EMC TEST REPORT

Report No.	:	21127012BKK-001
Testing laboratory	:	Intertek Testing Services (Thailand) Ltd. 1285/5 Prachachuen Rd., Wongsawang Bangsue, Bangkok 10800 THAILAND
Issue Date	:	6 May 2022
Client's Reference Number	:	01227733
Product Description	:	Air conditioner
Model/Type	:	Indoor unit: RAV-HM561SDTY-E, RAV-HM1101KRTP-E, RAV-HM1601UTP-E, RAV-HM1601CTP-E, RAV-HM1601BTP-E and RAV-HM1601FT-E
Applicant's name	:	Toshiba Carrier (Thailand) Co., Ltd.
Address	:	144/9 Moo 5, Bangkadi Industrial Park, Tivanon Road, Tambol Bangkadi, Amphur Muang, Pathumthani 12000 THAILAND
Sample received date	:	17 January 2022
Test date	:	21 January 2022 - 5 April 2022
Received Sample Condition	:	The sample(s) was(were) in working condition when received.
Test conclusion	:	☒ Comply ☐ Non-comply
Test standard	:	EN 55014-1: 2017/A11: 2020 EN 55014-2: 2015 EN 61000-3-2: 2014 EN 61000-3-3: 2013 EN 61000-3-11: 2000 EN 61000-3-12: 2011
Test Result	:	See the attached sheets

Prepared & Checked By:

Namo Laoprasert

Test Engineer

Approved By:

Chairat Saeheng

Reviewer

General Remark:

- "-" refers to item is not requested to test.
- "P" refers to the item does meet the requirement.
- "F" refers to the item does not comply with standard.
- "N/A" refers to test case does not apply to the test object.
- Throughout this report a point is used as the decimal separator.

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Manufacturer 1:		
	:	Toshiba Carrier (Thailand) Co., Ltd.
Model	:	RAV-HM561UTP-E/TR, RAV-HM801UTP-E/TR, RAV-HM901UTP-E, RAV-HM1101UTP-E/TR, RAV-HM1401UTP-E/TR, and RAV-HM1601UTP-E/TR, RAV-HM401CTP-E, RAV-HM561CTP-E/TR, RAV-HM801CTP-E/TR, RAV-HM901CTP-E, RAV-HM1101CTP-E/TR, RAV-HM1401CTP-E/TR, and RAV-HM1601CTP-E/TR, RAV-HM561BTP-E/TR, RAV-HM801BTP-E/TR, RAV-HM901BTP-E, RAV-HM1101BTP-E/TR, RAV-HM1401BTP-E/TR, and RAV-HM1601BTP-E/TR, RAV-HM301KRTP-E, RAV-HM401KRTP-E, RAV-HM561KRTP-E/TR, RAV-HM801KRTP-E/TR, RAV-HM901KRTP-E, and RAV-HM1101KRTP-E/TR
Address	:	144/9 Moo 5, Bangkadi Industrial Park, Tivanon Road, Tambol Bangkadi, Amphur Muang, Pathumthani 12000, Thailand
Manufacturer 2:		
		Toshiba Carrier Corporation Fuji Factory & Engineering Center
Mode	:	RAV-HM301MUT-E, RAV-HM401MUT-E, and RAV-HM561MUT-E/TR, RAV-HM561FT-E/TR, RAV-HM801FT-E/TR, RAV-HM901FT-E, RAV-HM1101FT-E/TR, RAV-HM1401FT-E/TR, and RAV-HM1601FT-E/TR, RAV-HM561UT-E/TR, RAV-HM801UT-E/TR, RAV-HM1101UT-E/TR, and RAV-HM1401UT-E/TR

Manufacturer 3:		
		Toshiba Carrier Air Conditioning (China) Co., Ltd.
Model	:	RAV-HM301SDTY-E, RAV-HM401SDTY-E, and RAV-HM561SDTY-E/TR
Address	:	Building 1 No.60, 21st Avenue, Baiyang Street, Hangzhou, Economic and Technological Development Area, P.R. China
Address	:	Same as applicant
Factory(ies)	:	Same as applicant
Address	:	Same as applicant
Test Facility	:	Intertek Testing Services (Thailand) Ltd. Electrical and Electronics Product Test Center (PTEC).
Tested by	:	Namo Laoprasert
Subcontractor Remark	:	Following tests subcontract to ILAC accredited laboratory: Harmonic current emission Voltage fluctuation and flicker Radiated electromagnetic field Fast transients Surges Injection current up to 230 MHz Voltage dips

CONTENT

1. GENERAL INFORMATION

1.1 Description of Equipment Under Test (EUT)

EUT	**:**	Air Conditioner

Description of EUT:

The EUTs are air conditioner indoor unit intended to use as household/ light commercial appliance.

Model, type and Critical component in EUT:

Test model (Indoor unit)	Cover model (Indoor unit)	Type	Indoor unit PCB model
RAV-HM561SDTY-E	RAV-HM301SDTY-E	Slim duct (TCAC)	MCC-1643
	RAV-HM401SDTY-E		
	RAV-HM561SDTY-E/TR		
RAV-HM1101KRTP-E	RAV-HM301KRTP-E	High wall (TCTC)	MCC-1696
	RAV-HM401KRTP-E		
	RAV-HM561KRTP-E/TR		
	RAV-HM801KRTP-E/TR		
	RAV-HM901KRTP-E		
	RAV-HM1101KRTP-E/TR		
RAV-HM1601UTP-E	RAV-HM561UTP-E/TR	4-way cassette (TCTC)	MCC-1643
	RAV-HM801UTP-E/TR		
	RAV-HM901UTP-E		
	RAV-HM1101UTP-E/TR		
	RAV-HM1401UTP-E/TR		
	RAV-HM1601UTP-E/TR		
	RAV-HM561UT-E/TR	Smart cassette (TCC)	
	RAV-HM801UT-E/TR		
	RAV-HM1101UT-E/TR		
	RAV-HM1401UT-E/TR		
	RAV-HM301MUT-E	Compact 4 Way (TCC)	
	RAV-HM401MUT-E		
	RAV-HM561MUT-E/TR		
RAV-HM1601CTP-E	RAV-HM401CTP-E	Under celling (TCTC)	MCC-1643
	RAV-HM561CTP-E/TR		
	RAV-HM801CTP-E/TR		
	RAV-HM901CTP-E		
	RAV-HM1101CTP-E/TR		
	RAV-HM1401CTP-E/TR		
	RAV-HM1601CTP-E/TR		

Test model (Indoor unit)	Cover model (Indoor unit)	Type	Indoor unit PCB model
RAV-HM1601BTP-E	RAV-HM561BTP-E/TR	Standard duct (TCTC)	MCC-1720
	RAV-HM801BTP-E/TR		
	RAV-HM901BTP-E		
	RAV-HM1101BTP-E/TR		
	RAV-HM1401BTP-E/TR		
	RAV-HM1601BTP-E/TR		
RAV-HM1601FT-E	RAV-HM561FT-E/TR	Floor standing (TCC)	MCC-1643
	RAV-HM801FT-E/TR		
	RAV-HM901FT-E		
	RAV-HM1101FT-E/TR		
	RAV-HM1401FT-E/TR		
	RAV-HM1601FT-E/TR		

EUT operated with connect to outdoor unit as dummy load for certify indoor unit.

Test result of model RAV-HM1601CTP-E and RAV-HM1601BTP-E have been referred to report no. 21025489BKK-001 issue date 12 May 2021 with evaluated update standard from EN 55014-1: 2017 to EN 55014-1: 2017/A11: 2020, after review test result in referred report can be transferred to this report without additional test require.

The EMC compliance of EUT can be found in this report and represents also the compliance of others model in family as shown in Appendix II.

EUT Model number	**:**	Indoor unit: RAV-HM561SDTY-E, RAV-HM1101KRTP-E, RAV-HM1601UTP-E, RAV-HM1601CTP-E, RAV-HM1601BTP-E and RAV-HM1601FT-E
Serial number	**:**	--

Rating(s)	**:**	RAV-HM561SDTY-E: 220 - 240 Va.c.; 50 Hz; 15.50 A; Class I, RAV-HM1101KRTP-E: 220 - 240 Va.c.; 50 Hz; 22.80 A; Class I, RAV-HM1601UTP-E: 220 - 240 Va.c.; 50 Hz; 27.40 A; Class I, RAV-HM1601CTP-E: 220 - 240 Va.c.; 50 Hz; 27.40 A; Class I, RAV-HM1601BTP-E: 220 - 240 Va.c.; 50 Hz; 27.40 A; Class I and RAV-HM1601FT-E: 220 - 240 Va.c.; 50 Hz; 27.40 A; Class I	
Clock frequency (MHz)	**:**	10.00 for all model	
Main lead length (m)	**:**	Fixed Appliance	
Data line length (m)	**:**	N/A	
Control line length (m)	**:**	14.00 for model: RAV-HM561SDTY-E, RAV-HM1101KRTP-E RAV-HM1601UTP-E, RAV-HM1601CTP-E, RAV-HM1601CTP-E, and RAV-HM1601BTP-E N/A for model: RAV-HM1601FT-E	
Mounting position	**:**	☒	Table-top equipment (Indoor unit)
		☒	Wall/Ceiling mounted equipment (Indoor unit)
		☒	Floor standing equipment (Indoor unit and dummy outdoor unit)
		☐	Hand-held equipment
		☐	Other:

1.2 Operation modes during the test

Operating modes:	No.	Operating mode of test item	Applied for testing	
			Emission	Immunity
	1	Within this test report, EUT has been measured with the temperature controller setting at the lowest position when in cooling mode. The ambient temperature is defined at the temperature of the air flow to the indoor unit. The ambient temperature for testing is 30 ± 5 °C when it is operating in cooling mode	☒	☒
	2	--	☐	☐
	3	--	☐	☐
	4	--	☐	☐
	5	--	☐	☐
	6	--	☐	☐
	7	--	☐	☐
	8	--	☐	☐
Used mains voltage for the test Measured:			230 V	
Used mains frequency for the test Measured (50 Hz / 60 Hz):			50 Hz	
Supplemental information to the operating modes		--		

2. TEST SPECIFICATIONS

2.1 Test equipment

Equipment used refer to 21025489BKK-001

Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
EMI Test receiver	Rohde&Schwarz	ESR7	E5-026	18-Oct-19	17-Apr-21
EMI Test receiver	Rohde&Schwarz	ESR7	E5-026	25-Mar-21	24-Mar-22
Absorbing clamp	Schaffner	AMZ41	E5-004	15-May-20	14-May-21
Click Analyzer	NARDA	PMM9010	E5-038	26-Oct-20	25-Oct-21
EMI Receiver	NARDA	PMM9010	E5-037	26-Oct-20	25-Oct-21
LISN	AFJ Instruments	LT32C/10	E5-040	08-Nov-19	07-May-21
LISN	AFJ Instruments	LT32C/10	E5-040	26-Mar-21	25-Mar-22

Equipment used test in this report

Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
EMI Test receiver	Rohde&Schwarz	ESR7	E5-026	25-Mar-21	24-Mar-22
Voltage Probe	Schwarzbeck	TK9420	E5-035	02-Mar-21	01-Mar-22
Absorbing clamp	TESEQ	MDS 21B	E5-036	13-May-21	12-May-22
Click Analyzer	Schaffner	DIA1512D	E5-002	01-Sep-21	31-Aug-22
LISN	AFJ Instruments	LT32C/10	E5-040	26-Mar-21	25-Mar-22
Harmonics, Flicker Test System	TESEQ	Profline2105	E5-030	21-Sep-21	20-Sep-22
EMC Simulator Test System	TESEQ	NSG3040	E5-017	07-Dec-21	06-Dec-22
Single Supply Source for PQT Testing	TESEQ	INA6501	E5-021	20-Dec-21	19-Dec-22
Compact Immunity Test System	TESEQ	NSG4070	E5-022	07-Dec-21	06-Dec-22
Coupling/Decoupling Network	TESEQ	CDN M016S	E5-023	07-Jun-21	06-Jun-22
ESD Simulator	TESEQ	NSG435	E5-024	14-Jul-21	13-Jul-22
Signal Conditioning Unit	TESEQ	CCN1000-3	1347A01034	--	18-Apr-22
AC-Power Source	TESEQ	NSG1007	1347A01034	--	18-Apr-22
Signal Conditioning Unit	TESEQ	CCN1000-3	1347A01034	--	18-Apr-22
Three Phase Impedance Network	TESEQ	INA2197	1347A01034	--	18-Apr-22
EMC Simulator	TESEQ	NSG3040	1943	--	17-May-22

Coupling/Decoupling network	TESEQ	CDN M332S	39604	37751	22-May-22
PQF Simulator	TESEQ	INA 6501	223	--	18-May-22

2.2 Software

Software used refer to 21025489BKK-001

Software	Manufacturer	Version
EMC Calculator	-	2018.07
PMM Emission Suite	Narda	2.31.0.0

Software used in this report

Software	Manufacturer	Version
EMC Calculator	-	2018.07
DIS9966	Schaffner	2.5.0.0

2.3 Uncertainty application

Uncertainty of Measurement applied according to CISPR 16-4-2. Reference U_{cispr} in the table as followed used as a reference value for the judgment.

Test Method	U_{Lab} (dB)	U_{cispr} (dB)
Conducted disturbance at mains port using AMN 9 kHz – 150 kHz	3.41	3.8
Conducted disturbance at mains port using AMN 150 kHz – 30 MHz	3.44	3.4
Conducted disturbance at mains port using voltage probe 150 kHz – 30 MHz	2.89	2.9
Disturbance power 30 MHz – 300 MHz	3.89	4.5
Conducted disturbance at mains port using CDNE 30 MHz – 300 MHz	3.46	3.8
Radiated disturbance 30 MHz – 1000 MHz	S[1]	6.3

Compliance or non-compliance with a disturbance limit shall be determined in the following manner:

a) If U_{lab} is less than or equal to U_{cispr} in Table, then the test report may either state the value of U_{lab} or state that U_{lab} is less than U_{cispr}.
   - Compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit;
   - Non-compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.

b) If U_{lab} exceeds U_{cispr} of Table, then the test report shall contain the value of U_{lab} (in dB) for the measurement instrumentation actually used for the measurements.
   - Compliance is deemed to occur if no measured disturbance level, increased by (U_{lab} – U_{cispr}), exceeds the disturbance limit;
   - Non-compliance is deemed to occur if any measured disturbance level, increased by (U_{lab} – U_{cispr}), exceeds the disturbance limit.

[1] Refer to subcontractor uncertainty of measurement, if applicable.

3. TEST SUMMARY

Test standard		Requirement – Test case	Verdict
EN 55014-1	☒	Continuous disturbances mains port (150 kHz to 30 MHz)	P
	☒	Continuous disturbances associated port (150 kHz to 30 MHz)	P
	☒	Disturbance power (30 MHz to 300 MHz)	P
	☐	Radiated emission (30 MHz to 1000 MHz)	N/A (Note 1)
	☒	Discontinuous disturbance (clicks)	P
EN 61000-3-2	☒	Harmonic current emission (≤ 16 A)	P
EN 61000-3-12	☒	Harmonic current emission (> 16 A)	P
EN 61000-3-3	☒	Voltage fluctuation and flicker (≤ 16 A)	P
EN 61000-3-11	☒	Voltage fluctuation and flicker (> 16 A)	P
EN 55014-2	☒	Electrostatic discharge	P
☐ Category I	☐	Radiated electromagnetic field	N/A
☒ Category II	☒	Fast transients	P
☐ Category III	☒	Surges	P
☐ Category IV	☒	Injected currents 0.15 to 230 MHz	P
	☐	Injected currents 0.15 to 80 MHz	N/A
	☒	Voltage dips	P
Note :	Note 1: Not applicable, due to the EUT that contains clock frequency of less than 30 MHz.		

☒ Test topic applicable in this test report
☐ Test topic non-applicable in this test report

EMISSION TEST

4. Continuous disturbances

4.1 Test method

- ❑ EUT is configured by follow the particular requirement in the reference standards, if available. If the particular requirements are not specified, EUT shall be configured with appropriate load to maximize the disturbance signal.
- ❑ Mains terminal disturbance is measure at line to earth and neutral to earth.
- ❑ Pre-scan shall be done over the whole range of frequency as specified by the standard.
- ❑ At least 6 worst peaks which are closet to the limit(s) shall be selected to do the Final scan.
- ❑ Final scan shall be done by reduce the span zooming in to the selected peak and fine tune to the exact frequency which give the highest disturbance value. Re-measure at that frequency with peak detector and other detector according to the limit(s) applied.

4.1.1 Test set up

Test set-up description:	☒	Table-top equipment set-up (40 cm distance to vertical ground plane, 80 cm over ground plane) (Indoor unit)
	☒	Wall/Ceiling mounted equipment (Indoor unit)
	☒	Floor standing equipment set-up (10 cm over ground plane) (Indoor unit and dummy outdoor unit)
	☐	Artificial hand applied
	☐	Other:

4.1.2 Limit

Table 1: Limit for Continuous disturbance

Frequency range (MHz)	Main ports Disturbance voltage limits		Associated ports Disturbance voltage limits	
	Quasi-peak dB(µv)	Average dB(µv)	Quasi-peak dB(µv)	Average dB(µv)
0.15 - 0.5	66 - 56 *	59 - 46 *	80	70
0.5 - 5	56	46	74	64
5 - 30	60	50	74	64
Note:	1. * means the limit decreasing linearly with the logarithm of the frequency from 0.15MHz to 0.5MHz.			
	2. The test report shall state which test method was used and which limits were applied			

4.2 Test result

4.2.1 Test environment

Ambient Temperature (15 - 35 °C):	26	°C
Relative Humidity (30 - 60 %):	48	%
Air pressure (800 - 1060 mbar):	1008	mbar

4.2.2 Test port

Test port:	☒	Mains ports
	☐	Associated ports
	☐	Other:

4.2.3 Scanning trace and final measurement

Model:	RAV-HM561SDTY-E
Operating modes:	1
Test port:	Mains ports

Freq List (MHz)	QP Level (dB(μV))	QP Limit (dB(μV))	QP Margin (dB)	AV Level (dB(μV))	AV Limit (dB(μV))	AV Margin (dB)	Path
0.6940	50.80	56.00	-5.20	44.40	46.00	-1.60	L-PE
0.7700	49.90	56.00	-6.10	43.10	46.00	-2.90	N-PE
0.5420	49.20	56.00	-6.80	43.10	46.00	-2.90	N-PE
2.3220	48.60	56.00	-7.40	42.10	46.00	-3.90	L-PE
2.1980	48.30	56.00	-7.70	41.60	46.00	-4.40	N-PE
4.9200	47.80	56.00	-8.20	41.20	46.00	-4.80	L-PE

Note: 1. The test result shown are 6 worst measurement result and sort by average margin.

Model:		RAV-HM1101KRTP-E					
Operating modes:		1					
Test port:		Mains ports					
Freq List (MHz)	QP Level (dB(µV))	QP Limit (dB(µV))	QP Margin (dB)	AV Level (dB(µV))	AV Limit (dB(µV))	AV Margin (dB)	Path
3.3180	50.30	56.00	-5.70	43.10	46.00	-2.90	L-PE
3.0820	49.60	56.00	-6.40	42.40	46.00	-3.60	L-PE
0.7620	44.60	56.00	-11.40	38.70	46.00	-7.30	L-PE
0.7300	43.90	56.00	-12.10	37.80	46.00	-8.20	N-PE
8.6540	44.30	60.00	-15.70	38.70	50.00	-11.30	N-PE
0.3700	42.40	58.50	-16.10	36.10	49.25	-13.15	N-PE
Note:	1. The test result shown are 6 worst measurement result and sort by average margin.						

Model:		RAV-HM1601UTP-E					
Operating modes:		1					
Test port:		Mains ports					
Freq List (MHz)	QP Level (dB(µV))	QP Limit (dB(µV))	QP Margin (dB)	AV Level (dB(µV))	AV Limit (dB(µV))	AV Margin (dB)	Path
0.3660	51.60	58.59	-6.99	45.10	49.36	-4.26	N-PE
0.2620	54.50	61.36	-6.86	47.30	52.97	-5.67	L-PE
0.2180	56.50	62.89	-6.39	48.00	54.96	-6.96	L-PE
0.1580	59.20	65.56	-6.36	51.00	58.43	-7.43	L-PE
0.2540	53.70	61.62	-7.92	45.70	53.31	-7.61	N-PE
15.7620	47.80	60.00	-12.20	42.20	50.00	-7.80	N-PE
Note:	1. The test result shown are 6 worst measurement result and sort by average margin.						

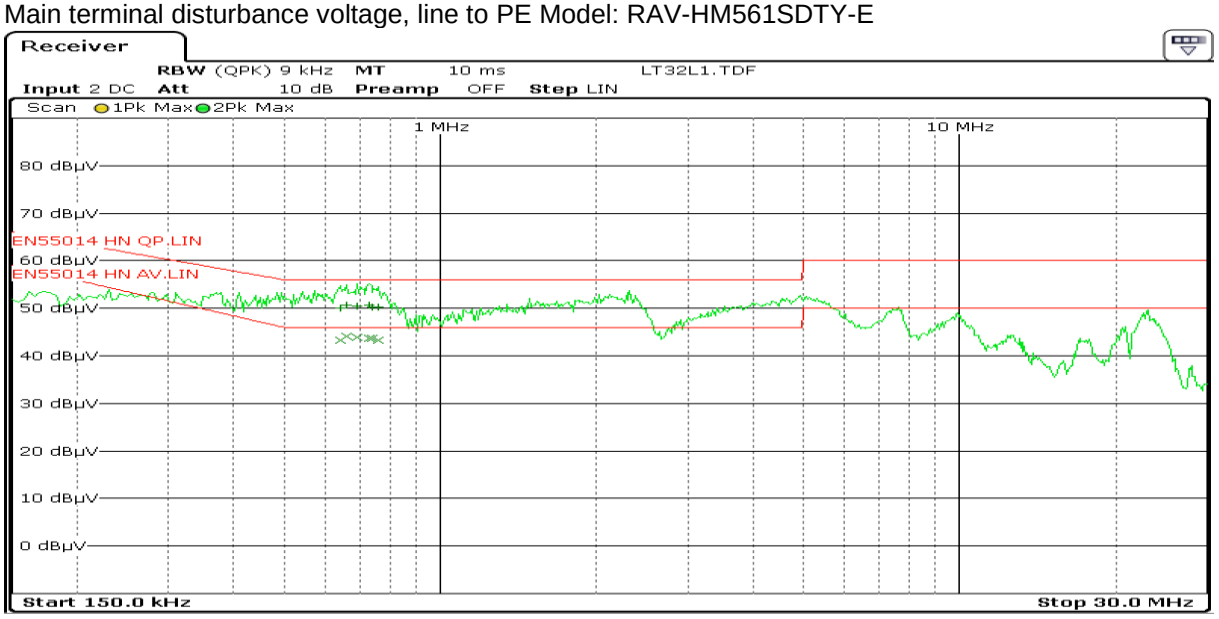
Model:		RAV-HM1601CTP-E					
Operating modes:		1					
Test port:		Mains ports					
Freq List (MHz)	QP Level (dB(µV))	QP Limit (dB(µV))	QP Margin (dB)	AV Level (dB(µV))	AV Limit (dB(µV))	AV Margin (dB)	Path
0.2580	55.60	61.49	-5.89	45.50	53.14	-7.64	N-PE
0.2340	55.10	62.30	-7.20	44.90	54.19	-9.29	L-PE
1.1020	50.80	56.00	-5.20	34.90	46.00	-11.10	L-PE
0.1780	56.80	64.57	-7.77	45.90	57.15	-11.25	N-PE
1.0180	50.90	56.00	-5.10	34.50	46.00	-11.50	N-PE
0.1820	55.40	64.39	-8.99	44.70	56.91	-12.21	L-PE
Note:	1. The test result shown are 6 worst measurement result and sort by average margin.						

Model:		RAV-HM1601BTP-E					
Operating modes:		1					
Test port:		Mains ports					
Freq List (MHz)	QP Level (dB(µV))	QP Limit (dB(µV))	QP Margin (dB)	AV Level (dB(µV))	AV Limit (dB(µV))	AV Margin (dB)	Path
0.1620	62.90	65.36	-2.46	53.80	58.16	-4.36	N-PE
0.1620	63.00	65.36	-2.36	53.30	58.16	-4.86	L-PE
0.1780	60.50	64.57	-4.07	50.80	57.15	-6.35	N-PE
0.1780	60.10	64.57	-4.47	50.20	57.15	-6.95	L-PE
1.1500	52.40	56.00	-3.60	37.90	46.00	-8.10	L-PE
0.3020	54.70	60.18	-5.48	42.50	51.44	-8.94	N-PE
Note:	1. The test result shown are 6 worst measurement result and sort by average margin.						

