

Test report

Number T251-0455/25

Project file: C20250450

Date: 2025-06-13

Pages: 92

Product: Uninterruptible Power Supply

Type reference: UPSI-2406R2IP-38AC,
UPSI-2406R2IP-38AC-B3

Ratings: Input: 100 - 240 V a.c.; 50 - 60 Hz; 2,1 - 0,9 A
Output:
- UPSI-2406R2IP-38AC: 24 – 23,5 V d.c.; 6 A
- UPSI-2406R2IP-38AC-B3: 48 V d.c.; 2,5 A

Trademark:



Applicant: Bicker Elektronik GmbH
Ludwig-Auer-Strasse 23, 86609 Donauwörth, Germany

Manufacturer: Bicker Elektronik GmbH
Ludwig-Auer-Strasse 23, 86609 Donauwörth, Germany

Place of manufacture: Bicker Elektronik GmbH
Ludwig-Auer-Strasse 23, 86609 Donauwörth, Germany

Summary of testing

Testing method: Partial testing according to:
EN IEC 62040-2:2018 and EN 61000-3-3:2013 + A1:2019
See page 3 for details.

Testing location: SIQ Ljubljana
Mašera-Spasičeva ulica 10, SI-1000 Ljubljana, Slovenia

Remarks: Date of receipt of test items: 2025-03-26
Number of items tested: 1
Date of performance of tests: 2025-04-14 - 2025-05-20
The test results presented in this report relate only to the items tested.
The test items were tested in the condition as received.
The product complies with the requirements of the testing methods.

Tested by: Mitja Rozman

Approved by: Marjan Mak



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1. General

Testing method:

Devices were tested according to EN IEC 62040-2:2018:

- UPSI-2406R2IP-38AC: performed all tests
- UPSI-2406R2IP-38AC-B3: performed all tests except conducted immunity (EN 61000-4-6)

Abbreviations and markings:

AC mains power port	Port used to connect to the mains supply network
DC network power port	Port, not powered by a dedicated AC/DC power converter and not supporting communication, that connects to a DC supply network
Signal/control port	Port intended for the interconnection of components of an EUT, or between an EUT and local AE and used in accordance with relevant functional specifications
Port	Physical interface through which electromagnetic energy enters or leaves the EUT
Wired network port	Point of connection for voice, data and signalling transfers intended to interconnect widely dispersed systems by direct connection to a single-user or multi-user communication network (for example CATV, PSTN, ISDN, xDSL, LAN and similar networks).
AE associated equipment	Equipment needed to exercise and/or monitor the operation of the EUT
EUT	Equipment Under Test
Highest internal frequency (F_x)	Highest fundamental frequency generated or used within the EUT or highest frequency at which it operates
ESD	Electrostatic Discharge
CDN	Coupling and Decoupling Network
RF	Radio Frequency

Possible test case verdicts:

Test does not apply to the tested sample:	N/A
Tested sample passed the requirements:	P (Pass)
Tested sample failed the requirements:	F (Fail)
Test was not performed:	N/P (Not performed)

Throughout this report a comma is used as the decimal separator. Numerical data taken from IEC standards are using a comma as the decimal separator.

History sheet:

Date:	Report No.:	Change:	Revision:
2025-06-13	T251-0455/25	Initial Test Report issued.	--

2. Measurement uncertainty

The following measurement uncertainty levels have been calculated according to the SIQ internal document EN208, as specified in CISPR 16-4-2 and EN 55016-4-2. The uncertainties represent an expanded uncertainty expressed at 95% confidence level using a coverage factor $k=2$.

The following measurement uncertainty has been included in test results as specified in each of the basic referenced standards as applicable.

Emission:

Measurement / test method		U_{LAB}	U_{CISPR}
Conducted emission measurement	(150 kHz to 30 MHz)	3,1 dB	3,4 dB
Radiated emission measurement (electric field strength at an OATS or in a SAC)	(30 MHz to 1000 MHz)	5,3 dB	6,3 dB
Harmonic current emission measurement	/	$\pm 0,0016$ A	/
Voltage changes, fluctuations, and flicker measurement	/	2,4 %	/

Immunity:

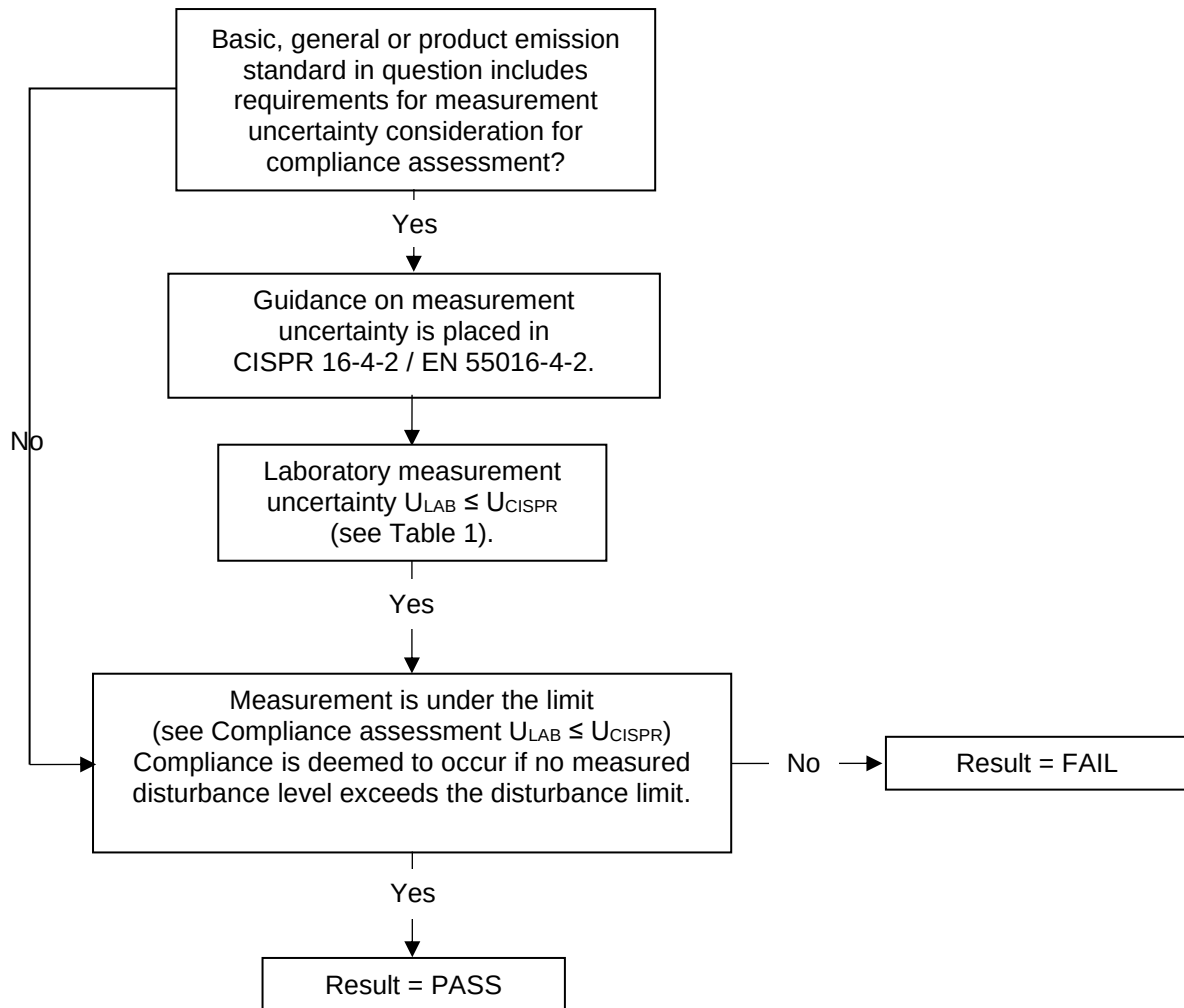
Measurement / test method	Parameter values
Electrostatic discharge immunity measurement	All required parameters comply with requirements of standard.
Radiated, RF electromagnetic field immunity measurement	2,2 dB
Electrical fast transients/burst immunity measurement	All required parameters comply with requirements of standard.
Surge immunity measurement	All required parameters comply with requirements of standard.
Conducted disturbances, induced by RF fields immunity measurement	3,2 dB
Power frequency magnetic field immunity measurement	All required parameters comply with requirements of standard.
Voltage dips, short interruptions, and voltage variations immunity measurement	All required parameters comply with requirements of standard.

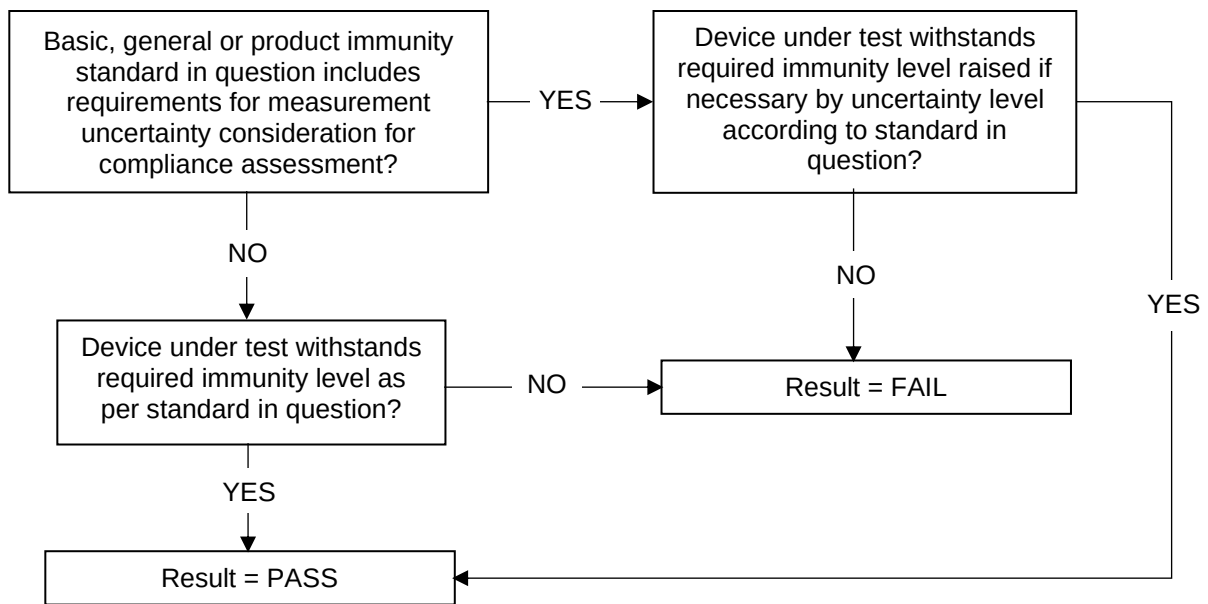
3. Decision rule

Application of decision rule and statement of conformity is defined in document TN023 Decision rule and measurement uncertainty.

As a general rule Pass/Fail decisions are based on simple acceptance rule and acceptance limits chosen based on simple acceptance ($w = 0$, $AL = TL$) except if a decision rule is governed by particular standard or guidance document.

Decision rule applicable for emission:



Decision rule applicable for immunity:

4. Product specific data

General description of test item: Device is UPS with built in battery.

Product key: UPSI-2406R2IP-38AC, UPSI-2406R2IP-38AC-B3

Both devices are similar in design with difference that UPSI-2406R2IP-38AC-B3 includes additional DC-DC converter on DC output to convert 24 V d.c. to 48 V d.c.

UPSI-2406R2IP-38AC-B3 sample includes following AC-DC converter on AC input:

- Manufacturer: Cincon Electronics Co. Ltd.
- Type: LFM200S240C

UPSI-2406R2IP-38AC sample includes following AC-DC converter on AC input:

- Manufacturer: Cincon Electronics Co. Ltd.
- Type: CFM260S240B

Power supply type:	AC supplied (single-phase)	
UPS category:	UPSI-2406R2IP-38AC: C1, also complies with C2 UPSI-2406R2IP-38AC-3B: C2	
Mounting position:	☒	Table-top equipment:
	☐	Floor-standing equipment:
	☐	Wall/ceiling mounted equipment:
	☐	Hand-held equipment:
	☐	Other:
Highest Internal Operating Frequencies:	Name:	Frequency:
	Maximum clock frequency	< 108 MHz

Port(s):

No.	Port	Type	cable length / m	cable shielded
0	Enclosure	N/E	/	/
1	AC input	AC	/	NO
2	DC output	DC	< 3 m	NO
Note:	AC = AC mains power port DC = DC network power port / input d.c. power port I/O = Signal/control port WNP = wired network port GND = grounding N/E = Non-Electrical			

Copy of marking plate:

The artwork below may be only a draft. The use of certification marks on a product must be authorized by the respective NCBs that own these marks.

UPSI-2406R2IP-38AC:**UPSI-2406R2IP-38AC-B3:**

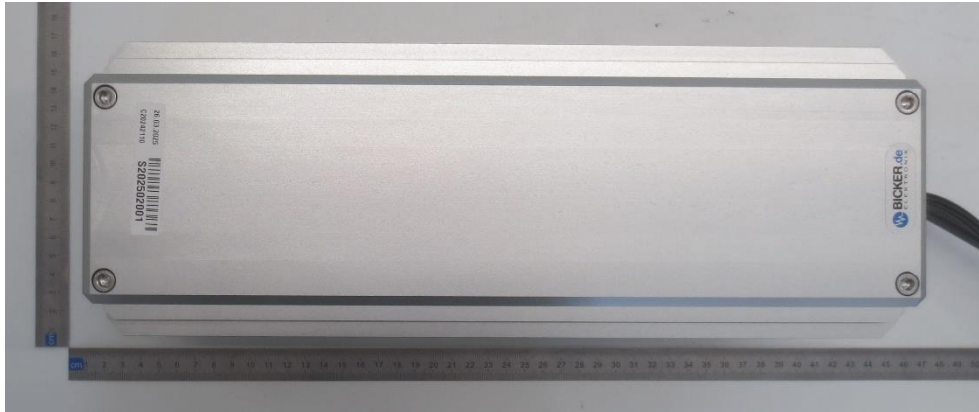
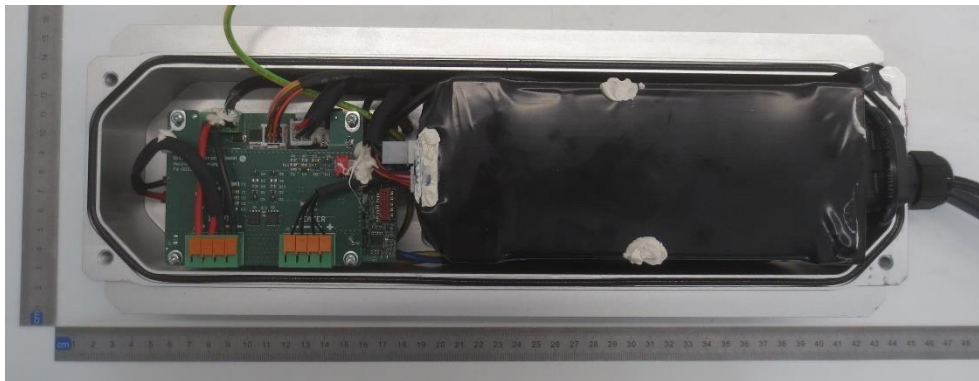
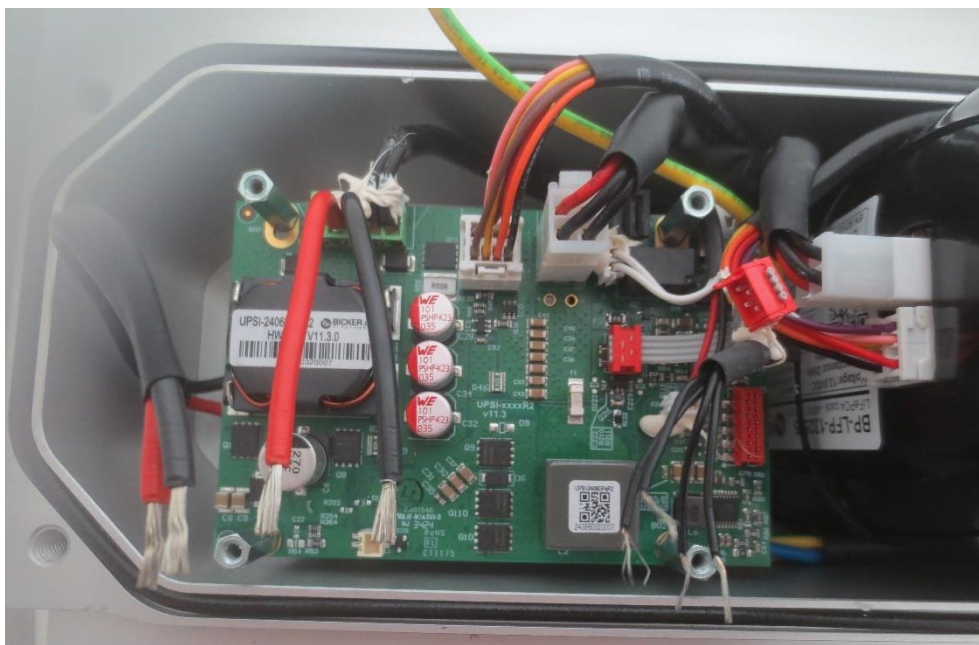
NOTE: The information in this section has been provided by the applicant.

5. Equipment under test (EUT)

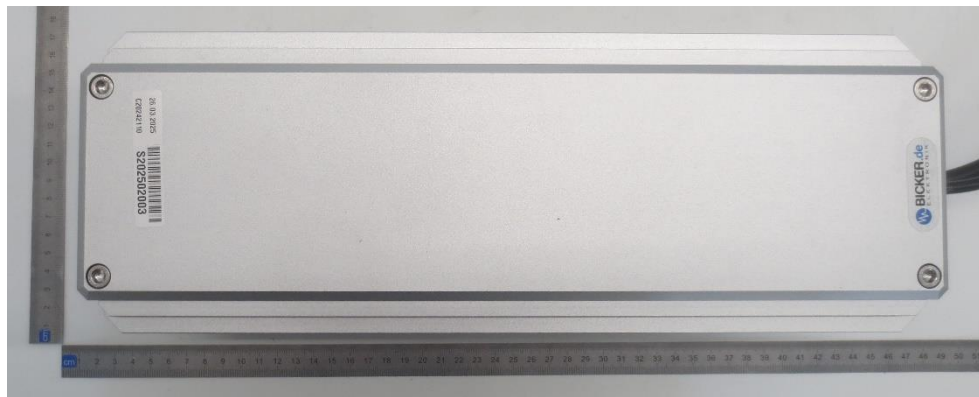
Product Type	Device	Manufacturer	Model No.	Comments
EUT	Uninterruptible Power Supply	Bicker	UPSI-2406R2IP	/
Note: EUT = Equipment Under Test AE = Associated Equipment				

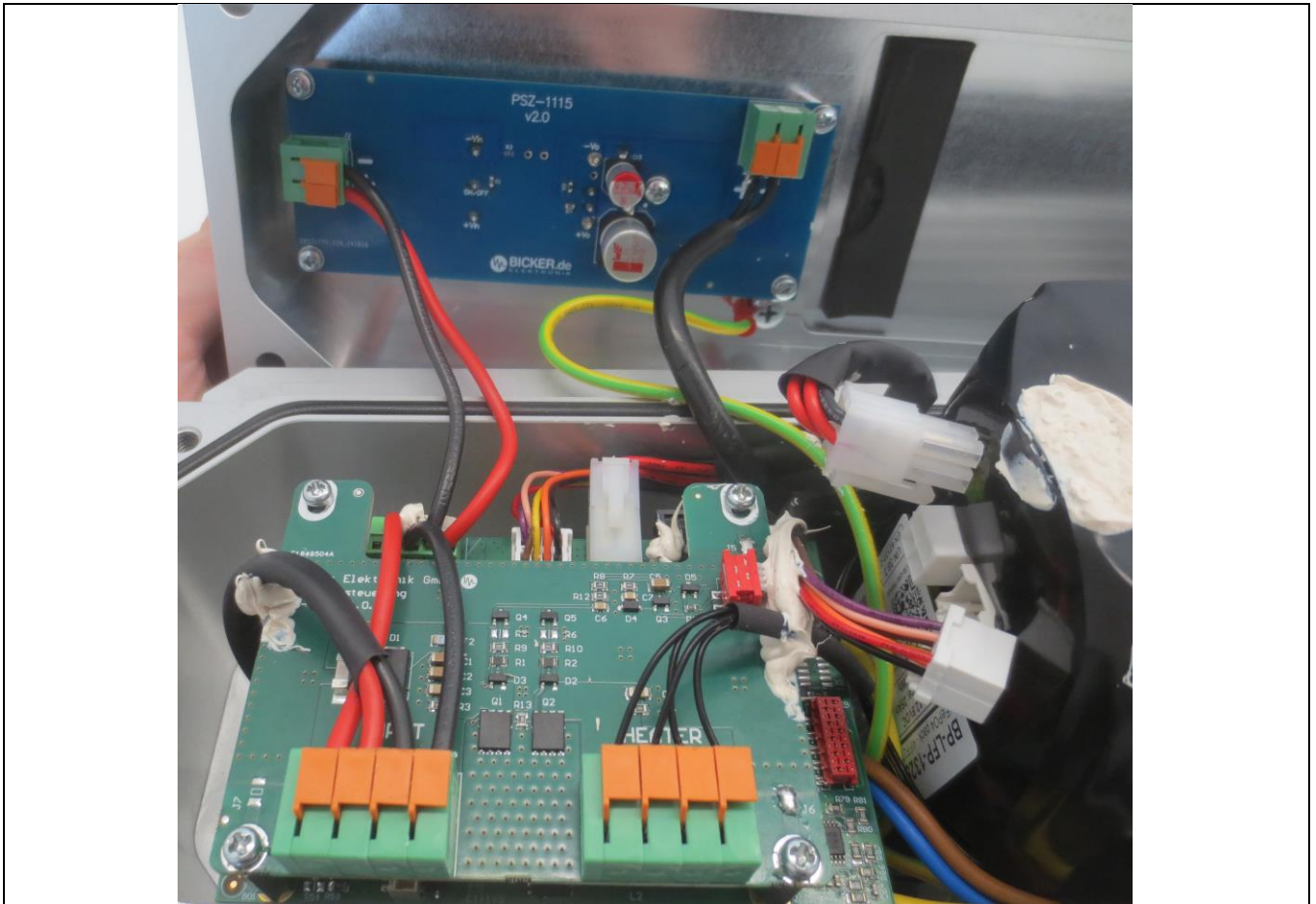
Pictures of EUT:

UPSI-2406R2IP-38AC:



UPSI-2406R2IP-38AC-B3:





Operating conditions:

Clause	Test	Connection type	Operating conditions
9.1	Conducted emission measurement	1Ph + N + PE	240V/50Hz, 100V/60Hz
9.2	Radiated emission measurement	1Ph + N + PE	100V/60Hz, 240V/50Hz
9.3	Harmonic current emissions measurement	1Ph + N + PE	230V/50Hz
9.4	Voltage changes, fluctuations, and flicker measurement	1Ph + N + PE	230V/50Hz
10.1	Electrostatic discharge immunity measurement	1Ph + N + PE	230V/50Hz
10.2	Radiated, RF electromagnetic field immunity measurement	1Ph + N + PE	230V/50Hz
10.3	Electrical fast transients/burst immunity measurement	1Ph + N + PE	230V/50Hz
10.4	Surge immunity measurement	1Ph + N + PE	230V/50Hz
10.5	Conducted disturbances, induced by RF fields immunity measurement	1Ph + N + PE	230V/50Hz
10.6	Power frequency magnetic field immunity measurement	1Ph + N + PE	230V / 50Hz 100V / 60Hz

Operating modes:

UPSI-2406R2IP-38AC:	
No.	Operating mode
1	Full load on output (24V/6A). AC supplied
2	Full load on output (24V/6A). Battery mode

UPSI-2406R2IP-38AC-3B:	
No.	Operating mode
1	Full load on output (48V/2,5A). AC supplied
2	Full load on output (48V/2,5A). Battery mode

6. Environmental conditions

The climatic conditions during the tests were within the following limits:

Ambient temperature: 15 °C to 35 °C

Relative humidity Electrostatic Discharges (ESD): 30 % to 60 %

Relative humidity all other testing except Electrostatic Discharges (ESD): 15 % to 75 %

Atmospheric pressure: 860 mbar to 1060 mbar

7. Verdict summary section

STANDARDS (details on first page)	PERFORMED ¹⁾	CONCLUSION ¹⁾
EN IEC 62040-2:2018 Uninterruptible power systems (UPS) - Part 2: Electromagnetic compatibility (EMC) requirements	YES	PASS
EN IEC 61000-3-3:2013 + A1:2019 + A2:2021 Electromagnetic compatibility (EMC) – Part 3-3: Limits – Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems for equipment with rated current ≤ 16A per phase and not subjected to conditional connection	YES	PASS
¹⁾ See details in table(s) below		

UPSI-2406R2IP-38AC:				
Test (emission)	Referenced standard	Clause within the report	Class	Conclusion
Conducted emission measurement	EN IEC 62040-2:2018	9.1	B	PASS
Radiated emission measurement	EN IEC 62040-2:2018	9.2	B	PASS
Harmonic current emission measurement	EN IEC 61000-3-2:2019	9.3	A	PASS
Voltage changes, fluctuations and flicker measurement	EN 61000-3-3:2013 + A1:2019 + A2:2021	9.4	/	PASS

UPSI-2406R2IP-38AC-3B:				
Test (emission)	Referenced standard	Clause within the report	Class	Conclusion
Conducted emission measurement	EN IEC 62040-2:2018	9.1	B	PASS
Radiated emission measurement	EN IEC 62040-2:2018	9.2	A	PASS
Harmonic current emission measurement	EN IEC 61000-3-2:2019	9.3	A	PASS
Voltage changes, fluctuations and flicker measurement	EN 61000-3-3:2013 + A1:2019 + A2:2021	9.4	/	PASS

UPSI-2406R2IP-38AC:				
Test (immunity)	Referenced standard	Required criteria	Achieved criteria	Conclusion
Electrostatic discharge immunity measurement	EN 61000-4-2:2009	B	A	PASS
Radiated, RF electromagnetic field immunity measurement	EN 61000-4-3:2006 + A1:2008 + A2:2010	A	A	PASS
Electrical fast transients/burst immunity measurement	EN 61000-4-4:2012	B	A	PASS
Surge immunity measurement	EN 61000-4-5:2014	B	B	PASS
Conducted disturbances, induced by RF fields immunity measurement	EN 61000-4-6:2014	A	A	PASS
Power frequency magnetic field immunity measurement	EN 61000-4-8:2010	A	A	PASS
Immunity to low-frequency signals	EN IEC 62040-2018, D.6	A	A	PASS
NOTE: for detailed description of achieved criteria refer to each test separately				

UPSI-2406R2IP-38AC-3B:				
Test (immunity)	Referenced standard	Required criteria	Achieved criteria	Conclusion
Electrostatic discharge immunity measurement	EN 61000-4-2:2009	B	A	PASS
Radiated, RF electromagnetic field immunity measurement	EN 61000-4-3:2006 + A1:2008 + A2:2010	A	A	PASS
Electrical fast transients/burst immunity measurement	EN 61000-4-4:2012	B	A	PASS
Surge immunity measurement	EN 61000-4-5:2014	B	B	PASS
Power frequency magnetic field immunity measurement	EN 61000-4-8:2010	A	A	PASS
Immunity to low-frequency signals	EN IEC 62040-2018, D.6	A	A	PASS
NOTE: for detailed description of achieved criteria refer to each test separately				

NOTE: no non-standard test method used

8. Performance/observation criteria

If there are no special manufacturer performance criteria defined, those below are used for evaluation.

