PFR-089 Title: PCB IMON_P10VA increased current draw

Assembly : FM3 IDPU	**SubAssembly : PCB SN002**	
Component : IMON_P10VA	**Units Affected:**	**Units fixed:**
Originator: Corinna Chen	[ ][ ][X][ ][ ][ ]	[ ][ ][x][ ][ ][ ]
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Failure Occurred During (Check one √)

X Functional test □ Qualification test □ S/C Integration □ Launch operations □ Other (Flight Assy)

Environment when failure occurred:

X Ambient	□ Vibration	□ Shock	□ Acoustic
□ Thermal	□ Vacuum	□ Thermal-Vacuum	□ EMI/EMC

Problem Description

(In this section it is important to document the specific symptoms which exhibited the problem. In the event we see it happen again, we would like to know as much as possible.)

During FM3 CPT, the IDPU current monitor for P10VA was higher than previously seen on FM1 and FM2. The current draw was first noticed when the FGE was turned on. The current monitor during the test was 32d.

Analyses Performed to Determine Cause

(How do we know how the failure happened? Was it a bad part, bad handling, what?)

The P10V circuit breaker on the PCB was tested and it was working properly. The IMON_P10V static load current was nominal for both FGE and SCM but current monitor readback was 120mV above average. The FGE jumper for P8V was removed and the direct current was measured for the instrument electronics. The FGE current draw was 27mA, which is the expected draw. All parts and its values were checked for the P10V circuit breaker circuit. Multipoint volt measurements on PCB SN002 compared to PCB SN005 did not yield any obvious defects.

The current monitor readback depends on mainly two components, the current sense 1mΩ resistor and the following op-amp. A heat gun test was performed on both ends of the current sense resistor and its wire modifications for PCB SN002 and PCB SN005 (for comparison). The current readback was steady for both boards when heat was applied. Heat was applied to the op amp for both boards. On PCB SN002, the current readback rapidly increased when heat was applied for a very short period of time. When heat was applied to SN005, the monitor fluctuated mildly.

Corrective Action/ Resolution

(How do we fix the unit? And how do we make sure it doesn't happen again?)

The op-amp, part number 5962-9320901MPA, was replaced on SN002. After the part was replaced, the current monitor readback was 110mV lower and no longer sensitive when heat was applied. The IMON_P10V is now in the upper average range. To fully conclude the monitor functionality, the current sense resistor was replaced with a resistor that measured closest to 1mΩ. The resistor change did not affect the readback. The difference in the current readback from board to board is attributed to the individual board impedances. Overall, all board readbacks are consistent.

Acceptance:

MAM: Ron Jackson_____; MSE: Ellen Taylor_____

PM: Peter Harvey_____; Cognizant Engineer_____

Date of Closure_____