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6220 CULEBRA ROAD • POST OFFICE DRAWER 28510 • SAN ANTONIO, TEXAS, USA 78238-5166 • (210) 684-5111 • TELEX 244846

Mechanical and Materials Engineering Division
September 22, 2003

SUMMARY OF ENVIRONMENTAL TESTS PERFORMED

Project Number: 18.04481.04.101

Company: Panasonic Personal Computer Company
50 Meadowlands Pkwy
Secaucus, NJ 07094
Attn: Alfred Tolentino

Equipment Tested: Panasonic CF-18 Toughbook Computer

Test Dates: August 2003 – September 2003

Notes: *Each test item was able to boot into the Microsoft Windows® operating system following each of the tests described within this summary report. A listing of summarized tests appear in the accompanying table.*

Two test units were exposed to each test, except for drop testing (26 drops were applied across 5 test units with touch screens).

Functional or visual anomalies noted for the testing are listed as follows.. Minor corrosion on case screw following the Humidity Test. Following the Dust Resistance Test, slight dust intrusion was observed in the external display port.

Report Written By: */s/ Rick Pitman*
Rick Pitman
Engineering Technologist

Reviewed By: */s/ Eric Dornes*
Eric Dornes
Project Manager



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Summary⁺ of Environmental Tests Performed on the Panasonic CF-18

Test Description	Test Parameters	MIL-STD-810F Reference	Pass/Fail*
Drop	36" drop height onto 2" of plywood, 26 drops total	Method 516.5, Procedure IV (Transit Drop Test)	Pass
Vibration	Non-Operational (from Figure 514.5C-17 of MIL-STD-810F): 0.04 g ² /Hz at 20-1000 Hz, -6 dB/Octave at 1000-2000 Hz, 1 hour/axis duration Operational (tailored to in service conditions as allowed in MIL-STD-810F)	Method 514.5, Procedure I, Category 24 (Minimum Integrity Test) for the non-operational condition and in-service environment for operational condition	Pass
Water Resistance	15 minutes of exposure to dripping water	Method 506.4, Procedure III (Drip)	Pass
Dust Resistance	Operating temperature of 140°F and silica flour with particle sizes as defined by MIL-STD-810F	Method 510.4, Procedure I (Dust)	Pass
Altitude	15,000 feet (the highest equivalent altitude given within MIL-STD-810F for cargo pressures of military aircraft) and two hours duration for both operation and storage conditions	Method 500.4, Procedures I (Storage) and II (Operation)	Pass
High Temperature	Storage temperature = 160°F Cyclic temperature exposures (Basic Hot Induced Conditions) were used for High Temperature Storage Test. Operation temperature = 140°F Constant temperature exposures were used for High Temperature Operation Test	Method 501.4, Procedures I (Storage) and II (Operation)	Pass
Low Temperature	Operation temperature = -20°F, Storage temperature = -60°F	Method 502.4, Procedures I (Storage) and II (Operation)	Pass
Temperature Shock	High non-operating temperature = 200°F, Low non-operating temperature = -60°F, Three cycles (high to low = one cycle)	Method 503.4, Procedure I (Steady State)	Pass
Humidity	The temperature cycled between 68°F and 140°F with the relative humidity maintained at 95%. Each cycle is 48 hours and the entire test consisted of 5 cycles. The computers were non-operational during the test. A functional check was performed every 24 hours.	Method 507.4 (Aggravated)	Pass

* "Pass" indicates that the computer successfully booted Microsoft Windows[®] following each test



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