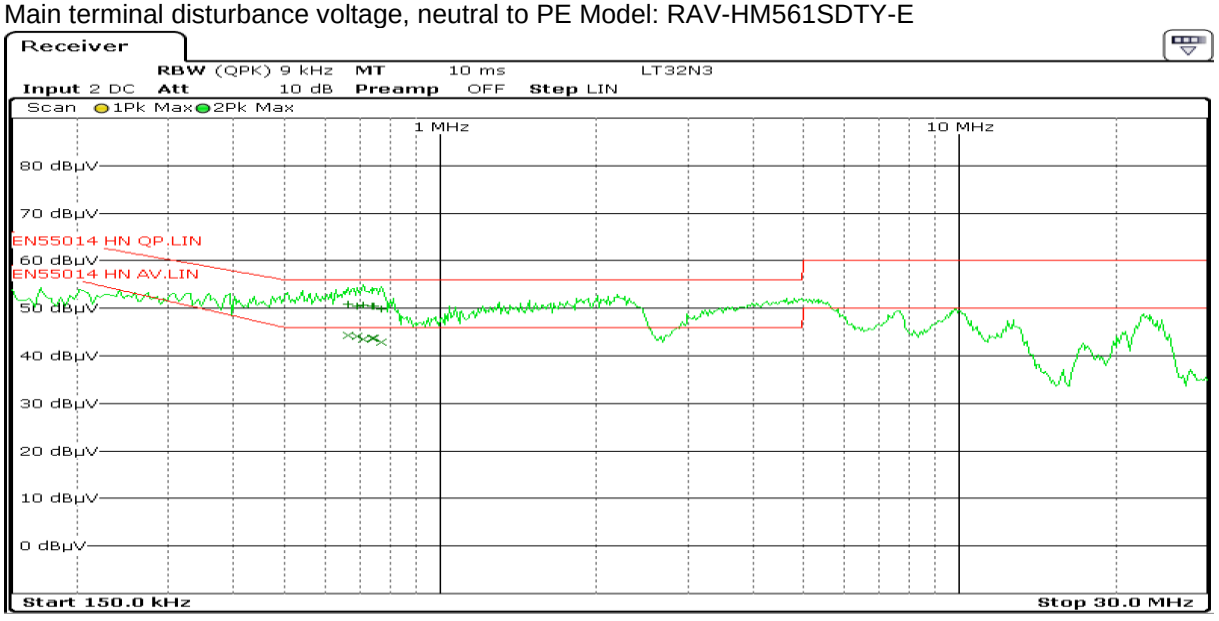
Model:		RAV-HM1601FT-E					
Operating modes:		1					
Test port:		Mains ports					
Freq List (MHz)	QP Level (dB(µV))	QP Limit (dB(µV))	QP Margin (dB)	AV Level (dB(µV))	AV Limit (dB(µV))	AV Margin (dB)	Path
0.4060	53.10	57.72	-4.62	46.70	48.24	-1.54	L-PE
0.3900	52.50	58.06	-5.56	45.50	48.68	-3.18	N-PE
0.3380	53.70	59.25	-5.55	46.80	50.22	-3.42	L-PE
0.1980	56.90	63.69	-6.79	49.20	56.00	-6.80	L-PE
0.2300	53.90	62.44	-8.54	46.50	54.38	-7.88	N-PE
11.4260	47.80	60.00	-12.20	41.70	50.00	-8.30	N-PE
Note:	1. The test result shown are 6 worst measurement result and sort by average margin.						

4.2.4 Graphical representation of conducted emissions data

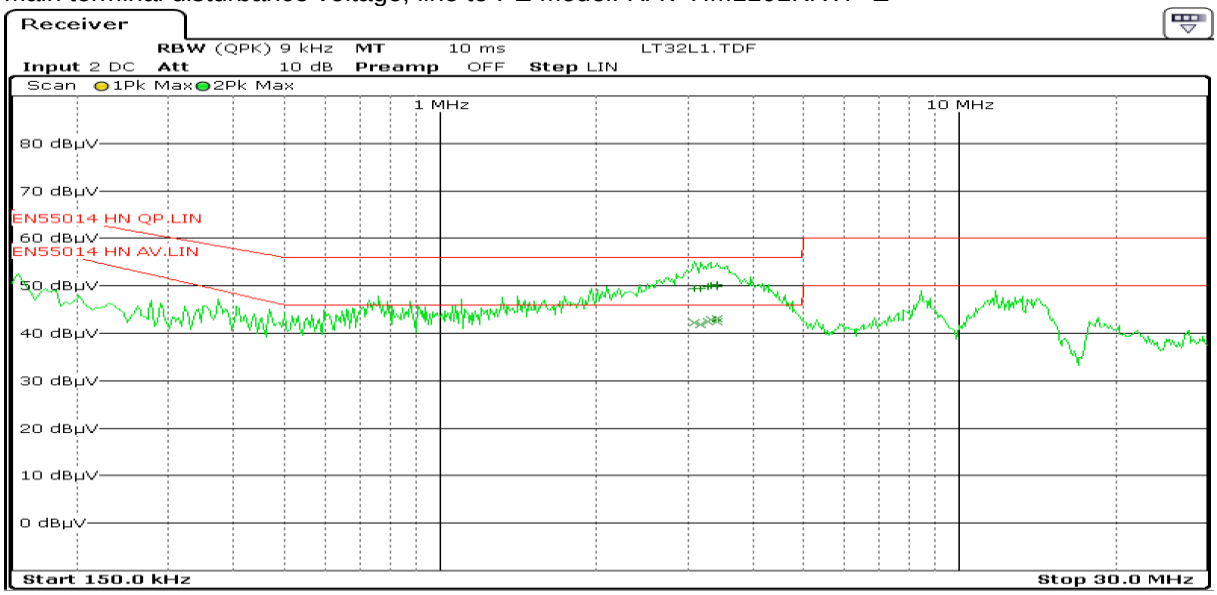
Main terminal disturbance voltage, line to PE Model: RAV-HM561SDTY-E



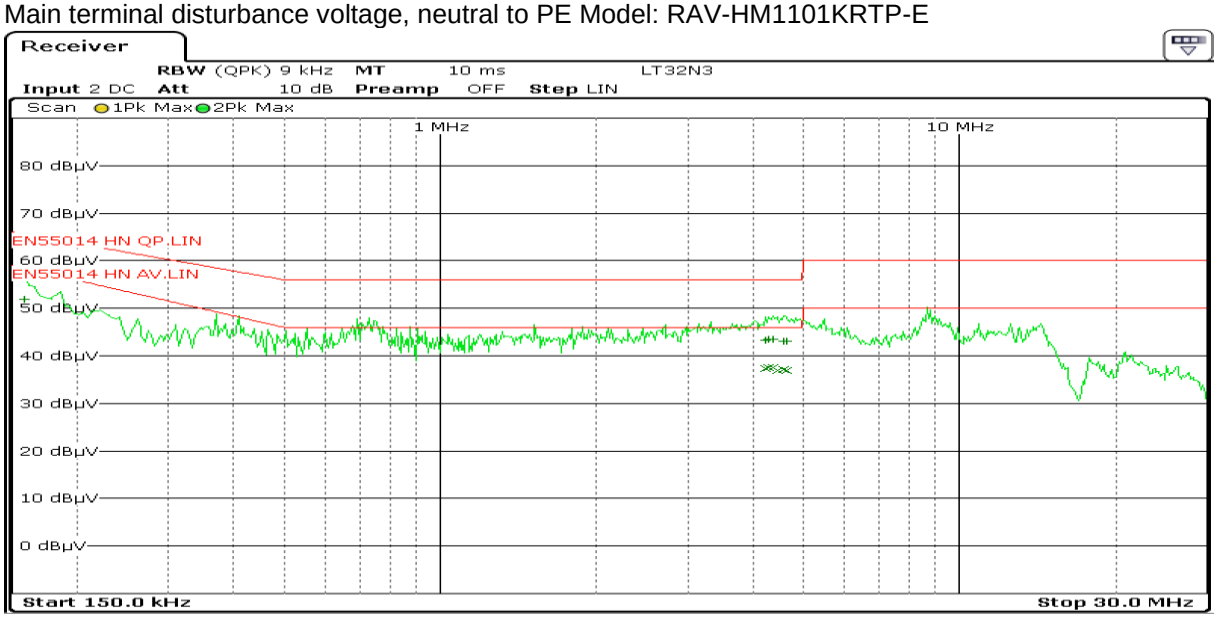
Main terminal disturbance voltage, neutral to PE Model: RAV-HM561SDTY-E



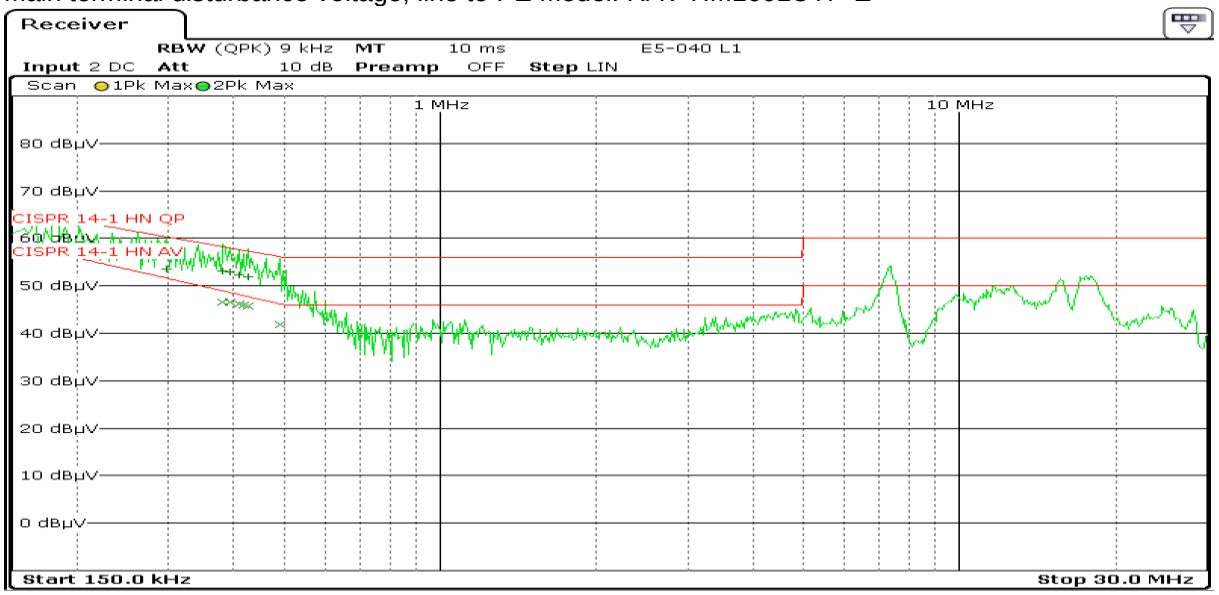
Main terminal disturbance voltage, line to PE Model: RAV-HM1101KRTP-E



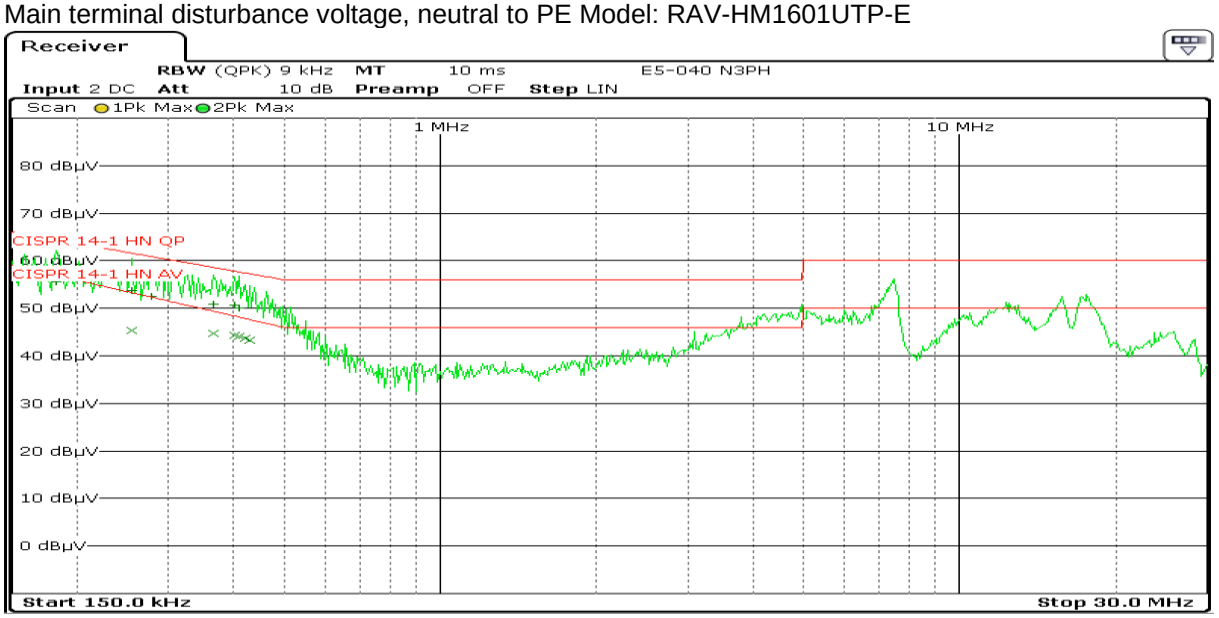
Main terminal disturbance voltage, neutral to PE Model: RAV-HM1101KRTP-E



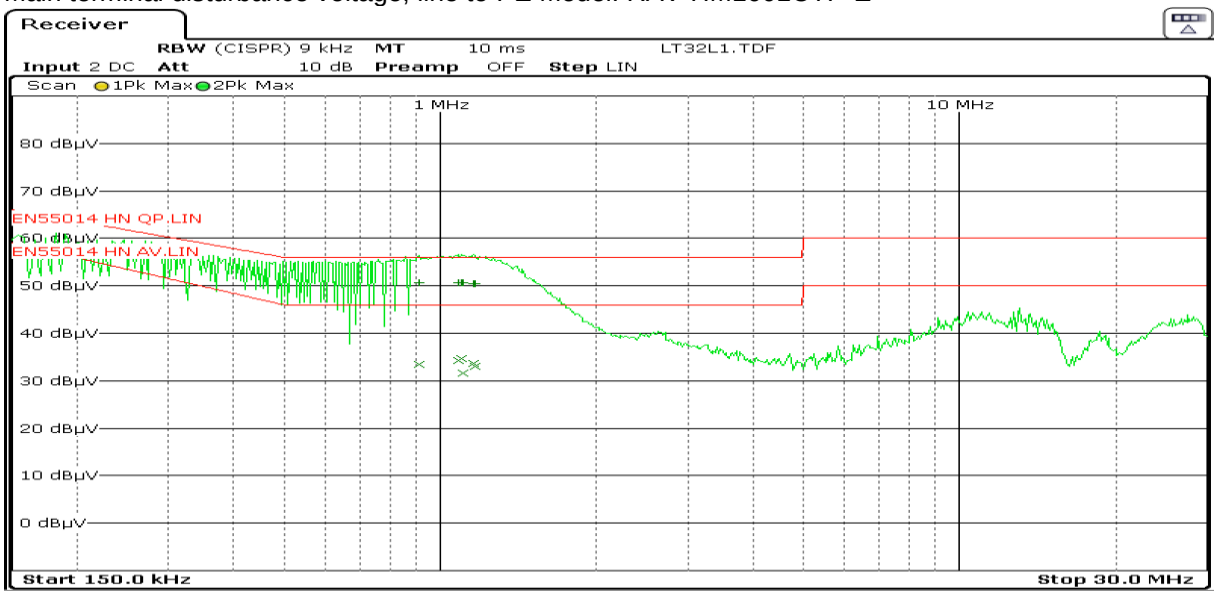
Main terminal disturbance voltage, line to PE Model: RAV-HM1601UTP-E



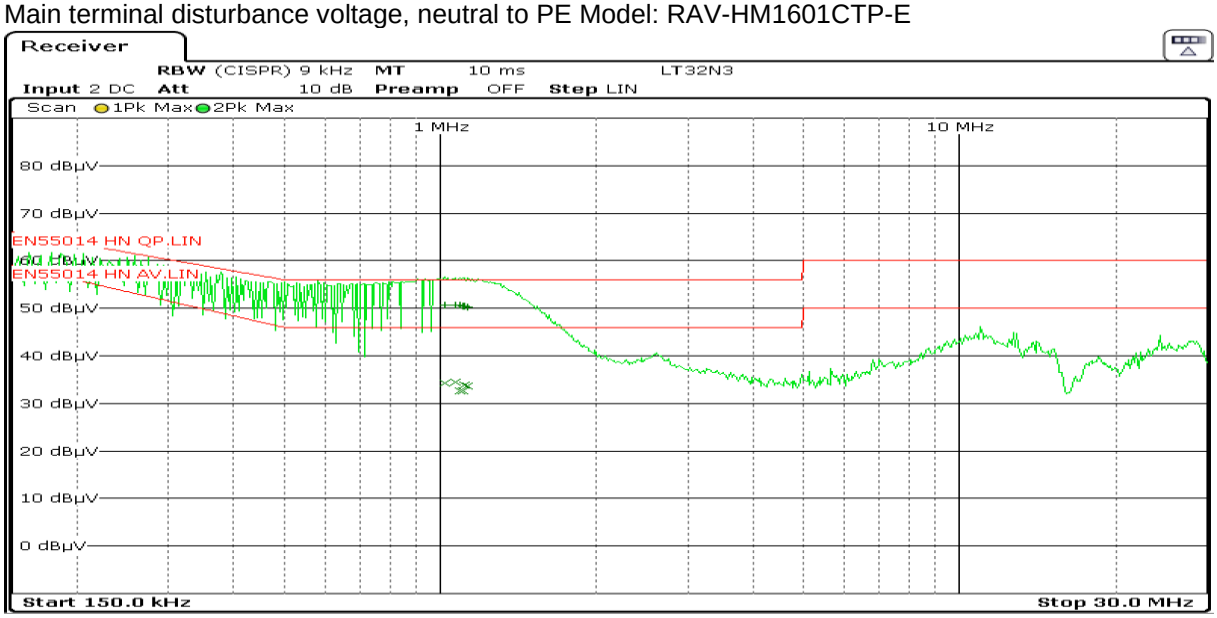
Main terminal disturbance voltage, neutral to PE Model: RAV-HM1601UTP-E



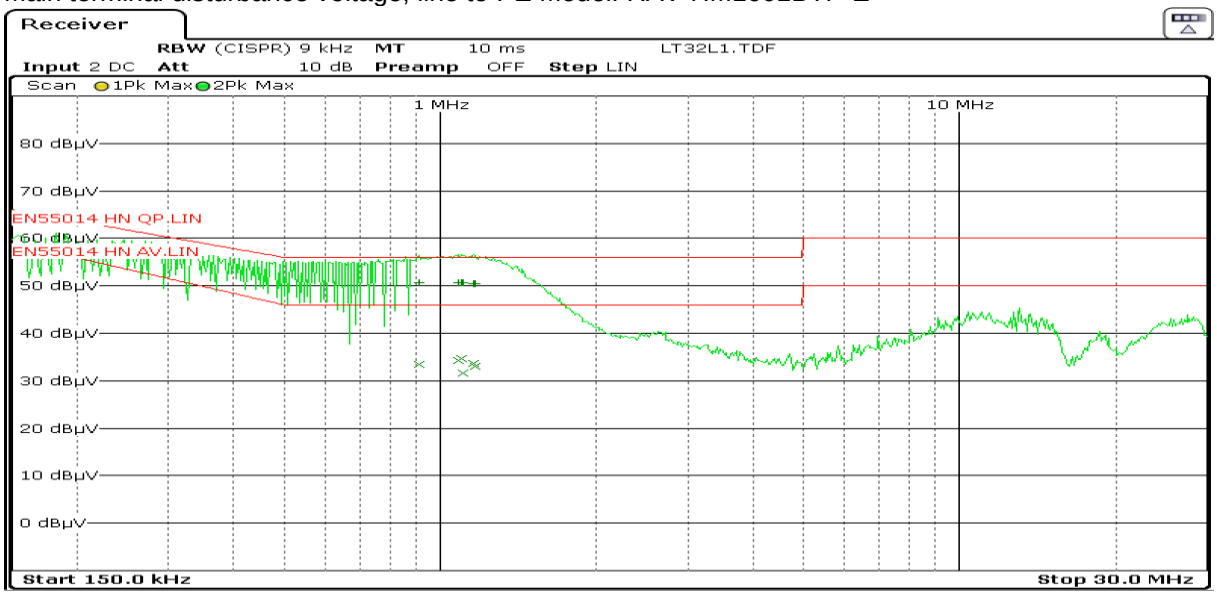
Main terminal disturbance voltage, line to PE Model: RAV-HM1601CTP-E



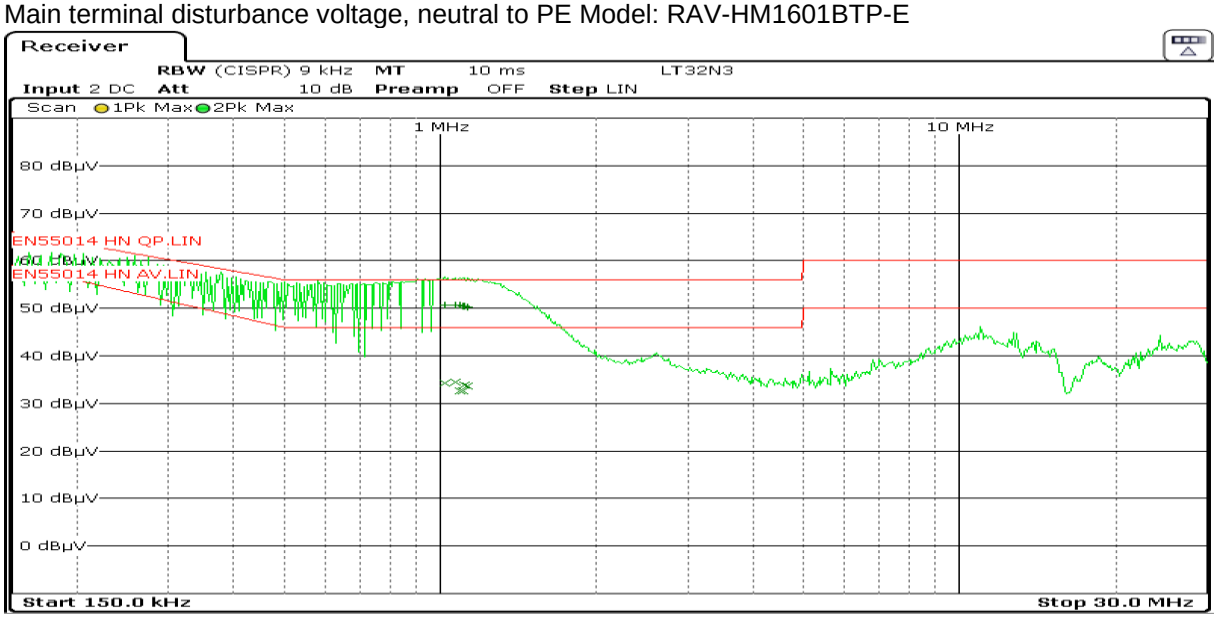
Main terminal disturbance voltage, neutral to PE Model: RAV-HM1601CTP-E



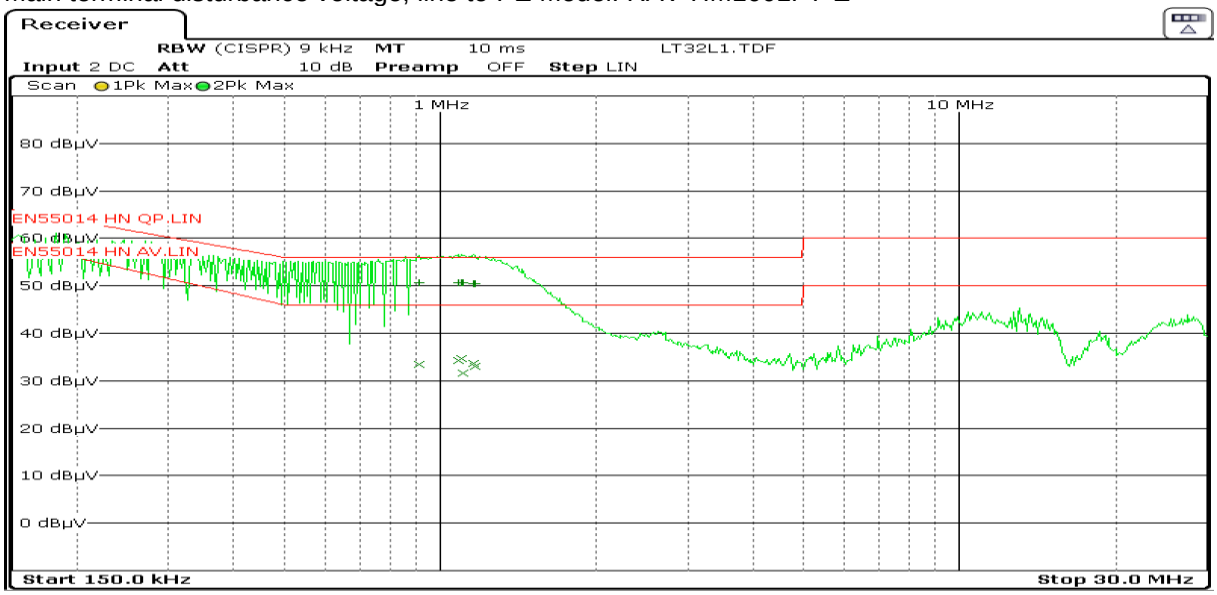
Main terminal disturbance voltage, line to PE Model: RAV-HM1601BTP-E



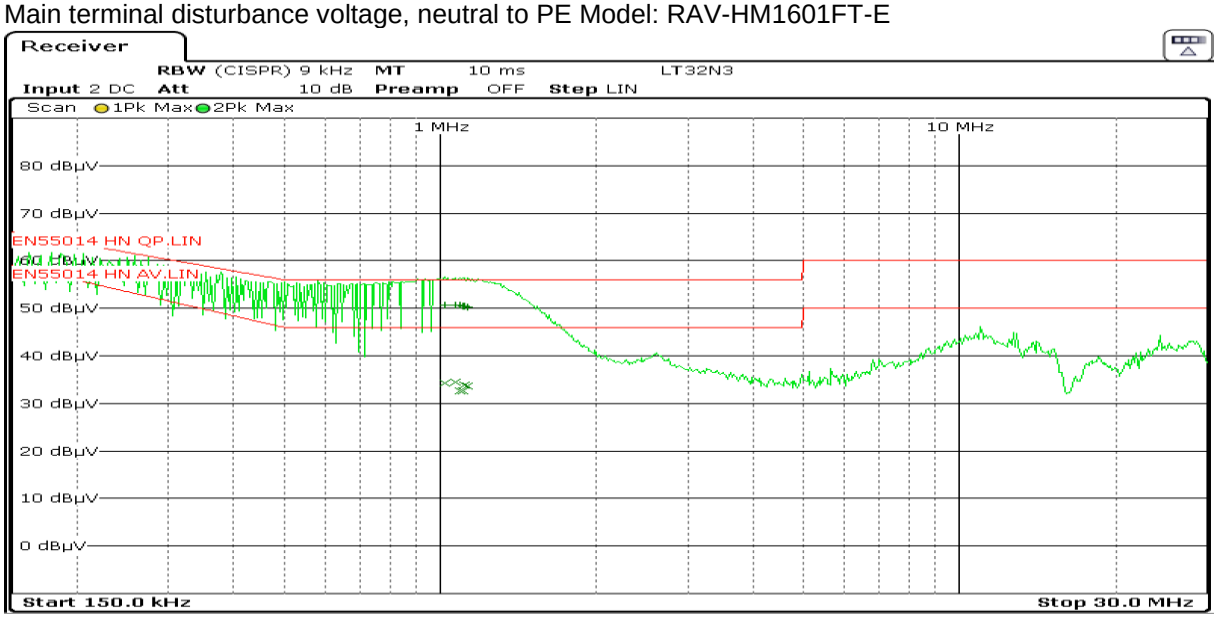
Main terminal disturbance voltage, neutral to PE Model: RAV-HM1601BTP-E



Main terminal disturbance voltage, line to PE Model: RAV-HM1601FT-E



Main terminal disturbance voltage, neutral to PE Model: RAV-HM1601FT-E



5. Disturbance power

5.1 Test method

- ❑ EUT is configured by follow the particular requirement in the reference standards, if available. If the particular requirements are not specified, EUT shall be configured with appropriate load to maximize the disturbance signal.
- ❑ Continuous disturbance power is measure over the 6 m length cable by pre-scan 2m a time. The pre-scan is done at 0.1m (the closet to EUT), 3m.
- ❑ Pre-scan shall be done over the whole range of frequency as specified by the standard. One worst trace will be selected to report as a pre-scan trace.
- ❑ At least 6 worst peaks which are closet to the limit(s) shall be selected to do the Final scan. The selection will do base on the 3 scanning results as mention above. Different frequency will be selected.
- ❑ Final scan shall be done by reduce the span zooming in to the selected peak and fine tune to the exact frequency which give the highest disturbance value. Re-measure at that frequency with peak detector and other detector according to the limit(s) applied.

