EMC Test Report

Raspberry Pi Ltd
7” Display Screen, Model: Raspberry Pi Touch Display

In accordance with EN 55035 and EN 55032

Prepared for: Raspberry Pi Ltd
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Document 75956732-01 Issue 01

SIGNATURE			
A.J. Lawson			
NAME	**JOB TITLE**	**RESPONSIBLE FOR**	**ISSUE DATE**
Andrew Lawson	Chief Engineer, EMC	Authorised Signatory	15 May 2023

Signatures in this approval box have checked this document in line with the requirements of TÜV SÜD document control rules.

EXECUTIVE SUMMARY
A sample of this product was tested and found to be compliant with EN 55035: 2017 A11: 2020 and EN 55032: 2015 A11: 2020 for the tests detailed in section 1.3.

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Contents

1 Report Summary

1.1 Report Modification Record

Alterations and additions to this report will be issued to the holders of each copy in the form of a complete document.

Issue	Description of Change	Date of Issue
1	First Issue	15-May-2023

Table 1

1.2 Introduction

Applicant	Raspberry Pi Ltd
Manufacturer	Raspberry Pi Ltd
Model Number(s)	Raspberry Pi Touch Display
Serial Number(s)	Not Serialised (FAR-702760-004)
Hardware Version(s)	2.0
Software Version(s)	1.0
Number of Samples Tested	1
Test Specification/Issue/Date	EN 55035: 2017 A11: 2020 and EN 55032: 2015 A11: 2020
Order Number Date	PO-6424 06-October-2022
Date of Receipt of EUT	05-January-2023
Start of Test	10-January-2023
Finish of Test	12-January-2023
Name of Engineer(s)	Matthew Dawkins
Related Document(s)	EN 61000-4-2: 2009 EN 61000-4-3: 2006 A1: 2008 A2: 2010 EN 55016-2-3: 2010 A1: 2010 A2: 2014

1.3 Brief Summary of Results

A brief summary of the tests carried out in accordance with EN 55035 and EN 55032 is shown below.

Section	Specification Clause	Test Description	Result	Comments/Base Standard
Configuration and Mode: AC Powered - Operating				
2.1	5 Table 1, 1.4	Enclosure Port - Electrostatic Discharge	Pass	EN 61000-4-2: 2009
2.2	5 Table 1, 1.2	Enclosure Port - Continuous RF Electromagnetic Field Disturbances, Swept Frequency	Pass	EN 61000-4-3: 2006 A1: 2008 A2: 2010
2.3	5 Table 1, 1.3	Enclosure Port - Continuous RF Electromagnetic Field Disturbances, Spot Frequencies	Pass	EN 61000-4-3: 2006 A1: 2008 A2: 2010
2.4	Annex A, Section A.2	Radiated Emissions	Pass	EN 55016-2-3: 2010 A1: 2010 A2: 2014

Table 2

1.4 Declaration of Build Status

MAIN EUT	
MANUFACTURING DESCRIPTION	7” Display Screen
MANUFACTURER	Raspberry Pi Ltd
MODEL	Raspberry Pi Touch Display
PART NUMBER	Not Applicable
HARDWARE VERSION	2.0
SOFTWARE VERSION	1.0
PSU VOLTAGE/FREQUENCY/CURRENT	13 A mains in 5.1 V DC out @ 3 A (supplied as accessory)
HIGHEST INTERNALLY GENERATED FREQUENCY	450 MHz
FCC ID (if applicable)	TBC (Can be Not Applicable)
INDUSTRY CANADA ID (if applicable)	TBC (Can be Not Applicable)
TECHNICAL DESCRIPTION (a brief technical description of the intended use and operation)	7″ touchscreen display for use with a Raspberry Pi and lets you create interactive projects such as tablets, entertainment systems, and information dashboards
COUNTRY OF ORIGIN	UK
SEPARATE BATTERY/POWER SUPPLY (if applicable)	
MODULES (if applicable)	
ANCILLARIES (if applicable)	

I hereby declare that the information supplied is correct and complete.

DocuSigned by:
6412FB9CB8B3427...

25 April 2023 | 19:21 BST

James Adams

Chief Operating Officer

Raspberry Pi Ltd

1.5 Product Information

1.5.1 Technical Description

The Equipment under test (EUT) was a Raspberry Pi Ltd 7" Touch Display Screen, Model Raspberry Pi Touch Display.

The primary function of the EUT is as a 7″ touchscreen display for use with a Raspberry Pi and lets you create interactive projects such as tablets, entertainment systems, and information dashboards.

Figure 1 - General View

Figure 2 - Rear View

1.5.2 EUT Port/Cable Identification

Port	Max Cable Length specified	Usage	Type	Screened
AC Power Port	1.5 m	Power	DC supply from Raspberry Pi DC output. Raspberry Pi powered from AC to DC adapter with USB-C output.	Yes

Table 3

1.5.3 Test Configuration

Configuration	Description
AC Powered	The EUT was tested with a Raspberry Pi and a display drive board fitted to the rear side of the EUT. The EUT was powered from a 5 V DC output from a Raspberry Pi. The EUT had a ribbon cable connection to a display drive board which was then connected to the Raspberry Pi.

Table 4

1.5.4 Modes of Operation

Mode	Description
Operating	The EUT was powered and running a command prompt script.

Table 5

1.5.5 Monitoring of Performance

The EUT was monitored for constant display of a running tera term script, CCTV was used where required.

1.5.6 Performance Criteria

Performance Criteria A

The apparatus shall continue to operate as intended during and after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer when the apparatus is used as intended. The performance level may be replaced by a permissible loss of performance. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, either of these may be derived from the product description and documentation and what the user may reasonably expect from the apparatus if used as intended.

The manufacturers specified performance level is detailed as:

The EUTs command prompt script shall continue to update throughout the test with no loss of performance or degradation.

Performance Criteria 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 specified by the manufacturer when the apparatus is used as intended. The performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed. No change of actual operating state or stored data is allowed. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, either of these may be derived from the product description and documentation and what the user may reasonably expect from the apparatus if used as intended.

The manufacturers specified performance level is detailed as:

The EUTs command prompt script is allowed to stop updating if it self-recovers and continues to update after the test has been applied.

1.6 Deviations from the Standard

No deviations from the applicable test standard were made during testing.

1.7 EUT Modification Record

The table below details modifications made to the EUT during the test programme.

The modifications incorporated during each test are recorded on the appropriate test pages.

