

FCC and ISEDC Test Report

Sepura Ltd
TETRA Radio, Model: SC2028

In accordance with FCC 47 CFR Part 15B,
ICES-003 and ISEDC RSS-GEN

Prepared for: Sepura Ltd
9000 Cambridge Research Park
Beach Drive
Waterbeach
Cambridge
CB25 9TL
United Kingdom



Add value.
Inspire trust.

FCC ID: XX6SC2028

IC: 8739A-SC2028

COMMERCIAL-IN-CONFIDENCE

Document 75947270-01 Issue 01

SIGNATURE

NAME	JOB TITLE	RESPONSIBLE FOR	ISSUE DATE
Andy Lawson	Senior Engineer	Authorised Signatory	20 January 2020

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

ENGINEERING STATEMENT

The measurements shown in this report were made in accordance with the procedures described on test pages. All reported testing was carried out on a sample equipment to demonstrate limited compliance with FCC 47 CFR Part 15B, ICES-003 and ISEDC RSS-GEN. The sample tested was found to comply with the requirements defined in the applied rules.

RESPONSIBLE FOR	NAME	DATE	SIGNATURE
Testing	Connor Lee	20 January 2020	

FCC Accreditation

90987 Octagon House, Fareham Test Laboratory

ISEDC Accreditation

12669A Octagon House, Fareham Test Laboratory

EXECUTIVE SUMMARY

A sample of this product was tested and found to be compliant with FCC 47 CFR Part 15B: 2018, ICES-003: 2016 and ISEDC RSS-GEN: Issue 5 (04-2018) + A1 (03-2019) for the tests detailed in section 1.3.



DISCLAIMER AND COPYRIGHT

This non-binding report has been prepared by TÜV SÜD with all reasonable skill and care. The document is confidential to the potential Client and TÜV SÜD. No part of this document may be reproduced without the prior written approval of TÜV SÜD. © 2020 TÜV SÜD. This report relates only to the actual item/items tested.

ACCREDITATION

Our UKAS Accreditation does not cover opinions and interpretations and any expressed are outside the scope of our UKAS Accreditation. Results of tests not covered by our UKAS Accreditation Schedule are marked NUA (Not UKAS Accredited).

TÜV SÜD
is a trading name of TÜV SÜD Ltd
Registered in Scotland at East Kilbride,
Glasgow G75 0QF, United Kingdom
Registered number: SC215164

TÜV SÜD Ltd is a
TÜV SÜD Group Company

Phone: +44 (0) 1489 558100
Fax: +44 (0) 1489 558101
www.tuv-sud.co.uk

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



Contents

1	Report Summary	2
1.1	Report Modification Record.....	2
1.2	Introduction.....	2
1.3	Brief Summary of Results	3
1.4	Declaration of Build Status	4
1.5	Product Information	6
1.6	Deviations from the Standard.....	8
1.7	EUT Modification Record	8
1.8	Test Location	8
2	Test Details	9
2.1	Conducted Disturbance at Mains Terminals	9
2.2	Radiated Disturbance	17
3	Incident Reports	33
4	Measurement Uncertainty	34



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	20 January 2020

Table 1

1.2 Introduction

Applicant	Sepura Ltd
Manufacturer	Sepura Ltd
Model Number(s)	SC2028
Serial Number(s)	1PR001925GK63ZJ
Hardware Version(s)	Pre-Production
Software Version(s)	2001 730 07367
Number of Samples Tested	1
Test Specification/Issue/Date	FCC 47 CFR Part 15B: 2018 ICES-003: 2016 ISED RSS-GEN: Issue 5 (04-2018) + A1 (03-2019)
Order Number	PLC-PO014257-2
Date	11-October-2019
Date of Receipt of EUT	22-October-2019 and 06-December-2019
Start of Test	03-January-2020
Finish of Test	06-January-2020
Name of Engineer(s)	Connor Lee
Related Document(s)	ANSI C63.4: 2014



1.3 Brief Summary of Results

A brief summary of the tests carried out in accordance with FCC 47 CFR Part 15B, ICES-003 and ISED RSS-GEN is shown below.

Section	Specification Clause			Test Description	Result	Comments/Base Standard
	Part 15B	ICES-003	RSS-GEN			
Configuration and Mode: AC powered with standard battery - Transmitting and charging						
2.1	15.107	6.1	8.8	Conducted Disturbance at Mains Terminals	Pass	ANSI C63.4: 2014
Configuration and Mode: AC powered with standard battery - Idle and charging						
2.2	15.109	6.2	7.1	Radiated Disturbance	Pass	ANSI C63.4: 2014
Configuration and Mode: AC powered with high capacity battery - Transmitting and charging						
2.1	15.107	6.1	8.8	Conducted Disturbance at Mains Terminals	Pass	ANSI C63.4: 2014
Configuration and Mode: AC powered with high capacity battery - Idle and charging						
2.2	15.109	6.2	7.1	Radiated Disturbance	Pass	ANSI C63.4: 2014

Table 2



1.4 Declaration of Build Status

Equipment Description

Technical Description: <i>(Please provide a brief description of the intended use of the equipment)</i>	The SC20 hand-portable terminal is a TETRA enabled radio with Bluetooth and Wi-Fi capability
Manufacturer:	Sepura Limited
Model:	SC2028
Part Number:	N/A
Hardware Version:	Pre-Production
Software Version:	2001 730 07367
FCC ID (if applicable)	XX6SC2028
IC ID (if applicable)	8739A-SC2028

Intentional Radiators

Technology	TETRA	TETRA	BT Classic/EDR	BLE	WLAN	
Frequency Band (MHz)	806-824	851-869	2402-2480	2402-2480	2412-2462	
Conducted Declared Output Power (dBm)	34	34	7.382	7.382	16.5	
Antenna Gain (dBi)	> 0	> 0	2.5	2.5	2.5	
Supported Bandwidth(s) (MHz)	25 kHz	25 kHz	1	2	16.5 22 16.5	
Modulation Scheme(s)	$\pi/4$ DQPSK	$\pi/4$ DQPSK	8PSK, DQPSK, GFSK	8PSK, DQPSK, GFSK	802.11g, 802.11b, 802.11n	
ITU Emission Designator	22K0DXW	22K0DXW	1M00F1D	2M00F1D	16M5D1D 22M0G1D 16M5D1D	
Bottom Frequency (MHz)	806	851	2402	2402	2412	
Middle Frequency (MHz)	815	860	2441	2441	2437	
Top Frequency (MHz)	824	869	2480	2480	2462	

Un-intentional Radiators

Highest frequency generated or used in the device or on which the device operates or tunes	2480 MHz
Lowest frequency generated or used in the device or on which the device operates or tunes	32.768 kHz
Class A Digital Device (Use in commercial, industrial or business environment) <input checked="" type="checkbox"/>	
Class B Digital Device (Use in residential environment only) <input type="checkbox"/>	

AC Power Source

AC supply frequency:		Hz
Voltage		V
Max current:		A
Single Phase <input type="checkbox"/> Three Phase <input type="checkbox"/>		



DC Power Source

Nominal voltage:	7.4	V
Extreme upper voltage:	7.4	V
Extreme lower voltage:	6.2	V
Max current:	2	A

Battery Power Source

Voltage:	7.4	V
End-point voltage:	6.2	V (Point at which the battery will terminate)
Alkaline <input type="checkbox"/> Leclanche <input checked="" type="checkbox"/> Lithium <input type="checkbox"/> Nickel Cadmium <input type="checkbox"/> Lead Acid* <input type="checkbox"/> *(Vehicle regulated)		
Other <input type="checkbox"/>	Please detail:	

Charging

Can the EUT transmit whilst being charged	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
---	---

Temperature

Minimum temperature:	-30	°C
Maximum temperature:	+65	°C

Antenna Characteristics

Antenna connector <input checked="" type="checkbox"/> TETRA	State impedance	50	Ohm
Temporary antenna connector <input type="checkbox"/>	State impedance		Ohm
Integral antenna <input checked="" type="checkbox"/>	Type: PCB	State impedance	50 Ohm
External antenna <input type="checkbox"/>	Type:	State impedance	dBI

Ancillaries (if applicable)

Manufacturer:		Part Number:	
Model:		Country of Origin:	

The SC2028 may be used with standard SC20 accessories, batteries, chargers, belt clips, holsters, remote speaker and microphones, earpieces etc

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

Name: Chris Beecham
 Position held: Conformance Engineer
 Date: 21 October 2019

1.5 Product Information

1.5.1 Technical Description

The SC20 hand-portable terminal is a TETRA enabled radio with Bluetooth and Wi-Fi capability.

