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Test report No: 4390416.51

TEST REPORT
Electromagnetic Compatibility (EMC)

Identification of item tested	Split-Type Air-Conditioner
Trademark	TCL
Model and /or type reference	TAC-09CHSD/*I3A, TAC-12CHSD/*I3A, TAC-18CHSD/*I3A, TAC-24CHSD/*I3A (* = TP11, TP21, TP31, TP41, TP51, TP61, TP71, TP72, TP81, TP91, TPA1, TPB1, TPC1, TPC2, TPD1, TPD2, TPE1, TPE2, TPG11, TPG21, TPG31)
Features	220-240 V~, 50 Hz, Class I
Derived model(s)	N/A
Applicant´s name / address	TCL Air Conditioner (Zhong Shan) Co., Ltd. No.59 Nantou Road West, Nantou Town, Zhongshan City, Guangdong, China
Test method requested, standard	ETSI EN 301 489-17 V3.2.4 (2020-09) ETSI EN 301 489-1 V2.2.3 (2019-11)
Verdict Summary	COMPLIANCE
Tested by (name / signature)	Kenny Liang
Approved by (name / signature)	Tim Yan
Date of issue	2022-10-17
Report template No	TRF_EMC 2017-06-489

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GENERAL CONDITIONS

1. This report is only referred to the item that has undergone the test.
2. This report does not constitute or imply on its own an approval of the product by the Certification Bodies or Competent Authorities.
3. This document is only valid if complete; no partial reproduction can be made without previous written permission of DEKRA.
4. This test report cannot be used partially or in full for publicity and/or promotional purposes without previous written permission of DEKRA.
5. This report will not be used for social proof function in China market.

UNCERTAINTY

For all measurements where guidance for the calculation of the instrumentation uncertainty of a measurement is specified in EN 55016-4-2 (CISPR 16-4-2), EN/IEC 61000-4 series or a product standard, the measurement instrumentation uncertainty has been calculated and applied in accordance with these standards.

Uncertainties have been calculated according to the DEKRA internal document. The reported expanded uncertainties are based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95%. Refer to the Annex 1 for furter information.

ENVIRONMENTAL CONDITIONS

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:

Ambient temperature	15 °C – 35 °C
Relative Humidity air	30% - 60%
Atmospheric pressure	86 kPa – 106 kPa

If explicitly required in the basic standard or applied product / product family standard the climatic values are recorded and documented separately in this test report.

POSSIBLE TEST CASE VERDICTS

Test case does not apply to test object	N/A
Test object does meet requirement	P (Pass) / PASS
Test object does not meet requirement	F (Fail) / FAIL
Not measured	N/M

DEFINITION OF SYMBOLS USED IN THIS TEST REPORT

☒ Indicates that the listed condition, standard or equipment is applicable for this report/test/EUT.				
☐ Indicates that the listed condition, standard or equipment is not applicable for this report/test/EUT.				
Decimal separator used in this report	☒	Comma (,)	☐	Point (.)

ABBREVIATIONS

For the purposes of the present document, the following abbreviations apply:

EUT	:	Equipment Under Test
QP	:	Quasi-Peak
CAV	:	CISPR Average
AV	:	Average
CDN	:	Coupling Decoupling Network
SAC	:	Semi-Anechoic Chamber
OATS	:	Open Area Test Site
BW	:	Bandwidth
AM	:	Amplitude Modulation
PM	:	Pulse Modulation
HCP	:	Horizontal Coupling Plane
VCP	:	Vertical Coupling Plane
U_N	:	Nominal voltage
*T*x	:	Transmitter
*R*x	:	Receiver
N/A	:	Not Applicable
N/M	:	Not Measured

DOCUMENT HISTORY

Report nr.	Date	Description
4390416.51	2022-10-17	First release.

REMARKS AND COMMENTS

The equipment under test (EUT) does meet the essential requirements of the stated standard(s)/test(s).

The ETSI EN 301 489-17 standard has been used in conjuction with ETSI EN 301 489-1 standard.

1 GENERAL INFORMATION

1.1 General Description of the Item(s)

Description of the item .....:	Split-Type Air-Conditioner
Trademark .....:	TCL
Model / Type number .....:	TAC-09CHSD/*I3A, TAC-12CHSD/*I3A, TAC-18CHSD/*I3A, TAC-24CHSD/*I3A (* = TP11, TP21, TP31, TP41, TP51, TP61, TP71, TP72, TP81, TP91, TPA1, TPB1, TPC1, TPC2, TPD1, TPD2, TPE1, TPE2, TPG11, TPG21, TPG31)
Ratings .....:	220-240 V~, 50 Hz, Class I
Manufacturer.....:	Same as applicant
Factory .....:	TCL Air conditioner (Zhong Shan) Co., Ltd. No. 59, Nantou Road West, Nantou, Zhongshan, Guangdong, China

			Reference poles				
Rated power supply .....:	Voltage and Frequency		L1	L2	L3	N	PE
	☒	AC: 220-240 V, 50 Hz	☒	☐	☐	☒	☒
	☐	AC:	☐	☐	☐	☐	☐
	☐	DC:					
	☐	Battery:					
Clock frequencies .....:	Less than 15MHz						
Mounting position.....:	☐	Table top equipment					
	☐	Wall/Ceiling mounted equipment					
	☒	Floor standing equipment					
	☐	Hand-held equipment					
	☐	Other:					

According to customer's declaration, the products contain RF wireless module(WIFI+BLE) and the characteristics are:

For BLE characteristics:

Operating frequency range(s) – Tx :	2402-2480 MHz
Operating frequency range(s) – Rx :	2402-2480 MHz
Type of Modulation ..... :	GFSK
Maximum RF output power ..... :	6 dBm
Antenna type..... :	Integral Antenna
Antenna gain..... :	2,5 dBi
Adaptivity	Adaptive
Geo-location Capability ..... :	Not Support
Number of channel..... :	40
Operating Temperature Range..... :	-10 – +40 ℃

For WIFI characteristics:

Operating frequency range(s) – Tx :	2412-2472 MHz
Operating frequency range(s) – Rx :	2412-2472 MHz
Type of Modulation ..... :	IEEE 802.11b: DSSS(CCK, DQPSK, DBPSK) IEEE 802.11g: OFDM(64-QAM, 16-QAM, QPSK, BPSK) IEEE 802.11n-HT20: OFDM(64-QAM, 16-QAM, QPSK, BPSK)
Data Rate ..... :	IEEE 802.11b: Up to 11 Mbps IEEE 802.11g: Up to 54 Mbps IEEE 802.11n-HT20: Up to MCS7
Geo-location Capability ..... :	Not Support
Adaptivity..... :	Adaptive
Maximum RF output power(EIRP). :	20 dBm
Antenna type..... :	Integral Antenna
Antenna gain..... :	2,5 dBi
Number of channel..... :	IEEE 802.11b: 13 IEEE 802.11g: 13 IEEE 802.11n-HT20: 13
Operating Temperature Range..... :	-10 – +40 ℃

Intended use of the Equipment Under Test (EUT)
The apparatus as supplied for the test are split type air conditioners which have cooling and heating functions and intended for residential use. The products contain electronic control circuitry and earth connection. Models TAC-09CHSD/*I3A, TAC-12CHSD/*I3A, TAC-18CHSD/*I3A, TAC-24CHSD/*I3A have similar construction except for the size and components. In the model name, * = TP11, TP21, TP31, TP41, TP51, TP61, TP71, TP72, TP81, TP91, TPA1, TPB1, TPC1, TPC2, TPD1, TPD2, TPE1, TPE2, TPG11, TPG21, TPG31 which indicates different panel of indoor unit. Hence, models TAC-09CHSD/ TP11I3A, TAC-12CHSD/ TP11I3A, TAC-18CHSD/ TP11I3A, TAC-24CHSD/ TP11I3A were chosen for full test and the corresponding data are also representative for other models as well.

No	Module/parts of test item	Type	Manufacturer

No	Documents as provided by the applicant - Description	File name	Issue date

Modifications to the test item during testing .....:	☒	N/A	☐	

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. Not provided.

1.2 The environment(s) in which the EUT is intended to be used

The equipment under test (EUT) is intended to be used in the following environment(s):

☒	Residential (domestic) environment.
☒	Commercial and light-industrial environment.
☐	Industrial environment.
☐	Vehicular environment
☐	Telecommunication centre environment

1.3 Classification according to ETSI EN 301 489-1 / ETSI EN 301 489-17

For the purpose of the EMC performance assessment in the listed standards, the radio equipment and/or associated ancillary equipment under test is classified as:

☒	Equipment for fixed use (e.g. base station equipment). See note 1.
☐	Equipment for vehicular use (e.g. mobile equipment). See note 2.
☐	Equipment for portable use (e.g. portable equipment). See note 1 and note 2.
NOTE 1 :	Hand portable or mobile equipment, or combinations of equipment, declared as capable of being powered for intended use by ac mains shall additionally be considered as fixed station equipment.
NOTE 2 :	Hand portable equipment, or combinations of equipment, declared as capable of being powered for intended use by the main battery of a vehicle shall additionally be considered as vehicular mobile equipment.

1.4 Classification according to EN 55032

The radio equipment and/or associated ancillary equipment under test is classified as:

☒	Class B	An ancillary equipment intended to be used exclusively in an residential (domestic) or commercial and light-industrial environment.
☐	Class A	An ancillary equipment intended to be used exclusively in an industrial environment or telecommunication centres.

1.5 Test data

Test Location 1	DEKRA Testing and Certification (Shanghai) Ltd. Guangzhou Branch Block 5, No.3, Qiyun Road, Huangpu District, Guangzhou, Guangdong, China
Test Location 2	Guangdong Testing Institute of Product Quality Supervision No.10, Science Avenue, Science City, Huangpu District, Guangzhou, Guangdong, China
Date of receipt of test item	2022-05-26
Date (s) of performance of tests	2022-05-26 to 2022-07-27

Test Location 2: for Radio-frequency electromagnetic fields immunity test.

Test Location 1: for other rest tests.

2 DESCRIPTION OF TEST SETUP

2.1 Operating mode(s) used for tests

During the tests the following operating mode(s) has(have) been used.

Operating mode	Operating mode description	Used for testing	
		Emission	Immunity
1	Cooling mode keep swinging at high speed and adjust the EUT temperature at the lowest temperature position with wireless communication	☒	☒
2	Heating mode keep swinging at high speed and adjust the EUT temperature at the highest temperature position with wireless communication	☒	☒
3		☐	☐
Supplemental information:			

2.2 Port(s) of the EUT

Port name and description	Connected to / Termination	Cable		
		Length used during test [m]	Attached during test	Shielded
AC mains	AC network	0,8	☒	☐
Signal	Indoor and outdoor	5	☒	☐
			☐	☐
Supplemental information:				

2.3 Support / Auxiliary equipment / unit / software for the EUT

The EUT has been tested with the following auxiliary equipment / unit / software:

Auxiliary equipment / unit / software	Type / Version	Manufacturer	Supplied by
Supplemental information:			

2.4 Test Configuration / Block diagram used for tests

The following test setup / configuration / block diagram has been used during the tests:

Refer to annex 3 test photos.

3 VERDICT SUMMARY SECTION

This chapter presents an overview of standards and results. Refer to the next chapters for details of measured test results and applied test levels.

3.1 Standards

Standard	Year	Description
ETSI EN 301 489-17 V3.2.4	2020-09	ElectroMagnetic Compatibility (EMC)cstandard for radio equipment and services; Part 17: Specific conditions for Broadband Data Transmission Systems.
ETSI EN 301 489-1 V2.2.3	2019-11	ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements.
EN 55032	2015	Electromagnetic compatibility of multimedia equipment – Emission requirements.
EN 55016-2-1	2014	Methods of measurement of disturbances and immunity - Conducted disturbance measurements.
EN 55016-2-3 +A1 +A2	2010 2010 2014	Methods of measurement of disturbances and immunity - Radiated disturbance measurements.
CISPR 25 (2nd edition) +Cor1	2002 2004	Radio disturbance characteristics for the protection of receivers used on board vehicles, boats, and on devices - Limits and methods of measurement.
EN 61000-4-2	2009	Electrostatic discharge immunity test.
EN 61000-4-3 +A1 +A2	2006 2008 2010	Radiated, radio-frequency, electromagnetic field immunity test.
EN 61000-4-4	2012	Electrical fast transient/burst immunity test.
EN 61000-4-5	2006	Surge immunity test.
EN 61000-4-6	2009	Immunity to conducted disturbances, induced by radio-frequency fields.
EN 61000-4-11	2004	Voltage dips, short interruptions and voltage variations immunity tests.
ISO 7637-2	2004	Road vehicles - Electrical disturbances from conduction and coupling -Part 2: Electrical transient conduction along supply lines only.
EN 61000-3-2	2014	Limits for harmonic current emissions (equipment input current ≤ 16 A per phase).
EN 61000-3-3	2013	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.

3.2 Deviation(s) from the Standard(s) / Test Specification(s)

The following deviation(s) was / were made from the published requirements of the listed standards:
N/A.

3.3 Overview of results

EMISSION TESTS – ETSI EN 301 489-17, ETSI EN 301 489-1			
Requirement – Test case	**Basic standard(s)**	**Verdict**	**Remark**
Conducted disturbance voltage at AC mains power input / output port(s)	EN 55032, EN 55016-2-1	PASS	---
Conducted disturbance voltage at DC power input / output port(s)	EN 55032 and/or CISPR 25 (equipment for vehicular use)	N/A	---
Conducted disturbance voltage at wired network port(s)	EN 55032, EN 55016-2-1	N/A	---
Radiated electromagnetic disturbances (30 MHz to 1000 MHz)	EN 55032, EN 55016-2-3	N/A	---
Radiated electromagnetic disturbances (above 1 GHz)	EN 55032, EN 55016-2-3	N/A	---
Control principle shall be allowed for the application according to the clause 6.1	EN 61000-3-2	PASS	---
Harmonic current emissions	EN 61000-3-2	PASS	
Voltage changes, voltage fluctuations and flicker	EN 61000-3-3	PASS	---
Supplementary information:			

IMMUNITY TESTS – ETSI EN 301 489-17, ETSI EN 301 489-1			
Requirement – Test case	**Basic standard(s)**	**Verdict**	**Remark**
Electrostatic discharge	EN 61000-4-2	PASS	
Radio-frequency electromagnetic fields	EN 61000-4-3	PASS	
Fast transients	EN 61000-4-4	PASS	
Surge transient	EN 61000-4-5	PASS	
Injected currents (radio-frequency common mode)	EN 61000-4-6	PASS	
Voltage dips and short interruptions	EN 61000-4-11	PASS	
Transients and surges in the vehicular environment	ISO 7637-2	N/A	See 1)
Supplementary information: 1) These tests are not applicable to radio and ancillary equipment does not intended for vehicular use.			

The measurement result is considered in conformance with the requirement if it is within the prescribed limit, It is not necessary to calculate the uncertainty associated with the measurement result.

3.4 Exclusion bands

The frequencies on which the transmitter part of the EUT is intended to operate is excluded from radiated emission measurements when performed in transmit mode of operation.

There is no frequency exclusion band applied to emission measurements of the receiver part of transceivers or the stand alone receiver under test, and/or associated ancillary equipment.

The exclusion band for immunity testing of equipment operating in the 2,4 GHz band is:

- lower limit of exclusion band = lowest allocated band edge frequency -120 MHz, i.e. 2 280 MHz;
- upper limit of exclusion band = highest allocated band edge frequency +120 MHz, i.e. 2 603,5 MHz.

The exclusion band for immunity testing of equipment operating in the 5 GHz Wi-Fi band is:

- lower limit of exclusion band = lowest allocated band edge frequency -270 MHz, i.e. 4 880 MHz;
- upper limit of exclusion band = highest allocated band edge frequency +270 MHz, i.e. 5 995 MHz.

The exclusion band for immunity testing of equipment operating in the 5,8 GHz band is:

- lower limit of exclusion band = lowest allocated band edge frequency -270 MHz, i.e. 5 455 MHz;
- as the immunity requirements have an upper frequency range of 6 GHz and any upper edge exclusion band would be greater than this for the 5,8 GHz band. The above frequency is also regarded as the upper end of the test range.

NOTE: These receiver exclusion band ranges align with the relevant blocking test ranges.

4 EMISSION TEST RESULTS

4.1	Conducted disturbance voltage – AC power port(s)	VERDICT: PASS

Standard	ETSI EN 301 489-17, ETSI EN 301 489-1
Basic standard(s)	EN 55032, EN 55016-2-1

Limits – Class B

Frequency range [MHz]	Limit: QP [dB(µV)[1)]]	Limit: AV [dB(µV) [1)]]	IF BW	Detector(s)
0,15 - 0,50	66 – 56 [2)]	56 - 46 [2)]	9 KHz	QP, AV
0,50 - 5,0	56	46	9 KHz	QP, AV
5,0 - 30	60	50	9 KHz	QP, AV

[1)] At the transition frequency, the lower limit applies.

[2)] The limit decreases linearly with the logarithm of the frequency.

NOTE 1: The exclusion band for transmitters shall be considered for transmitters operating at frequencies below 30 MHz.

NOTE 2: Where the AC output port is directly connected (or via a circuit breaker) to the AC power input port of the EUT the AC power output port need not to be tested.