Modification State	Description of Modification still fitted to EUT	Modification Fitted By	Date Modification Fitted
Model: Raspberry Pi Touch Display, Serial Number: Not Serialised (FAR-702760-004)			
0	As supplied by the customer	Not Applicable	Not Applicable

Table 6

1.8 Test Location

TÜV SÜD conducted the following tests at our Octagon House Test Laboratory.

Test Name	Name of Engineer(s)	Accreditation
Configuration and Mode: AC Powered - Operating		
Enclosure Port - Electrostatic Discharge	Matthew Dawkins	UKAS
Enclosure Port - Continuous RF Electromagnetic Field Disturbances, Swept Frequency	Matthew Dawkins	UKAS
Enclosure Port - Continuous RF Electromagnetic Field Disturbances, Spot Frequencies	Matthew Dawkins	UKAS
Radiated Emissions	Matthew Dawkins	UKAS

Table 7

Office Address:

TÜV SÜD
Octagon House
Concorde Way
Fareham
Hampshire
PO15 5RL
United Kingdom

2 Test Details

2.1 Enclosure Port - Electrostatic Discharge

2.1.1 Specification Reference

EN 55035, Clause 5 Table 1, 1.4

2.1.2 Equipment Under Test and Modification State

Model: Raspberry Pi Touch Display, Serial Number: Not Serialised (FAR-702760-004)

2.1.3 Date of Test

12-January-2023

2.1.4 Test Method

The equipment under test including associated cabling was configured on a horizontal coupling plane fitted with a 0.5mm insulated surface attached to the top of a 0.8m non-conductive table for table-top equipment or on a 0.1m insulated support for floor standing equipment, above a ground reference plane within a test laboratory.

Using the air discharge method for non-metallic parts, contact discharge method for metallic parts with both vertical and horizontal couple plane discharge methods for the sides of the equipment under test, The required electrostatic discharge voltage levels in both voltage polarities were applied at the detailed pulse repetition rate.

During this test, any anomalies in the equipment under tests performance were recorded.

2.1.5 Environmental Conditions

Ambient Temperature	19.2 °C
Relative Humidity	42.6 %
Atmospheric Pressure	993.0 mbar

2.1.6 Specification Limits

Required Test Levels			Performance Criteria
Discharge type	Discharge Level (±kV)	Number of discharges per location (each polarity)	
Air – Direct	2, 4 and 8	10	B
Contact – Direct	4		
Contact – Indirect	4		
Supplementary information: None.			

Table 8

2.1.7 Test Results

Results for Configuration and Mode: AC Powered - Operating.

Performance assessment of the EUT made during this test: Pass.

Detailed results are shown below.

Test Point	Discharge	Results									
		2 kV		4 kV		6 kV		8 kV		15 kV	
		+	-	+	-	+	-	+	-	+	-
Horizontal Coupling Plane	Contact	N/A	N/A	✓	✓	N/A	N/A	N/A	N/A	N/A	N/A
Vertical Coupling Plane	Contact	N/A	N/A	✓	✓	N/A	N/A	N/A	N/A	N/A	N/A
Contact Discharges	Contact	N/A	N/A	✓ O1	✓ O1	N/A	N/A	N/A	N/A	N/A	N/A
Air Discharges	Air	✓*	✓*	✓*	✓*	N/A	N/A	✓*	✓*	N/A	N/A

Table 9

Key to Results	
✓	The EUT's performance was not impaired at this test point when the ESD pulse was applied.
✓*	No discharge occurred at this point when the ESD pulse was applied.
N/A	Not Applicable.
O1	When applying contact discharges to the rear of the EUT, the mounted Raspberry Pi lost its functionality, The EUT stayed powered and illuminated and the client believes that the display was still running but the Raspberry Pi itself was susceptible.