The EUT was tested using the following ancillary items which were not under test:

- Antenna Model: Serial Number: Not serialised (0075947270-TSR0004)
- Battery, Model: 300-01852, Serial Number: 6E000000BC04173D
- Battery, Model: 300-01853, Serial Number: 38000000A984183D
- Charging Station, Model: STP/SC2 Series 1+1 Charger, Serial Number: 300-019307PP101839B91JQT
- AC to DC power adaptor, Model: ABSP024100240-1, Serial Number: 0075947270-TSR00020



Figure 1 - Front view



Figure 2 - Rear view

1.5.2 EUT Port/Cable Identification

Port	Max Cable Length specified	Usage	Type	Screened
Configuration and Mode: AC powered with standard battery - Transmitting and charging				
120 V AC Live	1.5 Meters	Power	120 V AC Power	No
120 V AC Neutral	1.5 Meters	Power	120 V AC Power	No
Configuration and Mode: AC powered with standard battery - Transmitting and charging				
120 V AC Live	1.5 Meters	Power	120 V AC Power	No
120 V AC Neutral	1.5 Meters	Power	120 V AC Power	No

Table 3

1.5.3 Test Configuration

Configuration	Description
AC powered with standard battery	The EUT was situated in its charging station during testing. The charging station was powered from a 120 V 60 Hz AC supply. The EUT had a standard battery fitted during testing.
AC powered with high capacity battery	The EUT was situated in its charging station during testing. The charging station was powered from a 120 V 60 Hz AC supply. The EUT had a high capacity battery fitted during testing.

Table 4



1.5.4 Modes of Operation

Mode	Description
Idle and charging	The product was in an idle state and was situated in its charge station with a discharged battery fitted so that the EUT was drawing maximum current.
Transmitting and charging	The product was in a transmitting state and was situated in its charge station with a discharged battery fitted so that the EUT was drawing maximum current.

Table 5

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
Handset Model: SC2028, Serial Number: 1PR001925GK63ZJ			
0	As supplied by the customer	Not Applicable	Not Applicable

Table 6

1.8 Test Location

TÜV SÜD conducted the following tests at our Fareham Test Laboratory.

Test Name	Name of Engineer(s)	Accreditation
Configuration and Mode: AC powered with standard battery - Idle and charging		
Radiated Disturbance	Connor Lee	UKAS
Configuration and Mode: AC powered with high capacity battery - Idle and charging		
Radiated Disturbance	Connor Lee	UKAS
Configuration and Mode: AC powered with standard battery - Transmitting and charging		
Conducted Disturbance at Mains Terminals	Connor Lee	UKAS
Configuration and Mode: AC powered with high capacity battery - Transmitting and charging		
Conducted Disturbance at Mains Terminals	Connor Lee	UKAS

Table 7

Office Address:

Octagon House
 Concorde Way
 Segensworth North
 Fareham
 Hampshire
 PO15 5RL
 United Kingdom



2 Test Details

2.1 Conducted Disturbance at Mains Terminals

2.1.1 Specification Reference

FCC 47 CFR Part 15B, Clause 15.107
ICES-003, Clause 6.1
ISED RSS-GEN, Clause 8.8

2.1.2 Equipment Under Test and Modification State

SC2028, S/N: 1PR001925GK63ZJ - Modification State 0

2.1.3 Date of Test

06-January-2020

2.1.4 Test Method

The EUT was setup according to ANSI C63.4, clause 5.2.

The EUT was placed on a non-conductive table 0.8 m above a reference ground plane. A vertical coupling plane was placed 0.4 m from the EUT boundary. A Line Impedance Stabilisation Network (LISN) was directly bonded to the ground-plane. The EUT was located so that the distance between the boundary of the EUT and the closest surface of the LISN was 0.8 m.

Interconnecting cables that hanged closer than 0.4 m to the ground plane were folded back and forth in the centre forming a bundle 0.3 m to 0.4 m long.

Input and output cables were terminated with equipment or loads representative of real usage conditions.

The EUT was configured to give the highest level of emissions within reason of a typical installation as described by the manufacturer.

2.1.5 Example Calculation

Quasi-Peak level (dB μ V) = Receiver level (dB μ V) + Correction Factor (dB)
Margin (dB) = Quasi-Peak level (dB μ V) - Limit (dB μ V)

CISPR Average level (dB μ V) = Receiver level (dB μ V) + Correction Factor (dB)
Margin (dB) = CISPR Average level (dB μ V) - Limit (dB μ V)

2.1.6 Example Test Setup Diagram

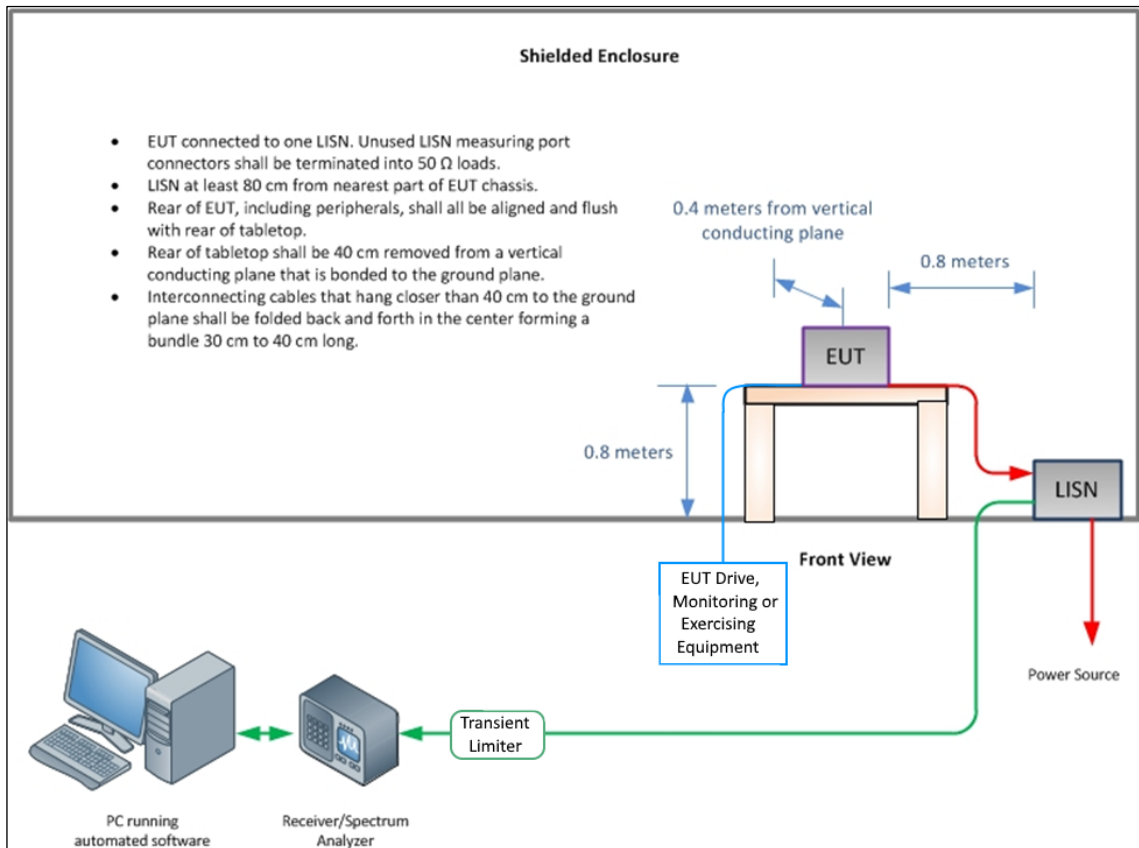


Figure 3 - Conducted Disturbance Example Test Setup

2.1.7 Environmental Conditions

Ambient Temperature 19.9 °C
 Relative Humidity 34.0 %

2.1.8 Specification Limits

Required Specification Limits (Class A)			
Line Under Test	Frequency Range (MHz)	Quasi-peak (dBμV)	CISPR Average (dBμV)
AC Power Port	0.15 to 0.5	79	66
	0.5 to 30	73	60

Table 8



2.1.9 Test Results

Results for Configuration and Mode: AC powered with standard battery - Transmitting and charging.

The test was performed in accordance with the Class A limits.

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

Detailed results are shown below.