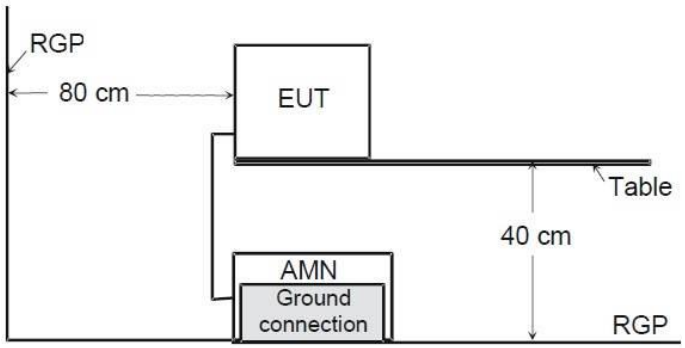
Performed measurements

Port under test		Terminal							
☒	AC mains input power	☒	N	☒	L1	☐	L2	☐	L3
☐	AC output power	☐	N	☐	L1	☐	L2	☐	L3

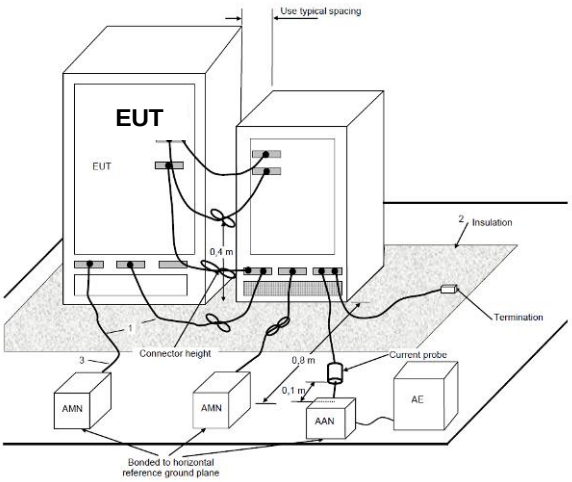
Voltage – Mains [V]	230 Vac			
Frequency – Mains [Hz]	50 Hz			
Test method applied	☒	Artificial mains network		
	☐	Voltage probe		
Test setup	☐	Table top	☐	Artificial hand applied
	☒	Floor standing	☐	Other:
	Refer to the Annex 3 for test setup photo(s).			
Remark	---			

See next page.

Test Configuration



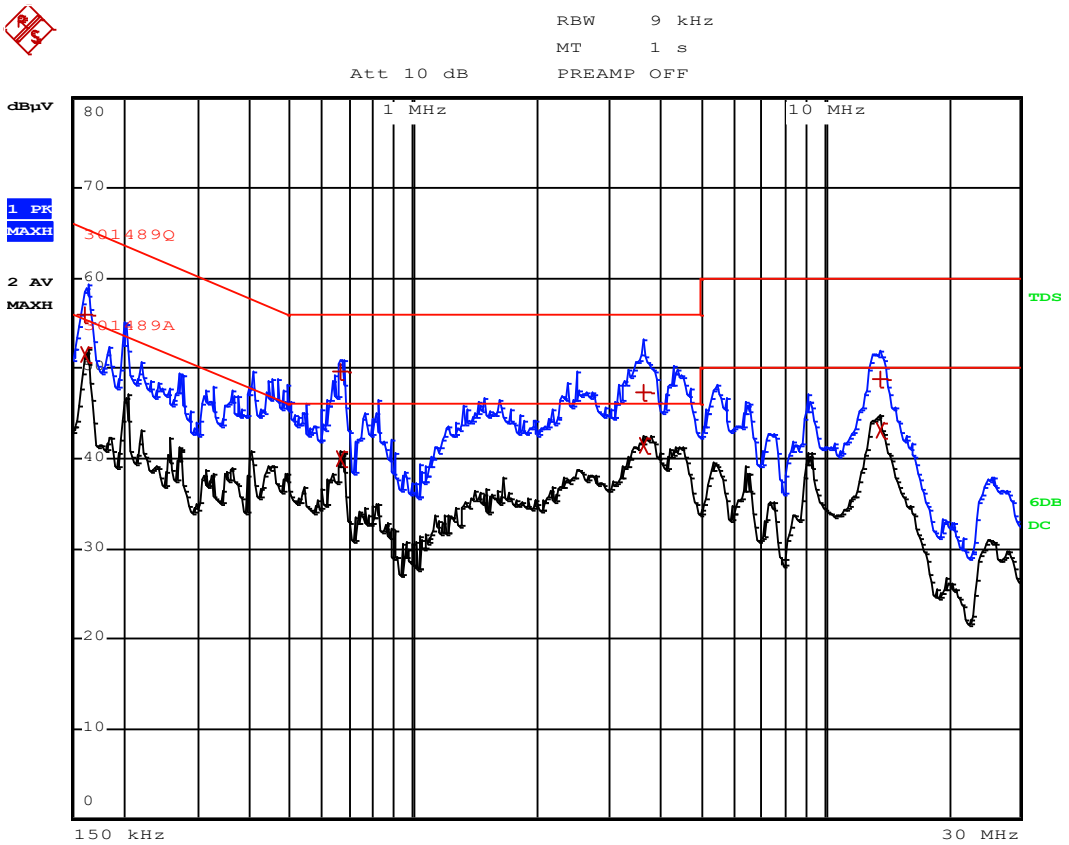
Test setup for “Table-top” DUT.



Test setup for “Floor-standing” DUT.

Measurement data of TAC-09CHSD/ TP11I3A	Port under test	AC mains power input
Operating mode / voltage / frequency used during the test		Mode 1 / 230 Vac / 50 Hz – worst case

Live



EDIT PEAK LIST (Final Measurement Results)			
Trace1:	301489Q		
Trace2:	301489A		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dBµV	DELTA LIMIT dB
2 Average	162 kHz	51.48	-3.87
2 Average	3.63 MHz	41.49	-4.50
2 Average	662 kHz	39.99	-6.00
1 Quasi Peak	662 kHz	49.75	-6.24
2 Average	13.674 MHz	43.10	-6.89
1 Quasi Peak	3.63 MHz	47.41	-8.58
1 Quasi Peak	162 kHz	55.87	-9.48
1 Quasi Peak	13.674 MHz	48.85	-11.14

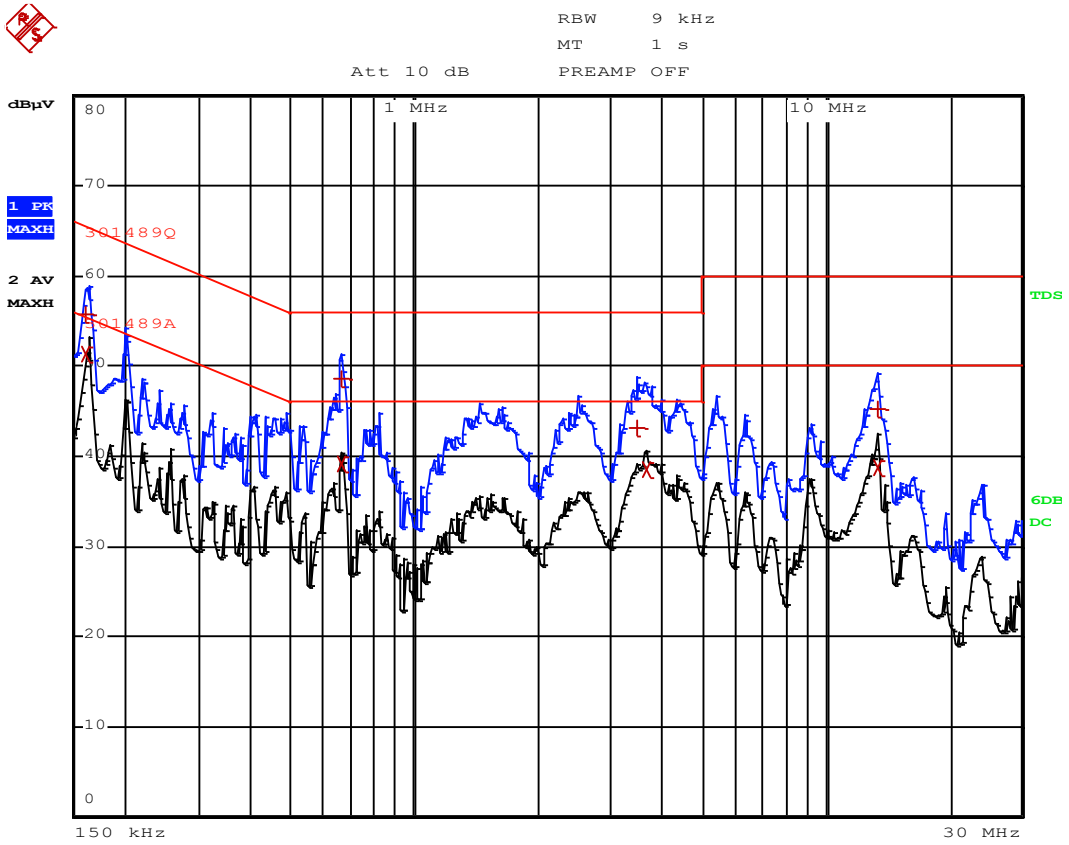
Remarks:

1) Level (Final measurement) = received value + transducer (Lisn + cable)
2) Delta = Level – Limit

No other significant emissions were measured at the frequency range of interest employing both the QP and AV detectors.

Measurement data of TAC-09CHSD/ TP11I3A	Port under test	AC mains power input

Neutral



EDIT PEAK LIST (Final Measurement Results)			
Trace1:	301489Q		
Trace2:	301489A		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dBµV	DELTA LIMIT dB
2 Average	162 kHz	51.39	-3.96
2 Average	666 kHz	39.21	-6.78
1 Quasi Peak	666 kHz	48.54	-7.45
2 Average	3.682 MHz	38.47	-7.52
1 Quasi Peak	162 kHz	55.82	-9.53
2 Average	13.394 MHz	38.67	-11.32
1 Quasi Peak	3.498 MHz	43.23	-12.76
1 Quasi Peak	13.394 MHz	45.21	-14.78

Remarks:

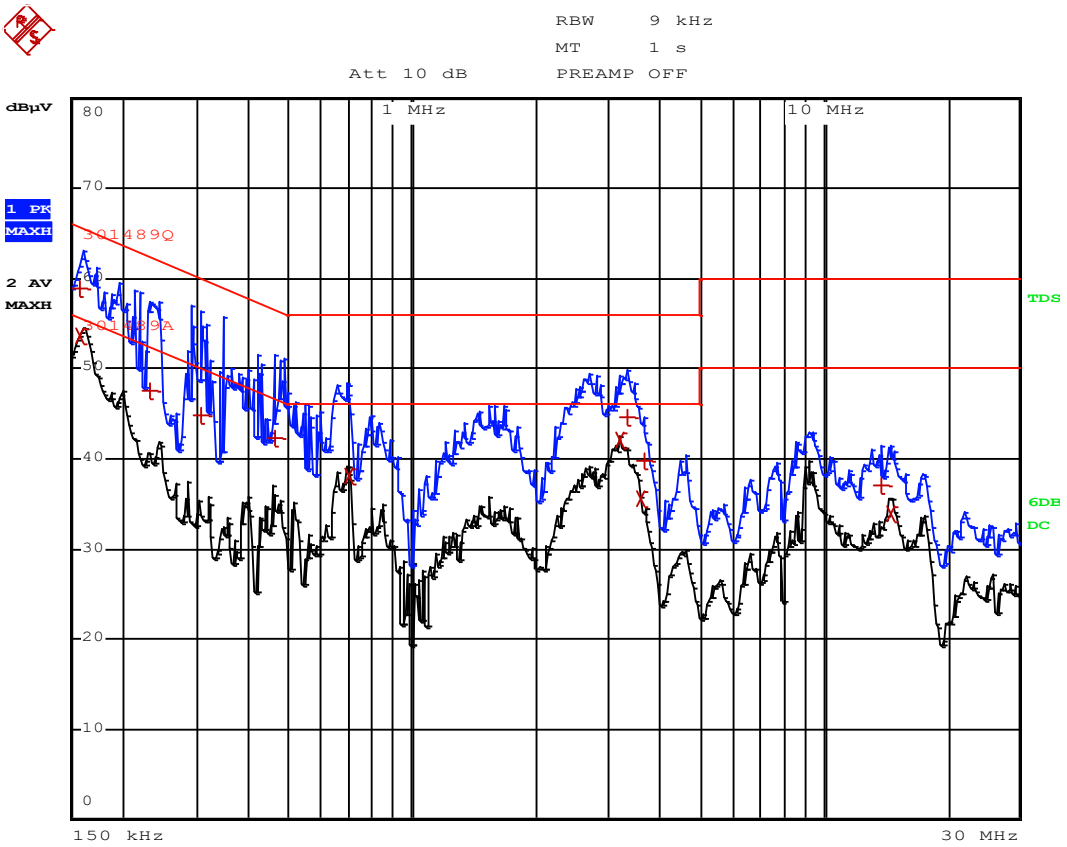
1) Level (Final measurement) = received value + transducer (Lisn + cable)
2) Delta = Level – Limit

No other significant emissions were measured at the frequency range of interest employing both the QP and AV detectors.

Remark	

Measurement data of TAC-12CHSD/ TP11I3A	Port under test	AC mains power input
Operating mode / voltage / frequency used during the test		Mode 1 / 230 Vac / 50 Hz – worst case

Live



EDIT PEAK LIST (Final Measurement Results)

Trace1:	301489Q
Trace2:	301489A
Trace3:	---

TRACE		FREQUENCY	LEVEL dBµV	DELTA LIMIT dB
2	Average	158 kHz	53.74	-1.82
2	Average	3.194 MHz	42.08	-3.91
1	Quasi Peak	158 kHz	58.82	-6.74
2	Average	698 kHz	38.08	-7.91
2	Average	3.618 MHz	35.56	-10.43
1	Quasi Peak	3.338 MHz	44.69	-11.31
1	Quasi Peak	462 kHz	42.23	-14.41
1	Quasi Peak	230 kHz	47.62	-14.82
1	Quasi Peak	306 kHz	44.79	-15.28
2	Average	14.594 MHz	33.95	-16.04
1	Quasi Peak	3.67 MHz	39.71	-16.28
1	Quasi Peak	13.834 MHz	36.97	-23.02

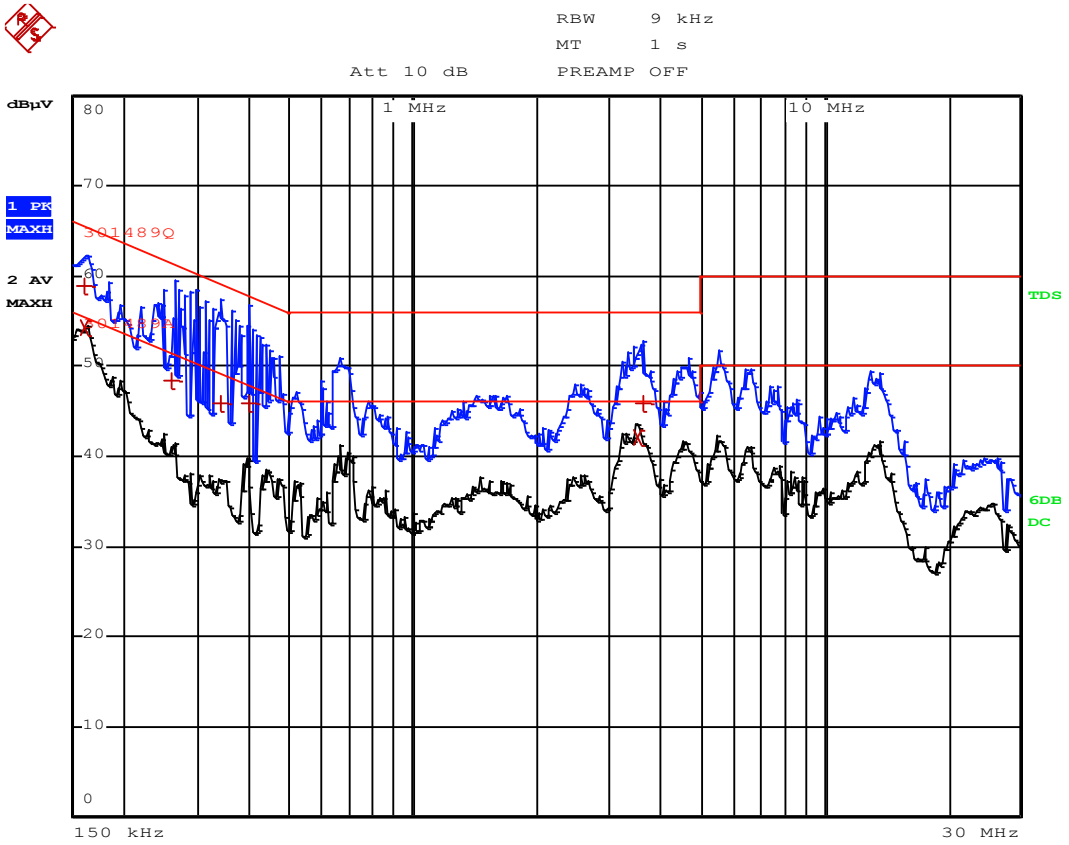
Remarks:

1) Level (Final measurement) = received value + transducer (Lisn + cable)
2) Delta = Level – Limit

No other significant emissions were measured at the frequency range of interest employing both the QP and AV detectors.