Table 10

Contact Air

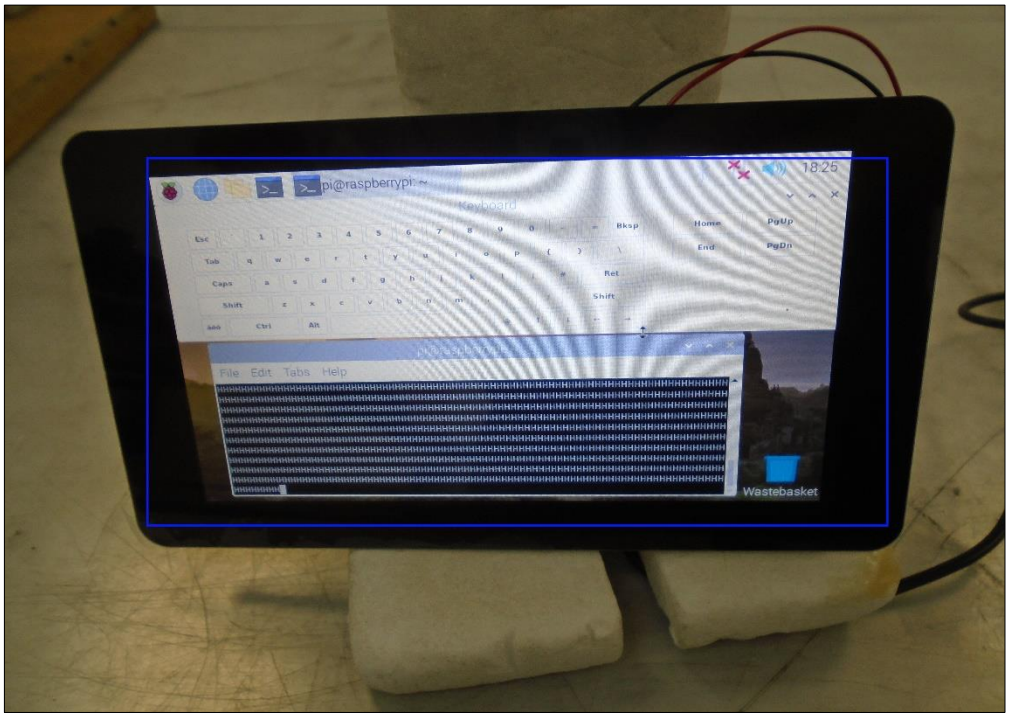

Figure 3 - ESD Test Positions

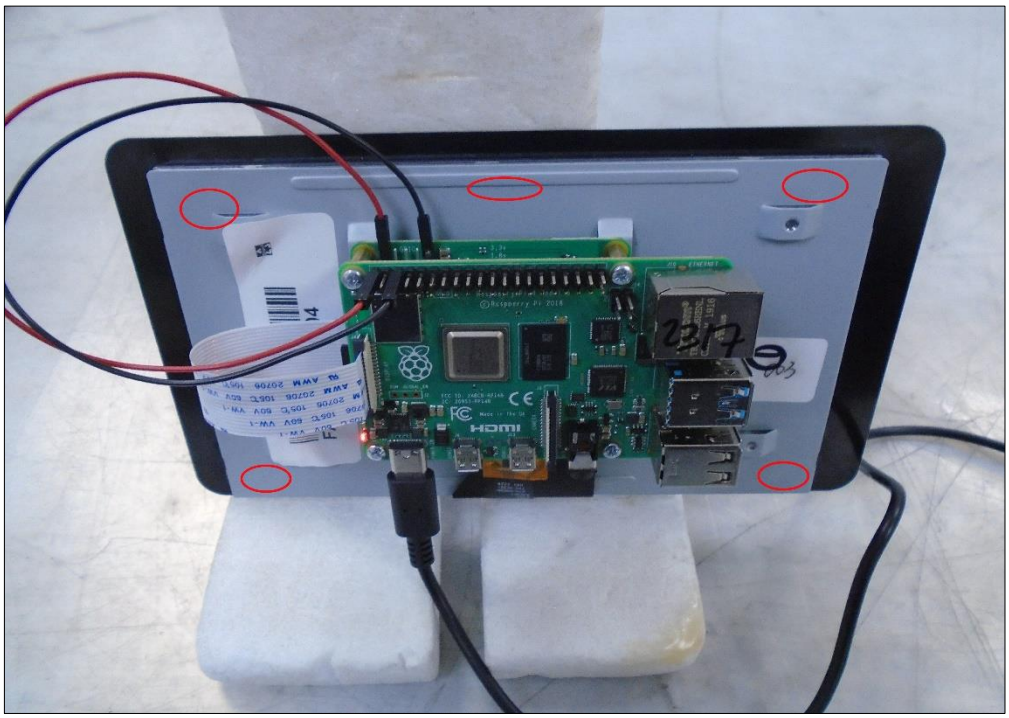

Figure 4 - ESD Test Positions

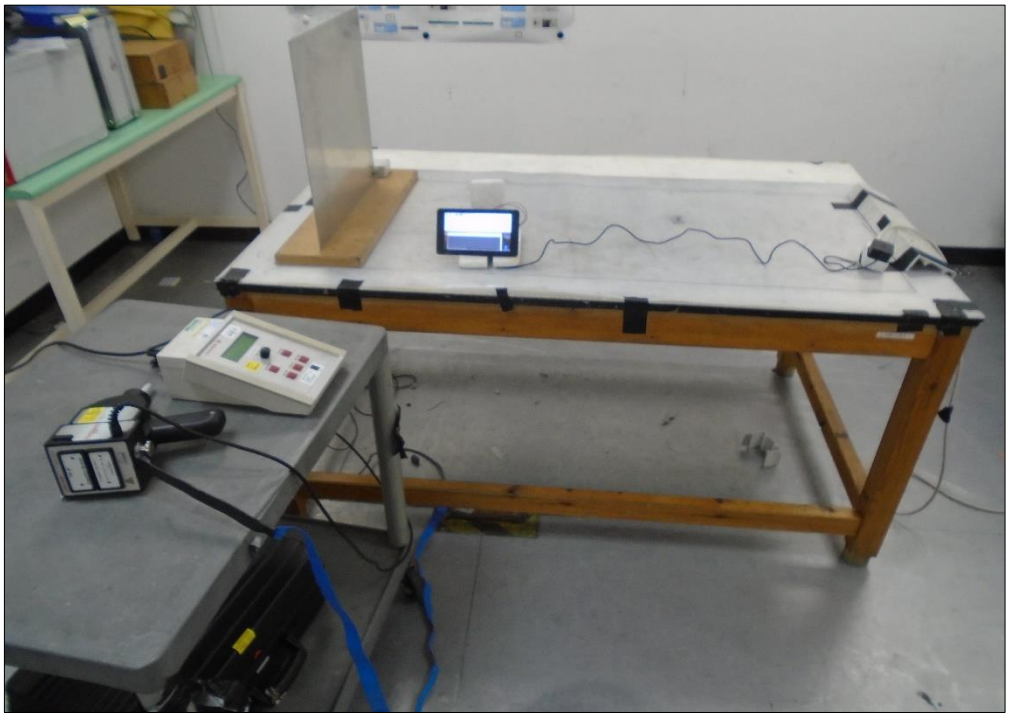

Figure 5 - Test Setup

2.1.8 Test Location and Test Equipment Used

This test was carried out in EMC Laboratory 2.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Expires
ESD Generator	Schloder	SESD 30000	4724	12	13-Sep-2023

Table 11

2.2 Enclosure Port - Continuous RF Electromagnetic Field Disturbances, Swept Frequency

2.2.1 Specification Reference

EN 55035, Clause 5 Table 1, 1.2

2.2.2 Equipment Under Test and Modification State

Model: Raspberry Pi Touch Display, Serial Number: Not Serialised (FAR-702760-004)

2.2.3 Date of Test

12-January-2023

2.2.4 Test Method

The equipment under test including associated cabling was configured on a 0.8 m non-conductive table for table-top equipment within a pre-calibrated semi anechoic chamber.

Due to the EUTs small physical size and narrow build, X, Y and Z orientations of the equipment under test were subjected to the required RF field strength, modulated as described and swept over the frequency range of test with the antenna positioned in both horizontal and vertical polarisations.

During this test, any anomalies in the equipment under tests performance were recorded.

2.2.5 Environmental Conditions

Ambient Temperature	21.8 °C
Relative Humidity	36.1 %
Atmospheric Pressure	996.0 mbar

2.2.6 Specification Limits

Required Test Levels					Performance Criteria
Frequency Range (MHz)	Test Level (V/m)	Modulation	Step Size (%)	Dwell (s)	
80 to 1000	3	AM (80 %,1 kHz, sine wave)	1	≥ 1 but ≤ 5	A
Supplementary information: None					

Table 12

2.2.7 Test Results

Results for Configuration and Mode: AC Powered - Operating.

Performance assessment of the EUT made during this test: Pass.

Detailed results are shown below.

