

Continuous Time Linear Equalizers (CTLEs) for PCIe3 and PCIe4

BSXPCI3EQ and BSXPCI4EQ Datasheet



Tektronix offers Continuous Time Linear Equalizers (CTLEs) to correct for losses and distortions caused by high frequency transmission lines.

Key performance specifications

- High correlation to the PCIe3/4 Behavioral CTLE Models
- Nominal 2 dB insertion loss
- <10 dB insertion loss
- DC coupled
- 23 dBm RF power

Product description

Continuous Time Linear Equalizers (CTLEs) are implemented to correct for losses and distortions caused by high frequency transmission lines. Two different sets of equalizers are offered for PCIe3, 8GT/s (BSXPCI3EQ) and PCIe4, 16GT/s (BSXPCI4EQ). Each offering contains two sets of equalizers with two different gain corrections (3 dB and 6 dB).

The CTLEs can improve eye openings due to the trace losses of the PCBs, enabling a higher level of testability of the corresponding data channels.

The equalizers follow the PCIe3/4 specifications for the transfer function given as follows:

$$H(s) = \frac{\omega_{p2} \times (s + \omega_{p1} \times A_{DC})}{(s + \omega_{p1}) \times (s + \omega_{p2})}$$

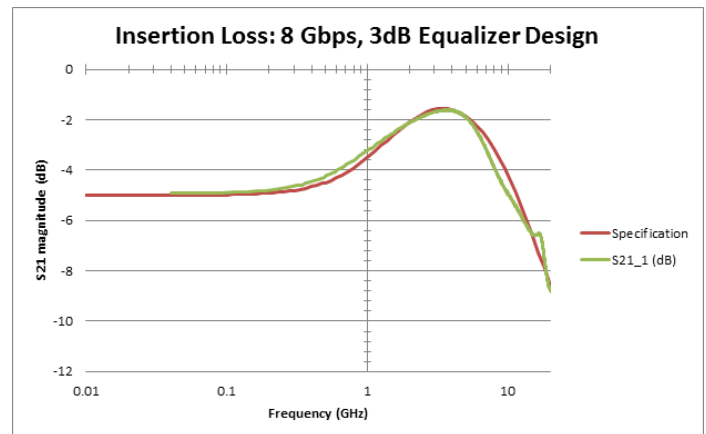
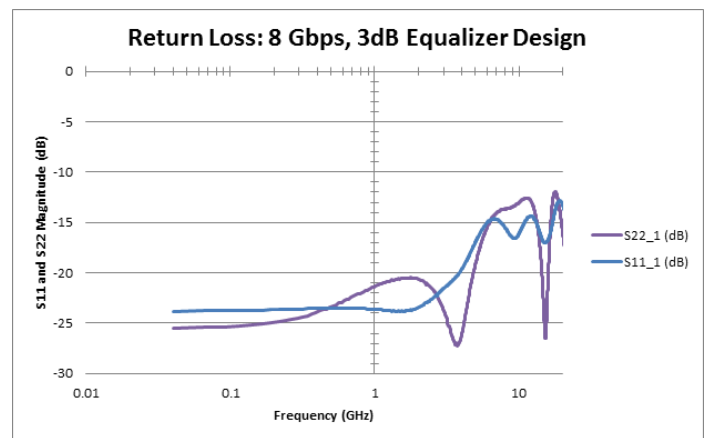
For PCIe3

- A_{DC} = DC Gain
- ω_{p1} = pole 1 = $2\pi \times 2$ GHz
- ω_{p2} = pole 2 = $2\pi \times 8$ GHz

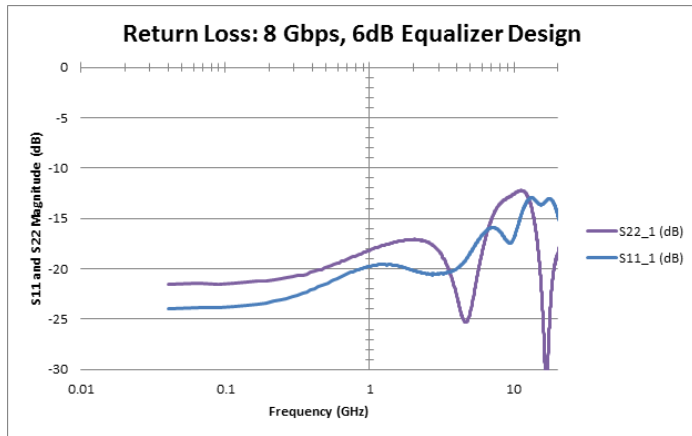
For PCIe4

- A_{DC} = DC Gain
- ω_{p1} = pole 1 = $2\pi \times 4$ GHz
- ω_{p2} = pole 2 = $2\pi \times 16$ GHz

