table 3 column 2)	
	☐	Class C with active input power ≤ 25 W (Second requirement)	
	☐	Class D	
Observation period ..... :	Description		Period selected T_{obs}
	☒	Quasi stationary	2.5 min
	☐	Short cyclic	T_{obs} ≥ 10 cycles =
	☐	Random	T_{obs} =
	☐	Long cyclic	Full program cycle or 2.5 min. with highest THC T_{obs} =
Version of measurement instrument standard used IEC 61000-4-7 (Clause 7) ..... :	☐	IEC 61000-4-7 (ed. 1)	
	☒	IEC 61000-4-7 (ed. 2) + am1	
Control principle used in the sample ..... :	N/A		
AC Mains voltage during test ..... :	230V/50Hz		
Supplementary information ..... :	N/A		

Test set-up photo.....	
Supplementary information: N/A	

Graphical presentation of the result



Name:	Jarosław Nawrocki	Serial no:	
Department:		Operating modes:	
Company:	ITE PREDOM Division	Comment1:	
Test report no:	BS-3/093/EMC/19	Comment2:	--
Device:		Comment3:	--
Specimen:		Comment4:	--
Manufacturer:	GTV Poland	Date:	05.06.2019
Type:	LD-VE4060W-50	Test date:	05.06.2019

Maximum RMS current and corresponding values in timewindow 1:

Voltage:	230.67 Vrms		THD=0.01 %	THV=0.013 V	POHV=0.004 V	PWHD=0.01 %
Current:	0.213 Arms	-0.321 Apk	THD=12.38 %	THC=0.026 A	POHC=0.002 A	PWHD=6.28 %
Power:	47.8 W	P1=47.8 W	49.1 VA			
Power factor:	0.972	CosPhi1: 0.979				

Test conditions: EN 61000-3-2, f=50 Hz, Phase=L1, Range=0.80 A
Time window=10/12 (200ms), Grouping (>2nd harm.)=on, Rated I1=3.0 A, Rated pf=1.0
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 = worst 2.5 min: tw 1..750; POHC: avg=0.00 A, limits=0.02 A
Iavg=0.212 Arms; Rated I1/Pf exceeded, changed to 0.21 A/1.000

Ha	Entire measurement (2.5 min = 750 time windows)						Worst 2.5 min		Worst 2.5 min avg		PASS	FAIL
	Maximum	Window	EN61000-3-2 Class C a)	Margin in MaxWin	100 to 150%	Ex-ceeded	100 to 150%	Ex-ceeded	Value	Ex-ceeded		
DC	0.0002 A	266	-.- - - -	- - - . -	0	0	0	0	0.0001 A	0	X	
1	0.2114 A	1	-.- - - -	- - - . -	0	0	0	0	0.2107 A	0	X	
2	0.0001 A	77	0.0042 A	-98.3 %	0	0	0	0	0.0000 A	0	X	
3	0.0222 A	748	0.0634 A	-65.1 %	0	0	0	0	0.0220 A	0	X	
4	0.0001 A	121	-.- - - -	- - - . -	0	0	0	0	0.0001 A	0	X	
5	0.0112 A	662	0.0211 A	-47.1 %	0	0	0	0	0.0111 A	0	X	
6	0.0001 A	71	-.- - - -	- - - . -	0	0	0	0	0.0001 A	0	X	
7	0.0074 A	726	0.0148 A	-50.0 %	0	0	0	0	0.0074 A	0	X	
8	0.0001 A	34	-.- - - -	- - - . -	0	0	0	0	0.0001 A	0	X	
9	0.0043 A	2	0.0106 A	-59.2 %	0	0	0	0	0.0043 A	0	X	
10	0.0001 A	34	-.- - - -	- - - . -	0	0	0	0	0.0001 A	0	X	
11	0.0024 A	1	0.0063 A	-62.0 %	0	0	0	0	0.0023 A	0	X	
12	0.0001 A	209	-.- - - -	- - - . -	0	0	0	0	0.0001 A	0	X	
13	0.0013 A	43	0.0063 A	-79.7 %	0	0	0	0	0.0012 A	0	X	
14	0.0001 A	218	-.- - - -	- - - . -	0	0	0	0	0.0001 A	0	X	
15	0.0009 A	1	0.0063 A	-86.6 %	0	0	0	0	0.0008 A	0	X	
16	0.0001 A	307	-.- - - -	- - - . -	0	0	0	0	0.0001 A	0	X	
17	0.0010 A	26	0.0063 A	-85.0 %	0	0	0	0	0.0009 A	0	X	
18	0.0001 A	330	-.- - - -	- - - . -	0	0	0	0	0.0001 A	0	X	
19	0.0011 A	469	0.0063 A	-83.3 %	0	0	0	0	0.0010 A	0	X	
20	0.0001 A	497	-.- - - -	- - - . -	0	0	0	0	0.0001 A	0	X	
21	0.0011 A	199	0.0063 A	-83.2 %	0	0	0	0	0.0011 A	0	X	
22	0.0001 A	495	-.- - - -	- - - . -	0	0	0	0	0.0001 A	0	X	
23	0.0010 A	34	0.0063 A	-83.5 %	0	0	0	0	0.0010 A	0	X	
24	0.0001 A	438	-.- - - -	- - - . -	0	0	0	0	0.0001 A	0	X	
25	0.0010 A	3	0.0063 A	-84.9 %	0	0	0	0	0.0009 A	0	X	
26	0.0001 A	570	-.- - - -	- - - . -	0	0	0	0	0.0001 A	0	X	
27	0.0007 A	32	0.0063 A	-88.2 %	0	0	0	0	0.0007 A	0	X	
28	0.0001 A	421	-.- - - -	- - - . -	0	0	0	0	0.0001 A	0	X	
29	0.0005 A	10	0.0063 A	-92.8 %	0	0	0	0	0.0004 A	0	X	
30	0.0001 A	52	-.- - - -	- - - . -	0	0	0	0	0.0001 A	0	X	
31	0.0003 A	24	0.0063 A	-95.6 %	0	0	0	0	0.0003 A	0	X	
32	0.0001 A	1	-.- - - -	- - - . -	0	0	0	0	0.0001 A	0	X	
33	0.0003 A	740	0.0063 A	-95.1 %	0	0	0	0	0.0003 A	0	X	
34	0.0001 A	606	-.- - - -	- - - . -	0	0	0	0	0.0001 A	0	X	
35	0.0005 A	664	0.0063 A	-92.8 %	0	0	0	0	0.0004 A	0	X	
36	0.0001 A	76	-.- - - -	- - - . -	0	0	0	0	0.0001 A	0	X	
37	0.0006 A	513	0.0063 A	-91.1 %	0	0	0	0	0.0005 A	0	X	
38	0.0001 A	127	-.- - - -	- - - . -	0	0	0	0	0.0001 A	0	X	
39	0.0006 A	2	0.0063 A	-90.1 %	0	0	0	0	0.0006 A	0	X	
40	0.0001 A	71	-.- - - -	- - - . -	0	0	0	0	0.0001 A	0	X	

