NAME P/N QTY	CRIT	FAILURE MODE & CAUSES	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE
		350FM01		
DCM ELECTRONICS, ITEM 350 (PIVOTED, PLANAR) --- SV792291-41 (1) OR (ORU) --- SV822071-8 (1)	3/2RB	Loss of primary SSER power. Semiconductor or solder joint failure, broken connection, output printed circuit trace shorts to ground.	END ITEM: Loss of power on primary SSER power line. GFE INTERFACE: Loss of primary SSER power. SSER will continue to operate from secondary power line. MISSION: None for single failure. Terminate EVA for an additional loss of operationally redundant secondary EVC power line. CREW/VEHICLE: None. TIME TO EFFECT /ACTIONS: Seconds. TIME AVAILABLE: Days. TIME REQUIRED: Days. REDUNDANCY SCREENS: A-PASS B-FAIL C-PASS	A. Design - Semiconductor failure is minimized through the use of high reliability components. Established reliability capacitors (level S) and resistors (level R) are used and are qualified to the requirements of their respective MIL specs and thermal shocked per condition B of MIL-STD-202 Method 107. The transistors and diodes are qualified to the requirements of MIL-S-19500 and receive the burn-in of JANTXV level parts per the applicable methods, 1038, 1039 and 1040, of MIL-STD-750. The electronic components are operating within the power derating requirements of SVHS 7804. The printed circuit boards are polyimide per MIL-P-13949 Type GI and manufactured per SN-P-0006. Parts mounting and soldering is per MSFC-STD-136 and NHB5300.4 (3A-1). The board assemblies are hard mounted to the DCM case to provide a thermal transfer path between the board heatsinks and the case to direct heat away from the electronic components. The board assemblies are also conformal coated per MIL-A-46146 (Dow Corning RTV 3140) for environmental protection. All wiring used in the DCM is M22759/11 (teflon insulated). Soldering is per NHB5300.4 (3A-1) and wire crimping is per SVHS 4909 (based on MSC-SPEC-Q-1A). All wires are strain relieved. Electrical connectors are environmentally sealed to prevent damage due to contamination and humidity. B. Test - In-process: The DCM electronics assembly is tested during initial build-up: at the board assembly level, after the PC boards have been interwired, after installation of the boards and wiring, and after installation of the front cover. These tests consist of continuity through the switches and wiring, voltage checks,functional check of all current limiters, and full operation of the DCM electronics. The tests insure proper operation of all electronic components. PDA: Vibration testing per SEMU-60-015 followed by continuity and full functional testing verifies the integrity of the solder joints and crimp connections in the DCM. The random vibration level for this test is 6.6 grms for a duration of 1 minute per axis for each of the three orthogonal axes. (JSC Spec SP-T-0023) Thermal Vacuum testing followed by full functional electrical testing per SEMU-60-015 also verifies the health of the solder joints as well as the acceptability of the components. The DCM is placed in a vacuum chamber at 1 x 10-3 torr. The DCM case temperature is cycled 3 times from 70 to 130 degree F. At the end of the third cycle, the temperature is held betweem 130 & 135 degrees F for a minimum of four hours. The DCM display must remain on throughout the test. This verifies proper transfer of heat from the electronics to the DCM case to prevent overheating of components. Certification Test - Certified for a useful life of 25 years (Ref. EMUM1-0332). C. Inspection - 100% inspection of all soldering (PC boards and wiring) by Hamilton Standard QA

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and DCAS QA per quidelines in NHB-5300-4.

All board assemblies are inspected for damage and contamination.
All wiring is inspected for damage, nicks in the insulation, wear, and strain relief.

The DCM is internally inspected after installation of the circuit boards and wiring to insure no damage has occurred during assembly.

D. Failure History -
None.

E. Ground Turnaround -
None for single failure.

F. Operational Use -
Crew Response
Pre-EVA/EVA : No response, single failure undetectable by crew or ground.
Special Training
No training specifically covers this failure mode.
Operational Considerations
For single failure, no constraints.
Flight rules require that EVA be terminated if two-way communication between each EVA crewmember and orbiter, either direct or through relay is unavailable.

EXTRAVEHICULAR MOBILITY UNIT

SYSTEMS SAFETY REVIEW PANEL REVIEW

FOR THE

I-350 DCM ELECTRONIC ASSEMBLY

CRITICAL ITEM LIST (CIL)

EMU CONTRACT NO. NAS 9-97150

Prepared by: _____
HS - Project Engineering

_____
HS - Reliability

_____ 4/24/02
HS - Engineering Manager

Approved by: _____
NASA - SSE/SSM
ES5

_____
NASA - EMU/SSM

_____
NASA - S&MA

_____
NASA - MOD

_____
NASA - Crew

_____
NASA - Program Manager