Low Power Adaptive Passive equalizer

Bit Error Rate Tester

Target channel

Receiver

| Equalizer | CDR | Internal Circuits |

Equalizer

Tunable Passive Filter

Limiting Amplifier

Input

Output Driver

Control Voltage

Voltage to current converter

Rectifier

Power Detector

Low-Pass Filter
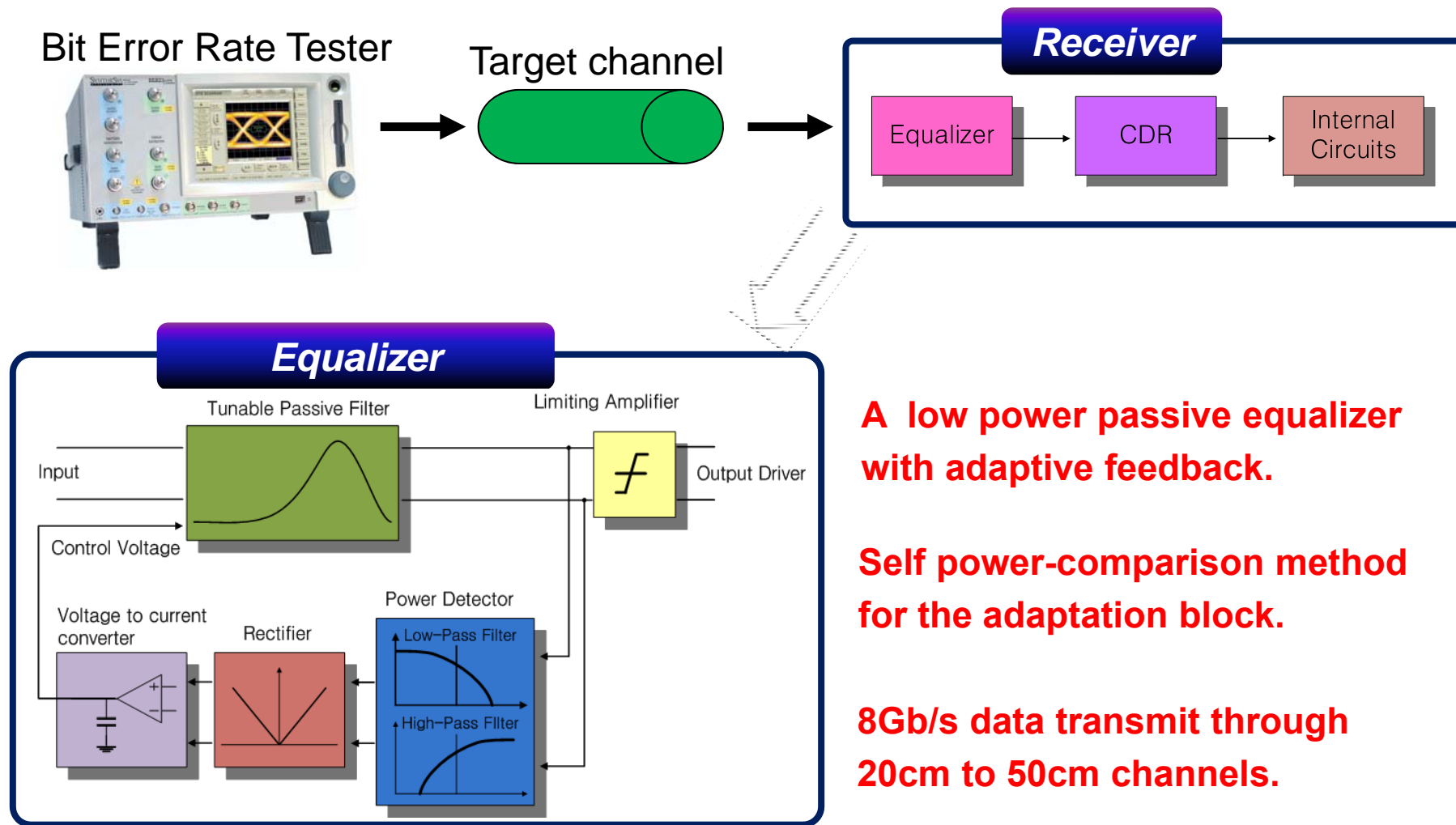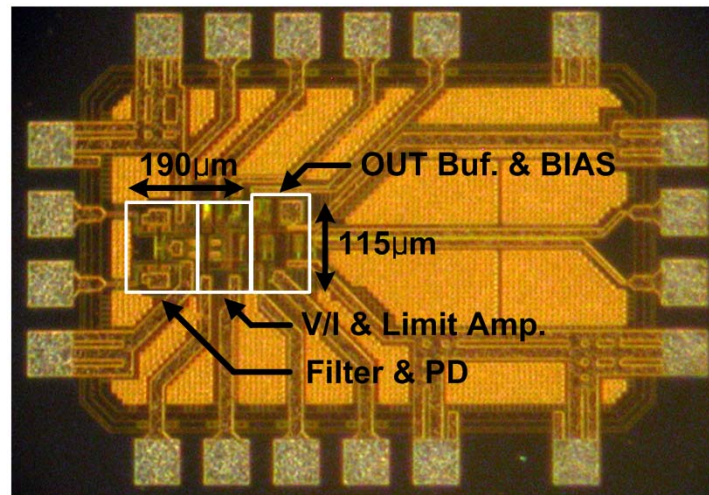
High-Pass FIlter