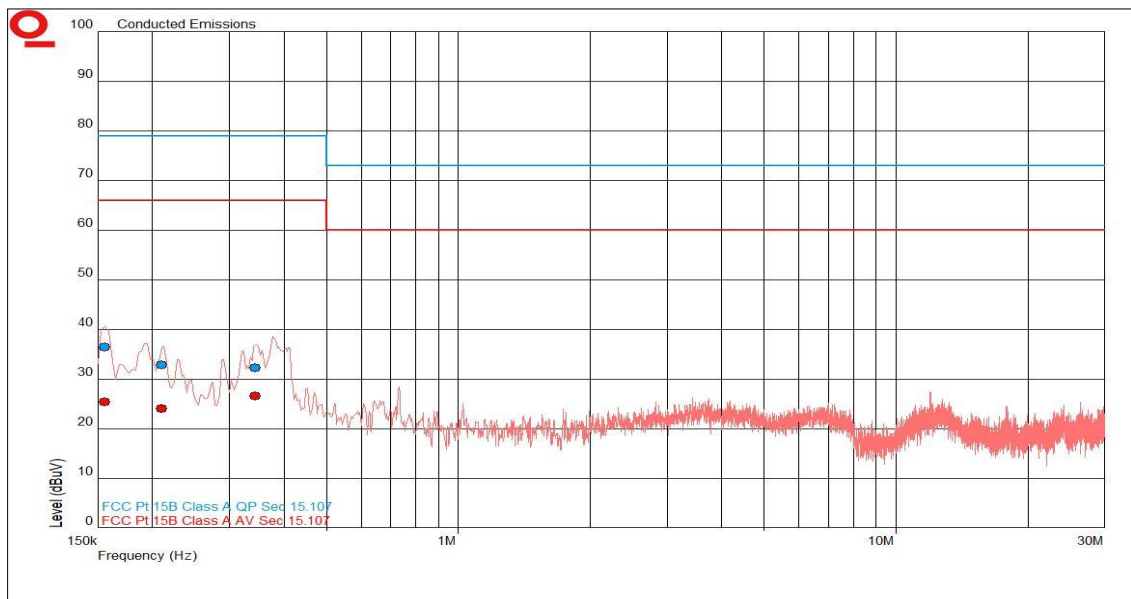


Figure 4 - Graphical Results - 120 V AC Live

Frequency (MHz)	QP Level (dBµV)	QP Limit (dBµV)	QP Margin (dB)	CISPR Average Level (dBµV)	CISPR Average Limit (dBµV)	CISPR Average Margin (dB)
0.156	36.4	79.0	-42.6	25.4	66.0	-40.6
0.210	32.9	79.0	-46.1	24.1	66.0	-41.9
0.344	32.3	79.0	-46.7	26.6	66.0	-39.4

Table 9

No other formal measurements were made as all other peak emissions seen were greater than 20 dB below the CISPR Average test limit.

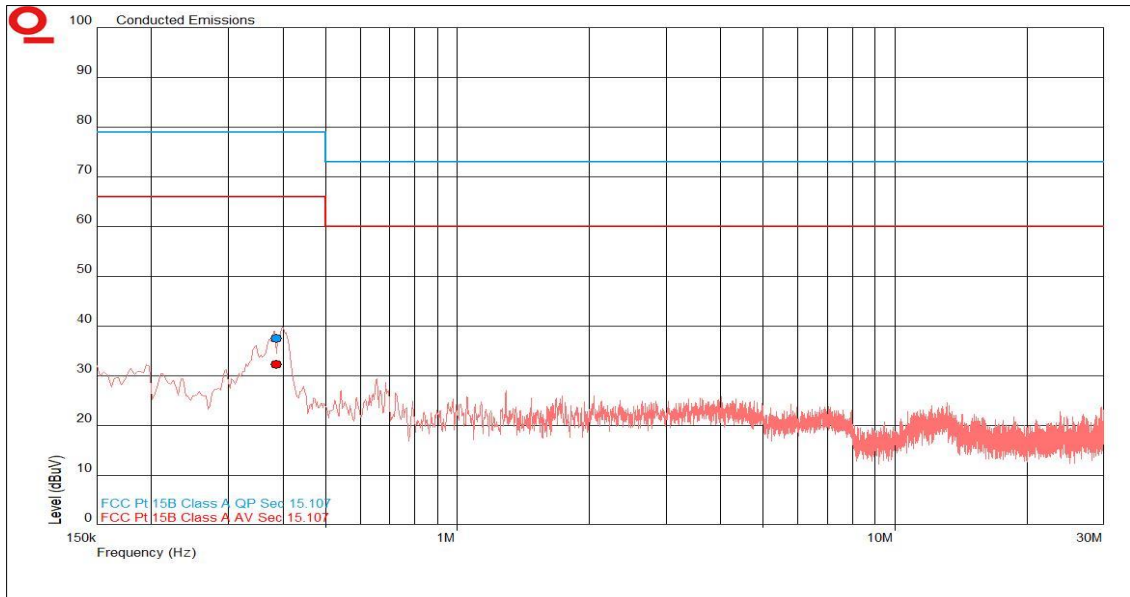


Figure 5 - Graphical Results - 120 V AC Neutral

Frequency (MHz)	QP Level (dBµV)	QP Limit (dBµV)	QP Margin (dB)	CISPR Average Level (dBµV)	CISPR Average Limit (dBµV)	CISPR Average Margin (dB)
0.387	37.5	79.0	-41.5	32.3	66.0	-33.7

Table 10

No other formal measurements were made as all other peak emissions seen were greater than 20 dB below the CISPR Average test limit.



Results for Configuration and Mode: AC powered with high capacity battery - Transmitting and charging.

The test was performed in accordance with the Class A limits.

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

Detailed results are shown below.

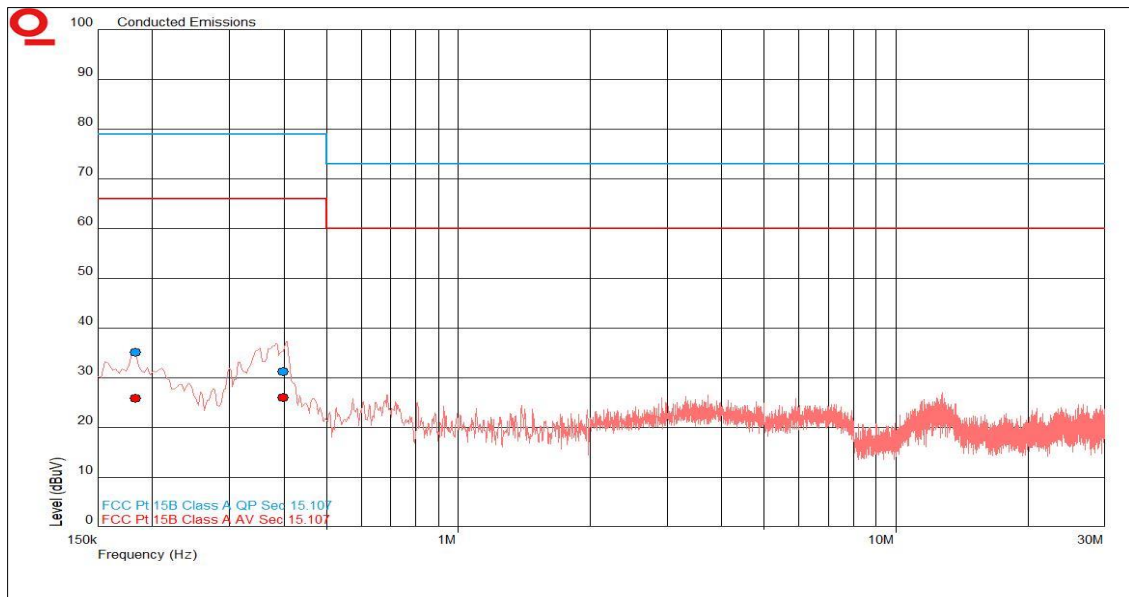


Figure 6 - Graphical Results - 120 V AC Live

Frequency (MHz)	QP Level (dBµV)	QP Limit (dBµV)	QP Margin (dB)	CISPR Average Level (dBµV)	CISPR Average Limit (dBµV)	CISPR Average Margin (dB)
0.183	35.1	79.0	-43.9	25.9	66.0	-40.1
0.397	31.2	79.0	-47.8	26.0	66.0	-40.0

Table 11

No other formal measurements were made as all other peak emissions seen were greater than 20 dB below the CISPR Average test limit.