Measurement data of TAC-12CHSD/ TP11I3A	Port under test	AC mains power input

Neutral



EDIT PEAK LIST (Final Measurement Results)

Trace1:	301489Q
Trace2:	301489A
Trace3:	---

TRACE	FREQUENCY	LEVEL dBµV	DELTA LIMIT dB
2 Average	162 kHz	54.29	-1.06
2 Average	3.514 MHz	42.03	-3.96
1 Quasi Peak	162 kHz	58.92	-6.43
1 Quasi Peak	3.638 MHz	45.89	-10.10
1 Quasi Peak	397.4 kHz	45.80	-12.10
1 Quasi Peak	262 kHz	48.45	-12.91
1 Quasi Peak	338 kHz	45.88	-13.36

Remarks:

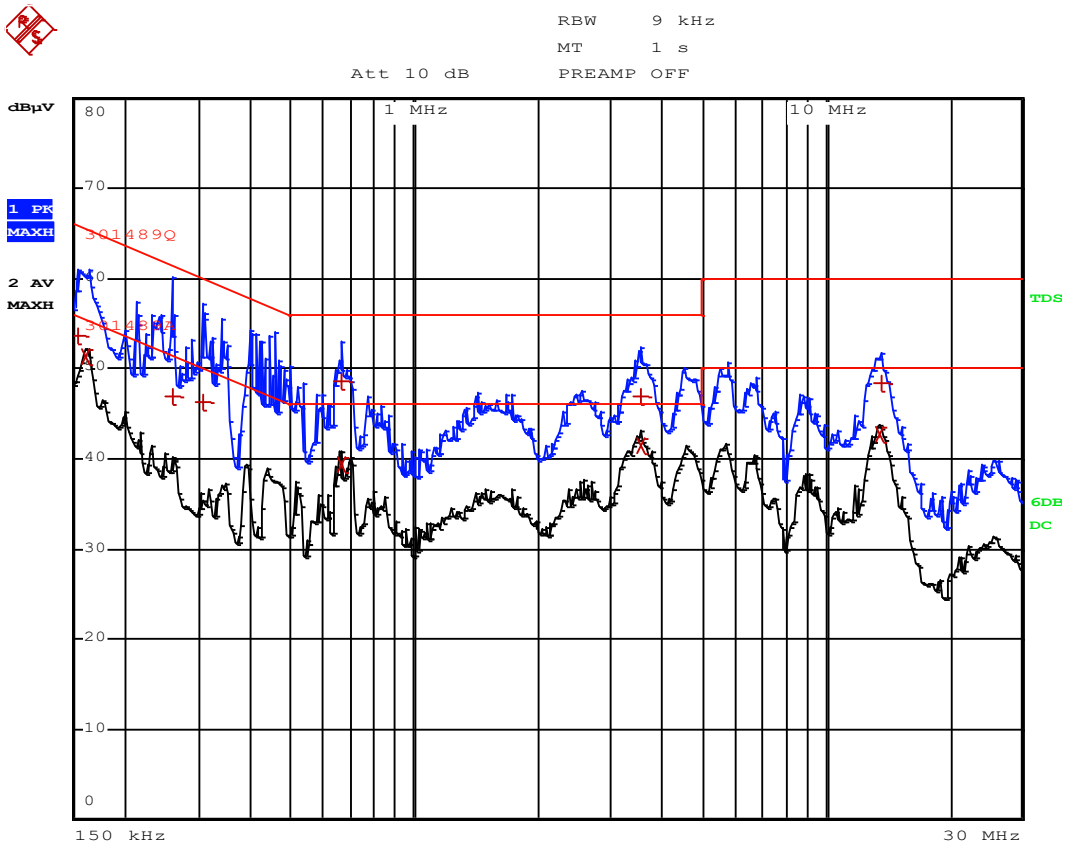
1) Level (Final measurement) = received value + transducer (Lisn + cable)
2) Delta = Level – Limit

No other significant emissions were measured at the frequency range of interest employing both the QP and AV detectors.

Remark	

Measurement data of TAC-18CHSD/ TP11I3A	Port under test	AC mains power input
Operating mode / voltage / frequency used during the test		Mode 1 / 230 Vac / 50 Hz – worst case

Live



EDIT PEAK LIST (Final Measurement Results)			
Trace1:	301489Q		
Trace2:	301489A		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dBµV	DELTA LIMIT dB
2 Average	162 kHz	51.38	-3.97
2 Average	3.57 MHz	41.54	-4.45
2 Average	666 kHz	39.39	-6.60
2 Average	13.514 MHz	42.77	-7.22
1 Quasi Peak	662 kHz	48.64	-7.35
1 Quasi Peak	3.57 MHz	46.95	-9.04
1 Quasi Peak	13.714 MHz	48.36	-11.63
1 Quasi Peak	154 kHz	53.57	-12.20
1 Quasi Peak	306 kHz	46.39	-13.68
1 Quasi Peak	258 kHz	46.88	-14.61

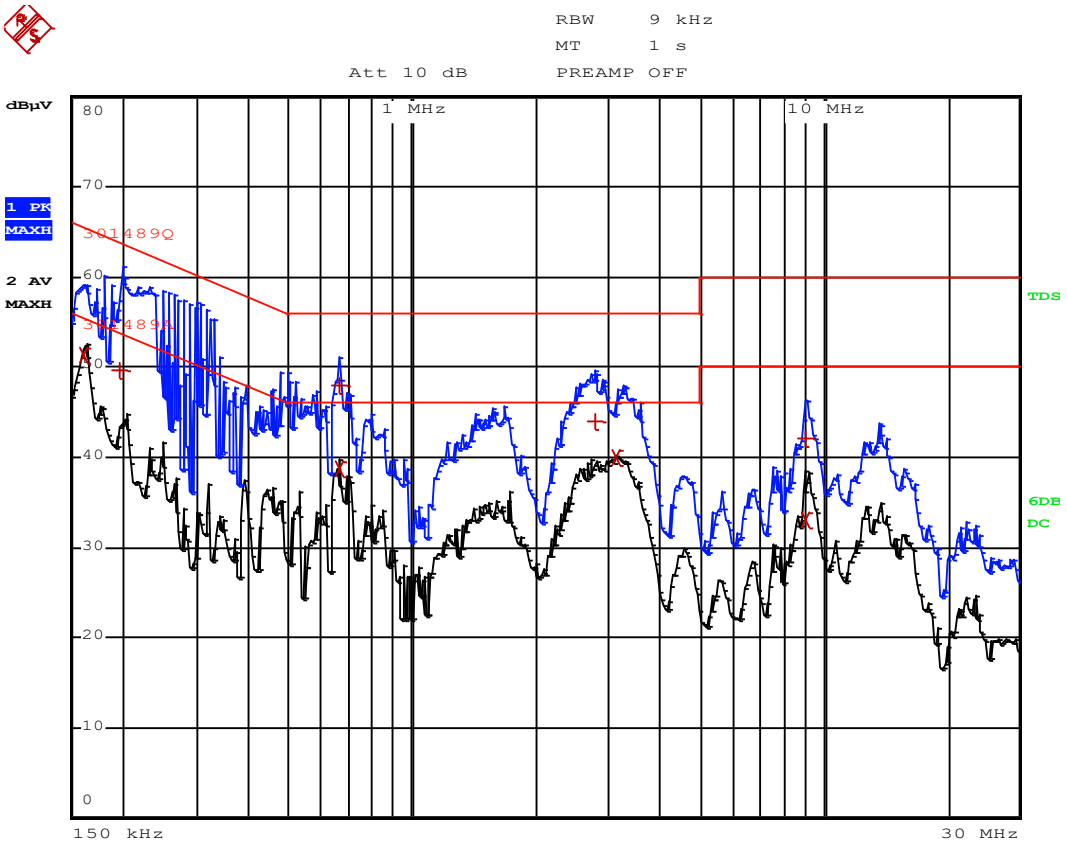
Remarks:

1) Level (Final measurement) = received value + transducer (Lisn + cable)
2) Delta = Level – Limit

No other significant emissions were measured at the frequency range of interest employing both the QP and AV detectors.

Measurement data of TAC-18CHSD/ TP11I3A	Port under test	AC mains power input

Neutral



EDIT PEAK LIST (Final Measurement Results)

Trace1:	301489Q		
Trace2:	301489A		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dBµV	DELTA LIMIT dB
2 Average	162 kHz	51.28	-4.07
2 Average	3.142 MHz	40.09	-5.91
2 Average	662 kHz	38.67	-7.32
1 Quasi Peak	666 kHz	47.89	-8.10
1 Quasi Peak	2.798 MHz	44.01	-11.99
1 Quasi Peak	198 kHz	49.70	-13.98
2 Average	9.078 MHz	33.16	-16.83
1 Quasi Peak	9.078 MHz	42.05	-17.94

Remarks:

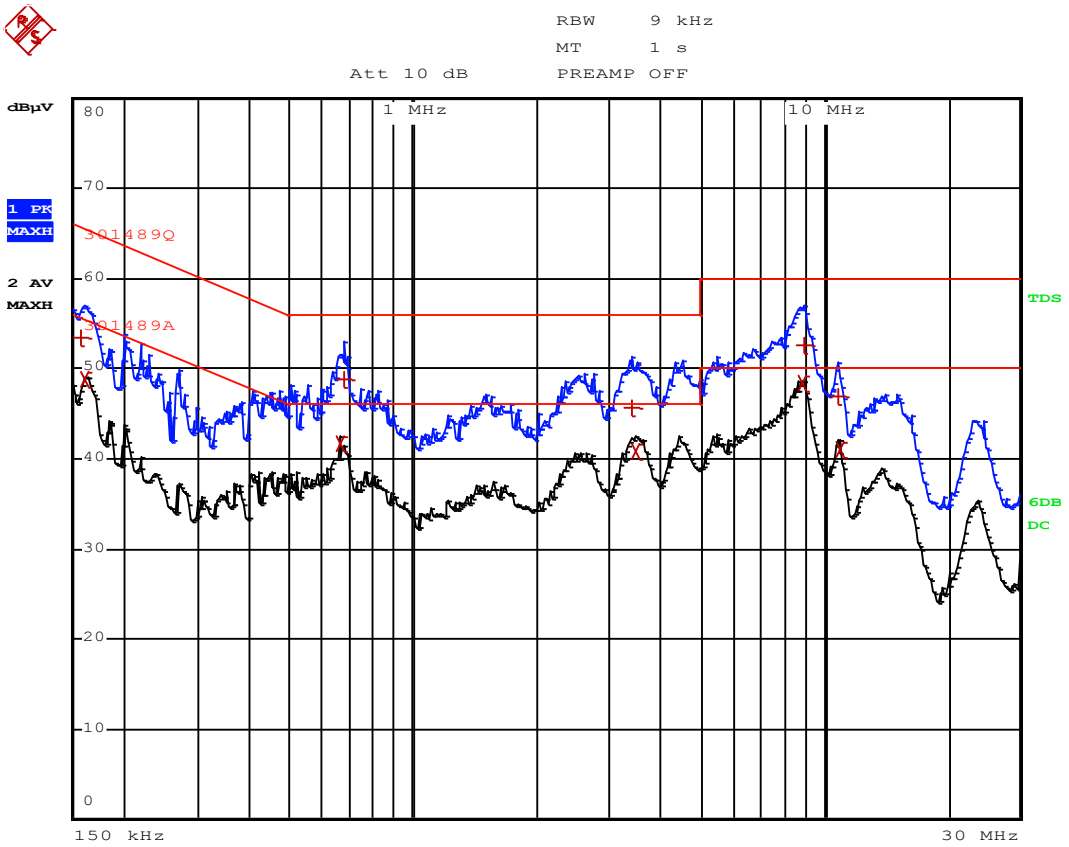
1) Level (Final measurement) = received value + transducer (Lisn + cable)
2) Delta = Level – Limit

No other significant emissions were measured at the frequency range of interest employing both the QP and AV detectors.

Remark	

Measurement data of TAC-24CHSD/ TP11I3A	Port under test	AC mains power input
Operating mode / voltage / frequency used during the test		Mode 1 / 230 Vac / 50 Hz – worst case

Live



EDIT PEAK LIST (Final Measurement Results)

Trace1:	301489Q		
Trace2:	301489A		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dBµV	DELTA LIMIT dB
2 Average	8.878 MHz	48.41	-1.58
2 Average	666 kHz	41.67	-4.32
2 Average	3.47 MHz	40.87	-5.12
2 Average	162 kHz	48.87	-6.48
1 Quasi Peak	678 kHz	48.91	-7.08
1 Quasi Peak	8.922 MHz	52.67	-7.32
2 Average	10.962 MHz	41.14	-8.85
1 Quasi Peak	3.41 MHz	45.62	-10.38
1 Quasi Peak	158 kHz	53.50	-12.05
1 Quasi Peak	10.882 MHz	46.90	-13.09

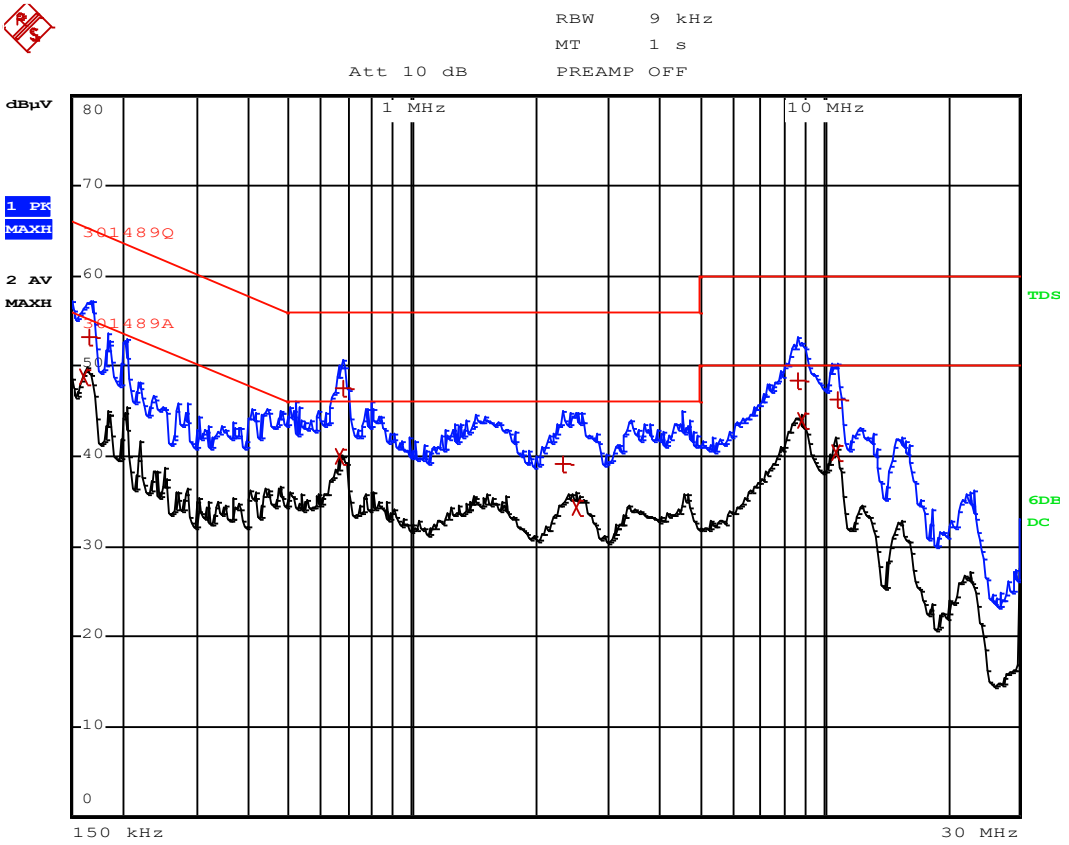
Remarks:

1) Level (Final measurement) = received value + transducer (Lisn + cable)
2) Delta = Level – Limit

No other significant emissions were measured at the frequency range of interest employing both the QP and AV detectors.

Measurement data of TAC-24CHSD/ TP11I3A	Port under test	AC mains power input

Neutral



EDIT PEAK LIST (Final Measurement Results)

Trace1:	301489Q
Trace2:	301489A
Trace3:	---

TRACE	FREQUENCY	LEVEL dBµV	DELTA LIMIT dB
2 Average	8.838 MHz	44.01	-5.98
2 Average	666 kHz	39.99	-6.00
2 Average	162 kHz	48.77	-6.58
1 Quasi Peak	682 kHz	47.66	-8.34
2 Average	10.762 MHz	40.45	-9.54
1 Quasi Peak	8.686 MHz	48.47	-11.53
2 Average	2.498 MHz	34.34	-11.65
1 Quasi Peak	166 kHz	53.31	-11.84
1 Quasi Peak	10.802 MHz	46.24	-13.75
1 Quasi Peak	2.326 MHz	39.21	-16.78

Remarks:

1) Level (Final measurement) = received value + transducer (Lisn + cable)
2) Delta = Level – Limit

No other significant emissions were measured at the frequency range of interest employing both the QP and AV detectors.

Remark	

4.2	Conducted disturbance voltage– DC power port(s)	VERDICT:	N/A

Standard	ETSI EN 301 489-17, ETSI EN 301 489-1
Basic standard(s)	EN 55032, EN 55016-2-1 or CISPR 25 (equipment for vehicular use)

Limits – Class B

Frequency range [MHz]	Limit: QP [dB(μV)]	Limit: AV [dB(μV)]	IF BW	Detector(s)
0,15 - 0,50	66 – 56 [1)]	56 - 46 [1)]	9 KHz	QP, AV
>0,50 - 5,0	56	46	9 KHz	QP, AV
>5,0 - 30	60	50	9 KHz	QP, AV

[1)] The limit decreases linearly with the logarithm of the frequency.

NOTE 1: This test is applicable for radio equipment and ancillary equipment for fixed use that may have DC cables longer than 3 m and for vehicular use irrespective of cable length.

NOTE 2: If the DC power cable of the radio and/or the ancillary equipment is less than or equal to 3 m in length, and intended for direct connection to a dedicated AC/DC power supply, then the measurement shall be performed on the AC power input port of that power supply. If the DC power cable is longer than 3 m, then the measurement shall additionally be performed on the DC power port of the radio and/or ancillary equipment.

NOTE 3: If the DC power cable between the mobile radi and/or ancillary equipment and the dedicated DC/DC power converter is less than or equal to 3 m in length, then the measurement can be limited to the DC power input port of that power converter only. If this DC power cable is longer than 3 m, then the measurement shall additionally be performed on the DC power port of the mobile radio and/or ancillary equipment.

NOTE 4: The exclusion band for transmitters shall be considered for transmitters operating at frequencies below 30 MHz.

