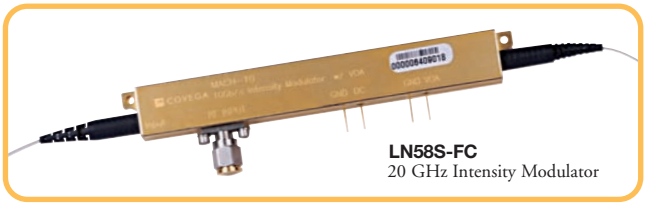
20 GHz Low V_π Analog Intensity Modulator



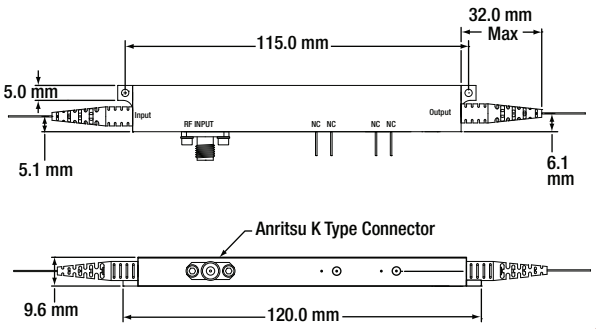
LN58S-FC
20 GHz Intensity Modulator

The LN58S Analog Intensity Modulator from Thorlabs Quantum Electronics (TQE) is a high-frequency, analog intensity modulator for use in the 1550 nm window. This innovative, single-ended drive modulator is based on Mach-Zehnder interferometric architecture, which uses Z-cut titanium-indiffused $LiNbO_3$. It is designed for ease of system integration to benefit customers developing high-speed analog modulation systems.

The LN58S offers a very low drive voltage (V_π < 3.9 V at 20 GHz) while supporting 20 GHz operating frequencies, making it well-suited for fiber optic antenna remoting and microwave photonics.

The LN58S is packaged in a hermetic housing with a K-connector RF input signal port and PM and SM fiber pigtails on the device input and output, respectively. This modulator is offered with FC/PC connectors. For more information on custom configurations (i.e., fiber type, connectorization, etc.) and quotes, please contact Technical Support.

20 GHz Modulator Package Drawing



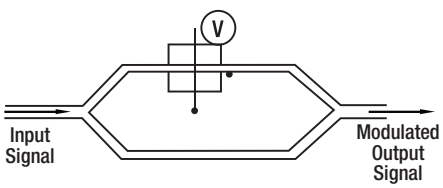
ITEM #	LN58S		
Parameter	Min	Typical	Max
Operating Wavelength*	1525 nm	–	1605 nm
Optical Insertion Loss (Connectorized)	–	–	5.5 dB
Vπ at 20 GHz	–	3.5 V	3.9 V
Vπ at DC	–	1.5 V	2.0 V
Optical On/Off Extinction Ratio	20 dB	–	–
Optical Return Loss	40 dB	–	–
S11 (DC to 20 GHz)	–	-12 dB	-10 dB
Insertion Loss Variation (EOL**)	-0.5 dB	–	–
Operating Case Temperature	0 °C	–	70 °C
Storage Temperature	-40 °C	–	85 °C

*The modulator is designed for use in the 1550 nm window. Using the modulator at another wavelength may cause a temporary increase in loss that is not covered under warranty.
** End of Life

Mach-Zehnder Modulator Operation

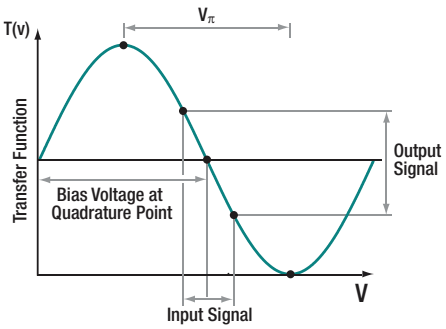
Applying a voltage across one arm of the Mach-Zehnder modulator shifts the phase of the signal through that arm by an amount proportional to the voltage applied. If the phase shift equates to an integral number of wavelengths, the two beams will combine constructively, and the intensity of the output power will be at its maximum. If the phase shift is a half wavelength out of phase, the two beams will combine destructively and the output power will be at its minimum.

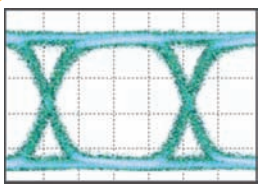
Schematic Diagram of a Mach-Zehnder Modulator



Mechanical Drawings Available on the WEB

Transfer Function of a Mach-Zehnder Modulator





The display of a receiver "Eye Pattern" is a convenient graphical method to indicate the data signal quality produced by the communications channel. As one of the first elements in the communication channel, the modulators from Thorlabs Quantum Electronics (TQE), have been Telcordia GR-468-CORE qualified for use in communication systems.

The image is an example "Eye Pattern" produced by a TQE Modulator, showing the oscilloscope trace at the receiver of a two-level modulation scheme such as an "On-Off-Keying" (OOK) signal.

ITEM #	$	£	€	RMB	DESCRIPTION
LN58S-FC	$ 5,250.00	£ 3,780.00	€ 4.567,50	¥ 41,842.50	20 GHz Low V_π Intensity Modulator, FC/PC Connectors