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Global Product Certification
EMC-EMF Safety Approvals

Electromagnetic Compatibility Test Report

Report No.: M2210003-2

TESTED FOR:	**ISSUED BY:**
HitIQ Ltd	EMC Technologies Pty. Ltd.
Suite 1, Level 2, 9-17 Raglan Street South Melbourne VIC 3205 Australia	176 Harrick Road, Keilor Park, VIC, 3042, Australia.
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Product Name:	Wireless Charger
Model:	NEX-MC-002-L, NEX-MC-002-S
Tested Model:	NEX-MC-002-S
FCC ID:	2A2G6-ICC2
Test Date(s):	7 December 2022
Issue Date:	16 February 2023
Specification(s):	47 CFR Part 18 FCC/OST MP-5: 1986

The test sample, under the condition and operating mode described in this test report, complies with the standard/s listed above.

Test Engineers:

Ian Paul Ng

Authorized Signatory:

William Alam
Senior Test Engineer

NATA Accreditation No. 5292
Accredited for compliance with ISO/IEC 17025 – Testing.
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection and proficiency testing scheme providers reports.

Revision History

Version	Issue Date	Reason / Comments
1	16 February 2023	Initial issue

General Remarks

EMC Technologies Pty Ltd hereby certify that the device(s) described herein were tested as described in this report and that the data included is that which was obtained during such testing.

EMC Technologies Pty Ltd reports apply only to the specific samples tested under stated test conditions. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. EMC Technologies Pty Ltd shall have no liability for any deductions, inferences or generalisations drawn by the customer or others from EMC Technologies Pty Ltd issued reports. This report shall not be used to claim, constitute or imply product endorsement by EMC Technologies Pty Ltd.

Content

1 Project Overview

1.1 Test Facility

Measurements were performed at the following location:

☒ Melbourne Laboratory 176 Harrick Road, Keilor Park, Vic 3042

☐ Sydney Laboratory Unit 3/87 Station Road, Seven Hills, NSW 2147

EMC Technologies Pty. Ltd. is an independently owned Australian company that is NATA accredited to ISO 17025 for both testing and calibration and ISO 17020 for Inspection. – **Accreditation Number 5292**.

Country	Assessment Body	Lab Code / Member No.
Australia	NATA	Accreditation Number: 5292
Europe	European Union	Notified Body Number: 0819
USA	FCC	Designation Number: AU0001
Canada	ISED Canada	CAB Identifier Number: AU0001
Japan	VCCI	Company Number: 785
Taiwan	BSMI	Lab Code SL2-IN-E-5001R

1.2 Standards Applied

Unless otherwise noted, only the cited edition applies.

47 CFR Part 18 – Industrial, Scientific and Medical Equipment.

FCC/OST MP-5: 1986 – FCC Methods of Measurement of radio noise Emissions from Industrial, Scientific and Medical Equipment.

1.3 Results Summary

The test sample was provided by the client. All results herein apply only to the test sample.

47 CFR Part 18					
Section	**EMC Test**	**Range**	**Applicability**	**Limit**	**Result**
18.305	Radiated Emission	9 kHz to 30 MHz	Enclosure	18.305 (b) – Any type	Complied
18.307	Conducted Emission	150 KHz to 30 MHz	AC Mains	18.307 (b)	N/A *1
*1 Not applicable, port not present					

1.4 Additions to, Deviations and Exclusions from the Method/Standard

No additions to, deviations or exclusions from the method/standard were performed.

1.5 Measurement Uncertainty

EMC Technologies has evaluated the equipment and the methods used to perform the EMC testing. The estimated measurement uncertainties for the various tests shown within this report are as follows:

EMC Testing	Range	Value
Radiated Emission	30 MHz to 300 MHz	± 5.1 dB
	300 MHz to 1000 MHz	± 4.7 dB
	1 GHz to 18 GHz	± 4.6 dB

The above expanded uncertainties are based on standard uncertainties multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95%.