5.1.1 Test set up

Test set-up description:	☒	Equipment on table of 80 cm height (Indoor unit)
	☒	Wall/Ceiling mounted equipment (Indoor unit)
	☒	Equipment on support of 10 cm height (Indoor unit and dummy outdoor unit)
	☐	Other:

5.1.2 Limit

Table 2: Disturbance power limits

Frequency range (MHz)	Quasi-peak dB(pW)	Average dB (pW)
30 - 300	45 - 55*	35 - 45*
Note:	1. * means the limit increasing linearly with the frequency.	
	2. If the limit for the measurement with the average detector is met when using a receiver with a quasi-peak detector, the equipment under test shall be deemed to meet both limits and the measurement with the receiver with average detector need not be carried out.	

Table 3: Reduction applicable to disturbance power limits

Frequency range (MHz)	Quasi-peak dB(pW)	Average dB (pW)
200 - 300	0 to 10	0

5.2 Test result

5.2.1 Test environment

Ambient Temperature (15 - 35 °C):	26	°C
Relative Humidity (30 - 60 %):	48	%
Air pressure (800 - 1060 mbar):	1008	mbar

5.2.2 Test port

Test port:	☒	Mains power lines
	☐	Signal lines
	☒	Control lines
	☐	Other:

5.2.3 Scanning trace and final measurement

Model:	RAV-HM561SDTY-E
Operating modes:	1
Test port:	Mains power lines, inter-connecting cable and remote wire

Freq List (MHz)	QP Level (dB(pW))	QP Limit (dB(pW))	QP Margin (dB)	AV Level (dB(pW))	AV Limit (dB(pW))	AV Margin (dB)	Sensor
41.7600	42.50	45.43	-2.93	30.20	35.43	-5.23	Remote
55.0800	41.70	45.92	-4.22	28.30	35.92	-7.62	I/D
38.9600	37.80	45.33	-7.53	27.10	35.33	-8.23	I/D
30.5200	37.40	45.01	-7.61	27.80	35.01	-7.21	Remote
55.0000	36.30	45.92	-9.62	24.20	35.92	-11.72	Main
38.0400	33.80	45.29	-11.49	24.20	35.29	-11.09	Main

Note:	1. The test result shown are 6 worst measurement result and sort by quasi-peak margin.
Remark:	Main: Clamp on main cable, sensor head to main.
	I/D: Clamp on inter-connecting cable, sensor head to indoor.
	Remote: Clamp on remote wire, sensor head to air conditioner.

Model:		RAV-HM1101KRTP-E					
Operating modes:		1					
Test port:		Mains power lines, inter-connecting cable and remote wire					
Freq List (MHz)	QP Level (dB(pW))	QP Limit (dB(pW))	QP Margin (dB)	AV Level (dB(pW))	AV Limit (dB(pW))	AV Margin (dB)	Sensor
30.5600	40.80	45.02	-4.22	26.80	35.02	-8.22	I/D
31.2000	42.20	45.04	-2.84	27.90	35.04	-7.14	Remote
39.7200	36.70	45.36	-8.66	23.90	35.36	-11.46	Main
39.8000	36.10	45.36	-9.26	23.00	35.36	-12.36	Remote
35.2800	30.50	45.19	-14.69	19.10	35.19	-16.09	I/D
36.9600	28.50	45.25	-16.75	18.50	35.25	-16.75	Main
Note:	1. The test result shown are 6 worst measurement result and sort by quasi-peak margin.						
Remark:	Main: Clamp on main cable, sensor head to main.						
	I/D: Clamp on inter-connecting cable, sensor head to indoor.						
	Remote: Clamp on remote wire, sensor head to air conditioner.						

Model:		RAV-HM1601UTP-E					
Operating modes:		1					
Test port:		Mains power lines, inter-connecting cable and remote wire					
Freq List (MHz)	QP Level (dB(pW))	QP Limit (dB(pW))	QP Margin (dB)	AV Level (dB(pW))	AV Limit (dB(pW))	AV Margin (dB)	Sensor
32.5200	30.90	45.09	-14.19	19.60	35.09	-15.49	I/D
49.3200	31.30	45.71	-14.41	19.30	35.71	-16.41	Remote
37.7200	30.50	45.28	-14.78	18.60	35.28	-16.68	Remote
49.0400	30.90	45.70	-14.80	19.00	35.70	-16.70	I/D
78.4400	29.20	46.79	-17.59	13.80	36.79	-22.99	Main
103.3600	29.50	47.71	-18.21	13.40	37.71	-24.31	Main
Note:	1. The test result shown are 6 worst measurement result and sort by quasi-peak margin.						
Remark:	Main: Clamp on main cable, sensor head to main.						
	I/D: Clamp on inter-connecting cable, sensor head to indoor.						
	Remote: Clamp on remote wire, sensor head to air conditioner.						

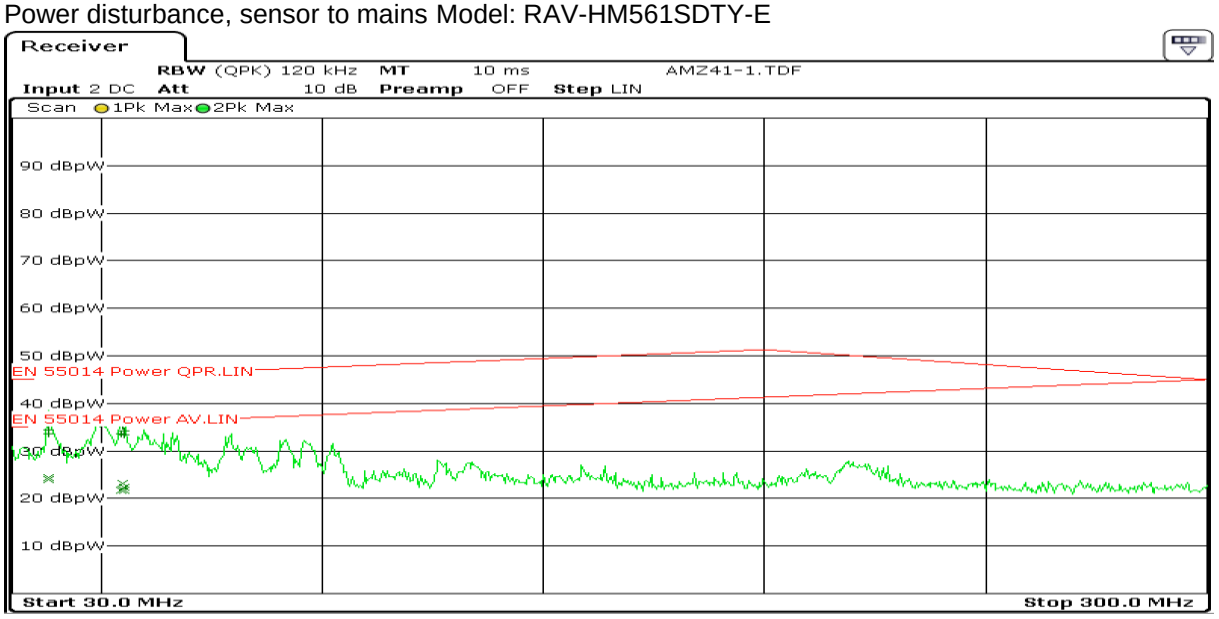
Model:		RAV-HM1601CTP-E					
Operating modes:		1					
Test port:		Mains power lines, inter-connecting cable and remote wire					
Freq List (MHz)	QP Level (dB(pW))	QP Limit (dB(pW))	QP Margin (dB)	AV Level (dB(pW))	AV Limit (dB(pW))	AV Margin (dB)	Sensor
30.3200	34.50	45.01	-10.51	21.40	35.01	-13.61	Main
30.9200	34.10	45.03	-10.93	24.10	35.03	-10.93	Remote
41.1200	32.90	45.41	-12.51	21.50	35.41	-13.91	Main
39.8000	30.90	45.36	-14.46	22.30	35.36	-13.06	Remote
30.3200	29.90	45.01	-15.11	18.20	35.01	-16.81	I/D
41.4400	26.70	45.42	-18.72	18.30	35.42	-17.12	I/D
Note:	1. The test result shown are 6 worst measurement result and sort by quasi-peak margin.						
Remark:	Main: Clamp on main cable, sensor head to main.						
	I/D: Clamp on inter-connecting cable, sensor head to indoor.						
	Remote: Clamp on remote wire, sensor head to air conditioner.						

Model:		RAV-HM1601BTP-E					
Operating modes:		1					
Test port:		Mains power lines, inter-connecting cable and remote wire					
Freq List (MHz)	QP Level (dB(pW))	QP Limit (dB(pW))	QP Margin (dB)	AV Level (dB(pW))	AV Limit (dB(pW))	AV Margin (dB)	Sensor
30.0400	40.50	45.00	-4.50	29.80	35.00	-5.20	Remote
38.6000	35.00	45.31	-10.31	24.50	35.31	-10.81	Remote
41.3200	32.90	45.41	-12.51	23.00	35.41	-12.41	Main
30.9200	30.50	45.03	-14.53	16.20	35.03	-18.83	Main
30.0000	26.50	45.00	-18.50	17.70	35.00	-17.30	I/D
39.9600	25.50	45.36	-19.86	17.40	35.36	-17.96	I/D
Note:	1. The test result shown are 6 worst measurement result and sort by quasi-peak margin.						
Remark:	Main: Clamp on main cable, sensor head to main.						
	I/D: Clamp on inter-connecting cable, sensor head to indoor.						
	Remote: Clamp on remote wire, sensor head to air conditioner.						

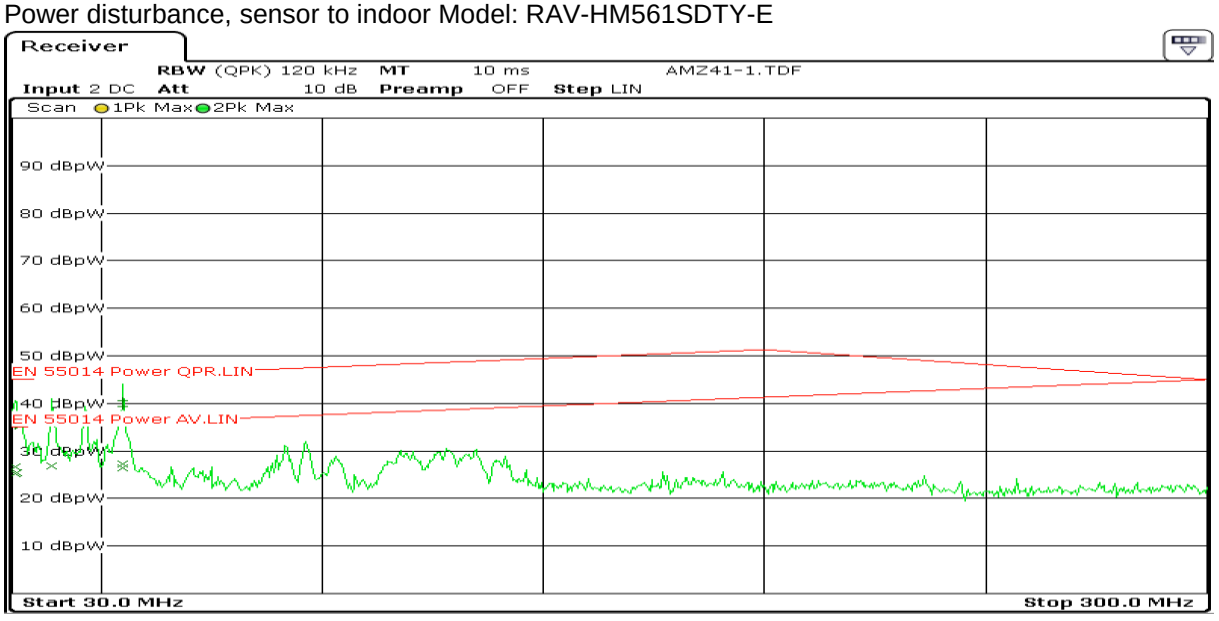
Model:		RAV-HM1601FT-E					
Operating modes:		1					
Test port:		Mains power lines, inter-connecting cable					
Freq List (MHz)	QP Level (dB(pW))	QP Limit (dB(pW))	QP Margin (dB)	AV Level (dB(pW))	AV Limit (dB(pW))	AV Margin (dB)	Sensor
32.2000	33.10	45.08	-11.98	20.30	35.08	-14.78	Main
52.1600	33.80	45.82	-12.02	19.80	35.82	-16.02	I/D
37.8000	33.20	45.28	-12.08	20.80	35.28	-14.48	I/D
32.1600	31.40	45.08	-13.68	19.10	35.08	-15.98	I/D
100.3600	32.50	47.60	-15.10	15.50	37.60	-22.10	Main
36.2800	27.30	45.23	-17.93	14.80	35.23	-20.43	Main
Note:	1. The test result shown are 6 worst measurement result and sort by quasi-peak margin.						
Remark:	Main: Clamp on main cable, sensor head to main.						
	I/D: Clamp on inter-connecting cable, sensor head to indoor.						

5.2.4 Graphical representation of disturbance power data

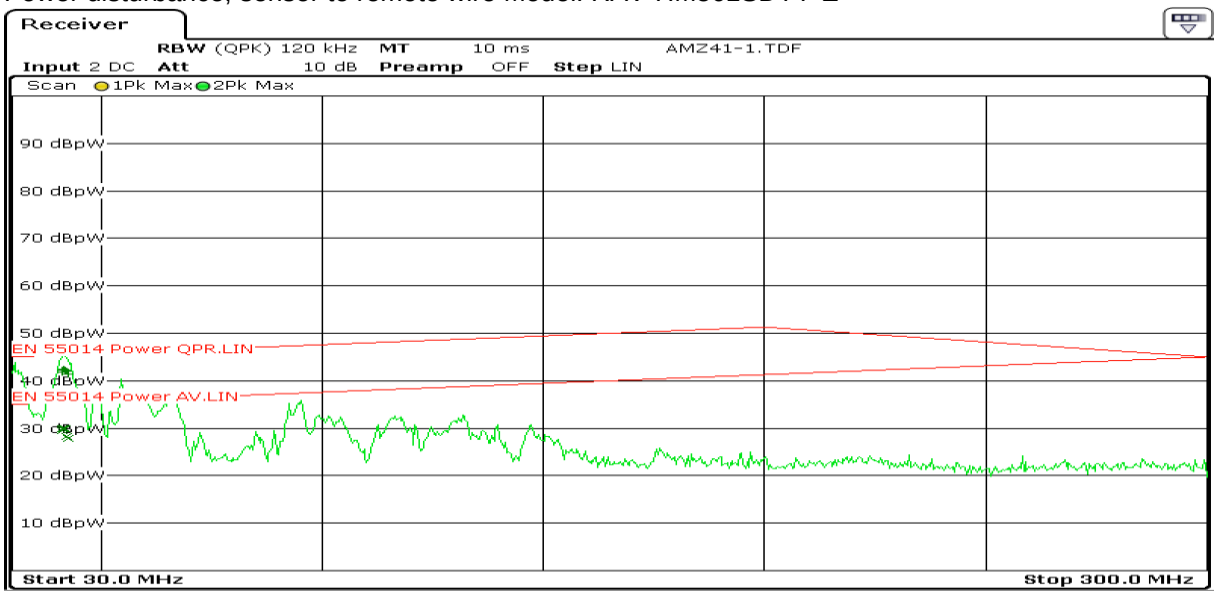
Power disturbance, sensor to mains Model: RAV-HM561SDTY-E



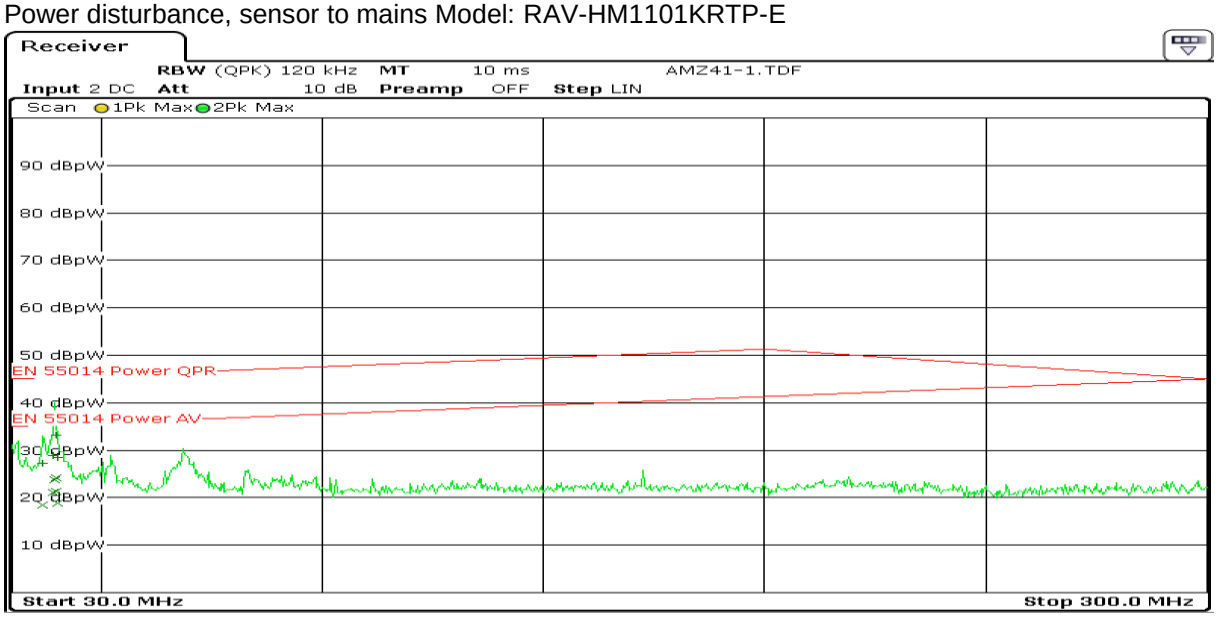
Power disturbance, sensor to indoor Model: RAV-HM561SDTY-E



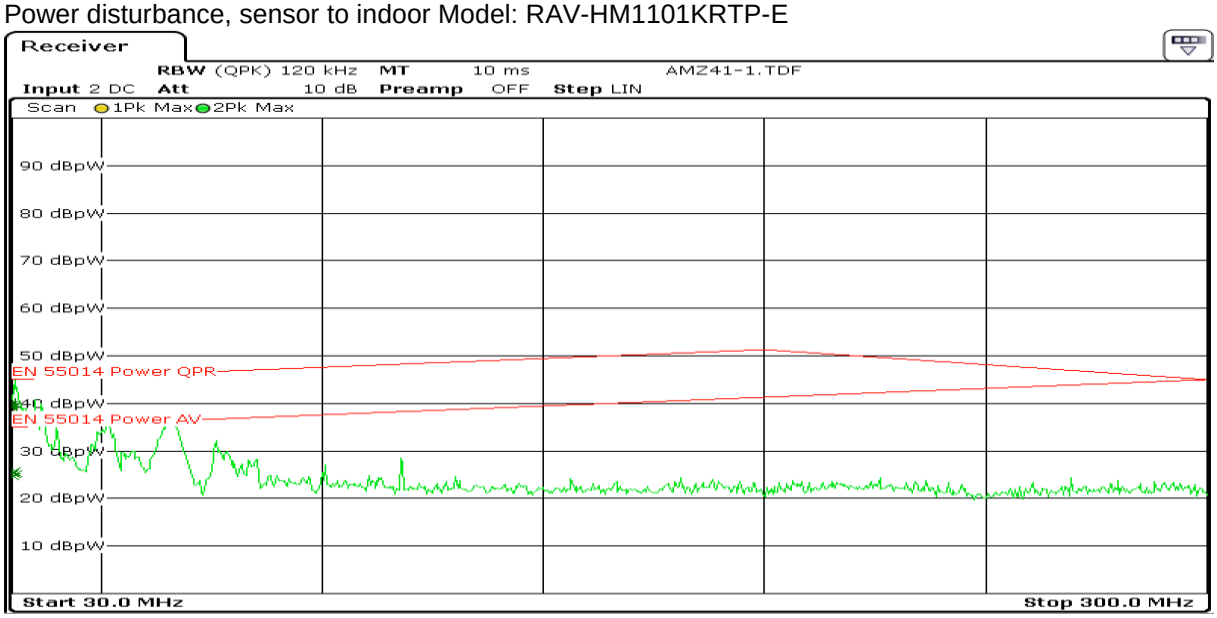
Power disturbance, sensor to remote wire Model: RAV-HM561SDTY-E



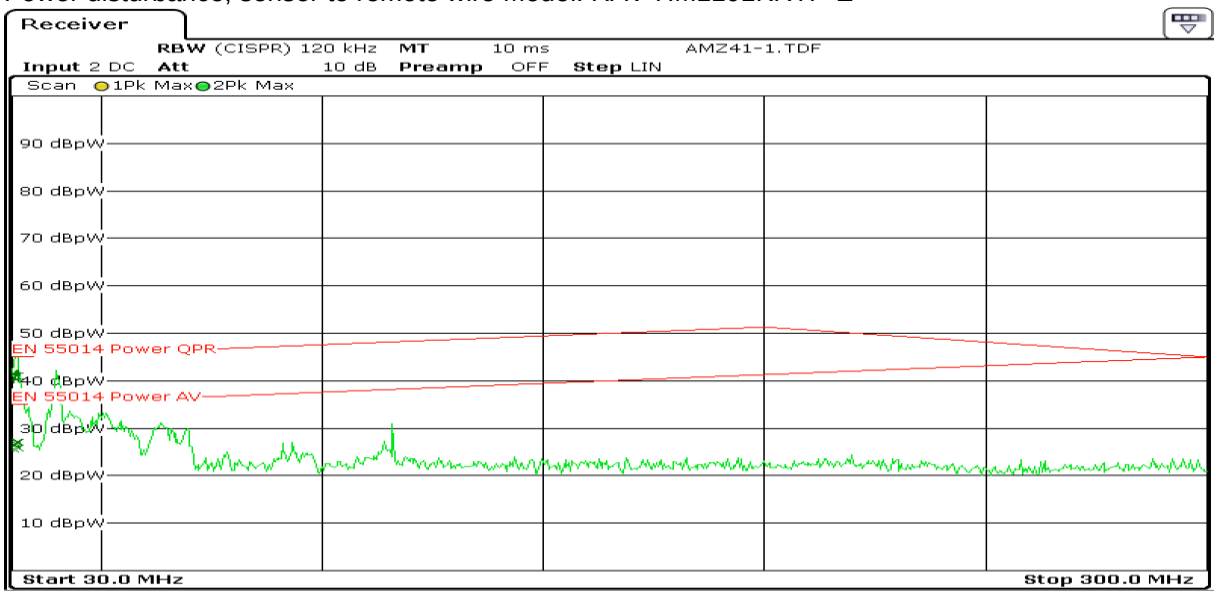
Power disturbance, sensor to mains Model: RAV-HM1101KRTP-E