Tabulated Results for RF Electromagnetic Field					
Frequency Range (MHz)	Side of the equipment under test	Antenna Polarization	Test Level (V/m)	Dwell Time (s)	Result
80 to 1000	X, Y and Z	Horizontal and Vertical	3	1	80 to 1000

Table 13

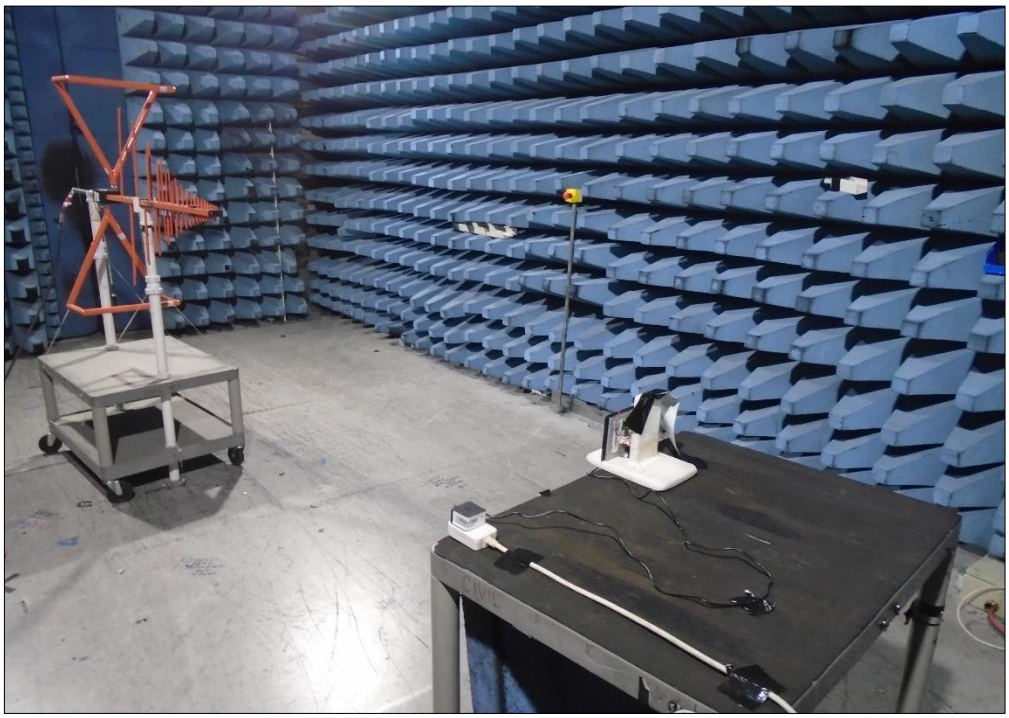

Figure 6 - Test Setup

2.2.8 Test Location and Test Equipment Used

This test was carried out in EMC Chamber 2.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Expires
Screened Room (2)	Rainford	Rainford	1542	12	23-Mar-2023
Radiated Immunity Test Software	Amp Research	EMCWare V4.0.7	4899	-	Software
Signal Generator (9 kHz to 6 GHz)	Rohde & Schwarz	SMB 100A	3500	12	25-Apr-2023
Amplifier (80 MHz to 1 GHz)	Amp Research	250W1000A	3029	-	TU
Directional Coupler	Amp Research	DC6180	283	-	TU
Power Sensor (100 kHz to 6 GHz)	Rohde & Schwarz	NRV-Z4	3815	-	TU
Power Meter	Rohde & Schwarz	NRVD	747	-	TU
Antenna (Bilog, 30 MHz to 1 GHz)	Schaffner	CBL6143	322	-	TU
Laser Powered Electric Field Sensor	Dare Development	RadiSense VI - CTR1001A	3209	-	TU

Table 14

TU - Traceability Unscheduled

2.3 Enclosure Port - Continuous RF Electromagnetic Field Disturbances, Spot Frequencies

2.3.1 Specification Reference

EN 55035, Clause 5 Table 1, 1.3

2.3.2 Equipment Under Test and Modification State

Model: Raspberry Pi Touch Display, Serial Number: Not Serialised (FAR-702760-004)

2.3.3 Date of Test

12-January-2023

2.3.4 Test Method

The equipment under test including associated cabling was configured on a 0.8 m non-conductive table for table-top equipment within a pre-calibrated semi anechoic chamber.

Due to the EUTs small physical size, X,Y and Z orientations of the equipment under test were subjected to the required RF field strength at the required spot frequencies and modulated as described with the antenna positioned in both horizontal and vertical polarisations.

During this test, any anomalies in the equipment under tests performance were recorded.

2.3.5 Environmental Conditions

Ambient Temperature	21.8 °C
Relative Humidity	35.0 %
Atmospheric Pressure	996.0 mbar

2.3.6 Specification Limits

Required Test Levels				Performance Criteria
Frequency (MHz)	Test Level (Vrms/m)	Modulation	Dwell (s)	
1800	3	AM (80 %,1 kHz, sine wave)	≥ 1 but ≤ 5	A
2600				
3500				
5000				
Supplementary information: None				

Table 15

2.3.7 Test Results

Results for Configuration and Mode: AC Powered - Operating.

Performance assessment of the EUT made during this test: Pass.

Detailed results are shown below.

Tabulated Results for RF Electromagnetic Field						
Frequency (MHz)	Side of the equipment under test	Antenna polarization	Test Level (Vrms/m)	Dwell Time (s)	Modulation Applied	Result
1800, 2600, 3500 and 5000	X, Y and Z	Horizontal and Vertical	3	5	AM (80 %,1 kHz, sine wave)	Pass