Performed measurements

~~Port under test~~			~~Terminal~~			
☐	~~DC mains input power~~		☐	~~Positive (+)~~	☐	~~Negative (-)~~
☐	~~DC output power~~		☐	~~Positive (+)~~	☐	~~Negative (-)~~
~~Voltage – Input [V_{DC}]~~	☐	~~12~~	☐	~~24~~	☐	~~Other:~~
~~Voltage – Output [V_{DC}]~~	☐	~~24~~	☐	~~24~~	☐	~~Other:~~
~~Test method applied~~	☐	~~Artificial mains network as specified EN 55016-1-2~~				
	☐	~~Artificial Network (AN) as specified in CISPR 25 Annex D~~				
~~Test setup~~	☐	~~Table top~~	☐	~~Artificial hand applied~~		
	☐	~~Floor standing~~	☐	~~Other:~~		
	~~Refer to the Annex 3 for test setup photo(s).~~					
~~Operating mode(s) used~~						
~~Remark~~	~~---~~					

4.3	Conducted disturbance voltage – Wired port(s)	VERDICT:	N/A

Standard	ETSI EN 301 489-17, ETSI EN 301 489-1
Basic standard(s)	EN 55032, EN 55016-2-1

Limits – Class B

Frequency range [MHz]	Limit: QP [dB(μV)[1)]]	Limit: AV [dB(μV) [1)]]	IF BW	Detector(s)
0,15 - 0,50	84 – 74 [2)]	74 – 64 [2)]	9 KHz	QP, AV
0,50 - 30	74	64	9 KHz	QP, AV

[1)] At the transition frequency, the lower limit applies.

[2)] The limit decreases linearly with the logarithm of the frequency.

NOTE: This test is applicable for radio equipment and/or ancillary equipment for fixed use which have wired network ports.

Performed measurements

~~Port under test~~			
☐	~~LAN / Ethernet~~	☐	~~Other:~~
☐	~~Other:~~	☐	~~Other:~~
~~Voltage – Mains [V]~~			
~~Frequency – Mains [Hz]~~			
~~Test method applied~~	☐	~~ISN – Impedance Stabilisation Network~~	
	☐	~~CDN according to EN / IEC 61000-4-6~~	
	☐	~~Voltage probe~~	
	☐	~~Current probe~~	
	☐	~~Artificial mains network~~	
	☐	~~Other:~~	
~~Test setup~~	☐	~~Table top~~	☐ ~~Artificial hand applied~~
	☐	~~Floor standing~~	☐ ~~Other:~~
	~~Refer to the Annex 3 for test setup photo(s).~~		
~~Operating mode(s) used~~			
~~Remark~~	~~---~~		

4.4	Radiated electromagnetic disturbances (30 – 1000 MHz)	VERDICT:	N/A

Standard	ETSI EN 301 489-17, ETSI EN 301 489-1
Basic standard(s)	EN 55032, EN 55016-2-3
Test method	Antenna method according to EN 55032 standard.
NOTE: This test is only applicable to ancillary equipment not incorporated in the radio equipment and intended to be measured on a stand-alone basis, as declared by the manufacturer.	

Limits – Class B

Frequency	Limit: QP [dB(μV/m)[1)]]			IF BW	Detector
[MHz]	@3 m.	@5 m.	@10 m.		
30 - 230	40	36	30	120 KHz	QP
230 - 1000	47	43	37	120 KHz	QP
[1)] At the transition frequency, the lower limit applies.					

Performed measurements

~~Port under test~~	~~Enclosure~~	
~~Voltage – Mains [V]~~		
~~Frequency – Mains [Hz]~~		
~~Test method applied~~	☐	~~OATS or SAC with measurement distance [m]: 3 m.~~
	☐	~~OATS or SAC with measurement distance [m]: 5 m.~~
	☐	~~OATS or SAC with measurement distance [m]: 10 m.~~
~~Test setup~~	☐	~~Equipment on a table of 80 cm height~~
	☐	~~Equipment on the floor (insulated from ground plane)~~
	☐	~~Other:~~
	~~Refer to the Annex 3 for test setup photo(s).~~	
~~Operating mode(s) used~~		
~~Remark~~	~~—~~	

Note: this test only applicable to ancillary equipment not incorporated in the radio equipment and intended to be measured on a stand-alone basis.

4.5	Radiated electromagnetic disturbances (above 1 GHz)	VERDICT:	N/A

Standard	ETSI EN 301 489-17, ETSI EN 301 489-1	
Basic standard(s)	EN 55032, EN 55016-2-3	
Test method	Antenna method according to EN 55032 standard.	
Required highest frequency for radiated measurement		
Highest internal frequency [f_x]		Highest measured frequency
☐	f_x ≤ 108 MHz	1 GHz
☐	108 MHz < f_x ≤ 500 MHz	2 GHz
☐	500 MHz < f_x ≤ 1 GHz	5 GHz
☐	f_x ≥ 1 GHz	5x f_x or up to 6 GHz

Limits – Class B

Frequency [GHz]	Limit: PK@3m.[dB(µV/m)[1)]]	Limit: AV@3m.[dB(µV/m)[1)]]	IF BW	Detector
1 - 3	70	50	1 MHz	PK, AV
3 - 6	74	54	1 MHz	PK, AV

[1)] At the transition frequency, the lower limit applies.

Performed measurements

~~Port under test~~	~~Enclosure~~	
~~Voltage – Mains [V]~~		
~~Frequency – Mains [Hz]~~		
~~Test method applied~~	~~☐~~	~~Absorber-lined OATS or SAC with measurement distance [m]: 3 m.~~
	~~☐~~	~~Absorber-lined OATS or SAC with measurement distance [m]: 1 m.~~
~~Test setup~~	~~☐~~	~~Equipment on a table of 80 cm height~~
	~~☐~~	~~Equipment on the floor (insulated from ground plane)~~
	~~☐~~	~~Other:~~
	~~Refer to the Annex 3 for test setup photo(s).~~	
~~Operating mode(s) used~~		
~~Remark~~	~~---~~	

Note: this test only applicable to ancillary equipment not incorporated in the radio equipment and intended to be measured on a stand-alone basis.

4.6	**Harmonic current emissions**	**VERDICT: PASS**

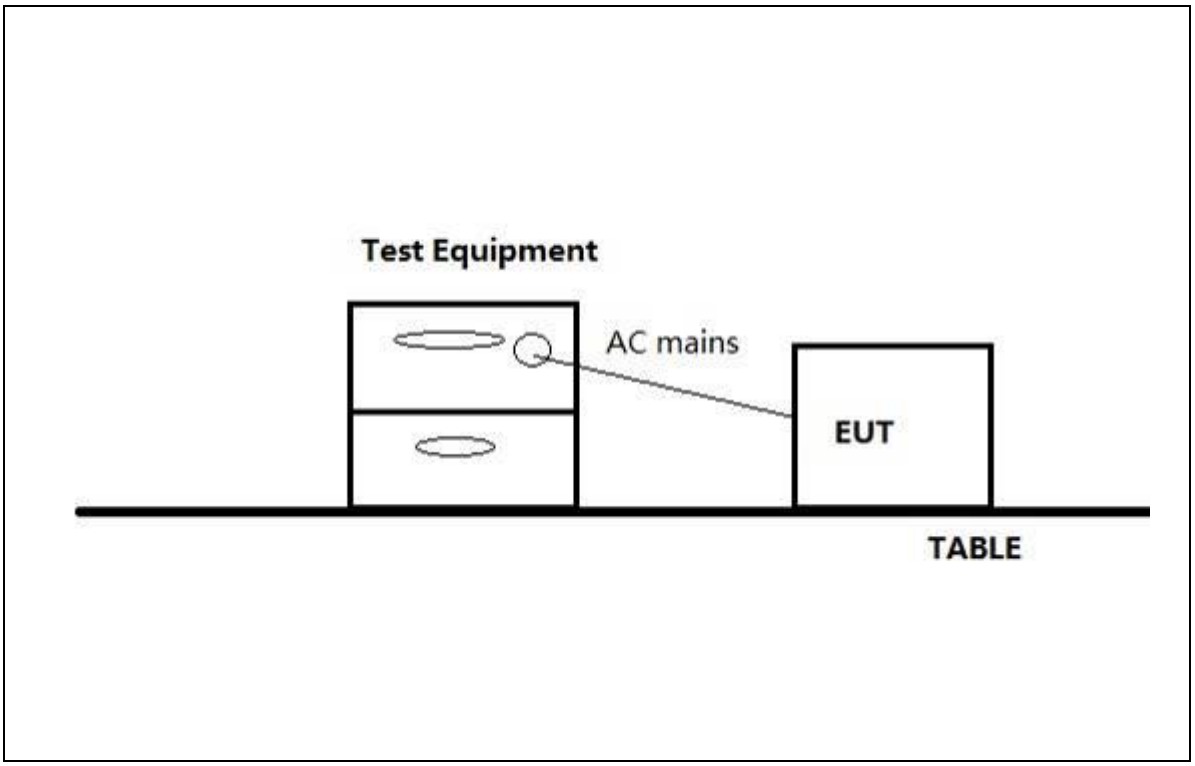
Standard	ETSI EN 301 489-17, ETSI EN 301 489-1	
Basic standard	EN 61000-3-2	
Exlusions (For these categories of equipment, limits are not specified in the EN 61000-3-2 standard)	☐	Arc welding equipment intended for professional use.
	☐	System(s) with nominal voltage(s) less than 220 V_{AC} (line-to-neutral).
	☐	Equipment with rated power of ≤ 75 W (other than lighting equipment).
	☐	Professional equipment with total rated power > 1 kW.
	☐	Symmetrically controlled heating elements with a rated power ≥ 200 W.
	☐	Independent dimmers for incandescent lamps with rated power ≤ 1 kW.

Classification			
☒	Class A	All apparatus not classified as Class B, C or D	
☐	Class B	Portable tools	
☐	Class C	☐	Lighting equipment with active input power > 25 W
		☐	Lighting equipment with active input power ≤ 25 W)
☐	Class D	Personal computers, television receivers	

Performed measurements

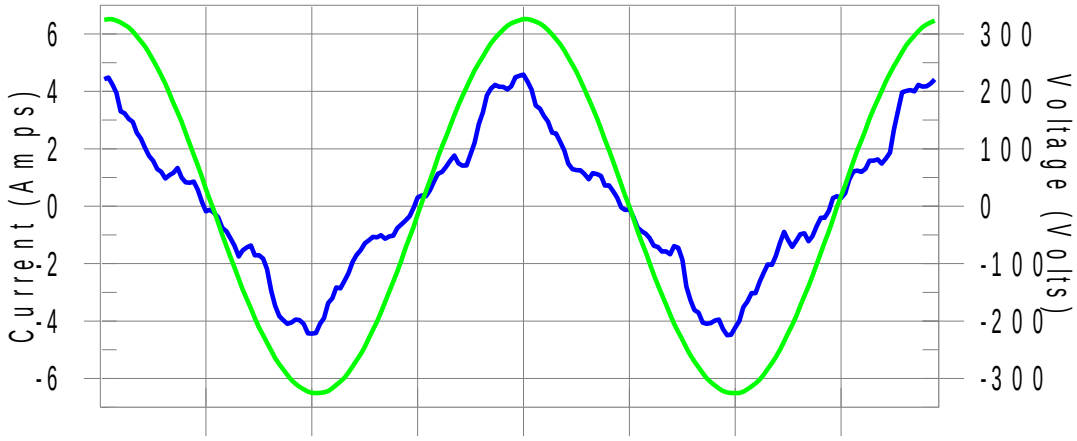
Port under test	AC mains power input					
Voltage – Mains [V]	230 Vac					
Frequency – Mains [Hz]	50 Hz					
Observation peroid	☐	6.5 min.	☒	2.5 min.	☐	Other:
Version of measurement instrument standard used EN / IEC61000-4-7 (Cl. 7)	☒	EN 61000-4-7:2002 + AM1:2009 (IEC 61000-4-7:2002+AM1:2008)				
	☐	EN 61000-4-7:1991				
Control principle used in the EUT	☒	Comply with the requirements of the Clause 6.1 (EN / IEC 61000-3-2).				
	☐	Not comply with the requirements of the Clause 6.1 (EN / IEC 61000-3-2).				
Operating mode(s) used	Mode 1, 2					
Remark	Ambient temperature is 30 °C ± 2 °C for cooling mode, 15 °C ± 2 °C for Heating mode					

Test Configuration

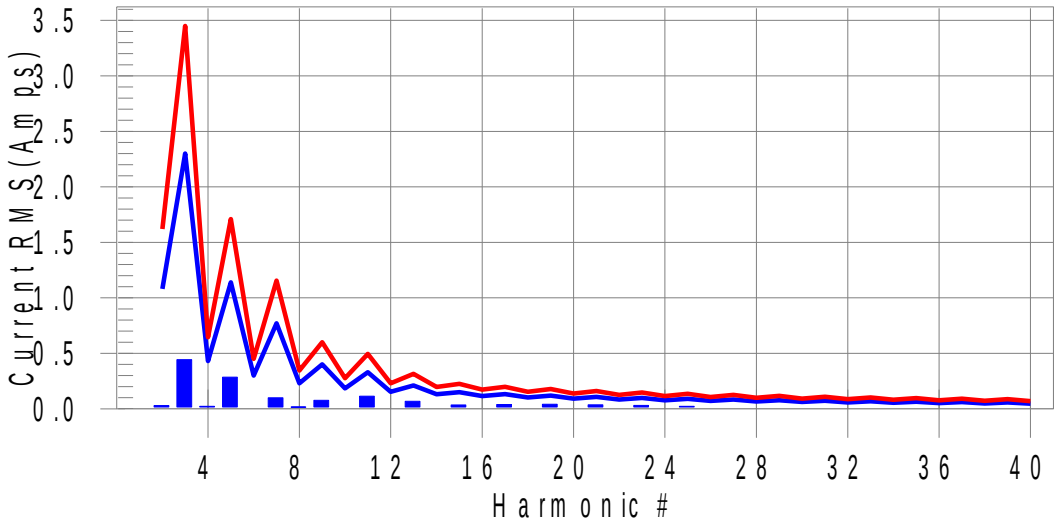


Measurement data of TAC-09CHSD/ TP11I3A	Port under test	AC mains power input
Operating mode / voltage / frequency used during the test		Mode 1 / 230 Vac / 50 Hz – worst case

Current & voltage waveforms



Harmonics and Class A limit line **European Limits**



Test result: Pass Worst harmonics H15-31.5% of 150% limit, H19-34.7% of 100% limit

Measurement data of TAC-09CHSD/ TP11I3A	Port under test	AC mains power input

THC(A): 0.566 I-THD(%): 23.0 POHC(A): 0.054 POHC Limit(A): 0.251

Highest parameter values during test:

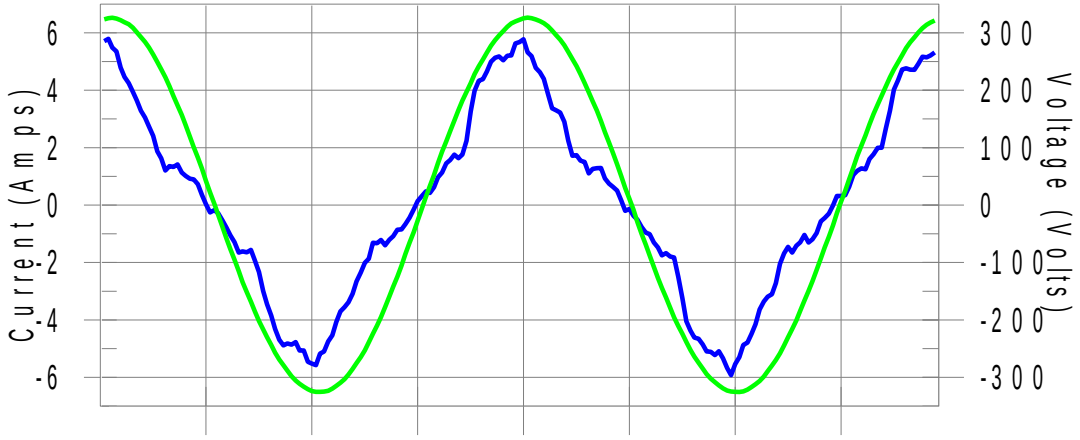
V_RMS (Volts):	230.55	Frequency(Hz):	50.00
I_Peak (Amps):	4.728	I_RMS (Amps):	2.533
I_Fund (Amps):	2.458	Crest Factor:	2.428
Power (Watts):	560.8	Power Factor:	0.963

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.030	1.080	2.8	0.090	1.620	5.6	Pass
3	0.442	2.300	19.2	0.498	3.450	14.4	Pass
4	0.023	0.430	5.3	0.126	0.645	19.6	Pass
5	0.285	1.140	25.0	0.417	1.710	24.4	Pass
6	0.015	0.300	N/A	0.080	0.450	N/A	Pass
7	0.099	0.770	12.9	0.164	1.155	14.2	Pass
8	0.016	0.230	6.8	0.067	0.345	19.4	Pass
9	0.076	0.400	19.1	0.097	0.600	16.2	Pass
10	0.012	0.184	N/A	0.062	0.276	N/A	Pass
11	0.114	0.330	34.4	0.136	0.495	27.5	Pass
12	0.011	0.153	N/A	0.047	0.230	N/A	Pass
13	0.068	0.210	32.3	0.079	0.315	25.1	Pass
14	0.008	0.131	N/A	0.031	0.197	N/A	Pass
15	0.035	0.150	23.3	0.071	0.225	31.5	Pass
16	0.007	0.115	N/A	0.022	0.173	N/A	Pass
17	0.039	0.132	29.8	0.046	0.198	23.4	Pass
18	0.005	0.102	N/A	0.017	0.153	N/A	Pass
19	0.041	0.118	34.7	0.051	0.178	28.6	Pass
20	0.004	0.092	N/A	0.013	0.138	N/A	Pass
21	0.036	0.107	33.5	0.040	0.161	24.7	Pass
22	0.003	0.084	N/A	0.009	0.125	N/A	Pass
23	0.031	0.098	31.8	0.034	0.147	23.5	Pass
24	0.003	0.077	N/A	0.006	0.115	N/A	Pass
25	0.022	0.090	24.8	0.026	0.135	19.5	Pass
26	0.002	0.071	N/A	0.006	0.107	N/A	Pass
27	0.007	0.083	N/A	0.009	0.125	N/A	Pass
28	0.002	0.066	N/A	0.005	0.099	N/A	Pass
29	0.005	0.078	N/A	0.014	0.116	N/A	Pass
30	0.002	0.061	N/A	0.004	0.092	N/A	Pass
31	0.004	0.073	N/A	0.006	0.109	N/A	Pass
32	0.002	0.058	N/A	0.003	0.086	N/A	Pass
33	0.009	0.068	N/A	0.011	0.102	N/A	Pass
34	0.002	0.054	N/A	0.003	0.081	N/A	Pass
35	0.003	0.064	N/A	0.005	0.096	N/A	Pass
36	0.002	0.051	N/A	0.003	0.077	N/A	Pass
37	0.003	0.061	N/A	0.004	0.091	N/A	Pass
38	0.003	0.048	N/A	0.003	0.073	N/A	Pass
39	0.002	0.058	N/A	0.004	0.087	N/A	Pass
40	0.001	0.046	N/A	0.002	0.069	N/A	Pass