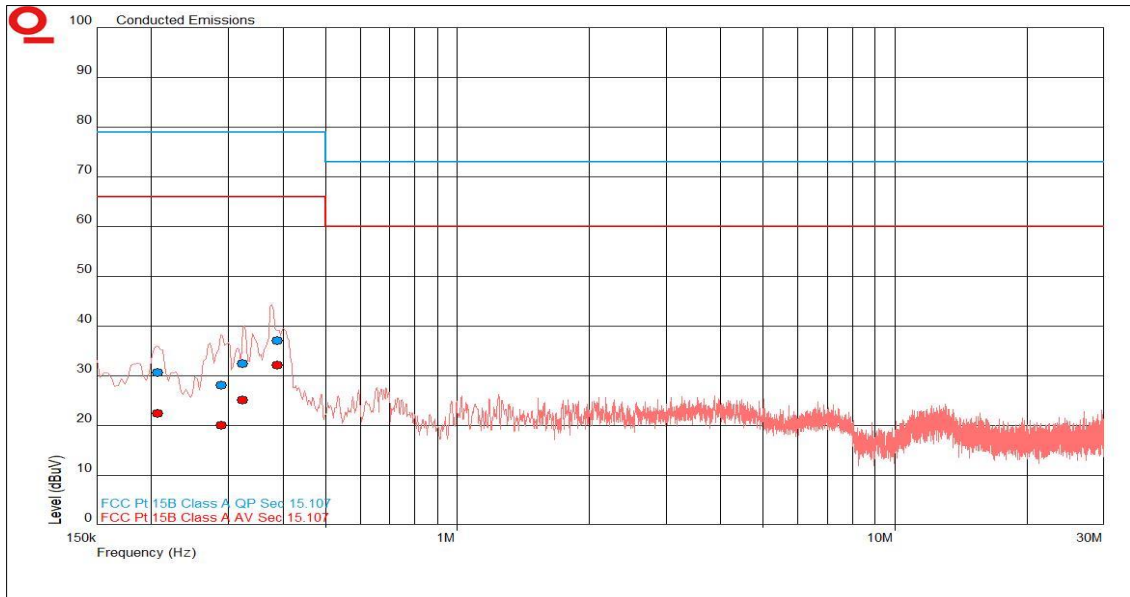


Figure 7 - Graphical Results - 120 V AC Neutral

Frequency (MHz)	QP Level (dBµV)	QP Limit (dBµV)	QP Margin (dB)	CISPR Average Level (dBµV)	CISPR Average Limit (dBµV)	CISPR Average Margin (dB)
0.207	30.6	79.0	-48.4	22.5	66.0	-43.5
0.290	28.1	79.0	-50.9	20.1	66.0	-45.9
0.323	32.4	79.0	-46.6	25.2	66.0	-40.8
0.388	37.0	79.0	-42.0	32.1	66.0	-33.9

Table 12

No other formal measurements were made as all other peak emissions seen were greater than 20 dB below the CISPR Average test limit.

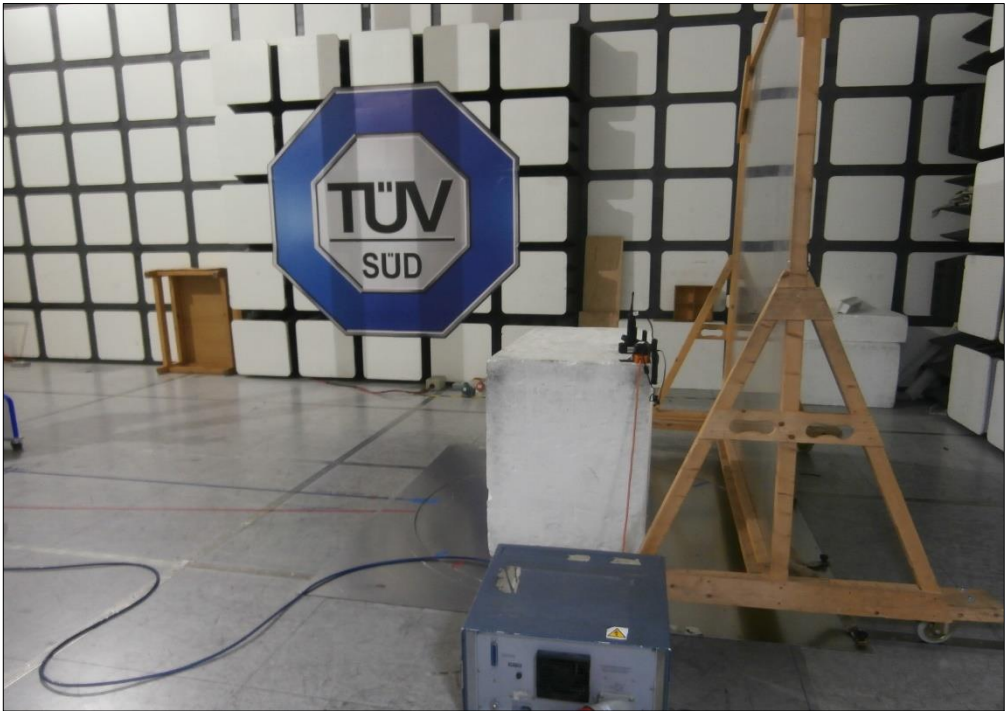


Figure 8 - Test Setup



Figure 9 - Test Setup



2.1.10 Test Location and Test Equipment Used

This test was carried out in EMC Chamber 5.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Due
Screened Room (5)	Rainford	Rainford	1545	36	23-Jan-2021
Compliance 5 Emissions	Teseq	V5.26.51	3275	-	Software
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	03-Jan-2021
Transient Limiter	Hewlett Packard	11947A	2377	12	26-Feb-2020
3 Phase Artificial Mains Network (LISN)	Rohde & Schwarz	ESH2-Z5	16	12	28-Feb-2020
8 Meter Cable	Teledyne	PR90-088-8MTR	5212	12	30-Aug-2020

Table 13



2.2 Radiated Disturbance

2.2.1 Specification Reference

FCC 47 CFR Part 15B, Clause 15.109
ICES-003, Clause 6.2
ISED RSS-GEN, Clause 7.1

2.2.2 Equipment Under Test and Modification State

SC2028, S/N: 1PR001925GK63ZJ - Modification State 0

2.2.3 Date of Test

03-January-2020

2.2.4 Test Method

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

A pre-scan of the EUT emissions profile was made at a 3m distance while varying the antenna-to-EUT azimuth and polarisation using a peak detector.

Using a list of the highest emissions detected during the pre-scan along with their bearing and associated antenna polarisation, the EUT was formally measured using a Quasi-Peak, Peak or CISPR Average detector as appropriate.

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

2.2.5 Example Calculation

Below 1GHz:

Quasi-Peak level (dB μ V/m) = Receiver level (dB μ V) + Correction Factor (dB)
Margin (dB) = Quasi-Peak level (dB μ V/m) - Limit (dB μ V/m)

Above 1GHz:

CISPR Average level (dB μ V/m) = Receiver level (dB μ V) + Correction Factor (dB)
Margin (dB) = CISPR Average level (dB μ V/m) - Limit (dB μ V/m)

Peak level (dB μ V/m) = Receiver level (dB μ V) + Correction Factor (dB)
Margin (dB) = Peak level (dB μ V/m) - Limit (dB μ V/m)