Application of measurement uncertainty for this report:

The referenced uncertainty standard specifies that determination of compliance shall be based on measurements without taking into account measurement uncertainty. However, the measurement uncertainty shall appear in the test report.

1.6 Test Equipment

Measurement instrumentation and transducers were calibrated in accordance with the applicable standards by a NATA accredited laboratory or the National Measurement Institute (NMI).

Radiated Emission						
Manufacturer	**Model**	**Serial No.**	**Asset No.**	**Description**	**Cal. Date**	**Cal. Due**
EMCO	3115	8908-3282	A-004	Antenna Horn	13/01/2022	13/01/2025
Sunol Sciences	JB6	A012312	A-363	Antenna Bilog	26/07/2022	26/07/2024
Huber & Suhner	Sucoflex 104A	503061/4A	C-463	RF Cable	25/11/2022	25/11/2023
Huber & Suhner	Sucoflex 104A	507100/4A	C-478	RF Cable	25/11/2022	25/11/2023
Rohde & Schwarz	ESW26	101306	R-143	EMC Receiver	29/07/2022	29/07/2023
Frankonia	Room 13 SAC-3	-	R-144	Room 13 3m SAC	10/08/2020	10/08/2023
EMCO	6502	2021	A-310	Loop Antenna	20/09/2022	20/09/2024

2 Equipment Under Test

2.1 EUT Details

(EUT details are supplied by the customer)

Products:	Wireless Charger
Model:	NEX-MC-002-L, NEX-MC-002-S
Tested Model:	NEX-MC-002-S
Manufacturer:	HITIQ Limited
Serial No:	Sample 1: 0000000014
Power Rating:	5.0V DC (USB) or Integrated 20mAh Lithium Ion Battery
Highest Internal Frequency:	215 KHz wireless charging (no data just power)
Description:	Charging device for smart mouthguard

Wireless Charger Radio Module				
Manufacturer	**Model**	**Operating Bands**	**Antenna**	**Remarks**
Linear Technology	RM4	215 kHz	Type 1: 1200x600 panel Type 2: 600x400 panel Type 3: 900x25 panel Type 4: ferrite wand	Testing performed with Type 1 antenna.
Comment: Type 1, 2 and 3 antennas are similar in construction and have similar radiation patterns. Type 1 with the highest gain was therefore tested as the worst-case representative of the three.				

2.2 Reference Document

No.	Document Title	Issue No.
--	None supplied	---

2.3 Test Configuration

Installation Type:	☒Tabletop ☐Floor-Standing ☐Combination Tabletop and Floor-Standing

Auxiliary Equipment				
No.	**Description**	**Model**	**Serial No.**	**Remark**
AE1	Mouthguard	NEX-MG-1-002	7299	---

Cables used for testing				
No.	**Description**	**Length**	**Shielded**	**Remark**
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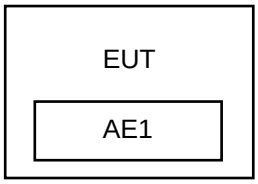


2.4 Operating Test Mode

Mode No.	**Description**
	The EUT was set up in accordance with FCC Part 18 and as per the customer's operating instructions. The EUT was operated in the following test modes:
1	Wireless Charger powered ON – mouthguard charging in charger cradle. * Radiated emission above 30MHz was conducted with other test samples to cover other EMC standards. This report only covers the WPT function of the EUT.

2.5 Modifications

No modifications were required to achieve compliance.

3 Evaluation of Emission Test Results

Radiated Emission measurements were tested according to the following configurations:

Limit:	Class B	
Receiver Bandwidth:	6 dB	
Detector:	0.009 – 0.15 MHz:	QP
	0.15 - 30 MHz:	QP,AV
	30 - 1000 MHz:	QP
	Above 1000 MHz:	PK,AV
Antenna:	☒ 0.009 - 30 MHz	Loop Antenna
	☒ 30 - 1000 MHz	Biconilog
	☒ 1 - 18 GHz	Double-Ridged Guide Horn
	☐ 18 - 40 GHz	Standard Gain Horn

Margin is calculated by subtracting the emission level by limit value. Negative margin signifies emission level below the specified limit.