	Criterion A	Criterion B
External and internal indications and metering	Change only during test	Change only during test
Control signals to external devices	No change	Change only temporarily in consistency with the actual UPS mode of operation
Mode of operation	No change	Change only temporarily

Test	Observed function
Electrostatic discharge immunity measurement ^{NOTE}	AC input current, DC output voltage, LED
Radiated, RF electromagnetic field immunity measurement ^{NOTE}	
Electrical fast transients/burst immunity measurement ^{NOTE}	
Surge immunity measurement ^{NOTE}	
Conducted disturbances, induced by RF fields immunity measurement ^{NOTE}	
Power frequency magnetic field immunity measurement ^{NOTE}	
NOTE: see section 7, referenced standards	

9. Emission

9.1 Conducted emission measurement

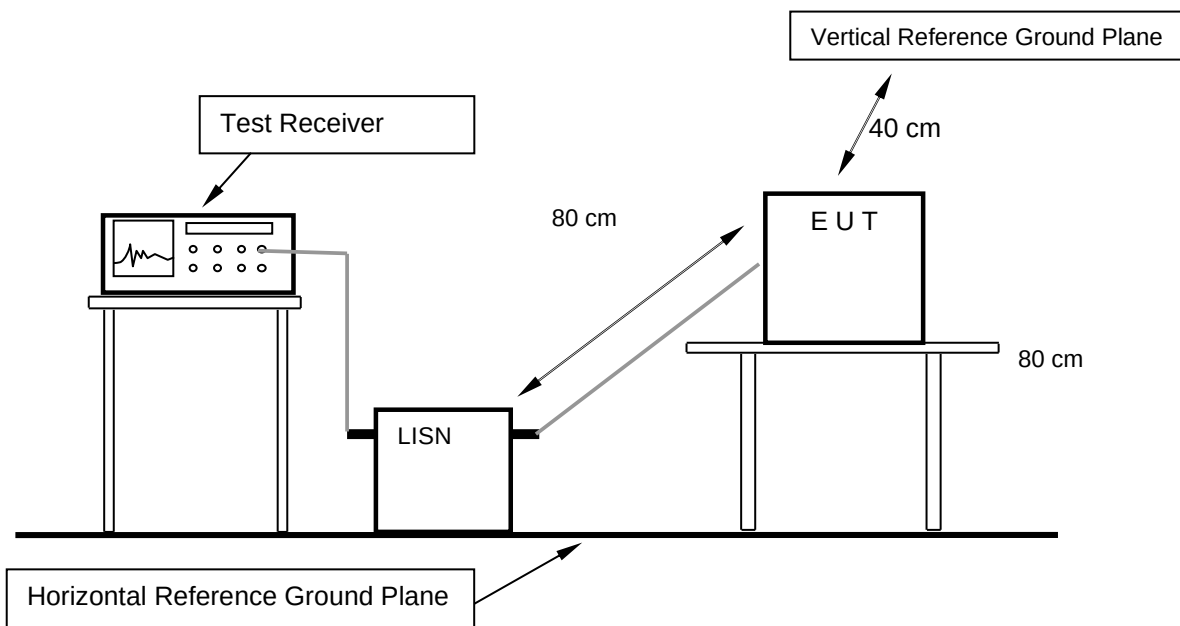
9.1.1 Limits of conducted emission measurement

AC ports:		
Frequency (MHz)	Limit Class B (dB μ V)	
	Quasi-peak	Average
0,15 – 0,5	66 - 56	56 - 46
0,5 – 5,0	56	46
5,0 – 30,0	60	50

9.1.1 Test procedure

- The EUT is placed 0,4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). LISN provide 50 Ohm / 50 μ H+5 Ohm of coupling impedance for the measuring instrument.
- EUT is checked for maximum conducted interference:
- Frequency range from 150 kHz to 30 MHz is searched.
- Artificial hand is not applied

9.1.2 Test setup



For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

9.1.1 Test results

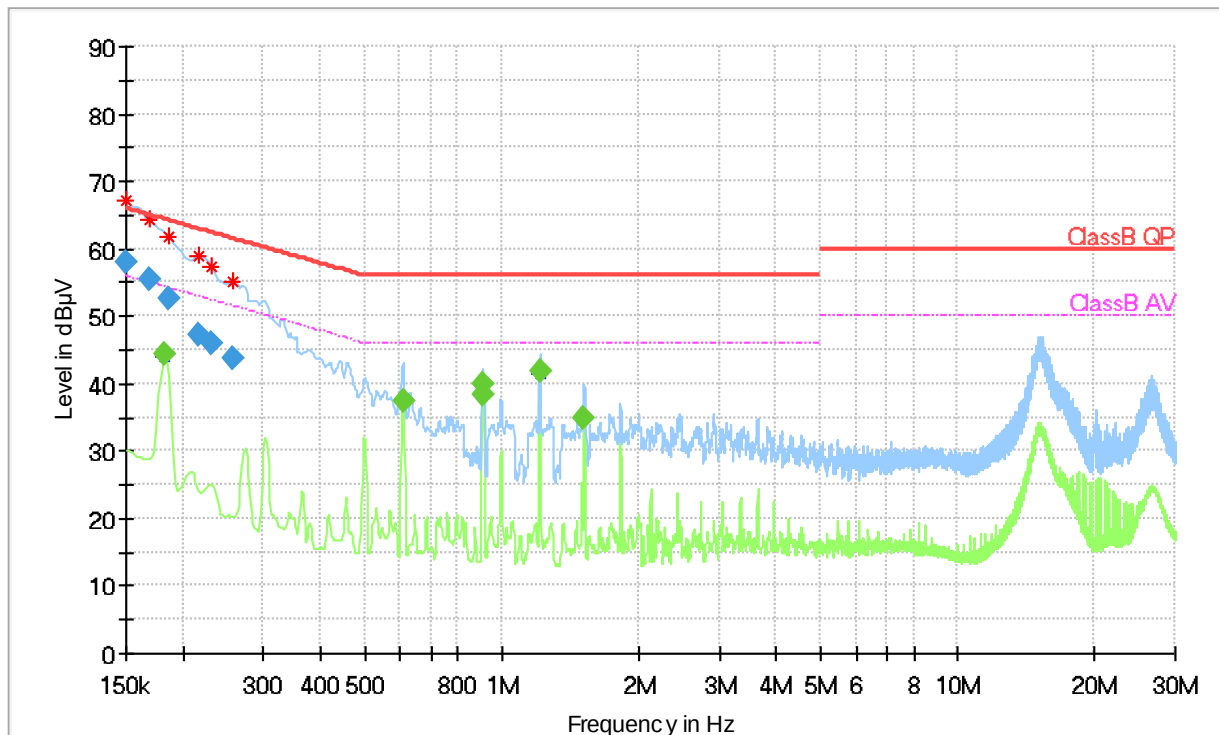
UPSI-2406R2IP-38AC:

Operating mode(s): 1

CONDUCTED EMISSION

EUT Information

EUT: UPSI-2406R2IP-38AC
Operating mode: Uin: 100 V / 60 Hz; Output: 24VDC 6A
Lines: L + N



— Preview Result 2-AVG — Preview Result 1-PK+ * Critical Freqs AVG
* Critical Freqs PK+ — ClassB QP --- ClassB AV
◆ Final Result QPK ◆ Final Result CAV

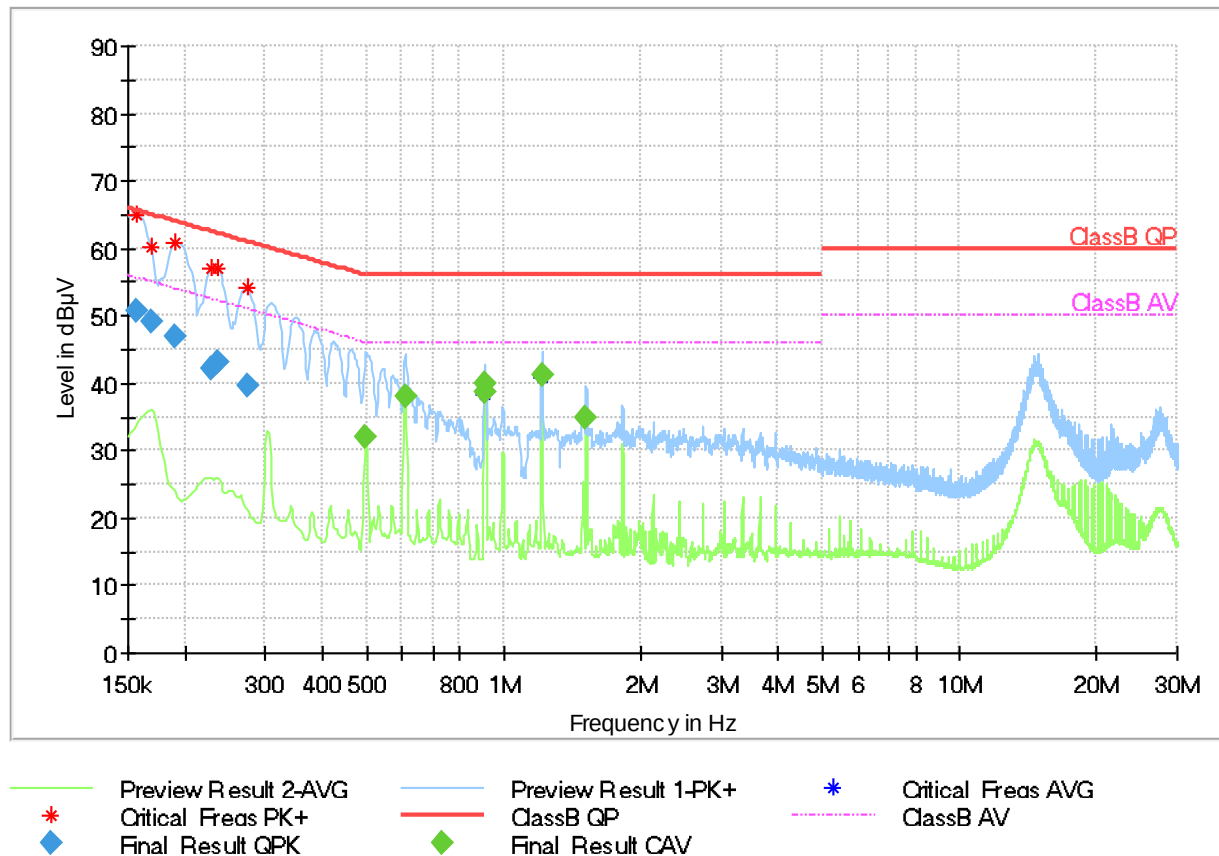
Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
1.214250	---	41.90	46.00	4.10	1000.0	9.000	L1	ON	9.8
0.910500	---	39.77	46.00	6.23	1000.0	9.000	N	ON	9.9
0.908250	---	38.49	46.00	7.51	1000.0	9.000	N	ON	9.9
0.150000	58.01	---	66.00	7.99	1000.0	9.000	L1	ON	9.8
0.606750	---	37.45	46.00	8.55	1000.0	9.000	N	ON	10.0
0.168000	55.36	---	65.06	9.70	1000.0	9.000	L1	ON	10.2
0.181500	---	44.22	54.42	10.20	1000.0	9.000	L1	ON	10.1
1.518000	---	34.89	46.00	11.11	1000.0	9.000	N	ON	9.8
0.186000	52.53	---	64.21	11.68	1000.0	9.000	L1	ON	10.0
0.217500	47.21	---	62.91	15.71	1000.0	9.000	N	ON	9.9
0.231000	46.00	---	62.41	16.41	1000.0	9.000	N	ON	9.9
0.258000	43.58	---	61.50	17.92	1000.0	9.000	N	ON	9.9

CONDUCTED EMISSION

EUT Information

EUT: UPSI-2406R2IP-38AC
 Operating mode: Uin: 240 V / 50 Hz; Output: 24VDC 6A
 Lines: L + N



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
1.214250	---	41.24	46.00	4.76	1000.0	9.000	L1	ON	9.8
0.910500	---	40.07	46.00	5.93	1000.0	9.000	N	ON	9.9
0.908250	---	38.65	46.00	7.35	1000.0	9.000	N	ON	9.9
0.606750	---	37.90	46.00	8.10	1000.0	9.000	N	ON	10.0
1.518000	---	35.01	46.00	10.99	1000.0	9.000	L1	ON	9.8
0.498750	---	31.90	46.02	14.12	1000.0	9.000	N	ON	10.1
0.156750	50.60	---	65.63	15.03	1000.0	9.000	N	ON	10.0
0.168000	48.97	---	65.06	16.09	1000.0	9.000	N	ON	10.2
0.190500	46.81	---	64.02	17.21	1000.0	9.000	N	ON	10.0
0.235500	43.19	---	62.25	19.06	1000.0	9.000	N	ON	9.9
0.228750	42.14	---	62.50	20.36	1000.0	9.000	N	ON	9.9
0.273750	39.56	---	61.00	21.44	1000.0	9.000	N	ON	9.9

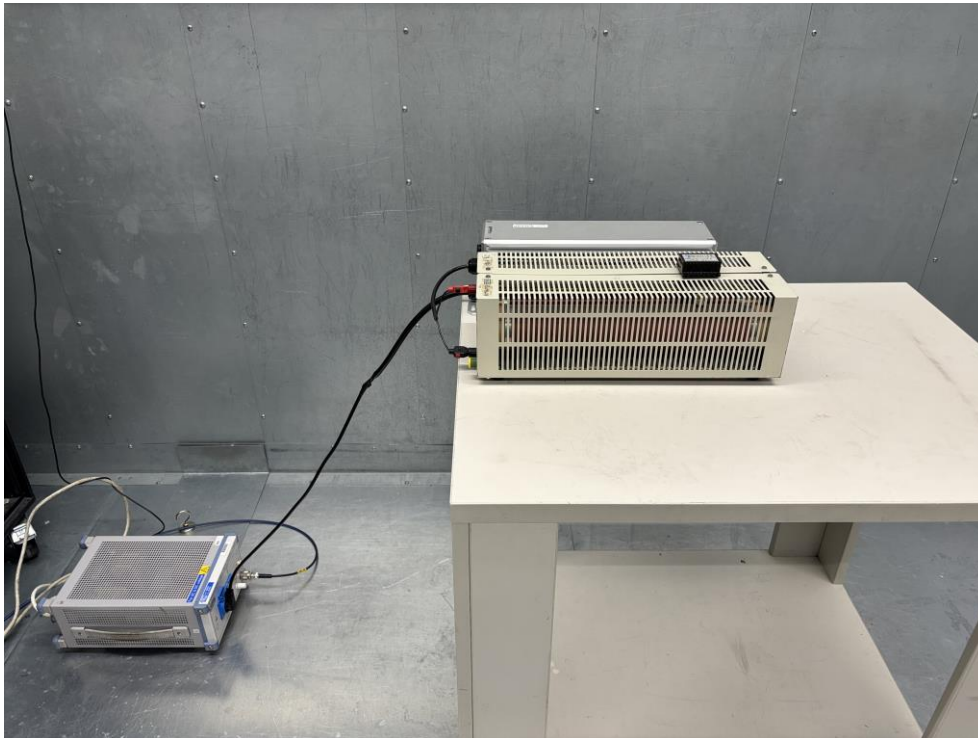


Figure 1: Conducted emission measurement

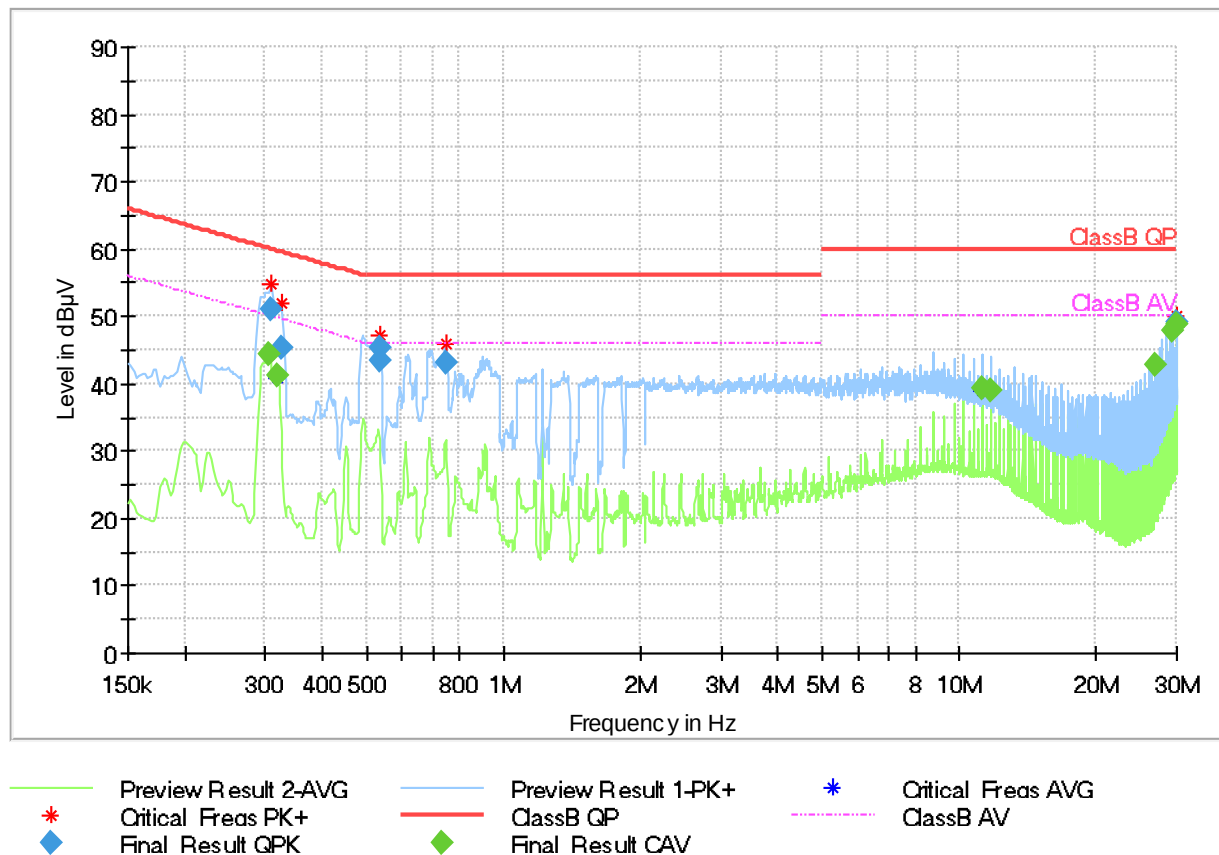
UPSI-2406R2IP-38AC-3B:

Operating mode(s): 1

CONDUCTED EMISSION

EUT Information

EUT: UPSI-2406R2IP-38A-B3
 Operating mode: Uin: 100 V / 60 Hz; Uout: 48VDC 2.5A
 Line L + N



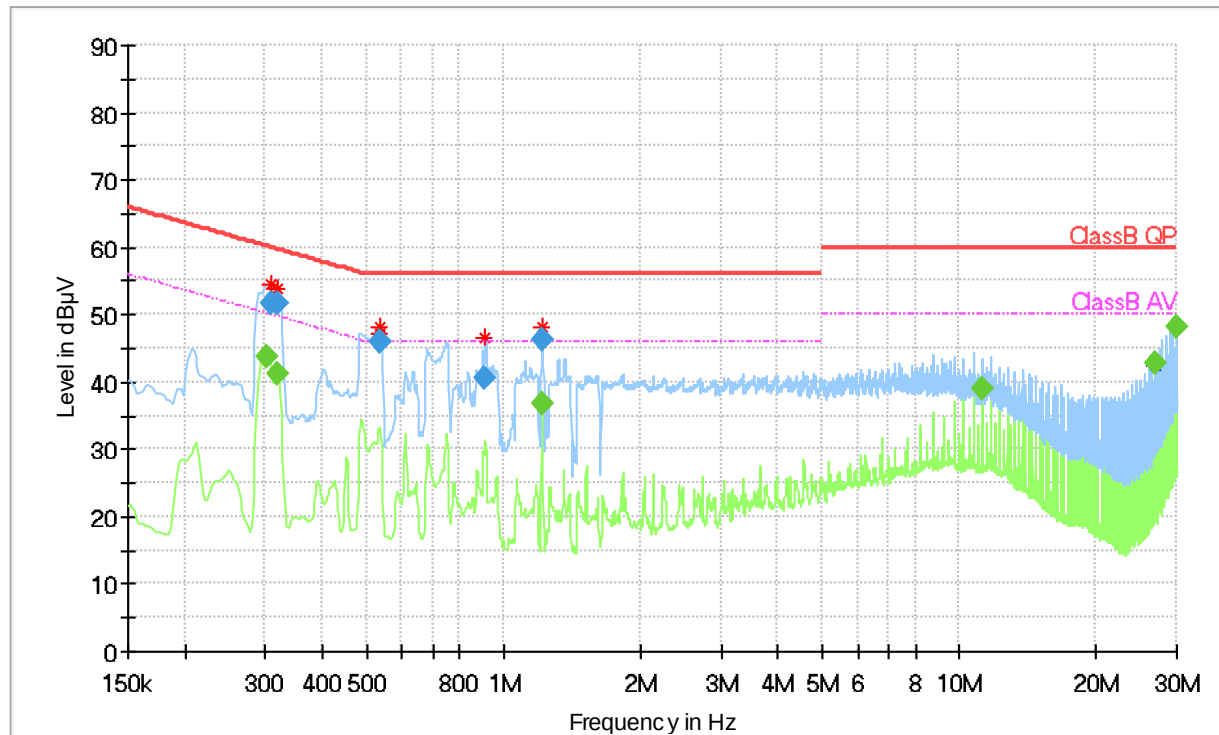
Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
29.951250	---	48.72	50.00	1.28	1000.0	9.000	L1	ON	10.1
29.451750	---	47.89	50.00	2.11	1000.0	9.000	L1	ON	10.1
0.305250	---	44.30	50.10	5.79	1000.0	9.000	L1	ON	9.9
26.956500	---	42.93	50.00	7.07	1000.0	9.000	L1	ON	10.1
0.318750	---	41.05	49.74	8.69	1000.0	9.000	L1	ON	9.9
0.309750	51.17	---	59.98	8.81	1000.0	9.000	N	ON	9.9
0.534750	45.38	---	56.00	10.62	1000.0	9.000	L1	ON	10.1
11.231250	---	39.16	50.00	10.84	1000.0	9.000	L1	ON	9.8
11.730750	---	39.13	50.00	10.87	1000.0	9.000	L1	ON	9.8
29.951250	49.12	---	60.00	10.88	1000.0	9.000	L1	ON	10.1
0.537000	43.29	---	56.00	12.71	1000.0	9.000	L1	ON	10.1
0.748500	43.23	---	56.00	12.77	1000.0	9.000	L1	ON	9.9
0.325500	45.18	---	59.57	14.39	1000.0	9.000	L1	ON	9.9