2.2.6 Example Test Setup Diagram

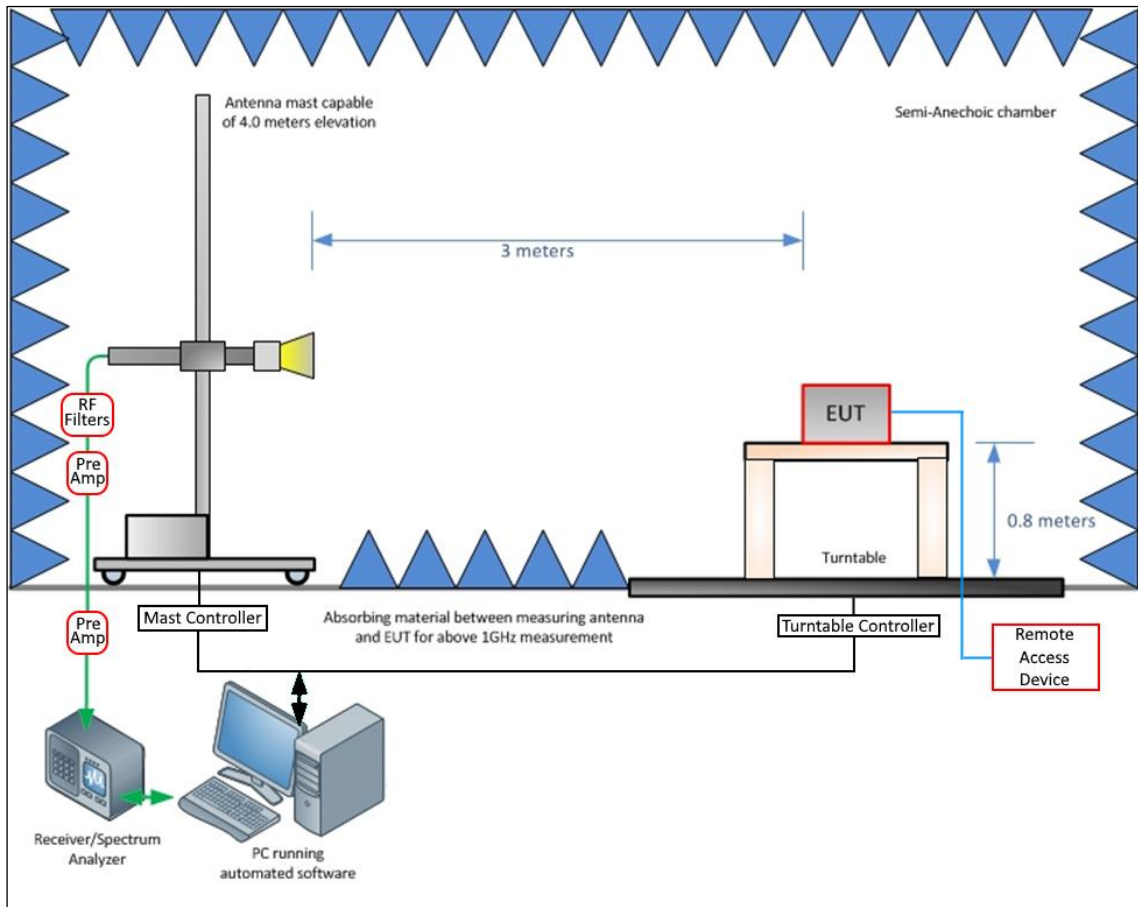


Figure 10 - Radiated Disturbance Example Test Setup

2.2.7 Environmental Conditions

Ambient Temperature 19.2 - 20.7 °C
 Relative Humidity 34.0 - 36.0 %

2.2.8 Specification Limits

Required Specification Limits, Field Strength (Class A @ 10m)		
Frequency Range (MHz)	($\mu\text{V}/\text{m}$)	($\text{dB}\mu\text{V}/\text{m}$)
30 to 88	90	39.1
88 to 216	150	43.5
216 to 960	210	46.4
Above 960	300	49.5

Supplementary information:
 Quasi-peak detector to be used for measurements below 1 GHz
 CISPR Average detector to be used for measurements above 1 GHz
 Peak test limit above 1 GHz is 20 dB higher than the CISPR Average test limit.

Table 14



2.2.9 Test Results

Results for Configuration and Mode: AC powered with standard battery - Idle and charging.

The test was performed in accordance with the Class A limits.

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

Detailed results are shown below.

Highest frequency generated or used within the EUT: 2.48 GHz
 Which necessitates an upper frequency test limit of: 13.00 GHz

Frequency Range of Test: 30 MHz to 1 GHz

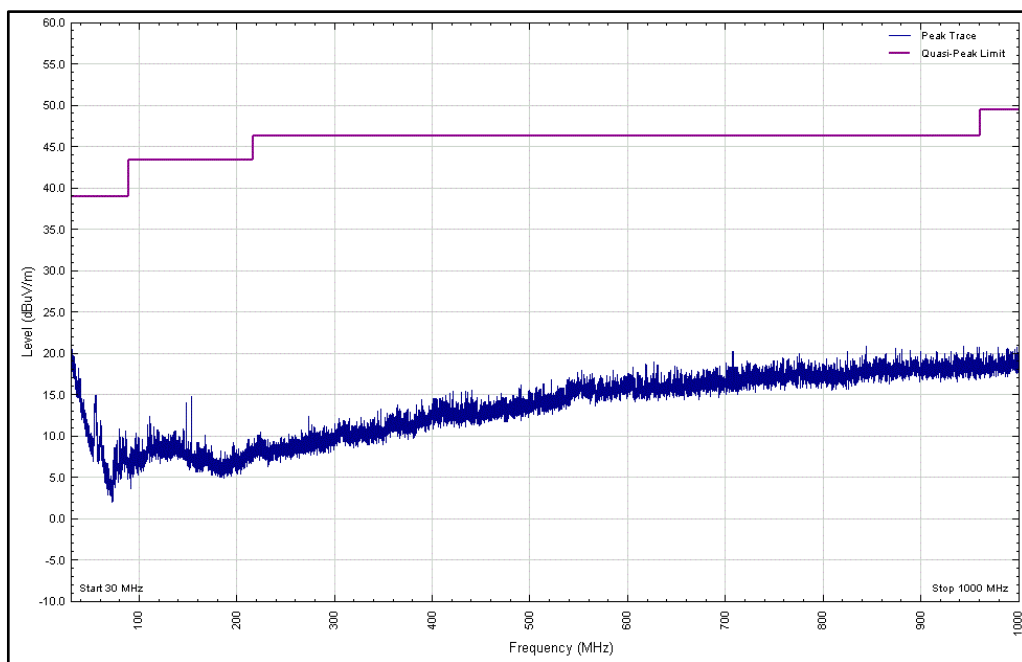


Figure 11 - Graphical Results - Vertical Polarity

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation	Orientation
*								

Table 15

*No formal measurements were made as all peak emissions seen were greater than 10 dB below the test limit.

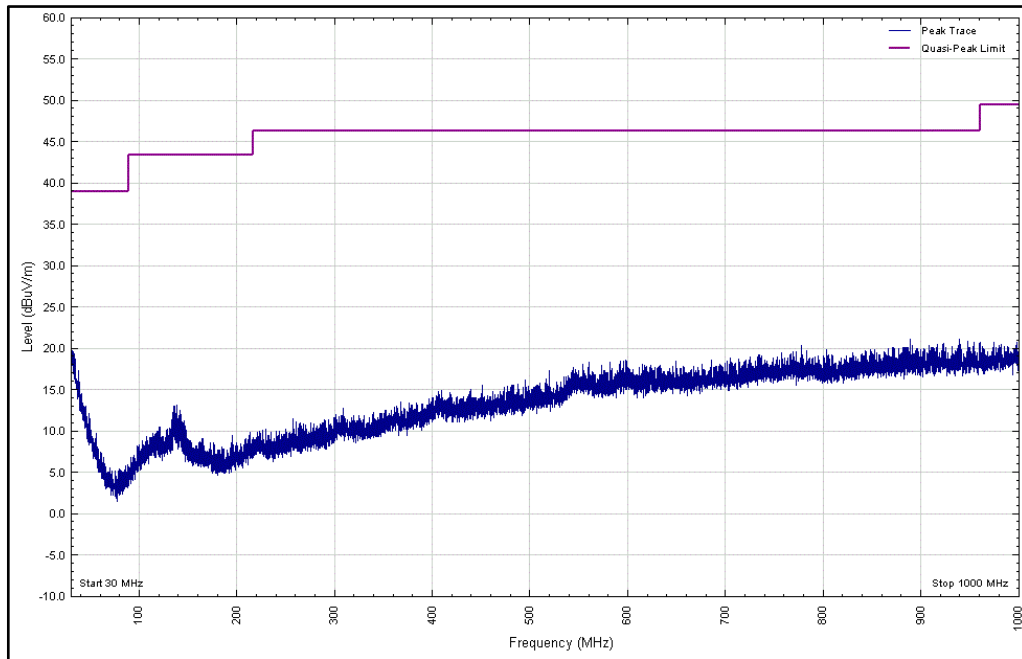


Figure 12 - Graphical Results - Horizontal Polarity

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation	Orientation
*								

Table 16

*No formal measurements were made as all peak emissions seen were greater than 10 dB below the test limit.