3.1 Radiated Emission

3.1.1 Measurement Procedure

The EUT was set up on the middle of turntable above the ground plane. The EMI Receiver was operated under software control via the PC Controller through the IEEE.488 Interface Bus Card Adaptor. The test frequency range was sub-divided into smaller bands with sufficient frequency resolution to permit reliable display and identification of possible EMI peaks while also permitting fast frequency scan times.

The EUT was slowly rotated with the Peak Detector set to Max-Hold. This was performed for at least two antenna heights. Each significant peak was then investigated and maximised with the Quasi-Peak detector for measurements below 1 GHz; and an Average and a Peak detector for measurements above 1 GHz. The measurement data for each frequency range was automatically corrected by the software for cable losses, antenna factors and preamplifier gain and all data were then stored on disk in sequential data files. This process was performed for both horizontal and vertical antenna polarisations.

Calculation of field strength

The field strength was calculated automatically by software using pre-stored calibration data. The method of calculation is shown below:

$$E = V + AF - G + L$$

Where: E = Radiated Field Strength in dBµV/m.

V = EMI Receiver Voltage in dBµV/m.

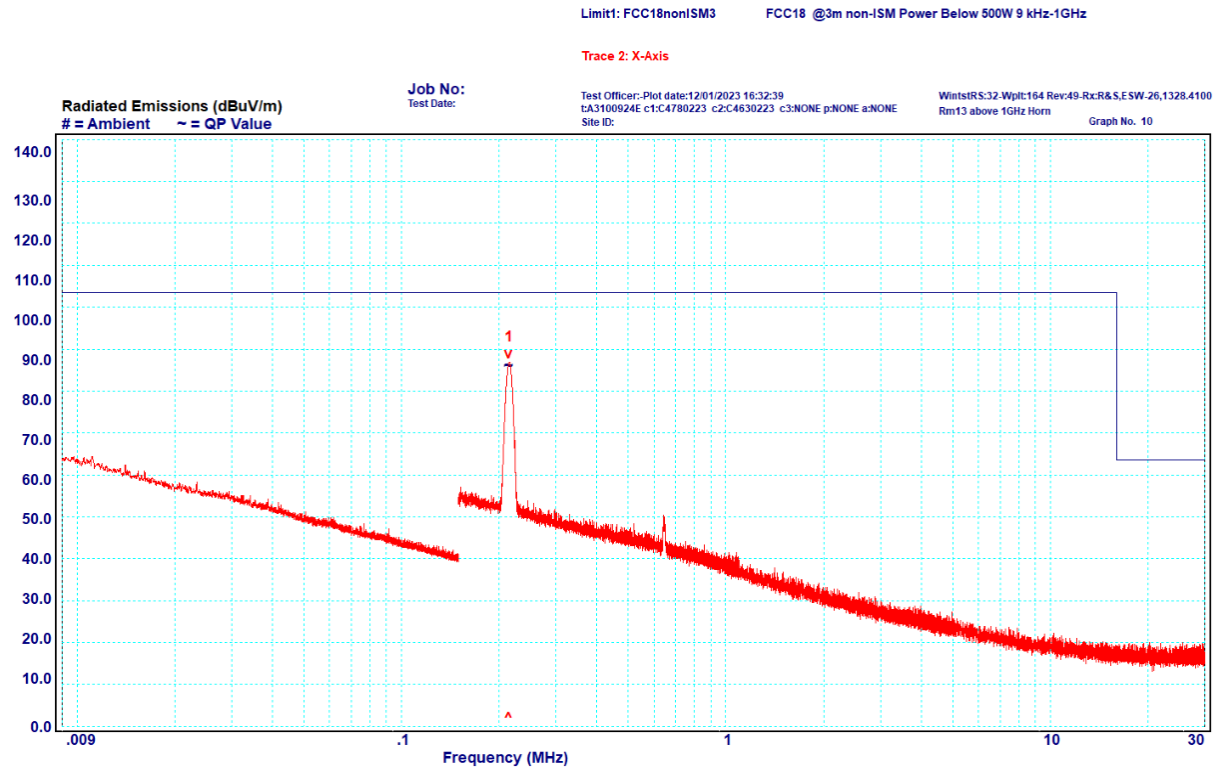
AF = Antenna Factor in dB/m. (stored as a data array)