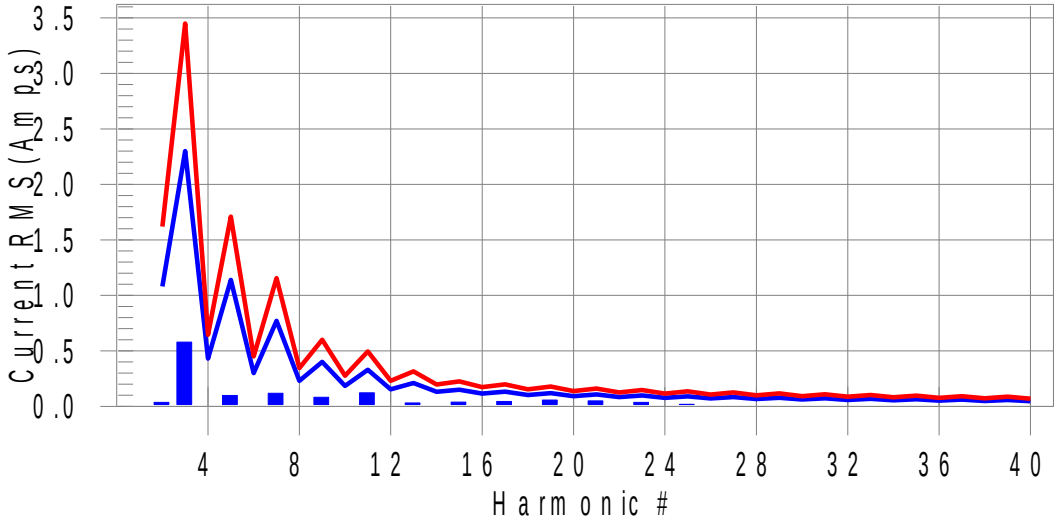
Remark	

Measurement data of TAC-12CHSD/ TP11I3A	Port under test	AC mains power input
Operating mode / voltage / frequency used during the test		Mode 1 / 230 Vac / 50 Hz – worst case

Current & voltage waveforms



Harmonics and Class A limit line **European Limits**



Test result: Pass Worst harmonics H19-37.0% of 150% limit, H19-47.7% of 100% limit

Measurement data of TAC-12CHSD/ TP11I3A	Port under test	AC mains power input

THC(A): 0.627 I-THD(%): 19.2 POHC(A): 0.066 POHC Limit(A): 0.251

Highest parameter values during test:

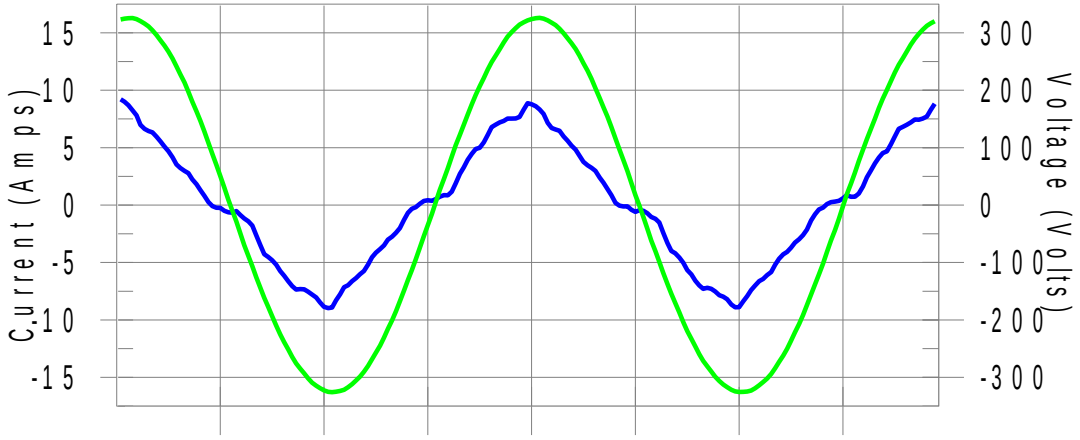
V_RMS (Volts):	230.54	Frequency(Hz):	50.00
I_Peak (Amps):	6.116	I_RMS (Amps):	3.347
I_Fund (Amps):	3.265	Crest Factor:	1.869
Power (Watts):	744.3	Power Factor:	0.972

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.036	1.080	3.3	0.054	1.620	3.3	Pass
3	0.579	2.300	25.2	0.673	3.450	19.5	Pass
4	0.014	0.430	N/A	0.021	0.645	N/A	Pass
5	0.098	1.140	8.6	0.152	1.710	8.9	Pass
6	0.013	0.300	N/A	0.019	0.450	N/A	Pass
7	0.118	0.770	15.3	0.131	1.155	11.4	Pass
8	0.010	0.230	N/A	0.015	0.345	N/A	Pass
9	0.082	0.400	20.4	0.105	0.600	17.5	Pass
10	0.011	0.184	N/A	0.017	0.276	N/A	Pass
11	0.122	0.330	36.9	0.135	0.495	27.4	Pass
12	0.008	0.153	N/A	0.012	0.230	N/A	Pass
13	0.031	0.210	14.6	0.043	0.315	13.8	Pass
14	0.008	0.131	N/A	0.012	0.197	N/A	Pass
15	0.038	0.150	25.4	0.056	0.225	24.9	Pass
16	0.006	0.115	N/A	0.009	0.173	N/A	Pass
17	0.044	0.132	33.2	0.059	0.198	29.7	Pass
18	0.006	0.102	N/A	0.010	0.153	N/A	Pass
19	0.057	0.118	47.7	0.066	0.178	37.0	Pass
20	0.004	0.092	N/A	0.007	0.138	N/A	Pass
21	0.050	0.107	46.3	0.054	0.161	33.7	Pass
22	0.004	0.084	N/A	0.006	0.125	N/A	Pass
23	0.036	0.098	36.5	0.042	0.147	28.4	Pass
24	0.003	0.077	N/A	0.004	0.115	N/A	Pass
25	0.018	0.090	N/A	0.024	0.135	N/A	Pass
26	0.002	0.071	N/A	0.004	0.107	N/A	Pass
27	0.007	0.083	N/A	0.009	0.125	N/A	Pass
28	0.002	0.066	N/A	0.003	0.099	N/A	Pass
29	0.010	0.078	N/A	0.012	0.116	N/A	Pass
30	0.002	0.061	N/A	0.003	0.092	N/A	Pass
31	0.006	0.073	N/A	0.008	0.109	N/A	Pass
32	0.002	0.058	N/A	0.003	0.086	N/A	Pass
33	0.005	0.068	N/A	0.006	0.102	N/A	Pass
34	0.002	0.054	N/A	0.002	0.081	N/A	Pass
35	0.004	0.064	N/A	0.007	0.096	N/A	Pass
36	0.001	0.051	N/A	0.002	0.077	N/A	Pass
37	0.005	0.061	N/A	0.009	0.091	N/A	Pass
38	0.003	0.048	N/A	0.003	0.073	N/A	Pass
39	0.003	0.058	N/A	0.006	0.087	N/A	Pass
40	0.001	0.046	N/A	0.002	0.069	N/A	Pass

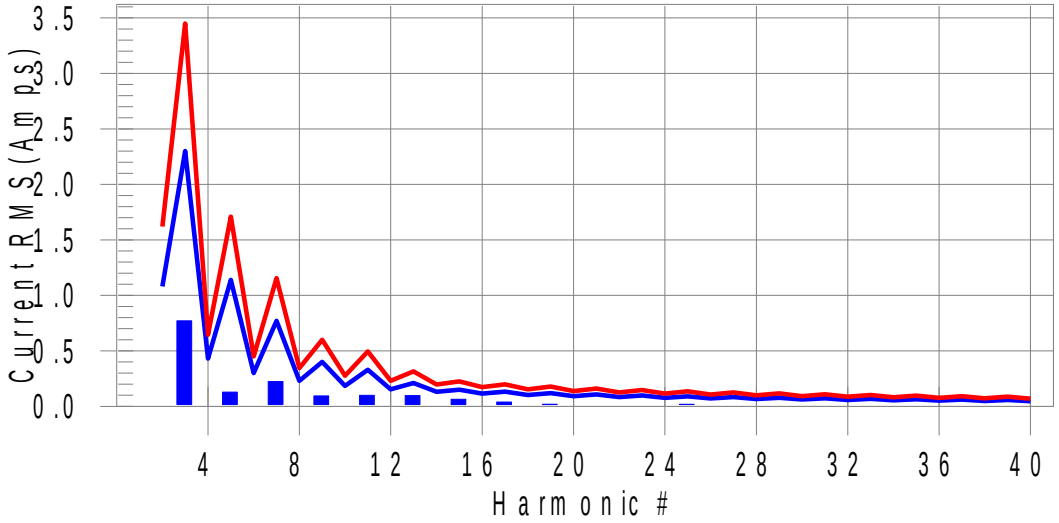
Remark	

Measurement data of TAC-18CHSD/ TP11I3A	Port under test	AC mains power input
Operating mode / voltage / frequency used during the test		Mode 1 / 230 Vac / 50 Hz – worst case

Current & voltage waveforms



Harmonics and Class A limit line **European Limits**



Test result: Pass Worst harmonics H13-32.2% of 150% limit, H13-46.1% of 100% limit

Measurement data of TAC-18CHSD/ TP11I3A	Port under test	AC mains power input

THC(A): 0.834 I-THD(%): 16.0 POHC(A): 0.031 POHC Limit(A): 0.251

Highest parameter values during test:

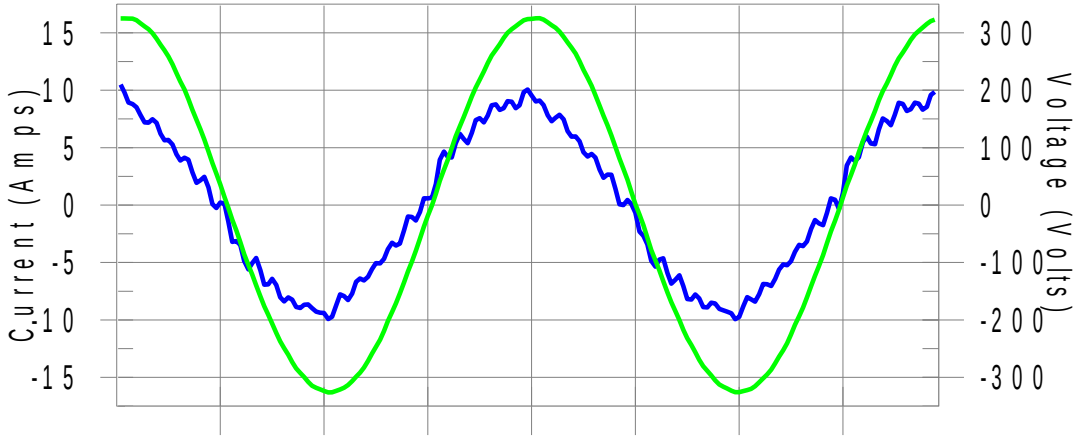
V_RMS (Volts):	230.50	Frequency(Hz):	50.00
I_Peak (Amps):	9.209	I_RMS (Amps):	5.277
I_Fund (Amps):	5.199	Crest Factor:	1.808
Power (Watts):	1182.5	Power Factor:	0.975

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.012	1.080	N/A	0.013	1.620	N/A	Pass
3	0.771	2.300	33.5	0.783	3.450	22.7	Pass
4	0.004	0.430	N/A	0.005	0.645	N/A	Pass
5	0.129	1.140	11.3	0.151	1.710	8.9	Pass
6	0.004	0.300	N/A	0.005	0.450	N/A	Pass
7	0.224	0.770	29.1	0.241	1.155	20.9	Pass
8	0.005	0.230	N/A	0.009	0.345	N/A	Pass
9	0.094	0.400	23.6	0.130	0.600	21.7	Pass
10	0.007	0.184	N/A	0.013	0.276	N/A	Pass
11	0.099	0.330	30.1	0.107	0.495	21.6	Pass
12	0.004	0.153	N/A	0.009	0.230	N/A	Pass
13	0.097	0.210	46.1	0.102	0.315	32.2	Pass
14	0.006	0.131	N/A	0.012	0.197	N/A	Pass
15	0.064	0.150	42.8	0.072	0.225	32.1	Pass
16	0.004	0.115	N/A	0.008	0.173	N/A	Pass
17	0.039	0.132	29.3	0.043	0.198	21.5	Pass
18	0.003	0.102	N/A	0.006	0.153	N/A	Pass
19	0.019	0.118	N/A	0.030	0.178	N/A	Pass
20	0.002	0.092	N/A	0.004	0.138	N/A	Pass
21	0.013	0.107	N/A	0.017	0.161	N/A	Pass
22	0.002	0.084	N/A	0.003	0.125	N/A	Pass
23	0.007	0.098	N/A	0.009	0.147	N/A	Pass
24	0.001	0.077	N/A	0.002	0.115	N/A	Pass
25	0.018	0.090	N/A	0.020	0.135	N/A	Pass
26	0.001	0.071	N/A	0.002	0.107	N/A	Pass
27	0.011	0.083	N/A	0.016	0.125	N/A	Pass
28	0.001	0.066	N/A	0.002	0.099	N/A	Pass
29	0.011	0.078	N/A	0.012	0.116	N/A	Pass
30	0.001	0.061	N/A	0.002	0.092	N/A	Pass
31	0.009	0.073	N/A	0.010	0.109	N/A	Pass
32	0.001	0.058	N/A	0.002	0.086	N/A	Pass
33	0.003	0.068	N/A	0.007	0.102	N/A	Pass
34	0.001	0.054	N/A	0.002	0.081	N/A	Pass
35	0.003	0.064	N/A	0.005	0.096	N/A	Pass
36	0.001	0.051	N/A	0.002	0.077	N/A	Pass
37	0.006	0.061	N/A	0.008	0.091	N/A	Pass
38	0.002	0.048	N/A	0.002	0.073	N/A	Pass
39	0.006	0.058	N/A	0.007	0.087	N/A	Pass
40	0.001	0.046	N/A	0.001	0.069	N/A	Pass

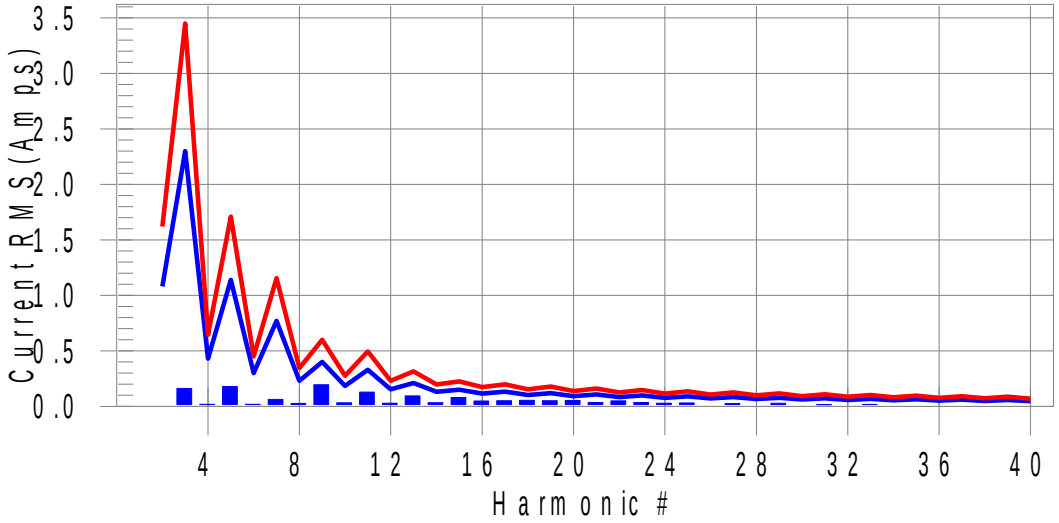
Remark	

Measurement data of TAC-24CHSD/ TP11I3A	Port under test	AC mains power input
Operating mode / voltage / frequency used during the test		Mode 1 / 230 Vac / 50 Hz – worst case

Current & voltage waveforms



Harmonics and Class A limit line **European Limits**



Test result: Pass Worst harmonics H20-41.7% of 150% limit, H22-58.5% of 100% limit

Measurement data of TAC-24CHSD/ TP11I3A	Port under test	AC mains power input

THC(A): 0.398 I-THD(%): 6.2 POHC(A): 0.075 POHC Limit(A): 0.251

Highest parameter values during test:

V_RMS (Volts):	230.49	Frequency(Hz):	50.00
I_Peak (Amps):	10.562	I_RMS (Amps):	6.472
I_Fund (Amps):	6.428	Crest Factor:	1.820
Power (Watts):	1453.4	Power Factor:	0.979