|| average value < 0.6 % of Iavg or < 5 mA

6 Voltage changes, voltage fluctuations and flicker

Tested by ..... :	Jarosław Nawrocki	
Test date ..... :	05.06.2019	
Test Location (stand) ..... :	U-84	
Test set-up description ..... :	N/A	
Operating modes of EUT ..... :	1	
Test method ..... :	☒	4.2.2 Flicker meter according IEC 61000-4-15
	☐	4.2.3 Simulation
	☐	4.2.4 Analytical method
	☐	4.2.5 Use of P_{st} = 1 curve
Observation time selected ..... :	☒	10 Minutes
	☐	120 Minutes
	☐	24 times switching according to Annex B
Limit for dmax applied..... :	☐	4 %
	☒	6 %
	☐	7 %
AC Mains voltage during test..... :	230V/50Hz	
Supplementary information..... :	N/A	

Test set-up photo:.	

Name:	Jarosław Nawrocki	Serial no:	
Department:		Operating modes:	--
Company:	ITE PREDOM Division	Comment1:	--
Test report no:	BS-3/093/EMC/19	Comment2:	--
Device:		Comment3:	--
Specimen:		Comment4:	--
Manufacturer:	GTV Poland	Date:	05.06.2019
Type:	LD-VE4060W-50	Test date:	05.06.2019

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	Tmax [s]	|dmax| [%]	|dc| [%]	PASS	FAIL
13:59:17	0.000	0.0050	0.0050	0.000	0.000	- . - - -	X	
Limits:		1.000	0.650	0.500	6.000	3.300		
Plt: 0.005000								
Evaluated: PST, dc, dmax								

FLICKER: Source test PASS!

Time	Pmax	Pst	Sliding Plt	Tmax [s]	|dmax| [%]	|dc| [%]	PASS	FAIL
13:59:17	0.001	0.0200	- . - - - -	0.000	0.000	- . - - -	X	
Plt: 0.020000								
Evaluated: PST <= 0.4 dmax < 20 % dmax1								

Tested with SPS EMC 4.1.3 / PAS5000 by Spitzenberger & Spies GmbH & Co. KG, Schmidstr. 32-34, 94234 Viechtach, Germany, 05.06.2019

7 Immunity

7.1 General information

Performance criteria as defined by the standard	
Criterion	**Description from standard**
A	During the test, no change of the luminous intensity shall be observed and the regulating control, if any shall operate during the test as intended.
B	During the test, the luminous intensity may change to any value. After the test, the luminous intensity shall be restored to its initial value within 1 min. Regulating controls need not function during the test, but after the test, the mode of the control shall be the same as before the test provided that during the test no mode changing commands were given.
C	During and after the test, any change of the luminous intensity is allowed and the lamp(s) may be extinguished. After the test, within 30 min, all functions shall return to normal, if necessary by temporary interruption of the mains supply and/or operating the regulating control. Additional requirement for lighting equipment incorporating a starting device: After the test, the lighting equipment is switched off. After half an hour, it is switched on again. The lighting equipment shall start and operate as intended.
Other:	N/A

Manufacturer defined performance criteria .....:	N/A
	N/A
	N/A
	N/A
Monitoring during the tests .....:	Radio-frequency electromagnetic fields: visual EUT observation using a camera.

7.2 Electrostatic discharge

Tested by ..... :	Jarosław Nawrocki	
Test date ..... :	11.06.2019	
Test Location(Stand) ..... :	ESD stand	
Test set-up ..... :	☒	Table top equipment
	☐	Floor standing equipment
	☐	Wall or ceiling mounted equipment (Treated as table top)
Supplementary test set-up description ..... :	Operating mode: 1	
Size of horizontal coupling plate .. :	1,6 m x 0,8 m	
Size of vertical coupling plate:	N/A	
Number of discharges for each test point ..... :	+/- 10	
Discharge interval ..... :	1 sec	
Performance criterion ..... :	B	
Supplementary information ..... :	230V/50Hz	

Test set-up photo..:	

Table: Test results for electrostatic discharges

No.	Location of discharge	Polarity	Discharge	Number of discharges	Test level [kV]	Operating mode	Observations
1	HCP top side	P	C	10	4	N/A	N/A
2	HCP top side	N	C	10	4	N/A	N/A
3	HCP bottom side	P	C	10	4	N/A	N/A
4	HCP bottom side	N	C	10	4	N/A	N/A
5	VCP right side	N/A	C	10	4	N/A	N/A
6	VCP right side	N/A	C	10	4	N/A	N/A
7	VCP left side	N/A	C	10	4	N/A	N/A
8	VCP left side	N/A	C	10	4	N/A	N/A
9	Points on conductive surface as indicated in the picture above	P	C	10	4	1	P
10	Points on conductive surface as indicated in the picture above	N	C	10	4	1	P
11	Points on non-conductive surface as indicated in the picture above	P	A	10	8	N/A	N/A
12	Points on non-conductive surface as indicated in the picture above	N	A	10	8	N/A	N/A