G = Preamplifier Gain in dB. (stored as a data array)

L = Cable loss in dB. (stored as a data array of Insertion Loss versus frequency)

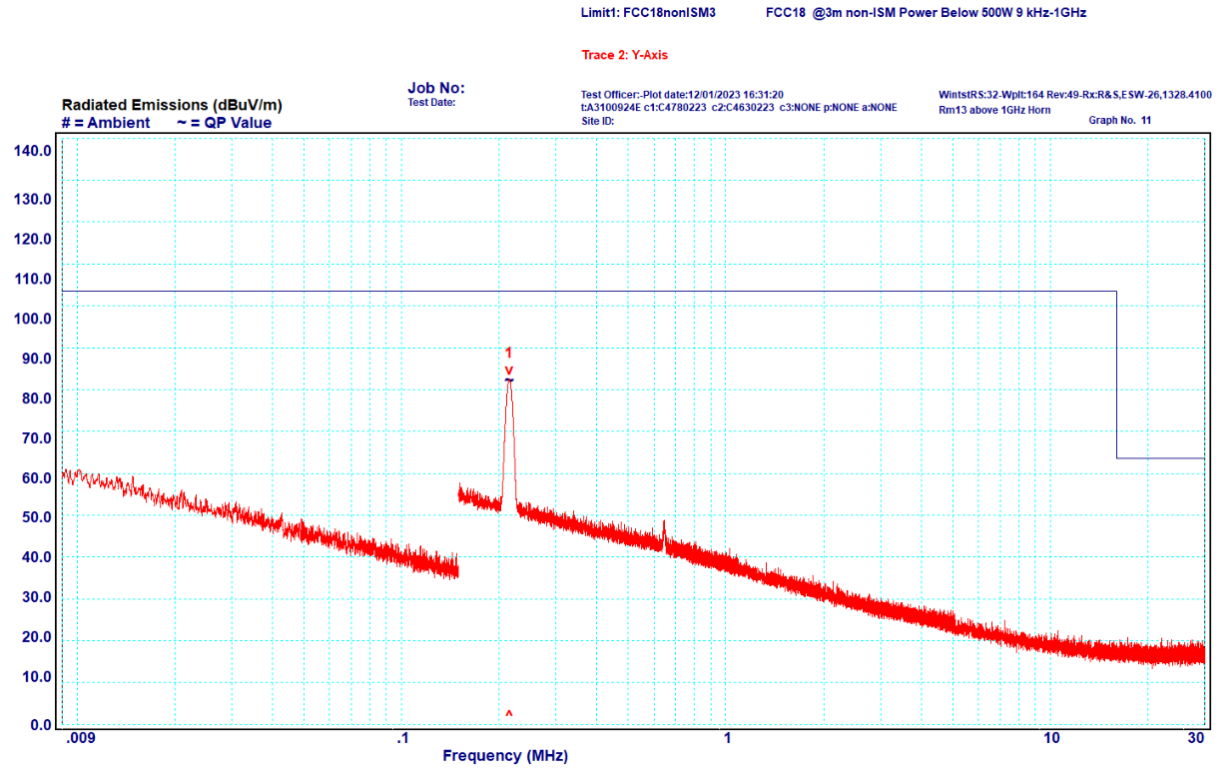
3.1.2 Measuremend Data – 9kHz to 30MHz

Operating Mode:	Mode 1	**Test Date:**	7/12/2022
Power Input:	120VAC 60Hz	**Temperature:**	18°C
Measurement Distance:	3 m – X Axis	**Humidity:**	50%
Test Standard:	47 CFR Part 18		