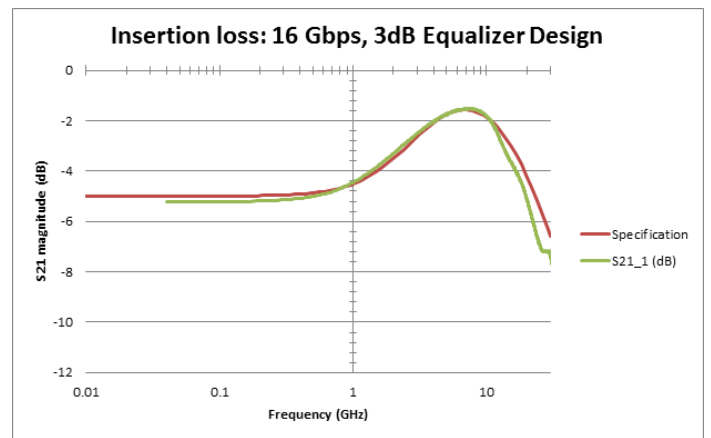
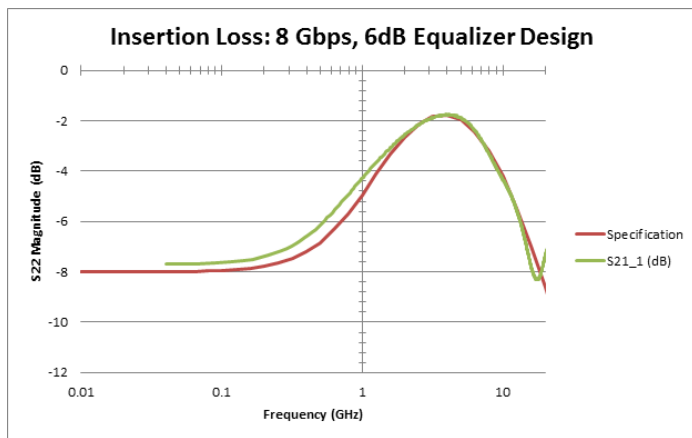
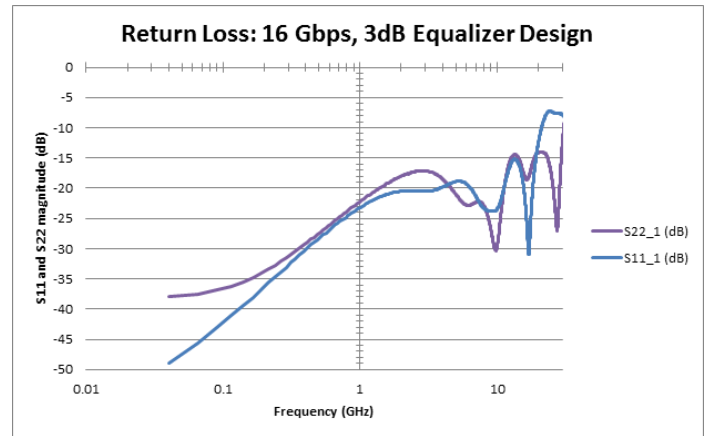
Typical performance BSXPCI3EQ 3 dB