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.015	1.080	N/A	0.017	1.620	N/A	Pass
3	0.161	2.300	7.0	0.190	3.450	5.5	Pass
4	0.018	0.430	N/A	0.021	0.645	N/A	Pass
5	0.178	1.140	15.6	0.194	1.710	11.4	Pass
6	0.018	0.300	N/A	0.025	0.450	N/A	Pass
7	0.062	0.770	8.1	0.079	1.155	6.8	Pass
8	0.026	0.230	N/A	0.029	0.345	N/A	Pass
9	0.195	0.400	48.8	0.225	0.600	37.5	Pass
10	0.031	0.184	N/A	0.039	0.276	N/A	Pass
11	0.128	0.330	38.9	0.160	0.495	32.3	Pass
12	0.029	0.153	N/A	0.034	0.230	N/A	Pass
13	0.093	0.210	44.3	0.106	0.315	33.8	Pass
14	0.033	0.131	N/A	0.037	0.197	N/A	Pass
15	0.079	0.150	53.0	0.091	0.225	40.6	Pass
16	0.049	0.115	42.4	0.053	0.173	30.9	Pass
17	0.050	0.132	37.9	0.058	0.198	29.3	Pass
18	0.054	0.102	53.1	0.060	0.153	39.4	Pass
19	0.050	0.118	42.5	0.063	0.178	35.4	Pass
20	0.053	0.092	57.9	0.058	0.138	41.7	Pass
21	0.034	0.107	N/A	0.040	0.161	N/A	Pass
22	0.049	0.084	58.5	0.051	0.125	41.0	Pass
23	0.035	0.098	N/A	0.039	0.147	N/A	Pass
24	0.029	0.077	N/A	0.031	0.115	N/A	Pass
25	0.031	0.090	N/A	0.036	0.135	N/A	Pass
26	0.014	0.071	N/A	0.016	0.107	N/A	Pass
27	0.025	0.083	N/A	0.029	0.125	N/A	Pass
28	0.008	0.066	N/A	0.010	0.099	N/A	Pass
29	0.027	0.078	N/A	0.033	0.116	N/A	Pass
30	0.007	0.061	N/A	0.008	0.092	N/A	Pass
31	0.016	0.073	N/A	0.020	0.109	N/A	Pass
32	0.006	0.058	N/A	0.007	0.086	N/A	Pass
33	0.017	0.068	N/A	0.021	0.102	N/A	Pass
34	0.006	0.054	N/A	0.007	0.081	N/A	Pass
35	0.013	0.064	N/A	0.014	0.096	N/A	Pass
36	0.006	0.051	N/A	0.007	0.077	N/A	Pass
37	0.012	0.061	N/A	0.016	0.091	N/A	Pass
38	0.006	0.048	N/A	0.007	0.073	N/A	Pass
39	0.012	0.058	N/A	0.015	0.087	N/A	Pass
40	0.002	0.046	N/A	0.003	0.069	N/A	Pass

Remark	

4.7	Voltage changes, voltage fluctuations and flicker	VERDICT: PASS

Standard	ETSI EN 301 489-17, ETSI EN 301 489-1
Basic standard	EN 61000-3-3

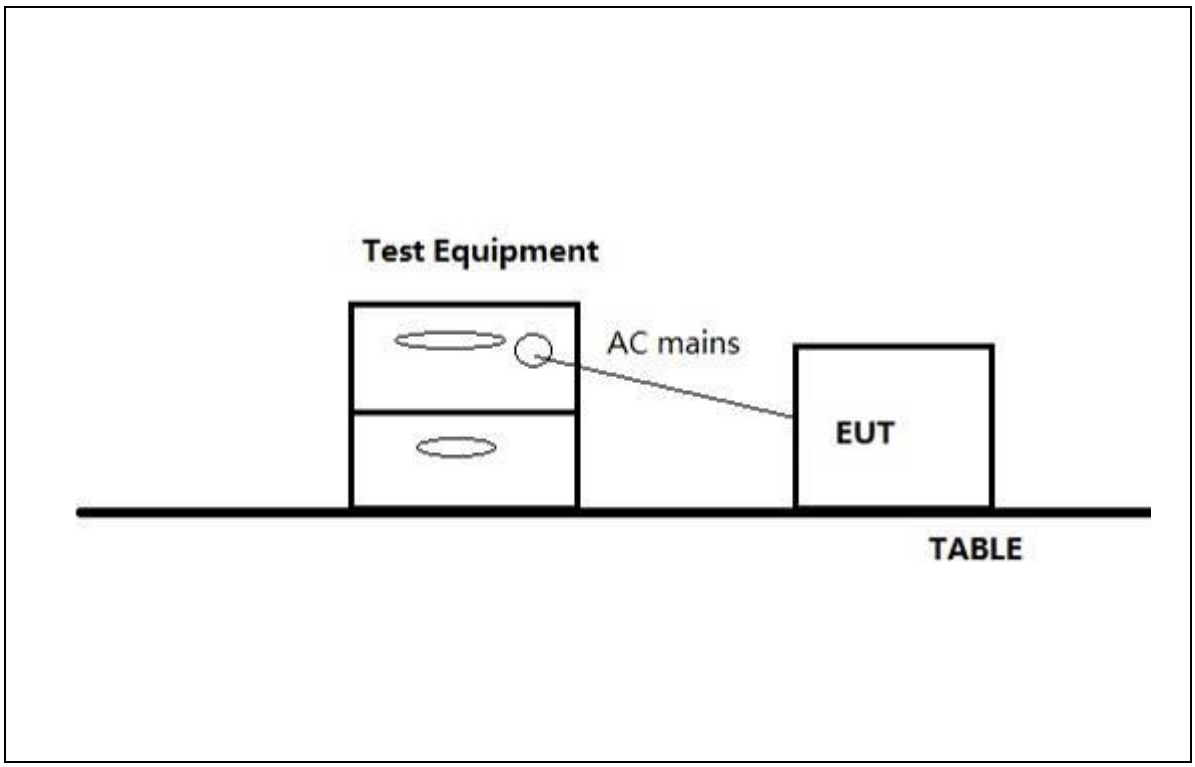
Limits

P_{ST} (Short term flicker)	☒	≤ 1	☐	Not Applicable
P_{LT} (Long term flicker)	☐	≤ 0,65	☒	Not Applicable
d_C (Relative Voltage change)	☒	≤ 3,3%	☐	Not Applicable
d_{MAX} (Max. voltage change)	☐	≤ 4%	☒	6%
	☐	7%	☐	Not Applicable
Supplemental information:				

Performed measurements

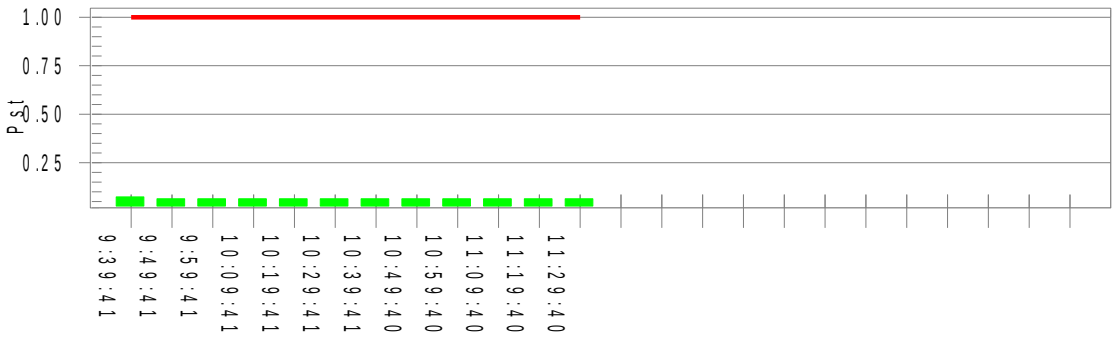
Reason for not performing the measurement(s)	☐	Tests are not necessary because the EUT is unlikely to produce significant voltage fluctuations or flicker (clause 6.1).				
Port under test	AC Mains power input					
Voltage – Mains [V]	230 Vac					
Frequency – Mains [Hz]	50 Hz					
Test method	☒	Flickermeter according EN / IEC 61000-4-15:2011				
	☐	Simulation (Clause 4.2.3 of EN / IEC 61000-3-3)				
	☐	Analytical method (Clause 4.2.4 of EN / IEC 61000-3-3)				
	☐	Use of P_{st} = 1 curve (Clause 4.2.5 of EN / IEC 61000-3-3)				
Observation peroid	☐	10 min.	☒	120 min.	☐	Other:
	☐	24 times switching according to Annex B				
Operating mode(s) used	Mode 1, 2					
Remark	Ambient temperature is 30 °C ± 5 °C for cooling mode, 15 °C ± 5 °C for Heating mode					

Test Configuration



Measurement data of TAC-09CHSD/ TP11I3A	Port under test	AC Mains power input
Operating mode used during the test	Mode 1 – worst case	

Pst$_i$ and limit line **European Limits**



Plt and limit line

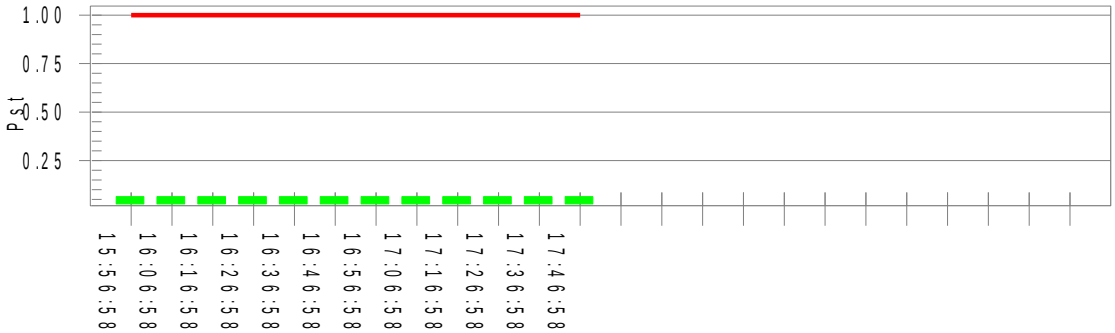
Parameter values recorded during the test:

Vrms at the end of test (Volt):	**229.49**			
Highest dt (%):		**Test limit (%):**		
T-max (mS):	**0**	**Test limit (mS):**	**500.0**	**Pass**
Highest dc (%):	**0.00**	**Test limit (%):**	**3.30**	**Pass**
Highest dmax (%):	**0.00**	**Test limit (%):**	**6.00**	**Pass**
Highest Pst (10 min. period):	**0.073**	**Test limit:**	**1.000**	**Pass**
Highest Plt (2 hr. period):	**0.065**	**Test limit:**	**0.650**	**Pass**

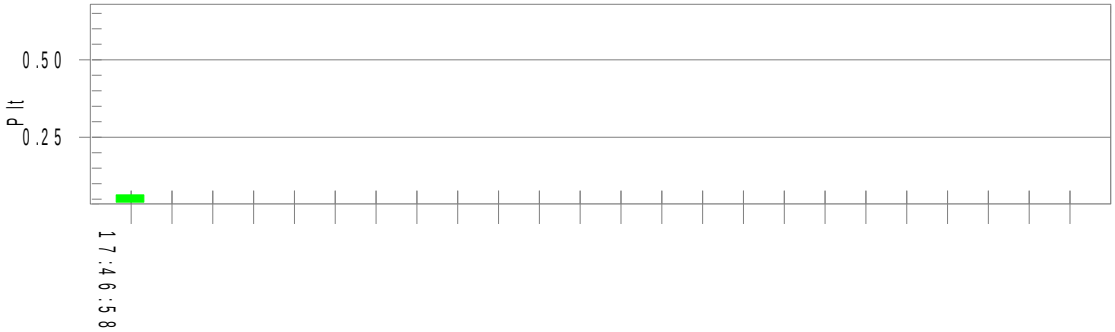
Remark	

Measurement data of TAC-12CHSD/ TP11I3A	Port under test	AC Mains power input
Operating mode used during the test	Mode 1 – worst case	

Pst and limit line **European Limits**



Plt and limit line



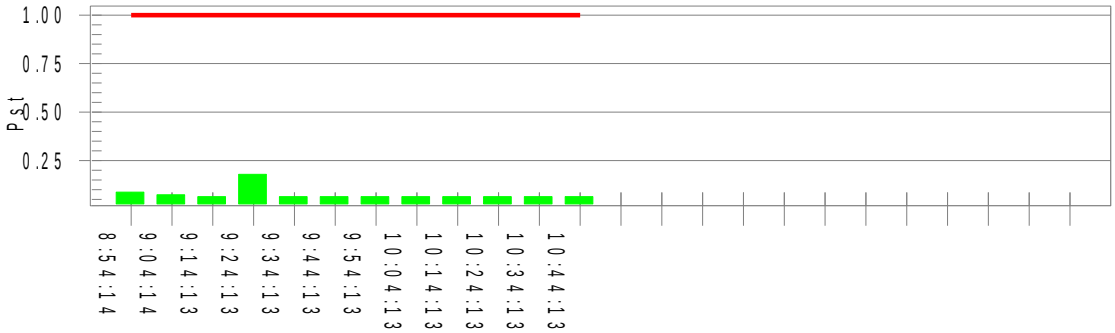
Parameter values recorded during the test:

Vrms at the end of test (Volt):	**233.12**			
T-max (mS):	**0**	**Test limit (mS):**	**500.0**	**Pass**
Highest dc (%):	**0.00**	**Test limit (%):**	**3.30**	**Pass**
Highest dmax (%):	**0.00**	**Test limit (%):**	**6.00**	**Pass**
Highest Pst (10 min. period):	**0.064**	**Test limit:**	**1.000**	**Pass**
Highest Plt (2 hr. period):	**0.064**	**Test limit:**	**0.650**	**Pass**

Remark	

Measurement data of TAC-18CHSD/ TP11I3A	Port under test	AC Mains power input
Operating mode used during the test	Mode 1 – worst case	

Pst and limit line **European Limits**



Plt and limit line

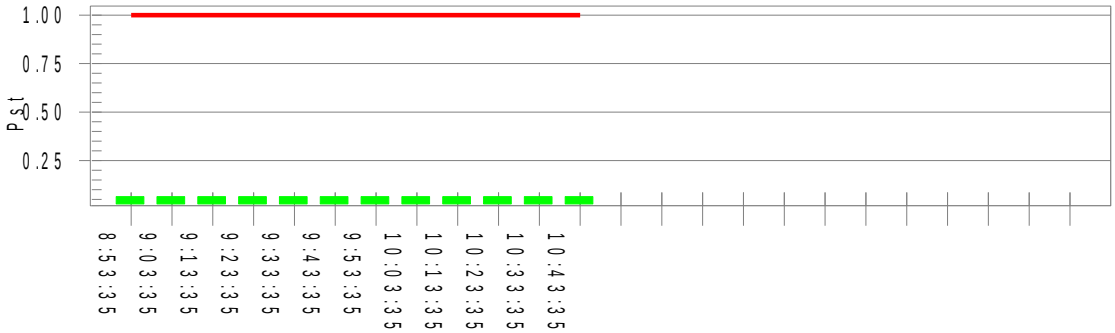
Parameter values recorded during the test:

Vrms at the end of test (Volt):	**234.14**			
Highest dt (%):		**Test limit (%):**		
T-max (mS):	**0**	**Test limit (mS):**	**500.0**	**Pass**
Highest dc (%):	**-1.13**	**Test limit (%):**	**3.30**	**Pass**
Highest dmax (%):	**-1.17**	**Test limit (%):**	**4.00**	**Pass**
Highest Pst (10 min. period):	**0.179**	**Test limit:**	**1.000**	**Pass**
Highest Plt (2 hr. period):	**0.091**	**Test limit:**	**0.650**	**Pass**

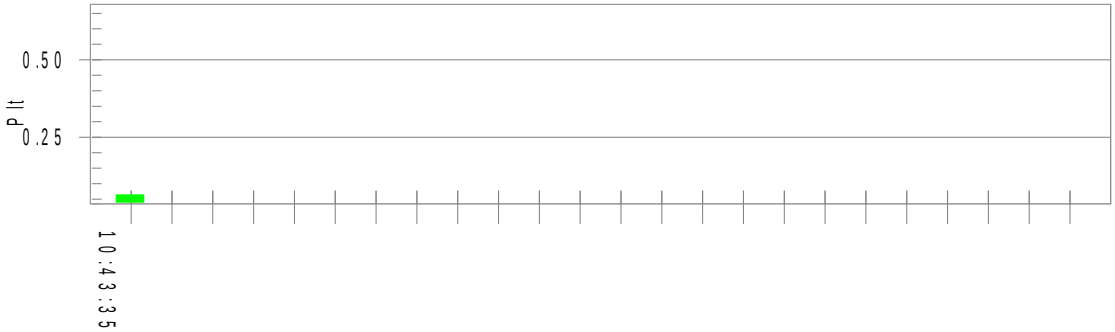
Remark	

Measurement data of TAC-24CHSD/ TP11I3A	Port under test	AC Mains power input
Operating mode used during the test	Mode 1 – worst case	

Pst and limit line **European Limits**



Plt and limit line



Parameter values recorded during the test:

Vrms at the end of test (Volt):	**232.25**			
T-max (mS):	**0**	**Test limit (mS):**	**500.0**	**Pass**
Highest dc (%):	**0.00**	**Test limit (%):**	**3.30**	**Pass**
Highest dmax (%):	**0.00**	**Test limit (%):**	**4.00**	**Pass**
Highest Pst (10 min. period):	**0.064**	**Test limit:**	**1.000**	**Pass**
Highest Plt (2 hr. period):	**0.064**	**Test limit:**	**0.650**	**Pass**

Remark	

5 IMMUNITY TEST RESULTS

5.1 Performance (Compliance) criteria

The performance criteria are:

- Performance criteria A for immunity tests with phenomena of a continuous nature;
- Performance criteria B for immunity tests with phenomena of a transient nature;
- Performance criteria C for immunity tests with power interruptions exceeding a certain time.

The equipment shall meet the minimum performance criteria as specified for each test.

Criteria	During test	After test (i.e. as a result of the application of the test)
A	Shall operate as intended. (See note). Shall be no loss of function. Shall be no unintentional transmissions.	Shall operate as intended. Shall be no degradation of performance. Shall be no loss of function. Shall be no loss of critical stored data.
B	May be loss of function.	Functions shall be self-recoverable. Shall operate as intended after recovering. Shall be no loss of critical stored data.
C	May be loss of function.	Functions shall be recoverable by the operator. Shall operate as intended after recovering. Shall be no loss of critical stored data.
NOTE: Operate as intended during the test allows a level of degradation in accordance with clause 6.2.2.		