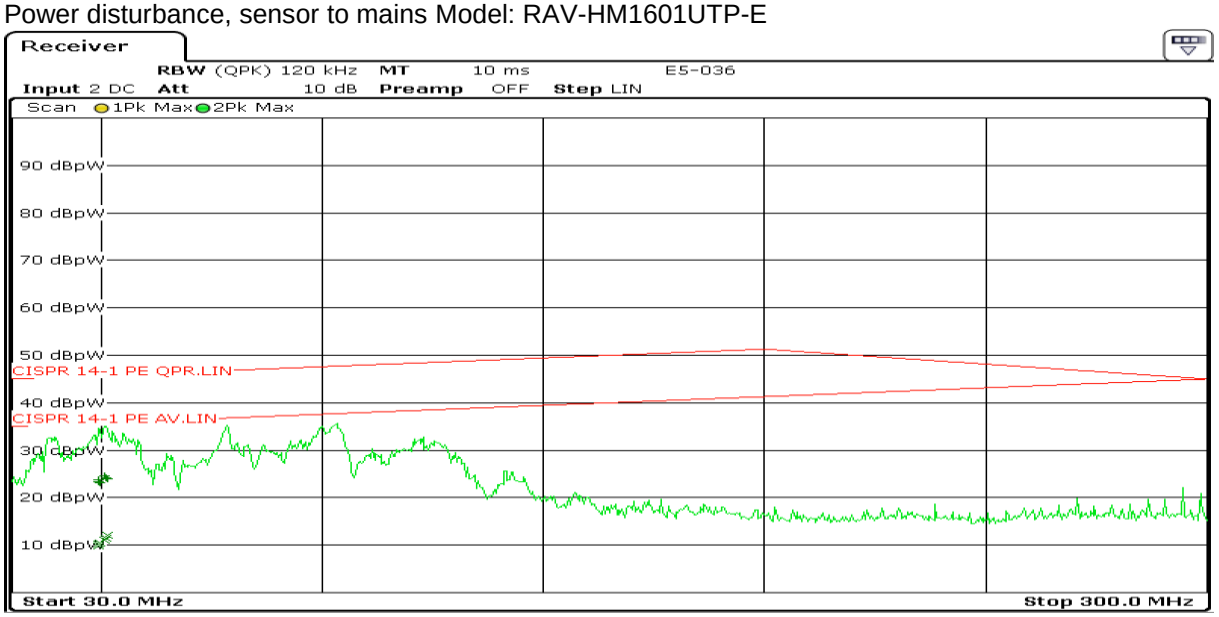
Power disturbance, sensor to indoor Model: RAV-HM1101KRTP-E



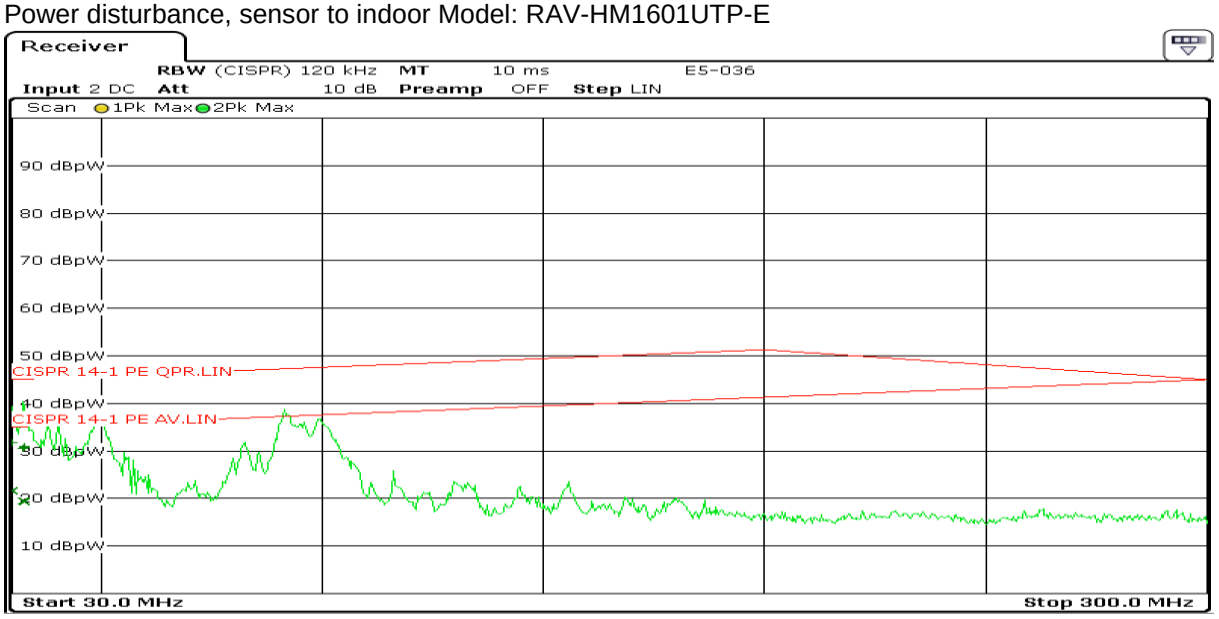
Power disturbance, sensor to remote wire Model: RAV-HM1101KRTP-E



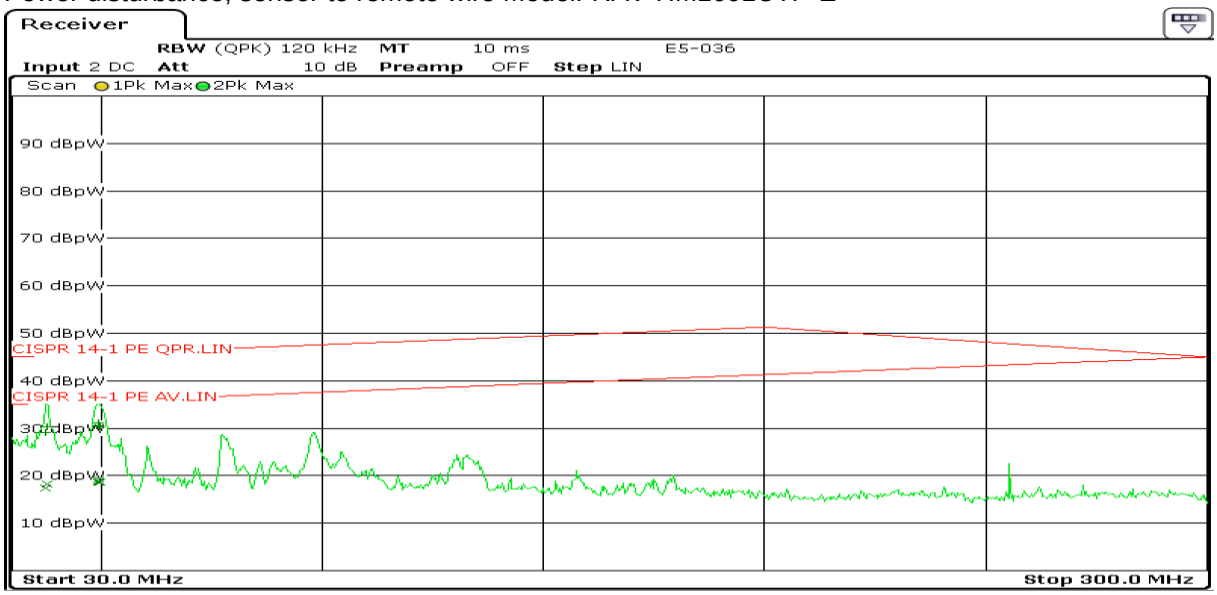
Power disturbance, sensor to mains Model: RAV-HM1601UTP-E



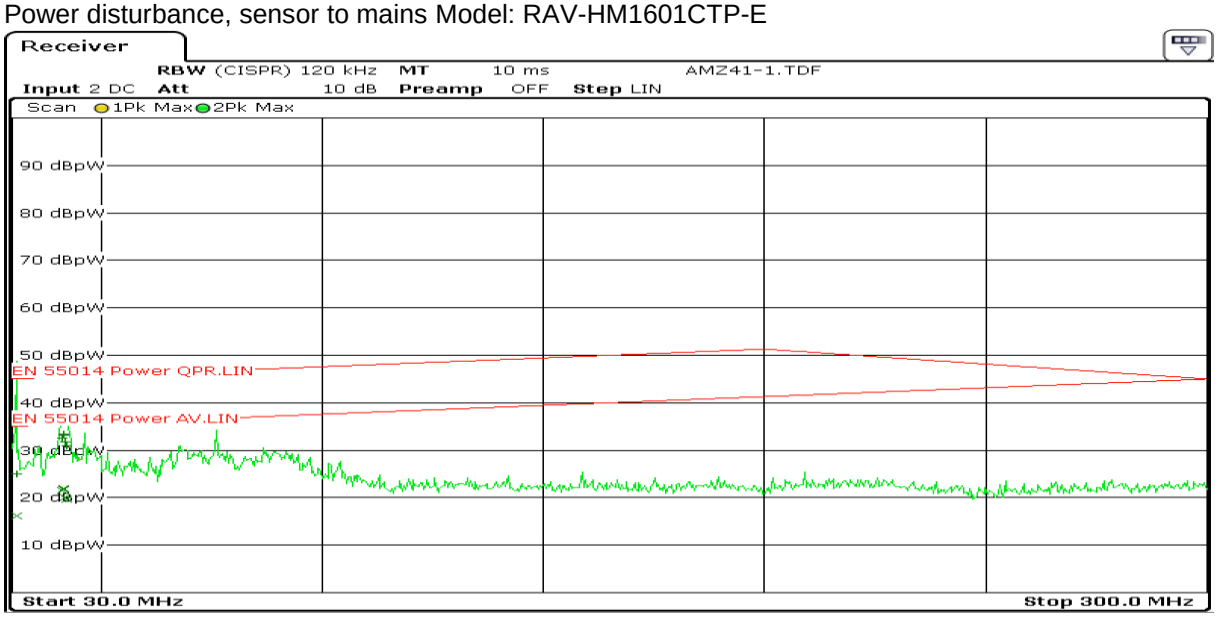
Power disturbance, sensor to indoor Model: RAV-HM1601UTP-E



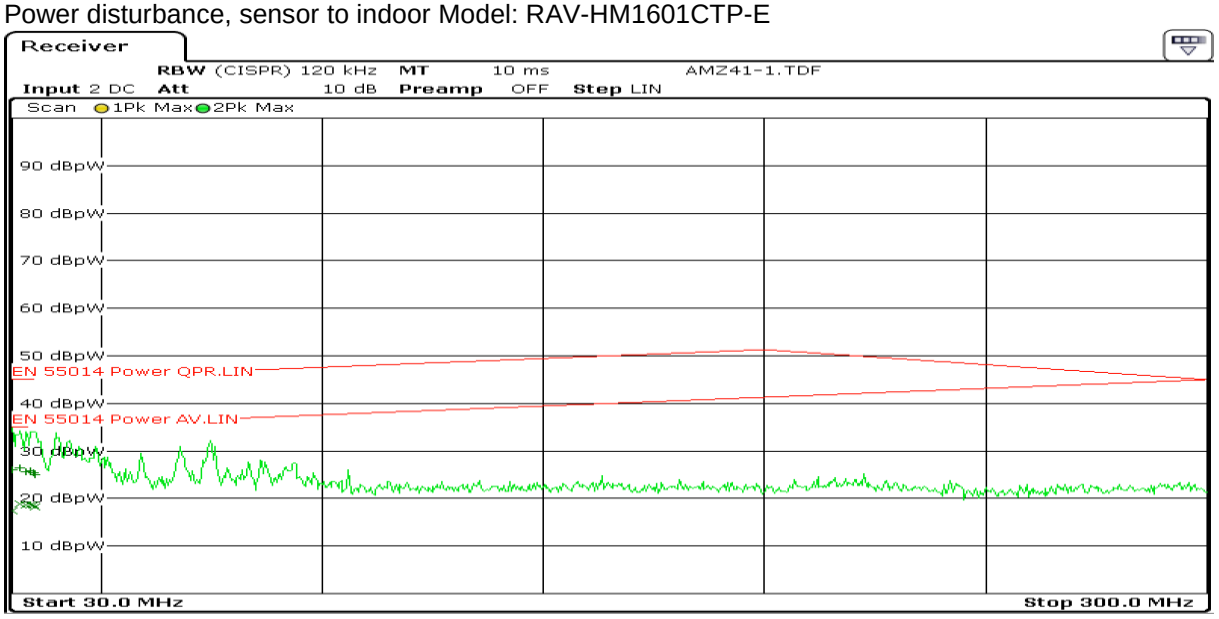
Power disturbance, sensor to remote wire Model: RAV-HM1601UTP-E



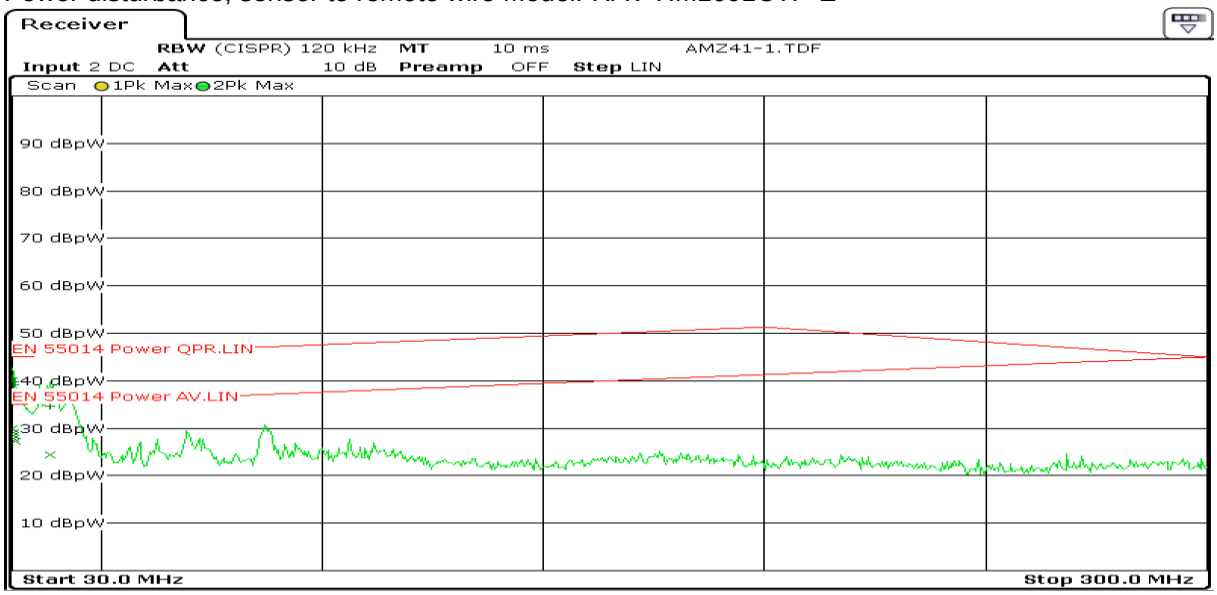
Power disturbance, sensor to mains Model: RAV-HM1601CTP-E



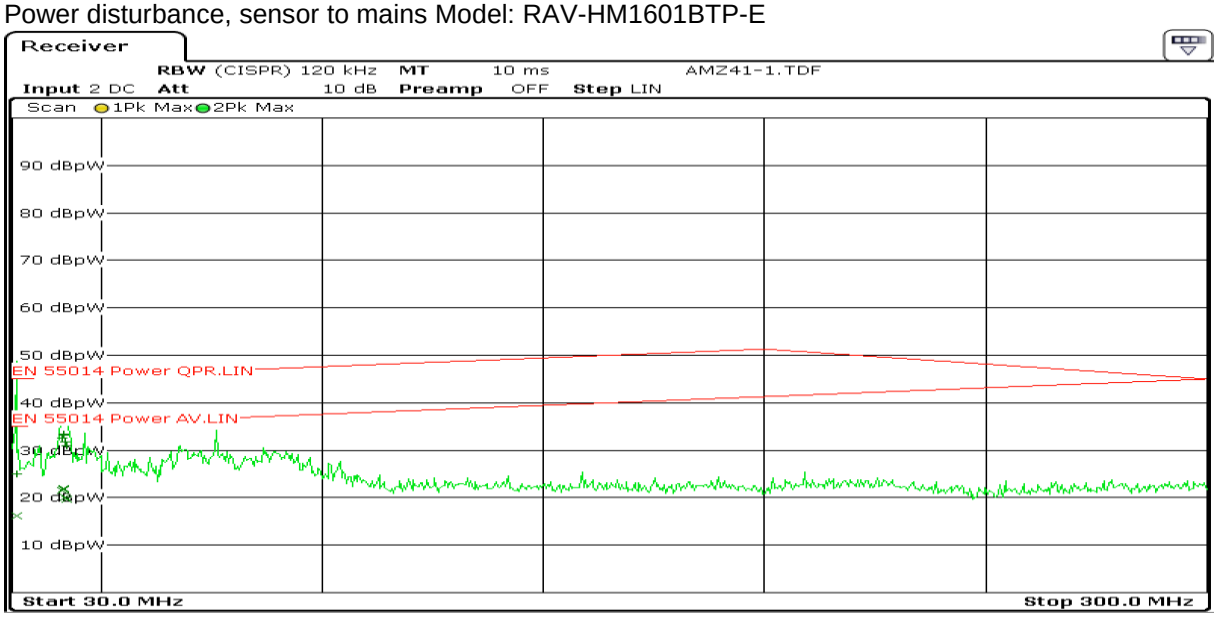
Power disturbance, sensor to indoor Model: RAV-HM1601CTP-E



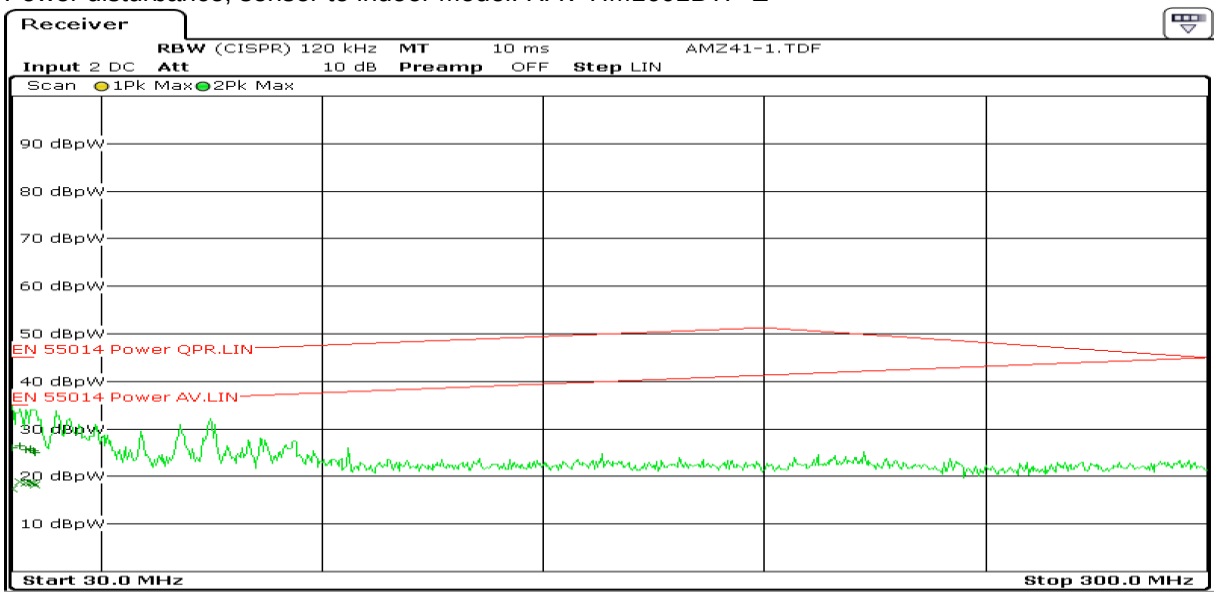
Power disturbance, sensor to remote wire Model: RAV-HM1601CTP-E



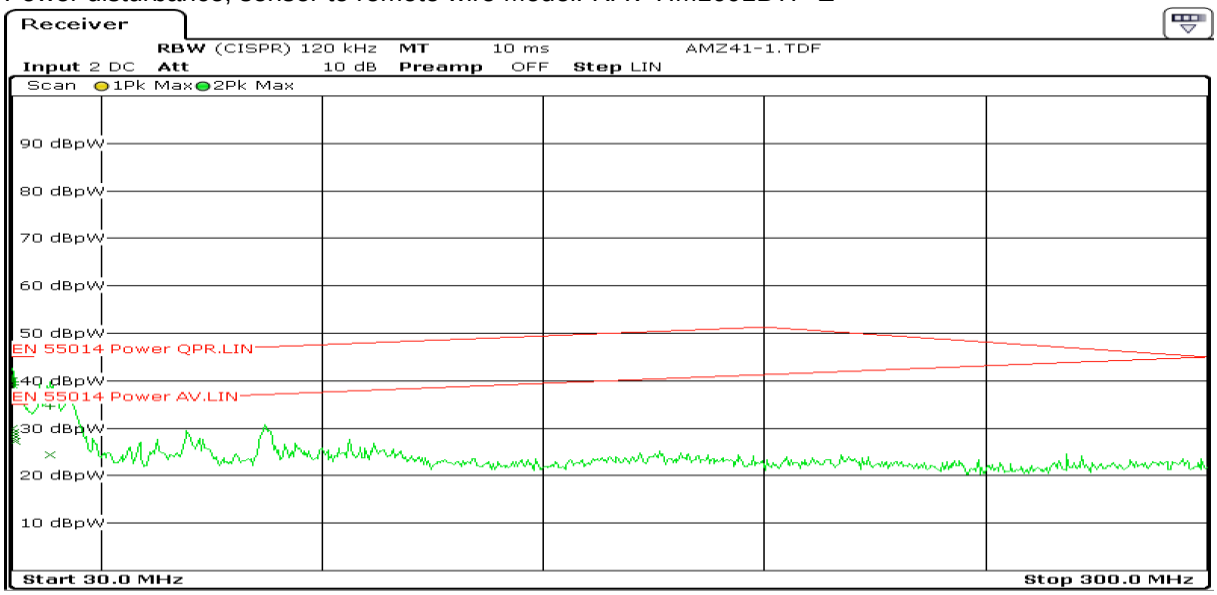
Power disturbance, sensor to mains Model: RAV-HM1601BTP-E



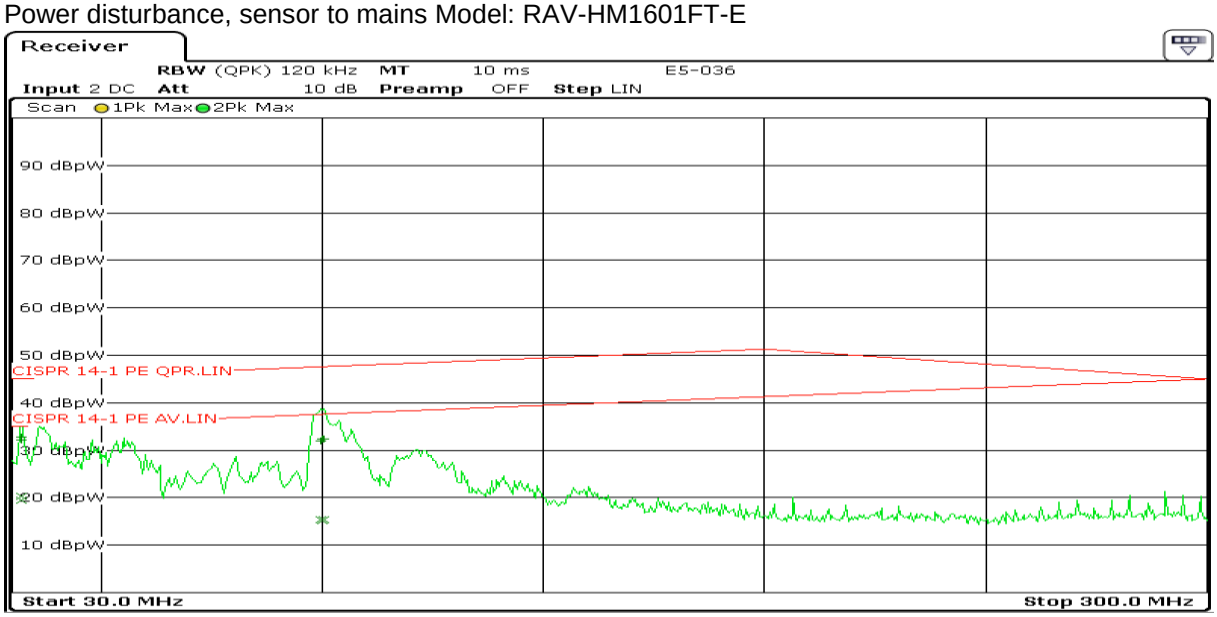
Power disturbance, sensor to indoor Model: RAV-HM1601BTP-E



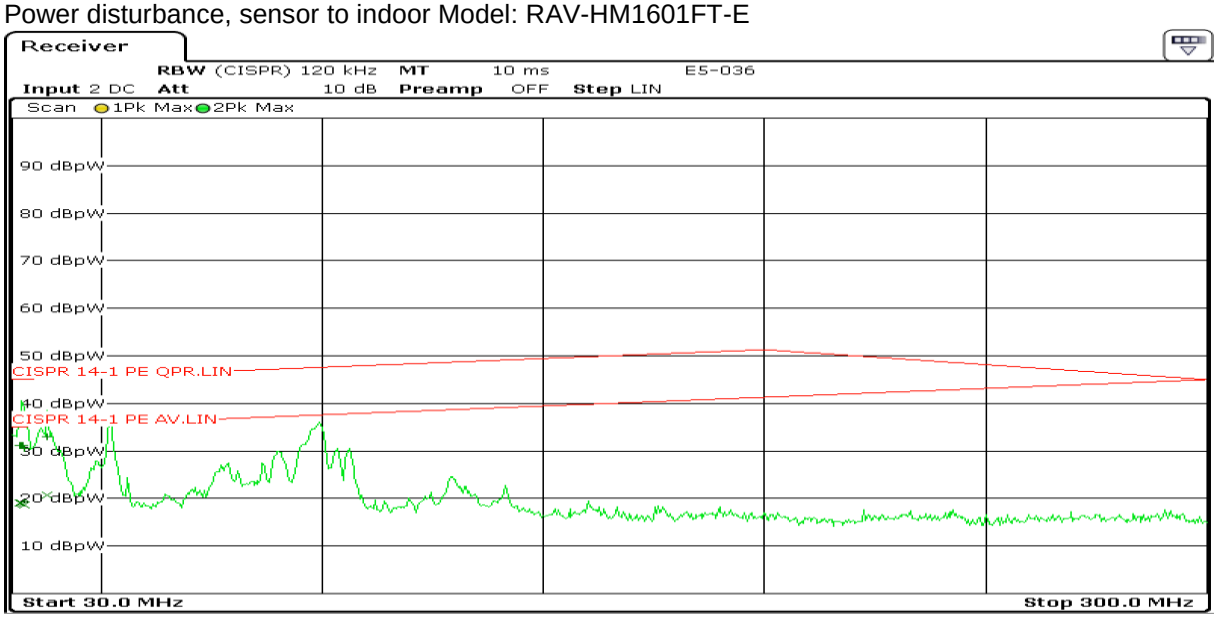
Power disturbance, sensor to remote wire Model: RAV-HM1601BTP-E



Power disturbance, sensor to mains Model: RAV-HM1601FT-E



Power disturbance, sensor to indoor Model: RAV-HM1601FT-E



6. Radiated disturbance

6.1 Test method

- The radiated disturbance measurements were performed with EMI receiver to measure the emissions characteristic and to identify the frequency of emission that has the highest amplitude related to the EUT configuration. EUT configuration, cable configuration of operation are determined for product the maximum level of emission.
- The antenna (30 MHz - 1000 MHz) was used for received the noise of EUT and put on the antenna mast. The testing method and EUT setup were performed according to EN 55014-1.

