

Test Certificate

CERTIFICATE No: TRA-031358-39-03A

ISSUE: A

DATE: 19 April 2016

PURPOSE OF TEST: EMC Electrical Testing

CLIENT ORDER No: 1920

CLIENT: C2UK LTD
Unit 1
Twyford Court
Rotherwas
Hereford
HR2 6JR

EQUIPMENT UNDER TEST: C-COM MINI
Serial No. 001

TEST SPECIFICATIONS: MIL-STD-1275D 29th August 2006 – Department of
Defence Interface Standard – Characteristics of 28 Volt
DC Systems in Military Vehicles

TEST DATE: 15th April

TEST LOCATION: Element Materials Technology, 74-78 Condor Close,
Woolsbridge Industrial Park, Three Legged Cross,
Wimborne, Dorset, BH21 6SU

TESTS CARRIED OUT: See Page 2

TEST RESULTS: Measured as compliant
(Measurement uncertainty as per RF522 current issue)

WRITTEN BY: J Wright
Senior EMC Test Engineer

APPROVED BY: A Bitcon
Technical Authority -
EMC

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.

RF671R 2.0

Test Certificate

CERTIFICATE No: TRA-031358-39-03A

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TESTS CARRIED OUT:

<i>Test Method and Description</i>	<i>Test Result</i>
Ripple Voltage Imported 50 Hz to 200 kHz Spot Frequencies	Pass
Voltage Spikes Exported	Pass
Voltage Spikes Imported	Pass
Voltage Surge Imported	Pass

NOTES:

1. Full test detail contained in Element report TRA-031358-39-02A

Test Certificate

CERTIFICATE No: TRA-031358-39-01A

ISSUE: A

DATE: 19 April 2016

PURPOSE OF TEST: EMC Emissions Testing

CLIENT ORDER No: 1920

CLIENT: C2UK LTD
Unit 1
Twyford Court
Rotherwas
Hereford
HR2 6JR

EQUIPMENT UNDER TEST: C-COM MINI
Serial No. 001

TEST SPECIFICATIONS: Defence Standard 59-411 Part 3 Issue 2 March 2014

TEST DATE: 13th – 14th April 2016

TEST LOCATION: Element Materials Technology, 74-78 Condor Close,
Woolsbridge Industrial Park, Three Legged Cross,
Wimborne, Dorset, BH21 6SU

TESTS CARRIED OUT: See Page 2

TEST RESULTS: Measured as compliant
(Measurement uncertainty as per RF522 current issue)

WRITTEN BY: Signature
J Wright
Senior EMC Test Engineer

APPROVED BY: Signature
A Bitcon
Technical Authority -
EMC

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Test Certificate

CERTIFICATE No: TRA-031358-39-01A

ISSUE: A

DATE: 19 April 2016

TESTS CARRIED OUT:

<i>Test Method and Description</i>	<i>Test Result</i>
DRE01.B Radiated Emissions Electric (E) Field 14 kHz to 18 GHz (Land Service Class A)	Pass
DRE03.B Radiated Emissions E Field (Land Service Class A) Tuned Antenna 1.6 MHz to 30 MHz	Pass

NOTES:

1. Full test detail contained in Element report TRA-031358-39-00A

Test Certificate

CERTIFICATE No: TRA031358CC01

ISSUE: A

DATE: 04/05/2016

PURPOSE OF TEST: Environmental Testing

CLIENT ORDER No: 1928

CLIENT: Andrew Atkinson
C2UK Ltd, Unit 1, Twyford Court, Rotherwas, Hereford,
GB. HR2 6JR.

EQUIPMENT UNDER TEST: C-Com Mini
1 Off
Part No.: 40-004-02
Serial No.: 001
Stores Number: TRA-031358-S1 (18/04/2016)

TEST SPECIFICATIONS: In accordance with quotation TRA-031358-01 and in
general accordance with DEF-STAN 00-35 Part 3 Issue
4, MIL-STD-810G, CAF2531 and CAF2532.

TEST DATE: 18/04/2016 to 22/04/2016

TEST LOCATION: Element Materials Technology, 74-78 Condor Close,
Woolsbridge Industrial Park, Three Legged Cross,
Wimborne, Dorset, BH21 6SU

WRITTEN BY:



Ryan Ballard
Test Engineer

APPROVED BY:



S. J. Brown
General Manager

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EMTEACC02

TESTS CARRIED OUT:**Vibration and Shock Testing**

The C-Com Mini was secured by ten M6 screws to an adaptor plate mounted to a hydrostatic slip table in the horizontal axes and directly to the shaker armature in the vertical axis.

Two control accelerometers were attached to the plate in diagonally opposed corners at the specimen fixing/adaptor plate interface. An average control strategy utilising both control accelerometers was employed to run all vibration tests and a signal point control was used to perform all shock testing.

Vibration testing consisted of a one hour random endurance test in three orthogonal axes in general accordance with DEF STAN 00-35, Part 3, Issue 4, Test M1. Shock testing consisted of three terminal peak sawtooth shocks of 40g, 11ms shocks in each direction of the three orthogonal axes (18 total), in general accordance with MIL-STD-810G, Method 516.6, Section 4.6.2, Procedure I - Functional Shock.

The specimen was powered and functionally tested by a customer representative throughout testing.

Temperature Testing

The C-Com Mini was positioned on wire rack shelving in the centre of the climatic chamber. Five platinum resistance thermometers (PRT) and a humidity probe were positioned around the specimen to measure the local environment and an additional PRT was taped directly to the top of the specimen in order to measure its skin temperature.

After an initial stabilisation period a twenty four hour Low Temperature Test was performed to the profile of DEF STAN 00-35, Part 3, Issue 4, Test CL5, Diurnal Cycle; C1 Storage and Transit. After completion of the Low Temperature Test the C-Com Mini was returned to ambient and stabilised at 30°C overnight before a twenty four hour High Temperature Test was performed to the profile of DEF STAN 00-35, Part 3, Issue 4, Test CL6, Diurnal Cycle; B2 Storage and Transit.

The specimen was powered throughout and intermittently functionally tested by a customer representative.

TEST RESULTS:**Vibration and Shock Testing**

The C-Com Mini satisfactorily completed vibration testing in all axes; the customer representative reported no issues. However during shock testing in the two horizontal axes problems were encountered with the power supply modules moving and losing contact, causing functional issues. The customer representative decided to pack out the space in front of the modules with Velcro material and the shocks were repeated. No further issues were encountered during the repeat shocks or during the vertical axis shock testing.

Temperature Testing

During the initial stabilisation period of the Low Temperature Test a problem was found with the reading from the skin temperature PRT. The PRT was replaced and its output monitored. As the reading was still inconsistent another PRT was used in a different channel on the chart recorder. This solved the problem and testing proper was commenced. No further issues were encountered during either temperature test and the customer representative reported no functional issues with the specimen.

At the end of the testing program the specimen showed no obvious signs of external damage or degradation and was returned to the customer for further investigation.