Table 16

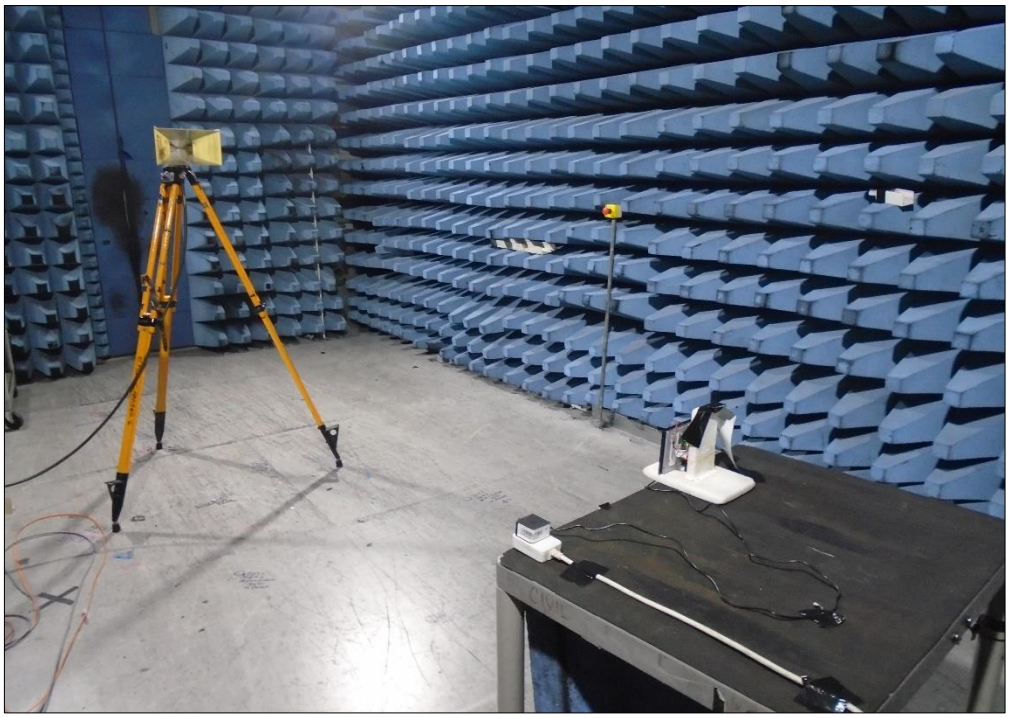

Figure 7 - Test Setup

2.3.8 Test Location and Test Equipment Used

This test was carried out in EMC Chamber 2.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Expires
Screened Room (2)	Rainford	Rainford	1542	12	23-Mar-2023
Radiated Immunity Test Software	Amp Research	EMCWare V4.0.7	4899	-	Software
Signal Generator (9 kHz to 6 GHz)	Rohde & Schwarz	SMB 100A	3500	12	25-Apr-2023
Amplifier (1 GHz to 2.5 GHz)	Thorn	PTC6341	2069	-	TU
Amplifier (2.5 GHz to 8 GHz)	Thorn	PTC6343	2068	-	TU
Power Sensor (100 kHz to 6 GHz)	Rohde & Schwarz	NRV-Z4	3815	-	TU
Power Meter	Rohde & Schwarz	NRVD	747	-	TU
Antenna (Double Ridge Guide, 1GHz-18GHz)	EMCO	3115	234	-	TU
Laser Powered Electric Field Sensor	Dare Development	RadiSense VI - CTR1001A	3209	-	TU

Table 17

TU - Traceability Unscheduled

2.4 Radiated Emissions

2.4.1 Specification Reference

EN 55032, Clause Annex A, Section A.2

2.4.2 Equipment Under Test and Modification State

Model: Raspberry Pi Touch Display, Serial Number: Not Serialised (FAR-702760-004)

2.4.3 Date of Test

10-January-2023 to 11-January-2023

2.4.4 Test Method

The EUT was set up in a semi-anechoic chamber on a remotely controlled turntable and placed on a non-conductive table 0.8 m above a reference ground plane.

A pre-scan of the EUT emissions profile was made while varying the antenna to EUT azimuth and polarisation using a peak detector.

Using the pre-scan list of the highest emissions detected, their bearing and associated antenna polarisation, the EUT was then formally measured using Quasi-Peak and CISPR Average detectors as appropriate.

The readings were maximised by adjusting the antenna height, polarisation and turntable azimuth, in accordance with the specification.

2.4.5 Environmental Conditions

Ambient Temperature	24.4 °C
Relative Humidity	40.5 %
Atmospheric Pressure	998.0 mbar

2.4.6 Specification Limits

Required Specification Limits - Class B at 3 m Measurement Distance			
Frequency Range (MHz)	Quasi-peak (dBµV/m)	Peak (dBµV/m)	CISPR Average (dBµV/m)
30 to 230	40	N/A	N/A
230 to 1000	47	N/A	N/A
1000 to 3000	N/A	70	50
3000 to 6000	N/A	74	54

Supplementary information:
Note 1. The EUT is powered at one of the nominal input voltages and frequencies, unless the EUT is intended for worldwide use.
Note 2. For apparatus containing devices operating at frequencies less than 9 kHz measurements only need to be performed up to 230 MHz. If the highest internal frequency of the EUT is less than 108 MHz, the measurement shall only be made up to 1 GHz. If the highest internal frequency of the EUT is between 108 MHz and 500 MHz, the measurement shall only be made up to 2 GHz. If the highest internal frequency of the EUT is between 500 MHz and 1 GHz, the measurement shall only be made up to 5 GHz. If the highest internal frequency of the EUT is above 1 GHz, the measurement shall be made up to 6 GHz. Where the highest internal frequency if not known, tests shall be performed up to 6 GHz.
Note 3. At transitional frequencies, the lower limit applies.

Table 18

2.4.7 Test Results

Results for Configuration and Mode: AC Powered - Operating.

Performance assessment of the EUT made during this test: Pass.

Tested to EN 55032 Class B Test Limits.

Detailed results are shown below.

Highest frequency generated or used within the EUT:	375 MHz
Which necessitates an upper frequency test limit of:	2 GHz (Tested to 6 GHz).
Measurement distance used for < 1 GHz measurements:	3 m
Measurement distance used for > 1 GHz measurements:	3 m