6.1.1 Test set up

Test set-up description:	☐	Equipment on a table of 80 cm height
	☐	Wall/Ceiling mounted equipment
	☐	Equipment on the floor (insulated from ground plane)
	☐	Other:

6.1.2 Limit

Table 4: Radiated disturbance limits in the frequency range 30 – 1000MHz

Test method	Frequency range (MHz)	Limit [a] Quasi-peak (dB(µV/m))	Measurement distance (m)
OATS or SAC [b]	30 -230 230 - 1000	30 37	10 m
FAR [c]	30 -230 230 - 1000	42 to 35 [d] 42	3 m
FAR [c]	30 -230 230 - 1000	42 to 35 [d] 42	3 m

Note:	a. The lower limit is applies at the transition frequency.
	b. Measurements may be made at closer distance, down to 3 m. An inverse proportionality factor of 20 dB per decade shall be used to normalize the measured data to the specified distance for determining the limit in this case the recommendations of the CISPR basic standards shall be considered when testing large EUT at frequency approaching 30 MHz, due to near field effects.
	c. All equipment shall be measured within the test volume as described in 5.3.4.3 and shown in Figures 12 to 19.
	d. Decreasing linearly with the logarithm of the frequency.

6.2 Test result

6.2.1 Test environment

Ambient Temperature (15 - 35 °C):	--	°C
Relative Humidity (30 - 60 %):	--	%
Air pressure (800 - 1060 mbar):	--	mbar

6.2.2 Test method applied

Test method applied:	☐	OATS or SAC with measurement distance [m]: 10
	☐	FAR CISPR 16-2-3 with measurement distance [m]: 3
	☐	FAR IEC 61000-4-22 with measurement distance [m]: 3

6.2.3 Scanning trace and final measurement

Operating modes:	--
Test port:	Enclosure

Freq List (MHz)	QP Level (dB(µV/m))	QP Limit (dB(µV/m))	QP Margin (dB)	Path
--	--	--	--	--

Note: 1. The test result shown are 6 worst measurement result and sort by quasi-peak margin.

6.2.4 Graphical representation of radiated emissions data

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7. Discontinuous disturbance

7.1 Test method

- ❑ EUT is configured by follow the particular requirement in the reference standards, if available. If the particular requirements are not specified, EUT shall be configured with appropriate load to maximize the disturbance signal.
- ❑ The observation time is based on the EUT (ensure that cycle of operation shall be fully complete) or 120 minutes.
- ❑ Discontinuous disturbance (click) is measured by Discontinuous disturbance analyzer with the limit specified in 7.1.2 for the defined observation time.
- ❑ Test and conclusion of test result shall be referred to the flow chart in EN 55014-1.

7.1.1 Test set up

Test set-up description:	☒	Table-top equipment set-up (40 cm distance to vertical ground plane, 80 cm over ground plane) (Indoor unit)
	☒	Wall/Ceiling mounted equipment (Indoor unit)
	☒	Floor standing equipment set-up (10 cm over ground plane) (Indoor unit)
	☐	Artificial hand applied
	☐	Other:

7.1.2 Limit

Table 5: Allowable limits for discontinuous noise terminal voltage

Frequency range (MHz)	0.15	0.5	1.4	30
Limit (dB(μV))	66	56	56	60

7.2 Test result

7.2.1 Test environment

Ambient Temperature (15 - 35 °C):	26	°C
Relative Humidity (30 - 60 %):	48	%
Air pressure (800 - 1060 mbar):	1008	mbar

7.2.2 Test method applied

Test method applied:	☐	Click rate determined on base of switching operations
	☒	Click rate determined on base of clicks measurements
	☐	Other:

7.2.3 Test result

Model:	RAV-HM561SDTY-E					
Operating modes:	1					
Test port:	Mains (Line-PE)					
Frequency (MHz)	First measurement: Determine the limit L_q – Quasi-peak					
	Limit L (dB(µV))	Number of clicks – N1	Time of measurement T (min)	Click rate N	Increasing ratio (dB)	Limit L_q (dB(µV))
0.15	66	--	120	0.00	--	--
0.5	56	--	120	0.00	--	--
1.4	56	--	120	0.00	--	--
30	60	--	120	0.00	--	--

Frequency (MHz)	Second measurement with Limit = L_q (Upper quartile method)			
	Limit L_q (dB(µV))	Number of clicks – N2	Number of authorized clicks N2 ≤N1/4	Verdict
0.15	--	--	--	P
0.5	--	--	--	P
1.4	--	--	--	P
30	--	--	--	P

Supplementary information:
N not more than 5 and no long click.

Model:	RAV-HM1101KRTP-E
Operating modes:	1
Test port:	Mains (Line-PE)

Frequency (MHz)	First measurement: Determine the limit L_q – Quasi-peak					
	Limit L (dB(µV))	Number of clicks – N1	Time of measurement T (min)	Click rate N	Increasing ratio (dB)	Limit L_q (dB(µV))
0.15	66	--	120	0.00	--	--
0.5	56	--	120	0.00	--	--
1.4	56	--	120	0.00	--	--
30	60	--	120	0.00	--	--

Frequency (MHz)	Second measurement with Limit = L_q (Upper quartile method)			
	Limit L_q (dB(µV))	Number of clicks – N2	Number of authorized clicks N2 ≤N1/4	Verdict
0.15	--	--	--	P
0.5	--	--	--	P
1.4	--	--	--	P
30	--	--	--	P

Supplementary information:
N not more than 5 and no long click.

Model:	RAV-HM1601UTP-E					
Operating modes:	1					
Test port:	Mains (Line-PE)					
Frequency (MHz)	First measurement: Determine the limit L_q – Quasi-peak					
	Limit *L* (dB(µV))	Number of clicks – N1	Time of measurement *T* (min)	Click rate *N*	Increasing ratio (dB)	Limit L_q (dB(µV))
0.15	66	--	120	0.00	--	--
0.5	56	--	120	0.00	--	--
1.4	56	--	120	0.00	--	--
30	60	--	120	0.00	--	--

Frequency (MHz)	Second measurement with Limit = L_q (Upper quartile method)			
	Limit L_q (dB(µV))	Number of clicks – N2	Number of authorized clicks N2 ≤N1/4	Verdict
0.15	--	--	--	P
0.5	--	--	--	P
1.4	--	--	--	P
30	--	--	--	P

Supplementary information:
N not more than 5 and no long click.

Model:	RAV-HM1601CTP-E
Operating modes:	1
Test port:	Mains (Line-PE)

Frequency (MHz)	First measurement: Determine the limit L_q – Quasi-peak					
	Limit *L* (dB(µV))	Number of clicks – N1	Time of measurement *T* (min)	Click rate *N*	Increasing ratio (dB)	Limit L_q (dB(µV))
0.15	66	--	120	0.00	--	--
0.5	56	--	120	0.00	--	--
1.4	56	--	120	0.00	--	--
30	60	--	120	0.00	--	--

Frequency (MHz)	Second measurement with Limit = L_q (Upper quartile method)			
	Limit L_q (dB(µV))	Number of clicks – N2	Number of authorized clicks N2 ≤N1/4	Verdict
0.15	--	--	--	P
0.5	--	--	--	P
1.4	--	--	--	P
30	--	--	--	P

Supplementary information:
N not more than 5 and no long click.

Model:	RAV-HM1601BTP-E					
Operating modes:	1					
Test port:	Mains (Line-PE)					
Frequency (MHz)	First measurement: Determine the limit L_q – Quasi-peak					
	Limit *L* (dB(µV))	Number of clicks – N1	Time of measurement *T* (min)	Click rate *N*	Increasing ratio (dB)	Limit L_q (dB(µV))
0.15	66	--	120	0.00	--	--
0.5	56	--	120	0.00	--	--
1.4	56	--	120	0.00	--	--
30	60	--	120	0.00	--	--

Frequency (MHz)	Second measurement with Limit = L_q (Upper quartile method)			
	Limit L_q (dB(µV))	Number of clicks – N2	Number of authorized clicks N2 ≤N1/4	Verdict
0.15	--	--	--	P
0.5	--	--	--	P
1.4	--	--	--	P
30	--	--	--	P

Supplementary information:
N not more than 5 and no long click.

Model:	RAV-HM1601FT-E
Operating modes:	1
Test port:	Mains (Line-PE)

Frequency (MHz)	First measurement: Determine the limit L_q – Quasi-peak					
	Limit *L* (dB(µV))	Number of clicks – N1	Time of measurement *T* (min)	Click rate *N*	Increasing ratio (dB)	Limit L_q (dB(µV))
0.15	66	--	120	0.00	--	--
0.5	56	--	120	0.00	--	--
1.4	56	--	120	0.00	--	--
30	60	--	120	0.00	--	--

Frequency (MHz)	Second measurement with Limit = L_q (Upper quartile method)			
	Limit L_q (dB(µV))	Number of clicks – N2	Number of authorized clicks N2 ≤N1/4	Verdict
0.15	--	--	--	P
0.5	--	--	--	P
1.4	--	--	--	P
30	--	--	--	P

Supplementary information:
N not more than 5 and no long click.

8. Harmonics current emission

8.1 Test method

8.1.1 Test set up

Test set-up description:	☒	Table-top equipment set-up (Indoor unit)
	☒	Floor standing equipment set-up (Indoor unit and dummy outdoor unit)
	☒	Wall or ceiling mounted equipment (Indoor unit)
	☐	Other:
Operating modes of EUT:	EUT operated at lowest temperature setting, maximum fan speed. The ambient temperature for testing shall be 30 °C ± 2 °C in the cooling mode. Measured after the operation becomes steady state.	

8.1.2 Limit according classification of EUT current ≤ 16 A

Class	EUT classified	
A	Equipment not specified as belonging to Class B, C or D shall be considered as Class A equipment.	
	☐	balanced three-phase equipment
	☒	household appliances, excluding equipment identified as Class D
	☐	tools, excluding portable tools
	☐	dimmers for incandescent lamps
	☐	audio equipment
B	☐	portable tools
	☐	arc welding equipment which is not professional equipment
C	☐	lighting equipment
D	Equipment having a specified power according to 6.2.2, less than or equal to 600 W, of the following types:	
	☐	personal computers and personal computer monitors
	☐	television receivers
	☐	refrigerators and freezers having one or more variable-speed drives to control compressor motor(s)

8.1.3 Limit according classification of EUT current > 16 A

Table	Current emission limits	
2	Equipment other than balanced three-phase equipment Minimum R_{sce} =	
	☐	33
	☒	66 for model: RAV-HM1101KRTP-E, RAV-HM1401UTP-E, RAV-HM1601UTP-E, RAV-HM1601CTP-E and RAV-HM1601FT-E
	☒	120 for model: RAV-HM1601BTP-E
	☐	250
	☐	≥350
3	Balanced three-phase equipment Minimum R_{sce} =	
	☐	33
	☐	66
	☐	120
	☐	250
	☐	≥350
4	Balanced three-phase equipment under specified conditions (a, b, c) Minimum R_{sce} =	
	☐	33
	☐	≥120
5	Balanced three-phase equipment under specified conditions (d, e, f) Minimum R_{sce} =	
	☐	33
	☐	≥250

8.2 Test result

8.2.1 Test environment

Ambient Temperature (15 - 35 °C):	28	°C
Relative Humidity (30 - 60 %):	48	%

8.2.2 Limit classification applied for EUT current ≤ 16 A

Limit classification applied:	☒	Class A
	☐	Class B
	☐	Class C with power > 25 W, 7.3a
	☐	Class C with power ≤ 25 W, 7.3b
	☐	Class D

8.2.3 Limit classification applied for EUT current > 16 A

Current emission limits applied:	Table 2; Minimum R_{sce} =	☐	33
		☒	66
		☒	120
		☐	250
		☐	≥350
	Table 3; Minimum R_{sce} =	☐	33
		☐	66
		☐	120
		☐	250
		☐	≥350
	Table 4; Minimum R_{sce} =	☐	33
		☐	≥120
	Table 5; Minimum R_{sce} =	☐	33
		☐	≥250

8.2.3 Test result

Test Verdict:	☒ Pass	☐ Fail
AC mains voltage during test (V):	230	

Model:		RAV-GM562ATP-E					
Phase:		L		Measured I_{ref} (A):		2.379	
THC(A):		1.390		POHC(A):		0.042	
I-THD(%):		74.0		POHC Limit (A):		0.251	
Harm#	Harm(arg)	100%Limit	%of Limit	Harm(max)	150%Limit	%of Limit	Status
2	0.005	1.080	N/A	0.006	1.620	N/A	P
3	1.283	2.300	55.8	1.291	3.450	37.4	P
4	0.003	0.430	N/A	0.003	0.645	N/A	P
5	0.493	1.140	43.3	0.494	1.710	28.9	P
6	0.002	0.300	N/A	0.002	0.450	N/A	P
7	0.104	0.770	13.6	0.105	1.155	9.1	P
8	0.001	0.230	N/A	0.001	0.345	N/A	P
9	0.122	0.400	30.5	0.123	0.600	20.4	P
10	0.001	0.184	N/A	0.001	0.276	N/A	P
11	0.079	0.330	23.9	0.079	0.495	16.0	P
12	0.001	0.153	N/A	0.001	0.230	N/A	P
13	0.067	0.210	31.7	0.067	0.315	21.2	P
14	0.001	0.131	N/A	0.001	0.197	N/A	P
15	0.039	0.150	26.2	0.039	0.225	17.5	P
16	0.001	0.115	N/A	0.001	0.173	N/A	P
17	0.027	0.132	20.6	0.027	0.198	13.8	P
18	0.000	0.102	N/A	0.000	0.153	N/A	P
19	0.017	0.118	14.7	0.018	0.178	9.9	P
20	0.000	0.092	N/A	0.001	0.138	N/A	P
21	0.021	0.107	19.8	0.021	0.161	13.4	P
22	0.000	0.084	N/A	0.001	0.125	N/A	P
23	0.019	0.098	19.3	0.019	0.147	13.0	P
24	0.001	0.077	N/A	0.001	0.115	N/A	P
25	0.020	0.090	21.7	0.020	0.135	14.6	P
26	0.001	0.071	N/A	0.001	0.107	N/A	P
27	0.013	0.083	N/A	0.014	0.125	N/A	P
28	0.001	0.066	N/A	0.002	0.099	N/A	P
29	0.010	0.078	N/A	0.010	0.116	N/A	P
30	0.001	0.061	N/A	0.001	0.092	N/A	P
31	0.006	0.073	N/A	0.006	0.109	N/A	P
32	0.002	0.058	N/A	0.002	0.086	N/A	P
33	0.008	0.068	N/A	0.009	0.102	N/A	P
34	0.001	0.054	N/A	0.001	0.081	N/A	P
35	0.009	0.064	N/A	0.009	0.096	N/A	P
36	0.000	0.051	N/A	0.000	0.077	N/A	P
37	0.010	0.061	N/A	0.010	0.091	N/A	P
38	0.000	0.048	N/A	0.001	0.073	N/A	P
39	0.008	0.058	N/A	0.009	0.087	N/A	P
40	0.000	0.046	N/A	0.001	0.069	N/A	P

Test Verdict:	☒ Pass	☐ Fail
AC mains voltage during test (V):	230	

Model:		RAV-HM1101KRTP-E					
Phase:		L		Measured I_{ref} (A):		13.397	
THC/Iref (%):		19.4		PWHC/Iref (%):		5.1	
Limit (%):		26.0		PWHC Limit (%):		26.0	
Harm#	Harm(arg)	100%Limit	%of Limit	Harm(max)	150%Limit	%of Limit	Status
2	0.047	1.050	4.5	0.059	1.574	3.8	P
3	2.033	3.149	64.6	2.072	4.723	43.9	P
4	0.006	0.525	1.1	0.009	0.787	1.1	P
5	1.181	1.706	69.2	1.194	2.558	46.7	P
6	0.003	0.350	N/A	0.004	0.525	N/A	P
7	0.880	1.050	83.9	0.891	1.574	56.6	P
8	0.003	0.262	N/A	0.004	0.394	N/A	P
9	0.214	0.656	32.6	0.226	0.984	23.0	P
10	0.003	0.210	N/A	0.005	0.315	N/A	P
11	0.103	0.525	19.5	0.121	0.787	15.3	P
12	0.002	0.175	N/A	0.003	0.262	N/A	P
13	0.208	0.394	52.8	0.217	0.590	36.7	P
14	0.002	N/A	N/A	0.003	N/A	N/A	N/A
15	0.100	N/A	N/A	0.110	N/A	N/A	N/A
16	0.001	N/A	N/A	0.002	N/A	N/A	N/A
17	0.161	N/A	N/A	0.165	N/A	N/A	N/A
18	0.002	N/A	N/A	0.002	N/A	N/A	N/A
19	0.048	N/A	N/A	0.057	N/A	N/A	N/A
20	0.001	N/A	N/A	0.002	N/A	N/A	N/A
21	0.046	N/A	N/A	0.054	N/A	N/A	N/A
22	0.001	N/A	N/A	0.002	N/A	N/A	N/A
23	0.054	N/A	N/A	0.055	N/A	N/A	N/A
24	0.001	N/A	N/A	0.002	N/A	N/A	N/A
25	0.048	N/A	N/A	0.050	N/A	N/A	N/A
26	0.001	N/A	N/A	0.002	N/A	N/A	N/A
27	0.015	N/A	N/A	0.020	N/A	N/A	N/A
28	0.002	N/A	N/A	0.002	N/A	N/A	N/A
29	0.042	N/A	N/A	0.049	N/A	N/A	N/A
30	0.001	N/A	N/A	0.002	N/A	N/A	N/A
31	0.060	N/A	N/A	0.062	N/A	N/A	N/A
32	0.001	N/A	N/A	0.002	N/A	N/A	N/A
33	0.010	N/A	N/A	0.012	N/A	N/A	N/A
34	0.002	N/A	N/A	0.003	N/A	N/A	N/A
35	0.006	N/A	N/A	0.011	N/A	N/A	N/A
36	0.002	N/A	N/A	0.003	N/A	N/A	N/A
37	0.041	N/A	N/A	0.044	N/A	N/A	N/A
38	0.002	N/A	N/A	0.004	N/A	N/A	N/A
39	0.005	N/A	N/A	0.009	N/A	N/A	N/A
40	0.002	N/A	N/A	0.003	N/A	N/A	N/A
Phase L = 83.9 % of tested Rsce = 66.000				Minimum Rsce required: Rsce = 55.353			

Test Verdict:	☒ Pass	☐ Fail
AC mains voltage during test (V):	230	

Model:	RAV-HM1601UTP-E						
Phase:	L			Measured I_{ref} (A):		20.014	
THC/Iref (%):	23.9			PWHC/Iref (%):		5.0	
Limit (%):	26.0			PWHC Limit (%):		26.0	
Harm#	Harm(arg)	100%Limit	%of Limit	Harm(max)	150%Limit	%of Limit	Status
2	0.129	1.594	8.1	0.169	2.391	7.1	P
3	4.130	4.783	86.4	4.197	7.174	58.5	P
4	0.049	0.797	6.2	0.066	1.196	5.6	P
5	2.021	2.591	78.0	2.034	3.886	52.3	P
6	0.035	0.531	6.5	0.042	0.797	5.3	P
7	0.833	1.594	52.3	0.851	2.391	35.6	P
8	0.022	0.399	5.6	0.029	0.598	4.9	P
9	0.445	0.996	44.6	0.450	1.495	30.1	P
10	0.017	0.319	5.2	0.022	0.478	4.6	P
11	0.526	0.797	66.0	0.552	1.196	46.2	P
12	0.010	0.266	3.8	0.012	0.399	3.1	P
13	0.373	0.598	62.3	0.377	0.897	42.1	P
14	0.005	N/A	N/A	0.007	N/A	N/A	N/A
15	0.043	N/A	N/A	0.049	N/A	N/A	N/A
16	0.003	N/A	N/A	0.005	N/A	N/A	N/A
17	0.241	N/A	N/A	0.245	N/A	N/A	N/A
18	0.004	N/A	N/A	0.006	N/A	N/A	N/A
19	0.150	N/A	N/A	0.156	N/A	N/A	N/A
20	0.003	N/A	N/A	0.007	N/A	N/A	N/A
21	0.076	N/A	N/A	0.088	N/A	N/A	N/A
22	0.004	N/A	N/A	0.005	N/A	N/A	N/A
23	0.030	N/A	N/A	0.038	N/A	N/A	N/A
24	0.003	N/A	N/A	0.005	N/A	N/A	N/A
25	0.151	N/A	N/A	0.154	N/A	N/A	N/A
26	0.003	N/A	N/A	0.004	N/A	N/A	N/A
27	0.084	N/A	N/A	0.090	N/A	N/A	N/A
28	0.003	N/A	N/A	0.004	N/A	N/A	N/A
29	0.079	N/A	N/A	0.092	N/A	N/A	N/A
30	0.003	N/A	N/A	0.004	N/A	N/A	N/A
31	0.083	N/A	N/A	0.090	N/A	N/A	N/A
32	0.003	N/A	N/A	0.005	N/A	N/A	N/A
33	0.122	N/A	N/A	0.126	N/A	N/A	N/A
34	0.003	N/A	N/A	0.004	N/A	N/A	N/A
35	0.120	N/A	N/A	0.128	N/A	N/A	N/A
36	0.003	N/A	N/A	0.005	N/A	N/A	N/A
37	0.073	N/A	N/A	0.081	N/A	N/A	N/A
38	0.003	N/A	N/A	0.004	N/A	N/A	N/A
39	0.084	N/A	N/A	0.089	N/A	N/A	N/A
40	0.003	N/A	N/A	0.005	N/A	N/A	N/A
Phase L = 91.9 % of tested Rsce = 66.000				Minimum Rsce required: Rsce = 60.678			