CONDUCTED EMISSION

EUT Information

EUT: UPSI-2406R2IP-38A-B3
Operating mode: Uin: 240 V / 50 Hz; Uout: 48VDC 2.5A
Line L + N



— Preview Result 2-AVG
— Preview Result 1-PK+
— ClassB QP
- - - ClassB AV
★ Critical Freqs PK+
◆ Final Result QPK
◆ Final Result CAV
★ Critical Freqs AVG

Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
29.949000	---	48.31	50.00	1.69	1000.0	9.000	L1	ON	10.1
0.303000	---	43.65	50.16	6.51	1000.0	9.000	N	ON	9.9
26.954250	---	42.71	50.00	7.29	1000.0	9.000	L1	ON	10.1
0.318750	51.65	---	59.74	8.08	1000.0	9.000	L1	ON	9.9
0.307500	51.55	---	60.04	8.48	1000.0	9.000	N	ON	9.9
0.318750	---	41.10	49.74	8.64	1000.0	9.000	L1	ON	9.9
1.216500	---	36.85	46.00	9.15	1000.0	9.000	N	ON	9.8
1.216500	46.38	---	56.00	9.62	1000.0	9.000	N	ON	9.8
0.537000	46.03	---	56.00	9.97	1000.0	9.000	L1	ON	10.1
0.534750	45.81	---	56.00	10.19	1000.0	9.000	L1	ON	10.1
11.231250	---	39.09	50.00	10.91	1000.0	9.000	L1	ON	9.8
0.912750	40.71	---	56.00	15.29	1000.0	9.000	N	ON	9.9

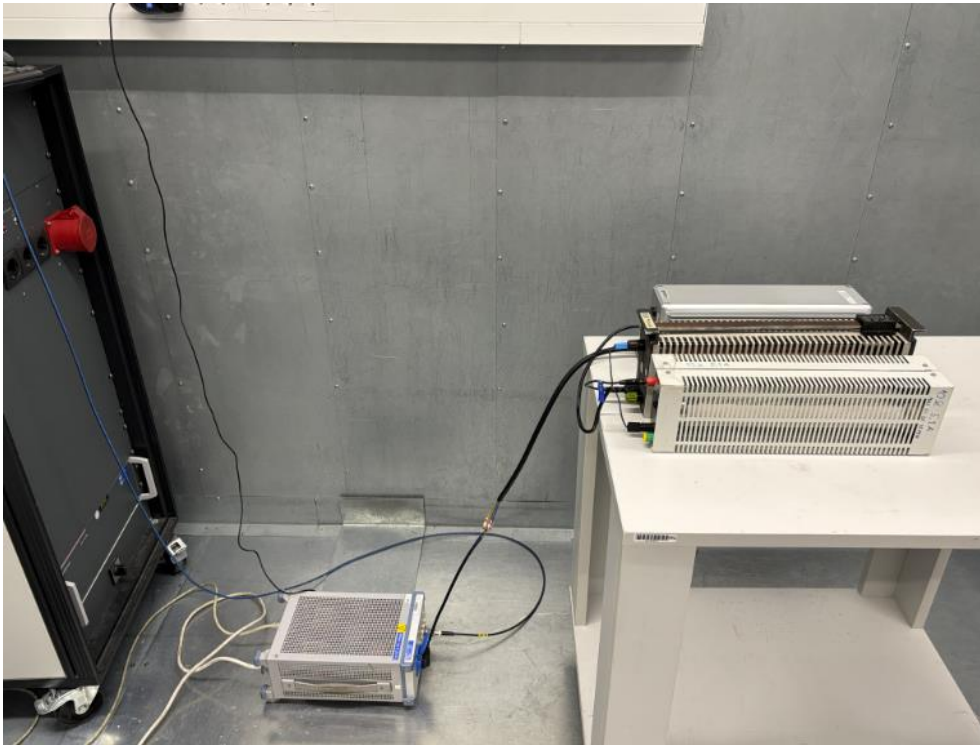


Figure 2: Conducted emission measurement

9.2 Radiated emission measurement

9.2.1 Limits of radiated emission measurement

Frequency (MHz)	Limit class B (at 3 m) (dB μ V/m)	
30 – 230	40	Quasi Peak
230 – 1000	47	Quasi Peak

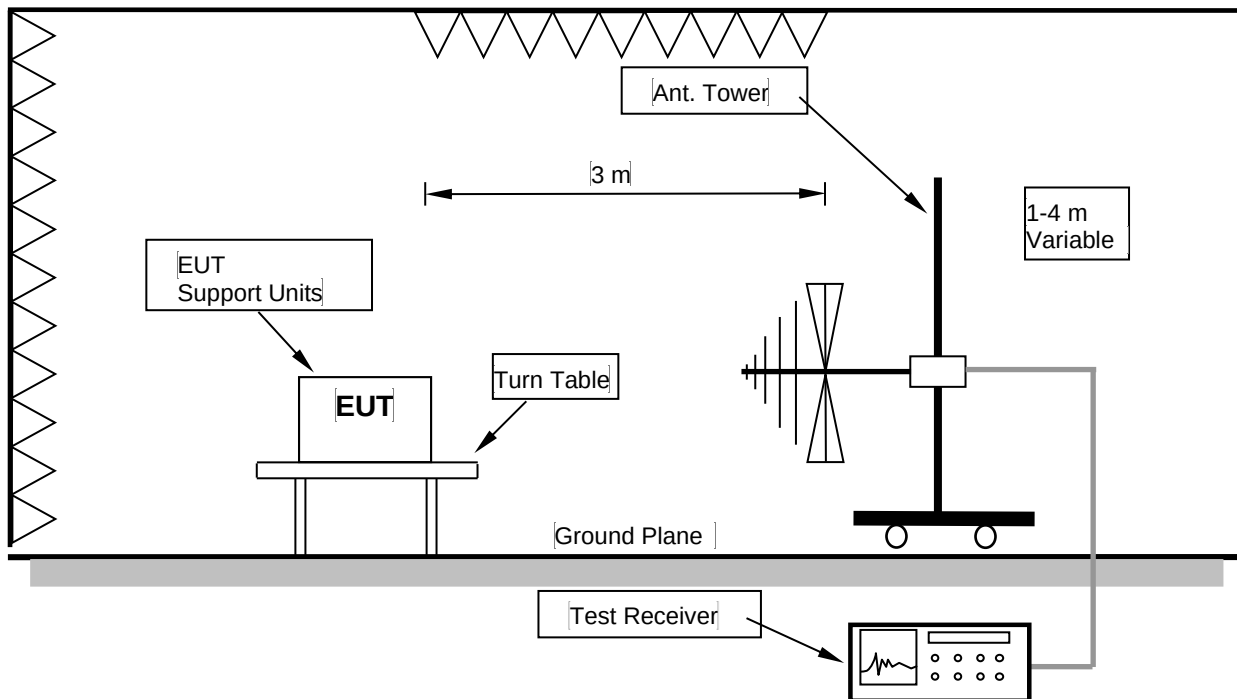
Frequency (MHz)	Limit class A (at 3 m) (dB μ V/m)	
30 – 230	50	Quasi Peak
230 – 1000	57	Quasi Peak

NOTE: • The lower limit shall apply at the transition frequencies.
• Emission level (dB μ V/m) = 20 log Emission level (μ V/m).

9.2.2 Test procedure

- The EUT is set 3 m away from the interference-receiving antenna, which was mounted on the top of variable-height antenna tower.
- The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- For each suspected emission, the EUT is arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the turn table is turned from 0 degrees to 360 degrees to find the maximum reading.
- The test-receiver system is set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- The highest points are to be re-tested one by one using the quasi-peak method.
- CMAD has been applied in test setup on the following cables: AC input

9.2.1 Test setup



For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

9.2.2 Test result

UPSI-2406R2IP-38AC:	
Operating mode(s):	1, 2

Precheck measurements:

Radiated emission

EUT Information

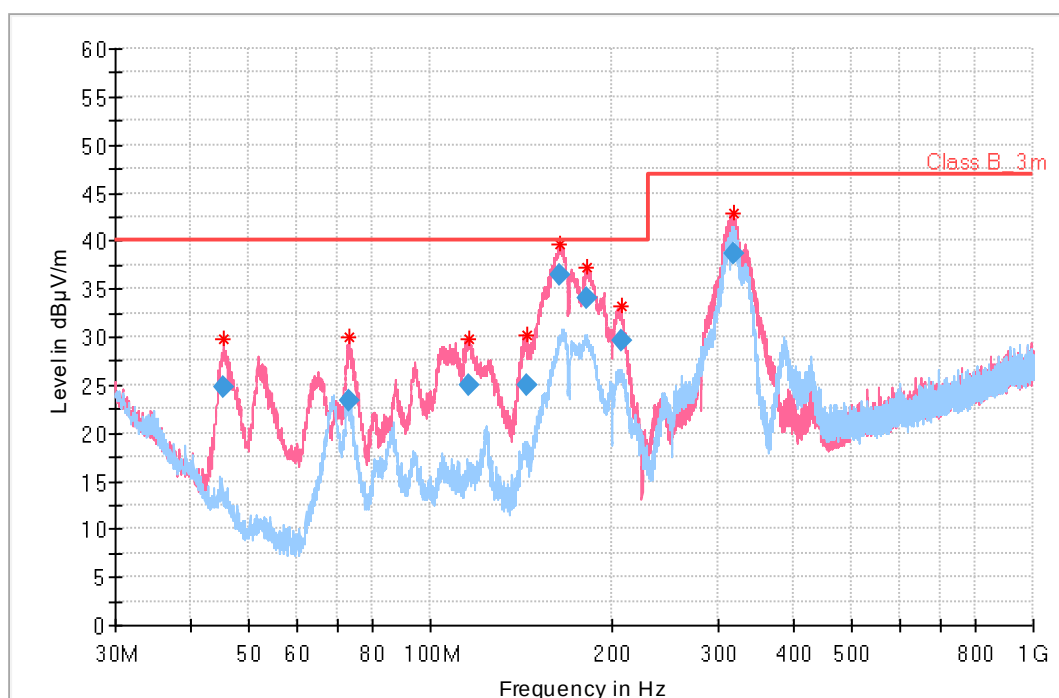
EUT:

UPSI-2406R2IP-38AC

Operating Mode:

Uin: 100V / 60Hz; Output on load 24VDC 6A

Full Spectrum



Final Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth h (kHz)	Height (cm)	Pol	Azimuth h (deg)	Corr . (dB/)
163.830000	36.54	40.00	3.46	1000.0	120.000	100.0	V	0.0	9.3
181.710000	34.02	40.00	5.98	1000.0	120.000	100.0	V	0.0	9.4
318.180000	38.66	47.00	8.34	1000.0	120.000	150.0	V	0.0	13.2
206.970000	29.53	40.00	10.47	1000.0	120.000	100.0	V	0.0	9.9
115.770000	24.98	40.00	15.02	1000.0	120.000	100.0	V	0.0	11.6
144.690000	24.89	40.00	15.11	1000.0	120.000	100.0	V	0.0	9.5
45.300000	24.79	40.00	15.21	1000.0	120.000	100.0	V	0.0	10.5
73.200000	23.42	40.00	16.58	1000.0	120.000	150.0	V	0.0	9.0

Radiated emission

EUT Information

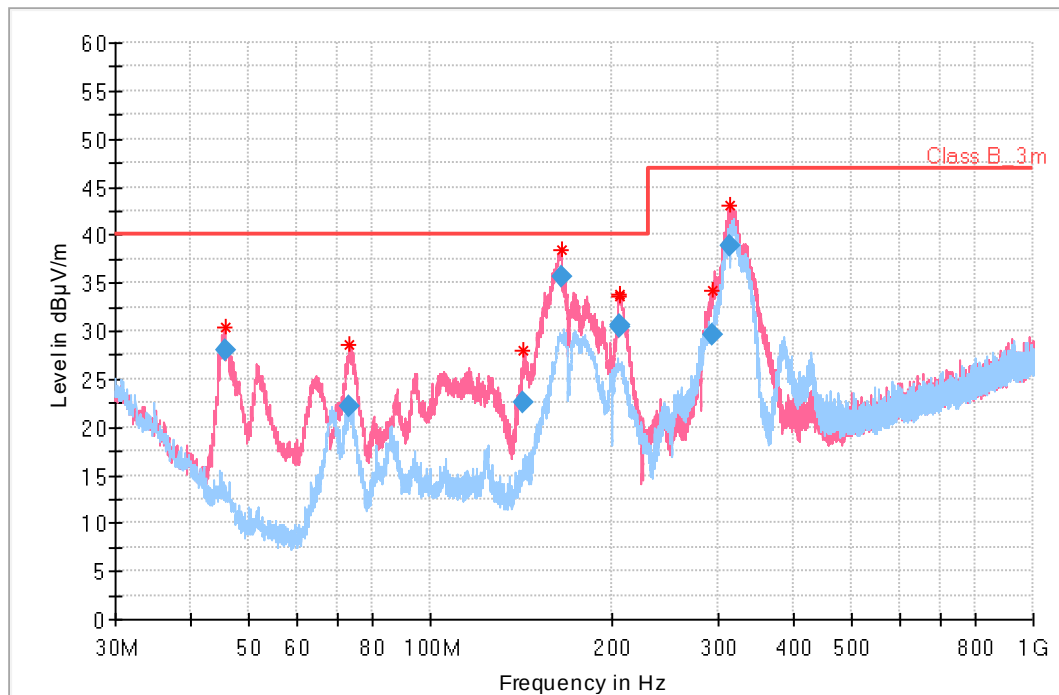
EUT:

UPSI-2406R2IP-38AC

Operating Mode:

Uin: 240V / 50Hz; Output on load 24VDC 6A

Full Spectrum



Final_Result

Frequency (MHz)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr (dB)
164.820000	35.68	40.00	4.32	1000.0	120.000	100.0	V	0.0	9.3
313.770000	38.81	47.00	8.19	1000.0	120.000	150.0	V	0.0	13.1
205.650000	30.58	40.00	9.42	1000.0	120.000	100.0	V	0.0	9.8
206.520000	30.45	40.00	9.55	1000.0	120.000	100.0	V	0.0	9.9
45.540000	28.00	40.00	12.00	1000.0	120.000	100.0	V	0.0	10.4
293.040000	29.56	47.00	17.44	1000.0	120.000	150.0	V	0.0	12.4
142.950000	22.54	40.00	17.46	1000.0	120.000	100.0	V	0.0	9.6
73.290000	22.25	40.00	17.75	1000.0	120.000	200.0	V	0.0	9.0

Final measurements:

Radiated emission

EUT Information

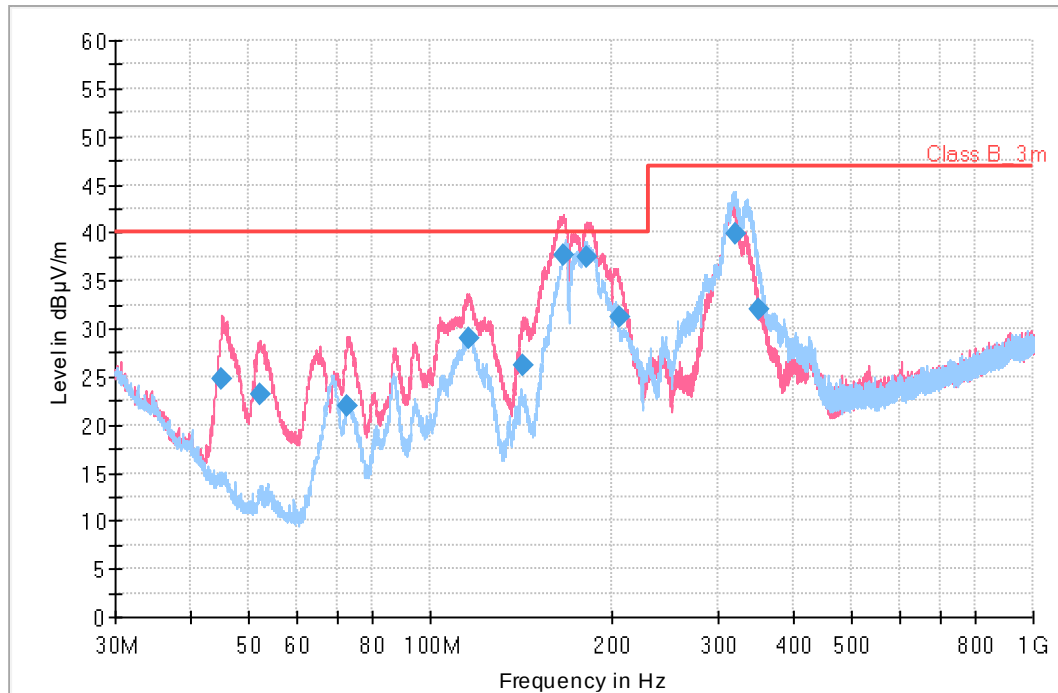
EUT:

UPSI-2406R2IP-38AC

Operating Mode:

Uin: 100V / 60Hz; Output on load 24VDC 6A

Full Spectrum



Final Result

Frequency (MHz)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
166.620000	37.73	40.00	2.27	1000.0	120.000	103.0	V	226.0	9.4
181.980000	37.46	40.00	2.54	1000.0	120.000	103.0	V	270.0	9.3
320.010000	39.89	47.00	7.11	1000.0	120.000	104.0	H	145.0	13.3
206.400000	31.28	40.00	8.72	1000.0	120.000	103.0	V	261.0	9.9
115.680000	28.98	40.00	11.02	1000.0	120.000	103.0	V	192.0	11.6
142.860000	26.23	40.00	13.77	1000.0	120.000	103.0	V	300.0	9.6
350.760000	32.06	47.00	14.94	1000.0	120.000	100.0	H	242.0	14.2
45.180000	24.81	40.00	15.19	1000.0	120.000	103.0	V	116.0	10.6
52.200000	23.10	40.00	16.90	1000.0	120.000	100.0	V	62.0	6.8
72.990000	21.99	40.00	18.01	1000.0	120.000	103.0	V	67.0	8.9

Radiated emission

EUT Information

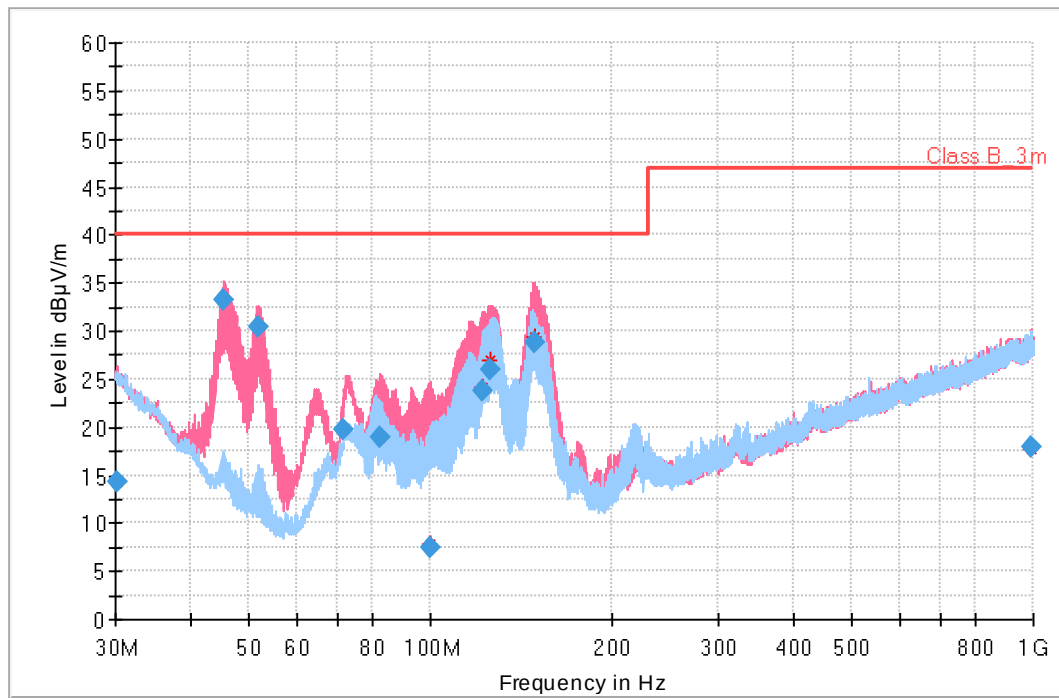
EUT:

UPSI-2406R2IP-38AC

Operating Mode:

Battery mode; Output on load 24VDC 6A

Full Spectrum



Final Result

Frequency (MHz)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr (dB)
45.510000	33.27	40.00	6.73	1000.0	120.000	103.0	V	138.0	10.4
51.870000	30.46	40.00	9.54	1000.0	120.000	103.0	V	123.0	6.9
148.680000	28.70	40.00	11.30	1000.0	120.000	103.0	V	33.0	9.2
125.910000	25.93	40.00	14.07	1000.0	120.000	103.0	V	163.0	11.1
121.680000	23.69	40.00	16.31	1000.0	120.000	110.0	V	173.0	11.4
71.910000	19.69	40.00	20.31	1000.0	120.000	140.0	V	108.0	8.8
82.230000	18.94	40.00	21.06	1000.0	120.000	103.0	V	82.0	10.3
30.270000	14.21	40.00	25.79	1000.0	120.000	106.0	V	2.0	19.7
994.350000	17.83	47.00	29.17	1000.0	120.000	100.0	V	254.0	23.7
100.140000	7.43	40.00	32.57	1000.0	120.000	103.0	V	0.0	11.1



Figure 3: Radiated emission measurement

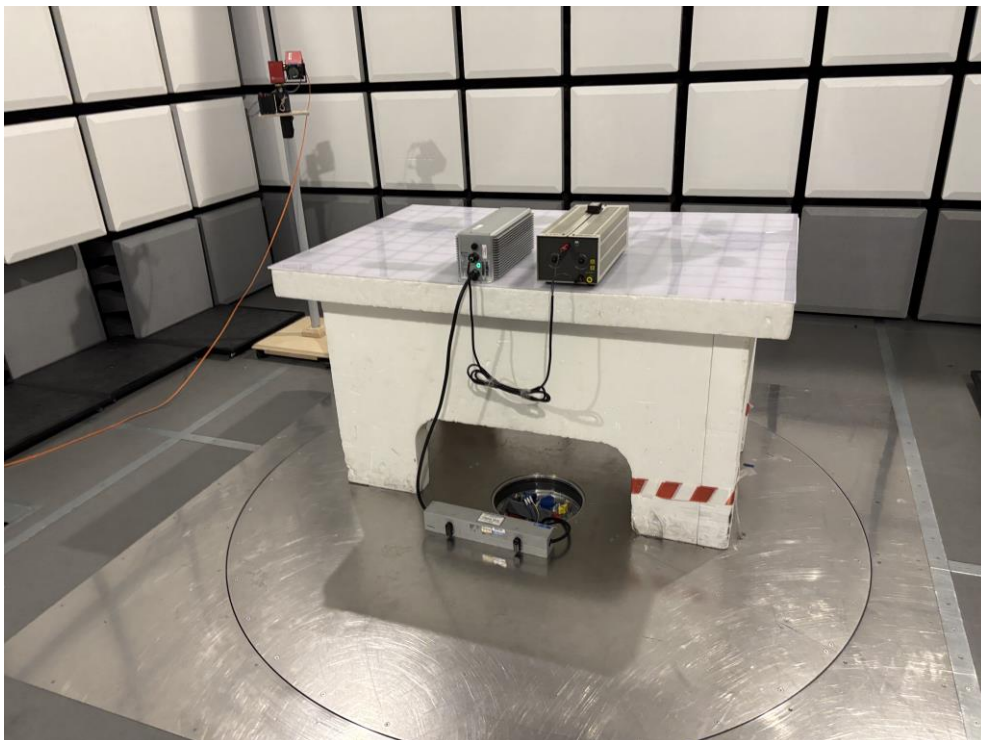


Figure 4: Radiated emission measurement

UPSI-2406R2IP-38AC-3B:
Operating mode(s):
1, 2
Precheck measurements:

Radiated emission

EUT Information

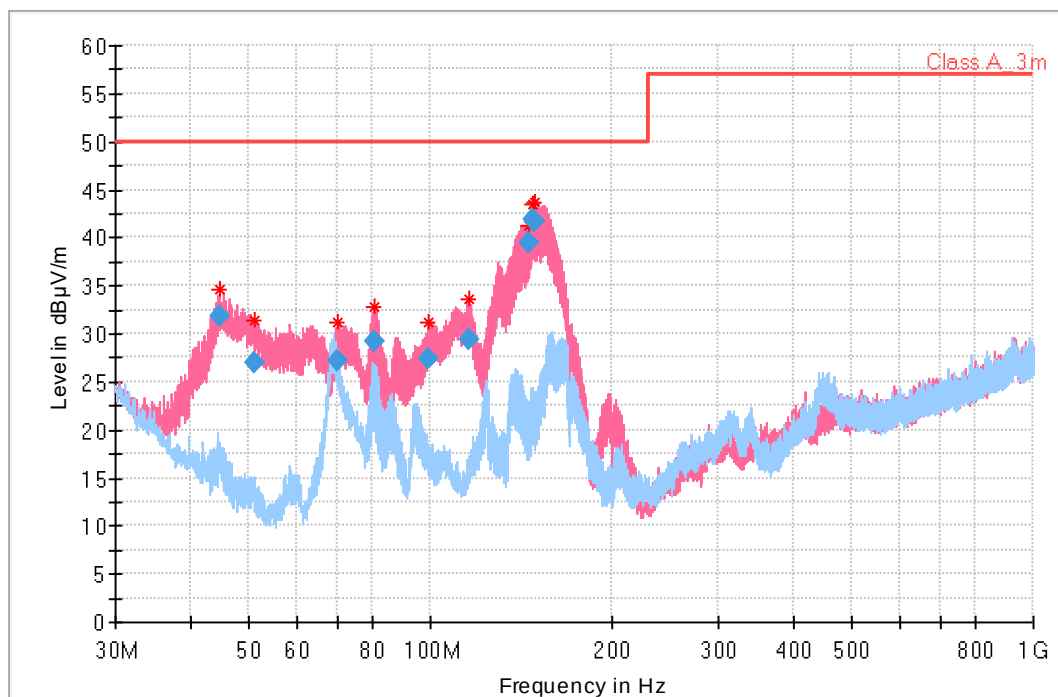
EUT:

UPSI-2406R2IP-38AC-B3

Operating Mode:

Uin: 100V / 60Hz; Output on load 48VDC 2.5A

Full Spectrum



Final Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth h (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr (dB/)
148.020000	41.89	50.00	8.11	1000.0	120.000	100.0	V	0.0	9.2
148.800000	41.69	50.00	8.31	1000.0	120.000	100.0	V	0.0	9.2
145.230000	39.52	50.00	10.48	1000.0	120.000	100.0	V	0.0	9.4
44.760000	31.74	50.00	18.26	1000.0	120.000	100.0	V	0.0	10.9
116.220000	29.44	50.00	20.56	1000.0	120.000	100.0	V	0.0	11.6
80.640000	29.23	50.00	20.77	1000.0	120.000	150.0	V	0.0	10.1
99.450000	27.37	50.00	22.63	1000.0	120.000	200.0	V	0.0	11.1
69.930000	27.18	50.00	22.82	1000.0	120.000	200.0	V	0.0	8.5
51.150000	26.97	50.00	23.03	1000.0	120.000	100.0	V	0.0	7.2

Radiated emission

EUT Information

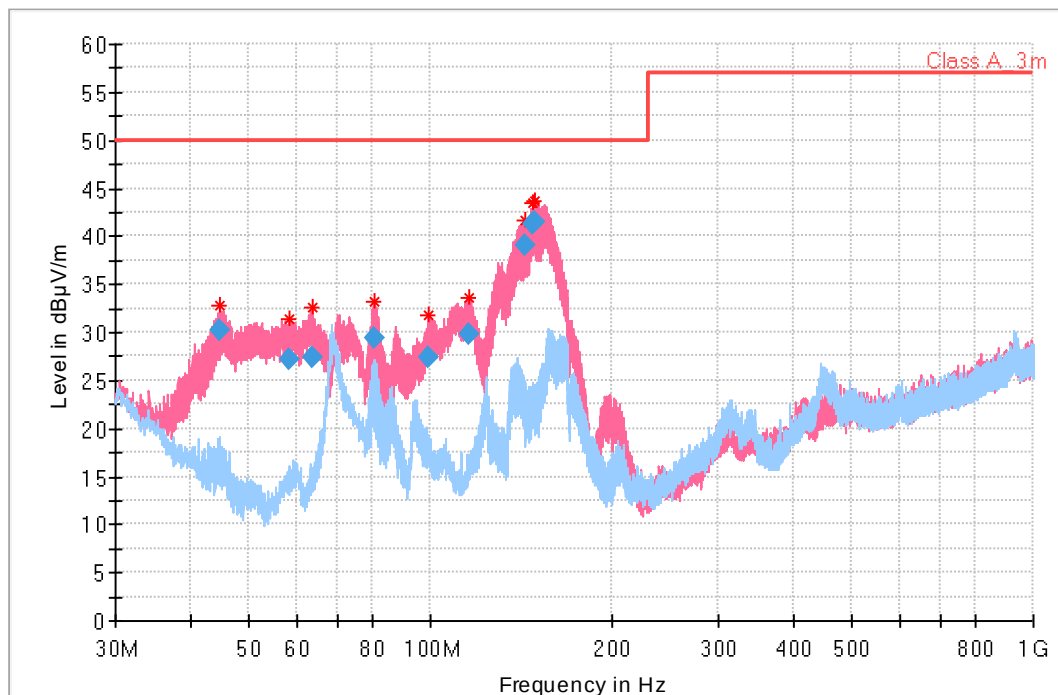
EUT:

UPSI-2406R2IP-38AC-B3

Operating Mode:

Uin: 240V / 50Hz; Output on load 48VDC 2.5A

Full Spectrum



Final Result

Frequency (MHz)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
148.830000	41.50	50.00	8.50	1000.0	120.000	100.0	V	0.0	9.2
147.810000	41.18	50.00	8.82	1000.0	120.000	100.0	V	0.0	9.2
142.980000	38.97	50.00	11.03	1000.0	120.000	100.0	V	0.0	9.6
44.760000	30.25	50.00	19.75	1000.0	120.000	100.0	V	0.0	10.9
116.010000	29.71	50.00	20.29	1000.0	120.000	100.0	V	0.0	11.6
80.910000	29.44	50.00	20.56	1000.0	120.000	100.0	V	0.0	10.1
63.840000	27.41	50.00	22.59	1000.0	120.000	200.0	V	0.0	7.0
99.480000	27.34	50.00	22.66	1000.0	120.000	100.0	V	0.0	11.1
58.500000	27.23	50.00	22.77	1000.0	120.000	200.0	V	0.0	6.0

Final measurement:

Radiated emission

EUT Information

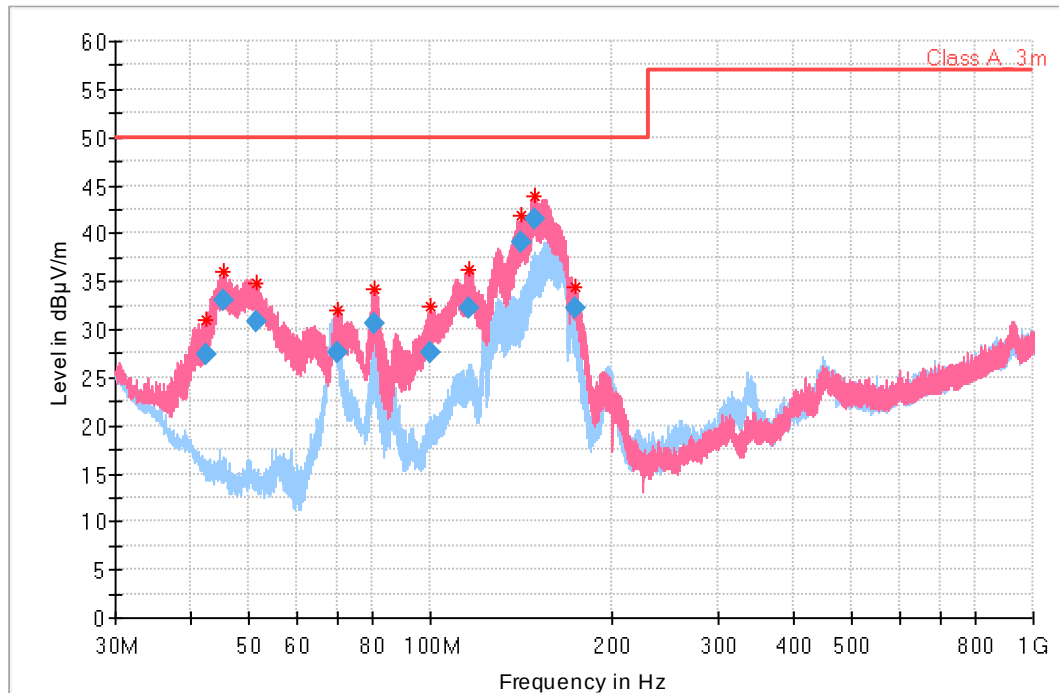
EUT:

UPSI-2406R2IP-38AC-B3

Operating Mode:

Uin: 100V / 60Hz; Output on load 48VDC 2.5A

Full Spectrum



Final Result

Frequency (MHz)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/)
148.770000	41.49	50.00	8.51	1000.0	120.000	100.0	V	327.0	9.2
141.630000	39.16	50.00	10.84	1000.0	120.000	100.0	V	317.0	9.7
45.270000	32.97	50.00	17.03	1000.0	120.000	100.0	V	175.0	10.5
173.430000	32.29	50.00	17.71	1000.0	120.000	100.0	V	130.0	10.0
115.710000	32.24	50.00	17.76	1000.0	120.000	100.0	V	135.0	11.6
51.360000	30.86	50.00	19.14	1000.0	120.000	100.0	V	145.0	7.1
80.610000	30.61	50.00	19.39	1000.0	120.000	100.0	V	51.0	10.1
99.930000	27.68	50.00	22.32	1000.0	120.000	100.0	V	72.0	11.1
70.170000	27.54	50.00	22.46	1000.0	120.000	100.0	V	87.0	8.6
42.450000	27.39	50.00	22.61	1000.0	120.000	100.0	V	150.0	12.3

Radiated emission

EUT Information

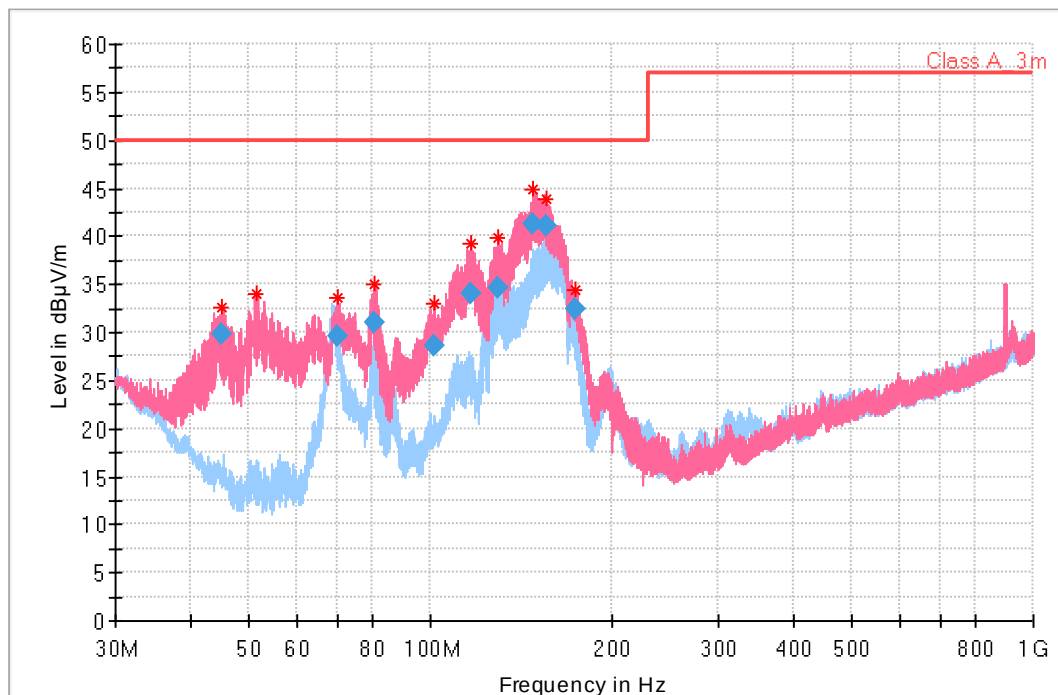
EUT:

UPSI-2406R2IP-38AC-B3

Operating Mode:

Battery mode; Output on load 48VDC 2.5A

Full Spectrum



Final Result

Frequency (MHz)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
147.990000	41.31	50.00	8.69	1000.0	120.000	100.0	V	314.0	9.2
155.610000	41.00	50.00	9.00	1000.0	120.000	100.0	V	324.0	9.1
129.420000	34.61	50.00	15.39	1000.0	120.000	100.0	V	290.0	10.8
116.970000	33.96	50.00	16.04	1000.0	120.000	100.0	V	128.0	11.6
173.400000	32.47	50.00	17.53	1000.0	120.000	100.0	V	138.0	9.9
80.850000	30.96	50.00	19.04	1000.0	120.000	100.0	V	88.0	10.1
45.000000	29.81	50.00	20.19	1000.0	120.000	100.0	V	164.0	10.7
69.900000	29.50	50.00	20.50	1000.0	120.000	100.0	V	98.0	8.5
101.460000	28.56	50.00	21.44	1000.0	120.000	100.0	V	78.0	11.2
51.360000	-0.50	50.00	50.50	1000.0	120.000	100.0	V	185.0	7.1



Figure 5: Radiated emission measurement

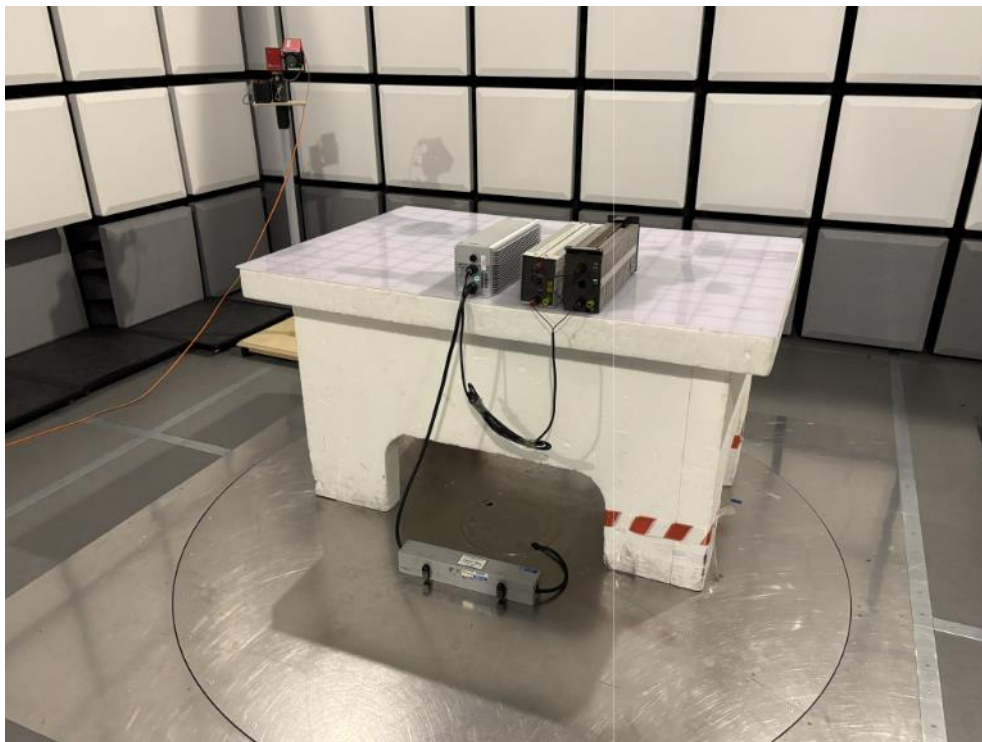


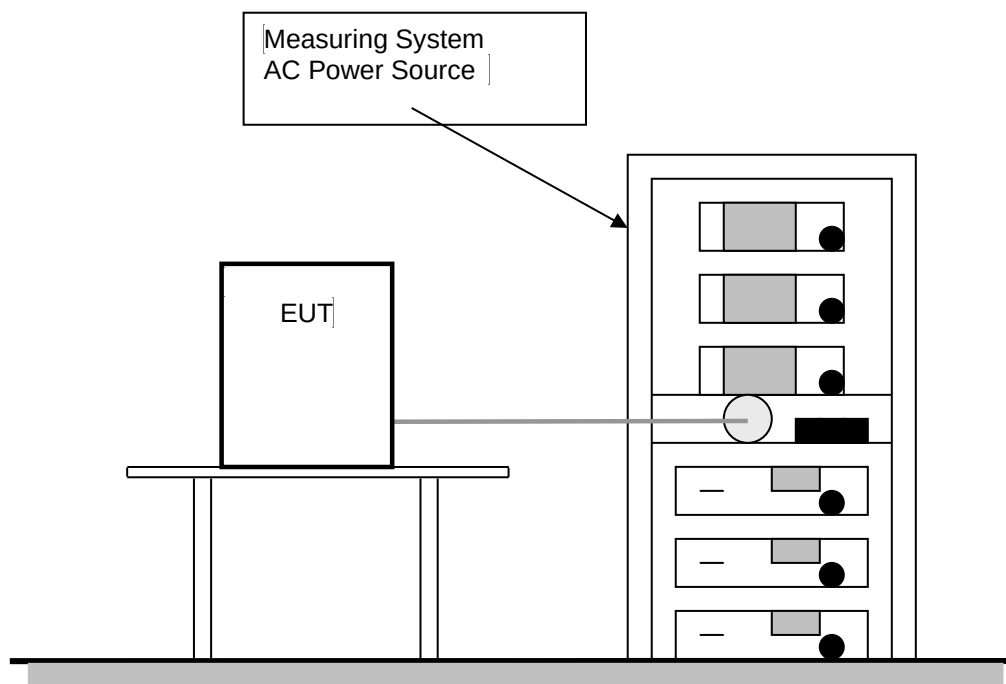
Figure 6: Radiated emission measurement

9.3 Harmonic current emissions measurement

9.3.1 Configuration

- The EUT is placed on the top of an insulating support 0,1 (floor equipment) or 0,8 (table-top equipment) meters in height above the ground and operated to produce the maximum harmonic components under normal operating conditions for each successive harmonic component in turn.
- The correspondent test program of test instrument to measure the current harmonics emanated from EUT is chosen. The measure time shall be not less than the time necessary for the EUT to be exercised.

9.3.2 Test setup



For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

9.3.3 Test results

UPSI-2406R2IP-38AC:
Operating mode(s): 1

Test Report

Report Number : C20250450

Test Object : UPSI-2406R2IP

Test Standard : IEC 61000-3-2 (Edition 5.2)

Test Date : 4/18/2025 9:25:24 AM

Result

E.U.T. : PASS Power Source : PASS

Test Object / Product

Name : UPSI-2406R2IP Operation Mode : Uin:230V/50Hz; Ouput on load 24VDC 6A

Serial Number : Connection :

Description :

Devices

Device : DPA500N1.1 Serial Number : P2502295364

Interface : USB Firmware : 6.13

Measurement Settings

According to : IEC 61000-3-2 (Edition 5.2)

Measure Window : 10 periods Voltage Range : 500 V

Refresh Interval : 2 s Current Range : 200 A

Sampling Rate : 10,24 kS/s

Scaled Window : Rectangular Current Probe : Other
(Ratio: 10 mV/A,
Number of turns: 2,
PhaseCompensation: 0)

Test Duration : 2 min 30 s / 2 min 30 s Observation Period : Quasi-stationary

Detailed Results

E.U.T.:	PASS
Power Source:	PASS
Connection Type:	L - N
Main Line:	230 V, 50 Hz
Classification:	Class A
Application of Limits:	less than or equal to 150% (without POHC clause)

Evaluation of Partial Odd Harmonics Enhancement

<i>Partial Odd Harmonic Currents</i>	<i>measured value</i>	<i>limit</i>	<i>result</i>
Line 1:	0,008 A (1,18 %)	0,251 A	PASS
<i>Evaluation for current limits</i>	<i>without enhancement</i>	<i>with enhancement</i>	<i>need enhancement</i>
Line 1:	PASS	PASS	No
Enhancement is not applied			

Check Harmonics 2..40

<i>First detected harmonic order > 150 %</i>	
Line 1:	None
<i>Harmonics orders > 150 %</i>	
Line 1:	None
<i>Harmonics orders with average > 100 %</i>	
Line 1:	None

Measured values

	<i>Fundamental Current</i>	<i>Active input Power</i>	<i>Circuit power factor</i>
Line 1:	0,682 A	157,095 W *	0,996 *

* Absolute value.

Detailed Results

E.U.T.:	PASS
Power Source:	PASS
Connection Type:	L - N
Main Line:	230 V, 50 Hz
Classification:	Class A
Application of Limits:	less than or equal to 150% (without POHC clause)

Evaluation of Partial Odd Harmonics Enhancement

<i>Partial Odd Harmonic Currents</i>	<i>measured value</i>	<i>limit</i>	<i>result</i>
Line 1:	0,008 A (1,18 %)	0,251 A	PASS
<i>Evaluation for current limits</i>	<i>without enhancement</i>	<i>with enhancement</i>	<i>need enhancement</i>
Line 1:	PASS	PASS	No
Enhancement is not applied			

Check Harmonics 2..40

<i>First detected harmonic order > 150 %</i>	
Line 1:	None
<i>Harmonics orders > 150 %</i>	
Line 1:	None
<i>Harmonics orders with average > 100 %</i>	
Line 1:	None

Measured values

	<i>Fundamental Current</i>	<i>Active input Power</i>	<i>Circuit power factor</i>
Line 1:	0,682 A	157,095 W *	0,996 *

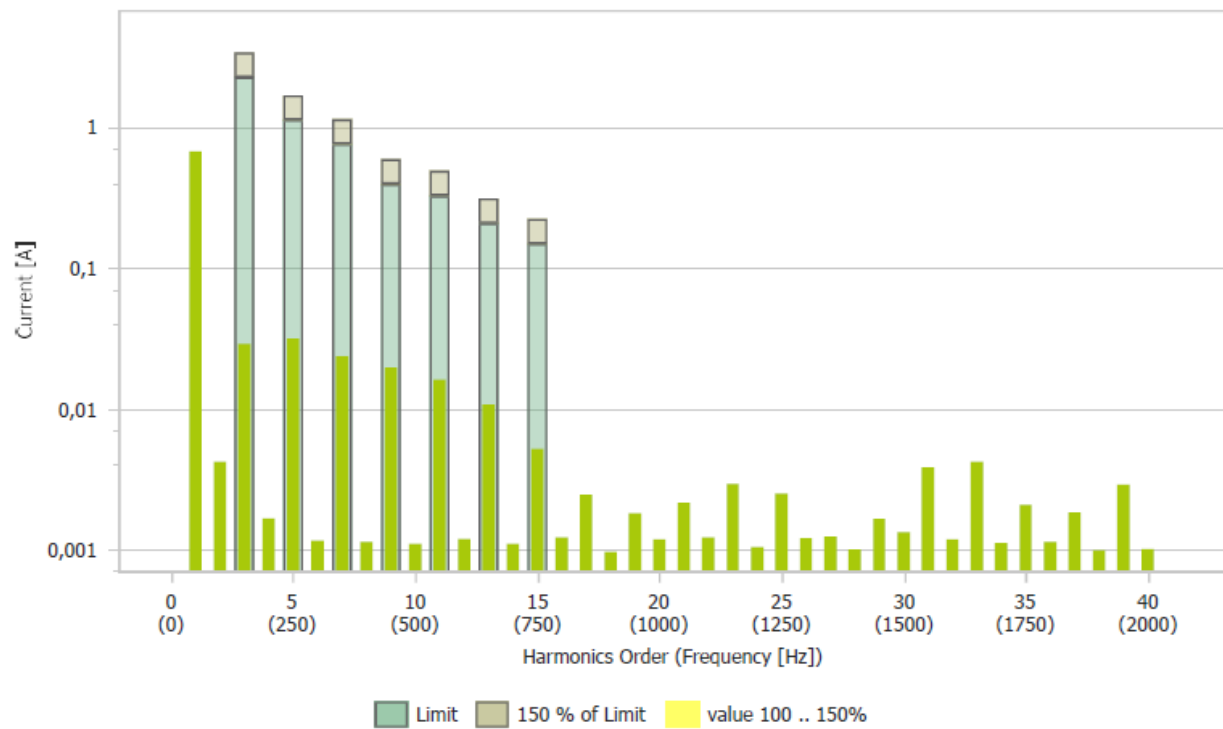
* Absolute value.

