

## 40 GHz Phase and Intensity Modulators



**LN05S**  
40 GHz Intensity Modulator

The LN05S, LN27S, and the LN66S are 40 Gb/s Modulators manufactured by Covega, Thorlabs Quantum Electronics. These three revolutionary, Titanium-indiffused Z-cut Lithium Niobate, high-performance optical modulators were designed for ease of system integration; they offer large bandwidths and are ideal for developing high-speed modulation systems.

The LN05S intensity modulator with external DC bias is a high-performance 40 GHz (40 Gb/s) modulator that has a single-ended drive configuration with a fixed chirp coefficient of  $\pm 0.7$  and an industry-leading low RF drive voltage.

The LN05S has a Mach-Zehnder interferometric architecture with external DC bias, ideal for both NRZ and RZ data format solutions.

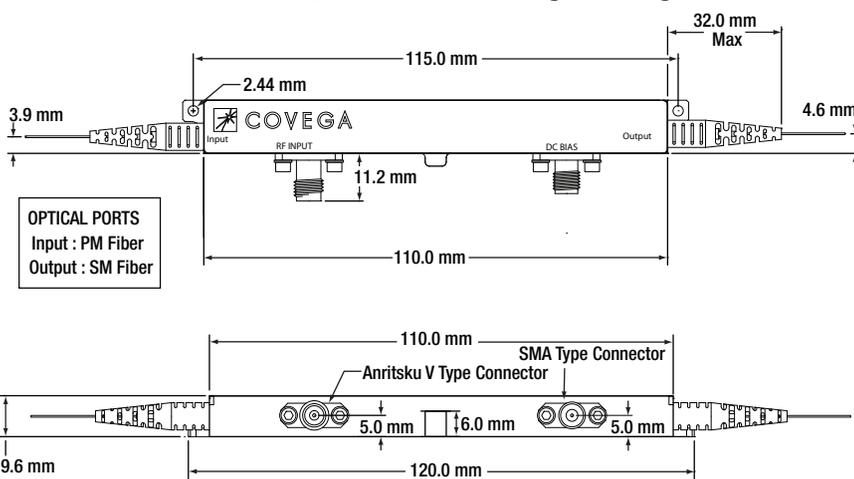
The LN27S and the LN66S are high-performance 40 GHz (40 Gb/s) phase modulators, allowing for chirp control in high-speed data communications; these modulators, which can support data rates up to 43 Gb/s, are also ideal for applications in coherent communications, sensing, all-optical frequency shifting, and data encryption. The LN27S and LN66S modulators both offer internal RF terminations, but the LN27S also offers an optical polarizer not included with the LN66S.

ITEM#	Parameter	Symbol	LN05S			LN27S / LN66S		
			Min	Typ	Max	Min	Typ	Max
	E/O Bandwidth (-3 dB)	$f_{c-3dB}$	30 GHz	35 GHz	–	30 GHz	35 GHz	–
	Bit Rate Frequency	$f_{BR}$	–	40 Gb/s	–	–	40 Gb/s	–
	Optical On/Off Extinction Ratio	E.R.	–	20 dB	–	N/A	N/A	N/A
	Optical Extinction Ratio (PRBS)		–	13 dB	–	N/A	N/A	N/A
	Optical Insertion Loss (Connectorized)	I.L.	–	4.0 dB	5.0 dB	–	4.0 dB	5.0 dB
	Insertion Loss Variation (EOL)	$\Delta I.L.$	-0.5 dB	–	0.5 dB	-0.5 dB	–	0.5 dB
	Optical Return Loss		40 dB	–	–	40 dB	–	–
	Operating Wavelength	$\lambda$	1525 nm	–	1605 nm	1525 nm	–	1605 nm
	S11 (DC to 10 GHz)		–	-12 dB	-10 dB	–	-12 dB	-10 dB
	S11 (30 GHz to 40 GHz)		–	-10 dB	-8 dB	–	-10 dB	-8 dB
	RF Drive Voltage (PRBS)	$V_{PRBS}$	–	5.5 V	–	–	5.5 V	–
	$V_{\pi}$ @ DC		–	5.5 V	6.0 V	–	5.5 V	6.0 V
	Operating Case Temperature		0 °C	–	70 °C	0 °C	–	70 °C
	Storage Temperature		-40 °C	–	85 °C	-40 °C	–	85 °C
	V-Connector		RF Signal			RF Signal		
	SMA Connector		DC Bias Voltage			Not Used / No Connect		

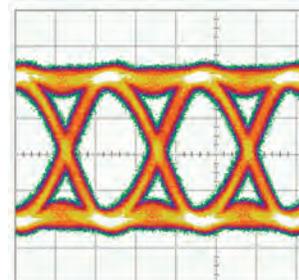
All three modulators are based on Z-cut Titanium-indiffused LiNbO<sub>3</sub> and are hermetically packaged in a dual-port housing with PM and SM fiber pigtailed on the device input and output, respectively. The fiber pigtailed are connectorized with FC/PC and SC/PC connectors.

Please note that polarization-maintaining fiber and a full range of connectorization options are available for all Lithium Niobate Modulators. Contact our Technical Support Team for assistance and details.

### 40 GHz DQPSK Modulator Package Drawing



Please refer to our website for complete models and drawings.



The image above is an example “Eye Pattern” produced by Thorlabs Quantum Electronics’ Modulators showing the oscilloscope trace of a two-level modulation scheme such as an “On-Off-Keying” (OOK) signal. The modulators have been Telcordia GR-468-CORE qualified for use in communication systems.

ITEM#	\$	£	€	RMB	DESCRIPTION
LN05S-FC	\$ 4,850.00	£ 3,363.00	€ 4,306.00	¥ 40,954.00	40 GHz Intensity Modulator, FC/PC Connectors
LN05S-SC	\$ 4,850.00	£ 3,363.00	€ 4,306.00	¥ 40,954.00	40 GHz Intensity Modulator, SC/PC Connectors
LN66S-FC	\$ 4,350.00	£ 3,016.00	€ 3,862.00	¥ 36,732.00	40 GHz Phase Modulator without Polarizer, FC/PC Connectors
LN66S-SC	\$ 4,350.00	£ 3,016.00	€ 3,862.00	¥ 36,732.00	40 GHz Phase Modulator without Polarizer, SC/PC Connectors
LN27S-FC	\$ 4,350.00	£ 3,016.00	€ 3,862.00	¥ 36,732.00	40 GHz Phase Modulator with Polarizer, FC/PC Connectors
LN27S-SC	\$ 4,350.00	£ 3,016.00	€ 3,862.00	¥ 36,732.00	40 GHz Phase Modulator without Polarizer, SC/PC Connectors