Test Verdict:	☒ Pass	☐ Fail
AC mains voltage during test (V):	230	

Model:	RAV-HM1601CTP-E						
Phase:	L			Measured I_{ref} (A):		19.797	
THC/Iref (%):	24.0			PWHC/Iref (%):		5.1	
Limit (%):	26.0			PWHC Limit (%):		26.0	
Harm#	Harm(arg)	100%Limit	%of Limit	Harm(max)	150%Limit	%of Limit	Status
2	0.134	1.574	8.5	0.170	2.362	7.2	P
3	4.053	4.723	85.8	4.140	7.085	58.4	P
4	0.051	0.787	6.4	0.065	1.181	5.5	P
5	2.062	2.558	80.6	2.084	3.838	54.3	P
6	0.035	0.525	6.7	0.043	0.787	5.5	P
7	0.808	1.574	51.3	0.823	2.362	34.9	P
8	0.023	0.394	5.9	0.029	0.590	4.9	P
9	0.482	0.984	49.0	0.498	1.476	33.7	P
10	0.017	0.315	5.5	0.022	0.472	4.6	P
11	0.482	0.787	61.2	0.502	1.181	42.6	P
12	0.011	0.262	4.2	0.013	0.394	3.3	P
13	0.371	0.590	62.9	0.381	0.886	43.0	P
14	0.006	N/A	N/A	0.008	N/A	N/A	N/A
15	0.071	N/A	N/A	0.080	N/A	N/A	N/A
16	0.003	N/A	N/A	0.005	N/A	N/A	N/A
17	0.243	N/A	N/A	0.250	N/A	N/A	N/A
18	0.004	N/A	N/A	0.005	N/A	N/A	N/A
19	0.138	N/A	N/A	0.147	N/A	N/A	N/A
20	0.003	N/A	N/A	0.005	N/A	N/A	N/A
21	0.077	N/A	N/A	0.084	N/A	N/A	N/A
22	0.004	N/A	N/A	0.006	N/A	N/A	N/A
23	0.049	N/A	N/A	0.063	N/A	N/A	N/A
24	0.004	N/A	N/A	0.005	N/A	N/A	N/A
25	0.136	N/A	N/A	0.142	N/A	N/A	N/A
26	0.003	N/A	N/A	0.005	N/A	N/A	N/A
27	0.092	N/A	N/A	0.097	N/A	N/A	N/A
28	0.003	N/A	N/A	0.004	N/A	N/A	N/A
29	0.082	N/A	N/A	0.090	N/A	N/A	N/A
30	0.003	N/A	N/A	0.004	N/A	N/A	N/A
31	0.085	N/A	N/A	0.098	N/A	N/A	N/A
32	0.003	N/A	N/A	0.005	N/A	N/A	N/A
33	0.115	N/A	N/A	0.119	N/A	N/A	N/A
34	0.003	N/A	N/A	0.004	N/A	N/A	N/A
35	0.129	N/A	N/A	0.135	N/A	N/A	N/A
36	0.003	N/A	N/A	0.005	N/A	N/A	N/A
37	0.077	N/A	N/A	0.081	N/A	N/A	N/A
38	0.003	N/A	N/A	0.005	N/A	N/A	N/A
39	0.079	N/A	N/A	0.088	N/A	N/A	N/A
40	0.003	N/A	N/A	0.005	N/A	N/A	N/A
Phase L = 92.1 % of tested Rsce = 66.000				Minimum Rsce required: Rsce = 60.812			

Test Verdict:	☒ Pass	☐ Fail
AC mains voltage during test (V):	230	

Model:	RAV-HM1601BTP-E						
Phase:	L			Measured I_{ref} (A):		21.640	
THC/Iref (%):	25.5			PWHC/Iref (%):		4.3	
Limit (%):	23.0			PWHC Limit (%):		30.0	
Harm#	Harm(arg)	100%Limit	%of Limit	Harm(max)	150%Limit	%of Limit	Status
2	0.145	1.686	8.6	0.194	2.529	7.7	P
3	4.544	5.691	79.8	4.749	8.536	55.6	P
4	0.056	0.843	6.6	0.081	1.265	6.4	P
5	2.705	3.162	85.6	2.785	4.742	58.7	P
6	0.036	0.562	6.4	0.048	0.843	5.7	P
7	0.467	2.108	22.1	0.578	3.162	18.3	P
8	0.024	0.422	5.8	0.034	0.632	5.3	P
9	0.643	1.265	50.8	0.684	1.897	36.0	P
10	0.017	0.337	5.1	0.023	0.506	4.6	P
11	0.245	1.054	23.3	0.271	1.581	17.2	P
12	0.009	0.281	3.2	0.011	0.422	2.6	P
13	0.213	0.843	25.2	0.220	1.265	17.4	P
14	0.004	N/A	N/A	0.007	N/A	N/A	N/A
15	0.116	N/A	N/A	0.123	N/A	N/A	N/A
16	0.003	N/A	N/A	0.005	N/A	N/A	N/A
17	0.216	N/A	N/A	0.221	N/A	N/A	N/A
18	0.004	N/A	N/A	0.006	N/A	N/A	N/A
19	0.159	N/A	N/A	0.176	N/A	N/A	N/A
20	0.003	N/A	N/A	0.005	N/A	N/A	N/A
21	0.048	N/A	N/A	0.052	N/A	N/A	N/A
22	0.003	N/A	N/A	0.004	N/A	N/A	N/A
23	0.102	N/A	N/A	0.109	N/A	N/A	N/A
24	0.003	N/A	N/A	0.005	N/A	N/A	N/A
25	0.134	N/A	N/A	0.136	N/A	N/A	N/A
26	0.004	N/A	N/A	0.006	N/A	N/A	N/A
27	0.083	N/A	N/A	0.098	N/A	N/A	N/A
28	0.003	N/A	N/A	0.004	N/A	N/A	N/A
29	0.054	N/A	N/A	0.060	N/A	N/A	N/A
30	0.003	N/A	N/A	0.004	N/A	N/A	N/A
31	0.099	N/A	N/A	0.106	N/A	N/A	N/A
32	0.003	N/A	N/A	0.004	N/A	N/A	N/A
33	0.130	N/A	N/A	0.133	N/A	N/A	N/A
34	0.003	N/A	N/A	0.005	N/A	N/A	N/A
35	0.100	N/A	N/A	0.117	N/A	N/A	N/A
36	0.003	N/A	N/A	0.004	N/A	N/A	N/A
37	0.083	N/A	N/A	0.090	N/A	N/A	N/A
38	0.003	N/A	N/A	0.004	N/A	N/A	N/A
39	0.098	N/A	N/A	0.102	N/A	N/A	N/A
40	0.003	N/A	N/A	0.004	N/A	N/A	N/A
Phase L = 85.6 % of tested Rsce = 120.000				Minimum Rsce required: Rsce = 102.680			

Test Verdict:	☒ Pass	☐ Fail
AC mains voltage during test (V):	230	

Model:		RAV-HM1601FT-E					
Phase:		L		Measured I_{ref} (A):		20.702	
THC/Iref (%):		24.5		PWHC/Iref (%):		4.3	
Limit (%):		26.0		PWHC Limit (%):		26.0	
Harm#	Harm(arg)	100%Limit	%of Limit	Harm(max)	150%Limit	%of Limit	Status
2	0.131	1.646	8.0	0.171	2.468	6.9	P
3	4.275	4.937	86.6	4.368	7.405	59.0	P
4	0.044	0.823	5.3	0.060	1.234	4.9	P
5	2.520	2.674	94.2	2.542	4.011	63.4	P
6	0.030	0.549	5.5	0.035	0.823	4.3	P
7	0.412	1.646	25.0	0.425	2.468	17.2	P
8	0.021	0.411	5.1	0.028	0.617	4.5	P
9	0.707	1.028	68.7	0.722	1.543	46.8	P
10	0.017	0.329	5.1	0.022	0.494	4.4	P
11	0.315	0.823	38.3	0.334	1.234	27.0	P
12	0.010	0.274	3.5	0.012	0.411	2.9	P
13	0.259	0.617	42.0	0.263	0.926	28.5	P
14	0.005	N/A	N/A	0.008	N/A	N/A	N/A
15	0.155	N/A	N/A	0.159	N/A	N/A	N/A
16	0.003	N/A	N/A	0.007	N/A	N/A	N/A
17	0.212	N/A	N/A	0.215	N/A	N/A	N/A
18	0.003	N/A	N/A	0.006	N/A	N/A	N/A
19	0.132	N/A	N/A	0.140	N/A	N/A	N/A
20	0.003	N/A	N/A	0.005	N/A	N/A	N/A
21	0.022	N/A	N/A	0.024	N/A	N/A	N/A
22	0.003	N/A	N/A	0.005	N/A	N/A	N/A
23	0.075	N/A	N/A	0.082	N/A	N/A	N/A
24	0.003	N/A	N/A	0.005	N/A	N/A	N/A
25	0.133	N/A	N/A	0.135	N/A	N/A	N/A
26	0.003	N/A	N/A	0.005	N/A	N/A	N/A
27	0.100	N/A	N/A	0.107	N/A	N/A	N/A
28	0.003	N/A	N/A	0.004	N/A	N/A	N/A
29	0.039	N/A	N/A	0.044	N/A	N/A	N/A
30	0.003	N/A	N/A	0.005	N/A	N/A	N/A
31	0.106	N/A	N/A	0.112	N/A	N/A	N/A
32	0.003	N/A	N/A	0.007	N/A	N/A	N/A
33	0.131	N/A	N/A	0.133	N/A	N/A	N/A
34	0.003	N/A	N/A	0.005	N/A	N/A	N/A
35	0.099	N/A	N/A	0.106	N/A	N/A	N/A
36	0.003	N/A	N/A	0.005	N/A	N/A	N/A
37	0.084	N/A	N/A	0.089	N/A	N/A	N/A
38	0.003	N/A	N/A	0.005	N/A	N/A	N/A
39	0.093	N/A	N/A	0.096	N/A	N/A	N/A
40	0.003	N/A	N/A	0.005	N/A	N/A	N/A
Phase L = 94.3 % of tested Rsce = 66.000				Minimum Rsce required: Rsce = 62.242			

9. Voltage fluctuation and flicker

9.1 Test method

9.1.1 Test set up

Test set-up description:	☒	Table-top equipment set-up (Indoor unit)
	☒	Floor standing equipment set-up (Indoor unit)
	☒	Wall or ceiling mounted equipment (Indoor unit and dummy outdoor unit)
	☐	Other:
Operating modes of EUT:	Operate the equipment until a steady-state condition has been established or for a minimum compressor run time of 30 min. The ambient temperature for testing shall be 30 °C ± 5 °C for cooling.	

9.1.2 Limit for EUT current ≤ 16 A

Observation time selected:	☐	10 Minutes
	☒	120 Minutes
	☐	24 times switching according to Annex B
	☐	Other:
Limit for dmax applied:	☒	4 % for all model
	☐	6 %
	☐	7 %
AC mains voltage during test:	230	
In case the EN 61000-3-11 has been applied:	☐	Yes
	☒	No

9.1.3 Limit for EUT current > 16 A

Observation time selected:	☐	10 Minutes
	☒	120 Minutes
	☐	24 times switching according to Annex B
	☐	Other:
Limit for dmax applied:	☐	4 %
	☒	6 % for all model
	☐	7 %
AC mains voltage during test (V):	230	
Means of IEC 61000-3-11 compliances:	☒	Declaration of maximum permissible system impedance Zmax (clause 4, a) of IEC 61000-3-11, Measurement and evaluation according to subclause 6.3)
	☐	Declaration of minimum service current being equal to or greater than 100 A (clause 4, b) of IEC 61000-3-11)

9.2 Test result

9.2.1 Test environment

Ambient Temperature (15 - 35 °C):	28	°C
Relative Humidity (30 - 60 %):	48	%

9.2.2 Test result

Model:	RAV-HM561SDTY-E		
Measurement Description	Measurement Result	Limit	Verdict
T-max (ms)	0.00	5.00	P
Highest dc (%)	0.00	3.30	P
Highest dmax (%)	0.00	4.00	P
Highest Pst (10 min. period)	0.064	1.000	P
Highest Plt (2 hr. period)	0.064	0.650	P
Test Verdict:	☒ Pass		
	☐ Fail		
	☐ IEC 61000-3-11 has been applied.		
Note:	--		

In case the EN 61000-3-11 has been applied:		
System impedance	Calculated	Impedance [Ohm]
Zsys1 (dmax)	--	--
Zsys2 (dc)	--	--
Zsys3 (Pst)	--	--
Zsys4 (Plt)	--	--
Minimum Zsys calculated is maximum permissible system impedance, Zmax:		--

Model:	RAV-HM1101KRTP-E	
Measurement Description	Measurement Result	
T-max (ms)	0.00	
Highest dc (%)	0.00	
Highest dmax (%)	-0.31	
Highest Pst (10 min. period)	0.097	
Highest Plt (2 hr. period)	0.073	
Evaluation results and Lowest system impedance calculation according to 6.3.2:		
System impedance	Calculated	
Zsys1 (dmax)	0.418	
Zsys2 (dc)	0.000	
Zsys3 (Pst)	0.130	
Zsys4 (Plt)	0.098	
Minimum Zsys calculated is maximum permissible system impedance, Zmax:		6.848 Ohm + j 4.280 Ohm (6.848 Ohm + 13624 µH)

Model:	RAV-HM1601UTP-E	
Measurement Description	Measurement Result	
T-max (ms)	0.00	
Highest dc (%)	-0.27	
Highest dmax (%)	-0.37	
Highest Pst (10 min. period)	0.073	
Highest Plt (2 hr. period)	0.068	
Evaluation results and Lowest system impedance calculation according to 6.3.2:		
System impedance	Calculated	
Zsys1 (dmax)	0.500	
Zsys2 (dc)	-0.358	
Zsys3 (Pst)	0.098	
Zsys4 (Plt)	0.091	
Minimum Zsys calculated is maximum permissible system impedance, Zmax:		7.634 Ohm + j 4.771 Ohm (7.634 Ohm + 15188 µH)

Model:	RAV-HM1601CTP-E	
Measurement Description	Measurement Result	
T-max (ms)	0.00	
Highest dc (%)	-0.31	
Highest dmax (%)	-0.36	
Highest Pst (10 min. period)	0.078	
Highest Plt (2 hr. period)	0.069	
Evaluation results and Lowest system impedance calculation according to 6.3.2:		
System impedance	Calculated	
Zsys1 (dmax)	0.485	
Zsys2 (dc)	-0.412	
Zsys3 (Pst)	0.105	
Zsys4 (Plt)	0.092	
Minimum Zsys calculated is maximum permissible system impedance, Zmax:		7.552 Ohm + j 4.720 Ohm (7.552 Ohm + 15024 µH)

Model:	RAV-HM1601BTP-E	
Measurement Description	Measurement Result	
T-max (ms)	0.00	
Highest dc (%)	0.00	
Highest dmax (%)	-0.24	
Highest Pst (10 min. period)	0.073	
Highest Plt (2 hr. period)	0.066	
Evaluation results and Lowest system impedance calculation according to 6.3.2:		
System impedance	Calculated	
Zsys1 (dmax)	0.320	
Zsys2 (dc)	0.000	
Zsys3 (Pst)	0.098	
Zsys4 (Plt)	0.088	
Minimum Zsys calculated is maximum permissible system impedance, Zmax:		8.080 Ohm + j 5.050 Ohm (8.080 Ohm + 16075 µH)

Model:	RAV-HM1601FT-E	
Measurement Description	Measurement Result	
T-max (ms)	0.00	
Highest dc (%)	-0.32	
Highest dmax (%)	-0.37	
Highest Pst (10 min. period)	0.073	
Highest Plt (2 hr. period)	0.068	
Evaluation results and Lowest system impedance calculation according to 6.3.2:		
System impedance	Calculated	
Zsys1 (dmax)	0.496	
Zsys2 (dc)	-0.427	
Zsys3 (Pst)	0.098	
Zsys4 (Plt)	0.091	
Minimum Zsys calculated is maximum permissible system impedance, Zmax:		7.634 Ohm + j 4.771 Ohm (7.634 Ohm + 15188 µH)

IMMUNITY TEST

General Information

Performance criteria as defined by the standard

Criterion	Description from standard
A	The apparatus shall continue to operate as intended during the test. No degradation of performance or loss of function is allowed below a performance level (or permissible loss of performance) specified by the manufacturer, when the apparatus is used as intended. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and from what the user may reasonably expect from the apparatus if used as intended.
B	The apparatus shall continue to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level (or permissible loss of performance) specified by the manufacturer, when the apparatus is used as intended. During the test, degradation of performance is allowed, however no change of actual operating state or stored data is allowed to persist after the test. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and from what the user may reasonably expect from the apparatus if used as intended.
C	Temporary loss of function is allowed, provided the function is self-recoverable or can be restored by the operation of the controls, or by any operation specified in the instructions for use.
Other:	--

Specific information EN 55014-2

Category of test item:	☐	CAT I (Category I)
	☒	CAT II (Category II)
	☐	CAT III (Category III)
	☐	CAT IV (Category IV)

Test Description		Performance criteria required
☒	Electrostatic discharges	B
☐	Radiated electromagnetic field	A
☒	Fast transients	B
☒	Surges	B
☒	Injected currents 0.15 to 230 MHz	A
☐	Injected currents 0.15 to 80 MHz	A
☒	Voltage dips	C

10. Electrostatic discharge

10.1 Test method

10.1.1 Test set up

Test set-up description:	☒	Table-top equipment set-up (Indoor unit)
	☒	Floor standing equipment set-up (Indoor unit and dummy outdoor unit)
	☒	Wall or ceiling mounted equipment (Indoor unit)
	☐	Other:

10.1.2 Test specification

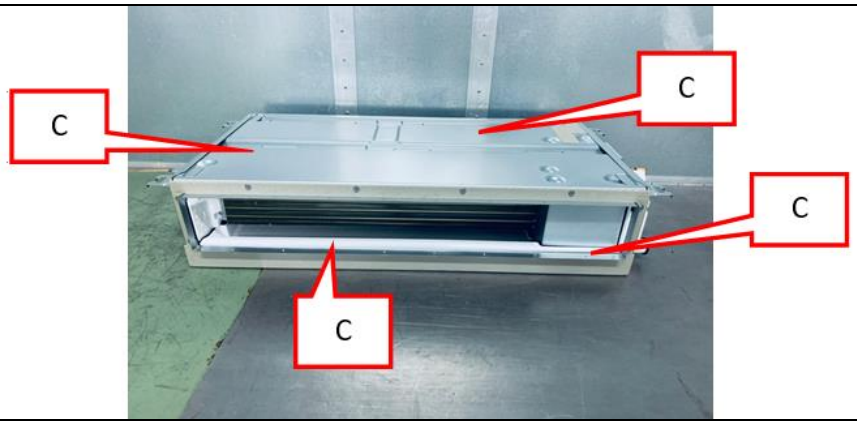
Location of discharge:	☒	Enclosure
	☐	Horizontal coupling plate
	☒	Vertical coupling plate
	☐	Other:
Test polarity:	☒	Positive
	☒	Negative
Test level:	Air discharge = 8 kV	
	Contact discharge = 4 kV	
Number of discharges for each test point:	10	
Discharge interval time:	1 s	
Performance criterion:	B	

10.2 Test result

10.2.1 Test environment

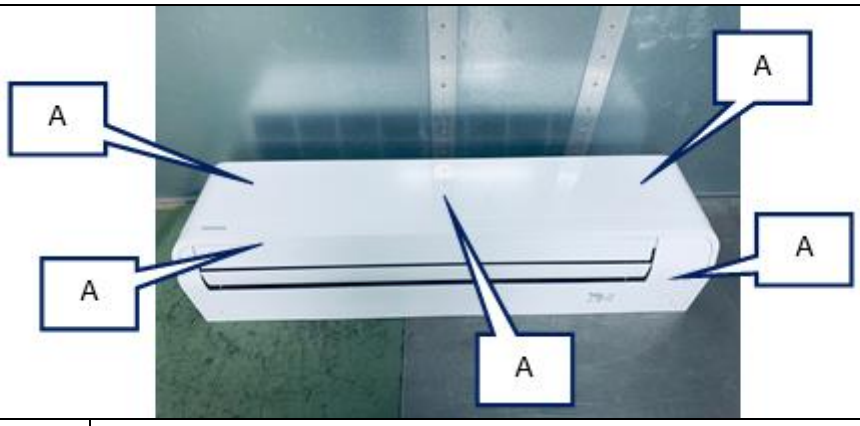
Ambient Temperature (15 - 35 °C):	26	°C
Relative Humidity (30 - 60 %):	48	%
Air pressure (860 - 1060 mbar):	1008	mbar

10.2.2 Results for electrostatic discharges



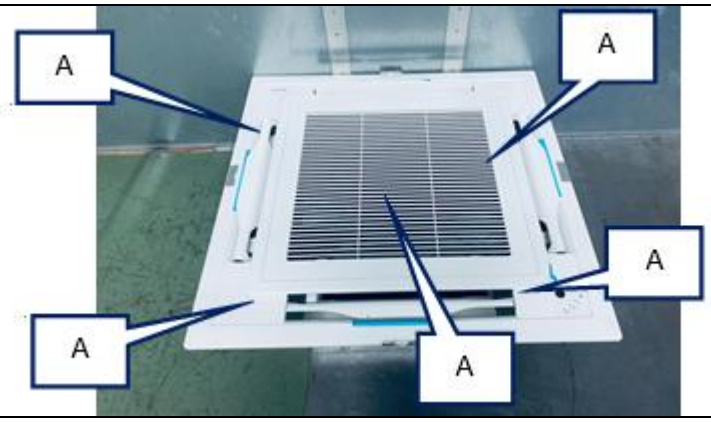
Note:	A = Air discharge C = Contact discharge

Photos of selected test points Model: RAV-HM561SDTY-E



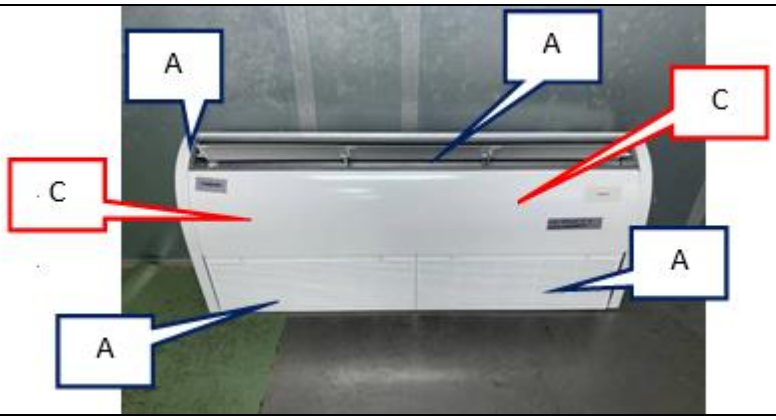
Note:	A = Air discharge C = Contact discharge

Photos of selected test points Model: RAV-HM1101KRTP-E



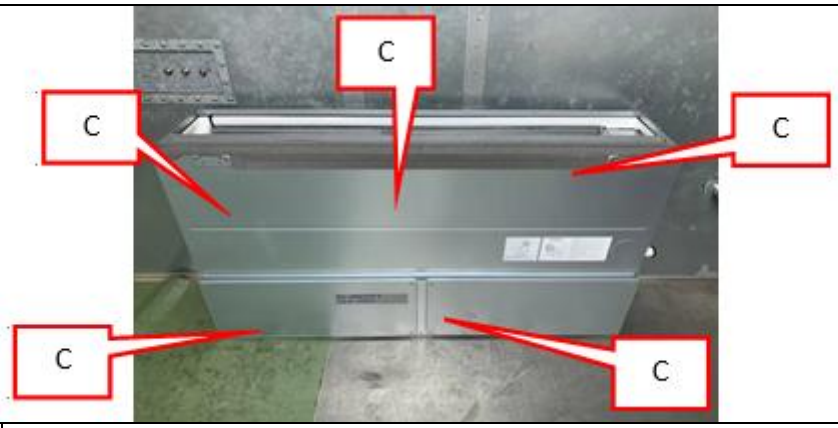
Note:	A = Air discharge C = Contact discharge