Applied Supply Voltage:	5 V DC
Applied Supply Frequency:	N/A

Frequency Range of Test: 30 MHz to 1 GHz

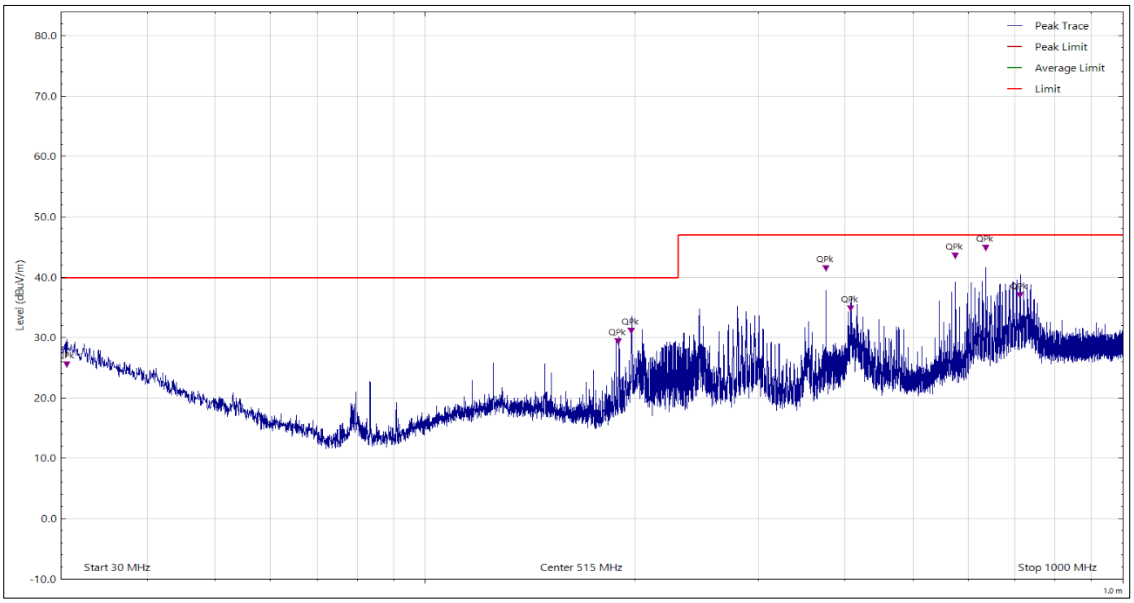

Figure 8 - Graphical Results - Horizontal Polarity

Frequency (MHz)	Level	Limit	Margin (dB)	Detector	Unit	Angle (°)	Height (cm)	Polarisation
30.597	24.77	40.00	-15.23	Q-Peak	dBµV/m	22	100	Horizontal
189.237	28.64	40.00	-11.36	Q-Peak	dBµV/m	207	110	Horizontal
197.512	30.32	40.00	-9.68	Q-Peak	dBµV/m	204	100	Horizontal
375.004	40.67	47.00	-6.33	Q-Peak	dBµV/m	197	100	Horizontal
407.461	34.07	47.00	-12.93	Q-Peak	dBµV/m	330	100	Horizontal
575.209	42.77	47.00	-4.23	Q-Peak	dBµV/m	159	130	Horizontal
635.749	44.08	47.00	-2.92	Q-Peak	dBµV/m	209	119	Horizontal
711.731	36.24	47.00	-10.76	Q-Peak	dBµV/m	360	100	Horizontal

Table 19

Frequency Range of Test: 30 MHz to 1 GHz

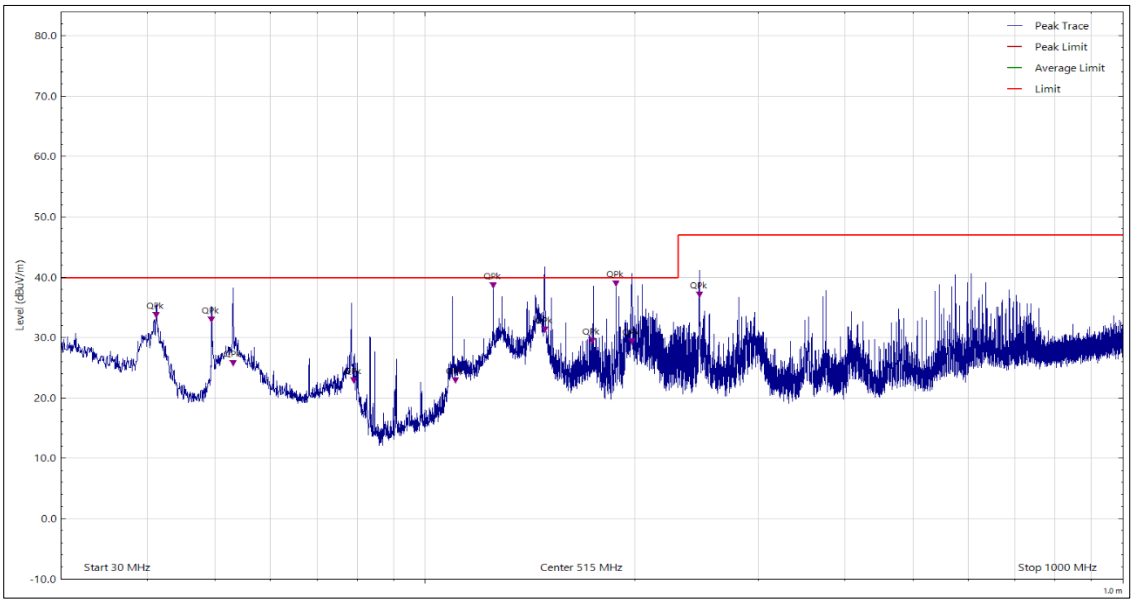

Figure 9 - Graphical Results - Vertical Polarity

Frequency (MHz)	Level	Limit	Margin (dB)	Detector	Unit	Angle (°)	Height (cm)	Polarisation
41.167	32.97	40.00	-7.03	Q-Peak	dBµV/m	194	100	Vertical
49.345	32.18	40.00	-7.82	Q-Peak	dBµV/m	344	109	Vertical
52.997	25.04	40.00	-14.96	Q-Peak	dBµV/m	243	110	Vertical
79.022	22.18	40.00	-17.82	Q-Peak	dBµV/m	240	153	Vertical
110.471	22.11	40.00	-17.89	Q-Peak	dBµV/m	234	100	Vertical
125.004	37.90	40.00	-2.10	Q-Peak	dBµV/m	275	104	Vertical
148.279	30.54	40.00	-9.46	Q-Peak	dBµV/m	356	100	Vertical
173.559	28.65	40.00	-11.35	Q-Peak	dBµV/m	194	101	Vertical
187.502	38.19	40.00	-1.81	Q-Peak	dBµV/m	309	100	Vertical
197.757	28.54	40.00	-11.46	Q-Peak	dBµV/m	341	108	Vertical
247.042	36.34	47.00	-10.66	Q-Peak	dBµV/m	302	100	Vertical