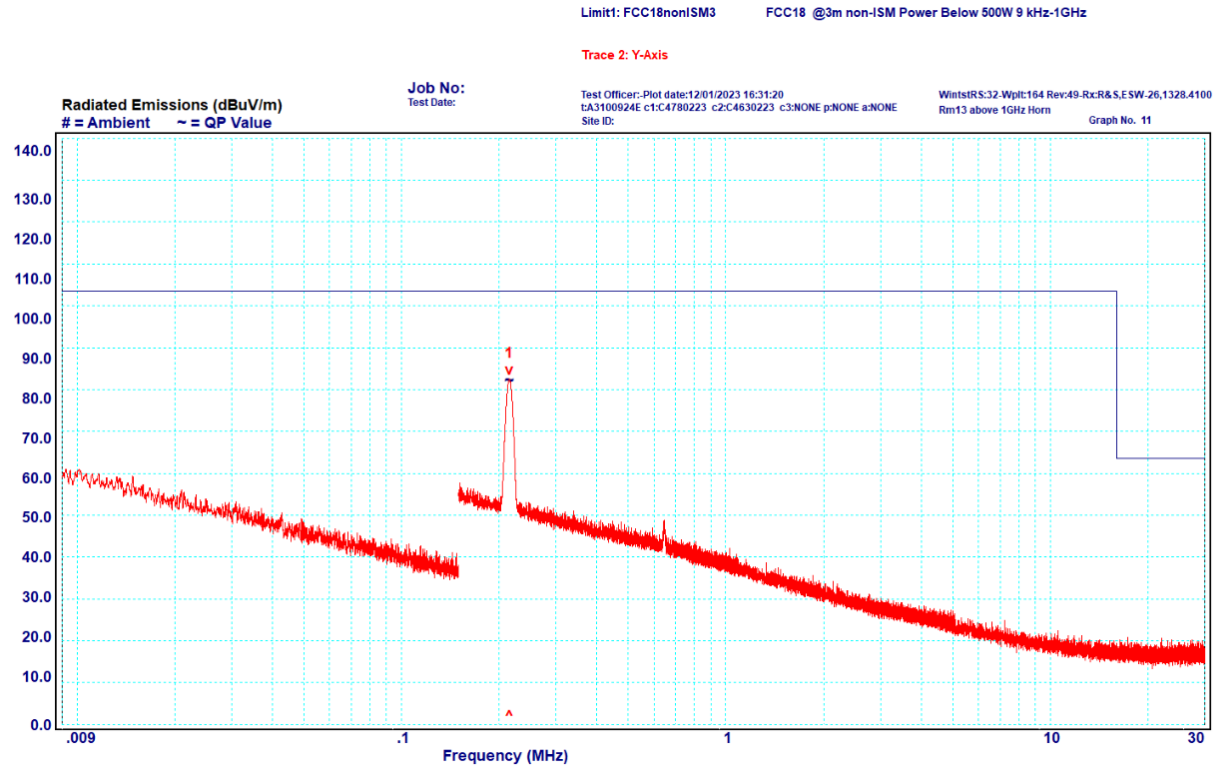
Peak	Frequency [MHz]	Polarisation	Level [dBµV/m]	QP Limit [dBµV/m]	Margin [dB]
1	0.215	X-Axis	86.6	103.5	-16.9

