

CHARACTERIZATION OF SINGLE-EVENT TRANSIENTS IN THE LM119 VOLTAGE COMPARATOR

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The LM119 voltage comparator is a fast device with an 80 ns response time. Testing and modeling such fast devices require modifications to the procedures used for much slower devices such as the LM124. For testing, it is important to be aware that the loading has a significant effect on the shape of fast transients. For modeling it is necessary to use very short injected current pulses to simulate the injected charge when using the circuit simulator program SPICE. Fig 1 shows a comparison between two transients, one generated with laser light and the other the result of SPICE simulation.

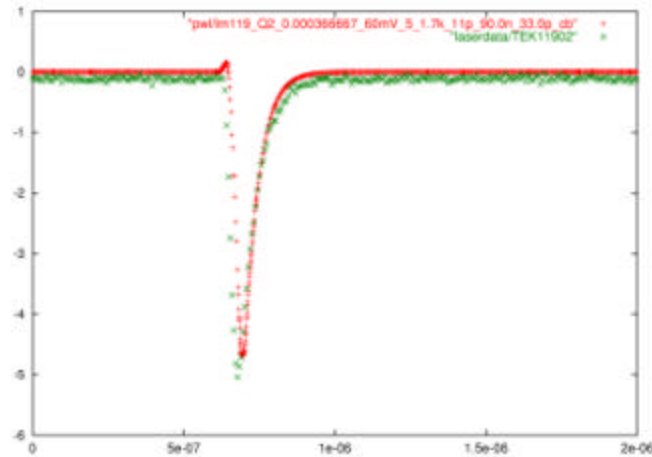


Fig. 1. Comparison of SET obtained with a laser and from SPICE for the LM119

We have obtained data on the SET response and sensitivity using both a pulsed laser and heavy ions. The laser and ion data were obtained under various conditions of loading, bias and differential input voltage. The characteristics of SETs obtained with the laser were reproduced by circuit simulation. Heavy ion data was also used to verify the characteristics.

Transients generated in the LM119 with the laser were compared for 4" and 6" wafers to determine whether there were any differences in the SET sensitivity due to differences in processing. The variations in response of six different parts, all from the same 6" lot as measured with the laser, were about 15%. The variations in SET response between parts from 4" and 6" wafers were comparable. Heavy ion data will be taken to see whether the process variations affect the SET response to heavy ions as much as they affect the SETs generated with laser light.