Voltage Source Verification

Harmonic voltage results

Hn	Ueff [V]	Ueff [%]	Limit [%]	Result
1	230,649	100,282		
2	0,059	0,026	0,200	PASS
3	0,054	0,023	0,900	PASS
4	0,018	0,008	0,200	PASS
5	0,078	0,034	0,400	PASS
6	0,031	0,014	0,200	PASS
7	0,069	0,030	0,300	PASS
8	0,030	0,013	0,200	PASS
9	0,025	0,011	0,200	PASS
10	0,013	0,006	0,200	PASS
11	0,073	0,032	0,100	PASS
12	0,018	0,008	0,100	PASS
13	0,012	0,005	0,100	PASS
14	0,015	0,006	0,100	PASS
15	0,061	0,027	0,100	PASS
16	0,030	0,013	0,100	PASS
17	0,029	0,013	0,100	PASS
18	0,017	0,007	0,100	PASS
19	0,091	0,039	0,100	PASS
20	0,028	0,012	0,100	PASS
21	0,034	0,015	0,100	PASS
22	0,014	0,006	0,100	PASS
23	0,069	0,030	0,100	PASS
24	0,020	0,009	0,100	PASS
25	0,054	0,023	0,100	PASS
26	0,011	0,005	0,100	PASS
27	0,047	0,020	0,100	PASS
28	0,019	0,008	0,100	PASS
29	0,047	0,020	0,100	PASS
30	0,019	0,008	0,100	PASS
31	0,044	0,019	0,100	PASS
32	0,022	0,010	0,100	PASS
33	0,059	0,025	0,100	PASS
34	0,022	0,010	0,100	PASS
35	0,025	0,011	0,100	PASS
36	0,014	0,006	0,100	PASS
37	0,052	0,023	0,100	PASS
38	0,019	0,008	0,100	PASS
39	0,021	0,009	0,100	PASS
40	0,011	0,005	0,100	PASS

Maximum Harmonics						
Hn	Freq.	Current				
	[Hz]	eff [A]	eff[%]	of Limit [%]	Limit [A]	Time Window
1	50	0,682	100	-	-	1
2	100	0,004	0,617	0,26	1,62	219
3	150	0,029	4,268	0,843	3,45	57
4	200	0,002	0,244	0,258	0,645	405
5	250	0,032	4,663	1,858	1,71	57
6	300	0,001	0,171	0,259	0,45	152
7	350	0,024	3,484	2,056	1,155	623
8	400	0,001	0,166	0,329	0,345	258
9	450	0,02	2,893	3,287	0,6	46
10	500	0,001	0,161	0,399	0,276	480
11	550	0,016	2,376	3,272	0,495	263
12	600	0,001	0,175	0,518	0,23	1
13	650	0,011	1,572	3,401	0,315	45
14	700	0,001	0,162	0,56	0,197	383
15	750	0,005	0,764	2,313	0,225	1
16	800	0,001	0,179	0,708	0,173	109
17	850	0,002	0,361	1,241	0,199	454
18	900	0,001	0,141	0,628	0,153	94
19	950	0,002	0,266	1,021	0,178	693
20	1000	0,001	0,173	0,853	0,138	582
21	1050	0,002	0,317	1,346	0,161	471
22	1100	0,001	0,18	0,976	0,125	594
23	1150	0,003	0,431	2,002	0,147	60
24	1200	0,001	0,153	0,908	0,115	1
25	1250	0,003	0,368	1,859	0,135	148
26	1300	0,001	0,177	1,139	0,106	244
27	1350	0,001	0,181	0,988	0,125	250
28	1400	0,001	0,147	1,016	0,099	137
29	1450	0,002	0,243	1,423	0,116	285
30	1500	0,001	0,195	1,447	0,092	597
31	1550	0,004	0,568	3,554	0,109	428
32	1600	0,001	0,173	1,366	0,086	494
33	1650	0,004	0,621	4,141	0,102	631
34	1700	0,001	0,163	1,372	0,081	1
35	1750	0,002	0,306	2,161	0,096	2
36	1800	0,001	0,166	1,478	0,077	102
37	1850	0,002	0,269	2,006	0,091	630
38	1900	0,001	0,145	1,359	0,073	485
39	1950	0,003	0,425	3,351	0,087	162
40	2000	0,001	0,148	1,461	0,069	500



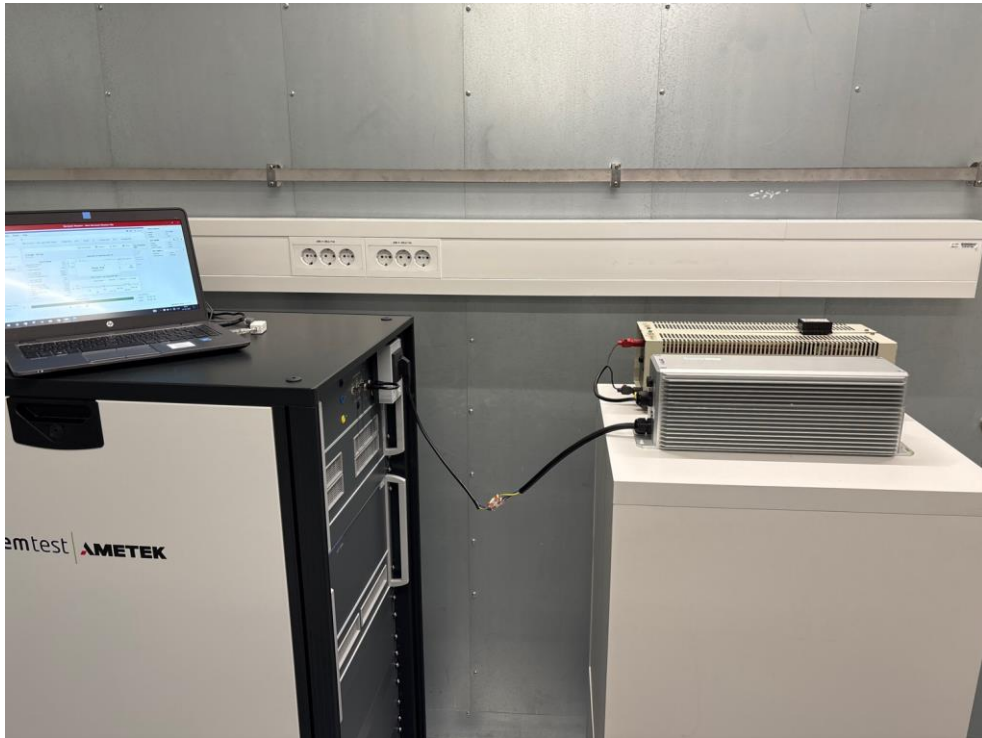


Figure 7: Harmonic current emissions measurement

UPSI-2406R2IP-38AC-3B:	
Operating mode(s):	1

Test Report

Test Object : UPSI-2406R2IP-38AC-B3

Test Standard : IEC 61000-3-2 (Ed5-2) - Class A (230V - 50Hz)

Test Date : 5/5/2025 4:15:05 PM

Result

E.U.T. : PASS Power Source : PASS

Test Object / Product

Name : UPSI-2406R2IP-38AC-B3 Operation Mode : Uin: 230V / 50 Hz; Uout: 48VDC 2.5A

Serial Number : Connection :

Description :

Devices

Device : DPA500N1.1 Serial Number : P2502295364

Interface : USB Firmware : 6.13

Measurement Settings

According to : IEC 61000-3-2 (Edition 5.2)

Measure Window : 10 periods Voltage Range : 500 V

Refresh Interval : 2 s Current Range : 200 A

Sampling Rate : 10,24 kS/s

Scaled Window : Rectangular Current Probe : Other
(Ratio: 10 mV/A,
Number of turns: 2,
PhaseCompensation: 0)

Test Duration : 2 min 30 s / 2 min 30 s Observation Period : Quasi-stationary

Detailed Results

E.U.T.:	PASS
Power Source:	PASS
Connection Type:	L - N
Main Line:	230 V, 50 Hz
Classification:	Class A
Application of Limits:	less than or equal to 150% (without POHC clause)

Evaluation of Partial Odd Harmonics Enhancement

<i>Partial Odd Harmonic Currents</i>	<i>measured value</i>	<i>limit</i>	<i>result</i>
Line 1:	0,028 A (4,18 %)	0,251 A	PASS
<i>Evaluation for current limits</i>	<i>without enhancement</i>	<i>with enhancement</i>	<i>need enhancement</i>
Line 1:	PASS	PASS	No
Enhancement is not applied			

Check Harmonics 2..40

First detected harmonic order > 150 %

Line 1: None

Harmonics orders > 150 %

Line 1: None

Harmonics orders with average > 100 %

Line 1: None

Measured values

	<i>Fundamental Current</i>	<i>Active input Power</i>	<i>Circuit power factor</i>
Line 1:	0,625 A	140,769 W *	0,908 *

* Absolute value.

Current Test Result

Average and Maximum harmonic current results

Hn	Average				Maximum				Harmonic Result
	Ieff [A]	of Limit [%]	Limit [A]	Result	Ieff [A]	of Limit [%]	Limit [A]	Result	
1	0,624				0,625				
2	0,002	0,172	1,080	n/a	0,002	0,132	1,620	n/a	PASS
3	0,236	10,273	2,300	PASS	0,237	6,869	3,450	PASS	PASS
4	0,001	0,299	0,430	n/a	0,001	0,222	0,645	n/a	PASS
5	0,065	5,670	1,140	PASS	0,065	3,817	1,710	PASS	PASS
6	0,001	0,296	0,300	n/a	0,001	0,223	0,450	n/a	PASS
7	0,031	4,068	0,770	PASS	0,032	2,737	1,155	PASS	PASS
8	0,001	0,396	0,230	n/a	0,001	0,302	0,345	n/a	PASS
9	0,006	1,480	0,400	PASS	0,006	1,066	0,600	PASS	PASS
10	0,001	0,490	0,184	n/a	0,001	0,370	0,276	n/a	PASS
11	0,010	2,982	0,330	PASS	0,010	2,029	0,495	PASS	PASS
12	0,001	0,598	0,153	n/a	0,001	0,437	0,230	n/a	PASS
13	0,005	2,460	0,210	PASS	0,006	1,833	0,315	PASS	PASS
14	0,001	0,748	0,131	n/a	0,001	0,556	0,197	n/a	PASS
15	0,004	2,900	0,150	n/a	0,004	1,998	0,225	n/a	PASS
16	0,001	0,780	0,115	n/a	0,001	0,569	0,173	n/a	PASS
17	0,003	2,630	0,132	n/a	0,004	1,970	0,199	n/a	PASS
18	0,001	0,974	0,102	n/a	0,001	0,724	0,153	n/a	PASS
19	0,005	3,925	0,118	n/a	0,005	2,795	0,178	n/a	PASS
20	0,001	1,084	0,092	n/a	0,001	0,807	0,138	n/a	PASS
21	0,004	4,098	0,107	n/a	0,006	3,827	0,161	PASS	PASS
22	0,001	1,331	0,084	n/a	0,001	0,983	0,125	n/a	PASS
23	0,019	19,607	0,098	PASS	0,020	13,777	0,147	PASS	PASS
24	0,001	1,243	0,077	n/a	0,001	0,950	0,115	n/a	PASS
25	0,012	13,544	0,090	PASS	0,013	9,429	0,135	PASS	PASS
26	0,001	1,487	0,071	n/a	0,001	1,137	0,106	n/a	PASS
27	0,007	8,817	0,083	PASS	0,008	6,683	0,125	PASS	PASS
28	0,001	1,543	0,066	n/a	0,001	1,134	0,099	n/a	PASS
29	0,005	6,922	0,078	PASS	0,006	4,954	0,116	PASS	PASS
30	0,001	1,840	0,061	n/a	0,001	1,335	0,092	n/a	PASS
31	0,006	8,810	0,073	PASS	0,007	6,097	0,109	PASS	PASS
32	0,001	1,578	0,058	n/a	0,001	1,147	0,086	n/a	PASS
33	0,005	7,024	0,068	n/a	0,005	4,849	0,102	n/a	PASS
34	0,001	1,802	0,054	n/a	0,001	1,332	0,081	n/a	PASS
35	0,009	14,556	0,064	PASS	0,010	10,040	0,096	PASS	PASS
36	0,001	1,745	0,051	n/a	0,001	1,282	0,077	n/a	PASS
37	0,003	5,032	0,061	n/a	0,003	3,699	0,091	n/a	PASS
38	0,001	2,080	0,048	n/a	0,001	1,515	0,073	n/a	PASS
39	0,003	5,247	0,058	n/a	0,004	4,141	0,087	n/a	PASS
40	0,001	1,983	0,046	n/a	0,001	1,463	0,069	n/a	PASS

Note: Harmonic currents less than 0.6 % of the input current measured under the test conditions, or less than 5 mA, whichever is greater, are disregarded.

Voltage Source Verification

Harmonic voltage results

Hn	Ueff [V]	Ueff [%]	Limit [%]	Result
1	230,678	100,295		
2	0,061	0,026	0,200	PASS
3	0,086	0,037	0,900	PASS
4	0,016	0,007	0,200	PASS
5	0,095	0,041	0,400	PASS
6	0,033	0,014	0,200	PASS
7	0,070	0,031	0,300	PASS
8	0,031	0,013	0,200	PASS
9	0,022	0,010	0,200	PASS
10	0,017	0,008	0,200	PASS
11	0,047	0,020	0,100	PASS
12	0,014	0,006	0,100	PASS
13	0,032	0,014	0,100	PASS
14	0,017	0,008	0,100	PASS
15	0,071	0,031	0,100	PASS
16	0,023	0,010	0,100	PASS
17	0,037	0,016	0,100	PASS
18	0,014	0,006	0,100	PASS
19	0,072	0,031	0,100	PASS
20	0,021	0,009	0,100	PASS
21	0,017	0,007	0,100	PASS
22	0,014	0,006	0,100	PASS
23	0,074	0,032	0,100	PASS
24	0,012	0,005	0,100	PASS
25	0,023	0,010	0,100	PASS
26	0,014	0,006	0,100	PASS
27	0,062	0,027	0,100	PASS
28	0,006	0,003	0,100	PASS
29	0,025	0,011	0,100	PASS
30	0,008	0,004	0,100	PASS
31	0,042	0,018	0,100	PASS
32	0,009	0,004	0,100	PASS
33	0,020	0,009	0,100	PASS
34	0,013	0,005	0,100	PASS
35	0,059	0,026	0,100	PASS
36	0,007	0,003	0,100	PASS
37	0,016	0,007	0,100	PASS
38	0,013	0,006	0,100	PASS
39	0,044	0,019	0,100	PASS
40	0,009	0,004	0,100	PASS

Maximum Harmonics						
Hn	Freq.	Current				
	[Hz]	eff [A]	eff[%]	of Limit [%]	Limit [A]	Time Window
1	50	0,625	100	-	-	3
2	100	0,002	0,343	0,132	1,62	487
3	150	0,237	37,892	6,869	3,45	676
4	200	0,001	0,229	0,222	0,645	710
5	250	0,065	10,437	3,817	1,71	744
6	300	0,001	0,161	0,223	0,45	98
7	350	0,032	5,055	2,737	1,155	723
8	400	0,001	0,166	0,302	0,345	146
9	450	0,007	1,042	1,086	0,6	1
10	500	0,001	0,163	0,37	0,276	86
11	550	0,01	1,617	2,044	0,495	3
12	600	0,001	0,161	0,437	0,23	364
13	650	0,006	0,927	1,84	0,315	20
14	700	0,001	0,175	0,556	0,197	56
15	750	0,004	0,719	1,999	0,225	22
16	800	0,001	0,157	0,569	0,173	61
17	850	0,004	0,625	1,97	0,199	692
18	900	0,001	0,178	0,724	0,153	494
19	950	0,005	0,806	2,84	0,178	1
20	1000	0,001	0,178	0,807	0,138	109
21	1050	0,006	1,03	4,007	0,161	1
22	1100	0,001	0,21	1,047	0,125	1
23	1150	0,02	3,271	13,942	0,147	1
24	1200	0,001	0,175	0,95	0,115	67
25	1250	0,013	2,035	9,429	0,135	735
26	1300	0,001	0,193	1,137	0,106	329
27	1350	0,008	1,336	6,683	0,125	750
28	1400	0,001	0,179	1,134	0,099	312
29	1450	0,006	0,922	4,954	0,116	129
30	1500	0,001	0,196	1,335	0,092	111
31	1550	0,007	1,061	6,097	0,109	364
32	1600	0,001	0,158	1,147	0,086	383
33	1650	0,005	0,793	4,849	0,102	353
34	1700	0,001	0,173	1,332	0,081	231
35	1750	0,01	1,548	10,04	0,096	102
36	1800	0,001	0,192	1,563	0,077	1
37	1850	0,003	0,539	3,699	0,091	716
38	1900	0,001	0,21	1,81	0,073	1
39	1950	0,004	0,573	4,141	0,087	649
40	2000	0,001	0,161	1,463	0,069	183

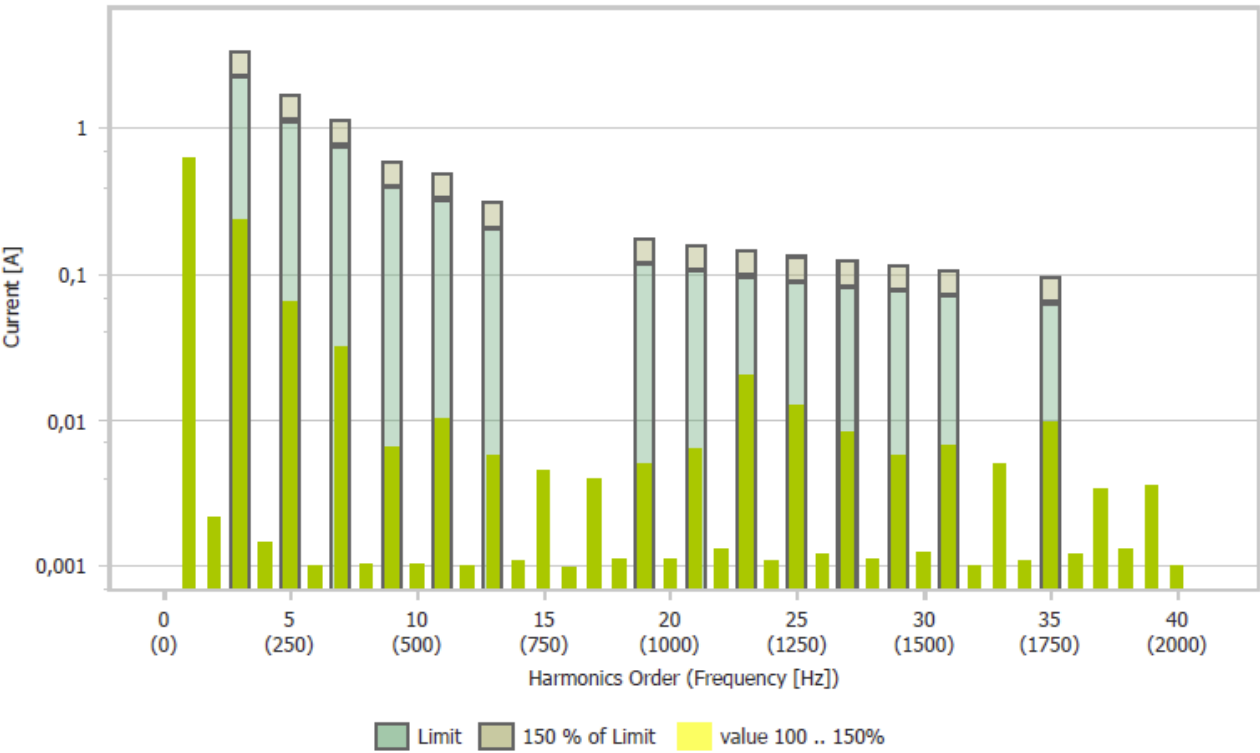




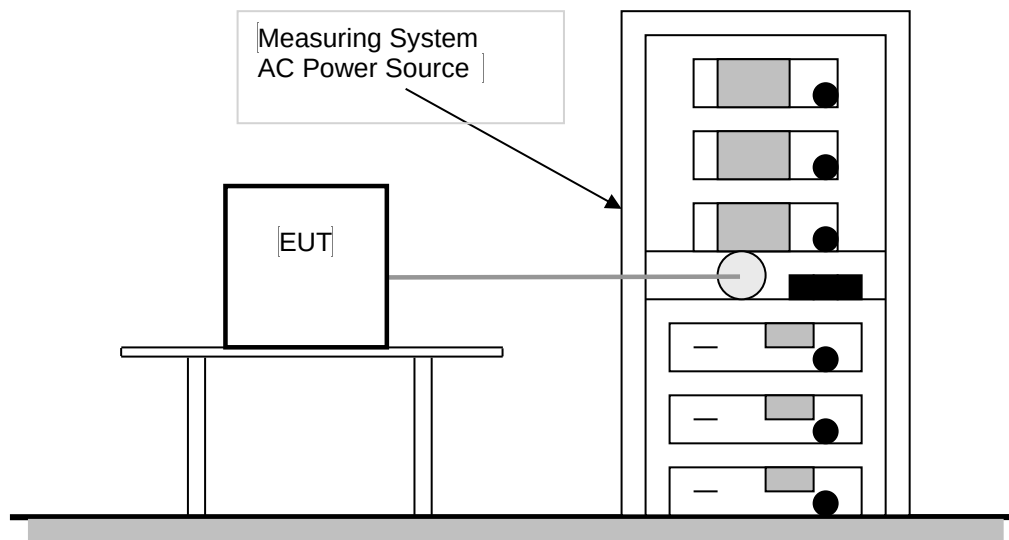
Figure 8: Harmonic current emissions measurement

9.4 Voltage changes, fluctuations, and flicker measurement

9.4.1 Configuration

- The EUT is placed on the top of an insulating support 0,1 (floor equipment) or 0,8 (table-top equipment) meters in height above the ground and operated to produce the **most unfavourable sequence of voltage changes under normal operating conditions**.
- During the flicker measurement, the measure time shall include that part of whole operating cycle in which the EUT produce the most unfavourable sequence of voltage changes. The observation period for short-term flicker indicator is 10 minutes and the observation period for long-term flicker indicator is 2 hours.

9.4.2 Test setup



For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

9.4.3 Test results

Test parameter	Limit	Note
P_{st}	1,0	P
P_{lt}	0,65	P
D_t (ms)	500	P
D_{max} (%)	4	P
dc (%)	3,3	P

NOTE:

- P_{st} means short-term flicker indicator.
- P_{lt} means long-term flicker indicator.
- D_t means maximum time that d_t exceeds 3.3 %.
- d_{max} means maximum relative voltage change.