Operating Mode:	Mode 1	**Test Date:**	7/12/2022
Power Input:	120VAC 60Hz	**Temperature:**	18°C
Measurement Distance:	3 m – Y Axis	**Humidity:**	50%
Test Standard:	47 CFR Part 18		



Peak	Frequency [MHz]	Polarisation	Level [dBµV/m]	QP Limit [dBµV/m]	Margin [dB]
1	0.215	Y-Axis	82.5	103.5	-21.0

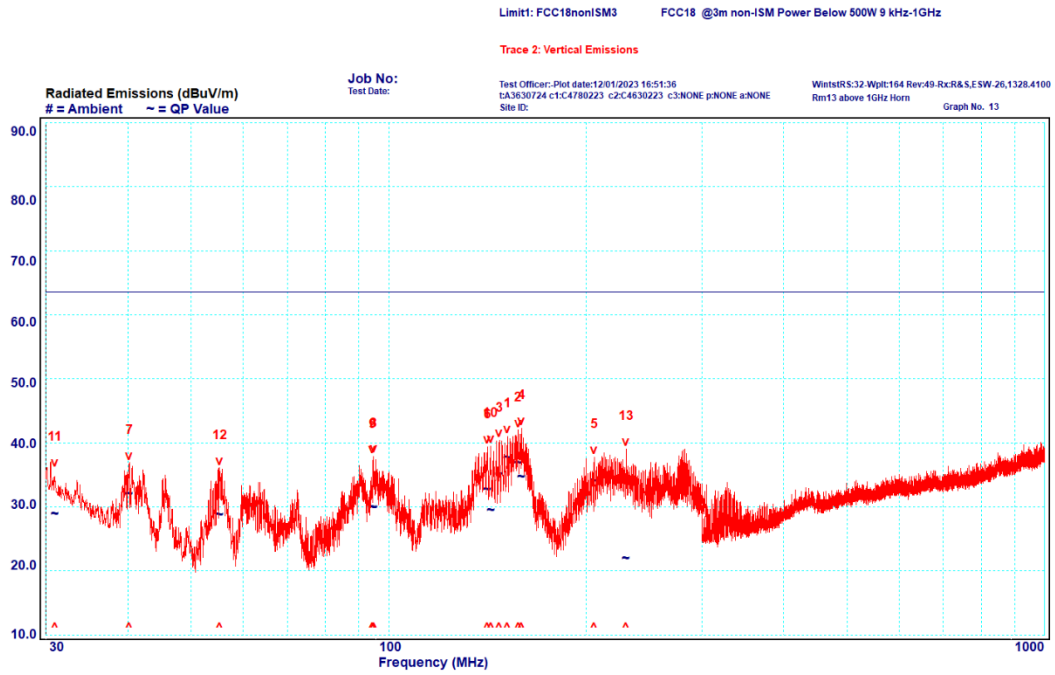
Operating Mode:	Mode 1	**Test Date:**	7/12/2022
Power Input:	120VAC 60Hz	**Temperature:**	18°C
Measurement Distance:	3 m – Z Axis	**Humidity:**	50%
Test Standard:	47 CFR Part 18		



Peak	Frequency [MHz]	Polarisation	Level [dBµV/m]	QP Limit [dBµV/m]	Margin [dB]
1	0.215	Z-Axis	79.7	103.5	-23.8