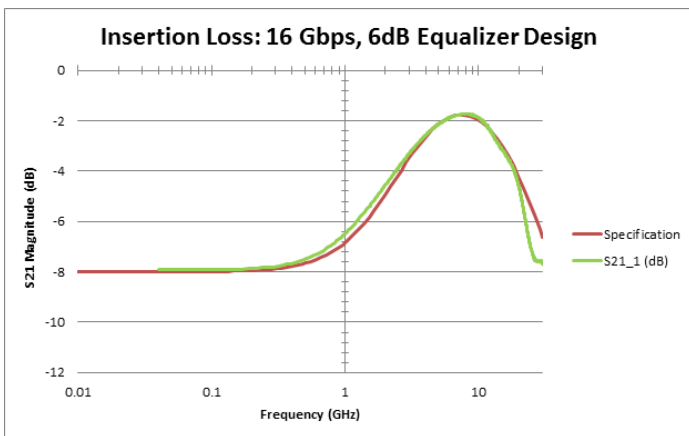
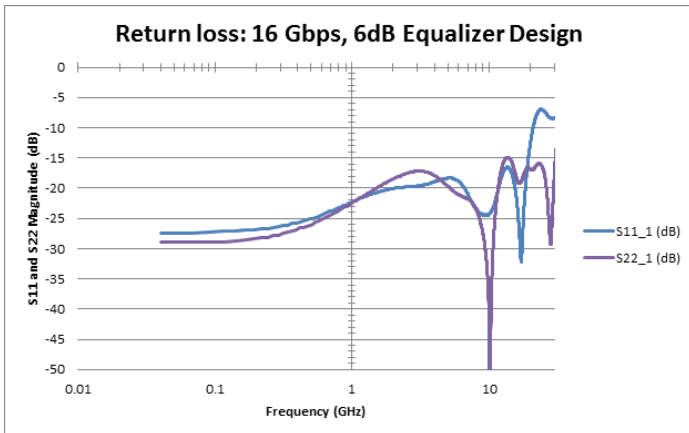
Typical performance BSXPCI3EQ 6 dB



Typical performance BSXPCI4EQ 3 dB



Typical performance BSXPCI4EQ 6 dB

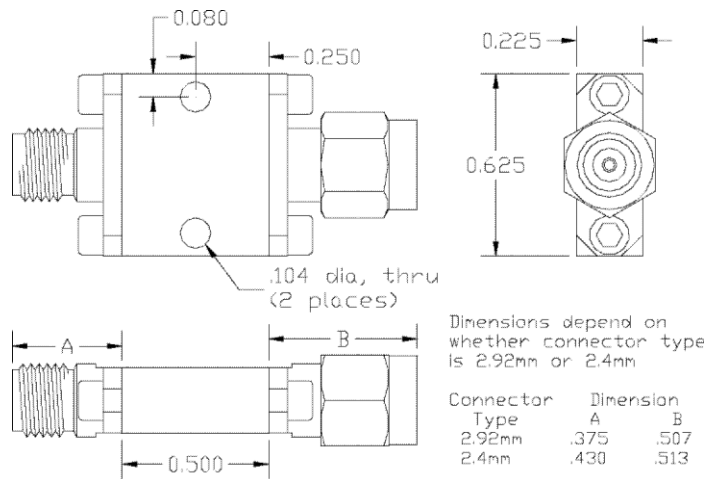


Specifications

All specifications are guaranteed unless noted otherwise.

Parameter		BSXPCI3EQ		BSXPCI4EQ	
		PCIe3, 3 dB	PCIe3, 6 dB	PCIe4, 3 dB	PCIe4, 6 dB
Attenuation, DC	Minimum	4.5 dB	7.5 dB	4.5 dB	7.5 dB
	Typical	5 dB	8 dB	5 dB	8 dB
	Maximum	5.5 dB	8.5 dB	5.5 dB	8.5 dB
Passband insertion loss	PCIe3 (fc=4 GHz) PCIe4 (fc=8 GHz)	2 dB nominal 2.5 dB maximum			
Connector configuration		SMA	SMA	2.92 mm	2.92 mm
Return loss (see plots)		-12 dB, 0 to 8 GHz -10 dB, 8 to 12 GHz		-12 dB, 0 to 12 GHz -10 dB, 12 to 20 GHz	
Maximum power, CW		23 dBm			
Storage temperature	Case	-25 °C, minimum +90 °C, maximum			
Impedance		50 Ω			
Warranty		One year, typical			

Mechanical dimensions



Ordering information

Models

BSXPCI3EQ	PCIe3 CLTE 3 dB, 6 dB (2 each) (SMA)
BSXPCI4EQ	PCIe4 CTLE 3 dB, 6 dB (2 each) (2.92mm)

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