A low power passive equalizer with adaptive feedback.

Self power-comparison method for the adaptation block.

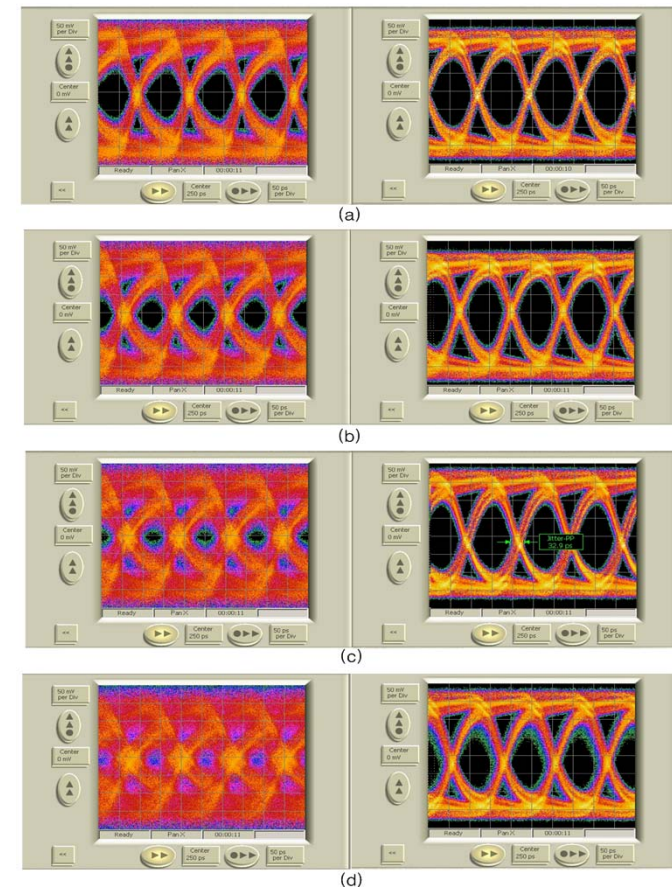8Gb/s data transmit through 20cm to 50cm channels.

Low Power Adaptive Passive equalizer

Die photographs of adaptive EQ

190μm

OUT Buf. & BIAS

115μm

V/I & Limit Amp.

Filter & PD

Achieves the error-free condition (BER < 10^{-13})

at all target channels.

The equalizer has very small power efficiency

of 0.84 mW/Gbps and occupies only 0.021 mm^2

of chip area in 0.18-μm CMOS technology.

(a)

(b)

(c)

(d)

Measured waveform before (left) and
after (right) equalization at 8 Gb/s of
(a) 20-cm FR4 PCB trace
(b) 30-cm FR4 PCB trace
(c) 40-cm FR4 PCB trace
(d) 50-cm FR4 PCB trace