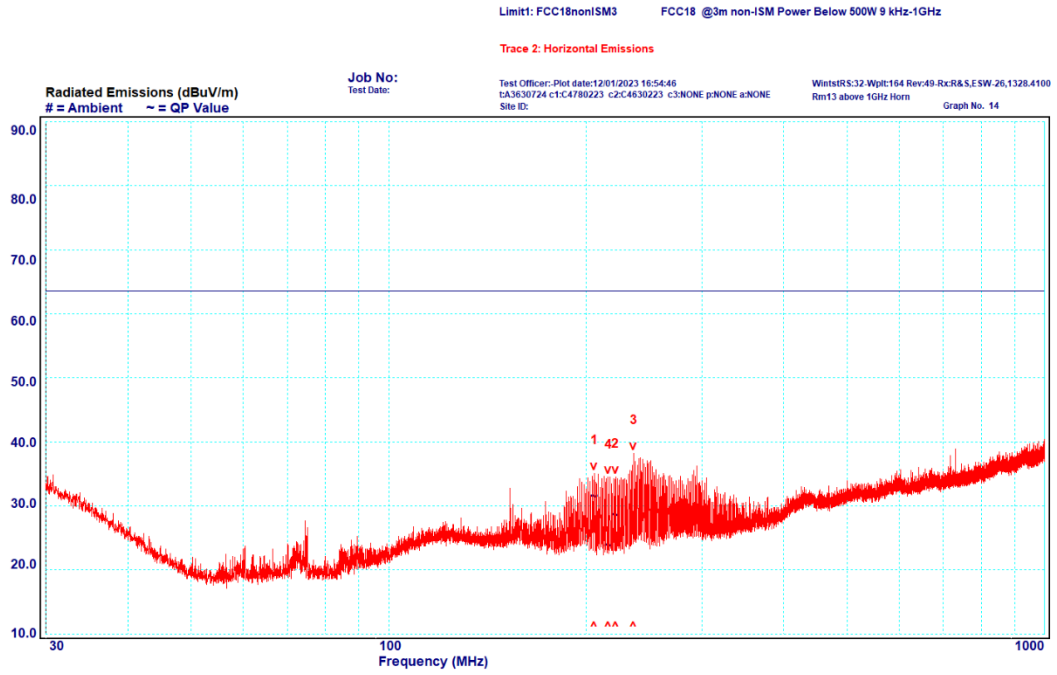
3.1.3 Measurement Data – 30 to 1000 MHz

Operating Mode:	Mode 1	**Test Date:**	7/12/2022
Power Input:	120VAC 60Hz	**Temperature:**	18°C
Measurement Distance:	3 m	**Humidity:**	50%
Test Standard:	47 CFR Part 18		



Peak	Frequency [MHz]	Polarisation	Level [dBµV/m]	QP Limit [dBµV/m]	Margin [dB]
1	151.71	Vertical	38.2	63.5	-25.3
2	157.47	Vertical	37.4	63.5	-26.1
3	147.34	Vertical	35.6	63.5	-27.9
4	159.32	Vertical	35.2	63.5	-28.3
5	205.66	Vertical	34.6	63.5	-28.9
6	141.41	Vertical	33.2	63.5	-30.3
7	40.25	Vertical	32.5	63.5	-31.0
8	94.85	Vertical	30.4	63.5	-33.1
9	94.48	Vertical	30.4	63.5	-33.1
10	143.07	Vertical	29.9	63.5	-33.6
11	31.00	Vertical	29.4	63.5	-34.1
12	55.25	Vertical	29.3	63.5	-34.2
13	230.15	Vertical	22.4	63.5	-41.1

Operating Mode:	Mode 1	**Test Date:**	07/12/2022
Power Input:	120VAC 60Hz	**Temperature:**	18°C
Measurement Distance:	3 m	**Humidity:**	50%
Test Standard:	47 CFR Part 18		



Peak	Frequency [MHz]	Polarisation	Level [dBµV/m]	QP Limit [dBµV/m]	Margin [dB]
1	205.59	Horizontal	31.9	63.5	-31.6
2	221.65	Horizontal	29.1	63.5	-34.4
3	236.13	Horizontal	28.2	63.5	-35.3
4	216.11	Horizontal	24.3	63.5	-39.2

3.1.4 Minimum Margin

Mode	Polarisation	Frequency	Detector	Margin
Mode 1 120V, 60 Hz	X-Axis	215.00 kHz	QP	-16.9 dB
The EUT complied with the 47 CFR Part 18.305 limit.				

-- End of Report --