

## PFR-028 Title: DFB resistor misplacement on FM-2

Assembly :		SubAssembly : DFB SN003	
<b>Component :</b>			
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<b>Failure Occurred D</b> × Functional test	<b>uring (Check one</b> $$ ) Qualification test	□ S/C Integration	□ Launch operations
Environment when failure occurred:   × Ambient □ Vibration □ Shock □ Acoustic			
Thermal		□ Thermal-Vacuum	□ EMI/EMC

## **Problem Description**

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

During initial visual inspection at LASP, it was noted that two pairs of resistors were incorrectly installed.

## **Analyses Performed to Determine Cause**

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

Resistor pairs R220-R222 and R228-R229 were installed incorrectly. Since this issue had previously been observed (on DFB SN002), the anomaly was detected using visual inspection. The picture below shows the problem.



**Corrective Action/ Resolution** 

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

The resistors were removed and then soldered in the proper orientation and the board has functioned properly since. Although this problem was detected and corrected prior to powering up the board at LASP, if digital power was applied during analog testing at Berkeley then the integrity of the parts could be in question. If digital power was applied during previous testing, then the following comments are relevant... Aref Nammari confirmed that the result of the incorrect installation is that the FPGA pins would be connected together through a 100 ohm resistor and also that the SRAM pins would be connected together through a 100 ohm resistor. The FPGA should be fine since the current drive capability exceeds 50mA. However, R228 and R229 are connected to data bits on the SRAM and these could have driven into each other during a read operation. The absolute maximum rated value for the average output current on the



RAM chip U55 is 25mA and the 50 mA that would have flowed through the 100 ohm resistor given +5V on one pin and 0V on the other would have exceeded this limit. The RAM chip (U55) could have been stressed in this situation and I recommend replacing it. These resistors should be checked before powering up future boards since the situation was repeated on FM-2 after occurring on FM-1.

Date of Closure\_\_\_\_\_