

# Digital Front End Motherboard

## Assembly Fabrication Specification

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### General Information

The Digital Front End Motherboard is a 6U x 320mm printed circuit board with approximately 400 components. Most of the components are surface mount, the smallest consisting of 0.5mm pin pitch packages and "0603" discrete passives. It is expected that the vendor will purchase all parts and assemble all parts on the printed circuit boards. A total of 125 boards are expected to be assembled. Ten (10) initial boards will be built, then the remaining 115 after Fermilab checkout. The vendor is required to fully conform to Class 2 of the assembly quality standard titles ANSI/IPC-A-610.

### Parts

#### Initial parts list

The initial parts list will contain all known components to be assembled including those to be supplied by Fermilab. Each component will have a unique Fermilab assigned number (F/N) and estimated cost. This list should be used for bidding purposes only. Pricing of parts is for reference only and may vary widely from actual purchase pricing.

#### Substitution of equivalent parts

All part substitution must first be approved in writing or FAX by Fermilab. Vendor shall supply Fermilab with specifications of the part to be substituted. This part will be assigned a new Fermilab assigned number (F/N).

#### Additions, deletions, and substitutions initiated by Fermilab before parts approval

Additions, deletions, and substitutions to the parts list will be handled as follows:

- Price differentials will be submitted by the vendor to Fermilab in writing.
- If the resulting differential results in a price increase, Fermilab reserves the right to purchase the part and supply it to the vendor for assembly with a corresponding downward adjustment in the contact price via a change order.
- Additional parts will be assigned a new Fermilab assigned number (F/N).

### **Additions, deletions, and substitutions initiated by Fermilab after parts approval**

Additions, deletions, and substitutions to the parts list can occur for each assembly phase and will be handled as follows:

- Price differentials for the remaining assembly will be submitted by the vendor to Fermilab in writing.
- If the resulting differential results in a price increase, Fermilab reserves the right to purchase the part and supply it to the vendor for assembly with a corresponding downward adjustment in the contact price via a change order.
- Deleted parts that cannot be returned to the distributor and/or OEM will be delivered to the Fermilab without adjustment of the contract price.
- Restocking charges encountered by the vendor on deleted parts will be added to the contract price via a change order.
- Additional parts will be assigned a new Fermilab assigned number (F/N).

### **Assembly Drawing and Insertion File**

Fermilab will supply all applicable assembly drawings and auto insertion files.

### **Testing**

After completion of board assembly, each board must be visually inspected.

### **Board Warpage**

Bare board warpage is specified at less than 0.005mm per linear centimeter. Board warpage after assembly must be less than 0.01mm per linear centimeter.

### **Schedule**

The vendor is expected to fabricate and test the printed circuit boards, order the parts, stuff and inspect the digital front end motherboards. Ten fully stuffed and inspected prototypes will be expected for Fermilab approval within 5 weeks of accepting the bid. After these prototypes have been checked out and approved by Fermilab, the remaining 115 fully stuffed and inspected boards must be delivered within 5 weeks.