6.2.2 Minimum performance level

For equipment that supports a PER or FER, the minimum performance level shall be a PER or FER less than or equal to 10 %.

For equipment that does not support a PER or a FER, the minimum performance level shall be no loss of the wireless transmission function needed for the intended use of the equipment.

5.1.1 Performance criteria for Continuous phenomena

The performance criteria A shall apply.

Where the EUT is a transmitter in standby mode, unintentional transmission shall not occur during the test.
Where the EUT is a transceiver in receive mode, unintentional transmission shall not occur during the test.

5.1.2 Performance criteria for Transient phenomena

The performance criteria B shall apply, except for voltage dips greater than or equal to 100 ms and voltage interruptions of 5 000 ms duration, for which performance criteria C shall apply.

Where the EUT is a transmitter in standby mode, unintentional transmission shall not occur as a result of the application of the test.

Where the EUT is a transceiver in receive mode, unintentional transmission shall not occur as a result of the application of the test.

5.1.3 Performance criteria related to immunity tests

Immunity test	Performance criteria
Electrostatic discharge	B
Radio-frequency electromagnetic fields	A
Fast transients	B
Surge transient	B
Injected currents (radio-frequency common mode)	A
Voltage dips and short interruptions	B, C

5.1.4 Manufacturer defined performance criteria

Not provided.

5.2 Monitored – Checked Functions / Parameters

During the immunity tests the following functions of the EUT has/have been monitored/checked.

☒	Motor speed	☐	Display data
☐	Switching	☐	Data storage
☐	Standby mode	☐	Sensor functions
☒	Temperature	☐	Audible signals
☐	Power consumption	☒	Others : LED's
☒	AC mains input current	☐	Others :
☐	Timing	☐	Others :
☐	Illumination	☐	Others :
Supplementary information :			

Immunity test	Monitored - Checked function(s)/parameter(s) during / after the test	Method
Electrostatic discharge	Mode 1&2	Visual
Radio-frequency electromagnetic fields	Mode 1&2	Visual
Fast transients	Mode 1&2	Visual
Surge transient	Mode 1&2	Visual
Injected currents (radio-frequency common mode)	Mode 1&2	Visual
Voltage dips and short interruptions	Mode 1&2	Visual
Supplementary information :		

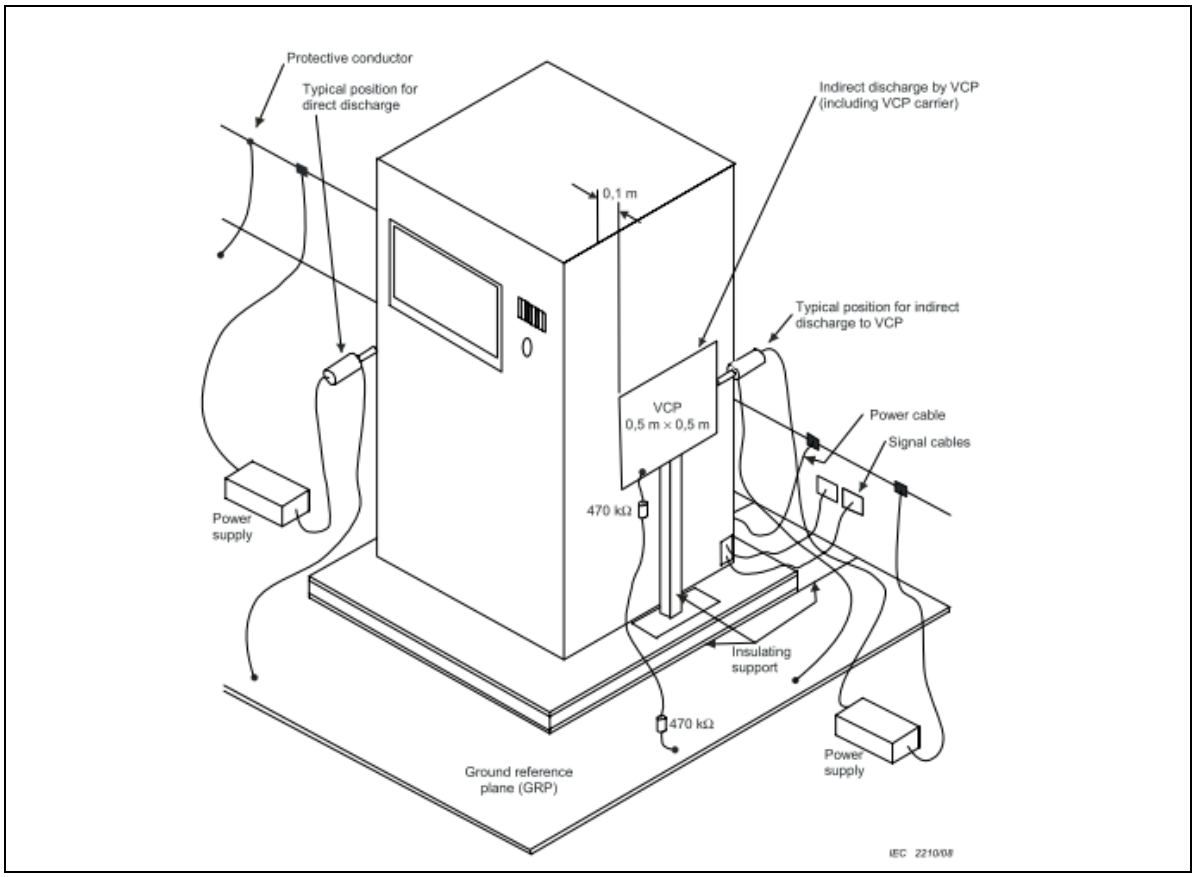
5.3	Electrostatic discharge immunity	VERDICT:	PASS

Electrostatic discharges (ESD) are the result of persons or objects that accumulate static electricity due to for instance walking on synthetic carpets. The ESD can influence the operation of equipment or damage its electronics, either by a direct discharge or indirectly by coupling or radiation. Both effects are simulated during the tests.

Requirements

Standard	ETSI EN 301 489-17, ETSI EN 301 489-1							
Basic standard	EN 61000-4-2							
Port under test	Enclosure							
Air discharges	☒	±2 kV	☒	±4 kV	☒	±8 kV	☐	kV
Contact discharges	☐	±2 kV	☒	±4 kV	☐	±8 kV	☐	kV
Number of discharges	≥ 10 per polarity with ≥ 1 sec interval.							

Test Configuration



Performed tests for TAC-09CHSD/ TP11I3A, TAC-12CHSD/ TP11I3A, TAC-18CHSD/ TP11I3A, TAC-24CHSD/ TP11I3A

Set-up	☐	Table-top	☒	Floor standing	
Ambient temperature [°C]	23,5		Relative Humidity air [%]		53,4
Voltage – Mains [V]	230 Vac				
Frequency – Mains [Hz]	50 Hz				
Operating mode(s) used	Mode 1, 2				

Test Point (Location of discharge, see also photo)		Test Voltage [kV] & Polarity	Coupling type	# of applied discharges / polarity	Discharge interval [s]
☒	Points on conductive surface as indicated in the picture below.	±4	Contact	10	1
☒	Points on non-conductive surface as indicated in the picture below.	±8	Air	10	1
☐	HCP	±4	Contact	10	1
☒	VCP	±4	Contact	10	1
Observation(s)	During the test no loss of performance was observed. After the test the EUT functioned as intended. No unacceptable loss of performance or data was observed.				
Supplementary information:					

Photo of selected test points

All models have the same construction

Remark: this is the representative selected points for ESD test, the other side which can be touched points are also selected for ESD test.

Supplementary information: Red and bue arrows representative discharge points.

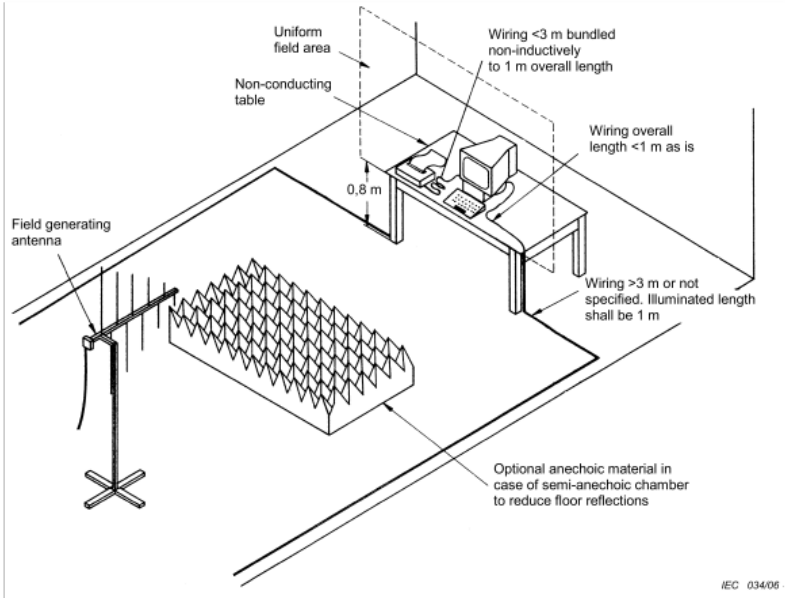
5.4	Radio-frequency electromagnetic fields immunity	VERDICT: PASS

During the test it is verified if the equipment under test (EUT) has sufficient immunity against radiated electromagnetic fields. Industrial electromagnetic sources, walkie-talkies, radio transmitters, television transmitters and telecommunication equipment including cellular telephones and other emitting devices can generate these fields.

Requirements

Standard	ETSI EN 301 489-17, ETSI EN 301 489-1			
Basic standard	EN 61000-4-3			
Port under test	Enclosure			
Frequency range	Test level	Modulation [1)]	Dwell time	Step size
80 - 1000 MHz	3 V/m	80% AM (1kHz)	≥ 0,5 s	≤ 1%
1000 - 6000 MHz	3 V/m	80% AM (1kHz)	≥ 0,5 s	≤ 1%
Supplementary information: [1)] The test signal shall be amplitude modulated to a depth of 80 % by a sinusoidal audio signal of 1000 Hz. If the wanted signal is modulated at 1000 Hz, then an audio signal of 400 Hz shall be used.				

Test Configuration



Performed tests for TAC-09CHSD/ TP11I3A, TAC-12CHSD/ TP11I3A, TAC-18CHSD/ TP11I3A, TAC-24CHSD/ TP11I3A

Test method	☒	EN 61000-4-3		☐	EN 61000-4-20	
Test set-up	☐	Equipment on the table (0,8 m height)				
(see annex 3 for photo)	☒	Equipment standing on floor (0,05 – 0,15 m height)				
Voltage – Mains [V]	230 Vac			Frequency – Mains [Hz]		50 Hz
Operating mode(s) used	Mode 1, 2					
Frequency range (applied)	Antenna Polarization	Test level (applied)		Modulation (applied)	Dwell time (applied)	Remark
80 – 1000 MHz	H	3 V/m		80% AM (1kHz)	2 s	
(step size 1%)	V	3 V/m		80% AM (1kHz)	2 s	
1000 – 6000 MHz	H	3 V/m		80% AM (1kHz)	2 s	
(step size 1%)	V	3 V/m		80% AM (1kHz)	2 s	
Exposed side of the EUT	☒	Front (0°)	☒	Right (90°)	☐	Top
	☒	Rear (180°)	☒	Left (270°)	☐	Bottom
Observation(s)	During the test no loss of performance was observed. After the test the EUT functioned as intended. No unacceptable loss of performance or data was observed.					
Supplementary information:						

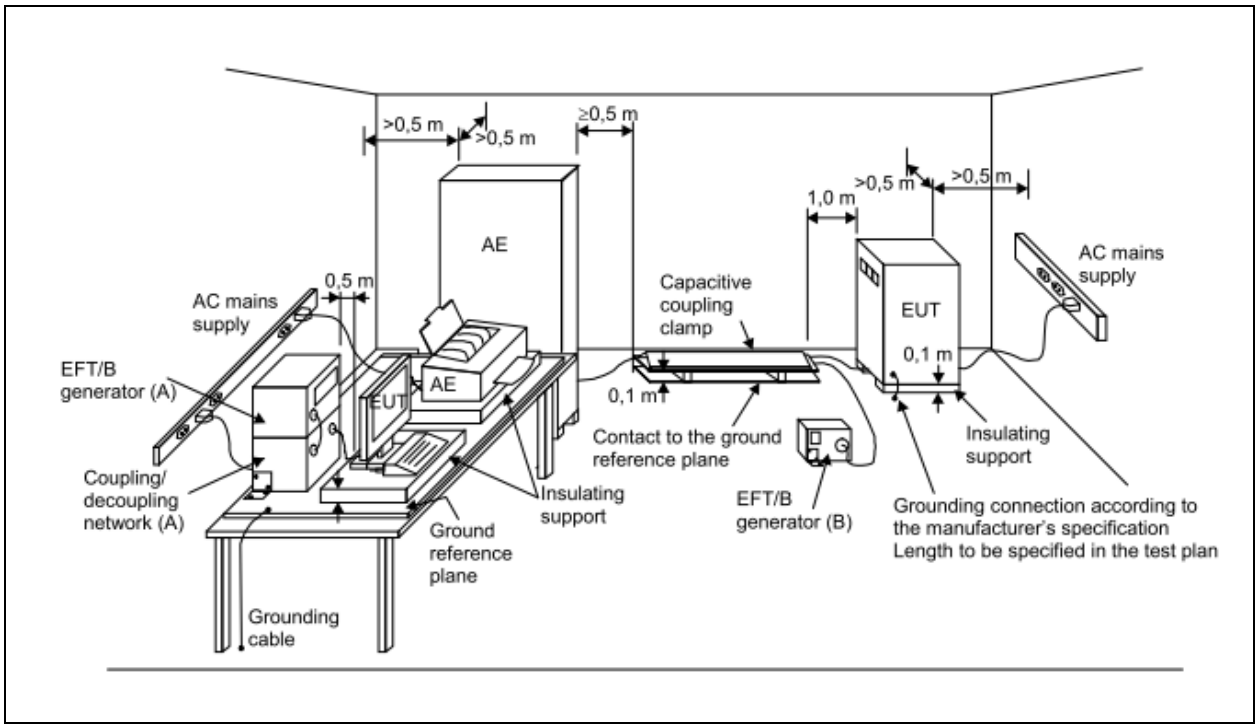
5.5	Electrical Fast Transients immunity	VERDICT: PASS

The EFT immunity test simulates disturbances by bursts of very short transients caused for example by switching off loads such as an AC motor or bouncing relay contacts. The transients are likely to disturb electronics but less likely to cause damage.

Requirements

Standard	ETSI EN 301 489-17, ETSI EN 301 489-1			
Basic standard	EN 61000-4-4			
Pulse characteristics	5/50 ns			
Port under test		Test level	Repetition frequency	Duration
☒	AC input-output power	± 1000 V	5 KHz	2 min. / polarity
☐	DC input-output power [1) 2)]	± 500 V	5 KHz	2 min. / polarity
☒	Signal/Control/Wired network [1)]	± 500 V	5 KHz	2 min. / polarity
☐	xDSL network	± 500 V	100 KHz	2 min. / polarity
[1)] Only applicable to ports interfacing with cables whose total length may exceed 3 m. [2)] Only applicable to equipment that is connected to the mains while in use.				

Test Configuration



Performed tests for TAC-09CHSD/ TP11I3A, TAC-12CHSD/ TP11I3A, TAC-18CHSD/ TP11I3A, TAC-24CHSD/ TP11I3A

Voltage – Mains [V]	230 Vac			
Frequency – Mains [Hz]	50 Hz			
Operating mode(s) used	Mode 1, 2			
Test Set-up (see annex 3 for photo)	☒	Equipment standing on floor at (0,1 ± 0,01) m above ground plane		
	☐	Equipment on the table (0,1 ± 0,01) m above ground plane		
	☐	Artificial hand applied. Location refer to chapter 9.		
Coupling	☒	Common mode	☐	Other:

Port under test	Test Voltage &Polarity	Repetition Frequency	Test duration / polarity	Injection method			
AC mains power input	± 1000 V	5 KHz	2 min. / polarity	☒	CDN	☐	Clamp
Signal ports	± 500 V	5 KHz	2 min. / polarity	☐	CDN	☒	Clamp
Observation(s)	During the test no loss of performance was observed. After the test the EUT functioned as intended. No unacceptable loss of performance or data was observed.						
Supplementary information:							

5.6	Surge transient immunity	VERDICT: PASS

The surge transient immunity test simulates the surges that are caused by over-voltages due to indirect (induced) lightning transients. The pulse is a slow transient with high-energy contents and due to its long duration may cause damage to an unprotected EUT.