UPSI-2406R2IP-38AC:	
Operating mode(s):	1

Test Report

Report Number : C20250450

Test Object : UPSI-2406R2IP

Test Standard : IEC 61000-3-3 (Edition 3.2)
Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current ≤ 16 A per phase and not subject to conditional connection

Test Date : 4/18/2025 9:44:02 AM

Result

E.U.T. : PASS

Test Object / Product

Name : UPSI-2406R2IP Operation Mode : Uin:230V/50Hz; Ouput on load 24VDC 6A

Serial Number :

Connection :

Description :

Devices

Device : DPA500N1.1 Serial Number : P2502295364

Interface : USB Firmware : 6.13

Detailed Results

Test Condition: General Test Conditions
 Analysis Status: **PASS**

Flicker Measurements Settings

According to : IEC 61000-3-3 (Edition 3.2)
 Main Line: 230V, 50Hz
 Flicker Meter: 230V / 50Hz
 Flicker Impedance: Zref
 Observation Time: 1 × 10 min
 Measurements: 1

Flicker Measurements

	P_t	Max P_{st}	Max d_c	Max d_{max}	Max T_{max}
Line 1:	0,058	0,132	0,101	0,241	0
Limits:	0,65	1	3,3	4	0,5
Results:	PASS	PASS	PASS	PASS	PASS

Flicker Individual Measurements

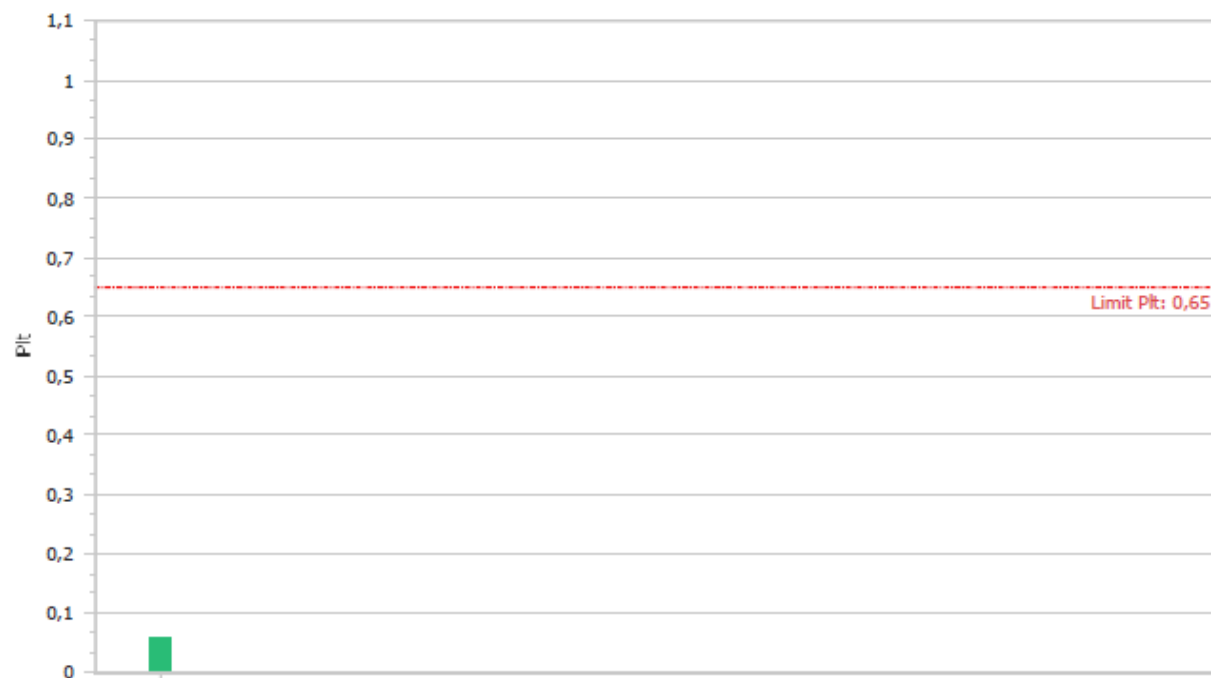
Measurement	P_{st} []			d_c [%]			d_{max} [%]			T_{max} [s]		
	Value	Limit	Result	Value	Limit	Result	Value	Limit	Result	Value	Limit	Result
#1	0,13	1,00	PASS	0,10	3,30	PASS	0,24	4,00	PASS	0,00	0,50	PASS

Pst Data									
Flicker (Line 1)									
Meas.	P0,1	P1s	P3s	P10s	P50s	Pst	dc	dmax	Tmax
No.							[%]	[%]	[s]
1	0,092	0,049	0,033	0,028	0,023	0,132	0,101	0,241	0

Short-term Flicker Severity (Pst) (Line 1)



Long-term Flicker Severity (Plt) (Line 1)



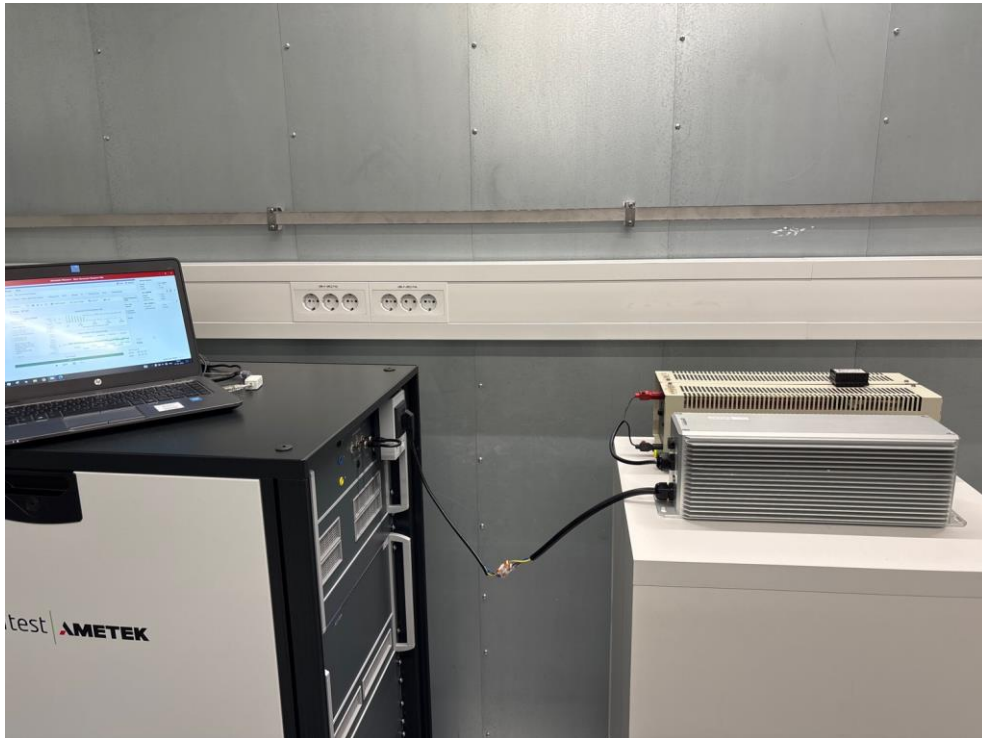


Figure 9: Voltage flicker emissions measurement

UPSI-2406R2IP-38AC-3B:	
Operating mode(s):	1

Test Report

Test Object : UPSI-2406R2IP-38AC-B3

Test Standard : IEC 61000-3-3 (Ed3-2) - Annex B - dmax voltage changes caused by manual switching (230V - 50Hz)

Test Date : 5/5/2025 4:08:21 PM

Result

E.U.T. : Passed

Test Object / Product

Name : UPSI-2406R2IP-38AC-B3 Operation Mode : Uin: 230V / 50 Hz; Uout: 48VDC 2.5A
 Serial Number : Connection :
 Description :

Devices

Device : DPA500N1.1 Serial Number : P2502295364
 Interface : USB Firmware : 6.13

Detailed Results

Test Condition: Measuring dmax voltage changes caused by manual switching
 Analysis Status: **PASS**

Flicker Measurements Settings

According to : IEC 61000-3-3 (Edition 3)
 Main Line: 230V, 50Hz
 Flicker Meter: 230V / 50Hz
 Flicker Impedance: Zref
 Observation Time: 24 × 1 min
 Measurements: **24**

Flicker Measurements for dmax Check

Test Number	dmax	
1	0,277	
2	0,244	
3	0,253	
4	0,257	
5	0,211	(lowest)
6	0,271	
7	0,215	
8	0,262	
9	0,240	
10	0,302	
11	0,269	
12	0,214	
13	0,248	
14	0,415	(highest)
15	0,388	
16	0,371	
17	0,266	
18	0,332	
19	0,231	
20	0,234	
21	0,225	
22	0,221	
23	0,357	
24	0,248	
Limit	4,000	
Average	0,269	
Lowest	0,211	
Highest	0,415	

Note: Only the summary table is taken into consideration for the Pass/Fail decision. The following tables of the single dmax measurement are for information only.

Flicker Measurements

	P_{It}	Max P_{St}	Max d_c	Max d_{max}	Max T_{max}
Line 1:	0,136	0,148	0,104	0,415	0
Limits:	<i>No Limit</i>	<i>No Limit</i>	<i>No Limit</i>	4	<i>No Limit</i>
Results:				PASS	

Flicker Individual Measurements												
Measurement	P_{St} []			d_c [%]			d_{max} [%]			T_{max} [s]		
	Value	Limit	Result	Value	Limit	Result	Value	Limit	Result	Value	Limit	Result
#1	0,14	-	N/A	0,09	-	N/A	0,28	4,00	PASS	0,00	-	N/A
#2	0,13	-	N/A	0,05	-	N/A	0,24	4,00	PASS	0,00	-	N/A
#3	0,13	-	N/A	0,09	-	N/A	0,25	4,00	PASS	0,00	-	N/A
#4	0,14	-	N/A	0,06	-	N/A	0,26	4,00	PASS	0,00	-	N/A
#5	0,13	-	N/A	0,10	-	N/A	0,21	4,00	PASS	0,00	-	N/A
#6	0,14	-	N/A	0,09	-	N/A	0,27	4,00	PASS	0,00	-	N/A
#7	0,13	-	N/A	0,07	-	N/A	0,21	4,00	PASS	0,00	-	N/A
#8	0,14	-	N/A	0,07	-	N/A	0,26	4,00	PASS	0,00	-	N/A
#9	0,13	-	N/A	0,05	-	N/A	0,24	4,00	PASS	0,00	-	N/A
#10	0,13	-	N/A	0,10	-	N/A	0,30	4,00	PASS	0,00	-	N/A
#11	0,13	-	N/A	0,07	-	N/A	0,27	4,00	PASS	0,00	-	N/A
#12	0,13	-	N/A	0,08	-	N/A	0,21	4,00	PASS	0,00	-	N/A
#13	0,13	-	N/A	0,06	-	N/A	0,25	4,00	PASS	0,00	-	N/A
#14	0,15	-	N/A	0,10	-	N/A	0,42	4,00	PASS	0,00	-	N/A
#15	0,14	-	N/A	0,10	-	N/A	0,39	4,00	PASS	0,00	-	N/A
#16	0,13	-	N/A	0,10	-	N/A	0,37	4,00	PASS	0,00	-	N/A
#17	0,13	-	N/A	0,07	-	N/A	0,27	4,00	PASS	0,00	-	N/A
#18	0,13	-	N/A	0,10	-	N/A	0,33	4,00	PASS	0,00	-	N/A
#19	0,13	-	N/A	0,04	-	N/A	0,23	4,00	PASS	0,00	-	N/A
#20	0,13	-	N/A	0,03	-	N/A	0,23	4,00	PASS	0,00	-	N/A
#21	0,14	-	N/A	0,04	-	N/A	0,22	4,00	PASS	0,00	-	N/A
#22	0,13	-	N/A	0,10	-	N/A	0,22	4,00	PASS	0,00	-	N/A
#23	0,13	-	N/A	0,10	-	N/A	0,36	4,00	PASS	0,00	-	N/A
#24	0,14	-	N/A	0,05	-	N/A	0,25	4,00	PASS	0,00	-	N/A

Pst Data

Flicker (Line 1)									
Meas.	P0,1	P1s	P3s	P10s	P50s	Pst	dc	dmax	Tmax
No.							[%]	[%]	[s]
1	0,098	0,053	0,035	0,031	0,025	0,137	0,087	0,277	0
2	0,072	0,038	0,034	0,03	0,025	0,13	0,045	0,244	0
3	0,085	0,042	0,033	0,03	0,025	0,132	0,094	0,253	0
4	0,11	0,058	0,035	0,03	0,025	0,138	0,058	0,257	0
5	0,05	0,036	0,033	0,03	0,025	0,126	0,1	0,211	0
6	0,134	0,06	0,034	0,03	0,025	0,141	0,085	0,271	0
7	0,072	0,044	0,034	0,03	0,025	0,131	0,07	0,215	0
8	0,105	0,051	0,034	0,03	0,025	0,136	0,069	0,262	0
9	0,057	0,039	0,033	0,029	0,024	0,127	0,046	0,24	0
10	0,072	0,039	0,033	0,03	0,025	0,129	0,099	0,302	0
11	0,098	0,044	0,033	0,03	0,024	0,133	0,071	0,269	0
12	0,081	0,05	0,033	0,029	0,024	0,132	0,079	0,214	0
13	0,102	0,045	0,033	0,029	0,024	0,134	0,06	0,248	0
14	0,201	0,061	0,033	0,029	0,024	0,148	0,099	0,415	0
15	0,169	0,059	0,035	0,029	0,024	0,144	0,101	0,388	0
16	0,113	0,044	0,033	0,029	0,024	0,135	0,099	0,371	0
17	0,077	0,037	0,032	0,029	0,024	0,128	0,067	0,266	0
18	0,069	0,045	0,032	0,029	0,024	0,129	0,104	0,332	0
19	0,073	0,038	0,032	0,029	0,024	0,128	0,041	0,231	0
20	0,112	0,046	0,032	0,029	0,024	0,135	0,034	0,234	0
21	0,167	0,062	0,034	0,029	0,024	0,144	0,037	0,225	0
22	0,081	0,042	0,032	0,029	0,024	0,13	0,098	0,221	0
23	0,082	0,039	0,032	0,029	0,024	0,129	0,098	0,357	0
24	0,159	0,055	0,032	0,029	0,024	0,141	0,048	0,248	0

Short-term Flicker Severity (Pst) (Line 1)

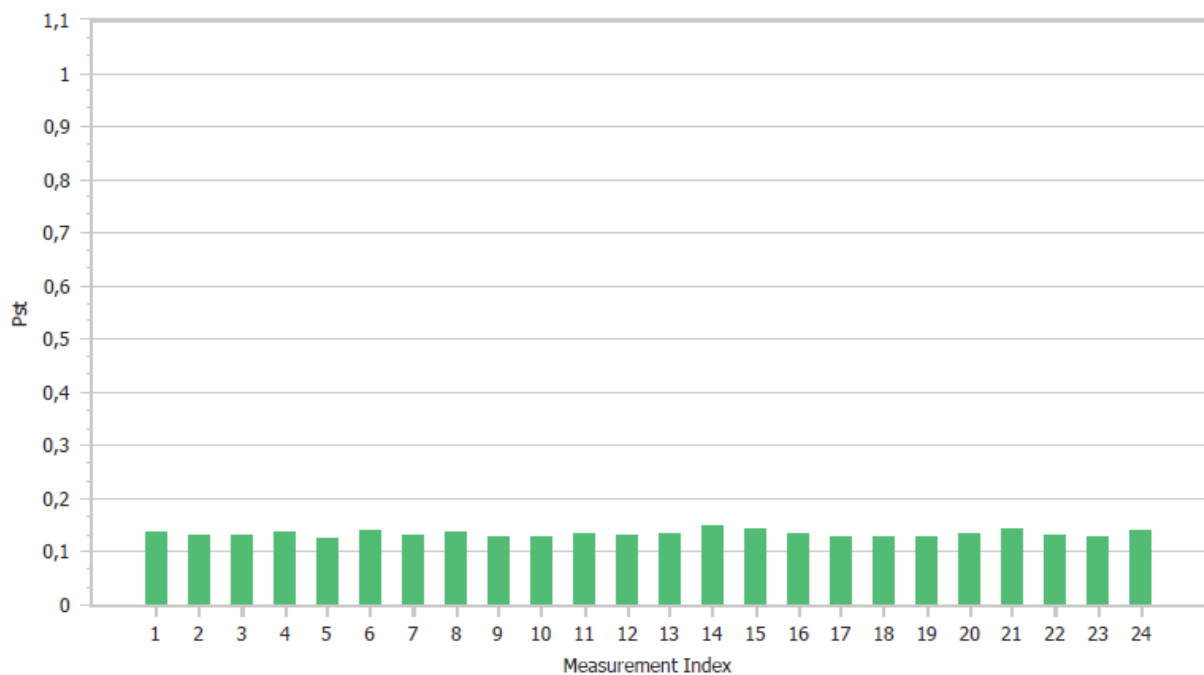






Figure 10: Voltage flicker emissions measurement

10. Immunity

10.1 Electrostatic discharge immunity measurement

10.1.1 Test specifications

Referenced Standard:	See clause 7.
Discharge Impedance:	330 Ω / 150 pF
Discharge Voltage:	Air Discharges – 8 kV (Direct) Contact Discharge- 4 kV (Indirect, Direct)
Polarity:	Positive / Negative
Number of Discharges:	Minimum 20 discharges (10 positive and 10 negative polarity)
Discharge Mode:	Single Discharge
Discharge Period:	1-second minimum

10.1.2 Test procedure

The discharges shall be applied in two ways:

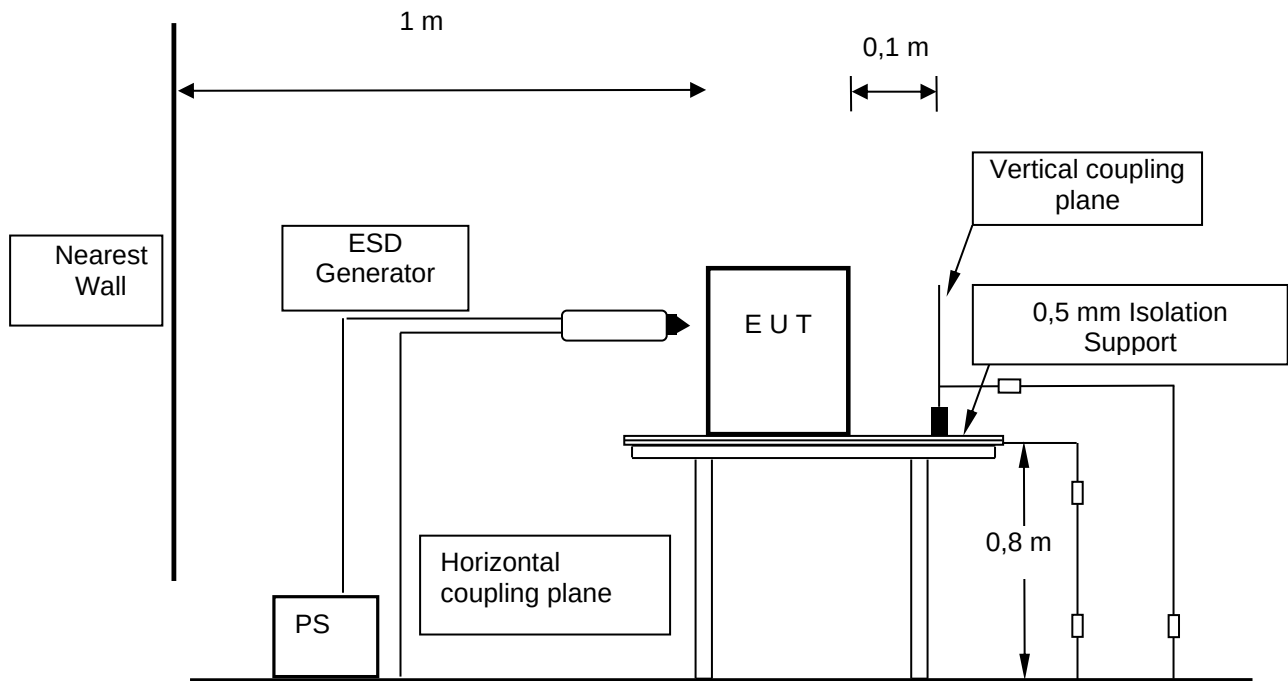
- Contact discharges to the conductive surfaces and coupling planes:
The EUT shall be exposed to at least 20 discharges, 10 each at negative and positive polarity on each accessible metal part. If no direct contact points are available, then at least 20 indirect discharges shall be applied in the indirect mode. Test shall be performed at a maximum repetition rate of one discharge per second.
- Air discharges at slots and apertures and insulating surfaces:
On those parts of the EUT where it is not possible to perform contact discharge testing, the equipment should be investigated to identify user accessible points where breakdown may occur. Such points are tested using the air discharge method. This investigation should be restricted to those area normally handled by the user.

For air discharge testing, the test starts with 2 kV and continues with value multiplied by 2 up to and including the specified test level.

The test procedure is in accordance with referenced standard:

- Electrostatic discharges are applied only to those points and surfaces of the EUT that are accessible to users during normal operation.
- The test is performed with at least ten single discharges on the pre-selected points in the most sensitive polarity.
- The time interval between two successive single discharges is at least 1 second.
- The ESD generator is held perpendicularly to the surface to which the discharge is applied, and the return cable is at least 0,2 meters from the EUT.
- At least ten single discharges (in the most sensitive polarity) are applied to the Horizontal Coupling Plane at points on each side of the EUT. The ESD generator is positioned vertically at 0,1 meters from the EUT with the discharge electrode touching the Horizontal Coupling Plane.
- At least ten single discharges (in the most sensitive polarity) were applied to the centre of one vertical edge of the Vertical Coupling Plane in sufficiently different positions that the four faces of the EUT were completely illuminated. The Vertical Coupling Plane (dimensions 0,5 m x 0,5 m) was placed vertically to and 0,1 meters from the EUT.

10.1.3 Test setup



For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

The **GRP** is of a sheet of aluminium at least 0,25 mm thick, and it projects beyond the EUT by at least 0,5 meters and is connected to the protective grounding system. A **Horizontal Coupling Plane** (1,6 m x 0,8 m) is placed on the table and attached to the **GRP** by means of a cable with 940 kΩ total impedance. The equipment under test, is installed in a representative system as described in referenced standard on an insulating support 0,1 (floor equipment) or 0,8 (table-top equipment) meters in height, and its cables are placed on the **HCP** and isolated by an insulating support of 0,5 mm thickness. A distance of 0,8-meter minimum is provided between the EUT and the walls of the laboratory and any other metallic structure.