Frequency Range of Test: 1 GHz to 13 GHz - Peak

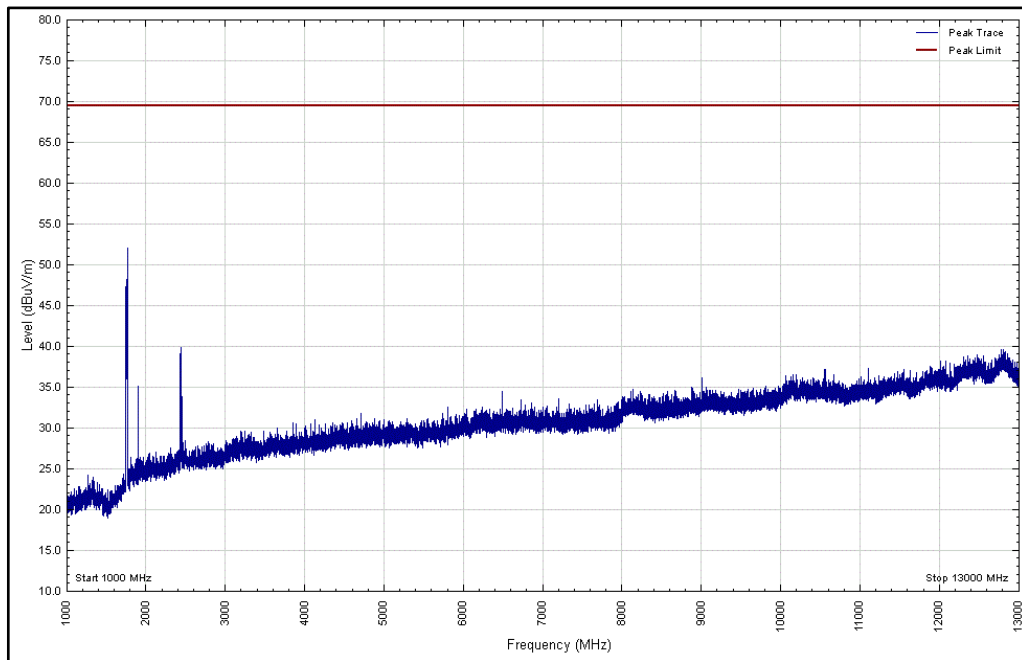


Figure 13 - Graphical Results - Vertical Polarisation

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation	Orientation
*								

Table 11

*No formal measurements were made as all peak emissions seen were greater than 10 dB below the test limit.

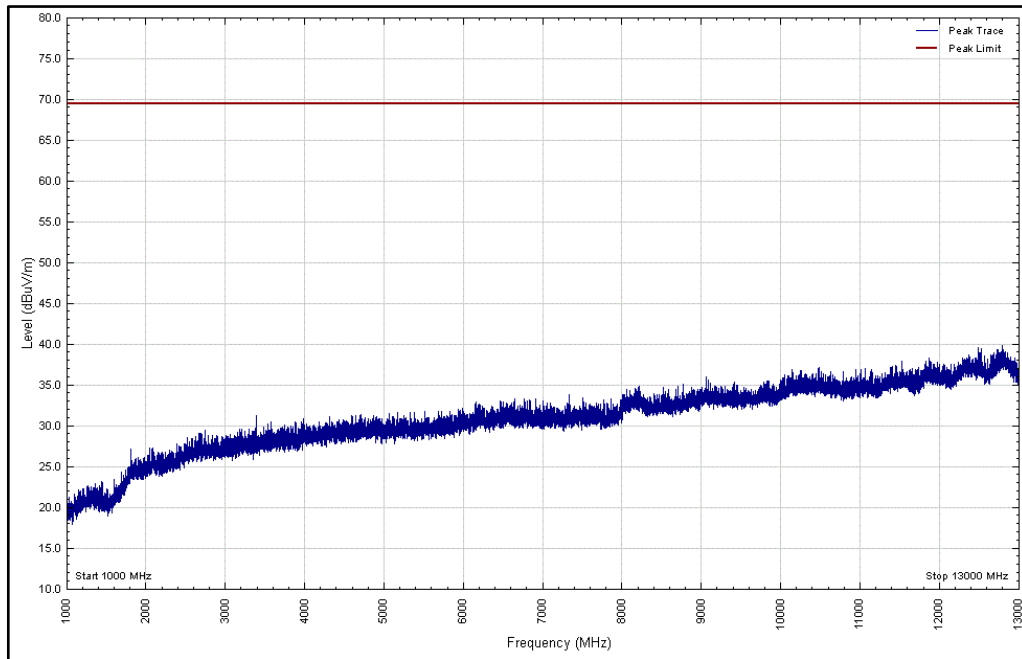


Figure 14 - Graphical Results – Horizontal Polarisation

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation	Orientation
*								

Table 11

*No formal measurements were made as all peak emissions seen were greater than 10 dB below the test limit.

Frequency Range of Test: 1 GHz to 13 GHz – CISPR Average

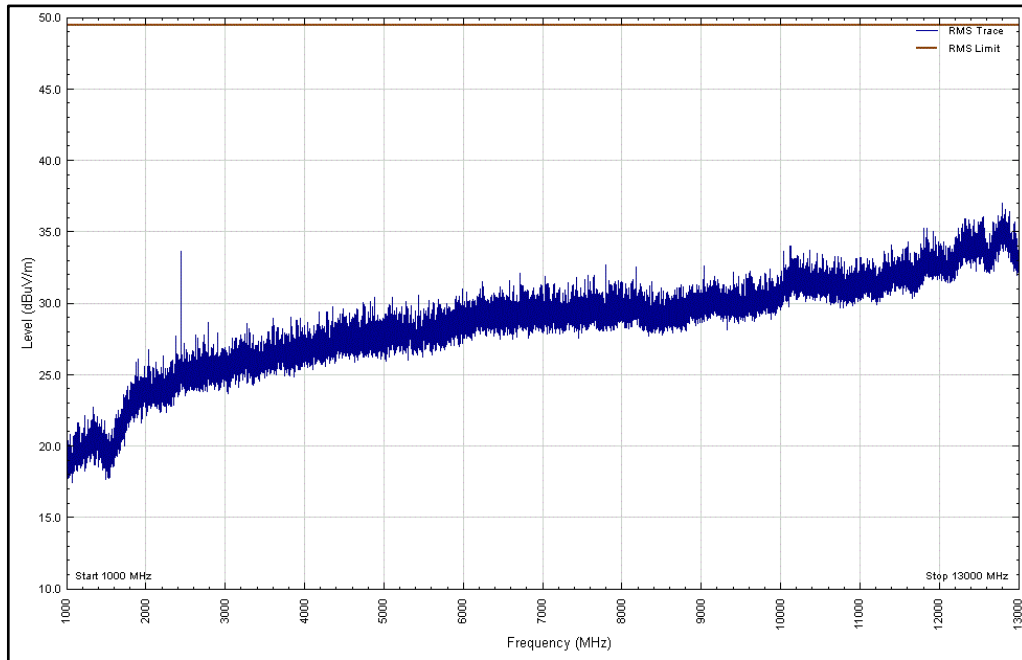


Figure 15 - Graphical Results - Vertical Polarisation

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation	Orientation
*								

Table 11

*No formal measurements were made as all peak emissions seen were greater than 10 dB below the test limit.

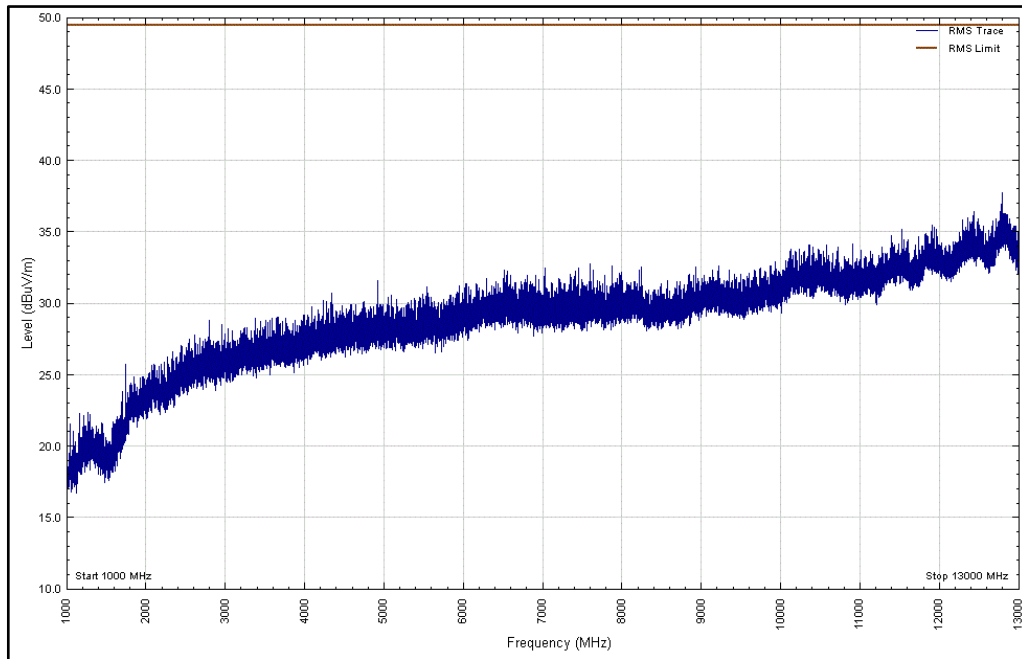


Figure 16 - Graphical Results – Horizontal Polarisation

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation	Orientation
*								

Table 11

*No formal measurements were made as all peak emissions seen were greater than 10 dB below the test limit.



