

Test Certificate

CERTIFICATE No: TRA043445CC01

ISSUE: A

DATE: 04/04/2019

PURPOSE OF TEST: Environmental Testing

CLIENT ORDER No: 230003693

CLIENT: Panorama Antennas Limited, Frogmore, Wandsworth Town, London, GB. SW18 1HF.

EQUIPMENT UNDER TEST:

EUT Name: 4x4 MiMo dual band WiFi + GNSS (panel mount)
Part Number: LGM4-24-58
Element Stores No: TRA-043445-S1
Receipt date: 27th February 2019

EUT Name: 4x4 MiMo dual band WiFi + GNSS (panel mount)
Part Number: LGM4-24-58
Element Stores No: TRA-043445-S5
Receipt date: 12th March 2019

EUT Name: 4x4 MiMo dual band WiFi (ceiling mount)
Part Number: CM4-24-58
Element Stores No: TRA-043445-S2
Receipt date: 27th February 2019

EUT Name: 4x4 MiMo dual band WiFi (ceiling mount)
Part Number: CM4-24-58
Element Stores No: TRA-043445-S6
Receipt date: 12th March 2019

TEST SPECIFICATIONS: Tested in accordance with Element Quotation TRA-043445-01 dated 15th November 2018

TEST DATE: 26th February 2019 to 20th March 2019

TEST LOCATION: Element Materials Technology, Rothwell Road, Warwick, Warwickshire, CV34 5JX

WRITTEN BY:



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Environmental
Test Engineer

APPROVED BY:



Lee Gilbert
Operations Manager

The results herein relate only to the particular samples of equipment tested and the specific tests performed, as detailed above, and in accordance with the contract. Full details of test results, modifications and marginal results are held by Element Materials Technology Warwick Ltd. The quality control arrangements are in accordance with our UKAS accreditation. No representation or warranty is given that the tests performed under the terms of contract constitute, in themselves, a sufficient programme for the client's purpose, nor that the client's equipment is suitable for any particular purpose, nor that any approval has or will be granted by Element Materials Technology Warwick Ltd or any other body. The contents of this certificate shall not be reproduced, except in full, without the written approval of Element Materials Technology Warwick Ltd.

TESTS CARRIED OUT:**Cooling Test:**

Tested in accordance with BS EN 50155:2017, section 13.4.4 – Low Temperature Start-up Test and EN 60068-2-1 Test Ad

Temperature:	-25°C±2°C
Relative Humidity:	Uncontrolled
Ramp Rate:	<1°C/min
Dwell Duration:	2 hours after thermal stabilization of the chamber
Configuration:	Non Operational, except for an operational check after dwell and after recovery.

Dry Heat Test:

Tested in accordance with BS EN 50155:2017, section 13.4.5.3 – Dry Heat Thermal Test – Cycle B, referencing EN 60068-2-2 Test B

Initial Temperature:	25°C±2°C
2nd Temperature:	70°C±2°C
Duration at 2nd Temperature:	2 hours stabilisation followed by 6 hour dwell
Final Temperature:	85°C±2°C
Duration at final Temperature:	15 minutes
Ramp Rate:	<1°C/min
Configuration:	Operational checks after 6 hour and 10 minute dwell.

Salt Spray Test:

Tested in accordance with BS EN 50155:2017, section 13.4.10 and EN 60068-2-11, Test Ka Spray Configuration

Salt Solution:	5% NaCl/95% H ₂ O
Salt Solution pH:	6.5 to 7.2
Fall Out:	1 to 2 ml/80cm ² /hr
Chamber Temperature:	35± 2°C
Total test duration:	48 hour continuous
Configuration:	Non Operational

Vibration and Shock Tests:

As the specimen can be installed in-service in any orientation the vibration levels of the most onerous test axis (vertical) was applied to all axes.

Simulated Long Life Vibration

Tested in accordance with EN 61373:2010, Clause 9, Category 1, Class B.

Frequency Range:	5 Hz to 150 Hz
ASD:	0.964 (m/s ²) ² /Hz from 5Hz to 20Hz Falling at -6dB/octave to 150Hz
RMS Value:	5.72 m/s ² rms
Number of Axes:	3 mutually orthogonal
Duration:	5 hours per axis
Configuration:	Non Operational

Shock Test

Tested in accordance with EN 61373:2010, Clause 10, Category 1, Class B.

Pulse Shape:	Half Sine
Acceleration:	50m/s ² peak
Duration:	30ms
Number of Pulses:	3 in each direction (18 in total)
Number of Axes:	3 mutually orthogonal
Configuration:	Non Operational

Functional Vibration Test

Tested in accordance with EN 61373:2010, Clause 8, Category 1, Class B.

Frequency Range:	5 Hz to 150 Hz
ASD:	0.0301 (m/s ²) ² /Hz from 5Hz to 20Hz Falling at -6dB/octave to 150Hz
RMS Value:	1.01 m/s ² rms
Number of Axes:	3 mutually orthogonal
Duration:	10 minutes per axis
Configuration:	A functional test was carried out on completion of testing in all three axes.

TEST RESULTS:

Cooling Test

The specimens S1 and S2 completed testing without showing any external signs of damage or degradation. All functional tests were reported to be a pass by a representative of Panorama Antennas Limited.

Dry Heat Test

The specimens S1 and S2 completed testing without showing any external signs of damage or degradation. During the test the 2nd Temperature was above the upper limit. The temperature was 74°C throughout. All functional tests were reported to be a pass by a representative of Panorama Antennas Limited.

Salt Spray Testing

The specimens S5 and S6 completed testing without showing any external signs of damage or degradation to the units. The enclosures the specimens were mounted showed evidence of corrosion and salt deposits. All functional tests were reported to be a pass by a representative of Panorama Antennas Limited.

Vibration and Shock Testing

The specimens S5 and S6 completed testing without showing any external signs of damage or degradation. All functional tests were reported to be a pass by a representative of Panorama Antennas Limited.