10.1.1 Test results

UPSI-2406R2IP-38AC-3B:						
Operating mode(s):		1				
Discharge Level (kV)	Polarity	Test Point	Contact Discharge	Air Discharge	Required criteria	Achieved criteria
8	+ / -			X	B	A
4	+ / -		X		B	A
Were air discharge lower levels also tested:			/			
Changes in operation observed during testing:						
HCP		no observed changes				
VCP		no observed changes				
Contact discharge		no observed changes				
Air discharge		no observed changes				

Legend:

- contact discharge points (including HCP and VCP)
- air discharge points

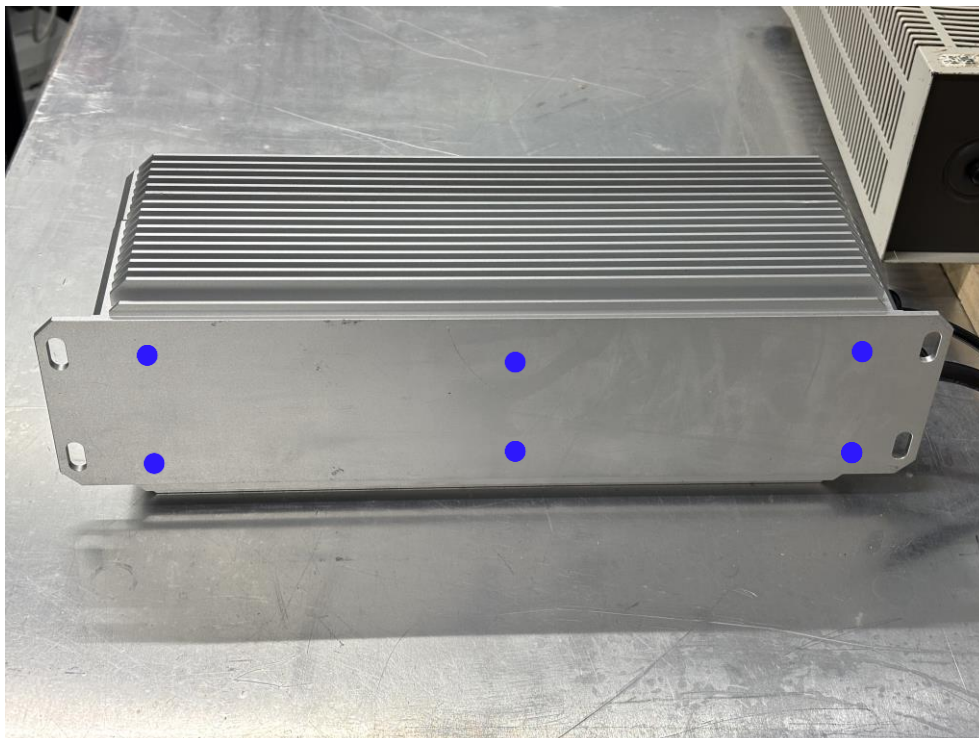


Figure 11: Electrostatic discharge immunity test

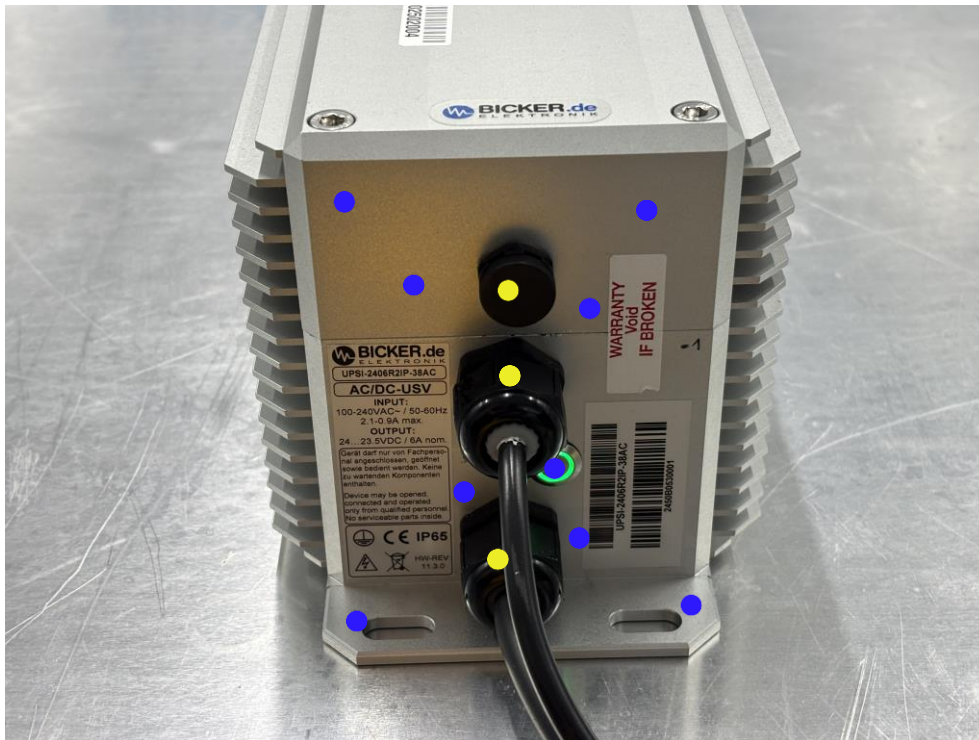


Figure 12: Electrostatic discharge immunity test



Figure 13: Electrostatic discharge immunity test

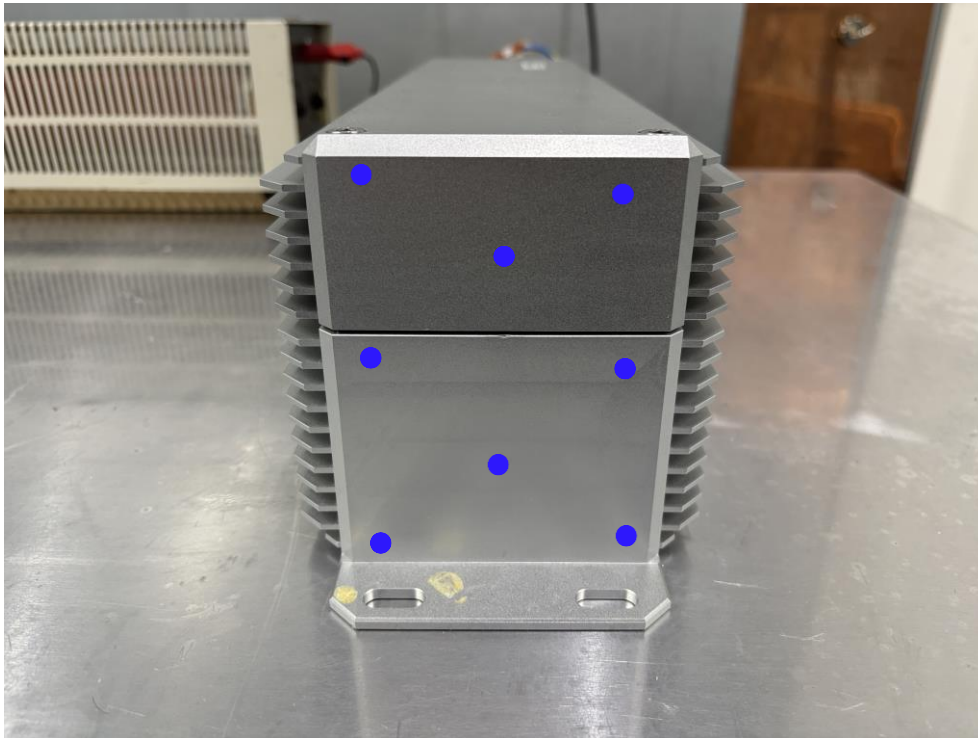


Figure 14: Electrostatic discharge immunity test

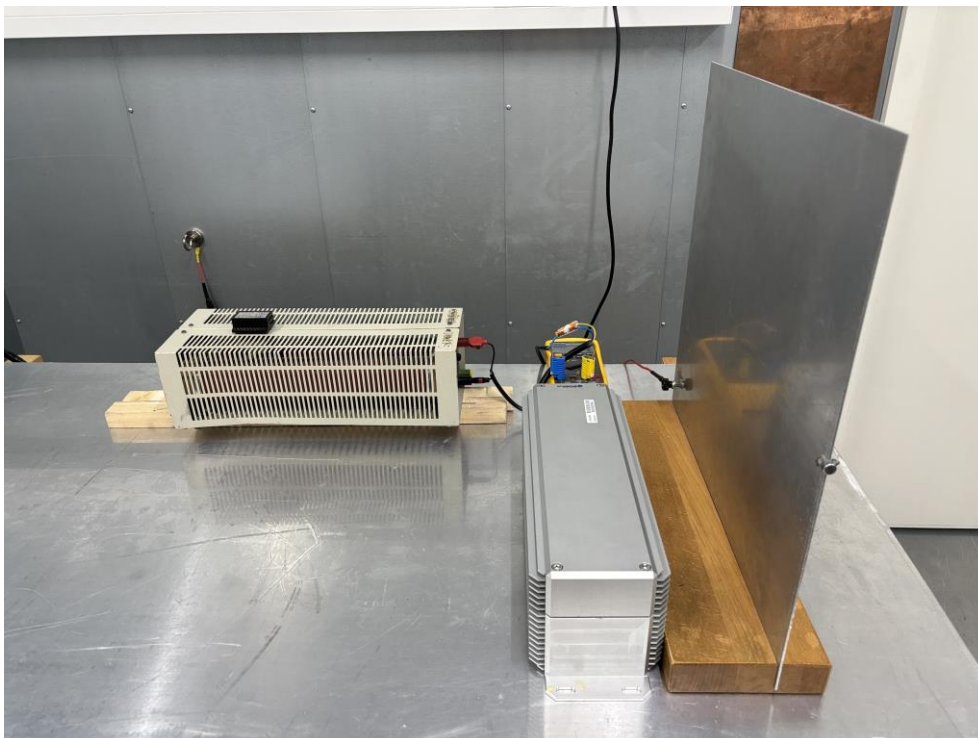


Figure 15: Electrostatic discharge immunity test

UPSI-2406R2IP-38AC-3B:	
Operating mode(s):	1

Discharge Level (kV)	Polarity	Test Point	Contact Discharge	Air Discharge	Required criteria	Achieved criteria
8	+ / -			X	B	A
4	+ / -		X		B	A
Were air discharge lower levels also tested:			/			
Changes in operation observed during testing: HCP no observed changes VCP no observed changes Contact discharge no observed changes Air discharge no observed changes						

Legend:
 - contact discharge points (including HCP and VCP)
 - air discharge points

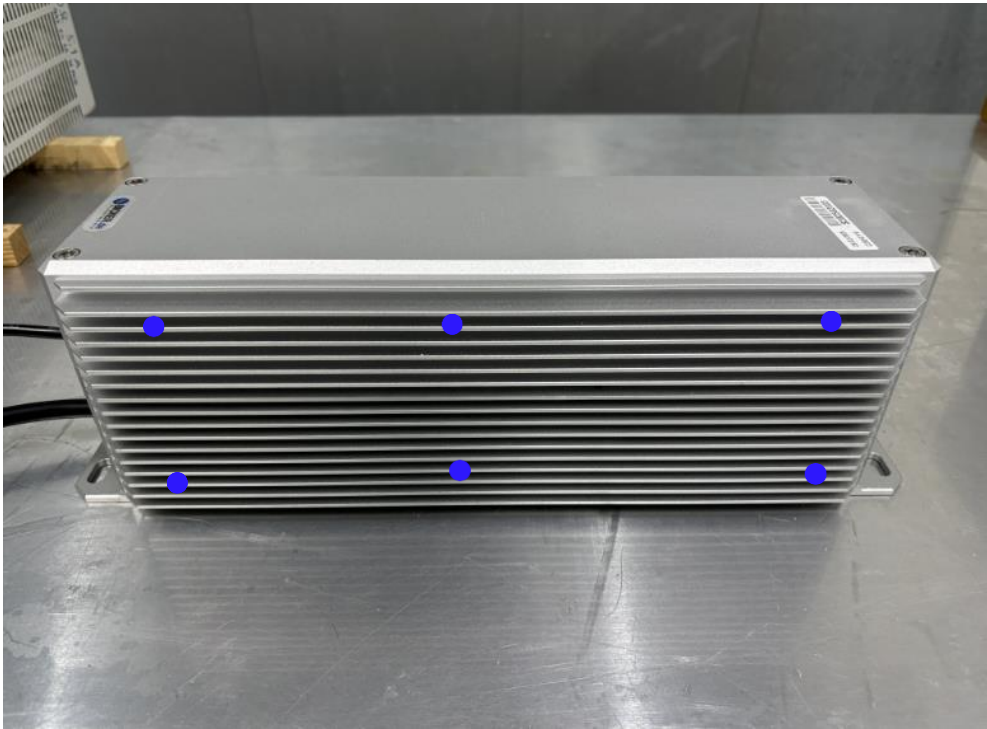


Figure 16: Electrostatic discharge immunity test

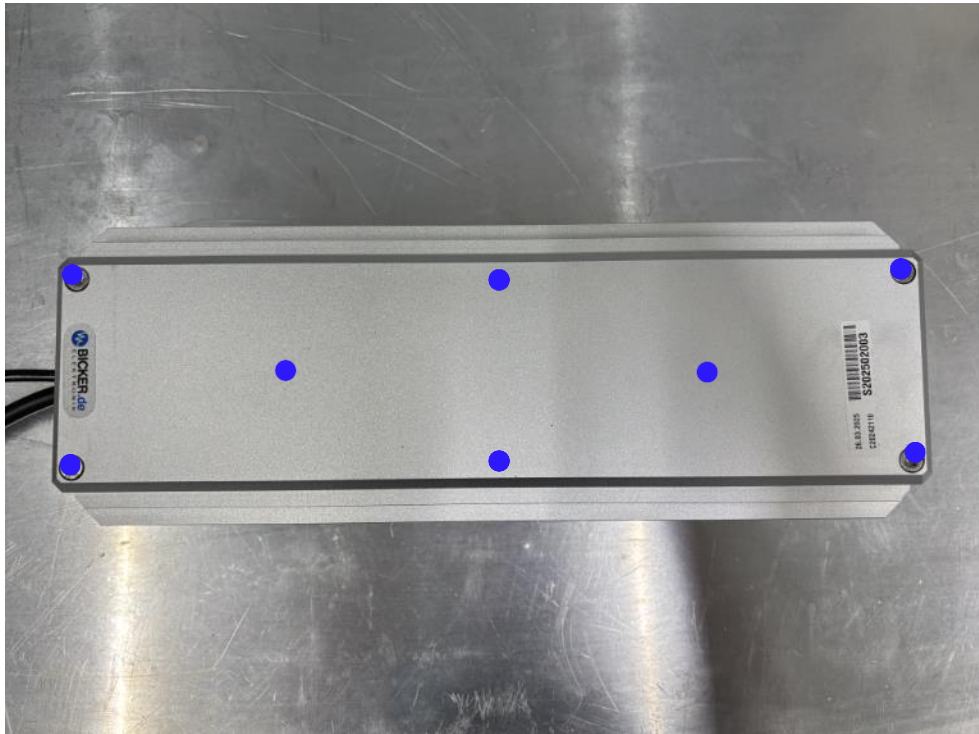


Figure 17: Electrostatic discharge immunity test



Figure 18: Electrostatic discharge immunity test



Figure 19: Electrostatic discharge immunity test

10.2 Radiated, RF electromagnetic field immunity measurement

10.2.1 Test specification

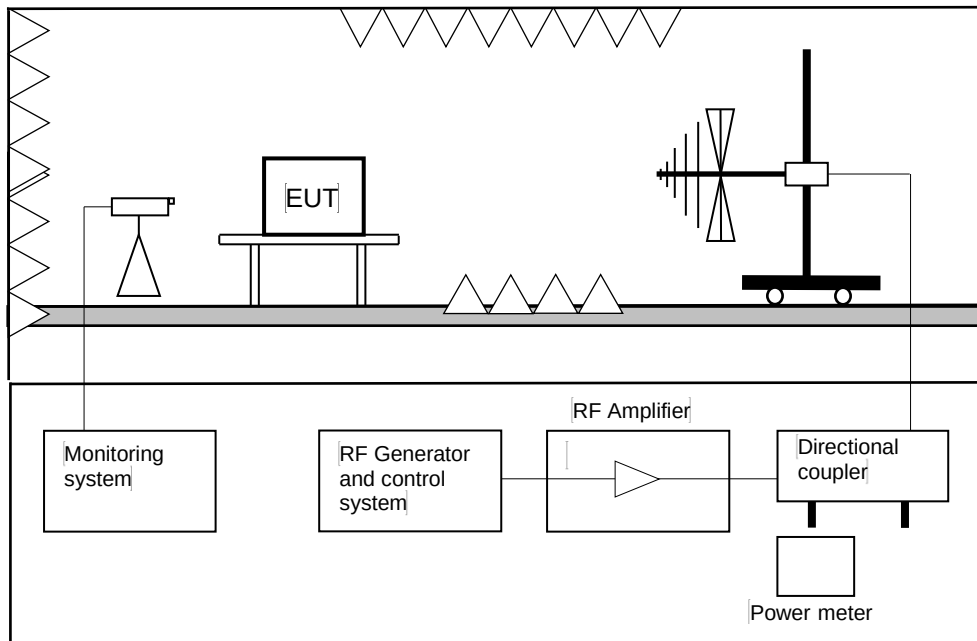
Referenced Standard:	See clause 7.	
Frequency Step:	1 % of fundamental	
Modulation:	1 kHz Sine Wave, 80 %, AM Modulation	
Polarity of Antenna:	Horizontal and Vertical	
Illumination sides:	Front, Rear, Left and Right side	
Frequency Range	Field Strength	Antenna distance / Antenna height
80 - 1000 MHz	10 V/m	2,2 m / 1,75 m

10.2.2 Test procedure

The test procedure was in accordance with referenced standard.

- The testing is performed in an anechoic chamber.
- The frequency range is swept with the signal 80 % amplitude modulated with 1 kHz sine wave. The rate of sweep does not exceed $1,5 \times 10^{-3}$ decade/s. Where the frequency range is swept incrementally, the step size is 1% of fundamental.
- The dwell time at each frequency shall be not less than the time necessary for the EUT to be able to respond.
- The test is performed with the EUT exposed to both vertically and horizontally polarized fields on each of the four sides.

10.2.1 Test setup



For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

The EUT shall be installed in a representative system as described in referenced standard on an insulating support 0,1 (floor equipment) or 0,8 (table-top equipment) meters in height. The system under test is connected to the power and signal wire according to relevant installation instructions.

10.2.1 Test results

UPSI-2406R2IP-38AC:					
Operating mode(s):		1			
Frequency	Level	Dwell time	Illuminated side	Required criteria	Achieved criteria
80 - 1000 MHz	10 V/m	1 s	Front	A	A
			Rear	A	A
			Left	A	A
			Right	A	A
Changes in operation observed during testing: no observed changes					

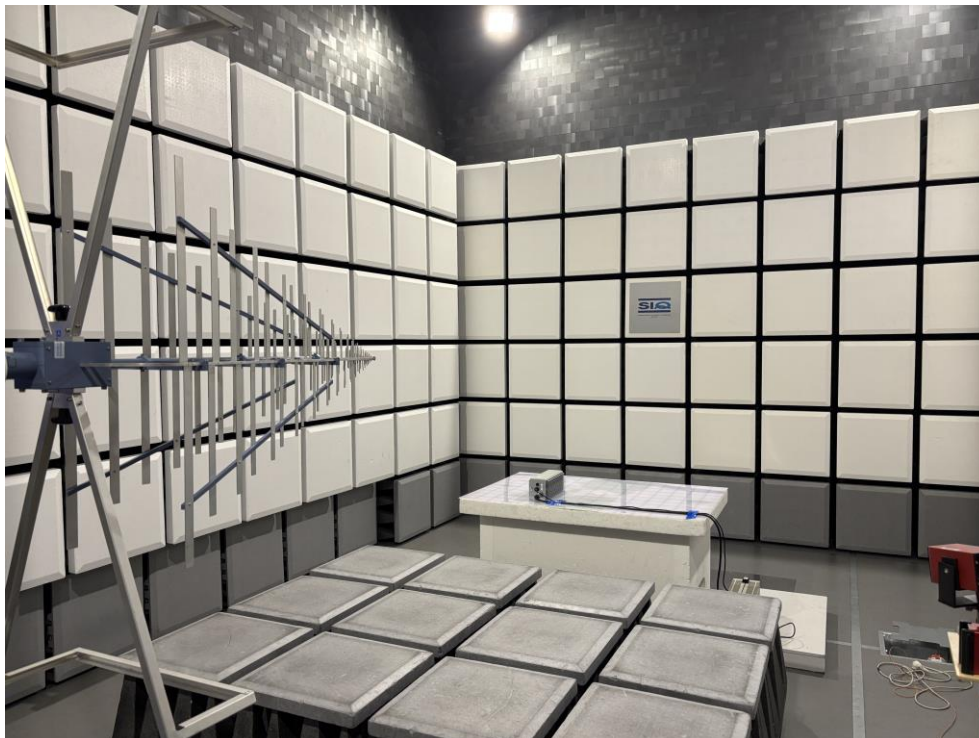


Figure 20: Radiated, RF electromagnetic field immunity measurement



Figure 21: Radiated, RF electromagnetic field immunity measurement

UPSI-2406R2IP-38AC-3B:					
Operating mode(s):		1			
Frequency	Level	Dwell time	Illuminated side	Required criteria	Achieved criteria
80 - 1000 MHz	10 V/m	1 s	Front	A	A
			Rear	A	A
			Left	A	A
			Right	A	A
Changes in operation observed during testing: no observed changes					



Figure 22: Radiated, RF electromagnetic field immunity measurement

10.3 Electrical fast transients/burst immunity measurement

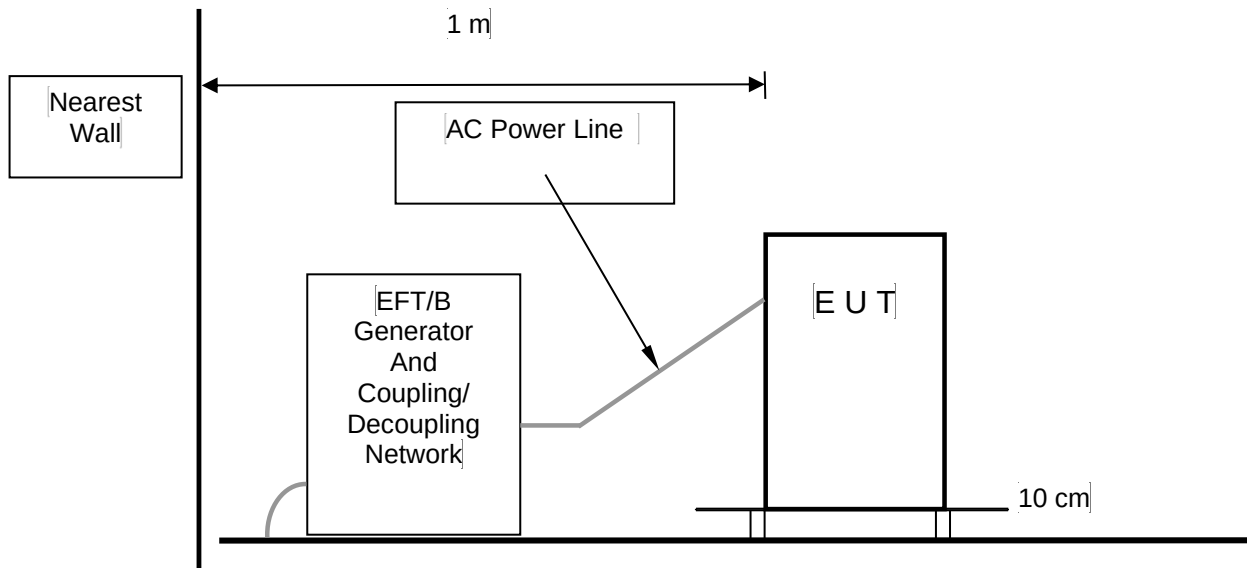
10.3.1 Test specification

Referenced Standard:	See clause 7.
Test Voltage:	AC input: 2 kV
Polarity:	Positive/Negative
Impulse Frequency:	5 kHz
Impulse Waveshape:	5/50 ns
Burst Duration:	5 kHz
Burst Period:	300 ms
Test Duration:	1 min

10.3.2 Test procedure

- Both positive and negative polarity discharges are applied.
- The cable length between the EUT and the coupling device shall be as intended for installation.
- The duration time of each test sequential is 1 minute.
- The transient/burst waveform is in accordance with referenced standard, 5/50 ns.
- Artificial hand is not applied

10.3.1 Test setup



For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

The EUT is installed in a representative system as described in referenced standard on an insulating support 0,1 meters in height and its cables are isolated from the Ground Reference Plane. The GRP consists of a sheet of aluminium (at least 0,25 mm thick and 2,5 m square) connected to the protective grounding system.

