

Schedule

Singapore Test Services Pte Ltd
Product Reliability Division
601 Rifle Range Road
Singapore 588398

Certificate No. : LA-1999-0172-E

Issue No. : 19

Date : 23 April 2018

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FIELD OF TESTING: Electrical Testing

MATERIAL / PRODUCT TESTED	TESTS / PROPERTIES	STANDARD METHODS / TECHNIQUES / EQUIPMENT
Any Electronic Products or Components	1. Vibration Testing	<p>MIL-STD-810C Method 514.2 (except for ambient condition) Method 516.2, applicable only to:</p> <ul style="list-style-type: none"> • Procedure 1 & 5, for terminal peak sawtooth pulse • Procedure 2, trapezoidal pulse up to 50g, 10ms <p>MIL-STD-810D Method 514.3 (except for ambient condition) Method 516.3, applicable only to:</p> <ul style="list-style-type: none"> • Procedure 1 & 5, for terminal peak sawtooth pulse • Procedure 2, trapezoidal pulse up to 50g, 10ms <p>MIL-STD-810E Method 514.4 (except for ambient condition) Method 516.4, applicable only to:</p> <ul style="list-style-type: none"> • Procedure 1 & 5, for terminal peak sawtooth pulse • Procedure 2, trapezoidal pulse up to 50g, 10ms <p>MIL-STD-810F Method 514.5 (except for ambient condition) Method 516.5, applicable only to:</p> <ul style="list-style-type: none"> • Procedure 1 & 5, for terminal peak sawtooth pulse • Procedure 2, trapezoidal pulse up to 50g, 10ms <p>Mil-STD-810G Method 514.6 (except for ambient condition) Method 516.6, applicable only to:</p> <ul style="list-style-type: none"> • Procedure 1 & 5, for terminal peak sawtooth pulse • Procedure 2, trapezoidal pulse up to 50g, 10ms

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		<p>MIL-STD-202G Method 213B, up to 100g at vertical configuration only Method 201A Method 204D (all tests excepts F) Method 214A (test condition up to G)</p> <p>MIL-STD-883G Method 2007.3 (variable frequency, test condition A & B only) Method 2026 (random vibration, test condition A to K) Method 2005.2 (vibration fatigue, test condition A & B)</p> <p>IEC 60068-2-6: 2007 Test Fc: Vibration (sinusoidal) IEC 60068-2-27: 2008 Test Ea: Shock</p> <p>ISTA Procedure 3A: 2006 ISTA Procedure 1A, 2A: 2001</p> <p>RTCA / DO-160 D & G Section 8 – Vibration Section 7 – Operational shock</p> <p>MIL-STD-167-1A Mechanical vibrations of shipboard equipment (Type I - environmental vibration) SAE USCAR 2 Rev 4 Method 5.4.6 Vibration / Mechanical Shock ETSI EN 300019-2-3 (Stationary use at weather protected locations) *Min starting frequency 5Hz</p> <p>GMW 3172, min starting frequency 5Hz</p> <p>IEC 61373: 1999 Ed 1, min starting frequency 5Hz</p> <p>IEC 62133 Ed 2.0 7.2.2 Vibration (Nickel) 7.3.4 Mechanical Shock (Crash Hazard) (Nickel)</p>

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	2. Climatic Testing (-61°C to 150°C)	<p>MIL-STD-810C Method 500.1 Low pressure-altitude (Except for Procedure 3 & 4) Method 501.1 High temperature (RH 10% or higher) Method 502.1 Low temperature Method 504.1 Temperature-altitude Method 507.1 Humidity Method 518.1 Temperature-humidity altitude</p> <p>MIL-STD-810D Method 500.2 Low pressure-altitude (Except for Procedure 3 & 4) Method 501.2 High temperature (RH 10% or higher) Method 502.2 Low temperature Method 507.2 Humidity</p> <p>MIL-STD-810E Method 500.3 Low pressure-altitude (Except for Procedure 3 & 4) Method 501.3 High temperature (RH 10% or Higher) Method 502.3 Low temperature Method 507.3 Humidity</p> <p>MIL-STD-810F Method 500.4 Low pressure-altitude (Except for Procedure 3 & 4) Method 501.4 High temperature (RH 10% or higher) Method 502.4 Low temperature Method 507.4 Humidity</p> <p>MIL-STD-810 G Method 500.5 Low pressure-altitude (Except for Procedure 3 & 4) Method 501.5 High temperature (RH 10% or higher) Method 502.5 Low temperature Method 503.5 Temperature shock Method 507.5 Humidity</p> <p>MIL-STD-202G Method 107G Thermal shock Method 106G Moisture resistance Method 103B Humidity (steady state) Method 108A Life (elevated ambient temperature up to 200°C)</p>

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		<p>MIL-STD-331C, Test C1 IEC 60068-2-1: 2007 (Cold. Test A) IEC 60068-2-2: 2007 (Dry Heat. Steady state) IEC 60068-2-3:1969 (Damp heat, steady) IEC 60068-2-13:1983 (Test M: Low air pressure) IEC 60068-2-14: 2009 (only for Test Na & Test Nb) IEC 60068-2-30: 2005 (Damp heat, cyclic) IEC 60068-2-78: 2012 (Damp heat, steady state. Tests Cab)</p> <p>IEC 62133 Ed 2.0 7.2.3 Moulded case stress at high ambient temp (Nickel) 7.2.4 Temp cycling (Nickel) 7.3.5 Thermal abuse (Nickel) 8.2.2 Moulded case stress at high ambient temp (Lithium) 8.3.4 Thermal abuse (Lithium)</p> <p>RTCA / DO-160D Section 5: Temperature variation Section 6: Humidity Section 4: Temperature & altitude test (altitude only)</p> <p>ISTA Procedure 1A, 2A: 2001 (climatic)</p> <p>EIA JES D22-A105B Power & temperature cycling (Temperature cycling only) EIA JES D22-A104B Temperature cycling</p> <p>SAE USCAR 2 Rev 4 Method 5.6.1 Thermal shock Method 5.6.3 High temperature exposure Method 5.6.2 Temperature / Humidity cycling EIA-364-31B Humidity test procedure for electrical connectors and sockets</p>

Approved Signatories

Edward Choong – All tests
Alvin Teo – For item 1
Ryan Chua – For item 2
Sorreda Jenmark – For item 2

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Note:

This laboratory is accredited in accordance with the recognised International Standard ISO/IEC 17025:2005. A laboratory's fulfilment of the requirements of ISO/IEC 17025:2005 means the laboratory meets both the technical competence requirements and **management system requirements** that are necessary for it to consistently deliver technically valid test results. The **management system requirements** in ISO/IEC 17025:2005 (Section 4) are written in language relevant to laboratory operations and meet the principles of ISO 9001:2008 **Quality Management Systems — Requirements** and are aligned with its pertinent requirements.