PFR-088 Title: IDPU Mechanical Board Fouling Issue

Assembly : IDPU	**SubAssembly : DAP/BEB**	
Component : Board Shields	**Units Affected:**	**Units fixed:**
Originator: Michael Ludlam	x x x x x x	x x x x x x
Organization: UCB	**Date: 3/AUG/05**	
Phone: 510 642 7732	**Email : mludlam@ssl.berkeley.edu**	

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 the F1 Pre-Workmanship Vibration LPT the SST tripped off during power on. Because the PCB trip switches are disabled to cope with the extended SST inrush current during this power on the PCB was also affected. Housekeeping TM was corrupted, however on sending a IDPUSAFE command the PCB reset correctly.

Analyses Performed to Determine Cause

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

The problem was traced to the shorting of capacitors on the underneath of the DAP board to the board shield below it (BEB). The IDPU box was disassembled and the BEB shield was examined. It was seen to have a number of scratches where components on the DAP board were touching up against the shield.
It was verified with the DAP team that no damage could be done to the DAP board in this instance and the PCB engineer confirmed that the current draw through the PCB for this time was within limits for the FETs used. The LVPS has over current protection and survives this kind of incident.

Corrective Action/ Resolution

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

After analysis it was decided to redesign the IDPU board shields and make them from pcb board material with a layer of copper sandwiched in the middle. This will prevent an touching of components to a metal shield from changes during any environmental testing and later during flight.

This PFR can be closed when the IDPU box assembly instructions have been updated to include shield modification and other lessons learnt from the box build.

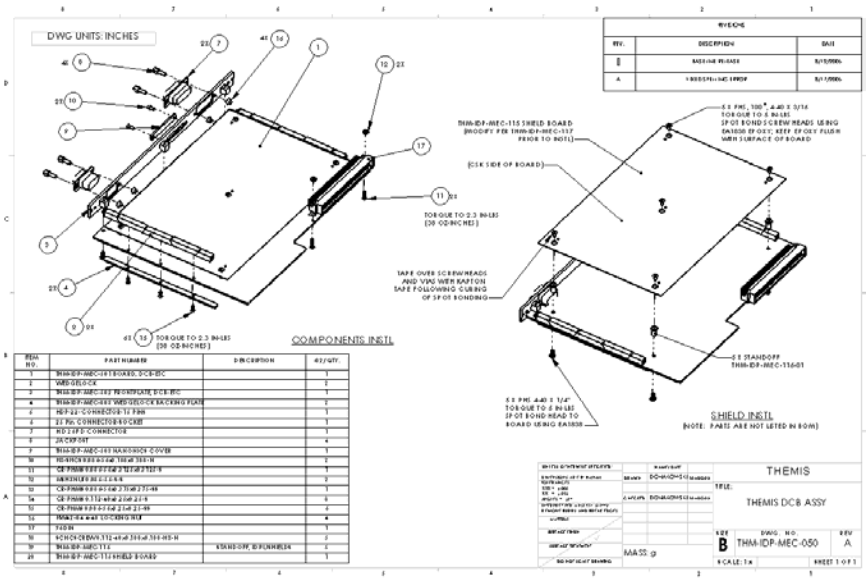
(Following added 09 November 2005, B. Donakowski):
New G10 Covers designed and fabricated (UCB Dwg# THM-IDP-MEC-115). All dwgs updated to reflect new G10 covers design (attached). No other fixes need to be implemented; insulated G10 layer on covers provides excellent insulation against components grounding. All work completed, problem eliminated and verified by test.

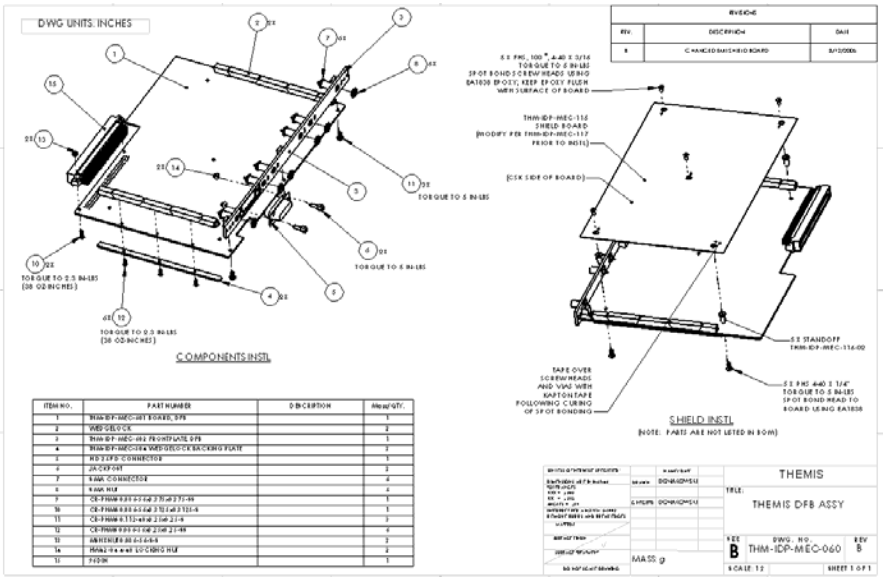
Acceptance:
MAM: Ron Jackson_____; MSE: Ellen Taylor_____

