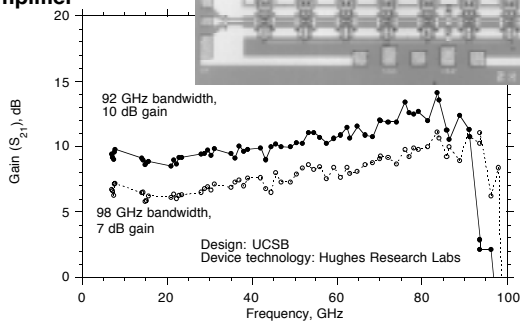


# Electronic Components for High Speed Fiber Transmission

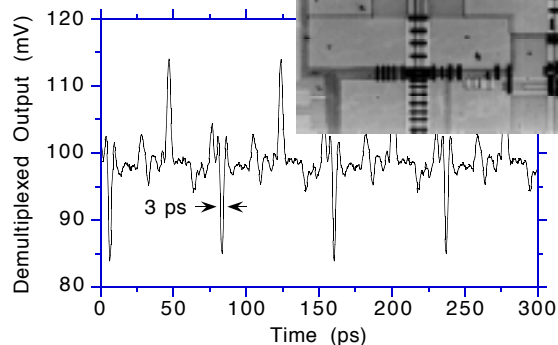
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Standard optical receivers, employing HBT amplifiers and multiplexers, require transistor bandwidths of c.a. twice the TDM data rate, and HBT current-gain and power-gain cutoff frequencies must exceed 200 GHz to implement 100 Gb/s TDM systems. We will report diode-based demultiplexer ICs and 96 GHz HEMT distributed amplifiers, both targeted for 100 Gb/s receivers. We will also report recent results with transferred-substrate HBTs, a modified device structure whose power gain cutoff frequencies increases rapidly with submicron scaling. Present 2 micron devices obtain 165 GHz  $f_{max}$ . Deep submicron devices are expected to obtain  $f_{max}$  approaching 500 GHz, supporting TDM transmission at rates in excess of 100 Gb/s.

**Capacitive-Division  
Traveling-Wave  
Amplifier**



**100 GB/sec  
Demultiplexer:  
1010... Output**



**Transferred Substrate HBT**

