NAME P/N QTY	CRIT	FAILURE MODE & CAUSES	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE
DCM ELECTRONICS, ITEM 350 SV792291-27 (1)	2/1R	350FM27: Power return line fails open. CAUSE: Broken wire.	END ITEM: Loss of power to DCM. GFE INTERFACE: Loss of power to entire EMU, including EVC and fan. MISSION: Terminate EVA. CREW/VEHICLE: None for single failure. Possible loss of crewman with loss of SOP.	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 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 SVHS7804. 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 heat sinks 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 6909 (based on NSC-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 Test - 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 limiter, and full operation of the DCM electronics. The tests insure proper operation of the DCM electronics. POA Test - Vibration testing per SEMU-60-015 followed by continuity and full function, 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

NAME P/N QTY	CRIT	FAILURE MODE & CAUSES	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE
	2/1R	350FM27:		electrical testing per SEMU-60-015 also verifies the solder joints as well as the acceptability of the components. The DCM is placed in a vacuum chamber at 1 x10-3 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 at between 130 and 135 degree F for a minimum of four hours. The DCM display must remain on thoughout the test. This verifies proper transfer of heat from the electronics to the DCM case to prevent overheating of components. Certification Test - The liquid crystal display version of the DCM electronics assembly (Item 350, SV792291-7), as part of the full DCM Item 300 (Items 350 and 385 combined), was successfully subjected to levels of vibration and shock equivalent to those experienced over a fifteen (15) year life. Random Flight Vibration 1.625 grms. 48 min/axis Sinusoidal Flight Vibration 1 grms. 5-35 Hz ea. axis Design Shock 6.5 grms 11 ms/peak The LED display version of the DCM electronics Assembly (Item 350, SV792291-5) was subjected to certification testing between June and August of 1986 with the exception of EMI which occurred in September of 1985. The testing verified the basic integrity and flight worthiness of the redesign DCM configuration (Item 300, SV792294). The Item 350 completed qualification vibration (7.8 grms, 6 minutes per axis) as a separate item, and structural vibration (1.625 grms, 48 minutes per axis), and shock testing as part of the full DCM Item 300 (Item 350 combined with Item 385). The DCM/300 also completed the four hour thermal vacuum certification at 135 degree F and storage temperature testing at 35 degree F. No class 1 EC*s have been incorporated into this version of the DCM since certification was completed. C. Inspection - 100% inspection of all soldering (PC boards and wiring) by Hamilton Standard QA and DCAS QA. All board assemblies are inspected for damage and contamination. All wiring is inspected for damage, nicks in the insulation,

NAME P/N QTY	CRIT	FAILURE MODE & CAUSES	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE
	2/1R	350FM27:		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 - J-EMU-151-004 (6-12-85) J-EMU-151-005 (6-12-85) During an EVA airlock power functional test, the EMU could not be powered from either the SCU or BAT modes. The failure was due to a short circuit in the 151 harness. The resulting high current caused the current sense/power return line to fuse open. See Item 151 for details and corrective action. E. Ground Turnaround - Failure would be detected per PEMU-R-001, Transducer and DCM Gage Calibration Check. It would not be possible to power up the EMU with this failure. F. Operational Use - Crew Response - Pre/PostEVA: Troubleshoot problem. If no success, consider third EMU if available. EMU no go for EVA. EVA: Deactivate EMU battery power, open Helmet purge valve, terminate EVA. Training - Standard EMU training covers this failure mode. Operational Considerations - EVA checklist procedures verify hardware integrity and systems operational status prior to EVA. Flight rules define go/no go criteria related to battery power. Real Time Data system allows ground monitoring of EMU systems.