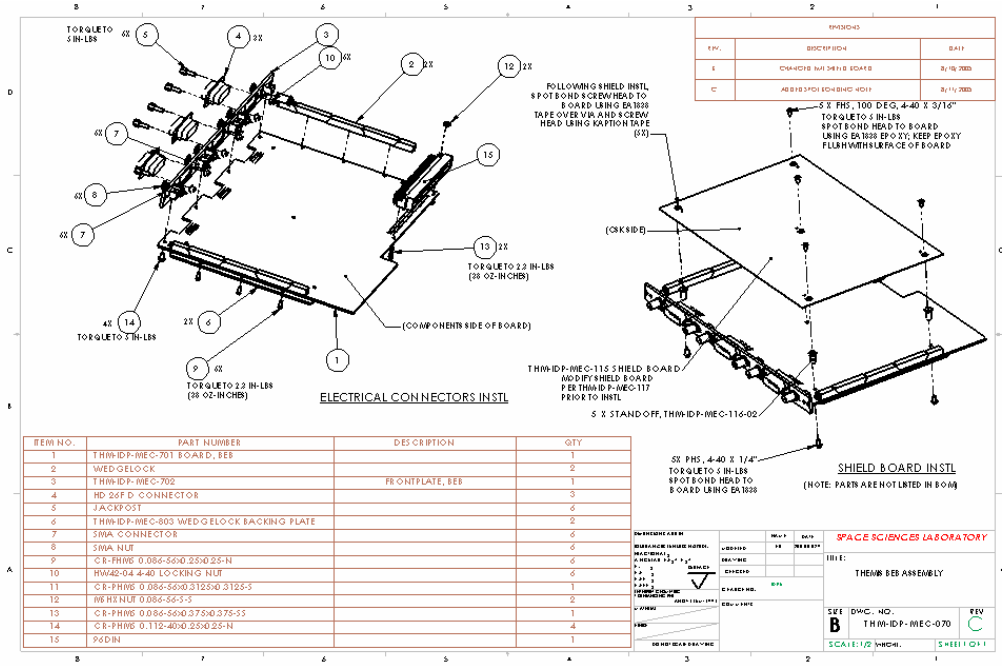
PM: Peter Harvey_____; Cognizant Engineer_____

Date of Closure_____

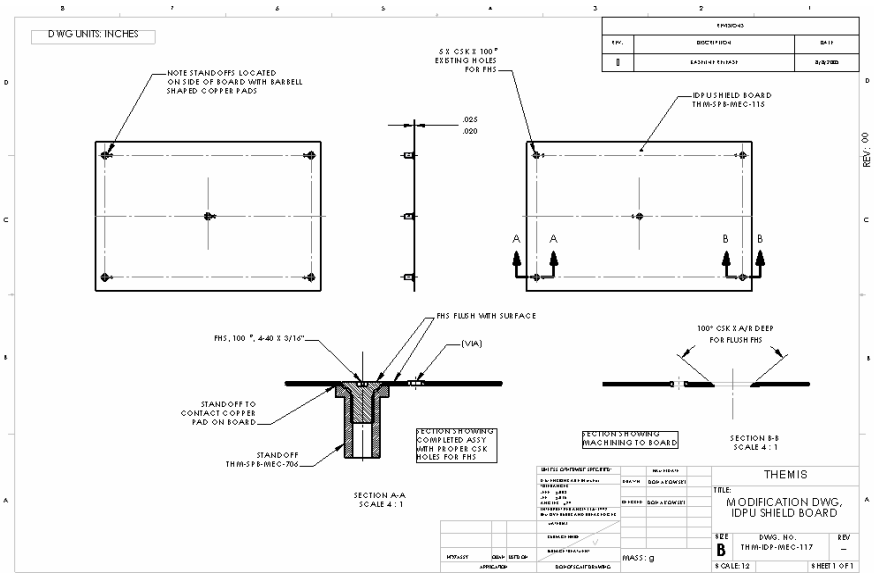
Assy and Detail Dwgs of G10 PCB Covers Design and Installation

