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Multichannel board for picosecond timing measurements of silicon sensors

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A dedicated 16-channel board was designed for matrix test and inter-pixel proprieties. Each channel is composed of a dual stage amplifier design with an uniform response up to a frequency range of 8 GHz. A single SiGe transistor configuration is used for both stages, with the first acting as a transimpedance amplifier and the second as a voltage amplification stage. The design features a passive daughter board for versatile sensor replacement, triaxial HV input and coaxial outputs, implemented on a hermetically EM shielded HF-Rogers dielectric. Preliminary tests indicate a total gain of 70 with both stages combined and an SNR higher that 100 for a typical 50 µm planar pixel sensor signal. The inter-channel cross-talk with a 4x4 50 µm thick pixelated matrix has been evaluated. More test are on the way to evaluate 3D sensors.

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