Table 20

Frequency Range of Test: 1 GHz to 6 GHz

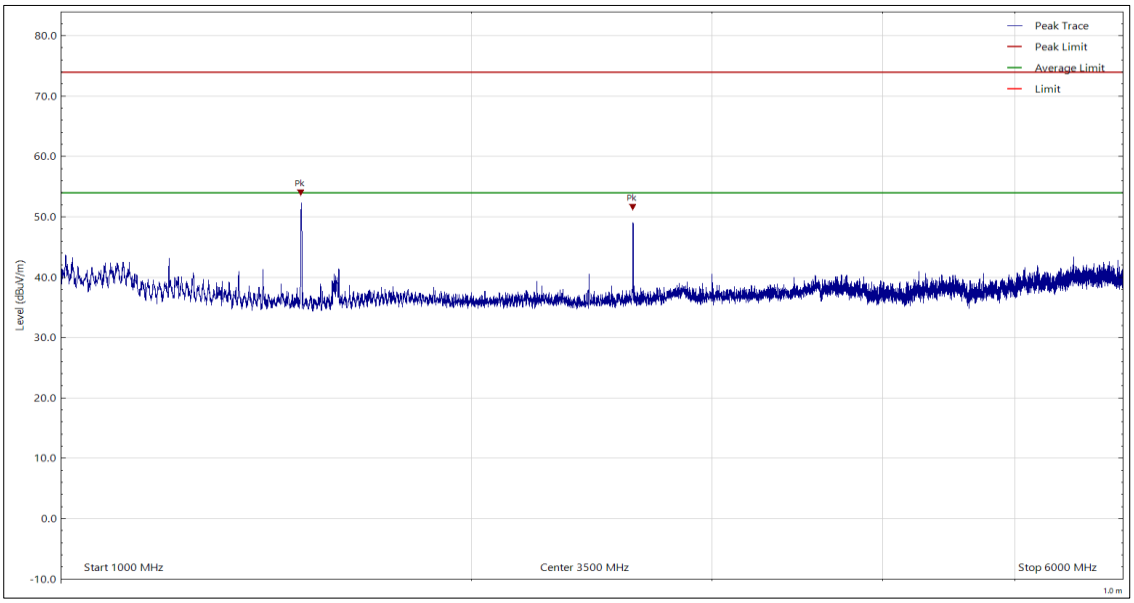

Figure 10 - Graphical Results - Horizontal Polarity

Frequency (MHz)	Level	Limit	Margin (dB)	Detector	Unit	Angle (°)	Height (cm)	Polarisation
1499.855	53.25	74.00	-20.75	Peak	dBµV/m	233	106	Horizontal
1499.855	48.48	54.00	-5.52	CISPR Avg	dBµV/m	233	106	Horizontal
2625.395	50.85	74.00	-23.15	Peak	dBµV/m	219	101	Horizontal
2625.395	41.30	54.00	-12.70	CISPR Avg	dBµV/m	219	101	Horizontal

Table 21

No other final measurements were made as all other peak emissions seen were greater than 10 dB below the CISPR Average test limit.

Frequency Range of Test: 1 GHz to 6 GHz

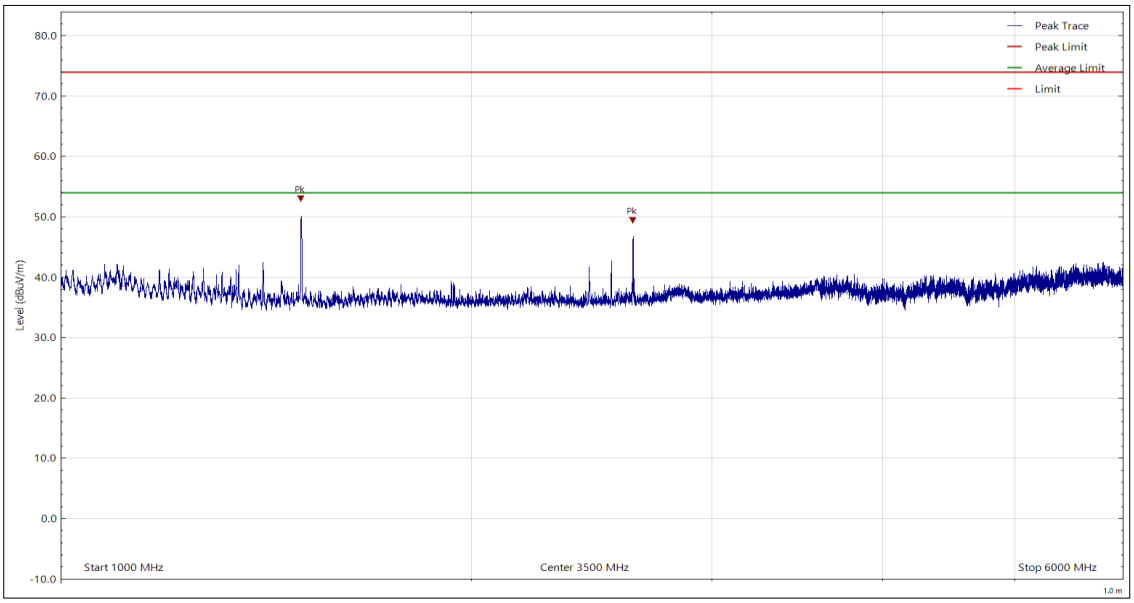

Figure 11 - Graphical Results - Vertical Polarity

Frequency (MHz)	Level	Limit	Margin (dB)	Detector	Unit	Angle (°)	Height (cm)	Polarisation
1499.999	52.28	74.00	-21.72	Peak	dBµV/m	210	109	Vertical
1499.999	47.50	54.00	-6.50	CISPR Avg	dBµV/m	210	109	Vertical
2624.538	48.69	74.00	-25.31	Peak	dBµV/m	91	100	Vertical
2624.538	36.21	54.00	-17.79	CISPR Avg	dBµV/m	91	100	Vertical

Table 22

No other final measurements were made as all other peak emissions seen were greater than 10 dB below the CISPR Average test limit.