Photos of selected test points Model: RAV-HM1601UTP-E



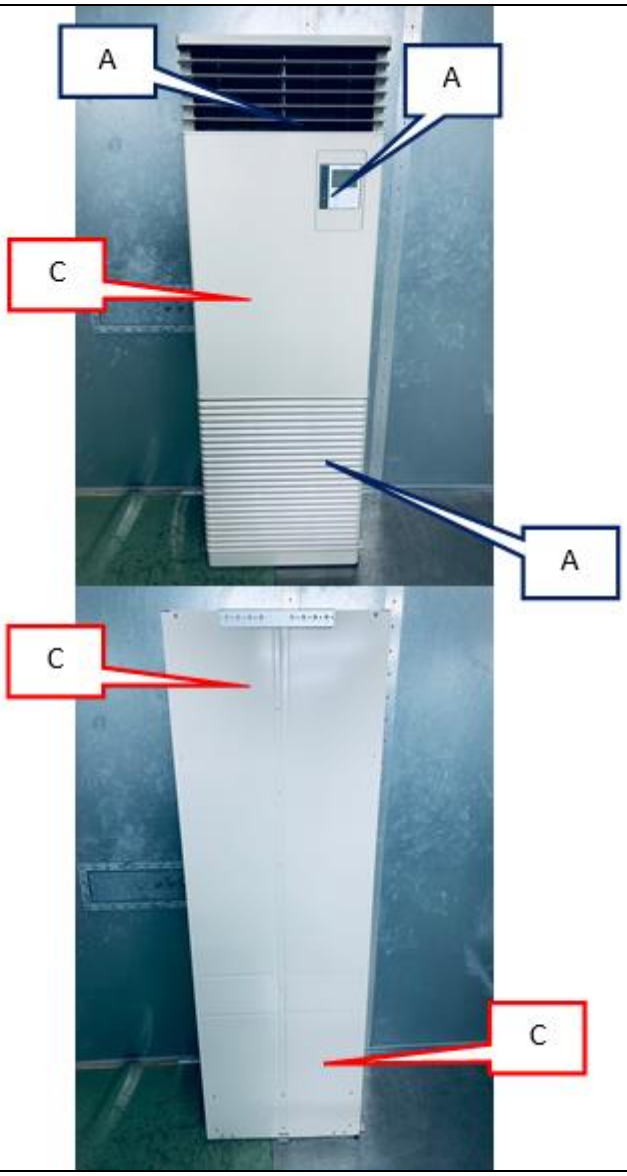
Note:	A = Air discharge C = Contact discharge

Photos of selected test points Model: RAV-HM1601CTP-E



Note:	A = Air discharge C = Contact discharge

Photos of selected test points Model: RAV-HM1601BTP-E



Note:	A = Air discharge C = Contact discharge

Photos of selected test points Model: RAV-HM1601FT-E

10.2.2 Results for electrostatic discharges (Cont'd)

Model:	RAV-HM561SDTY-E				
Test Verdict:	☒ Pass		☐ Fail		
Operating mode:	1				
Monitoring condition:	There was no change of operation status during test.				
Location of discharge	Polarity	Discharge	Number of discharges	Test level (kV)	Observations (Criterion)
HCP	P	C	10	4	--
HCP	N	C	10	4	--
VCP	P	C	10	4	Normal operate (A)
VCP	N	C	10	4	Normal operate (A)
Point on conductive surface as indicate in Photos of selected test points	P	C	10	4	Normal operate (A)
Point on conductive surface as indicate in Photos of selected test points	N	C	10	4	Normal operate (A)
Point on non-conductive surface as indicate in Photos of selected test points	P	A	10	8	--
Point on non-conductive surface as indicate in Photos of selected test points	N	A	10	8	--
Note:	HCP = Horizontal coupling plate VCP = Vertical coupling plate		N = Negative P = Positive	A = Air discharge C = Contact discharge	

10.2.2 Results for electrostatic discharges (Cont'd)

Model:	RAV-HM1101KRTP-E				
Test Verdict:	☒ Pass		☐ Fail		
Operating mode:	1				
Monitoring condition:	There was no change of operation status during test.				
Location of discharge	Polarity	Discharge	Number of discharges	Test level (kV)	Observations (Criterion)
HCP	P	C	10	4	--
HCP	N	C	10	4	--
VCP	P	C	10	4	Normal operate (A)
VCP	N	C	10	4	Normal operate (A)
Point on conductive surface as indicate in Photos of selected test points	P	C	10	4	--
Point on conductive surface as indicate in Photos of selected test points	N	C	10	4	--
Point on non-conductive surface as indicate in Photos of selected test points	P	A	10	8	Normal operate (A)
Point on non-conductive surface as indicate in Photos of selected test points	N	A	10	8	Normal operate (A)
Note:	HCP = Horizontal coupling plate VCP = Vertical coupling plate		N = Negative P = Positive	A = Air discharge C = Contact discharge	

10.2.2 Results for electrostatic discharges (Cont'd)

Model:	RAV-HM1601UTP-E				
Test Verdict:	☒ Pass		☐ Fail		
Operating mode:	1				
Monitoring condition:	There was no change of operation status during test.				
Location of discharge	Polarity	Discharge	Number of discharges	Test level (kV)	Observations (Criterion)
HCP	P	C	10	4	--
HCP	N	C	10	4	--
VCP	P	C	10	4	Normal operate (A)
VCP	N	C	10	4	Normal operate (A)
Point on conductive surface as indicate in Photos of selected test points	P	C	10	4	--
Point on conductive surface as indicate in Photos of selected test points	N	C	10	4	--
Point on non-conductive surface as indicate in Photos of selected test points	P	A	10	8	Normal operate (A)
Point on non-conductive surface as indicate in Photos of selected test points	N	A	10	8	Normal operate (A)
Note:	HCP = Horizontal coupling plate VCP = Vertical coupling plate		N = Negative P = Positive	A = Air discharge C = Contact discharge	

10.2.2 Results for electrostatic discharges (Cont'd)

Model:	RAV-HM1601UTP-E				
Test Verdict:	☒ Pass		☐ Fail		
Operating mode:	1				
Monitoring condition:	There was no change of operation status during test.				
Location of discharge	Polarity	Discharge	Number of discharges	Test level (kV)	Observations (Criterion)
HCP	P	C	10	4	--
HCP	N	C	10	4	--
VCP	P	C	10	4	Normal operate (A)
VCP	N	C	10	4	Normal operate (A)
Point on conductive surface as indicate in Photos of selected test points	P	C	10	4	--
Point on conductive surface as indicate in Photos of selected test points	N	C	10	4	--
Point on non-conductive surface as indicate in Photos of selected test points	P	A	10	8	Normal operate (A)
Point on non-conductive surface as indicate in Photos of selected test points	N	A	10	8	Normal operate (A)
Note:	HCP = Horizontal coupling plate VCP = Vertical coupling plate		N = Negative P = Positive	A = Air discharge C = Contact discharge	

10.2.2 Results for electrostatic discharges (Cont'd)

Model:	RAV-HM1601CTP-E				
Test Verdict:	☒ Pass		☐ Fail		
Operating mode:	1				
Monitoring condition:	There was no change of operation status during test.				
Location of discharge	Polarity	Discharge	Number of discharges	Test level (kV)	Observations (Criterion)
HCP	P	C	10	4	--
HCP	N	C	10	4	--
VCP	P	C	10	4	Normal operate (A)
VCP	N	C	10	4	Normal operate (A)
Point on conductive surface as indicate in Photos of selected test points	P	C	10	4	Normal operate (A)
Point on conductive surface as indicate in Photos of selected test points	N	C	10	4	Normal operate (A)
Point on non-conductive surface as indicate in Photos of selected test points	P	A	10	8	Normal operate (A)
Point on non-conductive surface as indicate in Photos of selected test points	N	A	10	8	Normal operate (A)
Note:	HCP = Horizontal coupling plate VCP = Vertical coupling plate		N = Negative P = Positive	A = Air discharge C = Contact discharge	

10.2.2 Results for electrostatic discharges (Cont'd)

Model:	RAV-HM1601BTP-E				
Test Verdict:	☒ Pass		☐ Fail		
Operating mode:	1				
Monitoring condition:	There was no change of operation status during test.				
Location of discharge	Polarity	Discharge	Number of discharges	Test level (kV)	Observations (Criterion)
HCP	P	C	10	4	--
HCP	N	C	10	4	--
VCP	P	C	10	4	Normal operate (A)
VCP	N	C	10	4	Normal operate (A)
Point on conductive surface as indicate in Photos of selected test points	P	C	10	4	Normal operate (A)
Point on conductive surface as indicate in Photos of selected test points	N	C	10	4	Normal operate (A)
Point on non-conductive surface as indicate in Photos of selected test points	P	A	10	8	--
Point on non-conductive surface as indicate in Photos of selected test points	N	A	10	8	--
Note:	HCP = Horizontal coupling plate VCP = Vertical coupling plate		N = Negative P = Positive	A = Air discharge C = Contact discharge	

10.2.2 Results for electrostatic discharges (Cont'd)

Model:	RAV-HM1601FT-E				
Test Verdict:	☒ Pass		☐ Fail		
Operating mode:	1				
Monitoring condition:	There was no change of operation status during test.				
Location of discharge	Polarity	Discharge	Number of discharges	Test level (kV)	Observations (Criterion)
HCP	P	C	10	4	--
HCP	N	C	10	4	--
VCP	P	C	10	4	Normal operate (A)
VCP	N	C	10	4	Normal operate (A)
Point on conductive surface as indicate in Photos of selected test points	P	C	10	4	Normal operate (A)
Point on conductive surface as indicate in Photos of selected test points	N	C	10	4	Normal operate (A)
Point on non-conductive surface as indicate in Photos of selected test points	P	A	10	8	Normal operate (A)
Point on non-conductive surface as indicate in Photos of selected test points	N	A	10	8	Normal operate (A)
Note:	HCP = Horizontal coupling plate VCP = Vertical coupling plate		N = Negative P = Positive	A = Air discharge C = Contact discharge	

11. Radiated electromagnetic field

11.1 Test method

11.1.1 Test set up

Test set-up description:	☐	Table-top equipment set-up
	☐	Floor standing equipment set-up
	☐	Wall or ceiling mounted equipment

11.1.2 Test specification

Exposed side of EUT:	☐	0° (Front)
	☐	90 °
	☐	180 ° (Rear)
	☐	270 °
	☐	Top side
	☐	Bottom side
Distance Antenna to EUT:	3 m	
Frequency range:	80 - 1000 MHz	
Test level (V/m):	3 V/m (r.m.s.) (unmodulated)	
Modulation:	80 % AM @ 1 kHz	
Step size (%):	1 %	
Performance criterion:	A	

11.2 Test result

11.2.1 Test environment

Ambient Temperature (15 - 35 °C):	--	°C
Relative Humidity (30 - 60 %):	--	%
Air pressure (800 - 1060 mbar):	--	mbar

11.2.2 Results for radiated electromagnetic field

Test Verdict:			☐ Pass		☐ Fail	
Operating mode:			--			
Monitoring condition:			--			
Frequency range (MHz)	Angle.	Ant. Polarity	Test Level (V/m)	Modulation	Dwell time (s)	Observations (Criterion)
80 - 1000	0 °	Horizontal	3	80 % AM @ 1 kHz	3	--
80 - 1000	90 °	Horizontal	3	80 % AM @ 1 kHz	3	--
80 - 1000	180 °	Horizontal	3	80 % AM @ 1 kHz	3	--
80 - 1000	270 °	Horizontal	3	80 % AM @ 1 kHz	3	--
80 - 1000	0 °	Vertical	3	80 % AM @ 1 kHz	3	--
80 - 1000	90 °	Vertical	3	80 % AM @ 1 kHz	3	--
80 - 1000	180 °	Vertical	3	80 % AM @ 1 kHz	3	--
80 - 1000	270 °	Vertical	3	80 % AM @ 1 kHz	3	--
Note:	--					

12. Fast transients

12.1 Test method

12.1.1 Test set up

Test set-up description:	☒	Table-top equipment set-up (Indoor unit)
	☒	Floor standing equipment set-up (Indoor unit and dummy outdoor unit)
	☒	Wall or ceiling mounted equipment (Indoor unit)
	☐	Other:

12.1.2 Test specification

Test port:	☐	Signal lines & control lines
	☐	Input & output d.c. power ports
	☒	Input & output a.c. power ports
Test level (kV):	Signal lines & control lines = 0.5 kV	
	Input & output d.c. power ports = 1 kV	
	Input & output a.c. power ports = 1 kV	
Repetition frequency:	5 kHz, 5/50ns Tr/Td	
Number of discharges for each test point:	10	
Test time:	2 min with a positive polarity and 2 min with a negative polarity	
Performance criterion:	B	

12.2 Test result

12.2.1 Test environment

Ambient Temperature (15 - 35 °C):	26	°C
Relative Humidity (30 - 60 %):	48	%
Air pressure (800 - 1060 mbar):	1008	mbar

12.2.2 Results for fast transients

Model:	RAV-HM561SDTY-E			
Test Verdict:	☒ Pass	☐ Fail		
Operating mode:	1			
Monitoring condition:	There was no change of operation status during test.			
Test port	Coupling	Polarity	Test Level (kV)	Observations (Criterion)
Input a.c. power ports	L to GND	P	1	Normal operate (A)
Input a.c. power ports	L to GND	N	1	Normal operate (A)
Input a.c. power ports	N to GND	P	1	Normal operate (A)
Input a.c. power ports	N to GND	N	1	Normal operate (A)
Input a.c. power ports	PE to GND	P	1	Normal operate (A)
Input a.c. power ports	PE to GND	N	1	Normal operate (A)
Input a.c. power ports	L, N, PE to GND	P	1	Normal operate (A)
Input a.c. power ports	L, N, PE to GND	N	1	Normal operate (A)
Note:	P = Positive N = Negative			

Model:	RAV-HM1101KRTP-E	
Test Verdict:	☒ Pass	☐ Fail
Operating mode:	1	
Monitoring condition:	There was no change of operation status during test.	

Test port	Coupling	Polarity	Test Level (kV)	Observations (Criterion)
Input a.c. power ports	L to GND	P	1	Normal operate (A)
Input a.c. power ports	L to GND	N	1	Normal operate (A)
Input a.c. power ports	N to GND	P	1	Normal operate (A)
Input a.c. power ports	N to GND	N	1	Normal operate (A)
Input a.c. power ports	PE to GND	P	1	Normal operate (A)
Input a.c. power ports	PE to GND	N	1	Normal operate (A)
Input a.c. power ports	L, N, PE to GND	P	1	Normal operate (A)
Input a.c. power ports	L, N, PE to GND	N	1	Normal operate (A)

Note: P = Positive
N = Negative

Model:	RAV-HM1601UTP-E	
Test Verdict:	☒ Pass	☐ Fail
Operating mode:	1	
Monitoring condition:	There was no change of operation status during test.	

Test port	Coupling	Polarity	Test Level (kV)	Observations (Criterion)
Input a.c. power ports	L to GND	P	1	Normal operate (A)
Input a.c. power ports	L to GND	N	1	Normal operate (A)
Input a.c. power ports	N to GND	P	1	Normal operate (A)
Input a.c. power ports	N to GND	N	1	Normal operate (A)
Input a.c. power ports	PE to GND	P	1	Normal operate (A)
Input a.c. power ports	PE to GND	N	1	Normal operate (A)
Input a.c. power ports	L, N, PE to GND	P	1	Normal operate (A)
Input a.c. power ports	L, N, PE to GND	N	1	Normal operate (A)

Note: P = Positive
N = Negative

Model:	RAV-HM1601CTP-E	
Test Verdict:	☒ Pass	☐ Fail
Operating mode:	1	
Monitoring condition:	There was no change of operation status during test.	

Test port	Coupling	Polarity	Test Level (kV)	Observations (Criterion)
Input a.c. power ports	L to GND	P	1	Normal operate (A)
Input a.c. power ports	L to GND	N	1	Normal operate (A)
Input a.c. power ports	N to GND	P	1	Normal operate (A)
Input a.c. power ports	N to GND	N	1	Normal operate (A)
Input a.c. power ports	PE to GND	P	1	Normal operate (A)
Input a.c. power ports	PE to GND	N	1	Normal operate (A)
Input a.c. power ports	L, N, PE to GND	P	1	Normal operate (A)
Input a.c. power ports	L, N, PE to GND	N	1	Normal operate (A)

Note: P = Positive
N = Negative

Model:	RAV-HM1601BTP-E	
Test Verdict:	☒ Pass	☐ Fail
Operating mode:	1	
Monitoring condition:	There was no change of operation status during test.	

Test port	Coupling	Polarity	Test Level (kV)	Observations (Criterion)
Input a.c. power ports	L to GND	P	1	Normal operate (A)
Input a.c. power ports	L to GND	N	1	Normal operate (A)
Input a.c. power ports	N to GND	P	1	Normal operate (A)
Input a.c. power ports	N to GND	N	1	Normal operate (A)
Input a.c. power ports	PE to GND	P	1	Normal operate (A)
Input a.c. power ports	PE to GND	N	1	Normal operate (A)
Input a.c. power ports	L, N, PE to GND	P	1	Normal operate (A)
Input a.c. power ports	L, N, PE to GND	N	1	Normal operate (A)

Note: P = Positive
N = Negative

Model:	RAV-HM1601FT-E	
Test Verdict:	☒ Pass	☐ Fail
Operating mode:	1	
Monitoring condition:	There was no change of operation status during test.	

Test port	Coupling	Polarity	Test Level (kV)	Observations (Criterion)
Input a.c. power ports	L to GND	P	1	Normal operate (A)
Input a.c. power ports	L to GND	N	1	Normal operate (A)
Input a.c. power ports	N to GND	P	1	Normal operate (A)
Input a.c. power ports	N to GND	N	1	Normal operate (A)
Input a.c. power ports	PE to GND	P	1	Normal operate (A)
Input a.c. power ports	PE to GND	N	1	Normal operate (A)
Input a.c. power ports	L, N, PE to GND	P	1	Normal operate (A)
Input a.c. power ports	L, N, PE to GND	N	1	Normal operate (A)

Note: P = Positive
N = Negative

13. Surges

13.1 Test method

13.1.1 Test set up

Test set-up description:	☒	Table-top equipment set-up (Indoor unit)
	☒	Floor standing equipment set-up (Indoor unit and dummy outdoor unit)
	☒	Wall or ceiling mounted equipment (Indoor unit)
	☐	Other:

13.1.2 Test specification

Test port:	Input a.c. power ports	
Test polarity:	☒	Positive
	☒	Negative
Test specification:	1.2/50 (8/20) T_r/T_d μs	
Test level (kV) and impedance:	phase-to-phase = 1 kV with 2 Ω Impedance	
	phase-to-neutral = 1 kV with 2 Ω Impedance	
	phase-to-earth = 2 kV with 12 Ω Impedance	
	neutral -to-earth = 2 kV with 12 Ω Impedance	
Repetition rate:	1/min	
Number of pulses for each coupling:	5	
Performance criterion:	B	

13.2 Test result

13.2.1 Test environment

Ambient Temperature (15 - 35 °C):	26	°C
Relative Humidity (30 - 60 %):	48	%
Air pressure (800 - 1060 mbar):	1008	mbar

13.2.2 Results for surges

Model:		RAV-HM561SDTY-E			
Test Verdict:		☒ Pass	☐ Fail		
Operating mode:		1			
Monitoring condition:		There was no change of operation status during test.			
Test port	Coupling	Polarity	Phase angles (°)	Test level (kV)	Observations (Criterion)
Input a.c. power ports	L-N	P	90	1	Normal operate (A)
Input a.c. power ports	L-N	N	270	1	Normal operate (A)
Input a.c. power ports	L-PE	P	90	2	Normal operate (A)
Input a.c. power ports	L-PE	N	270	2	Normal operate (A)
Input a.c. power ports	N-PE	P	90	2	Normal operate (A)
Input a.c. power ports	N-PE	N	270	2	Normal operate (A)
Lower test levels:	☐ The lower test levels are tested also.				
	☒ The lower test levels are not tested.				
Note:	P = Positive N = Negative				

Model:		RAV-HM1101KRTP-E			
Test Verdict:		☒ Pass	☐ Fail		
Operating mode:		1			
Monitoring condition:		There was no change of operation status during test.			
Test port	Coupling	Polarity	Phase angles (°)	Test level (kV)	Observations (Criterion)
Input a.c. power ports	L-N	P	90	1	Normal operate (A)
Input a.c. power ports	L-N	N	270	1	Normal operate (A)
Input a.c. power ports	L-PE	P	90	2	Normal operate (A)
Input a.c. power ports	L-PE	N	270	2	Normal operate (A)
Input a.c. power ports	N-PE	P	90	2	Normal operate (A)
Input a.c. power ports	N-PE	N	270	2	Normal operate (A)
Lower test levels:	☐ The lower test levels are tested also.				
	☒ The lower test levels are not tested.				
Note:	P = Positive N = Negative				

Model:		RAV-HM1601UTP-E			
Test Verdict:		☒ Pass	☐ Fail		
Operating mode:		1			
Monitoring condition:		There was no change of operation status during test.			
Test port	Coupling	Polarity	Phase angles (°)	Test level (kV)	Observations (Criterion)
Input a.c. power ports	L-N	P	90	1	Normal operate (A)
Input a.c. power ports	L-N	N	270	1	Normal operate (A)
Input a.c. power ports	L-PE	P	90	2	Normal operate (A)
Input a.c. power ports	L-PE	N	270	2	Normal operate (A)
Input a.c. power ports	N-PE	P	90	2	Normal operate (A)
Input a.c. power ports	N-PE	N	270	2	Normal operate (A)
Lower test levels:	☐ The lower test levels are tested also.				
	☒ The lower test levels are not tested.				
Note:	P = Positive N = Negative				

Model:		RAV-HM1601CTP-E			
Test Verdict:		☒ Pass	☐ Fail		
Operating mode:		1			
Monitoring condition:		There was no change of operation status during test.			
Test port	Coupling	Polarity	Phase angles (°)	Test level (kV)	Observations (Criterion)
Input a.c. power ports	L-N	P	90	1	Normal operate (A)
Input a.c. power ports	L-N	N	270	1	Normal operate (A)
Input a.c. power ports	L-PE	P	90	2	Normal operate (A)
Input a.c. power ports	L-PE	N	270	2	Normal operate (A)
Input a.c. power ports	N-PE	P	90	2	Normal operate (A)
Input a.c. power ports	N-PE	N	270	2	Normal operate (A)
Lower test levels:	☐ The lower test levels are tested also.				
	☒ The lower test levels are not tested.				
Note:	P = Positive N = Negative				

Model:		RAV-HM1601BTP-E			
Test Verdict:		☒ Pass	☐ Fail		
Operating mode:		1			
Monitoring condition:		There was no change of operation status during test.			
Test port	Coupling	Polarity	Phase angles (°)	Test level (kV)	Observations (Criterion)
Input a.c. power ports	L-N	P	90	1	Normal operate (A)
Input a.c. power ports	L-N	N	270	1	Normal operate (A)
Input a.c. power ports	L-PE	P	90	2	Normal operate (A)
Input a.c. power ports	L-PE	N	270	2	Normal operate (A)
Input a.c. power ports	N-PE	P	90	2	Normal operate (A)
Input a.c. power ports	N-PE	N	270	2	Normal operate (A)
Lower test levels:	☐ The lower test levels are tested also.				
	☒ The lower test levels are not tested.				
Note:	P = Positive N = Negative				

Model:		RAV-HM1601FT-E			
Test Verdict:		☒ Pass	☐ Fail		
Operating mode:		1			
Monitoring condition:		There was no change of operation status during test.			
Test port	Coupling	Polarity	Phase angles (°)	Test level (kV)	Observations (Criterion)
Input a.c. power ports	L-N	P	90	1	Normal operate (A)
Input a.c. power ports	L-N	N	270	1	Normal operate (A)
Input a.c. power ports	L-PE	P	90	2	Normal operate (A)
Input a.c. power ports	L-PE	N	270	2	Normal operate (A)
Input a.c. power ports	N-PE	P	90	2	Normal operate (A)
Input a.c. power ports	N-PE	N	270	2	Normal operate (A)
Lower test levels:	☐ The lower test levels are tested also.				
	☒ The lower test levels are not tested.				
Note:	P = Positive N = Negative				

14. Injected currents

14.1 Test method

14.1.1 Test set up

Test set-up description:	☒	Table-top equipment set-up (Indoor unit)
	☒	Floor standing equipment set-up (Indoor unit and dummy outdoor unit)
	☒	Wall or ceiling mounted equipment (Indoor unit)
	☐	Other:

14.1.2 Test specification

Test port:	☐	Signal lines & control lines
	☐	Input & output d.c. power ports
	☒	Input & output a.c. power ports
Modulation:	☒	80 % AM with 1 kHz
	☐	Other:
Frequency range /discrete frequencies:	☐	0.15 to 80 MHz
	☒	0.15 to 230 MHz
	☐	Other:
Test level (V):	1 V (r.m.s.) (unmodulated) for signal lines & control lines	
	3 V (r.m.s.) (unmodulated) for Input & output d.c. power ports	
	3 V (r.m.s.) (unmodulated) for Input & output a.c. power ports	
Source impedance:	150 Ω	
Performance criterion:	A	

14.2 Test result

14.2.1 Test environment

Ambient Temperature (15 - 35 °C):	26	°C
Relative Humidity (30 - 60 %):	48	%
Air pressure (800 - 1060 mbar):	1008	mbar

14.2.2 Results for injection currents

Model:		RAV-HM561SDTY-E		
Test Verdict:		☒ Pass	☐ Fail	
Operating mode:		1		
Monitoring condition:		There was no change of operation status during test.		
Frequency range /discrete frequencies	Test port	Test Level (V)	Modulation	Observation (Criterion)
0.15 to 230 MHz	Input a.c. power port	3 V (r.m.s.) (unmodulated)	80 % AM with 1 kHz	Normal operate (A)
Note:	--			

Model:		RAV-HM1101KRTP-E		
Test Verdict:		☒ Pass	☐ Fail	
Operating mode:		1		
Monitoring condition:		There was no change of operation status during test.		
Frequency range /discrete frequencies	Test port	Test Level (V)	Modulation	Observation (Criterion)
0.15 to 230 MHz	Input a.c. power port	3 V (r.m.s.) (unmodulated)	80 % AM with 1 kHz	Normal operate (A)
Note:	--			