HCP = Horizontal coupling plate
VCP = Vertical coupling plate
N = Negative
P = Positive
A = Air discharge
C = Contact discharge

Supplementary information: N/A

7.3 Radio-frequency electromagnetic fields

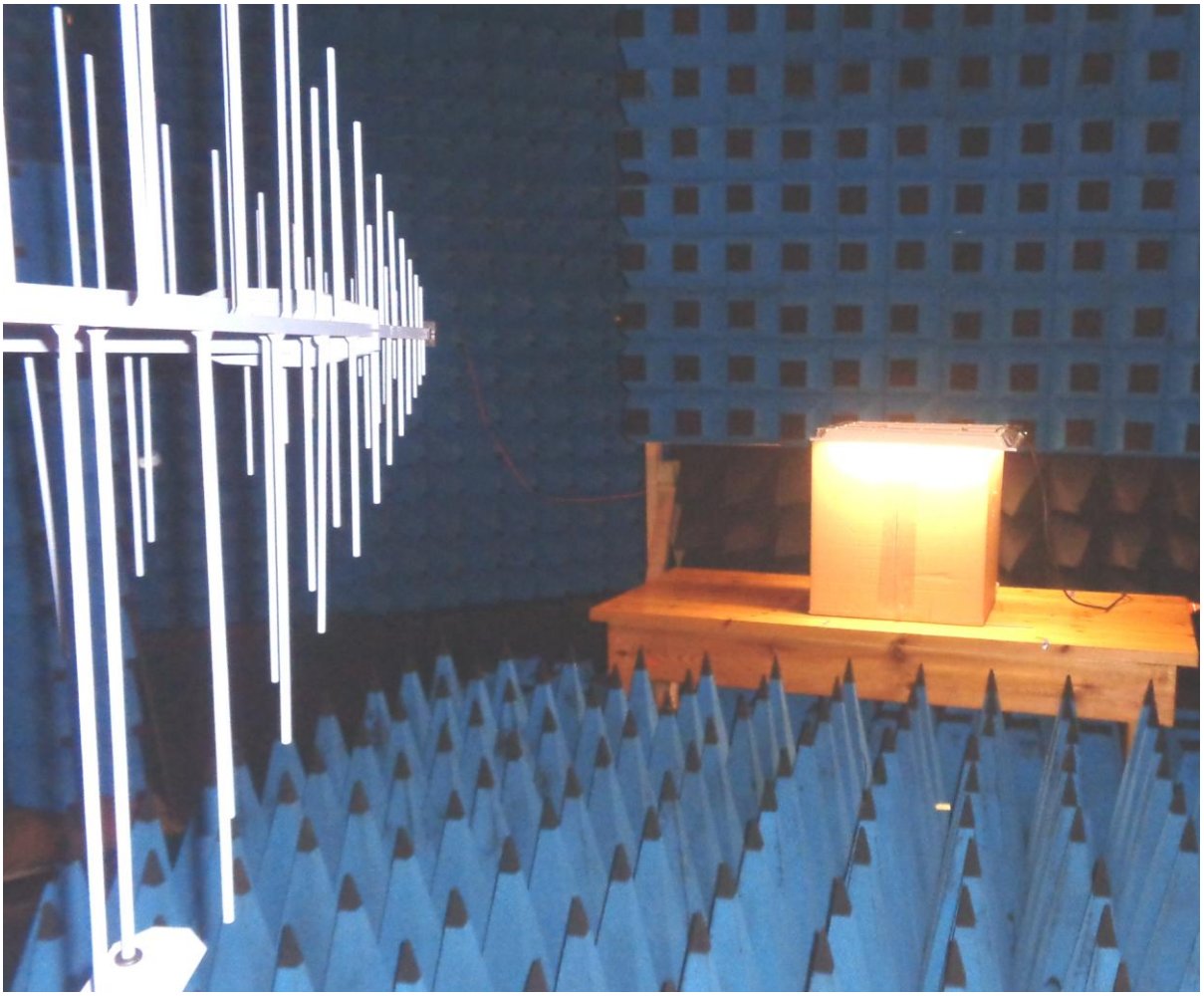
Tested by ..... :	Jarosław Nawrocki	
Test date ..... :	12.06.2019	
Test set-up ..... :	☒	Equipment on a table (1,55 m over a ground plane)
	☐	Equipment standing on floor (0,05 – 0,15 m height)
Supplementary test set up description ..... :	Radio-frequency electromagnetic fields stand Semi-anechoic chamber U-86 Operating mode: 1	
Exposed side of EUT ..... :	☒	0 ° (Side)
	☐	90 °
	☐	180 °
	☐	270 °
Reason for not exposing a side ... :	As a result of the analysis, it was found that the EUT (front) side is the most susceptible to radiation, see below photos, next page.	
Distance Antenna to EUT ..... :	3 m	
Step size [%] ..... :	1	
Performance criterion ..... :	A	
Mains voltage / frequency during test ..... :	230V/50Hz	
Supplementary information..... :	N/A	

Table: Test results for radiated electromagnetic fields

Frequency range	Test Level [V/m]	Polarization	Modulation	Operation mode	Dwell time [s]	Observations
80 MHz ÷ 1 GHz	3,0	V	AM: 80,0 %; 1,0 kHz	1	1,0	P
80 MHz ÷ 1 GHz	3,0	H	AM: 80,0 %; 1,0 kHz	1	1,0	P

H = Horizontal
V = Vertical

Test set-up photo……:



Graphical presentation of the result

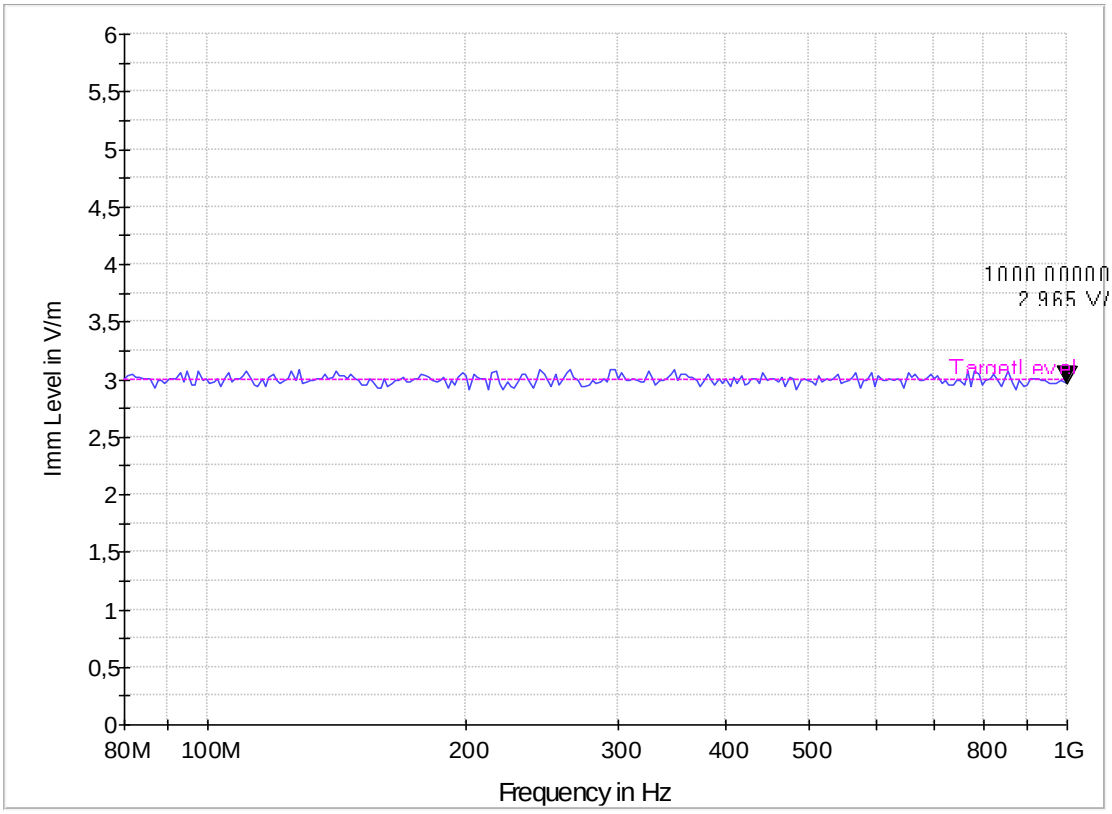
EMC32 Report Polarization V

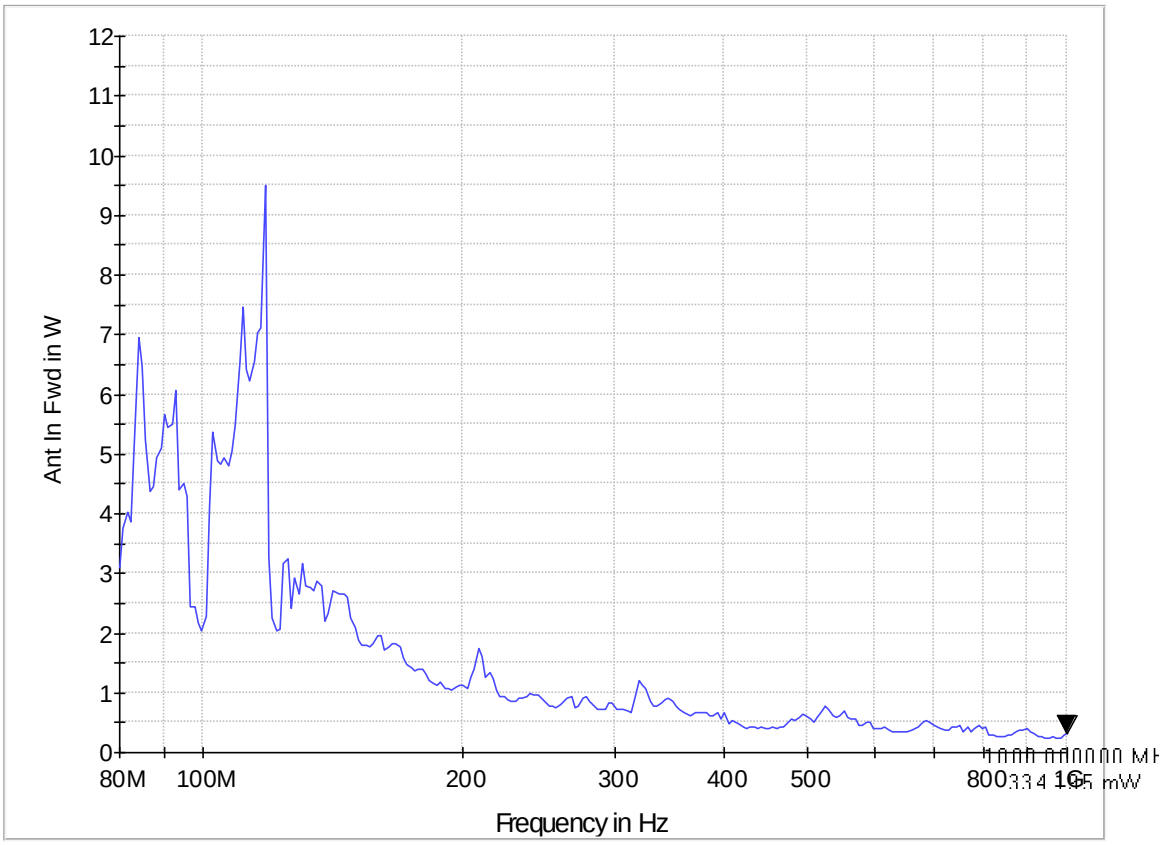
EMS Scan Template: EMS Scan 3Vm AM 80 80-1000MHz V [EMS Radiated]

Hardware Setup: EMS radiated\Copy of Hardware Setup 80-1000MHz 24.05.2017_SMBV100A

Level On: Substitution Method: EMS radiated\24.05.2017\Cal 24.05.2017 28Vm V K4+Kant_EN61ED3

Subrange	Step Width	Level	Modulation	Dwell Time
80MHz - 1GHz	1% LOG	3V/m	AM: 80,0%; 1,0kHz	1s





Result Table_NOGO

Frequency (MHz)	Imm Level (V/m)	Ant In Fwd (W)	Comment	Modulation	Polarization	Height (m)

(continuation of the "Result Table_NOGO" table from column 7 ...)