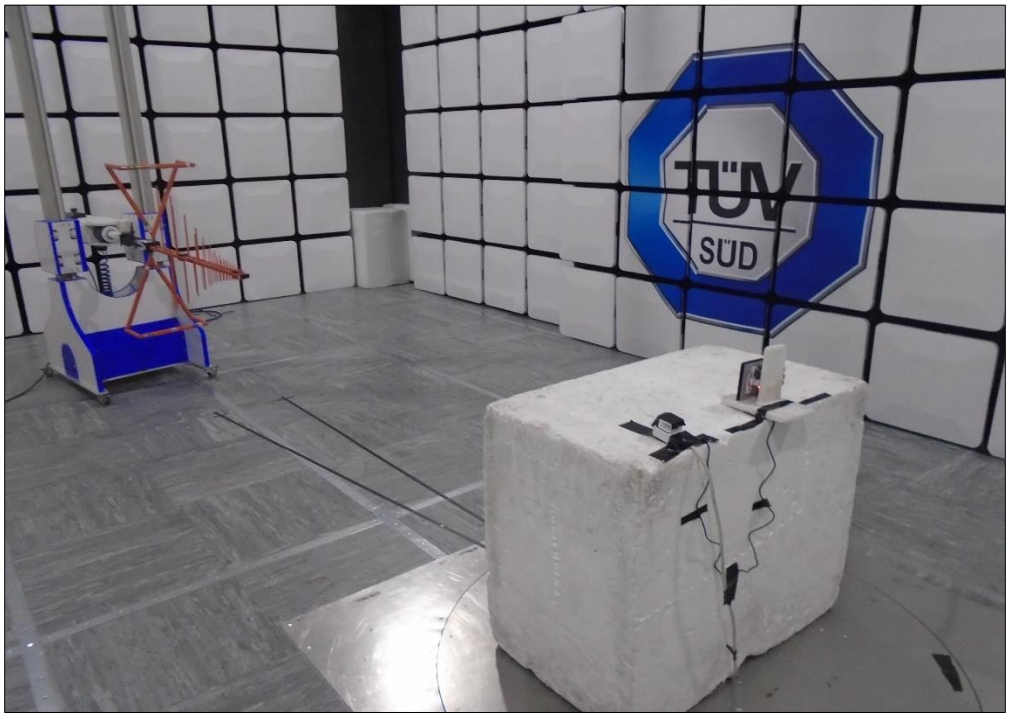

Figure 12 –Test Setup - Below 1 GHz

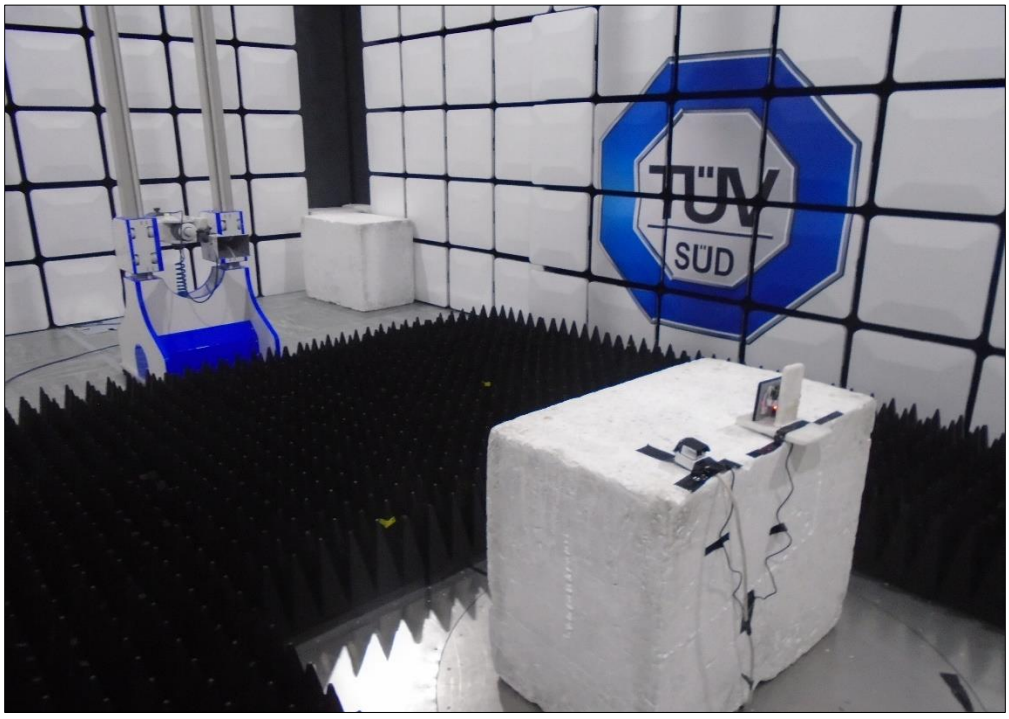

Figure 13 - Test Setup - Above 1 GHz

2.4.8 Test Location and Test Equipment Used

This test was carried out in EMC Chamber 12.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Expires
Screened Room (12)	MVG	EMC-3	5621	36	11-Aug-2023
Emissions Software	TUV SUD	EmX V3.1.6	5125	-	Software
Test Receiver	Rohde & Schwarz	ESU40	3506	12	25-Mar-2023
Turntable & Mast Controller	Maturo Gmbh	NCD/498/2799.01	5612	-	TU
Tilt Antenna Mast	Maturo Gmbh	TAM 4.0-P	5613	-	TU
Cable (SMA to SMA, 2 m)	Rhophase	3PS-1801A-2000-3PS	4113	12	27-Jan-2023
Cable (N-Type to N-Type, 8 m)	Teledyne	PR90-088-8MTR	5450	6	23-Apr-2023
2m K-Type Cable	Junkosha	MWX241/B	5909	12	14-Apr-2023
Pre-Amplifier (1 GHz to 18 GHz)	Schwarzbeck	BBV 9718 C	5350	12	20-Oct-2023
Antenna with attenuator (Bilog, 30 MHz to 3 GHz)	Schaffner	CBL6143	287	24	02-Dec-2024
Antenna (DRG, 1 GHz to 10.5 GHz)	Schwarzbeck	BBHA9120B	5611	12	16-Oct-2023

Table 23

TU - Traceability Unscheduled

3 Test Equipment Information

3.1 General Test Equipment Used

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Expires
Thermo-hygro-Barometer	PCE Instruments	PCE-THB-40	5472	12	25-Mar-2023

Table 24

4 Incident Reports

No incidents reports were raised.

5 Measurement Uncertainty

For a 95% confidence level, the measurement uncertainties for defined systems are:

Test Name	Measurement Uncertainty
Enclosure Port - Electrostatic Discharge	The test was applied using proprietary equipment that meets the requirements of EN 61000-4-2
Enclosure Port - Continuous RF Electromagnetic Field Disturbances, Swept Frequency	10 MHz to 6 GHz Test Amplitude ±2.0 dB
Enclosure Port - Continuous RF Electromagnetic Field Disturbances, Spot Frequencies	10 MHz to 6 GHz Test Amplitude ±2.0 dB
Radiated Emissions	30 MHz to 1 GHz, Bilog Antenna, ±5.2 dB 1 GHz to 40 GHz, Horn Antenna, ±6.3 dB

Table 25

Worst case error for both Time and Frequency measurement 12 parts in 10^6.

Measurement Uncertainty Decision Rule

Determination of conformity with the specification limits is based on the decision rule according to IEC Guide 115:2021, Clause 4.4.3 (Procedure 2). The measurement results are directly compared with the test limit to determine conformance with the requirements of the standard.

Risk: The uncertainty of measurement about the measured result is negligible with regard to the final pass/fail decision. The measurement result can be directly compared with the test limit to determine conformance with the requirement (compare IEC Guide 115). The level of risk to falsely accept and falsely reject items is further described in ILAC-G8.