Model:		RAV-HM1601UTP-E		
Test Verdict:		☒ Pass	☐ Fail	
Operating mode:		1		
Monitoring condition:		There was no change of operation status during test.		
Frequency range /discrete frequencies	Test port	Test Level (V)	Modulation	Observation (Criterion)
0.15 to 230 MHz	Input a.c. power port	3 V (r.m.s.) (unmodulated)	80 % AM with 1 kHz	Normal operate (A)
Note:	--			

Model:		RAV-HM1601CTP-E		
Test Verdict:		☒ Pass	☐ Fail	
Operating mode:		1		
Monitoring condition:		There was no change of operation status during test.		
Frequency range /discrete frequencies	Test port	Test Level (V)	Modulation	Observation (Criterion)
0.15 to 230 MHz	Input a.c. power port	3 V (r.m.s.) (unmodulated)	80 % AM with 1 kHz	Normal operate (A)
Note:	--			

Model:		RAV-HM1601BTP-E		
Test Verdict:		☒ Pass	☐ Fail	
Operating mode:		1		
Monitoring condition:		There was no change of operation status during test.		
Frequency range /discrete frequencies	Test port	Test Level (V)	Modulation	Observation (Criterion)
0.15 to 230 MHz	Input a.c. power port	3 V (r.m.s.) (unmodulated)	80 % AM with 1 kHz	Normal operate (A)
Note:	--			

Model:		RAV-HM1601FT-E		
Test Verdict:		☒ Pass	☐ Fail	
Operating mode:		1		
Monitoring condition:		There was no change of operation status during test.		
Frequency range /discrete frequencies	Test port	Test Level (V)	Modulation	Observation (Criterion)
0.15 to 230 MHz	Input a.c. power port	3 V (r.m.s.) (unmodulated)	80 % AM with 1 kHz	Normal operate (A)
Note:	--			

15. Voltage dips

15.1 Test method

15.1.1 Test set up

Test set-up description:	☒	Table-top equipment set-up (Indoor unit)
	☒	Floor standing equipment set-up (Indoor unit and dummy outdoor unit)
	☒	Wall or ceiling mounted equipment (Indoor unit)
	☐	Other:

15.1.2 Test specification

Test port:		Input a.c. power ports		
Test specification:				
Environmental phenomena		Test level in % UT	Durations for voltage dips	
			50 Hz	60 Hz
Voltage dips in %	100	0	0.5 cycle	0.5 cycle
	60	40	10 cycle	12 cycle
	30	70	25 cycle	30 cycle
U_T is the rated voltage of the EUT				
Performance criterion:		C		

15.2 Test result

15.2.1 Test environment

Ambient Temperature (15 - 35 °C):	26	°C
Relative Humidity (30 - 60 %):	48	%
Air pressure (800 - 1060 mbar):	1008	mbar

15.2.2 Results for voltage dips

Model:		RAV-HM561SDTY-E		
Test Verdict:		☒ Pass	☐ Fail	
Operating mode:		1		
Monitoring condition:		The fan motor was malfunction.		
U_T (V)	Frequency (Hz)	Test Level % of U_T	Duration in cycles	Observations (Criterion)
230	50	0	0.5 (50Hz) 0.5 (60Hz)	Malfunction (B)
230	50	40	10 (50Hz) 12 (60Hz)	Malfunction (B)
230	50	70	25 (50Hz) 30 (60Hz)	Malfunction (B)
Note:	U_T = The rated voltage of the EUT			

Model:		RAV-HM1101KRTP-E		
Test Verdict:		☒ Pass	☐ Fail	
Operating mode:		1		
Monitoring condition:		The fan motor was malfunction.		
U_T (V)	Frequency (Hz)	Test Level % of U_T	Duration in cycles	Observations (Criterion)
230	50	0	0.5 (50Hz) 0.5 (60Hz)	Malfunction (B)
230	50	40	10 (50Hz) 12 (60Hz)	Malfunction (B)
230	50	70	25 (50Hz) 30 (60Hz)	Malfunction (B)
Note:	U_T = The rated voltage of the EUT			

Model:		RAV-HM1601UTP-E		
Test Verdict:		☒ Pass	☐ Fail	
Operating mode:		1		
Monitoring condition:		The fan motor was malfunction.		
U_T (V)	Frequency (Hz)	Test Level % of U_T	Duration in cycles	Observations (Criterion)
230	50	0	0.5 (50Hz) 0.5 (60Hz)	Malfunction (B)
230	50	40	10 (50Hz) 12 (60Hz)	Malfunction (B)
230	50	70	25 (50Hz) 30 (60Hz)	Malfunction (B)
Note:	U_T = The rated voltage of the EUT			

Model:		RAV-HM1601CTP-E		
Test Verdict:		☒ Pass	☐ Fail	
Operating mode:		1		
Monitoring condition:		The fan motor was malfunction.		
U_T (V)	Frequency (Hz)	Test Level % of U_T	Duration in cycles	Observations (Criterion)
230	50	0	0.5 (50Hz) 0.5 (60Hz)	Malfunction (B)
230	50	40	10 (50Hz) 12 (60Hz)	Malfunction (B)
230	50	70	25 (50Hz) 30 (60Hz)	Malfunction (B)
Note:	U_T = The rated voltage of the EUT			

Model:		RAV-HM1601BTP-E		
Test Verdict:		☒ Pass	☐ Fail	
Operating mode:		1		
Monitoring condition:		The fan motor was malfunction.		
U_T (V)	Frequency (Hz)	Test Level % of U_T	Duration in cycles	Observations (Criterion)
230	50	0	0.5 (50Hz) 0.5 (60Hz)	Malfunction (B)
230	50	40	10 (50Hz) 12 (60Hz)	Malfunction (B)
230	50	70	25 (50Hz) 30 (60Hz)	Malfunction (B)
Note:	U_T = The rated voltage of the EUT			

Model:		RAV-HM1601FT-E		
Test Verdict:		☒ Pass	☐ Fail	
Operating mode:		1		
Monitoring condition:		The fan motor was malfunction.		
U_T (V)	Frequency (Hz)	Test Level % of U_T	Duration in cycles	Observations (Criterion)
230	50	0	0.5 (50Hz) 0.5 (60Hz)	Malfunction (B)
230	50	40	10 (50Hz) 12 (60Hz)	Malfunction (B)
230	50	70	25 (50Hz) 30 (60Hz)	Malfunction (B)
Note:	U_T = The rated voltage of the EUT			

APPENDIX I: PHOTO(S) OF EUT

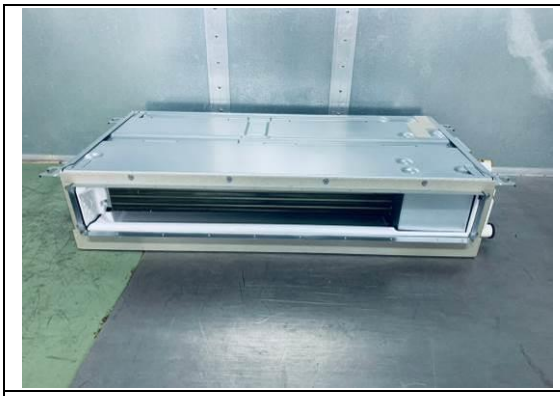
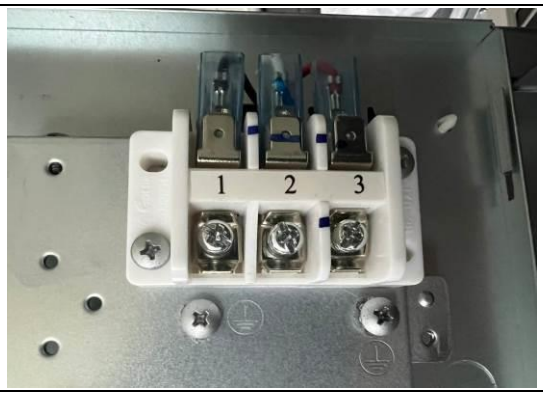
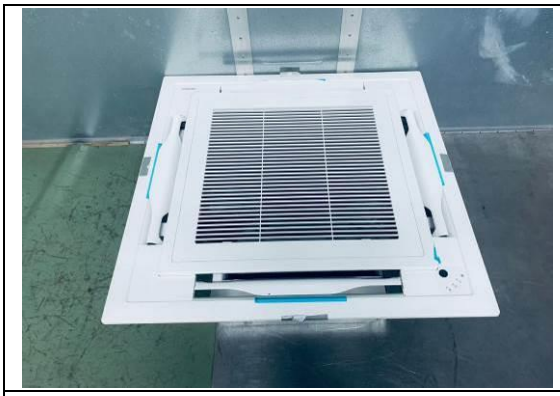
	
No.1.: Front view	No.2: Connection terminal

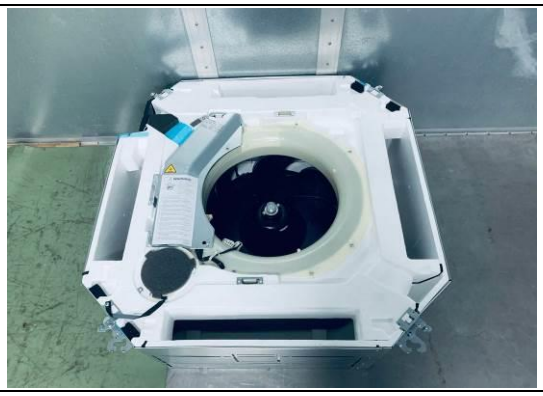
Figure AI.1: EUT Photos indoor model: RAV-HM561SDTY-E

	
No.1.: Front view	No.2: Front view (Open cover)
	
No.3: Connection terminal	

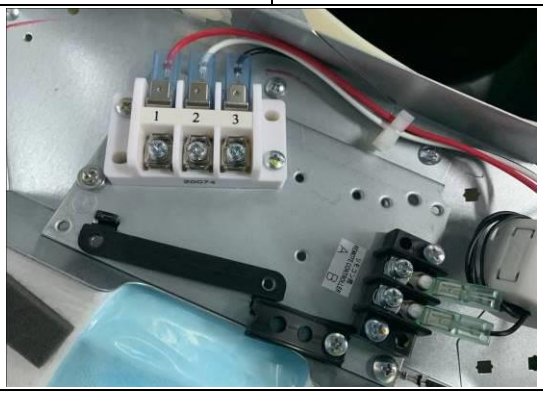
Figure AI.2: EUT Photos indoor model: RAV-HM1101KRTP-E



No.1.: Front view



No.2: Front view (Open cover)



No.3: Connection terminal

Figure AI.3: EUT Photos indoor model: RAV-HM1601UTP-E

No.1.: Front view

No.2: Connection terminal

Figure AI.4: EUT Photos indoor model: RAV-HM1601CTP-E

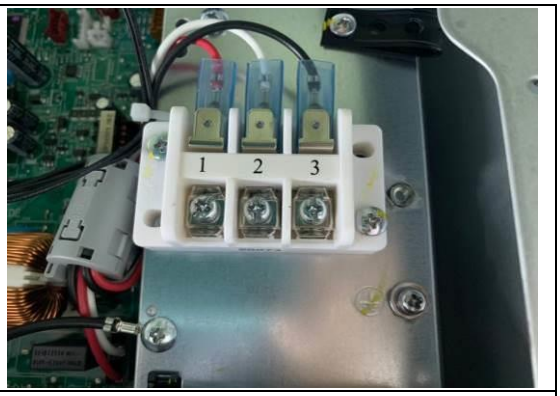
	
No.1.: Front view	No.2: Connection terminal

Figure AI.5: EUT Photos indoor model: RAV-HM1601BTP-E

No.1.: Front view

No.2: Rear view

No.3: Side view (right)

No.4: Side view (left)

No.5: Connection terminal

Figure AI.6: EUT Photos indoor model: RAV-HM1601FT-E

	
No.1.: Front view	No.2: Front view (open cover)

Figure AI.7: EUT Photos remote model: RBC-AMS41E-ME

APPENDIX II: MODEL(S) INFORMATION

Model cover by this report

Test model (Indoor unit)	Cover model (Indoor unit)	Type	Indoor unit PCB model
RAV-HM561SDTY-E	RAV-HM301SDTY-E	Slim duct (TCAC)	MCC-1643
	RAV-HM401SDTY-E		
	RAV-HM561SDTY-E/TR		
RAV-HM1101KRTP-E	RAV-HM301KRTP-E	High wall (TCTC)	MCC-1696
	RAV-HM401KRTP-E		
	RAV-HM561KRTP-E/TR		
	RAV-HM801KRTP-E/TR		
	RAV-HM901KRTP-E		
	RAV-HM1101KRTP-E/TR		
RAV-HM1601UTP-E	RAV-HM561UTP-E/TR	4-way cassette (TCTC)	MCC-1643
	RAV-HM801UTP-E/TR		
	RAV-HM901UTP-E		
	RAV-HM1101UTP-E/TR		
	RAV-HM1401UTP-E/TR		
	RAV-HM1601UTP-E/TR		
	RAV-HM561UT-E/TR	Smart cassette (TCC)	
	RAV-HM801UT-E/TR		
	RAV-HM1101UT-E/TR		
	RAV-HM1401UT-E/TR		
	RAV-HM301MUT-E	Compact 4 Way (TCC)	
	RAV-HM401MUT-E		
	RAV-HM561MUT-E/TR		
RAV-HM1601CTP-E	RAV-HM401CTP-E	Under celling (TCTC)	MCC-1643
	RAV-HM561CTP-E/TR		
	RAV-HM801CTP-E/TR		
	RAV-HM901CTP-E		
	RAV-HM1101CTP-E/TR		
	RAV-HM1401CTP-E/TR		
	RAV-HM1601CTP-E/TR		
RAV-HM1601BTP-E	RAV-HM561BTP-E/TR	Standard duct (TCTC)	MCC-1720
	RAV-HM801BTP-E/TR		
	RAV-HM901BTP-E		
	RAV-HM1101BTP-E/TR		
	RAV-HM1401BTP-E/TR		
	RAV-HM1601BTP-E/TR		
RAV-HM1601FT-E	RAV-HM561FT-E/TR	Floor standing (TCC)	MCC-1643
	RAV-HM801FT-E/TR		
	RAV-HM901FT-E		
	RAV-HM1101FT-E/TR		
	RAV-HM1401FT-E/TR		
	RAV-HM1601FT-E/TR		

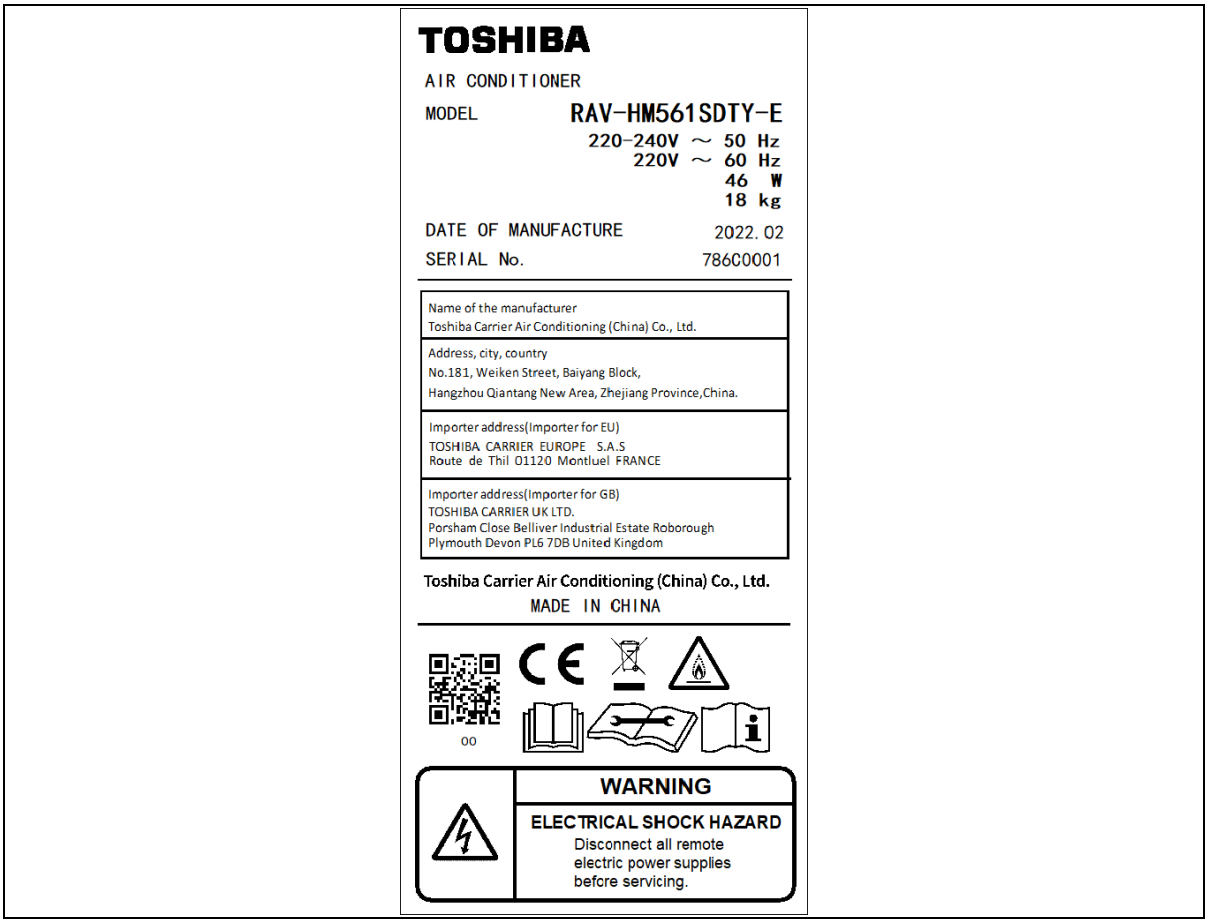


Figure AII.1: Nameplate indoor unit model: RAV-HM561SDTY-E

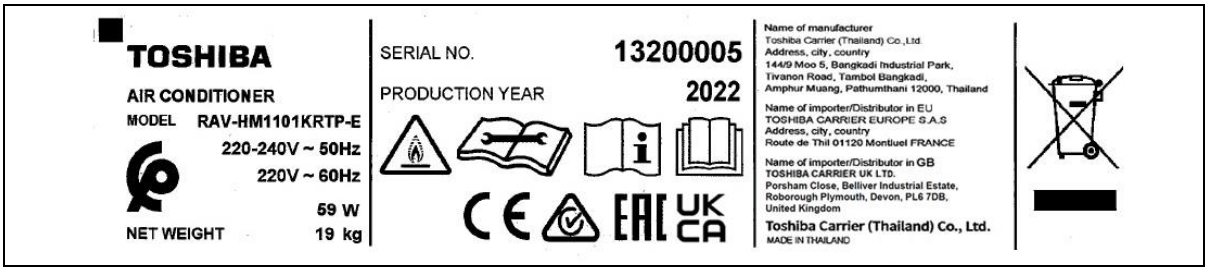


Figure AII.2: Nameplate indoor unit model: RAV-HM1101KRTP-E

Figure AII.3: Nameplate indoor unit model: RAV-HM1601UTP-E

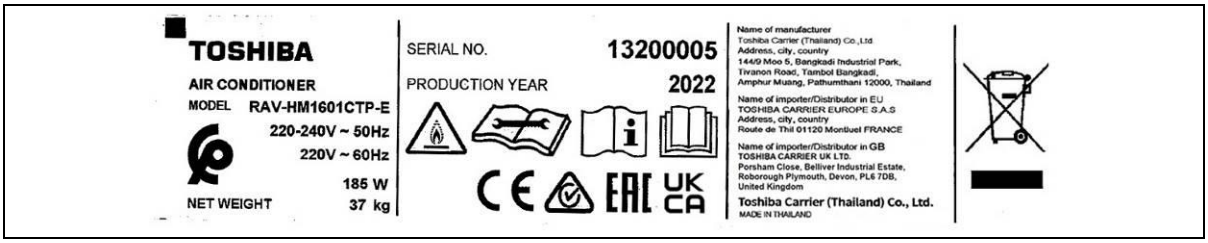


Figure AII.4: Nameplate indoor unit model: RAV-HM1601CTP-E

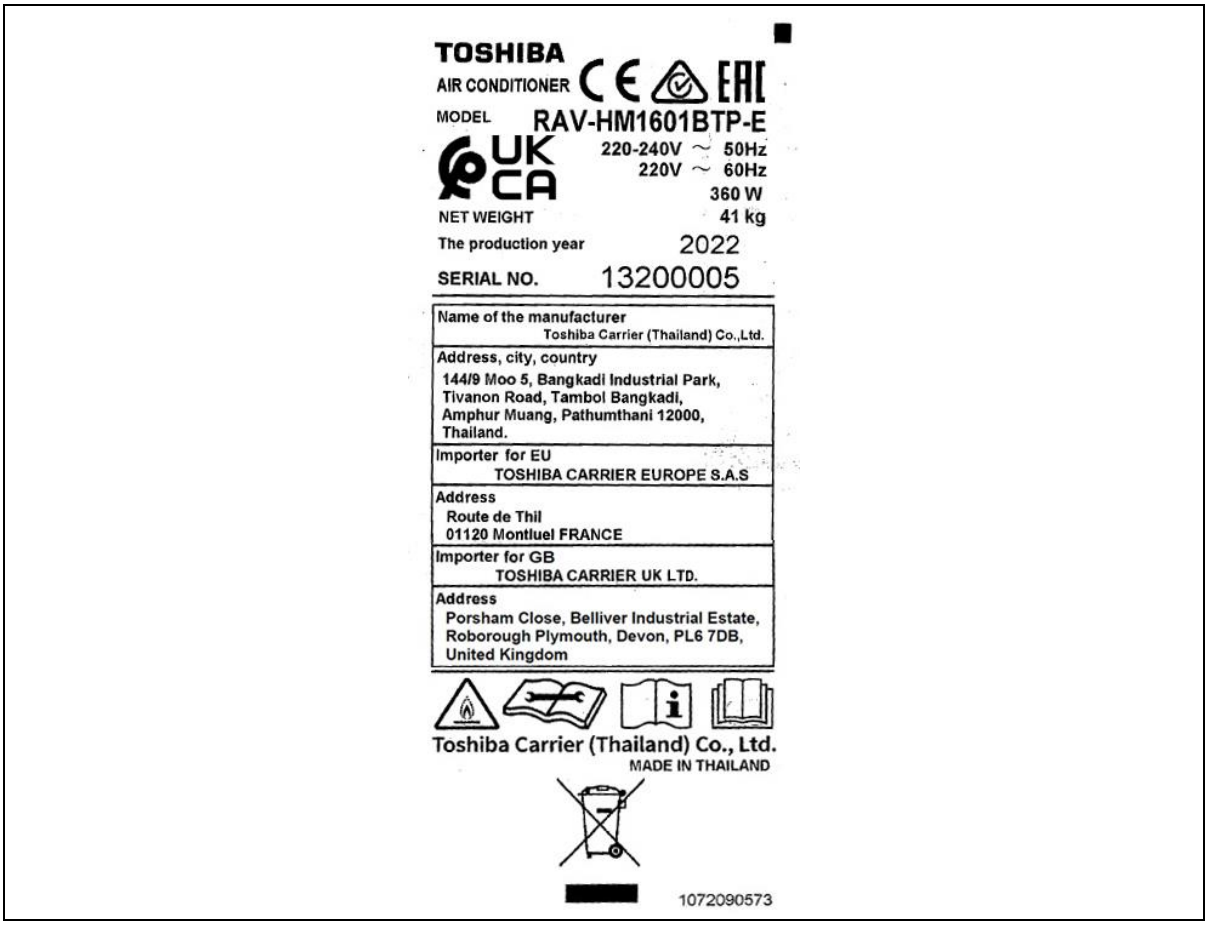


Figure AII.5: Nameplate indoor unit model: RAV-HM1601BTP-E

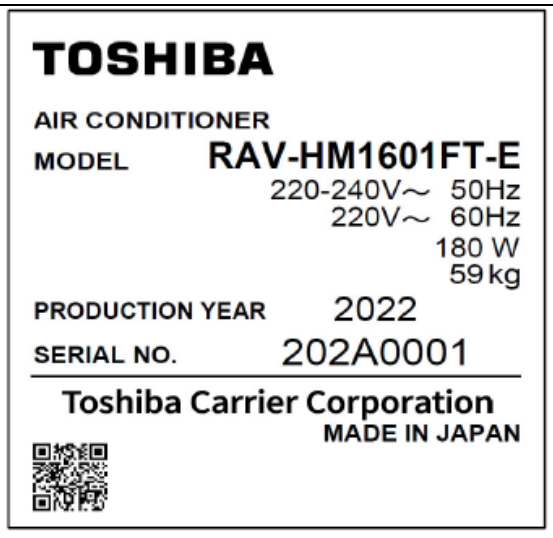


Figure AII.6: Nameplate indoor unit model: RAV-HM1601FT-E

APPENDIX III: PHOTO OF TEST SETUP

Figure AIII.1: Continuous/Discontinuous disturbance voltage test set-up

Figure AIII.2: Disturbance power test set-up

Figure AIII.3: Harmonic current emission, Voltage fluctuation and flicker test set-up

Figure AIII.4: Electrostatic discharge test set-up

Figure AIII.5: Injection current test set-up

Figure AIII.6: Fast transients, Surges, Voltage dips test set-up

********** End of Report **********