

The GEB is a crucial element in the design of the GEM detector readout system. Its principle roles are three fold; to carry electrical signals between the front-end chips and the Optohybrid board, distribute power and provide electrical shielding to the detector. The GEB is placed on top of GEM readout board as shown in Figure 1.

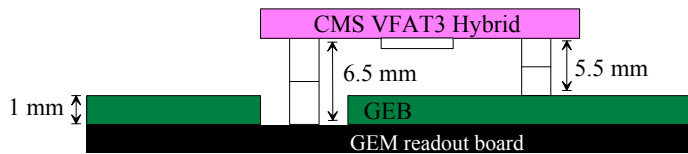


Figure 1. Crosssection of detector and readout electronics.

Lowest layer of GEB functions as a shield preventing the EMI created by the switching of the digital electronics from interfering the analog low-level signals on the GEM readout board. Top layer is the component layer with the connectors and SMD components. Other layers of the 6 layer 1 mm thick GEB PCB are used for the signal routing and powering. Power cables provided by the CMS Experiment connect to the GEB which distributes power to VFAT3 hybrids and to the Optohybrid.

CMS VFAT3 hybrids are plugged on top of GEB. Clock distribution from optohybrid to the CMS VFAT3 hybrids is done in 6 segments, shown in Figure 2 (left). Segmenting the MCLK, T1 and Datavalid signals is done because of the limited address bits available on VFAT3 front-ends. The latest GEB prototype PCB is shown in figure 2 (right).

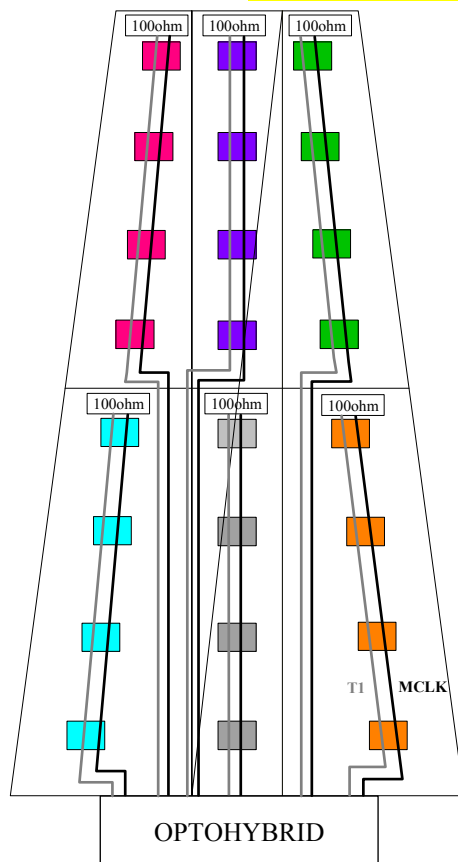


Figure 2

The CMS VFAT3 hybrids are plugged on both on GEB and GEM readout board. This way the CMS VFAT3 hybrid provides the electrical connection for the low-level analog signals

from GEM readout board to the VFAT3 and for the digital signals from the VFAT3 to the Optohybrid through the GEB. Latest VFAT2 hybrid prototype is shown in figure 3.

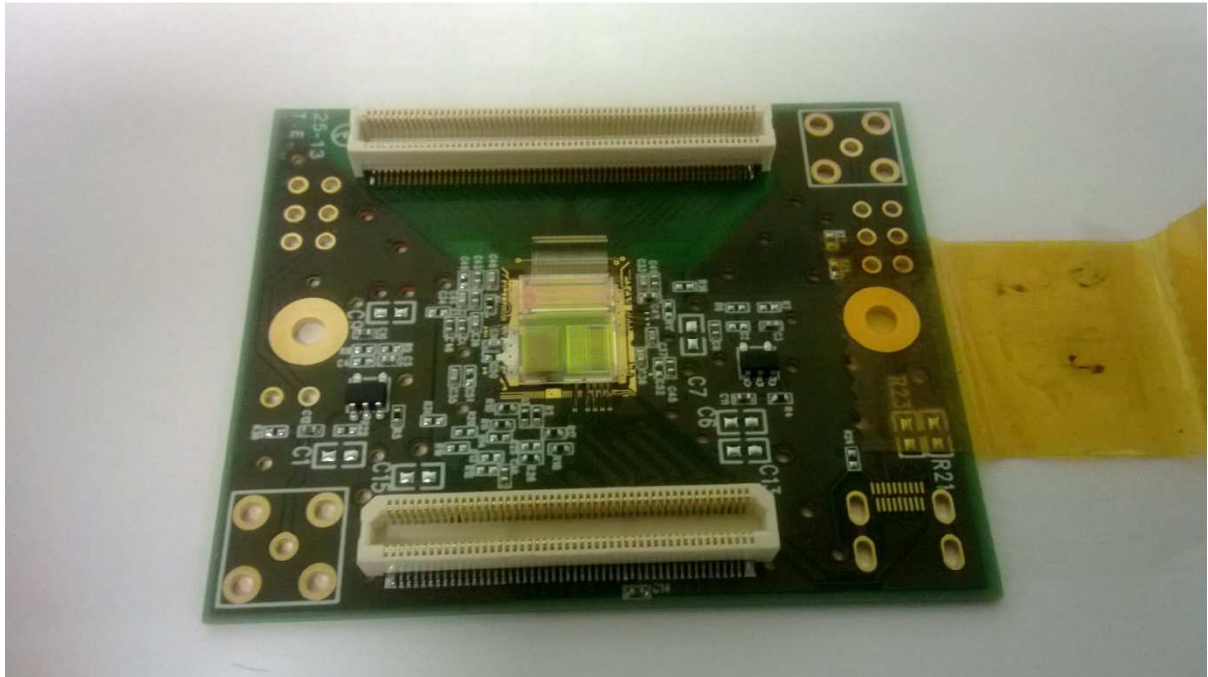


Figure 3.