Results for Configuration and Mode: AC powered with high capacity battery - Idle and charging.

The test was performed in accordance with the Class A limits.

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

Detailed results are shown below.

Highest frequency generated or used within the EUT: 2480 MHz
 Which necessitates an upper frequency test limit of: 13 GHz

Frequency Range of Test: 30 MHz to 1 GHz

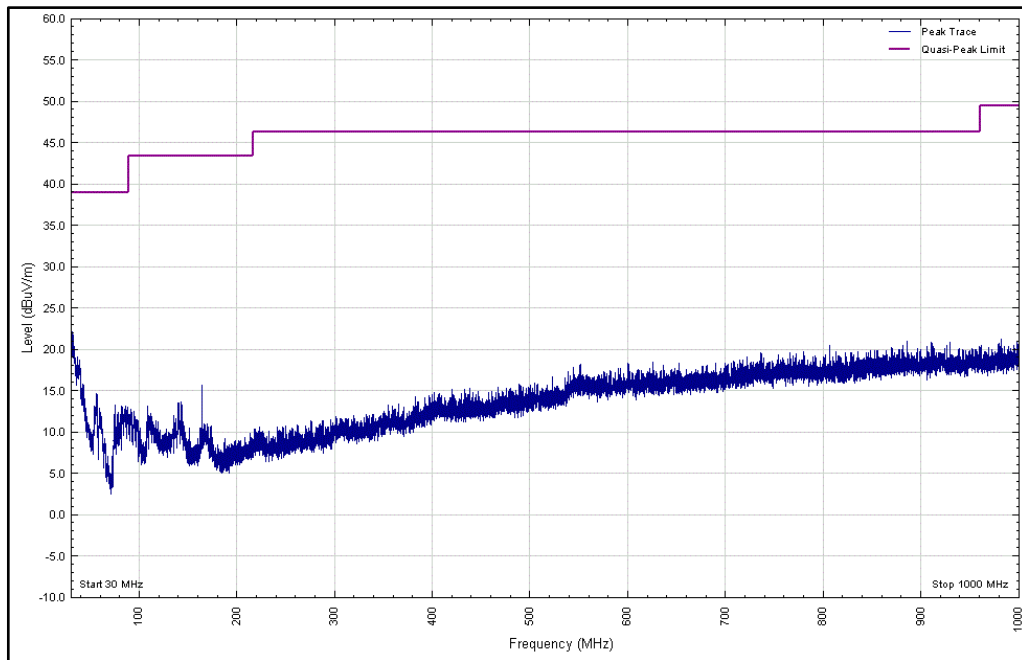


Figure 17 - Graphical Results - Vertical Polarisation

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation	Orientation
*								

Table 17

*No formal measurements were made as all peak emissions seen were greater than 10 dB below the test limit.

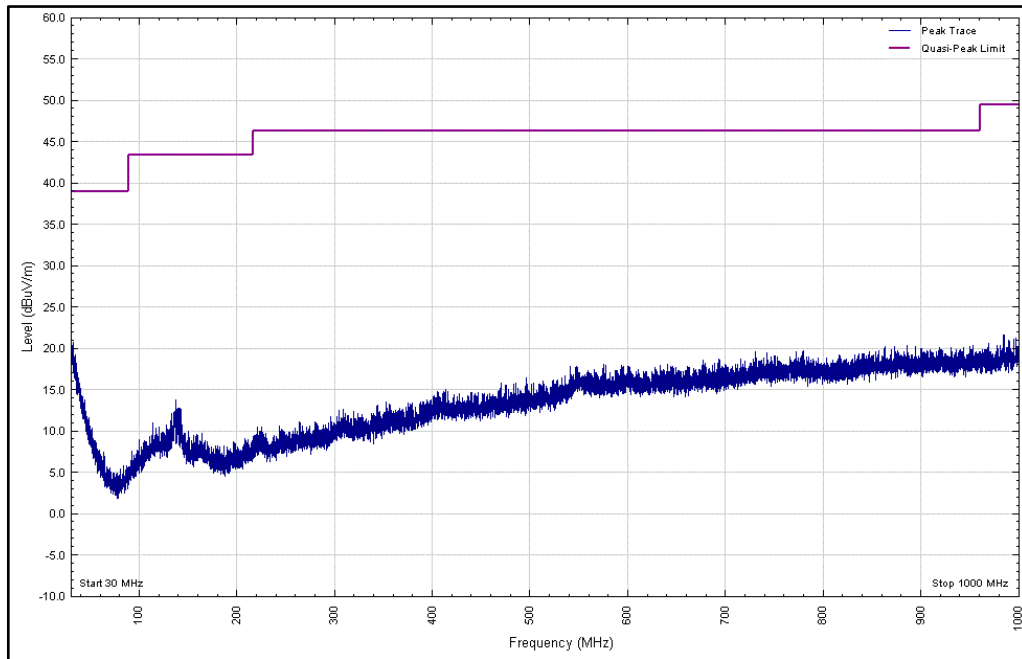


Figure 18 - Graphical Results - Horizontal Polarisation

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation	Orientation
*								

Table 18

*No formal measurements were made as all peak emissions seen were greater than 10 dB below the test limit.



Frequency Range of Test: 1 GHz to 13 GHz - Peak

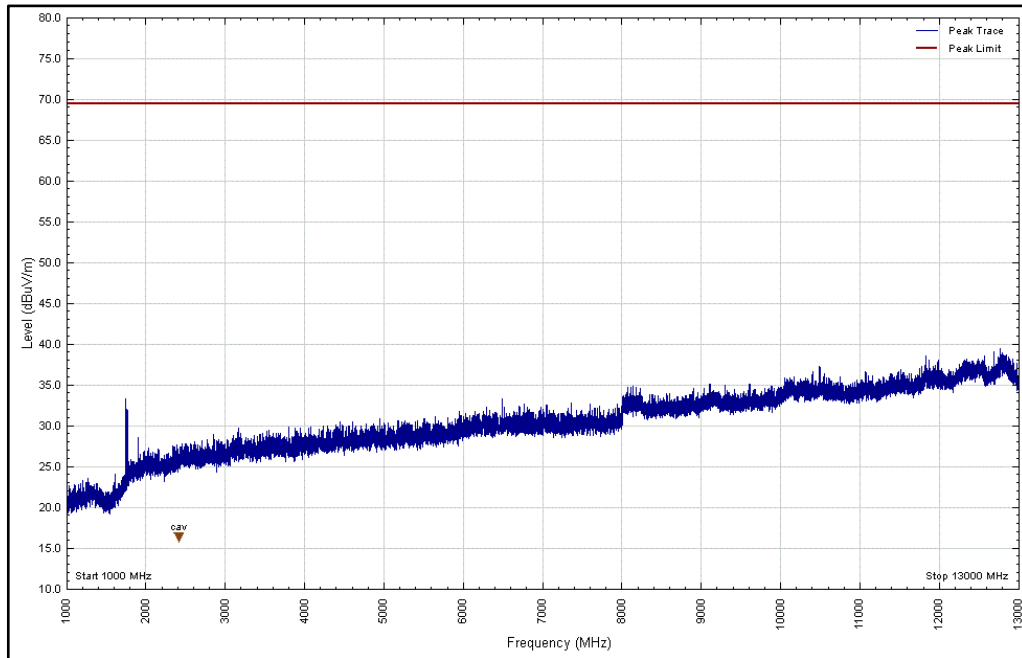


Figure 19 - Graphical Results - Vertical Polarisation

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation	Orientation
*								

Table 11

*No formal measurements were made as all peak emissions seen were greater than 10 dB below the test limit.