10.3.1 Test results

UPSI-2406R2IP-38AC:					
Operating mode(s):		1			
Test Point		Polarity	Test Level (kV)	Required criteria	Achieved criteria
1)	AC input	+/-	2	B	A
Changes in operation observed during testing:					
1)	no observed changes				

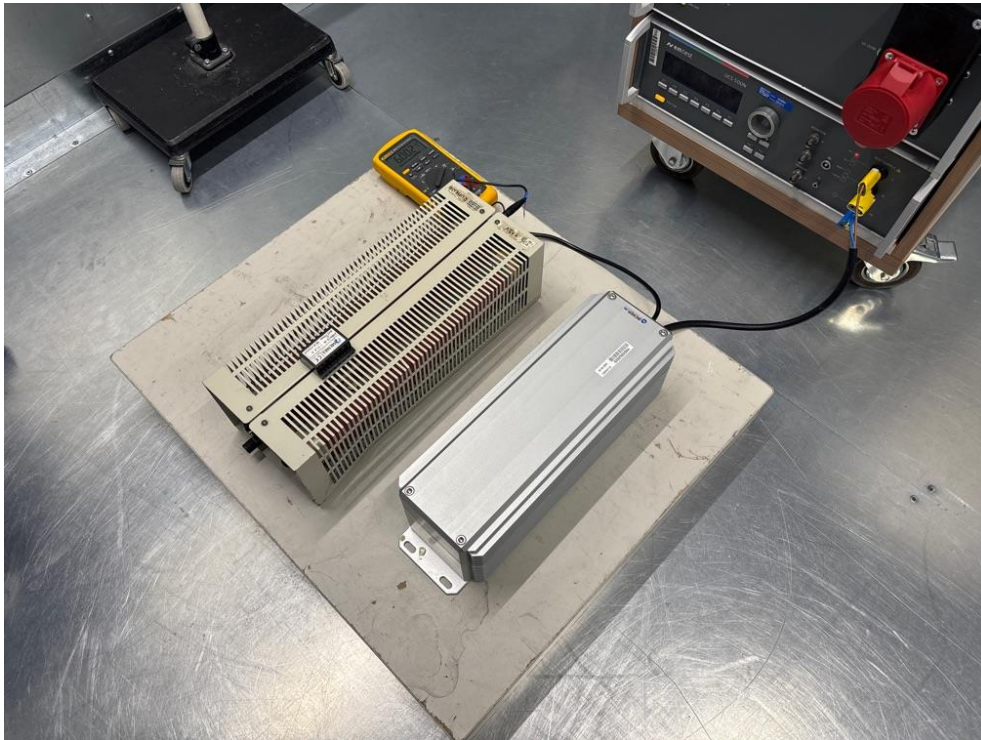


Figure 23: Electrical fast transient/burst immunity test

UPSI-2406R2IP-38AC-3B:					
Operating mode(s):			1		
Test Point		Polarity	Test Level (kV)	Required criteria	Achieved criteria
1)	AC input	+/-	2	B	A
Changes in operation observed during testing:					
1)	no observed changes				



Figure 24: Electrical fast transient/burst immunity test

10.4 Surge immunity measurement

10.4.1 Test specification

Referenced Standard:	See clause 7.		
Wave-Shape:	Combination Wave		
Test voltage / kV	AC input	Line - Line: 1 kV	
		Line - Ground: 2 kV	
	1,2/50 us Open Circuit Voltage		
Generator Source:	2 ohm between networks 12 ohm between network and ground		
Polarity:	Positive/Negative		
Phase Angle:	0°, 90°, 180°, 270°		
Pulse Repetition rate (time between surge events):	60 s		
Number of Tests:	5 positive and 5 negative at selected points		

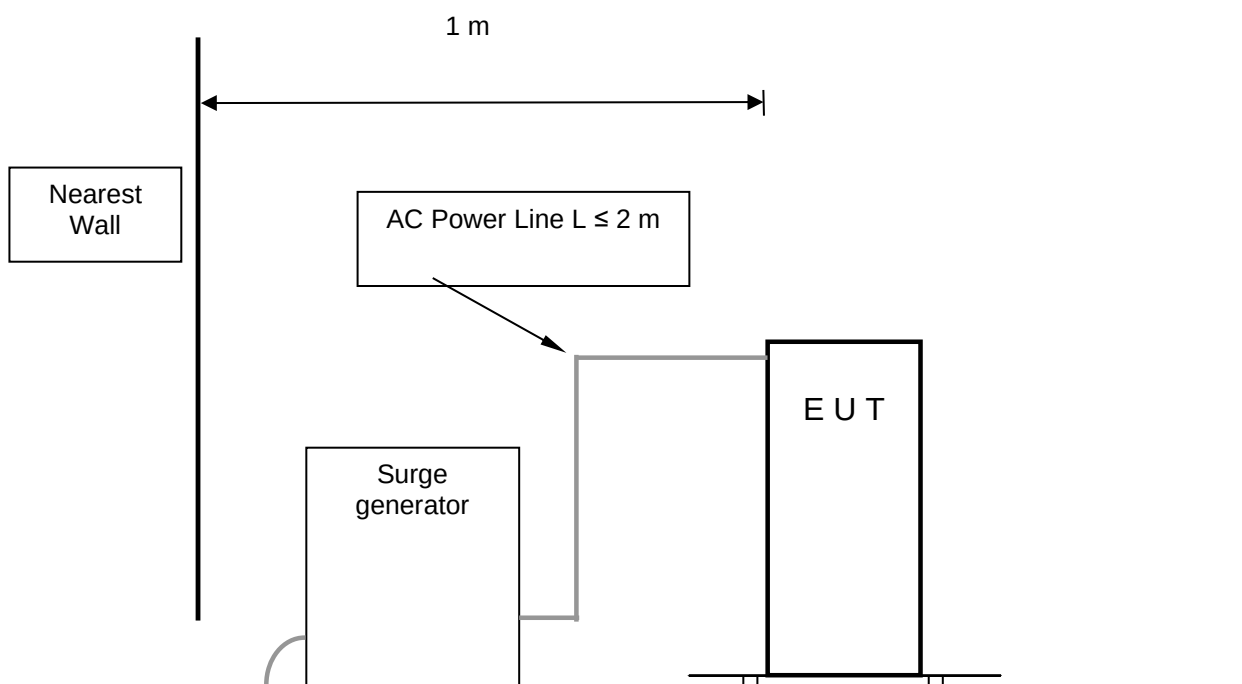
10.4.2 Test procedure

For EUT power supply:

The surge is to be applied to the EUT power supply terminals via the capacitive coupling network. Decoupling networks are required in order to avoid possible adverse effects on equipment not under test that may be powered by the same lines, and to provide sufficient decoupling impedance to the surge wave. The power cord between the EUT and the coupling/decoupling networks shall be 2 meters in length (or shorter).

The test shall be started with low voltage 0,5 kV and continued with level, which is higher for 0,5 kV.

10.4.3 Test setup



For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

10.4.1 Test results

UPSI-2406R2IP-38AC:							
Operating mode(s):			1				
Test Point		Coupling	Polarity	Angle (°)	Test Level (kV)	Required criteria	Achieved criteria
1)	AC input	L-N	+/-	0°, 90°, 180°, 270°	1	B	A
2)	AC input	L-PE	+/-	0°, 90°, 180°, 270°	2	B	A
3)	AC input	N-PE	+/-	0°, 90°, 180°, 270°	2	B	A
Were lower levels also tested?: Yes							
Changes in operation observed during testing:							
1)	no observed changes						
2)	no observed changes						
3)	no observed changes						

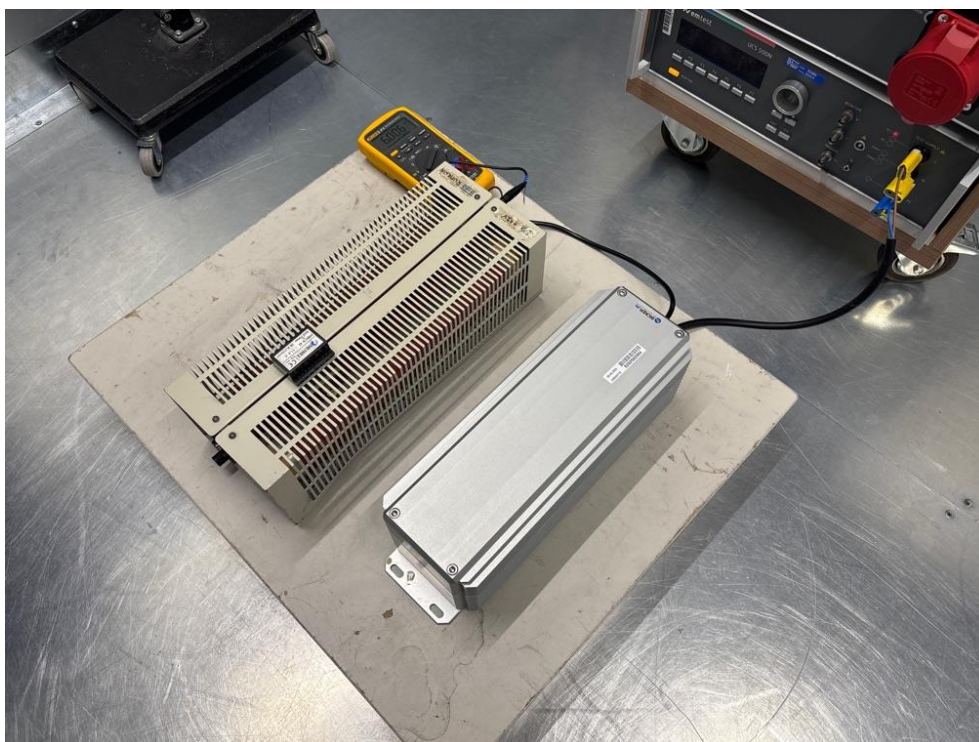


Figure 25: Surge immunity test

UPSI-2406R2IP-38AC-3B:							
Operating mode(s):			1				
Test Point		Coupling	Polarity	Angle (°)	Test Level (kV)	Required criteria	Achieved criteria
1)	AC input	L-N	+/-	0°, 90°, 180°, 270°	1	B	A
2)	AC input	L-PE	+/-	0°, 90°, 180°, 270°	2	B	A
3)	AC input	N-PE	+/-	0°, 90°, 180°, 270°	2	B	A
Were lower levels also tested?: Yes							
Changes in operation observed during testing:							
1)	no observed changes						
2)	no observed changes						
3)	no observed changes						



Figure 26: Surge immunity test

10.5 Conducted disturbances, induced by RF fields immunity measurement

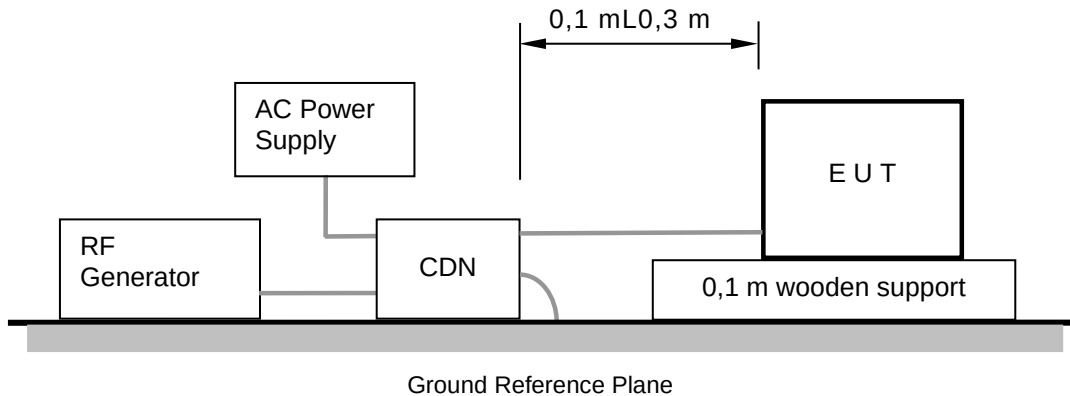
10.5.1 Test specification

Referenced Standard:	See clause 7.
Frequency Range:	150 kHz - 80 MHz
Field Strength:	10 V rms
Modulation:	1 kHz Sine Wave, 80 %, AM Modulation
Frequency Step:	1 % of fundamental
Coupled Cable:	AC input

10.5.2 Test procedure

- The EUT shall be tested within its intended operating and climatic conditions.
- The test shall be performed with the test generator connected to each of the coupling and decoupling devices in turn, while the other non-excited RF input ports of the coupling devices are terminated by a 50 Ω load resistor.
- The frequency range is swept from 150 kHz to 80 MHz, using the signal level established during the setting process and with a disturbance signal of 80 % amplitude. The signal is modulated with a 1 kHz sine wave, pausing to adjust the RF signal level or the switch coupling devices as necessary. The sweep rate shall not exceed $1,5 \times 10^{-3}$ decades/s. The step size shall not exceed 1 % of the start and thereafter 1 % of the preceding frequency value where the frequency is swept incrementally.
- The dwell time at each frequency shall not be less than the time necessary for the EUT to be exercised, and able to respond. Sensitive frequencies such as clock frequency(ies) and harmonics or frequencies of dominant interest, shall be analysed separately.
- Attempts should be made to fully exercise the EUT during testing, and to fully interrogate all exercise modes selected for susceptibility.
-

10.5.1 Test setup



For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

The equipment to be tested is placed on an insulating support 0,1 meters in height on a ground reference plane. All relevant cables shall be provided with the appropriate coupling and decoupling devices at a distance between 0,1 meters and 0,3 meters from the projected geometry of the EUT on the ground reference plane.

10.5.2 Test results

UPSI-2406R2IP-38AC:								
Operating mode(s):			1					
Test point		Level	Dwell time	Frequency	CDN type	Port with terminated CDN	Required criteria	Achieved criteria
1)	AC input	10 V	1 s	150 kHz - 80 MHz	M3 A	DC output	A	A
Changes in operation observed during testing:								
1)	no observed changes							

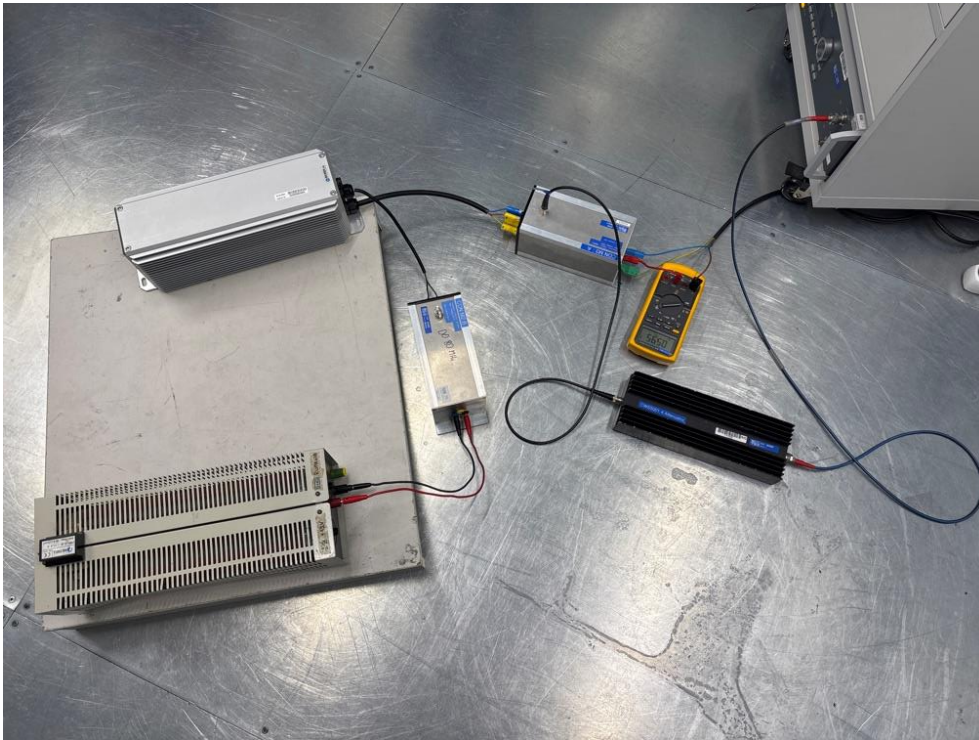


Figure 27: Conducted disturbances, induced by RF fields immunity measurement

10.6 Power frequency magnetic field immunity measurement

10.6.1 Test specification

Referenced Standard:	See clause 7.
Frequency Range, field strength:	50 Hz, 30 A/m
Frequency Range, field strength:	60 Hz, 30 A/m

10.6.2 Test procedure

- The test procedure is in accordance with referenced standard.
- The EUT is tested with magnetic field antenna.
- The test is performed with the EUT exposed to all three directions (X, Y, Z).

10.6.3 Test setup

The EUT installed in a representative system as described in referenced standard is placed on non-conductive table 0,1 (floor equipment) or 0,8 (table-top equipment) meters in height. The system under test is connected to the power and signal wire according to relevant installation instructions.

10.6.4 Test results

UPSI-2406R2IP-38AC:	
Operating mode(s):	1

Frequency (Hz)		Supply voltage / frequency	Polarity	Field Strength (A/m)	Dwell time	Required criteria	Achieved criteria
1)	50	230V / 50 Hz	X, Y, Z	30	60	A	A
2)	60	230V / 60 Hz	X, Y, Z	30	60	A	A
Changes in operation observed during testing:							
1)	no observed changes						
2)	no observed changes						

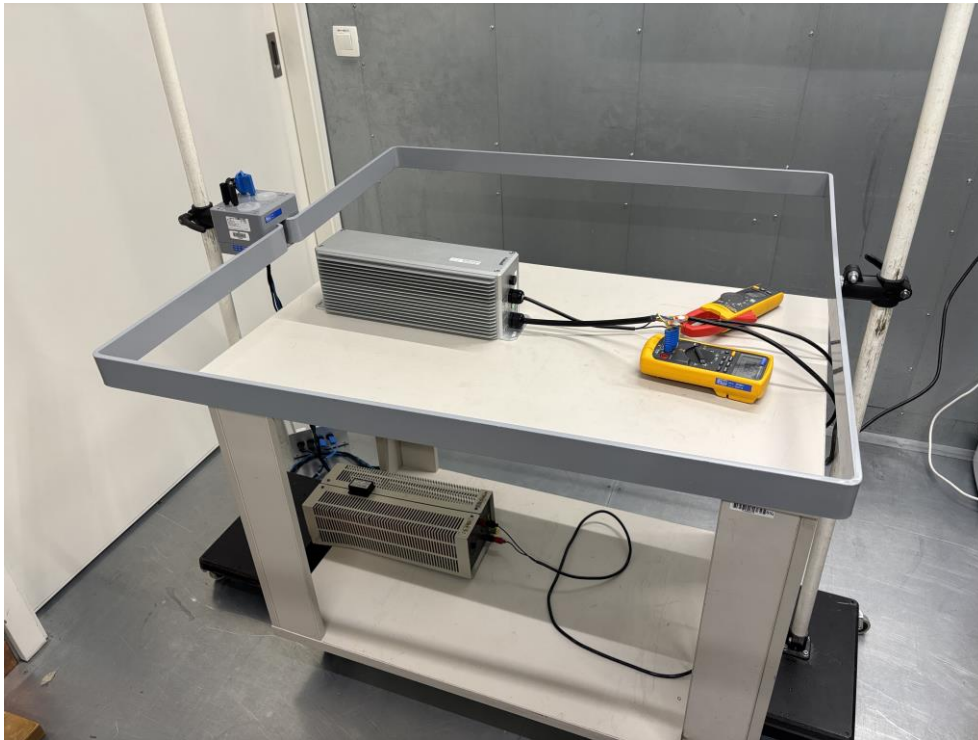
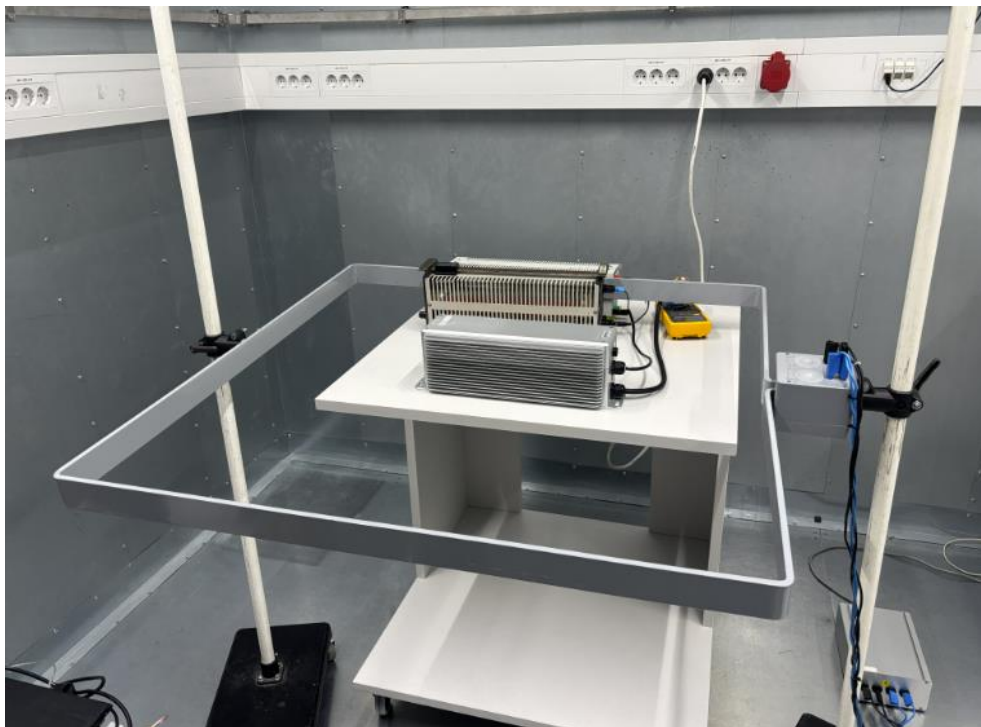


Figure 28: Power frequency magnetic field immunity measurement

UPSI-2406R2IP-38AC-3B:
Operating mode(s):
1

Frequency (Hz)		Supply voltage / frequency	Polarity	Field Strength (A/m)	Dwell time	Required criteria	Achieved criteria
1)	50	230V / 50 Hz	X, Y, Z	30	60	A	A
2)	60	230V / 60 Hz	X, Y, Z	30	60	A	A
Changes in operation observed during testing:							
1)	no observed changes						
2)	no observed changes						


Figure 29: Power frequency magnetic field immunity measurement

10.7 Voltage dips, short interruptions, and voltage variations immunity measurement

Test is not applicable.

10.8 Immunity to low-frequency signals

10.8.1 Test specification

Referenced Standard:	See clause 7.
Frequency Range	140 Hz – 360 Hz
Test Level	10 V

10.8.2 Test procedure

- The test level voltage was applied to input sine at fixed frequency
- Frequency is swept so all harmonics of 50 Hz and 60 Hz in required frequency range are covered.

10.8.1 Test results

UPSI-2406R2IP-38AC:	
Operating mode(s):	1

Supply voltage		Teste frequencies Polarity	Test level	Required criteria	Achieved criteria
1)	240V/50Hz	150 Hz, 200 Hz, 250 Hz, 300 Hz, 350 Hz	10 V	A	A
2)	240V/60Hz	180 Hz, 240 Hz, 300 Hz, 360 Hz	10 V	A	A
Changes in operation observed during testing:					
1)	no observed changes				
2)	no observed changes				

UPSI-2406R2IP-38AC-3B:	
Operating mode(s):	1

Supply voltage		Teste frequencies Polarity	Test level	Required criteria	Achieved criteria
1)	240V/50Hz	150 Hz, 200 Hz, 250 Hz, 300 Hz, 350 Hz	10 V	A	A
2)	240V/60Hz	180 Hz, 240 Hz, 300 Hz, 360 Hz	10 V	A	A
Changes in operation observed during testing:					
1)	no observed changes				
2)	no observed changes				

11. Used test equipment

9.1 Conducted emission measurement

Equipment	Manufacturer	Type	ID number	Last calibration date	Last due date
EMI test receiver	R&S	ESU26	EM0003	2024-10-11	2026-04-11
Artificial Mains Network	R&S	ENV216	EM0166	2024-09-02	2025-09-02

9.2 Radiated emission measurement

Equipment	Manufacturer	Type	ID number	Last calibration date	Last due date
SAC 2	Comtest Engineering	SAC 3m	EM0146	2022-04-14	2025-04-14
Ultra Broadband Antenna (SAC2)	R&S	HL562E	EM0130	2023-09-26	2026-09-26
EMI test receiver	R&S	ESW 44	EM0291	2024-09-26	2026-03-26
Turn table (2 m diameter)	Maturo	TT 2.0 SI	/	N/A	N/A
Bore-sight antenna mast	Maturo	BAM-4.0-P	/	N/A	N/A
Multi-channel positioning equipment	Maturo	Maturo NCD	/	N/A	N/A

9.3 Harmonic current emissions measurement

Equipment	Manufacturer	Type	ID number	Last calibration date	Last due date
3-phase harmonics and flicker system	DPA 503N with AIF503	EM Test	EM0015	2024-11-14	2026-05-14
Power Source	ACS 500N6	EM Test	EM0389	2025-02-17	2026-02-17

9.4 Voltage changes, fluctuations, and flicker measurement

Equipment	Manufacturer	Type	ID number	Last calibration date	Last due date
3-phase harmonics and flicker system	DPA 503N with AIF503	EM Test	EM0015	2024-11-14	2026-05-14
Power Source	ACS 500N6	EM Test	EM0389	2025-02-17	2026-02-17

10.1 Electrostatic discharge immunity measurement

Equipment	Manufacturer	Type	ID number	Last calibration date	Last due date
ESD Generator	EM TEST	Dito P18	EM0023	2024-12-11	2025-12-11

10.2 Radiated, RF electromagnetic field immunity measurement

Equipment	Manufacturer	Type	ID number	Last calibration date	Last due date
SAC 1	Comtest Engineering	SAC 3m	EM0145	N/A	N/A
RF and Microwave Signal Generator (SAC1-A2)	R&S	SMB100A03	EM0232	2024-02-16	2025-08-16
Average power sensor (A2)	R&S	NRP18AN	EM0233	2024-02-16	2025-08-16
Average power sensor (A2)	R&S	NRP18AN	EM0234	2024-02-19	2025-08-19
Ultra Broadband Antenna (SAC1)	R&S	HL562E	EM0140	N/A	N/A
Field Uniformity (SAC1 - A2, HL562E)	SIQ	UFA	EM0229	2022-08-19	2025-08-19

10.3 Electrical fast transients/Burst immunity measurement

Equipment	Manufacturer	Type	ID number	Last calibration date	Last due date
Ultra Compact Simulator	EM Test	UCS 500 N5	EM0045	2024-03-05	2025-03-05

10.4 Surge immunity measurement

Equipment	Manufacturer	Type	ID number	Last calibration date	Last due date
Ultra Compact Simulator	EM Test	UCS 500 N5	EM0110	2024-10-22	2026-04-22

10.5 Conducted disturbances, induced by RF fields immunity measurement

Equipment	Manufacturer	Type	ID number	Last calibration date	Last due date
Continuous Wave Simulator	EM Test	CWS500N1.4	EM0098	2024-10-28	2025-10-28
Attenuator	EM TEST	ATT6/80	EM0099	N/A	N/A
Coupling/Decoupling Network	SIQ	CDN M3/32A	EM0055	2024-08-07	2026-02-07
CDN M2/32A	SIQ	M2/32A	EM0206	2025-01-10	2026-07-10

10.6 Power frequency magnetic fields immunity measurement

Equipment	Manufacturer	Type	ID number	Last calibration date	Last due date
Magnetic field coil	EM Test	MS100N	EM0035	N/A	N/A
True RMS Clamp Meter	FLUKE	375FC	EM0219	2024-10-10	2025-10-10
Current transformer	EM TEST	MC 2630	EM0056	2022-02-01	2025-02-01

-----END OF TEST REPORT-----