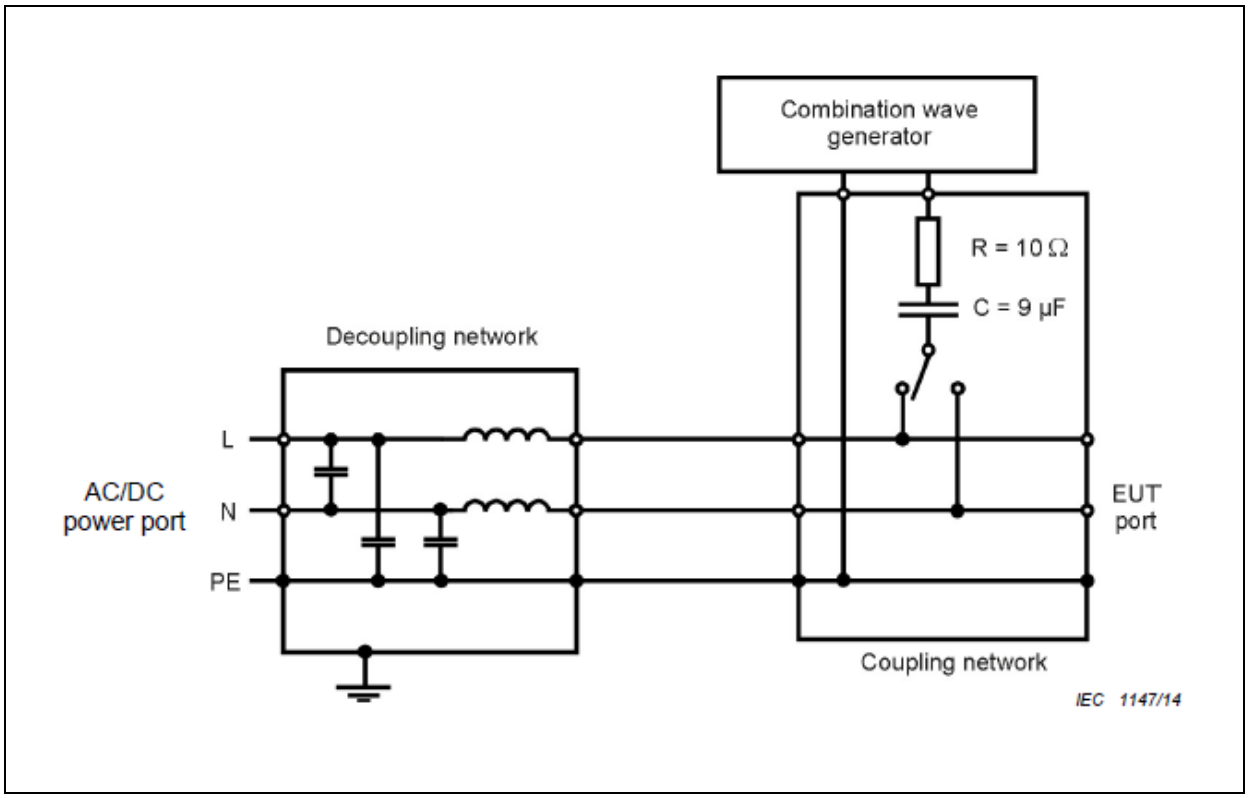
Requirements

Standard	ETSI EN 301 489-17, ETSI EN 301 489-1
Basic standard	EN 61000-4-5
Pulse characteristics	1,2/50µs Voltage; 8/20µs Current
Repetition rate	≥ 60 secs. (for each test level and phase angle)
Number of pulses	5 pulses (at each polarity and phase angle)

Port		Test level & Polarity & Coupling		Phase angle
		Line to Line	Line to Earth	[º]
☒	AC mains power input	±1 kV	±2 kV	0, 90, 180, 270
☐	Wired network, indoor cables >30m. 3)	N/A	±0,5 kV	---
☐	Symmetrically operated wired network, outdoor cables 2) 3)	N/A	±1 kV	---
☐	Non-symmetrically operated wired network, outdoor cables 1) 3)	± 0,5 kV	±1 kV	---

1) In addition to the specified test level, all lower test levels as detailed in EN 61000-4-5 should also be satisfied.
2) The test generator shall provide the 10/700 µs pulse as defined in EN 61000-4-5, clause 6.2.
3) No test shall be required where normal functioning cannot be achieved, because of the impact of the CDN on the EUT.

Test Configuration



Performed tests for TAC-09CHSD/ TP11I3A, TAC-12CHSD/ TP11I3A, TAC-18CHSD/ TP11I3A, TAC-24CHSD/ TP11I3A

Voltage – Mains [V]	230 Vac
Frequency – Mains [Hz]	50 Hz
Operating mode(s) used	Mode 1, 2
Repetition rate	60 secs. (for each test level and phase angle)
Number of pulses	5 pulses (at each polarity and phase angle)

Port under test		Coupling	Test level & Polarity	Phase angle [°]	Remark
☒	AC mains input power	Line to Neutral	±0,5 / ±1 kV	0, 90, 180, 270	
☒	AC mains input power	Line to Earth	±0,5 / ±1 / ±2 kV	0, 90, 180, 270	
☒	AC mains input power	Neutral to Earth	±0,5 / ±1 / ±2 kV	0, 90, 180, 270	
Observation(s)		During the test no loss of performance was observed. After the test the EUT functioned as intended. No unacceptable loss of performance or data was observed.			
Supplementary information:					

5.7	Injected currents (RF common mode) immunity	VERDICT: PASS

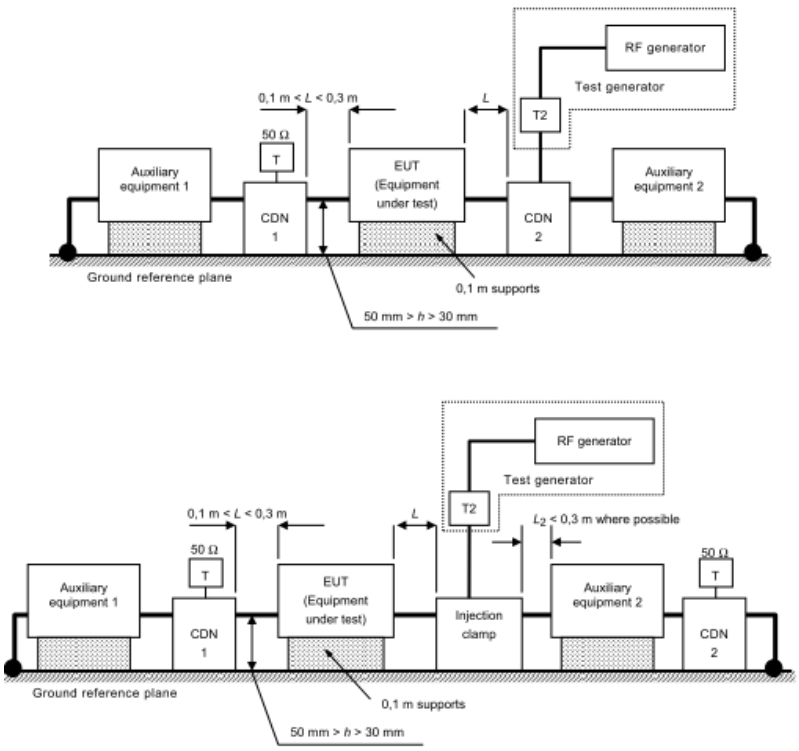
During this test the immunity of the equipment for induced or conducted electromagnetic fields is checked. Fields generated by radio and other transmitters cause RF voltages in long cables like the mains network. This test reproduces these induced disturbing voltages by injecting them to the EUT via the cabling.

Requirements

Standard	ETSI EN 301 489-17, ETSI EN 301 489-1				
Basic standard	EN 61000-4-6				
Frequency range	0,15 – 80 MHz				
Port under test		Test level, *Uo*	Modulation [3]	Step size	Dwell time
☒	AC input-output power	3 V	80% AM (1kHz)	1%	≥ 0,5 s
☐	DC input-output power [1]	3 V	80% AM (1kHz)	1%	≥ 0,5 s
☒	Signal/Control/Wired network [1] [2]	3 V	80% AM (1kHz)	1%	≥ 0,5 s

[1] Only applicable to ports interfacing with cables whose total length may exceed 3 m.
[2] Change of state commands are not applied during the test.
[3] The test signal shall be amplitude modulated to a depth of 80 % by a sinusoidal audio signal of 1000 Hz. If the wanted signal is modulated at 1000 Hz, then an audio signal of 400 Hz shall be used.

Test Configuration



Performed tests for TAC-09CHSD/ TP11I3A, TAC-12CHSD/ TP11I3A, TAC-18CHSD/ TP11I3A, TAC-24CHSD/ TP11I3A

Test method (applied)	Frequency range (applied)	Modulation (applied)	Step size (applied)
EN 61000-4-6	0,15 – 80 MHz	80% AM (1kHz)	1%
Voltage – Mains [V]	230 Vac	Frequency – Mains [Hz]	50 Hz
Operating mode(s) used	Mode 1, 2		
Test set-up (see annex 3 for photo)	☒	Equipment standing on floor at (0,1 ± 0,01) m above ground plane.	
	☐	Equipment on the table (0,1 ± 0,01) m above ground plane.	
	☐	Artificial hand applied. Location refer to Annex 3.	

Port under test	Test Level (applied	Injection method	Dwell time (applied)	Remark
AC mains input	3V	CDN-M2	3s	
Signal ports	3V	EM Clamp	3s	

Observation(s)	During the test no loss of performance was observed. After the test the EUT functioned as intended. No unacceptable loss of performance or data was observed.
Supplementary information:	

5.8	Power supply interruptions and dips immunity	VERDICT:	PASS

The purpose of the test is to verify the immunity of the equipment against voltage dips and voltage interruptions. It helps to ensure that the equipment functions properly (as expected and safely) with power supply fluctuations. Voltage dips and interruptions are caused by faults in the LV, MV, HV networks (short-circuit or ground faults).

Requirements

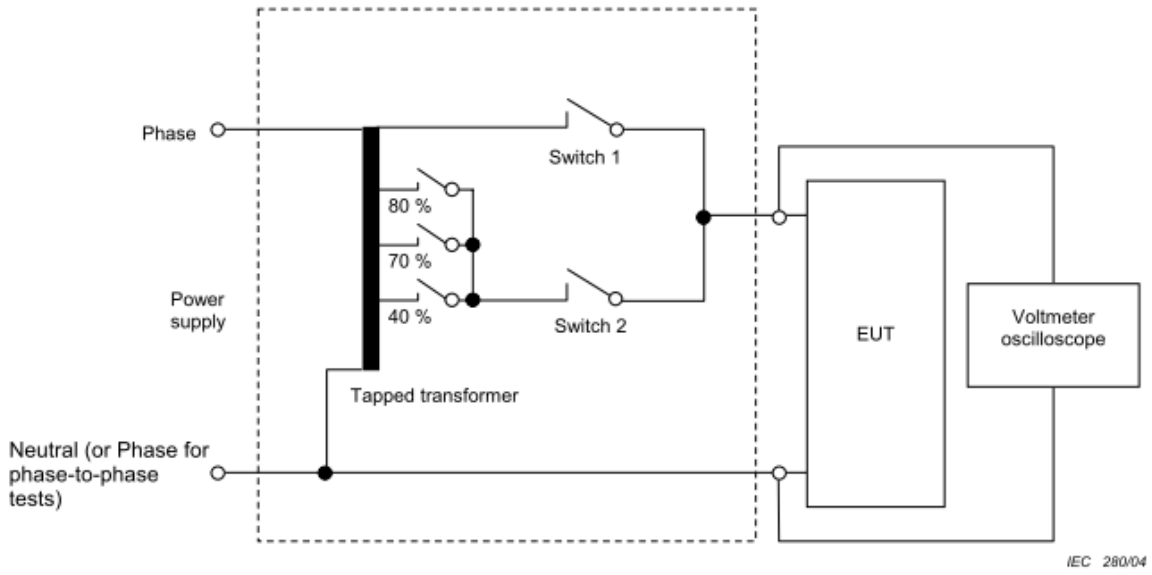
Standard	ETSI EN 301 489-17, ETSI EN 301 489-1
Basic standard	EN 61000-4-11
# of dips & interruptions	3 dips / interruptions for each test level and phase angle
Interval between events	≥ 10 seconds

Port under test	Test level [1)]	Period (Cycles)		Performance Criteria
		50 Hz	60 Hz	
AC input power port	U_{NOM} – ≥95%	0,5	---	Refer to the chapter 5.1 for details.
AC input power port	U_{NOM} – ≥95%	1	---	Refer to the chapter 5.1 for details.
AC input power port	U_{NOM} – 30%	25	---	Refer to the chapter 5.1 for details.
AC input power port	U_{NOM} – ≥95%	250	---	Refer to the chapter 5.1 for details.

[1)] Changes to the voltage level shall occur at a zero crossing point in the a.c. voltage waveform.

NOTE: Where the equipment has a rated voltage range the following shall apply:
- If the voltage range does not exceed 20% of the lower voltage specified for the rated voltage range. A single voltage within that range may be selected for testing.
- In all other cases, the test procedure shall be applied for both the lowest and highest voltages declared in the voltage range.

Test Configuration



Performed tests for TAC-09CHSD/ TP11I3A, TAC-12CHSD/ TP11I3A, TAC-18CHSD/ TP11I3A, TAC-24CHSD/ TP11I3A

U_{NOM} [V_{AC}]	Terminal	Test level [% U_{NOM}]	Duration [cycles]		Repetion rate [s]	Number of dips per test	Phase angle [º]
			50 Hz	60 Hz			
230	L-N	0	0,5	---	10	3	0, 180
230	L-N	0	1	---	10	3	0, 180
230	L-N	70	25	---	10	3	0, 180
230	L-N	0	250	---	10	3	0, 180

Operating mode(s) used	Mode 1,2
Observation(s)	During the test loss of performance was observed. After the test the EUT functioned as intended. No unacceptable loss of performance or data was observed.
Supplementary information:	

6 IDENTIFICATION OF THE EQUIPMENT UNDER TEST

The photographs show the tested device.

Indoor unit view of TAC-09CHSD/ TP11I3A

Outdoor unit view of TAC-09CHSD/ TP11I3A

Indoor unit view of TAC-12CHSD/ TP11I3A

Outdoor unit view of TAC-12CHSD/ TP11I3A

Indoor unit view of TAC-18CHSD/ TP11I3A

Outdoor unit view of TAC-18CHSD/ TP11I3A

Indoor unit view of TAC-24CHSD/ TP11I3A

Outdoor unit view of TAC-24CHSD/ TP11I3A

7 ANNEX 1 - MEASUREMENT UNCERTAINTIES

The table(s) below show(s) measurment uncertainties of the EMC test set-ups. The reported expanded uncertainties are based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95%.

Measurement		Uncertainty
Mains disturbance voltage	(9 kHz –150 kHz)	**2,18 dB**
	(150 kHz –30MHz)	**2,82 dB**

8 ANNEX 2 – USED EQUIPMENT

DEKRA Testing and Certification (Shanghai) Ltd. Guangzhou Branch					
Instrumentation	Manufacturer	Model No.	Serial No.	DEKRA No.	Cal. Due date
Shielding Room	Changzhou Feite	/	/	G/L861	2024/05/31
EMI Receiver	R&S	ESCI	101206	G/L857	2023/07/07
LISN	R&S	ENV216	101336	G/L859	2023/07/07
POWER SOURCE	California Instruments	500LiX-CTS-400	1132A00193	G/L862	2023/07/07
Analyzer	California Instruments	PACS-A	1132A00193	G/L862	2023/07/07
ESD Generator	TESEQ	NSG435	6513	G/L867	2022/08/10
Signal Generator	TESEQ	NSG3040	1821	G/L868	2023/05/08
STEPTRANSFORMER	TESEQ	INA6501	/	G/L868	2023/05/08
Clamp	TESEQ	CDN 8014	/	G/L868	2023/05/08
33nF capacitor	-	-	-	G/L2248	2023/07/19
Signal Generator	TESEQ	NSG4070	31446	G/L870	2022/12/26
CDN	TESEQ	M016	31564	G/L870	2022/12/26
EM-Clamp	TESEQ	KEMZ801	31493	G/L870	2022/12/26
6dB	TESEQ	ATN6075	30789	G/L870	2022/12/26

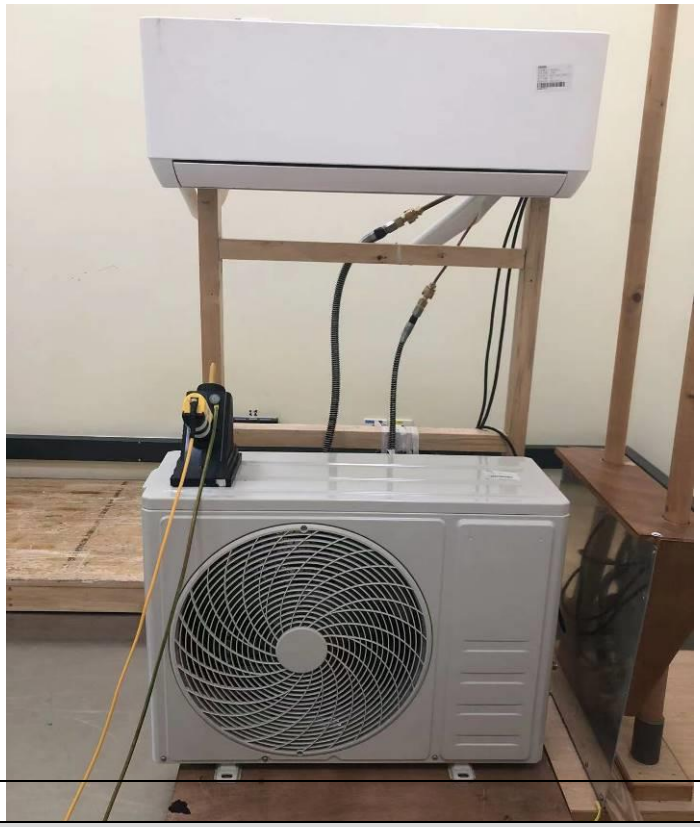
Guangdong Testing Institute of Product Quality Supervision				
Sequence Number	Equipment	Type	Equipment Number	Valid date
1	Signal generator	N5182A	Aa.07Ee003-B	2022.07.04-2023.07.03
2	Power meter	4232A	Aa.07Ee003-E	2022.08.14-2023.08.13
3	Power Amplifier	AS0860-74/45	Aa.07Ee003-A	2022.07.06-2023.07.05
4	Power Amplifier	150W1000	08094	2022.04.29-2023.04.28
5	3m Anechoic Chamber	CAC-3	A07F421	2018.08.28-2023.08.27
6	Antenna	VULB 9163	Aa.07F420-3	2021.10.19-2022.10.18
7	Antenna	STLP 9149	Aa.07Ee003-F	2019.10.16-2022.10.15

9 ANNEX 3 - TEST PHOTOS

Conducted disturbance voltage at AC mains terminals

Harmonic current emissions & Flicker

Electrostatic discharge immunity



Radiated EM Field Immunity

Electrical fast transient (EFT) / Burst transients immumity, Surge transients & Power supply voltage interruptions & dips immunity

Conducted RF disturbances immunity

---End---