Frequency (MHz)	Azimuth (deg)

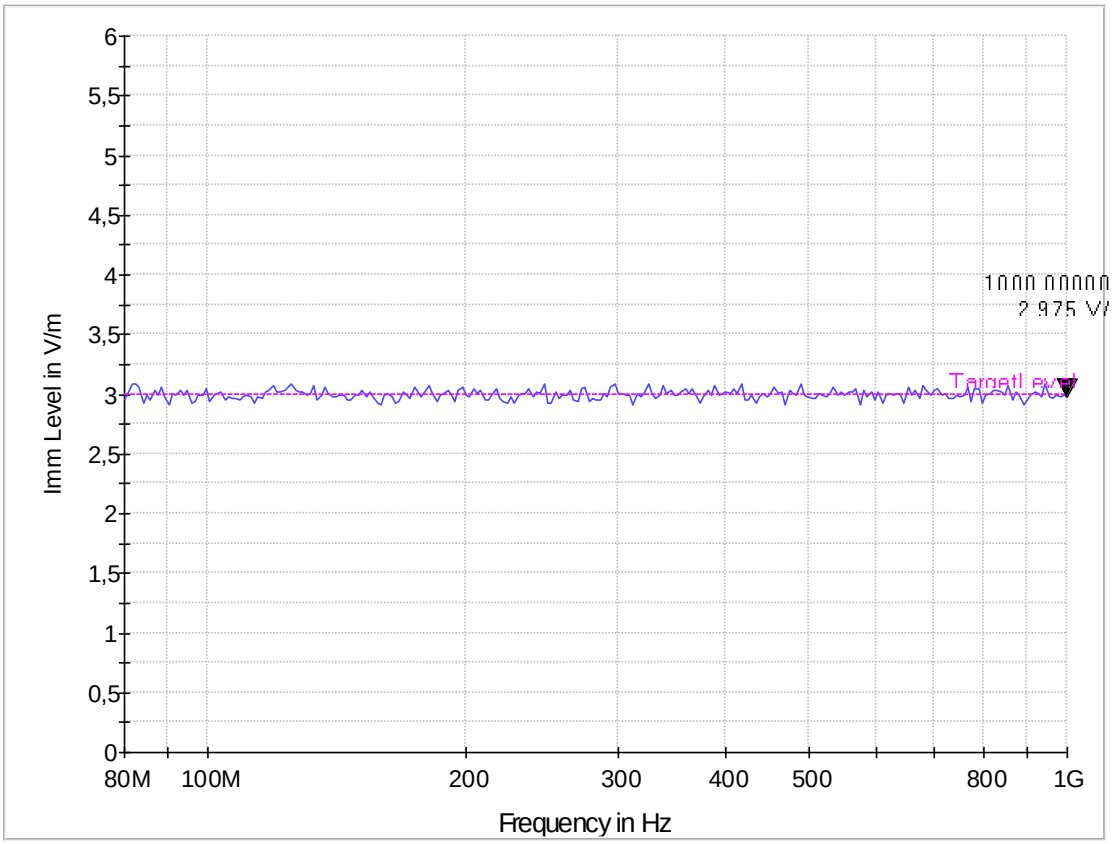
EMC32 Report Polarization H

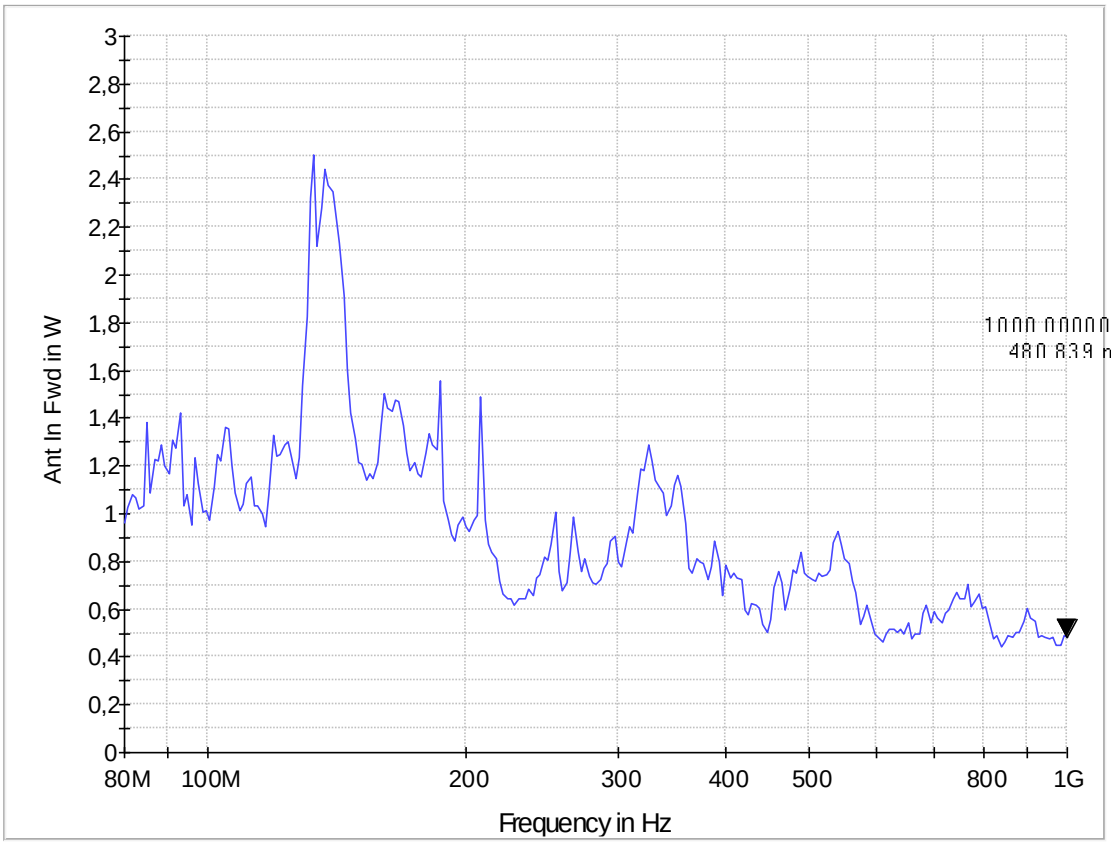
EMS Scan Template: EMS Scan 3Vm AM 80 80-1000MHz H [EMS Radiated]