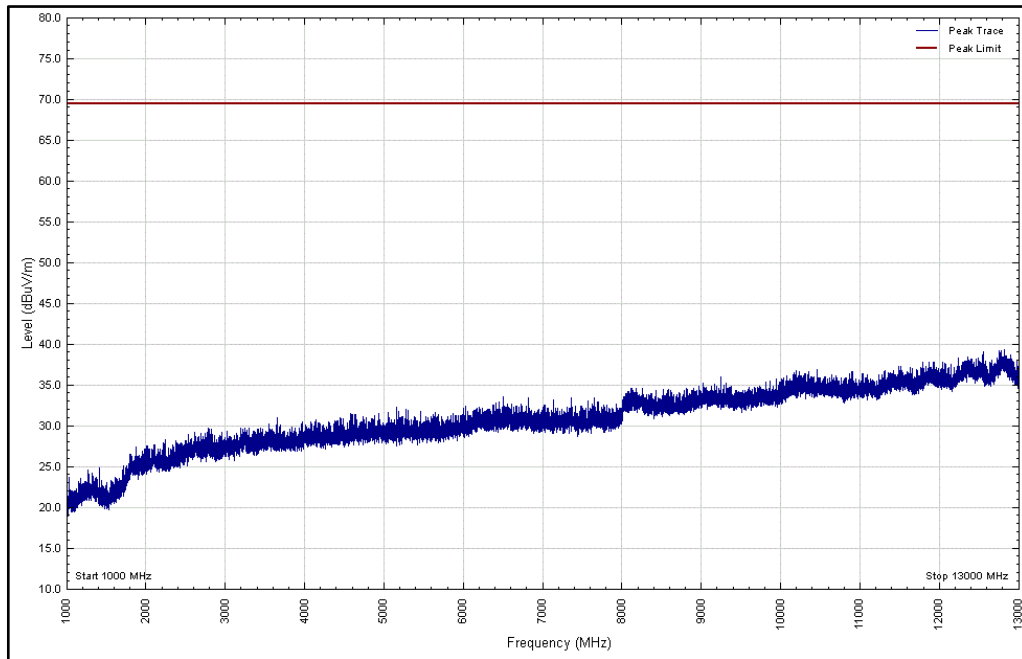


Figure 20 - Graphical Results – Horizontal Polarisation

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation	Orientation
*								

Table 11

*No formal measurements were made as all peak emissions seen were greater than 10 dB below the test limit.

Frequency Range of Test: 1 GHz to 13 GHz – CISPR Average

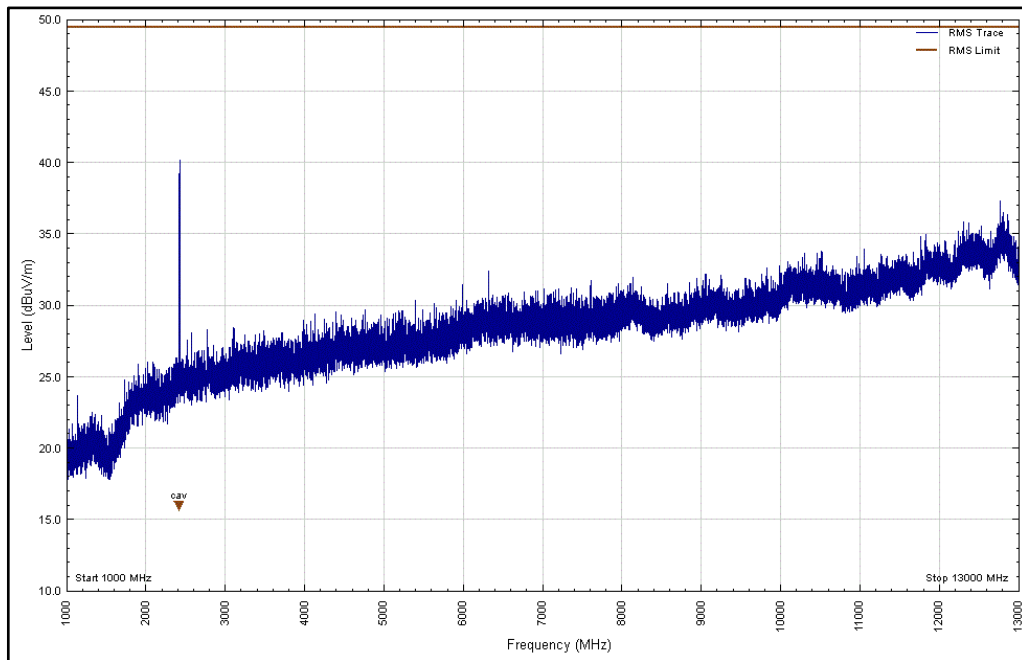


Figure 21 - Graphical Results - Vertical Polarity

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation	Orientation
2423.932	15.5	49.5	-34.0	CAV	29	105	Vertical	N/A

Table 11

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

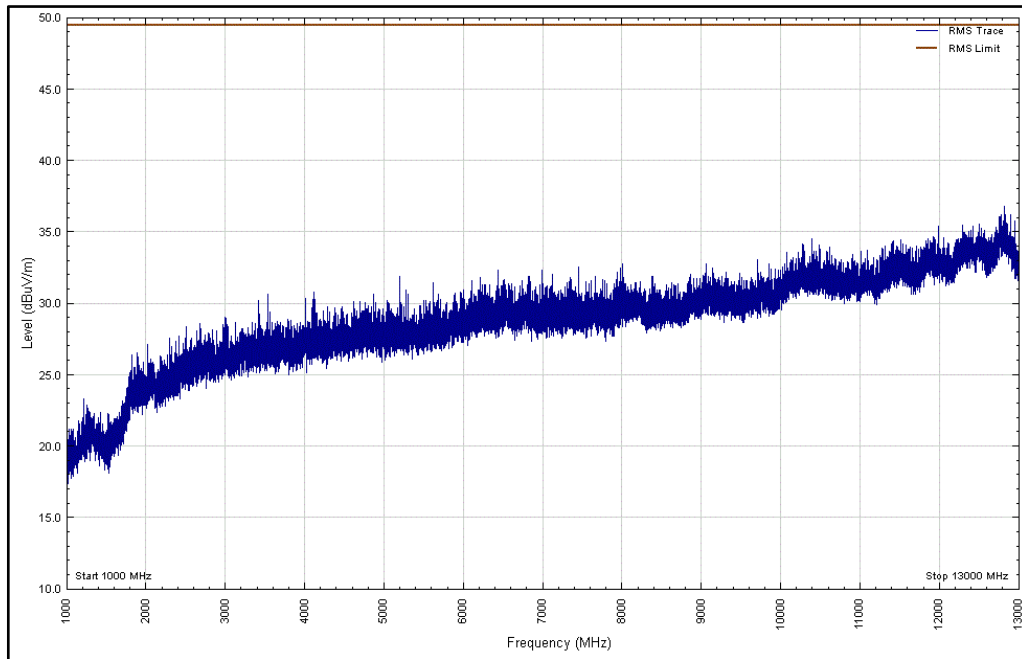


Figure 22 - Graphical Results – Horizontal Polarity

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation	Orientation
*								

Table 11

*No formal measurements were made as all peak emissions seen were greater than 10 dB below the test limit.



Figure 23 - Test Setup - 30 MHz to 1 GHz



Figure 24 - Test Setup - Above 1 GHz



2.2.10 Test Location and Test Equipment Used

This test was carried out in EMC Chamber 5.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Due
Screened Room (5)	Rainford	Rainford	1545	36	23-Jan-2021
EmX Emissions Software	TUV SUD	EmX	5125	-	Software
EMI Test Receiver	Rohde & Schwarz	ESW44	5382	12	08-Oct-2020
Turntable Controller	Inn-Co GmbH	CO 1000	1606	-	TU
Mast Controller	Maturo GmbH	NCD	4810	-	TU
Tilt Antenna Mast	Maturo GmbH	TAM 4.0-P	4811	-	TU
1 GHz to 8 GHz Low Noise Amplifier	Wright Technologies	APS04-0085	4365	12	14-Nov-2020
8 GHz to 18 GHz Low Noise Amplifier	Phase One	PS04-0086	1533	12	08-Feb-2020
Antenna with permanent attenuator (Bilog)	Chase	CBL6143	2904	24	30-Sep-2021
Double Ridged Waveguide Horn Antenna	ETS-Lindgren	3117	4722	12	05-Mar-2020
'2.92mm' - '2.92mm' RF Cable (2m)	Rhophase	KPS-1503-2000-KPS	3695	12	11-Jun-2020
1.5m 40GHz RF Cable	Scott Cables	KPS-1501-2000-KPS	5127	6	20-Jan-2020
8 Meter Cable	Teledyne	PR90-088-8MTR	5212	12	30-Aug-2020

Table 19

TU - Traceability Unscheduled



3 Incident Reports

No incidents reports were raised.



4 Measurement Uncertainty

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

Test Name	Measurement Uncertainty
Radiated Disturbance	30 MHz to 1 GHz, Bilog Antenna, ± 5.2 dB 1 GHz to 40 GHz, Horn Antenna, ± 6.3 dB
Conducted Disturbance at Mains Terminals	150 kHz to 30 MHz, LISN, ± 3.7 dB

Table 20

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: 2007, clause 4.4.3 and 4.5.1.