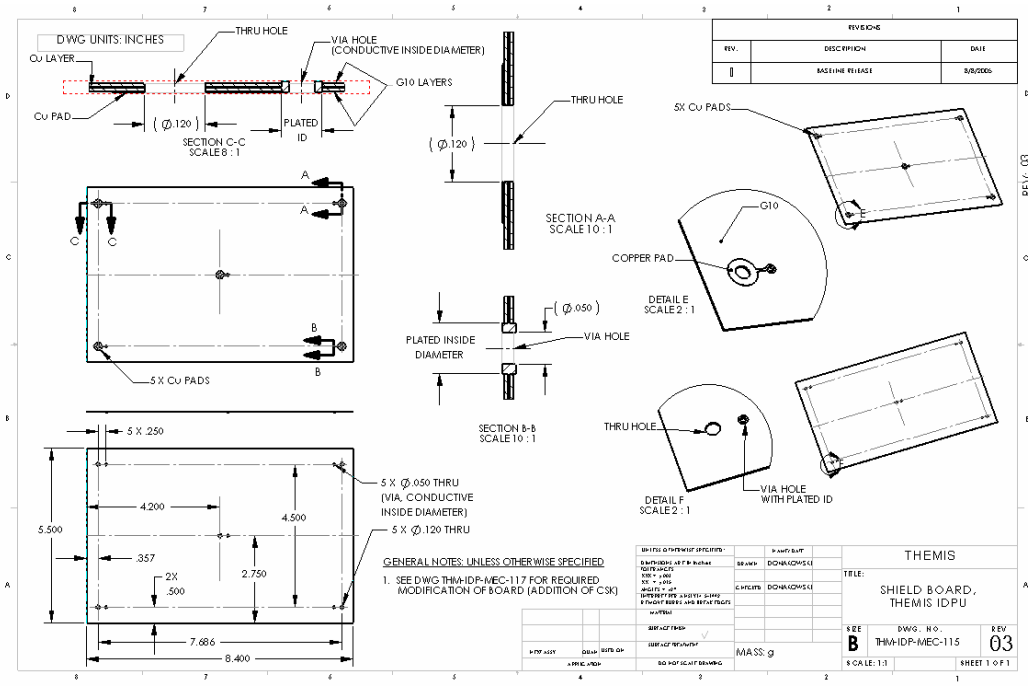






ITEM NO.	PART NUMBER	DESCRIPTION	QTY
1	THM-IDP-MEC-701 BOARD, BEB		1
2	WEDGELOCK		2
3	THM-IDP- MEC-702	FRONTPLATE, BEB	1
4	MD 26F D CONNECTOR		3
5	JACKPOST		6
6	THM-IDP-MEC-803 WEDGELOCK BACKING PLATE		2
7	SMA CONNECTOR		6
8	SMA NUT		6
9	C R-PHMS 0.086-56X0.250-0.25-N		6
10	MW42-04 4-40 LOCKING NUT		6
11	C R-PHMS 0.086-56X0.3125X0.3125-S		1
12	MS MX NUT 0.086-56-S-S		2
13	C R-PHMS 0.086-56X0.375X0.375-SS		1
14	C R-PHMS 0.112-40X0.250-0.25-N		4
15	P-DIN		1




DWG UNITS: INCHES
THRU HOLE
VIA HOLE (CONDUCTIVE INSIDE DIAMETER)
Cu LAYER
G10 LAYERS
Cu PAD
PLATED ID
SECTION C-C SCALE 8 : 1
THRU HOLE
SECTION A-A SCALE 10 : 1
5X Cu PADS
G10
COPPER PAD
DETAIL E SCALE 2 : 1
PLATED INSIDE DIAMETER
VIA HOLE
SECTION B-B SCALE 10 : 1
5 X .250
4.200
4.500
5.500
.357
2X .500
2.750
7.686
8.400
5 X Ø.050 THRU (VIA, CONDUCTIVE INSIDE DIAMETER)
5 X Ø.120 THRU
5 X Cu PADS
THRU HOLE
VIA HOLE WITH PLATED ID
DETAIL F SCALE 2 : 1
GENERAL NOTES: UNLESS OTHERWISE SPECIFIED
1. SEE DWG THM-IDP-MEC-117 FOR REQUIRED MODIFICATION OF BOARD (ADDITION OF CSK)
REVISIONS
REV. DESCRIPTION DATE
0 BASELINE RELEASE 9/8/2005
THEMIS
TITLE: SHIELD BOARD, THEMIS IDPU
SIZE B DWG. NO. THM-IDP-MEC-115 REV 03
SCALE: 1:1 SHEET 1 OF 1
MASS: g