Hardware Setup: EMS radiated\Copy of Hardware Setup 80-1000MHz 24.05.2017_SMBV100A

Level On: Substitution Method: EMS radiated\24.05.2017\Cal 24.05.2017 28Vm H K4+Kant_EN61ED3

Subrange	Step Width	Level	Modulation	Dwell Time
80MHz - 1GHz	1% LOG	3V/m	AM: 80,0%; 1,0kHz	1s





Result Table_NOGO

Frequency (MHz)	Imm Level (V/m)	Ant In Fwd (W)	Comment	Modulation	Polarization	Height (m)

(continuation of the "Result Table_NOGO" table from column 7 ...)

Frequency (MHz)	Azimuth (deg)

7.4 Power frequency magnetic fields

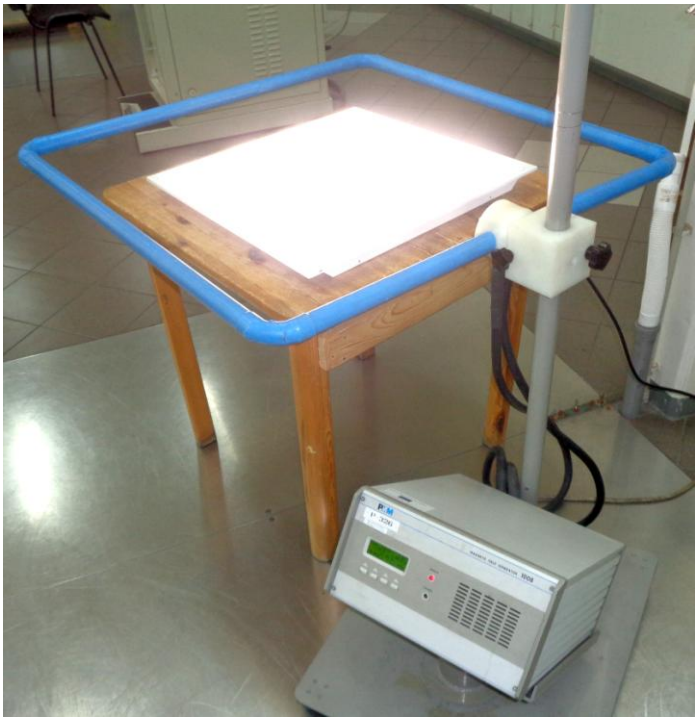
Tested by ..... :	Jarosław Nawrocki	
Test date ..... :	12.06.2019	
Test location (Stand) ..... :	PMM 1008	
Operating mode(s) used ..... :	1	
Test set-up ..... :	☐	0,1 m above metal surface
	☐	Homogeneous field (Helmholtz coil). Dimensions: ---
	☒	Single Coil. Dimensions: 1 x 1 m
	☐	Single Coil. Dimensions: 1 x 2,6 m
Performance criterion ..... :	A	
Reason for not performing the test:	☐	The equipment contains no components which are susceptible to power frequency magnetic fields.
	☐	Other:
Supplementary information ..... :	230/50Hz	

Test results for power frequency magnetic field immunity test

Test frequency	Test Level [A/m]	Test time [s]	Coil size/type	Axis	Operating mode	Mains voltage/ frequency	Observations
50Hz/60Hz	3	180	1m x 1m	X	1	230V/50Hz	P
50Hz/60Hz	3	180	1m x 1m	Y	1	230V/50Hz	P
50Hz/60Hz	3	180	1m x 1m	Z	1	230V/50Hz	P

Supplementary information: N/A

Test set-up photo.....:

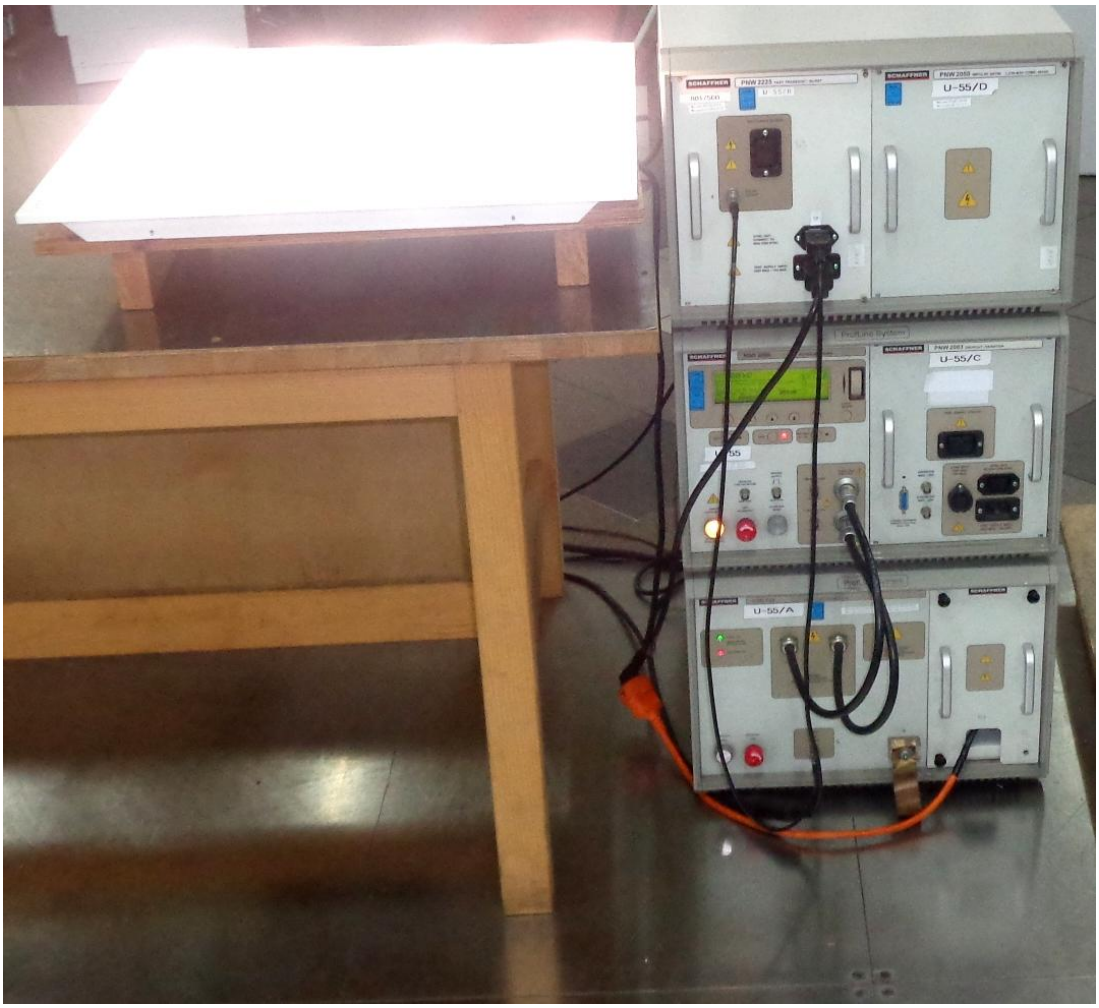


7.5 Fast transients

Tested by ..... :	Jarosław Nawrocki	
Test date ..... :	12.06.2019	
Test location (stand) ..... :	Fast transient stand	
Test set-up ..... :	☐	Equipment on the table (0,1 ± 0,01) m above ground plane
	☒	Equipment standing on floor at (0,1 ± 0,01) m above ground plane
	☐	Artificial hand applied. Location see photo
Supplementary test set-up description ..... :	class: I Operating mode: 1	
Repetition frequency ..... :	300 ms	
Test time ..... :	4 min 07 sec	
Performance criterion ..... :	B	
Supplementary information ..... :	230V/50Hz	

Test results fast transients						
Port	**Coupling**	**Level [kV]**	**Polarity**	**Operating mode**	**Mains voltage/ frequency**	**Observation**
Mains	L1 N PE	1	Positive	1	230V / 50Hz	P
Mains	L1 N PE	1	Negative	1	230V / 50Hz	P
Supplementary information: N/A						

Test set-up photo..... :



7.6 Injected currents (radio-frequency common mode)

Tested by ..... :	Jarosław Nawrocki	
Test date ..... :	12.06.2019	
Test location (Stand) ..... :	Injected currents stand	
Test set-up ..... :	☒	Equipment located (0,1 ± 0,05) m above ground plane
	☐	Elevated ground plane according to Annex F
	☐	Artificial hand applied. Location see photo.
Supplementary test set-up description ..... :	Operating mode: 1	
Modulation ..... :	☒	80 % AM with 1 kHz
	☐	Other:
Step size ..... :	1 %	
Performance criterion ..... :	A	
Mains voltage / frequency during test ..... :	230V/50Hz	
Supplementary information ..... :	N/A	

Test results for conducted disturbances, induced by radio-frequency fields							
Frequency range	**Test Level [V]**	**Port under test**	**CDN type**	**Port with terminated CDN**	**Operating mode**	**Dwell time [s]**	**Observations**
0,15 ÷ 230 MHz	3,0	Mains	CDN-M3	N/A	1	1,0	P
Supplementary information: N/A							

Test set-up photo.....:

7.7 Surges

Tested by ..... :	Jarosław Nawrocki
Test date ..... :	12.06.2019
Test location(Stand)..... :	Surge stand
Test set-up description ..... :	Operating mode: 1
Repetition rate ..... :	60 sec
Number of pulses for each coupling ..... :	10
Performance criterion ..... :	C
Supplementary information..... :	230V/50Hz

Test results for surges

Port	Coupling	CDN	Level [kV]	Polarity	Phase angles [°]	Operating mode	Mains voltage/ frequency	Observation
Mains	N-PE	MCN	2	Positive	90	1	230V / 50Hz	P
Mains	L1-PE	MCN	2	Negative	90	1	230V / 50Hz	P
Mains	N-PE	MCN	2	Positive	270	1	230V / 50Hz	P
Mains	L1-PE	MCN	2	Negative	270	1	230V / 50Hz	P
Mains	L1-N	MCN	1	Positive	90	1	230V / 50Hz	P
Mains	L1-N	MCN	1	Negative	270	1	230V / 50Hz	P

Lower test levels ..... :	☐	The lower test levels are tested also.
	☒	The lower test levels are not tested.

