TFB Power Rules

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Overview

The TFB requires four (4) low voltage supplies and one (1) high voltage (HV) supply, these are nominally 1.7V, 3.1V, 3.8V, 5.5V and 70V respectively. The low voltage supplies are regulated using linear regulators to 1.2V, 2.5V, 3.3V and 5.0V respectively. The HV supply provides the SiPM bias.

Power Up Sequencing: Low Voltage

The 1.7V, 3.8V and 5.5V low voltage supplies may be applied in any order, and ramped to their final levels at any slew rate. The 3.1V low voltage supply should be brought up last, and should reach 3.1V within 1 second of starting. Applying a lower slew rate may compromise the power-on reset (POR) of the TFB. This last voltage also controls the enable pins of all four of the regulators, and hence, before is is applied, the TFB will draw no current on any of the supplies. When switching off the TFB, the 3.1V should be powered down first.

Once powered off, it is recommended that the TFB not be repowered for a minimum of 15 seconds to allow the POR circuit to discharge.

Power Up Sequencing: High Voltage

The TFB contains a switch that controls whether the SiPM bias will be applied on not. The power up default for this switch is off. Although there is no reason why the HV cannot be applied with the low power switched off, it is probably good practice not to do so until the TFB is powered up.

Absolute Maxima

The low voltage regulators must not have their inputs taken above 7V, and the HV supply must not be taken above 100V.

Power Consumption

The power consumption for the low voltage rails has been measured for current firmware implementation and is shown in Table 1. Note that no significant changes are expected to these numbers.

Table 1: TFB Power Consumption

Rail	***Current Consumption***
1.7V	260mA
3.1V	600mA
3.8V	50mA
5.5V	180mA

Supply Commoning

The input tolerances and power up requirements mean that it would be possible to common the 5.5V and 3.8V supply rails. It is not advised to common any other rails together.