Positive
Negative

CDN:
Mains = Mains Coupling Network F13 = Figure No. 13 of IEC 61000-4-5 etc.
S/C = Signal/Control lines D = Direct Coupling (shielded lines)

Supplementary information: N/A

Test set-up photo……...:

7.8 Voltage dips and short interruptions

Tested by ..... :	Jarosław Nawrocki
Test date ..... :	05.06.2019
Test Location (Stand) ..... :	U-84
Test set-up description ..... :	Operating mode: 1
Repetition rate ..... :	10,5 sec
Number of dips or interruptions ... :	3
Performance criterion ..... :	Dips: C, Interruptions: B
Supplementary information..... :	230V/50Hz

Test results voltage dips						
U_N [V]	**Frequency in Hz**	**Test Level [% of U_N]**	**Phase angle**	**Duration [Cycles]**	**Operating mode**	**Observations**
230	50	70	0º	10	1	P
Supplementary information: N/A						

Test results voltage interruptions						
U_N [V]	**Frequency in Hz**	**Test Level [% of U_N]**	**Phase angle**	**Duration [Cycles]**	**Operating mode**	**Observations**
230	50	0	0º	0,5	1	P
Supplementary information: N/A						

Test set-up photo……:

Name:	Jarosław Nawrocki	Serial no:	
Department:		Operating modes:	--
Company:	ITE PREDOM Division	Comment1:	--
Test report no:	BS-3/093/EMC/19	Comment2:	--
Device:		Comment3:	--
Specimen:		Comment4:	--
Manufacturer:	GTV Poland	Date:	05.06.2019
Type:	LD-VE4060W-50	Test date:	05.06.2019

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:	Test name
Test description:	--
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	70 %	10 periods	0° L1
2	Voltage dip / short interruption	0 %	0.5 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 SPSEMC 4.1.3 /PAS5000 by Spitzenberger & Spies GmbH &Co.KG, Schmidstr.32-34, 94234 Viechtach, Germany, 05.06.2019

8 List of test equipment

Equipment used			
Equipment	**Type**	**Inventory number**	**Manufacturer**
Test Stand:	Disturbance voltages		
EMI Test Receiver	ESCS 30	U-57	Rohde & Schwarz
Artificial Mains Network	ESH 2-Z5	U-57/A	Rohde & Schwarz
Faraday Cage	EK-1	U-11	Unitra Unima Olsztyn
Test Stand:	Disturbance powerstand		
EMI Test Receiver	ESCS 30	U-57	Rohde & Schwarz
Absorbing clamp	MDS-21	P-395/A	Rohde & Schwarz
Faraday Cage	EK-1	U-11	Unitra Unima Olsztyn
Test Stand:	Discontinuous disturbance (clicks)		
Automatic Click Analyzer	ACA-4c	P-448	National Institute of Telecommunication
Artificial Mains Network	ENV4200	Pp-588	Rohde & Schwarz
Faraday Cage	EK-1	U-4	Unitra Unima Olsztyn
Test Stand:	Harmonic current emissions, Voltage changes, voltage fluctuations and flicker		
Test System	EMV D 15000/PAS	U-84	Spitzenberger+Spies GmbH
Test Stand:	Electrostatic discharges		
Simulator ESD	NSG 435	U-55/F	Schaffner
Test Stand:	Fast Transients		
System Mainframe	NSG 2050	U-55	Schaffner
3 Phase Coupling-Decoupling Network	CDN 133	U-55/A	Schaffner
Fast Transient/Burst Module	PNW 2225	U-55/B	Schaffner
Test Stand:	Surges		
System Mainframe	NSG 2050	U-55	Schaffner
3 Phase Coupling-Decoupling Network	CDN 133	U-55/A	Schaffner
Impulse Netw. 1,2/50-8/20 Comb. Wave	PNW 2050	U-55/D	Schaffner
Test Stand:	Conducted Disturbances Immunity		
Continuous Wave Simulator	CWS 500	U-56	EM TEST
Coupling-Decoupling Network	CDN-M3	U-56/C	EM TEST
Attenuator	ATT 6	U-56/F	EM TEST
Test Stand:	Radiated electromagnetic disturbances stand Semi-anechoic chamber U-86		
EMI Test Receiver	ESIB 26	P-377	Rohde & Schwarz
Antenna	HL 562	P-382	Rohde & Schwarz
Test Stand:	Power frequency magnetic fields		
Magnetic field generator	1008	P-326	PMM

9 Measurement instrumentation uncertainties

Type of disturbance test method	Used test equipment (only main instruments, no details)	Calculated uncertainty	U_{CISPR}
Disturbance voltage Mains terminals 9 kHz … 150 kHz 150 kHz … 30 MHz	EMI Test Receiver Artificial Mains Network	3.6 dB	4.0 dB 3.6 dB
Electric field strength Horiz. 30 MHz … 200 MHz Horiz. 200 MHz … 1000 MHz Vert. 30 MHz … 130 MHz Vert. 130 MHz … 200 MHz Vert. 200 MHz … 1000 MHz	EMI Test Receiver Antenna	Horiz. 30 MHz … 200 MHz 4.9 dB Horiz. 200 MHz … 300 MHz 5.2 dB Vert. 30 MHz … 200 MHz 5.1 dB Vert. 30 MHz … 200 MHz 5.2 dB Vert. 200 MHz … 300 MHz 5.2 dB	5.2 dB

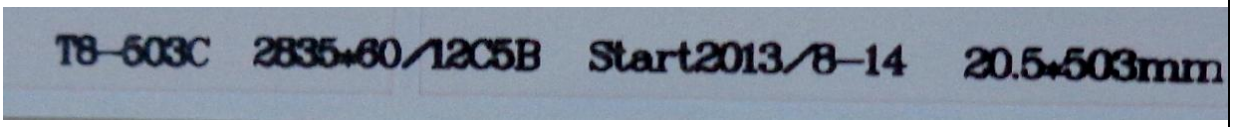
10 Annex

10.1 Annex A:

Component/ Part No.	Manufacturer/ Trademark	Type No./model No./	Technical data
-	*See below Photos of the components and Technical Documentation*		

10.2 Annex B:

TABLE: Photography of the components	
Component/ Part No.	Photography
Llighting luminaire	

Power Supply/ LED panel	  

End of the Report